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EDITORIAL It has taken about 9 months to produce this Issue and I hope to keep to this time scale for OSN 50.

Shorter NOTES, with thanks to all contributors.

1. *Encyclopédie des Jeux de Construction Métalliques* Jean-Pierre Guilbert has revised & updated this excellent compendium of all known metal construction systems, see 43/1292 & 46/1388. Apart from these changes a most useful addition is that all the pages can now be accessed as PDF's as well as WORD documents. As before the DVD includes a useful Database (called an Index) which incidentally is available on its own as a free download (an EXCEL file) from Jean-Pierre on request. Other new features are an alphabetical list of all the systems included, notes on screw threads, and numerous extra photos of various systems. Jean-Pierre's email address is jeanpierre1g@orange.fr.

Encyclopédie des Jeux de Construction Métallique 49/1484

2. **Snippet. FALCO ELET.** This Italian system was named in 15/426 with the suggestion that it might be related to the German ELECTRIC (see 24/694). The only reference to hand is the manual cover below. Said manual is for Sets 1, 1a, 2, 2a, & 3, and was said to have 42 pages, 23*16.5cm, and to date from 1933. The PR bottom left is not absolutely clear but might be 'L 160 - 7500 - 7:33 - ?'. The children on the cover are not in the ELECTRIC style,



nor are the Motors and the Crane's Base. Also I don't think there were ever ELECTRIC linking sets. So it remains to be seen if there was more than one version of FALCO ELET.

FALCO ELET: S1

[49/1484]



3. **'New' System: NEUER STÄBCHEN-BAUKASTEN.** Urs Flammer sent some details of his set, including the photo above. The box, 25½*16*2cm, has a lid with light blue patterned sides. Bottom right on the label is 'No. 3164'; bottom left a logo pierced by 4 arrows with 'W&S/B' in the centre: Guilbert's *Encyclopédie* gives the maker as Werner & Schumann GmbH (Berlin). The Set's date isn't known but Nuremberg museum suggested 1920.

The 4mm Ø wooden Rods (the two arrowed are original, the rest were added to make the Seesaw on the lid) push into the brassed steel Connectors. Of the latter, 2-, 3-, & 4-Way can be seen in the box & the Seesaw on the lid. All have cutaway centres to allow the arms to be bent – through 120° for the 2-Ways at the bottom of the Seesaw's side frames. An Ebay set had a wooden Wheel of about 3½cm Ø with a bore that looked suitable for the Rods, but there is nothing to suggest that it was an original part.

The text on the lid translates as 'Entertaining employment following Fröbel's principles for children', and this brings to mind another 'Fröbel' set, CONSTRUCTION AUX BATONNETS, from the early 1900s at the latest, see 43/1307. Apart from its date (if the 1920 is correct) and its smaller, 2mm Ø Rods, the two seem to be similar in concept.

NEUER STÄBCHEN-BAUKASTEN: S1

[49/1484]

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CONSTRUCTION in 2014

What follows was gleaned from the Eitech website in April. 10 sets have been added since 2013 (see 48/1467), 4 have been deleted, and the range, with the new sets shown red, is now: 04,05,09-11,12,14-17,22,26,27, 33,35,45,47,51,52,57-59,60,62, 63,67-69,81,83,84,91,92,93,400, 420,450,460,500,1000. Note that No.33, the Eiffel Tower without lights, should have been included as a current set in OSN 48.

The sets' style of packaging is unchanged. The new sets are perhaps not as exciting as in recent years, but one welcome feature in a number of new models is the use of Curved Strips of various radii.

The New Sets: No.04 (330 parts) is a Space Shuttle, a smaller version of the shuttle in Figs.1-3, 18cm long, but without the moving parts.

No.12 (Figs.1,3) is the only new, large model: it has over 1400 parts, and an alternative model (Fig.2) has a framework at the base of the rocket to allow it to stand vertically.

In Fig.3 it isn't clear what detail is revealed in the shuttle's interior when the doors along the top are open, but presumably the arm with whatever it is carrying can then be folded out. Perhaps the structure underneath the shuttle is just a stand to display it.

No.22 (140 parts) is a R/C Buggy, some 20cm long. **No.27**, another R/C outfit, has 350+ parts and is called Jeep.

The 2 models shown, about 25cm long, are rather similar and neither look at all like a WW2 Jeep.

No.52 is a small set to make a 10cm long unnamed, 4-wheel model with a cab and what is probably a dozer blade at the front. **No.60's** model is the Trials Bike in Fig.5, a fair little model I thought though it could do with a saddle.

No.91 appears to be identical to the little Loco introduced in 2009 and shown in 9/1231. **No.93** (120 parts) is a simple (unnamed) Robot, about 18cm high, with flashing blue LED eyes. **No.450** has over 100 part for the 40cm high Berlin TV-Tower (Fig.4). **No.460** is a simple, 40cm high model of the Eiffel Tower made with 250+ parts.

The Deleted Sets: These are as follows with the Issue in which they were noted in brackets: **No.28**, a 300-part, F.1 Racing Car with R/C (45/1360). **No.29**, a R/C Jeep similar in concept to the new No.27, but slightly larger (48/1467). **No.32**, a 50cm long 6-wheel Lorry (27/795). **No.61**, a small Motorcycle (22/622).

Add-on Sets & Accessory Packs: these remain as in 2013.



Fig.1



Fig.2



Fig.3



Fig.4



Fig.5

Snippet. 'New' System: ARMCILO This is about a set called ARMCILO seen on Brazilian Ebay. Apart from 2 extra parts and some very minor differences, the Set is identical to CASTCO's Make-A-Bike outfit described in 39/1167, but with all the text rendered into Spanish. Given the language it probably didn't originate in Brazil, more likely one of the Spanish-speaking South American countries, with Argentina as the most probable.

The Set's box was said to measure 42*26cm and the lid is shown right (ignore the name of the toyshop in white and part of its logo at the top). The only addition to it is 'Establecimiento ROD-MET S.R.L.' along the bottom, perhaps the maker or agent. A date of Dec. 1950 was mentioned in the Ebay ad but without saying what it represented.



Fig.1

The CASTCO's parts were numbered 1 to 12: the new parts are #13 & 14 and occupy previously empty spaces under the red panel at the top of the tray, right. The new parts are shown larger below and are most likely formed rods. The other change is a wire Screwdriver (if original) instead of the previous one with a yellow plastic handle.



Fig.2



Fig.3

The purpose of the new parts isn't known but I suppose they were to be used in new or improved models. I wonder if CASTCO ever added them to the Make-A-Bike set, and if so

whether the model sheet was changed to include them. Or perhaps they were shown in an additional leaflet. There was no mention of instructions in the ARMCILO Ebay ad.

ARMCILO: S1

OSN 49/1486

Snippet: a CONSTRUCTA Outfit

An account of this 100-part Brazilian system, based on a B&W photocopied manual, was given in 14/376. Some details of a No.1 set, the smallest of the 5 basic sets, seen on the Brazilian Ebay follow.



Fig.1a

The outside of the box is whitish and the top of the lid is nearly covered by a label identical in design to the manual cover right. Both their top left corners are printed, or possibly stamped, with the Fig.1a logo. It has some text to its right and its gist, it isn't legible when reproduced, is that Epotec is a company dealing in synthetic resins based in the Brazilian state of Paraná. It has an office at 1740 Avenida João in a town called Gualberto, a head office in Guarayuba, & a factory in Piraquara. It's not clear how, or indeed if, it's connected to CONSTRUCTA. Neither the logo nor the text were on the OSN 14 manual.



Fig.1

Most of the major different parts in the Set can be seen in the open box right. They look like the parts in the OSN 14 Manual, and as would be expected some resemble MÄRKLIN, the Flanged Plate, & the Trunnions (in the bottom right bay); some MECCANO, the DAS, & Curved Strip; and one STABIL, the Wire Stay in the top right bay. The Set looks to be largely complete (the contents were given in an MCS Extra Sheet) and there are actually a few more of some parts than would be expected – the extras include at least 2 of the (yellow) 1" Pulleys, a Curved Strip, & possibly a second Flanged Plate.

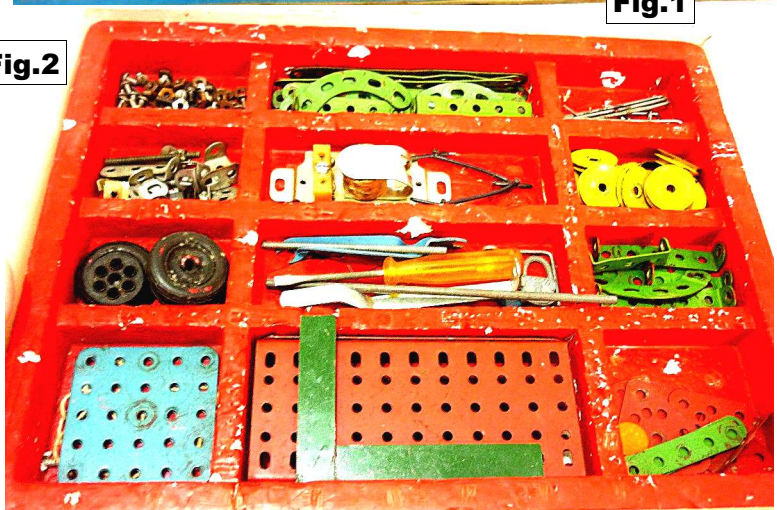


Fig.2

'Foreign' parts are the green strips on the Flanged Plate; the silvery formed strip, the padlock, the longer of the two Screwed Rods in the second centre bay up from the bottom, and perhaps the part in the bay above – it possibly has an electrical coil but doesn't really look like a motor (one was mentioned in the Manual but not illustrated). The 2 Tyres

which should be in the Set could be those in the bay above the light blue Plate but it's odd that one seems to be mounted on a black Pulley, and the other is on, or underneath, a probable foreigner. Said part is almost certainly not a Wheel Disc (there is meant to be one in the Set) – it doesn't match the part shown in OSN 14 (a normal 8h Wheel Disc of '3h' diameter, with normal size holes & radial hole pitch).

CONSTRUCTA [1]: S1

OSN 49/1486

The Gilbert MECCANO 1000-Series Wide Beam Sets

These notes include a description of an apparently complete 1025 set with Snap Rivets instead of N&B.

For anyone who hasn't met Snap Rivets before please see Fig.1 right, taken from the manual in Fig.10. The Rivet has 3 prongs and is made of springy brass. It was introduced in 1934 and some were included in the regular Gilbert MECCANO outfits through 1936 (Nos.1, 3, 5, 10, & 15). Also in the 1934 Little Jim sets (1, 3, & 5). It was probably not considered a great success because the only ERECTOR sets to include it were the 1935 Nos.3½-9½ (36 in each), and the 1935-37 Skyscraper outfits (240 to attach the card Panels to frameworks of A/Gs).

The dates to be quoted are the copyright dates on the manuals with the sets, and as will appear, the N&B in the 1933 outfits were replaced by Snap Rivets in 1934.

Usually a set's number is on the lid's apron, and on the model leaflet, though in quite small type for the later editions. All known 'manuals' are a single sheet folded to give 4 sides.

1933 SETS known (with N&B as fasteners)

No.1000 This Ebay set, the smallest seen, is shown in Figs.2-4, and the date given for it was 1933, possibly the year in which the 1000-Series sets were introduced. Screwed Rods as axles can be seen in the models and these, with the N&B, and other small parts would have been in a packet or envelope glued into the empty space at the bottom of the insert. Most of the parts push into slits in it, but the Strips are held by the usual Gilbert 'T' Clips. Instead of the usual green paint the Strips have a bright finish, probably nickel, as on the A/Bs in all the known 1000-Series sets.

No.1025 An Ebay set, said to be from 1933, is in a larger box than the No.1000. The lid is in the same style but the models are a Sand Yacht, Telegraph Pole, Delivery Wagon, Railway Footbridge, Beam Engine & one other, possibly a Hoist. An open box is shown in Fig.5 (courtesy Gaston Marette). A/Bs instead of ¾" Washers should be in the slots below the printing top centre, with the latter in the green packet. The Manual's front page layout is like the 1000's but the 6 models on it are a little more ambitious; they include the Beam Engine, Railway Footbridge, & ?Hoist on the lid. The back page is in MCS with 12 models followed by the 3 for Set 1050 shown in Fig.7.

No.1026 Details of this outfit were given in 24/706, and it seems to have been the same as the 1025 but in cheaper packaging. The parts are as in the 1025 except that the Wheel Discs are dark blue. The manual had been changed by substituting '1026' for '1025' on it.

No.1050 The Model Leaflet in an Ebay set was said to be dated 1933. The lid is in the Fig.2 style – its 6 models are a Derrick Crane, a Hammerhead Crane, a Windmill Pump, a Press or Stamping Machine, plus the Shovel and Reaper below. The open box is shown in Fig.6. The parts which don't push into the insert are held with U-clips, and there were no doubt parts above and below the Flanged Plate held in the same way. The Strips in the box look to be single parts but more would certainly be needed for the 1050 models. The Model Leaflet has the Fig.4 layout but with only 4 models on the front, the 3 in Fig.7 plus the Windmill top left on the insert.

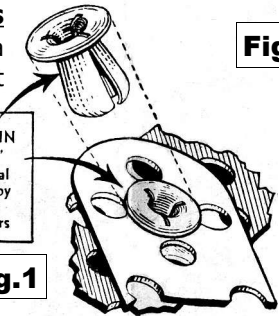


Fig.1



Fig.2



Fig.3

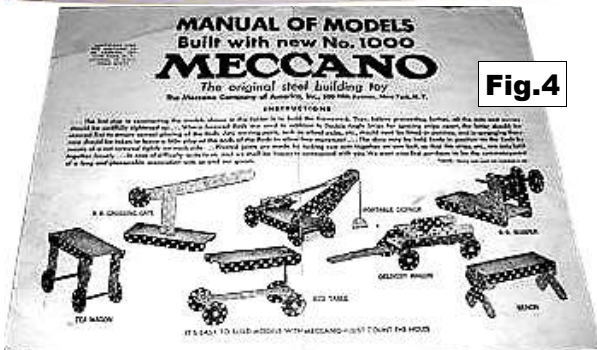


Fig.4



Fig.5



Fig.6

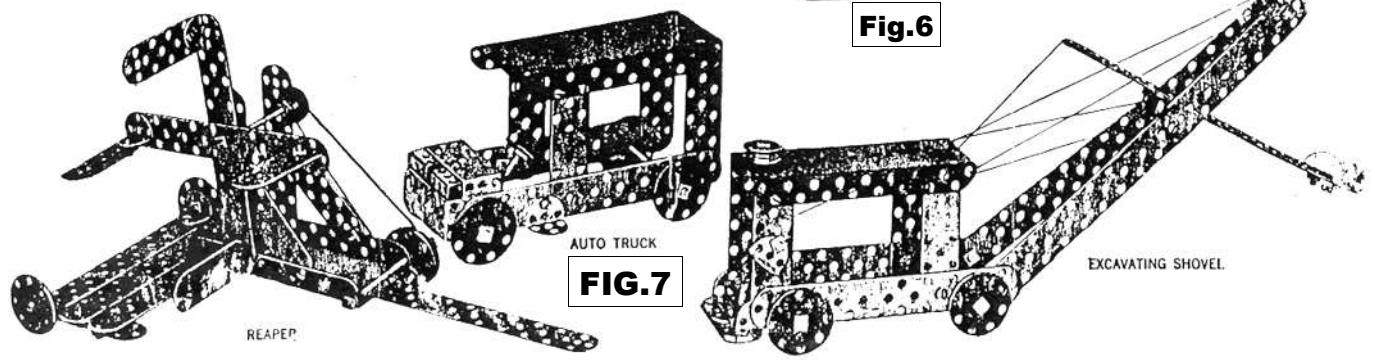


FIG.7

1934 SETS known (with Snap Rivets & no N&B)

No.1025 This is the set that has been seen most frequently on Ebay and an example to hand is shown in Figs.8-10. The box measures 25½*22*1½cm and the main parts are as in the 1026 except that it has no Screwed Rods and only 2 (instead of 4) 2¾" Strips. As can be seen the lid differs from the 1933 version only in the models shown, the centre illustration of the Rivet, and the note about it by the boy's head. The DAS, Flanged Plate, & A/Bs push into slits in the card insert, the other parts are held by Snap Rivets. The 12 Rivets used for this are enough to make any of the Manual models.

The Manual (Fig.10) is 280*178mm and its 48 models go from Table on the first page to Parcel Truck on the last. Many of the 1025 models shown in *MCS* were carried over but not some of the more interesting ones, the Toy Horse (see 12/319) for example, and the Jumping Jack puppet. In some cases this was because of the smaller number of Strips in the Set, in others, as explained below, it would have been the difficulty in providing adequate bracing, or reliable freedom of movement for pivoted parts. The virtues of the Snap Rivet are explained on the front page, together with hints on using them. If they became too loose it was suggested that a knife be used to spread the prongs. In the non-Wide Beam Gilbert MECCANO sets a Rivet Extractor tool was included which could be used to do this. More importantly it was used to remove the Rivets and in its absence they were to be pushed out from the prong side using 'a screw driver, a small piece of wood, or even the fingers' – with a tight Rivet the wood worked quite well though some force was needed, a screwdriver tended to slip between two prongs, and all I achieved with my fingers was to make dents in them. It was also said that if two parts were to pivot the Rivet should only be pushed partially through the second part.

In practice the Rivets hold the parts together quite well but a part held by a single Rivet can be easily knocked out of position. Most of the parts in the models were adequately braced, sometimes by cord in suitable models. Using a Rivet to hold parts required to pivot, and especially to rotate, was less satisfactory – wheels usually either wobbled or jammed.

Jacques Pitrat has an identical 1025 except that the Wheel Discs are red; 4 other 1025's have been seen on Ebay, all identical save the Wheel Discs with one blue and 3 red, and in one of the latter the red parts look to be a much lighter shade.

There is no mention of a 1050 outfit in the Manual.

No.1050 A line drawing of this set taken from an advertisement was shown in 19/546, and was said to have been listed from 1934 to 1936. It was shown as the smallest of the then range of Gilbert MECCANO outfits, but the absence of the 1025 may have been due to Gilbert's habit over the years of not including very small sets in his main lists. The parts were attached, in the same way as in the 1025, to an insert which was larger but in the same style. The main new parts in the Set, as in the N&B version, were 5¼" Strips.



Fig.8



Fig.9

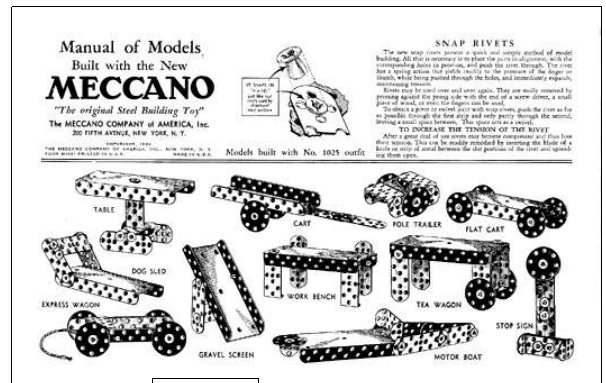


Fig.10

GILBERT MECCANO: S3

OSN 49/1488

Snippet. 'New' System: MECCANO (for Dolls)

Thanks to Urs Flammer for sending photos of the set right, with the manual's back cover inset top right. He spotted them on the German auction site Ricardo. The Set No. on the lid is blurry but might be No.14! In one photo the box was shown against a ruler and it was 4.5cm long. Scaling the hole pitch from this gives between 1½ & 1¾mm, appreciably different from the 1/12-scale often used for dolls house accessories.



Fig.2

And if that pitch is about correct this outfit is not one of the 1/12-scale Black Country Miniatures sets mentioned in 21/619. The example described there differed too in having red & green Plates. In my files I found the photo left of a miniature set (set against an inch ruler) and it may be from the Black Country range, but I can't be sure.

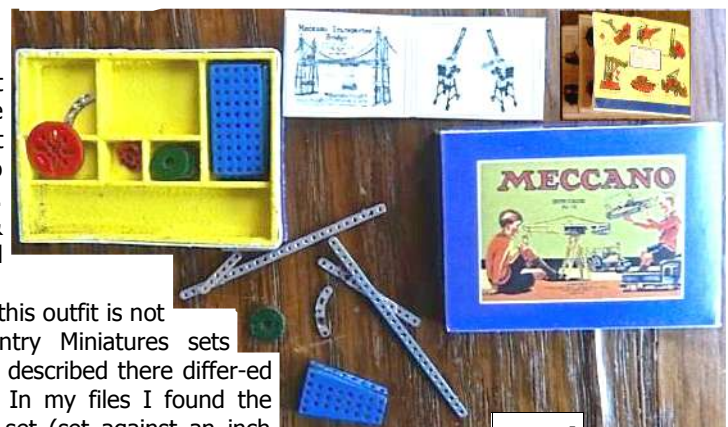


Fig.1

DOLLS' HOUSE SETS: S1

OSN 49/1488

Snippets. ZIG-ZAG. All that was known in the 20/572 note about this Swedish system was that there was a set AZ with TRIX-style parts, and a wooden dealer's cabinet. Now more can be gleaned from Tradera photos of four AZ sets, two smaller BZ sets, and a parts lot which are may be the contents of an AZ outfit.

FIG.1



The packaging of the AZ sets is identical and one is shown right with the parts in recesses in a wooden block. Non-TRIX-style parts are the Bush Wheel, bossed Pulleys, and the Crank Handle. And they seem genuine because they can be seen in the other sets & in the loose parts. The box was said to measure 26*13.3cm and scaling from that gives a hole pitch very near to TRIX's 7.8mm.

It is hard to be sure about the colour of the parts. Most could be 'nickel' with brass bosses, but the loose parts look dull grey, like TRIX perhaps, except that the Brackets look shiny, and the Pulleys are all brass (though they are nearly the same diameter as the Wheel Disc and therefore suspect).

The parts that can be seen in the various photos are as follows, with their possible quantities, mainly based on the loose parts, in curly brackets. Strips, 17,13,9,5h {4 of each}; DAS {4}; A/B {4}; D/B {3}; Narrow 2h high D/B {1}; Wheel Disc {4}; Bush Wheel {1}; bossed Pulley {2}; Washer, large {2?4}; Washer, small; Screwed Rods, $\approx 2\frac{1}{2}$ & $5\frac{1}{2}$ cm {2, 4?}; Rod $\approx 5\frac{1}{2}$ cm {2? if any}; Crank Handle ≈ 9 cm o/a {1}; Hook {1}; cheeseheaded Bolt; hex Nut; Span'driver {1}.

The Model Leaflet is one sheet folded to give 4 panels. The front is shown in Fig.1, and 2 panels from the underside in Fig.2. Text on the panel adjacent to the front says that all the models in the leaflet can be made with the set, and to start with the simpler ones, etc.

The BZ set has the same style of packaging as the AZ but the box is smaller, 22*9½cm, with only 9 recesses for the parts. It has none of the non-TRIX parts, but all the other major parts can be seen except the 17h Strip and the Narrow D/B. The front of the Model Leaflet is similar in style to the AZ version; the models on it are a Bicycle and a 4-bladed Fan.

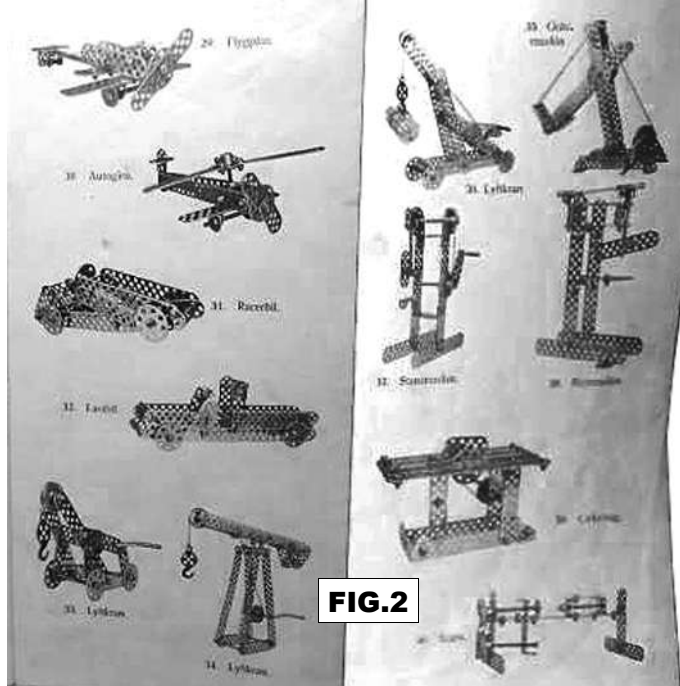


FIG.2

OSN 49/1489

ZIG-ZAG: S1

MÄRKLIN's Early Days Following the note about the change of name from MECCANO to MÄRKLIN in 48/1452, Clive Weston kindly sent 3 related scans. These also add to the general account of the Meccano/Märklin story in 47/1447.

The first is a pink price list pasted into the last, 1918, Meccano/Märklin manual. It is for 'Metall-Baukasten MÄRKLIN' and gives prices effective from 1st August 1919. It lists Sets 0-6 & 0A-5A in cardboard boxes, and 5H, 6H, 4AH, & 5AH in wooden boxes. Also Sets 201 & 202 (Spring Motors for Sets 0-3 & 4-6 respectively); 300 (Lifting Electromagnet); 301 (Electric Motor); 302 (Magnet, Motor, & Light); 301A a linking set; 401 & 402 (Steam Engines, small & large). The 300 series were all described as high voltage.

Next the newspaper ad right, from Nov. 1919. It features the 'Märklin boy' with a large Crane which was in the early (and all pre-WW2) manuals. It included many of the new MÄRKLIN parts which had been introduced. MECCANO is still mentioned, though in very small letters under MÄRKLIN METALLBAUKASTEN, to no doubt attract/



OSN 49/1489

MÄRKLIN: S5

retain the interest of 'Meccano boys'. The logo is probably unusual and isn't listed on a Märklin enthusiast's website.

The third scan is of an inside cover of the 1918 manual. Printed in a box on it is an announcement which I translate as saying that MECCANO is a completely German product. And that the name MECCANO, the design and manufacture of the parts, and the presentation of the sets are protected from imitation by patents & registered designs. No doubt that when this manual first appeared towards the end of the war it was thought necessary to dispel any lingering thoughts that MECCANO was in any way British.

Clive added that Meccano finally regained the use of their name in Germany from a court judgement, Meccano Ltd. v. Märklin Brothers & Co., Case No.341, at the Anglo-German Mixed Arbitral Tribunal of 6th November 1928. Märklin were found to be in breach of the treaty of Versailles in not returning the use of the Trademark to Meccano. Meccano wasted little time in reopening a German office, but it had faded away again by 1933/1934.

MECA LABO by Jacques Pitrat

Meca Labo was a French system for industrial use which was made by the Compagnie des Compteurs (CdC). CdC was created in 1879: its first activity was manufacturing gas meters, later on water & electricity meters, and finally, with a large research department, the design & manufacture of many kinds of electromechanical equipment. For instance, they created a television department in 1927, and devised the equipment used for the first French official television broadcast in 1935. Their main site was 12 place des Etats-Unis at Montrouge, a town bordering Paris to the south. Other plants were created but 6,000 workers were still at Montrouge in 1960. Circa 1970, Schlumberger took control of CdC and it became Compteurs Schlumberger, but carried on with the production of MECA LABO. Several more changes happened to the company; the Montrouge plant no longer exists, and MECA LABO has not been produced for many years.

CdC had many laboratories and they developed a system for experimenting on new devices, or creating specific apparatus for the needs of their own laboratories. As this system proved very useful, it was decided to sell it to other companies under the name MECA LABO. It is thought that this was circa 1960 or even earlier, and by 1963 a new 'Miniature' system was added with a range of similar but smaller parts. MECA LABO is believed to have continued until at least 1990.

This account is based on my own Miniature set, the 1963 Leaflet that was with it, and the *MCS* entry which, at least in part, reflects a Leaflet from 1982.

The LEAFLETS The 1963 one with my set is 27*21cm, printed on a sheet folded in two. A mechanism (Fig.5) is on the first page: it is not indicated what it is doing, and it is very difficult to guess, perhaps it was simply to demonstrate the parts. The same model, but with one more shaft on the right, also appears in the *MCS* leaflet, though the image is not very clear. The second page presents the system and contains photos of some parts, the third lists all the parts of the system, while the last gives the contents of the sets: there were three outfits differing only in their Gears which had different modules: 0.2, 0.25, or 0.3 (see 3/31 for the definition of Module – MECCANO gears are Mod 0.67, much coarser). There is no mention of the original system.

Only the Mod 0.2 & 0.3 versions are listed in the 1982 Leaflet, but a Mod 0.5 version has been added. It is thought probable that this was the original system which had been available all along. The 1963 parts continued but 3 new specialised parts were also listed.

The SYSTEM MECA LABO does not contain all the parts that are necessary for a particular mechanism. It was devised to allow the use of most of the electromechanical components that existed on the market: motors, synchros, potentiometers, etc. As their dimensions were standardized, they could be bought from any manufacturer.

Starting with the Miniature system, it was based on the same principles as the original one, but all its parts were smaller. The 1963 leaflet explains that as electrical components became smaller it was necessary to manufacture smaller parts to build mechanisms which used these new components.

The system's main structural parts were a slotted Base Plate, see Fig.5, and various kinds of Support Brackets that bolted on to it. The latter were for two purposes. Some were fitted with ball races and these carried the system's 3mm Shafts. They were geared together by 10 different fine-toothed spur Gears for each of the modules mentioned above, plus a Bevel. Thus the input drive was linked to one or more output functions. The 4.0mm wide slots in the base of the Supports



Fig.1

made it possible to position them anywhere on the Base Plate, and so any two Gears, no matter what their diameters, could be meshed correctly.

The Brackets' second purpose was to allow proprietary items such as a micro-switch, motor or other electromechanical equipment, to be mounted.

Certain specific parts & assemblies were also available, an Oldham Coupling & a Differential Unit for example – all are described in the next section.

Full details of the original system are not available but as already mentioned the Gears were probably Mod .5, and the Shaft diameter larger – *MCS* gives the hole size as 5.5mm, though exactly what this refers to isn't clear. 2 of the photos in *MCS* show mechanisms built on a different type of Base Plate with round holes in parallel but staggered rows. If their spacing is the 20mm hole pitch value given in *MCS* it would be 40cm long. Perhaps this Base was the original version.

The SETS. The sets for the Miniature system had the same contents except that each had the Gears of only one module.

My set has the .25 module Gears and is packed in a two drawers chest, 41*33*24cm (Fig.1). The small green labels read 'MECA-LABO MINIATURE' at the top & 'CdC' at the bottom. The parts in the drawers are shown in Figs.3 & 4. The main part missing from the Set is the Base Plate: at a glance the obvious place for it would be the empty space in the lower, Fig.4, drawer, but in fact it is much too small to take the part. The Leaflet with the Set speaks of a 'cover' for the Base, so it seems that it was not included in the chest but was separate in its own packaging. There are what look like 6 screw holes towards the edges of the 'empty' area in the lower drawer but there is no indication of their purpose.

Several parts from the system are not included in this Set.

MCS shows a similar chest but with 4 drawers, so perhaps a larger set or one for the original parts. (Chests were built in modular form with a top, a bottom, and any number of frames complete with drawer between them – these different parts were not secured together, simply stacked up.)

The PARTS All the parts in my Miniature set are shown in Figs.3 & 4 overleaf, with examples of each part in Fig.2 Further details of some of them can be seen in Figs.A-C and in Fig.5.

Almost all the parts are made of aluminium alloy.

Two methods are used to fasten parts to a Shaft. In most cases the part has a split boss and a Boss Clamp is used to tighten it onto the shaft. A few parts have a conventional boss, double-tapped at 120°, but unless it is certain that the torque will always be light, damage to the shaft from the Grub Screws is avoided by a thin Split Sleeve which fits inside the bore to prevent the Grub Screws bearing directly on the Shaft.

Below a list of all the parts with some notes on them.

The Parts in the 3 Miniature Sets

These will be listed in the order they appear in Fig.2, with their quantities, as given in the 1963 leaflet, in parentheses (apart from the spur Gears all the parts are common to the three Miniature versions).

The Spur Gears. A complete set is provided for each module, and all have split bosses.

The Mod.25 Gears in my set are all the parts in Row 1 and the first 4 in Row 2. All have 2.0mm thick discs, and the module & number of teeth are stamped on each. They have the following numbers of teeth: 25(2), 50(1), 75(1), 100(2), 125(2), 150(2), 175(1), 200(1), 225(1), & 250 (1).

The Mod 0.20 Gears have 30, 60, 65, 90, 120, 150, 180, 210, 240, & 270 teeth; **the Mod 0.30 Gears** 20, 40, 60, 80, 100, 120, 140, 160, 180, & 200. The quantities are the same for the Nth Gear of each sequence. Surprisingly, the progression of the number of teeth is different for module 0.20: for the other modules the number of teeth of the

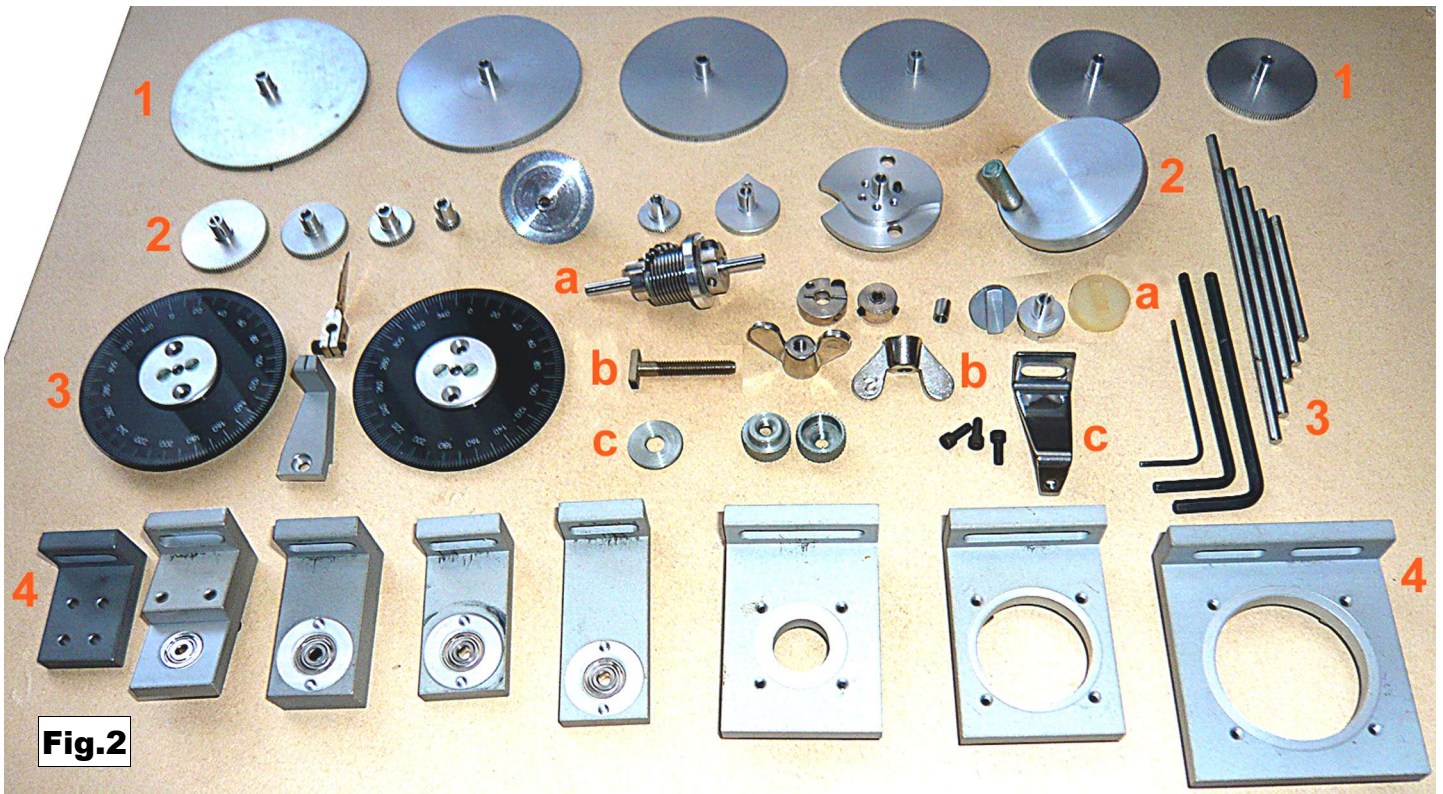
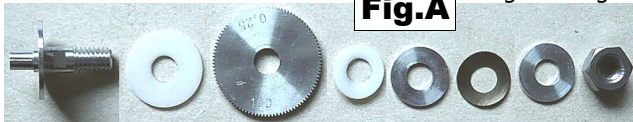


Fig.2

Gears is the product of the number of the teeth of the smallest gear by the integers from 1 to 10. For the 0.20 module, one finds only the products by the integers from 1 to 9, while the 65 tooth Gear does not belong to the progression.

Other Parts. These start at the 5th item in Row 2 of Fig.2 and continue along Row 3 (with the first 4 parts, then the sub-Rows 'a', 'b' & 'c', & then the Allen Keys & Shafts).

Friction Slip Clutch (1). Its parts are shown below. The threaded Core with its **Fig.A** integral flange



has a split end and is held fast to the output shaft by a Boss Clamp. The input is from a Gear which meshes with the free spur Gear without boss running on the Core (120, 100, 100 teeth for the 3 modules). Said Gear has Washers on either side of it and this assembly is clamped against the flange by a large adjusting Nut which is tightened to give the desired torque at which slippage will occur. An example is in the middle at the bottom of Fig.5, just before the Dial.

Bevel Gear with boss (2). with 60, 40, 40 teeth for the 3 modules. This Gear can only be used in pairs.

Single-lobe Cam with boss (1).

Adjustable Cam with boss (1). Two discs can be rotated to change the width of the drop zone, and are then bolted together. In Fig.5 an example is to the right of the micro switch at top left, which it switches on & off.

Crank (1). It is a disc with a crank pin; its boss has two Set Screws at 120°, with a Split Sleeve inside it.

Fixed Dial with divisions from 0 to 360 (1). It is to be bolted to a Support. One is the lefthand large disc at the front in Fig.5.

Pointer (1). It is clamped to a Shaft to indicate its position on a Dial. One is in front of the Dial in Fig.5.

Index (1). It is bolted to a Support to read the position of a Rotating Dial.

Rotating Dial with divisions from 0 to 360 (1). It is



Fig.3

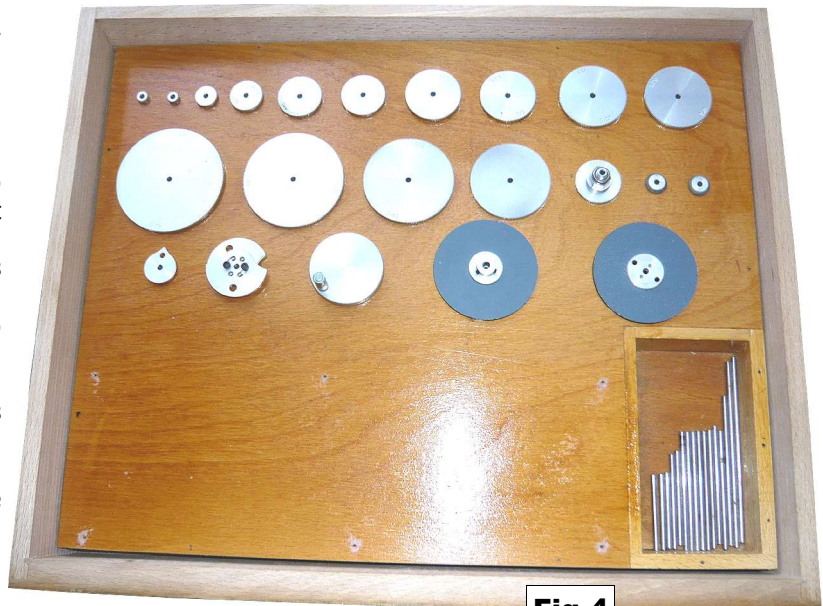


Fig.4

Fig.5



held by two Screws at 120° in its boss. It has no Sleeve but it is possible to add one.



Fig.B

Rotation Limiter (1). It is shown above and is made of, from left to right, a Boss Clamp holding a Bossed Disc with a circular tab on its righthand face, 11 pairs of Tabbed Discs & Washers, and a Collar. The separate parts are



Fig.C

shown above with the middle 9 pairs of Discs/Washers omitted. In Fig.5 it is on the righthand shaft. This device locks the Shaft after it has performed N revolutions and N can take any value between 1 & 10. To set N one uses the long tab on the righthand end Tabbed Disc. First, one turns it in the direction of rotation of the Shaft to the end of its travel, engaging the other Tabbed Discs in the process. Then in the opposite sense for N revolutions. When this is done a

Locking Link (which is missing from the Set, and a Gear hides it in Fig.5.) is rigidly attach to the long tab and a fixed support (probably to one of the tapped holes in a Bearing Support Bracket). After N revolutions of the Shaft it is locked and the long tab has unwound. In Fig.B it has made 5 revolutions. In Fig.5 the Differential could be set up to allow the Motor to continue to drive the shafting etc to its left with the Shaft locked. Without a Differential, and one is not included in the Set, it would seem that the Limiter would cause the motor to stall, and for most motors some means would be needed to turn off its electrical supply.

Boss Clamp with Bolt (25). The Bolt gives the clamping action which tightens a split boss onto a Shaft without a Screw having contact with the Shaft.

Collar with Grub Screws (16). The two tappings are 120° apart. A Split Sleeve protects the Shaft from the Grub Screws.

Split Sleeve (6). For use in the Collar, Gear bosses, & some other parts.

Oldham Coupling (5). It is used to join 2 Shafts which are parallel but slightly out-of-line – up to 1mm is permissible in this case. It is of conventional design with 2 identical bossed Outer Discs, one on the end of each Shaft, with a Rilsan (a type of nylon) Disc between them. The inner face of each Outer Disc has a raised strip along a diameter. Each side of the Centre Disc has a groove, normal to the other, which engages & slides on the strip of an Outer Disc. In Fig.5 one is between the motor & Differential, with another bottom left.

Mounting Bolt (30): 4.0mm Ø, 25mm u/h with 20mm of thread, and used to bolt the Supports to the Base Plate. The head is rectangular, its length such that a short side fits against the Support's upright. Thus it is unnecessary to hold the head while tightening the Bolt; moreover the Bolt cannot turn even if there are vibrations. Curiously enough, none of the 6 Bolts visible in Fig.5 are correctly positioned: they are diagonal and not perpendicular to the Support.

Wing Nut (30). Used with the Mounting Bolt.

Washer (30).

Knurled Nut (6). The knurling facilitates tightening by hand. It is impossible to use a Wing Nut near other Wing Nuts so it was necessary to include a less bulky Nut.

Bolt, 2.5mm Ø with Allen head.

Grub Screw (not shown), 2mm Ø with hexagon socket.

Offset Bracket (4). It is stainless steel, 30mm high, with a small plain hole in the top. Its French name, 'équerre support prise' is not clear, and it is not used in the Fig.5 model. As 'prise' can mean a socket for an electric plug, I assume that the Brackets are used to support a power supply. A supply generates heat, and thus putting it directly on the Plate might create distortions which should be avoided in high-precision mechanisms. The contact area of the 4 feet would be comparatively small & stainless steel does not conduct heat as well as aluminium.

Allen Keys with the following sizes: 1.3mm (2), 2.0mm for the 2.5mm Ø Bolts (1), 2.5mm for the 2.5mm Ø Bolt used in the Adjustable Support (1), and 3.0mm (1). No part present in the Set has Bolts for the 3mm key; I assume it is used for bolting Feet to the Base.

Shafts, stainless steel, 3.0mm Ø, with five lengths: 40, 50, 63, 80, 100mm (2, 4, 8, 4, 2).

Support Brackets. See Row 4 in Fig.2. All are L-shaped with, generally, a 15mm wide slotted foot, & a 5mm thick upright. The slots are 4mm wide. Heights quoted are above the Base

Plate. Supports are attached to the Base Plate by Mounting Bolts, Nuts, & Washers.

For a Microswitch (1). It is 30mm high and 20mm wide. Its four holes are not threaded. One can be seen middle left in Fig.5 with the switch held by 2 bolts.

Fitted with Ball Race(s). The width is always 20mm, and the top is 10mm above the Shaft. All but the Adjustable have two threaded holes so that it is possible to bolt on various parts such as the Dial, Index, etc. **Adjustable (2).** It has a short 'L' and a slotted bearing block (see Figs.2 & 3) which is held to the 'L' by two 2.5mm Allen Bolts. The height of the bearing can be adjusted from 30 to 45mm. **With 2 races 30mm high (3).** The bearings are aligned. The foot is 20mm wide, and the upright 10mm thick. This Support appears bottom left in Fig.5. **With 1 race 30mm high (10).** **With 1 race 40mm high (2).** This height is necessary for the large Gears: for Mod 0.25, the 250 teeth Gear has a radius of 31.25mm. In Fig.5 two are used for the second shaft from the right.

For Electromechanical Items. These fit into the Support's large hole whose centre is always at 30mm above the Base Plate. The 4 tapped holes around the large hole carry Clips held by Allen Bolts which hold the item's flange to the Support. The 3 Supports are 35, 35, 50mm wide with 12.5, 25, 33mm holes (2, 2 (but 4 are present in my set), 2), and accommodate items with the following standardized sizes: 08, 11, 15.

Parts Missing from My Set.

Base Plate (1). See Fig.5. It measures 308*203mm and the distance between the centres of its 25 lines of slots is 12mm. Alternate lines have 5 long slots, and 4 long with a short one at each end. Four **Feet** may be bolted to the Plate.

Locking Link (1). See Rotation Limiter above.

Parts not in the Miniature Sets.

Dog Clutch. No details are available.

Differential. One is on the motor shaft in Fig.5. The input gear has 80, 80, or 60 teeth depending on the module.

Anti-backlash Gears. They have the same number of teeth as the normal Gears, but they do not exist when the number of teeth is less than 100. Therefore, there are 7 such Mod 0.25 Gears, and only 6 for the other modules. Without these special Gears it is impossible to completely eliminate backlash between two spur gears; this is particularly inconvenient when the direction of rotation of these gears changes. Many mechanisms have been patented for gears to remove backlash but, as the Set does not contain this kind of Gear, and there are none in the Fig.5 mechanism, I have no idea of the chosen solution.

Dials. There are 4 other kinds: fixed & movable, each with divisions from 0 to 100, or from -100 to +100.

Vernier for the 360 Dial. No details available.

New Parts in the 1982 Leaflet.

Cardan Joint. No details are available.

Boss Clamp. This part is in addition to the earlier one. It is a well-balanced part – with its bolt on one side the earlier Clamp was not symmetrical, and it could cause vibration if a shaft was revolving very fast.

OSN 49/1493

MECA LABO: S4

Snippet. A SEYMOUR AIRPLANE FACTORY SET A poster for this set, a promotional item for Voigt's Crescent flour, was discussed in 32/952. It said that the set was made under a Metalcraft patent and a drawing of the open box showed parts which looked very like those in a METALCRAFT 951 outfit.

The Ebay set has a lid identical to the one in the poster and the parts too, right, mostly match. But there is no sign of the Pilots Cabin, a part not in the 951 anyway, and compared to the 951 one Propeller is missing (the 3 parts under the red box are the Engines), and the remaining two have 3 blades instead of 2. The parts look to have the usual METALCRAFT finish except for the red Wheels. Notice that there are 2 Wings – it was mooted in OSN 32 that there might have been only one.

One oddity: on the poster the price was \$1.69 plus 8 Voigt coupons, against 'a Regular Price' of \$5, but the 951 price in the several Metalcraft ads to hand is \$1.50.

OSN 49/1493

SEYMOUR AIRPLANE FACTORY: S2

A 'Thermostatique' Joint. I have not found a reference to this type of part in mechanics, only in plumbing.

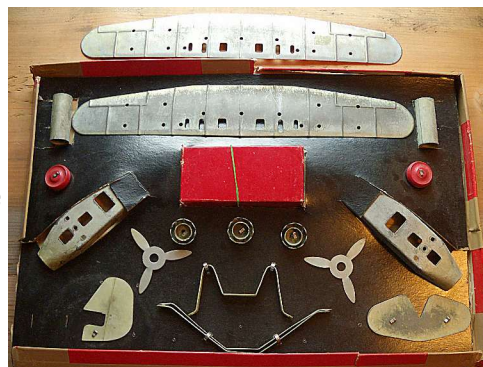
REMARKS. MECA LABO is remarkable for its quality; it was used to build high-precision electro-mechanical devices quickly.

3 goals were possible for the system: development of proto-types, realisation of apparatus needed by a laboratory, and teaching electromechanics. The parts of the system were sold separately, which was very convenient for the first two goals, and most of the sales were probably made in that way. However for teaching it is better to define a set with a well-chosen assortment of parts. Probably my set was one such and perhaps more were available. There was no manual in my set but no doubt there was one originally: it would be necessary to provide some help in understanding how the parts could be used correctly & efficiently. Moreover, it is likely that it described some mechanisms as they are useful for learning how to use the parts, & essential for the teaching goal of this system.

It is very rare to find MECA LABO sets. However, this does not mean that it was not successful: it lasted about 30 years. Moreover, it was sold outside of France, I bought my set in Germany and in 1966 there was a UK agent: C.d.C. (Great Britain) Ltd., Terminal House, 52 Grosvenor Gardens, London S.W.1. I see two reasons for this scarcity. First, for the first two goals of this system a set was not very useful: the users only bought the parts that they needed to build a particular mechanism. Secondly, when something that is not very expensive is bought in an industrial laboratory and is no longer needed, it is not sold on, but simply discarded. On the contrary, the boy who no longer uses his system stores it in the attic, and his children or grandchildren sell it on eBay many years later.

Apart from a few new parts the main change in the 1982 leaflet is that the Mod 0.25 Gears have disappeared, leaving only the 0.50, 0.30, & 0.20 modules. 'Leaving' implies that the 0.50 Gears were always part of the system and it has been deduced that they were the original Gears. The supporting evidence comes from the *MCS* entry which is thought to be largely based on the 1982 leaflet, and which says that MECA LABO has 180 different parts. This number would include all the parts corresponding to the 3 modules above, and taking into account that all the parts of the 0.5 module are different from those of the other modules, and that the last two modules have half of their parts in common, 180 parts for the whole gives about 70 for each module. This is a little higher than the 65 parts for a module in 1963. The other possibility is that by 1982 the original parts & gears were no longer part of the system and the 0.5 module system was similar to those for the 0.2 & 0.3, that's to say the common parts plus the 0.5 Gears. This possibility seems much less likely because the total number of parts would then be far short of 180.

Another point of interest is why when the miniature system was launched it was thought necessary to have Gears with 3 quite similar modules. One possibility is that at the time it was wished to accommodate proprietary equipment that used all of these modules.



Snippet. 'New' Romanian System: MECANO

The No.1 set right was offered on the UK Ebay and, with the main body of its parts resembling STABIL, it is clearly different to the MECANO's previously mentioned in OSN. The words under the name on the lid mean 'The Construction Set for every Boy', and the maker is given along the bottom: EMSA, Electromecanica S.A., 14 Dacilor Street, Timișoara 11. This city is in the west of Romania, some 100km from both the Serbian & Hungarian borders. There is nothing to date MECANO but no doubt it was one of the several copies, or near copies, of STABIL which appeared after WW2.

Of the parts the Ebay ad said that most strips & plates are aluminium (STABIL parts were of course steel) and that the holes are at 1/2" centres. The parts that are not aluminium or STABIL-type include the blue & yellow ERECTOR Plates, the 15h Strips in the top centre bay, and, most likely, the DAS & Curved Strips top & bottom right. On the hole pitch I suspect, by scaling from the ERECTOR parts, that it is the STABIL value of 12.5mm rather than 1/2". (In the photo the 3*7h Perforated Plate looks smaller than the opening in the Flanged Plate but this is because it is farther from the camera – in another photo not shown here they are at nearly the same level and obviously match one another.)

The 'STABIL' parts that can be seen are as follows (most of their originals were described in OSN 13).
 • 3,5,7,11h Strips. • 5*11h Flanged Plate (in the other photo the flange holes can be seen to be slotted), and 3*7h Perforated Plate cut out from its centre. • 3*5h Triangular Plate. • A/B & D/B. • 2*2h 'L' Corner Bracket. • 8h Wheel Disc. • Roller (top centre, left end – an untapped Collar). • Wire Stay. • 28t Gear (the STABIL Bakelite pattern).

Other parts that can be seen on the lid are, on the bench, a Flanged Sector Plate (with the Triangular Plate cutout, & a Flanged Ring (though it isn't clear if it has a pulley groove), and, probably, a Slotted Plate in the back of the Trolley Bus.



Fig.1

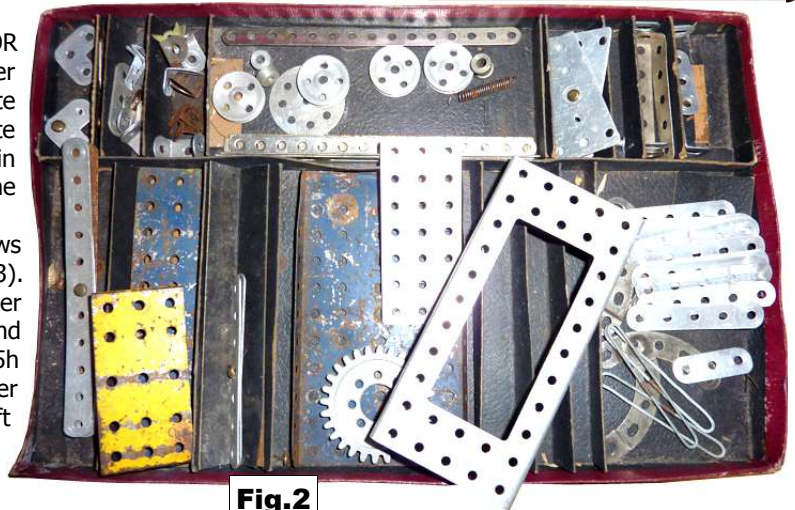


Fig.2

The wheels on the Bus, Tyres on Pulleys with 4 face holes, don't have any STABIL equivalents, but look rather like the Hungarian MECHANIKA parts.

MECANO [3]: S1

OSN 49/1494

More BELIX Following the account of this Dutch system in 48/1466 Jan Ringnalda has kindly sent details of a No.A outfit. The lid is shown right and, below, the parts on the backing card, plus the small envelope with the threaded parts in it. The latter consist of 4 Screwed Rods which scale at about 50mm long, 9 Bolts some 14mm long o/a, and 21 Nuts. These parts are shown in Fig.2A at about the same scale as the card, and larger in Fig.3. The thread is 1/8" BSW. The other details of the parts from Jan agree with

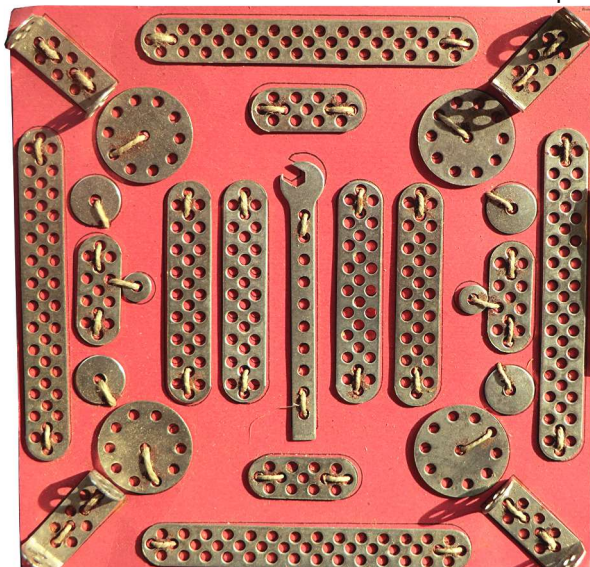


Fig.2A

Fig.1

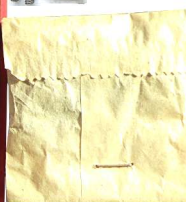


Fig.2

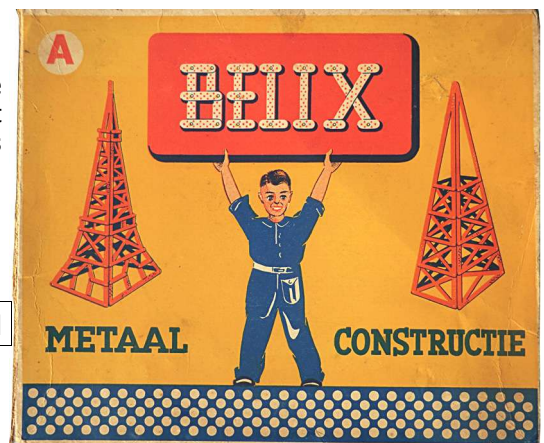


Fig.3

those in OSN 48 except for two small differences: 15.1mm wide Strips, and 7.75mm hole pitch (against 15 & 7.7mm respectively).

The model sheet in the Set was the one shown in OSN 49.

BELIX: S2

OSN 49/1494

New System: MAKEBLOCK This system, from China, is in the same style as VEX (see 34/1006, 41/1243 & 1253). That's to say a range of parts including motors and electronic components to make Robots and almost any other electro-mechanical device. Some kits are available for specific models but, as with VEX, there are no 'cladding' parts to give the models greater realism.

MAKEBLOCK is made by the Hulu Robot Technology Inc. of 426 Gong Le Hua Ting, Xihu Road, Xixiang Jiedao, Baoan District, Shenzhen, China. Shenzhen is a large city some 40km north of Hong Kong. Development started in 2011 & the company now has 10 employees. There are agents in 10 countries including for the UK, The Little British Robot Company of Wollaston, www.thelittlebritishrobotcompany.co.uk. What follows is taken from the Makeblock website: www.makeblock.cc.

The PARTS

I counted 92 in all. Most non-electrical parts are aluminium, anodised blue or yellow, your choice. The few steel parts are mostly zinc plated. The hole pitch is 8 & 16mm and the thread M4 (though Grub Screws are M3). Holes in some parts are 4.1 or 4.2mm but sometimes the size isn't given and it is said that they can be drilled out for '4mm hardware' – Shafts no doubt but possibly threaded items too. Bosses are usually double-tapped M3 at right angles.

Structural Parts

Beams. These are the main structural parts and there are two types. The 5 **Beams 0808** (Fig.1) are from 80 to 192mm long with 5 to 12 holes at 16mm pitch, and have an internal thread along the inside walls. The latter allows Beams and other parts to be added anywhere along their length. I think the double circle showing the side holes in Fig.1 denotes a chamfer – they are the 'to be drilled out' size. **Beams 0824** (Fig.2) are in 9 lengths from 64 to 192mm. They have tapped holes in each end to further add to their ease of use and nearly all of the structures of the models shown on the website are made from these Beams.

Brackets, Plates, etc. Perforated Plate 3*6h. **Disc** (Fig.5, with Beams bolted to it). 2mm thick and about 60mm o.d. **Link Rod** ('a' in Fig.3), 2mm thick, 20h long, with holes at 8mm pitch. It is to be cut to length and can be used for light frameworks, to reinforce end to end joints in Beams, etc, etc. 11 **Brackets** are listed, with 6 of them to allow specific items such as Motors to be mounted, and 5 for general use. 3 of the latter are shown in Fig.3, all to about the same scale, and all with holes at 8mm pitch. The **Bracket 3x6** 'b' has a smaller **3x3** version, 3*3*3h. The **Bracket P1** ('c') is 33mm long and its end hole is tapped. Of the 3 overlapping side holes the centre one is 4mm Ø and the outer ones 3.7mm. The top hole of the **Bracket P3** ('d') is 8mm Ø, the centre end hole 6mm. The **General Bracket** (Fig.4) is 24mm long with a bore of 28.4mm Ø: circular section components, a marker pen and a Motor are shown as examples, are clamped down onto the bore's bottom vee by long Bolts through the top tapped holes.

Hardware. Socket Cap Screws: 8, 14, 22mm u/h. **Nut,** hexagonal, 3.2mm thick, probably steel. **Stiff Nut,** hexagonal. **Socket Grub Screw,** M3. **Plastic Rivets.** Button headed rivet pushes into a lipped sheath – the sheath itself in 2 sizes: 4mm o.d. (4, 6, 12mm long), & 3mm o.d. (7.5mm long).

Shafts, Slides, Pulleys, etc

D Shafts, 50 & 160mm long, are 4mm Ø with 0.4mm removed to form the flat. This to give Grub Screws a better grip. **Shafts** (called Linear Motion Shafts): **4mm Ø,** stainless steel, 288mm long; **8mm Ø,** chromed steel, 480mm long, with ends counterbored 12mm deep & tapped M4. **Shaft Connector** (Fig.6). Used in pairs. The disc is 22mm Ø & 5mm thick with 4 face holes on a 16mm pcd, 2 of them tapped M4. The edge tapping is for a Grub Screw. **Flange Bearing.** A 4mm ball race, 8mm o.d. with a 9.2mm Ø flange. Fits into the

Bracket P3. **Linear Motion Slide Unit** (Fig.7). The side holes are tapped M4 through to the base. A pair mounted on an 0824 Beam are shown sliding along parallel 8mm Ø Shafts. The bearing is said to be 4 rows of recirculating balls. **V-slot Bearing.** A 13mm Ø loose pulley. **Slider** (Fig.8). A 256 or 496mm long extrusion with a lengthways internal thread. It runs between a pair of V-slot Bearings mounted at 16mm centres, or a slide can run along a pair as in Fig.9. **Screwed Rods,** M4, steel, 192 & 280mm long. **Thread Drive Beam.** A 5h long 0808 Beam with its centre holes tapped through M4.

Timing Pulleys etc. All 4 parts are aluminium and 3 are shown in Fig.10, though not to scale. The smallest (a) has 18 teeth and a 4mm bore. The largest (b) has 90 teeth and is 58.2mm o.d. with an 8mm bore. A 62 tooth version is similar to the 90t but has shorter arms with only 2 holes. Both these are extrusions, 8mm thick, and are held to a 4mm Shaft by bolting to a Shaft Connector. Also shown is one with a Flange Bearing inserted into each end of the bore. Part (c) is called a Pulley Slice: it is .8mm thick, 62mm o.d., and has no teeth. A pair can be attached to the sides of the 90t Pulley as flanges using Plastic Rivets. **Timing Belts.** Neoprene, 6.6mm wide, 2.032mm pitch. 2 & 5m long unjoined, and joined with 123, 216, 378 teeth. **Tyre** (Fig.13). Black silicon with 'Makeblock 68.5x22' moulded onto sidewall. Fits over Timing Pulley 90T. **Track Elements** (Fig.14) are of black silicon held together with metal Pins. Tracks run on the Timing Pulleys.

Fittings

Threaded Shaft (Fig.11). Used as per Meccano's Threaded Pin. **Collar.** 10mm Ø with 4mm bore and 5mm wide. **Studs** (Fig.12): (a) Threaded M4, 16 & 32mm long; (b) M4, 14mm long o/a with 6mm long threaded spigot, & 7mm of internal thread. Both are brass, about 7mm A/F. **Universal Joint** (Fig.15). Stainless steel with a 4mm bore, and 22mm long o/a. **Flexible Coupling** (Fig.16). Aluminium, 16mm Ø x 23mm long, for 4mm Shafts. The helical groove is said to give flexibility. Tapped 4x M3 for Grub Screws.

Other Parts

Battery Holder for 6x AA cells. **Robot Gripper** (Fig.17) with 70mm jaw opening, and operated by a solenoid. **Strong Robot Gripper** (Fig.19). Mainly made of acrylic with 76mm maximum opening. Driven by the motor's screwed shaft. 2 or 4 jaw configuration possible. **Robot Turntable** (Fig.18). The main part is a big aluminium bearing supported by brass pillars from an acrylic circular base board, with the intermediary board to carry a driving Motor. The design is subject to change. **Castor** with a white plastic wheel. It can be bolted through the 8mm hole in Bracket P3.

Motors etc

All Motor shafts are 4mm Ø. **DC-25 & DC-37.** 6/12v, geared to 185/50rpm, with 25/37mm Ø bodies, 52/56mm long. **Stepper 42BYG.** 12v, 1.8° steps. 42mm cube body. **Servo MED 515.** 6v. Body 47*52mm o/a x 20mm wide. The output shaft is from one of the 20mm wide sides and carries a 24mm Ø face plate. **DC Frame Type Solenoid HCNE1-0530.** 12v, 6mm stroke of 6mm Ø shaft.

Electronic Modules

There are 12 of these and, as their finer points are beyond me, some of the key words are: drivers for Motors (including LEGO), Servos; Ultrasonic & Limit Switch sensors; Line Finder; Infrared Decoder (remote control is by IR); and Bluetooth (to link to mobile phones for instance). Also mentioned are Arduino & Meduino with talk of easy programming and open source software. Meduino is the name used for MAKEBLOCK modules and they are said to be Arduino compatible. Wikipedia says that 'Arduino is a single-board microcontroller to make using electronics in multidisciplinary projects more accessible. The hardware consists of an open-source hardware board designed around an 8-bit Atmel AVR_microcontroller, or a 32-bit Atmel ARM. The software consists of a standard programming language compiler and a boot loader that executes on the

microcontroller. Arduino boards can be purchased pre-assembled or as do-it-yourself kits. Hardware design information is available for those who would like to assemble an Arduino by hand. It was estimated in mid-2011 that over 300,000 official Arduinos had been commercially produced.'

KITS

Mechanical Kits. The 7 of these include various Robot chassis, a Music Robot including a Xylophone, and an X-Y Plotter. All the Kits contain appreciably more parts than are needed for the featured model.

Electronic Kits. A Starter outfit with the electronics to allow IR control and a line finder Robot. An Advanced kit which contains most of the Electronic Modules.

Extension Kits. There are 7 of these: 2 for a Motor, 4 with Beam parts, and Servo, Motion, & Thread Drive Packs.

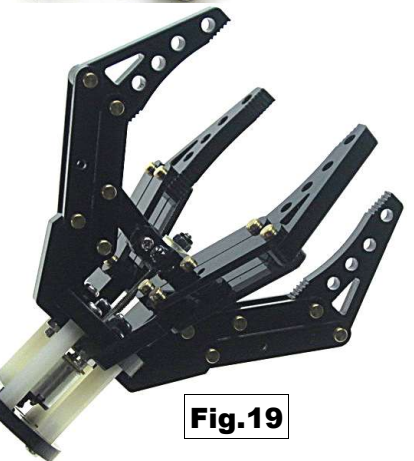
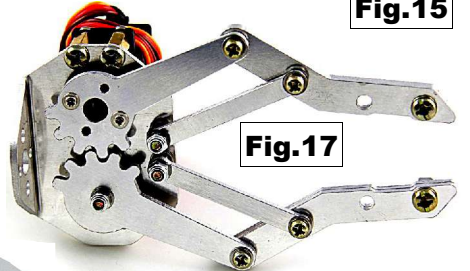
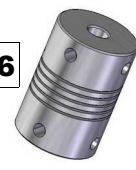
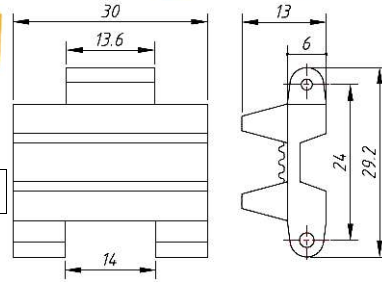
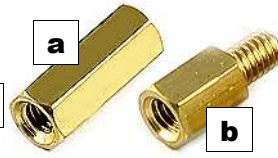
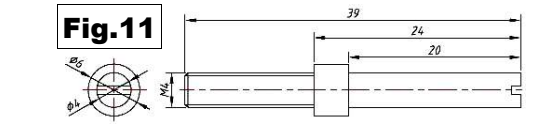
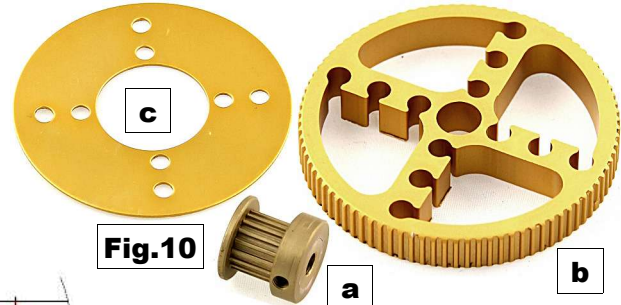
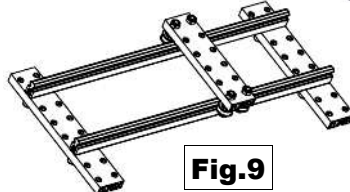
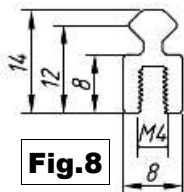
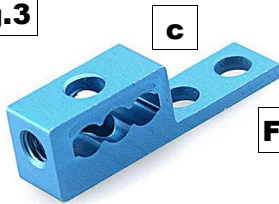
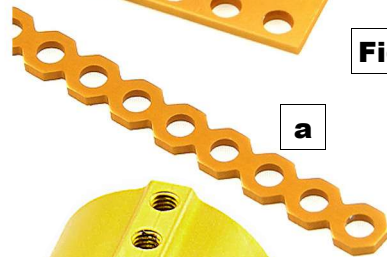
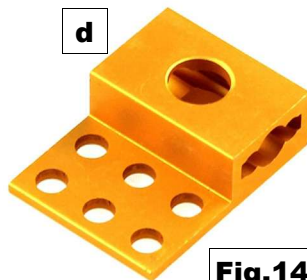
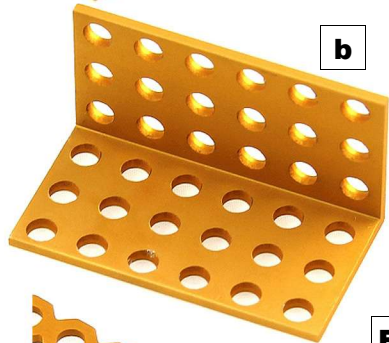
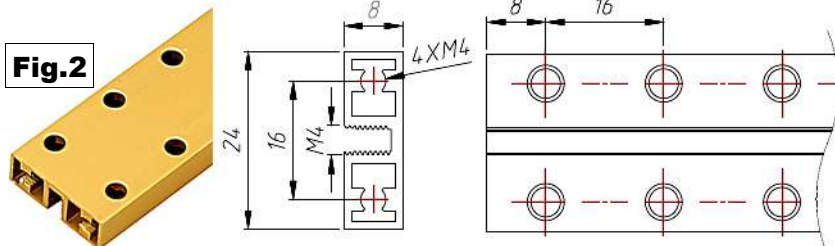
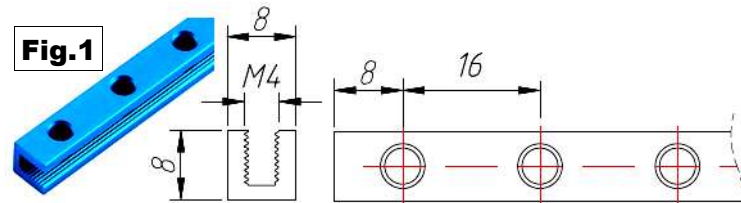
MODELS

Step-by-step instructions for 10 models from the Arduino library can be downloaded from the website. All are structurally quite simple and no details are given of the electronics needed to control them. 6 of the models are tracked Chassis with 2 of them carrying a Gripper which can move fore & aft. One is a Beer Robot (a 3-wheeled chassis carrying a bottle which can tilt, and one a Slide Drive mechanism. The other two (slightly more interesting ones) are shown overleaf.

REMARKS

MAKEBLOCK doesn't have as large a range of parts as VEX, and noticeably lacks Gears, or any straightforward way of providing a right-angled drive.

It does though have some interesting and innovative



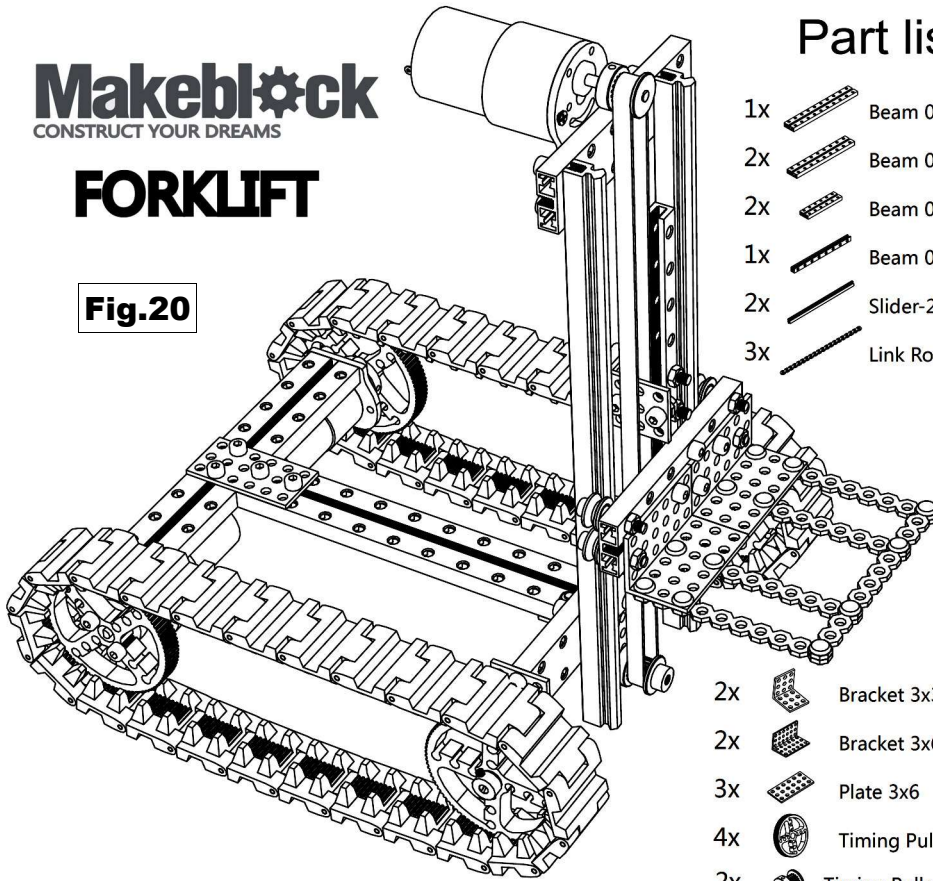
parts, including some, such as the Linear Motion Slide Unit, which could allow precisely defined movement. I wonder how the parts work in practice, comments on the X-Y Plotter are

given in the Forum link from the website including 'I have some vibration and friction problems, but it works!'.

Makeblock
CONSTRUCT YOUR DREAMS

FORKLIFT

Fig.20



Part list

- | | | | | | |
|----|--|-------------------|-----|--|------------------------|
| 1x | | Beam 0824-160 | 2x | | DC Motor-25 Bracket |
| 2x | | Beam 0824-144 | 1x | | DC Motor-37 Bracket |
| 2x | | Beam 0824-96 | 2x | | DC Motor-25 |
| 1x | | Beam 0808-128 | 1x | | DC Motor-37 |
| 2x | | Slider-256 | 48x | | Track |
| 3x | | Link Rod | 48x | | Track Axle |
| 2x | | Bracket 3x3 | 2x | | Shaft Connector-4 |
| 2x | | Bracket 3x6 | 5x | | Threaded Shaft 4X31mm |
| 3x | | Plate 3x6 | 4x | | V-slot Bearing |
| 4x | | Timing Pulley 90T | 4x | | Flange Bearing 4x8x3mm |
| 2x | | Timing Pulley 18T | 5x | | Shaft Collar 4mm |
| | | | 15x | | Nut M4 |
| | | | 6x | | Countersunk Screw M3x8 |
| | | | 8x | | Headless Screw M3x5 |
| | | | 6x | | Screw M4x22 |
| | | | 18x | | Screw M4X14 |
| | | | 18x | | Screw M4x8 |
| | | | 20x | | Plastic Ring 4x7x2 |
| | | | 12x | | Plastic Rivet R4060 |
| | | | 1x | | Timing Belt 378T |

Makeblock
CONSTRUCT YOUR DREAMS

4 LEGGED ROBOT

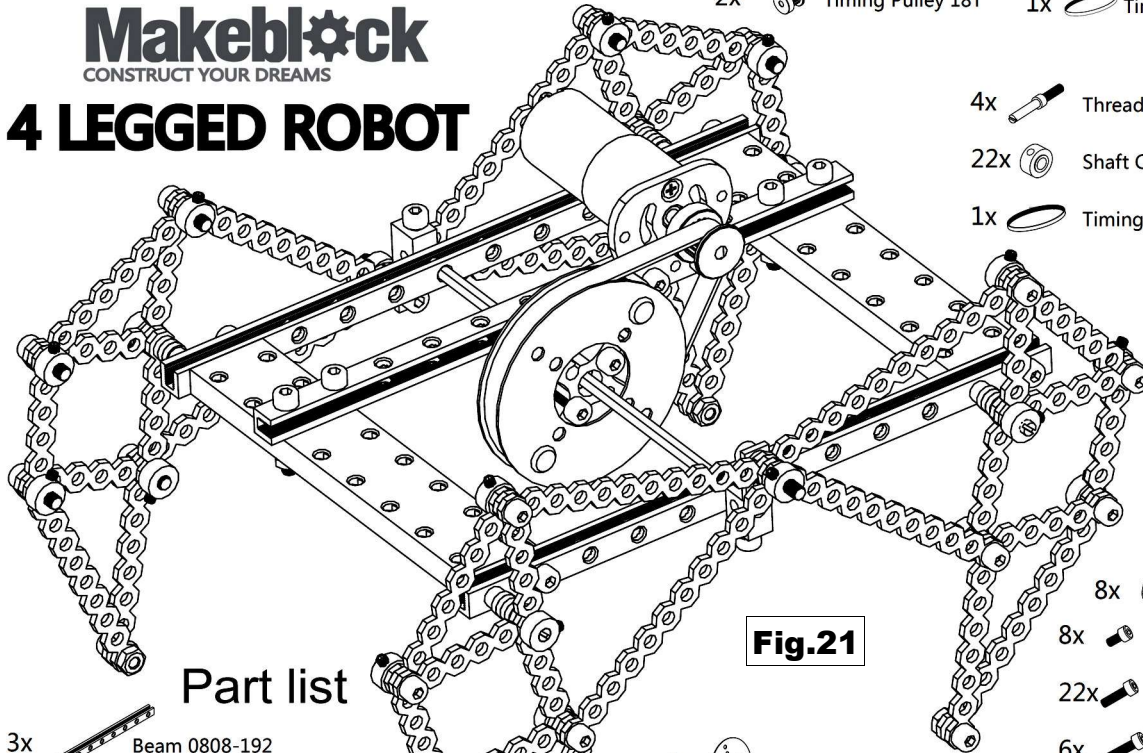


Fig.21

Part list

- | | | | | | |
|-----|--|-------------------------|-----|--|------------------------|
| 3x | | Beam 0808-192 | 4x | | Threaded Shaft 4x31mm |
| 2x | | Beam 0824-128 | 22x | | Shaft Collar 4mm |
| 18x | | Link Rod | 1x | | Timing Belt 123T |
| 1x | | D Shaft 4x160mm | 8x | | Nut M4 |
| 1x | | Timing Pulley 90T | 8x | | Screw M4x8 |
| 1x | | Timing Pulley 18T | 22x | | Screw M4X14 |
| 2x | | Timing Pulley Slice 90T | 6x | | Screw M4x22 |
| 2x | | Bracket P1 | 2x | | Countersunk Screw M3x8 |
| 1x | | DC Motor-25 Bracket | 24x | | Headless Screw M3x5 |
| 1x | | DC Motor-25 | 2x | | Plastic Rivet R4120 |
| 1x | | Shaft Connector-4 | 16x | | Plastic Ring 4x7x2 |

'New' Dutch System:

STAAL-BOUW Thank you to Jan Ringnalda for sending details of his outfit. It was made by a company called Evers of Prinsenstraat 28, Dordrecht and is believed to date from around 1949-50.

The box measures 225*145*30mm and the lid is shown right. Staal of course means Steel; Bouw, Construction Set; and the slogan 'The construction set for every boy'. The parts are shown on the inside of the lid (Fig.2).

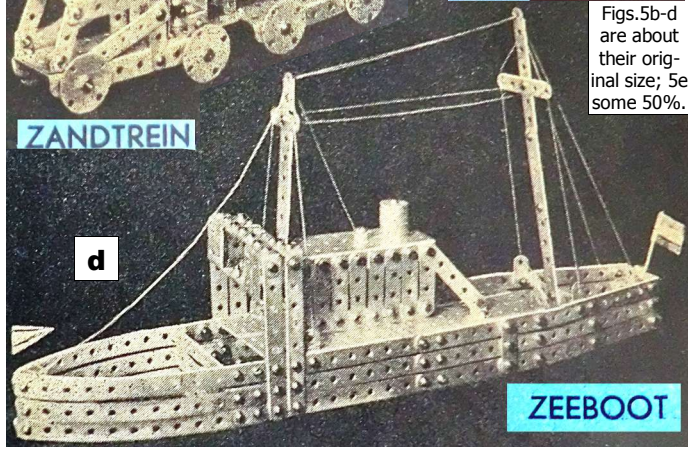
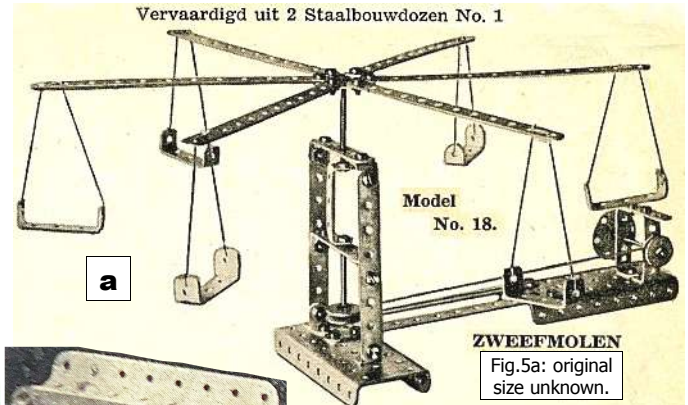
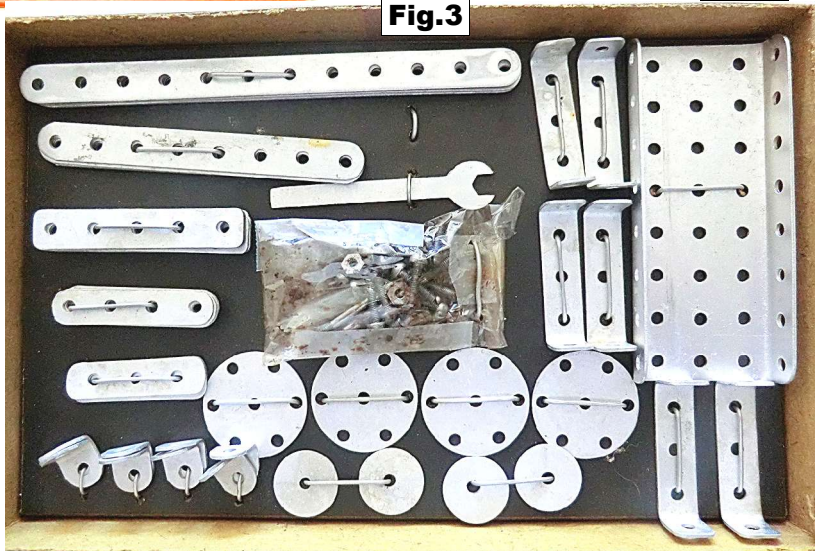
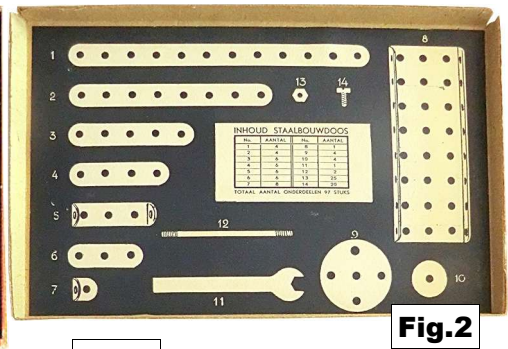
The actual parts are still strung in the open box right. Despite the 'Staal' name they are, save the threaded ones, aluminium. All the holes are round and are 3.4mm Ø at 12.0mm pitch. The thread is M2.5. The different parts are listed below with some notes, & quantities, from the table inside the lid, in curly brackets. #1-4,6 **Strips:** 12, 8,5,3h {4,4,6,6}. They vary in width from 9.6 to 10.7mm and while some lengths have near fully rounded ends, others are nearly square. #5, **DAS:** 1*3*1h {6}. #7 **A/B:** {8}. #8 **Flanged Plate:** 3*8h, 95*39mm {1}. #9 **Wheel Disc:** 6h, 30mm Ø {4}. #10 **Washer:** 18mm Ø {4}. #11 **Span'driver:** {1} (perhaps it was originally intended to include 2 because there is an empty loop below the right end of the 12h Strip which could have held the second). #12: **Rod with Screwed Ends:** 48mm o/a {2} #13 **Nut:** hexagonal {25}. #14, **Bolt:** roundheaded & 12.5mm long, though a shorter part with a large, flat cheesehead is shown in the lid {20}.

The manual is printed on blue paper with 12 pages 132*89mm, & the cover right. It contains 17 original looking models, each in a large black panel with a single photo & no instructions or Parts List. The first model is the TREKWAGEN (Fig.4), the last TUIBANKJE, Garden Seat. These plus 6 or so other simple or fairly simple models, a Swing, See-saw, Step Ladder, etc, could be made with one Set. The other models need, as mentioned in the Introduction, additional sets or extra parts, & many of them are much more ambitious. They include a Chair-O-Planes roundabout, a Lifting Bridge, a Locomotive, & the models in Figs.5c-e. Most are attractive but only the Crane appears to have any mechanical feature, and that only by virtue of a Crank Handle (see inset) which isn't one of the system's parts. The Wheel Discs in the models (& on the lid) are the 4h type.

Another manual is shown on the HONG website. Its cover is identical to the Fig.1 lid & the 2 inside pages shown are cream. One has an Intro that says that all the models in the manual can be made with 1 or 2 Sets. The other page has two models which need 2 No.1 Sets (the only mention of a Set No.1), each with a Parts List: a simple Fire Engine, but with a lever-operated ladder, & the Chair-O-Planes in Fig.5a, simpler than the one above but cord-driven. The Wheel Discs in the models are the 6h type and that together with the other differences already mentioned indicate that this manual may have been later than Jan's.

The lid and both manuals were the work of a graphics designer called Louis Akkermans and carry his monogram.

The lid and both manuals were the work of a graphics designer called Louis Akkermans and carry his monogram.



Figs.5b-d are about their original size; 5e some 50%.

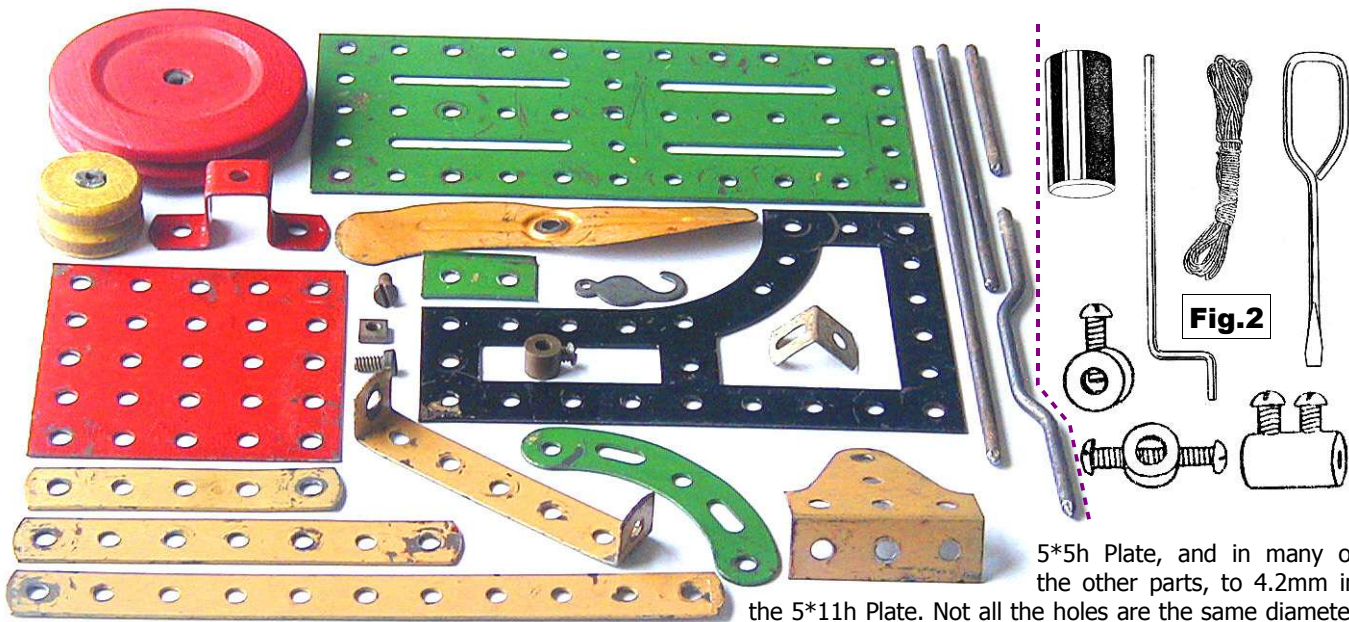


Fig.1

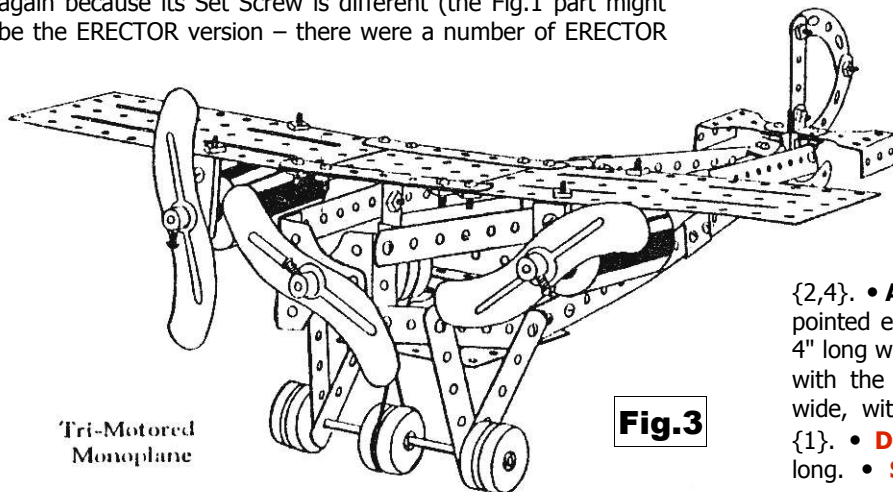
HUSTLER BILDKRAFT This is mainly about a some parts which have recently come to hand. An example of each is shown above and they include all those which are in the Illustrated Parts in *MCS* except the B&W ones on the right in Fig.2. These have been copied from *MCS* but the top 4 have been scaled so that vertically they roughly match in size the actual parts in Fig.1. The other 3 parts at the bottom of Fig.2 are as shown in *MCS* and are approximately full size (as are all the parts in *MCS*). The Collar is the part in Fig.1 but is shown again because its Set Screw is different (the Fig.1 part might be the ERECTOR version – there were a number of ERECTOR

5*5h Plate, and in many of the other parts, to 4.2mm in the 5*11h Plate. Not all the holes are the same diameter as those in the parts described in 28/820, though wear & the thick paint in some holes are often imponderables.

• **Quality.** Most of the parts are accurately made, and quite well painted though with some paint runs on one side around holes. • **Strips:** 11,7,5h, 12.7mm wide under the paint {10,6,6}. • **DAS:** {4}. • **Curved Strip:** it spans 2" & 4 make a 3" circle (pcd). The slots are 10.2mm long. {4}. • **2h Strip Joiner:** its width allows too much play to make it a particularly useful part {7}. • **A/B:** 13*13mm, and 13mm wide, with a 7/32mm slot {15}. • **Double Bent Strip:** {4}. • **Trunnion:** a rather attractive part {4}. • **Perforated Plates:** 5*5 & 5*11h. The pitch of the lengthways holes in the 5*11h is 12.6mm. {2,2}. • **Frame:** if two are abutted to make a square some holes are out of their expected position – only slightly but enough to matter {4}.

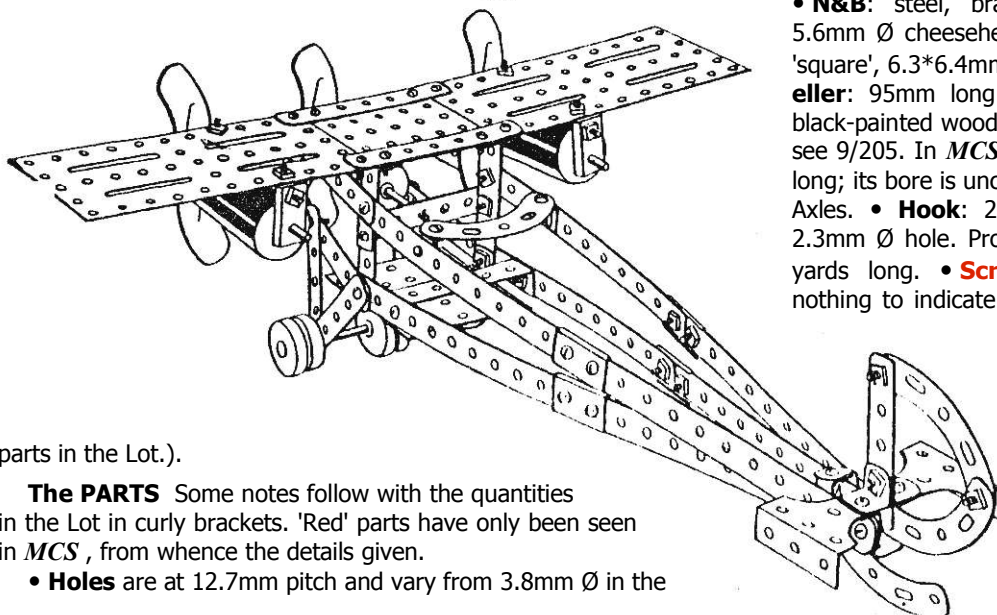
• **Pulleys:** .9 & 2.3" Ø with a rubber insert to grip an Axle. The hidden face of the 2.3" in Fig.1 is not recessed. {2,4}. • **Axles etc:** 3.41-3.45mm Ø with somewhat pointed ends. **Rods:** 6,3 1/2, 2" {1,2,1}. **Crankshaft:** 4" long with a 3/8" stroke {1}. **Crank Handle:** 5" o/a with the handle offset 7/8". • **Collar:** 5/16" Ø, 1/4" wide, with a 3.6mm bore, and single-tapped 6-32 {1}. • **Double-tapped Collar.** • **Coupling:** 15/32" long. • **Set Screw:** roundheaded and 5/16" u/h. • **N&B:** steel, brass plated, 6-32 thread. **Bolt:** 5.6mm Ø cheesehead, 1/4" u/h {25}. **Nut:** pressed, 'square', 6.3*6.4mm, and 2.2mm thick {39}. • **Propeller:** 95mm long o/a {2}. • **Cylinder:** probably black-painted wood as in the ACTION TOY BUILDER, see 9/205. In *MCS* it is shown as 27mm Ø & 55mm long; its bore is unclear but from Fig.3 it may suit the Axles. • **Hook:** 24mm o/a. .85mm thick, with a 2.3mm Ø hole. Probably tin plated. {1}. • **Cord:** 2 yards long. • **Screwdriver:** 4 1/2" o/a. There is nothing to indicate that there was a Spanner in the system. Many of the N&B would tighten without a spanner but certainly not all.

The SETS BILDKRAFT parts are few and far between and sets seen to be unknown. A web search found only a flyer from about 1930 which advertised a number, possibly



Tri-Motored Monoplane

Fig.3



parts in the Lot.)

The PARTS Some notes follow with the quantities in the Lot in curly brackets. 'Red' parts have only been seen in *MCS*, from whence the details given.

• **Holes** are at 12.7mm pitch and vary from 3.8mm Ø in the

all, of the then current Hustler toys (if all then the ACTION TOY BUILDER was not among them). Two BILDKRAFT sets were shown with a poor illustration of each, the No.1 (at \$1) in Fig.4 right and the No.3 (at \$2.50) below it. It is clear from the model page in *MCS* that the No.3 was not an add-on outfit and so it must have included another card of parts. There is no indication anywhere that there was ever a Set 2.

If the parts in the Lot were the bulk of a No.3 the missing parts would have included 2 of the 1" Pulleys, & 2 Cylinders. And judging from the Set 3 models shown in *MCS* a third propeller would have been included, 6 more 11h Strips, several additional Collars, and another Strip Joiner.

The MODELS The model page in *MCS* shows the Tri-Motor in Fig.3 plus the Hay Wain and Hammer below – all reproduced here at their original size. The three 'slogans' in Fig.8 were in the corners of the model page.

I used the parts in the Lot, plus a few Strips and Trunnions already to hand, plus a few substitute parts, and many extra N&B, to make the Goods Yard Crane in Fig.9. The only parts not in the system were some long Bolts to engage with the handles of the Crank Handles, and perhaps at a pinch Set Screws could have been used instead.

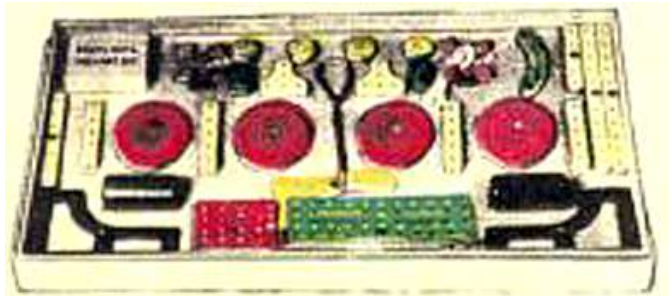


Fig.4

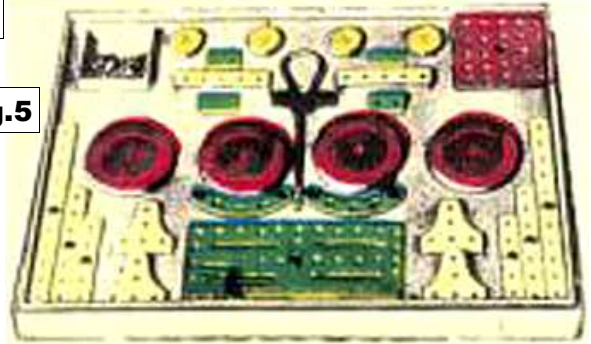
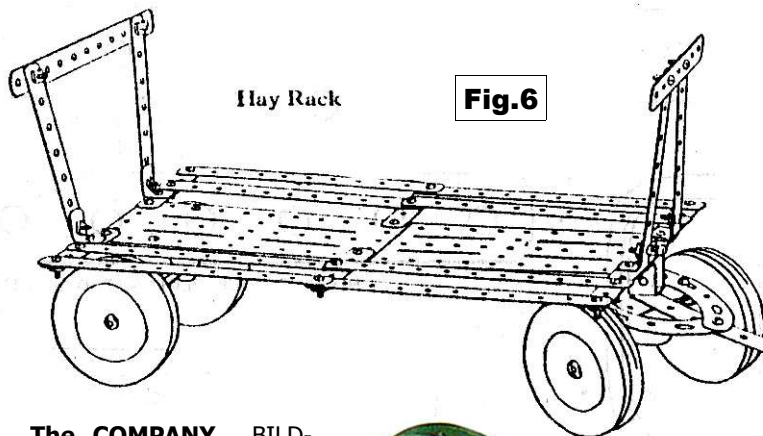


Fig.5



Hay Rack

Fig.6

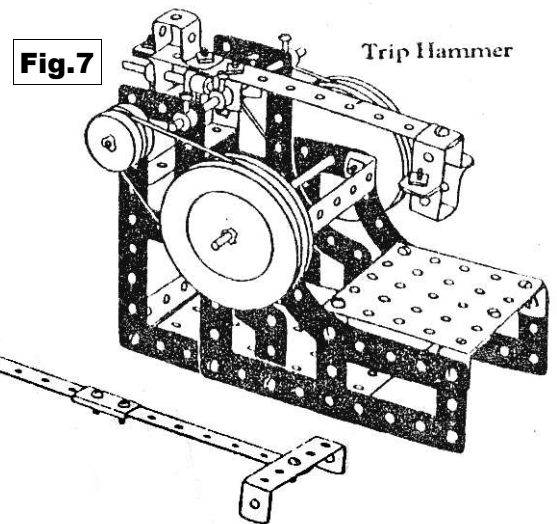


Fig.7

Trip Hammer

The COMPANY BILD-KRAFT was made by the Hustler Toy Co., a subsidiary of the Frantz Mfg. Co., both of Sterling, Illinois. Frantz started making wooden toys & games in 1919 and created the Hustler company in 1925. Production of these lines ceased in 1934 but roller skates were made until the early 1970s. Frantz is still in business producing steel balls and various bearings. This information, and the flyer mentioned earlier, came from http://www.oldwoodtoys.com/hustler_toys1.htm.

REMARKS The claim of realistic models on the model page is perhaps justified by the Hay Rack & Hammer, and even the Tri-Motor must be a brave try. And all are I think better than those of the equivalent ERECTOR sets (no doubt the main competitor with its Nos.1 & 3 at again \$1 & \$2.50). The 'Builds Models in Colors' claim is indisputable and though the colour scheme may not be to everyone's taste, the painted Strips would have made BILDKRAFT models more eye catching than ERECTOR's with their nickelled Strips. And perhaps more important as a selling point, open boxes displayed in shops might have looked more attractive.

The Frames are used to good effect in the Hammer but I wonder how useful the part was in the other manual models. Unless it was already being produced for some other application it would have a somewhat expensive part to be included in a small system, but perhaps it was intended to be another selling point – something would have been needed to count against the 2 Gears in the ERECTOR No.3.

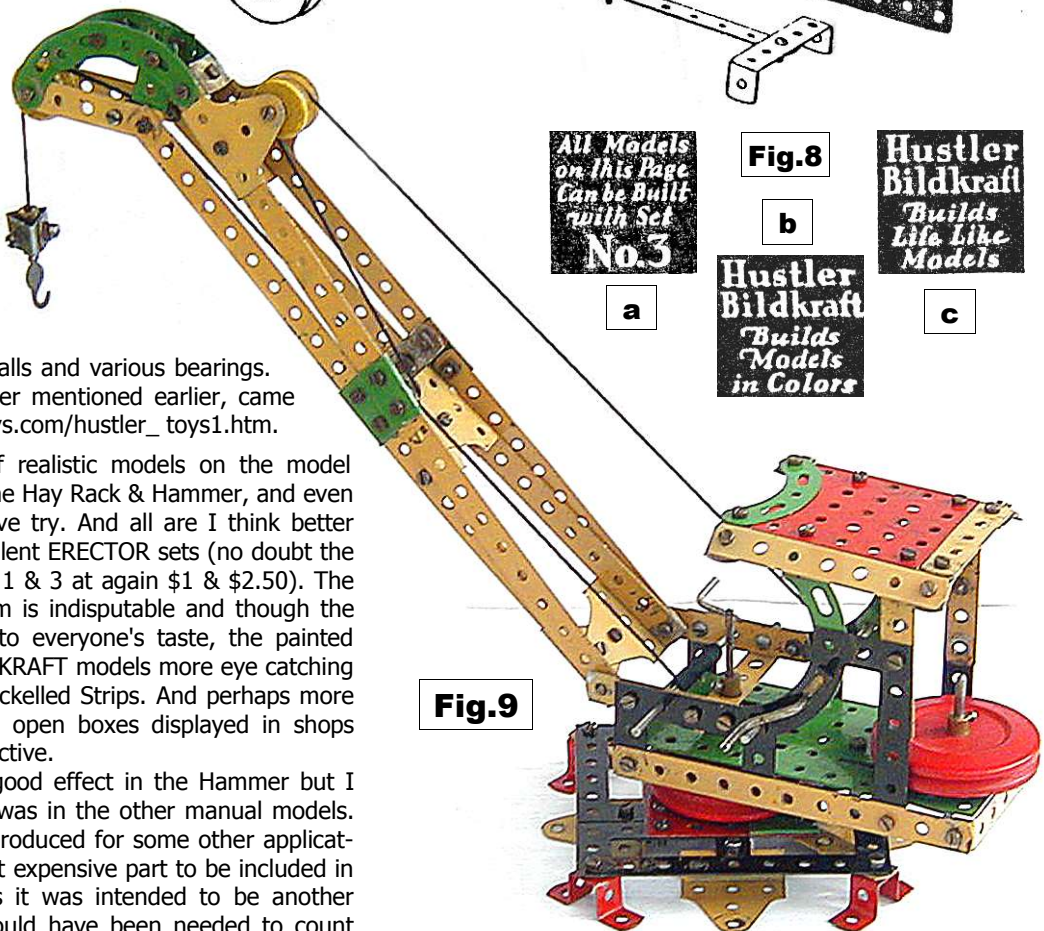


Fig.9

All Models on this Page Can be Built with Set No.3

Fig.8

Hustler Bildkraft Builds Like Like Models

b

Hustler Bildkraft Builds Models in Colors

a

c

More on KONSTRUKTIONSPIEL

Notes on this this small-scale, 7mm pitch, post-WW2 German system were given in 9/224 & 38/1138. Only one set was ever produced and it contained around 500 parts (200 plus N&B). The 11 main parts among the 15 shown right in Fig.1, were 4, 6, & 11h Strips, 5 A/Bs, 2 DAS, & a 27mm Pulley. More examples of the Set have been seen on Ebay since OSN 38 and recently Urs Flammer kindly sent details of his outfit, notable for its shallower than usual box, and also the Ebay photos of a similar outfit.

K'SPIEL's HISTORY Most of what little is known comes from the sets' model sheets, and two versions have been seen. Both are a sheet approximately 29*26cm, folded into four; both show the same models and the only differences are in the front face. One (Fig.1) has 'Made in U.S. Zone' along the bottom, and thus dates from before 1949; the other has 'Made in Germany', and so no doubt K'SPIEL continued into the 1950s. (The rest of the text is in German and why 'Made in Germany' isn't I don't know.) As explained in OSN 38 the post-49 version shows a few more of 5 of the parts than are listed in Fig.1. In both versions the 2-line heading of the list of parts says that the Set contains a ready-assembled Tramcar and some additional parts. (In dating Ebay items it is sometimes useful to notice that in the post-49 version the second line is nearly as long as the first – the increased length comes from Einsatz [something extra?] being replaced by Einsatzkarton.)

URS' SET is in a red box 16*14*4cm with the label as in OSN 38. • The parts sit in the bottom of the box, in 9 bays formed by shallow cardboard boxes. • The model sheet with the Set is as Fig.1 but if the Set originally contained the built-up Tramcar the model's top face would be well above the top of the box. In that case the box lid, which looks much deeper than in the other sets, might still engage with the base, though this would hardly be an ideal arrangement. • All the parts in the Set are steel with the grey finish of the OSN 38 parts, and they look the same as those described in earlier Issues. Urs wrote that the Strips are 7.0-7.2mm wide, 1.2mm thick, and their holes are 3.1mm Ø at 7mm pitch. Also that the thread is 2.5mm Ø with a pitch of .45mm, and the Nuts are 5mm A/F.



Fig.1

A SIMILAR but later SET From its model sheet Urs' set would be pre-49. The Ebay photos he sent of a similar set show it to be post-49, but in an identical box, with the same unusual, deep lid. Its parts though, apart from the Span'drivers and N&B, look to be all aluminium.

K'SPIEL PACKAGING & PARTS No definite pattern can be seen in the packaging and the type of metal used, but there follows an attempt to summarise the main features of the 8 known sets (including Urs' & those in OSN 38).

Packaging. • One box is light blue & one black (both pre-49); all the others are red. All have the same label and all are about the size of the OSN 38 boxes except that at 10cm the black box is deeper, and 2 (1 pre-, 1 post-49) are only 4cm high. • The 2 OSN 38 sets (pre-49) both include a small, light blue box to house the parts (other than those in the Tramcar); in Urs' 2 sets, & 2 others (dates unknown), the parts are in shallow boxes which form partitioning in the base of their boxes, and 1 set, the black one (pre-49), has a lift out tray partitioned into 9 bays.

The Parts. In the sets where the parts can be seen reasonably clearly, all have steel Span'drivers and N&B. **Pre-49.** 1 set has all steel parts. 2 sets (those described in OSN 38) have steel Pulleys, and either: one has steel & one aluminium Strip parts, or both have a mix of both. **Unknown date.** 1 set has steel Pulleys but aluminium Strip parts. **Post-49.** 1 set has steel Pulleys but aluminium Strip parts. 1 set has steel Pulleys & a mix of Strip parts. 2 sets have all aluminium parts.

So steel parts are more likely pre-49 and almost all the Pulleys are steel.

Card Parts Sheet. 2 sets (the 2 pre-49 in OSN 38) have the card parts sheet (right), 160*149mm, folded twice (joggled) to fit over the blue parts box. 2 sets (1 pre-, 1 post-49) have a similar sheet but only about 12½cm high, unfolded, and with the Scale printed below the other parts.

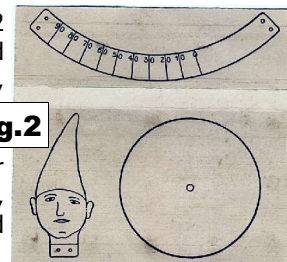


Fig.2

OSN 49/1501

KONSTRUKTIONSPIEL: S3

Snippets. New Argentinean System: ARMAMEC

The top face of two boxes are shown right and on their undersides are small pictures of the 8 models in the current range. The featured models for the other 6 sets are a Breakdown Truck, a Fire Engine, a Helicopter, a Mechanical Shovel, a Buggy, & one too blurry to be recognisable. The sets vary in size from 80 to 260 parts and the boxes from 17*25 to 34*50cm. 3 different models can be made from at least the larger sets, and one is simple Crane with a 20h long jib on a 20h high tower.

Parts that can be seen in the various models are 5, 7, & 11h Strips; a 5h Curved Strip, 1*3*1 & 1*5*1h DAS; 3 & 5h A/Gs; 5*3, 5*5, & 5*11h Flanged Plates, and a 3*5h flanged on the 3h & one of the 5h sides; 2*8 or 9, 3*3, 3*5, & 5*7h



Fig.1



Fig.2

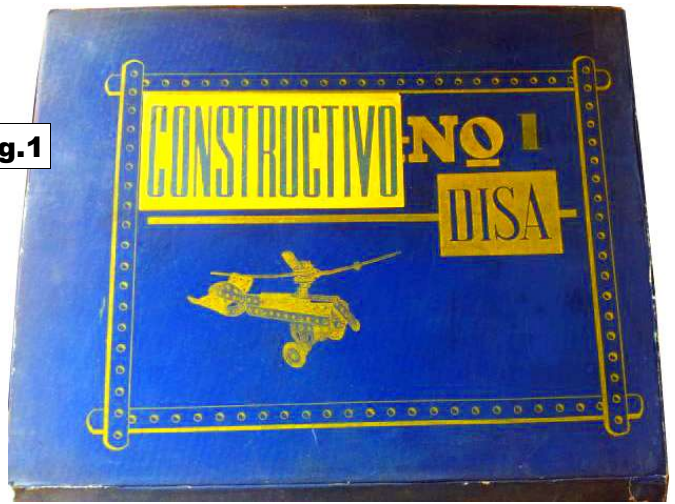
Perforated Plates; a 3*3h Corner Bracket; a Trunnion & Flat ditto; a 2h wide 1*2h A/B; an 8h Bush Wheel; a Road Wheel; a small Pulley; Axles; a Crank Handle, & a Wire Hook. There is no indication of the pitch of the holes, or their diameter. The colours of the various parts (red, blue, green, yellow, white, & silver) vary somewhat from model to model, and sometimes even on the top & bottom of the boxes.

OSN 49/1501

ARMAMEC: S1

Snippet. 'New' System: CONSTRUCTIVO This is about a set seen on the French Ebay, or rather 3 sets but with only one lid. Said lid and one of the boxes are shown right. The other boxes have the same insert but the parts in them are sometimes in different recesses, and two parts can be seen in only one set (they are shown in Fig.2A). The Ebay ad said that CONSTRUCTIVO is compatible with MECCANO.

Fig-1



Despite the French connection it seems likely that the system was Spanish rather than French: Constructivo is not a French word but means 'constuctive' in Spanish, and DISA is a Spanish oil company. Another likely pointer is the Autogiro on the lid. It is no doubt a Cierva, a machine invented and developed by the Spaniard Juan de la Cierva in the 1920s. But given its moulded plastic insert, the set shown here would date from well after WW2, most probably sometime after the mid-1950s.

The parts that can be seen are:

- 2, 3, 7, 11h Strips (the 2h is in Fig.2A, on top of the 3h). Unexpectedly, no 5h Strip could be seen in any of the Sets.
- A Curved Strip with its 2nd & 4th holes slotted.
- A 5*11'h Plate, probably flanged on its long sides (it is strange that it has no centre hole, a very uncommon feature but not unknown, one version of the UK BILT-E-ZE comes to mind, see 22/629).
- A 5*5h Plate, see Fig.2A.
- A 5h Trunnion & Flat Trunnion.
- An 8h Wheel Disc with eyelet boss.
- A Pulley with Rubber Ring; its boss is perhaps not tapped.
- A smaller bossed Pulley.
- An A/B with 2 round holes.
- A D/B.
- 2 Axles, probably about 3½ & 1" long.
- A Crank Handle.
- A roundheaded Bolt & largish, square Nut.
- A Screwdriver & a Spanner.

Fig.2



Postscript There seemed something familiar about CONSTRUCTIVO and by chance I realised what it was: see MECA, described in 36/1070 & 39/1177. Both have the same type of box insert and most of the parts look identical. The most noticeable difference is that the corners of the MECA 5*5h Plate are much more rounded. The lids are different in colour but otherwise quite similar and both have 'DISA' in large letters. MECA was said to have been made in Mexico and there are several Mexican companies of that name which are seemingly not connected to the Spanish oil company. But if CONSTRUCTIVO was Spanish it would not be the only Spanish

construction system to move production to Mexico – Exin moved its production of MECCANO there around 1970, see 17/491.

A final thought on the CONSTRUCTIVO lid: is the yellow panel with the name on it a label stuck on to cover MECA?



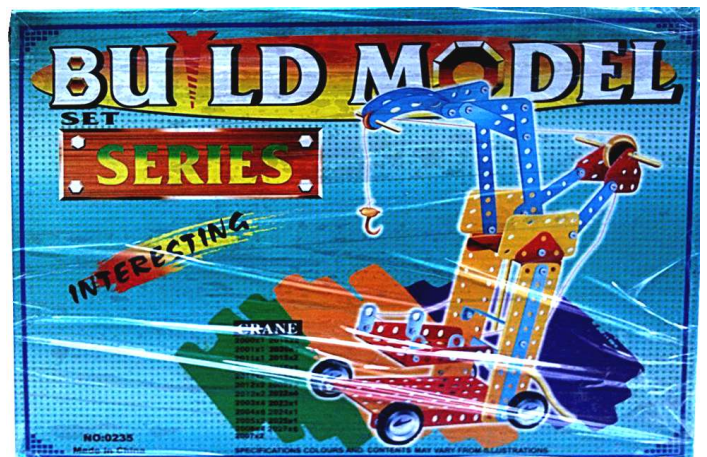
Fig.2A

CONSTRUCTIVO: S1

OSN 49/1502

Snippet. New System: BUILD MODEL The photo right, seen on American Ebay, is all that's to hand of the 'Series' claimed on the lid. In the bottom left corner is 'NO:0235' and 'Made In China'. The latter would be expected these days and in fact the parts in the featured Crane look, apart from their colours, like the Chinese WISDOM, and its other lookalikes. Note especially the 7h long Flanged Sector Plate, the Trunnion, the Flat Trunnion, and the Wheels with their bright, pressed hubcaps. Only the Hook is perhaps not quite the WISDOM pattern (flat and similar in outline to the MÄRKLIN part).

The only caveat in the comparison with WISDOM is that though the parts in the later Chinese-made STEEL BUILDER are in the main very like WISDOM, its hole pitch is 12.2mm (see 32/961) against WISDOM's value of 12.5mm.

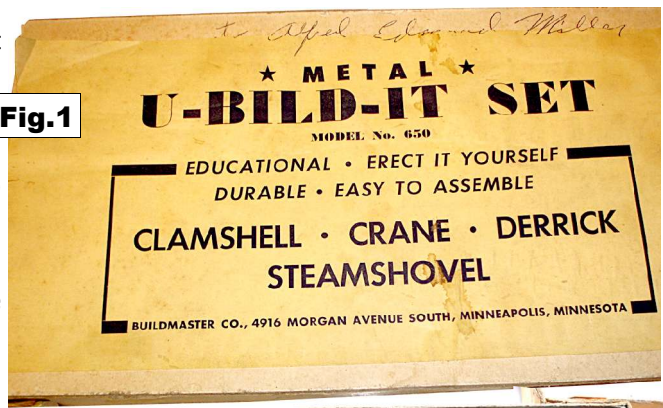


BUILD MODEL: S1

OSN 49/1502

'New' American System: U-BILD-IT Kendrick Bisset kindly sent details of his set, newly acquired from Ebay. There was no manual with it but the lid, right, gives an indication of the types of model which it probably included. It also has 'Model No. 650' on it, and the maker: Buildmaster Co., 4916 Morgan Avenue South, Minneapolis, Minnesota. There is no indication of date but post-WW2 seems very likely. The parts in the Set, as found, are of two types, aluminium with holes at 1/2" pitch, and steel with a hole pitch of 1". The latter include a Clamshell & a Digger Bucket. Kendrick commented that the aluminium parts are VERY similar to SKY-SCRAPER (see 21/595).

Fig.1



The Box measures 15 1/4 * 8 1/4 * 1 1/2". The parts can be seen in Figs.2-7: in Fig.3 the aluminium parts are within the red lines and in Fig.4 the only aluminium part is the A/B. Some details of the parts follow with the quantities found in curly brackets.

Non-Steel 'SKY-SCRAPER' Parts. • **Strips:** 4,6,11h, .369-.372" wide, with holes .138" Ø {3,8,10}. • **A/B** {5}. • **Perforated Plate**, 2*6h {2}. • **Flanged Plates:** 4*7h & 2*4h {1,2}. • **Channel Plate**, 2*2*2h {1}. • **Spanner**, its flat end may have been intended to be a screwdriver but is much too thick to fit the slots in the Bolts {1}. • **Wheel**, 1 1/4" Ø, hard rubber or plastic. {4}. (The only SKY-SCRAPER part not in the Set is the 2*4h version of the Channel Plate.)

Fig.2



Steel Parts. • **Strips:** 6,10,15h, .382-.386" wide with holes .132" Ø {4,2,1}. The 6h is the same length as the 1/2" 11h, & the 15h is about 14 1/2" long. • **D/B**, 1/2" wide strip & 2" long o/a {2}, one carrying 2 Crank Handles. • **Rev. A/B**, 3" long & 1/2" wide, with just one hole at each end {1}. No

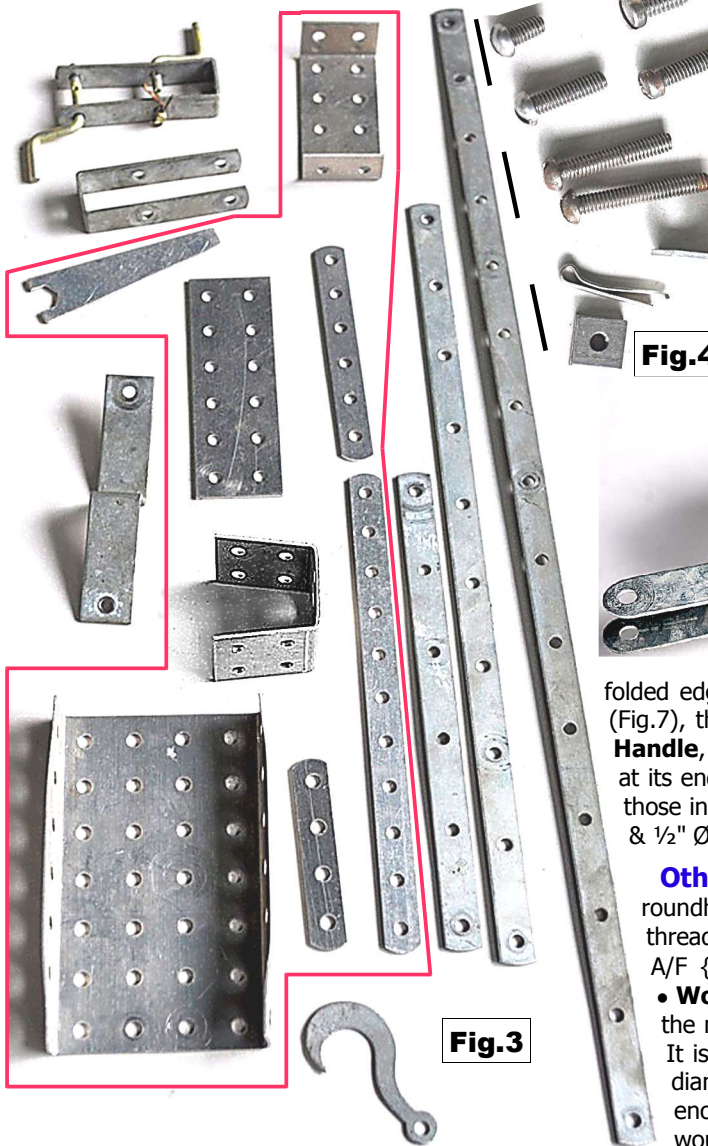


Fig.5

Fig.4

Fig.7

Fig.6 doubt it is used as a mounting bracket: it fits nicely inside the base of the D/B & it was found so assembled.

• **Clamshell Bucket** (above), the toothed edge is 1 1/4" & the long, folded edge 1 3/4". It is a shallow vee when closed. • **Digger Bucket** (Fig.7), the face opening is 1 1/4" (the toothed edge) by 1 3/4". • **Crank Handle**, it is .125" Ø with a shaft about 1" long, drilled for Cord and, at its end, for a Split Pin {2}. • **Split Pin** about 5/8" long {3 including those in the Crank Handles}. • **Hook**, 1 5/8" long {1}. • **Washers**, 7/8" & 1/2" Ø {1,2}. The centre holes look somewhat oversize.

Other Parts. • **Bolts:** fillister-headed, 5/16" & 5/8" u/h {17,4}; roundheaded, 1/4", 1/2", 3/4", 7/8" u/h {1,3,4,3}. All have a 5-40 thread except the 6-32 5/16" fillister. • **Nuts**, 5-40 & 6-32, all 5/16" A/F {26 total}. • **Spacers**, brass, 1/4" Ø, 1/4 & 3/8" long {2,5}. • **Wooden Base**, 9*5 5/8*3 3/4" (Fig.5). It would be useful in some of the models mentioned on the lid and may well be a genuine part. It is stained on 5 sides and the hole is a good fit for the smaller diameter Bolts. There is a recess on the underside (Fig.5) deep enough to accommodate a Bolt head or Nut, and a 7/8" Bolt would protrude 3/8" above the top face {1}.

Fig.3

It isn't known which if any Bolts are not original but 2 SKY-SCRAPER sets have been seen on Ebay which contain $\frac{5}{16}$ " 6-32 Bolts, and longer ones with the 5-40 thread, while other sets have only 5-40 Bolts. Probably all were bought-in parts at a time when shortages limited choice.

Parts needed for Cranes etc but noticeably absent are Pulleys & Axles. Possibly the Washers could be used to make pulleys, as in TRIX but mounted on the long Bolts, though it would hardly be practical in many cases.

Remarks. It can be supposed that Buildmaster's aim with the steel parts was to allow more realistic models. The question of course is whether the box contains a mix of SKY-SCRAPER & U-BILD-IT parts, or do all of them belong to the No.650 outfit. The quantities of the former are very similar to those in a known SKY-SCRAPER set, but despite this a case

can be made for all the parts belonging to the Set. Of the steel parts at least one 11h Strip is missing, and a number of others would be needed before even minimal examples of the models mentioned on the lid could be made. So it is certainly possible that the 'SKY-SCRAPER' parts were part of the Set, and it wouldn't be a great surprise if they were genuine SKY-SCRAPER items. It would have been unusual to have included virtually all of another maker's set in a new system, but it would have made sense to do so if money was limited and it allowed Buildmaster to achieve its objective. Ames Mfg. in St Paul, the makers of SKY-SCRAPER, was just across the Mississippi River from Minneapolis, and so would have been an obvious source of suitable parts. It's even conceivable that production of SKY-SCRAPER had ceased and Buildmaster bought the remaining stock, and/or the tooling to produce the parts itself.

U-BILD-IT: S2

OSN 49/1504

MAK-A-TOY 'Hardboard and Metal' does not perhaps have quite the same ring to it as PRIMUS's 'Wood and Metal' but it describes MAK-A-Toy. I've seen 2 identical sets on Ebay in 15 years and I couldn't resist the second one, shown here. MAK-A-TOY was made by the J.L.Hammett Company of Cambridge, Mass. No date for it is known but soon after WW2 seems the most likely – the Set cost \$1.75 and for comparison a Sears ERECTOR 'Girder' set (which built 75 models) cost \$1.98 in 1939 and \$3 in 1948.

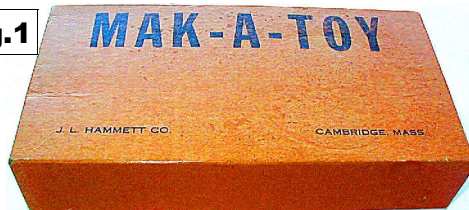


Fig.1

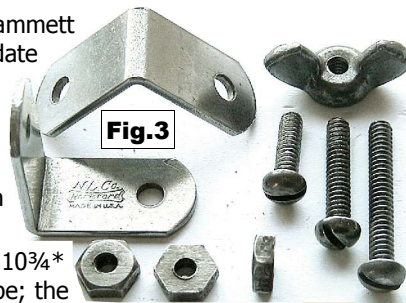


Fig.3

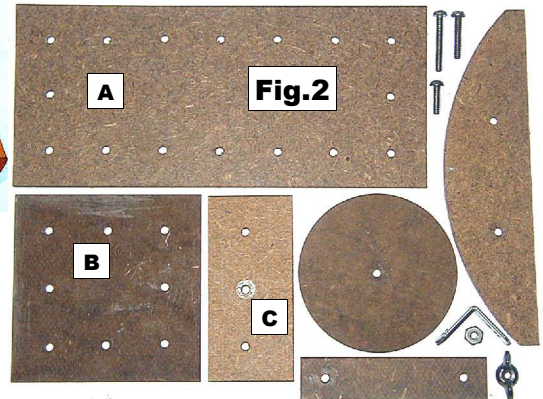


Fig.2

The Box (Fig.1) measures 21*10 $\frac{3}{4}$ *4cm. The N&B are in a small envelope; the other parts loose in the box.

The Parts (Figs.2 & 3) comprise 6 of (good quality) hardboard, 3.7mm thick, a steel A/B, & steel N&B. All are accurately made. The holes are at 1" or 2" pitch, 3.5mm Ø in the hardboard but 3.9mm in the A/B.

Comments on the various parts follow with the quantities found in curly brackets. • **Plates A,B,C** are 3 $\frac{1}{4}$ *7 $\frac{1}{4}$, 3 $\frac{1}{4}$,1 $\frac{1}{2}$ " o/a {4,4,2}. • **Curved Plate,**

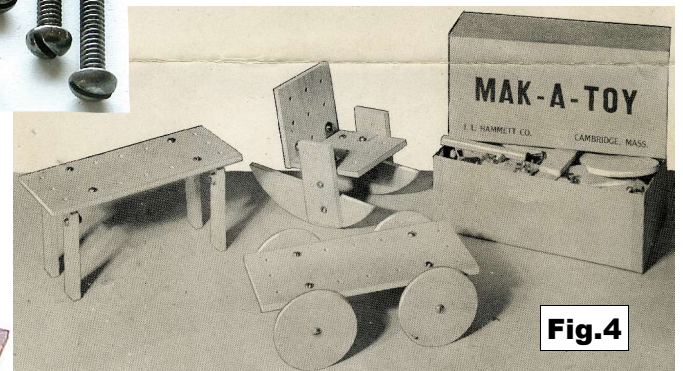


Fig.4

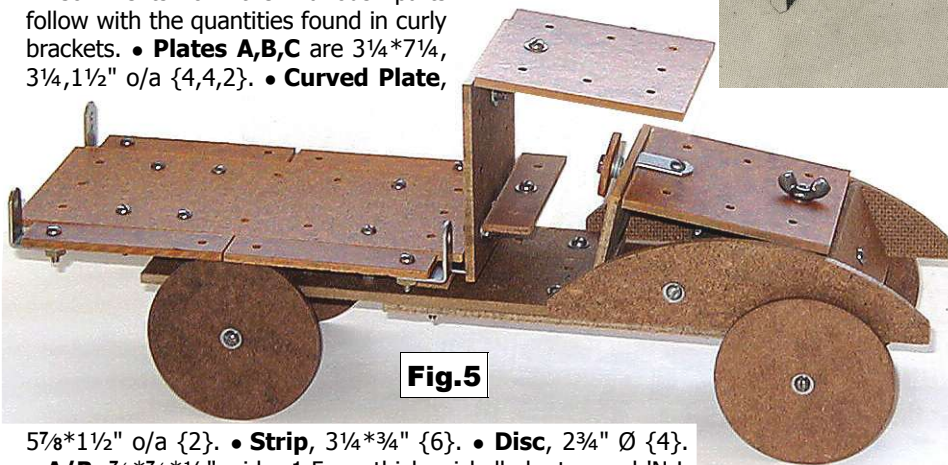


Fig.5

57 $\frac{8}{8}$ *1 $\frac{1}{2}$ " o/a {2}. • **Strip,** 3 $\frac{1}{4}$ * $\frac{3}{4}$ " {6}. • **Disc,** 2 $\frac{3}{4}$ " Ø {4}. • **A/B,** 7 $\frac{8}{8}$ *7 $\frac{8}{8}$ * $\frac{1}{2}$ " wide, 1.5mm thick, nickelled, stamped 'N L Co. Rockford. Made in USA.' {12}. • **N&B,** 6-32, plain steel. • **Bolts,** 6.3mm head, 1, $\frac{3}{4}$, $\frac{1}{2}$ " u/h {12,9,12}. • **Nut,** 7.8mm A/F, 2.8mm thick {20}. • **Winged Nut,** 21mm o/a {6}.

Note Apart from Plate A & the Curved Plate, the hardboard is smooth on both sides.

The Models Both sets had the same model sheet, single-sided, 266*200mm. The top quarter has the name, the bottom quarter Hammett's 4 addresses (Kendall Square, Cambridge, Mass., 10 Beacon Street, Boston, Mass., 89 Broad Street, Lyons, N.Y., & 380 Jelliff Avenue, Newark, N.J.), and the middle is shown in Fig.4. I thought the Rocking Chair quite nice but wanted to build something a little more demanding. Cranes and the like seemed out of the question but a Lorry appeared just possible. The result is

shown in Fig.5, and it is quite a rugged model. It did though need a few homemade parts: the steering wheel; a Strip with a centre hole (for the driver's seat); 4 A/Bs & 4 Flat Brackets (flattened A/Bs), all used to add Strips to the sides of the load platform); 3 Bolts; & 18 Nuts.

MAK-A-TOY: S1

OSN 49/1504

More MEX Some details of this 1930s UK system were given in 16/452 and since then some points of interest have come to light, mainly about the packaging. Thank you to Rob Mitchell (Editor of the *Sheffield Meccano Guild Journal*) & David Hobson for their help.

SET 1. The parts were in a packet, 162*115cm (Fig.1) inside the box (Fig.2). The Set No. is shown on the Packet but not on the lid. The words in small letters along the bottom of the packet are 'PRINTED IN BAVARIA' (Fig.1A), and this supports the theory that the parts were made in Germany (despite the 'British Made' claim in the G&T ad mentioned in OSN 16).

Set 2. The lid is shown in *MCS*, and it is very similar to the one in Fig.3 – the only differences are '80 PIECES' by the boy's head, and the text along the bottom: 'EIGHTY PIECES INCLUDING FOUR RUBBER TYRED WHEELS'. Said Wheel is a yellow loose Pulley of about 1" Ø, fitted with black, treaded Tyres of about 1½" o.d. The Pulley is shown with an eyelet boss in an ad, see 19/554, but the examples in a poor photo of a set appear to have no boss of any sort.

SET 1a. This set has not been noted before. Fig.3 shows the lid and a corner of what is probably the packet which contained the parts. The 'a' after '1' might indicate a linking set but this seems unlikely since 60 parts are claimed on the lid, the same quantity as in the No.1, whereas there were only 80 in the No.2. Possibly

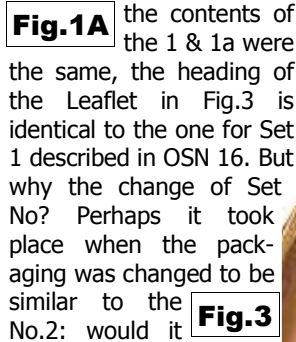


Fig.1A the contents of the 1 & 1a were the same, the heading of the Leaflet in Fig.3 is identical to the one for Set 1 described in OSN 16. But why the change of Set No? Perhaps it took place when the packaging was changed to be similar to the No.2: would it be too cynical to suggest that it was hoped that the 1a would be bought as a new, different set? Or maybe that the Sets 1a & 2 would be preferred to Trix's two basic sets, numbered 1 & 1a at the time.

OSN 49/1505

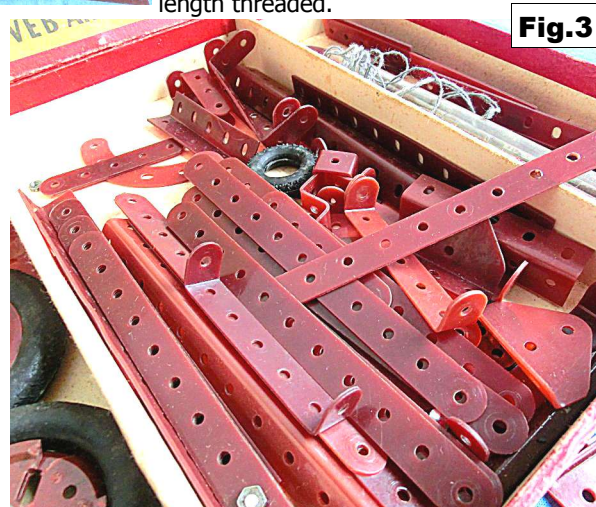
MEX: S1

Snippets. KUKO This is about the set right seen on German Ebay. A box lid was shown in 33/972 and it gave the maker as the East German VEB Ankerwerk. The Ebay lid is identical except for the white circular label bottom right with the set number, said to be '1H', on it, though the 'H', if 'H' it be, is too small to be seen in any of the Ebay photos.

A list of the parts that can be seen in all the Ebay photos follows and most of them can be picked out in the snippets shown here. 'Probables' are asterisked. As no indication of size was given diameters etc are given in terms of the hole pitch, 'p'.

The N&B, Axles, bosses, & small fittings look to be steel; the large Pulleys were said to be Bakelite. From their appearance the other parts are most likely plastic.

The parts: • 5 & 11h Strips; 5h Curved Strip.
• 1*5*1 & 2*5*2h DAS.
• 5 & 11h A/Gs.



- A/B. • Reversed A/B.
- D/B*. • 3h high D/B.
- Trunnion. • Flat ditto*.
- 5*5h Flanged Plate. • 8h long Flanged Sector Plate. • 5*5h Perforated Plate.
- 2¾p Ø Bush Wheel with 4 round & 4 slotted face holes.
- 3p Ø Pulley with Tyre. • 1p Ø Loose Pulley with Tyre*.
- 2-hole Coupling. • Collar of the same diameter.
- Threaded Pin 2p long with 40% of its length threaded.

- Axles: 2p, 4p, 6p, & longer.
- Cheeseheaded Bolt. • Hexagonal Nut. • Grub Screw.
- Grey Cord.

OSN 49/1505

KUKO: S2

'New' System: AUTO-MÉCA

News of this French system thanks to Jean-Pierre Guibert who sent the Ebay details of a set in a recent lot, plus other photos from Google and one of his friends. The Set has parts to make the one model shown on the lid below. Nothing is known of



the **Fig.1** manufacturer, nor of any other sets which could be from the same stable. And there is nothing to indicate AUTO-MÉCA's date but Jean-Pierre wrote that it might have existed before WW2 and would certainly have been from the 1930s or 1940s.

The BOX The words along the bottom of the lid label are 'Marque et modèle déposés - PARIS'. The partitions in the box's base (Fig.3) are as in another (empty) box except that along the bottom the latter has a narrow bay at each end and its righthand one is divided across into three.

The PARTS are made of aluminium and are shown on the instruction sheet inside the lid (Fig.2). Most can be seen in the open box and Fig.6, but the 3 nose parts in 'Fig.IV' of Fig.3 are missing from the Set. Also the parts in the green box in Fig.6 are probably alien - one of them looks to be the Riveting Tool from MAC ET NICK (see 17/472).

The MODEL The Chassis is 20cm long and the model about 30cm o/a. The front Axle is pivoted on the Chassis to give steering but is not connected to the Steering Wheel. As can be seen in Fig.6 Split Pins are used to locate several parts.

Apart from this Set, two built-up models are known and are

Fig.4

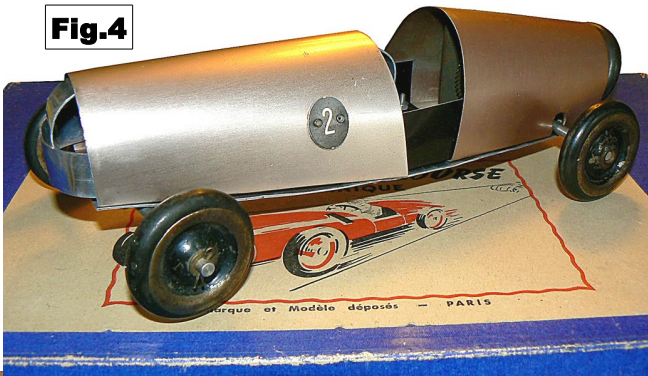


Fig.5

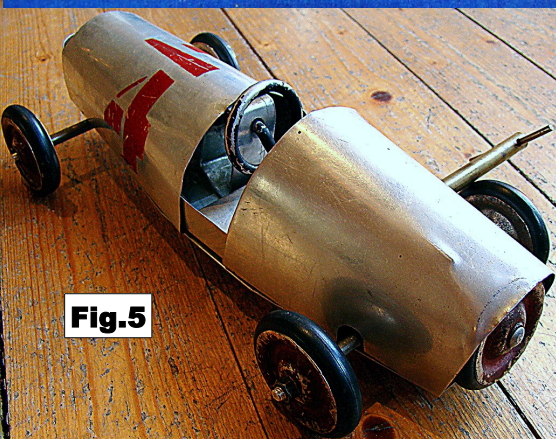
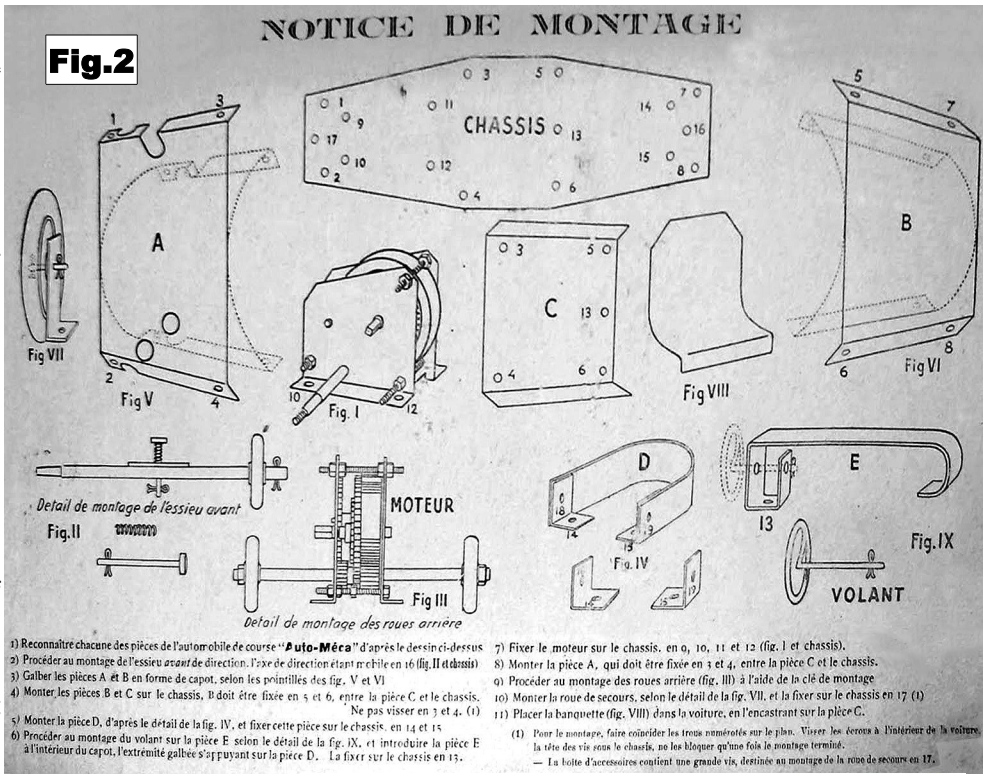
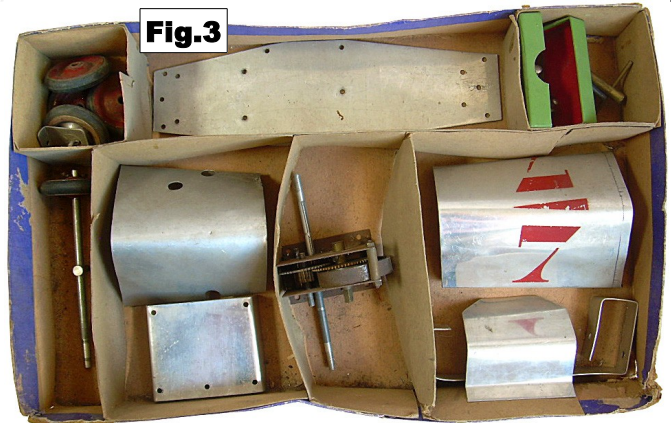


Fig.2



- 1) Reconnaître chacune des pièces de l'automobile de course "Auto-Méca" d'après le dessin ci-dessus
 - 2) Procéder au montage de l'essieu avant de direction. L'axe de direction étant mobile en 16 (fig. II et chassis)
 - 3) Galber les pièces A et B en forme de capot, selon les pointillés des fig. V et VI
 - 4) Monter les pièces B et C sur le chassis, B doit être fixée en 5 et 6, entre la pièce C et le chassis. Ne pas visser en 3 et 4. (1)
 - 5) Monter la pièce D, d'après le détail de la fig. IV, et fixer cette pièce sur le chassis, en 14 et 15
 - 6) Procéder au montage du volant sur la pièce E selon le détail de la fig. IX, et introduire la pièce E à l'intérieur du capot, l'extrémité galbée s'appuyant sur la pièce D. La fixer sur le chassis en 15.
 - 7) Fixer le moteur sur le chassis, en 9, 10, 11 et 12 (fig. I et chassis).
 - 8) Monter la pièce A, qui doit être fixée en 3 et 4, entre la pièce C et le chassis.
 - 9) Procéder au montage des roues arrière (fig. III) à l'aide de la clé de montage
 - 10) Monter la roue de secours, selon le détail de la fig. VII, et la fixer sur le chassis en 17 (1)
 - 11) Placer la banquette (fig. VIII) dans la voiture, en l'encastrant sur la pièce C.
- (1) Pour le montage, faire coincider les trous numérotés sur le plan. Visser les écrous à l'arrière de la voiture, la tête des vis sous le chassis, ne les bloquer qu'une fois le montage terminé.
— La boîte d'accessoires contient une grande vis, destinée au montage de la roue de secours en 17.

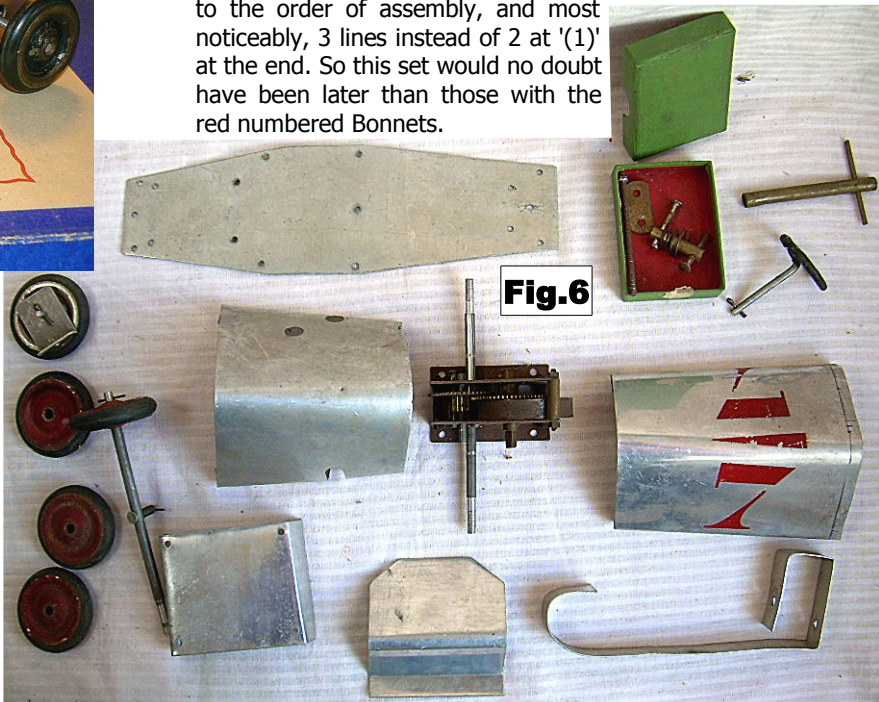
Fig.3



shown in Figs.4 & 5. The 'No.2' is missing its Seat & Steering Wheel. Otherwise they are the same except for the colour of the Wheels & the number on the Bonnet.

Minor Variations in the sets are the different types of numbering on the Bonnets, and for the 'No.2' set, slightly improved building instructions (as in Fig.2) with some changes to the order of assembly, and most noticeably, 3 lines instead of 2 at '(1)' at the end. So this set would no doubt have been later than those with the red numbered Bonnets.

Fig.6



New from MERKUR The notes that follow were based on the Merkur website in mid-February – at the time the catalogue which can be downloaded from the site had not been changed to include a number of sets which have been added since those noted in 45/1363, and its name includes '2011'. Czech prices are shown on the website but those here are approximately the corresponding GBP.

LARGER SETS There are three new ones, all with 2 layers of parts. One is the Red Baron below with 680 parts and a manual showing 40 models



Fig.2

including several different types of aircraft, a House, & a Motorcycle. The second is Flying Wings with 640 parts and a manual with again 40 models, this time including spaceships, jets, prototypes, & experimental planes. The lid shows 2 1930's style 'interesting looking' monoplanes of about 40cm span with nearly all the parts dark green. Finally, the Age of the Vikings below with 1350 parts, and again a 40-model manual with



Fig.3

modern models as well as the Viking Ship, plus others said to hark back to the Greek myths: Trojan Horse, Siege Tower, Catapult, Trebuchet, & Battering Ram,

RETRO SETS 3 new sets have been added to the existing C01 & C02 in the Retro series: C03, C04, & C05, all with 2 layers of parts, and all with colourful 1930s style labels – Fig.1 shows the C04. C05 is packed in a suitcase-style box. No details are given of the contents but presumably they are similar to the prewar outfits. There is no indication of the



Fig.1

and some wheeled, but there is also a Mini Robot and the Ant below. Sample programs can be downloaded for

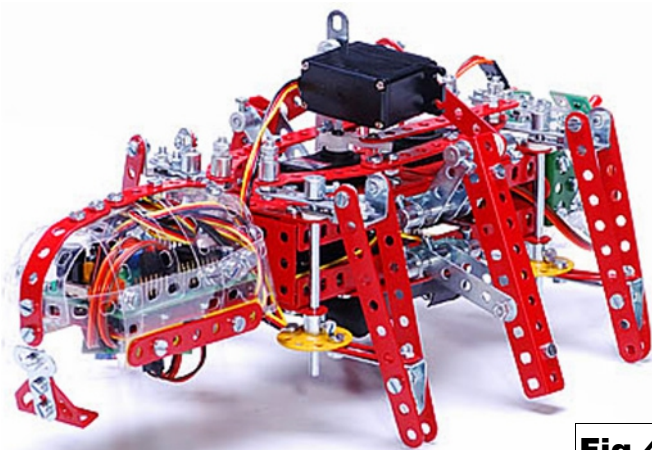


Fig.4

most of the models.

SCHOOL SETS There are 3 series of these. **Mini Kits:** 6 sets: the Alphabet; 3 simplicity models (a Weightlifter, a Skier, & a Sailing Ship); a simple Chair-O-Planes roundabout with its 6 seats represented by Trunnions; and a Pump worked from a Crank Handle via a rocking lever. **Physics for 9-14 year olds** with 7 sets: Mechanika 1 with parts to make simple apparatus for experiments with pulleys, weights, spring balance, etc; EMA 2 with just an illustration of a circuit diagram & a meter of some sort; a set called Module Switches but with no details except the price; 4 sets, each a mechanism on a light blue 17*25h Flanged Plate with the Geared Motor driving various

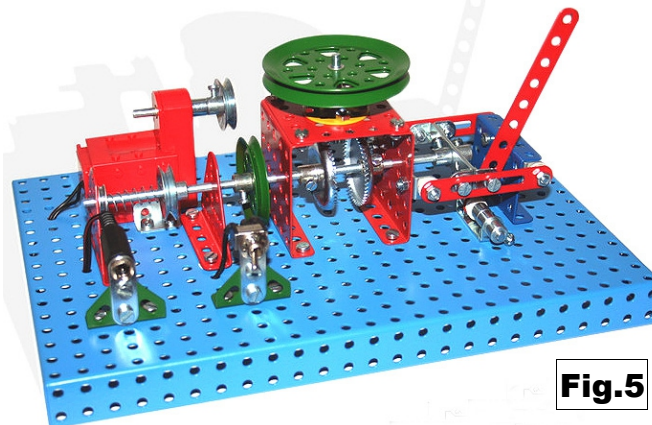


Fig.5

gearboxes, cranks, etc. One is shown above. **Mechanics:** 27 sets in all but usually without any details beyond a title and sometimes a photo. They include: • 3 sets, Elektronika I, II & III, are for technical secondary schools – Set III is shown in Fig.6 and costs some £2000 (for comparison the Red Baron is priced at £33, the Viking £46, the Retro sets from £24 to £48, the School set above at £39, & the Ant at £96). • 2 sets are to make elaborate models. One is called Programmable Mini Line



Fig.6

and has a robot working on items on a conveyor belt. The other, Automated Warehouse, Fig.7, costs nearly £1800 and a video shows a sequence of the gantry crane picking up one of the red 'boxes' (on the base at the back), putting it on the down conveyor, the robot picking it up at the bottom and putting it on the up conveyor, and the gantry crane putting it back in its original position. Presumably it could then go on to circulate other boxes in the same way. The gantry crane moves along what looks to be an extruded metal cross member. • Finally 22 Modules, mostly at about £100 each to control Motors, measure distance, sound, temperature, pressure, colour, moisture, etc, and one labelled WiFi. In those that are illustrated the components are mounted on the light blue Flanged Plates.

Zakázkové stavebnice The website in Czech but not the English or German versions, has this additional category of

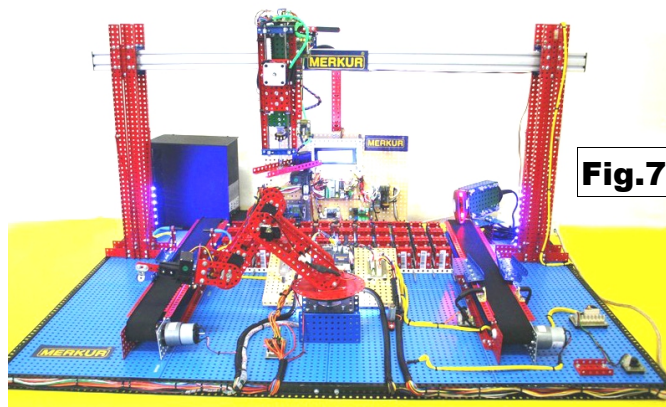


Fig.7

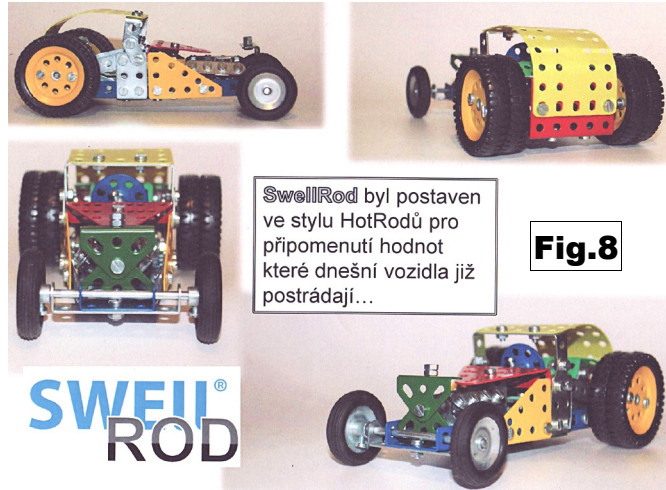


Fig.8

sets. The name translates as Custom Kits and 5 models are shown, each probably from a different £10 set. They are small cars, 3 Saloons; a hot rod called a 'Rat Rod'; and the one above.

MERKUR [1]: S11

OSN 49/1058

Snippet. 'New' System:

WIDES Right, the Ebay photos of an Auto Set and part of the instructions. From the 'Wides-Metall+spiele Auto-Baukasten' on the latter the maker is probably a firm called Wides, and it was said that the Set was complete and dated from the 1940s or 1950s. There was no indication of the size of the parts.

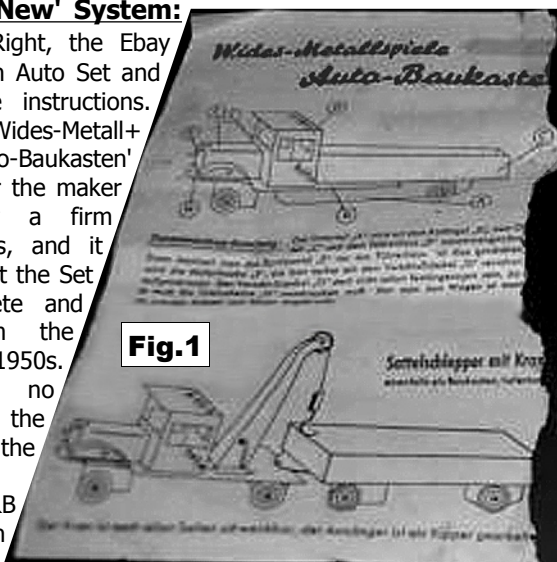


Fig.1

No N&B can be seen but most probably the parts are bolted together. One Wheel can be seen in box's bottom left corner; it is rather nice looking but it's a pity that it isn't larger to be in scale with the model. Nothing of the crane is visible – at a glance I wondered if the green circular part on top of the blue Chassis, and partly

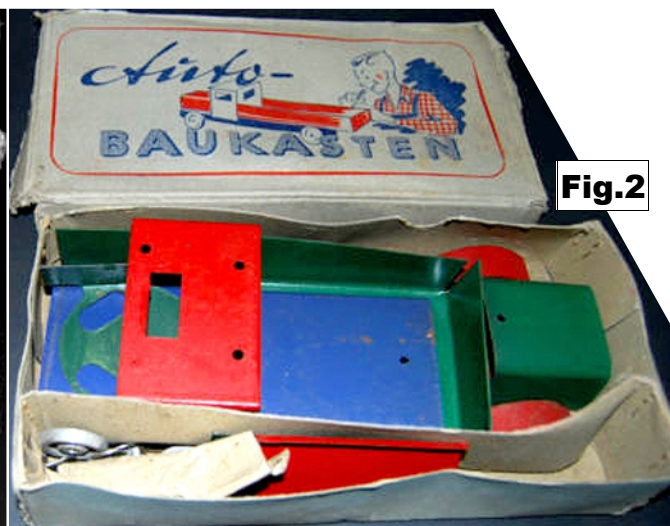


Fig.2

hidden by the red Cab Back, was its base, but the side leg on view, and no doubt with a fellow on the opposite side, makes it probable that it is the mounting for the front Wheels of the Lorry or the Trailer. And if it has a centre hole that could allow centre pivot steering.

WIDES: S1

OSN 49/1058

'New' System: MECANIC Jan Ringnalda kindly sent photos of a set from this hitherto unknown system. It is basically similar to A.W.S., see 38/1143 & Fig.3, but the parts are steel rather than aluminium. Nothing is known of the maker and even its country of origin isn't certain, though I suppose it's very likely to be German.

The box is wooden with a sliding lid (Fig.1); the name on it, in white letters on what remains of a red ground, is hard to see but may be clearer in a tweaked, negative version below.



Fig.1

Fig.2



Fig.3

Fig.3 shows the open box with its A.W.S. counterpart alongside. The A.W.S. box is of course cardboard but otherwise, as can be seen, the two are almost identical, virtually the same size overall and with only very minor changes to the partitioning.

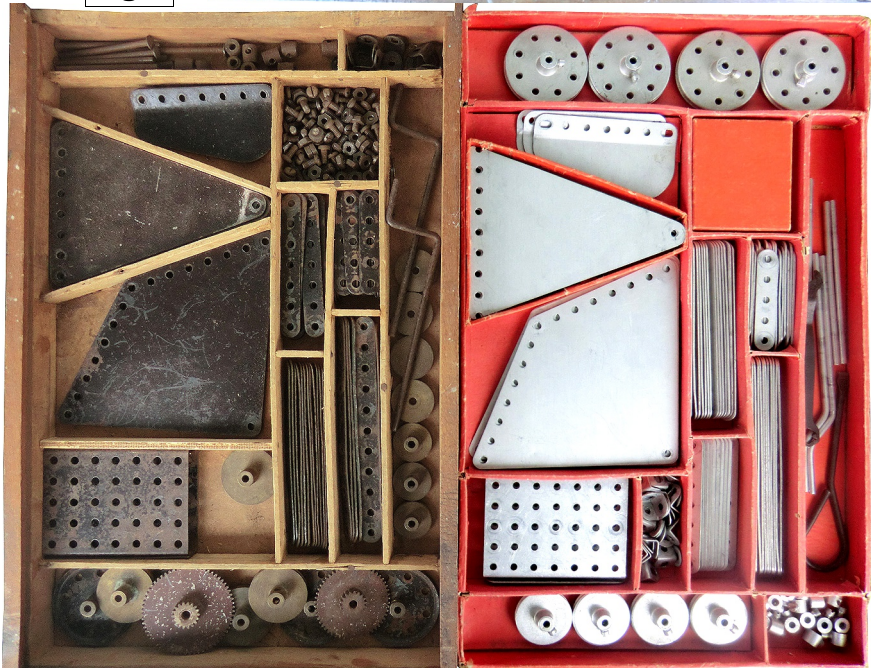
Apart from their colour the sheet metal parts look identical in the two with a few exceptions. The MECANIC holes may be slightly larger, the end holes in the MECANIC Windmill Sails are not elongated, and there are 8 holes along the base of the 'Roof' Sector Plate whereas the A.W.S. part has 7 plus a half hole at each end (to allow one Bolt to hold two parts abutting one another in, for example, a roof).

A.W.S. has 4 each of 2 sizes of Pulley and the MECANIC parts match them (it may not be clear in the photo but the larger diameter ones have 8 peripheral holes like the A.W.S. part). In addition there are some smaller Pulleys in the right side compartment of the MECANIC: 3 with boss plus 4 slightly larger without boss.

The shafts of the Crank Handles are about the same length but the A.W.S. part has angled rather than square bends. No long Axles can be seen in the MECANIC set but there are some Headed Pins in the top left bay. They scale at about 60mm long, 10mm longer than the corresponding

A.W.S. part, an Axle (and there are only 2 of them in A.W.S.).

A.W.S. has no Gears but 2 compound Gears with 18/54 & 18/64 teeth can be seen in the bottom bay of the MECANIC box. Like the smaller Pulleys it isn't known if they are original.



OSN 49/1509

MECANIC [7]: S1

'New' System: EDUCATIONAL TOY

Thank you to Jan Ringnalda for sending details of his little set. It was produced by Daiya in Japan (see Fig.1, a corner of the lid below), and presumably, with all the text on the lid in English, it was to be exported.



Fig.1

The blue strip parts in the box (Fig.3) remind one of CONSTRUCTION JEEP, another set produced by Daiya (among others), see 19/537. Their dimensions too are virtually the same with the 3mm holes at 10.0mm pitch, and the Strips 9.5mm wide. Other parts which look the same, or very similar,

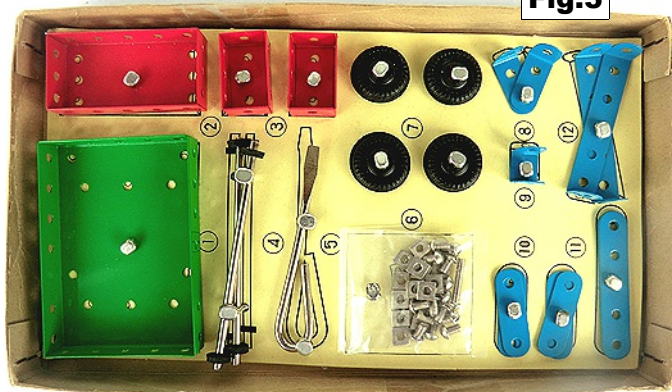
are the Screwdriver, the Axles with their push-on Axle Stops, and the N&B. The Wheels have the same look to them but at 18mm Ø are much smaller. The Flanged Plates measure 70*50, 50*25, & 25*15mm o/a. The thread is 1/8" BSW.

The claim of 100 constructions on the lid, and the several sizes of Flanged Plates, bring 'Matchbox' sets to mind (see 6/130) and this Set could be seen as a super one of those, though with of course conventional packaging. And the models on the lid have perhaps something of the 'Matchbox' character about them.



Fig.2

Fig.3



OSN 49/1509

EDUCATIONAL TOY: S1

GEBRÜDER KELLER

by Jacques Pitrat

In the 1880s, the Keller brothers, Georg and Paul, worked for Richter in the manufacturing plant in Rudolstadt which produced ANKER Stones (Steine in German; the Stones are often called Blocks, or sometimes Bricks). Rudolstadt is now in Thuringia; at the time it was the capital of a small principality, Schwarzburg-Rudolstadt. In 1886 the Kellers quit and started another plant to make Stones, also in Rudolstadt. Their Stones were an imitation of Anker's; however, they were not sued by Anker, probably because its patent was questionable: it was invalidated in the following year.

In 1890 metal parts were added to the KELLER system; this was an innovation not only with regard to ANKER, but also all the construction systems of the time. Their patent is dated 1890, a newspaper advertisement for an Eisenbaukasten from November 1890 is known, and the manual of a Stone set (Fig.1), indicates that they started sets with metal parts in 1890.

From 1887 national exhibitions were organized in London for the products of particular countries. After the US, Italy, and France, a German exhibition was held in 1891. The Keller brothers did not present their system in Group VIII, which included toys, but in group V: Educational and didactic technical and industrial publications. There were two levels of awards: first and second class diplomas of honour. Only seven first class diplomas were awarded in group V, one of them to the Keller brothers for 'Model-Building Boxes'. Richter was also in the same group, and received another first class diploma for 'Stone-building Boxes'. It is likely that Keller showed the metal building parts: if only stone sets, it would have been impossible to honour a reproduction of Richter's blocks, and the award does not mention 'stones', as for Richter, but 'model building'.

In 1897 Keller received a silver medal at the Leipzig fair for an impressive 5 metres model of the Brooklyn Bridge (Fig.2). The access ramps are well designed, using Stones certainly improved the quality of the model. The Stones in the towers were probably glued so that they could support the 1.5 metres centre span.

Although KELLER sets are much rarer than ANKER outfits, the Keller system had some success, and the brothers were successful in exporting their system, I have seen several examples of English language sets.

In 1910 one brother died or retired (it depends on the author); the other brother returned to work with Anker, and Richter bought the company (just before he died). KELLER sets were still sold up to WW1, but it does not seem that Anker made a great effort to promote them. The main interest of this acquisition was probably to remove a competitor.

My information on this system is mainly based on *Baukästen*; notes by David Hobson on the history of the system and his own set; the 1891 British patent; early Keller ads from Mathias Lindenmann (via Werner Sticht); and my seven sets. *Richter's Anchor Stone Building Sets*, by George

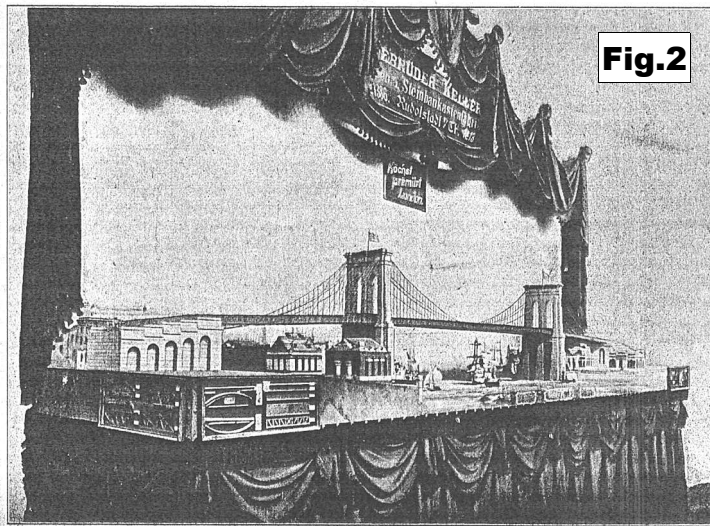
Verlangen Sie in besseren Geschäften Keller's Diamant
Eisenbaukasten
gänzlich zerlegbarer Baukasten für Brücken- und Dächer.
Seit 1890 im Verkehr. Mehrfach hoch prämiert.
Das schönste, einfachste und am leichtesten zu handhabende
Beschäftigungsmittel dieser Art.

Fig.1



Built with Keller's Diamant Bridge Builder. Bâti à Keller Boite à ponts.
Gebaut mit Keller's Diamant Eisenbaukasten.

Ask your dealer for Keller's Diamant Bridge Builder. Demandez Boite à ponts, à la marque Diamant de Keller.



Hardy, describes the links between the brothers and Anker, while the 1913 Keller catalogue, produced by Anker and including the photo of the Brooklyn Bridge, is reproduced at <http://www.ankerstein.ch/archiv/>.

Most of the KELLER sets with metal parts also contained Stones. These were almost identical to ANKER Stones, except in some details of the Arch pieces. ANKER had two sizes (often called calibres) for its stones, 20 & 25mm All the dimensions of a Stone were multiples or fractions of its calibre. The small size was called Kleines Kaliber (KK), and the larger one Grosses Kaliber (GK). The difference in size may seem small; however, as the cube of 2.5 is almost 16, a GK Stone weighs twice as much as the equivalent KK piece. All the Stones in a set had the same calibre. Of Richter's later ANKER sets with metal parts, a few had KK Stones, but most

had the GK size, while Keller sets always had KK Stones.

The Keller brothers produced two versions of their metal parts, the change from the first version to the second one probably happened c1896. The main difference was that flat Strips were replaced by Braced Girders – both versions have T-Girders with a double-thickness web with an open edge, and the Strips/Braced Girders are slid into the web of the T-Girders. They are held quite firmly but could not withstand the heavy loads which could be applied to structures fixed with Nuts and Bolts – for example those built with THE IRON CONSTRUCTOR four years after the Keller metal parts were introduced (see 29/854 & 38/1147).

First Version of the Metal Parts.

The SETS The name of the system on the lid was 'Eisen & Stein Bau', translated as 'Building with Iron & Stone' for English language sets. The label on the sliding lid of the boxes represents (Fig.3 overleaf) the glass roof of the Frankfurt railway station, and three famous bridges: the Brooklyn bridge, the Forth bridge, and the Garabit viaduct. Curiously enough, the first two of these bridges were the subject of the first super-models ever built: the Brooklyn Bridge with THE PRACTICAL IRON CONSTRUCTOR and DEMONSTRATOR (1895), and with KELLER (1897), both 5m long, and the Forth Bridge with MECHANICS MADE EASY (1904), again 5m long. For the Garabit viaduct we had to wait until Michel Bréal presented a MECCANO model (once more 5m long) at Novegro in 2013. The lid picture also includes an eagle on a stone with the inscription 'Gesetzlich geschützt', which means 'protected by the law'. This eagle is important: the manual indicates (as in ANKER manuals!) that one must be careful not to buy other construction toys which have not the same quality. To be sure that one has the good stuff, one must check that the eagle is

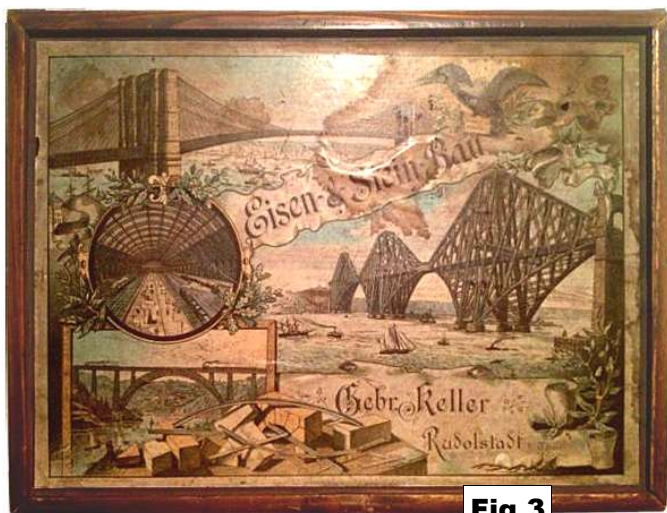


Fig.3

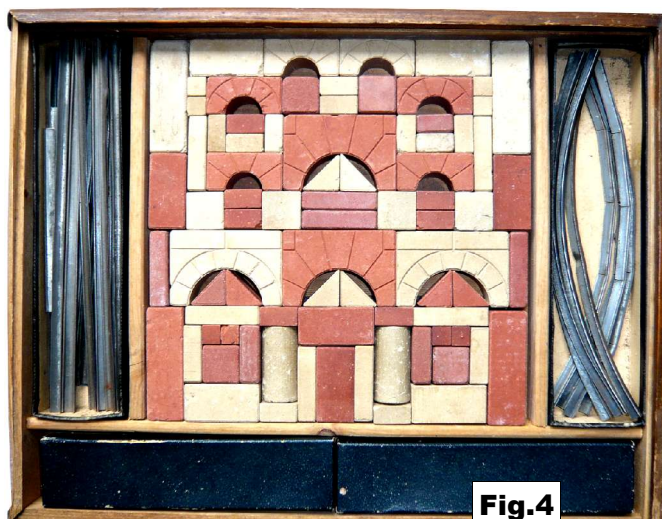


Fig.4

present (and, implicitly, not an anchor).

Three sizes of sets which included stone and metal parts were numbered 1 to 3. The set number appears only inside the lid with the packing plan of the stones. My #2 and #3 sets are in wooden boxes with sliding lids, like ANKER boxes: Set 2 measures 310*225*40mm; Set #3 345*270*40mm (Fig.4) and it contains four cardboard boxes, the two along the front still having their lids, covered in black leather-effect paper without any inscription.

David's set is probably a No.3, but of the packaging only four cardboard boxes remain. Their lids have the same black leather-effect covering but differ in size from those of my set and have 'London 1891 Höchste Auszeichnung First Prize' printed in silver on each (as in Fig.6). The 'First Diploma of Honour' has been upgraded to 'First Prize': so instead of an excellent product, we have the best one! Its Stones have disappeared, but David's set and my #3 set have roughly the same number of metal parts, especially for the large parts which are not easily lost. As nothing is printed on the lids of the cardboard boxes in my #3 set, it is possible that it was made before the London exhibition, that is in 1890 or 1891.

The manual indicates that there were also connecting sets, their number being followed by letter 'A': with Sets 1 and 1A, one had the contents of a No.2.

At least one set without any stone parts was marketed; perhaps it was the first set ever made that contained only metal parts. Unfortunately, as it was a metal only set, there is no packing plan, and no set number is shown on it anywhere. Its box, right, is the same size as Set No.2, and has four green boxes of the pull-out drawer type. Each is printed as already mentioned. The sliding lid is as in Fig.3.



Fig.6

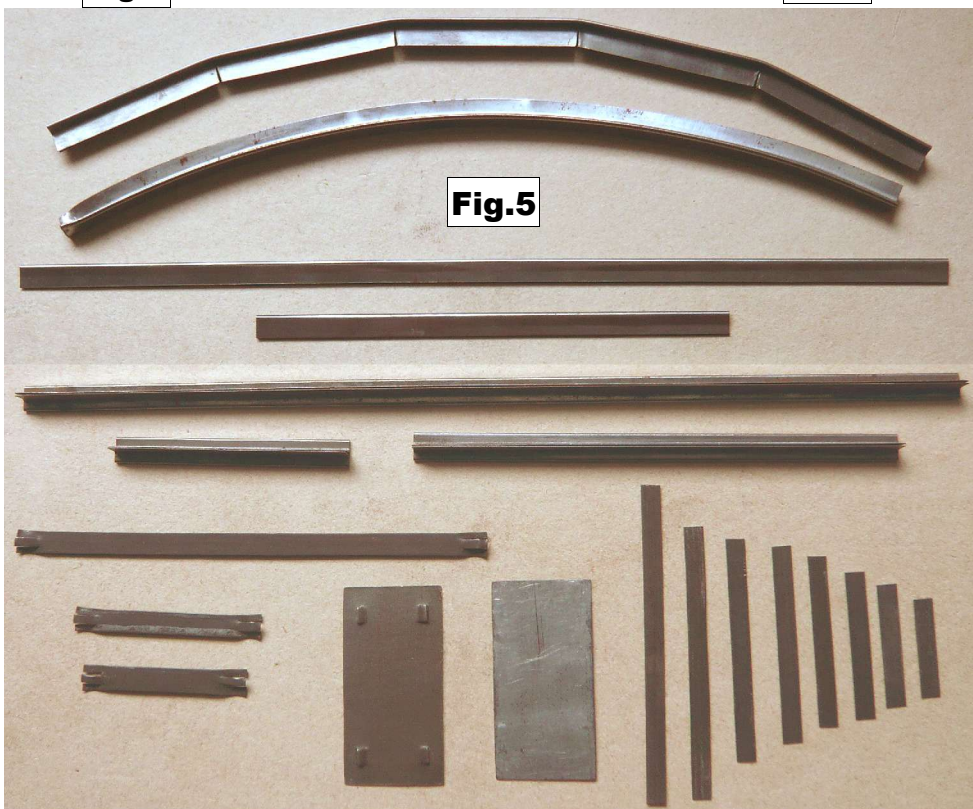


Fig.5

The PARTS are shown above and also in the Patent (Fig.7). They are described below and I will give the number of parts in my all-metal set in brackets. It contained around twice the number of metal parts as Set 3; however, because almost all of the Plates are missing, I indicate their quantity in Set 3. Certainly, several Strips are also missing, it is easy to lose them, they are very light: a Strip weighs less than a MECCANO nut. The parts have become rather black with age, but small areas are still shiny. David thinks that there was possibly a thin nickel plating, but some parts may be tin plated.

Strips 4mm wide in the following lengths: 65mm (10), 55 (33), 45 (32), 40 (20), 35 (51), 30 (38), 25 (119), 20 (41). As well as their main use they can join T-Girders end-to-end by inserting them lengthwise in the double-thickness webs.

T-Girders, folded double thickness, open at the bottom of the web, height 5.5mm, width over flanges 5.5mm: **Straight**: 200mm (11), 100 (19), 50 (11); **Curved, Convex**, with the web of the 'T' on the convex side: 200mm (10); **Curved, Concave**, with the web of the 'T' on the concave side: 200mm (8). It has the same curvature as the preceding part. However, as it has four slits, it would be possible to modify the curvature and even make it straight.

Folded Strips, double thickness, 4mm wide: 200mm

(3), 100 (4).

Claw-Strip, 4mm wide, a slit 5mm long at each end giving 3-prong claws: 100mm (11), 40 (16), 35 (7). They can link the sides of a Bridge by connecting the flanges of T-Girders. This part, which disappeared in the second version, is shown on the box lid.

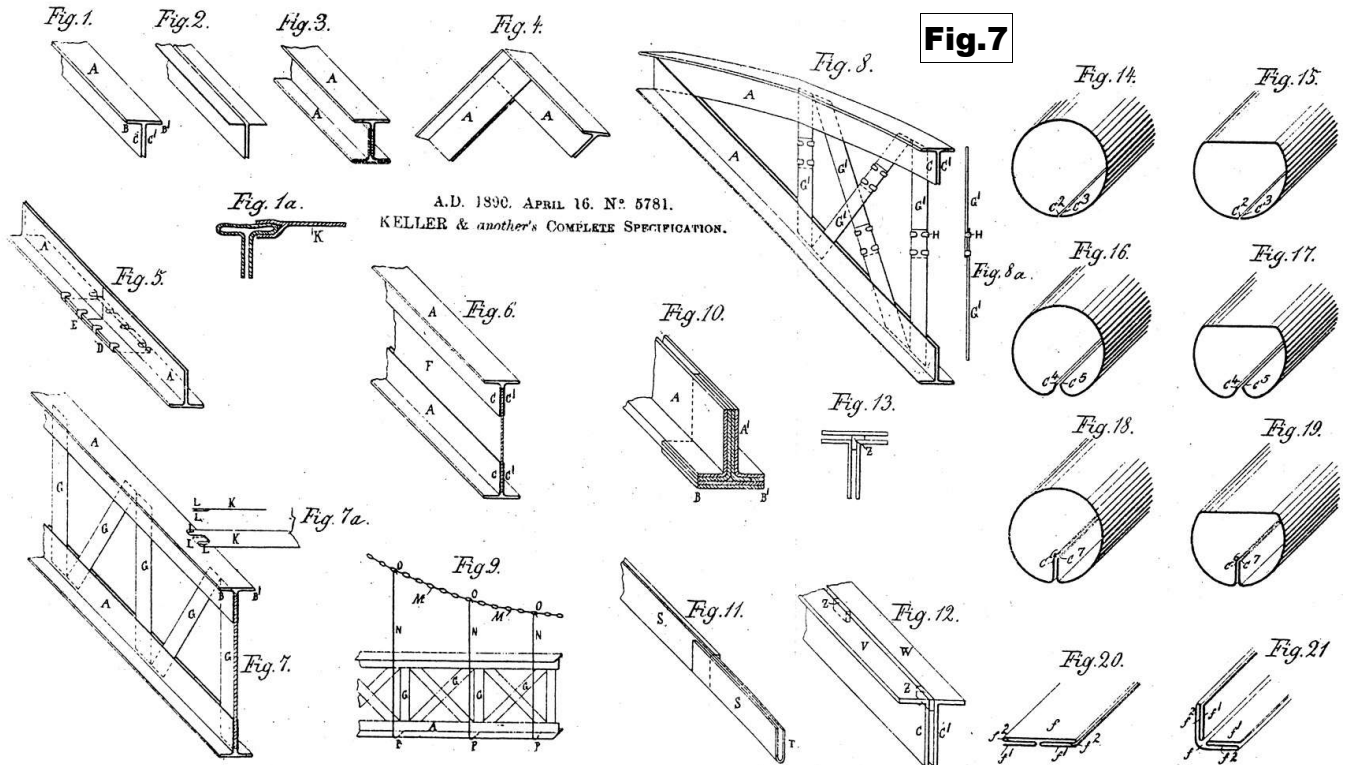
Plates, 40*20mm (11), very thin, they must be used cautiously if one does not want to bend them. They are useful for building a large I-girder by putting them between two T-Girders; they can also be used instead of Strips to join T-Girders end-to-end.

Claw-Plates, also 40*20mm (19), are thicker with a rectangular claw pressed out at each corner onto one side of the plate. These Plates are used for the deck of Bridges, or for roofs, in a similar way to the Claw-Strips.

on one side, and they are from the second version. Therefore, the change was made between 1895 and 1897, but it is possible that, for some time, both versions coexisted.

The main difference between the versions is the elimination of Strips, and their replacement by Braced Girders. Therefore, it is easy to see if a model is made with first or second version parts: when, in an X of a balustrade for example, one of the 'strips' passes under or over another, it is certainly a first version model; if it does not, one has the second version. For instance, the Bridge in Fig.1 has second version parts.

The SETS A new kind of picture (Fig.8) is on the lid of my four second version sets; it displays two Bridges, a roof, two buildings without metal parts, and a few isolated Stones and metal parts, one of them is the new Narrow Claw-Plate which replaced the Claw-Strip. Paradoxically, both Bridges and the



The PATENT. The figures from it are shown above, and their numbers will be indicated by #N. The parts in the known sets are shown in #1,1a,3,4,6,7,7a,8; the other parts include: • The chain M and the wire draw-rods N for suspension bridges (#9). • The tubular and other parts in #14-21. The patent indicates that they are employed 'in lieu of the T-girders', but it does not explain why it is interesting to have both sorts of part. • Part H (#8), allowing a long strip to be made from two shorter Strips. • Shoe D (#5) to join two Girders end-to-end. The brothers finally chose a simpler solution using Strips.

It is a pity that the girder shown in #13 was not produced. With it, it would be possible to connect a Bridge's deck, a vertical part above it, and a vertical part under it. In that way, the model would be in one piece: it could be moved as a whole, as with Bridges built with Nuts and Bolts. Without such a part, some substructures of the Bridge are simply layered, without being connected. However, as David said, the part 'would presumably be quite difficult and expensive to manufacture'.

Second Version of the Metal Parts.

The date of the introduction of these new parts is not known exactly. However, David has found a note in an April 1895 issue of the trade journal *Games, Toys and Amusements* which included an ad for Keller sets No. 1, No.2, and No.3. These sets are of the first version, the names of those of the second version begins with letter 'E'. On the other hand, in the picture of the 1897 Leipzig bridge, the parts used are displayed

roof are made with first version parts. No eagle now appears in the picture, and there is no indication of the maker; the set number is printed in tiny letters in the lower left corner, the letter 'E' followed by its number in Roman numerals (but it also may appear elsewhere, such as the side of the box, in Arabic numerals). When the same picture is used for several boxes of the same size, both numbers are on the lid (E V & E VII for example), and the actual number appears in the packing plan glued on the underside of the lid.

The first sets with this picture have no text printed on them

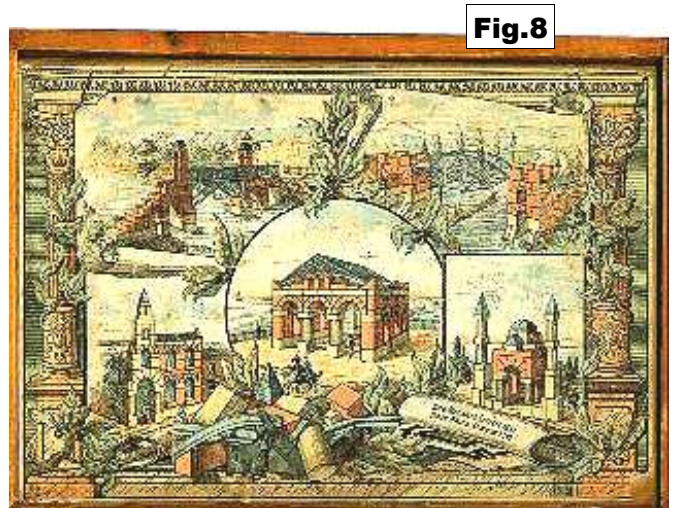
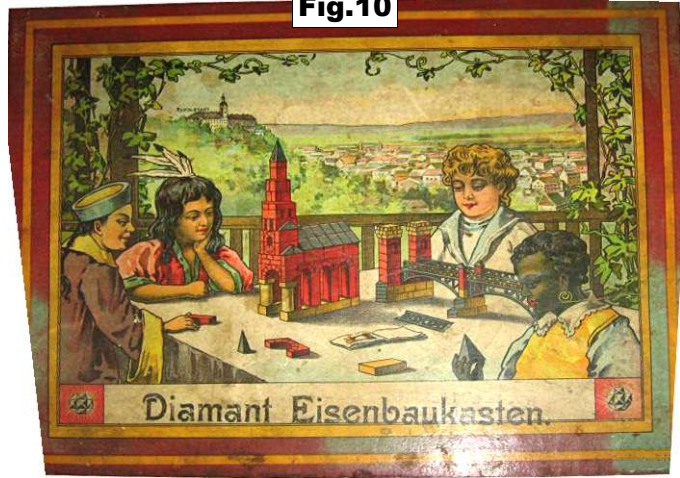




Fig. 9

while on later sets **Fig. 9** the awards from the London and Leipzig fairs are added. Unfortunately, they made a mistake for London, printing 'first price' instead of 'first prize', downgrading the best system to the cheapest one! More information on the sets may be on a label glued onto the side of the box, often with

Fig. 10



Diamond, but also with Bridge Builder, or Keller's Rudostädter Eisenbaukasten. My four sets with second version parts have KK Stones.

With the packing plan, the total number of 'pieces for construction (steel, iron and wood)' is written – in English, German, and French for the sets intended for export. Unfortunately, one has only the global number of these parts. Here are the number of non-stone parts and the size of my sets: E I (22) 220*155*35mm, E II (30) (cardboard) 250*170*35mm, E V (Fig.9) (55) 355*255*35mm, E III ½ (50) 310*220*37mm.

This last set has an unusual number; it contains too many metal parts to transform Set E III into E IV. I believe that it was an E III set improved by the addition of more metal parts. Indeed, one manual contains only models for set E III or E III ½; moreover, the inside of the E III ½ lid mentions 'proper supplementing box E 3A': the same connecting set was used for both the III & III ½ sets.

I have only the one set in a cardboard box. Most such sets have probably not survived with the weight of the stones. The 1913 Anker-Keller catalog gives an indication of the Anker strategy with cardboard and wooden boxes, which was possibly also used by Keller. At that time among ANKER Sets 1 to 17, 1 to 8 could be bought in a cardboard box, and 2 to 17 in a wooden box. When both kinds of boxes existed, the wooden box was naturally more expensive: wooden number N cost approximately

the same price as cardboard number N+1.

Other sets have a different lid (Fig.10) with a European girl, and three boys (African, Chinese, and European) looking at two models including a Bridge with metal parts. The name along the bottom of this set is 'Diamant Eisenbaukasten' but in other known sets with the same picture it is variously 'Diamond Stones Blocks' 'Diamond Bridge Builder', and 'Diamant-Baukasten'.

The PARTS of the second version (Fig.11) are nickel plated, and are listed below.

T-Girders. Straight: 200, 100, 50mm as before, plus 75 and 125mm. **Angled,** a 50mm length with one slit in the middle bent to form a 120° angle. **Curved:** the **Convex** as before; the **Concave** is not present in my sets, but appears in the centre span of the Fig.1 model.

Narrow Claw Plate, The Claw Strips are replaced by this 55*10mm Claw Plate. A pair of rectangular claws is pressed out at each end. A T-girder can be inserted into each pair and thus it can be used to link both sides of a Bridge. This part is characteristic of the new version, and it appears in the picture on the new lid.

Braced Girders. The four types have the same thickness: they can be inserted inside the open edge of a T-Girder. They are: • **Rectangular,** 25*50mm. • **Square,** 50*50mm. • **Trapezoidal,** 50mm high with the parallel sides 25 and 50mm. • **Curved,** 50mm long with the vertical sides 35 & 15mm. It can be used between a Concave T-Girder and a Straight one.

Plates. There are several kinds in my four sets: one has none, and each of the others has its own kind of Plates: • Thick black 100*40mm metal Plates. • Thin metal Plates with lithographed planks, in two sizes: 100*40 and 25*40mm. • Wooden Plates, 2.5mm thick, in two sizes: 100*40 and 25*40mm. We have seen that inside the lid '(steel, iron & wood)' is printed after the numbers of these parts in the sets but the only wooden parts in my sets are the Plates

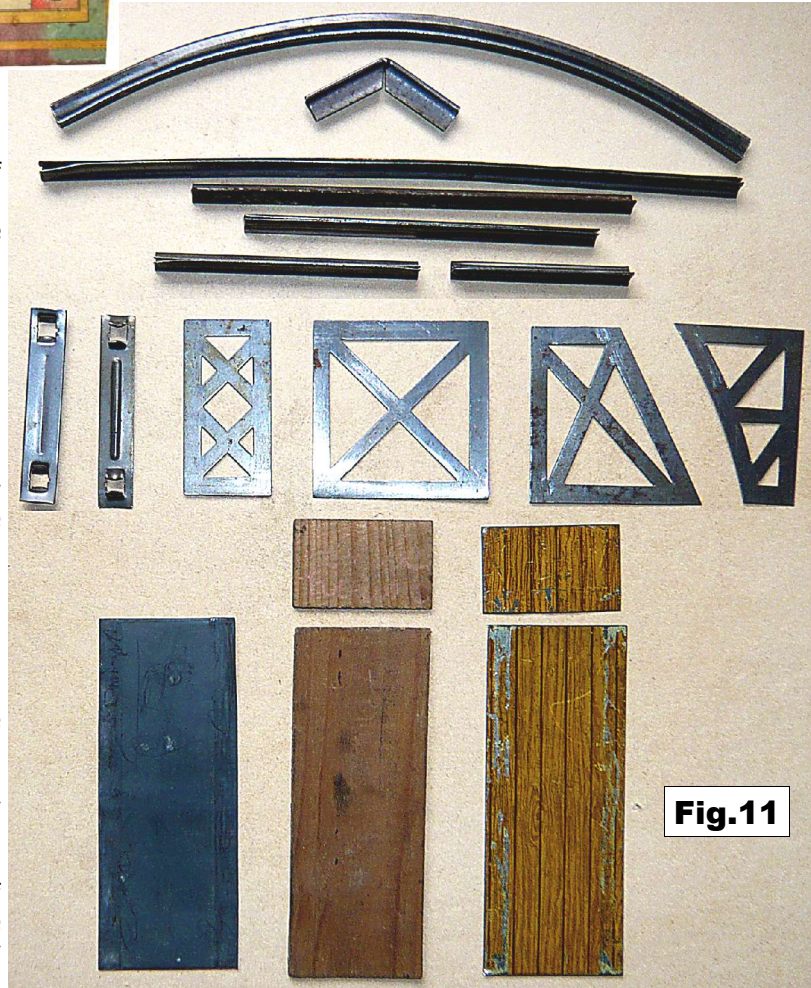


Fig. 11

above in one of them.

It is easier to use the new Braced Girders than the previous Strips, but the system has lost a part of its versatility; for instance, it is no longer possible to build models with metal roofs.

Other parts are shown beside the Leipzig Bridge, a Rectangular Braced Girder for instance, and a Deck Plate, whose lengths are probably 200mm. Such large parts were certainly very useful for improving the sturdiness of the Bridge. I believe that the realization of the five metre Brooklyn Bridge would be almost impossible with only the parts that are in my sets. I do not know whether the long parts were made specially for this Bridge, or if they were also included in larger sets.

The Manuals

The 'books of design' for Keller sets are very rare, most of them have disappeared with the years. The pages from them in Figs.13, 14, & 16-18 are about 2/3 of their original size.

Fig.12



One manual, above, entitled Heft 1, remains with Set 3. It looks very much like an ANKER manual: the models are shown with figures in a landscape, all in colour, printed on one side of the (20*14cm) pages. Most of the models are very simple; probably, there were other manuals for this set. The inside covers have text in Gothic letters indicating how to use the parts, illustrated by 17 figures on the first two pages. It also contains general information on the system, and recommends avoiding other construction systems, which have not the same quality: as we have seen, the presence of the eagle ensured that one had a Keller set. The last 10 pages display ten models: six Bridges (one is shown in Fig.13), two Buildings with metal roofs (Fig.16 overleaf), one Tomb with railings, and one Crane in a railway station (Fig.17). This Crane is not operational, there are neither Pulleys, nor Cranks in the system.

Set 3 also contained five 230*165mm sheets without text, but with illustrations, printed on one side, showing how to insert the pieces; the same pictures were reduced to 200* 140mm in the stoneless set. The goal of the first pages of the manual (and of the patent) was to present some substructures that could be built with

the system, such as I-girder or braced girders. In addition, these sheets indicate how one could actually build such substructures: for instance, one can use a T-Girder as a tool for pushing a Strip toward its correct place.

David used his parts to build the Bridge in Fig.15. The decking (Clawed Plates pushed into one another) and balustrades simply sit on top of the main structure, the two sides of which are joined by Clawed Strips. He found that 'the braced girders were surprisingly strong', but it was difficult to insert the strips into the web, and to adjust them: 'When it is desired to insert the Strips at intermediate points along the

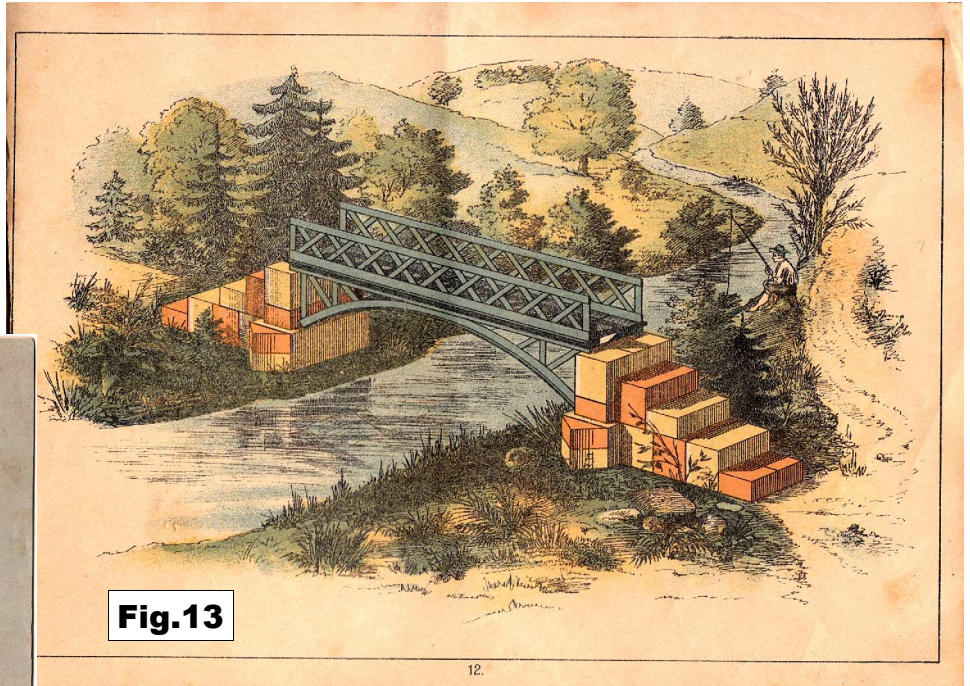


Fig.13

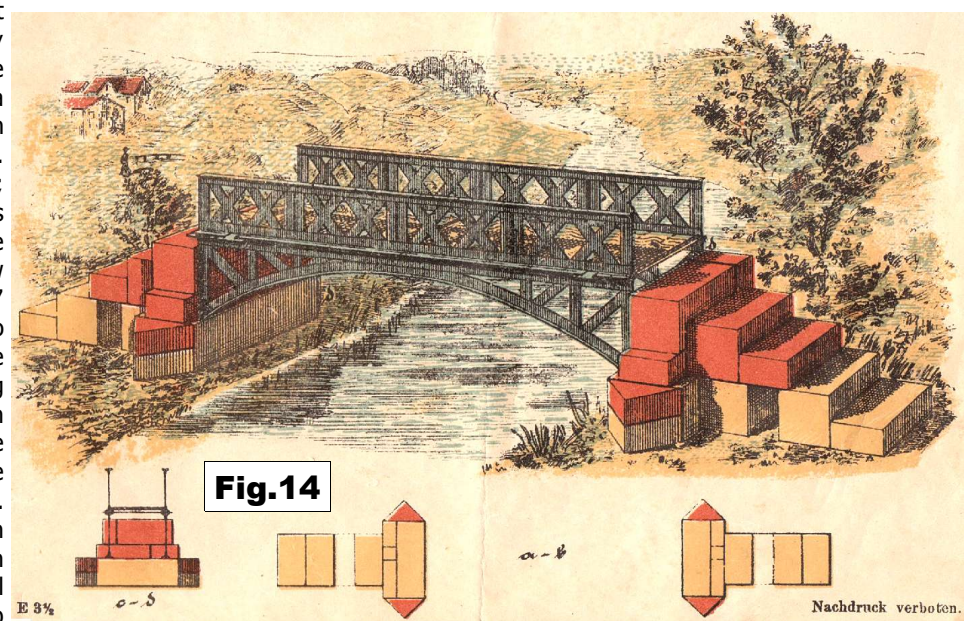


Fig.14



Fig.15

length of the Girder, this is almost impossible unless a sharp pointed blade is used to carefully open the double-thickness web slightly. This is a rather fiddly operation, and I think many children would be deterred. The use of a sharp blade to assist the insertion of the Strips along the length of the Girders could also present some hazard for both children and adults alike! The Clawed Strips were found to be less satisfactory: their claws were relatively stiff, had rather rough edges, and gave relatively weak joints.

Anyway, the brothers introduced, probably c1996, new parts, so that it was no longer necessary to build braced girders with Strips.

The Second Version For this I have only one manual of eight pages, again 20*14cm, plus the missing covers. Three pages present several simple models without metal parts, except one with a metal ramp. More interesting are four pages with a Bridge on each. One is shown in Fig.14 (the page's edging frame isn't shown) under the Version 1 model. Fig.18 has the new versions of the Crane, and of the Tomb.

The pictures are less artistic than those of the preceding version: there are no longer figures in the landscapes. For each page, the name of the set is printed at the left bottom. Six pages are marked E 3, and two of the bridges E 3½: it is likely that my manual is for Set 3. The inside of Set E V lid states that it contains four manuals Nos.2, 3, 4, and 5; therefore, each manual probably displays the models of the set with the same number.

The models shown here, for both versions, do not do justice to the system, they are taken from manuals for small sets. The model in Fig.1, and the Bridges on the second version lids give a better idea of the possibilities.

END WORD It is not unexpected to find defects in a system that was probably the first to include metal parts. However, the 1897 Leipzig Bridge was a brilliant feat, and it certainly deserved its silver medal. We are accustomed to models made with Nuts & Bolts, which can be carried in one piece, while a Keller model is often built up from sub-structures, one just sitting on the next; nevertheless, this was (and is) normal for stone block systems.

Finally, I completely agree with David's conclusion: 'The absence of perforations in the Strips and Girders does mean that the models do have an undoubted charm and elegance.'

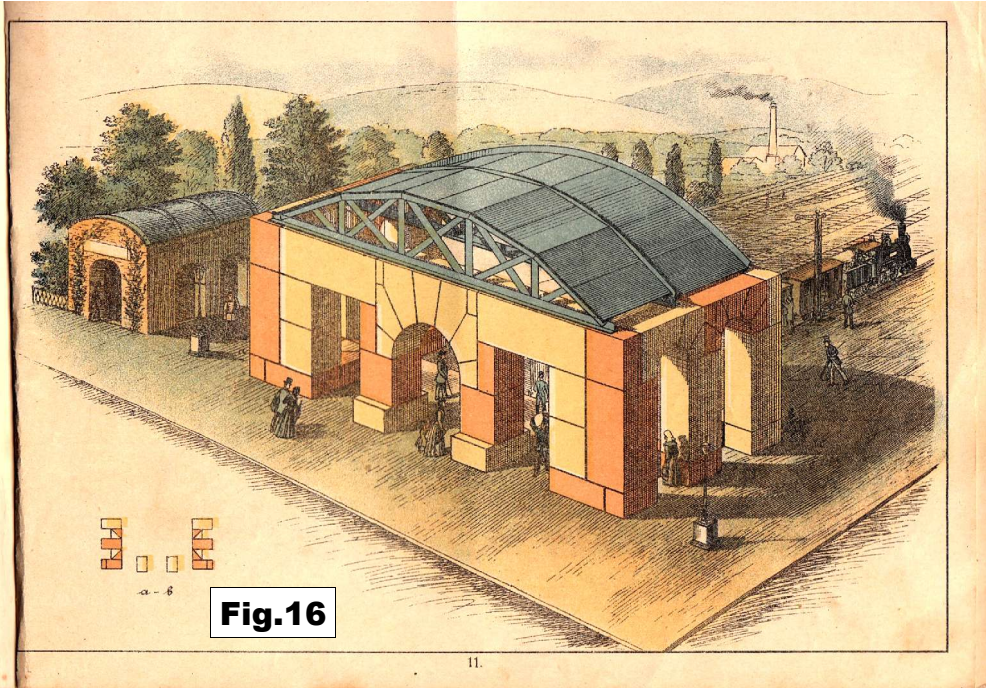


Fig.16

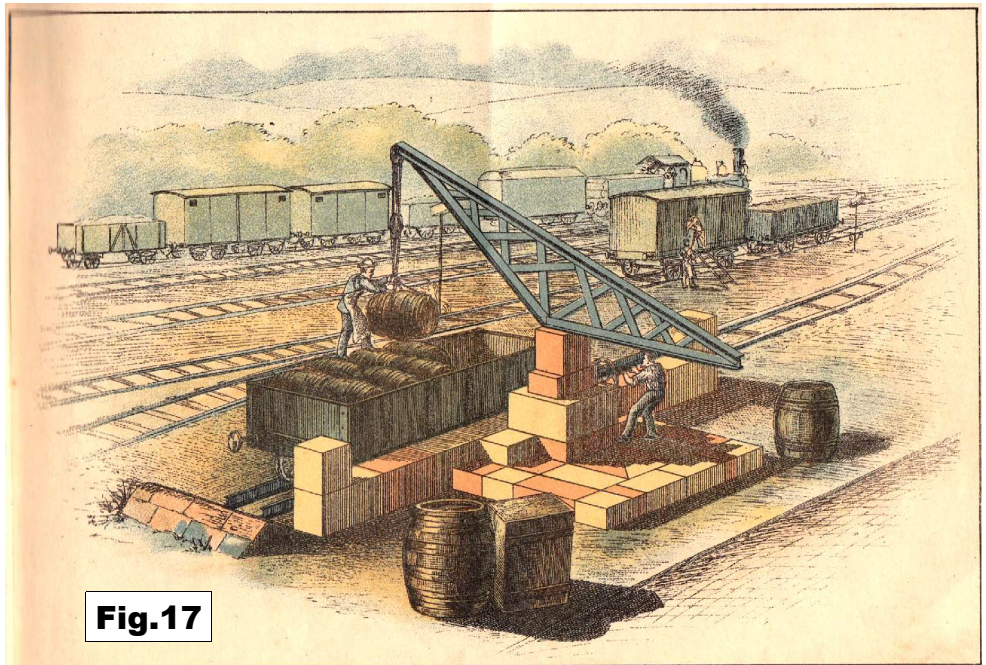


Fig.17

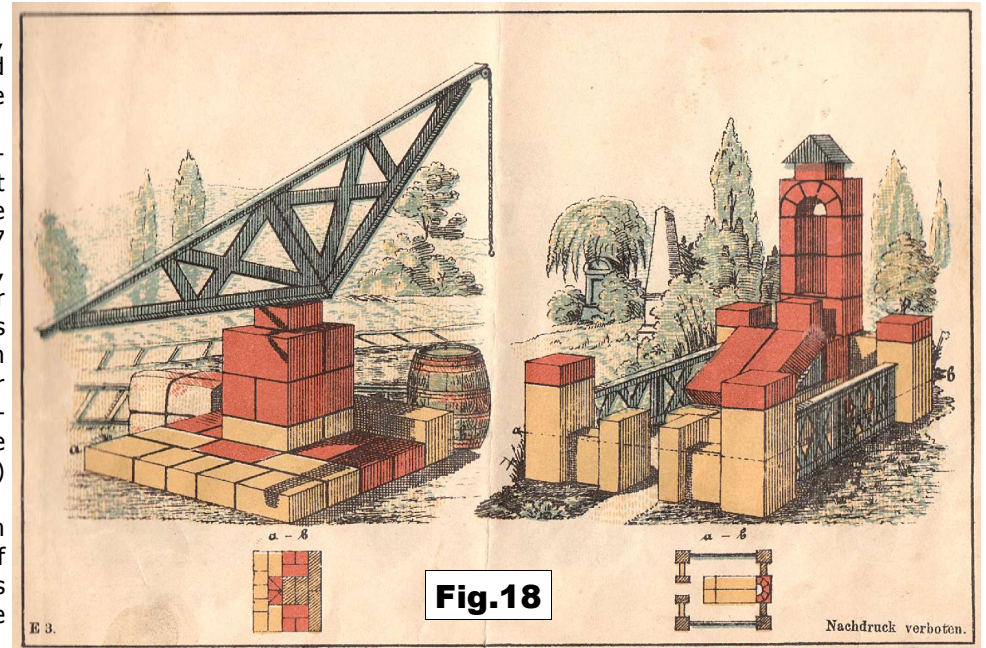


Fig.18

Nachdruck verboten.