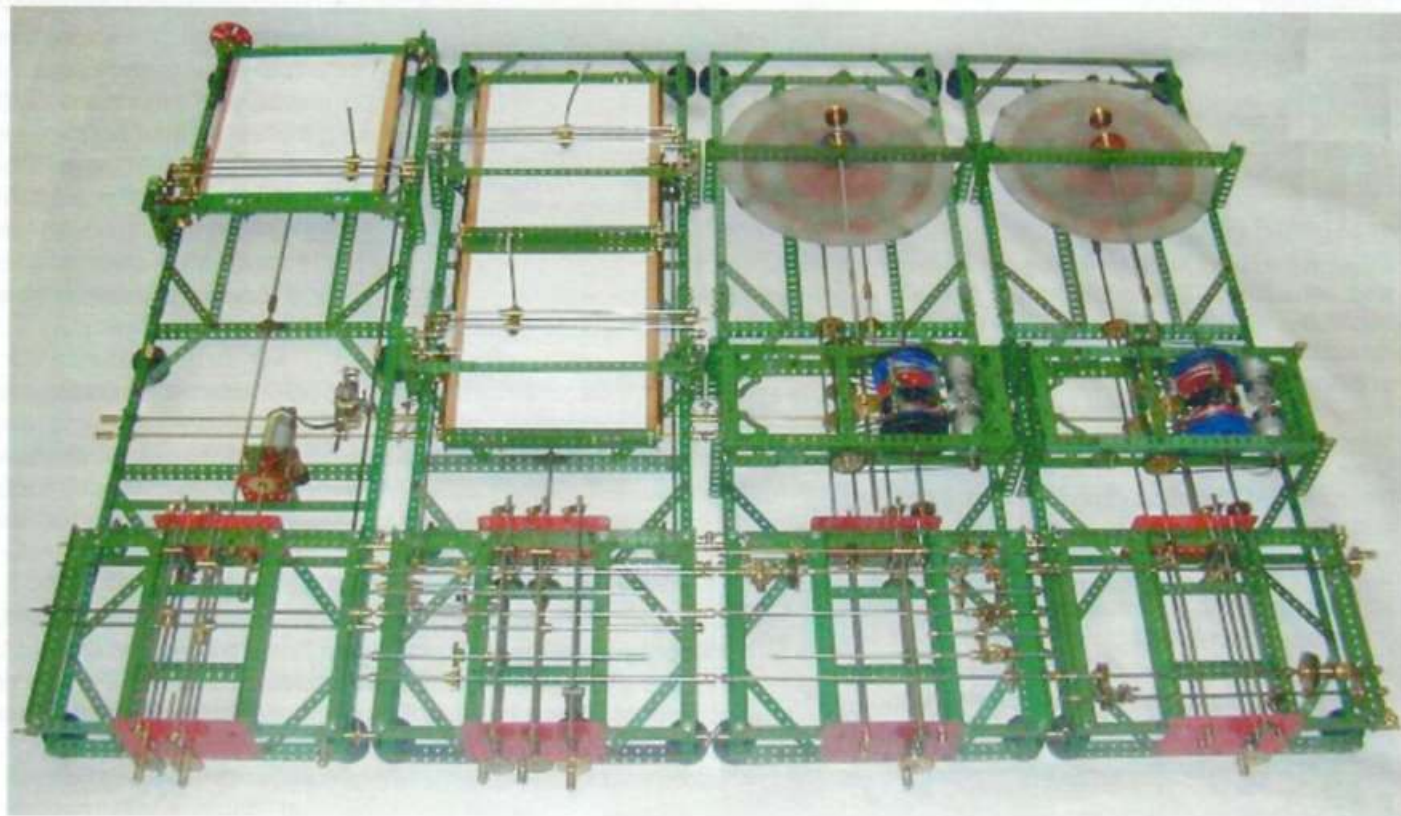




NZFMM MAGAZINE

Volume 26 No 3

June 2002



$$\int_g^s f'(x) dx = \text{MECCANO Differential Analyser}$$

where $f'(x)$ is the range of Meccano parts,
from g - girders to s - strips.

William Irwin tells more about this fascinating device on page 3



Worth \$350.00?
See page 23

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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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A Business Card Seen Recently.

"The time has come," the Walrus said.

Where will the Meccano hobby be in twenty years time? Meccano model building will have disappeared, the Meccano investor/collector will remain, and in my considered opinion, we are the last of the Meccanomen.

This is my reasoning:

Man is basically a lazy animal and given the opportunity to find the easy way to work or play, he will use his ingenuity. Speaking generally, we have moved in the last 100 years from living mechanically to living by motors and electronics. Children copy what they see in the real world. The boys of the 1900's to 1950's were in the golden age of mechanical engineering with examples of trains, planes, cranes, bridges and the 'out in open' engineering marvels of the world to marvel at and to emulate in their toys. The commencement of the electronic age from the 1960's onward moved the emphasis to motorisation, miniaturisation, streamlining and concealment of mechanical elements which doesn't leave much to inspire and be replicated in Meccano and so children have moved on to new toy versions of the current world around them.

Social attitudes have also changed in the last 100 years and the society that favoured discipline, respect, rewarded ability and achievement, and encouraged involvement with young people, all of which are the climate in which Meccano model building thrives, has been replaced with the opposite attitudes. Our new heroes are dubious sports and pop stars and our new toys are franchised from fantasy movies.

Our current collection of Meccano builders are middle age plus, and in twenty years time most of you will have departed to a hotter place or been sent to a rest home carrying your worldly possessions in two suitcases. There is no new generation of Meccano builders trained or experienced or excited or parts deprived to carry on the Meccano tradition.

As the gladiators said to Caesar "We who are about to die, salute you".

Keep on Meccano-ing. - R. Bruce Neilson

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New Zealand Meccano Agent Appointed

Extracts from a letter from Gordon Good of Rainbacryl Ltd to Lloyd Spackman.

I am glad to be able to tell you that at last we have been appointed as Meccano's agent for New Zealand".....The first shipment is due to leave France in mid June...almost all Hobby, Toy and Educational shops have bought.

Spares will be a short term problem as Meccano still have not appointed anyone to oversee this...they have agreed to do this "shortly".

The Differential Analyser Explained

by William Irwin

Introduction.

The mechanical Differential Analyser has intrigued mathematically minded Meccanomen for many years, ever since this machine was first modelled, largely in Meccano, by Douglas Hartree and Andrew Porter at Manchester University in 1934. Many full scale non-Meccano Differential Analysers were built in USA, UK and Europe between 1934 and the early 1950s, until they were eventually replaced by faster digital computers. The unique aspect of the Meccano Differential Analyser was that it was accurate enough for the solution of many scientific problems, and much cheaper to build. It is estimated by Garry Tee of Auckland University that about 15 Meccano model Differential Analysers were built for serious work by scientists and researchers around the world.

Very few of the original Meccano model Differential Analysers have survived. In fact I know of only two. The first is part of the original Meccano Differential Analyser no. 1 built by Hartree and Porter at Manchester, which is currently



glass, and various other parts such as the torque amplifier drums were separately manufactured. Indeed it was considered that a reliable torque amplifier could not be built entirely out of Meccano parts! This has been disproved several times over the years by dedicated Meccanomen. Tim Robinson of California, USA, has perfected the Meccano Differential Analyser to a high accuracy using Meccano parts only, except for the ground glass integrator disc and cord for the torque amplifiers. The cover picture is an early example of Tim's work, and shows what can be achieved in pure Meccano.

What is a Differential Analyser?

The Differential Analyser is a mechanical analogue computer. What does this mean and where does it fit into the scheme of things?

There are two distinct branches of the computer family. One branch descends from the abacus, which is an extension of finger counting. The devices that stem from the abacus use digits to express numbers, and are called digital computers. These include calculators and electronic digital computers.

The other branch descends from the graphic solution of problems achieved by ancient surveyors. Analogies were assumed between the boundaries of a property and lines drawn on paper by the surveyor. The term "analogue" is derived from the Greek "analogikos" meaning by proportion. There have been many analogue devices down the ages,

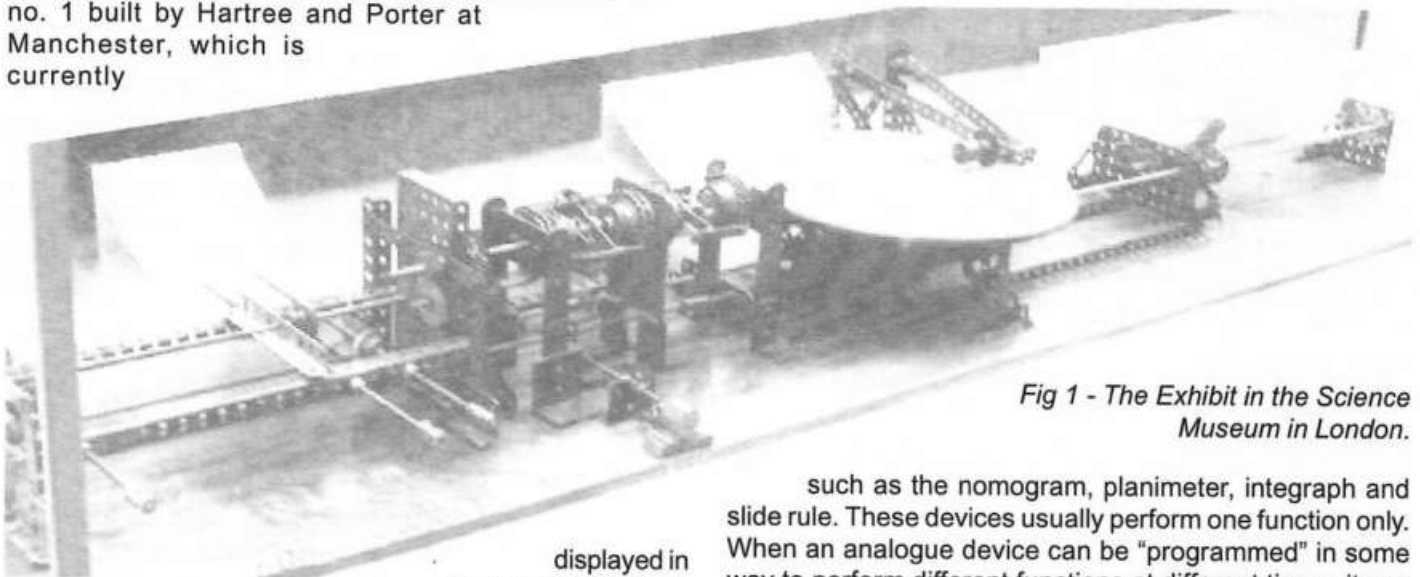


Fig 1 - The Exhibit in the Science Museum in London.

displayed in the Science Museum in London (see fig. 1). The second is right here at the Museum of Transport and Technology (MOTAT) in Auckland, New Zealand, and consists of the entire Meccano Differential Analyser no. 2 built by J.B. Bratt at Cambridge University in 1935. This machine was last displayed at MOTAT in the seventies and early eighties. It is currently in a bad state of repair due to some water damage sustained during storage, but steps are being taken to restore it for display purposes in the near future.

The early Meccano model Differential Analysers were not built entirely of Meccano. The integrator discs were ground

such as the nomogram, planimeter, integrator and slide rule. These devices usually perform one function only. When an analogue device can be "programmed" in some way to perform different functions at different times, it can be called an analogue computer. The Differential Analyser is such a computer as it can be set up in different configurations, i.e. "programmed", to suit a particular problem.

In an analogue computer the process of calculation is replaced by the measurement and manipulation of some continuous physical quantity such as mechanical displacement or voltage, hence such devices are also called continuous computers. The analogue computer is a powerful tool for the modelling and investigation of dynamic systems, i.e. those in which some aspect of the system changes with

time. Equations can be set up concerned with the rates of change of problem variables, e.g. velocity versus time. These equations are called Differential Equations, and they constitute the mathematical model of a dynamic system.

The Differential Analyser solves differential equations by integration. It makes use of one or more wheel and disc integrators (or Kelvin-disc integrators), interconnected by shafts in various ways to suit the problem equations. The process of integration can be illustrated by the simple example of the acceleration of a car. This can be represented for input by a curved graph showing speed varying with time. Say one wanted to find out the distance travelled in a

certain time, say five minutes. The period of 5 minutes can be divided into much smaller intervals of say 10 seconds each, and

assuming a constant speed over each interval from the graph, a distance travelled for each interval is calculated. The sum of the distances travelled in successive intervals is then the total distance travelled. The smaller the interval taken the more accurate will be the result. This is called Integration, and is the function performed by the integrator in a continuous manner.

How does the Differential Analyser Work?

A typical mechanical Differential Analyser consists of the following components:

- Two or more Integrator units (including one Torque Amplifier per unit).
- adding and counting units.
- Input and Output tables.
- A gearing and shafting system to link everything together.

The Integrator:

The Integrator is in essence a variable-speed gear, and takes the form of a rotating horizontal disc on which a small knife-edged wheel rests. The principle used is shown in fig. 2. The vertical axis of the horizontal disc is supported in a movable carriage so that the distance of the point of contact of the wheel on the disc, from the centre of the disc, can be varied. The two inputs to the integrator are therefore the rotation of the disc x , and the carriage movement y . When the unit is integrating, the disc rotates and undergoes a translational movement simultaneously. The rotating disc drives the wheel by friction. The rotation of the wheel represents the output of the integrator. For proper operation the wheel must not slip

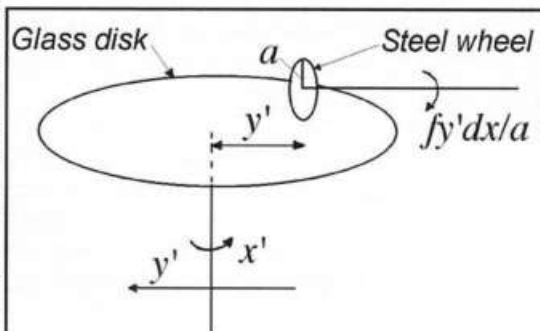


Fig 2 - The Integrator Principle.

on the disc so the rim of the wheel must be as sharp as possible, usually hardened steel on a polished glass disc.

The Torque Amplifier:

The torque on the shaft carrying the integrator wheel is very small due to the low frictional force between the wheel and disc. In order to drive other units of the machine, the shaft from the integrator passes into a Torque Amplifier, the output shaft of which rotates with the same velocity as the input shaft but with greatly increased torque. The principle of the torque amplifier is essentially that of the capstan, where a small force, applied at one end of a friction band wrapped around a rotating drum, produces considerably increased tension at the other end of the band. The principle is shown diagrammatically in fig. 3. The two drums are driven by a motor in opposite directions. Movement of the input shaft tightens the thread on the motor driven drum, which causes the output shaft to rotate with amplified torque. The construction of a Meccano demonstration model of a torque amplifier is described by Michael Adler in the International Meccanoman, no. 34, September 2001.

Adding and Counting Units:

These can be included in the shafting when required. Adding units consist of a differential gear system so arranged that the angular rotation of one shaft connected to it is the sum of the angular rotation of two other shafts. Counters are used when it is desired to know the number of revolutions made by a particular shaft.

Input and Output Tables:

The Input Table is a unit whereby information concerning the differential equation is transmitted to the machine. A stylus is manually made to follow a pre-plotted curve, representing the known functional relationship between the variables. The result is mechanically linked to the input drives. Not all problems require the use of the input table. The Output Table is similar in construction to the input table. The solution to the equation is drawn by a pen on paper, in the form of a curve, thus plotting the results from the various

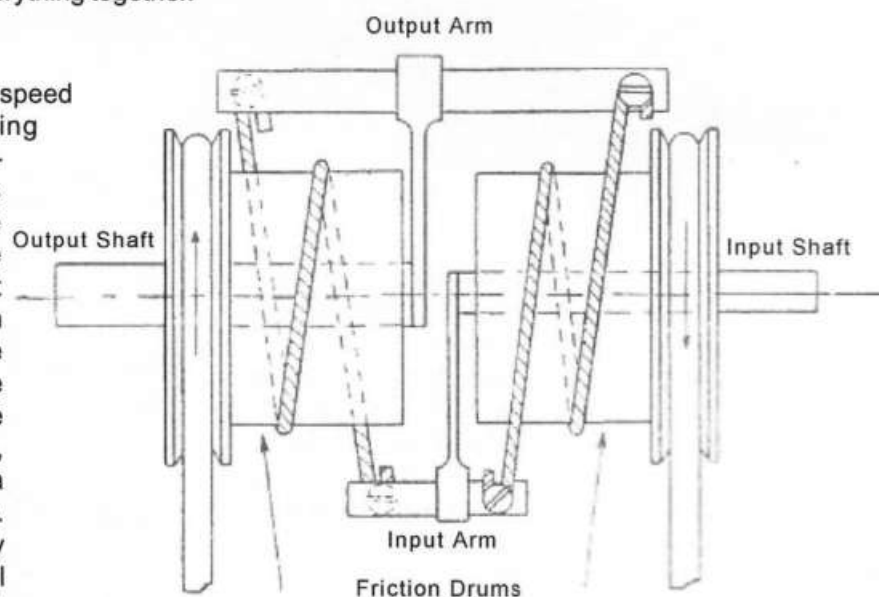


Fig 3 - The Torque Amplifier.

mechanical linkages.

Operation:

Motors are required for each torque amplifier, and one motor is required for the main input drive. Secondary inputs are manual via the input table. Tim Robinson's fine model on the cover gives the reader a general idea of a typical set-up.

I have purposely not gone into any mathematical background here. Suffice it to say that the Integrators, Input and Output tables, Adders and Counters if required, are all linked together by gearing and shafting to suit the particular differential equation solution required. This requires a lot of effort in setting up for each different problem and is in effect the "programming" of the machine which defines it as a computer. Of course a thorough knowledge of the mathematics of the problem is required by the user.

Examples of usage:

Two practical examples of the type of calculation for which the Differential Analyser has been used to predict results are:

a) The development of the "Bouncing Bomb" by Barnes Wallis for the "Dam Busters" attack on the Ruhr Valley hydroelectric dams in WWII. The height, length and number of bounces changed according to various parameters such as:

- 1) the speed of rotation of the bomb "spin-up"
- 2) the speed and height of the aircraft at moment of the drop
- 3) the weight of the bomb
- 4) the "ballistic characteristics" of the bomb, i.e. its shape
- 5) the natural buoyancy of the bomb in water

b) Use by river control authorities in the calculation of soil erosion characteristics of various surface areas. The rate of erosion is among other things dependent upon the following:

- 1) the rate at which the water is falling on the surfaces
- 2) the resistance the surface cover offers to the flow of surface water
- 3) the speed of flow of surface water
- 4) the volume of water flowing

The Differential Analyser was used in many other fields of science and engineering before being displaced by faster digital computers.

References:

- Analog Computation, by Albert S Jackson, McGraw Hill 1960
 The Differential Analyser, by J Crank, Longmans Green & Co. 1947
 Differential Analyser, GMM leaflet no. 4, The Meccanoman's Club, 1967
 Mini Differential Analyser, by Ron Fail, MMG Gazette no. 16, April 1993
 Torque Amplifiers, by Alan partridge, CQ no. 19, March 1993
 Meccano Torque Amplifier, by Michael Adler, IM no. 34, September 2001

Acknowledgments:

Cover photograph courtesy of Tim Robinson.
 Fig. 1: photograph courtesy of Michael Adler
 Other diagrams are by William Irwin.

APPENDIX

For those of a mathematical inclination, the simplest differential equation which can be solved by the Differential Analyser is $d^2y/dx^2 = -y$

Since the equation has constant coefficients no manual controls via the input table are required. The output table records dy/dx as a function of y so the plotted output should be a circle. This is known as the "circle test" for accuracy. If

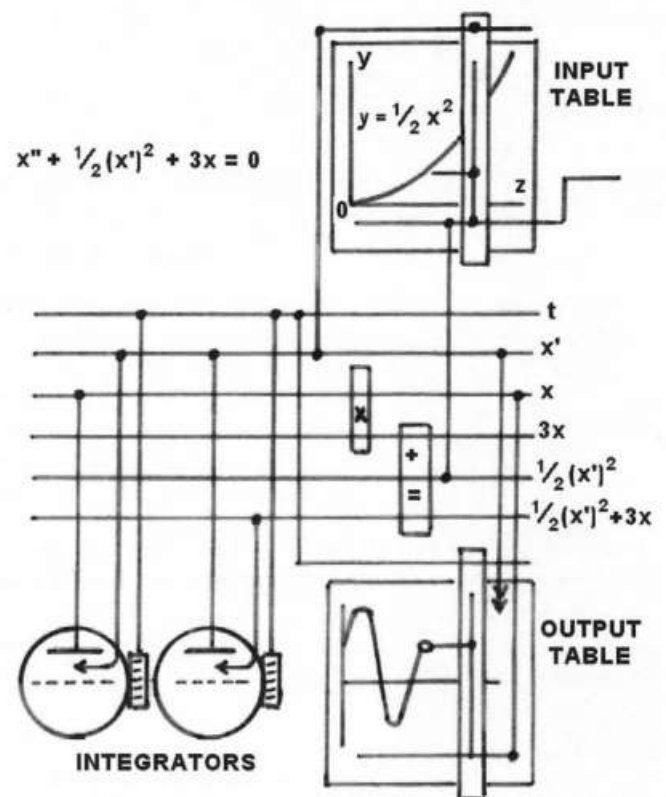


Fig 4: A Diagrammatic Representation of the Differential Analyser.

there is slippage or any backlash the machine will draw a close spiral instead of a circle.

For other Differential equations the output might be a sine wave (damped or undamped), a plotted trajectory or other curve, depending on the problem being investigated.

The above fig 4 illustrates the differential analyser in diagrammatic form set up to solve a more complicated differential equation involving the use of 2 integrators, input of a function on the input table, and resultant solution in the form of a curve on the output table.

An Oldie but a Goodie - Crazy Driver

by Bob Prescott

The Meccano boy who favours models that are capable of performing remarkable feats should not fail to build up the motor car illustrated in Fig 1.

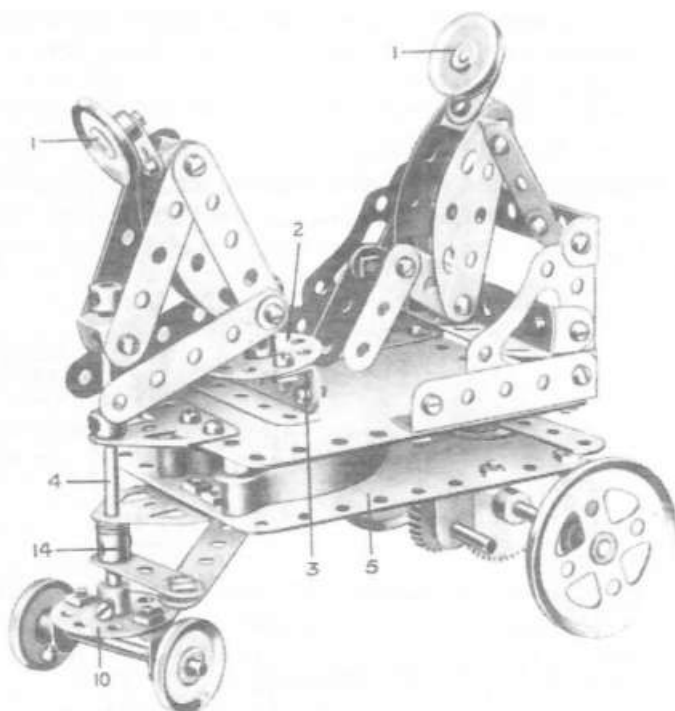


Fig 1 - Model 7.8 from the 1930 Manual

That's what it said in the April 1929 Meccano Magazine (MM) so I decided to build the model but it wasn't as straight forward as it looked. I have included the 1929 MM instructions in italics and added my own comments in plain text.

Construction

A Clockwork Motor fulfills the double duty of chassis and driving unit in this model and construction should therefore be commenced by attaching to it four 1" x 1" Angle

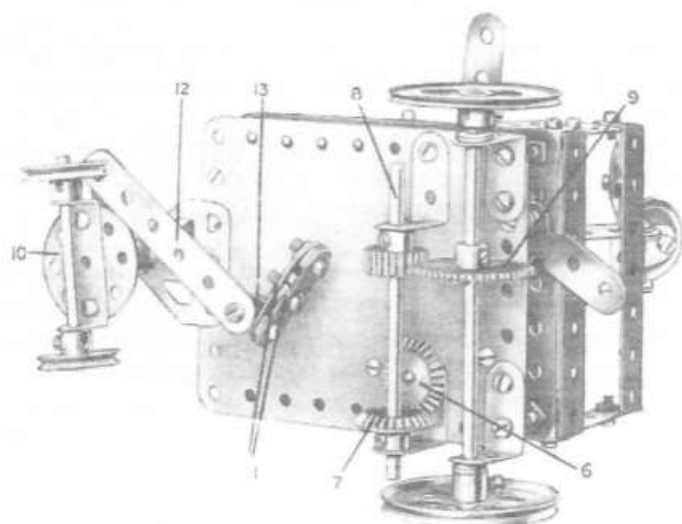


Fig 2 - Also from the 1930 Manual

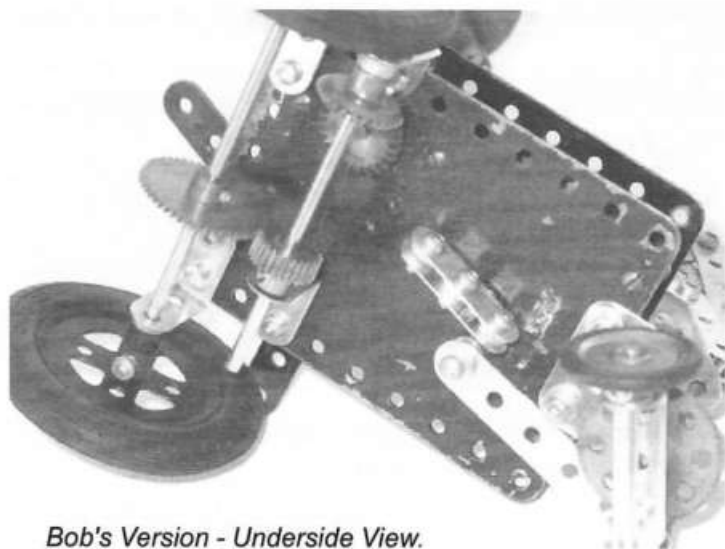
Brackets that form journals for the Rod carrying the rear road wheels and for the Axle Rod 8.

The motor used is a No 2 Clockwork Motor (7 x 9 holes) and I concur with the 1" x 1" Angle Brackets for the rear axle but more about Axle Rod 8 fittings later.

The Rod 8 should be slipped in place and a $\frac{3}{4}$ " Pinion and a $\frac{7}{8}$ " Bevel 7 secured upon it, while a second Bevel 6 should be secured to the motor shaft.

Here I met the biggest problem. Although using a 1" x 1" Angle Bracket at the non-Bevel end of Rod 8 is OK, there is no way two $\frac{7}{8}$ " Bevels will mesh as shown in a 1" x 1" Angle Bracket at the bevel end - there is simply not enough room! Research disclosed that P/N 30b $\frac{3}{4}$ " Bevel was produced in 1927 (and only 1927) and a "small quantity sold before they could be withdrawn" (Don Blakeborough's Encyclopedia of Meccano Parts). I don't know why they were withdrawn but it may answer the problem. Although the text states $\frac{7}{8}$ " bevels and the Parts List indicates two P/N 30, in fact two $\frac{3}{4}$ " Bevels were used. I'm guessing, but two $\frac{3}{4}$ " bevels would mesh at right angles in a 1" x 1" Angle Bracket, eh Sherlock? Back to using two $\frac{7}{8}$ " Bevels - I built up a bracket using a $\frac{1}{2}$ " Angle Bracket and a $\frac{1}{2}$ " Perforated Strip and Washers to provide adequate space.

The $\frac{3}{4}$ " Pinion meshes with a 50-teeth Gear Wheel 9 secured to the road Axle on which are also fastened two 2" Pulleys, Washers being placed between the bosses of the Pulleys and the Angle Brackets forming the bearings.



Bob's Version - Underside View.

I added 2" Tyres to the Pulleys - I'm not sure why the model was built without Tyres, perhaps the builder didn't have any? They were introduced in 1927.

The journals for the 2" Rod carrying the front wheels consist of Angle Brackets bolted to a Bush Wheel 10. The Wheel is secured to a $3\frac{1}{2}$ " Rod 4 journaled in a pair of Trunnions bolted to each Motor Plate 5, but before slipping the Rod in place, the crank mechanism that reciprocates the front wheels must be built up.

As I used P/N 155 Flexible Rings (introduced in 1937) on the 1" front wheel Pulleys, I had to use P/N 38a Washer Plastic Spacers between the Angle Bracket and the Bush Wheel to prevent the tyres rubbing on the turning mechanism. Care must be taken attaching the Flat Trunnions to the motor plates. Use washers to ensure just enough "bolt room" inside the plates or they will rub against the spring and main gear wheel of the motor.



Bob's Completed Model - Just like the Original?

The crank mechanism "comprises two 1½" Strips held apart from each other by means of Washers placed on the securing bolts. The slot thus formed enables the square

shaft of the Motor winding spindle to pass in between the Strips. As the spring of the Motor is allowed to run down, the winding spindle rotates very slowly and this provides a very convenient method of imparting an oscillating movement to the front axle. When winding the motor the 1½" Strips can be lifted off the spindle so that the winding key can be used.

The arm 11 needs to be a snug fit on the Motor Winding Spindle or it will slip off when the model is operating.

A Collar 13 is secured to one end of the arm 11 and to this Collar a 3" Strip 12 is pivoted by means of a Bolt. The other end of the arm 11 is connected pivotally to a Crank 14 attached to the Axle Rod 4.

I placed a P/N 38b Washer Plastic Spacer Mini between the Collar 13 and the 3" Strip 12 to ensure it doesn't snag the arm 11 when it revolves.

Construction of the driver and passenger can be seen from the photographs or make to your own design. As you can see I used Pulleys for the heads and strips for the limbs locknuttied at the limb joints. For the seats I used P/N 324a Cab Plastic.

When I checked Bruce Neilson's Index it was interesting to find that the model had been included in the 1929 to 1935 model Manuals. I had looked forward to seeing how they had "solved" the bevel problem, but alas, they used the same pictures and similar text to the 1927 MM!

Once you have built the model you will need quite a large area for the model to perform its "remarkable feats". Give it a go - it's great fun.



Convention 2003 Update

from Daryl Anderson, Hawera, New Zealand.
Email <meccano2003nz@bitworks.co.nz>.

The following is the latest update on the Convention to be held in Hawera, New Zealand, at Easter, 18 to 20 April 2003. At a recent meeting of the MWT Meccano Club, it was decided on the following format:-

Good Friday 18 April 2003 - *Arrive and Setup* from 1pm. Hall open as long as necessary. Evening meal own arrangements.

Easter Saturday 19 April 2003 - *Modellers Morning*. Hall opens 8am for last minute setup. 9am organised tour of each model with owner describing functions, parts used, problems solved etc. with time for questions. Lunch 12 noon. Hall open to the public 1pm to 4pm. 5pm bi-annual meeting of the New Zealand Federation of Meccano Modellers followed by prize giving and auction. Group dinner at 7pm.

Easter Sunday 20 April 2003 - *Public Day*. Hall open from 8am, Modellers only. Open to the public 10am to 4pm.

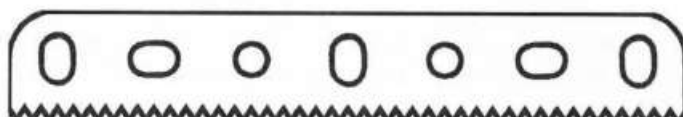
Packup and cleanup begins at 4pm. Evening meal own arrangements.

Easter Monday 21 April 2003 - *Taranaki Day*. A chance for visitors to see our wonderful attractions: our national quality 'Tawhiti Museum', our beautiful mountain, our rugged coastline with unique black sand beaches, 'Dairylands' farm visitors centre - see how cows are milked at the largest dairy factory in the world. Organised day tours of these and other attractions can be arranged.

The Public admission prices will be \$2 adults, \$1 children, \$5 family.

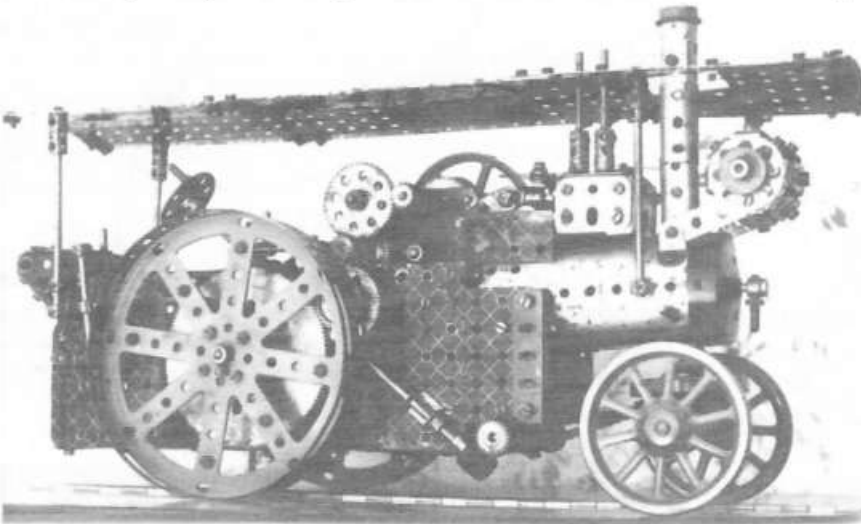
Alistair Tong is visiting local Motels, camping grounds and B&B. A list of options will be made available.

Registration forms will be out towards the end of the year.



Meet the Meccanoman Mike Stoodley - Meccano(mad)man alias "The Twiddler"

Having first seen daylight in Bournemouth, England in 1926, I progressed safely to 1930 when, one bright summer morning, my mother heard a tremendous caterwauling coming from the bathroom. There I was - horrid little sadist - trying to push the family kitten round the twiddly bit of the loo. Not long after that event, I developed a lifelong love of music - especially the twiddly bits.



Picture No 1: The 1936 Traction Engine

A year or so later I received my first Meccano set - 000 - and over the next six or seven years made many models, especially cranes and wagons - always enjoying the twiddly bits! My Meccano arsenal developed to about a number 8 or 9 set in the original red/green series.

In 1937 when we lived near Salisbury, we went to a fair. I spent 23.4% of the time enjoying the fair amusements and 76.6% gazing in rapt attention at the magnificent Showman's Engines - there were four - and, of course, all the twiddly bits. This, naturally, resulted in the immediate and urgent construction of a Showman's Engine, based partly on the old Super Model and mainly on what I had seen. This behemoth was clockwork driven and badly out of scale and proportion. (See Picture 1).

After I came to New Zealand in 1951, my mother sold all my Meccano (at my request) but kept the Showman's Engine. When our son Mike turned eight in 1970, she sent it out to us. Having seen more real traction engines at Feilding and Tokomaru, I dismantled the 1937 shocker and started all over again. Also, about this time, I came into contact with Trevor Adam in Napier who guided me to Bunkers in Hastings - so it was all go.

A Moment of Fame

In August 1972 I was pleasantly surprised and very pleased to see a photograph of my 1970-71 remake of the Showman's Engine appear on the front cover of the August 1972 Meccano Magazine. This model (Picture 2) shows

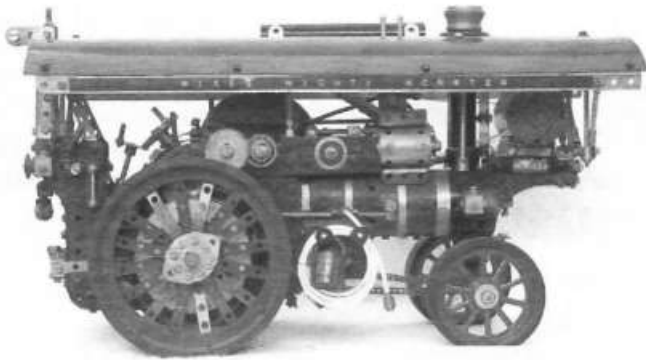
some improvements on the 1937 model (Picture 1) but falls well short of the final 1977 version (Picture 3). The photo was taken in the Karioi Forest, near Ohakune, in May 1972 and Mt. Ruapehu is visible in the background. At the time, I had taken the model with me (on a working trip) to show to some friends in Ohakune.



Nowadays I have about 60% of a No 10 set with related models. I lay no claim to being a Meccano purist, being by choice a bit of a maverick (the boiler of my Crane Traction Engine is a piece of 3 1/2" diameter PVC downpipe) so my models would not go beyond the eagle eyes of purists in a competition. However to me the fun of modelling is just that, fun, and a striving for perfection and functional realism.



Picture No 2: This version of the 1924 Showman's Traction Engine was pictured on the front cover of the August 1972 Meccano Magazine



Picture No 3: The Traction Engine as it was in 1978

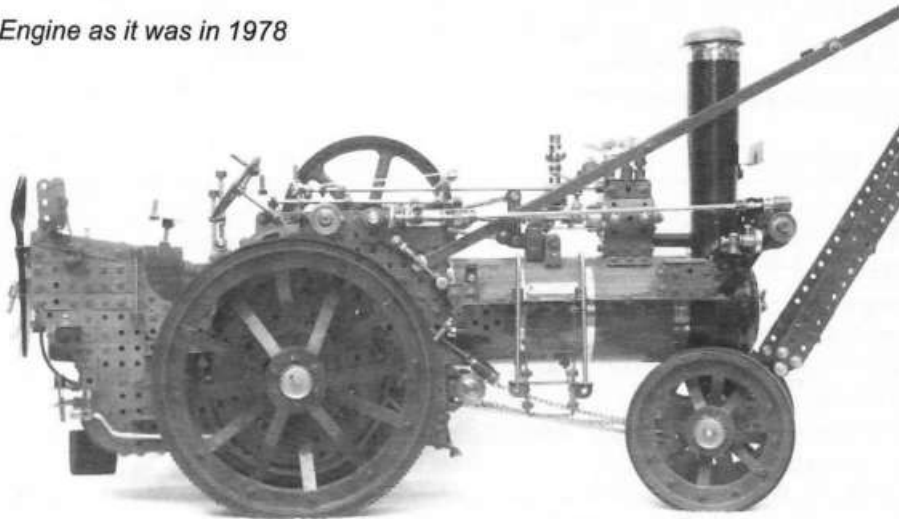
The 1926 Burrell Crane Traction Engine

This model was originally built as an ordinary Farm Traction Engine in 1988. Eight years later I decided to convert it into a Crane Engine with a roof. This is a real maverick model made mainly in Meccano but with the road wheels, flywheel, boiler, and funnel and some super-detailing items such as bucket, shovel and hosepipe being non-Meccano. (Ed: *What else is there that could be Meccano?*) Power comes from a 6-12 volt, 6 gear, PDU Meccano motor (yellow plastic) which is most efficient in either high or low ratio.

My old job with the Forest Service took me all over the southern areas of the North Island and I recall a pleasant evening with 'The Don' (Blakeborough) and family when they still lived in Ngaio in Wellington; also contact with Bruce Neilson in New Plymouth and Lindsay Bond in Stratford. In more recent years John Ince has proved to be most helpful in getting various parts from MW Models at Henley-on-Thames. Simon Moody has also been helpful and I am most grateful.

Over the past two years I have also realised a boyhood dream and set up a model railway layout (Hornby 00) which is also great fun - Bruce Neilson has also been most helpful.

My basic philosophy of life is based on an old Arabian proverb: "I had no shoes and I grumbled; then I met a man who had no feet". Happy twiddling Meccano folk



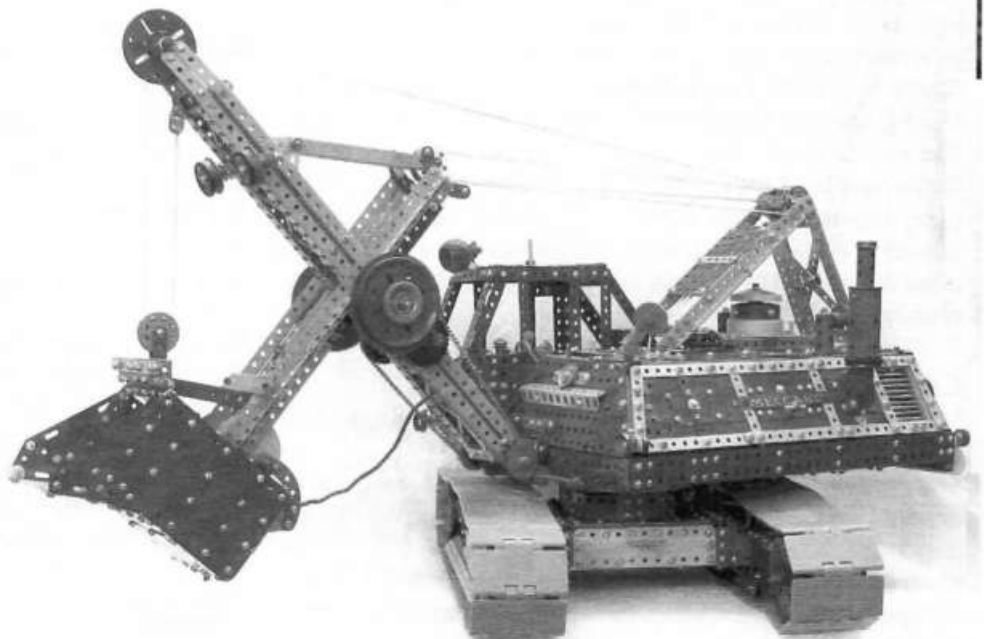
The 1926 Burrell Crane Traction Engine

The 1930s Smith & Wesson Mechanical Excavator

Built around 1990, this is a freelance model, based on personal knowledge and observations of such machines in England during the 1938-50 era. Apart from the tracks, the model is 95% Meccano. Power comes from an old E20 Meccano Electric Motor in the rear of the body and all four movements are linked to this single motor. Swivelling and travelling are basically similar to those in the old

'Supermodel' Steam Shovel but with several modifications and improvements. The plastic tracks are made up from 60 links obtained from a commercial engineering plastic supplier at a cost about

NZ\$1.70 each and are most realistic in this scale. The luffing and hoisting motions are automatically "braked" by worm drives in the gearing. Two levers in the cab control :- (1) swivelling and travelling; and (2) hoisting and luffing. The door is a sliding one and the side and top plates are easily removable. General scale is based on the two 5 1/2" Hub Discs that form the swivelling motion.



1930s Smith & Wesson Excavator

Bruce's Choices From Around The World

by Bruce Neilson

Modelplan 134 - Lartigues Steam Monorail 0-3-0 Locomotive by Peter Matthews.

22 pages being 15 pages of Isomec drawings, 2 pages parts list, 2 pages prototype, 2 pages text and 1 page photo.

This is a model of an unusual 1886 railway locomotive which straddles an elevated monorail mounted on trestles. The locomotive had two vertical boilers (one on each side of the monorail) to maintain balance. The model is about 10" wide, 24" long, and 11" high, and uses standard Meccano parts plus some of MW Models special parts. Built in modular fashion, the Isomec drawings give a clear indication of each sub-assembly.

Available from MW Models.

Modelplan 135 - 1901 House in 1:16 scale by Tony Parmee.

20 pages being 4 pages of coloured photographs, 15 pages text 1 page parts list. The model can be built with the parts of a 1954 No 10 set with extra nuts, bolts and washers, some second hand Angle Brackets to be bent to varying degrees, and some electrical pieces for lighting and a door opening device (optional). The origins of this model is the 1937 Manual No 10.9 Modern House. When complete it measures out at 36" long, 15" wide and 24" high and a baseboard is required.

Architectural models are uncommon in Meccano and this one appeals with bay windows, verandas, two stories, conservatory, tower, porch, staircase and automatic doors. With an open back, a small girl can use it as a dolls house (and be influenced into the potential of Meccano).

Available from MW Models.

Southern California Meccano & Erector Club Newsletter - March 2002.

Pick of the articles - Plastic Meccano Track Link P/N P91 as rack railway track by Anton Calleia.

Clamp the Track Link between Flat Girders bolted to 2 1/2" Flat Plates with Angle Girders serving as the outside rails. The Flat Girders have to be raised by the thickness of two Strips over the flange of the Angle Girders to allow the track to fit properly between them. A P/N P84 Or P/N P85 Plastic Sprocket Wheel is mounted in the middle of the locomotive in such a way as to engage the "rack" without riding on it or slipping off it.

Canadian MeccaNotes - March 2002.

Pick of the articles - P/N 27A 1 1/2" Gear Wheel The Liverpool Years.

The minutiae and lengths that Meccano historians go to to analyse and chronicle Meccano parts is amazing. Three pages of text and table covers all the variations from the 56 tooth of 1915 to the Delrin plastic, no boss of 1979. Cross reference to your Encyclopaedia of Meccano Parts (EMP) book.

Runnymede Newsletter - February 2002.

Pick of the articles - Chronology of the Hook by Clive Weston.

Using manuals, outfit contents sheets and illustrated parts price lists; Clive Weston traced the mixed-up Hook saga since 1962. The results of his sleuthing are summarised in four charts. Collectors and restorers should cross-reference this article.

Frank Hornby, Notes and Pictures by Jim Gamble.

This book fills a gap in the story of Meccano Ltd. Enthusiasts have a reasonable amount of well researched literature on the products of the company but little on Frank Hornby and his extended family.

The various chapters covers the following topics:-

Pages 11 to 27 - The various Meccano factories.

Pages 28 to 96 - Personal glimpses of Frank Hornby and his family through four generations.

Pages 87 to 136 - Pictorial glimpses of Meccano Ltd, the work place.

Pages 137 to 148 - Frank Hornby the politician.

Pages 149 to 151 - Frank Hornby in death.

Strangely enough, very little was written by or about Frank Hornby during his lifetime and so this book is timely in capturing personal memories of those who knew or worked with him.

I enjoyed this book, particularly the large assortment of photographs, and am able to forgive the odd spots of incorrect names and poor proofreading. Jim Gamble as Meccano historian supreme is probably the only person who could have brought this project to print and I thank him.

Available from MW Models or the author.

The International Meccanoman - May 2002.

Pick of the articles - Modern Building Technology by Philip Webb.

If you are into designing your own models, there is a case for not reinventing the wheel. For example do you really want to spend time developing the differential for your Super Truck or can you make use of someone else's hard work. Philip Webb uses Isomec drawings to illustrate very useful mechanisms he has found among the Meccano fraternity and in this issue has an all-bevel differential, heavy duty differential, Bolton's differential and a HGV Axle with an 'over the top' axle to allow the drive to be taken to a second axle. What makes these mechanisms a little different is that the very latest parts such as tri-flat axles and pinions, six hole helicals, bossless pinions, Flanged Square Plates, etc are incorporated and shows what can be done with these parts.

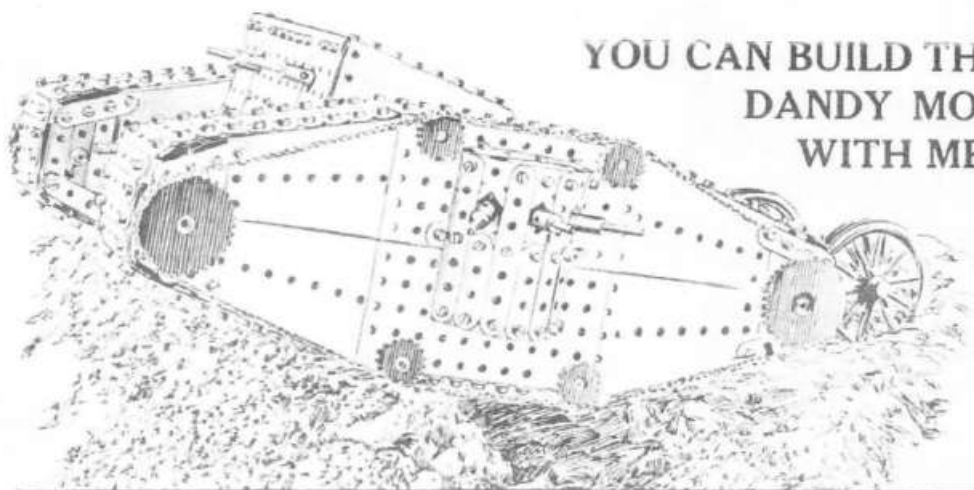
This issue has a bonus with a two page write up on 'Reduction box evolution' where we start with a MO motor (preferably with the tri-flat axle) and a P/N 160G. A reduction ratio of 104:1 gets developed to 343:1 inside the confines of the P/N 160G cube of 1 1/2".

Subscription rates, addresses, etc. for the above publications are available from the Editor, NZFMM Magazine.

MECCANO

Toy Engineering for Boys

Boys
Never
Tire
of
Meccano
and
it
Never
Wears
out



YOU CAN BUILD THIS
DANDY MODEL
WITH MECCANO

and
Hundreds
More
Just as
Interesting

Meccano Model of a Big Battle Tank

Every boy has read of the wonderful machines which crawl over trenches and shell holes, knock down trees and houses, and climb right over them.

Boys! Be Prepared

Build all sorts of wonderful Engineering models with Meccano—"Tanks," Submarines, Aeroplanes, Machine Guns, great Cranes and Bridges, giant Towers. You can build all the engineering wonders you see and read about with Meccano because Meccano parts are true engineering parts like real engineers use, only smaller.

Just look at the dandy gears, pulleys, pinions, perforated strips and girders—all shining brass or bright nickel, and made dead accurate. You get such parts only with Meccano. That's why it's so easy. And why you can build so many models, wonderful models that actually *work*—Engines and Automobiles that *run*, Cranes that lift heavy weights, Bridges that open and close, Clocks that actually keep time, Looms that weave, Scales that weigh, high Towers with Electric Elevators. You can build almost anything you want to with Meccano. That's why you want to be sure to get Meccano. Nothing else is "just the same" or "just as good." See that the name Meccano is on the box.



Meccano No. 1X \$4.50

Your fun begins the minute you open the box

There is nothing to study or learn with Meccano. A fine book comes in each Meccano set, picturing hundreds of wonderful models that you can begin building right away, or you can build some model of *your own*! With the powerful Meccano Electric Motor you can make your models actually run like real machinery! There are Meccano Motors in outfits as low as \$4.50, or you can buy a Motor separately at \$2.00 and \$4.00.

Ask to see this extra-value No. 1X Outfit at \$4.50 complete with Meccano Electric Motor. It's a daisy.

Copyright, 1917, Meccano Limited, Liverpool, Eng.

The reproduction of the MECCANO - Toy Engineering for Boys on pages 11 to 14 is from the 1917 original kindly made available by Viv Alexander.

MECCANO

No. 3, \$9.00

No. 4, 15.00



Meccano No. 3 will make heaps and heaps of interesting models, such as a Rotating Crane, Pile Driver, Tower Wagon, Lifesaving apparatus, etc.

No. 4 is a specially fine Outfit. Builds Dandy Cranes, Towers, Elevators, Viaducts, Suspension and Cable Bridges, Motor Buses, and hundreds of other machines that run and models that work.



It
Actually
Digs!

MODEL OF STEAM SHOVEL.

Made with No. 4 Outfit. Has boom and shovel that raise and lower and swing out and in. It is operated by levers, and actually digs! Runs on wheels. Lots of fun!

Presentation Outfits

Nos. 5 and 6 are big Meccano Outfits, nicely boxed, suitable for presentation. When you give a boy an outfit like this, you are giving him much more than a toy—you are giving him a real education in mechanics that will serve him well in after life.

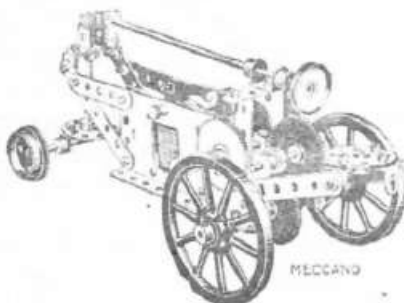
MECCANO No. 5, \$20.00

No. 6, \$40.00



MECCANO TRACTOR AND TRAILERS.

This model shows how easily the Meccano Motor can be mounted on wheels and converted into a motor vehicle. The illustration shows it travelling under its own power, the current being supplied by 2 dry cells mounted on wheels as Tankwagons.



MECCANO FARM TRACTOR

A wonderful model built entirely of Meccano parts and the Meccano Motor. Notice the worm steering gear.

MECCANO OUTFITS WITH ELECTRIC MOTORS

No. 1X \$4.50

No. 3X \$12.00

No. 2X 7.50

No. 5X 25.00

These are the big value Outfits in the Meccano system. Nos. 1X and 2X contain, at only a slight increase of price, an E-1 Meccano Electric Motor, and 3X and 5X contain a Meccano Electric Motor with starting, stopping and reversing lever. This wonderful Motor will drive any Meccano model and is a great power house, enabling any boy to run all models which he builds. Motor runs on batteries or house current at very little cost.

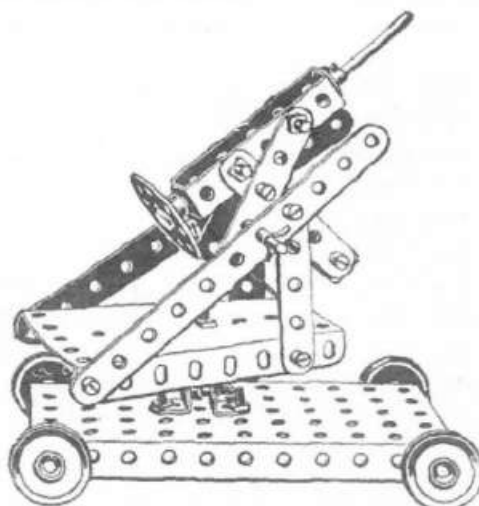




MECCANO

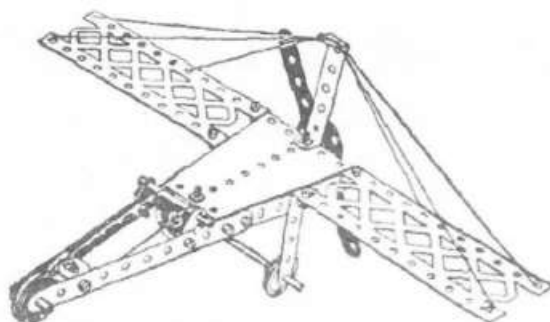
No. 00, \$1.00

This is the big Dollar Outfit, a most interesting toy for a boy. No skill or study required to make the models. Full instructions included for making more than 50 models, but any bright boy can invent hundreds more. The outfit is complete with all necessary tools. There is nothing more to be bought.



ANTI-AIRCRAFT GUN

Gun raises and lowers for aiming; swings around on carriage; carriage rolls on wheels. Made from Meccano Outfit No. 00.



MODEL OF MONOPLANE

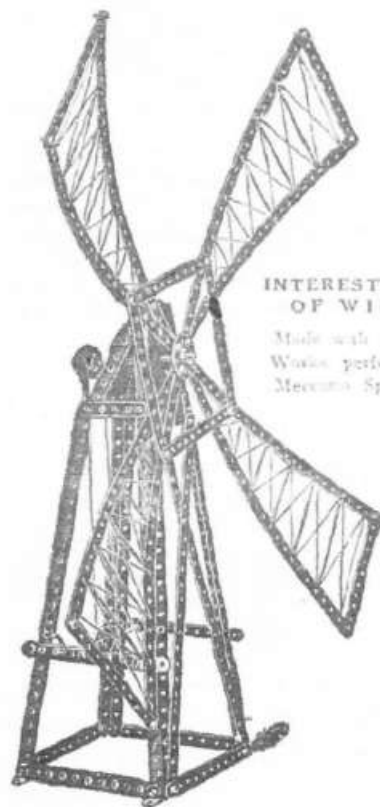
Made with No. 1 Meccano. It's great fun designing and building all sorts of Aircraft

MECCANO

No. 0, \$1.50

No. 1, 3.00

These Outfits contain all the necessary parts and tools to make Freight Cars, Cable Ropes, Derricks, Aeroplanes, Bridges, Windmills, and hundreds of other fine engineering structures. Illustrated Instruction Book included.



INTERESTING MODEL OF WIND MILL.

Made with No. 2 Meccano. Works perfectly with the Meccano Spring Motor.

MECCANO

No. 2, \$6.00

This Outfit contains a large number of parts for building bigger and more advanced models. Swing Bridges, Railroad Bridges with Signals, Monoplanes and hundreds upon hundreds of fascinating models. Contains 136-page illustrated instruction book.



No. 2 Meccano, a splendid outfit.

Boys who already have Meccano should see page 4 for accessory outfits

No. 00a	ACCESSORY OUTFIT, containing sufficient parts to convert a No. 00 into a No. 0 Outfit.							\$.50
No. 0a	"	"	"	"	"	"	No. 0 " No. 1 "	1.50
No. 1a	"	"	"	"	"	"	No. 1 " No. 2 "	3.00
No. 2a	"	"	"	"	"	"	No. 2 " No. 3 "	3.00
No. 3a	"	"	"	"	"	"	No. 3 " No. 4 "	6.00
No. 4a	"	"	"	"	"	"	No. 4 " No. 5 "	5.00
No. 5a	"	"	"	"	"	"	No. 5 " No. 6 "	20.00
Meccano Inventor's Accessory Outfit.								3.00

SEND FOR PRICE LIST OF MECCANO SEPARATE PARTS

MAKE MECCANO MODELS WORK LIKE REAL MACHINERY!

FOR 110 VOLTS A. C.
(60 CYCLES)

Brooklyn, N. Y.

Death of a Dinosaur - Part 1

Reprinted by permission of The Hornby Railway Collector Magazine from June, July and August 2001 issues.

A paper written by K D Brown, The Queen's University of Belfast, tracing the commercial fortunes of Meccano Ltd. from 1908 to 1979, sourced from Business Archives Sources and History, No. 66, November 1993. Compiled by David Neale (1972), who found it on his last trip to England and who has added further notes on Hornby Dublo and Tri-ang

It was a sudden shock to be told the firm was closing. We were given four hours notice. No one knew anything about it... we couldn't understand why. For three months we went to work and sat around hoping that somehow the firm would reopen but of course it didn't.

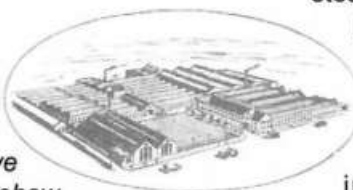
With these words a production worker at Meccano's famous Binns Road plant in Liverpool described the closure in 1979 of one of Britain's best known and longest surviving toy manufacturers. For generations of British children, especially boys, childhood had been virtually synonymous with Hornby trains, Meccano building sets, and Dinky Toy cars. Now after seventy years, the firm was no more.

Toy making of course represents only a very small part of Britain's manufacturing industry in the 20th century. Total employment in the sector has rarely exceeded 30,000 while the typical firm has been both small scale and short-lived. For these reasons it has, like other equally minor players on the industrial stage, attracted relatively little attention from the business historian. A few studies have touched upon the history of individual firms but for all their undoubted merits such works are not intended primarily as business histories. Undoubtedly a major reason for this neglect has been the lack of archive material on which to base any appropriate study of the industry. The survival of records from Meccano Ltd., is a major boon to historians interested in relatively peripheral industries and also in business history more generally. The circumstances of their survival – they were rescued from the incinerator by an alert local archivist who, hearing of their impending destruction, hurried to Binns Road in his car, armed with a supply of plastic bags – mean that the archive is inevitably somewhat eclectic and uneven. Most of the papers relate to the 1960s and 1970s. Supplemented with evidence drawn from interviews and questionnaires, however, they do provide sufficient evidence to permit a fairly detailed analysis of the difficulties which finally forced the company to close. It is this which forms the substance of this paper, while the first section sketches in the broad outlines of the firm's earlier history. All the papers now reside in the National Museums & Galleries on Merseyside and can be viewed by a prearranged appointment with the museum.

Foundation and early years of Meccano.

A Liverpool businessman, Frank Hornby, established Meccano Ltd. in 1908, in order to manufacture commercially

a new construction toy which he had originally designed for his two sons Roland and Douglas. Patented in 1901 as Mechanics made Easy, it was changed in 1907 to Meccano, under which name it achieved worldwide fame. In the last full accounting year before the First World War sales were worth almost £120,000, net profits £54,000. By the autumn of 1916 Hornby was able to claim that to date he had sold a million Meccano sets. With profits further boosted by the war work he emerged in 1918 with the largest Toy Company in Britain. Despite the generally depressed state of British industry during the interwar years, Meccano's profits held steady, averaging about £41,000 a year at current



prices. Behind this long spell of prosperity lay two key elements, high quality, superior products and an innovative, aggressive approach to marketing. Although Hornby experimented with several different lines, including chemistry sets and wireless,

Meccano's success depended in the main on three products. The original construction set was the first commercially successful toy of its type to appear and always stayed well ahead of its numerous imitators. Then came the model railway engines which evolved from kits made originally on the Meccano principle. They first appeared in 1920 in order to fill the gap left in the market by the cessation of German imports during the war. By 1925 Hornby had abandoned the initial concept and moved to producing finished models, ready assembled from specially made components. Finally, there was the famous range of diecast transport toys – aeroplanes, boats and, above all, road vehicles – which first sold under the name of Dinky Toys in 1934. These carried the whole art of model making into a new dimension. The essential engineering quality and realism that went into all three lines became legendary. There were plenty of competitors but none could match the quality. Few commentators would have disagreed with the verdict of a trade journal in 1930 that 'Messrs. Meccano Ltd. may justly claim to be one of the pioneers of the British toy industry and their position today is such that they stand alone in the particular class of goods which they manufacture.' When Dinky Toys first appeared shortly afterwards the same paper observed that their 'outstanding features are quality and finish'.

Having established a lead in the field and, when necessary, protecting it with vigorous resort to the patent laws, Hornby kept his products firmly in the public eye with a series of well advertised developments. For Meccano there were low voltage electric motors and coloured parts. In 1925 the first electrically driven trains appeared and they were followed just before the Second World War by the smaller Hornby Dublo system of trains. The realism of the Dinky cars was further enhanced by the use of rubber tyres. Further more, all of Hornby's products had the advantage that once purchased, they could quite easily generate additional sales. Meccano was available in sets of increasing size and complexity, encouraging modellers to attempt ever more ambitious constructions. In the same way the acquisition of a train set led inevitably to a demand for additional rolling stock, more elaborate track layouts, as well as lineside features, such as stations and signals.

But quality alone was not sufficient to sell the goods. The success of the firm depended secondly, therefore, on Hornby's eye for a market and his selling skills. The original construction set appeared at a fortuitous moment in that it coincided with the growing middle class prosperity and toy buying of the Edwardian period. But it is important to note that initially it was slow to sell, a reflection perhaps of the fact that Hornby's previous business experience had been in the grocery and meat trades. He was quick to learn, however. Advertising costs appear in some of the earliest balance sheets and the acquisition of a London office gave him an important physical proximity to the major domestic market. Quite soon he decided to eschew the wholesaler, who dominated the selling side of the British toy business, opting instead to sell direct to selected retailers. In effect, therefore, he was creating Meccano franchises. This ensured customer loyalty and was backed by a first rate repair service and assistance with shop display work. As early as 1923 the Toy Trader was commenting that 'dealers handling Meccano products are particularly fortunate as they have the backing of Messrs. Meccano Ltd. in an ample supply of publicity matter.' Above all, the advent of the Meccano Magazine, launched in 1916, proved a remarkably effective advertising medium. Even at sixpence the English version achieved monthly sales in excess of 70,000 by the early 1930s. If they wished, readers could enroll in one of the two clubs which Hornby also organized, capitalising on the interwar enthusiasm for such organisations. The Meccano Guild was started in 1919 and had a membership of 100,000 by the 1930s. A similar function was performed from 1928 by the Hornby Railway Company, which brought together the model train enthusiasts, 'thousands of boys from all over the world.'

For a British toy manufacturer Hornby was unusually aware of the overseas market. In 1913 he organised the first international Meccano model building contest and was gratified to receive entries from Europe and the Americas. This reflected the success of his overseas marketing policies. As early as 1909 he appointed an exclusive agent to cover Meccano sales in the United States. Three years later he established an independent company to manufacture Meccano products in France (now the home of 1990s Meccano production), and also arranged to have them distributed in Germany by Marklin, then the best known of Europe's metal toy producers. Overseas sales were further boosted by the inclusion of foreign instruction manuals in the construction sets, while the Meccano Magazine was produced not only in English but also in French and Spanish. Such arrangements provided direct access to the major toy markets of Western Europe. As a result, by the early 1930s rather more than a third of Meccano's average annual sales were overseas. Annual export sales averaged £137,000 at a time when total British toy exports were running at about £420,000 a year.

After Hornby's death in 1936 his son, Roland, took over as chairman of Meccano. Roland though had little impact on the immediate running of the company as he left this to the managing director. Roland was very keen at golf and this was his greatest interest. There was also a brother called Douglas who died in 1950 and hence his widow Una Hornby

was placed on the Meccano board and remained there along with Roland until the takeover of February 1964.

In the first decade after the end of the Second World War profits soared, once initial shortages of raw materials were overcome. Tariffs and import quotas protected the home market and in any case major prewar producers such as Germany and Japan had other priorities. The scarcity of serious competition made the export market especially accessible. Even if the large American industry had been geared for exports, which it was not, potential overseas purchasers preferred to devote their scarce dollars to more essential commodities. For established market leader like Meccano, sales were easy and generated average annual pretax profits of well over £400,000. From the mid 1950s onwards, however, profits began to decline. Even the enforced resignation of Roland Hornby in 1964 and a takeover by the world's largest toy manufacturer, Lines Brothers, merely slowed the slide. Profitability was restored temporarily. This was brought about by the reduction of the senior staff in particular and transferring model train production to G & R Wrenn Ltd.. Long term though this compounded future problems as the core Hornby Dublo tooling asset was sold for a fraction of cost. This had the effect of upsetting a lot of employees at Meccano according to a long serving toolmaker at the time. Lines were very conscious of the value and threat of the Dublo tooling to their own Tri-ang brand. In a letter from Moray Lines to Richard Lines he states '*I would be strongly against selling any old Meccano HO tools to Trix under any circumstances. This would simply aid a possible competitor*'. The fact was, the 1964 takeover was a business decision to monopolise the toy market. If the Lines Brothers did not make a substantial profit out of Meccano, Lines other divisions would because of the lack of competition. After the takeover in 1964 the only completely new product which did prove successful was Plastic Meccano. Moray Lines in a unit attached to Minic did the development at Canterbury. Plastic Meccano would have been unthinkable in the early 1960s but could have saved the company from takeover. But this when introduced by Lines and a colour change to the main series, helped to revitalise Meccano.

The Lines Group itself collapsed in 1971 before underlying problems at Meccano had been properly addressed. A second takeover, by Airfix, proved no more successful. In the three years before Airfix finally closed the Binns Road factory at the end of November 1979, Meccano's losses had reached more than £4,000,000.

Meccano's collapse was the first of a series which over the next few years decimated the indigenous British toy industry. But in the fact of the company's failure was noted by both the national and trade press, the causes were not much discussed. Both were more taken up with the virtually simultaneous demise of Britain's largest independent toy manufacturer, Dunbee Combex Marx, which went down in circumstances sufficiently uncertain to prompt a Stock Exchange inquiry. The survival of the Meccano archive is thus a major aid to our understanding of the company's failure.

(to be continued)



IN HAWKES BAY: To modellers who visit Hawkes Bay, I recommend calling on Trevor Adam in Napier. Please telephone first, as Trevor works variable shifts. He will make you very welcome and show you his large collection of Meccano (and other Model Construction Systems) parts, sets and literature as well as many working

models. The pick of these is surely his 7 ft. tall Ferris Wheel. Into it Trevor has built several interesting design features. His current projects are a large gantry and a dragline excavator. (picture of Ferris Wheel in next column).

MODEL ENGINEERING (ME): Nos. 4144, 4146 and 4148 contain a well illustrated series by Alan Bibby on model engineering in New Zealand. It is mainly about the Model Railway Societies such as Havelock North and Rotorua. Copies of ME should be available in your Public Library.

MACABRE MECCANO: Radio New Zealand, in its 'Revolutions per Minute' programme dealt with memories of the rituals of the gallows. It was entitled 'The Meccano Set'.

References from *The Dictionary of New Zealand English* (OUP, 1997) are:

Obs. Prison: A jocular or euphemistic name for a hangman's moveable scaffold.

MacKenzie: 'While we have Prisons' - "At this time it was decided to have a moveable scaffold capable of being transported to wherever required. A later version of this contraption became known as 'The Meccano Set'. The term was used in official telegrams - 'Meccano Set arrived safely and erected'." (Thanks to Lou Nichols for this happy item).

SET 10 PRICES: A mint blue/yellow/zinc Set 10 was auctioned on eBay in April and fetched \$US3499 (approx. \$NZ8000).

QUOTATION:

The river tide was sluggishly at the ebb. Away on the other side, a row of cranes stood like Meccano toys in the beginnings of dusk.

(From 'Flying Finish' by Dick Francis.). (Thanks to Bruce Neilson for this one).

BEARINGS: Several Spanner Newsgroup members have recommended using the 1½" 5 hole plastic strips (P/N 260c) as axle bearings, saying they give good support and smooth running. A snag may be the amount of space they take up.

CLEANING BRASS PARTS: Nick Rodgers (UK) says his most successful cleaner of brass parts is the tablets you dissolve in water to clean your false teeth.

QUOTATION:

I find this (Spanner) Group amazing. You post a question at 2200 hours on Day 1 and within 3 hours there are answers from the UK, Portugal and Argentina.

(Peter Bridger, UK).

GLUING PARTS TOGETHER: Terry Dixon uses superglue for temporary joining of Meccano parts when a bolt and nut won't do. He says the glue will break its bond under gentle heat and the residue is easily cleaned off. (*International Meccanoman* (IM) No. 34)

NUT FIXING: To fix short strips behind a join where it is difficult to hold a nut in place, Howard Somerville suggested pre-fixing nuts, one at each hole, with superglue. He says the nuts can easily be removed afterwards and the superglue leaves no visible trace. Dave Fellows has made nut strips like thick fishplates, with threaded holes, to get the same result. (*West London Meccano Society Newsletter* (WLME) April, 1999)



MECCANO IN 1819

?: Maurice Whitta has researched a metal construction system devised early in the 19th Century which seems to have been a direct

forerunner of Meccano. It was invented by William Farish who was a Cambridge University Professor of Natural and Experimental Philosophy. He demonstrated his lectures with mechanical models which he was able to take apart and rebuild the parts into new models for his next day's lectures. Whitta's research is described in ME of 13/2/98 and reprinted in the WLME April, 1999.

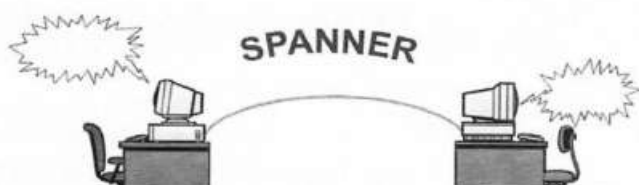
KEITH CAMERON'S MECCANO: Bob Galler, in New Mexico, USA, acquired Keith's Meccano collection as well as his extensive Meccano library and hundreds of photographic negatives of his models

SPRING CORD TIP: If you fit a loop of spring cord around a pulley it will run in the centre of plastic caterpillar track. (George Illingworth in IM No. 34)

THE BRIGHTON RAILWAY TRAM: Mike Dennis built a model of the Magnus Volks tram which ran along the Brighton (England) foreshore on underwater rails. His model is mostly Meccano and is described in ME issues No. 4152 (10/8/2001) and 4154 (7/9/2001).

DID YOU KNOW ?

1. Every 60 seconds your blood makes a complete trip through your body.
2. All polar bears are left-handed and bats always turn left when leaving a cave.



The use of email from the Spanner group is acknowledged.

Insulated Plates and Strips

I have just tried the production of insulated plates and strips by machining pieces of scrap Formica (Melaminic paper laminate) with success. Using a similar Meccano part as a template it is very easy to drill, saw, grind to shape a piece of Formica panel. Here I can get them with four different thickness. The ones most suitable are 2.1 mm (for paving floor) and 1.3 mm (for wall covering). For long strips they have the undesirable tendency to be arched, but even so you may cut them parallel to the generatrix. They come with a brown back and a coloured front face that could be chosen to match any colour scheme. You do not feel guilty if you have to mutilate it in order to fit micro electric components like sockets, switches, LEDs etc. (Edmundo Veiga, Rio, Brazil).

Key ring

Just to let you know that I managed to obtain an official Meccano Keychain. This is a metal $1\frac{1}{2}$ " x $1\frac{1}{2}$ " red flat plate with an "M" punched in the centre. (Joe Attard, Malta).



Renumbering of Meccano Parts

I have just received MW Models NewsSheet May 2002, as no doubt many of you have. I was jolted to read on page four as follows: "Meccano have introduced a parts numbering system. All parts are divided into sections, with an appropriate prefix letter. SUFFIX LETTERS ARE NO LONGER USED (my bold typing). The first digit of the new part number varies to correspond to the deleted suffix letter. Old and new numbers are shown alongside each other in the instruction manuals included in the latest "Crazy Inventors" sets. As information becomes available, details will be included in our NewsSheets".

This is indeed momentous news, and an example is shown on page two for Crazy sets 5650 and 6651. Thus: Part No 2 becomes A202, 6A - A506, 9F - A109, 12 - A012, 12C - A712, 147D - A247, 235D - A415. (Joe Attard, Malta).

Book "Meccano – Un joven de 100 años"

(1) Dr Raimón Ripoll Espiau has sent his excellent historical work "Meccano – Un joven de 100 años" ("Meccano - A 100-years old young man"). The work is very good, as well as the printing job. In all, over 50 pages full of colour images. The author takes us through a year-by-year review of the principal events that mark the development of Meccano, starting 1901 and up to 2001. This work is a limited edition specially prepared for the Meccano Centennial Exposition that took place in Barcelona, Spain, during December 2001 and January 2002, but I think it is worthwhile trying to obtain a copy. It should appeal particularly to Spanish speaking

enthusiasts. The cover displays an amazing model of the Templo Sagrada Familia (Church of the Holy Family) at Barcelona. The church was designed and built by Antonio Gaudi, the famous architect, who died before completing it. The model was built by Luis Fleck. (Juan Carlos Rovetta, Buenos Aires, Argentina).

(2) I suggest you snail-mail the author. This is the only way I have ever communicated with him, except for a not-so-cheap phone call last year. The address is: Dr Raimón Ripoll Espiau, Madrazo, 26-28, Barcelona 08006, SPAIN. (Juan Carlos Rovetta).

Lead Weight corrosion.

As far as I know the original Meccano Lead weights were pressure die cast from a Lead Zinc Alloy and the white powder that they develop with age is a Zinc compound, I would suggest carbonate but I may be wrong. In the 1927 #7 Outfit I found many years ago, and now owned by Jacques Vuye, the weights as found not only had the white encrustation but part of them had been eaten away. I carefully removed all the "corrosion" with a wire brush and then coated them with Wattyl Estapol and that stopped any further deterioration. (Bill Inglis, Australia).

Your Face on the Internet.

Not every Spanner can get to Skegness and have his photo taken. Why not send yours to the photo gallery of Meccanomen which can be found on the ISM website at <www.internationalmeccanomen.org.uk>.

Send your photo as a .jpg file attached to an email to <anthias@actcom.co.il>. (Michael Adler, Israel).

Welding parts.

Recently I found a couple of $5\frac{1}{2}$ " Perforated Strips and a $12\frac{1}{2}$ " Braced Girder that were broken in two. These were saved from collections that I had obtained second-hand recently. I took the items to a welder friend in business and, for a couple of dollars, he carefully "mig" welded the pieces together. Then I did a little bit of filing and sanding to remove the excess welding which gave me reclaimed parts that are now being painted. (With careful hand-work it is very difficult to see where the parts were broken). (Alistair Tong, Hawera, NZ).

**Don't Forget That Next Year
is Convention Year!**

10 Months to Go

New Zealand 2003 Convention.
18 -19 -20 April 2003.
Community Centre, Albion Street, Hawera.
Organiser - Daryl Anderson.
Email <meccano2003nz@bitworks.co.nz>.

For more details turn to page 7

Some Non-MECCANO Sets - Part 2



This illustration is of Buz Set No 6



A Wisdom No 3 Set

Buz Builder was first made in Australia from the late 1940s until September 1974. Manufacture then moved to New Zealand where it was produced from 1976 until 1990. Buz is similar to Meccano with the same hole diameter and spacing, but it does not match the quality of finish of Meccano.

Construction Models was manufactured in China from 1983. It is not known when production ceased. The sets were marketed under the name Wisdom and while quite well made, could not be used with Meccano as the hole spacing was 12.75mm and the hole diameter 4.3mm - just enough difference to be annoying!



Boy Constructor comes from the USA. Bolts are not used; the parts are connected by metal pins which are secured in place by rubber grommets.

Constructionneer was produced in USA briefly from 1947 to 1949. As the hole spacing is 11.2mm and diameter 4.7mm it is not compatible with Meccano. The above set is in a good metal box.

Auckland Meccano Club at MODEL X 2002

by William Irwin

The MODEL X Model and Hobbies Extravaganza held at Henderson over the Queen's Birthday weekend, under the auspices of the Western Districts Model Railway Club, was attended in record numbers by the public. The Auckland Meccano Club participated again after a two year break and our four tables were jam-packed with models. The magnificent Meccano sign contributed by John Denton ensured that our location was visible from every corner of the hall.

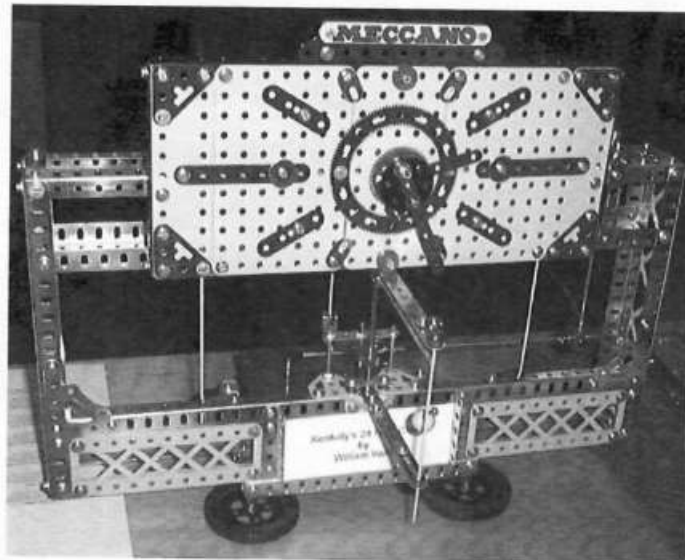
We were very pleased to welcome **Bruce Geange** from the MWT club for the day on Saturday, and were proud to show his fully operational Caterpillar tractor alongside our models.

John Denton had a fine collection of models, including a nickel tower crane as shown on the 1925 manual covers. His various smaller models included a vintage car, Jeep, 3 wheel Morgan, motorcycle and sidecar (SML3) all in red/green. His woodpecker on a pole from the 1920s and a walking elephant from one of the new Meccano sets amused the public, while in the background his octopus fairground model driven by an E020 cricket ball motor whirled around gaily.

George Ovenden provided 3 models with crank handles which proved very popular with the children, namely a ferris wheel, swing boats and an ingenious right angle drive without gears using sliding rods. Junior member **Jonathan Ovenden** (George's grandson) showed a Set 5 gantry crane.

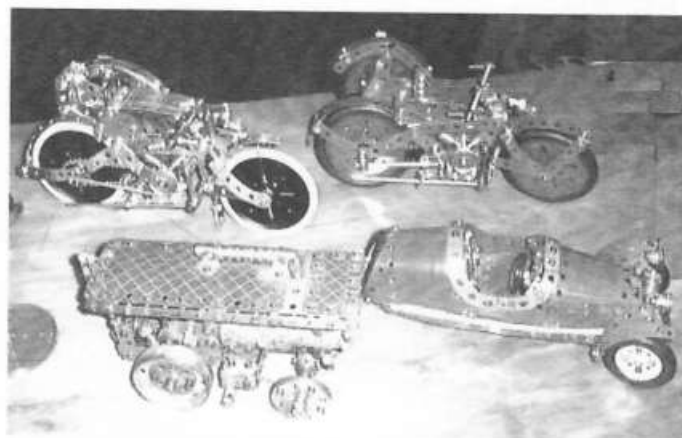


Graeme Wrightson and son **Kegan Wrightson** produced a fine combined effort in three very mini models of steamrollers suitably written up. Graeme showed a tower crane similar to John Denton's but in red/green, a railway crane and a swivelling jib crane. Kegan showed a magic motor driven beam engine, crane truck and plastic Meccano jeep.



William Irwin's Konkoly Clock

William Irwin showed his Konkoly 24 hour clock with the ingenious centrifugal intermittent motion escapement mechanism, as well as Hoppy the robot. Hoppy unfortunately hopped off the edge of the table on Sunday and bumped his head, which necessitated running repairs on Monday leaving a very bent rod with keyway needing to be straightened! William also showed a motorcycle and sidecar similar to John Denton's but in zinc plated parts. A really fun model was the new Crazy Inventors Airship with its flapping wings which really amused the public. William's south seeking chariot yet again elicited a lot of interest.



Bruce Haines's Mini Models

Bruce Haines brought along a selection of delightful mini models, including a road grader. Our chairman **David Wall** showed one of his usual exquisitely crafted stationary steam engines on Sunday.

It was an excellent show, made all the more pleasant by the proximity of Hornby Dublo and Hornby gauge O layouts alongside our tables. Thanks to all members of our club who helped and participated.

MWTC

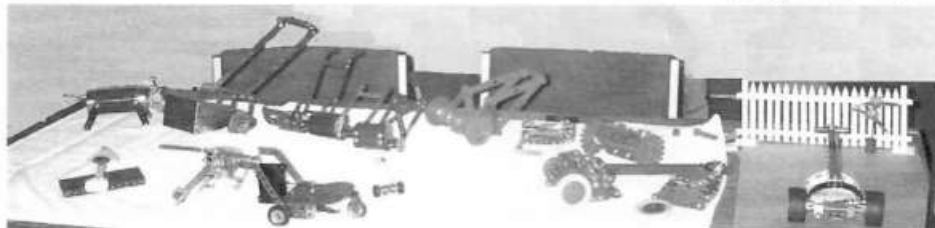
MECCANO CLUB

Meeting Report for 8 June 2002

by Paul Vodanovich and
Bruce Neilson
Photographs by Daryl
Anderson

According to recent
television advertising,

there are herds of cows and flocks of sheep, so how would you describe a table load of Domestic Lawn Mowers? A clutch?



The Lawnmowers

Starting at the right hand side and along the back of the table, the above picture shows:

- Masport fully working hand mower in yellow/zinc with blade twist, internally geared wheels, cutter blade, catcher, and complete with lawn, flower, and picket fence by Bruce Geange. This was created in one evening

- Two Junior Plastic mowers, and a three blade metal mower incorporating Elektrikit parts and Moody brass discs, created in three evenings by John Hansen.

- Four domestic mowers re-created from 1919, 1928-31, 1935, and 1939 Manuals by John Ince.

- A self-perpetuating, environment friendly, Goat-a-Mower by Lloyd Spackman.

Starting at the right hand side and along the front of the table:

- Masport fully working hand mower in red and green with cutter bar and catcher, road wheels, external plastic pinions, bolts through trunnion oblique holes, and corner brackets. Thirty hours work by Alistair Tong.

- The fastest mower in the West. A mini hand mower built in five minutes by Daryl Anderson.

- A Hayter rotary mower from the 1950s. Powered by a clockwork Magic Motor, this working model could not quite emulate the real one when Chris Morton mowed

the school lawns and was able to fire daffodil bulbs out as 30mph missiles.

- The helicopter is actually upside down. In it's gorse and grass cutting position, the pilot suffers from a rush of blood to the head. Presented by Michael Anderson.

- A revolving arrow on a base. How does this fit into a Domestic Lawn Mower exercise? Well you gather the family in a circle around the arrow, Dad spins the arrow, and when it stops, the person the arrow is pointing at gets "Its your turn to mow the lawn!!". As explained by Robin Rye.

(Detailed construction plans of some of these lawn mowers will be published in the December 2002 issue of this magazine - Editor).

In the normal model tour, members had a variety of Meccano and Meccano related exhibits.

Daryl Anderson had coloured printouts from his new laser copier ranging from hobby cards, 4" x 6" pictures up to A3+ pictures, Meccano Manual cover replicas etc. This lead onto a general

discussion on digital cameras and their workings and advantages.

Don Blakeborough had a pair of dice put together by a cunning plan which made the assembly nearly impossible to reveal.

Bruce Geange has made bulldozers a

specialty for some years and the evolution continues with a RD8 from the 1940s, motorised by a PDU, which had separate steering for each track to lock or drive through differentials and a forward/reverse switch. An neat McCormack Farm Tractor was also displayed.

John Ince demonstrated his infra-red controlled Payloader as seen in MW Modelplan No 124.

Lou Nichols has started his Convention 2003 model which is the Krazy Klock from a Canadian MeccaNotes model plan.

Lloyd Spackman likes Stationary Steam Engines and had a very unusual Revolving Cylinder Steam Engine (see picture in Wellington Meccano Club Report) in immaculate colours and parts. His next project is a reconstruction of the 1928 SML Pontoon Crane and the spider bearing was displayed. Alistair Tong presented a 2.5 amp power supply which comes in kitset form.



The Critics: from left to right:- Bruce Neilson, John Hansen (with cap), Chris Morton and Alistair Tong (also with cap)



The Admirers: Lou Nichols discusses Bruce Geange's model with Bruce and Paul Vodanovich.

Wellington Meccano Club Meeting Report 31 May 2002

by Bryan Jones

The Wellington Meccano Club meeting, which would have been held on 7th June, was brought forward to 31st May. Seven members attended, and brought several models being prepared for the Club display at the 2003 Convention. Much of the evening was spent examining the various models and discussing proposals for combining them into the display.

Of particular note were two models brought by Lloyd Spackman. The first was a rotating cylinder steam engine, the original of which was built by the firm of P Black and Son in 1873. In this unusual construction the piston rod was attached to the rim of a large flywheel, and the rod operated almost radially to a double acting cylinder mounted near the flywheel axis. The cylinder rotated with the flywheel, the stroke being provided by the fact that the cylinder rotation axis was eccentric to that of the flywheel. The original would have required a coaxial steam joint to supply and exhaust

steam to the cylinder. Lloyd's model was constructed from a plan published by Colin Hoare in the March 1991 "Canadian MeccaNotes".

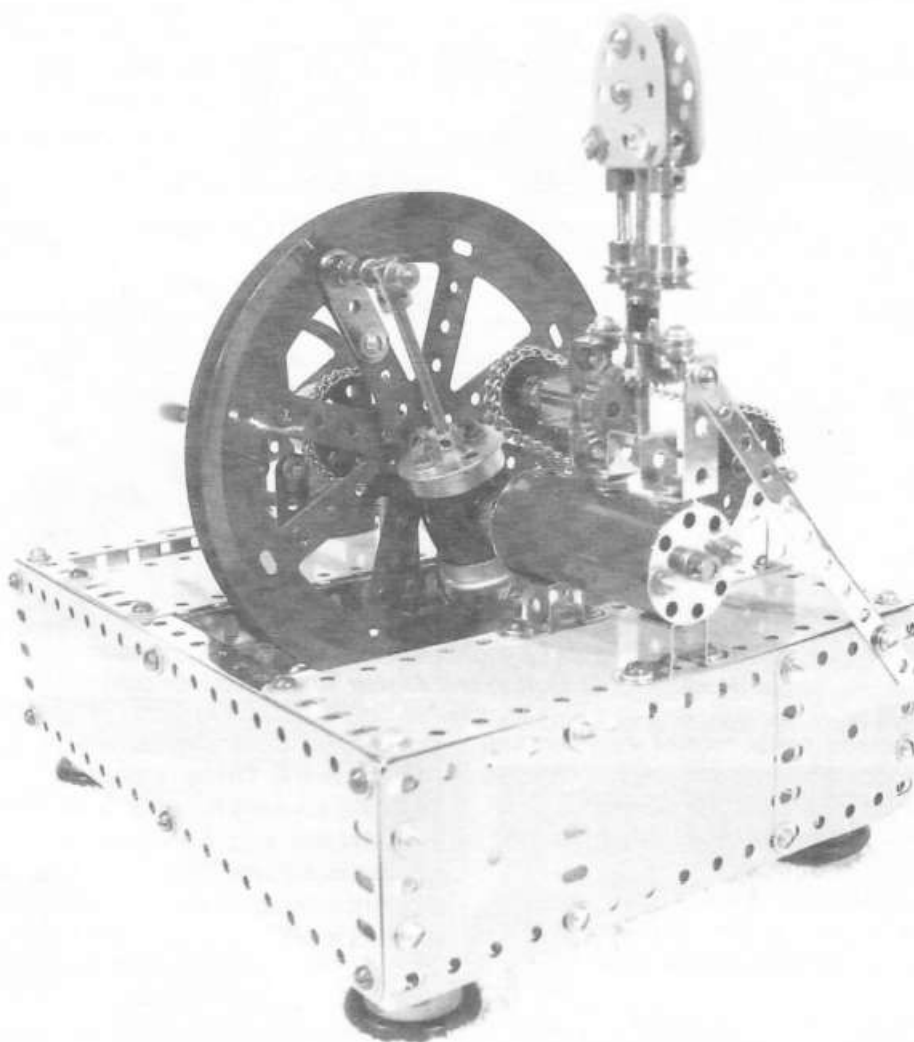
Lloyd's second model was the "spider" for the turntable of the SML Pontoon Crane. He is making it up to fit circles made from W. Inglis replica Channel Segments, but has changed the original design in two ways. He has used the 2 1/2" strips with centre holes to attach eight extra flanged wheels, making sixteen in total, and by using Small Flanged Wheels the appearance of the complete turntable is greatly improved.

Laurie Webb spoke of a visit he recently made to the Maylands Meccano Club in Perth. He had made contact with member Ross Smith prior to visiting, and a few of their members had held a meeting to show him their clubroom. This turned out to be a fine hall, built for the club in 1935 by a generous benefactor, who also set up the club with several Set 10s and a large collection of Meccano literature. Over the years the membership had peaked at about 40, who had been quite active judging by the much used appearance of many of the parts and the literature, but the membership is now declining and they have difficulty in attracting young members.

Simon Moody introduced his idea for a "Keep It Simple" convention, a wider-membership club meeting to be held at a central location on the years between Conventions. Details of his suggestion are to be circulated to other clubs for comment.

A letter was received from Capital E, the educational discovery centre in Wellington, asking if a display of Meccano could be staged in 2003. We thought that the best time might be a weekend after the Convention, when a number of models would still be available.

Lloyd Spackman enquired if anyone knew if a nose cone and cockpit for a Space Set might be available. He knows of someone who is interested in buying these items



Lloyd Spackman's Rotating Cylinder Steam Engine

-all offers can be made direct to him.

Supper was held during the meeting, and proceedings ended at around 10:30 pm. The next meeting will be held on Friday, 2nd August, probably at St Luke's, Wadestown. With the rebuilding plans for the community centre being delayed, it will be advisable to check with Lou Nichols that the venue has not changed.

Christchurch Meccano Club Meeting Reports

by Ian Torrens

April 2002

A quiet evening for our April 2002 meeting, with only eight members being present. Unfortunately no models were on display. Quite a disappointment. General discussions of a varied nature filled in the evening until supper was served. This was at 2045 hours and the meeting finished at 2115 hours.

John's "eBay Auction" Column

by John Hansen

Hope you enjoyed my last column. This month, let's have a look at some special sets, Meccano literature, obsolete parts, and end with a curious Meccano item.

Special and Theme sets.

Meccano Motor Car 1930's. Red body, cream mudguards. Good condition and has Stokys wheels as two rear wheels. Clockwork motor OK. Seller lives in Switzerland. Sold for NZ\$1050.

Meccano Clock Kit No 1. Box in good condition. All parts there except the replaceable paper discs. Sold for NZ\$160. 1976 Crane Building Kit. In superb condition, decal sheet unused, only missing few nuts and bolts. Building instructions there and box in very good condition. Sold for NZ\$85.

1981 Hyper Space set. Box and set in near mint condition. Not a popular set of it's time. Sold for NZ\$110 with four bids.

French Meccano 4M 1960s-1970s. Blue box with red plastic inner tray. Parts look to be in good condition and box is good to vg. After nine bids, sold for NZ\$38.

Meccano Gears outfit "A". In the words of the seller, "in its original box in mint condition with instruction manual and guarantee". Looks vg for it's age. Box a little scruffy. Sold for NZ\$90.

Meccano literature

1938 full product catalogue from Hamleys in the UK. 72

THE ALTERNATE YEARS

by Simon Moody

Two years between conventions is quite a long time. I have had a thought that a meeting of the NZ Federation could be held in the year between the conventions - 2004, 2006, etc.

1. Keep it simple.

2. That it will be a **meeting** for Meccano enthusiasts, NZ and any overseas ones that are here anyway or that care to synchronise a tourist venture with the meeting.

3. Hire a venue in Turangi or nearby. (I will not mind organising it. Not having anything else to do apart from providing a venue will enable it to be done from afar. I travel through the centre of the North Island and Turangi often enough to be able to check out some facilities.)

4. Turangi is roughly central in that it is about 4 1/2 hours drive from Auckland and Wellington. Closer to Napier and New Plymouth and those in the Waikato and Central Districts are closer still, i.e. it will be a relatively easy drive.

5. Meeting Saturday 1pm or 2pm until whenever including a group meal. Sunday activity optional. To be talked and decided about.

6. Turangi being a tourist centre has accommodation and restaurants in it or nearby. There are also other attractions/activities. Even to stay in Taupo on Friday and/or Saturday night

May 2002

For the occasion of our May 2002 meeting, nine members were present on a mild summer night. No Meccano models were on show but Eddie Wiley brought along an ACTO set with a model of a man carrying Rocket Launchers. Quite a neat model. As this was the only model on show, general discussions followed until supper. This was at 2045 hours and the meeting finished at 2100 hours.

pages and one of those catalogues that are very desirable to own. In excellent condition. NZ\$140 the selling price.

Dinky, Hornby Dublo, Meccano price lists 1956/57/58. In good condition. Appears to be NZ price lists. Sold for NZ\$37. 1971 Meccano Price list in vg condition. Quite common. NZ\$10.

Very early Meccanoland book. Cover shows a ship being loaded by a Meccano crane. Very good condition for it's age. Sold after six bids for NZ\$260.

1940's Meccano manual 3A. French in vg condition. NZ\$70. Set of 1986 No 10 pamphlets. All 30 there (one a photocopy) in good condition. Not sure if plastic folder to hold them in is there. Sold well at NZ\$120.

Obsolete parts.

Meccano Felt Pennant or Flag. Sold from NZ. A deep blue triangular flag with Meccano in red printed across it. In very good condition and very rare. Sold for NZ\$350 after eleven bids.

Pointer P/N 156. VG condition. NZ\$40.

Original Digger Bucket. Grey in excellent condition. Would look great on any model. Realised NZ\$100.

Meccano Flywheel. NZ sale. Black in good condition. Sold well at NZ\$75.

And to end here's a curious item from the past. A 1930's Meccano instruction book in Japanese. It is 136 pages long and is in fairly good condition. Can't tell you what Sets it covered as my Japanese is very limited. Sold for nearly NZ\$200.

That's all for this time. Happy collecting.

involves only a 40 minute drive down the side of the lake to get to Turangi. What I am getting at is: **make it a weekend away!!**

7. Keep the meeting to an 'ordinary' weekend to avoid clashes with the masses and high traffic periods.

8. Late March or April seems good in that it avoids snow bound roads on the Central Plateau.

9. Try to take a model and I will provide a theme also. I have a challenge type one in mind that is not too large (shoe box approximately, especially if you are 7'4" tall).

10. \$\$ Costings \$\$ Make the registration fee \$20. I cannot see that a venue such as a community/ school/ church hall will cost much more than \$200 (probably less), allow \$100 for incidentals = \$300. Say 20 x registrations = \$400 therefore \$5 refund to registrants. More registrations equates to a bigger refund as I cannot see a reason to do anything apart from breaking even.

11. Incidentals to cover tea, coffee, sugar and milk. Meals are the participant's responsibility. Group meal to be paid for individually and I will notify the restaurant of numbers.

12. Think about it. Drop me a line sooner than later. Blue Mountains Rd, RD 1, Upper Hutt or email <moodys@ihug.co.nz>.

New Zealand Club Diary 2002

Auckland Meccano Club.

Contact - David Wall - Ph 09 426 1965.

Meetings at 2 pm on second Saturday every third month.

10th August - Neil Carey's home, 23 Eaton Road, Hillsborough, Auckland.

9th November - George Ovenden's home, 19 Richards Avenue, Milford, Auckland.

MWT Meccano Club.

Contact - Bruce Neilson - Ph 06 355 0776.

Meetings at 2pm on second Saturday every second month at St. Luke's Church Hall, cnr. Cornfoot and Manuka Streets, Wanganui.

10 August, 12 October.

Wellington Meccano Club.

Contact - Lou Nichols Ph 04 973 6177.

Meetings at 7.30 pm on first Friday every second month at ?? (contact Lou to get place of meeting).

2 August, 4 October, 6 December.

Christchurch Meccano Club.

Contact - Graeme O'Neill Ph 03 322 7456.

Meetings at 7.30 pm on first Friday every month (except January) at St John's Hall, cnr St John St. and Ferry Rd., Woolston, Christchurch.

5 July, 2 August, 6 September, 4 October, 1 November, 6 December.

Additional Meccano Contacts

Hamilton - Don McClelland Ph 07 847 4503.

Wanganui - Tom Pittams Ph 025 274 8486.

Palmerston Nth - Bruce Geange Ph 06 357 0566.

Napier - Trevor Adam Ph 06 843 4837.

Internet sites

International Society of Meccanomen (ISM)

<www.internationalmeccanomen.org.uk>

Meccano Webring <www.meccanoweb.com/meccring>

Articles etc. for the August issue of NZFMM Magazine should be sent to the Editor well before 14 August 2002.

Back Numbers - NZFMM Magazines from April 2001 are available. Contact the Editor

Inclusive Parts List (IPL)

Meccano Model Builders have been presented with an ever growing range of parts, many of which, while conforming to Meccano standards of hole size and spacing and thread size and gear pattern, have greatly expanded the usefulness of the system. The Inclusive Parts List (IPL) has been produced to provide Meccano enthusiasts with information as to which parts are available, what they look like, and where they can be obtained. There are those who prefer to use only parts produced by Meccano Ltd and its subsequent owners, and there are also many who like to use parts which are compatible with the original Meccano system. The latter group feel that parts development should not cease because the original company no longer exists, and would like to see parts developed that reflect modern advances in engineering and technology. Most models built lately are known to have many parts which have been altered from the original or incorporate compatible parts. For developers of Model

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Buy, Sell, Auction, & Exchange.

Advertisements in this section are free.

First insertion will be printed in full.

Subsequent identical insertions (max. one) may be abbreviated to fit space available.

For Sale - Meccano Supplies.

Contact Wayne Blakely.

Phone 06 327 6184, Fax 06 327 4184.

Meccano Parts - New - Used - Replica.

If you are short of Meccano parts for your Convention model, I may be able to help.

If phoning, please leave a message when I am not available.

For Sale - WRI Replica Channel Segments P/N 119.

Models which show my Channel Segments in use are shown on my Internet site <www.meccanonut.com/wri/>

Available in Nickel Plate, @ A\$30-00 per set of 8 (= one circle) plus postage and packing.

All enquiries to: Bill Inglis, P.O. Box 620, Myrtleford, Victoria 3736, Australia. Telephone. +61 (03) 5751 1846. Email <inglis@netc.net.au>

Wanted - NZFMM Magazine Back Numbers

Prior to April 2001. Ashok Bannerjee. Email to <shardulad1@sancharnet.in>

Wanted - Meccano Set - No 10 preferably

Kelvin Davies, 6 Sanctuary Point, Pakuranga, Auckland.

Phone (09) 576 4616. Email <Hel_Kel@xtra.co.nz>

For Sale - Meccano Centennial Commemorative Stamps

by Michael Adler, ISM 1 and Doug Harris, ISM 158. Featured is the Giant Blocksetting Crane, with a portrait of Frank Hornby. 'Meccano Centennial' is printed at the top, 'Frank Hornby' below. The stamp is orange, black and white. (Page 18, Oct 2001 NZFMM Magazine). A full colour version may be seen on my website: <www.geocities.com/hornbymeccano>, also my Meccano and Hornby posters. NZ\$20 posted for 5 sheets of 20 stamps, overseas prices on the website. Order there or from Doug Harris at Box 82 323, Auckland. email <digbee@xtra.co.nz>



Plans, it is also useful to have a ready reference source of parts availability in order to broaden the scope of the models they produce.

The IPL has been drawn up by Howard Somerville, whose MeccInv software has become the standard for documenting parts. The latest version 8.0 (which will be released shortly) will have the option to include the IPL.

IPL has been produced in an electronic form for free distribution across the Internet, and will be available in due course in printed form as well. It will be subject to revision and addition as the need occurs. Original parts numbers have been retained, and parts which have similar characteristics have been added incorporating that numbering system and the supplier is identified with a prefix.

The IPL is now available for download from the ISM website. The address is: <www.internationalmeccanomen.org.uk>