

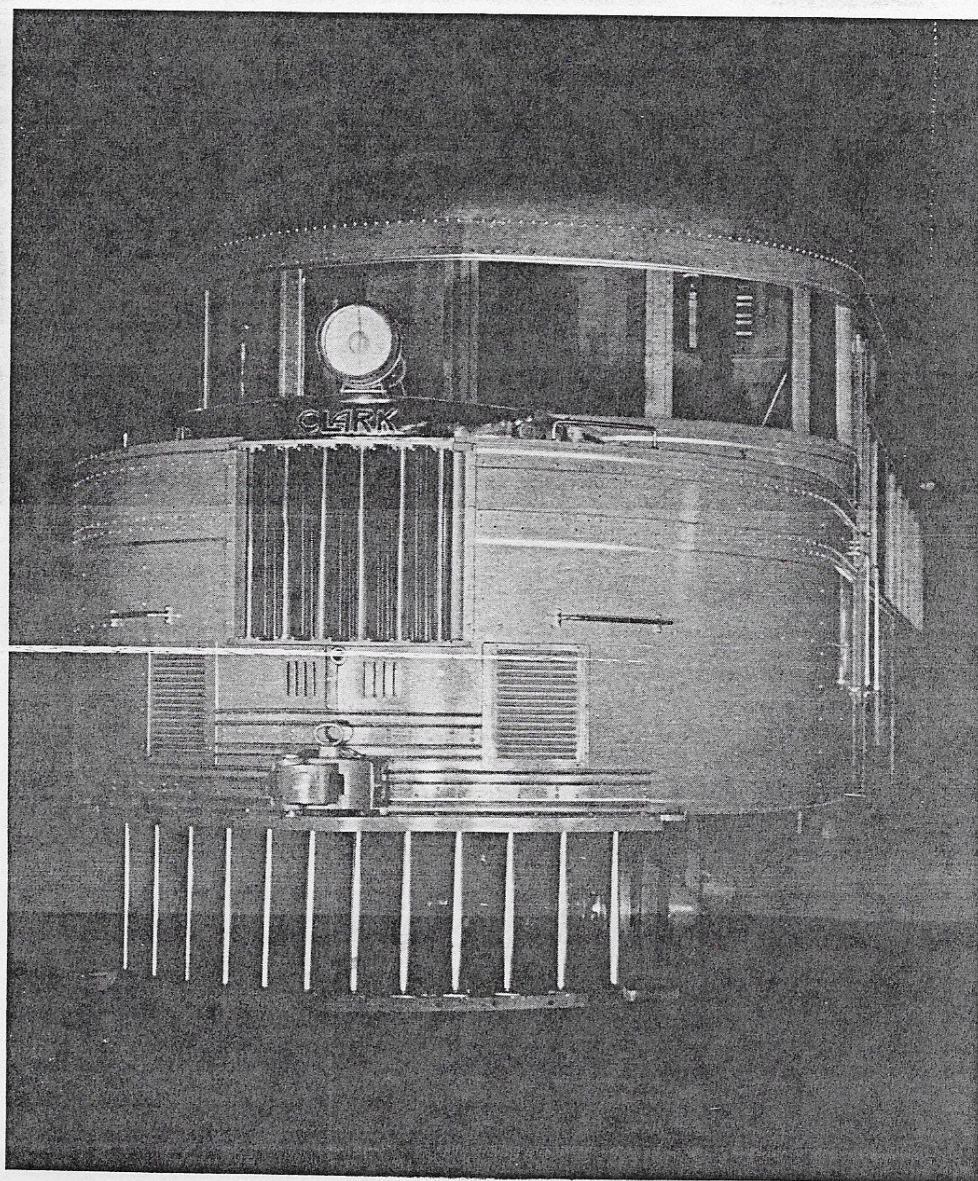
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THE CLARK  
AUTOTRAM



*A brief description*  
of the **AUTOTRAM**

*Clark Equipment Company*  
*Battle Creek, Michigan*

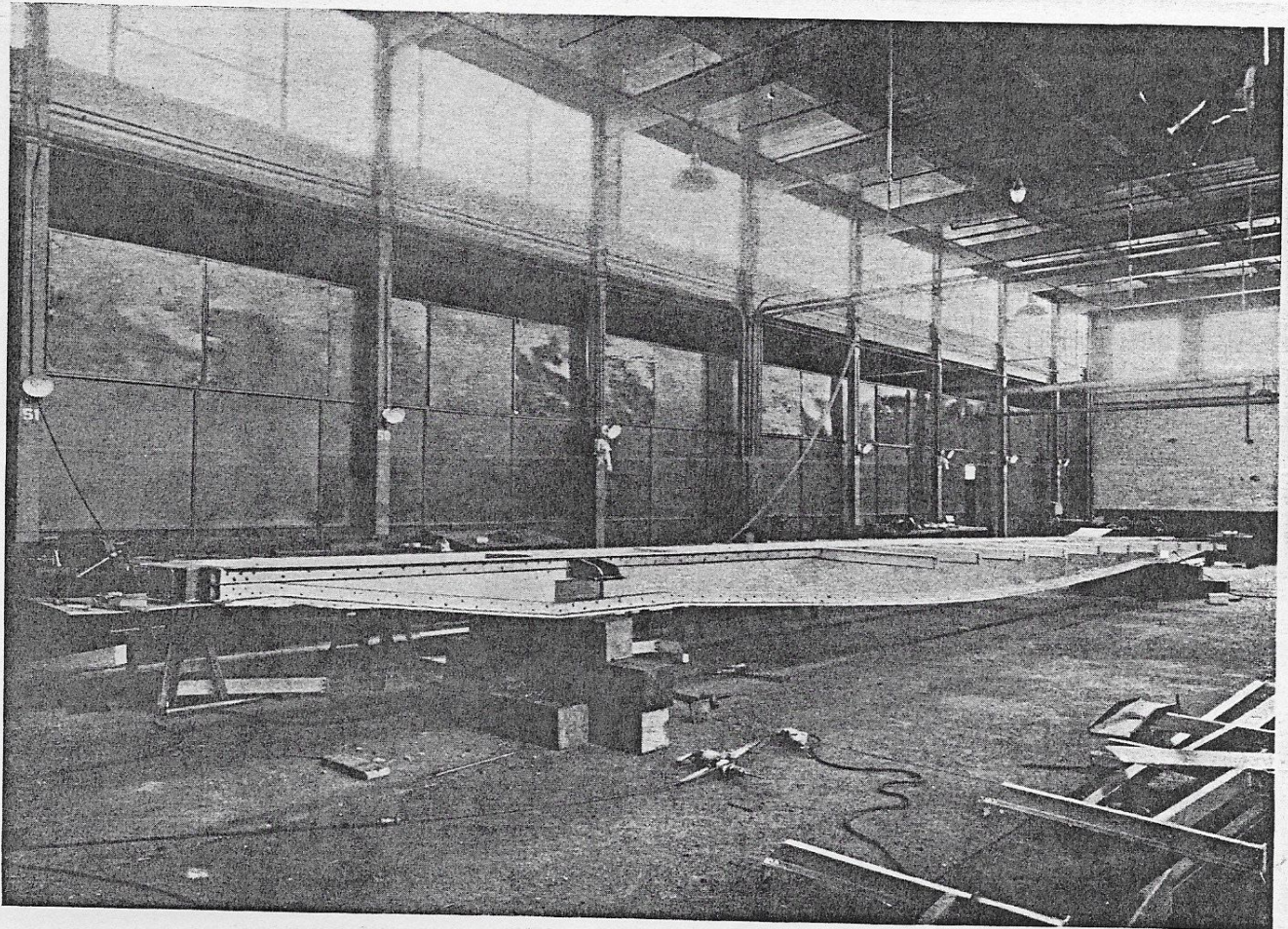




The Autotram is a new railroad vehicle in which principles of automotive design have been applied to railroad needs. It is in fact an automobile built for use by railways, on their main lines, in the hope that it may enable them to supply faster and more frequent passenger service at lower cost.

The drive of the Autotram while purely of an automotive type naturally differs greatly from that of the standard automotive vehicle built for highway use. There is no chassis in the automotive sense of the word but in its place there are two trucks upon which the body is carried in a manner similar to the standard railroad car.

In the front end of the vehicle is a power compartment containing not only the main driving engine but also certain auxiliary units. The driving engine is a high speed 16 cylinder gasoline engine of the V-type. Tractive effort is supplied to the wheels from the engine through a series of sturdy units designed for the purpose and adapted to the peculiar necessities of the vehicle. Means are provided to convey the tractive effort from the rigid body to the swiveling trucks as the vehicle rounds curves. All driving is done on the forward truck which is equipped with two pairs of wheels, each driven by a specially designed automotive axle. The



The Autotram body construction is what is known as the "center-sill" type. It has a strong duralumin beam from end to end with a buffer strength of 450,000 lbs.

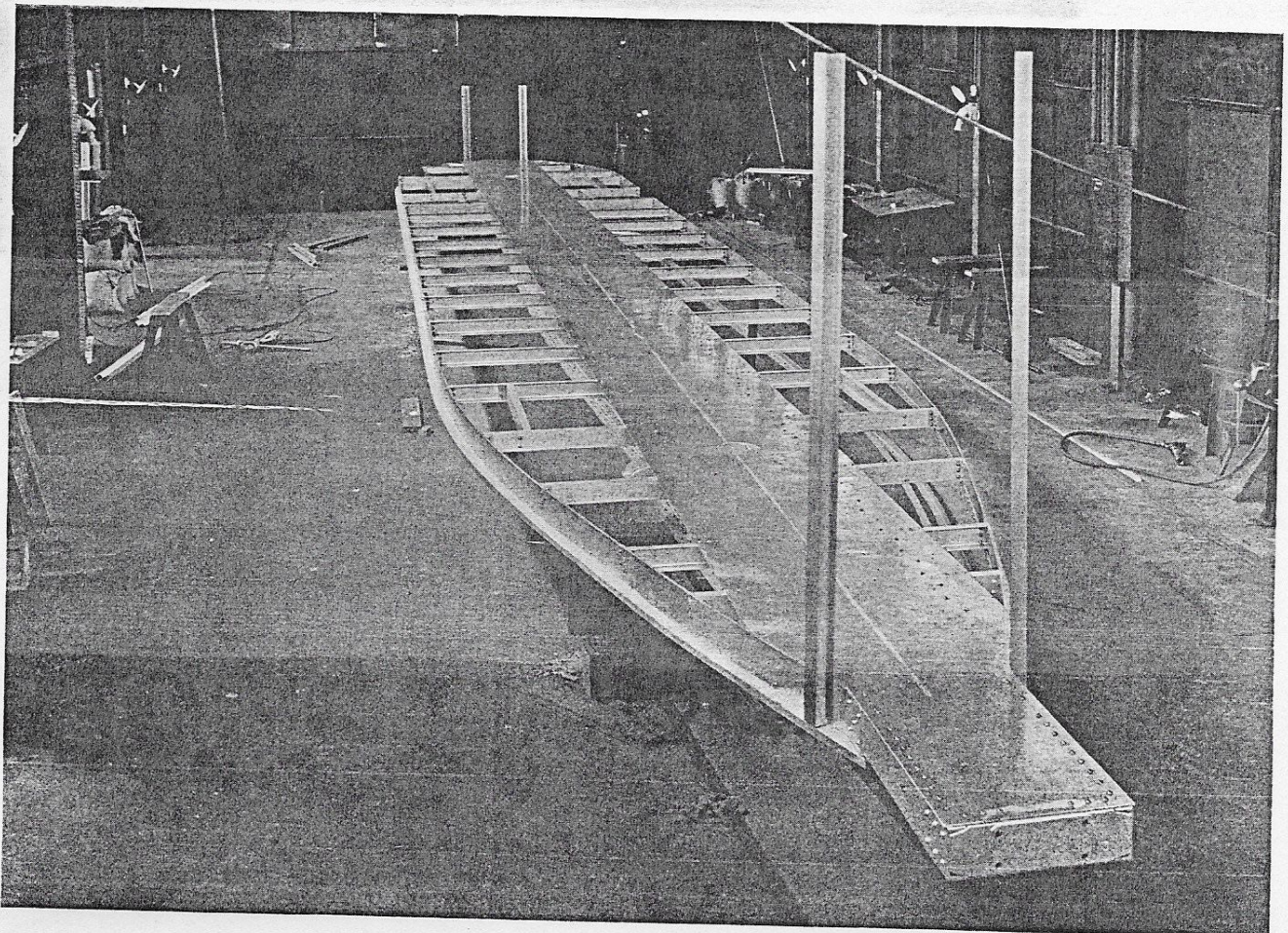


rear truck is a trailing truck. Means are provided to permit side slipping of the wheels as is usual in railroad vehicles. Braking is accomplished on all wheels of both trucks. Brakes are of the automotive type rather than of the railroad type. They are internal expanding hydraulically operated, but controlled by air from the engineer's cab.

The design of the trucks is such that rubber-tired wheels may be used if and when tire development will permit. The vehicle as at present built is equipped with steel-tired wheels, the contour of the rims being of the standard railroad specification. Much attention has been

given to the design of these wheels. They are so built as to include rubber to provide cushioning and resiliency and yet to conform to railroad standards. The design is such as not only to be resilient but also to insulate the car body against the noise generated by the wheels rolling on the rails.

Rubber has been used liberally throughout the vehicle to insulate against noise and to prevent vibration. Not only are all power units mounted on rubber in such a way as to avoid metal to metal contact, but the body itself is rubber mounted on the trucks, and the wheels contain rubber between the tires and



The Clark Autotram body is of all aluminum alloy construction. The entire body structure is of duralumin which is as strong as steel.



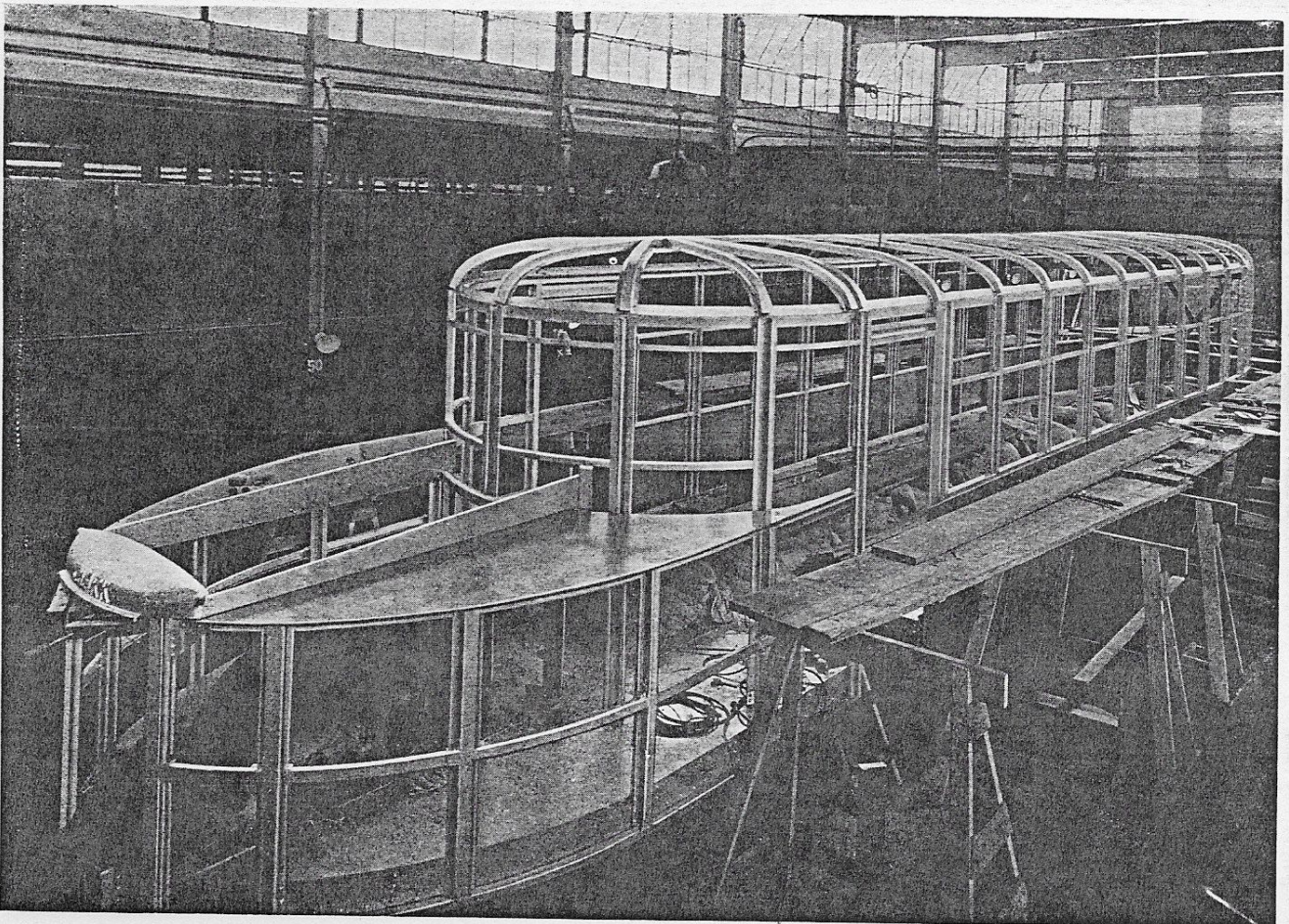
hubs. The result is to promote quietness and to prevent vibration of the car while in operation. Except for the liberal use of rubber throughout the structure of this car the qualities desired by its designers could not have been obtained.

The body is of aluminum construction throughout. In most places an aluminum alloy called Duralumin is used, and all pieces are heat-treated before use. Aluminum—or perhaps we should say Duralumin—is especially suitable for the purpose of this vehicle, not only because of its lightness but because

of its quality of yielding rather than shattering under shock. The fabrication of the body utilizes a large number of sections, many standard and many special. Aluminum, because it permits of extrusion, may easily be formed into special sections which lend themselves readily to construction purposes.

These aluminum alloy structural members have the strength of mild steel although only one-third as heavy.

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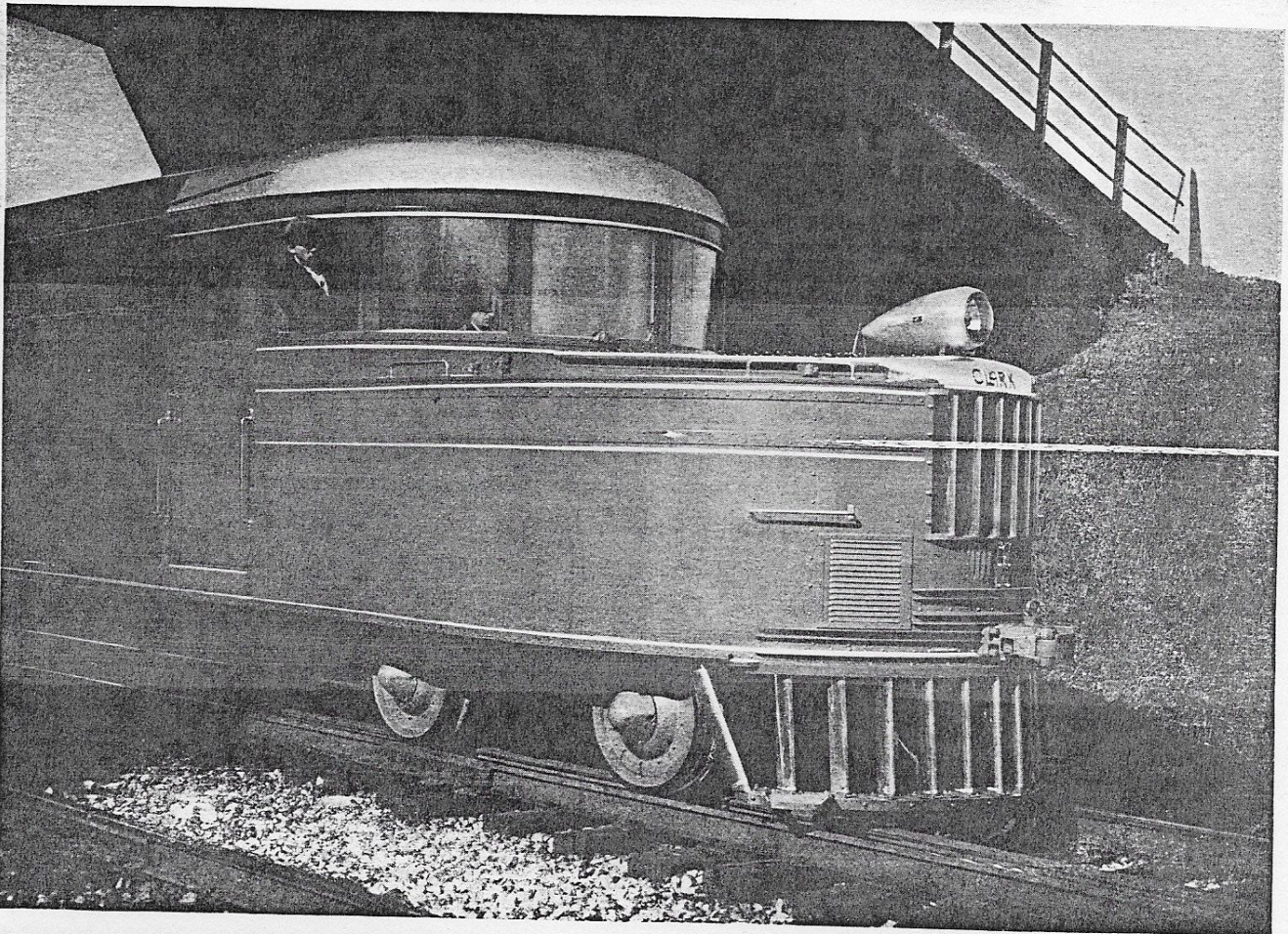


give strength longitudinally. While the Autotram is not intended to be operated in trains, still it has the buffer capacity, that is to say the strength longitudinally to permit its use in trains if so desired.

The vehicle is approximately sixty feet long. It is of fully streamlined construction with an approximately round front end and a wedge-like rear end. Extreme care has been given to the streamlining. Not only has the contour of the body been such as to reduce wind resistance, but aeroplane practice has been followed to the extent that all exposed struts and guards have

been made of the shape which is conducive to minimum wind resistance.

In the forward part of the body is the power compartment. Above and behind this is the driver's cab, in which are located the controls and the instruments. The front of the cab is of approximately spherical contour and is equipped with windows which give adequate vision ahead and to both sides. Behind the engineer's cab is a passageway, access to which is obtained by doors to each side of the vehicle. From this passageway access also is given to



The Autotram is streamlined with a round front end and a wedge-like rear end. Aeroplane practice has been followed in the shaping of exposed struts and guards to reduce wind resistance.



the passenger compartment, in which there is a seating capacity for forty passengers.

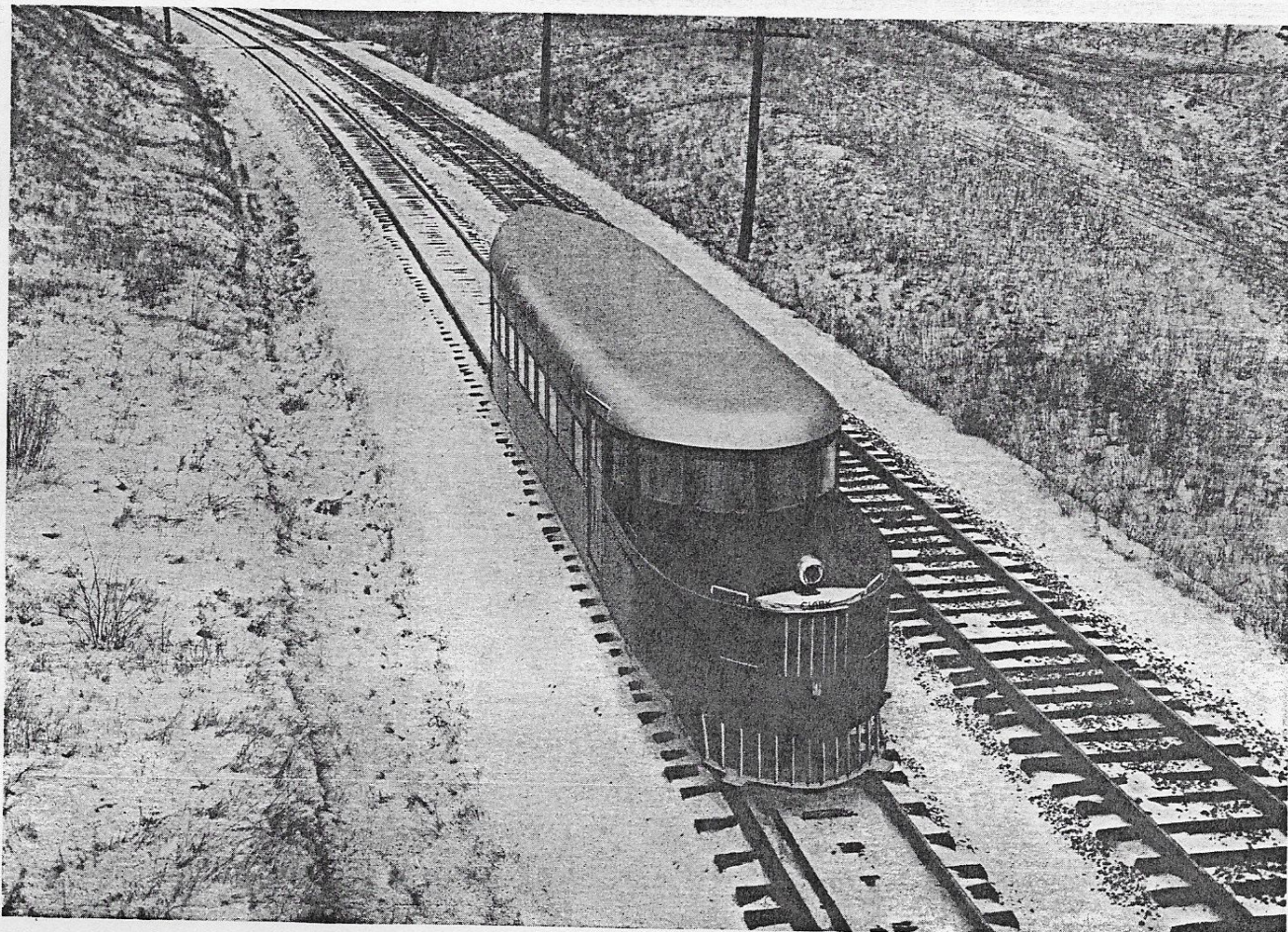
Windows are fixed and are equipped with double glass, of which the inner pane is shatter-proof. Lighting is modern and liberal. Ventilation is artificial and of such liberal capacity that the entire air in the car is changed every three minutes. Under this arrangement smoking may be indulged by the passengers without discomfort to non-smokers. Heating is by apparatus especially designed, using waste heat from the engine. Temperature regulation is automatic. The walls as well as the floor and roof are of double shell construction with in-

sulating material between the inner and outer shells so that regulation of internal temperature may be accomplished, without waste, irrespective of weather conditions outside.

The car is equipped with a small kitchenette from which luncheons may be served. Adequate toilet facilities are provided.

An emergency exit has been installed at the rear of the vehicle but ingress and egress is expected to be made from the front.

The Autotram weighs 30,000 lbs. empty but equipped for passenger service; of this weight approximately 12,000 lbs. represents



The Autotram is built for operation on main lines and is equipped with signal apparatus for operating semaphores and crossing signals; it also has bell and air whistle.



various aluminum alloys. Had it been built of ordinary car structural material, it would have weighed 52,000 to 55,000 lbs.

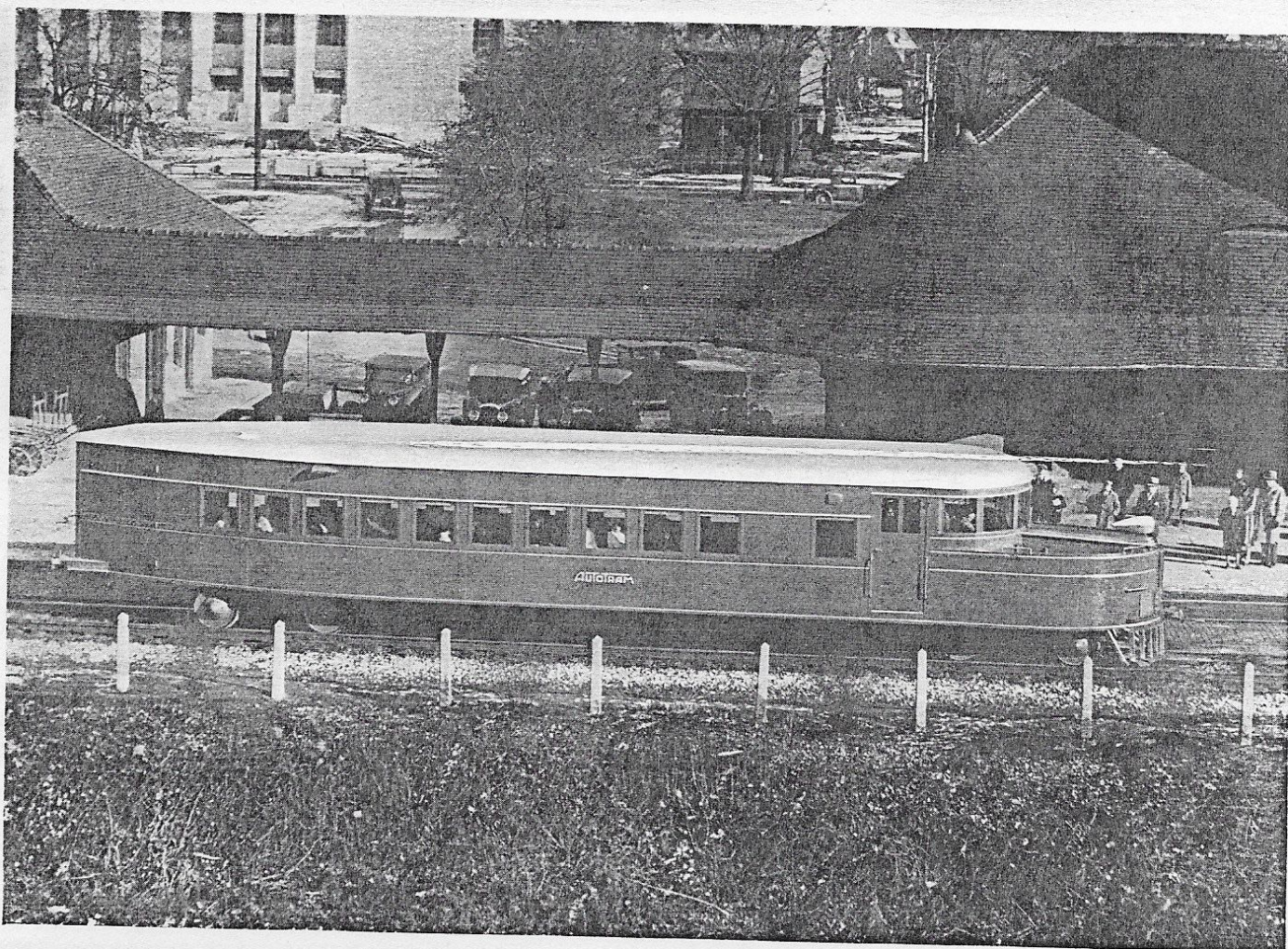
The Autotram is built for operation on main lines and to that end is equipped with signaling apparatus to operate semaphores and crossing signals. Automatic train control may be installed if desired. The car is equipped with a bell arranged for automatic ringing; with a whistle operated by air; and with sanding apparatus for use on wet rails.

A separate electric lighting plant is installed in the power compartment from which are operated all interior lights, as well as the

headlight and tail-lights, these latter being of standard railroad specifications.

The result sought by the designers of the Autotram has been the development of a light, but very strong, vehicle capable of high speed with quick acceleration and rapid braking. The safety and comfort of its passengers have been given first consideration. Low cost of transportation has been the next consideration.

It is hoped, and believed, that the Autotram is a marked step in advance for railroad vehicles. In its construction automotive principles have been applied to railroad needs. Since it is undeniably true that the automotive industry



Autotram design, power and drive provide quick starts and stops. Automotive type brakes are air controlled, hydraulically operated. Resilient steel flanged wheels are distinctive. Rubber is freely used to dampen vibration.



has been strongly competitive with the railroad, it now seems fitting that the automotive industry should make a contribution to the railroads. It is believed that the Autotram is such a contribution.

The railroads, in common with all other industries, are now suffering from the wide spread, unsatisfactory economic conditions. The country cannot prosper unless the railroads prosper. Adequate transportation always has been and still is necessary to our welfare.

If the railroads could reduce their passenger fares they unquestionably would attract business, but in order to reduce fares they must reduce costs. We believe this vehicle presents an opportunity to the railroads to reduce transportation costs by permitting faster, more frequent and less costly service. We estimate that the Autotram will operate at ten and one-half cents per mile, exclusive of labor, but inclusive of operating costs, maintenance and depreciation.



Club lounge or standard coach seats as specified. Double windows of safety and plate glass are fixed. Autotram is air conditioned, temperature automatically controlled. Lighting is modern and liberal.



*We desire to express appreciation to the following and other companies for assistance in our development of the Autotram.*

ALUMINUM COMPANY OF AMERICA, Pittsburgh, Pa.

CADILLAC MOTOR CAR Co., Detroit, Mich.

B. F. GOODRICH COMPANY, Akron, Ohio

HARRISON RADIATOR Co., Lockport, N. Y.

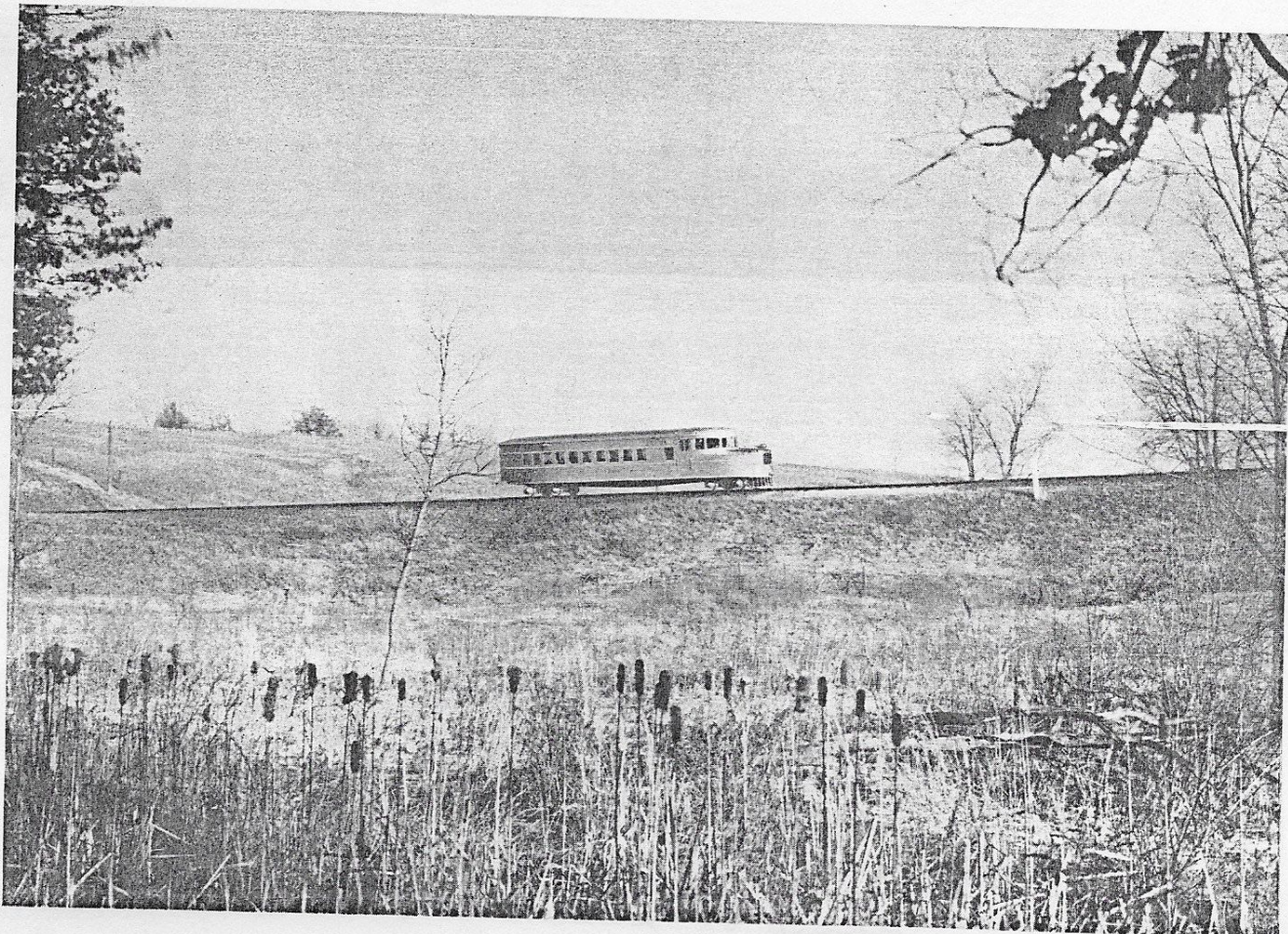
HYDRAULIC BRAKE Co., (Division of Bendix Corp.) Detroit, Mich.

KOHLER COMPANY, Kohler, Wis.

MINNEAPOLIS HONEYWELL REGULATOR Co., Minneapolis, Minn.

UNION SWITCH & SIGNAL Co., Swissvale, Pa.

CLARK EQUIPMENT COMPANY  
BATTLE CREEK, MICH.



Autotram has cruising speed of 70 m. p. h. with capacity for much higher speed between stations. Direct gas power and special mechanical drive enable Autotram to climb exceptional grades.



## SPECIFICATIONS

12 TON "BMD-12" -- 56½" GAUGE

### POWER PLANT

--- McCormick-Deering (International Harvester Company) Model 300 Industrial. Brake h.p. 40 at 1050 r.p.m. Develops 48 h.p. at 1200 r.p.m. Cylinder bore 4¾" Stroke 6". A high grade, heavy duty, long lived, slow speed motor equipped with renewable cylinder liners, ball bearing crank shaft, air cleaner and other advanced features. Either kerosene or gasoline can be used with standard carburetor.

### SPEEDS

--- Five (5) forward; five (5) reverse. Approximate range: First-1½ miles per hour. Second-2¼ miles per hour. Third-3 miles per hour. Fourth-6 miles per hour. Fifth-12 miles per hour.

### END SILLS & COUPLERS

-- Semi steel castings (Not cast iron) 80" X 30". Thickness varies slightly but is approximately 9" on the BMD-12. Equipped standard with pole pushing pockets. Couplers are standard MCB connected to end sill castings by means of steel coupler flanges. Supplied standard with coupler height of 34½" above the rails.  
(Note) Either Three Quarter or One Half MCB can be supplied.

### BRAKES

--- Cast iron brake shoes on each of the four drive wheels, controlled by a single hand lever conveniently located in cab. Westinghouse Air Brake equipment can be supplied at extra cost.

### AXLE BEARINGS

--- Standard equipment includes Brookville Journal Boxes with Bronze Bearings, with Timken Roller Bearings optional.

### DRIVE WHEELS

--- 33" Dia. is used standard on all 56½" gauge. Three different types are available. (a) One piece wheel with 4" chilled face and flange. (b) Solid one piece, forged steel. (c) Combination rolled steel face and flange (ARA) shrunk upon a cast wheel center.

### WHEEL BASE

--- 60" wheel base is used standard with 33" Dia. drive wheels.

### FRAME

--- A 15" section of ship channel weighing 75 Lbs. to the lineal foot is used standard. With engine and transmissions carried on sub frame.

### CAB & CURTAINS

--- Cab and curtains are optional. Two standard types can be supplied: (a) Steel, with fully enclosed roll curtains. (b) Steel, with sliding doors and windows, fitted with heavy plate wire glass. (Note) Illustration covers standard steel and wire glass enclosed cab.

### OVERALL DIMENSIONS

-- Overall length, free of couplers and flanges 14 Ft. Overall width 80". Overall height - this dimension is not set, but is approximately 66" less cab, and 96" with cab.

(Note) Tool box, tools, gong, etc. are supplied as standard equipment.

(Note) Electric starting and lighting is optional.

(Note) Chassis cut is shown on Page 8. Bulletin B-28-1.