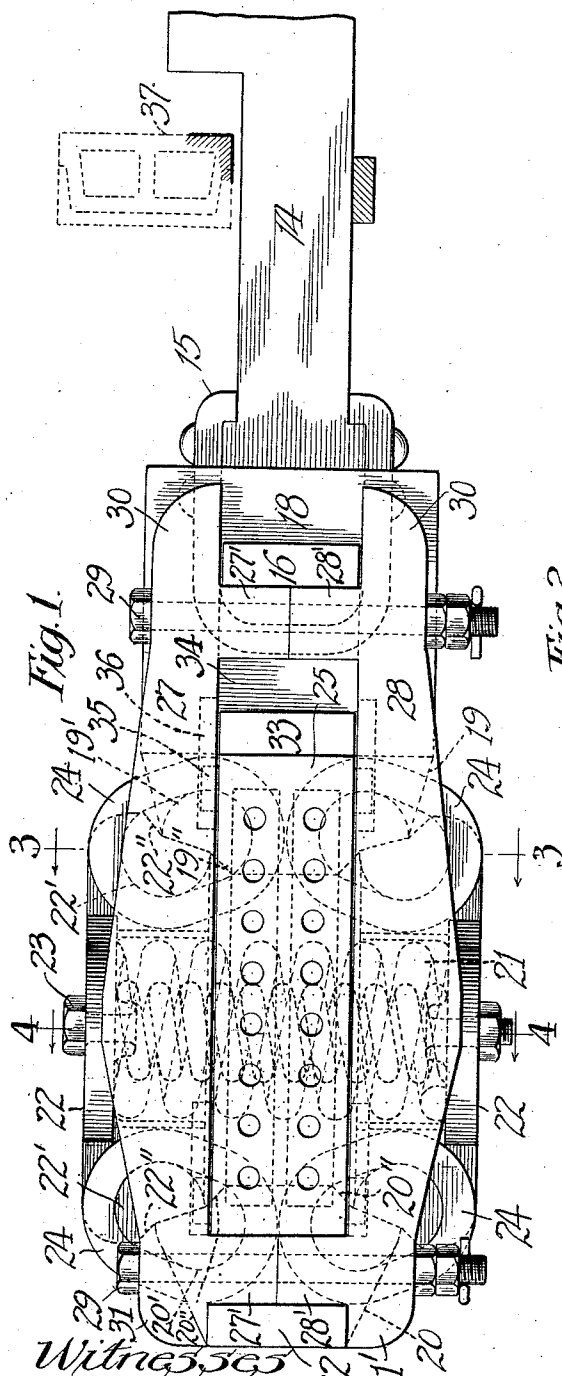


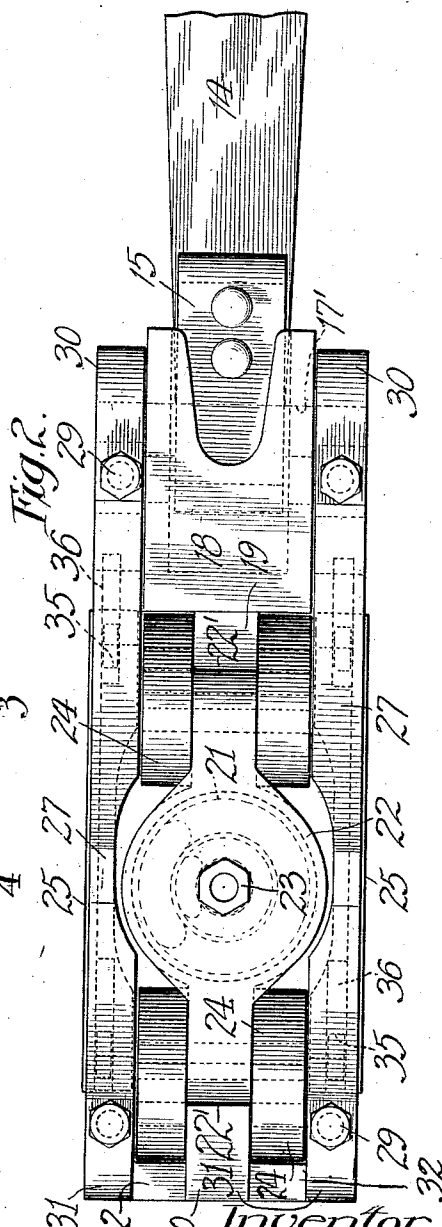
APPLICATION FILED JAN. 23, 1908.

Patented Oct. 17, 1911.

3 SHEETS—SHEET 1.



Witnesses  
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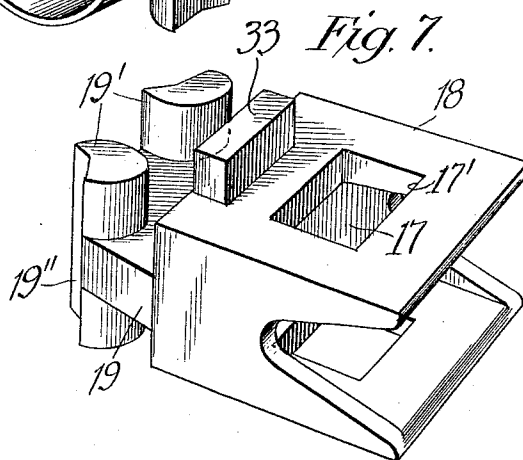
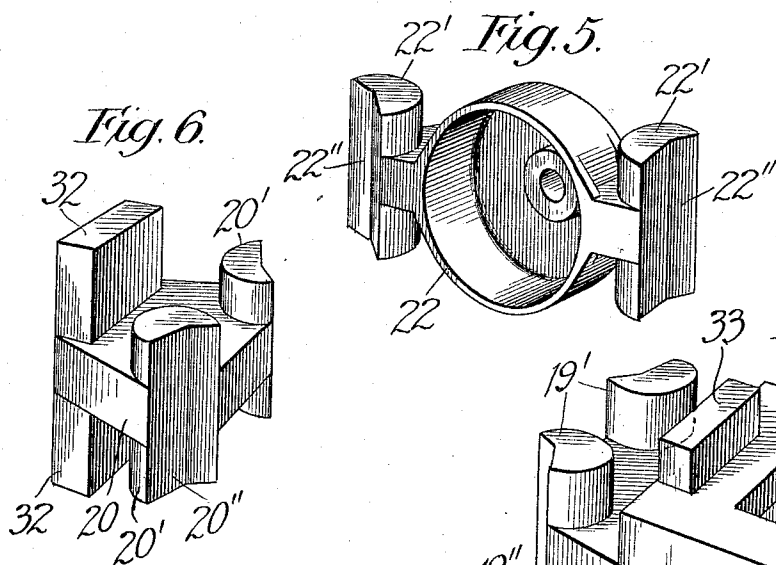
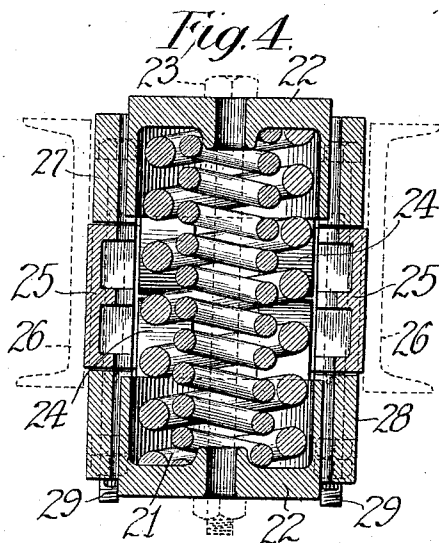
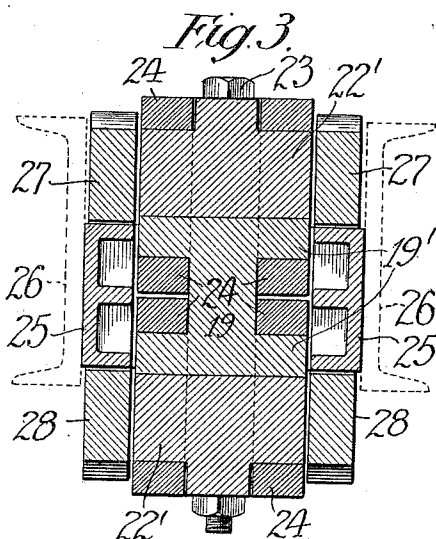
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1,006,120.

Patented Oct. 17, 1911.

3 SHEETS—SHEET 2.



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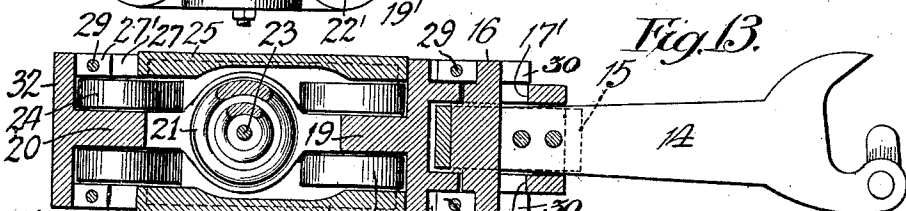
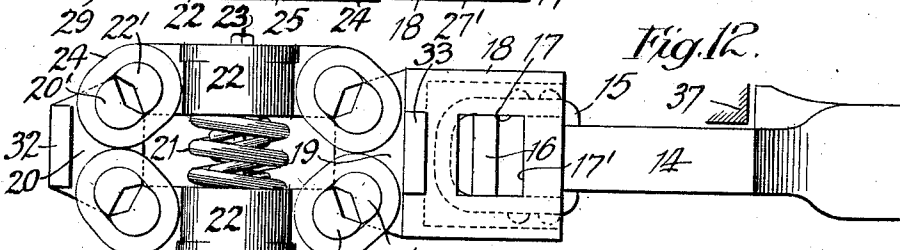
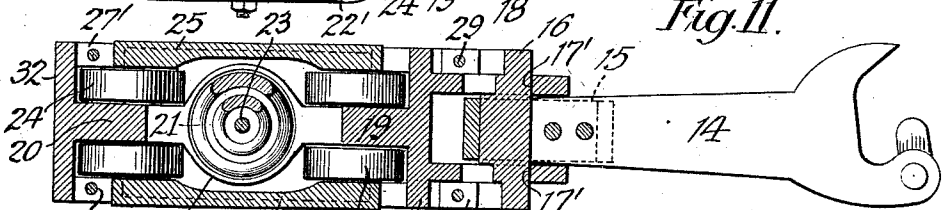
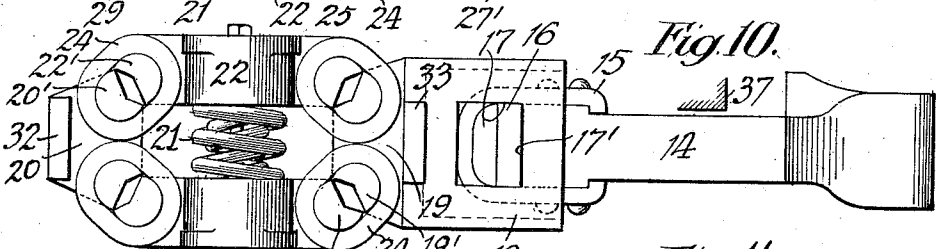
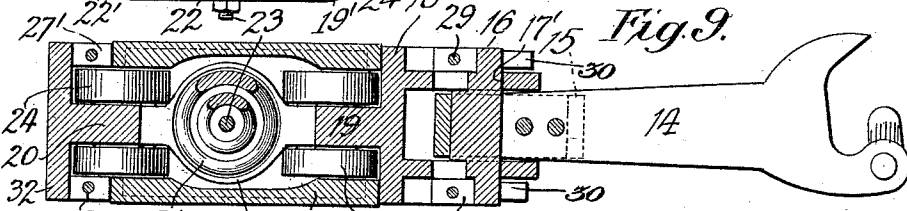
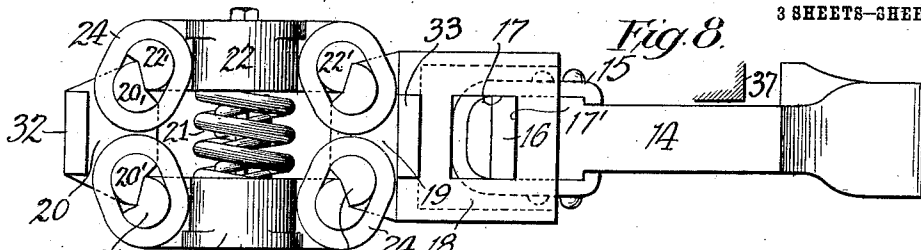
DRAFT GEAR.

APPLICATION FILED JAN. 23, 1908.

1,006,120.

Patented Oct. 17, 1911.

3 SHEETS—SHEET 3.



Witnesses  
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# UNITED STATES PATENT OFFICE.

ALBERT E. NOBLE, OF ANNISTON, ALABAMA.

## DRAFT-GEAR.

1,006,120.

Specification of Letters Patent.

Patented Oct. 17, 1911.

Application filed January 23, 1908. Serial No. 412,242.

*To all whom it may concern:*

Be it known that I, ALBERT E. NOBLE, a citizen of the United States, residing at Anniston, in the county of Calhoun and State of Alabama, have invented new and useful Improvements in Draft-Gears, of which the following is a specification.

The object of this invention is to provide an improved draft gear for railway cars which will more effectually absorb the shocks, jars, concussions and sudden strains to which cars are subjected in service than has been done by the draft gears heretofore used, so far as I can ascertain.

Further objects of the invention are to provide a draft gear of strong, substantial and compact construction, consisting of few parts which can be readily assembled and applied to a car, and which can be manufactured at low cost; also to provide a draft gear which will increase the resistance to the coupler movement as the coupler travels relative to the car; to apply the principle of the toggle joint to a draft gear and employ a spring in an upright position to resist the action of the toggles; to connect the coupler to the front end of the draft gear and thereby reduce the lateral strains on the car, the wear on the wheel flanges and the transverse shearing strains on the coupler fastenings; and to absorb a large part, if not all, of the sudden shocks given to a coupler before the inertia of the car is overcome.

The invention has other objects in view which will appear hereafter in a detailed description of the accompanying drawings, showing one embodiment of the invention, and in which—

Figure 1 is an elevation showing my invention. Fig. 2 is a top plan view. Figs. 3 and 4 are transverse sectional views on the lines 3—3 and 4—4, respectively, of Fig. 1. Figs. 5, 6 and 7 are perspective views, respectively, of a spring cap, the back lug and the front lug. Fig. 8 is an elevation, with the compression bars and cheek plates removed, showing the gear in normal position. Fig. 9 is a horizontal central sectional view, with the compression bars and cheek plates present, of the gear in normal position.

Figs. 10 and 11 are views similar, respectively, to Figs. 8 and 9, showing the gear in position with the coupler in tension. Figs. 12 and 13 are views similar, respectively, to Figs. 8 and 9, showing the gear in position with the coupler in compression.

Referring to the drawings, 14 designates the coupler to which a yoke 15 is suitably attached. This yoke carries a tail plate 16 which projects laterally through openings 17 in a housing 18 on the front lug 19. This front lug 19 and the back lug 20 (Figs. 7, 6) are provided with two pairs of laterally projecting pivot studs 19', 20', and these studs have a portion 19'' and 20'' of the true circle removed for a purpose hereafter described. A spring 21 has its ends inclosed in caps 22 (Figs. 4, 5) and these caps carry pivot studs 22' which also have a portion 22'' of the true circle removed. To facilitate the assembling of the parts the caps are secured in place on the spring by a bolt 23 and when these parts are assembled in proper position relative to the front and back lugs the pivot studs on the caps will engage the pivot studs on the lugs in the manner shown in Figs. 1 and 8. Toggle links 24 are engaged with these pivot studs to connect the spring caps with the front and back lugs, and these links can be made very short because the cut-out portions of the pivot studs permit each pair of studs to overlap, as shown in Figs. 1 and 8.

Cheek plates 25, forming guides and supports for the gear, are suitably supported on the sills 26 of the car frame, and compression bars 27 and 28 are connected together above and below the cheek plates by bolts 29. These compression bars have projections 27' and 28' which abut against each other to space the bars apart, and the bolts pass through said projections. Extensions 30 at the forward end of the compression bars constitute guides for the tail plate 16 which projects therebetween, as shown in Figs. 9, 11 and 13. Extensions 31, 31' at the back end of the compression bars (Fig. 1) guide and support the back lug 32, the lateral wings of which (Fig. 6) rest upon extensions 31'. The front lug 33 also has lateral wings, located on the housing (Fig.

7) which project through the openings 34 (Fig. 1) between the upper and lower compression bars and the projections thereon. The compression bars move longitudinally and relatively to the cheek plates and the latter are provided with guide studs 35 which project into the guide grooves 36 on the compression bars (Figs. 1, 2). The ends of the tail plate 16 are arranged to engage the abutting projections 27' and 28' which constitute the front end of the compression bars (Figs. 1, 9, 13). While one spring may be sufficient I have shown two springs, one within the other, in the drawings to provide a resistance to the movement of the toggles.

In assembling the parts, the yoke attached to the coupler is inserted in the housing of the front lug and the tail plate is slipped into place in the yoke, its ends projecting through the side openings in the housing. The caps are fastened on the ends of the spring by the bolt 23 and the spring is compressed so that the links can be readily applied to the pivot studs to connect the caps with the front and back lugs. The upper compression bars are arranged on the cheek plates, the previously assembled parts are placed in position between the cheek plates, the lower compression bars are arranged beneath the cheek plates and bolted to the upper compression bars to secure the gear in operative position. Then the bolt 23 is loosened and the spring expanding draws the back lug against the back end of the compression bars and the latter against the back end of the cheek plates, the front lug against the front end of the cheek plates, and the tail plate in contact with the front end of the compression bars and the front wall 17' of the side openings in the housing.

In the drawings, the end sill of the car is indicated by 37 and Figs. 1, 2, 8 and 9 show the parts in normal position with the cut-out portions of the pivot studs in engagement.

In Figs. 10 and 11, the gear is shown under a pulling strain applied to the coupler. As the tail plate is in engagement with the front wall 17' of the side openings in the housing in normal position a pulling strain on the coupler will be transmitted through the tail plate and the yoke to the front lug to move the front lug forward in unison with the coupler. The back lug, in the normal position of the gear, is in engagement with the back ends of the compression bars and the latter are in engagement with the back ends of the cheek plates so that the back lug will be prevented from moving forward with the front lug under a pulling strain applied to the coupler. Therefore the links will swing on the pivot studs to move the cap plates inwardly toward each

other and compress the spring, and this compression increases, and consequently the resistance afforded by the spring against the toggle motion increases, as the forward movement of the coupler proceeds. A pulling strain on the coupler is applied to the car at the back end of the cheek plates.

In Figs. 12 and 13 the gear is shown under a compression strain applied to the coupler. As the coupler moves backward, under a compression strain, it carries with it the tail plate which engages the front end of the compression bars and forces them back to move the back lug backward. The front lug is then in engagement with the front end of the cheek plates and is thus prevented from backward movement so that the links are swung on the pivot studs to compress the spring as heretofore explained. A compression strain on the coupler is applied to the car at the front end of the cheek plates.

My invention comprises only a comparatively few parts of strong and substantial construction which can be easily assembled and applied in operative position. The construction is such that the resistance afforded by the spring to the strains applied to the coupler is automatically increased in an increasing ratio to the degree of the strain, by means of toggle motion. The invention also provides for absorbing a large part of sudden shocks given to the coupler before the inertia of the car is overcome and the construction of the pivot studs, cut-away to overlap each other, enables the use of very short links to provide the toggle joints in compact form. By connecting the coupler to the front end of the draft gear, as herein shown and described, transverse shearing strains on the yoke fastening, lateral strains on the car and wear on the wheel flanges due to lateral strain on the coupler are greatly reduced.

What I claim and desire to secure by Letters Patent is:

1. In a draft-gear, the combination with a coupler, of a spring, a pair of members between which said spring is disposed, and oscillatory connecting means between each end of said members and the coupler for transmitting the longitudinal movement of the coupler in either direction to said members to compress the spring disposed between them whereby the strain applied to the coupler is yieldingly resisted.

2. In a draft-gear, the combination with a coupler, of a plurality of movable members adapted to receive a spring between them, a spring disposed between the members, and oscillatory link and stud connecting means between said members and the coupler whereby longitudinal movement of the coupler in

either direction will compress the spring between the members to yieldingly resist the strain applied to the coupler.

3. In a draft-gear, the combination with a coupler, of a spring disposed transversely to the longitudinal axis of the coupler, a member operatively engaged with either end of the spring, and toggle joint connections between the ends of said members and the coupler whereby movement of the coupler in either direction will draw the members together against the force of the spring to yieldingly resist the strain applied to the coupler.

4. In a draft gear, the combination with a coupler, of a spring, and toggle joint means between the coupler and spring and engaging the ends of the spring for applying the longitudinal movement of the coupler in either direction to compress the spring in a direction transverse to the longitudinal axis of the coupler and in a constantly increasing ratio to the movement of the coupler to resist the strain applied to the coupler.

5. In a draft gear, the combination with a coupler, of a spring arranged transversely of the direction of movement of the coupler, a pair of cheek plates, and means comprising a toggle joint connection movable relatively to and guided on said cheek plates to apply the longitudinal movement of the coupler in either direction to compress the spring whereby the strain applied to the coupler is yieldingly resisted.

6. In a draft gear, the combination with a coupler, of a spring, a pair of cheek plates, and toggle joint means movable relatively to the cheek plates and limited in their movement in one direction by engagement with one end of the cheek plates and in the other direction by engagement with the other end thereof and adapted to compress the spring to resist the strain on the coupler.

7. In a draft gear, the combination with a coupler, of a spring, stationary cheek plates, and means comprising members movable transversely of the axis of the coupler, and permanently connected to said coupler by oscillatory connecting means and adapted to be operated by the coupler and movable between and relatively to the cheek plates to engage the end thereof opposing the direction of movement of the coupler and compress the spring to resist the strain on the coupler.

8. In a draft gear, the combination with a coupler, of a spring, a pair of cheek plates, and toggle means operated by the coupler to compress the spring to resist the strain on the coupler, said means being bodily movable relatively to the cheek plates and limited in said movement by engagement with an end of the cheek plates.

9. In a draft gear, the combination with a coupler, of a spring, a pair of cheek plates, and toggle means bodily movable relatively to said cheek plates and limited in said bodily movement in one direction by said cheek plates, said means being movable independently of said bodily movement to compress the spring to resist the strain on the coupler.

10. In a draft gear, the combination with a coupler, of a spring, a pair of stationary cheek plates, and toggle means bodily movable relatively to the cheek plates and limited in said movement in one direction by engagement with an end of the cheek plates, said toggle means being further movable after said bodily movement ceases to straighten the toggles and compress the spring to resist the strain on the coupler.

11. In a draft gear, the combination with a coupler, of a spring, caps at the ends of the spring, compression bars adapted to be moved longitudinally by and with the coupler, and means connected with said caps and operated by said compression bars for moving the caps to compress the spring to resist the strain on the coupler.

12. In a draft gear, the combination with a coupler, of a spring, caps at the ends of the spring, a pair of cheek plates, movable compression bars guided on said cheek plates and limited in their movement by said cheek plates, and means intermediate of the caps and compression bars for so transmitting the longitudinal movement of the bars to the caps to compress the spring that an increasingly yielding resistance is offered to the movement of the compression bars as they approach the limit of their movement in the direction in which the coupler is moved.

13. In a draft gear, the combination with a coupler, of a spring, caps at the ends of the spring, movable lugs on opposite sides of the spring, connections between said caps and lugs, said lugs being capable of a relative movement to compress the spring to resist the strain on the coupler in either direction.

14. In a draft-gear, the combination with a coupler, of a spring, caps at the ends of the spring, movable lugs on opposite sides of the spring, connections between said caps and lugs, and means for moving said lugs relatively to the caps to compress the spring to resist the strain on the coupler.

15. In a draft gear, the combination with a coupler, of a vertically arranged spring, caps at the ends of the spring, movable front and back lugs on opposite sides of the spring, connections between said caps and lugs, means for moving said lugs, and means for holding said lugs stationary, the back lug being stationary and the front lug movable under a pulling strain on the coupler, and

the front lug being stationary and the back lug movable under a compression strain on the coupler to compress the spring for resisting the strain on the coupler.

5 16. In a draft gear, the combination with a coupler, of a spring, caps at the ends of the spring, movable lugs on opposite sides of the spring, means normally engaged by the lugs for limiting the movement of said  
10 lugs toward each other, means connecting said caps and lugs, and means operated by the coupler on its longitudinal movement under a compression strain for moving one  
15 lug while the other remains stationary to compress the spring and resist the strain on the coupler.

17. In a draft gear, the combination with a coupler, of a spring, caps at the ends of the spring, movable lugs on opposite sides  
20 of the spring, cheek plates between said lugs and normally engaged thereby for limiting the movement of said lugs toward each other, means connecting said caps and lugs, and means operated by the coupler on its  
25 longitudinal movement under a pulling strain for moving one lug while the other remains stationary to compress the spring and resist the strain on the coupler.

18. In a draft gear, the combination with  
30 a coupler, of a spring, caps at the ends of the spring, lugs on opposite sides of the spring, link connections between the caps and lugs, and means operated by the coupler on its longitudinal movement in one di-  
35 rection for moving one of said lugs and means operated by the coupler on its longitudinal movement in the other direction for moving the other lug to compress the spring to resist the strain on the coupler.

19. In a draft gear, the combination with a coupler, of a spring, caps on the ends of the spring, lugs on opposite sides of the spring, stops for the lugs connections be-  
45 tween the caps and lugs, and compression bars adapted to be moved by and with the coupler for moving one of said lugs to produce an inward movement of the caps thereby compressing the spring to resist the strain on the coupler.

20. In a draft gear, the combination of a pair of lugs, stops for said lugs, a spring, caps on the ends of the spring, connections between the caps and lugs, said spring acting by expansion to hold said lugs normally  
55 in engagement with said stops, and a tail plate operated by and with the coupler to move one of said lugs while the other remains stationary and thereby produce an inward movement of the caps to compress  
60 the spring and resist the strain on the coupler.

21. In a draft gear, the combination with a coupler, of a spring, caps on the ends of

the spring, lugs on opposite sides of the spring, stops for the lugs connections be- 65  
tween the caps and lugs, compression bars having a limited play and engaged with and adapted to move one of said lugs to produce an inward movement of the caps, thereby compressing the spring to resist the 70  
strain on the coupler, and a tail plate actuated by the coupler on its longitudinal movement to engage and operate said compression bars.

22. In a draft gear, the combination with 75  
a coupler, of a spring, caps on the ends of the spring, lugs on opposite sides of the spring, stops for the lugs connections between said caps and lugs, compression bars movable longitudinally and adapted to move one of 80  
said lugs to produce an inward movement of the caps thereby compressing the spring to resist the strain on the coupler, and a tail plate operated by the coupler to engage and operate the other lug on the longitudinal 85  
movement in one direction of the coupler and to engage and operate said compression bars on the longitudinal movement of the coupler in the other direction.

23. In a draft gear, the combination with 90  
a coupler, of a spring, caps on the ends of the spring, lugs on opposite sides of the spring, contacting pivot studs on the caps and on the lugs, links embracing the studs on the lugs with the studs on the caps, and 95  
means for moving one of said lugs relative to the other to produce an inward movement of the caps thereby compressing the spring to resist the strain on the coupler.

24. In a draft gear, the combination with 100  
a coupler, of a spring, caps on the ends of the spring, lugs on opposite sides of the spring, stops for the lugs pivot studs on said caps and on said lugs, said studs being cut-away so that the studs on the caps will 105  
overlap the studs on the lugs, links connecting said studs, and means for moving one of said lugs to produce an inward movement of the caps thereby compressing the spring to resist the strain on the coupler. 110

25. In a draft gear, the combination with a coupler and a pair of stationary cheek plates, of a spring, caps on the ends of the spring, lugs on opposite sides of the spring and at opposite ends of the cheek plates, 115  
connections between the caps and lugs, movable compression bars guided on and limited in their movement by said cheek plates, one of said lugs engaging said compression bars, and a tail plate engaged with 120  
the coupler and adapted to operate said compression bars and said lug.

26. In a draft gear, the combination with a coupler and a pair of stationary cheek plates, of compression bars arranged above 125  
and below said cheek plates and movable

longitudinally thereon, the upper bars having projections to engage similar projections on the lower bars, bolts passing through the upper and lower bars through  
5 said projections to secure the bars together on the cheek plates, a spring located between the bars, caps on the ends of the spring, lugs located between the bars and at opposite ends of the cheek plates and flex-  
ibly connected to the caps, one lug being 10 engaged with the bars, and a tail plate operated by the coupler and engaged with the other lug and adapted to engage the compression bars.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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