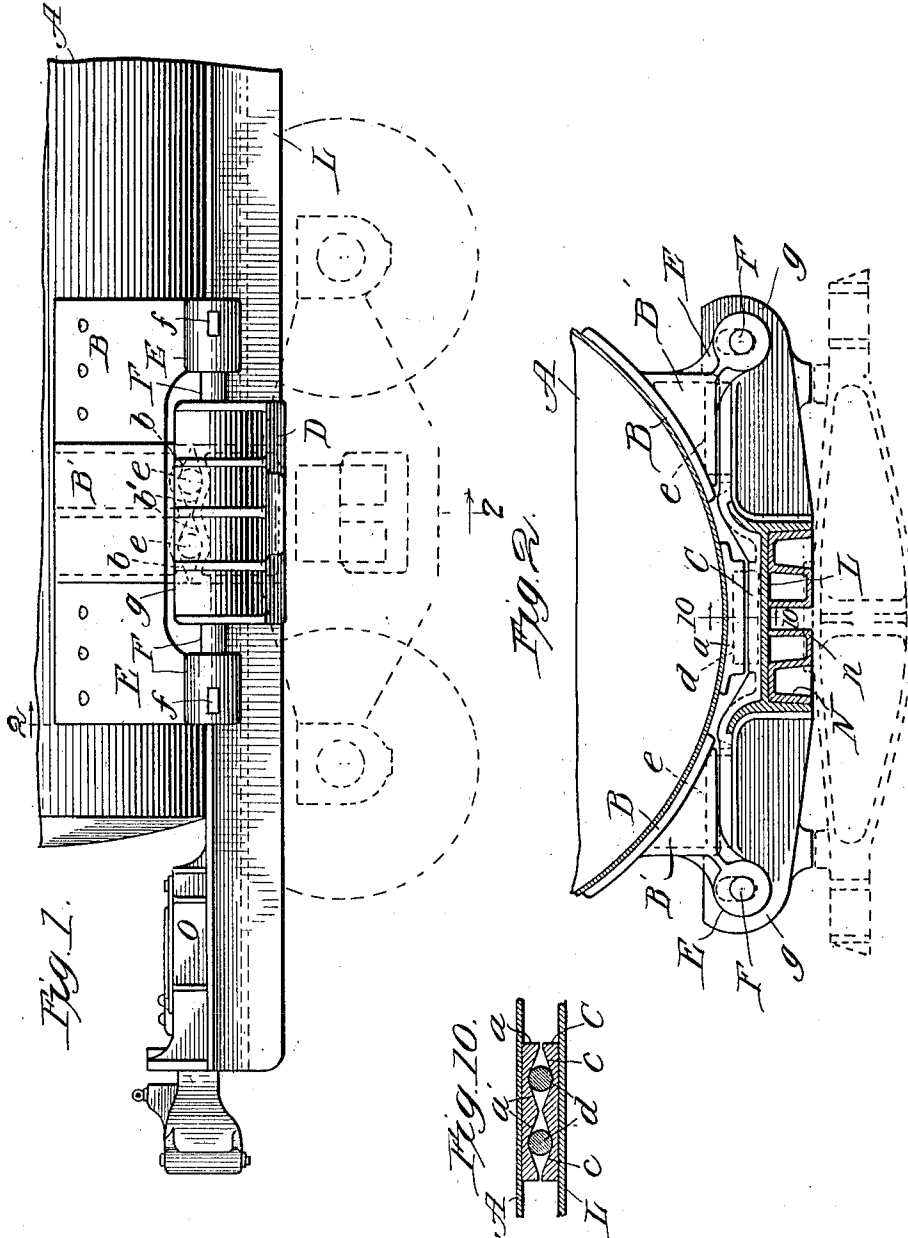


W. P. BETTENDORF, DEC'D.
J. W. BETTENDORF, ADMINISTRATOR.
MEANS FOR CUSHIONING THE BODIES OF RAILWAY CARS.
APPLICATION FILED MAY 23, 1910.

1,035,847.

Patented Aug. 20, 1912.

4 SHEETS—SHEET 1.



Witnesses:
Harry S. Gaither
E. Hundy.

Inventor:
William P. Bettendorf
by Frank D. Thomson
att'y

W. P. BETTENDORF, DEC'D.

J. W. BETTENDORF, ADMINISTRATOR.

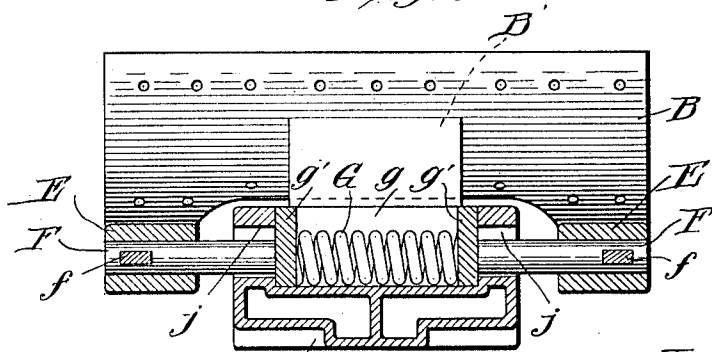
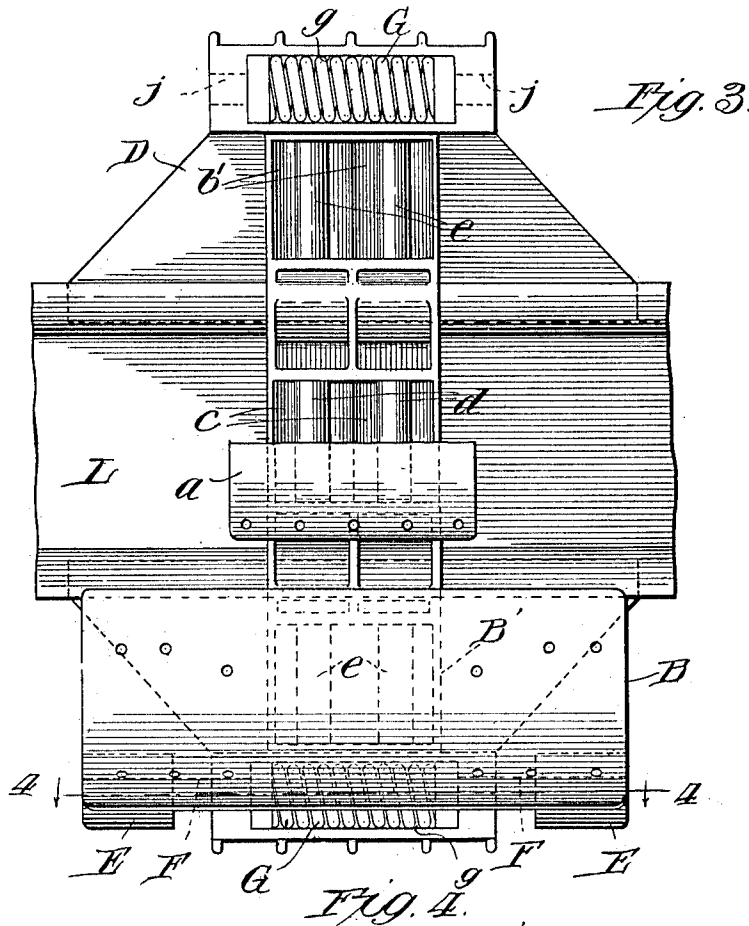
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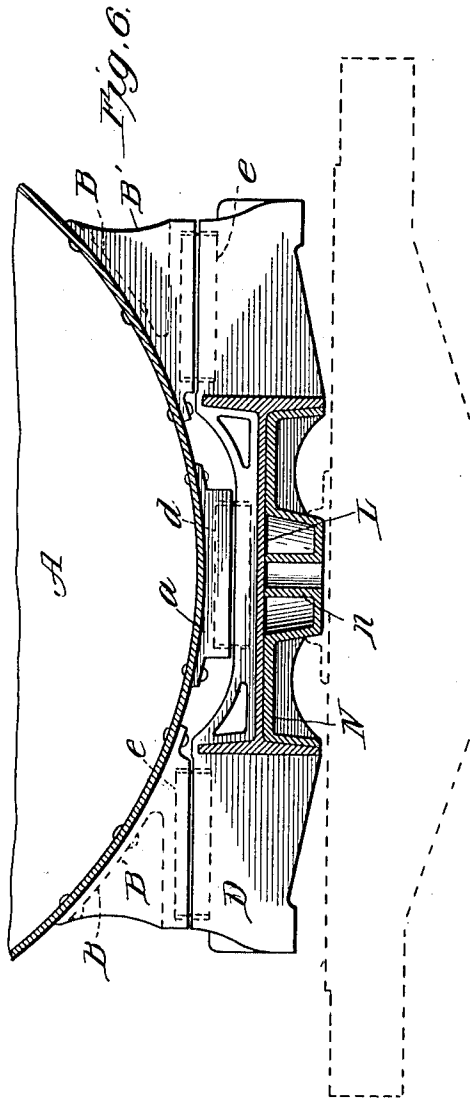
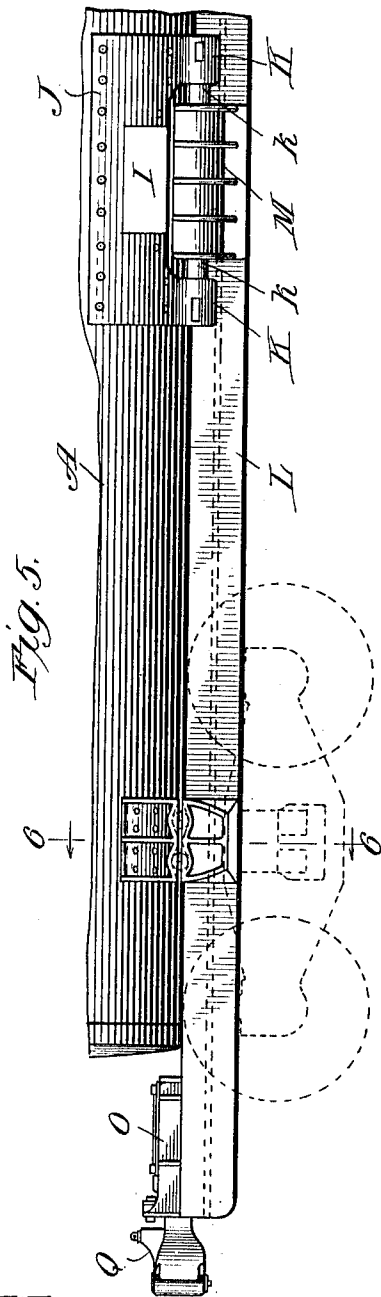
Witnesses:
Harry S. Gaither
E. Lundy.

Inventor:
William P. Bettendorf
by Frank D. Thomas
att'y

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4 SHEETS—SHEET 3.



Witnesses:

Harry S. Gaither
E. Lundy.

Inventor:

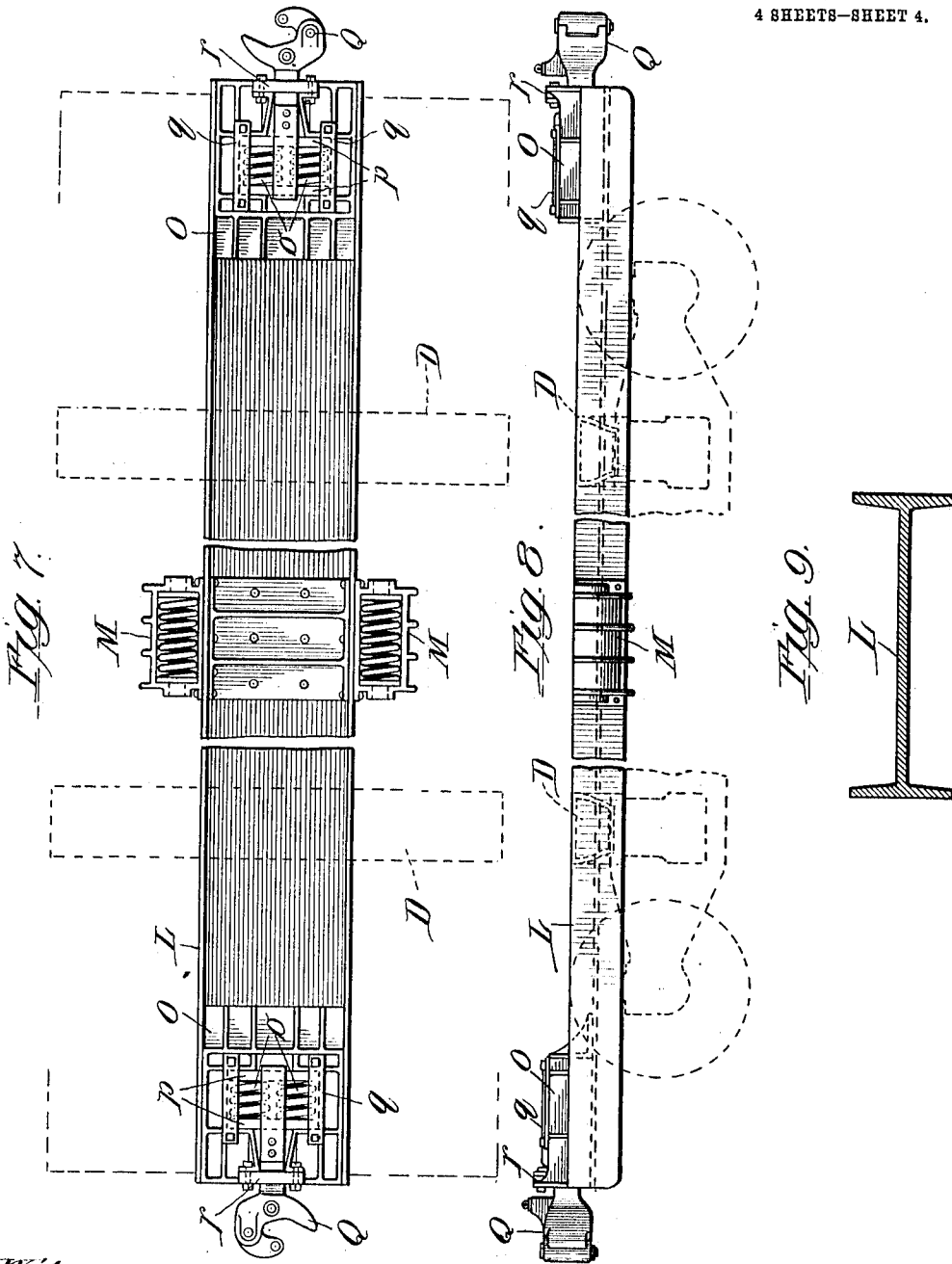
William P. Bettendorf

By Frank D. Thompson
attys

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4 SHEETS—SHEET 4.



Witnesses:

Harry S. Gaither
E. Lundy.

Inventor:

William P. Bettendorf
by Frank D. Thomsen
att'y.

UNITED STATES PATENT OFFICE.

WILLIAM P. BETTENDORF, OF BETTENDORF, IOWA; J. W. BETTENDORF ADMINISTRATOR OF SAID WILLIAM P. BETTENDORF, DECEASED.

MEANS FOR CUSHIONING THE BODIES OF RAILWAY-CARS.

1,035,847.

Specification of Letters Patent.

Patented Aug. 20, 1912.

Application filed May 23, 1910. Serial No. 562,922.

To all whom it may concern:

Be it known that I, WILLIAM P. BETTENDORF, a citizen of the United States, residing at Bettendorf, in the county of Scott and State of Iowa, have invented new and useful Improvements in Means for Cushioning the Bodies of Railway-Cars, of which the following is a full, clear, and exact description.

My invention relates to improvements in railway cars, and particularly to cars, such as tank cars, in which the load consists of material or matter that is liable to shift when the car is subjected to a sudden buffing or pulling strain or is in motion.

The object of my invention is primarily to provide a single rolled beam center-sill extending from draft-rigging to draft-rigging and arranged so that the web between its longitudinal flanged edges is horizontal.

Another object of my invention is to provide means that will permit of a limited longitudinal movement of the body of the car independent of the center-sill and reduce to a minimum the friction caused by such movement.

Still another object of my invention is to resist this longitudinal movement of the car-body and automatically restore the latter to its normal position. This I accomplish by the means hereinafter fully described and as particularly pointed out in the claims.

In the drawings:—Figure 1 is a side elevation of one end of a tank-car embodying the improved features of my invention. Fig. 2 is a transverse vertical section taken on dotted line 2—2, Fig. 1. Fig. 3 is a plan view of a portion of the underframe of the car with the tank removed and showing one-half of the body-bolster and the other half with the superimposed tank saddle over the body-bolster. Fig. 4 is a vertical central section taken on dotted line 4—4, Fig. 3. Fig. 5 is a side elevation of a broken away end of a car embodying a modified construction of the invention. Fig. 6 is a transverse vertical section of the same taken on dotted line 6—6, Fig. 5 drawn to a slightly larger scale. Fig. 7 is a plan view of the center-sill, with the bolsters removed, showing the modified arrangement of the cushioning devices. Fig. 8 is a side edge view of the same. Fig. 9 is a cross section of the center-sill. Fig. 10 is a fragmentary vertical sec-

tion taken on line 10—10, Fig. 2 showing the arrangement of the pockets in the center-plate.

For convenience of explanation, I have shown my invention applied to a tank car, although it will be understood that with very slight modification or variation in construction, my improvements can be applied to a car having a flat bottom whether it be of the freight or passenger type of cars.

In the drawings A represents a suitable tank, the bottom of which is, in the transverse vertical plane of the body-bolster, provided with a center-plate *a*, and with side-plates B, B, that are securely attached thereto and constitute the equivalent of a saddle-plate with which most tank cars are provided, in one form or another. The center-plate *a* has a depending central portion that is, preferably, rectangular, and has its under surface horizontal excepting for the two or more transverse inverted corrugations *a'* therein. These inverted corrugations oppose and are immediately above corresponding corrugations *c* made in the upper horizontal surface of a rectangular plateau occupying the central portion of the body-bolster D, which is, at this point, lower than the plane of the upper part of the end portions of the bolster, substantially as shown. These corrugations *a'* and *c* correspond in every substantial particular, and have rollers *d* placed between them.

The plates B, B, have integral triangular portions B' built down and depending therefrom, and these triangular portions have their under surfaces in a horizontal plane, excepting for inverted transverse corrugations *b*, *b*, that correspond in dimensions to the inverted corrugations in plate *a*. These latter corrugations are arranged above corresponding corrugations *b'*, *b'*, made in the upper surface of the body-bolster D between the central roller bearing and the ends thereof, and are supplied with suitable rollers *e*, *e*.

The ends of plates B are provided with outwardly projecting arms E that extend downward at an angle of about 90 degrees to the members B of the tank, and the ends of these arms terminate in cylindrical bosses, the bores of which, at one end, have longitudinal plungers F secured therein by means of transverse keys *f*. Each end of the bolster is made wider so as to provide a de-

pressed transversely elongated seat or pocket *g* for a coiled spring *G*. This spring is compressed between follower-plates *g'* inserted in the ends of said pockets and these follower-plates are engaged by the adjacent ends of the plungers *F, F*, that are arranged in alinement with the axes of the springs and extend through vertically widened openings *j* in the ends of the cradle.

In operation, when the car is given a sudden pull, or receives a sudden bump, the inertia of the car-body will cause the rollers of the roller-bearings to roll up the inclines of the corrugations, and this tendency will be resisted by the compression of spring *G* in the pockets in the ends of the bolsters, which latter will compress, and the moment the force of the shock to the car is spent will expand and assist the weight of the car-body and cause it to return to its original position of rest, in which latter position the rollers of the roller bearings will occupy the centers or deepest parts of the corrugations.

In Figs. 5, 6, 7 and 8 I show a modification of my invention. In this modification the arrangement of the roller-bearings is the same, but the cushioning devices for modifying the shock of the pulling and pushing strains of the car are located at the center of length of the car. These cushioning devices consist of plates *J* that are constructed in every respect similar to plates *B* and are provided with the angularly projecting arms *K* that are similar in every respect to the arms *E* of the preferred form of my invention hereinbefore described. The arms *K* terminate in cylindrical bosses in which the shanks of plungers *k* are removably secured, and these plungers have their free ends passing through vertically widened openings in the ends of the pockets *M*, and engage the follower-plates of a coiled spring cushioning device, which latter is constructed identically the same as the cushioning devices of the preferred form of the invention all as hereinbefore described.

I prefer to connect the bolsters of both the preferred and the modified constructions of my invention by a single center-sill *L* consisting of an I-beam of sufficient size, so arranged that the web connecting the flanges thereof is horizontal. The body-bolsters, which are secured directly to the center-sill, have the central portion of their under sides removed, to permit of the passage therethrough of the single I-beam center-sill and the contours of this removed portion conforms to the shape of the upwardly projecting flanges of the I-beam. The under side of the I-beam center-sill is, in the transverse plane of the body-bolster, provided with a filler, *N*, consisting, preferably, of a cast metal plate, which extends from flange to flange of the said center-sill, and has an integral male center-plate *n* at its center-of

length, substantially as shown. The ends of this single I-beam center-sill extend, preferably, beyond the ends of the car-body or tank, and support and have secured upon their ends a suitable draft-rigging box *O* for the cushioning devices and the car-coupler and its draw-bar, substantially as shown in Figs. 7 and 8 of the drawings. In these figures, these boxes are shown to consist of rectangular castings that fit snugly between the flanges of the ends of the center-sill, and each to have a central rectangular compartment, *P*, for the springs *o, o*, and follower-plates *p, p*, and an opening for the passage of the draw-bar of the car-coupler, *Q*, into said compartment. The longitudinal sides of compartment *P*, are provided with superimposed retaining-strips *q, q*, and the mouth of the draw-bar opening with a bridge *r*, to prevent the vertical displacement of the draw-bar, and follower-plates, which latter are engaged by the draw-bar through the medium of the conventional yoke. This draft-rigging box is riveted or otherwise secured to the end portion of the I-beam center-sill; and I prefer to provide its rear end with a longitudinally extending basal flange, for the accommodation of rivets, and to reinforce this flange with a series of vertical webs, substantially as shown. This, or any other style or arrangement of draft-rigging, I desire to be considered as contemplated within the scope of my invention.

What I claim as new is:—

1. In a railway car, an underframe comprising body-bolsters, longitudinally arranged corrugations in the upper surface of the center of length of said body-bolsters, a car-body having a slight movement in the direction of its length independent of the body-bolsters and underframe, plates secured to the underside of said car-body having corrugations in their under surfaces opposing and parallel to the corrugations in said body-bolster, and suitable rollers placed between the corrugations in said body-bolsters and plates.

2. In a railway car, an underframe comprising body-bolsters, the central portion of the upper surfaces of which are lower than that of their ends, longitudinally arranged corrugations in the upper surface of the center of length of said body-bolsters, a car-body having a slight movement in the direction of its length independent of the body-bolsters and underframe, plates secured to the underside of said car-body having corrugations in their under surfaces opposed to and parallel with the corrugations in said body-bolsters, and suitable rollers placed between the corrugations in said body-bolsters and plates.

3. In a railway car, an underframe comprising body-bolsters, longitudinally arranged corrugations in the upper surface of

the center of length of said body-bolsters and at each side of the center of length thereof, a car-body having a slight movement in the direction of its length independent of the body-bolsters and underframe, plates secured to the underside of said car-body having corrugations in their under surfaces coterminous with and opposed to and parallel with the corrugations in said body-bolsters, and suitable rollers placed between the corrugations in said body-bolsters and plates.

4. In a railway car, an underframe comprising body-bolsters, longitudinally arranged corrugations in the upper surface of the center of length of said body-bolsters and at each side of the center of length thereof, a car-body having a slight movement in the direction of its length independent of the body-bolsters and underframe, a cushioning device for limiting the movement of the car-body, plates secured to the underside of said car-body having corrugations in their under surfaces coterminous with and opposed to and parallel with the corrugations in said body-bolsters, and suitable rollers placed between the corrugations in said body-bolsters and plates.

5. In a railway car, an underframe comprising body-bolsters, longitudinally arranged corrugations in the upper surface of the center of length of said body-bolsters, a car-body having a slight movement in the direction of its length independent of the body-bolsters and underframe, plates secured to the underside of said car-body having corrugations in their under surfaces opposed to and parallel with the corrugations in said body-bolsters, suitable rollers placed between the corrugations in said body-bolsters and plates, and a cushioning device for limiting the independent movement of said car-body.

6. In a railway car, an underframe comprising body-bolsters, the central portion of the upper surfaces of which are lower than that of their ends, longitudinally arranged corrugations in the upper surface of the center of length of said body-bolsters, a car-body having a slight movement in the direction of its length independent of the body-bolsters and underframe, plates secured to the underside of said car-body having corrugations in their under surfaces opposed to and parallel with the corrugations in said body-bolsters, suitable rollers placed between the corrugations in said body-bolsters and plates, and a cushioning device for limiting the independent movement of said car-body.

7. In a railway car, an underframe comprising body-bolsters having longitudinally elongated pockets in their ends, springs inserted in said pockets, a car-body having a slight longitudinal movement independent of said underframe, means secured to and

depending from said car-body and engaging said springs, and roller bearings interposed between said car-body and the ends of said bolsters next said pockets, and at the center of length of said bolsters.

8. In a railway car, an underframe comprising body-bolsters having transverse pockets in the ends thereof, and a car-body adapted to have a slight longitudinal movement independent of said bolsters, springs placed in said pockets, and means secured to and depending from said car-body and adapted to engage said springs.

9. In a railway car an underframe comprising body-bolsters, cushioning devices arranged in the ends thereof and transverse thereto, a car-body adapted to have a slight longitudinal movement independent of said bolsters, and means secured to and depending from said car-body adapted to engage said cushioning devices.

10. In a railway car an underframe comprising body-bolsters having transversely elongated pockets in the ends thereof, springs arranged therein, a car-body adapted to have a slight longitudinal movement independent of said body-bolsters, arms secured to and depending down from said car-body, and plungers secured in said arms and extending through the perforate ends of said pockets and engaging said springs.

11. In a railway car, an underframe comprising body-bolsters having transverse pockets in the ends thereof, springs placed in said pockets, a car-body having a slight longitudinal movement independent of said underframe, means secured to and depending from said car-body and adapted to engage said springs, roller bearings located under said car-body and consisting of corrugations in the upper surface of the center of length of said body-bolsters, plates secured to the underside of said car-body having corresponding corrugations in their under surfaces, and suitable rollers placed between said roller-bearings and said plates.

12. In a railway car, an underframe comprising body-bolsters, cushioning devices arranged in the ends thereof, a car-body having a slight longitudinal movement independent of said underframe, means secured to and depending from said car-body adapted to engage said cushioning devices, roller-bearings located under said car-body and consisting of corrugations in the upper surface of the center of length of said body-bolsters, plates secured to the underside of said car-body, having corresponding corrugations in their under surfaces, and suitable rollers placed between said roller-bearings and said plates.

13. In a railway car, an underframe comprising body-bolsters having transversely elongated pockets in the ends thereof, springs arranged therein, a car-body having

a slight longitudinal movement independent of said under-frame, arms secured to and depending down from said car-body, plungers secured in said arms and extending through the perforate ends of said pockets and engaging said springs, roller-bearings located under said car-body and consisting of corrugations in the upper surface of the center of length of said body-bolsters, plates secured to the underside of said car-body, having corresponding corrugations in their under surfaces, and suitable rollers placed between said roller-bearings and said plates.

14. In a railway car, an underframe comprising body-bolsters, cushioning devices arranged in the ends of the same, a car-body having a slight longitudinal movement independent of said underframe, means secured to and depending from said car-body adapted to engage said cushioning devices, each of said bolsters having corrugations in its upper surface at its center of length and at each side of its center of length and said car-body having suitable plates secured to its bottom having horizontally disposed surfaces having inverted corrugations therein coterminous with and opposed to those in said bolsters, and rollers interposed between said corrugated surfaces of the plates and bolsters.

15. In a railway car, an underframe comprising body-bolsters, having transversely elongated pockets in the ends thereof, springs arranged therein, a car-body having a slight longitudinal movement independent of said underframe, arms secured to and depending down from said car-body and plungers secured in said arms and extending through the perforate ends of said pockets and engaging said springs, each of said bolsters having corrugations in its upper surface at its center of length and at each side of its center of length, and said car-body having suitable plates secured to its bottom having horizontally disposed surfaces having inverted corrugations therein coterminous with and opposed to those in said bolsters, and rollers interposed between said corrugated surfaces of the plates and bolsters.

16. In a railway car, an underframe comprising body-bolsters, having transverse pockets in the ends thereof, the ends of which pockets have openings, the vertical diameters of which are greater than the horizontal, and said bolsters having longitudinal corrugations in their upper surfaces adjacent to said pockets, in combination with a car-body having a slight longitudinal movement independent of said underframe and saddle plates secured to the underside of said car-body each having integral arms depending downward therefrom and having a depending enlargement mediate said arms, the horizontal under surface of which is

provided with corrugations corresponding to and coterminous with the corrugations in the bolster, springs in said pockets, plungers secured in said arms and extending through the openings in the ends of said pockets and engaging the springs therein.

17. In a railway car, an underframe comprising body-bolsters, a center-sill connecting the same, a car-body having a slight longitudinal movement independent of said under-frame, roller-bearings located under said car-body and consisting of corrugations arranged transversely to the length of the car in the upper surface of the center of length of said body-bolster, plates secured to the underside of said car-body, having corresponding transverse corrugations in their under surfaces and suitable rollers placed between the same.

18. In a railway car, an underframe comprising body-bolsters a center-sill connecting the same, a car-body having a slight longitudinal movement independent of said underframe, each of said bolsters having corrugations in its upper surface at its center of length and at each side of its center of length said corrugations arranged transversely to the length of the car and said car-body having suitable plates secured to its bottom having horizontally disposed surfaces that have inverted transverse corrugations therein coterminous with and opposed to those in said bolster, and rollers interposed between said corrugated surfaces of the plates and bolsters.

19. In a railway car an underframe comprising body-bolsters, a center-sill connecting the same, a car-body having a slight longitudinal movement independent of said underframe, a cushioning device for limiting the movement of said car-body, each of said bolsters having corrugations in its upper surface at its center of length and at each side of its center of length, said corrugations arranged transversely to the length of the car and said car-body having suitable plates secured to its bottom having horizontally disposed surfaces that have inverted transverse corrugations therein coterminous with and opposed to those in said bolster, and rollers interposed between said corrugated surfaces of the plates and bolsters.

20. In a railway car, an underframe comprising body-bolsters having transverse pockets in the ends thereof and a car-body adapted to have a slight longitudinal movement independent of said bolsters, springs placed in said pockets, means secured to and depending from said car-body and adapted to engage said springs, and a single rolled beam center-sill connecting said body-bolsters.

21. In a railway car, an underframe comprising body-bolsters having transverse

pockets in the ends thereof, and a car-body adapted to have a slight longitudinal movement independent of said bolsters, springs placed in said pockets, means secured to and depending from said car-body and adapted to engage said springs.

22. In a railway car, an underframe comprising body-bolsters, cushioning devices arranged in the ends thereof and transverse thereto, a car-body adapted to have a slight longitudinal movement independent of said bolsters, means secured to and depending from said car-body adapted to engage said cushioning devices, and a single rolled beam center-sill connecting said body-bolsters which is so disposed that its web is horizontal.

23. In a railway car an underframe comprising body-bolsters, cushioning devices arranged in the ends thereof and transverse thereto, a car-body adapted to have a slight longitudinal movement independent of said

bolsters, means secured to and depending from said car-body adapted to engage said cushioning devices, and a single rolled beam center-sill connecting said body-bolsters.

24. In a railway car, an underframe comprising body-bolsters having transversely elongated pockets in the ends thereof, springs arranged therein, a car-body adapted to have a slight longitudinal movement independent of said body-bolsters, arms secured to and depending down from said car-body, plungers secured in said arms and extending through the perforate ends of said pockets and engaging said springs, and a single rolled beam center-sill connecting said body-bolsters.

In witness whereof I have hereunto set my hand this 19th day of May, A. D., 1910.

WILLIAM P. BETTENDORF.

Witnesses:

A. B. FRENIER,

O. C. STABY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."