F. STEFFENS.

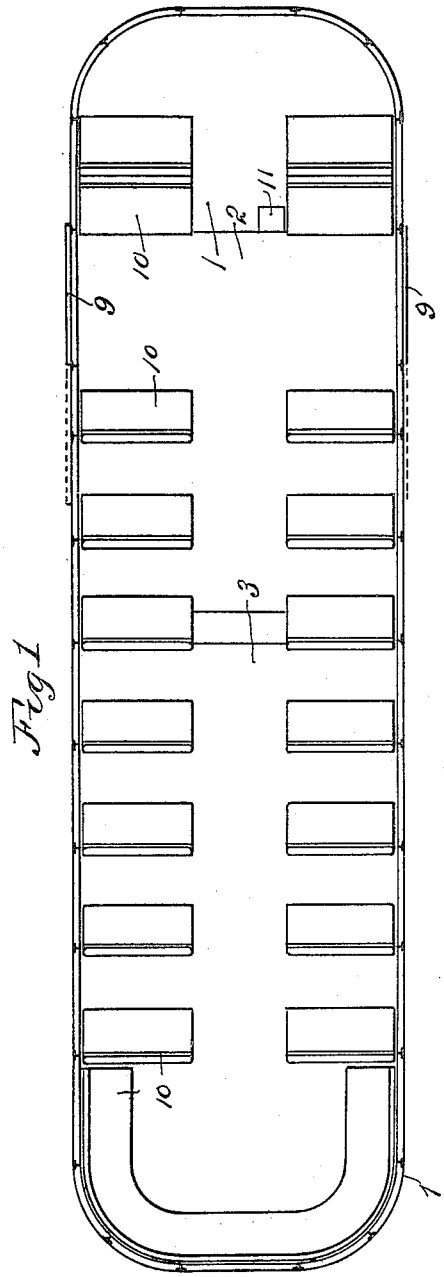
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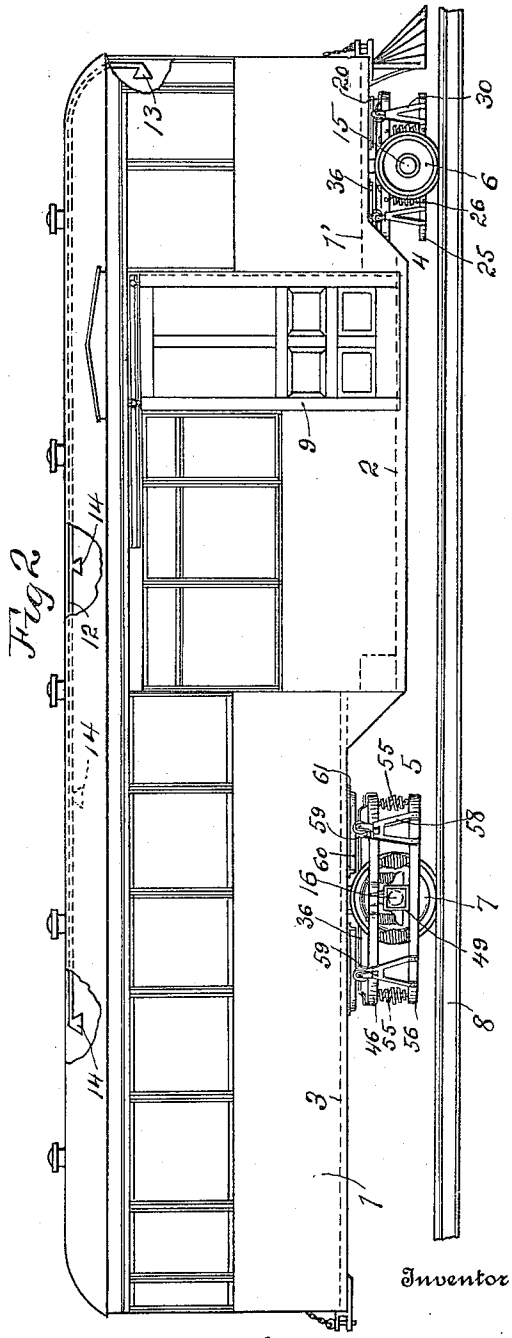
APPLICATION FILED AUG. 23, 1915.

1,225,882.

Patented May 15, 1917.

5 SHEETS—SHEET 1.





Witnesses

E. B. House.

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5 SHEETS—SHEET 2.

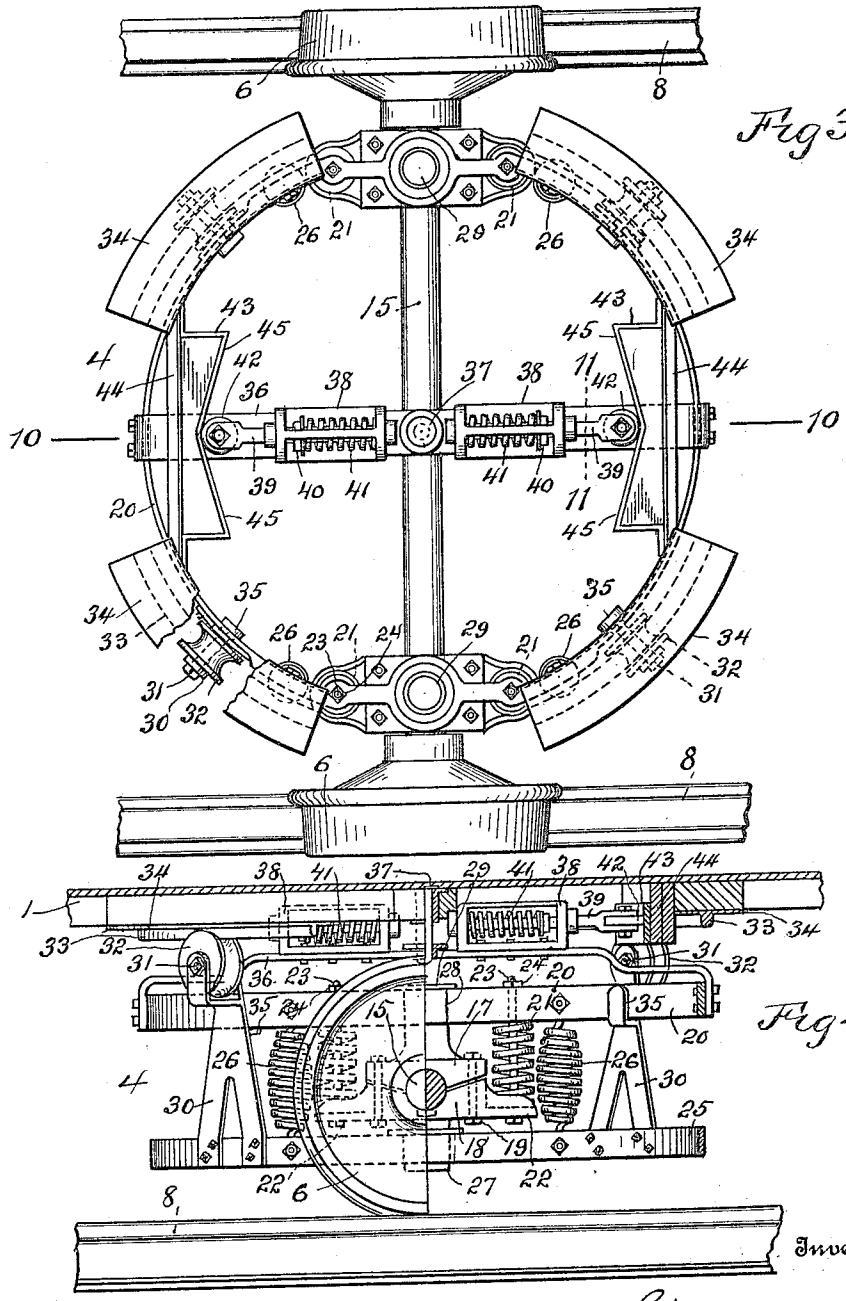


Fig 3

Fig 4

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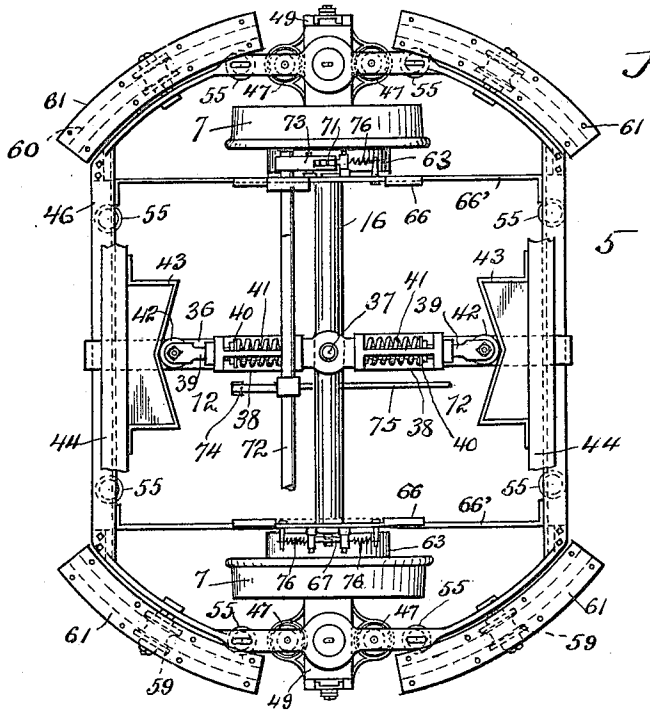


Fig 5

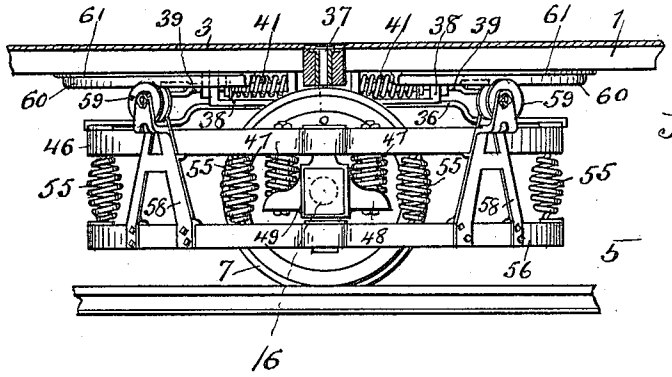


Fig 6

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5 SHEETS—SHEET 4.

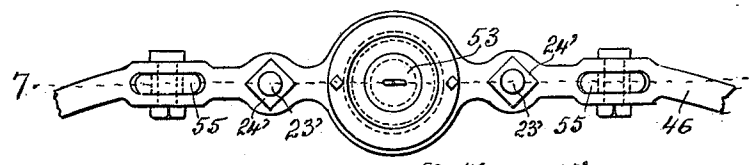


Fig 8

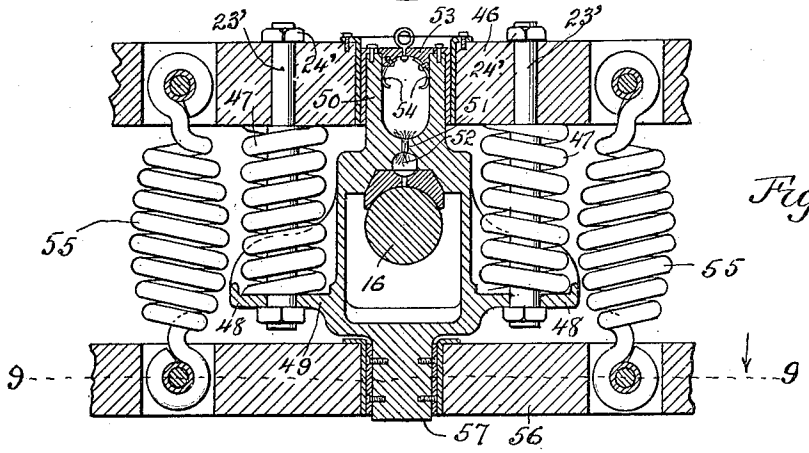


Fig 7

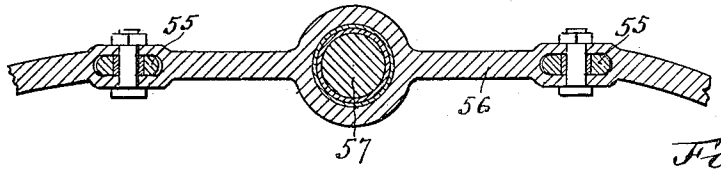


Fig 9

Fig 10

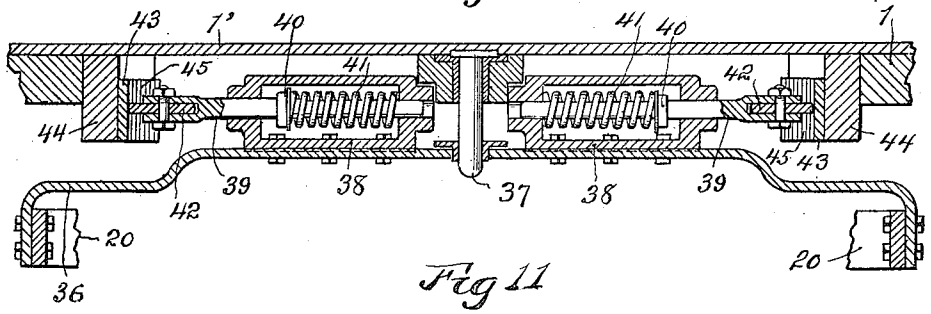
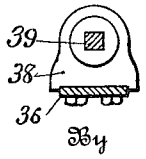


Fig 11



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Fig 12

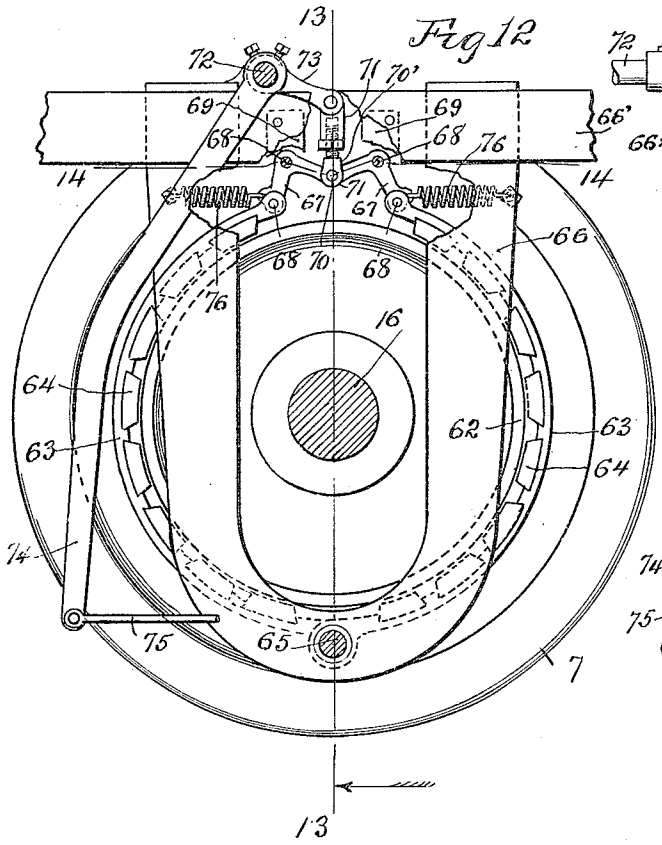


Fig 13

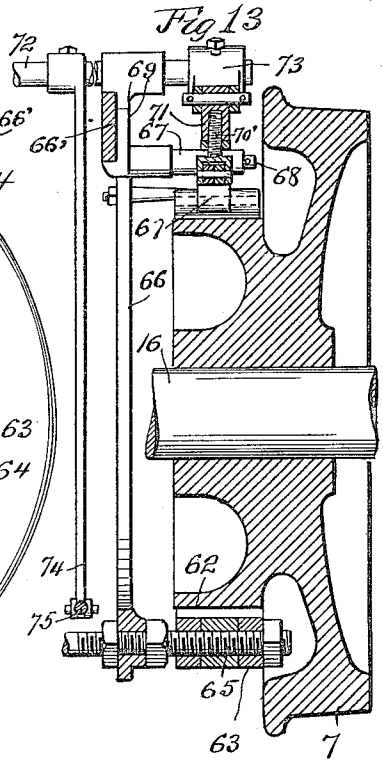
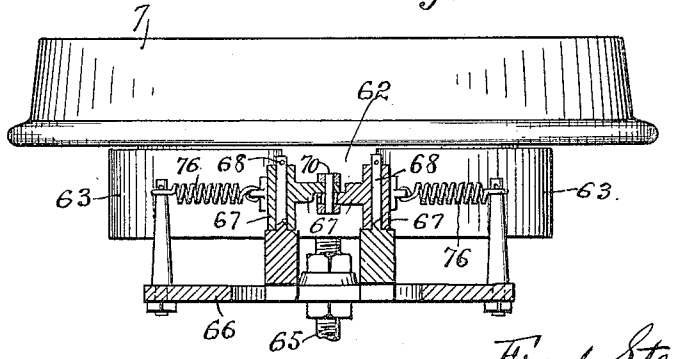


Fig 14



Witnesses

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UNITED STATES PATENT OFFICE.

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CAR.

1,225,882. Specification of Letters Patent. Patented May 15, 1917.

Application filed August 23, 1915. Serial No. 46,767.

To all whom it may concern:

Be it known that I, FRED STEFFENS, a citizen of the United States, residing at St. Joseph, in the county of Buchanan and State of Missouri, have invented a certain new and useful Improvement in Cars, of which the following is a specification.

My invention relates to improvements in cars.

The object of my invention is to provide a car which will be of light weight and large seating capacity, which will be readily accessible to passengers, which will be easy running, which will readily make sharp curves and will have great traction power, and which can be successfully operated by one man.

The novel features of my invention are hereinafter fully described and claimed.

In the accompanying drawings which illustrate the preferred form of my invention,

Figure 1 is a floor plan view of my improved car.

Fig. 2 is a side elevation, partly broken away, of my improved car.

Fig. 3 is a plan view of the front truck.

Fig. 4 is a view, partly in side elevation and partly in vertical section of the front truck.

Fig. 5 is a plan view of the rear truck.

Fig. 6 is a view showing the rear truck in side elevation, and a portion of the car body in vertical section.

Fig. 7 is a vertical sectional view of the rear truck taken on the line 7—7 of Fig. 8.

Fig. 8 is a plan view of a portion of the upper frame of the rear truck.

Fig. 9 is a horizontal sectional view on the line 9—9 of Fig. 7.

Fig. 10 is a vertical enlarged sectional view on the line 10—10 of Fig. 3.

Fig. 11 is a cross section on the line 11—11 of Fig. 3.

Fig. 12 is an enlarged cross section on the line 12—12 of Fig. 5, showing the brake mechanism, some of the parts being broken away.

Fig. 13 is a vertical sectional view on the line 13—13 of Fig. 12.

Fig. 14 is a horizontal sectional view on the line 14—14 of Fig. 12.

Similar reference characters designate similar parts in the different views.

1 designates the body of the car which is provided with a front floor section 1′, an intermediate floor section 2 and a rear floor section 3, Figs. 1 and 2. The floor sections 1′ and 3 are disposed respectively above the front and rear trucks 4 and 5 which are respectively pivoted thereto and which are, preferably, operable independently of each other.

The trucks 4 and 5 are best shown in Figs. 3 and 4 and 5 and 6, and their specific construction will be hereinafter described.

The wheels 6 of the truck 4 are, preferably, of smaller diameter than the wheels 7 of the rear truck, the latter wheels being made higher to accommodate the driving motors, not shown, and the wheels 6 of the front truck being lower so as to bring the floor section 1′ as low as possible.

The floor section 2 is a drop floor section, which is located intermediate of the trucks 4 and 5, this floor being disposed lower than the pivotal connection of the trucks with the other floor sections, and being preferably not more than twelve inches above the rails 8 so as to provide an easy entrance and exit for passengers through the doorway which is located above the floor 2 and is adapted to be closed by a forwardly and rearwardly slidable door 9, which may be operated by the usual type of mechanism employed for this purpose.

When the car is used as a one man car, the door 9 is preferably located closely adjacent to the floor section 1′ which is the floor of the compartment occupied by the motorman.

Seats 10 may be provided on the floor sections 1′, 2 and 3.

When the car is operated as a one man car, a coin receptacle 11, Fig. 1, may be placed in the motorman's compartment closely adjacent to the door 9.

In order that the motorman may call the stops so that all the passengers in the car may hear him, a longitudinally disposed

speaking tube 12 is secured to the under side of the roof of the car, and is provided, at its forward end in the motorman's compartment with a mouthpiece 13, and at its rear end and, when desired, at intermediate points with downwardly projected megaphones 14.

In order that a long wheel base may be secured, the front truck 4 is located closely adjacent to the forward end of the car body 1. In order that great traction power may be obtained with the truck 5, the latter is preferably located at a point about midway between the center of the car and the rear end thereof, thereby enabling the rear truck 5 to carry a greater portion of the load.

The trucks 4 and 5 are, preferably, provided respectively with single axles 15 and 16, and in order to secure a large amount of flexibility, required by its extreme forward location, the front truck 4 is provided with axle bearings which are located at the inner sides of the wheels 6, and consist each of upper and lower members 17 and 18, which are secured together and to the axle 15 by bolts 19, see Fig. 4.

Referring now particularly to Figs. 3 and 4, which illustrate the front truck, 20 designates an annular horizontal upper frame which is supported by two pairs of vertical coil compression springs 21, said pairs being respectively mounted upon lateral wings 22 with which the lower bearing members 18 are provided.

Vertical bolts 23 extend respectively through the springs 21 and are rigidly secured at their upper ends to the frame 20, and which have their lower ends slidably guided in the wings 22, the heads of the bolts being adapted to bear against the under sides of said wings. The upper ends of the bolts 23 are provided with nuts 24.

An annular horizontal lower frame 25 is suspended below the axle 15, by coil suspension springs 26, from the upper frame 20.

By suspending the lower frame 25 from the upper frame by suspension springs, greater flexibility of action and easier riding are obtained than can be obtained by the use of the commonly used compression springs.

For vertically guiding the lower frame 25, it is provided with two vertical diametrically opposite holes, in which are respectively slidable two downwardly extending projections 27, with which the lower bearing members 18 are respectively provided.

For vertically guiding the upper frame 20, it is provided with two diametrically opposite vertical holes, in which are slidably mounted respectively two vertical upwardly extending tubular projections 28, with which the bearing members 17 are respectively provided.

The tubular projections 28 are adapted to contain a lubricant and the openings therein extend through to the axles 15. To prevent the access of dirt, the projections 28 may be provided at their upper end with removable covers 29.

Secured to the lower frame 25 are upwardly extending brackets 30 in the upper ends of which are respectively secured horizontal bolts 31 upon which are respectively rotatably mounted carrying rollers 32 which are adapted to travel upon horizontal arcuate flanges 33, which form tracks and which are integral with horizontal plates 34, which are secured to the under side of the car body 1. The rollers 32 are grooved rollers to enable them to keep the track.

The brackets 30 are preferably provided with inwardly and upwardly extending guiding arms 35 disposed at the inner side of the upper frame 20, the rollers 32 being at the outer side thereof.

Secured in a diametrical position into and extending across the upper frame 20, is an arch bar 36, which is provided with a central vertical hole, in which is pivotally mounted the king bolt or center pin 37, which is mounted in the car body 1 directly above the middle of the axle 15, and which forms the axis upon which the truck frame 4 swings.

For the purpose of normally bringing the truck 4 to the straight-ahead position, the following described mechanism is provided.

Secured to the upper side of the arch bar 36, at opposite sides respectively of the king bolt 37, are two U-shaped members 38, Figs. 3 and 4, which respectively slidably support two horizontal longitudinal bars 39, each of which is slidably mounted in the vertical arms of the adjacent member 38 and which intermediate of said arms, has secured to it a nut or collar 40. Respectively encircling said bars 39 are two coil springs 41, one set of ends of which bear against the arms of the members 38 which are adjacent to the king bolt 37, and the other set of ends of which respectively bear against the nuts or collars 40. Respectively rotatably mounted in the outer ends of the members 39 are two friction rollers 42, adapted respectively to bear against two horizontal abutments 43, which are respectively supported, forward and rearward of the axle 15, on the car body 1 by cross beams 44.

Each of the abutments 43 at its inner side is provided with converging faces 45, against which the rollers 42 are adapted to bear. Said faces are respectively tangent to circles of smaller diameter than a circle having the bolt 37 as a center and which passes through the point of intersection of said faces.

By means of this arrangement, if the rollers 42 travel in either direction from the

central straight-ahead position, the faces 45 will force the members 39 inwardly, thereby compressing the springs 41.

The springs thus serve to normally swing the truck 4 to the straight-ahead position when the wheels 6 pass from a curve onto a straight track.

The arch bar 36 thus serves as a lever, the fulcrum of which is the axis of the truck 4. By locating the axle bearings at the inner sides of the wheels 6 of the front truck 4, the truck may have a smaller diameter in the frame portion, than is possible with constructions in which the truck frames are mounted on journal boxes at the outer sides of the wheels.

By having the truck frames of small diameter, the abutments 43 may be disposed closely adjacent to the axis of the truck, thus permitting the springs 41, U-shaped members or housings 38, bars 39 and rollers 42 to also be disposed closely adjacent to the axis of the truck, whereby the action of the spring mechanism is rendered easier and more effective and the strain upon the parts is less.

By having the abutments 43 located at opposite sides of the axle 15 and within the truck frame, the strain is equalized and the wear upon the king bolt and parts connected therewith is reduced to a minimum.

Another advantage in having the axle bearings at the inner sides of the wheels is the reduction in diameter of the circle upon which the carrying rollers 32 travel. This permits of a reduction in weight of the truck and gives it freer action, a great desideratum, when the truck is placed closely adjacent to the end of the car.

To prevent the bars 39 turning, each of these bars may be square in cross section, as shown in Fig. 11, at the place in which it is slidably mounted in the outer arm of the adjacent member 38, said arm being provided with a similar shaped hole in which the bar is fitted.

The rear truck 5, shown in Figs. 5 and 6, is very similar in construction to the truck 4, the principal difference being that in the truck 5, the axle bearings are located at the outer sides of the wheels 7 in order that the car body be given a stable foundation with a wide bearing to prevent lateral tipping.

The rear truck is provided with a horizontal annular upper truck frame 46, similar in function and construction to the frame 20, and which is supported upon coil compression springs 47, Figs. 6 to 9, the latter being mounted upon lateral wings 48, with which each of two journal boxes 49 is provided. The journal boxes 49 are mounted on the axle 16 at the outer sides of the wheels 7.

The upper end of each axle box 49 is provided with a vertical tubular extension 50, which is slidably mounted in the upper frame 46.

The interior of the projection 5 serves as a receptacle for a lubricant and communicates by means of a passage 51 with the interior of the journal box. Wicking 52 is extended through the passage 51, for the purpose of feeding the lubricant to the axle box.

Each projection 50 is provided with a removable cover 53, which may be releasably held in position by springs 54, Fig. 7, which bear against the inner wall of the projection 50. Suspended from the upper frame 46 by helical suspension springs 55 each having a vertical axis is a lower frame 56 of annular form and disposed horizontally below the axle 16. The lower frame 56 is provided with two vertical holes in which are respectively slidably mounted downwardly extending guiding projections 57, with which the journal boxes 49 are respectively provided.

Secured to the lower frame 56 are upwardly extending brackets 58 which respectively carry rollers 59, which are grooved and respectively travel upon arcuate flanges 60, which extend downwardly from horizontal plates 61, which are secured to the under side of the car body 1. The upper frame 46 of the rear truck is provided with mechanism for normally bringing it to the straight-ahead position which corresponds in construction to the mechanism employed for this purpose in connection with the front truck 4.

An arch bar 36 is secured to the upper frame 46, in the same manner as the front bar 36 is secured to the upper frame 20 of the front truck 4. On the rear arch bar 36 are provided U-shaped members 38, disposed at opposite sides of a rear king bolt 37 and having slidably mounted in them respectively horizontal central bars 39, which carry rollers 42 which respectively engage the converging faces 45 of two abutments 43 which are secured to two transverse bars 44 respectively, the latter being secured to the car body 1.

The mode of operation of these parts with respect to the rear truck 5 is the same as the mode of operation of the corresponding parts connected with the front truck 4.

As the rear motor truck 5 is to be equipped with low wheels, and twin motors, not shown, there will not be sufficient room for use of the usual brake rigging.

I have, therefore, provided a new brake, which is particularly adapted for use in connection with the rear truck 5.

Referring particularly to Figs. 12, 13 and 14, it will be noted that each wheel 7 is provided on its inner side with an annular flange 62 which is partly encircled by two concentric curved members 63, each of which

carries on its inner side brake shoes 64, which have dove-tail connection therewith, and which are adapted to exert a braking pressure against the flange 62. The lower ends of the members 63 are hinged to a transverse bar 65, disposed below the axle 16 and having its ends respectively secured to two depending brackets 66, the upper ends of which are secured respectively to two horizontal plates 66′ of the upper truck frame 46.

Two pairs of levers 67 are respectively pivoted to horizontal pins 68 secured respectively to plates 69, which are secured one pair to each plate 66′.

One set of ends of the levers 67 are respectively pivoted to the members 63. The other set of ends of said levers are respectively pivoted by a horizontal bolt 70 to a vertical bolt 70′ which has a screw-thread connection with a block 71.

Oscillatively supported on the car body 1 is a transverse rock shaft 72 having two cranks 73 respectively pivoted to the blocks 71. Secured to the rock shaft 72 is a crank 74 to the lower end of which is pivoted the rear end of an operating rod 75, adapted to be manually drawn forwardly, to apply the brake shoes 64 to the flanges 62, by any suitable means, not shown.

For retracting the brake shoe members 63 from the braking position, two coil springs 76 are respectively secured to the lower ends of the levers 67 of each pair of levers and to the adjacent brackets 66, the arrangement and tension of the springs being such that they will draw the upper ends of the members 63 away from the flanges 62.

From the foregoing description, it will be understood that the car and its appliances may be easily operated by one man. Its construction is such that it has large carrying capacity, great tractive powers, may be easily entered or departed from, and will make sharp curves easily. By reason of the weight of the car being supported by suspension springs, and by reason of the arrangement of the trucks, the car will be easy riding.

I do not limit my invention to the structure shown and described, as modifications, within the scope of the appended claims, may be made without departing from the spirit of my invention.

What I claim is:—

1. A car body, and two independently operable trucks centrally pivoted thereto and operable independently of another car, one truck being located closely adjacent to the forward end of the car and the rear truck disposed so that it carries a greater portion of the load.

2. A car body, and two independently operable trucks centrally pivoted thereto and operable independently of another car, each truck provided with a single axle, one truck being located closely adjacent to the forward end of the car and the rear truck disposed so that it carries a greater portion of the load.

3. A car body, and two independently operable trucks centrally pivoted thereto, each truck having a single axle, one truck being located closely adjacent to the forward end of the car, and the rear truck disposed so that it carries a greater portion of the load, the car body having intermediate of said trucks a drop floor portion and floor portions above said trucks, and a side door in said lower portion.

4. A car body, and two single axle trucks centrally pivoted thereto and operable independently of each other and another car, the car body having a drop floor portion between said trucks and floor portions above said trucks, and a side door in said drop floor portion.

5. A car body, two single axle trucks pivoted thereto and operable independently of each other and of another car, and means operable independently of the weight of the car body for forcing the trucks to the straight ahead position.

6. A car body, two single axle trucks centrally pivoted thereto and operable independently of each other and of another car and means operable independently of the weight of the car body for forcing the trucks to the straight ahead position.

7. A car body, and two trucks pivoted thereto and operable independently of each other, and of another car, one of the trucks being a single axle truck centrally pivoted to the car body closely adjacent to the forward end thereof, and the rear truck being disposed so as to carry the greater part of the load.

8. A car body, two single axle trucks pivoted thereto and operable independently of each other and of another car, and resilient means for normally forcing the trucks to the straight-ahead position.

9. A car body, a single axle truck pivotally connected thereto, and means located wholly within the truck and operable independently of the car body for normally bringing it to the straight-ahead position.

10. A car body, two trucks pivotally connected thereto, and each truck provided with a single axle having two wheels mounted thereon, one truck having axle bearings at the inner sides of its wheels, and the other truck having axle bearings at the outer sides of its wheels.

11. A car body, two single axle trucks pivotally connected thereto, each axle having two wheels mounted thereon, one truck having axle bearings at the inner sides of its wheels, the other truck having axle bear-

ings at the outer sides of its wheels, and means for automatically bringing the trucks to the straight-ahead position.

12. A car body, two trucks pivotally connected thereto and provided with axles and wheels, one truck having axle bearings at the inner sides of its wheels, the other truck having axle bearings at the outer sides of its wheels, and means for automatically bringing the trucks to the straight-ahead position.

13. A car body, and two single axle trucks pivotally connected therewith, one truck having wheels of less diameter than the wheels of the other truck and provided with axle bearings at the inner sides of its wheels.

14. A car body, and two single axle trucks pivotally connected therewith, one truck having wheels of less diameter than the wheels of the other truck and having axle bearings at the inner sides of its wheels, the other truck having axle bearings at the outer sides of its wheels.

15. A car body, an axle, an upper frame, a lower frame, means carried by the lower frame for supporting the car body, suspension springs supported by the upper frame and suspending the lower frame, and means supported by the axle for supporting the upper frame.

16. A car body, an axle, an upper frame, a lower frame, means carried by the lower frame for supporting the car body, suspension springs supported by the upper frame and suspending the lower frame, and springs supported by the axle for supporting said upper frame.

17. A car body, an axle, an axle box supported by the axle, an upper frame, springs supported by the box and supporting the upper frame, a lower frame, and suspension springs supported by the upper frame and suspending the lower frame.

18. A car body, an axle, an axle box supported by the axle, an upper frame slidably connected to said box, springs supported by the box and supporting the upper frame, a lower frame slidably connected with the box, and suspension springs supported by the upper frame and suspending the lower frame.

19. A truck frame, and an axle box having an upwardly extending tubular guide slidable in the truck frame and communicating interiorly with the box, the guide being adapted to contain a lubricant.

20. A car body, a truck frame pivoted thereto, means supported by said frame for supporting the car body, an abutment carried by the car body and having two converging faces, a lever secured to the frame and pivoted to the car body on the same axis as the axis of the frame, a member longitudinally movable on said lever and adapted to engage said faces, and a spring for normally forcing said member against said faces for normally swinging the frame to the straight-ahead position.

21. A car body, a truck frame pivoted thereto, means supported by the truck frame for supporting the car body, two abutments carried by the car body at opposite sides of the axis of said frame and provided each with two converging faces, a lever secured to the frame and pivoted to the car body on the axis of the frame, two members longitudinally movable on said lever and adapted to respectively engage the faces of said abutments, and resilient means for normally forcing said members against said abutments for normally swinging the frame to the straight-ahead position.

22. A car body, and two trucks supporting said body and pivotally connected thereto, the car body having a front floor portion, a rear floor portion and an intermediate floor portion, the latter having a side entrance and being disposed intermediate of said trucks and having a floor lower than the floor of said front floor portion, the floor of the latter being lower than the floor of said rear floor portion.

23. A car body, two trucks supporting said car body and pivoted thereto, said body having a front floor portion, a rear floor portion, and an intermediate floor portion, the latter having a side entrance and being disposed intermediate of said truck and having a floor lower than the floor of said front floor portion, the floor of the latter being lower than the floor of said rear floor portion, and seats mounted on each of said floor portions.

24. A car body, an axle, and means including a helical suspension spring having a vertical axis for supporting the car body upon the axle.

25. A car body, an axle, an axle box on the axle, a frame, means carried by the axle box for supporting said frame, and means including a helical suspension spring having a vertical axis supported by said frame for supporting the car body.

26. An axle box, two truck frames slidably mounted on the axle box one above the other, and means by which one of said frames is supported by the other.

27. An axle box, two truck frames slidably mounted on the axle box one above the other, and resilient means for supporting one of said frames upon the other.

28. An axle box, two truck frames slidably mounted on the axle box, and resilient means for supporting one of said frames upon the other.

29. An axle box, two truck frames slid-

ably mounted thereon, resilient means carried by the axle box supporting one frame, and resilient means carried by the latter for supporting the other truck frame.

30. A car body, two centrally pivoted single axle trucks operable independently of each other and another car, one truck located closely adjacent to the forward end of the car body, and the other truck located so that it carries the greater part of the load, and means operable independently of the weight of the car body for forcing the trucks to the straight ahead position.

31. A car body, two single axle trucks pivoted thereto and operable independently of each other, and means located wholly within each truck and operable independently of the weight of the car body and of another car for forcing the truck to the straight ahead position.

32. A car body, a single axle truck pivotally connected thereto, and means located wholly within said truck and operable independently of the weight of the car body and of another car for forcing the truck to the straight ahead position.

33. A car body, and two single axle trucks pivoted centrally thereto, one truck located closely adjacent to the forward end of the car body, and the rear truck disposed so that it carries the greater portion of the load.

In testimony whereof I have signed my name to this specification.

FRED STEFFENS.

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