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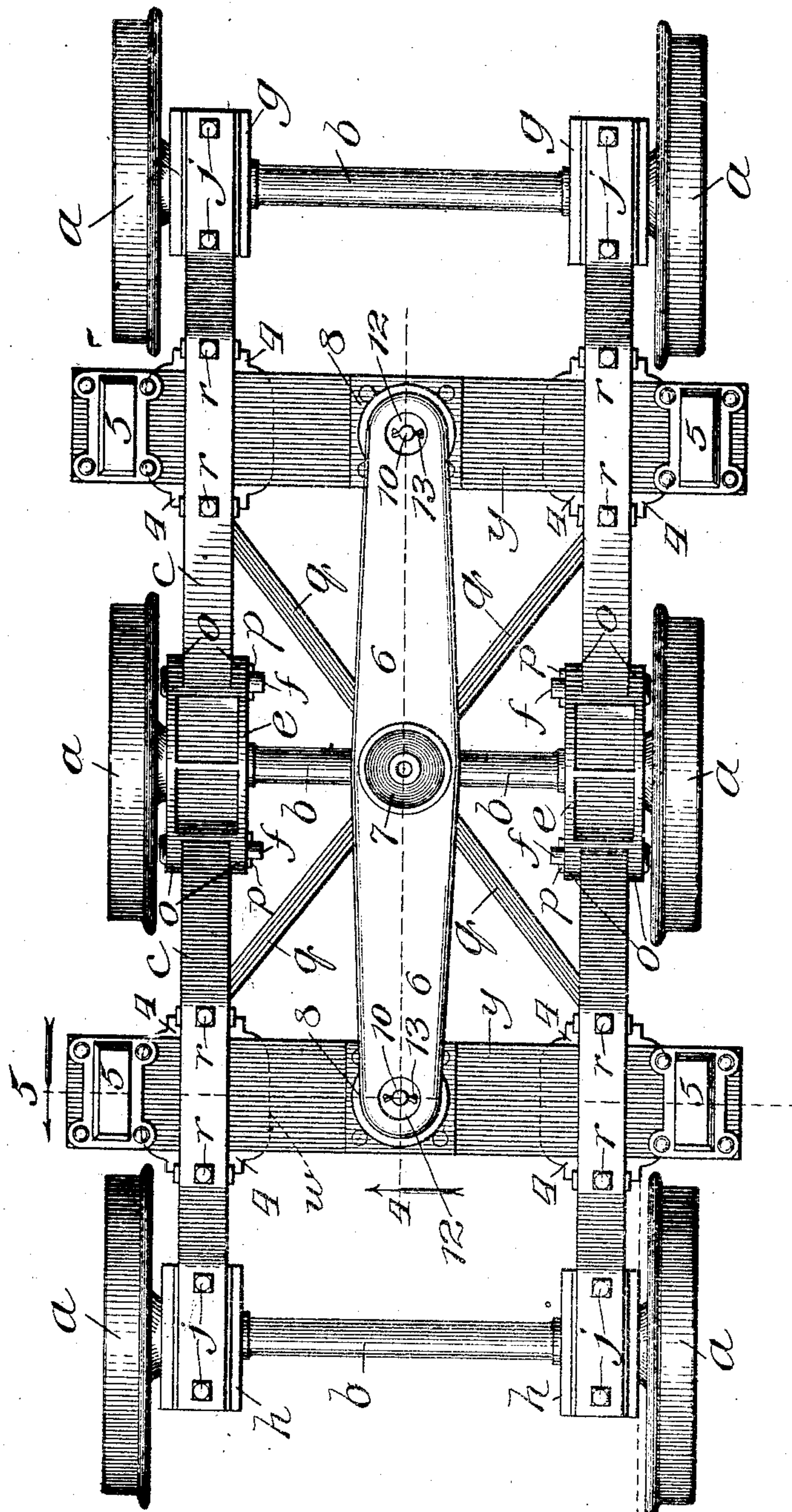
PATENTED JULY 24, 1906.

S. OTIS.
CAR TRUCK.

APPLICATION FILED FEB. 13, 1905.

3 SHEETS—SHEET 1.

Fig. 1.



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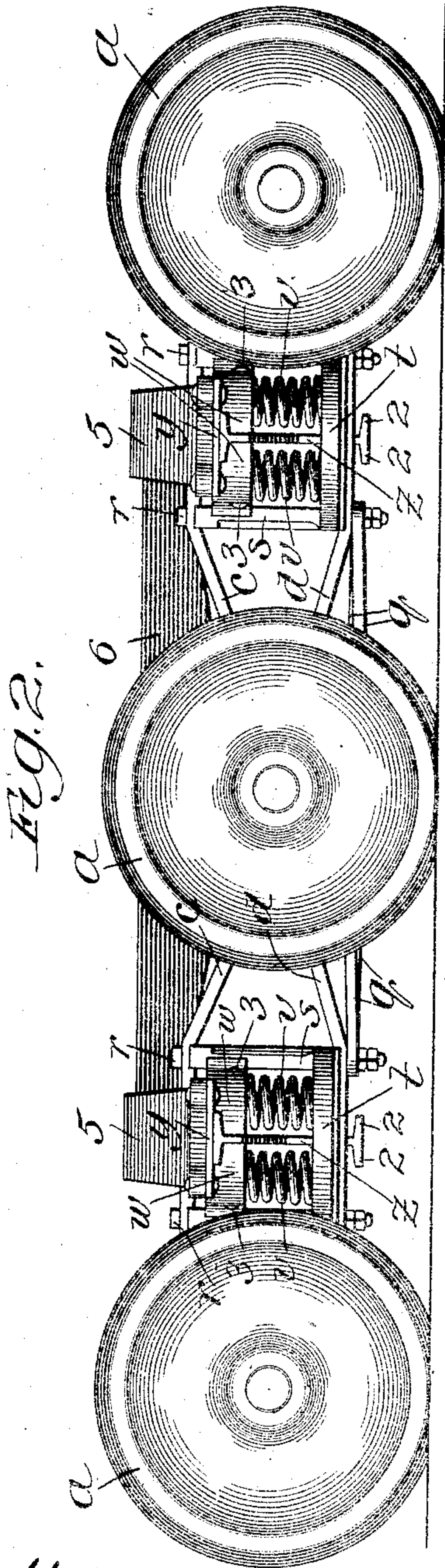
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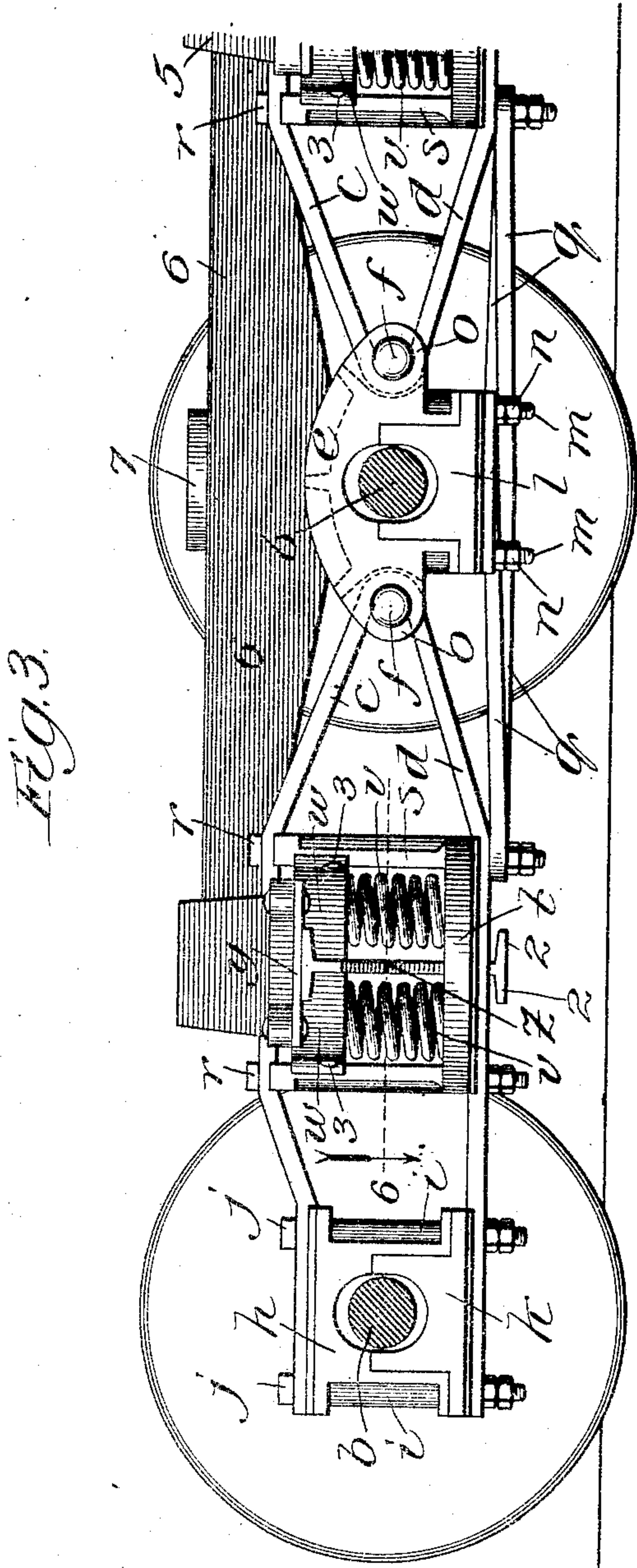
S. OTIS.
CAR TRUCK.

APPLICATION FILED FEB. 13, 1906.

3 SHEETS—SHEET 2.



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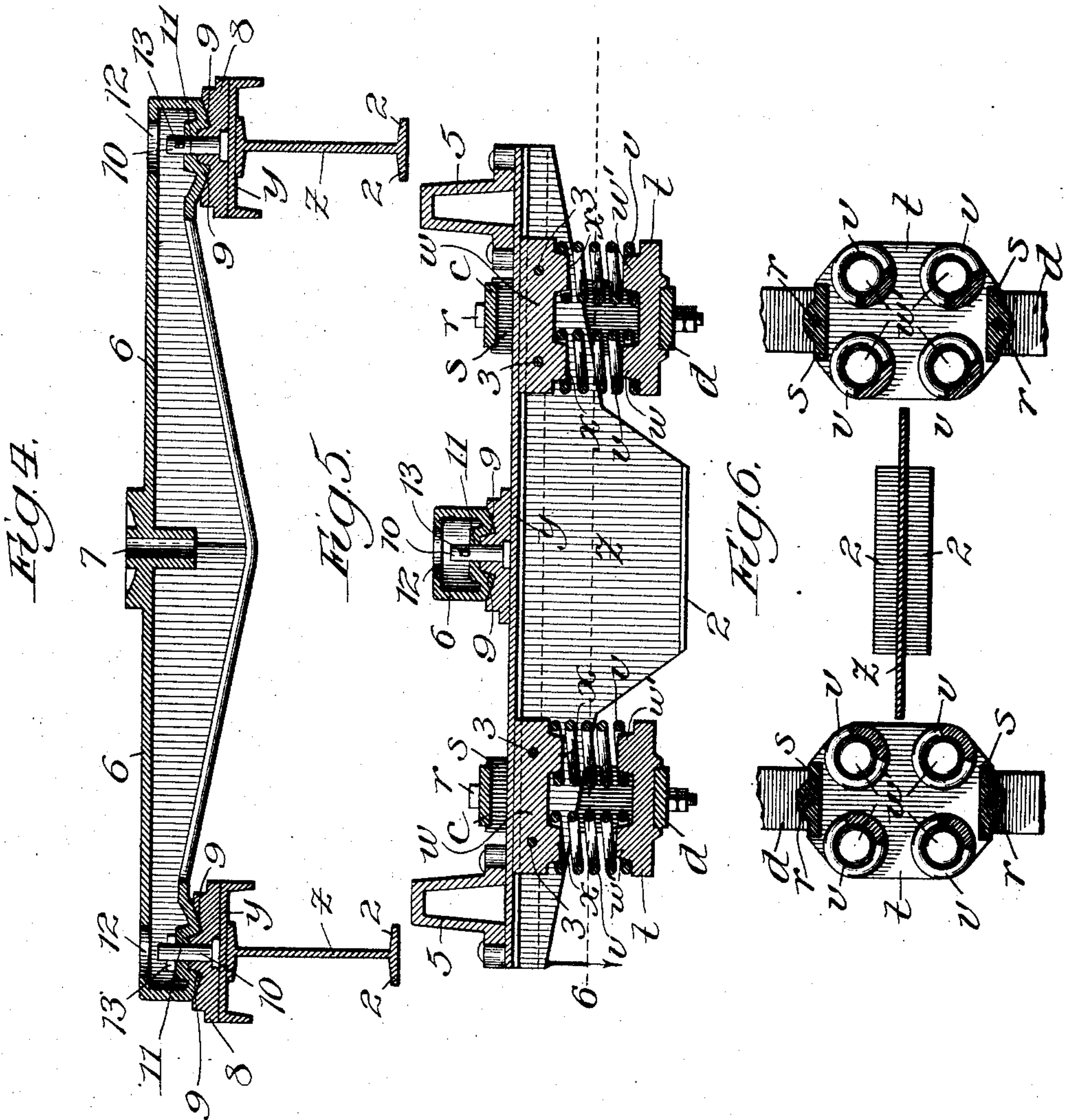
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S. OTIS.
CAR TRUCK.

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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

SPENCER OTIS, OF CHICAGO, ILLINOIS.

CAR-TRUCK.

No. 826,872.

Specification of Letters Patent.

Patented July 24, 1906.

Application filed February 13, 1905. Serial No. 245,454.

To all whom it may concern:

Be it known that I, SPENCER OTIS, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Car-Trucks, of which the following is a specification.

My invention relates to that class of car-trucks having flexible side frames and provided with means for equalizing the weight of the load upon the supporting-wheels.

The principal object of my invention is to provide a simple, economical, and efficient car-truck.

A further object is to provide a car-truck having a frame and bolster mechanism comprising means for equalizing the weight of the load.

A further object is to provide a car-truck having three pairs of wheels, with frame and bolster mechanism mounted upon such wheels and adapted to permit the independent vertical movement of each pair of wheels to equalize the weight of the load upon such wheels and to enable the entire truck-frame to be mounted inside the wheels.

A further object is to provide a car-truck mechanism comprising three pairs of wheels, with bolster mechanism and spring mechanism arranged between the wheels for supporting the bolster mechanism, whereby the use of an ordinary pedestal-frame having springs directly over the axle-journals may be dispensed with in a six-wheel truck.

Other and further objects of the invention will appear from an examination of the drawings and the following description and claims.

The invention consists in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a plan view of a car-truck constructed in accordance with my improvements; Fig. 2, a side elevation of the same; Fig. 3, a view in elevation taken on line 3 of Fig. 1 looking in the direction of the arrow with one end portion of the track omitted to permit an enlarged view of the parts shown; Fig. 4, a longitudinal sectional elevation taken on line 4 of Fig. 1 looking in the direction of the arrow, showing the longitudinal bolster in longitudinal section and the transverse bolsters each in cross-section; Fig. 5, a transverse sectional elevation taken on line 5 of Fig. 1 through the

center of one of the transverse bolsters; and Fig. 6, a sectional plan view taken on line 6 of Fig. 3, showing the spring-seats in detail with the springs removed and a section of the bottom portion of one of the transverse bolsters.

In constructing a car-truck in accordance with my improvements I provide three pairs of wheels *a*, having axles *b*, each provided with journal portions, preferably inside of or between the wheels. The truck-frame consists of flexible side frames suitably connected. Each side frame comprises a pair of upper arch-bars *c* and lower arch-bars *d*, pivotally connected to the central journal box or frame portion *e* at the longitudinal center of the truck-frame by means of pivot-pins *f*. These central journal-boxes are free to rock upon their supporting-axle and form a pivoted link or articulate connection between the pivoted forward and rear arch-bars.

The opposite ends of each pair of upper and lower arch-bars are secured to the front and rear journal-boxes *j* and *h*, respectively, and held permanently in operative position by means of columns *i* and headed bolts *j*, the lower portion *k* of each of the end journal-boxes being removably secured in position by means of such columns and bolts, and such journal-boxes being thus held in operative position between the arch-bars. Each of the central journal-boxes is also provided with a removable bottom portion *l*, secured to the body portion of such journal-box by means of bolts *m* and nuts *n*, as shown in Fig. 3, the main body portion of such journal-box being provided at the front and rear sides thereof with perforated lugs *o* for receiving the pivot-pins *f*, already described, and admitting the pivoted upper and lower arch-bars therebetween. The pins *f* may be secured in place by means of cotters *p* or in any ordinary and well-known manner, and all of the journal-boxes are of course provided with suitable bearings for the axle-journals, which bearings may be of any desired-known type, and therefore need not be described in detail. By this arrangement it will be seen that each side frame consists of a pair of end portions pivotally connected together by means of a central oscillating frame portion which also forms the central journal-box, thus permitting the independent vertical movement of each pair of wheels

and providing side frames which are flexible vertically. In order to provide the desired rigidity of the truck-frame transversely or in a horizontal plane, suitable tie rods or bars *q* extend diagonally across the under side of the truck-frame and are each secured at their opposite ends to the opposite side frames by means of bolts *r*, which extend vertically through upright columns *s*, such columns being arranged in opposite sides of spring-seats *t* and between the upper and lower arch-bars of each of the pivoted end portions of the side frames.

An upper spring-seat *w* is slidably mounted between each pair of columns *s* and supported upon suitable springs *v*, which are held in operative position by means of upwardly-projecting studs *w'* on the lower spring-seats and downwardly-projecting studs *x* on the upper spring-seats. Transverse bolsters *y*, having a central web portion *z* and lower flange portions 2, which may be formed of an I-beam, extend transversely across the truck from side frame to side frame, one forward and the other rearward of the central pair of wheels and central pivotal portions of the side frames. Each of these transverse bolsters is mounted between a set of columns *s* and rests upon the springs *v*, already described. The upper spring-seats *w*, already described, are secured to the transverse bolsters by means of bolts 3 and may be said to form a part of such bolsters.

Suitable lugs 4 upon the transverse bolsters slidably engage opposite sides of the columns between which such bolsters are mounted and permit the vertical movement of the bolster between such columns, at the same time securing the bolsters in position transversely of the truck.

Suitable side bearing portions 5 are provided upon the opposite ends of each of the transverse bolsters for preventing the undue tipping of the car-body, and the ends of central bolster portions *z* form depending end portions which extend vertically between the bolster-supporting springs.

In order to normally support the weight of the car and to equalize or distribute it as may be required, an equalizing longitudinal bolster 6, having a central bearing 7 for supporting the weight of the car, is provided. This longitudinal bolster is mounted with its opposite ends resting upon the center of the forward and rear transverse bolsters, respectively, suitable center bearing-plates 8 being provided for supporting the ends of the equalizing-bolster upon such transverse bolsters. Each of these bearing-plates 8 has a central or annular recess in its upper surface, as shown in Fig. 4, for admitting depending projections 9 on the longitudinal bolster, and in order to secure the longitudinal bolster

and transverse bolsters together so as to permit the desired amount of play and at the same time hold them securely in operative position a headed bolt 10 is mounted in a central perforation in each of the bearing-plates 8, so as to extend upward beyond the upper face of such bearing-plate, forming a central stud upon each transverse bolster. The opposite ends of the longitudinal bolster are each provided with perforations 11 for receiving such upright bolts or pins, and a perforation 12 is also provided at each end of the longitudinal bolster directly over each perforation 11 for permitting the insertion of a cotter-pin 13 into the upper end of the bolt or stud 10. By this arrangement the bolt or stud is not required to extend above the upper surface of the longitudinal bolster, and the separation of the parts when desirable is rendered feasible, and the parts are held securely in operative position, while at the same time permitting the desired amount of play therebetween.

By the above arrangement it will be readily seen that the weight of the car resting upon the center of the longitudinal or equalizing bolster is transferred to the front and rear transverse bolsters, which rest upon the springs, and that such weight is yieldingly supported upon the springs and equalized or distributed upon all of the six wheels of the truck. It will also be seen that the pivotal connection between the opposite end portions of each side frame and the central journal-box permits the desired independent vertical movement of each pair of supporting-wheels and that by thus placing the transverse bolsters and the spring mechanism for yieldingly supporting them between the supporting-wheels a simple and efficient car-truck is provided which dispenses with the necessity for mounting the springs directly over the axles or axle-bearings, as in the case of the ordinary pedestal-truck. I prefer to mount the side frames of the truck between the supporting-wheels rather than upon the outside thereof.

The central and front and rear side frame portions are so flexibly connected by the means above described that each side frame is sufficiently flexible both vertically and transversely to permit a limited transverse movement of the flexibly-connected portions and also the desired vertical movements thereof.

I claim—

1. In a car-truck, the combination of a central journal-box section and end journal-box sections, an end journal-box section being pivotally connected to each end of the central journal-box section.

2. In a car-truck, the combination of a central journal-box section and end journal-box sections, an end journal-box section be-

ing pivotally connected to each end of the central journal-box section, and means carried by the sections for supporting the car-body.

5 3. The combination in a car-truck of a central journal-box section and end journal-box sections each having independent connection with the central section, transverse bolsters mounted on each of the end sections, 10 and a single longitudinal bolster connecting the transverse bolsters and supported thereby.

4. The combination in a car-truck of a central journal-box section and end journal- 15 box sections each having independent connection with the central section, transverse bolsters mounted on each of the end sections, a single longitudinal bolster connecting the transverse bolsters and supported thereby, 20 and means on the longitudinal bolster for supporting the car-body.

5. In a car-truck, the combination of side frames each having front and rear pivoted portions provided with bearings, a bolster 25 mounted in the rear pivoted portions of such side frames, a bolster mounted in the forward portions of the side frames, bolster mechanism mounted upon such forward and rear bolsters for supporting the car-body, and 30 means for connecting such side frames all arranged between the supporting-wheels of a car.

6. In a car-truck, the combination of side frames each having front and rear pivoted 35 portions provided with bearings, a bolster mounted in the rear portions of such side frames back of the pivotal points thereof, a bolster mounted in the forward portions of the side frames forward of the pivotal points 40 thereof, spring mechanism for yieldingly supporting such bolsters, and an equalizing-bolster extending longitudinally of the truck and having its opposite end portions mounted upon such front and rear bolsters.

7. In a car-truck, the combination of side frames each having a central member provided with a journal-box and having front 45 and rear side frame portions pivotally connected to such central member, bearings for all of such front and rear pivoted portions, a transverse bolster mounted upon the rear pivoted portions of such side frames, a transverse bolster mounted in the forward pivoted 50 portions of the side frames, and a single longitudinal bolster mounted upon such forward and rear transverse bolsters.

8. In a car-truck, the combination of side frames having front and rear pivoted portions each provided with a journal-box, a 60 center journal-box for each side frame mounted between and pivotally connected to such front and rear portions, transverse bolster mechanism mounted upon the front and rear pivoted portions of the side frames, and

equalizing bolster mechanism mounted upon 65 such transverse bolster mechanism and supported thereby.

9. In a car-truck, the combination of side frames each having a central journal-box and front and rear side frame portions piv- 70 otally connected to such journal-box, journal-boxes mounted in such front and rear pivoted portions of the side frames, transverse bolsters mounted in the front and rear pivoted side frame portions respectively be- 75 tween the journal-boxes and pivotal points thereof, and an equalizing-bolster mounted upon the transverse bolsters.

10. In a car-truck, the combination of side frames each having a central journal-box 80 and front and rear side frame portions pivotally connected to such journal-box, journal-boxes mounted in such front and rear pivoted portions of the side frames, transverse bolsters mounted respectively in the 85 front and rear pivoted side frame portions between the journal-boxes and pivotal points thereof, spring mechanism for yieldingly supporting such transverse bolsters, and a longitudinally-extending equalizing-bolster 90 mounted upon such transverse bolsters and provided with a central bearing for supporting the car-body.

11. In a car-truck, the combination of intermediate front and rear supporting-wheels 95 arranged in pairs, an axle for each pair of such wheels provided with journals between the wheels connected thereby, side frames each provided with a central journal-box and having front and rear side frame por- 100 tions pivotally connected to such journal-box, a journal-box mounted in each of such front and rear portions, a transverse bolster mounted upon the rear pivoted portions of such side frames back of the pivotal points 105 thereof, a front transverse bolster mounted upon the front pivoted portions of the side frames forward of the pivotal points thereof, and an equalizing-bolster mounted upon such transverse bolsters. 110

12. In a car-truck, the combination of side frames each having a central frame portion provided with a journal-bearing, arch-bars pivotally secured to such central frame portion extending forward and rearward there- 115 from provided with journal-bearings and forming pivoted frame portions, columns mounted in the pivoted frame portions formed by such arch-bars between the pivotal points thereof and the journal-bearings, 120 transverse bolsters extending between such columns and provided with means for slidably engaging the columns, spring mechanism for supporting such bolsters, and an equalizing-bolster extending longitudinally 125 of the truck and having its opposite ends mounted upon such transverse bolsters.

13. In a car-truck, the combination of side

frames, vertically-compressible springs mounted in the side frames and a transverse bolster resting on and having a central depending web extending between a plurality of such springs in each side frame.

5 14. In a car-truck, the combination of side frames, vertical compressible springs arranged in pairs mounted on the side frames, transverse bolsters having their ends resting

on the spring, and a depending web on the bolster extending across the truck between the springs of each pair.

Chicago, Illinois, February 4, 1905.

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Witnesses:

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