

1,025,522.

G. H. FORSYTH.
DRAW BAR MECHANISM.
APPLICATION FILED APR. 20, 1903.

Patented May 7, 1912.

3 SHEETS-SHEET 1.

Fig. 1.

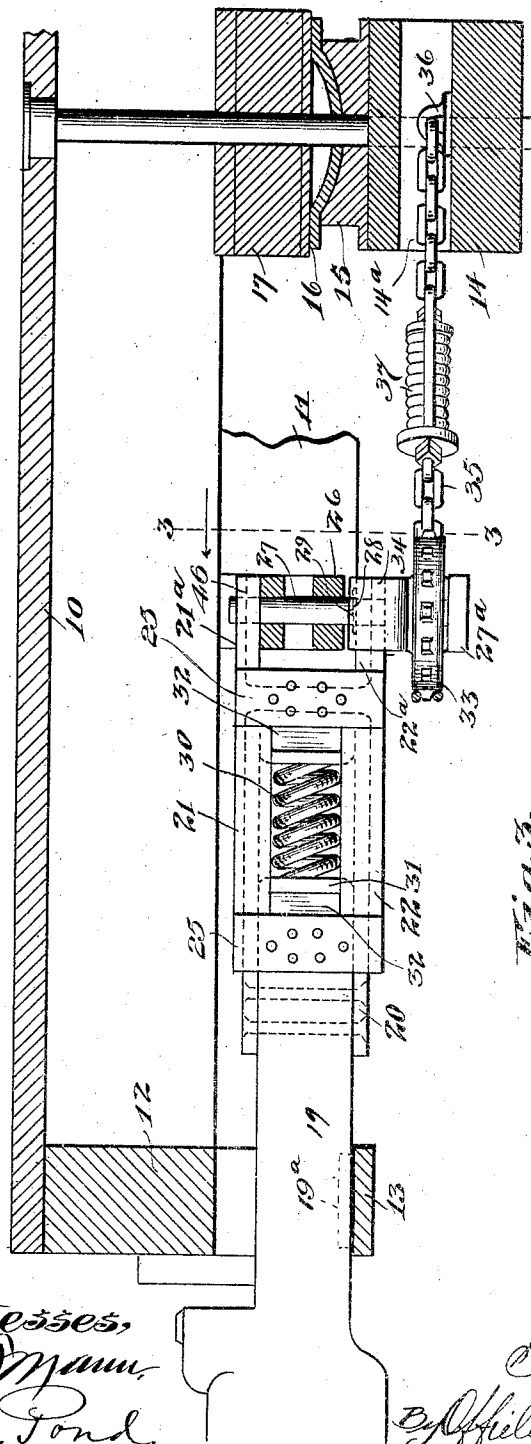
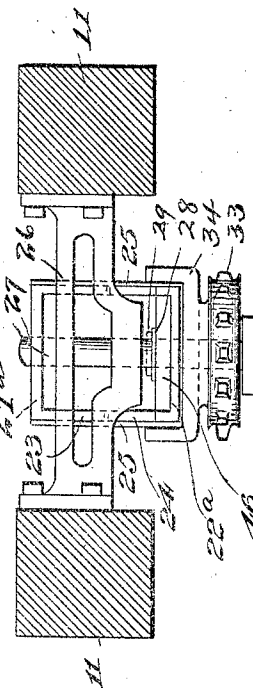


Fig. 3.



Witnesses,
J. M. Mann,
S. N. Pond

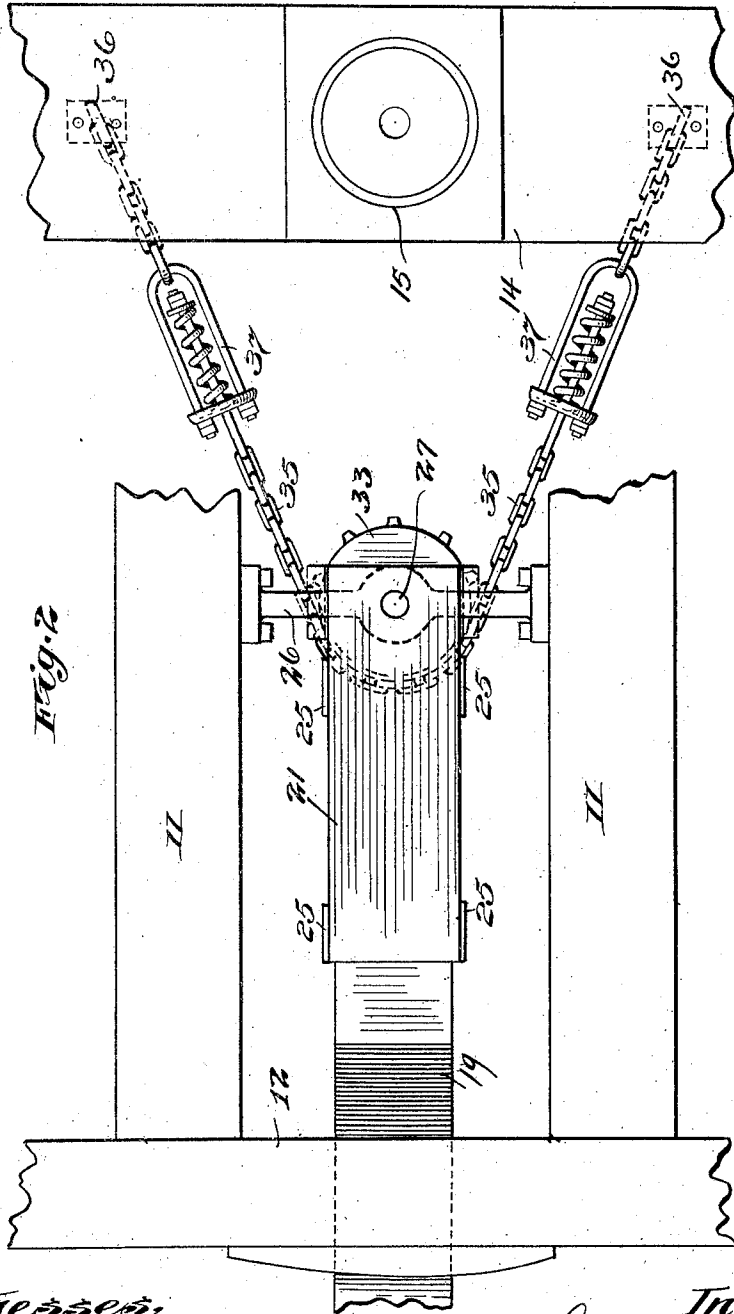
Inventor,
George H. Forsyth
Byfield, Fowler & Lathrop
Attys.

G. H. FORSYTH.
DRAW BAR MECHANISM.
APPLICATION FILED APR. 20, 1903.

1,025,522.

Patented May 7, 1912.

3 SHEETS-SHEET 2.



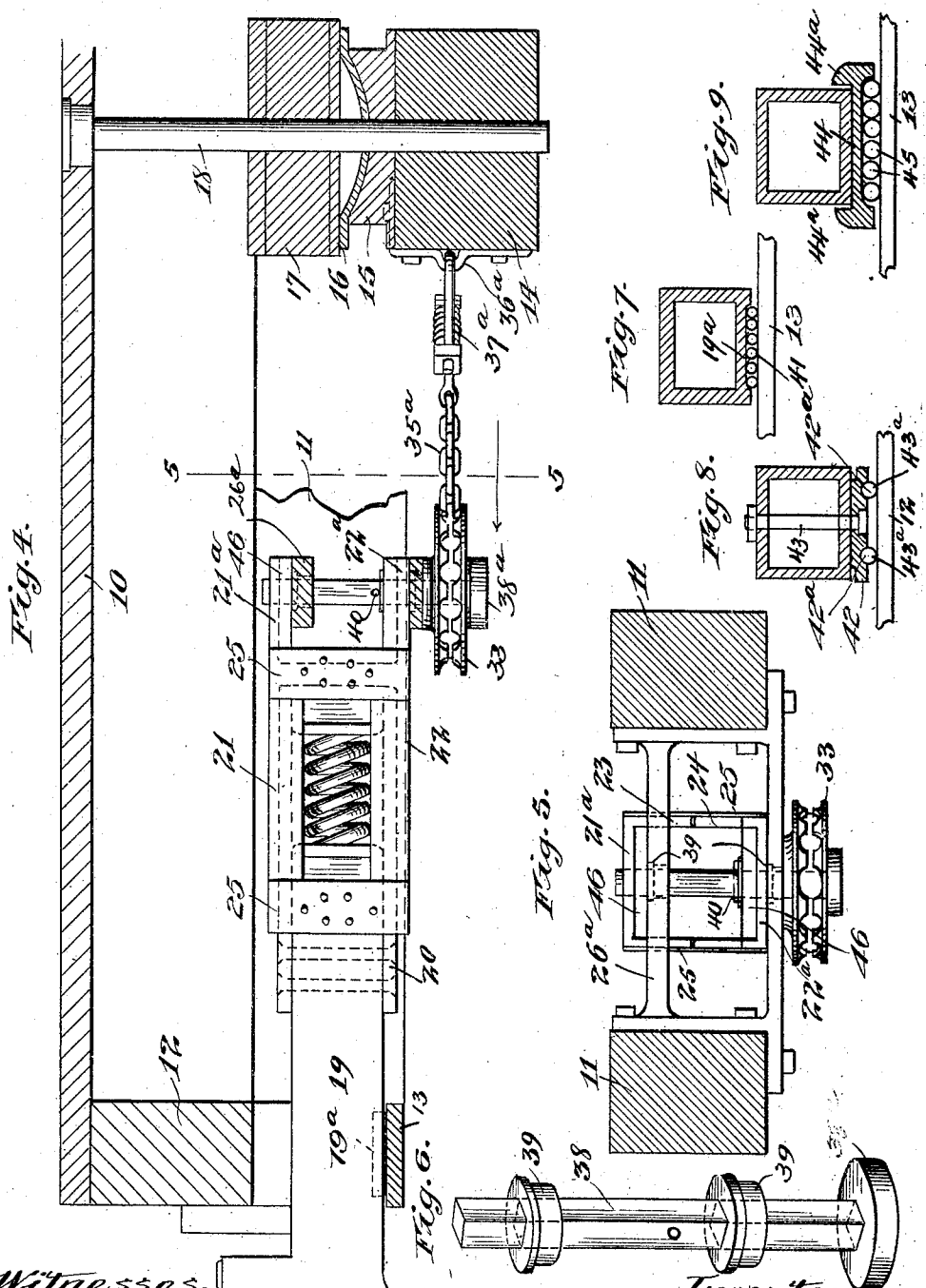
Witnesses,
J. D. Mann,
J. N. Pond.

Inventor,
George H. Forsyth
By Offield, Towle & Lindheim
Attys.

1,025,522.

Patented May 7, 1912.

3 SHEETS—SHEET 3.



Witnesses,
S. M. Mann,
S. N. Pond

Inventor,
George H. Forsyth
By *Offield, Bowls + Lathrop*
Attys.

UNITED STATES PATENT OFFICE.

GEORGE H. FORSYTH, OF CHICAGO, ILLINOIS.

DRAW-BAR MECHANISM.

1,025,522.

Specification of Letters Patent.

Patented May 7, 1912.

Application filed April 20, 1903. Serial No. 153,539.

To all whom it may concern:

Be it known that I, GEORGE H. FORSYTH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Draw Bar Mechanism, of which the following is a specification.

My invention relates to that class of railway appliances which relate to the draft rigging of railway cars, and more particularly such as have to do with the centering of the draw-bar mechanism.

The older forms of draw-bar centering devices consisted essentially of springs located on opposite sides of the draw-bar and operating, when the latter was deflected to one side or the other under the strains of draft, to automatically return the draw-bar to its central or otherwise normal position. More recent devices of this nature have taken the general form of a draw-bar pivotally connected to the car at a point coincident or substantially coincident with the longitudinal axis of the king-bolt, said bar being provided with rod connections from its opposite sides to the truck-bolster on opposite sides of the king-bolt, whereby the angular movement of the truck-bolster relatively to the car-body in passing around curves transmitted a corresponding angular swing of the draw-bar relatively to the central median line of the car-body, automatically maintaining the draw-bar thus at right-angles to the truck-bolster, this latter being a somewhat more favorable position for coupling purposes than that wherein the draw-bar is always maintained coincident with the longitudinal median line of the car, when the cars are uncoupled. The last described improvement however falls short of the most effective arrangement wherein the draw-bars of adjacent and uncoupled cars would be automatically maintained substantially coincident with the line of draft on all kinds and character of track; and in Patents Nos. 766,610 and 785,943, granted to me August 2, 1904 and March 28, 1905, respectively, I have shown, described and claimed means for effecting the last described result, such means embodying as its underlying principle of operation the imparting to the draw-bar of a lateral swing from the angular movement of the truck-bolster relatively to the car-body through connections which makes such an-

angular swing of the draw-bar greater in amount than the angular movement of the truck-bolster, such angular swing being proportional to the differences in degrees of curvature of the track; and the essential elements of such preferred means are disclosed as consisting of a pair of pulleys or sprocket-wheels of unequal sizes, the larger being rigidly connected to the truck-frame and the smaller to the car-body in advance of the truck-frame and a flexible connection between said pulleys, whereby a given angular movement of the larger pulley produces a larger angular movement of the smaller pulley and consequently of the draw-bar connected to the latter, and such excess being proportional to the degrees of curvature of the track.

While it is a desirable feature of such a mechanism to thus make the angular lead of the draw-bar over the truck-bolster proportional to varying degrees of curvature in the track in maintaining the draw-bar coincident with the line of draft, yet in practice it is not essential to the securing of satisfactory results that such exactness in the movements of the draw-bar be maintained; and I have found that the mechanism disclosed in the patents aforesaid may be considerably modified and simplified by eliminating the larger pulley on the truck-bolster and in place thereof connecting the ends of the chain or other flexible connection directly to the truck-bolster or other element of the truck-frame on opposite sides of the king-bolt and at distances from the latter exceeding the radii of the smaller pulley, such flexible connection being capable of attachment to the truck either in advance of or in a line coincident with the pivotal point about which the truck turns. Such a construction produces a lateral swing of the draw-bar which is in excess of the angular movement of the truck-bolster relatively to the body-bolster, although such excess is not directly proportional to the varying angular movements of the truck-bolster caused by passing over tracks of varying degrees of curvature.

In the accompanying drawings I have illustrated two slightly modified forms of mechanism in which my invention may be embodied; and referring thereto Figure 1 represents a side elevation of a draft rigging and draw-bar centering device constructed in accordance with my invention;

Fig. 2 is a top plan view thereof; Fig. 3 is a transverse vertical section on the line 3—3 of Fig. 1 looking in the direction of the arrow; Fig. 4 is a view similar to Fig. 1 illustrating a modified form of the invention. Fig. 5 is a transverse vertical section, similar to Fig. 3, on the line 5—5 of Fig. 4; Fig. 6 is a detail perspective view of the draw-bar pivot-bolt; and Figs. 7, 8 and 9 are detail cross-sectional views illustrating an anti-friction means for supporting the outer end of the draw-bar in the carry-iron.

Referring to the drawings, 10 designates the bottom or floor of the end portion of a railway car, and 11 the draft-timbers or beams, 12 the end sill, pendent from which latter is the usual carry-iron 13.

14 designates the truck-bolster, 15 the bottom center-plate mounted thereon, 16 the top center-plate, 17 the body-bolster, and 18 the king-bolt passing through said parts and pivotally connecting the center-plates.

19 designates the draw-bar, having extending inwardly from its rear end the usual strap or yoke 20. This yoke is surrounded and incased by a casing formed by a pair of oppositely-disposed channel-beams 21 and 22, the opposite side walls of which are cut out leaving at the opposite ends of said beams inwardly extending and meeting tongues 23 and 24, respectively, to the outer faces of which are bolted transverse tie-plates 25. The rear ends of the channel-beams are continued rearwardly in the form of upper and lower extensions 21^a and 22^a, respectively, which embrace the upper and lower faces of a support 26 rigidly bolted to and extending between the draft-timbers or beams 11. Between the channel-shaped extensions 21^a and 22^a and embracing the upper and lower faces of the support 26 is a U-shaped reinforcing piece 46. A round bolt 27 is passed from beneath through registering holes in the extensions 21^a and 22^a, interposed reinforcing piece 46, and support 26, said bolt having on its lower end an enlarged head 27^a and being retained in place by any suitable means, as, for instance, by a collar or washer 28 and a cotter-pin 29.

30 designates the draft and buffing spring located within the yoke, and at its opposite ends abutting against a pair of what I term follower-shells 31, these latter being simply castings or short sections of channel-iron cut to a suitable length to fit between the abbreviated side flanges of the channel-beams constituting the members of the casing, and 32 designates a pair of follower-blocks which are capable of being inserted laterally of the casing into operative position within the shells, the ends of said follower-blocks abutting against the inner edges of the tie-plates 25 and the inwardly-extending tongues or flanges of the chan-

nel-beams to which said tie-plates are secured. The last described draft-rigging mechanism is not claimed herein, but constitutes in part the subject-matter claimed in the aforesaid Patent, No. 785,943.

Referring now to the mechanism for automatically positioning the draw-bar, 33 designates a pulley, preferably in the nature of a sprocket-wheel, rotatably mounted on the lower end of the pivot-bolt 27 and resting upon the enlarged head of the latter. Secured to or formed integral with the upper face of the pulley 33 is a controller here-in shown as having the form of a saddle 34 so disposed as to lie across and seat the inner or rear end of the lower extension member of the yoke casing and having upwardly-extending walls which embrace and guide the sides of the latter. 35 designates a flexible pulley-actuating means, preferably a sprocket-chain, which engages the forward portion of the periphery of the pulley and at its rear ends is connected to the truck-bolster, entering mortises 14^a formed therein and engaging eyes or staples 36 so disposed as to be in a straight line with the axis of the king-bolt. Elastic sections 37 are preferably interposed in the parts of the chain 35 on either side of the pulley 33 to take up any slack that may be present.

The operation is as follows: When a car is passing from straight to curved track and vice versa, or over track of varying curvature, the truck-bolster 14 undergoes an angular movement relatively to the superposed car-body, whereby one end of the chain 35 is drawn rearwardly of the car-body relatively to the transverse plane of the king-bolt and the other end moves forwardly to an equal extent. Such longitudinal movement of the chain 35 sets up a partial rotation of the pulley 33, which latter, through the saddle 34, imparts a lateral angular movement to the draw-bar equal to the extent of angular movement of the pulley itself. This angular movement thus imparted to the draw-bar, by reason of the connection of the inner ends of the chain 35 to the bolster at radial distances from the center thereof greater than the radii of the pulley 33, causes an angular movement of the draw-bar considerably in excess of the angular movement of the truck-bolster, which suffices to move the draw-bar sufficiently to one side of its position at right-angles to the bolster to bring it substantially into the line of draft. Of course, the angular lead of the draw-bar over the truck-bolster constantly decreases as the angular travel of said parts is increased, owing to the fact that the effective radial movement of the inner ends of the chain is constantly decreasing; but this lead is sufficient for all practical purposes to carry the draw-bar

into a position coincident with the line of draft or substantially so on all degrees and characters of curves which are met with in practice.

5 In Figs. 4, 5 and 6 I have illustrated a slightly modified form of the invention, wherein the chain 35^a is connected at its inner ends to eyes or staples 36^a on the front face of the truck-bolster, through the inter-
10 position of elastic connections 37^a. In this form of my invention I have also illustrated a modified means of imparting to the draw-bar its angular movement from the partial rotation of the pulley 33, such means consist-
15 ing in a square bolt 38 passed upwardly through correspondingly shaped apertures in the pulley 33 and the end extensions 21^a and 22^a of the draw-bar casing, said bolt being rotatably mounted in the upper and
20 lower transverse members of a support 26^a by means of bushings 39 rotatably mounted in said transverse members of the support and having squared bores to receive the bolt. The bolt has an enlarged head 38^a on which
25 the pulley may rest, and is secured in operative position by any suitable locking means, such as a cotter-pin 40.

My invention also contemplates the employment of means to facilitate the ease of
30 lateral movement of the draw-bar in the form of anti-friction bearings interposed between the under side of the draw-bar and the upper surface of the carry-iron 13. Such anti-friction devices may take a variety of forms; and in Figs. 1, 4, 7, 8 and 9 I
35 have illustrated three ways in which these devices may be applied. Referring to Figs. 1, 4 and 7, 19^a designates a recess formed in the under side of the draw-bar directly
40 above the carry-iron, said recess containing a series of rollers 41 and having both side and end walls confining said rollers against escape in any direction. In Fig. 8 I have shown a plate 42 secured to the under side
45 of the draw-bar as by a bolt 43, said plate having formed in its under surface a pair of half bearings 42^a adapted to seat a pair of rollers 43^a. In Fig. 9 I have illustrated still another form, wherein there is employed a saddle 44 having upstanding side
50 flanges 44^a embracing the sides of the draw-bar, and recessed on its under side to contain and confine a group of rollers 45.

I claim:

55 1. The combination with a car-body, a truck-frame and a draw-bar pivotally connected to said car-body, of a pulley rotatably mounted on the car-body in advance of the king-bolt, a flexible driving connection en-
60 gaging the periphery of said pulley and at its ends secured to a member of the truck-frame on opposite sides of the king-bolt, and connections between said pulley and the draw-bar for imparting to the latter a lateral movement from the rotation of the pul-

ley due to the angular movement of the truck-frame relatively to the car-body, substantially as described.

2. The combination with a car-body, a truck-frame and a draw-bar pivotally connected to said car-body in advance of the king-bolt, of a pulley mounted to rotate about the pivotal axis of the draw-bar, a flexible driving connection engaging the periphery of said pulley and at its ends secured to the truck-bolster on opposite sides of the king-bolt, and connections between said pulley and the draw-bar through which the rotation of the pulley effects a sidewise angular movement of the draw-bar, substantially as described.

3. The combination with a car-body, a truck-frame and a draw-bar pivotally connected to said car-body in advance of the king-bolt, of a pulley mounted to rotate about the pivotal axis of the draw-bar, a flexible and extensible driving connection engaging the periphery of said pulley and at its ends secured to the truck-bolster on opposite sides of the king-bolt, and connections between said pulley and the draw-bar through which the rotation of the pulley effects a sidewise angular movement of the draw-bar, substantially as described.

4. The combination with a car-body, a truck-frame and a draw-bar pivotally connected to said car-body in advance of the king-bolt, of a sprocket-wheel mounted to rotate about the pivotal axis of the draw-bar, a sprocket-chain engaging the periphery of said sprocket-wheel and having an elastic extensible section interposed therein, said chain being connected at its ends to the front face of the truck-bolster on opposite sides of the king-bolt, and connections between said pulley and the draw-bar through which the rotation of the pulley effects a sidewise angular movement of the draw-bar, substantially as described.

5. The combination with a car-body, a truck-frame and a draw-bar pivotally connected to said car-body in advance of the king-bolt, of a pulley mounted to rotate about the pivotal axis of the draw-bar, a flexible driving connection engaging the periphery of said pulley and at its ends secured to a member of the truck-frame on opposite sides of the king-bolt, and draw-bar seating and guiding means carried by and angularly movable with said pulley, substantially as described.

6. The combination with a car-body, a truck-frame and a draw-bar and draft-rigging pivotally connected to said car-body in advance of the king-bolt, of a pulley mounted to rotate about the pivotal axis of the draw-bar, a flexible driving connection engaging the periphery of said pulley and at its ends secured to a member of the truck-frame on opposite sides of the king-bolt, and

a saddle mounted upon and rigid with said pulley and itself seating the draft-rigging, substantially as described.

7. The combination with a carry-iron and a draw-bar supported thereby, of a plurality of anti-friction devices between said parts, substantially as described.

8. The combination with a carry-iron and a draw-bar supported thereby, of a plurality of anti-friction devices between said parts permitting lateral movement of the draw-bar in a horizontal line, substantially as described.

9. The combination with a draft-rigging and a support therefor, of a pivotal connection insertible from beneath through said draft-rigging and its support, substantially as described.

10. The combination with a car-body, a truck frame, and a draft-rigging pivotally connected to said car-body in advance of the king-bolt, of flexible connections between said draft-rigging and an element of the truck frame for actuating said draft-rigging from the angular movement of the truck frame relatively to the car-body, substantially as described.

11. The combination with a car-body, a truck frame, and a draw-bar and draft-rigging pivotally connected to said car-body in advance of the king-bolt, of flexible connections between said draft-rigging and an element of the truck frame adapted to impart to said draw-bar and draft-rigging a greater angular movement relatively to the car-body than the angular movement between the latter and the truck, substantially as described.

12. The combination with a car-body, a truck frame, a draw-bar and a draft-rigging pivotally connected to said car-body in advance of the king-bolt, of flexible connections between said draft-rigging and the bolster of the truck frame for actuating said draw-bar and draft-rigging from the angular movement of the truck frame rela-

tively to the car-body, substantially as described.

13. The combination with a car-body, a truck frame, and a draw-bar pivotally connected to said car-body, of a draw-bar controller pivotally mounted on the car-body in advance of the king-bolt, and flexible and extensible connections between said controller and an element of the truck frame for actuating said controller from the angular movement of the truck frame relatively to the car-body.

14. The combination with a car-body and a truck frame, of a draft-rigging pivotally mounted on said car-body in advance of the king-bolt, and devices for actuating the draw-bar sidewise connected to an element of the truck frame and operatively engaging said draft-rigging adjacent to its pivotal point, substantially as described.

15. The combination with a car-body and a truck frame, of a draft-rigging pivotally mounted on said car-body in advance of the king-bolt, and devices for actuating the draw-bar sidewise connected to an element of the truck frame and operatively engaging the draft-rigging at points diametrically opposite to the pivotal point when swinging the draw-bar in either direction, substantially as described.

16. The combination with a car-body, a truck frame, and a draw-bar pivotally connected to said car-body on a center in advance of the king-bolt, of flexible draw-bar operating connections directly attached to an element of the truck frame.

17. The combination with a car-body, a truck frame, and a draw-bar pivotally connected to said car-body on a center in advance of the king-bolt, of flexible draw-bar operating connections directly attached to the truck bolster.

GEORGE H. FORSYTH.

Witnesses:

SAMUEL N. POND,
FREDERICK C. GOODWIN.