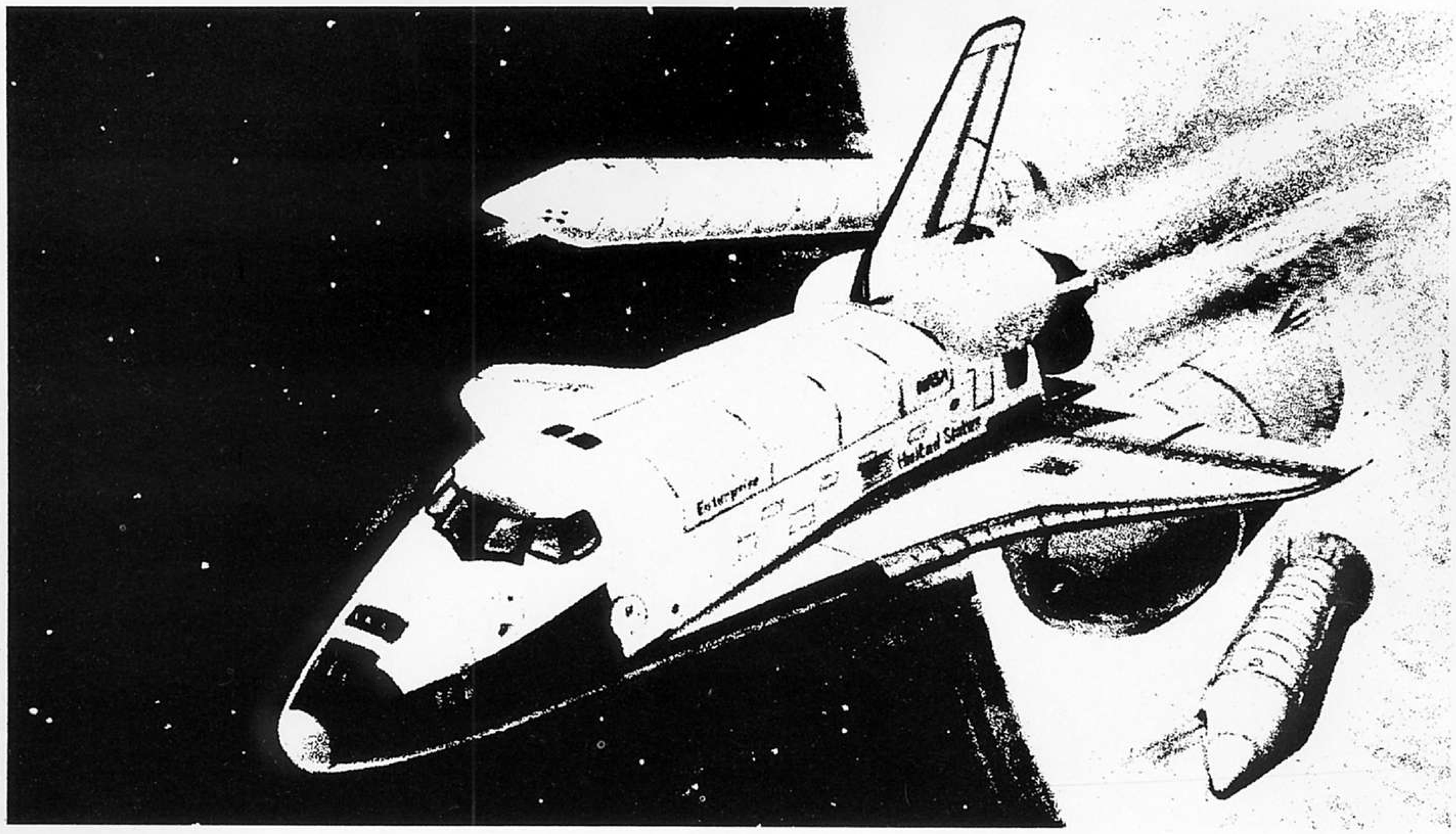
MECCANO MAGAZINE

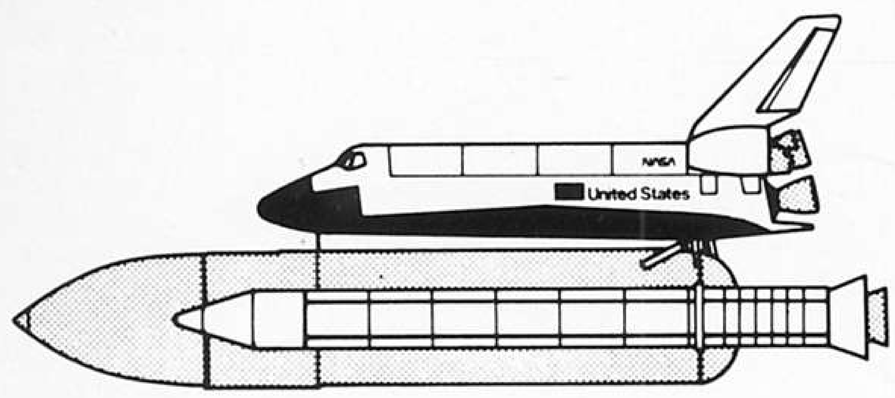
VOL. 64 No. 3
1979 JULY £1

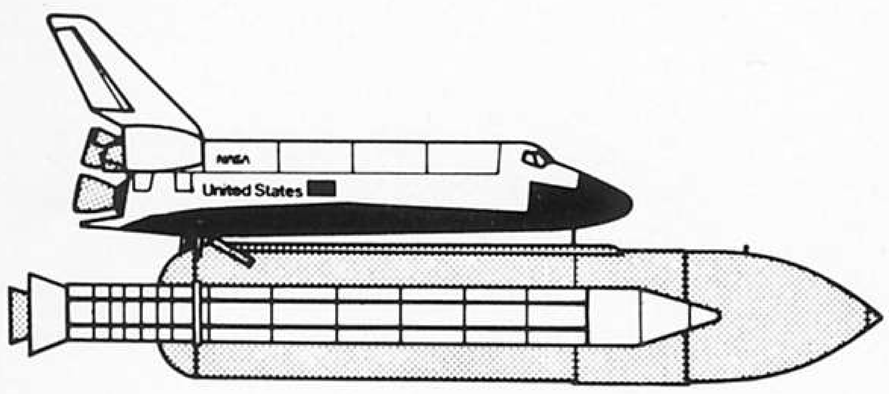
'DEREK THE DRAGON'
BY GEOFF COLES

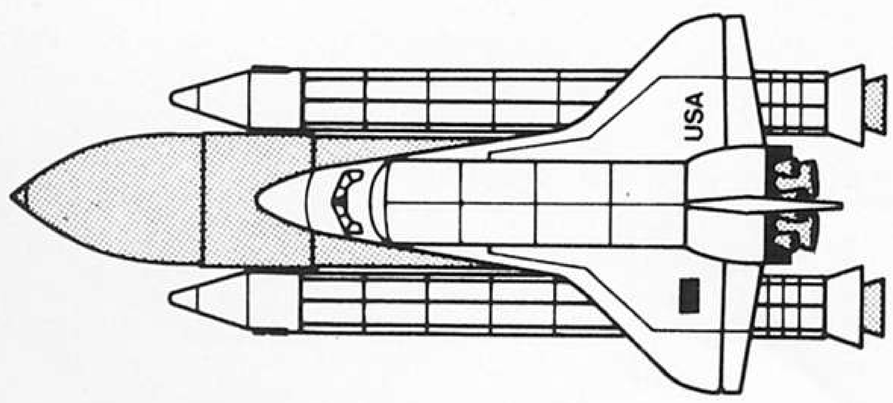
NEW FROM AIRFIX



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.64, No. 3 July 1979

ON THE COVER: 'The only known survivor of the original live-steam transport system', is the description applied by Geoff Coles, Secretary of the North Midlands Meccano Group, to his latest creation, Derek the Dragon. Dominating the front cover with his dramatic colouring, Derek's internal layout is equally interesting and a short description with more photographs, appears elsewhere within this issue.

EDITOR
MICHAEL J. WALKER

SINCE news of my appointment as 'MM' Editor reached the enthusiasts who subscribe to the magazine, I have received many kind letters offering congratulations. For these I thank you, and offer in return my assurances that I will make every effort to make the Meccano Magazine as lively, informative and entertaining as possible.

A high proportion of these letters have also touched on other subjects, the most common being speculation as to how the 'MM' will look in the future, if any features will be dropped in favour of new ones etc.

To these people I have replied that, in the main, I will be adopting a policy of 'no change' in the basic structure of the magazine contents. I am of the opinion that my predecessors did a good job on the 'MM' and I see no reason to deviate from the traditional policy of providing a well-balanced spread of articles, of the broadest reader interest.

The term 'broadest reader interest' covers a multitude of possibilities, just as the Meccano hobby itself encompasses a wide variety of interests and specialisations. Meccano Magazine readers include those who collect obsolete parts; build advanced models of a particular type to a state of perfection; those who build always large, and those who miniaturise, their models. There are even those who construct period models in the authentic colour schemes, adding yet one more variation to the complex network of possibilities that is the Meccano hobby today. Meccano is the heart of all these allied interests, and it is my intention to improve on the role of the Meccano Magazine as part of the 'set contents' of every enthusiast, to feature articles of interest to every sector of the Meccano modelling public.

Of particular interest to the less-experienced constructors, it is my intention to introduce a 'Model-building Query' advice service in the near future. In each issue, a selection of queries will be answered by a Meccano modelling expert. The questions can be about any aspect of Meccano modelling, so why let that question mark hang there any longer? Jot it down on paper, send it to me at Binns Road and let the new feature solve your problem!

Dinky Toys News is regrettably, absent this issue, but collectors of these ever popular modelled miniatures are not ignored, a two page article on early Dinky Aeroplanes is featured inside. Dinky Toys News will be back, in the October Meccano Magazine.

PLEASED TO MEET YOU! Seen here holding a copy of his favourite magazine is Dr. Keith Cameron of Florida, USA. Dr. Cameron has been a keen Meccano enthusiast ever since 1917 and his prize-winning career started as far back as 1925 with a 4-2-2 Locomotive entered in a Locomotive contest and featured in the April 1926 issue of the Meccano Magazine. His 'Fury' Locomotive won a prize in the 1932 International contest and appeared in the 1932 Book of Prize Models. His push-button elevator was featured in the Meccano Magazine for November 1932. His model building career was interrupted by training for the medical profession, and later on, his original outfit was sold when he left the USA to work in China. His present large collection was purchased some ten years ago, this permitted him to begin the design of a new range of modern Supermodels, many of which can be found described in leaflets from the GMM range. Correspondence with a large number of Meccano enthusiasts around the world keeps him in touch with all the latest developments, and his many model designs have earned for him a proud reputation amongst today's advanced Meccano modelling fraternity. (Photograph kindly loaned by Geoff Coles).

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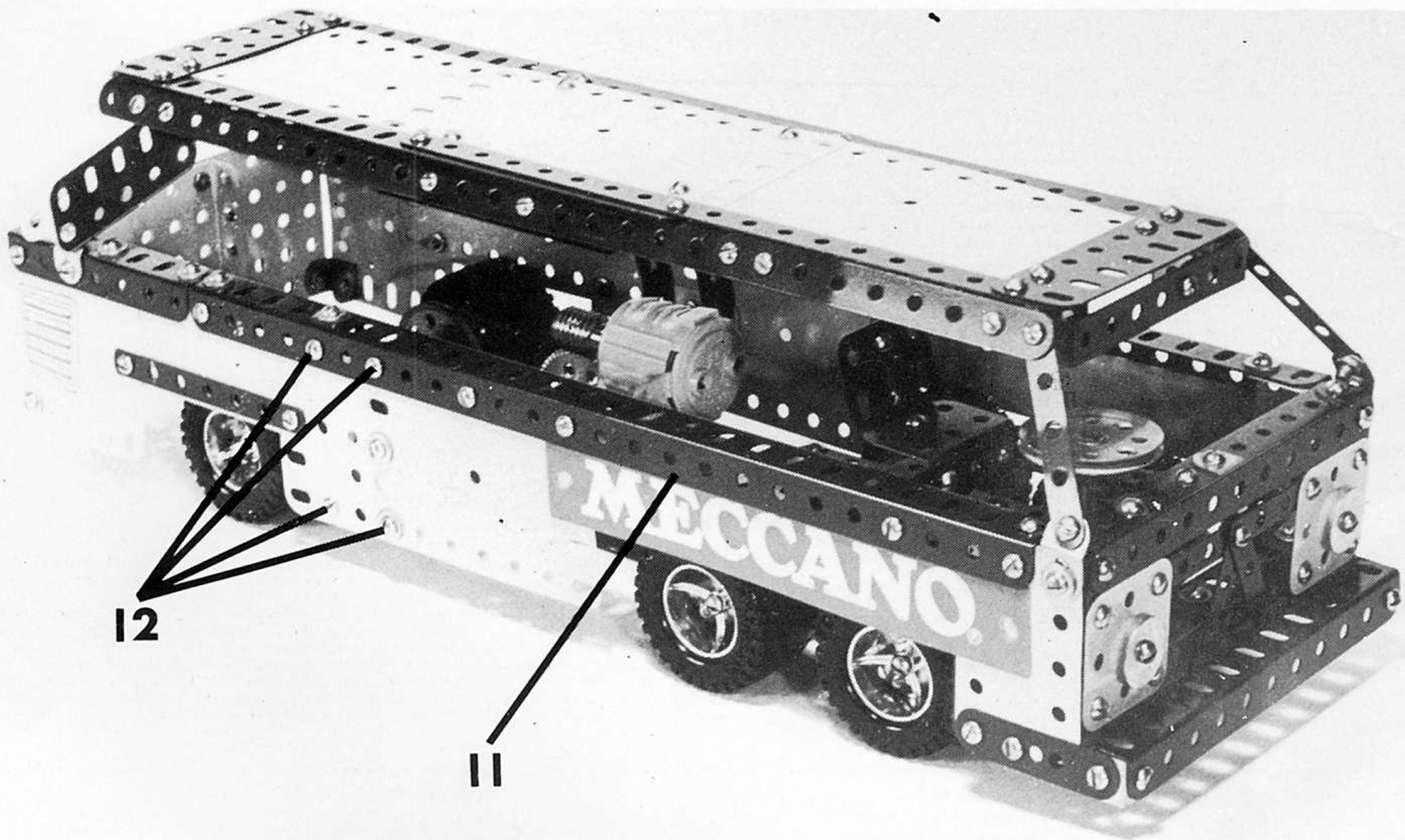
MOTOR COACH

A new model built from the contents of Meccano Outfit No. 5

THIS model follows the four-forward and two-rear wheels configuration found on many heavy motor coaches today. A vehicle of this type, the Vega Major Luxury Coach, was the subject of a Dinky 'Supertoys' model in the early 1960's. Construction of the model requires the slight 'widening-out' of some ½" x ½" Angle Brackets to the Obtuse Angle Bracket configuration. Power for the fitted Junior Power Drive Unit Mk. II is derived from the battery box, not shown. This can be carried 'on board' if so wished.



Front ¾ right hand view of the Motor Coach.

CHASSIS

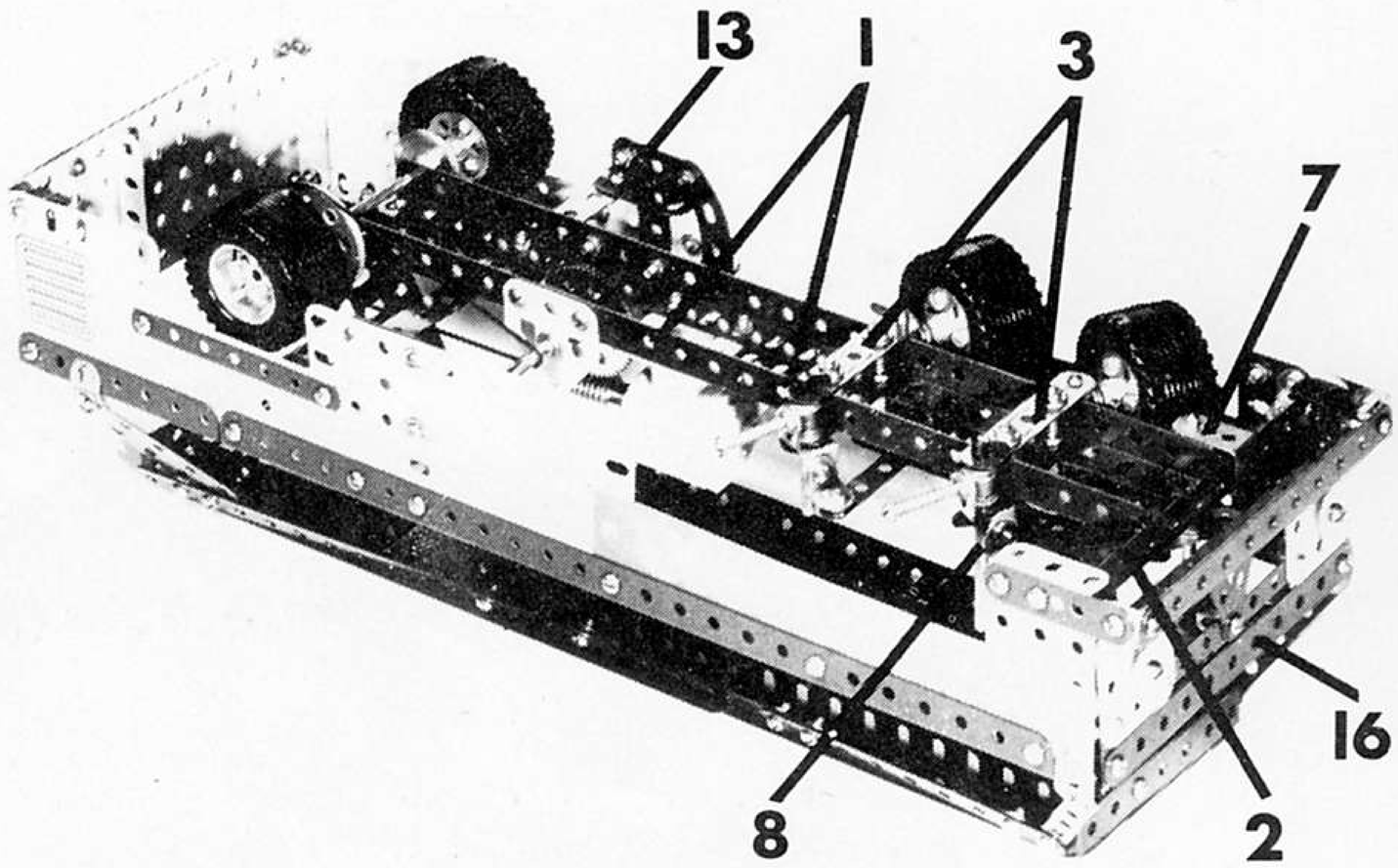
Two 12½" Angle Girders 1 are connected via their elongated holes by, (from the front), a 5½" Angle Girder 2, two pairs of 2½" Strips 3, one pair below and the other above the Girders 1 and held by Nuts on ¾" Bolt shanks, a 11053 motor and a 5½" Strip 4. The rear axle consists of a 4" Axle Rod on which are fixed two Road Wheels, a 1" Pulley and a 1½" Pulley 5. A 2½" Axle Rod 6 is held by a Spring Clip and a Rod Connector in the centre holes of two Flat Trunnions bolted to the Girders 1. A 57t Gear Wheel on the Rod 6 is driven by a Worm Gear on the motor output shaft, and a 6" Driving Band is looped around the Rod Connector on Rod 6, and the 1½" Pulley 5, thus completing the transmission.

The steering mechanism actuates all four of the coach's front wheels, and a steering column is represented by a 3" Axle Rod, held by a 19t Pinion in the lugs of a 1" x ½" Double Bracket 7 bolted to the 5½" Angle Girder 2. This 3" Axle Rod also holds a Double Arm Crank about ½ way up its length, and a 1½" Pulley representing the steering wheel. The right hand front wheel pivots on a vertical 1½" Axle Rod journalled through the end holes of the forward pair of Strips 3. The Rod carries at it's top end an 8-hole Bush Wheel, and a Collar is held on the Rod by the 1⅛" Bolt carrying the right hand front Road Wheel, spaced by Washers.

A 2" Axle Rod 10 forms the pivot for the right hand rear steerable wheel, and this carries a 6-hole Bush Wheel at it's upper end with, again, a Collar spaced by Washers supporting the 1⅛" Bolt carrying the Road Wheel. However, in this case, an arrangement consisting of a Corner Angle Bracket and a ½" x ½" Angle Bracket is built up and slipped over the Rod 10.

When the Road Wheel is secured, the Nut on the shank of it's 1⅛" Bolt grips the lug of the Corner Angle Bracket firmly, thus the assembly becomes a built-up crank.

The rear left hand side steering axle unit is similarly constructed, and the two built-up cranks thus formed are connected, via their ½" x ½" Angle Bracket lugs, by a 2½" Narrow Strip. A 2½" Axle Rod 8 is pressed into service as the 'king pin' for the left hand side forward steering axle unit, but in this case the built-up crank consists of a reversed Angle Bracket 9, and a 'Corner Angle Bracket' built-up from two ½" x ½" Angle Brackets. The forward projecting lug of this built-up unit is connected to the 8-hole Bush Wheel by a 2½" Narrow Strip. Finally, a 4½" compound Narrow Strip built-up from two overlapped 3" Narrow Strips, connects the steering column Double Arm Crank, the 8-hole Bush Wheel and the 6-hole Bush Wheel. Thus, when the 1½" Pulley steering wheel is actuated, all four front wheels turn, steering the model.



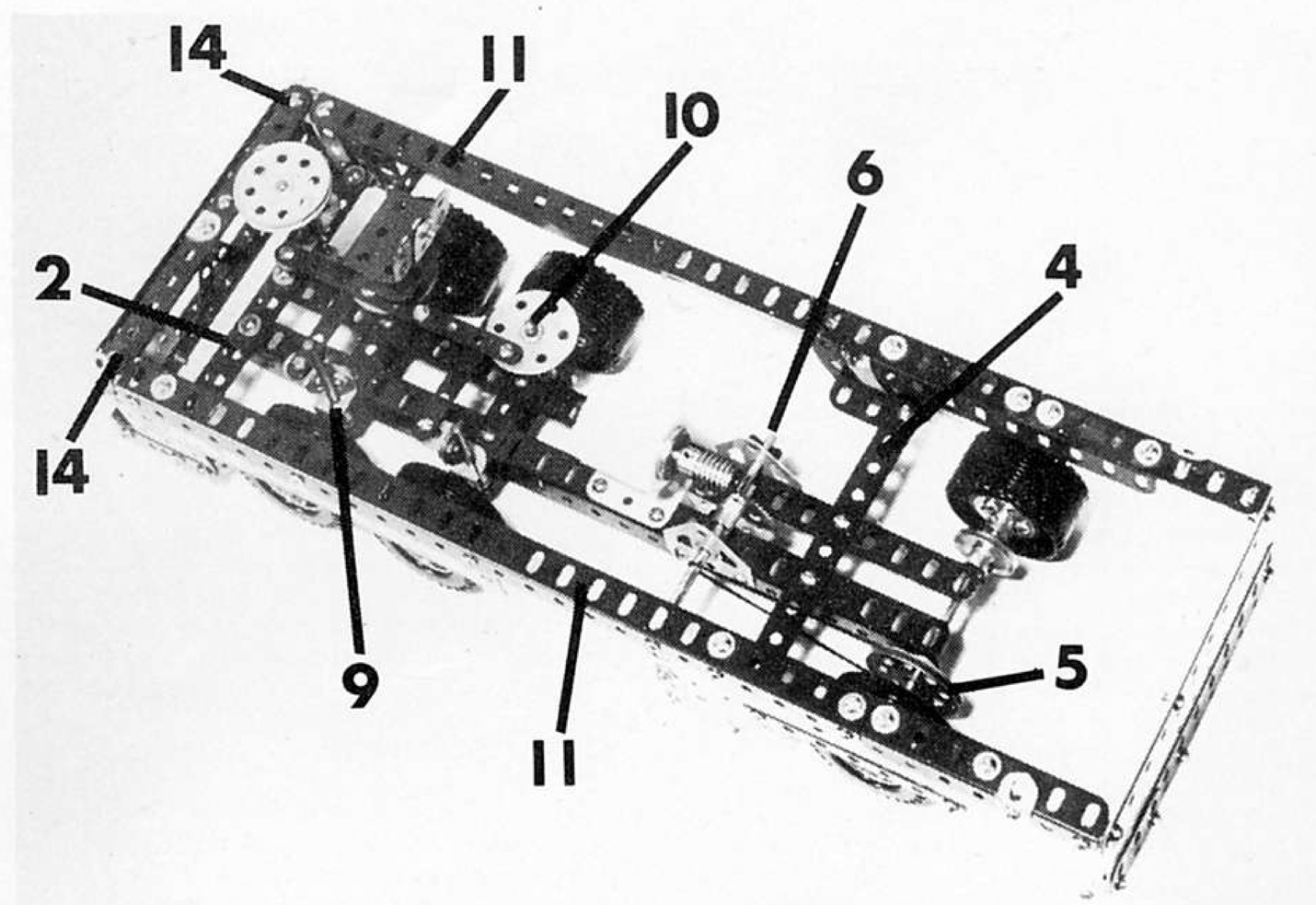
Underside showing arrangement of steering mechanism. The Spring Clips fitted to the nearside king pins shown merely assist in holding the parts in place during construction and do not feature in the finished model.

BODYWORK

The sides are built-up in a similar manner by extending a 12½" Angle Girder 11 a distance of seven holes by butt-joining a 3½" Angle Girder. A 4½" Angle Girder is employed on the inside for bracing purposes. Both sides are then filled in by, (from the rear), a 2½" x 2½" Plastic Flexible Plate, a 5½" x 1½" Flexible Plate, a 2½" x 1½" Plastic Flexible Plate, a 3½" x 2½" Flexible Plate, a Meccano nameplate, (these can be cut from suitable Meccano cartons if no nameplates are to hand), over the front wheels, and on the right hand side, a further 2½" x 1½" Plastic Flexible Plate braced on the inside by a 2½" Flat Girder and extending one hole beyond the 12½" Angle Girder 11. On the left hand side, a 2½" x 1½" Flanged Plate occupies the same relative position, again extending one hole beyond the left hand 12½" Angle Girder 11. Two 2½" Stepped Curved Strips reinforce the inside of both bodywork sides, the fixing Bolts can be seen at 12. The lower holes of these are connected by a 1½" Angle Girder 13. 3½" Narrow Strips edge the rear wheel arches.

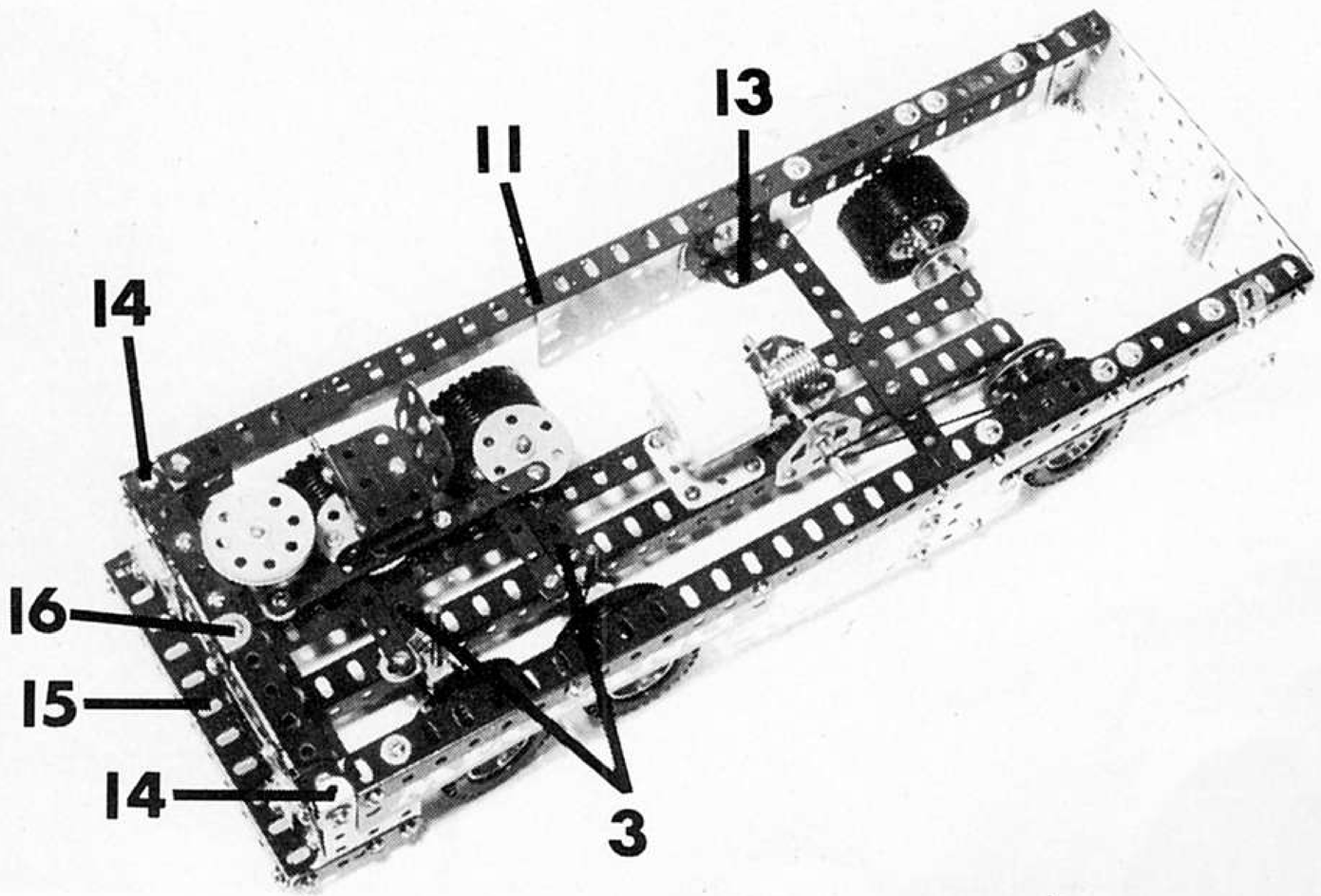
The rear panel is composed of a 5½" x 2½" Flat Plate overlaid on the inside by a 3½" x 2½" Flanged Plate. The panel is attached to the rear of the right hand side utilising the 3½" x 2½" Plate flange, and by two Double Brackets to the rear of the left hand side. Decoration is provided by a 5½" Strip and a composite 5½" Flat Girder built-up from 4½" and 1½" lengths.

The front of the coach consists of two 2½" x ½" Double Angle Strips 14 connected by a 5½" Strip 15 secured to their upper lugs, another 5½" Strip 16, and a radiator grille comprising two 4½" Narrow Strips connecting two 1½" x 1½" Flat Plates. Two 1½" Narrow Strips and a 1" x ½" Angle Bracket 16A are arranged as shown to complete the front assembly, which is then attached to the main bodywork by means of Bolts securing the lugs of the left hand 2½" x 1½" Flanged Plate; and the top lug of the right hand 2½" x ½" Double Angle Strip is fixed, via a Fishplate, to the right hand 12½" Angle Girder 11. A bumper, represented by a 5½" Angle Girder, is fixed by ½" x ½" Angle Brackets to two forward-projecting 2" Strips lining the lower front edges of the bodywork. The two headlights are formed by ¾" Washers spaced by ½" Pulleys on the shanks of ½" Bolts.



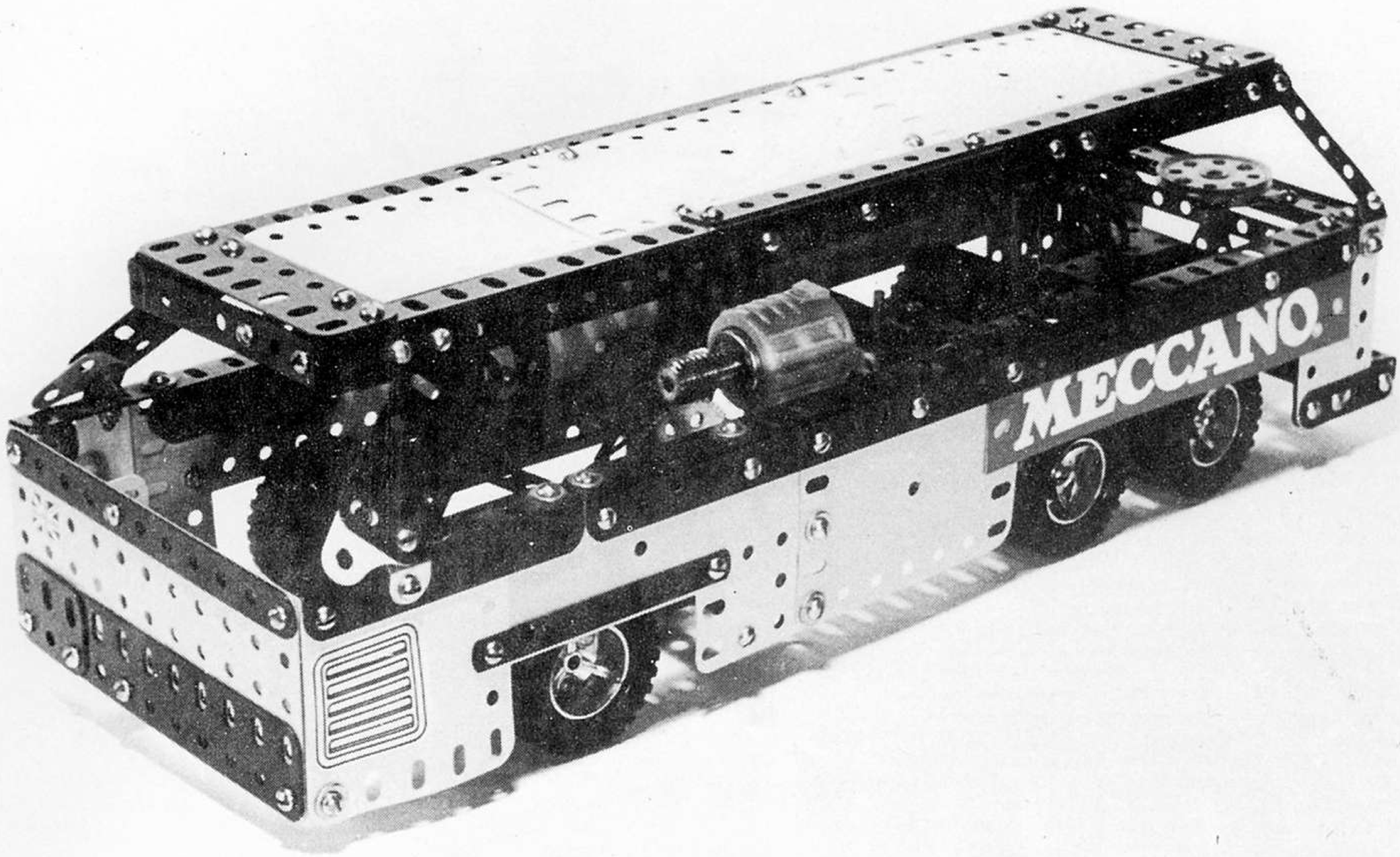
Left hand rear ¾ view after removal of roof.

View from above with roof removed, showing steering linkage.



THE ROOF

Two 14½" compound Angle Girders are built up from four 9½" Angle Girders 17 overlapped in pairs by nine holes. The two compound girders are connected at each end by 3½" Flat Girders, and filling-in is provided by a compound 13½" x 2½" Plastic Flexible Plate composed of three suitably overlapped 5½" x 2½" Plastic Flexible Plates. Each end of the



Rear ¾ view of the completed model.

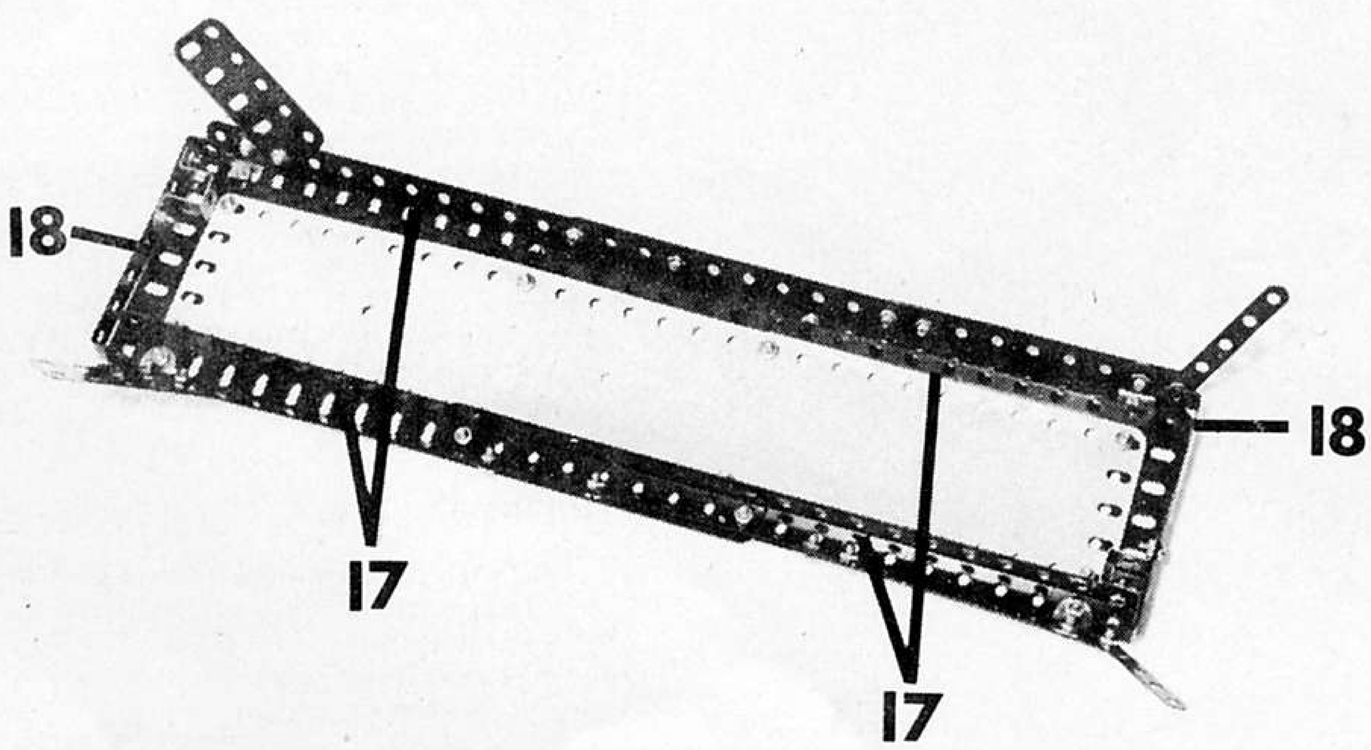
compound Plastic Plate is secured to the 3½" Flat Girders. Roof side edgings are formed by two 14½" compound Strips, each comprising 4½", 5½" and 7½" lengths, bolted via Obtuse Angle Brackets to the Girders 17. Front and rear edgings consist of 3½" x ½" Double Angle Strips 18, each held in place by a Double Bent Strip secured to one of the Girders 17.

At this stage the roof can be attached to the main bodywork by means of the four roof pillars. These are represented at the rear by two 2½" Flat Girders extended by 1" Corner Brackets and fixed as shown. The forward roof pillars consist of 2½" Narrow Strips held in the end holes of the 14½" compound roof edging Strips, at their upper ends; and by Obtuse Angle Brackets (formed by widening-out ½" x ½" Angle Brackets), at their lower ends.

These in turn are bolted to the main bodywork as shown, but note that the 2½" x 1½" Plastic Flexible Plate on the front right hand side has this fixing hole reinforced from behind by a Fishplate secured to the right hand 12½" Angle Girder 11. A representation of the driver's seat is made by fixing a Channel Bearing to a 2½" x ½" Double Angle Strip and securing to the right hand Girder 11 as shown. A 1½" Flat Girder forms the seat back, secured to the Channel Bearing by a 1" x ½" Angle Bracket.

FINAL ASSEMBLY

The bodywork is attached at it's front end by two ½" x ½" Angle Brackets secured to 5½" Angle Girder 2, and at a point rear of centre where the Strip 4 meets the 1½" Angle Girders 13. The upper portion of the steering column 3" Rod is further held by two 1½" Narrow Strips bolted to 5½" Strip 15.



Underside of roof after separation. The rear of the roof is to the left of the photograph.

PARTS REQUIRED

No. Req.	Part No.	No. Req.	Part No.
2 of No.	1b	1 of No.	53
6 of No.	2	4 of No.	59
2 of No.	2a	1 of No.	62b
4 of No.	5	8 of No.	69a
2 of No.	6	1 of No.	70
4 of No.	8	2 of No.	74
4 of No.	8a	4 of No.	90a
2 of No.	9	1 of No.	103c
2 of No.	9a	2 of No.	103d
2 of No.	9f	3 of No.	103f
2 of No.	10	2 of No.	103h
2 of No.	11	4 of No.	111
1 of No.	11a	9 of No.	111a
8 of No.	12	4 of No.	111d
2 of No.	12b	1 of No.	125
4 of No.	12c	2 of No.	126a
1 of No.	15	2 of No.	133a
2 of No.	16a	1 of No.	154a
1 of No.	16b	1 of No.	154b
2 of No.	17	1 of No.	160
1 of No.	18a	1 of No.	186a
2 of No.	21	6 of No.	187c
1 of No.	22	2 of No.	189
2 of No.	23	2 of No.	190a
1 of No.	24	3 of No.	194
1 of No.	24b	2 of No.	194a
1 of No.	26	3 of No.	194e
1 of No.	27a	1 of No.	213
1 of No.	32	4 of No.	235
1 of No.	35	2 of No.	235a
150 of No.	37b	2 of No.	235b
172 of No.	37c	2 of No.	235d
43 of No.	38	4 of No.	235g
2 of No.	38d	4 of No.	611
2 of No.	45	1 of No.	618
3 of No.	48a	1 of No.	11053
2 of No.	48b	Electric Motor.	
1 of No.	51		

Midlands Outlook

by ROGER WALLIS

IN this, the second article of my series, I will explain my approach to the subjects of lubrication in Meccano models, and the motors that power them.

IF my previous ideas have been followed, it should be found that your model should work satisfactorily without any kind of lubrication. If this is not the case, and lubrication is found necessary, it probably indicates that there is something binding in the mechanism, and this ought to be sought out and corrected. Having therefore built the complete model and successfully tested it, how do we keep it free-running? At this point lubrication is required, and for bearings, I use 'Shell Tonna 33' oil, which is fairly light but has a 'sticky' consistency.

It is only available from specialist lubricant suppliers, so for a more readily available alternative a light sewing machine oil such as 'Three-In-One can be employed. Never oil pin-point bearings, as I have found out the hard way that the oil globules in the recessed Pivot Bolts tend to create further friction by attracting every speck of dust in the vicinity! With regard to spur gearing, I have observed that these gears run just as happily 'dry' as 'oily', particularly in the slower moving mechanisms. In the faster moving parts of a gear train I use a light grease as used in car wheel bearings etc. If oil is employed here, the centrifugal force of the spinning gears tends to throw it off in all directions, defeating the original object.

The sliding gears, ie the Helicals and Worms, do need lubrication and again, grease should be used as it performs much better than oil in these sliding situations. Incidentally, I try to avoid using Worm gears if at all possible as their design, in my view, leaves a lot to be desired. Although the constructor may reduce the speed of any given shaft by say, 57 times if used with the 57t Gear, the increase in power resulting is less than half this amount, the loss being entirely due to friction. I never use a Worm gear on the output shaft of a Powerdrive 6-12 volt DC Motor-with-Gearbox, as the integral bearings do not successfully withstand the powerful end thrust set up by the action of the Worm. If I therefore have to resort to using a Worm, it is placed in the middle portion of the gear train and not on either the input or output shafts. I cannot stress the importance of these points too strongly, they have been in use in my models for the past few years and have saved me a lot of heartache over the problems associated with overloaded motors etc.

Talking of motors, the 'Crane' motor, or more correctly the 'Junior Powerdrive Unit Mark II', is becoming a very popular source of motive power. I was surprised, however, at a recent meeting of the Midlands Meccano Guild, to find several members were using these motors at 12 volts. This is absolutely criminal! These motors are intended to work on 3-6 volts and no more. If the model has been designed correctly using suitable gearing etc: they will do virtually anything and last for a long time.

I have employed one of these motors in a Konkoly Meccanograph and it has performed quite satisfactorily on a supply of just over two volts. As to the 'senior' Powerdrives, I try to run them on 5 to 6 volts whenever possible. Keeping them to this voltage will give them an extremely long life and enable them to run continuously for long periods. Again, from practical experience, I have employed a Powerdrive fed only 6 volts to move an 80 lb Blocksetter. This was run as an exhibition model for days on end and afterwards, the motor showed no signs of wear!

How does one obtain power supplies at this lower, recommended, 5-6 volt level for the Powerdrive units? In a multi-motored model, there are two considerations to be taken into account when looking for a suitable power source. The first, is whether the model will be required to run on a single motor, or, secondly, will more than one motor be required to run at any instant of time?

In the first instance, only a low current supply, at our chosen voltage, is required. However, as we increase the number of motors in use, so the current drawn from the supply increases. As a rough guide, a Powerdrive unit fed 6 volts, working an average load, will consume 0.5 amp, so therefore four such motors will draw around two amps. Now, a power supply of any kind has an internal resistance.

The higher this resistance, the less the output voltage will be as the number of motors in use increases. A power supply with a low internal resitance is therefore preferable and a good example of this is a car battery, which can deliver up to 30 amps. or more for short periods, (that's 60 Powerdrive units!). Unfortunately, the car battery has it's disadvantages, it's heavy, dangerous if handled roughly, dur to it's acid content; and it can also explode if for some reason the output terminals are accidentally short-circuited for a long period. On the other hand, model train controllers have a fairly high internal resistance. This is due to the fact that a variable resistance often suffices for the speed control and also, when taking over about the usual one amp limit they either cut-out or overheat. Some controllers made by Hammant & Morgan use, instead of a variable resistor, variable taps on the secondary of the transformer. These are superior to the variable resistor type, although they can still overheat when more than two or three motors are used together.

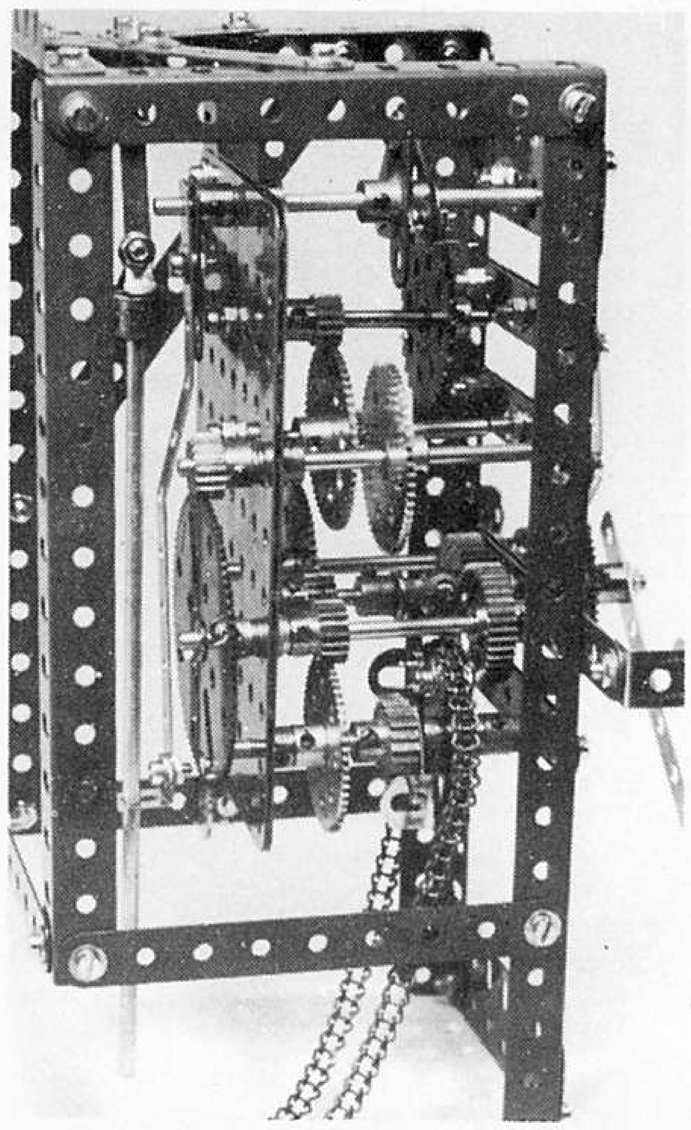
What alternative is there? Well, full details of my recommended power supplies were given in the 'Meccano Engineer' March 1976, but I will go over the main points again here. Basically, my supply comes from a good 6/12 volt battery charger that has been modified for various reasons to give a 6 volt only nominal output. On test, It was found that the nominal output voltage with no load was 7.5 volts, and on a 4 amp. load, the equivalent of a 7 or 8 Powerdrive units, the voltage only dropped to 6.5 volts without any sophisticated electronic gadgetry.

Unfortunately, this supply will not control the speed of motors and for this a transistor or IC (Integrated Circuit) type of control is required. Designs for these are often published in electronics hobby magazines, such as 'Practical Electronics'.

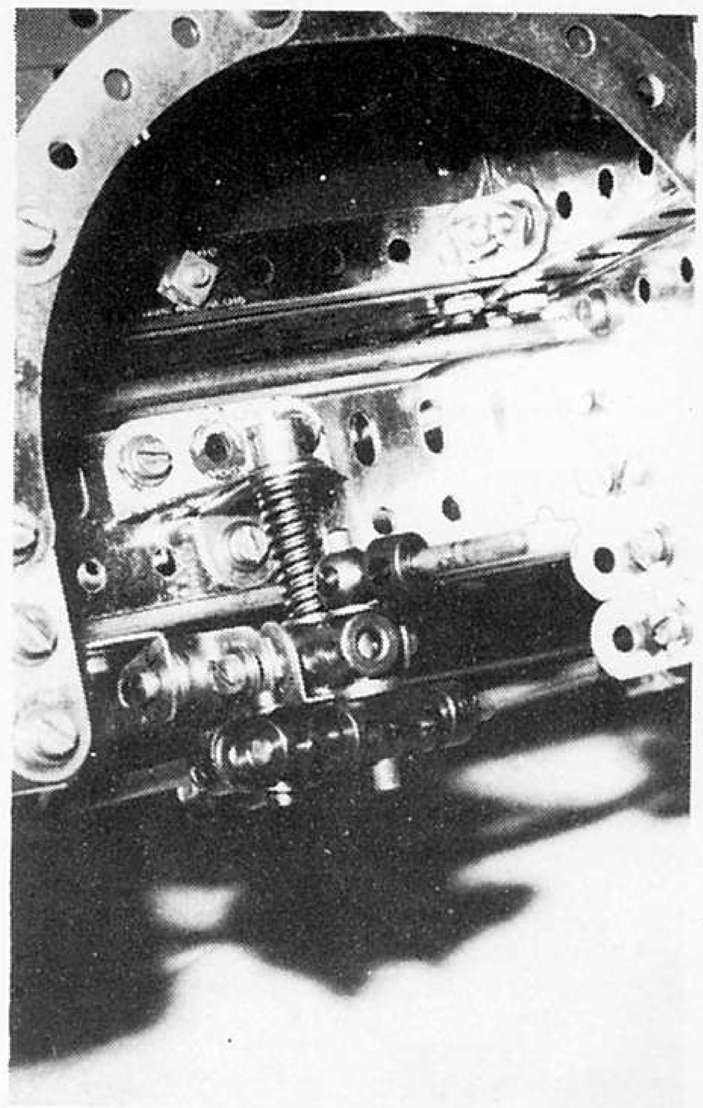
Going back to the 'Crane' motor, as yet I have had little experience in using these in multi-motor combinations. When using them singly, the 3 volt battery box is often adequate as a power source, but if two or more 'Crane' motors are to be run together, one of the two following recommendations should be considered.

Firstly, a special 3 volt supply can be arranged on the lines indicated above, or, if the motors drive a common shaft, they may be wired in series. This is the case when one motor lead goes to the supply, the other lead goes to the adjacent motor and the third lead connects the remaining supply terminal to the vacant input of the second motor. Of course, the motors must be very carefully checked to ensure that their output shafts rotate in the correct manner.

Finally a word of caution when using battery chargers. Do please ensure that you use a good electrical earth on the charger, and that the outputs are fused to avoid damage. The mains lead plug should be fitted with a 3 amp. fuse for additional security.



The Author recommends the use of light sewing machine oil for use in mechanisms such as are found in the example of a Clock, above.



A close-up of the front suspension unit of the Author's well-known Midland Red S15 Motor Bus.

EARLY DINKY TOY AEROPLANES

How I became a collector, and some collectors' items

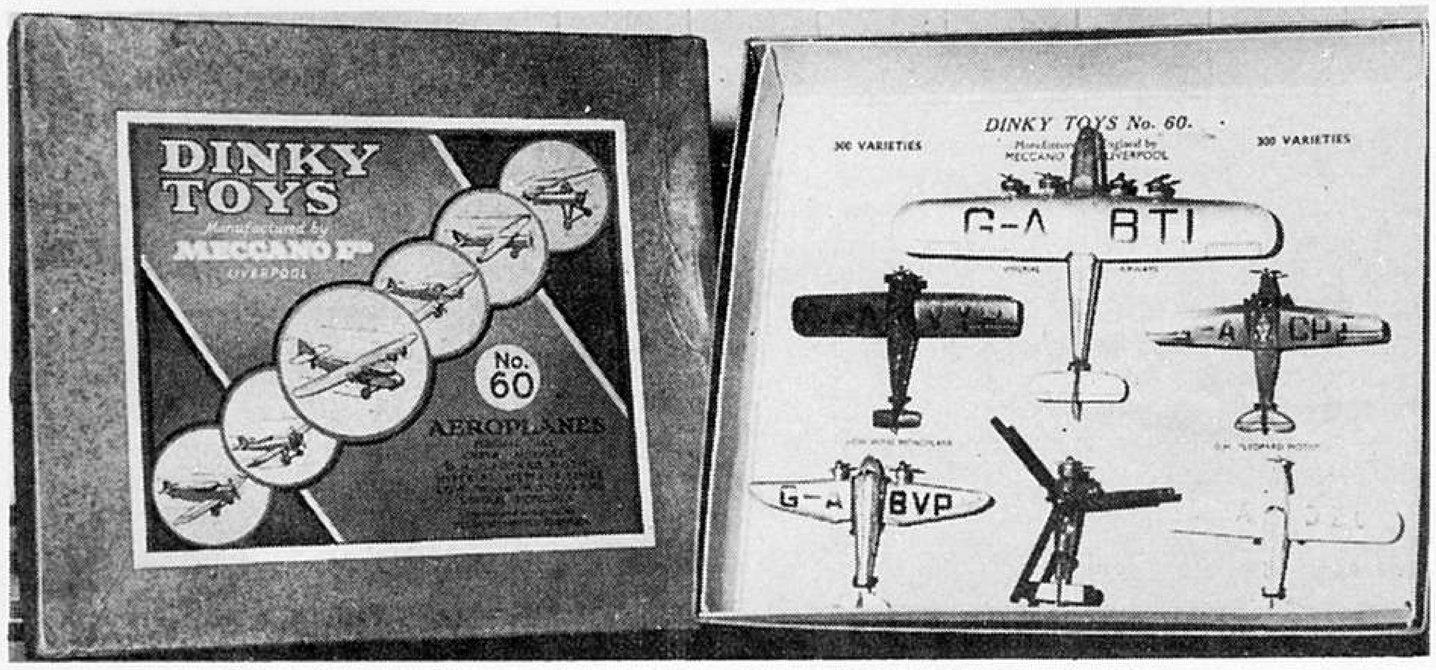


Fig. 1 The 1936 No. 60 Aeroplane Set, in original box with lid.

By Alan Dimmock

THE idea of collecting Dinky Toys miniatures according to type has, no doubt, been around as long as Dinky—about 45 years. Most youngsters start off with a general collection of cars, lorries, cranes, bulldozers etc., and then, (finding the attraction of the miniatures as strong as ever as they grow older) tend to specialise so that they can attempt a complete collection of the type of model in which they are most interested.

In my own case it was the miniature aeroplanes, probably because they were not widely available during the early post-war years when I was a boy—so it was all the more exciting to find one in a shop among all the cars and trucks! When I had the opportunity in 1948 of seeing an adult enthusiast's pre-war collection, I was really 'hooked' on them, even though I had only two or three examples myself.

Dinky aeroplanes disappeared completely from toyshops around 1949 and relations insisted on buying me cars and lorries for Christmas and birthdays—I was pleased to have them, but it was really Dinky 'planes that I sought after! In 1952 some of the early post-war models were re-introduced, the Avro York, Vickers Viking, Tempest etc.—so every bit of pocket money was saved in order that I could buy them—I was determined not to miss out this time! I still remembered that pre-war collection . . . flying boats, biplaines, airliners, fighters, bombers, small flying-club planes.

In the mid 1950's Dinky brought out their new range including some jets—The Comet Jet Airliner, Hawker Hunter, Supermarine Swift and Gloster Javelin. Collecting and keeping up to date with these issues kept my mind off the unobtainable (as I thought them) earlier issues of 1934-9. It was not until about ten years ago that I was able to make any progress and I determined to try and find some of the pre-war models by placing classified advertisements in the Meccano Magazine and its contemporaries. The response was amazing, I gradually accumulated obsolete items and got to know other enthusiasts—and eventually realised my ambition of owning a collection of Dinky Toys aircraft equal to the one I had seen so many years before.

Some of the items I have been fortunate enough to acquire are shown in the accompanying photographs. The very first Dinky aircraft were sold as a set of six in 1934 without registration letters—Pictures 1 and 2 show this set as it appeared in 1936 with registration markings on the wings. The types represented are the Armstrong Whitworth 'Atalanta' Imperial Airways Liner; a Low-Wing Monoplane based on the Vickers 'Jockey'; the Percival 'Gull'; D. H. 'Leopard Moth'; General 'Monospar' twin-engined monoplane; and the Cierva Autogyro.

The scale of these is approximately 1/150; later introductions varied between this scale and 1/220. With the exception of the Monospar (completely die-cast) and Autogiro (cast fuselage, tinplate type rotor), all these models had tin wings, cast fuselage/tailplane units and were fitted with miniature undercarriages with tiny wheels and propellers which could be spun with a flick of the finger.

A special version of the Percival 'Gull' model appeared in 1936 (Picture No. 3). This souvenir model commemorated the record flight to South Africa and back by Mrs. Amy Mollison (Amy Johnson) in a 'plane of this type. The miniature is finished in the actual colours of the prototype—aluminium-colour wings with blue registration letters, light blue fuselage and fin and aluminium-colour tailplane. The Percival 'Gull' model contained in the No. 60 boxed set subsequently appeared with the same registration letters G-ADZO but was finished in a single colour only. In 1940 the Dinky Percival 'Gull' was sold for a short time in camouflage finish; and the model was re-introduced briefly after the war as a 'Light Tourer'.

The famous D. H. 88 'Comet' Racing Aircraft (not the jetliner!) was represented by Dinky Toy No. 60g in 1935, originally without registration letters but later with G-ACSR in black on a range of attractive colours including red, silver and gold. (Picture No. 4).

Another interesting model, produced in 1938, was a special version of the Airspeed 'Envoy' twin-engined monoplane finished in the attractive colours of the King's Flight. The miniature is beautifully enamelled in red and blue with silver-colour wings and tailplane. Windows are picked out in silver and the registration letters G-AEXX are featured in dark blue on the wings. (Picture No. 5).

Some idea of the scale proportions of the

Fig. 3
The Dinky version of the Percival Gull monoplane flown by Amy Mollison, (Amy Johnson). Dinky Toys No. 60k.

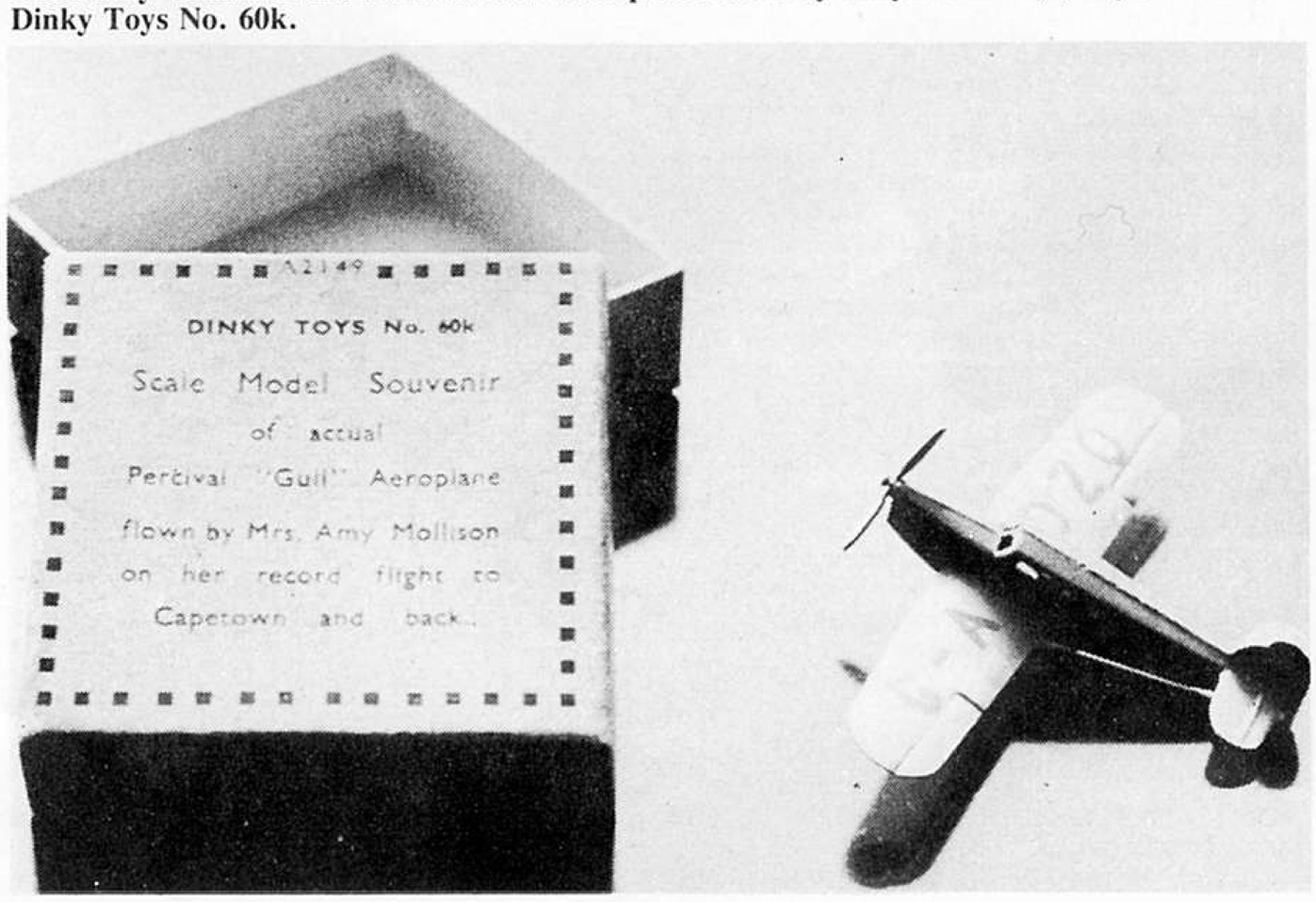


Fig. 2 Close-up of the Set contents.

range can be gained from the group shown in Picture No. 6. Apart from the items mentioned earlier, this includes an old-fashioned-looking biplance flying boat—Dinky Toys No. 60h Short Singapore III. This first Dinky flying-boat was originally finished in silver-colour, later in grey, with R.A.F. roundels prominent on the upper wings. From late 1936 the toy had a roller fitted so that the young enthusiast could push it along more easily (this was hidden within the hull casting so did not detract from the appearance in any way).

Nearly 50 varieties of aeroplane miniatures were produced as Dinky Toys before 1940 and a similar number have been issued since production resumed after the Second World War; the latest types to a much larger scale then the miniatures of earlier years, so that working features can be incorporated. Whilst some of the latest models have been withdrawn now, others are still available so now is the time to complete your collection—it is always easier to buy them now rather than wait until they are obsolete!

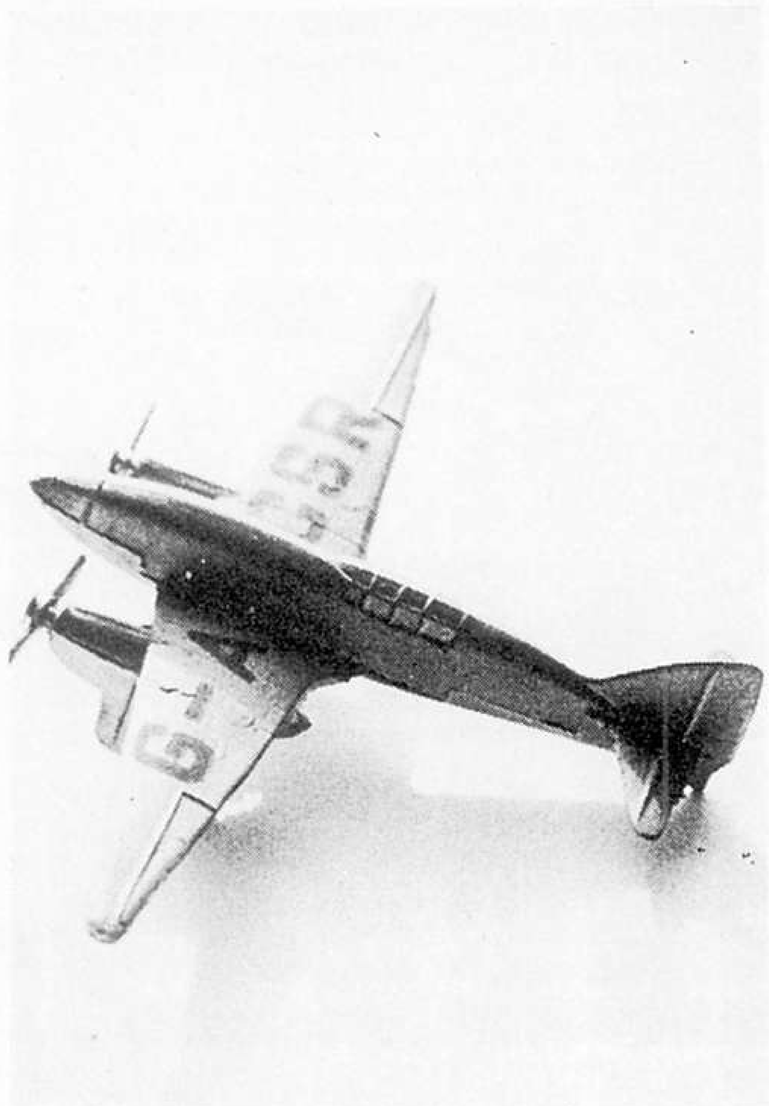


Fig. 4
The famous De Havilland 'Comet' racing aircraft, Dinky Toys No. 60g.

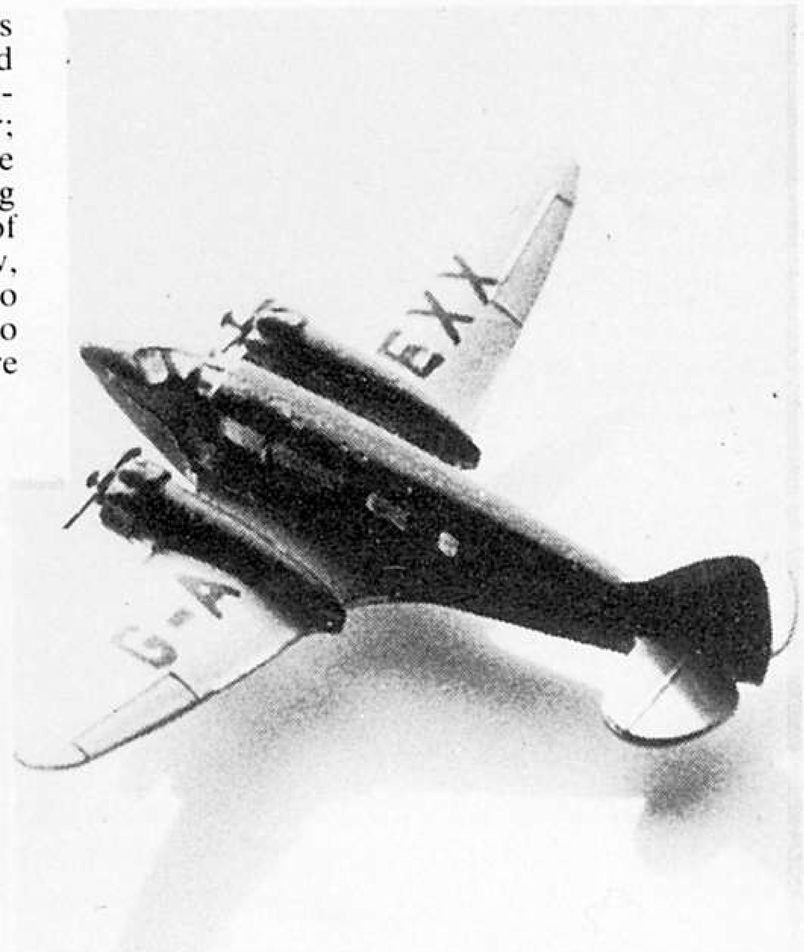
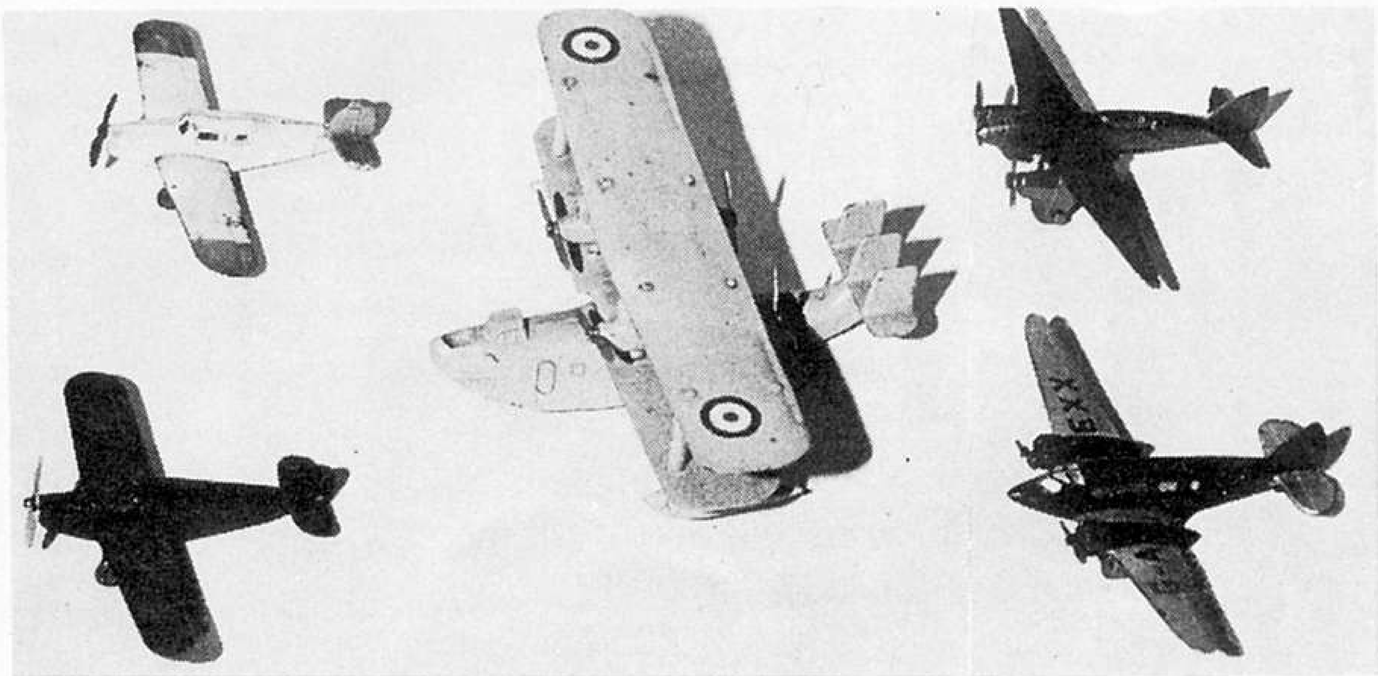


Fig. 5
The Airspeed Envoy used by King George VI, Dinky Toys No. 62k, dubbed 'The King's Aeroplane'.

Fig. 6
A few examples of Alan Dimmock's large collection of Dinky aircraft, the Short Singapore Flying Boat, Dinky Toys No. 60h, can be seen at the centre.



MECCANO and the History of Aviation

by Brian W. Williams

Photographs by Chris Goodwin and Charles Harrison

PART TWO

The Forerunners of Flight–from Crete to Kitty Hawk

THE beginnings of Man's desire to fly are shrouded in myth and legend, not least of the legends being the well-known story from classical mythology, of Daedalus and his son Icarus, and their winged escape from the island of Crete. Subsequent more substantial events in the evolution of Flight are such developments as the kite, which originated in China around 800 B.C.—although it was 2000 years before it arrived in Europe: the advent of the 'tower jumpers' who attempted to fly or glide from towers or other high places to the ground; the works of such imaginative men as Roger Bacon: and the more practical ideas of Leonardo da Vinci in the fifteenth century.

Much of da Vinci's work was based on imitations of bird flight—otherwise ornithoptering flight—which is considered by historians to have led many later pioneers of aviation along what was in effect a blind alley. Only many years later were the possibilities of fixed-wing flight investigated. Nevertheless da Vinci was an undoubted genius, although many of his brilliant ideas were romantic rather than scientific.

During the next four hundred years many other developments took place. In the 17th century the engineer Robert Hooke realised that man, unaided, lacked sufficient power for flight, and suggested that some form of engine was essential. It was in 1783 that mankind ceased to be earthbound, when the Montgolfier brothers constructed the first hot-air balloon. Later that same year the first manned balloon ascent was made, in a hydrogen balloon, and the success of lighter-than-air flight was assured.

Heavier-than-air flight was not neglected—in 1784 in Paris the first experiment with helicopter models, from which all subsequent helicopter development stemmed, were made. It was a Yorkshireman, Sir George Cayley, who in the first half of the nineteenth century brought to the question of flight the first really scientific approach; he was an inspired inventor whose work was practical but nevertheless imaginative, and who in later years was rightly hailed as the 'Father of Aeronautics' and founder of the science of aerodynamics. Amongst his many achievements in the field of aerodynamics, Cayley stressed the need for a lightweight power-plant, and suggested the ideal configuration for an aircraft, consisting of fuselage, undercarriage, mainplane and tailplane. He was the first man to realise the potential of the kite; and he built several gliders, including a full-size man-carrying glider in 1853, when he was eighty years of age.

W.S. Henson's design, the 'Aerial Steam Carriage' of 1843, owed much to Cayley's work, and was the first powered aircraft to feature a 'modern' configuration. Unfortunately, although it caught the public imatination, it was a failure. A model, when tested, failed to become airborne, and a full-size version was never built. The Aerial Steam Carriage was fifty years ahead of its time, because the steam engines then available were too heavy to be of use in flying machines. In spite of such disappointments, the foundations of aeroplane development were being laid by the work of such pioneers. A Meccano model of Henson's Aerial Steam Carriage, built by Mike Nicholls was illustrated on the front cover of the J.M.E. of March 1975, and the original is illustrated in Figure 1.

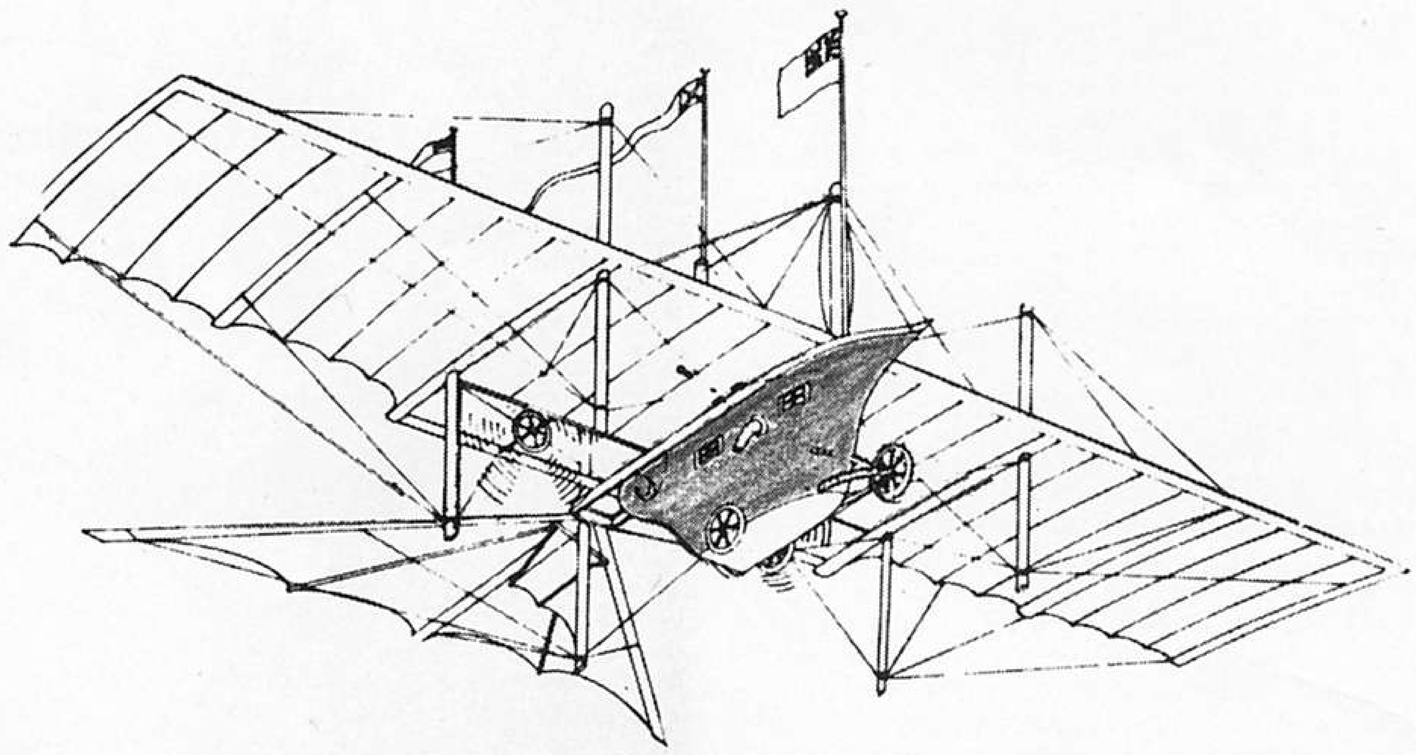


Fig. 1: Henson's 'Aerial Steam Carriage'.

Pioneers of aviation in the second half of the 19th century paid much attention to the search for a suitable, lightweight, efficient power plant. Pioneers of this period include such men as Felix du Temple, Stringfellow, and de la Landelle, each making small but important contributions to the science of aeronautics. It may be mentioned in passing that the word 'aviation', meaning powered heavier-than-air flight, was coined in 1863 by de la Landelle, (although this was not his sole contribution to aeronautics!).

The possiblities of the ornithopter continued to be investigated by many; and on a more practical level, the first dirigible, or navigable, airship was built, by Henri Giffard, in 1852; but it was seriously underpowered, its meagre 3 h.p. steam engine proving capable of giving it a speed of only 5 mph. The great drawback facing all the early pioneers was the problem of the engine. The steam engine was certainly powerful enough—it powered railway locomotives and ships—but it was too big and heavy to be of practical value for flying machines.

In 1866 the Aeronautical Society (now the Royal Aeronautical Society) was formed in England, and two years later the Society held the world's first aeronautical exhibition. In 1876 it at last appeared that Cayley's hope for a lightweight powerplant might be realised, for the German engineer August Otto designed and built the world's first internal combustion engine. In the 1880's two pioneers appeared who made important steps forward: The Englishman Horatio Phillips, and the Australian Lawrence Hargrave. Phillips carried out vital research on aerofoils, and Hargrave, although cut off from the mainstream of aeronautical activity, made a great contribution to flight with his invention of the box-kite, and also designed and built the first rotary engine.

Others who made partially successful attempts to fly during this period included Clement Ader, with his flying machine 'Ecole', Sir Hiram Maxim, the inventor of the machine gun; and the American Samuel Langley. In spite of the lack of real success in heavier-than-air flight, there was no doubt that it would be achieved in the foreseeable future.

The story of man's attempts at flight is full of blind alleys: examples as already mentioned, are the 'tower jumpers' and the ornithopterists, who were merely misguided dreamers. Even balloonists contributed only indirectly to the advancement of flight, because of the impossibility of proper control. The true pioneers of powered flight were the glider pioneers, and those who concentrated on aerodynamics, because basic aerodynamics apply equally to gliders and to powered aeroplanes.

One of the most successful of the glider pioneers was the German, Otto Lilienthal, who studied bird flight and published his 'Der Volgelflug als Grundlags der Fliergekunst' (Bird Flight as the Basis of the Art of Flying) in 1889. Lilienthal's gliders were in effect hang-gliders, and were controlled mainly by movements of the body.

Another pioneer in the period immediately prior to the Wright brothers' successful flights

in 1903 was the American engineer Octave Chanute. He was the first aeronautical historian, his book 'Progress in Flying Machines (1894) became the definitive guide for all aspiring aeronauts.

Yet another pioneer, later to become a leading figure in European aviation, was the Brazilian, Alberto Santos-Dumont. He built the first practical airship, circling the Eiffel Tower in 1901 in his No. VI which was powered by a 12 hp car engine. The German Graf Ferdinand von Zeppelin built the first commercially practical airship in 1906.

In America, in the year 1898, Samuel Langley received a large grant from the U.S. War Department for the construction of a man-carrying aeroplane. The full-size 'Aerodrome A' with engine driving two pusher propellers. Control of the aircraft was primitive in the extreme; Langley hoped that it would have sufficient inherent stability to require only the minimum adjustment during flight.

Another of his basic errors was his insistence on the machine being catapulted off a houseboat moored in the Potomac River. The first launching took place in October 1903, when the 'Aerodrome A' crashed into the river after fouling the launching mechanism. A second attempt in December was a repeat of the first, the unfortunate pilot, Charles Manly, receiving a second ducking. The Aerodrome 'A' is illustrated in Figure 2.

Meanwhile, an extremely cautious and practical approach to the problems of flight was followed by the Wright brothers of Dayton, Ohio, including their discovery of the need for lateral control, and their invention of wing-warping—a helical twisting of the wings—to achieve this.

With the aid of advice from Octave Chanute, the Wright brothers designed and built a series of gliders between 1899 and 1903. From their early researches two schools of thought on aircraft control evolved: (i) that of inherent stability, with minimal control, and (ii) inherent instability, requiring continuous corrective action by the pilot. The Wrights firmly followed the inherently unstable line in all their gliders and later powered aircraft. During their years of research and experiment they carried out over 2000 glider flights, mainly at the Kill Devil Sand Hills in North Carolina. They concentrated until 1903 purely on gliders and aerodynamics, rightly believing that the problems of control in flight were of prime importance, and that the addition of power to flying machines was subordinate.

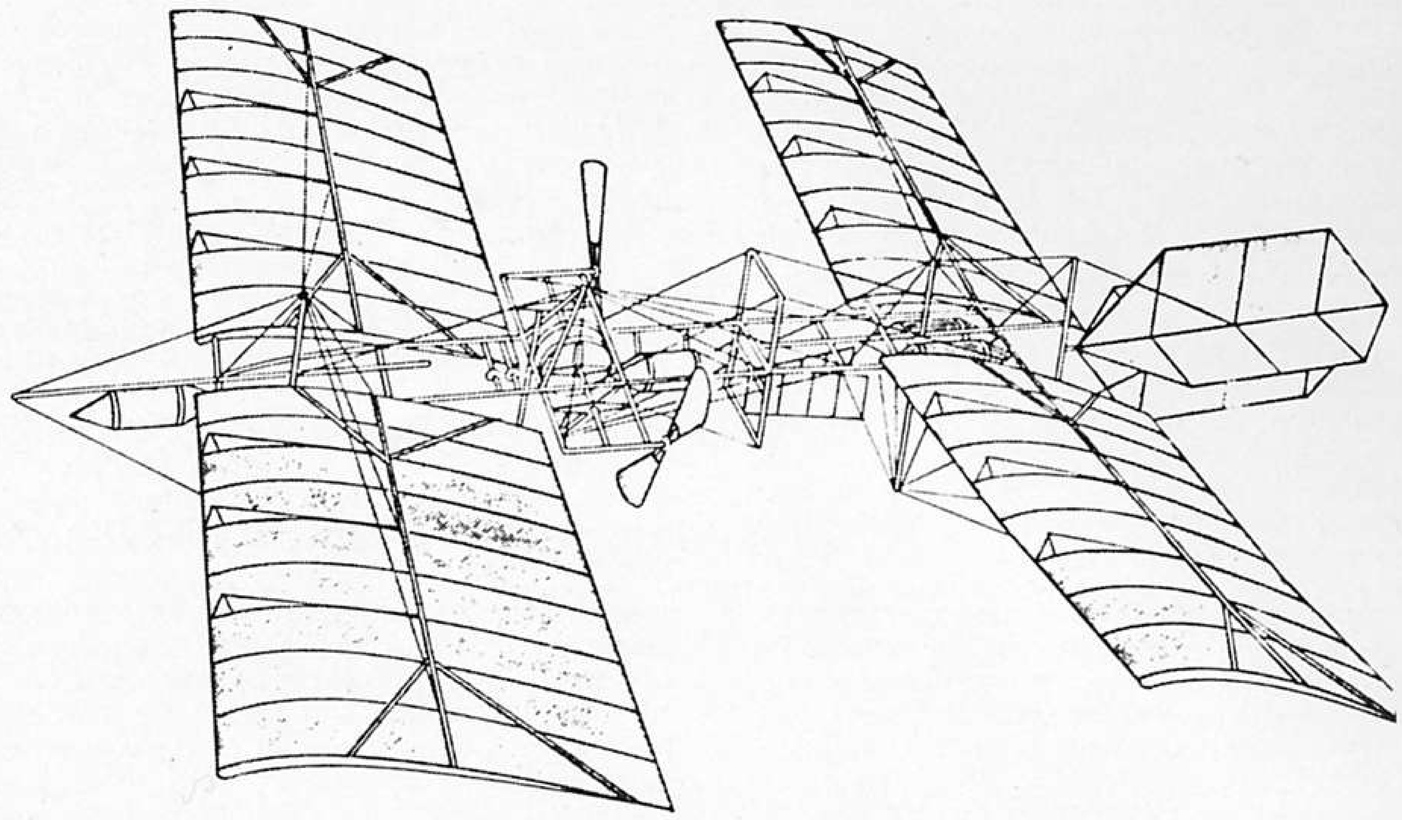


Fig. 2: Langley's 'Aerodrome A' 1903.

Meanwhile in Europe several pioneers, for example the German Karl Jatho, succeeded in making what were, in effect, powered hops with little or no control, but there were no real rivals to the Wrights during this period.

The Wrights' approach to the problems of propulsion was typical of their painstaking research. They found that no suitable engine existed, so they set about designing and building their own. Moreover, their aim was to produce a water-cooled engine of 12 h.p. weighing a maximum of 200 lbs. That they succeeded in this aim is a sign of their true genius.

To put this feat of engine design into perspective, it may be pointed out that it was another seven years before the London General Omnibus Company considered that petrol engines were reliable enough to permit replacement of their horse-buses!

Concurrently with their engine studies, Wilbur and Orville studied propeller design, finding again that no suitable designs existed, and so designed and built their own. They were the first aviation pioneers to realise that an aircraft propeller is totally different in concept to a ship's screw, and that it utilises the aerofoil's principle of lift, but in a forward instead of upward direction.

The Wrights built their first powered aeroplane, the FLYER, in the summer of 1903. Like their glider designs, it was a biplane, with forward-mounted elevators, and twin movable rudders. The engine drove two pusher propellers, contra-rotating to avoid rotational stresses. It had a skid undercarriage, and was mounted on a launching trolley which ran on a single rail laid on the sands of the Kill Devil Hills. A successful attempt at flight was made on the 17th. The Flyer took off and flew for 12 seconds, covering a distance of 120 feet.

This was the first powered, controlled, sustained flight in history by a manned, heavier-than-air flying machine. Other, longer, flights were made by the Wrights on that same day.

Clement Ader, Sir Hiram Maxim, Karl Jatho, and Samuel Langley had all seemed to be on the point of producing the first powered, man-carrying aeroplane, but in the end it was the Wright brothers, through their determination and hard work, who alone succeeded. They were without doubt the greatest men in aviation—men of genius who mastered the design of aeroplanes, engines and propellers, and also mastered the technique of control in the air.

Figure 3 shows a Meccano model of the Wrights' Flyer III aeroplane of 1905, which was broadly similar in layout and design to their original 'Flyer' of 1903.

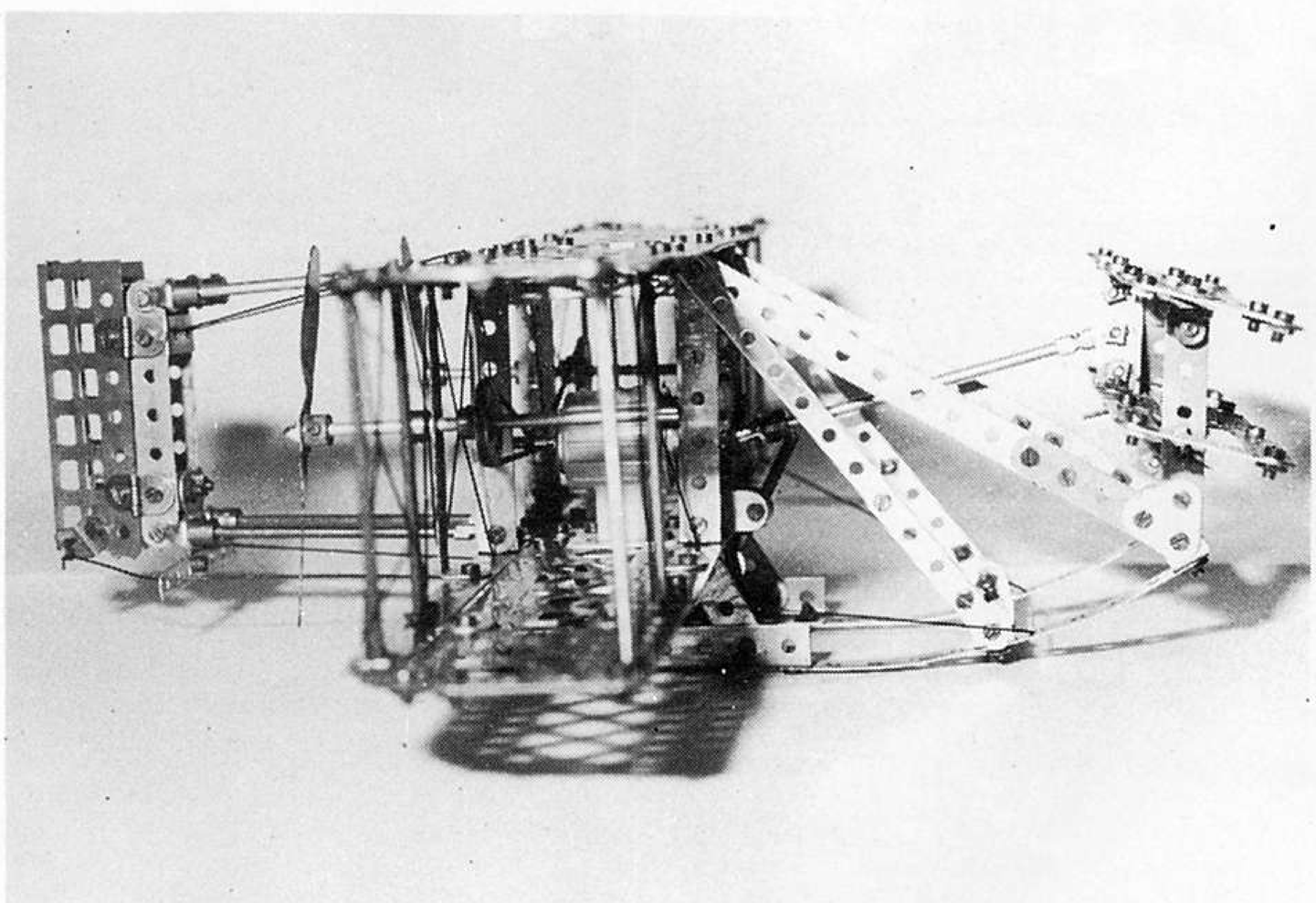


Fig. 3: Wright Flyer III of 1905

The model is approximately 1/24th scale and comparative dimensions are:

	Wing Span	Length	Height	Prop dia.	Elevators span
Flyer III	40' 6"	28' 0"	9' 0"	8' 0"	14' 0"
Model	20½"	15½"	5"	4½"	7½"

DESCRIPTION OF THE MODEL

THE model illustrated is built mainly of nickel parts but current parts may of course be used: if double-braced girders are not available, pairs of single-braced girders back-to-back may be used. Similarly current painted Windmill Sails or 3½" Flat Girders may be substituted for the obsolete Windmill Sails used for the rudders.

Details of construction of the model are as follows:

WINGS: Both upper and lower mainplanes are identical in construction, both wing centre sections consisting of 3½" x 2½" Flanged Plates, with their flanges downward. The leading edge of each wing is 20½" in length, consisting of a 12½" Strip extended at each end by 5½" Strips overlapped 3 holes. Each wing trailing edge consists of a 12½" Strip extended by 3½" Strips overlapped 2 holes, and the trailing-edge tip formed by a 2½" Curved Strip. The wing surfaces consists of Braced Girders to represent the flimsy fabric of the original.

STRUTS: The centre section struts are 3½" Strips, bolted to the flanges of the upper wing 3½ x 2½ Flanged Plate, and fixed to the lower wing by Angle Brackets. 3½" x ½" Double Angle Strips are used for the struts which carry the propeller shafts. The outer struts are 3½" Screwed Rods, although if available samples slightly longer than the nominal 3½" should be used.

PROPELLERS: The propeller shafts are 4½" Rods held in place by Collars and carrying 1" Pulleys for the Motor drive. Aeroplane Constructor propellers have been used on the model illustrated, but 4½" Narrow Strips fixed to Rod Sockets at their centre holes would serve equally well.

FUSELAGE: Details of the forward part of the fuselage are apparent from the illustration. The rear portion of the fuselage consists of four 4" Rods fixed in pairs to the upper and lower wings by Rod & Strip Connectors, and carrying End Bearings at their rear ends. Each pair of End Bearings is connected by a vertical 3½" Strip, and the two Strips are linked either by two Argentine Meccano ½" x 1" Double Brackets (part no. 11b) or two pairs of 1" x ½" Angle Brackets (12b).

The lower ½" x 1" Double Bracket carries a 1" Triangular Plate, extended downward by a Fishplate, to which is bolted a horizontal 3½" Narrow Strip by it's centre hole. The end holes of the Narrow Strip form guides for the rudder cords.

The bolts holding the vertical 3½" rudder posts and ½" x 1" Double Brackets also carry Hinges, to which the twin rudders are fitted. Short lengths of cord are used to keep the rudders parallel.

MOTOR: The motor, a 1½-4½v 'Crane' motor is fitted to the 3½" x 2½" Flanged Plate of the lower wing, to the right of the centre line; on the early Wright aeroplanes the pilot lay prone, to the left of the engine, to balance the machine. Drive to the propellers is by a 6" Driving Band to the R/H prop shaft and by a crossed 10" Driving Band to the L/H shaft, to provide contrarotation of the propellers as on the original.

ELEVATORS: The typical Wright forward elevators are pivoted on 4½" Rods through 3½" x ½" Double Angle Strips bolted beneath the Braced Girders forming the elevators, the rods being held in the vertical 3" Strips of the forward fuselage by Collars or Spring Clips. The upper elevator, 7½" in span, consists of Braced Girders with 2" Strips at the tips. The centre portion of the lower elevator is a 3½" Braced Girder.

The elevators are linked together by a 1½" Strip locknutted to Angle Brackets as shown, a Rod & Strip connector locknutted to the centre hole of the 1½" Strip carries a 4½" Rod which is linked at its other end by a Swivel Bearing to the elevator control column. This is pivoted on the lower wing Flanged Plate.

The second, (right hand) control column, pivoted fore and aft, actuates the twin rudders through a simple linkage fitted beneath the lower wing and connected by cords tied to Angle Brackets on each rudder as shown. The linkage may consist of a Rod or Strip linking the control column and a Double arm Crank.

On the prototype 'Flyer' the R.H. control column was universally-mounted and operated both lateral and yaw control surfaces. For and aft movement of the column controlled the rudders, as on the model, and sideways movement warped the wings for banking the aircraft. Wing-warping was generally used until the successful development of ailerons between the years 1905 and 1910.

SKIDS: The undercarriage skids are 5½" Angle Girders fixed to the lower wing Flanged Plate by 1½" Strips. The model is completed by adding cord bracing between the upper and lower wings and between wings and fuselage as shown.

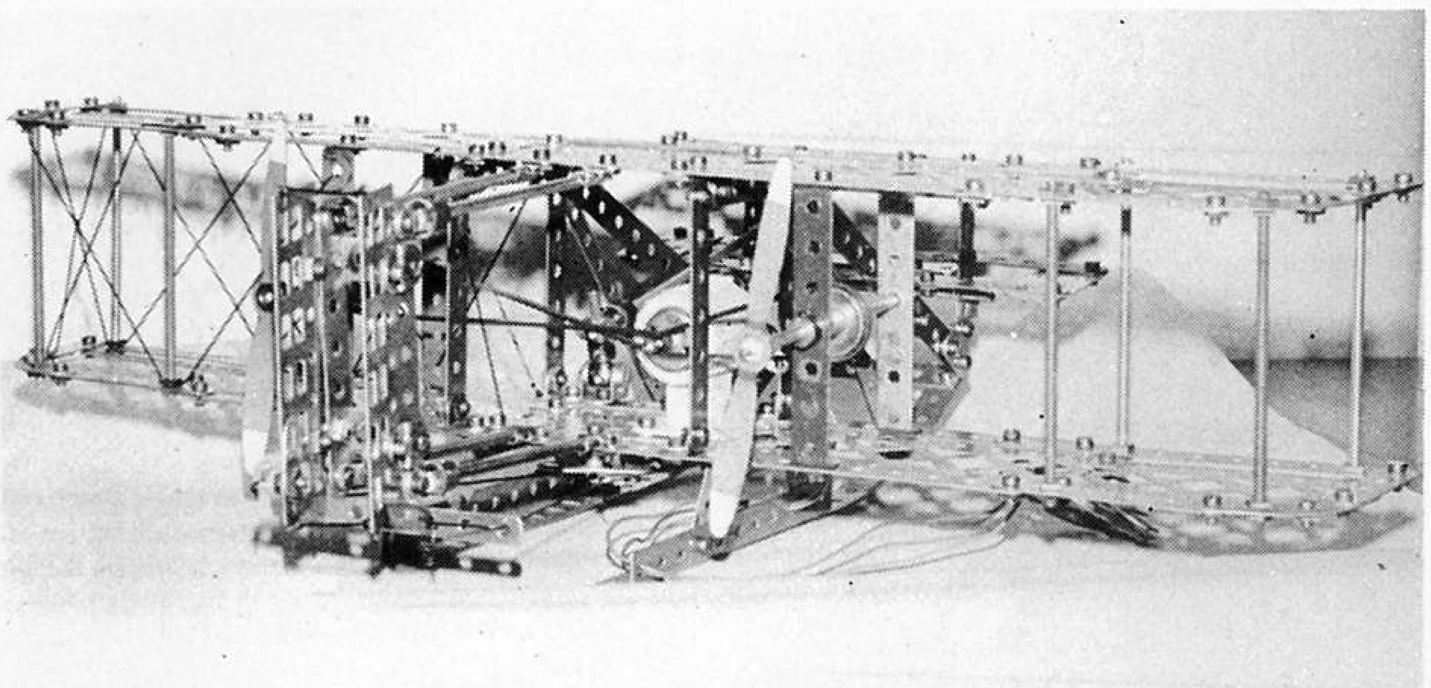
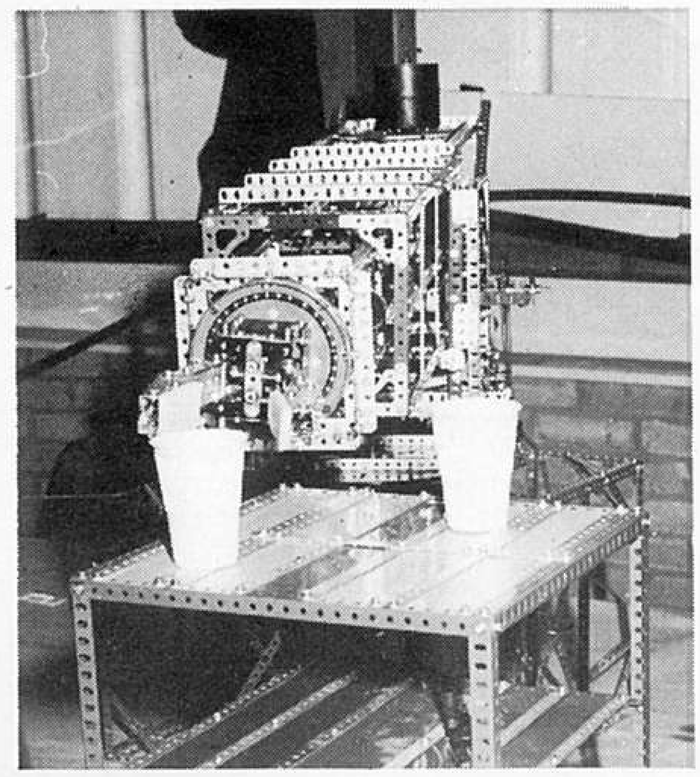


Fig. 4: Wright Flyer III (1905) Model

BIONIC ARM!

Constructed and photographed by Nicholas Wright

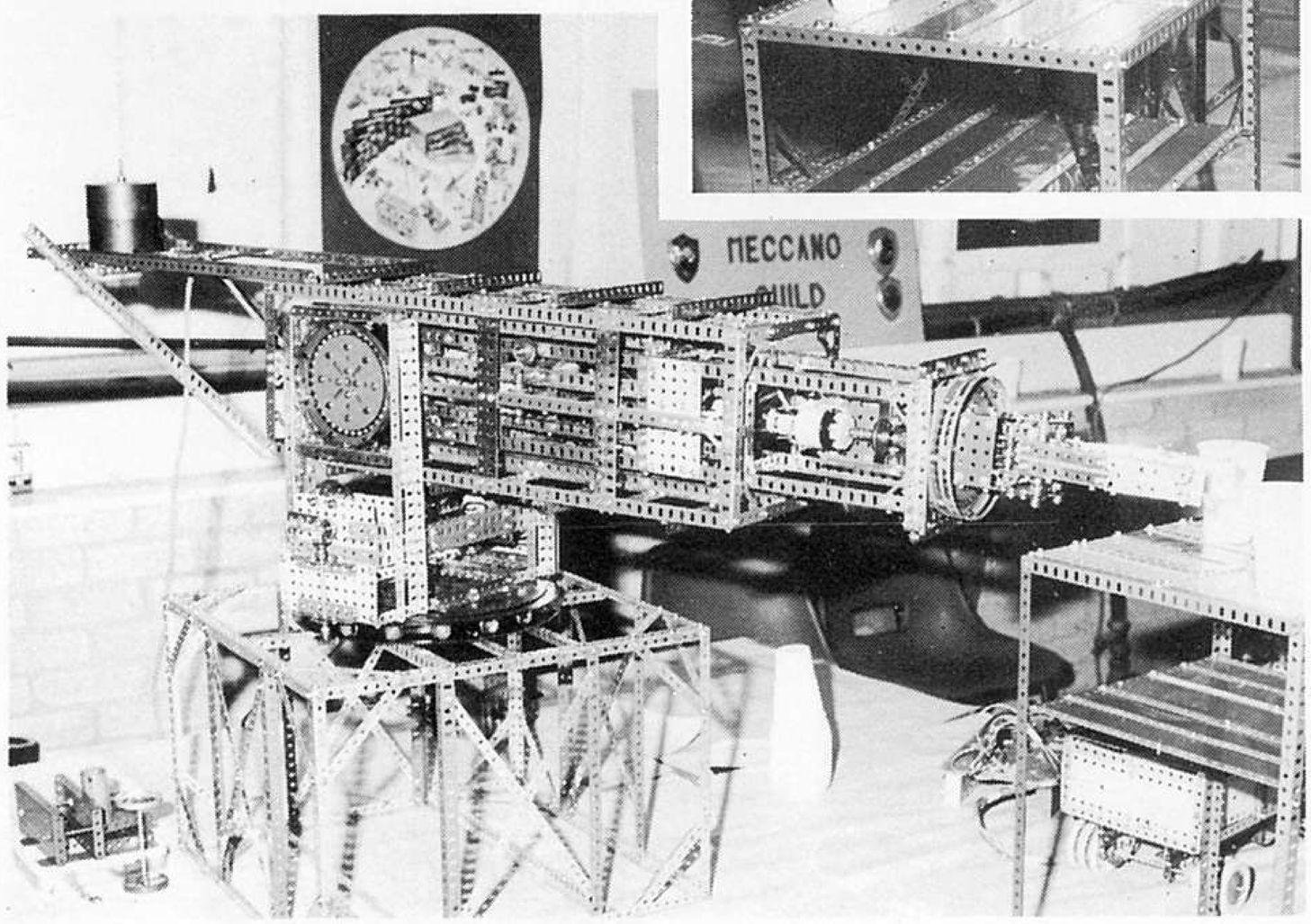


SEEN at a recent meeting of the Midlands Meccano Guild, of which Nicholas Wright is a member, was this highly complex and fully operating mechanical arm. The main functions of a hand are reproduced, and the model incorporates all the equipment necessary to perform the stretching, swinging, lifting and lowering movements of the average, (or perhaps super-average!) Bionic Arm.

Based on an actual Robot Arm of this type used in industry for the remote control handling of dangerous materials, the model incorporates no fewer than five motors, themselves fully remote-operated. The crocodile jaw type powered 'hand' is capable of delicately gripping such a flimsy item as a plastic cup, and, by means of the front mounted built-up ball bearing, rotating the cup so as to pour its contents into another vessel.

Should the 'target' vessel be some distance away, the arm is able to extend to well over one foot longer than its normal, arm-retracted length of just over two feet, excluding counterbalance. Two large captive ball races enable full raising and lowering movements, and a 12" diameter Geared Roller Bearing situated on the base framework facilitates 360 degrees of rotation. The counterbalance is capable of being remotely positioned so as to allow for the extra compensation required when the arm is at its fullest extension.

Models of this type are a fine example of the capabilities of the Meccano system as was proven by the reaction of the crowds of people who witnessed its fascinating operation at the following Stoneleigh Meccano display. Meccano has always been a remarkable construction medium, and I'm sure even more so, now that it has 'gone Bionic!'



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, especially 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, a Shaping Machine, Milling Machine, a Lathe and now we have a

PUNCHING MACHINE

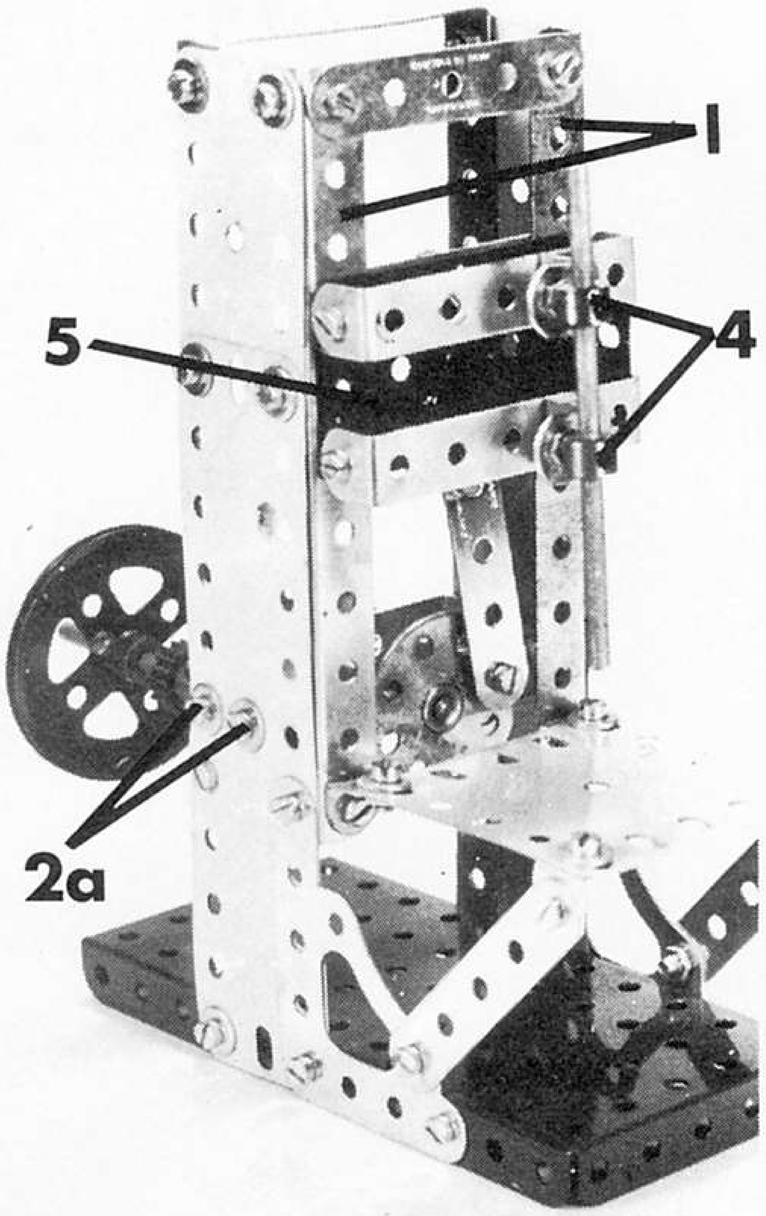


Fig. 1

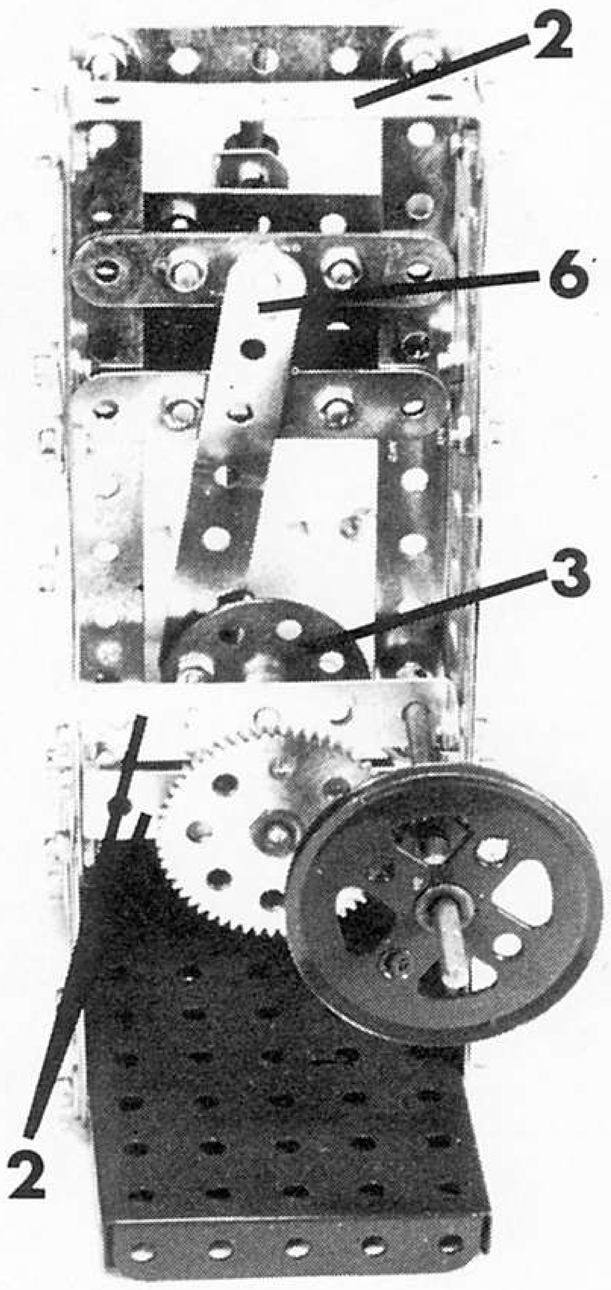


Fig. 2

THIS latest model in the 'Teknikit' series reproduces the basic motion of a type of machine commonly used in industry to speedily and accurately punch holes in sheets of steel, etc. The base consists of a 5½" x 2½" Flanged Plate, to either long flange of which, sides comprising, (in each case) a 5½" x 1½" Flexible Plate extended by a 2½" x 1½" Flexible Plate are attached, these being arranged vertically as shown.

Corner Gussets are employed for bracing purposes at the lower ends of the built-up sides as shown. Two 5½" Angle Girders 1 are secured by their elongated holes to the inside front edges of the two built-up sides. The uppermost holes of the 5½" Angle Girders 1 are connected by a 2½" Perforated Strip.

The inside rear edges of the built-up sides are reinforced by two 5½" and two 2½" Perforated Strips, and three 2½" x ½" Double Strips 2 are located as shown to additionally connect the two sides. The lower two of these are held by the Bolts shown at 2A, and these serve as journals for a centrally positioned 2" Axle Rod and a 3½" Axle Rod located in the right hand side holes as seen in fig. 2. The 2" Axle Rod carries at its inside end, a Bush Wheel 3, and on its outside end a 57t Gear Wheel. The 3½" Axle Rod is held by a Collar and supports a 2" Pulley and a 19t Pinion, which engages with the 57t Gear Wheel on the 2" Axle Rod.

A work table is then constructed, this comprises a 2½" x 2½" Flexible Plate held by Angle Brackets to the bottom round holes of the 5½" Angle Girders 1. The 2½" x 2½" Flexible Plate is further supported at its forward edge by a 2½" x ½" Double Angle Strip, the lugs of which hold two 2½" Perforated Strips, connected to the base Corner Gussets.

The punch itself is represented by a 3½" Axle Rod, held by Collars 4 firmly fixed in the round holes of two ½" Reversed Angle Brackets by a Bolt and a Nut, the transverse threaded bore of each Collar being employed for mounting purposes. The 3½" Axle Rod is then slid through the longitudinal smooth bores of the Collars and held by their Grub Screws.

The Reversed Angle Brackets are then secured to the fourth hole in each of two Double Angle Strips, and these in turn are attached to the short flanges of a 2½" x 1½" Flanged Plate 5. Two 2½" Perforated Strips are secured to the rear of this 2½" x 1½" Flanged Plate 5, spaced by a Washer on each Bolt shank, but before doing this, the Plate 5 is brought up to the flanges of Angle Girders 1, and the 2½" Perforated Strips affixed so that they are inside the Angle Girder flanges.

It will then be found that the entire sub-assembly can be slid up and down on the round hole flanges of Girders 1. A Short Threaded Pin 6, firmly fixed to the centre hole of the upper 2½" Perforated Strip is connected by a 3½" Perforated Strip, lock-nutted to the Bush Wheel 3.

The operation of the punching machine is as follows: a suitable drive is arranged to the 2" Pulley Wheel at the rear of the unit. The drive is then transmitted by the 19t Pinion and 57t Gear Wheel to the Bush Wheel 3. Rotation of this Bush Wheel causes the slide weight assembly to move up and down in the flanges of Girders 1, and with it the 3½" Axle Rod representing the punch. Careful alignment with suitable packing Washers if necessary should result in the 'punch' neatly entering and leaving the centre hole in the 2½" x 2½" Flexible Plate representing the work table.

Parts Required

Qty.	Part No.	Qty	Part No.
2	of No. 2	49	of No. 37c
1	of No. 3	26	of No. 38
7	of No. 5	6	of No. 48a
2	of No. 9	1	of No. 51
2	of No. 12	1	of No. 52
2	of No. 16	3	of No. 59
1	of No. 17	2	of No. 108
1	of No. 20a	1	of No. 115
1	of No. 24	2	of No. 125
1	of No. 26	2	of No. 188
1	of No. 27a	2	of No. 189
45	of No. 37b	1	of No. 190

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

PROTOTYPES

by Bernard Dunkley

FOR the first two articles in this series, the themes, were 'lift it' when two large cranes were described, and 'move it' when I gave details of heavy-duty load-carrying devices. This time I have some ideas for you that could be put under the general heading of 'reach it'.

Fig. 1
The EPL Underbridge Mk. Ii in action.

OVER AND UNDER

My eye was caught by a magazine illustration of the EPL Underbridge Mk. II. This is shown in Fig. 1, and as an access platform for bridge quite an achievement. A truck drives up close to the bridge parapet, and from the platform of the truck an arm unfolds, by means of pinjoints, swivel and telescopic extension to locate a man-carrying platform closely under the bridge. The swivel joint remains vertical so that the extending arm can take the 'cage' over a very large radius of operation.

The truck can move along the bridge while the arm is extended. The interruption to traffic on or under the bridge is minimal, and jobs that wuld take days using conventional scaffolding can be completed in a few minutes.

When the Underbridge Mk. II is in position, the two or three men in the cage have full control of the extension and location of the boom. The cage (or 'bucket') is kept horizontal by an automatic hydraulic system that is 'fail-safe', but safety belts are standard equipment. The control panel is duplicated on the truck chassis for safety.

The maximum downward reach is 48ft, the maximum inward reach is 40ft, and the cage can hold 600lb. The cage (bucket) size is 3 ft 6in 1ft 8in x 4ft 6in. Folded (can you work out how?), the overall length of the truck and Underbridge can be as small as 32ft 6in.

The innermost boom is mounted on a rotatable turret on the vehicle and has 150° rotation. The central boom is attached to the inner boom by a turntable that has 360° rotation. The outer boom, carrying the bucket, has three telescopic sections. All knuckle joints are fully articulated.

Astute readers will have noticed from Fig. 1

Fig. 2
Going down, in the Underbridge Mk. Ii.

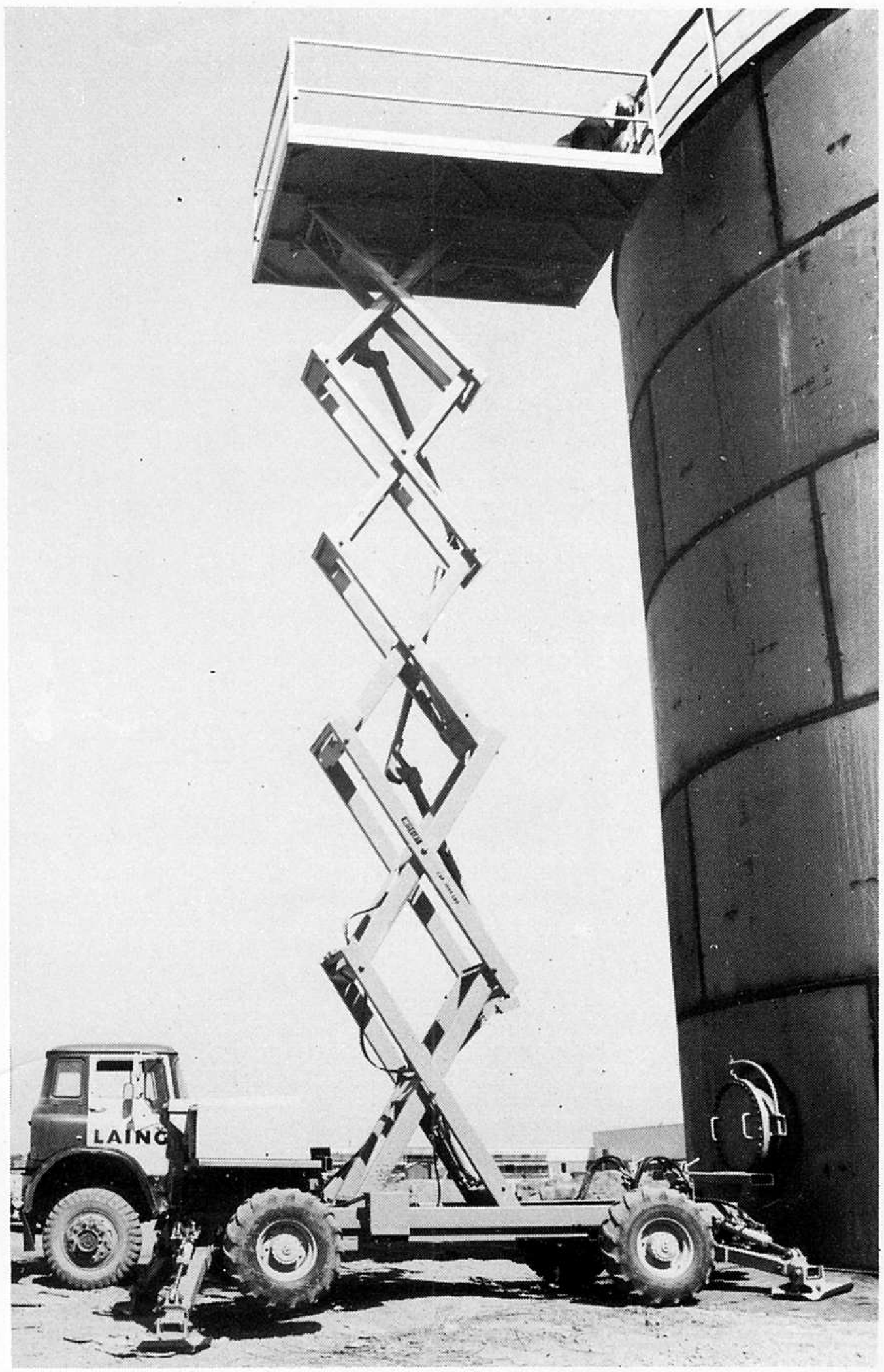


Fig. 4

EPL Mite-E-Lift scissor platform.

that the Underbridge Mk. II has had a name change during its development. Fig. 2 shows a particularly clear view of the booms and joints of the Underbridge Mk. II.

EPL COOPERATION

To get material for this article, I wrote to several makers of construction platforms, and EPL International was the only firm to reply. EPL not only provided lots of information and photographs, but also made a very generous offer, that I shall tell you about later. For now, let us look at some more of EPL's products.

AIMING HIGH

Knowing that Meccano enthusiasts like to model something spectacular, I now offer you the EPL Moonshot 150 (Fig. 3). No need to ask why that name was chosen, just look at the height it can reach—150ft. I can take four men and their equipment to the 14th floor of a tower block in less than three minutes.

Both the booms are telescopic, and hydraulic cylinders with holding valves provide locking of the 7ft x 3ft cage in any position. The turntable has a heavy-duty duo-race ball bearing with an internally toothed slewing ring. Cage positioning controls are electro-servo type and can be operated from the cage, from the chassis, or from a remote pack up to 50ft from the vehicle, the cage has pneumatic, hydraulic or electricity supplies for power tools etc.

More dimensions: the sideways reach is 70 ft and the turntable can be rotated through the full 360° while other controls are being used. The cage can be rotated around the upper

Fig. 3

EPL Moonshot 150 on highway maintenance duty.

boom through an angle of 45°. A nice detail for modellers is that there is a lifting eye under the cage. The total working payload is 1000lb.

SMALLER FRY

We now turn to three of EPL's smaller 'reach it' aids. Fig. 4 shows a very versatile scissor platform, the EPL Mite-E-Lift, working in rough terrain. This is self propelled, the 'works' being in the boxes on the left-hand end of the chassis. Hydraulic jacks, just visible inside the lowest scissor legs, do the raising and lowering.

Fig. 5 shows the EPL Condor 40-46, which is a 40ft self-propelled working platform with a single telescopic boom. It can be driven along, from the platform, while the boom is extended. This is a piece of equipment that has universal appeal: just think how it would help with outside house decorating!

Finally, the EPL UD 110 universal demountable platform is shown in Figs. 6 and 7 on two different trucks. You buy this unit in a seven-part kit and attach it to the vehicle of your choice. Fully extended, it goes to a height of 36ft with a 15ft sideways reach. It can carry a load of 397lb. The 'hydraulics' are completely self contained within the unit, and the only connections to the vehicle are four mounting bolts and an electric plug.

OPPORTUNITY FOR MODELLERS

Now I'll give you details of EPL's offer that I mentioned earlier. If anyone builds a model of an EPL product and sends a photograph of it to the Publicity Department, EPL International Ltd., Manor Way, Borehamwood, Herts. WD6 1WD. England, the firm would consider using the model to advertise their working platforms at shows and exhibitions. It accepted, EPL would pay for the parts used and the time spent in making the model.

If you want to follow this offer, I suggest you write to EPL before you build a model. The firm is most friendly and helpful, and you will no doubt receive leaflets etc. that will improve the accuracy of your model no-end.

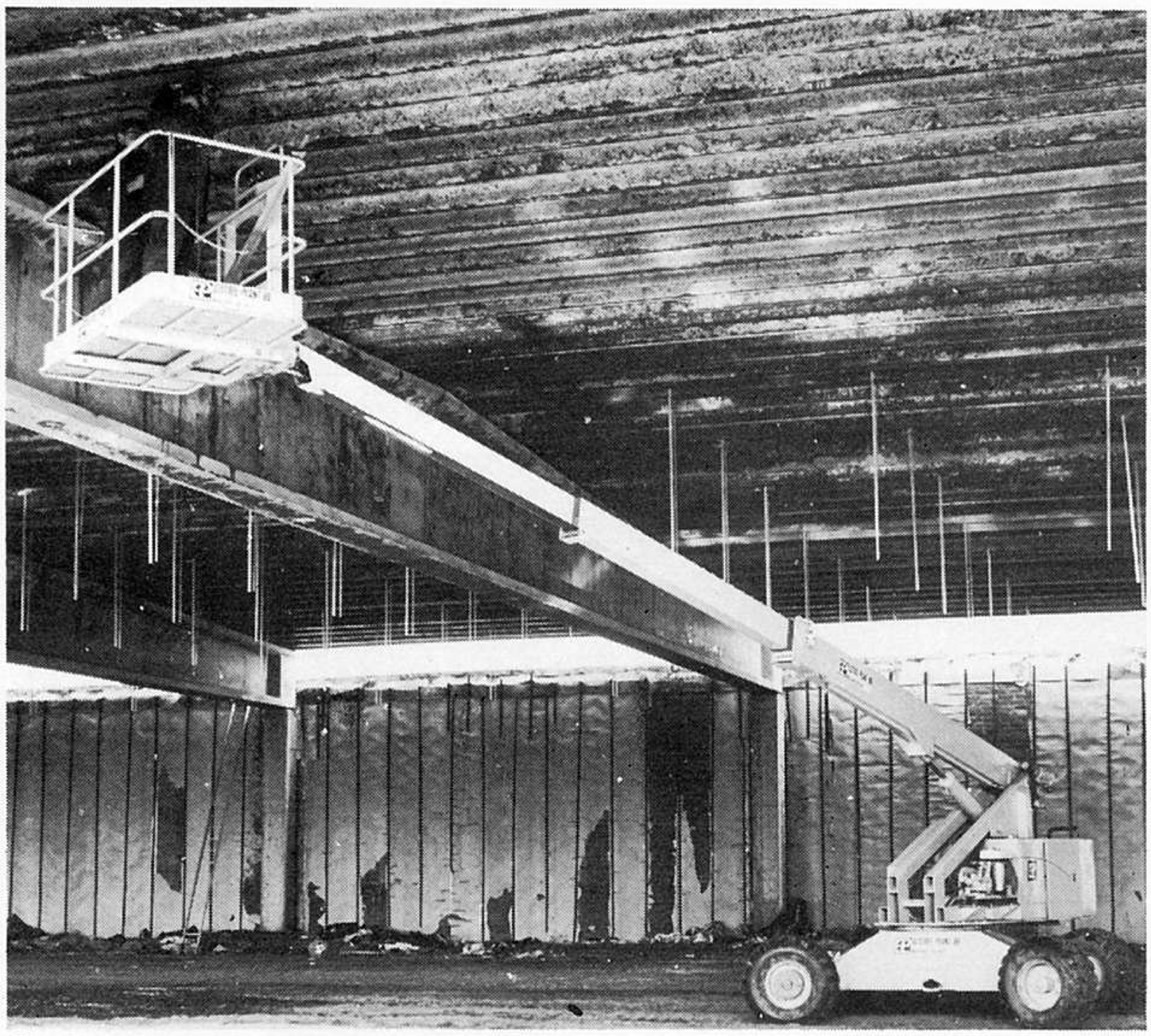


Fig. 5 EPL Condor 40-46 self-propelled work platform.

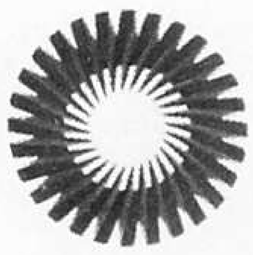
Fig. 6

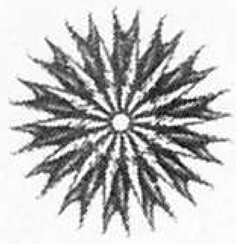
EPL UD 110 demountable platform, folded.

Fig. 7

EPL UD 110 demountable platform in action.

DESIGN FOR JOY





PART 5

BY ANDREAS KONKOLY

Andreas Konkoly is seen here in Muhlhausen, DDR, in 1976.
Fig. 1

Mr. Chris Jelley, the earlier Editor of Meccano Magazine, mentioned in 1978; 'I will be very happy to give space to the continuation of Andreas' story at a future date, as I feel that his development of the Meccanograph mechanisms from a crude toy to an exact science is a very important facet in the history of Meccano'.

Due to the fact that my range of Set 10 model instructions encompasses many compact high-capacity designing machines, I would like to show you some further examples of my work along these lines, from the 1973-1978 period.

It is my principle that, 'The journey is one of life's most beautiful gifts'. You, dear reader, if you have the time and money, travel. Travel into foreign countries, splendid capitals, nice places. To do this you will often need to put your hand into your pocket for banknotes, also when purchasing gifts. Have you thoroughly examined the designs of these foreign banknotes? All paper money of every country carries the most magnificent patterns and charming designs. If you are a keen Meccanoman or a Meccanograph builder, no doubt you would like to have a machine that could make lace samples, similar to the banknote patterns.

The birth of a new Meccanograph requires very much careful thought and mathematical calculation. In those summer vacation days in 1976, spent in East Germany and the Soviet Union, how often I have thought when looking at a banknote in my hand, 'What kind of machine produced such intricate, captivating drawings? What mysteries lie within it's mechanism? How can I best utilise my Meccano parts to produce the gear ratios and functions to model a device to make patterns like them? Later on, with the LACEGRAPH was ready, I often produced similar designs, then I felt a great sense of achievement.

Not only banknotes feature intricate designs, so do share certificates and securities. The Lacegraph produces hundreds of phenomenal designs. These are light as the breath and intricate as the cobweb. The drawings are especially beautiful if they consist of the finest hair-thin lines.

To commence, the machine draws a seemingly entangled pattern, as can be seen in fig. 4, but this confusion later develops to an enchantingly beautiful design.

I have often read in Meccano Magazine that Mr. X or Y Meccanograph constructor planned a 'very complicated' designing machine. I myself have invented 25 kinds of Meccanograph already, and so I feel that I have sufficient experience in this field. A Meccanograph maybe large or small, high or low, long or short, compact and complex, but complicated, never. In cases of many sliding and/or gear transmissions the drawings show the result of too complex a mechanism by developing a 'trembled' and inexact form, damaging the beauty of the samples. A designing machine, however grandiose, should incorporate the simplest possible mechanism to ensure the maximum stability of the lines making up the pattern.

I often wonder that many Meccanomen still construct and even display at Meccano exhibitions, what are in my view unfashionable, low-capacity machines and don't experiment with other systems. I have still never seen in the Meccano Magazine, any longitudinal design samples, except my Guilloche Longit patterns. In the next, part 6, continuation of my series, I shall introduce to you my SUPER Carpet-design Maker's samples. There still are innumerable possibilities to explore in the area of Meccanograph design, not merely the traditional methods. I know surely, I have a mission on this line, and see myself as a prophet of the new world of different, new-style Meccanographs. I wonder also, why I haven't read in the Meccano Magazine, any views, criticism or remarks about my Design For Joy articles, parts 1-4. Perhaps the readers don't like writing in, there was only the Editor's note, which made me feel so very proud!

Fig. 2

With his wife Clara, in the 'Soviet Versailles' of Petrodvorec, in the Leningrad area, Summer 1976.

OP-ART GRAPHIC PICTURE MAKER

IF we combine the principles behind the Variograph and Guilloche Vario No. 10 models, we get the above machine for Op-Art samples. The paintings are extraordinary in the Meccano world. Their characteristic feature being that each picture consistes of about 600 exclusively vertical, straight lines. The thick lines are merged into splendid paintings. The machine draws these lines so precisely that one can re-describe already drawn lines, going over the same pattern twice or three times without mis-alignment causing damage to the pattern. The drawings take on an almost 3-D effect, almost 'springing-out' from the draftpaper. If varied-colour designs are required, snow-white paper, not too hard or too thin, must be purchased if best results are to be obtained. For the Op-Art Graphic Picture Maker I recommend you buy about 100,20 x 30 cm. size sheets of bank-post paper.

T-FORM MECCANOGRAPH

The model resulting from a marriage of the Universal Design Maker's, and Variograph's

Andreas' superb T-Form Meccanograph. **Fig. 6**

The uniquely-beautiful and distinctive Op-Art Graphic Picture Maker's typical work. Fig. 5

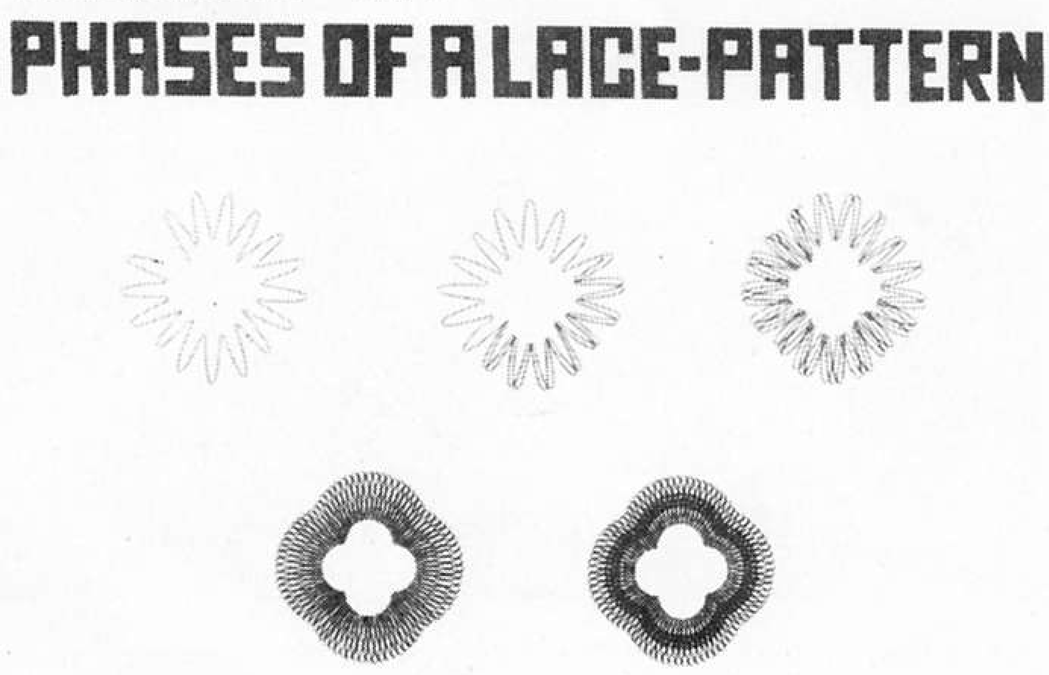
principle. Incorporating hanging mechanisms and built-in gear-changing solution, it produces hundeds of 2,3,4,7,14 and 21-way superb patterns. Yet this model can be built in just 8 hours by the average enthusist! It assures continual amusement for it's constructor, and it is, like all designing machines, an ideal display model. My wife Clara often asks, 'When will I again build-up the T-Form Meccano-graph?' My reply is 'After my death!' 'Now I must use my time to invent new and ever better No. 10 models. Up to now I've designed and built 88 new models of this type, and I would like to soon celebrate the completion of my 100th Supermodel!'

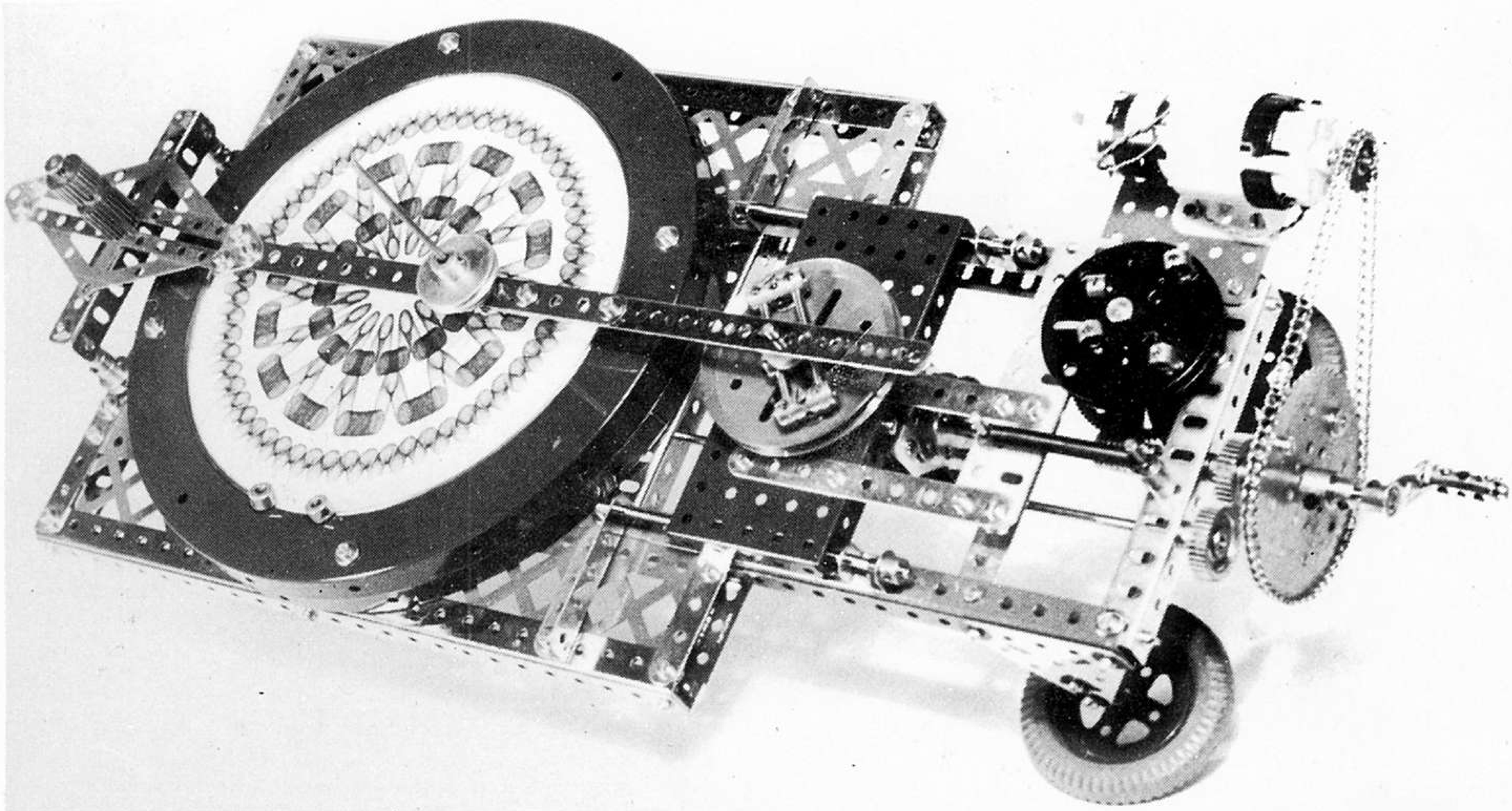
GOLLILIP DESIGNING MACHINES NOS. 1 AND 2.

I needed to design a machine capable of drawing not only little, 'Lilliput' designs, but also big 'Goliath' 170mm patterns. The larger designs are especially attractive I feel. Uniting into one the words 'Lilliput' and 'Goliath', I came up with 'Gollilip'. It uses an 'O' letter only as it's basis, and this can be repeated 4000 times to produce a typical sample design. The No. 1 Gollilip machine shown in Fig. 8, holds the paper in the frame of a Flanged Ring, which

The Lacegraph produces patterns of a banknote-like design. **Fig. 3**

This illustration shows the many phases in the production of a typical Lacegraph pattern. Fig. 4





The larger designing table based on the 9-7/8th' diameter Flanged Ring allows this Gollilip machine to produce large or small patterns. Fig. 8

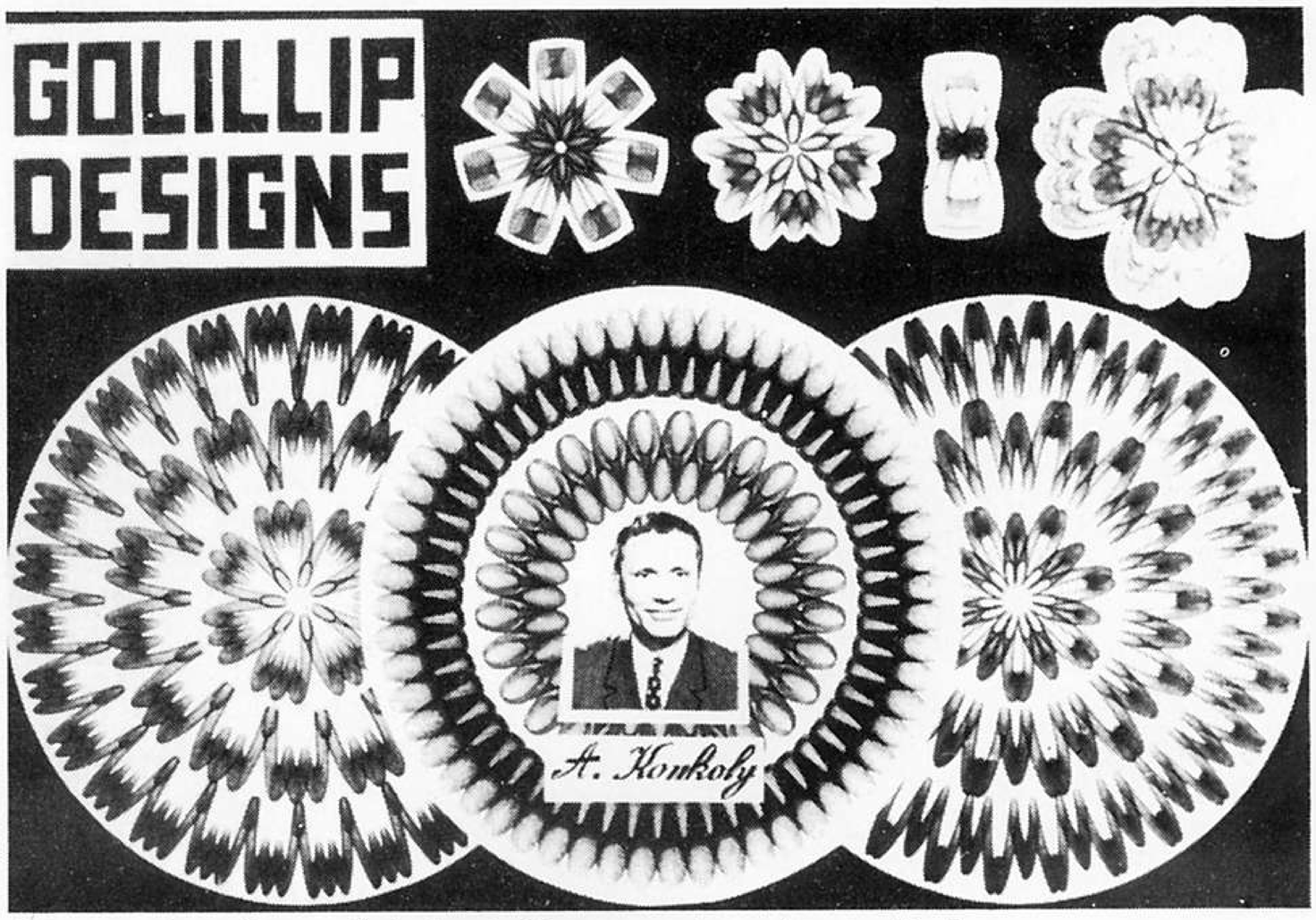
slowly turns on the rim of another Flanged Ring below.

The No. 2 Gollilip machine also holds the draftpaper in the frame of a Flanged Ring, but under it are situated 4 Large Toothed Quadrants transmitting the drive. The whole machine rests on four 1" pulleys fitted with Motor Tyres. The instrument works so precisely it is almost unbelievable. Improvements over the No. 1 Gollilip include the capability to draw patterns 1½ times more dense, much quieter operation and smoother mechanism due to the buffering action of the rubber bearings.

MECCANO
ELLIPT-O-GRAPH

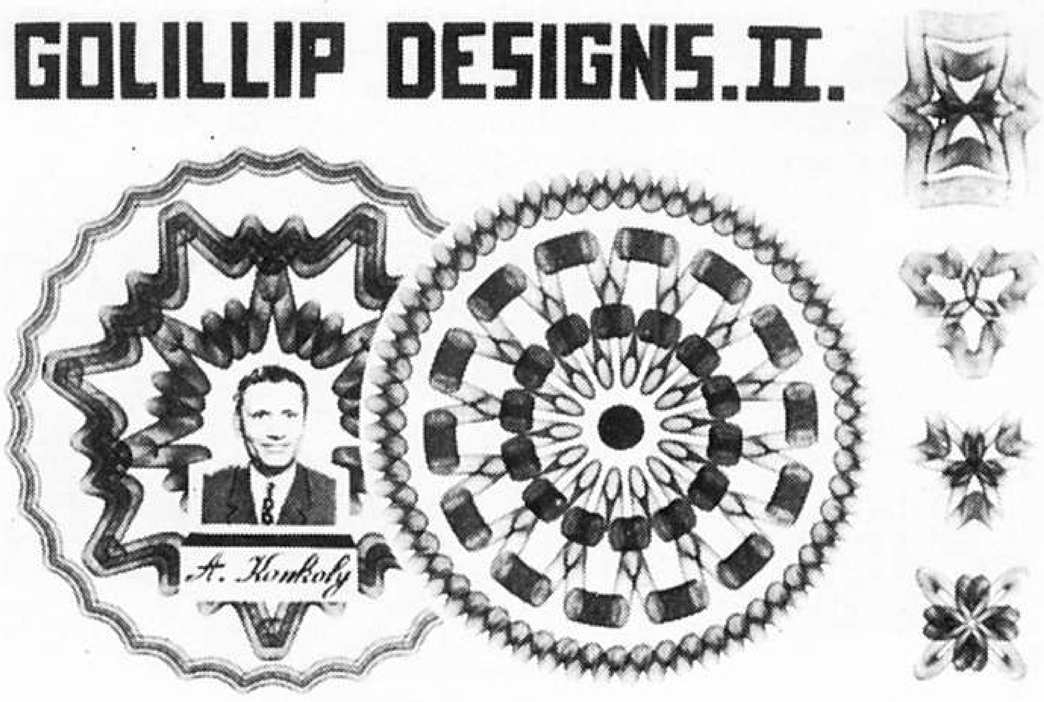
It was long an old dream of mine to plan and produce a machine which draws within an ellipse. At last I produced a very simple, but clever model. It compresses the ellipse-form patterns closely together, enabling the creation of other patterns in addition.

In my next instalment I shall be continuing my review of the Meccanographs I have designed, by introducing you to the Guilloche Round, Egg Garland Designer, SUPER Carpet-design Maker and the fantastic SPIRAL Guilloches series.

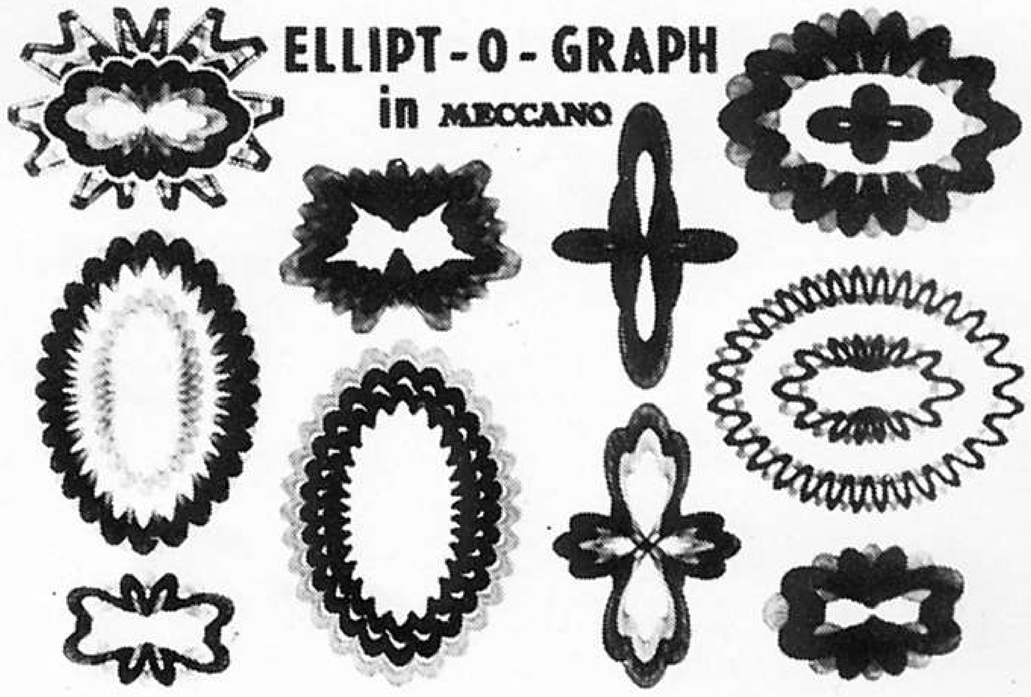


Demonstration of any of Andreas' Meccanographs makes an ideal exhibition display. The seemingly endless versatility of the Gollilip machine is amply proven by a close look at the types and sizes of patterns produced. Fig. 7

The improved Gollilp No. 2 easily creates patterns like these, plus a great many more. Fig. 9



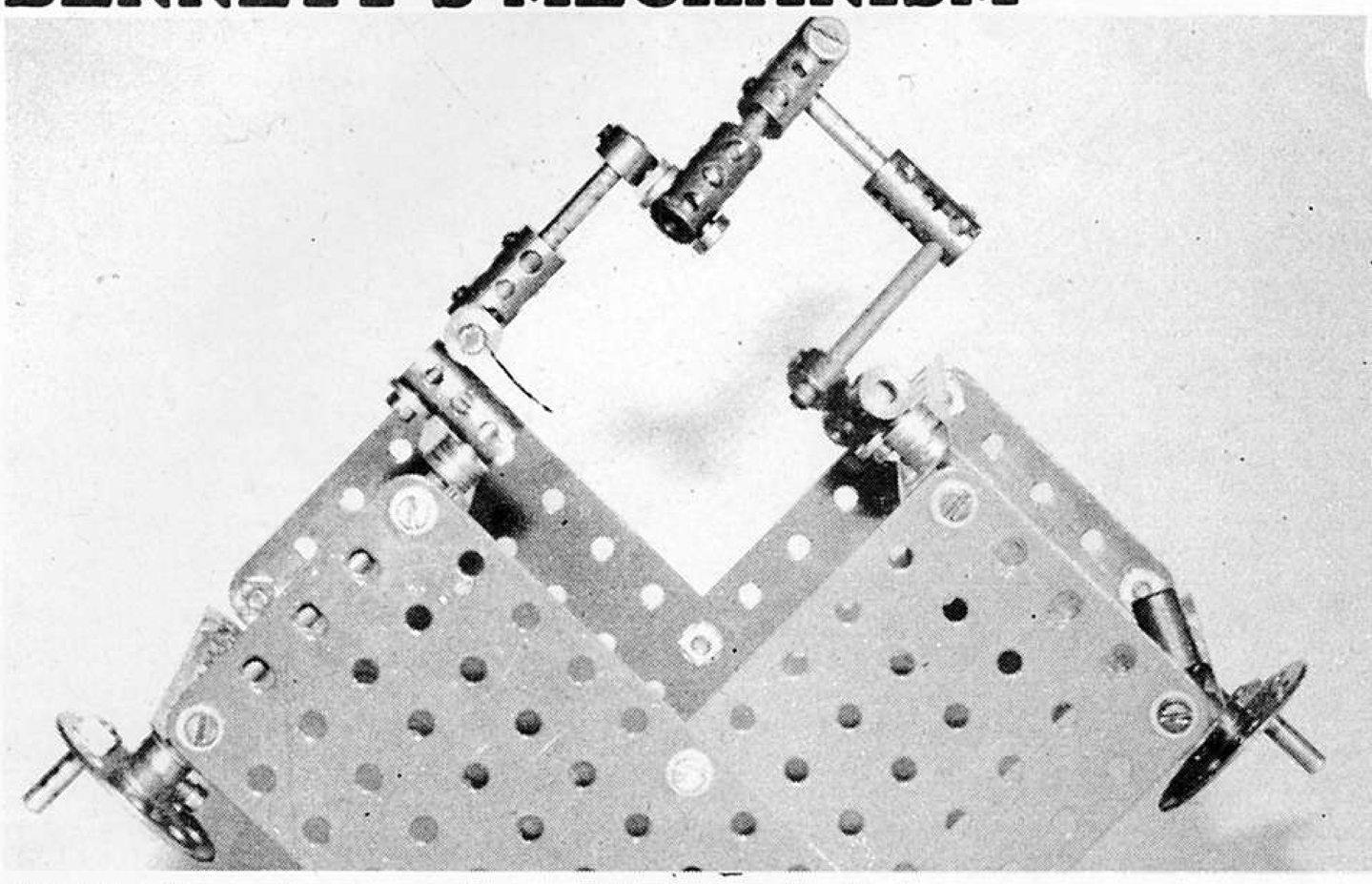
Unusual ellipse-based designs from the Ellipt-o-graph. Fig. 10



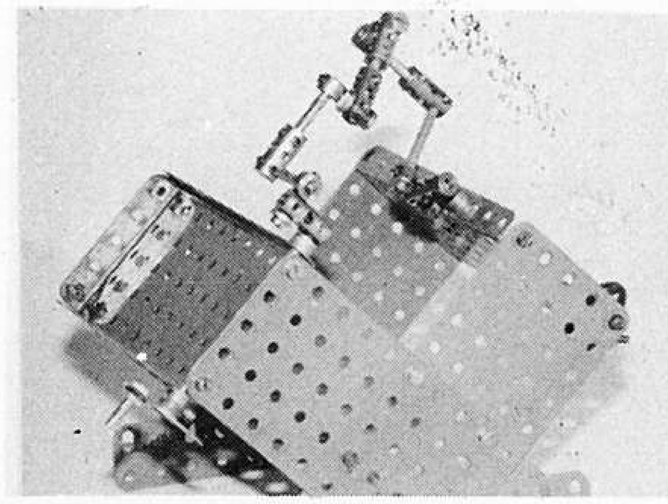
AMONG THE MODEL-BUILDERS

with 'Spanner'

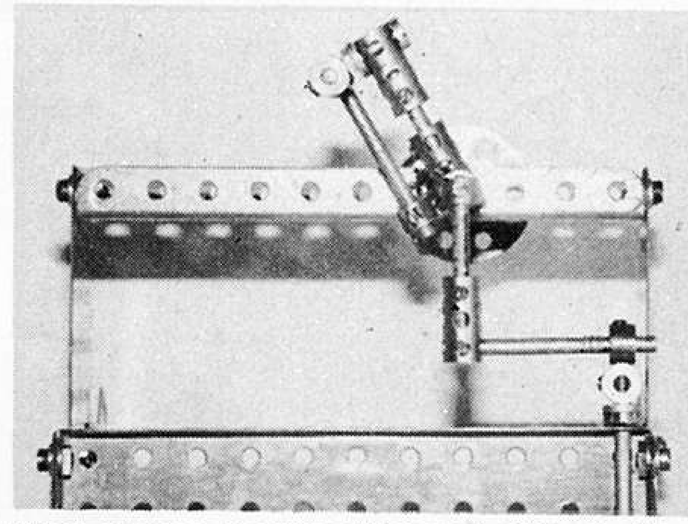
BENNETT'S MECHANISM



Careful setting-up is necessary to ensure the best results. Photographs kindly supplied by Alan Partridge.



The more advanced version of Bennett's Mechanism, designed by Steve Tonkin and built for demonstration purposes by Alan Partridge.



Edge-on view showing alignment of the built-up crank Axle Rods.

'A mechanism for which no application can be found', this is the claim made for Bennett's mechanism, details of which were included in 'Among The Model Builders', April 1979. A further development of the same theme has since been researched by Mr. Tonkin, a description of which follows:

This more advanced version of Bennett's Mechanism carries to an extreme, one particular feature of the simpler example. For a basic Bennett's Mechanism the 'velocity ratio' ripples above and below unity. For the mechanism described here the 'ripple' becomes so large that it actually goes from zero to infinity. This feature opens up new possibilities for experimentation.

CONSTRUCTION

The basic demonstration framework described in the April 1979 'MM' can again be employed, this consists of two 5½" x 2½" Flanged Plates, to the short flanges of which are bolted four 4½" x 2½" Flat Plates. These are angled and mounted on two 5½" Flat Girders as shown. Four 2" Perforated Strips are used for bracing purposes, between the Flat Plates and the 5½" Flat Girders.

Two built-up cranks are made in an identical manner thus; to the inside end of a 3½" Axle Rod journalled through the long flanges of the 5½" x 2½" Flaged Plate, a Coupling is affixed by its end transverse bore, spaced from the flange by washers. A Collar holding a 2" Axle Rod is then held by a ½" Bolt passed through the transverse bore of the opposite end of the Coupling. Washers are again used under the Bolt head to ensure a rigid attachment.

The 2" Axle Rod held in the Collar supports a Coupling at one end, this in turn holding a 1½" Axle Rod. A Collar at the end of this 1½" Axle Rod supports a Pivot Bolt, this acts as a bearing for the connecting rod, which in this advanced version of Bennett's Mechanism is composed of a 1" Axle Rod and two Couplings. The many joints will require careful setting-up, but your patience will be rewarded with a smoothly operating mechanism. Note that in this case, the two crankshafts are situated only four holes apart, and not at opposite ends of the Plate flanges as in the simpler version.

ACTION

If the mechanism is set in the dead centre position, either shaft, but not both, can be turned continuously without the other moving. Indeed, until the rotated shaft is returned to the dead centre position, the other shaft is locked. The mechanism can thus be looked upon as an either/or logic device, as used in computer jargon and technology. Mr. Tonkin observes that it is amusing to set up a motor drive to each crankshaft using an extendible rubber band, the two shafts then alternately start and stop, 'going ding-dong, like a couple of tired boxers', as Alan Partridge described it!

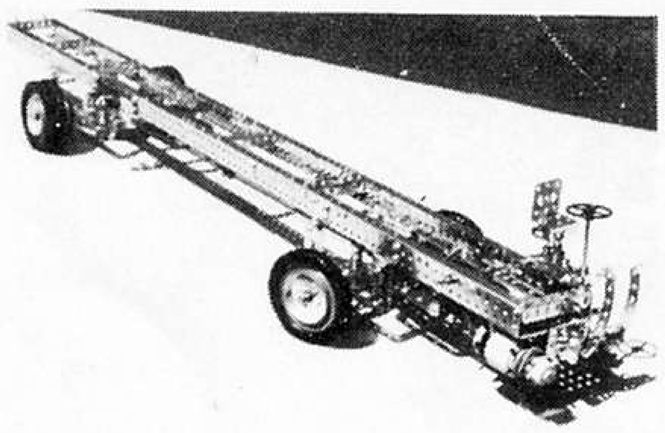
FRENCH PULLMAN COACH

MOTOR Coach modeller Mr. Andre Barbe of Voiron, France, has sent me some photographs of his excellent French Pullman Coach, built in 1975 from the contents of his No. 10 outfit.

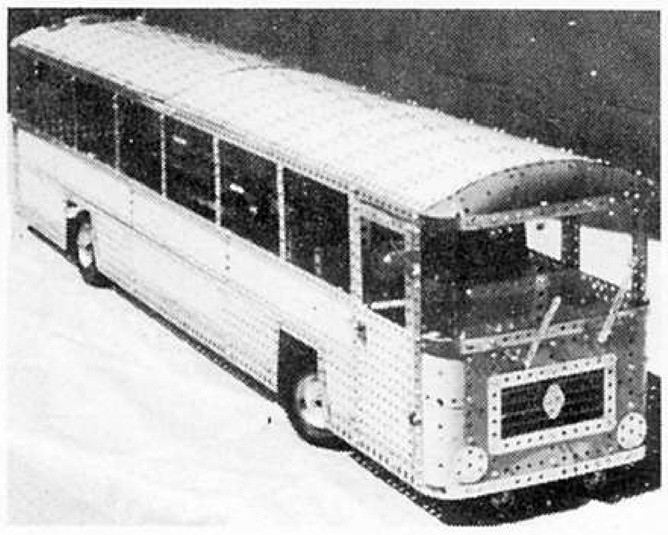
Built to a scale of 1/10, the model incorporates many advanced features including completely separate body and chassis sub-constructions. In fact, only eight Bolts need to be removed in order to completely separate the bodywork from the chassis, this means that alternative designs of chassis can be utilised. Drawing its power from the popular 6-12 volt DC Motor-with-Gearbox situated at the front, a 3-forward and 1-reverse manual-type gearbox transmits the drive to a standard differential on the rear axle. Drum brakes are provided for the rear wheels, and the suspension follows the heavy weight Renault principle.

The clutch and footbrake are actuated by pedals situated in the correct position in relation to the driving seat. Other points of interest include twin windscreen wipers operated from the interior, (is this a 'first' in Meccano modelling?), rear-view mirrors, transparent windscreen and even a representation of the familiar Renault insignia mounted on the radiator grille. Overall length is some 3 feet 10 inches, height including body, 1 foot. On examination of the photographs supplied by Mr. Barbe, I feel he is to be congratulated on producing such a magnificent model, incorporating so many fine details, fully capturing the 'luxury' atmosphere of the original.

The extremely strong chassis makes full use of Angle Girders and Flat Girders to achieve rigidity. Note the unusual positioning of the electric motor.



This 3/4 front view of Mr. Barbe's Renault Coach shows the operating windscreen wipers.



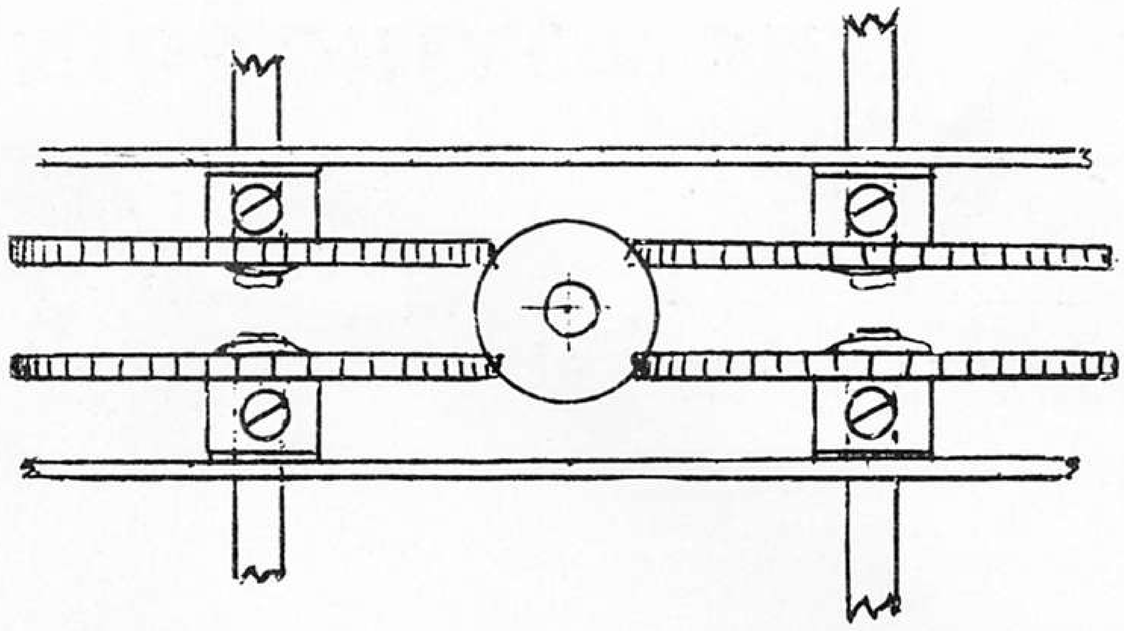
WORM GEAR

MR. Bert Halliday of London is a prolific writer for these pages, and his first of two very useful suggestions in this issue concerns an arrangement of four 60t. Gear Wheels and a Worm Gear, to provide four separate driven shafts at standard spacing.

'Following up the idea, (says Mr. Halliday), of meshing a 60t Gear Wheel to a Worm Gear at standard spacing as featured in the April 1979 'MM', by off-setting the Gear Wheel to the Worm's centre line, the following arrangement was built up.

This consists of four 60t Gear Wheels which are in constant mesh with one Worm Gear, and driven from this simultaneously. All the Gear Wheels are on the same plane, but on separate shafts. The illustration is self-explanatory, although the two pairs of Gear Wheels contra-rotate they can be driven in either direction. Supporting Strips or Plates for the Gear Wheel Axle Rods should be located ½" away from the Worm Gear's centre line, and the unit requires careful setting-up. Any 'slack' between the meshing Gears should be taken up by Washers.

The arrangement is ideal in that it can provide four separate take-off shafts of great power, that could, from one motor, economically drive four display models: although it is admitted that it has not actually been tried-out in this respect, yet. The Worm Gear is driven according to the requirements of the arrangement, as a whole'.



Top elevation of arrangement of Worm Gear driving four 60t Gear Wheels, as described by Mr. Halliday.

ADJUSTABLE THROW CRANK

MR. Halliday's second suggestion is for a simple, built-up, highly adaptable and adjustable-throw crank.

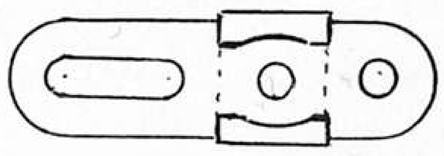
'Sometimes, in more complicated mechanisms, a non-standard crank throw is required, and is such that the slotted holes in either the normal Meccano Crank or Double Arm Crank, fail to provide the solution. While there are sophisticated methods of overcoming such problems, it is not always that the parts required are available, or the space to fit them can be found. Faced with a requirement for a non-standard throw in a limited space recently, the following provided the answer.

Simply fit two 2" Slotted Strips into the jaws of a Slide Piece, making sure that they fit tightly, closing the jaws until they do. Then, fit the Axle Rod on which the Slide Piece is to be secured through the boss of this and whichever round hole of the 2" Slotted Strip is required. If, for example, a 'throw' of something between ½" and 1" is required, use the second hole. If more than 1" 'throw': the end hole must be used. The slot in the 2" Slotted Strip allows liberal adjustment for the crank pin, and careful measurement will provide a 'throw' exact to a fraction of an inch.

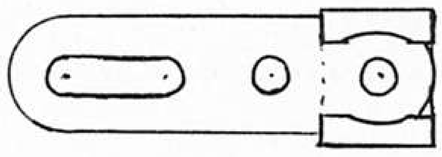
If the Slide Piece has to be fitted boss upwards, as mine was, a Threaded Boss bolted to the slotted hole of the Strip provides a substantial anchor for a connecting strip. I recommend the use of a Shouldered Bolt from a Universal Coupling to provide the pivot attachment for the connecting strip and the Threaded Boss. Providing the Slide Piece Axle Rod does not protrude from the boss, the connecting strip will just clear this. Otherwise, use Washers as required for spacing purposes.

The general idea can be elaborated on, by using a straightened 3" Formed Slotted Strip to give another range of 'throws', in for example, a stationary engine of some sort. The opposite projecting end of the Strip could then serve as an anchorage for a counterbalancing weight'.

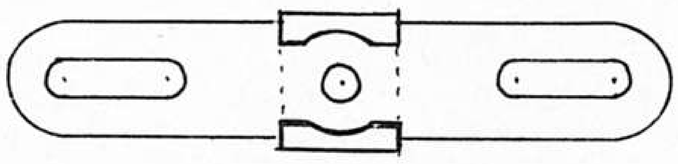
Arrangements of various Slotted Strips, for Adjustable-Throw Crank.



1. For Throws between ½" and 1".



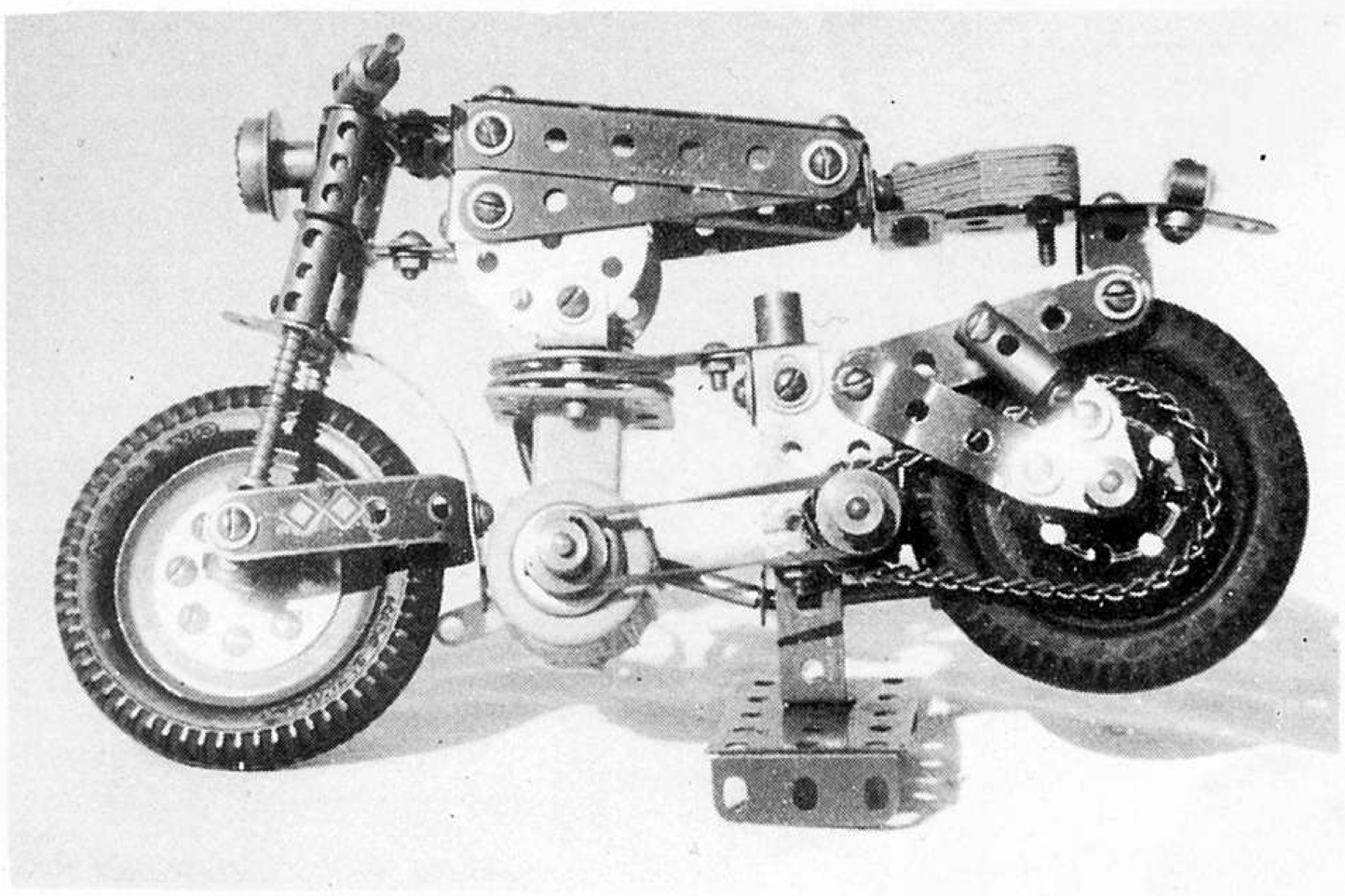
2. For Throws between 1" and 1½".



3. Using straightened, Formed Slotted Strip, for Throws between 13/16ths. and 1 5/16th", and adding a counterbalance weight, if required.

MOTOR BIKE

Alan Holman's simple, compact, yet highly realistic Motor-Cycle. Photograph supplied by Norman Mason.



MR. Alan Holman of Newton-Le-Willows, Merseyside, has forwarded details of his latest model of a traditionally 'difficult' subject, a Motor Bike.

Whilst experimenting with the Junior Power Drive Motor Mk. II, or 'Crane' Motor as it is often referred to, Mr. Holman realised that it bore a striking similarity to the engines of many Motor Bikes. As the main 'stumbling-block' inherent in the construction of any Meccano version of this machine has often been the provision of a compact power unit, many attempts of this nature in the past have not really succeeded, at least as far as powered models are concerned.

His imagination fired by the possibilities of the tiny 'Crane' Motor, Alan set to work and produced the very realistic model illustrated. As can be seen, the Motor is used to represent the engine, the power being taken to the rear wheel via a speed reduction consisting of a Pulley arrangement, followed by a realistic Chain drive. The fuel tank, seat, mudguards, lights and even front wheel springs are correctly represented, and for demonstration use, the model is mounted on a simple plinth. This allows the operating features to be appreciated without fear of the Bike attempting to 'escape'!

Considering the sometimes quite daunting problems encountered when modelling a subject of this type in Meccano, Mr. Holman has, I feel, used the 'Crane' Motor to significant advantage in what is, after all, a fine representation of a rarely-modelled machine.

SPIRAL LINE MOVING POINT MECHANISM

MR. Andreas Konkoly of Budapest has established for himself an enviable reputation as being a designer of models showing stunning originality of thought. The unique nature of his fine models can be attributed in most cases to the clever mechanisms employed, and the latest offering from Mr. Konkoly will ultimately form the basis of the operation of his Egg-Garland designer, certainly something to look forward to!

For the purpose of holding the mechanism, a base is built up as follows. A 5½" x 3½" Flat Plate 1 is fitted inside a square formed by four 5½" Angle Girders. To the longer edges of this Flat Plate 1 are fixed two 4½" Angle Girders 2 each holding a 2½" Triangular Plate. The apexes of each Triangular Plate are connected by a 3½" Perforated Strip 3 held by two 1" x ½" Angle Brackets. Four legs for the base are formed by four 2½" Perforated Strips braced in each case by 3½" Perforated Strip. The bottom holes of each 2½" Perforated Strip are connected in pairs by two 5½" x ½" Double Angle Strips as shown.

A Double Arm Crank is fixed to the upper surface of the 3½" Perforated Strip 3 and another Double Arm Crank is secured to the upper surface centre of the 5½" x 3½" Flat Plate 1. Two of the four 5½" Angle Girders forming the 'square' have 5½" Perforated Strips overlaid, and the upper long edges of the 5½" x 3½" Flat Plate are similarly overlaid with 5½" Perforated Strips. A Flat Trunnion 4 is affixed to the centre of one of the overlaid 5½" Angle Girders, apex upwards. A 4½" Axle Rod is journalled through the two central Double Arm Cranks, but is not fixed at any point. The upper end of this 4½" Rod receives a Washer, a Coupling and four further Washers are placed above the Coupling, which serves with the apex hole of the Flat Trunnion 4 as a journal for a 5" Crank Shaft, held by a Collar and to which a 25t Pinion is fixed.

The rotating Spiral Mechanism itself is constructed by first inserting three 1⅛" Bolts through the peripheral holes of a 6" Diameter Circular Plate 5. Two of these are held by a Nut and support three Collars, but the third one grips a stack of twelve 2½" Perforated Strips, (acting as a counterweight), by their end holes. A gap is left on the shank of this Bolt, then a Nut. The other end holes of the stack of Strips are secured by a ½" Bolt, this also, with the assistance of two ordinary Bolts, holds a 50t Contrate Wheel to the underside of the 6" Circular Plate 5. A second counterweight consisting of four stacked 2" Perforated Strips is situated immediately to the left of the primary counterweight as depicted in the illustration. A Crank 6 is bolted in the position shown to the underside of the 6" Circular Plate 5, acting as lower bearing for a 2" Axle Rod 6A, supporting in turn a 60t Gear 7. The upper 6" Diameter Circular Plate 8 has a 2½" Perforated Strip bolted across it's centre, to reduce the hole diameter to regular Axle Rod size.

A 1½" Double Angle Strip, spaced by two 1½" Strips, and two Washers on the shank of each fixing Bolt, supports in it's lugs a horizontal 2½" Axle Rod 9. Held in place by a Collar on the outside end, and a 25t Contrate at the inner end, this 2½" Axle Rod 9 carries a Worm Gear in the middle, engaging the teeth of the 60t Gear Wheel 7. Turning the 6" Circular Plate over to the upper side, a Crank 10 positioned as shown acts as the upper bearing for the 60t Gear Wheel supporting Rod 6A, and the top end of this rod carries a Single Throw Eccentric 11.

The slider rails consist of two smoothly polished 3½" Axle Rods 12, held in the transverse smooth end bores of two Couplings. These two Couplings are secured to the Circular Plate 8 by means of ½" Bolts with a Washer for spacing purposes between. The slider unit itself comprises two Couplings held together by a 1⅛" Bolt passed through the transverse tapped bore of one, and into the transverse tapped bore of the other, securing a vertical 1½" Axle Rod. A Nut on the shank of the 1⅛" Bolt fixes the arrangement firmly.

When the sliding unit has been thoroughly tested and proven to be sliding smoothly, the arm of the Single Throw Eccentric can be passed over the 1½" vertical Axle Rod, and the entire unit assembled marking use of the three 1⅛" Bolts held on the lower Circular Plate 5. During assembly, A25t Pinion 9A, with suitable Spacing Washers, is slid over the central 4½" Axle Rod and fixed. The 4½" rod itself is then secured by a Grub Screw in the boss of the Baseplate Double Arm Crank. The Pinion 9A engages with the 25t Contrate Gear. Mr. Konkoly used a Fishplate secured over the arm of the Single Throw Eccentric to reduce the amount of 'free' Axle Rod play in the end hole, increasing the accuracy of the device, an aspect that will be of great importance when the time comes to install it in the forthcoming Egg-Garland Designer!

When the mechanism is driven by turning the Crank Handle, the 1½" Axle Rod vertically held in the sliding unit describes a very interesting spiral motion.

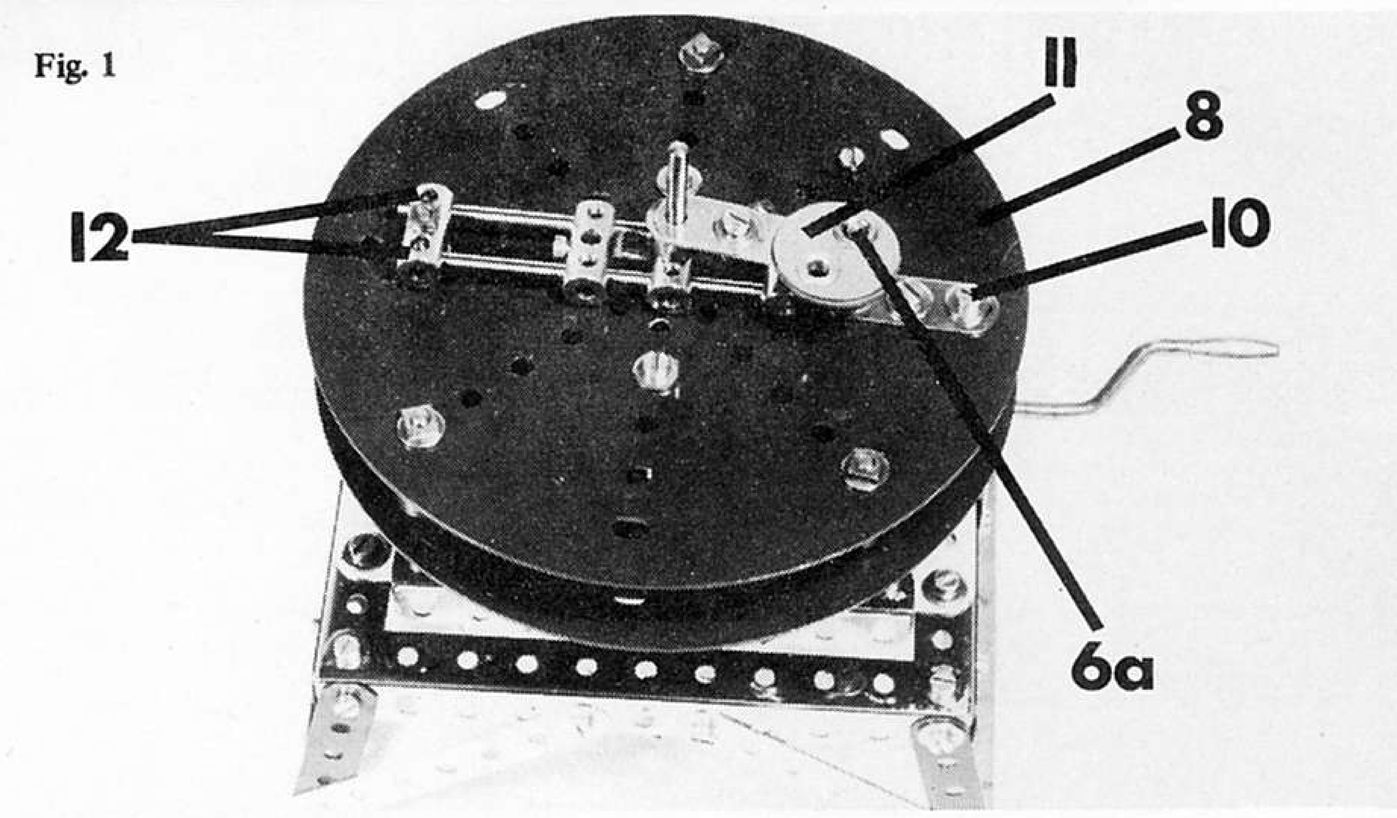


Fig. 1

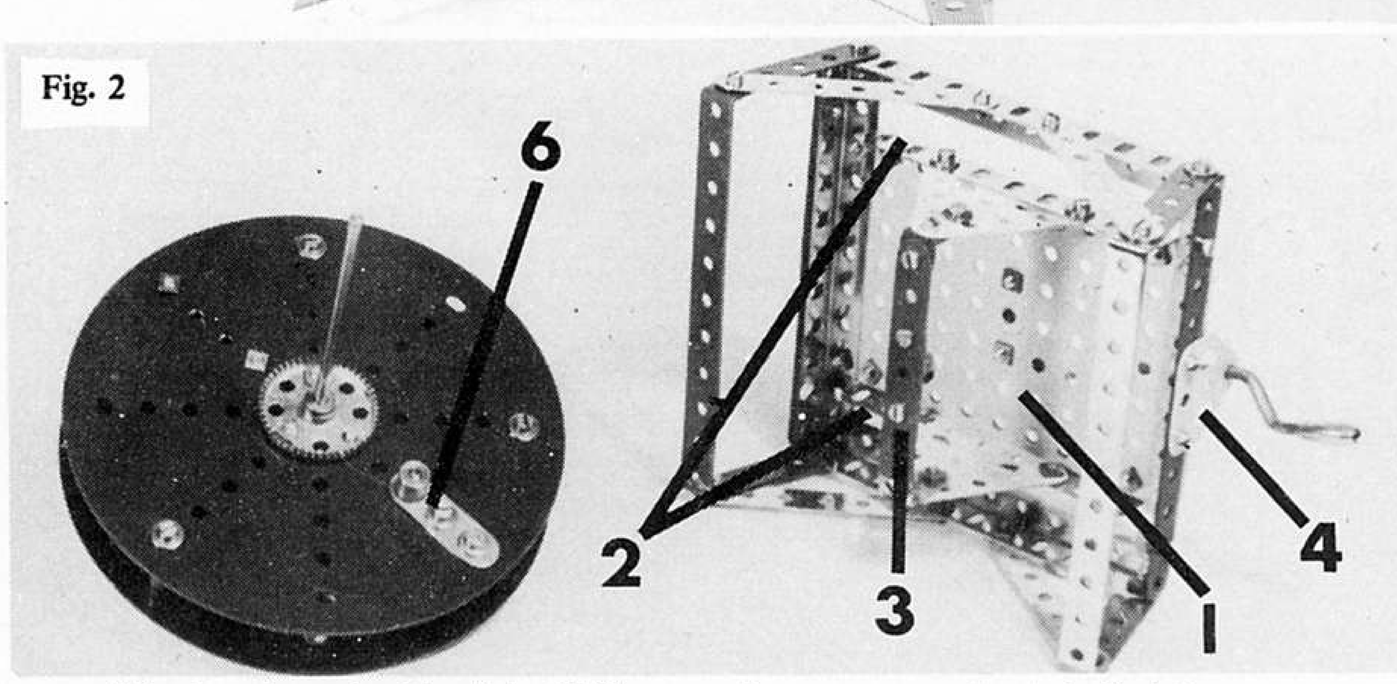


Fig. 2

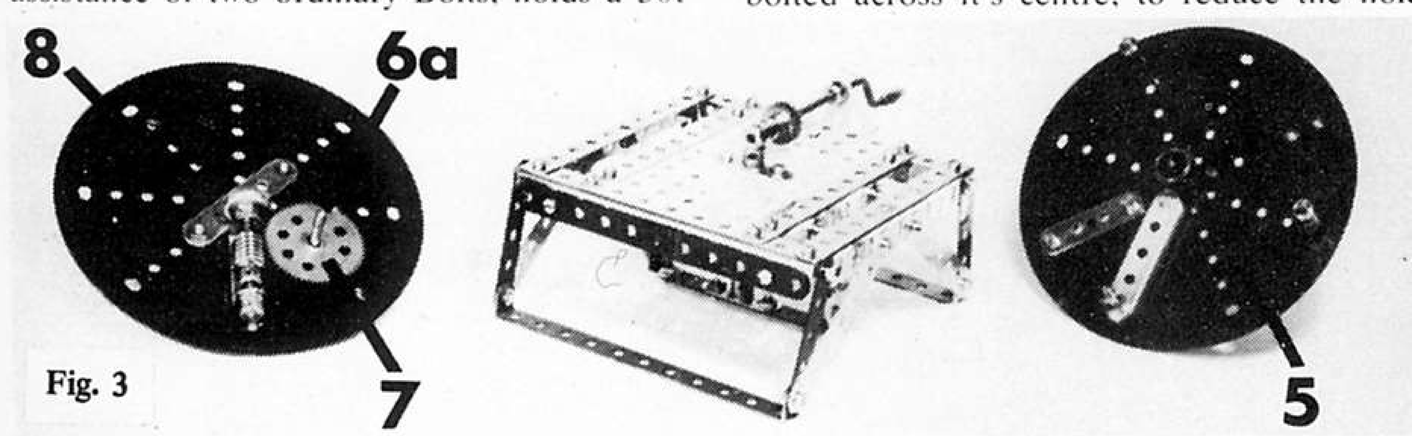


Fig. 3

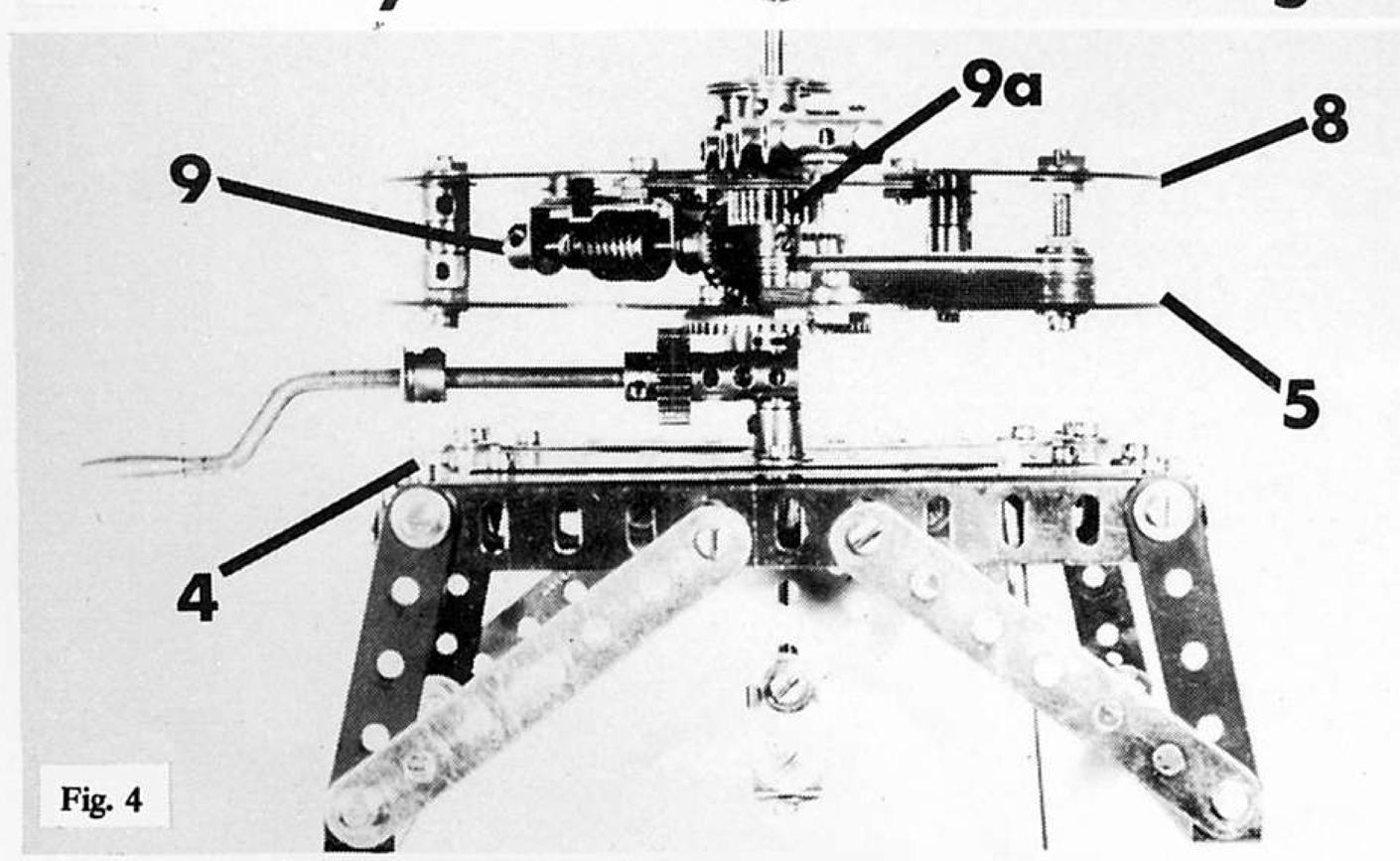
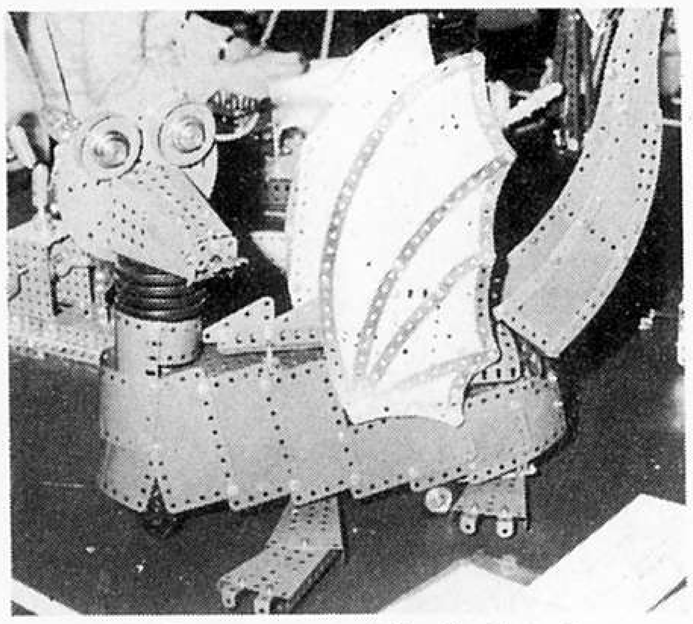


Fig. 4

Derek the Dragon!

An appealing, fun-orientated new model designed and constructed by Geoff Coles



Derek the Dragon on public display at Wigan, May 12th.

MAKING its debut at the May 12th Wigan Meccano Exhibition was one of the most strikingly original Meccano models seen for some time, a 22" long, 20" tall, fiery red and brilliant yellow Dragon! The brainchild of Geoff Coles, Secretary of the North Midlands Meccano Group, 'Derek' proved a great attraction, particularly so when the Meccano Steam Engine incorporated in its frame was fired up, resulting in 'Derek' performing a wide variety of interesting motions accompanied by suitably effective clouds of steam!

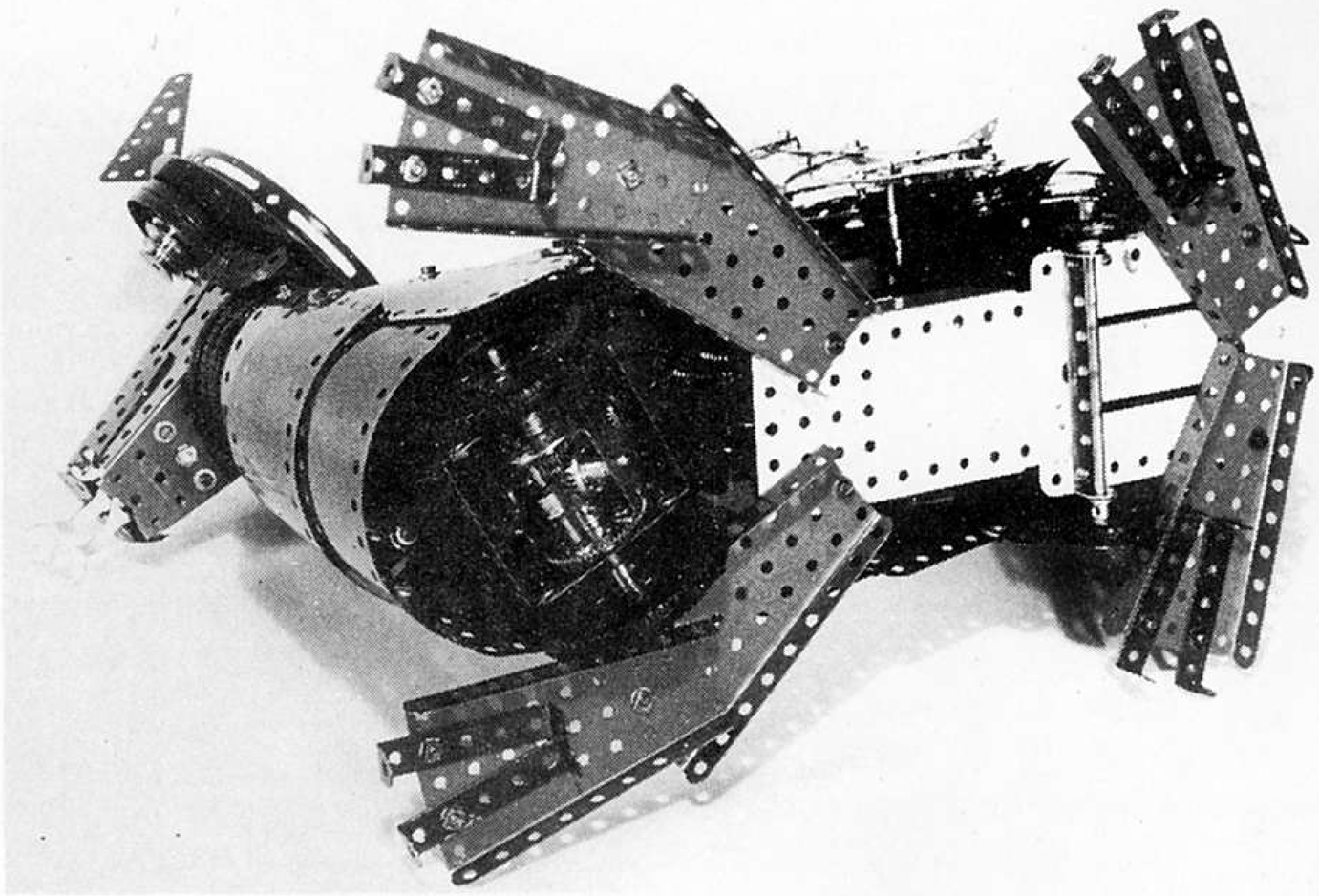
Based on a character portrayed in a children's book by Nancy Catford, the model exhibits anything but a childlike approach to the solution of many problems associated with coupling the Meccano Steam Unit to an internal linkage system actuating the tail, head, and road wheels with powered castor steering.

The sophisticated reader will need no prompting to appreciate the wealth of original thinking necessary to design such an unusual model with so many features. The mechanism is very cleverly designed, making optimum use of the Steam Engine's power reserve, although Mr. Coles himself is at pains to point out that it is, (like all the best mechanisms), essentially quite simple.

A three-stage gear reduction from the Steam Engine crankshaft powers a Single Throw Eccentric linked to the tail, producing a 'wagging' motion. An extension of this gear train takes the drive to the base of the head, causing it to rotate, and the first of a further two power take-offs motivates the front wheels consisting of two 2" Pulleys with Tyres, held in a castor steering arrangement which itself rotates on a 3½" Gear Wheel under power from the second take-off.

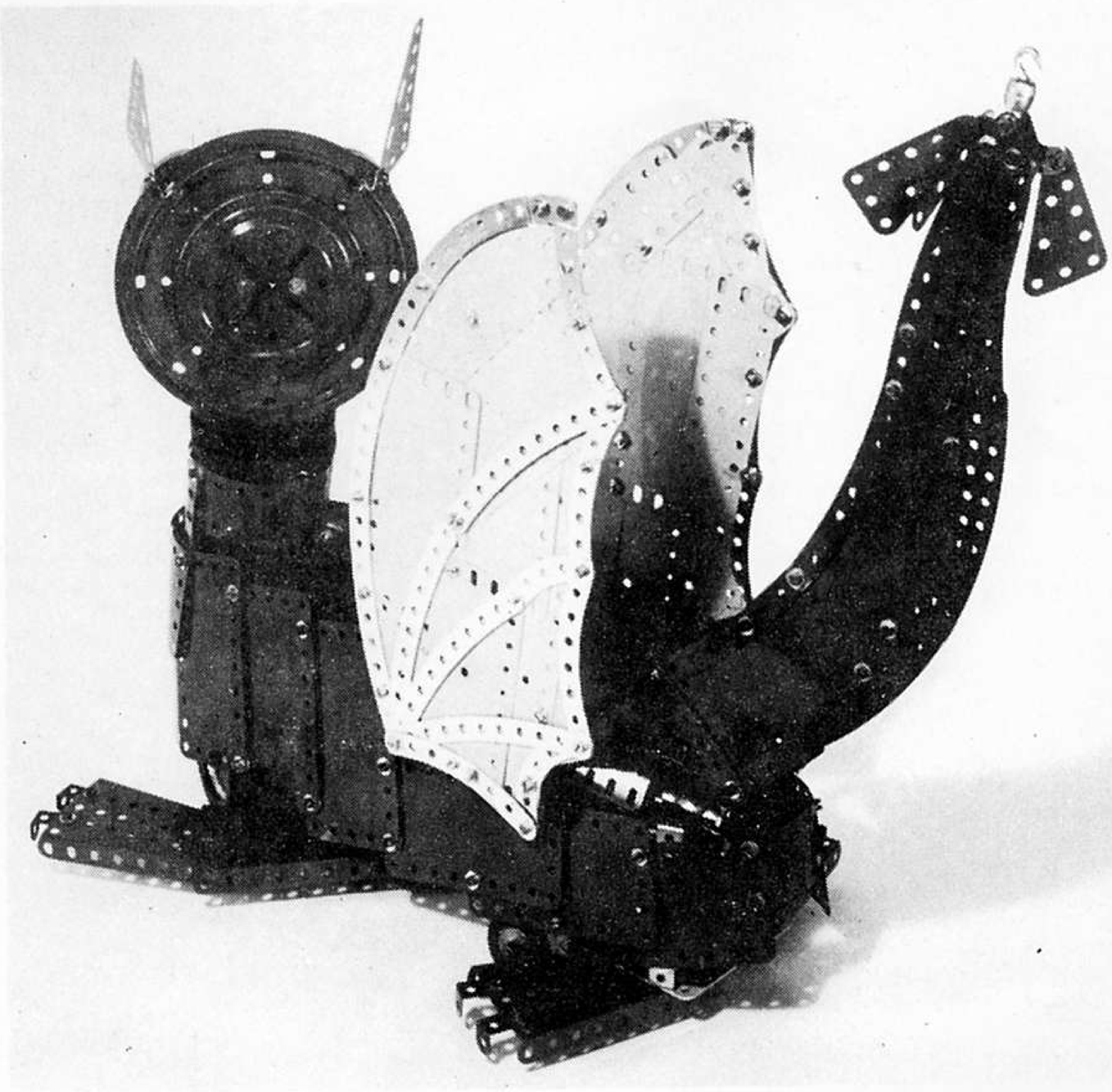
The main body of the model comprises effectively laid-out Flexible Plates in a variety of sizes, but rather surprisingly for a model inviting attention from the younger age groups, rare mint-condition red Flexible Plates with round holes rather than the more common elongated holes, are used. The fact that the Plates are in such good condition, and perfectly 'flat', does however lend the Dragon a certain 'scaly' appearance, accentuated by the diagonal overlapping. Cone Pulleys represent the eyes again very effectively, and two Spanners protruding from the 'mouth' simulate the 'forked-tongue' one expects from all Dragons found in ancient mythology. A large Hook forms a Scorpion-like barb at the end of the tail.

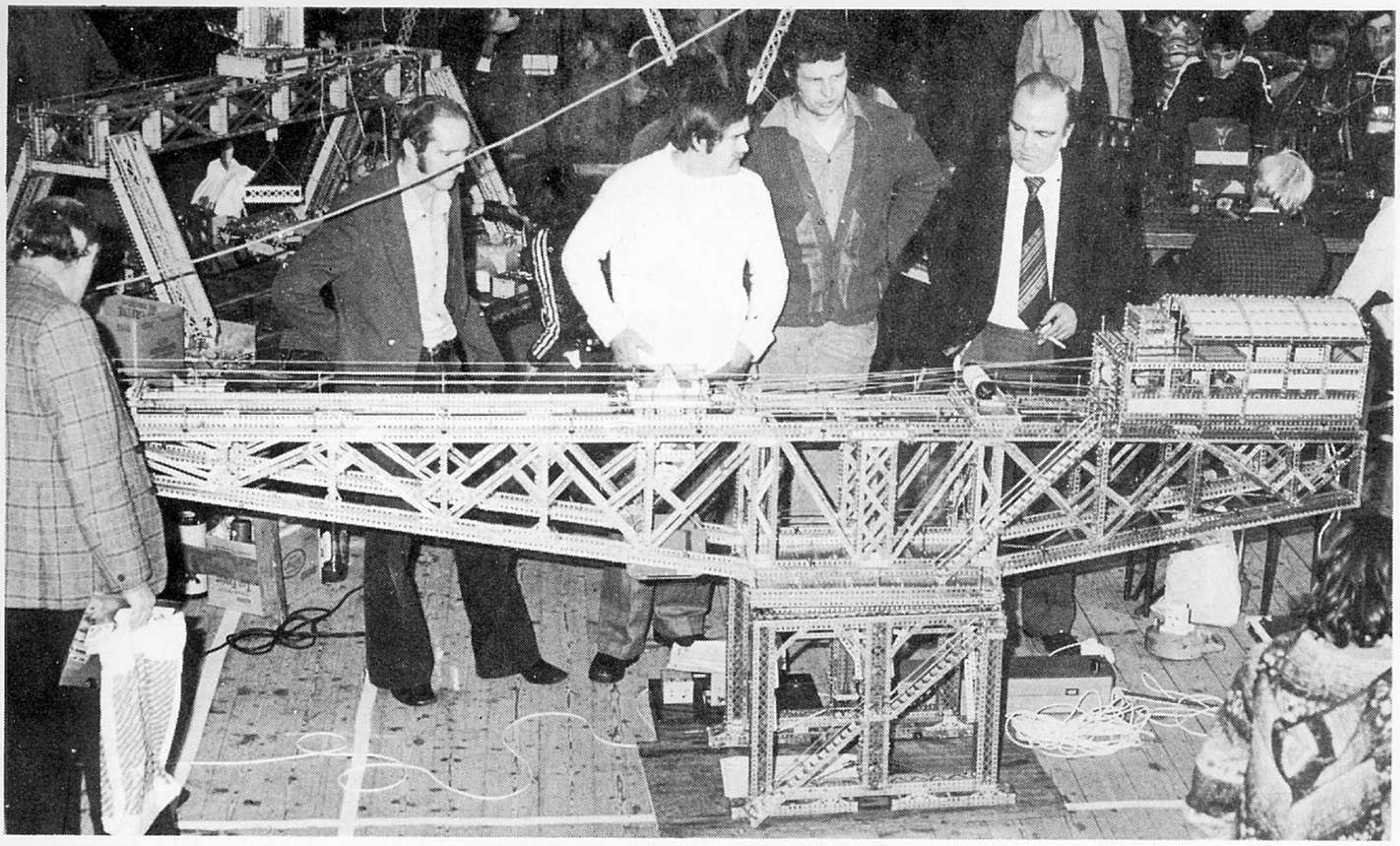
For all the model's ferocious looks and prickly appendages, one cannot help but admit that the overall impression given by 'Derek' is one of playful exuberance. Onlookers are most surprised to observe the model move around in an apparently random manner, simultaneously wagging its tail and moving its head, eveloped in steam from the engine providing the motive power. The resulting performance can only be described as extremely effective, and latest reports confirm that 'Derek' is winning new admirers at every public showing!



Underside of model showing castor steering arrangement.

Rear view of Derek the Dragon; note the Meccano Steam Engine concealed inside.

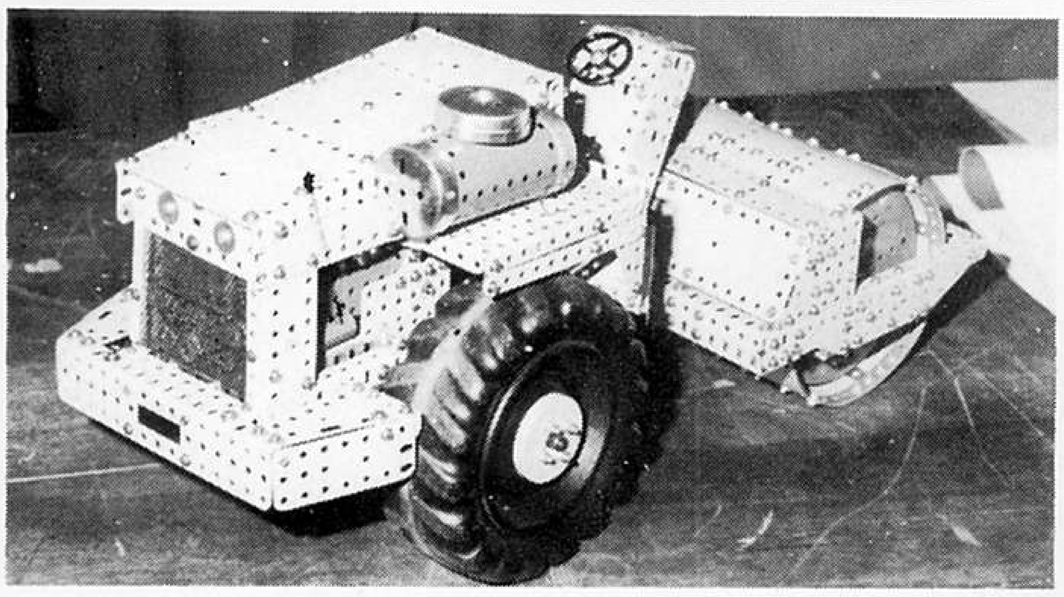




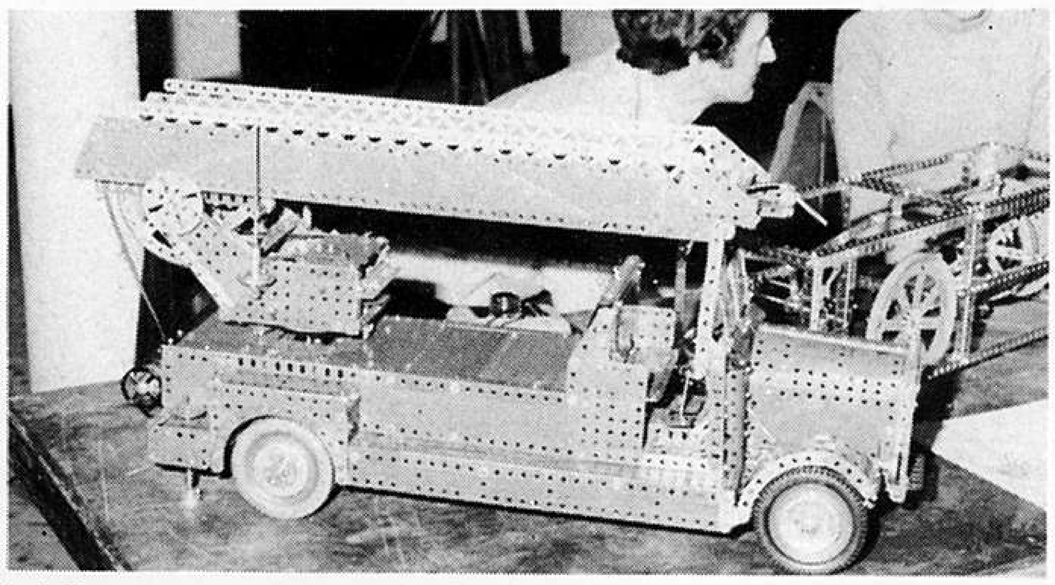
An astounding Giant to end all Giant Blocksetting Cranes, by James Walker of Preston.

Dateline Wigan!

A selection from the many fine Meccano models displayed at the North West Meccano Guild's annual Meccano Exhibition held at Wigan, Lancs, on May 12th.

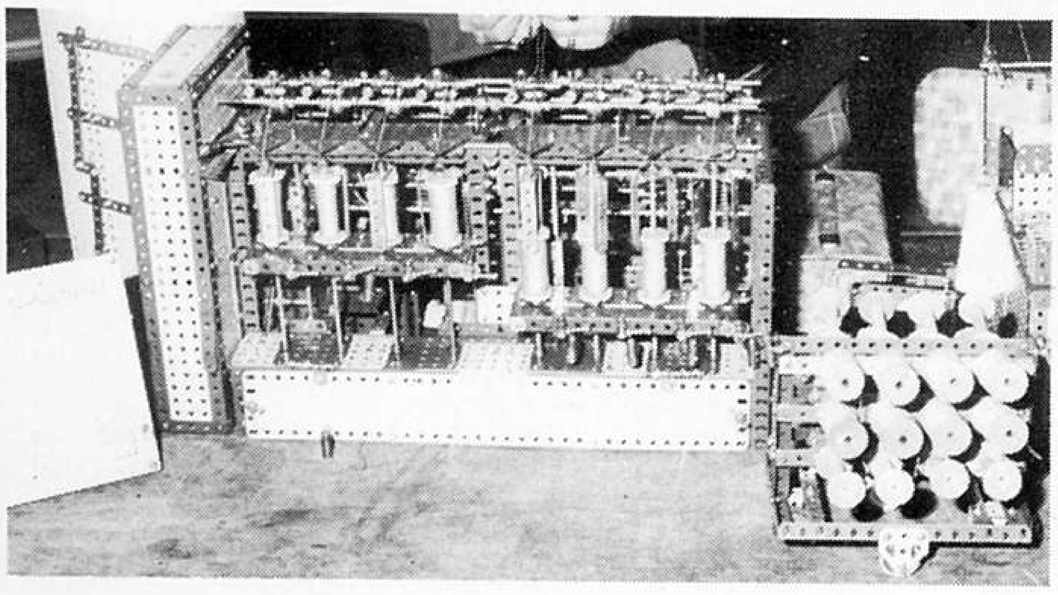


A rugged looking and neatly modelled Road Roller by David Dalton of the N.E.M.S.

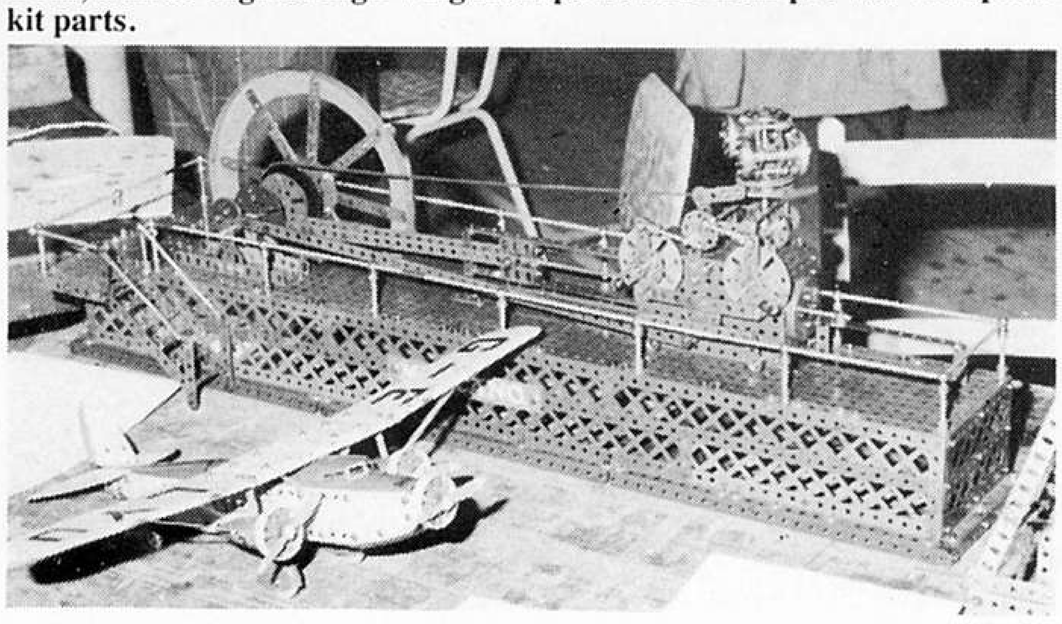


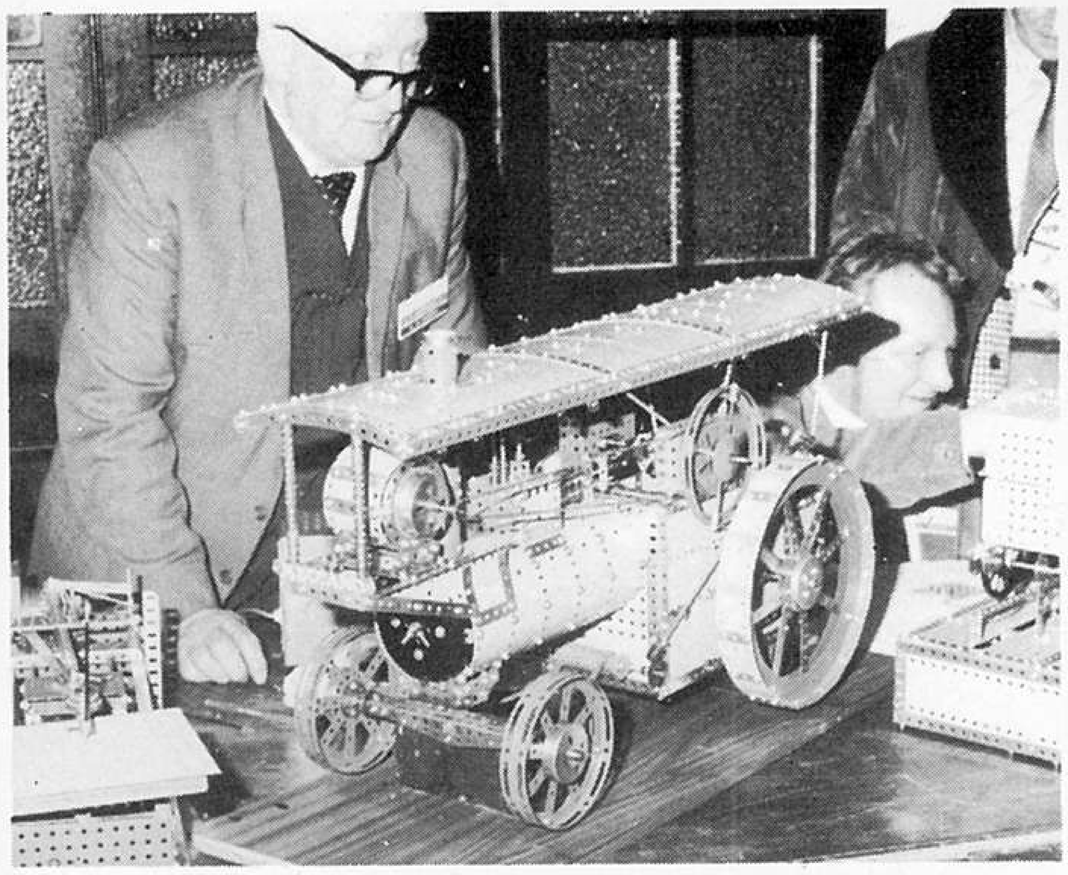
A fully-operating vintage Fire Engine with 3-section powered extending ladder by Brian Bloor of Burnley.

A doubling frame, used in carpet weaving, expertly modelled by George Barrett of Rochdale.

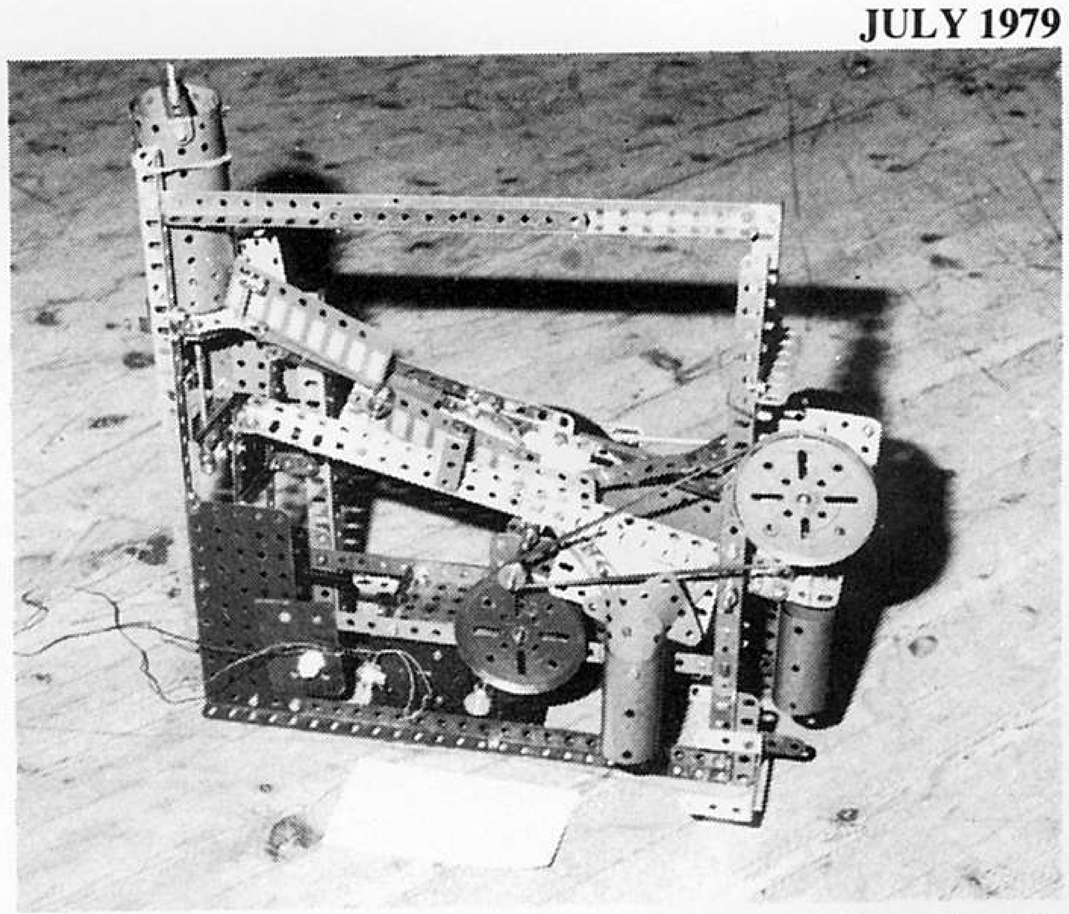


Dick Watson of Manchester showed this fine Gorliss valve engine, with, in front, a three-engined high-wing monoplane built from pre-war Aeroplane kit parts.



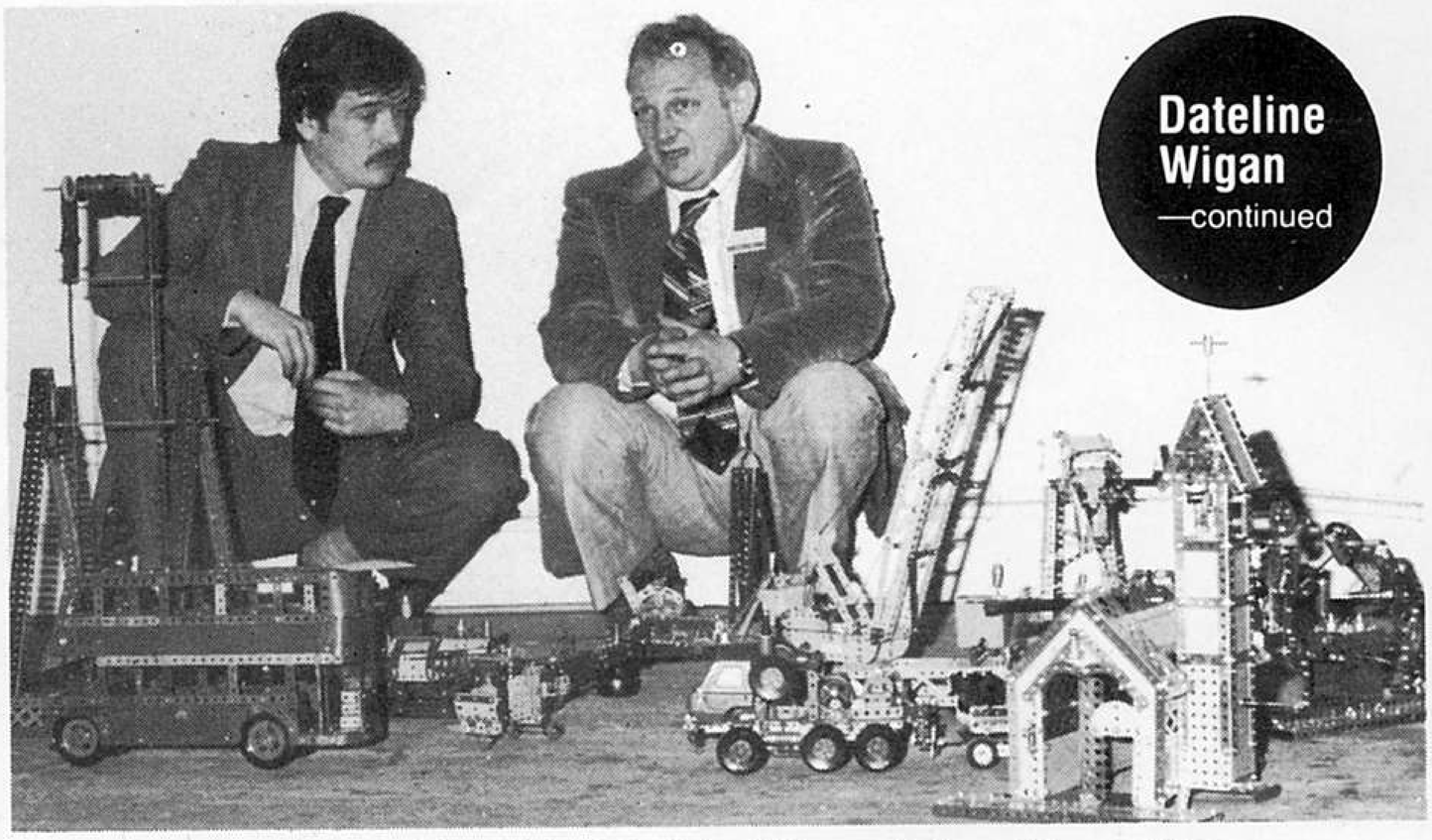


A splendid Showman's Traction Engine by NWMG Chairman, Norman Mason, who can be seen to the right, adjusting another model.



Brian Reay of the NEMS is a specialist in the more unusual types of model, and this Nut and Bolt sorting machine earned him a prize in the competition.

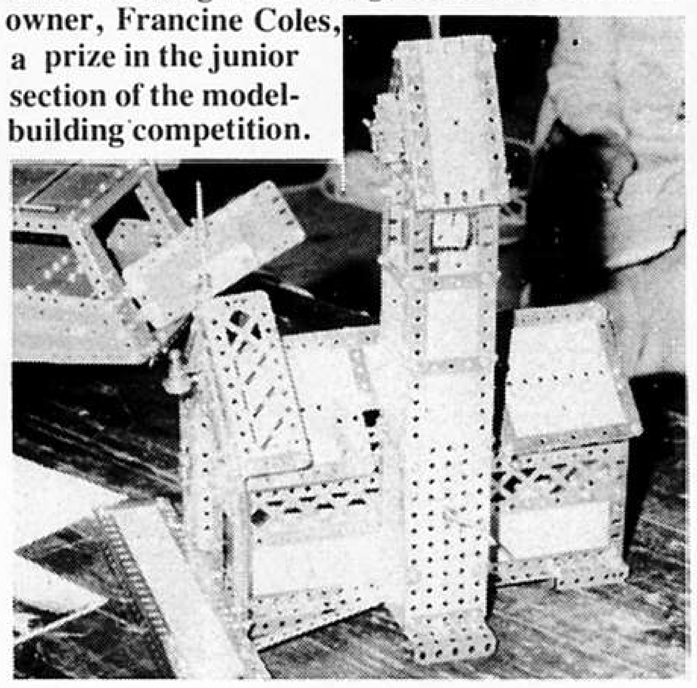
John Ellis of Prescot with his 'Dive Bombers' Fairground ride.



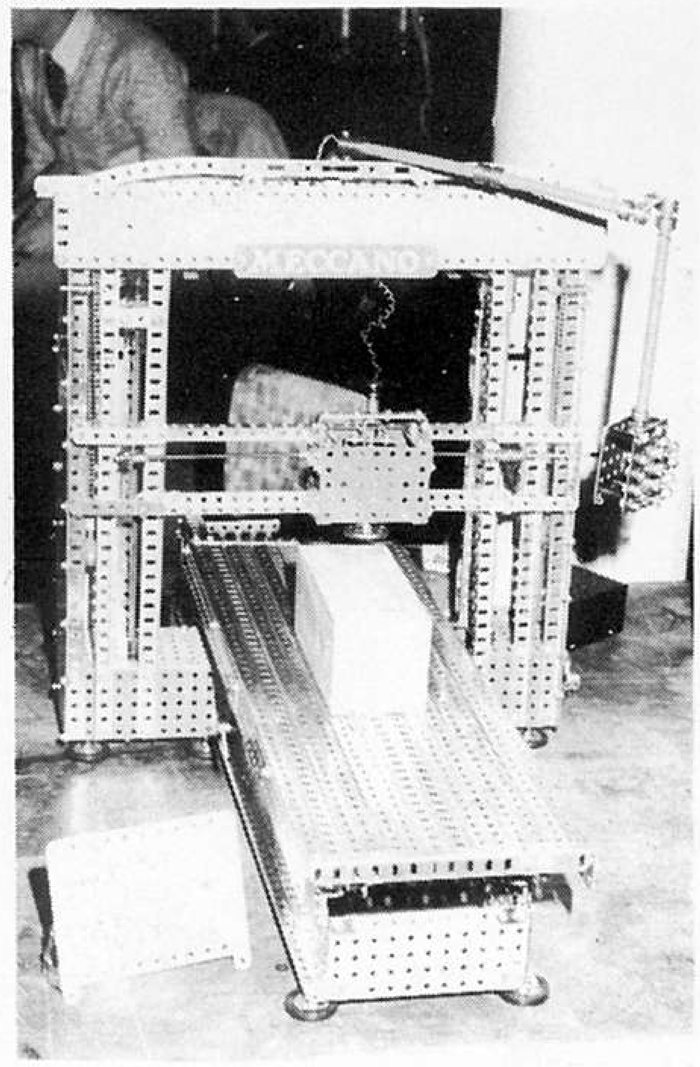
Dateline Wigan —continued

Decisions, decisions! Eric Mair, (left) of Meccano Ltd; and Norman Mason, Chairman of the NWMG, judging the Junior Meccano Modelling competition entries.

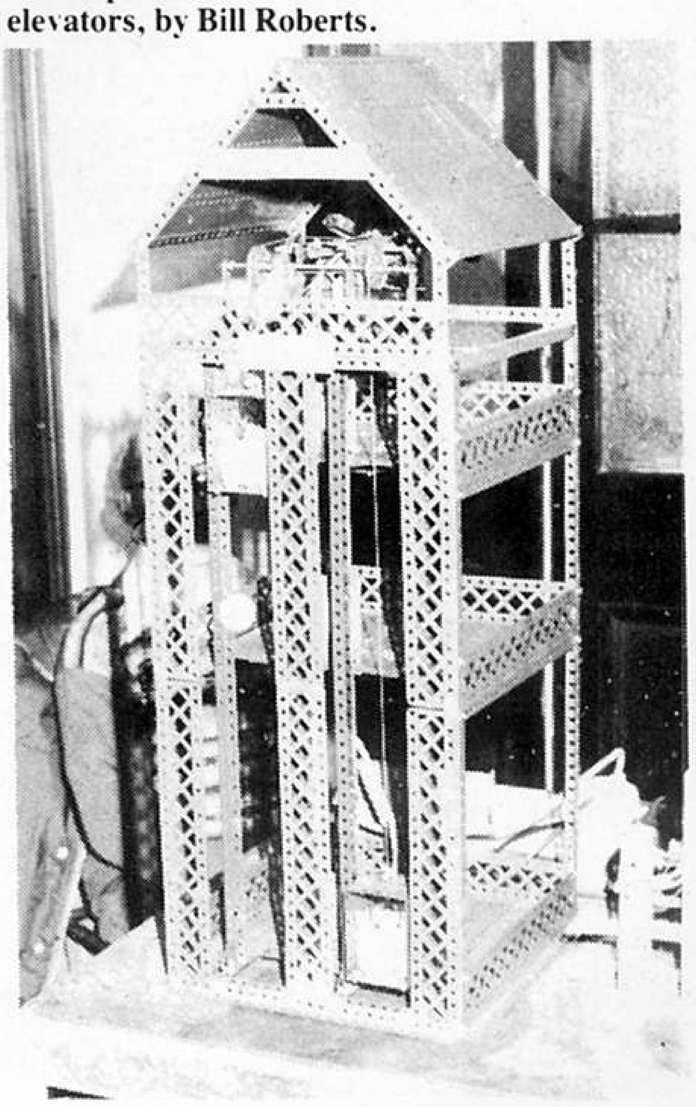
This charming little Village Church secured its owner, Francine Coles, a prize in the junior section of the model-building competition.

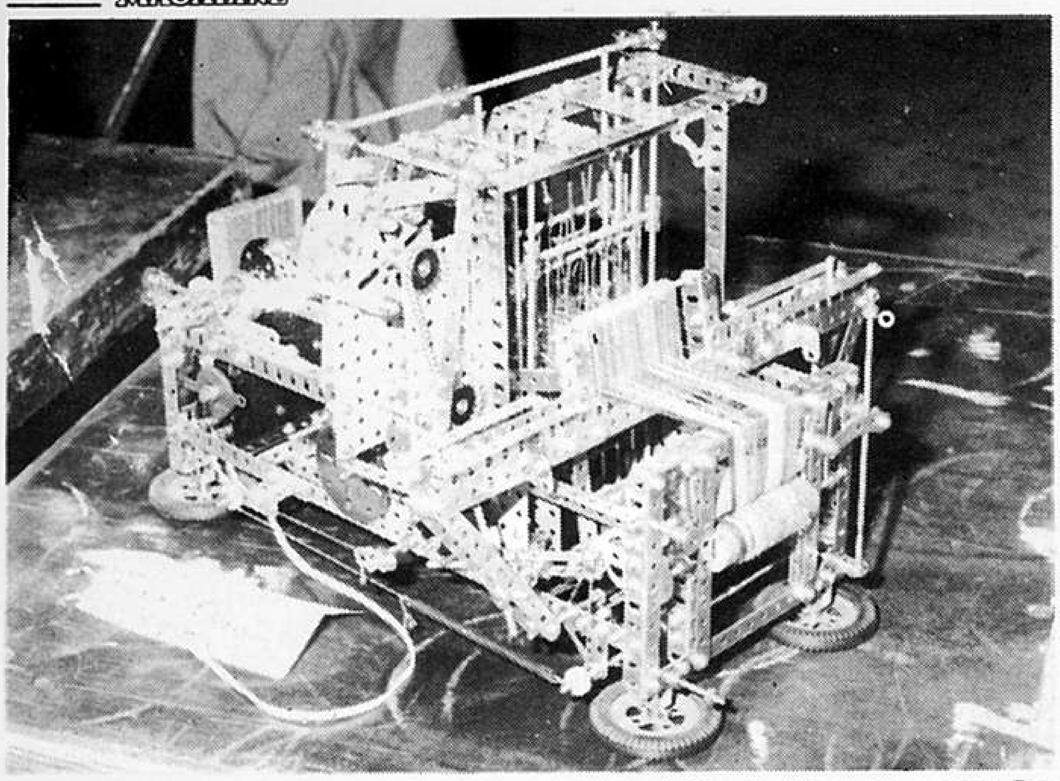


A Planer-Milling machine by Harry Wolfenden of Rochdale, Secretary of the Pennine Meccano Guild.

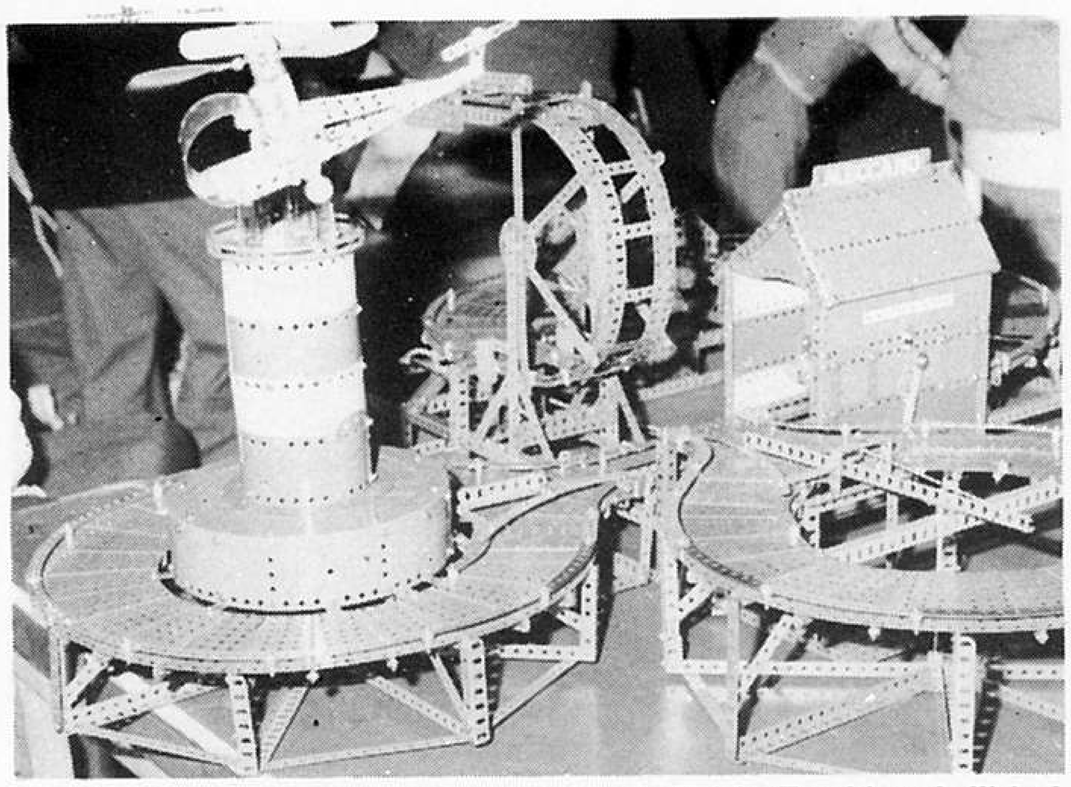


The Supermodel Warehouse with operating elevators, by Bill Roberts.

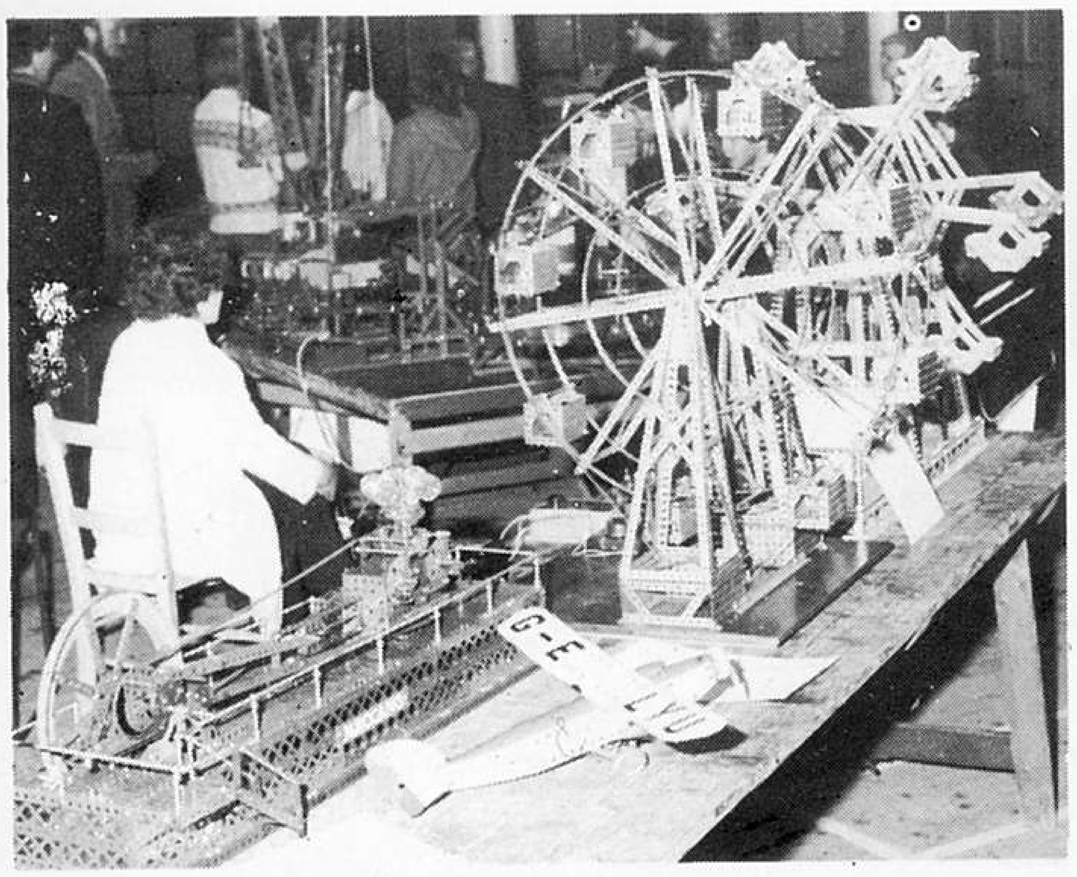




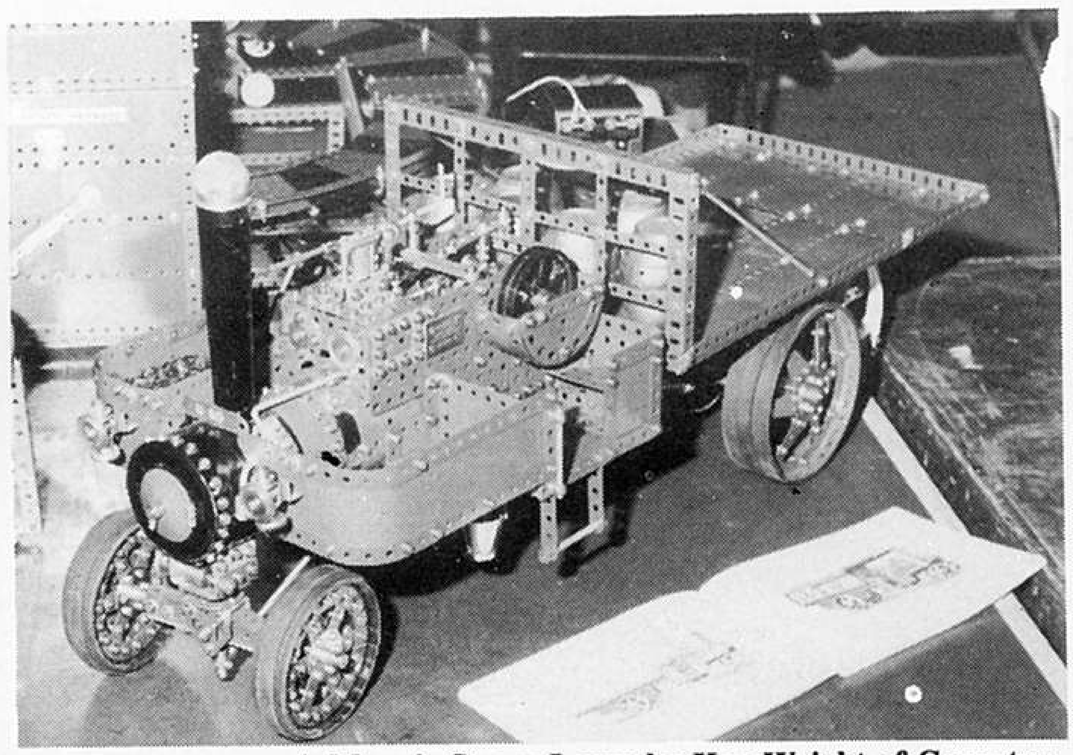
A very attractive, yet surprisingly compact, fully working Loom by Joe Etheridge.



Ken Wright's version of Dr. Keith Cameron's 'Tricky Track', embellished with an 'engine shed' and rotating helicopter.

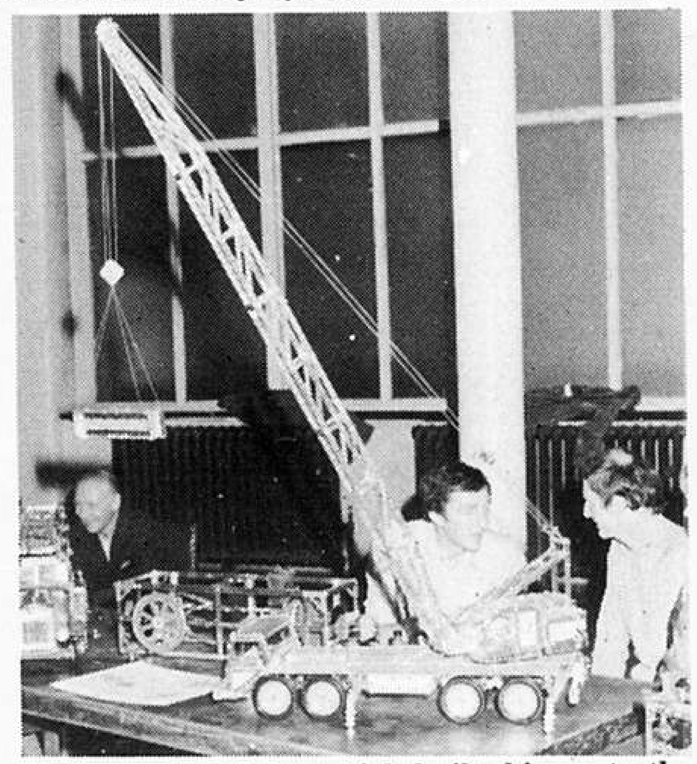


Authentic nickel-plate parts were employed by Dick Watson of Manchester to give a distinctive look to his Flyboats fairground ride.



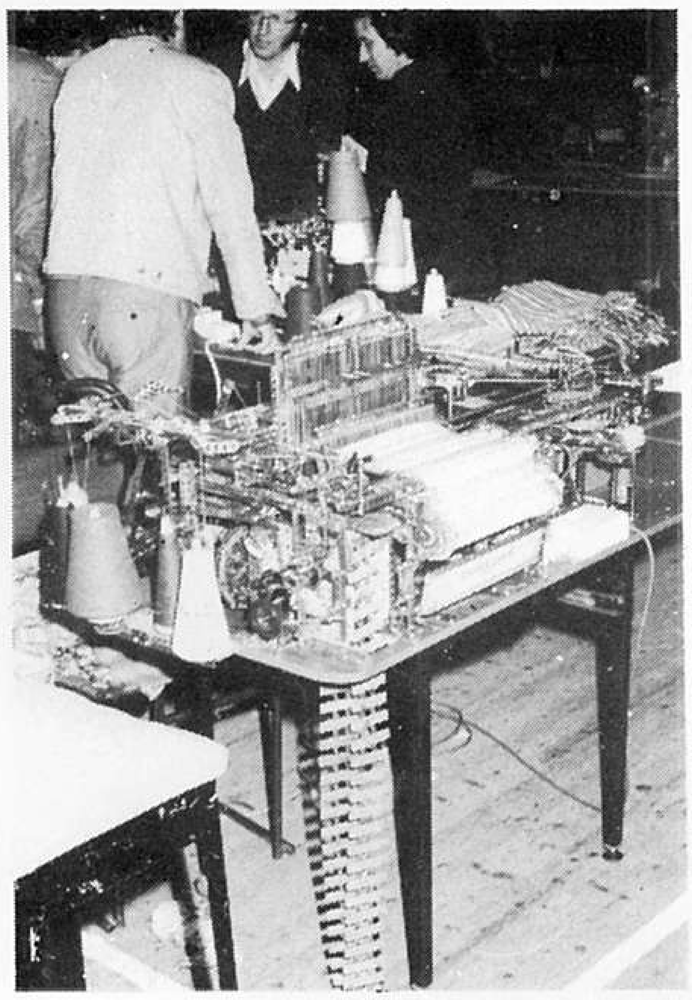
A Mann's Steam Lorry by Ken Wright of Coventry.

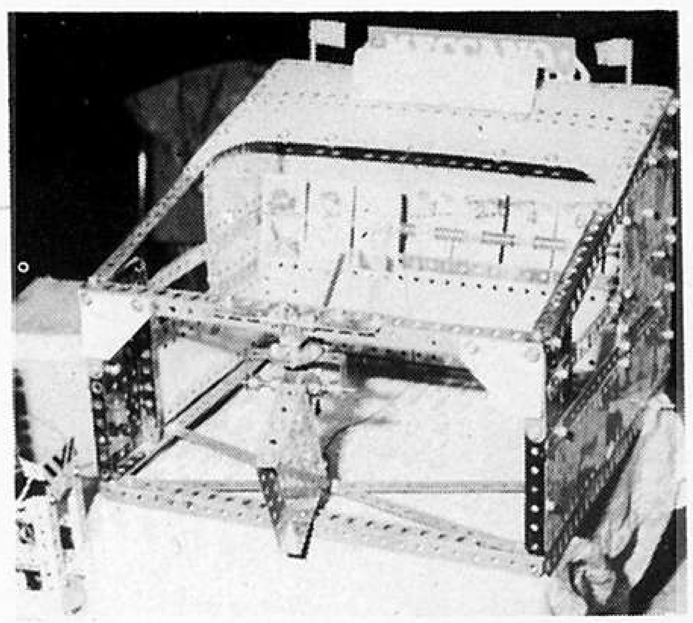
Dateline Wigan
—continued



Chris Taylor of Ormskirk built this up to the minute lorry mounted crane.

Programmable, automatic, and super sophisticated, Ernest Keighley's Rapier Loom.



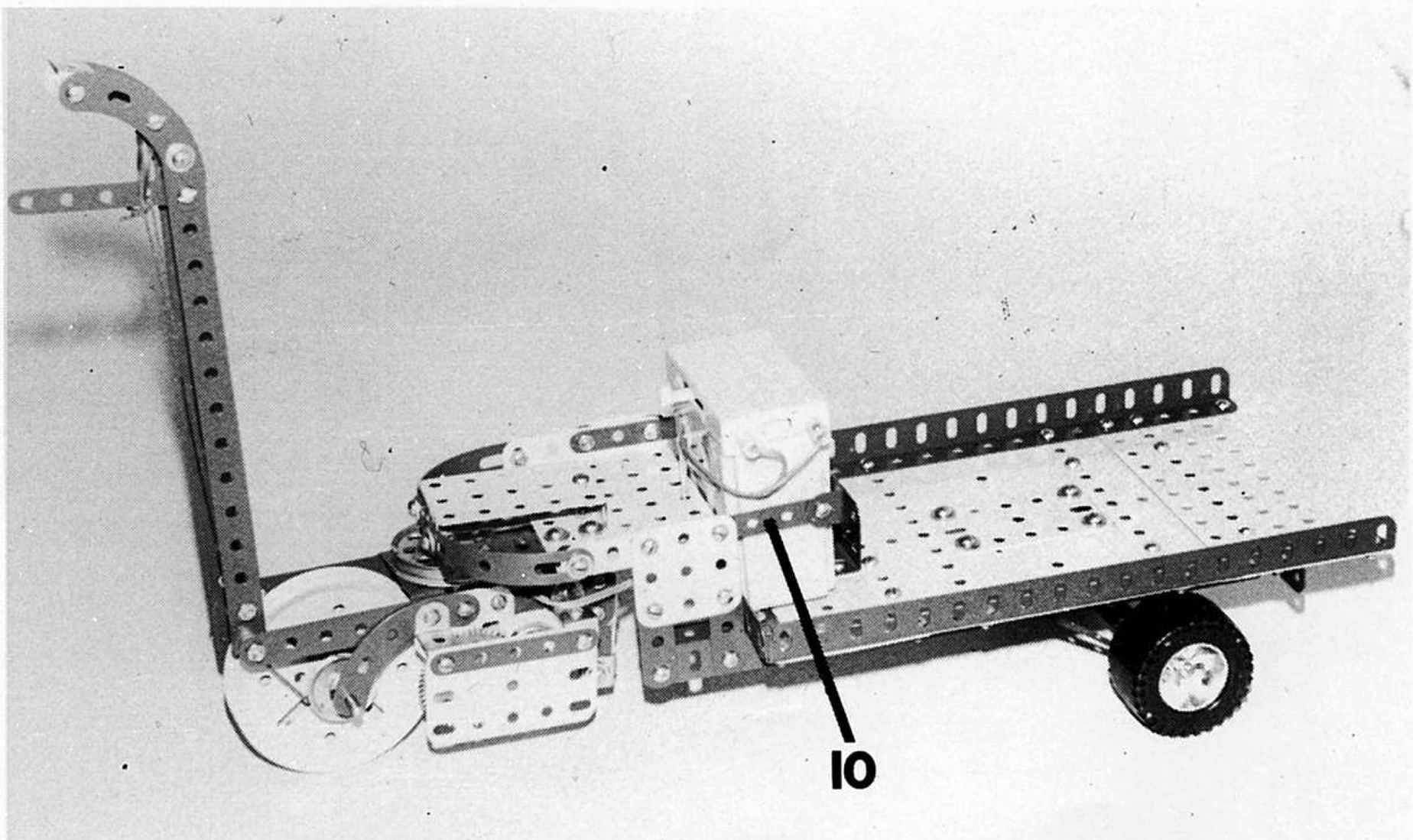


'Try your skill', invited Peter Roberts, with this very novel shooting gallery.

Roger Wallis' impressive display, including, (far right) his amazing juke-box which netted him first prize in the competition.

Pedestrian Controlled Delivery Truck

A new model built from the contents of Outfit No. 4 designed and described by Dr. Keith Cameron



The Pedestrian Controlled Delivery Truck by Dr. Keith Cameron of Florida, USA.

ELECTRICALLY powered trucks of this type are used in factories for the transport of goods, and in some towns for the delivery of milk from house to house. Forward and reverse motions are controlled by movement of the motor unit steering handle, which also incorporates a handbrake. As in the prototype, the truck carries its own battery power source.

THE MOTOR UNIT

Two 5½" Strips 1 are connected by two 1½" x ½" Double Angle Strips 2, to which a 1½" Pulley is bolted, boss down. Washers are employed for spacing purposes to prevent the Bolt shanks projecting beyond the Nuts. A 1½" Axle Rod is secured in the boss of this Pulley, with ¾" projecting above. To the 5½" Strips 1 are also affixed Flat Trunnions, overlaid two holes by 2½" Stepped Curved Strips as shown, and at the rearmost holes, 2" Strips braced by 1" Corner Brackets.

A Junior Power Drive Unit Mk. 11 is fixed to the 2" Strips by means of four Angle Brackets. A 19t Pinion, boss outward, on the motor output shaft, drives a 57t Gear mounted on a 2½" Axle Rod 3 journalled through the apex holes of the Flat Trunnions and held in place by a Collar. The Rod 3 drives two 3" Pulleys by means of two 6" Driving Bands passed around the Rod 3 and the grooves of the 3" Pulleys which are held, rims together, on a 2½" Axle Rod passed through the end holes of the 2½" Stepped Curved Strips. This Rod also carries a Collar and a 1" Pulley.

THE CONTROL HANDLE

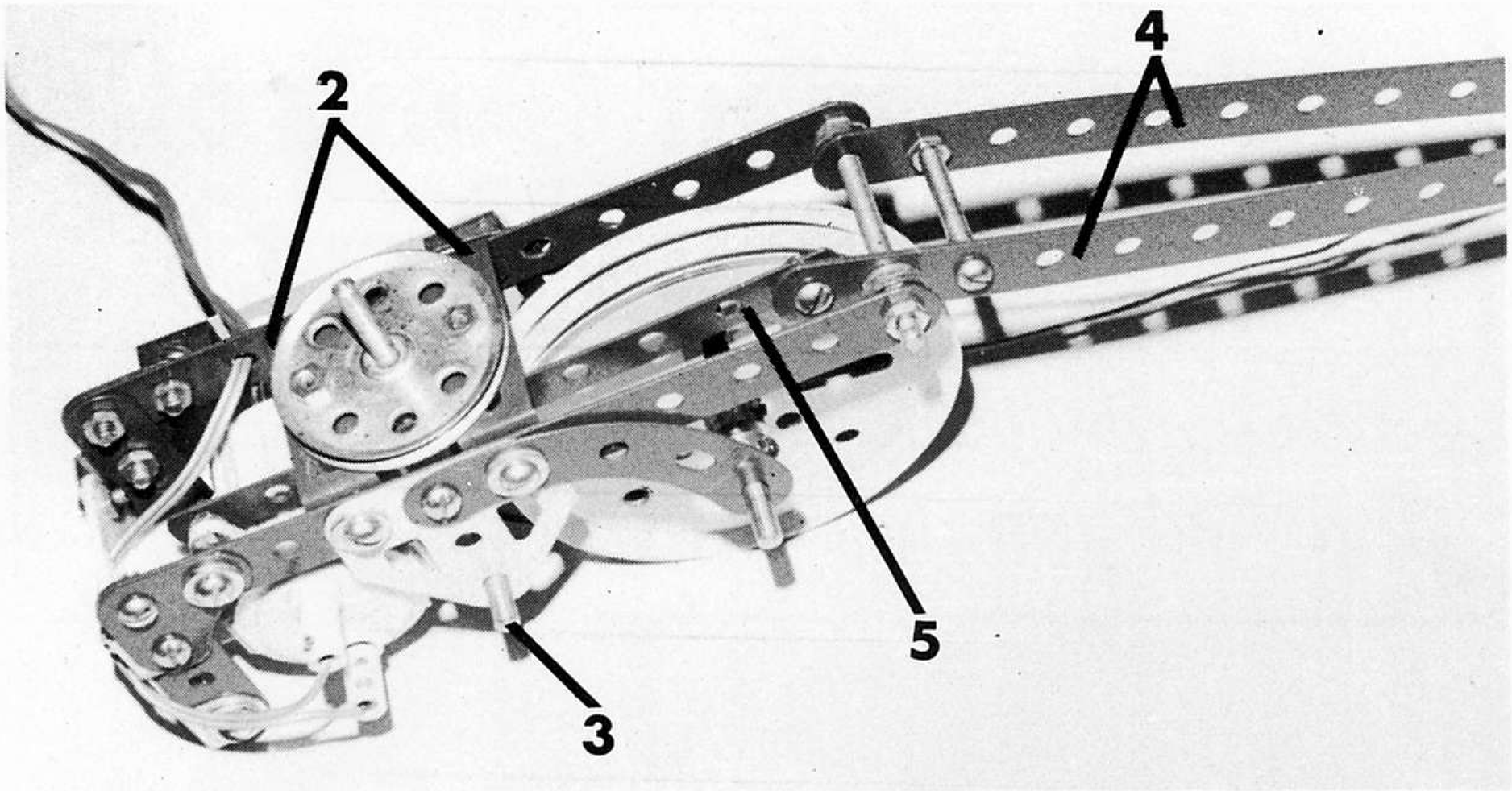
Two 7½" Strips 4 are connected at their upper ends by a ¾" Bolt 4a, and at their lower ends by a 1⅛" Bolt, but two 'free' holes are left below the 1⅛" Bolt on the right hand side and only one 'free' hole on the left hand side. The handle is pivotted on a 2" Screwed Rod 4b, connecting the forward holes of the 5½" Strips 1. The fixing Nuts of the 2" Screwed Rod 4b are tightened against the 7½" Strips 4 comprising the handle so as to give enough friction to maintain it free-standing in a vertical 'off' position.

The right hand 7½" Strip 4 is lock-nutted via it's bottom hole to the end hole of a 4½" Narrow Strip 5, the rear hole of which is lock-nutted to the motor reversing switch. The Strip 5, and it's attached Nuts, must clear the driving wheels and the Bolts on the motor unit frame. The upper section of the control handle is extended by two 2½" Stepped Curved Strips, connected by two ½" x ½" Double Brackets.

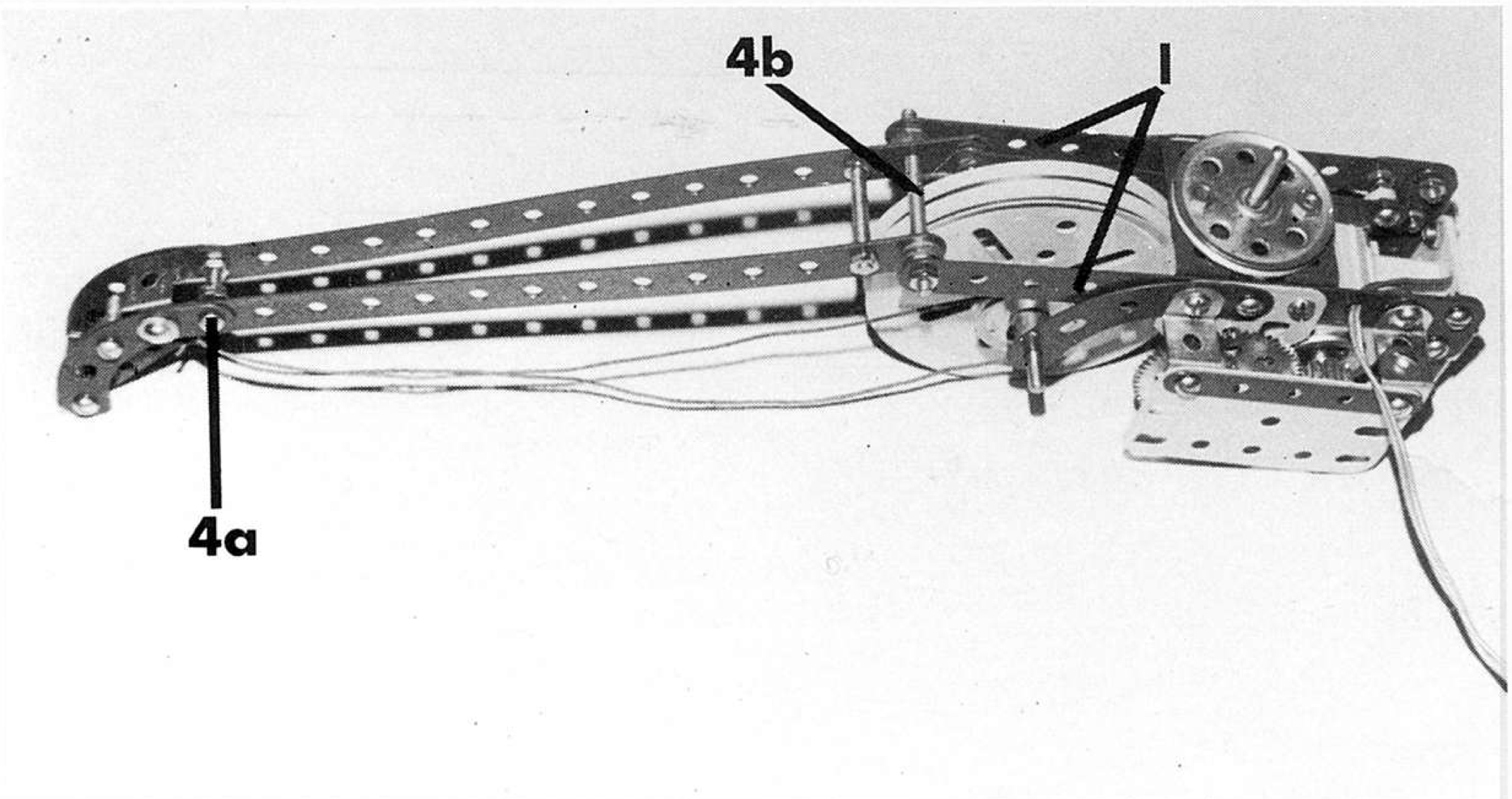
A 2½" Narrow Strip pivots on the ¾" Bolt 4a and is held in place by lock-nuts. A 2½" Driving Band is looped around this 2½" Narrow Strip and a ½" Bolt in the centre hole of one of the 2½" Stepped Curved Strips. A length of Cord looped around the 1" Pulley on the front axle passes around the Screwed Rod 4b and up the handle, to be tied to the 2½" Narrow Strip, against the tension of the 2½" Driving Band. Upward movement of the 2½" Narrow Strip thus provides a braking effect.

The motor unit and control handle subassembly is completed by the provision of a motor cover plate consisting of a 2½" x 1½" Plastic Flexible Plate, fixed over the 19t and 57t Gears by using a Reversed Angle Bracket and a built-up version of same using two ½" x ½" Angle Brackets formed by 'closing-in' two

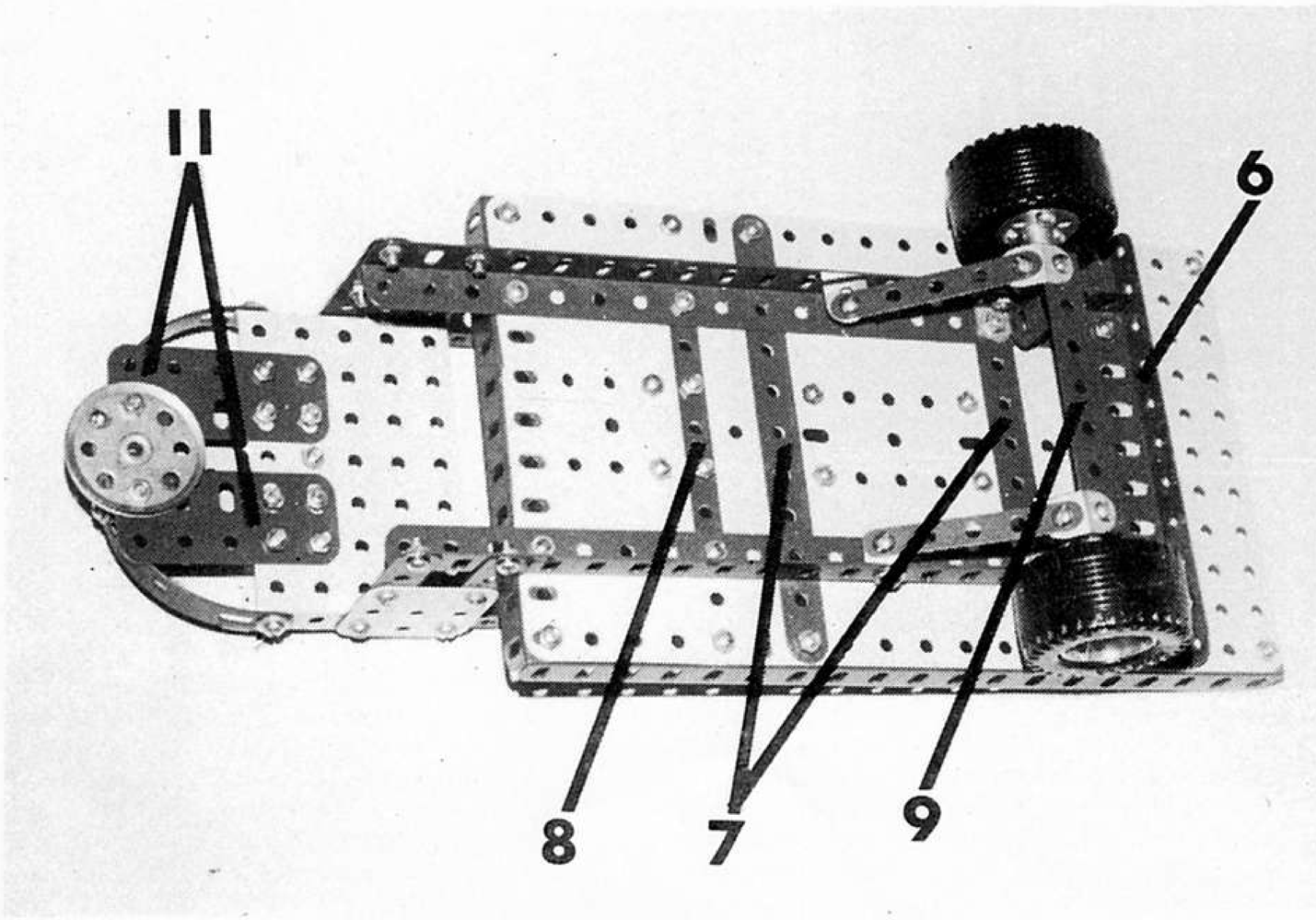
The motor unit seen from above.



The motor unit and control handle.



Underside of the truck bed.



Obtuse Angle Brackets. A 2½" Narrow Strip can be employed here for edging purposes.

THE MAIN PLATFORM

A three-sided open frame comprising two 9½" Angle Girders and a 5½" Angle Girder is filled in by, (from the rear), a 5½" x 2½" Flat Plate, a 5½" x 1½" Flexible Plate, two 3½" x 2½" Flexible Plates with a 2½" x 1½" Plastic Flexible Plate between, a further 5½" x 1½" Flexible Plate, and then two 2½" x 2½" and one 2½" x 1½" Plastic Flexible Plates at the front. The underside of the platform is braced crosswise by a 5½" Angle Girder 6, two 5½" Strips 7 and a 3½" Narrow Strip 8.

Longitudinal bracing is provided by two 9½" Angle Girders projecting three holes beyond the forward edge. At the point where the two 9½" Angle Girders intersect with the rear 5½" Strip 7, 1½" Angle Girders are secured vertically at this point to the 9½" Angle Girders, and braced by 1" x ½" Angle Brackets.

The Road Wheels are carried on 1⅛" Bolts lock-nutted to the end holes of the 1½" Angle Girders, these Bolts also secure a transversely mounted 3½" x ½" Double Angle Strip 9 to which two Obtuse Angle Brackets are attached. Struts are formed by two 2½" Narrow Strips and these connect the Obtuse Angle Brackets to the 9½" Angle Girders via ½" x ½" Angle Brackets.

THE FORWARD RAISED PLATFORM

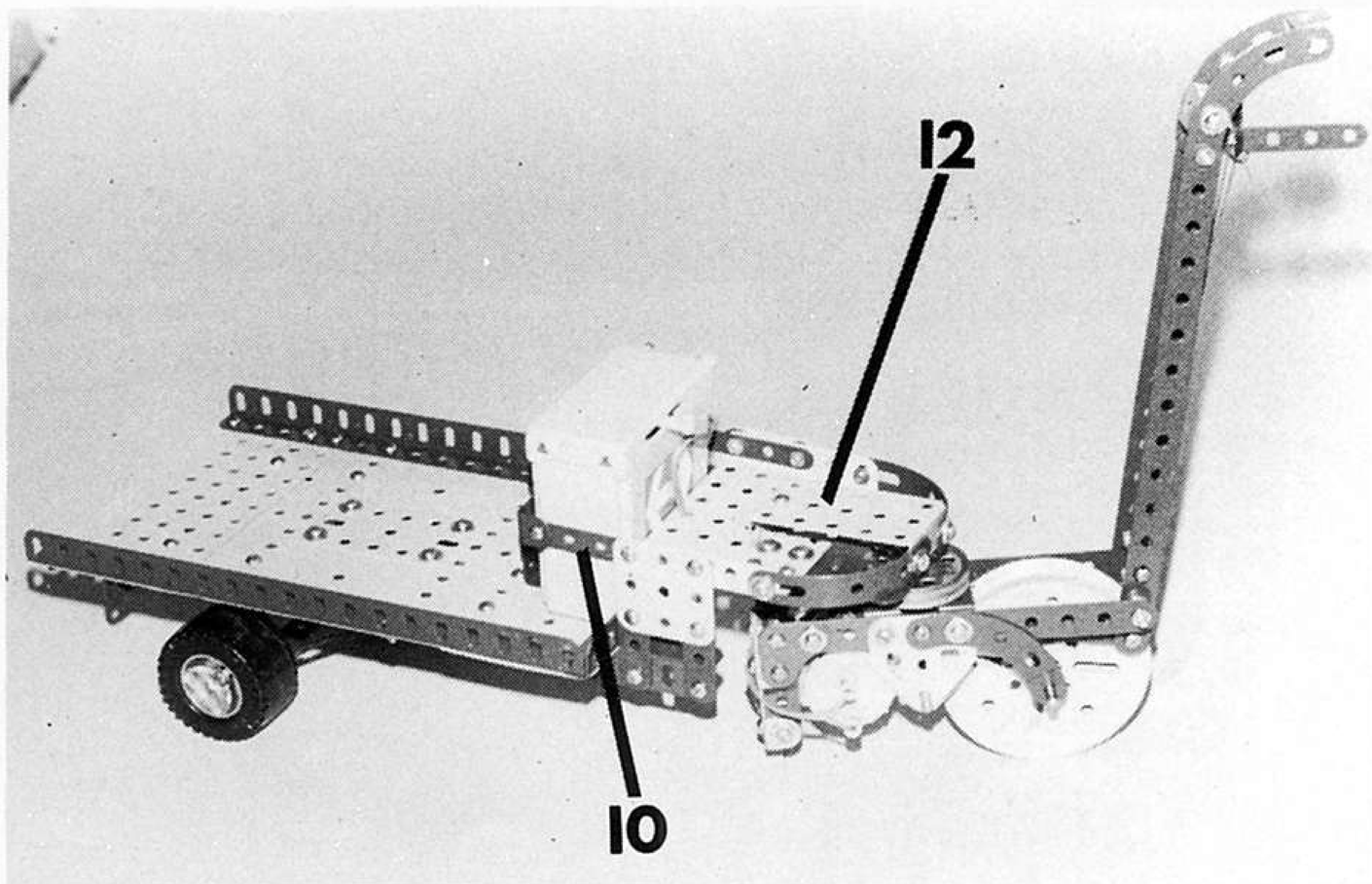
This comprises a 3½" x 2½" Flanged Plate connected to the 9½" Angle Girders by four 2½" Strips braced by two 1½" x 1½" Flat Plates. The Bolts fixing the Strips to the Plate flanges also secure two 3" Narrow Strips 10, the rear holes of which are connected by a 3½" x ½" Double Angle Strip, thus forming a holder for the battery box.

A Channel Bearing fixed to the main platform immediately to the rear of the 3½" x ½" Double Angle Strip gives additional location to the battery box. Two 2½" Flat Girders 11 are bolted to the underside of the 3½" x ½" Flanged Plate, and a 1½" Pulley, boss upwards, is attached to the forward slotted holes of these, again utilising Washers for spacing purposes to prevent the Bolt shanks projecting beyond the Nuts.

FINAL ASSEMBLY

The 1½" Axle Rod of the motor unit and control handle sub-assembly is passed through the boss of the 1½" Pulley of the raised platform. It is free to turn with this boss and is secured by a Collar so that the rims of the two pulleys ride firmly against each other. The forward edge of the raised platform can be given a finished appearance using a 2½" x 1½" Flanged Plate 12 fixed to it's rear by a ¾" Bolt, and it's forward flange connected by two Formed Slotted Strips to the flanges of the 3½" x 2½" Flanged Plate.

Wires from the battery box are fed through suitable holes in the frame, being led down to the motor terminals in such a fashion that they do not impede full steering action of the motor unit. The reversing switch of the motor must be set so that forward movement of the control handle results in forward movement of the main drive wheel.



Right hand side of completed model.

PARTS REQUIRED:

2 of No.	1b	2 of No.	74
4 of No.	2	1 of No.	81
4 of No.	5	4 of No.	90a
2 of No.	6	2 of No.	103f
4 of No.	8a	1 of No.	111
2 of No.	9	7 of No.	111a
2 of No.	9f	3 of No.	111d
2 of No.	11	1 of No.	125
6 of No.	12	2 of No.	126a
2 of No.	12b	2 of No.	133a
2 of No.	12c	1 of No.	160
2 of No.	16a	1 of No.	186
1 of No.	18a	2 of No.	186a
2 of No.	19b	2 of No.	189
2 of No.	21	2 of No.	190a
1 of No.	22	3 of No.	194
1 of No.	26	2 of No.	194a
1 of No.	27a	2 of No.	215
100 of No.	37b	4 of No.	235
126 of No.	37c	2 of No.	235a
40 of No.	38	1 of No.	235b
18 of No.	40	1 of No.	235d
2 of No.	48	4 of No.	611
2 of No.	48b	1 of No.	618
1 of No.	51	1 of No.	11053 motor
1 of No.	53	1 of No.	13524
2 of No.	59	2 of No.	187c
1 of No.	70		

SHOW BIZ

THE level of enthusiasm which is around in the Meccano world these days is pretty high, and one of its more obvious outlets is in the public contact which takes place at Exhibitions sponsored by the various clubs. Of course there's a lot which goes on behind the public face which is shown; exhibitors make considerable efforts to produce models for the occasion, wives and families are roped in to man the door and feed the famished, and many enthusiasts travel long distances to take part—as indeed so many of those who come along simply to view.

But one of the great features is that all Exhibitions are *different,* and it's quite fascinating to see just how.

For instance, in May this year successive Saturdays saw North West Meccano Guild presenting their work to the public at Wigan and Solent Meccano Club doing their thing in Chichester. And how different the two shows turned out to be: not quite chalk-and-cheese perhaps, but at least black-pudding-and-scampi! First on the calendar were NWMG with their fifth annual show, appearing for the second time at Wigan after an initial three outings at Clitheroe. Dropping down from the misty heights of Scammonden Moor along a dank M62 it was very much the industrial North on show; venue was the Victorian red-brick Queen's Hall, a fairly utilitarian setting with its faintly-claustrophobic basement; well, it is coal-mining country!

Functionally adequate for the occasion though, but only just, for great hordes of modellers came along to be accomodated. Of course the local lads were there in force, but a happy feature was the good support from other clubs, primarily Northern ones obviously.

In fact there were about fifty modellers present, including some dozen juniors, and from Surrey to the Scottish Borders, it could lay claim to being something of a national occasion. Of course Wigan itself is also but a few miles from the Meccano home-town of Liverpool, and it was nice to see Brian Farrar and Eric Mair of Meccano Ltd. in attendance—though whether they enjoyed the verbal battering they got is more debatable.

One week on, SMC's third annual show was a noticeably cool and airy contrast, even though the weather had by now become high summer. The venue was quite fantastically different; the fabulous 18th-century Assembly Rooms in Chichester, beautifully decorated, provided a light and charming setting. Not so many modellers though; about twenty turned up, with visitors from Southern clubs and the SMC members themselves, and this time it was almost entirely an adult occasion. A fairly local occasion too, with, your reporter excepted, probably the furthest man from home being Eddie Oatley from Edgware. The welcome and hospitality however were just as warm and genuine as NWMG's.

A personal appraisal of two recent Meccano exhibitions by North Midlands Meccano Group Secretary Geoff Coles.

So, how about the models. Well it would really be quite invidious to draw comparisons in quality, but even so some models just must be mentioned, and perhaps some generalised comments can be made.

First of all, there were some differences evident in the subjects chosen for modelling; obviously it was Lancashire's industrial heritage which was showing through in the textile machines on show at Wigan—Ernest Keighley's incredible Rapier Loom, and the sections of a Twisting and Doubling Frame and a Cop Winder produced by George Barrett. None of that satanic mill stuff in Chichester!—though Chris Goodwin had two splendid models of 'The men who make Meccano parts', one being 'The man who punches holes in strips' and the other 'The man who peens-on bosses'!

No live steam at Chichester either—perhaps the hot-oil-and-meths would have been a bit out of place in those elegant surroundings, but models such as Reg Hall's Steam Car and Dick Watson's Ferris Wheel were much appreciated at Wigan. In the extreme-model stakes too it's possible that Wigan was slightly ahead. Certainly Chichester had nothing to compete in sheer size with either Mike Cotterill's Gantry-crane-to-end-all - gantry-cranes, or the co-operative project twelve-foot-long-jib Block-setter which came by mini-bus (? pantechnicon) from Preston. Even so Harry Gower's Container Crane and Eddie Oatley's Grabbing Grane were no less sophisticated—and perhaps just that little bit more practicably sized! And whilst visitors to Wigan might well have felt the ultimate in decibel output to have been achieved by Roger Wallis's Juke Box and Clive Hine's Wlatzer, both were easily outblasted by Eric and Mike Downer's Rock Drill whose fantastic operation resulted in much of Chichester being covered in a fine spray of powdered polystyrene!

Despite the marginal advantage of its famous Pier, Wigan can't really claim to have too much of a nautical flavour generally, and in this area there was no doubt that Chichester was way ahead. Several Marine Engines were on show, with a particularly neat small vertical version by Charlie Harrison; there was a nostalgic nickel-plated Battleship by Tony Knowles, and to cap it all there was an absolutely superb model of an English Man-o'-War of around 1600 with all sails set. This model was really spectacularly beautiful with full use made of colour in its construction, particularly featuring the new brassed washers, and the whole made a real entrance eye-catcher. How it was constructed was quite a puzzle; it ended up as the original closed box, but one of the multitudinous bolt-heads must have provided a well-concealed way in somewhere.

So really there are no sensible comparisons to be drawn; two very fine exhibitions put on in very different surroundings, with both giving great pleasure to those participating. Both clubs concerned are to be much congratulated on their efforts to present themselves to the public; let's hope they'll go on doing so, and that they'll reap the support they deserve for their efforts. Now, where's the next Exhibition?

'Grasshopper' type Stationary Steam Engine

DESIGNED, BUILT & DESCRIBED BY MIKE COTTERILL
PHOTOGRAPHS BY JOHN WOODWARD

NOT built from the contents of any specific Meccano outfit, the Steam Engine described here by Mike Cotterill is a good example of a medium sized 'freelance' advanced model. Although built originally without regard to the parts required, owners of a Meccano set 10 should be able to reproduce the main features without difficulty.

WHEN Meccano first appeared, industrial steam engines were far more common than today, and it is little wonder that plans for engines of various sorts have repeatedly appeared in Meccano Instructions Books and Leaflets.

Characteristic of the real-life engines was the massive constructional strength and engineering perfection that kept many in sound working order for well over a century of continued work in hoisting, powering, generating and pumping. In my version I set out to capture those qualities of strength and power.

In real life, the larger steam engines generally transmitted power from the piston rod to a rocking beam via James Watt's parallel motion, and an article on this appeared in the Midlands Meccano Guild Gazette No. 1 of January 1978, with an important correction in issue No. 2 of September 1978.

James Watt patented his invention and established a hold on the growing industry of engine manufacture that gave him a premier position. The most successful effort to by-pass this patent hold was with a linkage that became known as the 'Grasshopper Type', and this continued to be produced long after Watt's patents had expired, although Watt's motion dominated in the larger engines.

This model is of the Grasshopper type, and Meccano modellers who build it will be rewarded by being able to observe it's fascinating motion in action. My own model is powered by a mains motor of uncertain origin, and for that reason it is left to the individual to determine the most suitable motor to power the model.

Liberal use is made of brassware and Washers, but modellers will readily recognise that which can safely be dispensed with, or substituted if supplies are limited. The model will readily lend itself to further ornamentation in the way of railings and steps etc. if required.

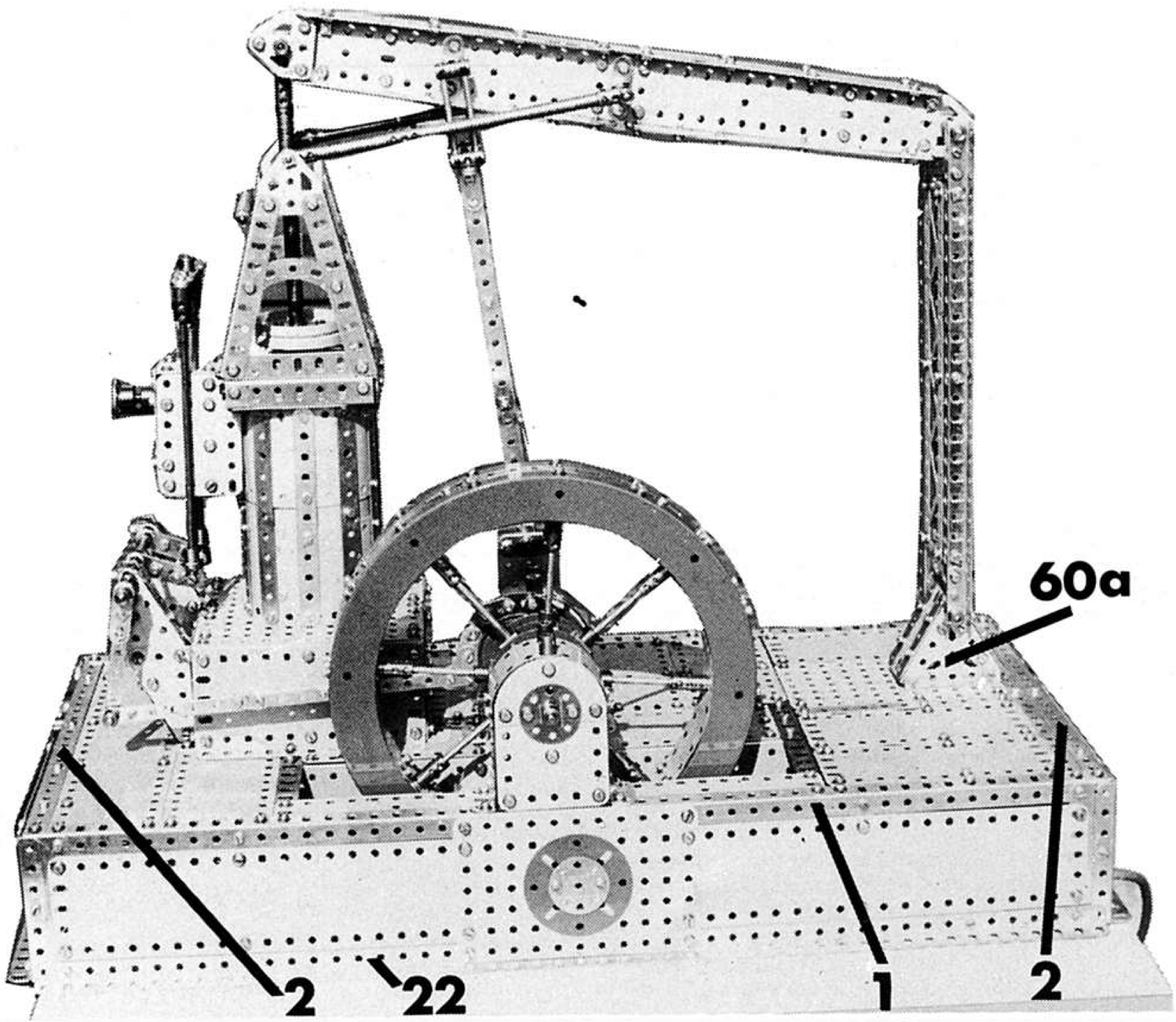


Fig. 1 General view of the Grasshopper beam Engine showing the beam at top dead centre of it's stroke.

THE BASE

Figs. 1, 2, 3 and 4.

Two 24½" Angle Girders 1 are bolted to two 12½" Angle Girders 2 to form a rectangle. Across this frame are fixed six separate 12½" Angle Girders, 3, 4 and 5 and 6. Note that pairs 3 and 5 are bolted back-to-back for strength. Between Girders 4 and 5 are fixed 12½" Angle Girder lengthways, 7, 8, 9, 10 and 11. A 4½" Angle Girder 12 is fixed alongside the Girder 10. Two 9½" Flat Girders, 13 and (fixing Bolts shown at) 14, are fixed to Girders 2, and a further 9½" Flat Girder 15 is affixed to 24½" Angle Girder 1, as shown in fig. 3. A 12½" Flat Girder 16A is joined to Flat Girder 13.

Two 2½" Flat Girders 28 and 29 are fixed vertically to Angle Girders 11 and 12. A 2½" x 1½" Flanged Plate 16 has its long sides extended outwards by a 2½" Strip 17 and, on the other side, a 2½" Narrow Strip 18, held by Fishplates. The entire sub-assembly is fixed to the framework by two 1½" Angle Girders, the fixing Bolts of which can be seen at 19.

Most of the base plating detail is clear from fig. 2; points to note are the 5½" x 1½" Flexible Plates 20, and the presence of a 2½" x 1½" Flexible Plate underneath the eccentric.

The construction of each of the four corners is clear from fig. 4; each has a 3½" Flat Girder on either side, held together by a 3½" Angle Girder. The two short sides are joined by 12½" Angle Girders with flanges outwards, and the longer sides are similarly joined by 24½" Angle Girders 22 affixed by their penultimate holes to allow a vertical corner. Side plating is shown in figs. 1 and 3, the incorporation of opening flaps is optional and depends on the machinery within. The use of Flat Plates here adds considerably to the overall strength of the main framework.

Two 12½" Angle Girders 21 are affixed to the Girders 22 and joined transversely by two further 12½" Angle Girders 23, whose flanges face upwards. The square thus formed is braced at its four corners by Large Corner Brackets. Three further 12½" Angle Girders 25, 26 and 27 run across the square with their flanges upward. To each Flat Girder 28 and 29 is fixed a 2½" x 2½" Flat Plate 30, these are also joined to the flanges of Girders 26 and 27 respectively. The centre holes of Plates 30 support a 3½" Axle Rod 32, on one end of which is a ½" Pinion. This meshes with a 50ft Contrate Gear on a vertical 5" Axle Rod 31, which rises in the centre of the innermost crankshaft bearing, and which is surmounted by a ½" Bevel Gear. This Gear is later used to power the crankshaft.

Each side of the flywheel well consists of a 12½" x 2½" Strip Plate joined to the flanges of Girders 7 and 8, and braced at the bottom corners by 2½" x ½" Double Angle Strips. The bottom of the well is a 4½" x 2½" Flexible Plate 34 joined to one Girder 23 and a 5½" Strip 35. By means of 2½" Angle Girders, two

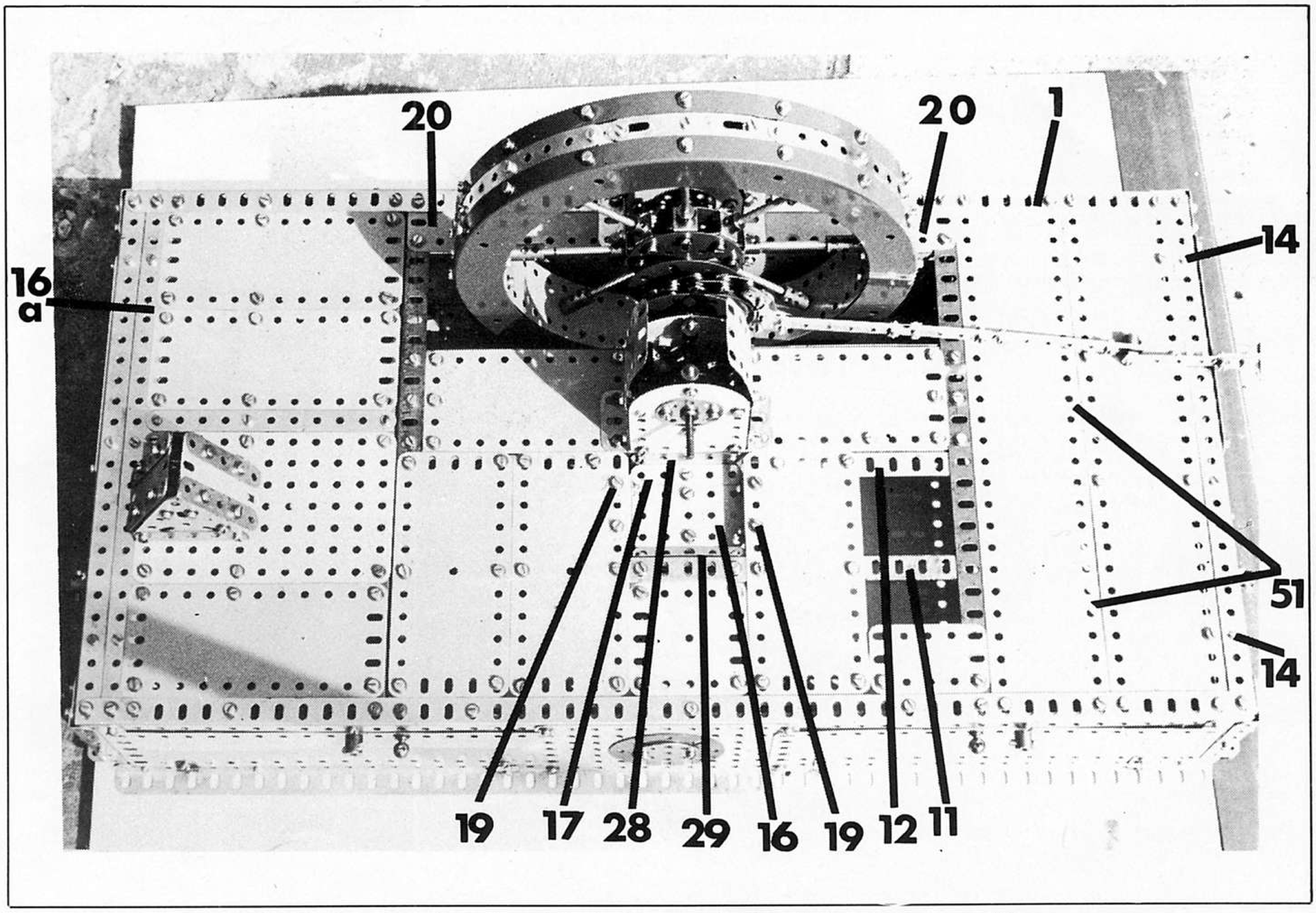


Fig 2 The base as seen from above, following the removal of the cylinder and beam assemblies.

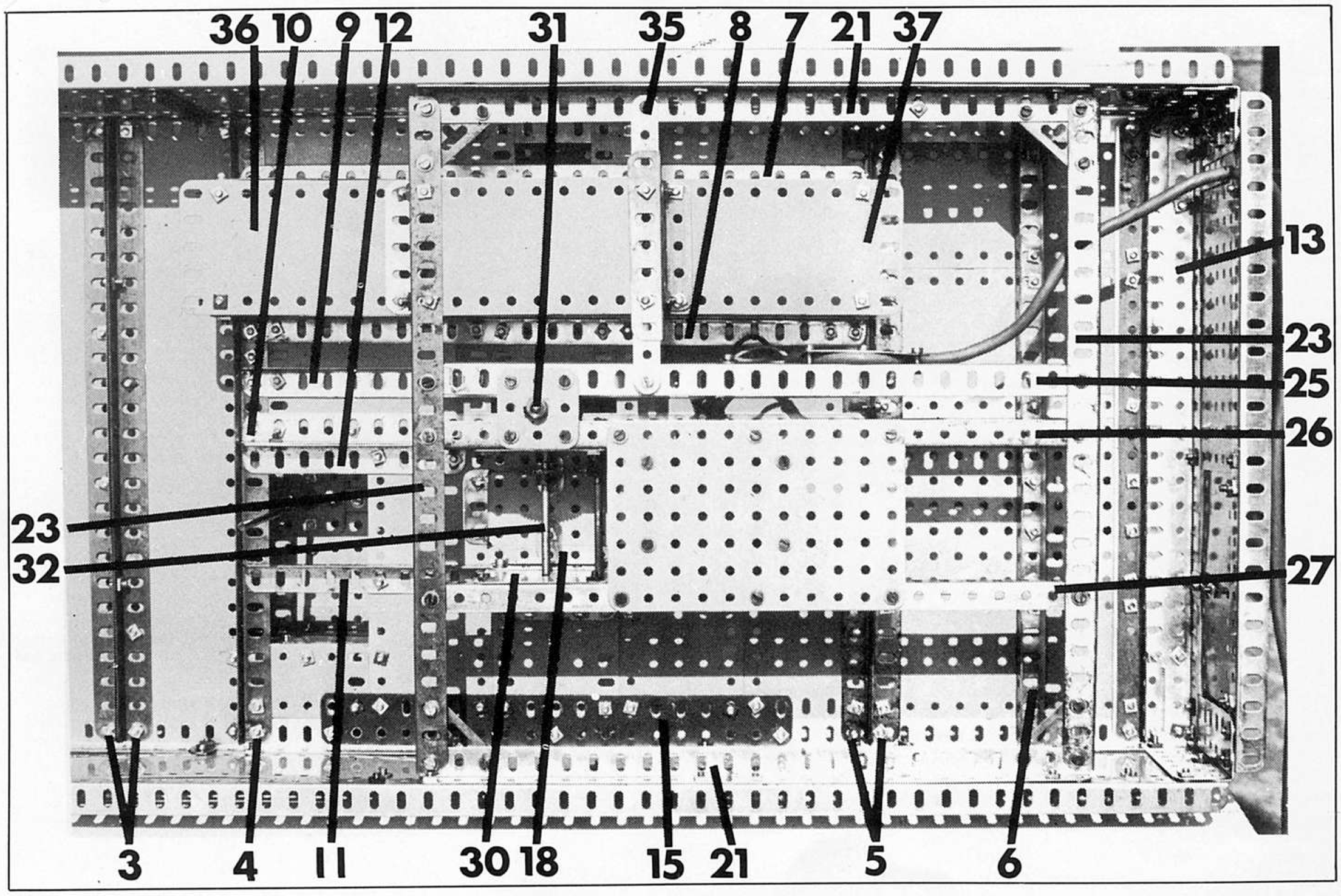


Fig. 3 View of the underside of the base.

further 4½" x 2½" Flexible Plates 36 and 37 join the 2½" x ½" Double Angle Strips to complete the bottom of the flywheel well, which thus has a central dip to accommodate the flywheel. The ends are filled in by 2½" x 2½" Flexible Plates, and the sides of the central dip are filled by 4½" Flat Girders fixed to the vertical Strip Plates.

At this point one should arrange the motor and drive transmission to turn Axle Rod 31 at about 180 RPM. This will produce a crankshaft speed of about 30 RPM, at which the intricate motion can be appreciated without strain on the gearing.

THE CYLINDER AND BASE.

Figs. 4, 5, 6 and 7.

Fig. 5 shows the underside of the cylinder base. It consists of two 5½" x 2½" Flat Plates 38, and two 2½" Strips fixed to a central 1½" x 1½" Flat Plate. The 2½" Strips 'fill-in' the gap between the Plates 38. Around the inside top edges are fixed four 5½" Angle Girders, and the vertical corners are 2½" Angle Girders joined at their lower ends by four more 5½" Angle Girders, elongated hole flanges facing outwards. The four sides are filled in with one 5½" x 2½" Flexible Plate each. The valve control brackets 38a are seen in fig. 4 and consist of 2½" x 1½" Trianglular Flexible Plates arranged as shown and made up to ½" thickness by two 2½" Angle Girders 40. The upper sloping edge, near the cylinder, is filled by a 2½" Strip held by an internally-mounted Angle Bracket, and the lower sloping edge is filled by a 2" Slotted Strip held by an internally mounted Double Bracket. Each complete valve support bracket is mounted by means of two further 2½" Angle Girders to one side of the cylinder base, so the brackets are 4½" apart, ie there are seven holes left clear between them.

The cylinder, figs. 6 & 7, is 5½" tall and comprises three rings each consisting of five 2½" x 2½" Curved Plates joined to form a complete circle. The bottom and top circles overlap the central one. Alternate vertical lines of holes are overlaid with 5½" Strips to simulate cladding, and fixed inside the cylinder are two 5½" Angle Girders to lend rigidity. At the base of the cylinder, four Threaded Bosses 45 are mounted on ½" Bolts with their transverse threaded bores vertical. The cylinder is mounted on it's base by the four Bolts 40a passing through the threaded bores of the Threaded Bosses 45.

The top of the cylinder consists of four 3½" Angle Girders forming a square, with two additional 3½" Angle Girders 41 on opposite sides, providing the superstructure mountings. Four 4½" Angle Girders are then affixed to the flanges of Girders 41, and inclined as shown. On three sides, further 3½" Angle Girders 42 are bolted to the square to provide horizontal surfaces underneath, to which are affixed two 3" Flat Girders. At the inside top end of the cylinder, in line with the internal 5½" Angle Girders are situated two further Threaded Bosses 44, again with their transverse threaded bores vertical. Bolts passed through holes in the

Fig. 5 Underside of Cylinder base.

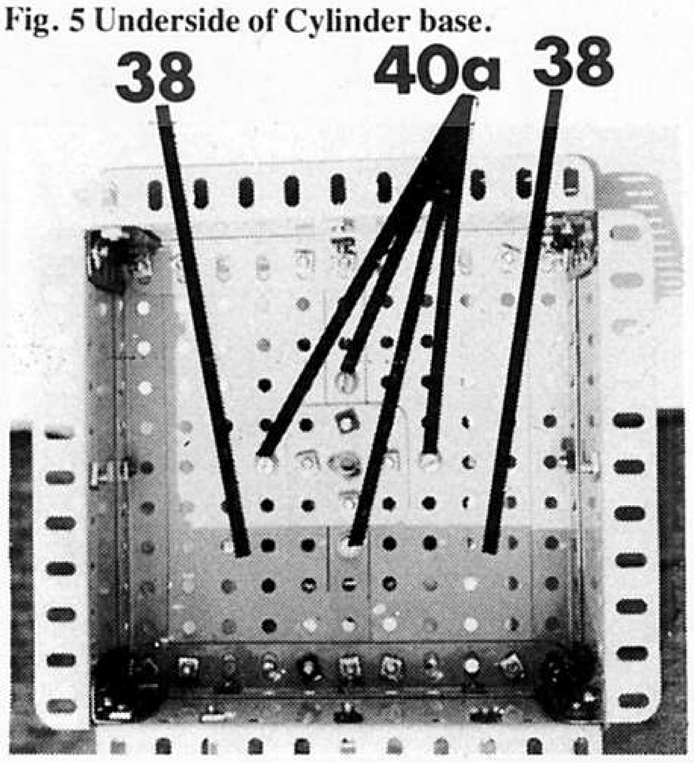
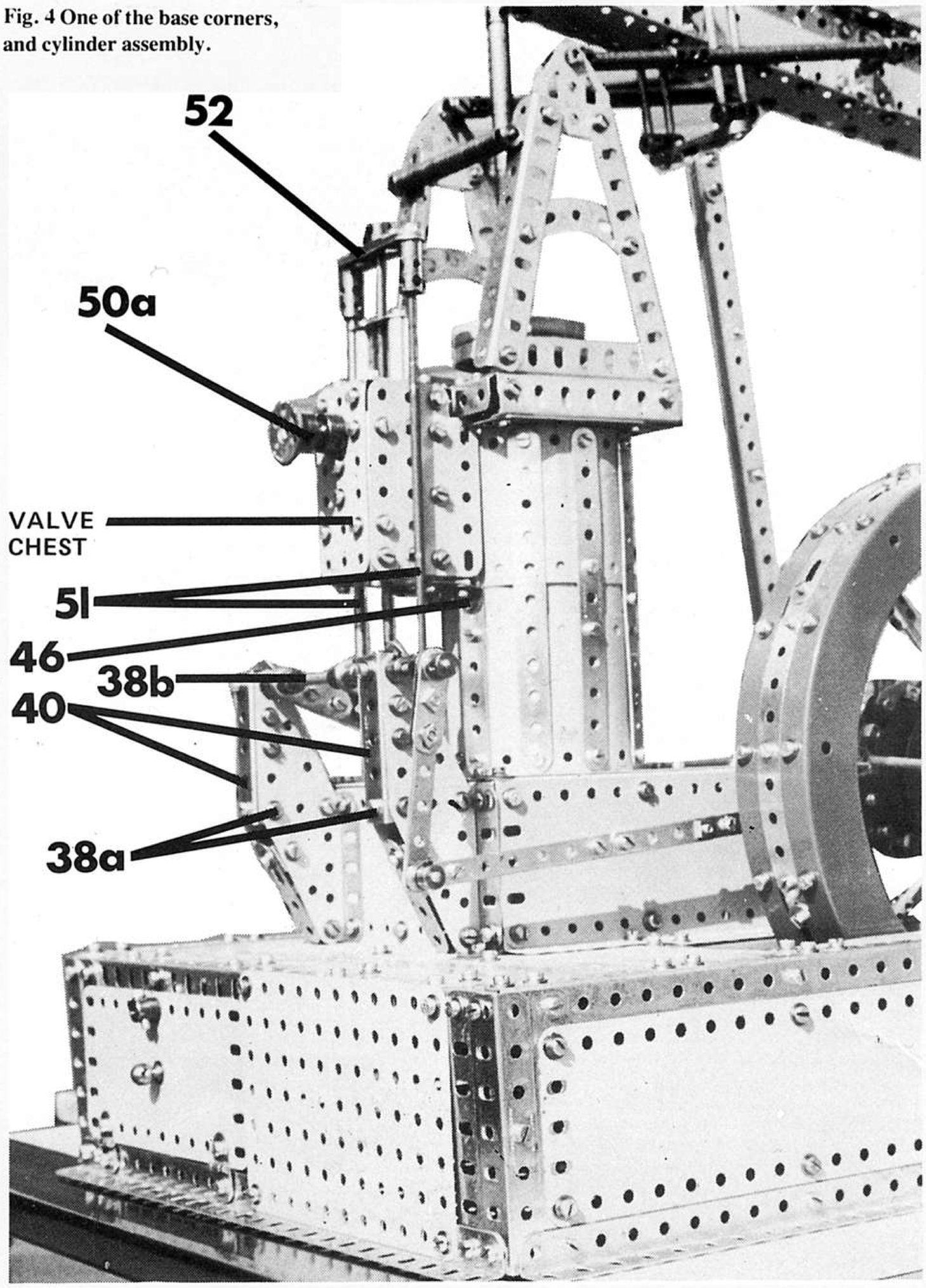


Fig. 4 One of the base corners, and cylinder assembly.



3" Flat Girders secure the top to the cylinder. On the fourth side of the 3½" Angle Girder square a 1½" Angle Girder is fitted, with it's elongated hole flange facing outward, and on the side of the cylinder, about ½ way up, are fixed two ½" x ½" Angle Brackets 46 (fig. 4). These are spaced 1½" apart, with protruding lugs uppermost.

The plating on the cylinder top, (fig. 6) consists of four 2½" x 1½" Flexible Plates overlapped to leave a ½" square hole in the centre. The piston rod guide consists of two Wheel Flanges, back-to-back, fixed to the top by four 1⅛" Bolts spaced by Couplings. The bracing at the top of the superstructure is effected by a 3½" Axle Rod, packed with Washers to give a more realistic effect, and held between two Collars. These are secured to the frame by Bolts, packed with two Washers each under their heads to ensure a tight grip.

THE VALVE CHEST

Figs. 4 & 8.

The side of the valve chest facing away from the cylinder is formed by a 3" x 1½" Flat Plate, and the two other sides consist of 3" x 1" Flat Plates, each partly overlaid by a 2½" x 1½" Flexible Plate. The sides are held together internally by 1½" and 2" Angle Girders. Two Threaded Bosses 47 are arranged so that their transverse threaded bores are vertical, and the 1½" Angle Girder protruding from the cylinder top, slides between the Threaded Bosses and the top 1½" x 1½" Flat Plate 48. Bolts passing through the corner holes of the Flat Plate 48 and the 1½" Angle Girder screw into the transverse threaded bores of Threaded Bosses 47, and thus secure the valve chest to the cylinder top.

The bottom of the valve chest is formed by another 1½" x 1½" Flat Plate, and two Fishlates connect this to the two Angle Brackets 46 on the cylinder side, thus giving additional rigidity. The Threaded Crank 50 is secured to the inside end wall of the valve chest and receives a 3/4" Bolt which secures a Collar to the outside wall. To this Collar is affixed a Socket Coupling 50a, carrying a 1" dia. Bush Wheel to simulate the steam pipe connection. The vertical centre holes of the valve chest are extended upwards by a 1½" Strip supported by two small cylindrical cores from the now obsolete 4EL Outfit. These can easily be substituted by Couplings or Collars etc.

The entire cylinder and base sub-assembly is fixed to the main frame by placing the protruding 5½" Angle Girder, underneath the valve support brackets, on the holes in the main frame marked 51 (fig. 2). Two Bolts are passed through each of the four Angle Girders forming the bottom of the base, to make a firm fixing.

MAIN BEARING SUPPORT

Fig. 9

Each of two sides consists of a 2½" x 2½" Flat Plate for strength, overlaid on the outside

by a 2½" x 2½" Flexible Plate for a solid appearance, plus a Semi-Circular Plate overlapping one hole. A Rod Socket is secured to the top hole of the Semi-Circular Plate on each side, by a Bolt through it's transverse threaded bore, and spaced from the Plate by a Washer.

The two sides are connected by four 2½" x 1½" Flexible Plates and two 1½" Angle Girders. The two uppermost 2½" x 1½" Flexible Plates are curved over and secured to the Rod Socket threads by Threaded Bosses to represent grease cups. The Wheel Discs on the outside are for decoration only. Two main bearing supports are constructed in this manner.

ECCENTRIC

Fig 9.

It is advisable to build this up on a temporary crankshaft as shown. It consists of a 1⅛" Bolt over which are passed a Face Plate, two 2" Pulleys with bosses outermost, and a second Face Plate. The crankshaft runs through the bosses of the Face Plates and through a hole of each of the 2" Pulleys. The gap between the Face Plates and Pulleys is filled with Collars and/or Washers.

The eccentric strap consists of thirteen Fishplates joined in a circle but spaced apart by three Washers so that two circles of Fishplates ride on the two 2" Pulleys of the eccentric. Two Small Corner Brackets complete the circle, and these grip two 5½" Narrow Strips sandwiching two 3½" Narrow Strips. The other holes of the Corner Brackets are spaced by two Washers. The eccentric arm is completed by two 3½" Narrow Strips sandwiching two 5½" Narrow Strips to make a solid eccentric arm 9" long. By removing one screw of the eccentric strap and loosening another, the assembly can be placed on the eccentric and adjusted. It is preferable to allow a fairly loose fit.

FLYWHEEL

Fig. 10.

Two large Flanged Rings are connected by eight 1½" Strips mounted internally and equally spaced around their circumferences. Four Formed Slotted Strips and four 4½" Strips are carefully curved to the same arc as the Flanged Rings, then alternately secured by a Bolt into a Threaded Boss to the centre holes of each 1½" Strip. To each end of each 4½" Strip is attached three Fishplates. One of these is fixed to the adjacent Formed Slotted Strip, and the other two are attached to the holes in the Flaged rings. In the longitudinal threaded bores of each of the Threaded Bosses are held 1" Screwed Rods and on each of these, in line with the inner edge of the Flanged Rings, are lock-nutted two Nuts.

The inside edge of the flywheel. (best seen in Fig. 1) consists of four 5½" x 1½" Flexible Plates joined to four 2½" x 1½" Flexible Plates so that only the central ½" portions of the latter show. The central holes of each of these eight Flexible Plates go over the ends of the 1" Screwed Rods, the plating is then secured against the lock-nuts by eight Threaded Couplings.

The hub of the flywheel (fig. 2) consists of eight Large Fork Pieces mounted bosses outermost inside and around the edges of two Face Plates. The spokes are eight 2½" Axle Rods which, during construction, can be pushed well into the Fork Pieces, and then pulled out to be secured in the smooth bores of the Threaded Couplings. This assembly should be self-centring if all the tightening is done together.

CRANKSHAFT ASSEMBLY.

An 8" Axle Rod forms the crankshaft, and, after inserting this through both sides of the outermost bearing assembly the following parts go on; three Washers, one Collar, the completed flywheel assembly, completed eccentric assembly, and one more Washer. The 8" Axle Rod then enters one side of the inner bearing assembly and receives a Large Bevel Gear. (This is powered by the ½" Bevel Gear mounted on Axle Rod 31 mentioned earlier.) Coming through the other side of the inner bearing assembly, it leaves 1" of available rod to receive the crank.

It is convenient at this point to link up the valve gear as seen in figs. 1 and 4. A 6½" Axle Rod 38b runs through the top holes of the valve support brackets, protruding a fraction at it's 'free' end. On it's operational end it carries a lever comprising three 3½" Narrow Strips clamped between two Cranks. In the end hole of this built-up lever is fixed a Small Threaded Pin, and the 9" long eccentric arm is secured to this by a Collar. Collars on the inside edges of the valve support brackets secure the 6½" Axle Rod 38b, and two trip levers are attached to this Rod between the brackets. Each trip lever consists of one 2" Slotted Strip sandwiched between two Cranks, with the end of the slot extending the Cranks to 1½" Radii. In each of the slots is lock-nutted an End Bearing, each holding a 6½" Axle Rod 51. These two Rods enter the smooth bores of two Threaded Couplings which form the valve crosspiece, being connected together by a bar of five stacked 2½" Strips 52. To the centre of this bar is fixed a Double Arm Crank, boss uppermost, and an 8" Axle Rod fixed in the boss of this represents the Valve Rod. This travels vertically through the central holes of the valve chest.

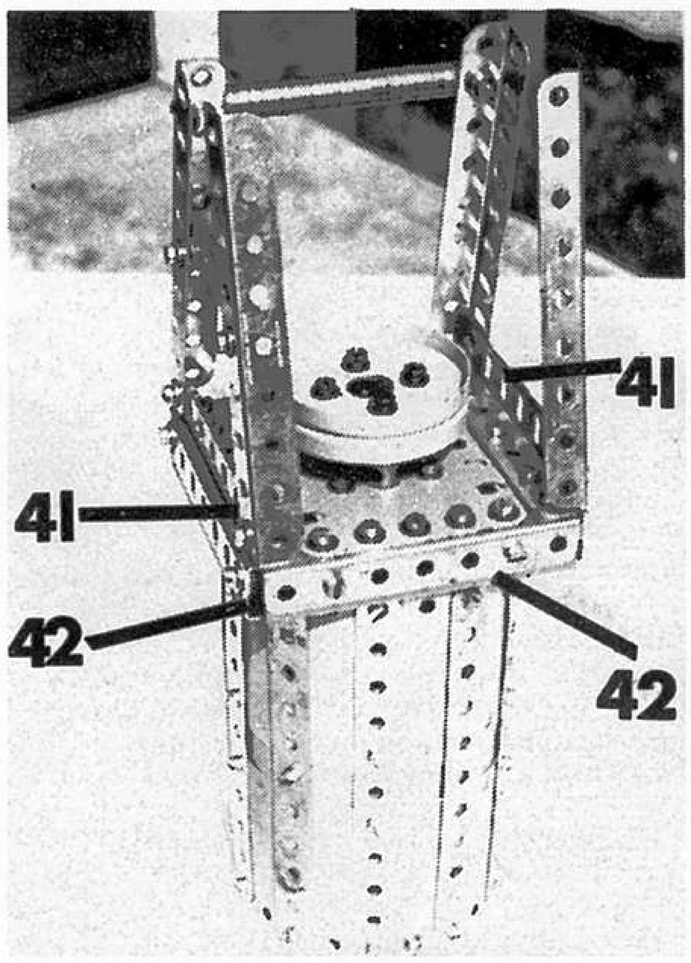


Fig. 6 The cylinder separated from it's base.

ROCKING ARM PIVOT BLOCK

Figs. 1 & 2.

This comprises two large Triangular Plates (fig. 1), each secured to the base by 2½" Angle Girders, and spaced 1½" apart. The two inside edges of the Triangular Plates support 1½" Angle Girders, and on each of these are mounted two 2½" x 1½" Flexible Plates overlaid with 2½" Strips, to fill in.

ROCKING ARM

Fig. 11

Each side consists of two 12½" Angle Girders joined to form a 'U' section girder, and at each end a Crank is situated with it's boss facing outward into the channel. Four 9½" Angle Girders are then made up into two further 'U' section girders, then fixed to the inside of the 12½" 'U' section girders. The two joined compound girders are then connected by two 9½" Braced Girders, and the entire assembly is strengthened by two 3" Screwed Rods at convenient points.

Fig. 7 Inside view of cylinder from below.

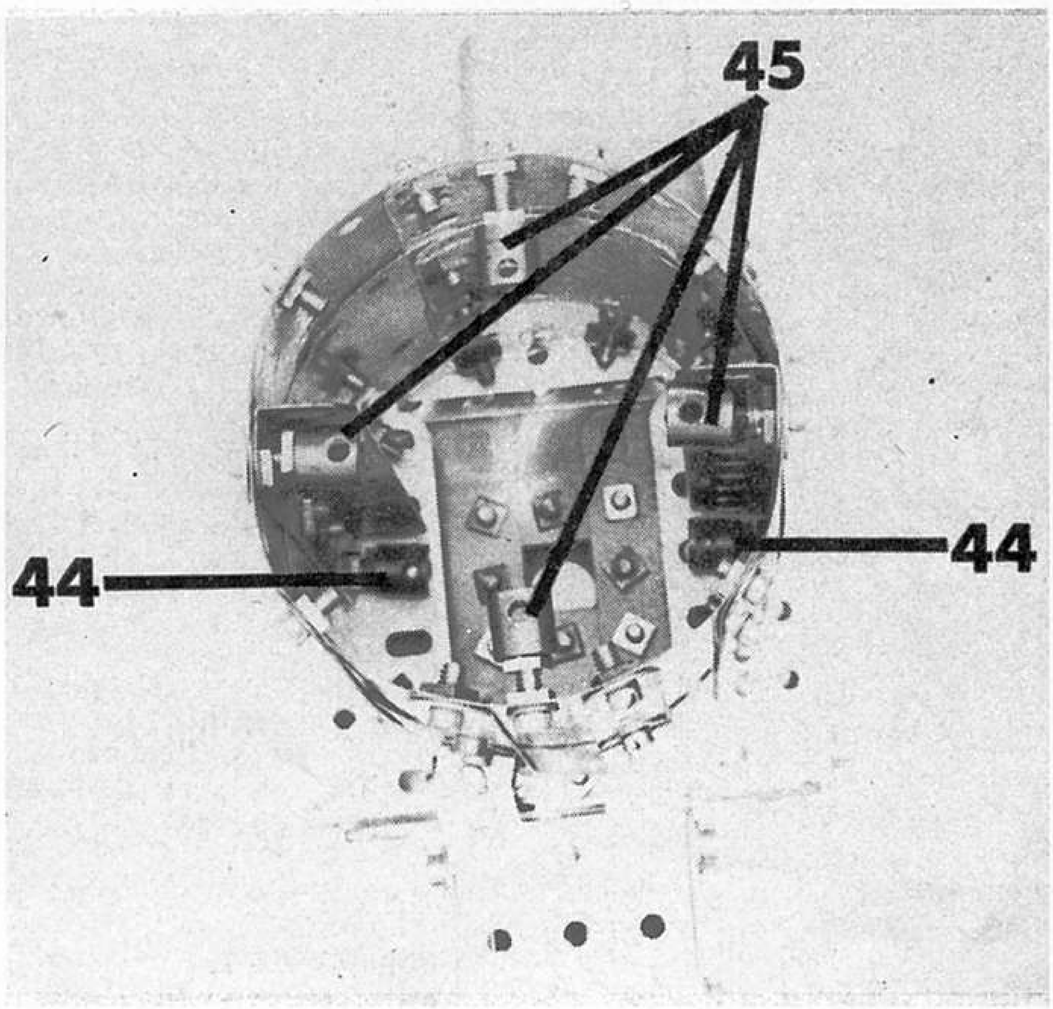
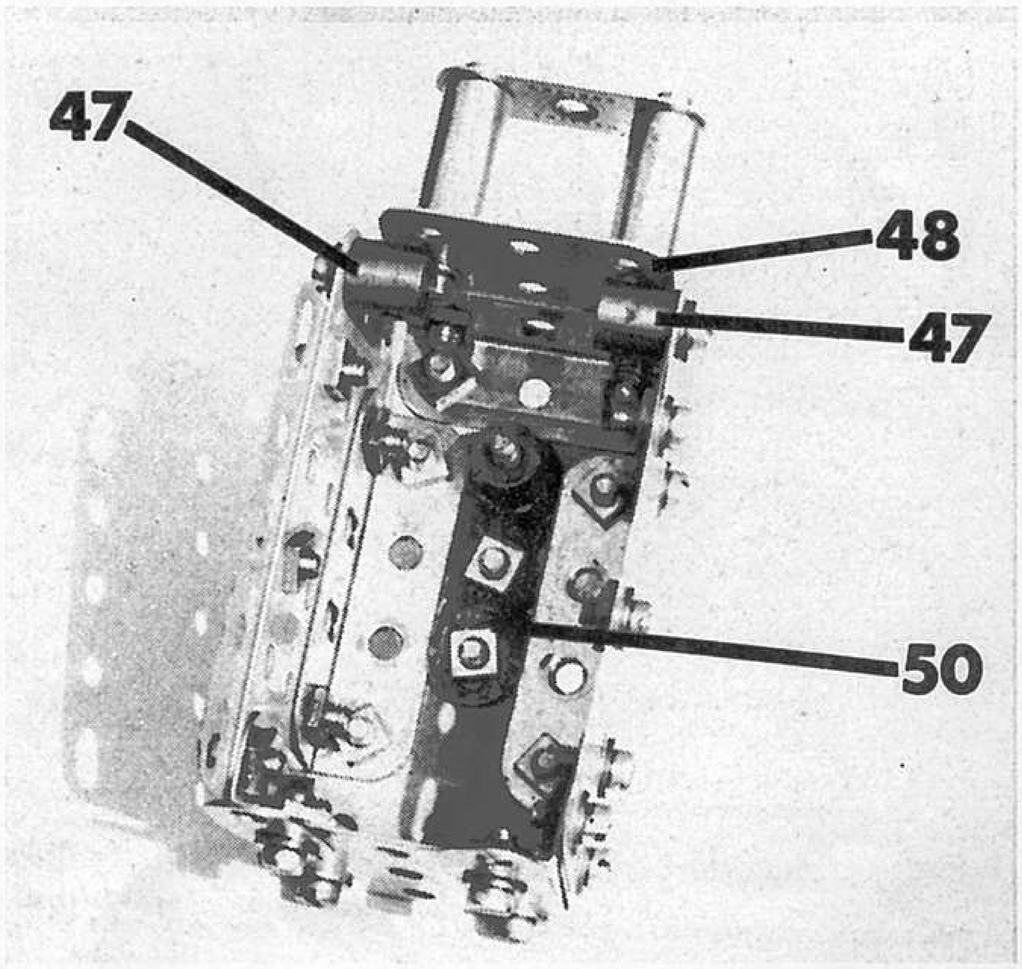


Fig. 8 Inside view of valve chest.



CRANK
Fig. 11.

This comprises seven stacked 3" x 1½" Flat Plates sandwiched at one end between two Double Arm Cranks which carry a 2" Axle Rod forming the crank pin. At the other end the Flat Plates are clamped between two Bush Wheels, spaced away by one Washer thickness and secured by four ½" Bolts. The two Bush Wheels are secured on the 8" Axle Rod crankshaft with suitable Washer spacing. The connecting rod consists of eight 9½" Strips clamped together and surmounted at the top end by two 1" x 1" Angle Brackets facing outwards.

A 'T' crosspiece of five stacked 2½" Strips is bolted to the innermost holes, and two Couplings are secured to the outer 'T' piece holes by Bolts passing into their central threaded bores. Four 2½" Rods rise vertically from these Couplings to two further Couplings 53. The connecting rod is secured pivotally to the crank pin by a Short Coupling with Washer spacing.

THE BEAM.
Fig. 11.

The centre of each side of the beam consists of a 1½" x 1½" Flat Plate to which are secured two 5½" x 1½" Flexible Plates 54 and four 7½" Angle Girders 55 by their elongated holes. Extending Plates 54 are two 2½" x 1½" Flexible Plates, and the assemblies should be tightened so that the Angle Girders lie away from the 1½" square Plate at the centre and close-in at the extremities to produce a slight taper. To the centre of each side is secured a Double Arm Crank 57, and 4" over to one side, (where there is no hole in the Flexible Plating), a second Double Arm Crank 58 is fixed. At one end the sides are joined by two 3/4" Bolts, clamping the ends on each side of an assembly of twelve stacked Flat Trunnions.

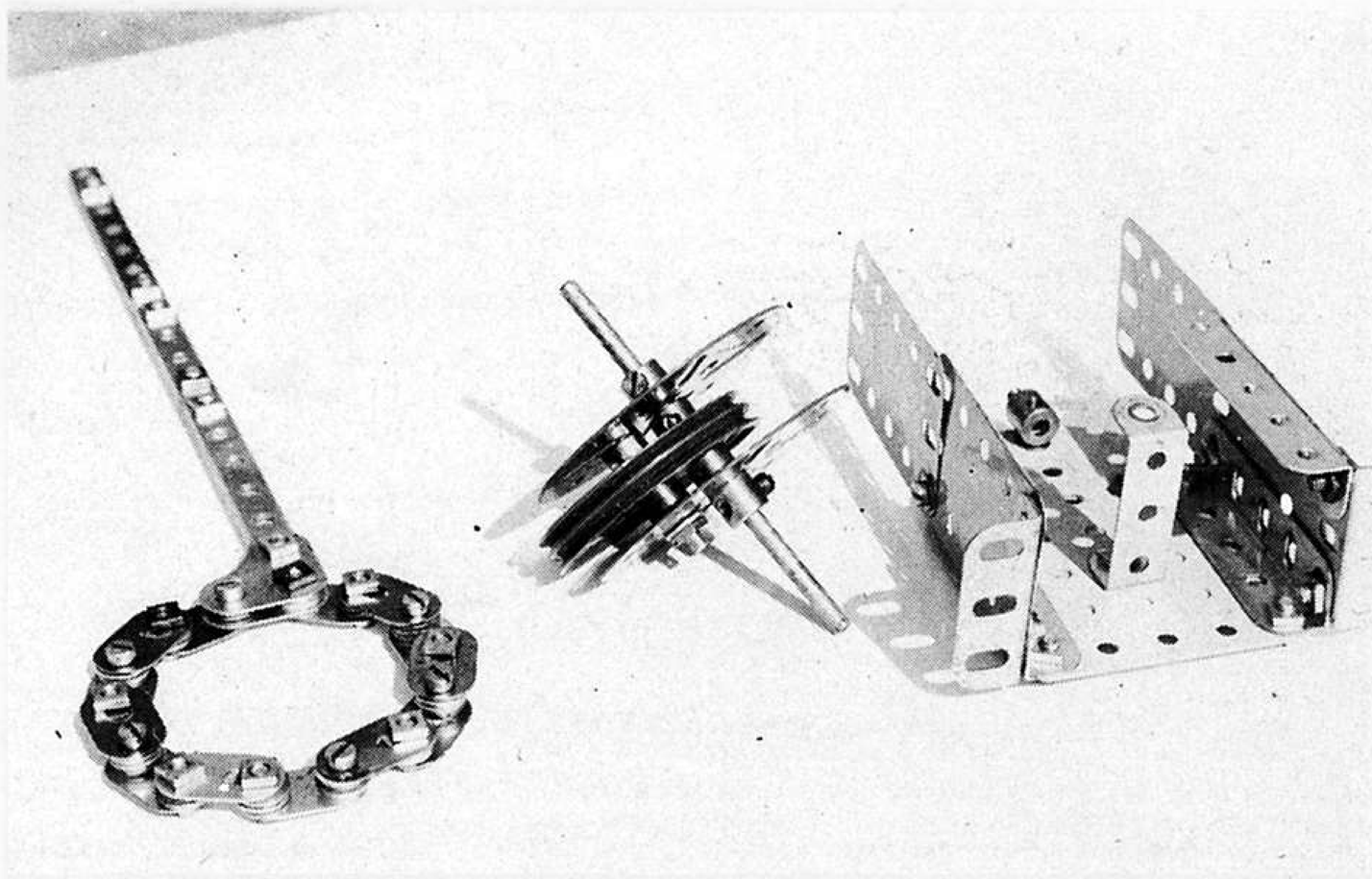


Fig. 9 (From left to right), The eccentric strap, built-up eccentric and a section of one of the two bearing supports.

At the other end, the two sides are joined by two 3/4" Bolts through the penultimate holes 59, with an assembly of sixteen stacked 1½" Strips between. Seven stacked Flat Trunnions are bolted to the exterior of each side on 3/8th" Bolts, and secured together by a 1⅛" Bolt through the apex hole of the Flat Trunnions, with clamping Nuts for each side. A 1½" Axle Rod, of which one of the securing Collars can be seen at 60, is held between the Flat Trunnions, and this holds a Coupling, hanging from the Rod 60 by it's top transverse smooth bore.

This Coupling receives the top end of the cylinder rod which must measure very close to 14¼" for correct operation. (Fig. 11, bottom.) Collars, Washers and Couplings can be used to 'widen-out' the diameter to improve realism but the length of 'free' Rod at the bottom must be 6". Any more will cause exposure at the top of the cylinder and any less may cause jamming. The 14¼" length may be made up from any suitable lengths of Axle Rod connected together.

The top and bottom of the beam are plated with overlapped 5½" x 1½" Flexible Plates when it becomes quite rigid. Through the bosses of central Double Arm Cranks 57 is passed a 4" Axle Rod and, from this, pivot the tie rods which measure 8½" end to end including Couplings. These can again be widened-out by liberal use of packed Washers etc. to achieve a realistic effect.

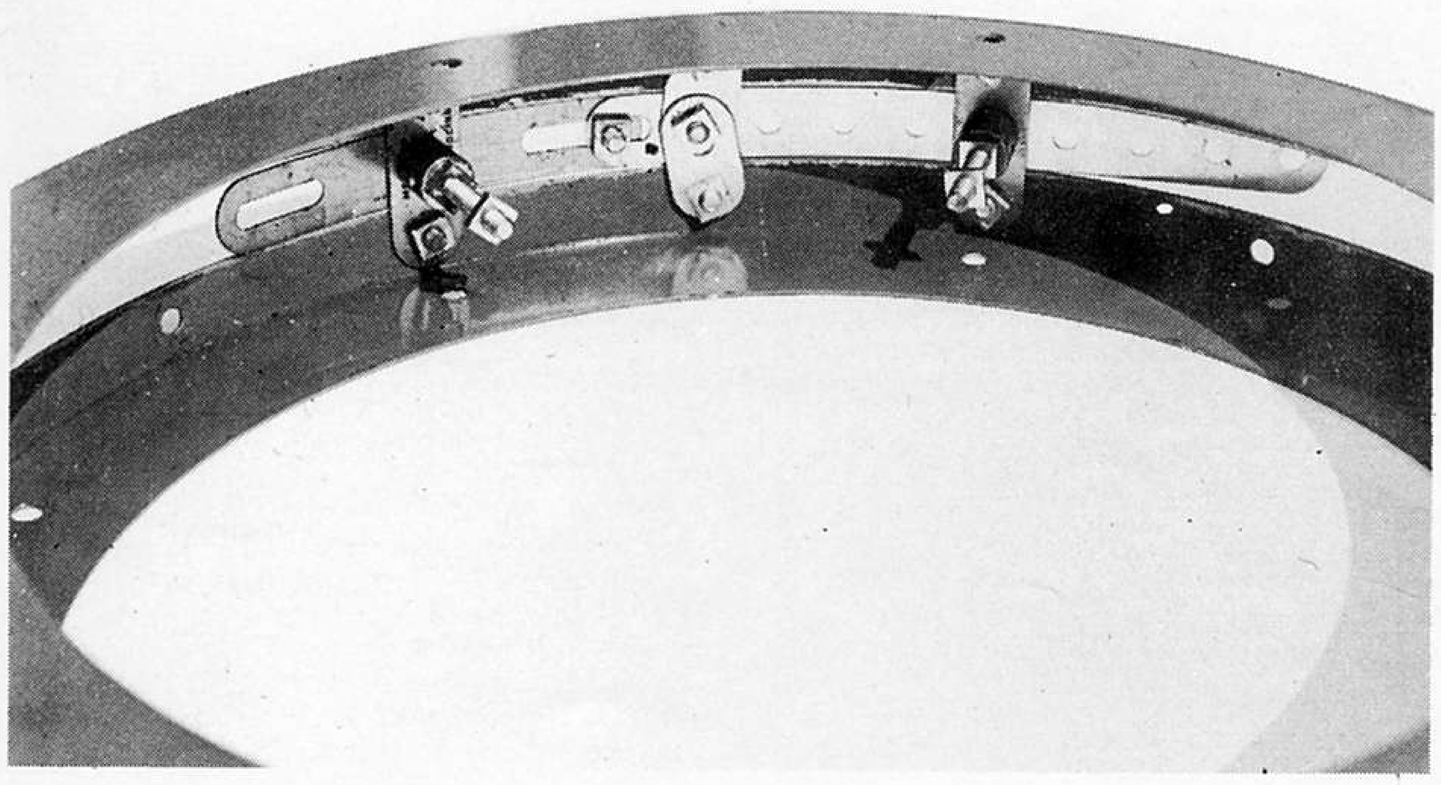
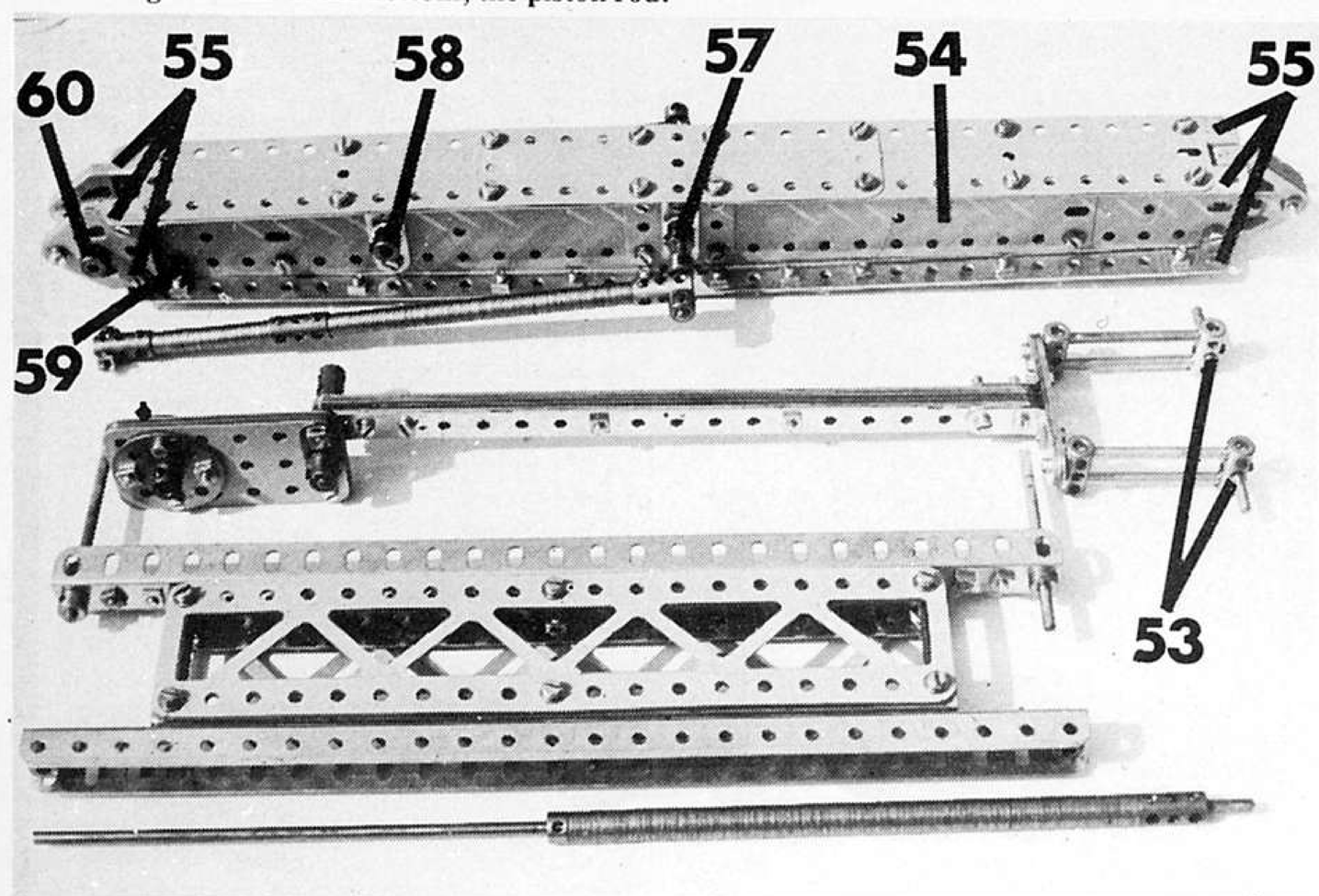


Fig. 10 Details of the flywheel's internal construction.

Fig. 11 Views of, (from top to bottom) the beam, crank with connecting rod, the rocking arm and at the bottom, the piston rod.



FINAL ASSEMBLY.

The rocking arm should be connected to it's triangular pivot block 60 by a 3" Axle Rod through the Crank bosses in it's lower end, spaced with washers and tightened. The upper end should be secured in a similar manner, through the stacked Flat Trunnions incorporating the penultimate hole of the beam.

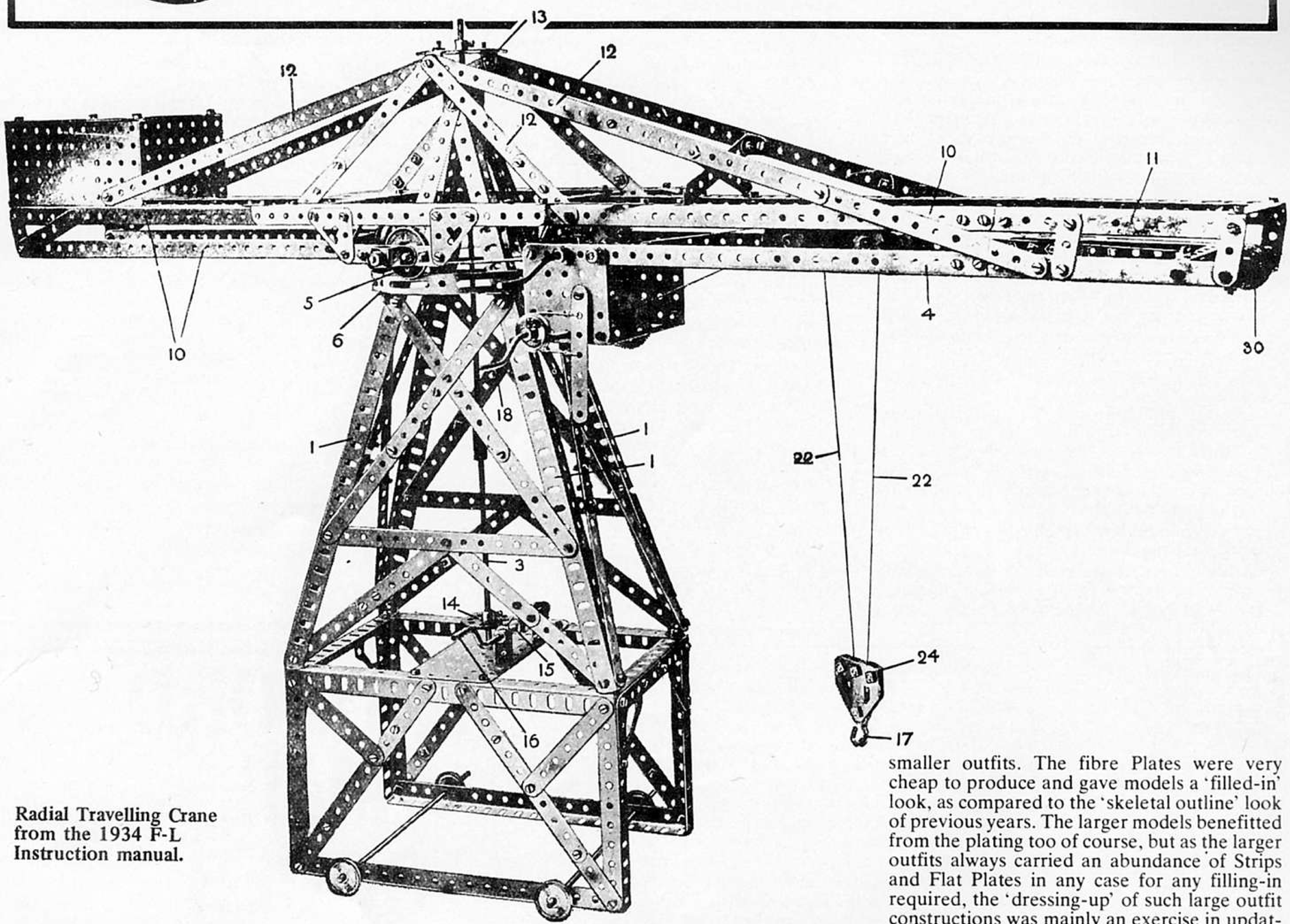
The Cylinder rod should be lowered down the centre holes of the cylinder and base and it's upper end locked into the Coupling pivotally attached to Rod 60 at the end of the beam. The tie rods should be secured to the Flat Trunnions completing the top of the cylinder superstructure (fig. 1) by Pivot bolts. It may be found in practice that small adjustments need to be made to the lengths of these rods to obtain an even action.

The crank is secured to it's shaft and the connecting rod brought up to the beam. 1" Axle Rods are pushed through Couplings 53 into the bosses of the Double Arm Cranks 58, and locked there to minimise any sideways 'play'.

After checking the tightness of all transmission bosses plus a light oiling, the model will be ready to demonstrate its unusual and fascinating motion.

NORTH WEST FRONTIER

by Michael J. Walker



Radial Travelling Crane from the 1934 F-L Instruction manual.

INSTRUCTIONS manuals have been a vital feature of every Meccano set ever produced. Many hundreds of different manuals have been published, in a variety of languages and degrees of complexity of models depicted, by Meccano Ltd. in the past. The history of these books is every bit as interesting as every other facet of Meccano's production, yet I feel that the study of the more 'glamourous' areas of obsolete parts and Supermodel instructions have tended to push the acquisition of old manuals into the background of enthusiast's activity today. I think this is a pity because the purchase of an old instructions book is an ideal way in which to get extra models to build, and we all know that Meccano constructors can never have enough of those!

Very early outfit literature is not of great interest to the serious modeller of today, in that the 'Mechanics Made Easy' and early Meccano sets contained only a comparatively narrow range of basic parts, suitable only for simple models. Line drawings with minimal constructional guidance in the form of written text was deemed quite adequate for the purpose of describing these rather skeletal frameworks.

The rapidly increasing parts range and phenomenal success of Meccano on the toy market led to larger outfits becoming available with a richer variety of components. Thus, after 1913, more complex models were described, the 1913 manuals themselves incorporating inside the back cover a selection of mechanisms from the 'Hornby System of Mechanical Demonstration'. From 1921, half-tone illustrations of models began to make an appearance, initially in addition to, and later on completely superseding the earlier line drawings.

Models depicted in the instructions manuals continued to improve in both quality and quantity up until the early 1930's, particularly quantity, the 1930 outfit No. 1 had no fewer than 229 examples given of the models it was possible to make with that one set. Admittedly the models were very simple in nature, but if a 1930 No. 1 set could make so many, the mind stretches to imagine the capabilities of the present day set 10! A few of the examples described in these early manuals were a positive menace in the wrong hands, Swords, Crossbows, various forms of Pistol etc. One has visions of pitched battles down at the early '30's Meccano clubs!

The instructions for the larger outfits at this time are a positive delight to any enthusiast though, with such fine models as a large Revenge Class Battleship and a really neat Automatic Weighing Crane.

The 1934 introduction of fibre board Flexible Plates and metal Strip Plates caused something of a revolution in model design, and hence in the appearance of the outfit manuals. The greatest effect of the introduction of these important new parts as this time was felt by the smaller outfits. The fibre Plates were very cheap to produce and gave models a 'filled-in' look, as compared to the 'skeletal outline' look of previous years. The larger models benefitted from the plating too of course, but as the larger outfits always carried an abundance of Strips and Flat Plates in any case for any filling-in required, the 'dressing-up' of such large outfit constructions was mainly an exercise in updating the looks. Nevertheless this era ushered in a great many new models to the manuals and I'd particularly recommend the 1935 F-L manual to any enthusiast today.

The 'Blue-Gold' era of 1934-37 was brought to an end by the re-introduction of red/green parts to the range, and a revamped outfit structure spanning the range 0-10 instead of O, A, up to L. The model books that were introduced at this time would be instantly recognisable in style to anyone who was given their first Meccano set in the early '50's, in that much fewer models per outfit were described, but in each case a much more complete account of the constructional sequence was given. The best manual of this era is undoubtedly the 1937 set 10 book.

Early post-war editions were mainly reissues of pre-war manuals, and the first truly post-war collection of models appeared in the 1954 set of instructions. These followed the earlier style of presentation, the best book of this range being the one for outfit 9. (The current range of leaflets displaced the set 10 manual).

1962 saw the introduction of a far-reaching development, 'exploded-view' type diagrams with no text at all. After a great deal of research by Meccano Ltd. this system was adopted because the lack of any written instructions obviated the need for foreign language translation for the overseas markets. The 'blueprint' look of the manuals certainly caused a stir at the time, but the knack of following the sketches

EXPORT BIRD'S-EYE

'OF course I know Meccano!' was my rather smug reply when Derek offered me the job of Export Sales Administrator less than twelve months ago. I little realised then that this sweeping statement was, in fact, totally untrue! Meccano is a household word in this country and my vague recollections were limited to the old red and green construction outfits with which sundry small boys of my acquaintance used to play in the pre-T.V. era of the early fifties. It didn't take long for all of my misconceptions to be put straight!

Let me start at the beginning. Derek is Derek Noble who has been Meccano's Export Manager for the last 18 months. Since joining the Company nearly 3 years ago he has managed to visit most corners of the world in an effort to achieve, with the help of our distributors, an instant international recognition of our name by child and adult enthusiasts alike. At the time of writing this article he is doing the European rounds and visiting both long-established and recently-appointed Meccano/Dinky distributors in order to hear the news and views passed on to them by their own customers. I am responsible for the administration work (well, somebody has to be!) involved in this small but exceptionally busy office and have happily been swept up in the maelstrom of exporting Meccano.

Thrust suddenly into the merry-go-round here at Binns Road, my imagination was instantly caught by the new colours, striking packaging and exciting themes of Today's Meccano. What creative child could fail to be lured by the traditional Meccano name coupled with the ideas of tomorrow despite the keen competition from modern recreations such as T.V. I wandered spell-bound round the factory watching thousands of Meccano parts being manufactured and then packed into the sets which are so familiar to you all.

After my induction the job really started in earnest. I have been fortunate enough to meet many of our distributors personally and correspond frequently with the others. In Europe as a whole we have exclusive distributorships for each country. These agencies are responsible for putting Meccano into all the stores and shops wishing to carry stocks for that particular country. Many of these distributors have been handling Meccano since we first began to export and Edilio Parodi SPA of Milan, Italy has recently celebrated over 60 years of successful selling with us.

Other agents who should be particularly mentioned in this long-serving connection are Jean Fremineur of Brussels, whose father was initially responsible for setting up the present Meccano agency in Belgium, H. Bienengraeber of Hamburg, West Germany, Ludvig Wigart of Helsingbourg, Sweden, Riva and Kunzman our distributors in Switzerland and Firma Hermann Stadlbauer of Austria to name but a few.

Not all of our successful European distributors are old hands at the job. Pyro B.V. of the Netherlands have really done a tremendous job for us over the past year as all Dutch enthusiasts will already know.

Leaving Europe for a moment, what about the major markets of Canada and the U.S.A. Both are very large areas for a single distributor to handle but our present set-ups of Parker Brothers Games of Ontario, Canada and Ava International of Texas, U.S.A., seem to be coping extraordinarily well with their markets and we are happy to enjoy an extremely sound business relationship with each.

As a small child I was informed that if I dug long enough and hard enough I would end up in Australia! Well, we don't export Meccano there quite by doing that! Instead we rely on the major shipping lines to take vast quantities of Meccano to Liberty Trading in New South Wales who take care of the Australian distribution scene for us. Just across the Tasman Sea from them is New Zealand where John Goodman, alias Models (New Zealand) Ltd. face the daunting task of importing our products for the New Zealand territories.

Where else do we export? Certainly to the Middle East, the Far East, South Africa, South America and many parts of India. Meccano pops up in the most unlikely shops and bazaars and Derek and I do our best to fulfill any order placed as promptly as possible. Trying to cope with the various customs documents, import licence parameters and other red tape paraphernalia associated with the export world poses persistent problems, but somehow everybody copes!

Noticeably missing from the previously mentioned places are the Iron Curtain countries. We have shipped small amounts of Meccano to Hungary, Poland and Czechoslovakia in the past, but if any reader has any constructive suggestions as to how we may allow the U.S.S.R. to share our enthusiasm for Meccano, I should welcome them!

In the meantime, I hope the foregoing gives any interested Meccanoman a little insight into the doings of the Export Dynamic Duo—Derek and Rosemary.

Cheers!

by Rosemary Critchley (Assistant Export Manager of Meccano)

Continued from previous page

was soon acquired and this feature was carried into the '1970's' Meccano with the addition of colour to the smaller outfit manuals.

During this early 1970's period, development of yet another style of presentation was being carried out, step by step sequencial photographs. The Multikit range was the first to be supplied with the photostep books, which showed each model actually in the many phases of construction, as many as fifty separate photographs being used for one model. This gave overwhelming advantages in terms of clarity, so much so that the idea was used for the instructions books contained in the latest 1978 series of Meccano sets 1-5, to great benefit.

So, the next time you purchase a boxed Meccano outfit, don't just toss the instruction book aside in your haste to get to the parts, there's no doubt, that, in time it will become a much sought-after collector's item!

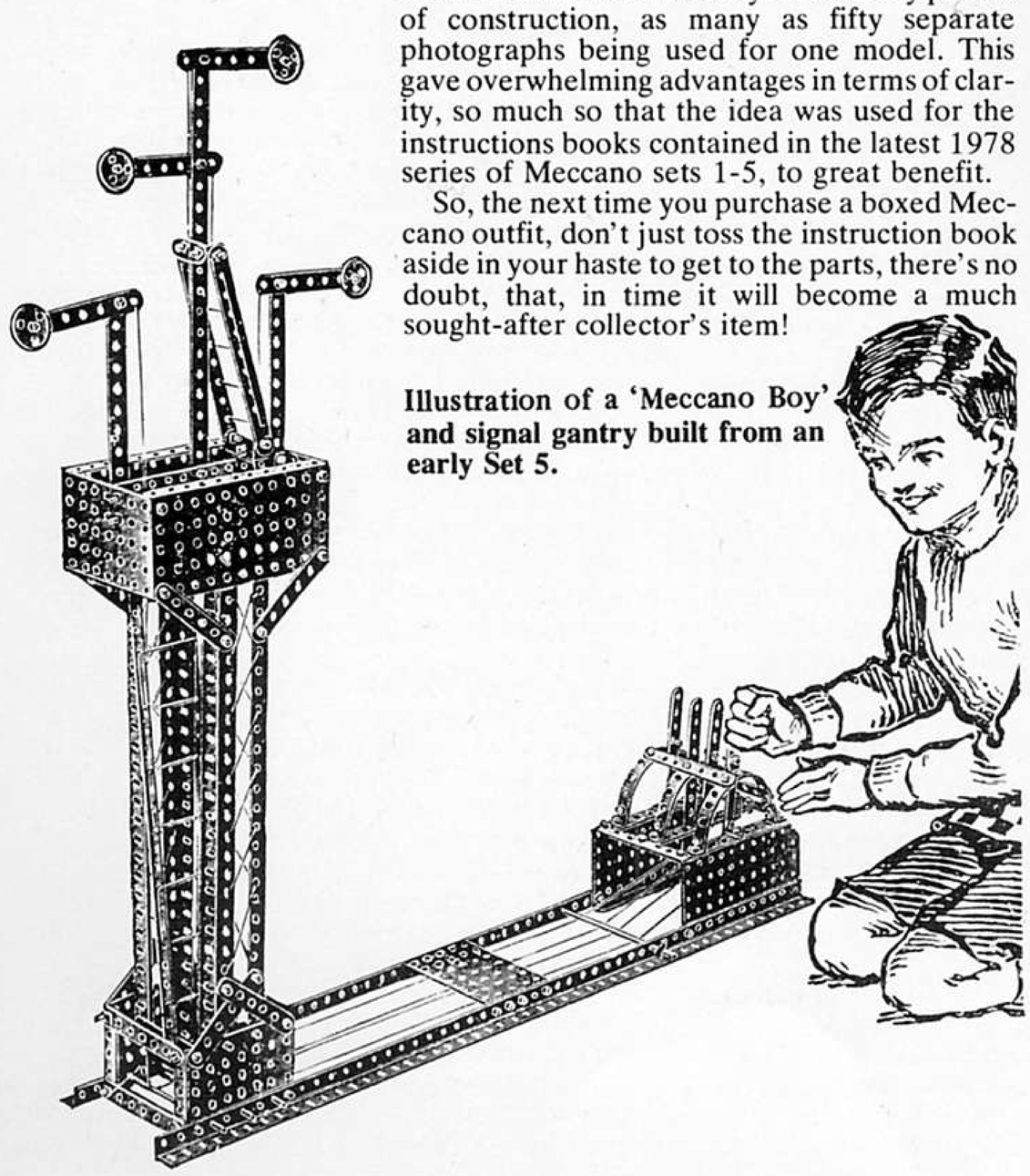


Illustration of a 'Meccano Boy' and signal gantry built from an early Set 5.

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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

The 24th Meeting of the Midlands Meccano Guild was held at Alcester on Saturday, 31st March, 1979, all day. The weather being very kind to us, we had the second really decent day in the month. This was a great relief to the committee knowing the long distances members travelled to be present.

Once again the hall was prepared by Dave Guilluame and Clive Hine and the Caretaker. The 'eats' were all laid on by Dave, a good attendance being aniticipated. Over 50 people attended, and upwards of 60 models were on display.

Emphasis seemed to be on the larger models for this meeting, there were several large Cranes, Tank Engines and a super Juke Box standing 4' high and 2' square.

Guests at the Meeting were a Journalist of a local monthly magazine which specialises a feature each month, and the lady who types our reports and newsheets.

The committee decided to revert to the original idea of a conducted tour of the models. This system had been tried before, and it was generally agreed that it is the best for our club. About 20 members spoke about their models and received the appreciation of the meeting. Tea was followed at 5.30 p.m., by a short business meeting where the Hon. Secretary explained the arrangements for Stoneleigh 1979 Town and Country Festival, and the charity exhibition at Stratford-on-Avon.

He also apologised to the Holy Trinity Club and the North Midlands Club for having a dates clash. The Hon. Secretary hoped to avoid this another year. The Hon. Treasurer explained how the Guild funds were spent and what comprised to make up the meeting fee, and also told members to expect an increase in the Guild subscription at the next Annual General Meeting.

Dr. Alan Partridge had called on the Hon. Secretary, prior to his engagement in India, and had left the winning model in his 'Build a Meccano Mouse' competition, and his own version of a Meccano Mouse.

These two models were on show during the Meeting. Correspondence from the TMG South Africa, the SAMC, Liverpool, and several overseas members was on display for all to read. After the conclusion of the business meeting, there was time for more 'free roaming' before tea and leftovers at 7.00 p.m. Several local members stayed to clear up and sweep up and to leave the premises in a tidy state.

Many thanks to all who took part in the most successful meeting yet.

The ladies who looked after the inner man were sincerely thanked for a very good spread, which was enjoyed by all.

NORTH MIDLANDS MECCANO GROUP

The Group's Spring Meeting for 1979 was held at the now-usual venue at Thurgarton on 28th April, and proved to be a very successful occasion with some thirty group members present and about forty-five models on display. And what models too! Inevitably the scene was dominated visually by the cranemen, with Mike Cotterill's supermammoth Gantry-Crane-to-end-all-gantry-cranes and two splendid Level-luffing Dockside Grabbing Cranes, quite different from each other, produced by Bert Shaw and Alan Scargill.

Coming a little down the sheer size spectrum there was plenty of interest in smaller models too; outstanding was Patrick Briggs' latest Astronomical Clock—accurate to 12 significant figures in its lunar gear trains, and believed to be the world's most accurate clock, bar none! More conventional, but just as interesting was Dick Portus' Blackstone twin-cylinder Generating Engine, a splendid large-scale model, and another fine sight was Jim Gamble's beautifully nickel-plated recreation of the old Bucket Dredger carefully decanting its load into a period Hornby truck. And so one could on, and on!

A special feature of the meeting was an auction of items donated by members, principally centring around photocopies of older literature. A great success; this left quite a number of members in position of returning home with bargains, and the Group profiting by some £30: grateful thanks are offered to all participants.

The next Group function was a public showing put on at Newark and Notts. Yesteryear Rally on 30th June/1st July. The Autumn meeting has been fixed for 22nd September. Newcomers are very welcome; present Group strength is about 50, but we're always pleased to see new faces, and there's a regular Magazine for members to keep in touch with their hobby. So if you're interested, contact the Secretary, Geoff Coles at 'Little Court', Bleasby, Nottingham.

G. M. Coles,
Hon. Secretary.

NORTH WEST MECCANO GUILD

The fifth annual NWMG Meccano Exhibition, held again in Wigan this year, was a huge success, attracting modellers from all points of the compass. Although the great day coincided with the Cup Final at Wembley, resulting in reduced public attendance in the afternoon, the show paid for itself quite adequately. The same hall is being re-booked for next year, when every effort will be made to secure a date more in line with the NWMG's 'traditional' slot of early April.

There's little point in attempting to describe the multitude of fine models on display that day, a good selection of photographs showing a few exhibits of the many, appears elsewhere in this issue. The Adult section of the model building contest was the subject of ferocious competition but Roger Wallis of Solihull carried off the first prize of a No. 3 set for his Juke Box. This produced excellent background music all day! Other prizes in the Adult section went to Roger Le-Rolland of the North Staffs. area, and Brian Reay, a member of the North Eastern Meccano Society Chris Wilson's fabulous Army lorry with tank secured him first prize in the Junior section, again a No. 3 set. Other prizes consisting of a PDU and a No. 1 set went to Francine and Julian Coles respectively.

The position of Editor of the North West Meccano Guild's monthly gazette 'Bits & Pieces' was taken over by John Nuttall, the club Treasurer. His style and presentation have certainly made an impact and his issues to date have been very well received by the members. The Press responded in fine style to the initiatives put forward by Norman Mason, the club's Chairman. Approximately half a page the week before, and half a page the week after the show, were devoted to Meccano matters, plus a radio interview & other publicity. The Meccano hobby should be all the better known in the North-West as a result of all these efforts, and may I thank all who assisted in any way!

Michael J. Walker
Hon. Secretary.

SOUTHERN CALIFORNIA MECCANO CLUB

The Spring 1979 Club meeting was held on the afternoon of Saturday April 7th, at the residence of Doug Lock in Manhattan Beach, California. Clyde Suttle showed the No. 9 and No. 4 Meccano sets in the latest colours along with 'C' and 'E' extension sets by Marklin, for display and comparison, along with the latest literature on both.

Due to a shortage of parts many of our model-building members are turning to the older parts available, cleaning and repainting them for use. Al Whidden of Embros, Ontario, has adopted a procedure whereby each part is either power wire brushed or sanded to obtain a suitable surface. Bent components are straightened out using a good hammer on a flat surface. The parts are then sprayed with zinc-chromate primer, or red-oxide primer. After this, they are laid out on aluminium foil for either brush or spray painting.

Five new members have been welcomed, they are Alfred Arruda of Fall River, Mass; Richard Collette of Ste. Agathe, Manitoba; Allan Myers of Phoenix, Arizona; Rudi Shipperus of Calgary, Alberta; and Joe D. Schultz of Montreal, Quebec.

The next meeting of the Southern California Meccano Club has been scheduled for October 6th 1979. July 7th meeting will have passed by the time you read this.

Clyde T. Suttle Jr.
Corresponding Secretary,
6062 Cerulean Avenue,
Garden Grove,
California 92645, U.S.A.

THE TRANSVAAL MECCANO GUILD

At our last meeting, held on Saturday the 10th March, we held the competition as announced in the January MM report i.e. for vehicles powered by neither electricity, clockwork, steam nor pyrotechnic devices. A total of 19 models were entered, the most common single type of power source being falling masses.

The competition was won by our visiting country member, Ian Laing who built his model with parts from Peter Matthew's collection. The motive power was provided by a heavy flywheel made up of 10 Circular Strips bolted together and running on a vertical spindle made from a Drift, the point providing a low friction bearing. Two sets of Multi-Purpose Gear Wheels transmitted the power from the flywheel (which was set spinning by means of an electric drill) to the rear axle. Once the flywheel was spinning the rear wheels were lowered onto the floor and the model rocketed forward (sideways into a chair on its first run). At the end of the hall it was turned around and the flywheel had enough momentum to send it more than half-way back again.

Second was Jacques Rossouw's falling mass-driven vehicle. It was a 4' high tower on a 12½" wheelbase chassis. The lead mass was suspended from a cord which passed over a 3" Pulley at the top of the tower and was wound around a Wooden Roller on the rear axle. The cord length was such that it unwound from the Roller as the mass reached ground level and the lightened vehicle free-wheeled on its hub disc rear wheels and Face Plate front wheels. The vehicle which came third by a close margin was Paul Hatty's free running car which was very light, with Face Plate wheels and discs on the axles to add momentum but not friction. It ran down a ramp to set it in motion.

In the other mass-powered vehicles the friction due to their total mass mitigated against long runs. Undoubtedly the most ingenious model was Mike Holland's pendulum powered vehicle. A swinging pendulum moved it forward in spurts, ratchets on the wheels preventing it from moving backwards during the back-swing of the pendulum. Abie Koegelenberg's model aero engined vehicle was disqualified as being a pyrotechnic device, but kept members on their toes when it got going and sped between their legs.

The T.M.G. was offered the use of a new hall at the Rand Show this year (it is an annual agricultural industrial show in Johannesburg). Although we had very little time to prepare it was decided to take the opportunity to exhibit and the Easter weekend but there were a number of new ones, the most spectacular being Peter Matthew's 3' diameter roundabout. ('Three abreast Gallopers')

Our oldest member, 79 yr. old Koos Pienaar built an electrically powered road lift bridge for the occasion. There were about 90 models on show varying from 'simplicity' models (to show that it is possible to have fun building with only a few parts) to Paul Hatty's giant 1: 12, P and H shovel. It was expected that one million people would visit the show, and a good proportion of these would visit our exhibition. A fuller account of our exhibit will be given in our next report.

Jacques Rossouw,
Hon. Secretary,
66 4th Avenue,
Parktown North,
Johannesburg 2293

HOLY TRINITY MECCANO CLUB

The 25th meeting of the club was held at Hildenborough on 29th April 1979. The hall was opened by 12 noon and the tables were set up by the early arrivals. Alterations to the hall made it easier to supply power outlets to the tables. As more members turned up all three rows of tables were soon occupied as well as the stage for the display of models.

Tea and biscuits were available by 1 p.m. for the early arrivals. Just after 2 p.m. the Chairman welcomed members and especially new members John Dean, John Westwood and Michael Potter and visitors Tony Hayward and Eddie Oatley—(Eddie later in the meeting formally became a member). Cards were available from the secretary for those models entering for the Stuart Wilson cup competition. Apologies for absence had been received from a number of members, some of whom were attending the exhibition at Stratford on Avon organised by Ernest Chandler.

The talks on selected models followed, as agreed at the AGM in

MECCANO GUILD

Dear Michael,

You. 'North West Frontier' article in the A/J J 1977 issue of the Meccano Magazine sang the praises of the old Meccano Guild. You suggested that it should once again play a more active role in the Meccano world. I agreed with you at the time, but now I find an even more pressing reason for agreeing with you.

My 2½ year-old son is the proud owner of some building bricks produced by a leading manufacturer, (he's too young for Meccano at the moment!). The latest catalogue from this company advertises a club, in which every member receives badges plus regular newsletters, for a very nominal subscription fee. These newsletters contain news of current developments, model-building ideas, competitions and even pictures of members' models. The club can be seen therefore to encourage the owners of these sets to purchase more sets and spare parts.

The new Meccano sets contain no such inducements for the purchaser, they no longer contain an advertisement for the 'MM', a sad state of affairs. A re-vitalised Meccano Guild, for a membership fee of say, £1, could issue regular newsletters on the lines above and thus promote extra sales. These in turn would help pay the runnings costs. The newsletter, perhaps named the 'Junior Meccano Magazine' shouldn't be too much of a problem to launch. New outfit models, pictures of members models, hints & tips on the techniques involved in Meccano construction and so on could combine to make an ideal publication for the younger enthusiast.

Many firms have realised that their sales, and therefore profits, will be much improved if they encourage their customers to buy more of their product. Surely this applies with equal force to Meccano Ltd, but of course it follows that if such a policy is to be successful the complete range of parts must be manufactured and sold,—but that's another problem.

Yours sincerely,
JOHN B. EVANS

Anglesey.

SUGGESTIONS

Dear Sir,

As a youth in the 1930's I always opened a new 'MM' at the Suggestions Section page(s). I guess many model-builders did, for some of the ideas were well worth incorporating into a model of one's own design.

I'm not suggesting many or all of these old suggestions should be resurrected but so many recent models shown in the 'MM' hide some very interesting and ingenious mechanisms.

Would it be possible to invite model builders who submit photographs of complete models to include at least one particular problem that could help others? Some of the individual club magazines feature some gems of ingenuity and it's a pity these hints are not passed on to the 'MM' by the Secretaries or Editors for wider circulation.

The Cavendish series of volumes are great, especially to the nostalgically inclined, but I would like to see a volume of modern suggestions, a really up-to-date Mechanisms Manual. For the serious enthusiast, Bert Love's 'Model Building In Meccano' book went some considerable way in this direction but one feels there are many gems of ingenuity that are lost. Obviously it would not be an economically viable proposition to produce a 'Super-Model Book' of today's wonderful models, but the ingenious solutions to particular problems should be made available for posterity.

At the risk of labouring the point one could give an example of lost ideas. The Rahn Clock which was illustrated and described in the March 1933 'MM', is in the storeroom of a Paris museum, (forgotten & no longer in working order). We have little or no idea of the fantastic problems M. Rahn tackled or how he overcame them.

Superb models will always act as a spur, building within a limited range of parts is a challenge, but 'how it was done' will keep the fascination alive.

Yours sincerely,
R. R. HAUTON

Lincoln

HAMMERHEADS

Dear Sir,

I was very interested in Mr. Palmer's letter in the January issue, and I would like to add a few notes of my own on the subject.

The 'Hammerhead' was a distinctly British deisgn, evolved for fitting out the large, tall steamships of the 20th century. (American and Continental builders in time replied with equivalent but less elegant designs). Known in the trade as Giant or Cantilever Cranes, about a dozen were made from c.1906 onwards. There were five on the River Clyde, two on the Tyne and others are in shipyards at Barrow, Hull and Sunderland. A handful also worked in the Naval dockyards. They were built on deep foundations and always electrically driven.

The design otherwise owed much to that of the Giant Block-Setting Cranes, but was much larger and heavier. Outstanding was one of the latest built, in 1930, for the Walker Naval Yard. The maker was Sir W. Arrol & Co. Ltd., Glasgow, and the capacity was 250 tons taken on 112 ropes.

Finally, SML 29 was regrettably a rather simplified reproduction of these fine cranes but nevertheless an impressive model of the period when such examples were in vogue.

Yours sincerely,
J. BROWNLIE

Kilsyth, Scotland.

'MECCANO SYNDROME'

Dear Michael,

The word 'Meccano' has by now become so well accepted into the English language that to the average man in the street it may well pass unrecognised as the trade name of a manufactured product. Believe it or not, the word has now entered into medical terminology.

In an article by Lord Taylor published in the Christmas 1978 edition of the British Medical Journal, the author described a medical complaint known as 'The Presenile Meccano Syndrome'. The 'victims' of this obsession apparently fall into the affluent middle-aged category, people who are able to buy huge Meccano outfits and indulge themselves after possibly many years of not being able to afford to do this.

In two out of three cases, the gentlemen concerned are content to gaze at their outfits through the cellophane wrappings, while the third, who has probably never constructed a Meccano model in his life, delights in dismantling the models of others and very carefully replacing the parts in the appropriate compartments of the carton. All three men are supposedly pathologically tidy in their work.

It should be stressed that the article was written in a tongue-in-cheek style, with the author describing other conditions such as the 'Pontius Pilate Syndrome' (where one washes one's hands of all responsibility), and 'The Multiple Bookcase Syndrome', (where one constructs, & continues to construct, bookcases).

Yours sincerely,
COLIN G. D. HOARE

Pointe Claire, Quebec, Canada.

CLUB ROUNDUP – continued

October, and continued until 4 p.m. when refreshments were available. Voting for the Stuart Wilson cup proceeded and the chairman called the meeting to order to discuss some business. The Secretary read a letter from Mr. Farrar, the Marketing Manager of Meccano Ltd., about enthusiasts building models from the new sets, particularly the No. 4 and 5 sets. A number of doubts were expressed about the feasibility of the project and the secretary was asked to reply to Mr. Farrar expressing the feeling of the members to the scheme. Mention was also made of the future exhibitions by the Solent club at Chichester and Waterlooville. Some members would be able to support one or both of these projects.

Further talks on the models continued and voting for the Stuart Wilson cup completed. The cup was won by Ray Senior for his model of a motor bike and sidecar and the cup was duly presented by the President, Tony Homden. Ray now shares the honours with Phil Bradley of winning the cup on two occasions, Ray having won it last in 1974 for his Paper-Folding Machine.

A full report on the models has been circulated to members. A varied selection from the 1920's to the present day showed the lasting virtue of Meccano—if the standard of the product is maintained. Clearing up after 'the show' was done by a willing band of helpers and the hall was cleared by 6.30 p.m.

Our next meeting will be at the Henley Exhibition August 31st & September 1st, and the next meeting at Hildenborough will be the AGM on October 27th 1979.

Frank Palin, Hon. Sec.,
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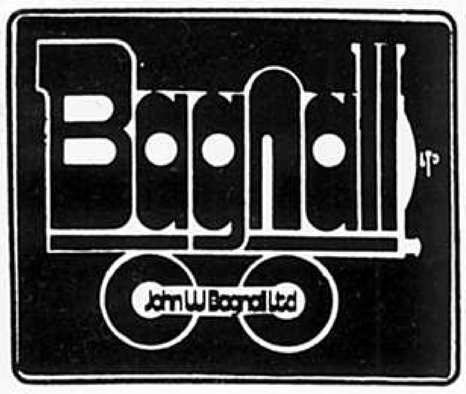

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