

New Tramcars for Melbourne

The Melbourne and metropolitan tramways board recently completed the first of a number of cars of new design, known as the W4 class. In general they are similar to the W3 class bogie cars, which have been the board's standard type, but the design has been modified in several particulars in order to provide more comfort for passengers. The body of the new car is wider in order to accommodate upholstered cross seats in the saloon in place of the longitudinal wood seats which have been standard in all previous designs. The greater width of body gives wider aisles between seats in the open compartment, and this extra width will be a convenience to both pas-

The bodywork has been built of steel, electrically welded, woodwork being used only for interior facings on the steel work. Considerable strength, combined with lightness, has been achieved with this design. The sills are of $3\frac{1}{2}$ in. x $2\frac{1}{2}$ in. x $5\frac{1}{16}$ in. angle steel, the belt rail $2\frac{1}{2}$ in. x $5\frac{1}{16}$ in. angle, and the cant rail $2\frac{1}{2}$ in. x $2\frac{1}{2}$ in. x $3\frac{1}{16}$ in. angle. The corner posts are $2\frac{1}{2}$ in. x $2\frac{1}{2}$ in. x $\frac{1}{4}$ in. angle, the saloon pillars $1\frac{1}{2}$ in. x $1\frac{1}{2}$ in. x $3\frac{1}{16}$ in. tee section, and the roof ribs $1\frac{1}{2}$ in. x $3\frac{1}{16}$ in. tee section. The pillars of the centre vestibule are of wood, curved inwards at the bottom to allow for the standard width of footboard to be used without exceeding the overall

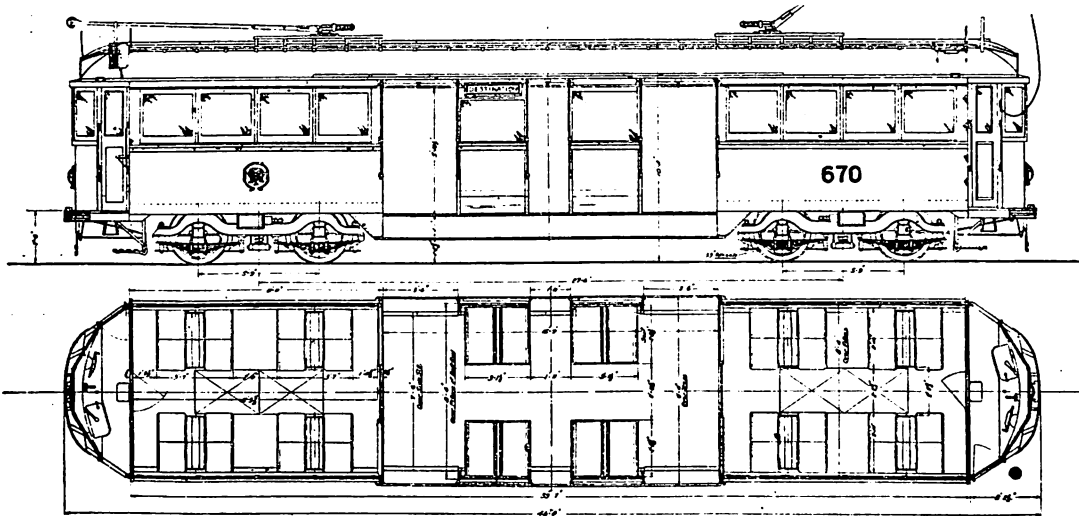


Fig. 1.—Outline Arrangement of W4 type Tramcar for Melbourne

sengers and conductors. The upholstered seats in the saloon are fixed and in pairs, placed back to back. The space below the seats is boxed in, giving extra clearance over the 33 in. diameter wheels. This allows the floor level and step heights to be kept lower than in the W3 class cars. The wide entrances which were a feature of the W3 and W2 cars have been retained.

Fig. 1 shows the general arrangement of the new car. The car is 46 ft. long, 8 ft. 4 in. wide over pillars, and 9 ft. over footboards, and 10 ft. 4 in. high from rail to roof. The weight is $16\frac{1}{2}$ tons. There are three entrances along each side to the loading vestibule, which has cross bench seats to accommodate 16 persons. This vestibule provides for smoking accommodation. Saloons open off either end of the vestibule, and are provided with sliding doors, and at the end with a communicating door to the motorman's compartment. The total seating capacity is 48, and the crush loading capacity 150.

width of 9 ft. The bolsters, which are 10 in. wide x $7\frac{1}{2}$ in. deep at the centre, are of the box type, built up with $\frac{1}{2}$ in. top and bottom plates and $\frac{1}{4}$ in. web plates, strengthened with ribs, all held together by electric welding. The cross members are 4 in. x 2 in. x 7.09-lb. channel section, and the end sills 5 in. x $2\frac{1}{2}$ in. x 10.22-lb. channel. Panels are 14-gauge, and the letter board 16-gauge special panel steel, all electrically welded to the pillars and cant rail.

The roof is of $5\frac{1}{16}$ in. ply wood, covered with cotton duck, laid in white lead, and supported on roof sticks of Australian blackwood. The interior finish of the ply wood roofing is in the natural color. T. and G. Vanikoro kauri $\frac{3}{4}$ in. thick forms the flooring. The hatch doors, which are of wood, are built with specially designed aluminium framings to fit neatly into their recesses, and are provided with flush fitting hatch lifts. The bulkhead framing, saloon lining and doors are made of Tasmanian mountain ash, panelled with ornamental

Queensland maple, while pillar facings and mouldings are of Australian blackwood.

The saloon seats are built with blackwood framings and panelled to match the interior design of the car. They are fitted with special soft sponge rubber cushions and backs, and are fully upholstered in brown leather. The cross bench seats in the smoking vestibule are built of Tasmanian mountain ash and blackwood framing around three-ply moulded forms, and supported on light pipe framework.

The interior finish of the car is in the natural colour of the wood, and the timbers are of ornamental quality, combined to give a pleasing effect. The floors in the saloons have been covered with 3/16in. thickness solid rubber of green color to

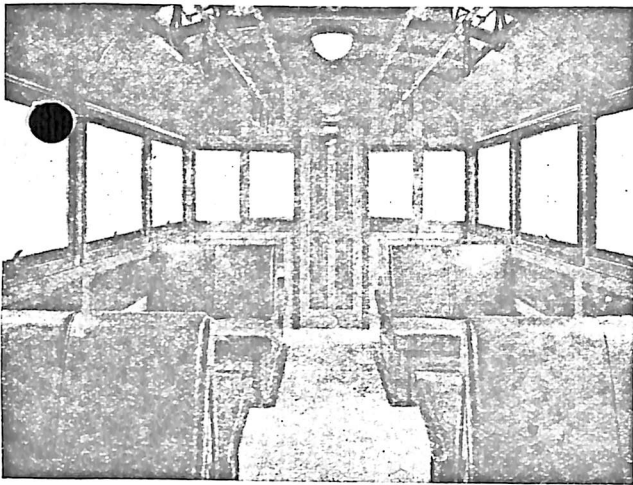


Fig. 2.—Saloon of New Melbourne Tramcar

match the paint work of the car, and the floor of the smoking vestibule is set in with hardwood slats. Aluminium anti-slip angle finishing pieces are fitted to all doorways and along the footboards. Polished plate-glass, 3/16in. thick, is used for the end windscreens, while on the remainder of the car 26-oz. mechanically drawn glass is used. The windows are provided with sashes and louvred blinds, which open their full depth, and run in extruded brass sections to the pillars to form the sash guides. The entrances are provided with canvas weather blinds, fitted on spring rollers, for use in wet weather. The grab handles are all made of stainless steel, and strap handles of bakelite. The exterior finish of the car is in chrome green and cream enamel, decorated with gold lining, and the board's monogram and car number in gold. The roof is of stone color, and the trucks are sprayed with black enamel.

The interior lighting is carried out by two lamps in each saloon, and three in the smoking vestibule. These lamps are fitted with opal dome-

shaped shades, 10in. in diameter, and are provided with reflectors of polished nickel, all mounted in aluminium cast frames, finished in bronze lacquer. The headlight, which is of the board's own manufacture, is cast in aluminium, and fitted with polished nickel parabolic reflector and condenser lens. The lamps are all 100-volt, 60-watt gas-filled traction type, of Australian manufacture.

The trucks are of the board's recent design; similar trucks have been used for some time on another type of car,* and have many favorable features. The wheels are 33in. diameter. The trucks have steel section side frames and long, semi-elliptic springs rigidly attached to the axle boxes, and joined to the side frames by a pin on one end and a sliding shoe on the other. The bolster is of box section, built up of mild steel plates, electrically welded, and supported on helical springs carried on a spring plank swung on long swing links. The whole effect combines to give an easy-riding car.

The brakes are of the clasp type, operated by air cylinders mounted on each truck side frame. The air cylinders are connected to the straight air brake system through a relay valve by a flexible hose. The handbrakes are interconnected throughout the car. It has been found that the use of clasp brakes gives smooth riding and braking, reduced brake shoe wear, and less maintenance. The use of the two brake cylinders on each truck eliminates the use of a heavy brake cylinder on the car body, and all the brake levers, rods, pins, etc., with their loss of efficiency and weight.

The car is equipped with four 40-h.p. Metropolitan-Vickers motors, made in Australia. The gear ratio is 13/77, and the free running speed 28 m.p.h. The schedule speed is 11 m.p.h., with eight stops of 5 sec. per mile. The controllers are of the G.E. series—parallel type, and were made in Australia. The line breakers were built by the English Electric Co. and the compressor and motorman's valves by the Consolidated Brake Co. The hand brakes, trolley bases, destination signs and route numbers are of the board's own manufacture.

These cars have been designed and built under the supervision of the board's chief engineer, Mr. T. P. Strickland, M.I.E.E., and his staff at the local tramway workshops.

The Ryde municipal council, N.S.W., has adopted a scheme for improved highway and street lighting. The section between Ryde and North Ryde at present lit by gas will be replaced by electricity.

*See "Electrical Engineer and Merchandiser," March, 1932.