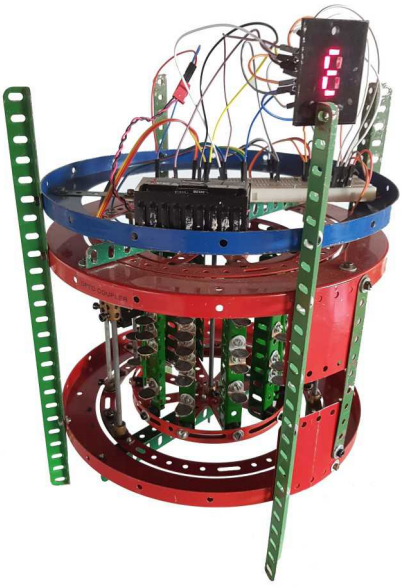
NZFMM MAGAZINE

Volume 44, No. 2 **May 2020**

- Spiderbike
- Tips ‘n’ Tricks
- Virtual meetings
- Westcoast Meccano
- Robotics Review



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Editor: Richard Feltham
174 Brooklands Road
New Plymouth 4310
Phone: 027 300 2548
Email: richard.feltham174@gmail.com

Proof Reader: Bruce Geange
4 Winchester St., Palmerston North 4412
Email: a.b.geange@slingshot.co.nz

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From the Editor

Tēnā koa fellow Meccanomen

As I write this it is unclear when, or if, we will be able to get hardcopies printed. Personally I would be disappointed if it remains electronic only. There is something ineffably satisfying about holding the printed version in one hand and a beer in the other.

Because of the lockdown Meccano club activity has been severely curtailed, which is reflected in the paucity of Club Reports. **The Wellington Meccano Club** has shown considerable ingenuity with their ad hoc virtual meetings and exchange of details about member's projects, Meccano or otherwise. David Couch is to be commended for his website gallery initiative on www.nzmeccano.com as a way for members to display their models for us all to see.

This issue has a number of intricate models to tempt your creative urges, as well as a new '*Tips and Tricks'* section, collated by **David Couch** and **John Stark**. Readers contributions are solicited for future issues. David has also produced an excellent summary of the pitfalls around chains and sprockets, and how best to avoid them. A great resource.

Hopefully by August things will be more normal, unless this *is* the new normal. As Alert level 4 drops a cog to 3, and with the approach of colder, shorter days it's time to rev up your resolve and do some serious modelling.

Stay well. Stay safe. Stay home.
Richard.

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Spiderbike

A Meccano model built for the
NZFMM Convention, Easter 2019
Bryan Jones MWT

A few years ago I found on YouTube a video of the prototype of this machine. It was built of plywood, and was filmed at a public event, probably in America. There were enough action shots and close-ups of the walking mechanism to spark my interest, and I built a trial mechanism in Meccano to see if I could replicate the action of one of the feet.

In the "Dominion Post" newspaper published for Saturday June 18th 2016 an article appeared about a Stratford farmer named **Dave Hunger**, who had built his own full-sized version of the Spiderbike, also in plywood. It served as the catalyst to getting started on my model, as our 2019 Convention was to be based at Inglewood and there was this link to a Taranaki identity. "Spiderbike" was Dave's name for it, his logic being that it had six legs of its own, plus two for the rider.

Crankshaft construction

The starting point to my model had to be the successful replication of the walking feet in a suitable scale. The original mechanism was designed by Dutch kinetic artist **Theo Jansen**, who is known for his fabulous "*Strandbeest*" creations, which may be seen in various YouTube videos. I also found a linked video which showed the geometrical model for the mechanism, and after several experiments I developed a version which was compact but which worked successfully within the constraints of Meccano's half inch spacing.

Six feet were made up, with lots of packing washers used to give them thickness so that they would not wobble. The beam which they are mounted on used the slotted holes in angle girders to allow fine adjustment so that the pivot axle and crankshaft could be lined up. With multiple bearings along the length of the beam for stability, it was vital to have everything aligned for free running.

The crankshaft was made up of Short Couplings, Threaded pins and short Axles. I had to go through my collection of couplings to select the ones with the best lineup of threaded and plain holes, but in the end there was a "cheat"…the crankshaft is not rigid. Some of the crankpins are only fastened in one of the two couplings making up each crank. The free end of the crankpin in the next coupling allows just enough "give" for the crankshaft to turn in the multiple bearings without jamming.

The cranks were spaced at 120 degree angles to move the feet in pairs. Reference to the video and photos was required to determine which feet worked together, so that the walking motion would not produce an out-of-balance situation which might result in the "tricycle" wanting to fall over.

Front wheel

Working from Dave Hunger's photo, the proportions of the feet and front wheel seemed to work out well for a wheel construction based on the 9.75 inch large Flanged Ring. Two of these were bolted back-to-back, with a layer of 8 spokes made from three Curved Strips (*2x 90, 1x 90A*) bolted alternately to each side of a Wheel Disk. A further two layers of spokes were fitted, one on each side, with the spokes curved in the opposite direction to the centre layer. These were "dished" and adjusted so that the wheel ran true, both radially and without sideways wobble.

The frame was a curved box girder, built up from the foot end using 3 inch Stepped Curved Strips connected internally with fishplates and 1.5 inch x 0.5 inch Double Angle Strips. Slotted holes again allowed the sides of the girder to be made of multiple strips stacked three wide, in spite of the changes of radius which theoretically should have been required. 1.5 inch wide Flexible Plates along the top and bottom closed in most of the girder and provided rigidity.

The prototype had a chain drive from pedals to the crankshaft, and this was reproduced in simple form. There was just enough room inside the frame to include a 1.5 inch Contrate on the pedal shaft, which meshed with a 15 tooth Pinion on the output shaft of a Buhler geared motor. The motor was mounted on a custom made adapter bracket and fitted within the frame at the right angle to mesh the gears correctly.

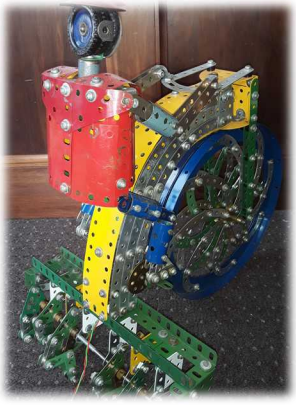
The front wheel was journaled in forks made up from pairs of 7.5 inch Strips, which were spaced using Plastic Spacers to make them rigid. A box construction of 2 inch Angle Girders, a 2.5 inch x 1.5 inch Flanged Plate, and a couple of Semi-circular Plates made up the steering head at the top of the forks, as suggested by Dave Hunger's construction. I spent a lot of time building the rider. I wanted something with a bit more character than the usual stick figure of strips. I started with a skeleton of Double Angle strips for backbone, shoulders and hips sitting on a saddle of Flat Trunnions. The legs were made from pairs of Narrow Strips inside Sleeve Pieces, with built-up representations of shoes attached to the pedals. The body was made up in layers of flexible plates in contrasting colours, curved to represent trousers, a shirt, and an open jacket. The arms were more strips and sleeve pieces, but ended up being a bit long in proportion, as the rider had to reach the handlebars! The arms and hands were lock-nutted to allow steering to be done, although the range of movement is limited by the stiffness of the rider's body.

The rider's head was made of two 1.5 inch x 0.5 inch Double Angle Strips at right angles, with a short Axle through the centre holes. Two boss-less Pulleys with rubber tyres on were threaded onto the shaft to form the basis of the head, with a Pulley with boss and a third tyre making the back of the head. An 8 hole Bush Wheel made the face, with a couple of Allen-headed Bolts with thin washers representing eyes.

The Double Angle strips in the head served as ears (for the horizontal one) and the attachment for the neck (a 1 inch Bolt through a Chimney Adaptor) and a Conical Disc hat for the vertical one.

The Spider bike was completed and tested in time for showing at the Easter Convention, where it was run from a 12 volt power supply. This gave it a cranking speed of about 50 rpm and it made its way along the table top over our allocated space using a long trailing lead. Many viewers described the motion as fascinating, albeit somewhat creepy.

We had the pleasure of having Dave Hunger visit the exhibition and giving his approval to our re-creation. After videos and photos of the Convention were posted on the internet, I was contacted by a Meccano modeler in England requesting building instructions. A very tidy copy appeared soon after, and was exhibited at one or two of the major exhibitions there. I understand that photos of his model have appeared on our NZ website.



Far left: Front of Rider
Left: Rear view of rider
Below: Completed Spider bike

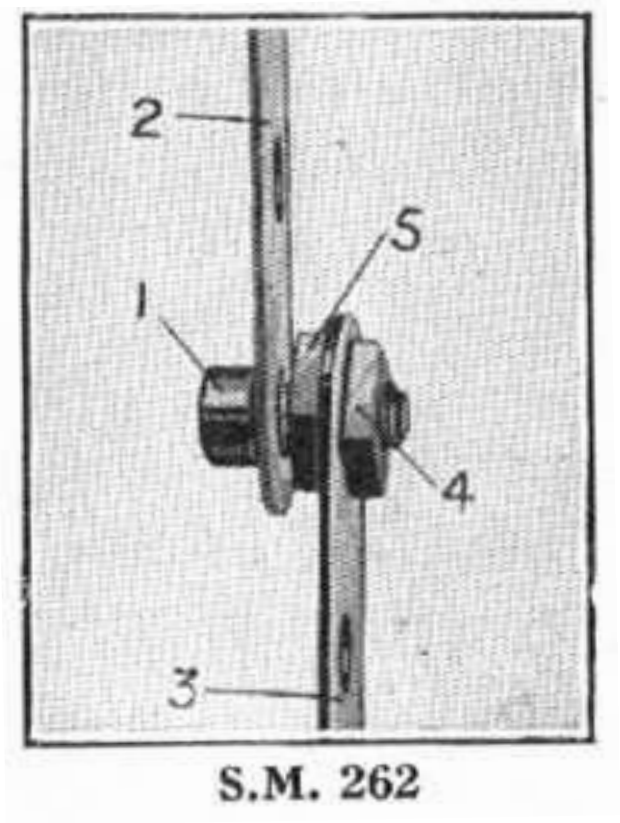
Model Building Technology

by David Couch and John Stark

We are trying the idea of a "tips and tricks" feature, along the lines of that in the late lamented **International Meccanoman.** For this first instalment we are describing a few of our own favourite techniques, some original and some not. In future this feature will be dependent on contributions sent in by readers. Please send your ideas, preferably with a photograph, drawing or **VirtualMec** image, to:

david.couch46@gmail.com.

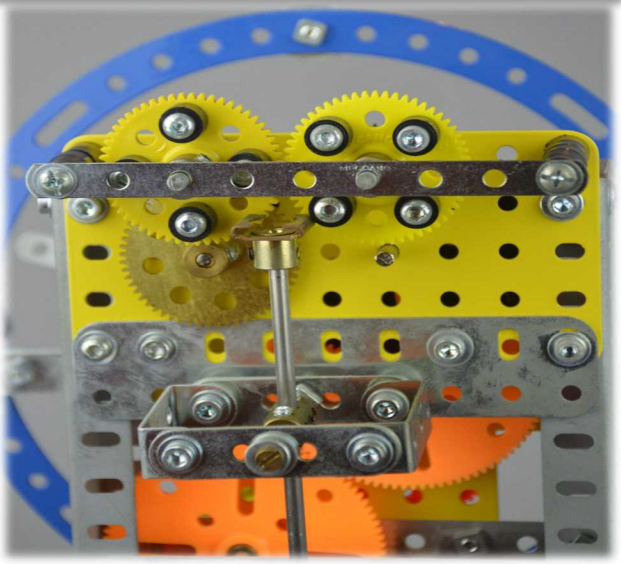
#1: Lock nuts – *David Couch*



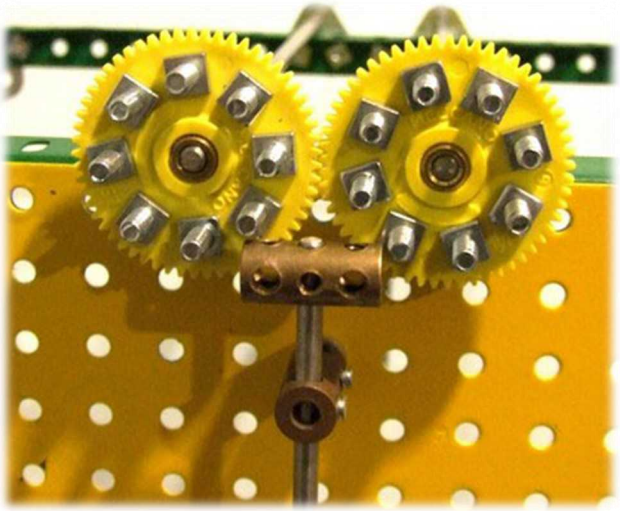
If you want to pivot two parts on a bolt, fixing the bolt to one part with two nuts results in less wobble and lost motion than the classic "lock-nutting" method. This is a very old idea, as shown by the illustration from the 1926 Standard Mechanisms manual.

To take the idea further, if you want a structure such as a gun turret on a warship to pivot on a bolt, do this. Put the bolt through the moving part and screw a nut on it, finger tight. Pass the bolt through the fixed part and screw a second nut on, finger tight. Hold the first nut with a spanner and turn the bolt until the part just rotates freely. Then tighten the second nut. The structure should then rotate without wobbling.

#2: The "LEGO®" Escapement – *John Stark*



About 8 years ago when I was looking for inspiration to build a new Meccano clock I came across some YouTube videos of clock escapements that had been made with LEGO®. One in particular called "LEGO® Clock Escapement W5" by **Ben van de Waal** looked like it would be easy to replicate in Meccano. A video of the LEGO® version is shown here:
(https://www.youtube.com/watch?v=ysrbMk0v9rk)

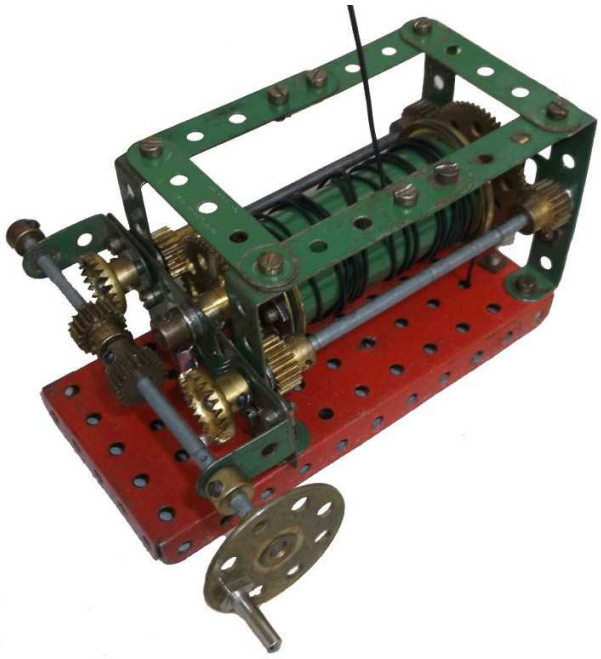


The Meccano version is constructed by bolting four plastic (collar-sized) spacers to diametrically opposite holes in the faces of two 57 tooth gears. One of these is driven by the gear train of the clock and the other meshes with it making sure that each spacer on one gear is half-way between two spacers on the other. A slide piece on the upper end of the pendulum rod engages with spacers alternately to the left and the right. The pendulum pivots a short distance below the slide piece. An alternative version can be made with bolts in each hole of two 57 tooth gears, with a coupling on top of the pendulum rod.

#3: Bracing a corner – *David Couch*

Every Meccano builder knows that a right angle corner can be braced with a 3" strip, thanks to Mr. Pythagoras. However some may not have realised that a 3" stepped curved strip, part no. 89a, can be used in the same way, giving a more attractive appearance.

#4: Auto-braking winding drum – *David Couch*



This is a mechanism I invented in response to a challenge on Rust Bucket in July 2017. The problem was how to prevent a crane winding drum from unwinding when the drive to it is disconnected.

The winding drum is a cylinder fixed between two 1½" pulleys by four 3" screwed rods. The shaft it is on is supported in the slotted holes of two flat girders, so that it can move up and down a short distance. Two band brakes are formed by passing lengths of inelastic cord around the pulleys, through holes in the baseplate, and fastening them with bolts, nuts and washers. The length of each cord must be carefully adjusted so that it comes tight when the shaft is in the centre of the slotted holes.

Two 57 tooth gears are also fixed on the shaft. Two parallel shafts each carry two ½" pinions which mesh with the gears. In this example, the two side shafts carry ¾" contrates which mesh with ½" pinions on the input shaft. This shaft always rotates clockwise, as seen from the near end, and slides to engage either pinion with one of the contrates. As shown in the picture, the near shaft causes the cord to be wound on the drum, while the far shaft unwinds it.

When the input is not being driven, the tension on the cord being wound pulls the drum upward and tightens the band brakes. When either drive is engaged, the gears tend to push the drum down, releasing the brakes.

If the band brakes are not completely effective, they can be augmented by a device at either end, consisting of a rod and strip connector, a short rod, a compression spring and a collar, which exerts a small upward force on either end of the winding shaft. One of these is visible in the picture. (*Left*)

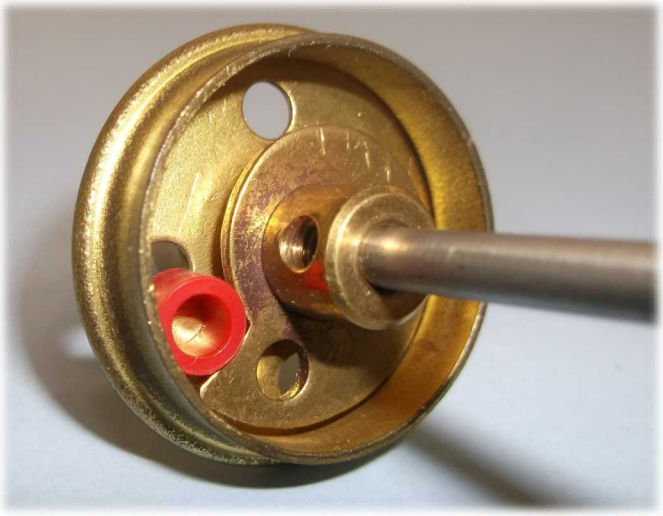
#5: Light-duty in-line safety clutch – *John Stark*

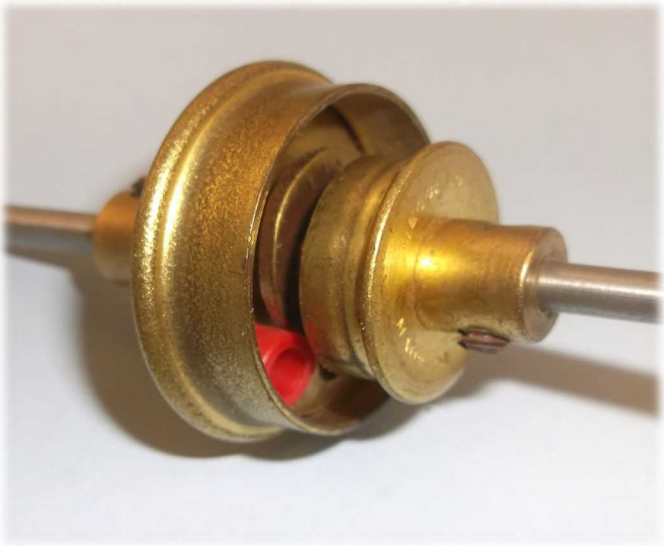
Often it is a good idea to build in a safety device in case a mechanism jams up. A driving band between two pulleys can be used, but not if an in-line solution is required. This light-duty friction clutch has a narrow 1" x 1/2" double bracket placed over the end of the motor shaft. A collar holds it in place. An old-style flat-headed pivot bolt with a compression spring on it is loose inside the bore of the female part of a dog clutch. This is fixed to the double bracket using set screws, each with two standard washers, so that the pivot bolt remains free inside the dog clutch. The head of the pivot bolt is held against the collar by the spring and this provides the friction that transmits the drive. The tension of the clutch can be adjusted by using a stronger (or weaker) compression spring. The dog clutch compensates for any slight misalignment.

#6: Roller ratchet – *David Couch*

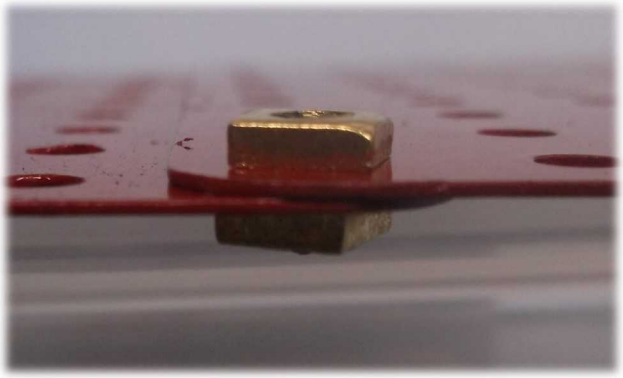
A roller ratchet provides a smooth way of achieving a one-way drive without the clicking associated with a standard ratchet. A cam is fixed on an axle which turns freely in the boss of a 1⅛" flanged wheel, with one washer between. A small plastic washer, part no 38b, is placed in the space between the cam and the wheel. The cam rotates freely clockwise, but grips the washer and wheel when rotated anticlockwise. The washer can be held captive by a ¾" flanged wheel. The drive is taken from the larger flanged wheel, perhaps with the use of a socket coupling.

It may be necessary to file a very small amount off the point of the cam to get it to rotate freely inside the flanged wheel. Also you may need to try several flanged wheels and plastic washers to find a combination that works freely.





#7: A low-profile fastener – *David Couch*



Where space is very tight in a model and the shank of a bolt would project too far, a low-profile fastener that can be used consists of a long 5/32" grub screw with two nuts.

#8: Lubricating Meccano models - *John Stark*

When I first started making Meccano models in the early 1960's I used 3-in-1 oil because we had it at home - my mother used on her 1953 Singer sewing machine. However, it was messy and attracted dust.

These days, I only use silicone dry lube. There are several different types available but my favourite is Selleys® Ezy Glide. It really does leave a dry film, unlike some other silicone spray lubes that leave an oily residue.

It is just the job for clocks and French knitting machines.

#9: Improved pen holder – David Couch

The standard way of fixing a pen in a Meccanograph or other drawing machine has been to grip it in a stepped bent strip. I have found this a very unreliable way to hold a pen and had to invent something better.

My solution is very simple. It consists of a 1½" strip and two angle brackets, fixed through their slotted holes by two long bolts, and each spaced with four washers. The space between the angle brackets is adjusted to fit the width of the pen. A ¾" bolt clamps the pen firmly in place. The bolts can also hold brackets to attach the holder to the strip or carriage that moves it.

#10: Triple-flat axles – *David Couch*

When there is a lot of torque on a rod, gears, cranks etc will sometimes slip no matter how much you tighten the grub screws. The answer is to use triple-flat axles. A variety of triple-flat axles are included in many of the modern Meccano sets. If you haven't enough of those, you can buy Ashok's triple-flat axles in 14 sizes from Stan Baker.
The grub screws in the bosses of parts must of course be tightened on the flats of the axles, which may be limiting for directional parts such as cranks. The flats are at 120° angles, and you can get 60° angles by inserting the grub screw in either tapped hole of the boss. To get smaller angles, join two triple-flat axles with a coupling, using the end and centre tapped holes. By choosing the appropriate holes in the coupling and the parts, you can place parts at any multiple of 30°. The picture shows two cranks fixed at a 30° angle in this way.

#11: Fixing a wheel to an axle – *David Couch*

The wheel consisting of a plastic hub, part no. 187c, and a tyre, part no. J45, is found in many of the modern Meccano sets and is a very useful part. The wheel has no boss, so the problem is how to fix it on an axle if it is to be driven.

If the axle is a triple-flat axle, you need part no. 144c, called a driving dog, shown in the picture. This part should also be included in a modern set. It fits over a gear-shaped projection on either side of the hub. A collar is needed to retain the wheel.

If the axle is a standard round one, fit a 57-tooth gear into the toothed ring on the wheel and fix the boss of the gear to the axle. Again a retaining collar is required.

Alternatively, the wheel can be bolted to a 6-hole bush wheel. In this case, a collar is not required to retain the wheel on the axle.

#12: Flattening flexible plates – *David Couch*

Every Meccano builder should own a plate bending machine. It produces beautifully smooth curves in flexible plates and strips, and will prevent those parts from becoming wavy and kinked.

Various designs have been published in Rust Bucket and magazines in recent years. You can get rollers wide enough for 2½" flexible plates as part no. 59k (3" spacer) from **Stan Baker.**

During the lock down I have been repainting a large part of my Meccano collection. There is no point in painting parts that are bent and kinked, and so the first job is to examine all the parts and straighten them out if necessary. Flexible plates always need the most attention, as many of them will be wavy or have sharp bends and kinks.

Wavy plates can be much improved as follows. Set the bending machine to produce a gentle curve. Put each plate through, and then turn it over and put it through again, curving it in the opposite direction. Repeat this as often as necessary to produce a smooth curve. After all the plates have been treated in this way, set the machine to just flatten them.
Kinks and sharp bends can be flattened out by hammering on a suitable "anvil" such as the top of a vice. After these treatments and repainting even the most horrible-looking plates can come up looking almost like new.

Do you have any bright ideas? Any favourite Meccano tricks and tips up your sleeves?
Email **David Couch** at:
david.couch46@gmail.com.

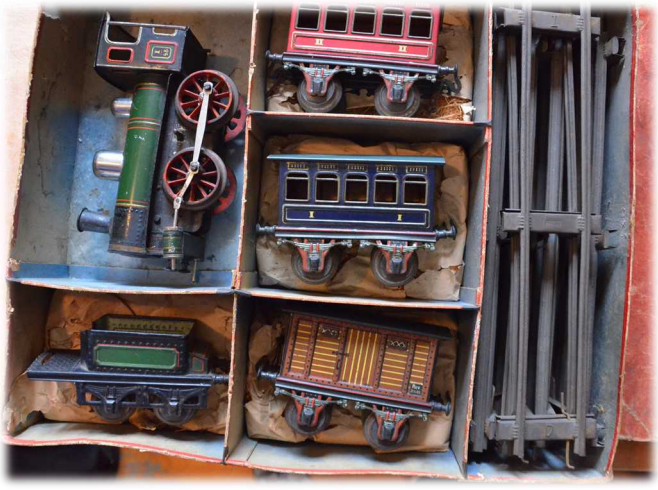
Regular highlights at the MWT meetings are **Viv Alexander's** entertaining accounts of his detective work on whatever item he has brought along. This mint Bing train set from ~1905 with its original wood and wool protective packaging was no exception.

The pictures show an item I took along to the MWT Meccano club meeting in February. As you can see, it is made by Bing, which obviously didn't come from Frank Hornby's factory. Actually I had originally intended to bring along a couple of Meccano items, which I had put in a safe place - so safe that I couldn't find them, so took this along instead.

The firm of the two Bing brothers was established in 1863, and by the turn of the century, had become the biggest toy manufacturer in the world, with over 3000 employees at its peak. But to get to the models and it's date. I find this one of the most interesting aspects of collecting. To do this you have to refer to ads at the time, but more so catalogues. These can be a bit misleading sometimes. Dates of introduction are usually reliable, but illustrations were not always updated when some changes were made. Even Mr Hornby was guilty of this sometimes.

So, first, the lid. This appears to be for the English market, from the spelling of buffet and restaurant. Both would be different for France, and buffet would be different in German. Also, they appear to be using up old stock, as the two trademarks in the lower right hand corner are pre 1902. (Dates for trademarks can be determined from dated catalogues.) This set is later than that. However, this set is for the German market. That is certain, as the coaches have either "l" or "ll" on them. In all the catalogue illustrations of trains for the British market, the tenders were initialled with the letters of the four main companies. This tender has no lettering. Also, the loco is not named, and British locos often were.

Now for dates. Couplings were changed in 1907 (although one expert says 1908). This set has the former coupling, so the set is pre 1907. All the coaches and the tender are impressed underneath with a simplified version of the 1902-1907 trademark. So that gives a time frame. However, I have done some more investigating, and think the set is a little earlier. The tender has a box on the back (a tool box? I don't know). This had disappeared from the 1906 catalogue, but occurs in the 1904 catalogue. So the set is 1904 or 1905 - I haven't seen a 1905 catalogue. The coaches appear to have been produced from 1902 onwards.



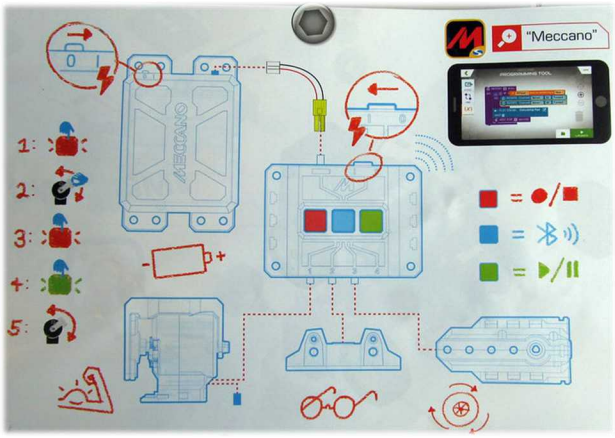
Anyway, it's a nice set. Boxed sets pre 1910 are not common, and the earlier, the scarcer. It is a little upmarket, as the engine has connecting rods pivoted to all wheels, not like Hornby's M locos. So I am very pleased to have this one.

Viv Alexander MWT

Gary Higgins reviews the latest Spinmaster offering in their Robotics Series

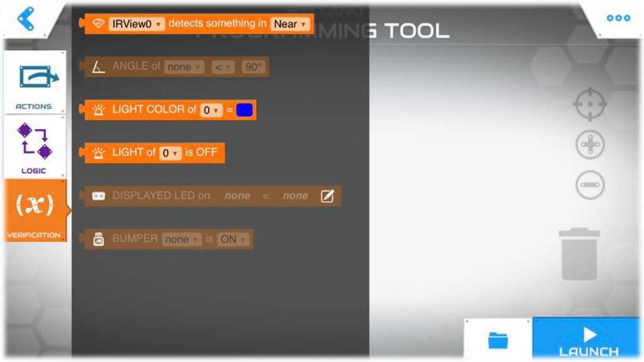
This is the largest set (apart from the so called 10 set) that has been available for commercial sale. It appears to make up a truck like vehicle which is subject to robotic control. The plastic storage box is about twice the size of the original set. There are even some new metal parts included along with all the plasticano.

There is only the one model in the manual, which appears to be the case with all the new sets, and a number of blueprint ideas on separate pages.



There is very little, almost no written description of how to use the model and once made and powered up I waited for it to do something apart from flash lights at me. Further checking of the manual showed a picture of a smartphone with the Meccano logo so one has to assume from this that a downloaded application is required to run the model and this is indeed the case.

Opening the application gives a choice of a set 10 logo with the button control microprocessor of the above set shown or the Meccano robot. Select the set 10 option, perhaps the above set is set 10, it does not tell you anywhere.
Once downloaded I selected an option to use sliders to control the vehicle and away it went. Still somewhat limited with an option to move the machine



back and forward and steer by means of a small servo motor the same one used for the arms of the robot also selected by a slider. The machine has its own bluetooth receiver which is recognized by the application. The infrared sensor also shows but as yet I am not sure how to use it.

Apart from the slider options there is also a programming option which I have yet to try. I have posted screen dumps of all these options.

There also appears to be room to mount another motor on the main driver i.e. one free plug option and some of the units e.g. the servo and the infrared have an extra plug which according to the pictorial is not used. None of the above is included in the boxed manual you have to find it out by trolling the web.

The model goes together easily enough however the steering was not well designed and there was not enough room for the wheels to turn, easily rectified with spacers. Also the battery compartment is conveniently mounted on the rear which would be great if the access plate faced out, it of course faces in, meaning that you have to remove the unit to change batteries. Again an easy fix with spacers but something Spinmaster should have seen.

The lack of advice in the set on the Bluetooth application is very limiting. One user told me he returned the unit only to be given a second unit and only realized after I had told him that it requires a Bluetooth application to work. It has possibilities but not a good start Spinmaster!

N.Z FEDERATION OF MECCANO MODELLERS

Income and Expenses - 01 February 2019 to January 31 2020

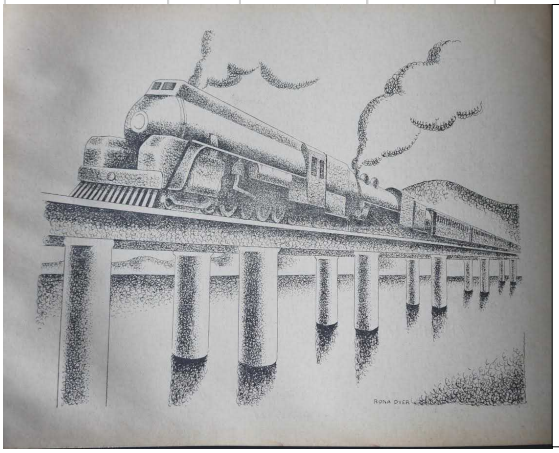
2018/2019		2019/2020
$3,240.01	Cash Book Balance February 01 2019	$2,451.66
	[Bank Statement No 218 dated February 01 2019]	
	INCOME	
3,543.98	Subscriptions N.Z 3,687.00	
472.12	Subscriptions Australia 460.20	
632.70	Subscriptions Rest of World 572.25	
-	Subscriptions in advance -	
46.10	Back copies 40.00	
-		
$4,694.90		**$4,759.45**
$7,934.91		$7,211.11
	EXPENSES	
3,294.75	Printing 4 issues [Feb,May,August,Nov] 2,990.00	
-	Printing back copies -	
80.00	Plastic Wrapping 80.00	
1559.30	Postage 1,553.20	
471.50	NZFFM Web Hosting 385.25	
$ 77.70	Freight -	
-	Stationery 7.50	
-	Annual sub Microsoft Publisher 165.00	
$ 5,483.25		5,180.95
$2,451.66	**Cash Book Balance January 31 2020**	**$2,030.16**

Bank Reconciliation

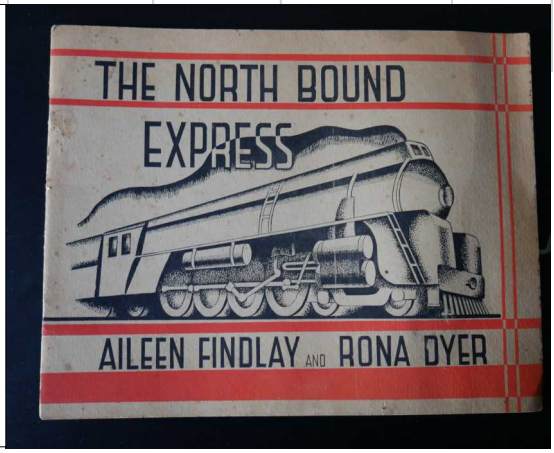
Closing Bank Balance - Bank Statement - Number 244 **$2,030.16**

Dated 31 January 2020

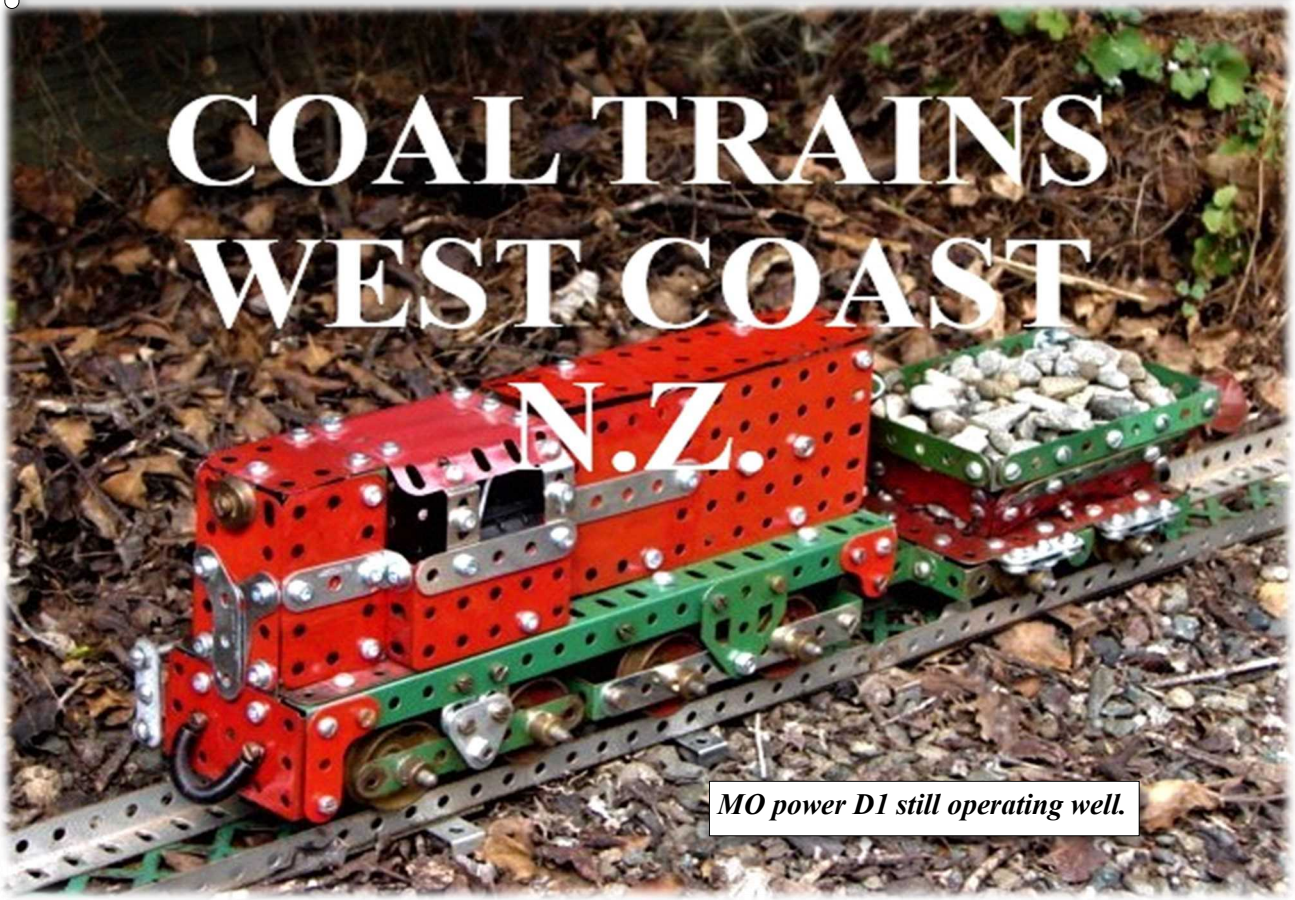
Peter Hancock
NZFMM Treasurer



Les Megget winds back the years to counter lockdown fever by dusting off the top shelves of his library. These were published in 1944 Dunedin.



David Glenday reports on his visit to the West Coast –Part I



MO power D1 still operating well.

My wife and I recently stayed in Waimangaroa at the foot of the Denniston plateau. We explored the mining area and admired the remains of the famous incline and had a glimpse of the lives the men women and children led at the mines (see the novel "*Denniston Rose*" for more detail). Soberingly there wasn't sufficient topsoil on the plateau for burials and most people were interred in the coastal cemetery at Waimangaroa. Thank you DOC for maintaining this history.

We walked from the rail head at Ngakawau, alongside the river where "The Charming Creek" private railway ran, to "The Bins". The Bins were where the "Lokeys" brought the small trains of mined coal down the narrow line to an elevated platform and tipper, so coal was sorted and loaded into the larger wagons.

The Lokeys and other coal and timber engines (see **Doug Harris's** model November '19 issue) reflected the ingenuity of early settlers, and were often based on road vehicles (even a Model A Ford) with flanged wheels and chained 4 wheel drive.

The Company owned an "F Class" Loco but it proved too large and unsuitable for most of the track, and indeed the Cab was too high to fit under the Bins, so

The 'Magic Motor' in the Lokey working hard with its load.

it could only take the full bins to the junction at Ngakawau for larger trains to Westport. The Bins themselves were large, fairly crude, timber structures using materials at hand. The model reflects this approach!

We visited the small museum at Granity. Outside drawing your attention is the boom and bucket of a Marion excavator, a machine familiar to all Meccano men from the earliest model plans. The museum is

built around the remains of three coke ovens where the coal wagons on an incline unloaded the coal above the ovens. Inside are two coal wagons made from imported English heavy corrugated steel panels fitting together with rods in their corners (the "original flat-packs" as the curator described them adding "like Meccano"). More like "Dinky Builder" actually !

The enterprise at Denniston was huge and brought millions of tons of coal down during the life of the mine until 1968. The incline was for many years the only access apart from a rough walking track. So coal plunged down what was known as "The 8th Wonder of the World" and people could occasionally sit on the empty wagons on the return trip. Today the view from about 500m height above Waimangaroa is breathtaking and one marvels at the enterprise and industry that has passed.

Waiting at the top of the incline.

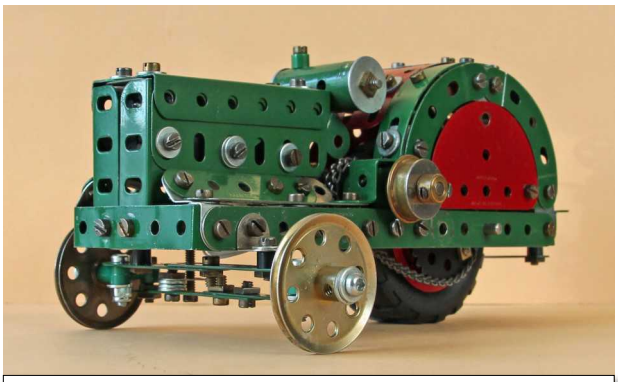
See https://teara.govt.nz/en/video/7429/the-denniston-incline

The majority of the buildings and plant were removed but there are many rusting pieces of steel, wheels and parts of the aerial system to wonder at, as well as the overall scale and grandeur of the whole area.

An aerial ropeway system was installed in the 1950's to replace the original tracked ropeway that brought the coal wagaons from the coal faces to the main sorting area before being loaded into the larger wagons and onto the head of the incline itself. The aerial system was designed to more efficiently bring the excavated coal from the mines over some miles. The system is described on site and one of the towers remains for tourists to admire.

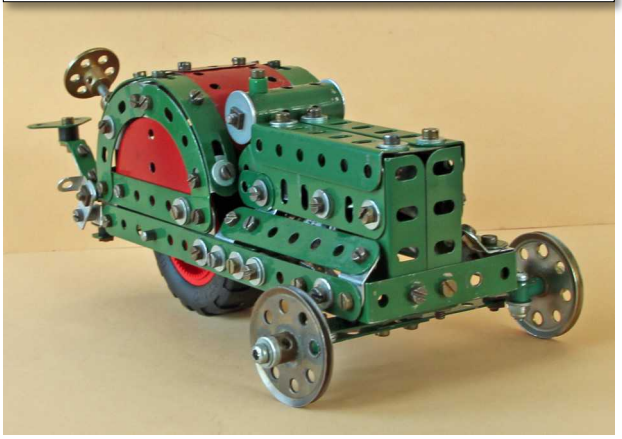
The 'F' Class Loco ready to take a load from the 'Bins'. The Lokey has pushed the coal wagons onto the Bins for unloading.

The overhead system is not dissimilar to the Meccano model described In the January/February 1930 Meccano Magazines, and will feature in **PART TWO** of this article.



COMING IN THE AUGUST ISSUE

1916 Emmerson farm tractor; from the master of miniature, ***Bruce Geange.***



MWT Meccano Club

8th February 2020

Model Challenge entries were:.

Robin Rye: A vase of flowers.

Hugh Ramage: A child's Xylophone driven by a Meccano drum set up to play Happy Birthday.

Mikayla Lindsay: A box of Meccano Cadbury Favourites chocolates.

Bruce Durdle: Cake cutter.

Richard Feltham: Universal Presence.

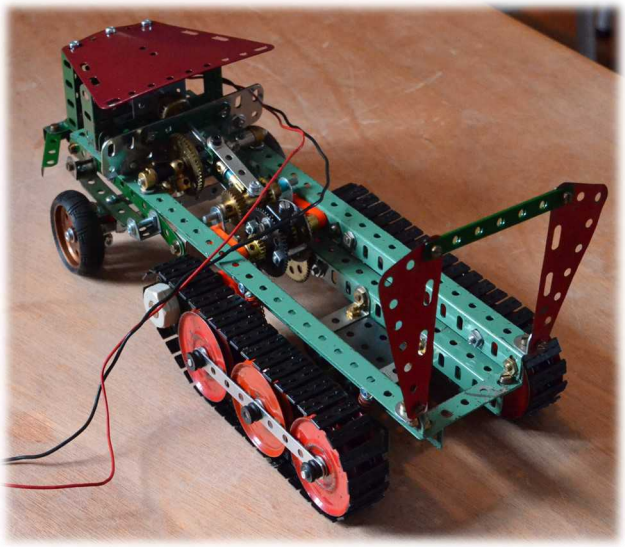
Stuart Lindsay: A number 10 for Mikayla's birthday.

Hugh Ramage won the challenge along with a computer mouse pad from **John Hanson.**

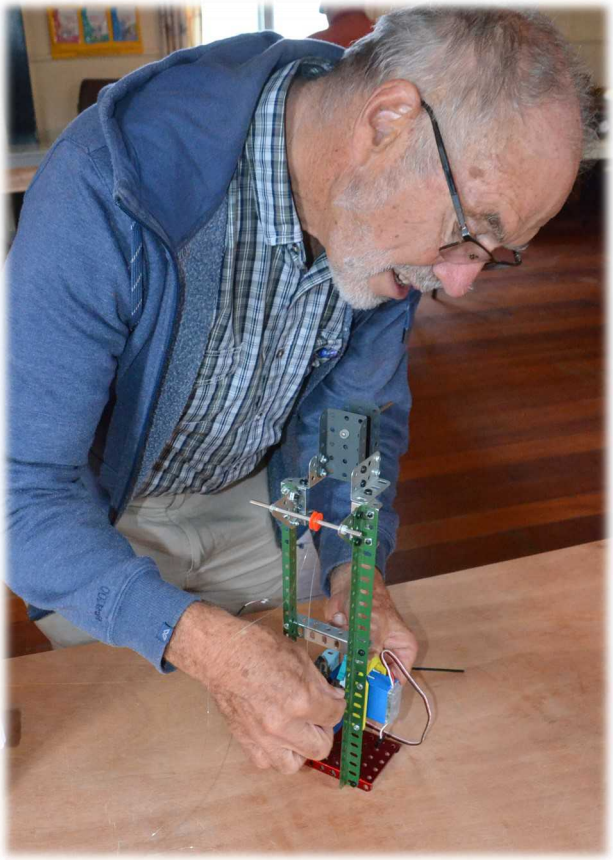
General Tour.

Viv Alexander: A boxed Bing of Germany from 1906 train set. Nice paint but no curved track in the box. A wooden Meccano No. 1 Storage Box from the late 1920's. Not a set but used for storing your Meccano. (*See page 10 for details)*

John Freer: His current model under construction is a military half track truck. Buzz, Metalus, Ashok, Exacto as well as Meccano pieces are used. A small dimension differential is a special feature. (*Below*)



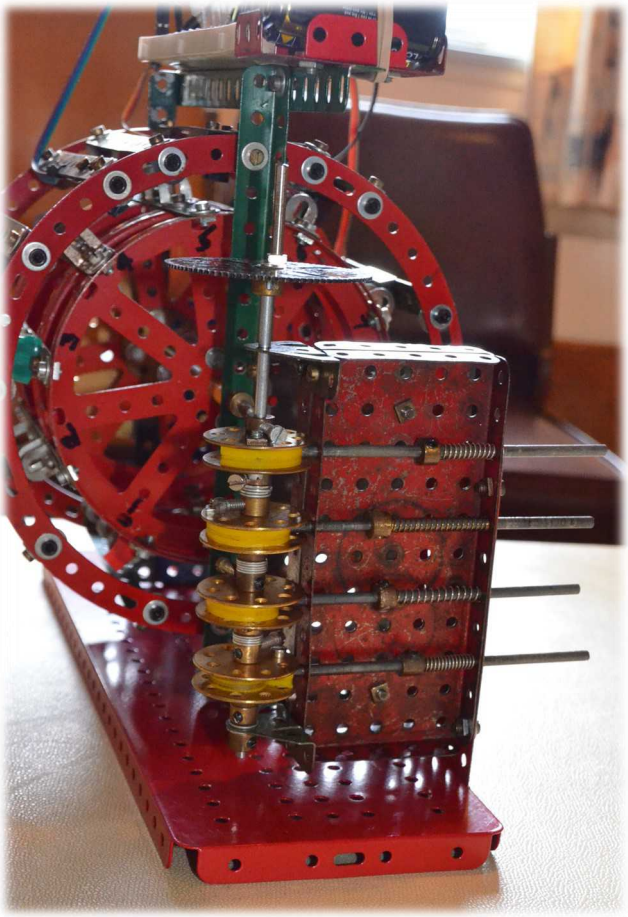
Bruce Durdle: Electronics is Bruce's interest in the hobby and showed a device for measuring the torque in an electric motor. Two most recent Meccano sets on display were Motorized Movers and Geared Machines. (*Below*)



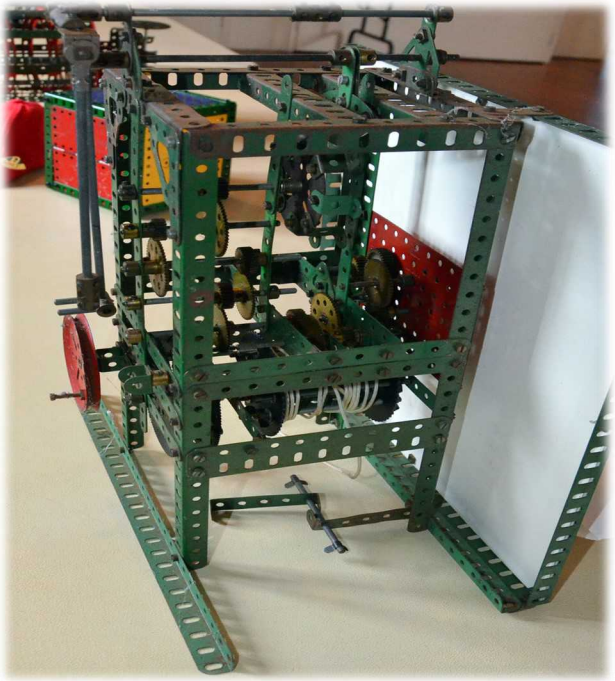
Mikayla and Stuart Lindsay: An old wooden box revealed some neglected 0 gauge Hornby track and Cranko wagons. (*Below*)

Robin Rye: Another **Charlie Cross** model, this time a large dump truck. Features included electric drive to 3 axles (6 wheel drive) and electric steering. A "mysterious" Meccano switch on the model turned out to be the top piece off of a battery box. (*See next page for picture)*

Richard Feltham: Work in progress. Automaton. Combining electronics and Meccano in an as yet not understood by anybody way!



Tom Pittams: A Meccano clock was found when he reached into a special room at home. Where it came from has been long forgotten. It looks very much like a clock featured in Meccano Magazine November 1931. Additionally needed is a pedestal and a dropping weight to make it tick tock.



Paul Vodanovich: A set 8 car that he made 10 years ago. Various Meccano copies of trunions were on the table as well as examples of brackets 11a and 101. A discussion on how to bend (or unbend) Meccano strips without fracturing the steel.

MWT members sit entranced...

Above left: **Richard Feltham's** automaton.
Top: **Paul Vodanovich:** No 8 set roadster.
Left: **Tom Pittams'**: Grandfather clock guts.
Below: **Robin Rye** brought this **Charlie Cross** creation.

The Wellington Meccano Club

Minutes

Reporter – Max George

Meeting Date: Friday 6th February 2020 at 7:30pm at Max George's place Tawa.

Meeting:

As there were only a few at the meeting we discussed the models and then Paul showed us some very early Newsletters that **Don Blakeborough** produced. In an early newsletter it even mentioned **Max George** had attended the meeting and they hoped that he would join the club. This lead to reminiscing about members who attended meetings in the early days. With both **Paul Roberts** and **Stephen Westmoreland** being junior members at the time there were a lot of names that we could remember.

Model Building:

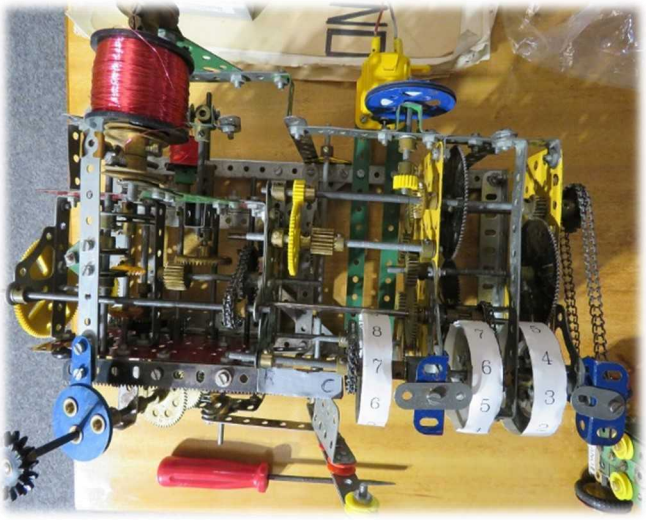
There was no theme for the meeting.

Max George: With the meeting being held at Max's place we were able to see his Little Joe and Tricky Track layout that he has set up in a spare bedroom. It has most of the bridges he has built.

He also showed the latest bridge he has built but is having problems adjusting it.

This is a Drop Bridge originally constructed by the South West London Meccano Club where it was in a layout at Henley in 2015 and various photos of it were posted on the web.

Paul Roberts: Again brought along his bobbin winder with changes made. It will still need some more tweaking, but we are all looking forward to seeing the finished product. This winder is to be used to re-wind Electrikit Solenoids. The wire is wound clockwise on a cylindrical coil and anticlockwise on a rectangular coil. Paul has decided it needs changes before it will work properly.



Stephen Westmoreland: Has added to his tractor he brought along to last month's meeting by making a sickle mower that connects to the back of the tractor.

Trevor Green: Has been working in wood on a prototype 'rack' to hold parts while he builds a model. This is instead of trays or parts spread out on the table. The meeting closed at 09:30 pm

Next Meeting: Will be announced when Alert Level permits.

Auckland Meccano Guild Meeting
8th February 2020

The meeting took place at the home of **Les and Shirley Megget** at Papakura. **William Irwin** sent his apologies

I must apologise for omitting to mention that the Auckland Guild attended its 45th meeting in November. A proud moment for the founder **David Wall** who had baked a cake for the occasion.

Les has been working on another of his crane trucks, this time a Leibherr 90 tonne mobile crane. (*below*) As usual with models from Les this is a superb example of engineering in miniature with a fantastic gearbox and drive mechanism. Les had the boom completed for the meeting and demonstrated the cranes movements.

Rick Vine has been experimenting with models using the 1970 Meccano Multikit cabs and had built a good variety of trucks using these. They included a hopper or skip carrying truck, an army tanker, a mobile crane, a little smaller that Les' model, an a army truck and a truck with the Meccano logo.

He had also made up a digger using the Action Control Meccano set which features large knobbly wheels and a specialist digger or dozer blade. Driven by an electric motor the model worked well.

Rick had made up an excellent bicycle using spoked wheels and a variable speed device which was intended to drive wheels at different rates, Rick admits he has not got it quite right yet. He had also brought along a Dinky Toys Austin Healey to show Les who I believe has the real deal.

David Wall had been gifted a 40 model set in purple from which he made a small motorized dragster and he had also built a tractor like model from a no 1 motor of the silent wind variety. I had not heard of this particular motor. The motor when wound is silent with none of the usual clicking sounds. A great little model . David had also completed a small red car model.

Kegan Wrightson brought along a hand operated windmill in nickel. This model was one of the first individual boxed single models made by Meccano, I believe there is only one boxed example to be seen. Kegan is looking for medium green and red parts to complete a No #9 set if anyone can help him.

Gary Higgins has been experimenting with tractors and has scratch built his own version of a quad tracked John Deere tractor, it is not motorized at this stage, he had also brought along the two recent John Deere tractor kits from Meccano for comparison. Gary has built up the Meccano Spinmaster Supercar set model No 18211 which he describes as poor value for money. The variable speed control motor is feeble at the best and the LED lights via fibre optic cables are a very poor fit requiring some manual filing of the holes.

Gary has also built the Introduction to Robotics model in the plastic box. This appears to be the largest set currently available it has a complete robotic control circuit with its own blue tooth receiver / sender and an electric motor which is connected by cable to a separate battery box. An interesting model with very poor manual instructions. Nowhere does it tell you an application via a smartphone is required to run it. One of our other members had built one and could not get it to work. He was not aware of the need for a smart phone and returned to the shop, he was given a second set and told to keep the original!

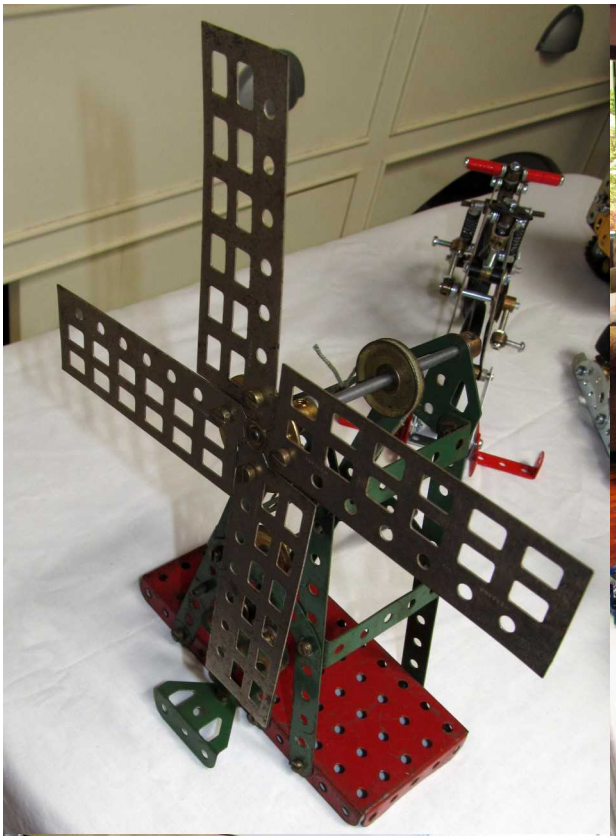
Gerald Hart had made up an excellent model of the Morgan 3 wheeler car from a model plan. This model is very detailed featuring an operating motor gearbox and steering. It very much looked the part and the body casing could easily be removed to view the workings.

Neil Carey had been exploring some of his old photo albums, remember those! And had brought along some photographs of his magnificent model train displayed at the 1993 Meccano convention.

Mike Walmsley Joined us from Paeroa where he has been attending the local Meccano club and he brought along a crane gearing model ex the Meccano Magazine with two handles for adjustments.

Anthony Caldwell brought along a tow truck made from the recent evolution series models in yellow and black and a model of the Ferrari La Ferrari. The meeting closed after an excellent afternoon tea, courtesy of the ladies.

Above: **Les Megget's** Leibherr 90 tonne crane

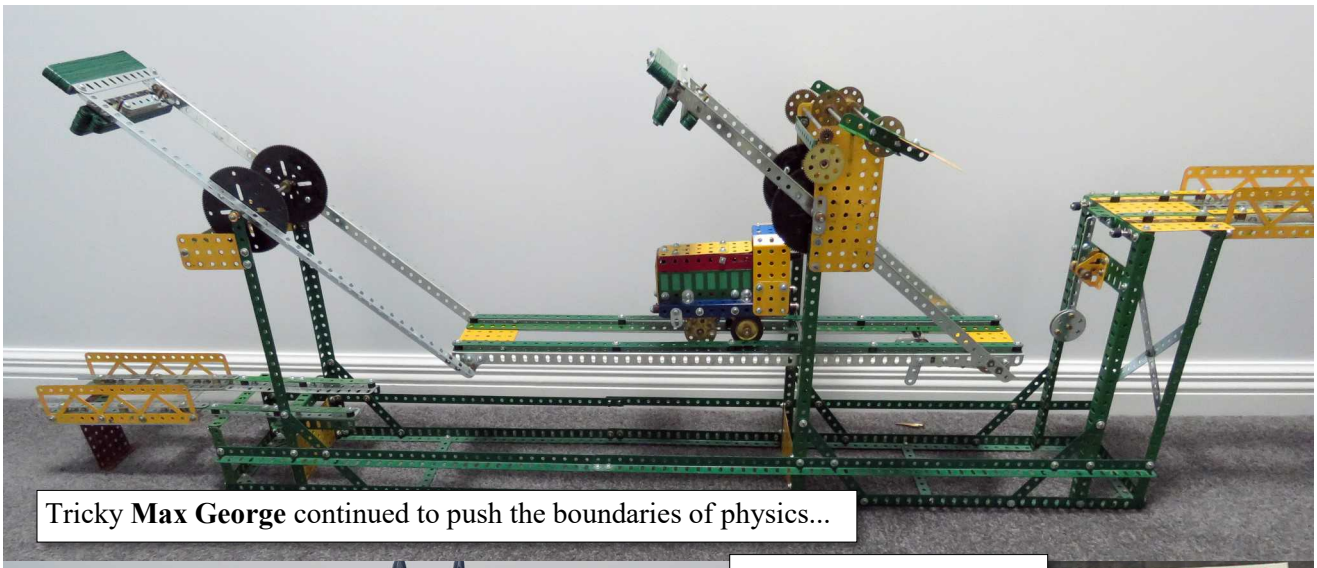


David Wall operates on his creation . . . respite from ideas and ideals.

Top left, then anticlockwise:

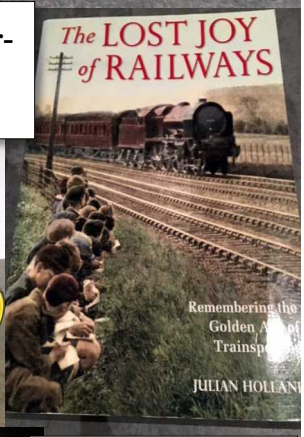
- **Kegan Wrightson's** nickel windmill.
- Poster child of the sixties, **David Wall.**
- **Gerald Hart's** Morgan car.
- Silent No 1 motor tractor.
- **Neil Carey** shares his memories.

Beating the Lockdown in and around Wellington…..



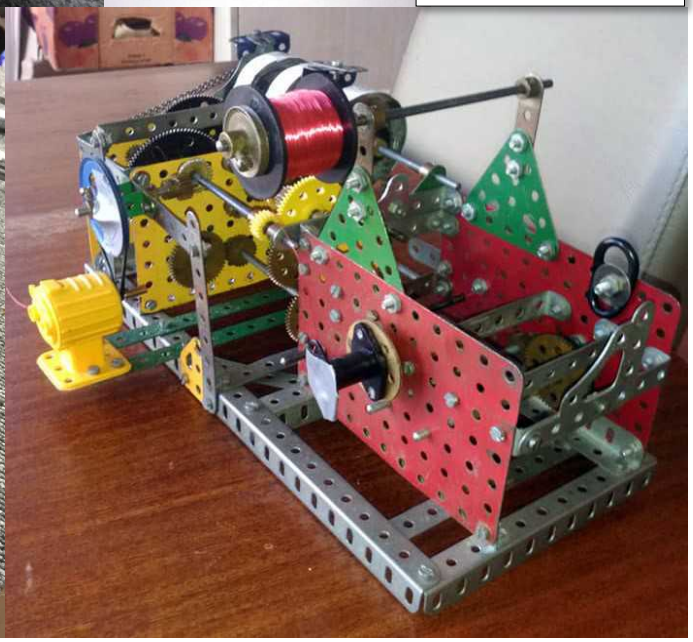
Tricky **Max George** continued to push the boundaries of physics...

A misty eyed **Reg Barlow** kept his nimble fingers at work...



Paul Roberts re-wound his Electrokit in a most ingenious manner...

Campbell Morrison diversified his red/green collection...



Greater Waikato Meccano Club

Meeting Notes for 7th March 2020
by Mike Walmsley (Secretary) and Graeme Wrightson (Chairman)

Our first meeting for 2020 was held at **Brian Hickson's** place in Putaruru. Six modellers attended and there were four apologies.

The theme for the meeting was a carry-over from last November's meeting: a gearbox from the 1950s and 60s Meccano Magazine "Among the Model-builders" columns.

Graeme Wrightson produced his auto-reversing mechanism (MM November 1960), now with an electric motor drive which, after a bit of gentle persuasion, operated very well.

Clive Nicols showed his fine 3-speed and reverse gearbox (*MM May 1957*). This has taken numerous rebuilds and improvements over several months as the original design structure had several deficiencies. Clive has shown great perseverance with this mechanism. (*Fig 1*).

Mike Walmsley produced a radial gearbox for a small crane with 4 outputs from the one input. Beautifully built and a real shame it didn't actually work. (F*ig 3*)

Brian Hickson presented a very smooth "Circular Drive Auto Reverse Mechanism" modified from the design featured in the December 1960 Meccano Magazine. He has further improved his handsome No.5 Set fire-engine with an extending ladder, and showed this, together with a very efficient Horstmann suspension system he has designed for a small Vickers Valentine tank he is building. An update from Brian notes that this model is progressing steadily but unfortunately the chap 3d-printing the track plates for him has run into a spot of bother with his printer. Brian also needs to find some stronger springs for the suspension as the model is only half built and is already too heavy for the springs! (*Fig 2 & 6*)


Fig 2

Graeme Wrightson showed a 6-wheel ATV off-road machine from the Master Connection series of the 1990s. Unfortunately a major problem turned its demonstration into a disaster as the modern Meccano fastening systems didn't hold up under drive and the rear axle system fell apart! Meccano Ltd please take note: you can't beat real collars and grub screws. Further work is definitely needed. (*Fig 4*).

Graham Stuart brought along his previously shown North American Aviation Mustang P51, one of his minimalistic but extremely realistic aeroplane series. He also displayed a neat rack and pinion steering system, suitable for very small models such as the go-kart he had built. (*Fig 5 & 7*)

The meeting concluded with a nosh-up and disbanded at 4pm.

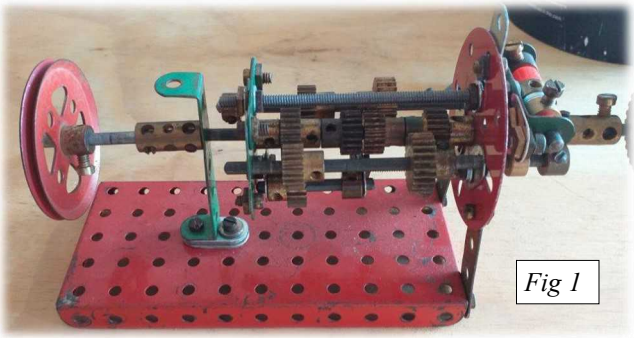


Fig 1


Fig 7

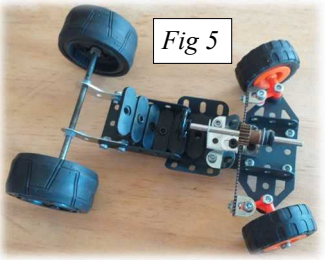


Fig 5

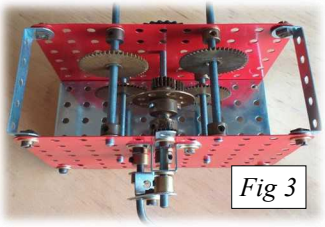


Fig 3

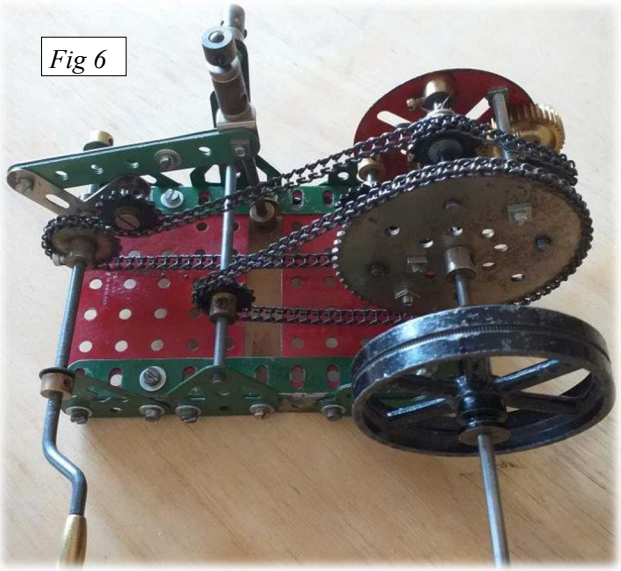


Fig 6

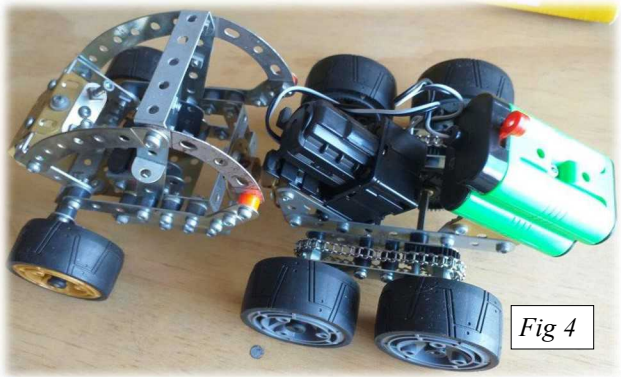


Fig 4

Footnote: Meetings for May and July have been cancelled, due to the COVID19 pandemic.

Using Meccano Chain and Sprockets

David Couch WMC

I used to hate using chain. Somehow I could never get the length of the chain just right, and it usually ran in a jerky and uneven fashion over the sprockets. However, a year or so ago I decided to build a plotter, which required moving a pen in a straight line across the width of a piece of paper. The best way I could see to do this was to use a loop of chain driven by a sprocket on a stepper motor. I was pleasantly surprised at how smoothly it ran and how precisely the pen could be positioned. The reasons are explained here: new chain, smooth "pulleys" and proper tensioning.

Uses of chain:

Here are some uses of chain that I have seen in Meccano models:

- Transmitting a drive between two parallel shafts
- Producing a linear motion
- Suspending clock weights
- As a conveyor belt
- Carrying dredger buckets
- Representing tracks on a small vehicle
- Representing chains on the prototype, such as a ship's anchor chains

Here I am mainly concerned with the first two uses.

Advantages of chain drives:

- Chain drives can transmit a large amount of torque and power.
- They do not require axles to be at standard spacing.
- They can work over considerable distances.
- There is no slipping.
- With proper tensioning there is no backlash or lost motion.
- Combinations of sprockets provide exact gear ratios: 1:1, 1:2 and 1:4.

  Note: (The combination of 1" and 3" sprockets does not give an exact 1:3 ratio.)

Selecting chain:

Most of us have a collection of old chain in various lengths. Using this is NOT a good idea because:

- It gets rusty
- It stretches
- Links get bent out of shape and catch on the sprockets.

My advice is to get new chain. **Stan Baker** has **Ashok's** chain, which is zinc or nickel plated, at about $33 per metre. It is well worth the price.

Fitting the chain:

If you are going to use a simple loop of chain to transmit a drive between two shafts, an easy way to determine the length of the chain is to build a mock-up with the axles and sprockets in the same relative

position as in the model, as shown in *Figure 1*. Then you can wrap the chain around the sprockets and easily determine which link you need to open.

Figure 1 **Measuring the length of chain required in a mock-up of the final configuration**

Figure 2 **Opening a link of chain with side cutters**

Opening the loops in a link can be a tricky business. Trying to do it with just a screwdriver is frustrating and can lead to a stabbed finger. A safer method is to "cut" into the space at the end of the link with a pair of side cutters, as shown in *Figure 2.* Once the opening is started you can open it further with a flat-bladed screwdriver. You will also need to squeeze the legs of the link together to unhook it from the next link.

After you have hooked the ends of the chain together

- Close the loops that you opened in the link.
- Spread the link out to its normal width.
- Fit the chain on the sprockets with the link loops outward.
- Rotate the chain several times by hand to ensure that it runs smoothly without any links catching or riding up on the sprockets.

Then you can confidently install the sprockets and chain in the final position in the model.

Tensioning chain:

If the drive is light and always in one direction, a relatively loose loop around two sprockets may work well. **Mike Edkins** used this technique between the escape wheel shaft and the second-hand shaft in his weight-driven striking clock (MW MP No. 205).

However, if you want a chain drive to run really smoothly and without backlash it needs to be correctly tensioned. For a simple loop of chain between two sprockets, one way to adjust the tension is to support one or both axles in the slotted holes of angle girders or flat girders. Then fit a fishplate or two-hole narrow strip over the axle, bolt it to the adjacent hole, and turn it to get the chain just taut. (*See Figure 3.)*

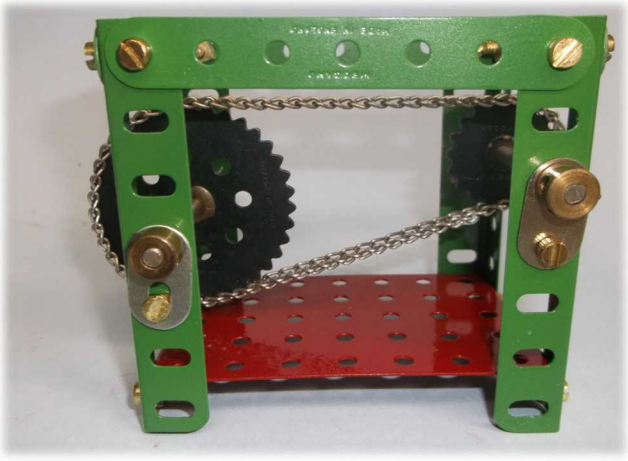


Figure 3 **Axles supported in slotted holes, and the chain tensioned by adjustable fishplates. It may be possible and preferable to place the fishplates inside the angle girders.**

Figure 4 **Chain tensioned by a fishplate bearing against it**

Another simple way to tension chain is to position a fishplate or other part to bear against the chain, as shown in *Figure 4*. The tension is adjusted by rotating the part on the bolt.

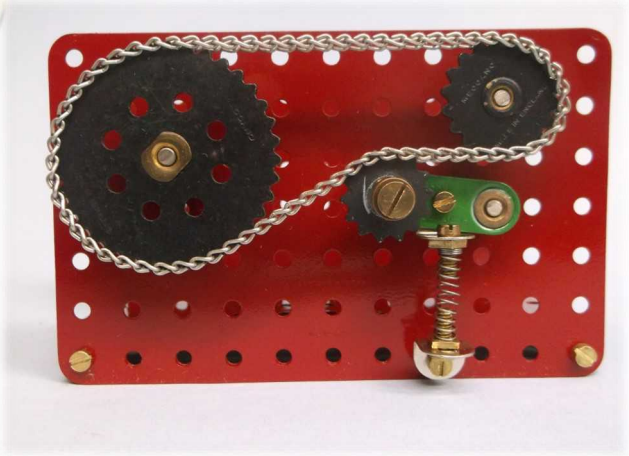


Figure 5 **A spring-loaded tensioner on a simple loop of chain**

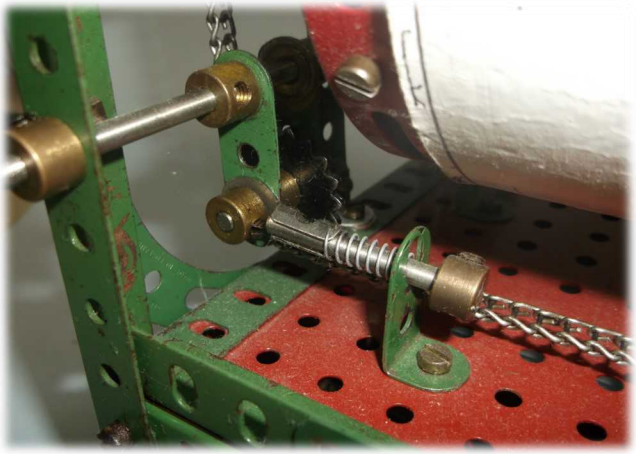


Figure 6 **A spring-loaded tensioner at a right-angle bend in a large loop of chain**

For the smoothest running and to minimize backlash, the best solution is a spring-loaded tensioner. Figures 5 and 6 show examples. If the drive is predominantly in one direction, the straight run of chain should be under tension. For example, in *figure 5,* if the right-hand sprocket is driving it should be rotating clockwise.

Note that if a chain drive is required to transmit decent torque, the chain must wrap around at least a quarter, but preferably half, the circumference of the driving sprocket, otherwise it may slip.

Using "pulleys":

If the chain configuration is more complex, or the chain is used to move something linearly, you will need idlers, that is, wheels supporting the chain that are not driven. In this case I have found that "pulleys" run much more smoothly than sprockets. A "pulley" consists of a 1⅛" flanged wheel and a standard bush wheel, or a ¾" flanged wheel and a 1" bush wheel, as shown in *figures 7 and 8*. The small gap between the two components needs to be carefully adjusted so that the chain does not bind between them and does not slip into the gap. It works better if the link loops face outward. **Michael Adler** used this technique with a continuous loop of chain in the automatic rewind mechanism for his weight-driven Arnfield Mantel Clock (MW MP No. 104).

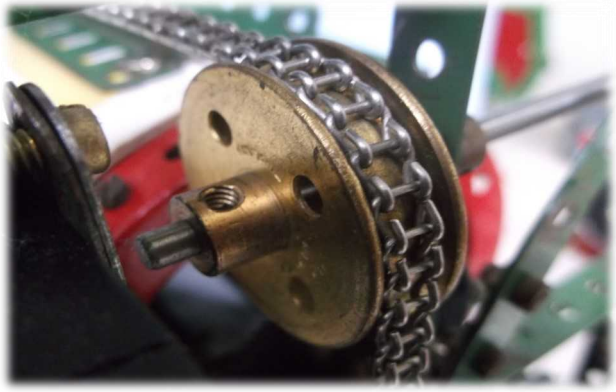


Figure 7 **A "pulley" consisting of a 1⅛" flanged wheel and a bush wheel**

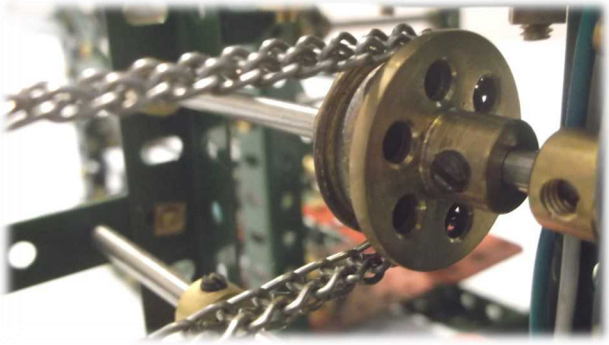


Figure 8 **A "pulley" consisting of a ¾" flanged wheel and a 1" bush wheel**

Linear motion:

Chain provides a good way of moving an object uniformly in a straight line over any distance. There are two ways to get the chain to move the object. One is to use an open loop of chain and to hook the two ends of the chain to the object, as shown in *Figure 9.*

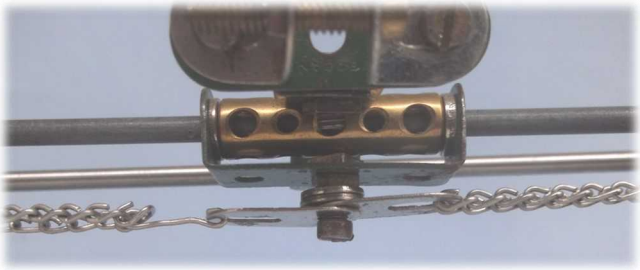


Figure 9 **A loop of chain attached to a sliding assembly**

The other is to use a closed loop and to connect the object to the chain with a piece of thin steel wire, as shown in *Figure 10.*

Figure 10 **Another way of attaching a loop of chain to a sliding assembly**

Speed:

Chain is not meant to run fast. It would not be sensible to use a chain drive as the first stage of transmission from a non-geared motor. Pulleys and driving bands are more appropriate for this.

Chain in a horizontal plane:

Chain drives are normally between horizontal axles, so that the chain runs in a vertical plane. If the chain is in a horizontal plane it tends to slip sideways and ride up on the teeth of the sprockets. If you really need horizontal chain, a good idea is to place a wheel in contact with the chain to prevent it from moving sideways, as shown in *Figure 11*. Correct tensioning also helps.

Figure 11 **A loop of chain running in a horizontal plane, supported by a face plate and a bush wheel.**

A note on chain pitch:

It has been commented the Ashok's chain does not have the correct pitch (i.e. distance between links) for Meccano sprockets. *Figure 12* shows a comparison between Ashok's chain and some real Meccano chain, and it can be seen that Ashok's does indeed have a slightly smaller pitch. I have found that it runs quite satisfactorily over sprockets up to 2", but may give problems with a 3" sprocket.

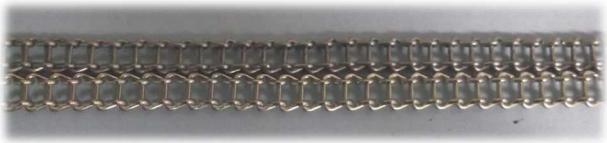


Figure 12 **A comparison of Ashok's chain, top, and real Meccano chain**

Puzzle No 3.

The question was - how many openings and closings does it take to connect five lengths of three links each, to an existing length, to form a continuous closed loop, employing the most efficient possible strategy.

Answer: 30 in total. Remember each link has two sides. Each join requires four operations. The most efficient way is outlined in the table below.
Although there were no correct answers, **Ross Quayle** deserves honourable mention for his effort.

	Aim	Openings	Closings	Total
Step 1	Separate one length into its component three links	4 openings (two per link)	No closings	4
Step 2	Join the other four short lengths with these 3 links	2 openings per join, 6 in all	4 closings per join, 12 all up.	22
Step 3	Join the two lengths into a closed loop	4 openings	4 closings	30

An impressive solution to Puzzle No 2 from Mike Stuart.

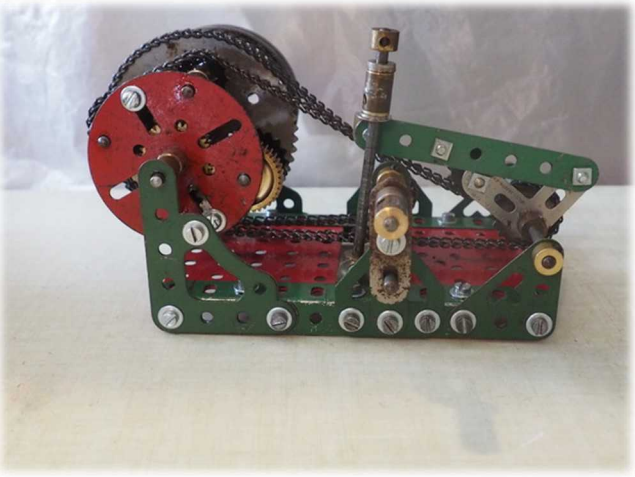
My final solution is a 13-pair set using only 13 15 19 20 25 56 and 57 tooth gears in the calculation (since these figure prominently in solutions for 4, 5, 6, 7 and 8 pairs of gears) The result, interestingly, only uses 5 of these gear sizes:

19:13)x2 + (20:13)x2 + (20:15)x3 + (20:25)x6 = **3.141592965** ie correct to 6 decimal places. Dazza should now be happy again-providing he has 4 clockwork motors!

NOTE: There is no puzzle in this issue because of space restrictions. Hopefully next time….

Kiwi Pickers

(Left to right):
Barry McKey (Tauranga),
Wayne Blakely, Chris Morton (MWT),
Clive Nicols (Matamata),
Barry Babbage (Tauranga),
Brian Hickson (Putaruru)
Dave Shand (Tauranga), pictured here at the Tauranga Summer BBQ, courtesy of **Dave** and **Colleen Shand.**
According to inside information, yes that's right, a dastardly whistle-blower, a rousing good time was had by all. Some models illustrated here.



New Zealand Club Diary 2020

Auckland Meccano Club

President: David Wall, Tel. (09) 426 1965
Secretary: Gary Higgins, Tel. (09) 832 4292
Meetings: **Meetings cancelled until further notice**

MWT Meccano Club

Chairman: Chris Morton, Tel. (06) 323 8001
Secretary: Robin Rye, Tel. (06) 764 8670
Meetings: Second Saturday of every second month, at 2pm. Next meeting: **To be announced,** at St. Luke's Church Hall, Corner Cornfoot and Manuka Streets, Castlecliff, Wanganui.

Wellington Meccano Club

President: Reg Barlow, Mob. 021 955 488
Secretary: Max George, Tel. (04) 232 4200
Contact: Lou Nichols, Tel. (04) 297 1515
Meetings: Begin 7:30pm on first Friday every second month. **Next meeting will be announced when Alert levels permit**

Christchurch Meccano Club

President: Neil Pluck, Tel. (03) 382 0411
Secretary: Roland Jaspers, Tel. (03) 351 4389
Meetings: Start 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, (Mob) 027 671 6004
Meetings: These are held on the first Saturday of every second month, except January. Most meetings are held in the Central Waikato area starting at 2 pm. Contact Graeme Wrightson on 027 671 6004, Matamata.

Other 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 August 2020 issue of NZFMM Magazine should be sent to Richard Feltham before the 20th July 2020. at: richard.feltham174@gmail.com

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

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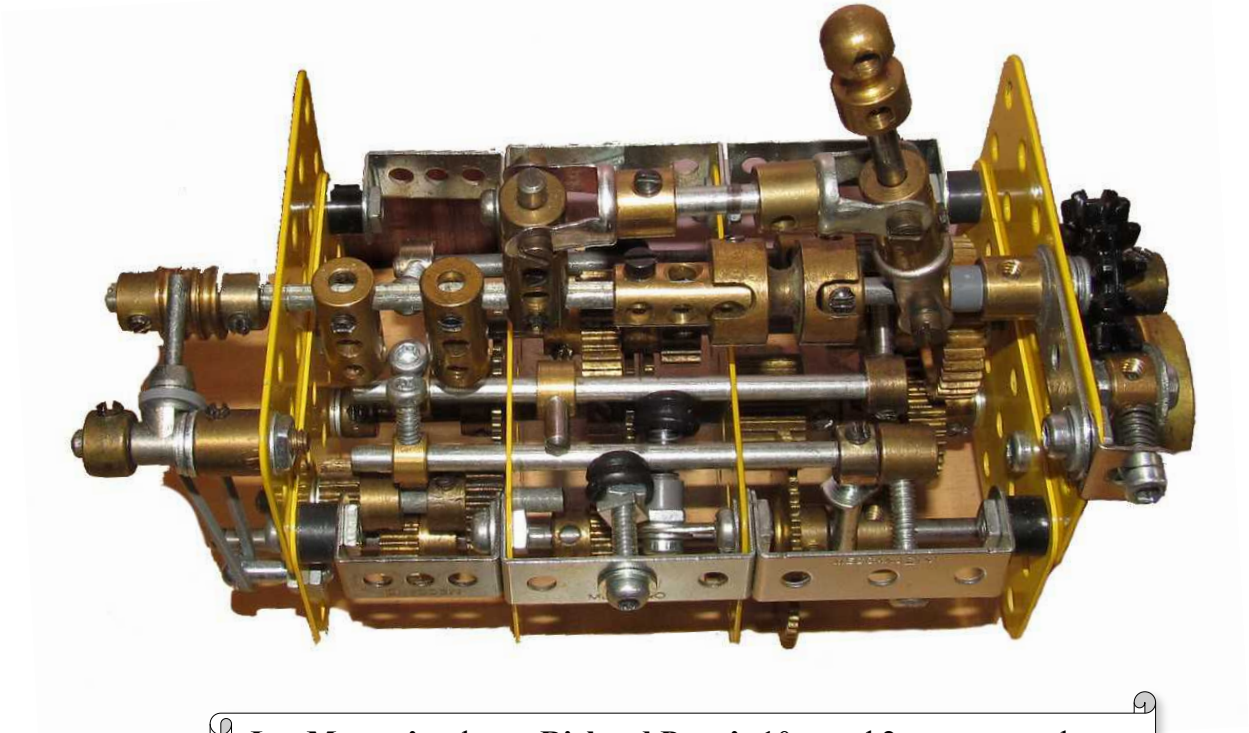
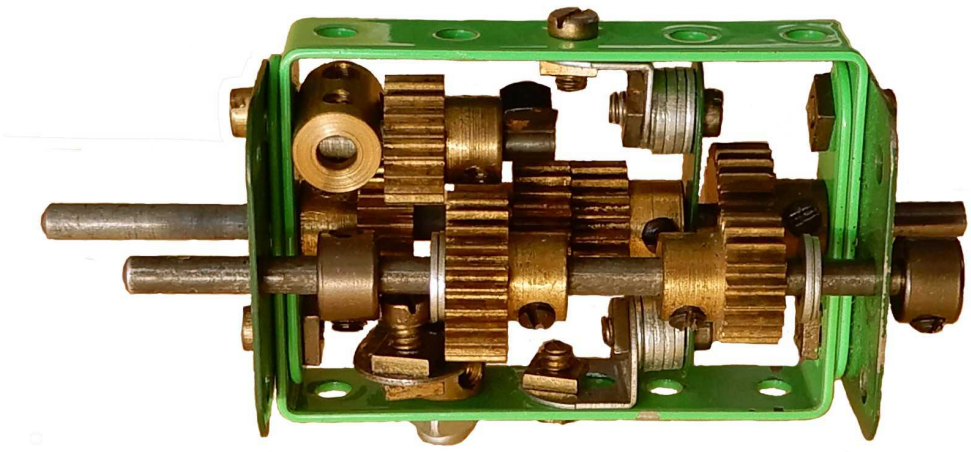
2021 Convention
Waikanae Memorial Hall
19th, 20th, 21st March

WHAT MECCANO DOES BEST - MECHANISMS.

Two lovely examples by NZFMM members.



Les Megget's take on **Richard Payn's** 10 speed 2 reverse gearbox. Les' version has 5 forward and 1 reverse. A full description of this can be found on the NZMeccano website.



Bruce Geange's ultra-compact two speed and reverse gearbox. This was featured in the Meccano magazine for April 1956, page 212.