H. BURRMANN.

RAILWAY CAR TRUCK.

APPLICATION FILED APR. 19, 1917.

1,237,167.

Patented Aug. 14, 1917.

3 SHEETS—SHEET 1.

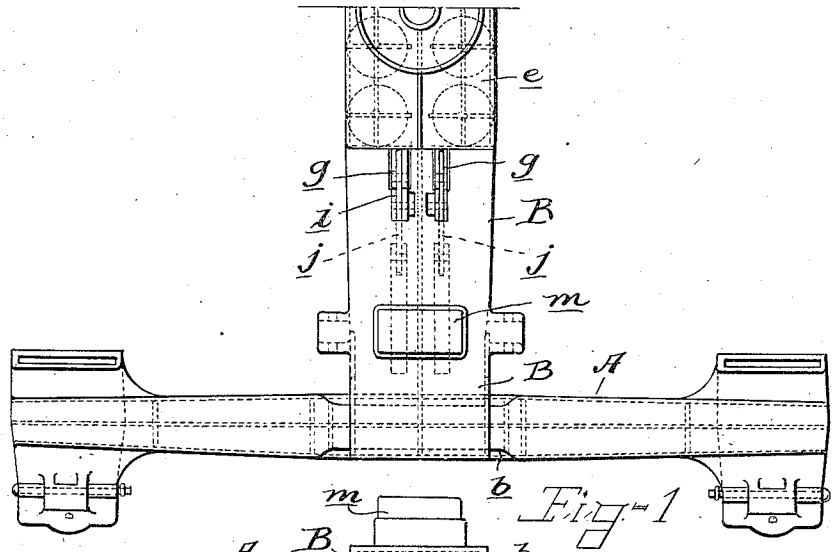

Fig. 1

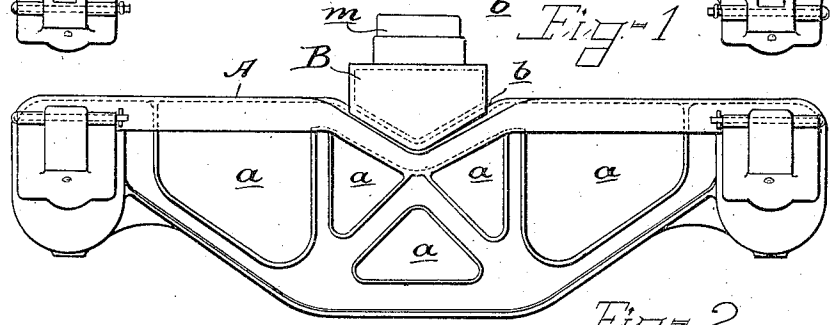

Fig. 2

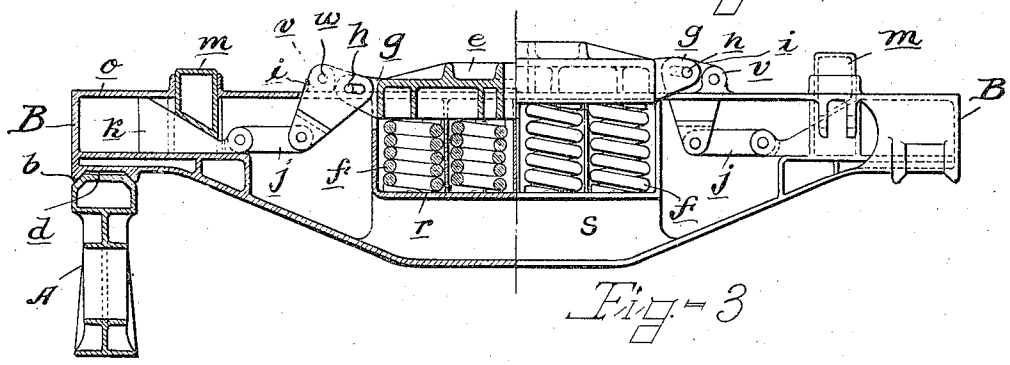

Fig. 3

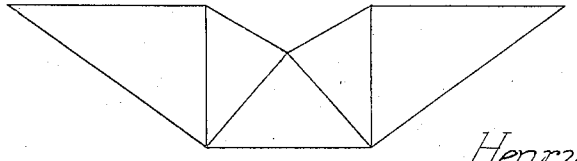

Fig. 15.

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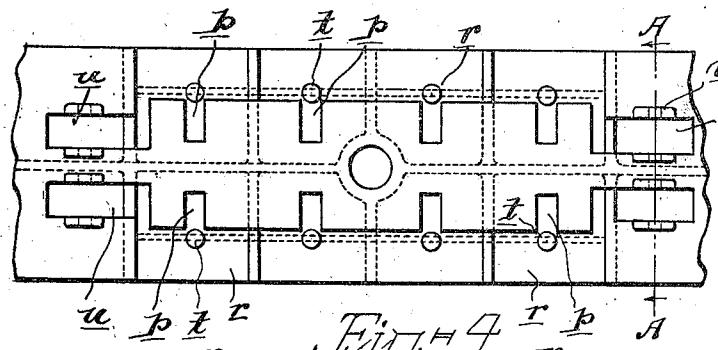

Fig. 4

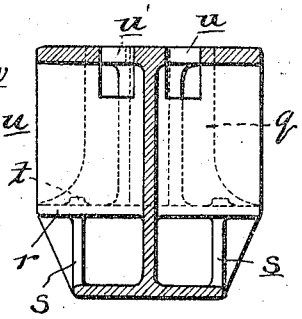

Fig. 5

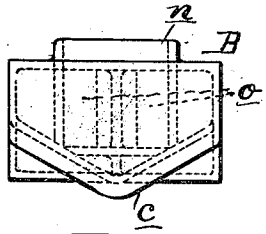

Fig. 6

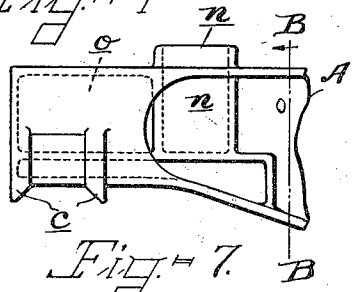

Fig. 7

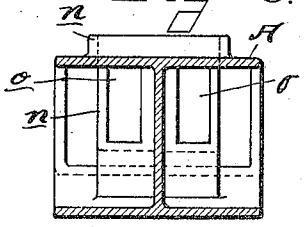

Fig. 8

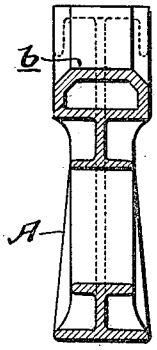

Fig. 9

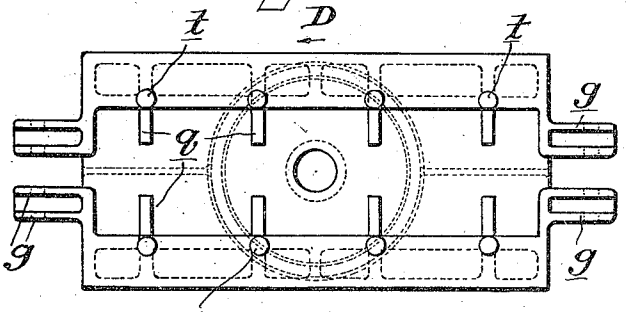

Fig. 10

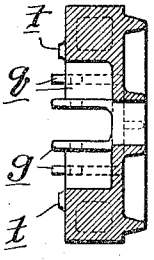

Fig. 11

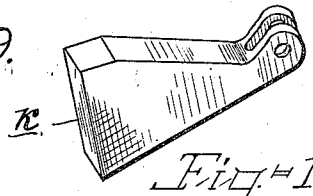

Fig. 12

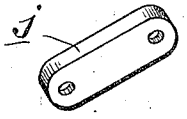

Fig. 13

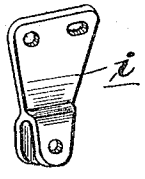

Fig. 14

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3 SHEETS—SHEET 3.

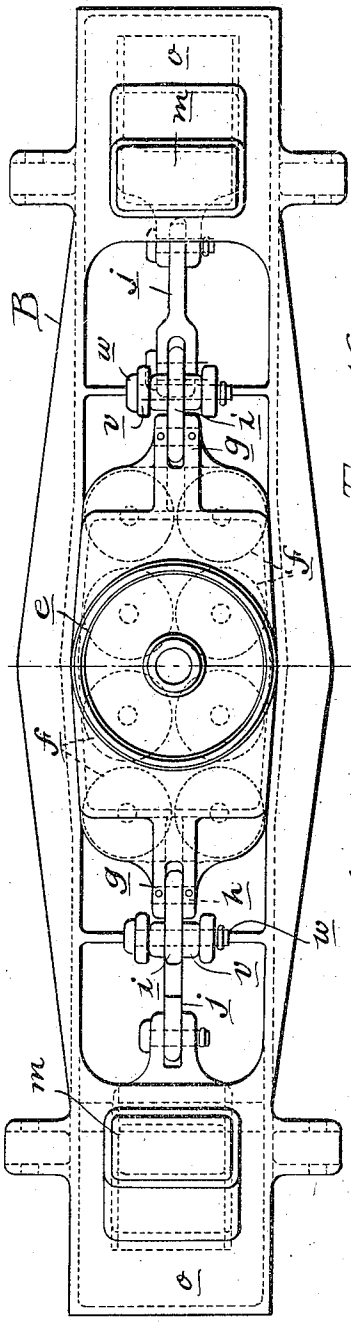

Fig. 16.

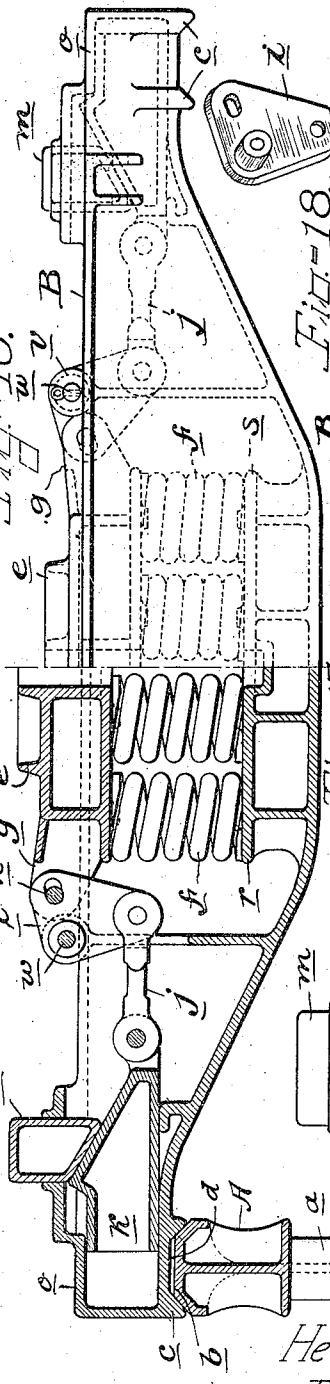

Fig. 17.

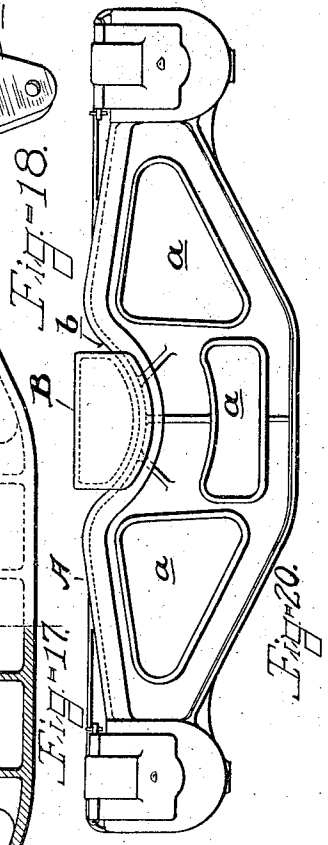

Fig. 18.

Fig. 20.

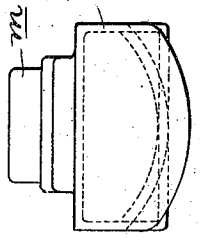

Fig. 19.

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UNITED STATES PATENT OFFICE.

HENRY BURRMANN, OF DAVENPORT, IOWA.

RAILWAY-CAR TRUCK.

1,237,167. Specification of Letters Patent. Patented Aug. 14, 1917.

Continuation in part of copending application Serial No. 137,109, filed December 15, 1916. This application filed April 19, 1917. Serial No. 163,184.

To all whom it may concern:

Be it known that I, HENRY BURRMANN, a citizen of the United States of America, and a resident of Davenport, county of Scott, State of Iowa, have invented certain new and useful Improvements in Railway-Car Trucks, of which the following is a full and clear specification.

This application is a continuation in part of my co-pending application Serial No. 137,109, filed December 15, 1916, which application has been subordinated to this one.

In the railway cars now in common use, the car-body-bolster rests rigidly on the truck-bolster and the ends of the truck-bolster are slidingly engaged in vertical slots in the truck side frames, springs being arranged in the side frames to give the necessary resiliency and tie bars or other devices being arranged to connect the truck side frames. In this construction, the lateral thrusts due to the tendency of the car body to move laterally on the trucks are transmitted directly to the side frames of the truck, thereby necessitating the employment of heavy side frames and also the tie bars or other connections above referred to. It is one of the objects of my present invention to relieve the side frames of the truck greatly from these heavy thrusts, so as to thereby make it possible to not only do away with the tie bars, but also to reduce the weight of the side frames, as more fully hereinafter set forth.

A further object of this invention is to provide the truck with side bearings which will automatically adjust themselves to the proper height in accordance with the load carried by the car and which also will cushion the thrusts of the car body when it tilts, thus tending to stabilize it, as more fully hereinafter set forth.

In the drawings—

Figure 1 is a plan view of a side frame with one-half of a bolster supported thereon;

Fig. 2 is a side elevation of the same;

Fig. 3 is a view partly in vertical section and partly in side elevation of the bolster, one of the side frames being shown in vertical section;

Fig. 4 is a plan view of the middle portion of the bolster, the center plate being removed;

Fig. 5 is a vertical sectional view on the line A—A of Fig. 4;

Fig. 6 is a view of the end wall of the bolster;

Fig. 7 is a side elevation of one end of the bolster;

Fig. 8 is a vertical section on the line B—B of Fig. 7;

Fig. 9 is a vertical sectional view taken through the middle of the side frame;

Fig. 10 is a bottom view of the preferred form of center plate;

Fig. 11 is a vertical section therethrough on the line D—D of Fig. 10;

Figs. 12, 13 and 14 are perspective views of details hereinafter described;

Fig. 15 is a diagram illustrating the truss construction of the side frame;

Fig. 16 is a plan view of a slightly modified form of bolster;

Fig. 17 is a view partly in side elevation and partly in vertical section of the type of bolster shown in Fig. 16;

Fig. 18 is a perspective view of one of the bell-cranks employed in the bolster shown in Fig. 17;

Fig. 19 is a view of the end wall of the bolster shown in Fig. 17; and

Fig. 20 is a side elevation of the modified side frame used in connection with the bolster shown in Fig. 17.

Referring to the drawings annexed by reference characters, A′ designates the side frame, which, in its preferred form, as shown in Fig. 2, is cast or otherwise constructed with its several panels *a* each of a triangular shape. The upper edge of the side frame is provided at midlength with a notch *b*, the sides of which incline downwardly toward each other to form a substantially V-shaped notch, although, as shown in Fig. 20, this notch may have a true concave shape, the essential feature being that the sides of the notch shall incline downwardly toward the center thereof. The end of the bolster B is correspondingly shaped to fit down in this notch, and, in order to prevent the bolster having any endwise movement with respect to the side frame, the bolster at its end is provided with depending flanges *c* which are beveled on their inner (adjacent) faces to fit down on the similarly beveled corners of the bolster notch, the distance betweeen the flanges at their juncture with the body of the bolster being slightly less than the distance across the top surface of the notch, so that, when the bolster is in engagement

with the side frame, there will be a space *d* between the inclined faces of the bolster and the similarly inclined faces of the notch. With this construction, gravity alone will be sufficient to hold the bolster in place on the side frames, depending flanges *c* serving to prevent the bolster moving endwisely with respect to the side frame. It will be observed also that by reason of employment of the inclined-wall notch and the similarly shaped bolster end, a certain amount of flexibility is provided between the side frame and the bolster, to allow a slight rocking movement of the side frame while running on an uneven track.

The center plate *e* is supported resiliently on the bolster by means of coil springs *f*, or in any other suitable manner, and in the form shown in Figs. 1, 2 and 3 it is provided with two pairs of lugs *g* at each end. Between each pair of lugs is pivotally connected, by a pivot *h*, one end of a bell-crank *i*, the lower ends of these bell-cranks being pivotally connected, respectively, to links *j*. Each of the links *j* is pivotally connected to a wedge-shaped thrust block *k* suitably guided in the bolster. Resting on each pair of thrust blocks is a side-bearing-block *m*, which is suitably guided in the bolster. With this construction, it will be observed that when the car is weighted and the center plate depressed, the wedges *k* will be pushed toward the respective ends of the bolster and thus allow the bearing-blocks *m* to descend into the bolster a distance depending on the distance the wedges are moved. In this way, it will be observed that the load carried by the car will automatically determine the position of the thrust blocks, the heavier the load, the lower the side bearings *m* will be with respect to the top surface of the bolster.

It will be observed that the side-bearing-blocks *m* are guided vertically and held in position on the inclined faces of the wedges by a housing or tube *n* cast integral or otherwise built in the bolster, and also that the wedges *k* are confined and guided within a pocket *o* formed in the ends of the bolster. The center plate *e* may be supported and guided in any suitable manner, but I prefer the construction shown in Figs. 3, 4, 5, 10 and 11. In this structure, I employ a bolster of the I-beam type and cut away the upper flanges of the beam to receive the side edges of portions of the center plate, the cut-away portions of the flanges being provided with notches *p* to receive and guide the vertical flanges *q* formed on the center plate. Suitable ribs are cast in the center plate and in the bolster to afford the necessary strength and rigidity. The springs rest upon a horizontal shelf *r* cast in the bolster, this shelf being supported by a suitable arrangement of ribs *s* underneath it. Suitable bosses *t* are formed on the shelf and the under side of the center plate to maintain the springs *f* in proper position. It will be observed also that the top flanges of the I-beam are cut out at *u* to receive the bell-cranks *i* and suitable lugs or ears *v* are cast on the upper face of the flange for the reception of the pivot *w* of the bell-crank. It will be observed also that the hole in the bell-crank through which pivot *h* extends is elongated to form a slot; this provides the necessary lost motion between the bell-crank and the center plate. It will be understood, however, that these features are all of minor importance and that, therefore, they may be greatly varied without departing from the spirit of my invention.

On sheet 3 of the drawings, I have shown an arrangement whereby I employ but a single bell-crank *i* at each side of the center plate and a single thrust wedge *k*. In this construction also, I employ a U-beam or box-beam instead of the I-beam type shown in the other figures. In this U-beam bolster type, the center plate *e* fits down between the flanges of the beam and is thereby guided and steadied. With this structure I also employ, as hereinbefore stated, a rounded or concaved notch *b* for the reception of the similarly shaped end of the bolster, this construction being desirable as compared with the V-notch structure in that it allows a freer rocking movement of the frame with respect to the bolster while at the same time the bolster and the side frames are rigidly locked against independent lateral movement. In the type of side frame I have shown on sheet 3, the panels are not arranged in accordance with the triangular scheme shown in the other figures; I prefer the triangular arrangement of panels shown in the other figures because that arrangement provides a truss-like structure in which the vertical load will be transmitted directly to a panel point of the truss, as shown in diagram in Fig. 15.

It will be observed that in the truss side frame shown on sheet 1, the bolster-end being rigid, the load will be transmitted directly to the apex of the central triangle so that the upright bars of this triangle will be subjected to compression strain only, while the base bar of the triangle will be subjected to tension strain only. The lower bars of the two larger end-triangles will be subjected to tension strain only, while the upper bars of these triangles will be subjected to compression strain only. The top bars of the two flanking small triangles will be subjected to compression strain only, while the two vertical bars of the small triangles will be subjected to tension strain only. In this way, I avoid entirely subjecting any bars of the triangles to a bending or transverse breaking-strain, so that with a given weight I gain very materially in the strength of the

side frames; in fact, with this true truss construction of side frame, I can produce a side frame with the weight 75 to 100 pounds less than the ordinary type of the same capacity and at the same time reduce the stresses on the members.

The nature and scope of the invention having been thus indicated and its preferred embodiment having been specifically described, what is claimed as new is:

1. A side bearing for trucks, consisting of a vertically movable side-bearing-block, means for normally resisting the downward thrust of said block, and means operated by the load for positioning said side-bearing block at the predetermined clearance with respect to the body bolster of the car.

2. A side bearing arrangement for trucks, consisting of vertically movable side-bearing-blocks, thrust blocks in the bolster against which the side-bearing-blocks normally bear, and resilient means operated by the load for positioning said thrust blocks.

3. A side bearing arrangement for trucks, consisting of vertically movable side-bearing-blocks, thrust blocks in the bolster against which the side-bearing-blocks normally bear, and means operated by the load for positioning said thrust blocks, said means embodying a resiliently supported center bearing for the car body.

4. A side bearing arrangement for trucks, consisting of vertically movable side-bearing-blocks, slidable wedge-shaped thrust blocks in the bolster, and means operated by depression of the center bearing for pushing said blocks outwardly to permit the bearing blocks to move downwardly into the bolster.

5. The structure defined in claim 4, said means consisting of bell-cranks connected to the center bearing and links connecting these cranks to the thrust blocks.

6. The combination with a side frame having a notch in its upper edge said notch having its walls inclined downwardly toward each other, of a bolster having its end shaped to fit down in said notch and rest therein, said bolster being provided with depending flanges engaging the edges of the notch, the engaging faces of the flanges in the notch being correspondingly beveled, the distance between the beveled flanges being less than the distance between the beveled edges of the notch, so that a space is formed between the main face of the notch and the face of the bolster between the flanges.

7. A side frame for car trucks in which the cut-out panels are all triangles to thereby form a truss-like structure, the upper side of the side frames being provided with a seat for the bolster and one of the triangles being arranged centrally under said seat and having its apex supporting said seat.

In testimony whereof I hereunto affix my signature.

HENRY BURRMANN.