

959,040.

W. S. ADAMS.
MAXIMUM TRACTION TRUCK.
APPLICATION FILED JUNE 19, 1908.

Patented May 24, 1910.

6 SHEETS—SHEET 1.

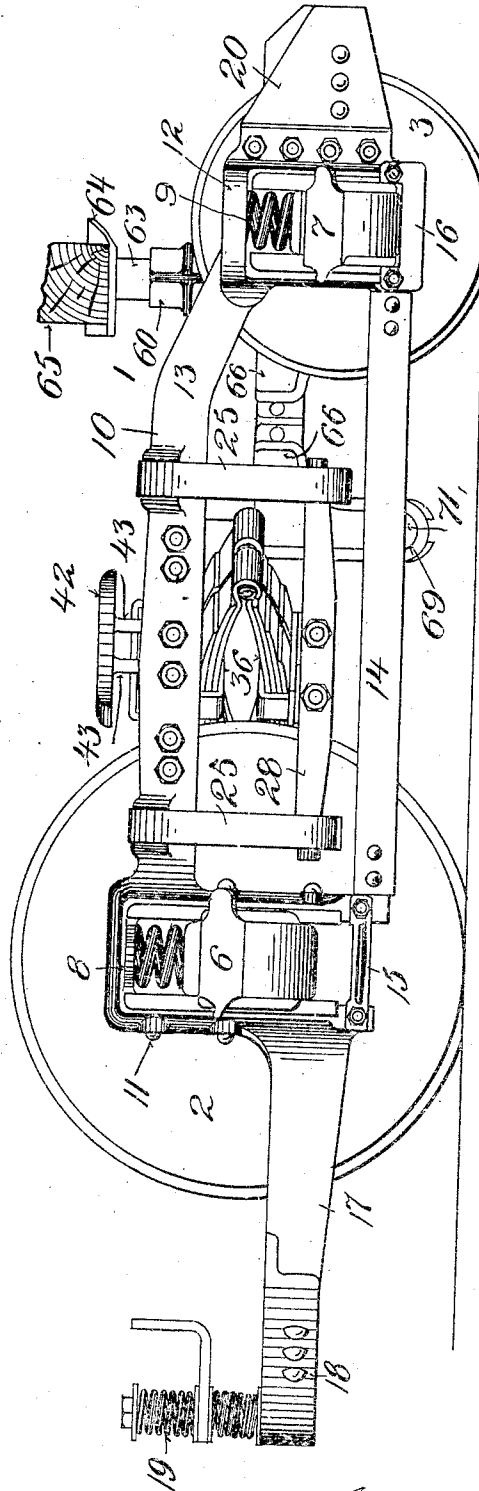


Fig. 1.

Witnesses:
W. Benjamin
M. D. Knowlton

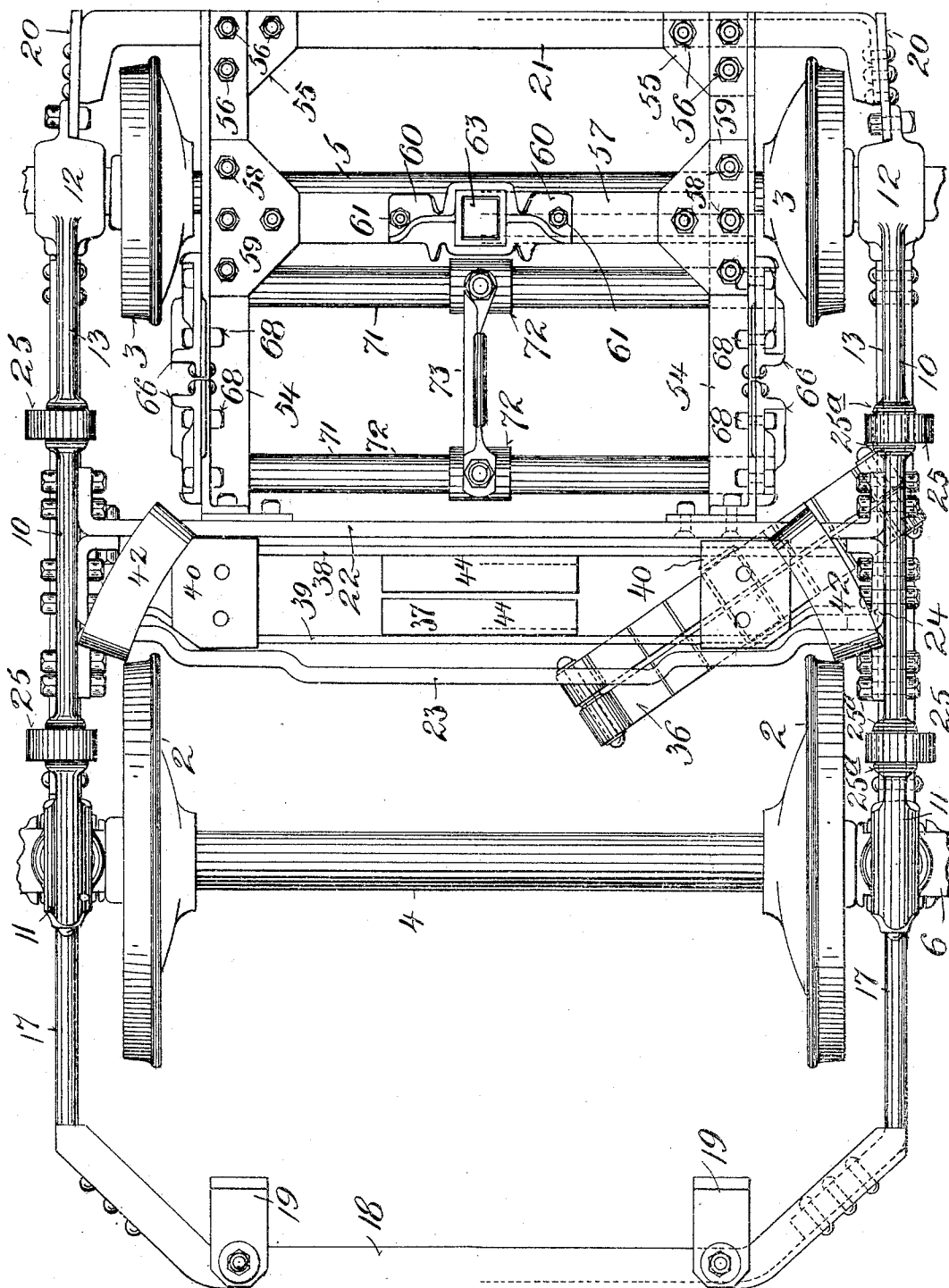
Inventor
Walter S. Adams
By his Attorney
Joseph R. Levy

W. S. ADAMS.
 MAXIMUM TRACTION TRUCK.
 APPLICATION FILED JUNE 19, 1908.

959,040.

Patented May 24, 1910.

6 SHEETS—SHEET 2.



Witnesses:
Chas. Benjamin
G. J. Amos

Fig. 2.

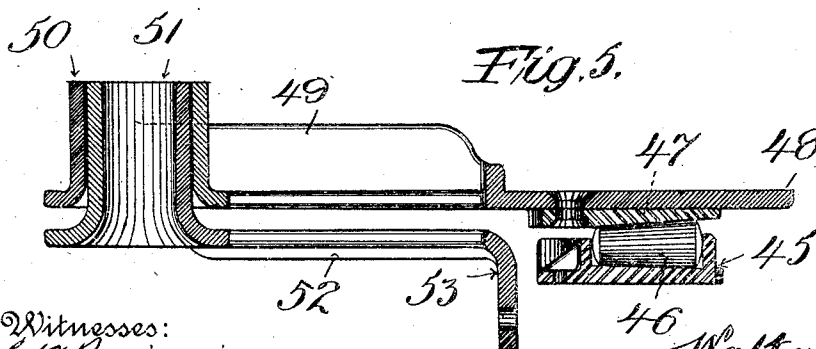
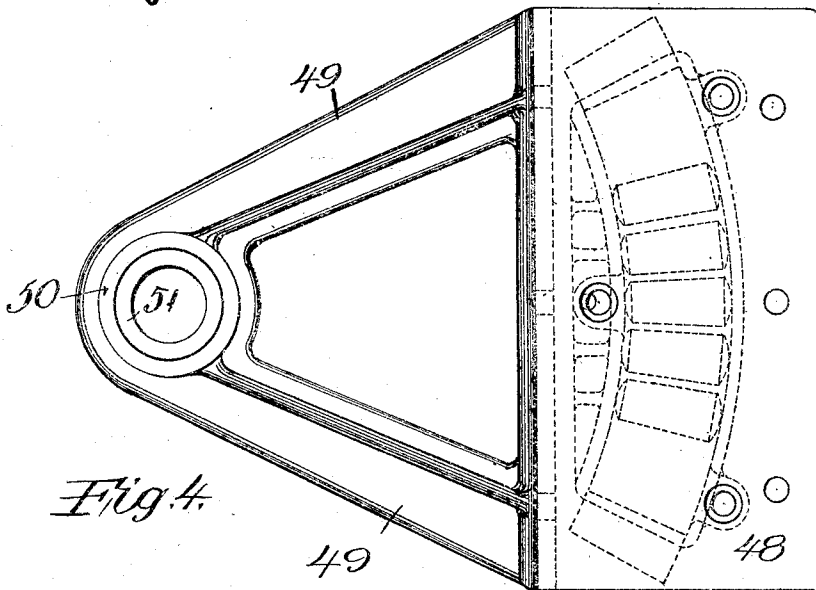
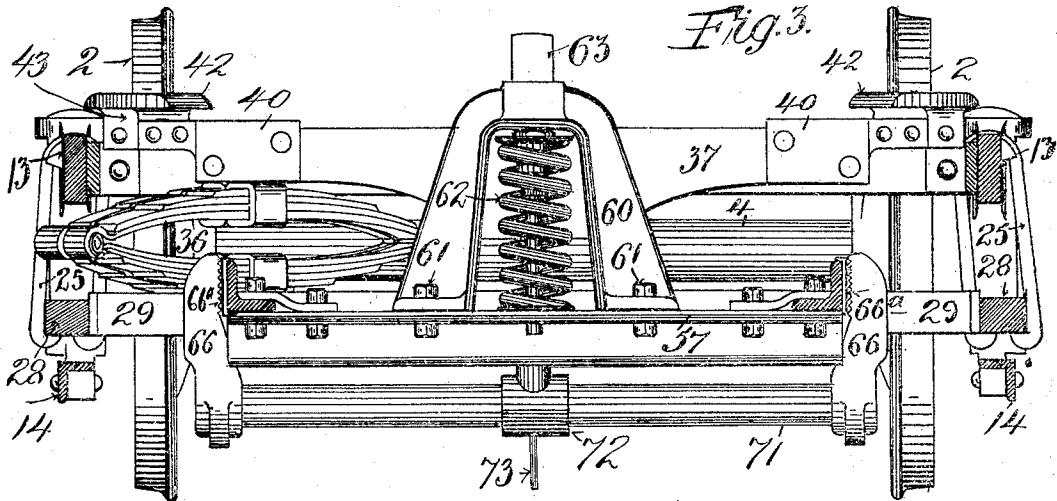
Inventor
Walter S. Adams
 By his Attorney,
John L. Levy

W. S. ADAMS.
 MAXIMUM TRACTION TRUCK.
 APPLICATION FILED JUNE 19, 1908.

959,040.

Patented May 24, 1910.

6 SHEETS—SHEET 3.



Witnesses:
 C. W. Benjamin
 J. H. Homan

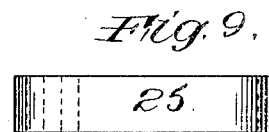
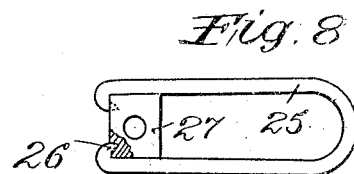
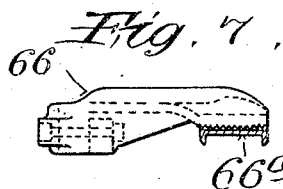
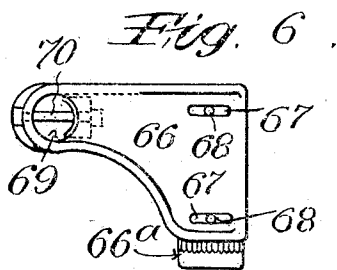
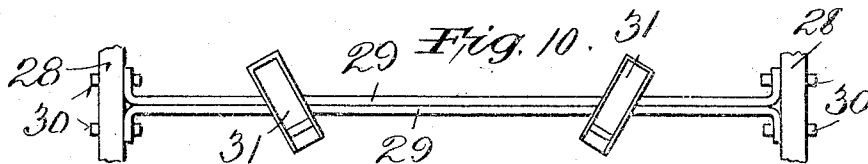
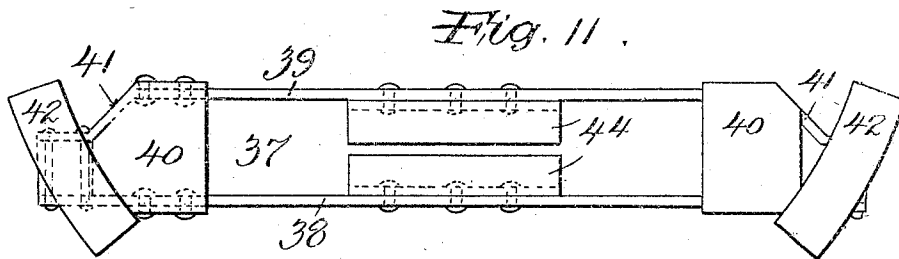
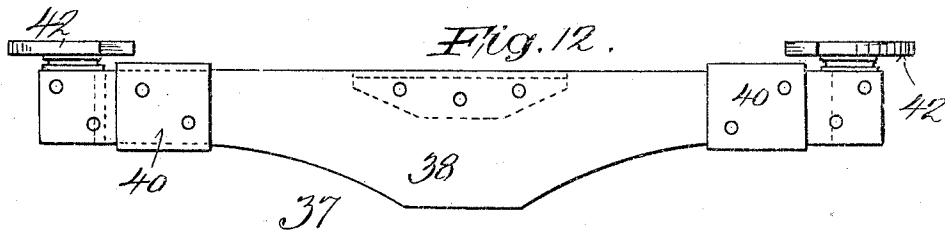
Inventor
 Walter S. Adams
 By his Attorney
 Joseph L. Day

959,040.

W. S. ADAMS.
MAXIMUM TRACTION TRUCK.
APPLICATION FILED JUNE 19, 1908.

Patented May 24, 1910.

6 SHEETS—SHEET 4.



Witnesses:
Wm. Benjamin
Charles H. Heman

Inventor
Walter S. Adams.
By his Attorney
Joseph L. Levy

959,040.

W. S. ADAMS.
MAXIMUM TRACTION TRUCK.
APPLICATION FILED JUNE 19, 1908.

Patented May 24, 1910.

6 SHEETS—SHEET 5.

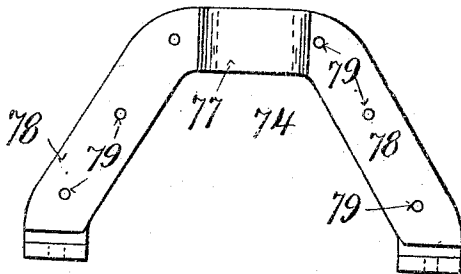


Fig. 18.

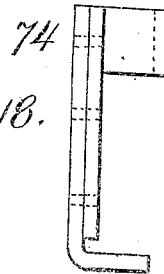


Fig. 19.

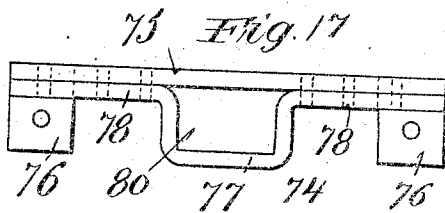


Fig. 17.

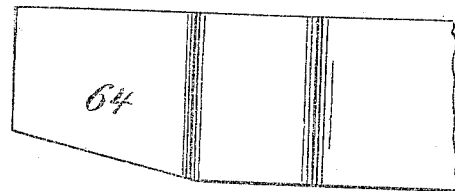


Fig. 15.



Fig. 16.

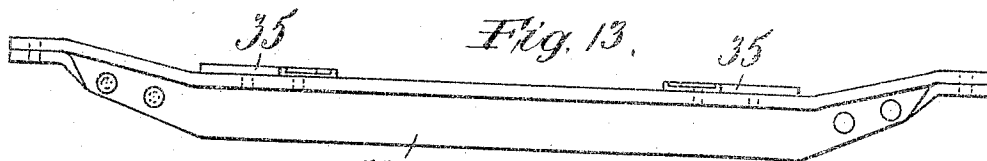


Fig. 13.

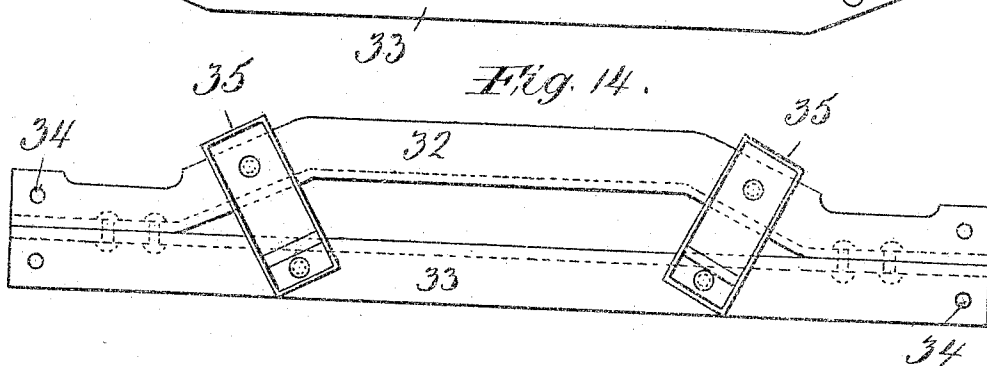


Fig. 14.

Witnesses:
L. M. Benjamin
J. D. Leonard

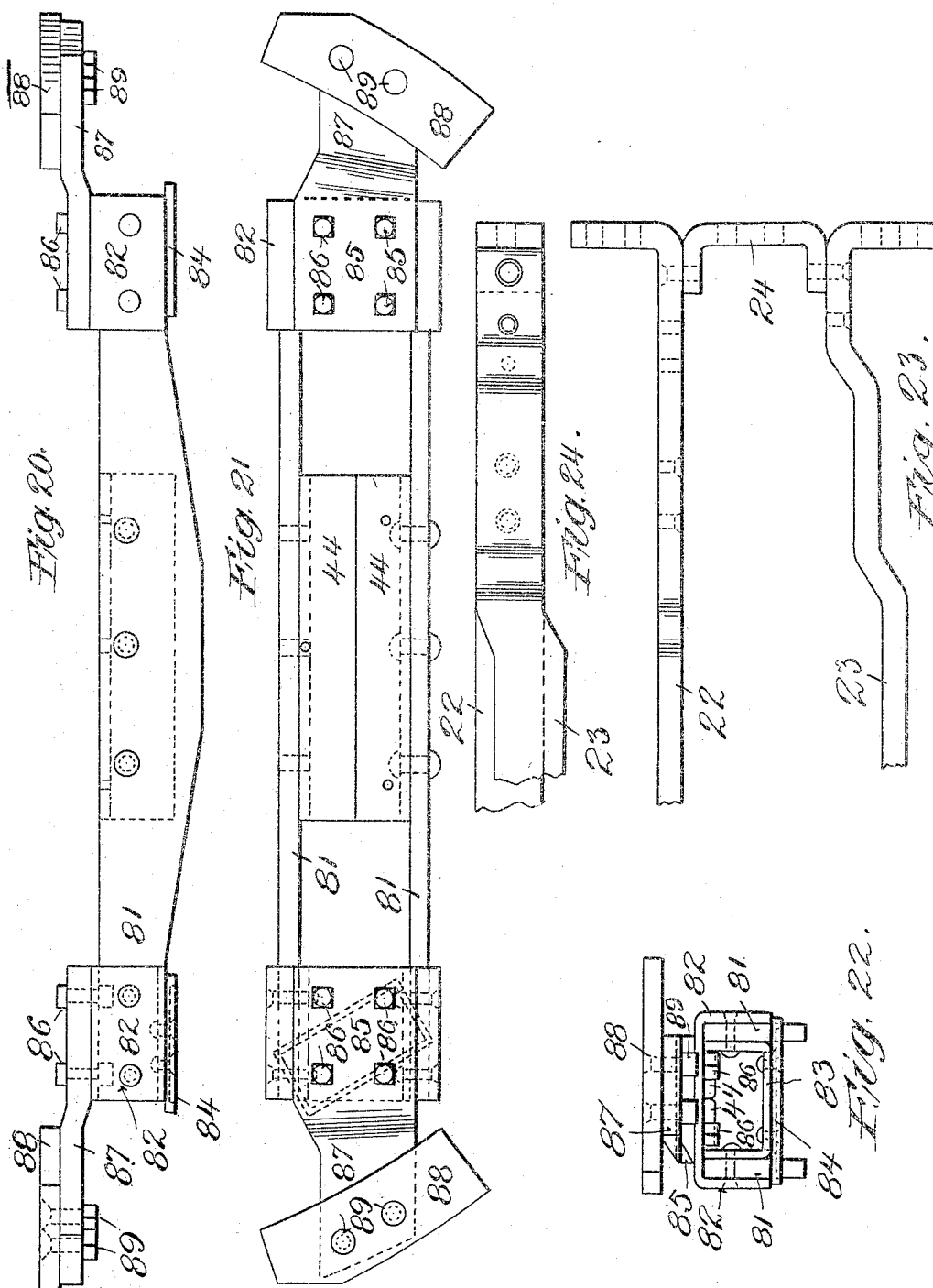
Inventor
Walter S. Adams
By his Attorney
Joseph L. Day

W. S. ADAMS.
 MAXIMUM TRACTION TRUCK.
 APPLICATION FILED JUNE 19, 1908.

959,040.

Patented May 24, 1910.

6 SHEETS—SHEET 6.



Witnesses:
 Benjamin
 Adams

Inventor
 Walter S. Adams.
 By his Attorney
 Joseph L. Bay

UNITED STATES PATENT OFFICE.

WALTER S. ADAMS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE J. G. BRILL CO., OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

MAXIMUM-TRACTION TRUCK.

959,040.

Specification of Letters Patent.

Patented May 24, 1910.

Application filed June 19, 1908. Serial No. 439,433.

To all whom it may concern:

Be it known that I, WALTER S. ADAMS, a citizen of the United States, and a resident of the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Maximum-Traction Trucks, of which the following is a specification.

The object of my invention is to provide a truck of this class which may be used on any of the conventional forms of street cars and carry the same so that the body will be low-hung, whereby passengers may enter or leave the car with a minimum of inconvenience, and at the same time carry the body of the car on a spring system so that the car will be easy-riding. This object is accomplished by my invention which consists, broadly speaking, in providing a truck of this type with a motor which is supported outside the wheel-base by the frame of the truck and an axle of the truck and by placing a suitably arranged spring system within the wheel-base of the truck for carrying the car body.

There are also other and incidental details of my invention as will appear below.

For a more detailed description of my invention, reference is to be had to the accompanying drawings forming a part hereof, in which,

Figure 1 is a side elevation of my improved truck. Fig. 2 is a plan of the same, certain parts being omitted so as to avoid confusion. Fig. 3 is an end elevation, certain parts being omitted to more clearly show the structure. Figs. 4 and 5 are plan and sectional views respectively, of the draw bar and its attachments. Figs. 6 and 7 show the adjustable bracket for supporting the bars from which the plow is suspended. Figs. 8 and 9 show an equalizing bar hanger. Fig. 10 shows in plan a form of spring plank or sand plank. Figs. 11 and 12 show a preferred form of bolster. Figs. 13 and 14 show the preferred form of spring plank.

Figs. 15 and 16 show a cam plate or rub plate. Figs. 17, 18 and 19 show a form of compression guide. Figs. 20, 21 and 22 are views in elevation, plan and end elevation, respectively, of another form of bolster.

Figs. 23 and 24 show the transom in plan and elevation, respectively.

Throughout the various views of the

drawings, similar reference characters designate similar parts.

My improved truck 1 is provided with the usual driving wheels 2 and trailing wheels 3, the driving wheels 2 being connected by a suitable axle 4, and the trailing wheels by suitable axle 5. The axle 4 has its ends journaled in the conventional axle boxes 6 and the axle 5 has its ends journaled in similar boxes 7, and each of these boxes support a coiled spring 8 and 9 respectively, which carry the side frame 10. The side frame 10 is provided with the larger pedestal 11 in which the axle box 6 slides, and the smaller pedestal 12 in which the axle box 7 slides, and these pedestals are connected at their upper ends by a top chord 13 which is preferably formed integral therewith and shaped as shown in Figs. 1 and 2, and at their lower ends these pedestals are connected by any suitable tie-bar 14 secured in any desired manner. The lower ends of the pedestals are connected together in the usual manner by suitable bars 15 and 16, respectively. The greater portion of the length of the top chord 13 is made parallel with the top-chord 14 for a reason which will appear below. The free leg of each pedestal 8 is provided with a projecting arm 17 which is united to the other arm 17 by suitable angle metal crossing 18 which is provided with a suitable spring system 19 by which one end of the motor or motor casing is supported. This is the usual construction for what is known as an outside-hung motor. The free leg of each pedestal 9 is provided with a vertical plate 20 connected to the other plate 20 by a suitable angle metal crossing 21 and is secured to this crossing by either bolts or rivets or other suitable means.

The top-chords 13 are connected together by means of transoms 22 and 23 respectively, which transoms are either bolted in place or secured by rivets, and they are separated by means of U-plates 24, placed as shown in Fig. 2. The transom 22 runs straight across the truck and the transom 23 is usually offset as shown in Figs. 2, 23, and 24, so as to permit this transom to be placed as near the driving wheels as possible, and at the same time to provide ample room for the car bolster hand-spring system and wish-bone bracket. Each of the top chords 13 is provided with downwardly and outwardly

splayed hangers 25 which have upwardly projecting points 26 which enter corresponding grooves in the block 27 in which the ends of the equalizing bar 28 are journaled.

5 The hangers 25 are hung in pairs from each top chord 13 and the two in each bar are connected by the equalizing bar 28. The equalizing bars 28 are united by a spring plank or sand plank.

10 In Fig. 10 is shown one form of spring plank which consists of two flat bars 29 with their ends bent at right angles and secured to the equalizing bars 28 by bolts 30. The upper surfaces of the bars 29 are provided
15 with suitable elliptical spring cups 31 which are connected in any suitable manner and preferably diagonally disposed.

In Figs. 13 and 14 I have shown two angle metal bars 32 and 33 respectively, which
20 angle metal bars have their vertical webs bent under the horizontal webs at the extreme ends so that these bars may be secured on tops of the equalizing bars 28. The bar 32 toward its center is bent away from and
25 spaced slightly from the bar 33, as shown in Fig. 12, the bar 32 being nearer the driving wheels, and these bars are also united by the elliptical spring cups 35 which are diagonally disposed for a purpose that will
30 appear below. They are also united by rivets, bolts or similar means where their vertical webs are together.

As shown in Fig. 13, the bars 32 and 33 are bent downwardly so that the spring cups
35 35 will be carried as low as desirable and are provided with bolt holes 34. The elliptical spring sides carry diagonally disposed elliptical or leaf springs 36 secured to said sides in any suitable manner. (For convenience
40 only one spring 36 is shown.) These springs are diagonally disposed so as not to interfere with the driving wheels or the frame of the truck, and at their upper points they are provided with a bolster 37 which
45 unites them. (See Figs. 11 and 12.) The bolster 37 consists of two bars 38 and 39 respectively, which are held in fixed relation by means of rectangular reinforces 40 placed near each end. The bar 39 is parallel to the
50 bar 38 throughout the greater portion of its length, but is offset at 41 so as to conform to the distance between the transoms. The bolster bands 40 are preferably made in the form of hollow prisms and might be
55 compared to a box without either a top or a bottom. One side of each band is cut away and beveled and the two adjacent corners are removed so as to make this bolster band 40 be flush with the offset portion 41
60 of the bar 38, so that this band will not interfere with the proper movement of the bolster 37 between the transoms 22 and 23. The bars 38 and 39 are riveted or otherwise suitably secured to the bands 40 and these
65 bars are also united by rub plates 42 which

are also diagonally disposed in the manner described below. Each of these rub plates 42 has depending lugs 43 which are secured to the bars 38 and 39 by rivets or bolts or other suitable means. Near their centers the bars
70 38 and 39 are provided with angle metal shelves 44 fixed thereto in any suitable manner, and adapted to receive the cup 45 for the cones 46 of the bearing which will be described below. The cup 45 is fixed to the
75 angle metal shelves 44 in any suitable manner as by bolts or rivets. Above the cones 46 is a cone-bearing 47 fixed to a plate 48 which is fixed to the bolster of the car, and plate 48 is integral with converging arms
80 49 which unite to form a bearing 50 for the king bolt 51 which is preferably located nearly over the axle 4, but slightly inside the wheel-base. The king bolt 51 extends from the wish-bone bracket 52 and is preferably
85 integral therewith, and this bracket 52 is provided with vertically disposed flange 53 which is bolted or otherwise secured to the bar 39 of the bolster 37. The rub plates 42 are so set and arranged as to
90 be concentric with the center of the king bolt 51.

The transom 22 is connected to the crossing 21 by means of the longitudinally disposed angle bars 54 which run horizontally
95 to a point adjacent to the transom 22 and then vertically to said transom so that these bars 54 clear the axle 5. These bars 54 are secured to the frame of the truck by plates 55 and bolts 56 or other suitable means, the
100 lower member 52, 53, of the wish-bone drawing device being secured to the bolster. These longitudinally disposed angle bars 54 are connected by a transverse angle bar 57 which runs parallel to the axle 5 and slightly
105 within the wheel-base. This bar 57 is secured in place by means of bolts 58 and plates 59, the plates being on top of the bars 54 and 57, and the bar 57 is also secured below the horizontal webs of the bars 54.
110 Secured to the center of the bar 57 is a bracket 60 provided with a square opening, which bracket 60 has upwardly extending and converging arms which are united by the portion that surrounds said rectangular
115 opening. This bracket 60 is secured in place by bolts 61 or other suitable means, and is also provided with coil-spring 62 which surrounds the lower portion of the plunger 63 and forces the same upwardly against a
120 cam plate 64 fixed to a crossing 65 of the car body. This plunger 63 serves to force the trailing wheels upon the track with increased pressure when passing around a curve and acts in the conventional manner.
125

Near the transom 22 the vertical webs of the angle metal bars 54 are provided with depending brackets 66 and the exteriors of these webs are preferably provided with a roughened shoe 66^a to correspond with the
130

similar roughness on each of said brackets 66 and these brackets are provided with slots 67 through which extend bolts 68 by which the brackets are secured to the angle bars 54.

The lower ends of the brackets 66 are provided with suitable openings 69 and bolts 70 so that the transversely disposed bars 71 may be fixed in place in said openings 69 and adjustably mounted so as to permit removal. Each of these bars 71 is provided with a sliding collar 72 on which is carried a plow 73 of the conventional form, and these collars slide freely on the bars 71 so that the plow may be shifted as the exigencies of its use may require. If the truck is to be used on a car provided with an overhead trolley, it is obvious that the bars 71 and the plow 73 would be unnecessary and can be omitted.

In Figs. 17, 18 and 19 are shown a modified form of compression guide. In this form the guide 74 is composed of a bar having a straight central portion and downwardly and divergently disposed intermediate portions terminating in ends 76 bent at right angles to the inclined portion, which ends 76 are perforated and adapted to be fixed to the crossing 57. A second bar 77 is fixed to the bar 75 and has its ends 78 fixed to the divergently disposed portions of the bar 75, in any suitable manner, both bars being provided with perforations 79 for this purpose and the central portion of the bar 77 is offset from the bar 75 so as to leave a rectangular opening 80 for the plunger 63.

In Figs. 20, 21 and 22 are shown a modified form of bolster. In this form, two parallel and identical bars 81, shaped substantially as shown in said figures, are united by means of suitable bolster-bands 82 and reinforces 83 all of which are riveted together substantially as shown in Fig. 22. Each reinforce 83 is also riveted to a spring cap 84 which is diagonally disposed, as shown in dotted lines in Fig. 21. The upper surface of the band 82 is provided with a plate 85 which is fixed thereto by means of bolts 86 and which has a longitudinally projecting end 87 which is slightly offset so as to be in a plane higher than the plane of the upper surface of the band 82 and this projecting end 87 of the plate 85 is provided with a rub plate 88 secured by bolts 89 or in any other suitable manner. This form of bolster is also provided with the shelves 44 identical with those above described. This bolster can be used in lieu of the bolster above described and with substantially the same results.

It is to be understood that either the central pivotally drawing device, or the "wishbone" construction may be used for drawing the car.

Yet another embodiment of my invention

is shown in my co-pending application of even date herewith, Ser. No. 439538, Patent No. 919803 of April 27, 1909.

It is obvious that my invention is not restricted to the embodiments shown in either of my said applications, but is broad enough to cover all structures that come within the scope of the annexed claims.

What I claim is:—

1. In a truck, a spring plank, and means for supporting the same, diagonally disposed elliptic springs mounted on said spring plank, and a bolster carried by and directly connected with said springs.

2. In a truck, a spring plank, and means for supporting the same, diagonally disposed elliptic springs mounted on said spring plank, a bolster carried by and directly connected with said springs, and means for connecting said bolster with a king bolt.

3. In a truck, a spring plank, and means for supporting the same, diagonally disposed elliptic springs mounted on said plank, a bolster carried by and directly connected with said springs and rub plates secured to said bolster.

4. In a car truck, the combination with a truck frame having side-bars, larger driving wheels and smaller wheels journaled in pairs in the frame, a pair of swinging links suspended from said frame on each side thereof, a spring-plank, means for connecting the pairs of links on each side and supporting the spring-plank thereon, springs on said spring-plank and diagonally disposed, a bolster on the springs having a bearing, said bearing being eccentrically disposed relative to the driving wheels, a transom located adjacent to the driving wheels, a two-part drawing device, the lower element being secured at one end to the transom and extending forwardly toward the driving wheels, the other and overlying part extending to the bolster, means for pivotally connecting the outer ends of both elements of said drawing device, a bearing on the upper element engaging the bolster bearing, and means for securing the said upper element to a car body.

5. In a truck having larger driving and smaller wheels, side frames, paired links pendent from the side frames, a spring-plank supported by horizontally disposed equalizers on each pair of links diagonally disposed, springs on the spring-plank, a bolster carried by said springs, a bearing on said bolster, a draw frame secured to the truck frame adjacent to and extending toward axle of the drive wheels, a companion frame secured to the outer end of the draw frame carrying bearing devices engaging the bearing on the bolster, and means for pivotally connecting the draw and companion frames together.

6. In a truck, side frames with top chords, links hanging from said chords, equalizing bars connecting said links, a spring plank connecting said equalizing bars and diagonally disposed springs mounted on said plank.

7. In a truck, side frames with top chords, links with inwardly turned ends suspended from said chords, journal blocks secured within said links on said ends, said blocks having apertures, equalizing bars having ends journaled in said apertures and within said links and above said ends, a spring-plank connecting said equalizing bars, and a bolster on the spring-plank.

8. The combination of a truck and larger driving and smaller wheels, a truck frame having pedestals united by a top-chord, pedestals for the journals of the driving wheels which are disposed higher than the other pedestals, said top chords being bent so as to compensate for the different in height of said pedestals and so arranged and disposed that their greater length is parallel to the wheel-base when in use, paired links supported upon said parallel portions of the top chord, journal-blocks in the links, equalizing bars in said journal-blocks and extending between the links, a spring-plank connecting the equalizing bars, and a bolster spring supported upon said spring-plank.

9. In a truck, two side frames, crossings and transoms uniting said side frames, longitudinally disposed bars uniting one of said transoms with one of said crossings, top chords connected by said transoms and a shorter crossing uniting said bars and adapted to receive a portion of the weight of a car carried by said truck.

10. In a truck, side frames and crossings and transoms uniting said frames, bars with two parts at right angles uniting one of said transoms with one of said crossings and crossings uniting said bars, and means connecting with the car body and said crossing whereby said crossing has stress put thereon when the truck is in use.

11. In a truck, side frames united by end crossings and transoms, longitudinally disposed bars connecting one of said transoms with one of said crossings and having their greater portion horizontally disposed, top chords connected by said transoms and means for supporting a plow by said longitudinally disposed bars.

12. In a truck, side frames and transoms and crossings uniting the same, one of said transoms being straight between said side frames and the other being provided with offset portions which are offset in a horizontal and in a vertical plane.

13. In a truck, large driving and smaller wheels disposed in pairs, axles connecting the respective pairs of wheels, axle boxes in which said axles are journaled, a top

chord connecting each driving wheel pedestal and the pedestal for the other pair of wheels, said top chord being parallel to the wheel-base throughout the greater portion of their lengths between the pedestals, paired links suspended from the top chords, equalizing bars journaled in and extending between each pair of links, a spring-plank transversely connecting said equalizing bars, diagonally disposed springs on said spring plank and means for supporting a car from said spring plank.

14. In a truck, a bolster and means for supporting the same, said bolster being composed of parallel bars connected by bolster bands and reinforce rub plates, means for supporting said rub plates from said bands and shelves fixed to said bars and adapted to support center bearings.

15. In a truck, longitudinally disposed bars and means for supporting the same, brackets adjustably suspended from said bars, bars uniting some of said brackets, a plow and means for carrying the same from said bars.

16. In a truck, longitudinally disposed bars, and means for supporting the same, brackets suspended from said longitudinally disposed bars and adjustably mounted thereon, bars uniting said brackets and bolts passing through said bars and securing them to said brackets.

17. A compression guide composed of a pair of bars, one of which has a central portion vertically disposed, divergently disposed intermediate portions and horizontally disposed ends and the other part being formed with posts adapted to be fixed to said intermediate portions and separated from said center portions whereby an opening is formed between said bars for the compression means.

18. In a car truck, the combination of larger driving and smaller wheels disposed in pairs, a frame and journals therein for said wheels, a bolster with a bearing disposed eccentrically with relation to the driving wheels, and a four-point pivotal support for the bolster comprising links suspended in pairs from the frame at each side, bolster springs disposed to converge toward the axle of the driving wheels and equalizing devices connecting each pair of links so as to allow the links, bolster and said equalizing devices to swing transversely of the truck, the bolster being connected with said equalizing devices at the center of the latter.

19. In a car truck, the combination of large driving and smaller wheels disposed in pairs, a frame and journals therein for said wheels, a bolster with a bearing disposed eccentrically with relation to the driving wheels, and a four-point pivotal support for the bolster comprising links suspended in pairs from the frame at each side, bolster

5 springs disposed to converge toward the axle of the driving wheels, equalizing devices connecting each pair of links so as to allow the links, bolster and equalizing devices to swing transversely of the truck, the bolster being connected with said equalizing devices at the center of the latter, and an end bearing adjacent the smaller wheels.

10 20. In a car truck, the combination of larger driving and smaller wheels disposed in pairs, a frame and journals therein for said wheels, a bolster with a bearing disposed eccentrically with relation to the driving wheels, bolster springs disposed so as to converge toward the axle of the driving wheels, and a four-point pivotal support for the bolster comprising links suspended in pairs from the frame at each side, and equalizing devices adapted to swing transversely of the truck, the bolster being connected with said equalizing devices at the center of the latter.

20 21. In a car truck, the combination of

larger driving and smaller wheels disposed in pairs, a frame and journals therein for said wheels, a bolster with a bearing disposed eccentrically with relation to the driving wheels, and a four-point pivotal support for the bolster comprising links suspended in the same horizontal plane and in pairs from the frame at each side, equalizing devices adapted to swing transversely of the truck, the bolster being connected with said equalizing devices at the center of the latter, an end bearing adjacent the smaller wheels, and bolster springs on said connection disposed so as to converge toward the axle of the driving wheels.

Signed at the city and county of Philadelphia and State of Pennsylvania, this 17th day of June, 1908.

WALTER S. ADAMS.

Witnesses:

H. H. HEULING,
WM. M. LLOYD, Jr.