Aug. 27, 1940. W. J. METZGER 2,212,843

DRAFT RIGGING

Filed March 8, 1938 3 Sheets-Sheet 1

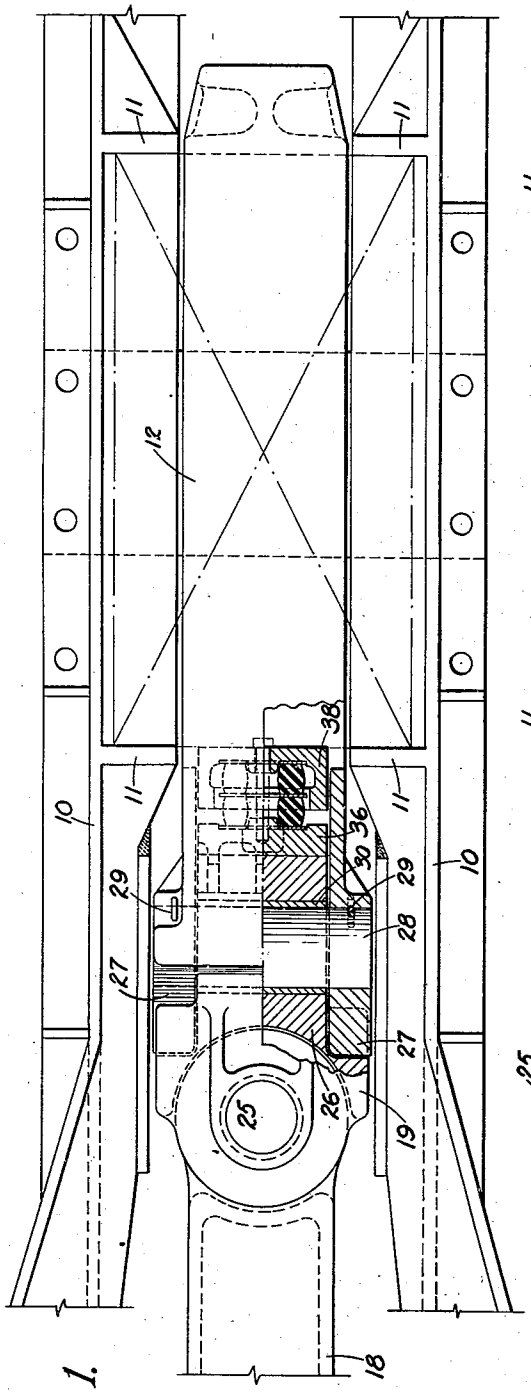


Fig. 1.

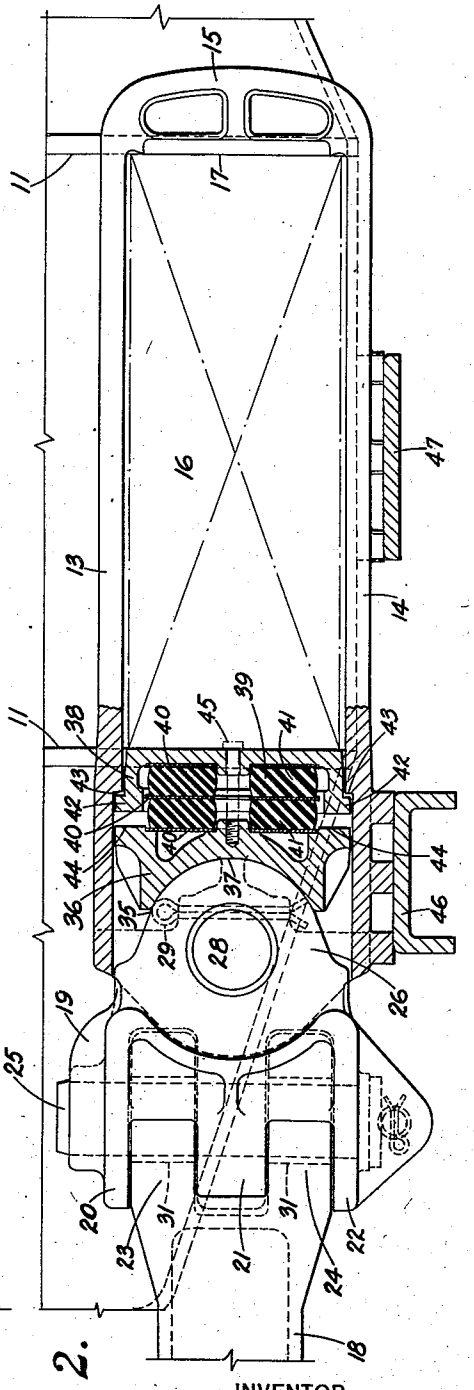


Fig. 2.

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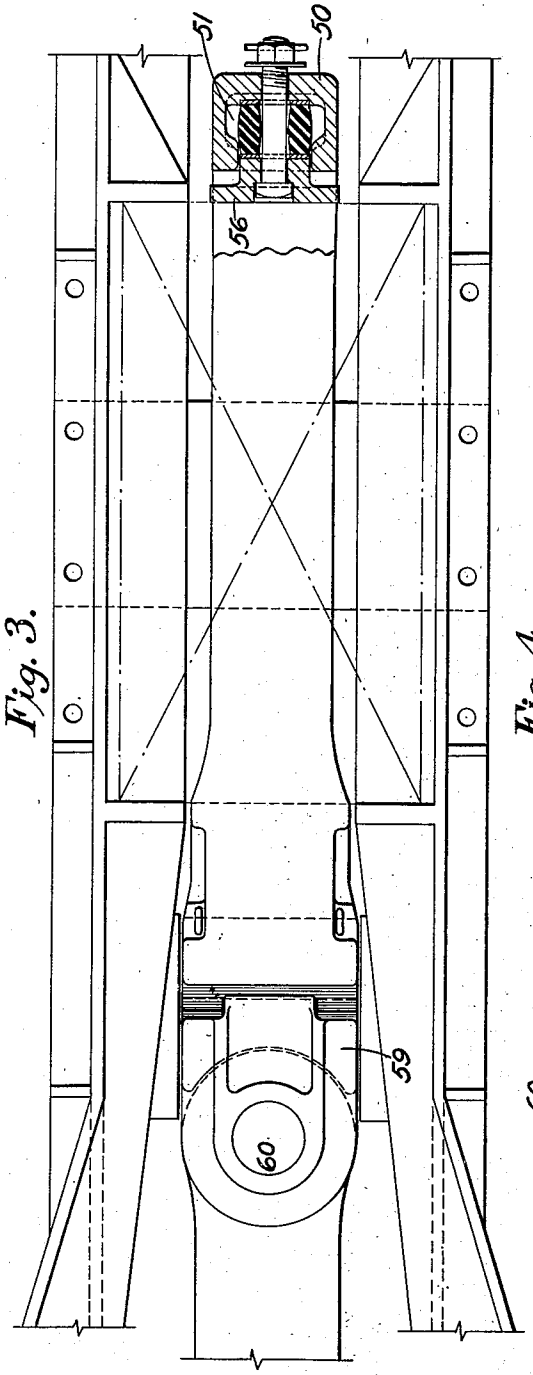


Fig. 3.

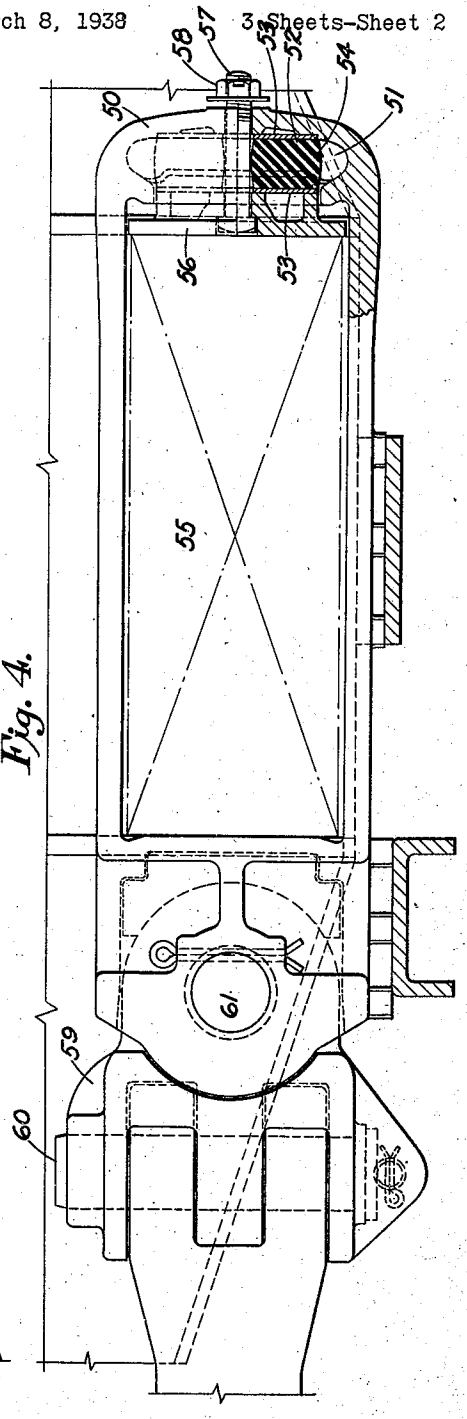


Fig. 4.

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Fig. 5.

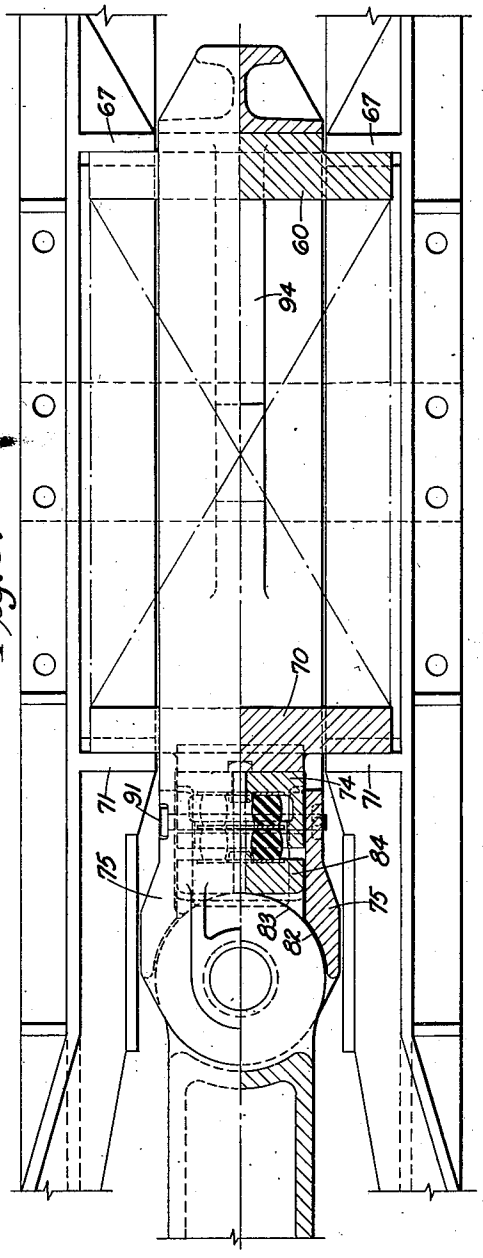
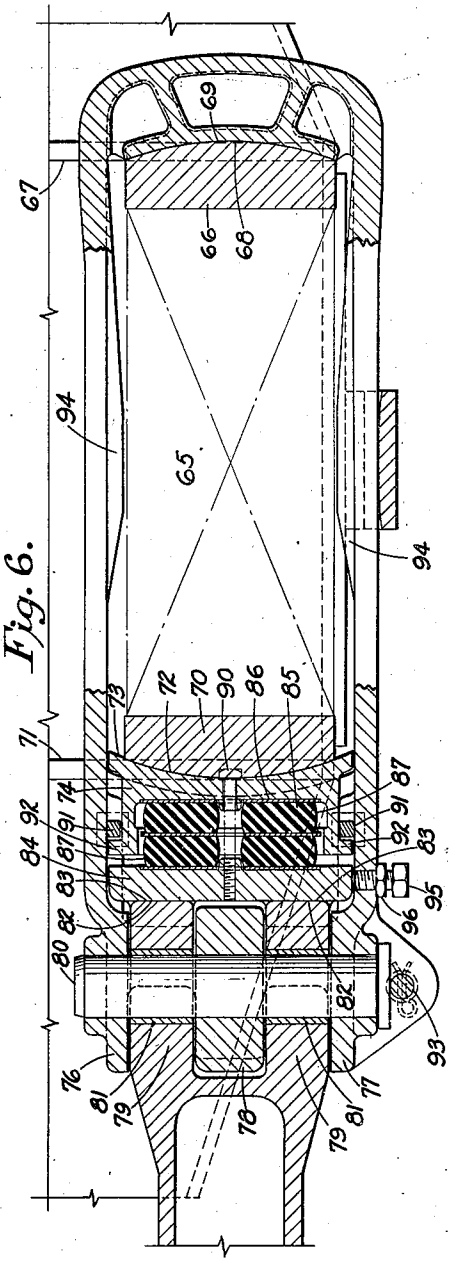


Fig. 6.



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DRAFT RIGGING

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Application March 8, 1938, Serial No. 194,538

3 Claims. (Cl. 213—64)

This invention relates to improvements in draft rigging and more particularly to an arrangement for maintaining the draft gear in tight engagement with the abutments in the yoke and at the same time permitting the draft gear to expand so as to normally engage the associated draft lugs.

The present trend in railway equipment and more particularly that used in passenger service is toward the elimination of slack in the draft rigging. In the usual form of yoke it is virtually impossible to maintain the tolerances close enough to enable the draft gear to engage the draft lugs and the abutments at each end of the yoke at the same time. Furthermore, the cost of maintaining these close tolerances in the rough castings employed would be prohibitive.

My invention has for an object the provision of means positioned at one end or the other of the draft gear and within the yoke, permitting the draft gear to expand until it engages the draft lugs. At the same time a movable stop forming one of the abutments in the yoke assures a tight fit of the draft gear in the yoke. Another object of my invention is to provide in addition to the foregoing advantages, an arrangement that eliminates the slack from the connection between the coupler shank and yoke, and which also compensates for wear of the parts so that slack cannot develop in service.

These and other objects and advantages of my invention will be more fully understood from the following detail description taken in conjunction with the drawings, in which:

Figure 1 is a plan view partly in horizontal section, showing an embodiment of my invention.

Figure 2 is a view in elevation, partly in vertical section of the arrangement shown in Fig. 1.

Figure 3 is a horizontal view partly in section, showing another embodiment of my invention.

Figure 4 is a view in elevation, partly in vertical section of the device shown in Fig. 3.

Figure 5 is a view partly in plan and partly in horizontal section showing a still further embodiment of my invention; and

Figure 6 is a vertical sectional view of the arrangement shown in Fig. 5.

In Figs. 1 and 2 the center sills 10 have associated therewith the usual draft lugs 11 between which is positioned a yoke 12. The yoke is formed with upper and lower arms 13 and 14, respectively, joined at their rear ends by a vertical wall 15. The draft gear 16, shown in dot-dash lines, is positioned in the yoke between arms 13 and 14 and engages abutment 17 at the forward end of wall 15. The ends of the draft gear engage the lugs or stops 11 on the center sills. The yoke shown in Figs. 1 and 2 has attached thereto a coupler shank 18 adapted to swivel both in a horizontal and in a vertical plane. The member 19 formed with forwardly extending arms 20, 21 and 22 receives the rearwardly extending projections 23 and 24 of the coupler shank. A vertical pin 25 extends through aligned openings in the aforesaid arms on member 19 and the shank to pivotally join said member and shank for relative movement in a horzontal plane. If desired, bushings 31 may be inserted in the openings in projections 23 and 24. Extending rearwardly from member 19 is a projection 26 which is positioned between forwardly extending arms 27 of the yoke. A pin 28 pivotally joins projection 26 and arms 27 for relative pivotal movement in a vertical plane. Preferably, pin 28 is held from pivotal movement relative to the yoke by means of pins 29, and the opening in projection 26 is lined with a bushing 30 so that wear is taken on the bushing and pin rather than on the yoke.

Between the vertically curved surface 35 on the rear of projection 26 and the forward end of the gear is interposed means forming a forward abutment for the draft gear in the yoke. A block 36 has a front surface 37 corresponding in curvature to surface 35 on member 26. Between blocks 36 and 38 is a resilient unit 39 comprising a group of metal plates 40 with rubber elements 41 therebetween. As shown in Figs. 1 and 2, elements 41 are under initial compression, preferably less than the initial compression of draft gear 16, so that the draft gear may compress unit 39 and expand to the full extent necessary for a tight fit between stop lugs 11. Moreover, the initial compression in unit 39 will urge block 36 forwardly to take up any slack that might be present between the projection 26, pin 28 and the yoke. Block 38 is limited in its movement rearwardly with respect to the yoke by means of projections 42 at the top and bottom of the block which may engage stops 43 on the yoke. It will be observed that there is clearance between the forward surface of projections 42 and adjacent surfaces 44 on block 36 so that blocks 36 and 38 may move closer together than is shown in Figs. 1 and 2 to take care of even greater variations in the distance between the stop lugs.

Buffing blows are transmitted from the coupler shank through pin 25 to block 19 and thence to block 36. The resilient unit 39 is compressed during this action until surfaces 44 on block 36 engage adjacent surfaces on block 38. Preferably, the

pressure travel characteristics of unit 39 are such that the draft gear starts to compress before the aforesaid engagement of adjacent surfaces on blocks 36 and 38. Thus, the resilient unit 39 provides a cushioned preliminary action during buffing movements which gradually builds up resistance to a buffing blow until the beginning of compression of the draft gear, and thus avoids any sudden shock that might be caused by direct engagement of the coupler shank and the draft gear. Draft stresses are transmitted from the coupler shank to the yoke through pins 25 and 28, and during this movement block 38 moves away from the draft gear but cannot become displaced from operative engagement due to contact between projections 42 with stops 43 on the yoke.

In assembling the parts with the yoke, the resilient unit and blocks 36 and 38 are held together by a bolt 45, shown in dot-dash lines, threaded into an opening in the rear of block 36, and the assembly is then slid into the forward end of the yoke. Either before or after insertion of the above members in the yoke, bolt 45 is tightened to compress the resilient unit, thus providing sufficient clearance between surfaces 35 and 37 to permit assembly of member 19 and pin 28 with the yoke. The draft gear is next inserted part way into the yoke after which bolt 45 is removed and the draft gear forced through the yoke to the position shown in Fig. 1. The draft rigging as a whole may then be inserted between the sills and supports 46 and 47 secured in place to hold the parts in position.

As has been previously stated, resilient unit 39 is under initial compression when in operative position which maintains block 36 in engagement with projection 26 of member 19. Moreover, block 38 may move forwardly or rearwardly, within the limits of surfaces 43 and 44 to compensate for variations in the spacing of the draft lugs. If lugs 11 are closer together than shown in Fig. 1, block 38 will be moved rearwardly by the resilient means until it contacts the draft gear, and if the lugs are farther apart the draft gear will move block 38 forwardly, compressing the resilient means. Under all conditions the slack will be eliminated.

Referring to Figs. 3 and 4 the resilient unit is shown positioned at the rear end of the yoke. In this embodiment the vertical wall 50 is formed with a recess 51 which receives rubber unit 52. Only two plates 53 and a single piece of rubber 54 are shown but it will be understood that any number of plates and rubber pieces may be used to obtain the desired pressure travel characteristics of the unit. Between the forward end of unit 52 and the rear of draft gear 55 is a block 56 which forms the rear abutment for the draft gear in the yoke. Bolt 57 and nut 58 are used to compress the rubber unit to facilitate assembly of the draft gear in the yoke. After the draft gear has been inserted, nut 58 is released so as to allow the rubber unit to force block 56 forwardly so as to be in tight engagement with the draft gear. It will be observed that normally clearance is maintained between the nut and yoke so as to permit expansion of the resilient unit when that is necessary to take up slack. The coupler shank and yoke connection at the forward end of the yoke is quite similar to that shown in Figs. 1 and 2, an intermediate block 59 being pivotally joined to the coupler shank by pin 60 and to the yoke by pin 61 to provide pivotal movement in horizontal and vertical planes between the coupler shank and yoke. However, if desired, any other type of coupler shank and yoke connection may be used in this embodiment of my invention.

Inasmuch as block 56 may move forwardly or rearwardly with respect to the yoke it will adjust itself to compensate for variations in the spacing of the draft lugs in a manner similar to the form of the invention shown in Figs. 1 and 2. However, if the lugs are spaced farther apart than is shown in Figs. 3 and 4, block 56 will move rearwardly with respect to the yoke and conversely lugs spaced closer together will cause the resilient means to force block 56 forwardly until it engages the draft gear.

In this embodiment of the invention there will be a preliminary cushioning action in draft due to the fact that the resistance of the rubber unit, when the parts are in normal position, is less than the initial compression of the draft gear.

In Figs. 5 and 6 there is shown an arrangement in which vertical angling takes place between the yoke and draft gear. At the rear end of draft gear 65 is a follower block 66 engaging rear stop lugs 67. The central part of block 66 is formed with a curved surface 68 engaging a correspondingly curved surface 69 at the rear end of the yoke. Likewise, at the forward end of the draft gear is a follower block 70 engaging front stops 71 and formed with a curved surface 72 engaging a correspondingly curved surface 73 on a movable front abutment 74. At the forward end of the yoke, side walls 75 are joined intermediate top wall 76 and bottom wall 77 by a wall 78, forming spaces receiving the rearwardly extending arms 79 of the coupler shank. A vertical pin 80 extends through openings in the walls and arms of the yoke and coupler shank to pivotally join the shank and yoke for movement in a horizontal plane. The openings in arms 79 of the coupler shank are preferably provided with bushings 81 which may be replaced when wear takes place. The rear ends of arms 79 are curved concentric with pin 80, as at 82, and engage correspondingly curved surfaces 83 on the front of a block 84. Between blocks 74 and 84 is positioned a resilient unit 85 formed of plates 86 and interposed rubber elements 87. The purpose of the rubber unit is the same as in the preceding embodiments and it provides a tight fit between the yoke and draft gear, at the same time permitting the draft gear to expand sufficiently to normally engage the front and rear stop lugs 71 and 67, respectively. In assembling the parts shown in Figs. 5 and 6, the rubber unit 85 and block 74 may be placed in position in the yoke and a bolt 90 (shown in dot-dash lines) threaded through an opening in block 84 to force blocks 74 and 84 toward each other to compress the rubber unit until pins 91 can be inserted through openings in walls 75 of the yoke, which pins would then lie in front of projections 92 on block 74. In lieu of the above described assembly operation, blocks 74 and 84 and rubber unit 85 may be assembled outside of the yoke and inserted as a unit, after which pins 91 may be placed in position. With the rubber unit still compressed the coupler shank can be assembled with the yoke, and vertical pin 80 inserted in the openings in the shank and yoke. A horizontal pin 93 beneath the pin 80 serves to maintain the latter in position. Before the draft gear is assembled in the yoke, bolt 90 must be removed due to the fact that surface 72 on the follower projects forwardly from the stop lug engaging por-

tions thereof, and it would be impossible to remove the bolt if an attempt were made to insert the followers and draft gear with the bolt in place. Preferably, therefore, the draft gear is held in compressed position sufficient to enable insertion thereof, along with followers 66 and 70, in the yoke.

It will be noted that the cooperating curved surfaces on the yoke and followers permit vertical angling of the yoke relative to the draft gear. Ribs 94 project inwardly from the upper and lower arms of the yoke, and taper from the center toward the ends thereof to position the yoke with regard to the draft gear and to maintain proper clearance therebetween for the vertical angling.

As it is sometimes desired to change a coupler, I have provided means for readily accomplishing such change without removing the yoke and draft gear from between the sills. Bolt 95 in the lower arm of the yoke is first screwed tightly against follower 84, forcing the same against the top wall of the yoke until the follower is held rigidly in position. The coupler shank may then be changed after first removing pin 80 and the new shank inserted. Bolt 95 prevents the rubber which is under compression from moving the follower forwardly to such a point as to prevent alignment of the openings in the coupler shank and yoke when the shank is being changed. A lock nut 96 normally prevents the loss of bolt 95 when the latter is not in use.

It will thus be apparent that my invention provides effective means for maintaining the draft gear tight in the yoke and at the same time permits the draft gear to expand into proper engagement with the draft lugs on the car center sills. The resilient units under compression also take up within the limit of their initial compression any wear or lost motion that may occur in the associated part of the draft rigging. These units will also compensate for a loss in the initial compression of the draft gear itself.

While I have shown a resilient unit either at the front or rear of the yoke, my invention also contemplates a construction wherein a resilient unit is placed both at the front and rear of the yoke.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described or portions thereof, but recognize that various modifications are possible within the scope of the invention claimed.

What I claim is:

1. In a railway draft rigging, a yoke, a draft gear in said yoke, a coupler, an intermediate member pivotally connecting said coupler to said yoke for relative angular movement in a vertical plane, said member having a vertically curved rear surface, abutment means in said yoke, said means comprising an element in engagement with said member having a forward surface corresponding in curvature with said first mentioned surface and an element engaging said draft gear, and resilient means interposed between said elements.

2. In a railway draft rigging a yoke having walls at the forward end thereof forming a box-section, a draft gear in said yoke, rigid abutment means in the rearward portion of said yoke, resilient abutment means in said box-section guided by said walls, said resilient abutment means projecting rearwardly from said box-section and adapted to engage said draft gear to provide a tight fit of said draft gear in said yoke, each of said means having vertically curved surfaces to permit vertical angling of said yoke with respect to said draft gear.

3. In a railway draft rigging a yoke, a draft gear in said yoke, stop lugs adjacent said draft gear, abutment means in said yoke including a member adapted to move longitudinally thereof, resilient means urging said member into engagement with said draft gear, said means being constructed and arranged to move a limited amount in either direction longitudinally of said yoke to permit said draft gear to engage said stop lugs while maintaining a tight fit between said draft gear and the abutment means in said yoke, and said abutment means and draft gear having vertically curved surfaces adapted to permit vertical angling of said yoke without disturbing the engagement between said draft gear and stop lugs.

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