March 30, 1943. S. SIMONSON 2,314,954

CAR CONSTRUCTION

Filed Sept. 22, 1941

FIG. 1.

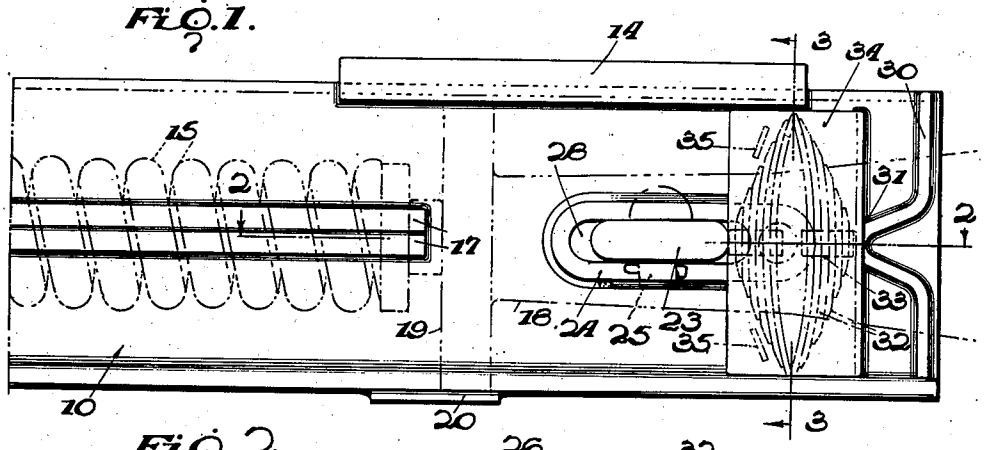
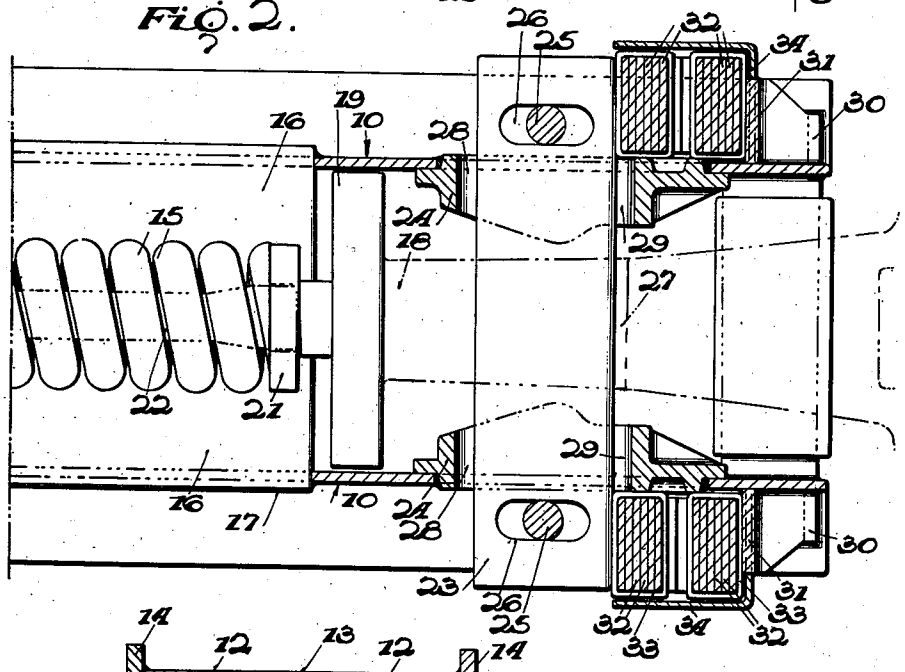


FIG. 2.



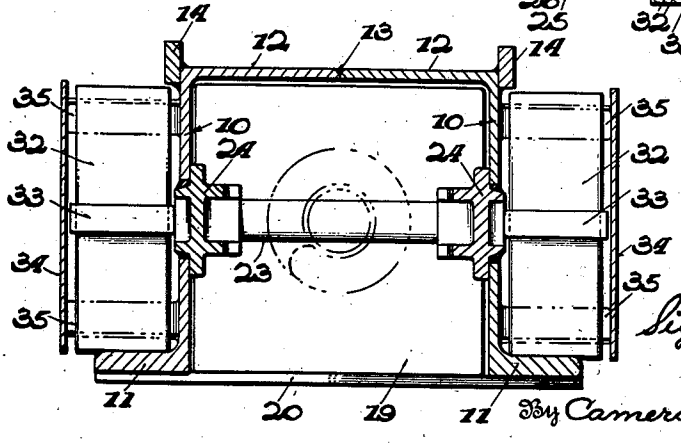


FIG. 3.

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UNITED STATES PATENT OFFICE

2,314,954

CAR CONSTRUCTON

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Application September 22, 1941, Serial No. 411,925

12 Claims. (Cl. 213—8)

This invention relates to railway car underframes of the Duryea type which provide long travel for resisting draft and buffing shocks with low forces, together with train slack predetermined independently of and preferably shorter than said long travel.

In a form well known in practice the Duryea underframe comprises a draft and buffing column which extends substantially the length of the car body and is longitudinally movable relative thereto, and car couplers which are mounted at the ends of the column for movement of limited extent relative thereto. The car body is cushioned against draft and buffing shocks by suitable cushion gears interposed between it and the column, these gears comprising various types of spring and friction devices and having relatively long travel to provide low forces. On the other hand, the shorter relative movement between the couplers and the column is also cushioned by suitable coupler cushioning means. For example, in underframes such as typified by the patent to Otho C. Duryea No. 1,693,194, coupler cushion springs separate from the long travel cushion gears are provided. In other constructions, such as typified by the patent to Otho C. Duryea No. 1,904,294, the long travel cushion gear springs are disposed between the bolster and the couplers and are arranged so that their initial compression cushions the limited movement of the couplers relative to the column and their further compression cushions the greater movement of the column relative to the car body.

In the constructions shown in the above patents, and usually in practice as well, movement of the couplers relative to the column has been provided only in an inward direction, i. e., in buff only. However, it has also been proposed, where desirable, to permit a limited amount of outward movement of the couplers relative to the column on draft, and the present invention is directed particularly to underframes of the latter type.

One of the objects of the invention is to provide novel means for cushioning outward movement of the couplers relative to the column on draft.

Another object is to provide means as characterized in the preceding object which may be used in conjunction with either of the above types of the Duryea underframe which are illustrated by Patents Nos. 1,693,194 and 1,904,294.

A further object is to provide such means in a form which can be added to or incorporated in Duryea underframes without substantial modification of their design or operation in other respects heretofore shown to be satisfactory in service and accepted by the art.

A still further object is to provide such means in a form which is simple and inexpensive, easy to install, capable of ready replacement, and at the same time reliable and effective in operation.

One embodiment of the invention has been illustrated in the accompanying drawing, which shows by way of example a part of a Duryea underframe of that type illustrated by Patent No. 1,904,294, but it is to be expressly understood that said drawing is for purposes of illustration only and is not to be taken as a definition of the limits of the invention, reference being had to the appended claims for this purpose.

In the drawing,

Fig. 1 is a side elevation of one end of an underframe embodying the invention;

Fig. 2 is a plan view in section on the line 2—2 of Fig. 1; and

Fig. 3 is a vertical section on the line 3—3 of Fig. 1.

In the particular underframe construction used as an example herein, the draft and buffing column comprises a pair of Z-sections 10 having their lower horizontal flanges 11 turned outwardly and their upper horizontal flanges 12 turned inwardly and welded together along the line 13. It will be understood that this column preferably extends substantially the length of the car body (not shown) and is mounted in any suitable manner for longitudinal movement relative thereto as disclosed in the patents referred to above. Thus the bars 14 which are welded along the upper edges of the column comprise part of the means which have been employed heretofore for supporting and guiding the column in its longitudinal movement.

The coil spring 15 within the column forms part of a suitable long travel cushion gear for cushioning the relative movement between the column and the car body. The operation of such gears will be understood from the patents referred to above, as well as from other patents such as the patent to Otho C. Duryea No. 2,238,163 and from the copending application of William A. Bierman and Sigvard Simonson, Serial No. 400,466 filed June 30, 1941. Any suitable means, such as those disclosed in these prior patents, may be used for supporting the spring 15 within the column. For purposes of example, however, the drawing shows a spring housing which is disclosed and claimed in a copending application and which, briefly described, com-

prises dished or arcuate housing members 16 surrounding the spring with their edges 17 projecting through and welded in slots in the webs of the members 10.

The coupler butt 18 extends into the draft and buffing column and engages a follower plate 19 supported by a plate 20 secured to the flanges 11 of the column, inward movement of the coupler being transmitted through the follower plate 19 to the head 21 of the spring link 22 and compressing the spring 15. A coupler key 23 extends through a slot in the coupler shank and through aligned openings in the members 10 which are defined by the ribs 24, said key being retained in position by pins 25 in slots 26 at its opposite ends. The slot in the coupler shank is longer than the width of the key 23 as indicated by the space 27, and the openings in the draft and buffing column are also longer than the width of the key, as indicated by the spaces 28 and 29.

With the parts in the normal position shown in the drawing, and assuming a buffing force is applied, the coupler can move inwardly relative to the key due to the space 27 and the coupler and key can also move inwardly together relative to the column due to the spaces 28. Hence train slack is provided on buff, its extent being limited by the engagement of the follower plate 19 with the outer end of the spring housing 16, and such inward movement of the coupler relative to the draft and buffing column being cushioned by the initial compression of the spring 15. Any further inward movement of the coupler and column together relative to the car body is cushioned by further compression of the spring. It will be understood that except for the spaces 29, the purpose of which is described hereinafter, the construction and operation described above are merely illustrative of the typical construction and operation of the Duryea underframe and that the invention can be embodied in any of the other forms of this underframe as indicated above.

When a draft force is applied to the coupler, on the other hand, the coupler and key move outwardly together relative to the column due to the spaces 29, and such relative outward movement of the coupler is cushioned independently of the cushioning spring 15 by suitable resilient means interposed between the coupler and the column. Preferably and as shown, these resilient means are interposed between the ends of the key 23 and suitable abutments on the draft and buffing column and are thus disposed on the outer sides of the members 10 where they do not interfere in any way with the construction or operation of the underframe as described above.

In the form shown for purposes of illustration, said abutments are conveniently provided by plates 30 suitably secured to the members 10 as by welding and bent intermediate their ends to provide spring abutments 31, and the resilient means comprise elliptic springs 32 the leaves of which are held together by straps 33. These spring units may be supported in any suitable way, as by resting their lower ends on the lower horizontal flanges 11 of the draft and buffing column, and are preferably proportioned so that one of the straps 33 engages the abutment 31 and the other strap engages the adjacent end of the key 23. Accordingly when the coupler and key move outwardly relative to the column, such movement is cushioned by the compression of the spring units 32.

Any suitable housing means may be provided to insure retention of the springs 32 in operative position at all times, as when they are released on inward movement of the coupler and key. Preferably this end is accomplished by a substantially U-shaped housing means surrounding each spring unit with the ends of its legs secured to the draft and buffing column, said housing means being large enough to permit free operation of the spring as desired and being suitably slotted or otherwise formed to permit operative engagement between the spring unit and the key 23 and abutment 31. In the form shown, plates 34 are bent substantially at right angles so that each forms the bottom and one leg of a U-shaped housing, the leg having its end secured to the web of the adjacent member 10 in any suitable manner as by welding and being slotted to fit around the spring abutment 31. The other leg of each housing may then comprise bars or straps 35 which extend between and are welded at their ends to the plate 34 and the member 10, said bars being spaced on either side of the key 23. The housings thus substantially surround the spring units and retain them in position.

It will thus be seen that a simple and inexpensive means is provided for cushioning outward movement of the coupler relative to the draft and buffing column. The design and construction of this means is such as to facilitate installation and assembly and at the same time to avoid any substantial alteration or modification of the design and operation of the Duryea underframes as heretofore known and used in practice. Moreover, constructions embodying the invention can readily be applied to or incorporated in any of the several types of Duryea underframes referred to above.

While only one embodiment of the invention has been described and illustrated in the drawing, it is to be expressly understood that this embodiment is for purposes of illustration only and that various changes may be made in the design, details of construction and arrangement of the parts without departing from the spirit of the invention. Reference should therefore be had to the appended claims for a definition of the limits of the invention.

What is claimed is:

1. In a railway car, a draft and buffing column movable longitudinally relative to the car body and comprising spaced parallel members, a coupler extending inwardly between said members, means connecting said coupler with said column for inward and outward movement of limited extent relative thereto and including a key extending through said members, means for cushioning said relative inward movement of said coupler, and resilient means disposed on the outer side of each member and interposed between it and the adjacent end of said key for cushioning said relative outward movement of said coupler.

2. In a railway car, a draft and buffing column movable longitudinally relative to the car body and comprising spaced parallel members, a coupler extending inwardly between said members, means connecting said coupler with said column for inward and outward movement of limited extent relative thereto and including a key extending through said members, means for cushioning said relative inward movement of said coupler, and an elliptic spring disposed on the outer side of each member and interposed between it and the adjacent end of said key for

cushioning said relative outward movement of said coupler.

3. In a railway car, a draft and buffing column movable longitudinally relative to the car body and comprising spaced parallel members, a coupler extending inwardly between said members, means connecting said coupler with said column for inward and outward movement of limited extent relative thereto and including a key extending through said members, means for cushioning said relative inward movement of said coupler, resilient means disposed on the outer side of each member and interposed between it and the adjacent end of said key for cushioning said relative outward movement of said coupler, and housing means secured to each member for retaining said resilient means in position.

4. In a railway car, a draft and buffing column movable longitudinally relative to the car body and comprising spaced parallel members, a coupler extending inwardly between said members, means connecting said coupler with said column for inward and outward movement of limited extent relative thereto and including a key extending through said members, means for cushioning said relative inward movement of said coupler, an elliptic spring disposed on the outer side of each member and interposed between it and the adjacent end of said key for cushioning said relative outward movement of said coupler, and housing means secured to each member for retaining said springs in position.

5. In a railway car, a draft and buffing column movable longitudinally relative to the car body and comprising spaced parallel members, a coupler extending inwardly between said members, means connecting said coupler with said column for inward and outward movement of limited extent relative thereto and including a key extending through said members, means for cushioning said relative inward movement of said coupler, an abutment on the outer face of each member, and resilient means interposed between each abutment and the adjacent end of said key for cushioning said relative outward movement of said coupler.

6. In a railway car, a draft and buffing column movable longitudinally relative to the car body and comprising spaced parallel members, a coupler extending inwardly between said members, means connecting said coupler with said column for inward and outward movement of limited extent relative thereto and including a key extending through said members, means for cushioning said relative inward movement of said coupler, an abutment on the outer face of each member, resilient means interposed between each abutment and the adjacent end of said key for cushioning said relative outward movement of said coupler, and housing means retaining said resilient means in juxtaposition with said abutments.

7. In a railway car, a draft and buffing column movable longitudinally relative to the car body and bolsters and comprising spaced parallel members, a coupler extending inwardly between said members, means connecting said coupler with said column for inward and outward movement of limited extent relative thereto and including a key extending through said members, spring means interposed between said coupler and the adjacent bolster for cushioning inward movement of said coupler relative to said column and further inward movement of said coupler and column together, and resilient means disposed on the outer side of each member and interposed between it and the adjacent end of said key for cushioning outward movement of said coupler relative to said column.

8. In a railway car, a draft and buffing column movable longitudinally relative to the car body and bolsters and comprising spaced parallel members, a coupler extending inwardly between said members, means connecting said coupler with said column for inward and outward movement of limited extent relative thereto and including a key extending through said members, spring means interposed between said coupler and the adjacent bolster for cushioning inward movement of said coupler relative to said column and further inward movement of said coupler and column together, and an elliptic spring disposed on the outer side of each member and interposed between it and the adjacent end of said key for cushioning outward movement of said coupler relative to said column.

9. In a railway car, a draft and buffing column movable longitudinally relative to the car body and bolsters and comprising spaced parallel members, a coupler extending inwardly between said members, means connecting said coupler with said column for inward and outward movement of limited extent relative thereto and including a key extending through said members, spring means interposed between said coupler and the adjacent bolster for cushioning inward movement of said coupler relative to said column and further inward movement of said coupler and column together, a spring disposed on the outer side of each member and interposed between it and the adjacent end of said key for cushioning outward movement of said coupler relative to said column, and housing means secured to each member for retaining said springs in position.

10. In a railway car, a draft and buffing column movable longitudinally relative to the car body and bolsters and comprising spaced parallel members, a coupler extending inwardly between said members, means connecting said coupler with said column for inward nad outward movement of limited extent relative thereto and including a key extending through said members, spring means interposed between said coupler and the adjacent bolster for cushioning inward movement of said coupler relative to said column and further inward movement of said coupler and column together, an abutment on the outer side of each member, a spring interposed between each of said abutments and the adjacent end of said key for cushioning outward movement of said coupler relative to said column, and housing means retaining said springs in juxtaposition with said abutments.

11. In a railway car, a draft and buffing column movable longitudinally relative to the car body and bolsters and comprising spaced parallel members having outwardly extending bottom flanges adjacent their ends, a coupler extending inwardly between said members, means connecting said coupler with said column for inward and outward movement of limited extent relative thereto and including a key extending through said members, means for cushioning inward movement of said coupler relative to said column, an abutment on the outer side of each member, an elliptic spring unit disposed on the outer side of each member between said abutment and the adjacent end of said key for cushioning outward movement of said coupler relative to said column, said units being disposed vertically with their

lower ends supported by said flanges, and means for retaining said units in position on the outer sides of said members.

12. In a railway car, a draft and buffing column movable longitudinally relative to the car body and bolsters and comprising spaced parallel members having outwardly extending bottom flanges adjacent their ends, a coupler extending inwardly between said members, means connecting said coupler with said column for inward and outward movement of limited extent relative thereto and including a key extending through said members, spring means interposed between said coupler and the adjacent bolster for cushioning inward movement of said coupler relative to said column and further inward movement of said coupler and column together, an abutment on the outer side of each member, an elliptic spring unit disposed on the outer side of each member between said abutment and the adjacent end of said key for cushioning outward movement of said coupler relative to said column, said units being disposed vertically with their lower ends supported by said flanges, and means for retaining said units in position on the outer sides of said members.

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