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FRONT COVER

The winning model in the very successful Meccano "Globe-Trotting" Competition, a magnificent working steam powered model of a locomotive in Disney World by Mark Knowles of Laverstock, Salisbury, Wilts. An article on the construction of this super model will feature in the first Meccano Magazine Quarterly.

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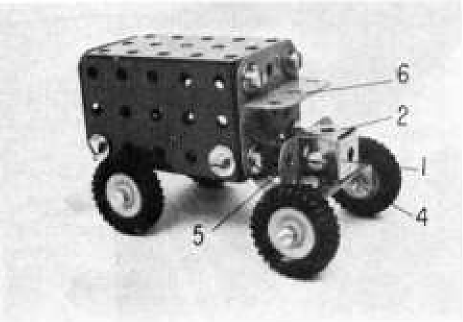
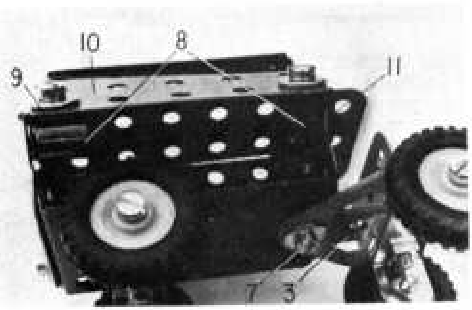
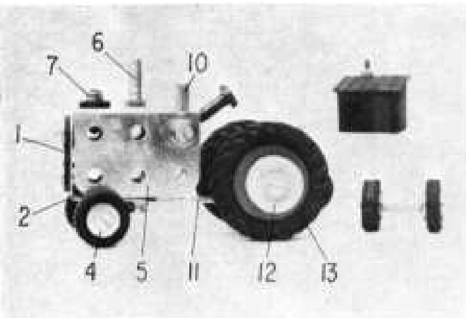
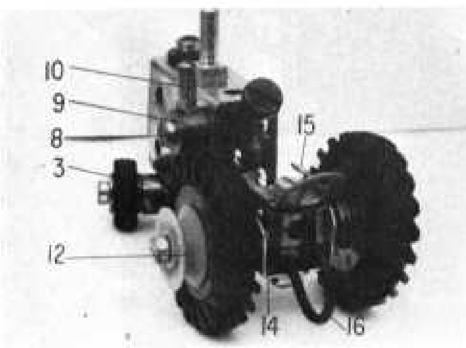
New Ideas for 'Tyred' Models

By Mike Nichols









THROUGHOUT Meccano's long history, one group of models have been constantly popular—the "simplicity" models, where the idea is to make a recognisable representation of the prototype with as few parts as possible. One of the main difficulties encountered in this type of modelling, however, is the representation of tyred road wheels and, in fact, as the smallest tyre in the Meccano system is for the 1 in. Pulleys, simplicity modellers do not usually bother with tyres at all, leaving the representation of road wheels to Collars, Washers, and ½ in. Pulleys, etc.

Meccano Ltd., however, do make a wide range of miniature tyres for the Dinky Toy series and, as these tyres are all available seperately, the Meccano engineer has at his disposal tyres to fit almost every circular Meccano part from the ½ in. Pulley down to the Collar, and for some of the larger parts as well!

The most obviously useful tyre is Dinky Toy No. 093, which fits the range of Meccano ½ in. Pulleys, as shown in Fig. 1 which illustrates a model of the Butcher's Wagon from the T.V. series "Dad's Army". The 093 is 1¼ in. overall diameter.

Moving on to a larger tyre, the 087 is 1⅝ in. in overall diameter and fits the Plastic Meccano Pulley Wheel (Part No. P62). The road wheel thus formed runs freely on a "metal" Meccano Axle Rod if placed over a Collar (Part No. 59) from which the Grub Screw has been removed. The wheel is then sandwiched between two ¾ in. Washers (Part No. 38d) or, as in the case of the tractor in Figs. 3 and 4, a ¾ in. Washer and a ½ in. plastic Pulley Wheel (Part No. 23) which gives a good representation of a winching hub. Fig. 5 shows a demonstration unit with an 087 tyre on an axle, as detailed above,

Top to bottom, Fig. 1, a Butcher's Wagon based on that featured in the T.V. series "Dad's Army", designed by Nigel Robb of Henley-on-Thames and fitted here with Dinky Toy Tyres, No. 093. Fig. 2, an underside close-up view of the Butcher's Wagon with the right hand side of the body hinged open to show the Threaded Bosses. Fig. 3, a simplicity model Tractor designed by the author and featuring rear wheels each built up from Dinky Toy tyre No. 087 fitted to a Plastic Meccano Pulley. The short Axle Rod alongside uses Dinky Toy tyres Nos. 020 and 086 which are similar in diameter but of different widths. Fig. 4, A rear view of the Tractor. Note the ½ in. Pulley 12 which gives a good representation of a winching hub.

with the alternative method of fixing using a small Flanged Wheel (Part No. 20b) forming a very realistic recessed hub. This latter arrangement also facilitates firm fixing of the wheel to the Axle Rod.

Alongside the Tractor in Fig. 3 is shown an Axle Rod fitted with two Collars upon which can be seen two of the smaller Dinky Toy tyres. The wide example is No. 020 and the narrow version is No. 086, but both are similar in overall diameter at ⅝ in. These tyres are useful for the very small models which use Collars as wheels, such as the illustrated Tractor which itself uses 020's for the front wheels.

Moving up in size, we come to the 080 tyre, which is 1 3/16 in. in overall diameter and fits the Socket Coupling (Part No. 171). In fact, two of these tyres may be fitted side by side on a Socket Coupling to form a realistic double wheel which is particularly useful for models of buses and other heavy vehicles. The effect of this arrangement may be seen in Fig. 6 which shows a dragster fitted with these built-up wheels at the rear. The same picture shows a "recessed hub" formed by a Chimney Adaptor (Part No. 164) attached to an Axle Rod by means of a Rod Socket (Part No. 179) and fitted with an 080 tyre.

The front wheels of the dragster are formed by a ½ in. Pulley with boss (Part No. 22a) alongside a ½ in. "loose" Pulley (Part No. 23b) over which a No. 021 tyre has been fitted. The adjoining rims of the Pulleys fit nicely into the cavity inside the 021 tyre which is 13/16 in. in overall diameter. As can be seen in the illustration, this tyre has no tread, being intended for the *rear* wheels of the Dinky Toy dragsters.

Our last Dinky tyre is No. 030, shown in Fig. 9. As can be seen, this is actually a miniature caterpillar track, used in this picture on a tank made of only eight parts (including the two Grub Screws which hold the model together!).

The foregoing is by no means the limit to the uses of Dinky Toy tyres in the Meccano system. Meccano engineers will no doubt find other applications for the tyres mentioned, as well as uses for those tyres not mentioned. I have outlined only the obvious applications, and have not touched at all on their uses in clutch mechanisms or miscellaneous uses such as fenders for small boat models, etc. Although not strictly Meccano parts, they are members of the same family, and those modellers to whom this fact is sufficient to validate their inclusion in Meccano models should derive a great deal of fun from their use. Meccano engineers who experience difficulty in obtaining these tyres should contact M.W. Models of Henley (see advertisement pages) who stock the full range.

Traction Engine Tyres

Moving away from Dinky Toy tyres, we turn to large models of traction engines. Meccano engineers have found many ways of providing tyres for the large wheels of this type of vehicle, usually resorting to non-Meccano items such as strips of rubber. It is however possible to provide a wheel of this type with a "tyre" made of Meccano parts.

The wheels of traction engine models are usually based on the Flanged Ring (Part No. 167b) or the Hub Disc (Part No. 118), and in each case tyres may be constructed as shown in Fig. 10 using the Caterpillar Track (Part No. P91) with a pair of Rings or Discs. It can be seen that the chain link mouldings of the track make a good tight fit in the recess between both the two Flanged Rings and the two Hub Discs. Eighty Track Links are required for the larger wheel illustrated and 42 for the smaller.

It will also be found that the caterpillar track can be fitted with the chain link moulding on the outside of the wheels, as shown in Fig. 11. This does not produce a tyre, but it does provide a drivable surface at the standard meshing distances for the Plastic Meccano Sprocket Wheels (Parts P83 & P84), thus making the assembly useful as part of a drivable built-up roller bearing for crane models, etc. The procedure is the same for the Flanged Rings for the Hub Discs illustrated. The number of Track Links required in this instance is 86 for the Flanged Rings and 47 for the Hub Discs.

The remainder of this article deals with building instructions for the models used as illustrations. At this point I would like to thank 14 year-old Nigel Robb of Henley-on-Thames for lending me his model of the "Dad's Army" wagon, the other models being my own.

Butcher's Wagon

Dealing first with construction of Nigel's Butcher's Wagon, the bonnet is formed by bolting a Double Bracket 1 (Fig. 1) to a Double Bent Strip 2 which is in turn bolted to a Flat Trunnion 3 secured between this bonnet unit and a 1½ × ½ in. Double Angle Strip 4 forming the front wheel bearer. The front wheels (two ½ in. Plastic Pulleys fitted with 093 tyres) are free to rotate on ½ in. Bolts lock-nutted to the lugs of the Double Angle Strip. Another 1½ × ½ in. Double Angle Strip, similarly equipped, forms the rear wheel assembly. Flat Trunnion is 3 overlaid by a Trunnion 5, as shown.

The body of the wagon is a "box" constructed by bolting four 2½ × 1½ in. Flanged Plates to two 1½ × 1½ in. Flat Plates which form the ends. The offside Flanged Plate 10 (Fig. 2) is left loose on its Bolts.

At this point a Trunnion 6 is bolted, apex downwards, to the front plate of the box, then the front wheel assembly is secured to the underside of the box by a bolt 7, and the rear unit by another two Bolts.

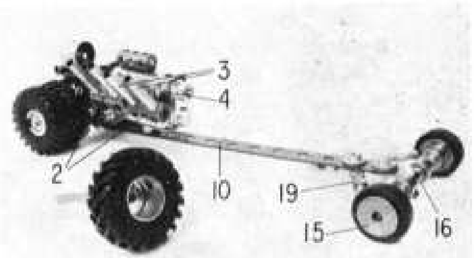
A pair of Threaded Bosses 8 are attached to Flanged Plate 10, as shown, the rear Threaded Boss being spaced from the Plate by a Washer 9, whilst a second Washer 11 is lodged between the front Threaded Boss and the flange of Plate 10. The upper Bolts holding Flanged Plate 10 are then tightened and the side secured in place by Bolts screwed into the Threaded Bosses. The Bolt entering from the front passes through the trapped Washer 11.

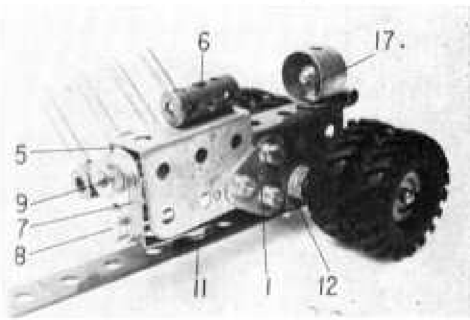
PARTS REQUIRED

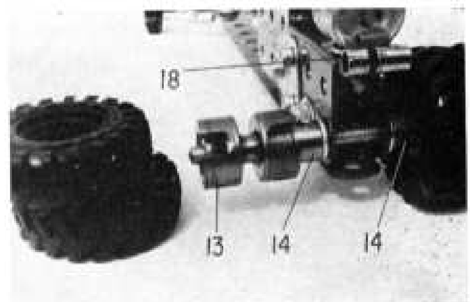
1—11	14—38	4—51	4—111a
24—37a	1—45	2—64	2—126
18—37b	2—48	2—74	1—126a
			4—Dinky Tyre 093

Tractor

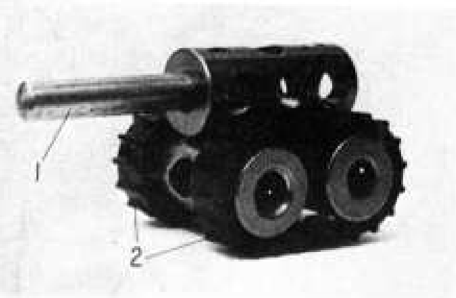
Turning next to the Tractor, an electrical Insulating Fishplate 1 (Fig. 3) is bolted to a 1 × 1 in. Angle Bracket 2, the upper Bolt also carrying a ½ × ½ in. Angle Bracket, forming a "U"-shape with Bracket 2. Pivotally attached to the lower arm of this "U" is a Coupling 3 (Fig. 4), the securing Bolt being passed through from the inside of the

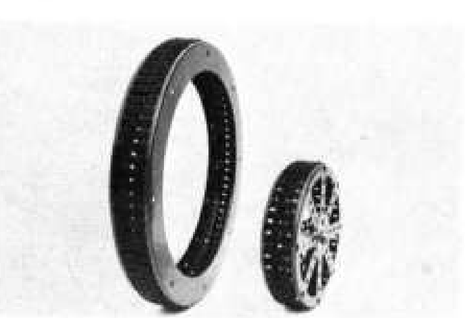


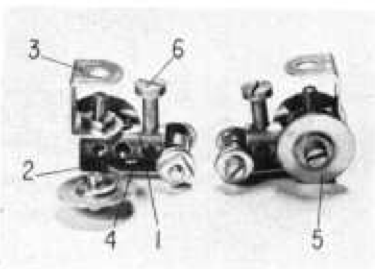




Top to bottom, Fig. 5, a demonstration unit showing two alternative methods of mounting Dinky Toy tyre No. 087. Fig. 6, a very realistic Dragster model which makes use of Dinky Toy tyres No. 080 at the rear and tyre No. 021 at the front. Fig. 7, a close-up view of the Dragster showing the engine and "driver". Fig. 8, one of the Dragster's rear wheels showing how a Socket Coupling will serve as the hub for a "double wheel" using two Dinky Toy tyres No. 080.







"U"-bracket and engaged in the centre transverse tapped bore of the Coupling. Two "wheels" 4 are made by fitting Dinky 020 tyres over Collars and are then attached to the Coupling by two ½ in. Bolts passed one into each end where they are secured by the Couplings. Sufficient "play" should be allowed to enable the wheels to rotate.

The "engine" is represented by a Channel Bearing 5 carrying a Short Threaded Pin 6 in the centre top hole. The Channel Bearing is then fixed to the ½ × ½ in. Angle Bracket by a Contact Screw 7 which carries two Washers. A ¾ in. Bolt 8 carrying a Collar 9 is passed through the upper rear hole in the left-hand flange of the channel Bearing, is fitted with two Washers and another Collar and, finally, a Nut to hold the assembly in place. A pivot Bolt is screwed into the latter Collar to form the steering wheel, while a Pallet Pin 10 (Part No. 25, recently introduced in the Meccano Clock Kits) is inserted in Collar 9.

Next, a 2½ in. Strip 11 is bolted to the end hole in Angle Bracket 2, just behind the Coupling, and to the other end of this strip is fixed the rear wheel and seat assembly. This consists of two ¾ in. Bolts, each carrying from the outside, a ½ in. Plastic Pulley 12, a Plastic Meccano Pulley supported on a Collar and carrying a Dinky 087 tyre 13, a ⅜ in. Washer, and two ordinary Washers. The bolts, which serve as the axles, are then each lock-nutted to a Double Bracket 14 which is fixed to the end of Strip 11 by means of another ¾ in. Bolt carrying an Obtuse Angle Bracket slipped into the slot of a Slide Piece 15 and two Washers. The Hook 16 illustrated is optional. (For the interest of Meccano historians, this Hook is actually a replica of Meccano's original Hook (Part No. 57) and copies are available from M.W. Models of Henley).

PARTS REQUIRED

1—6	11—37a	1—63	1—251
1—11	5—37b	4—69a	1—513
1—12	19—38	4—111	1—543
1—12a	2—38d	2—111a	2 Plastic
1—12c	1—50	1—115	Meccano
2—23	6—59	1—160	Pulleys P62
Dinky Tyres 2—020			
2—087			

Top to bottom, Fig. 9, simplicity exemplified! A tiny little tank using two Dinky Toy tyres No. 030 as caterpillar tracks. Fig. 10, two large-scale traction engine wheels which make use of Caterpillar Track Links for tyres. Fig. 11, another use for the Caterpillar track to provide a positive drive to the outside of a built-up wheel. Fig. 12, slipped in by "Spanner"—a tiny Traction Engine designed by Stephen Kuc of the Stevenage Meccano Club.

Dragster

Coming now to the Dragster, the body is composed of two Channel Bearings joined together, but off-set one hole, by a 1 in. Triangular Plate 1 (Fig. 7) at each side. The exhaust units can be seen in Fig. 6 and four are required, two on each side of the body, although the near-side pair is not shown in the illustrations for reasons of clarity. Each unit simply consists of a Coupling 2, in the end transverse bores of which two 1 in. Rods are secured. Rod Connectors 3 are slipped over these Rods, then an Obtuse Angle Bracket 4 is secured to the opposite side of the Coupling by a Bolt passed through the round hole in the Bracket and into the centre transverse tapped bore of the Coupling.

When completed, the exhaust units are attached by the Obtuse Angle Brackets to the outer top holes of the front Channel Bearing, but note that the Bolt fixing the offside front unit in place also secures an Angle Bracket 5 inside the Channel Bearing. A Coupling 6 is secured to the top of the body assembly by passing two Bolts through from inside.

The front of the body unit is supplied by a 1 × 1 in. Angle Bracket overlaid by five Fishplates 7, secured by a Contact Stud 8 and a ¾ in. Bolt fitted with a Terminal Nut 9, the latter Bolt and Nut also fixing the assembly to Angle Bracket 5 in the unit body. The lower lug of the 1 × 1 in. Angle Bracket is attached to the fifth hole in a 7½ in. Strip 10 by a ⅜ in. Bolt, spaced as necessary with Washers 11. The body unit is also fixed by means of a Double Bracket 12 bolted through the second hole in the Strip. The Double Bracket is secured to the body by means of a ¾ in. Bolt, the appearance of which is enhanced if a Terminal Nut is used instead of the normal Nut.

The rear wheels are each constructed, as described in the earlier part of this article, from two Dinky 080 tyres fitted on a Socket Coupling 13 (Fig. 8). The Socket Couplings are each supported on two Collars and the travel of the supporting 3 in. Axle Rod is limited by two further Collars 14, one each side of the body unit. The front wheels, also described earlier, consist of 021 tyres on ½ in. Pulleys with boss 15. They are mounted on a 3 in. Axle Rod, the travel of which is limited by two Collars as shown in Fig. 5. As can be seen, the Axle is attached to Strip 10 by a Right-angled Rod and Strip Connector 16, with the rod section (which will have to be eased open to allow the axle to rotate) fitted to the underside of the Strip.

A "driver" is represented by a Handrail Support 17 containing a Bolt for his "face", held in place by a Grub Screw. The Handrail Support is slipped inside a Chimney Adaptor, representing the head-guard, a Washer is added and the assembly is fixed into the rear hole of the body unit. A Right-angled Rod and Strip Connector 18 is added before the Nut, as shown.

The finishing touch is to bolt, two holes in underneath Strip 10, a Three-way Rod Connector 19 carrying 1 in. Axle Rods in its front two sockets. These Rods should be pushed in just far enough to allow the front wheels to rotate.

PARTS REQUIRED

1—1b	10—18b	5—63	2—160
5—10	2—23 or	8—59	1—164
1—11	23b	2—77	2—212a
1—12	2—23a	1—111	8—213
1—12a	16—37a	2—111c	1—213a
4—12c	20—37b	1—136	1—544
2—16b	16—38	2—171	2—542
2—Dinky Tyres 021			
4—Dinky Tyres 080			

Tank

My final model is the little Tank illustrated in Fig. 9 and, as can be seen, this is simplicity itself! Three Couplings are fixed together in the arrangement shown by two $\frac{7}{32}$ in. Grub Screws which engage their transverse tapped holes, one of the Grub Screws also holding a 1 in. Axle Rod 1 in place to form the gun barrel. The tracks—supplied by two Dinky 030 tyres 2—are then slipped over the two transverse Couplings—and it's finished!

'SPANNER' writes: In addition to Mike Nicholls' excellent models, I would like to slip in here one final and equally delightful simplicity offering designed by 10 year-old Stephen Kuc of the Stevenage Meccano Club. It's a marvellous little Traction Engine, built up from a Coupling 1 (Fig. 12) to the underside of which an Angle Bracket 2 is fixed by a $\frac{3}{8}$ in. Bolt, passed up through the end transverse smooth bore of the Coupling. The securing Nut also fixes a Double Bracket 3 to the top of the Coupling. Note that a Right-angled Rod and Strip Connector 4 is tightly sandwiched between the lower lug of Angle Bracket 2 and the Coupling.

Each rear wheel is represented by a $\frac{3}{8}$ in. Washer 5, sandwiched between two ordinary Washers on a Bolt screwed into the end transverse threaded bore of the Coupling. The front wheels are ordinary Washers on a $\frac{3}{8}$ in. Bolt carried in the rod portion of Rod and Strip Connector 4 and, finally, the chimney is a Pivot Bolt 6 locked by Grub Screws in the vertical front smooth bore of the Coupling.

PARTS REQUIRED

1—18b	3—63	2—69b
2—Dinky Tyres 030		

Statement by the Managing Director of Meccano (1971) Ltd.

As is announced elsewhere in these pages, this is the last issue of Meccano Magazine to be published by M.A.P. and, at the same time, is the start of a new and exciting magazine era for my company.

For the past five years, M.A.P. have published the Meccano Magazine on behalf of Meccano Ltd. and, in my opinion, they have made a fine job of it. I believe, also, that this is the opinion of the majority of serious Meccano enthusiasts, many of whom have written to "Spanner" with the genuine compliment thay the M.M. was at last returning to the high standard of the Meccano hobby magazine "it used to be". I echo this sentiment and I think all will agree it has been a good and highly interesting publication, particularly during the last two or three years under M.A.P. control.

M.A.P., however, is a self-contained publishing organisation, whose continued existence relies on profitable operation and, perhaps because of the high overheads of such an organisation, Meccano Magazine has proved unprofitable for them. They have now been forced to take the course which I can understand as being unavoidable in their circumstances.

The M.A.P. decision to discontinue publication is, of course, the result of their own experience solely with the magazine and is in no way connected with the international buoyancy of the Meccano product, or our own interest in this product. I naturally regret the need for the decision, but, in a sense (and with no disrespect meant to M.A.P.), it has proved a blessing in disguise by enabling us to bring the magazine "Home" again. As described in the official announcement on page 581, we will henceforth be publishing a new version of the magazine—the Meccano Magazine Quarterly—at our Liverpool headquarters which has been the "Home of Meccano" for more than 50 years.

It was from our Binns Road factory that the first issue of Meccano Magazine was published in 1916 and all subsequent issues since then, until that fateful year of 1964 when our own situation forced us to transfer the M.M. to an independent publisher outside the Company. Although this action was necessary at that time, my colleagues and I were personally sorry to lose direct responsibility for "our" magazine and we are therefore delighted to welcome it back under our own roof. Perhaps more important, though, I am convinced that the majority of Meccano enthusiasts will welcome the move. Our contact with readers indicates that, while supporting the M.M. over the past nine externally-published years, they have felt an inevitable weakening in the unique relationship which has always existed between Meccano Magazine readers and Meccano Limited. Now, we will again be in direct contact—I hope to our mutual help and interest—and I am delighted this is so. The Meccano hobby, I believe, cannot fail to benefit from such contact.

It is important to remember, however, that our new magazine will be published on a non-profit making basis and will therefore rely strongly on reader support for its continued existence. I am confident that the support will be wholeheartedly given, and I look forward to a long and successful life for the Meccano Magazine Quarterly.

torches to their legs and set these alight. Flying in panic, the birds set fire to the houses and in the confusion the Vikings attacked and demolished the village.

Naturally fear exaggerated tales of their exploits. In time legends grew up around these dreaded fighters. One told how the 'Skibladnir', a well known long-boat, had been built by dwarfs and was so large all their weapons and equipment could be carried in her. In actual fact, the biggest ships with 100 oars were mainly used to terrify the enemy while smaller 12 oared boats were used for fighting. Each captain, or local King, commanded his own fleet of armoured vessels, sometimes as many as 700. Armoury ranged from cables used to capsize the enemy's boats to bows and arrows and stone-slings.

The Vikings knew the power of psychological warfare. To see a fleet of black boats approaching was enough to scare anyone but when these boats had terrifying figures fore and aft, demoralisation increased. Usually a serpent's head or dragon-like beast was carved, head at the bow, tail astern. When later in their era most Vikings exchanged paganism for Christianity, they kept their fearsome carved figureheads as examples of evil. Conversion was not always from the heart. Olaf Tryggrason was only too pleased to 'convert' his fellows by battle. If they refused to turn Christian, he had a fool-proof excuse for a fight, keeping any boats and plunder to swell the Church funds through his own possessions.

For a Viking to become a Christian meant a great change. Vikings believed that to be killed in battle ensured a place with the Gods in Valhalla where fighting lasted all day, and the wounded were treated by night to fight again on the morrow. To die in bed meant damnation in the land of Hela, the Norse equivalent for Hell. No wonder Olaf found physical persuasion necessary to increase his converts.

Fortunately they had a burial custom which enables us to gain a true picture of what these Viking boats were like. When a chief died, his boat was buried with him. In the Viking ship hall at Oslo, the Oseberg Ship, the Gokstad Ship and the Tune Ship, all carefully restored, can be seen. The names refer to the site of burial. Denmark has two Viking ships and the Isle of Man also has a couple.

As shipbuilders they were superb. Planks were thinned to the precise degree required. Animal hair twisted and rubbed together formed the caulking. Pine floorboards made the deck. With a striped red and yellow sail and demoniac figureheads, no wonder they terrified all whom they met.

The Oseberg ship, dug out of the mud in 1904, had a 19.8 metres long keel made of oak, and boasted 30 oarsmen who buried their oars with their chief. Naturally the figurehead at the bow, a serpent's head, was well carved with gaily painted fierce eyes. It is interesting to find that the mast, 13 metres high, was of pinewood, the anchor of iron, while the rudder, really an outsized oar, could be steered by a tiller. Probably the Oseberg ship never crossed the ocean but was used in coastal work.

Whether you dislike their warlike habits or admire their courage, there is no doubt that this race of fighting seamen had a remarkable record of discovery, trade and settlement to their credit. There was no room for the weakling in their way of life and without their enterprise, much nautical knowledge would have been lost to succeeding navigators and shipbuilders. We owe them a debt, for in the Dark Ages, tribes united into nations to repel them and eventually, on settling in our land, they brought their trades and skills with them to our lasting benefit.

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wheel. To achieve this a pair of 3 × 1½ in. Double Angle Strips 130 are bolted together with the lugs overlapping, the fixing Bolts also securing two Bush Wheels 131 in place, one each end with bosses outwards. A 5 in. Rod is mounted in the bosses of the Bush Wheels and this should be positioned before the Bolts are tightened to ensure that the Bush Wheels are exactly in line so that the Rod runs perfectly freely. This Rod carries a 1½ in. Pulley with Tyre 132 at one end and a Universal Coupling at the opposite end, allowing the Rod an essential half-inch end float.

Two 1 in. Corner Brackets 133 are bolted to the centre of Double Angle Strips 130 to complete the friction wheel carrier which is pivotally attached to the machine by a 3½ in. Rod passed through the Corner Brackets and located in an upper hole of the rear panel. The outer end of this Rod is supported by a further 1 in. Corner Bracket 134 bolted to the rear of the body. Collars retain the Rod, Washers being employed to space the carrier away from the body.

To keep the friction wheel firmly in contact with the flywheel, the carrier is spring-loaded by a Tension Spring 135 retained on the inboard Bushwheel by a lock-nutted ½ in. Bolt. A 1 in. Bolt lock-nutted to the rear panel of the machine secures the lower end of the Spring. The Universal joint on the end of the friction wheel Rod is connected by a 1 in. Rod to a further Universal Coupling 136 which also carries a 2½ in. Rod, this latter Rod being journalled in a pair of Flanged Brackets bolted to the rear panel of the machine base. A 1½ in. Sprocket 137 is locked on this Rod.

Bolted to each flange of an E15R Motor are four downward-projecting Angle Brackets, these being fixed to a pair of 3½ in. Angle Girders 138 which are in turn bolted to the rear of the machine. The output shaft carries a ¾ in. Pinion which drives a 50-teeth Gear Wheel on a 2½ in. Rod journalled in the Motor side plates. On the opposite end of this Rod is mounted a ½ in. Pinion, meshing with a 57-teeth Gear Wheel 139 immediately above it. This latter Gear is fixed on a 3½ in. Rod located by a Collar, a 1 in. Sprocket Wheel 140 also being mounted on the right-hand end of the Rod. This Sprocket is connected by Chain to Sprocket Wheel 137 on the driving shaft.

This completes the assembly and it remains only to "time" the two cams, two Eccentrics and the crank to give the sequence of operation detailed at the beginning of these articles. It is essential of course, to ensure that each mechanism turns freely and is lubricated to give a good and reliable operation of the finished model—which, it is guaranteed, will even rattle in a similar manner to its full-size counterpart!

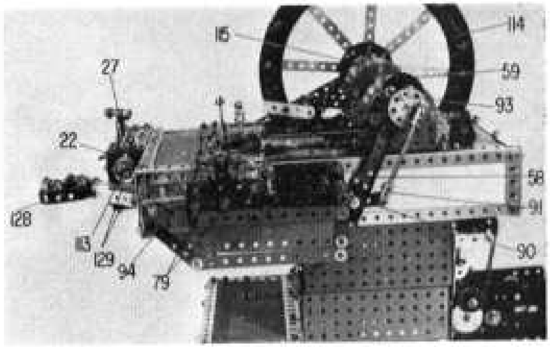
PARTS REQUIRED

5—1b	1—15	9—62	1—136
15—2a	1—15b	8—63	1—139
6—3	4—16a	1—63c	1—139a
7—4	3—17	6—70	2—140
9—5	3—18a	2—72	1 | 142
8—6	5—18b	2—73	1—147a
9—6a	1—21	2—74	5—147b
8—8	2—22	4—77	1—147c
4—8a	7—23b	1—94	1—148
13—8b	5—24	1—95a	1—160
6—9	1—25	1—96	3—161
4—9a	1—26	1—102	2—166
3—9c	1—27	1—103f	2—167b
12—9d	1—27a	4—103h	1—179
6—9e	2—31	2—103k	8—188
7—10	6—35	1—108	5—189
1—11	310—37	2—114	12—190
1—11a	2—43	6—115	14—193
13—12	1—44	1—116a	3—196
2—12a	2—45	2—126	1—197
3—12b	2—47a	4—126a	4—212
10—12c	3—48	1—128	4—214
2—13	1—50	1—130	1—222
2—13a	4—53	1—130a	1—235
1—14	2—53a	2—133	1—235b
1—14a	19—59	5—133a	1—E15R Motor

1 Paxolin or metal disc 1½ in. diameter

Automatic Rivet-Making Machine

Last of a four-part series by Paul Blythe



Flywheel

We now come to the flywheel which is built up from a pair of 9¾ in. Flanged Rings 114, sandwiched between which are eight spokes formed by 4½ in. Strips. The inner ends of the Strips are neatly arranged and bolted to the outer circle of holes in a pair of Face Plates 115. Spacing Washers will be required to ensure neat assembly and note that the sixteen securing Bolts should not be tightened until the wheel is found to be running true. The wheel is mounted on the left-hand end of the crankshaft where it is held in place by the set screws in *both* Face Plates.

Base Assembly

Turning to the base of the machine, the two 5½ × 2½ in. Flanged Plates 53 at each side of the body are extended down by two further similar Plates 116, their long flanges being bolted together. This second pair of Plates are joined across the machine by a 7½ in. Strip 117 which overlays a 5½ × 2½ in. and a 2½ × 2½ in. Flexible Plate, these Plates being reinforced four holes down by a 7½ in. Angle Girder 118, slotted flange forwards.

Bolted through the lower row of holes in each Plate 116 is a 9½ in. Strip Plate 119 extending the assembly forwards by a further eight holes. These Plates at each side are overlaid by 9½ in. Strips with the front and rear edges being capped by vertical 2½ in. Angle Girders. The bottom edges are reinforced by 12½ in. Angle Girders 120 extending six holes rearwards. Further Flexible Plates and a 7½ in. Flat Girder 121 fill in the horizontal shelf which is edged at the front by a 7½ in. Angle Girder 122. The front panel of the shelf is also enclosed by Flexible Plates and strengthened at the bottom by a further 7½ in. Girder 123, slotted flange outwards.

Dealing now with the rear of the base, this is completely panelled with Flat Plates reinforced at the lower edge by a 7½ in. Angle Girder 124. Two 3½ × 2½ in. Flanged Plates 125 and a 3 × 1½ in. Flat Plate complete the rear horizontal panel which, again, is strengthened by a 7½ in. Angle Girder 126, slotted Flange outwards and fixed by three Angle Brackets. The base itself is edged by additional Girders, these being bolted with the flanges projecting downwards. The four corners are completed by diagonally-fixed 1½ in. Strips, the vertical flanges being enclosed by Obtuse Angle Brackets and Fishplates 127.

Wire Straightener

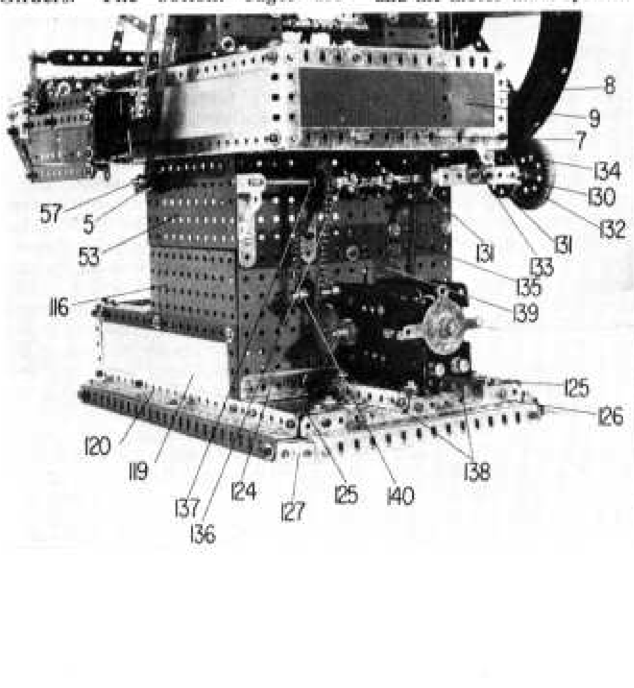
Moving upwards from the base to the wire-straightening mechanism, two Girder Brackets 128, with their wide flanges overlapped, are secured together by four ½ in. Bolts, a ½ in. Pulley being fitted under the head of each Bolt. The front end of the assembly is enclosed by two Angle Brackets, then the unit is attached to the front of the body by a pair of 3 in. Strips 129, connected by Fishplates and Obtuse and "ordinary" Angle Brackets.

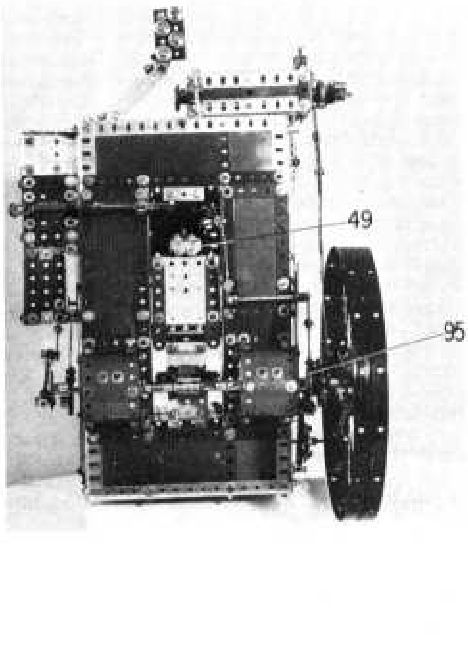
Motor Drive Assembly

Finally, we have the drive system. Although the real machine is driven by rear-mounted motor and "vee" belt on the flywheel, it is more convenient to drive our model by a friction wheel bearing on the fly-

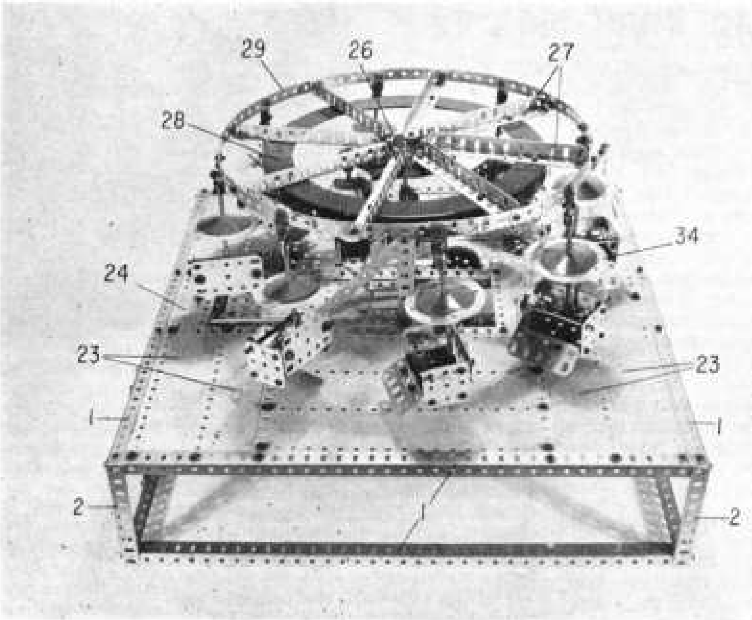
(continued opposite)

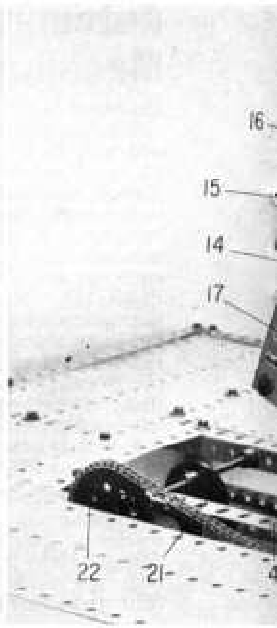
Above, a general view of the right-hand side of the finished Riveting Machine. Below right, the completed machine as it appears when viewed from above. Below left, a rear view of the completed model showing construction of the base and the motor drive system.





Far right, "Rising Swingers" is the title 'Spanner' has given to this intriguing Meccano fairground ride. Centre, in this illustration, the revolving structure has been removed to show the tilting arm. Right, in this general view of the "Rising Swingers" the overall layout of the model is clearly shown.





RISING S

'Spanner' descri

fairgro

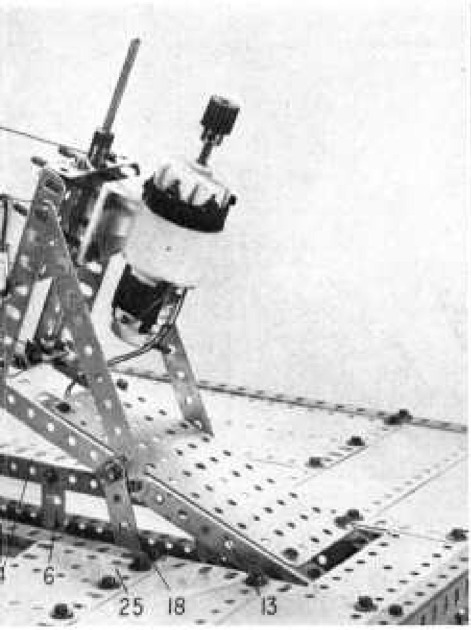
LOOKING back through past issues of Meccano Magazine, it struck me that we haven't paid a visit to the fairground for some considerable time—speaking purely from a model-building point of view, of course. Fairground rides have always proved popular with modellers, as well as with members of the public who see their models, so we felt it was about time that we again presented something in this line. I say "again" because we have featured very many fairground models in these pages over the years—so many, in fact, that I might have thought we had covered everything there is to cover, if our ingenious Yorkshire model-builder hadn't come up with the quite fascinating "Rising Swingers" illustrated in the accompanying photographs!

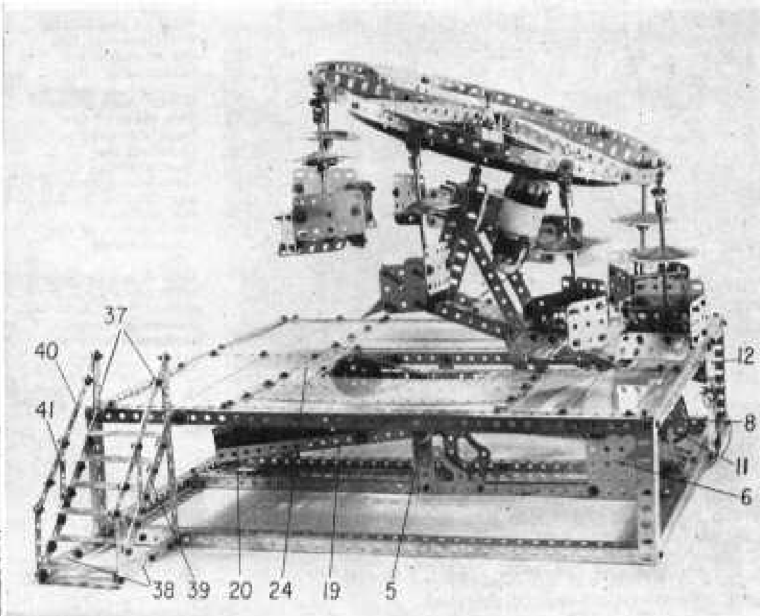
I hasten to add that "Rising Swingers" is the name I have given to the model. I seriously doubt if it is the correct title, but I do think it describes the model reasonably accurately. Basically, it is a roundabout in which the passenger chairs are suspended on a pivoted overhead mounting. Thus, as the roundabout revolves, the chairs swing outwards under the action of centrifugal force. This movement, alone, would not be particularly outstanding, of course, but it is not the only movement. While the chairs are whirling round, the whole revolving section gradually rises up at an angle until the chairs are spinning well out of the vertical, and then it sinks down again to normal, then up again, and so on as often as required.

The two distinct movements are achieved with the minimum of trouble in the model by the use of two separate Motors with Gearbox, one to drive the revolving motion and the other the lifting action, but we will deal with these as we come to them. Construction begins with a base framework consisting of two separate square Girder constructions each built up from four 18½ in. Angle Girders 1, the two squares being connected together at the corners by 4½ in. Angle Girders 2. Two further 18½ in. Angle Girders 3 are bolted between the sixteenth and twenty-second holes of two opposing lower Girders 1, while another two similar Girders 4 are bolted between the fifteenth and twenty-third holes of corresponding upper Girders 1. The centres of Girders 3 and 4 are connected by two 4½ in. Angle Girders, the lower connection in each case being strengthened with a Corner Gusset. A Crank 5 is bolted to each Gusset and Girder, the boss coinciding with the centre hole of the Girder.

Also bolted between Girders 3 and 4, in the positions shown, are two 4½ × 2½ in. Flat Plates 6, in which a 4½ in. Rod 7 is held by Collars. A 7/16 in. Pinion on this Rod meshes with a 60-teeth Gear 8 fixed vertically above it on another 4½ in. Rod, also held by Collars in Plates 6. A ½ in. Pinion is also secured on the Rod, this meshing with a 2½ in. Gear 9 on a 5 in. Rod held by Collars in the Flat Plates. A ¾ in. Sprocket Wheel 10 is secured on the end of this Rod. A 1½ in. Pulley 11 is now fixed on the opposite end of Rod 7, this being connected by a 6 in. Driving Band to a ½ in. Pulley fixed on the output shaft of a Motor with Gearbox secured to a 4½ × 2½ in. Flat Plate 12, bolted between nearby Angle Girders 1 and 2. The Motor gearbox is set into the 16:1 ratio.

As can be seen from the photographs, the top of the base framework is enclosed by suitable plating, but, before adding this, it is advisable to complete the lifting arm and turntable drive system. Two 7½ in. Angle Girders 13 are joined at one end by a 2½ in. Strip and throughout the major part of their remaining length by a 4½ × 2½ in. Flat Plate. Two upright 4½ in. Angle Girders 14 are bolted to the inner ends of the Girders and braced by two 5½ in. Strips running between the centre holes of Girders 13 and the second





WINGERS

bes a fun-packed und ride

holes down of Girders 14. A 2½ in. Angle Girder is bolted between the upper ends of Girders 14, the securing Bolts helping to fix a 2½ × 2½ in. Flat Plate 15 to the "backs" of the Girders. A Double Arm Crank 16 is bolted to the upper flange of the 2½ in. Girder, another similar Crank 17 being bolted to the 2½ in. Strip joining Girder 13, then four 2 in. Screwed Rods are tightly fixed by Nuts in Flanged Plate 15 in the positions shown, the two upper Rods also passing through the 2½ in. Angle Girder. The second Motor with Gearbox, set in the 32:1 ratio, is securely fixed by Nuts on the Screwed Rods, the exact positioning of the Motor later being determined by the turntable drive gearing. A ½ × ½ in. Pinion is fixed on the end of the Motor output shaft.

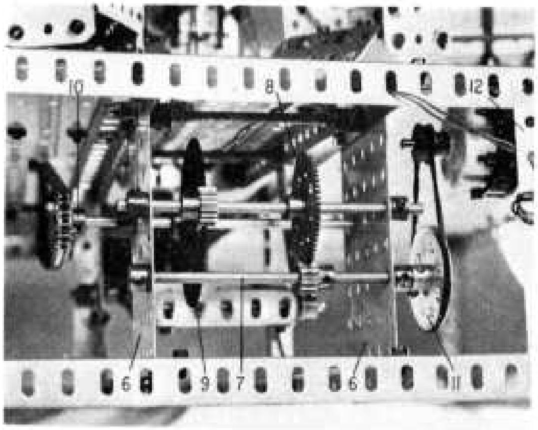
Four 3½ in. Strips 18 in two pairs, one on top of the other, are pivotally attached to Girders 13 by a 3 in. Rod which passes through the end holes of each pair of Strips and through the ninth holes inward of Girders 13. Collars hold the Rod in place. Pivotally attached to the lower end of the Strips by a 3½ in. Rod held by Collars are two 12½ in. Angle Girders 19, connected together at the ends and through their eighth and tenth holes by four 2½ in. Angle Girders, the Rod passing through the end holes of Girders 19. A suitable counterweight 20 (we used a 3½ lb. chunk of lead) is secured to the opposite end of the Girders.

Bolted to each Girder 19 is a Double Arm Crank, the boss of the Crank coinciding with the ninth hole of the Girder. The assembly, thus far built, is now mounted in the base framework by means of a 5 in. Rod passed through the bosses of these Double Arm Cranks and through the bosses of Cranks 5. Note that the Rod is fixed in the former Cranks, but is free to turn in the latter.

Now held by Collars in the twelfth holes from the counterweight end of Girders 19 is a 3½ in. Rod, on which a Crank is fixed. The arm of this Crank is, in turn, fixed to the arm of a Triple-throw Eccentric 21, secured by this ½ in. stroke boss on a 5½ in. Rod held by a Collar and a 2 in. Sprocket Wheel 22 in the fifteenth holes of Angle Girders 4 in the base frame. Sprocket Wheel 22 is connected by Chain to Sprocket Wheel 10, then the top of the base frame is enclosed. We used ten 9½ × 2½ in. Strip Plates, four 7½ × 2½ in. Strip Plates 23, two 5½ × 1½ in. Flexible Plates 24 and one 2½ × 1½ in. Flexible Plate 25, all arranged as shown.

This brings us to the actual revolving section of the model which should present no difficulty. A "wheel" is built up from a 3½ in. Gear Wheel 26, to which eight radiating 5½ in. Angle Girders 27 are tightly fixed by ½ in. Bolts, each Girder being spaced from the Gear by a Collar on the shank of the securing Bolt. A 9¾ in. Flanged Ring 28 is bolted to the Girders through their fourth holes from the outer ends, then a wheel-rim 29 is provided by eight 5½ in. Strips, gently curved to shape and attached to the ends of the Girders by Angle Brackets. The completed wheel is secured by the boss of Gear 26 to a 6½ in. Rod mounted free in Double Arm Cranks 16 and 17. A Collar on the Rod above Crank 16 holds the Rod in place. Gear Wheel 26, of course, meshes with the ½ × ½ in. Pinion on the nearby Motor output shaft and the Motor should be adjusted on its Screwed Rod mountings to ensure perfect engagement.

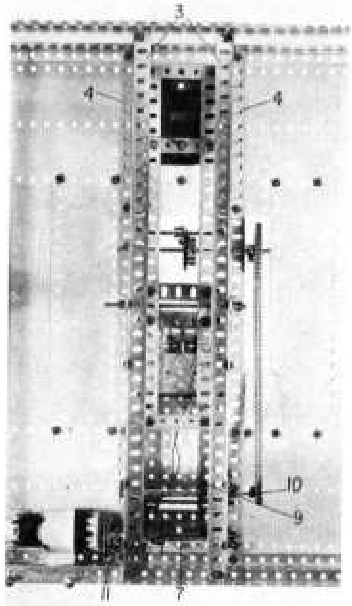
Suspended from the wheel-rim are eight chairs, all similarly built up from a 2½ × 1½ in. Flanged Plate, to the flanges of which two 1½ × 1½ in. Flat Plates 30 are bolted. The upper rear corners of the Plates are connected by a 2½ × ½ in. Double Angle Strip to which a 2½ × 1½ in. Flexible Plate is bolted to serve as a chair back, while a 2½ in. Flat Girder 32 is attached by Obtuse Angle Brackets to the forward edge of the



Left, a close-up view of the initial drive system for the roundabout tilting movement.

Right, an underside view of the base assembly showing the Motor with Gearbox which provides drive for the tilting movement of the roundabout.

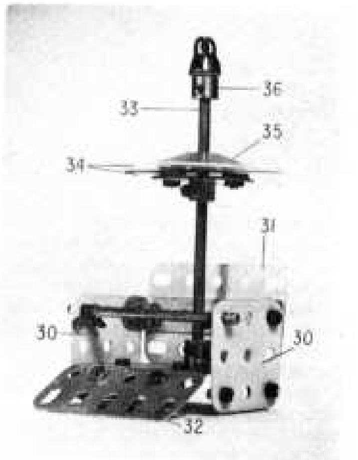
Below, a close-up view of one of the eight identical passenger cars, removed from the model.



Flanged Plate. A guard rail is supplied by a 3 in. Rod held by Spring Clips in the upper forward corner holes Flat Plates 30.

Fixed in the rear row centre hole of the Flanged Plate is a Rod Socket in which a 4 in. Rod 33 is held. Secured part-way up this Rod is an 8-hole Bush Wheel, to the face of which two Semi-circular Plates 34 are bolted, being spaced from the Bush Wheel by a Washer on the shank of each securing Bolt. A loose Conical Disc 35 is positioned on top of the semi-circular Plates, then an End Bearing 36 is secured on the upper end of the Rod. Pivotally held in the lugs of this End Bearing is a Hinge, the upper lug of which is secured to the wheel-rim, as shown.

Finally, a set of access steps for the model is provided by two 6½ in. compound strips 37 bolted, along with two 5 in. compound strips 38, to the lugs of a 2½ × ½ in. Double Angle Strip fixed to one lower Angle Girder 1 in the position shown. The outer end of each Strip 38 is connected to the fifth hole down of Strip 37 by a 6½ in. compound strip 39, the upper securing Bolt holding



an Angle Bracket in place and the lower Bolt holding a 2½ in. Narrow Strip. The Bracket is fixed to upper Girder 1, while the upper end of the Narrow Strip is attached to the upper end of compound strip 37 by a 6½ in. compound narrow strip 40 which serves as a handrail. An additional support is provided by a second 2½ in. Narrow Strip 41, then, last of all, the step treads are supplied by six 2½ × ½ in. Double Angle Strips bolted as shown between compound strips 39.

PARTS REQUIRED

16—2	2—15a	128—38	10—111c
2—2a	9—15b	15—48a	8—114
4—3	3—16	8—51	1—130
7—5	8—16a	3—53a	8—166
12—7a	1—21	25—59	1—167b
2—8	1—23a	3—62	8—179
2—9b	8—24	4—62b	8—187a
10—9	1—26	1—70	9—188
6—9a	1—26a	17—74	2—189
6—9d	1—26c	5—81	4—195
10—12	1—27b	1—94	10—196
16—12a	1—27c	1—95	16—214
1—14	16—35	1—96a	4—235
1—14a	342—37a	8—103f	4—235f
2—15	302—37b	2—108	2 Motors
		8—111a	with
			Gearbox

TRACTOR DRIVER

(continued from opposite page)

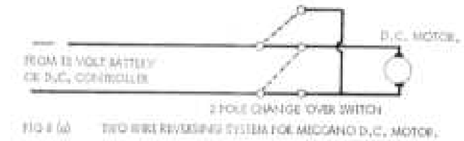
he will have to be prepared to work in the evenings or at week-ends. While he never gets rich, he often enjoys his work because he feels well respected. After all, he has to work without supervision, and is in charge of machinery that may have cost £4,000 or more. When he knows the farm work inside out he could become a farm manager.

Other drivers leave the farm itself for contract driving which is more demanding but usually better paid. Many big contractors today started as drivers. It is one way to get a foot onto the farming ladder.

A line-up of Leyland tractors, models 384, 344, 253, & 154, with b.h.p. of 70, 55, 47, & 25 respectively.

1

2



Meccano Parts and How to Use Them

Part 12—Power supplies for motors, etc

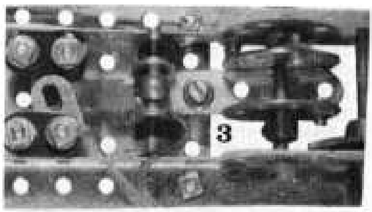
By **B. N. Love**

IN this final chapter of this series of brief articles on using Meccano parts we will look at the power supplies required for operating Meccano motors.

Two distinct types of electric motors are currently available for Meccano models, one type being a 'universal' A.C./D.C. motor, the E15R, and the other being D.C. only, such as the 3–12 volt Motor with six-speed Gearbox and the 4½ volt reversible Motor. Generally speaking, the E15R motor is driven by means of a mains transformer which reduces the 240 volt household mains (in the U.K.) to an output of approximately 15 volts A.C. Although Meccano Ltd. no longer market a transformer of any sort, units bearing the name HORNBY, MARSHALL, or MECCANO have been produced over the years at Binns Road and it is useful to know which transformer is required for which motor.

Fig. 1 shows a Hornby transformer known as a T20 which stands for "Train; 20 volts" and was made principally for operating 20 volt Hornby locomotives. It can be seen from the illustration that a speed controller is built into this transformer and two sockets are provided so that radio type wander plugs can be used for making connections to the electric rails. Such a speed controller depends on a coil of resistance wire looped between five of the contact studs showing and, as the lever is moved from stud to stud, the resistance is increased, or decreased according to the direction of rotation of the lever. Theoretically, this gives a speed control of the motor connected to the transformer. However, the current flowing through the motor also flows through the resistance wire and this is fine so long as the motor has a constant load. In the case of a Hornby 'O' gauge 20 volt locomotive, the running current was reasonably constant and the speed controller is reasonably effective. One interesting point here; it often comes as a surprise to Meccano modellers using the T20 for Meccano electric motor control to find that the first position on the controller next to the "off" position is full speed! This is quite a deliberate design feature to enable a locomotive to get a full "burst" of voltage when at a standstill in order to overcome the inertia of the locomotive and its rolling stock.

An E15R motor, or its predecessor, the E20R motor, can certainly be run from the T20 transformer, but the speed regulation will be poor for different load conditions. The harder the motor is required to drive, the more current it consumes and the more voltage does it drop across the resistance wire behind the controller contact studs. Fig. 2 shows the type of transformer which was designed for motor driving as its title implies, i.e. the M20 (Motor – 20 volt). As no resistance wire is included with this transformer there is a constant 20 volts available at the terminals under normal load conditions which permits the motor to run at its design speed. If the constructor requires



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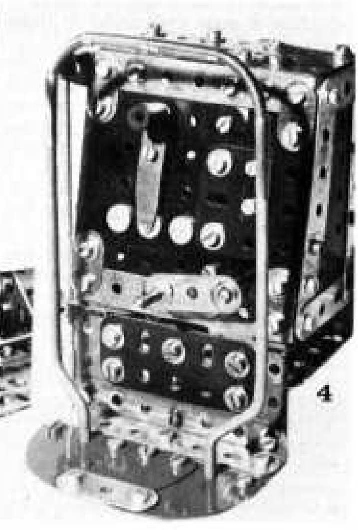

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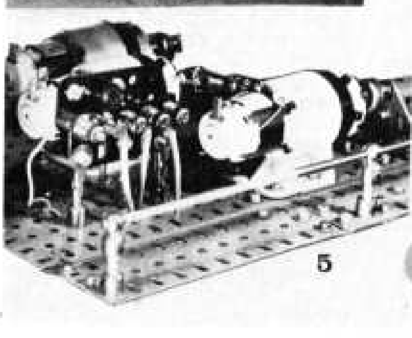

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Fig. 1 Hornby transformer Type T20 for 20 volt locomotives with speed controller. **Fig. 2** Similar transformer Type M20 for 20 volt Meccano A.C./D.C. motors such as E20R and E15R. **Fig. 3** One way of making a two-way switch, mechanically operated, from Standard Meccano and Electrical parts. **Fig. 4** Another two-way switch, hand-operated, also made from standard parts. **Fig. 5** Meccano electrical parts used to make a neat distribution board on the control platform of a giant crane.

low speed outputs from the E15R then he should arrange gearboxes to give the necessary output speed and power.

As mentioned above, Meccano Ltd. no longer market a transformer of any sort, but all current Meccano motors will operate successfully from the Meccano Battery Box which gives D.C. outputs of 4½ and 12 volts. If a Mains source is preferred, however, then any of the popular model railway power control units will generally prove adequate, such as those manufactured by Rovex and Hammant and Morgan.

By far the most versatile of electric motors for Meccano models is the 3–12 volt D.C. Motor with Gearbox, as illustrated in Fig. 5. Three motors are shown in this illustration where they form part of the main drives to a Giant Block-Setting Crane. When fully ballasted with counterweights the model weighs over half a hundredweight but is driven along a set of rails via four bogies by one single 12 volt D.C. unit and, since much of the bulk of the motors illustrated is taken up with internal gear reduction trains, the small diameter motor incorporated gives a surprising power output.

As the D.C. power unit uses a high quality ring-field magnet for its 'field', it requires electrical connections only to the armature and when these are reversed, the direction of rotation of the armature is also reversed. In the case of the E15R motor, however, no fewer than four connections need to be changed over, unless structural modifications are made to the motor. Because the D.C. unit reverses so easily, it is very suitable for remote control and the circuit diagram of Fig. 6(a) shows the connections and switch required for this operation.

There are occasions when a model may be fitted with a number of D.C. units operating the various motions of a crane and the number of leads for remote control increases accordingly. However, there is a method of remotely controlling these D.C. motors by the "one wire method" which uses the metal chassis of the model as a common return path for all of the motor circuits. Fig. 6(b) shows how this is done, but two power sources are required for the operation. These could be supplied by two Meccano battery boxes or two D.C. controllers operating from the house mains so long as their output leads are independent and not separately 'earthed'. The important thing to ensure is that, when the battery or D.C. supplies are linked, one battery has its terminal "positive with respect to centre". The 'centre' in this case is the junction of the other two battery terminals according to the polarity indicated in Fig. 6(b).

Thanks to the versatility of the Meccano Electrical parts, the required switches can be made from standard items. Fig. 3 shows a single-pole 2-way switch made from Meccano parts and this one is operated by boltheads in a Bush Wheel providing automatic sequencing in a programmed model. A simpler hand-operated switch is shown on the front of a mobile crane trolley in Fig. 4. In this case, the switch studs are electrical Contact Studs (Part No. 544), the centre Stud being disconnected and merely providing smooth passage of the Wiper Arm above, which is pivoted on a Bolt lock-nutted to the fibre Insulating Plate forming the switchboard at the front of the trolley. The addition of an Insulated Spacer to the second hole of the 2 in. Wiper Arm forms a hand-knob for operating the switch.

It would be quite impossible here to illustrate the tremendous scope of the Meccano electrical parts in both elementary and advanced model-building, but the reader should be encouraged to exploit their possibilities in adding realism and control to his models. Some constructors, incidentally, will be familiar with the electrical Insulating Plates and Strips in black finish. This is obtained by loading the basic material with carbon black which gives an excellent surface finish but unfortunately it can also make the original fibre mix somewhat brittle. To improve the mechanical strength of the electrical fibre parts therefore, the carbon black is omitted in current production batches and the amber colour now supplied is the basic colour of the fibre when bonded.

Looking back over the past 12 chapters it is obvious that it has been possible to touch on just a few salient points in the use of Meccano parts, scope for which is virtually endless. However, I hope the areas we have covered have been of interest and help to aspiring modellers and, if this is so, then the series has been worthwhile.

The author will always welcome correspondence on Meccano topics and readers interested may write to him at 61 Southam Road, Hall Green, Birmingham 28. A stamped addressed envelope should be included if a reply is required.

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500 Mountains Could Blow Their Tops

By Sam Napier

As the boiling lava flowed down the slopes of Mount Etna a few months ago, experts recalled that there were about 500 other volcanoes on earth, active today, and which could blow their tops at any time.

In more than a month of rumbling and bubbling, Mt. Etna gave one of the most dangerous and dazzling displays of Nature's powers for many years. The power behind a volcanic eruption is enormous. One Russian eruption in 1956 was estimated by scientists to be equal to the explosive power of 200 hydrogen bombs. These experts claimed that such violence in the centre of a densely populated part of earth would kill more than 1 million people.

As it is, Etna slowly added up a growing toll of destruction. An observatory, bridges, roads, buildings and power lines were all destroyed by the hot lava flowing in rivers down the slopes of Europe's tallest and most active volcano. In Sicily men grappled for weeks with the problem of turning off the fiery mountain. A village of 2,000 people, lying in the lava's path, became a major target as the burning mountain's raging continued.

For those who live in the shadow of volcanoes known to be active there are two urgent problems. The first is devising some accurate way of predicting when the mountain is likely to erupt. The other is discovering a technique for stopping it once the bursting into activity has begun.

When a mountain decides to blow its top the first action begins many miles below the earth's surface. Then the steam, gases and lava (sometimes as hot as 2,000 degrees Fahrenheit) shower out. But the accurate prediction of a volcano's conduct is still quite a way off. Control of the burning mountains is even more remote.

Mount Etna's record has shown it to be dangerous at all times. It has erupted violently on more than 100 known occasions. In 1928 it blew a new crater and 1950 witnessed one of its most powerful eruptions, but it was three hundred years ago that it caused the greatest disaster in its history. Then the mountain awakened and, accompanied by an earthquake, killed 60,000 people.

Experts have been studying Etna and its behaviour for years. Seismologists have been keeping careful watch on nearby earth tremors, and an international team has been studying the crater floor. Other scientists have kept careful watch on other aspects of the dangerous mountain. Yet when it began to erupt, scientists were helpless. Some people suggested the bombing of the crater to control the lava flow; others suggested a rocket attack by aircraft on the mountainside for the same purpose.

(continued on page 619)

tanks potential bombs for playing kids. In all, Britain scraps a million cars a year, and someone has reckoned that, nose to tail, they would stretch from London to Madrid and back again.

Most cars have at least five tyres, and standard ways of destroying them include burning (with resultant clouds of evil-smelling, polluting smoke), burying and dumping in the sea. Some are cut up and sent overseas to developing countries for conversion into makeshift shoe soles. The Americans say this is sheer bad economics. For valuable chemicals, oils and gas with the heating power of the best North Sea kind can all be extracted if the tyres are treated in the right way.

In the United States tyres have been reclaimed by baking them in retorts normally used for checking the coking quality of coal at the Bureau of Mines research Centre at Pittsburgh. When the tyres are heated to over 100 deg. gases are given off which yield 140 gallons of liquid oils per ton of tyres—about 100 used tyres go to the ton—and compounds of sulphur and zinc, as well as 1,500,000 cubic feet of gas with the heating value of the best natural gas. Large quantities of nitrogen can also be recovered. The residue in the retort, weighing just over a third of that original ton, consists of practically pure carbon, which can be used as lamp-black or compressed into graphite blocks.

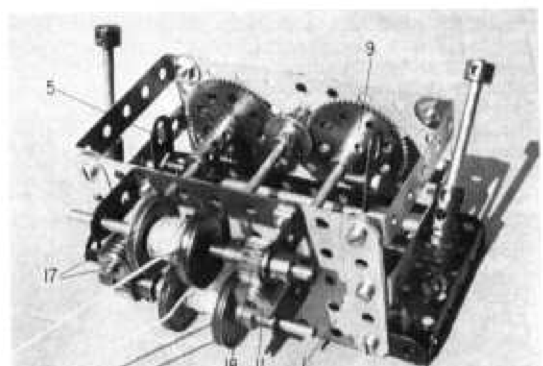
Brother, look to thine own eye! At one time the Americans used to drop their junk cars in the sea off Long Island, but there as here a change in outlook has come about with scrap merchants battling for the rising pile of rusty assets. Wrecks quickly disappear these days into the maw of giant plants which welcome a diet of up to 1,000 tons of scrap a day, about 100 tons an hour. A whole car can be processed in a matter of minutes.

The cars, minus petrol tanks (removed as a safety precaution), are transported on a conyever and fed into a giant hammer-mill, where they are pulverized into small pieces. The tyres are usually removed by suppliers for separate disposal. Dirt, glass, rubber, plastics, and all non-ferrous elements are progressively eliminated by magnetization, incineration, and sterilization.

The resultant scrap, reduced to fist-size pieces, comes out clean, dense, relatively pure, uniform in size and consistent in quality, with a ferrous content of virtually 100 per cent. The steel industry snaps up all the scrap it can get of this quality.

Among the Model-Builders

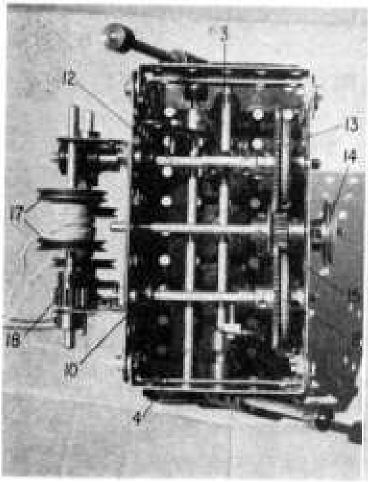
with 'Spanner'

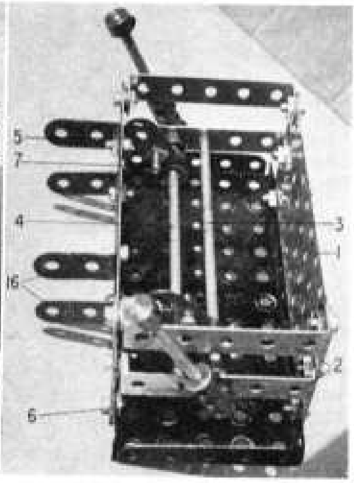


A constant-mesh, twin-hoist mechanism for a crane, designed by Mr. F. G. Rayer of Longdon Heath, Upton-on-Severn, Worcs.

BEFORE covering anything else this month, I must add my own comments to those of my Managing Director, Mr. Fallmann, and of M.A.P. which are given in statements appearing elsewhere in this issue. The statements make clear that M.A.P. are regretfully discontinuing publication of the M.M. and that Meccano (1971) Ltd. are bringing it home to Binns Road. Rather than belabour the point, therefore, I would just like to say a sincere "goodbye" to my colleagues at M.A.P.

As many readers know—and most others have rightfully assumed —I am based at Binns Road in Liverpool and my efforts for the M.M. are actually paid for by Meccano Ltd. Nonetheless, I have had a very happy, enjoyable and—particularly important—an extremely co-operative relationship with M.A.P. over the past five years while they have been publishing the Magazine. We have worked well together and I have made many





Left, the basic framework of Mr. Rayer's twin hoist unit without the winding drums and friction clutch cross-shafts. Far left, the completed mechanism, viewed from above.

personal friends among the editorial staff at Hemel Hempstead. Their interest, both in the M.M. generally and in the Meccano hobby in particular, has been strong and genuine and I know for a fact that the decision to relinquish the Magazine has been taken with the greatest reluctance. On a personal basis, therefore, I am very sorry to see the end of such a good relationship.

Having said this, though, I think I will be forgiven for also admitting to a feeling of delight that the Magazine is returning to Meccano. No matter how personally enjoyable it might have been "outside", I have always felt that the true place for "Meccano Magazine" is at Meccano itself, and your letters indicate that Meccano enthusiasts share the same opinion. This, after all, is where it all happens! I thus look forward to a continuing and perhaps more direct contact with readers through the "Meccano Magazine Quarterly", when it appears, and I sincerely trust that all Meccano hobbyists will themselves continue to support us in the new publication.

Crane Hoist

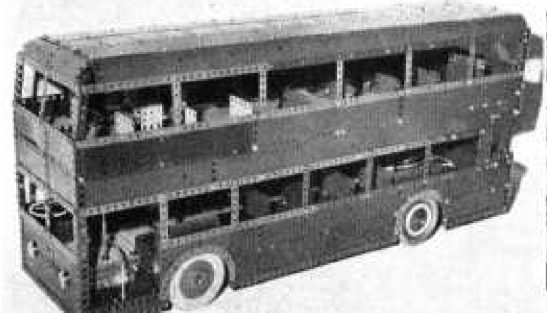
To move on to model-building matters, now, Mr. F. G. Rayer of Longdon Heath, Upton-on-Severn, Worcestershire, has supplied me with the accompanying illustrations and details of a constant-mesh, twin-hoist mechanism which will be of considerable interest to advanced crane builders. It has already been used with success for the jib and hook of a large crane and, says Mr. Rayner, "Its advantages lie in the automatic locking of the winding drums by the Worm drives, and the smooth engagement of either or both drives".

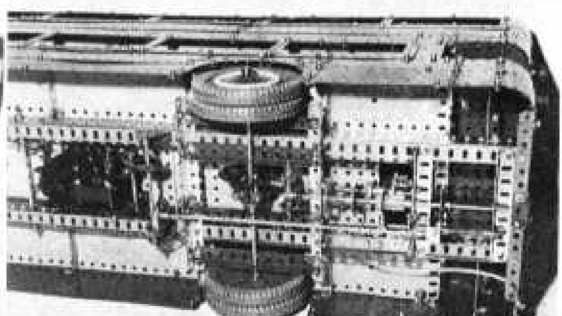
The supporting framework consists of a 5½ × 2½ in. Flanged Plate, to the side flanges of which two 4½ × 2½ in. Flat Plates 1, edged by 2½ in. Strips, are bolted. These Plates are connected by four 2½ × ½ in. Double Angle Strips 2, two at each end, as shown, the lower pair serving as bearings for the two control lever axles 3 and 4, both supplied by 5 in. Rods. Each Rod carries a Collar and Crank 5 inside the frame and a Coupling 6 outside the frame, the Rod passing through the lower transverse bore of the Coupling. Note that the Couplings on the two Rods are positioned at opposite ends of the framework. Fixed in the longitudinal bore of each Coupling is a 2 in. Rod, fitted with a Collar, which serves as the control handle, while a ¾ in. Bolt 7 is secured by a Nut in the centre of each Crank 5.

The first cross-shaft - supplied by a 3½ in. Rod—is fitted in the positions shown with a fixed 1 in. Pulley with Motor Tyre 8 and a loose 57–teeth Gear Wheel 9, the latter held in place by a Collar. Crank 5 on Rod 3 is positioned so that Bolt 7 makes contact with the collar. A further Collar 10 prevents lateral movement of the Rod, while a Worm 11 is fixed on the end of the Rod outside the framework. The second cross-shaft 12 is similarly fitted out except that the Gear-securing Collar is replaced by a Coupling 13.

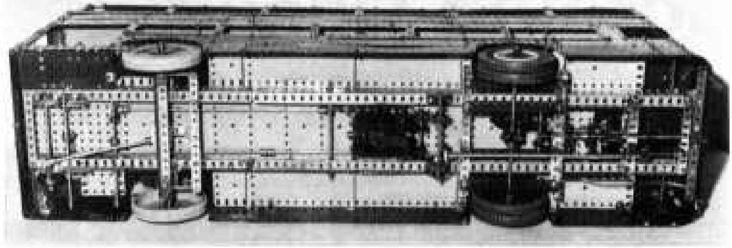
A centre cross-shaft is supplied by a third 3½ in. Rod held in place by a 1 in. Pulley 14 outside the frame and a ½ in. Pinion inside the frame, the latter engaging with the 57-teeth Gears on the cross-shafts. A ¾ in. Washer, trapped by a Collar 15, is added to the Rod to prevent the Gears moving out of mesh with the Pinion.

Finally the two winding drum units are each built up from a 3½ in. Rod held by a Collar in the outer holes in the lugs of one or other of two 2½ × 1 in. Double Angle Strips 16 bolted to front Flat Plate 1. Fixed on the Rod are two 1 in.





Left, easily recognisable—a Leyland Atlantean model built by Mr. Martin Brown of Leyland, Lancs, with some help from friends. Right, a close-up view of Mr. Brown's Atlantean showing the motor and drive system.



An underside view of the Leyland Atlantean showing the chassis layout.

Pulleys 17, bosses inwards, and a ½ in. Pinion 18, this Pinion meshing with the nearby Worm on the end of the appropriate cross-shaft. A Cord Anchoring Spring is carried on the Rod between the bosses of the Pulleys.

In operation, drive is taken to Pulley 14 and is subsequently transmitted to one or other, or both, winding drums by moving the control handles so that Gear Wheels 9 are forced against Pulleys with Tyres 8. The Gears and Pulleys, of course, make up simple friction clutch arrangements. Mr. Rayer also points out that Pulley 14 can be replaced by any other suitable part to receive the drive, as dictated by individual requirements.

PARTS REQUIRED

4—5	2—27a	2—46	3—63
2—15	2—32	4—48a	2—111c
5—16	18—37a	1—52	2—155
2—17	16—37b	2—53a	2—176
7—22	2—38	10—59	
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Leyland Atlantean

For general interest, now, I would like to draw attention to the remaining photographs, reproduced here by kind permission of the "Leyland Truck and Bus Times". They show a very well-proportioned and finely detailed model of a Leyland Atlantean bus, built by Mr. Martin Brown of (appropriately!) Leyland in Lancashire. Mr. Brown tells me he was helped with construction by three of his friends and the results obtained were so good that the model caught the interest of the Editor of the "Leyland Truck and Bus Times" who subsequently featured it in his magazine.

"The bus", writes Mr. Brown, "Has a total length of 3 ft. 1 in., a height of 1 ft. 5 in., a width of 9½ in. and it weighs approximately 28 lbs. It is powered by an E15R Motor, mounted a few inches in front of the rear axle. In a real Atlantean, the engine is of course mounted behind the axle, but there was insufficient room for this in the model. The drive is taken behind the rear axle, where it reaches the input shaft of the gearbox after a 3 : 1 reduction ratio. The input shaft carries a ½ × ¾ in. face Pinion which meshes constantly with a 1½ in. Gear on the sliding layshaft. The drive is then taken to the output shaft which is journalled at one end in the ¾ in. face Pinion. Using the gears shown in the photographs, the output ratios are 1 : 1, 2 : 1 or 4 : 1. From the gearbox, the transmission goes to the rear axle differential via two Bevel Gears".

Mr. Brown goes on to explain that the steering linkage follows the true Ackermann principle: "When the steering wheel is turned, bevels rotate and pull a draglink which turns a bell crank mechanism on the front axle. One arm of this bell crank is pivotally attached to the track rod.

"Journalled across the chassis ahead of the front axle are two shafts turned by levers in the cab. The foremost shaft controls the gearbox layshaft and the rear shaft controls the E15R Motor switch, the shafts being connected to their relevant "operations" by longer shafts running parallel to the chassis, between the chassis members. The chassis itself is of rigid construction, each side composed of a compound channel girder with a cross-sectional area of 1 × ½ in. The bodywork is secured to the chassis in numerous places, the floor being fixed directly on top of the chassis.

"Total seating accommodation is 51, with 29 seats in the lower saloon and 22 in the upper saloon. A spiral staircase connects the two saloons. The entrance is divided into two sections by a handrail fixed as shown in the photograph, while other details include headlamps, driving mirrors, etc."

This is as far as Mr. Brown goes with his description, but it is, I feel, enough to give a fair idea of the features he has included in a very worthwhile model. It also closes the last "Among the Model-builders" article with M.A.P.—the next will be in the first issue of "Meccano Magazine Quarterly". See you then!

500 MOUNTAINS *(continued from page 611)*

It's more than thirty years ago since, on Mount Larvna Loa in Hawaii, these techniques were first tried out. The results have never been satisfactory. Hence, apart from evacuations to save life and movable property, there is little man can do but wait for the mountain to blow itself out.

But volcanoes are not all bad. They add rich fertilisers such as potash to the soil, and their gases, turned into sulphur, can be mined. Sometimes eruptions bring minerals from the inner depths of the earth to the surface. Even diamonds have been found in the necks of old volcanoes.

Among the most recent uses for the volcanic waste is to turn it into rockwool which is used to insulate walls and thus stop a heat loss in homes. Another benefit, apart from sulphur springs and geysers, lies in harnessing volcanic energy. For instance, by boring down to the hot lava when a mountain is inactive and then pumping water down into it, the energy, released as steam, could provide as much as a giant power station working flat out for 25 years.

Today the men and women who live in the shadow of known volcanoes have much to fear. Experts claim that none of them ever becomes extinct. They only rest for a few hundred years at most and then burst into activity again. But, while the burning mountains are inactive, men can still tap their resources to provide central heating for homes and energy to provide electricity.

The Editor and staff of Meccano Magazine would like to thank all readers for their support, to wish Meccano Magazine Quarterly a successful future, and, since this is the December issue, to wish everyone a Merry Christmas and a happy, prosperous, and peaceful 1973.