(No Model.) 3 Sheets—Sheet 1.

F. E. CANDA.

STREET CAR TRUCK.

No. 525,590. Patented Sept. 4, 1894.

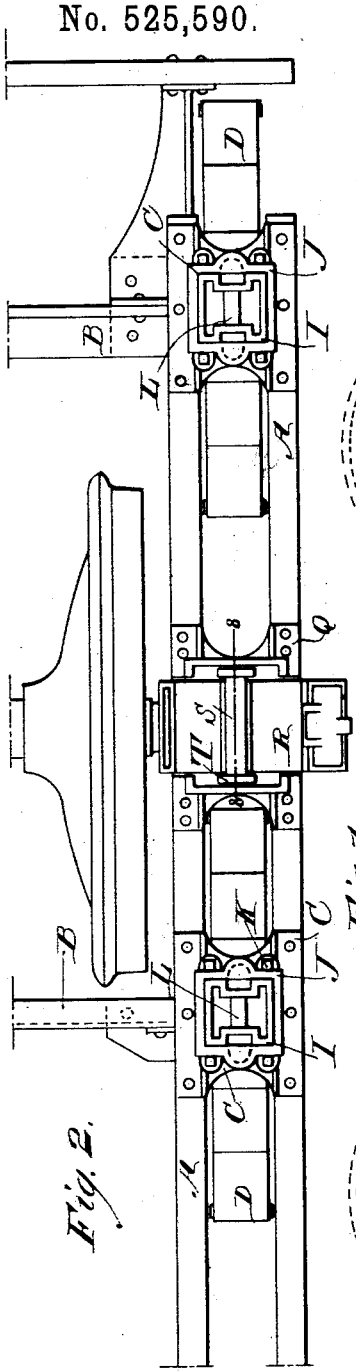

Fig. 2.

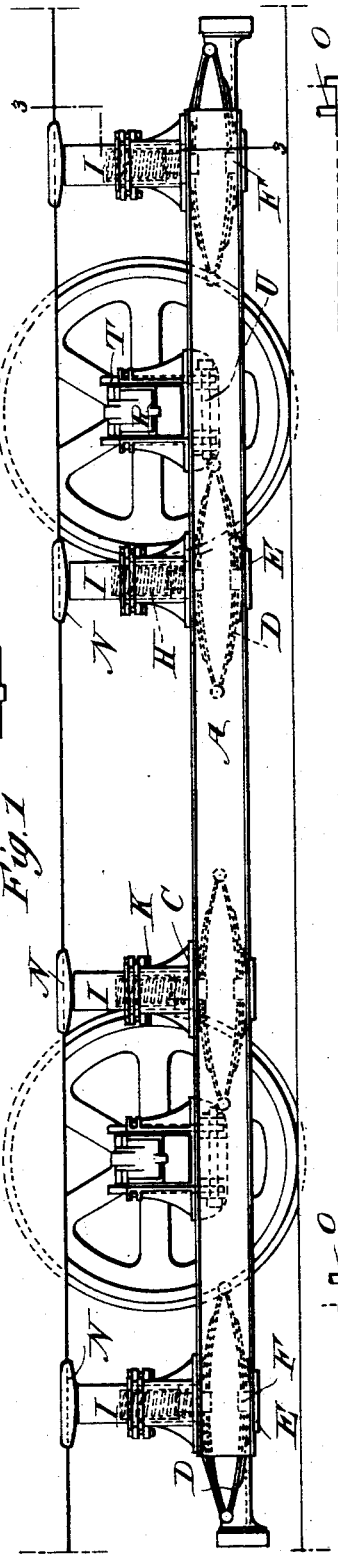

Fig. 1.

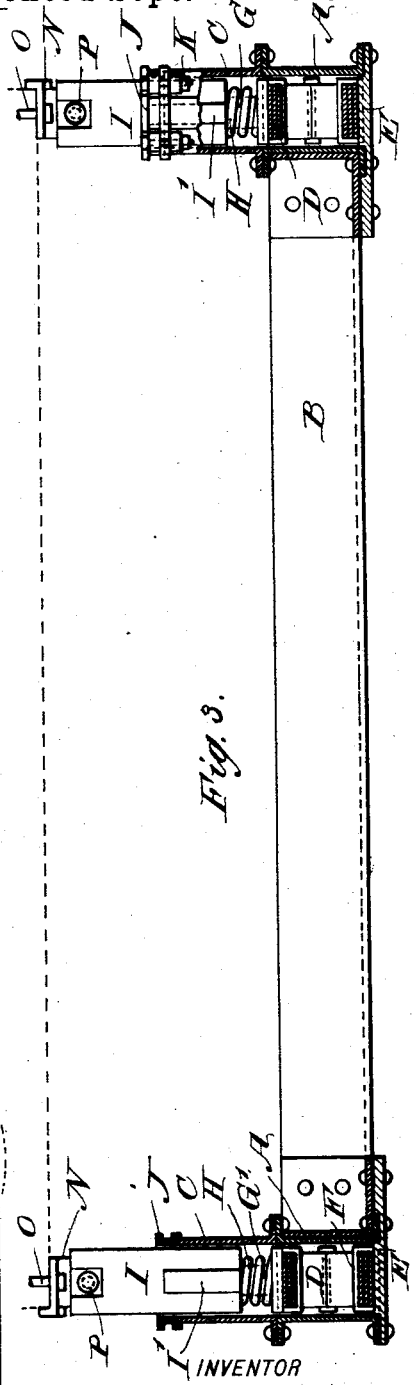

Fig. 3.

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STREET CAR TRUCK.

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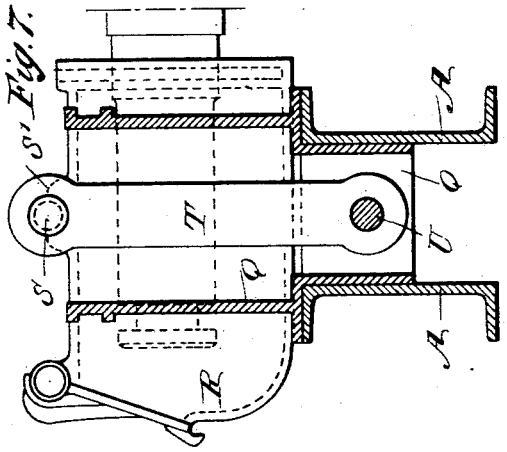

Fig. 7.

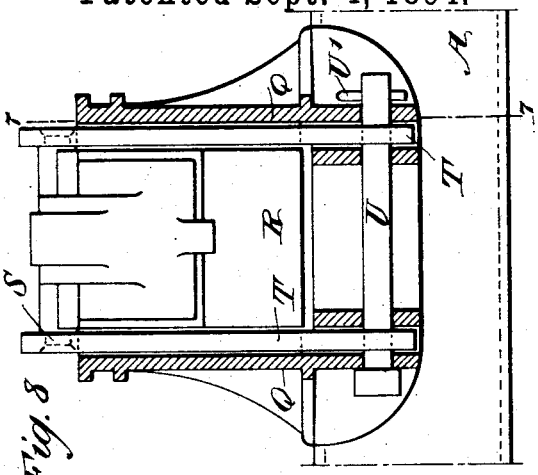

Fig. 8

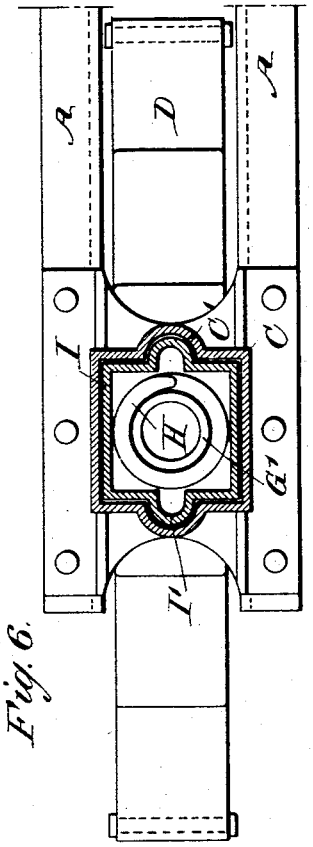

Fig. 6.

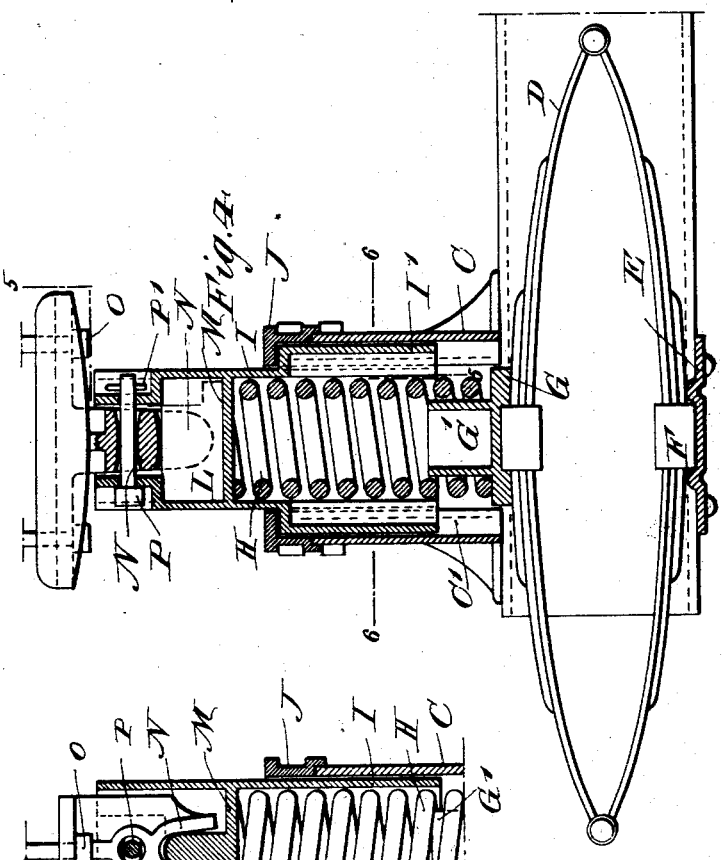

Fig. 4.

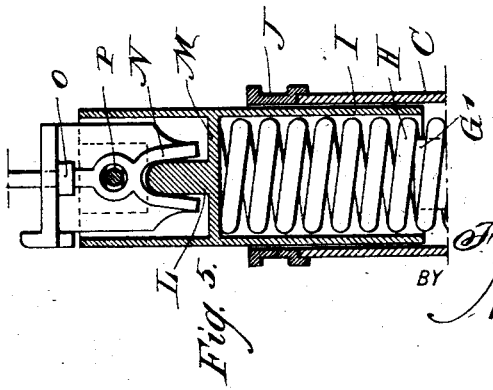

Fig. 5.

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STREET CAR TRUCK.

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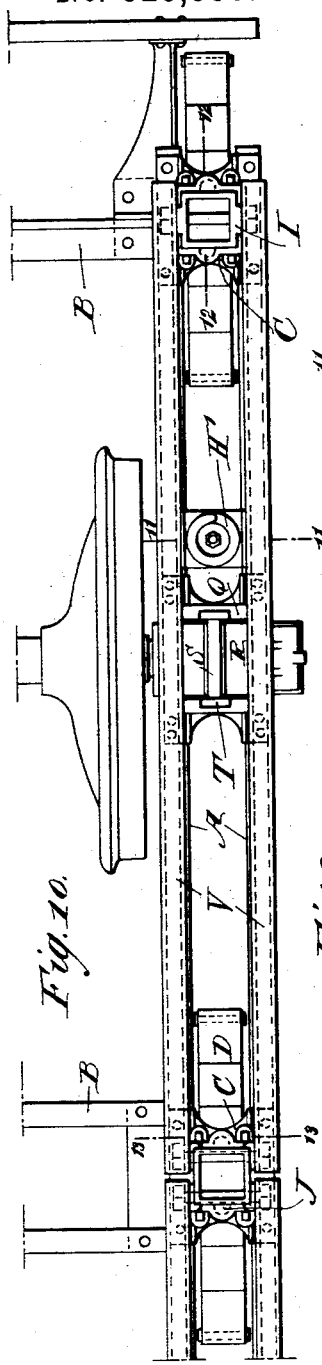

Fig. 10.

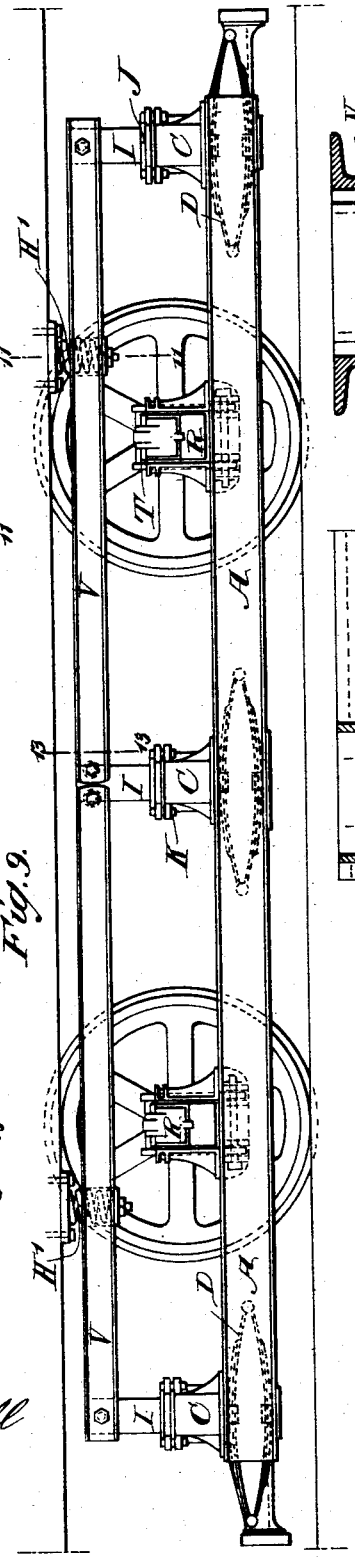

Fig. 9.

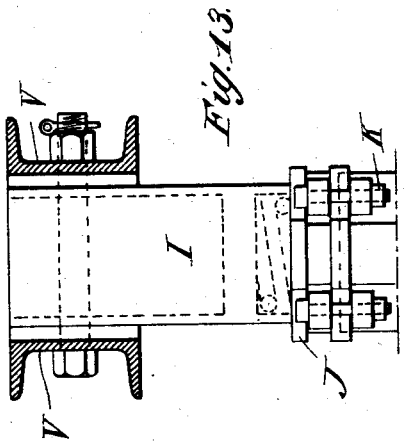

Fig. 13.

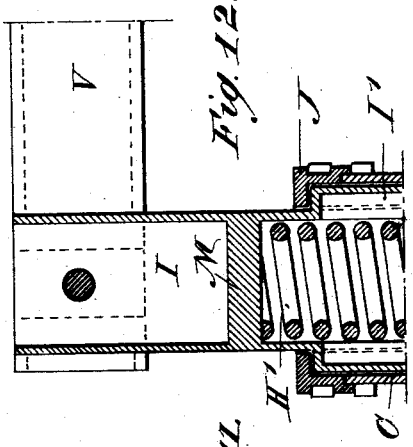

Fig. 12.

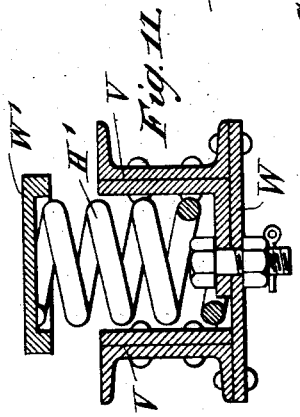

Fig. 11.

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UNITED STATES PATENT OFFICE.

FERDINAND E. CANDA, OF NEW YORK, N. Y.

STREET-CAR TRUCK.

SPECIFICATION forming part of Letters Patent No. 525,590, dated September 4, 1894.

Application filed February 1, 1894. Serial No. 498,749. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND E. CANDA, of New York city, in the county and State of New York, have invented certain new and useful Improvements in Street-Car Trucks, of which the following is a full, clear, and exact description.

The improved street car truck has been designed with a view to securing an easy spring movement, whether the car is running light or is heavily loaded.

Another object of the invention is to allow of a yielding lateral movement of the car axles and car body relatively to one another, thus avoiding shocks to the body of the car in rounding the sharp curves so common in street railroads.

A further object of the invention is to uniformly distribute the weight of the car to all the supporting springs.

To these ends, my invention consists of a particular and novel combination of an elliptic and a coiled spring placed the one above the other, and of various features of construction and arrangements of parts, that will be fully described hereinafter, and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings which form a part of this specification, and in which—

Figure 1 is a side elevation showing the construction of my improved truck applied to a four-wheeled car. Fig. 2 is a plan view of one end of the said truck, drawn on an enlarged scale. Fig. 3 is partly an end elevation and partly a cross sectional elevation of the truck, taken essentially on the line 3—3 of Fig. 1. Fig. 4 is a detail longitudinal sectional elevation of one of the spring supports. Fig. 5 is a cross sectional elevation of a portion of the same, taken on line 5—5 of Fig. 4. Fig. 6 is a sectional plan view of the same, taken essentially on the line 6—6 of Fig. 4. Fig. 7 is a cross sectional elevation, on the line 7—7 of Fig. 8, illustrating the connection of the truck with one of the axle boxes. Fig. 8 represents the same parts in side elevation, the truck proper being shown in section on the line 8—8 of Fig. 2. Fig. 9 is a side elevation of another form of my improved truck. Fig. 10 is a partial plan of the same; and Figs. 11, 12, and 13, are detail sectional elevations taken on the lines 11—11, 12—12, and 13—13, respectively, of Figs. 9 and 10.

Similar letters denote similar parts throughout the several views.

Each of the truck sides consists of two long channel bars A, extending practically from one end of the car to the other, and connected by means of cross bars B. To the top of the said channel bars is riveted or otherwise secured a series of hollow column stands C. Under each of these column stands and between the channel bars A is placed an elliptic spring D, which rests on a riveted plate E, shaped so as to receive the band F of the elliptic spring. Directly on top of the elliptic spring is a cap G on which rests a coil spring H, the cap being preferably provided with an upward extension or stem G′. The coil spring H is surrounded by a hollow follower I which is guided by the walls of the column stand, and the follower may be provided with vertical ribs I′, adapted to enter recesses C′ of the column stand. A cap or cover J, which is fastened to the column stand by means of bolts and nuts K, serves to limit the upward movement of the follower so as to securely hold it in position. Each follower has a solid ridge L arranged in its upper part above a partition M, which forms a bearing for the upper end of the coil spring H. On this upwardly projecting ridge rests a saddle N (Figs. 4 and 5). The engaging surfaces of the saddle and the ridge are rounded, and the saddle is so shaped that it will be able to rock longitudinally owing to the longitudinal curvature of its lower surface (see Fig. 4), and also transversely owing to the transverse curvature of the said surface, so that the saddle and the ridge practically form a universal joint within certain limits. The saddle is bolted to the car frame, as shown at O, and also keyed to the follower I by means of a bolt P and key P′, or equivalent devices. It will be observed that the walls of the aperture in the saddle through which the bolt P is passed, are curved both longitudinally and transversely, so as to permit of the above-explained rocking movement of the saddle. In this manner the truck is securely yet movably connected to the body of the car.

The connection of the truck with the axle boxes is shown in Figs. 1, 2, 7, and 8. Suit-

able vertical plates Q extend transversely from one channel bar A to the adjacent one and are secured to the said bars. Between the said plates is arranged the axle box R. A longitudinal rod or bolt S rests in a groove S′ on the upper surface of the axle box, and links T depend from the ends of the said bolt at the sides of the axle-box. The lower ends of the said links project below the axle box, and are connected by a bolt U supported in the plates Q and held against longitudinal displacement by a key U′. It will be obvious that owing to this arrangement the axle box is capable of moving transversely to the truck, but the weight of the car body will automatically restore the said parts to their normal position.

As shown in the drawings, the supporting springs are not located above or below the car axles, but at a certain distance in advance or in the rear of the axles. The channel bars are suspended from the car axles, and the car body is supported by the channel bars.

The form of construction shown in Figs. 9 to 13, has been designed especially for a motor truck, but may be used for an ordinary car, if desired. The truck frame, its connection with the car axles, and the improved arrangement of the supporting springs, are substantially the same as above described. The followers I, however, are pivotally connected to equalizing bars V which extend longitudinally of the car above the channel bars A. The connection between the said equalizing bars and the car body is effected through the medium of coil springs H′ which have a bearing at one end against plates W secured to the equalizing bars V, and at the other end against plates or caps W′ secured to the car body. The springs H′ are so located that the weight of the car body will be equally distributed to all the supporting springs, that is, in the truck shown in Figs. 9 and 10, the springs H′ are placed at the division of one-third the length of each equalizing bar. It will be further observed that each of the springs H′ is allowed a certain lateral play by leaving a portion of the springs exposed (see Figs. 9 and 11) so that the car body and the truck frame with the car axles are capable of a yielding lateral movement to deaden shocks. When the truck is a motor truck, the axle boxes have no lateral mobility relatively to the channel bars, the links T being securely held in the plates Q instead of being capable of swinging therein, as will be readily understood by reference to Fig. 10. The springs H′ usually are stronger than the springs H or the elliptic springs D. The latter are stronger than the coil springs H. It will be seen that when the coil spring H is compressed to its utmost capacity, the follower I will rest on the elliptic spring D and the latter will have a further action. It will be obvious that such an operation is not possible with the usual combination of elliptic and coil springs where the springs are placed in the same horizontal plane, instead of being located one above the other, as in my invention. The functions of the remaining parts of my improved truck will be obvious without further explanation. It will be observed that all the supporting springs are connected by the channel bars A.

I desire it to be understood that the forms of construction illustrated by the drawings are but examples of the various manners in which my invention may be carried out, and I do not limit myself to these forms of construction. The position of the coil springs H and the elliptic springs D may be reversed, and other changes may be made without departing from the nature of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. In a car, a supporting spring, the same comprising an elliptic spring and a coil spring located one above the other, a follower arranged on top of the upper spring and adapted to rest on the lower spring when the upper spring is compressed to its full capacity, and a hollow vertical column stand in which the follower has guided movement, substantially as described.

2. The combination, with the truck frame, the elliptic spring resting thereon, the coil spring supported by the elliptic spring, and the follower arranged on top of the coil spring, and having guided movement in the truck frame, said follower having an upward projection or ridge above the said spring, of a saddle connected to the car body and having a loose connection with the follower, the saddle resting on the ridge of the follower and practically forming therewith a universal joint, substantially as described.

3. The combination, with the truck frame, the elliptic spring resting thereon, the coil spring supported by the elliptic spring, and the follower arranged on top of the coil spring and having guided movement in the truck frame, said follower having a rounded projection or ridge, of a saddle resting on the said ridge and having a rounded lower surface to allow it to rock longitudinally and transversely of the car, the saddle being connected to the car body and having also a loose connection with the follower, substantially as described.

4. The combination, with the truck frame, of an elliptic spring supported thereby, a cap resting on the elliptic spring, and provided with an upwardly projecting stem, a coil spring carried by the said cap and into which projects the said stem, a hollow follower arranged on top of the coil spring and surrounding the same, the follower having guided movement in the truck frame, and means, substantially as described, for connecting the follower to the car body, as set forth.

5. The combination with the truck frame provided with a hollow vertical column stand, of an elliptic spring supported by the frame and located below the said column stand, a

coil spring resting on the elliptic spring and located mainly within the said column stand, a hollow follower having guided movement in the column stand and arranged on top of the coil spring, and means, substantially as described, for connecting the follower to the car body, as set forth.

6. In a car, a truck frame comprising longitudinal horizontal bars located at the sides of the car, the bars being arranged in sets of two adjacent to each other on the same side of the car and at substantially the same height, supporting springs arranged between adjacent longitudinal bars and interposed between them and the car body, and means, substantially as described, whereby the car body is enabled to move laterally relatively to the axle boxes.

7. The combination, with the car axles, the axle boxes, and the truck frame, comprising longitudinal horizontal bars located at the sides of the car in sets of two, and vertical plates each secured to both bars of one of the sets of longitudinal bars, and arranged transversely of the car at each side of the axle boxes to form guides therefor, of links pivotally connected with the said plates between the longitudinal bars of the respective sets, the pivots being located longitudinally of the car so that the links are adapted to swing transversely thereof, and connections between the upper ends of the links, the said connections being adapted to rest on top of the axle boxes, substantially as described.

8. The combination, with the horizontal bars located longitudinally at the sides of the car, the supporting springs resting on the said bars, and the followers arranged on top of the supporting springs, of equalizing bars pivotally connected with the upper portions of the followers, and supports interposed between the car body and the said equalizing bars, substantially as described.

9. The combination, with the horizontal bars located longitudinally at the sides of the car, the supporting springs resting on the said bars, and the followers arranged on top of the supporting springs, of equalizing bars pivotally connected with the upper portions of the followers, and supporting springs interposed between the car body and the said equalizing bars, substantially as described.

10. The combination, with the horizontal bars located longitudinally at the sides of the car, the supporting springs resting on the said bars, and the followers arranged on top of the supporting springs, of equalizing bars pivotally connected with the upper portions of the followers, and coiled supporting springs interposed between the car body and the said equalizing bars, a portion of each of these supporting springs being capable of lateral movement to enable the car body to yield laterally in relation to the equalizing bars and the truck frame, substantially as described.

FERDINAND E. CANDA.

Witnesses:
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F. W. HANAFORD.