MECCANO® Magazine

APRIL 1968 VOLUME 53 NUMBER 4

Meccano Magazine, founded 1916.

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MAP **HOBBY MAGAZINE**

FRONT COVER

Artist Laurie Bagley captures Craig Breedlove's "Spirit of America —Sonic-1" at speed, on the Utah Desert, U.S.A., during one of many high speed trials and record runs. The story of this Jet Car appears on page 190, and you can make a simple model of it from the full-size plans on page 200.

NEXT MONTH

Full-size plans for Ray Malmstrom's "Brigadyr," a simple rubber-powered, free flight model, is the main feature, with yet another half-size plan for a simple all-balsa model. Trackside Construction continues with a simple OO gauge tunnel, whilst the A.B.C. of Railways describes some of the more common types of railway goods wagons. Many new interesting Meccano models will be described, together with Dinky Toy news. There will also be a special Captain Scarlet feature, as well as our other regular features, so don't miss this issue —easily recognisable with its futuristic Captain Scarlet S.P.V. and S.P.C. cover.

Advertisement and Subscription Offices: Model Aeronautical Press Limited, 13-35 Bridge Street, Hemel Hempstead, Hertfordshire. Tel: Hemel Hempstead 2501-2-3.

Direct Subscription rate 35/- per annum. U.S.A. and Canada direct subscription rate $5 including current index.

Publishers of Aeromodeller, Model Boats, Model Cars, Model Engineer, Radio Control Models, Model Railway News,

MODEL AERONAUTICAL PRESS LTD.

13-35 BRIDGE STREET, HEMEL HEMPSTEAD, HERTFORDSHIRE

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Pantograph in Plastic Meccano

A simple but very effective instrument for drawing larger or smaller images of a given illustration, constructed from Plastic Meccano Set A, by I. J. Smith.

ONE OF the earliest "mechanical gadgets" ever employed by draughtsmen and plan-makers was—and still is—the pantograph. With this basically very simple instrument, consisting of a series of pivotally connected strips, a pointer and a marker, it is possible to scale up or down almost any plan, sketch or picture without doing anything more difficult than outlining the original with the pointer while the marker produces a copy on a suitable piece of material. The simplicity of the basic instrument, in fact, is obvious from the photograph below supplied by Mr. I. J. Smith of Ipswich, Suffolk, which shows a Pantograph he built up using his son's Plastic Meccano Set A.

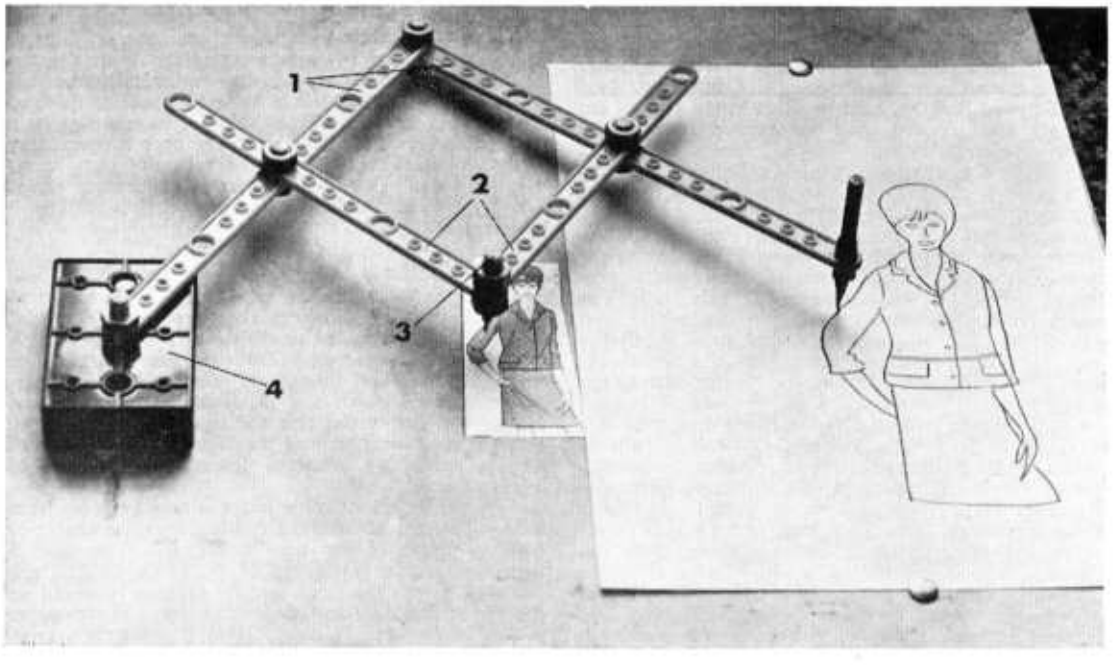
Construction is quite straightforward. The ends of two 5-hole Strips 1 are joined together, as also are the ends of two 4-hole Strips 2, using a 1 in. Bolt 3 in the latter case. Each Strip 2 is then bolted to corresponding Strip 1, as shown, a Base 4 also being attached to the free end of one Strip 1. Note that, in every case, the connection between the various parts must be sufficiently free to enable each part to pivot freely.

A pointer is next provided by any suitable object—a piece of cocktail stick, the end of a knitting needle, etc. —and is wedged into the hole in the centre of Bolt 3. Finally, the marker is obtained from a pencil or ball-point pen which is itself wedged in the free end hole of the remaining Strip 1. When using the Pantograph, incidentally, it is important to remember that the Base must never be allowed to move even a fraction of an inch during the execution of any particular drawing otherwise the finished product will be mis-shapen.

The above photograph shows Mr. Smith's Pantograph set up for producing a magnified image. If the subject is to be scaled down, then the positions of the pointer and marker should be reversed.

PARTS REQUIRED:

2—4-hole Strips	3—Bolts
2—5-hole Strips	2—1 in. Bolts
5—Nuts	1—Base



Meccano Motor Chassis by Spanner

Started last month, this concludes the first advanced Meccano model for experienced constructors. Last month "Spanner" dealt with the Chassis, Engine, Clutch, Gearbox, Front Axle and Steering.

SO FAR in this two-part article featuring the Meccano special display Motor Chassis introduced last month we have dealt with construction of the basic chassis, engine, clutch, gearbox and front wheel arrangements. We are now left with the rear axle, differential and a rather ingenious working cable brake operated from a foot pedal in the driving position.

Rear axle and differential

The basic rear axle and differential arrangement fitted to this model is more or less the standard Meccano construction found in many models. A 4 in. Rod carrying, in order, a Boiler End, a Collar, a Washer, a 1½ in. Contrate Wheel 74, two more Washers and a ¾ in. Contrate Wheel 75, is loosely inserted half way into the longitudinal bore of a Coupling. Loosely inserted into the other half of the Coupling is a 3½ in. Rod that also carries a Boiler End in addition to a ¾ in. Contrate Wheel, spaced from the Boiler End 76 by three Washers.

Held in the centre transverse smooth bore of the Coupling is a 1½ in. Rod on each end of which a Collar is fixed. Each Collar is connected to Contrate 74 by a 1 in. Screwed Rod 77, held by Nuts in the face of the Contrate and screwed into one tapped bore of the Collar. Screwed into the centre transverse smooth bores of the Coupling are two Pivot Bolts, each carrying a loose ¾ in. Pinion 78 that meshes with the ¾ in. Contrates.

Attached to each Boiler End by two 1½ × ½ in. Double Angle Strips 79 is a Wheel Flange 92 to the inside of which an 8-hole Wheel Disc is bolted to provide a bearing for the corresponding axle Rod. The two Boiler Ends themselves are now joined by four 2 in. Strips, one of which is spaced from the Boiler Ends by three Washers on the shanks of the securing Bolts. This Strip is overlayed by a Double Arm Crank 80.

Bolted to each pair of Double Angle Strips 79 is a Double Bent Strip 81 to the lugs of which a built-up leaf spring is fixed, the forward securing Bolt being screwed into the tapped bore of a Collar 82 instead of carrying a Nut. Two Washers space the Collar from the spring, which is built up from one 5½ in., one 4½ in., one 3½ in., one 2½ in. and one 1½ in. Strip. A right-angled Rod and Strip Connector is bolted to the rear end of the 5½ in. Strip while a Handrail Support 83 is bolted to the forward end of the Strip. This Handrail Support is loose on the shank of a ¾ in. Bolt, held by a Nut in the short lug of a 1 × ½ in. Angle Bracket fixed to rear Angle Girder 6. The Rod and Strip Connector is loose on another ¾ in. Bolt held by Nuts in a Fishplate and Reversed Angle Bracket 84 lock-nutted to a second 1 × ½ in. Angle Bracket fixed to Angle Girder 5.

Mounted, along with three Washers, on the shank of a ½ in. Bolt loose in the bore of Collar 82 is a Rod and Strip Connector which is fixed by a 1 in. Rod to another Rod and Strip Connector, bolted to Strip 2, but spaced from it by a Collar 85 on the shank of the securing Bolt.

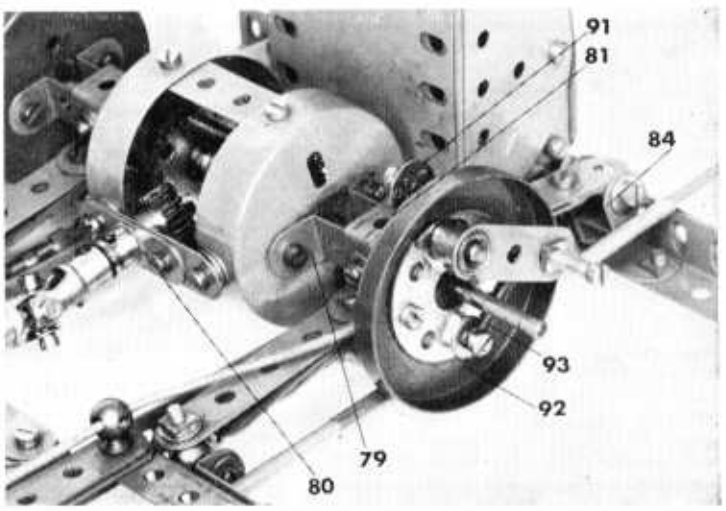
At this point, the transmission to the rear axle can be completed. A 1½ in. Rod is held, by a ½ in. Pinion 86 and a Universal Coupling 87, in the boss of Double Arm Crank 80. Pinion 86 meshes with Contrate 74, while Universal Coupling 87 is connected by a 2½ in. Rod to another Universal Coupling 88 on the output shaft of the gearbox.

At the rear of the model, a petrol tank is obtained from two vertically-mounted 2½ in. Angle Girders joined at the top by another, similar, Angle Girder. Bolted to their lower ends are two horizontally mounted 1½ in. Angle Girders joined by a 2½ × 1½ in. Flanged Plate 89. The front of the tank is then enclosed by a 2½ × 2½ in. Flexible Plate, while the back is covered by a 3½ × 2½ in. Flexible Plate and each side by a Semi-circular Plate. The finished item is attached to Strips 2 by a 2½ × ½ in. Double Angle Strip 90.

Working brake

The rear wheels are 4½ in. Road Wheels bolted to Wheel Flanges, but, before they are fitted, a special working brake is added to the nearside rear wheel. A Fishplate 91 is fixed on a Threaded Pin which is then journalled in Wheel Flange 92, being held by a Crank, to the arm of which a ¾ in. Bolt is secured by two Nuts. Attached to this bolt and to a ¾ in. Bolt held by Nuts in the lowest hole of the Wheel Flange is a tensioning spring 93, obtained from a short length of Spring Cord.

A rather ingenious cable brake is now built up from a 10 in. length of Spring Cord, through the centre of which a length of thin wire is threaded. The cable is then mounted in two Handrail Supports, fixed to appropriate Angle Girder 7, and in a Collar mounted on the Bolt securing forward Double Angle Strip 79 to Wheel Flange 92. It is important to remember, how-



Fitted to the Motor Chassis is a working cable brake. In this view, the rear near-side wheel has been removed to show the construction of the brake mechanism.

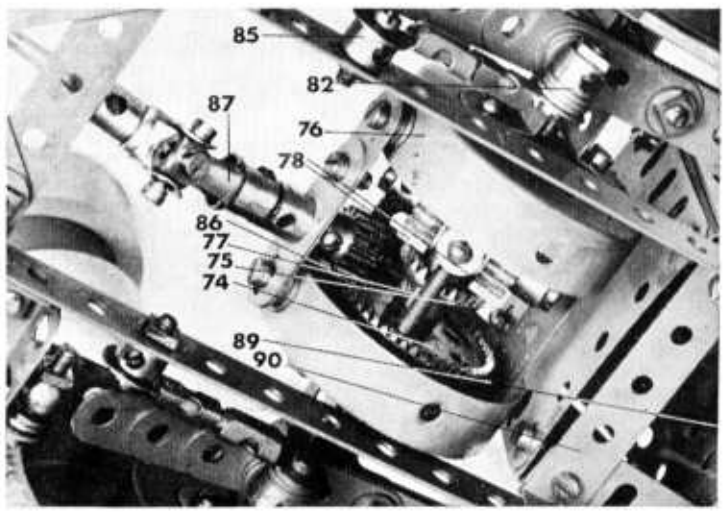
ever, that the Grub Screws securing the cable must grip only the Spring Cord and not depress the Cord so as to foul the wire in the centre.

Finally, the ends of the wire are looped, then one end is secured to a Bolt held by Nuts in Fishplate 91, while the other is fixed to a ½ in. Bolt screwed into a Collar 94. This Collar is mounted on one end of a 3 in. Rod journalled in Angle Girders 1 and held in place at its other end by a Crank 96. A Fishplate is attached to the arm of this Crank by an Angle Bracket to act as a brake pedal. Note that extended bearings for the Rod are provided by two 1½ in. Strips bolted one to each Angle Girder 1.

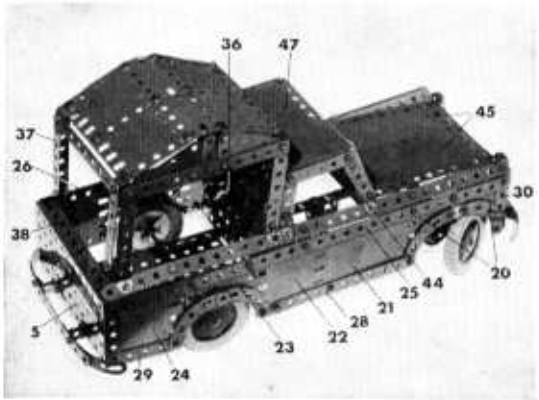
As mentioned at the beginning of this article, the motor chassis described here was built specially for display purpose. When on show, it was mounted on a wooden plinth inside which a slow-running electric motor was fixed. The motor was connected by Sprocket Chain to Sprocket Wheel 24 so that all the mechanisms were shown to be in " working " trim.

PARTS REQUIRED:

2—1	1—16a	3—63	2—140
5—1b	2—17	2—63d	2—147a
3—2	7—18a	1—64	2—147b
10—2a	4—18b	2—72	3—154a
2—3	1—20	1—77	2—154b
32—5	2—22	2—81	1—155
9—6	2—23a	3—82	2—162a
12—6a	6—25	1—89	1—163
2—8	4—26	2—90a	2—164
5—8b	1—28	1—96	2—175
9—9d	2—29	2—103d	2—179
9—9f	150—37	2—103h	1—185a
11—10	70—38	4—111	1—186a
6—11	2—45	4—111a	4—187b
13—12	1—46	8—111c	1—190
4—12a	6—48	1—115	1—190a
8—12b	1—48a	2—115a	10—212-
2—12c	2—48b	4—116	2—212a
1—13	3—51	2—120b	2—213
1—13a	1—58	2—125	2—213a
1—15a	24—59	8—133a	2—214
2—15b	4—62	6—136	2—215
6—16	2—62b	Approx. 12 in. of thin wire	



An underside view of the rear suspension and differential in close-up. The differential is a fairly standard Meccano construction and could be fitted as a complete unit into many model vehicles.



ICE CREAM VAN IN MECCANO

A No. 7 Outfit Plus model by SPANNER

An easily identified model, typical of the vans seen in towns, cities and holiday resorts throughout the summer season. It can be built with Outfit No. 7, plus an extra 12 Obtuse Angle Brackets.

IT'S NOT often that Meccano models stir up memories of long-forgotten episodes in my life, but the Ice Cream Van featured here certainly took me back a few years when I saw it. I remember when I was at school working during one summer holiday for eight or more hours a day in a van very similar in appearance to the model. It was parked on a beach in Cheshire and, as it was a beautiful summer that year, we were surrounded by long queues of customers nearly all day long. Believe it or not, I can honestly say that I have never been so hot for so long as I was in that van, surrounded by freezing ice cream and lolly ices! But to get down to the business in hand, the Meccano Ice Cream Van is a pretty straightforward model and should not present any difficulties.

Chassis

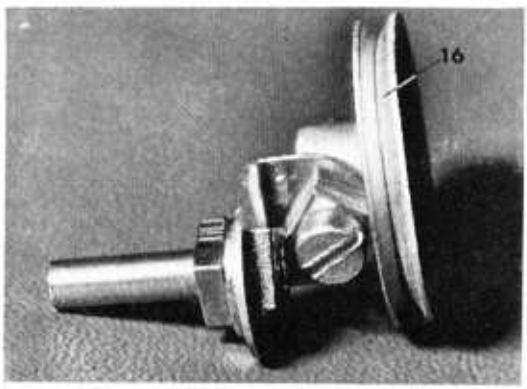
Dealing first with the chassis, two 12½ in. Angle Girders 1 are each extended rearwards a distance of four holes by a 3½ × ½ in. Double Angle Strip 2. Girders 1 are then joined by a 5½ in. Strip 3 and a 4½ × 2½ in. Flat Plate 4, the latter projecting a distance of two holes behind the Girders, while a 5½ × 2½ in. Flanged Plate 5 is bolted to the rear lugs of Double Angle Strips 2.

To the forward end of each Angle Girder 1, a 1½ × ½ in. Double Angle Strip 6 is fixed by one of its lugs, as shown. Attached to this Double Angle Strip is a 2½ × 1½ in. Flexible Plate 7, overlayed by a 5½ in. Strip 8 which is bolted between the Double Angle Strips at each side. The securing Bolt in each case also holds a Reversed Angle Bracket, the outside lug of which provides an anchoring point for the front bumper, built up from two Formed Slotted Strips 9 joined by a 5½ in. Strip. A rear bumper is similarly obtained, and is fixed to Flanged Plate 5 also by Reversed Angle Brackets.

Steering arrangement

Bolted through the fourth hole of each Angle Girder 1 is a 3 in. Strip 10 which is angled slightly, the two Strips then being joined together as shown. Note that the end of each Strip projects a distance of two holes over the edge of the corresponding Girder to allow room for a Double Bracket to be lock-nutted through its end hole. Fixed between the lugs of this Double Bracket by the locking Bolt is a 1½ in. Strip 11, Strips 11 at each side then being joined together by a 4½ in. compound strip 12, lock-nutted in place using ½ in. Bolts. The compound strip, which is obtained from two 2½ in. Strips, is spaced from Strips 11 by three Washers on the shank of each locking Bolt. Journalled in the lugs of each Double Bracket is a 1½ in. Rod held in place by a Collar and a 2½ in. Road Wheel 13.

A Trunnion is now attached to Strip 3 by Bolts 14



The special arrangement incorporated in the steering gear as it appears before being fitted to the lower end of the steering column. Care should be taken with its construction.

PARTS REQUIRED

4—1	1—15a	2—48a	4—187
12—2	4—16	2—48b	4—188
3—2a	2—18a	1—51	1—189
8—3	1—22	1—52	4—190
2—4	2—22a	2—53a	2—191
14—5	1—23a	8—90a	4—192
4—6a	1—24	2—111a	1—193e
4—10	6—35	4—111c	2—194
4—11	151—37a	1—115	2—194a
16—12	144—37b	4—125	4—215
1—12a	26—38	1—126	8—221
20—12c	2—48		

and a Fishplate is in turn fixed to its apex to provide one of the bearings for a 3½ in. Rod 15 forming the vehicle's steering column. Mounted on the lower end of the Rod is an arrangement (see accompanying photograph) which must be built up separately, as follows: an Angle Bracket is fixed to the boss of a 1 in. Pulley 16 by placing the Bracket in position with the hole in one lug coinciding with one tapped bore in the boss of the Pulley. A Nut is next placed over the hole in the Bracket and a Bolt is then screwed through both the Nut and the Bracket and into the bore of the Pulley boss sufficiently far to provide a firm mounting but not so far as to project into the central smooth bore of the Pulley. The Angle Bracket is then fixed tightly against the boss by means of the Nut. A Threaded Pin is attached to the free lug of the Angle Bracket, a Washer being used as a spacer.

The complete unit is now mounted on the Rod, with the Threaded Pin projecting through the elongated hole of a Fishplate that is attached to compound strip 12 by an Angle Bracket 17. The upper bearing for the steering column, incidentally, is provided by a 1 × 1 in. Angle Bracket 18 which will later be fixed to the body. Spaced from this Angle Bracket by a Collar is an 8-hole Bush Wheel, serving as the steering wheel. The rear wheels are 2½ in. Road Wheels mounted on a 5 in. Rod held by a Collar and a ½ in. Pulley 19 in Girders 1.

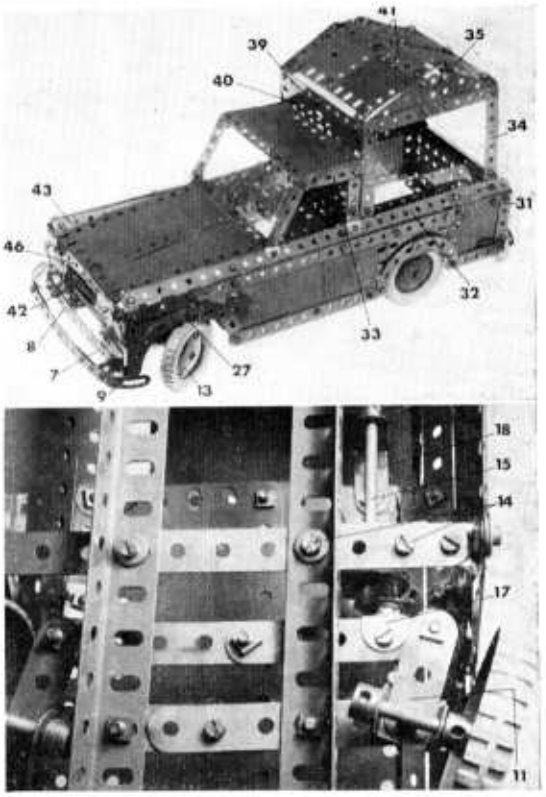
Bodywork

Next we come to the bodywork, each side being similarly built up from two 2½ × 1½ in. Triangular Flexible Plates 20, a 4½ × 2½ in. Flexible Plate 21, a 2½ × 2½ in. Plastic Plate 22, a 2½ × 1½ in. Plastic Plate 23 and a 2½ × 2½ in. Flexible Plate 24, all edged along the top by a 12½ in. Strip 25 on the outside of the Plates. In addition, Plate 24 is edged on the inside top by a 2½ × ½ in. Double Angle Strip 26. The wheel arches are each supplied by two 2½ in. Stepped Curved Strips, those at the front being joined by a Fishplate 27, while the lower edges of Plates 21 and 22 are overlayed by a 5½ in. Strip 28 and Plate 24 by a 2½ in. Strip 29.

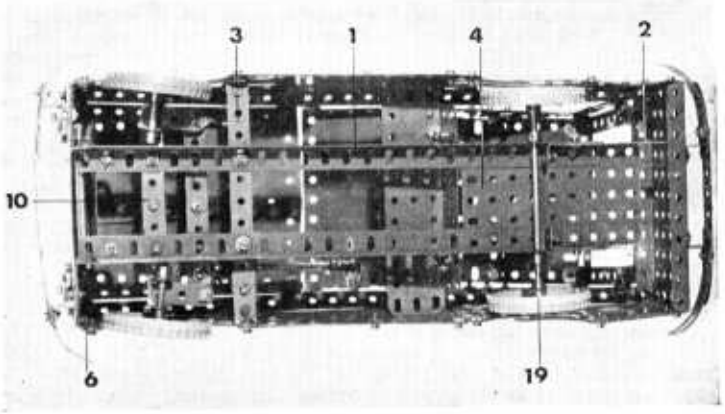
At the front of the model, the forward wheel arch is connected to Strip 25 by another 2½ in. Strip 30, the upper securing Bolt also fixing an Obtuse Angle Bracket in position. Another Obtuse Angle Bracket is held by Bolt 31, then the two are joined by a 14½ in. compound strip 32, obtained from a 12½ in. strip extended by a 2½ in. Strip. Two further Obtuse Angle Brackets are added at strategic positions.

Attached to compound strip 32, also by Obtuse Angle Brackets, are the cab window supports—two 2½ in. Strips joined by another 2½ in. Strip 33—and the sales compartment framework, supplied by two 3½ in. Strips 34 joined by a 5½ in. Strip to which are bolted two 2½ × 1½ in. Triangular Flexible Plates and a 1½ in. Strip 35. Bent to shape and bolted between the cab window rear supports is a 5½ × 2½ in. Flexible Plate,

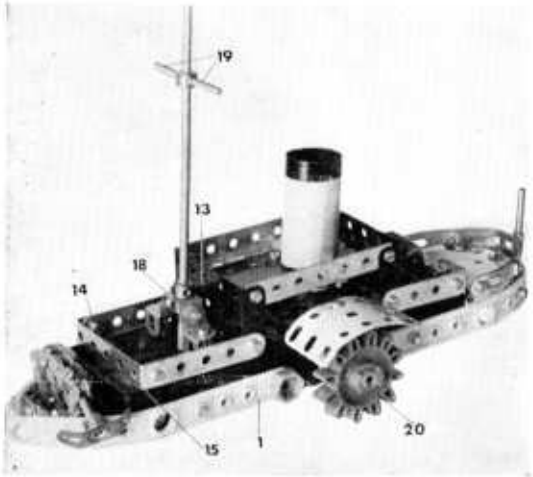
Continued on page 208



Above top: built with Meccano Outfit No. 7 plus a few extra Obtuse Angle Brackets, this model Ice Cream Van is typical of the vehicles found in holiday resorts all over the country. Above: a close-up of the steering gear. Note that, although Strips 11 and 12 are lock-nutted together, they are separated by three Washers on the shank of each securing Bolt.



An underside view of the model showing the general layout of the chassis as well as the steering gear.



PADDLING FOR PLEASURE

It's loads of fun making this little Paddle Steamer, built from a mixture of metal and Plastic Meccano by SPANNER.

EVER SINCE *Meccano Magazine* reappeared at the beginning of the year I have stressed that Plastic Meccano, besides being a self-contained constructional system in its own right, is specially designed to be used with the standard metal Meccano system if required. Although the theme of Plastic Meccano is "Big Pieces for Little Hands," the large holes in the various parts, designed to accommodate the big Bolts and Axles in the system, are interspaced with small holes to the same diameter and spacing as those in standard Meccano Parts. Result—the two systems can be "mated" without any trouble at all.

Plastic Meccano, of course, is mainly intended for young children whose fingers are not agile enough to deal with the comparatively tiny Nuts, Bolts and other parts found in the standard system. The built-in design enabling the two systems to be used together is for those more experienced youngsters who, having mastered the plastic system, are making a gradual change-over to metal Meccano. There is, however, another almost coincidental reason for combining metal and Plastic Meccano. In certain circumstances far more realism can be produced using Plastic Meccano than might otherwise be obtained with standard metal parts or, alternatively, sufficient realism might be obtained easily, using a few plastic parts, whereas a highly complicated construction could be needed to give a similar effect with standard Meccano. To put it more simply, Plastic Meccano can have advantages over metal Meccano in some models, and the little Paddle Steamer featured here is just one example showing this to be true.

Construction presents no problems. The hull is built up from two Plastic Meccano Bases, bolted end to end, as shown. To each side of the forward Base a 3-hole Strip 1 is fixed by one Plastic Nut and Bolt and one metal Nut and ½ in. Bolt, while a 5-hole Strip 2 is shaped to form a "U" and is fixed to the sides of the rear Base by only metal ½ in. Bolts in this case. The

Continued on page 213

PARTS REQUIRED:

STANDARD MECCANO

3—5	1—13a	1—48a	1—126a
2—6	3—18a	2—51	1—138
2—9b	1—22	7—59	1—154a
5—10	1—22a	1—62b	1—154b
2—11	2—35	2—82	2—188
1—11a	57—37a	2—111	2—194
9—12	40—37b	6—111a	1—212
2—12b	2—38	9—111c	1—214
2—12c	2—38d	2—125	2—215

PLASTIC MECCANO

2—3-hole Strips	3—Nuts
1—5-hole Strip	2—12-teeth Gear Wheels
2—Bases	30—Chain Links
3—Bolts	1 4½" AXLE

Ice Cream Van—continued from page 207

extended downwards to Girders 1 by a 4½ × 2½ in. Flat Plate 36. A 5½ × 1½ in. Flexible Plate is fixed to this Flat Plate by Angle Brackets to act as a driving seat.

At the back of the model, a 3½ in. Strip 37, extended downwards by an Obtuse Angle Bracket, is fixed by Angle Brackets to Strip 34 at each side, then the Obtuse Angle Brackets are connected by a 4½ in. Strip 38. Another 4½ in. Strip is bolted between Strips 37 at the top, while a further 4½ in. Strip 39 is attached by Angle Brackets between forward Strips 34, the securing Bolts are holding two 2½ × 1½ in. Flexible Plates 40 in place. The sales compartment is then completed with a roof, obtained from four 2½ × 2½ in. Flexible Plates joined by two 2½ × 1½ in. Flexible Plates 41, which is fixed in place by Obtuse Angle Brackets.

Before enclosing the cab it is best to finish the radiator-grille and bonnet, which can be done without any great difficulty. The radiator-grille consists quite simply of three 3½ in. Rods held by Spring Clips in the flanges of a 2½ × 1½ in. Flanged Plate 42, fixed by Double Brackets to Girders 1. A 5½ in. Strip 43 is then attached to each compound strip 32 by an Angle Bracket at the front end, these Angle Brackets also being connected together by another 5½ in. Strip, the ends of which are angled upwards to fit in place. Yet another 5½ in. Strip 44 with angled ends is bolted between compound strips 32, and the two are connected by two 5½ × 2½ in. Flexible Plates 45 to provide the bonnet. Angle Bracket 18 is bolted to the underside of Strip 44.

The upper edges of Flexible Plates 7 are joined by a 5½ in. Strip 46, at the same time fixing the Plates to the sides with Angle Brackets. Two 1 in. Pulleys without boss are added to the Strip, using ⅜ in. Bolts, to serve as headlamps and, finally, the cab is completed with a 5½ × 2½ in. Flexible Plate 47 for the roof and a 5½ × 2½ in. Transparent Plastic Plate for the windscreen, both bent to shape.

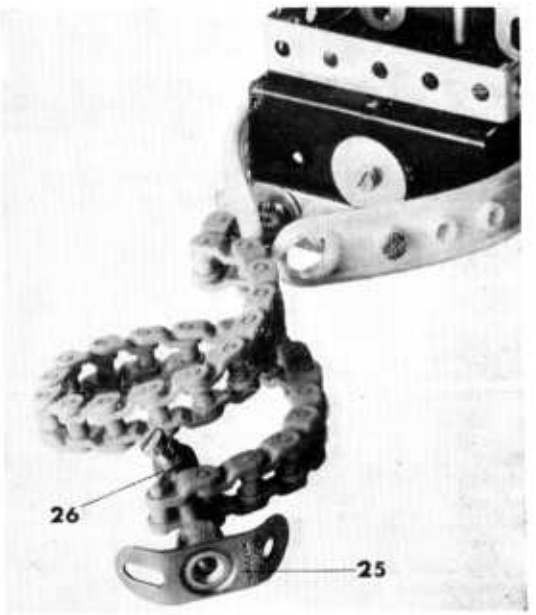
free ends of Strips 1 are brought together at the front to represent the bow and are held in position by two standard Obtuse Angle Brackets joined by a Fishplate 3. At the stern, the "after-deck" is provided by a Flat Trunnion 4, fixed to Strip 2 by a standard Angle Bracket, the securing Bolt also fixing in place a Rod and Strip Connector, carrying a 1½ in. Rod 5.

Also fixed to Strip 2 are two Fishplates 6, to the upper ends of which two shaped Formed Slotted Strips 7 are bolted, the securing Bolts also holding two Angle Brackets 8. The free lug of each of these Angle Brackets projects beneath Flat Trunnion 4, but it is not bolted to the Trunnion. Lying on top of the Trunnion, on the other hand, is a Semi-circular Plate 9, attached to the rear Base by a Double Bracket, remembering to fit a ¾ in. Washer on the Bolt to lie over the large hole in the Base. Bolted to this Semi-circular Plate are two Angle Brackets 10, the upper lugs of which are also bolted to Formed Slotted Strips 7. A further two Angle Brackets are bolted to the top of the Plate to provide anchoring points for two 1 × ½ in. Angle Brackets, to the small lug of which a metal 2 in. Strip 11 is fixed. Bolted between the free ends of these Strips is a 2½ × 1½ in. Flanged Plate 12.

Another 2½ x 1½ in. Flanged Plate 13 is bolted between two 2½ in. Strips, attached to the forward Base by standard Angle Brackets 14, the securing Bolts also fixing a standard 2½ x ½ in. Double Angle Strip 15 between the Strips. Flanged Plates 12 and 13 are now joined by two 3½ in. Angle Girders 16, the centres of which are themselves joined by a 2½ in. Strip 17. Bolted to this Strip is a 3½ × 1½ in. compound plastic plate, obtained from two standard 2½ × 1½ in. Plastic Plates. Above this and bolted to Girders 16 is a Raked Ship's Funnel (standard Part No. 138).

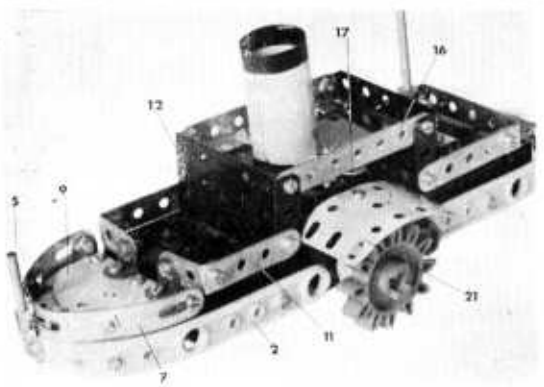
A mast is next provided by an 8 in. Rod, held by Collars in a Double Bracket 18. The lugs of this Double Bracket are bolted to one right-hand and one left-hand Corner Angle Bracket, each of which is fixed to the top of the forward base by a ¾ in. Bolt, but is spaced from it by two Collars on the shank of each Bolt. The "crosstrees" is built up from two 1 in. Screwed Rods 19 mounted in the transverse tapped bores of a Collar situated about 1½ in. from the top of the mast. The mast, incidentally, projects some distance downwards through the centre hole in the forward Base.

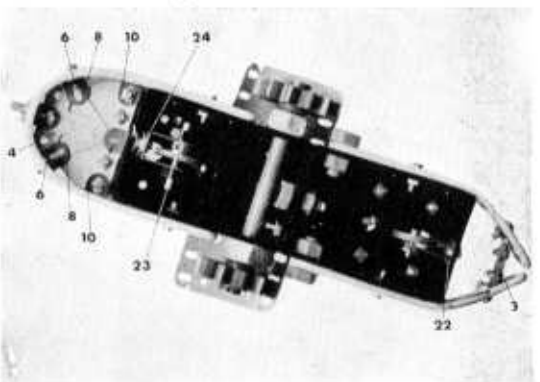
We come now to the paddle wheels, which illustrate admirably the point I made earlier about a few Plastic Meccano parts often giving as good an effect as a whole load of standard Meccano parts. Each paddle wheel, in fact, is obtained from only one Plastic Meccano Part—a 12-teeth Gear Wheel 20, mounted on a



4½ in. Axle journalled in the forward side holes of the rear Base—and the effect is excellent; better even than it would be possible to produce with standard Meccano considering the size of the model! A cover for each wheel is provided by a shaped 2½ × 1½ in. Flexible Plate 21, attached to the rear Base by a Reversed Angle Bracket.

Finally, because the Paddle Steamer is only a model representation, and cannot actually float, two jockey wheels are provided to enable it to run on land. The front wheel consists of a 1 in. Pulley without boss on a 1½ in. Bolt lock-nutted in a Single Bent Strip 22 fixed to the forward Base by a Fishplate, again remembering to include a ¾ in. Washer. The rear wheel is a 1 in. Pulley with boss, mounted on a 1½ in. Rod 23 held by Spring Clips in the lugs of a 1 × ½ in. Double Bracket 24. This is attached to the rear Base, also by a Fishplate and then an anchor, connected to the boat by a number of Plastic Meccano Chain Links, is built up from a standard Double Arm Crank 25, the arms of which are bent to shape. Mounted in the boss of the Crank is a 1½ in. Rod, towards the top of which a Collar 26 is fixed by two standard Bolts.



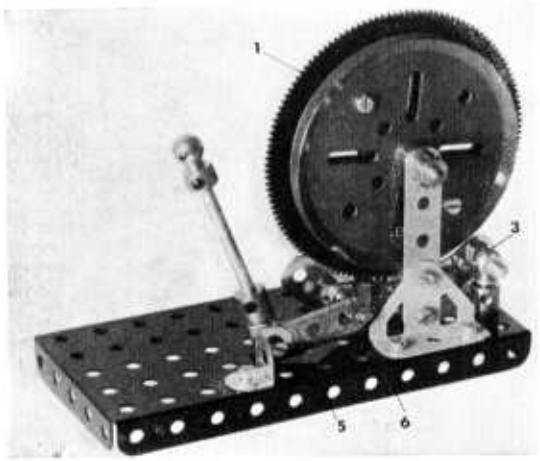


AMONG THE MODEL BUILDERS with Spanner

★ Winding Drum Brake for cranes
★ Simple Roller Bearing
★ Adjustable Throw Crankshaft
★ Vertical Shaft Bearing

FEATURED IN our February issue was an interesting Twin-Drive Unit for cranes designed by a reader in Burton-on-Trent. Since then I have received details of a very effective brake for the winding drums of cranes from Mr. J. G. Gamble of Lenton, Nottingham, and, as this is an extremely useful piece of apparatus, I felt it a must for this article.

Mr. Gamble, whose mechanism appears in the accompanying photographs, writes, "I designed this brake for a dragline I'm in the process of building. It is set up here, as is obvious, for demonstration." It follows from this, of course, that it is the actual mechanism that matters, not the mounting, which depends entirely on the model to which the brake is fitted. In other words, the accompanying pictures (and the following description) show Mr. Gamble's brake mounted on a $5\frac{1}{2} \times 2\frac{1}{2}$ in. Flanged Plate. In a model, this Flanged Plate might well be replaced by a different or collection of different parts. As the brake stands, however, a $3\frac{1}{2}$ in. Gear Wheel 1 is mounted on the Rod normally carrying the crane winding drum, this Rod being journalled in two $2\frac{1}{2}$ in. Strips each bolted to a Trunnion fixed to the $5\frac{1}{2} \times 2\frac{1}{2}$ in. Flanged Plate. Attached to the Gear, but spaced from it by two Washers and a Nut on the shank of each securing Bolt, is a 3 in. Pulley carrying a 6 in. Driving Band in its "V" groove. Acting on this Driving Band is a "brake shoe" obtained from a 3 in. Stepped Curved Strip 2, *stiffly* pivoted at one end on a Handrail Support 3 screwed into a Threaded Boss, which is itself bolted to the $5\frac{1}{2} \times 2\frac{1}{2}$ in. Flanged Plate.



The operating lever is a suitable Axle Rod, to the lower end of which is fixed a Rod Socket 4 screwed into one transverse tapped bore of a Threaded Crank 5. The complete arrangement is then pivotally connected, as shown, to a right-angled Corner Angle Bracket, using a $\frac{3}{4}$ in. Bolt screwed through the Bracket and into the central bore of the Threaded Crank, where it is lock-nutted *stiffly* in place. The arm of the Crank is, in turn, pivotally connected, using a Pivot Bolt, to Curved Strip 2, but it is spaced from it by a Washer and a Compression Spring 6 on the shank of the Bolt. A Handrail Coupling 7 is mounted on the upper end of the brake operating lever. Drive to the winding drum Rod is, of course, transmitted via Gear Wheel 1.

PARTS REQUIRED:

2—5	1—52	2—126
1—16	2—59	1—136
1—17	1—62a	1—136a
1—19b	1—64	1—147b
1—27b	1—89a	1—154a
18—37a	1—111	1—179
9—37b	3—111a	1—186a
6—38	1—120b	

N.B.: The above Parts List applies to the Crane Brake exactly as it is illustrated.

Small Roller Bearing

On a different subject, but still with Mr. Gamble, we come to a small roller bearing, details of which he sent along with his Crane Brake. The most common use for a roller bearing, of course, is in a crane, where it gives the swivelling superstructure a good, strong "seating," at the same time allowing it to turn with the minimum of friction. Long-established readers of *Meccano Magazine* will know that we have featured many built-up roller bearings over the years, perhaps one very similar to Mr. Gamble's, yet his is such a strong but simple mechanism that I feel it well worth including here for the benefit of our newer readers.

A glance of the relevant pictures will show you just how simple it is. A roller race is built-up from eight $\frac{1}{2}$ in. Pulleys without boss 1, each loose on a $\frac{3}{4}$ in. Bolt, lock-nutted to a Hub Disc 2. The locking Nuts must be as close as possible to the tip of the Bolt. The roller race is then "sandwiched" between two 6 in. Pulleys 3, Pulleys 1 riding on their angled circumferences. Lastly, a $1\frac{1}{2}$ in. Axle Rod is fixed in the boss of lower Pulley 3, is passed through the centre of Hub Disc 2 and the boss of upper Pulley 3, to be held in position by a Collar 4. Note that the Rod is free in the boss of the upper 6 in. Pulley.

The final word comes in the form of a hint from Mr. Gamble himself. "The 'V' groove in the large wheels," he writes, "offers a perfect track for a friction drive using a Small Pulley fitted with a Motor Tyre."

PARTS REQUIRED

1—18a	16—37a	8—111
2—19c	1—59	1—118
8—23		

A useful Brake, at left, for the winding drums of Meccano Cranes, designed by Mr. J. G. Gamble of Lenton, Nottingham. Although very simple in design, this mechanism is extremely effective in operation.

Adjustable Throw Crankshaft

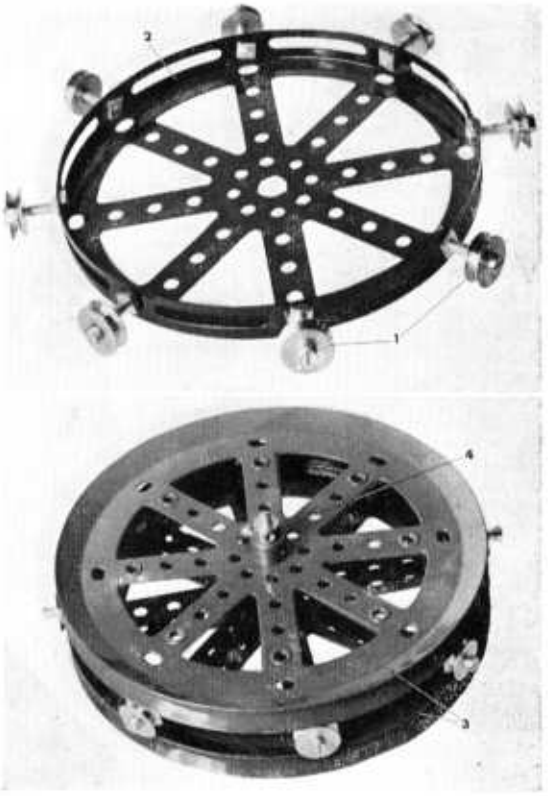
Keenly interested in the sort of mechanical designing machine we have christened "Meccanograph" is Mr. H. J. Halliday of London, S.E.15. Judging from past correspondence, in fact, I would classify him as an expert on "this ever-fascinating gadget," as he calls it. He has certainly produced some mechanisms seemingly insignificant in their simplicity, which, in actual practice, tremendously increase the scope of a "standard" Meccanograph such as that featured in the current 7/8 Instructions Manual. The adjustable Throw Crankshaft illustrated here is just such a mechanism.

In a Meccanograph, one of the chief ways of varying the pattern is to alter the throw of the crank actuating the pen arm. What is required, therefore, is a variable throw crank and most standard models do incorporate such a mechanism. It's usually a pretty basic thing, however, allowing only limited changes to be made, while Mr. Halliday's mechanism is a very much more sophisticated offering. As he says, "With careful building of the unit, a range of "throws" from absolute zero to a maximum of 2 in. is obtainable in 25 stages, with a positive setting at each stage." This is a vast improvement.

The accompanying diagram of the Crank, with its key, is so self-explanatory that no building instructions are necessary, but I must leave the last comment on the Unit to Mr. Halliday, who writes, "I would point out that the Meccanograph into which it is fitted at the moment is not the standard Meccano model, but I don't doubt that enthusiasts for this partciularly model are quite capable of any modifications that may be necessary to make the mechanism fit in." I'm sure he's right!

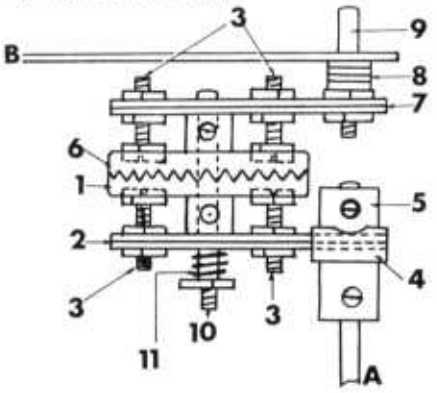
Final hint

I close this month with a useful model-building "tip," also supplied by Mr. Halliday, on a method of greatly reducing the friction resulting from a considerable weight acting on the bearings of a vertical shaft. In most cases, the bearings of a vertical shaft are supplied by Strips or Plates or perhaps the bosses of Bush Wheels, etc., the shaft passing through a hole in the part, and usually being held in place by Collars or Pulleys. The weight of any equipment mounted on the shaft forces the securing Collar against the adjacent bearing, causing friction. Mr. Halliday's solution is easy: simply replace the lower bearing with a Rod Socket, used as a "footstep bearing," and mount the shaft in this, first inserting a $\frac{5}{8}$ in. ball bearing. (This last is not a Meccano part but it is easily obtainable from any bicycle repair shop.) "The ease with which a vertical shaft will spin after this operation is most startling," says Mr. Halliday.

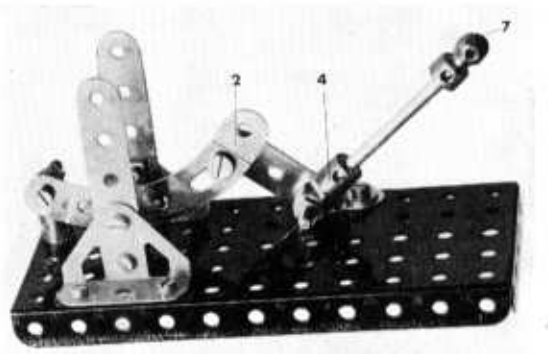


Also designed by Mr. Gamble of Lenton, Nottingham, is this small Roller Bearing, above, which, he informs us, has proved highly successful in his own models. As this picture shows, the actual roller race consists quite simply of eight $\frac{1}{2}$ in. Pulleys loose on $\frac{3}{4}$ in. Bolts fixed by Nuts in a Hub Disc.

Mr. Gamble's Brake, below, with the $3\frac{1}{2}$ in. Gear Wheel and 3 in. Pulley removed. Note that the winding drum of the Crane would be mounted on the Rod normally carrying these parts.



An Adjustable Throw Crank at left, designed by Mr. H. J. Halliday of London, S.E.15. KEY: 1—$1\frac{1}{2}$ in. Contrate; 2—2 in. Strips; 3—$\frac{1}{2}$ in. Bolts; 4—Slide Piece; 5—Collar; 6—$1\frac{1}{2}$ in. Contrate; 7—two 2 in. Strips; 8—packing Washers; 9—Threaded Pin; 10—Long Threaded Pin; 11—$\frac{1}{2}$ Compression Spring; A—Meccanograph driven Rod; B—Meccanograph pen arm.



THE MAGIC OF MECCANO

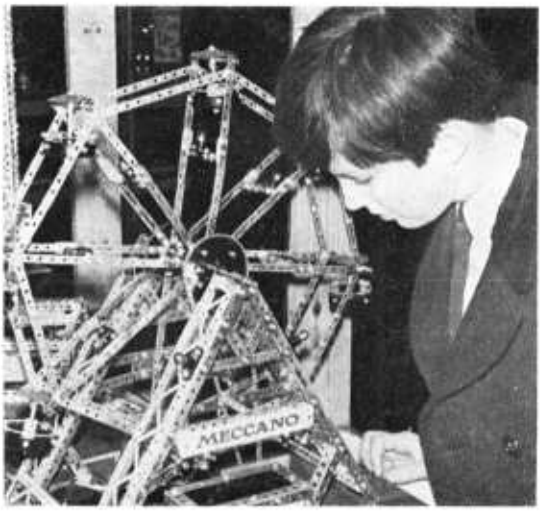
A short report and list of winners from the Meccano contest at the Schoolboys and Girls Exhibition, Olympia, last January

THE MAGIC of the Meccano constructional system was displayed to all who attended the Daily Mail Schoolboys and Girls Exhibition at Olympia this year.

Meccano Ltd., Liverpool, and the *Meccano Magazine* were well represented with a large corner stand just off the central hall's main entrance. The accent was on action, with plenty of working Meccano display models and audience participation in a content organised on the stand. The contestants had to construct a Meccano Lorry composed of 93 parts in the shortest possible time against five other contestants. Six competitors sat down to each contest, run every half hour, each winner having a choice of a Meccano Playset or Plastic Meccano Set A. Besides, each contestant was presented with a free January *Meccano Magazine* and could purchase the February issue if they wished.

In all 834 boys and girls entered the contest and 139 heat winners were found from the 139 contests run. Such was the interest in the contest, that queues very often formed enforcing a long wait for lucky contestants. The age range was wide, youngest being six years old and the oldest 15 years, including a few girls.

The versatility of the Meccano constructional system was demonstrated by the master timing clock, this, unbeknown to most contestants, being operated by a Meccano Electric Motor with standard Meccano Gears; also a panel of gear and pulley layouts attracted a lot of interest. With a 15 minute limit on building time, after which a run-off for the two most advanced contestants was held, 12 minutes was reckoned as a good time, but 13-year-old Peter Lawrence of Oaklands Road, Hanwell, London, W.7, the overall Exhibition winner, just flew through his Meccano Lorry in 9 minutes and 48 seconds. Such an effort deserved a worthwhile prize, and this Peter received after the Exhibition.



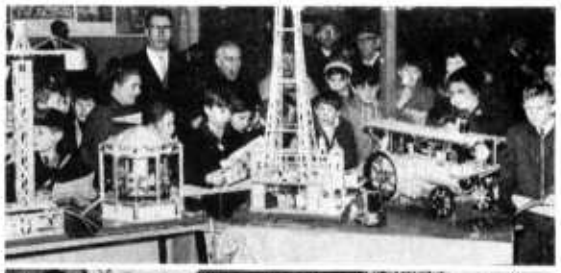
Peter's prize was a No. 6 Meccano Outfit and it was presented to him by W. G. Lines, Esq., Chairman of Meccano Ltd., at the Tri-ang Toy Fair on Monday, January 22nd, held at Tri-ang House, London. Peter explained his Meccano interest to Mr. Lines and was privileged to be shown some of the new products to be marketed during 1968-69 by Meccano Ltd., including some not yet released Dinky Toys—lucky lad. Congratulations, Peter—we hope to see you at next year's Exhibition trying to make it two in a row!

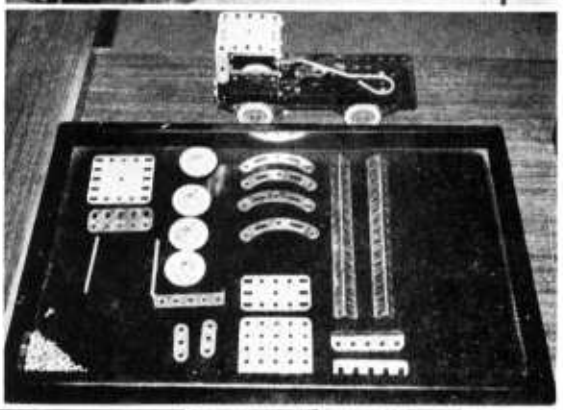
Mr. W. G. Lines, Chairman of Meccano, presents Peter Lawrence with his No. 6 Meccano Outfit at the Tri-ang Toy Fair. At left, Peter examines a motorised Meccano display model.

★ Contest Heat Winners ★

BEDFORDSHIRE: S. Heath, Dunstable. **BERKSHIRE**: A. Matthissen, Sunninghill; J. Cox, Maidenhead. **BUCKINGHAMSHIRE**: T. Thornton, Beaconsfield. **CAMBRIDGESHIRE**: D. Blunn, Cambridge. **DERBYSHIRE**: R. Booth, Chesterfield. **ESSEX**: M. Lethan, Romford; S. Trayman, Ilford; S. Turner, Romford; M. Bateman, Rainham; T. Falcon-Uff, Romford; S. Takobeck, Theydon Bois; K. Wynne, Hornchurch; G. Claridge, Dagenham; R. Barton, Romford; P. Rhodes, Ilford. **GLOUCESTERSHIRE**: N. MacDawell, Archdeacon Street. **HAMPSHIRE**: D. Foley, Alton; M. Prince, Southampton; L. Underdown, Portsmouth. **HERTFORDSHIRE**: J. Lee, Hemel Hempstead; G. Perry, Berkhamsted; S. Kearney, Ware; M. Evans, Watford; M. Benson, Hemel Hempstead. **KENT**: P. Jones, Tunbridge; P. Bridges, Nr. Faversham; C. Randall, Welling; M. Green, Barnehurst; J. Hooper, Shortlands. **LINCOLNSHIRE**: S. Fell, Brigg. **LONDON**: R. Jackson, Lynewood Close; S. Hotham, Tottenham; T. Pearce, Clem Atlee Court; P. Lacey, W.12; B. Webb, Stepney; A. Grey, Blackheath; G. Horncastle, Stepney; S. Charnley, Mile End; J. Champkin, Barnes; C. Gray, S.W.3; C. Cockerell, Fulham; A. Lawrence, Hanwell; H. Davies, Hendon; A. Dillon, Streatham; T. Ronson, N.W.11; M. Owen, W.4; M. Keegan, West Ealing; N. Reeves, Cricklewood; Miss J. Greenwood, Hendon; G. Richards, Eltham; D. Spinks, Forest Hill; D. Charles, Golders Green; P. Briscall, Chingford; D. Bushell, Roehampton; M. Gee, Hallfield Estate; A. Karsan, W.1; J. Gaffney, N.19; P. Blunden, Ealing; G. Smith, Hanwell, W.7; G. Macey, Palmers Green, N.13; A. Stickley, East Dulwich; K. White, Fulham; M. Borudan, Friern Barnet; P. Roseberg, S.W.16; J. Harrison, S.W.19; J. Nuttall, Mill Hill; R. Tuckwell, Fulham; K. Kierns, Brixton; R. Oscroft, N.W.10. **MIDDLESEX**: C. Edwards, Pinner; K. Bishop, Harrow; B. Taylor, Kenton; P. Saunders, Harrow; N. Bradbury, Potters Bar; T. Jones, Twickenham; N. Taylor, Greenford; P. Myrants, Harrow; J. Savage, Isleworth; D. Wedd, Shepperton; P. Cumber, Teddington; G. Behr, Greenford; J. Parsons, Heston; C. Peers, Hanworth; C. Ellson, Kenton; N. Brant, Brentford; D. Boorman, Hounslow; P. Crush, Hounslow; K. Hall, Hounslow. **NORFOLK**: G. Overell, Thetford. **NORTHANTS**: M. Dixon, Peterborough. **NORTHUMBERLAND**: J. Ellwood, North Shields. **OXFORDSHIRE**: D. Butterfield, Tiddington; P. Foxley, Emmergreen. **SURREY**: M. Gibson, New Malden; M. Winsbury, Worcester Park; L Naef, Lightwater; A. Corbett, Ashtead; R. Garrett, Sutton; S. Meech, Warlingham; K. Bosher, Thorpeley; N. Hemming, Caterham; P. Saunders, Kew; M. Wright, Mitcham; R. Burch, Redhill; N. Bruver, Richmond; J. Gribble, Carshalton; C. Blackler, Wallington; D. Worth, Ashtead; I. Hudson, Milford; J. Knight, Wallington; P. Gilbert, Walton-on-Thames. **SUSSEX**: C. Patrick, Lewes; J. Gordon, Chichester; D. Mint, Brighton.

17 others did not leave their names and addresses.





At right, top to bottom. A selection of the Meccano show models on display in the Meccano stand. Mike Rickett, Meccano Limited, Liverpool, looks at his watch as the six lucky contestants commence construction of their lorry. Next, we see the lorry composed of 93 parts in its finished form, with the trayful of components. Below, some of the lucky contestants, left to right, were Howard Eastwood, Adrian Worth and James Gray, seen reading his free Meccano Magazine.