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CONCRETE RAILWAY CAR.

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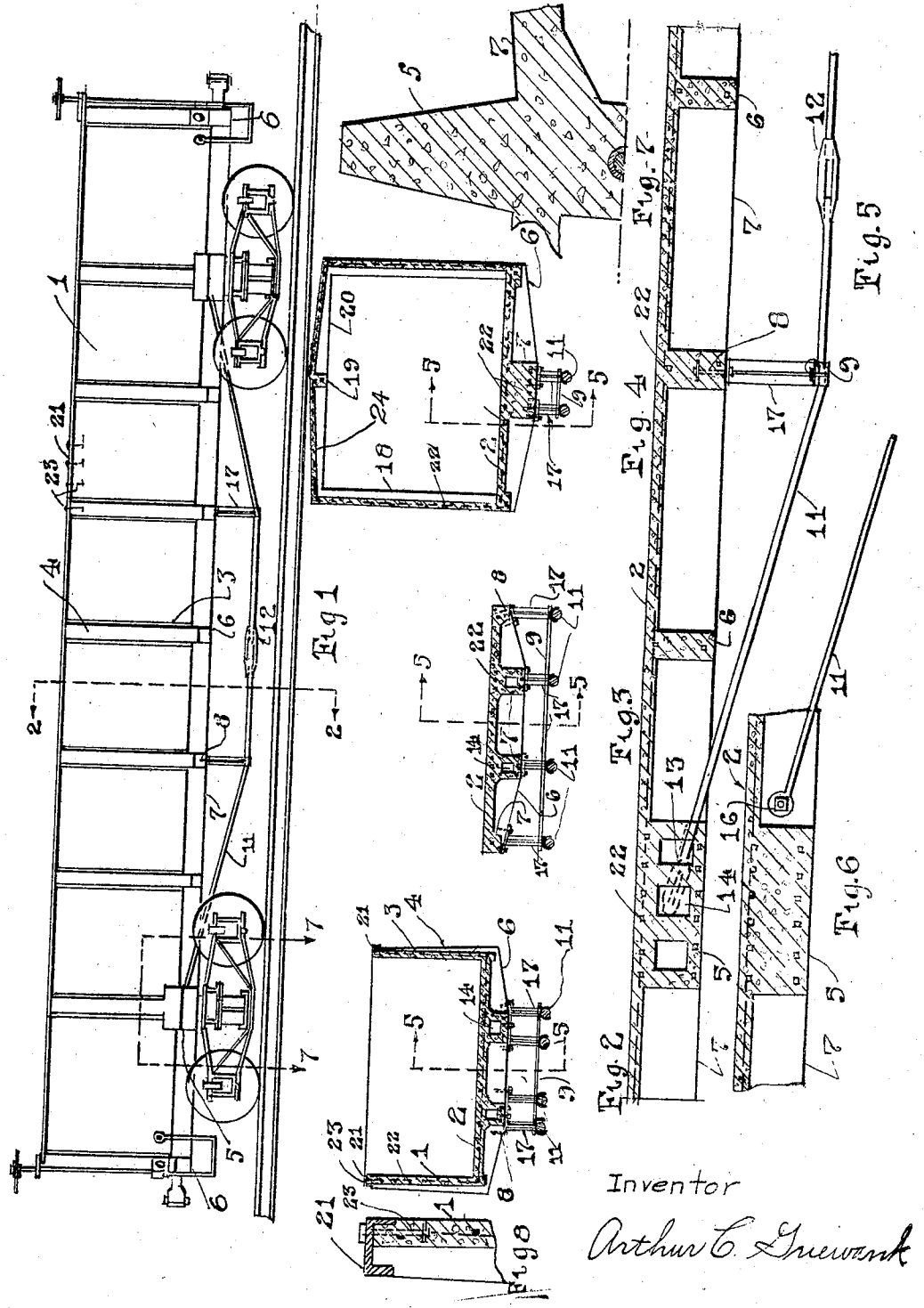


Fig 1

Fig 2

Fig 3

Fig 4

Fig 5

Fig 6

Fig 7

Fig 8

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CONCRETE RAILWAY-CAR.

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To all whom it may concern:

Be it known that I, ARTHUR C. GRIEWANK, a citizen of the United States, residing at 775 Bush street, in the city and county of San Francisco and State of Califorina, have invented new and useful Improvements in Concrete Railway-Cars, of which the following is a specification.

The present invention relates to improvements in reinforced concrete cars especially railway cars, the object of the invention being to provide such a car which will be of the lightest possible weight in proportion to its strength and durability.

In the accompanying drawing, Figure 1 is side view of a reinforced concrete railway car showing a concrete body and concrete underframe mounted on trucks, constructed in accordance with my invention; Fig. 2 is a sectional view thereof on the line 2—2 of Fig. 1; Fig. 3 is a view similar to Fig. 2 of a flat car; Fig. 4 is a view similar to Fig. 2 of a box car; Fig. 5 is a partial enlarged longitudinal section on the line 5—5 of Figs. 2, 3 or 4; Fig. 6 is a broken similar section of a modified form of the invention; Fig. 7 is an enlarged partial plan section on the line 7—7 with floor slab removed showing a bolster; Fig. 8 is a partial enlarged section of upper edge of wall on line 2—2.

Referring to the drawings, Figs. 2, 3 and 4 indicate the floor, which may be made of reinforced concrete, wood, metal or any other suitable substance, 1 the sides and 24 the roof of a reinforced concrete car body. Said sides 1 are formed with fillets 3 to the intervening posts 4 to stiffen the construction; the posts 4 are of variable section. The floor is formed with depending bolsters 5, with depending cross ties or beams 6, with longitudinally extending concrete girders, sills or chords 7, and with depending posts 17 which may be made of concrete, metal, wood, or any other suitable material. To the lower portion of said posts 17 are secured longitudinally extending tie or truss rods 11 in sections connected to each other by turn buckles 12 and having their ends embedded or secured in said bolsters or girders. In Fig. 5, I show the ends of the tie rods screwed into sleeves or nuts 13 embedded in said bolsters and in Fig. 6, I show said ends secured to girder by bolt 16.

The floor and sides of the car, and also the roof in case of a box car, are all formed in one piece with the sills or girders, cross ties or beams and bolsters, so that the car is monolithic, except for depending posts 17, tie-rods 11 and metallic member 21. The longitudinal girders or sills 7 may be made as shown in Figs. 2 and 3 with hollow cavities 14 or may be made solid as shown in Fig. 4, and the girder is of variable section.

In Fig. 3, I show four such girders, or sills, whereas in Fig. 2, I show only two, and in Fig. 4 I have shown only one such girder. In the form of the invention shown in Fig. 4, the sides of the car have formed integrally therewith, inwardly extending posts 18 and the roof 24 of the car has formed integrally herewith a longitudinal beam 19 and a cross beam 20.

In Figs. 2, 3 and 4, the tie rods and depending posts 17 are supported against lateral strain by tie bars 9; the depending posts 17 may be secured to concrete car body by bolts 8.

The bolsters 5 as shown in Fig. 6 may be solid or have cavities 14 as shown in Fig. 5. The section of bolster 5 may vary as shown in Figs. 1, 5 and 7 which will reduce the weight and at the same time take care of the stresses to which it is subjected. The cross tie 6 as shown in Figs. 1, 2, 3 and 4 may be of variable section. As shown in Figs. 8, 2 and 1, on the top of the concrete posts 4 and the wall 1 is secured a metallic member 21; this metallic member 21 is secured by bolts 23 to the concrete wall and the posts as shown in Figs. 8 and 1; this reduces the weight at the same time taking care of the lateral strains and the abrasion to which the top edge of the side of a gondola car may be subjected. The vertical concrete post is of variable section as shown in Fig. 2; and is shown to be integral with the crossties and the side wall 1 in Figs. 1 and 2. In Figs. 2, 3, 4, 5 and 6 is shown metallic reinforcement 22, in all concrete members.

I claim:

1. In a reinforced concrete car, a concrete body, having depending therefrom and integral therewith, bolsters and a chord, and depending posts and truss members which are operatively associated with the lower ends of said posts extending longitudinally beneath said body and means for transferring the stresses of same to said car-body.

2. In a reinforced concrete car, a concrete

body having depending therefrom and integral therewith, bolsters, chords and depending posts and truss members which are operatively associated with the lower ends of said posts extending longitudinally beneath said body, means for transferring the stresses of same to said body.

3. In a reinforced concrete car, a floor, bolsters, a chord and cross ties, all of concrete, all adjoining parts of the before recited elements, being integral with each other, and a depending post, and a truss rod which is operatively associated with the lower end of the post extending longitudinally beneath said concrete car, and means for securing same to said concrete car.

4. In a reinforced concrete car, a floor, bolsters, chords, and cross ties, all of concrete, all adjoining parts of the before recited elements, being integral with each other and depending posts and truss members which abut against the lower ends of said posts extending longitudinally beneath said concrete parts, and means for securing same to said concrete parts.

5. In a reinforced car, a concrete body, hollow bolsters, depending from said body, and a truss member extending longitudinally beneath said body and means for transferring the stresses of same to said body.

6. In a reinforced concrete car, a concrete body, hollow bolsters, and a hollow chord, and truss members extending longitudinally beneath said body and means for transferring the stresses of same to said body.

7. In a reinforced concrete car, a concrete body, hollow bolsters, and hollow chords, and truss members extending longitudinally beneath said concrete body and means for securing same to said body.

8. In a reinforced concrete car, a concrete body, a hollow chord, and truss rods extending longitudinally beneath said concrete body and means for transferring the stresses of same to said body.

9. In a reinforced concrete car, a concrete body, hollow chords, and truss rods extending longitudinally beneath said concrete body and means for securing same to said body.

10. In a reinforced concrete car, a concrete body with a concrete bolster of variable section.

11. In a reinforced concrete car, a concrete body with a hollow concrete bolster of variable section.

12. In a reinforced concrete car, a concrete body with walls and floors, and thereunder, cross beams projecting beyond the outside face of the wall and, vertical posts integral with said cross-beams, all of the above parts being of concrete and all adjoining parts being integral with each other, and a metallic member on the top of said posts and walls, and means for securing same to said walls and posts.

13. In a reinforced concrete car, walls, posts, bolsters, a chord and crossties, all of concrete, all adjoining parts of the before recited elements being integral with each other, and a depending post and a truss member which is operatively associated with the lower end of the post, extending longitudinally beneath said concrete car, and means for transferring the stresses of same to said car.

14. In a reinforced concrete car, walls, posts, bolsters, a chord and crossties, all of concrete, all adjoining parts of the before recited elements being integral with each other, and depending posts and truss members, which are operatively associated with the lower ends of the posts, extending longitudinally beneath said concrete car, and means for transferring the stresses of same to said concrete car.

15. In a reinforced concrete car, walls, posts, bolsters, chords, and crossties, all of concrete, all adjoining parts of the before recited elements being integral with each other, and a depending post and a truss rod, which is operatively associated with the lower end of the post, extending longitudinally beneath said concrete car, and means for transferring the stresses of same to said concrete car.

16. In a reinforced concrete car, walls, posts, bolsters, chords and crossties, all of concrete, all adjoining parts of the before recited elements being integral with each other and depending posts and truss members, which abut against the lower ends of the posts, extending longitudinally beneath said concrete car, and means for securing same to said concrete car.

17. In a reinforced concrete car, a concrete body and underframe, a truss member extending longitudinally beneath said body and underframe, and means for transferring the stresses of same to said concrete car.

18. In a reinforced concrete car, a concrete body and underframe, truss rods extending longitudinally beneath said body and underframe, and means for securing same to said concrete car.

19. In a reinforced concrete car, a concrete body and underframe, a depending post, truss members extending longitudinally beneath said body and underframe, and means for transferring the stresses of same to said concrete car.

20. In a reinforced concrete car, a concrete body and underframe, depending posts and truss members extending longitudinally beneath said body and underframe, and means for securing same to said concrete car.

21. In a reinforced concrete car, a floor, bolsters, a chord, cross ties, walls and vertical posts, all of concrete, all adjoining parts

of the before recited elements being integral with each other and a depending post, and a truss rod which is operatively associated with the lower end of said post extending longitudinally beneath said concrete car, and means for transferring the stresses at the ends of said members, to said concrete car.

22. In a reinforced concrete car, a floor, bolsters, a hollow chord, and cross ties, all of concrete, all adjoining parts of the before recited elements being integral with each other, and a depending post, and a truss member operatively associated with the lower end of said post, and means for transferring the stresses at the ends of said members to said concrete car.

23. In a reinforced concrete car, a floor, hollow bolsters, a hollow chord, and cross ties, all of concrete, all adjoining parts of the before recited elements being integral with each other, and a depending post, and a truss member which is operatively associated with said post, and means for transferring the stresses at the ends of said members to said concrete car.

24. In a reinforced concrete car, walls, posts, a floor, bolsters, a hollow chord, and cross ties, all of concrete, all adjoining parts of the before recited elements being integral with each other and a depending post and a truss member which is operatively associated with said post and means for transferring the stresses of said members to said concrete car.

25. In a reinforced concrete car, side and end walls, a floor, posts, hollow bolsters, a hollow chord, and cross ties, all of reinforced concrete, all adjoining parts of the before recited elements being integral with each other and a depending post and a truss member operatively associated with the lower end of said post and means for transferring the stresses of said members to said concrete car.

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