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FRONT COVER

Veteran Hornby trains belonging to the Hornby Railway Collectors' Association ran on a "tinplate layout" throughout our recent Model Railways Exhibition and (whisper it!) seemed to have a far greater reliability factor than many more modern layouts. They brought back nostalgic memories to many of the thousands of middle-aged and elderly visitors to the Show.

NEXT MONTH

Full-sized plans for an inexpensive but efficient little kite are a feature of February's issue. Its performance will surprise you!

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Pocket Meccano Competition

"Staggering Success" says 'Spanner'

The lucky winners receive their prizes from Mr. J. D. McHard, Marketing Manager of Meccano (1971) Ltd. From left to right, Mark Knowles, Mr. McHard, Jonathan Thompson and Dixon Upcott. Below, the 11 finalists in the 8-years and under section.

IN my years with Meccano I have seen many things that have surprised me, but never have I been so amazed as by the response to the Pocket Meccano Competition which closed at the end of September—and by response I not only mean the number of entrants, but also the unbelievable variety of models submitted. It was, in short, a staggering success!

Before going into detail, it should be borne in mind just how "miniature" Pocket Meccano really is. Excluding the Instructions Leaflet, the Set contains a grand total of only 68 parts and, of these, Nuts and Bolts account for 47 of them, with a length of Cord serving as another. This leaves 20 "buildable" parts and yet competition entrants used these parts to produce more than 750 *different* models. Yes, *different* models! No two models were identical, although there were, of course, many similar *types* of models in the sense that there were several helicopters, several cranes, several cars, etc., but no two models of a particular type were identical in design.

Obviously, then, we were first of all amazed that so many models could be built with such a small Set, but we were also greatly surprised by the excellent quality of very many of the models submitted and the ingenuity that had been used to build them. Considering the size of the Set, there were no end of models that really looked very much like the objects they represented and there were numerous others which "worked", i.e., models that performed the actions of the originals. There were plenty more that both looked right *and* worked right.

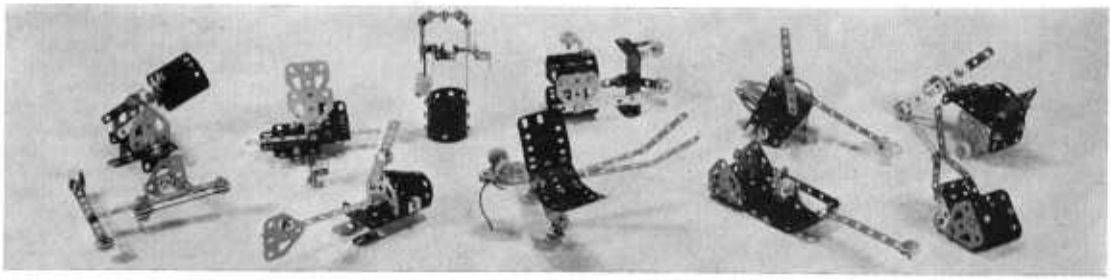
Understandably, a lot of the models entered in the competition were based on the popular Meccano subjects such as cranes, road vehicles, aircraft, etc., but it was surprising how many totally unusual and unexpected creations turned up. There were, for example, a number of birds and other animals—including people—as well as various "fictional" creations drawn from the fertile imaginations of the children who took part. A weird "Meccano Insect", for instance, comes to mind as an example of the last type.

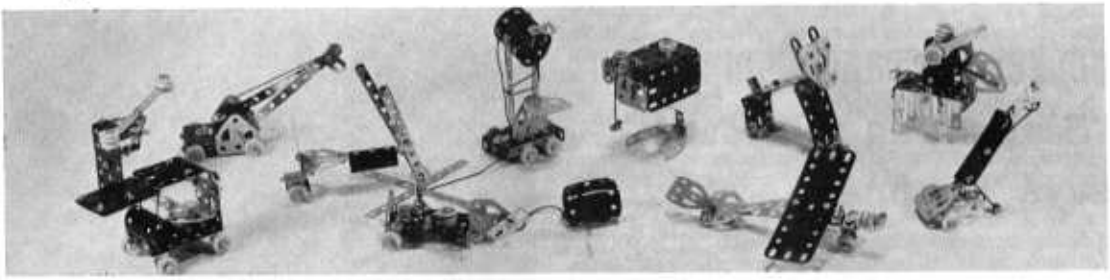
In many cases, the ordinary standard parts contained in the Pocket Meccano Set were put to some unusual and extremely clever uses to achieve successful results. In several models, for example, a Plastic Plate, normally used for cladding purposes, was used as a spring. In others, the Cord was carefully interwoven between parts to secure them together, thus leaving Nuts and Bolts free for other uses. In one model, the Spanner itself was even used as an integral part of the construction! Ingenuity, in fact, was frequently in evidence, so much so that I am prompted to say that, if this competition did nothing else, it proved that the modern youngster is not the television-engrossed "moron" that many people claim, these days!

Judging

In entering the competition, a number of contestants seemed a little worried that the drawing of their model on their entry form was not very good and might therefore prejudice their chances of success. I can put their minds at rest as Meccano in Liverpool used an excellent system to ensure that every entry worthy of consideration received an equal chance of success. When each entry was received, the model-building experts at Meccano were able to tell from even the worst drawing whether or not the illustrated model would stand even the ghost of a chance in the final judging. If it did stand a chance, then the model was re-built at Meccano, exactly as depicted in the drawing, and it was the model which the judges considered—not the drawing. Thus nobody had an unfair advantage.

When the competition closed, all the models for judging were separated into the three competition Sections: 8 years and under, 9–12 years and 13–15 years, then the difficult task of judging began, this being split into two parts. In each Section, a first prize of a bicycle was being offered, with ten runners-up each receiving a No. 5 Meccano Set. This meant that 33 finalists (11 in each Section) had to be chosen and





The final selection of 11 in Section 2 of the competition.

this choice was accordingly made by a primary panel of judges in Liverpool. This primary panel was concerned only with selecting the 33 finalists, however, and was in no way concerned with choosing the overall winners in three Sections

The final winning selections were made at the Glendower Hotel in London by a distinguished panel of judges made up of Mr. N. Hauser, Director of "Toys International" magazine, Mr. E. Simmons, Editor of "Games and Toys", Mr. V. E. Smeed, Editor of "Meccano Magazine" and Mr. T. V. Thomas, Editor of "British Toys". Keeping originality and ingenuity strongly in mind, the judges had an extremely difficult job choosing the winners, but they finally awarded the prizes to the following:

Section 1 (8 years and under), Jonathan Thompson of Lymington, Hants. for his "Prehistoric Bird".

Section 2 (9–12 years), Mark Knowles of Salisbury, Wilts. for his "Small Dog".

Section 3 (13–15 years), Dixon R. S. Upcott of South Harrow, Middlesex for his "Dock Crane".

The ten runners-up in each Section were as follows:

Section 1

Lawrence Broom of Ipswich, Suffolk; John Aidan Byrne of Stockport, Cheshire; Andrew Hill of Boston, Lincs; Matthew Loivis of Godalming, Surrey; Ian Palmer of Horsham; Sussex; Mark Powell of Thurmaston, Leicester; Kenneth Murray of St. Annes-on-Sea, Lancs; Cheryl Rhodes of Pudsey, Yorks; David Stern of Sutton, Surrey; Richard Taylor of Liversedge, Yorks.

Section 2

Michael Belcher of Reading, Berks; Colin Carruthers of Muirhouse Grove, Edinburgh; Philip Chapman of Askam-in-Furness, Lancs; David Ferrisey of Liverpool, Lancs; Timothy Haylett of Poole, Dorset, Gary Reuben Kitchen of Newcastle-on-Tyne, Northumberland; Andrew Norton, Chesterfield, Derbyshire; Gary Middleweek of Sudbury, Suffolk; Anthony Pople of Cheddar, Somerset; David Russel of Mansfield, Notts.

Section 3

Jonathan Green of Scunthorpe, Lincs; Martin Price of Sheffield, Yorkshire; C. J. Barling of Bromley, Kent; Raymond Anderson of Morpeth, Northumberland; Stephen Manthorp of Keighley, Yorkshire; Frances Matthews of Hurstpierpoint, Sussex; Nigel Parsons of Hawkhurst, Kent; Andrew Bell of Stoke-on-Trent, Staffs; James Nelson of Nevilles Cross, Co. Durham; J. C. Steventon, of Upminster, Essex.

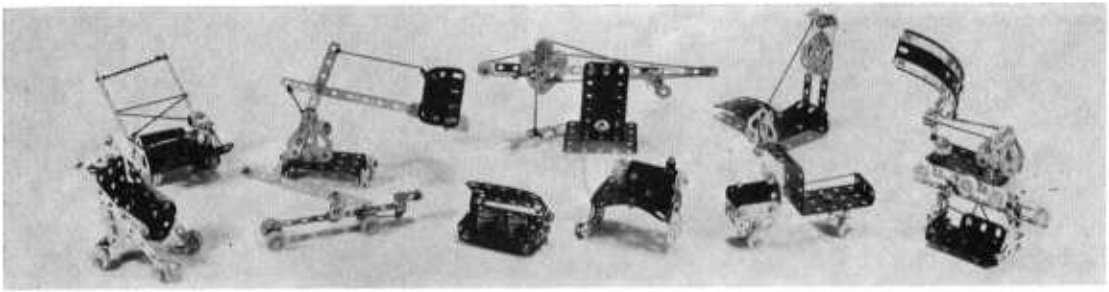
Having myself seen all the models which were built up for the competition judging, I can readily understand just how difficult a task the judges had in choosing both the finalists and the Section winners. In fact, I can honestly say that this is one occasion when I was glad I was not among the judges! I would, however, like to offer my hearty congratulations to all the successful entrants and I am sure they will agree that Pocket Meccano has a great future.

Models to Build

In the coming months we propose to feature quite a few of the models entered in the Competition in the M.M. and it is only right that we should begin here with the three winners. Looking first at Section 1, therefore, we have the Prehistoric Bird designed by 8-year old Jonathan Thompson of Lymington, Hants. The main body is supplied by a $2\frac{1}{2} \times 1\frac{1}{2}$ in. Flanged Plate 1, to which two $2\frac{1}{2} \times 1\frac{1}{2}$ in. Plastic Plates 2 are bolted to serve as the wings. The Plates are curved upwards slightly to increase realism and full advantage is taken of their slotted holes to allow a "sweep back" effect. The tail is supplied quite simply by two $4\frac{1}{2}$ in. Narrow Strips 3, bent to shape, and fixed by one bolt through the centre rear hole of the Flanged Plate.

In the case of the head, two Flat Trunnions 4 are bolted to a $\frac{1}{2}$ in. Reversed Angle Bracket fixed through the centre front hole of the Flanged Plate. Note, however, that a Bolt, without a Nut, is carried free in the apex hole of the lower Trunnion, being held in place by the pressure of the upper Trunnion on

Below, the 11 finalists in the oldest age group, 13-15 years.



the bolthead. A short length of Cord is threaded through the slot in the bolthead, this Cord representing a worm! The Bird's eyes are ½ in. Pulleys 5 on ½ in. Bolts, held in the lugs of two Angle Brackets bolted to the Flat Trunnions.

Two further ½ in. Pulleys serve as the feet, each of these being fixed on a ½ in. Bolt held by Nuts in one lug of an Angle Bracket 6. The other lug of this Angle Bracket is bolted, at the angle shown, to a Fishplate which is in turn secured to one or other flange of the Flanges Plate. When the angle of the legs is correctly adjusted, the bird will balance rather nicely on its feet.

PARTS REQUIRED

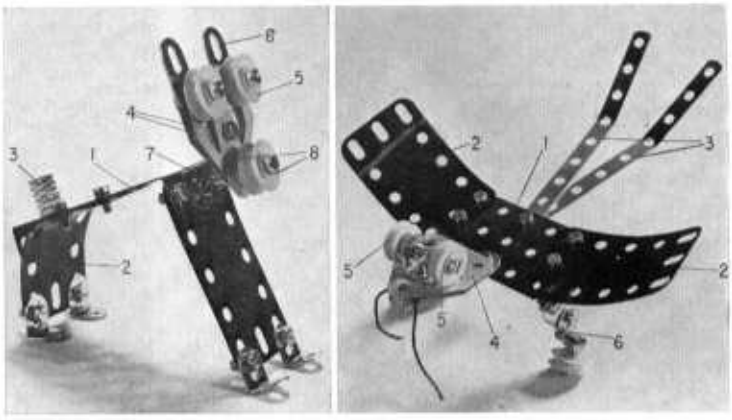
2—10	13—37b	1—125
4—12	1—40	2—126a
4—23	1—51	2—194
22—37a	4—111a	2—235d

Meccano Dog

"Meccano Woof" is the delightful name which 10 year-old Mark Knowles of Salisbury gave to the Dog which won him first prize in Section 2. I must say that this is a particularly novel model because, as Mark said on his Entry Form, "If you prod the middle of its back, it jumps along." It does, too!

Its back consists quite simply of a 2½ × ½ in. Flanged Plate 1, with the front and rear legs being provided by two 2½ × 1½ in. Plastic Plates. Note that the front Plate is bolted to one flange of Plate 1, with the full length of the Plate serving as the legs, while the rear Plate 2 is bolted to the underside of the Plate 1 and is curved round so that only half the Plate serves as the rear legs. It will be noticed that the Bolts securing the Plastic Plate to the Flanged Plate pass through the second row of holes from the rear end of the Flanged Plate, but through the end holes of the Plastic Plate. Before fitting the Plastic Plate, however, it is advisable to first fit the tail 3, this being supplied by a ½ in. Bolt fixed, shank upwards, in the centre end hole in Flanged Plate 1 and fitted with six Nuts.

Woof's head is built up from two Flat Trunnions 4, bases upwards and placed one in front of the other. Two ½ in. Bolts are passed through the base corner holes of the Trunnions, each of these Bolts fixing a ½ in. Pulley 5 to the front Trunnion and a Fishplate 6 to the rear Trunnion, a Nut being used to space the front Trunnion from the Fishplate. The Pulleys, of course, serve as eyes and the Fishplates as ears.



Left, "Meccano Woof", the jumping dog which gained 1st Prize in Section 2 for Mark Knowles, aged 10, of Salisbury, Wilts., and right, the "Prehistoric Bird" which won 1st Prize in Section 1 for 8-year-old Jonathan Thompson of Lymington, Hants.

At their apexes, the Flat Trunnions are connected together by a ¾ in. Bolt which also fixes in place a ½ in. Reversed Angle Bracket 7 and two ½ in. Pulleys 8, the latter one on top of the other to represent the snout. The spare lug of the Reversed Angle Bracket is bolted to the body of the dog to secure the head in place, then the "paws" are finally supplied by four Angle Brackets bolted to the lower corners of the Plastic Plates.

As Mark said, if Flanged Plate 1 is prodded, the model will jump along, this movement resulting from the flexibility of the Plastic Plates forming the legs. It's great fun!

PARTS REQUIRED

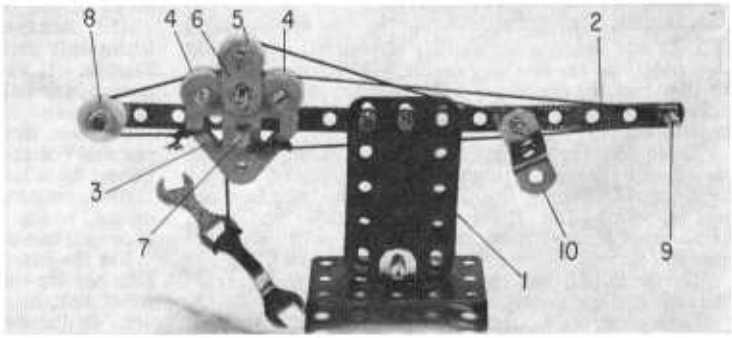
2—10	21—37a	1—111	2—126a
4—12	10—37b	3—111a	2—194
4—23	1—51	1—125	

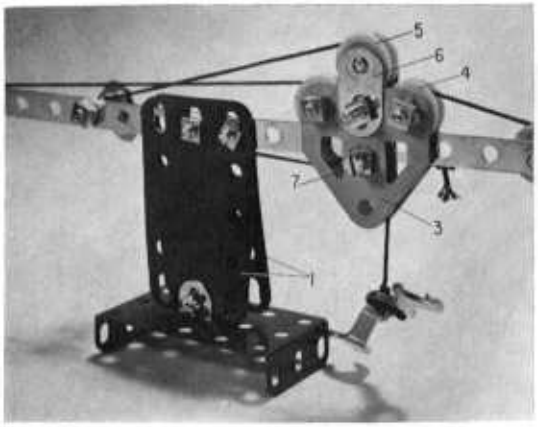
Dock Crane

Last, but not least, we have the Dockside Crane which gained first prize in Section 3 for 14 year-old Dixon Upcott of South Harrow, Middlesex. This is particularly interesting for its working features, achieved by a very clever use of Cord. The body of the Crane is supplied by two 2½ × 1½ in. Plastic Plates 1 which are attached by Angle Brackets to a 2½ × 1½ in. Flanged Plate, forming the base. An 8 in. compound narrow strip 2, built up from two 5½ in. Narrow Strips, serves as the jib, this being bolted between the upper ends of Plates 1 to project seven holes one way and six holes the other.

Running on the longer arm of the jib is the gantry trolley which is built up from two Flat Trunnions 3 connected through their base corner holes by two ½ in. Bolts, on each of which a ½ in. Pulley 4 is mounted, the Pulley being sandwiched between the Trunnions. Another ½ in. Pulley 5 is mounted above the first Pulleys on another ½ in. Bolt held in two Fishplates 6, bolted to the Trunnions. A rather clever stabilising system to ensure that the

A general view of the Dock Crane with which 14-year-old Dixon Upcott, of South Harrow, Middlesex gained 1st Prize in Section 3.





A close-up view of the Gantry Trolley fitted to Dixon Upcott's Dock Crane. Note the stabilising Bolt 7.

trolley remains upright is supplied by two Bolts 7 each screwed into two Nuts, placed one each side of each Trunnion. The shanks of the Bolts, while not gripping the jib, are screwed sufficiently close to prevent the trolley tipping over.

A fourth Pulley 8 is mounted at one end of the jib, while a ½ in. Bolt 9 is fixed at the other end, then a winding handle for control of the load is provided by another ½ in. Bolt, lock-nutted to the jib in the position shown. A ½ in. Reversed Angle Bracket 10 is fixed to the end of the Bolt.

Finally, we come to the Cord arrangement. The load is hoisted on a length of Cord running from the winding handle, over upper Pulley 5 and down through the centre of the gantry trolley. Trolley movement is controlled by another length of Cord which is tied to one side of the gantry trolley, passed around Pulley 8, over Pulleys 4, but under Pulley 5, along and around Bolt 9, to be finally brought back and tied to the remaining side of the gantry trolley. The limitations of the Set prevented a control handle being incorporated, and so the trolley is moved by holding the upper length of Cord, running between Bolt 9 and the Trolley, and by moving the Cord by hand. With load hoisting and gantry movement, therefore, this little model is packed with "play-value".

PARTS REQUIRED

2—10	10—37b	2—126a
2—12	1—111	2—194
4—23	4—111a	2—235d
22—37a	1—125	

The Goanna (left) grows to at least six feet. Opposite, the Cape-necked Lizard of the Northern Territory and another goanna, valuable for destroying snakes, mice, and rats.

The Amazing Lizards of Australia

By Frank Madigan

IT IS not only the marsupials of Australia which are unique in the realm of nature. The Lizard Family of that country, also, can claim distinction, for it contains among its species some of the most amazing reptiles found anywhere in the world.

There are over 300 species in the five distinct families ranging in size from a tiny inch long Skink, to the seven foot Giant Goanna. The Dragon-Lizards, the Geckoes and the snake-like Pygopodes, as well as the other families of lizards, have many strange members with peculiar ways.

The Barking Lizard, for instance, is aptly named, as it barks just like a puppy when disturbed.

Then there is the Australian Frilled Lizard, so named because of the collar around its neck, which is used for storing food, mainly insects, until required.

Another of its peculiarities is that it is able to run on its hind legs at a terrific speed, carrying its body almost erect.

The running feat of the Crested Dragon 'Bicycle' Lizard is even stranger, as it races along moving its hind legs just like a cyclist.

The Mountain Devil Lizard is a frightening looking creature completely covered with spikes, and having two horns, which protect its head. Like its relative, the Chameleon, it eludes its enemies by its ability to change colour to harmonise with its surroundings.

The most colourful lizard is undoubtedly the Painted Dragon Lizard with its coat of many colours. These colours vary from red, yellow and brown to blue.

Dragon Lizards are rather terrifying creatures to look at. One large variety of Bearded Lizards found in the Eastern states have whiskers framing their faces, and for this reason they are sometimes known as Jew Lizards, as they look like shrewd, be-whiskered old Jews.

The Water-Dragon Lizard found in Gippsland, Victoria, is about 30 inches long and has a long, whip-like tail. It lives in rocky places near water, and when disturbed usually makes for the water, dives in, and then disappears.

People in different parts of Gippsland have their own pet title for this creature, as he appears to them. At Orbost he is known as the "Snowy River Crocodile".

Also common in Victoria is to be found the little tree-dragon, which is about a foot long. Its natural habitat is open forest places.

But the most amazing Dragon Lizard is described in Life Nature Library book, "The Land and Wildlife of Australia", thus:

"The dimunitive white salt dragon pursues tiny black

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.

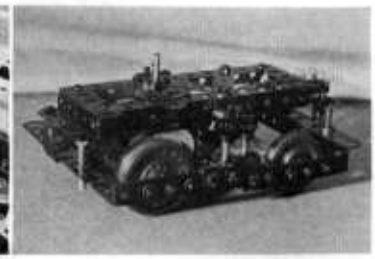
Construction Details

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 $\frac{1}{16}$ 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 $\frac{1}{4}$ 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.

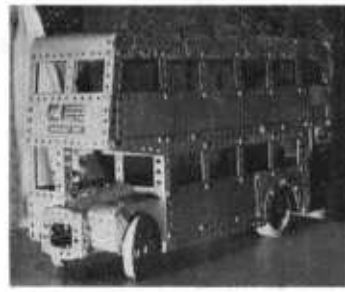
Route Board Holders—Hamblings 'OO' gauge fishplates slightly opened out.

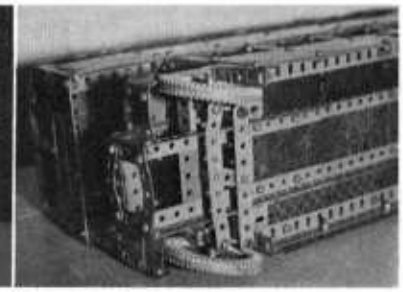
Route Boards—Slaters Plastikard rubbed down. UNO Stencil lettering.

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.

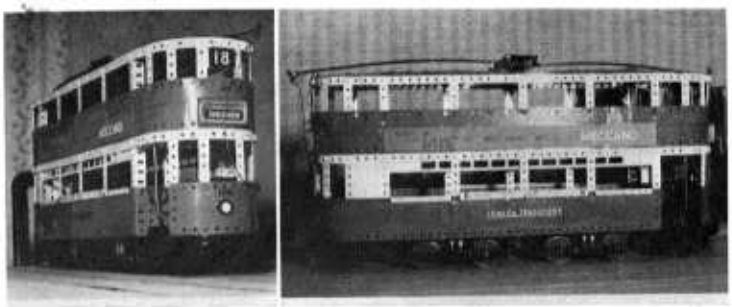
A pair of simple, unsprung, bogies was made with disastrous results—derailments unlimited. The wheels, on $\frac{1}{12}$ in. steel axles, run in brass bearings (Double Arm Cranks —Part 62B with Grub Screws removed to act as oil holes) which are bolted to the bogie frames. Many different bogie arrangements 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 ⅛ in. × $\frac{3}{32}$ in. strip brass from Smiths, the wholesalers, St. Johns Square, London, a quantity of ⅛ in. punched birdcage (tinned steel) strip from Romany's, of Camden Town and a fair quantity of 2 × ½ in. and ¾ × ½ 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 × ½ in. battens under the running rails screwed to 2 × ½ in. cross supports about every two feet and ¾ × ½ 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 ⅛ 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 ⅛ × $\frac{3}{32}$ in. brass strip which is soldered in the same way using a strip of ⅛ 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 ⅛ 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!

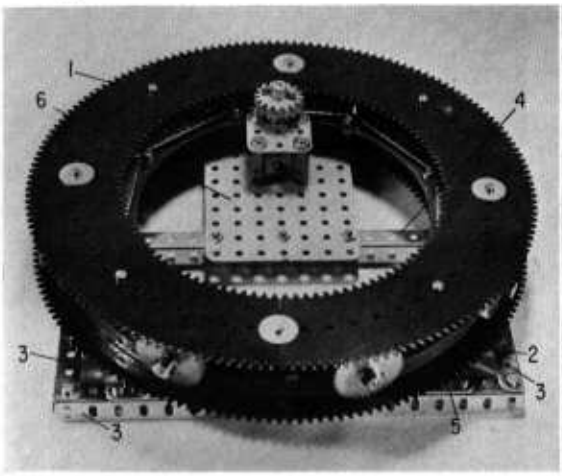
TALE OF TWO CITIES (*continued from opposite page*) are thought to have been buried here, re-interred in the late eighteenth century from hundreds of graveyards in the centre of Paris in order to clear valuable land for building and reduce the risk of polluting the underground water supply.

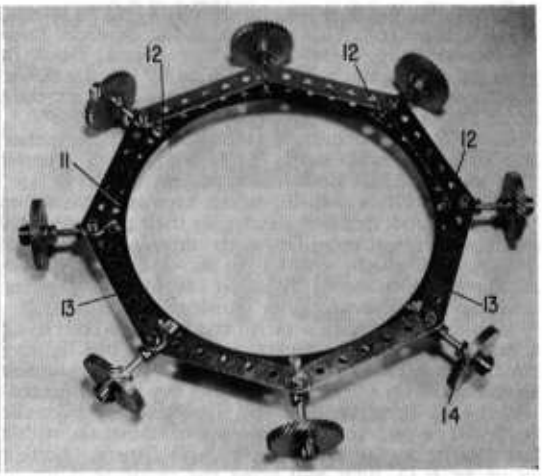
It was the Romans who laid the foundations for the underground city by quarrying stone for their houses in the village of Lutetia. Paris and the quarries grew hand in hand. The oldest parts of the cathedral of Notre Dame, the Church of St Etienne and the Louvre were all built from stone mined beneath 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.



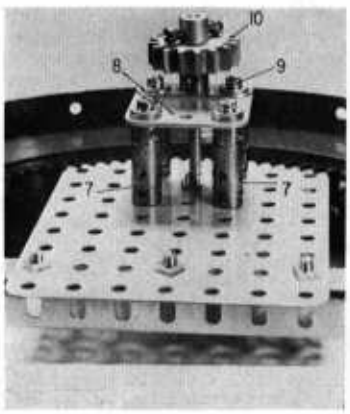


Among the Model-Builders with 'Spanner'

Heavy Duty Turn-table

It is, of course, well-known among enthusiasts that Meccano (1971) Ltd. in Liverpool have a special Model-building Department, whose job it is to design and build display models for Meccano dealers and for various shows and exhibitions which are held from time to time around the Country. Some of these models are necessarily very large and heavy constructions and one such model was a 6 ft. diameter Roundabout which was in fact included in the Company's Lord Mayor's Parade float illustrated on last month's cover.

This really excellent model was the work of Pat Lewis of the Model-building staff and, for use in it, Pat designed an exceptionally Heavy-duty Turn-table intended not only to carry the heavy weight of the model's revolving superstructure, but also to stand up to the "hammering" the model would taken when being bounced about on the back of an articulated flat truck. Pat has kindly built up and supplied me with a copy of the mechanism and, although extremely costly from a component point of view, I feature it here because I am sure it will be of considerable interest to advanced modellers.



As can be seen, the unit makes use of two Large-toothed Quadrant assemblies 1 and 2, each bolted to a 9⅞ in. Flanged Ring. The lower assembly is bolted to the stationary portion of the parent model—in this case represented by a square Girder arrangement, built up from four 12½ in. Angle Girders 3, two of the resulting sides being centrally joined by a fifth 12½ in. Angle Girder 4. When building the square, of course, two of the Girders will, of necessity, be the thickness of a Girder flange lower than the other two. To counteract this difference in level, a 7½ in. Strip 5 is bolted to one of the lower Girders, while a 5½ × 3½ in. Flat Plate 6 is bolted between the other Girder and Girder 4. The result is a flush seating for the Quadrant assembly.

Above left, a general view of the Heavy-duty Turn-table, produced by Mr. Pat Lewis, and designed to stand the rigours imposed on long-running giant display models. Left, a close-up view of the final drive system to the Turn-table. Above right, the central "spider" assembly included in the Heavy-duty Turn-table.

Secured to the top of Flat Plate 6 in the positions shown are four Threaded Couplings 7, the securing Bolts also helping to fix an 8-hole Wheel Disc to the underside of the Plate to later provide an extended bearing for the drive shaft. Attached to the upper ends of the Couplings by ½ in. Bolts, but spaced from them by a Collar on each Bolt are two 1½ × 1½ in. Flat Plates 8, one on top of the other, the relevant securing Bolts also fixing a Double Arm Crank 9 along one edge of these Plates. Note that a spacing Washer is carried under the head of each of these fixing Bolts, while two Washers are carried on each of the other fixing Bolts. The boss of the Double Arm Crank, Plate 6 and the Wheel Disc beneath the Plate all serve as bearings for the drive shaft, on the upper end of which a Large-toothed Quadrant Pinion 10 is fixed.

The central "spider" of the turn-table is supplied by a 7½ in. Circular Strip 11, to which eight Slotted Couplings 12 are secured at regular intervals, the Circular Strip engaging in the slot in the Couplings. Eight 3½ in. bracing Strips 13 are bolted between the Couplings, as shown, to prevent the Couplings from swivelling on the Circular Strip, then secured in the longitudinal bore of each Coupling is a 2 in. Rod, on which a 1½ in. Helical Gear 14, boss inwards, and a Washer are *loosely* mounted to serve as a roller. A Collar on the end of the Rod holds the Roller in place.

Simple, but remarkably effective with lighter drives, is this Flexible Coupling designed by Alan Wright of Statham, Lymm, Cheshire.

With the completed unit finally assembled, the central spider is positioned with the Helical Gears outside the flanges of the Flanged Rings and running on the inside faces of the Large-toothed Quadrants. Pinion 10 engages with the inner teeth of the upper Quadrant assembly in this case, although, in another model, the drive could be taken to the external teeth of the Quadrants. It's all a matter of individual requirements.

PARTS REQUIRED

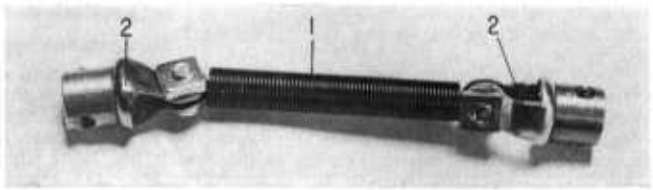
1—1b	31—37a	8—59	8—111c
8—3	39—37b	1—62b	1—145
5—8	14—38	8—63b	8—167a
8—17	8—38d	2—74	2—167b
1—24a	1—52a	8—111a	1—167c
			8—211b

Flexible Coupling

On a completely different subject, Alan Wright of Statham, Lymm, Cheshire has supplied me with details of a simple Flexible Coupling which I think is of interest. Working on the same principle as the Meccano Flexible Coupling Unit, it has the advantage of being considerably more flexible than the standard part, but the disadvantages of being suitable primarily for light, rather than heavy drives.

As a glance at the accompanying illustration will show, it consists quite simply of a Tension Spring 1, to each end of which an End Bearing 2 is fixed. Secured in the bosses of the End Bearings, of course, would be the Rods transmitting the drive to and from the coupling unit.

In operation, it is inadvisable to incorporate the Unit in a heavy drive system. The Tension Spring is a coil spring and, if too great a torque



is applied to it—at least in the relevant direction—the coils will tend to unwind. With light drives, however, it would present no problem whatsoever and will certainly give a very wide angle of operation.

PARTS REQUIRED

2—37a	2—37b	1—43	2—66

South African Specials

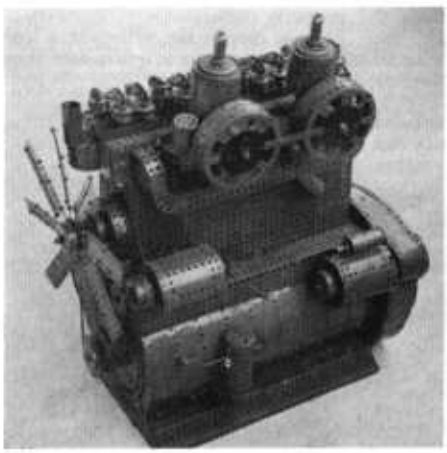
For some general interest, next, I should like to draw your attention to the two excellent advanced models illustrated in the accompanying photographs. These are a Motor Car Engine and a 1908 (or thereabouts!) Rolls-Royce, both the work of Mr. H. Smith of Port Elizabeth, South Africa, and, to give you some idea of Mr. Smith's enormous parts collection, both were built *simultaneously* over a period of six months!

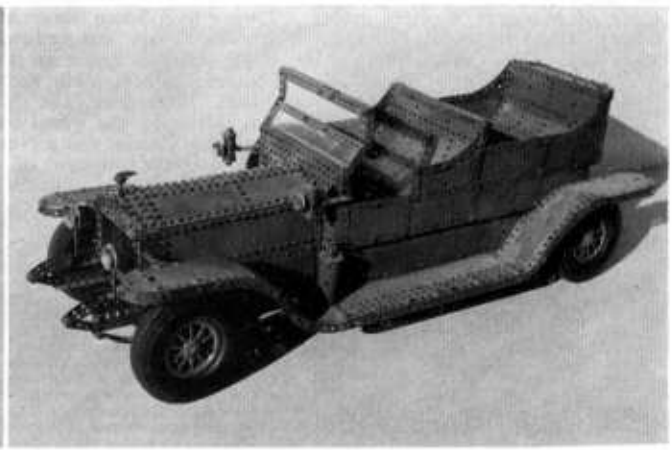
In the case of the Car Engine, says Mr. Smith, "The crank case is mounted on a framework 18½ in. long by 12½ in. wide, while the cylinder block measures 8½ in. height. The crankshaft is built up from Flanged Sector Plates, which allow for perfect balance, the pistons being made up from Flexible Plates, with 3 in. Pulleys to represent piston rings. The model, in fact, is complete in every mechanical detail.

"Being a motor mechanic by trade, valve timing and ignition timing was no problem and, as you will see from the photographs, the Engine is fitted with starter motor, distributor, oil filter manifold, twin S.U. carburettors, fuel pump and a working clutch. Torch bulbs fitted inside the cylinders light up as the "spark plugs" fire. The push rods are operated from a cam shaft, with the cams themselves constructed from Bush Wheels and Trunnions. The rockers are made up from 2½ in. Curved Strips, while the valves are 1 in. Pulleys fitted on to Axle Rods. Finally, "water jackets", water pump and coil complete the model".

Turning to the Rolls-Royce, Mr. Smith tells us that this "Is fitted with a 3-speed and reverse gearbox with 'H' gate change, the selected gear being held in position by spring-loaded steel balls. A working clutch and differential completes the transmission assembly, while engine accessories include "spark plugs", manifold, carburettor, etc. The body is supported on a fully-detailed chassis which includes leaf spring suspension on all four wheels

The skill, not only of an advanced Meccano modeller, but also of an experienced motor mechanic, is characterised by the highly-detailed Motor Car Engine below left, built by Mr. H. Smith of Port Elizabeth, South Africa. Below right, all the lines and atmosphere of the real thing have been captured in this superb Rolls-Royce, circa 1908—another fine achievement by Mr. H. Smith.





and Ackermann steering. Hand and foot brakes are fitted to the rear wheels.

"I paid a lot of attention to detail in the body construction—note the rivets on the bonnet which can be opened to reveal the "works". Overall length of the model is about 2 ft. 7½ in. Construction of the radiator-grille is simple and neat as I simply used 2½ in. Strips on a Screwed Rod, spacing each Strip with a Nut. The fenders (bumpers) and bodywork are made up from Flat Plates, Flexible Plates and Girders. Please note the "gas" lamps and cylinders!

"The only non-Meccano parts used in either of the models were the Rolls-Royce's tyres, these being kindly supplied by a local tyre manufacturer."

Mr. Smith went on to say that both his models were powdered by Meccano 20 volt Motors. These, as you know, are now obsolete, but I think we can overlook that on this occasion!

Club Report

I would like to finish this month by reprinting the following 1971 Report of the Stevenage Meccano Club which has been supplied by Secretary Mr. D. Higginson, 7 Buckthorn Avenue, Stevenage, Herts.

"The year started with a visit to the Model Engineer Exhibition in London which was enjoyed by all and a good stock of new Meccano parts was purchased by members. We had a very busy year exhibiting our models at various schools and Garden Fetes and raised a grand total of £35 for the various functions we attended, the biggest of which was held by the Pin Green School Parents Association. All members contributed to this display and we were able to show 20 models—all exhibited outdoors without any ill-effects. One of them was the Steam Engine which was re-built from the June M.M. by Peter Walton and which worked very well indeed.

"We have lost a valued member in Philip Hodges who has been granted a place at Rugby and we all wish him the very best at his new school. Several new members have joined the Club, however, including Paul Bourbousson, Phillip Phillipson, Geoff Long, Stephen Kuc, Simon Baker and a very keen adult member, Mr. John Foord, who is our lecturer. We also had the great fortune of a visit from Mr. Ron Fail to give us a lecture, with photographic slides, on mechanisms and general Meccano constructions relating to Clocks and Meccanographs. All in all, it has been a very successful year and bookings are already coming in for Fetes to be held during 1972".

Anybody interested in joining the Stevenage Meccano Club should contact Mr. Higginson at the address given above.

AIR NEWS (*continued from page 38*)

coast of the U.S.A. to show the kind of data that can be expected from the satellite. Carrying four 70 mm. cameras, it makes repeated passes over the test areas at an altitude of 65,000 ft., taking photographs every 18 days at precise local times that coincide with the time-intervals at which the ERTS satellite will pass overhead the same places. Three of the cameras produce the same "pattern" of pictures as those which will be aboard the ERTS; the fourth is loaded with colour infra-red film.

Sky Wedding on "Firework Night"

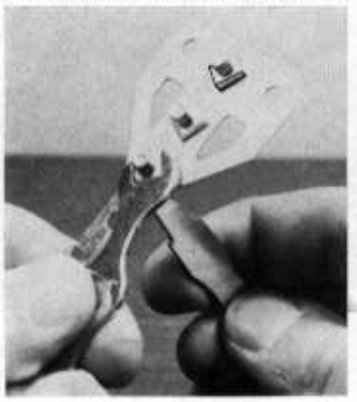
November 5th, Britain's traditional "firework night", will be remembered for a different reason by 20 Japanese couples. To celebrate the inauguration of its Boeing 747 "Jumbo jet" services from Japan to Europe, Lufthansa German Airlines invited them to be married sky-high on board its first 747 flight on that date and then to spend a 12-day honeymoon in Germany.

The wedding rites, which took place between Tokyo and Hong Kong, were conducted by a Shinto priest from the Shiba Daijingu shrine, in an age-old ceremony. The Lufthansa captain, in accordance with international law, officiated at the wedding. None of the traditional trimmings were omitted. The couples "walked down the aisle" over Kyushu to the strains of Etenraku court music, exchanged vows (seishi) in view of Okinawa, and drank the ceremonial saké over Taipei.

MECCANO PARTS

(*continued from opposite*)

extra strong grip when applied "saucer edge down", but if scoring is to be avoided they should be fitted the other way round. In the absence of Meccano Washers, paper is an excellent anti-score substitute.



The lock-nut process is one of the most useful for the Meccano constructor. In the Pocket Meccano Set there are no Axle Rods, so wheels must be attached with Bolts. In the illustration of the simple Tractor with Scoop shown in Fig. 2 the wheels are attached to ½ in. Angle Brackets Bolted to the small Flanged Plate forming the tractor chassis. Procedure is as in Fig. 5, but, this time, the wheel is placed on the Bolt shank and a Nut is run on to the Bolt just short of binding against the wheel. The Bolt then goes through the hole in the Angle Bracket and a second Nut is tightened to secure the Bolt and hence the wheel to the Bracket. A simple job but it can make a tremendous difference to the appearance and the smooth running of your model when properly done!

Next month we will have a look at some more basic parts and their uses.

Fig. 4 (left) Correct use of the Spanner with a simple assembly. The Nut is held still and the Bolt is tightened with the Screwdriver—*not* the other way round.

Fig. 5 (right) Lock-nutting a Bolt to a Plate with two Nuts. The lower Nut beneath the Plate is held steady with one Spanner, while a second Spanner is applied to the upper Nut. To prevent scoring of the enamel, a Washer should be placed under the upper Nut.

MECCANO PARTS AND HOW TO USE THEM

A new series for the younger constructor written and illustrated by Bert Love

Fig. 1. Two Meccano Publications from the 30's on how to use Meccano Parts. Both booklets cost 6d (2½p) at the time of publication, the smaller being issued in 1930 and the larger in 1935. Although both are long since out of print, they still make very useful reference manuals.

HOW to use Meccano parts?—surely everybody with a Meccano Set knows how to use Meccano parts! But do they?

Even forty years ago Meccano parts were thirty years old but a small booklet called "How to use Meccano Parts" sold like hot cakes in 1930. A later and enlarged edition with a slight change in title published in 1935 was also a sell-out. A recent photograph of the author's copies is shown. Both books are out of print now and although some of the parts and mechanisms are now obsolete, these manuals are still very useful as reference material and are well worth looking after if the reader is fortunate enough to possess either or both. The two editions sold for 6d. in the U.K. at the time of publishing and they represented excellent value. However, it is not the intention of this series to reproduce the contents of these earlier manuals because both parts and techniques have made considerable strides since the introduction of the two booklets illustrated.

There is nothing like getting down to brass tacks when a new series is started so we will begin by looking at the hardest worked part of any Meccano Set, viz., Nuts and Bolts. Millions of these are turned out at the Binns Road Factory where high speed machines roll the threads on to the Bolt shanks faster than the eye can see. They are well made and finished with a zinc plating so that with reasonable use they will last the constructor literally for a lifetime. However, some thought and care in their use is well worth considering. Since basics should be kept simple, the Pocket Meccano Set is chosen for this introductory chapter and its contents are illustrated in Fig. 2. "Just a handful of parts", . . . you might rightfully exclaim, but judging by the popularity of the 1971 Pocket Meccano Model Building Competition and the amazing range of models submitted for prizes there is enormous scope for simple Nut and Bolt construction.

Consider Fig. 3 in which a Narrow Strip is shown attached to a Trunnion. When the boltheads are neatly aligned the construction is a pleasure to look at. Compare this with the rear view at the right of the illustration where the results of bad "Spannermanship" is all too plainly evident. The enamel on Meccano parts is really quite durable but it will not stand up to deliberate abuse. A rule of thumb for preventing such disfiguring of parts is as follows; if the Nut is against an enamelled part, hold it still and screw up the Bolt with the Screwdriver. This method is clearly illustrated in Fig. 4 and although applied to a simple assembly in this case, the principle applies right up to the largest "Supermodel".

There are occasions when Nuts must be turned against an enamelled surface as shown in Fig. 5 where a Bolt is to be lock-nutted to a Plate. Two items can assist in preventing scoring in this case. The Meccano Washer may be placed between the Nut and the enamel but a word of warning here. The Washers are 'dished', that is to say they are slightly saucer-shaped to give an

(continued opposite)

Fig. 3. Samples of both neat and ugly nut and bolt construction. Note neat alignment of boltheads in left-hand Flat Trunnion and the bad scoring of right-hand Flat Trunnion by poor Spanner work.

Fig. 2 (right) Contents of the Pocket Meccano Set. Although comprising only a handful of parts, the scope for Nut and Bolt construction with this Set is enormous. An example of what can be done is shown below—a working Tractor Shovel with bucket hoist made from the Pocket Meccano Set. Dinky Toy tyres add the final touch of realism.