(No Model.) 3 Sheets—Sheet 1.

C. T. SCHOEN.

BUILT-UP PRESSED STEEL TRUCK FRAME.

No. 553,431. Patented Jan. 21, 1896.

Fig. 1

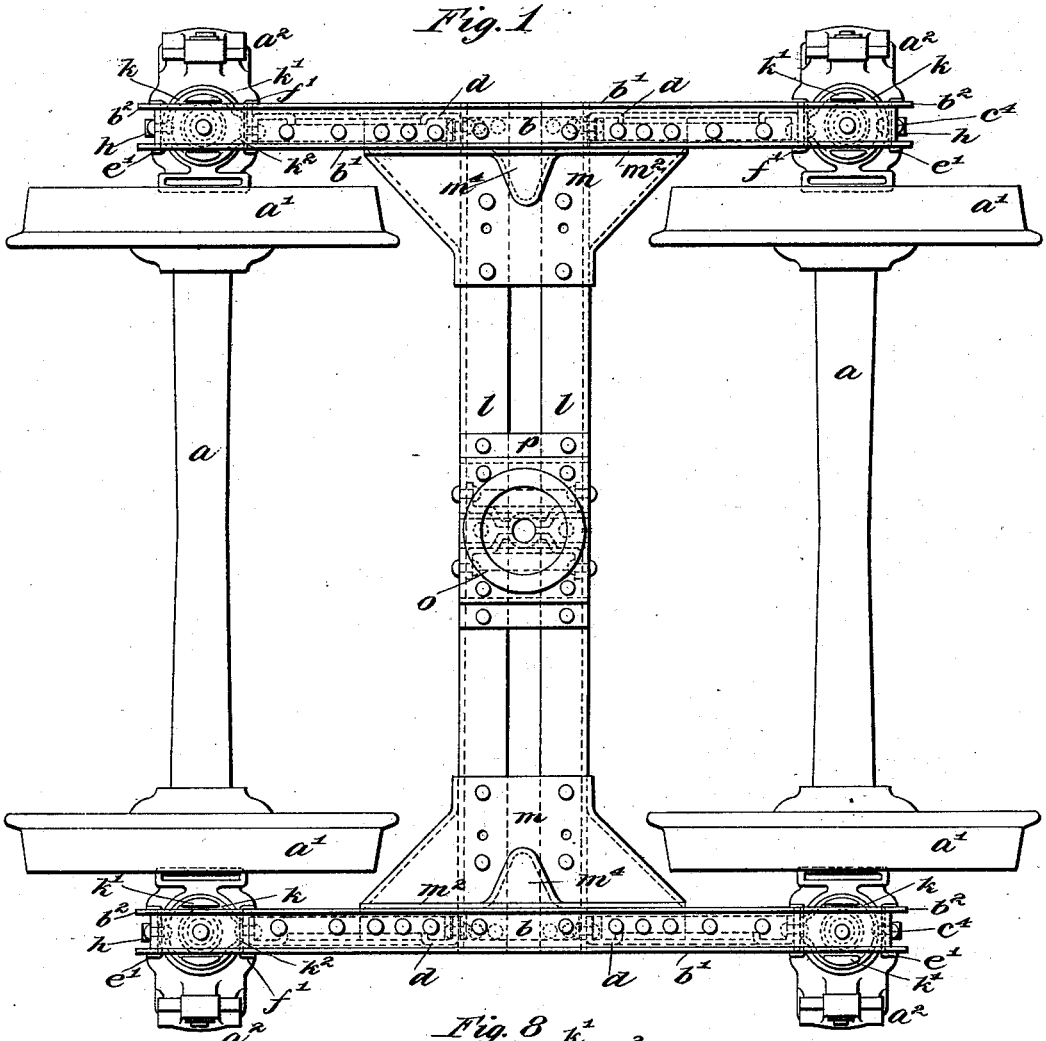


Fig. 8

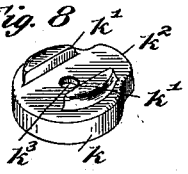


Fig. 9

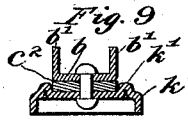


Fig. 7

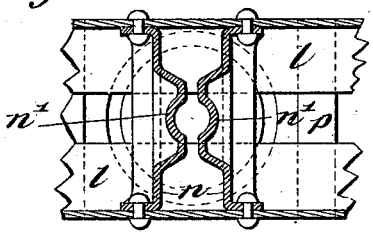


Fig. 10

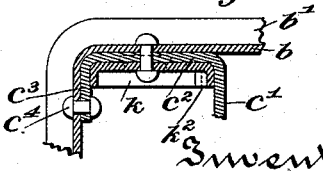
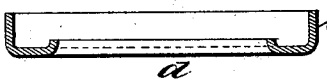


Fig. 11



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(No Model.) 3 Sheets—Sheet 2.

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BUILT-UP PRESSED STEEL TRUCK FRAME.

No. 553,431. Patented Jan. 21, 1896.

Fig. 2

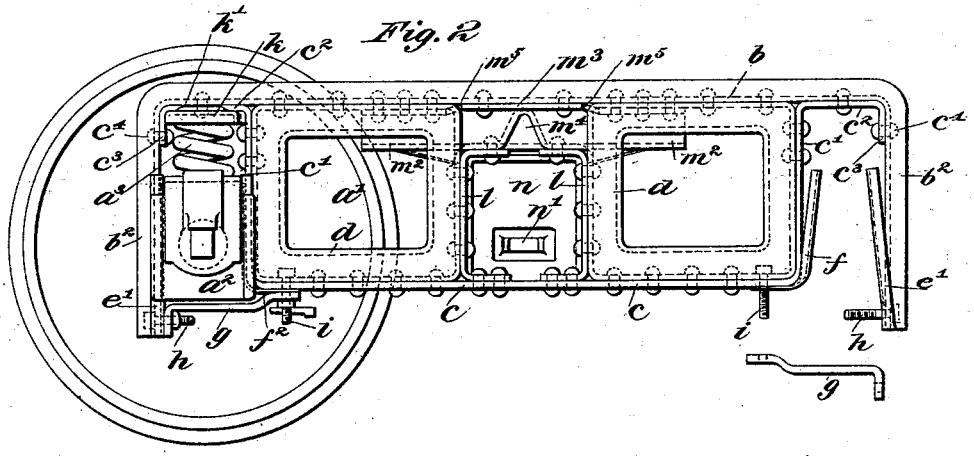


Fig. 3

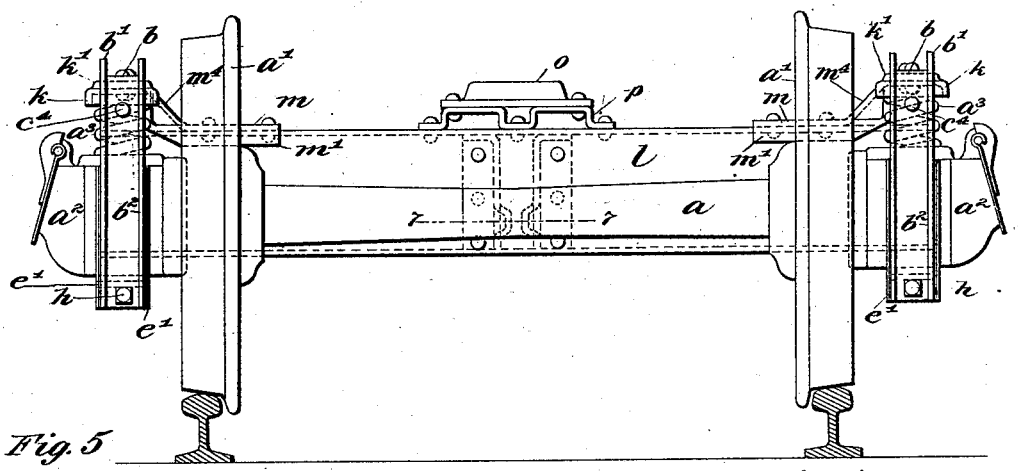


Fig. 5

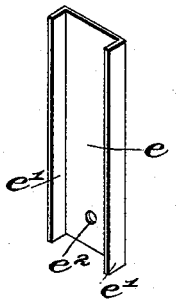


Fig. 4

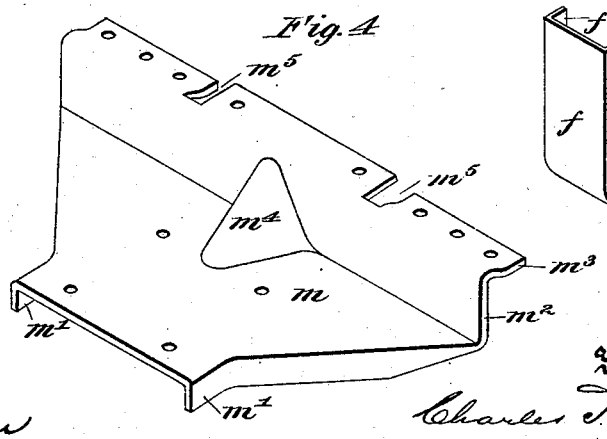
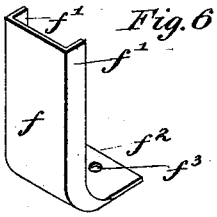


Fig. 6



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(No Model.) 3 Sheets—Sheet 3.

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BUILT-UP PRESSED STEEL TRUCK FRAME.

No. 553,431. Patented Jan. 21, 1896.

Fig. 12

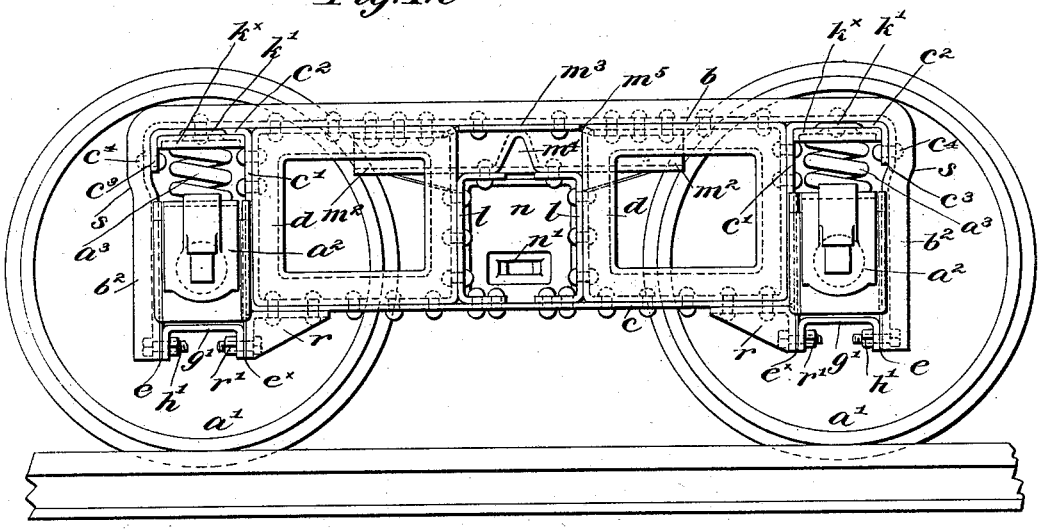


Fig. 13

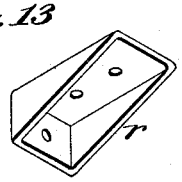
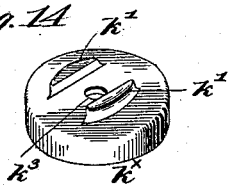


Fig. 14



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UNITED STATES PATENT OFFICE.

CHARLES T. SCHOEN, OF PHILADELPHIA, PENNSYLVANIA.

BUILT-UP PRESSED-STEEL TRUCK-FRAME.

SPECIFICATION forming part of Letters Patent No. 553,431, dated January 21, 1896.

Application filed October 24, 1895. Serial No. 566,772. (No model.)

To all whom it may concern:

Be it known that I, CHARLES T. SCHOEN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Built-Up Pressed-Steel Truck-Frames, of which the following is a full, clear, and exact description.

The object of this invention is to provide a light but strong metallic truck-frame for railway-cars. In contradistinction to those frames in which each side is struck up as one piece from steel plate, my sides are each made or built up of a number of pieces which are riveted or bolted together; and as distinguished from those sides which are constructed of a number of pieces united by bolts and formed of wrought metal—as, for example, the well-known diamond frame—I use in my construction pressed steel, flanged to increase its rigidity, as will be described.

The invention consists in certain features of construction of the upper and lower chords of the sides of the frames, the pedestals, the transoms, and the transom connections with the sides, all as I will proceed now more particularly to set forth and finally claim.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is a top plan view of a truck constructed in accordance with my invention. Fig. 2 is a side elevation, omitting the right-hand axle, journal-box, and wheel of truck. Fig. 3 is an end elevation. Fig. 4 is a perspective view of the connection-plate for the transom and side. Figs. 5 and 6 are perspective views of the chafing-plates for the pedestals. Fig. 7 is a horizontal cross-section through the transom at 7 7, Fig. 3, looking toward the top. Fig. 8 is a perspective view of the spring-cap. Figs. 9 and 10 are respectively cross-sections taken transversely and longitudinally, relatively to the frame, of the spring-caps and their adjacent parts. Fig. 11 is a longitudinal section of one of the struts. Fig. 12 is a side view showing modifications in the pedestals. Figs. 13 and 14 are perspective views of a bracket and a spring-cap used in Fig. 12.

The axles a, wheels a', journal-boxes a^2, and springs a^3, may be as usual, and need no description.

The sides of the frame are composed of a top or compression member or chord b, constructed as a channel, preferably of pressed steel, and having its flanges b' standing outwardly. This chord is bent at its ends to form the outer portions b^2 of the pedestals, said ends being prolonged somewhat below the level of the lower or tension member or chord c. The chord c has its ends turned up at c' to meet the upper chord, and then turned horizontally at c^2 to extend beneath and parallel with the upper chord, and then the terminals are returned at c^3 to fit against the ends b^2 of the upper chord, to which they are riveted at c^4, and thereby stiffen such corner. In order to stiffen the sides the skeleton and channeled pressed-steel spacing-plates or struts d (see Figs. 2 and 11) are interposed between them and riveted to them substantially as indicated, the channel form of these struts being indicated by the dotted lines in Fig. 1 and shown in detail, Fig. 11. These struts are blanked out with a central opening for economy in metal and weight.

The pedestals are provided with the chafing-plates e and f, made of steel, and with the side flanges e' f' to embrace adjacent edges of the pedestal. I prefer to construct them with a spring-temper and set them while forming so as to approach each other, as at the right, Fig. 2. When thus constructed, the journal-box must be forced to place against the elasticity of the chafing-plates, and these chafing-plates, therefore, serve to center the box and act as friction-plates for it, and they also serve to cushion the blow or concussion received in turning curves and by reason of uneven or rough tracks. The flanges of the chafing-plates receive the usual flanges or side lugs of the journal-boxes. The chafing-plate e has the bolt-hole e^2 and the chafing-plate f has the return f^2, in which is the bolt-hole f^3, and these plates are secured in place and the bottoms of the pedestals closed by the straps g and the bolts h and i, which bolts respectively extend through the ends b^2 of the upper chord and the bottom portion of the lower chord and the bolt-holes e^2 and f^3. The straps g further serve to tie the ends b^2 to the lower chord c, and they may be readily removed for access to and removal of the journal-boxes.

The springs a^3 are provided with pressed-

steel caps k having the swells k' to embrace the sides of the portion c^2 of the lower chord, and thus hold themselves, the said caps, in place against lateral displacement, and they are further extended toward the inner side of the pedestal, as at k^2, Figs. 1 and 9, and bear against the portion c' to prevent displacement longitudinally of the sides. A hole k^3 is made in each cap for clearance of the rivet used to unite the chords at that point.

Instead of a bolster, which is unnecessary in the class of trucks in which the springs are arranged over the journal-boxes, there is employed a transom rigidly secured to the sides of the frames, and the transom which I prefer to employ is composed of two pressed-steel channel-beams l l, the flanges of which face one another, and these channels are riveted to the lower chords and to the struts, and are connected to the upper chords by connection-plates m of pressed steel. These plates are applied to opposite ends of the transom, and are made with side flanges m', which embrace the sides of the transom, and thence the plates extend like the outline of a letter **Y** with rise m^2 and a horizontal flange m^3, the body of each plate and its rise being reinforced by a swell m^4. The flange m^3 is notched at m^5 m^5, so as to pass beneath the upper chord and about the struts, and the two end portions of the said flange are depressed, so as to pass beneath the upper flanges of the struts, while the intermediate portion extends beneath the upper chord. The body portions of the connections are riveted to the transom, and their horizontal flanges are riveted to the upper chords and their rises abut against the sides, and thus a very stiff, rigid and secure union of the transom and sides is effected.

The transom is braced internally, at the point where the king-bolt or center-pin is used, by the flanged tie-plates n riveted thereto and having the inwardly embossed portions n' n', which serve as a socket for the king-bolt or center-pin. These tie-plates are flanged at their tops n^2, as shown in Figs. 3 and 7, in order to afford a broad bearing, and at their sides n^3 for purposes of riveting to the channel-beams. The tie-plates may be of pressed steel.

The center bearing-plate o may be mounted upon a spacing-plate p, as in my Patent No. 537,076, dated April 9, 1895.

Referring now to Figs. 12, 13, and 14, which illustrate a variation or modification coming, among others, within the scope of my invention, it will be observed that the construction may be modified in the following particulars: The tie-plate g' may be secured at its outer end to the outer member of the upper chord by a bolt h', as before described, while its inner end is secured to a metallic bracket r by a bolt or other suitable fastening r', the said metallic bracket being riveted solidly to the lower chord. In this way the strain of the bolt upon the lower chord and injury to the bolt, which may take place with the construction first described, are avoided. The bracket r may be struck up with side and end flanges. (See Fig. 13.)

In order to provide for the use of a heavy spring above the journal-box, the upper chord may be bulged out, as at s, and in such case the circular spring-cap $k^\times$, such as shown in Fig. 14, may be used, and the pedestal may be adapted thus for use with standard journal-boxes.

In both modifications the pedestals are formed of the compression and tension members, or upper and lower chords of the side.

In the form of pedestal shown in Fig. 12 the chafing-plates e and $e^\times$ may be flanged, as in Fig. 5, but it is obvious that the form of chafing-plate shown in Fig. 6 will not be required, and that in its stead a straight chafing-plate, such as is shown in Fig. 5, may be used for both sides of the pedestal, and both of said chafing-plates will be secured in position by the bolts h' and r', which are used to hold the tie-plate in position.

A car-truck constructed as described embodies the preferred form of my invention, but it is obvious that the details may be varied, and that various combinations of the several elements or features of the invention may be employed. Moreover, while I prefer to die-press or stamp the parts from plate-steel because of its strength, stiffness, and lightness, yet I do not limit my invention to the use of that metal.

Some of the advantages of my invention are as follows:

First. As compared with a solid side frame, made of a single piece of plate-steel pressed to shape, it is to be noted that the compression and tension members, or upper and lower chords, in which the greater strength is required, may be made of any required thickness of metal to attain such strength, while the filling or intermediate portion—namely, that which I call the "struts"—may be of much lighter material and in skeleton form, and still subserve all the purposes of strength, thereby effecting a very considerable economy in cost of construction, weight of metal, and in repairs over such solid sides where the thickness of metal is uniform throughout.

Second. In order to form the pedestals in the solid sides, it is necessary to use special rolled shapes, which are very expensive, whereas I form the pedestals by interbending the chords, a construction quite as efficient as the former and very much cheaper.

Third. In practice it is possible to construct a perfectly strong and durable side by making its bottom chord of five-eighths-inch metal, its top chord of one-half-inch metal, and the connecting-struts of five-sixteenths-inch metal, instead of metal of the same thickness in all, and this example will illustrate the considerable reduction in cost in favor of my construction.

Fourth. By the utilization of the tie-plates to form the king-bolt socket I avoid the

necessity of using the commonly-employed cast tie-plate below the transom.

What I claim is—

1. A built-up side frame for car-trucks, comprising individual upper and lower chords having their ends returned and united and riveted together to form the pedestals, substantially as described.

2. A built-up side frame for car-trucks, comprising a compression member having its ends turned down to form the outer portions or sides of the pedestals, and a separate tension member having its ends bent up to meet the compression member at points distant from its bent ends sufficient to form the inner portions or sides of the pedestals, and then bent parallel to the horizontal portion of the compression member and again returned about the corners of the bent ends of the compression member and riveted to it, substantially as described.

3. A built-up side frame for car-trucks, comprising a compression member, and a separate tension member, suitably spaced and having their ends inter-bent to form the pedestals and riveted together, substantially as described.

4. A built-up side frame for car-trucks, comprising a flanged compression member, and a separate tension member, the ends of such members being bent about and riveted to one another to form pedestals, substantially as described.

5. A built-up side frame for car-trucks, comprising a compression member, a tension member, pedestals integral therewith, and skeleton struts interposed between the said members and secured to them, substantially as described.

6. A car-truck frame comprising built-up sides, each having a compression member, and a tension member, and a transom resting upon and secured to the tension member, and connection plates interposed between the transom and the compression member and rigidly secured thereto, substantially as described.

7. The combination with the sides and the transom, of the connection plates, each having a body portion secured to the transom, a rise abutting against the side, and a horizontal flange secured to the upper portion of the side next adjacent thereto, substantially as described.

8. The combination with the sides, each comprising compression and tension members, and struts interposed between and rigidly secured to them, of a transom secured directly to the tension member and the adjacent flanges of the struts, and connection plates bracing and uniting the transom and compression member, substantially as described.

9. In a car-truck frame, the combination with the pedestals, of the spring tempered chafing plates set in their manufacture to stand away from the sides of the pedestal, substantially as described.

10. In a car-truck frame, the combination with the separate compression and tension members riveted together, the pedestals, and a detachable strap applied across the open end of each pedestal, substantially as described.

11. In a car-truck frame, the compression member and the separate tension member having their ends bent about one another to form the pedestals and riveted together, and removable straps connecting the ends of the compression member with the tension member and closing the bottoms of the pedestals, substantially as described.

12. In a car-truck frame, the bolster having tie-braces therein provided with inwardly-extended embossments forming a socket for the king-bolt or center-pin, substantially as described.

13. The combination of the built-up pressed steel sides, composed of compression and tension members having their ends bent to form pedestals, flanged, skeleton struts interposed between and uniting such members, and extending along the inner adjacent sides of the pedestals, a transom secured directly to the tension member and struts, and connection plates uniting the transom and compression member, substantially as described.

In testimony whereof I have hereunto set my hand this 22d day of October, A. D. 1895.

CHARLES T. SCHOEN.

Witnesses:
GEORGE MCCURDY,
JOHN ANDERSON.