

All-Steel Suburban Passenger Cars for the Erie

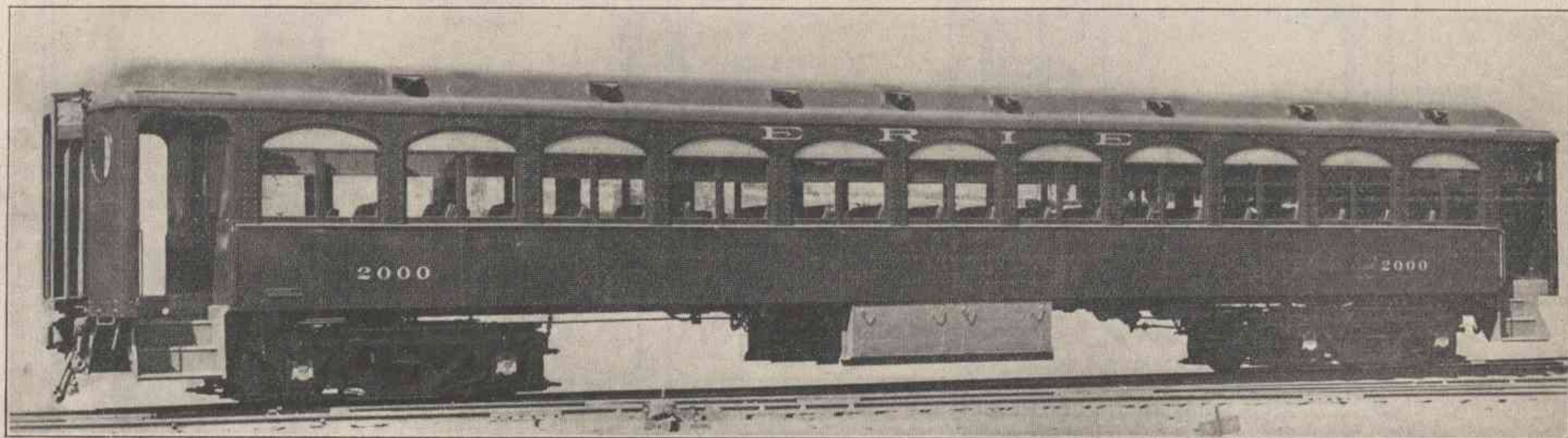
Coaches Have Seating Capacity of 86 and Are Exceptionally Light in Weight; Built for Future Electrification

A train of eight suburban passenger cars of all-steel construction, consisting of seven coaches and one combination baggage and smoker, has recently been placed in service by the Erie Railroad. The cars were built by the Pressed Steel Car Company, Pittsburgh, Pa., from designs prepared by L. B. Stillwell, consulting engineer, New York.

The design of these cars was made with a view to meeting the following conditions: Safety and comfort of passengers; low cost of operation; low cost of maintenance, and moderate

weight per foot of over-all length, when compared with the lightest wooden cars in the same company's service.

The comparison per foot of over-all length is unaffected by the seat spacing, and is particularly interesting in this instance, as the new cars include heavy buffing and friction draft gears, as well as heavy draft sills, whereas the lightest wooden car has only the platforms and wooden draft sills with tandem spring draft gears. The light weight can be attributed to the exclusion of all unnecessary members. The deep and heavy center sill

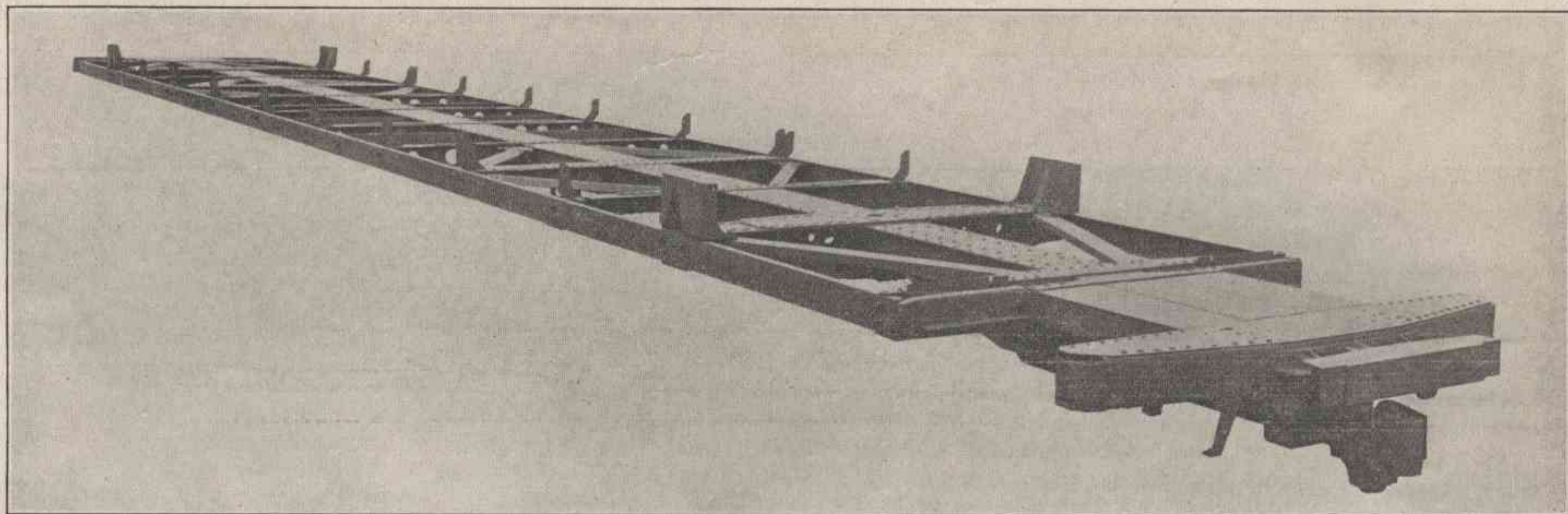


Erie All-Steel Suburban Coach

first cost. In general their construction is similar to that of the New York, Westchester & Boston electric suburban cars, described and illustrated in the June 14, 1912, issue of the *Railway Age Gazette*, and while they are built for steam operation, provision has been made for the ultimate addition of electric motive power equipment. One of the points of greatest interest in the construction of these cars is the arrangement of the superstructure, whereby all parts contribute to its strength to with-

stand shocks of derailment, overturning or collision. Other notable features are the light weight per seated passenger and the easy-riding qualities which have developed in service.

construction of the fishbelly type has been dispensed with, and sills of uniform section are supported by the deep side frame through a system of crossbearers. Provisions for application of electric motive power equipment consist in the suitable height and outline of roof to permit of application of overhead current collector if required; the arrangement of vestibule for application of platform control equipment; the arrangement of underframe members for the support of elec-



Underframe; Erie All-Steel Suburban Cars

trical motive power equipment in the most advantageous manner for operation and for thorough inspection and maintenance of apparatus, and the design of draft sills, bolster and of truck whereby clearance is provided for electric motors.

The center sill construction of these cars is of uniform depth and section between bolsters, and consists of two 8-in. 16.25-lb. channels spaced 14 in. back to back, with a 19-in. by 3/8-in. top cover plate and two 4-in. by 3 1/2-in. by 3/8-in. angles reinforcing the bottom flanges. This gives a total section of 22 sq. in. Forward of

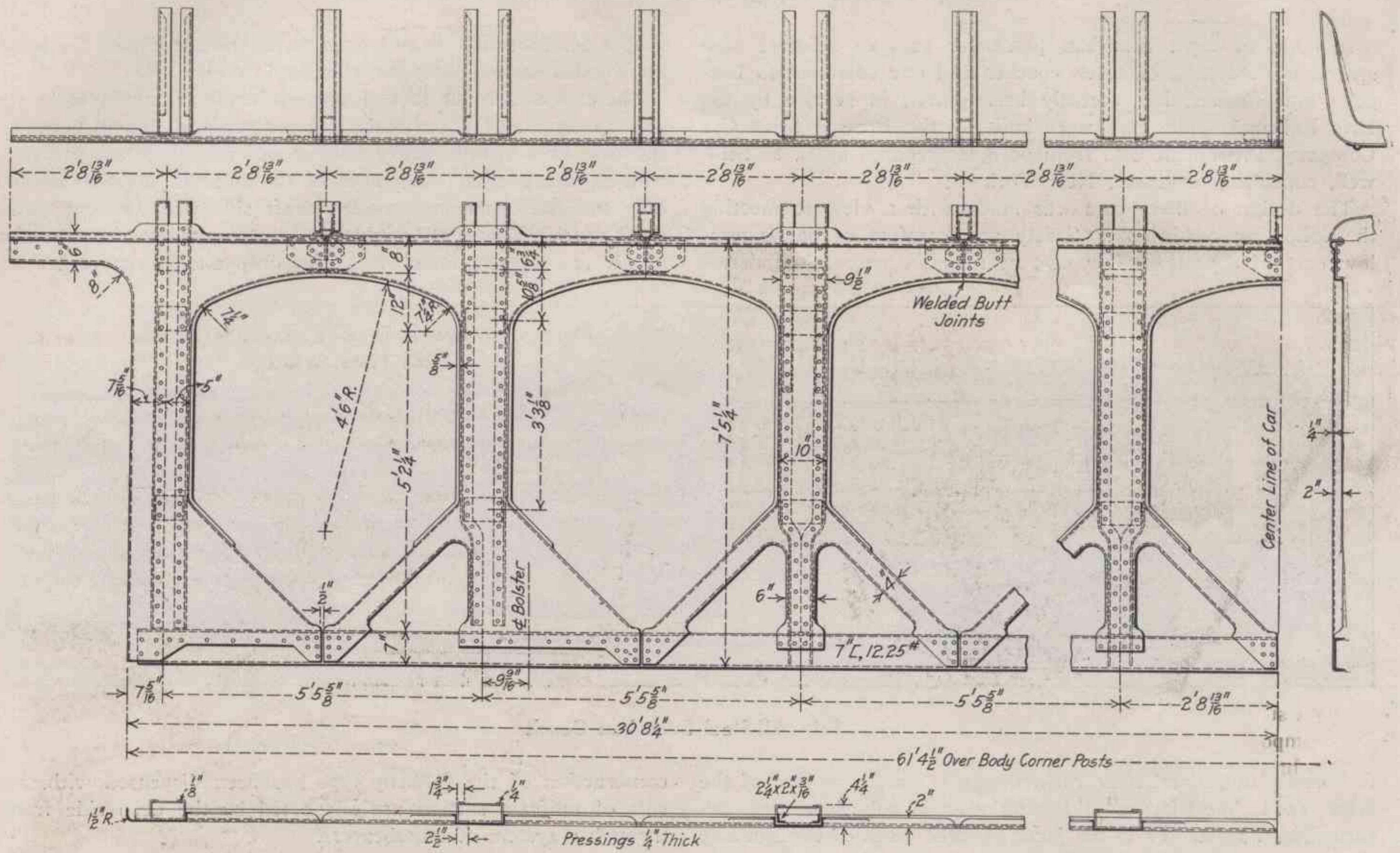
The coaches are 70 ft. 4 in. long over-all and weigh complete 95,400 lb. The table on page 1245 of comparative weights of Erie passenger equipment shows that the total weight is less than that of two classes of steel underframe passenger cars having a smaller seating capacity. It shows further that the all-steel car weighs less per seated passenger and closely approximates the

stand shocks of derailment, overturning or collision. Other notable features are the light weight per seated passenger and the easy-riding qualities which have developed in service.

the bolsters deep pressed steel draft sills extending through the bolsters reinforce the center sills and at the point of maximum depth add 10 sq. in. to the section.

The center sill construction forward of the bolsters is sup-

ported by the high side frames through the body end sill and bulkhead construction. As the rigidity of an all-steel car underframe makes the use of a heavy draft gear practically imperative, and the installation of an effective buffing device equally necessary, the new Erie cars are fitted with a friction draft gear and buffing device calculated

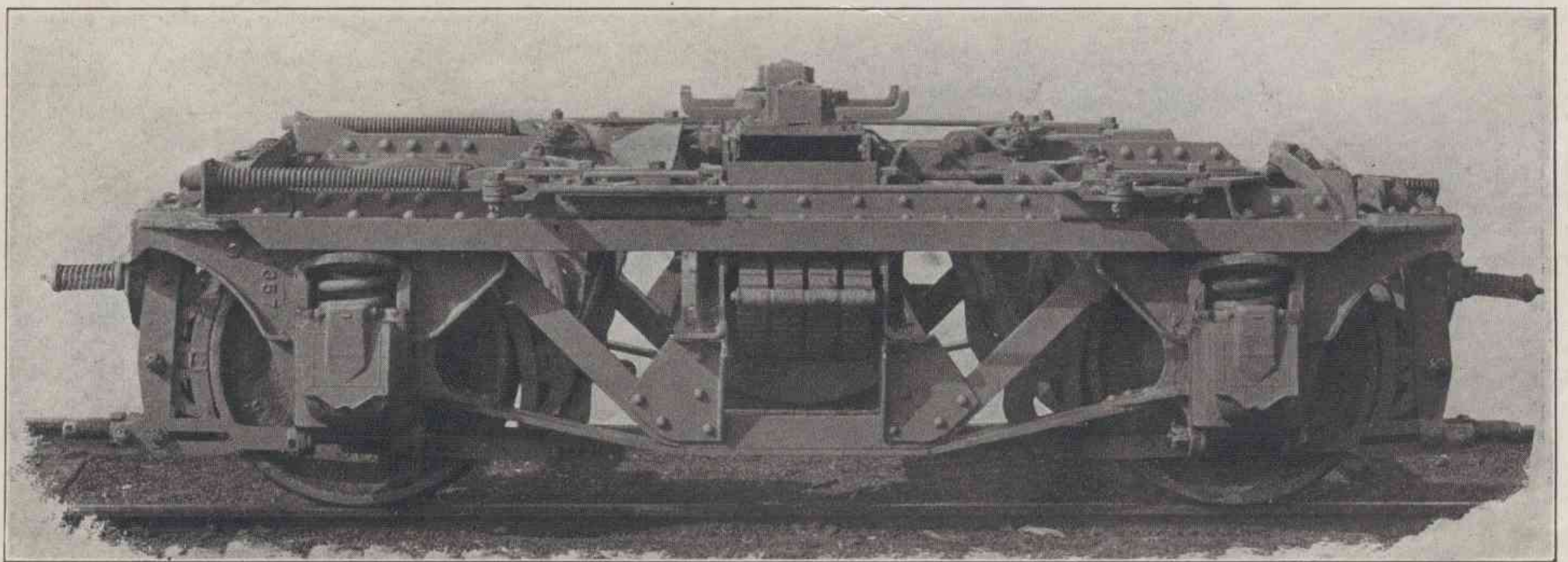


Pressed Steel Unit Side Frame Construction of the Erie Suburban Cars

ported by the high side frames through the body end sill and bulkhead construction. The bending moment occurring at this point due to the eccentric draft gear forces is resisted by the draft sills and is transferred by the body end sill and bulkhead

to be of sufficient capacity to absorb the most severe shocks received in service.

The side frames of the car are 7 ft. 5 1/4 in. from bottom of sill to top of side plate, and are 61 ft. 4 1/2 in. long over body

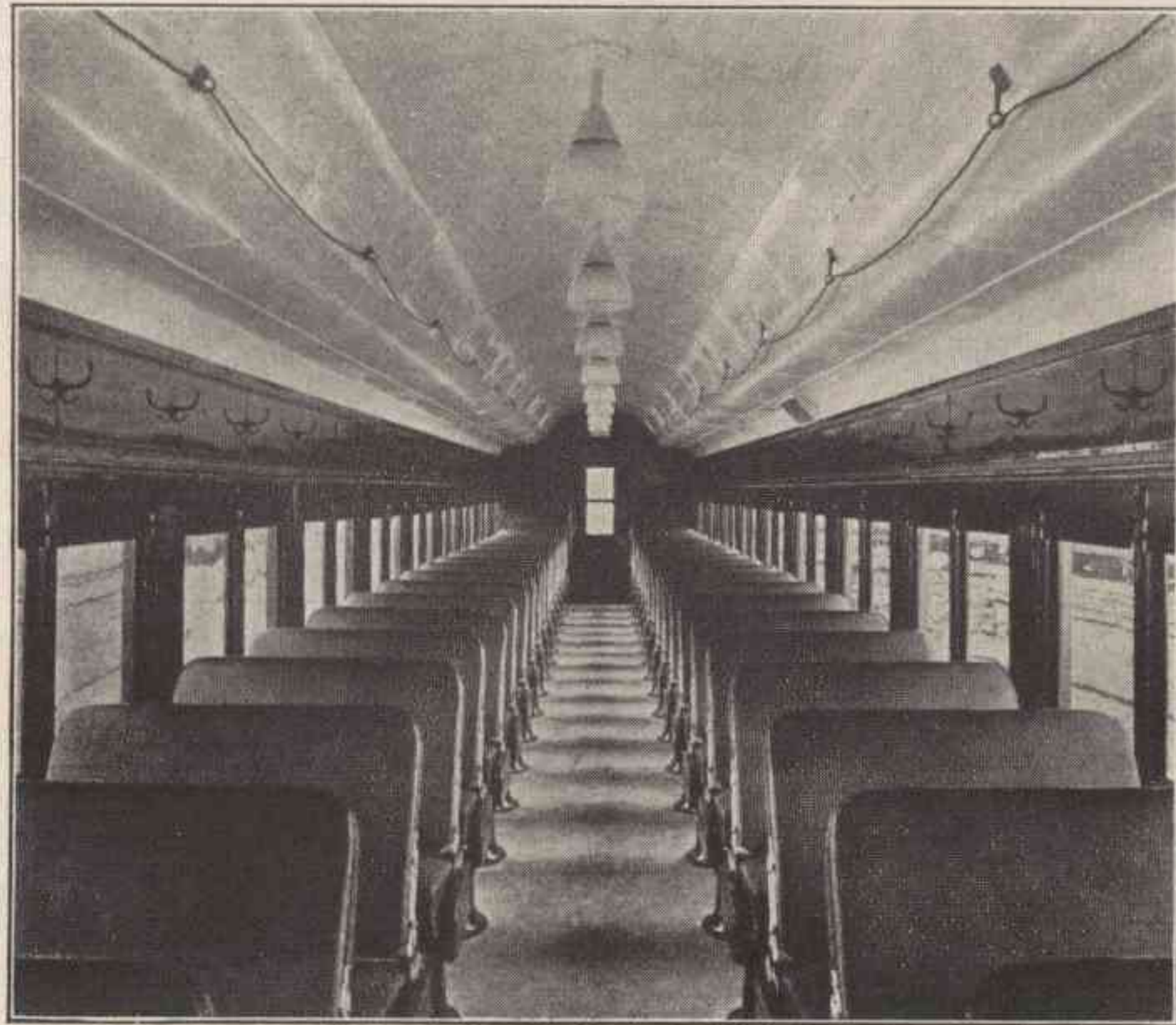


Truck Used on the Erie All-Steel Coaches

construction to the high side frames. The center sill construction between bolsters is thus relieved of any eccentric loading from the draft gear forces, and the full section is available to resist the consequent direct compression because of the support afforded by the high side frames and heavy crossbearers placed under the side posts.

corner posts. The entire frame is designed as a girder, with a pressed steel compression member at the side plate and a 7-in. 12.25-lb. channel tension member at the side sill. The posts connecting these members are of 10-in. pressed channel form, 1/4 in. in thickness, and are spaced 5 ft. 5 5/8 in. between centers. They are furnished with integral diagonal braces below the windows

and with flanged gussets at the portal arches. The vestibule end posts consist of 9-in. I-beams framed into the sills and to the vestibule ceiling construction. The body end walls are fitted

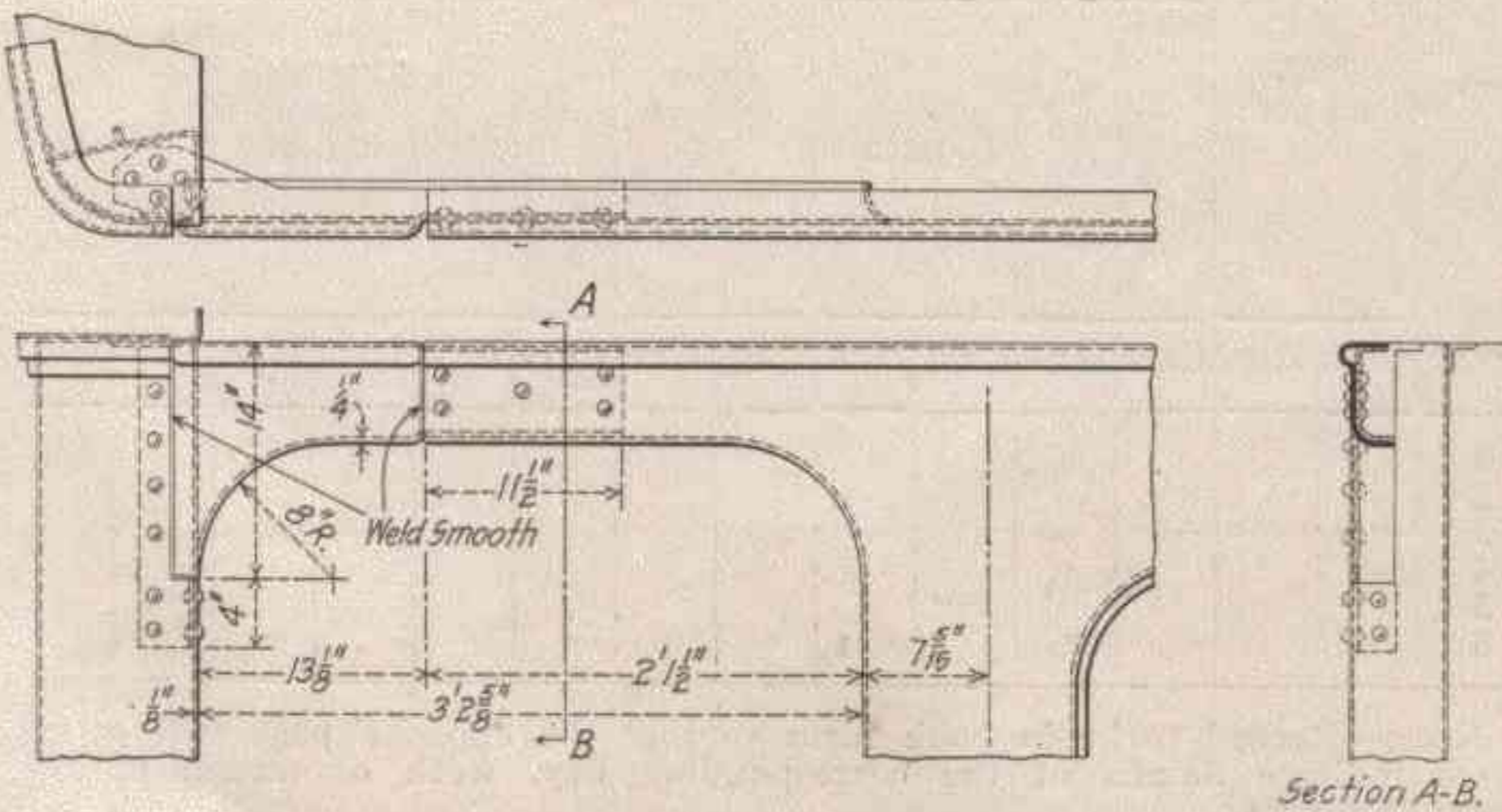


Interior of Erie Steel Suburban Coach

with 1/4-in. pressed steel corner posts 12 in. deep, with gusset connections to the side sills and to the side plates of flanged form 1/4 in. thick, thus bracing the end walls against collapse.

The roof structure is formed of pressed channel carlines, and is of the compound arch type. This form of roof is not only strong, light and inexpensive, but gives good ventilation good distribution of reflected light and is particularly suitable for the support of electric current collectors, should the cars later be fitted with electrical motive power equipment.

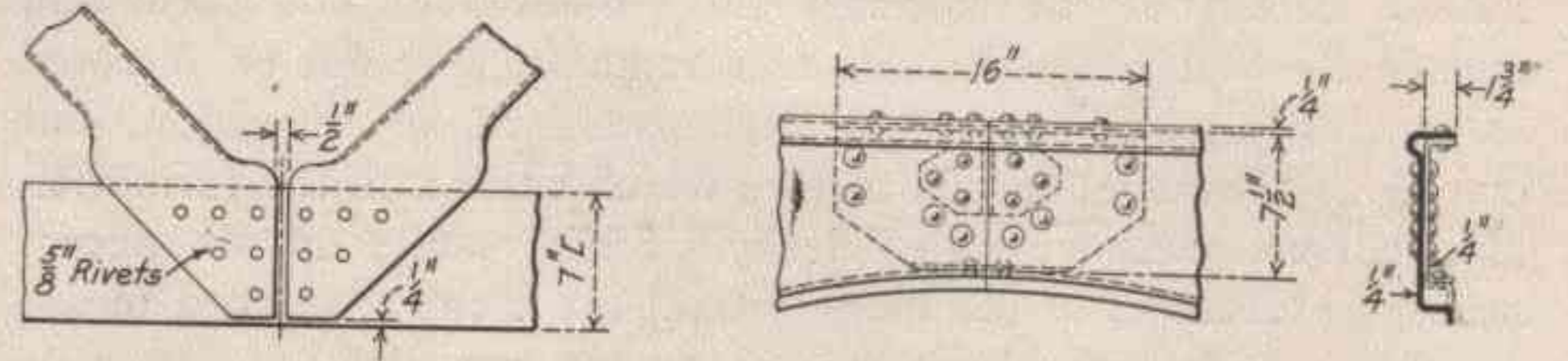
The trucks are 47 ft. 7 1/2 in. apart from center to center and



Detail of Vestibule Corner Post Connection to Side Door Header

are of a non-equalized type, generally similar to those on the Westchester cars previously referred to. They are fitted with coil journal box springs and long quadruple elliptic springs under the bolsters. The proportioning of the springs is such as

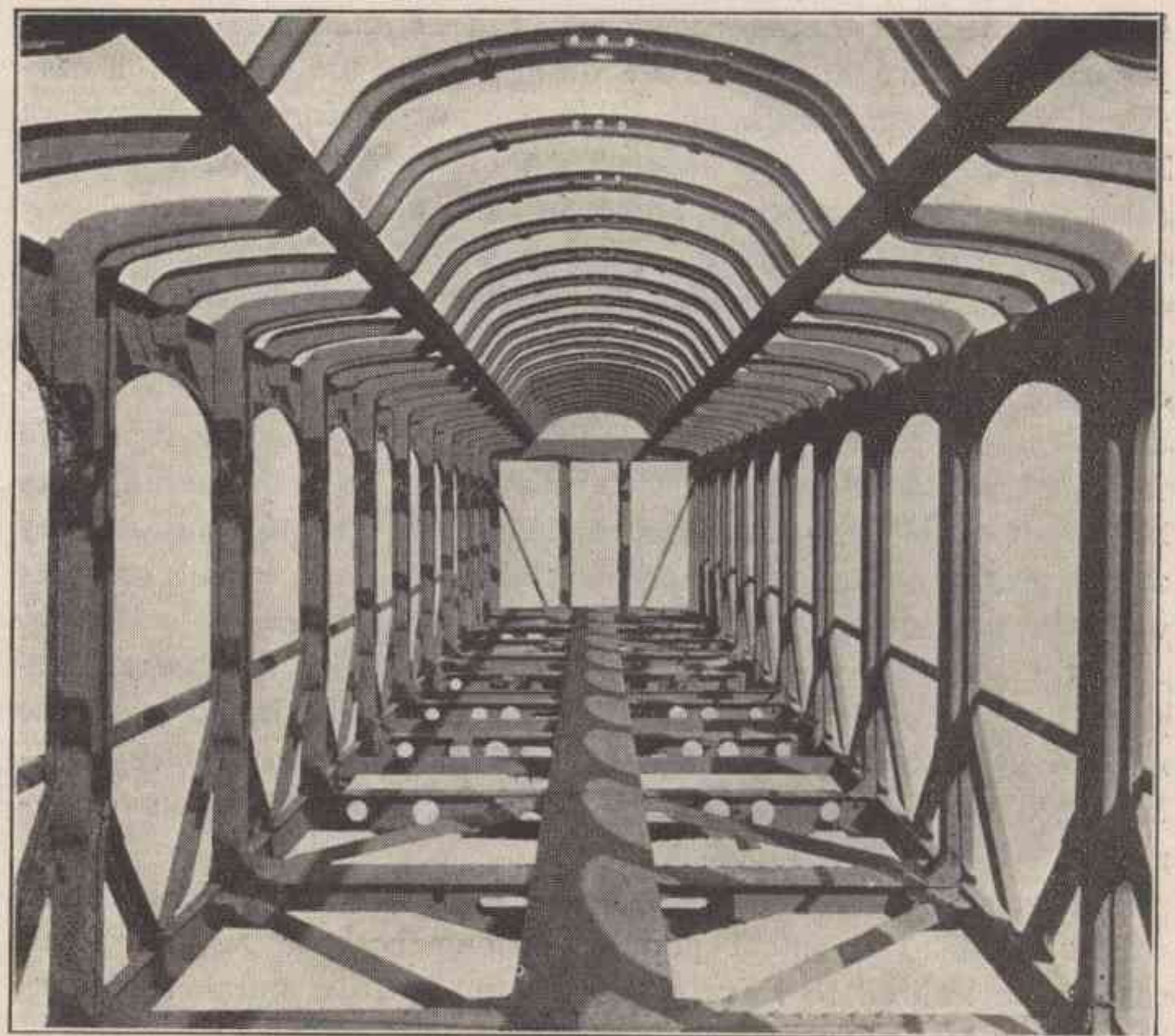
to produce the easy-riding qualities essential in steel car construction, not only for the comfort of the passengers but for the maintenance of equipment and roadbed. The trucks have an 8-ft. wheel base and complete, with clasp brakes and 33-in. wheels with 5-in. by 9-in. journals, weigh 12,500 lb. each. These trucks are designed with ample clearance for the application of electric motive power equipment, if at any future time their use in such service is required. Other features of interest on the trucks are Coleman bolster locking center pins which prevent the separation of car body from truck in case of derailment or collision, and



Details Showing Diagonal Brace Connection to Side Sill and Side Plate Splice

clasp brakes, which greatly reduce brake shoe and journal wear and facilitate smooth stops, which is an especially desirable feature in suburban service.

The illumination of these cars is secured by eleven electric fixtures arranged in center line of car, the form of ceiling outline being such as to reflect and distribute the light evenly over the seats and aisle without producing shadows. One 25-watt lamp is



Interior View of the Completed Framing; Erie Suburban Cars

used on each fixture. Power for lighting is furnished by a Wilson storage battery of 800 ampere hour capacity.

The equipment of the cars includes Miner friction draft gear and buffing device; Pitt couplers and Hale & Kilburn seats. Wherever renewals or maintenance require that a stock be kept on hand the railroad's standard parts have been used.

Number of seats.....	86	72	72	72	72
Average weight, lb.....	95,400	96,500	100,500	83,200	86,600
Weight per seated passenger, lb.....	1,100	1,340	1,400	1,140	1,200
Weight of lighting equipment, lb.....	8,000	8,000	8,000	2,000	6,500
Net weight of car, exclusive of lighting equipment.....	87,400	88,500	92,500	81,200	80,100
Weight per seated passenger, exclusive of lighting equipment.....	1,017	1,230	1,284	1,128	1,112
Length over-all.....	70 ft. 4 in.	66 ft. 3 1/2 in.	66 ft. 3 1/2 in.	66 ft. 3 1/2 in.	66 ft. 3 1/2 in.
Weight per ft. of over-all length, exclusive of lighting equipment.....	1,243	1,333	1,395	1,225	1,210

	Class 1935-1950, steel underframe	Class 1910-1934, steel underframe	Class 1825-1874, wood	Class 1800-1824, wood
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