

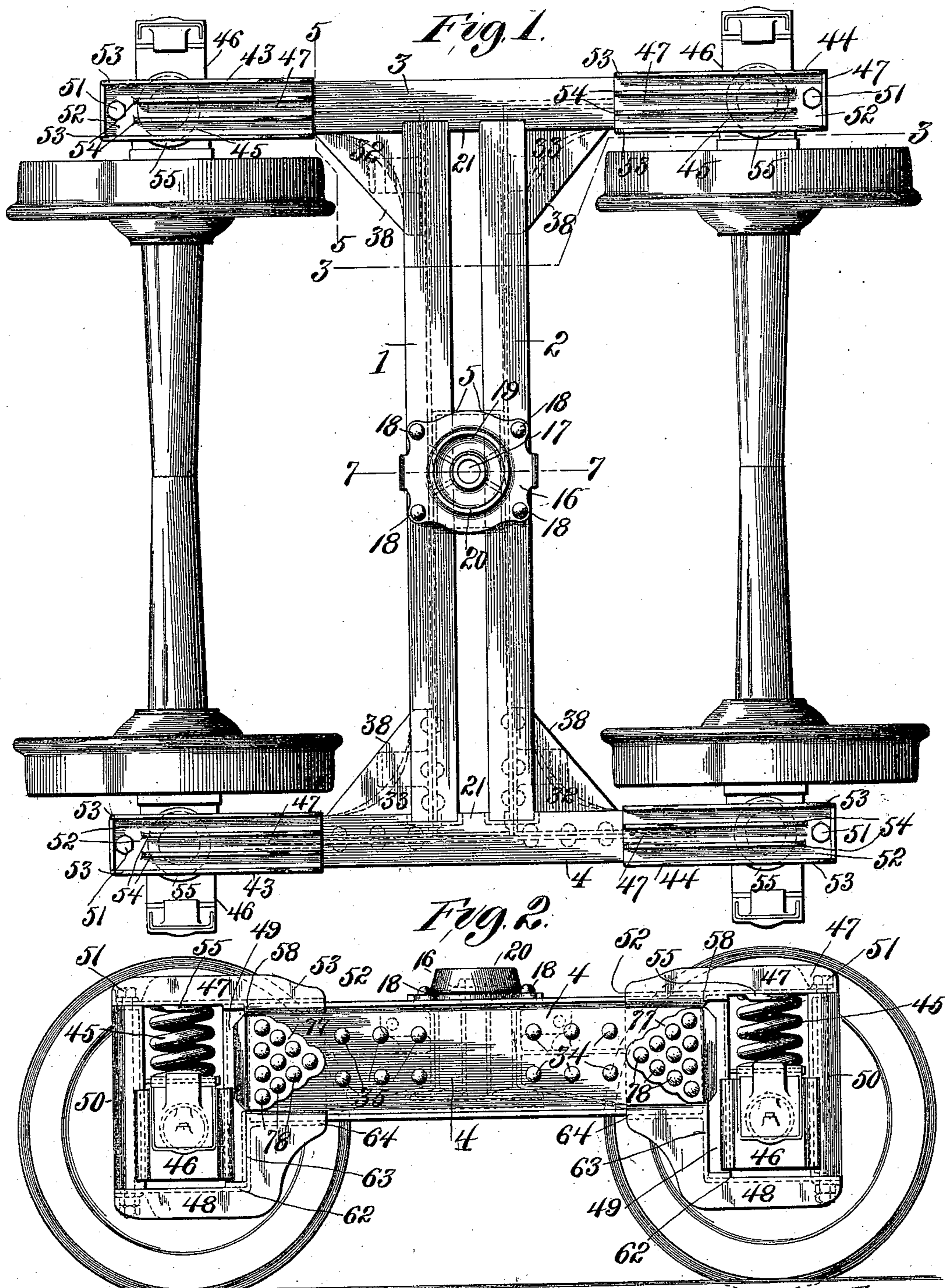
(No Model.)

3 Sheets—Sheet 1.

J. C. WANDS.  
CAR TRUCK.

No. 562,262.

Patented June 16, 1896.



Attest:  
J. G. Wells,  
Maud Griffin.

Inventor:  
John C. Wands  
By Higdon, Langford & Higdon,  
Attys.

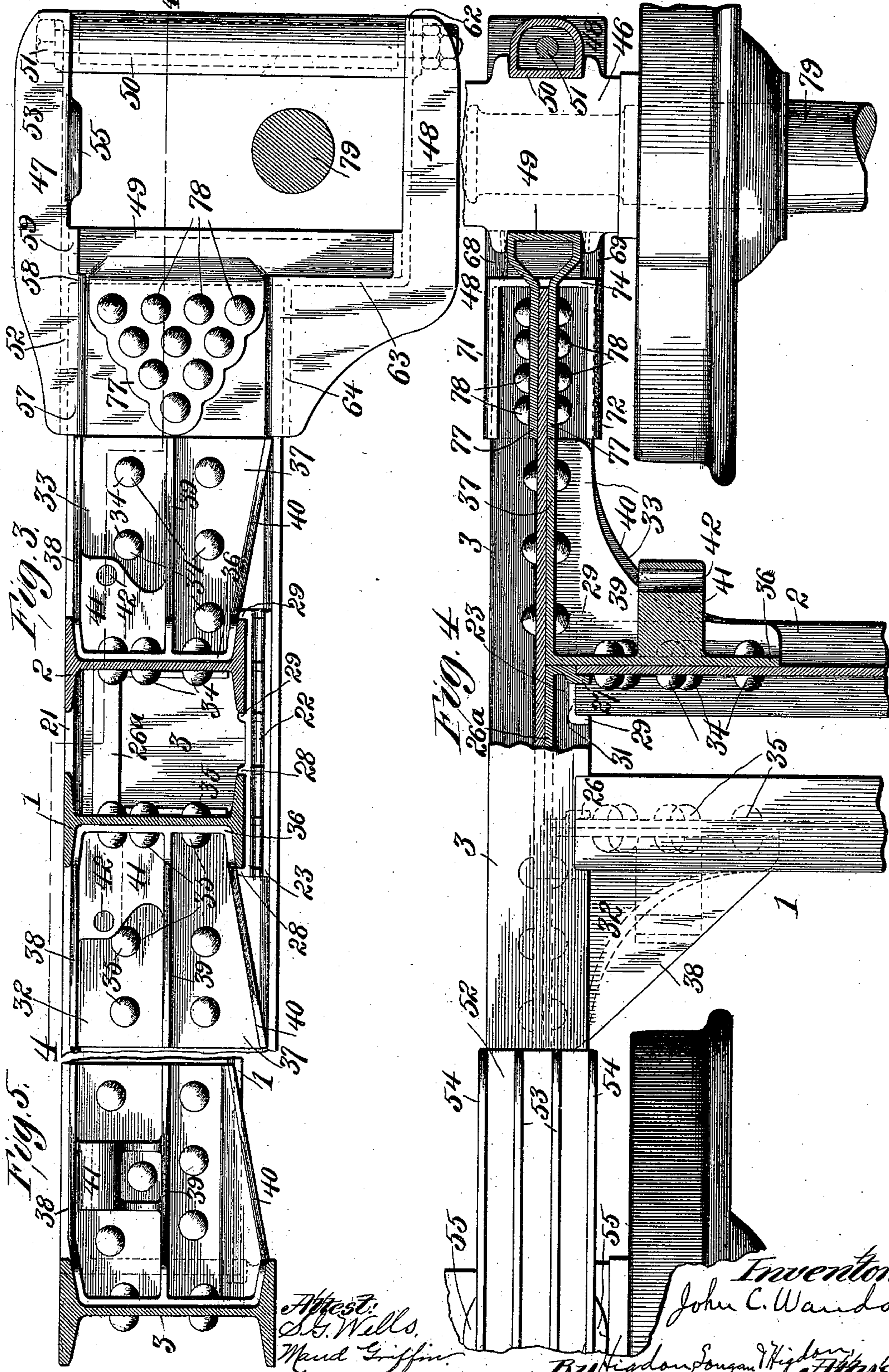
(No Model.)

3 Sheets—Sheet 2.

J. C. WANDS.  
CAR TRUCK.

No. 562,262.

Patented June 16, 1896.



Attest:  
L. S. Wells,  
Maud Griffin.

Inventor:  
John C. Wands  
By Higdon, Sargent & Higdon  
Attys

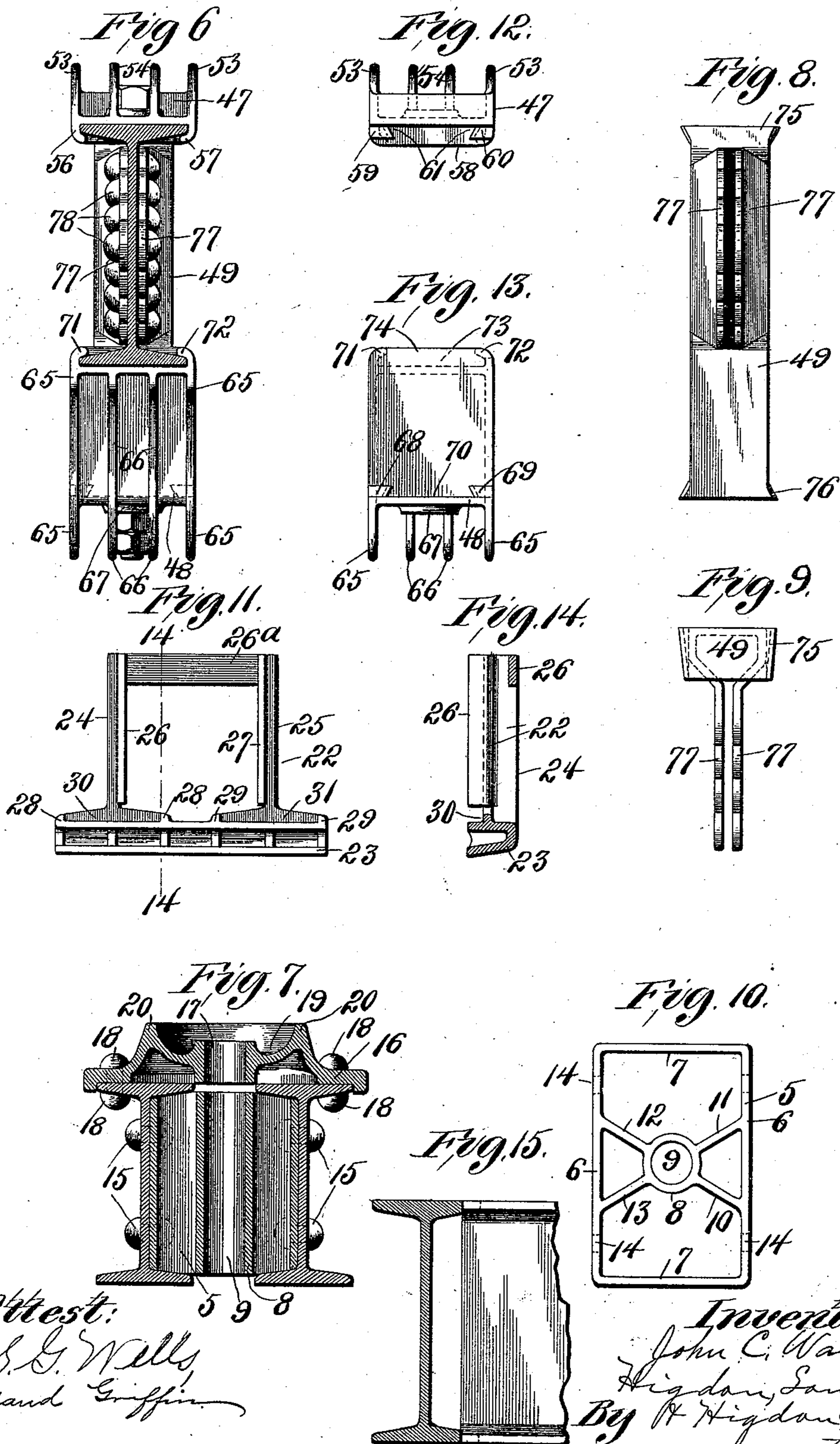
(No Model.)

3 Sheets—Sheet 3

J. C. WANDS.  
CAR TRUCK.

No. 562,262.

Patented June 16, 1896.



Attest:  
S. G. Wells  
Maud Griffin

Inventor:  
John C. Wands  
By A. Higdon, Solicitor  
Atty's.

# UNITED STATES PATENT OFFICE.

JOHN C. WANDS, OF ST. LOUIS, MISSOURI.

## CAR-TRUCK.

SPECIFICATION forming part of Letters Patent No. 562,262, dated June 16, 1896.

Application filed April 27, 1896. Serial No. 589,253. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN C. WANDS, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Car-Trucks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to an improved car-truck; and it consists in the novel construction, combination, and arrangement of parts, hereinafter described and claimed.

In the drawings, Figure 1 is a top plan view of my improved car-truck. Fig. 2 is a side elevation of the truck shown in Fig. 1. Fig. 3 is a vertical sectional view taken approximately on the indicated line 3 3 of Fig. 1. Fig. 4 is a horizontal sectional view taken approximately on the indicated line 4 4 of Fig. 3 and looking downwardly. Fig. 5 is a vertical sectional view on the line 5 5 of Fig. 1. Fig. 6 is a vertical sectional view on the line 6 6 of Fig. 3. Fig. 7 is a vertical sectional view on the line 7 7 of Fig. 1. Fig. 8 is an end elevation of a casting of which I make use, and Fig. 9 is a top plan view of the same casting. Fig. 10 is a plan view of the casting of which I make use, said casting being shown in section under the bolster-plate in Fig. 7. Fig. 11 is a side elevation of a casting used upon each end of the cross-beams of my truck. Fig. 12 is an end elevation of the casting which I use upon the top of the spring. Fig. 13 is an end elevation of the casting of which I make use under the box of the car-axle. Fig. 14 is a vertical sectional view taken approximately on the line 14 14 of Fig. 11. Fig. 15 shows a modified form of the joint between the cross-beams and the side beams.

In the construction of my improved car-truck, the distinguishing feature is the employment of wrought I-beams and malleable castings. To support the bolster of the car, I employ two I-beams 1 and 2, arranged in parallel position transversely of the car and midway between the axles of the truck. The ends of the I-beams 1 and 2 are joined to longitudinally-extending I-beams 3 and 4 in such a way that the upper edges of said beams are all approximately on the same level, but I prefer to make the side beams 3 and 4 some-

what wider than the cross-beams 1 and 2, and this brings the lower edges of the side beams below the lower edges of the cross-beams, as shown in Fig. 3. However, the cross-beams may be of the same width as the side beams and then they will be joined, as shown in Fig. 15, the upper and lower edges being on the same level.

The casting 5 (shown in plan in Fig. 10 and in cross-section in Fig. 7) is placed between the cross-beams 1 and 2 and at the longitudinal center thereof. The casting 5 is a rectangular frame consisting of the parallel sides 6 and the parallel ends 7 connecting said sides. In the center of the rectangular frame is a circular portion 8, having the vertical bore 9, and extending radially from said circular portion 8 to the side pieces 6 are the arms 10, 11, 12 and 13. Extending horizontally through the side pieces 6 are apertures 14 and there are mating apertures in said cross-beams in which are positioned rivets 15, and by which said cross-beams are secured to said casting 5.

The bolster-plate 16 is placed directly above the casting 5 and with its centrally-located aperture 17 in vertical alinement with the vertical bore 9 of said casting 5 and is secured to the cross-beams 1 and 2 by means of the rivets 18, as shown in Figs. 1 and 7. In the upper face of the bolster-plate 16 is an annular recess 19, which recess is semicircular in cross-section, and is arranged concentric to the aperture 17 in said plate. Surrounding the recess 19 is an annular lug 20.

In the flanges 21 of the side beams 3 and 4 are recesses in which are seated the ends of the cross-beams 1 and 2, as shown in Fig. 1. The castings 22 (shown in detail in Fig. 11) are placed against the inner faces of the side beams 3 and 4 and approximately at the longitudinal center of said side beams to form seats for the ends of the cross-beams 1 and 2.

The casting 22 consists of the base 23, designed to rest upon the upper surface of the lower inner flange of said side beams. Extending upwardly in parallel position from said base are the arms 24 and 25, which are connected at their upper ends by the bar 26<sup>a</sup>. Projecting inwardly from said arms 24 and 25 are flanges 26 and 27, designed to fit upon

the inner faces of the webs of said cross-beams, and the arms 24 and 25 are designed to fit between the ends of said webs and the webs of the side beams, as shown in section 5 in Fig. 4.

Projecting upwardly from the base 23 are the pairs of lugs 28 and 29, between which the ends of the cross-beams are seated. Between the lugs 28 and in alinement with the 10 arm 24 and forming the base for said arm is the lug 30, which fits between the lower flanges of the cross-beam 1 and the webs of the side beams. A similar lug 31 connects the lugs 29 and forms the base for the arm 15 25 and is designed to fit between the lower flanges of the cross-beam 2 and the webs of the side beams.

Cast brackets 32 and 33 are inserted in the corners formed by the junction of the cross- 20 beams with the side beams and upon the outside of said cross-beams and are secured both to the cross-beams and side beams by means of the rivets 34 and 35. The brackets 32 and 33 are essentially alike, except that they are 25 made in rights and lefts and each bracket consists of the webs 36 and 37, joining each other at right angles. The web 36 is designed to fit snugly against the web of the cross-beam and the web 37 is designed to fit snugly against 30 the web of the side beam and the rivets 34 pass through the bracket and through the webs of said beams, thus holding the beams at right angles to each other, as shown in Fig. 1.

Upon the opposite side of the webs 36 and 37 from the surfaces which contact with the webs of the beams are three strengthening- 35 ribs 38, 39, and 40. The rib 38 is in the shape of a right-angle triangle and its upper surface is practically on a level with the upper 40 surfaces of the beams. The rib 39 extends longitudinally along the center of said bracket and its outer edge is curved inwardly, and the rib 40 extends along the lower edge of the 45 bracket and longitudinally thereof and its outer edge is curved somewhat less than is the outer edge of the rib 39.

Extending from the web 36 and at right angles thereto is a lug 41, interposed between 50 the ribs 38 and 39, and extending transversely through the outer end of said lug is a bore 42, designed as a bearing for the brake-beam hangers, and the object in cutting away or curving the outer edges of the ribs 39 and 40 55 is to give room for the operation of said brake-beam hangers.

Upon each end of the side beams 3 and 4 are the housings 43 and 44 in which operate the springs 45 and the oil-boxes 46. The 60 housings are essentially alike and consist of the upper housing-plate 47, the lower housing-plate 48, the inner column 49 and the outer column 50, and the bolt 51, passing vertically through the upper housing-plate 47, 65 outer column 50 and the lower housing-plate 48. The upper housing-plate 47 is shown in rear elevation in Fig. 12, in front elevation

in Fig. 6, and top plan views of the same may be seen in Fig. 1 and inside elevation in Fig. 2.

The base 52 of the housing-plate 47 rests 70 upon the upper edge of one of the side beams and projects outwardly in a horizontal line over the spring. Projecting upwardly from said base 52 are a pair of ribs 53, extending the entire length of said plate, and a pair of ribs 75 54 are located intermediate of said pair of ribs 53 and are somewhat shorter than said first-mentioned ribs. Upon the under face of said plate 52 and directly over the oil-box 46 is a spring-seat 55. Projecting down- 80 wardly and curving inwardly from the edges of the front end of said plate are lugs 56 and 57, which form a dovetailed seat to receive the upper flanges of the side beams, as shown in Fig. 6. At the outer ends of the lugs 56 and 85 57 is a lug 58, extending transversely of the lower face of the plate 52 and connecting the ends of said lugs 56 and 57, thus forming a stop against which the corner of the side beam strikes when it is inserted into the dove- 90 tail heretofore described. In front of the lug 58 and extending downwardly from the lower face of the plate 52 are lugs 59 and 60, between which is formed a dovetailed recess 61, designed to receive the upper end of the col- 95 umn 49.

The lower housing-plate 48 consists of the horizontal plate 62, upon the outer end of which rests the column 50 and upon the inner end of which rests the column 49 and over 100 the center of which operates the oil-box 46. Attached to the inner end of the plate 62 and extending upwardly at right angles to said plate inside of the column 49 is a plate 63, and to the upper end of said plate 63 and 105 extending inwardly at right angles to said plate is the plate 64, upon which plate 64 rests the lower flange of the side beams.

Strengthening-ribs 65 extend the entire length of said housing-plate 48 and project 110 downwardly from the edges of said plates 62, 63 and 64. At the angle formed by the junction of the plates 63 and 64, the ribs 65 assume the form of a right-angled bracket. A pair of intermediate ribs 66, and resembling 115 the ribs 65 in every essential, are placed between said ribs 65 and said intermediate ribs terminate in the boss 67 under the free end of the plate 62, and said boss 67 forms a base through which an aperture is made to receive 120 the bolt 51 and against which the nuts upon the ends of said bolt operate.

Extending upwardly from the edges of the plate 62, and at the end thereof opposite the boss 67, are lugs 68 and 69, between which is 125 formed a dovetailed recess 70 directly in vertical alinement with the recess 61 and designed to receive the lower end of the column 49. Projecting upwardly from the edges of the plate 64 and curving inwardly are lugs 71 130 and 72, between which is formed an approximate dovetailed recess 73, designed to receive the lower flanges of the side beams. Connecting the outer ends of said lugs 71 and 72

is a lug 74, which extends upwardly in a line with the plate 63 and forms a stop directly in vertical alinement with the lug 58, against which stop the lower corner of the side beam strikes.

The upper end 75 of the column 49 is dovetailed to fit within the recess 61 between the lugs 59 and 60 and against the lower face of the plate 52, and the lower end 76 of said column 49 is dovetailed to fit within the recess 70 between the lugs 68 and 69 and against the upper face of the plate 62.

The ends 75 and 76 of the column 49 are wedge-shaped, or taper, as shown in Fig. 9, and the recesses 61 and 70 are narrowed at their inner ends to correspond with the shape of said tapered ends of the column 49.

Extending inwardly from the upper end of the column 49 is a pair of triangular flanges 77, between which the web of the side beam is inserted, and said side beams are secured in position relative to said column by means of the series of rivets 78.

The axle 79 is journaled in the oil-box 46 and said oil-box fits between the columns 49 and 50, as shown in Fig. 4, and the springs 45 are interposed between the oil-box 46 and the spring-seats 55, as shown in Fig. 2. The sides of the columns 49 and 50 which face each other are in vertical parallel lines. The outside of the column 50 is semicircular or oval, as shown in Fig. 4.

The bolster-plate 16 is of ordinary construction, but all the other castings of which I make use are new in design, construction and purpose. One essential common to all the castings of which I make use is that they be of a good quality of malleable iron.

The spreading frame or casting 5 which is placed between the beams 1 and 2 to hold said beams rigidly in line with each other, is essentially of the construction shown. The arms 10, 11, 12, and 13 are all attached to the side pieces 6 of said casting in order that the openings in the ends of said casting in line with the apertures 14 may be unobstructed by said arms, as is required to give room to hold the heads of the rivets while said rivets are being headed down and tightened. If one of the arms supporting the circular portion 8 were attached to the end piece 7, it would be difficult to get the rivets 15 into place and hold them there while they were being headed and tightened. By making the casting 5 of good malleable iron and of the form shown and described, a very rigid connection is secured between the centers of the beams 1 and 2 and in such a way that the danger of shearing the rivets by the weaving and twisting caused by the strain upon the beams through the bolster-plate is reduced to a minimum.

The casting 22 should possess all the essentials shown and described in order to form a good joint between the ends of the cross-beams and the side beams. The base 23 of said casting is of such a shape that it fits

against the lower inner face of the web of the side beam and upon the upper face of the inner flange of the side beam, and the upper face of said base is designed to form a seat for the heel of the cross-beam. The pairs of lugs 28 and 29 hold the heels of the cross-beam from lateral motion. The arms 24 and 25 are designed to fit the space between the end of the webs of the cross-beams and the side of the web of the side beams. The flanges 26 and 27 attached to said arms 24 and 25 act as a spreading frame between the ends of the webs of the cross-beams, and the cross-bar 26<sup>a</sup> acts as a brace to stiffen this spreading frame. This casting 22 should be made of good malleable iron, and when properly designed and properly fitted in place bolts or rivets are unnecessary to hold said casting in position.

The brackets or corner castings 32 and 33 may be varied somewhat in shape, but should possess all the features substantially as shown and described. When said brackets are placed in position with the web 36 fitting closely against the sides of the webs of the cross-beams and the rib 38 fitting closely under the upper outer flange of the cross-beam and the web 37 fitting closely against the web of the side beam and the rib 40 fitting upon the upper side of the outer lower flange of the cross-beams and all secured in position by the rivets 34, a very substantial joint is formed between the ends of the cross-beams and the sides of the side beams.

By letting the ends of the cross-beams into the recesses in the upper inner flanges of the side beams, much strain is taken off of the rivets 34 and the danger of shearing said rivets is reduced to a minimum. When these castings are made of good malleable iron and securely fastened in place, they will stand any reasonable strain or shock to which they may be subjected.

By forming the lugs 41 integral with the web 36 and between the ribs 38 and 39, as shown, a very convenient and substantial bearing is formed for the brake-beam hangers.

The housings 43 and 44 of the oil-boxes and springs are constructed entirely of malleable iron, with the exception of the bolt 51, and it is only necessary that the pieces of which said housing is composed are properly fitted together to form a housing which is unsurpassed for lightness and strength.

In the construction of the casting 47 the recess between the lugs 56 and 57, under the plate 52, is made small enough to form a good driving fit between the upper flange of the side beam and said casting. The casting is driven onto the flanges of the side beam until the upper corner of said side beam strikes the lug 58.

In the construction of the casting 48 the recess 73 between the lugs 71 and 72 is of such a size as to form a good driving fit between said lugs and the lower flange of the side beam and said casting is driven onto

said flanges until the lower corner strikes the lug 74. Then the column 49 is inserted between the castings 47 and 48 and driven firmly into place against the opposite side of the lugs 58 and 74 from the sides against which the side beam rests. Then the rivets 78 are inserted, connecting the flanges 77 securely to the web of the side beam. The oil-box 46 is then placed in position upon the upper face of the plate 62 and the spring 45 is compressed and inserted between the upper face of the oil-cup 46 and the spring-seat 55. Then the column 50 is placed in position between the outer ends of the castings 47 and 48, and the bolt 51 is inserted through the boss in the outer end of the casting 47, then through the column 50, and then through the boss 67 in the outer end of the casting 48, and said bolt is secured in position by suitable nuts.

The columns 49 and 50 are of necessity cast hollow in order that they may be properly annealed.

A housing thus constructed is very strong and capable of sustaining almost any strain or shock that may be inflicted upon it.

By the employment of the dovetailed connections all danger of shearing the rivets is entirely avoided as long as said dovetailed parts stand. In actual practice at the present time I am using ten-inch I-beams for the cross-beams and twelve-inch I-beams for the side beams and I prefer this construction; but it is obvious that other sizes and other proportions may be used, if found desirable, without departing from the spirit of my invention.

In Fig. 15 I show how cross-beams and side beams of the same dimensions may be joined together, but I do not consider it necessary, or advisable, when two cross-beams are used to make them of the same dimensions as the side beams.

I claim—

1. In a car-truck, a pair of parallel I-beams, a spreading frame between the centers of said I-beams, spreading frames between the ends of said I-beams and means of supporting the ends of said I-beams, substantially as specified.

2. In a car-truck, a pair of parallel I-beams, a spreading frame between the centers of said I-beams, a bolster-plate upon the top of said I-beams, spreading frames between the ends of said I-beams, and means of supporting said I-beams, substantially as specified.

3. In a car-truck, the cross-beams 1 and 2, the spreading frame 5 between the centers of said cross-beams and the spreading frames 22 upon the ends of said cross-beams, said frames 22 having the base 23 supporting the heels of said cross-beams, substantially as specified.

4. In a car-truck, the spreading frame 5 consisting of the side piece 6, the end pieces 7 connecting said side pieces, the circular central portion 8 having the vertical bore 9, and the arms 10, 11, 12 and 13 connecting said portion 8 to said side pieces 6, substantially as specified.

5. In a car-truck, the spreading frame 22 consisting of the base 23 designed to rest upon the lower inner flange of a side beam, the arms 24 and 25 extending upwardly from said base, the cross-bar 26<sup>a</sup> connecting the upper ends of said arms 24 and 25, the flanges 26 and 27 upon said arms and designed to engage the inner faces of the webs of the cross-beams, the pairs of lugs 28 and 29 projecting upwardly from the base 23 to limit the lateral movement of the heels of the cross-beams, the lug 30 connecting said pair of lugs 28 and the lug 31 connecting said pair of lugs 29, substantially as specified.

6. In a car-truck, a pair of parallel I-beams constituting the cross-beams of the truck, a pair of I-beams one at each end of said cross-beams, said last-mentioned I-beams constituting the side beams of the truck, and suitable connections between the ends of said cross-beam and said side beams, substantially as specified.

7. In a car-truck, a pair of parallel I-beams constituting the cross-beam of the truck, a pair of I-beams, one at each end of said cross-beam, said last-mentioned I-beams constituting the side beams of the truck, the ends of said cross-beam being let into the flanges of said side beams, a spreading frame between the ends of the parallel I-beams, and corner brackets connecting said cross-beam and said side beams, substantially as specified.

8. In a car-truck, a cross-beam made of I-beams, side beams each made of an I-beam, and suitable connections between said cross-beam and said side beams, substantially as specified.

9. In a car-truck, a cross-beam made of two parallel I-beams, side beams each made of an I-beam, a spreading frame at each end of the cross-beam and against the inner sides of the side beams, bosses under the heels of said cross-beam and supported by said side beams, and corner brackets connecting said side beams to said cross-beam, substantially as specified.

10. In a car-truck, the corner bracket consisting of the webs 36 and 37, arranged at right angles to each other, the ribs 38, 39 and 40 connecting said webs, and the lug 41 projecting from said web 36 and having the brake-beam-hanger bearing 42, substantially as specified.

11. In a car-truck, a pair of parallel I-beams forming the cross-beam of the truck, a spreading frame between the centers of said I-beams, a pair of I-beams, one at each end of said cross-beam, said last-mentioned I-beams forming the side beams of the truck, bosses under the heels of said cross-beam and supported by said side beams, spreading frame at the ends of said parallel I-beams, and brackets connecting said side beams to said cross-beam, substantially as specified.

12. In a car-truck, the I-beams 1 and 2, the spreading frame 5 between the centers of said I-beams, the casting 22 at each end of said

I-beams with the base 23 under the heels of said I-beams, the side I-beams 3 and 4 supporting the said bases 23, and the brackets 32 and 33 connecting said I-beams 1 and 2 to said side beams 3 and 4, substantially as specified.

13. In a car-truck, the I-beams 1 and 2, the spreading frame 5 between the centers of said I-beams, the casting 22 at each end of said I-beams with the base 23 under the heels of said I-beams, the side I-beams 3 and 4 supporting the said bases 23, and the brackets 32 and 33 connecting said I-beams 1 and 2 to said side beams 3 and 4 and the housings 43 and 44 upon the ends of said side beams 3 and 4, substantially as specified.

14. In a car-truck, a housing consisting of an upper plate, lugs projecting downwardly from the inner end of said plate and forming a dovetailed recess designed to receive the flanges of an I-beam, a stop-lug intersecting said first-mentioned lugs, lugs on the outer side of said stop and forming a second dovetailed recess, a lower plate having lugs projecting upwardly from its inner end to form a dovetailed recess designed to receive the lower flanges of an I-beam, a stop in front of said recess, lugs projecting upwardly from the upper face of said plate and forming a fourth dovetailed recess vertically under said second recess, a column designed to fit in said second and fourth recesses, flanges on said column designed to be attached to the opposite sides of the web of an I-beam and a second column between the outer ends of said plates, substantially as specified.

15. In a car-truck, an I-beam and a housing upon each end of said I-beam, each of said housings consisting of an upper plate upon the end of said I-beam and projecting outwardly, flanges projecting downwardly and inwardly from said plate and engaging the flanges of said I-beam, a stop projecting downwardly from said plate and against the end of said I-beam, a lower plate upon the under side of said I-beam opposite said first-mentioned plate and projecting outwardly from said I-beam, lugs projecting upwardly and inwardly from said lower plate and engaging the lower flange of said I-beam, a second stop projecting upwardly from said lower plate and engaging the end of said I-beam, lugs projecting downwardly from said first-mentioned plate outside of said first-mentioned stop and forming a dovetailed recess, lugs projecting upwardly from said lower plate and outside of said second stop and forming a second

dovetailed recess in vertical alinement with the last-mentioned recess, a column having its dovetailed ends fitted into said vertically-alined recesses, flanges upon said column and engaging either side of the web of said I-beam and securely riveted to said I-beam, and a column between the outer ends of said upper and lower plates, substantially as specified.

16. In a car-truck, the upper housing-plate 47 consisting of the horizontal plate 52, the pair of outer ribs 53 extending from the upper surface of said plate 52, a pair of intermediate ribs 54 upon the upper surface of said plate 52, the spring-seat 55 upon the under surface of said plate 52, the lugs 56 and 57 projecting downwardly from one end of said plate 52 and forming a dovetailed recess designed to receive the upper flanges of the I-beam, the lug 58 projecting downwardly from the under face of said plate 52 and forming a stop for the end of said I-beam, and the lugs 59 and 60 projecting downwardly from the face of said plate 52 outside of said lug 58 and forming the dovetailed recess 61, substantially as specified.

17. In a car-truck, the lower housing-plate 48 consisting of the plate 62 in a horizontal position, the plate 63 attached to said plate 62 and extending upwardly at right angles therefrom, the plate 64 extending inwardly at right angles from said plate 63, the pair of outer ribs 65 extending longitudinally of said plate 48 and on the under side thereof, the pair of intermediate ribs 66 between said outer ribs, the boss 67 upon the outer end and under side of said plate 62, the lugs 68 and 69 extending upwardly from the inner end of said plate 62 and forming the dovetailed recess 70, the lugs 71 and 72 extending upwardly from the plate 64 and forming the dovetailed recess 73, and the stop 74 extending upwardly from the face of the plate 64 in line with the plate 62, substantially as specified.

18. In a car-truck, the housing-column 49 cast hollow and annealed and having the pair of flanges 77 projecting inwardly at right angles from its upper end and having the dovetailed ends 75 and 76, said dovetailed ends being wedge-shaped in cross-section, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN C. WANDS.

Witnesses:

EDWARD E. LONGAN,  
S. G. WELLS.