

# Improved Type Tramcar

**Advanced Truck Design . . . Pneumatically Operated Doors  
. . . Special Lighting . . . Acceleration 3 m.p.h. per Sec.**

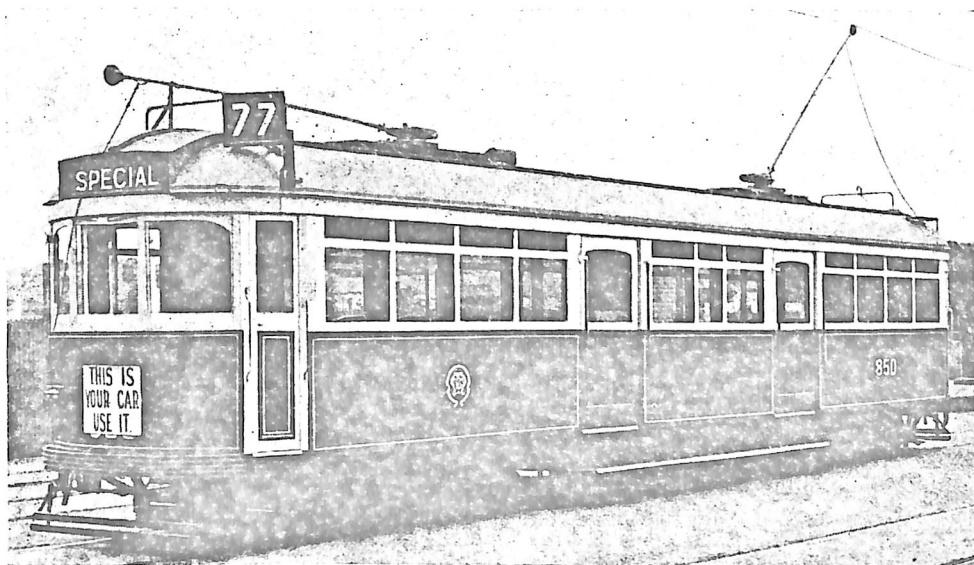
**E**MBODYING refinements and improvements observed by the chairman (Mr. H. H. Bell) in the course of his inspections of many transport systems during his tour abroad last year, a new tram car of the Melbourne Tramways Board is now completed and in service. This vehicle, which is 46 ft. long and 8 ft. wide, will accommodate 48 seats and has been designed specially for Melbourne conditions in order to give the maximum of passenger comfort in the directions of lighting, ventilation and seating.

One of the main features of the new car is the sliding doors, fitted with safety glass, which will be provided at each of the four entrances. Operated by compressed air, these doors are controlled by the driver so that they can be closed during inclement weather, opened when fine, or closed on one side and open on the other. The partitions with sliding doors which in the present trams separate the saloon from the smoking compartment, are omitted; their place being taken by shallow safety glass screens to protect the saloon passengers from draughts when the doors are open.

A light color scheme has been chosen for the interior finish, a feature of which is the ceilings. Hitherto the Melbourne tram-cars have not been

fitted with ceilings. On the new car, the ceilings are made of a special material which runs the full length of the car and which is finished in ivory color. The seats are arranged transversely as in some of the more recent cars, and four pairs of seats in each saloon are of the reversible type, so that passengers may face the direction in which the car is travelling. The seats are fitted with rubber cushions upholstered in leather of specially selected color, while the sides of the saloons are lined with leathercloth to match. The floors are covered with rubber in a color which will tone with the general color scheme, and the interior vertical handrails finished with green Doverite.

Special attention has been given to the question of lighting with the result that special lamp fittings have been designed to shade the two rows of lamps placed above the seats and yet give an even distribution of light with complete absence of glare. Ventilation was also given due consideration. Small Hopper type ventilator windows were finally selected for the purpose, and these have been placed above the main windows so that ample ventilation may be obtained even in wet weather when the main windows are closed. Wooden louvre sun blinds have been provided for all the saloon windows.



New Steel-Framed Tramcar of the Melbourne Tramways Board. Special features include pneumatically operated sliding doors, improved bogie truck design and springing, and rear lamp indicators for following traffic.

Rear lamps are provided on the car as indicators for following traffic. A red light shows when the motor controller is off, and a green light when the controller is on. A Cinch hand windscreen wiper is provided in the motorman's cabin which is fitted with two half-drop windows. The route number boxes are operated by a special mechanism from the cabin, and canopy lights are provided for slogan notices. A loud-speaker announcing system is installed in the car and is controlled from a microphone in the driver's cabin. The starting and stopping of the car is signalled by an electric buzzer system, operated by hand cords.

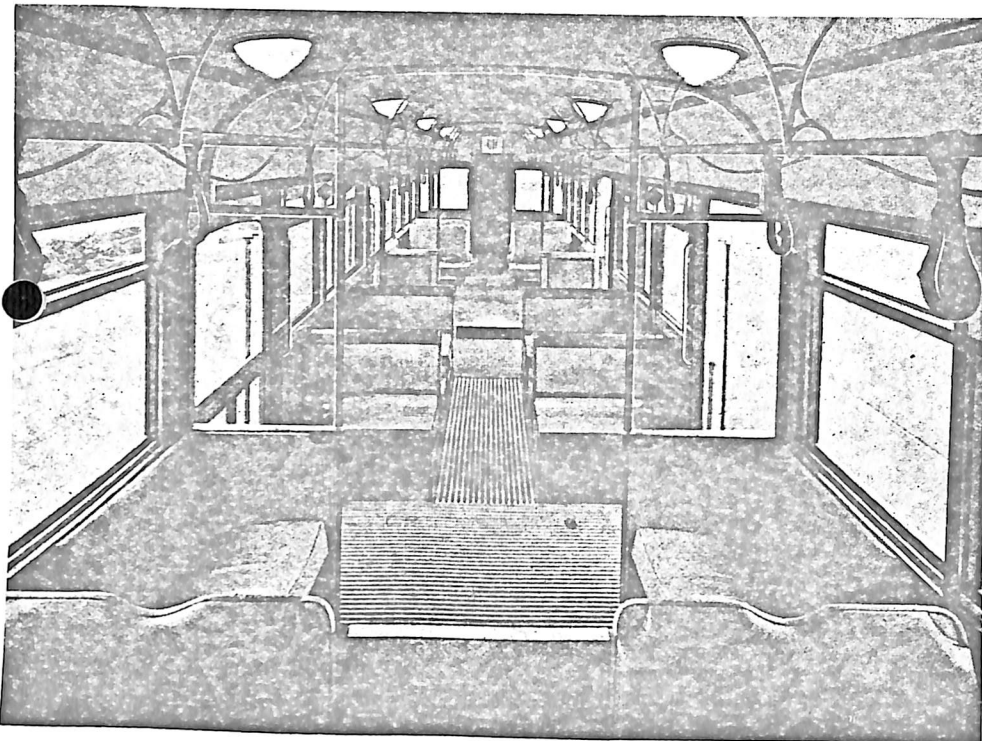
The principal dimensions of the new car are as follows:—

Length over bumpers .. . . . . .	46 ft. 6 in.
Length over corner posts .. . . . . .	40 ft. 1 in.
Width of car over pillars .. . . . . .	8 ft.
Width of car over footboards .. . . . . .	9 ft.
Height, rail to footboard .. . . . . .	1 ft. 2½ in.
Height, vestibule to saloon floor .. . . . . .	6 in.
Truck centres .. . . . . .	28 ft.
Truck wheel base .. . . . . .	5 ft. 2 in.
Size of wheels .. . . . . .	28 in.
Seating capacity .. . . . . .	48
Crush load capacity .. . . . . .	150
Weight .. . . . . .	16 tons 18 cwt.

The car body is of steel frame construction while the interior joinery work is of the modern plain finish. Bogie trucks are to the Board's latest design and ensure smooth and comfortable riding. They have steel section side frames supported on long semi-elliptic springs rigidly attached to the axle boxes, and joined to the side frame by a pin on one end and a sliding shoe on

the other. The pins are provided with rubber bushed bearings, and the sliding end with rubber pads. The wheels, which are 28 in. in diameter, are of the one wear solid rolled steel type, while the axle boxes are fitted with Timken taper roller bearings. Clasp type truck brake gear is used, and is equalised throughout. A new method has been adopted for securing the brake shoes to their holders. In place of the brake shoe keys, which frequently work loose and cause rattle and noise, the shoes and holders have been designed for bolting solidly together with a  $\frac{7}{8}$  in. bolt. The truck leverage is 6.344 to 1, and the foundation brake gear leverage on the car body 2.114 to 1, giving a total overall leverage of 13.39 to 1. The brakes are operated by compressed air.

The car is equipped with four 40-h.p. General Electric 247A motors with 15/58 gear ratio. This equipment is capable of average rates of acceleration and retardation of 3 m.p.h. per sec. from 0 to 12 m.p.h., or 2½ m.p.h. per sec. from 0 to 15 m.p.h. with a seated load on level tangent track without discomfort. The free running speed is 28 m.p.h., and the schedule speed 12 m.p.h. with seven stops of 6 sec. each per mile. The electrical control equipment is of the remote contactor control type, arranged for series-parallel operation with seven series and seven parallel resistance steppings. The hand-operated reverser barrel is made in two sections, either of which can be locked in the neutral position to isolate one pair of motors. The contactors, resistors, and line circuit breaker were supplied by Australian General Electric Co. Ltd. The brake equipment,



Interior View of Tramcar. In each saloon the seats are fitted with rubber cushions upholstered in leather. Special lighting and ventilating systems are installed. At the far end of the car may be seen the loudspeaker unit which, together with a microphone in the driver's cabin, enables the driver to supply information to passengers. The smoking compartment is separated from the saloons by shallow safety glass screens.

supplied by Westinghouse Brake Co. of Australasia, comprises a Westinghouse D.H.16 compressor, an 8-in. by 12-in. brake cylinder and a 60-in. by 16-in. air reservoir. All motors, gears, control and brake equipment were manufactured in Australia, while the hand brakes, trolley bases, destination signs and route numbers are of the Board's own design and manufacture.

### Acknowledgment

The foregoing particulars and illustrations have been kindly supplied by the Melbourne and Metropolitan Tramways Board.

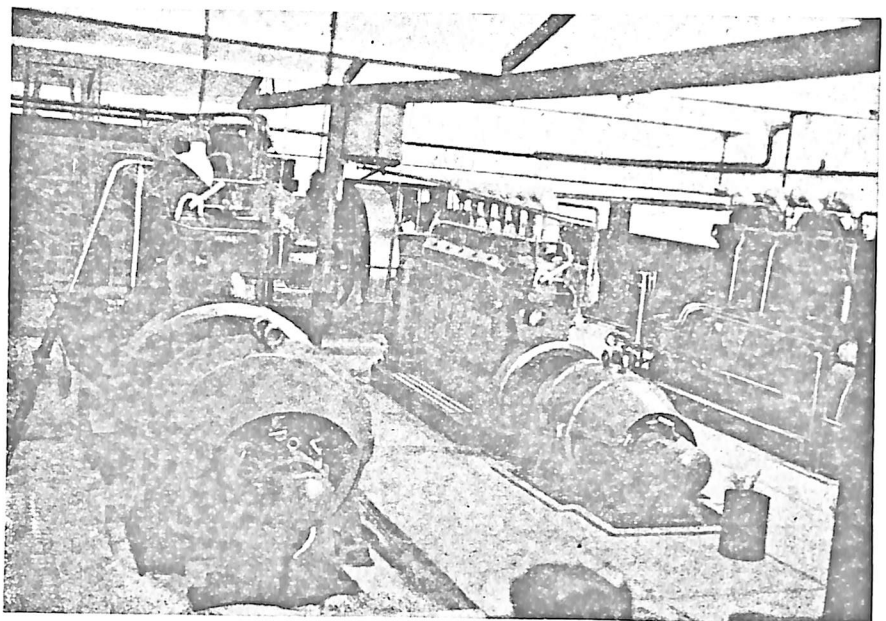
Since the council assumed control the following generating equipment has been installed: in 1927, one 120-h.p. oil engine direct coupled to an 85 kw. English Electric generator; in 1928, one 60 h.p. oil engine direct coupled to a 45 kw. M-V. generator; in 1936, one 180 h.p. oil engine direct coupled to a 120 kw. M-V. generator; and in 1939, one 275 h.p. oil engine direct coupled to a 185 kw. M-V. generator. All the engines were supplied by Ruston and Hornsby (Aust.) Pty. Ltd. and were installed by Mr. G. L. Price, erection engineer of the company.

The station furnishes power for the town water supply, the plant comprising a 36 h.p. 8 in. Pomona motor-driven deep well pump having a capacity of 16,000 gal. per hour; the total head being 300 ft. This load averages 14 hours daily. A motor-generator unit has been installed recently for the supply of power to the Commonwealth Aerodrome. Energy is transmitted at 2,200 volts to the aerodrome which is 1½ miles from the power station. Work is also in hand for the erection of motors for sewage pumping units. The town supply is 460/230 volts, three wire d.c., and the aerodrome supply 415/230 volts three phase a.c. The number of consumers totals 560 and the population in the area of supply, 1,800.

The electrical engineer to the Lowan shire council is Mr. F. H. Poolman who has been responsible for the development of the undertaking during the past 18 years. Acknowledgment is made to Mr. Poolman for the aforementioned particulars and the photograph of the power station.

## A Modern Country Power Station

With the installation of a 275-b.h.p. Ruston oil engine direct coupled to a Metropolitan-Vickers generator, the generating capacity of the Lowan shire council's power station at Nhill, Vic., now totals 655 b.h.p. It is interesting to note that it is claimed that the town was the first in the State to be supplied with electric light for commercial purposes. This supply was made available in 1888 from the flour mill of Messrs. Fry, but later a company was formed for the purpose of operating the undertaking on a larger scale. The Lowan shire council took over from the company in 1921.



Lowan Shire Council's Power Station, Nhill, Vic. Left.—275 h.p. generating unit. Centre.—180 h.p. generating unit. Right.—120 h.p. generating unit. Background.—60 h.p. generating unit. All units comprise Ruston oil engines direct coupled to M.V. and English Electric generators.