May 31, 1932. J. F. O'CONNOR 1,860,548

CAR CONSTRUCTION

Filed May 29, 1929 2 Sheets-Sheet 1

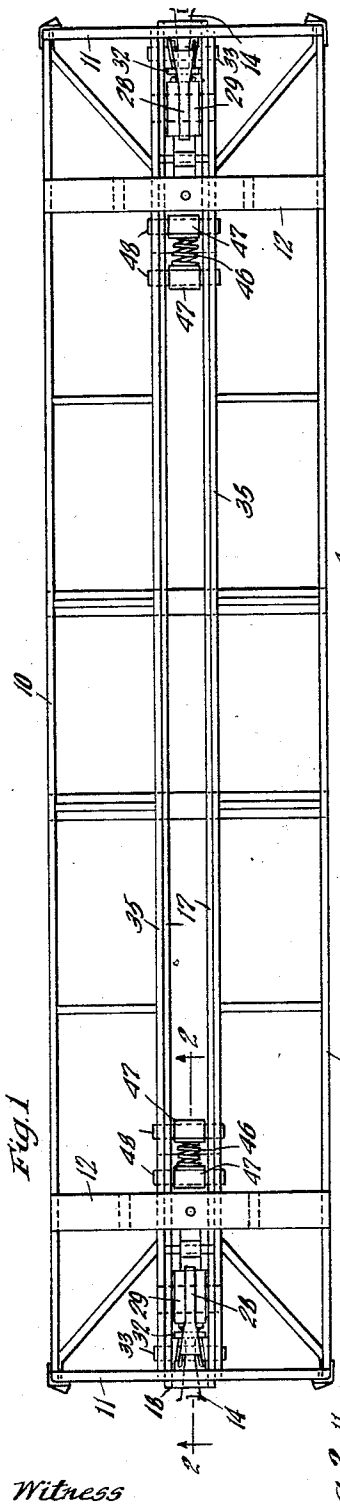


Fig. 1

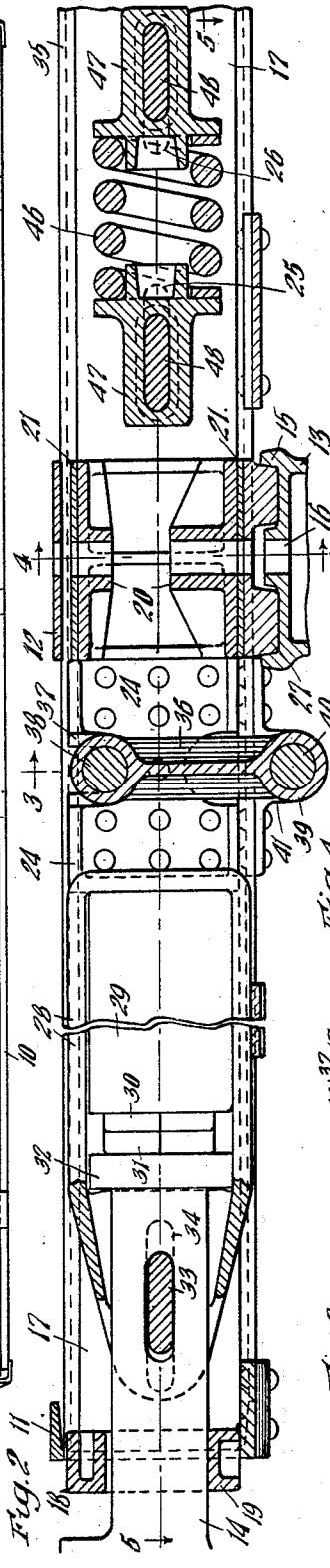


Fig. 2

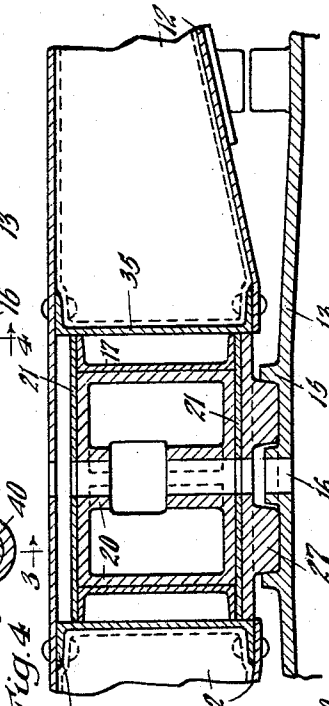


Fig. 4

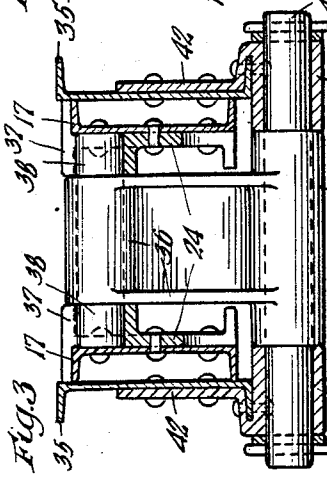


Fig. 3

Witness
Wm. Geiger

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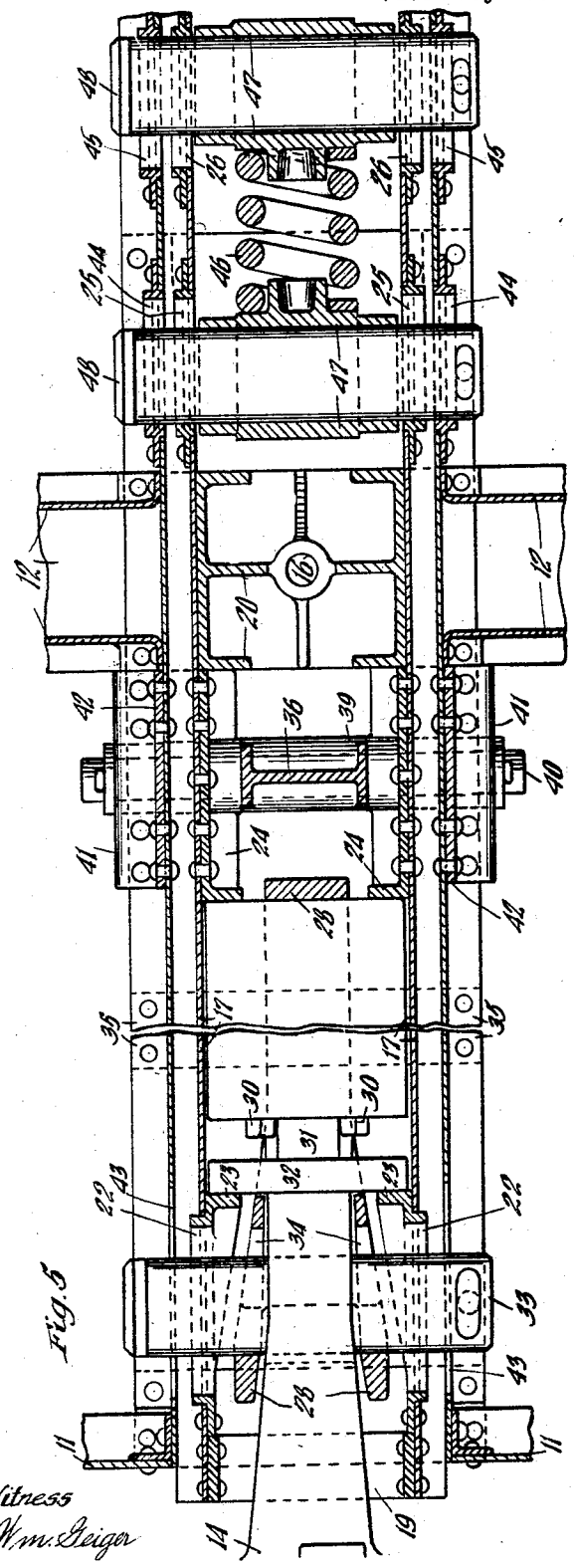


Fig. 5

Witness
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1,860,548

UNITED STATES PATENT OFFICE

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CAR CONSTRUCTION

Application filed May 29, 1929. Serial No. 366,782.

This invention relates to improvements in car construction, and more particularly to car suspension.

One object of the invention is to provide a car construction wherein the body of the car is cushioned with respect to the truck structure proper, to take care of the buffing and draft shocks in service.

Another object of the invention is to provide a car construction wherein the superstructure forms a separate unit from the underframe proper of the car and is movably carried thereby and cushioned with respect to the underframe proper to take care of buffing and draft shocks.

A more specific object of the invention is to provide a railway car construction including an underframe structure comprising truck members and longitudinally disposed draft sills fixed thereto having shock absorbing means cooperating therewith and a superstructure including longitudinally disposed sills and body bolsters, wherein the superstructure is movable lengthwise of the underframe structure and independent shock absorbing means is provided reacting between the sills of the underframe structure and the sills of the superstructure to take care of buffing and draft shocks.

Yet another object of the invention is to provide a railway car construction of the character described in the preceding paragraph wherein the superstructure is supported on the underframe structure by pendulum-acting link members.

Other objects of the invention will more clearly appear from the description and claims hereinafter following.

In the drawings, forming a part of this specification, Figure 1 is a top plan view of the underframe structure and the superstructure of a railway car embodying my improvements. Figure 2 is a longitudinal, vertical, sectional view corresponding substantially to the line 2—2 of Figure 1. Figure 3 is a transverse, vertical, sectional view corresponding substantially to the line 3—3 of Figure 2. Figure 4 is a transverse, vertical, sectional view, partly broken away, corresponding substantially to the line 4—4 of Figure 2, and Figure 5 is a horizontal, longitudinal, sectional view corresponding substantially to the line 5—5 of Figure 2.

In said drawings, 10—10 indicates the side sills of a car and 11 the end sills. The body bolsters at each end of the car are designated by 12 and the truck bolsters which cooperate therewith are indicated by 13. The car is provided with the usual coupler members 14—14 at opposite ends thereof which are operatively connected to the underframe structure. The truck bolster members as shown are provided with the usual center bearing portion 15 having a center pin opening 16.

In carrying out my invention, I provide a pair of longitudinally extending draft sills 17—17 which are operatively connected to the truck bolsters. The draft sills 17—17 are continuous and extend from end to end of the car, being of such a length as to project beyond the end sills 11, as most clearly shown in Figures 2 and 5. The sills 17 are of channel-shaped section and have a striking portion 18 formed thereon at each end of the car. Each striking member 18 includes a carry iron portion 19 on which the coupler shank of the coupler 14 at the corresponding end of the car is supported. At each truck bolster, a filler casting 20 is disposed between the sills 17 and is secured thereto. The filler castings 20 are provided with center pin receiving openings which are alined with the center pin openings 16 of the truck bolsters 13. The filler castings 20 may be secured to the sills 17 in any suitable manner and are preferably riveted thereto. At each casting 20, the sills are provided with top and bottom tie plates 21—21 which span the casting and overlap the flanges at the top and bottom sides of the sills. These tie plates may be secured to both the sills and the castings 20 in any suitable manner. At the opposite ends of the car, the sills 17 are provided with transversely alined coupler key receiving slots 22—22 which are reinforced by suitable cheek plate members having reinforced flanges extending into the slots. As most clearly shown in Figure 5, each cheek plate 22 has a transverse, vertical stop shoulder 23

at the inner end thereof, the stop shoulders of each pair of cheek plates forming front stop lugs for the shock absorbing mechanism by which the corresponding coupler is operatively connected to the sills 17. At each end of the car inwardly of the stop lugs 23, the sills 17 are provided with a pair of stop castings 24 which are secured to the webs of the sills by rivets as shown. The castings 24 are preferably of such a length that they bear directly at their inner ends on the outer side of the corresponding filler casting 20. The front end portions of the casting 24 present transverse rear stops for the shock absorbing mechanism. At each end of the car inwardly of the corresponding casting 20, the sills 17 are provided with front and rear follower key receiving slots 25—25 and 26—26 for a purpose hereinafter pointed out.

The underframe structure thus far described is directly connected to the truck bolsters 13 so as to move with the same. At each filler casting 20 I provide a center bearing casting 27 which cooperates with the center bearing portion 15 of the corresponding truck bolster in the usual manner. The casting 27 is secured to the corresponding filler casting 20 in any suitable manner preferably by being riveted thereto.

Any well known type of shock absorbing mechanism may be interposed between the coupler at each end of the car and the sills 17 and in the present instance a shock absorbing mechanism of the friction type is illustrated. As shown, each coupler 14 has a yoke member 28 connected thereto, the yoke comprising the usual strap portion within which the shock absorbing mechanism is disposed. As herein shown, the shock absorbing mechanism includes a friction shell 29 having friction shoes 30—30 and a wedge member 31 cooperating therewith. It will be understood that the arrangement of the friction shock absorbing mechanism is the usual one, in which spring resistance means is disposed within the casing 29 which opposes inward movement of the friction shoes and wedge. As shown, the inner end of the casing 29 cooperates directly with the rear stops 24 and a main follower 32 is interposed between the wedge and the stop lugs 23. The inner end of the corresponding coupler shank bears directly on the main follower 32 and the coupler shank is connected to the yoke by a transverse key 33 of the usual type extending through key slots 34—34 in the side walls of the hood of the yoke.

The key 33 of each coupler has the opposite ends thereof working in the slots 22—22 at the corresponding ends of the sills 17. The shock absorbing mechanism just described operates in the usual manner in absorbing the shocks in both buff and draft and reacts between the couplers and the underframe proper of the car which includes the sills 17 and the truck bolsters which are fixed thereto.

The superstructure of the car which carries the main body of the same includes a pair of longitudinally disposed spaced sills 35—35 extending from end to end of the car and secured at their opposite ends to the end sills 11. The body bolsters 12 at the opposite ends of the car are also directly secured to the sills 35 as shown in Figures 4 and 5. The sills 35 are spaced such a distance apart as to receive the sills 17 slidably therebetween.

The sills 35 are movably connected to the sills 17 by supporting links 36—36 at each end of the car. Each link 36 has a pivotal connection with the corresponding castings 24 at the same end of the car, the castings 24 being provided with inwardly projecting cylindrical sleeve-like portions 37—37 and the upper ends of the arm of the link 36 being provided with a sleeve-like section through which a connecting pivot pin in the form of a relatively heavy stub shaft 38 extends. At the bottom each link is also provided with a sleeve-like section 39 which accommodates a pivot pin in the form of a shaft 40 having its opposite ends journaled, in cylindrical portions 41—41 formed on castings 42—42 secured to the sills 35. As most clearly shown in Figure 3, the castings 42 are secured to the outer sides of the sills 35 and are slotted adjacent their lower ends to accommodate the bottom flanges of the sills. As further shown in Figure 3, the bottom edges of the sills 17 are disposed an appreciable distance above the cylindrical portions 41—41 of the castings 42 and the sleeve-like section 39 of the link 36. The pivot members 40 are held against endwise movement in any suitable manner and as herein shown are provided with cotter pins extending through the opposite ends thereof, washers being interposed between the pins and the outer sides of the castings 42. As will be evident, the superstructure of the car including the sills 35, bolsters 12, side sills 10 and end sills 11 are supported for swinging movement on the underframe structure proper, the superstructure thus having relative movement with respect to the underframe structure proper in a lengthwise direction.

At the opposite ends, the sills 35 are provided with alined slots 43—43 to accommodate the outer ends of the coupler keys 33. Inwardly of the body bolsters at each end of the car the sills 35 are provided with front and rear follower key receiving slots 44 and 45 which are normally in alinement with the corresponding follower key slots 25 and 26 of the sills 17.

The superstructure of the car is yieldingly supported on the underframe structure proper so as to take care of both buffing and draft shocks. Any suitable cushioning or shock absorbing means may be employed for this

purpose. In the present instance, I employ a spring shock absorbing means at each end of the car in the form of a helical spring 46.

Each cushioning spring cooperates with front and rear follower blocks 47—47 having transverse openings receiving the follower keys 48—48. The follower keys 48 extend through the alined key receiving slots 25 and 44 and 26 and 45 of the sills 17 and 35 respectively. As shown, the key receiving slots of the sills 17 and 35 are of greater length than the width of the keys so that the keys and the followers mounted thereon have movement with respect to the sills. In the normal position of the parts, the followers and the keys 48 are held separated by the springs 46 with the front edge of the front follower key 48 engaging the front end walls of the slots 25 and 44 and the rear edge of the rear follower key 48 engaging the rear end walls of the slots 26 and 45.

In the operation of my improved railway car structure, assuming that a buffing shock is applied to the coupler at the left hand end of the car as shown in Figures 1, 2 and 5, the shock absorbing mechanism 29 will be compressed between the follower 32 and the stops 24. Inasmuch as the trucks are connected to the sills 17, this shock absorbing means will absorb the major portion of the shock. The shocks transmitted to the sills 17 will also be transmitted to the front follower key 48 of the cushioning means immediately in back of the body bolster thereby compressing the spring 46 against the rear follower 47, the key of which is held against rearward movement with respect to the sills 35 of the superstructure of the car. The rearward movement of the sills 17 will also compress the spring shock absorbing means 46 at the other end of the car between the corresponding front and rear followers which cooperate with the follower keys 48 of the sills 17 and 35. As will be evident, the superstructure and the body of the car will thus be cushioned against shocks independently of the shock absorbing means cooperating with the coupler. Due to the compression of the spring shock absorbing means comprising the spring members 46, there will be relative movement between the sills 17 and the sills 35 lengthwise of the car. This movement is accommodated by the connecting links 36 which act in the manner of pendulum members to support the superstructure of the car. As will be evident, in addition to the tendency of the springs 46 to return the superstructure of the car to normal position with respect to the underframe structure proper, the weight of the car body and the superstructure acting on the pendulum links aids in this returning movement.

In a draft action, the operation is similar to that just described but the action of the parts will be reversed, that is the coupler will pull the yoke outwardly, compressing the friction shock absorbing means against the main follower 32 which reacts against the stop lugs 23 and the sills 17, thereby tending to pull the latter outwardly also and compressing the springs 46 at both ends of the car between the followers 47 which are connected to the sills 17 and 35 by the keys 48.

As will be evident, my improved car construction provides a rugged backbone for the car in that the same is provided with longitudinally extending spaced sills which are fixed with respect to the superstructure and the principal load of the buffing and draft shocks is carried by the draft sills which are movable with respect to the superstructure sills and are secured to the truck structure of the car. It is further pointed out that by the arrangement of separate and independent draft sills the entire superstructure of the car and especially the longitudinally extending sills thereof are relieved of compression strains which would tend to distort and bend the framing of the car.

I have herein shown and described what I now consider the preferred manner of carrying out my invention, but the same is merely illustrative and I contemplate all changes and modifications that come within the scope of the claims appended hereto.

I claim:

1. In car construction, the combination with a pair of spaced, longitudinally disposed sills extending from end to end of the car, said sills being fixed to the truck structure of the car; of coupler means operatively connected to said sills; a pair of spaced sills fixed to the superstructure of the car and forming the entire support for said superstructure, said sills extending from end to end of the car, said first named and second named sills being relatively movable with respect to each other lengthwise of the car; means engaging with said first and second named sills only for supporting said second named sills on said first named sills; and cushioning means opposing movement of the relatively movable sills.

2. In car construction, the combination with sills extending lengthwise of the car and supported and fixed to the truck structure of the car, said sills having coupler means connected thereto; of additional sills fixed to the superstructure of the car and forming the entire support for the same, said last named sills extending from end to end of the car and having movement lengthwise with respect to said first named sills and being supported on the latter; and cushioning means opposing relative movement of said first named and additional sills.

3. In car construction, the combination with the underframe structure of a car; of a superstructure carrying the car body proper; and pendulum link means for movably sus-

pending the superstructure on the underframe structure.

4. In car construction, the combination with underframe structure of a car; of a superstructure carrying the car body proper; pendulum link means for movably suspending the superstructure on the underframe structure; and means yieldingly opposing relative movement of the underframe structure and the superstructure.

5. In a railway car, the combination with draft sills extending lengthwise of the car; of coupler means at opposite ends of the car; shock absorbing means interposed between the coupler means and draft sills; a superstructure; and swinging links for movably supporting the superstructure on the draft sills.

6. In a railway car, the combination with draft sills extending lengthwise of the car; of coupler means at opposite ends of the car; shock absorbing means reacting between the coupler means and the draft sills; a superstructure; pivoted links for movably supporting the superstructure on the draft sills; and means for yieldingly opposing relative movement of the superstructure and sills.

7. In a railway car, the combination with draft sills extending lengthwise of the car; of coupler means at opposite ends of the car; shock absorbing means reacting between the coupler means and draft sills; a superstructure; and means anchored to the superstructure and draft sills for swingingly suspending the superstructure from the draft sills.

8. In a railway car, the combination with draft sills extending lengthwise of the car; of coupler means at opposite ends of the car; shock absorbing means reacting between the coupler means and draft sills; a superstructure including longitudinally extending sills and body bolsters secured thereto; links for swingingly supporting the last named sills from the draft sills; and cushioning means opposing relative movement of the draft sills and the sills of the superstructure.

9. In a railway car, the combination with longitudinally disposed, spaced draft sills secured to the car trucks; of coupler means at opposite ends of the car; shock absorbing means reacting between the coupler means and draft sills; a superstructure including longitudinally disposed sills and body bolsters fixed thereto; means for swingingly supporting the sills of the superstructure on the draft sills; inner and outer stop means on the draft sills; inner and outer stop means on the sills of the superstructure; inner and outer follower means cooperating with the stop means of said sills; and shock absorbing means interposed between the inner and outer followers.

10. In a railway car, the combination with longitudinally disposed spaced draft sills supported on and fixed with respect to the car trucks; of coupler means at opposite ends of the car operatively connected to the draft sills; a superstructure including longitudinally disposed sills and body bolsters secured thereto, said last named sills being supported on the draft sills, said draft sills and sills of the superstructure having front and rear alined key openings at each end of the car; front and rear follower keys extending through said openings; and shock absorbing means interposed between said front and rear follower keys.

In witness that I claim the foregoing I have hereunto subscribed my name this 27th day of May, 1929.

JOHN F. O'CONNOR.