NZFMM MAGAZINE

Volume 43, No. 3 August 2019

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- WIN great prizes in our NEW puzzle section.
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Published by The New Zealand Federation of Meccano Modellers

Volume 43, No. 3
NZ Federation of Meccano Modellers Magazine

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Deadline for November issue is 30th September

The NZFMM Magazine is published four times a year in February, May, August and November. The publisher is the NZ Federation of Meccano Modellers. The purpose of the magazine is to publish articles and photographs about Meccano and Meccano models, to report the meetings of New Zealand Meccano Clubs, to print letters expressing the views of Meccano modellers, to keep members informed of future events and to print advertisements of Meccano related things. The views expressed in the magazine are not necessarily those of the editor or of the Federation.

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2019/2020 subscription rates:

Within New Zealand: Hard copy mailed: NZ$45.00; Electronic pdf copy NZ$14.
Overseas: Hard copy mailed: AU$47.00; CAN$50.00; USA$38; GB£29; (Euro no longer accepted by NZ banks.)
Overseas: Electronic pdf: AU$14; CAN$14; USA$11; GB£8; **Note**: Euro no longer accepted.
New Zealander's paying for overseas subscribers in NZ$: **Hard copy only mailed O/seas**: NZ$50.
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Editorial

With the Convention now well-and-truly in the past and the westerly winds of winter howling around the eves, there is no better time to hunker down with a selection of your favourite Meccano parts and work on that creation which has been bubbling away just below consciousness for the last couple of months. Inevitably you will need to make a decision about motive power at some stage, so why not consider digital stepper motors with remote control? 'Too hard, too expensive' you might think. Not so, is the answer. The degree of control you can achieve is light years beyond what is possible with traditional motors and actuators. In an attempt to help spread the digital word (cough) we will be running a regular competition in the NZFMM magazine with small prizes of digital components to help members enter the world of bits and bytes. Each puzzle will be a simple Meccano related conundrum, well within the scope of any Meccano user. See page 15 for the first puzzle and conditions of entry.

In this issue we have a trilogy of vehicles, courtesy of **Les Megget, David Glenday** and **Bruce Geange**. As usual, Bruce has supplied detailed instructions for builders. **Bruce Durdle** offers more in-depth advice on motorizing your models. The regular **Club Reports** keep us in touch with fellow modellers.

Planning for the 2021 Convention is already afoot, with the Wellington Meccano Club carrying the torch. See page 16 for an important request from them regarding possible dates.

Lastly I must thank all those who have provided positive feedback about the magazine. In reality it is the contributors who set the tone and direction, and I am delighted with the response from members-at-large. Any material you have is most welcome, particularly if it shows Meccanomen in their natural habitat.

Best wishes
Richard

Contents:

1961 Aston-Martin DB4 Convertible by Les Megget (AMG)

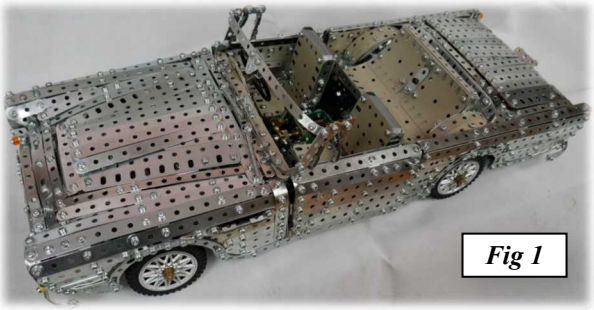


Fig 1

This 1:7.5 scale model (*Fig.1*) started life as another (smaller) James Bond Aston Martin DB5 after I constructed the *Lego* version of the Bond DB5 released in mid-2018. This model has some very smart mechanisms which I thought could be replicated in Meccano. I started the DB5 with the roof section flipping back and releasing the ejector seat, which I succeeded in getting the seat to take off across the room. However I realised that I didn't have enough silver-grey flexible plates to clothe the model because I am not allowed to pull the larger Bond Aston apart!
So the decision was made to scrap the Bond DB5 and convert the chassis into an earlier DB4 convertible. This model didn't have the plastic covers over the headlights but almost every other detail continued into the DB5 series. The boot detail is

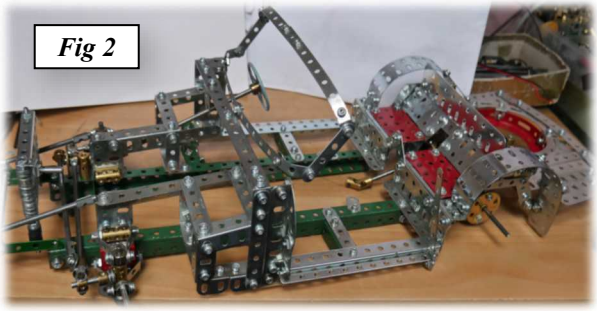


Fig 2

much simpler without the semi-spherical shape that I had so much trouble with in the larger scale model. *Fig.2* shows the half built chassis and suspension.

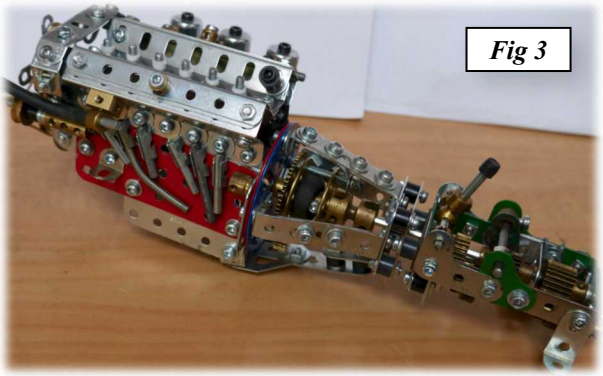


Fig 3

Fig.3 shows the DB4's engine, clutch and gearbox. The gearbox is only a 2-speed and reverse unit due to keeping the length to scale (as near as possible). The clutch came out of the earlier mini Austin-Healey 3000. The engine is the standard DB 6 cylinder, twin-cam 4 litre with triple SU carbs.

Chassis & Suspension: The DB4 doesn't have a conventional ladder frame chassis, just plated box sections from the front to behind the gearbox and 6" deep sill sections under the doors. The rear section is made up of welded plates. In *Fig.4* the

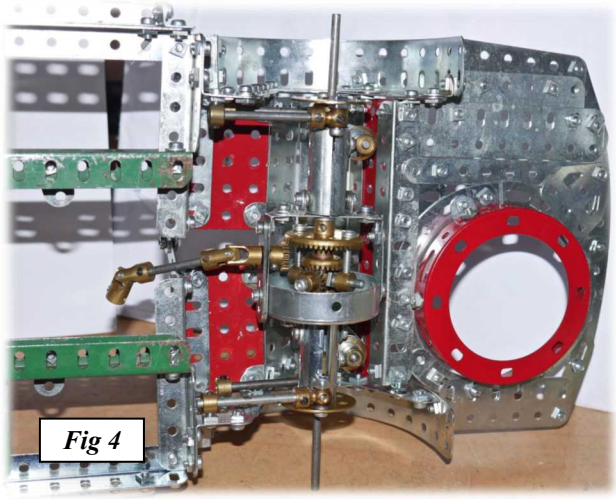


Fig 4

chassis is shown with the suspension units attached; double wishbones at the front and live rear axle with vertical coil springs held in position by 2 trailing arms on each side. The front coil springs should enclose shock absorbers but there was no room for those.

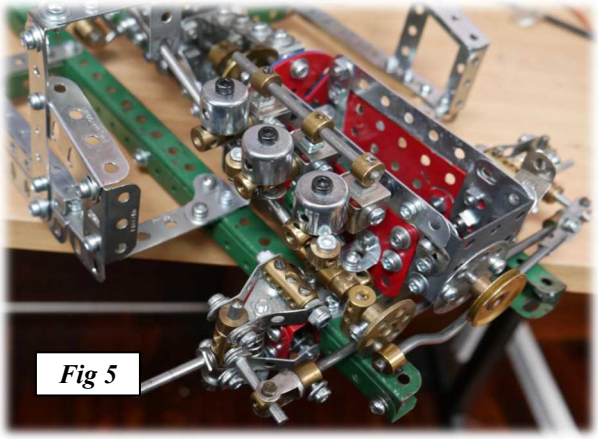


Fig 5

The steering mechanism and the front suspension detail can be seen in *Fig.5*. The steering should be rack and pinion but again lack of space forced me to use a crank (1" Bush Wheel and a Crank Handle across the chassis to the steering arm. The steering wheel shaft is articulated by a mini 1" long universal joint. The 2½"steering wheel looks huge but is reasonably close to scale, the prototype

having a 16" diameter wheel. The rear suspension detail is shown in (*Fig.4).*

Bodywork: Initially I intended to use green strips for the bodywork but the severe bending required in some places would have meant repainting some of them for sure. So I decided to use zinc-plated Strips in a form similar to that used by Terry Allen in the UK (see his award winning Bugatti and Piccard racing car in recent CQ magazines). The shape was formed by vertical Narrow Strips to which the standard Strips were bolted horizontally. This is somewhat similar to the method used in the actual DB4, where the vertical strips are small diameter tubes with hand-beaten alloy panels attached. The Strips were bent in my Meccano plate bender and I only broke 2 modern (non-ductile) strips by trying to bend them too tight!

The doors aren't pure rectangles and it proved difficult to get them to fit nicely without strip mutilation. The Aston's grill is complicated, in shape and construction. Again I used Narrow Strips spaced by Nuts within a Narrow Strip frame and I can say no Strips were mutilated (beyond recovery, hopefully) in the process. The complex curvature around the headlights took some effort with the pliers (and bad language helped) to get looking reasonably at this small scale (*Fig.7, cover*) but I think I did a better job than the square edged *Lego* DB5.

The "wire" wheels are a cheat being 2" Pulleys behind slightly modified plastic spoked wheel covers from the Mechanical Workshop set of a decade ago. A spare wheel resides in a recess in the boot floor. The tyres are the *Ashok* heavy-duty version of about 3" outer diameter.

The back seat (*Fig.8*) can be removed by unscrewing 1 bolt to reveal the "battery" residing below the seat just in front of the rear axle as per the original. The front seats fold forward to allow short rear passengers to take their places. The beige "leather" upholstery is from the recent Empire State Building set and the black "carpet" from a collection of modern-era sets (don't look too closely at the non-matching colours).

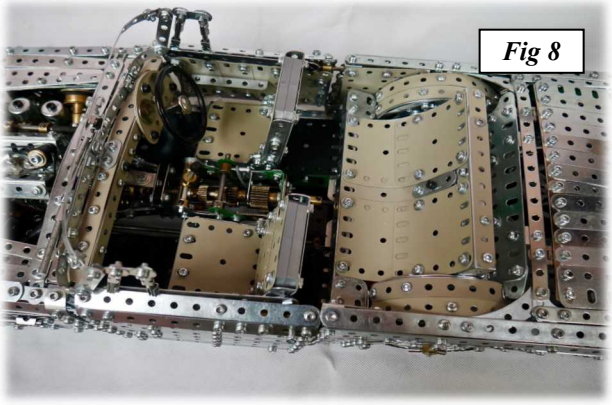


Fig 8

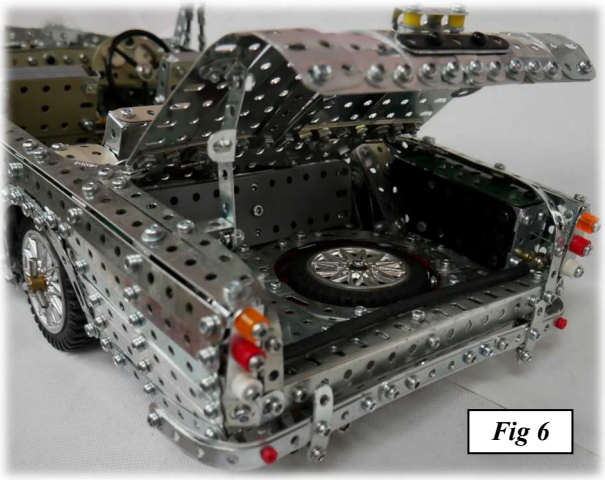


Fig 6

Some detail was added to the engine bay including, distributor + leads, coil, brake booster, radiator overflow tank and bonnet prop, shown in *Fig.9.* Squeezing all this detail in after the body was complete requires a lot of patience and finger dexterity. I certainly didn't want to remove portions of the body to fit these details, as I was fearful I would never see it all together again.

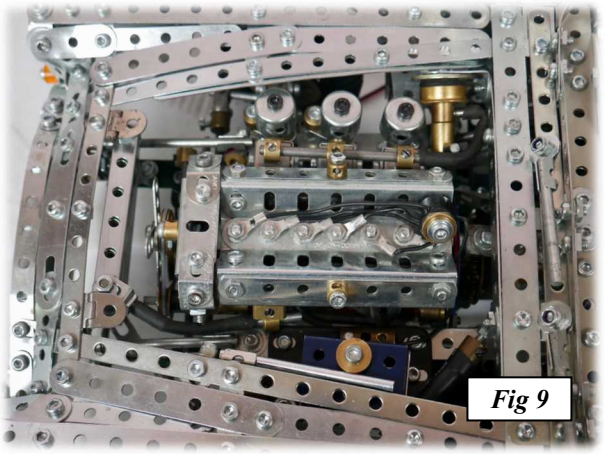


Fig 9

Finally the real DB4 is shown in *Fig.10.* Only 70 DB4 convertibles were ever built and they sell for much more than the coupe DB4 or DB5 versions even with the DB5's James Bond connection. Prince Charles has a later DB6 Volante, which he reportedly runs on discarded white wine from one of his vineyards, with a little additional whey!

Les Megget
AMG


Fig 10

EVERYBODY BUILDS A JEEP.

By **David Glenday.**

The 'Jeep' has been a vehicle of endless fascination since the end of WWII and a popular model prototype for many Meccano Boys born in the post war period.

It was the start of the 4 wheel drive phenomena that continues today. The original Jeep featured in all the theatres of the war, and epitomised the Anglo-American military effort. Fittingly Meccano released the US Jeep as its first completely new post war Dinky Toy in 1946 and it has remained highly collectable since.

Meccano men have modelled the Jeep in many sizes and partly based on the wheels selected, or imposed by their set number or available parts. Surprisingly though set construction manuals have only rarely contained models of Jeeps or similar vehicles.

Some manual plans with Dinky Jeep and Austin Champ

The other determining factor has been to accurately represent the width and length of the Jeep and its body shape. The writer recalls a NZFMM newsletter in the 1990's where the contributor provided a CAD drawing and justified the use of even number strips for the correct scale width of the body. So this was my starting point using the 3 inch strip and double angle strip.

I wanted to build a small model for play value and as a quick project. There isn't anything remarkable in mine - it could have had a small motor or working steering. However the steering does have a castor effect, and proved a good play toy when a 4 year old great niece stayed in the holidays.

Readers who are not aware of the enthusiasm in the *cj3b website* dedicated to this model of Jeep, may like to browse :

https://cj3b.info/Toys/MeccanoJeeps.html
https://cj3b.info/Toys/DinkyToys.html

where they will recognise models and Meccano men.

Meanwhile, my Jeep negotiates the rough garden pulling a Dinky Howitzer.

***Above**: Formation flying at Bruce Geange's...*

BUILD A BEACH BUGGY

By Bruce Geange

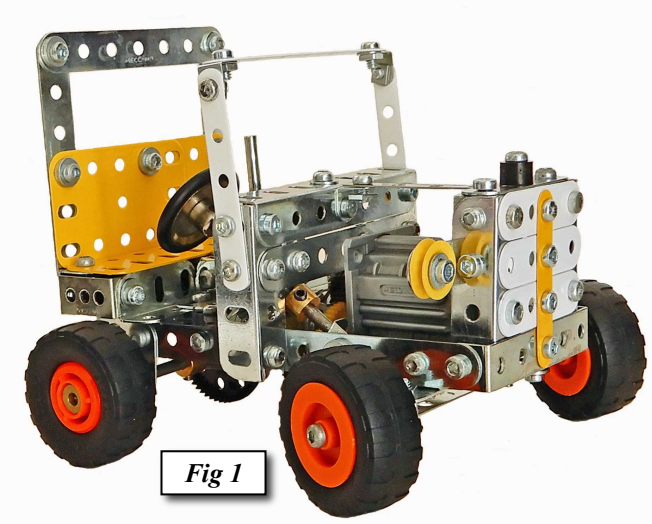


Fig 1

These vehicles were generally constructed from old cars and were mostly for having fun with (***fig 1***).

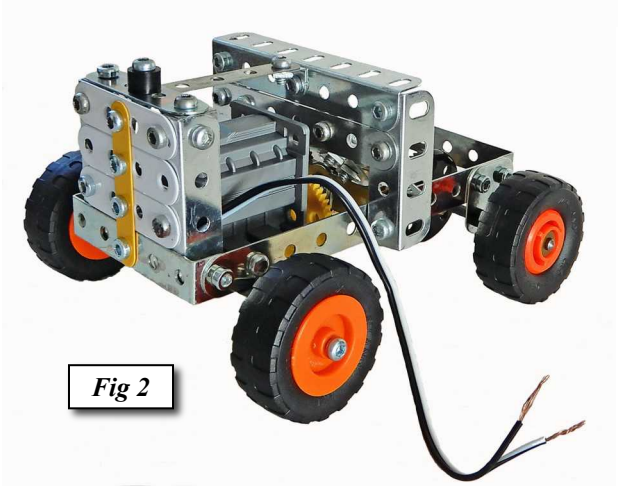


Fig 2

Start construction (***figs 2 & 3***) by bolting $5^1/_2$" Strips to either side of the front $2^1/_2$"x$^1/_2$" Double Angle strip to form the chassis. Bolt two more Double Angle strips at holes seven and eleven with a Corner Bracket on the outside and fixed by two Bolts at the rear. The centre DAS has a Fishplate fixed either side of the centre hole by the slotted holes as a bearing for the drive shaft. Bolt a 2" Narrow Strip to the centre hole on the front DAS with three 2" Strips across and 2" Angle Girders each side by the slotted holes and Angle Brackets at the top with a 2" Strip filling in the gap. Use a Plastic Spacer for the radiator cap with a 2" Narrow Strip to support the radiator.

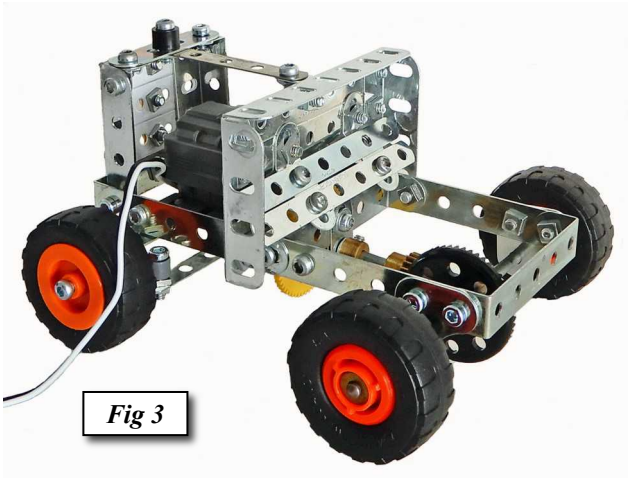


Fig 3

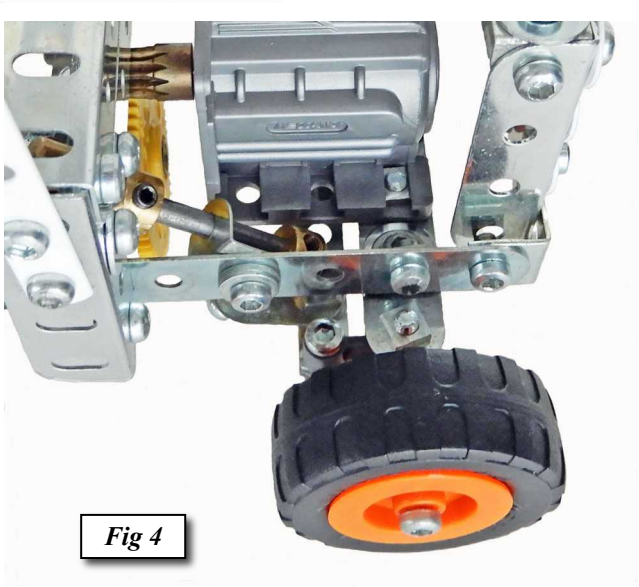


Fig 4

A $3^1/_2$" Strip is used for the front axle with Steering Arms fixed at either end with a 15mm Pivot Bolts and locknuts. (***figs 4 & 5***) Bolt Angle Brackets by the slotted holes in the next two holes on the axle facing out. A $3^1/_2$" Narrow Strip makes the tie rod and is fixed to the lower end of the Steering Arms with Pivot Bolts and locknuts. Fix a Fishplate to hole two on the narrow strip by the round hole facing the rear. Bolt a Meccano motor with an 11 Tooth Pinion using the end holes next to the A/B on the axle. This assembly can be fixed to the chassis in holes two on either side. The front wheels each have two Flanged Wheels (B451) with a tyre in between and fixed to the steering arms with 23mm Pivot Bolt.

A 5" Axle Rod is used for the rear axle (***fig 5, overleaf***) and has in between the chassis a $1^1/_2$" Contrate Wheel, two Washers, Coupling, Washer and a Collar. On the ends there are two Mini Plastic Spacers and a Coupling. The tyres (A044) are from the Cable Command set and fit onto a Double Pulley (A042) then over the coupling and held in place with a Bolt and two Washers with a short piece of wire under the

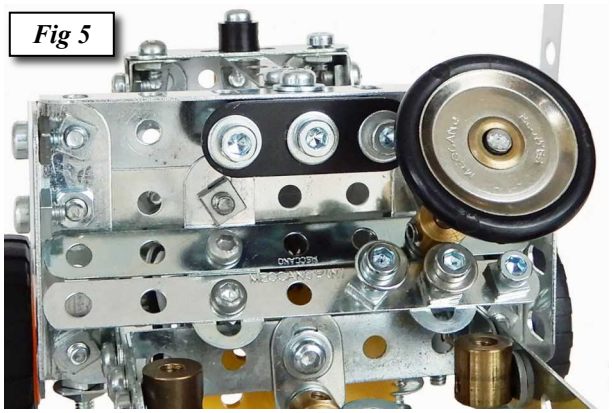


Fig 5

washers on the outside. A 2" Axle Rod fits into the end of the coupling with a $^1/_2$" Pinion, and Collar then through the fishplates with a $1^1/_2$" Gear Wheel on the end adjusted to mesh with the pinion on the motor.

The bulkhead (***figs 2 & 5***) is made up from a $3^1/_2$" Angle Girder that has 2" Angle Girders bolted at each end by the round holes. A Narrow Angle Bracket bolts to the middle round hole on the $3^1/_2$" A/G. Bolt a $3^1/_2$" Strip below the long A/G with Obtuse Angle Brackets fixed at holes two and five by the slotted holes. Fishplates bolt to holes two and five from the right side on a $3^1/_2$" Narrow Strip with hole two having a $^3/_8$" Bolt with a Washer next to the head and locknuts to the fishplate. Hole one has a Bolt and Washer with locknuts while hole three is the same as hole two. A second $3^1/_2$" Narrow Strip bolts to the fishplate in hole five and fixes to the obtuse angle bracket at hole five. Hole two has the steering axle through it. The dash is made from a $1^1/_2$" Strip with Bolts, Washers, Nuts and an Angle Bracket for mounting at the top of the bulk head. This assembly bolts to the chassis in holes six with Angle Brackets by the slotted holes. Bolt the narrow strip from the radiator to the narrow angle bracket. A windscreen can be added if required using two $2^1/_2$" and a $3^1/_2$" Narrow Strips joined at the top with Narrow Angle Brackets then fixed at an angle to the sides of the bulkhead at an angle.

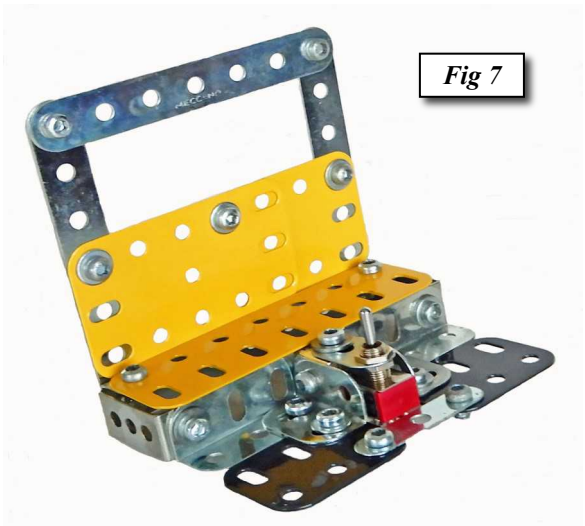


Fig 7

For the steering control (***fig 4 previous page***) bolt an Angle Bracket to hole four on the chassis by the slotted hole with two Washers under the bolt head. Fit a 1" Fixed Pulley with a Collar to a $3^1/_2$" Axle Rod then through the bulkhead with a Collar. Pass through the angle bracket and place another Collar having a $^3/_4$" Bolt through the fishplate and secured to the collar. The steering should now operate.

The floor and seat (***figs 7 & 8***) have been made using two 1" Angle Girders bolted by the round holes to each side of a $^1/_2$" x $^1/_2$" Double Bracket with the slotted holes fixed to the round holes on $1^1/_2$" Angle Girders. The front slotted holes on the 1" A/G have $1^1/_2$" Flat Girders by the slotted holes bolted to them. An $1^1/_2$" Narrow Strip bolts across the front. Bolt 1" x $^1/_2$" Double Angle Strips to the ends of the $1^1/_2$" A/G with a $3^1/_2$" Angle Girder bolted to the other end with $3^1/_2$" Strips facing up and joined at the top with another $3^1/_2$" Strip. A $3^1/_2$" Flat Girder becomes the seat and two $2^1/_2$" x $1^1/_2$" Flexible Plates make the seat back. A Double Pole ON-OFF ON miniature switch fitted to a Fish-plate fixes to the $^1/_2$" x $^1/_2$" double bracket. A triple AA battery box fits under the seat. This assembly bolts to Threaded Bosses in holes 8 on the chassis spaced with a Washer. After some wiring and a few drops of oil the model will run smoothly.

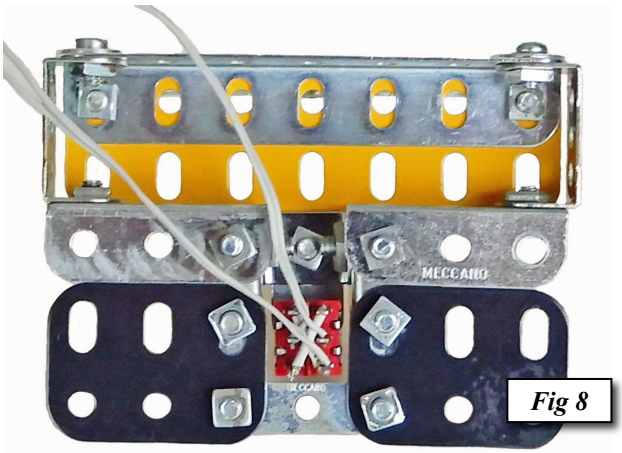


Fig 8

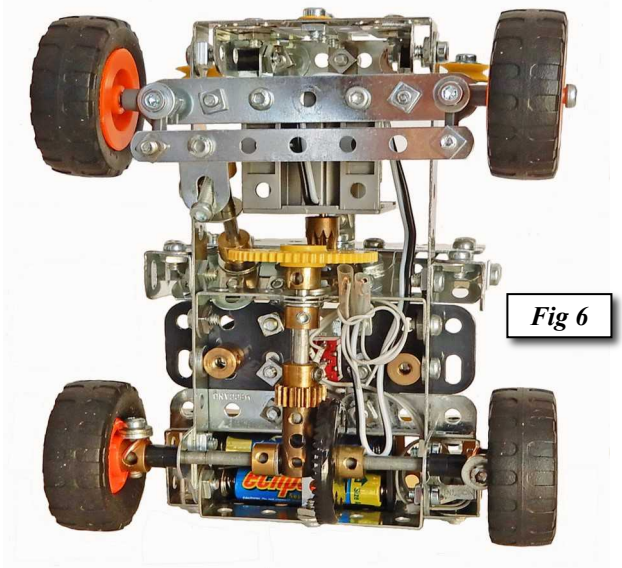


Fig 6

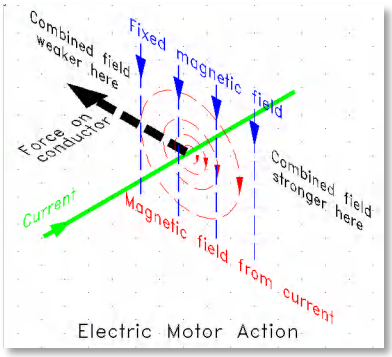
Smarten Up Your Meccano

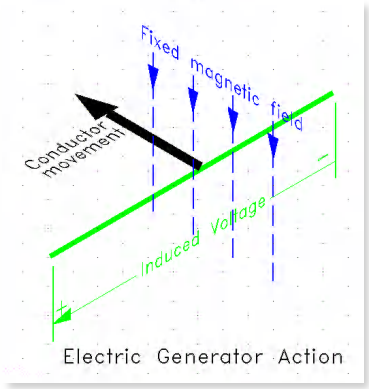
Part 3: Motors

Most models involving some sort of movement will use an electric motor of some sort. There are several options available, and choosing between them can greatly help in getting a satisfactory result.

The standard small DC motor is relatively simple to use, but does have some disadvantages. Small servo-motors are widely used in the RC model area, and can be adapted for Meccano systems – the Meccanoid® robots use these. Another alternative is a stepper motor, which can be used to give precise position control.

DC Motor Basics





Regardless of the type, all DC and AC motors or generators rely on the same basic physics:

An electric current produces a magnetic field aligned circumferentially around the conductor carrying the current.

- When two magnetic fields interact, a force is produced that tends to even out the overall magnetic fields.
- When an electric conductor moves in a magnetic field, a voltage is produced between the two ends of the conductor.

In a motor, we have a magnetic field set up in some way – for small DC motors, this is usually done by permanent magnets. Electrical conductors run in this at right angles to the field direction. When a current flows in these conductors, the field due to the current will oppose the permanent field on one side, and reinforce it on the other – so the total magnetic field is increased on one side and reduced on the other. This imbalance causes a force to act on the conductor which tends to move it towards the area with the lower total field.

If you compare the two diagrams, you will see that, if the conductor is free to move because of the force, both diagrams will apply – the current in the magnetic field causes the conductor to start moving, and the resulting movement produces a voltage (the induced voltage or back EMF) that opposes the current. When a motor is running, it reaches a balance between these two effects, so that the induced voltage is only a little less than the applied external voltage and only a small current flows. If the motor is stalled, this balancing act no longer operates and very high current can be drawn.

Torque Production

By arranging the conductor so that it forms a loop, with the top part carrying current in the opposite direction to that in the bottom part, the overall effect is to try and rotate the loop so that it aligns with the permanent field. This effect develops a torque that we can use to make something rotate – the strength of this torque depends on the current in the conductor and the magnetic field strength of the permanent magnet.

Torque is proportional to the current

Motor Speed

If the coil described above is free to rotate, the conductor will move relative to the magnetic field. From the second of the physical effects above, a voltage will be induced in the conductor. The polarity of the voltage is such that it acts against the current which develops the torque, while its magnitude depends on

the speed of movement. The electric circuit is made up of a voltage from the power supply, the opposing voltage set up inside the motor by the rotation, and a resistive voltage drop caused by the motor current flowing in the circuit resistance. Since the winding resistance is very low, the internal voltage is almost the same as the supply voltage. As the induced voltage is proportional to the speed,

Speed is proportional to the supply voltage.

Torque, Power, and Force

Quite a few of the articles and websites I've looked at when preparing this article have been quite confused when it comes to talking about the effort the motors can produce. Some use "power" when referring to the ability of a motor to drive a rotating load, while others use "force".

A rotating shaft can lift a weight against gravity. However, the weight that can be lifted depends on the distance between the axle and the point where the weight is applied. The take-up motor in a paper rolling machine must put out more effort as the drum fills up, as the radius at which the paper is being applied increases.

The effort that must be produced by a motor to lift a weight or pull on a rope depends on the product of the force being applied and the radius of the shaft - this quantity is referred to as the **TORQUE**. It is measured in newton-metres (N-m). 1 N-m is approximately the rotating effect produced by a mass of 100 g on a lever arm 1 m long. Small motor specifications suitable for use with Meccano may quote torque values in g-cm or kg-cm – to get the value in N-m, first convert grams (g) to kilograms by dividing by 1000, then convert the weight in kg to a force in N by multiplying by 9.8 (unless you're on the moon) and finally divide by 100 to convert cm to m. So if a motor torque rating is specified as 50 g-cm (typical for a small 6 V motor similar to those used in Meccano products), the value in N-m is:

$$50 / 1000 \times 9.8 \times 1/100 = 0.0049 \text{ N-m}$$

The torque can be used to find the power applied to a rotating load – but the speed of rotation is also a factor. Power is proportional to torque × speed. If torque T is given in N-m, and rotating speed R in rpm, the power is:

$$P = T \times R \times 2\pi / 60 \text{ watts}$$

Meccano motor characteristics

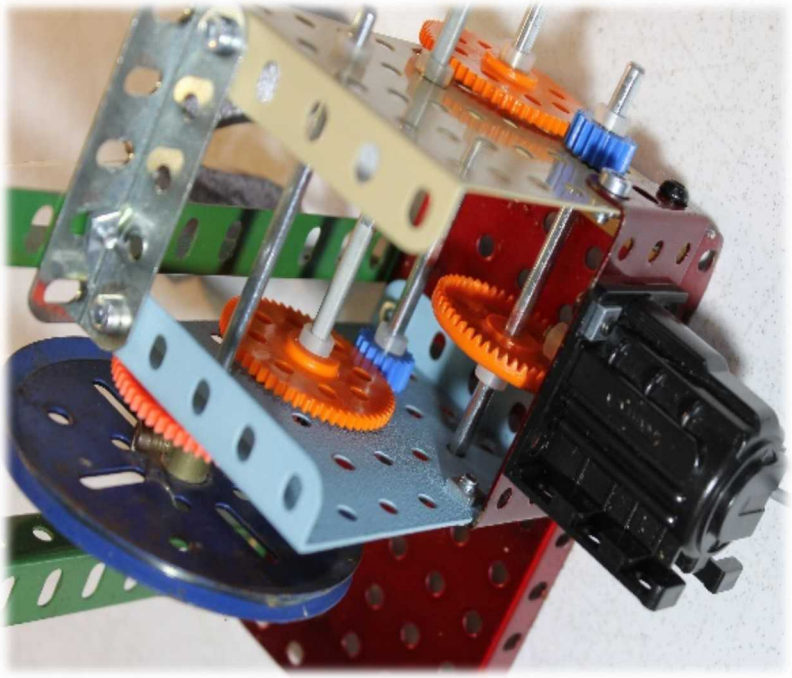
Small motors such as those included in the Meccano range use permanent magnets and relatively few turns of wire. One consequence of this is that the unloaded motor speed is very high, and the torque is low.

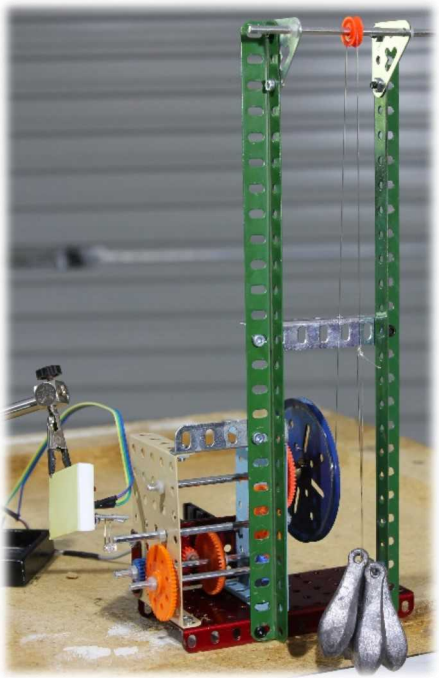
The Meccano "cube" motor part no 770 – EM02 draws around 100 mA from a 6 V supply when "on the bench" with no load connected. The speed varies between motors – one I tested did 5750 rpm at 3 V and 11500 rpm at 6 V, while another could only manage 5050 and 9900 rpm for the same voltages. However, the average speed of a number of these motors at 6.0 V is around 10,000 rpm. As predicted by the theory, at 3 V the average speed is almost exactly half or 5000 rpm. An estimate of the torque can be made by dividing the electrical power into the motor by 2π × rpm / 60 – this ignores the effect of motor and gearing efficiencies. So, at no load, the torque needed to overcome friction and other losses can be found from:

Electrical power = volts × amps
= 6 × 0.1
= 0.6 W.
Speed is 10,000 rpm

Torque = (Electrical power) / (2π × rpm / 60)
= 0.6 / (2π × 10000 / 60)
= 0.6 / (2π × 168)
= 0.6 / 1060
= 0.00057 N-m

As stated above, the torque is proportional to the motor current. If the speed remains at 10,000 rpm and the motor is loaded until the current reaches 1 A, the torque developed will be 10 times that calculated above, or 0.0057 N-m – still not very much. A useful indication is that the motor will lift the grand total of about 20 g using a 2½" diameter pulley. It's possible to stall the motor by holding the shaft.





To drive any sort of useful load, the speed must be reduced by gearing. This increases the available torque by the same ratio as the speed is reduced. For speed reduction, a gear driven by the motor (usually referred to as the pinion) must have fewer teeth than the gear driving the load. With Meccano, there are only a few options for gear ratios because of the ½" spacing restriction. The smallest pinion in the plastic gearing range is the 25bp3p with 12 teeth. If this is used to drive a 28p3p contrate gear with 50 teeth, the speed of the contrate gear will be 12 / 50 or 24 % of the pinion speed. At the same time, the torque available from the contrate gear is increased by a factor of over 4 – in theory, the torque increase will be 4.17, but there will be some torque lost in the gear train.

Adding a 26p pinion with 19 teeth to the contrate gear shaft, and using it to drive a 27a spur gear with 57 teeth, further reduces the speed to 19 / 57 = 1/3 of the contrate gear speed, or 8 % of the motor shaft speed, and increases the torque 3 times to 12.5 × the motor delivered torque. Repeating this combination will take the speed down to 1/3 of this or 2.6 %, and increase the torque a further three times to 37.5 × the motor delivered torque. Starting from 10,000 rpm, the speed will be 260 rpm or just over 4 revs/second.

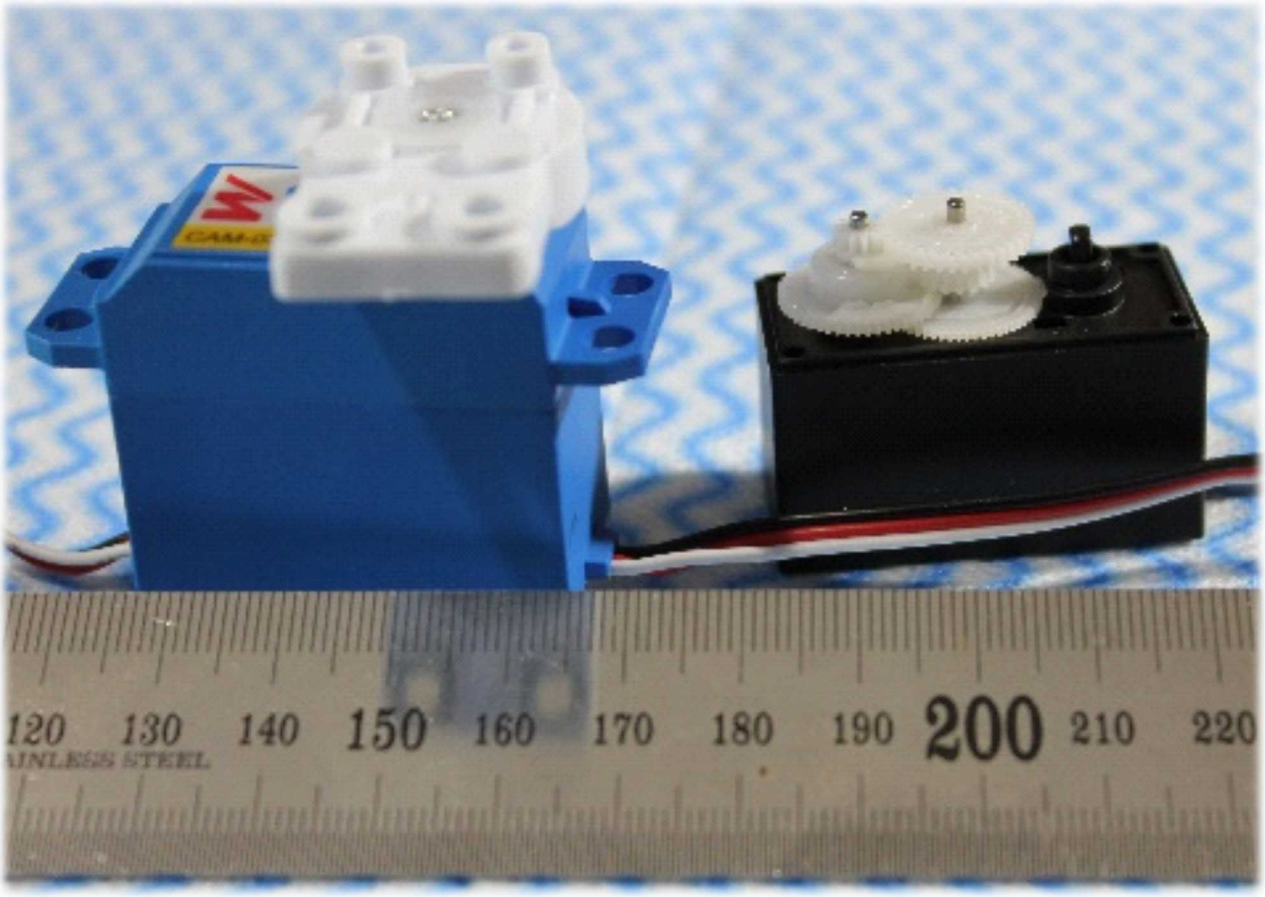
In practice, the actual speed will depend on several things. Loading the motor makes the torque and the current drawn increase. The increased voltage drop in the motor windings causes the speed to fall. I've tested a motor to see these effects in the simple rig in the photos, using a cube motor with 12 / 50 speed reduction followed by 3 sets of 19 / 57 reduction to give an overall speed reduction of 0.009. A nominal 10,000 rpm motor drive will theoretically give 90 rpm or 1.5 rps at the output. Results were:

No extra load	speed 1.42 rps	current 0.16 A
Load 0.115 N-m	speed 1.05 rps	current 0.63 A.

Under load, the input electrical power is 3.78 W, and the mechanical power to the load is 0.76 W. The overall efficiency is 20 %.

The battery voltage delivered to the motor will also fall as it ages, and the speed will fall in proportion. If we want to know exactly how far the motor has travelled, or how fast it is moving, the simple motor / battery combination is inadequate. To get a specific performance or meet some sort of specification, additional information is needed – this will usually involve some sort of measurement to provide feedback of what the motor is actually doing, rather than what it is expected to do. A simple form of feedback was used in the system described in Part 2 of this series, where limit switches stopped movement beyond specified limits.

Where a speed requirement must be met, or the motor must move by a specified amount, feedback sensors will be more complex.



Servomotors

One type of motor that does go some way to meeting the requirement for specifying position is a servomotor. These are widely available as they are used by the Radio Control people to control throttles and directional control elements. Meccano also uses "smart" servos in the Meccanoid® and MAX robots.

A servomotor includes a standard electric motor, some driving or controlling electronics, and a variable resistance to provide feedback of the actual output shaft position. The motor for the small R-C type servos is high-speed low-torque and there is an internal gearbox assembly (seen in the unit to the right in the photo) to reduce the speed and raise the torque to useful levels.

The position of an R-C servo is set by a control signal which has a varying pulse width, and they usually involve some electronics. The servos supplied with Meccanoid / MAX require a different form of signal, and can also provide an indication of position back to the controlling computer. I'll go into them in more detail in a later article.

One issue that can cause problems is mounting the R-C servos on to Meccano equipment. The Meccanoid and MAX kits have items M016, M100 and M101 which can be used as adapters for standard servos as well as the "smart" modules. The Meccano expansion pack 15403 has a single smart servo with mounting hardware. Cost on Amazon is $17.90 each at the time of writing.

Stepper motors

Another type of motor that can be used to give precise control of movement is a stepper motor. This has a different form from the standard DC motor described above. It is constructed with a number of windings which are energised in succession: this moves the internal magnetic field by a very small amount, with the rotating element following. The rotary angle between steps is relatively large - 7.5 ° is common – and gearing may be needed to get fine position control. Again, electronics is used to set up the stepping sequences. There are no generally recognised standard formats for stepper motors for our sorts of application, and mounting them into a Meccano project will generally require some sort of adaptor. Small steppers can be found in a lot of electronic items such as printers or scanners.

Bruce Durdle
MWT

Auckland Meccano Guild Meeting

11th May 2019

The Meeting took place at the home of Neil Carey in Hillsborough Auckland. We had an interesting range of models on display.

Neil Carey had built up a Boeing F/A Super Hornet which was the prize he won at the recent Meccano convention. His huge NZR Locomotive will now be due for the parts bin.

Gary Higgins had made up a steampunk submarine based on a resin model he had bought. The original model had a nice sequence of colour changes via LED, which Gary swiped for his model. Most parts were from rolled strips and triangular shapes from the Automotive construction set.

William Irwin had a model which harked back to the early days of computer control. He had a large console which could individually control a series of motors, it still worked well after all this time. He also had a number of other club magazines on display.

Gerald Hart had a rather unusual walking machine the basics of which were sourced from a Konkoly magazine model and a smoothly operating version of the horiziontal steam engine from some of the early Meccano model plans. Both worked very well and the walker was quite capable of taking over the model table.

Brian Cotton had scratch-built an amazing railroad scenario from WWII with flat bed mounted search lights and anti aircraft guns. He had modified original Hornby rolling stock and the results were remarkable. The search lights and AA guns were from various model sources suitable for the era.

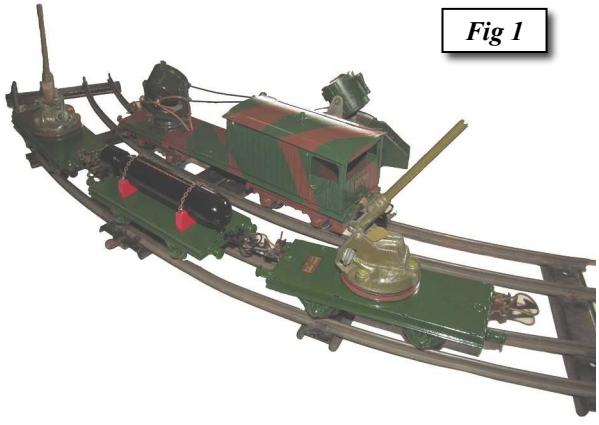


Fig 1

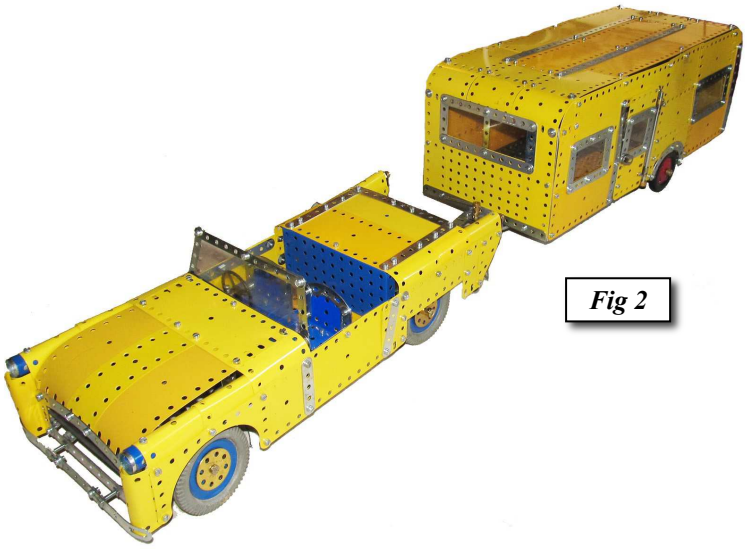


Fig 2

Anthony Caldwell had built an excellent model in yellow and blue of a car towing a caravan from a no 9 set. (*fig 2*) Very nice lines giving the car a 60s look.

Graeme Mills had made up a great farm tractor from one of the models by **Bruce Geange.** What intrigued me about this model was the design of the differential using a pinion inserted into a slot cut in the gear wheel for that purpose. Meccano mutilation but for a good cause.

Nice to see **Keegan Wrightson** at the meeting, His Dad left us to move to Matamata where he is promoting Meccano enthusiastically and Keegan has been left holding the fort and a quantity of Meccano. He built a dockside crane from a 1950s no 7 set and motorized it (*fig 3, overleaf).*

David Wall had built a small crane which had auto reversing capabilities with a small man bent over a crank handle who appeared to be doing all the work. Nice model David, the auto reversing mechanism worked a treat.

Rick Vine had constructed the apple picker model from Bernard Perier's new book 'Magic Factory', well worth a read if you get a chance. With small balls rolling down from a tree to be caught by a boy with a tube, getting the position of the figure just right was tricky. Rick also had the crazy inventors flying bat which came out in the 2000's and this flapped away quite happily and a side tipping truck from the Multikit Highway set of 1973.

Left: **Brian Cotton's** WWII O gauge scene.

Fig 3

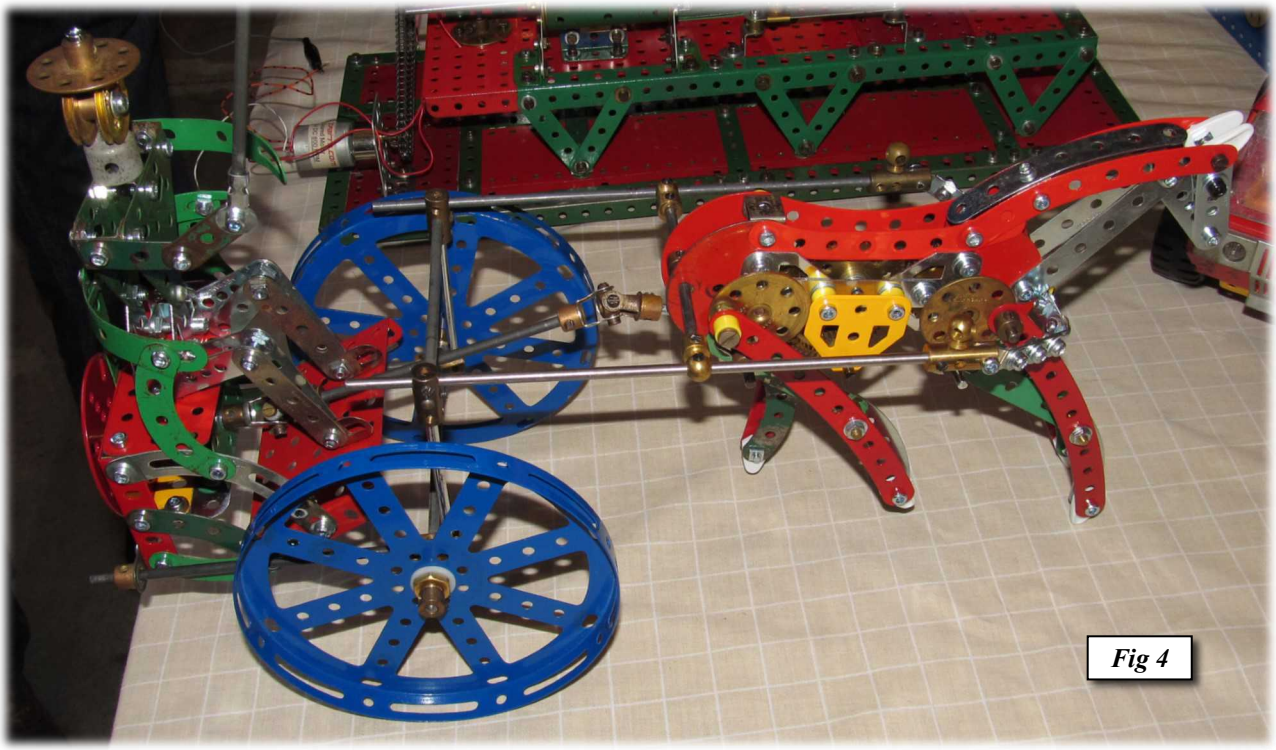
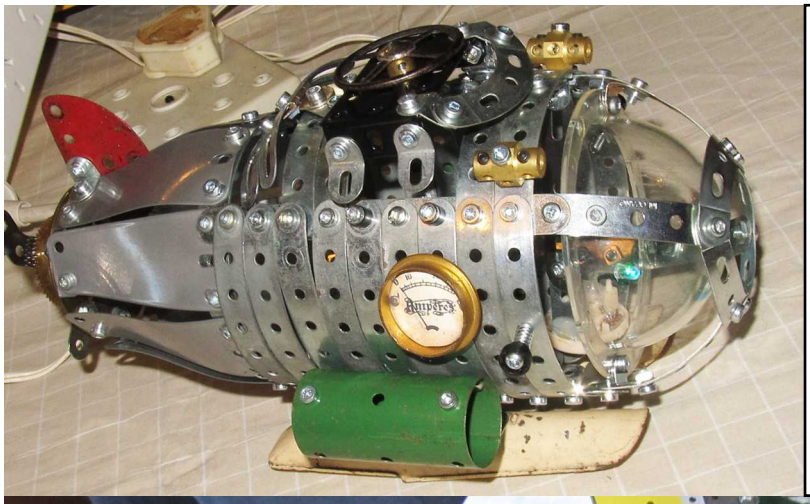


Fig 4

A new visitor to the club was Meccanoman **Dave Greenwood** of Auckland who has been coming to grips with Konkoly's Horse and Chariot model, not an easy one to master but he had done well. *(Fig 4)*

Others present were **David Barnard, Sefton Hinton** and **Mike Stuart.**

There was discussion about the Convention and about a proposed Meccano meeting in November at Taupo, it unfortunately coincides with our meeting which we will likely relocate by a week.



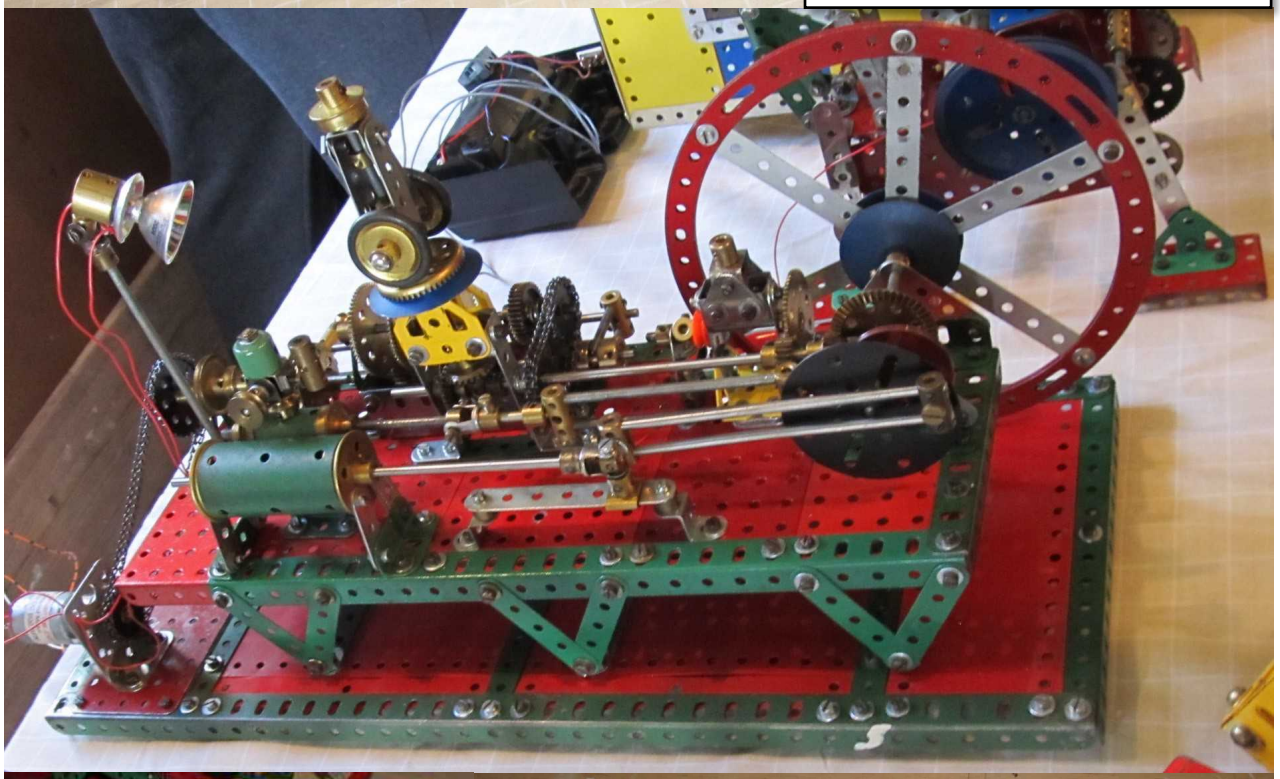
Models from the AMG Meeting.

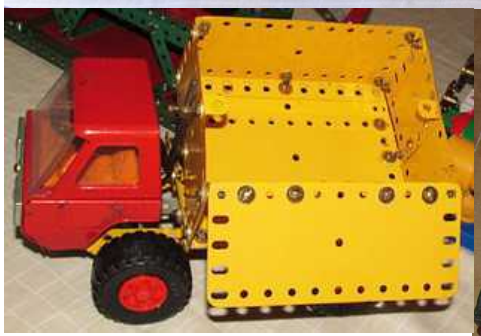
Left: Non-yellow submarine from **Gary Higgins. (**Gotta love that ammeter.)

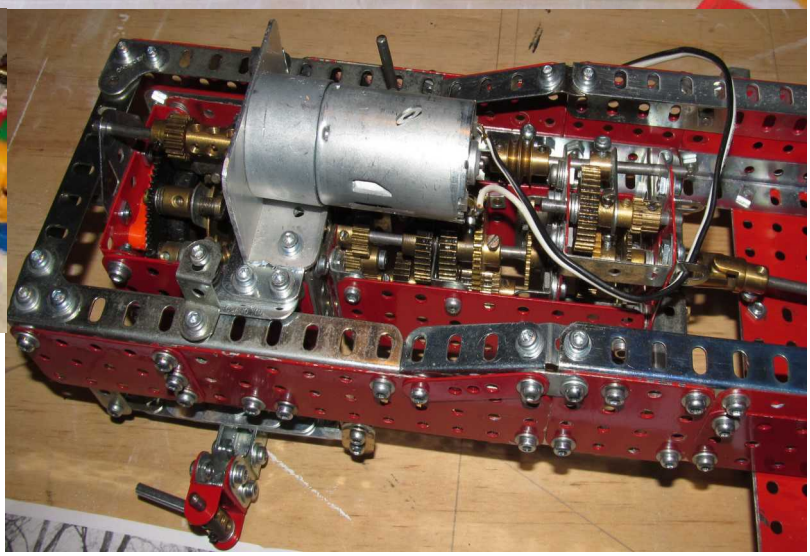
Middle: An horizontal steam engine courtesy of **Gary Hart.**

Lower left: A lovely little tipper from 1973 via **Rick Vine**

Lower right: Guts of **Les Megget's** mobile crane, inverted — AWIP.







Afternoon tea was enjoyed by all, courtesy of the ladies, and the meeting adjourned until next time.

COMPETITION AND PUZZLE PAGE

Each issue we will present a short Meccano related conundrum. Readers are invited to submit their answers to the Editor (richard.feltham174@gmail.com) before the deadline for the following issue, namely 20th September 2019, to be in the running for the prize. We hope that this will raise awareness of the advantages that digital controls and motive power confer on Meccano models.

The August prize is a package of assorted digital goodies, which this month will be an **Arduino** microprocessor, with one (1) NEMA 17 **stepper motor**, various **adaptor** mounting plates and power **driver** board. (See illustration below.)

Puzzle No 1.

Background:

*While sorting through his latest Trade Me purchase, a dilapidated box of rather rusty metal that once might have been a 1928 No 7 set, Dazza came across two parts still firmly bolted, nay rusted, together. In an attempt to get it unpacked and hidden before his wife came home, he wrestled to separate the pea-green **48d** from its attached part **52**, which although markedly 'play worn', still showed patches of its original mid-red paint. Much later the question below crossed his mind as he watched the blood drip from the deep gash in his thumb onto his pristine Meccano room carpet ...*

***Question**:*

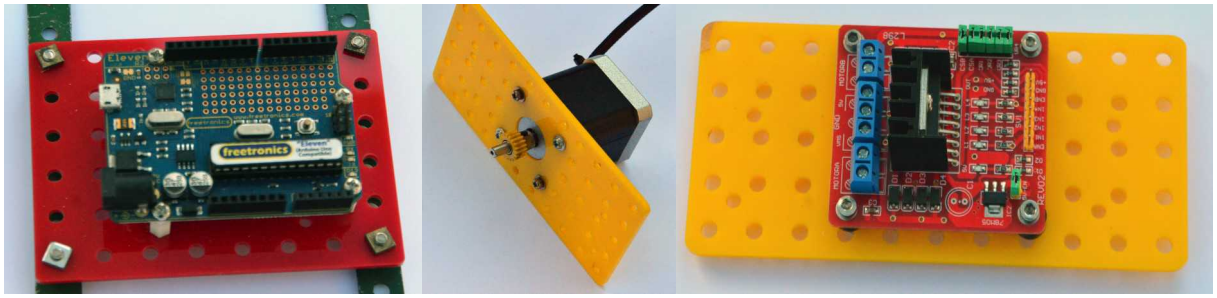
*How many **different ways** is it possible to join these two parts with a **single** bolt. Rotations about the bolt or simple mirror reflections do not count, nor do those that require either part to be bent. Your answer must include, where appropriate, methodology and/or diagrams, and be suitable for publication. As with all Meccano related things, neatness counts.*

***Conditions**:*

This competition is open to all financial NZFMM members. The prize will be awarded to the most correct answer received by the Editor. If no reasonably correct entry is forthcoming the prize will be held over to the next competition. In the event of multiple correct entries being received the winner will be decided by random draw. The Editor's decision is final and no correspondence will be entered into; (unless it is witty and/or only mildly abusive.) The solution and winning answer will be published in the November issue. Closing date for entries is 20/9/19

(***Note**: Images are representative only*.)

Arduino Uno	NEMA 17 stepper	H Bridge driver



CONVENTION 2021 —IMPORTANT NOTICE

The **Wellington Meccano Club** reports that planning is proceeding well for the 2021 Convention. They have agreed on the preferred location and hall but regrettably there is a local community group planning a major local event in 2021 and they have been given until 30th September to finalise the date for their function. One of the dates tentatively reserved is Easter and the convention has second choice.

At the convention though there were many who expressed the view that Easter was not a preferred timing. We would therefore like guidance from the NZFMM members that hope to come indicating their preference for:

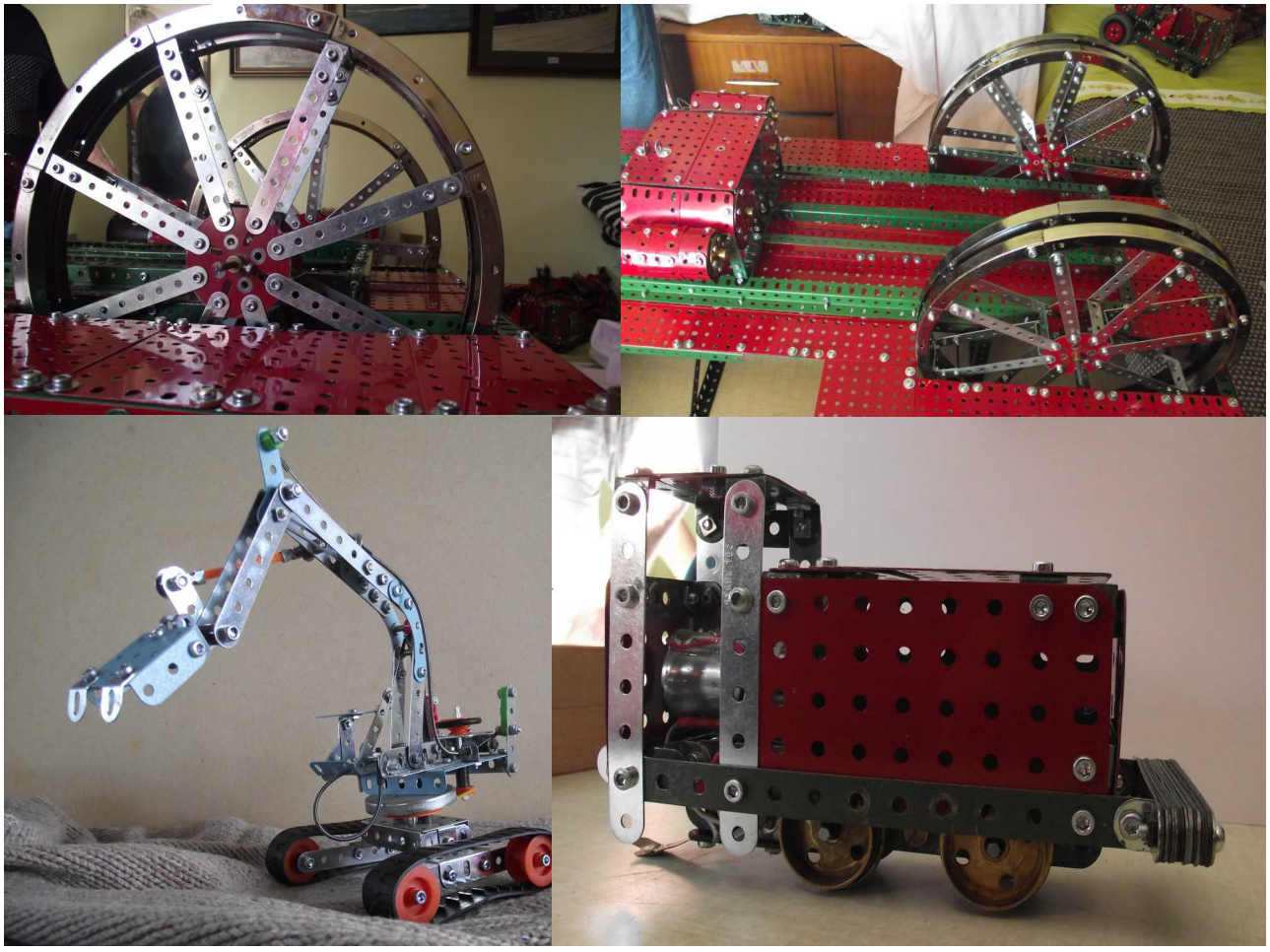
A) A weekend 2 or 3 weeks **before** Easter,

B) Easter,

C) 2 or 3 weeks **after** Easter.

Please send your vote to Reg Barlow at reg_barlow123@hotmail.com indicating your preference. As an example; if you preferred a couple of weeks after Easter, with Easter itself being your last choice, your vote would be 1 ***C*** : 2 ***A*** : 3 ***B***. Note also that daylight saving finishes on Easter Sunday night that year. Assume that the proposed format would be the same in each case., namely set up Friday morning and internal discussions all that day. Open to public Saturday and Sunday, clean up and vacate the hall by around 7pm Sunday night.

Below: Models from the recent Greater Waikato Meccano Club Meetings



Top: **Dave Shand's** Super Model SML 32 Twin Cylinder Steam Engine (WIP)
Lower: **Clive Nicols'** Excavator, and a nifty little Diesel shunter by **Dave Shand.**

Greater Waikato Meccano Club

Meeting Report 4 May 2019

Our May meeting was held at **Dave** and **Colleen Shand's** place at Tauranga with nine modellers (including five GWMC members) attending. There were two apologies.

Mike Walmsley showed his Metallus Track Pack which builds a heavy track unit running on rollers; we are hoping to see a model built soon to show these tracks in use.

Dave Shand displayed a neat little Diesel locomotive shunter for his Hornby O Gauge track; a special half-inch pinion with an eighth-inch face was used to fit the gearing in between the flanged wheels. He is also building the Super Model SML32 Twin Cylinder Steam Engine using replica channel segments in the double flywheels.

Graeme W demonstrated the full operation of the Radial Gearbox (SM47) taken out of his modified Derrick Crane (SML6) Convention model; this uses a planetary gear to drive up to four winches.

Barry Babbage brought along his green John Deere tractor that he had at the Easter Convention. This is a very nice model including a neat gearbox with PTO.

Later we had afternoon tea hosted by Colleen and Judith where a good spread was provided for us.
A big thank you to both of you.

The Easter Convention was the first topic of discussion and all agreed that it was a great convention which was very successful. There was a good crowd visiting each day and many superb models were seen. It was also a good chance to catch up with other modellers and find lots of innovative ideas.

Further discussion centred on earlier exploits and involvement with motorbikes including vintage machines such as the Douglas, Indians and Harley Davidsons. Fortunately Dave and Brian survived these exploits and were able to tell us all about them. Dave also produced his photo album with some vintage photos. We had fun dating them by identifying the cars in the photos. Mike also told us a bit about his classic car collection and the Jensen Interceptor.

Forthcoming Meetings of the Greater Waikato Meccano Club:

- **Saturday 7th Sept** 2019
- **Saturday 2nd November** 2019

Meetings start at 2:00 pm.
Contact Graeme Wrightson for venue details

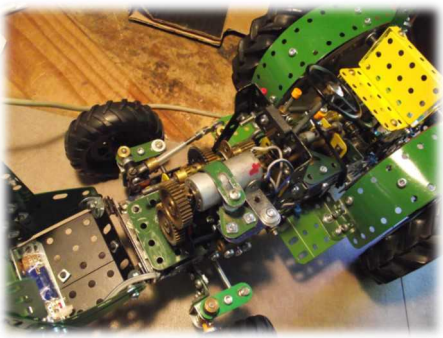
Meeting Report 6 July 2019

Our July meeting was held on a cold and cloudy day at **Brian Hickson's** place in Putaruru. Brian had stoked up the fire in the lounge and so we held our meeting there in comfort. Four modellers attended and there were six apologies.

Clive Nicols saved the day for our club by providing the only models for the table. These were a new helicopter and the older Excavator model. Both worked well but there was a lot of plastic in the helicopter.

We talked about cars with Brian and Graham and we discussed a little business, including the opportunity to have a display at the Cambridge Model Rail show in August.

We had afternoon tea and watched the 90 minute DVD of the 2013 Meccano Convention at Pukekohe. This brought back memories for some of us and was a convention insight and inspiration for those that weren't there.



Above and right: A well detailed John Deere tractor by **Barry Babbage**

A Plea from Graeme Fisher

Dear Dazza

I have a large Meccano collection, and part of it came from my father. And since he acquired his first Meccano set in 1915, that is how far into the past my collection stretches.

I added to it over the years, and there are two mystery parts in it that I hope you can identify. They are two steel gear wheels, one 48 teeth, the other 24 teeth, not of Meccano origin, but the circular ring of holes in the larger gear exactly fit a standard Meccano bush wheel.

The construction method is interesting, and you can possibly see from one of the photos how the tabs cut on each of the two sides were bent inwards at right angles so that they form the teeth. Quite clumsy, but it works! So, please, any ideas?

Dazza Replies:

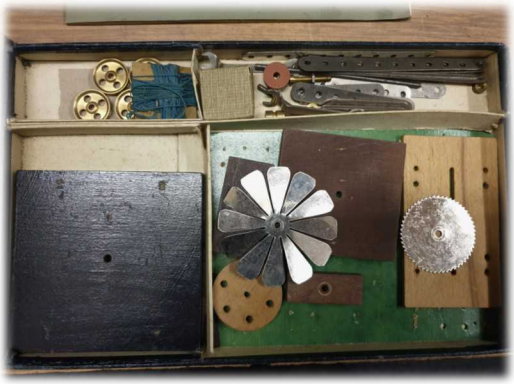
I believe the system is **Stabil** from Germany.

Please see photos of the set I have here, this doesn't have the gears but there may be other parts pictured that Graeme has that he can then identify from these photos. I may well have another set in the attic to be discovered! I certainly recognise the Red 1930 50a cover art on the website but couldn't seem to find it last night.

Website below is a great resource for OS info.

http://www.girdersandgears.com/stabil.html

Scroll down to see the gears



Top: Graeme's 48 and 24 tooth wheels.
Right: *Stabil* set 51, cover and contents.
Left: *Stabil* manual

Gazza's EBay Column
Gary Higgins

Hi all, and welcome to another edition. My, how time flies, especially after having experienced the excellent recent convention, but now back to business.

First up is the smallest of the Speedplay sets a small but well-designed motorcycle available at $42.95 plus $27.36PP, #202426635410

If you are a fan of the new Meccano why not try one of the plasticano folding part sets - a Ferrari F12 TDF. I have built one and they look ok, but in no way traditional Meccano. $37.90 plus $33.58pp; # 333219497212

A vintage French meccano set A, number 086400, is selling for $148.89 plus 30.60pp, #323761777815

There has been a new space set 18214 launched by Spinmaster, which I have not seen in NZ but I am aware it is in the UK and USA. It is packed in one of the earlier double type plastic boxes and makes up 3 space models; a space shuttle, a Mars rover and a rocket. Most parts are from the new plastic series so as not to get us old timers too excited. Selling for 84.79 plus $85.00pp #283520726440

How about a motorized no 5 set from the 1970's, selling at $470.17 #123737070350

If you are not into the newer stuff then how about an older space 2501 set, still shrink wrapped, selling for $132.62 plus $44.4pp. This was one of the last sets issued by Binns road #143276067511

Hayes has been releasing some new metal construction sets which may be of interest I know some are available in Whitcoulls NZ but eBay has a couple of the steam train and sports car, selling at $37.90 #153476561546

How about a Capitol building set? This contains the rear small domed part as well as one of the larger domes. Yours for $63.84 plus $43.38pp #283442461051

An oldie, but a goodie - the 70's highway construction set. This is the later version with the polystyrene base, one corner of which is damaged. Selling for $47.35 plus $26.79pp #32376852626

Next up is one of the more unusual sets, a 9009 Action Troopers set made for younger users, with four figures similar to those in the Meccano City series. This is the largest set in this series and is good for obtaining unusual plastic parts that are hard to find. selling at $147.40 plus $35.00pp # 300982279978

How about an unused crazy inventors car set 5650 from 2001, these sets are very popular these days and are getting harder to find in good condition. Selling for $87.15 plus $31.27pp # 153443072338

To go with that why not buy a Crazy Inventors helicopter set? This has been used, selling at $100.41 plus $35.06pp #153443072336 by the look of the numbers they are from the same seller.

Up next is a vintage Meccano no 7 set in red green selling for $483.88 plus $102.64pp #183525522474

For something different there is a space shuttle construction set Espace, similar to Eitech, selling for $23.74 #143208688289

For those of a military persuasion there are a number of Army parts up for grabs consisting of tracks, barrels, cabs, wheels and cogs - selling for $85.27 plus $37.90pp # 143287765370

A vintage Meccano outfit 3A, box only, from the 1930s is up for $24.54 plus $38.81 #254259870566

A Meccano radio controlled off road jeep in an M&S box from 2004 is selling for $94.74 plus $60.09pp # 113778359441

A Meccano vintage pre war no 6 set in blue gold from 1937/8 selling for $452.88 #192951039300
(*See next page for picture*)

A selection of Meccano accessory outfits 1a,2a,3a,4a some useful parts in these no doubt. Selling for $372.22 plus $56.22pp # 254235624033

A Meccano Constructeur D'Avions Bi fuselage style P38, selling for $1,017.32 #322962130749

Here is a Hornby type English Brimtoy clockwork train in excellent boxed condition and described as rare; selling for $308.22 plus $99.26pp #382603003394

A Meccano John Deere excavator 380G with working hydraulics, mine never worked very well!! Selling for $127.96 plus $43.68pp #23705838254

Get your Meccano Meccaspider now for only $96.78 plus $28.20pp #173658459057

Up next is a Hornby O gauge station #1 with two ramps and boxed selling at $151.50 plus $37.80pp #401672246247

A nice 1916 2X Meccano set electric motor in box with instructions, some mixed coloured parts as well, 1920s selling at $238.20 plus $105.11pp #323816437424

Finally a modern Meccano Dump Truck selling at $42.79 plus $11.44pp #26365390876

Keep looking out there, you will strike it lucky one day.

The Wellington Meccano Club

Minutes

Secretary / Reporter – Max George

Meeting Date: 3rd May 2019 at 7:30. Held at Stan Baker's home, Maungaraki.

Present: Don Flowers, Keith McCallum, Max George, Reg Barlow, Ross Quayle, Simon Moody, Stan Baker, Stephen Westmoreland.

Apologies: Brian Petersen, Lou Nichols, Trevor Green.

Discussion: Reg, Stan and **Max** described the very successful convention in Inglewood over Easter explaining the display and areas that we should be looking at for the next convention.

Reg then went onto discussing the 2021 Easter convention which our club offered to host. Various venues were discussed but nothing decided yet. The idea of using a hall at smaller location similar to MWT using Inglewood seems to be cheaper than somewhere in Wellington City. Elephanta have offered to support us again but note that their office has moved to Auckland.

A subcommittee of Reg, Stan, Keith, Stephen and Max has been set up to investigate further.

Simon and Reg brought along a load of parts Meccano and non Meccano plus rail magazines and there was nothing left over at the end of the night, our bring, swap table is proving popular.

A small reminder please for subs The account number: Wellington Meccano club: **03 0531 0495807 00.** Thanks in advance

Model Building: The theme for this meeting is a crane.

Simon Moody: Although no-one brought along a complete crane, Simon did have a section of his tucked away in a box that was noticed, but not displayed.

Ross Quayle – Was the only one who brought along a crane, or rather the start of a crane. He is building the Hikitea Crane that is berthed at the Taranaki Street wharf in Wellington, The jib that he has made looks very realistic as he uses the narrow strips as braces.

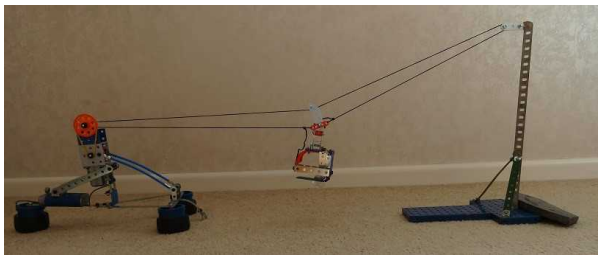
Max George – Built the model Dump Truck he received for the second place public vote at the Inglewood Convention where he displayed his very large Little Joe and Tricky Track setup.

Dump Truck set # 18120 from the Engineering and Robotics series. Notice the amount of plastic plates that could have been replaced with flexible metal plates.

Above: The Tricky Track layout at the Convention.

Again Max brought along models that have been built by members of the Tawa U3A Meccano building group.

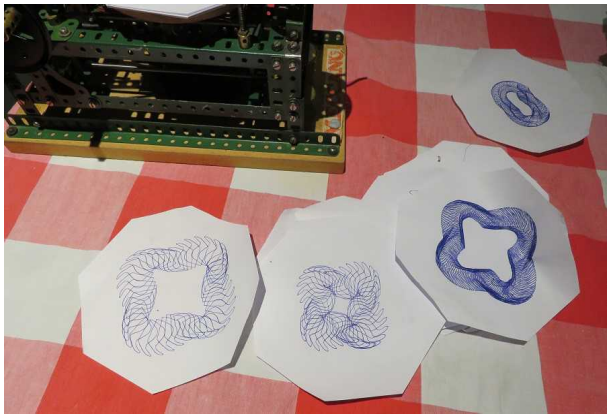
A Gondola built from the 20 model set # 6520 in the Multi Models / Motion System series. The model instructions only give the bottom tower, the gondola and a tag to hold the string. A small tower was built out of traditional Meccano so that the model could be displayed.



Another model was a forklift built from the 40 Model set # 8540 in the Multi Models / Motion System series. The member building it didn't realise the difficulty in constructing it.

Stephen Westmoreland – Again, brought along the impressive Railway Breakdown Cane from the 1950's Set 6/7 1950's booklet. Stan displayed it for him at the Inglewood convention.

Reg Barlow – Brought along one of his Meccanographs he displayed at Inglewood. After the convention, he left it with Stan who changed it a bit to create some amazing patterns. Thanks Stan.



Some of the patterns it made.

Stan Baker – Brought along the Crazy Inventors Clock kit #7651. Which he had partially completed at our previous meeting. This time it was complete and fully working. He displayed it at the Inglewood Convention. The meeting closed at 9:30 pm.

Next Meeting: This will be held on **Friday 7th June** at Stephen Westmoreland's place, Paraparaumu with information about where to go being sent out nearer the meeting. The model theme is to use the small black motor using reduction gearbox/s where possible.

The Wellington Meccano Club
Minutes
Secretary / Reporter – **Max George**

Meeting Date: 7th June 2019 at 7:30.
Held at Stephen Westmoreland's, Paraparaumu.

Present: Brian Petersen, Max George, Reg Barlow, Ross Quayle, Simon and Susan Moody, Stan and Rhonda Baker, Stephen Westmoreland, Trevor Green.

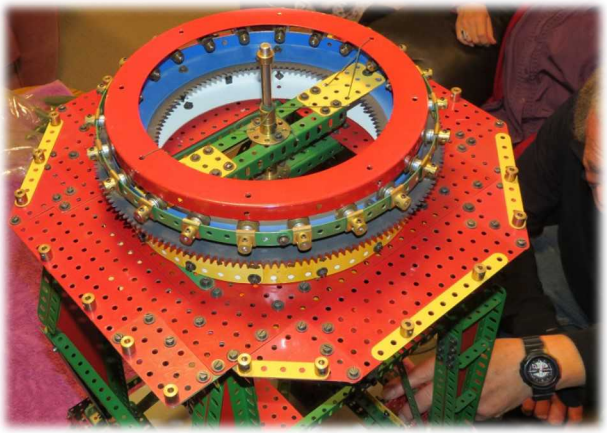
Apologies: Lou Nichols, Keith McCallum Kerry Westmoreland.

Discussion:
Stan has been researching halls around the district that would be suitable as a venue for the NZFMM 2021 Convention. He presented the size of halls comparing them with Inglewood, prices and availability. After a discussion it was decided that the Waikanae hall was the best and so Reg and Stan are going to see the Kapiti Council about it.
A small reminder please for subs.

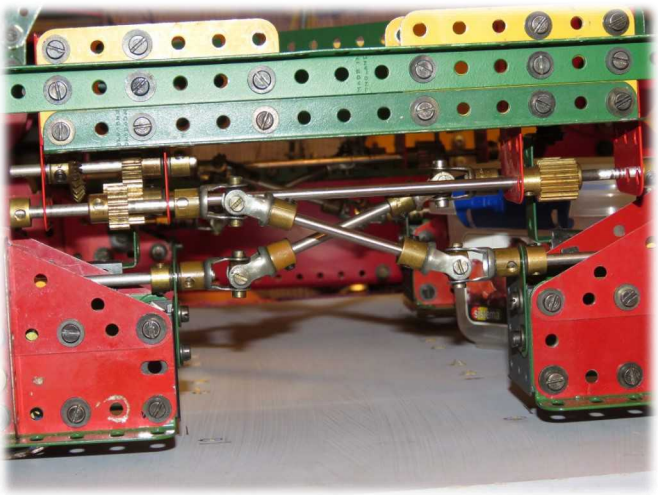
The account number:
Wellington Meccano club: **03 0531 0495807 00.**
Thanks in advance

Model Building:
The model theme was to use the small black motor using reduction gearbox/s where possible.

Simon Moody: Brought along the base of his Dockside Crane with a counterbalanced jib. The impressive part was the bogies that he completed that day. The bogies are able to tilt a little and the



eight wheels are driven by a single motor. The crane moved effortlessly along the table. He has built the jib already and the completed model will be displayed at Taupo Madness in November. It certainly is going to be an impressive model when completed. The Roller bearing at the top of the base.



Above: The drive for the bogies.

Brian Petersen – had built a very impressive model of the Queen Elizabeth 1 vessel. He made the funnels himself, but had them professionally painted. They are slightly larger than the Meccano ones. He also made the lifeboats out of tin cans.

QEI was originally built in 1938 and was used as a troop ship in WWII. For a while it held the record for the fastest crossing of the Atlantic. This model was based on a 1950's set 5 but bigger.

Stephen Westmoreland – Showed the start of a simple Meccanograph (not photographed). It will be interesting to see it working next meeting.

Max George – Managed to get some more small models from an op-shop that he will use at primary school sessions later in the year. The models of an ATV (Quad bike) was one he didn't already have and so built it up for the meeting.

Set number 2712 ATV from the Design Series.

The French lady who comes along to his U3A Meccano building session has completed the small stunt plane below from set number 17201 in the Engineering and Robotics series

Reg Barlow – Brought along a Ferris wheel based on the Special Edition set. It used the small motor and he added the gearbox as per the meeting theme.

It certainly works better with the gearbox which the original model didn't have.

Next Meeting:

This will be held on Friday 12th July at Ross Quale's place, Wilton with information about where to go being sent out nearer the meeting.

MWT MEETING REPORT for 7th June 2019

Below: St Luke's Church Hall scene on a wintery June day that meant fewer attendees than usual but the model quality was as high as we have come to expect.

Overleaf right top: **Viv Alexander's** *homage* to the hatched plate in three parts. Note the matching apparel.

Right middle: Crane truck chassis by Charlie Cross

Viv Alexander: Has made much progress on restoring the 9a set box that **Peter Winter** gave him. He noted that the box was not square from Binns Road. A selection of Meccano publications and an accessory set for the Swedish market. A French version set of Meccano Primo and three Meccano models made with blue hatched plates mainly. Viv also had a boxed set of a product called MINICINEX that was marketed by Meccano -Triang.

Bruce Geange: Adding to his fleet of small crawler tractor models was a Hanomag. Motorised and steered by a steering wheel as was the Hanomag way. Also a delightful dune buggy type vehicle. (*See page 6 for building instructions of this model*)

Daryl Anderson: Had on display the current Deere Excavator set with the movements made by transferring water via syringe type levers. A few issues with the water system but otherwise a pleasant build as was another current off road vehicle set he had made. Daryl had copies of Johnny's Meccano Magazine for sale.

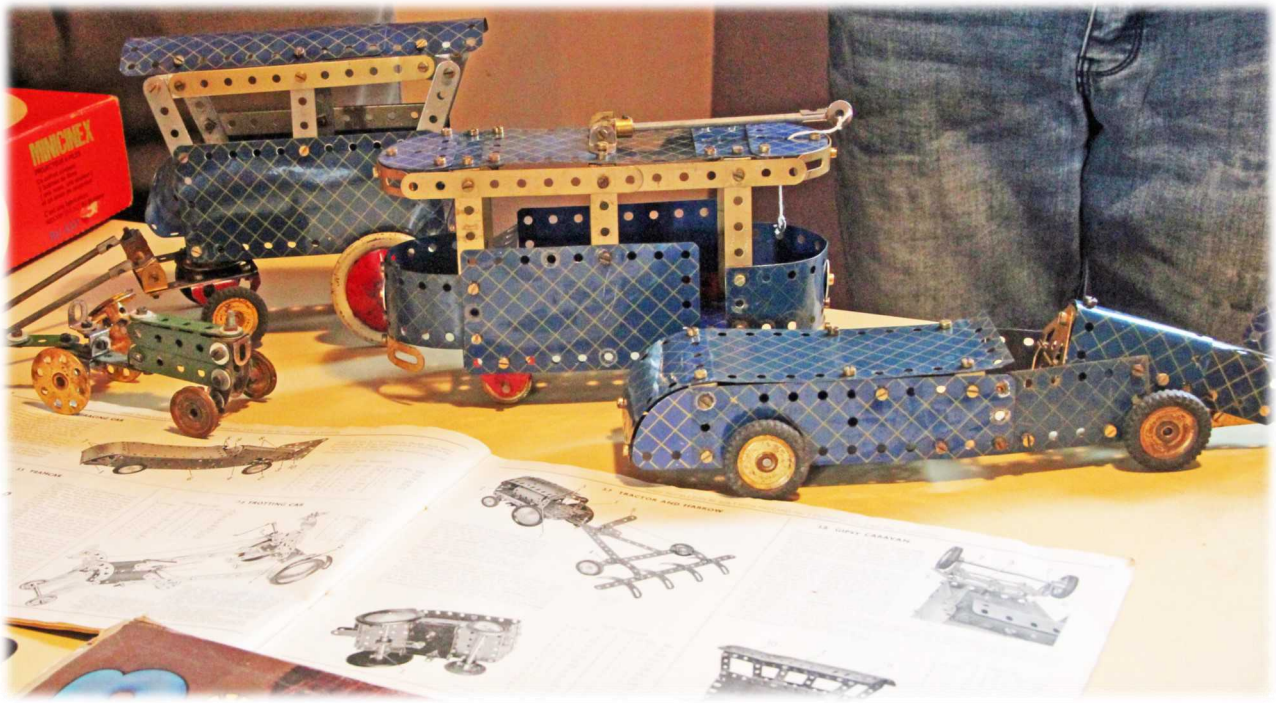
Selwyn Bluett: Had a table of various Meccano pieces for sale at set prices.

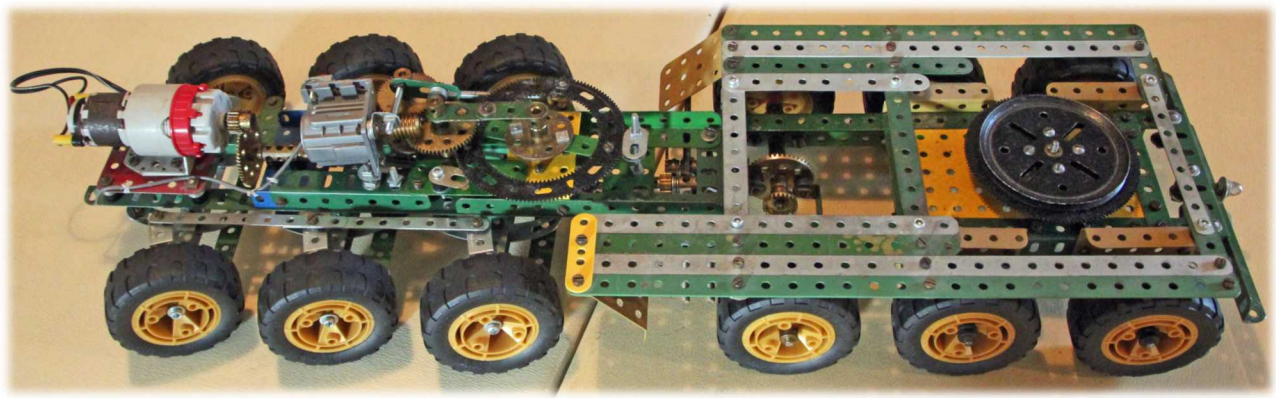
Robin Rye: A crane truck chassis that was part of his recent Meccano purchase from Charlie Cross. His three models to go into the Tawhiti Museum were on display. The two hedge cutter models had already been sighted at MWT. The Bren Gun Carrier hedge clipping sweep was new and built to compliment the hedge cutter. Bruce Geange's Bren Gun Carrier was also in Robin's display.

Paul Vodanovich: Built the classic Block Setter crane from an early number 4 set but with Paul mods.

John Freer: The fourth (in order of this report) Bren Gun Carrier model at the meeting was set up as an early Taranaki hedge cutter. A motorised revolving blade made a very realistic cutting sound when the cutting flails touched the table.

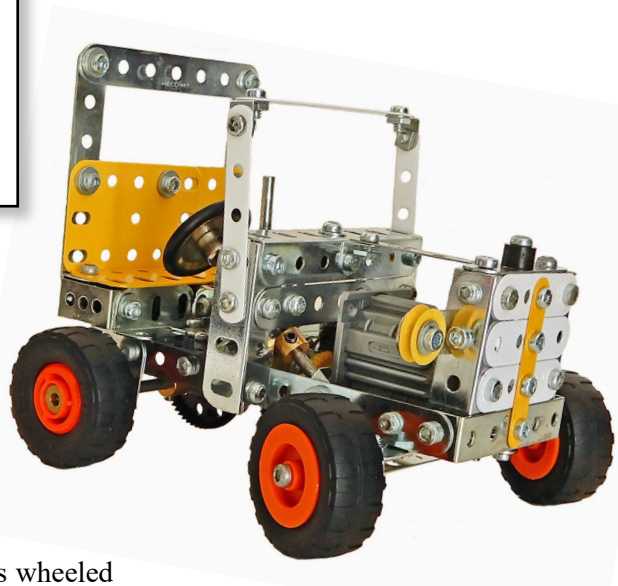
Tom Pittams: Kept himself busy making up several of the recent small sets.





Left: A quartet of Bren Gun Carriers

Right: Dune Buggy by **Bruce Geange**



Peter Hancock: Had copies of various Meccano publications on display as well as some surplus for sale.

Competition: This was the classic 'fit-in-a-six-inch -box'. Ultimately **Robin Rye's** Bren Gun Carrier won by a short head from **Daryl Anderson's** Mobile Toilet -"*Need a poo, we come to you.*" **Stuart Lindsay** had outsourced to his daughter, who's wheeled pram was well thought out. **Chris Morton's** Rocket Propelled Catherine Wheel Experimental Bomb failed to fire with the judges.

The afternoon conclude with fish and chips. Next meeting is on August 10th at St Luke's.

Photos: Bruce Geange
Report: Robin Rye

New Zealand Club Diary 2019

Auckland Meccano Guild

President: David Wall, Tel. (09) 426 1965
Secretary: Gary Higgins, Tel. (09) 832 4292
Meetings at 2pm on second Saturday every third month. The next meeting will be at Les & Shirley Megget's 231 Opaheke Road, Papakura; on **Saturday 17th August** from **2pm.**

MWT Meccano Club

Chairman: Chris Morton, Tel. (06) 323 8001
Secretary: Robin Rye, Tel. (06) 764 8670
Meetings at 2pm. Next meeting: **Saturday 10th August** at St. Luke's Church Hall, Corner Cornfoot and Manuka Streets, Castlecliff, Wanganui.

Wellington Meccano Club

President: Reg Barlow, 021 955 488
Secretary: Max George, Tel. (04) 232 4200
Contact: Stan Baker 021 955 488
Meeting at 7:30pm on first Friday every second month.
Next meeting**: Friday 12th July** hosted by Ross Quale.

Christchurch Meccano Club

President: Neil Pluck, Tel. (03) 389 8134
Secretary: Roland Jaspers, Tel. (03) 351 4389
Meetings at 7:30pm **on first Friday every month** (except January) at Papanui RSA Club, 55 Bellevue Ave or No. 1 Harewood Road, Christchurch.

Greater Waikato Meccano Club.

Contact: Graeme Wrightson
Meetings: **Saturday 7th Sept** 2019
Saturday 2nd November 2019 Starts at 2:00 pm.

Additional Meccano Contacts

Hamilton: Don McClelland, Tel. (07) 843 4198
Tauranga: Barry McKey, Tel. (07) 576-1623
Hawera: Daryl Anderson, Tel. (06) 278 7666
Napier: Trevor Adam, Tel. (06) 843 4837
Palmerston North: Bruce Geange, Tel. (06) 357 0566
Nelson: John Stark, Tel. (03) 545 1025

Articles, etc. for the November 2019 issue of NZFMM Magazine should be sent to Richard Feltham before the 20th September 2019. at:
richard.feltham174@gmail.com

Back Numbers: NZFMM Magazines from April 2001 are available. Please contact Bruce Geange.

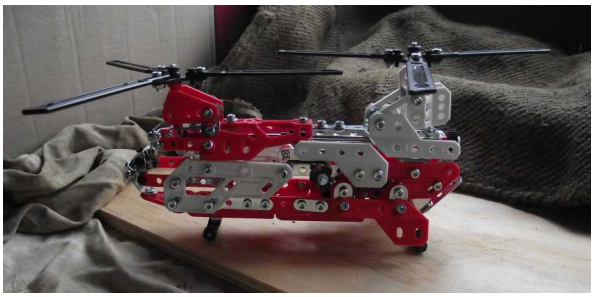
Buy, Sell, Auction & Exchange

Advertisements in this section are free.
First insertion will be printed in full.
Subsequent identical insertions (max. 1) may be abbreviated to fit space available.

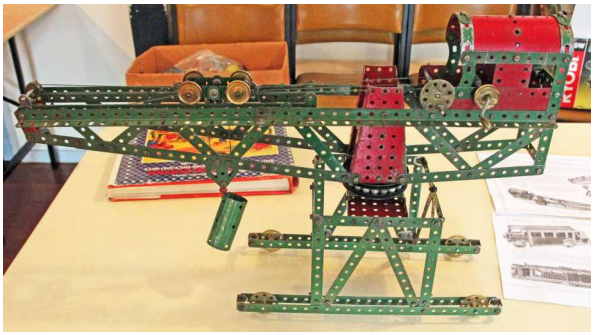
FOR SALE
Replica Meccano and Compatible Parts
Contact Stan Baker
nzmeccanoman@gmail.com
Phone +64 4 566 7150 Evenings
or +64 21 421 750 mobile

FOR SALE
Large amount of Meccano (huge) too large to list, enquires to :-
Mariefern@orcon.net.nz

MECCANO MEETING
TAUPO IN NOVEMBER
Saturday 9th November 9am to 5pm
St Andrew's Church Hall
91 Titiraupenga St, TAUPO
All Meccano Enthusiasts Welcome
$10 fee for hall hire.
Provide own lunch; dinner at 'Cossie Club'
Contact: Reg Barlow on 021 955 488 or
reg_barlow123@hotmail.com



Top: **Clive Nicols** helicopter



Above: **Paul Vodanovich's** block setting crane

Just a few of the 338 photos taken by **Gary Higgins** at the 2019 Inglewood Easter Convention confirming the classics never grow old! Incidentally the likely cause of the world-wide shortage of part 1 is clearly evident! You can view the entire collection on his Flickr album at this link:

https://www.flickr.com/photos/meccanohig/albums/72157677882295637