



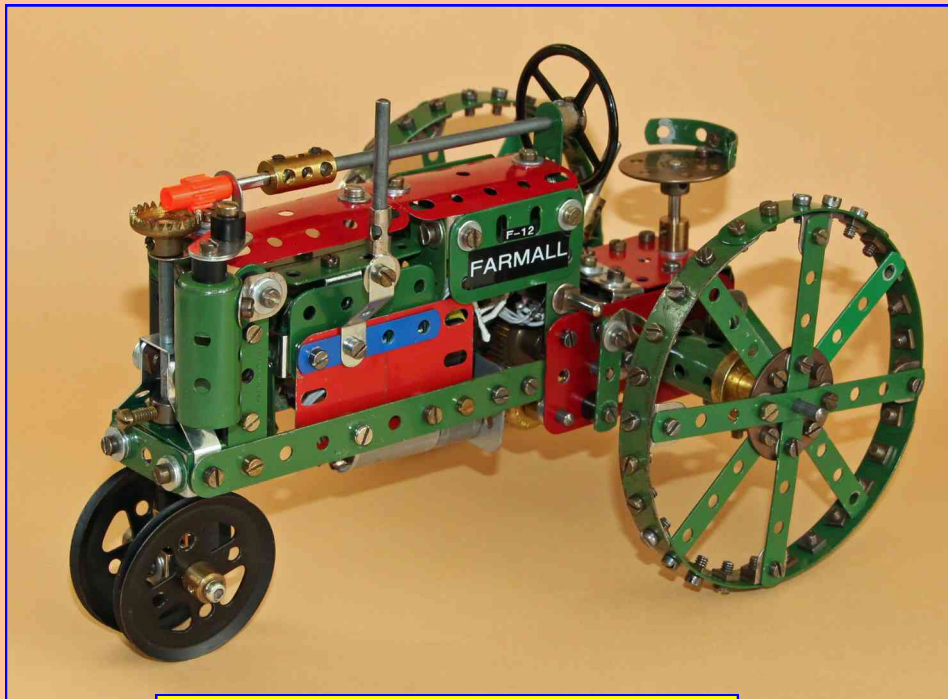
NZEMM MAGAZINE

Volume 38 No. 4

November 2014



Bruce Geange (left) receives his Golden Spanner and certificate from Bob Prescott.



Bruce Geange's Farmall F-12 Tractor, see p3.

Included in this issue:

- *Congreve Rolling Ball Clock*
- *A Rubik's Cube Solver*
- *BR 70t Telescopic Jib Breakdown Crane*
- *Dark Crystal Orrery*
- *Part 141, A Cautionary Tale*
- *NZ Club meeting reports*
- *New 10 Multimodel Set review.*

Volume 38, No. 4

NZ Federation of Meccano Modellers Magazine

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Letters are welcome and may be sent by post or by email. The author's name and address must be supplied. Publication of letters will be at the editor's discretion.

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Editorial

The 2015 Te Papa Convention is now but 5 months away and I hear there is much activity building models for Easter. With this Magazine you should find a Convention registration form which should be filled in and sent in asap.

The great news since the last Magazine is that our proof reader **Bruce Geange** has been awarded the **2014 Golden Spanner** by the ISM at their AGM at Henley in late August. This award is certainly well deserved for Bruce's modelling and his articles published in this magazine over many years, as well his continual contributions to MWT and the NZFMM. He has been referred to as "The Bernard Perier (regular CQ small model contributor) of the southern hemisphere" in an UK journal. This article features building instructions of Bruce's latest small model of a Farmall Tractor.

There has been speculation as how Meccano's new owners *Spin Master* will bring Meccano into the 21st century with regards to electronic control. That plastic brick construction system is far ahead of our favourite construction hobby currently. Hopefully a representative from Spin Master will be present at the Convention but this has not yet been confirmed. I've been reading an article in the IPENZ Magazine about the VEX system and how there are 102,000 students involved in 33 countries. This is a robotics competition using a Meccano like construction system (metal and plastic) with state of the art electronic control. I get the feeling that Meccano missed the bus a decade or so ago. However **David Couch** shows what can be done with Meccano and electronic control with his new Rubik's Cube solver on page 11. I believe that this model will be at Easter's Convention.

My thanks, as usual, to those who have contributed to this issue and may I wish you all the best for the fast approaching festive season.

LM

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Meccano Farmall F-12 Tractor by Bruce Geange

These tractors were built by International Harvester between 1932 and 1938 and became a popular row crop model. The early models had a Waukesha motor and the later one had the International motor. They were available as row crop or regular front axle and many attachments could be fitted. The model has the narrow front wheels and is fitted with steel wheels along with a differential and steering. Two Meccano parts have been altered to make the differential that was designed by John McDonald of England. A 19 tooth Pinion has had the boss removed and a 57 tooth Gear Wheel has a rectangle hole cut out opposite the grub screw hole. The pinion has a bolt through the hole with a nut and is screwed into the boss of the 57 tooth gear wheel. The Pinion should line up with a $\frac{3}{4}$ " Contrate Wheel on either side.

I built the rear wheels first as these would determine the size of the model. Three $5\frac{1}{2}$ " strips were rolled for each wheel to form a $4\frac{1}{2}$ " circle and were overlapped one hole. Four Angle Brackets were bolted to the circle at 90 deg. by their round holes facing out. Two $4\frac{1}{2}$ " Narrow Strips are bolted to the Angle Brackets with a eight hole Bush Wheel fixed to the centre of the strips and spaced with Washers. Four 2" Narrow Strips are bolted to the inside of the bush wheel. All outside holes have a Nut and Bolt. Make two of these wheels.

The frames for the tractor consist of two $4\frac{1}{2}$ " Strips either side overlapped two holes and bolted together with the rear strip on the inside. The front is joined by a $1\frac{1}{2}$ "x $1\frac{1}{2}$ " Double Angle Strip with an Angle Bracket fixed by the slotted hole on the inside and a Narrow Obtuse Reverse Angle Bracket facing up on either side and joined at the top by a $\frac{1}{2}$ " Narrow Double Bracket with Washers under the bolt heads. A $1\frac{1}{2}$ " Strip bolts to the angle brackets with two Washers under each bolt head. Hole two has a $2\frac{1}{2}$ " Strip for the radiator sides with a $1\frac{1}{2}$ "x $1\frac{1}{2}$ "x $1\frac{1}{2}$ " Flanged Plate for the front. A 1 "x $1\frac{1}{2}$ " Angle Bracket bolts to the top of the radiator with a $1\frac{1}{2}$ " Strip across the top. Hole ten has an Angle Bracket on either side bolted by the slotted holes and facing the front. A Stan Baker No. 2 six volt 250 rpm motor is bolted to the angle

brackets with the motor sitting one hole below the frames.

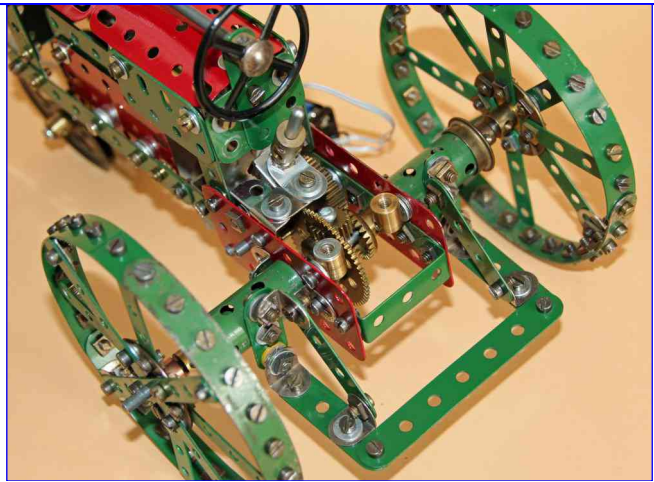
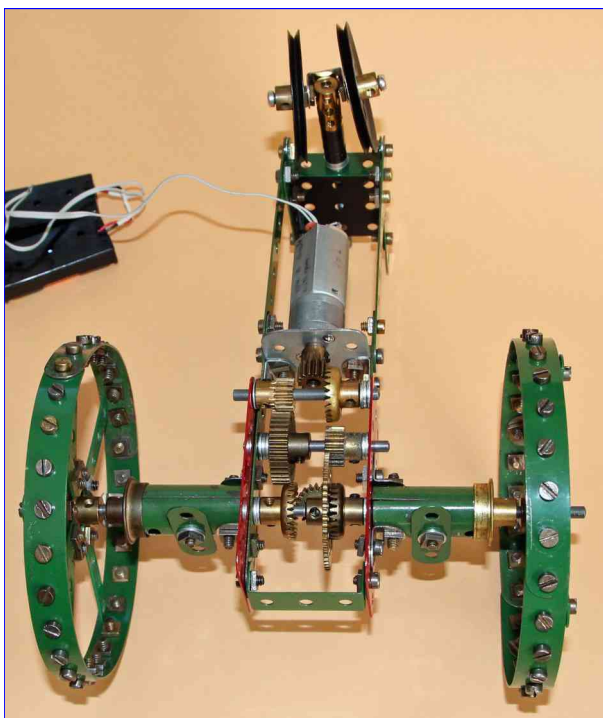
The next part is the rear axle housings which each consist of a Sleeve Piece with two Angle Brackets bolted with the nuts out at one end by their round holes. A $1\frac{1}{2}$ " Strip is bolted to a centre hole beside one of the angle brackets, nut facing out with washer and a $\frac{3}{4}$ " Flanged Wheel at the other end. The axle housings bolt to the frames at the rear of the tractor with a 3 "x $1\frac{1}{2}$ " Flat Plate in between for the side of the gearbox. I fitted a temporary axle through the holes to line everything up. A $1\frac{1}{2}$ "x $1\frac{1}{2}$ " Double Bracket bolts across the rear. The PTO pulley is made up from three 1" Loose Pulleys and a 1" pulley all on a $1\frac{1}{8}$ " Bolt with a Washer and a Nut. This unit is bolted to the right front side centre hole on the gearbox. Black electrical tape has been wrapped around the pulleys. Four $\frac{3}{8}$ " Bolts with Washers under the heads fit through the spare holes on the $1\frac{1}{2}$ " Strips with Washers under the nuts. The second top hole on each side from the rear of the gearbox has a Threaded Boss fixed by the round side and spaced with Washers. Two holes further along on the left side has an Angle Bracket fixed by the slotted hole and a Fish



Plate to the round hole. The control switch is bolted to the fish plate mounted on an Obtuse Angle Bracket with the round hole drilled out for the DPDT with centre off switch. The switch control lever is extended by a Short Coupling and 1" Axle Rod. An Angle Bracket is fixed beside the switch to fill in a gap. Bolt an Angle Bracket to a $1\frac{1}{2}$ " Narrow Strip for the clutch pedal and fix it to the second lower left hole on the side of the gearbox by a $\frac{1}{2}$ " Bolt spaced with a Plastic Washer.

The rear and top of the gearbox consists of two $1\frac{1}{2}$ "x $1\frac{1}{2}$ " Flat Plates bolted to a $1\frac{1}{2}$ " Angle Girder with a $1\frac{1}{2}$ " Strip added to the top right front. The seat is a $1\frac{3}{8}$ " six hole Bush Wheel the switch to fill in a gap. Bolt an Angle Bracket to a $1\frac{1}{2}$ " Narrow Strip for the clutch pedal and fix it to the second lower left hole on the side of the gearbox by a $\frac{1}{2}$ " Bolt spaced with a Plastic Washers. The rear and top of the gearbox consists of two $1\frac{1}{2}$ "x $1\frac{1}{2}$ " Flat Plates bolted to a $1\frac{1}{2}$ " Angle Girder with a $1\frac{1}{2}$ " Strip added to the top right front. The seat is a $1\frac{3}{8}$ " six hole Bush Wheel with an Angle Bracket bolted to it by the slotted hole and a $2\frac{1}{2}$ " Narrow Strip formed to suit the back of the seat. The seat fixes to a Rod Socket mounted in the centre hole at the rear and a Threaded Pin resembles the PTO shaft. This assembly bolts to the threaded bosses.

The motor shaft has a 15 tooth Pinion fixed to it that meshes with a $\frac{3}{4}$ " Contrate Wheel on a 2" Axle that also has another 15 tooth Pinion. Washers space the contrate wheel. The second 2" Axle mounted in the centre hole and two holes from the front of the flat plates has a 38 tooth Gear Wheel and a 19 tooth Pinion. Washers are again used for spacing. If you don't want to have a differential in your tractor you would need to drive the model on one wheel only and limit the turn of the front wheels. If you use the differential two $3\frac{1}{2}$ " Axles

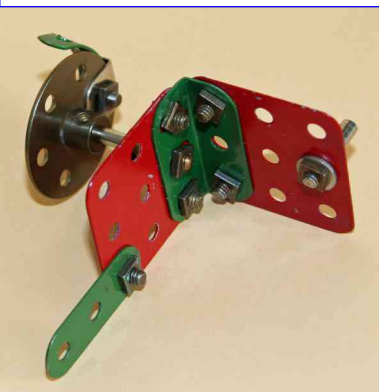
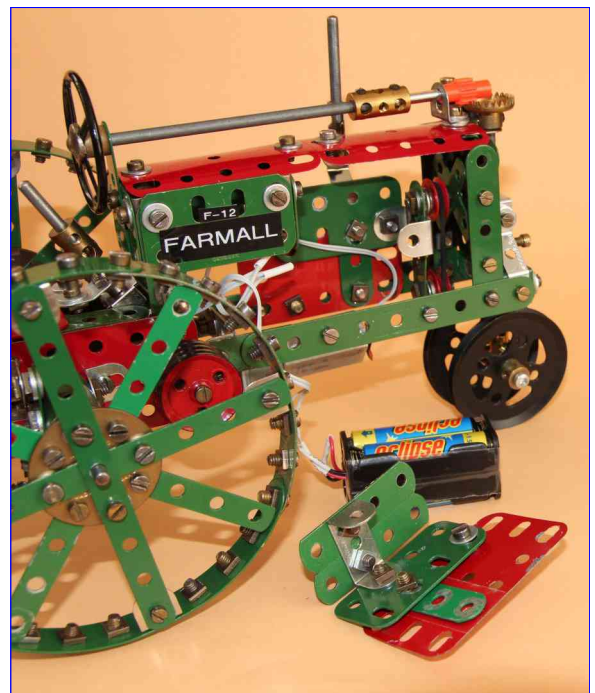
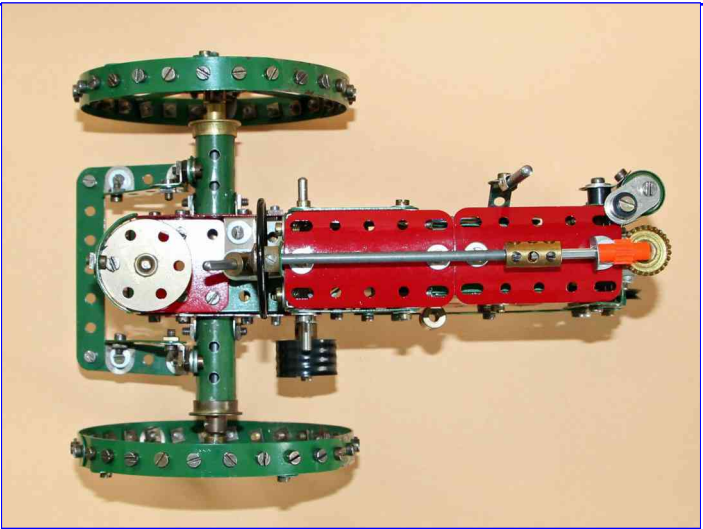


will be required and join in the boss of the 57 tooth Gear Wheel. The wheels can be adjusted on the axles to suit the job being done.

The 2" Pulleys for the front wheels are locknutted to the round hole of a Angle Bracket by a 15mm Pivot bolt. These are fixed to a threaded hole in a Coupling with a Washer under the bolt head and the wheels set at a small angle. A $3\frac{1}{2}$ " Axle secured to the other end of the coupling has 3 Plastic Washers and four Washers and passes through the $1\frac{1}{2}$ " DASTrip at the front and has a Collar with a $\frac{1}{2}$ " Bolt in This bolt limits the amount of turn on the steering. At the top fit a Fish Plate and a $\frac{3}{4}$ " Contrate Wheel. The fish plate is bolted later.

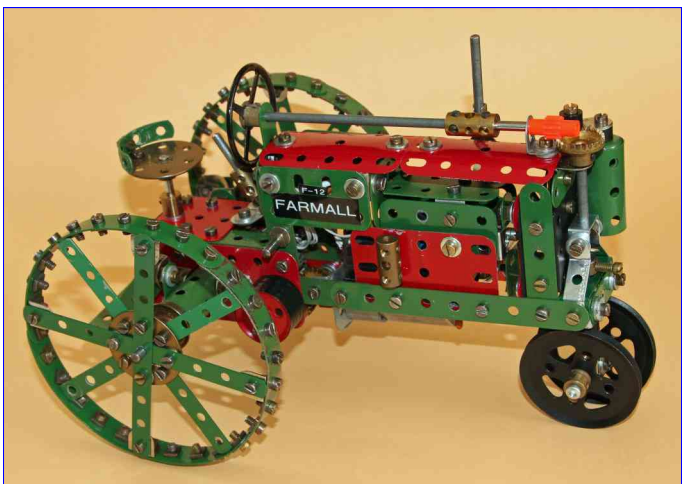
Bolt a 2" Strip to either front side of the gear box spaced with a Washer facing up. The next two holes have Threaded Pins bolted for the foot rests. The fuel tank is made from two 2" and two $1\frac{1}{2}$ " Flat Girders bolted by their slotted holes to Angle Brackets and the top of the 2" strips. A 2" Strip bolts to a Threaded Boss at the top centre hole of the rear $1\frac{1}{2}$ " flat girder for the steering axle. Two $2\frac{1}{2}$ "x $1\frac{1}{2}$ " Flexible Plates with a slight curve long ways and joined with a Fishplate form the bonnet. One end secures to the threaded boss at the rear and the front has an Angle Bracket bolted by the round hole with a $\frac{1}{2}$ " Bolt spaced with three washers and through the front centre hole of the bonnet with two washers, through the fishplate supporting the steering shaft and the 1 "x $\frac{1}{2}$ " angle bracket. Fit a 1" Triangular Axle to a 9mm Triangular Connector with Pinion (A313) and fit through the angle bracket and into a Coupling. The coupling is extended with a 4" Axle and a $1\frac{3}{4}$ " Steering Wheel fitted.

The left side of the engine is made from a 2 1/2"x1 1/2" Flexible Plate with a 2" Narrow Strip and a Narrow Obtuse Reverse Angle Bracket to represent the exhaust by a 3/8" Bolt through the flexible plate and a 1 1/2" Strip to stop the plate bending and two Washers then through the slotted hole of a 2" Flat Girder. The front hole has three Washers for spacing and a 1"x1 1/2" Double Angle Strip. Extend the exhaust with a Rod and Strip Connector at the other end and a 1 1/2" Axle for the exhaust pipe. This unit is bolted to the chassis rail as shown in the picture by 3/8" Bolts spaced with three Washers. Two 1 1/2" Narrow Strips represent the fan and are bolted to a 3/4" Bolt. Next is a Washer, 1/2" Loose Pulley and two Washers with a second Nut. This bolts to the slotted hole of a 2" Perforated Slotted Strip. A second 1/2" Loose Pulley is fixed to the other end of the strip with Washers and two nuts. Fit a Driving Band around the pulleys. This assembly bolts to the centre hole of the 1"x1 1/2" DAS. Keep the fan as low as possible. The right side of the engine is similar to the left. The Flat girder has a 1"x1 1/2" Double Angle Strip bolted to it with two 2" Strips for the top of the engine. A coupling is bolted to the outside to resemble the oil filter. A Nut and Bolt fit through holes four and seven on the chassis rail and the engine side fits over these with a second nut on the front bolt. Four AAA batteries in a holder fit inside the engine.



Two Fish Plates bolted with a 1/2" Bolt through the end hole of a Chimney Adaptor spaced with a Plastic Washer form the top of the air cleaner. A second Plastic

Spacer bolts to the slotted end of the fish plates. This assembly bolts to a Sleeve Piece with an Obtuse Angle Bracket by the round hole. The air cleaner now bolts to the left side of the radiator by the obtuse A/B and spaced with a Plastic Washer. The drawbar is made up from a 3 1/2" Strip with a 2" Strip bolted to either end at near right angles. A second 2" Strip bolts to the second hole in the 2" strip with an Angle Bracket.



Angle Brackets are fitted to the ends of the strips and fixed to the tractor with nuts as shown in the pictures. Happy building.

A NEW MECCANO SET

10 Multimodels set No. 5560

by Les Megget

This set is not yet available in NZ shops at the time of writing (early October) but could be available for the Christmas season. I note that the earlier 2009 equivalent set (No 5550) is still on the shelves at *Toy World* and *Farmers*. This had some - never seen jet fighter on the box powered by reverse acting props driven by the wheels via rubber bands (totally unrealistic in my view).

The box is similar to the last few years or so with a rip-off tab on the side with the parts in 5 plastic bags. However how nice it was to examine the parts: very little plastic (only the wheel rims, 1/4" washers and 5-hole bearing strips # A420). The rest is traditional Meccano, even four 11-hole Strips, not seen for a while. Even the bright construction yellow colour on some strips and brackets is identical to the recent Evolution truck-crane and digger. All other parts are zinc coated with only a few Narrow Brackets. One hopes the crazy purples, floro-orange and vibrant blues of recent sets have gone forever. The box states there are 260+ parts and that includes the nuts and bolts (no black bolts in this set).

The instruction manual is in A4 landscape format with step by step drawings without words. The main model described is the mining dump truck and the manual describes 3 other models namely a 4-wheel farm bike, a single engined aeroplane and a racing car. The remaining 6 model instructions can be downloaded from www.meccano.com and include a helicopter, a road roller and a forklift.

The instructions are clear and reasonably easy to read but the zinc parts are coloured a very dark grey and difficult to distinguish with other such parts on the printed page. However the dump truck went together with no problems and no manual mistakes that I found. Yippee; the first time I've said that for several years.

The rubber tyres have a lumpy tread pattern which is much more realistic than the low profile "slicks" used in earlier sets. The tyres could have a higher profile but you can't have everything I guess. Like any dumper prototype the vehicle steers by articulation at mid-length and the dumper tips well. You can tighten the Nyloc nuts up a bit if you want to hold it in the dumping position.

This model has plenty of play value for the 8+ year olds this set is aimed at (even younger I would say). The tipper has plenty of large holes due to the sides being triangular bent Braced Girders but large bits of gravel would be fine. The model does look like a larger mining dumper with a good representation of the cab and engine cover. There is even a driver's seat using a 1" by 1/2" Angle Bracket.

I was impressed with this set, "back to basics" I'd call it and with models which look like real vehicles rather than the rubbish served up over the last decade with models that were designed by people it seemed from another world!

I obtained my set from Amazon France for just over \$60 landed; pretty good value for money think.

Some of the yellow paint is tending to peel off the edges; hopefully *Spin Master* can sort that French production problem out. Now if the new 20, 30, 40



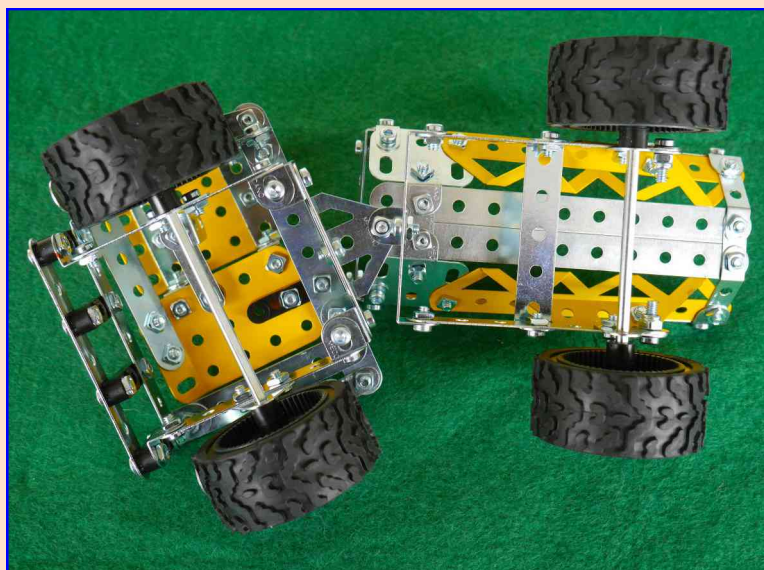
and 50 model sets were similar with similar colours Meccano would at last be getting back to the 20th century where the next larger set fitted perfectly with all the others. I live in hope.



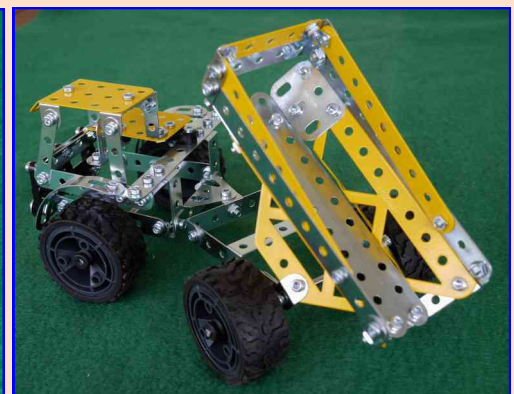
The earlier 10-Model set from 2009.



The dark-grey parts merge together in the manual.



Central steering pivot from below.



The tipper tipping.

CONGREVE ROLLING BALL CLOCK

by David Wall

Photos: David Wall & Gary Higgins

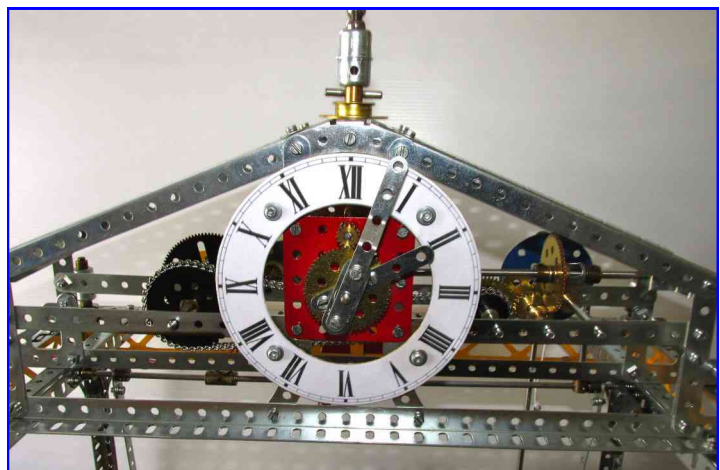
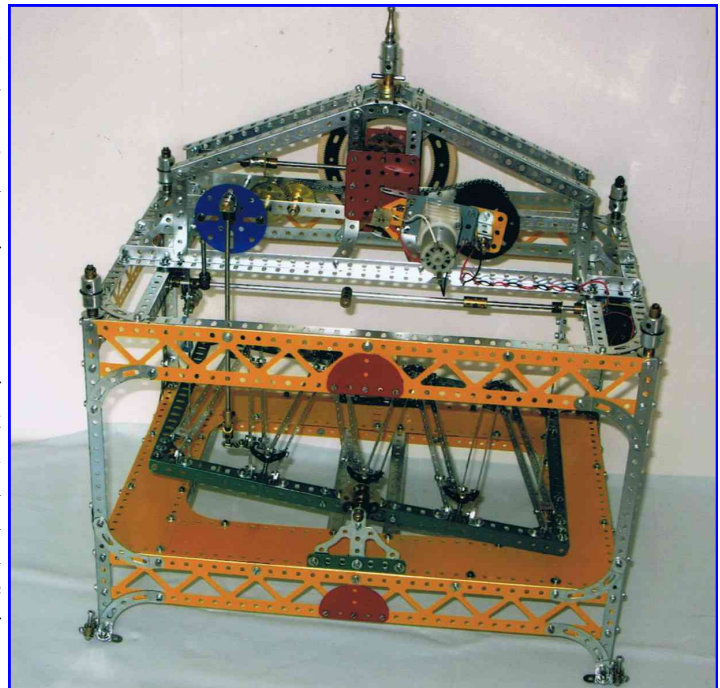
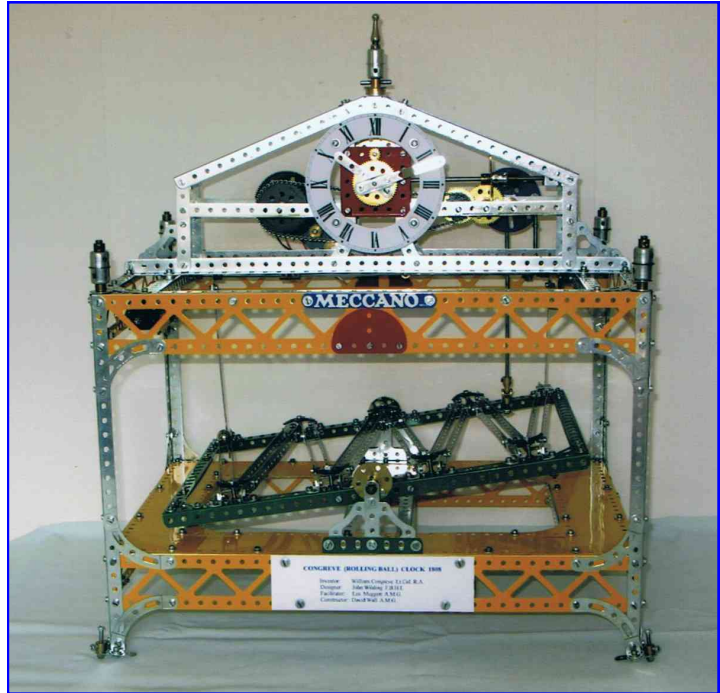
Many years ago whilst attending a Model Engineers exhibition I saw a Congreve Rolling Ball Clock (CRBC) which greatly impressed me. However it was not until I visited the 2011 Meccano Skegness exhibition in England that I came across my second CRBC. This one had been expertly modelled in Meccano by John Wilding FBHI, who unfortunately I was unable to meet. The model was described in Issue 73 (September 2006) of *Constructor Quarterly*. Back issues of this magazine were unavailable at the show. Needless to say Issue 73 was about the only one NOT available.

A year or two after returning home I approached Les Megget who kindly supplied me with the necessary CRBC instructions. Not being a natural Meccano clock constructor I did not attempt to “improve on John Wilding’s instructions but followed them to the letter, except for one or two minor cosmetic embellishments.

Thanks to the clarity of the instructions the clock is straight-forward to make. The gear train is extremely simple but of course must be free running. However, the rolling ball table must be accurately made and when setting up it must be level in both axis when in the mid position, the use of a spirit-level will facilitate this. I used a 6 volt Mabuchi pile motor activated by a mercury tilt switch for the motive power.

Although not an accurate time keeper it is very rewarding to construct and is fascinating to watch in operation as the $\frac{5}{8}$ ” steel ball relentlessly see-saws back and forth across the rocking table to activate the triggers.

My thanks go to Lt. Col. William Congreve RA the original designer, John Wilding FBHI the Meccano designer and Les Megget who provided the instructions.





Auckland Meccano Guild Meeting

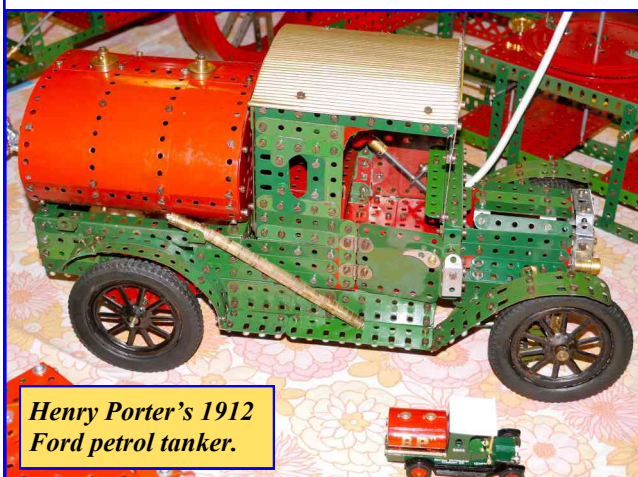
9th August 2014

Reporter: Gary Higgins

Photos: Gary & Les Megget

Peter Hancock surpassed all other modellers by bringing along a magnificent model of the Eiffel Tower made in yellow and silver Meccano. There was just room to squeeze it in under Neil's garage roof. Peter had made it for the very successful Remuera Bastille day Meccano show at the library, where it was well appreciated.

Henry Porter had brought along his usual, or some might say unusual, selection of models including a Best Traction engine (USA), a combine harvester (USA), a lovely model of a 1912 Ford petrol tanker (my favourite), an airship based on the Meccano Crazy Inventors design but with a dirigible using Meccano metal parts, a penny farthing bicycle, a crane grab and a design for an aero propeller and cowling.



*Henry Porter's 1912
Ford petrol tanker.*

Anthony Caldwell had a nice jet fighter and airport towing vehicle constructed from the earlier Evolution no 6 set which is one of the better sets from the 1990s.

John Denton had completed another part of his wish list and had made up the Tintin Galleon which is a nice looking model and probably the most innovative of that series.

Gary Higgins had a Turbo Pro car made up from the Turbo 8350 remote control set and a *Steel Tec* Corvette in yellow, one of the only two construction cars with die cast tops they made. He also had one of the new light aircraft Multimodel sets and a 1925 4A set, which was in very good condition with original boxing and guarantee.

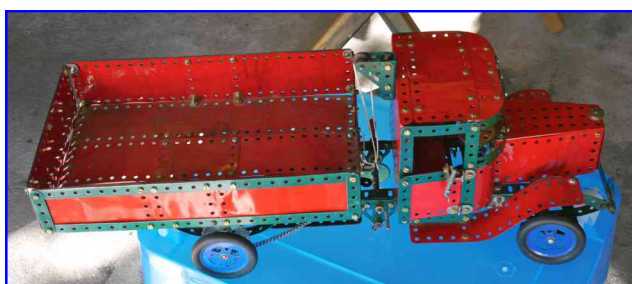
David Wall had made a small bulldozer from a Multimodel set and I was forced to take many pictures of this model. David is off on an OE and will no doubt be keeping his eyes open for more Meccano. It is always a bit more difficult to smuggle it indoors if you are living from a suitcase. Not much room for No 10 sets.

William Irwin had a fantastic collection of the Dark Blue sets from the late 70s. We were able to see the set transitions from the earlier though to the later with examples of how parts, boxing and contents changed over this period. William is of course an expert in this area of Meccano history.

Les Megget had a locomotive carriage, almost completed, for what will be a LMS 2-6-2 Tank engine of British design.

Mike Stuart had a paper folding machine which was most ingenious. Paper was fed into it via an upper tray and the machine proceeded to fold the paper neatly into 3, ideal for posting.

David Glenday who had been attending MWT meetings is currently in Auckland and brought along some excellent models: a Nickel car complete with gearbox, a travelling gantry crane made up from the Meccano advert of the same crane with the Meccano boy and a 1930s truck with a tipping back from the No. 8 manual. These had been made some time ago but all worked well.



David Glenday's model truck.



Another new visitor to the club was **Brian Cotton** and his son **Robert**. Brian had made a 1950s type car based on a set 7-8 from 1962, very similar to the car Christine in the Stephen King film, but definitely more friendly.



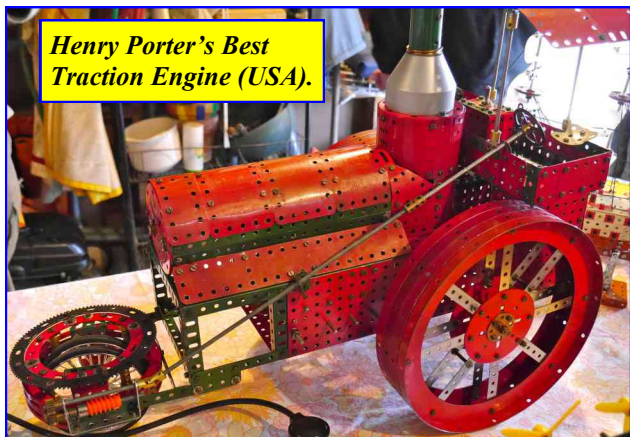
Brian Cotton's 1950s "Yank Tank", as they used to be known.



Rick Vine had a motorcycle driven by a magic motor, a No. 5 set cycle, a monoplane and a racing car.

Also in attendance were **Charl Louw, Neil Carey, Graeme Mills and Bob Pentney**.

The afternoon was again topped off by an excellent afternoon tea courtesy of the Meccano Ladies.



Henry Porter's Best Traction Engine (USA).

A RUBIK'S CUBE SOLVER

by David Couch, Nelson, New Zealand
(photograph: John Stark)

At the Melbourne Meccano Club Inc's annual exhibition on 11th and 12th October this year I successfully demonstrated a machine I have built to solve Rubik's Cube. It is a combination of a Meccano mechanism and some fairly advanced programming of an Arduino microcontroller. Two videos of the machine in operation, made by Graham Jost, can be seen at <https://www.youtube.com/watch?v=pMLsxIcpu0Q> and <https://www.youtube.com/watch?v=WVlqTsS1Xsg>. To start with, the cube is mixed up, usually by a member of the audience.

The first stage of solving the cube is to determine the positions of the small cubes or "cubies". A colour sensor is mounted inside the Sleeve Piece on the arm above the cube. It is lowered near the top face of the cube, and moved to each square in turn, recording the colour and transmitting it to the computer. The cube is then rotated so that each of the six faces can be scanned in the same way. This enables the program to construct a complete colour map of the cube, which is then transmitted to a program running on the PC, which displays it. No further scanning is required, as the program keeps track of the positions of the cubies as they are moved around. The movement of the sensor in three dimensions is powered by three servos.

Once the scanning is complete the sensor is raised out of the way and the solving begins, consisting of sequences of rotations of the whole cube and twisting of a single face about either of two axes. As the solving progresses the display on the PC is updated.

The cube manipulation part of the machine has five movements. The gripper seen on the left of the picture is fixed, and simply opens and closes. The one on the right can rotate through a quarter-turn. The platform on which the cube is resting can move up and down (to get out of the way of the gripper; the cube does not move with it) and rotate through a quarter-turn. These five movements are the minimum required to rotate or twist the cube about any axis. Four of them are powered by servos, while the lifting of the platform is powered by a geared motor, with photointerrupters to detect the limits of

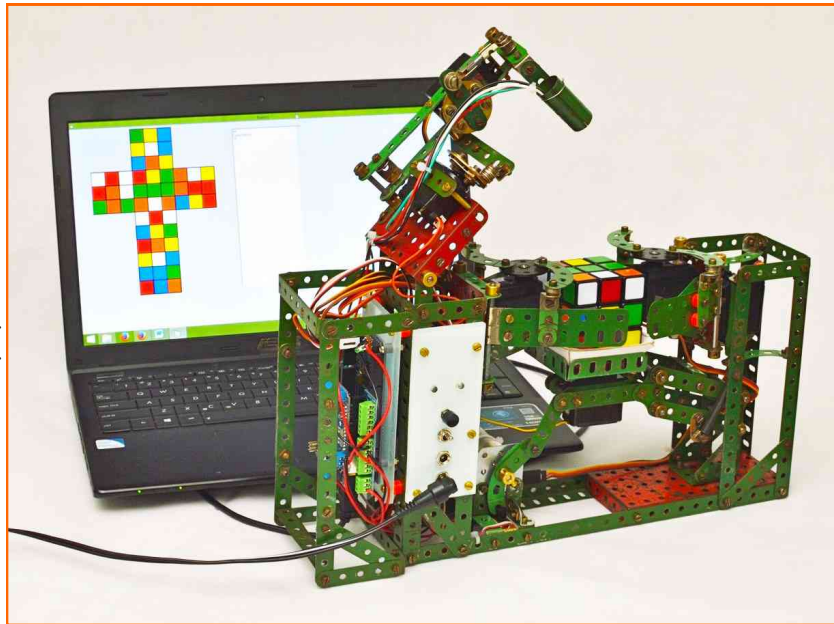
movement.

The machine is controlled by the microcontroller system which can be seen at the left of the picture. The system consists of an Arduino Mega, a screw terminal shield and a motor control shield. A small home-made circuit board provides the connections for the seven servos.

The Arduino program consists of 1900 lines of C++ code. It occupies 16k of flash memory and uses between 1k and 2k of RAM. It requires about 25 milliseconds of computing time to solve the cube. It should be emphasized that the solving is done by the Arduino. The PC is used only to develop the software and to display the diagram of the cube.

The machine took six months to build – two months for the programming and the rest for the Meccano. The main challenge on the Meccano side was to obtain fast, accurate rotations against the internal friction of the cube. I tried stepper motors and geared motors with photointerrupters, but eventually settled on servos as the best way to do this. I learnt some hard lessons along the way, the principal one being that standard \$20 servos are not up to this sort of work. I destroyed half a dozen of them! A second challenge was to find a way to grip the cube tightly without leaving the servo stalled. The solution was an "over-centre" mechanism that locks the gripper while leaving the servo unloaded. Pieces of foam rubber stuck to the gripper arms also help to improve the grip.

While very fast Rubik's Cube solvers have been built with a certain other construction system, I believe this is the first one to be built from Meccano. It is definitely a "Mark 1", cobbled together out of my tatty old Meccano, slow, inefficient and unreliable (though it performed very well



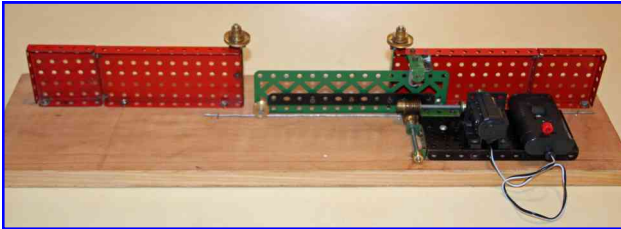
in Melbourne). In other words, just like my first French knitting machine. Other people took up that idea and improved it beyond recognition. I wonder if they will do the same with Rubik Cube solvers. There is certainly enormous scope for improvement.

I would be happy to receive email about the machine, or Arduino in general, at david.couch46@gmail.com. Three articles about Arduino are on the NZ Meccano web site, starting at <http://www.nzmeccano.com/Documents.php?show=100>

**MWT Meccano Club
Model report 7th
August 2014**



Tom Pittams: Rack strip model was an inclined ramp of rack strips that a vehicle rode down with the rack strips accelerating the rear wheels via a pinion on the rear axle to propel the vehicle along. Another model presented was a 6 legged walker powered by a Magic Motor.



Paul Vodonovich: (in his absence) An electric motorised opening and closing gate on a rack strip system.

Julie Hunt: Produced a comb for Bart Simpson utilising a rack strip.

Richard Feltham: Discussion on backlash in Meccano gears with his use of Meccano in his development of a 3D printer utilising rack strips.

Daryl Anderson: Displayed a Torro Engineering Set of 1966 vintage.

Chris Morton: A wood saw making use of a rack strip.

Brian Jones: Showed a programmable controller he is to incorporate into a Meccano lift model.

Robin Rye: Had 2 rack strip models....one simply a number of strips sitting in a Dinky army truck and the other made use of a rack strip in a ball game model. From the January 1945 Meccano Magazine a mechanism was reproduced using unusual gear mesh. Comment was passed re the thin content of this war time issue.

MWT Meccano Club: The "Member Of The Year" trophy, a model windmill, was on display. **John Freer** being this year's winner.

Bruce Geange: Progress on his 1939 Leyland fire engine with escape ladder is about complete. The escape ladder detaches and is movable on its own wheels. His rack strip model was of a pit saw. Also, a reproduction of a Meccano trade bulletin for a display held in Moscow in 1961.

Peter Winter: Has built the Super Model Steam Excavator and all of its functions worked powered by a 6v Sideplate Motor. He lamented having left his Meccano Steam Engine in an Auckland flat many years ago. A rack strip is incorporated

into the excavator but Peter also had a set of scales utilising a rack strip and proudly also made use of his Meccano pointer part 156. He explained that scale was graduated into units of weight called Funkins. A Funkin is the mass needed to move the pointer between the outer holes of the 4 inch circular faceplate of the scale. Detailed scientific measurement and analysis found that 4 Funkins were slightly more than 500 grams.

Selwyn Bluett: (in his absence) Used a rack strip as a blade on a power hacksaw model powered by a Magic Motor. A neat effect was the reciprocating saw would stop the clockwork as the saw dropped below the point of cut off of the imaginary material. Also featured on the model was a old style 2 inch pulley with the tabs.

John Freer: Road Grader model is progressing with the forward/reverse and 3 speed power shift module on display. A lot of time and toil he lamented.

Ross Quayle: First model in 50 years....a reversing mechanism where the output shaft kept turning the same way despite the input shaft reversing as in the pendulum of a wrist watch.

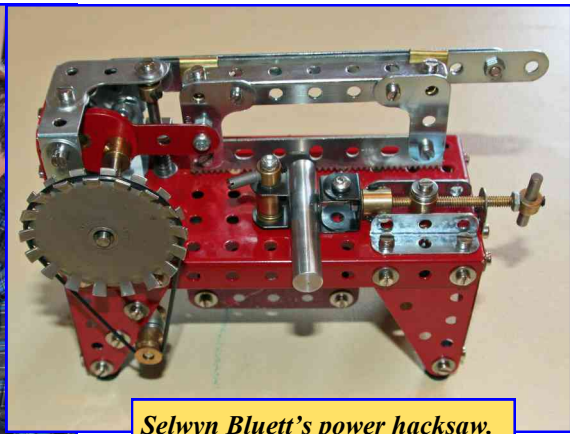
Bob Prescott: Rack strip model....a current auto one set model with rack and pinion steering.



Challenge model. Peter Winters balance scale model was judged the winner of the Rack Strip Challenge.



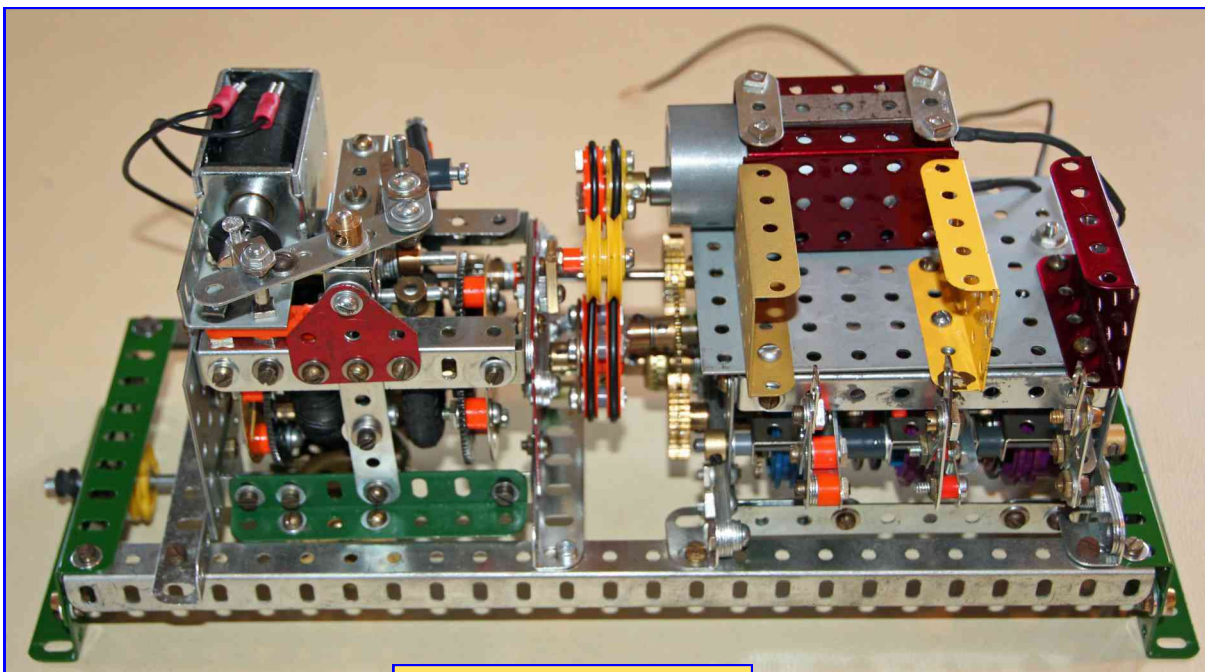
Richard Feltham's Meccano based 3D printer.



Selwyn Bluett's power hacksaw.



Peter Winter's Super Model Steam Excavator.



John Freer's grader gearbox.

COWANS SHELDON 75-tonne TELESCOPIC JIB CRANE

by Les Megget

I first saw this crane in the book "Railway Breakdown Cranes", Volume 2, by Peter Tatlow, published in 2013. As you know most railway breakdown cranes have traditionally been steam powered strut-jibbed cranes, some of which were converted to diesel power later in their working lives but this crane was a first for British Rail. The *Cowans Sheldon 75t* telescopic jib cranes are diesel powered (*Rolls Royce C6TFL*) with hydraulic activation (motors and cylinders) of all the cranes motions, including the stabilizer (outrigger) jacks. These hydraulics replaced the gears, shafts, wire ropes and tackle of the traditional cranes. A batch of 6 cranes was instigated in August 1973 and the contract was won by *Clarke Chapman Cranes Ltd* (in 1977) who now owned the historic crane makers *Cowans Sheldon*. The tender price was about 386,000 GBP but blew out to an actual cost of over 432,000 GBP for each crane!

The crane has a 2-section telescopic box-section steel jib which allows better access under electric overhead wires and dispenses with the need for a match wagon to support the jib when travelling. Also the total crane length is shortened and articulation of the jib is not required. Another advantage is that the width of the support at the foot of the jib was reduced thus allowing the driver's cab to be positioned at the front of the crane thus affording much better visibility over the vintage positioning of the driver's controls behind the jib and the associated mechanical gears and hoists. The crane's slewing bearing was positioned centrally on the carriage allowing the jib to be positioned in either direction when travelling.

The outriggers were hinged vertically and could be swung out hydraulically over a total range of about 170 degrees. This was an entirely new approach to BR outrigger design, which traditionally only moved transversely to the rails. The innovative aspect of the outriggers was that when in their travelling position, near parallel to the rails, they could load the relieving bogies at each end to reduce the dead load transmitted from the crane carriage to the rails. These relieving bogies are necessary because the loads on the 4-axle carriage in working conditions (153 tonnes total crane weight) exceeds the axle limit. These relieving bogies will be described in part 2.

The crane is able to propel itself up to 5 mph by

using 2-speed hydraulic motors operating on the outer axles of the 4-axle carriage. "Engaging and disengaging the travel gears was achieved by means of a sliding pinion inside each gearbox being moved in and out of mesh by a hydraulic ram". The crane was designed to travel in train formation at speeds up to 75 mph. The traditional practise of using blocking screws to render the cranes suspension inoperable when being self propelled was not considered satisfactory and this crane has suspension comprising coil springs and hydraulic dampers with vertical posts to restrain the wheel sets horizontally. Lateral displacements of up to 40 mm were built into the central carriage axles by using roller bearings rather than the spherical bearings used on the other axles. This allowed the crane to negotiate curves down to 80 m radius.

The NZ connection: *Trans Rail* had two very similar cranes (from 1980) to this BR version but with entirely different carriages with double 3-axle bogies and different relieving bogies (smaller 3'-6" gauge of course). From photos I've seen the NZ version had a near identical crane structure except the crane was rated at only 60 tonnes. *Trans Rail* "drowned" one crane north of Gisborne nearly 10 years ago when the Nuhaka River bridge it was traversing collapsed under it due to marine worm damage to the bridge piles. The crane was salvaged and I believe used for parts to repair the remaining crane, which I saw was for sale earlier this year. Railway companies worldwide have got away from having large capacity railway breakdown cranes in their stock and now often use road going and rough terrain hydraulic mobile cranes.

The NZ *Trans Rail* 60t version.



The BR 75t crane c1980.

My Meccano Model (Figure 1):

I realised early on that the telescopic boom of my last Liebherr mobile crane was the correct size for the railway crane if I used the intended scale of 1" to the foot (1:12). Also the loss of weight due to only having 2-sections, rather than 4, was a major advantage in luffing the jib as the lever arm between the jib's pivot axle and the line of thrust of the luffing cylinders (at the jib's horizontal travelling position) was less than that on the mobile crane. This reduction would require an increase in force in the cables within the fake hydraulic cylinders to lift the jib, always a major problem in these Meccano cranes.

The Carriage: This is 24 $\frac{1}{2}$ " long comprising varying lengths of 5-hole deep Flat Plates, extended by another hole using long Flat Girders with long Angle Girders (AG) top and bottom to stiffen it up. These AGs are 11-holes apart with 3-hole Flat Plate cantilevers extending the total width to 8 $\frac{1}{2}$ " at the top surface. The prototype cranes were all painted "construction" yellow so I've used *French Yellow* Meccano parts. This colour comes in several slightly different shades, which makes the crane look a bit patchy under artificial lighting.

The 8 wheels are made from 4" diam. Circular Plates bolted to 3 $\frac{1}{2}$ " diam. Wheel Flanges with Large Axle Bush Wheels on their inside. Figure 1 shows the working suspension on each wheel set. The $\frac{5}{8}$ " diam. springs are non-Meccano (*Bunnings*) on 1 $\frac{1}{4}$ " long Bolts lock-nutted at the top after passing through the carriage frame. The axle-boxes are Chimney Adaptors bolted to 5-hole 2" Strips together with Washers and Reversed Angle Brackets. The Vertical restraining "posts" are pairs of 3-hole Flat Girders spaced so that a 4 mm gap exists between them to allow the 4 mm axles to move vertically. The maximum vertical suspension movement is about $\frac{1}{4}$ ". The long blue Sleeve Pieces represent the casings of the hydraulic dampers.

The drive to the two outer axle sets is via articulated prop shafts with 25:50t Helical gears to each axle, see Figure 2. The

motor is a modern 12V job sandwiched between side plates (available from Dave Taylor, UK). The motor shaft has a worm/25t gear reduction then equal 26t Bevels to get the drive in the longitudinal direction. There is then a compact 2-speed gearbox with 1:1 and 2:1 ratios to the prop shafts. There is a neutral position between the 2 ratios controlled by a lever at one end of the carriage. I've used a new Ashok Socket Coupling machined for use with a stainless steel tri-axle instead of the old mild steel keyway, many of which I've ruined by attempting to transmit too high a torque. Obviously you don't want the carriage's drive motors engaged when the train is being pulled a loco. This happened once in the UK ruining both the crane's travelling hydraulic motors. The gearboxes on the wheel axles tended to rotate due to the flexibility of the UJs on the prop shafts so I added a restraint so that the gearboxes could only move vertically due to suspension travel.

The 6" diam. roller bearing came directly from the Liebherr crane and is fixed to the carriage at 4 points. Like in the crane there is a ring (2" diam.) of Ball Bearings positioned near the lower edge of the carriage to carry the vertical crane forces. This bearing is within a substantial reaction box, built across the carriage to resist the crane forces.

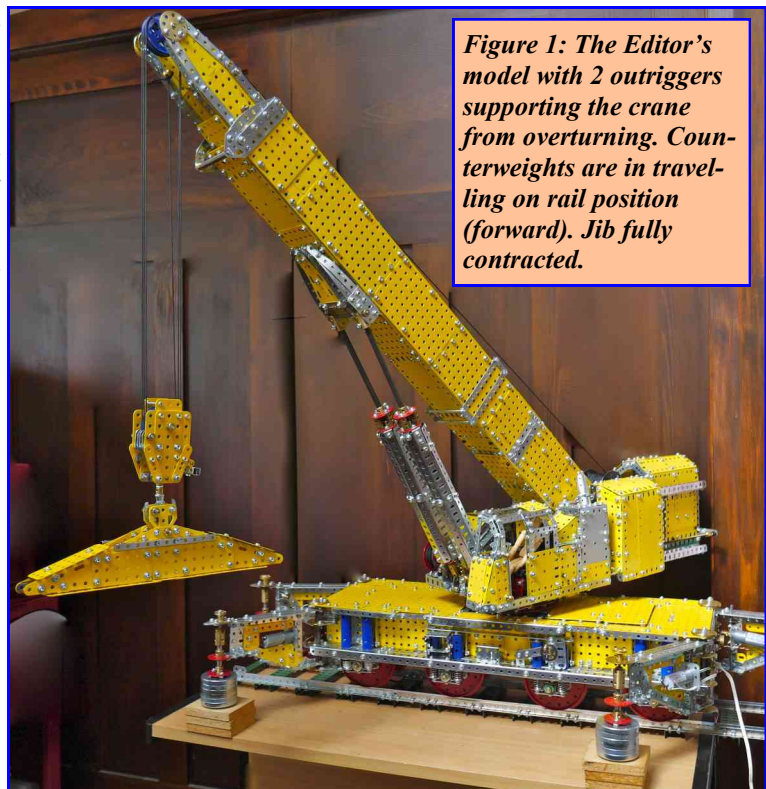


Figure 1: The Editor's model with 2 outriggers supporting the crane from overturning. Counterweights are in travelling on rail position (forward). Jib fully contracted.

Outriggers:

An outrigger is shown in Figure 3. The bearing to the outrigger from each corner of the carriage is substantial using 4 bearings comprised of Wheel Disks with a 5" stainless steel Axle Rod through all bearings. Each outrigger is made from double Angle Girders top and bottom bolted to a 5-hole Flat Girder at the outer end. Triangular bracing in the form of a 5-hole Strip prevents the outrigger distorting under the load of the crane. The lifting jack is made up from a Hollow Large axle, a Large Axle Socket Coupling (SC) with a Threaded Boss fitted in its top socket. By turning a 1" pulley at the top a 2" Screwed Rod drives the SC down through its Large Axle Bush Wheel at the bottom. As the jacks are positioned higher than conventional outriggers (props) on railway cranes a set of cast aluminium bearing cylinders are used to sit on timber bolsters at or near rail level. These alloy cylinders can be stacked 3 or 4 high (fixed by spigots) and are packed into cradles under the outer corners of the relieving bogies when not in use. In the model I've used a pair of Wheel Flanges for each aluminium cylinder, held together with Long Bolts. A Large Axle Bush Wheel can be fitted to the top of these cylinders to accept the jack's piston. The jacks are manually operated on the model as there wasn't space to provide a motor and keep within the dimensional limits.

Fig. 3 also shows the 50 rpm geared motor used to rotate the outrigger about a vertical axis. A Threaded Coupling on the motor shaft has a 1½" Screwed Rod in its threaded end which turns in a Coupling held by 2 vertical rods supported in some of the outrigger Bush Wheel bearings. The motor has to rotate by a few degrees about a vertical axis between the open and closed positions and is pivoted using Handrail Supports with short rods held by brackets bolted to the outrigger frame. This jacking system is almost identical to that used on the prototype. Initially no hydraulic positioning jacks were provided but it was found that they could not be manually positioned when the crane was resting on canted (on curves) or sloping track.

The Crane superstructure:

The base of the crane is made of two 6" diam. Circular Plates which are bolted to the inner portion of the roller bearing by 8 long Bolts. The 8 nuts can be easily undone to remove the crane superstructure

for transportation.

In this crane the boom support pivot is near the bottom of the boom, unlike most mobile cranes where the pivot is near the top of the boom's section. This lower position of course decreases the moment lever arm (mentioned earlier) resulting in larger forces required in the luffing cylinders with the boom in its travelling position (approx horizontal). A rigid triangular frame comprising Angle Girders forms the support structure for the boom's pivot, see Figure 5. The boom pivot rod is a 6" Large Axle version bearing in corresponding red 3x3-hole bearing plates.

The boom, as mentioned earlier, is the outer 2 sections from my Liebherr City crane shown at the 2013 Convention at Pukekohe. The second telescoping section increases the boom length from 35ft 9in to 52'-3" (divide by 12 to get the model's equivalent dimensions). In the model cables driven by a motor at the inner end are used to replicate the prototype's hydraulic cylinders to extend the boom.

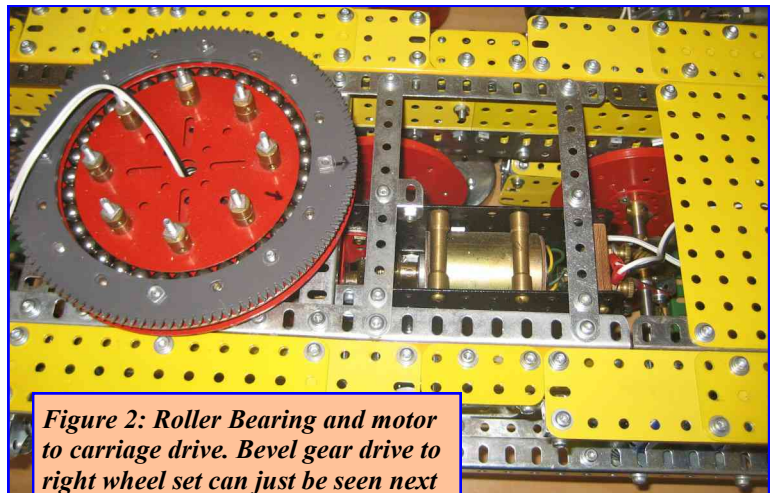


Figure 2: Roller Bearing and motor to carriage drive. Bevel gear drive to right wheel set can just be seen next to motor terminals.

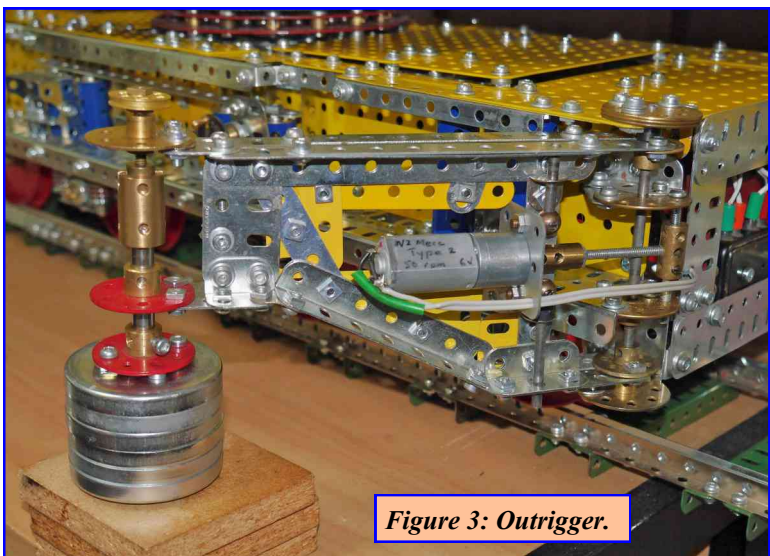


Figure 3: Outrigger.

The two prototype luffing cylinders are modelled using cylinders made from Strips and 19-hole Obtuse Flat Girders (Ashok) with Large Axle Bush Wheels at each end (see Fig. 5). The Large axle pistons are pulled out by a nylon coated stainless steel cable which runs from the luffing winch, up the cylinder, around a $\frac{1}{2}$ " Pulley fixed near the outer end and back to a pulley at the inner end of the piston rod and then around another pulley at the cylinder's top. In this case the cable then runs around $\frac{1}{2}$ " Pulleys near the bottom pivot and into the other cylinder, around a similar set of pulleys, to be finally attached to another winch on the other side of the luffing shaft. Thus both cylinders are extended by the same cable, therefore eliminating any problems of change of cable length between one cylinder and the other. I've used 150 lb breaking strain cable here as the force in each cylinder approaches 80 lb maximum when lifting the extended boom from its horizontal position (no load on the hook). The prototype range of luffing is -6 to 55 degrees from the horizontal while the model is 0 to 50 degrees. The large 24V *Exacto* geared motor is used for luffing; a Worm drives a pair of 57t Gears fixed to the winch shaft with filed down surfaces to reduce slip on the rod. On the previous crane I used a 22t Pinion meshing with the worm but the forces were so large that a couple of pinions and worms were badly damaged over 2 years of use. The prototype can fully raise its boom in 115 seconds, a very similar time to that of the model if the maximum 24V is used.

Counterweights: The crane has two 10 tonne counterweights (Figure 4) which can be moved longitudinally along the rear portion of the crane superstructure using an auxiliary pump. On the model the counterweights on each side run on 25-hole Angle Girders top and bottom using $\frac{1}{2}$ " Pulleys. A geared motor in the superstructure drives two $1\frac{1}{2}$ " Screwed Rods which each turn in the threaded tapping in a Handrail Support lock-nutted to a $2\frac{1}{2}$ " Slotted Strip at the bottom of each counterweight. Each screwed rod is supported at the rear in a bracket bolted to the side of the superstructure. This looks a bit unusual but I couldn't think of a neater way of hiding the counterweight drive other than using a motor within each counterweight. A small switch on the right hand side of the superstructure controls the counterweights. The real crane needed moving counterweights so as to reduce the axle loads when travelling and the crane can be used free on the rails with the counterweights at the rear at slewing

angles of ± 10 degrees from straight ahead.

Hoists:

The 75t main hoist is positioned on the top of the superstructure just behind the boom pivot (Fig. 4). Again I've used a 100rpm geared motor driving the winch through a Helical Gear reduction.

The auxiliary 6t hoist winch resides on the front right hand corner of the superstructure (Figure 5). A geared motor transmits the drive to the winch through a pair of equal toothed Helical Gears. Both hoists are controlled from a remote switch box via a 12 wire cable which plugs into the side of the crane superstructure. This switch box also controls the slewing, luffing and boom telescoping motions.

Part 2 will describe the relieving bogies.

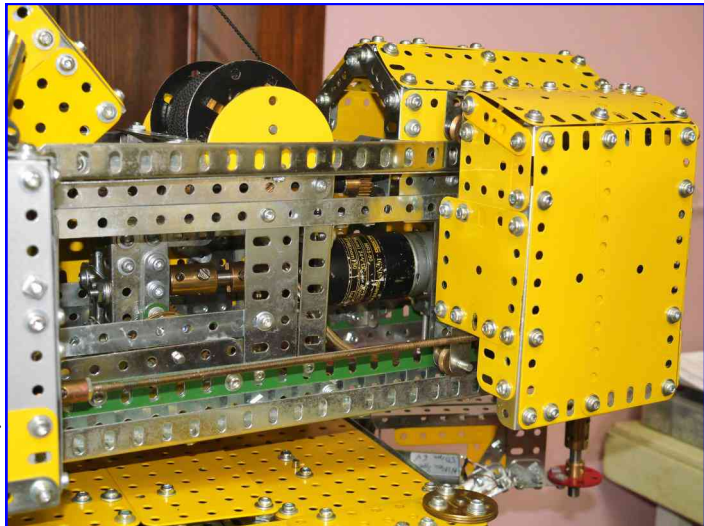


Figure 4: Counterweights at their rearmost position showing the Screwed Rod drive. With 2 machine house covers removed the large luffing motor can be seen.

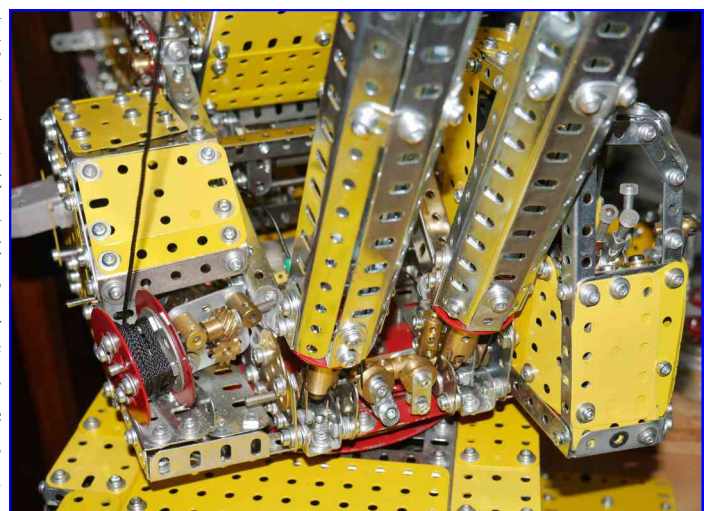


Figure 5: Shows the luffing cylinder's lower pivot and the auxiliary hoist to the left. Driver's cab to the right. Jib pivot can just be seen at top left.

DARK CRYSTAL ORRERY

by Henry Porter (AMG)

One evening when **Rick Vine** was visiting me I asked him if he could take some photos of the orrery in Ogra the witch's cave. He borrowed my DVD of the film and he photographed it. Then I received the photos I examined them carefully. Then I went to *Spotlight* and bought some large wooden beads of different colours. Next I went to several \$2 shops and got some brightly coloured bouncy balls. I already had some small polystyrene balls.

Then I watched the film to analyse the movements. The base revolves clockwise. The arms with the large planets on them revolve anticlockwise and the top planet, that is represented by the Star Wars Death Star, revolves clockwise.

The next stage was to look at where all the small balls were placed in groups which I had to simplify when I made the model. There were two big caliper like structures around the large planets on the arms and two small ones on the floor of the rotating structure.

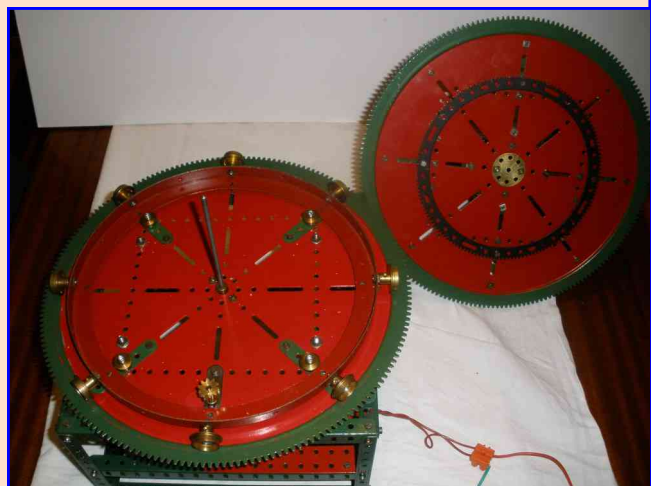
Construction of the Base:

A Geared Roller Bearing (GRB) was mounted on a frame $12\frac{1}{2}$ " square and $5\frac{1}{2}$ " high, see right. On the lower GRB plate were mounted five $2\frac{1}{2}$ " Strips. The centre one held a vertical drive to the upper plate. The gear at the top is a large 10 tooth Pinion, *Ashok* No. 1101A. On the other 4 strips were mounted four $\frac{1}{2}$ " Flanged Wheels without boss. This is to keep the 167B large Flanged Ring steady with no lateral movement. Because the inside of the 167B is too narrow it had to be ground down so that the inside diameter is $8\frac{1}{2}$ ".

This is the diameter of the inside of a circle of 4" Curved Strips if they were bolted to it. It allows for the axle for the vertical drive for the internal gearing.

On the underside of the top GRB plate was mounted a $7\frac{1}{2}$ " Toothed Ring (mine was *Exacto*). The new *Ashok* part No. 1106A replaces this. The gear ring was mounted with 4 Washers to space it from the GRB.

Henry's model Orrery.



Internals of the GRB showing Large Toothed Ring.



The movie's Orerry in the witch's cave.

On top of the upper GRB plate was mounted a dog-leg shaped structure which was $2\frac{1}{2}'' \times 2\frac{1}{2}''$ in section. Before the GRB plate was installed a vertical axle was screwed very tightly in a Bush Wheel on the lower plate. In the centre of the dog-leg section on top was an 8'' Axle that was lowered down till it nearly touched the vertical axle in the lower part. On the lower one was mounted a 48 tooth Bevel Gear facing upwards and another one was mounted at the bottom of the 8'' axle facing down. These were tightly screwed on because they drove all the upper mechanisms.

On the 8'' axle was a Collar and Washer, a 76 tooth Gear and another Collar and Washer to support the 3'' brass spacer mounted in a Socket Coupling. On the lower part of the socket coupling was a 25 tooth Pinion. In order to accommodate the brass spacer a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plate was drilled with a $\frac{3}{8}''$ diameter hole. The original one was removed and the new one installed. At this stage the gearing for the drive to the box with arms on it was installed and also to the 25 tooth pinion.

The next stage was to mount all the little coloured balls and two small calipers on the mountings at the bottom.

Two industrial washers from the local hardware

were put on the brass spacer. At this point two $1\frac{1}{2}'' \times 1\frac{1}{2}''$ Flat Plates with $\frac{3}{8}''$ holes drilled were bolted to two $1\frac{1}{2}''$ Flanged Plates and a 57 toothed Gear, which had the boss removed and filed out to fit over the brass spacer. This was bolted to the underneath of the box. The drive to the box was then connected. The arms with the large planets and calipers were attached and the machine was tested to see that all the drives worked satisfactorily. Then the top socket coupling was connected to the bush wheel put on the top end. A Collar was put at the top end of the 8'' axle. Four Screwed Rods were attached to the bush wheel and another at the other end. A short axle was screwed on the upper bush wheel and the Death Star fitted on top.



Another view of the Orerry showing the complex stand.

Christchurch Meccano Club (Est. 1929), November 2014 Quarterly Report by Mike Howse

Whilst it's been quiet on the Meccano front over the last couple of months CMC members who will be attending the NZFMM Convention over Easter 2015 are starting to organise their display models.

During our October monthly meeting President **Neil Pluck** called for a show of hands for members who will be attending and, or, who will supply working models to transport to Wellington to the Convention, from the response it appears that CMC will be well represented.

A number of CMC members have called for a re-design of the Clubs current logo. Members have been invited to submit alternative designs that may well be incorporated into the next order of Club shirts.

At our October meeting the models on display were of an animal.

The spotlight this quarter falls on CMC member **Hugh Aston** who outlines below his history with Meccano:

For me it all started when I was about 7 or 8 years old, enjoying life in the post-WWII boom years. To my parents' delight, I took to it straight away, making the choice of Christmas and birthday presents that much easier for them. A subscription was sent to Meccano Magazine, but each issue seemed to take forever to reach Kydd's Bookshop in Taumarunui. Further encouragement came from a neighbour who also had a mechanical bent – an interesting old chap who survived the horrors of WWI and claimed to have seen a Huia bird while working as a roadman around the central North Island. I recall him pronouncing that one day I would be a Mechanical Engineer – and so it came to pass.

My parents decided that my idyllic country life was not giving me the kind of education they wanted me to have so at age 10, I was packed off to boarding school in Wanganui. The Meccano had to stay at home though and was another reason for looking forward to school holidays. It could be brought out only when the weather was bad enough to preclude outdoor activities. Then came boarding at Wellington College, which I thoroughly enjoyed. Arriving home off the train for the school holidays, my precious Meccano was nowhere to be found; "You are getting far too old for

that now", explained Mother, "I have given it away." I had just turned 13.

Then came studying, electronics, old cars and motorbikes, more study, girls, work, marriage, children, computers, more work, grandchildren and finally, retirement – nearly 50 years passed without Meccano. It was time to revive the interest by building up a set once again. After buying various parts on Trade Me and elsewhere, I was told about the Christchurch Meccano Club, which I joined in late 2006.

Right from the start I enjoyed the meetings and especially the monthly challenges. One of my early challenge models was a helicopter made from 14 parts plus unlimited semi-circular plates. Another was a Wrigley 3-Wheeler made from a No.2 Outfit plus Magic Motor. It has since been rebuilt using re-painted parts and is still working fine. There have been a few failures, most notably the Wolsley Gyrocar which I could not get to function correctly. Other successful models include Flying Pendulum Clock (pictured), Recumbent Bicycle, Fairground Waltzer and Torsion Pendulum clock (pictured). All of these continue to work well and are regularly displayed at club events. My other post-retirement passion is old clocks, which I restore and collect. It is now sometimes difficult to tear myself away from the current clock project to complete the monthly Meccano challenge.

Also just a reminder to all Meccano folk visiting Christchurch we invite you to attend our monthly meetings held at the Papanui RSA, 55 Bellvue Ave, Papanui. Meetings are held on the first Friday of each month, except January.



Hugh with his Meccano clocks.

Images from the recent CMC meeting.



Hugh's crocodile.



Nathan's trotting racehorse.



A Dragon by Neil.



Robert's Horse & cart.



Sam's Mammoth.



Meeting Report

Date:
5th September
2014, 7:30pm

Reporter: Max George

Meeting: Held at Summerset Village, Paraparaumu, hosted by Lou Nichols.

Present: Bob Prescott, Eldon Porter, Max George, Lou Nichols, Simon Moody, Stan Baker, and a prospective member Ross Main.

Apologies: Brian Peterson, Campbell Morrison, Keith McCallum, Reg Barlow.

Golden Spanner Award: It was noted with pleasure that **Bruce Geange** has been awarded the Golden Spanner for this year. The club sent him their congratulations on this well-deserved award.

Models:



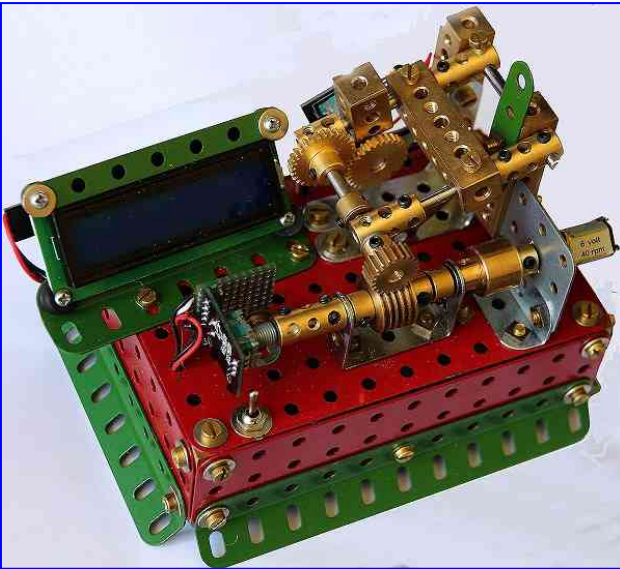
Simon is building Merrick another Thomas the Tank Engine Crane.



Lou Nichols displayed the Model Plan 193 Skeleton Clock - he is constructing.



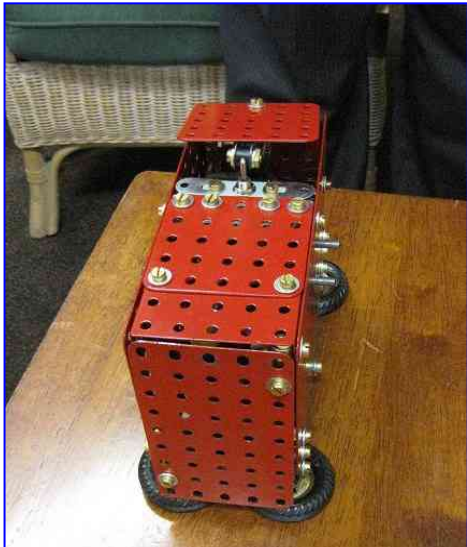
Stan is still constructing a large Eiffel Tower which will have two lifts in the top section and others below. He explained how the lifts would work. The model looks very impressive even if it is not complete. He still has to build the bottom section and it will certainly be an impressive model when completed.



Stan exhibited an almost completed model with an embedded Arduino controller and asked all to guess what its function was. No one was able to get the right answer. It was subsequently exhibited at the Melbourne Annual Exhibition. Any guesses as to what it does?



Tintin Plane by Bob.



Ross Main a prospective member and his "Do Nothing" machine.

Convention 2015:

Meccanomen from Australia who intend coming to the convention are:

Ross Smith – Western Australia, **June & Malcolm Booker** - NSW and **Graham & Mary Jost** Melbourne.

Dave Denner has some old sepia pictures about Meccano and Max will contact him when he is in Melbourne later in September.

Floor layout and registration will be handled by **John Stark and David Couch**.

It has been confirmed that adequate free car parks will be available.

Reg to negotiate meal and meeting room near Te Papa. The meeting will be at Te Papa with the meal somewhere else from 7:15pm onwards.

There will be Meccano related lectures on both Saturday and Sunday. **Lawrence Rabie**, brother of the owner of *Spin Master* is likely to talk about Meccano together with **Gary Higgins, Les Megget, Robert and Brenda Vale and David Couch**.

Talks are progressing with *Spin Master* about their support for the Convention.

Why not join the ISM? by Bob Prescott (ISM 565)

The International Society of Meccanomen has, as its title indicates, members from around the world – some thirty countries in all. The organisation's mission is "to encourage links in the Meccano world across international boundaries", a mission I am sure we all share.

The annual subscription at the present time is **£26** and you get the magazine "The International Meccanoman" (the I.M.) airmailed to you three times a year. This is an excellent 32 colour page magazine with lots of pictures. It includes articles about meccanomen, club exhibitions and models from all over the world as well as a 3 or 4 page "model building technology" section which will help both experienced and inexperienced members.

Also available online is the ISM Yearbook which has the Society's Constitution, ISM awards and contacts' information. There is a detailed list of all members and clubs, guilds and societies throughout the world as well as suppliers of Meccano sets and parts.

There is also an ISM badge available at a small cost.

The ISM has a website www.internationalmeccanomen.org.uk with lots of Meccano and Society information including how you can join and pay with your credit card.

Don't worry if you are not on line, I can provide a membership application and my details are:- bobandanne@paradise.net.nz or telephone 04 9052963. Feel free to contact me if you want any further information.

So take action NOW and join the ISM for the 2015 year.

PART 141 – A CAUTIONARY TALE

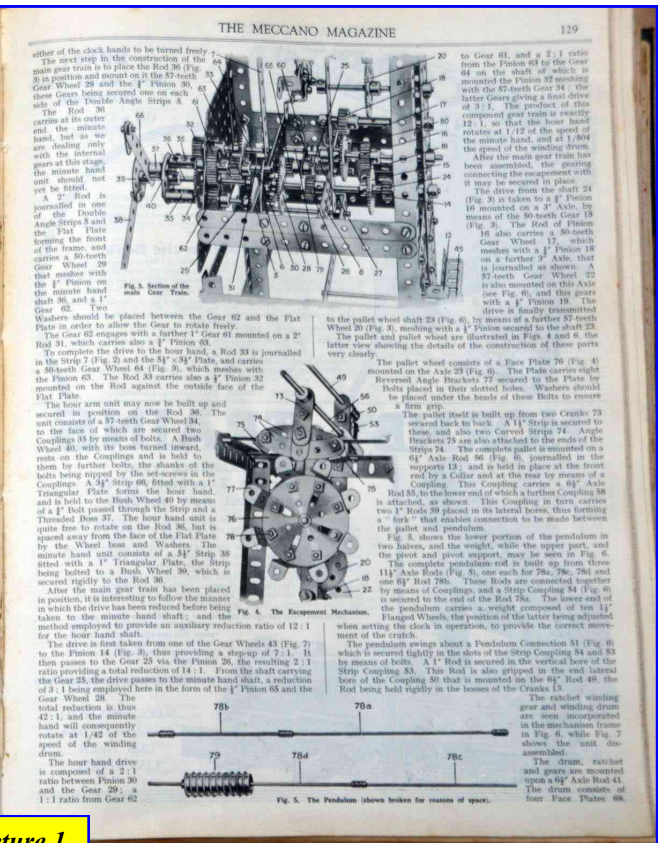
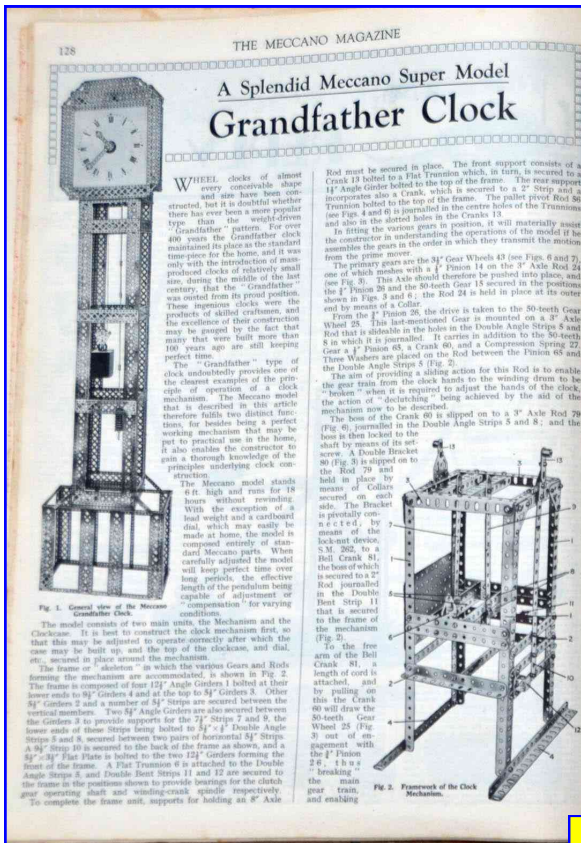
by Richard Feltham (MWT)

People who sell Meccano on Trade Me fall into two groups. There are those who lay out all the bits in a carefully orchestrated homage to Mondrian, with the part numbers listed. No surprises for the purchaser. The others content themselves with a single photograph, usually out of focus, of a battered suitcase or wooden box, the jumbled contents only dimly evident. These are the ones I favour, with possible gems lying hidden amongst the rust and mummified insects, so I was full of anticipation as I lifted the lid on my latest borer ridden purchase. As usual there was the collection of non-Meccano pieces, including *Primus* and the ubiquitous bent and broken no-name strips. However my luck held as a selection of genuine parts emerged from the bottom of the tray; a couple of Train Buffers and a Dredge Bucket, along with some early 20s gears. And a coil of stranded wire. This last item, together with a few buttons, hair-clips and sundry wood screws, went into my junk box as an obviously alien object. Later that week I was browsing the November 1932 Meccano Magazine, kindly passed to me by Bruce Geange, when my eye caught an article on building a grandfather clock (page 128), that claimed "the model is composed entirely of standard parts". As horology

has always been in the 'too hard' basket for me, I felt that here was something I could tackle with a moderate chance of success.

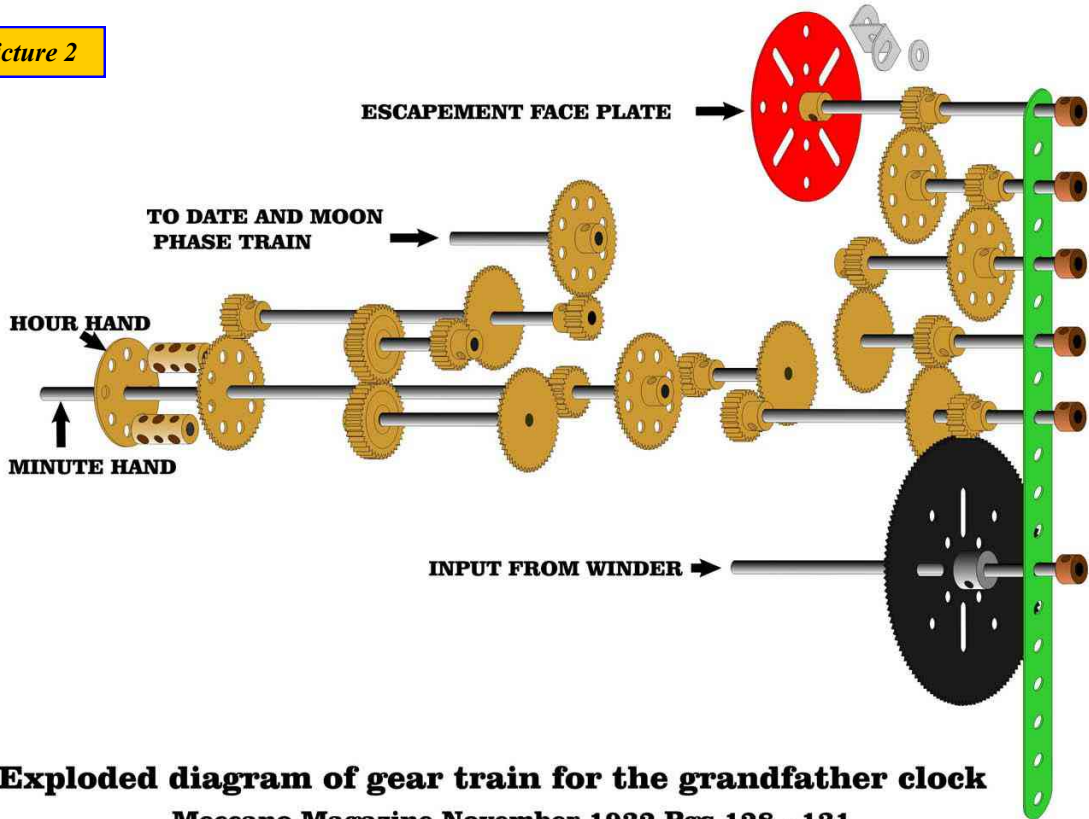
See Picture 1 below.

I began by checking the parts list and stockpiling the necessary items. It soon became clear that while I had everything needed to build the clock mechanism I was going to have to improvise on the case. Everything except parts 141 and 172, that is. Not only did I not have them,.. they weren't even mentioned on the standard factory parts list or on the various web resources I knew about. Undaunted I began construction. The clock uses several Standard Mechanisms, such as SM 112 Free Wheel Device and the notorious SM 108(a) Clock Escapement. The gear train design is a testament to Frank Hornby's ingenuity and foresight, needing only two different ratios of 2:1 and 3:1 to obtain the appropriate hour and minute hand rotations from a single source, without needing recourse to a differential.



Picture 1

Picture 2



Exploded diagram of gear train for the grandfather clock

Meccano Magazine November 1932 Pgs 128 - 131

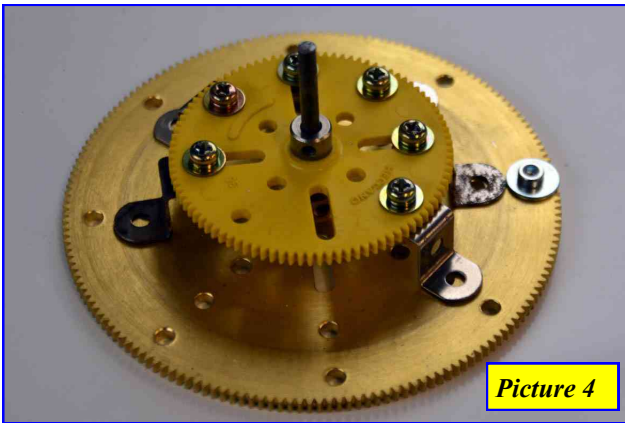
I have always struggled with the classical Meccano Magazine type written instructions, and more than once I struck a dead end and found myself making constant reference to the accompanying diagrams. The description did however clarify one thing; part 141 is a Wire Line, a standard part in 1932 apparently. Then the penny dropped. There, lurking in my junk box, was part 141!

I mocked up a temporary case, and using a lump of lead to provide the required 18 lb weight, set the pendulum swinging - and watched it grind to a halt after 30 seconds. To cut a long story short I spent the next two days trying to get the clock to run for anything more than few minutes - with absolutely no success. I consulted Chris Morton, our MWT President, a veritable fund of helpful tips. His advice was that all it needed was 'the patience of Job and the wisdom of Solomon'. Yeah, right. Oh, and I should be using hardened brackets. Following his suggestion I made up a jig to ensure the tips of the Angle Brackets mounted around the face of the Face Plate were all on the same radius, to within a tenth of a millimeter, and as equally spaced as I could manage.

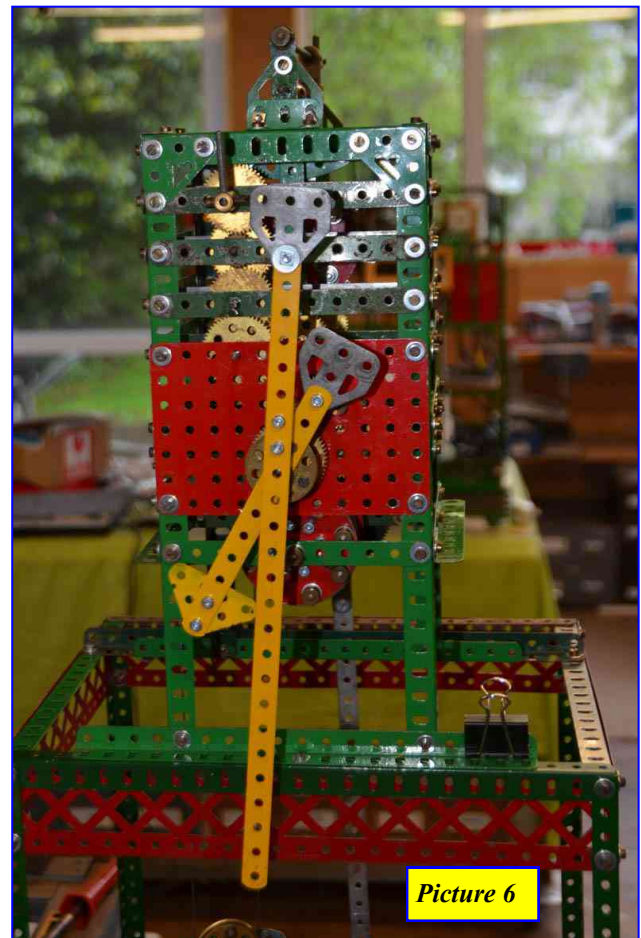
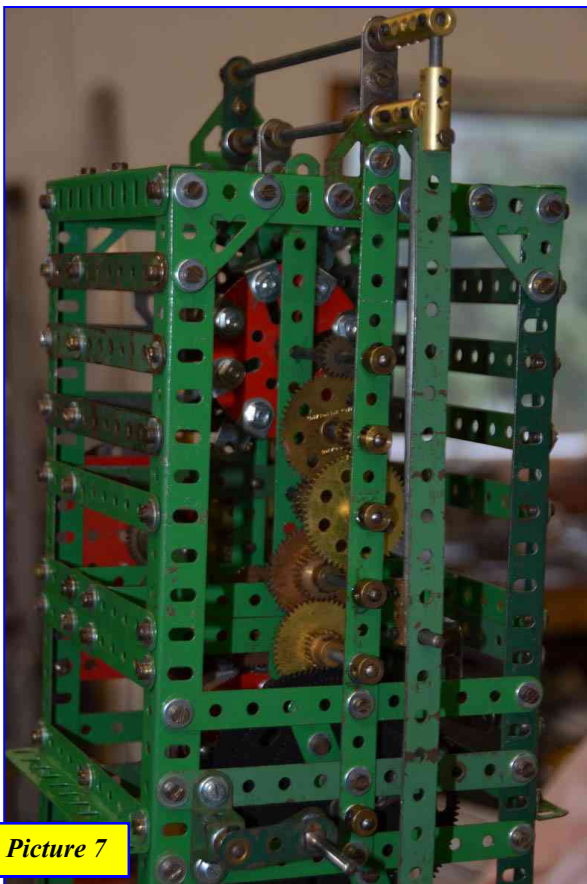
This made no appreciable difference. I refined the pendulum and pivot to try and cancel out unwanted oscillation. No improvement. I added lead to the weight. Zip, See *Picture 5* over.

Picture 3: Part 141 Wire Lines.





At this point I was pretty close to giving up. But mindful of Chris' injunction I went over everything for what seemed like the zillionth time. I checked all the rods for straightness and the gears for possible binding, replacing and readjusting where necessary. To my delight it ran for about 30 minutes before stopping. Fed up, I abandoned work for the day and unburdened my frustration on poor long-suffering Julie. She looked at it and said "Why is the minute hand so long?" (Picture 6). Bingo. The hugely unbalanced minute hand was stopping the mechanism as it passed the half-hour. A quick adjustment and has now been running quite happily for several days. The next step is to extend the gear train beyond the original design to display the day and phases of the moon. A tidy up of the case and I hope to have a presentable, functional model, Picture 7.



New Zealand Club Diary 2014

Auckland Meccano Guild

President: David Wall, Tel. (09) 426 1965

Secretary: Peter Hancock, Tel. (09) 535 5355

Meetings at 2pm on second Saturday every third month. The next meeting will be held on **Saturday 14th February** at Peter & Jan Hancock's 1 Orangewood Drive, Howick starting at 2pm.

MWT Meccano Club

Chairman: Chris Morton

Secretary/Treasurer Robin Rye, Tel. (06) 764 8670

Meetings at 2pm. Next meeting: **Saturday 14th February** at St. Luke's Church Hall, Corner Cornfoot and Manuka Streets, Wanganui.

Wellington Meccano Club

President: Stan Baker, Tel. (04) 566 7150

Secretary: Max George, Tel. (04) 232 4200

Contact: Lou Nichols, Tel. (04) 297 1515

Next meeting: **Saturday 8th November from 2pm** at Stan Baker's 7 Oceanview Tce, Tirohanga, Lower Hutt.

Christchurch Meccano Club

President: Neil Pluck, Tel. (03) 389 8134

Secretary: Roland Jaspers, Tel. (03) 358 1357

Meetings at 7:30pm on first Friday every month (except January) at Papanui RSA Club, 55 Bellvue Ave or No. 1 Harewood Road, Christchurch.

Additional Meccano Contacts

Hamilton: Don McClelland, Tel. (07) 843 4198

Hawera: Daryl Anderson, Tel. (06) 278 7666

Kapiti Coast: Bob Prescott, Tel. (04) 905 2963

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 February 2015 issue of NZFMM Magazine should be sent to Les Megget before the 1st February 2015.

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

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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.

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Price list in PDF, Excel or by printed copy (30 pages) .

Contact Stan Baker shb@ihug.co.nz

Phone +64 4 566 7150 Evenings or +64 21 421 750 mobile

Golden Spanner Award 2014

As I am the recipient of this award for 2014 I would like to thank members of the **MWT Meccano Club** for the nomination and work that went into putting this together and sending the writings to the Secretary to the Golden Spanner Award. I also wish to thank the other Meccano Clubs in New Zealand for their support.

I was surprised when a letter with the ISM stamp on it arrived and saying that I was the Golden Spanner Laureate for 2014. I thought about this for a few days then sent away my acceptance. The Golden Spanner Pin and Diploma were presented to me at the October MWT meeting. **Bruce Geange**

Recent interesting photos and models.

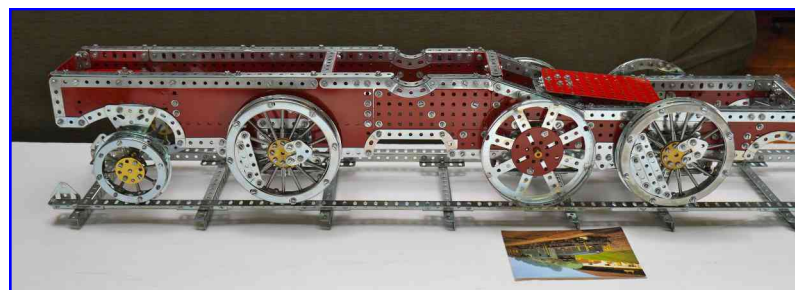
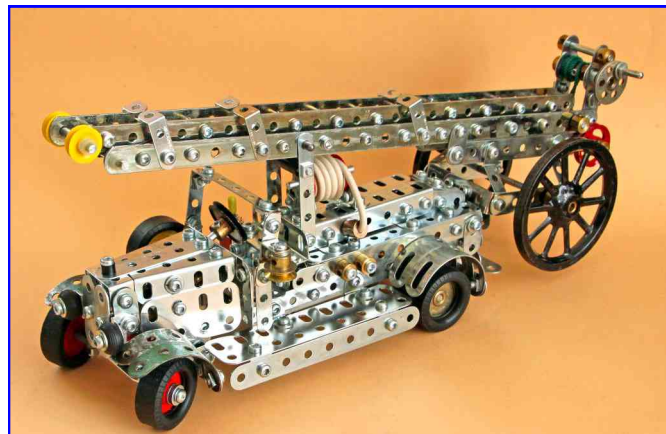


Terry Allen's (UK) magnificent Bugatti 57SC which won him the Issigonis Shield at Skegex this year. Photo: Malcolm Hanson

Meccano & Hornby Trains in Dunedin!

Seen recently (Below) in the Dunedin Settlers Museum in the Dunedin Railway Station. I can not see any NZFMM members living in Dunedin from looking at the 2014 subscriber's listing. There must be more Meccano there than this paltry lot. Photos: The Editor.

Another example of Bruce Geange's modelling prowess, a vintage fire engine. BG



Mike Stuart's (AMG) bogie of the Swiss electric 2-6-6-2 "Crocodile" loco made famous by Märklin who produced versions in 1, 0 and 00 gauges from the 1930s. This model will be about 9 feet long when complete. LM