(No Model.) 2 Sheets—Sheet 1.

J. C. BARBER.

CAR TRUCK.

No. 528,844. Patented Nov. 6, 1894.

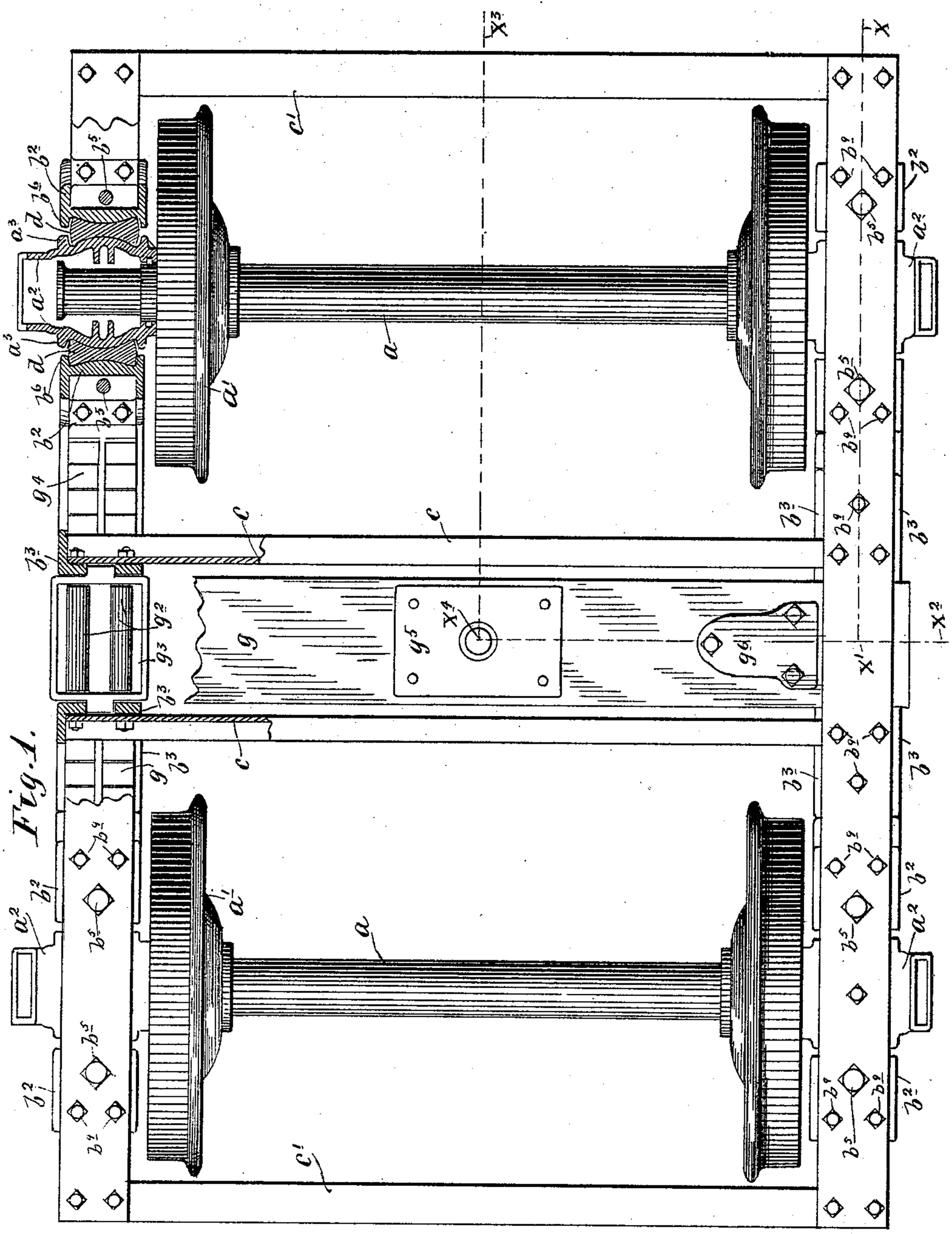

Fig. 1.

Witnesses.
A. W. Upsahl.
Frank D. Merchant,

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

(No Model.) 2 Sheets—Sheet 2.

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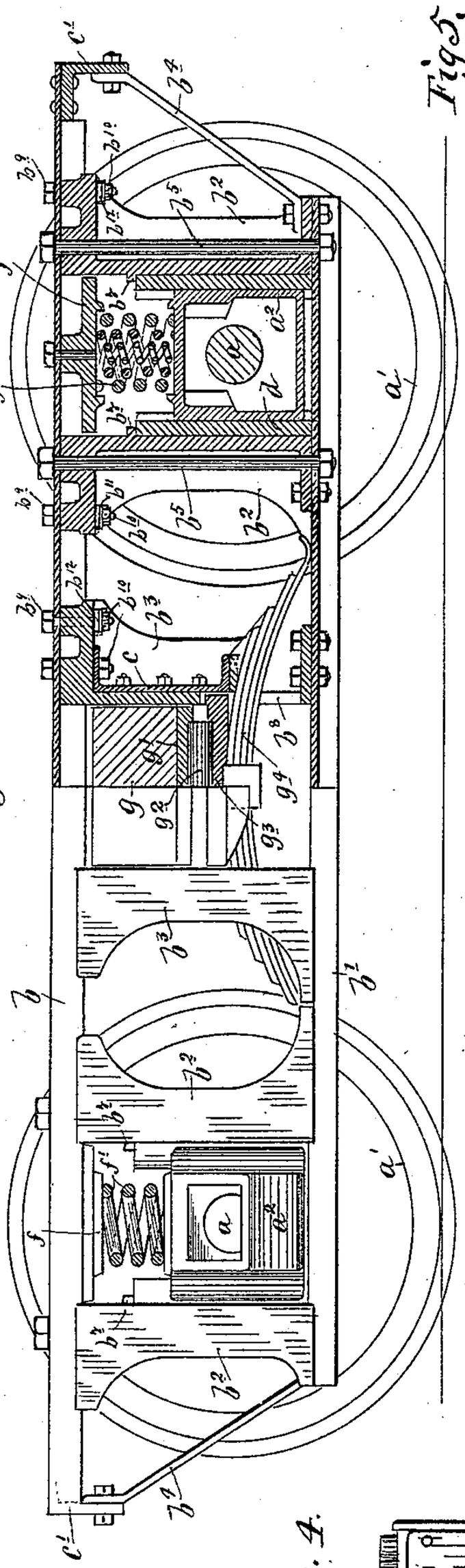

Fig. 2.

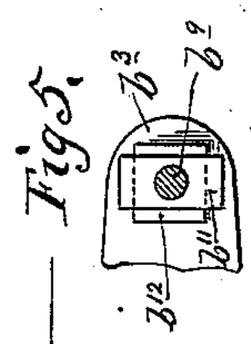

Fig. 5.

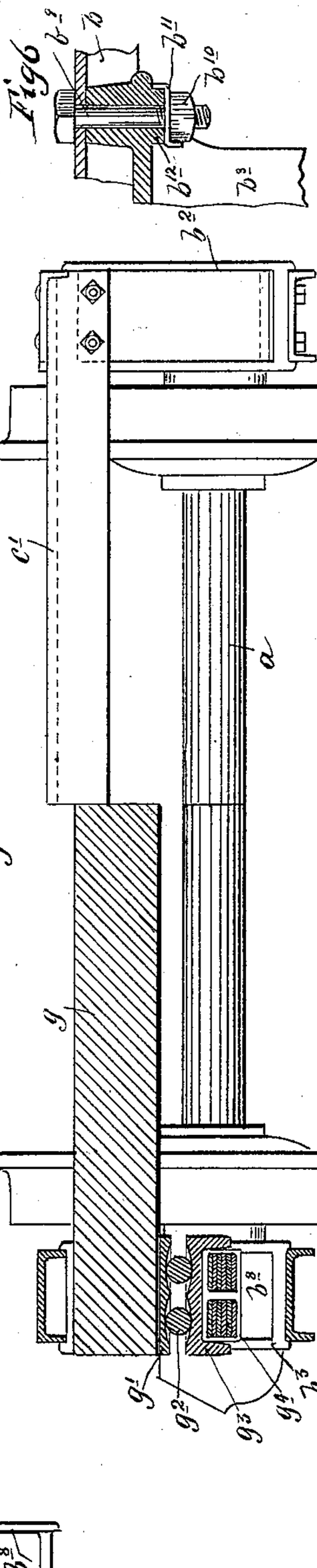

Fig. 6.

Fig. 3.

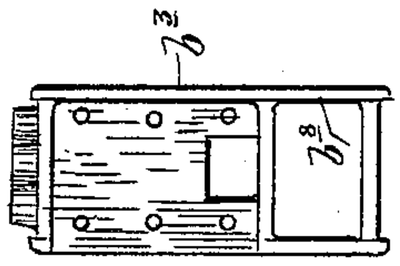

Fig. 4.

Witnesses.
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UNITED STATES PATENT OFFICE.

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

CAR-TRUCK.

SPECIFICATION forming part of Letters Patent No. 528,844, dated November 6, 1894.

Application filed December 23, 1893. Serial No. 494,537. (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.

The car-truck herein shown and described involves several features of construction, which have been disclosed and claimed in several prior patents for car-trucks, hitherto granted to me, in the United States; which prior patents are identified as follows: No. 370,758, of date October 4, 1887; No. 383,688, of date May 29, 1888; No. 433,063, of date July 29, 1890, and No. 506,460, of date October 10, 1893.

My present invention has for its object to improve the general structure of car-trucks, adapted for passenger service, as well as certain of the details thereof, with a view to reduced first cost of the truck, and to increased durability and economy in use, under the wear and tear of the service.

To these ends, my invention consists of the noval features which will be hereinafter fully described and be defined in the claims.

A car-truck embodying my improvements is illustrated in the accompanying drawings, wherein like letters refer to like parts.

Figure 1 is a plan view of the truck, with some parts shown in horizontal section. Fig. 2 is a side elevation of the truck, with some parts shown in section, on the lines X X′ X^2. Fig. 3 is an end elevation of the truck, with some parts shown in section, on the line X^3 X^4 X^2; and Fig. 4 is a detail of one of the bolster columns detached. Figs. 5 and 6 are details of the nut-lock and boss, for securing the pedestals and bolster columns to the side frames.

a a' represent respectively, the axles and wheels of the truck.

b b' represent respectively, the upper and lower members of a pair of channel-bars, which are spaced apart from each other and rigidly secured together by the axle-box pedestals b^2, bolster-columns b^3, end braces b^4 and tie-bolts b^5; which parts, taken together, constitute the side frames of the truck. The side frames are connected by channel-bar transoms c and angle-bar end-pieces or cross-ties c'. The side frames, transoms, and cross-ties, as described, constitute, together, what may be termed a rolled metal truck.

All the main-bars being made as described, of channel or angle-bars, either of wrought-iron or steel, produces a truck-frame of great strength and rigidity. On account of the increased strength and rigidity thus obtainable, by angle-bars and channel-bars, the parts may be made of less weight, than it would be otherwise necessary to employ. Hence, a truck-frame is thus securable, which has the distinctive merit of great strength with comparatively small mass or weight. On account of the availability of angle and channel bars, and the little hand-work that is required in making the truck-frame, the first cost of the same is comparatively small.

Turning now to other features, I place between the axle-boxes a^2 and their pedestals b^2 removable wearing-blocks d. For securing the wearing blocks d in place, all the parts are of reversely curvilinear form in cross section; and the pedestals are provided with marginal flanges b^6 and stop-lugs b^7; and the boxes have similar flanges a^3, for co-operation with the pedestal flanges b^6. As shown, both the pedestals and the boxes have their opposing surfaces or bearing surfaces, with respect to the wearing-blocks d, of convex form in cross-section; and both vertical faces of the wearing blocks are of concave form in cross section. It is obvious, however, that the construction might be reversed, so far as holding the wearing-blocks in place is concerned. In other words, if the opposing surfaces of the boxes and pedestals were of concave form in cross-section and the wearing blocks were of convex form in cross-section, the parts would be held equally well in their proper working position. The form which I have shown, however, is the desirable construction on account of its permitting the best form of boxes. The wearing blocks d, are loose in their seats; and are held from rising by the stop-lugs b^7, on the inner faces of the pedestals b^2. The wearing blocks d are made of soft iron; and the boxes a^3 are chilled on their faces. The great advantage in the use of these wearing

blocks d, is the fact that the pedestals are relieved from the wear and tear of the boxes; and hence, the pedestals will last as long as any other part of the truck-frame. The boxes and the wearing blocks receive all the wear. These parts may, therefore, be readily replaced, whenever required, without substituting any new parts in the truck frame; and as the boxes are chilled and the blocks are soft, the wear will nearly all be taken on the blocks. The boxes, will therefore last for a long time, as compared with the blocks.

Between the axle-boxes a^2 and the upper member b of the side frame channel-bars are located spring-caps f, and coiled springs f', of any suitable construction, but which are preferably of the double coil kind, as shown in the drawings. The axle-box pedestals b^2 are formed in separate or independent pieces, which are suitably spaced apart and bolted to the channel-bars of the side frames, through the respective flanges of the pedestals and channel-bars, which connections are reinforced by the tie-bolts b^4 running entirely through the pedestals and channel-bars of the side frame.

The pedestals b^2 and the bolster columns b^3 may be castings but are preferably of steel pressed or struck up into the desired forms.

With the exception of the tie bolts b^5, all the bolts and nuts b^9 b^{10}, securing the pedestals and bolster columns to the channel bars b b', of the side frames, are secured, as shown in Figs. 5 and 6, by strap iron nut-lock washers b^{11}, engaging with one rectangular surface of the nut and one rectangular surface of a nut-lock boss b^{12}, formed for the purpose on the pedestal and column flanges. This nut-lock boss b^{12} is a great convenience, as otherwise the nut-lock strap b^{11} would, in many cases, have to be extended to a considerable distance from the nut in order to engage with a suitable base of resistance.

The truck bolster g is mounted between the transoms c and the bolster columns b^3, and provided with roller-caps g', resting on the roller-bearings g^2, which are held in place with freedom for lateral motion by the combined spring-caps and roller-bearing seats $g^{3\times}$, resting on elliptical springs g^4. The elliptical springs g^4, are preferably of the half elliptic form, and are arranged longitudinally of and supported by the lower channel bars b' of the side-frames. The bolster columns b^2, are cut away or formed with openings b^8, at their lower portions, through which the end portions of the elliptical springs g^4, project outward lengthwise of the frames. Otherwise stated, the bolster columns b^3, are of such construction as to embrace both the bolster and the springs g^4, thereby serving to limit the bolster in its forward and backward motion, lengthwise of the frames, and to hold the springs g^4 in their proper working positions, against lateral, endwise or vertical displacement. The half elliptical springs g^4 will stand the same load as would full elliptical springs, and require only half as much room for clearance for their action. They, of course, furnish an easy riding bolster and car-body or other load carried thereby. The use and disposition of these elliptical springs is an important feature of my improved truck. With respect to the strain from the truck bolster, they render available the principle of a yoke or truss for spanning the central or weakest point and for distributing the load onto two of the strongest points of the side frames located as near as possible to the axle-box pedestals; and they also bring the entire strain from the bolster and its load directly in the longitudinal vertical plane through the centers of the frame bearings on the truck axles, thereby avoiding all tendency to tilt the frames sidewise on the axles and minimizing the wear and tear on the bearings.

The relative construction of the roller-bearing caps g', rollers g^2, spring-caps g^3, and the bolster columns b^3, for the proper co-operation of said parts is fully described and claimed in the prior patents, hereinbefore identified, and need no further notice for the purposes of this case.

The truck bolster g may be of any suitable construction and is provided with the usual center-plate g^5, and with stop-lugs g^6, at its opposite ends, for co-operation with the upper members b of the side frame channel-bars, to limit the lateral motion of the bolster. The strains or jars from the forward and backward motion of the truck-bolster, lengthwise of the side frames, are taken by the bolster columns. The construction, in this respect, is the same as that in the last issued of the hereinbefore identified patents.

Of course, it will be understood, that full elliptic springs might be substituted in lieu of the half elliptic springs herein shown; but would not be the mechanical equivalent of the half elliptic springs, with respect to the distribution of the load from the bolster. The full elliptic springs would distribute the load on single points of the side frames directly in the vertical plane through the bolster; while the half elliptic springs, as before stated, are in reality yoke-like supports, which yieldingly sustain and distribute the load, from each end of the bolster, onto two distant points of the respective side frames on opposite sides of the bolster.

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 axle boxes having the convex surfaces and side flanges, of the box pedestals having the convex surfaces and side flanges, the tie-bolts locking said parts together, and the wearing blocks with concave surfaces fitting between said boxes and pedestals and held from displacement by said side flanges, substantially as described.

2. In a car-truck, the combination with the

axle boxes having the convex surfaces and side flanges, of the box pedestals having the convex surfaces, side flanges and stop-lugs, the tie-bolts locking said parts together, and the wearing blocks with concave surfaces fitting between said boxes and pedestals and held from displacement by said side flanges and stop lugs, substantially as and for the purposes set forth.

3. The side frames for car-trucks, comprising upper and lower channel bars spaced apart from each other and rigidly connected together by pedestal and bolster columns, and suitable tie-bolts, certain of which tie-bolts are secured by nut-locks, comprising each an angular boss formed integral with the column, and a strap-iron washer, clamped between said boss and the nut having protruding ends adapted to be bent one for engagement with the angular edge of said boss, and the other with the angular edge of said nut, substantially as and for the purpose set forth.

4. In a car-truck, the combination with the side frames, bolster, and elliptic springs arranged longitudinally of and supported by said frames, of the bolster columns constructed to embrace both the bolster and the springs and hold the same in their proper working positions, substantially as described.

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

JOHN C. BARBER.

Witnesses:
JAS. F. WILLIAMSON,
E. F. ELMORE.