E. W. WEBB.

SIX-WHEELED FREIGHT TRUCK.

APPLICATION FILED OCT. 13, 1921.

1,432,929.

Patented Oct. 24, 1922.

4 SHEETS—SHEET 1.

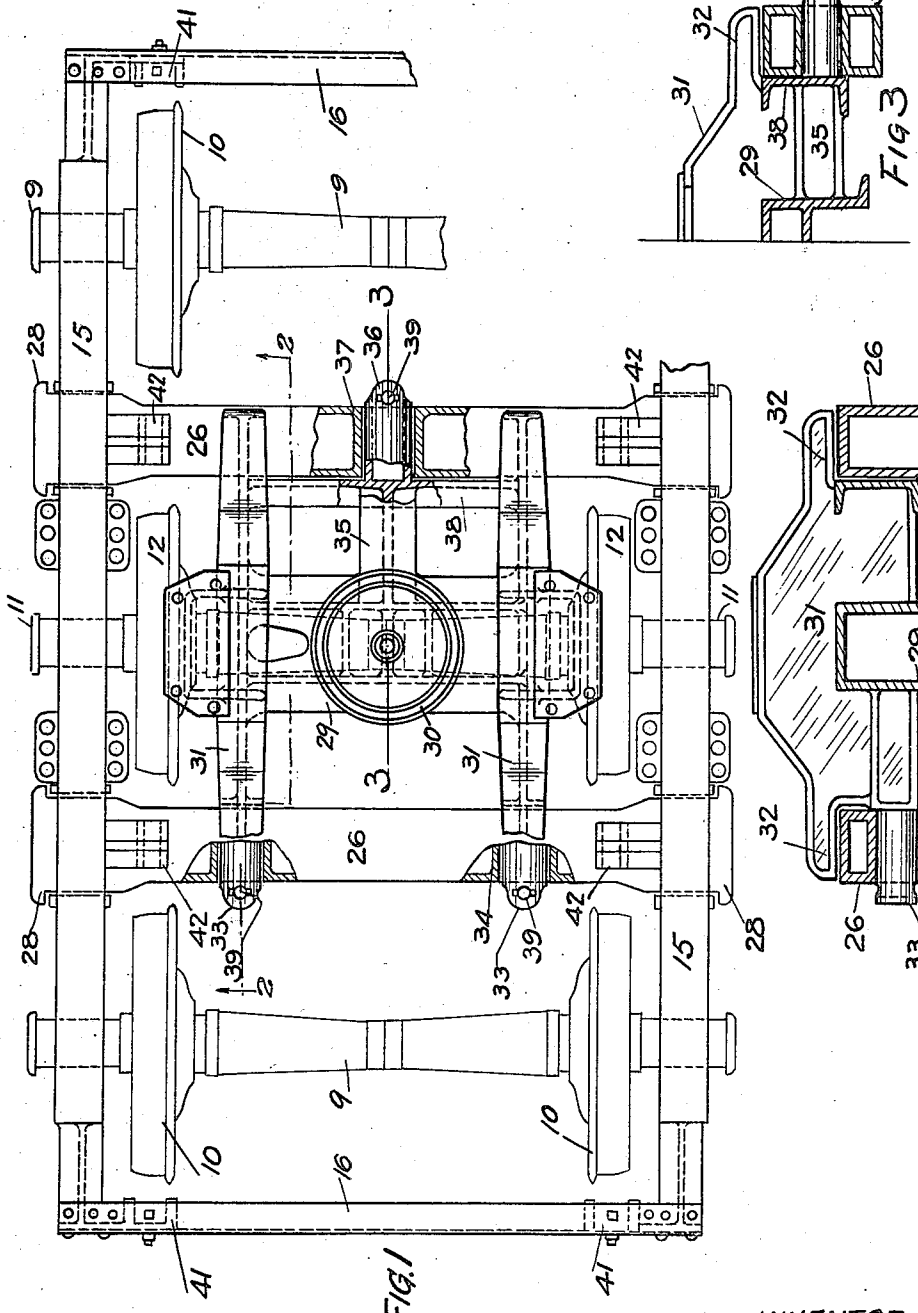

FIG 1

FIG 3

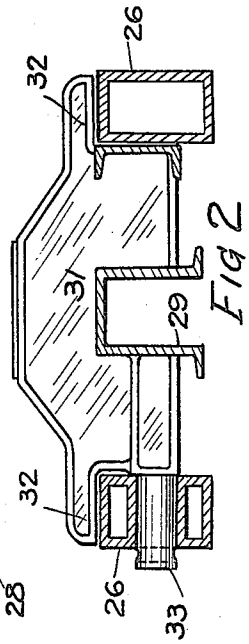

FIG 2

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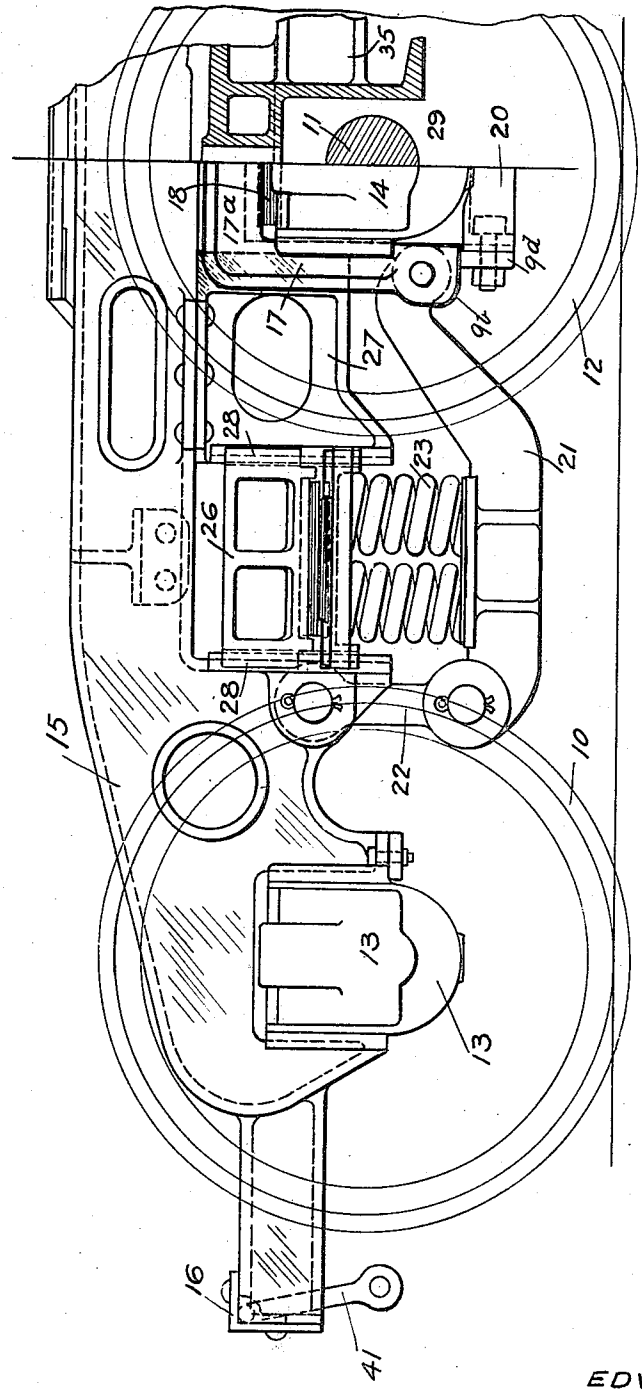

FIG. 4

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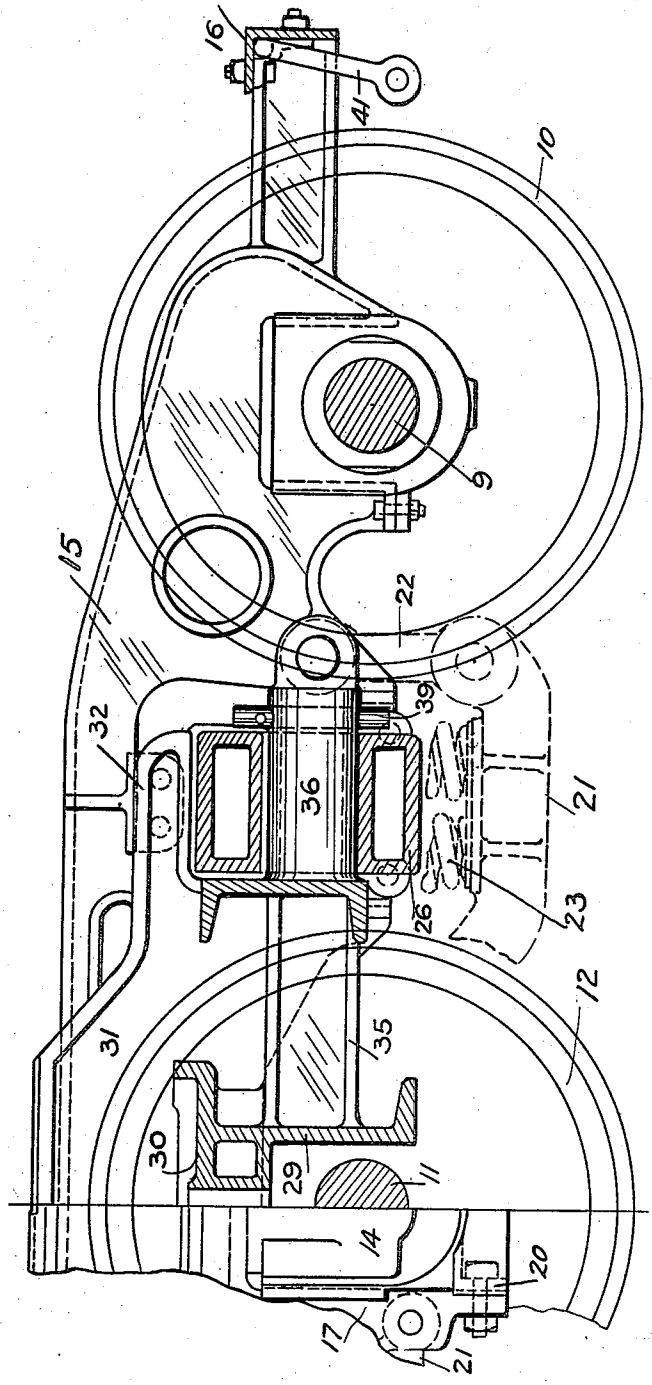

FIG 5

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4 SHEETS—SHEET

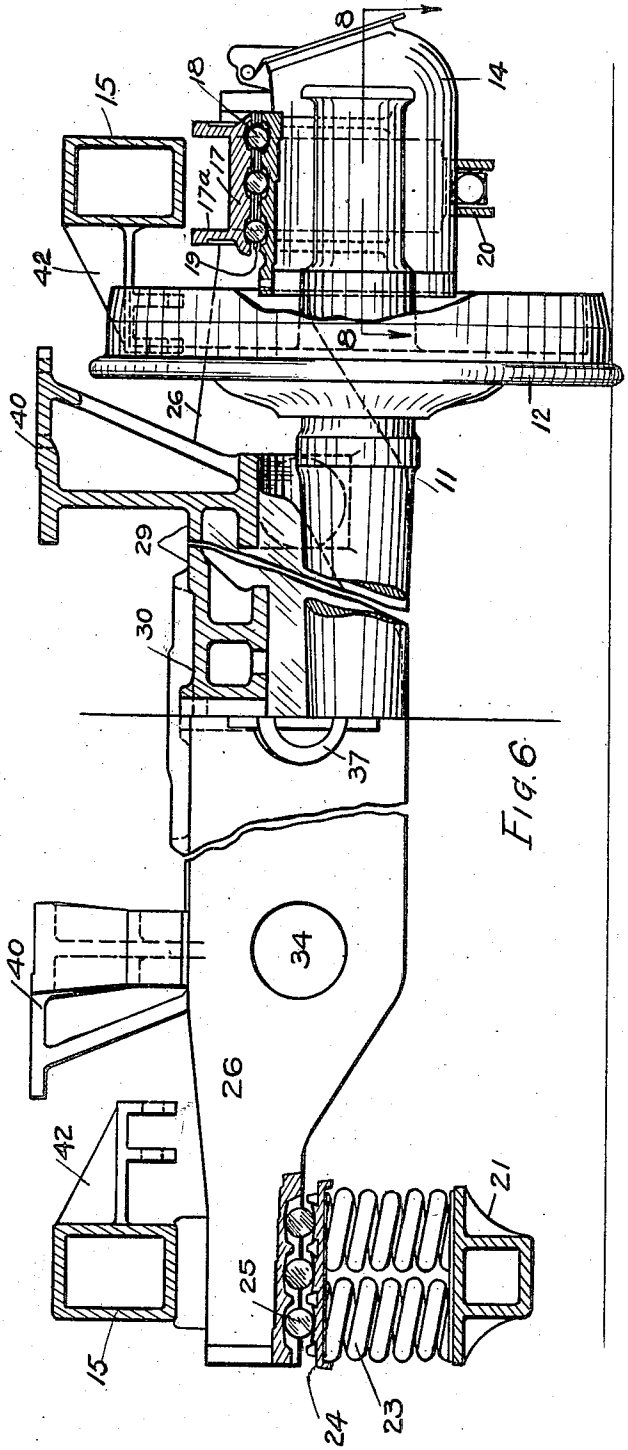

FIG. 6.

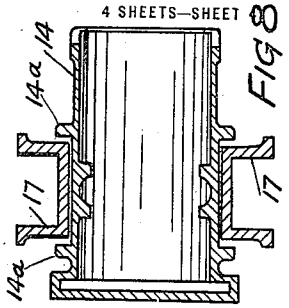

FIG 8

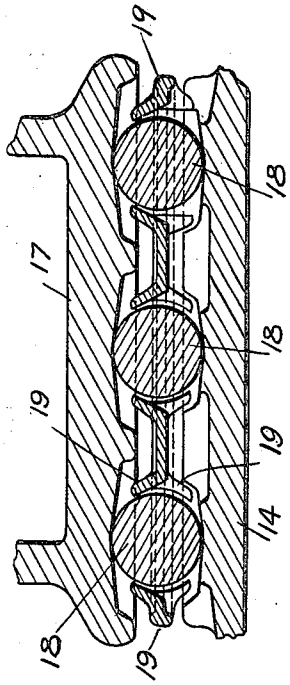

FIG 7

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Patented Oct. 24, 1922. 1,432,929

UNITED STATES PATENT OFFICE.

EDWIN W. WEBB, OF CHICAGO, ILLINOIS, ASSIGNOR TO STANDARD CAR TRUCK COMPANY, A CORPORATION OF NEW JERSEY.

SIX-WHEELED FREIGHT TRUCK.

Application filed October 13, 1921. Serial No. 507,407.

To all whom it may concern:

Be it known that I, EDWIN W. WEBB, 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 Six-Wheeled Freight Trucks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an improved six-wheeled car truck, of the general type disclosed in the J. C. Barber U. S. Patents 945,672, of January 4, 1910; 1,036,541, of August 27, 1912; and the Webb and Walton U. S. Patent 1,215,086, of February 6, 1917; and, to this end, my invention consists of the novel devices and combinations of devices hereinafter described and pointed out in the claims.

My improved truck, herein disclosed, also has in it lateral motion anti-friction devices, including rollers and bearing plates having bearing surfaces of the contour disclosed in the Lee W. Barber U. S. Patent 784,096, of March 7, 1905; and my said improved structure, herein disclosed, is also of such structure as to permit an independent lateral motion of the central axle and its wheels and journal boxes independently of the end axles and their wheels and independently of the laterally movable bolster structure or cradle which carries the car body, when the truck is in working position, as in J. C. Barber Patent 1,347,887, of July 27, 1920.

In respect to its general design, my improved truck is most nearly like that disclosed in the said Webb and Walton Patent 1,215,086, but involves certain details of improvement thereover, in respect to the equalizer levers and their connections to the side frames of the truck and to the yokes carried by the central journal boxes, with a view of getting a better distribution of the load carried on the bolster structure spring-supported from the equalizer levers, and minimizing the side thrust on the springs.

My said improved truck also involves a radical feature of novelty over anything disclosed in the above identified prior patents or the entire prior art, so far as known to me, towit: the embodiment of a bolster structure or cradle, composed of elements so articulated as to permit of a limited angular motion of the central or center bearing bolster relative to the two end bolsters from which said central bolster is supported, thereby giving a flexibility to the cradle members relative to each other and relative to the side frames of the truck, and which said flexibility better enables the truck to adapt itself to its load, under the varying conditions found in the service, due to the curves, irregularities of the roadbed and other causes.

The desirability of six-wheeled freight trucks for adaptation to heavy capacity cars, required under modern railway practice, is now well understood and is emphasized in several of the prior patents, above identified, and the same prior patents make clear the necessity of a short wheel-base, towit: a base approximately of eight feet and six inches, and this limitation makes it more difficult to secure the flexibility desired. All of my improvements recognize these elements of the problem and are intended to afford a six-wheeled freight truck best adapted to meet all of the conditions of the service.

With the foregoing general statements in mind, it will be easier to follow the detailed descriptions which will now be given.

My improved truck is illustrated in the accompanying drawings, wherein like notations refer to like parts throughout the several views.

In said drawings,

Fig. 1 is a plan view of my improved truck, with some parts removed, some portions broken away, and others shown in horizontal section;

Fig. 2 is a detail, partly in vertical section on the line 2—2 of Fig. 1, showing a portion of the central bolster and one of the tie-beams or yokes which support the central bolster from the end bolsters of the truck;

Fig. 3 is a detail in vertical section on the line 3—3 of Fig. 1, showing the central trunnion arm of the central bolster and a portion of one of the end tie-beams or yokes, shown in Fig. 2;

Fig. 4 is a view chiefly in side elevation, but partly in vertical section, looking at the central and left end portions of the truck, as shown in Fig. 1;

Fig. 5 is a view chiefly in vertical section, but partly in side elevation, looking at the central and right end portions of the truck, shown in Fig. 1, approximately on the section line 3—3 thereof;

Fig. 6 is a double view, partly in elevation and partly in vertical section, looking at the truck from the left on a line inward of the left end axle, with portions cut away, so as to expose to sight the inner face of the rear or left hand bolster, as shown in Fig. 1, a portion of the short or center plate bearing bolster, and parts carried thereby, and one-half of the center axle and its journal box in its relations to one of the side frames;

Fig. 7 is a detail in section showing the relation of one of the central journal boxes to one of the yokes carried thereby on anti-friction lateral motion devices located between the top of the box and the top cross bar of the yoke on the same section line as the same parts shown in Fig. 6, but on a larger scale; and

Fig. 8 is a detail in horizontal section through one of the central journal boxes and one of the yokes supported thereby on line 8—8 of Fig. 6, showing that the legs of the yoke are of less width than the spacing between the guide lugs for the same carried by the box.

The numerals 9 represent the end axles and the numerals 10 the wheels thereof fixed thereto. The numeral 11 represents the central axle and the numeral 12 the wheels fixed thereto.

The numerals 13 represent the end boxes, one of which is shown in Fig. 4, and another of which is shown in Fig. 5, mounted on the journals of the end axles in the usual way; and these end boxes are of modified standard M. C. B. type. The numeral 14 represents the central boxes, adapted to be mounted on the journals of the central axles, in the usual way, one of which is shown in Fig. 4 of the drawings in working position, on the right end journal of the central axle. These central journal boxes 14 are also of the M. C. B. modified standard type, and are identical with the end journal boxes 13, in most respects, but differ therefrom in certain details, which will hereinafter be noted.

The numerals 15 represent the side frames of the truck and are of the pedestal type mounted with their end jaws embracing the end journal boxes between suitable vertical guides, so spaced as not to permit any lateral motion of the side frames on the said end journal boxes, but to permit the journal boxes to be readily moved therefrom when the frame is jacked up, or the frame to be removed from the journal boxes by vertically lifting the same therefrom, when so desired. The said side frames 15 are rigidly connected at their opposite ends by cross ties 16, as shown in Fig. 1, so that the truck frame, made up of the said side frames 15 and the said cross ties 16, is a rigid structure.

The said side frames 15 are preferably made of cast steel, but might be made of pressed steel, and are so shaped as to afford the proper openings for the other parts of the truck, hereinafter to be noted. The portions of these side frames, which overlie the central journal boxes, stand at such a height as to afford sufficient clearance between the central boxes and the said overlying portions of said frames, as best shown in Figs. 4 and 6.

On said central boxes 14, are mounted yokes 17 (see Figs. 4, 6 and 8), the legs of which are of less width than the spacing between the vertical guides 14^a, provided for the same on the sides of the boxes, as best shown in Fig. 8. Between the head portions of the yokes 17 and the tops of the journal boxes 14, are mounted lateral motion rollers 18, as shown in Figs. 4, 6 and 7, and these several rollers 18 are held suitably spaced apart for common movement together by a suitable retaining grid 19, best shown in Fig. 7. The bearing surfaces for said rollers 18, provided on the top of the journal boxes 14 and on the under side of the heads of the yokes 17, are of the same contour as the bearing surfaces for the lateral motion rollers disclosed in the Lee W. Barber Patent, 784,096, above more fully identified, so that these rollers will be self-centering and will return automatically to their normal or central positions, under the weight of the load. The said yokes 17 have the lower ends of their legs connected by bridge bars 20 bolted thereto below the boxes 14, as best shown in Figs. 4, 5 and 6.

The legs of said yokes 17 are abutted and guided by the adjacent walls of pedestal brackets 27 riveted or otherwise rigidly secured to the body portions of the side frames 15, as best shown in Fig. 4, and are held thereby from any lateral motion in respect to the said side frames; and the heads of said yokes 17 have upwardly extended flanges 17^a, best shown in Fig. 6, adapted to embrace the overlying portions of the side frames, when the boxes and the yokes rise far enough to so permit, and, at that time, the said overlying portions of the side frames 15 will co-operate with the said pedestal brackets 27 to hold the yokes from any lateral motion, in respect to the frames, while the journal boxes and the central axle 11 will be free to move laterally, independently of the end axles 9 to the extent permitted by the guides 14^a or stop lugs for the legs of the yokes 17 formed integral with the sides of the said central boxes 14. The difference between the width of the said yokes 17 and the space between said stop guide lugs 14^a on the boxes 14 is best shown

in Fig. 8 of the drawings and is sufficient to afford a clearance of about five-eighths of an inch on each side of the central or normal position of the yokes, thus allowing a lateral play of about five-eighths of an inch each way to the said central journal boxes 14 and the central axle 11, independently of the end axles 9 and their wheels 10, which is enough for a truck having a wheel base of 8½ feet traveling on a curve of 150 feet radius.

The numerals 21 represent equalizing levers, the inner ends of which are pivoted to the adjacent legs of the yokes 17, as shown in Figs. 4 and 5, and the outer ends of which are pivoted to the lower ends of links 22, the upper ends of which links are pivoted to the side frames, as shown in Fig. 4. It will be understood, of course, that there are two sets of these equalizing levers 21 and links 22 for each side frame, one set of which connect the yokes 17 with the rear portions of the respective side frames and the other set of which connect the said yokes with the forward portions of the respective side frames.

The said equalizing levers 21 have portions properly shaped to afford bases for bolster-supporting springs 23, shown in Figs. 4 and 6, which springs are surmounted by caps 24, having mounted thereon lateral motion rollers 25, upon which rest the end portions of the end bolsters 26. The said caps 24 are so constructed that they are held by the bolster columns from any lateral motion, but with freedom for up and down motion, under the spring action; and hence, the bolsters 26 are free for lateral motion, with the rollers 25 traveling on their seats provided for the same in the upper surface of the said caps 24. The contours of the bearing surfaces for these rollers 25 on said caps 24 and the bolsters 26 are the same as those disclosed in the Lee W. Barber patent, above referred to; and hence, the rollers will return to their normal position automatically, under the weight of the load.

The side frames 15 are of such structure as to afford the proper openings for the said end bolsters 26 and the proper columns for guiding the said bolsters 26 and the combined spring caps and roller seats 24 in their vertical motion under the spring action available from the springs 23. The columns adjacent to the end wheels are afforded by the adjacent body portions of the side frames, while the co-operating inner columns are afforded by what might be called combined bolster column and central pedestal brackets 27 riveted or otherwise rigidly secured to the body portions of the said side frames 15 in position to permit the outer of their vertical walls to serve as bolster columns and the inner of their vertical walls to serve as pedestals abutting the legs of the yokes 17, and guiding the same in their vertical motion and preventing any lateral motion of said yokes relative to the frames, as hitherto noted. It has also already been noted that the directly overlying portions of the side frames 15 stand at such height above the central boxes and the yokes 17 carried thereby, as to permit the needed vertical motion of said central boxes and yokes relative to the side frames.

The lateral motion of the end bolsters 26 is limited by suitable stops 28 formed on the ends thereof, in proper position to strike the outer faces of the side frames 15 at the limits of their lateral travel, as can be readily understood from the illustration of said bolsters and stops appearing in Fig. 1.

The numeral 29 represents the central bolster, which is of less length than the space between the side frames 15, and carries, at its longitudinal center, the lower member 30, of the customary center plates by which the truck is connected with the car body (not shown), for the usual swiveling movement. This central bolster 29 is carried by and articulated to the pair of end bolsters 26, so as to permit a limited angular motion thereof relative to said end bolsters 26. The means for this purpose, illustrated in the drawings, are best shown in Figs. 1, 2 and 3. These means include end yokes 31, shown as cast integral with the end portions of the said central bolster 29, and provided at both ends with spanner lugs 32 adapted to overlap the faces of the end bolsters 26, and both provided, at the same corresponding ends, with horizontal trunnions 33, adapted to be loosely seated in horizontal trunnion bearings 34, provided for the same in one of the end bolsters 26, which, as shown in the drawings, is the one at the left end of the truck. The said yokes 31 are equally spaced apart on opposite sides of the longitudinal center or king-bolt position of the central bolster 29. Midway between the said two yokes 31, the said central bolster 29 is provided with a centrally disposed rigid arm 35, which projects in the opposite direction from the trunnion bearing yokes 31 and is itself provided with a horizontal trunnion 36, adapted to be loosely seated in a horizontal trunnion bearing 37, centrally located in the opposite end bolster 26. As shown, this central rigid arm 35, projecting from the central bolster 29, is cross-connected to the portions of the end yokes 31, between which it is located, by a cross tie 38, cast integral with said arm and said yokes, all as shown in Fig. 1 of the drawings. The said three horizontal trunnions (33 and 36) and the said three seats for the same in the end bolsters 26, are in a common horizontal plane and afford a three-point suspension of the said central bolster 29 from the end bolsters 26. It follows that there will be some

flexibility between the central bolster 29 and the parts rigid therewith relative to the end bolsters 26. The spanner lugs 32 of the said pair of yokes 31 stand at such a height above the trunnions 33 of said yokes and above the trunnion 36 of the rigid arm 35, as to afford some clearance between the faces of the end bolsters 26 and these spanner lugs 32, thereby permitting the limited angular adjustment of the central bolster 29 and the parts rigid therewith, in respect to said end bolsters 26, and making the yokes 31 also serve as safety devices.

The said end bolsters 26 and the central bolster 29, together with the parts rigid therewith, suspended from the end bolsters 26 by the trunnions and trunnion bearings or articulated connections above described, together constitute what may be properly called a cradle for supporting the car body (not shown), from the truck; and, in view of the way in which the end bolsters 26 are mounted in the truck side frames, with freedom for limited lateral motion on the anti-friction bearing rollers, it is, of course, obvious that the central bolster 29 and the parts rigid therewith are carried by the said end bolsters, or, in other words, the entire cradle is free for this limited lateral motion in the truck frames, thereby permitting a limited lateral motion of the truck relative to the car body, when rounding curves; and, in view of the contour of the roller bearing surfaces, the said cradle and the car body supported therefrom will return automatically to normal position, as soon as the truck again gets onto the straight sections of the track.

Then, in view of the three-point suspension of the central bolster 29 from the end bolsters 26, if the side frames should raise in respect to each other or get out of parallel with each other, when rounding curves or attempting to adapt themselves to irregularities of the roadbed, the cradle will, nevertheless, maintain a horizontal position and the load thereon will be equally distributed to all four of the sets of the end bolster supporting springs 23 and the equalizing levers 21. Then, in view of the fact that the central boxes 14 and the yokes 17, together with the inner ends of the equalizing levers 21, can rise or fall in respect to the side frames, while, at the same time, the central axle and its wheels and the said boxes 14 are free for limited lateral motion, independent of the end axles and their wheels and independent of the cradle, it follows that the truck is flexible in every direction, so that the load is distributed and carried to the utmost advantage in respect to the car body, the rails and all of the parts of the truck.

The trunnions 33 and 36 are provided with holes for retaining pins 39, as shown in Figs. 1 and 5, for preventing the separation of the end bolsters 26 from the central bolster 29 and its rigid yokes 31 and arm 35, until so desired. The numerals 40 represent side bearing brackets fixed to the ends of the central bolster 29 rising therefrom to the proper height, for co-operation with side bearings carried on the bolster of the car body, not shown. These side bearing brackets appear in Figs. 1 and 6.

The numerals 41 represent the outer members of brake hanger brackets, which are suspended from the end cross ties 16 of the side frames 15, in line with the end wheels 10, as shown in Figs. 1, 4, and 5. The said hangers 41 are of inverted U-shape, as clearly shown in Figs. 1 and 4. The inner brake hanger brackets 42 are shown as integral with the side frames 15 and as projecting inward therefrom at a suitable height above the end bolsters 26, as illustrated in Fig. 6. These positions for the said brake hangers adapt the said brake hangers for the support of a clasp brake in this six-wheeled truck, which is a matter of some difficulty, because of the short wheel-base. Clasp brakes have been found so satisfactory that they are now generally used on freight trucks.

It will, of course, be understood that the details of the structure illustrated may be varied without departing from the principles of my invention.

What I claim is:

1. In a six-wheeled car truck, the combination with the side frames, of end bolsters mounted in the said frames, with freedom for up and down motion and a limited lateral motion, and a central bolster supported from said end bolsters to permit a limited up and down angular motion of said central bolster in respect to said end bolsters, substantially as described.

2. In a six-wheeled car truck, the combination with the side frames, of end bolsters mounted in the said frames, with freedom for up and down motion and a limited lateral motion, and a central bolster supported from said end bolsters and articulated thereto at three points of suspension in a common horizontal plane, for permitting a limited angular motion of said central bolster in respect to said end bolsters, substantially as described.

3. In a six-wheeled car truck, the combination with the side frames, of end bolsters mounted in the said frames with freedom for up and down motion and a limited lateral motion, and a central bolster supported from said end bolsters and articulated thereto by three horizontal trunnions, two of which are seated in horizontal trunnion bearings of one of said end bolsters and the other of which is seated in a horizontal trunnion bearing of the other of said end bol-

sters, with all of said trunnions in a common horizontal plane, substantially as described.

4. In a six-wheeled car truck, the combination with the side frames, wheel axles and boxes, of equalizing levers having their inner ends pivoted to yokes carried by the central boxes and their outer ends pivoted to said frames, end bolsters spring-supported from said equalizing levers, with freedom for up and down motion and a limited lateral motion on anti-friction devices, and a central bolster of less length than the space between said side frames, and which central bolster is supported from said end bolsters and articulated thereto by three horizontal trunnions, two of which are rigid with the said central bolster and are seated in horizontal trunnion bearings of one of said end bolsters and the other of which is rigid with said central bolster midway between the other two and is seated in a horizontal trunnion bearing of the other of said end bolsters, with all of said trunnions in a common horizontal plane and the central member on the central line of the truck, substantially as and for the purposes set forth.

5. In a six-wheeled car truck, the combination with the side frames, of end bolsters mounted in the said frames, with freedom for up and down motion and a limited lateral motion, and a central bolster of less length than the space between the side frames, and which central bolster is supported from said end bolsters by two end yokes and a central arm, all rigid with the central bolster, which central arm has a horizontal trunnion seated in a horizontal trunnion bearing centrally located on one of said end bolsters, and which yokes are provided with horizontal trunnions seated in horizontal trunnion bearings on the other of said end bolsters with all of said trunnion bearings in a common horizontal plane and which yokes are provided with spanner lugs which overreach the faces of said end bolsters, substantially as and for the purposes set forth.

6. In a six-wheeled car truck, the combination with side frames of the pedestal type resting on the end boxes, of yokes carried by the central boxes, said central boxes being mounted for lateral movement relative to said yokes and said yokes being mounted with freedom for up and down motion therewith relative to said frames, and equalizing levers for carrying and distributing the load, and which equalizing levers have their inner ends pivoted to said yokes and their outer ends pivoted to links which, in turn, are pivoted to said side frames, substantially as described.

7. In a six-wheeled car truck, the combination with the side frames, wheel axles and boxes, of yokes carried by the central boxes, with freedom to move up and down with said central boxes, equalizing levers having their inner ends pivoted to said yokes and their outer ends pivoted to links which, in turn, are pivoted to said side frames, end bolsters spring-supported from said equalizing levers, with freedom for up and down motion in said frames, and a limited lateral motion on anti-friction devices, and a central bolster of less length than the space between the side frames and which central bolster is supported from said end bolsters and articulated thereto, for permitting a limited angular motion of said central bolster in respect to said end bolsters, substantially as described.

8. In a six-wheeled car truck, the combination with the side frames, wheel axles and boxes, of yokes carried by the central boxes, with freedom to move up and down with said central boxes, equalizing levers having their inner ends pivoted to said yokes and their outer ends pivoted to links which, in turn, are pivoted to said side frames, end bolsters spring-supported from said equalizing levers, with freedom for up and down motion in said frames, and a limited lateral motion on anti-friction devices, and a central bolster of less length than the space between the side frames, which central bolster is supported from said end bolsters and articulated thereto by three horizontal trunnions, all rigid with the central bolster, two of which are seated in trunnion bearings, in one of said end bolsters, and the other of which is seated in a trunnion bearing of the other of said end bolsters, with all of said trunnions in a common horizontal plane and the central member in the central line of the truck, substantially as and for the purposes set forth.

9. In a six-wheeled equalized car truck, wherein the inner ends of the equalizing levers are carried by yokes embracing the central journal boxes and which boxes and yokes are free for a limited up and down motion in respect to the side frames, but which yokes are held from any lateral motion in relation to said frames, of anti-friction lateral motion devices located between said yokes and said central journal boxes, for facilitating a limited lateral motion of the central axle and its wheels and boxes independent of the end axles and their wheels and boxes, substantially as described.

10. In a six-wheeled car truck, the combination with side frames of the pedestal type resting on the end boxes, of yokes carried by the central boxes, with freedom for up and down motion with said boxes relative to said frames but held against any lateral motion cross-wise of said frames, equalizing levers for carrying and distributing the load and which equalizing levers have their inward ends pivoted to said yokes and their outer ends pivoted to links which, in turn, are

pivoted to said side frames, a cradle spring-supported from said equalizing levers, with freedom for up and down motion in relation to said frames and a limited lateral motion on anti-friction devices carried by said springs, and anti-friction lateral motion devices located between said yokes and said central boxes, and which yokes are so related to the central boxes as to permit a limited lateral motion of the central axle and its wheels and boxes, independent of the end axles and their wheels and independent of the lateral motion of said cradle, all substantially as and for the purposes set forth.

11. In a six-wheeled car truck, the combination with side frames, of end bolsters mounted in said frames with freedom for up and down motion, and a central bolster having supports received in said end bolsters and movable relatively thereto but maintaining the end bolsters at approximately right angles to the axes of said central bolster supports.

12. In a six-wheeled car truck, the combination with the side frames, of end bolsters mounted in said frames with freedom for up and down motion, and a central bolster supported by a three-point suspension on said end bolsters and movable relatively thereto.

In testimony whereof I affix my signature.

EDWIN W. WEBB.

Witnesses:
F. L. BARBER,
F. D. BARBER.