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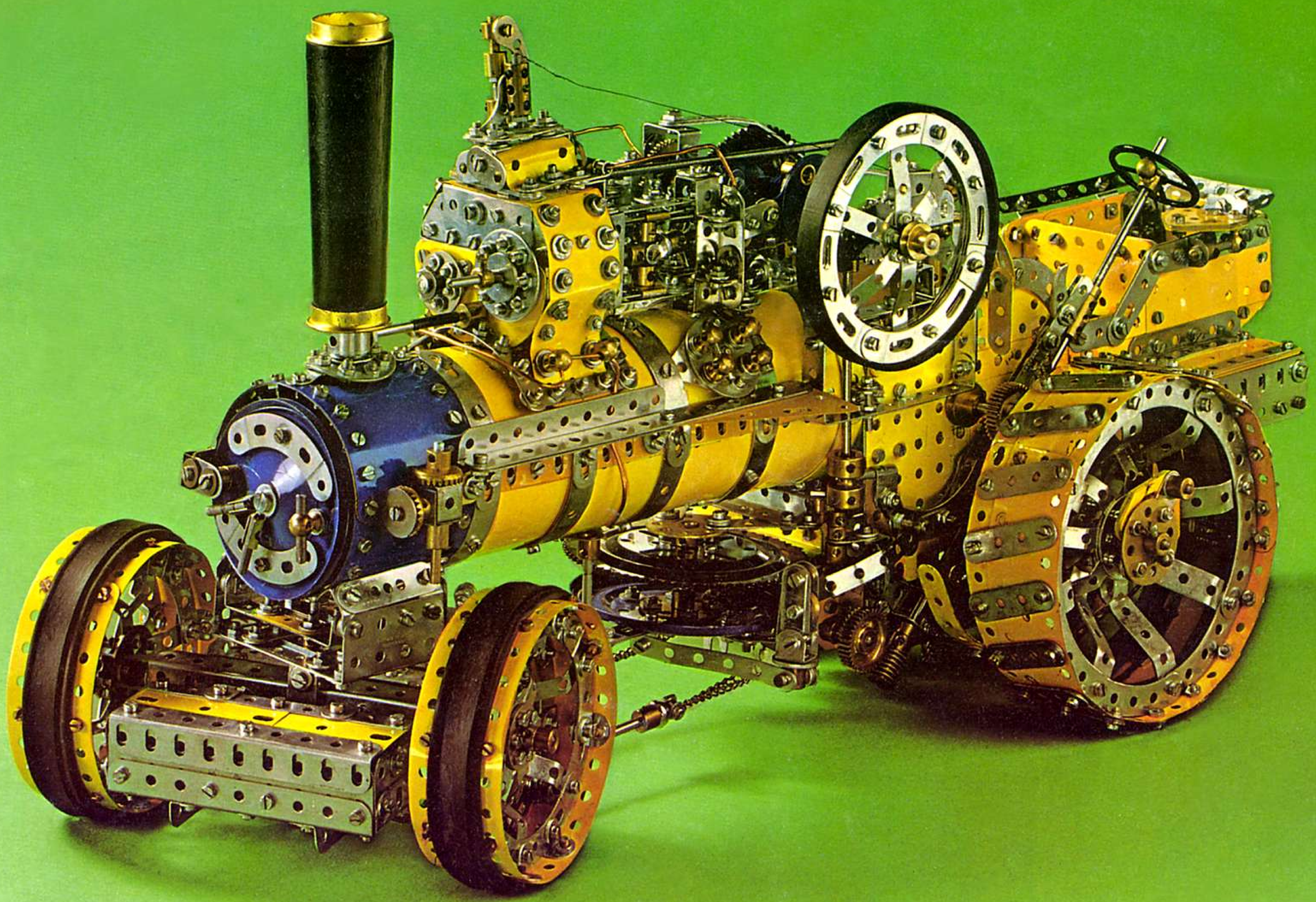
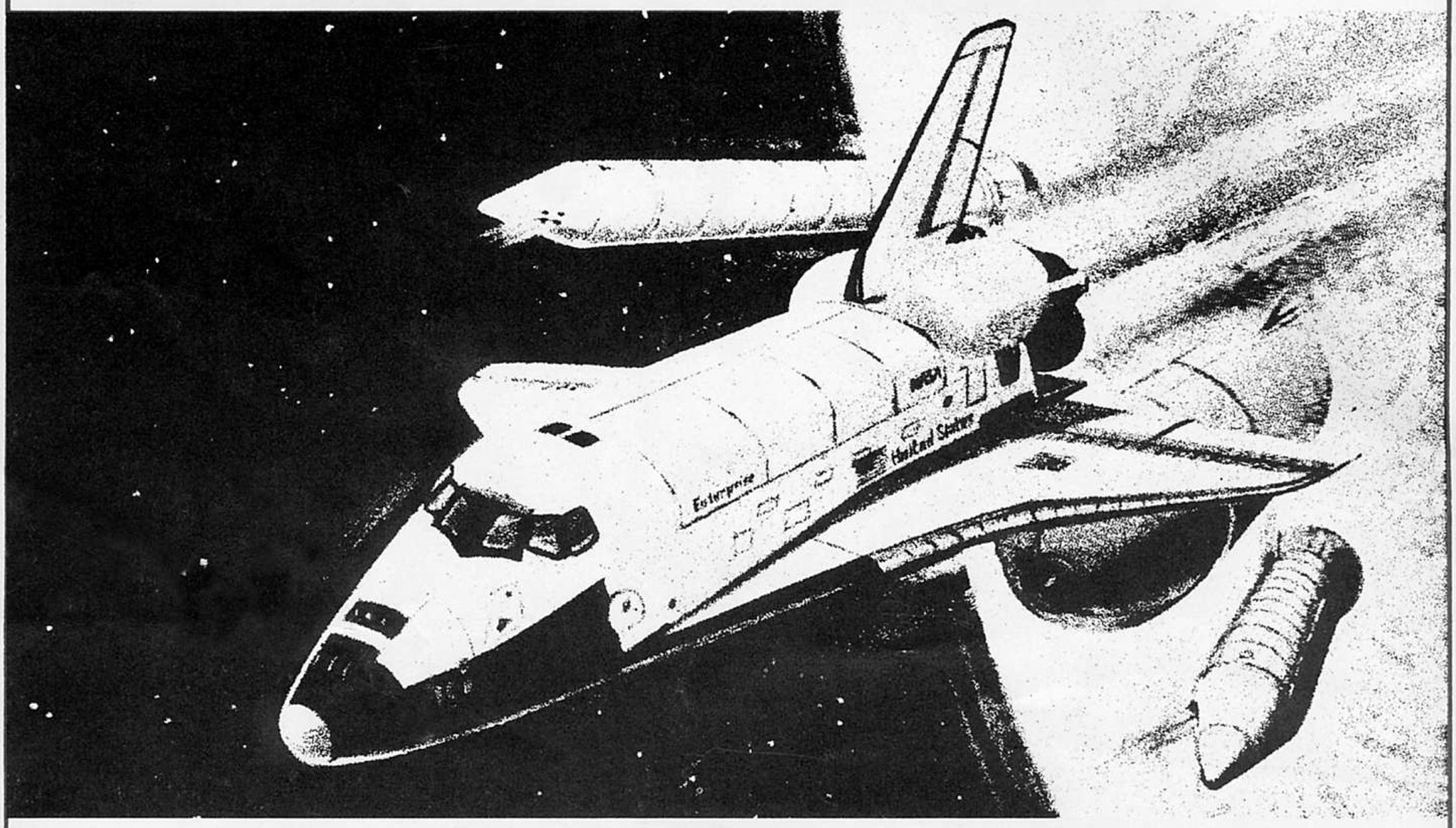
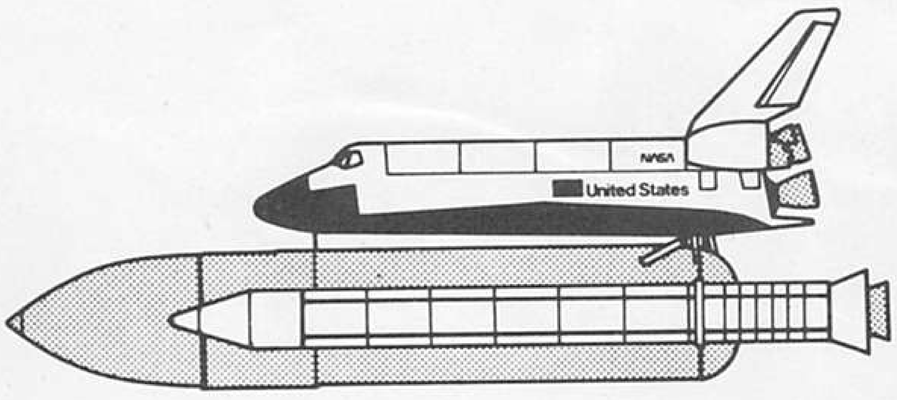


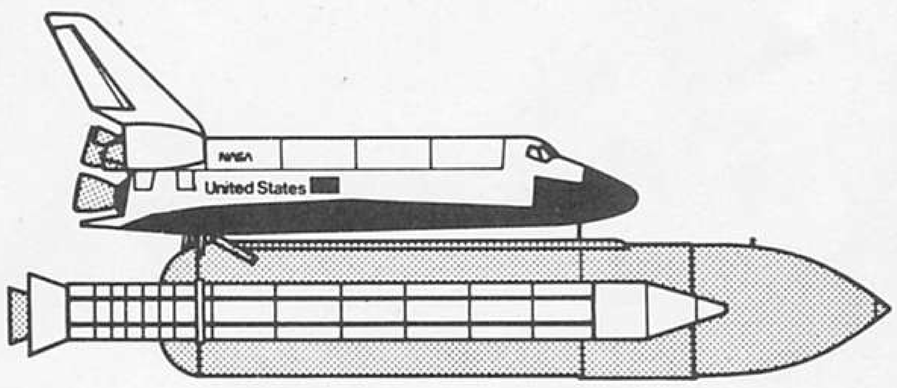
1916 FOWLER BB1 PLOUGHING ENGINE

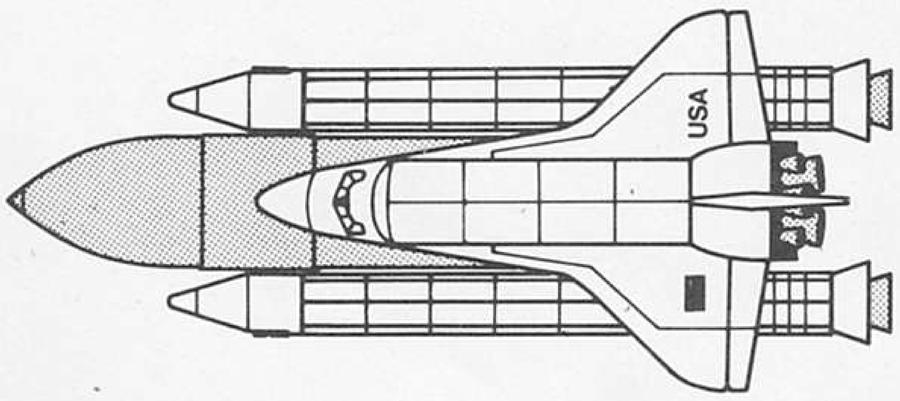
NEW FROM AIRFIX



THE 8.15 OF THE 1980's







For years the idea of spacecraft plying regularly between earth and space has been pure science fiction.

But now it's becoming science fact. In the shape of the Space Shuttle Transportation System being developed by NASA.

Its first manned space mission is planned for 1979, prior to the first scheduled operational mission in 1980.

By the mid 1980's, this re-usable space vehicle will be operating as a commuter ferry, shuttling men and materials with the same familiar regularity as the 8.15.

The Shuttle is now available in a 1/144 scale Airfix kit, with over 90 parts. The kit includes two strap on booster rockets, the huge fuel tank and a Space Lab payload.

Its detailed modelling is an eloquent demonstration of the close co-operation kindly provided by Rockwell Space Division, the Space Shuttle's designers.

Technical Details

Lift-Off Thrust:	6.61 million lb
Re-entry Speed:	17,450 mph
Re-entry Height:	76 miles
Touch-Down Speed:	215 mph

SPACE SHUTTLE
1/144 Scale

AIRFIX

MECCANO MAGAZINE

Vol. 63, No.4 October 1978.

ON THE COVER: A magnificent Fowler BB1 Ploughing Engine, circa 1916. Built by Norman Gilbert after only one year's experience of serious modelling. Detailed photographs of the model, taken by Bert Love, appear on pages 128–130 inside this issue, together with an outline description of its major points.

EDITOR – CHRIS JELLEY

SHOW SCENE SPECIAL

With photo-reports on Henley, Stoneleigh and the Solent Exhibition in Portsmouth, this issue certainly qualifies as a Show Scene Special. And, talking of Shows, I was lucky enough to be able to attend both Stoneleigh and Henley where, once again, I was genuinely amazed at the number and variety of models on display as well as the outstanding engineering skill they incorporated. I've said it before, but I make no apologies for repeating it here: I've worked for some eighteen years on Meccano Magazine, during which time I've seen countless Meccano models, yet I have never attended a modern enthusiasts' Meccano Exhibition without finding numerous new and ingenious things to surprise and excite me.

Readers who attended any of the Shows will know that the few illustrations we have been able to include in these pages represent a hopelessly small selection of the very many worthy models exhibited. However, there is just no way we could feature everything, so we have included as much as we can. I stress most forcibly, though, that we do not for one moment suggest that those not included are in any way inferior. To be honest in fact, your Editor's inexpert photography has had a lot to do with it – most of those selected were chosen simply because their photographs developed better than others; the quality of the models did not have a lot to do with it! This reminds me, incidentally: I owe special thanks to Nicholas Wright of the Midlands Meccano Guild for providing me with back-up photographs of Stoneleigh in case mine did not come out.

In the event, I did not need to use them for the Report page, but this in no way reduces the value of Nicholas' help, or my appreciation of it. Thanks, Nicholas, and thanks also to your dad, Ken, for giving me an extra film when I ran out!

TROPHY WINNERS

Still on Shows, or, more particularly, still on Stoneleigh, hearty congratulations go to the Midlands Meccano Guild and to young exhibitor James Gilbert for winning the Trophies described in our photo-caption above. The Town and Country Festival at which the MMG exhibited was a vast, 3-day show covering a huge range of subjects from show jumping and football to show bands (musical type!) and military displays. The Model Exhibition alone filled an enormous hall and featured all sorts of modelling from railways, through model soldiers to live steam equipment and precision miniature engineering.

At the vast Town & Country Festival held at the Royal Agricultural Showground, Stoneleigh, August 26th–28th, the Midland Meccano Guild gained the Sunday Mercury Trophy for the most meritorious display in the whole Model Exhibition and 12 year old James Gilbert won the Trophy for the best overall model in the 8–12 year age group. Our pictures show, left, Ernest Chandler, Secretary of the MMG, and, right James, receiving their Trophies from Mr. P. W. Slade, Editor of the Sunday Mercury. (Photos by Nicholas Wright)

The MMG's Meccano Exhibition was only one section among many, therefore their success in gaining the Trophy is particularly praiseworthy. And especially so is James' success – he was also chosen from among the Model Exhibition exhibitors as a whole, making him very much a modeller of distinction.

CIRCULATION BACK

Although it is now around a year since we resumed publication of the MM, we are still having some problems with magazine circulation and a contributory factor to this is that, because of computer commitments at Binns Road, it has not been possible for us to take direct control of circulation. In fact, since we took over publication, circulation has been handled by an independent agency in Henley-on-Thames (not connected with M.W. Models!). I am at last pleased to report, however, that, beginning with the next (January) issue of the magazine, we hope to resume circulation ourselves and we should soon then be able to iron out past problems. To help us, though, I strongly urge all direct subscribers to answer the questionaire which should be included with this issue of the magazine, even if you have not experienced any problems yourself. We are sorry for any inconvenience it might cause, but the future may be smoother-running as a result of your co-operation.

IT'S A GIRL

Finally, to end on a personal note, in the capacity of unpaid assistant, my wife had the pleasure of meeting many modellers at Exhibitions held during the past few months and it will not have gone unnoticed that she was, shall we say, in the process of expanding the Jelley family. In response to the many kind requests we received to be kept informed of the 'future event', therefore, I am now proud and delighted to say that, at 1.45 pm on Saturday, 30th September, my wife gave birth to a beautiful little baby daughter, weighing-in at 6 lbs 8 oz. We've named her Claire Catherine and both mother and daughter are doing fine!

CONTENTS

124	Road Wheels for Showman's Engines	143	Show Scene Stoneleigh
126	Among the Model-Builders	144	A Mobile Crane
128	Plougher Power	146	Let Your Models Live
131	Dinky Toys News	148	Meccano Club Roundup
132	Show Scene Solent	150	Gear Trains
133	Land Yacht	153	Taylor's Teknikit
134	The American Model Builder	154	Postbag
136	Electric Dockyard Crane	156	North West Frontier
140	Show Scene Henley		

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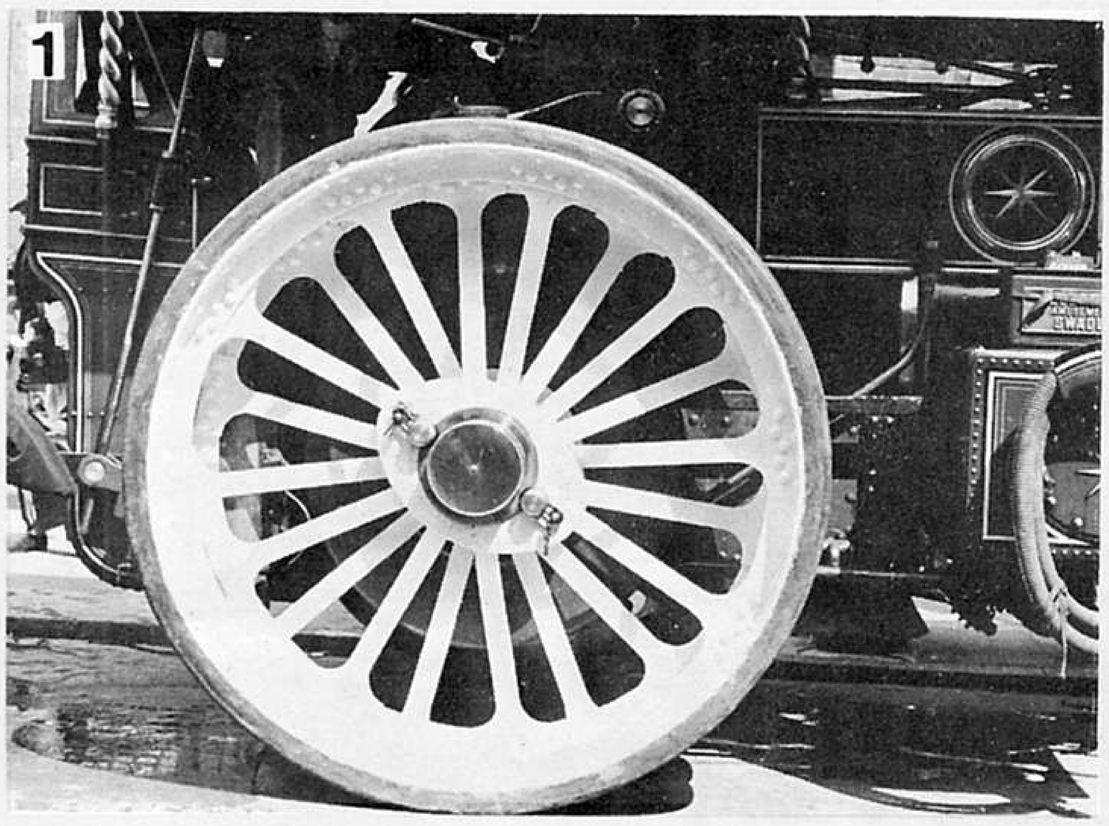
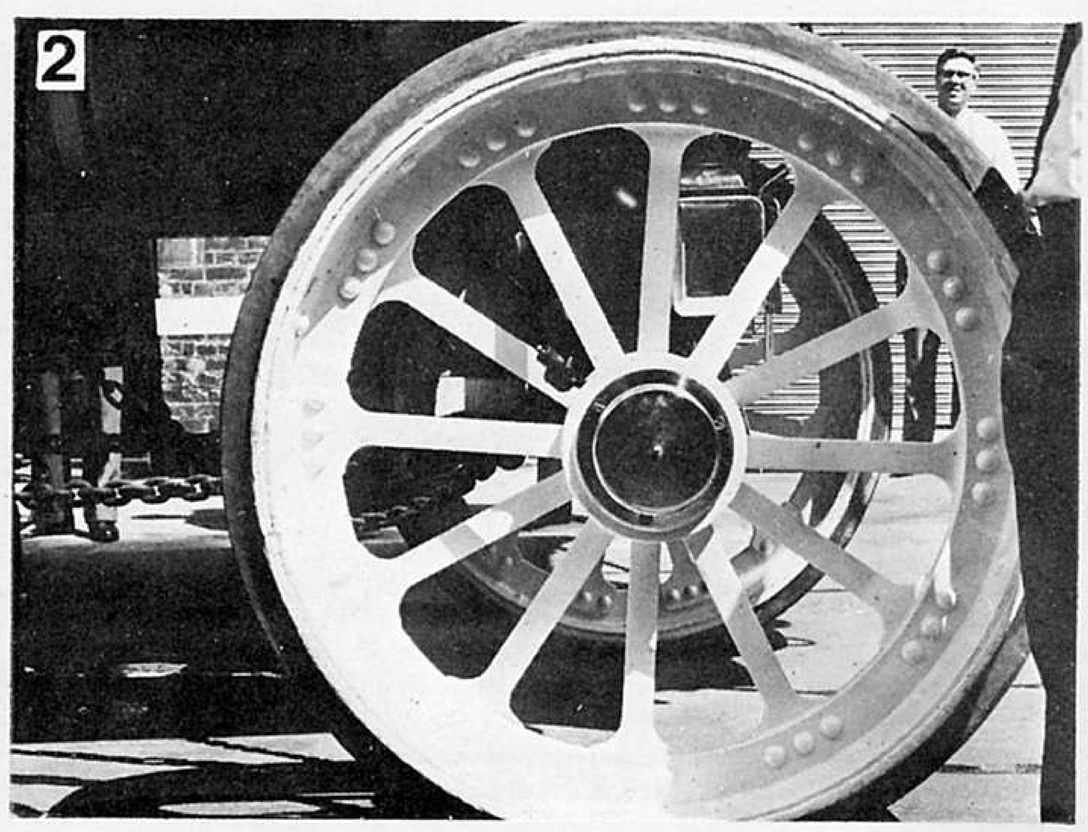
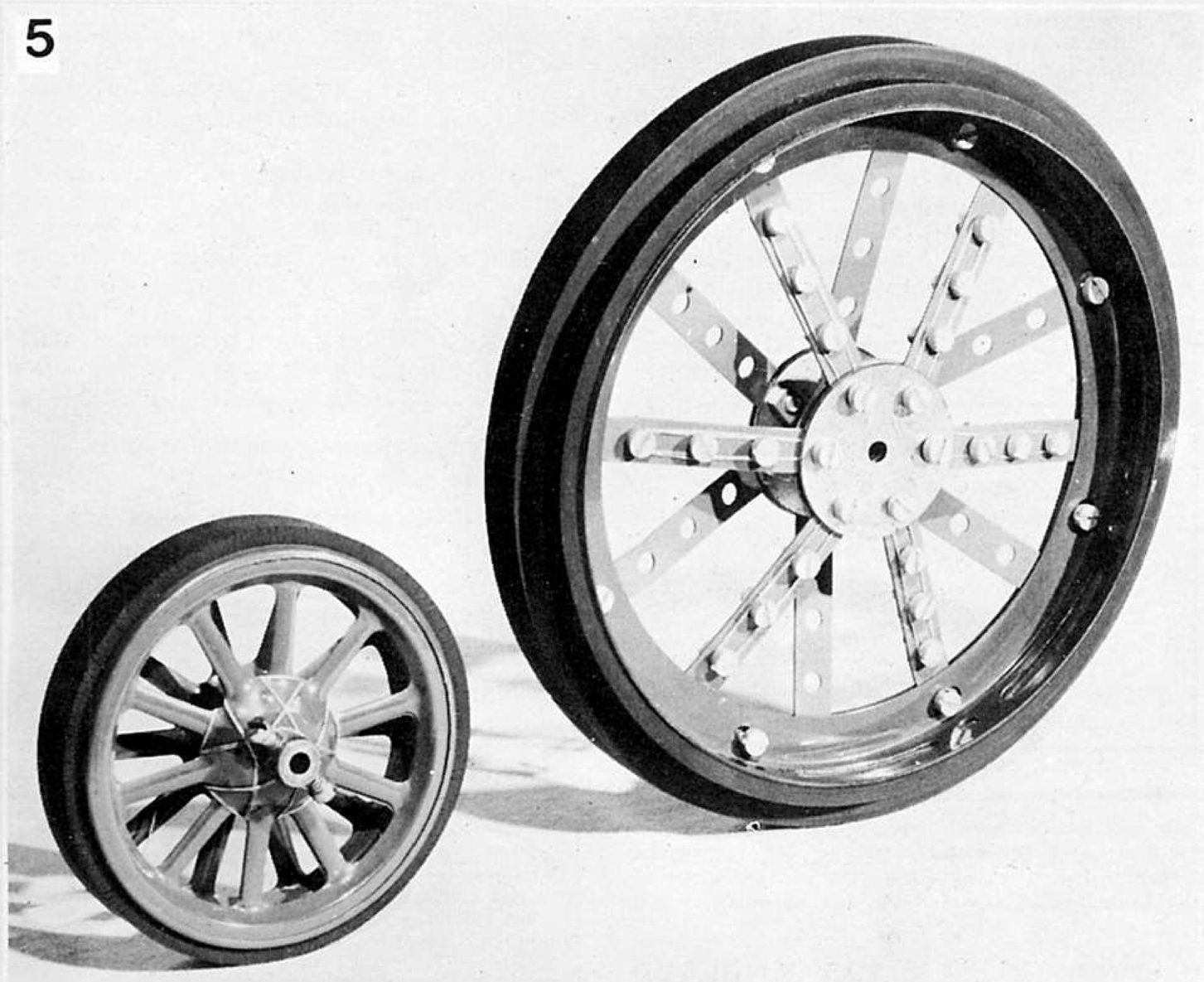




In Part 4 of his continuing series on traction engine modelling, COLIN HAMILTON turns his attention to ...

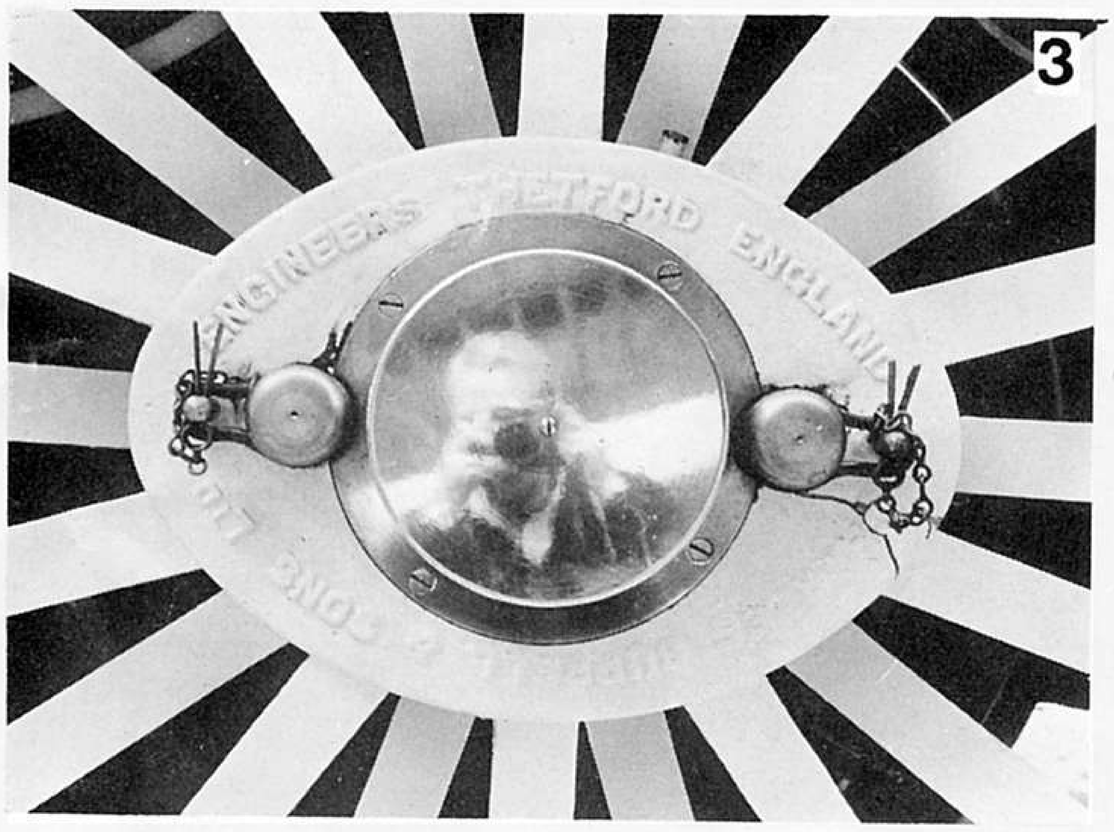
ROAD WHEELS FOR SHOWMAN'S ENGINES

Given the tremendous appeal of the Showman's Road Locomotive to Meccanomen and general show-visiting public alike, it is surely incumbent on the modeller to achieve the maximum possible realism within the scope of his collection. Yet there is one area of the traction engine which, despite its high importance in overall visual effect, is often neglected. I speak of the road wheel which, front or back, is often a minor work of art in itself!



Designs of wheels for steam-driven road vehicles are many and various, but once again, a typical Burrell pattern is used as the basis for this article. Fig. 1 captures the elements of the rear wheel of a Burrell Showman's Engine in the stark silhouette which immediately shows a work of art as well as an engineer's sound design. Although the axle of the full-sized road locomotive is as thick as a man's arm, and a quite massive hub is forged to cope with the working and weight loads, the individual spokes of the wheel are slim and elegant by comparison. Nevertheless, the diagonal arrangement of the twenty radial spokes which gives an interleaved construction provides all the strength required and a stable wheel with high resistance to sideways buckling. Given a standard Meccano Boiler and a pair of 3" Spoked Wheels, the chances are that a Hub Disc will be pressed into service as the rear wheels of an elementary Traction Engine, or Showman's Locomotive, but the serious constructor would never be satisfied with this.

Fig. 4 shows just what can be done to break away from the Hub Disc. By using Circular Girders combined with Narrow Strips and by using a Socket Coupling holding a pair of 8-hole Bush Wheels in each socket, quite an elegant wheel can be built up giving the separated flanges required for the rear wheel of an engine. In the particular construction shown every spoke is secured at hub and rim, advantage being taken of Threaded Bosses which not only guarantee parallel spacing of the rims all the way round, but also provide captive points



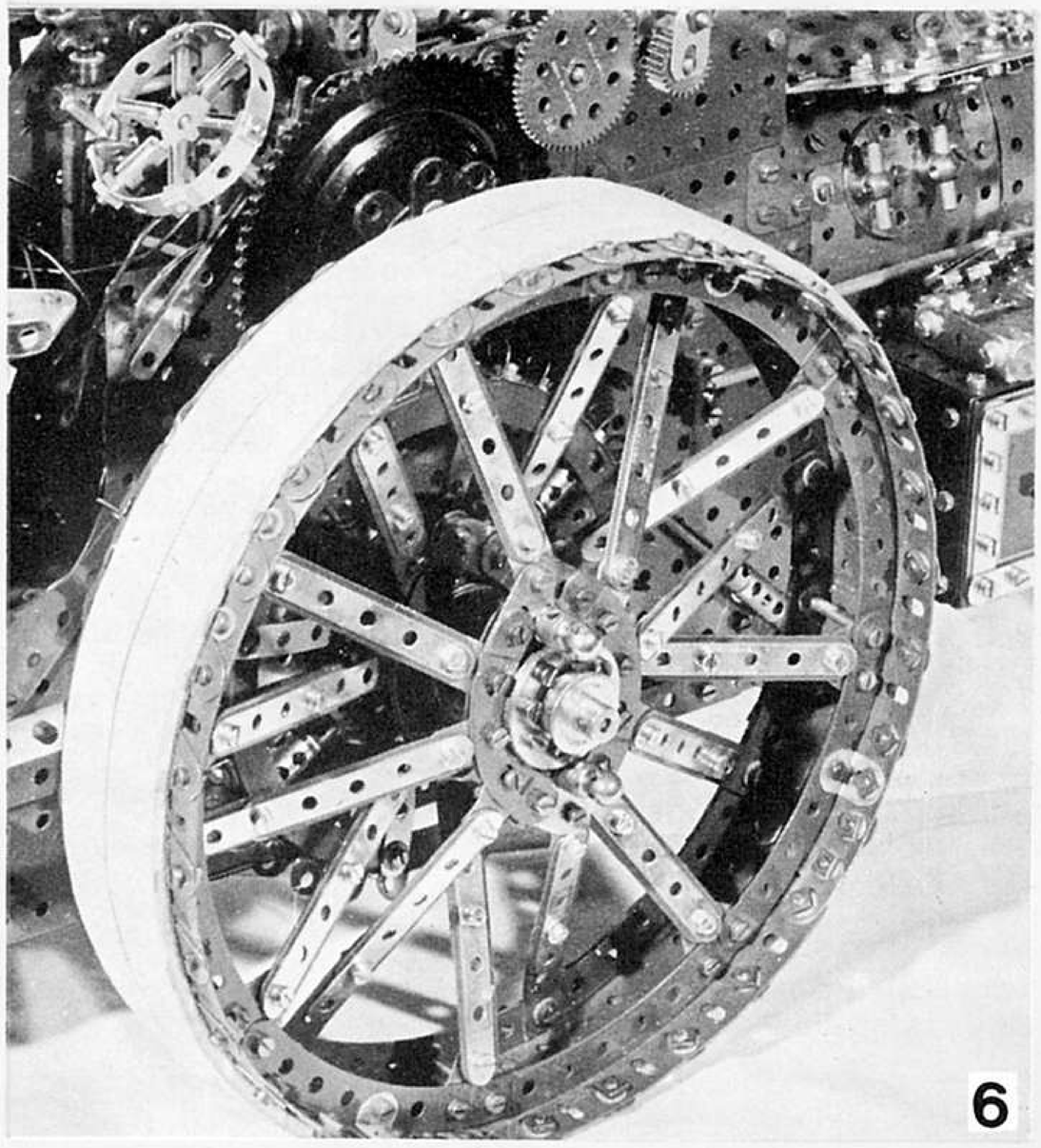
for the securing Bolts and leave no Nuts showing at the rims. It will be noted that substantial 'tyre' tread is supplied on the sample shown and these are actually used to trap double layers of Plastic Plates, 5½" x 1½" and 2½" x 1½", which form the outer faces of the wheels. Enterprising modellers keep a wary eye open for rubber belts on display in vacuum cleaner repair shops, lawn mower agents and washing machine stockists to make sure that they have a selection suitable for giving that professional rubber-tyred finish to their Showmen's Engines otherwise modelled in standard Meccano parts.

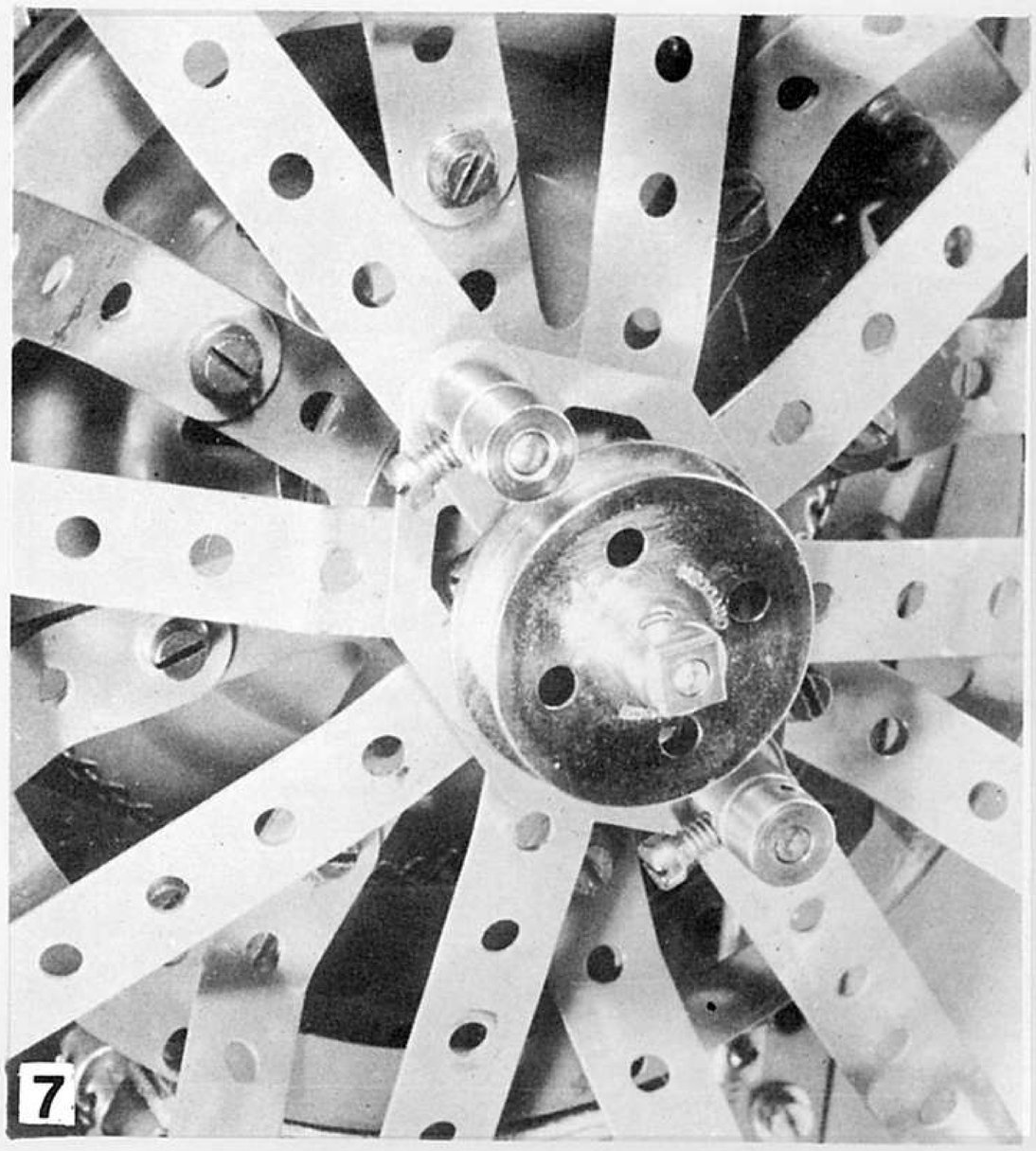
Looking at Fig. 2, which shows the front wheel of a Burrell engine, it will be noted that the wheel flanges are not separated. Since the greatest proportion of the engine's weight is located over the rear wheels, much lighter wheels of narrower 'tread' are required at the front end to facilitate steering. An acceptable simulation for the front wheels on the smaller scale is provided by Meccano 3" Spoked Wheels in pairs as shown in Fig. 5 and alongside this is a front wheel in Meccano parts when moving up to the larger scale road locomotives. Although Circular Girders and Narrow Strips are again the main components, only four of the twelve spokes are secured at the rim by bolting, the remaining eight simply being trapped between the Girder flanges as shown. Unless badly distorted bends are set into the Narrow Strips (a common fault in much Meccano model-building of traction engines, etc.) the Bush Wheels or Wheel Discs chosen for the hub must not be widely separated, or the 2½" Narrow Strips employed will simply not reach to the rim. Since modern Meccano Nuts are hexagon and accept 4BA size spanners, constructors will find that the use of 4BA Nuts & Bolts (cry heresy!) will just give that little bit of allowance with their slightly narrower shanks to let the Narrow Strips 'stretch' to the four points of the rim where spokes are actually bolted to the Girders. Where spokes are simply trapped by pinching, standard Bolts may be used at the hub.

In the same way that Hub Discs are often the popular choice for one size of rear wheel on a Meccano Traction Engine, so the Large Flanged Ring is often (and wrongly) 'favourite' for the larger rear wheel. Study of Fig. 6 will show that exactly the same diameter of wheel can be achieved by the use of a set of eight 4½" Curved Strips giving the correct depth of flange inside the rims. The flange of part No. 167b is far too deep for realism. In the construction illustrated, pairs of Flat Girders, edge to edge or side by side, are curved in a Meccano jig or bending roller to fit the curvature of the 4½" Curved Strips and secured by Angle Brackets at strategic points as shown. Long Meccano Bolts keep the wheel flanges parallel and overlaid 2½" Strips are set diagonally in every second slotted hole of the Flat Girders to join them round the face of the wheel. Something of a 'trick' is very successfully used in the construction of Fig. 6 to give the optical illusion of narrow spokes. This is achieved by overlaying the standard width Strips (in green) forming the spokes by 2½" Narrow Strips in silver. The illusion of narrow spokes thus created is quite striking.

Generally speaking, wheels on road locomotives are never fixed to their axles, but are free to revolve unless locked to the driving plate by pins. These can be seen in Fig. 3 on either side of the highly polished brass cap (reflecting the photographer at work!) Each locking pin has its own safety cotter pin preventing withdrawal of the locking pins by vibration. Both Figs. 6 and 7 show how this may be simulated in Meccano parts and in each case it will be seen that the model conforms to locking pin practice.

Finally, that extra touch of 'showground' decoration may be added to the wheels as shown in Fig. 5. Gold sewing thread is simply woven in and out of the spokes on the 3" Spoked Wheels nad locked under boltheads on the Narrow Strips used in the larger wheel of Fig. 5. Rubber belts complete the realism.





AMONG THE MODEL-BUILDERS

with 'Spanner'

A LITTLE UNORTHODOX

One of the many strengths of Meccano is the fact that all, or most, of the parts in the system are legitimate miniature engineering components; they are designed to fulfil particular known engineering functions and they succeed in doing so. However, Meccano parts are not always put to the engineering use for which they are designed. Ingenious minds often press them into non-orthodox service and it can be intriguing to see some of the non-orthodox ways they are used. For instance, Melvyn Down of Harlow, Essex, writes to say that the Crawler Track included in the Track Pack and Army Set can be used with Hub Discs to give two very different results.

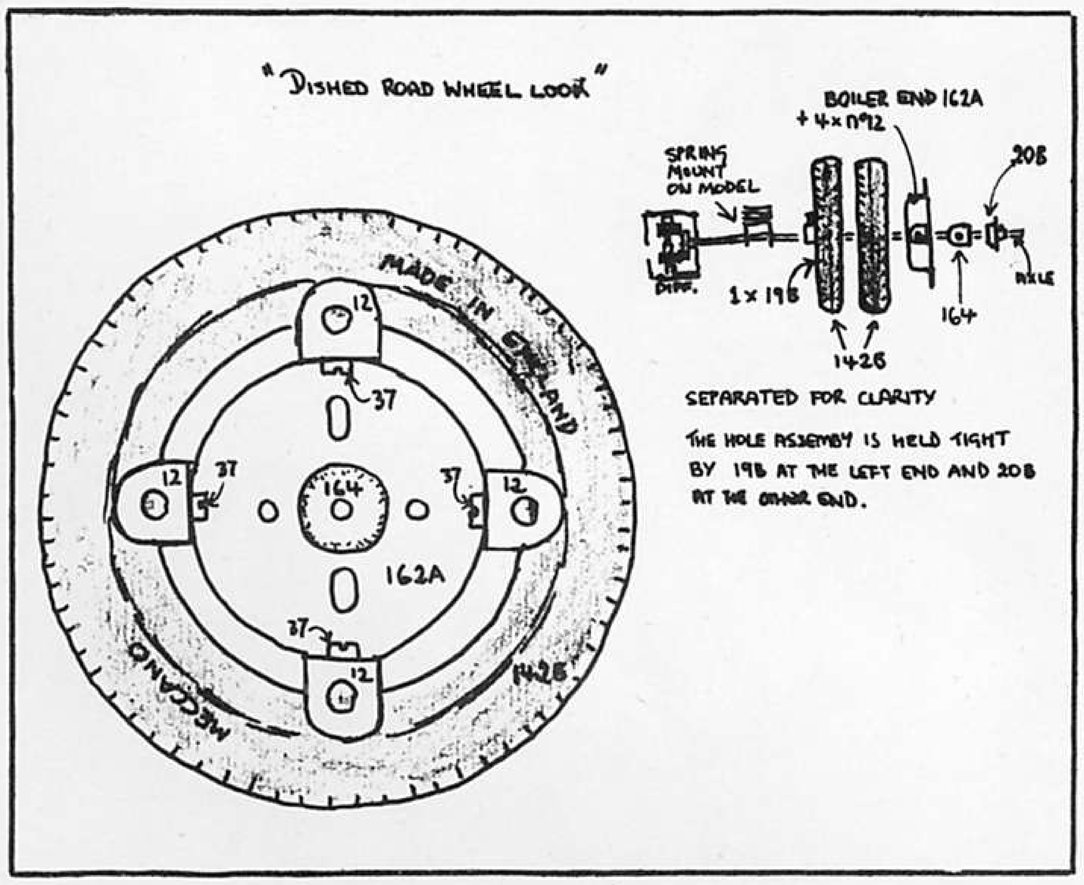
"By placing the plastic track into circles," writes Melvyn, "and sandwiching them between two Hub Discs, you have a large road wheel for, say, a Traction Engine" (see accompanying illustration).

To be honest, this is not an absolutely original idea; I have seen the method used on more than one model at various Meccano Exhibitions. However, Melvyn's second idea is new, at least to me. "By reversing the track" he writes, "so that the track plates lie inside the Hub Disc Flanges, you have a large gear wheel which can be driven by a Plastic Meccano Sprocket Wheel, P83 or P84. The Hub Discs can be held together with four Reversed Angle Brackets or long Bolts, Collar and Washers —whichever suits best.

"The plastic track," continued Melvyn, "also fits the 6" Pulley, but needs gently easing on and off. It is not very stable, but works quite well if not put under too much stress. The track can also be located between two 2" or 3" Pulleys with Motor Tyre to give a wide or an earth-working "beefy" look, as shown in the illustration."

In addition to the above ideas using the Crawler Track, Melvyn also provided the accompanying sketch showing a method of producing a dished road wheel. Construction is fairly clear from the diagram and Melvyn adds that the whole assembly is held tight by the 3" Pulley 19b at one end and by the ¾" Flanged Wheel 20b at the other end. He also admits that there is a slight trouble with the unit in that the outer wheel of the two will not be quite as large as the inner wheel as the built-up wheel centre is slightly smaller in diameter than the 3" Pulley. It seems to me, however, that the final appearance would outweigh this drawback.

Two examples illustrating the unorthodox use of Meccano Crawler Track, both suggested by Mr. Melvyn Down of Harlow, Essex. Right shows the Track sandwiched, track plates outwards, between two Hub Discs to give a tyred road wheel appearance for models such as Traction Engines; Left shows the Track sandwiched, with track links inwards, to produce a large diameter gear wheel.

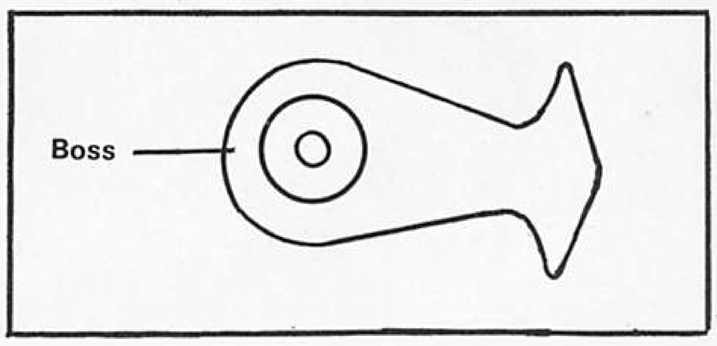


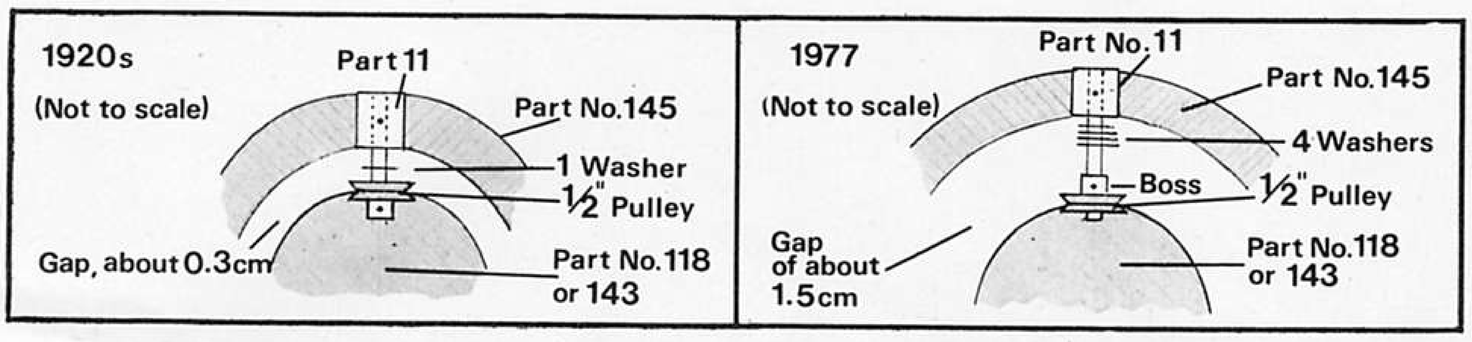
Left, a sketch, also by Melvyn Down, showing a method for producing a "dished" road wheel. The outer wheel centre is provided by a Boiler End, on which a Tyre for 3" Pulley is held by Angle Brackets. Below right, a sketch of an early-style Meccano Pawl, details of which have been requested by Mr. Desmond White of East Bendigo, Victoria, Australia.

OBSOLETE PAWL

On a totally different subject, now, Mr. Desmond White of East Bendigo, Victoria, Australia, has contacted me with a plea for assistance. "I have a Meccano part," writes Mr. White, "which I have never seen elsewhere or mentioned in any Meccano publication. It is a Pawl for use with ordinary Meccano gears (see accompanying sketch) and has 'Meccano England' stamped on it. Perhaps you can tell me something about it?".

Well, Mr. White, although you say that you have never seen it in any Meccano publication, I have consulted my copy of the "Meccano Parts Handbook" and I see that the part in question was the standard Pawl which was marketed between the years 1921 and 1925 under part No. 33. It was discontinued in 1925 when presumably the current design of Pawl was introduced. The "Meccano Parts Handbook" incidentally, compiled some years





Sketches illustrating the result of a change in design of Part No. 145. See "Part Modification".

ago by Mike Nicholls, is now unfortunately out of print, but the Meccanoman's Club publication "The Development of the Meccano System", and its Supplement, currently available from M.W. Models in Henley-on-Thames, is a good reference work for identifying obsolete parts – amongst many other things, of course! I have also heard a whisper that a much-improved replacement for the Meccano Parts Handbook is currently in the course of preparation and will be published some time in the future. Watch M.W. Model's future advertisements for details.

AUTOMATIC REVERSING GEARBOX

Despite the danger of being accused of editorial favouritism, I am again moved to featured the work of Mr. Dave Penney of New Whittington, Chesterfield. Dave writes to say that, although many automatic reversing gearboxes have been included in the MM in the past, they have all had one fault which makes them unsuitable for constant-running models that have a set pattern of movements to perform: namely, the respective number of forward and reverse revolutions has never been absolutely precise. There has always tended to be some discrepancy, even if only part of a revolution caused by different gear wheel teeth engaging on different runs.

"The problem is to engage and disengage the same pair of teeth each time the direction is changed" writes Dave, "and in my gearbox I have achieved this by making up 'gears' with only one tooth so that it is impossible for the teeth to be engaged incorrectly. Each gear consists of two sections, one built up from a Short Coupling which is screwed onto the threaded end of a Rod Socket where it is locked in position with a Grub Screw in the same bore. A Short Pivot Rod, Electrical Part No. 550, is fixed in the opposite transverse smooth bore of the Coupling. The other section consists simply of a 1" Bush Wheel, to the face of which an Angle Bracket is fixed by its shorter lug. If the two sections are mounted on separate Rods in line with each other, then the Pivot Rod engages with the long lug of the Angle Bracket to act as single-teeth gearing."

In the case of the gearbox itself, the side frames are produced from two 5½" x 2½" flat plates to which two 2½" x 2½" Flat Plates are attached by 2½" Angle Girders to form a box section at one end. At the other end, two 2½" x 1½" Flanged Plates, with two 2" Flat Girders extending the flanges one hole downwards, are bolted to the 5½" Flat Plates, the 2½" x 1½" Flanged Plates being spaced one hole apart to form the bearings for the output shaft. This is a 3" Rod A to which is fastened a Worm which meshes with a ½" x ¼" Pinion on Rod C. From Rod C, the drive is passed to Rod D by a 50-teeth Gear Wheel meshing with a ¾" x ½" Pinion on Rod D. Mounted on the outer end of Rod D is a second Worm which meshes with a ½" x ¾" Pinion on Rod G. This Rod carries two Cams and is supported in two Trunnions which are spaced from the gearbox by two Washers."

"A second drive from Rod A is taken through a 57-teeth Gear to a ½" x ¼" Pinion on a 3" Rod B which also carries a Worm. This Worm is in constant mesh with two ¾" x ½" Pinions on Rods E and F which are themselves held in continuous contact with the Cams on Rod G by the action of Compression Springs positioned between the Pinions and the nearby Flat Plate of the gearbox framework. As the Cams revolve, Rods E and F are pushed down to engage with the Gears on the output shafts, the Springs bringing the Rods out of gear as the peak of the Cam is passed."

"It will be seen that by turning Rod A, the drive is passed to Rods E, F and G. As G rotates, Rod E moves down and so brings the point of the Short Pivot Rod into contact with the Angle Bracket bolted to the 1" Bush Wheel. The drive out of the gearbox will continue to run only for as long as the Cam holds Rod E in gear. As the Cam turns and reaches its peak, the Spring will bring the Rod out of gear and so the drive will stop. As the Cams are set in opposition to each other, Rod S will now start to move into gear with the output shaft and reverse the drive for the same amount of turns. Thus a precise number of revolutions is achieved."

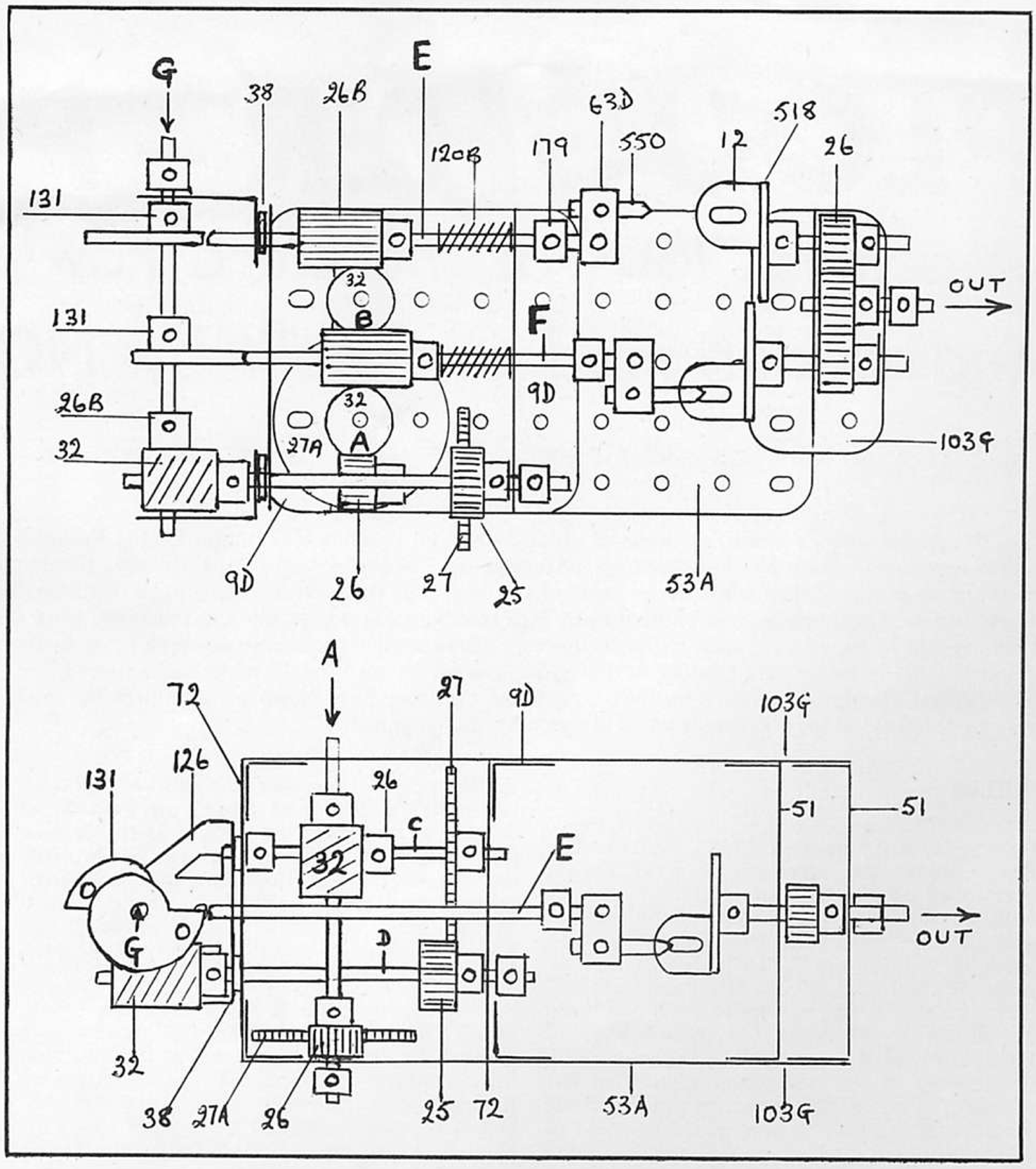
PART MODIFICATION

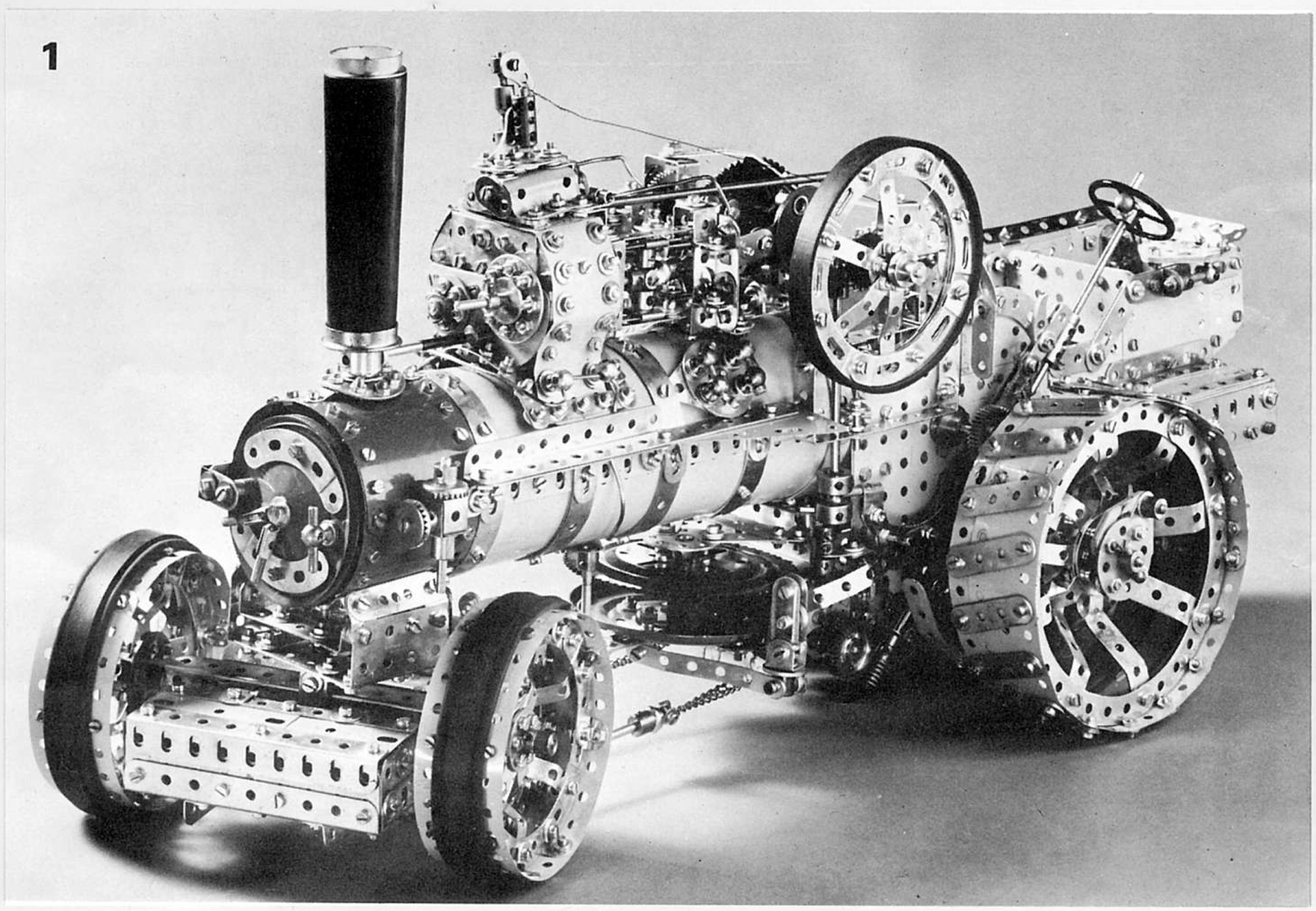
Finally, with this issue, I close with another piece of historical information. Michael Stoodley of Palmerston North, New Zealand, writes: "I have a query to make with regard to the size/diameter of part No. 145, the Circular Strip. In the original Supermodel (1920's) of the Meccano Steam Shovel, this part is used in conjunction with No. 118 (or 143) as a "spider" with four (or eight) ½" Pulleys arranged as in my diagram (see accompanying diagram A). However, now in 1978 I find that Parts 145 and 118 or 143 necessitate arranging the Pulleys as in diagram . What I would like to know is, has Part 145, now 19 cm (7½"), been made wider than it was way back in the 1920–30's?".

Well, Mr. Stoodley, again consulting my copy of the "Meccano Parts Handbook" I see that Part No. 145 Circular Strip was originally 7" in diameter, but the part was modified in the mid–1930's when the diameter was increased to 7½". I must confess that, after all this time, I do not know the *official* company reason for the modification, but I have been discussing the problem with Mr. Geoff Wright of M.W. Models and we feel that the reason would almost certainly have been that, because of the standard Meccano half-inch spacing, it was not possible to bridge the 7" Circular Strip with a standard Strip or similar part to give a hole in the centre of the ring. Also, all Meccano Strips and Girders – the components likely to be used for bridging purposes – have a length terminating at a half-inch distance rather than a round inch distance. Thus, when bridging the Circular Strip, it would either be necessary to use shorter parts bolted together – not always desirable – or have a length of bridging Strip projecting outside the Circular Strip. All in all, in Meccano terms, a 7" diameter circle is not a desirable dimension.

Referring to the Steam Shovel mentioned by Mr. Stoodley, incidentally, it is interesting to note that the Circular Strip illustrated in the original Supermodel Leaflet has already been the subject of some discussion within the Meccano fraternity. A close study of the Leaflet gives the very distinct impression that the Circular Strip used is noticeably *less* even than 7" in diameter. It would appear to be nearer to 6½" or 6¾". Something of a mystery!

Diagrams of an Automatic Reversing Gearbox by Mr. Dave Penney of New Whittington, Chesterfield.





PLOUGHER – POWER!

A general look at a superb Fowler BB1 Ploughing Engine designed and built by NORMAN GILBERT

Scenic Showmen's Road Locomotives usually steal the glamour at Traction Engine Rallies but there is a great deal to be admired in the mechanical juggernauts which revolutionised agriculture in the UK at the turn of the century. Steam power harnessed to the plough opened up vast areas of the Fens in East Anglia where large tracts of flat land lent themselves to long hauls of the multi-furrow plough by cable between a pair of Fowler Compounds. Great strength in construction, high reserves of steam power and reliability were the hallmarks of the Fowler ploughing engines and they are still to be seen at steam rallies to this day where their owners have as much pride in them as any showman of yesteryear. Norman Gilbert chose the 1916 Fowler BB1 Compound Ploughing Engine for his model and he has achieved a high standard of realism as our cover shot illustrates. This general descriptive article is by Bert Love based on notes from Norman. Although the model appears extremely advanced, it is comparatively easy to construct so long as care is taken in assembly and alignment.

BOILER

With a 13" length and a 3" diameter this is formed from six pairs of 5½" x 2½" Flexible Plates set to the curvature of a 3" Pulley, overlapped on the first five pairs by one hole with the last pair being butted at the forward end of the boiler and clad externally with black or blue Plastic Plates. Internal reinforcement of the boiler is provided by three 12½" Strips each side, the bottom of the boiler being bolted on to them as the curved pairs of Flexible Plates are assembled. Co-incident with the lapping of the boiler plating are five sets of four 3" Formed Slotted Strips which provide ornamental banding. Inside, at the rear end of the boiler, additional shorter Strips are added to the 12½" Strips to give extra support and two 4½" x 2½" Flat Plates are bolted on outside to form the first section of the firebox from which the driving platform and bunker are extended. These Plates are mounted vertically, bolted three holes down from the top to the side joint of the boiler, allowing one hole extension of the Plates behind the rear end of the boiler.

A chimney plate is made from an 8-hole Wheel Disc, carrying a Chimney Adaptor and secured to the boiler top by a 2½" Narrow Strip running fore and aft. An 8" Screwed Rod passes right through the chimney assembly and is secured inside the smoke box to a 2½" Double Angle Strip bolted across the boiler internally and centralised by packing Washers. Norman's model uses a tapered chimney which can be made from tinplate or cardboard but Standard Flanged Wheels are provided as shown in the illustrations so that the Meccano 3" Cylinder may be used if preferred.

WHEELS

Use is made of Meccano Curved Strips in the rims of both front and rear wheels, eight 3" Curved Strips being used for each front wheel. These are set up carefully to form a true pair of circles and are spaced by four ½" Double Brackets to give parallel rims. Small Bush Wheels form the outer hubs and standard

6-hole Bush Wheels are used inside, thus providing attachment points for the twelve bent and staggered spokes in the front wheels. Fig. 1 shows the general construction and it will be noted that only four-hole lengths of Narrow Strips are utilised. This means the use either of 2½" Narrow Strips the extra half-inches all stacked on the axle rod, or old Strips cut to four holes (they will finish up bent beyond redemption anyway!). It is important that each spoke is bent to identical shape before assembly (six external spokes and six internal – note slight difference in bending required for the internal large Bush Wheel hub). It is a good idea to set up half of the spokes and the rims and to spin the partially completed wheel to test for concentricity before adding the remainder of the spokes.

A feature of the Fowler Ploughing Engines was the large diameter and broad face of the front wheels. It must be remembered that the ploughing cable was operated at right angels to the boiler which applied a drag reaction to the whole engine and the heavy front wheels assisted in stabilising the engine. These massive engines were very heavy and narrow rim faces would have the engine bogged down rapidly in soft or muddy earth. Three 5½" x 1½" Flexible Plates form the wheel faces, or treads, curved and overlapped uniformly and fixed by ½" Angle Brackets to the wheel rims. By using Set Screws instead of standard Bolts, a shallower extension is achieved on the wheel treads. In the prototype, steel 'tyres' were employed, but the model is provided with rubber tyres made from bands cut from an old innertube.

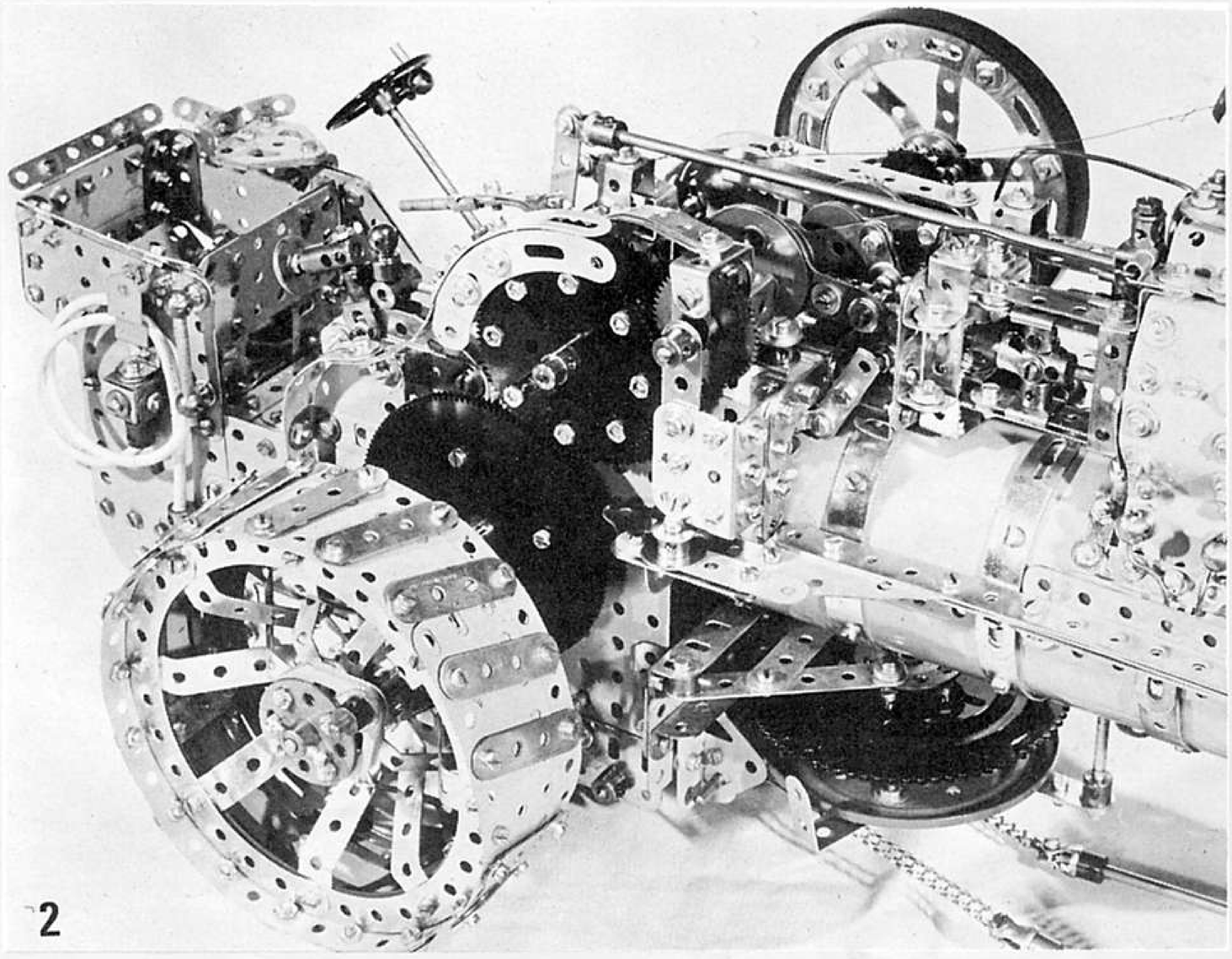

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Fig 2, above, shows a close-up view of the crankshaft and right-hand gear train drive to the penultimate drive of Norman Gilbert's Fowler BB1 Ploughing Engine. Note that the larger gears illustrated are each provided by two Gear Wheels bolted face-to-face. Fig. 1 on opposite page is a general view of the completed model.

Rear wheels are constructed from 5½" Circular Girders overlaid on the outside view only with eight 2½" plain Curved Strips. This time, sixteen spokes are provided, each one being six holes long, using eight standard 3" Strips and eight 3" Narrow Strips. A 2" width of 'tread' is achieved on the rear wheels by having 5½" x 1½" Flexible Plates overlapped sideways by two holes. Tread grips are provided by 2" Strips bolted to the wheel faces as shown. Note that the rear wheels are on a solid back axle, but are free to revolve thereon. No differential was used in this Fowler engine, acute turning angels being accommodated by draw-pins which would disconnect the rear wheels from the driving plates on back axle, allowing one wheel to do the work. This operation required nippy action by the engine driver's mate!

FRONT AXLE AND STEERING

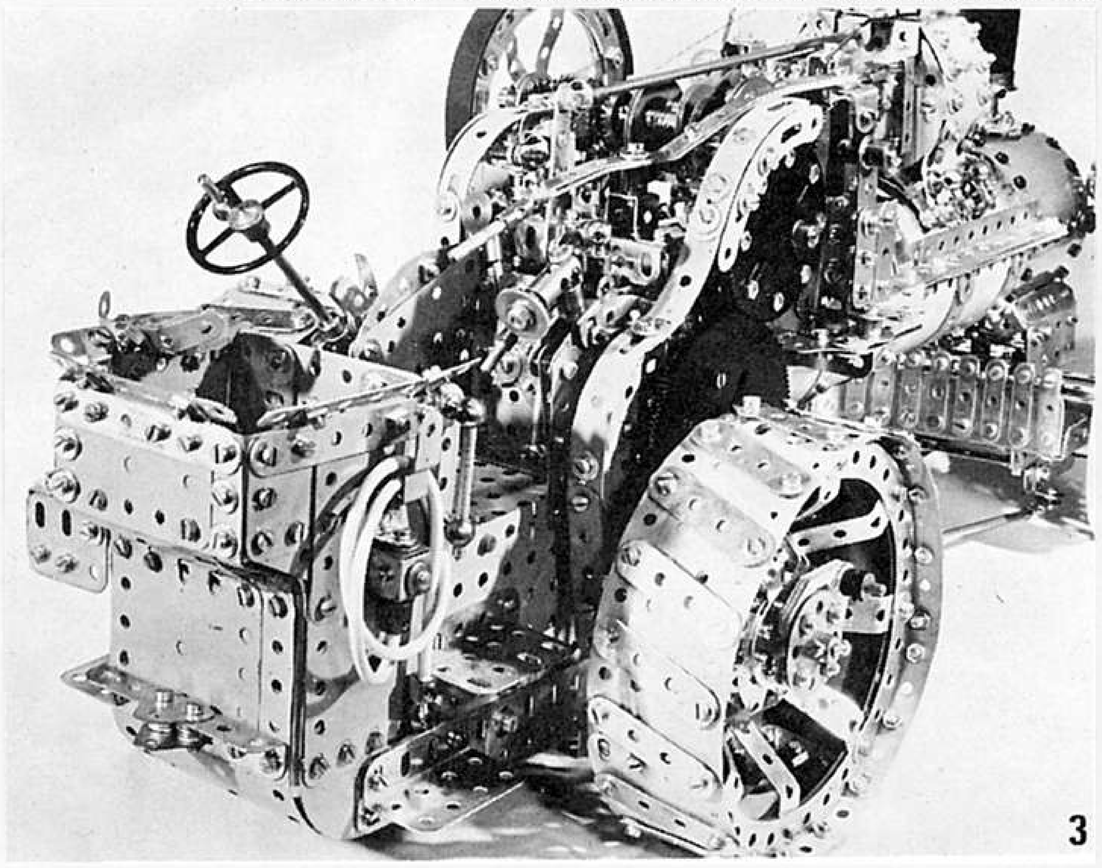
Fig. 5 shows the details of the front axle which is a pair of 5½" Girders, the lower Girder securing Couplings at each end which hold fixed 2½" Rods on which the front wheels turn freely, secured externally by Collars. The second 5½" Girder is fixed to the first by Bolts screwed into Threaded Bosses and the vertical slotted flanges of the paired Girders are fitted internally with 2½" Strips, centralised to give an axle pivot. The steering fork is a 1" x ½" Double Bracket locked to a Long Threaded Pin swivelling in 1½" Square Plates fixed in the framework below the smoke-box end of the boiler. Fishplates bolted by their slotted lugs and overlaid with a Washer reinforce the 1" lugs of the steering fork. A 1" Axle Rod passes through the steering fork and centre of the 5½" Girders and this Rod is held in place by an internal Collar set by a screwdriver poked through the centre Girder holes from below to lock the Grub Screw in the Collar.

A toolbox with hinged lid and a "Spud rack" are attached to the other girder members of the front axle assembly as shown. Steering rods, as used in these Fowler Ploughing Engines, are made in the model from 5½" Rods fitted with Rod and Strip Connectors lock-nutted to the axle assembly as shown and then connected via End Bearings to Sprocket Chain on the steering barrel. "Spuds" are extra steal dogs which can be clamped to the rear wheels in extra-muddy conditions and the Fowler Ploughing engines carried these on a rack across the rear of the front axle.

MOTION & STEAM CHEST

No attempt has been made to provide crankshafts on this model and a plain axle rod is used as a substitute. However, sliding gears are provided (two speeds) so that a Meccano Keyway Rod is required to form part of the substitute 'crankshaft', or a short section of Keyway Rod may be cut and extended by a Coupling. Fig. 2 shows the motion in close-up and the Crank supporting the outboard end of the crankshaft is a 'dummy' bearing, free, by lock-nutted Bolt attachment, to 'ride' on the end of the shaft, an inboard bearing actually providing the right-hand support for the crankshaft. Triple-throw Eccentrics are connected to the 2" Axle Rods acting as →

Fig. 3, below left, a close-up view of the rear end of the Ploughing Engine showing bunker construction and the driving platform, this filled with an array of interesting knobs and levers. Fig. 4, below right, is a detail view of the rear right-hand side of the model showing the final drive arrangement via double 3½" Gear Wheels to the back axle. Note the bevel drive from the main crankshaft to the winching gear below.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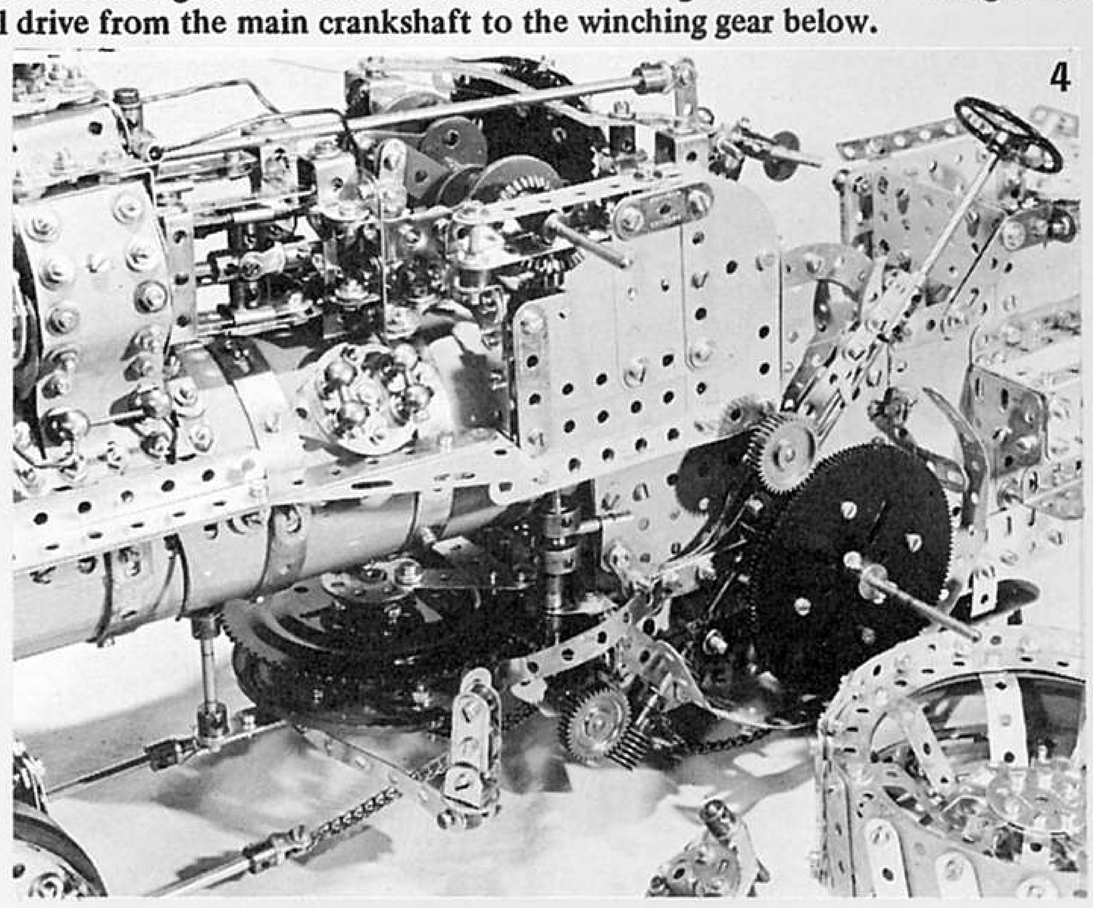
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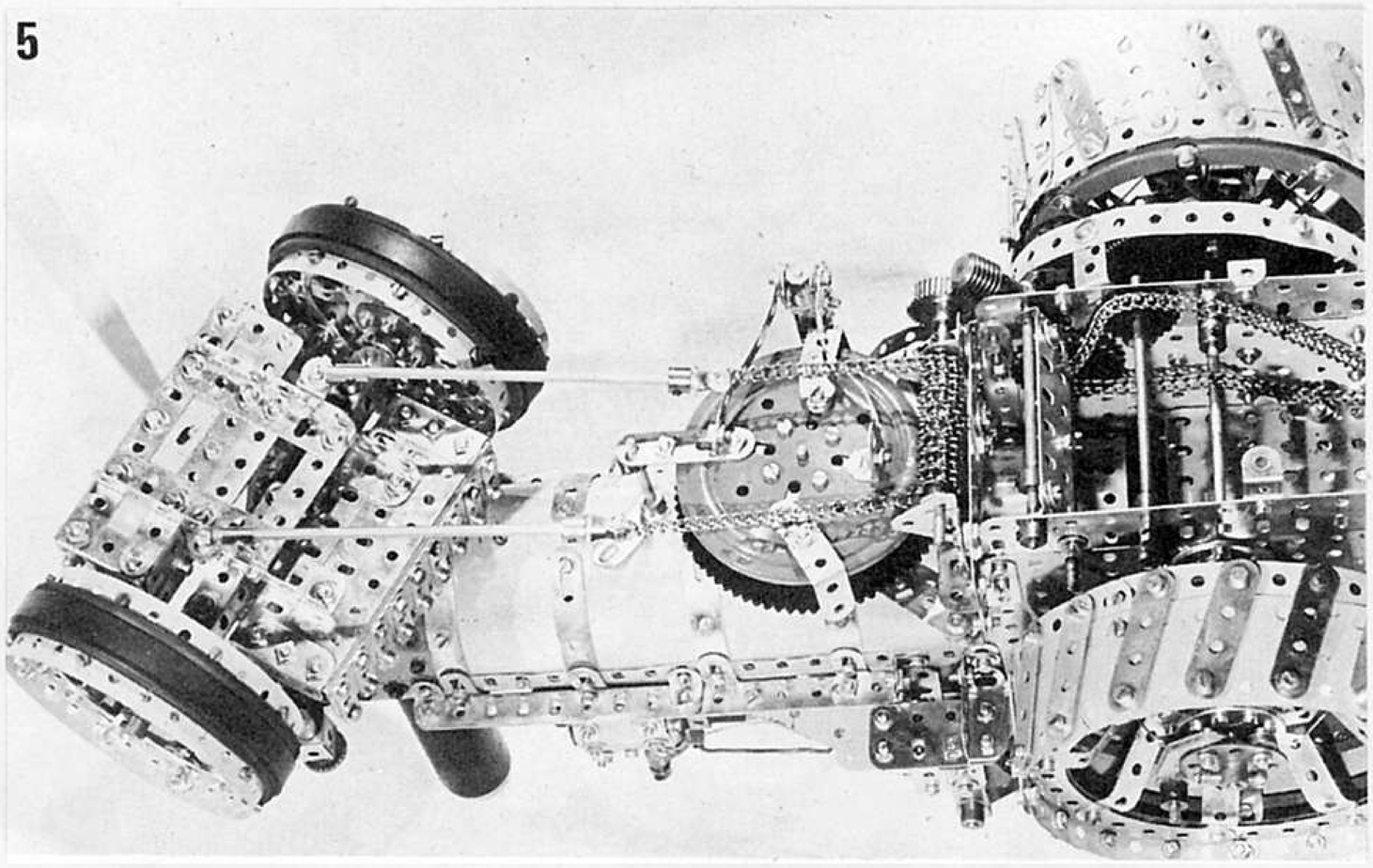


Fig. 5, above, an underside view of Norman Gilbert's Fowler BB1 Ploughing Engine showing the front axle, steering gear and lower winch supports. The loose chain in the section beneath the driving platform is used to take the drive from the powering electric motor which has been removed for this illustration.

←

connecting rods for the pistons and Single throw Eccentrics are used for the valve gear. Reversing links on the valve-gear are 1½" Narrow Strips sandwiching the Eccentrics' lugs and the Rod & Strip Connectors on the 4½" Rods carrying the Eccentrics. The lower ends of these 1½" links ride, by lock-nutted Bolts, in double thickness Fishplates which are locked on a 2" Screwed Rod and separated by a Threaded Boss. Two more 1½" Narrow Strips are secured by Nuts to the right-hand end of the Screwed Rod to form a short lever connected to the reversing rod running back to the driver's position.

Sixteen 3" Curved Strips in four layers make a substantial rim for the flywheel which has six Narrow Strips spokes with a slight 'set' bent into them to simulate the Fowler design. A 10" flat rubber driving band for vacuum cleaners is used as the outer rim for appearance sake. Construction of the steam chest is shown in general form in Fig. 7, Channel Bearings and overlapped 2½" Semi-circular Plates forming front and rear facings respectively. Spacing of pistons and valve rods is across four holes, the Eccentric carrying rods being in the centre two holes and one hole above the alignment of the piston Rods. The steam chest and guide frame for the piston crossheads are built as one unit and then fixed like a saddle on to the boiler top.

WINCH GEAR

Fig. 4 shows how the drive shaft to the winch is in continuous mesh by Bevel Gears with the main crankshaft, engagement of the winch being operated by Dog Clutch and Socket Coupling arrangement, as shown, the shift lever being carried up to the driving position and normally locked by a toothed rack. Heavy tooth drive to the winch is arranged by ¾" Sprocket meshing with the toothed flange of a Meccano Ball Race and details of the winch are seen in Fig. 4. In the prototype the 'fairlead' which ensures smooth pay-out of the ploughing cable could be swivelled to effect ploughing "on either hand", but a fixed position is maintained in the model.

MAIN DRIVE

First and second gear comprise a 50t. Gear and 1" Sprocket running together on the Keyway end of the crankshaft and these can be meshed with the large intermediate double gear mounted on the offside of the engine. A back-to-back pair of 2½" Gears bolted to a 3" Sprocket provide adequate meshing faces for the intermediate gear which is in constant mesh with a pair of 3½" Gear Wheels, also back-to back for additional meshing face. Running through the framework is a 5" Axle Rod journalled in the vertical 4½" x 2½" Flat Plates, on the back row of holes, four holes down and this takes the drive to the other side of the engine where one more doubled-up pair of 3½" Gear Wheels is firmly locked to the rear axle, supplied by a cut or composite rod of 10½" length. The freely-running composite intermediate gear on the off-side of the engine is mounted on a Rod fixed in the centre transverse bore of a Coupling which is adjusted for height by lock-nuts on two 1" Screwed Rods mounted vertically on the engine frame. These Rods pass through the other two transverse bores of the Coupling, thus, by this method, the intermediate gear can be adjusted into position to mesh with the gear-change spacing required. The general arrangements may be seen in Figs. 2 and 4.

FITTINGS

Fittings are largely a matter of personal choice, but the running boards on the boiler, the boiler inspection plates, water pick-up hose and smoke box door are based on the original Fowler BB1. A 3" Pulley, plus Conical Disc and two 2½" Stepped Curved Strips make the smoke-box which is hinged to the boiler as shown. Ornamental lamps are optional, of course, but may be constructed from ½" Double Brackets, Contrate Wheels, etc., as shown. There is sufficient room inside the rear portion, below the footplate, to accommodate several different makes of Meccano electric motor (one at a time of course!) so that the model is set in motion by chain drive to the crankshaft. Mounted on a plinth with the wheels raised, this makes a very attractive exhibition model and, although Norman Gilbert only took up serious Meccano modelling last year on joining the S.A.M.C. it is clear from the model that he has already reached a very high standard.

The model, in fact, does illustrate an important point, namely that you do not have to be a modeller of countless years experience before being able to tackle advanced constructional projects. A basic mechanical ability is of course required, plus modelling commonsense and a knowledge of the Meccano parts available, with an understanding of their uses. A certain amount of courage is also desirable – the courage to knuckle down and actual start building – but, with the Fowler, Norman has proved that success is possible even for the comparative newcomer to the hobby.

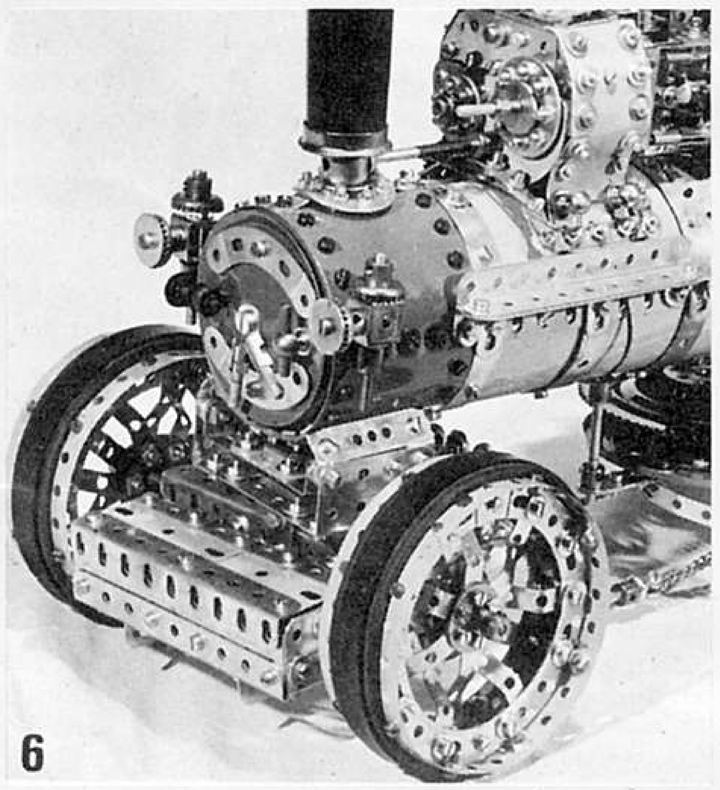
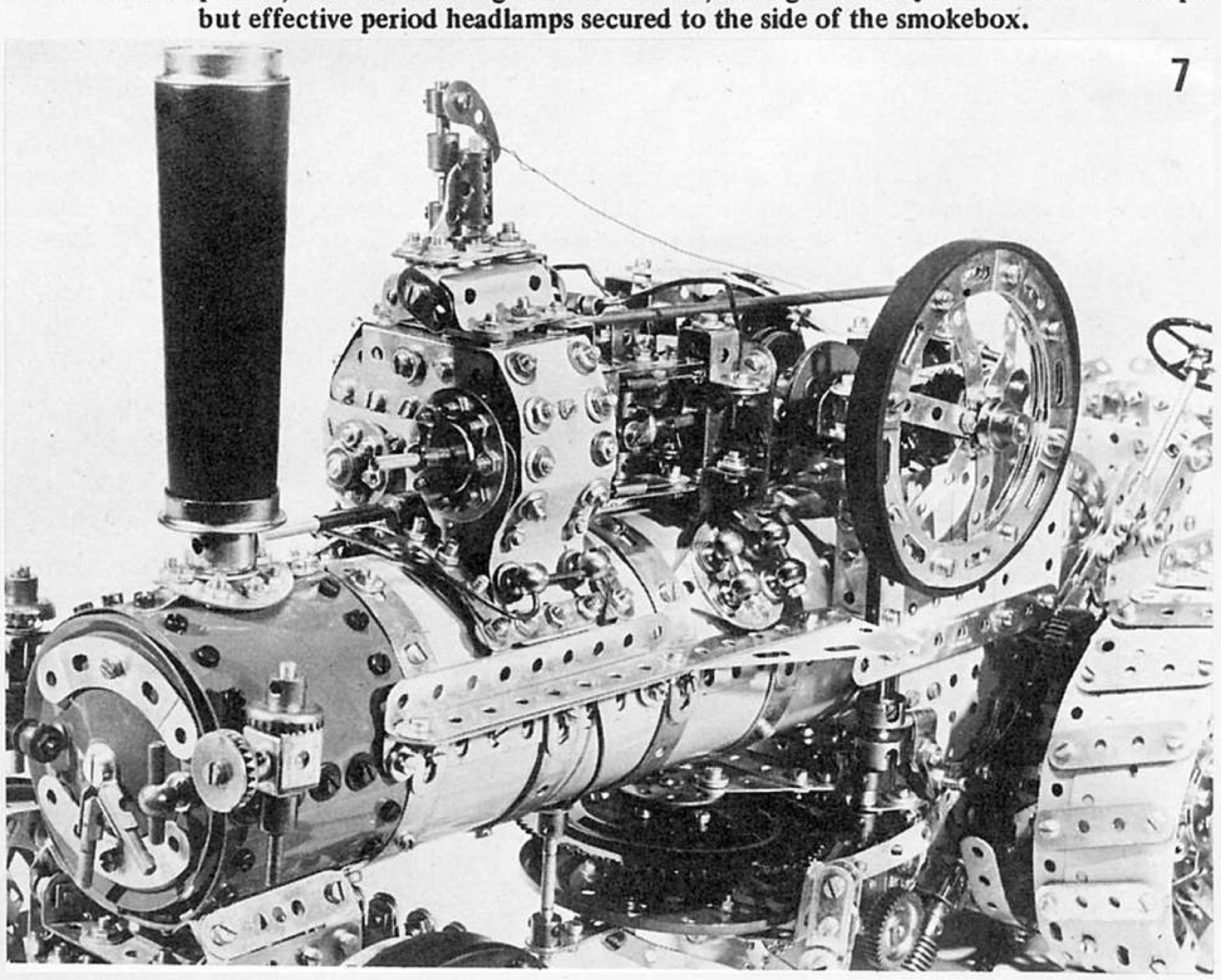


Fig. 6, above, a close-up view of the front axle and smoke box end of the boiler. Fig. 7, below, another close-up view, this one showing the steam chest, valve gear and flywheel. Note the simple but effective period headlamps secured to the side of the smokebox.



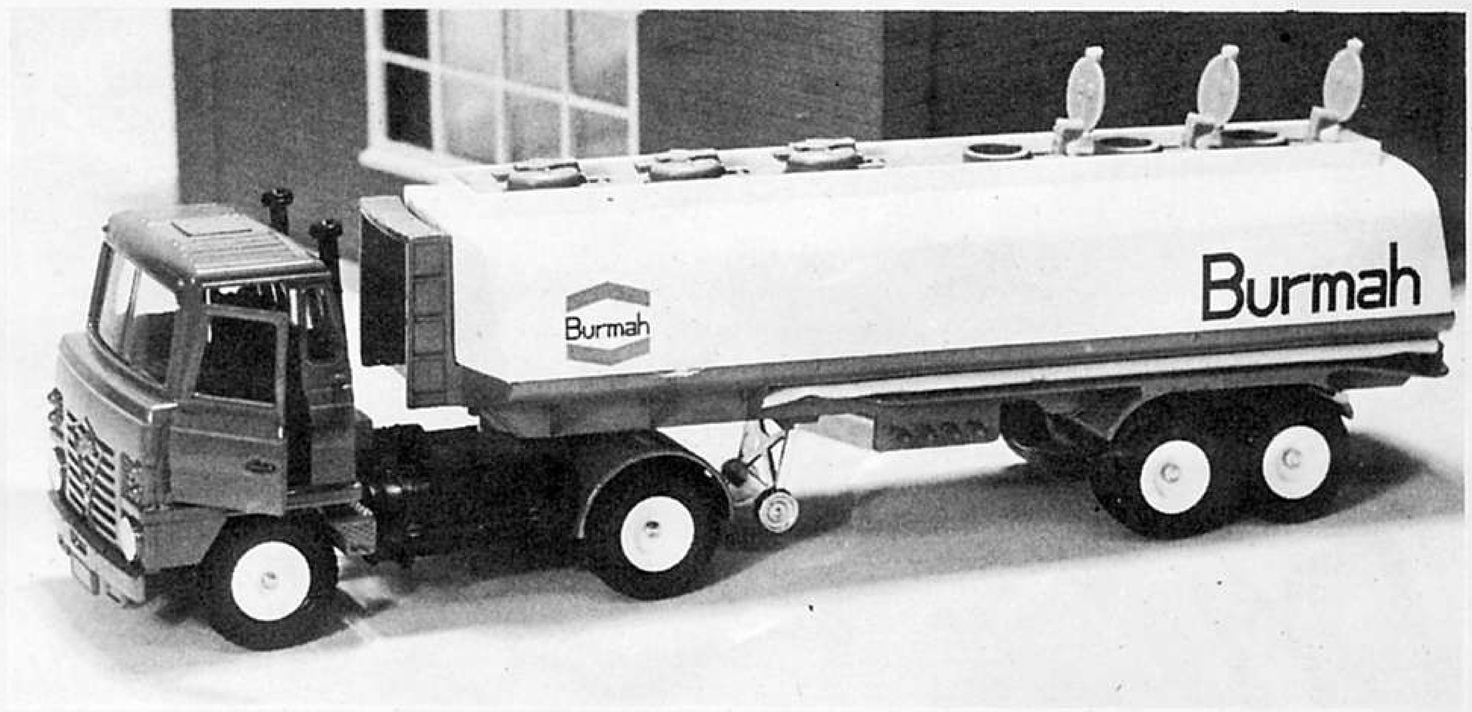
DINKY TOYS NEWS

A REVIEW OF THE DINKY TOYS INTRODUCED SINCE THOSE FEATURED IN THE JULY M.M.

* * *

No. 299 CRASH SQUAD GIFT SET

With the popularity of police themes in toys, coupled with the suitability of Dinky Gift Sets as Christmas presents, this new introduction has a very bright future indeed. A complete play situation in one set, it contains the Plymouth Police Car and the appealing Bell Police Helicopter, enabling young collectors to simulate the sort of police action adventure seen regularly on our TV screens these days. A typical American "Black and White", the police car is fitted with windows, seats and a roof-mounted console simulating siren and warning lights. A moulded radar speed-checking device is carried outside the rear left-hand door window and a radio aerial protrudes from the rear wing on the same side. Overall length is 135 mm. The helicopter, sporting a clear bubble-type cockpit canopy, has rotating main and tail rotors, simulated engine detail and a pilot figure seated within his cockpit. The set comes complete with separate police road sign boards and traffic cones.



No. 304 FIRE RESCUE GIFT SET

Another gift set of outstanding appeal, thanks to the fun children get from playing-out imaginary fire-fighting scenes, this three-vehicle set contains the Land Rover Fire Appliance, the Convoy Fire Rescue Truck and a Fire Chief's Car. The action-packed Fire Appliance offers a neat and detailed body casting complete with removable fire ladder, opening doors and glazed windows, plus simulated blue lights, hosereel, searchlight and rear pumping console. Overall length is 119 mm. The Fire Rescue Truck has windows, seats and an elevating, swivelling snorkel arm topped by a hinged fire-fighting platform. Overall length is 126 mm. The Fire Chief's Car, a bright red Range Rover, has opening front doors, bonnet and tailgate, engine representation, glazed windows and a highly detailed interior which even includes tipping backs to the front seats. A simulated blue light is carried on the roof and overall length is 109 mm.

No. 950 FODEN S20 FUEL TANKER

Always high in the popularity ratings are fuel tankers and this, the latest tanker in the Dinky fleet, is the finest yet to come from the Liverpool factory. A really substantial model based on a modern Foden original, it features a removable highly-detailed tractor unit complete with opening doors, glazed windows and full moulded interior fittings. The trailer has retractable jockey wheels, six opening tank hatches and a removable fuel hose which locates on simulated outlet nozzles beneath one side of the tank. Finished in a smart red gloss with white tank, the model currently carries "Burmah" livery. Length is 272 mm.

No. 300 LONDON SCENE GIFT SET (not illustrated)

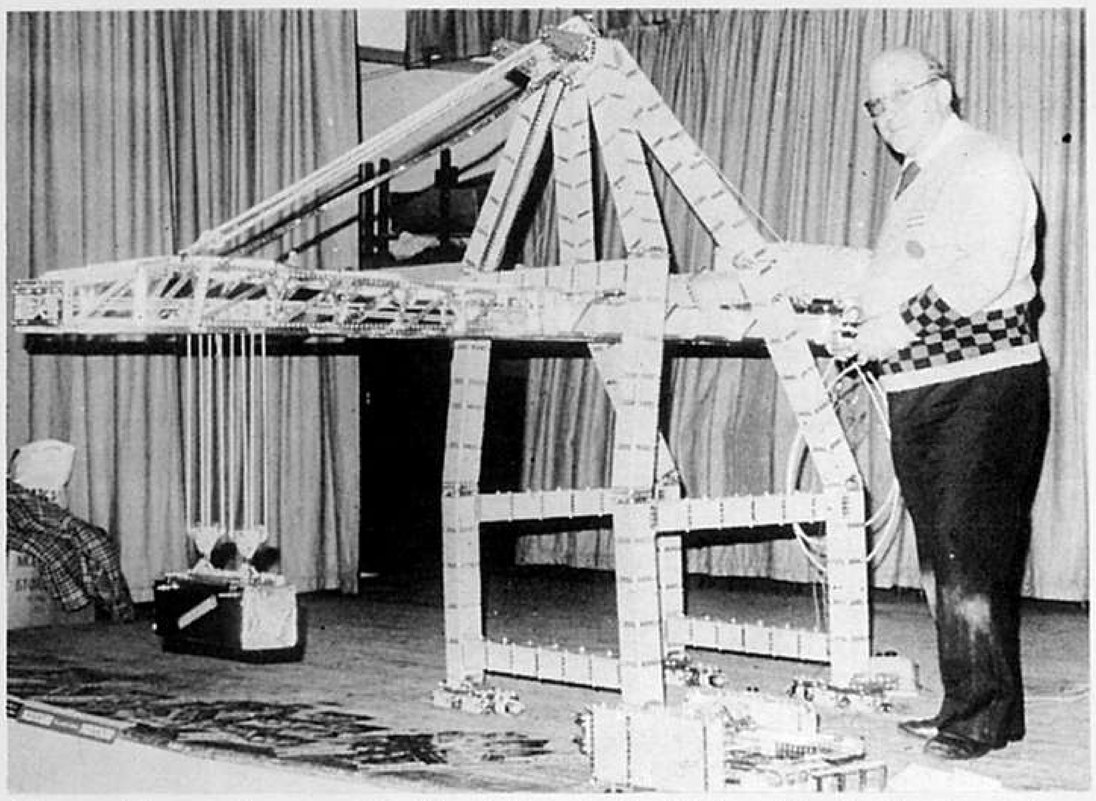
Absolutely ideal for overseas visitors to London, this attractive set contains the London Taxi and the London Routemaster Bus in highly appealing souvenir packaging. The smart black Austin Taxi, complete with driver, is fitted with windows, realistic interior seat moulding and opening passenger doors. Overall length is 112 mm. The Routemaster Bus, finished in London Transport red livery, has windows and seats, destination boards and advertisements at front, back and sides.

Nos. 380, 381, 382.

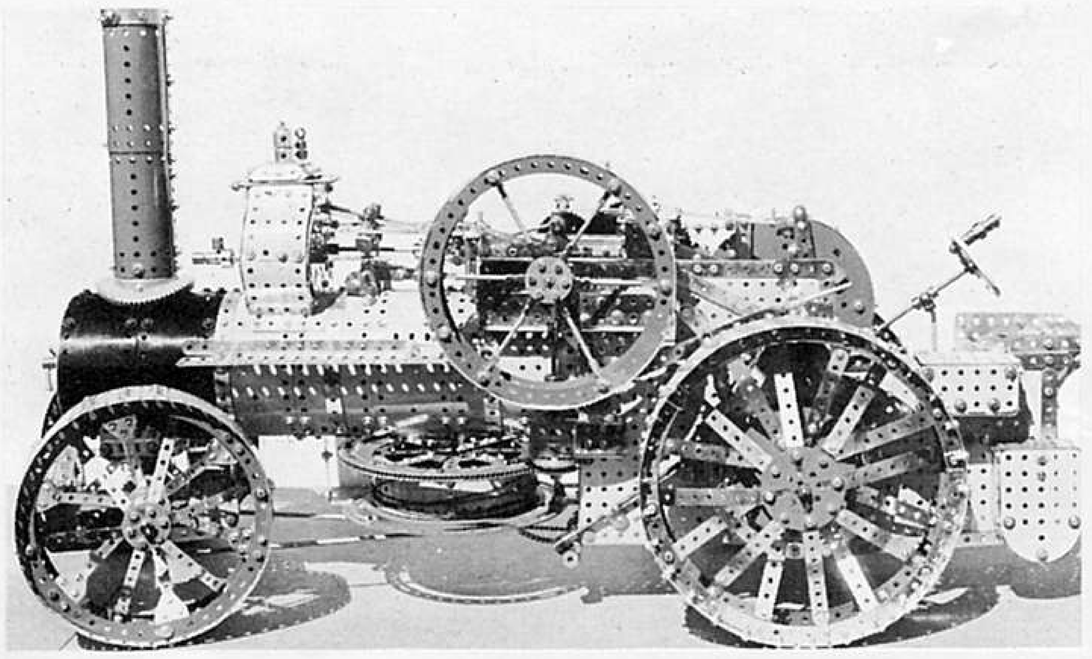
In January's MM, we reported the introduction of the Convoy Gift Set containing three specially-designed budget-priced models with a similar cast metal cab/chassis unit, but with different rear bodywork mouldings to give different identities. The models have now been released as separate items – No. 380 Skip Truck, No. 381 Farm Truck and No. 382 Dumper Truck – and all make very appealing subjects at a very reasonable price (99p in the UK). The Skip Truck has a working skip-loading mechanism and a removable skip which can be swung on and off its vehicle; the Farm Truck has a high-sided, slatted load body with drop-down loading ramp; the Dumper Truck has a tipping high-capacity load body of rugged design. The cab/chassis unit on all three toys is fitted with windows, seats and glazed headlamps.

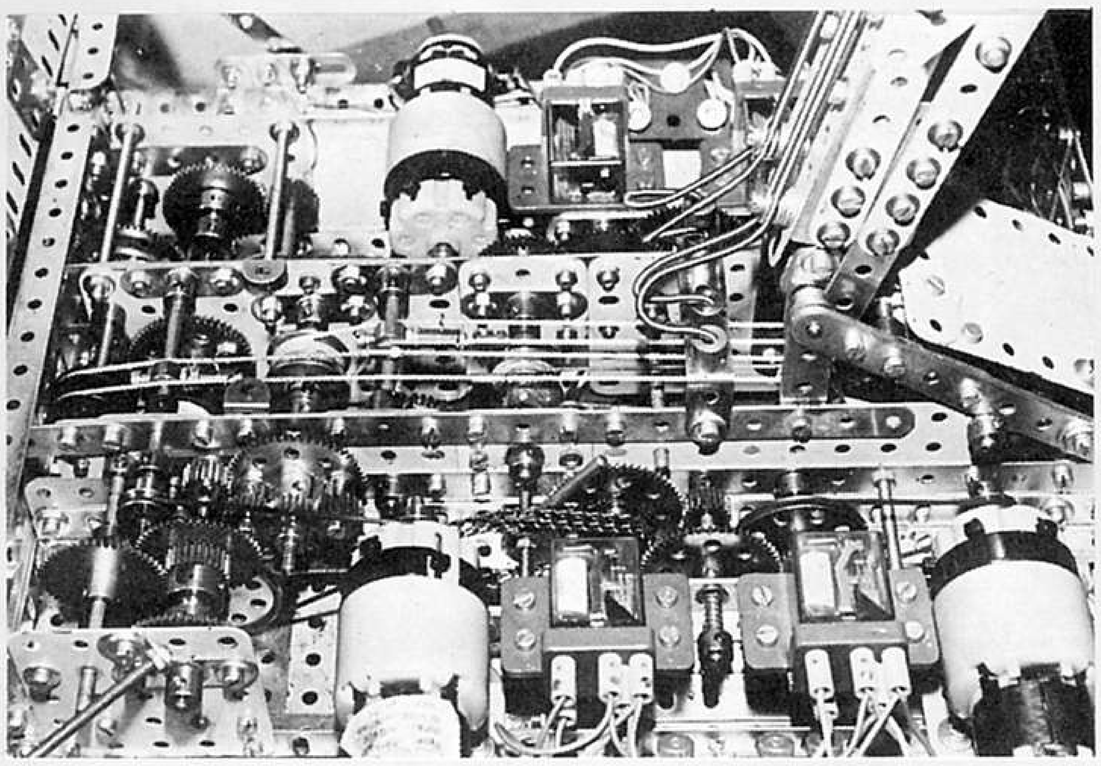
SHOW SCENE SOLENT

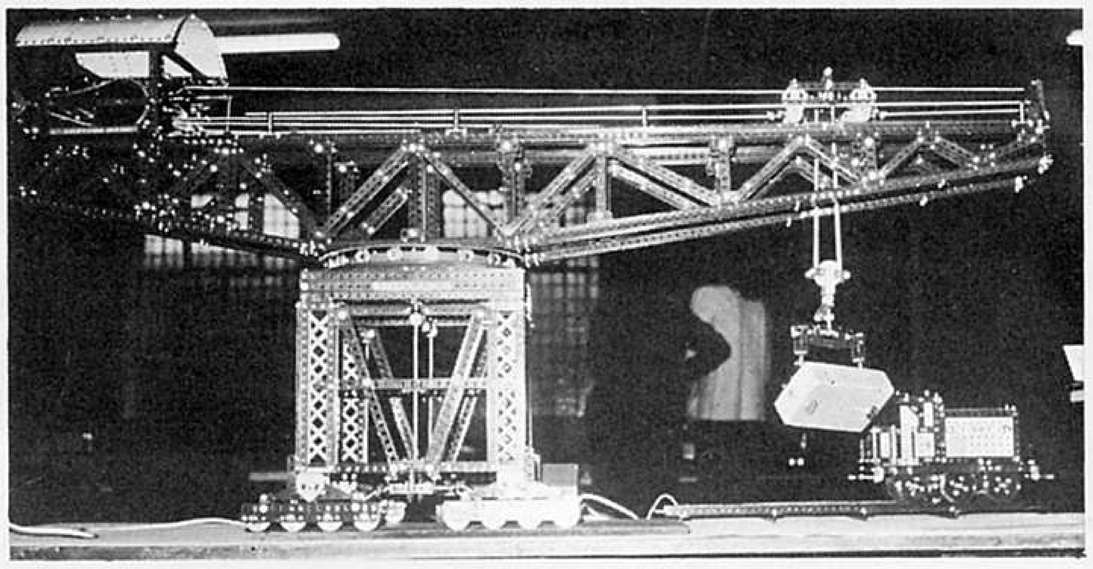
A selection from the many models displayed at the Solent M.C's. Portsmouth Exhibition on May 13



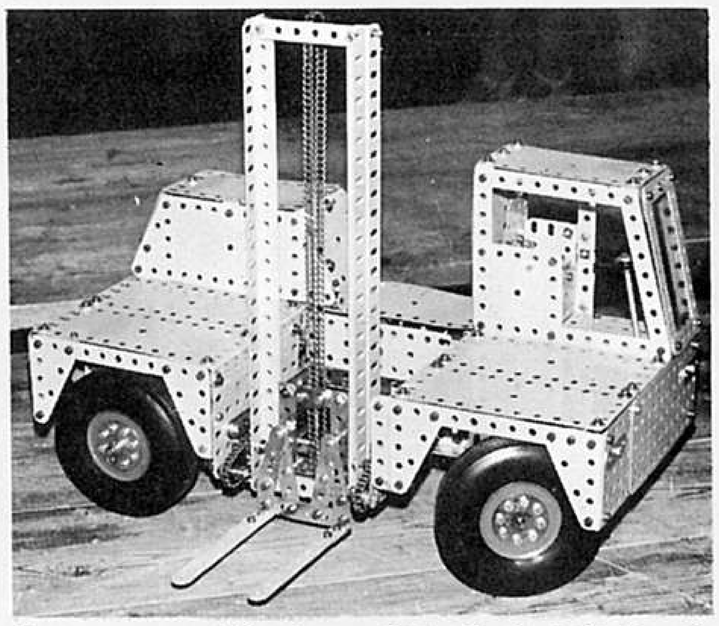
Above, Harry Gower with his 6 ft x 8 ft Vickers Dockside Container Crane which is modelled on a prototype at the Southampton container depot. The prototype is itself driven by Peter Riggs, another SMC member. Right, Chris Goodwin's Fowler BB1 Ploughing Engine, a scale model fitted with working Stephenson's link motion and winch drum.





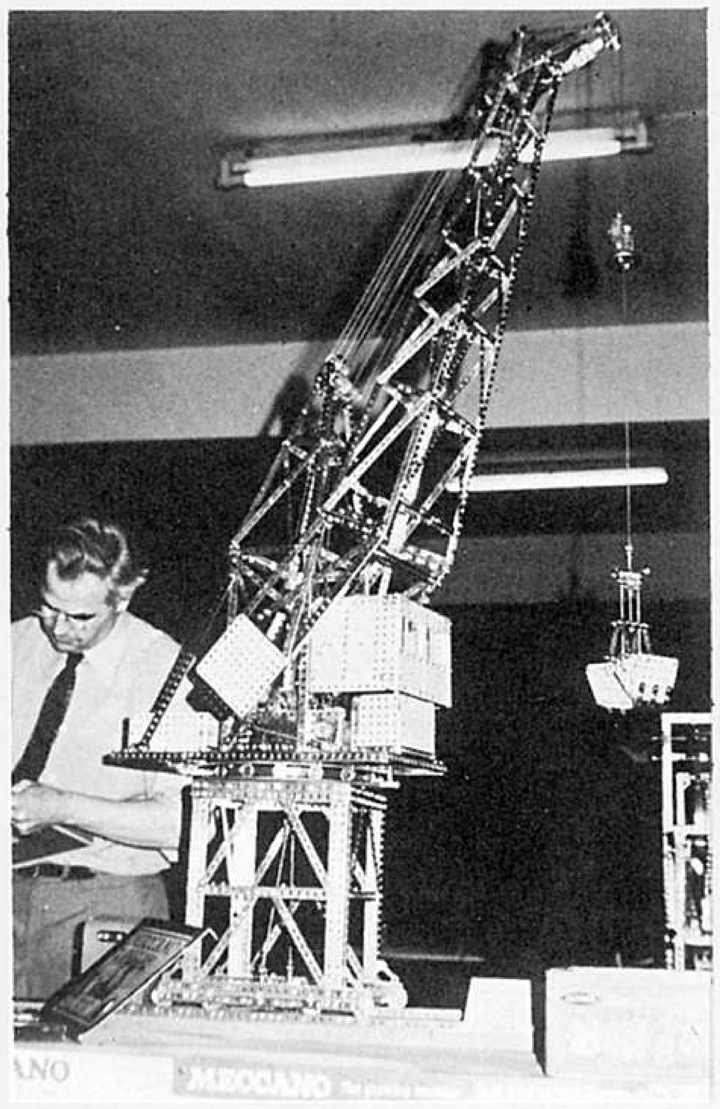


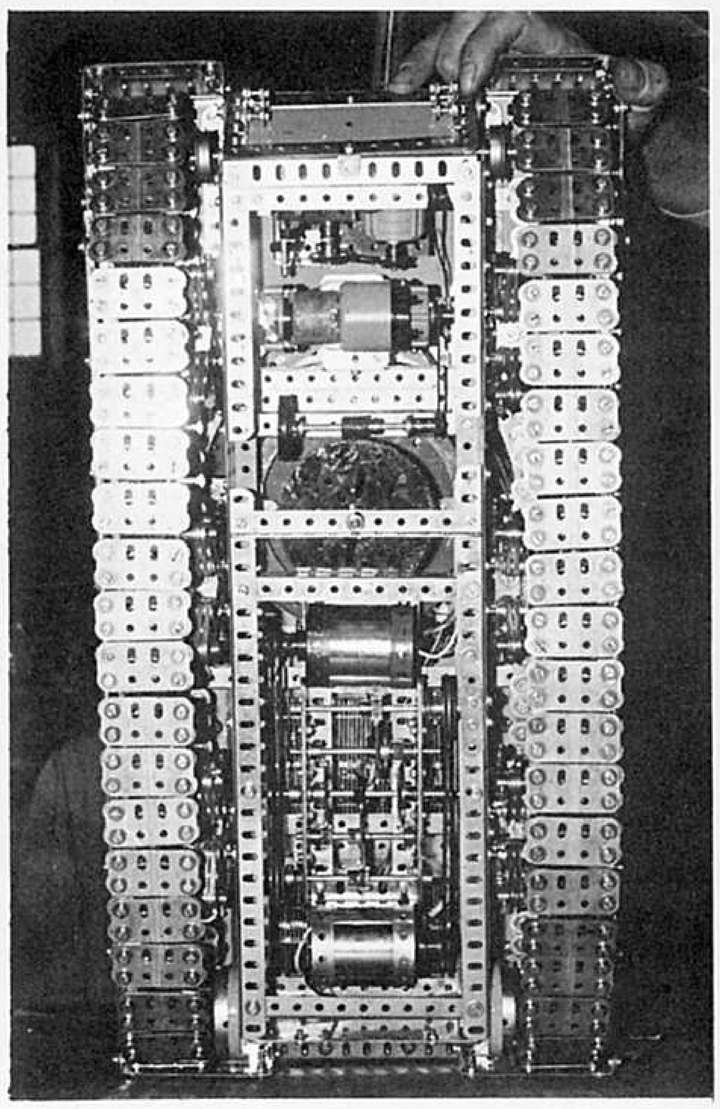
Above, the view inside Tony Rednall's much-admired Hymac 580c Excavator showing gear trains and part of the cord winding arrangement. Below, a lofty Level-luffing Grab Crane built and demonstrated by Tony Knowles, who can also be seen in this picture!



Above, a semi-freelance Side Fork Lift Truck built by Eddie Marshall. As well as working forks and transmission, it includes a novel power steering system. Below, a Marine Engine well-built from published plans by John Bridger.

Above, the ever-popular SML 4 Giant Block-setting Crane, this example built in the new Meccano colours by John Bashams. Below, an underside view of Brian Gulley's Chieftain Tank built to 1/12th scale. As can be seen, there are plenty of interesting features inside.



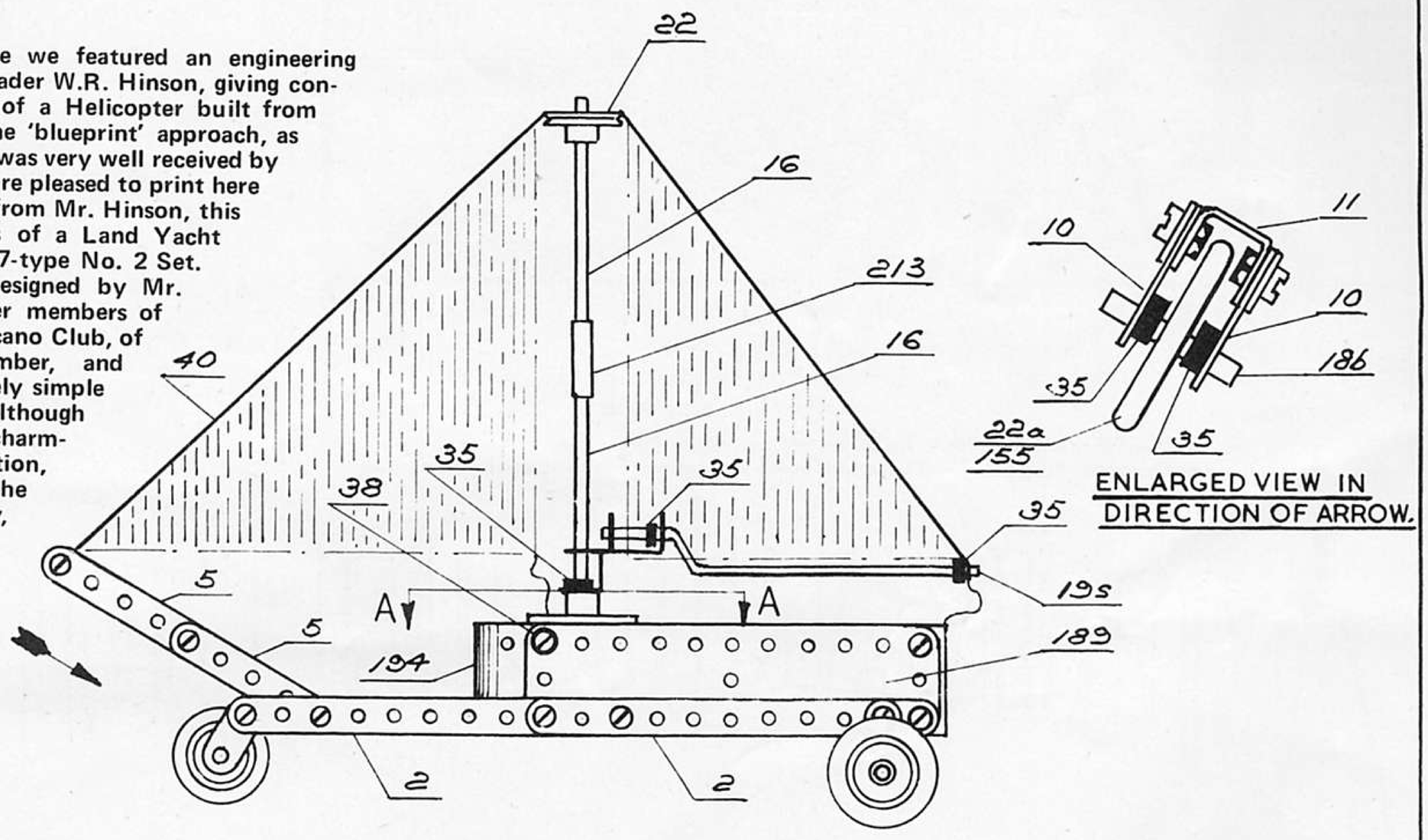


LAND YACHT

by W. R. Hinson

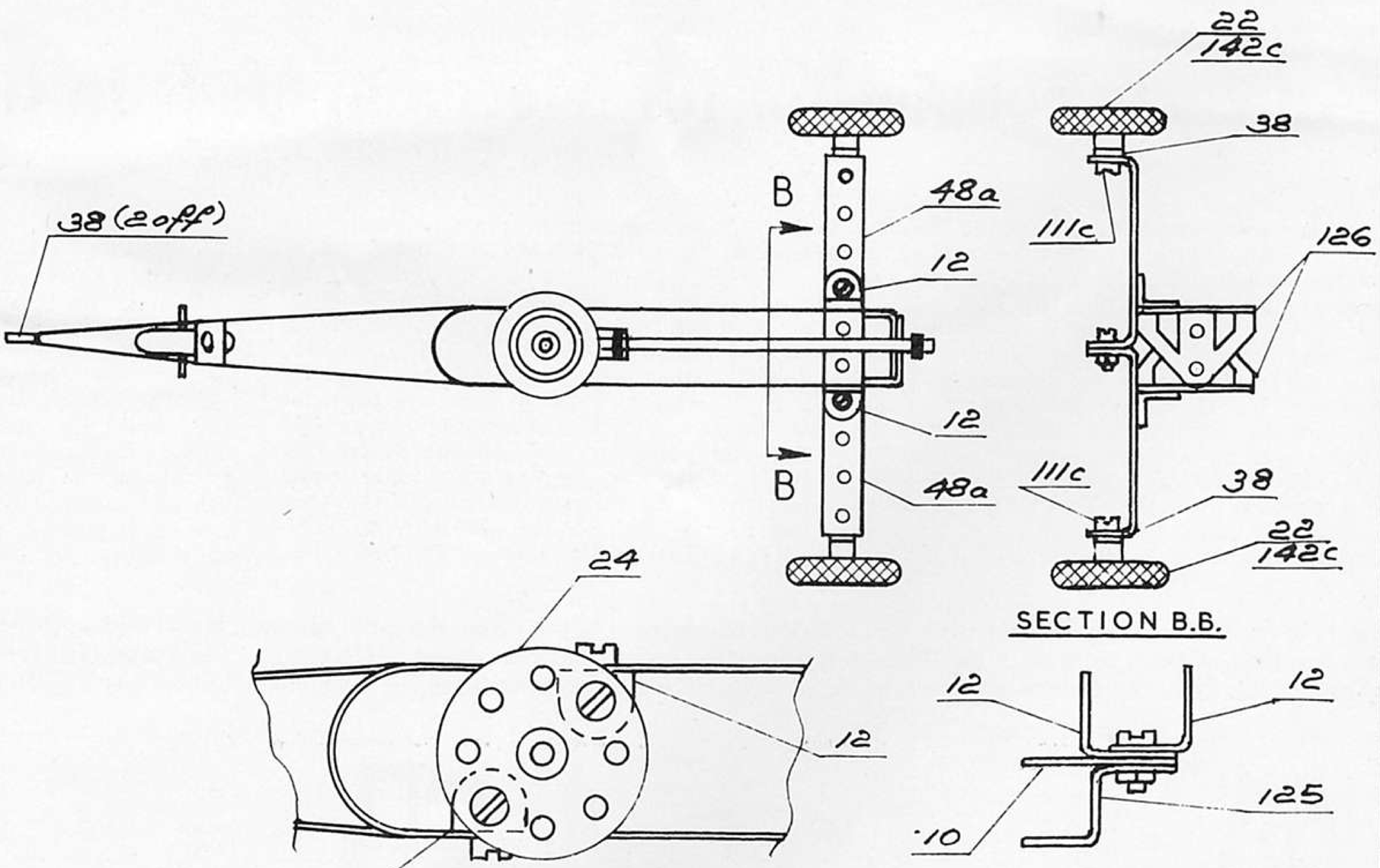
In our April issue we featured an engineering drawing by MM reader W.R. Hinson, giving constructional details of a Helicopter built from the Crane Set. The 'blueprint' approach, as well as the model, was very well received by readers and so we are pleased to print here a second drawing from Mr. Hinson, this time giving details of a Land Yacht built with the 1977-type No. 2 Set. The model was designed by Mr. Hinson for younger members of the Stevenage Meccano Club, of which he is a member, and thus it is deliberately simple in concept. But, although simple, it is still a charming little production, full of character. The sails, incidentally, can be supplied by thin material or even paper.

FIRST ANGLE PROJECTION.

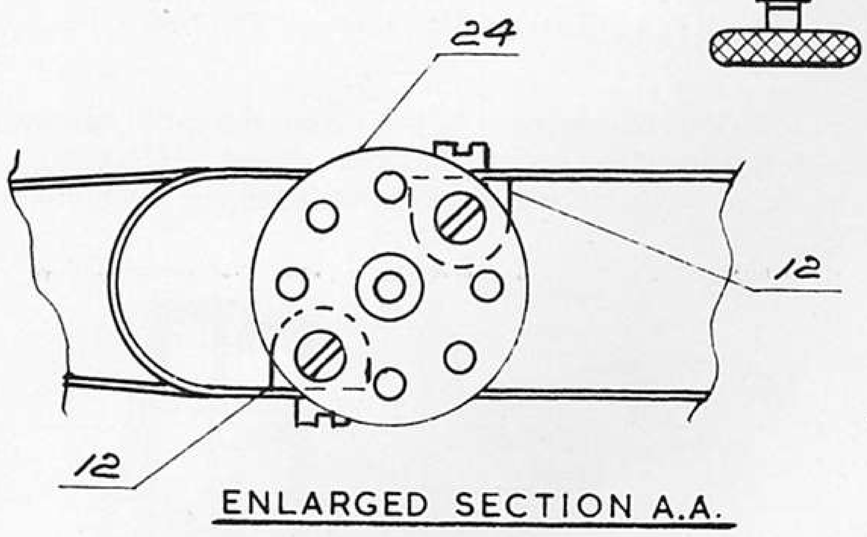


ENLARGED VIEW IN DIRECTION OF ARROW.

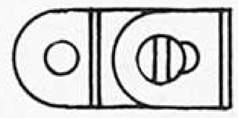
Parts required	
No. OFF	Part No.
4	2
4	5
3	10
1	11
6	12
2	16
1	18b
1	19s
3	22
1	22a
1	24
5	35
27	37b
27	37c
6	38
1	40
2	48a
2	111c
1	125
2	126
2	142c
1	155
2	189
1	194
1	213



SECTION B.B.



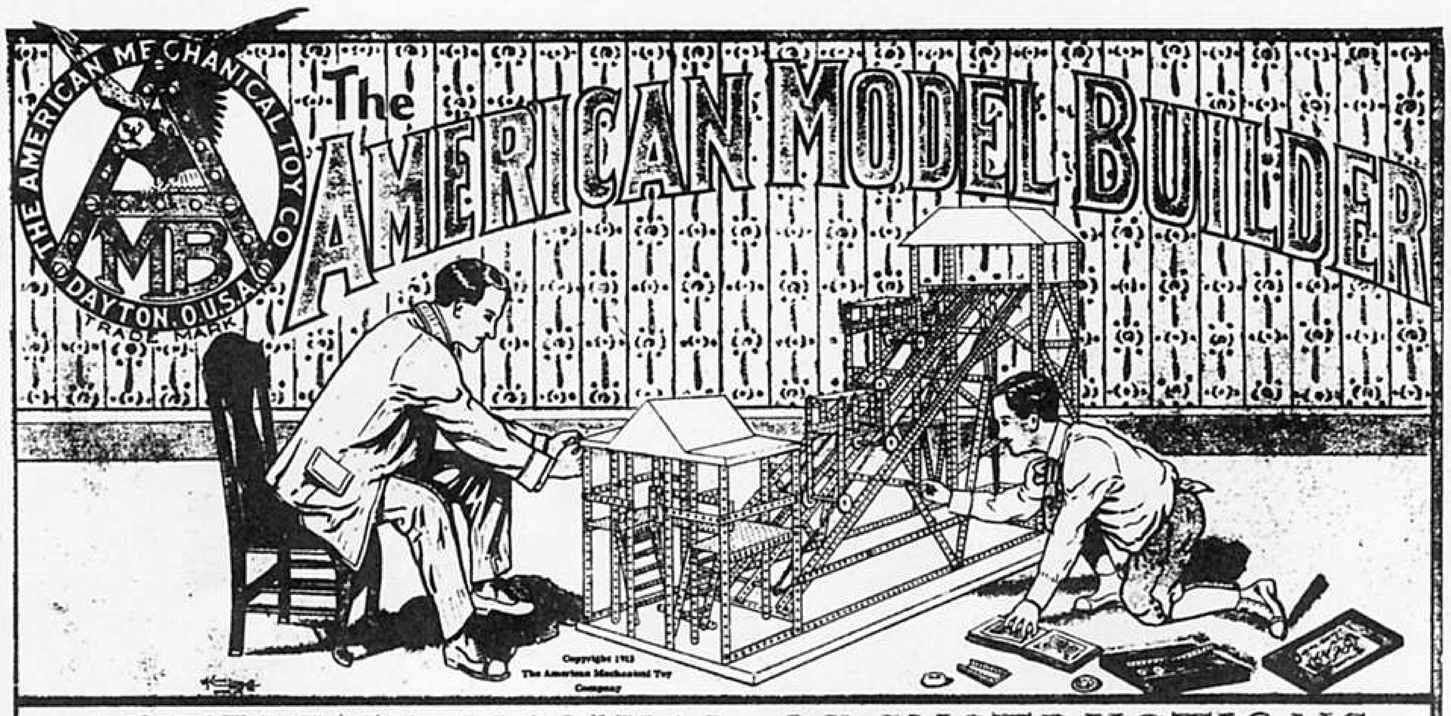
ENLARGED SECTION A.A.



ENLARGED VIEW OF SWIVEL.

TITLE: LAND YACHT.

SCALE.	DATE. 22-3-78	DESIGNED BY. K.W.R. Hinson	DRAWN BY. K.W.R. Hinson
STEVENAGE MECCANO CLUB.			DRG: No. 2/2



As the old saying has it, "Imitation is the finest form of flattery" and, if this is true, then Meccano has been flattered indeed over the years. Since 1901 many copies of Meccano have appeared in different places around the world, most only to disappear again in due time. In this feature we discuss one of the more enduring systems which was first introduced around 1912 – only a few years after the Meccano Trade Name had been registered.

The AMERICAN MODEL BUILDER

An early competitor for Meccano made in the U.S.A.

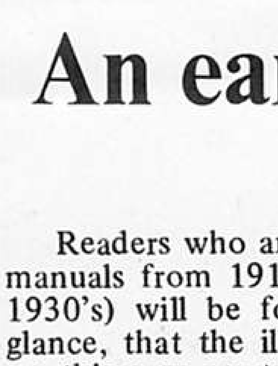
Readers who are familiar with the Meccano manuals from 1910 – 1920 (or indeed in the 1930's) will be forgiven for thinking, at first glance, that the illustrations for Figs. 1 and 2 on this page are taken from a piece of original Meccano literature. However, a closer inspection reveals that the name "American Model Builder" appears across the bottom of the illustrations, which are reproductions from the 1913 manual of instructions issued by Meccano's most serious rival in the constructional mechanical toy field. Even the page heading showing "MAKES MECHANICS EASY" is an obvious crib from Frank Hornby's early construction system which originated under the name of "MECHANICS MADE EASY".

From very humble beginnings at the start of this century, Frank Hornby patented his original MECHANICS MADE EASY creation in 1901 and proudly reported in his own "Life Story of Meccano" that he registered the name of Meccano in the U.K. during September 1907 and, five years later, in Germany during July 1912 in order to prevent any other manufacturer from pirating the trade name. However, this in no way deterred the AMERICAN MECHANICAL TOY COMPANY of Dayton, Ohio, from pirating the Meccano *system*, which they did very successfully for a period of some twenty years after 1912.

It is perfectly obvious from the first six models shown below that the American Model Builder Manuals were barely-disguised copies of the Meccano manuals of the period. In most cases the models were direct copies, strip for strip, wheel for wheel, bolt for bolt and the printed description of the parts required was virtually in the same phraseology. Even the mention of "Flanged and Grooved Wheels" was an indication of the identical form of manufacture and description at the time,

Fig 1, below left, and Fig. 2, below right, simple models which could be built from the early American Model Builder Outfit No. 1. Note the virtually identical form of parts to those of the Meccano system of the period. Even the design of Meccano's "Flanged and Grooved Pulleys" had been copied as can be seen from the Ladder on Wheels in Fig. 2. Also in Fig. 2, note the difference in the holes in the Flanged Plate between models 19 and 20.

MACHINIST'S LADDER
Fig. No. 13

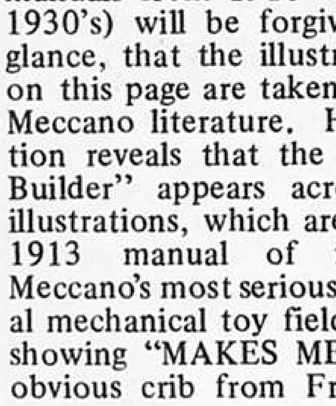


PARTS REQUIRED.
- 4 5½" Perforated Strips.
- 5 2½" Perforated Strips.
- 10 Angle Brackets.
- 22 Nuts and Screws.

REVOLVING TRUCK
Fig. No. 14

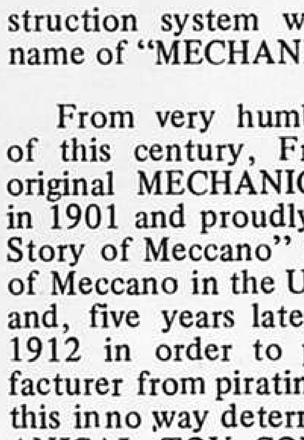
PARTS REQUIRED.
- 1 Large Rectangular Plate.
- 3 1" Pulley Wheels.
- 2 5½" Perforated Strips.
- 1 4½" Axle Rod.
- 1 2" Axle Rod.
- 8 Angle Brackets.
- 10 Nuts and Screws.

PULLEY SHAFT
Fig. No. 15



PARTS REQUIRED.
- 1 Large Rectangular Plate.
- 4 5½" Perforated Strips.
- 1 4½" Axle Rod.
- 4 Angle Brackets.
- 4 1" Pulley Wheels.
- 10 Nuts and Screws.

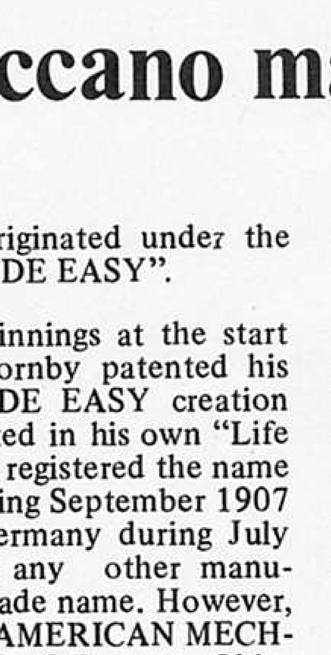
WINDMILL
Fig. No. 16



PARTS REQUIRED.
- 1 Large Rectangular Plate.
- 4 5½" Perforated Strips.
- 6 2½" Perforated Strips.
- 1 4½" Axle Rod.
- 1 Crank.
- 2 1" Pulley Wheels.
- 4 Angle Brackets.
- 2 Collars and Set Screws.
- 16 Nuts and Screws.
- 1 Bush Wheel.

All the Models shown on this page can be made with The American Model Builder Outfit No. 1

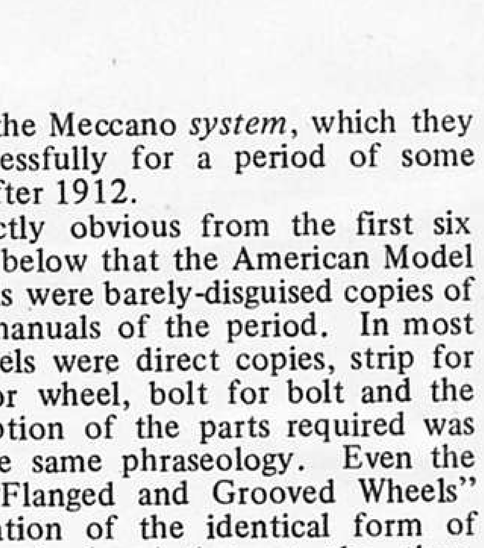
LADDER ON WHEELS
Fig. No. 19



PARTS REQUIRED.
- 6 12½" Perforated Strips.
- 12 2½" Perforated Strips.
- 16 Angle Brackets.
- 1 Large Rectangular Plate.
- 2 5" Axle Rods.
- 4 Flanged and Grooved Wheels.
- 44 Nuts and Screws.

Made with The American Model Builder, Outfit No. 2 or 1 and 1½

TRAVELING JIB CRANE
Fig. No. 20



PARTS REQUIRED.
- 2 12½" Perforated Strips.
- 3 5½" Perforated Strips.
- 3 2½" Perforated Strips.
- 6 1" Pulley Wheels.
- 1 Bush Wheel.
- 1 Hook.
- 2 Angle Brackets.
- 1 2" Axle Rod.
- 2 4½" Axle Rods.
- 1 3½" Crank.
- 1 Large Rectangular Plate.
- 1 Sector Plate
- 17 Nuts and Screws.
- 1 Collar and Set Screw.

Made with The American Model Builder, Outfit No. 3 or 2 and 2½

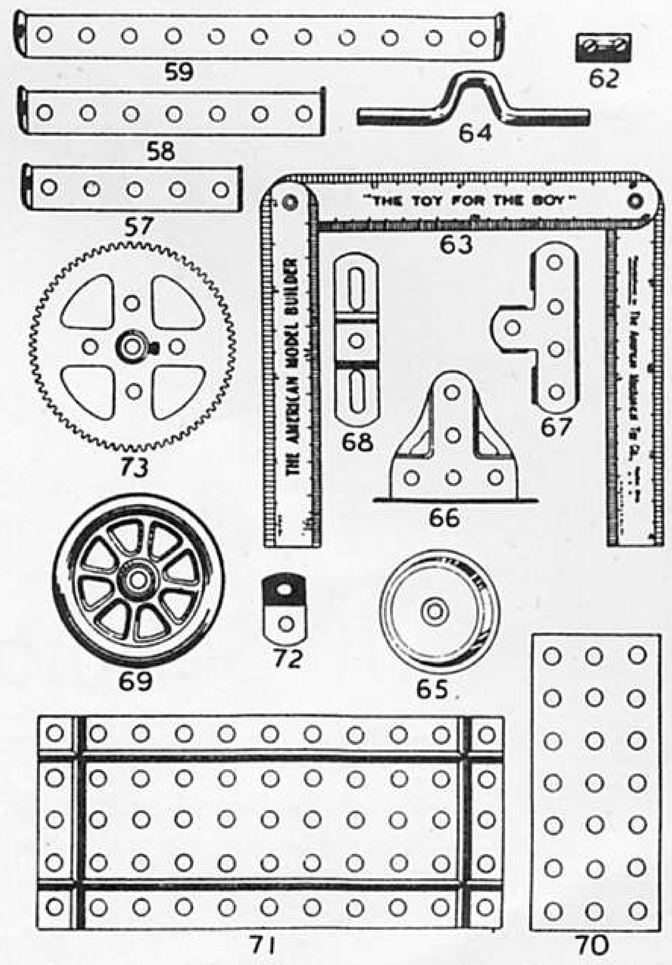
THE AMERICAN MECHANICAL TOY CO
MB
DAYTON, O.U.S.A.

TRADE MARK

Look for this Trade Mark on the lid of every box as well as the outside cover of your Instruction Book.

This is your protection against unsatisfactory substitutes.

The American Mechanical Toy Co.



Above left, the bold and unmistakable Trade Mark of the American Mechanical Toy Company. Note the American Eagle incorporated in the symbol. Above right, some new parts which were introduced into the American Model Builder system in 1915. The 2½" Gear Wheel gave a reduction ratio of 3 : 1 with the ¾" Pinion, thus allowing clocks to be built. Opposite page, a reproduction of the cover of the early American Model Builder manuals.

although there were one or two minor departures in style between genuine Meccano and American Model Builder parts. "LADDER ON WHEELS" in our Fig. 2 shows a 5½" x 2½" Flanged Plate with elongated holes in the side flanges and this later form of Flanged Plate became standard for a while after 1913, as subsequent A.M.B. manuals show.

Figs. 3 and 4 give the range of American Model Builder parts available in 1913 and the similarity with Meccano parts of the time leaves no one in doubt about which firm did the copying! Nevertheless, the few anomalies which existed are worthy of mention. Readers will recognise the general form of the great majority of parts, but there is a 'grey' area over the introduction of Sprocket Wheels and Sprocket Chain. Neither the 1912 nor 1914 Meccano Instruction Books illustrate Sprocket Wheels or Chain, although it did appear in the Meccano Inventor's Outfit of 1915 (See MMQ for April 1976).

But the American Model Builder Manuals after 1912 definitely showed models driven by sprocket chain, such as the Funicular Railway described in the 1913 American Model Builder manual as the "INCLINED CHAIN RAILWAY" Fig. No. (Model No.) 149 on page 64 of that book. Meccano models did have chain drive to models like the large Ferris Wheel before 1912, but it was not via sprockets, but by simple twisted link chain which hopefully obtained a friction grip round the grooves of the early-patterned Flanged Wheels. Those sprocket wheels illustrated in Fig. 3, Part Nos. 36 and 37, are 1" dia. and 1½" dia. respectively although they give the impression of being smaller from the illustrated parts list. The total of 62 A.M.B. parts listed was comparable with the Meccano range of the period, but bore no resemblance in terms of subsequent numbering.

Two special parts are worthy of individual mention and these are Part No. 51, Eccentric Wheel, and Part No. 52, Oscillating Rack. The Eccentric Wheel permitted six different throws from a crank pin, while the Oscillating Rack was able to convert crank pin constant rotation into reversing stroke pinion drive by means of a 'sawing' action. Nothing like this ever appeared in the Meccano system. No. 42 was a combined spanner and screwdriver while No. 57 was a special screwdriver with knurled handle. Meccano did follow suit on similar designs, but not for more than a decade after the American Model Builder introduced them.

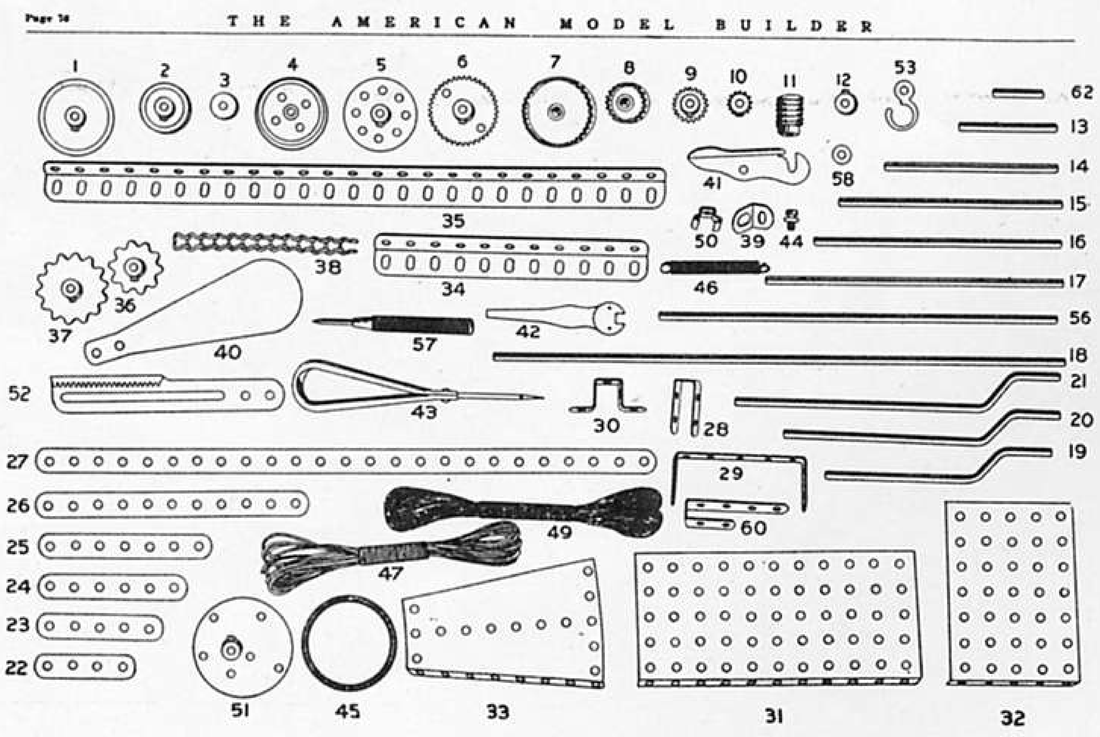
A retrograde step by the American Mechanical Toy Company was the downgrading of its manuals after 1912 when the half-tone printing blocks giving almost photographic quality to the manuals was replaced largely by line drawings and the quality of paper deteriorated from the fine glazed art finish of the 1912 editions. In 1915 they introduced a supplementary book of instructions listing some 370 models (all line drawings), no doubt culled from the annual model building competitions announced inside the covers of each successive year's standard instruction manuals. Covers on the standard A.M.B. manuals maintained the appealing domestic scene of the boy at play, but wisely included 'Dad' in the situation.

There was no mistaking the Trade Mark of the American Model Builder which dominated the rear cover of all the manuals as is shown above and it made good use of the National U.S.A. symbol of the Eagle perched inside the Company's motif. Collectors in the U.S.A. (and elsewhere), even if they are converts to the Meccano system, preserve many fine examples of these early A.M.B. sets and literature and we are indebted to Dr. Clyde Suttle of California for the loan of his early manuals on which this article is based.

At the period in question, eight outfits were available in the American Model Builder range from No. 0 to No. 7 and they ranged in price from 50 cents to 25 dollars.

Again, however, there was no comparison in contents with the Meccano range of sets from 1 to 6 at the time, although the top set, No. 7, of the A.M.B. outclassed the top set, No. 6, of the Meccano system circa 1915 in the contents of Strips, Angle Girders and Nuts and Bolts. However, Meccano was still the survivor!

Fig. 3, below left, the full range of American Model Builder parts as illustrated in the 1913 manual. Note parts 42, 51, 52 and 57 to which special reference is made in the text above. Fig. 4, below right, a descriptive parts list of the A.M.B. system in 1913. Note the similarity between the description of these parts and the equivalent parts in the Meccano system, but the difference in sequential numbering between the two.



THE TOY FOR THE BOY

PRICE LIST OF SEPARATE PARTS

No. 1.	1¼"	Pulley Wheels	at 10c Each	No. 32.		Small Rectangular Plates	at 10c Each
No. 2.	1"	" "	" 10c "	No. 33.		Sector Plates	" 10c "
No. 3.	½"	" "	" 05c "	No. 34.	5½"	Angle Girders	" 40c Doz.
No. 4.	1½"	Flanged Wheels	" 20c "	No. 35.	12½"	" "	" 60c "
No. 5.	1¼"	Bush Wheels	" 15c "	No. 36.	1"	Sprocket	" 50c Each
No. 6.	1½"	Gear Wheels	" 25c "	No. 37.	1½"	"	" 20c "
No. 7.	1½"	Crown Gears	" 30c "	No. 38.		Chain 4 ft. Length	" 20c "
No. 8.	¾"	" "	" 25c "	No. 39.		Angle Brackets	" 10c Doz.
No. 9.	¾"	Pinions	" 20c "	No. 40.		Propeller Blades	" 15c Pair
No. 10.	½"	"	" 15c "	No. 41.		Pawls	" 10c Each
No. 11.		Worm Wheels	" 20c "	No. 42.		Spanner and Screw Driver	" 10c "
No. 12.		Collars and Set Screws	" 05c "	No. 43.		Large Screw Driver	" 10c "
No. 13.	2"	Axle Rods	" 2½c "	No. 44.		Nuts and Bolts	" 10c Doz.
No. 14.	3½"	" "	" 2½c "	No. 45.		Pulley Belts	" 05c Each
No. 15.	4½"	" "	" 05c "	No. 46.	1¾"	Springs	" 05c "
No. 16.	5"	" "	" 05c "	No. 47.		Blue Cord 15 ft.	" 2½c "
No. 17.	6"	" "	" 05c "	No. 49.		Green Cord 80 ft.	" 05c "
No. 18.	11½"	" "	" 10c "	No. 50.		Eye Pieces	" 05c "
No. 19.	4½"	Cranks	" 10c "	No. 51.		Eccentric Wheels	" 15c "
No. 20.	5½"	"	" 10c "	No. 52.		Oscillating Rack	" 15c "
No. 21.	6½"	"	" 10c "	No. 53.		Hooks	" 05c "
No. 22.	2"	Perforated Strips	" 20c Doz.	No. 54.		Instruction Book No. 1	" 05c "
No. 23.	2½"	" "	" 20c "	No. 55.		Complete Manual of Instruction	" 15c "
No. 24.	3"	" "	" 20c "	No. 56.	8"	Axle Rods	" 10c "
No. 25.	3½"	" "	" 20c "	No. 57.		Knurled Screw Driver	" 15c "
No. 26.	5½"	" "	" 30c "	No. 58.		Washers	" 02c "
No. 27.	12½"	" "	" 50c "	No. 59.		Set Screws	" 10c Doz.
No. 28.		Single Bent Strips	" 05c Each	No. 60.		Hanger Strips	" 05c Each
No. 29.		Large Bent Strips	" 05c "	No. 61.	½"	Wood Screws	" 10c Doz.
No. 30.		Double Bent Strips	" 05c "	No. 62.	1"	Axle Rods	" 2½c Each
No. 31.		Large Rectangular Plates	" 15c "				

Electric Dockyard Crane

Part 2

A No.10 Set model built & described by B.N. LOVE

In the first part of this feature, published in the July MM, we gave building instructions for the bogies and travelling tower of this highly impressive No. 10 Set model. Now we conclude the building instructions by covering the boom, the upper part of the turntable, the machinery house, the travelling crab and the hoist system.

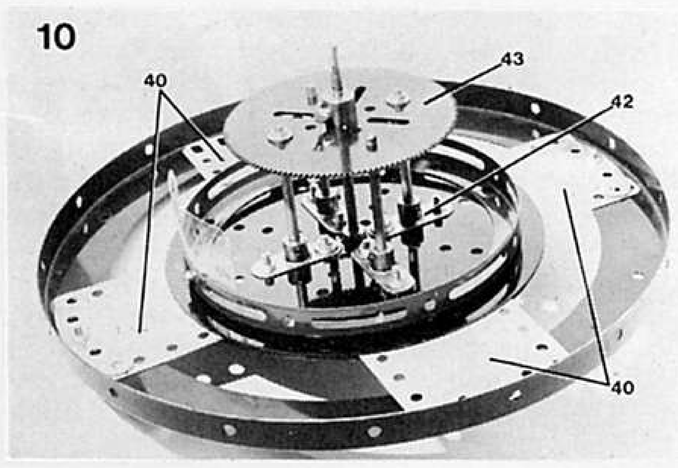
MAIN BOOM — CENTRE PORTION

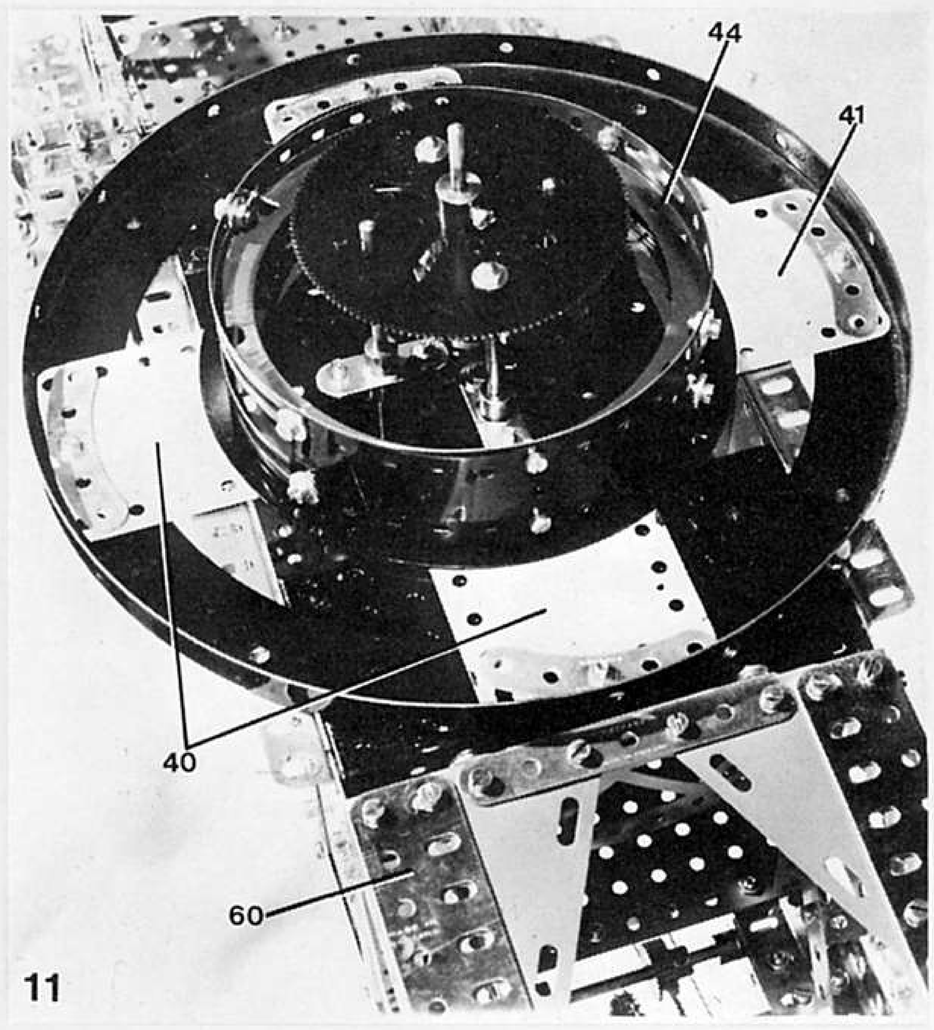
Figs. 10, 11 and 13 show the simple box structure and upper turntable ring forming the centre portion of the boom and of these, the turntable ring should be constructed first. A 'flexible joint' arrangement is used here by attaching a large Flanged Ring to a sandwich of two 6" Circular Plates via four 3½" x 2½" Flexible Plates 40 as shown in Fig. 10. This allows the inevitable flexing of the boom under load without distorting the centralising of the gear drive to the turntable. 2½" Curved Strips 41 are overlaid on the slotted holes of the Flexible Plates for additional anchoring where they are attached to the Flanged Ring. Four Double Arm Cranks 42 are bolted to the Circular Plates, as shown, and they carry 2½" or 3" Rods to form a 'cage' axle adding considerable rigidity to the central drive and ensuring that the 3½" Gear Wheel 43 cannot slip. All four rods are locked into their Double Arm Cranks, but only two of them are fixed to the 3½" Gear Wheel by means of Rod Sockets, the other two Rods simply protruding through the Gear by a few millimetres. When securing the inner Bolts, an 8–hole Bush Wheel is inserted through the Circular Plates' centre holes and fitted with a 4" Rod which is also locked into the boss of the 3½" Gear Wheel, allowing about one inch of Rod beyond the boss. This extension will locate the upper turntable ring in the 8–hole Wheel Disc which is already mounted in the centre of the lower portion of the turntable.

At this stage, the electrical pick-up is fitted for power to the hoisting motor. Fig. 11 shows a second 5½" Circular Girder 44 suspended and insulated by a pair of 5½" x 1½" Plastic or Transparent Plates, 1½" below the first Circular Girder. A feed wire is bolted to the insulated Circular Girder and passed up eventually to one terminal of the Powerdrive Motor in the machinery house. Modern Meccano is well enamelled so the second terminal of the motor is fitted with an 'earth' (chassis) return lead fastened by a Bolt and lock-nut into a Collar at the top end of the Axle Rod passing through the 3½" Gear Wheel. This ensures a good return path for the power supply to the crane tower.

Fig. 13 shows the central portion of the boom which is of box construction, the base being a pair of 5½" x 2½" Flanged Plates, upside down and secured at the extreme ends of the 9½" Angle Girders 45 shown externally. Standing vertically at the four corners of this 5½" x 9½" base are 5½" Angle Girders 46 sandwiched between the 9½" Girders and the Flanged Plates. Four vertical 5½" x 2½" Flexible Plates reinforce the uprights, overlaid by 5½" Strips and spaced by another pair of similar Strips horizontally to form the windows of the central section. Transparent Plates and 2½" Narrow Strips complete the windows and the construction is clear from Fig. 13.

At this stage, the first of the long girder sections is fitted by placing 18½" Angle Girders





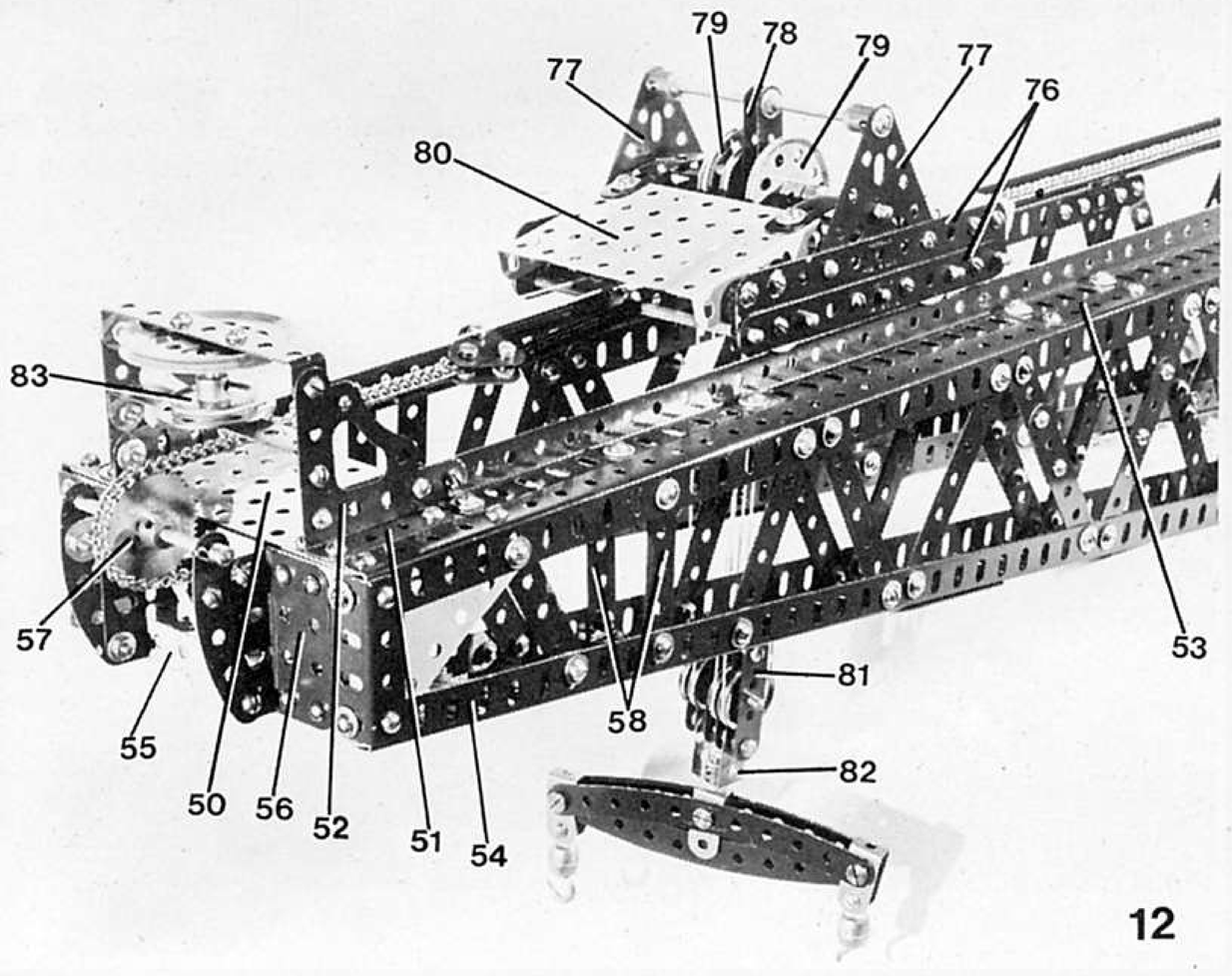


Fig. 10, above, and Fig. 11, below left, show the upper ring of the turntable, Fig. 11 showing it fixed in place to the underside of the boom. Note the 'flexible joint' provided by Flexible Plates 40 which allows flexing of the boom without distorting the centralising of the gear drive to the turntable. Fig. 12, below right, a close-up view of the forward boom showing the crab trolley in position. Note the liberal cross-bracing of the boom.

47 on the top of the centre box, allowing seven holes clear overhang to the rear which gives eleven holes clear overhang to the front. One 5½" x 2½" Flanged Plate is placed across the top of the structure in its centre and bolted to the Angle Girders and then the first of the upper deck plating is attached by fitting 5½" x 3½" Flat Plates at either side of the Flanged Plate. Anchoring plates for the front end of the boom are provided by 1" Corner Brackets 48 while 2½" Strips are bolted on at the back for the rear section and these can be seen in the various illustrations. One 5½" Braced Girder 49 is used at the front of the centre box section to give lateral support between the 5½" vertical Girders. The completed section can now be bolted to the upper turntable ring and this is done at two points only, through the centre holes of the leading edges of both inverted Flanged Plates which coincide with the holes on opposite sides of the large Flanged Ring (see Fig. 11).

A trial run should be carried out to ensure that the centre section of the boom is running properly on the turntable. Adjustment of the Spring Clips on the roller race will be required to ensure that the small Flanged Wheels run just clear inside the flange of the lower Flanged Ring. Meshing of the final turntable drive Pinion from the tower to the 3½" Gear Wheel is best adjusted by setting the 19–t Pinion up or down on Washers to obtain centre line engagement. A check should be made to ensure that the small Flanged Wheels do not scrape against the inside of the turntable drum and that they are all properly located inside the flanges of the turntable rings. Rotation from the Powerdrive Motor below should be almost effortless at this stage. Light lubrication of the rollers and a smear of graphite grease will assist smooth running on the ring flanges.

FORWARD BOOM;

Double bracing of channel section girders is employed throughout the forward section of the boom and these must be assembled by judicious use of the Angle Girders and Strips left in the No. 10 Set. Two side frames are made up of identical, but reversed (mirror image reversal), construction. Fig. 12 should be carefully studied as this gives most of the required visual information. A start is made by bolting a 24½" Angle Girder by its round holes to the 5½" x 2½" Flat Plate 50 which forms the small platform on the top of the leading edge of the boom. This is the upper and outer girder. The inner and upper girder is another

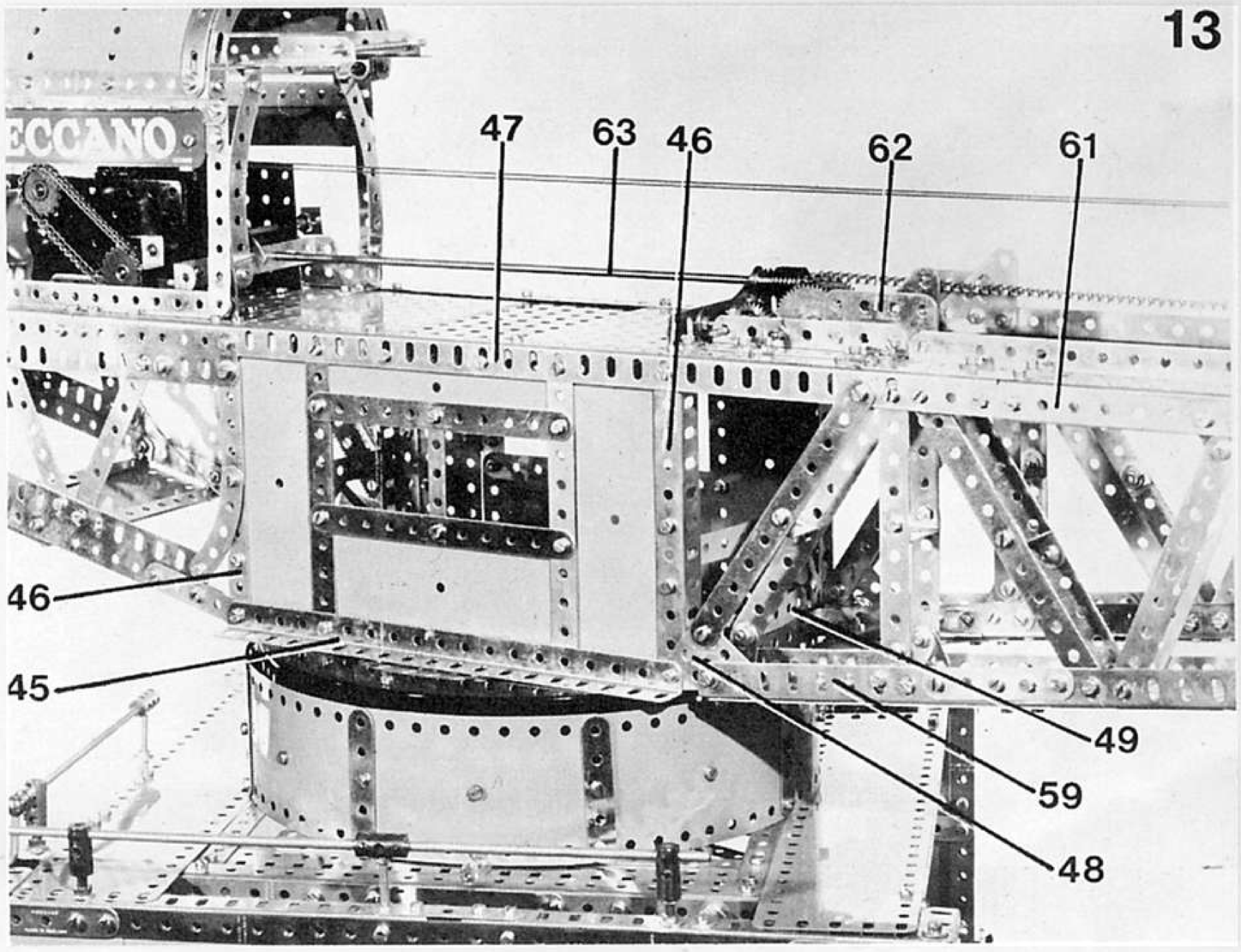


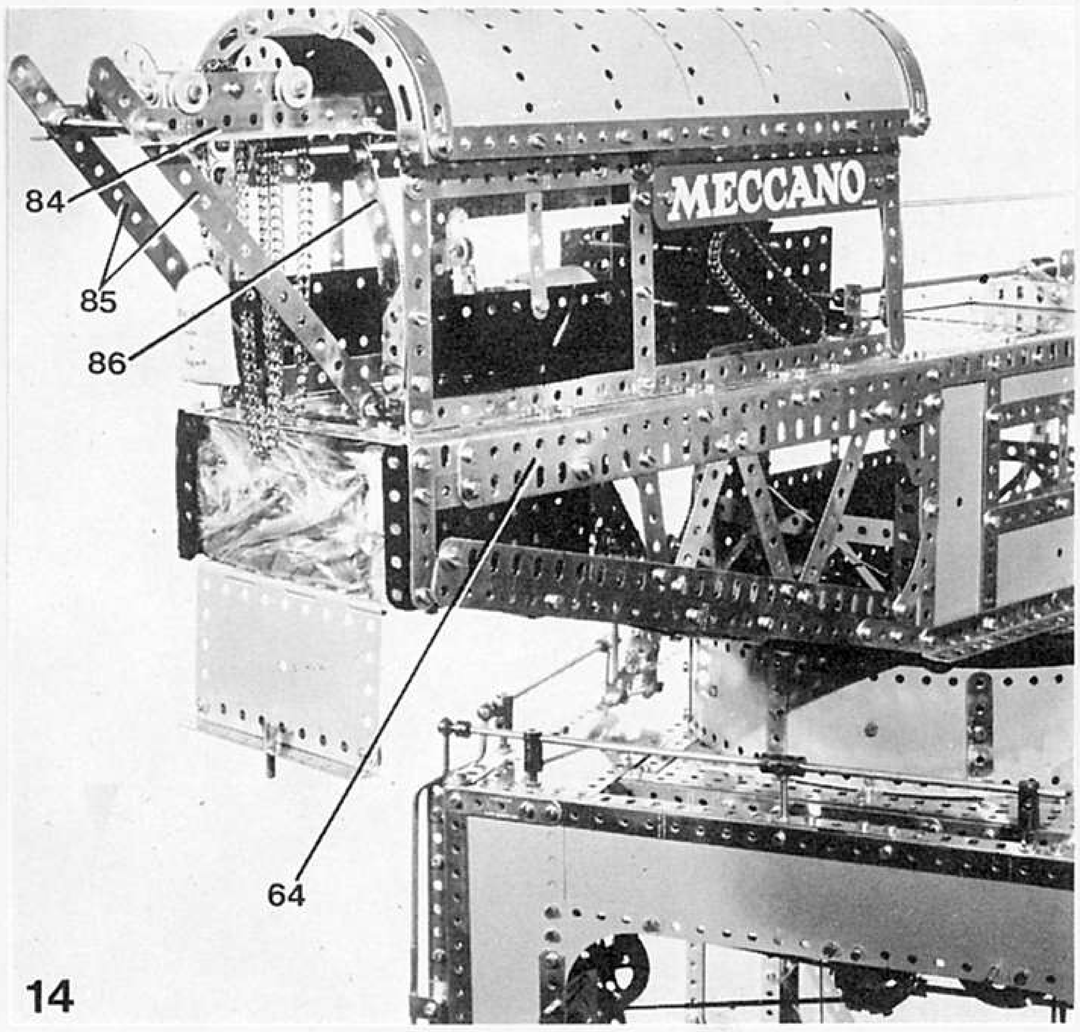
Fig. 13, a close-up view of the central portion of the boom secured to the upper turntable ring. Note that the boom is fixed to the ring at two points only, as described in the text. Construction of the control cabin representation is also fairly clear from this illustration.

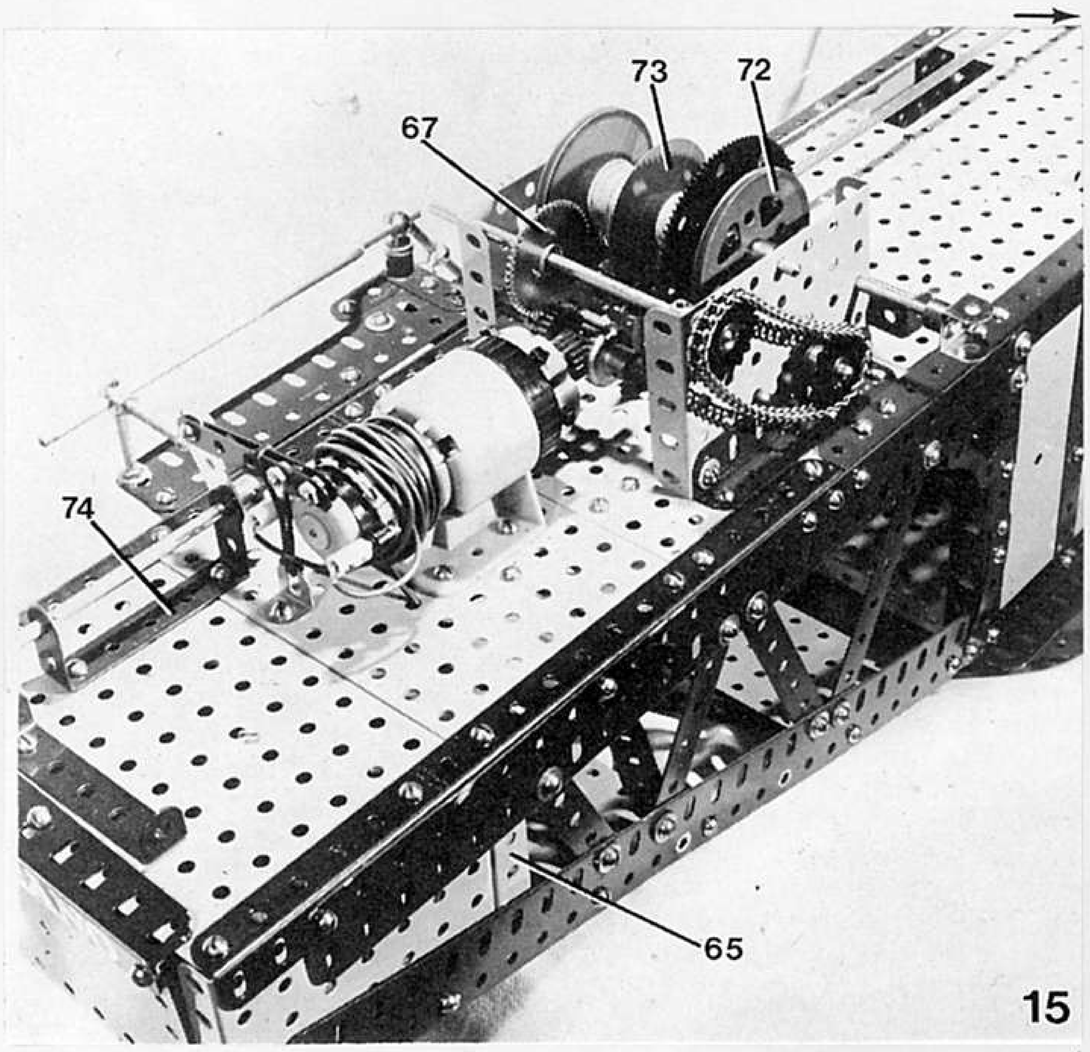
24½" Angle Girder, but this time it has only one hole lapped on to the 5½" Flat Plate, the space in front of this Girder being taken up by a 2" Girder 51 bolted on to the Flat Plate by its round holes. A joint between these two Girders is made by the five-hole edge of a Corner Gusset 52 and this is clearly seen in Fig. 12. Note the arrangement of the slotted flanges of all Girders throughout the construction of the boom.

Twenty-six holes back from the boom front, the upper 24½" Girders are joined by a reinforcing plate which is a 2½" Flat Girder 53. The inner Bolts for this Flat Girder also hold a 12½" Girder, slotted flange downwards, under the upper 24½" Girder. Location of the 12½" Girder is fifteen holes back from the front of the boom. A second channel section for the lower edge of the boom is another pair of 24½" Girders, but this time they are staggered by five holes instead of four. The outer lower 24½" Girder 54 is bolted to a second 5½" x 2½" Flat Plate running across the boom head at the lower level and the other 24½" Girder has its leading vertical slotted hole joined to the rear edge of the Flat Plate by a Right-hand Corner Bracket and this can be seen in Fig. 12. Twenty holes back from the boom head, a 2½" Flat Girder makes an overlay joint under the lower pair of 24½" Girders.

All of the double bracing struts for the boom are set at an angle as shown, starting with 2½" Strips five holes in for the top girders, angled to seven holes in for the lower girders. Across the boom head, a 5½" Braced Girder 55 forms a bracing panel four holes deep and this is reinforced by 2" Girders vertically at the corners and fronted by Girder Brackets 56

Fig. 14, below left, shows the rear boom section which also includes the machinery house and service gantry. Note the counterweight compartment beneath the machinery house, the author filling this with sand held in a strong quality plastic bag. Fig. 15, below right, shows the rear boom section viewed from above, with the machinery housing removed to show the hoist and trolley winch and driving motor. Also, note the solid deck plating





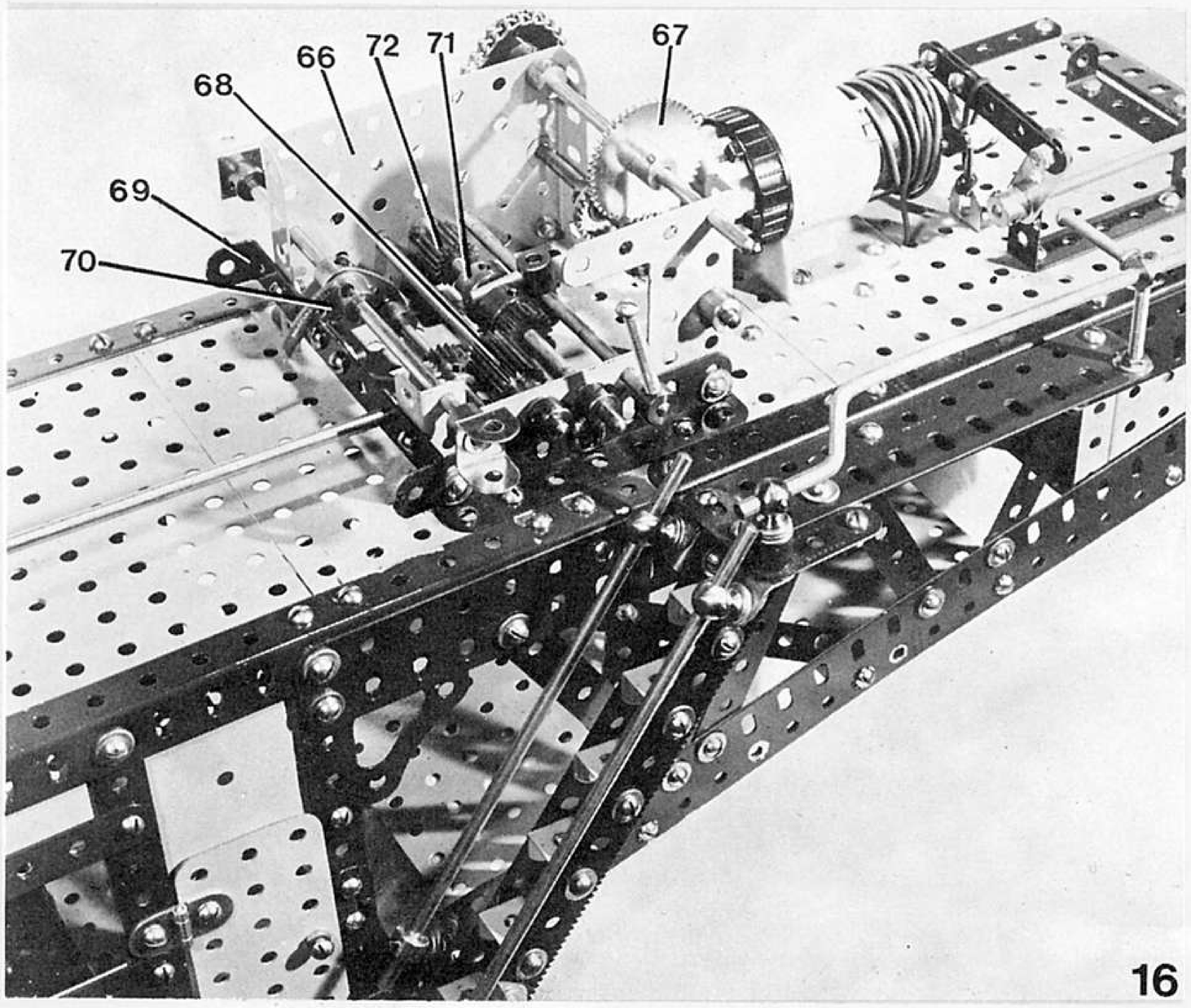


Fig. 16, another close-up view of the hoist and trolley winch, this time with the winding drums and one side plate removed to show the gearing and control linkages. Again, attention should be drawn to the very solid construction of the deck, thanks to the liberal use of Flat Plates.

←

carrying 2½" Curved Strips, stood off by Fishplates at the upper ends to form journals for the head wheel of the crab-trolley chain-drive. Note that Cord Anchoring Springs locate the 3" Axle Rod at the boom head and that a 50–t Gear Wheel 57 plays the role of a sprocket wheel. One 4½" Angle Girder runs behind the upper edge of the Braced Girder and is fixed under the top 5½" Flat Plate to give a firm bracing.

The second pair of bracing struts for the boom are almost vertical and are made from 2½" Double Angle Strips 58. Due to the limited numbers of short Strips in the No. 10 Set, Double Angle Strips are pressed into service to brace the boom where possible. A general pattern for the remainder of the bracings is clear from Figs. 12 and 13, progressing through 3", 3½" and 4" Strips as available. Where obvious joints are shown in the bracings, combinations of lapped 2½" or 3½" Strips are used. Towards the back, the boom frame opens up to accept 5½" Strips and these are shown in Fig. 13, but these are not fitted until the boom frames are near completion when they are married to the 18½" Girders protruding from the centre box section of the boom. Because of the staggers in the 24½" Girders, rear extensions are required. Lower channels are extended rearwards by a 5½" Girder 59 outside and a 3" Girder inside. To ensure a straight and strong joint here, the underside of the channel is lapped by a 9½" Flat Girder 60, first portions of which can be seen in Fig. 10. The rounded hole flange of the topmost pair of 24½" Angle Girders form the running rails for the crab trolley and the inward ends are bolted on to the leading edge of a 5½" Flat Plate running across the boom just in front of the crab driving gear. Three holes overlap is required on to the Flat Plate and then, starting at the top of the vertical forward 5½" Girders of the central box section, first a 3½" and then a 3" Flat Girder are used as overlays on the top girders at the same time. The join of the outer top 24½" Girder to the 18½" Girder is overlayed at the side by a 5½" Strip 61.

A pair of 3½" Angle Girders form journals for the crab driving gear and are joined to the rear end of the crab rails by 2" Flat Girders 62, mounted vertically as shown in Fig.13, together with 1½" Corner Brackets which act as rear stops for the crab trolley. A slipping clutch mechanism is provided as follows: on the final drive shaft for the crab chain, a 57–t Gear Wheel takes the place of a sprocket and is pressed against a 1" fixed Pulley with Rubber or Plastic Ring, by a Compression Spring and Collar. No Grub Screw is put into the Gear Wheel which revolves only under the friction drive and will slip when overdriven at either end of the crab trolley run. A second gear wheel, this time a 50–t Gear, is also fixed to the shaft and is then driven by a 25–t Pinion and this can be seen in Fig. 13. A Journal for the longitudinal Worm drive shaft 63 is provided by a 2½" Curved Strip bolted to the vertical slotted flange of a 4½" Angle Girder across the boom as shown. The Worm at the end of the 11½" Rod engages with a 19–t Pinion on the reduction shaft.

REAR BOOM

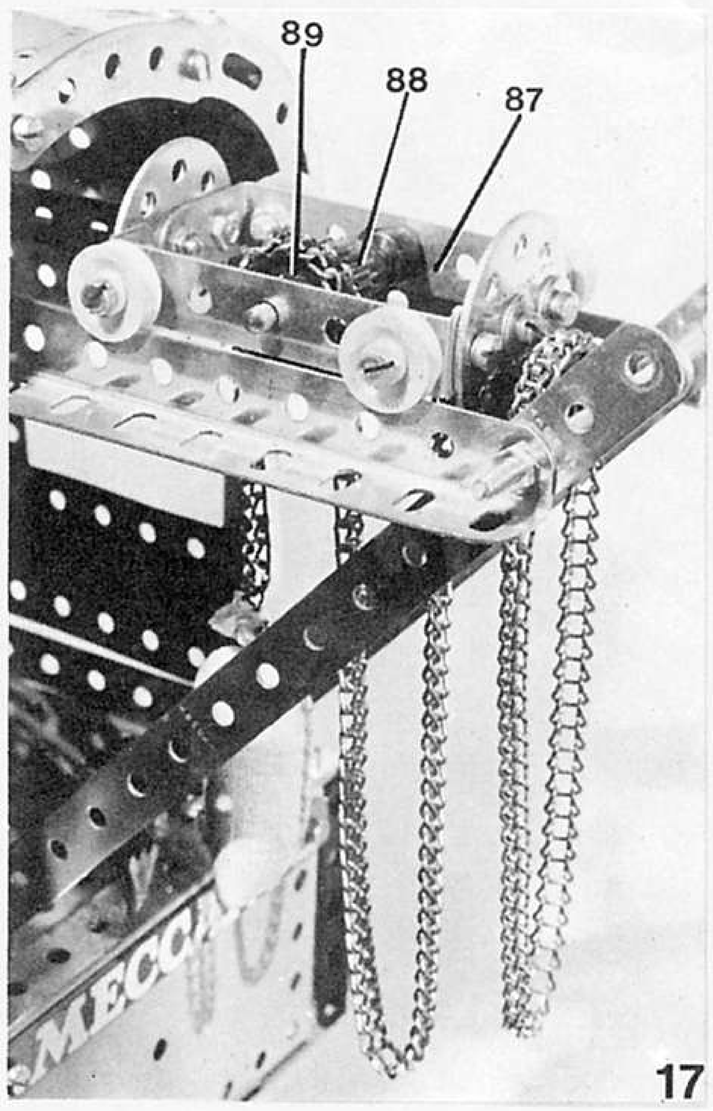
Fig. 14 illustrates the general construction of the rear boom in which the seven holes of the overhanging 18½" Angle Girder are extended by a 9½" Girder and reinforced as shown by an external 12½" Flat Girder 64, with slotted holes downwards to facilitate strut attachment. Upper deck plating can now be completed as shown in Fig. 15 and this requires one 5½" x 2½" Flat Plate followed by three 5½" x 3½" Flat Plates. A counterweight compartment is made from a 5½" x 2½" Flanged Plate 65, flanges forward and two 3½" x 2½" Flanged Plates to form the sides. A baseplate for the box is a 5½" x 3½" Flat Plate with its forward edge bolted to the lower flange of the Flanged Plate and secured by 1" x ½" Angle Brackets to the tail of the boom. A 4½" x 2½" Hinged Plate is bolted over the base of the box and capped with a 4½" Girder to form a closing lip when shutting the counterweight compartment. A good quality plastic bag with no perforations is filled with sand for stuffing into the box. Before doing so, the Meccano Ball Race, complete, should be bolted on centrally below the counterweight compartment for added ballast. If heavy loads are to be lifted, additional ballast in the form of lead weights should be substituted for the sand bag. Additional reinforcing for the lower 12½" Flat Girders on the rear boom is provided by internal 12½" Strips and a cross bracing below is provided by sandwiching 5½" x 2½" Flexible Plates and attaching them across the lower rear of the boom by Angle Brackets. Single strut bracing is added as shown, using appropriate Strips and Double Angle Strips as available.

HOIST AND CRAB TROLLEY GEAR

Figs. 15 and 16 show the hoist and trolley mechanism which is mounted in a pair of 3½" x 2½" Flanged Plates 66 supported by 3½" Angle Girders secured to the decking. One Plate has been removed to show the gearing clearly, as seen in Fig. 16. Location of the Plates and Powerdrive Motor is also clear from the illustrations and it will be seen that a 19–t Pinion on the motor shaft engages with a small Contrate Wheel to drive the first shaft of the gear box. From here, a 25–t Pinion drives the upper rear shaft via a 50–t Gear Wheel 67 and this shaft carries the drive by 1" Sprockets to a take-off shaft, three holes back from the front of the gearbox and two holes up. This shaft runs continuously when the motor is switched on. Drives to the crab or hoist are taken off by sliding Pinions from a ¾" face 19–t Pinion 68 mounted just inside the sideplate. A rear bearing for the 11½" Axle Rod 63 to the Worm drive is provided by a 4½" Double Angle Strip 69 mounted across the front of the gearbox two holes up and the Rod is fitted with a small Contrate Wheel at its inner end. A sliding shaft, operated by a second sliding shaft, moves a 19–t Pinion into engagement with either side of the small Contrate Wheel to effect reversing of the crab-trolley drive. Two Pawls with Boss 70 are fixed to the gear-shift shaft and the rear Pawl drops between a pair of Collars. In the fully 'off' position the 19–t Pinion for the crab is completely free of the long-face Pinion.

A take-off drive to the hoisting drum is provided also by a sliding shaft operated by yet another sliding shaft and this can be seen in the centre of the mechanism shown in Fig. 16. A Socket Coupling 71 is locked both to its shaft and to a 19–t Pinion and on the far end of the shaft a ½" face 19–t Pinion 72 passes on the drive to the winding drum and also

Fig. 17, a close-up view of the service hoist which, despite its comparatively simple construction, is nicely operational.



provides the 'stop' position when the shaft is disengaged. A simple, but effective, brake is provided by a Set Screw (*NOT* a standard Bolt!), in the Collar outside the gearbox on the take-off shaft mentioned so that when the hoist is disengaged by pushing the control lever inwards, the Set Screw locks against the external Collar on the adjacent shaft. It is important to fit that Collar with a 3mm Grub Screw to prevent 'knocking' every time the Collar rotates, which it will do all the time the motor is running. The control lever for the hoist is a long Bolt in a Collar on the end of a 4½" Rod with a Coupling in the centre of the Rod, fitted with two 1" Rods as a 'fork' for shifting the hoisting gear into mesh via the Socket Coupling.

Fig. 15 shows the twin hoisting drums in position which are made up as follows: first, a 2" Pulley 72 acts as a spacer, boss outwards, followed by a 2½" Gear Wheel, also boss outwards. Pressed to the face of the gear is a Conical Disc taking the closed end of a Chimney Adaptor against it. Inside the Chimney Adaptor is a Cord Anchoring Spring to which one end of a hank of Cord is attached after first passing the Cord through the side hole of the Chimney Adaptor. The process sounds fiddly, but is quite straightforward if done with a bit of patience and common sense and care is taken to ensure that the spring is rotated in the 'uncoiling' sense when locating it centrally inside the Chimney Adaptor. A back-to-back pair of Conical Discs 73 are now put on to the shaft to separate the twin drums and the second drum fitted, as described. Finally a second 2" Pulley traps the outer Conical Disc in place and all bosses are securely locked with Grub Screws. With the spacing described, the 2½" Gear Wheel will mesh correctly with the ½" face 19-Pinion below. A control switch rod for the Powerdrive motor is mounted in a 2½" x 1" Double Angle Strip 74 and led to the rear of the boom for reversing and stopping. Two 2½" Narrow Strips, spaced by Nuts, straddle the motor lever as shown in Fig. 15 and are held in place by a Driving Band through a ½" Angle Bracket bolted to the deck. Cranks, or long Bolts in Collars are used as shift levers on the Rod operating the motor switch.

CRAB TROLLEY

This is shown in Figs. 12 and 18 and the view from below should be studied first. The original trolley shown in Fig. 18 uses two Double Bent Strips 75 to support and space the lower pulley shaft. However, four Double Bents Strips are required to give the proper support for the turntable drum mounting on the crane tower, so one Crank is used to replace these parts and this will hold the shaft in place. Both Ratchet Wheels are retained to give correct spacing, with the internal Spring Clips, for location of the two 1" fixed Pulleys which are free to turn on the shaft and form part of the hoist system. It will also be noticed that four Cord Anchoring Springs are used on the front and rear draw bars of the trolley to locate the Axle Rods in place. These should be replaced with Spring Clips, one lug of which is trapped between the side Flat Girders of the trolley and the flange of the 3½"x 2½" Flanged Plates. Double Tension Springs are provided to take up slack in the Sprocket Chain drive and thus maintain tension throughout. All four 1" fixed Pulleys used as travelling wheels for the crab are free to turn independently, one being fixed by a Grub Screw on each 4½" Axle Rod while the second Pulley on each Rod is held in place by a Collar.

Upper construction of the crab is shown in Fig. 12, overlaying 5½" Strips 76 on the Flat Girders forming journals for the travelling wheel shafts. A pair of 2½" Triangular Plates 77 are joined across the top by a 3½" Screwed Rod running into Threaded Bosses and 2" Slotted Strips 78 are separated by a Spring Clip and lock-nutted in the centre of the Screwed Rod. These form internal spacers for a pair of 1" loose Pulleys which themselves are spaced by a Washer or two from 1½" Pulleys 79, boss outwards, these being located by Collars. The 'spring' effect of the Formed Slotted Strips securing the fore and aft 3½" x 2½" Flanged Plates 80 holds the pulley shaft in place. It is important that the side frames of the trolley are spaced from the flanges of the 3½" Flanged Plates by Spring Clips on $\frac{3}{8}$" Bolts, eight of each being required and located in the positions shown. The slight upwards tilting of the Flanged Plates gives added rigidity to the trolley, apart from improving its appearance.

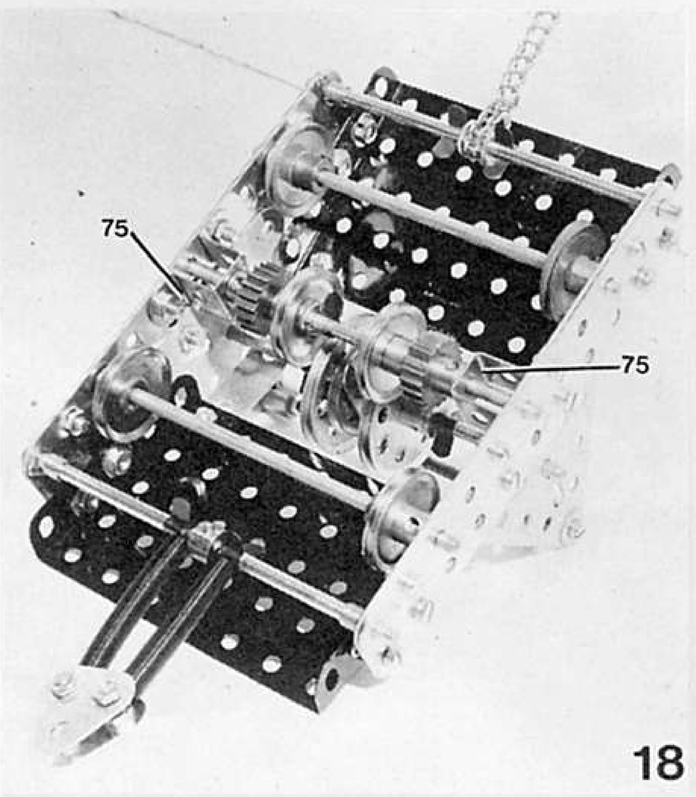
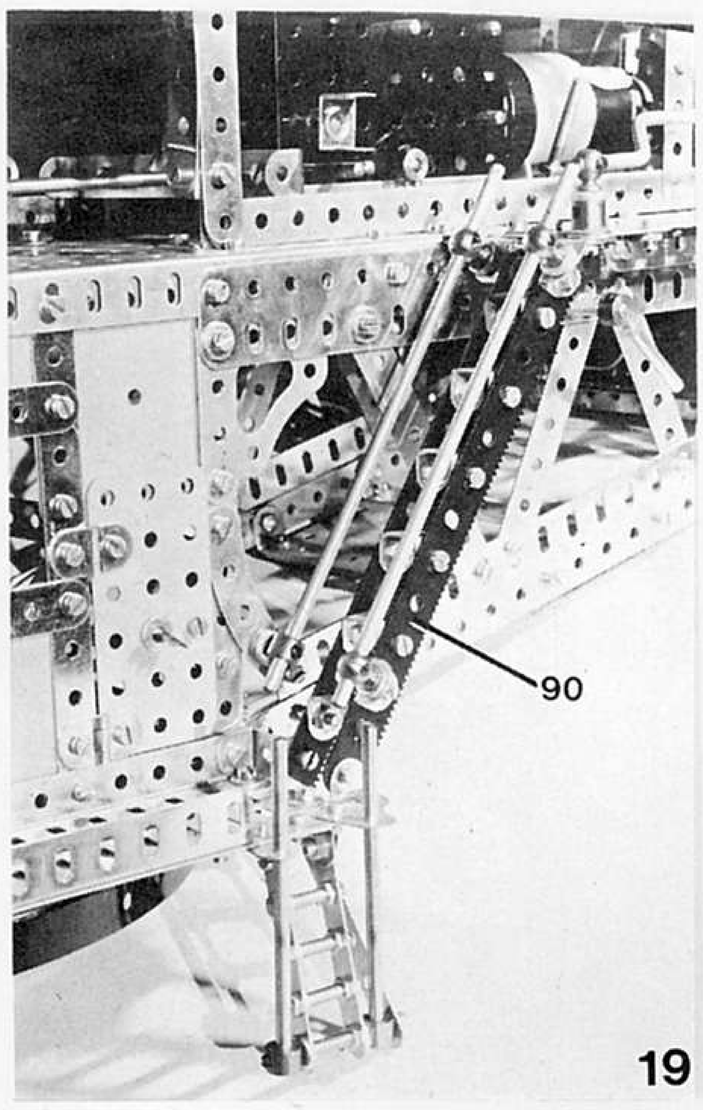


Fig. 18, an underside view of the gantry crab trolley. Note that one of the two Double Bent Strips 75 should be replaced with a Crank.

HOOK BEAM AND PULLEY BLOCK

Details of the block can be seen in Fig. 12 where six 2" Strips 81 form separators for the four 1" loose Pulleys running on a 1½" Axle Rod. This is trapped between the centre 2" Strips by a Spring Clip. Long Bolts are used with a series of lock-nuts at the top and bottom of the pulley block to set up critical spacing for free running of each Pulley. When fitting the lower 1 $\frac{1}{8}$" Bolt, a 1" x ½" Double Bracket 82 has to be juggled into position and set to swing freely. A Pivot Bolt with Collar spacing passes through the Double Bracket into a Double Bent Strip and is secured by lock-nuts, allowing the hook beam to revolve freely. Reversed pairs of 5½" Curved Strips form the actual beam and the Pivot Bolts employed use internal Washer spacing to maintain the universal pivotting properties of the beam hooks which are attached by lock-nutted Bolts to the outer Double Bent Strips. All bolted elements of the hook beam must be set and spaced to swing freely.

Fig. 19, the upper section of the access ladder-work. Note the unorthodox use of the Rack Strips 90 contained in the Set!



HOIST SYSTEM

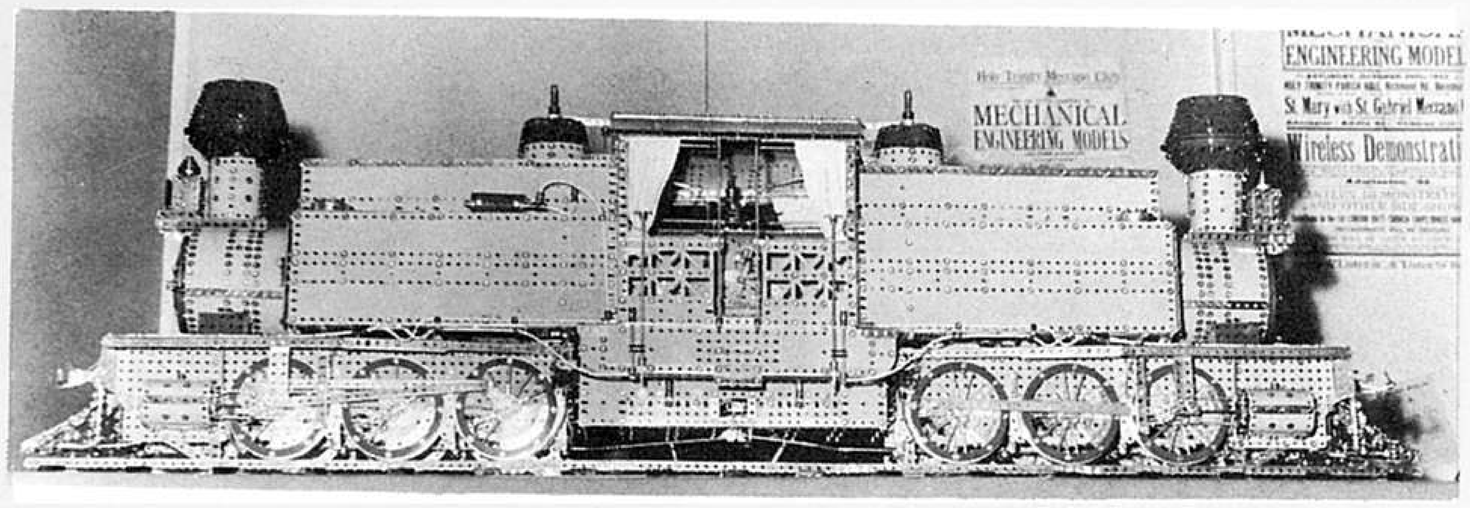
The double hoist system employed permits the winding drums to 'coil' at slight differences without tilting the pulley block and the first reeving of each separate cord from the twin drums is over the top 1½" Pulleys 79 of the crab, through the lower block, up round the top inner 1" loose Pulleys, down through the block again then up and over the lower pair of 1" fixed Pulleys (but loose running) in the lower portion of the crab. The twin tails of the cords then go up round the compensating Pulley 83 at the boom head where they are knotted together. Very little movement of the cord will ever be seen at this point, but the compensation for drum 'coiling' differences is quite automatic. Two 3½" Double Angle Strips form supports for the compensating Pulley, a 1" fixed Pulley free to revolve over a Wheel Disc on a 1" Rod fixed in a 2" Pulley bolted to the boom head brackets (Corner Gussets 52).

MACHINERY HOUSE & SERVICE GANTRY

Fig 14. shows most of the machinery house and service gantry which is of simple and open construction. The housing is 12½" long, using 12½" Strips with 5½" Double Angle Strips (preferred) so that Threaded Pins, either long or short, can be fitted to the bottom lugs of the Double Angle Strips and will thus allow the machinery house to be easily and quickly removed or located on the rear boom. It should be remembered that the structure forms part of the general balance or counterweighting of the whole boom. A gantry is formed from the last remaining pair of 18½" Angle Girders 84 in the No. 10 Set and these are supported by a pair of 9½" Strips 85 acting as rear struts, see Fig. 14. Curved Strips (4½") 86 and 1" x 1" Angle Brackets make vertical supports for the gantry rails and spacing for the rails is supplied by lock-nuts on a 3" Screwed Rod at the rear end and by a double thickness of 3" Curved Strips under the front end of the 18½" Girders. Roofing is made from twelve 5½" x 2½" Flexible Plates curved to the form of combined 3" and 2½" Curved Strips at either end, each side of the roof overhanging the machinery housing by the width of Double Brackets or ½" Reversed Angle Brackets. Four 12½" Strips are used on the roof, two along the top, 2½" apart, and two more along the lower edges each side.

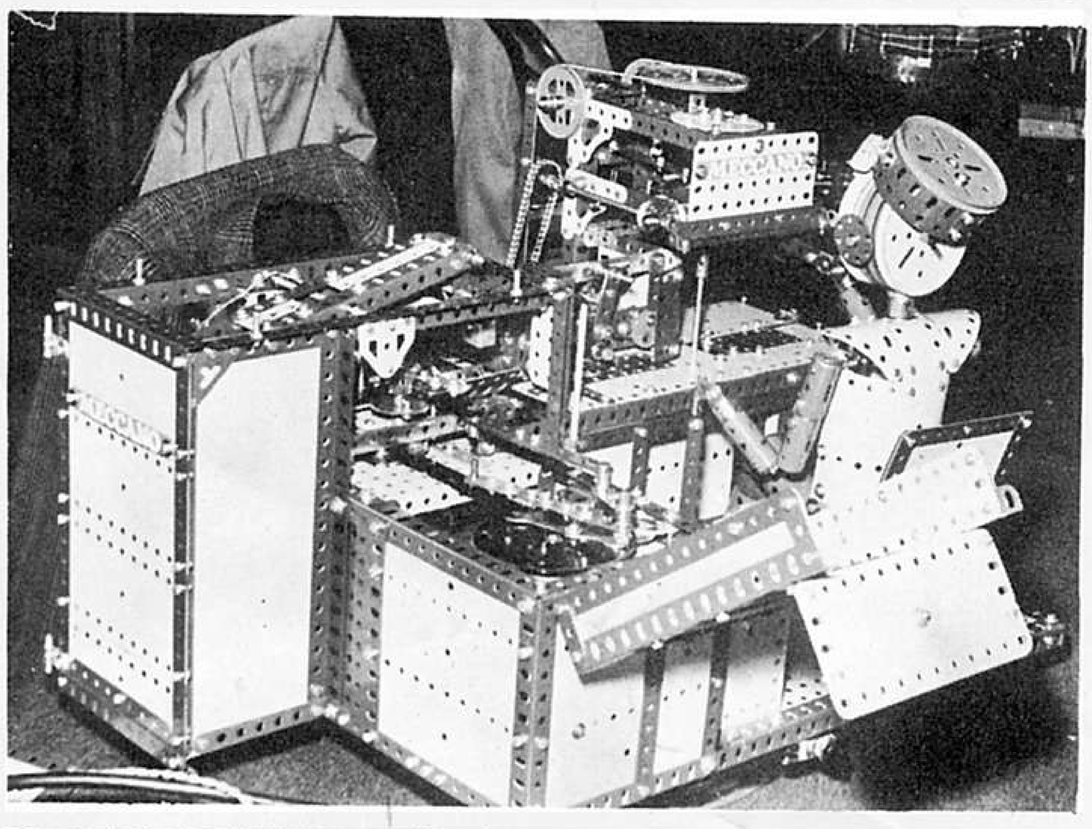
There are enough parts left in the No. 10 Set to make a working service hoist as shown in Fig. 17. One 2½" x ½" Double Angle Strip and one 2½" x 1" Double Angle Strip 87 are bolted to a pair of 8-hole Wheel Discs and fitted with four ½" Plastic Pulleys, as shown, by $\frac{3}{8}$" Bolts. A 3" Rod runs lengthwise through the bottom holes of the Wheel Discs and is rotated by Sprocket Chain in a 10" loop over a 1" Sprocket Wheel. This shaft carries a Worm which meshes with a 19-t Pinion 88 on a 2" Rod across the centre of the hoist. One end of an 18" length of Sprocket Chain is secured to an end Bolt of the hoist and then passed over a 1" Sprocket 89 also on the centre shaft and fitted with a Hook at the free end of the chain. Setting of the gantry rails should be to allow full run of the hoist right through the machinery house.

Final details are added by last stages of ladder work right up to the machinery house where even the 6½" Rack Strips 90 are pressed into service as ladder sides! (See Fig. 19). Six ½" Double Brackets form the final flight of steps and a Handrail Support set in a Threaded Crank at the top of the steps takes a Crank Handle for the last section of safety rail.

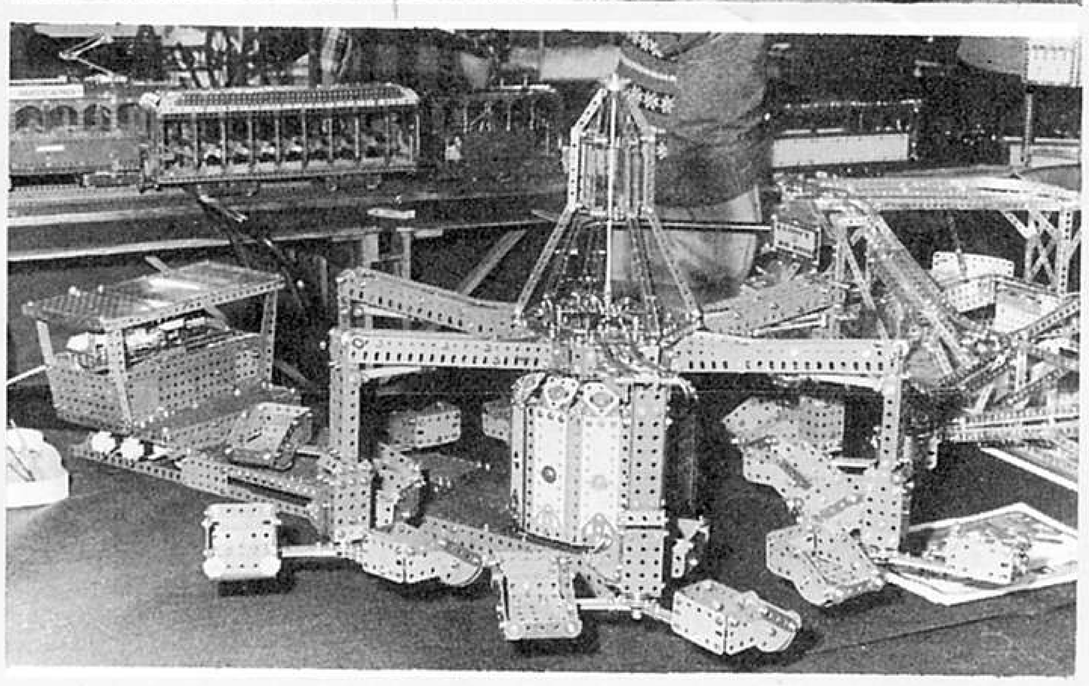


SHOW
HEN

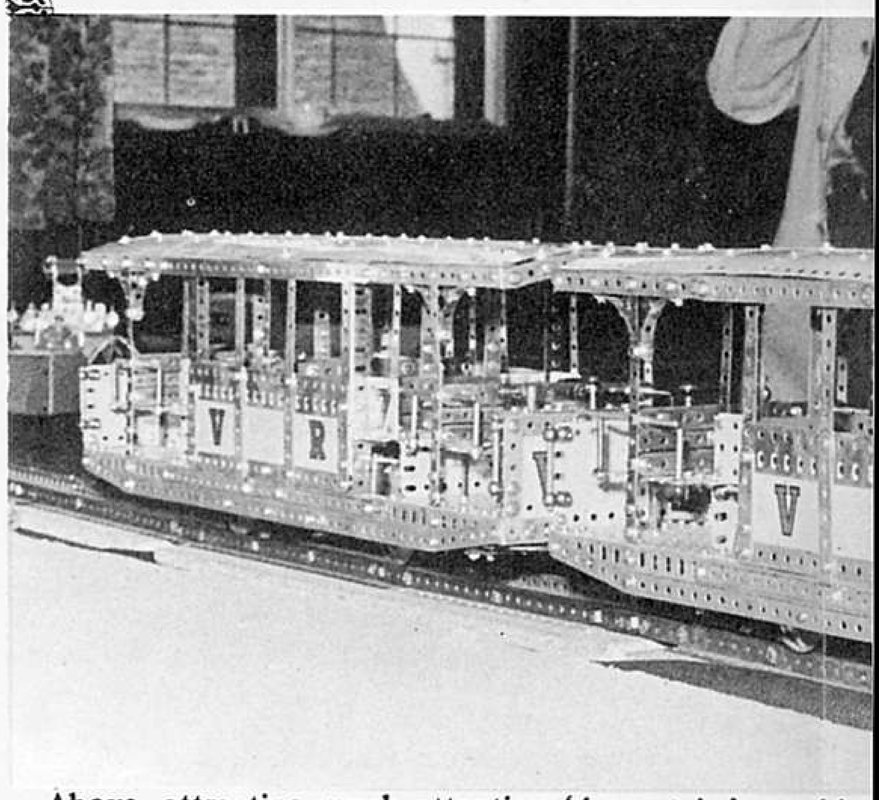
A photo-report
Annual Meccano
in Henley - on
1st and 2nd of



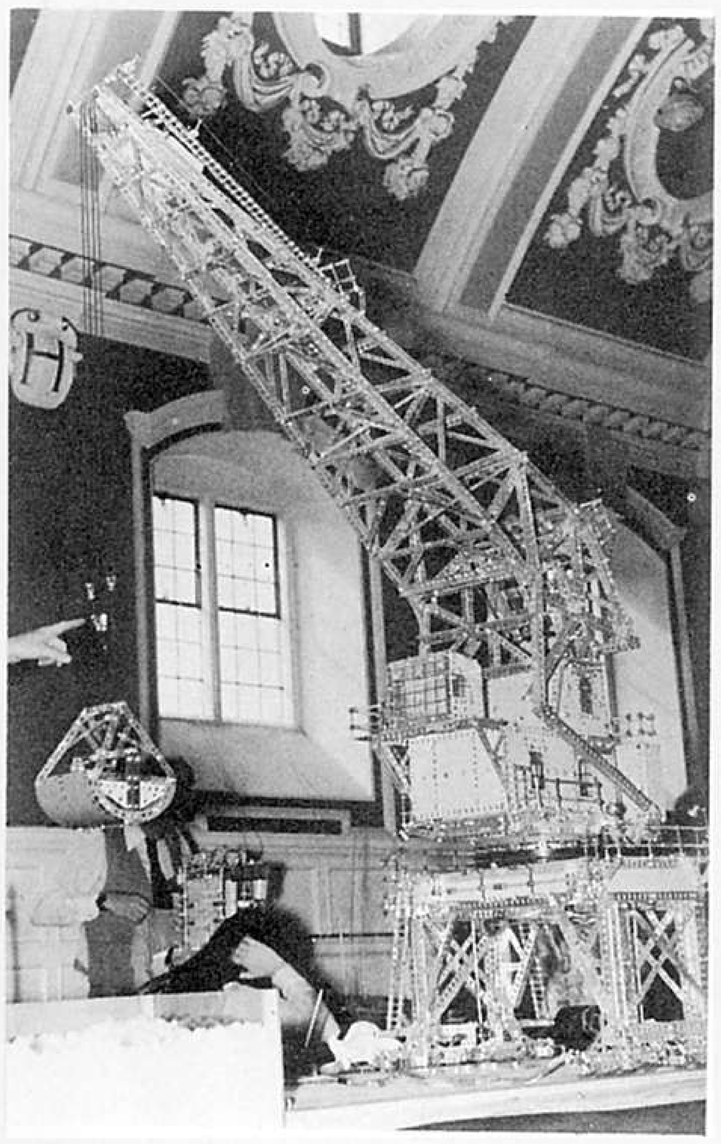
Above, a giant eye-catcher on the stage was this Mexican Railways Locomotive built to a scale of 1½ in. to 1 ft. by Bob Ford of Chalfont St. Peters. Can any reader confirm if it is a Double Fairlie? Left, an intriguing fun model was this 'Meccano Manufacturer' at work drilling holes in Strips! Built by Chris Goodwin of the Solent MC, it was captioned 'Meccano Parts and How to Make Them'!



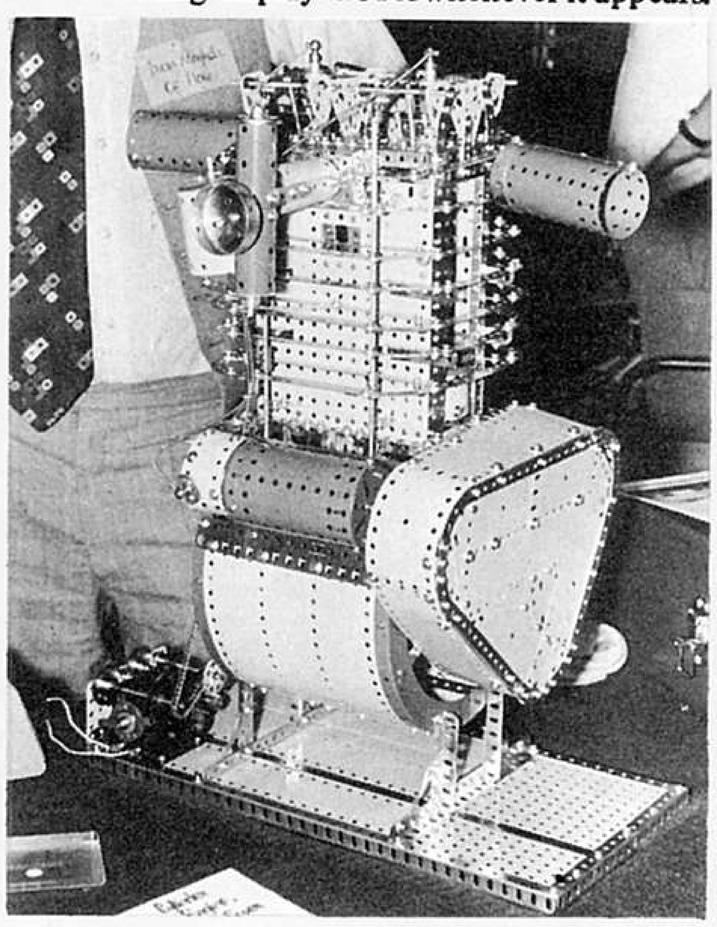
Fairground rides make highly popular Meccano subjects, and you can always rely on Clive Hine of the Midlands MG to produce something particularly outstanding in this sphere. His latest masterpiece, pictured left, reproduces "The Orbiter" and runs through a multiplicity of movements in an entirely automatic programmed sequence

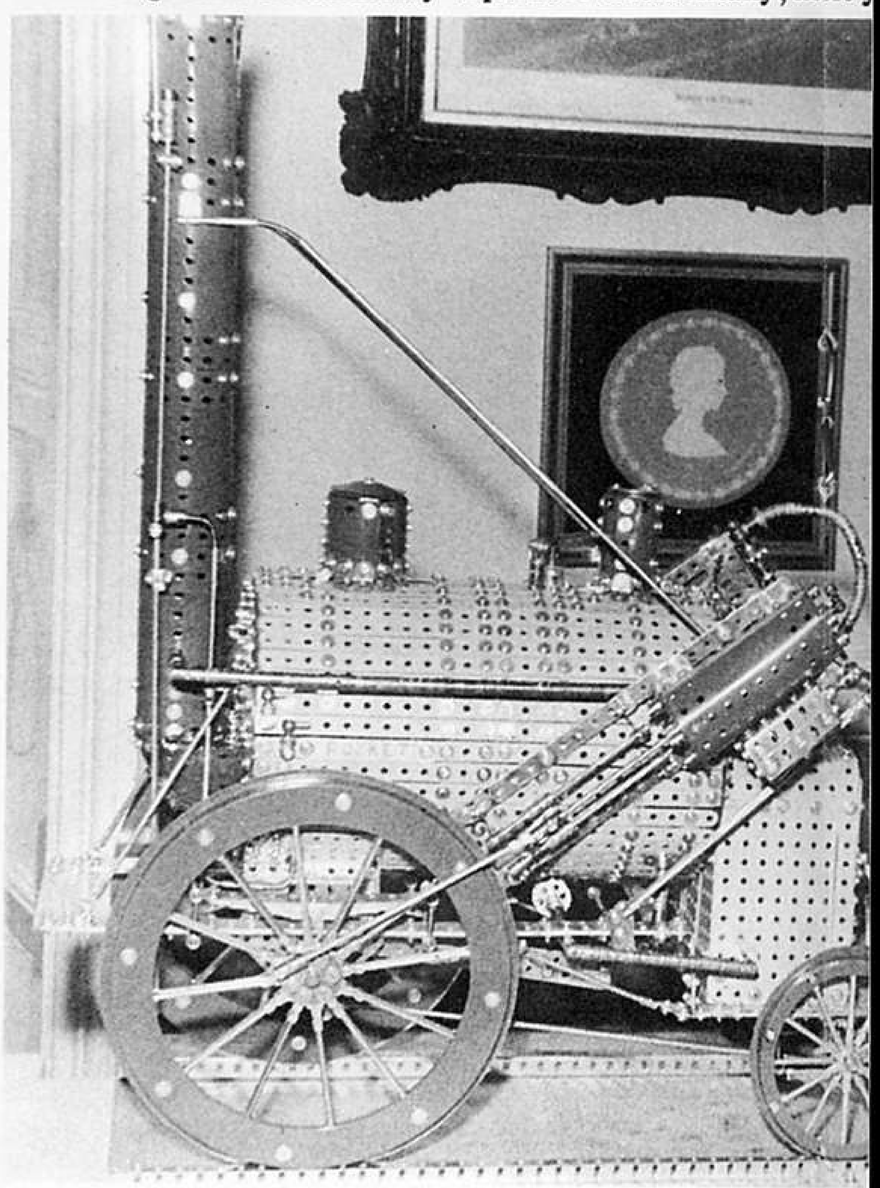


Above, attracting much attention 'downstairs' was this
by Michael Edwards of Brighton and displayed earlier th
Henley for automatic operation, it trundled realistically b
of the Show. We hope to include an article on the Rail
models at the Show, in your Editor's opinion, was th
Terry Pope, Secretary of the Wellingborough and Distri
original were faithfully captured. Incidentally, next y



Below left, one of the giants towering above the crowds was this 1/24th scale 15-ton Level-Luffing Grab Crane by Eddie Oatley. Below, the No. 10 Set Twin-Cylinder Motorcycle Engine by Ivan B. Maykels of Hove – always an interesting display model whenever it appears.

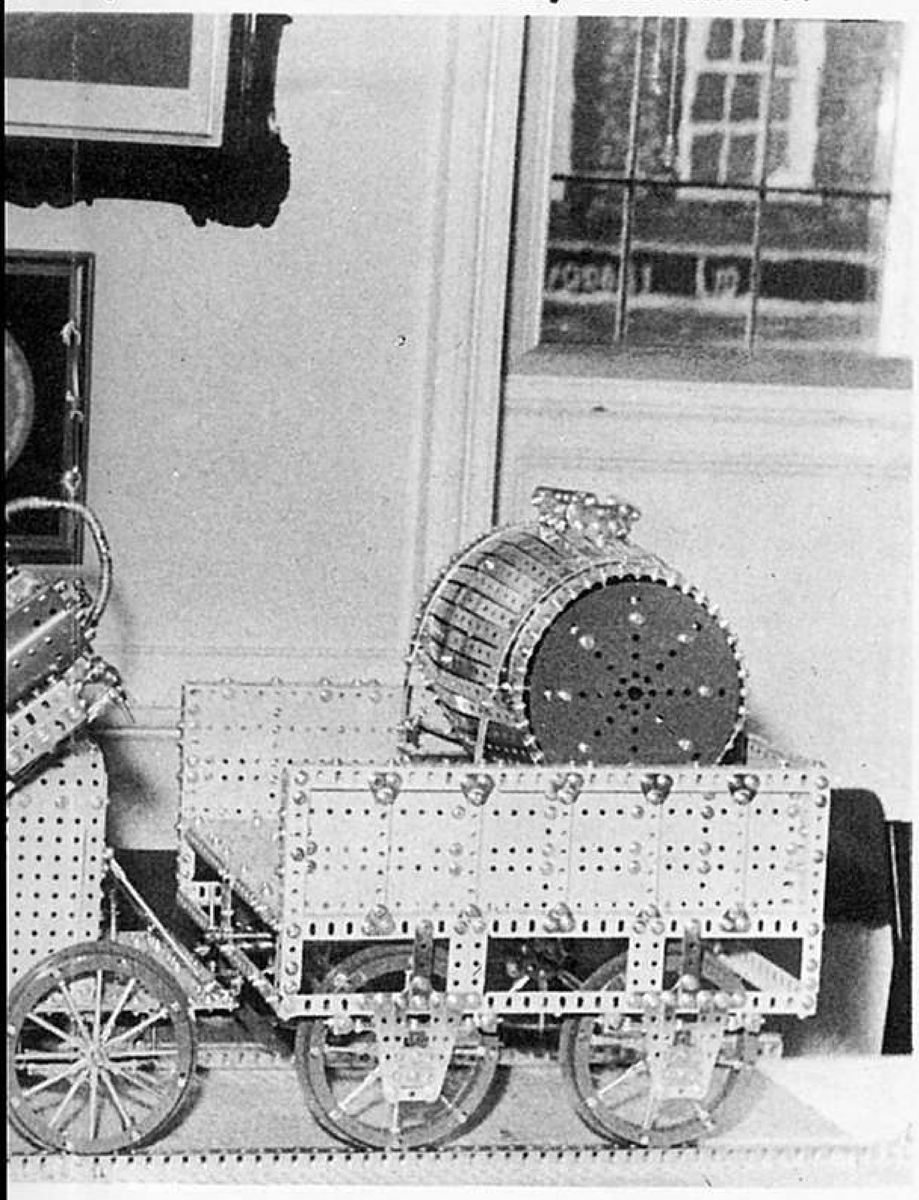


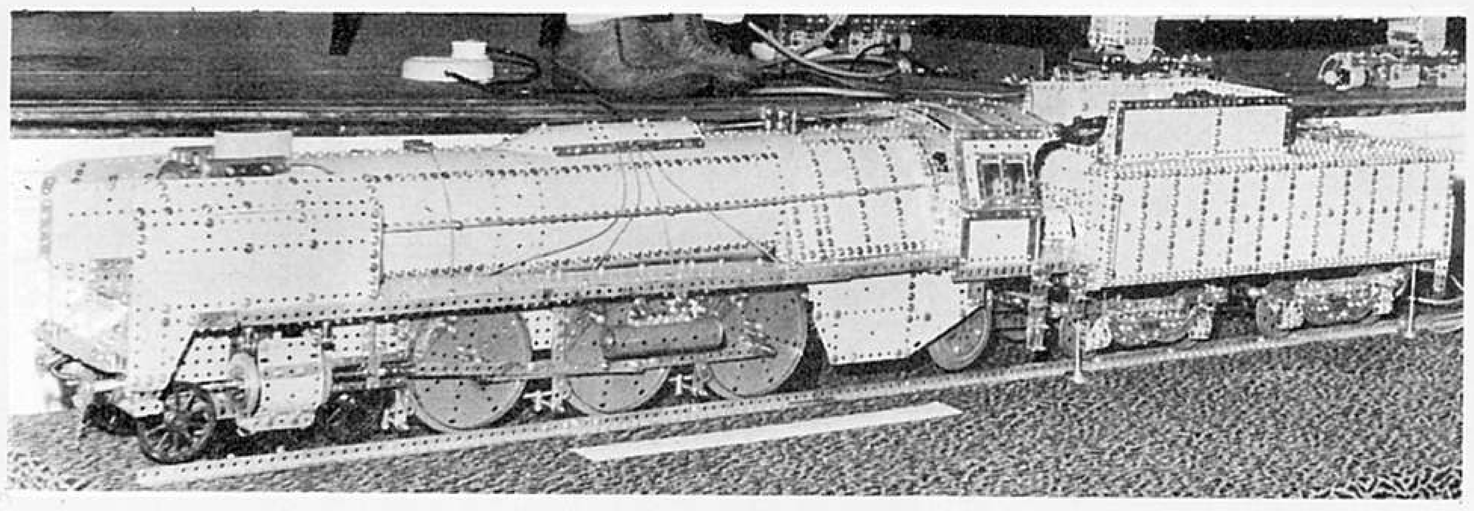


...Y SCENE ...NLEY

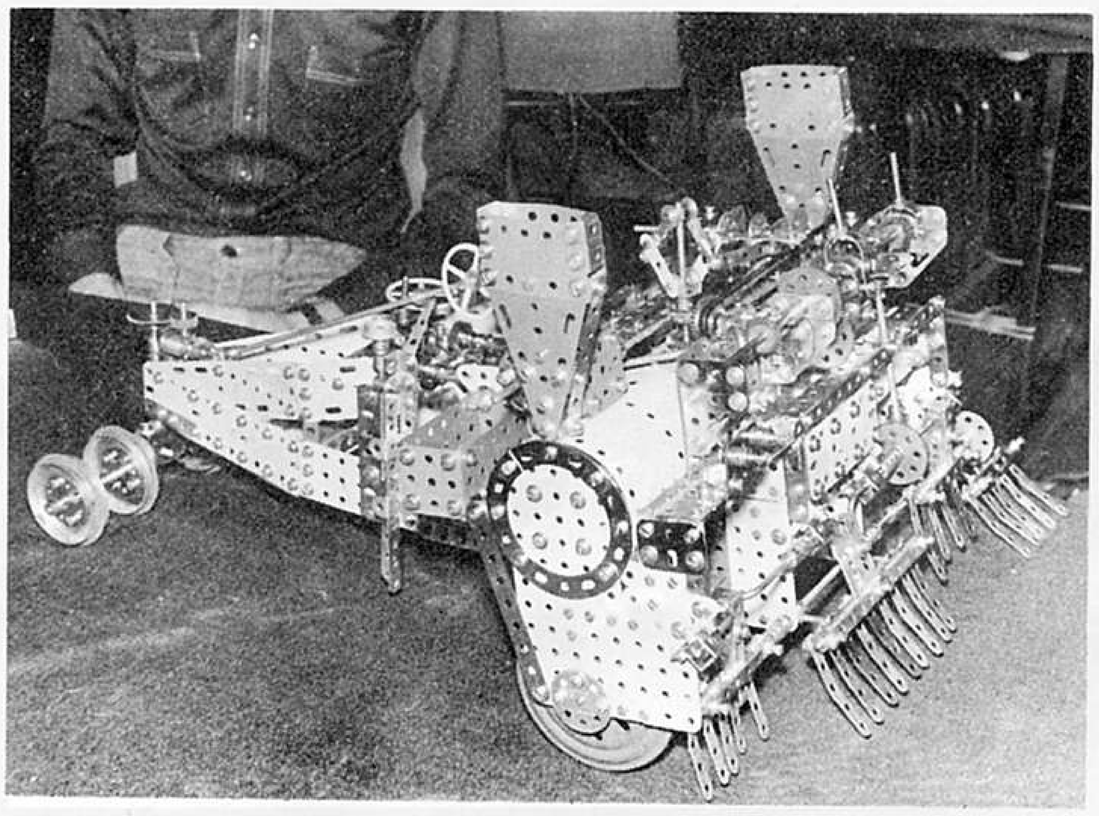
...rt on the Seventh ...ano Exhibition held ... Thames on the ...of September 1978

...was this beautiful model of Brighton's Volk's Railway built ...earlier this year in a Brighton Museum Exhibition. Set up at ...stically back and forth along a short length of track for most ... the Railway in a future MM. Below, one of the finest scale ..., was this reproduction of Stephenson's 'Rocket' built by ...d District MC. All the basic lines and atmosphere of the ...y, next year sees the 150th Anniversary of the 'Rocket'.

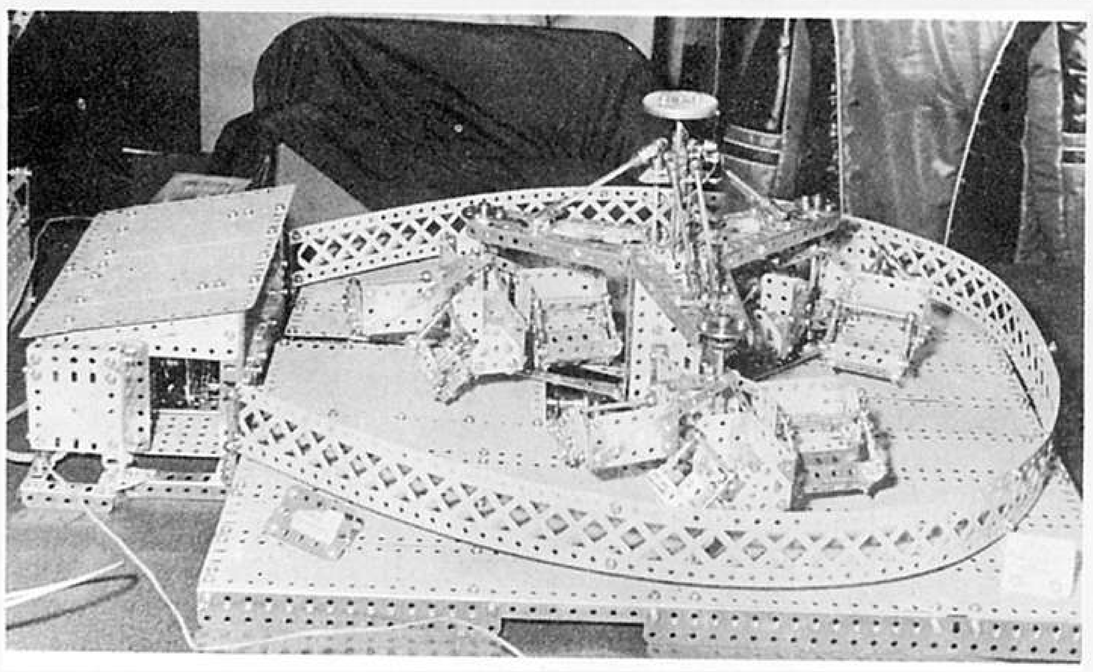




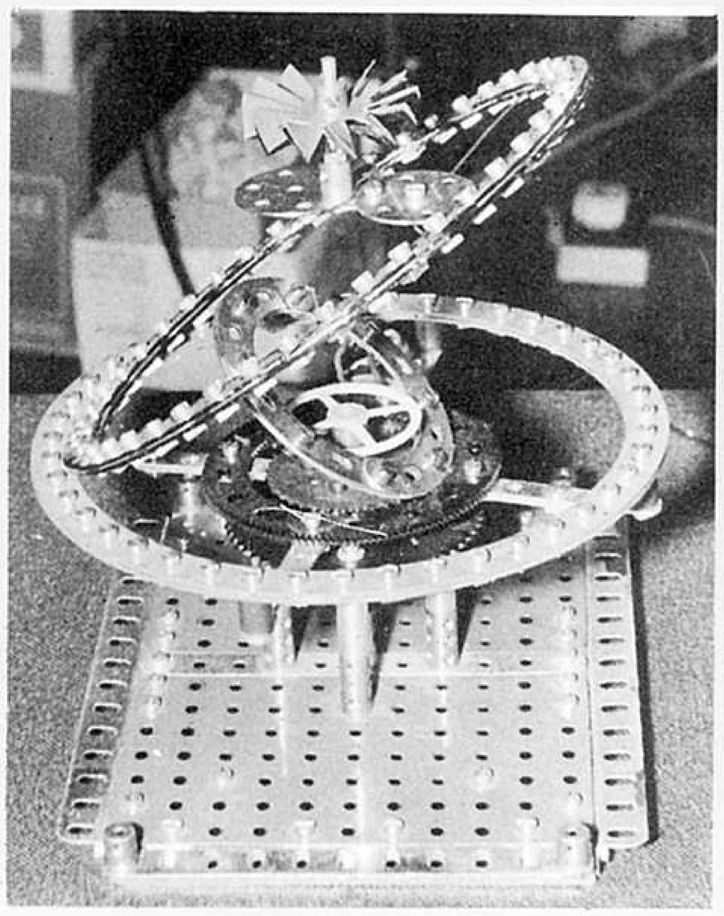
Above, another large and excellent reproduction to be found near the stage was this model of a French Pacific 4–6–2 Locomotive by I. K. Evans of Pembrokeshire. Right, a most unusual model of a Darby Savage Digging Machine built by David Whitmore of Bexley, Kent. Built around 1880, the original could probably be described as the forerunner of the mechanical plough.

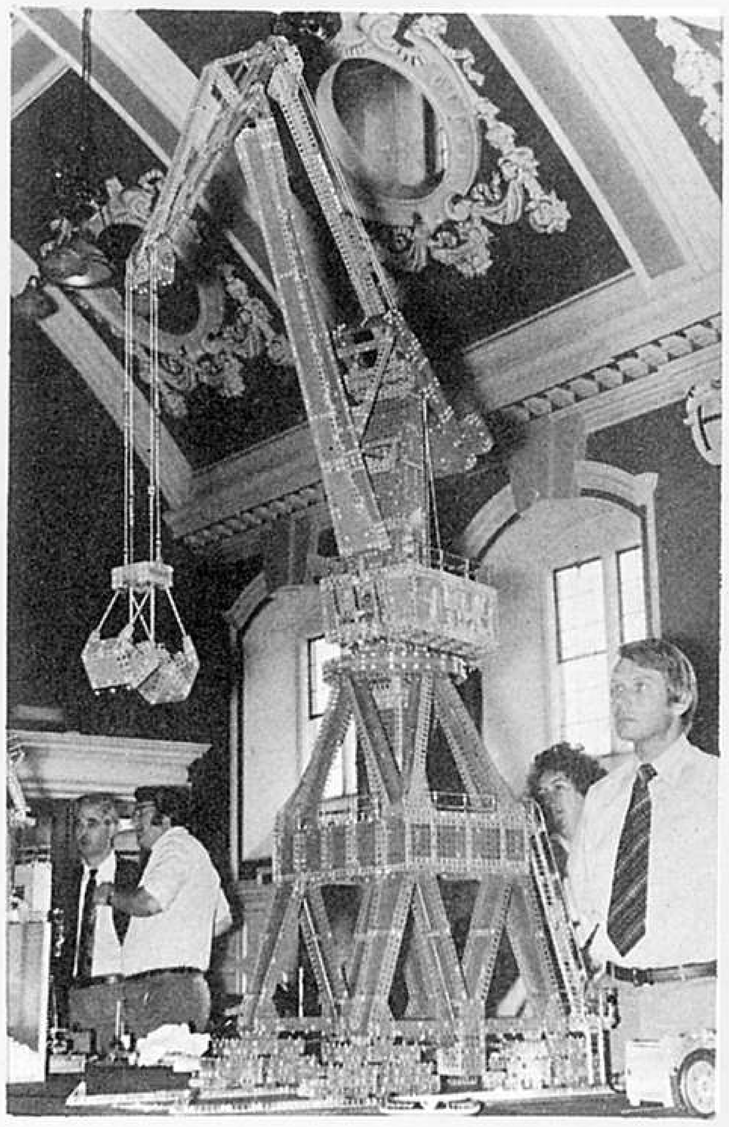


Right, another appealing fairground ride was this 'Fairground Twist' built and demonstrated at Henley by Mike Cotterill of Skegness, a member of the active North Midlands Meccano Group. Some measure of the visual popularity of this and the other fairground models at the Show could be had by simply looking at the delighted expressions on the faces of visitors!



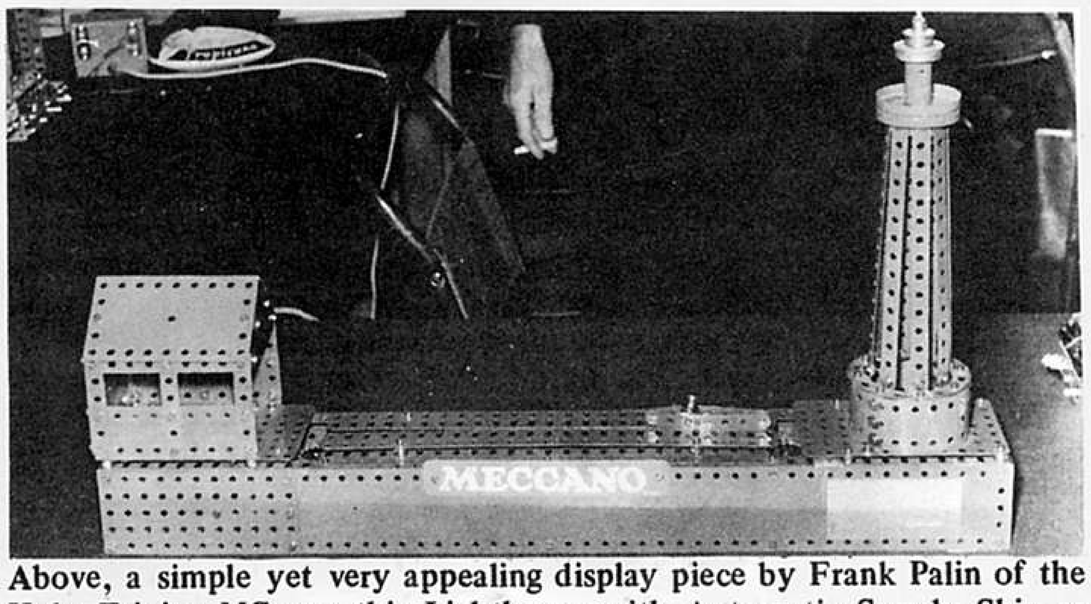
Below, Optical Illusion by Bert Halliday of London. When it's spinning, the upper parts seem to be floating, unattached, in the air! Below right, an exhibitor all the way from Holland, Hubert J. Van Wyngaarden with his giant 1/20th scale 25-Ton Slewing Grab Crane.



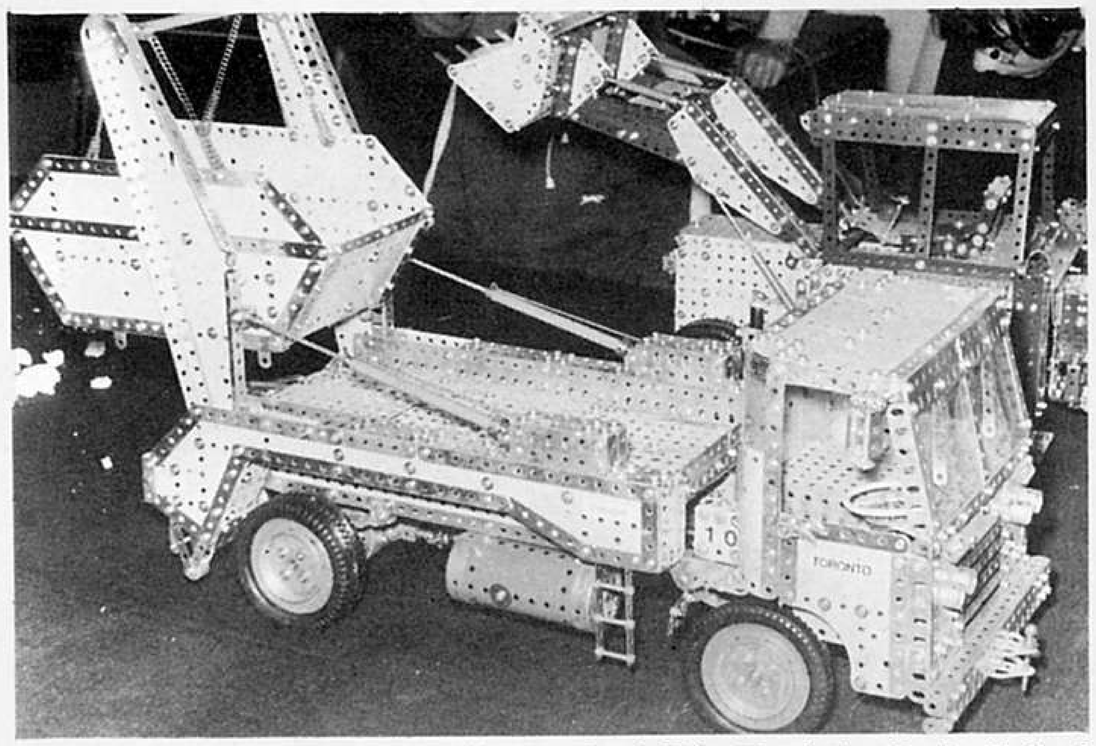


SHOW SCENE HENLEY

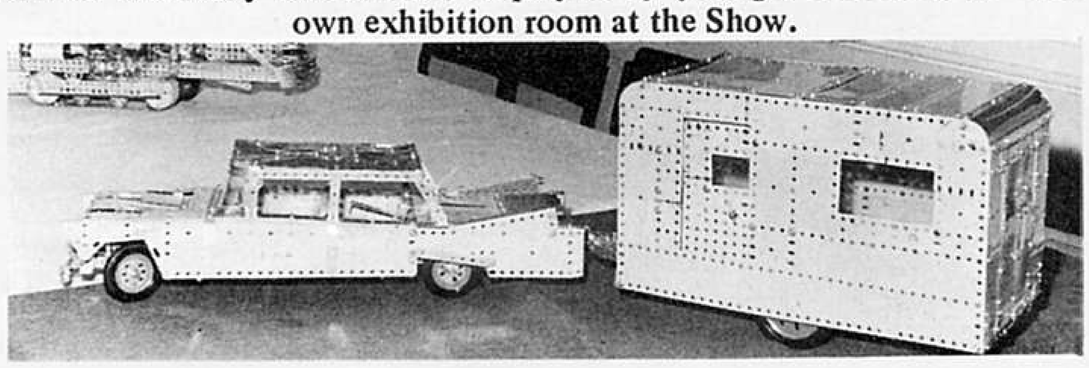
More sights from the seventh Annual Meccano Exhibition which again proved a great success

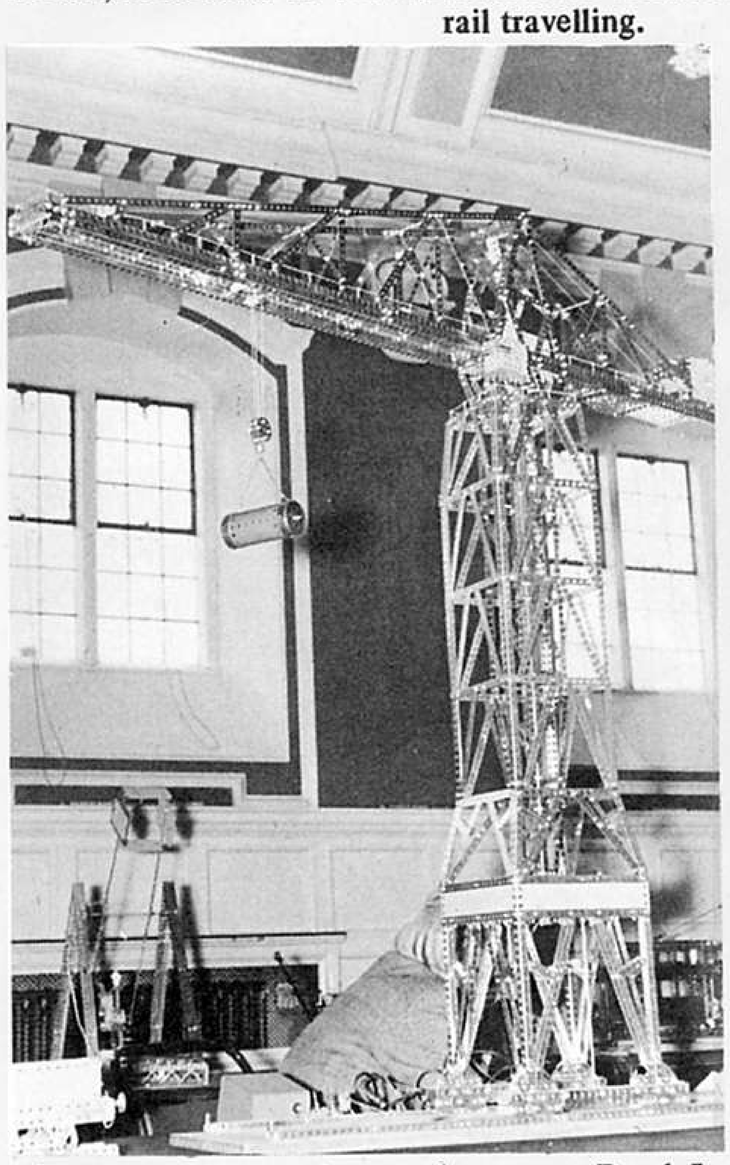


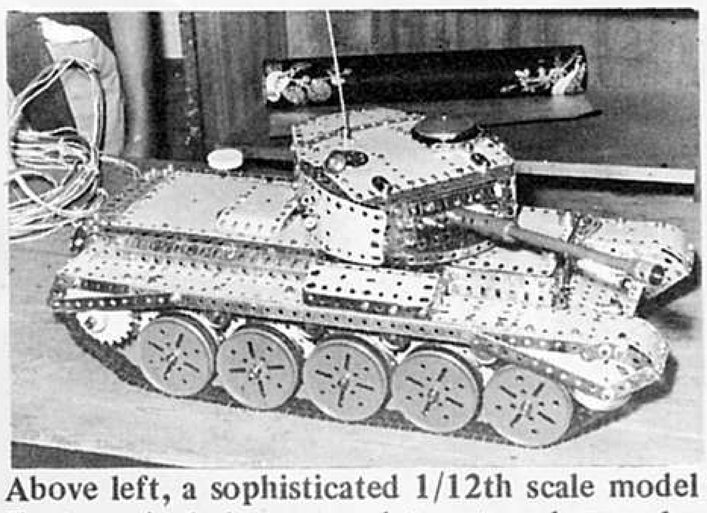
Above, a simple yet very appealing display piece by Frank Palin of the Holy Trinity MC was this Lighthouse with Automatic Supply Ship as first featured in the November 1957 MM. Below, another of the giants on display was Tom Mallow's 20-ton Travelling Crane. Remotely controlled, it features all the movements of a full-size crane including fixed rail travelling.

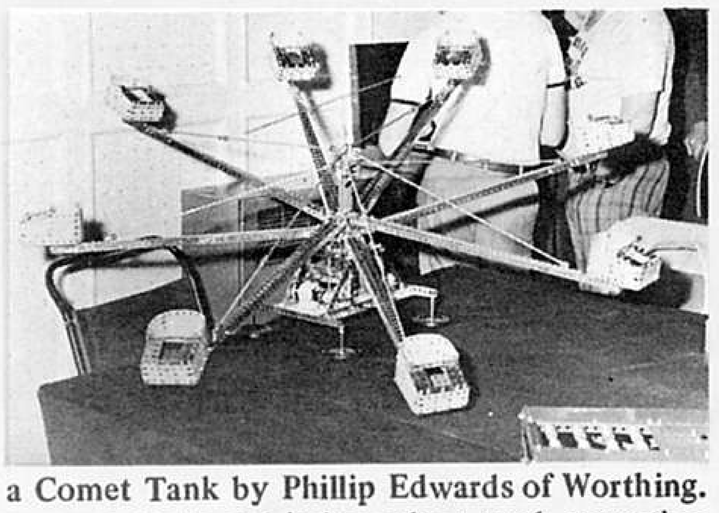


Above, a very neat and appealing Bedford Skip Truck by Kevin Hall of Horndean. It features working power-operated skip movement, steering and full remote control. Below, 12-year-old Geoffrey Routledge of Woodford Green, Essex, is to be congratulated for this Car and Caravan, one of the many fine models displayed by younger modellers in their own exhibition room at the Show.

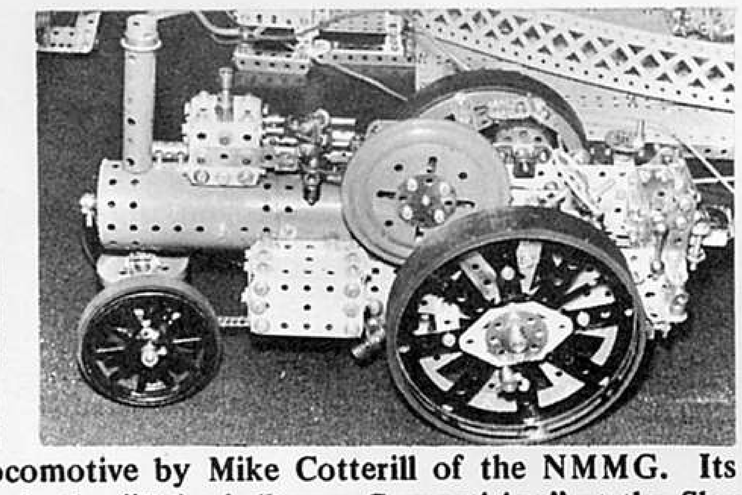


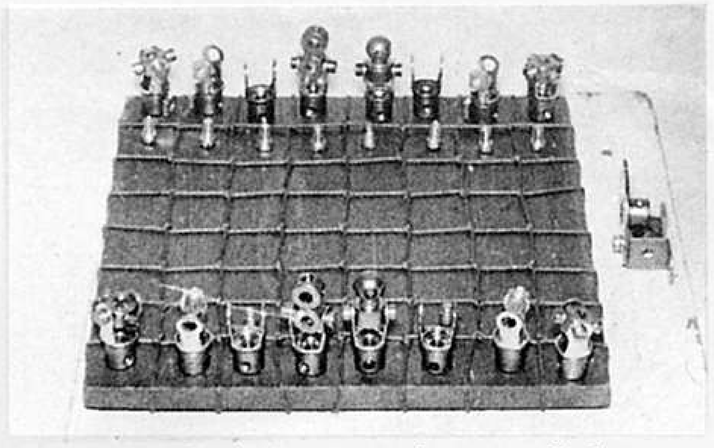




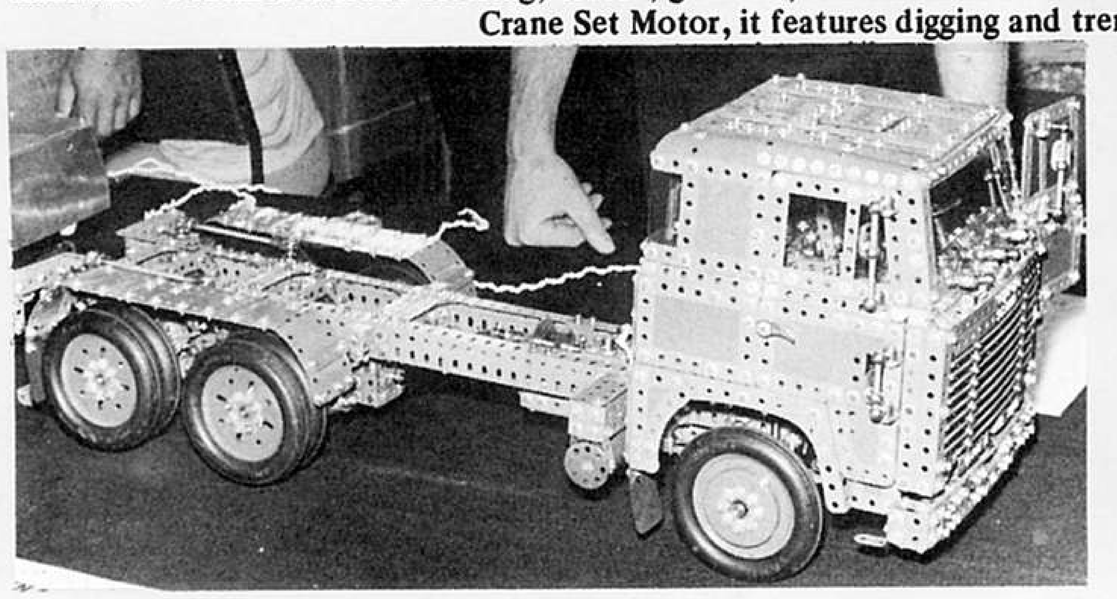


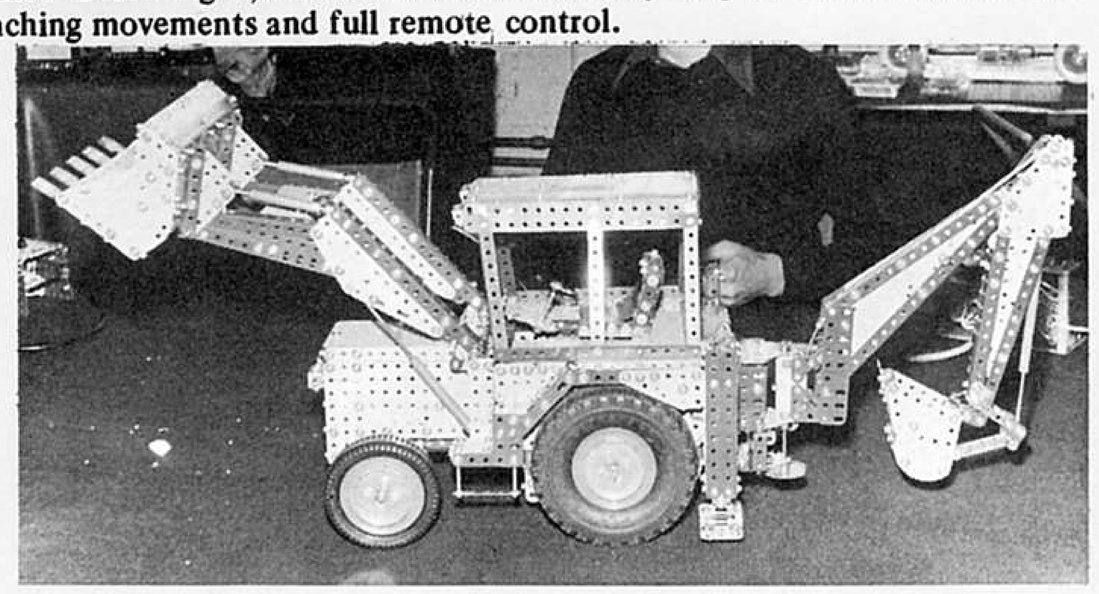
Above left, a sophisticated 1/12th scale model of a Comet Tank by Phillip Edwards of Worthing. Features include powered turret and gun elevation movements and independent track operation from a single drive unit. Above right, an 'Octopus' fairground ride of freelance design, the builder of which we were unfortunately unable to identify. We should be grateful if he will contact us so that we may give him credit for his work in a future MM.





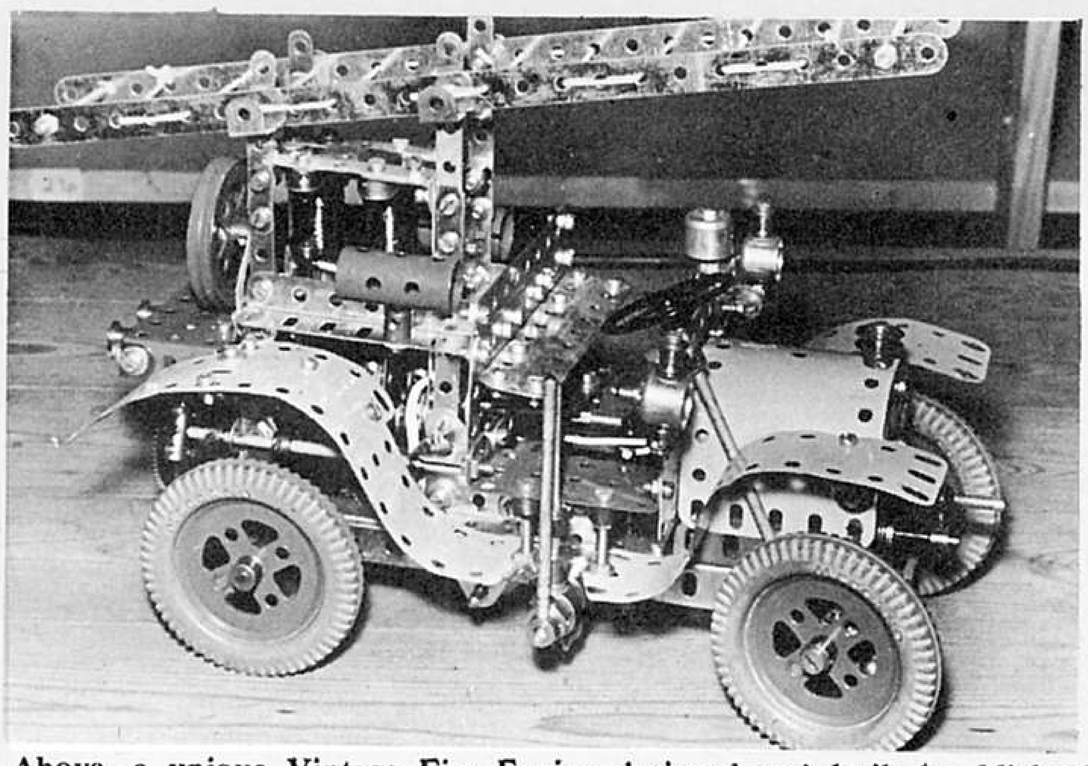
Above centre, a neat general purpose Road Locomotive by Mike Cotterill of the NMMG. Its many features include remotely-controlled power steering. Above right, a particularly novel entry in the "Baker's Dozen Competition" at the Show was this Chess Set by Alan Partridge. Excluding the Bolts, it uses only 13 parts! Below left, another model all the way from Holland was this detailed Scania Motor Chassis by Mr. T. de Nys of Haarlem. Features include steering, clutch, gearbox, differentials and tilt-cab. Below right, a JCB Loader Trencher by Stephen Hall. Powered by a Crane Set Motor, it features digging and trenching movements and full remote control.



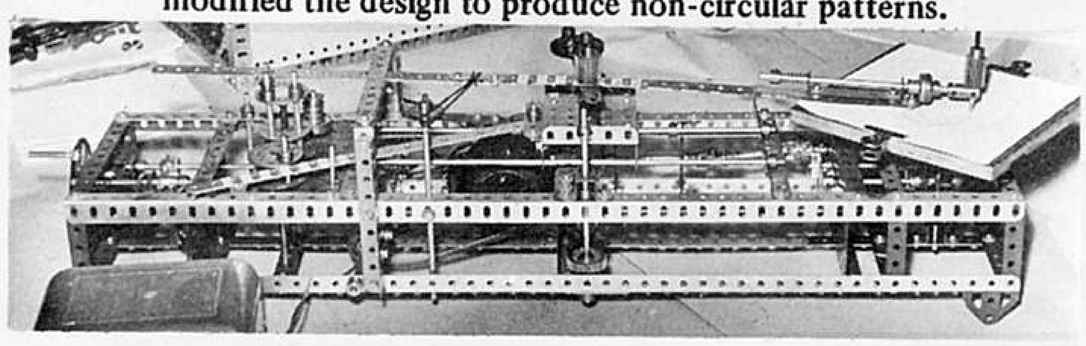


SHOW SCENE STONELEIGH

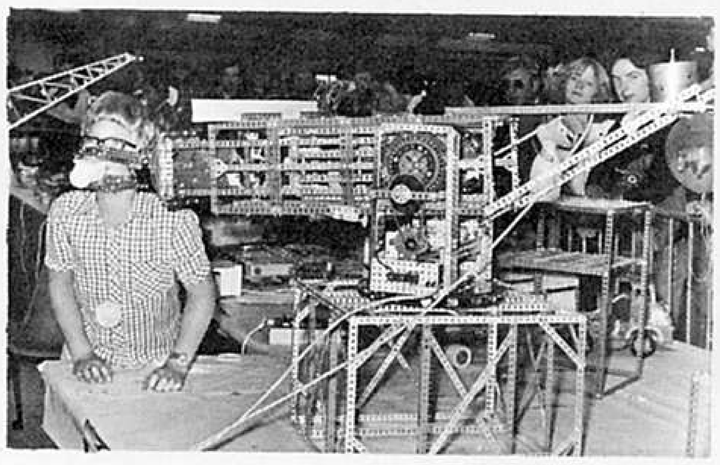
Just a few of the fine models displayed at the MMG's cup-winning Exhibition, Aug 21-23.

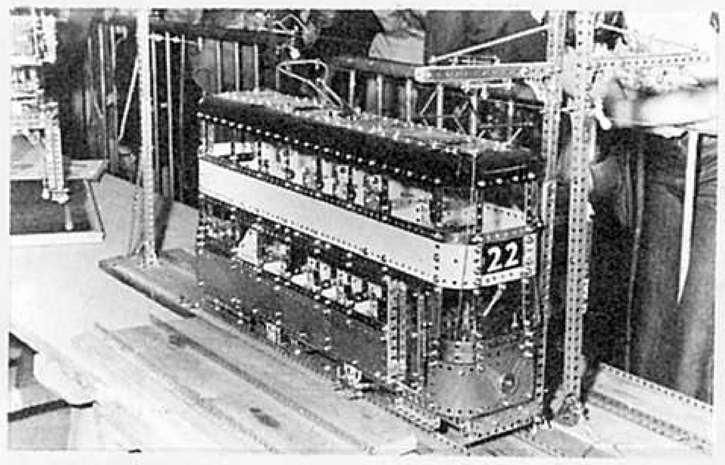


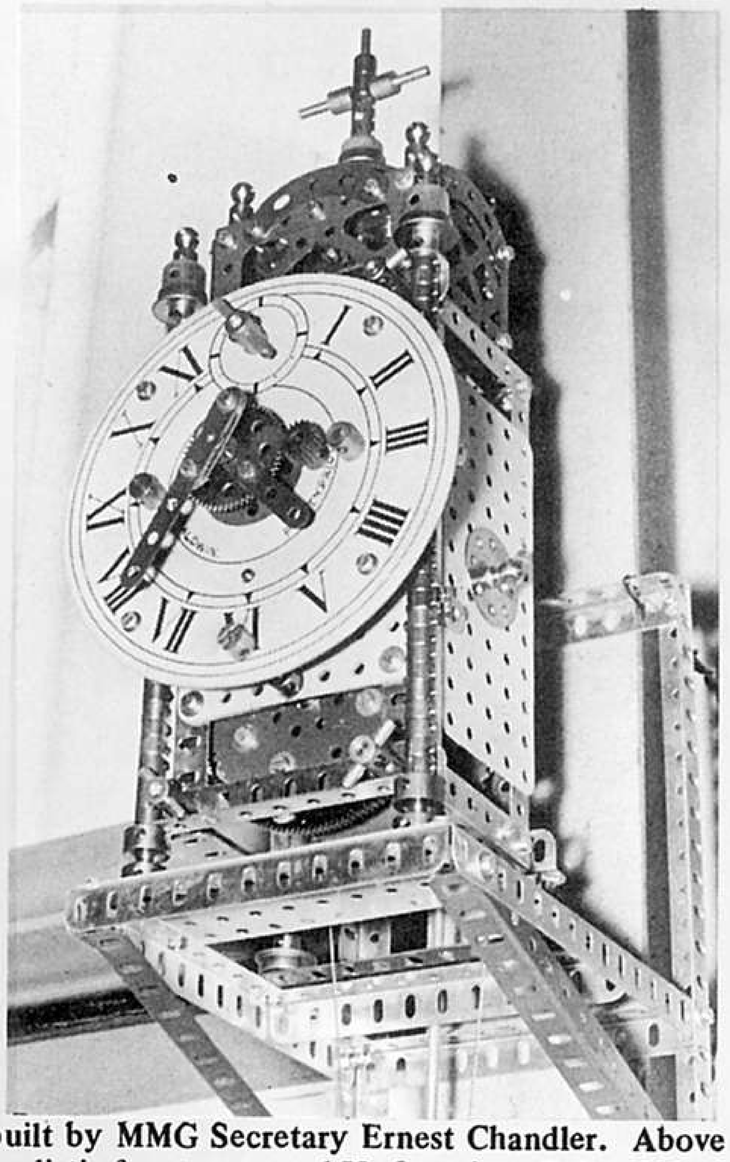
Above, a unique Vintage Fire Engine designed and built by Michael Edwards of Brighton. Driven by a built-up electric piston engine, this model was one of the most intriguing presentations at the Show. Below, a Meccanograph Designing Machine built by Eric Baldwin and based on an original Meccanograph featured in a 1916 MM. However, Eric has modified the design to produce non-circular patterns.



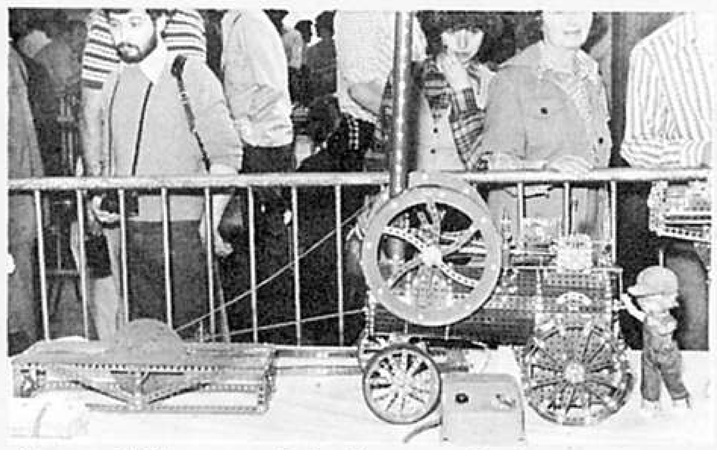
Above, James Gilbert of Rugby, winner of the Sunday Mercury Challenge Trophy for the best model (9–12 age group) in the whole model exhibition at Stoneleigh, pictured with his Cups and the Articulated Lorry which won him the title. The Midlands MG itself won the award for the best, most appealing display in the whole model exhibition. Below, Eric Baldwin's Bracket Clock based on an original design by Pat Briggs.

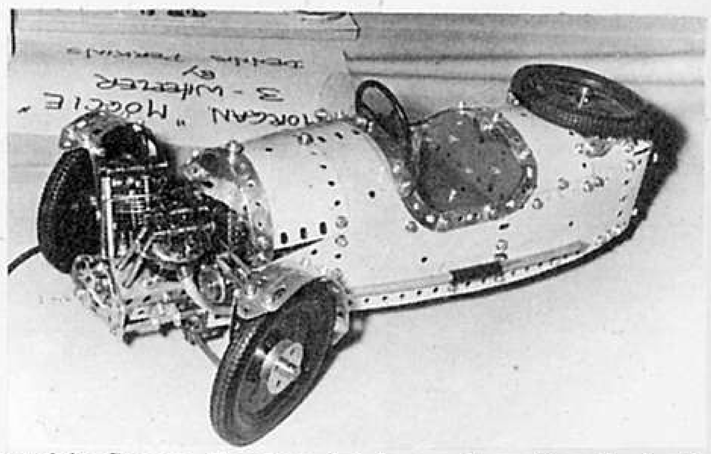




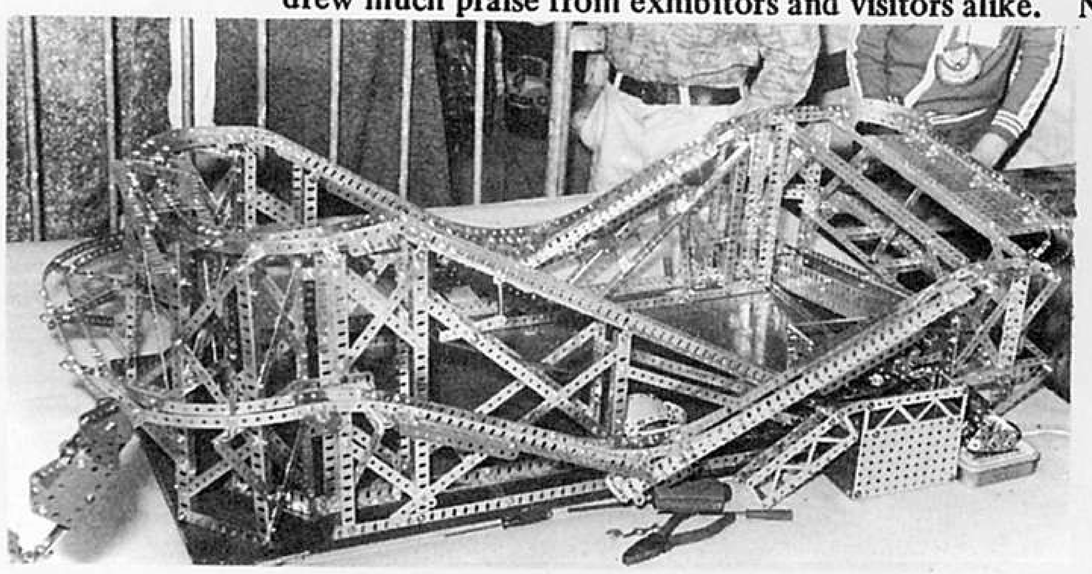


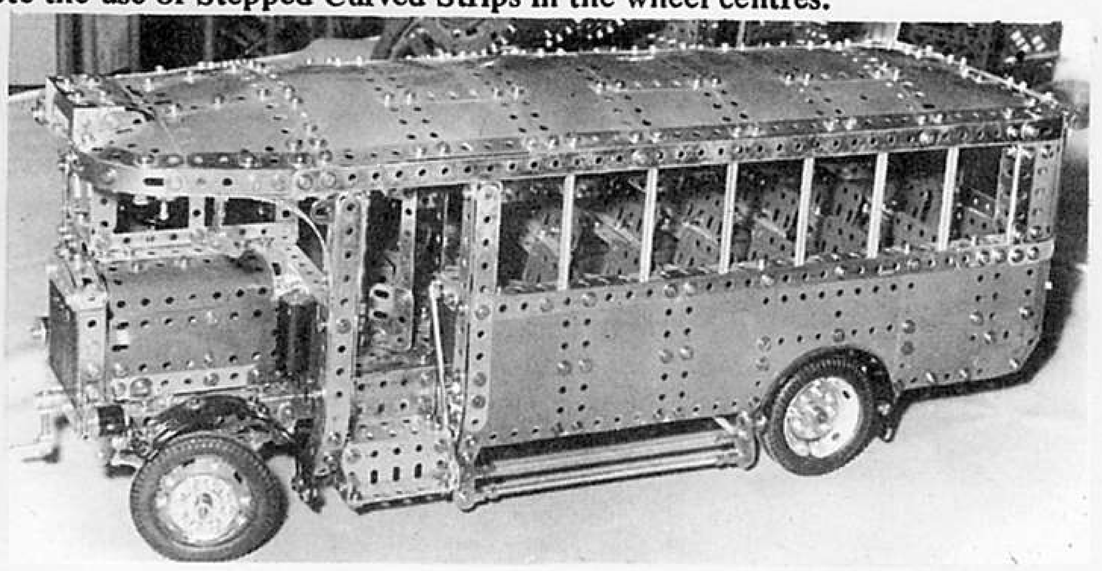
Above left, a fascinating remotely-controlled 'Bionic Arm', built by Nicholas Wright, feeds a drink to James Gilbert during the Show. The arm revolves and extends; the hand revolves and the 'claw' opens and closes. Above right, a beautifully appealing Double Deck Tramcar based on a Leeds 'Lance Corporal' and built by Esmond Roden, MMG President, as the latest addition to his now extensive tramway collection. Esmond's Trams always attract a great deal of attention.





Above left, a model of an early horse-drawn Portable Steam Engine driving a Saw Bench, both built by MMG Secretary Ernest Chandler. Above centre, a neat Morgan "Maggie" 3-wheeler built by long-time modeller Dennis Perkins. Note the realistic front-mounted V–2 engine. Below left, a very comprehensive and intriguing model in the fairground ride series was this Big Dipper designed and built by Mike Cuff. Below right, a superb reproduction of a Leyland Lion PLSC Omnibus built by Tom Pettitt of Northampton. Packed with detail, it captures all the feel of the subject and drew much praise from exhibitors and visitors alike. Note the use of Stepped Curved Strips in the wheel centres.





MECCANO MAGAZINE

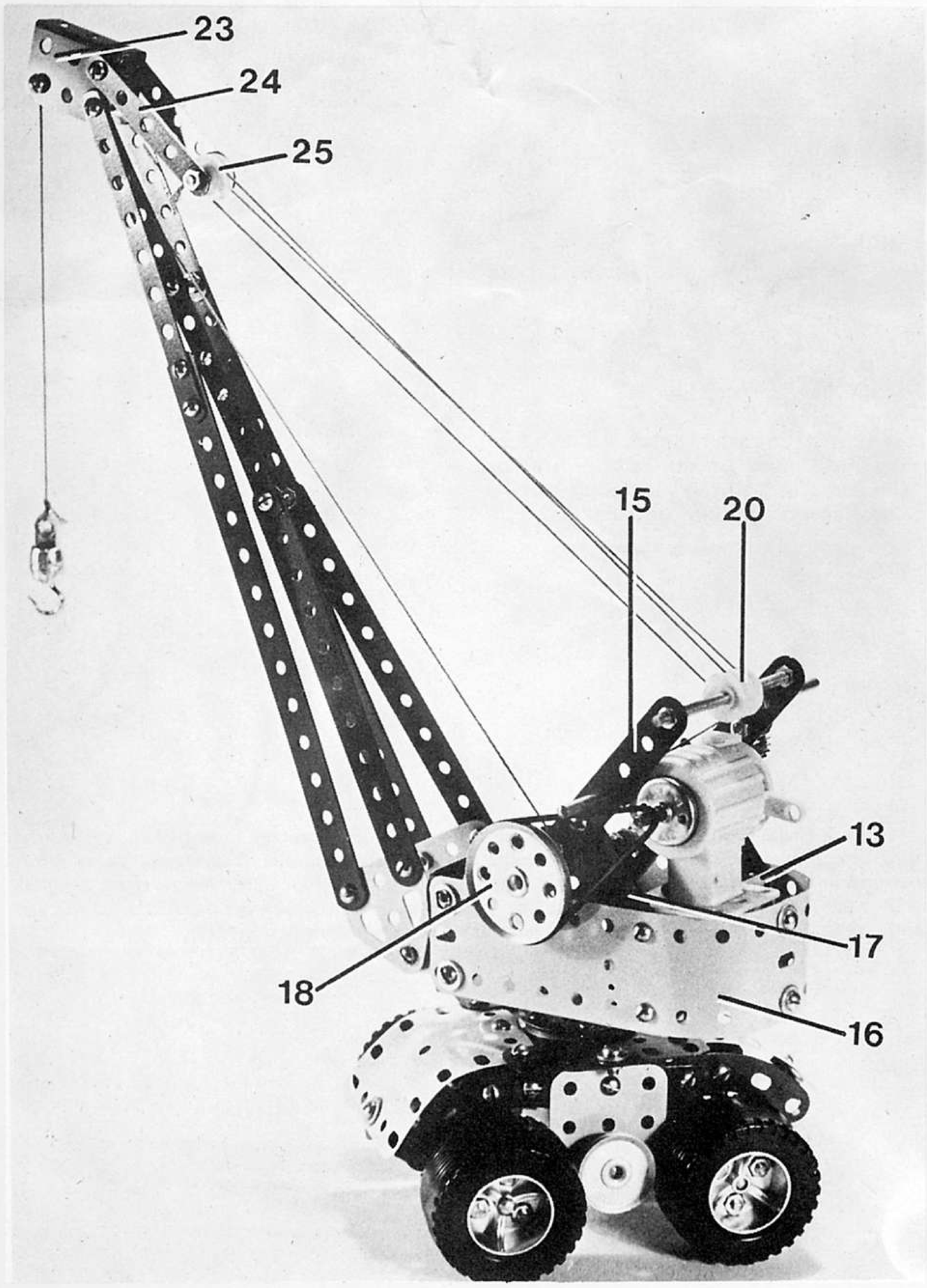
A favourite Meccano subject built for the first time from the new 1978-type No.3 Meccano Set

A MOBILE CRANE

Described by 'Spanner'

In July we made Meccano Magazine history by featuring our first-ever model built with a new 1978-type Meccano Set – a Formula 1 Racing Car built with the No. 3 Set. Now in October we go one step further with this very well-proportioned model of a Mobile Crane which, although it is also built from a No. 3 Set, qualifies as the first model of its highly popular type to be built with this new outfit. Fully operating, it features load-hoisting, jib-luffing and crane-slewing movements, the load-lifting operation being motor-powered thanks to the electric motor in the set. It should also be said that the new wheels are ideal for this model being in perfect scale, as a glance at the accompanying illustrations show.

Describing construction of the mobile chassis first, this is built up from a 1½" Pulley, to the underside of the face of which two parallel 3½" x ½" Double Angle Strips 1 are bolted with, between them, two Formed Slotted Strips 2, one extending forward and one extending rearwards. Bolted to the lugs of the Double Angle Strips at front and back is a 2½" x ½" Double Angle Strip 3, while bolted to the Formed Slotted Strips at front and back is a 2½" x 2½" Plastic Plate 4. Bolted between the inner corners of the Plastic Plates at each side is a 2½" Flat Girder 5, to the centre of which a 1½" x 1½" Flat Plate 6 is attached by an Angle Bracket, the securing Bolt also fixing a 2½" Narrow Strip to the upper inside edge of the Flat Plate. The ends of this Strip are bolted to two 2½" Stepped Curved Strips 7 which are themselves bolted to the lugs of Double Angle Strip 3. Note that the Bolt fixing each Curved Strip 7 to the Double Angle Strip lug at one end of the chassis also fixes a 1½" x ½" Double Angle Strip 8 to the same lug, the smaller Double Angle Strip projecting two holes vertically downwards. Locked by nuts in the lower hole of this Double Angle Strip is a 1 $\frac{1}{8}$" Bolt on which one of the new Road Wheels freely rotates. At the other end of the chassis, instead of Double Angle Strips 8, two Fishplates 9 are bolted to Double Angle Strips 3 and attached to these by Corner Angle Brackets is another 2½" x ½" Double Angle Strip 10, in the lugs of which a 4" Rod is journalled. This Rod carries the remaining road wheels.



Journalled in the lower centre hole of one 1½" Flat Plate 6, and in the lug of a ½" Reversed Angle Bracket bolted to it, is a 2½" Rod, on the inner end of which a Multi-purpose Gear 11 is fixed, this Gear being spaced from the Reversed Angle Bracket by four Washers. A 1" Pulley is fixed on the outer end of the Rod. The Multi-purpose Gear meshes with another Multi-purpose Gear on the lower end of another 2½" Rod free in the boss of the 1½" Gear Wheel, but fixed in the boss of a 57-teeth Gear above the Pulley.

This Gear is fixed to the underside of the crane body which is provided by a 3½" x 2½" Flanged Plate 12, to the rear flange of which a 2½" x 1½" Flanged Plate 13 is fixed. Secured to the forward flange of the Plate is a 2½" x 1½" Plastic Plate, the securing Bolt also fixing two rearward-pointing ½" Angle Brackets inside the Plate, and two forward-pointing 1" x ½" Angle Brackets 14 outside the Plate. Bolted to the spare lug of each ½" Angle Bracket is a 5½" Strip 15 and a 5½" x 1½" Flexible Plate 16, the upper front corner of which is bolted to the lug of a 2½" x ½" Double Angle Strip bolted inside the upper edge of the Plastic Plate. Strips 15 are angled rearwards and each is braced by a 2" Strip 17 bolted between the fifth hole in the Strip and the upper end hole in the flange of Flanged Plate 13, the latter securing Bolt also fixing Flexible Plate 16 to the Flanged Plate.

Bolted to the upper edge of Flanged Plate 13 is a 1½" Angle Girder to which the Electric Motor is fixed. The output shaft of the motor is connected by a driving band to a 1½" Pulley 18 fixed on one end of a 3½" Rod held by a Spring Clip in the seventh holes of Strips 15. This Rod later serves as the winding drum for the load hook cord. The winding drum for the jib-luffing cord, on the other hand, is provided by a 4" Rod held by a Spring Clip in the fourth holes of Strips 15. Fixed on the end of this Rod is a 19-teeth Pinion 19, to the boss of which an Angle Bracket is fixed, the Angle Bracket being clamped between two Nuts on the shank of a ½" Bolt screwed into one threaded bore of the Pinion. A Long Threaded Pin is held in the other lug of the

Angle Bracket to serve as a winding handle. The Rod must be free to slide approximately ½" in its bearings so that, with the Rod inwards, the ½" Bolt makes contact with another ½" Bolt fixed by Nuts in the third hole of nearby Strip 15 to serve as a locking device for the jib control. A 3" Screwed Rod carrying two ½" Plastic Pulleys 20 is fixed by Nuts in the upper end holes of Strips 15.

Turning to the jib, each side is built up from a Flat Trunnion 21 extended by two 11" compound strips 22, one built up from a 7½" Strip extended by a 4½" Narrow Strip and the other

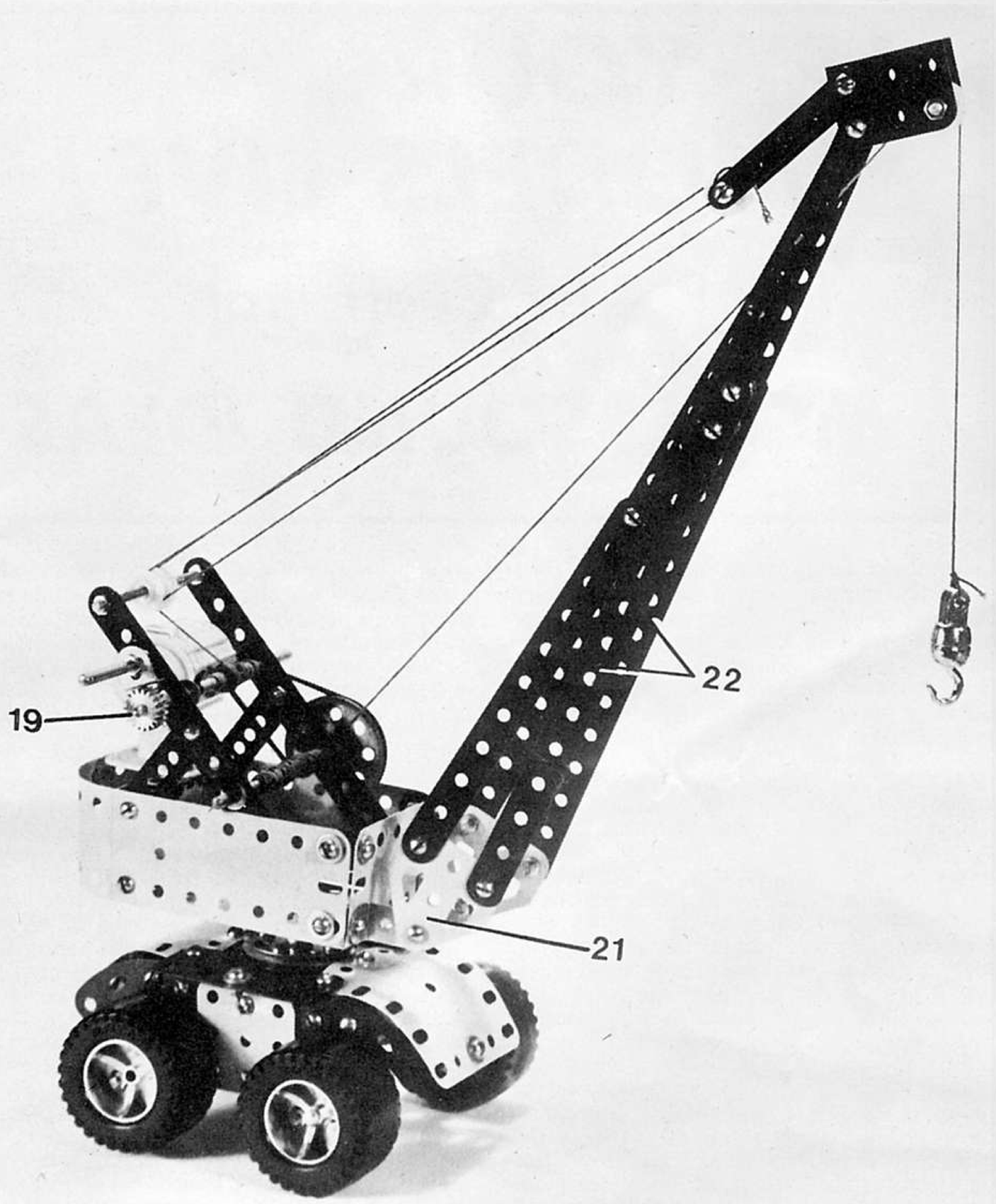
PARTS REQUIRED

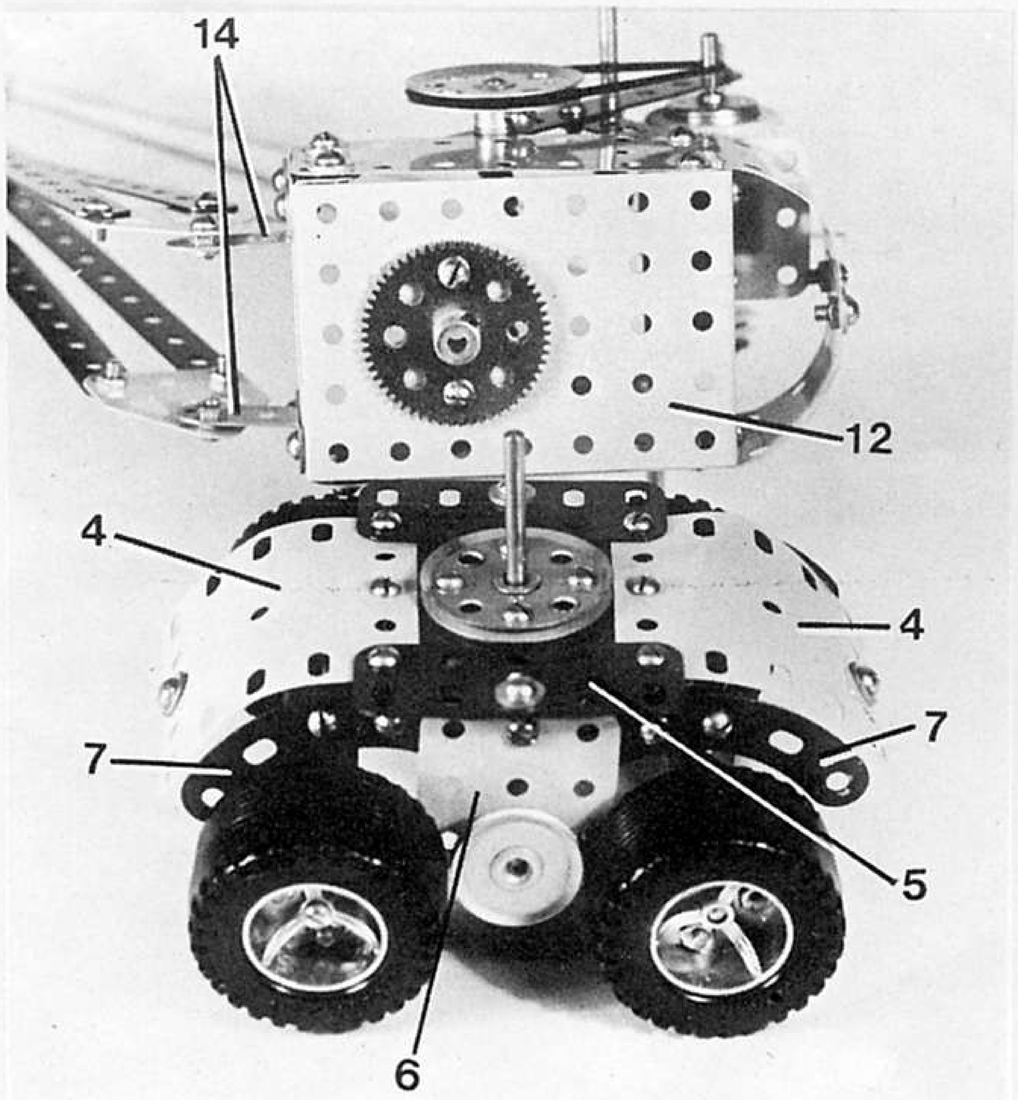
2– 1a	1–26	1– 57c	1–154b
4– 2	1–27a	6– 69a	1–160
2– 6	2–27f	2– 74	1–186a
2– 9f	2–35	1– 80c	2–189
2–10	75–37b	4– 90a	1–194
4–12	112–37c	2–103f	2–194a
2–12b	14–38	2–111	2–215
2–15b	1–40	13–111a	4–235
1–16	2–48	2–111d	2–235a
2–16a	4–48a	1–115a	2–235b
2–21	2–48b	1–125	2–235d
1–22	1–51	2–126a	4–187c
4–23	1–53	1–154a	

1 Junior Power Drive Motor Mk. 2.

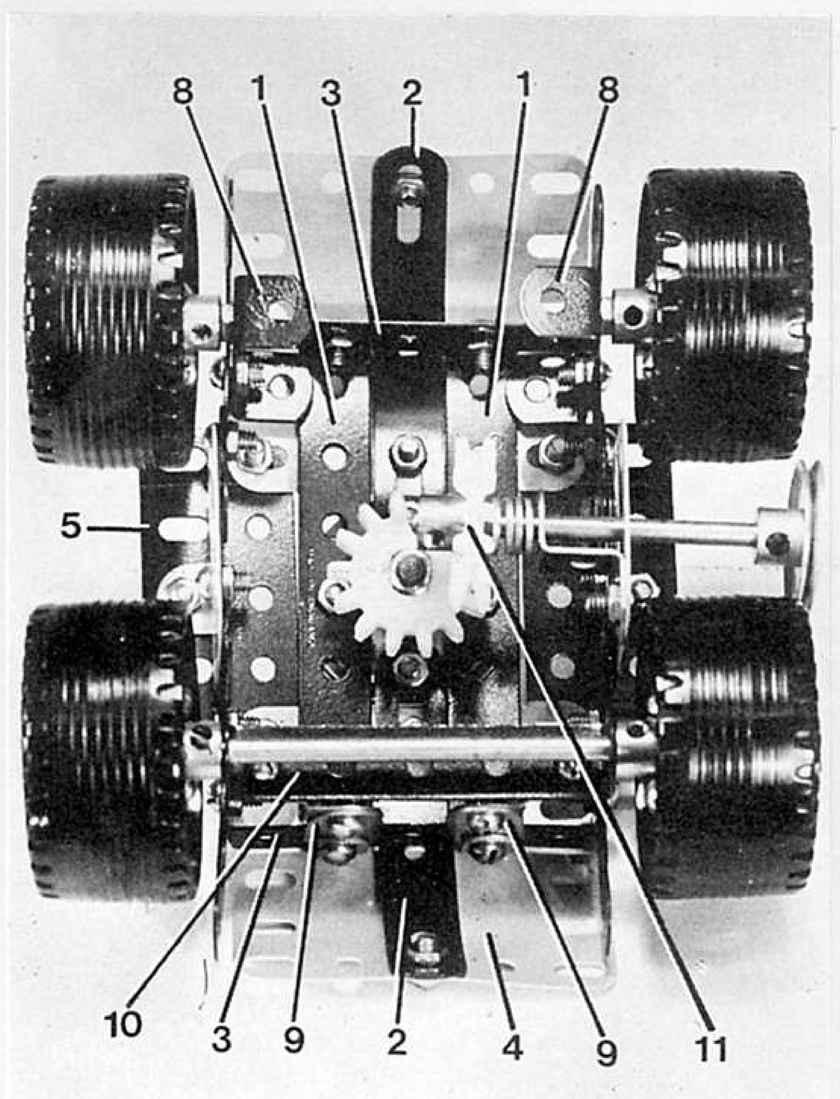
built from a 5½" Strip extended by a 3½" Narrow Strip, itself extended by a 3" Narrow Strip. At their upper ends, Strips 22 are tightly bolted to a Channel Bearing 23 through the rear corner holes of its flanges. The Channel Bearing is angled as shown, then two 2½" Narrow Strips 24 are pivotally attached by lock-nutted Bolts to the remaining rear holes in the flanges, the inner ends of these Narrow Strips being connected by a ¾" Bolt, on the shank of which a ½" Plastic Pulley 25 is carried. A further ½" Plastic Pulley is carried on another ¾" Bolt fixed in the front corner holes of Channel Bearing 23 and it is over this Pulley that the load hoisting cord passes, the cord being equipped with a Loaded Hook for lifting purposes. The cord is of course wound in by means of the previously-mentioned winding drum rod.

All that now remains to be fitted is the jib control cord. This is carried on the appropriate winding drum rod, as previously mentioned, from where it is taken over one Pulley 20 and around Pulley 25. It is then brought back and taken around the other Pulley 20, after which it is finally taken back and the end secured to the Bolt carrying Pulley 25 to complete the model.





Mobile Cranes have long been popular Meccano subjects, but the model featured in the illustrations on this and the opposite page is the first published example of the type to be built with this year's new No. 3 Set. Powered by an electric motor, it is a very well proportioned, working model as the general overall views show. Pictured left is a close-up view showing the underside of the crane body and chassis top. Right is an underside view of the chassis showing the slewing drive.



LET YOUR MODELS LIVE!

Part 9 – by Geoff Pratt

MORE SOUND IDEAS

Although we discussed sound in the July MM, we actually considered only simple soundtracks, consisting of music with or without commentary, and avoided the complications of closely synchronised sound. Also, the sound had been recorded on a separate tape. Now, while this is a satisfactory set-up for starting off into the realms of sound films, there are some inherent disadvantages which soon make their presence felt: each film must have its own cassette or reel of tape; film and tape must be set onto start marks and started simultaneously; close synchronisation is hardly possible. For these reasons, the best place for a soundtrack is *on the film itself,* as in professional practice.

EQUIPMENT

Amateur films can be "striped" with a 0.75mm wide strip of magnetic recording material. This is applied down one edge of the film, clear of the picture area and enables a magnetic recording to be made which, when once synchronised, remains in perfect synch for all subsequent showings. Such striped film does, however, need an 8mm stripe sound projector for recording and showing the film. They are not exactly cheap, but for quality results and convenience in operation there is nothing better (Fig. 2). It is perfectly feasible to build up quite complicated soundtracks using just a stripe projector, but as I shall explain, it is better to start with a soundtrack on separate tape first of all, transferring onto stripe as a final stage. Doing this does mean that for soundtracks that are to be closely synchronised there is a need for a *syncrhoniser* to keep recorder and projector in step with each other. There are several such devices in the market – most of them being electronic in operation. The one I use, and can recommend, is a mechanical synchroniser known as the "Synchrodek" (Fig. 3).

In use, the tape from the recorder is looped round a drive capstan (Fig. 1) and a flexible drive is connected to the drive shaft of the projector. Inside the synchroniser is a differential mechanism made from Meccano parts (which should endear it to MM readers!) driving a pointer. As long as the pointer remains static, tape and film are syncrhonised. As soon as the pointer starts to wander from its zero mark, a speed control circuit is brought into play which controls the projector speed automatically, bringing it back into synch once more.

For filmmakers who prefer the ultimate in sound quality, the soundtrack can remain on separate tape and in this case the Synchrodek or other synchroniser will be coupled up each time the film is shown. Some projectors have been produced with a synchroniser built in (Fig. 4). Although this particular model was only produced for Standard 8 film, it was built so robustly that many examples are still in use and can be obtained secondhand for a very reasonable price. The technique of using this type of set-up is similar to when using any other projector with a separate synchroniser and recorder.

A development of recently years in the world of amateur movies has been the introduction of "live-sound" cameras, enabling the sound to be recorded at the time of filming. Beneficial though this is when filming little Oswald reciting "Jack and Jill", or sister Tracey performing her guitar solo, it is of very limited use when filming Meccano models. The sound of a model working is very untypical of the sound of the real thing in operation and in any case, music is probably better suited. Another application of live-sound camera is in the filming of television-style interviews, again of little interest in our kind of filming. An exception to this would be where a film record is being made of another Meccanoist's model, and the modeller is being asked to relate some of his experiences in building the model, for example. Even so, unless the modeller is a real "character" and interesting enough to be filmed on his own, it would be better to tape-record his remarks and accompany them with extensive shots of the model itself. Moving pictures of "talking heads" are all very well for filling long hours of TV screen time, but when we are paying around £1-40 per minute for sound film, it can be better employed showing the model itself.

COMPILING THE SOUNDTRACK

Having settled on a particular combination of tape recorder/sound or silent projector/synchroniser, how best can we utilise them? Well, methods will vary from person to person, depending on your own particular equipment capabilities. There is no *one* best way to build up a soundtrack. It will depend on what equipment you have, what the soundtrack is to consist of, and how much time you are prepared to devote to the whole business. I should perhaps make it clear that the apparently effortless way in which the various sounds on a professional film are synchronised and blended together is not easy for the amateur to imitate, but can take many hours. Initial attempts at sound should be limited to just music and commentary until more expertise has been acquired.

SIMPLE MUSIC AND COMMENTARY – using stripe projector

The simplest method using a single record is with the Eumig Mk.S projector. Here, the output from a record player is plugged into one socket in the projector, and a microphone into another. Mixing of the two incoming signals is entirely automatic. As soon as you speak into the mike, the level of the music signal is reduced to a subdued background level which is then brought gradually back to full volume when you stop speaking.

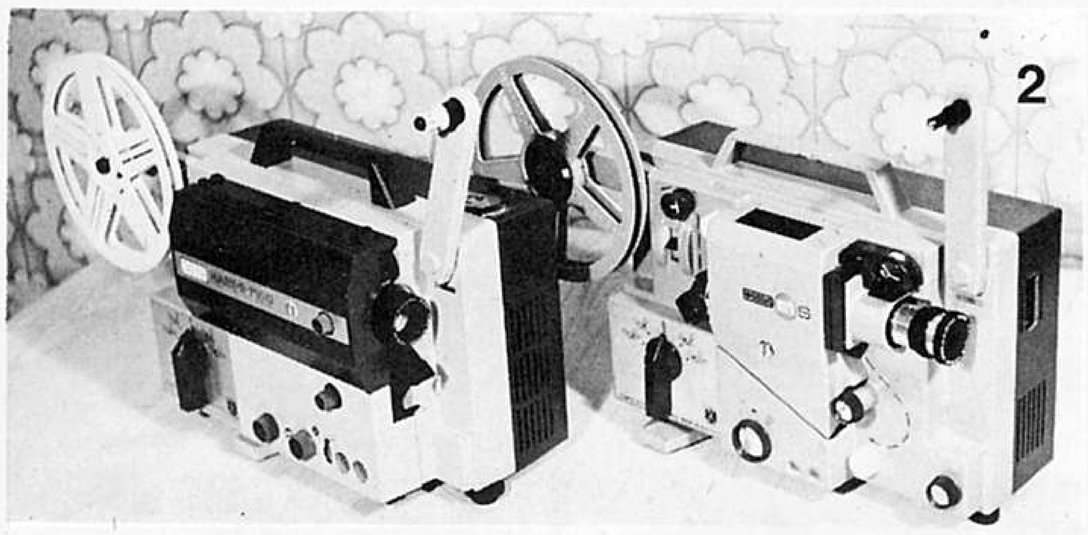
With most of the latest projectors, the music and speech is added in two stages; the speech being *superimposed* onto the music. First of all a record player, or recorder, is connected to the projector input socket and the music track is recorded according to the individual instructions supplied with the projector; also ensuring that the music commences at the same time as the pictures. The film is then re-run with a mike plugged in instead of the record player, and the projector switched to "TRIC" or "SUPERIMPOSE". The music track remains intact, except where commentary is added, when the volume of the music is reduced appropriately. According to the projector type, fading down of music during speech can be either automatic or manually operated.

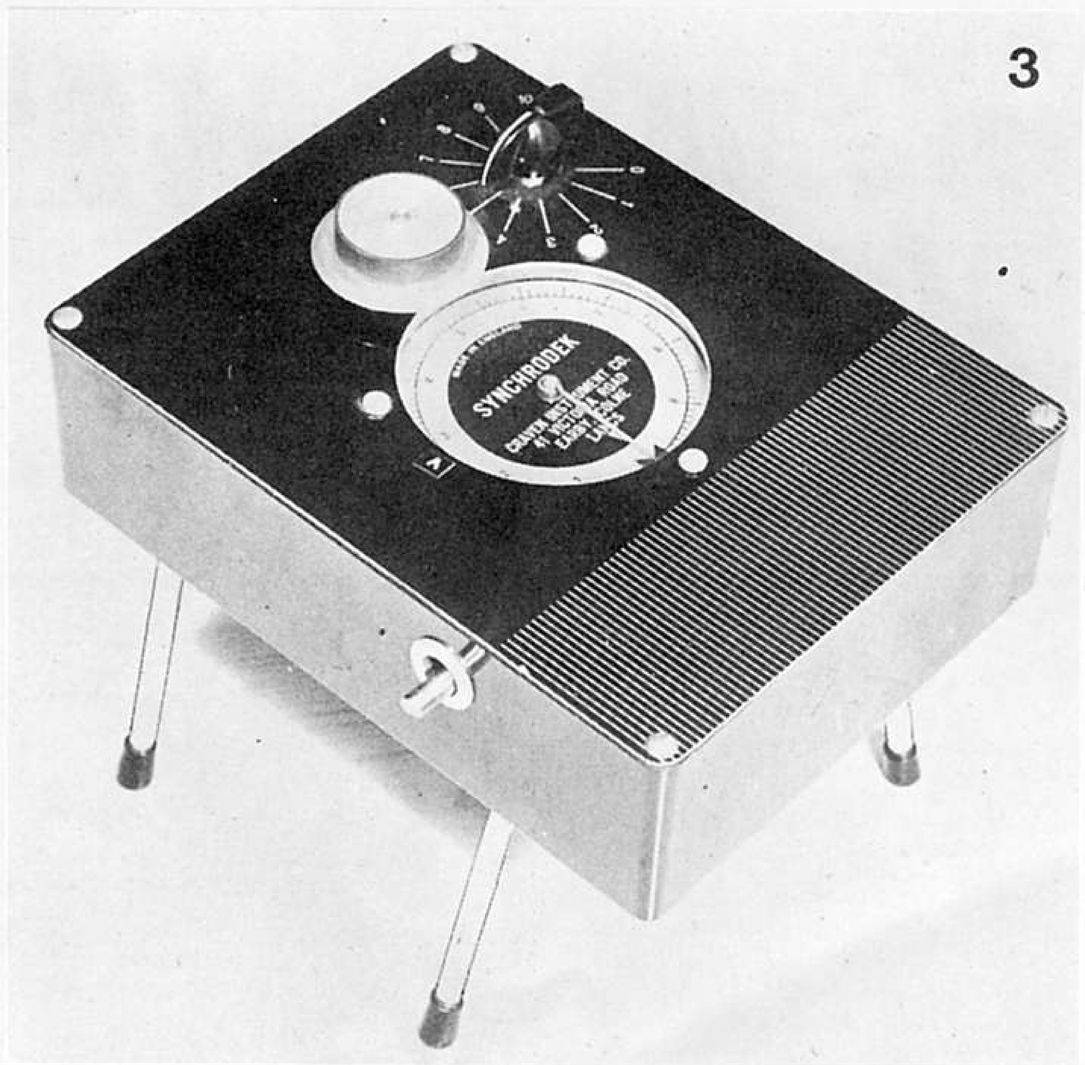
A simpler method – but one which brings shouts of horror from hi-fi enthusiasts – is to record music and commentary at the same time by means of a hand-held mike. For full volume music, the mike is held close to the loudspeaker of the record player/recorder. When commentary is required, the mike is moved away from the loudspeaker and held close to the mouth, being returned to the speaker after each speech passage. Surprisingly good results can be obtained with this very basic method (always assuming that the sound coming out of the loudspeaker is of good quality in the first place!). It just needs a little experimenting to determine the relative distances from mike to speaker so that the music remains at just the right level behind the commentary.

MULTIPLE MUSIC AND COMMENTARY

If a tape recorder is used to feed the music to the projector, it then becomes feasible to introduce changes of background music at appropriate stages in the film. It is seldom that the mood of one piece of music is suitable for an entire film, so music of different moods can be recorded onto your tape according to the mood of each section of film. This can be done in a similar way to the "Method 2" described in the previous article. Start marks on film and tape are aligned in projector and recorder respectively, and both are started simultaneously. A mark with a spirit marker is made on the tape wherever a change of music mood is required and these markings are subsequently used when recording the music onto tape, to indicate the start and stop of each musical

Fig. 1, the Synchrodek – a mechanical/electrical synchroniser for linking projector and recorder – hooked up for operation. The tape from the recorder is looped round the drive capstan of the Synchrodek and a flexible drive is connected to the drive shaft of the projector.





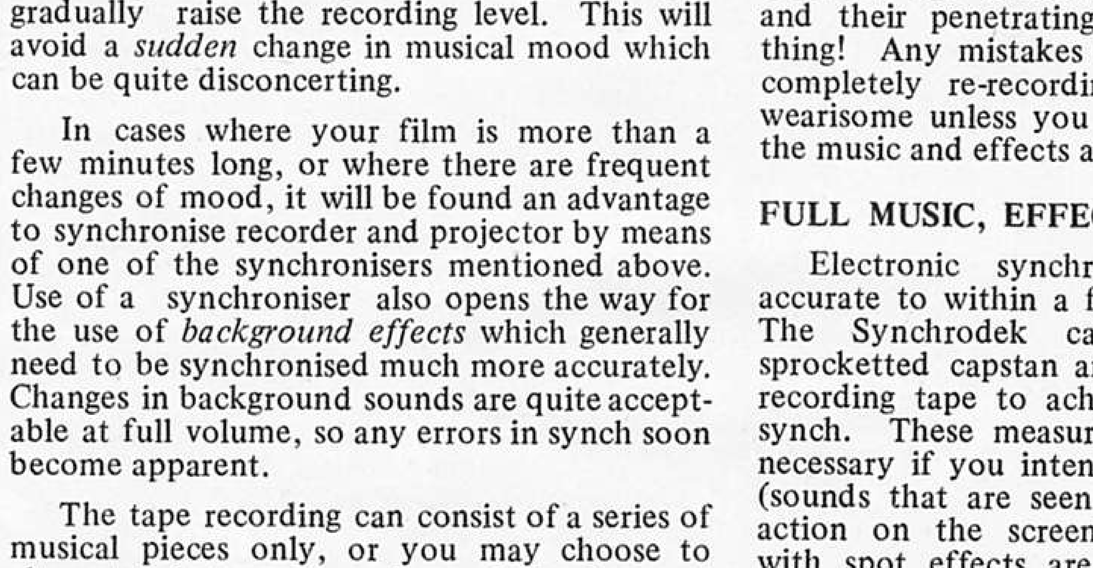


Fig. 2, top left above, two examples of an 8 mm stripe sound projector – recommended where sound is to be added. Fig. 3, above right, a close-up view of the "Synchrodek". Fig. 4, lower left above, running a soundtrack using a projector with a built-in synchroniser.

piece. A tip here: when changing from one piece of music to another, fade the first music gradually down to zero recording level. Start recording the second piece at zero volume and gradually raise the recording level. This will avoid a *sudden* change in musical mood which can be quite disconcerting.

In cases where your film is more than a few minutes long, or where there are frequent changes of mood, it will be found an advantage to synchronise recorder and projector by means of one of the synchronisers mentioned above. Use of a synchroniser also opens the way for the use of *background effects* which generally need to be synchronised much more accurately. Changes in background sounds are quite acceptable at full volume, so any errors in synch soon become apparent.

The tape recording can consist of a series of musical pieces only, or you may choose to alternate between music and background effects. If your recorder is 4-track with parallel-play facilities, or better still a stereo model, then you can really go to town! Music can be recorded onto one track and, where appropriate, effects on the other. In the final transfer to stripe, the relative balance between music and effects can be easily adjusted from time to time by judicious use of the recorder "BALANCE" control.

I should perhaps point out that many modern stripe projectors are designed to enable you to build up a composite track of effects and music without using a separate recorder and synchroniser. Such a method does involve a great deal of stopping and starting of the projector, running backwards and forwards and so forth, which can impose quite a strain on the precious film, thereby involving some risk of damage. For this reason I prefer to compile any sound on tape first and then transfer to stripe. Here you gain the advantage of only having to run the film right through two or three times and much reduce the risk of damage. You also gain two further advantages that are of major importance: i) having compiled a music/effects track, the next stage is to add the commentary by superimposing. Whether this is done by use of the mike, or by a tape recorded commentary, there is always the risk of making a mistake in the mixing and ruining the music/effects already recorded; ii) when using a mike, it is all too easy to fluff the commentary – to stumble over a pronunciation. Someone may flush a toilet or slam a door. All kinds of extraneous noises can creep in when using a mike. I have a young family and live close to an airport so I am perhaps more prone to this problem than some, but no-one is immune. Icecream van chimes seem to be omnipresent and their penetrating sound pervades everything! Any mistakes can only be rectified by completely re-recording – a task which is very wearisome unless you have a master tape with the music and effects already compiled.

FULL MUSIC, EFFECTS & COMMENTARY

Electronic synchronisers are absolutely accurate to within a fraction of a film frame. The Synchrodek can be fitted with a sprocketted capstan and used with perforated recording tape to achieve absolutely accurate synch. These measures will be found to be necessary if you intend to use "spot effects" (sounds that are seen to emanate from some action on the screen) because synch errors with spot effects are very noticeable. The simple method described of cueing the recording tape with a spirit marker is not accurate enough for really close synch, and it becomes necessary first of all to compile a "pilot track". To do this, set the projector to "RECORD" using the mike and run the film through. Record a pilot commentary describing the action on the screen, and also giving any relevant information to help in the subsequent compilation of the sound e.g. *"NOW*..... main title ..... credit titles ..... *NOW* ..... first pictures ..... general shots of car ..... close-ups ..... *NOW* ..... car approaching, passiinnggg *NOW* ..... receding ..... etc".

The *NOW's* will become the cue points so will need to coincide accurately with the critical points in the visuals. In the above example the first *NOW* coincides with the start of the main title, so it will mark the start of the opening music. Subsequent *NOW's* indicate the start of the first mood music, sound effects of a car approaching, the point where the car passes (for synch with Doppler effect) etc. For really critical timing I take the film with recorded pilot track and, using a small permanent magnet, erase about 1cm of sound at the exact point on the film required – remembering that the sound is AHEAD of the pictures by 18 frames in the case of Super 8 and 54 frames for Standard 8.

Now set up projector, tape recorder, and synchroniser and transfer the pilot track in synch onto tape using the recorder track 1 only. (Don't forget the start marks on film and tape!) Now the film can be put away until the final stage. Run through the tape, listening for the *NOW's* (or the patches of erased sound) and mark them on the back of the tape using your spirit marker. Give each cue a serial number. Compile a list of all cues and the sounds required for each cue, together with the tape reading.

Your next course of action will depend on the degree of complexity of soundtrack required. If spot effects, background effects and music are all required simultaneously on the tape, the recording will have to be built up by superimposing, using a "multi-play" facility (usually on stereo recorders only). In this intance, record the spot effects first, background effects next, and music last. The reason is that the spot effects are the most difficult to synchronise, so are best recorded first on a clean tape with no previous recordings to spoil. Multi-tracking, or superimposing (to give it its other name) usually incurs some slight loss in quality of recording each time a new recording is added, so music is best kept until last for optimum results. Some loss of quality is usually acceptable far more in the case of recorded effects than it is with music.

Without the ability to build up a recording by superimposition you will need to record effects on one track and music on the other, or alternatively use just one track, alternating between music and effects. Do, if possible, keep music/effects on one track only, as this does leave the second track free for just the commentary (if required, that is). Speech requires the ultimate in quality if it is to be intelligible. No loss of treble due to re-recording is acceptable, so speech is best recorded separately. You also gain the added benefit of being able to balance the relative volumes of speech and the rest of the soundtrack during the final transfer stage to stripe. (At this point the pilot track will have been erased during the various recordings of music/effects, but it is of no further use and has served its purpose in providing a guide for the marking up of the cue marks.) Now record the commentary, recording each passage in turn and ensuring it is perfect before moving on to the next. Now set up projector, recorder and synchroniser again for the final transfer to stripe. You can do this either using the projector mike supported in front of the recorder speakers which give you the advantage of using the recorder tone and balance controls for optimum results; alternatively, for better quality sound, use a connecting lead between recorder and projector. Finally next MM, I'll cover copyright.

MECCANO CLUB ROUNDUP

All Meccano Clubs are invited to submit reports for these pages. Report should be approx. 350–400 words long and should reach us by the end of the second month before the month of publication.

MIDLANDS MECCANO GUILD

Once again, the Midlands Meccano Guild was requested to put on a display at the premier Midlands event, the Town and Country Festival held at Stoneleigh over the three-day August Bank holiday weekend. Our negotiators managed to obtain over 50 feet of table space within the larger Model Exhibition and, by the Saturday lunchtime, 59 models were set up for displaying to the public.

First to hit the public eye upon entering the hall was a mass of fascinating and advanced fairground models including a Big Dipper from Mike Cuff, a programmed Roto-wheels from Phil Ashworth and Clive Hine's latest masterpiece, the Orbiter – a massive effort of cars on the end of long arms, rotating in all sorts of directions and angles, the whole thing programmed from a central built-in console. Also in the fairground line was Ken Wright's "Cobra" which ran continuously throughout the show, creating a lot of visual impact with its massive rotating arms and flashing lights. Ken also had on show two Steam Lorries, one a 1908 Manns Overtype and, on a smaller scale, a steam-powered Manns Undertype.

What does one say about Nicholas Wright? His massive robot 'Bionic Arm', driven by 5 PDU's amused the crowds by picking up a bottle of squash and pouring it into a cup for James Gilbert to drink! James himself, although only twelve years of age, showed three models, a Meccanograph, a steam-powered Traction Engine based on the No. 10 Set leaflet and a remote-controlled Lorry and Trailer. The Lorry won first prize for the best model in the 9–12 year old section of the whole model exhibition. Well done, James!

MM space limitations do not allow a full description of every model to be given here, but mention must be made of as many as the editor will permit. Stalwart exhibitor Roger Wallis put on a whole display himself with a Railway Breakdown Train, a Meccanograph, A Traction Engine, a Veteran Rolls Royce and an AEC Regal Bus. Some of Roger's models were lost in clouds of dust from Tony Homden's dust-emitting device, otherwise known as the 'Portsmouth Block-making Machinery' – a set of working models based on Brunel's machines that were designed to automate pulley-block manufacture for Brunel's steam/sailing ships.

An impressive giant on display was Mike Pashley's Ransomme and Napier W1800 Walking Dragline. Then next came a whole Tramway display from Esmond Roden, this including double-deck and single-deck trams, plus a live-steam model in the shape of a Belgian Steam Tram Engine. Ernie Chandler, next, showed a couple of Steam Engine models, one driving a power saw and he also had a small Block-setter. Nearby was the very interesting 0–10–0 Locomotive 'Decapod' built by Stephen Lacey. The original of this loco was built by the GER to prove that a steam loco could have the same haulage power and acceleration as an electric train!

That ever-popular subject, the traction engine, was well in evidence on this side of the display with examples from Phil Ashworth and Eric Baldwin, Eric showing no less than two examples along with various other models including two Meccanographa and a one-armed bandit which really pulled the crowds. Another crowd-puller was Bert Halliday's Meccanograph, pen arm tension for which was provided by a Meccano 'Corpse' suspended from a miniature gibbet!

An appealing half-track army vehicle from Robin Schoolar illustrated modern life while, nearby, was history in the form of Denis Perkins' Compound Tandem Pumping Engine produced in blue and gold.

Edgar Whalley came next with another one-man show including a Conjuror, a ninteenth century Ploughing Engine, a Folliot Verge Clock based on a Pat Briggs' original and a 1905 Singer Car. The motoring scene was further represented by a neat Morgan 3-wheeler from Denis Perkins and a beautiful Leyland Lion PLSC Single-deck Bus from Terry Pettitt, the latter setting a new standard in bus building. Matthew Goodman had a display of automatic vehicles including a Bentley which was an electrician's nightmare and a fascinating vehicle that was little more than a windscreen wiper motor on wheels! Matthew's father, David Goodman, showed a miniature Beam Engine, a Meccanograph and a very interesting Automatic Gearbox Test Rig.

A superb display of old MM's, obsolete outfits and parts, etc. by John Pentney attracted a lot of attention as, indeed, did the whole Meccano exhibition.

Later in the show, we were joined by welcome visiting exhibitors, including, on the Sunday, Alan Partridge (Orreries and South-seeking Chariots!) and, on the Monday, a coach-load from the Henley area including Bob Ford, Bill Roberts, Geoff Wright, Alf and Chris Reeve and brothers Michael and Phillip Edwards. There were others, of course, but unfortunately your reporter was only able to pay a brief visit to the show on the Monday and did not remember everybody, or all the models they exhibited. However, sticking clearly in mind was Michael Edwards' beautiful Leyland National Single-deck Bus and a remote-controlled Tank from his brother Phillip.

All in all, the Meccano Exhibition was a tremendous attraction for the thousands of people who visited the Town and Country Festival, a fact that was born out on the Sunday when the MMG was presented with the Sunday Mercury Challenge Cup for the finest model display in the whole exhibition!

Anybody wishing to join the Midlands Meccano Guild should contact the Secretary:

Ernest Chandler, Secretary
86 Clopton Road
Straford-upon-Avon
Warwickshire CV37 6SN

NORTH MIDLANDS MECCANO GROUP

The Group has now been in existence for a year and appears to have set the foundations for a busy life. Membership has now exceeded 40, with about two-thirds being senior modellers, and the rest comprising a body of very keen – and very good – juniors. Group activities have settled into a three-meetings-per-year pattern, one each in January, May and September, and the Club Newsletter has now become a full-scale 'Newsmag' published on the 15th of each alternate month with a minimum of sixteen pages of Meccanoings.

A very good meeting was held in May – too little space here to report fully, but some of the models shown must be mentioned. Two magnificent American Cars were produced by Michael Walker and Julian Coles; a vicious little Hot-Rod Car (consisting mainly of a Marklin motor) came from Mike Beadman, and John Russell and Gerald Griffin both competed very well against Hal Hussey's expertise in the Meccanograph stakes. A particularly fine model was Richard Palmer's Traction Engine, based on the old SML 22 and sporting a replica Flywheel made by Richard himself in his school metalwork shop – as he said 'all for 10p'.

July 1st and 2nd had the Group making its first full public appearance; the venue was the Newark Yesteryear Rally where a display was mounted very successfully. In fact, the whole event was marred only by the weather, which was more like November than July. Again, only a summary of the models can be fitted in, but this time they included a quite spectacular display of clocks and astronomical models by Patrick Briggs, some similar items and the fantastic Konkoly Double-Rolling Cavalcade by Alan Partridge; Mike Pashley's super-supermodel W1800 Dragline; the Dennis Fire-Engine from the January MM built by Julian Coles, and much-eyed by the Fire Service on a nearby stand since they only had plastic models themselves; and another of Barry Jessop's fun models, this time a unique rolling-ball Picture Maker.

Next Group meeting is on September 23rd and will be the start of year two – any new members will be welcomed, of course, but be quick – we've already grown our of one hall.

G. M. Coles, Secretary
'Little Court'
Bleasby, Nottingham

SOCIETY OF ADVANCED MECCANO CONSTRUCTORS

With the approach of autumn all Club members are busy on projects for the Society's October Meeting in Hall Green, Birmingham, but the officers and members have continued to show the flag at various Meccano shows throughout the summer. Our Reports Secretary, David Whitmore, attended the London Press Show for Meccano publicity in May, equipped with several models and, although having no personal transport, he has supported the Solent Meccano Club's meeting, the South London Club and the Henley Meccano Exhibition, making two return trips from London to Henley to charge his accumulators overnight!

It has also been an extra busy season for the Hon. Secretary starting with the Huddersfield Show where his new No. 10 Set Electric Harbour Crane was shown in the new colours for the first time. This model, together with Bert's personal historic Meccano Collection, was on exhibition in the new Solihull vast Library Complex for a period of three weeks during July and August where it drew 25,000 visitors to the centre. Publicity from three BBC departments followed, this including radio and television broadcasts of the exhibition. In the first week of November, the collection will be televised 'live' on the national programme "Pebble Mill".

Henley followed Solihull, finding Bert taking charge of the Meccano Limited stand at Henley Town Hall on the two days of the Exhibition with a wide range of working models in the new Meccano colour scheme, the general acceptance of the new colours being most encouraging. Roger Wallis supported both at Stoneleigh and Henley with a car load of models, his main theme continuing to be excellent models of buses. Other members travelled from Nottingham, Sheffield and Blandford to Henley and several made visits to the Solihull Library exhibition so there has been a great deal of individual and collective Meccano activities in the "off" season.

Peter Greenhalgh of Rhyl, North Wales, is still struggling to enrol Welsh enthusiasts (and any other keen Meccano modellers interested) to form a Meccano Club in that corner of the UK and I would urge those who can support to do so in the interest of expanding the hobby. His address is clearly advertised in the last two issues of the MM.

B. N. Love, Hon. Secretary
61 Southam Road
Hall Green
Birmingham B28 8DQ

SOLENT MECCANO CLUB

As reported in the July issue of the MM, the Solent Meccano Club's second annual exhibition was held in Portsmouth on Saturday, 13th May. A week later, two of our members, Brian Gulley and Brian Williams, attended the Basingstoke Steam Rally; their models were the only Meccano exhibits amongst the many models on display there, but nevertheless attracted a great deal of attention. Brian Gulley exhibited his excellent 1/12th scale Chieftain Tank, which operated splendidly all day but which occasionally broke a track. New plastic track parts have since cured this problem. Amongst other models, Brian Williams displayed a SML 1 Motor Chassis. It is noticeable that, at such exhibitions, a working motor chassis, even one of such a basic and elderly design as the SML 1, always attracts considerable interest.

A number of our members attended the Netley Marsh Steam Rally in July. Unlike the Basingstoke Rally, there was no electricity supply, and other sources of power, mainly car batteries, were necessary. Sunday's weather was atrocious, but the heavy rain brought more people into the model tent. In spite of such minor problems the models exhibited, especially the first-class Harbour Crane built by brothers Stephen and Robert Hall, worked faultlessly throughout the Rally and drew many spectators.

At a recent meeting, we welcomed new member David Lewis of Chichester to the Club, bringing our membership to a total of 32 including junior members.

Ten of our members attended the Seventh Annual Meccano Exhibition at Henley-on-Thames in September, and the models brought included, amongst others, Harry Gower's giant Vickers Dockside Container Crane, dominating the exhibition from its site on the stage; Tony Rednall's Hymac Excavator, operating smoothly throughout the exhibition; new member David Lewis's Agricultural Traction Engine, a first-class model built from a No. 10 Set; and Brian Gulley's Chieftain Tank mentioned earlier in this report.

All our members who exhibited models at Henley this year were pleased with the revised arrangements in the Hall and agreed that the Exhibition was better than ever.

Brian Williams, Secretary
7 Thorndike Road, Maybush
Southampton, Hants SO1 6FN

SOUTH EAST LONDON MECCANO CLUB

We held our ninth meeting on 8th July, 1978 and it was quite well attended with fourteen out of the eighteen members present, plus three guests. Tony Homden of the Holy Trinity MC showed one of the machines from his Victorian factory the prototype of which Mark Brunel designed to fabricate sailing ships' pulley blocks.

A part-completed model of the rack and pinnion locomotive which runs nearly to the top of the Pilatus mountain in Switzerland was demonstrated by Neil Bedford. The model is about 15" long and will have a pantograph from which to collect the current, as on the original, when completed. Neil also brought along a model of the McLaren 25 ton Showman's Traction Engine.

David Smithers' current project is a 100 ton dockyard crane. To date only the tower has been built; it is about 3 feet high and has four four-wheeled bogies each fully pivoted to allow for irregularities in the track, and each motorised.

Our Club held its first exhibition on the afternoon of Sunday, 30th July. We were, in fact, just part of quite a large fete at the Woolwich Memorial Hospital. It seemed as though we might have had to abandon it because of what can only be described as a deluge. However, David Whitmore arrived with a large plastic sheet which just about saved the day.

Members of the public were most interested in the models and many were amazed at what could be built; some did not even realise that Meccano was still made! One person said that he might be interested in joining the Club and two or three others wanted to sell Meccano. I think everyone who brought models agreed that it was a very successful event and I would like to thank all those who attended, or supplied models, for supporting it.

A list of models on show follows: Adrian Ashford – Routemaster Bus, Automatic Reversing Diesel Locomotive, Fire Escape and part-completed Fire Engine; Stan Bedford (not present) – Twin-cylinder Motor Cycle Engine from Set 10 instructions; Geoff Davison – Electric Tram, small-scale Car, Milk Float, German Rail Gun; David Smithers – Display of small pre-war models in 1977 colours; Chris Warrell – Container Crane; David Whitmore – Darby-Savage Digging Machine.

The next meeting will be on Saturday, 14th October, 1978, at 2.00 pm. Please contact the Secretary for details.

Christopher Warrell, Secretary
41 Beechhill Road, Eltham,
London SE9 1HJ

STEVENAGE MECCANO CLUB

Secretary Dennis Higginson was in hospital (yes, again) when he heard the news of the SMC's success in the Letchworth Carnival on the 1st July. The Stevenage Meccano Club float won 3rd prize, and so it should have, with our own Miss Meccano (Tamsyn Reseigh) presiding from her Meccano-built throne over a cluster of models and a group of lads hard at the job of constructing even more. The theme was "Make it, with Meccano". Alec Webb was the main brains and strength behind the Club entry, and the models on the float included Peter Walton's Loco No. 10000, Dennis Higginson's Traction Engine and Jazz Band, Neil Alston's Fire Engine, and a Steam Engine designed by Roger Le Rolland and built by G. Smith and C. Marshall. There were several other models; Alec Webb built the throne. Lots of the lads helped to put the show over, and Dennis thanks them all for their efforts; he had a great boost to his morale when he heard of the prize. He's out of hospital now!

How does one family come to receive three No. 4 Meccano Sets in the same morning post? Member Robert Clark bought some Ringo's Crisps at the time of the Wembley Model Engineering Exhibition and found that he could win a Meccano Set by guessing the number of holes in a (Meccano) model helicopter depicted on the packet. Why guess? Robert built the model from the tiny picture, and he and his family laboriously counted the holes. You did know that washers, nuts, tyres and wheels all have holes, didn't you? Three close results from Mum, Dad and Robert brought home the aforesaid three No. 4 Sets, in the form of runner-up prizes. Dad is Jim Clark, adult SMC member. Quite a family coup, but who, we wonder, won the No. 10 Set first prize?

On the 15th July, the Stalwarts of the Wellingborough and District Meccano Club, Terry Pope and his plucky lads, came to our rescue and played a fixture we couldn't manage because of Dennis' hospitalisation. It was Hornby day at Letchworth, and although there was no Stevenage-assembled Meccano on show, SMC members Neil Alston, Dick Barton and Peter Randall ran the exhibition railway.

We can announce three new members: Brian Shade of Lowestoft, Suffolk, and two of my own brood, Caroline Dunkley (12) and Thomas Dunkley (9). Because their faces are so familiar to me, I forgot to mention in earlier reports that they joined the Club in February. They are now well established members of Group D.

You can all get in on our act, if you are looking for Meccano contacts and fellowship, by writing to our Secretary, Dennis Higginson, 7 Buckthorn Avenue, Stevenage Herts. No fee.

Finally, the SMC wishes all Meccano modellers of every shape, size and geographical orientation a very Happy Christmas We hope your Christmas stockings are bulging with perforated metal on Christmas morning!

Bernard Dunkley

(Editor's note – Since this report was written, Dennis Higginson and a good turn-out of SMC members attended the Seventh Annual Meccano Exhibition at Henley where they put on their usual impressive display. A few days after the Exhibition, however, Dennis was again rushed into hospital, later undergoing an operation. We are now delighted to report that, at the time of writing, Dennis is well on the road to recovery and should be fit and well by the time you read this.)

CHILEAN MECCANO CLUB

Our Meccano activities are thriving. Some five months ago we started having weekly model building competitions. These proved most successful. Our Club membership increased from the nine founding members to 83 at present, and we are still growing!

In early August we had a Meccano stand at the Hobbies Exhibition, to be held yearly from now on. A conveyor-belt loader, a construction crane and several vehicles all designed and built by members were displayed. We feel we have managed to revive the interest for Meccano in Chile. Our activities have been so well liked by the public that, lately, we have been on TV and in newspapers and magazines.

This coming Saturday, September 9th, we shall have a short induction ceremony for all the new members living in Santiago and our Meccano Club badge shall be distributed to all.

We are happy to see that we have found, rather than just a club, a Meccano family where most members are in their early teens. Our special thanks go to Mr. Mario Bianchi, Meccano's friendly and capable representative, without whose assistance we could not have reached the good results we are now reaping. Our thanks go also to the rest of the Bianchi family: all true and enthusiastic Meccanoites who give us terrific support at all times.

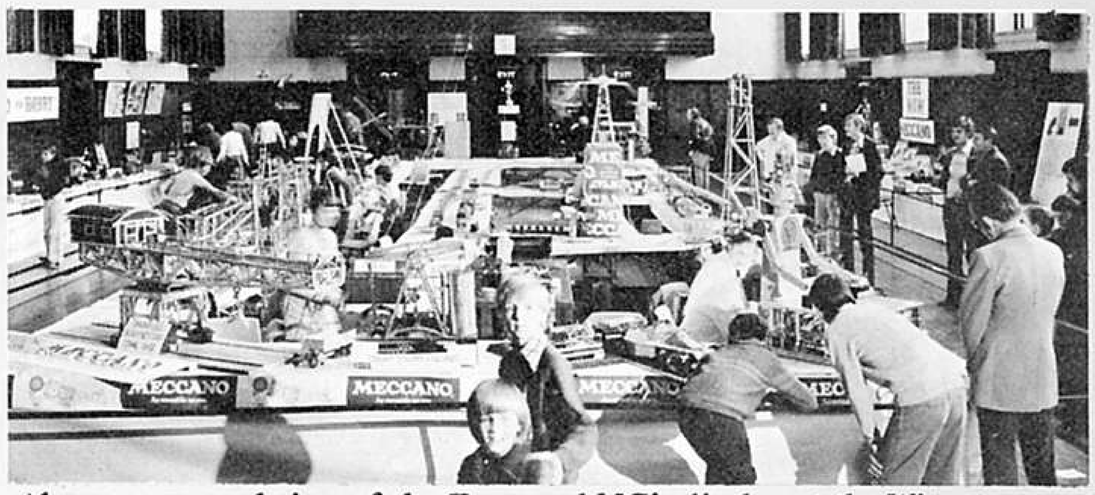
PAUL GATICA, President
PO Box 549, Santiago, Chile

SOUTHERN CALIFORNIA MECCANO CLUB

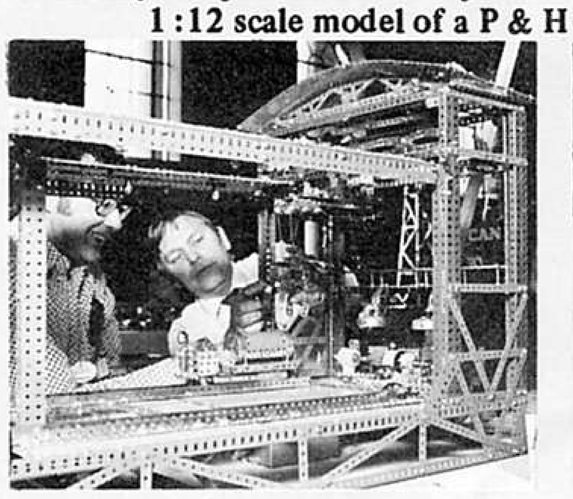
The Southern California Meccano Club now have fifty members mainly in the United States and Canada. Most of these have been acquired from our Club Report contained in the Meccano Magazine.

The summer meeting of the Club was held at the residence of Anton Calleia in Granada Hills, California, on Saturday, 8th July 1978. Anton Calleia was re-elected President and Clyde Suttle elected as Secretary. Some copies of the 1925–1927 US Meccano Magazines were on display.

Tamsyn Reseigh, Stevenage Meccano Club's "Miss Meccano" pictured on her throne on the Club's float in the Letchworth Carnival held at the beginning of July this year. The SMC won third prize in their group, and this despite the fact that they were competing against organised Companies in the area. An excellent result!



Above, a general view of the Transvaal MG's display at the Witwatersrand Hobbies Fair last July. Below left, Chairman Peter Matthews (right) and Secretary Jacques Rossouw adjust the Automatic Factory. Below right, a 1:12 scale model of a P & H Face Shovel by Paul Hatty



Also on display was a self-raising and lowering "Cherry Picker" mounted on a No. 9 set truck, which had a manually set arm and bucket. This model, along with some set models, were put together for the importer, AVA International, for display by their distributors of Meccano in the western United States. A "Unicyclist" had already been turned over to them.

The Club is also preparing a display for an Orange County Public Library during the month of September.

The next meeting of the Southern California Meccano Club will be at the residence of Clyde Suttle on Saturday afternoon, 7th October, 1978. For further information on the Southern California Meccano Club, contact the Secretary.

Clyde T. Suttle (Secretary)
6062 Cerulean Avenue
Garden Grove
California 92645, USA

TRANSVAAL MECCANO GUILD

The Transvaal Meccano Guild mounted an exhibit as part of the Witwatersrand Hobbies Fair which was held in the Johannesburg City Hall from 22nd to 29th July, 1978. The organiser's figure for attendance during the week was 25,000, amongst whom were the Mayor and Mayoress of Johannesburg who opened the Fair and who signed our visitors' book. The TMG exhibit occupied one of the side halls, the Selborne, and proved to be extremely popular with the public.

A total of 140 models were on display, the pride of place going to Paul Hatty's original model of a P&H 2100BL Face Shovel built in green and red to a scale of 1:12. Mains voltage was fed through the centre of the base to transformers which supplied power to the 7 motors which drove the model. All mechanisms and motiions were controlled by switches mounted in the cab with the hoist motion also controlled by a clutch pedal on the floor of the cab. The model performed impressively throughout the show, with only minor adjustments being required, and deservedly won the top award, a silver medal. Paul also had an Allan Partridge-designed Orrery on display.

Our honorary (and oldest at 78 years) member, Koos Pienaar, had built a Level-luffing Dockside Crane of his own design and was awarded a honorable mention, while our youngest member, Jannie Loubser, was awarded an Award of Merit for his Beam Engine. This was set in motion by a coin-in-the-slot mechanism and Jannie reaped a fair yield! Once again, one of the main attractions of the show was a working Model Railway built by Jaap Kies. There were two oval tracks in the centre of the hall and the 11 locos and 12 items of rolling stock, all on a 2½" gauge, kept onlookers well entertained. An unusual model was a working Cable Car system with the stations some 25 metres apart, built by Sandy Arbuckle. It ran throughout the show and it was calculated that each car ran a distance of 22 Km! Pierre Marais had an S1 Locomotive in yellow and silver on display with three very fine gauge 1 Locos on gauge 0 track which was very effective in giving the effect found on the South African Railways 3' 6" gauge. His 'piece de resistance' was an Argosy aircraft built from the 1920 SM Leaflet with some effective improvements. The aircraft was suspended on the left side of the stage, the corresponding position on the other side being occupied by a 5' 0" long model of the Eagle Transporter from the Space 1999 TV series, built by our Chairman, Peter Matthews. Also on display by Peter was his Award of Merit-winning model of the 1910 London General Omnibus described in the April 1978 MM. Other major models he had on display were Servetti's Magician and Automatic Factory.

A surprise exhibit to arrive at the show was a perpetual Calendar by Colin Cohen of the Capetown Meccano Club. This model, which came over 1600 Km to be here, was a mechanically simplified version of Georges Gambert's Calendar, but which performed the same functions. A difficult model to perfect was Clifford Brown's model of Whites Aerial Ropeway from the 1930's MM. He also had an Automatic Blocksetter on display. Special mention must go to Frank McClement who had a fine display of Marine Engines on display and who was in attendance for the entire time that the show was open. He also constructed the Railway Breakdown Crane from the No. 10 Set as a working demonstration of Meccano Building during the show. Graeme Davie displayed a beautifully-finished Horizontal Steam Engine.

The steam section consisted of a broad gauge Loco, Tender and Coach by Mike Holland and the 1928 SML Steam Excavator with a beautifully-restored examaple of the 1928 vertical boiler Steam Engine by Bill Steele. Secretary Jacques Rossouw had a model of the Keith Cameron-designed Loom with Programmer, while Peter Humphery, who does our exhibition organising, showed the No. 9 Robot. There was a large photograph of Frank Hornby surrounded by a small model from each Meccano period. Another crowd-puller was a Meccanograph, this one based on a Konkoly design.

A large display of Meccano products was set out on one side of the hall. This included the new 1 to 4 Sets and Plastic Meccano as well as Clock Kits and Crane and Highway Kits. The overall effect of the show was very pleasing and it was well covered photographically by Abie Koegelenberg and Pierre Marais who used both still and movie cameras. On the last day of the show, the organisers, Rotary and Round Table, awarded us the Hector Falconer Floating Trophy for the most meritorious exhibit for the third time in succession.

Jacques Rossouw, Secretary
66 4th Ave., Parktown North
Johannesburg 2193, RSA

MECCANO MAGAZINE

GEAR TRAINS

or "How To Design Compound Gearing To Give Specific Ratios"

By R.R. HAUTON & G.M. COLES

This feature is based on an article which appeared in a recent North Midlands Meccano Group Newsletter, copies of which are obtainable from the N.M.M.G. Secretary at the address given in 'Meccano Club Roundup'. Our thanks go to the Editor for his kind permission to reprint.

THE BACKGROUND TO THE PROBLEM

It is well known that the design of a gear train which will give a specific overall gear ratio can often be a complex exercise, especially when the desired ratio is one of those 'odd' values so often found in astronomical mechanisms. However such design problems can be eased by the inclusion of a differential in the system, since a differential is, in fact, merely a convenient gear assembly in which the cage rotates at the average speed of the two half-shafts. Thus the achievement of a difficult gear ratio may well be made possible by the use of a layout such as indicated in Figure 1, where the input drive is split into two parts, drive A being taken to one half-shaft and drive B to the differential's cage, with in each case a gear train (C_A or C_B) being inserted before the differential is reached. The output is taken from the second half-shaft, and the resultant effect is such that:

$$\frac{\text{Output Speed}}{\text{Input Speed}} = \frac{2}{b} - \frac{1}{a}$$

where a and b are the reduction ratios of gear trains C_A and C_B respectively (that is, for gear train C_A (output speed/input speed) = 1/a, and similarly for C_B).

Such a procedure can, of course, be extended to include the use of multiple differentials arranged in either series or parallel, with intermediate gear trains as appropriate, and a very high level of accuracy can be achieved. The differential unit itself can be built up in the form of any one of the wide range of conventional types which use an inner gear set of either bevels or pinions and contrates, or alternatively an all-pinion layout can be used. This could be either a full set of pinions as is usual in a spur differential, or could be just a half set with the output then being taken from a pair of universal couplings as was described by Alan Partridge in Meccano Magazine 1977 No. 2. These various possibilities are sketched in Figure 2; the fact is that the inner workings of the differential are unimportant, the unit being used solely for its capabilities as a shaft-speed averaging device.

A NEW APPROACH

A considerable further development from this technique can be made by modifying the spur-to-universal coupling type of differential and at the same time allowing the total gear train layout to be inverted so that the slave gear trains (C_A and C_B of Figure 1) follow the differential rather then precede it, and link the half-shafts rather than a half-shaft and the cage. The general layout is then as indicated in Figure 3. The input is now applied only to the cage of the unit containing two gears A and B, which are not necessarily the same size as each other. These gears are mounted on half-shafts X and Y which are then linked to the output shaft by gear trains C_X and C_Y having reduction ratios x and y respectively.

If A and B are, in fact, the numbers of teeth on their respective gears, the resultant effect of the complete layout is such that

$$\frac{\text{Output Speed}}{\text{Input Speed}} = \frac{A + B}{Ax + By}$$

The derivation of this formula is given in the original N.M.M.G. Newsletter version of this article for those interested in such matters; the major point, however, is that the simplicity and flexibility of the expression makes it a very powerful tool in gearing design.

APPLICATIONS

EXAMPLE A One of the great problems in Meccano gearings is the handling of ratios in which the numbers involved are powers of 2 and 3, where it is easy to get into a wasteful gear train of alternating step-up and step-down stages. For instance, in clocks and orreries where it is desired to have a shaft revolving once per lunar month (or Lunar Synodic Period as it is formally known) a reduction factor of 1 : 29.530589 from the once-per-day shaft must be provided. The closest approximation directly available with numbers interpretable in Meccano gears is 32/945 = 1 : 29.531250 giving an error of 661 x 10^{-6}. This ratio can be broken down to 19/133 x 19/95 x 32/27 for Meccano usage, the first two ratios then being immediately available with standard gears, but leaving the 32/27 as the problem. Either a combination of step-up and step-down gearing has to be used, or alternatively the (A+B)/(Ax+By) method makes it simple;

i) $\frac{32}{27} = \frac{20 + 12}{20 + 7} = \frac{A + B}{Ax + By}$

ii) Thus A/B = 20/12 which in Meccano could become 25/15 as a result of multiplying each term in the expression by 5/4

iii) 1/x = A/Ax = 20/20 = 1 – this means that the left-hand half-shaft rotates at the same speed, and in the same direction, as the output shaft (and thus might just as well actually *be* the output shaft)

iv) 1/y = B/By = 12/7 which is achievable in Meccano by a layout as sketched in Figure 4 (note that $ indicates a sprocket wheel).

Note that the 19-tooth Pinion between the 57-tooth and 38-tooth Gears is merely an idler; if such an idler were not used, the two shafts, being linked, would rotate in opposite directions,

Fig. 1.

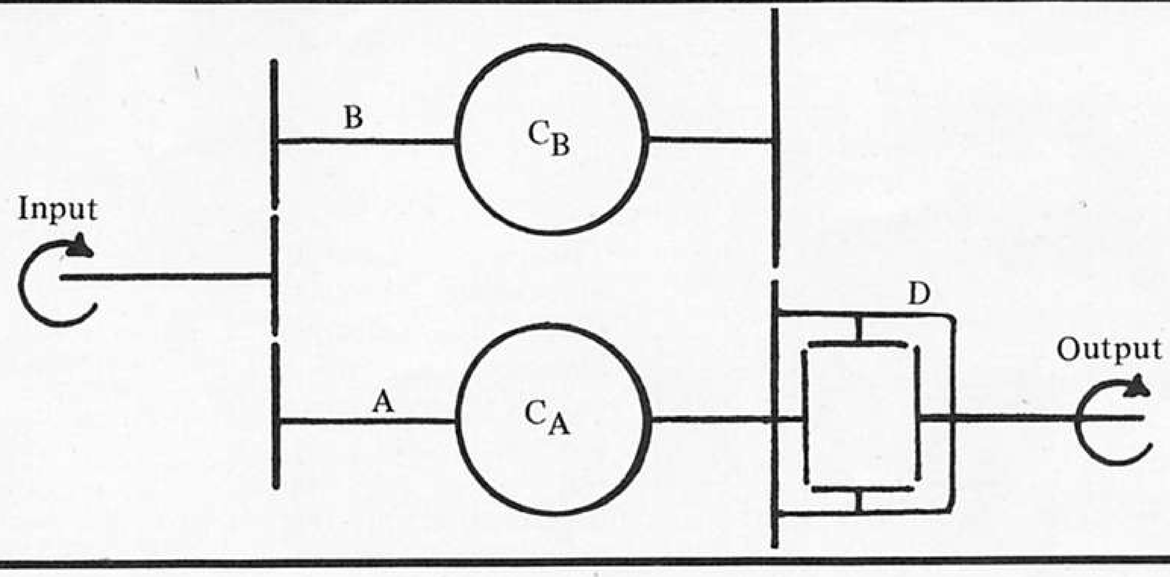


Fig. 2

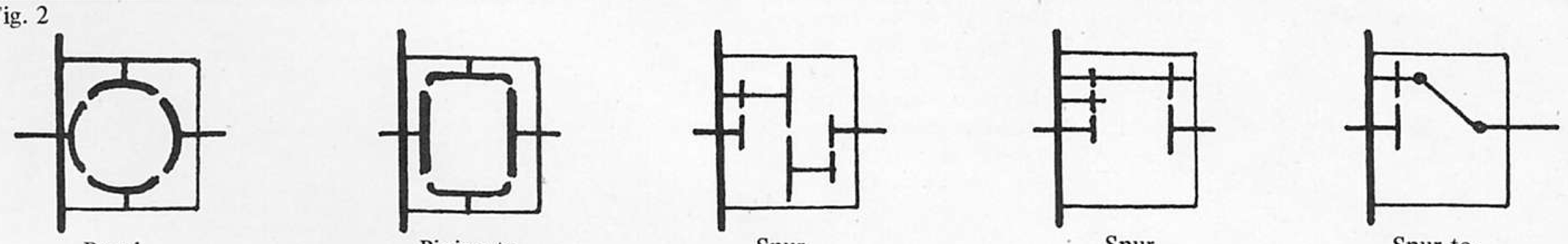


Fig. 3

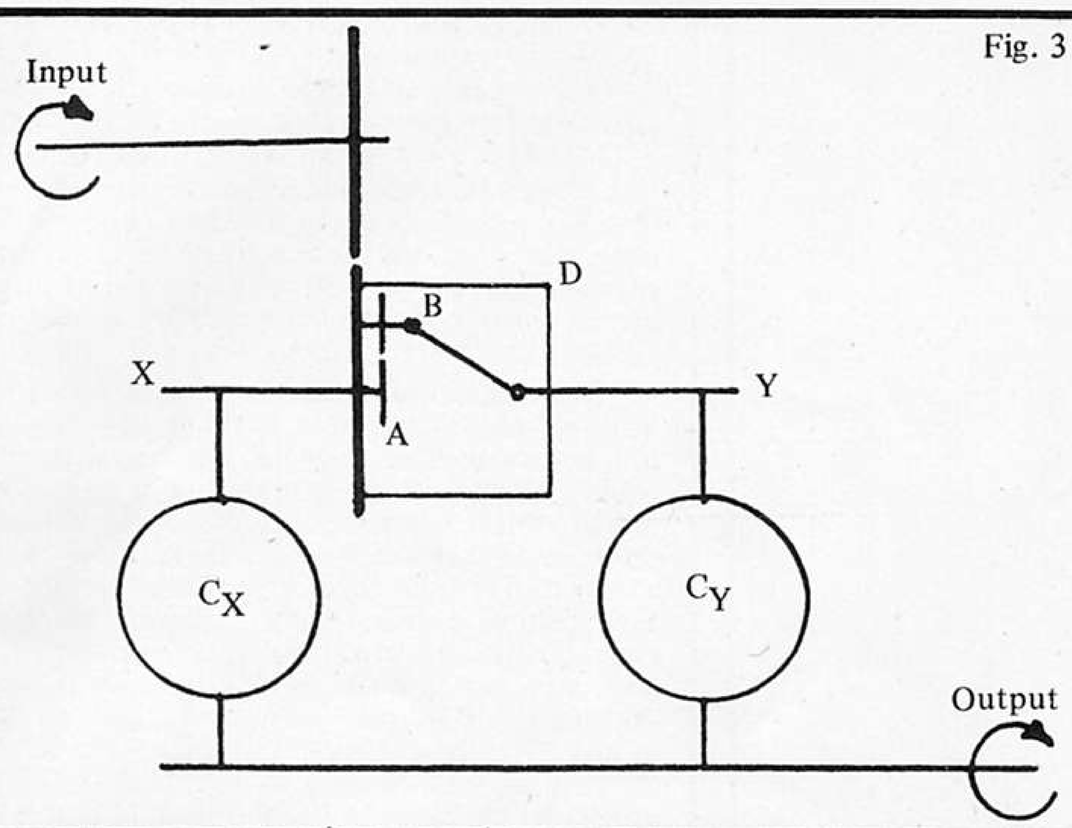


Fig. 4

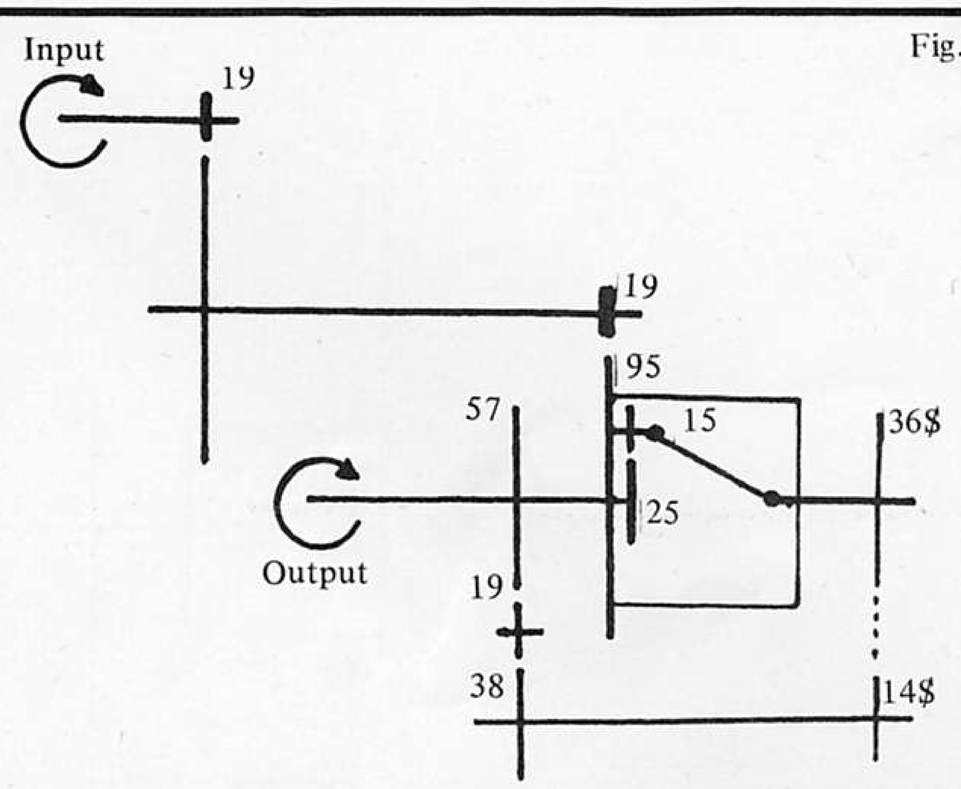


Fig. 5

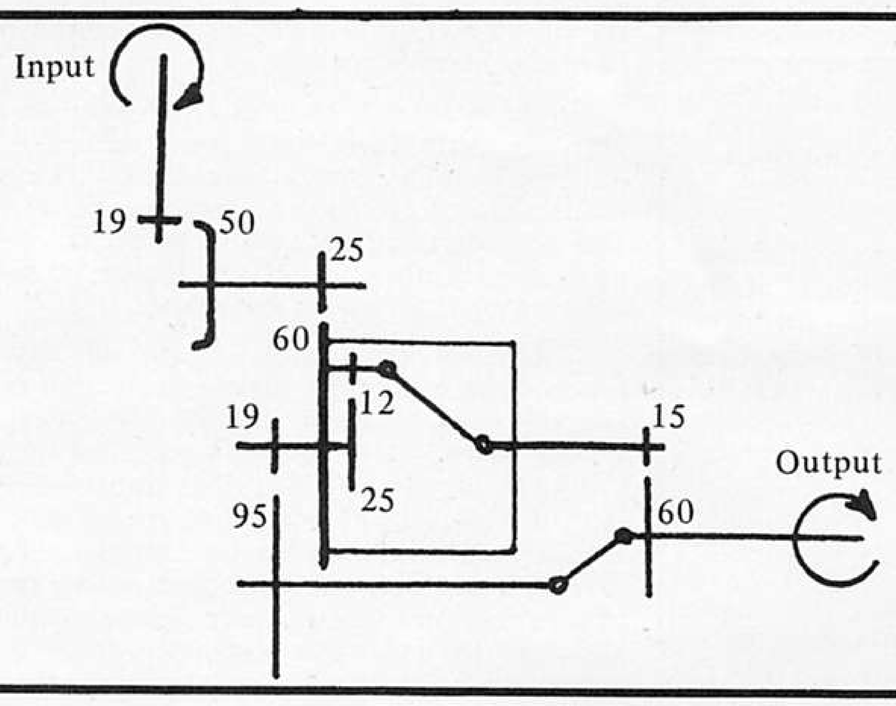
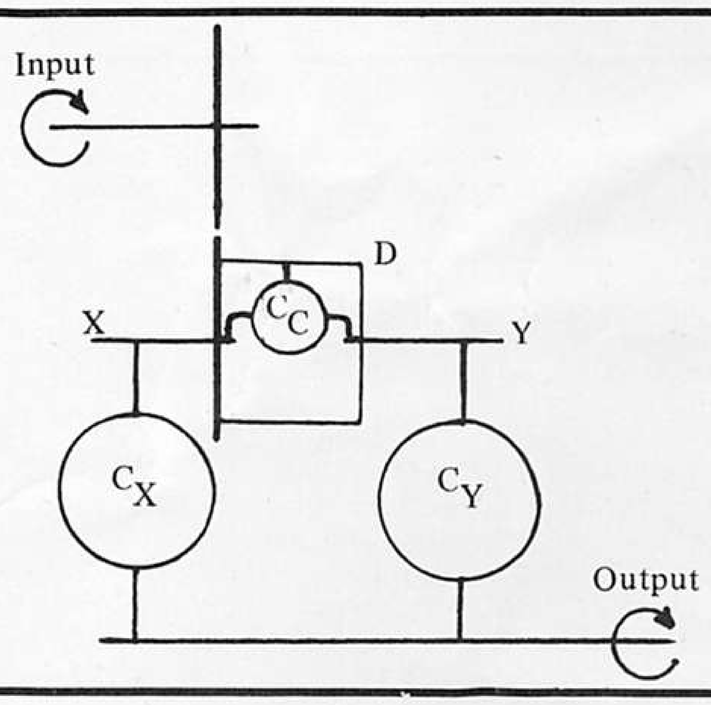


Fig. 6



thus giving a ratio of −12/7 rather than 12/7 desired for 1/y.

In making calculations on gear train design, it is necessary to adopt a 'Sign Convention' which identifies the direction of rotation of the various shafts involved. In this present article the rotation of a shaft is taken to be *positive* when the shaft is rotating clockwise when viewed from its right-hand end, and *negative* when it is rotating counter-clockwise. By extension of this principle a gear ratio will be given a positive (+) or negative (−) sign, depending upon whether it introduces a change in shaft rotational direction, or not.

EXAMPLE B The method, however, is not confined to dealing only with numbers such as 32 and 27 which are simply factorisable. Indeed, it is at its most powerful with relatively large primes. A much closer approximation to the reduction ratio needed for the Lunar Synodic Period than that used in Example A has long been known to be 19/120 x 37/173 = 1 : 29.530583 (an error of only -6×10^{-6}) and in the past some clockmakers have cut special gears for the primes 37 and 173. However, by using the (A+B)/(Ax+By) method this special gear-cutting is found to be unnecessary.

i) $\frac{37}{173} = \frac{25+12}{125+48} = = \frac{A+B}{Ax+By}$

ii) A/B = 25/12 which can be obtained in Meccano by the use of a 12-tooth clockwork motor pinion.

iii) 1/x = A/Ax = 25/125 = 1/5

iv) 1/y = B/By = 12/48 = 1/4

So, a layout as sketched in Figure 5 would be possible.

FURTHER DEVELOPMENT

Even further development of the (A+B) (Ax+By) principle is possible if there is a relaxation of the restriction to the use of only two gears within the differential-type unit. Strictly, if the two gears are replaced by a compound gear train C_C which provides a reduction ratio c between the left and right half-shafts, the overall effect becomes:

$$\frac{\text{Output speed}}{\text{Input speed}} = \frac{(1/c)-1}{(x/c)-y}$$

Again, the derivation of this expression is given in the original article; when c = − B/A as in the two-gear case already discussed, this new formula, of course, reduces to the now-familiar (A+B)/(Ax+By).

With this development the complete layout now takes the form indicated in Figure 6: the gear train C_C may be of any appropriate form, either using universal couplings as described previously, or not, as relevant – the only fundamental requirement is that the gear train is to be carried by the rotating cage. The reduction ratio c refers to the complete train of gears linking the two half-shafts, and if a pair of numbers are defined as A and B where 1/c = −A/B, the expression (A+B)/(Ax+By) may still be used to represent the overall gear ratio of the layout, retaining the simplicity of calculation which has already been demonstrated.

* * *

APPLICATION OF THE GENERAL TECHNIQUE

EXAMPLE C Another good approximation to the Lunar Synodic Period reduction ratio is 49/1447 = 1 : 29.530612 (an error of 23×10^{-6}). This ratio however creates a problem in that 1447 is a prime number much too large to be cut as the teeth of a single gear. In fact, even with the (A+B)/(Ax+By) technique 49/1447 is somewhat difficult to achieve; however −49/1447 is much easier to produce and of course gives the same rotational speed, but with the reverse rotational direction.

i) $\frac{-49}{1447} = \frac{-56+7}{1440+7} = \frac{A+B}{Ax+By}$

ii) 1/c = −A/B = 56/7 = 8

iii) 1/x = A/Ax − 56/1440 = −7/180

iv) 1/y = B/By = 7/7 = 1 which means that the right-hand half-shaft can be used as the output shaft.

Thus the desired result can be achieved with a gear train as sketched in Figure 7. A slight refinement can still be added even so; to avoid complications in the drive to the cage a reshuffle to the layout shown in Figure 8 makes a better practical arrangement.

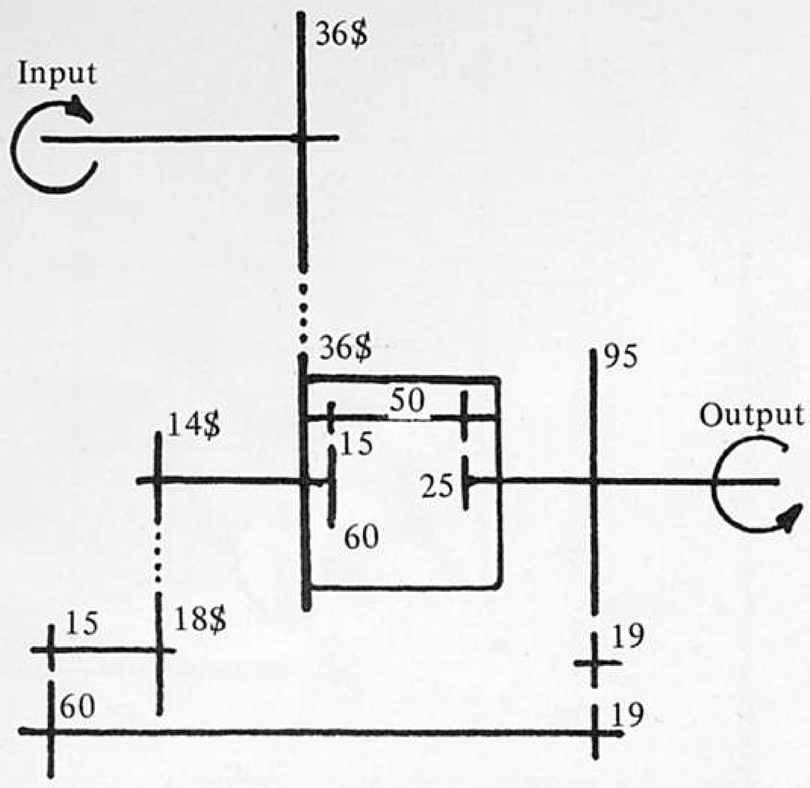
Here the left-hand half-shaft has become a Socket Coupling and drive is direct to a pair of Face Plates which are linked by Screwed Rods or other convenient means to form the cage, and then locked to the input shaft which enters through the Socket Coupling. As a result, the input and output shafts are in line with each other giving a very neat layout. The idling 19-tooth Pinion is used to ensure that the total reduction ratio in the external segment of the gear train is the − 180/7 which is desired, with not only the magnitude of the ratio being correct, but also with the first and last shafts contra-rotating as required by the minus sign. The job is done with only eleven gears, and it is doubtful if any other arrangement would be so economical in gears, so simple, or so convenient.

TIPS FOR USERS

From the foregoing it will have been seen that the (A+B)/(Ax+By) technique is an extremely powerful tool for designing gear trains – and it has the advantage that there is only one formula to remember!

All that the user has to do is to take the ratio required, split it into convenient Meccano gear multiples, and check that A/B, 1/x, and 1/y can be accommodated with Meccano gears. Frequently there will be several choices avail- →

Fig. 7



able and the decision will then involve such matters as the ease of construction, or the availability of components at the time.

A useful aid is a table of 'Meccano products' of which an example is given in Table 1. This shows numbers having only prime factors of 2, 3, 5, 7 or 19, these being the factors relevant to the use of Meccano gears and sprockets. A list can then be made for the pairs of 'Meccano products' whose sum, or difference, equals the numerator or the problem ratio, and another list can be made for the denominator. These lists are examined to find pairs having simple relationships to each other. For Example B, the pairs are:

173 = 171 + 2	37 = 36 + 1
168 + 5	35 + 2
152 + 21	32 + 5
135 + 38	30 + 7
133 + 40	28 + 9
128 + 45	27 + 10
125 + 48*	25 + 12*
98 + 75	21 + 16
	19 + 18

The stars (*) show the most convenient number-pairs to use.

It is often useful to remember that a 14-tooth sprocket linkage will operate in a 1" spacing, for instance in the rotating cage, thus often taking care of otherwise awkward A/B factors, for instance:

34 = 27 + 7 = A + B can be arranged as
27/7 = 3 x 9/7 = 57/19 x 18s/14s.
37 = 28 + 9 = A + B can be arranged as
28/9 = 4 x 7/9 = 60/15 x 14s/18s.
39 = 21 + 18 = A + B can be arranged as
21/18 = 3/2 x 7/9 = 57/38 x 14s/18s.

It is also very useful to remember, as noted earlier, that if either x or y can be made equal to 1, that half-shaft can be used as the output shaft.

These are only a few of the possibilities open to the use of this technique; many similar gear trains have been built to meet specific needs, and the overall impression is that the (A+B) /(Ax+By) method is a workable system for obtaining almost any gear ratio with (probably) the minimum usage of gears.

ACKNOWLEDGEMENT

The authors of this article jointly wish to express their thanks to Patrick Briggs and Alan Partridge for the advice and encouragement given during its preparation.

TABLE 1 – 'MECCANO PRODUCTS' IN THE RANGE 1 to 1000

Numbers which do not have prime number factors other than 2, 3, 5, 7 or 19 (note that * indicates that 19 is a factor)

1	36	100	196	342*	512	735
2	38*	105	200	343	513*	750
3	40	108	210	350	525	756
4	42	112	216	360	532*	760*
5	45	114*	224	361*	540	768
6	48	120	225	375	560	784
7	49	125	228*	378	567	798*
8	50	126	240	380*	570*	800
9	54	128	243	384	576	810
10	56	133*	245	392	588	840
12	57*	135	250	399*	600	855*
14	60	140	252	400	608*	864
15	63	144	256	405	625	875
16	64	147	266*	420	630	882
18	70	150	270	432	640	896
19*	72	152*	280	441	648	900
20	75	160	285*	448	665*	912*
21	76*	162	288	450	672	931*
24	80	168	294	456*	675	945
25	81	171*	300	475*	684*	950*
27	84	175	304*	480	686	960
28	90	180	315	486	700	972
30	95*	189	320	490	720	980
32	96	190*	324	500	722*	1000
35	98	192	336	504	729	

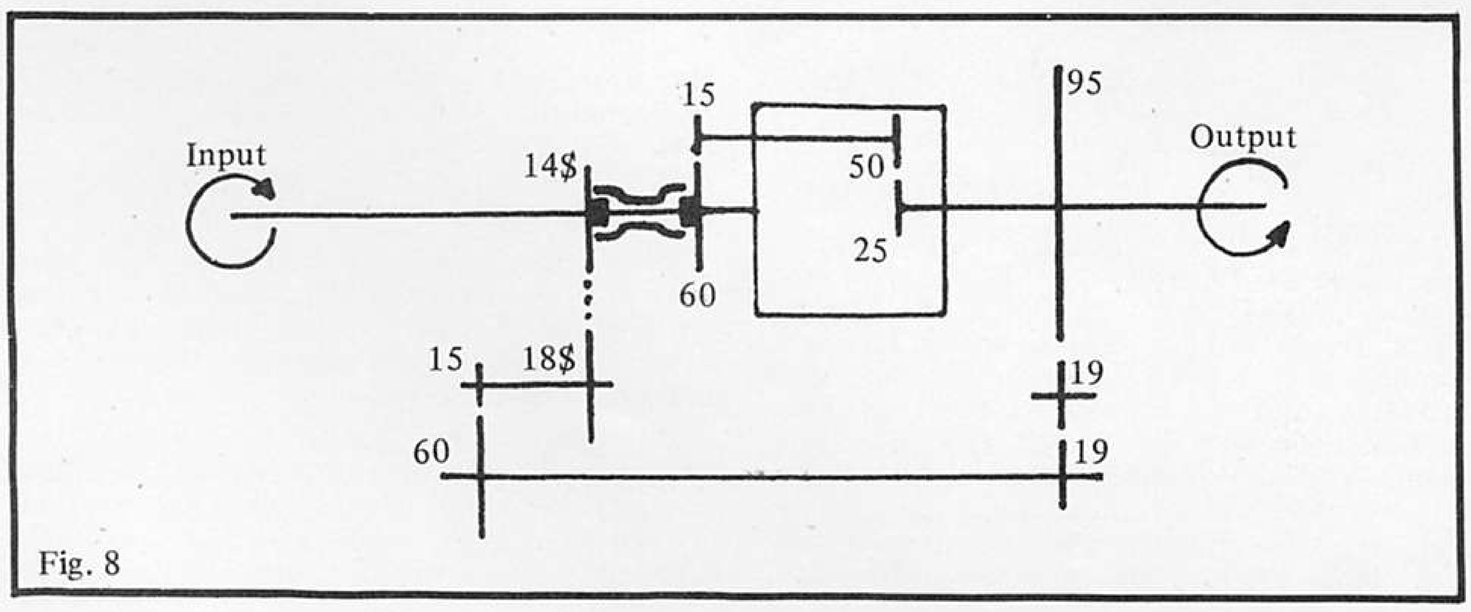


Fig. 8

MECCANO MOUSE CONTEST

Once again, this time because of the late circulation of the July MM, modellers who like a challenge were given insufficient time to tackle Alan Partridge's Meccano Mouse Contest, first announced in our April issue. For the last time, therefore, we have decided to extend the competition by a further 3 months, and *all entries must now reach us by 11th December, 1978.*

Our taskmaster has provided the following notes on the competition to set minds working, but before coming to them, we should remind readers that the task in question is to make a model which, when suitably prepared, set down on a smooth surface and released, will move along a figure-of-eight course and return to the starting point. Only standard Meccano parts (not Plastic Meccano) may be used, along with any motor made by Meccano in the last 10 years. Batteries must be carried on the model. The lightest model will win. The model itself must not be sent to us; just sufficient details to enable it to be re-built and a note of its all-up weight, including batteries. Alan Partridge now writes:–

"I have to confess that I cribbed this competition from one set a few years ago in a university engineering department. There the model had to be made from balsa, paper clips, and one standard office rubber band. I have not tried to make a Meccano Mouse myself, so most of what follows is guesswork.

"Meccano Driving Bands do not have as much stretch as most elastic bands and model aircraft rubber strip. I doubt whether they would provide enough power. The Tension Spring is very strong, but does not stretch very far; If it pulled a string wound round a rod this would probably have to be geared up to the driving axle. Spring Cord could not be twisted like rubber and Compression Springs would be awkward to use. The Magic Motor has spring power and the gearings all in one unit, and looks a good prospect. A crane motor with a few miniature heavy-duty alkaline cells, as used in flash guns, would have more than enough power for dozens of runs, but more weight. A small fly-wheel set in Elektrikit needle bearings would be worth trying; it has been shown that a high speed fly-wheel could run a city car for over 10 miles.

"The other problems to be solved are the form of the vehicle and how it is to be steered on a figure-of-eight course. If it starts at the centre, it needs to do one complete circle to left and one complete circle to right, or vice versa. The lightest form is likely to be a three-wheeler with one wheel steered. We cannot afford the weight of a differential, so only one of the others will be driven and the third will be loose. If the steered wheel has a tiller, this can rest against a cam, kept in contact by a Compression Spring. The cam can be driven with gearing-down, or the equivalent in Driving Bands or string, from the axle of the driving wheel; or more directly from the winding shaft of a Magic Motor. Alternatively the steering wheel can be set hard over to the opposite side, a catch being released by string taken up on an axle or winding shaft.

"Another interesting possibility is rather like a child's bicycle with stabilizers, but the two small wheels and the larger central wheel are all fixed on one driving axle. The front, or rear, single wheel castors revolve freely. The vehicle circles in whichever direction it is leaning, and a weight must move across to tip it over at half time. This links up with another possible source of power: a falling weight.

"Two aluminium rods from a Clock Kit pendulum would form a light triangle with a pulley at the top; the string from a falling weight would pass over the pulley and round the driving axle. Then, if the weight slid down one rod to one side, this could also tip the vehicle sideways as required.

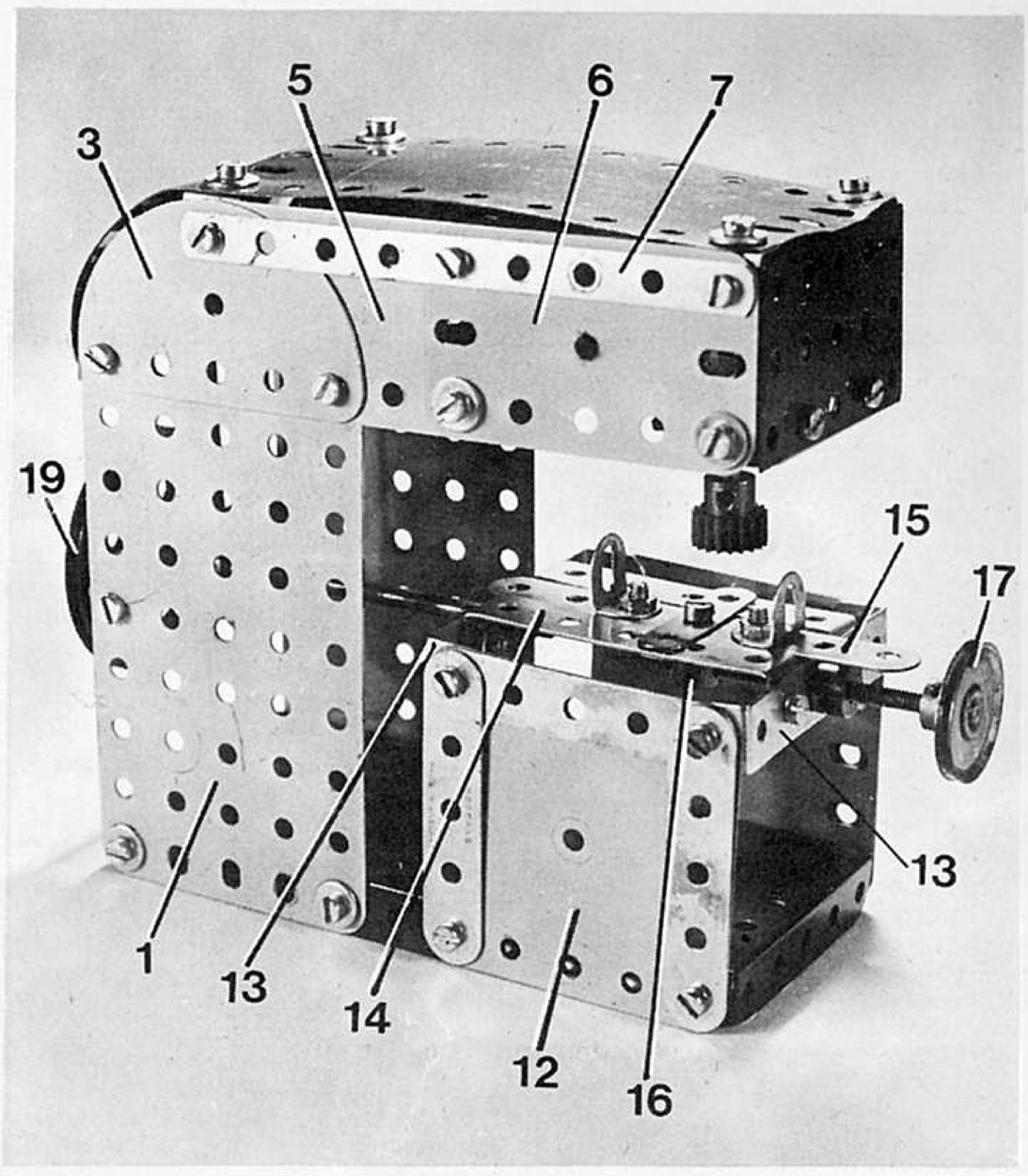
"What else haven't I thought of, and which will be the lightests? I'll be very interested to see."

ALAN PARTRIDGE

TAYLOR'S TEKNIKIT

Taylor's Teknikit is our name for a "machinery multikit" developed for his own interest by Mr. Harold Taylor of Huddersfield. From a standardised selection of parts, specially chosen for building interesting machine models, Harold has designed a number of excellent machines which we have been featuring in these pages. The 'Kit' is not commercially available, of course, but we give a list of its contents below for those who wish to collect the parts in order to build the models. Already we have featured a Bench Drill and a Shaping Machine; here we now have a compact little . . .

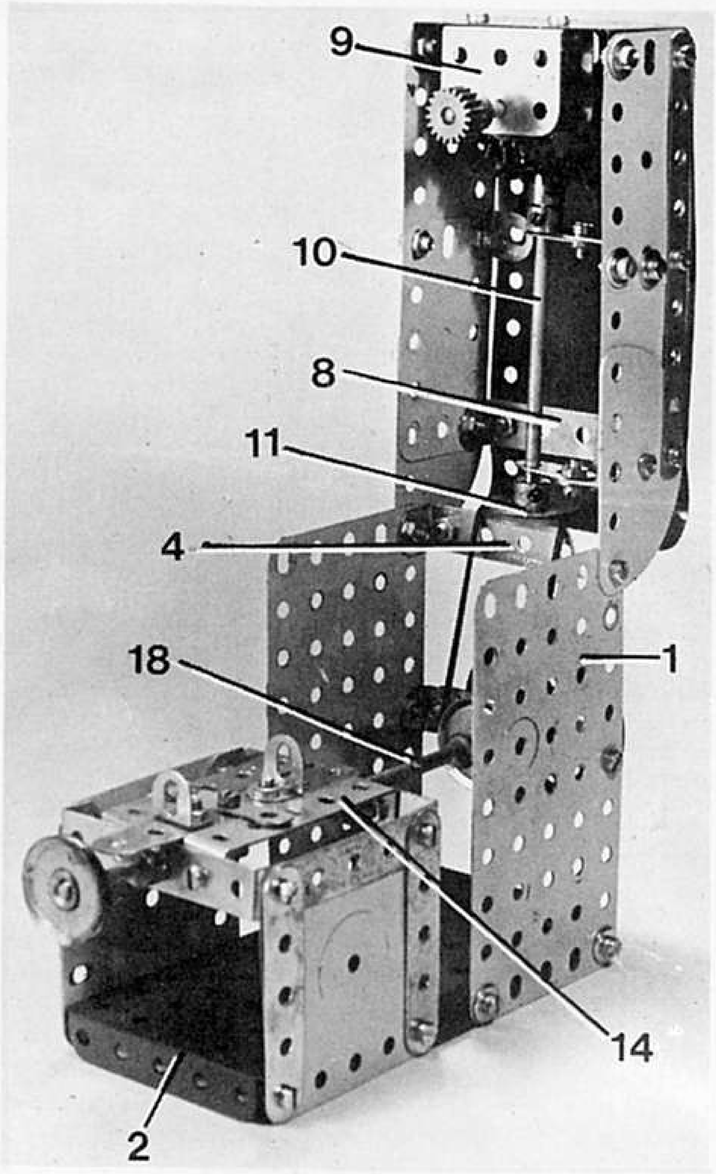
MILLING MACHINE



In very general terms a Milling Machine can be described as a versatile machine tool for metal removing and shaping. Often capable of carrying out highly precise work, such as making parts for tools and dies, it is thus admirably qualified for inclusion in the Taylor's Teknikit range of models.

As regards construction, the body of the machine is built up from two 4½" x 2½" Flat Plates 1 bolted to the side flanges of a 5½" x 2½" Flanged Plate 2. Fixed to the upper end of each Flat Plate is a Semi-circular Plate 3 (the rear securing Bolt helping to hold a 2½" x ½" Double Angle Strip 4 in place) and a 2½" x 1½" Flexible Plate 5, the rear holes of which coincide with the centre row of holes in the Flat Plate. Plate 5 is extended four holes forward by another 2½" x 1½" Flexible Plate 6, then the upper edges of Plates 3, 5 and 6 are overlaid by a 4½" Narrow Strip 7. Note that the rear fixing Bolt of this Strip helps to hold another 2½" x ½" Double Angle Strip 8, while both the centre and front fixing Bolts each hold an Angle Bracket in place.

The model with top raised to show interior.



Bolted between the front ends of Plates 6 at each side is a 2½" x 1½" Flanged Plate, to the inside lower edge of which a Channel Bearing 9 is fixed, flanges inwards. Located in the outer row centre holes of these flanges is a 1½" Rod which carries a Multi-purpose Gear between the flanges and a ½" Pinion on the lower end of the Rod. The Pinion represents the milling tool. The Multi-purpose Gear meshes with another Multi-purpose Gear fixed on the inner end of a 3½" Rod 10 journalled in the round holes of two Fishplates which extend the long lugs of two 1" x ½" Angle Brackets bolted to one side of the casing. The Rod is held in place by a Collar at one end and a 1" Pulley 11 at the other. The top of the casing can then be completed by bolting a 2½" x 2½" and 4½" x 2½" Plastic Plate to Double Angle Strips 4 and 8 and the above-mentioned Angle Brackets.

In building a work table, a 2½" x 2½" Flexible Plate 12, overlaid along the top and sides by 2½" Strips, is bolted to each side flange of Plate 2 in the position shown, then the upper corners of the Plates at each side are connected by 2½" x ½" Double Angle Strips 13. Two more 2½" x ½" Double Angle Strips 14 are bolted between the second and fourth holes of D.A. Strips 13, thus leaving a half-inch gap between them. Sliding in this gap is a 3½" Strip 15, across the centre of which two 1½" Narrow Strips (one above and one below the Strip and the Double Angle Strip alongside it) are fixed by a Bolt screwed into the central bore of a Threaded Boss 16 beneath the lower Strip. Screwed through the transverse bore of this Threaded Boss is a 3" Screwed Rod which is journalled in the centre hole of outer Double Angle Strip 13, where it is held in place by Collars. Thus, when the Screwed Rod is turned by means of a 1" Pulley 17 fixed on the end of the Rod, 3½" Strip 15 is moved backwards and forwards. Two Angle Brackets are bolted to Strip 15 to represent work-support frames.

Finally, a 4" Rod 18 is journalled in the centre hole of inner Double Angle Strip 13 and in a 2½" Strip attached by Angle Brackets to Flat Plates 1, being held in place by a Collar at one side of the Strip and a 2" Pulley 19 at the other. Fixed on the Rod is a 1" Pulley which is connected by a Driving Band to Pulley 11 above it. Drive to the model would of course be taken to Pulley 19.

PARTS REQUIRED

1– 3	1–20a	6–48a	1–160
7– 5	3–22	1–51	4–188
2–10	1–26	1–52	2–190
8–12	22–27f	2–53a	1–194a
2–12b	44–37b	4–59	1–194c
1–15b	44–37c	1–64	2–214
1–16	17–38	1–80c	2–235a
1–18a			2–235g

TAYLOR'S TEKNIKIT CONTENTS LIST

Part No.	Qty	Part No.	Qty
2	4	53a	2
3	2	59	6
5	10	62	1
8a	2	63	1
9	2	63d	1
10	4	64	1
11	2	80c	1
12	8	108	2
12b	2	110	1
15b	1	111	2
16	3	111a	2
17	2	111c	6
18a	2	115	1
20a	2	125	2
22	3	126	2
22a	2	126a	2
24	2	133a	2
26	2	160	1
27a	1	188	4
27f	2	189	4
32	1	190	2
35	2	194a	2
37b	64	194c	2
37c	64	214	2
38	30	230	1
43	1	231	1
48a	6	235a	2
51	1	235d	2
52	1	235g (1½" N.S.)	2

As 'Postbag' was omitted from the last MM, we have printed several of July's letters here, hence the reference in some cases to not-quite-so-topical issues. Nonetheless, we feel them worthy of inclusion.

NEW MECCANO

Dear Mr. Jelley,

May I use up a fraction of your time with one or two observations about the new Meccano? As one who was born into the "classical period" of the first red/green era, and the philosophy that accompanied it, I am delighted to see (judging from the few pictures) that Meccano has gone even further back to good engineering principles.

You will recall that the slogan of the time was "The Toy that Made Engineering Famous" and though one may feel a little amused by the Boys' Own Paper earnestness of it, nevertheless the idea was right. Whether the model was a Level-Luffing Dockside Crane or a Set 00 Tricycle, the engineering quality was good. I remember, even now, my dismay at the cheap toy approach of many of the designs accompanying the blue/gold period – wheels journalled in flexible plates, untriangulated structures, Strips instead of Girders and so on. One has only to look at the MM for c.1936 to see it all. The second red/green period was an improvement in principles, as well as appearance, and the silver/yellow/blue period, now on the way out, whilst to some not really aesthetically better, continued the improvement in principles. I think the latest change is an undoubted improvement all round.

I feel sure that all enthusiasts would echo this – the true engineering approach is essential in the Meccano philosophy. By all means, modernise the appearance of the models, but as you so rightly say in your editorial, they must be structurally sound.

Finally, would it be possible for someone to write an article, or series of short articles, on the history of Meccano and its changing philosophy since the early nickel-plate/brass period of Frank Hornby ? After all, it is a unique thing, I think; compare the paternalist pomposity of dear old Frank with his faintly evangelical approach, with the April 1978 Meccano Magazine; yet it is the same product really. Splendid work!

Sincerely yours,
IAN G. HAMPSON
Twickenham, Middlesex.

(Thanks, Mr. Hampson. It's particularly gratifying to have your comments on Today's Meccano. Ed)

* * *

Dear Sir,

Many thanks for yet another well-produced Meccano Magazine. Thanks also for re-introducing the 'Postbag' feature. I think Meccano enthusiasts need a platform to air their views.

It was interesting to read Meccano Ltd's views on the new sets and colours. I have already seen the sets and I think the new colours look very attractive. I would like to make one small suggestion relating to these sets: I'd like to see a leaflet included showing pictures of some of the bigger and more complicated models that adult enthusiasts build. This might help foster the notion that Meccano is more than a toy and it might also encourage more youngsters to aim for Supermodel standards.

When I was given my first Meccano set over 20 years ago, I was very impressed by the pictures of the Giant Blocksetting Crane and the Walking Dragline that were featured on the front covers of the instruction manuals. It became my ambition to improve my model-building skills (and to increase my stock of parts) so that I, too, could build these large models. I get the feeling that not enough emphasis is given to converting the young recipient of Today's Meccano into the adult enthusiast of the future.

I would also like to add a word about the instruction leaflets for the No. 10 Set. I have been feeling for some time that many of these models are now out-of-date and that they should be up-dated. Then, last year, Meccano themselves made the Special Model Leaflets obsolete by withdrawing the E15R Motor.

In addition to this, I have been very impressed by some recent 10 Set models – e.g. David Whitmore's Maudsley's Table Engine; Roger Wallis' Leyland National Single Decker Bus with automatic gearbox; Bert Love's Grandfather Clock and several others. Printed instructions already exist for Bert Love's Clock, but what about issuing instructions for some of these others. Perhaps Meccano Ltd. could run a competition to design new 10 Set models.

Yours sincerely,
J. B. EVANS
Llangefni, Gwynedd

(Many thanks for your comments, Mr. Evans. The No. 10 leaflet models are somewhat outdated, but we're working on the problem – witness the new No. 10 Crane in this issue!. Ed)

* * *

TERMINOLOGY

Dear Chris,

METRIC MECCANO

We now use a decimal system for our money; there are some advantages. But however completely we may (sooner or later) go over to a metric system for our weights and measures, I think we all agree that we cannot possibly envisage altering the basic half-inch Meccano unit to any sort of metric unit. Reasons are obvious.

But there seems to me to be in any case a need to reconsider our terminology. For years we have struggled along with this sort of expression: 'The plinth is filled in with a 5½" x 3½" Flat Plate, a 5½" x 1½" Flexible Plate, and a 3½" Strip; a 7½" Strip braces the underside'.

Such cumbersome phrasing must annoy Meccano friends on the Continent, because they do not use vulgar fractions as much as we do, and because (like us) they have to try to identify the Meccano parts referred to as an 11-hole by 7-hole Flat Plate, an 11-hole by 3-hole Flexible Plate, a 7-hole Strip, and a 15-hole strip. That is what we all visualise as we read.

It is no use whatever to convert these terms to millimetres. The figures do not relate properly to the number of holes. How then can we get away from our present system, which will look unbelievably archaic, even to us, in a few years' time? And how can we express Meccano units in a way we (and Meccano dealers) can all understand? Having had some years' experience on British Standards Institution committees, I am conscious of the need to solve the problem in a way which will satisfy all concerned.

Maybe the answer is simple enough. If we explain to everyone that in future our half-inch unit is to be called an 'M', most of the Meccano parts can be described neatly. The cumbersome phrase with which I began this note would read: 'The plinth is filled in with an 11M x 7M Flat Plate, an 11M x 3M Flexible Plate, and a 7M Strip; a 15M Strip braces the underside'.

Similar use of the 'M-units' would simplify our Parts Lists and Manuals. Those Parts not thought of in exact M-units would be expressed only in millimetres: a 28.5 mm Gear Wheel, and so on.

In this way, we can face the future without ever having to apologise for continuing to use an 'archaic' unit. And it won't cost Meccano Ltd or anyone else a penny (old or new!) in re-tooling or replacing parts.

Meccanomen all over the world would have a common system they can all understand.

Yours sincerely,
JOHN WESTWOOD
London SE23 3XN

* * *

SHOWMAN'S ENGINES

Dear Sir,

I read with interest the article Dynamos for Showman's Engines by Colin Hamilton. (Meccano Magazine January 1978). In the opening section, covering the historical aspect, the term for the Showman's Engines fitted with dynamo and field exciters is known as the "Special Scenic" Engine, versions of which were designed, and manufactured in great numbers by Burrell's of Thetford and Fosters of Lincoln, for use in pairs for the Electric Scenic Railway which first appeared in about 1910. These rides consisted of a set of eight four-wheeled cars running on a circular track of about 40ft diameter. The track was of the undulating type having two hills and two valleys incorporated in the ride. The eight cars had an electric motor driving the rear wheels by a chain.

These cars could be built portraying Whales, Dragons, Peacocks, Dolphins or, even motor cars, etc. When ready for transport, the rides could weigh in excess of 50 tons! The terrific starting loads of the riders used to throw off the belt of the Showman's Engine, and a field exciter was incorporated on the smokebox of the engine to excite the field windings of the Main dynamo to enable a variable starting load for use with the ride.

The engines (two were needed for each scenic ride) also had a special crane fitting which was built on the coal bunkers, to assist with the erection and dismantling of the rides, the cars of which weighed about 30 cwt each. Several engines of the non-scenic type, i.e. one dynamo, were returned to the works of their manufacture to be fitted with crane tripods over the coal bunkers.

The above describes briefly the use of Showman's Engines used with the scenics, but detailed information can be found in several books: "English Fairs" by Ian Starsmore; "Historic Fairground Scenes" by Michael E. Wore: "Fairground Steam" by Anthony Beaumont. They are all useful to the Meccano constructor interested in the fairground and are recommended for modellers.

I hope this information is of interest and may help readers with their models. Thanking you.

Yours faithfully,
STUART DAY
Portsmouth, Hants.

Dear Sir, (must do these things right)

I was pleased to see my Showman's Road Locomotive, "The Lady Marie", used as an example of advanced model-building by Colin Hamilton in his article on the front ends of such engines, in the April MM. This is the second time the model has been used in this manner; the first being by Bert Love, (who also took the pictures) in the Meccano Engineer, No. 11; March 1976. However, both writers classed the model as a BURRELL Road Locomotive, when in fact it is a free-lance design incorporating the most attractive detail features I could find in photographs of *all* types of such engines, taken at various rallies. And when the 'old girl' goes on public show, it is normally accompanied by a descriptive card which states all this. The main clue lies in the cylinder block, which is obviously *not* Burrell design, but in fact, *Fowler* pattern. To date, I've not received a shoal of letters querying the presence of a Fowler cylinder block on a Burrell engine, but who knows what the future holds?

Actually, at the time I was just about due to make the cylinder block for the model, I'd decided on the Fowler pattern, but the valve rod on the real thing enters the top of the cylinder block centrally, and at an oblique angle, and it looked as though I'd have to make an over-scale block in order to use the centre hole of a 2½" Strip. Then Binns Road, at a very vital moment, brought out the present 2" Strip with its central hole, and this enabled me to build a perfectly-proportioned cylinder block to Fowler pattern.

However, I think that Colin Hamilton, in criticising the 2" Sprocket Wheel used in the steering gear of the pre-war (*which* war?) design Meccano Traction Engine of Binns Road origin, misses the point that some Meccano parts then were used only to *represent* certain features of the prototype on which the Meccano model was based. Colin claims that, essentially, traction engines and road locomotives have a simple front beam axle on a simple but universal pivot point, and not a large circular bearing as in the Meccano model. Basically true, but I possess a book by W. J. Hughes in which pictures of Road Locomotives fitted with a large circular attachment to the axle beam appear, and the steering chains are attached to this. In fact, the drawing of the Fowler 'Big Lion' engine, from which I calculated the scale measurements of my model, actually shows such a gadget. But it was never a bearing as such; really it was a bowl-shaped object, known as a 'spud-pan', and was used to store the 'spuds'. These were *not* 'taters', but attachments to be fitted to the rear wheels under certain conditions and sixteen of them comprised a 'set'. Viewed horizontally, the 'spud-pan' tended to conceal the springing and axle-pivot arrangements, but of course, they were there.

I've never seen a 'spud-pan' on a genuine Showman's Engine, but according to my book, the Fowler Road Locomotive, "Lord Kitchener", which was built originally for military service and possessed a 'spud-pan', was later converted to a Showman's Engine, so possibly the 'pan' was retained. This engine ended its days pulling tubs out of a footrill coalmine, and was finally completed scrapped. That the Meccano model sported a rigid attachment illustrates that, while the advanced model-builder Meccano *enthusiast* can buy almost unlimited parts (in theory) and spend unlimited time in achieving a true-to-life effect, the Meccano firm, AS A BUSINESS, cannot take this point of view. In any case, the general model-building standard of the day of this particular model, was almost retrograde (in effect) to what is achieved now. Bert Love in his article on "The Lady Marie" commented that the scale 'looked right'. Yet the Meccano system has contained all the basic parts for achieving this scale for most of its life, so why didn't some advanced model-builder do it before, say fifteen years back when the break-through seemed to get *universally* under way? Perhaps it was a case of 'the blind leading the blind', as I have also committed the heinous 'crime' of a 5½" diameter boiler, with front wheels of the same size! Tut! TUT!

Finally, and to prevent other Meccanomen pointing out the fact to me, I would add the rider that I know that J. Matthews of Fillongley did produce some very fine true-to-scale effects before WW II, but he seemed to be the exception rather than the rule.

Yours sincerely,
BERT HALLIDAY
London

* * *

YOUR IDEAS

Dear Sir,

Congratulations on the new Meccano Magazines. All copies have been well balanced and well suited to my personal taste.

One suggestion for the future: how about some hints on renovating old

Binns Road products. They would provide an excellent back-up to Bert Love's articles on historic Meccano products. For starters, I recently acquired a No. 2 Motor Car, complete, but rather rusty. Painting is fairly straightforward, but the chrome on the radiator and bumper is more difficult to restore as, by the time all rust had been removed, the radiator was rather thin to say the least and it was too risky to try electroplating. I finally used cooking foil glued to the radiator with one of the new fast adhesive chrome trim as applied to cars. The final result was quite pleasing.

Could any reader provide drawings of No. 1 special aeroplane wings? I have a set, less these rather important items, and wondered if they could be produced from sheet tinplate.

Good luck with the MM. Trust it will continue.

Yours sincerely,
PETER HARRISON
Airdrie, Lanarkshire

Dear Chris,

May I on behalf of the Stevenage Meccano Club congratulate you on a wonderfully produced MM for April 1978 and if this is what future copies will be like, we at the SMC are looking forward to them.

I wonder if your readers would like you to do articles on other construction outfits similar to the Erector/Primus/Structro which were covered in the Meccano Engineer by Mike Nicholls. There must be other construction sets still to be covered. I can loan you 1935 Marklin manuals and parts lists, and Trix would make another interesting article. I also have one called BOB.

I would like to see articles on Famous Engineers, and on the machines which turn out our Meccano parts. The odd non-Meccano article makes interesting reading and can also give the reader ideas for his model building. A page on the early Dinky Toys would also make interesting reading. Boxes through the ages since Meccano was started would also make a good subject; tins could also come under this. Thanks for a good magazine.

DENNIS HIGGINSON
(Secretary, Stevenage MC)
Stevenage, Herts.

Dear Mr. Jelley,

Having now enjoyed the fourth new Meccano Magazine, I feel that it is high time I wrote and stated my appreciation.

I was very keen on Meccano as a lad and, having been off the scene, so to speak, for 27 years, I am amazed at the achievements which the enthusiasts have accomplished in that period of time. Many of the models I have studied in your magazine have set an almost unbelieveable standard of excellence and well deserve to be the subjects of Super Model Leaflets, I would have thought.

Not really getting started again until January '77, I am still feeling my way around the system, and still gathering parts together, but one model I have completed so far, a Fowler BB1 Traction Engine, is due to go on display in Shaftsbury in August, two weeks prior to the Steam Rally in Stourpaine in September. Another model, an 8 x 4 Heavy Mobile Crane was built to show the potential of some heavy-duty tyres I located in Poole – a tyre, I think, which Meccano would do well to introduce to the system. Four inches overall, it fits snugly over Boiler End 162a. This model was on display during the March meeting of the SAMC, but was an operational disaster, due to a stretched chain and using nylon fishing cord which tangled itself round everything within reach. Still we live and learn! I hope to show the tyres again at Henley, this time on a Bedford Panorama Twin Steer Coach chassis – if I can get the parts necessary in time.

One comment I would like to make on the magazine, which could be a great help: in the articles about various machinery, such as Concord, overall dimensions would be handy. Perhaps we could have a few lorry and bus chassis – the parts which are normally not seen by the readers – and a simple plan view of a steam engine would be useful, showing for instance where the cylinders are on the type of engines which don't appear to have any, like tank locos. The list of possibilities in this type of article is endless. For example, I am still trying to find out how the height is increased on a tower crane as the building goes up. There do not appear to be any books on the subject.

All the best for the magazine.

Yours sincerely,
M. V. GILBERT
Nr. Blandford, Dorset.

Dear Editor,

Congratulations on the July MM - another fine issue. The April issue was also excellent – I regret that I had no opportunity to write to you about it at the time.

With regard to the April issue, I particularly like the Traction Engine series, Taylor's Teknikit, and Collectors' Corner dealing with the No. O Aeroplane Constructor Sets. I thought the article on the Helicopter produced from engineering drawings was excellent and a refreshing change from the usual type of article in which the subject is illustrated by photographs.

I thought Mr. R.S. Draper's suggestions regarding Supermodels particularly interesting and giving considerable food for thought. But I am not convinced that extensive modifications are necessary to most SMLs; I think that only sufficient alterations to improve the mechanisms, etc. are required in most cases, although some SMLs are much better than others in this respect.

I agree with J.D. Horsman's views in his letter in the April issue, concerning the value of 'POSTBAG' for exchange of opinions and information, and was therefore disappointed to find it omitted from the July issue; although I appreciate the reason for its absence as expressed in the July editorial. It was, therefore, all the more disappointing to find once again no less than three full pages devoted to Geoff Pratt's long-running series "Let Your Models Live" on photography and filming. Although I am in agreement with the sentiment expressed by the title, and with all respects to Mr. Pratt, I feel that the series itself should now be allowed to die gracefully, if for no other reason than that it appears to me to have strayed considerably from even the flimsiest connection with Meccano modelling. I appreciate that keen photographers and film makers among MM readers may find the series absorbing, but my own personal view is that I would much prefer to see this series dropped in favour of a regular appearance of "POSTBAG" or an alternative Meccano-based article.

A series such as that on Traction Engines and Showman's Locomotives currently featured in the MM would be ideal, containing information on the full-size subject and with salient points illustrated by photographs both of Meccano models and the prototype.

Yours faithfully,
BRIAN WILLIAMS
Southampton, Hants.

(The final article in Geoff Pratt's "Let Your Models Live" series will appear in our next issue. However, I would like to make the point here that, as with many other things, opinions on magazine articles must inevitably be subjective and what interests one person will not necessarily interest another. I, personally, found Geoff's series extremely interesting, highly informative and, I might add as an Editor, very readable indeed. Other readers have every right to disagree, but I, in turn, cannot agree that the reason for the series, i.e. its Meccano connection, has been lost. The series was intended, in effect, as a 'course' on cine-filming to enable Meccano modellers to capture their handiwork on celluloid. It seems to me that, to do this properly, general subjects such as editing, sound effects and so on, must be covered. They are likely to be required for a film featuring Meccano just as much as for any other subject. Wouldn't you agree, Brian? – Ed.)

* * *

FROM PAST M.M's

Dear Sir,

With reference to Basil Harley's article on Steam Power for the Meccano Modeller in Meccano Magazine of April, I have just acquired a small steam engine known as the Model L.4., a PLANE model manufactured by Latimer Productions of Teddington, Middlesex. On the lid of the box it states 'Will drive "Meccano" and similar models'. There is no date as such, but the instruction leaflet bears the code SE 5.47 – Steam Engine, May, 1947 ?

Although the reference to Meccano is made, the base of the engine is not drilled with the familiar half-inch pattern, but has just two holes, one in each diagonally-opposite corner and 5½" apart. There is no provision for attaching Meccano gears, but a groove exists on the extended hub of the flywheel similar to that on the current Mamod/Meccano model. As I also have a Bowman PW 203 which has a 'Base drilled to suit all "Meccano" sets' notice on the box, it would be interesting to discover exactly how many different steam engines have been produced by different companies, but with 'Meccano' in mind.

Yours faithfully,
ALAN TAYLOR
Exeter, Devon.

Dear Sir,

CHINESE CHARIOTS

Stimulated by Alan Partridge's problem as to how to construct the South-seeking Chariot with a minimal number of toothed parts, I built Mr. M.J. Oliver's model as described in the January 1957 MM in order to see what was involved, but was non-plussed to find it didn't work, in spite of incorporating Dr. K. Cameron's modifications (MJ April 1971 and MM October 1977).

These modifications are what a mathematician might describe as "necessary but not sufficient". As long as road wheel Diameter D and separation ("Track") T are equal, there must be a one-to-one relationship between a road wheel and its contrate in the differential. The trouble with Mr. Oliver's model is that this ratio is 57/50. The obvious remedy is to replace the 57-tooth Gears by 50-tooth each joined to its Contrate by a Socket Coupling. All the Pinions on vertical shafts may conveniently have 25 teeth.

However, the requirement that road wheel diameter and track should be equal, given by Mr. Oliver and repeated by Dr. Cameron, is unnecessary. So is Terry Morris' requirement that road wheels should be equally spaced from the centre (MM January 1977). The minimum essential requirement is: road wheel speed T differential wheel speed = T/D. Tyres for 3 ins. wheels vary a little in size, so a closely matched pair must be chosen. If these have D = 4.2 ins, then T = 4.2 x 57/50, or 4.79 ins. This can be obtained on Long Threaded Pins as axles, but more easily if there is one live axle, as shown in the photograph. Adjustment is then by trial and error. The chariot is turned continually in one direction. If the pointer moves slowly in the same direction, the road wheels are too close; if in the opposite direction, too far apart.

Yours sincerely,
W. A. CLOUGH
Swansea

Dear Sir,

Having built and tested the Meccano Strip Bender (economy version) described in the January MM, I find it works with remarkable efficiency. I wonder that it has not been published before when, in the earlier days of Meccano, the bending of Strips was a much more common practice than it is today. The introduction of Curved Strips largely obviated this, although it is still necessary to bend Strips when producing leaf springs for motor vehicles. For this purpose the device is a boon.

Yours faithfully,
W. E. BOLLAND
Lutterworth, Leics.

ANNOUNCEMENT

Mr. G. A. Pollock of Watford, Hertfordshire, wishes to announce the introduction of a world wide mail order service for the supply of Meccano commencing on the 1st November, 1978. The service is primarily designed for the supply of spare parts, although a wide range of sets, motors and other items will be available.

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NORTH WEST FRONTIER

by Michael J. Walker

Not many people will doubt that Meccano is a very engaging hobby, so much so, in fact, that a great many who originally purchase a Meccano set on a casual basis become so 'hooked' by the system that they wish to involve themselves much further in the Meccano scene.

This is nothing new; since the earliest 'Mechanics Made Easy' days of the beginning of this century, serious enthusiasts have enjoyed talking and exchanging ideas with like-minded people. The nature of the hobby being what it is, it soon became obvious that a specified date and venue was necessary for the viewing of large models, and so, with very little fanfare, the first Meccano Clubs were formed.

In recognition of the educational value of the medium, meeting places at schools and youth clubs, etc. were readily provided by teachers and youth leaders, and it is a feature of the pre-war Meccano Club network that the great majority were conducted in such establishments; an adult 'leader' presiding over the then usually very young members. Although Meccano modelling was the predominant activity, time was often allowed during the meetings for the pursuance of other interests, Hornby Trains frequently being uppermost amongst these. Something of a 'boom' period in the inter-war years, co-inciding with the supremacy of Meccano on the toy market, is especially noticeable to readers of old MM's, but of course the Second World War saw a suspension of Meccano production with consequent damping of Club activities nationwide. Not until recent times were Meccano Clubs again to figure largely in the pattern of Meccano life as a whole.

Today, the intricate network of Meccano Clubs is visible proof of the serious involvement of some hundreds of advanced modellers, not as in pre-war days when most of the younger members of clubs at schools, etc. had only modest stocks of parts with which to build models at a not very advanced level. Today's Meccano Club member is usually an adult with huge stocks of equipment, as compared to the 'average' outfit, attending meetings held perhaps only twice a year to give time to build the next awe-inspiring construction! At this point I must of course stress that it is *by no means necessary* to own vast stocks of parts to join a Meccano Club, but it is a particular feature of today's Clubs that a majority of members do have such a large collection.

Each Club, Guild or Society is organised along broadly similar lines, the members attending a special General Meeting once a year to elect officials. These are the Chairman, Secretary and Treasurer, but in the case of a very large Club, it is sometimes found that another official, a President, is featured. The Chairman makes sure that the meetings are conducted in an orderly fashion, and that the business of running the Club on a normal basis is handled efficiently by the other officials. The Secretary is responsible for the writing of reports, keeping in contact with the members via a regular news sheet and generally running the Club. The Treasurer holds the Club's 'purse strings', as it were, and submits a financial statement at the Annual General Meeting. This details the income and expenditure for the previous year, and recommends the subscription to be paid by each member for the next year. A President, if any, is often a 'permanent' official (i.e., not re-elected every year) who serves as the honorary head of the Club, and he also takes temporary charge of a meeting during the election or re-election of a Chairman. The position of President is usually awarded to a stalwart member who has given great service in the past, as a gesture of thanks from the other members.

It is a well known fact that the great majority of people who buy Meccano do not get any more involved than the mere occasional construction of a model. There are still many, though, who attain a great degree of competence and skill at building models, who are not yet convinced of the many advantages of joining a Meccano Club. They continue to work quietly away at their hobby, completely cut off from the main-stream of Meccano life. These 'lone-wolves' as I call them, are of course free to enjoy the hobby as they wish, but I do sincerely believe that they are missing a great deal in not joining a Club. Besides the already-mentioned contact with like-minded people, the very latest Meccano models are on view at each Club meeting. There's no better way to improve the quality of one's own modelling, or to pick up new ideas, than by joining a Club. Old magazines, books and other items of obsolete literature are often on show, cheap second-hand parts for sale, even the odd slide show or visit by a Meccano representative. As a former 'lone-wolf' myself, I can say that my enjoyment of the hobby has increased enormously since I took up my Secretarial pen!

Practically the whole of England is within easy reach of a Meccano Club, these being frequently named after the area they serve, i.e. Midlands Meccano Guild, Solent Meccano Club, etc. A letter to the Secretary of the Club will be all that is required to secure full details of Club activities and meeting times, etc. Although basically similar in format, differences do occur as regards subscription rates, facilities available and conditions of membership, etc.

Just as the Meccano Magazine was launched in 1916, to help Meccano boys 'have more fun than other boys', so today the Meccano Clubs help Meccano modellers to obtain still more enjoyment from their fine hobby!

CLASSIFIED ADVERTISEMENTS

Rates charged in this section are as follows: Private, 2p per word; Trade, 3p per word. Please send advertisements, with remittance, to: Meccano Magazine, Classified Ads, P.O. Box No. 4, Binns Road, Liverpool L13 1DA.

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FOR SALE: 1924 Meccano No. 7 Set in 3 trays. Cleaned and resprayed. No bents. List available. Responsible offer to: H. Youlden, 4 Links Side, Enfield West, Middlesex. Tel: 01-363 5602.

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FOR SALE: Pre-War MMs, some 1940's; 1950's. Wanted MMs 1928 (July–December), 1929. S.A.E. for details. Altnaharra, Elsdon Lane, West Hill, Ottery St. Mary, Devon.

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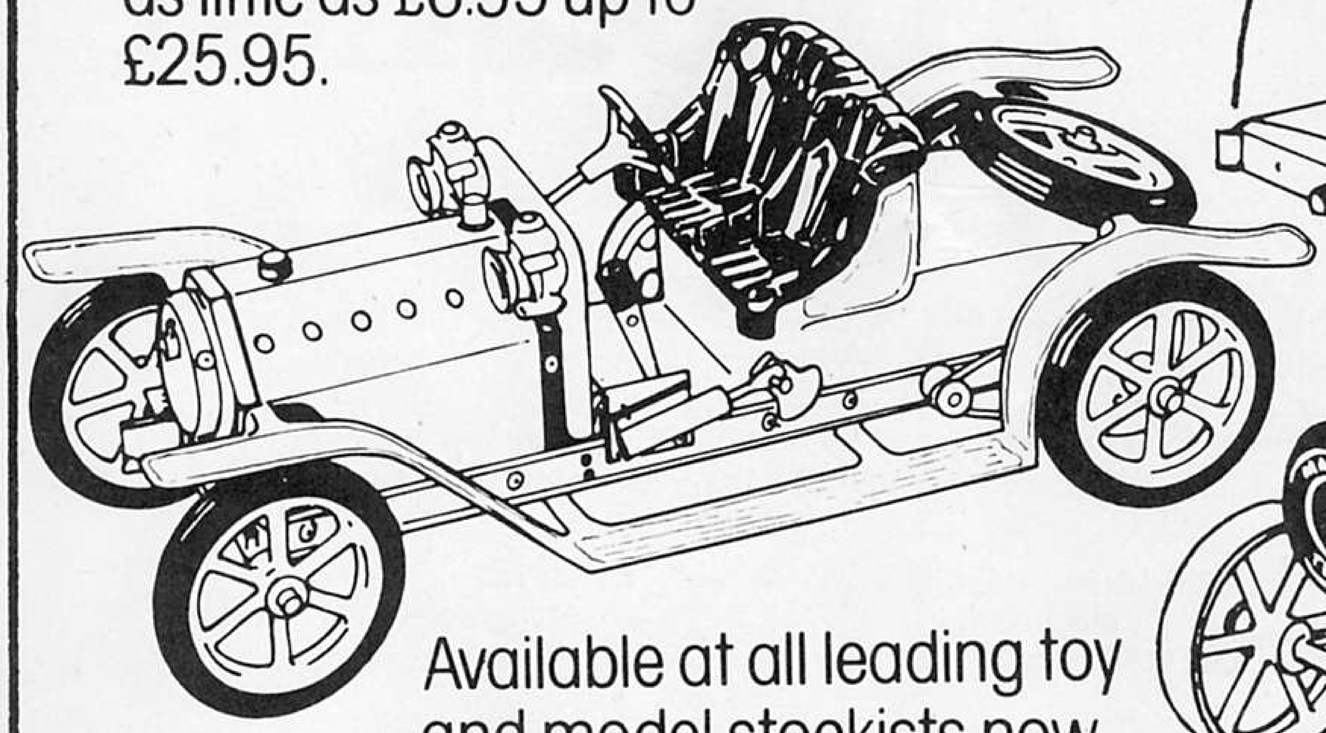

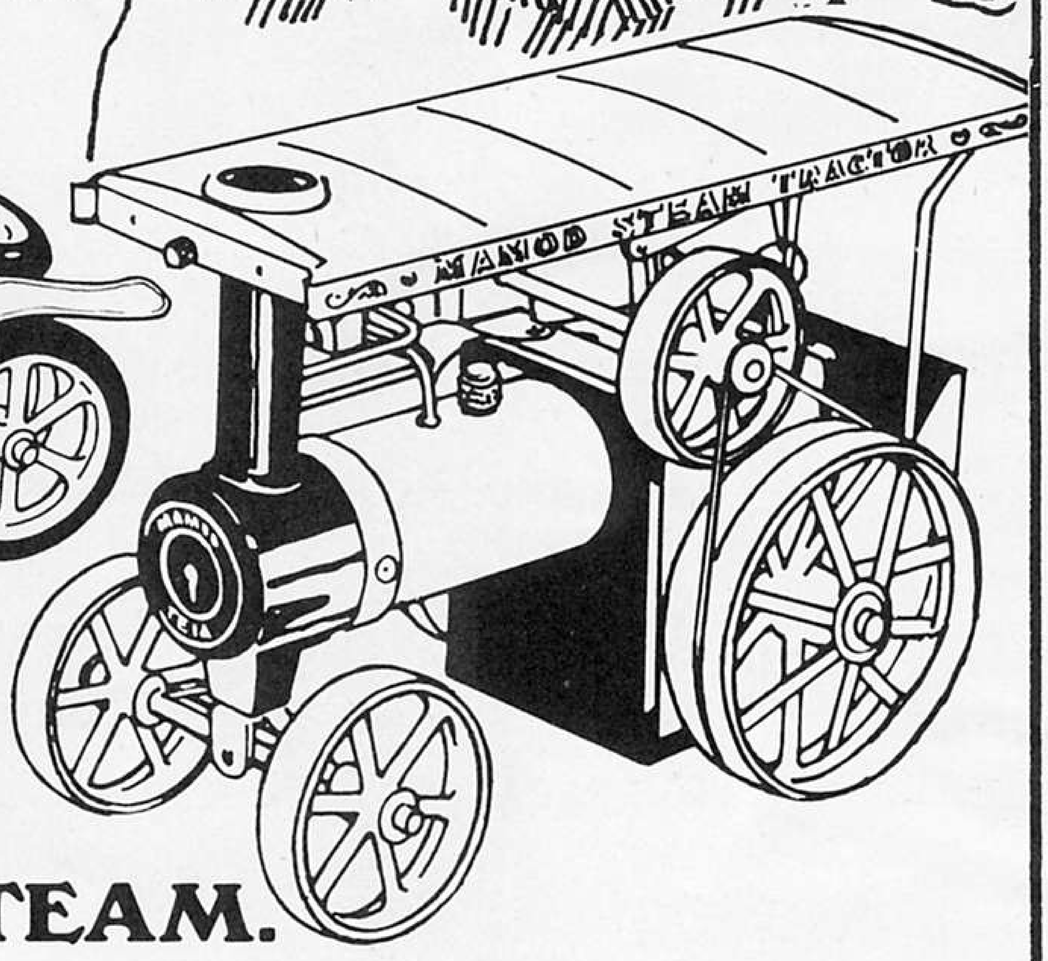

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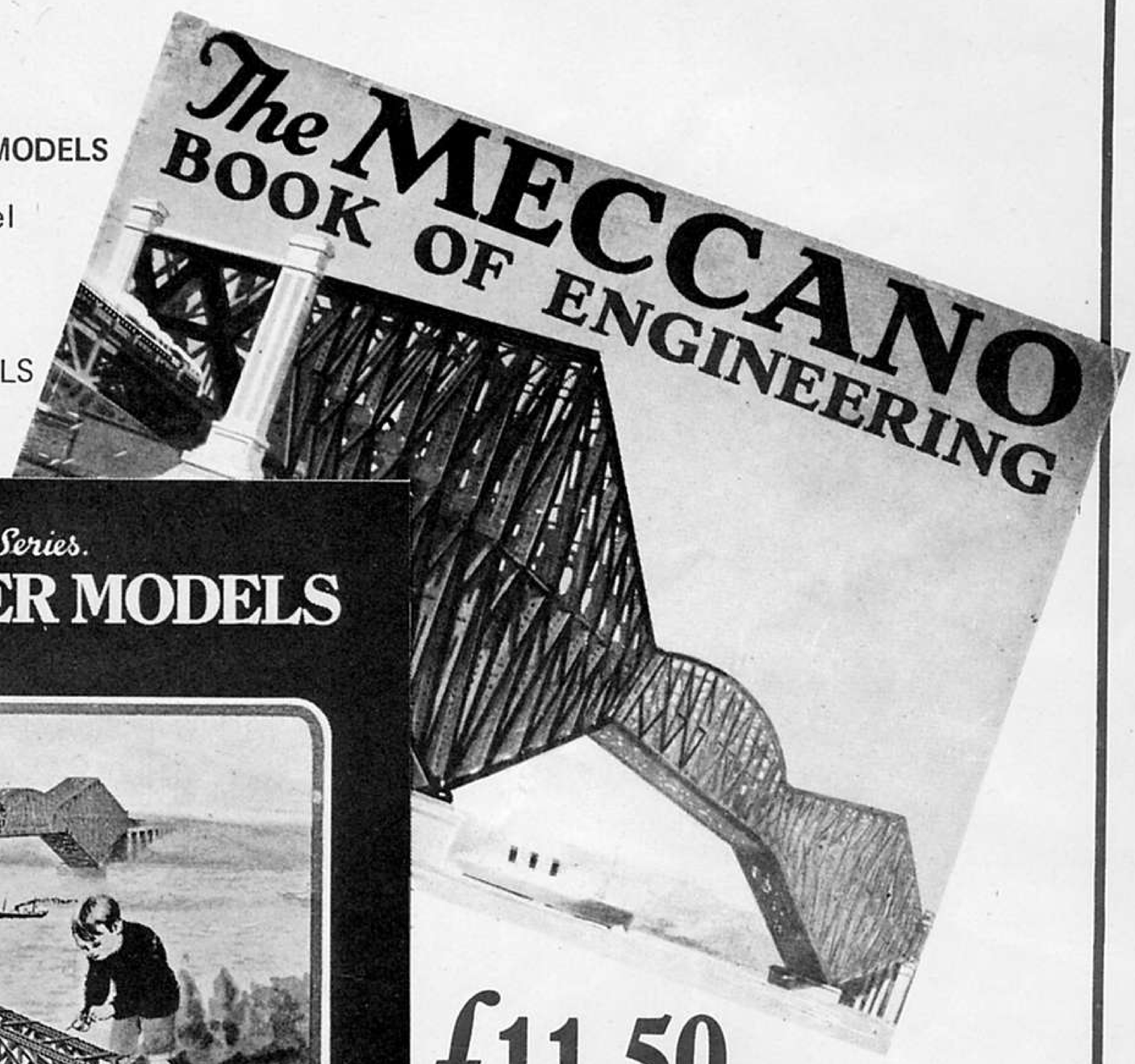

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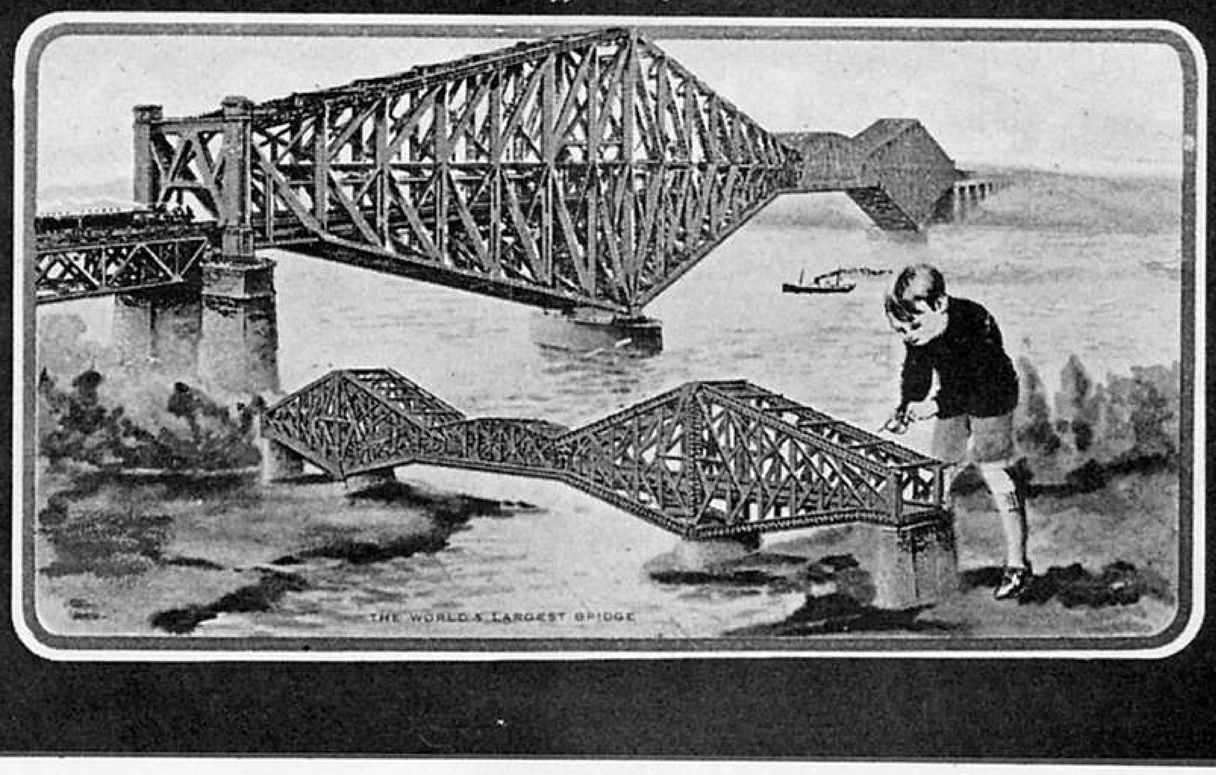

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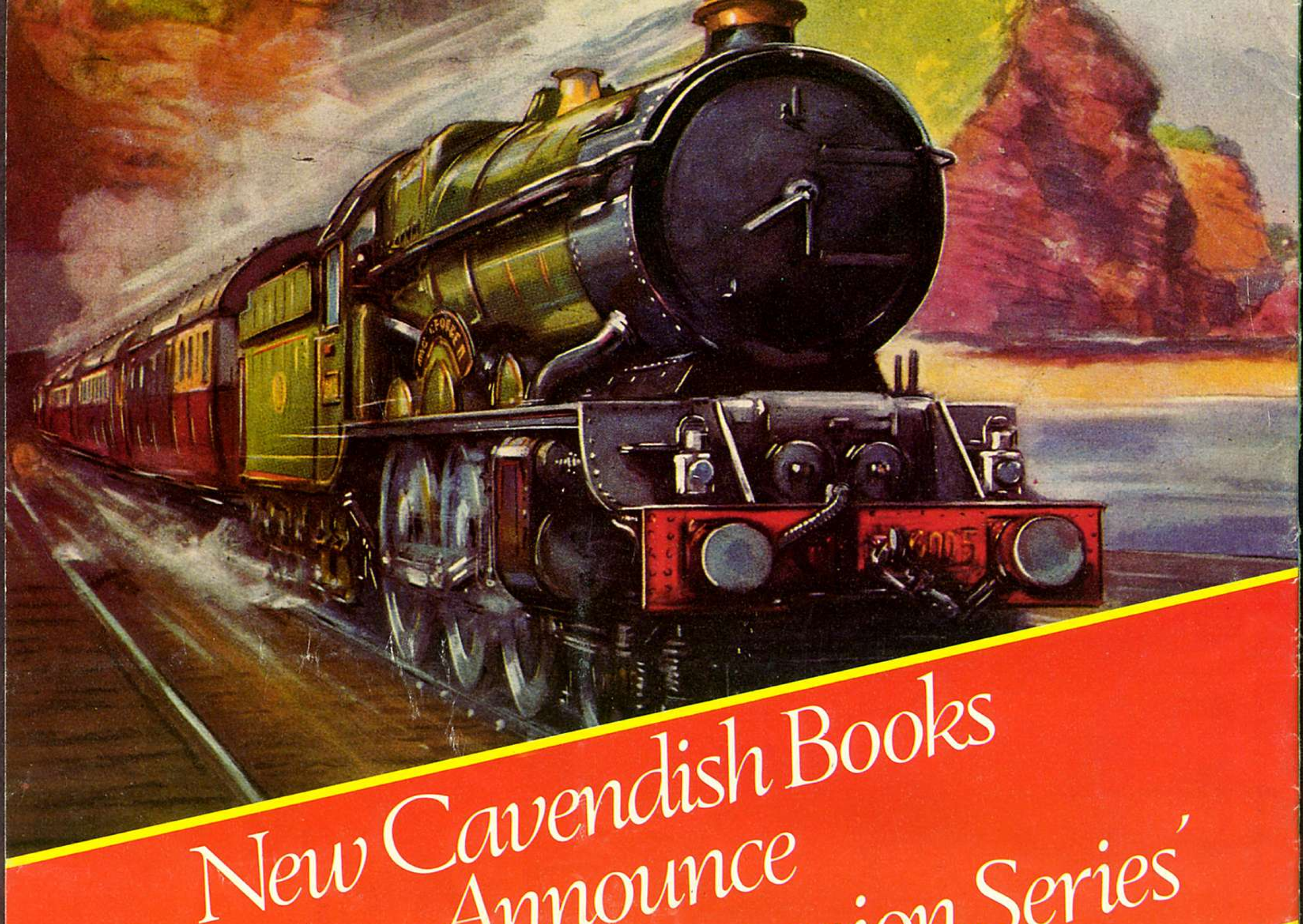

New Cavendish Books Announce 'The Hornby Companion Series'

THE MECCANO SUPER MODELS

by Geoff Wright

Dear Hornby Companion Reader

Our apologies for sounding the fanfare on Volume 2 too early. We will not bore you with the reasons, but instead are delighted to announce that the book will now appear in mid-November (of this year!) and we hope it will more than compensate for all the annoyance caused by the delay.

ABOUT THE BOOK: In this volume, Geoff Wright traces the historical background of the official Super Models, including the Super Models that "never were". The book includes reproductions of all 37 Super Model Leaflets issued before the war, together with 7 variations of those leaflets. In addition, the Meccano Book of Engineering published in 1928 will be reproduced including the full colour cover.

336 pp, over 600 b/w illustrations Price: £11.50
ISBN 0 904568 07 5

Volume 1 will be available again
in December Price: £12.50

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