

STEEL CAR DEVELOPMENT.

PENNSYLVANIA RAILROAD.

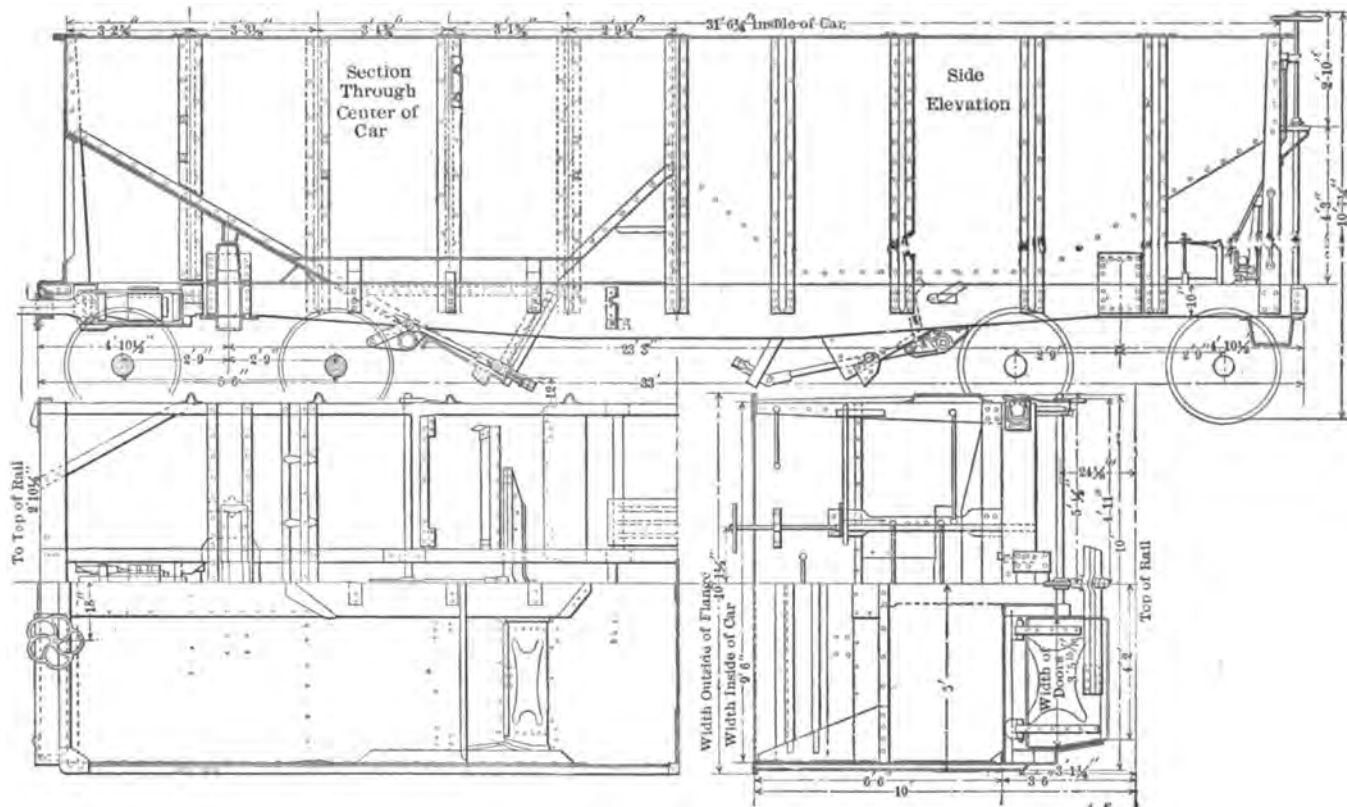
III.

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The first large all-steel, twin copper gondolas for the Pennsylvania Railroad were delivered by the Pressed Steel Car Company July 27, 1898. It seems but a short time since this important step in steel car development was taken. It was

As shown on page 354, the weight of the GL car is 39,150 lbs. Its cubical capacity is 1,897 cubic ft., including the heap over the top, and the ratio of dead to paying load is 36.4 per cent. Its success is due to the fact that the facility of unloading coal and ore made it very popular with shippers.

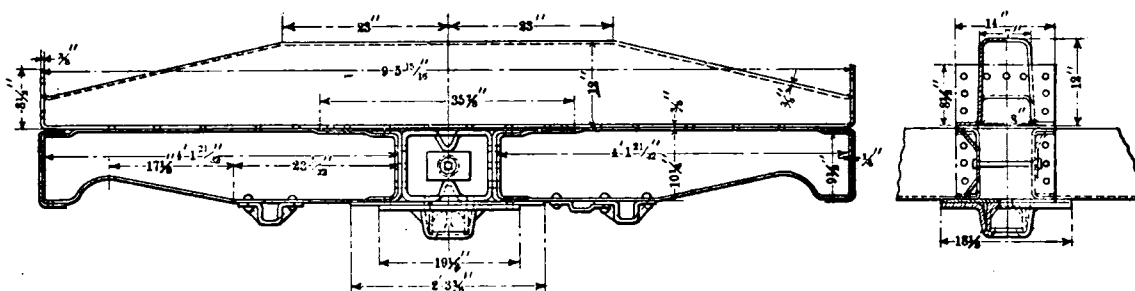
The backbone of the GL car is a pair of fish-bellied pressed steel channels 17 in. deep at the center and 10 in. deep at the ends. They are continuous through the length of the car, 33 ft., and the bolsters are riveted to them. These sills receive the draft gear and are spread 12 $\frac{3}{4}$ in. apart to receive the Westinghouse friction gear, which has been applied to all of the recent steel cars on this road. The side sills



CLASS GL STEEL CAR. STEEL CAR DEVELOPMENT—PENNSYLVANIA RAILROAD.

an important step because this GL car remains until now the standard coal car of this road. This type of construction was brought out in pressed steel on the Bessemer & Lake Erie, and its adoption by the Pennsylvania settled the form and type of the largest number of steel cars built in this country up to the present time. As already pointed out, the form was drawn from the class Gc wooden car. The design of the GL car was contemporaneous with the Gm car, illustrated in

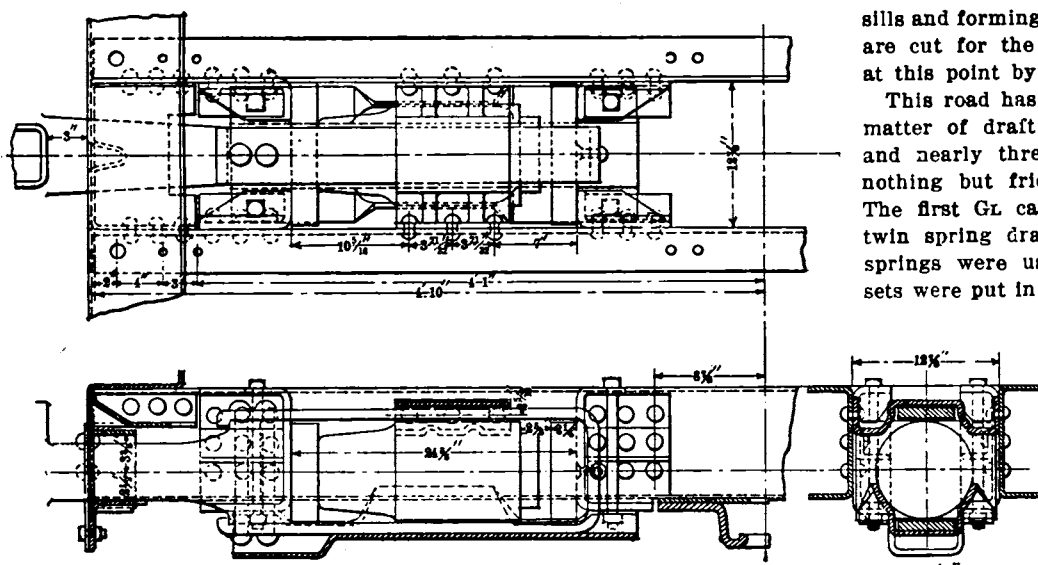
of this car are also continuous and of the same form and size as the center sills, except that the side sills are of $\frac{1}{4}$ in. plate, while the center sills are $\frac{3}{8}$ in. thick. In both cases the flanges of the channels are 3 $\frac{3}{8}$ in. wide. This construction neglects the possibility of utilizing the sides of the car as trusses to aid in carrying the load and the heavy side sills might have been omitted, which would have saved a great deal of weight and considerable expense.



BODY BOLSTER CONSTRUCTION—CLASS GL STEEL CARS. PENNSYLVANIA RAILROAD.

this journal in November. It is almost exactly the same now as when first designed, but it will probably be redesigned in order to save weight, but without in any way impairing its strength. This car was built originally for the lines west of Pittsburgh and was used for coal in one direction and ore in the other. It was designed by the Schoen people and adopted by them, with modifications, for a large part of the equipment of this type built for other roads.

With continuous center sills the lower portions of the body bolster were cut and made in the form of trough-shaped diaphragms, but the bolster proper lies on top of both center and side sills, and by its form is made to take some of the load from the sloping floor through a trough-shaped floor support, which bears on the bolster. This arrangement gives plenty of room for the bolsters, and it is easy to understand why these cars do not get "down on their side bearings." The



DETAILS OF DRAFT GEAR ATTACHMENT—WESTINGHOUSE—CLASS GL. CARS.

accompanying drawings are selected with a view of rendering an extended description unnecessary.

In all of the later forms of construction the center sills are continuous, and the bolsters are formed of trough-shaped diaphragms between them, with longer trough-shaped diaphragms between the center and side sills, riveted to their webs.

The end sills of the GL car are trough-shaped pressed plates. Westinghouse friction gear had been long enough in service to determine whether it had reached its full development, and as a matter of fact, a number of changes were afterward made in it.

sills and forming strong end construction. They are cut for the coupler shank and reinforced at this point by pressed plate angles.

This road has gone very thoroughly into the matter of draft gear for large capacity cars, and nearly three years ago decided to apply nothing but friction gear to this equipment. The first GL cars were equipped with double twin spring draft gear in which two sets of springs were used in pulling and two other sets were put in under initial compression with but $\frac{3}{8}$ -in. of motion left. In buffing the follower pushed in pins which acted through the center of the springs, against the follower plate and loaded the second pair of springs. At the time this gear was designed it was not thought that the Westinghouse friction gear had been long enough in service to determine whether it had reached its full develop-

ment, and as a matter of fact, a number of changes were afterward made in it. The spring gear gave fair service, but it was soon found that the Westinghouse gear was perfected so as to offer substantial advantages over springs alone, and the spring gear was abandoned in its favor. Since its first adoption this road has not used any but friction gear on large capacity cars. The Sessions standard friction gear is now applied to a number of cars on this road. The form of attachments for the Westinghouse draft gear on GL cars is illustrated in one of the accompanying engravings. In fact this arrangement is the one in use on all present types of steel cars on this road.

THE APPRENTICE QUESTION.

Mr. W. O. Thompson, division-superintendent of motive power of the New York Central at Oswego, N. Y., in a paper read last month before the Central Railroad Club, presented some of the features of the apprentice problem, in a way which should revolutionize practice in every railroad shop in the country.

In the opinion of the editors of this journal Mr. Thompson stated the case better than it has ever been stated before. The following paragraphs indicate its practical and sensible character. The author is certainly correct as to wages, unless the railroads establish schools for apprentice instruction:

"The average American boy, enters railroad shops at a salary that is not sufficient to take his girl to the circus and buy peanuts, all in the same evening, it does not take him long to see that the helper who does not know as much as the boy, after he has served three months, is getting enough to make him a comfortable living, and that if the helper shows himself a little proficient in some certain part of the business, he is paid a full-fledged mechanic's wages in a year or two. He also notices that it has been the policy of the railroads to better the condition of every one in financial and other ways from the president to and including the 'Dagos' on the section, with the exception of the apprentice. He also notices that he is looked upon with disfavor by a good many mechanics and barely tolerated by the sub-foremen; seldom noticed by the general foreman; and in a good many cases the division officer or superintendent of motive power is further away from him than the North Star. Under such circumstances is it any wonder that our boys get discouraged?

"What is needed is a complete change of heart and methods in regard to the apprentices. Instead of considering them as apprentices, we should look at it in the same light as we do in turning out more work every year for a given amount of money and the pace should be set by the highest division officer, and he should consider the welfare of his apprentices his paramount duty, and in that way create the opportunity of filling his shop with men fully prepared to successfully cope with their chosen profession.

"Apprentices' wages are altogether too low. Instead of compelling the boy to work one year for 5 or 6 cents an hour, he should work only six months for that pay. The next year his wages should not be less than \$1 a day. The next year he should be paid nearly as much as the ordinary helper. The next year and the last six months of the fourth year he should be paid as much as the ordinary and special helpers' respectively. It is of the utmost importance that very careful consideration be given to the critical period of a boy's life, that is at the time of the completion of his apprenticeship. The practice of discharging an apprentice when his time is out is decidedly wrong. The proper time to get rid of undesirable apprentices is the first six months or a year at the latest.

"Satisfactory results cannot be obtained in any apprentice system without the proper interest being taken by the foremen to train an apprentice. The apprentice is the coming foreman, master mechanic and superintendent of motive power. The most vital part in the training of apprentices is the selection of mechanics as their instructors. It is not possible to obtain even medium results with boys without developing them outside of shops and to gain that which will be of lasting benefit to the boys and railroad companies as well, and an apprentice club or association should be formed where boys who have not been fortunate enough to get technical education can secure information on a variety of subjects that will put them on an equality which their more fortunate brothers. No apprentice system that can be devised will ever be a success unless every one, from the highest official to the mechanic entrusted with the education of the boy, appreciates the responsibility connected with starting an apprentice.

"We all point with pride to our special apprentice boys who have had the advantage of a technical training. We spend our company's money to re-educate them to the practical side of railroad life and as far as my observation goes with the same amount of money spent and the same pains taken in the way of giving the ordinary apprentice a chance for self-education suitable for shop apprentices, we will get better mechanics, more capable foremen and officers for higher positions than can be obtained in any other way."