E. W. SUMMERS.

RAILWAY CAR TRUCK.

APPLICATION FILED DEC. 29, 1914.

1,144,392.

Patented June 29, 1915.

2 SHEETS—SHEET 1.

FIG. 1

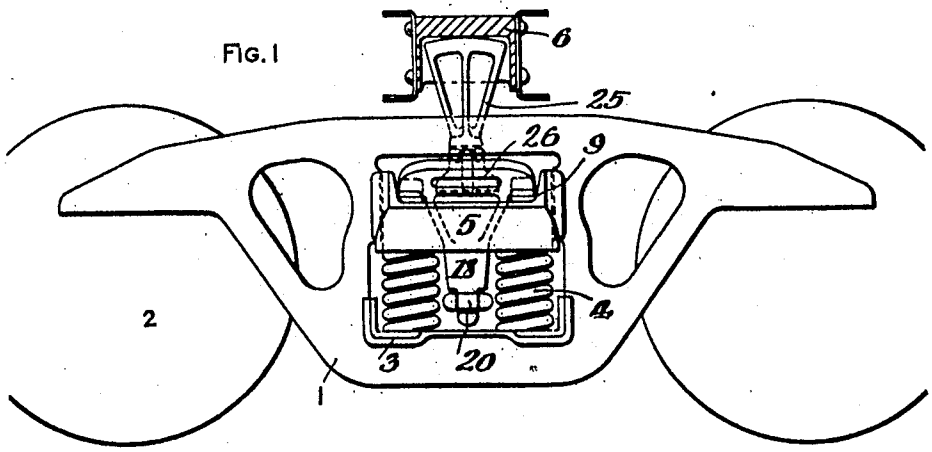


FIG. 3

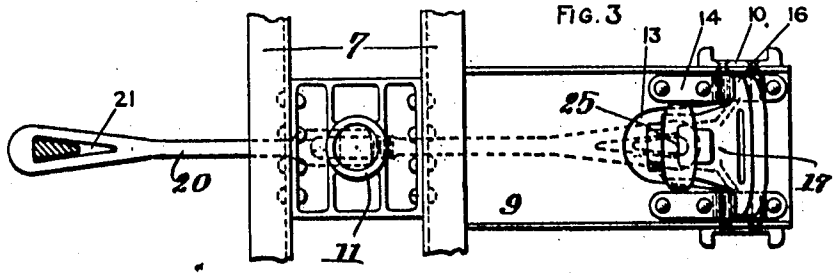


FIG. 2

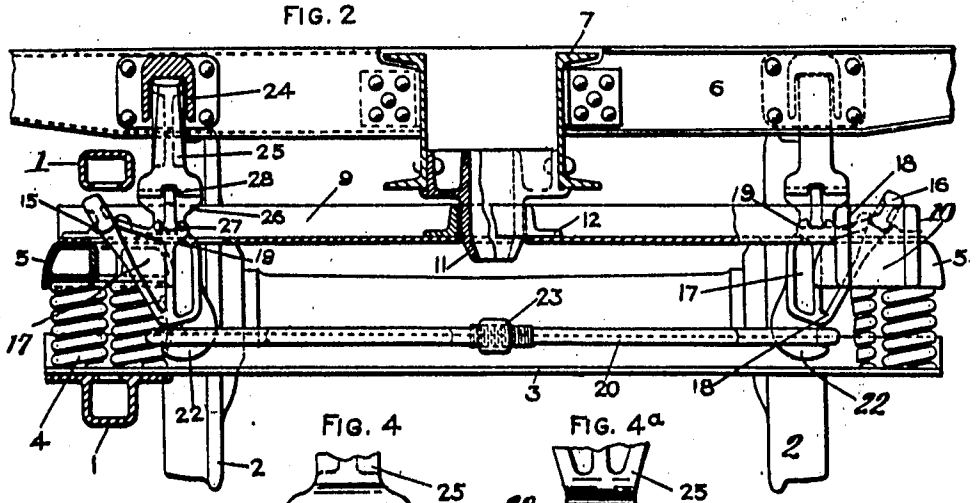


FIG. 4

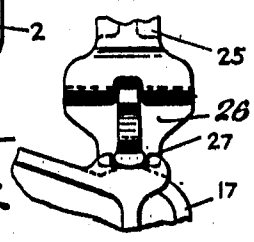
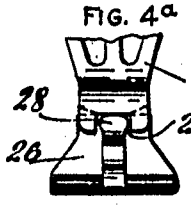


FIG. 4a



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2 SHEETS—SHEET 2.

FIG. 6

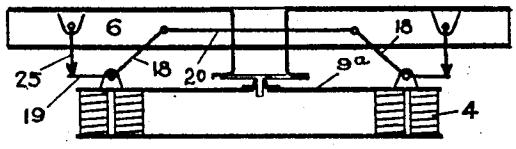


FIG. 7

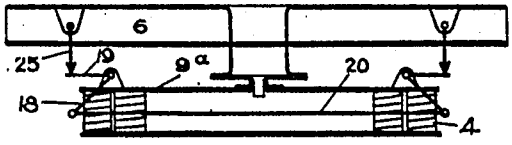


FIG. 8

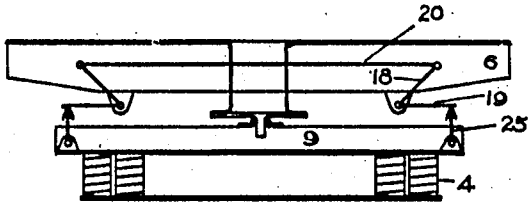


FIG. 9

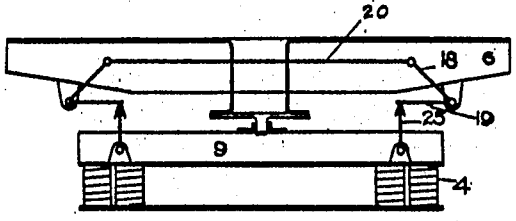
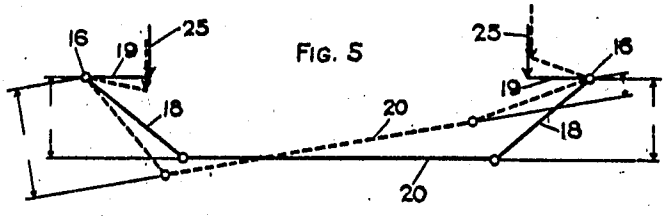


FIG. 5



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UNITED STATES PATENT OFFICE.

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RAILWAY-CAR TRUCK.

1,144,392. Specification of Letters Patent. Patented June 29, 1915.

Application filed December 29, 1914. Serial No. 879,499.

To all whom it may concern:

Be it known that I, EDGAR W. SUMMERS, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Railway-Car Trucks, of which the following is a specification.

This invention relates to railway car trucks.

The object of the invention is to provide a railway car truck with means for supporting the car body thereon so arranged that the car body is always balanced; is not subjected to severe strains when running over twisted track; in which the load of the car body is more evenly distributed among the four corners of the car body when running over twisted track than with standard types of car trucks, so that the tendency of derailment when running over twisted track is largely if not entirely overcome; whereby friction between the wheel flanges and rails, and consequently wheel flange and rail head wear is also largely overcome; the amount of power necessary to pull the car around curves and over twisted track is reduced; and whereby the pounding action of the wheels on the track, due to the swinging of the car body and closing up of the side bearings with standard forms of trucks is largely avoided, thereby avoiding pounding the track out of alinement.

The above and other objects are secured by supporting the car body on the truck through the intervention of lever or rocker members so arranged that when running on twisted or irregular track, the weight of the car body and its load is adjustably transmitted to the truck in a manner to distribute the load among the four corners of the car body and prevent the car body from being supported substantially at two diagonally opposite corners, as is the case with the ordinary center plate supporting side bearing trucks, in which if the track has a twist of to exceed 1¼ inches in a length equal to the distance between the center lines of trucks, the load of the car body is supported entirely on two of its diagonally opposite corners.

For the attainment of the foregoing objects the invention comprises the construction and arrangements of parts hereinafter described and claimed.

In the accompanying drawings Figure 1 is a side view of a car truck embodying the invention, showing the body bolster of the car in section; Fig. 2 is a transverse vertical sectional view through the car truck and body underframe; Fig. 3 is a top plan view showing on the right hand side the truck bolster, and on the left hand side the underneath cross connecting bar; Figs. 4 and 4ª are detail views of one of the side bearing universal members; Fig. 5 is a diagrammatic view illustrating the balancing principle of the truck; and Figs. 6, 7, 8 and 9 are diagrammatic views illustrating modified arrangements of the invention.

In the drawings 1 represents the truck side frame; 2 the truck wheels; 3 the spring plank; 4 the springs; and 5 the spring caps of the truck. All of these parts may be of the usual standard, or any other desired construction, and the particular forms of these parts illustrated in the drawings is merely illustrative of one form which these parts may take. The car body may also be of any kind or construction, and the drawings illustrate merely a portion of the underframe, comprising essentially the body bolster 6 and the longitudinal center or draft sills 7.

In the usual standard constructions of railway cars and trucks the body is supported on center plates, secured respectively to the car underframe and to the truck bolster, thereby supporting the load entirely upon small bearing surfaces at the central longitudinal line of the car. To limit the sidewise swinging or rocking motion of the car body, side bearings are provided between the truck and body bolsters, usually located approximately in the vertical planes of the truck wheels. The general practice is to allow from $\frac{1}{16}$ to $\frac{3}{8}$ of an inch clearance between such side bearings, $\frac{3}{8}$ of an inch being the maximum permissible. As a consequence, if the car runs on a track which has a twist of more than 1¼ inches in a length equal to the distance between the transverse center lines of the trucks, the side bearings on two diagonally opposite corners of the car close togther and the car body is then supported entirely upon these two diagonally opposite corners. This not only imposes a very severe twisting strain upon the car body, but if the car body is substantially rigid (as is the case with modern steel car constructions, particularly tank cars) the load is thrown entirely upon the wheels on two diagonally

opposite corners of the car, the opposite wheels in each truck being practically free from any load and therefore very readily jump up until the flanges can ride over the rail, causing derailment. Other very serious disadvantages result, such as producing a very heavy friction between the wheel flanges and the rail heads, and particularly does the closing up of the side bearings, whether on twisted track, or due to the swaying or rocking of the car body, produce a very severe pounding on the track, which soon gets its out of alinement. With my improved construction the center plate and side bearings as ordinarily used are entirely dispensed with, and in lieu thereof a construction provided whereby the car body automatically balances itself and distributes the load more evenly on all the four corners, and particularly whereby the pounding action above referred to is entirely overcome.

In the improved construction I provide a transverse truck member 9, which takes the place of the ordinary truck bolster, but which can be made very much lighter than ordinary truck bolsters because it carries very little load. This member fits between the columns of the truck side frames and is provided with column guides 10, which may be of the usual form. The center plates are entirely dispensed with and merely such connection provided between the bolster and car body as to insure the truck being pulled along with the car body and to prevent lateral displacement of the car body on the truck. As shown, this connection is formed by a king pin 11, which is secured to the car body, such as by being riveted between the center or draft sills 7, and which projects into an opening formed by a small casting 12 secured to the truck bolster. No load however is carried at this point, and consequently the truck bolster 9 can be a relatively light beam. The truck bolster at its ends is bifurcated, as shown at 13 in Fig. 3, and is provided with castings 14 which are provided with seats 15 for receiving the fulcrum portions 16 of downwardly inclined members 17, which will be hereinafter termed lever members. These members 17 are of the form shown in Figs. 2 and 3, having at their upper outer edges the projecting fulcrum parts 16, and having substantially downwardly and inwardly inclined portions 18, which in effect form inclined lever arms, and substantially horizontally projecting portions 19 which form in effect horizontal lever arms. The inclined lever arms 18 of the two opposite members 17 are connected by a cross connecting bar 20 which in the embodiment shown in Figs. 1 to 5 is a tension member, and is suitably secured to the inclined lever arms 18, such as by being provided at its ends with loops 21 into which hook portions 22 on the lower ends of said lever arms project. In order to compensate for wear of parts and also to assist in the proper assembling of the parts the cross connecting bar 20 is preferably adjustable in length, such as by being made in two parts united by the threaded connection shown at 23, or by any other suitable adjustable connection.

The car body is supported entirely upon the horizontal lever arms 19. To this end the body underframe has secured thereto castings 24, having therein inverted sockets into which project the upper ends of the supporting members 25, whose lower ends rest upon castings 26 which in turn rest in sockets 27 formed in the upper surface of the lever arms 19. The upper ends of the members 25 are rounded so that said members have a rolling or rocking movement longitudinally of the car in the sockets 24. Likewise the lower ends of members 26 are rounded, (see Fig. 4ª) so that said members can rock in the sockets 27, with a rolling action, laterally of the track. Likewise the upper ends of members 26 are rounded, as shown at 28 (see Fig. 4ª) and rest in sockets 29 in the lower ends of the members 25, so as to allow for a rocking or rolling movement longitudinally of the track. The upper ends of the members 25 likewise are rounded so that they have a slight rocking or rolling movement in the castings 24, laterally of the track. All of the bearing parts are rounded, so that the movements are substantially rolling ones, and the several rocking movements are such that a true universal connection is provided in the support between the car body and the lever members 17. The fulcrum members 16 are also rounded, so that they have a rolling motion in the seats 15, and the connections between the lower ends of lever arms 18 and the ends of the cross connecting bar 20 are also rounded so that there is also substantially a rolling movement at this point. As a consequence, friction is reduced to a minimum throughout, and the wear of parts due to sliding friction is eliminated and the necessity for lubrication avoided.

With the construction described the car body has no rocking or swaying motion, it being supported entirely at the sides, instead of at the center, and, furthermore, the body balances itself and stays substantially horizontal, entirely irrespective of irregularities or twists in the track. This is clear from an examination of Fig. 5, which in full lines shows the lever members 17 in normal position, that is, when upon a perfectly flat track. When the car strikes a warped track the wheels on one side of the leading truck are elevated, while those of the trailing truck are not disturbed. If in Fig. 5 we assume that the wheels on the left hand side are elevated the effect is the same as though the car body at that side were lowered. This causes

the lever members 17 to swing to the positions shown in dotted lines, with the horizontal lever arm 19 on the high wheel side slightly depressed to permit that corner of the car body to be lowered somewhat, and the inclined lever arm 18 swung downwardly to assume more nearly a vertical position. This pulls on the cross connecting bar 20, thereby swinging the lever member 17 on the right hand or low wheel side to the position shown in dotted lines, with the inclined arm 19 swung still farther toward a horizontal position, and the horizontal lever arm 18 swung upwardly to exert a lifting action on that corner of the car body. As a consequence, the load is not all supported upon the left hand or higher wheels, as with the old construction, but is distributed between the wheels on the two opposite sides. It can be shown mathematically that with a track having a twist equal to the worst conditions that are met with in actual service, at least 40% of the load is transferred to the low wheel side of the truck, leaving only 60% on the high wheel side. This gives such distribution of the load under irregular track conditions as to prevent the load being carried mostly on two diagonally opposite corners of the car, thereby preventing the warping or twisting of the car body, and even with a perfectly rigid car body preventing derailment from this cause. Instead of lifting a corner of the car, as with the old constructions, the end of the car body as a whole is lifted, thereby maintaining equilibrium and preventing rocking of the body.

It will be observed that in moving from the full line to the dotted line position in Fig. 5 the inclined lever arms have varied materially in length, while the horizontal lever arms have not varied materially in length. It will be further observed that the inclined lever arm on the high wheel side has increased in effective length, while the inclined lever arm on the low wheel side has decreased in effective length. It is the lifting action on the car body on the low wheel side, which, through the cross connecting bar, reacts upon the rocking lever member on the high wheel side, and prevents said rocking lever member going entirely down. Since both ends of the cross connecting bar must exert the same pull in order to produce equilibrium, the change in effective length of the inclined lever arms produces a condition under which a relatively small load on the low wheel side will balance the load on the high wheel side, and since the horizontal lever arms remain of substantially constant length, while the inclined lever arms on the low wheel side decrease in effective length and those on the high wheel side increase in effective length, a condition is produced which rapidly runs into the infinite, and which rapidly establishes equilibrium with both sides of that end of the car body lifted to the same extent. These conditions also prevent the loads on the two sides of the truck becoming very materially different, so that equilibrium is brought about with a material portion of the load carried by the low side wheels. This balancing of the car body is coincident with the track conditions, and because of the variation in the effective lengths of the lever arms equilibrium of the car body is gradually established and without sudden shock, so that there can be no pounding of the truck wheels on the track, with the consequent evil effects on track alinement. Furthermore, with this arrangement the heavy friction which is coincident with the usual truck and car construction when the car is passing around curves or over twisted track is entirely avoided, so that not only is less power required to pull the car around curves and over twisted track, but the heavy wheel flange and rail head wear is also avoided.

The invention may be applied in various ways, and in Figs. 6, 7, 8 and 9 several different arrangements are shown diagrammatically. In Fig. 6, the inclined lever arms 18 project inwardly and upwardly instead of inwardly and downwardly, as in the main form shown, while in Fig. 7 these inclined lever arms project downwardly and outwardly. In the latter case the cross connecting bar 20 is placed under compression instead of under tension. In Figs. 8 and 9 the lever members 17 are shown fulcrumed to the car body instead of to the truck. In Fig. 8 the inclined lever arms 18 are inclined upwardly and outwardly, while in Fig. 9 they project upwardly and inwardly. In the former case the cross connecting bar 20 is placed under compression, while in the latter case it is placed under tension. Various other modified arrangements may be made without departing from the principle of the invention.

It is an essential feature of my invention, in each arrangement illustrated, that whenever the car runs onto a twisted track, the car body is lifted against gravity, and it is this lifting of the car body which produces equilibrium, and enables the lever members to resume their normal positions as soon as the car passes off the twisted track.

What I claim is:—

1. The combination with a car body and a truck under each end thereof, said trucks constituting the sole support for the car body, each truck being swiveled to the car body about a center within the sides and ends of the truck, of a pair of lever or rocker members interposed between the car body and truck and arranged to adjustably transmit the weight of the car body and its load

to the truck, and means connecting the truck to the car body and arranged to center the truck relative to the car body.

2. The combination with a car body and a truck under each end thereof, said trucks constituting the sole support for the car body, each truck being swiveled to the car body about a center within the sides and ends of the truck, of a pair of lever or rocker members interposed between the car body and truck, connections between said pair of lever or rocker members whereby when one of said members is moved in one effective direction the other is moved in the opposite effective direction to thereby distribute the weight of the car body and its load between the two sides of the truck, and means connecting the truck to the car body and arranged to center the truck relative to the car body.

3. The combination with a car body and a truck under each end thereof, said trucks constituting the sole support for the car body, each truck being swiveled to the car body about a center within the sides and ends of the truck, of a pair of lever or rocker members interposed between the car body and truck, each of said members having lever arms of variable effective length and arranged to transmit and distribute the weight of the end of the car body and its load to the truck, and means connecting the truck to the car body and arranged to center the truck relative to the car body.

4. The combination with a car body and a truck under each end thereof, said trucks constituting the sole support for the car body, each truck being swiveled to the car body about a center within the sides and ends of the truck, of a pair of lever or rocker members interposed between the car body and truck, each of said members having lever arms of variable effective length, connections between said pair of lever or rocker members whereby when one of said members is moved in a direction to increase its effective lever arm the opposite member is moved in a direction to decrease its effective lever arm, and means connecting the truck to the car body and arranged to center the truck relative to the car body.

5. The combination with a car body and a truck under each end thereof and swiveled relative thereto, said trucks comprising the entire support for the car body, of a pair of lever or rocker members interposed between the car body and truck and arranged to adjustably transmit the weight of the car body and its load to the truck, and means to prevent displacement of the car body laterally of the truck.

6. The combination with a car body and a truck under each end thereof and swiveled relative thereto, said trucks comprising the entire support for the car body, of a pair of lever or rocker members interposed between the car body and truck, connections between said pair of lever or rocker members whereby when one of said members is moved in one effective direction the other is moved in the opposite effective direction to thereby distribute the weight of the car body and its load between the two sides of the truck, and means to prevent displacement of the car body laterally of the truck.

7. The combination with a car body and a truck under each end thereof and swiveled relative thereto, said trucks comprising the entire support for the car body, of a pair of lever or rocker members interposed between the car body and truck, each of said members having lever arms of variable effective length and arranged to distribute and transmit the weight of the car body and its load to the truck, and means to prevent displacement of the car body laterally of the truck.

8. The combination with a car body and a truck under each end thereof and swiveled relative thereto, said trucks comprising the entire support for the car body, of a pair of lever or rocker members interposed between the car body and truck, each of said members having lever arms of variable effective length, connections between said pair of lever or rocker members whereby when one of said members is moved in a direction to increase its effective lever arm the opposite member is moved in a direction to decrease its effective lever arm, and means to prevent displacement of the car body laterally of the truck.

9. The combination with a car body and a truck under each end thereof, said trucks comprising the entire support for the car body, of a pair of lever or rocker members interposed between the car body and truck and arranged to adjustably transmit the weight of the end of the car body and its load to the truck, and a king pin connection between the car body and truck.

10. The combination with a car body and a truck under each end thereof, said trucks comprising the entire support for the car body, of a pair of lever or rocker members between the car body and truck, connections between said pair of lever or rocker members whereby when one of said members is moved in one effective direction the other is moved in the opposite effective direction to thereby distribute the weight of the car body and its load between the two sides of the truck, and a king pin connection between the car body and truck.

11. The combination with a car body and a truck under each end thereof, said trucks comprising the entire support for the car body, of a pair of lever or rocker members interposed between the body and truck, each of said members having lever arms of

variable effective length and arranged to distribute and transmit the weight of the car body and its load to the truck, and a king pin connection between the car body and truck.

12. The combination with a car body and a truck under each end thereof, said trucks comprising the entire support for the car body, of a pair of lever or rocker members interposed between the car body and truck, each of said members having lever arms of variable effective length, connections between said pair of lever or rocker members whereby when one of said members is moved in one direction to increase its effective lever arm the opposite member is moved in a direction to decrease its effective lever arm, and a king pin connection between the car body and truck.

13. The combination with a car body and a truck under each end thereof and swiveled relative thereto, said trucks comprising the entire support for the car body, of a pair of lever or rocker members interposed between the car body and truck and located respectively in or near the vertical plane of the truck wheels, each of said members having lever arms of variable effective length, connections between said pair of lever or rocker members whereby when one of said members is moved in a direction to increase its effective lever arm the opposite member is moved in a direction to decrease its effective lever arm, and means connecting the truck to the car body and arranged to center the truck relative to the car body.

14. The combination with a car body and a truck under each end thereof and swiveled relative thereto, said trucks comprising the entire support for the car body, of a pair of lever or rocker members interposed between the car body and truck and located respectively in or near the vertical plane of the truck wheels, each of said members having lever arms of variable effective length, connections between said pair of lever or rocker members whereby when one of said members is moved in a direction to increase its effective lever arm the opposite member is moved in a direction to decrease its effective lever arm, and means to prevent displacement of the car body laterally of the truck.

15. The combination with a car body and a truck under each end thereof, said trucks comprising the entire support for the car body, of a pair of lever or rocker members interposed between the car body and truck and located respectively in or near the vertical plane of the truck wheels, each of said members having lever arms of variable effective length, connections between said pair of lever or rocker members whereby when one of said members is moved in a direction to increase its effective lever arm the opposite member is moved in a direction to decrease its effective lever arm, and a king pin connection between the car body and truck.

16. The combination with a car body and a truck under each end thereof and swiveled thereto, said trucks constituting the sole support for the car body, of a pair of lever or rocker members interposed between the car body and truck, each of said members having a horizontal arm and an inclined arm, the horizontal arms being arranged to support the car body and the inclined arms being oppositely inclined and connected together, whereby when one of said members is moved to increase the effective length of its lever arm the opposite member is moved to decrease the effective length of its lever arm, and means connecting the truck and car body and arranged to center the truck relative to the car body.

17. The combination with a car body and a truck under each end thereof and swiveled thereto, said trucks constituting the sole support for the car body, of a pair of lever or rocker members interposed between the car body and truck, each of said members having a horizontal arm and an inclined arm, the horizontal arms being arranged to support the car body and the inclined arms being oppositely inclined and connected together, whereby when one of said members is moved to increase the effective length of its lever arm the opposite member is moved to decrease the effective length of its lever arm, and means to prevent displacement of the car body laterally of the truck.

18. The combination with a car body and a truck under each end thereof, said trucks constituting the sole support for the car body, of a pair of lever or rocker members interposed between the car body and truck, each of said members having a horizontal arm and an inclined arm, the horizontal arms being arranged to support the car body and the inclined arms being oppositely inclined and connected together, whereby when one of said members is moved to increase the effective length of its lever arm the opposite member is moved to decrease the effective length of its lever arm, and a king pin connection between the car body and truck.

19. The combination with a car body and a truck under each end thereof and swiveled thereto, said trucks constituting the sole support for the car body, of a pair of lever or rocker members interposed between the car body and truck, each of said members having a horizontal arm and an inclined arm, the horizontal arms being arranged to support the car body and the inclined arms being oppositely inclined and connected together, whereby when one of said members is moved to increase the effective length of its lever arm the opposite member is moved

to decrease the effective length of its lever arm, universal joint connections between the horizontal arms of said members and the car body, and means connecting the truck and car body and arranged to center the truck relative to the car body.

20. The combination with a car body and a truck under each end thereof and swiveled thereto, said trucks constituting the sole support for the car body, of a pair of lever or rocker members interposed between the car body and truck, each of said members having a horizontal arm and an inclined arm, the horizontal arms being arranged to support the car body and the inclined arms being oppositely inclined and connected together, whereby when one of said members is moved to increase the effective length of its lever arm the opposite member is moved to decrease the effective length of its lever arm, universal joint connections between the horizontal arms of said members and the car body, and means to prevent displacement of the car body laterally of the truck.

21. The combination with a car body and a truck under each end thereof, said trucks constituting the sole support for the car body, of a pair of lever or rocker members interposed between the car body and truck, each of said members having a horizontal arm and an inclined arm, the horizontal arms being arranged to support the car body and the inclined arms being oppositely inclined and connected together, whereby when one of said members is moved to increase the effective length of its lever arm the opposite member is moved to decrease the effective length of its lever arm, universal joint connections between the horizontal arms of said members and the car body, and a king pin connection between the truck and car body.

22. The combination with a car body and a truck under each end thereof and swiveled thereto, said trucks comprising the entire support for the car body, of a pair of lever or rocker members interposed between the car body and truck, each of said members having lever arms of variable effective length, connections between said pair of lever or rocker members whereby when one of said members is moved in a direction to increase its effective lever arm the opposite member is moved in a direction to decrease its effective lever arm, said lever or rocker members being so arranged as to lift the car body against gravity when the truck is inclined laterally, and means connecting the truck and car body and arranged to center the truck relative to the car body.

23. The combination with a car body and a truck under each end thereof and swiveled thereto, said trucks constituting the sole support for the car body, of a pair of lever or rocker members interposed between the car body and truck, each of said members having a horizontal arm and an inclined arm, the horizontal arms being arranged to support the car body and the inclined arms being oppositely inclined and connected together, whereby when one of said members is moved to increase the effective length of its lever arm the opposite member is moved to decrease the effective length of its lever arm, said lever or rocker members being so arranged as to lift the car body against gravity when the truck is inclined laterally, and means connecting the truck and car body and arranged to center the truck relative to the car body.

24. The combination with a car body and a swiveled truck under each end thereof and swiveled thereto, said trucks comprising the entire support for the car body, of a pair of lever or rocker members interposed between the car body and truck, each of said members having lever arms of variable effective length, connections between said pair of lever or rocker members whereby when one of said members is moved in a direction to increase its effective lever arm the opposite member is moved in a direction to decrease its effective lever arm, said lever or rocker members being so arranged as to lift the car body against gravity when the truck is inclined laterally, and means to prevent displacement of the car body laterally of the truck.

25. The combination with a car body and a swiveled truck under each end thereof, said trucks comprising the entire support for the car body, of a pair of lever or rocker members interposed between the car body and truck, each of said members having lever arms of variable effective length, connections between said pair of lever or rocker members whereby when one of said members is moved in a direction to increase its effective lever arm the opposite member is moved in a direction to decrease its effective lever arm, said lever or rocker members being so arranged as to lift the car body against gravity when the truck is inclined laterally, and means to prevent displacement of the car body laterally of the truck.

26. The combination with a car body and a truck under each end thereof, said trucks comprising the entire support for the car body, of a pair of lever or rocker members interposed between the car body and truck and arranged to lift the car body against gravity when the truck is inclined laterally and adjustably transmit the weight of the end of the car body and its load to the truck, and a king pin connection between the car body and truck frame.

27. The combination with a car body and a swiveled truck under each end thereof, said trucks comprising the entire support for the car body, of a pair of lever or rocker

members interposed between the truck and car body, each of said members having a horizontal arm and an inclined arm, the horizontal arms being arranged to support the end of the car body and the inclined arms being oppositely inclined and connected together, whereby when one of said members is moved to increase the effective length of its lever arm the opposite member is moved to decrease the effective length of its lever arm, said lever or rocker members being so arranged as to lift the car body against gravity when the truck is inclined laterally, and means connecting the truck and car body and arranged to center the truck relative to the car body.

28. The combination with a car body and a swiveled truck under each end thereof, said trucks comprising the entire support for the car body, of a pair of lever or rocker members interposed between the truck and car body, each of said members having a horizontal arm and an inclined arm, the horizontal arms being arranged to support the end of the car body and the inclined arms being oppositely inclined and connected together, whereby when one of said members is moved to increase the effective length of its lever arm the opposite member is moved to decrease the effective length of its lever arm, said lever or rocker members being so arranged as to lift the car body against gravity when the truck is inclined laterally, and means to prevent displacement of the car body laterally of the truck.

29. The combination with a car body and a truck under each end thereof, said trucks comprising the entire support for the car body, of a pair of lever or rocker members interposed between the truck and car body, each of said members having a horizontal arm and an inclined arm, the horizontal arms being arranged to support the end of the car body and the inclined arms being oppositely inclined and connected together, whereby when one of said members is moved to increase the effective length of its lever arm the opposite member is moved to decrease the effective length of its lever arm, said lever or rocker members being so arranged as to lift the car body against gravity when the truck is inclined laterally, and a king pin connection between the truck and car body.

In testimony whereof, I have hereunto set my hand.

EDGAR W. SUMMERS.

Witnesses:
F. W. WINTER,
G. H. LERESCHE.

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