An early L.C.C. TRAMCAR

described by

LESLIE DOUGALL

Photographed by

BERT LOVE

PARTS REQUIRED

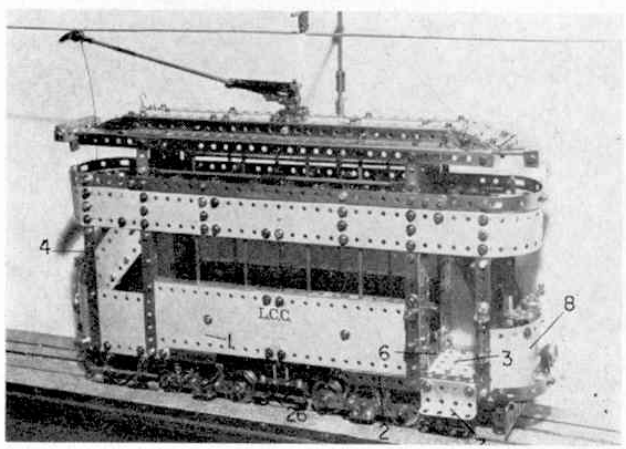
2—1	5—17	22—59	14—126a
8—2	4—18a	2—61	4—128
2—2a	8—20	1—63	2—147c
12—3	2—22a	2—72	2—161
8—5	2—23a	8—77	2—163
9—6	2—24	4—90	2—164
6—8	1—26	2—90a	3—179
4—9	1—27a	21—94	10—188
2—9a	8—35	1—96	17—189
4—9b	485—37a	3—96a	3—190

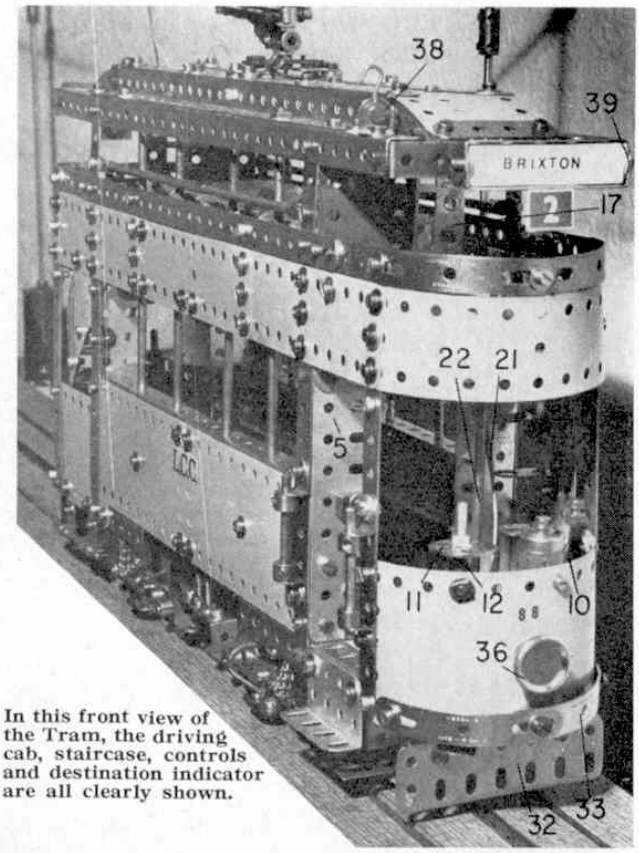
continued opposite

DUE TO an understandable reluctance on the part of the London County Council to permit the use of overhead conductor wires in the highly congested streets of central London and the inner suburbs, these areas were somewhat late in having the convenience of an electric tramway system. Such a system did eventually appear, however, but when it did, the usual mass of overhead cables did not appear with it, for the opening of the L.C.C. Tramways in their electrified form in 1903 by the Prince of Wales, later King George V, saw the introduction of the Conduit System where current for the cars was collected, not from an overhead wire, but from two conductor rails placed in a pit between the tracks. Access was by means of a narrow slot through which a long slender collector, known as a "plough", was drawn along by the car. This tramway system was probably the largest in the world and certainly the most sophisticated.

Later, through-running on systems already operating on overhead wires in the outer suburbs and the extension of the L.C.C. System to areas where trolley wires were permitted necessitated the modification of certain cars so as to be able to collect current from both beneath and over the track.

The model featured here shows an early open-deck car which has been roofed and equipped for overhead working. Certain obsolete parts have been used but





In this front view of the Tram, the driving cab, staircase, controls and destination indicator are all clearly shown.

these are not essential to the working of the model and suggested alternatives will be mentioned later on in the text.

Construction of the model is begun by forming the sides of the lower saloon 1 from two 5½ × 2½ in. Flanged Plates bolted together by their Flanges. These are then covered by two 5½ × 2½ in. Flexible Plates and one 2½ × 2½ in. Flexible Plate placed beneath them at the centre. Each platform is made from two 5½ in. Angle Girders 2 and one 5½ × 3½ in. Flat Plate 3 extended at the front end by a Semi-circular Plate 3a. All these Plates are bolted to the 5½ × 2½ in. Flanged Plates, as shown. Eight 5½ in. Strips 4 are bolted to the Angle Girders to receive the upper deck. Four 4½ Flat Girders 5 are attached as shown, these being joined at the lower end by a 3½ in. Angle Girder 6 and at the upper end by a 3½ in. Strip. Two 5½ × 2½ in. Flexible Plates, joined by a 2½ × 2½ in. Flexible Plate, are attached to 3½ in. Angle Girders 6 to form the floor of the lower saloon, while passenger seats running the length of the lower saloon on each side are made up from two 7½ in. Flat Girders overlapped four holes and attached by Angle Brackets to the car sides. A passenger step 7, consisting of a Girder Bracket is fitted to each side as shown, then each front dash 8 is made from a 5½ × 2½ in. Flexible Plate, extended by a 3½ × 2½ in. Flexible Plate, and is attached to upright 5½ in. Strips 5, the end of the 3½ × 2½ in. Flexible Plate being inserted behind the Flexible Plates forming the side of the car.

A Used Ticket Box 9 is formed from an electrical Short Circuit Piece fixed to the door frame by a Washer and ½ in. Bolt, a Sleeve Piece being bolted to each dash

A general view of the author's highly realistic Tramcar, based on an early vehicle used by London County Council Tramways. Motive power is supplied by the "Emebo" Motor, recently withdrawn from the Meccano system.

to form the controller 10. The controller handle is made from a narrow 1 in. piece cut from the perforated edge of an old Flexible Plate and bolted to a Chimney Adaptor using a Washer. A Bolt is locked in the second hole to represent a knob, the whole unit being cranked to make a realistic controller handle.

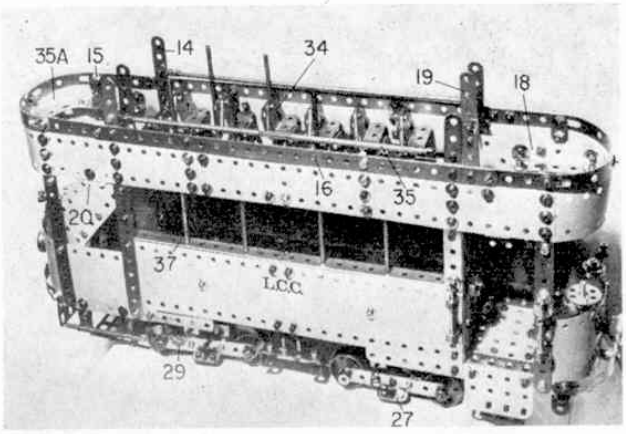
Each Peacock Brake 11 consists of an electrical 1 in. Bush Wheel and Threaded Pin on a 3 in. Rod, journalled in an Angle Bracket 12, attached to the dash and in a Flat Trunnion 13 fixed to the Semi-circular Plate on each platform. A ½ in. Pulley with boss is fitted to the bottom of the Rod.

Construction of the upper deck is now undertaken. The four central pillars are extended upwards by four 3½ in. Strips 14, while the outer uprights are extended by four 2 in. Strips 15. Bolted to these uprights to form the sides and ends of the upper saloon are a number of 5½ × 1½ in. Flexible Plates and two 2½ × 1½ in. Flexible Plates, these being topped with two 12½ in. Strips 16, four 2½ in. Strips and four Formed Slotted Strips.

The floor of the upper deck consists of two 5½ × 3½ in. Flat Plates attached to the Flexible Plates by Angle Brackets, the ends of the upper saloon being enclosed by means of two 2½ × 1½ in. Flexible Plates overlapped three holes, and one Windmill Sail 17, the latter representing the sliding door to the open section of the top deck. A floor for both open sections is constructed from a 2½ × 2½ in. Flexible Plate extended by a Semi-circular Plate, the whole being fixed in place by Angle Brackets. The side of each staircase headway 18 is made up from two 2½ × 1½ in. Flexible Plates attached by Angle Brackets to the floor and it is provided with an upright consisting of a 3½ in. Strip 19, the Flexible Plates being overlapped two holes.

Next to be fitted are the staircases, each of which is made from a 5½ × 1½ in. Flexible Plate, to which five 1 × ½ in. Angle Brackets are attached to form the treads. Bolting of the Angle Brackets is started at the third hole from the top and note that the bottom Angle Bracket has a ½ in. Reversed Angle Bracket bolted to its slotted hole. The top of the staircase is fixed as shown at 20, while at its lower end, it is bolted to the platform floor by the Reversed Angle Bracket. The inner staircase rail 21 is formed from a 4½ in. Strip, extended by a Fishplate, and bent to conform to the bend of the Flexible Plate with its 1 × ½ in. Angle Brackets. It is attached to the 3½ in. Strip forming the top of the lower saloon door by another Angle Bracket, its lower end being bolted to the Reversed Angle Bracket on the lowest tread of the staircase, the securing Bolt carrying a Rod and Strip Connector in which is held a 4 in. Rod 22.

At this point the model should be up-ended and the running gear fitted. This consists of the trucks 23 the safety guards, the bumper beams, the motor



An open view of the upper deck showing the seating arrangement and construction methods.

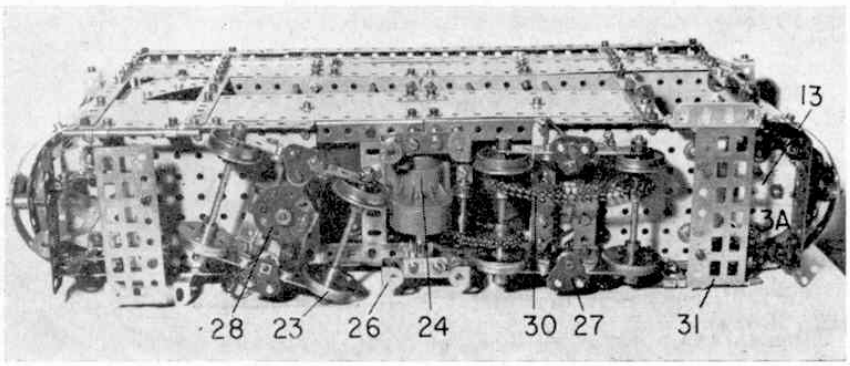
assembly and the plough guide. An Emebo Motor 24 is bolted to two 3½ in. Angle Girders attached to the 5½ × 2½ in. Flanged Plates forming the sides of the car in the position shown. A ½ in. Pinion on the shaft of the motor engages with a 57-teeth Gear Wheel on a 2 in. Rod journalled in two 1 × 1 in. Angle Brackets 25 bolted to the 3½ in. Girders, this Rod also carrying a ¾ in. Sprocket Wheel and a Collar. The plough guides 26 are each represented by a 2 in. Strip to which two Double Brackets are attached, these being fixed to the frame of the car by 1⅛ in. Bolts as shown.

Each truck is made up from two 2½ × 1 in. Double Angle Strips to which are attached two 3½ in. Strips spaced by two Washers, then four 1⅛ in. Flanged Wheels are fitted, using four Rods and Collars. The magnetic track brakes 27 are represented by two 1 in. Triangular Plates attached to the trucks by Angle Brackets. A small piece of rubber-covered wire is held in one of the securing Bolts and pushed through one of the Double Angle Strips to represent the usual connection to this type of brake. The driven truck is attached to the 5½ × 3½ in. Flat Plate forming one of the platforms by two Double Bent Strips. The other truck, which swivels, is provided with a Bush Wheel 28, attached to the Double Angle Strips by two Double Brackets, whereas a second Bush Wheel fixed to the platform floor is fitted with a 2 in. Rod, the truck then being held in position on this Rod by a Collar. Washers are added, as necessary, to ensure that the car is level on the track. Truck Radius-limiting Chains 29, consisting of short lengths of Sprocket Chain, are fitted to the trucks and the frame of the car by cord.

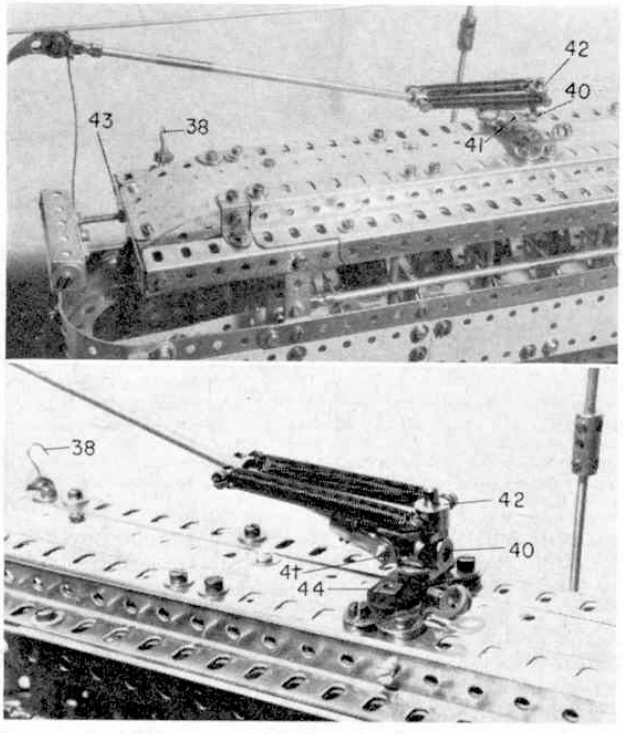
Drive from the motor is taken by Sprocket Chain from the earlier-mentioned ¾ in. Sprocket to a 1 in. Sprocket on the driven truck axle. Both axles of the

PARTS REQUIRED CONTINUED

19—10	441—37b	4—103c	2—190a
6—11	265—38	4—103b	8—192
80—12	2—43	4—103k	7—212
2—12a	2—45	2—111	4—212a
22—12b	4—46	2—111a	3—213
6—14	4—48	2—111c	4—214
3—15	6—48a	8—111d	8—215
3—15a	2—48b	4—115	1—503
5—16	4—52	1—116a	2—518
3—16a	4—52a	4—125	1—550
3—16b	3—37d	12—126	2—554
	1—Emebo Motor.		



The bogie trucks and drive system, viewed from below.



Upper: A view of the roof structure showing the trolley pole and slipper contact, the latter a change from the more usual type of pulley pick-up. Lower: Construction of the trolley pole swivel as well as the tensioning arrangements and electrical connections is obvious from this detail shot of the trolley pole mounting.

driven truck are connected by Sprocket Chain 30 running on ¾ in. Sprockets.

In the model illustrated, obsolete Windmill Sails 31 are used to represent the bottom rack of the safety guard, but these can be replaced by a 3½ in. Flat Girder supported on two 1½ in. Double Angle Strips bolted to the platform floor. The front safety guard 32 also consists of a 3½ in. Flat Girder which is attached by Angle Brackets to Bell Cranks or 1½ in. Corner Brackets, also fixed by Angle Brackets to the platform. The side guards on the other hand are represented by 2½ in. Rods held in Rod and Strip Connectors and connected to the frame of the car by Fishplates. Each bumper beam 33 consists of two Formed Slotted Strips, the centre Strip being spaced from the dash by a Collar and two Washers, a ¾ in. Bolt being used for fixing purposes.

Lastly, here, one motor lead should be earthed to the driven truck frame and the other led up through the bottom saloon to the top deck, then the car should be righted and tested on a track, made up from Angle Girders spaced by 3½ × 2½ in. Flanged Plates. The construction and attachment of the trucks should impart to the car the characteristic rolling action of a typical tramcar.

Fitting out the upper saloon can now begin. In the closed section of the upper deck twenty-four seats 34 are provided, each double-seat back consisting of a Flat Trunnion attached to the floor by a 1 × ½ in. Angle Bracket and each seat squab consisting of a Trunnion bolted to the Flat Trunnion. Each seat is given a slight backward rake by slightly bending the Angle Bracket.

The top saloon window safety rails 35 each consists of two 4½ in. Rods joined by a Rod Connector and it is fitted to the uprights by Rod and Strip Connectors. Additional seats are provided in each of the open ends of the upper deck by 2½ in. Stepped Curved Strips 35a and 2½ in. Strips joined together and bolted to the sides of the upper deck and the staircase headway. The headlights 36 on the tramcar illustrated are pre-war obsolete Meccano parts and should be replaced by 1 in. loose Pulleys fitted with ¾ in. Washers.

For the window frames 37, 6½ in. Rods are passed through the upper deck, at the points shown, and into the flange of the 5½ × 2½ in. Flanged Plates, being retained in position by Spring Clips on the floor level of the upper saloon. Due to the incidence and rake of the seats three points will be found where it is not possible to fit the window frames in this matter and, in these cases, 3 in. Rods are used for the lower deck and two Rods held in Rod Sockets are fixed to the roof members.

Construction of the roof and the trolley arm is now begun. Two compound girders each consisting of a 12½ in. Girder and a 4½ in. Girder overlapped two holes, are joined together at the ends by 3½ × ½ in. Double Angle Strips 43, the compound girders then being secured to the side uprights. Two 12½ in. Girders are now bolted in place as shown, the whole arrangement being extended by two ½ in. Reversed Angle Brackets. Four 2½ in. Curved Strips are now bolted to the upper roof members followed by a number of 5½ × 1½ in. Flexible Plates overlapped to make a roof section 2 × 16 in., the curved ends being attached by Angle Brackets to the four 2½ in. Curved Strips. Wire Hooks, 38 for parking the trolley pole are fixed in place by Angle Brackets, while the destination indicators 39 are made up from three 2½ × ½ in. Double Angle Strips fixed to the front roof members by 1½ in. Bolts. The route number is fixed to an Angle Bracket attached below the indicator.

The lead from the motor is now led up one of the vertical members of the top deck along the underside of the roof, to emerge through a hole in one of the Flexible Plates at the centre of the roof. It is connected to a Threaded Pin fixed in a 1½ in. Insulating Strip, serving as the trolley pole support. This is attached to two pairs of two Fishplates, bolted together by their slotted holes, and fixed to the roof, one pair at each side with two Washers being used as spacers. The trolley pole, itself, is built up from a Coupling 40 loose on the Threaded Pin and with a further Threaded Pin screwed into it. At its opposite end, this Coupling is fitted with a Small Fork Piece, retained by an electrical Short Pivot 41, the Fork Piece carrying a 6½ in. Rod extended, via a Rod Connector, by a 2 in. Rod. A Collar 42 is fixed to the second Threaded Pin by two Bolts which carry two Tension Springs, connected to a further Collar on the trolley pole.

As regards the collector, this is unusual as it has no pulley wheel, but, instead, is the experimental Carbon Slide type at one time used on certain L.C.C. cars. This Carbon Slide is represented in the model by two Pawls without boss, spaced by three Washers and attached to a Rod and Strip Connector. A length of cord from the Collector is fitted with a Wire Hook which clips conveniently on the uprights of the lower platform and allows the trolley to be raised, lowered and turned. The tram, as shown, operates on a special track made up from 12½ in. Angle Girders, but a suitable track and overhead wire system can be built up to suit all requirements.

It is necessary, owing to the weight of the model, to operate the Emebo Motor at the upper limit of 12 volts and, at this voltage, the tram runs at almost scale speed.