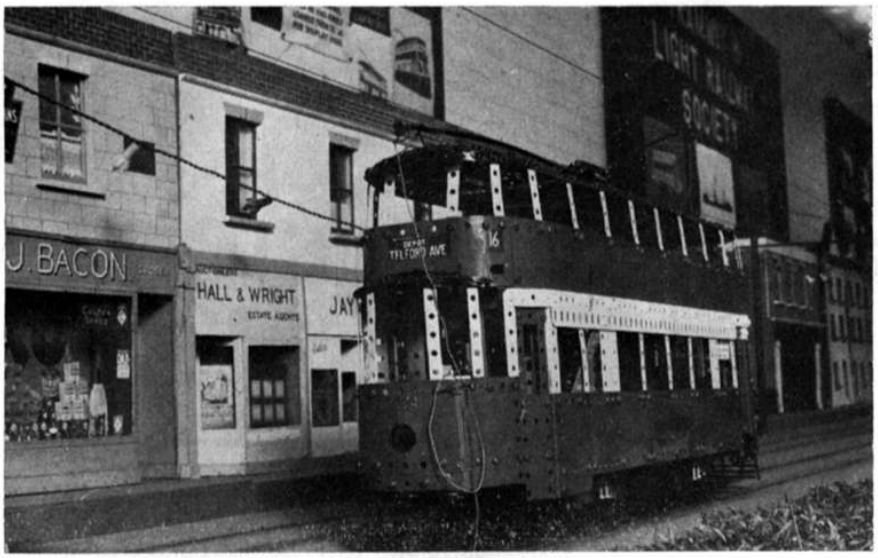


TRAMS IN MECCANO

'Spanner' introduces an interesting article which appeared in "Southern Transport Gazette"

"WHEN this article was written," says 'Spanner', "it was not aimed at the dedicated Meccano fraternity, but at readers of the "Southern Transport Gazette" who are made up primarily of model railway and tram enthusiasts. For this reason, several suggestions and methods of construction are described upon which the serious Meccano man might well frown and which will give terrible nightmares to a number of Meccano purists I know! In some cases non-Meccano parts are used and there are even plans for a complete non-Meccano assembly. I make no personal comment on any of these points as the article was not written with M.M. readers in mind and, in any case, the Meccano enthusiast will be able to modify accordingly, but I reprint the article with few omissions because it is readable and very interesting. I hope you will agree".

¾ INCH SCALE TRAM BUILDING IN MECCANO

by NORMAN MATTHEWS
Photos. by Roy Makewell
Reprinted from the
"Southern Transport Gazette'

It all started with Richard III. That is to say, someone gave my third son, Richard, a large box of Meccano.

After a period of making various models, I persuaded him that we could make a ¾ in. scale model of a London Transport Routemaster bus, complete with tyred wheels and Ackermann steering.

Having acquired a scale drawing of the vehicle we set to work to make this as nearly as possible to correct proportions within the limitations of the ½ in. spaced holes of the Meccano, e.g. the width of an eight foot bus in this scale should be 6 in., but, as the main plates were 5½ in., this size was adopted although it was "pulled out" as far as the slotted angle girders would allow to make it as near to 6 in. as possible.

The result is shown opposite and although it leaves a lot to be desired (have you ever tried to get a 'domed' effect for a roof with Flat Plates?) we think that it looks reasonable for a Meccano model.

The steering gear is on the Ackermann principle and has a 5:1 gear ratio, see photo. For ease of operation the steering column can be extended through the roof by coupling up a 11½ in. Axle Rod to the main steering wheel!

After a while the novelty of this 'push and steer' operation wore off for son No. 3 and as we had plenty of Meccano left over, our thoughts turned towards (or rather Dad's tramway enthusiasm suggested) making an L.C.C. tram which could be fitted with means of propulsion.

A ¾ in. scale plan of an H.R.2 was obtained and work commenced. Although we had stacks of Meccano parts, much of it was, of course, too long or too short for what we required, so even more had to be purchased. We obtained them from Jeremy's of Princes Arcade, Piccadilly, London, who keep a complete range of parts in stock.

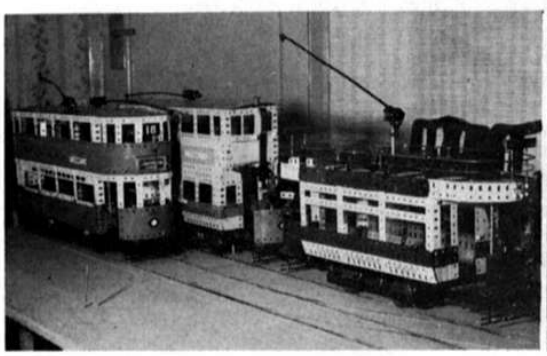
Here again, the body was constructed as nearly as possible to scale within the limits of Meccano and although the 5½ in. Plates in this case made the model a fraction too wide, the finished effect appears reasonably well proportioned as may be seen.

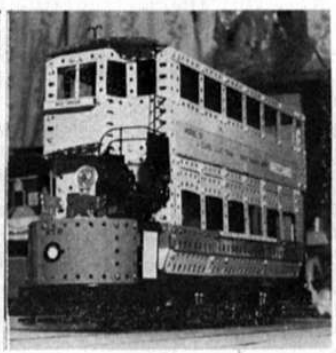
Construction Details

To build an acceptable model in this medium, certain compromises have to be made:

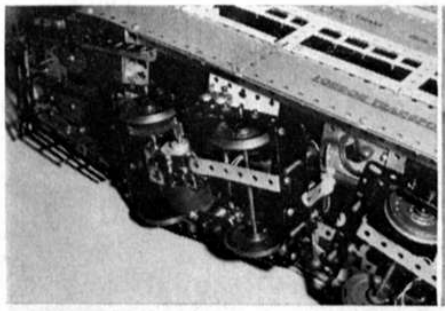
(a) Small details must be omitted or made up from other material.
(b) The largest possible Strips, Girders and Plates should be used to ensure the minimum amount of joins, overlapping, etc., which gives a patchwork quilt effect.
(c) Certain modifications must be made to avoid a clumsy appearance.

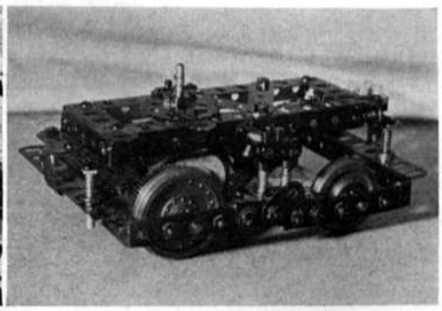
With regard to (a), while much of the detail has been omitted, essential items such as lifeguards, handrails, trolley arms and wheels, destination





Far left, a scene at the terminus of the author's tram layout. Left, an L.U.T., "U"-type Tram also produced by the author. Heading picture shows a Feltham Tram which was completed after the author had finished the article.





Right, an underside view of the H.R.2 showing one of the bogies. There are some things here which will cause the dedicated Meccano man to raise his eyebrows. Far right, the final and most successful U-type bogie, painted up for original colour-scheme realism.

boxes etc. have been made up from other materials.

An example of (b) is that for a tram side panel, one $12\frac{1}{2} \times 2\frac{1}{2}$ in. Strip Plate looks infinitely better than three $4\frac{1}{2} \times 2\frac{1}{2}$ in. Flexible Plates joined together.

With reference to (c), when making the H.R.2 it was found that the correct projecting windscreen would have entailed so many odd Strips and Nuts and Bolts that the finished result would have been ugly, clumsy and very heavy—so a flush front was decided upon.

However, now to get down to building hints. Having acquired the scale drawing and measured up the lengths required, we constructed the basic framework of the body with Angle Girders, making certain to get it absolutely square. Incidentally, if Angle Girders are not supplied in the lengths required we would recommend using a larger size and cutting them down to size with a hacksaw rather than joining shorter ones as this leads to uneven sides and other complications. Further, we found it better when cutting several Angle Girders to cut the whole lot at once, bolted together, as this method is much quicker and more 'certain'. Warning—do not forget to round off the sharp corners and file the rough edges or you will wonder where the blood is coming from when you start to use them!

The main body can then be built up as required using maximum size plates as mentioned above. Flush sided bodies can have $2\frac{1}{2}$ in. wide plates for side panels and be built $5\frac{1}{2}$ in. wide, see Fig. 4. Older types can have side panels made from two Flat Girders built up from a $4\frac{1}{2}$ in. width base spreading out to a $5\frac{1}{2}$ in. wide body. Of course, at times it is necessary to join plates together and it is preferable to make these where a pillar occurs if possible. Incidentally, although Plastic Plates can be used which have a weight (and cash) saving advantage, we found that Strip Plates and Flexible Plates are preferable.

For the strips between windows, the Meccano Narrow Strips might be more true to scale, but these are generally more expensive and might lead to complications. We did, however, use $\frac{1}{8}$ in. Birdcage punched bar for effect in the lower saloon, top windows of the H.R.2.

Other items can be made up as follows:

Fenders—Circular Girder $5\frac{1}{2}$ in. (Part No. 143) cut in half.

Controller—Pair of $2\frac{1}{2} \times 1\frac{1}{2}$ in. Flanged Plates (Part No. 51) with detail added.

Brake Wheel—Curtain Ring, 1 in., with six spokes soldered to $\frac{5}{32}$ in. Brass Tube.

Brake Handle—$\frac{1}{16}$ in. Brass Rod.

Trolley Arm—$\frac{1}{16}$ in. Steel Rod inside plastic covered sprung curtain wire (Woolworths) painted black.

Headlamp Frame—Fibre Washers $\frac{1}{2}$ in. internal; $\frac{3}{4}$ in. external; with three card fixing lips added.

Handrails—$\frac{1}{16}$ in. Brass Rod with ends wrapped round protruding 4BA screws and "Evostuck".

Destination Boxes—Two plastic Wilkinson Razor Blade holders, sawn in two offset halves and glued together giving the correct size and completed with 'blind' and glass. A piece of strip wood was glued to the top to give the correct proportions and added strength. Several coats of French Polish simulate polished wood and the boxes were recessed into an oblong hole cut into body. Destination 'card' can then be slid in and out as required.

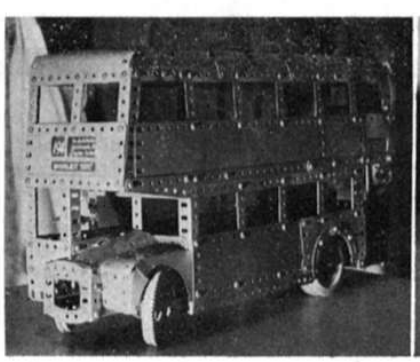
Route Board Holders—Hamblings 'OO' gauge fishplates slightly opened out.

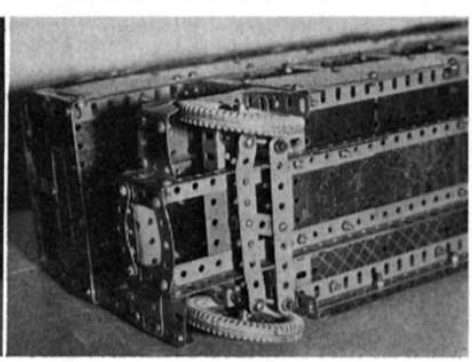
Route Boards—Slaters Plastikard rubbed down. UNO Stencil lettering.

When the first body was completed, our thoughts turned to the bogies. Meccano Flanged Wheels were found to be the incorrect size and were unsuitable as they rode unevenly—probably because they are stamped out instead of being turned up. After a good deal of hunting around we discovered suitable castings ($2\frac{1}{2}$ in. gauge Coach Wheels from Stuart Turner's) and asked a friend to turn these up to T.L.R.S. standards.

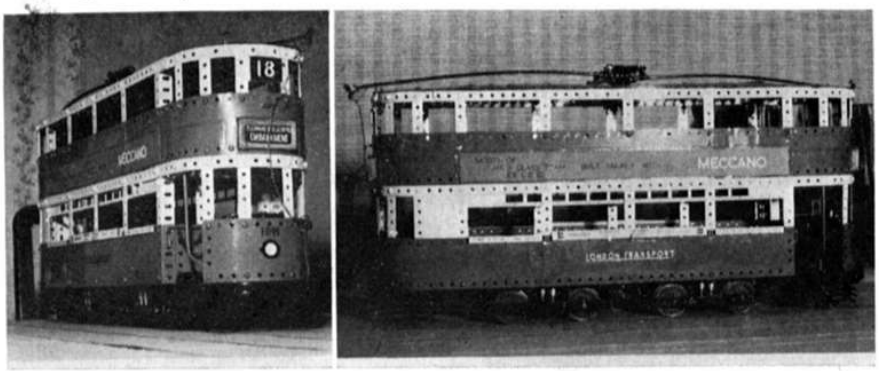
A pair of simple, unsprung, bogies was made with disastrous results—derailments unlimited. The wheels, on $\frac{5}{32}$ in. steel axles, run in brass bearings (Double Arm Cranks —Part 62B with Grub Screws removed to act as oil holes) which are bolted to the bogie frames. Many different bogie arrangements were tried out before we hit on the correct answer. Slotted Strips and Angle Girders were used at first to allow the axles flexibility, but this proved unsatisfactory and looked extremely clumsy. The only alternative was to spring the bogie frames themselves and give complete independent suspension, while still keeping the 'bearings' true with the axles.

The final result consists of 'U'-shaped ends rigid to the axleboxes with a 'floating arm' in the centre pivoted at each end where it joins the 'U' axle section. Inner frames were then made up to hold the bogie swivelling gear and the motor and these are connected by eight compression springs (Part 120B) to the outer frames—two at each end and two on each side as shown above.





Right, an early attempt at a Routemaster bus. Far right, an underside view of the Routemaster Bus showing the steering arrangement.



Left, a side view of the completed H.R.2 showing its realistic proportions.

These have proved very successful and have worked satisfactorily both at home and on the T.L.R.S. layout at Clapham Museum.

The Track

On completion of the first car, all we had to test it on was a ten foot length of Meccano (Angle Girder) track. This was not very satisfactory, was extremely expensive and moreover we wanted these 18½ in. Angle Girders for the next tram (L.U.T.—'U' type).

Brass flatbottomed rail was far too expensive so we bought some $\frac{1}{8}$ in. × $\frac{1}{32}$ in. strip brass from Smiths, the wholesalers, St. Johns Square, London, a quantity of $\frac{1}{8}$ in. punched birdcage (tinned steel) strip from Romany's, of Camden Town and a fair quantity of 2 × $\frac{1}{2}$ in. and $\frac{3}{4}$ × $\frac{1}{2}$ in. hard wood from our local wood shop.

Having built seven scale miles of 'OO' track in our early days, most of which was on the 'soldered rail to metal sleepers' principle, it was decided to use this system for the track, although using the birdcage strip as 'chairs' instead of sleepers.

The general idea is to make up a framework for the track with 2 × $\frac{1}{2}$ in. battens under the running rails screwed to 2 × $\frac{1}{2}$ in. cross supports about every two feet and $\frac{3}{4}$ × $\frac{1}{2}$ in. between each main cross support. Draw the track lines on the longitudinal battens and nail short lengths of punched birdcage strip about every two inches to form the 'chair' base plates. The $\frac{1}{8}$ in. square brass can then be soldered to the baseplates to form one rail. The second rail can then be soldered down with the aid of a jig. WARNING—It should be noted that sometimes there is a slight twist in the brass section. This must be 'detwisted' before using. We overlooked this point in one section and hoped that the finished soldered joints would be enough to hold it—we were wrong!

The 'check' rail can then be added using the $\frac{3}{8}$ × $\frac{1}{32}$ in. brass strip which is soldered in the same way using a strip of $\frac{1}{8}$ in. wood to give the correct clearance from the running rail.

We have built a 'jig' for making up curved track baseboard and a useful 'radial arm' for drawing large radius curves can be made by joining a few long strips of Meccano together and having a pencil at one end and a pivot at the other.

Points and Crossings are quite easy to make if drawn out on the baseboard and the gauge rigidly adhered to.

Finally, the 'road' can be filled in using $\frac{1}{8}$ in. hardboard. This hardboard rests nicely on the birdcage strip, but where the 'road' meets the rails, the underside of the hardboard should be chamfered to allow for the soldered joints. If a 'road' is provided parallel to the track it should be pinned down to the longitudinal batten at the gutter and in this way a slight camber will be formed which adds to the realism.

Filling in road with hardboard on straight track is easy but for curves and points we found the best method was to get some stout paper or thin cardboard and press it firmly over the track. This makes an imprint on the card which can be cut out and used as a template to mark the hardboard. It is advisable to keep the curved track road 'fill-in' sections short as the thin card tends to spread.

For points, it is as well to have a short removable section of road between the tracks screwed down so that the mechanism or spring is easily accessible.

In conclusion, we must say that the construction of the trams and the track has been most enjoyable. There must be many like ourselves who have a restricted amount of time, cash and modelling ability but who would like to have a working tramway.

To these we would say—have a go with Meccano!

TALE OF TWO CITIES (*continued from opposite page*) are thought to have been buried here, re-interred in the late eighteenth century from hundreds of graveyards in the centre of Paris in order to clear valuable land for building and reduce the risk of polluting the underground water supply.

It was the Romans who laid the foundations for the underground city by quarrying stone for their houses in the village of Lutetia. Paris and the quarries grew hand in hand. The oldest parts of the cathedral of Notre Dame, the Church of St Etienne and the Louvre were all built from stone mined beneath the expanding city. The myriad tunnels created have been a sanctuary for all kinds of villains and heroes, from the desperate refugees of the French Revolution to the Resistance fighters of the Second World War, who could literally be called the "French Underground"!

Today, one thousand million people travel beneath Paris every year—on the Metro, the underground railway. Fulgence Bienvenue was attacked from every side when he first proposed the building of a subway. Some said it could not be built, that it would undermine the foundations of the city, that if it were built no one could use it because of the risk to health caused by the damp, foul air. But the Metro was completed and is now one of the world's busiest underground railways.

Today's inhabitants of the City of Darkness are the eight hundred men who patrol and maintain the sewers. It is a perilous occupation. Their mole-like existence is a hazard to eyesight and lungs, and there is the ever-present danger of rain which can flood the tunnels to the roof in minutes, so every fifty yards there is an escape ladder to the surface.

Modern engineering skill and knowledge mean that underground Paris can now be on the move again. There are plans to build a network of roads to relieve traffic congestion above ground. Already, nearly thirty subterranean car parks have been built. It could mean that the underground city, simply begun by the Romans, points the way to the future development of densely populated towns—one city on the surface with its identical twin lying beneath.