

Latest Type of Dining Car for the Pennsylvania

Pennsylvania System Dining Cars Built at Altoona

Attractive Interior Finish, Kitchen Equipment, and Cast-Steel Truck Side Frames Features of Design

TWENTY new steel dining cars for the Pennsylvania System have just been completed in the car shops at the company's Altoona works.

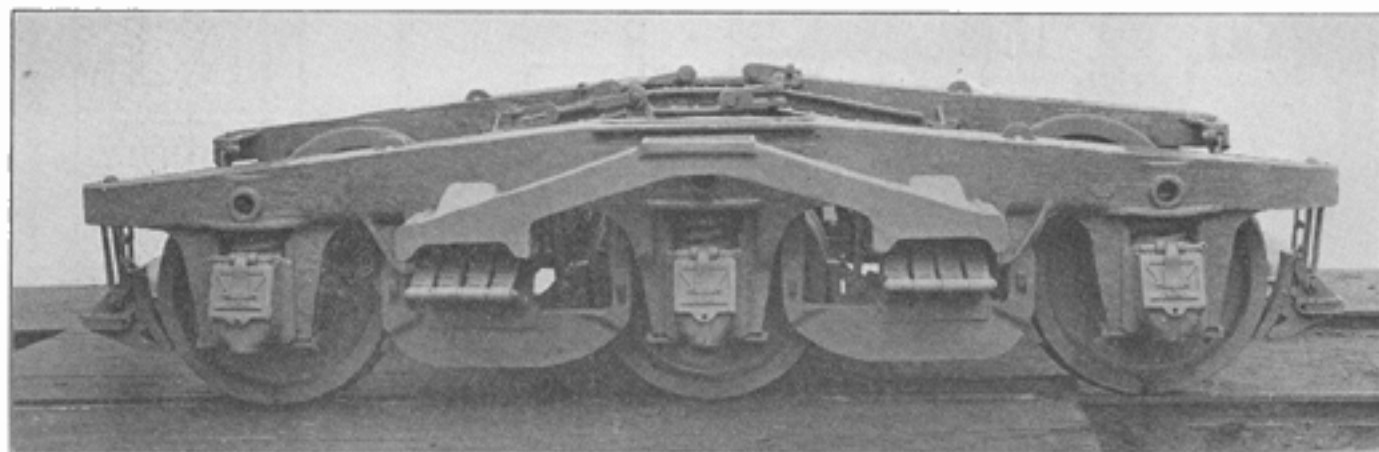
Structurally, these cars are the same as others now in service, having a center sill built up of two 18-in. channels with $\frac{1}{2}$ -in. by 24-in. top and bottom cover plates and four cantilevers, two attached to each side of the center sills, spaced 18 ft. 9 in. from the transverse center line of the car, supporting the superstructure. No bolsters are used.

The side truss below the window sills consists of a bottom angle $9/16$ in. by $3\frac{1}{2}$ in. by 5 in., a belt rail of special section having an area of about 4 sq. in. and web plates $\frac{1}{8}$ in. thick. The posts, of the cantilever type, are made of $\frac{3}{8}$ -in. pressed steel and extend from the bottom side angle to the

The general dimensions are as follows:

Length over buffers.....	82 ft.	$3\frac{1}{8}$ in.
Distance between centers of trucks.....	56 ft.	3 in.
Distance between centers of crossbearers.....	37 ft.	6 in.
Width over sides.....	9 ft.	$10\frac{1}{2}$ in.
Width over roof.....	9 ft.	$11\frac{1}{2}$ in.
Width over upper deck.....	7 ft.	7 in.
Height from rail to center line of coupler.....		$34\frac{1}{2}$ in.
Height from rail to top of platform.....		50 in.
Height from rail to car floor.....		52 in.
Height from rail to eaves, lower deck.....	11 ft.	$2\frac{1}{2}$ in.
Height from rail to eaves, upper deck.....	13 ft.	$3\frac{1}{2}$ in.
Height from rail to top of roof.....	14 ft.	$\frac{1}{2}$ in.
Seating capacity.....		36 persons
Weight when fully equipped with ice, coal, water and supplies.....		160,000 lb.

Some of the fundamental features of the design are: area of center sill 50 sq. in.; ratio of ratio unit stress to end load 0.024; draft gear travel $2\frac{3}{4}$ in.; maximum coupler side motion travel, total, 18 in.; thickness of draft follower plate



Cast Steel Side Frames Reduce the Weight of the Truck and Decrease the Number of Parts

deck plate, the lower deck roof, $1/16$ in. thick, being riveted directly to the posts. The deck plate is $\frac{1}{8}$ in. thick and the upper deck roof sheets are $3/32$ in. thick. The roof sheet joints are welded.

Vestibules have been omitted since passengers enter the dining cars only from adjoining cars. End protection against collapse is of the same strong construction used in all Pennsylvania System steel passenger equipment cars, which for non-vestibule cars consists of one 12-in. I-beam on each side of the doorway and two Z-bars, one 4 in. by 8.2 lb. and one 3 in. by 6.7 lb., at each corner, with pressed steel diagonals between corner and door posts. Standard diaphragms are attached to the I-beams.

$2\frac{3}{4}$ in., section modulus all vertical end members 100, and for those either forming or adjacent to door posts 76.

The air brake is the Westinghouse type UC-1812, without the electro-pneumatic attachments, although this feature can be readily applied, as the wiring has been installed. The cars are heated with vapor, having a thermostatic control and may also be operated manually, the thermostat being located at the center of the car between windows.

The lighting effect in these cars is very satisfactory, semi-indirect lights being used, one over each pair of tables. Each fixture contains a 100-watt lamp, which makes a very efficient light. Between each pair of lamps is an electric fan with an air deflector or distributor, which produce a move-

ment of air at intervals of about 20 times per minute. This feature of intermittent breeze eliminates the steady gust of air common to many types of electric fans.

The draft gear is the Westinghouse type N-11 with attachments for cheek castings at least 25 per cent stronger than the A.R.A. requirements for freight cars. The cheek castings are riveted directly to the webs of the center sill channels and the tail yoke is cast steel with quadruple shear attachment to the stem, which has the latest A.R.A. type D head.

The trucks are of the six-wheel clasp brake type and have a wheel base of 11 ft. 0 in. The axles are of the special Pennsylvania System type with $5\frac{1}{2}$ -in. by 11-in. journals, and the wheels are rolled steel, 36 in. in diameter. The general scheme of the trucks is the same as used on all former Pennsylvania System cars, the bolster being of riveted plate construction, which has been exceedingly satisfactory

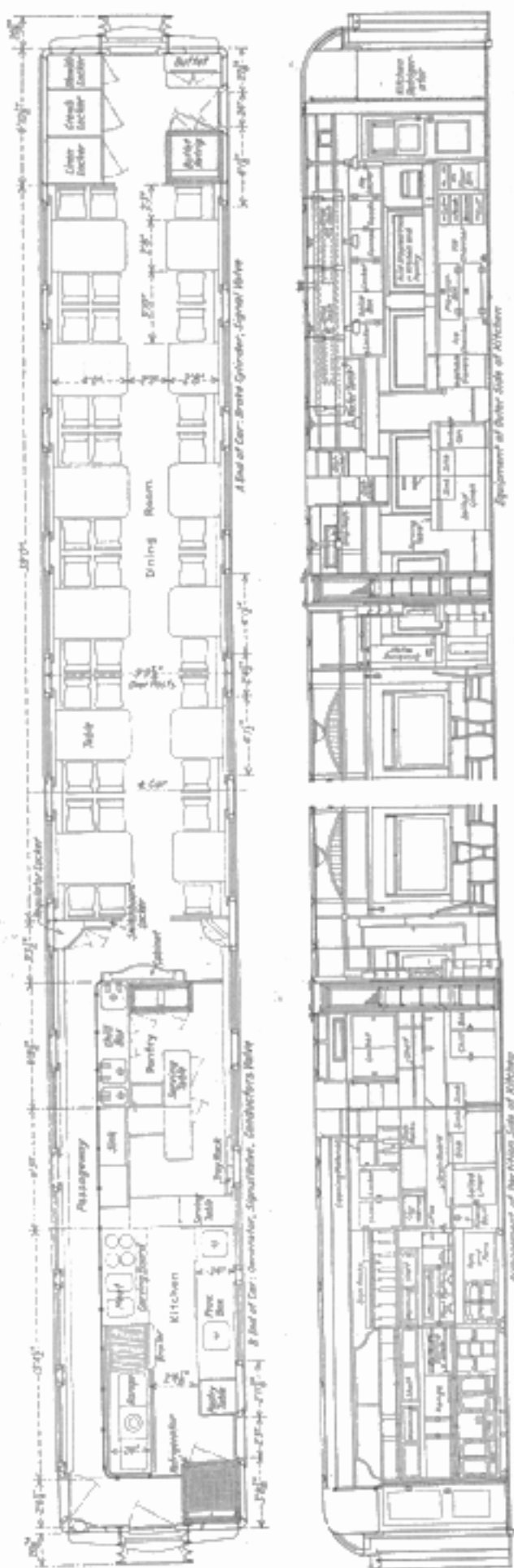


The Interior is Finished in Olive Green

on previous cars. It was designed to flex readily in a horizontal plane, but is rigid against transverse and longitudinal strains.

The truck bolster is supported on sets of quadruple elliptic springs, one set under each end of each spring beam. The equalizers supporting the elliptic springs have one end hung from the truck frame, the other being attached to an inverted U-shaped equalizer and hanger combined, which rests on the helical spring located over the center journal box. These trucks have exactly the same characteristics as the two axle passenger trucks, but with increased wheel base and a third or floating axle placed between the other two. The helical springs are supported directly on the journal boxes, which in turn are guided as usual in pedestals. It will be noted that this arrangement results in having the least possible non-spring-supported weight and, therefore, the least possible kinetic effect on rails. The features which differ from the old trucks are the journal boxes and side frames.

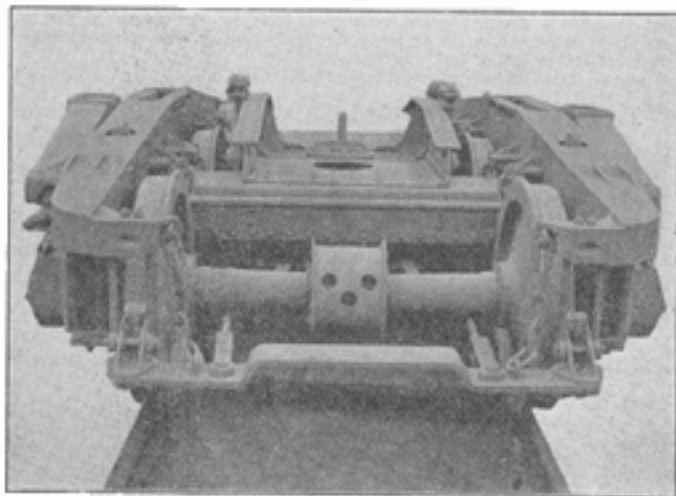
The journal boxes are of cast iron of a special mixture sometimes called semi-steel and also cylinder iron. The faces which bear against the pedestal legs are chilled and



Plan of Pennsylvania Diner and Elevation, Showing Kitchen Arrangement

the pedestals have renewable $\frac{3}{8}$ -in. plate steel wearing shoes riveted thereto.

The older trucks had side frames built up of channels, cast steel pedestals, spacing pieces, cross braces, etc. In the new truck all of these parts are combined into two cast steel frames, one on each side, connected flexibly by only two 2-in. transverse rods located respectively between the center and each end axle. Each frame can, therefore, readily adjust



End View of the Truck

itself, independent of the other frame, to meet track irregularities. Also, since the bolster is flexible in a horizontal plane, it in turn can adjust itself to the various positions taken by the side frames and, being rigid longitudinally, holds the side frames in correct transverse alignment. The cast-steel side frames were designed to be interchangeable with the old built-up side frames so that when repairs are necessary to old trucks the cast-steel frames, which weigh

less than the built-up frames, can be substituted. The total weight of each truck is 23,000 lb.

The interior of these dining cars is arranged so that there is a large dining room, seating 36 persons. They are finished in plain mission style of architecture, the walls being painted a medium shade of olive green with striping of a darker shade of green edged with gold. The ceiling is cream color striped with dark green. The carpet and curtains are of a green shade. The color of the side walls is very unique and has been the subject of many complimentary remarks from passengers.

At one end of the dining room are located the linen lockers, crew's lockers and steward's lockers, while on the opposite side of the passageway there is a large refrigerator used by the steward for mineral waters, etc. A humidifier is built into the refrigerator, but is made so that moisture from the refrigerator cannot enter the humidifier. There is also at this end of the car a buffet for the use of the steward.

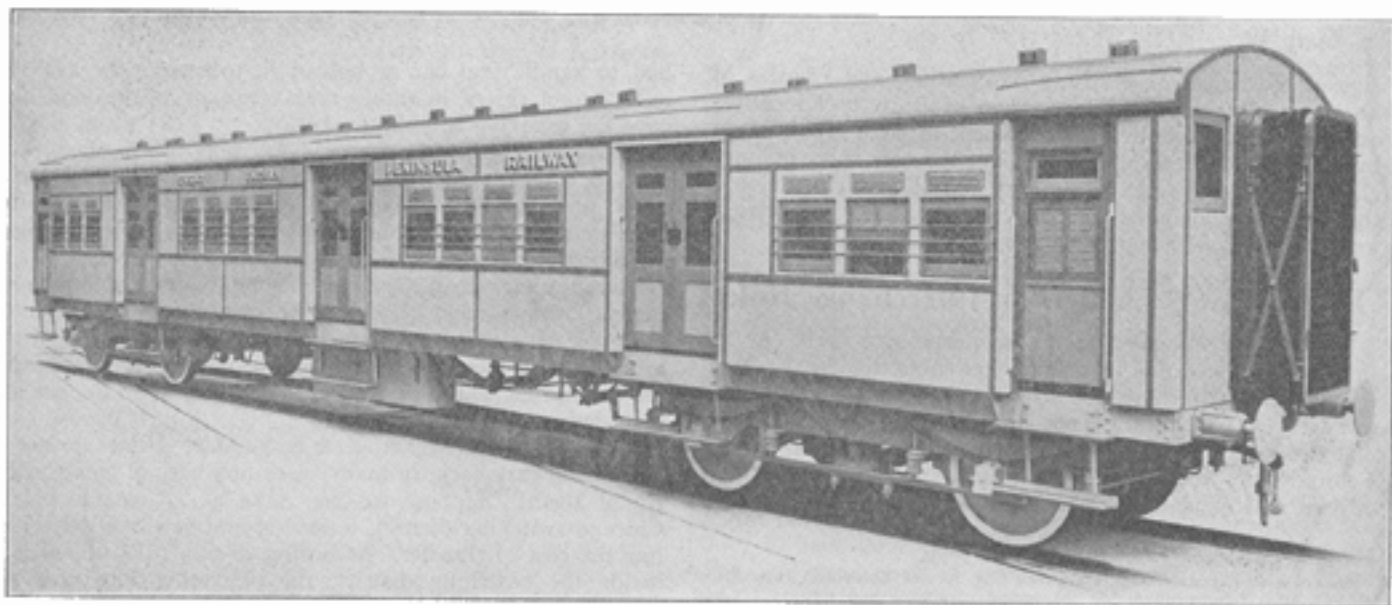
At the other end of the dining room the pantry and kitchen are located. These are arranged especially for quick service, the kitchen and pantry being in one without a partition between them as is usually the case, which permits the waiters to enter the kitchen and allows more freedom for the men.

The kitchen and pantry have a number of special features, such as a water filter for filtering all water used on the tables, separate coolers for milk, cheese, butter, meats and fish.

The refrigerators are of special design, being constructed as two separate steel boxes as nearly air tight as possible, one inside the other, with three layers of 1-in. cork board and two layers of paper between. The only connection between the outside and inside walls of the refrigerator is the aluminum door frame and this is separated from the steel plates by fibre insulation. The chill boxes in the pantry and kitchen are similarly constructed.

The table tops, sinks and splash boards are of monel metal, which, being rust proof, gives very satisfactory service for such parts.

— — — —



Steel Coach for Great Indian Peninsula Railway

Steel construction has been used for the recent passenger cars built by Cammel, Laird & Co., Nottingham, England, for use in India. The first-class vestibuled coach shown is 67 ft. 10 $\frac{1}{4}$ in. long over end sills, 10 ft. wide and of 5 ft. 6 in. gage. The trucks, spaced on 48 ft. centers, are of the swing bolster type with coil springs under the bolster and semi-elliptic springs over the journal boxes. The wheels are of 43 in. diameter, the journals 4 $\frac{1}{2}$ in. by 9 in., and the truck wheel base 10 ft. Screw couplers,

side buffers and vacuum brakes with two 21-in. cylinders are in accordance with British practice. Roof ventilators, louver ventilators over the windows and asbestos mill board insulation are provided on account of the tropical climate. The interior wood finish, the transverse seats, the electric lights and other fixtures were applied in India, the cars being dismantled and shipped in sections. Seats are of the longitudinal type. Side doors and vestibules provide for quick loading and inter-communication.