

and *Approach Next Signal Prepared to Stop*, but is incapable of displaying the aspects considered necessary on many of the railroads at interlockings, and it cannot be used as an adequate substitute for the method of signaling which gives definite information of the condition of three blocks ahead, or to indicate *Approach Next Signal at Restricted Speed*, an aspect frequently displayed approaching an interlocking with long crossovers; consequently, in the present state of development, a less favorable indication must be used on the cab signal at such points; but where an automatic stop is used, with the forestalling feature in the hands of an expert and alert engineman, it need not be anticipated that train operation will be greatly retarded.

An analysis of the fatalities preventable by train control, on the Pennsylvania Railroad at least, shows practically all of the few we have had resulted from collisions at slow speed which train control theoretically might have but, as a matter of fact, would not have prevented; or through enginemen missing entirely or unintentionally overlooking the signal, which the cab signal would have checked in a great majority of cases. Our accident at Manhattan transfer would not have been prevented by cab signal or train control.

The cab signaling we use has the same basic principles as the roadside signaling—that is, closed continuous cir-

cuit and the light signals without movable parts; and this is one of the reasons why the design can be considered as safe as that of the roadside signal, although, in its present development, it is more liable to so-called safe failures, it being subject to practically all the failures incident to the wayside signals in addition to those caused by defective apparatus on the engine.

It must also be realized that, conservatively estimated, 75 per cent and possibly over 90 per cent of these reported failures consist solely of flips of a few seconds duration, somewhat similar to the flipping of fixed signals, and which would not have been noticed if it had not been for the fact that in many cases they resulted in a brake application with the continuous train control. It should also be remembered that these signals have been much more closely watched than fixed signals would have been, as several observers have been assigned constantly for this duty. The cab signal is always in view of the engineman. The fixed signal may engage in calisthenics unnoticed, due to the absence of observers at the time of the performance, whereas, if a cab signal "pumps" it will surely be observed. The cab signal may be substituted for those signals whose aspects it is capable of duplicating, as for instance, the three-position automatic signals; but it cannot take the place of signals giving additional indications.

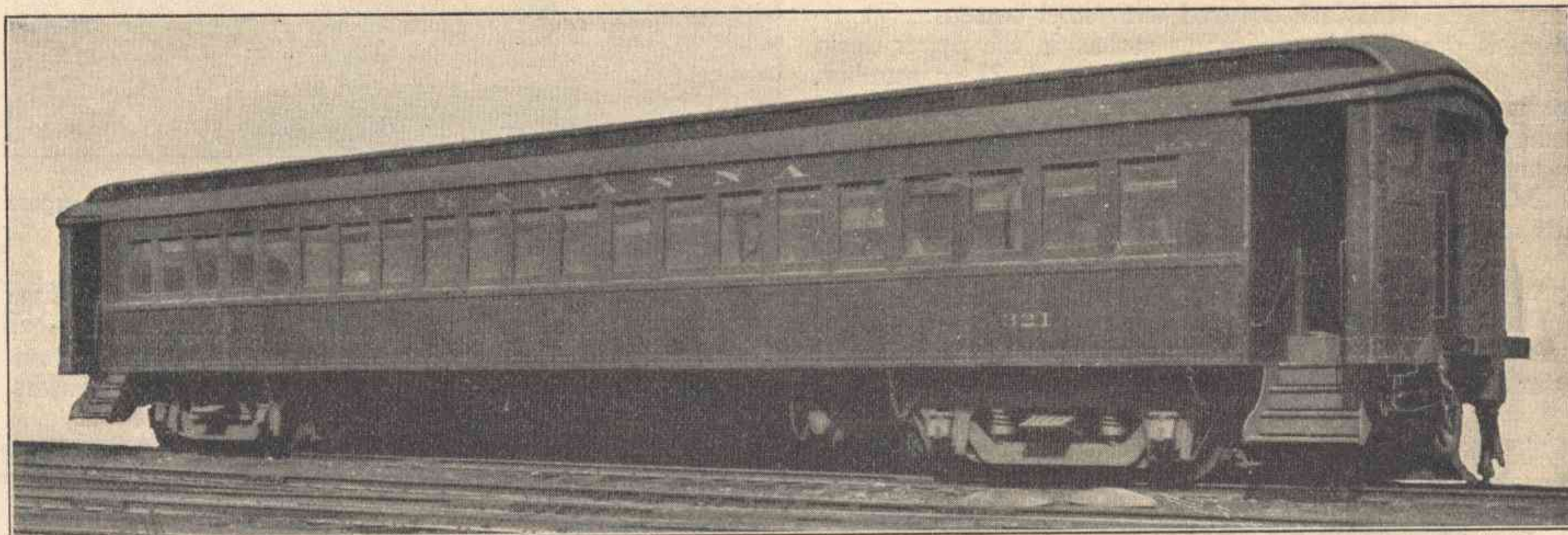
Suburban Cars for the D. L. & W.

New equipment designed with view to possible use in multiple-unit service

THE Delaware, Lackawanna & Western has recently placed 50 new steel suburban coaches and 10 suburban combination passenger and baggage cars in service between Hoboken and outlying points in the New Jersey suburban district. The 50 coaches were

may be easily transferred to and arranged for operation in multiple unit service should the Lackawanna, at some future date, decide to electrify its suburban territory.

The cars are of steel construction throughout with steel interior finish. The underframe and superstructure



Delaware, Lackawanna & Western Suburban Passenger Coach

built by the Pullman Car & Manufacturing Corporation and the 10 combination cars were built by the Bethlehem Shipbuilding Corporation, Ltd.

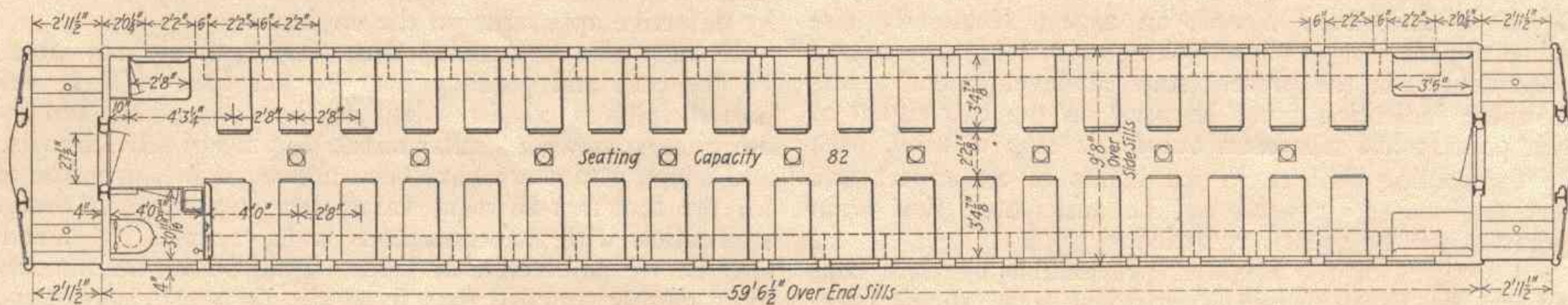
This equipment, in general design, follows closely the more recent steel suburban cars now in service. However, several important detail changes have been made in the design of the body and underframe so that the cars

details have been so designed as to provide the maximum possible strength consistent with weight limitations. The center sills are of the box girder type consisting of two 10-in., 23.6-lb. ship channels with 5/16-in. top and bottom cover plates. They extend in one length between the buffer end sills. In addition to the buffing shocks, the underframe is designed to carry the weight of any electrical

apparatus which may later be suspended beneath the car. The body bolsters are built up of pressed steel shapes and plates and extend from side sill to side sill.

The flooring consists of an under flooring of steel plate supported on the underframe, over which is placed one

toilet fixture are provided with 25-watt type "C" lamps. The generating equipment consists of a Gould ball-bearing, 30/40 volt generator with body suspension, generator regulator and lamp regulator. A two-compartment switch and regulator panel locker is provided having



Floor Plan and Seating Arrangement of the Coach

course of 3/4-in. 3-ply Salamander insulation. There is an air space between this insulation and the No. 24 gage galvanized steel Chanarch flooring which has 5/8-in. depressions. This flooring is secured to the floor supports in such a manner as to carry the load independent of the lower or deadening floor. Over the Chanarch is laid a 1/2-in. layer of Flexolith composition flooring. Around the sides and ends of the car the composition flooring is laid with a cove of about one inch to prevent water getting in behind the interior finish when the floor is washed. Vestibule end windows with steel sashes are provided. The vestibule space and window location are designed for the possible future installation of a motor-man's electric controller, brake valve, gages, etc.

As previously described, the car body is of steel construction with steel interior finish. Inside of the side, end and roof sheets is placed a layer of 1/4-in. Salamander hair felt insulation. Back of the inside finish, below the window stools, one course of 1/2-in. Salamander is applied. This insulation is covered with cloth on each side and stitched. Insulation is used between the backs of all interior finish sheets and the faces of the framing members in order to break direct metallic connection through the side walls of the cars. The headlining is Agasote, 3/16-in. and 1/4-in. thick in the lower and upper decks, respectively. All joints are covered with steel battens. Ventilation is provided by swinging sashes in the upper deck.

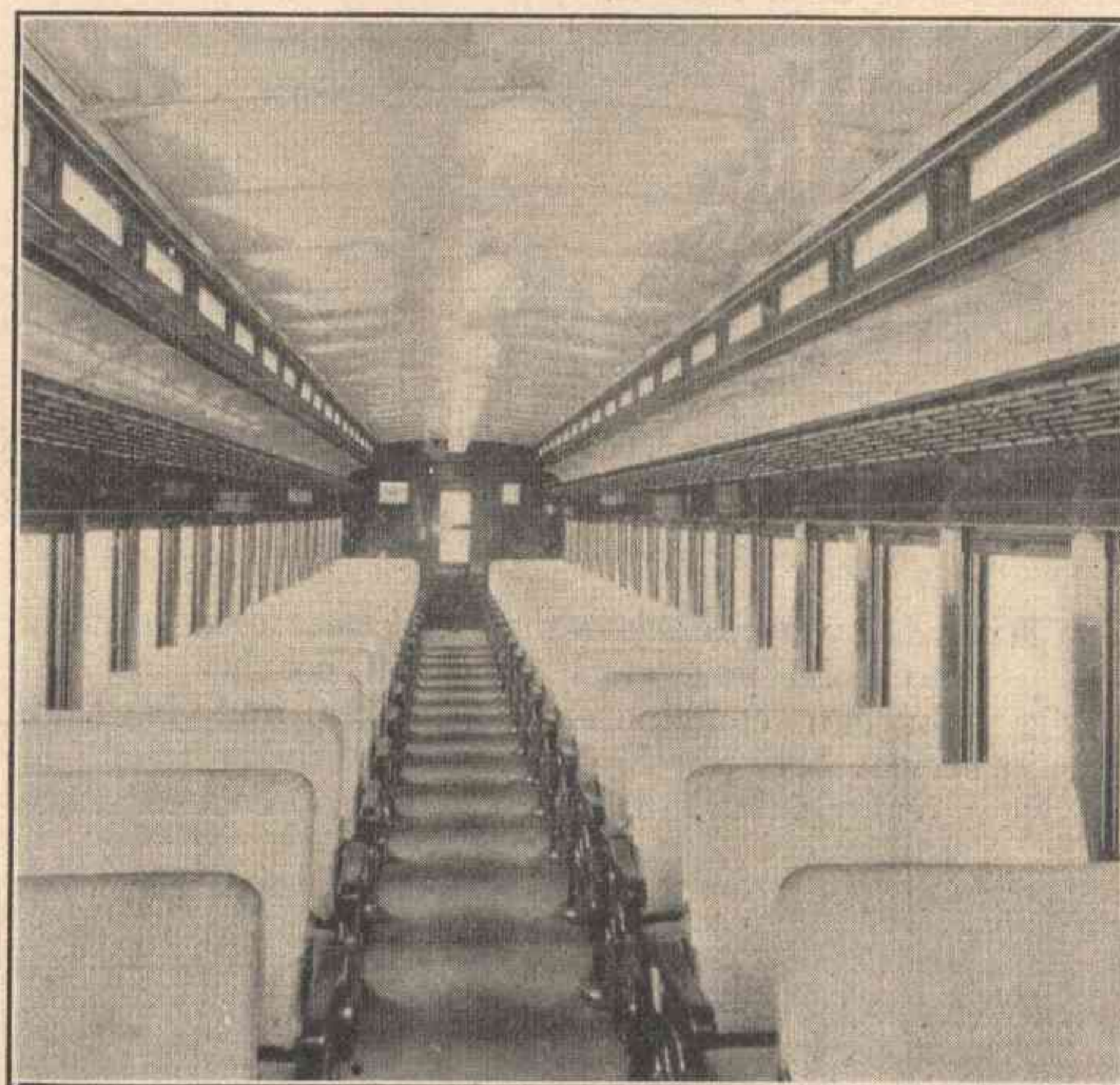
Single window frames of welded steel, 21 in number, are riveted to each side of the car body. Single wood sashes of 7/8-in. Mexican mahogany are fitted in such a manner as to provide unobstructed vision when raised. O. M. Edwards window fixtures are used. The window sills are also of Mexican mahogany.

Lighting Facilities Well Arranged

The interior lighting is provided by nine center fixtures fitted with Corona bowl and 50-watt type "C" lamps. Four flush platform fixtures, one over each step, and one

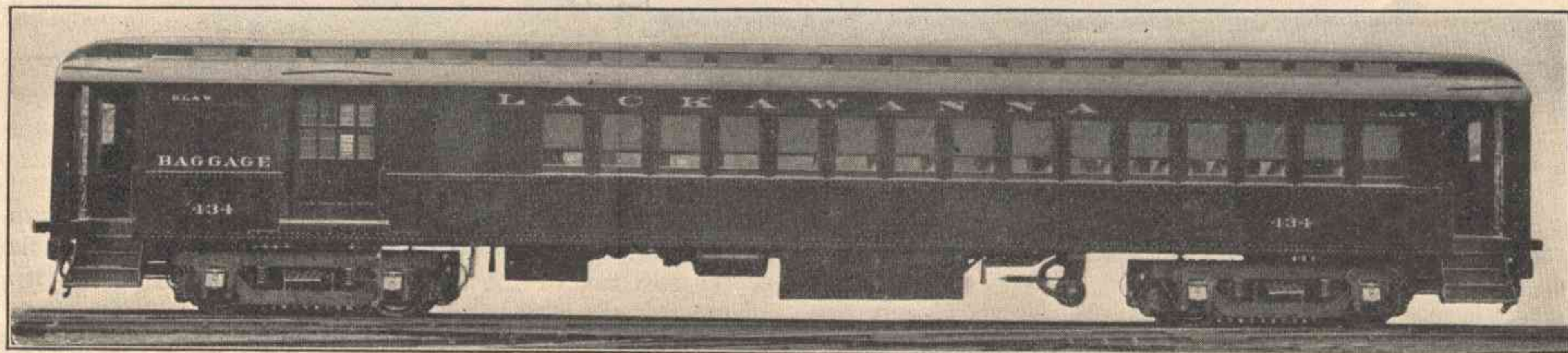
automatic door-controlled panel lights. The storage battery equipment consists of 16-cells of lead plate battery having a capacity of 200 ampere-hours. This is housed in a steel battery box.

The latest type of Gold vapor heating system is used



The Coaches Have Seating Accommodations for 82 Passengers —Continuous Parcel Racks Are Provided

in the cars, designed to maintain a comfortable interior temperature. The heating equipment is installed in such a manner that it can be removed at any time without marring the interior and replaced by electric heaters.



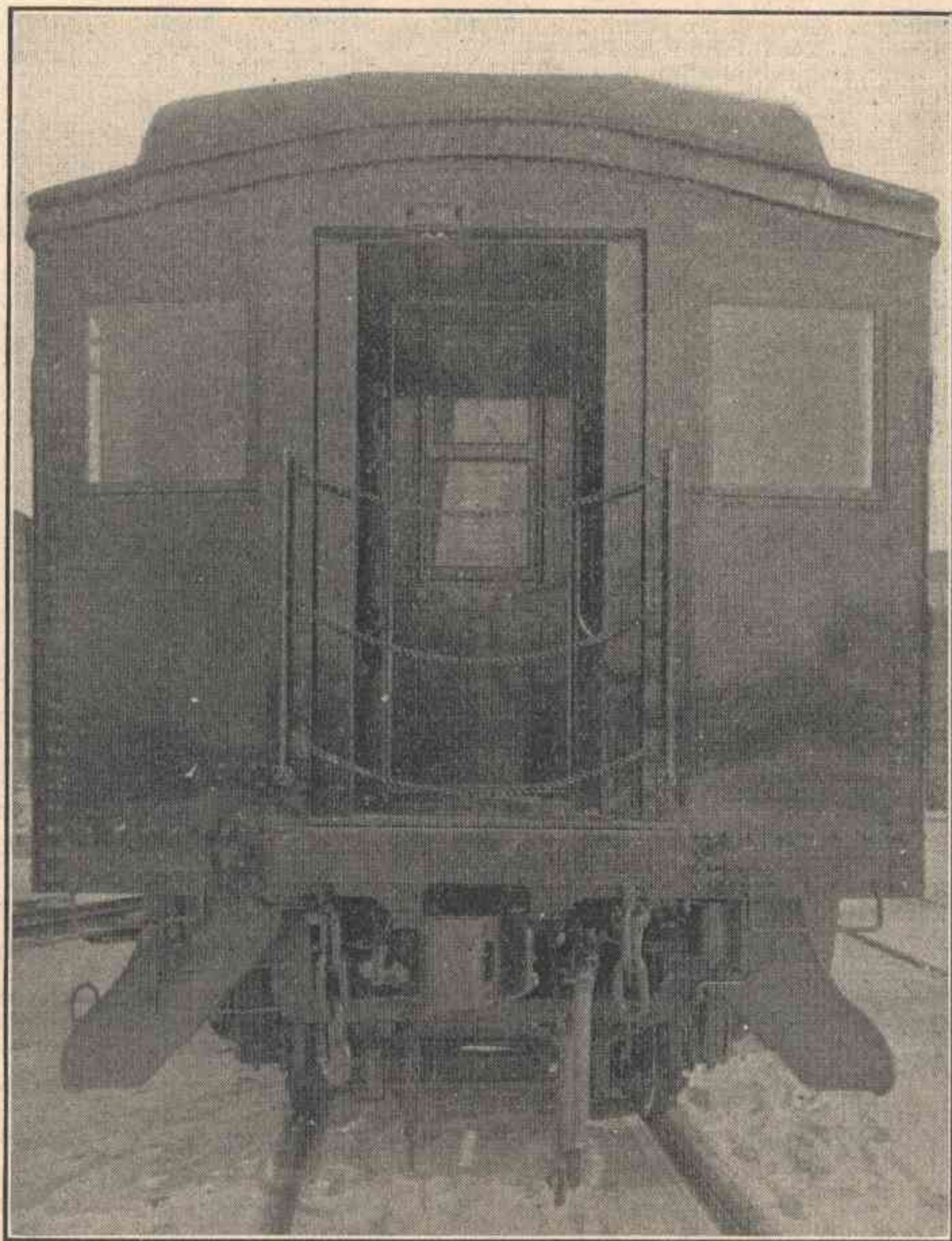
The Combination Cars Have a Seating Capacity of 58 Persons

The seats are of the Walkover type, manufactured by Hale & Kilburn, with twill rattan fabric cushions and backs and Mexican mahogany arm rests.

The cars are equipped with the Westinghouse UC air brake equipment arranged for clasp brakes and slack adjuster, to provide a braking power of 90 per cent of the light car weight with a brake cylinder pressure of 60 lb. All brake rigging is designed with ample strength for 105-lb. cylinder pressure.

Four-wheel trucks are used, with the Commonwealth Steel Company's one-piece truck frames, cast steel truck bolsters, 5-in. by 9-in. journals and 36-in. rolled steel wheels.

The light weight of these cars is approximately 106,000 lb. With a seating capacity of 82 persons, the weight per seated passenger is slightly less than 1,300 lb.



End View of the Car Showing the Box Type Vestibule with End Windows

The length of the cars over buffers is 70 ft. 6 in. and the height from the rail to the top of the roof at the center is 13 ft. This height is somewhat less than existing equipment and the roof structure is designed for the future application of a pantagraph and headlights.

The 10 combination passenger and baggage cars previously mentioned are of substantially the same design and equipment, having a baggage compartment with an inside length of 17 ft. 3 in. and a seating capacity of 58 persons in the passenger compartment. The combination cars have a total light weight of 106,700 lb. and the total weight of the two trucks complete is 32,200 lb.

THE PURCHASING AGENTS' ASSOCIATION OF CHICAGO, composed of purchasing agents of industries located in Chicago, has opened an office at 14 E. Jackson street, Chicago, through which it will supply information to its members.

The Railway Mail Service*

By Edwin McGrath

Superintendent of Railway Mail Service, Eighth Division.

TRANSPORTATION of mail has naturally improved in method and device along with other classes of transportation. I believe the first record of railway mail carried dates from 1830 when it was commenced on part of what is now the Baltimore & Ohio system between New York and Washington. Prior to the inauguration of parcel post service, the carriage of mail was comparatively simple except perhaps on some of the main line trains. The mail was carried in pouches and sacks and was not so great in volume that it could not be easily handled in the available space provided for baggage and express. Subsequent to the inauguration of the parcel post the mails grew burdensome even on the small lines. It is a question in my mind if the parcel post system as organized is just what it should be, but it must be administered under the laws provided by Congress. Railway mail service has grown from a few hundred miles in 1830 to 240,000 miles. This is not a small business to the railroads although it may not appear so large when distributed among the different roads. It might not be amiss to say that last year we paid to the railroads \$100,000,000 for the transportation of U. S. mail. We now have some 5,000 mail cars, 3,000 of which are steel, and in a year handle some 17 billion pieces of mail.

It is the duty of the railroads to load mail into storage cars and to take the mail therefrom. In the case of railway mail postal cars the clerks load and unload the mail. The department is not as strict in regard to connections as it was when the mails were smaller. It does not expect connections to be made if at all impracticable and if it is likely to cause material delay to a train. While the department will not insist on connections it does insist that connections be not missed without authority from the department, which authority is generally granted when justified.

Many improvements have been made by the railroad companies in postal cars in recent years, which have added to the comfort and efficiency of the mail clerks; and perhaps the greatest of all improvements was the steel postal car. Since their inauguration the death rate among the postal mail clerks has decreased materially. A few years ago it was not unusual to lose as high as 20 men in a year and I believe it went as high as 32 once, while last year we lost but 2 men.

Compensation for handling mail for the last four years has been in the hands of the Interstate Commerce Commission. They fix the rates, while the postage rates are fixed by Congress. Possibly the greatest burden to us and the greatest source of dissatisfaction to the railroads and express companies was the increasing of the size of packages to be handled. If we hold that the primary purpose of the postal department is to handle written and printed matter in small packages, we must view with alarm the increasing burden in the way of parcel post of all sizes and descriptions. The I. C. C. has the authority to fix the express rates as well as the parcel post rates and it may be that some day it will realize that it costs the government just as much to handle this class of mail as it does the railroad or express company; and they may adjust the rates so that we will be relieved of some of the burden and part of the business will go back to the express and railroad companies which have better facilities for handling it.

*An abstract of an address before the Pacific Railway Club, San Francisco, Cal.