(No Model.) 5 Sheets—Sheet 1.

E. CLIFF.

CAR TRUCK.

No. 560,779. Patented May 26, 1896.

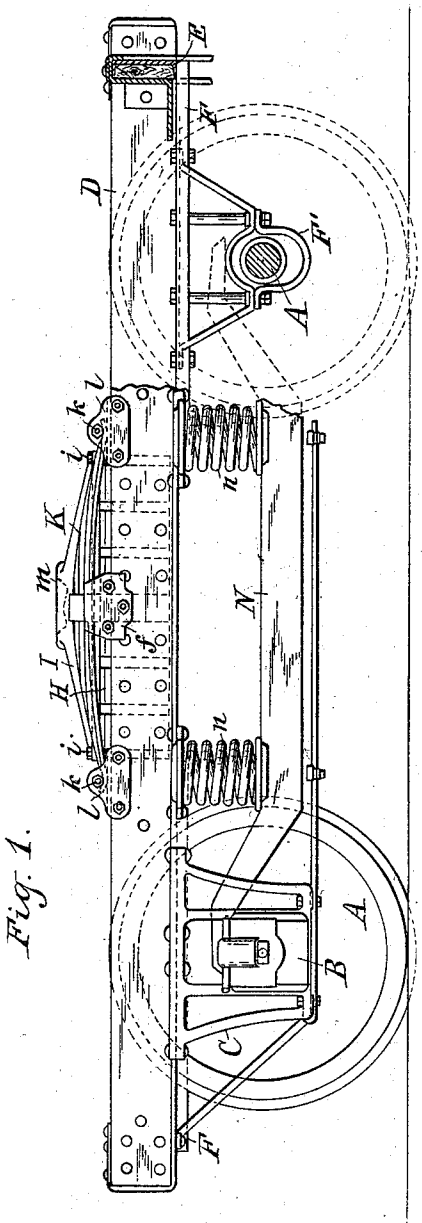

Fig. 1.

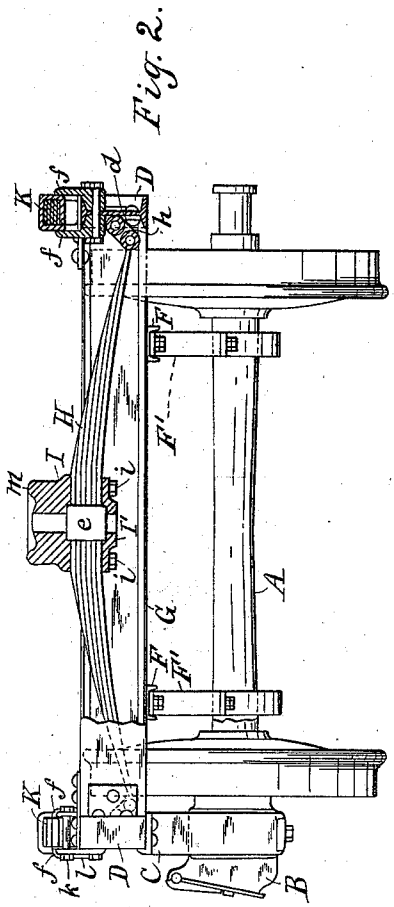

Fig. 2.

Witnesses.
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H. M. Seamans

Inventor.
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By C. H. Duell
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ANDREW B. GRAHAM, PHOTO-LITHO. WASHINGTON, D.C.

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E. CLIFF.

CAR TRUCK.

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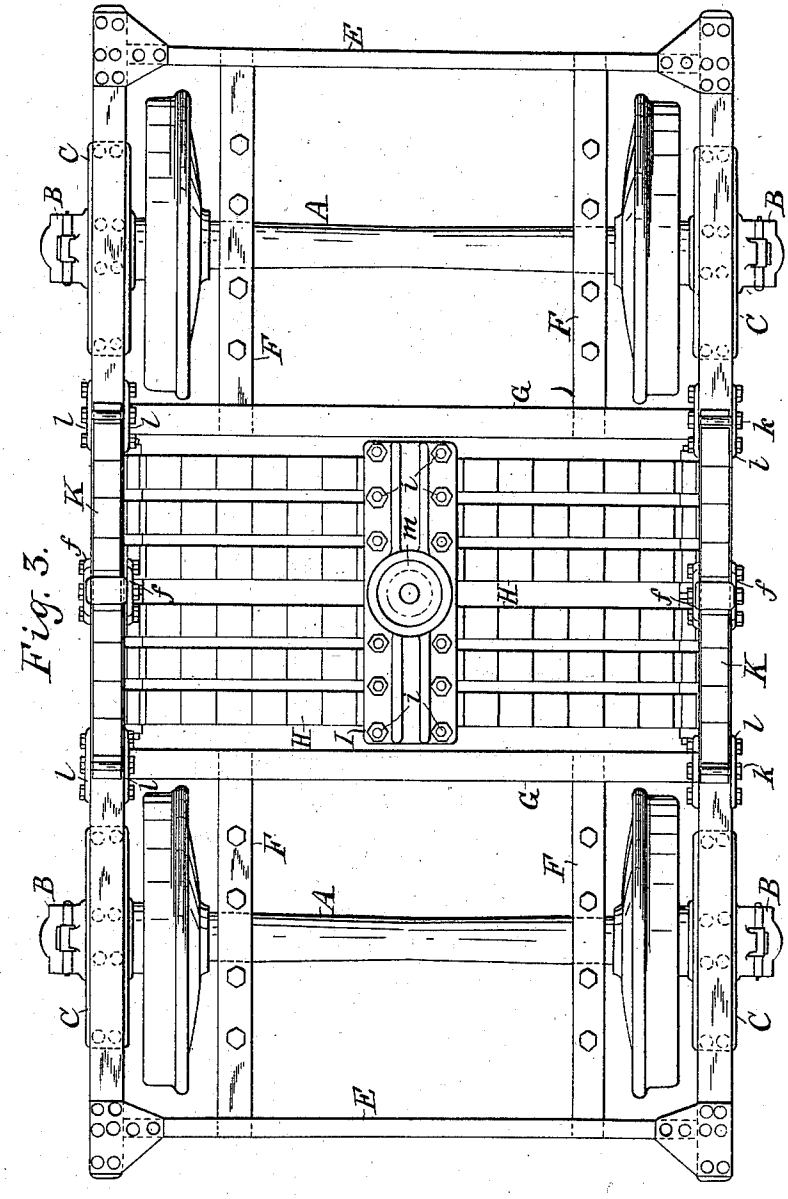
Fig. 3.



Witnesses.
R. F. Emery
H. M. Sanborn.

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(No Model.) 5 Sheets—Sheet 3.

E. CLIFF.

CAR TRUCK.

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Fig. 4.

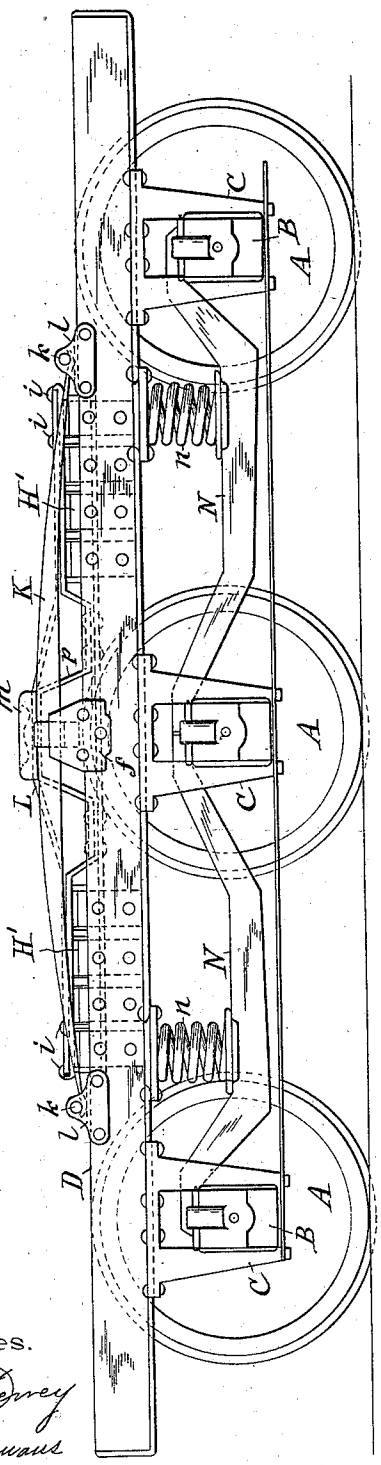
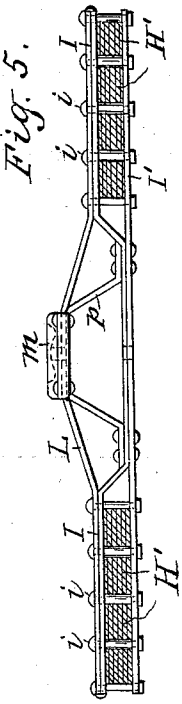


Fig. 5.



Witnesses.
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(No Model.)

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E. CLIFF.

CAR TRUCK.

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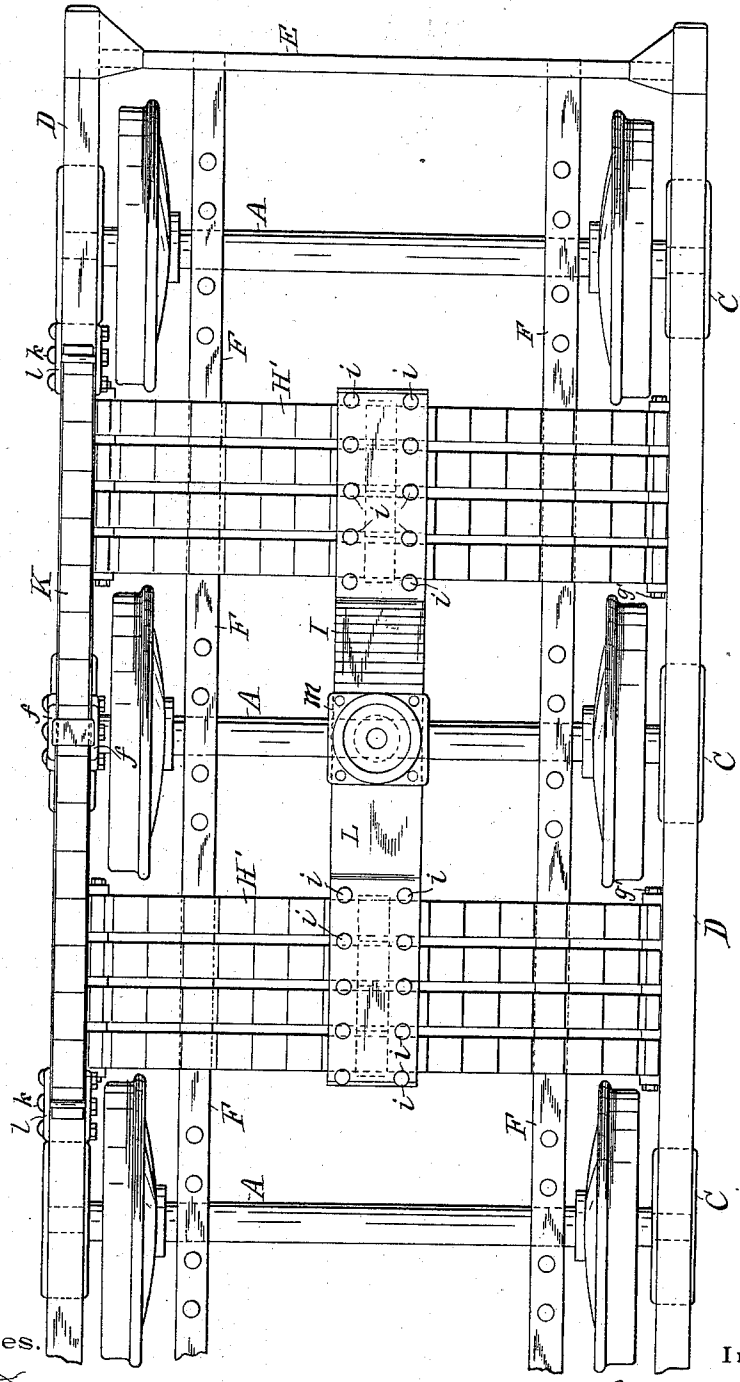

Fig. 6.

Witnesses.

R. S. Terry

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(No Model.) 5 Sheets—Sheet 5.

E. CLIFF.

CAR TRUCK.

No. 560,779. Patented May 26, 1896.

Fig. 7.

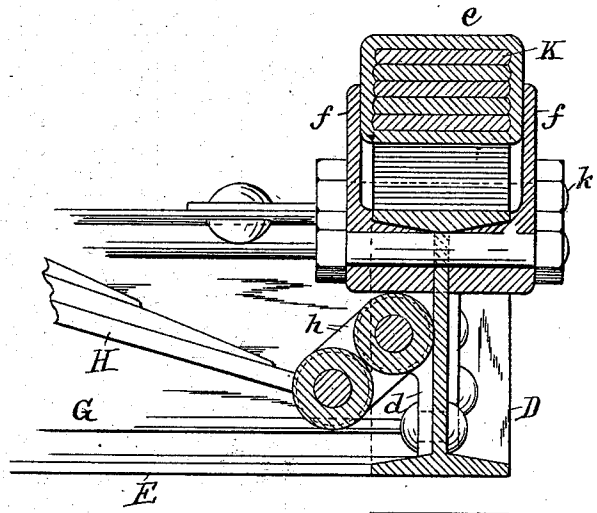


Fig. 8.

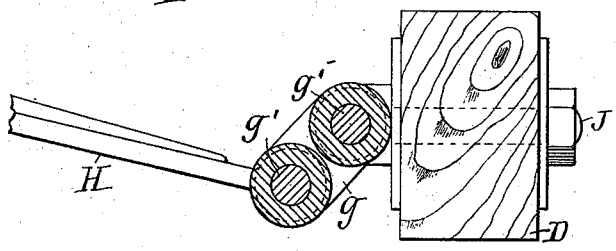
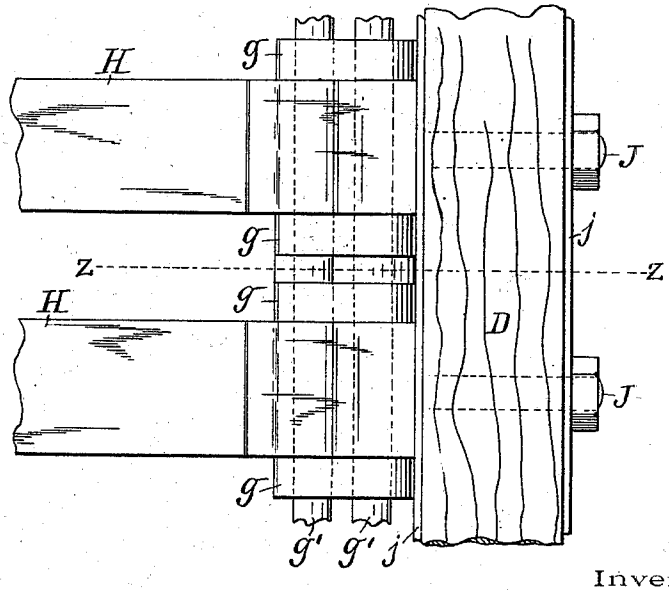


Fig. 9.



Witnesses.

R. F. Lewis

H. M. Seamans

Inventor.

Edward Cliff

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UNITED STATES PATENT OFFICE.

EDWARD CLIFF, OF NEWARK, NEW JERSEY.

CAR-TRUCK.

SPECIFICATION forming part of Letters Patent No. 560,779, dated May 26, 1896.

Application filed March 9, 1896. Serial No. 582,315. (No model.)

To all whom it may concern:

Be it known that I, EDWARD CLIFF, of Newark, in the county of Essex, in the State of New Jersey, have invented new and useful Improvements in Car-Trucks, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to car-trucks for passenger-cars, and the object is to provide a truck that will be simple and durable and at the same time be more easy-riding and capable of carrying its load without undue jarring or jolting.

To this end my invention consists in the combination, with the wheels, axles, and frame, of a bolster formed of a plurality of semielliptic springs extending across the truck between the sides of the frame and a plate or beam carrying the center plate or bearing of the truck secured to the centers of the said plurality of springs.

My invention consists also in the combination, with the wheels, axles, and side beams, of a semielliptic spring extending lengthwise of and in the center of each of said side beams, sockets secured to said beams holding the ends of the springs, and guides secured on the center and projecting above the side beams to receive the centers of the springs; and my invention consists also in certain other combinations of parts hereinafter described, and specifically set forth in the claims.

In the drawings hereto annexed and forming a part of this specification, Figure 1 is a side elevation of a four-wheeled truck embodying my invention. Fig. 2 is an end elevation, partly in section. Fig. 3 is a top plan view of the same. Fig. 4 is a side elevation of a six-wheeled passenger-truck embodying my invention. Fig. 5 is a view of the beam or truss connecting the two spring-bolsters together, the springs being shown in section. Fig. 6 is a top plan view of the six-wheeled truck. Fig. 7 is a detail view showing the spring hanger and guide; and Figs. 8 and 9 are detail views of a modified spring-hanger that may be used when the side beams are of wood, as in the ordinary trucks.

Referring specifically to the drawings, and particularly to Figs. 1, 2, 3, and 7, A A are the axles and wheels. B B are the axle-boxes. C C are the pedestals inclosing the boxes, and D D are the side beams of the frame, which are preferably formed of metallic I-beams. E E are channeled steel end beams joining the side beams together. F F, &c., are beams running parallel with but between the side beams to support the safety-straps F′ for the axles, and G G are cross-beams joining the side beams together between the wheels and supporting the inner ends of the beams to which the safety-straps are attached. The bolster of the truck is formed of a plurality of semielliptic springs H H, &c., and the upper parts of full elliptic springs, as shown clearly in Fig. 2 of the drawings. These springs are arranged side by side parallel with each other and are supported at their ends from the side beams by means of hangers *d* and links *h*. The hangers *d* are provided with eyes and shanks, which are riveted or bolted to the centers of the side beams. Six of these semielliptic springs are shown forming the bolster of the four-wheeled truck; but of course any suitable number may be employed. Resting upon the centers of these springs and extending parallel with the side beams is a plate I, having the center bearing *m* of the truck at its center. This center bearing is shown integral with the plate I; but it will be obvious that it may be formed separately and then bolted to the plate. Another plate I′, of the same size as the plate I, is placed below the springs and directly below the upper plate. These plates are secured rigidly together and to the springs by bolts *i* passing through the plates and between the springs, which are separated equal distances apart to receive the bolts. The leaves of each spring are shown held together at the center by the ordinary band *e*. When the side beams are of wood, as in the ordinary truck, eyebolts J may pass through the beams and through washers or strips of metal *j j* on each side of the timber to form hangers for the links *g* coupled to the springs. Either short bolts may be used to couple the links to the springs and hangers or long rods *g′* may be used and extended through the plurality of springs and hangers, as shown in Fig. 9 of the drawings. Above the central portion of each of the side beams I mount a semielliptic-spring side bearing. This side

bearing is formed of the upper portion of a full elliptic spring K, the leaves being held together at the center by a band, as usual. The ends of the spring are not provided with eyes, but are curved and lie below bolts *k*, connecting the upper portions of small plates *l l* together, secured to opposite sides of the side beams. The ends of the spring bear upon, or substantially upon, the top side of the side beam and are capable of slight longitudinal movement. To support the center of the spring K, I provide a guide formed of two plates *f f*, bolted in the center and on opposite sides of the side beam and projecting above the upper side of said beam and lying on opposite sides of the center of the spring.

In the six-wheeled truck shown in Figs. 4 and 6 the spring side bearing is constructed in the same manner as that already described, but is much longer, reaching to the outer wheels of the truck. N in the figures indicates the ordinary equalizing-bars on each side of the truck below the side beams, and *n n* are the coiled springs between these bars and the lower side of the side beams. The six-wheeled truck is provided with two spring-bolsters, the same or similar to that above described in reference to the four-wheeled truck. But four springs are shown in each of these bolsters; but any suitable number may be employed. These bolsters are shown arranged midway between the wheels and are joined together at their centers by a bolster L, extending between them. This bolster L preferably forms also the plates I and I′, lying on the upper and lower sides of the spring-bolsters. The bolster L is formed of three bars or plates, the ends of two being connected to the springs above the same and the other being connected to the springs below the same. The upper bar is arched or raised at its center and has the center plate or bearing *m* of the truck mounted thereon. The bar or plate below the springs is straight. The middle bar is depressed between the two spring-bolsters to lie upon the said straight bar or plate. Another angular bar *p* forms braces, as well as a separator, and lies with its central portion below the center plate, to which it is secured by rivets and with its end portions lying on the central long bar, its ends abutting against the inclined portions thereof at the angles therein. Rivets or bolts extend through all of these bars where they meet to secure them rigidly together. This bolster is shown clearly in Fig. 5 secured to the spring-bolsters H′ H′, which are shown in section.

It will be obvious that my invention does away with the old form of bolster, sand-planks of wood, and the hangers.

I do not desire to be limited to the precise forms of construction shown, as they may be varied without departing from my invention.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a car-truck, the combination with wheels, axles, and a frame provided with side beams connecting the axles together, of a bolster formed of a plurality of semielliptic springs extending across the truck between the side beams of the frame, and a plate carrying the center plate secured to the centers of the said plurality of springs, as set forth.

2. In a car-truck, the combination with the wheels, axles, and a frame provided with side beams connecting the axles together, of a bolster formed of a plurality of the upper portions of elliptic springs of equal size extending across the truck between the side beams of the frame, and a plate carrying the center plate secured to the centers of the said plurality of springs, as set forth.

3. In a car-truck, the combination with the wheels, axles, axle-boxes, pedestals, and a frame having side beams rigidly secured to the pedestals, of a bolster formed of a plurality of semielliptic springs arranged side by side, parallel with each other, and extending across the truck between the inner sides of the side beams, and a plate carrying the center plate secured to the centers of the said plurality of springs, as set forth.

4. In a car-truck, the combination with the wheels, axles, and frame, of a bolster formed of a plurality of upper portions of semielliptic springs arranged side by side, separated equal distances apart, parallel with each other, and extending across the truck between the inner sides of the side beams, a plate carrying the center plate above the centers of the springs, a plate below the centers of the springs, and bolts passing through the plates and between the said springs to secure the parts together, as set forth.

5. In a car-truck, the combination with the wheels, axles, axle-boxes, pedestals, and a frame having side beams rigidly secured to the pedestals, of a bolster formed of a plurality of semielliptic springs extending across the truck between the sides of the frame, hangers secured to the sides of the frame, links connecting the hangers with the ends of the springs, and a plate carrying the center plate secured to the centers of the said plurality of springs, as set forth.

6. In a car-truck, the combination with the wheels, axles and frame, of a bolster formed of a plurality of upper portions of semielliptic springs arranged side by side, separated but parallel with each other and extending across the truck between the inner sides of the side beams, hangers secured to the sides of the frame, links connecting the hangers with the ends of the springs, rods passing through the plurality of springs, hangers and links, and a plate carrying the center plate secured to the centers of the said plurality of springs, as set forth.

7. In a car-truck, the combination with the wheels, axles and frame of a pair of bolsters each formed of a plurality of semielliptic springs extending across the truck on opposite sides of the center, and between the sides

of the frame, and a third bolster extending between and secured to the center of each of said pair of bolsters, as set forth.

8. In a car-truck, the combination with the wheels, axles and frame, of a pair of bolsters each formed of a plurality of upper parts of elliptic springs extending across the truck on opposite sides of the center and between the inner sides of the side beams, and a bolster extending between and secured to the center of each spring, consisting of an arch-plate above the springs, a straight bar below the springs, and two angular plates between the said bars, said bolster carrying a center plate and secured to the springs by bolts passing between the springs, as set forth.

9. In a car-truck, the combination with the wheels, axles and frame, of a bolster formed of a plurality of semielliptic springs extending across the truck between the sides of the frame, a plate carrying the center bearing secured to the centers of the said plurality of springs, a semielliptic spring on the central portion of each side beam, sockets to hold the ends of the springs and guides for the centers of the said springs, as set forth.

10. In a car-truck, the combination with the wheels, axles and frame, of a bolster formed of a plurality of semielliptic springs extending across the truck between the sides of the frame, a plate carrying the center bearing secured to the centers of the said plurality of springs, an upper portion of an elliptic spring on the central portion and directly above each side beam, sockets to hold the ends of the springs secured to the beams, and guides for the centers of the springs secured to the side beams, as set forth.

11. In a car-truck, the combination with the wheels, axles, and frame, of a semielliptic spring on the central portion of each side beam, sockets to hold the ends of the springs, and guides secured to the side beams and extending upon opposite sides of the centers of the springs, as set forth.

12. In a car-truck, the combination with the wheels, axles and frame, of an upper portion of an elliptic spring on the central portion and directly above each side beam, sockets to hold the ends of the springs secured to the said beams, and guides for the centers of the springs secured to the side beams and projecting above the same, as set forth.

In testimony whereof I have hereunto signed my name.

EDWARD CLIFF. [L. S.]

Witnesses:
W. L. SAWYER,
L. D. JONES.