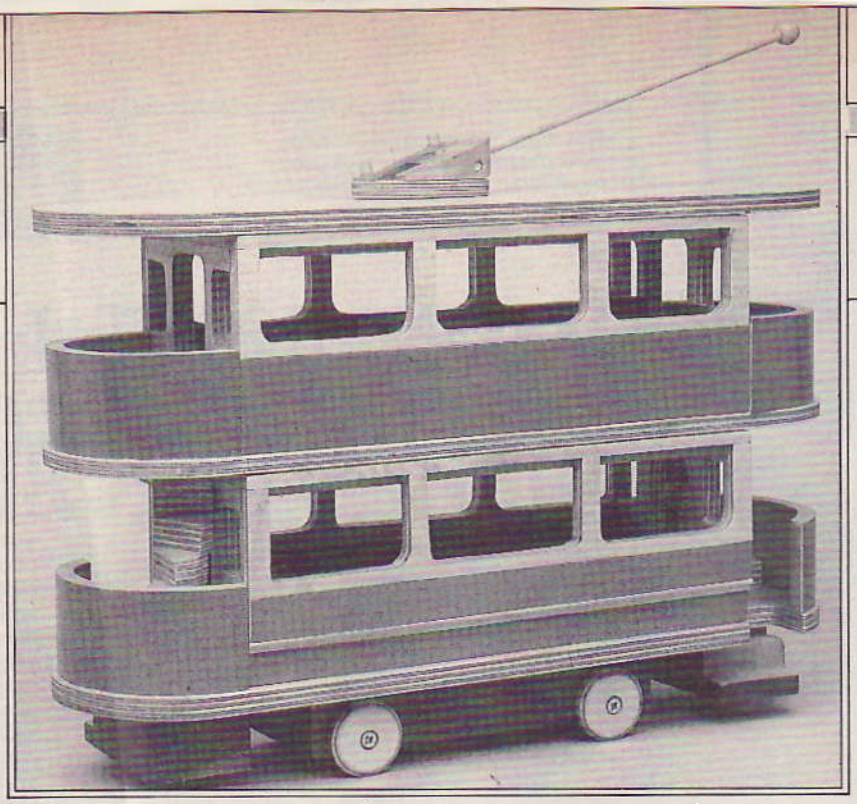

DESIGN A TOY Practical WOOD WORKING STANLEY 1991 COMPETITION

Just the ticket

To Pat Elliott trams are a transport of delight, and this version based on the early type shown below provided her with inspiration for a competition entry

THE inspiration for this toy came from reading about early transport in the Kingston area in our local newspaper. Apart from the obvious attraction of Sopwith's aircraft factory, there was also the A.C. car works in nearby Thames Ditton. The article also covered the long and complicated story of how the tramways came to Kingston after much resistance.

I have a soft spot for trams and decided to attempt a basic version in wood. The model is in fact based on the first tram to enter Kingston in 1906 although the design is very largely simplified for strength and safety as it was intended to be a toy.

I decided that all parts of the tram should be easily accessible to small fingers and, bearing this in mind, I designed it so that the top deck and roof were removable. The roof will also fit the lower deck so that a child can play with the tram as a Continental style single decker model.

Construction

With initial ideas worked out in balsa and card, the simplified toy shapes were drawn out for transferring onto the wood. Roof, upper and lower deck have a common shape, with the roof and lower deck being 9mm ply and the upper deck 6mm. Upper sides and lower sides have similar shapes and window cut-outs, although the

widths of these pieces vary with the lower sides being made up from two thicknesses of 4mm ply to form the recessed space below the windows. In all cases it pays to shape up the parts with the components sandwiched together. Window apertures can also be cut out in this way with 8mm holes drilled at the bottom corners to give neat rounded corners. The same shaping and finishing procedure also applies to the four deck doors.

Tape the lower cabin components together in a dry assembly for positioning centrally on the lower deck, and fit the 6mm ply inner floor of the cabin. Cut-outs for the street steps can also be marked out.

U-shaped pieces for the ends must be bandsawn either from the solid or, as here, from blocks made up of a cross-piece with two legs. Thickness around the curve is 9mm and the exact shape should be traced from the marked out deck so that at one end it abutts the cabin wall and at the other finishes flush with the step's cut-out.

An upper framework to go above the windows is formed from two strips of beech 8 by 5mm and 9 by 4mm in section glued together to form an L-shaped section with the lip to be glued to the inside wall of the cabin. With all parts checked for good fit, the cabin components are glued together.

The spiral staircase is made from seven pieces of 12mm ply 24 by 16mm. Initial assembly should be with double-sided tape so that adjustments can be made to the degree of spiral and the height of the top step can be planed down to be exactly level with the underside of the top deck.

Seats are formed from strips of pine or similar material initially cut into two wedge-shaped sections and then glued together as shown.

Assembly of lower deck starts with gluing on the inner floor, adding the cabin box and then the tram ends, checking the fit before gluing.

To finish the lower section, the front and rear street steps are formed from

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solid beech – each piece 84 by 40 by 20mm and the central undercarriage 160 by 66 by 20mm. Small ply wheels are simply screwed into pre-drilled pilot holes in the axle blocks so that they can still run fairly freely.

Upper deck

The upper deck cabin is assembled in the same way as the lower one and marked out on the floor for central positioning. The position of the top stair should also be marked and the stairwell hole formed just in front. This should be just large enough to allow a small doll to pass through. Curved ends are different to the lower deck in that there is no cut-out and so extend from cabin wall to cabin wall.

An alternative seat design is used with ¾in. square section material used for the bench parts and 4mm ply 1½ by 1in. for the backs.

Triangular locating blocks of 9mm ply must be glued to the underside of the roof and upper deck at the inner corners of the cabin bodies. This should give a snug fit to avoid the roof and top deck coming off too easily.

Conductor rod

From a scrap of 9mm ply, form the teardrop shape swivel plate. A 14mm length of 4mm dowel is inserted into this as shown. The rod holder is formed from a matching shaped piece of 15mm beech, cut diagonally to give a wedge shape and drilled 4mm through the side. At the high end take an angled cut and foreshorten the other end by 15mm. Cut the beech wedge into three equal pieces.

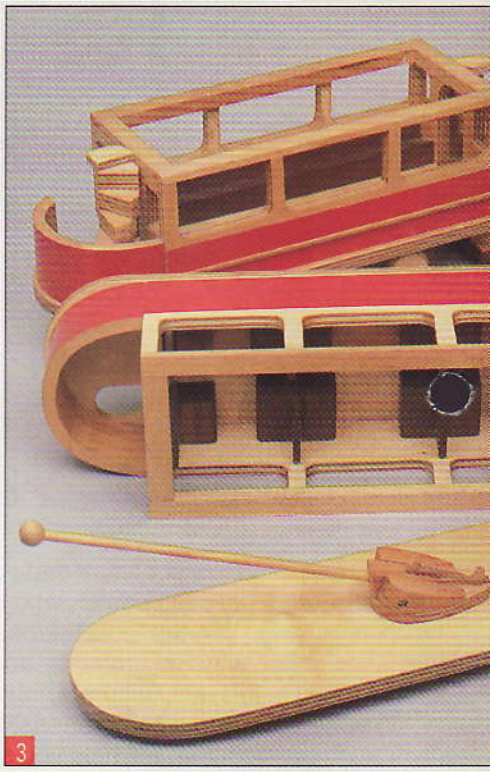
Now add the small protruding 4mm dowel to the top and also drill for and glue in the 170mm length for the conductor rod with protective bead on the end. Join the three pieces with 4mm dowel then, after paring to ensure the central piece can move up and down, glue the outer wedges to the ply shape. A 50mm piece of thick elastic band slit for inserting over the top dowels provides the spring tension to keep the pole in the raised position. The swivel plate is screwed to the roof allowing just enough play to allow it to turn.

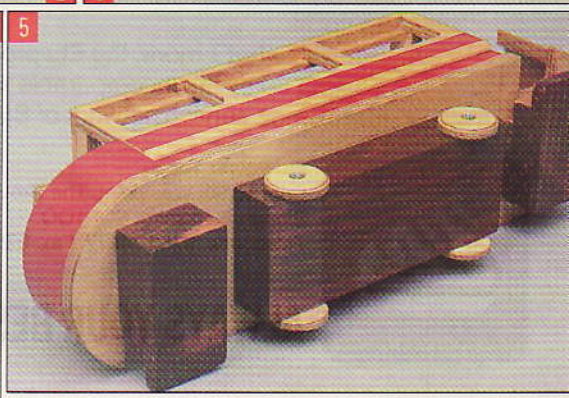
Finishing

Finally add the small moulding (small picture moulding cut down) to run along the underside of lower cab below the windows.

Paint a wide strip of colour around cabs and rounded ends, paint or stain other parts as you wish plus any lettering or transfers and give three coats of polyurethane matt varnish to all non-painted or lettered parts.

1. Based on the first tram to enter Kingston all shapes are greatly simplified.
2. Roof removed from top deck to show seating.
3. Roof and upper deck locate on small pieces of ply glued onto the undersides of roof and upper deck.
4. Curved end of the lower deck finishes flush with the cut-out.
5. Wheels are loosely screwed to the undercarriage.
6. The connector rod is kept in the raised position by an elastic band.





Cutting lists

Lower floor and roof	2 off	355 by 103 by	9mm	birch ply
Upper floor	1 off	355 by 103 by	6mm	birch ply
Inner floor	1 off	217 by 85 by	6mm	birch ply
Upper sides	2 off	235 by 80 by	9mm	birch ply
Lower sides	2 off	235 by 78 by	4mm	birch ply
Outer lower sides	2 off	235 by 60 by	4mm	birch ply
Deck end pieces	2 off	85 by 80 by	9mm	birch ply
Deck end pieces	2 off	85 by 78 by	9mm	birch ply
Undercarriage	1 off	160 by 65 by	28mm	beech
Street steps	2 off	84 by 40 by	28mm	beech
Wheels	4 off	32 dia. by	4mm	birch ply
Conductor rod	1 off	170 by 4mm dia.		dowel
Spiral stairs	14 off	24 by 16 by	12mm	birch ply

Also required

Rounded deck ends formed from solid or scraps to give overall size 58mm long by 103mm wide by 40mm high with 9mm thickness.

L-shaped section around top of cabin from two strips of 9 by 4mm and 8 by 5mm section glued together.

Bench seat from two strips 207 by 20 angle cut and glued together.

Upstairs seats from 18mm square section material with 32mm tall 4mm ply backs.

Scrap of 9mm ply and 15mm beech to form holder for conductor rod.

Oddments of 4mm dowel and protective ball for end of conductor arm.

Small moulding along lower sides.