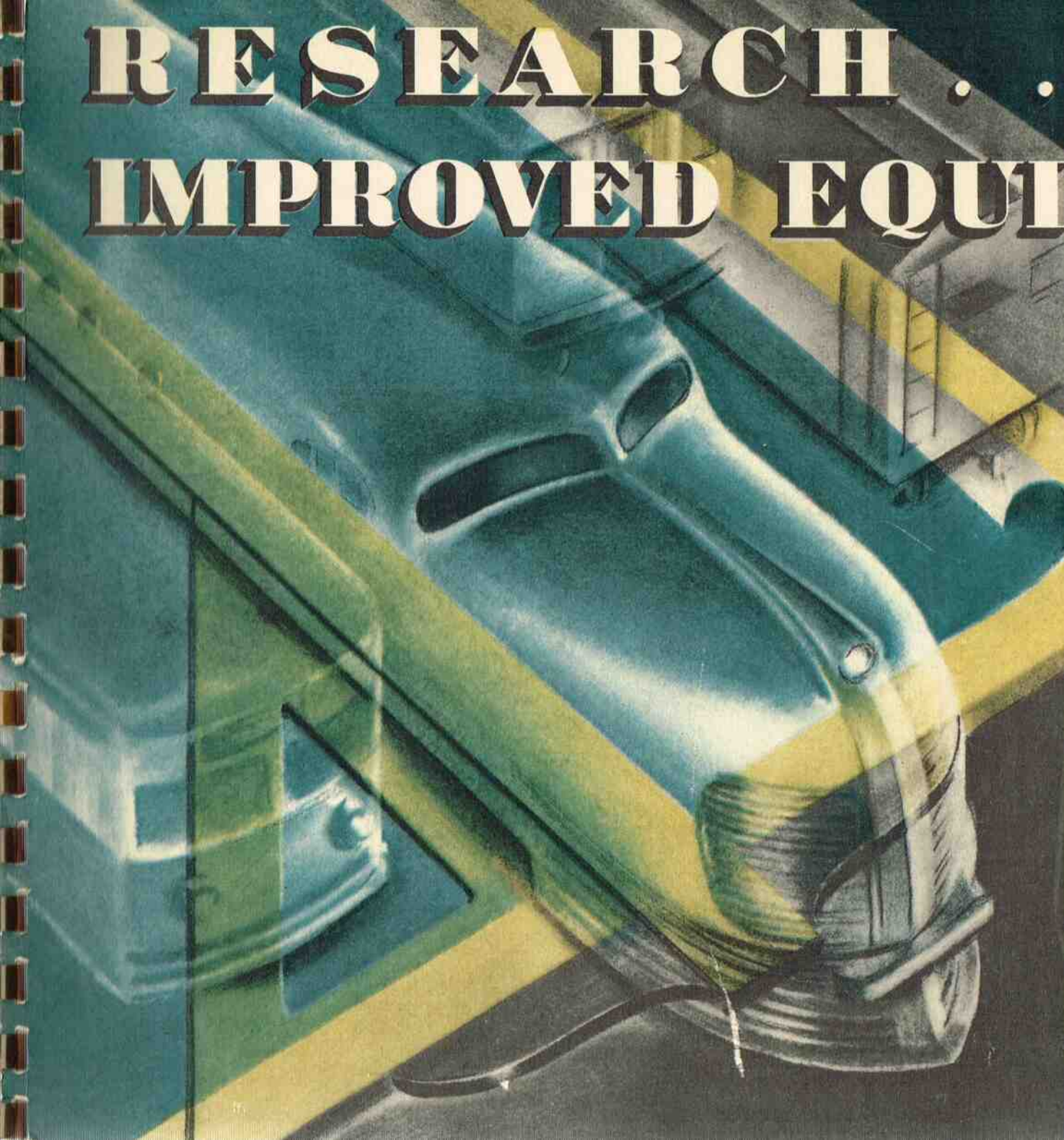




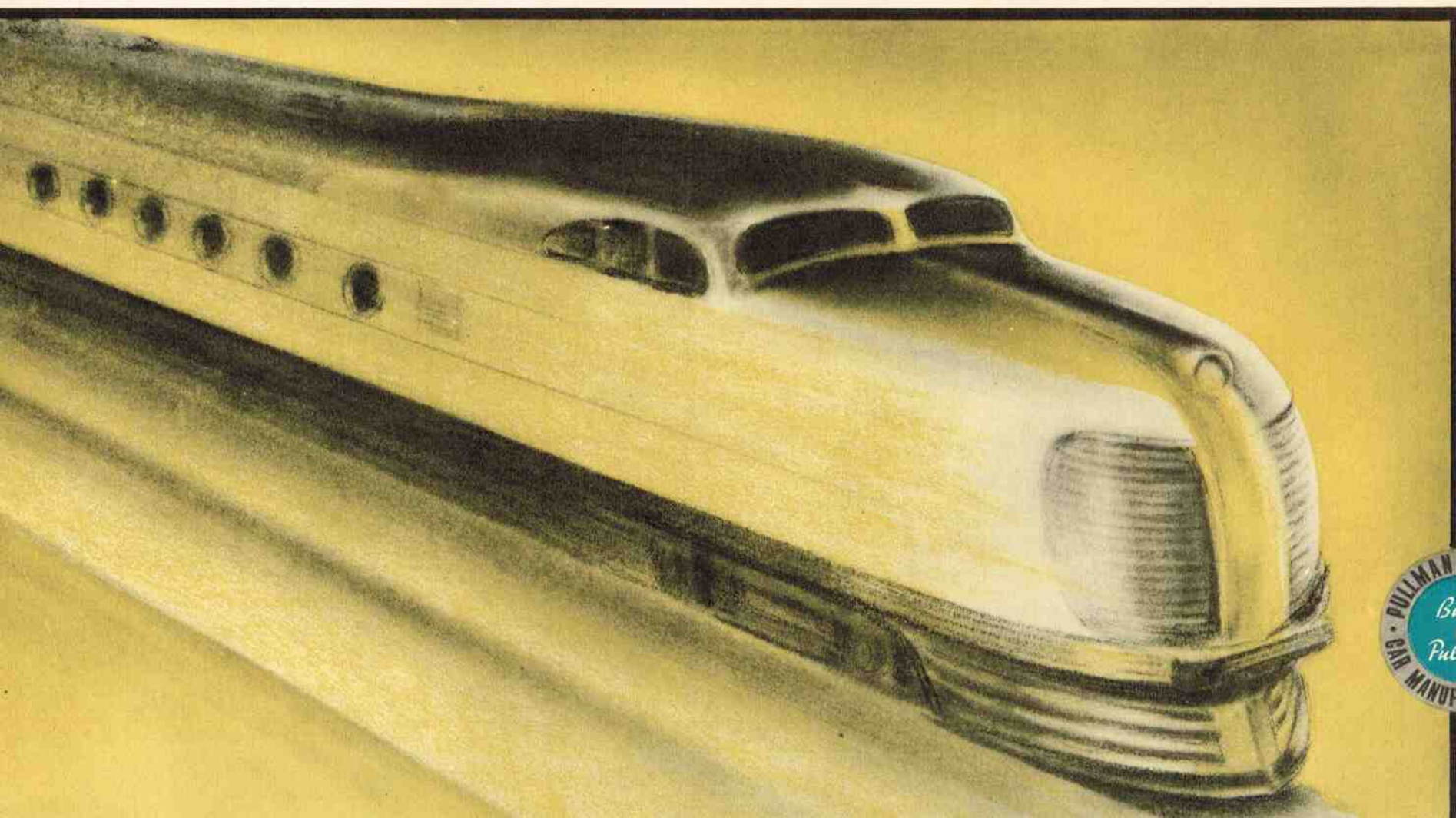
RESEARCH . . . and IMPROVED EQUIPMENT

*Recent Contributions
to the Railroad and
Transit Industries by*

**PULLMAN-
STANDARD**

RESEARCH . .

Streamlined trains with their sleek modern contours, their speed, their safety and their comfort are re-selling the public on railroad transportation.



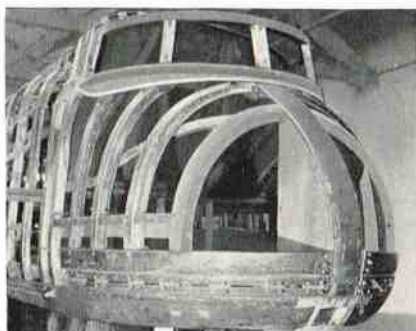
. . . AND IMPROVED EQUIPMENT

Recent Contributions to the Railroad and Transit Industries by Pullman-Standard

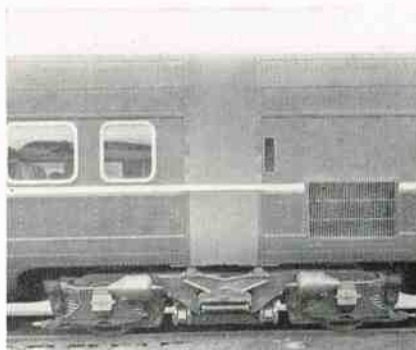
Development of new designs and the investigation of the economies that the railroads would enjoy through their use, always has been, and is, one of the fundamental policies of the Pullman-Standard Car Manufacturing Company. • The newer products of this Company, illustrated on the following pages, bear witness to the fact that this policy has been productive of important results.

PULLMAN-STANDARD CAR MANUFACTURING COMPANY

CHICAGO • PITTSBURGH • WASHINGTON, D. C. • NEW ORLEANS • CLEVELAND • HOUSTON • BALTIMORE • BIRMINGHAM
NEW YORK • WORCESTER, MASS. • San Francisco . . . Sales Representative . . . Latham McMullin, Russ Building

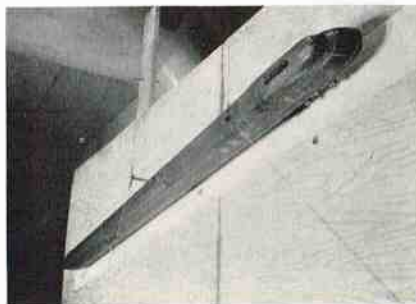


Bullet-like nose of a Pullman-built streamlined train, showing the structural members.



Trucks and articulation between coaches of streamlined train.

Below: Model and wind tunnel used in determining wind resistance of streamlined trains.



Weight Reduced by Use of New Materials

During recent years Pullman-Standard has promoted the production of new materials and their application to car designs, in its efforts to produce lighter cars of adequate strength. These early efforts covered aluminum, from which a great many cars have now been built, and later many alloy steels which had become available at moderate costs for railway cars.

In these activities it was necessary to consider not only the physical characteristics of the materials, but also the methods of forming, heat treating, fabrication and finishing. This resulted in radically different designs, requiring complete engineering and involving some engineering theories new to car design, in both the freight and passenger car fields.

The 50 coaches built by Pullman-Standard for the New York, New Haven & Hartford Railroad in 1934 were one of the first applications of alloy steel to through line passenger cars and permitted a weight reduction of approximately 26%, from approximately 145,000 pounds which was the weight of a conventional coach, air conditioned, to 107,000 pounds (the weight of the New Haven air conditioned coach). Much more weight could have been saved if it had been possible to obtain reductions in the weights of the specialties corresponding to the reduction made by the car-builder in the parts which came under his design and control. These New Haven cars though light in weight are equivalent in strength to conventional cars.

New Welding Methods Have Been Developed

Welding has played an important part in the structures made of the new materials and by the new methods of fabrication. Its study has lead to investigations of methods of arc welding with various kinds of electrodes, spot welding and new equipment for economically forming the weld and at the same time insuring positive welds, without impairment of the material welded.

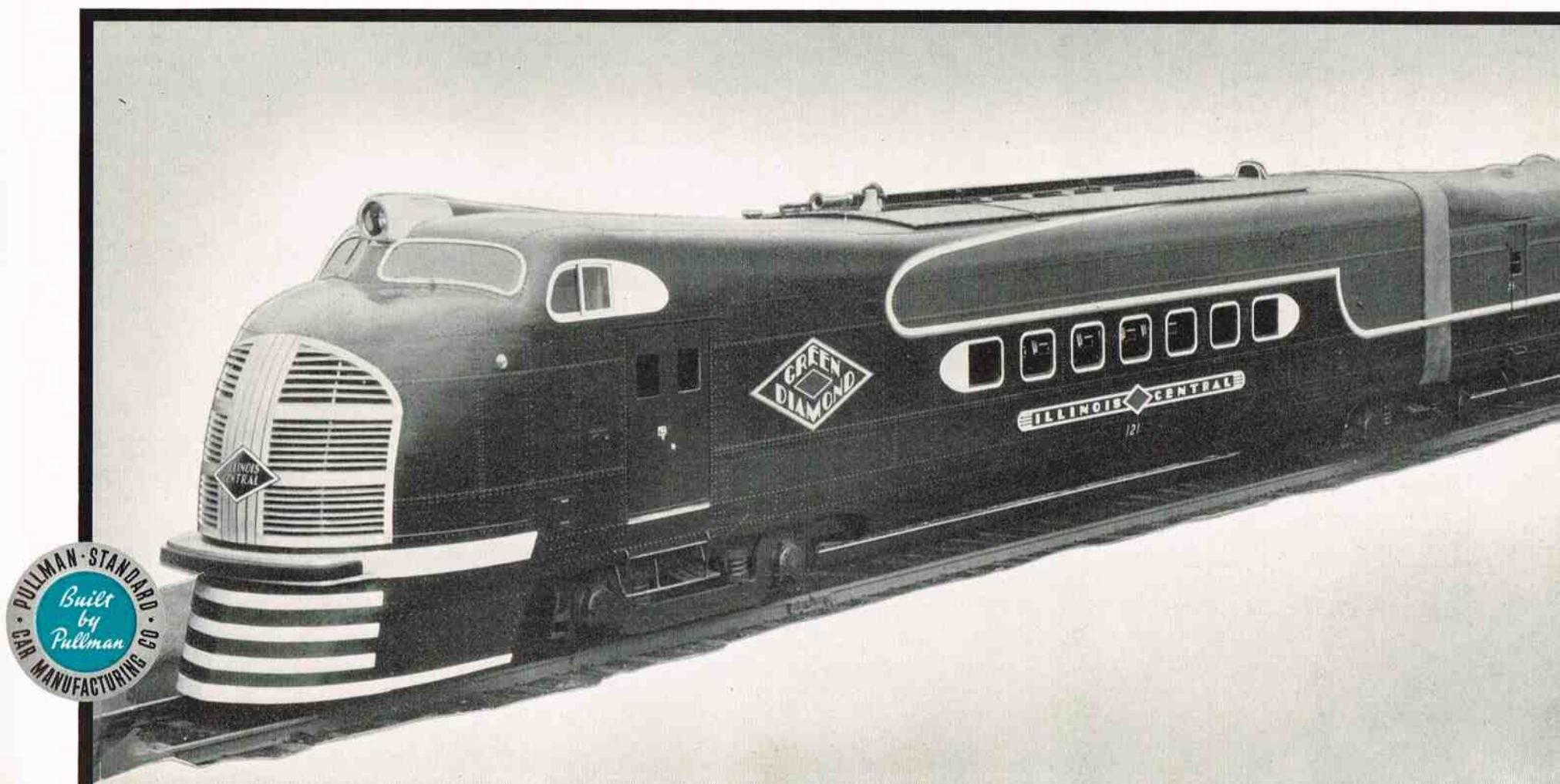
Power Saved by Decreasing Wind Resistance and Weight

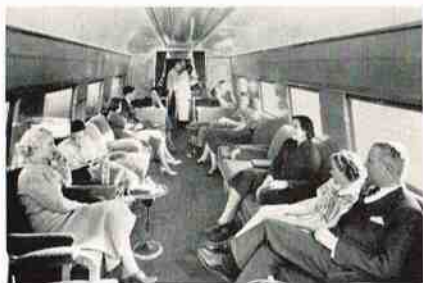
The lighter weight structures, particularly in the passenger car field, suggested the possibility of

ILLINOIS CENTRAL "GREEN DIAMOND"

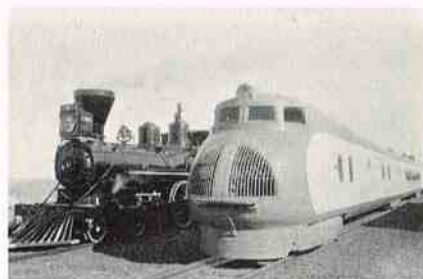
Five-car train built entirely of high-tensile steel. • Consists of power car, baggage and mail car, two chair cars and a diner-observation car. • Streamlined exterior—modern interior. • Two shades of green used for exterior colors. • Completely

articulated. • Improved illumination. • Air conditioned. • Seating capacity 144. • Length 328' 6". • Light weight 476,800 pounds—about half the weight of a similar conventional train. • Powered by a 1200 H. P. Diesel engine.





Lounge on the City of Los Angeles



Old No. 9 of the Union Pacific and a modern streamliner for the same road



So smoothly do Pullman-designed streamlined trains ride that a full cup may be served at 90 m.p.h.

smaller power units for handling, so that saving in power has become a fundamental factor in these new car designs. It was therefore of interest to learn what other factors would contribute toward saving in power other than that of weight.

Wind resistance loomed high in the calculations of various kinds of resistance to haul moving trains, so that it was found necessary to investigate cross-sectional contours of cars, as well as the shapes of the front end of the power car and the rear end of the last trailing car, so that the shape finally chosen would offer the least resistance to wind in a train running at high speed.

It is interesting to note that the wind resistance is the highest retarding factor in operating a train on level track at speeds above approximately 70 miles per hour, and that it increases rapidly from this speed as the velocity of the train increases.

To obtain the shape that would be most economical of power, i.e., that would offer the least resistance to the wind, the services of aeronautical engineers were sought, and extensive wind tunnel tests made on models of various shapes. From the results of these tests, the contours of streamlined trains produced by Pullman-Standard have been determined.

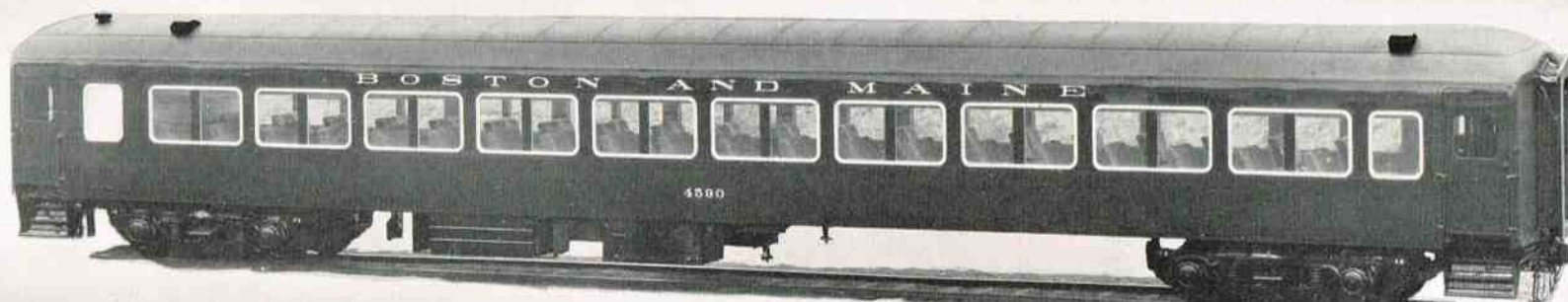
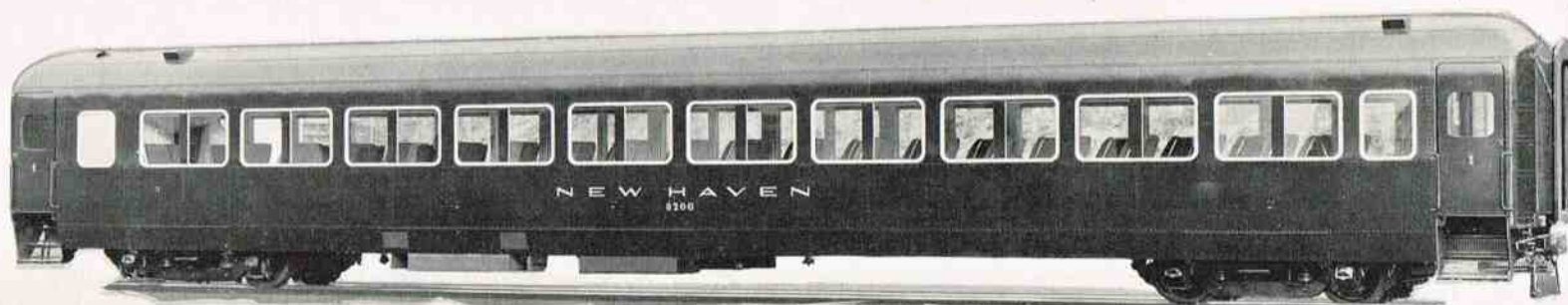
Riding Qualities Improved by New Truck Designs

A study of passenger trucks involving the construction of several different experimental designs, with service trials of each type, in collaboration with our customers, have resulted in outstanding improvement in riding qualities of high speed trains.

It is possible to operate these lighter trains on these new trucks at speeds of 100 miles per hour or more, and provide at least as high a degree of comfort to the passengers as they have been used to in modern, but conventional types of cars, at lower speeds.

Air Conditioning Developed to Meet Railway Conditions

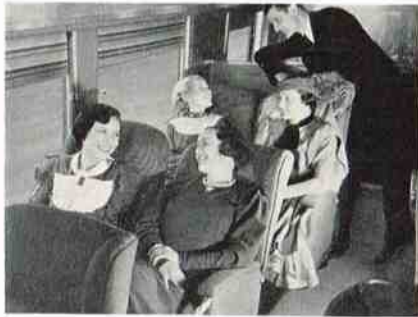
One of the most important contributions which Pullman-Standard has made to passenger car



NEW HAVEN COACHES. BOSTON & MAINE COACHES

Both built entirely of high-tensile steel. • Streamlined exteriors —attractively decorated interiors. • Improved illumination. • Air conditioned. • Seating capacity 84 (each). • Length 84' 6 1/4" (each). • Light weight 107,000 pounds (including air

conditioning equipment)—38,000 pounds less than a conventional steel coach. • These light-weight coaches answer all standard service requirements and can be used in the same train with conventional equipment.



The public likes air conditioned trains.



Interior of the Illinois Central "Green Diamond."

Luggage compartment of a streamlined train.



comfort has been in the field of air conditioning. More than ten years ago experiments were undertaken and the advice of recognized authorities in this field of engineering was sought.

However, it was found that at that time it was impossible to obtain from available sources, engineering designs, or proper equipment, which would do a satisfactory job on railway cars. It was necessary therefore for Pullman to develop within its own organization an air conditioning system applicable to railway cars and one that was flexible enough to provide comfort under varying conditions of train operation.

After the first few experimental installations were made, the demand for air conditioned cars grew by leaps and bounds so that in the short period of approximately five years the number of air conditioned cars has grown from none to 7345. Of this number 3873 are Pullman cars.

The system developed and used on Pullman cars has been used quite generally on many railroad cars; in fact practically all of the railroad car installations in this country have followed closely the arrangement of equipment covered by patents taken out by the Pullman organization.

An Interior Decorating Department to Meet Modern Trends

Modern trends to make passenger travel more inviting have led to improvements in appearance of cars and new designs have provided new problems in architecture and interior decorating. Pullman-Standard employs its own experts in this field and customers who buy their passenger cars from this Company may avail themselves of the work of these artists who work under the supervision of a man who has had many years of training in this particular field.

The research department of Pullman-Standard has made it a point to thoroughly investigate all of the new things which the market affords, frequently collaborating with the suppliers of these materials and devices, and jointly developing articles which satisfactorily meet the demands of the new types of trains.



UNION PACIFIC STREAMLINER M-10000

The first streamliner built in this country and now operating successfully in revenue service. • A three-car train built almost entirely of aluminum. • Consists of power car, coach and coach-buffet car. • Air conditioned and articulated. • Seating capacity 116. • Length 204' 5". • Light weight 190,000

pounds—less than half the weight of a similar conventional train. • Powered by a 600 H. P. distillate-burning engine. • Car roof three feet lower than in conventional car design. • Safety glass in car windows. • Low center of gravity. • Attractive interior decorative scheme. • Indirect lighting.

TRUSS - TYPE

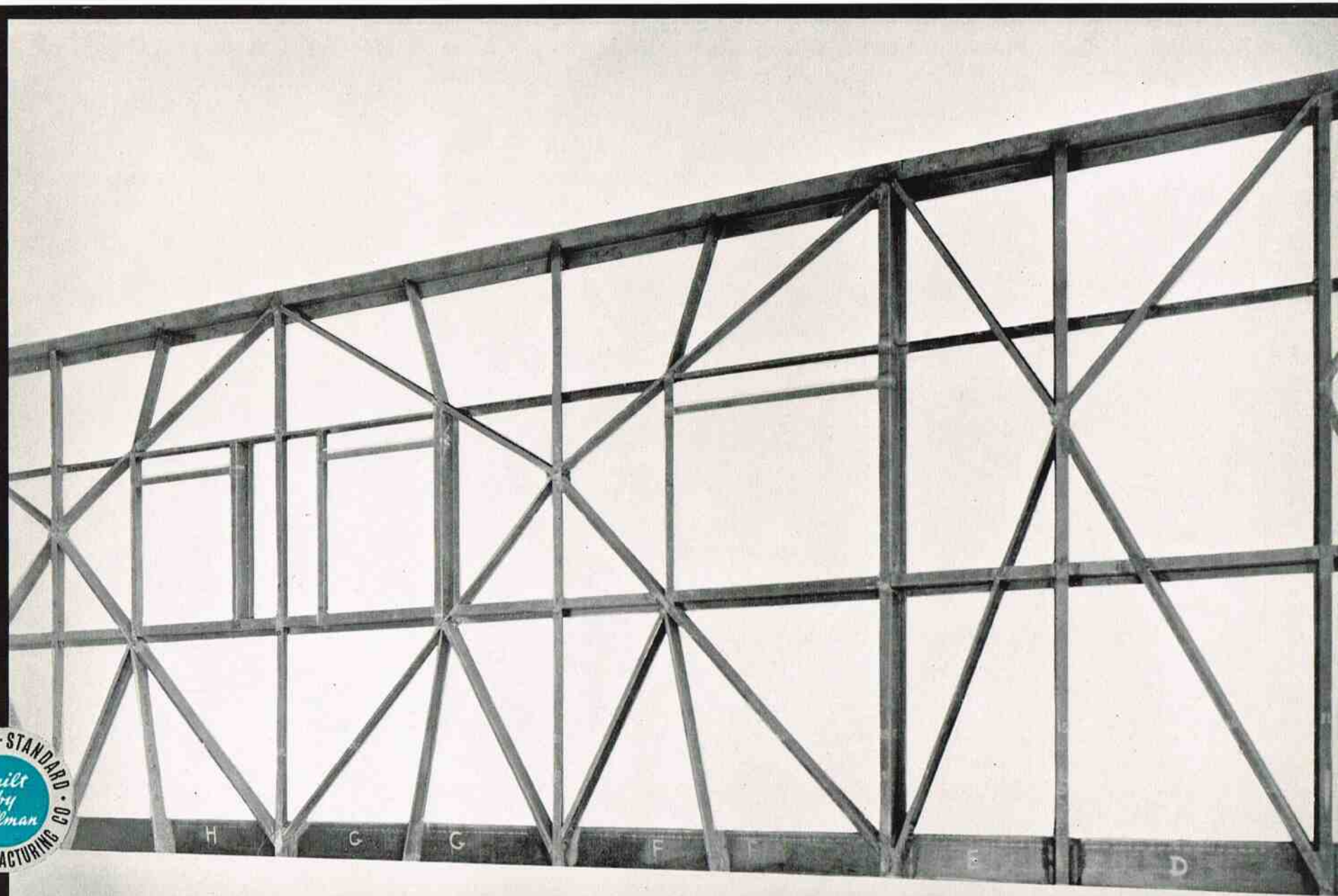
Our early developments in alloy steel structures used the conventional type of steel girder plate side frame construction which gave a very satisfactory structure and a substantial reduction in weight over conventional cars. It was necessary, however, to use side sheets heavier than required for structural strength to obtain a smooth finish in the completed structures or as an alternate to use thinner finish sheets combined with a large number of stiffeners which gave about the same weight results.

To secure the ultimate light weight with high tensile steels, we concluded that it would be necessary to design a truss-type of side frame to carry the entire load. This frame would then be covered with a very light gauged sheathing which would act only as an envelope or covering for the car frame. The frame was to be entirely welded since this eliminated the

CAR FRAME

necessity of overlapping any of the framing members with resultant additional weight.

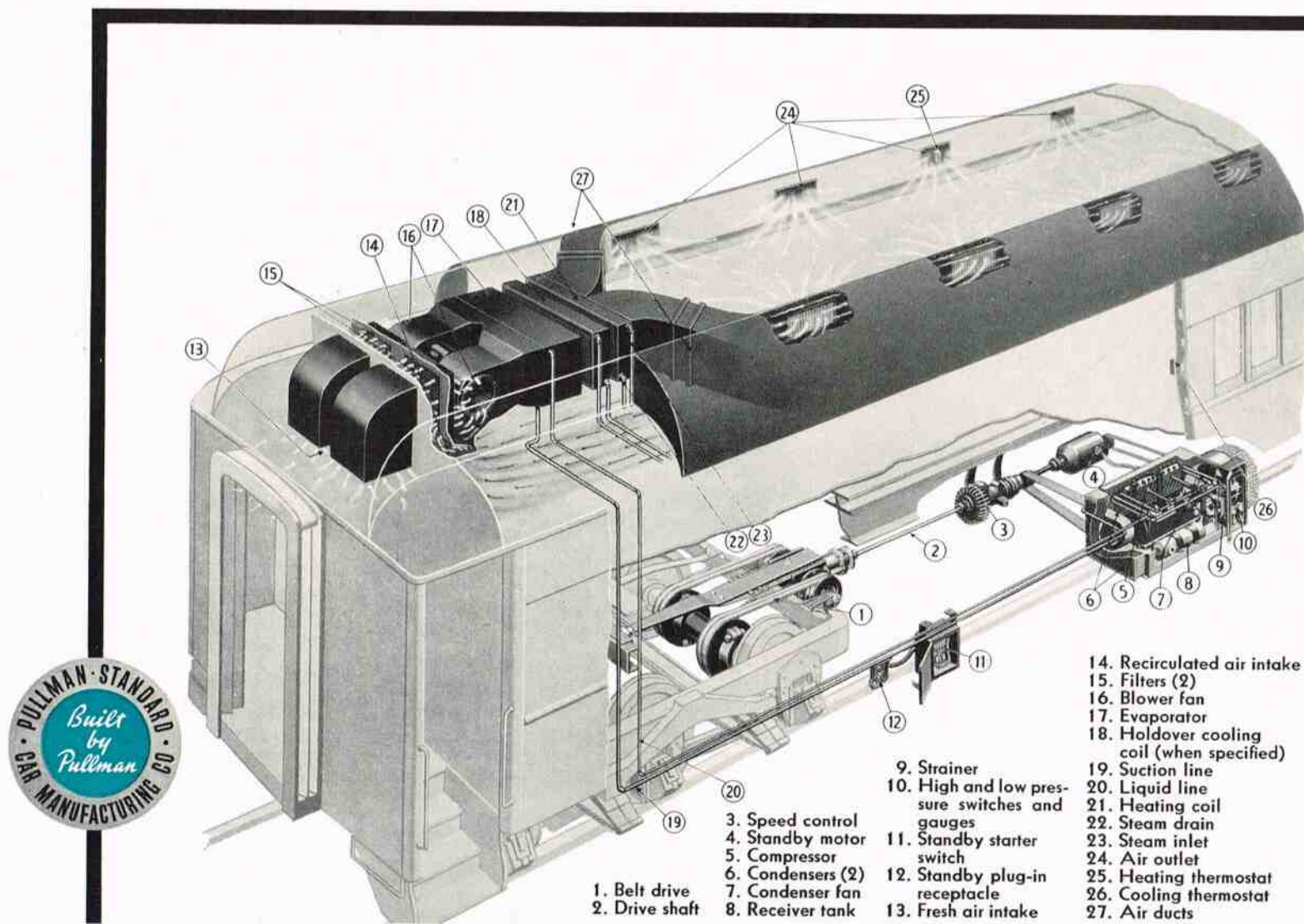
The first step was to construct a test frame along the lines described. This frame was tested by subjecting it to gradual increments of increased load, extensometer readings being taken between these increments and the frame finally tested to destruction. The stresses actually occurring in the frame closely checked with the computations on which the design was based and the failure occurred at 220% of the calculated maximum safe load. A Pullman sleeping car and two twelve-car trains for the Southern Pacific Equipment Co. are now under construction, employing this type of truss, which is considered the best design from the standpoint of cost and minimum weight yet produced or proposed for a high tensile steel car structure.



PULLMAN AIR CONDITIONING SYSTEM

Power transmission is through direct shaft drive. •
Low maintenance costs. • Ample capacity. • Per-

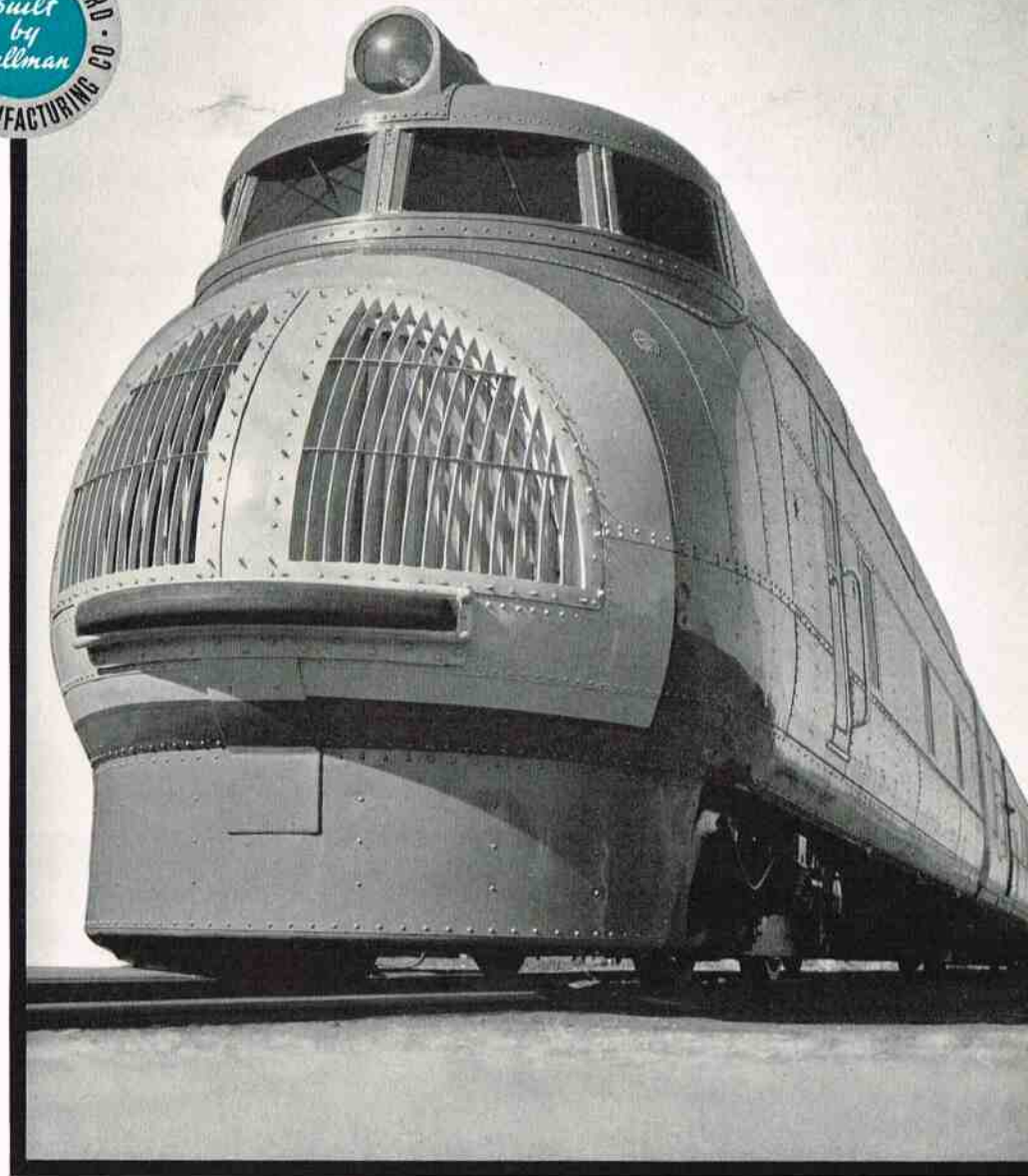
formance record for 1935—99 6/10% perfect. •
Eliminates weight of large auxiliary equipment.

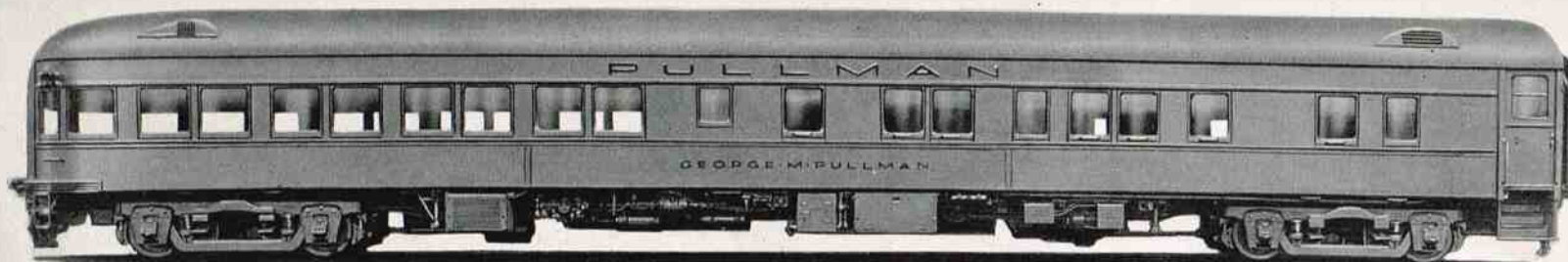




UNION PACIFIC STREAM- LINER *"City of Portland"*

The first streamliner with sleeping cars and now operating successfully in revenue service. • A seven-car train built entirely of aluminum. • Consists of power car, baggage and mail car, kitchen-diner-lounge, three sleepers and a coach-buffet. • Air conditioned—articulated. • Modern, attractive interior—improved illumination. • All windows are double and of shatter-proof glass. • Dining room provides accommodation for 24 passengers. • Sliding aluminum panels make each berth in effect a small compartment. • Seating capacity 157. • Length 454' 11". • Light weight 568,880 pounds. • Powered by a 1200 H. P. Diesel engine.

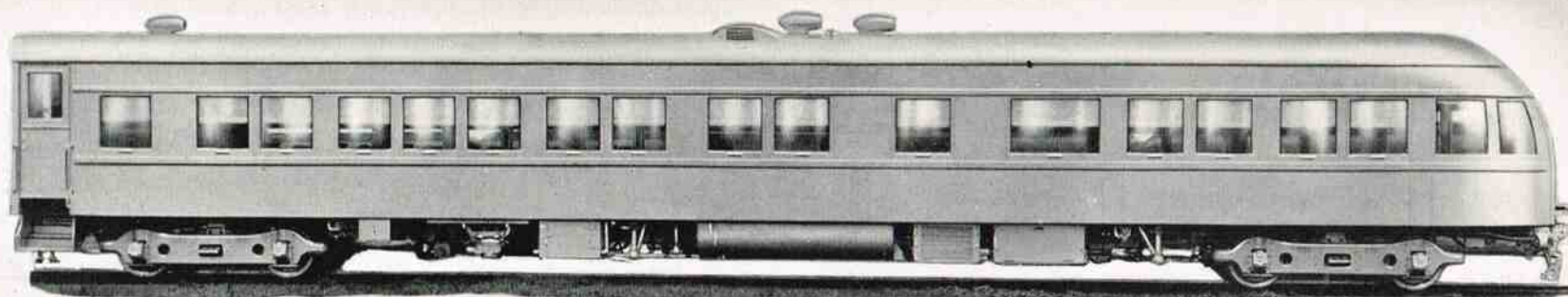




GEORGE M. PULLMAN SLEEPER EXPERIMENTAL ALUMINUM COACH

Exhibited at the Century of Progress, Chicago, 1933-34. •
Both built entirely of aluminum. • Modified streamlined
exterior. • Air conditioned. • Seating capacity of coach 50. •

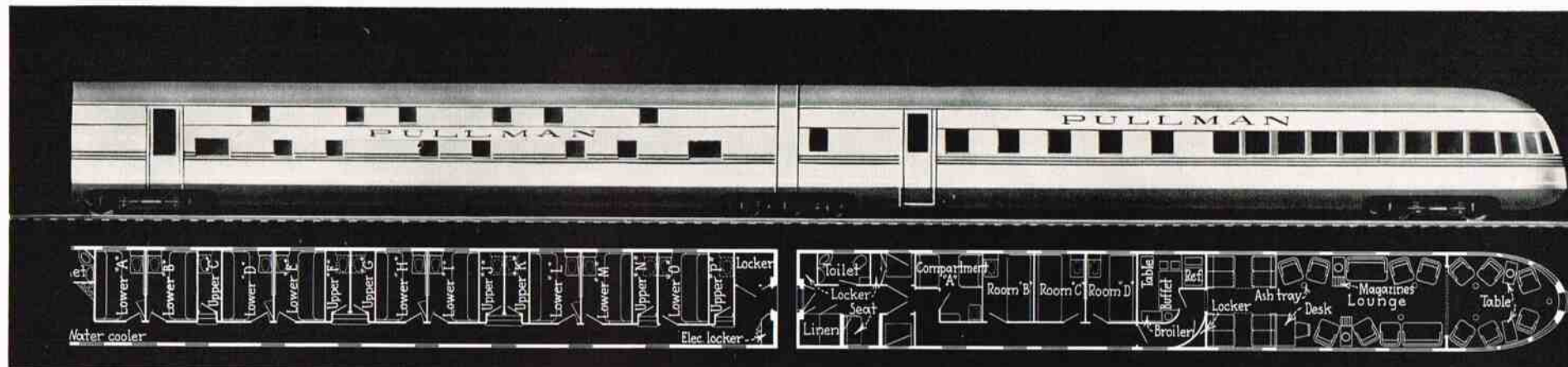
Length of sleeper 84' 3". • Length of coach 78' 10". • Light
weight of coach 73,880 pounds. Light weight of sleeper
96,980 pounds—a weight saving of 40% to 50%.



PULLMAN TWO-CAR UNIT

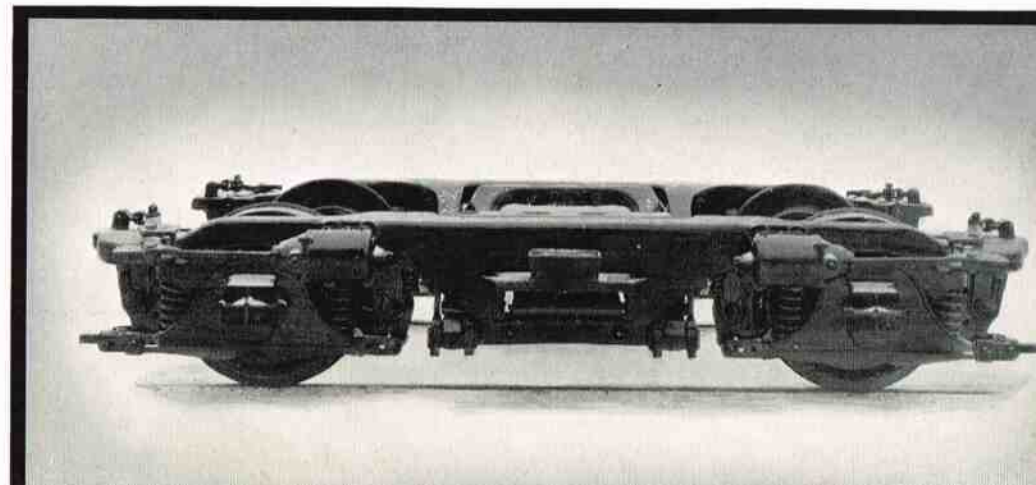
Two-car articulated unit built of high-tensile steel. • Interior fittings of aluminum. • Full standard width and streamlined. • Designed for use at end of trains—either of present standard cars or of other multiple-car units. • Head car contains

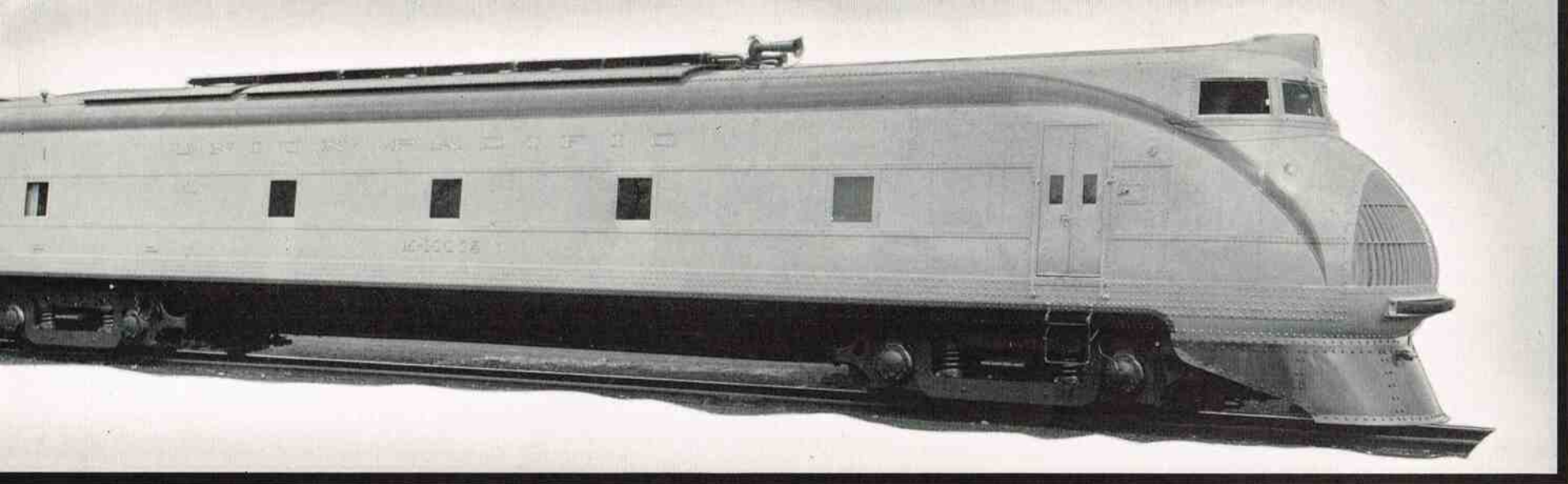
16 single bedrooms, seven of which are “upstairs” and the balance on the regular level. • Rear car contains rooms, buffet and lounge. Lounge will seat 26 persons. • Lighting of the most modern type.



THREE-BOLSTER TRUCK

This is one of the latest developments in passenger car truck design, particularly for high speed trains. Under the Illinois Central “Green Diamond” train it has already proven its easy riding qualities.





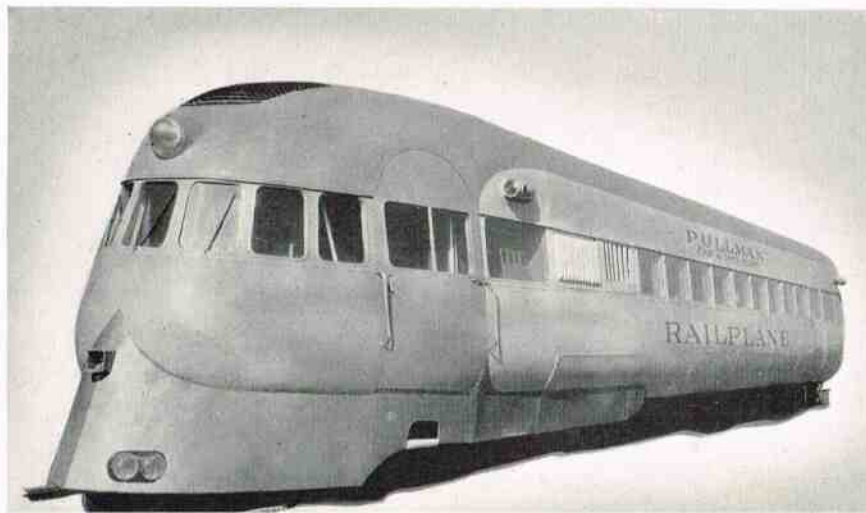
UNION PACIFIC STREAMLINER *"City of Los Angeles"*

An eleven-car train built of aluminum. • Consists of two power cars, baggage and mail, baggage dormitory, kitchen-diner-lounge, four sleepers, coach and coach-buffet. • Air conditioned—articulated. • Modern interior—improved light-

ing. • Seating capacity 228, including 84 in sleepers. • Length 713' 11". • Light weight 950,318 pounds. • Powered by two Diesel engines—1200 H. P. and 900 H. P. • Two-car power unit may be uncoupled from rest of train.

RAIL PLANE . . .

Built purely as an experiment in one of the early efforts to combine light weight and high speed. • Streamlined and constructed of steel and aluminum. • Air conditioned. • Seating capacity 50. • Length 60'. • Light weight 25,000 pounds or only 500 pounds dead weight per passenger. • Powered by two six-cylinder automotive-type engines which develop 160 H. P. each at 2200 r. p. m.



UNION PACIFIC STREAMLINER *"City of Denver"*

Consists of two power cars, auxiliary-engine-baggage car, baggage and mail, baggage-tavern-room car, a two-unit articulated coach, diner, a two-unit articulated sleeper and a two-unit articulated sleeper consisting of a sleeper and a bedroom

observation unit. • Air conditioned and modern in design and interior effects. • Seating capacity 272. • Length 864'. • Light weight 1,268,450 pounds. • Powered by two Diesel engines of 1200 H. P. each.



Freight Equipment

Railroad operators are always trying to effect a saving of train miles. If a certain road has been operating say, 100 freight trains a day to handle the tonnage on its lines, there would be a large money saving if this same tonnage could be handled with 80 trains, thereby eliminating 20% of the train miles. If freight cars could be made 20% lighter in weight, and if this saving in dead weight could be converted into revenue load (so that the journals would be carrying the same load) it would result in the saving of train miles.

Welding an Important Factor in Modern Car Construction

Pullman-Standard Car Manufacturing Company, having this idea in mind, has designed and

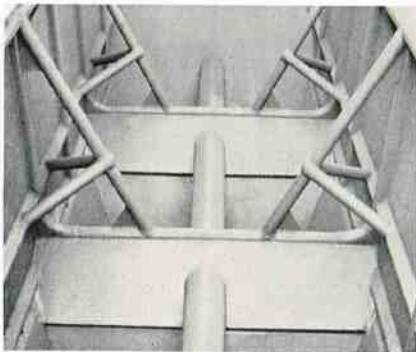
built several light-weight cars. The building of these cars required the engineering of new designs, the utilization of new materials, and the employment of new methods of fabrication.

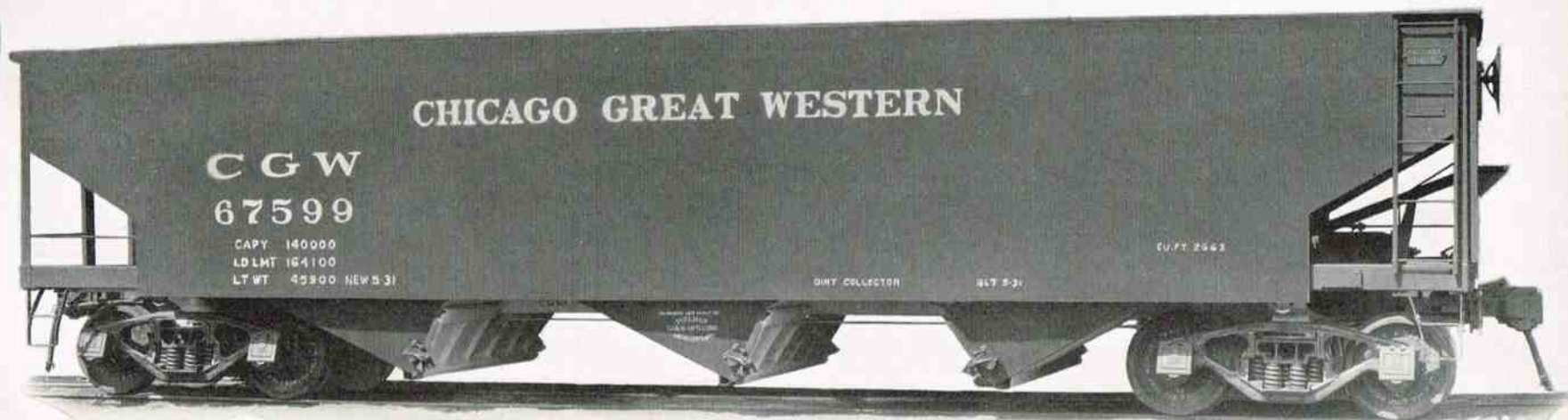
Welding has played an important part in this development. In the year 1931, the Company built five welded hopper cars of 70-ton capacity for the Chicago Great Western Railroad Company. These cars were very much lighter than any cars of this capacity which were in service at that time. Gas and arc welding were used in fabrication, and ordinary open-hearth steel was the material used, the newer alloys not being available then.

At the A. A. R. convention held in Chicago in June, 1935, Pullman-Standard exhibited a light-weight box car, which weighed 20% less than the A. A. R. standard box car. High-tensile alloy steel was used and the fabrication was accomplished to a large extent by the use of spot welding.

The design of this car was novel in many ways in order to make full use of

Interior of Chicago Great Western welded hopper car.



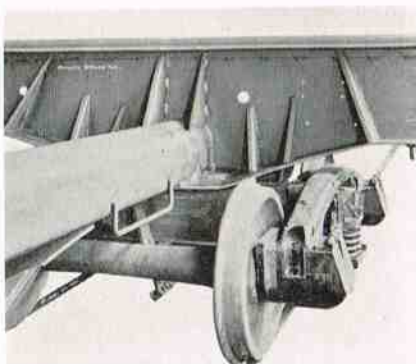


CHICAGO GREAT WESTERN WELDED HOPPER CARS

An early Pullman light weight development. • Five of these cars were built in 1931 and have been in successful revenue operation for over five years. • Welded body construction of

open-hearth steel. • Light weight 45,900 pounds—10,500 pounds less than a typical hopper car of the same capacity. • Journals, 6" x 11". • Load limit, 164,100 pounds.

Center sill construction of Chicago Great Western welded hopper car.



the strength of the high tensile steel and to accommodate it to the spot welding equipment which had been developed in doing this work.

In the early part of 1936, Pullman-Standard produced an all-welded steel-sheathed refrigerator car, which has been exhibited at the Pullman Car Works and at the A. A. R. 1936 Convention to a large number of railroad men from all parts of the country.

This car weighs 44,300 pounds, which is from 10,000 pounds to 13,000 pounds less than the conventional type of refrigerator cars now in service. Again high-tensile alloy steel and spot welding were employed in its construction.

Light Weight Cars Have Many Advantages

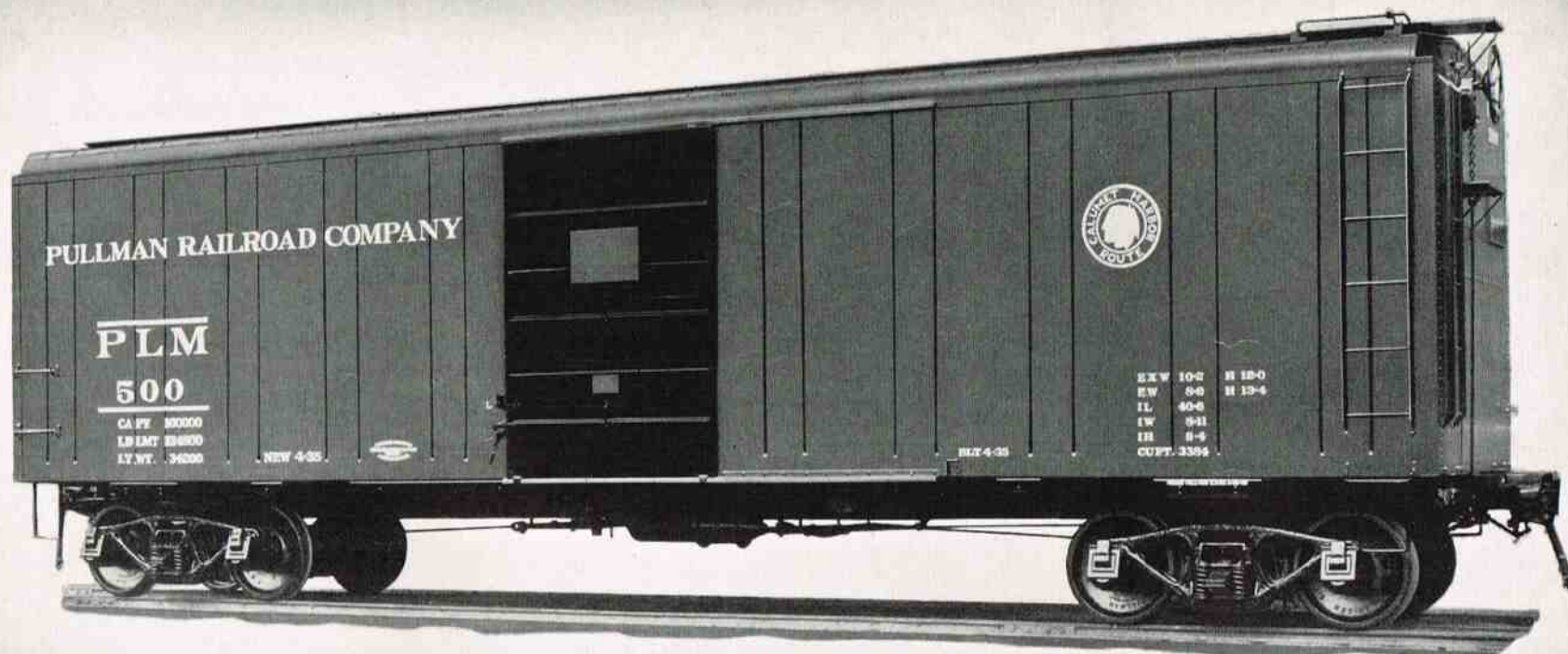
It is believed that the welded box and refrigerator cars just described are the forerunners of a large number of cars of this type and it is quite likely that similar cars will be used quite generally throughout the country within the next few years.

The principal advantages in these cars as developed are that they will not cost appreciably more than conventional cars and the seams are welded, making the cars water and air-tight. The latter feature contributes to long life by preventing corrosion, which usually occurs in the joints of riveted cars. This fact, of course, insures that the maintenance cost will be lower during the life of the cars. Furthermore, in the case of the refrigerator car, the thermal efficiency is higher because of the air-tight construction.

The three important points that have been emphasized by Pullman-Standard in building these cars are that, they are lighter in weight, lower in maintenance cost and higher in thermal efficiency. The lighter weight, of course, spells fewer train miles, with the resulting saving in operating costs.

Welded Draft Sill Assembly a Strong Construction

There are many novel features in the construction of the cars mentioned above, but one of especial



L I G H T W E I G H T B O X C A R

Built of high-tensile steel. • Welded body construction. • Light weight 34,200 pounds—10,000 pounds less than typical box cars. • Strength, equivalent to that of conventional car

of the same capacity. • Capacity 50 tons. • Inside length 40' 6". • Inside width, 8' 11 5/16". • Height clear at side, 9' 4 1/8". • Cubic capacity, 3,384 cu. ft.

importance that was used in the box and refrigerator cars is the welded draft-sill and body bolster centerfiller. These two items are usually riveted to the sill, but in the case of these two cars, the draft lugs and the centerfiller have been built-up and arc welded to the car structure and made integral therewith.

The strength of this welded arrangement is greater than the corresponding conventional design such as is used on A. A. R. cars. This was demonstrated in tests made of both types of construction at Purdue University. To quote from the University's report on these types:

"The riveted specimen was unserviceable after the $4\frac{1}{2}$ " cycle of blows, failure occurring by distortion of the draft lugs and shearing of four rivets."

• • •

"The welded specimen required the blows to be carried to the 6" cycle before it was unserviceable. Failure occurred by breaking of the welds along the edge of the draft lugs and buckling of the tops of the draft lug supporting members."

In other words the strength of the welded construction was greater under the drop tests than the A. A. R. sills to which the lugs and centerfiller were welded. There would be no advantage in increasing the strength beyond this point.

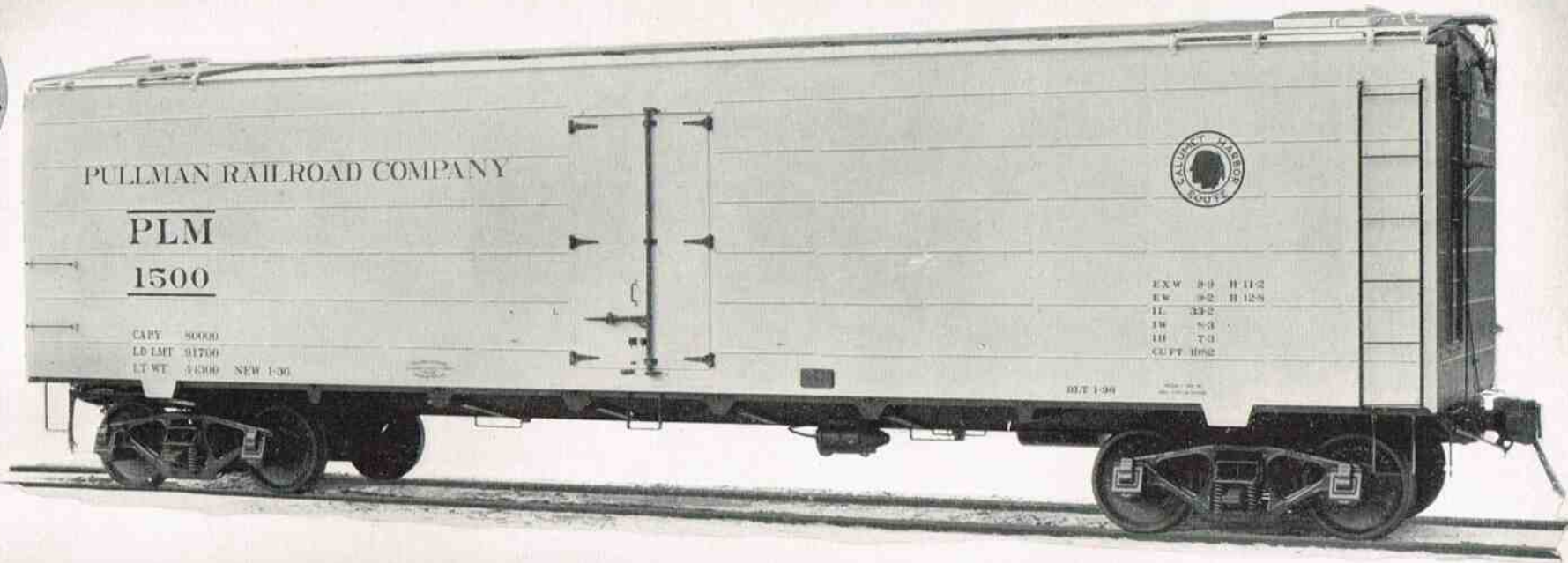
Special Cars for Special Uses

In addition to the research work mentioned above, which covers largely the development of new materials, designs and methods of fabrication in an effort to produce light equipment of equivalent strength, the Pullman-Standard Car Manufacturing Company has also designed many special cars for customers who have special transportation problems.

Among these are cars for handling ore, cement, phosphate, and hot billets, which are illustrated on the succeeding pages.

Interior construction of light-weight box car.





LIGHT WEIGHT REFRIGERATOR CAR

Built of high-tensile steel. • Welded body construction. • Centersill of new A. A. R. Z-section type and weighing 29.2 lbs. per foot. • Body can be removed from underframe as a unit, without tearing down any lining or insulation. •

Light weight 44,300 pounds—10,000 to 13,000 pounds less than typical refrigerator cars. • Steel construction eliminates periodic rebuilding, provides tight superstructure which protects insulation and prevents air leakage.

CONTAINERS AND CONTAINER CARS

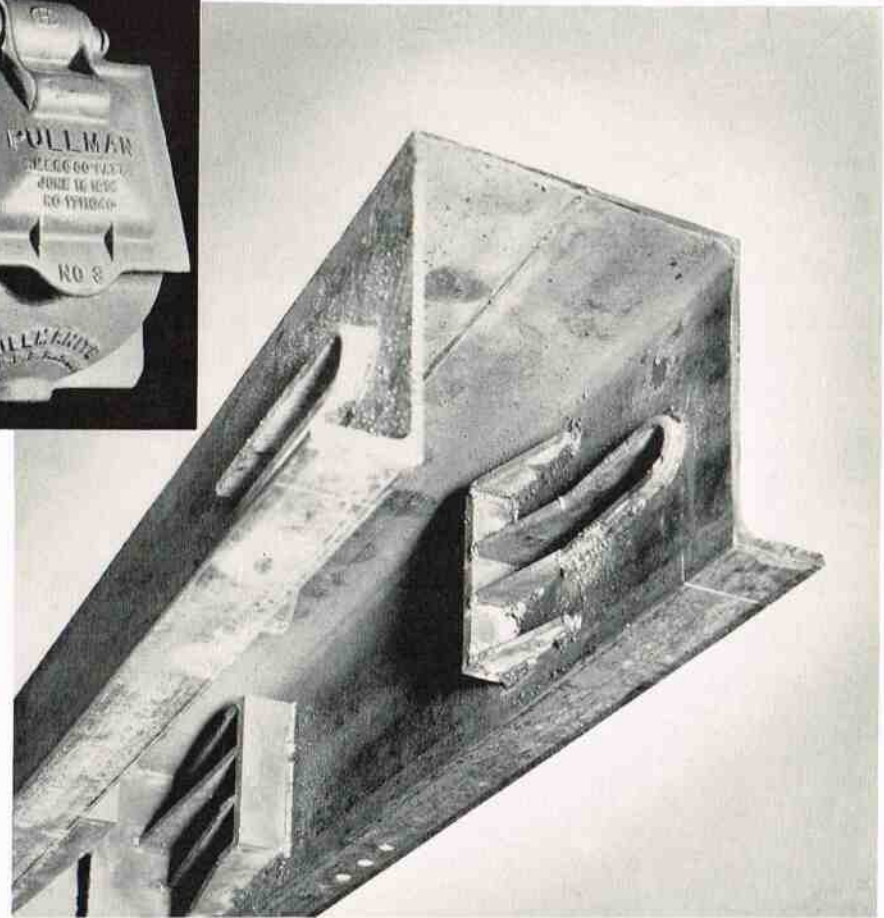
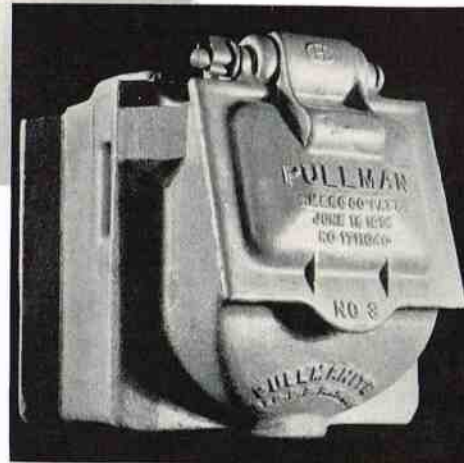
The Pullman-Standard organization has built over 1000 containers of various designs suitable for merchandise, lime, cement, etc. Special cars have also been built in sizable quantities designed specifically for transporting these containers.

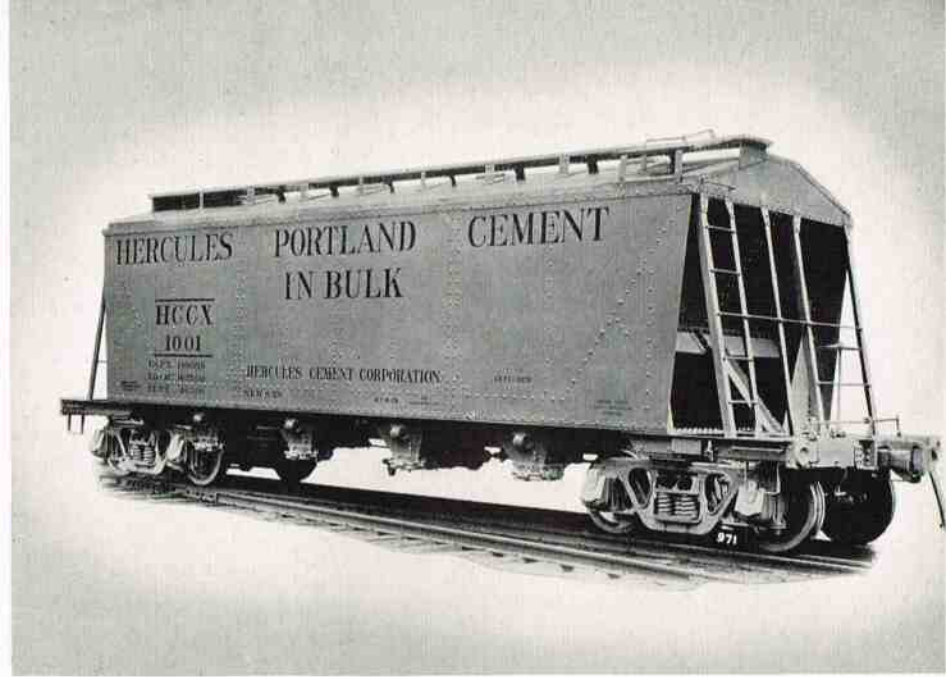
PULLMANITE JOURNAL BOXES

Made of a wear-resisting metal developed especially for journal boxes. Records show that they have an average life of over twice that of ordinary journal boxes.

WELDED DRAFT SILL ASSEMBLY

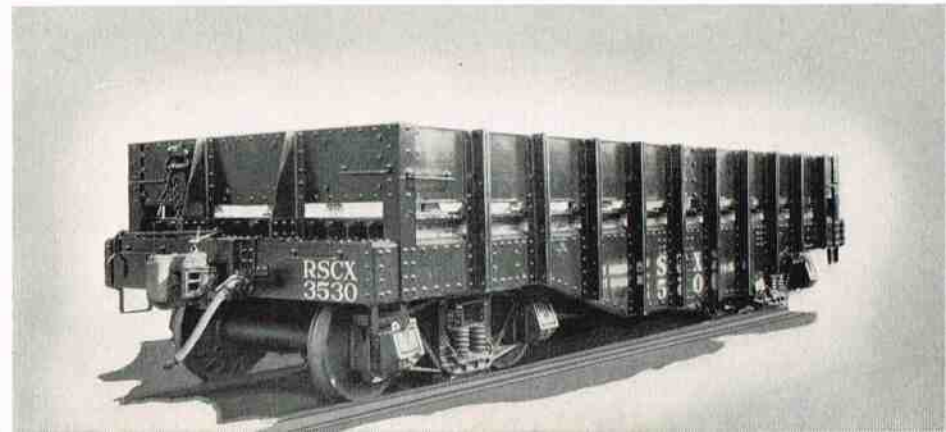
An improved draft lug and bolster centerfiller construction in which these features are welded to the car structure. • Tests at Purdue University have proven its superiority over standard riveted constructions.





SPECIAL CARS

Above: An advanced design of ore car incorporating the latest features. Built by Standard Steel Car Co., now a part of the Pullman-Standard Car Manufacturing Co. These cars have been in successful service on the Duluth, Missabe & Northern for five years and have received much favorable comment. • Right, above: All-steel, 70-ton car with special hopper arrangement for handling cement. • Right, center: One of 100 all-steel, 70-ton cars, designed by Pullman-Standard for hauling phosphate. • Right, below: All-steel, 62½ ton cars with special ventilated bottoms for transporting hot steel slabs.



Transit Equipment

The private automobile has become so popular that transit companies in most of the large cities have lost a large percentage of their street car patrons to the newer vehicle. Something had to be done to protect the revenue of these transit companies and the Pullman-Standard Car Manufacturing Company, a builder of traction equipment, has contributed largely to the development of modern equipment including street cars, trolley coaches, and rapid transit trains.

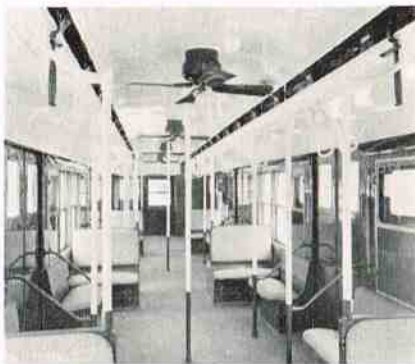
Its efforts in this direction include the promotion of production of materials which will produce light weight vehicles; excellent riding qualities which make the vehicles more comfortable; seats; interior lighting; exterior appearance; noiseless operation—all of which make the vehicle more attractive to patrons.

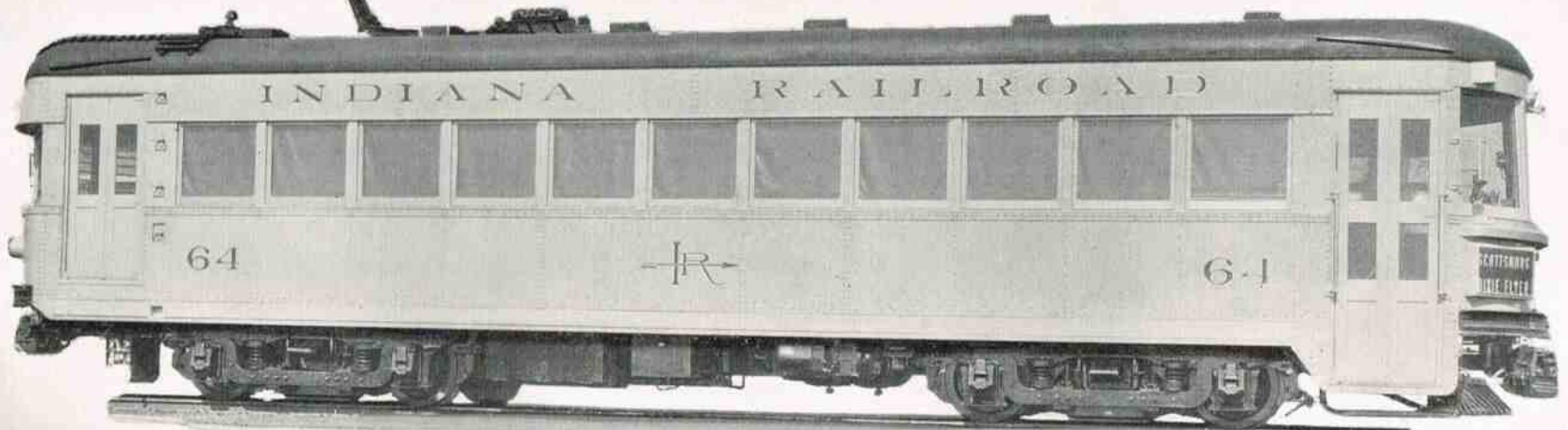
In addition to its own research in these directions, this Company has collaborated with the operators and with the manufacturers of electrical equipment, brakes, and other operating gear, in an effort to improve the operation of these vehicles so that they will not only ride well and be attractive, but accelerate and decelerate rapidly so as to keep pace with other street traffic and cut the time of the average trip, thus making it comparable with that of its competitor, the automobile.

Early Developments in Light Weight Suburban Cars

In the year 1923 the Pullman shops constructed the light-weight suburban trailer cars for the Illinois Central Railroad Company, in which aluminum was largely used in the sheets of the structure, in order to reduce the car weight and thereby conserve the electrical propelling power, as these cars were to be trailer cars for

*Interior of subway cars for Board of Transportation
of City of New York.*





INDIANA RAILROAD CARS

An early effort to reduce weight of transit equipment. • Built of aluminum in 1931. • Light weight 52,200 pounds—8200 pounds less than regular steel construction. • Seating capac-

ity 40. • A recent inspection of these cars after 5 years of high-speed interurban service shows them to be in excellent condition.

the electrified service, which was then under way. A little over a year later, all of the motor cars were constructed for the same company in the same shops, the design having been developed in collaboration with the engineers of the railroad and those of the electrical companies. These suburban cars are frequently referred to as the finest in the country.

In the year 1931 Pullman-Standard constructed 21 interurban cars for the Indiana Service Corporation; the bodies of these cars being built entirely of aluminum, resulting in very light weight. At about the same time there were constructed for the Delaware, Lackawanna & Western R. R., 141 electric motor suburban cars which were somewhat lighter than the conventional cars of the same size and capacity, for which ordinary steel was used for the structures. In this instance the lighter weight structure was obtained by improved design, by which a good deal of excess metal was eliminated.

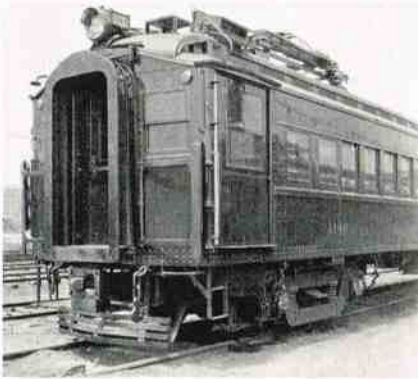
Recent Construction Makes Use of the Newer Alloys

The next Pullman developments in the transit field were the aluminum street car for the Chicago Surface Lines and the multi-section articulated aluminum car of 5 units built for the New York Rapid Transit Corporation. In both instances, aluminum was used for the entire structure, including framing members and sheets, as well as many other parts of the car. The reason for producing the street car was to meet the demands for a lighter weight vehicle, attractive in appearance, both as to interior appointments and exterior lines, quieter in operation, and with trucks of improved riding qualities.

The dominant specification for the New York Rapid Transit multi-section car was one of the weight limitation, in order to provide for rapid acceleration, thereby reducing operating schedules, and to provide large carrying capacity, without exceeding the load limits allowable on their elevated structures.

While this equipment was under construction in the Pullman shops, the

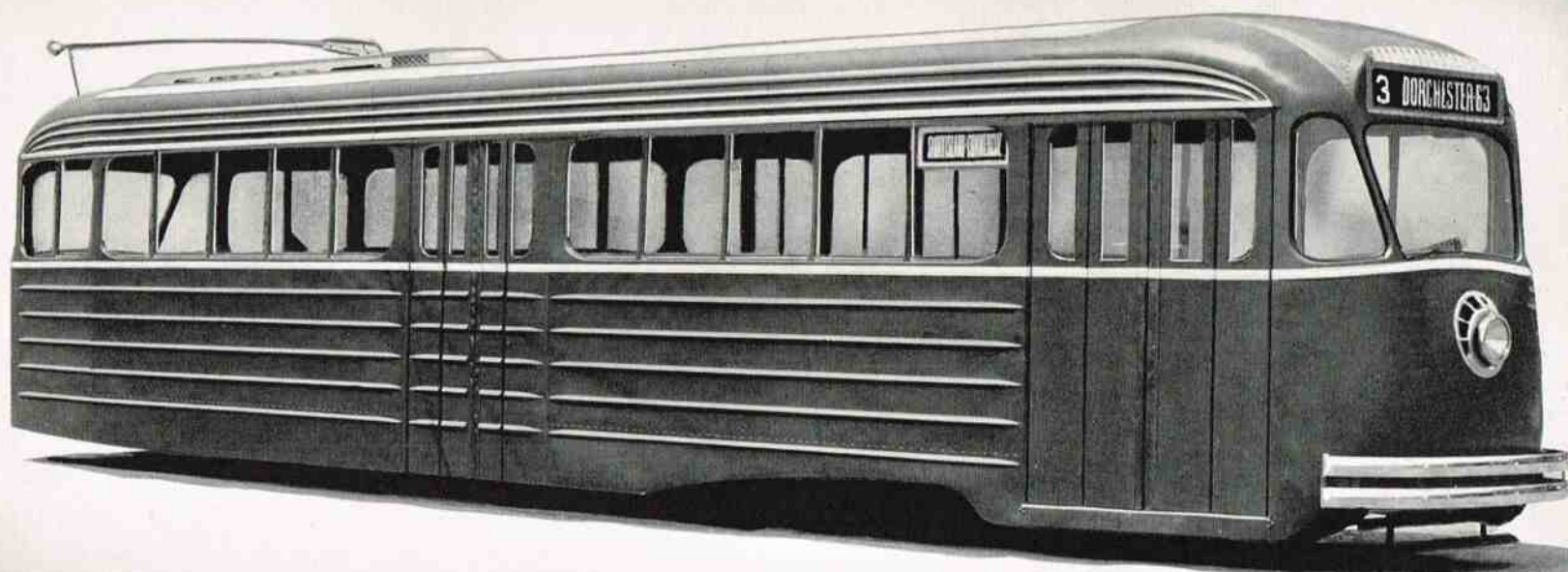
Illinois Central light-weight suburban cars built in 1923.



P R E S I D E N T S ' C O N F E R E N C E C A R

Designed for one-man operation. • Built of high-tensile steel. • Forced air system of ventilation and heating. • Rapid acceleration and deceleration—improved illumination—quietness of operation. • Light weight 31,400 pounds—18,000

pounds less than typical street car. • Seating capacity 47. • This street car embodies many new principles of construction and is provided with many features to add to the comfort of its passengers.



Presidents' Conference Committee of the American Transit Association gave an order to Pullman-Standard for the construction of a street car made of one of the new steel alloys, which up to that time had not been available for car construction. This street car embodies many novel features and Pullman-Standard was selected as the builder to cooperate in its research department with the engineers' committee of the Transit Association, in its efforts to provide a car light in weight, of rapid acceleration and deceleration, and of attractive exterior lines as well as comfortable and inviting interior appointments. Another requirement of design was that the car be very quiet in operation.

All of these experimental units were completed within a short interval of time and have since given satisfactory service to their operators.

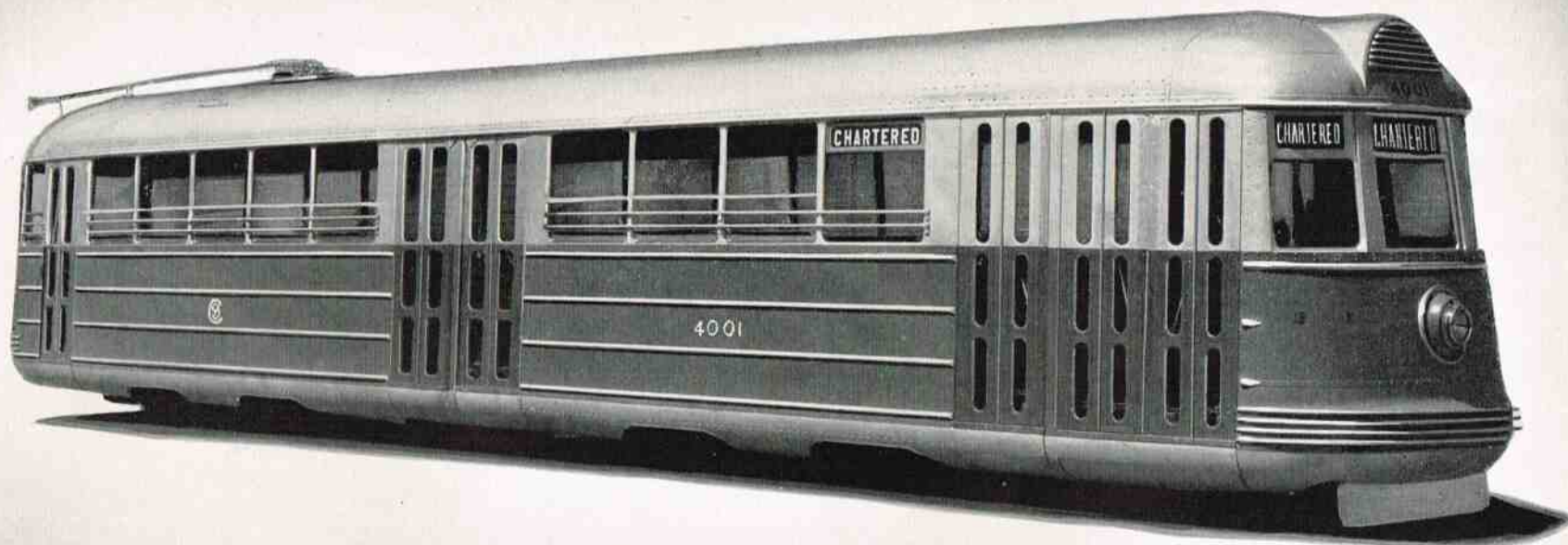
Up until the year 1933 light weight construction was accomplished by the use of aluminum to a large extent, but the steel companies soon recognized that the trend toward light weight construction necessitated development on their part of high-strength, low-cost alloy steels and within the last few years these steels also have been available to the car builders.

Modern Design Applied to the Trolley Coach

While the Pullman-Standard engineers were developing designs of railroad passenger coaches to be constructed of these new steel alloys they were at the same time devoting their efforts to producing designs of trolley coaches, utilizing these same materials in their construction. On one of the following pages will be found illustrations of coaches that have been built for some of the largest cities. Because of the sturdiness of these designs and the attractive appearance, Pullman-built trolley coaches have received a good deal of favorable comment, not only from the purchasers but also from the patrons of these vehicles. In all cases reports indicate that traffic is returning to the transportation companies which operate these modern vehicles and repeat orders have been necessary in many cases to properly handle the increased patronage.

*Driver's compartment of trolley coaches built for
Dayton, Ohio.*

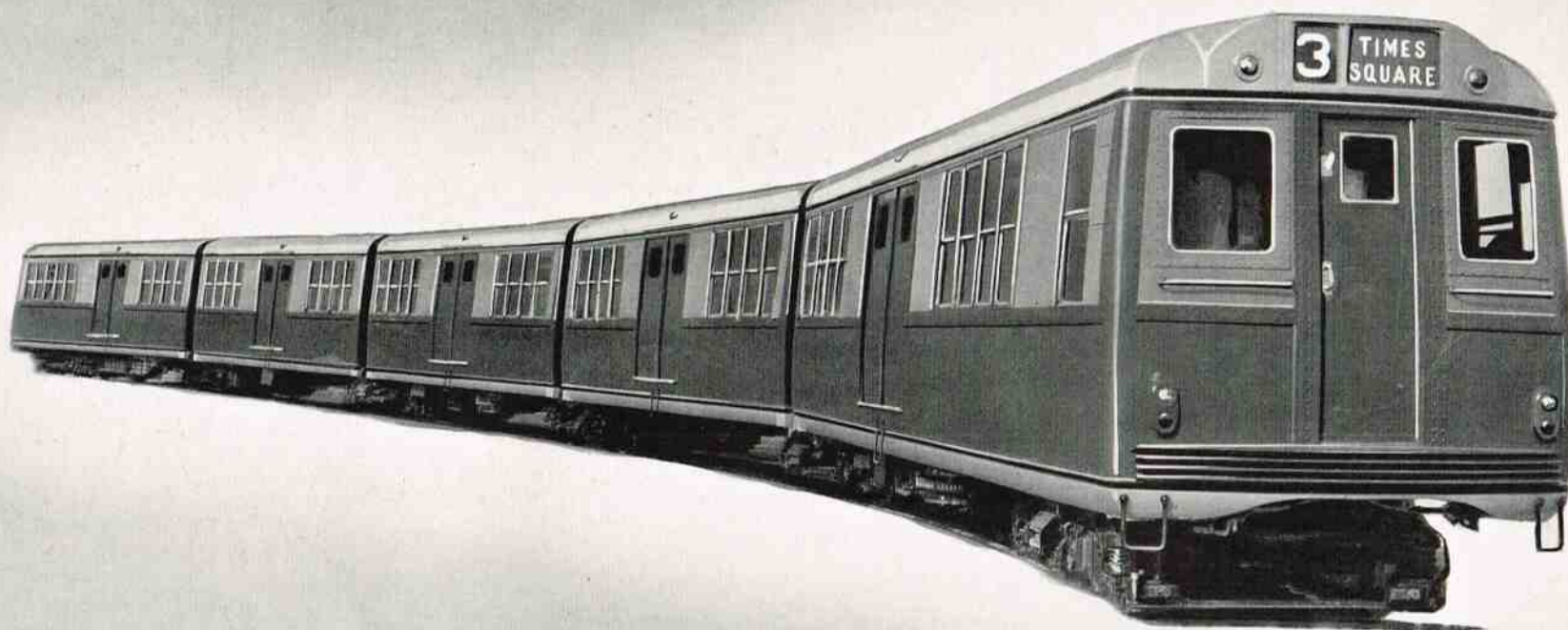




EXPERIMENTAL STREET CAR FOR CHICAGO

Built of aluminum. • Forced air system of ventilation and heating. • Rapid acceleration and deceleration—improved illumination—quietness of operation. • Light weight 29,600

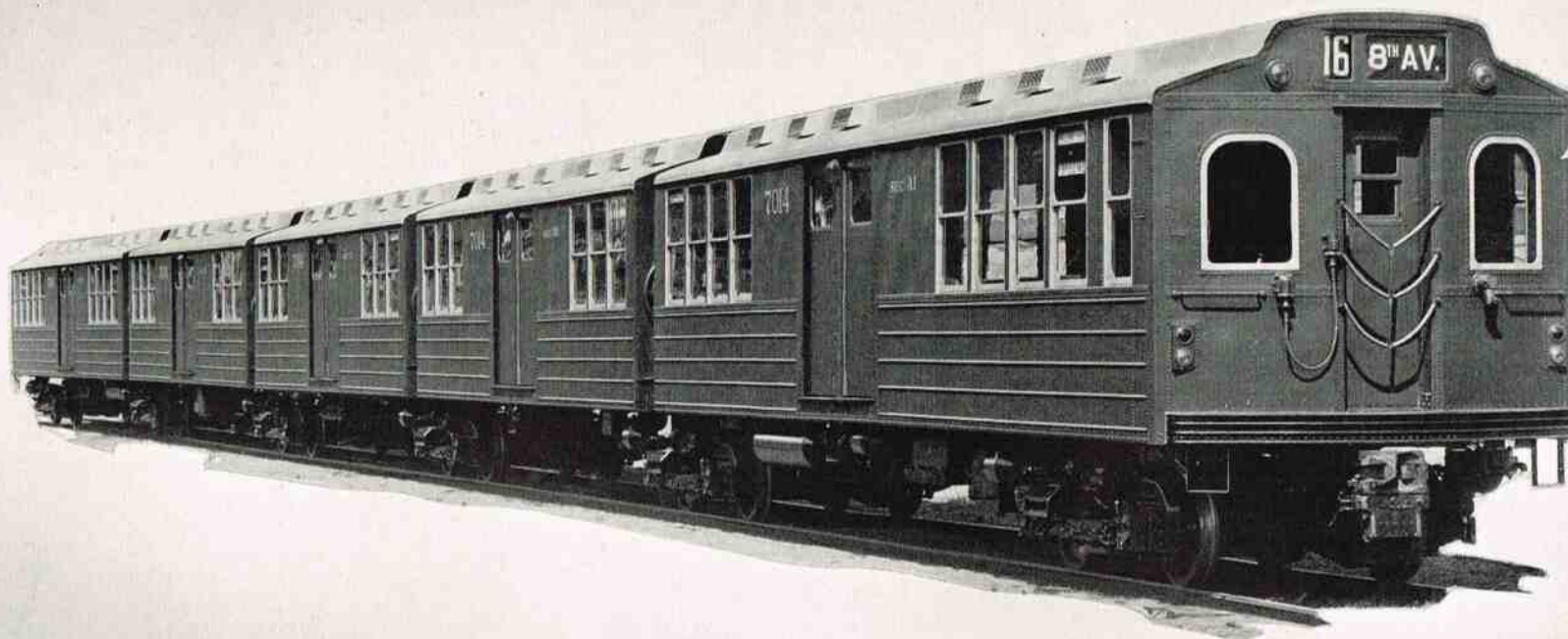
pounds—20,000 pounds less than typical street car. • Seating capacity 58. • New architectural design, originated by Pullman, giving attractive exterior appearance.



MULTI-SECTION CAR FOR NEW YORK RAPID TRANSIT

BUILT OF ALUMINUM

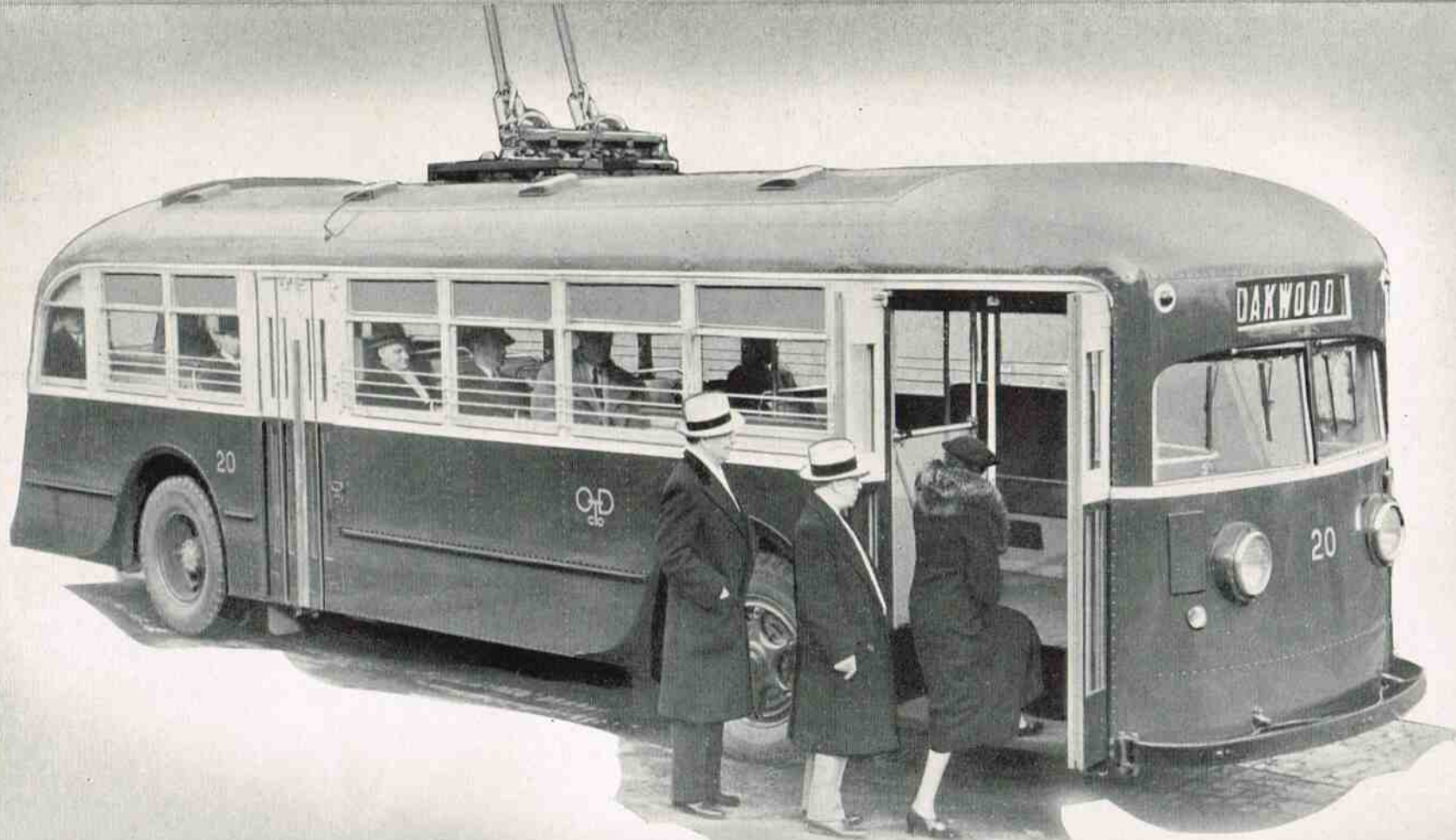
Light weight 170,610 pounds. • Seating capacity 184. •
Articulated. • Centralized and more flexible control.



MULTI-SECTION CAR FOR NEW YORK RAPID TRANSIT

BUILT OF COR-TEN STEEL

Light weight 174,068 pounds. • Seating capacity 198. •
Articulated. • Centralized and more flexible control.



TROLLEY COACH FOR DAYTON, OHIO

Body lines unusually attractive due to extensive streamlining.

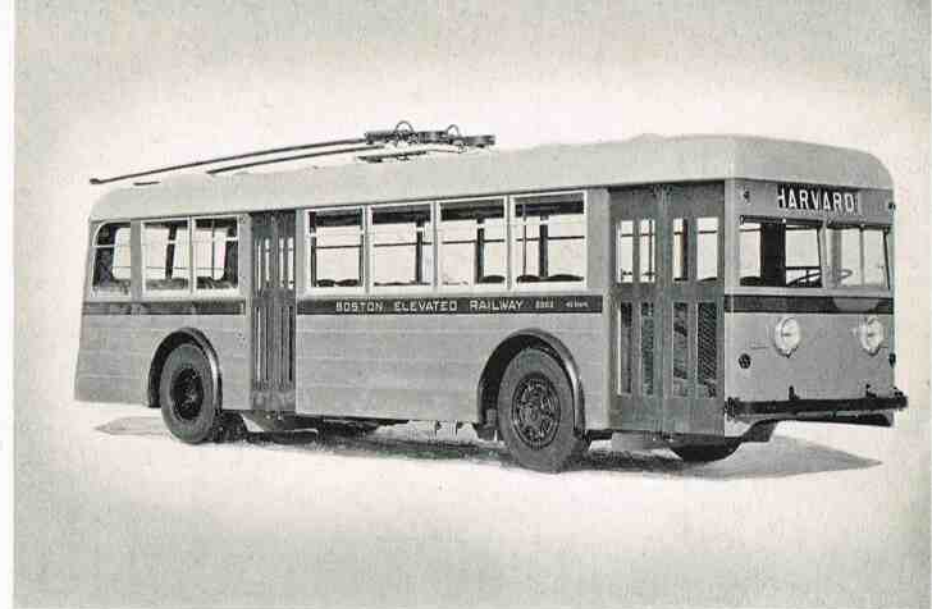
• Built of steel. • Light weight 20,080 pounds. • Seating

capacity 40. • Weight distribution is 60% on rear wheels and

40% on front wheels.



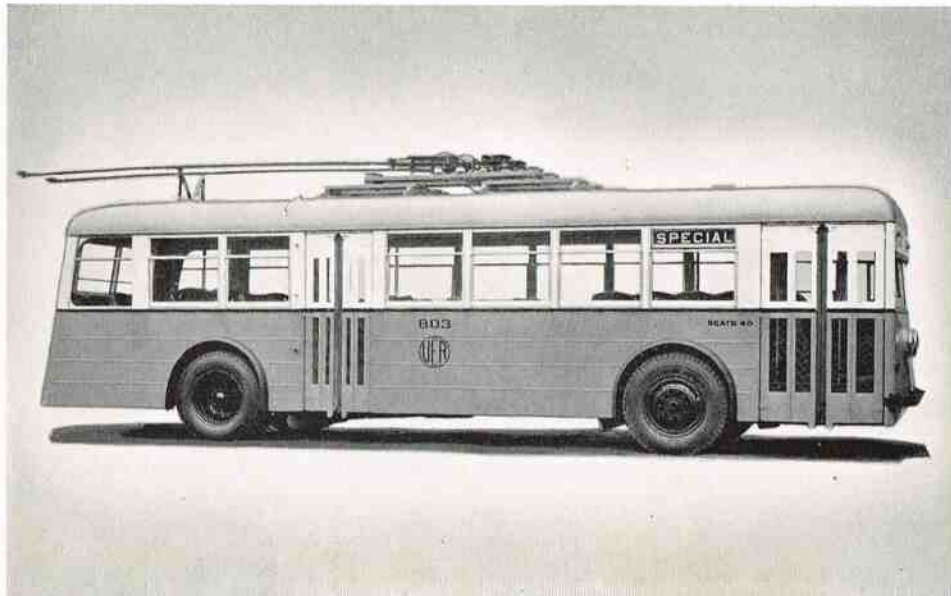
Trolley Coach for Chicago



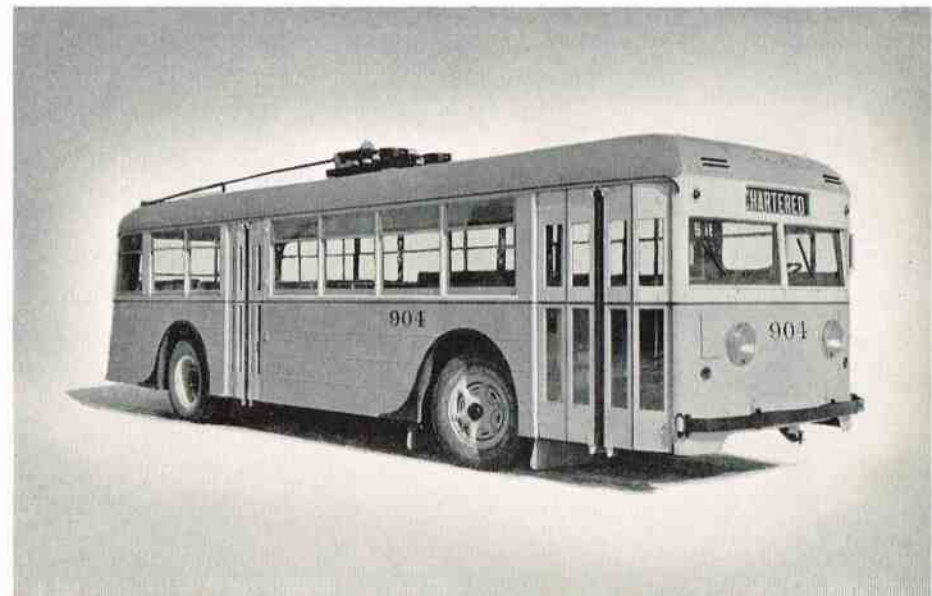
Trolley Coach for Boston

PULLMAN-BUILT TROLLEY COACHES

Trolley Coach for Providence



Trolley Coach for Cleveland



“Built by Pullman” is an assurance of advanced design and sound construction. • There is a Pullman-Standard car building plant or wheel foundry in your territory . . . each adjacent to one or more large railway systems and each an important factor in the prosperity of its community.

PULLMAN-STANDARD CAR MANUFACTURING COMPANY

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