No. 648,228. Patented Apr. 24, 1900.

J. C. BARBER.

CAR TRUCK.

(Application filed May 7, 1898.)

(No Model.) 3 Sheets—Sheet 1.

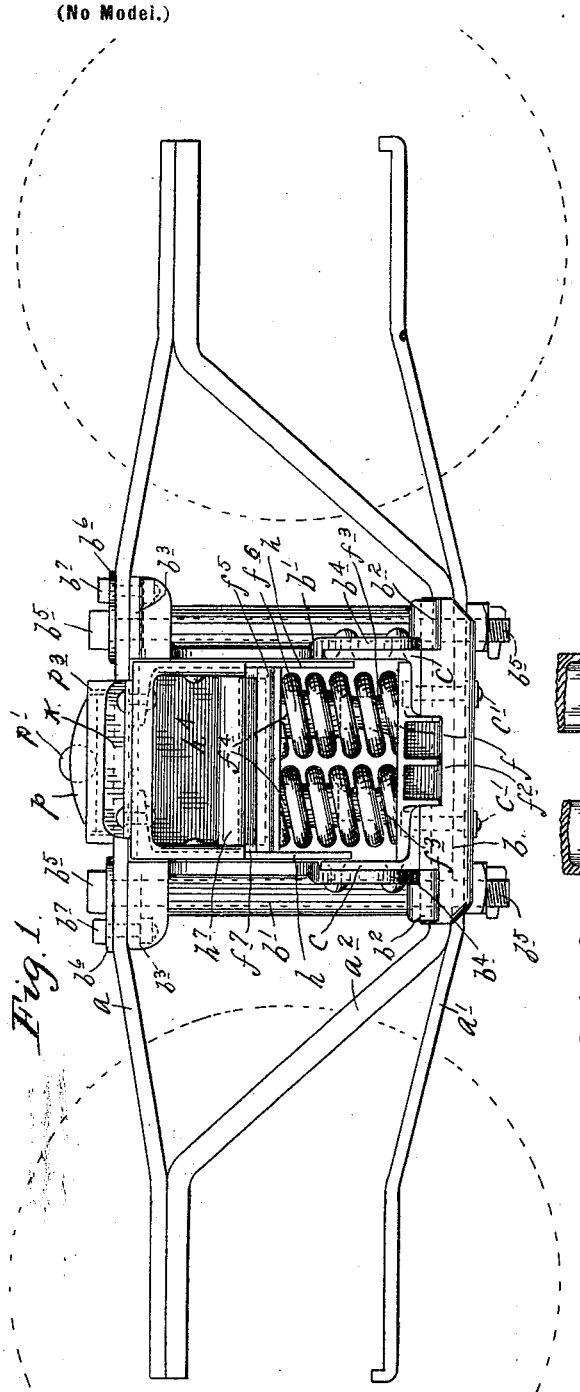

Fig. 1.

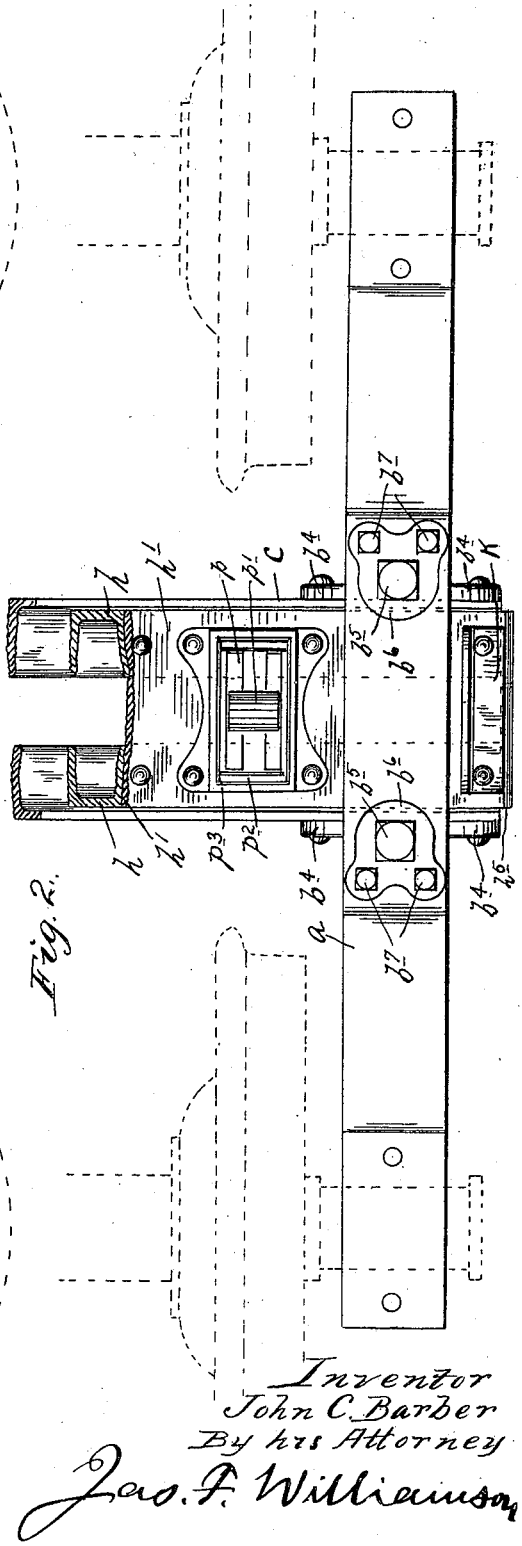

Fig. 2.

Witnesses
C. F. Kilgore
A. D. Merchant.

Inventor
John C. Barber
By his Attorney
Jas. F. Williamson

No. 648,228. Patented Apr. 24, 1900.

J. C. BARBER.

CAR TRUCK.

(Application filed May 7, 1898.)

(No Model.) 3 Sheets—Sheet 2.

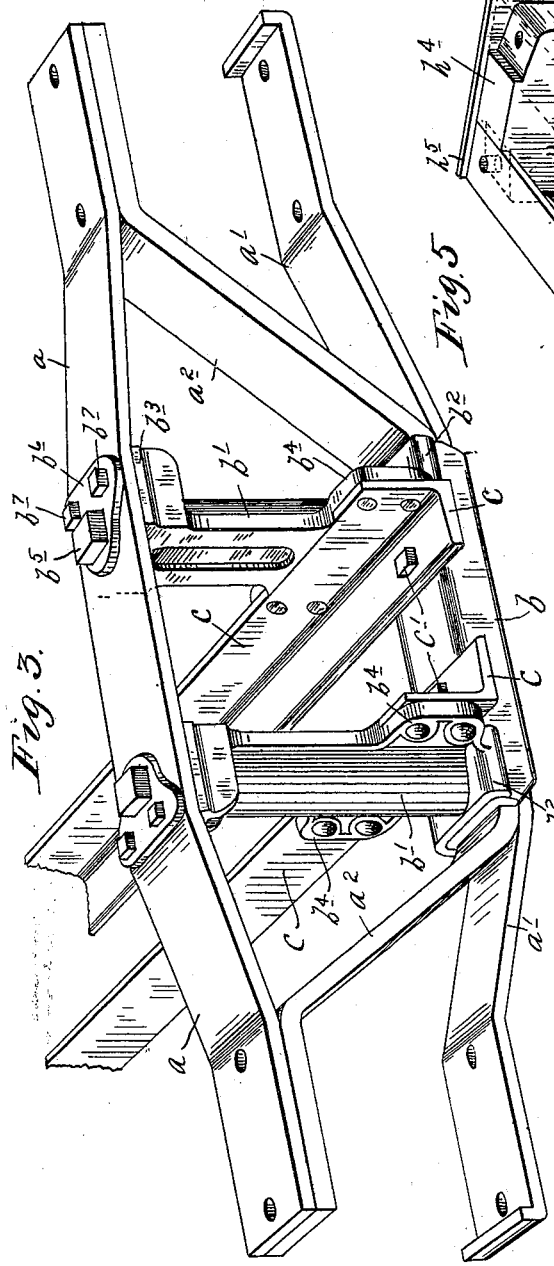

Fig. 3.

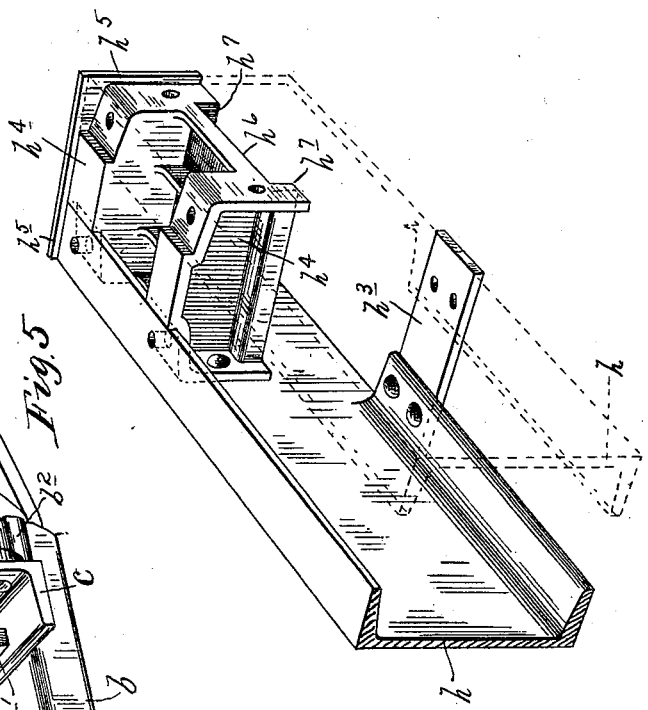

Fig. 5

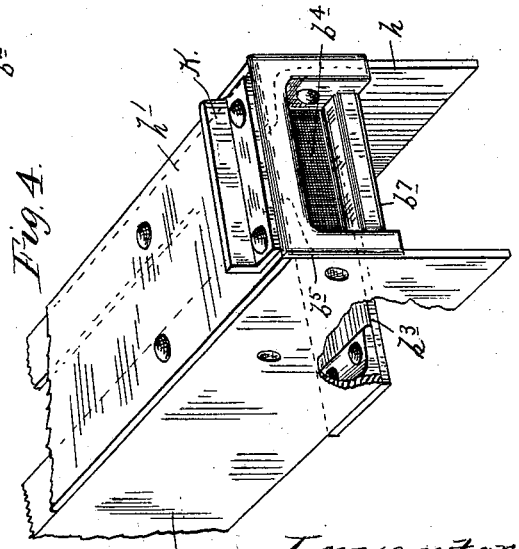

Fig. 4.

Witnesses
C. F. Kilgore
F. D. Merchant.

Inventor
John C. Barber
By his Attorney
Jas. F. Williamson

No. 648,228. Patented Apr. 24, 1900.

J. C. BARBER.

CAR TRUCK.

(Application filed May 7, 1898.)

(No Model.) 3 Sheets—Sheet 3.

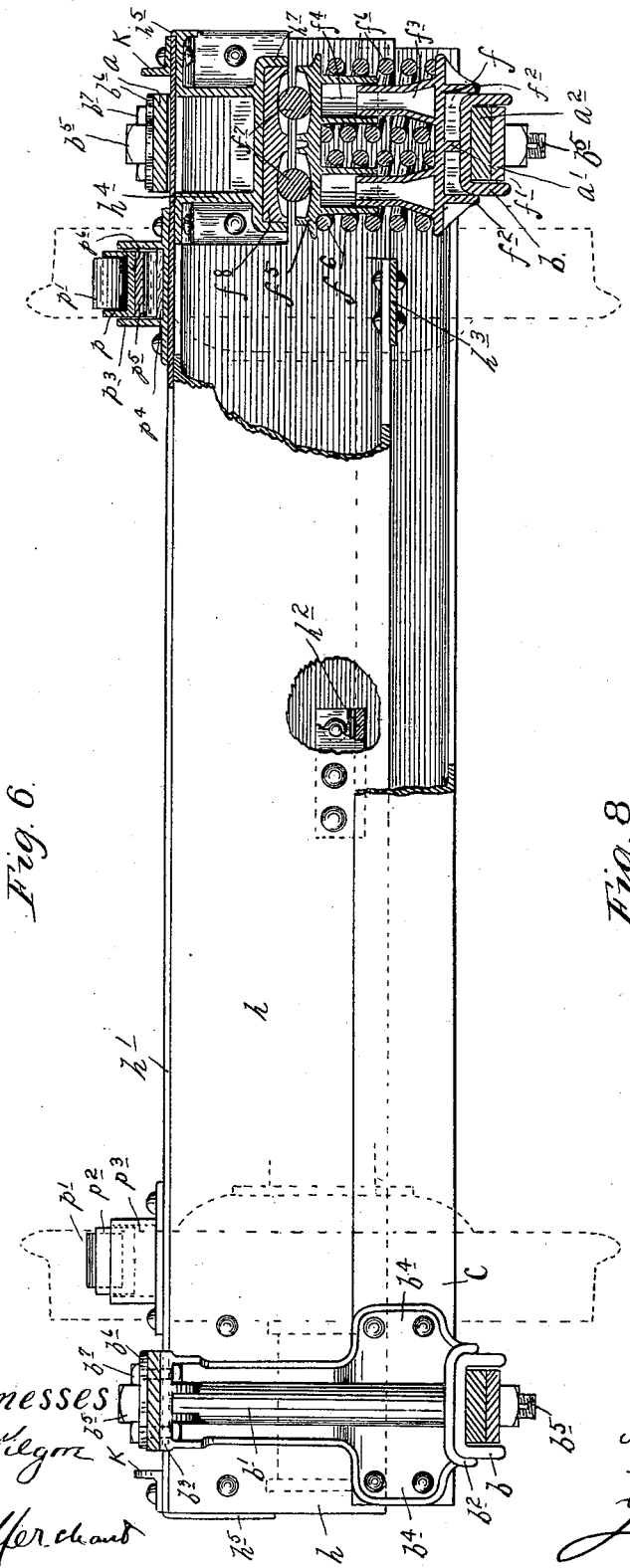

Fig. 6.

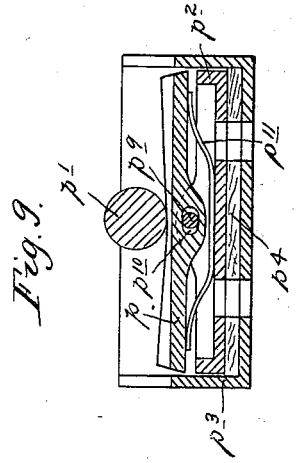

Fig. 9.

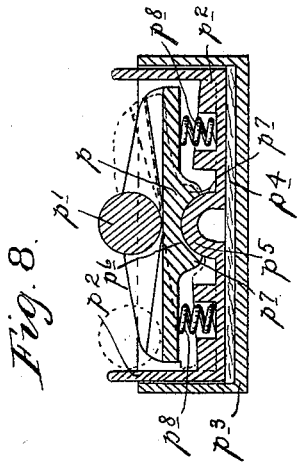

Fig. 8.

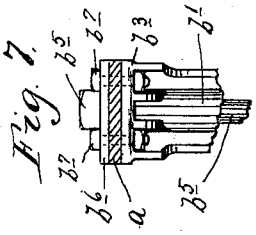

Fig. 7.

Witnesses
C. F. Kilgore
F. D. Merchant

Inventor
John C. Barber
By his Attorney
Jas. F. Williamson

UNITED STATES PATENT OFFICE.

JOHN C. BARBER, OF ST. PAUL, MINNESOTA.

CAR-TRUCK.

SPECIFICATION forming part of Letters Patent No. 648,228, dated April 24, 1900.

Application filed May 7, 1898. Serial No. 680,039. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. BARBER, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Car-Trucks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an improved car-truck.

To these ends my invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like notations refer to like parts throughout the several views.

Figures 1 and 2 are respectively an end elevation and plan view of part of a truck containing my improvements. Fig. 3 is a perspective view showing part of the truck-frame. Fig. 4 is a similar view showing a part of the truck-bolster. Fig. 5 is a view similar to Fig. 4, but with some of the parts removed. Fig. 6 is a view, partly in cross-section and partly in elevation, through the improved truck, with some portions broken away; and Fig. 7 is a detail showing end of column-head. Fig. 8 is a detail in sectional elevation, illustrating one form of my improved side bearing; and Fig. 9 is a view similar to Fig. 8, showing a modified form of side bearing.

The top bar a, bottom bar a', and truss-bar a^2 of the side frames of the truck are of the customary form. The bottom bar a' and the truss-bar a^2 at their over and underlying portions are embraced by a saddle b. On the saddle b rest the columns b', suitably spaced apart from each other. The columns b' are provided below with the saddle-like feet b^2, which embrace the saddle b. At their upper ends the columns b' have the laterally-expanded portions b^3 for securing the same to the top bar a of the side frames. The said columns are also provided with laterally-extended vertical webs or flanges b^4, extending for a short distance above their feet portions b^2 for securing the same to the cross-ties c, which are of angular form, as best shown in Fig. 3. The column-bolts b^5 extend through the columns b', the saddle b, and all the bars of the side frames. As shown, they also extend through top washer-plates b^6. The columns b' are also bolted above to the top bar a of the side frame by the reinforcing-bolts b^7. The cross-ties c, of angle form, as hitherto noted, are rigidly secured to the flanges b^4 of the columns b', with the horizontal portions of said cross-ties resting on the saddle b. The cross-ties are also secured to the said saddle b and to the side-frame bars a' a^2 by the reinforcing-bolts c'. As shown, the tie-bars c are riveted to the column-flanges b^4. With the construction above described it is obvious that the bottom and the truss bar of the side frame are reinforced against the shearing strains by the saddle-bars b and that the columns rest on the saddles and are connected to the top and bottom bars of the side frames not only by the column-bolts b^5 in the ordinary way, but by the reinforcing-bolts b^7 above with respect to the top bar a and by the reinforcing-bolts c' below with respect to the bottom bar a' and the truss-bar a^2. Otherwise stated, if the column-bolts should be sheared off the different parts of the frame would remain rigidly connected together. Moreover, the column-bolts b^5 and the reinforcing-bolts c' extend through the three thicknesses of metal afforded by the saddle b and the overlapping parts of the bars a' and a^2. The cross-ties c, of angular form, located and connected, as described, to the columns b', the saddle b, and the side-frame bars a' and a^2, afford an extremely rigid and strong cross-brace to the side frames. As a detail for the application of the top reinforcing-bolts b^7 it may be noted that the laterally-extended heads b^3 of the columns b' are formed with downwardly-extended webs suitably spaced apart to receive and lock the nuts of the reinforcing-bolts b^7 when the bolts are in position, as best shown in Fig. 7. The vertical flanges of the cross-ties c, which connect the opposite side frames of the truck, are comparatively short in depth, or, otherwise stated, they do not extend to the entire height of the columns b', like the ordinary transom. Nevertheless the said cross-ties c in virtue

of their form coöperate with my improved side frames above described to afford an extremely rigid truck.

The spring-bases f are of the proper shape to rest on the saddles b and the horizontal flanges of the cross-ties c between the columns b', as best shown in Figs. 1 and 6. The said spring-bases f are provided with downwardly-extended short central ribs f', which rest on the saddles b, and with downwardly-extended side flanges f^2 of greater length than the central flanges f' and spaced apart to embrace the side of the saddles b. The side flanges f^2 are of the proper length in the horizontal direction to work between the horizontal flanges of the cross-ties c, as best shown in Fig. 1. Hence when the spring-bases f are in working position they interlock with the saddles b against lateral displacement and with the cross-ties c against endwise displacement, and the load thereon is taken in part directly by the saddles b and in part directly by the cross-ties c. It is obvious that this affords a very advantageous distribution of the load. The spring-bases f are provided on their faces with the male members f^3 of telescoping spring-guides, the female members f^4 of which depend from the spring-caps f^5. These spring-guides f^3 and f^4 have telescoping engagement with each other, as best shown in Fig. 6, thereby permitting the necessary vertical motion, but preventing any lateral displacement of the bases and the caps under the motion from the springs f^6, which surround the spring-studs f^3 and f^4. This is a radical improvement in the means for supporting the required springs f^6 for taking the load from the bolster. It insures the rectilinear action of the springs f^6 and prevents any side motion thereof or torsional strain thereon. The spring-caps f^5 are of the proper form on their upper faces to serve as bearing-plates for the rollers f^7. Over the rollers f^7 are mounted the top bearing-plates f^8, which are embraced and held by the flanges h^7 of the bolster end castings h^4, as will presently more fully appear. The bearing-surface for the rollers f^7 on the plates f^5 and f^8 are concave for the same purpose as in my prior patents.

The bolster is made up of a pair of channel-bars h, set with their horizontal flanges facing each other, a top plate h', riveted or otherwise rigidly secured to said channel-bars, suitable cross-ties h^2 and h^3, and suitable bolster end castings h^4. The bolster end castings h^4 are of the proper form to fill the space between the side and upper horizontal flanges of the channel-bars h and to be riveted or otherwise secured both to the vertical and horizontal portions of said channel-bars, as best shown in Figs. 1, 4, 5, and 6. The castings h^4 are of less depth than the height of the vertical flanges of the channel-bars h and are also provided with end flanges h^5, adapted to abut against the ends of the channel-bars h, as best shown in Figs. 1 and 4, and serve as a name-plate. The castings h^4 are also of the proper form to afford seats h^6 for the upper bearing-plates f^8 and have downwardly-extended flanges h^7, adapted to embrace said plates f^8, thereby holding the same in proper working position, as best shown in Fig. 6. The lower horizontal flanges of the channels h are cut away for a distance inward from their outer ends, as shown in Fig. 5. This permits the castings h^4 to be raised into position between the channel-bars h from below and also gives the necessary clearance for the bolster in respect to the springs, spring-caps, and spring-bases.

The lower cross-ties h^3 reinforce the channels h at the outer ends of their horizontal flanges, and the central cross-tie h^2, which is of angle form, reinforces the central part of the bolster below and also serves as the bottom guide for the center pin. (Not shown.)

With this construction it is obvious that a cheap, rigid, and extremely-strong bolster is afforded of a design adapted to my improved means for mounting the springs, as herein described, in my roller-motion trucks.

The bolster is shown as provided with end stops k, located at the outer ends of the bolster, for coöperation with the outer surfaces of the top bars a of the side frames. The said bolster is shown as equipped with one form of an improved side bearing of my invention. The form shown on the bolster is the form illustrated in detail in Fig. 8. Another form thereof is illustrated in Fig. 9. Both forms have the common feature of a tilting table p, carrying the side-bearing roller p' and under spring tension to assume its horizontal or normal position. Both forms have the further common features of a suitable base p^2 for the tilting table of box-like form and adapted to set in a box-like casting p^3, fixed to the bolster. Between the table-base p^2 and the casting p^3 is also placed a removable shimming-block p^4. In the form shown on the bolster and in Fig. 8 the bearings for the tilting table are afforded by a raised convex surface p^5 on the base p^2 and a concave surface p^6 for coöperating therewith, formed on the boss p^7 of the table-casting. Spiral springs p^8 are then placed under the opposite ends of the table for restoring the same to normal position. In the form shown in Fig. 9 the bearings for the table are afforded by a pivot-bolt p^9, seated in the sides of the base p^2 and extending through an elongated hole p^{10} in the bearing-boss of the table, and a flat spring p^{11} is centrally fixed to the base p^2, with its opposite ends applied to the table on opposite sides of its pivot for restoring the same to normal position. The action is substantially identical in both, although the friction may be greater on one than on the other. With this tilting table as the bearing-plate for the roller it is obvious that the roller will adapt itself to the plane of the bolster in the bolster's forward and backward travel and that when the side bearing is relieved from

the bolster the table will restore the roller to its central or normal position, with the table horizontal, under the action of the table-springs.

The feature of my invention herein disclosed which I deem to be of the most importance is the feature affording guides for the bolster-supporting springs arranged to insure the vertical motion thereof, while preventing any lateral motion of the springs or any torsional strain thereon from the bolster. It will be understood, of course, that this feature is of special importance in my general type of car-trucks, wherein the bolster is mounted with freedom for both a vertical motion and a lateral motion on rollers. Inasmuch as the bolster thus moves laterally on rollers, it is a matter of large importance to prevent torsional strain on the springs. In one of my prior patents, to wit—No. 573,636, of date December 22, 1896—I accomplished that result by so mounting the springs and the bearing-plates that the springs, together with the upper bearing-plate for the rollers, were carried laterally with the bolster, while at all times freedom was afforded for the compression and expansion of the springs or the vertical motion of the bolster in respect to said upper bearing-plate for the rollers. In my present invention it will be seen that I reached the result named without shifting the relations of the springs to the truck-frame from that shown in some of my earlier patents—such for example, as No. 569,077, of date October 6, 1896. I believe that I am the first to accomplish this result and do not restrict myself to the details of construction herein shown for that purpose. It should further be noted that if found desirable the telescoping guide-sections might be made of the proper form and fit to afford more or less friction in their telescoping action, thereby relieving the springs to that extent.

By the above-noted construction for mounting the springs and by the general construction of the truck-frame and the bolster as herein disclosed a car-truck is secured with lateral motion on rollers which is extremely strong and is comparatively cheap.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. In a car-truck, the combination with the arch and the truss bars, of the saddle-bars embracing the overlapping parts of the arch and bottom bars, and rigidly secured thereto by means independent of the column-bolts, the columns resting on said sides and connecting the top bars to said truss and bottom bars and saddle-bars, column-bolts passed through said columns, top bars, truss-bars, bottom bars, and saddle-bars, and the cross-ties of angular form resting on and rigidly secured to said saddle-bars and to said columns by means independent of said column-bolt, substantially as described.

2. In a car-truck, side frames composed of arch and truss bars and saddle-bars embracing and reinforcing the overlapping parts of the truss and bottom bars beneath the columns, substantially as and for the purposes set forth.

3. In a car-truck, the combination with the side frames having the saddle-bars embracing the overlapping parts of the truss and bottom bars, the columns resting on said saddle-bars and connecting the top bars to said truss-bars, bottom bars and saddles, of the cross-ties of angular form resting on said saddle-bars and secured to said columns with their horizontal flanges facing each other, and spring-bases constructed to rest partly on said saddle-bars and partly on said cross-ties, and having flanges which interlock with the saddle-bars, to prevent lateral displacement, and with said tie-bars, to prevent longitudinal displacement, substantially as described.

4. In car-trucks, a side bearing, comprising a tilting table under spring tension to assume its normal or horizontal position, and a roller mounted thereon as a bearing-surface, substantially as described.

5. In a car-truck, the columns secured to the top, arch and bottom bars of the side frames by the ordinary column-bolts, and also by reinforcing-bolts, and having on their heads flanges which serve as locks to the nuts of said bolts, substantially as described.

6. The combination with a truck-frame and bolster, of coöperating spring-plates between the same, provided each with a plurality of projecting guides formed integral with the said plates, the said guides on the two plates coöperating and telescoping in pairs, and springs between said spring-plates held and guided by said telescoping guides, substantially as and for the purposes set forth.

7. The combination with a truck-frame and bolster, of spring-bases having each a plurality of guide-sections rising therefrom, with said spring-bases resting on the truck-frame, spring-caps with a plurality of depending guide-sections that telescope one with each of the said guide-sections rising from said spring-bases, springs between said bases and caps held and guided by said telescoping guide-sections, rollers resting in bearing-surfaces formed on the top faces of said spring-caps, and roller bearing-plates carried by the bolster and resting on said rollers, substantially as and for the purposes set forth.

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

JOHN C. BARBER.

Witnesses:
LYMAN W. BARBER,
WM. J. PETTEE.