WEMA This interesting looking 10mm system with alternate holes in the Strips and A/Gs, is in MCS part 5; it was made by J.Eberspächer of Esslingen/Neckar though production of the sets was at Nebenzweig (assuming that's the name of a place) from 1946 to 1948. To add to the colours given in MCS, the Face Plate is orange, and the Gears and large Flanged Discs are yellow. The latter appear to have bosses.

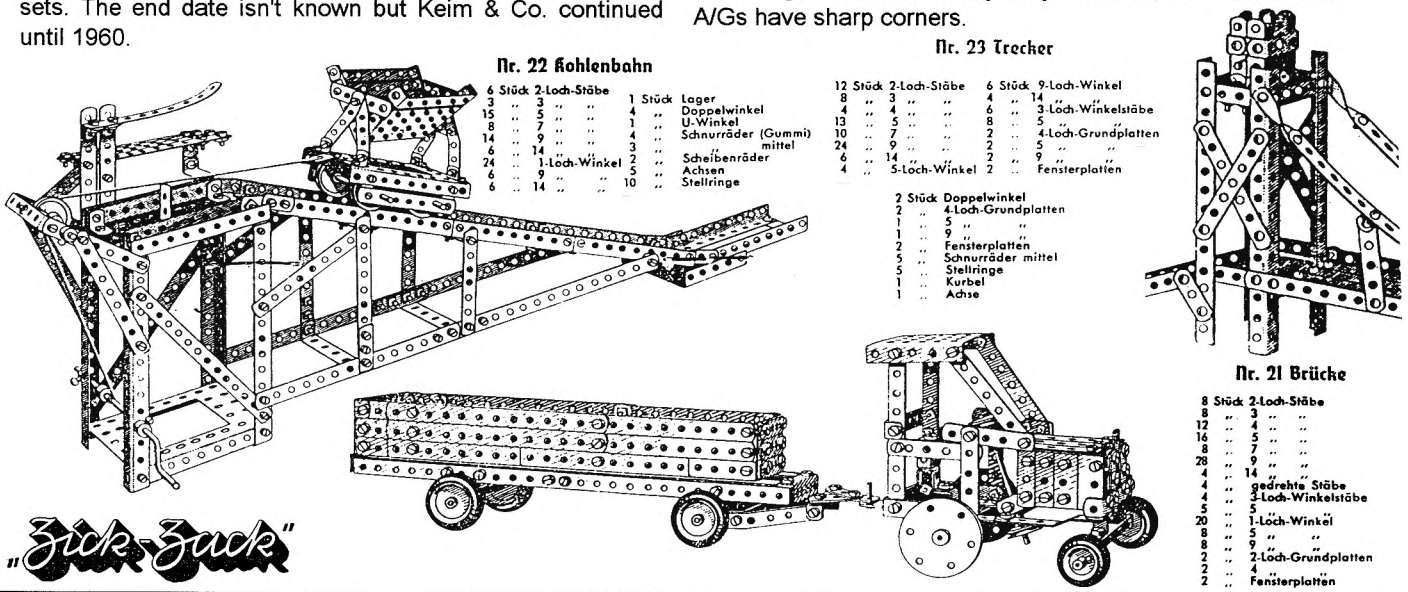
WESTFALIA A small system of about 20 steel parts which were either red or brass plated. The hole pitch was 14.1mm and the diameter 4.2mm. See also TECHNIK above

ZICK-ZACK This system dates back to the 1930s - it was made in Nürnberg, originally by Wilhelm Krauss, but from 1938, by Keim & Co, and that change saw a revision of the sets. The end date isn't known but Keim & Co. continued until 1960.

The holes were 5mm Ø, at 13.0mm pitch; some parts had a nickel finish, some were black metallic, and some were painted red or blue. Axles were made of aluminium.

30 parts are listed for models 21-23 on the page of the manual I have - • 2,3,4,5,7,9,14h Strips; • 1*3*1 & 1*5*1 DAS; • 5,9,14h A/Gs; • 4 Flanged Plates 5h wide with flanges along their length of 2,4,5, & 9 holes, and also a 5*9 with a centre 3*5 cutout; • Angle, Double, & Reversed Angle Brackets, and a Double Bent Strip; • 2 Pulleys both about 2h Ø, one with a boss, and the 6h Disc in the Tractor below which scales at over 60mm Ø; • an Axle, Crank Handle, Collar, and Rubber Ring for the Pulleys; • and a 90° Twisted Strip (gedrehte Stäbe) that looks well over 3h long but has only end holes - it can be seen in the Bridge tower below.

The ends of the Strips in the drawings of the models vary from large radius to nearly fully rounded; the Plates and A/Gs have sharp corners.



That was a Good Idea - The ASSEMBLO Patent

The French system ASSEMBLO was the first to use what many in this country will know as the DINKY BUILDER method of construction. Its French patent was granted on July 17, 1931; the UK application, which became Pat.No. 384191 was dated May 23, 1932 and was in the name of Marc Aurele Alfred Fay, a French citizen of 1, Avenue de Beauval, Garches, Seine-et-Oise.

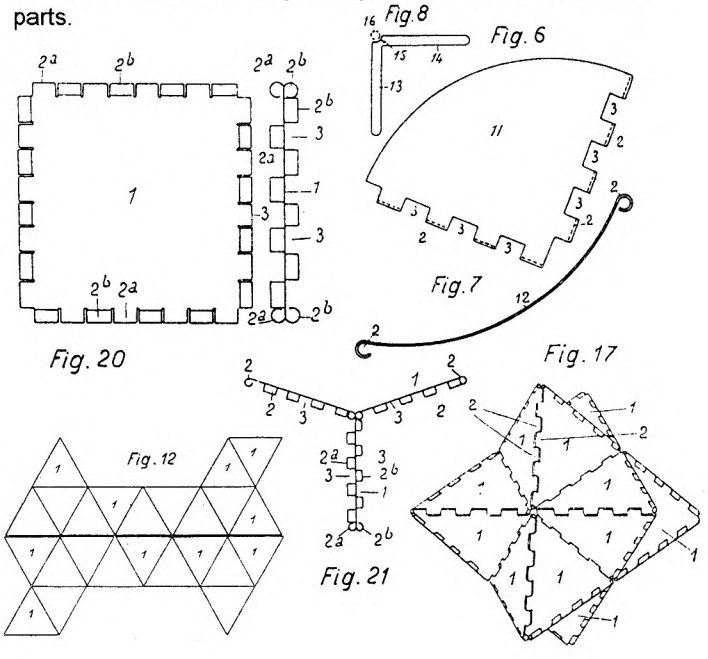
The basic idea is very simple, once you've thought of it, and presumably ASSEMBLO was quite successful, given that similar systems appeared in America as STANLO in 1933, in the UK as DINKY BUILDER in 1934, and in Italy as FALCO, sometime in the 1930s. ASSEMBLO claimed patent protection, in France and abroad, and as far as I know was the only one of the four to do so.

Two types of part were covered by the Patent. The ordinary Plates had gaps with formed tabs on the edges, all to one side; the other sort had a continuous series of tabs but formed alternately to either side of the Plate, as in Fig.20. This last feature was unique to ASSEMBLO and allowed more complex models to be made. Fig.21 is given in the Patent as an example. Another unique feature which added versatility was the Angled Rod (Fig.8) with the concave outer corner to allow another Rod to pass at right angles.

2 parts in the Patent were never produced, the Quarter Circle, Fig.6, and the Curved Rectangular Plate, Fig.7. Examples were given of making up 3-dimensional solids from a flat assembly of Plates - the 8-pointed star (Fig.17) from Fig.12 is a nice one. Models like that could help to enliven geometry lessons.

The side of the largest ASSEMBLO Square Plate measured about 70mm, a little larger than the 63mm of DINKY BUILDER, and slightly smaller than STANLO at 72mm. ASSEMBLO and STANLO Rods were about 3mm Ø, and DINKY BUILDER about 2.6mm. ASSEMBLO had 40 Plates, STANLO 20 and DINKY BUILDER 7, plus another 3 of those with painted doors and windows on them.

My thanks to David Hobson for sending the Patent, and to Bill Harrison who very kindly sent me some STANLO parts.



an 8-hole Wheel Disc, and the 2 Spanners with square tails shown below (enlarged), along with the top of the box lid (opposite). (JB)

• The parts in the **SACHSENMEISTER** theme sets (15/418) have only very limited compatibility with the ordinary parts. (JB)

• The parts in a photo of a **SCHWERKA** Set include the Windmill Sails illustrated in OSN 15, though they don't look black. (JB)

• On **TECHNOFIX** the parts are steel, brass plated, the holes are 3.5mm Ø, and the arms shown in Fig.5 can pivot independently. (JB)

• On **WEMA**, Nebenzweig is not a town, it means 'sideline' and thus constructional toys were only a sideline activity for the firm Eberspächer from 1946 to 1948. (They made and still make, heaters for cars.) (SG)

• The early 30s catalogue that listed ALPHA also includes **ZICK-ZACK** with as an illustration the box below. The WK logo (by Nr.) shows it to be from the Wilhelm Krauss period, and the main thing is the unusual hole pattern in the Strips. 3 sets are listed with 40, 80 and 147 parts. The largest one cost 18 Marks a dozen, against 66 a dozen for the ALPHA set with 150 parts, so it would have been aimed at the cheap end of the market. (SG)

The 'NEW' GERMAN NAMES

• **ANDERS**, blue and orange parts without many holes in them, and so not very adaptable. (JB)

• **BAUE SELBST**, from the 1930s with special parts for Cranes. (SG)

• **BOSCH**, MECCANO-type parts, painted black. A photo shows a wooden box with a sliding lid. The label on it is similar to the manual cover reproduced opposite. (JB)

• **COMBINATOR**, 1930, parts to make buildings. (JB)

• **CONRAD**, wooden parts but metal Brackets, Axles, and Wheels. (JB)

• **DUX Railway Sets**. (SG)

• **FRI-DIE**, a simple system with red and blue painted steel parts, and holes spaced at markedly more than ½". [It is probable that this is the FRI-BIE of 11/291; other mistakes in that list: KOHLER should be KOBLER, and WESFALIA, WESTFALIA.] (JB)

• **GECO**, preceded CONRAD and is identical to it. (JB)

• **GESCHA**, a simple system from the late 1940s, with an unusual hole alignment. (SG)

• **HEIKO**, MECCANO-type parts but only a limited number of simple ones. (JB)

• **INGENIO**, pierced or perforated sheet steel parts painted white, red or black, which slot one into the other to make Dolls' Furniture, parts of Buildings, and also Trains. (JB)

• **KOSMOS MASCHINEN**, from the 1930s, with semi-specialised parts to make machines. [Perhaps from makers of TECHNOFIX?] (JB)

• **MAGNETO**, heavy steel parts, with Wheels & Axles. (JB)

• **METALLIX**, from the 1950s, with MECCANO-style steel and natural aluminium parts. (JB)

• **RIAG Modelbau**, another simple system from the late 40s, with a hole pattern like that of ZICK-ZACK above. (SG)

• **ROCO**, possibly from the 1950s, & based on Rods. (JB)

• **UNSERE TAKTSTRASSE**, an East German theme set to make 2 different Tractors with mainly special parts. (SG)

• **WERNER'S Metallbaukasten**, an early postwar copy of TRIX. (SG)

An EGB-ELEKTRO Outfit Well actually most of the parts from one that Richard Symonds came across last year in Canada (for $5). He kindly sent a photo of the parts and as examples, a 3h Strip and a N&B. The Set is thought to be from the 1950s and is shown in MCS as ELEKTRO-BAUKASTEN. EGB was the name of the East German maker from Leipzig, and as well as this EM (Electro-Magnetism) Set, 3 others are noted in MCS - the M (Magnetism), RE (Static Electricity), and CE (Electro-Chemistry) - but no details are given.

The main parts of the EM Set are 2 8*14h Flanged Plates, various Strips and special Brackets, a ready-wound Coil and motor Armature, a Horseshoe and 2 Cylindrical Magnets, and a Bell. All the parts are shown in MCS but the following details can now be added.

• **DATA** (in mm) STRIP (3-hole): •hole pitch/dia, 10.0/4.2; •width, 10.0; thickness, .86; •ends fully radiused. [No bosses] THREAD: M3 [No Axles or Gears] NUT: hex 5.6 A/F; BOLT: tapered cheesehead 5.0 Ø; both nickeled steel.

• The **Flanged Plate** is moulded from dark brown plastic and has no holes in the flanges. The holes in the top look much smaller than those in the Strips.

• The 3 & 9h **Strips** are aluminium and have little material outside the end holes, so the 3h one is less than 28mm o/a. The 6h Strips look to be dark brown plastic.

• The **Trunnion** appears to be aluminium, and the long centre slot looks much longer than in the MCS illustration.

• Most of the other **Brackets** look as if they are nickel but some may be aluminium.

• The base and switch handle of the **Switch** #8 look to be red fibre, and the fittings, nickel.

• The **Coil** is about 20mm wide and its top and bottom are brown plastic. The **Armature** is about 10cm long o/a.

• The top contact part of #12 (**Contact Strip**?), and the **Brushes** #18 are copper.

• The **N&B** are in a flat square box that may be made of brown plastic. It's about 4*4cm with a hinged lid, and may be a substitute for the #21 shown in MCS. In Richard's parts the **Container** #22 (with Iron Filings in it I think) is a clear phial with stopper.

• The flat **Plates** #29 & 30 are red - plastic no doubt.

• The **Pointers** #31 & 32 are about 6cm long. #31 looks at first glance like light yellowy-brown wood, but is probably plastic; #32 is aluminium.

• Part 33 (**Nägel**, but I can't think of a suitable English word), looks aluminium, and is some 5cm long with a small hole in the 10mm long by 5mm wide spade end.

• The **Bell** is nickel and about 8cm diameter.

• What may be #35 (**Disc**?) is black and about 2cm Ø. **Axle** #36 is a brass looking Threaded Rod, 5cm long.

• There are 4 lots of **Wire** on the card former of #41, and the wording on it is Kupferdraht 0,10mm Ø; Kupferdraht 0,30mm Ø; Eisendraht 0,30mm Ø; Heizdraht 0,12mm Ø.

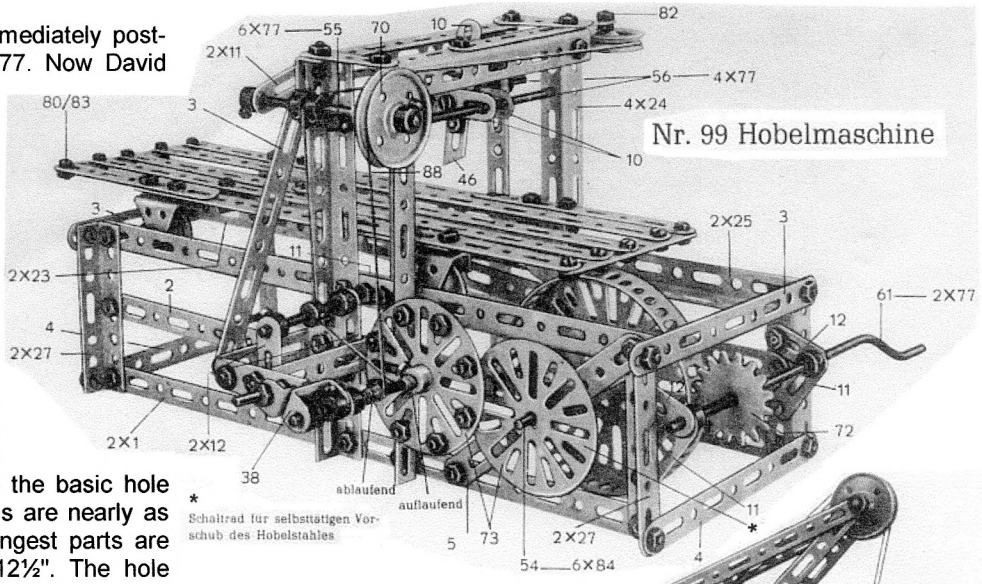
• The **Bolts** are 6mm u/h, and 2 longer ones can be seen, one 15 and the other 18mm long. Their (neat) heads are 2.0mm deep. The (machined) **Nuts** are 2.3mm thick.

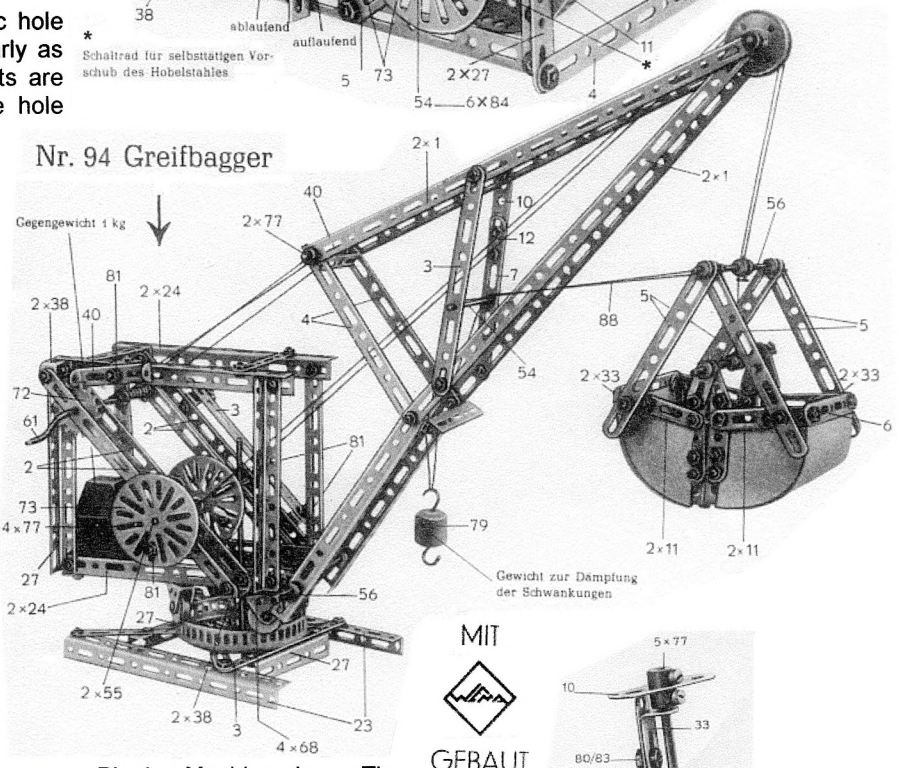
• There are 2 identical nickel **Spanners** which look like the one in MCS and are about 8cm long. The **Screwdriver** is perhaps 16cm o/a and has a long, round wooden handle.

Richard wrote that parts 13,14,15,19,20,27 & 40 are missing from the Set, and I can't see 23,26,38,39 & 42-46 either.

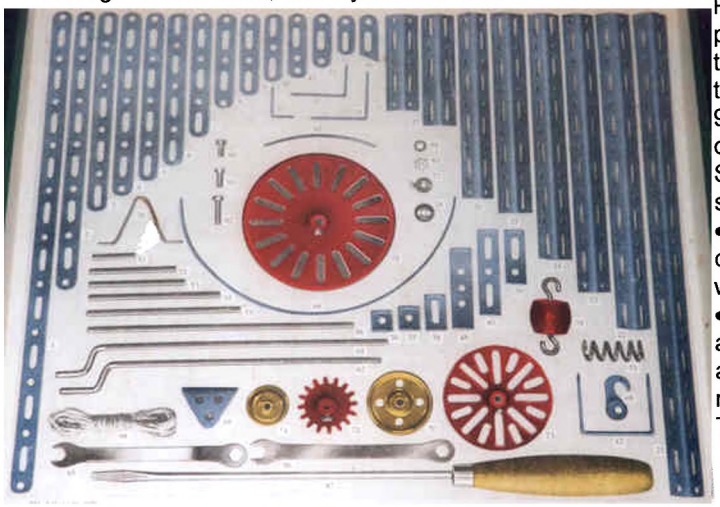
WEMA Brief notes on this German, immediately post-WW2, system appeared in 15/420 & 17/477. Now David Hobson has kindly lent me a No.C Set, apparently unused but (probably) with one DAS missing, and a manual for Sets A & B that was with it. No Set Contents are known for WEMA but from the illustrations of the Sets in the Manual (identical to those in MCS) it can be seen that they are not progressive. Models can be built from A or B alone, or A+B, and C is an add-on set with many parts not in A or B The largest set, ABC, had all the parts from A, B, & C.

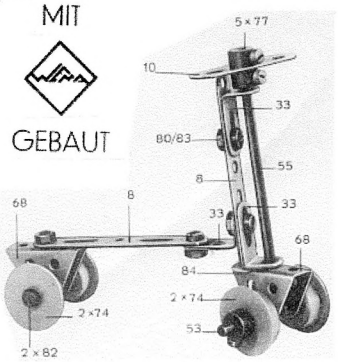
WEMA is an unusual system in several ways. In most parts every 2nd & 3rd hole are extended to make a slot, and the larger circular parts have many slots too. Although the basic hole pitch is 10mm, the Strips, Brackets, & A/Gs are nearly as wide as those in a ½" system, and the longest parts are only a little shorter than the 'traditional' 12½". The hole spacing, slots, and width of the parts would make them fit in reasonably well with systems such as STABIL & MÄRKLIN. The other unusual feature is the gearing, with a very coarse-toothed Gear Wheel meshing with the slots in the rim, or the face, of the Flanged Disc, or with a TRIX-type Worm.





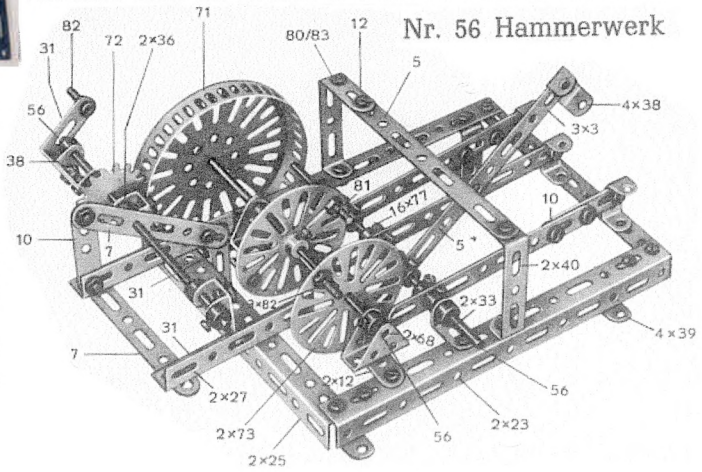
The **No.C box** is green, 342*402*32mm, and the lid is nearly covered by a colour label showing a large Multi-Jib Crane (as in MCS but with the jib extended). METALLBAUKAUSTEN in red, and the maker's name along the bottom, are easily noticeable on it; much less so the Wema logo (left), & 'Wema erector set \ Boîte de construction'. At top right is a small yellow 'C ZUSATZ KASTEN' label. *Baukästen* has a similar ABC lid on p215. Inside the lid is another label (below, from a photo) that shows all 63 parts of the system full-size & in colour. The parts in the Set are nearly all displayed individually, & most push down onto wire clips which are attached to the box's white base. The N&B are in a 7½cm square box, with a grey top that has METALLBAUKASTEN & the logo on it in white, and a yellow 'C' label.





Planing Machine above. The pitch of the end hole from the slot in the 11th Strip from the left (hshh) is about 9mm, and its PN (45) is outside those of the other Strips, so it probably has a special use.

- The 8 **A/Gs** have square corners and although they don't all show in the illustration above, holes are everywhere they would be expected.
- The 89mm Ø **Flanged Disc** in the centre has a boss, and 44 slots, 8mm long, in the rim. The actual part also has a central ring of 8 holes on a 25.8mm p.c.d., and 9mm long radial slots between the long ones, as shown in the models. The extra slots are needed to allow the Gear to run in the



The PARTS • DATA (in mm) Strip (11-hole): •Hole pitch/dia, 10.0/4.2; •width, 11.9; •thickness, 1.00; •ends near fully radiused. Boss: •o/d, 10.0; •i/d, 4.10; •painted steel; •double tapped M3. Thread: M4. Axle Dia: 3.92. Mod: 2.0. Nut: hex 8.0 A/F; Bolt: cheesehead 6.5 dia; both brassed steel.

In what follows reference is made to the photo above, and parts are sometimes described using h for hole & s for slot. Parts that have not been seen are asterisked, and their dimensions have been scaled from the box lid.

- Next to the 13 **Strips** is an Oblique-ended Strip* (PN 46), which can be seen acting as the cutting tool in the

side of the Disc (TRIX fashion). The other 4 main circular parts are from left to right: a **Flanged Wheel*** of about 24mm o.d (as in the Scooter); the 36mm o.d., 16t **Gear** with a 1.25mm thick disc; a 36mm **Pulley** made from 2 discs with deep centre belling, spot-welded together, with 4 face holes on a 23mm p.c.d; and a 62mm Ø **Face Plate***.

- Above the Flanged Disc are a 7h (hshsh) **Formed Strip**, & 3 **Angle Brackets**. The latter are h*s, hs*s, hs*sh. Below the Disc is a 23h (shs...shs) **Long Formed Strip** with square ends. Below and to the right of this part are three **Double Brackets** & 3 **DAS**. The former are from 15 to 22mm wide; the 3 holes in the first DAS are at standard pitch. The missing DAS* can be seen bottom right, with the Hook inside it.
- On the left under the Formed Strip are an inverted V-shaped **Wire Clip**, purpose unknown, made of 2mm Ø wire; 6 **Axles** from 25 to 153*mm, with slightly rounded ends; and 2 **Crank Handles** - the top one* has a smooth shaft; the other is 175mm long o/a, with 55mm of thread at the end of the shank.
- Under the Crank Handles are a Hank of **Cord** (the one in the Set doesn't look as large and is ordinary thin brown string); & a **Trunnion*** with 3 round holes in its flange (see the Scooter). At bottom right, a **Loaded Hook***, 48mm o/a; the TRIX-type **Worm**, 15mm o.d. & 36mm long; & a **Flat Hook***, 25mm o/a.
- To the left of the Flanged Disc are the 3 **Bolts**, 6, 10, & 17mm u/h: the latter has a 7.0mm head, and the 10mm a 7.1mm RH. (The M3 Set Screw, not shown separately, is 5mm u/h with a 5.5mm Ø CH.) To the right of the Disc is a 10.2mm Ø **Washer**; the **Nut**, with 2 types in the Set: machined, 2mm thick, & pressed, 2.3mm thick; a **Collar**, 10.0 Ø, 6.2mm wide, single-tapped M3; and a turned **Worm End Fitting**, a hollow cylinder 8.0mm Ø, 6.8mm long, with one end closed by a 1.0mm thick, 12.0mm Ø disc - it would make a neat flanged wheel.
- Along the bottom, 2 **Spanners**, one* flat and the other, 109mm o/a, with the ring end cranked, and a **Screwdriver** - the one illustrated is 310mm long with a plain wooden handle, but in the Set it is 184mm long, with the 86mm handle lightly fluted and painted red.
- **Finish**. All parts have a dullish chemical black finish except that the Flanged Disc & Gear are painted yellow, and the Pulley, deep orange. The colours on the lid are the other way round, and the Face Plate is orange there. The Flanged Wheel is shown yellow inside the lid & orange on the top.

The parts are generally accurately made, though some holes are 4.3mm, and a few, 4.1mm diameter. A couple of A/Gs have a little ragged flash (from worn dies) on one edge. The painted parts haven't survived their 50+ years as well as the black ones, and the Flanged Discs in *BK* have lost a lot of paint. Incidentally it is said in *BK* that the parts were made from steel and aluminium offcuts, but no aluminium pieces were found in this Set.

The MANUAL As already mentioned it is for the A/B Sets, with just 3 models on one page (as in MCS), that need C parts, and no detailed instructions for them. So perhaps there was originally another manual with the C Outfit.

This manual has no PR or date but from the look of its cover (left) it may be earlier than the one in MCS. That has the PR, '916 8. 47. J. I, Gö. 10000', which is the same as those on the box lid labels of this Set, except that the first number on the outside one is 915, with 915a on the inside.

SUMMARY OF MANUAL •Name: WEMA METALLBAUKASTEN AB. •Details of maker: J.Eberspacher, (14a) Esslingen/Neckar. •Dates &/or Ref Nos: none. •Page size: 211*299mm deep. •No. of pages: 32+covers. •Language: German. •Printing: ½-tones throughout; orange cover. •No Parts List or Set Contents. •Sets covered: A,B,A+B. •No. of models for each set: 27,20,10. •Name, Model No., Page No. of first & last model of each set: A: Warnkreuz,1,1; Windrad,28, 10. B: Schiff+schaukel,51,11; Ramme,70,21. A+B: Fahrbares Förderband, 91,22; Säulenbohrmaschine,100,31. •Other notes: •There is no Model 26. •p32 has photos of 3 ABC models (as MCS p5). •Sets A, B, C, & ABC are shown on the IBC. •The name WEMA on the FC is in the logo; BAUVORLAGEN means building instructions.

For the small models the photo provided, together with a Parts List, is more than adequate, but for the larger ones it is sometimes not clear what does what, even though a second view of the larger models is included in many cases. None of the models are very complicated mechanically though so guesswork would usually suffice. The Manual starts with a good selection of the usual small models, and then moves on to mainly Cranes & Machinery, with a few Vehicles & Fairground Rides. Some typical examples are shown here: the Scooter is an 'A' model, the Mechanical Hammer is a 'B', and the Planer & Crane need Sets A+B. The sides of the grab are to be made from card, which is also specified as fill-in panels on a number of the models.

The 'C' models would be appreciably bigger because the A+B ones need about 100 N&B and the C Set contains another 75 (as well as 21 Strips, 11 A/Gs, 12 DAS & Brackets, 3 Flanged Discs, 3 Pulleys, 3 Gears, & 2 Worms).

The mix of parts in WEMA seems rather strange with some Strips, A/Gs, Double Brackets, DAS, & Axles that are close in size to other parts. The larger circular parts, though versatile, don't suit large Vehicles as wheels very well.

GEOBRA Parts Following the notes on the Model Leaflet from this Set in 19/552, Philip Hore has kindly sent details of the parts in a made up model that he has come across, with only a few small pieces missing. It was noted in 21/618 that there were 2 sets with different size parts, but it isn't known which these are from.

There are 10 different types of Panel: a Long & a Short Window Panel, each with an aperture fitted with a tabbed window frame; a 1- & a 2-bay Cross Braced Rectangular Panel, 7cm wide by 10 & 20cm long, plus full width tab; a RH & LH Triangular Truss; a RH & LH End Panel; and a RH & LH End Panel with Tab. All the cross bracing is embossed to add rigidity. Each Panel is bolted to the 6mm deep full width tab at the end of the next. The Bolts are M3 and screw into the couple of turns of thread formed into upstood punched holes. The Panels are joined at right angles by 10 & 20cm long A/Gs and the tower & jib are then 78mm square in section. The jib is attached to the tower by a 7cm long Hinge. The finished model stands 770mm high, the jib is 610mm long, & the base is 228mm square.

Most of the parts are bolted together but one or two, the Pulley Axle Bearing Brackets for example, simply clip on. A few others are joined by small bent-over tabs but these are probably factory fitted.

The Pulleys are black plastic, 15mm Ø, with a 3mm bore. The Hook is 45mm long o/a. The Leaflet shows knobs on the Crank Handles but none are fitted to the actual parts.

The Gears are bright plated but most parts are painted: red for the Base, Windows, A/Gs & Hook, and silver for the rest. The name *Geobra* with a 25mm Ø circle around it is embossed below the Window on the Short Window Panel, and the turntable is stamped MADE II I WESTERN GERMANY.

The firm that made these Sets is given in *Baukästen* as Georg Brandstätter GmbH & Co. KG, of Zirndorf (near Nürnberg), and the Crane Outfit was introduced in 1954. No end date is given but after 1975 the company concentrated on plastic toys.

WEMA Matters The last notes, in 22/630, on this unusual, early post-WW2 German system were mainly about a Set C, and an AB manual. The set structure was Sets A & B which could be used independently or together, an add-on Set C, & a combined Set ABC. Since then a Set A & a Set B have come to hand, and also, thanks to Urs Flammer, a copy of a different manual with (mainly) models needing Sets A+B+C, plus a list of the parts in Set ABC.

FIG.1

SETS A & B These are in the same size green boxes as Set C, with the same label covering the lid (above), a similar yellow sticker giving the set size, & the same method of holding the parts.

SET ABC The 3 examples seen on Ebay have a similar box except that it is red rather than green, and the parts are in 13 bays formed by red-topped partitioning.

SET CONTENTS These are listed in Fig.4 with the parts shown in Fig.3 (the inside of the lid). The quantities for Sets A, B, & C are as found in the sets, all virtually complete. In a few cases those in Sets A, B, & C don't add up to the ABC figure. This could be packing errors, or the need to allow an A or a B set alone to have enough parts for the appropriate manual models, or, for the N&B, the inclusion of some spares.

The PARTS As mentioned in OSN 22 the colours of some of the parts in Fig.3 are incorrect. The Flanged Disc #71 is yellow (and the piercing shown is incorrect), the 'Wheels' #70 & 74 are steel, painted orange, & #79 the Loaded Hook is not painted.

Next, the parts not properly described in OSN 22. **#68** is a triangular-sided **Channel Bearing** (a sort of double bracket) with 3 holes along its base. **#69 Flat Hook** is 26¼mm long o/a. **#73 Face Plate** is 59¾mm Ø. **#74 Flanged Wheel** is a 24½mm Ø disc with an 18mm Ø cylinder attached to it to form the tread. The part, 7½mm wide o/a, has no boss, it runs on the centre hole in the disc and in the cylinder's outer closed end. **#79 Loaded Hook** is 50mm long o/a with a straight-sided weight 22mm Ø & 21½mm high.

The purpose of the **#78 Wire Clip** is still a mystery. It is only used in one manual model, at the jib head of the Multi-Jib Crane on the set lids.

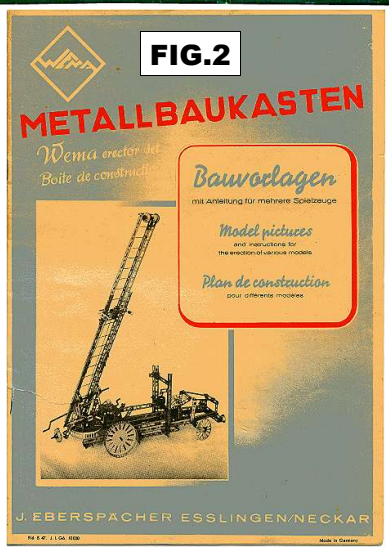


FIG.2

The MANUAL It has 16 A4 pages and the cover (Fig.2) has a PR '916 8.47 J. I. Gö. 10000' at the bottom, the same as the AB edition. An Intro, in German, English & French, talks of another manual later on which will include the Fire Engine on the cover. It also suggests buying a supplementary set when all the manual models have been made. Nothing is known of either. The 14 models go from Bockleiter (Step-ladder) to Kran, the one on the lid (& in Fig.7). The presentation is like the AB with a parts list & one or more good half-tones for each model. The first 8 vary from very to quite simple, but all but one need parts from Set C. The next two are small, but fair, Delivery Tricycles, though without any indication of how

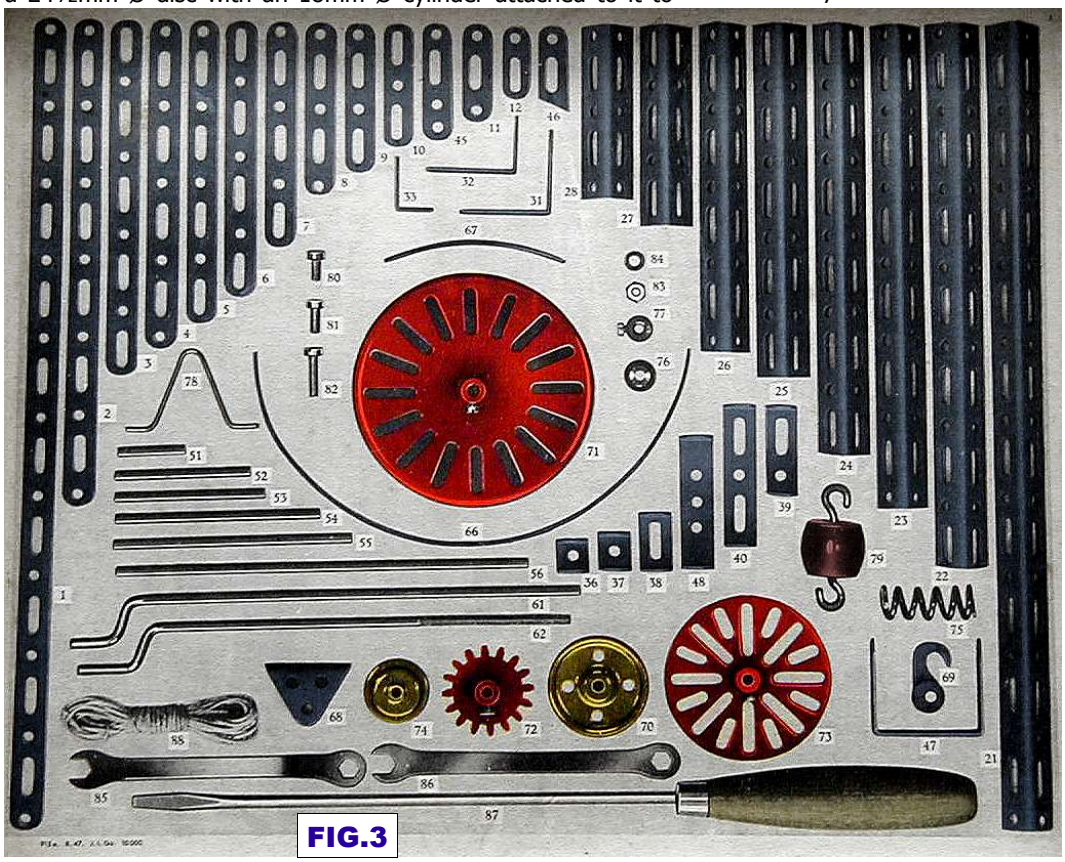


FIG.3

Part/Set	A	B	C	ABC
1. Strip	2	2	2	4
2. Strip	2	4	2	8
3. Strip		3		3
4. Strip	2			2
5. Strip		4	2	6
6. Strip	2		3	4
7. Strip		2	3	4
8. Strip	2			2
9. Strip			4	4
10. Strip	4	2		6
11. Strip	6			6
12. Strip	2	5		7
21. A/G			2	2
22. A/G			2	2
23. A/G		2	2	4
24. A/G	2	4	3	9
25. A/G	2	2		4
26. A/G			1	1
27. A/G	2	2		4
28. A/G			1	1
31. A/B		6	3	9
32. 'L' Brkt			1	1
33. 'L' Brkt	4	2		6
36. D/B		2		2
37. D/B			1	1
38. D/B		5	4	9
39. DAS		4	4	8
40. DAS		3	1	4
45. Strip			1	1
46. Pawlr		1		1
47. DAS			1	1
48. DAS			2	2
51. Axle			4	4
52. Axle	1	1		1
53. Axle	1			1
54. Axle	1			1
55. Axle	2			2
56. Axle		5		5
61. Cr Handle	1			1
62 Cr Hdl thrd			2	2
66. Formed Str			2	2
67. Formed Str			2	2
68. Ch Bearing	2	2		4
69. Flat Hook		1		1
70. Pulley	2		3	5
71. Flgd Disc		1	2	3
72. Gear		1	3	4
73. Face Plate	1	2		3
74. Flgd Wheel	4			4
75. Worm			2	2
76. Worm End			4	4
77. Collar	10	20	10	40
78. Wire Clip			1	1
79. L'd'd Hook		1		1
80. Bolt	41	67	69	160
81. Bolt	4	8	6	20
82. Bolt	5	4	2	10
83. Nut	52	79	93	200
84. Washer	6	8	6	20
85. Spanner	1	1	1	1
86. Spanner				1
87. S'driver	1	1	1	1
88. Cord	1	1	1	1

FIG.4

they would be propelled. Then the Windmill on the AB manual cover with the sails driven from a Crank Handle in the base through 2 pairs of Gears used as bevels, and the Road Roller in Fig.6. Next a good Mobile Crane with luffing, hoisting, & centre pivot steering. Its jib is about 40cm long and the wheels are Flanged Discs & Pulleys, the latter looking much too small. Finally the Multi Jib Crane.

The Crane right was my attempt at a multi-jib model from Sets A+B, and gives an idea of the WEMA look in colour. The unusual jib layout came from Abb.64 in http://www.math.tu-dresden.de/~baer/ScriptEbeneKinematik2007.pdf. The model is simple with slewing by a Gear on a vertical Crank Handle which runs around a Flanged Disc bolted to the top of the tower. Construction was straightforward and I found the numerous lengths of Strip helpful rather than confusing.

There are 3 photos of the Road Roller in the manual & 7 scrap views of the Crane: most of the main features can be seen in Figs.6 & 7 but they are much smaller than the originals. 6a shows the Roller's steering with a Worm on the end of a Crank Handle engaging a Gear on a shaft carrying a Face Plate with cords to the roller frame. Fig.6b shows the flywheel geared to one of the rear wheels, & a connecting 'rod' to the 'engine cylinder'. The canopy & roller were to be cardboard.

At Fig.7b's right end is a Crank Handle winding shaft with a Face Plate at its far end. Pawl #46, moved by handle #10, engages a slot in the Flanged Disc. The sloping Crank Handle carries a Worm which meshes with a Gear that drives the Flanged Disc on the luffing shaft through an idler Gear. In Fig.7c the Crank Handle in the base again carries a Worm and the Gear it meshes with has another at the top of its shaft. It rotates a Flanged Disc bolted to the superstructure.

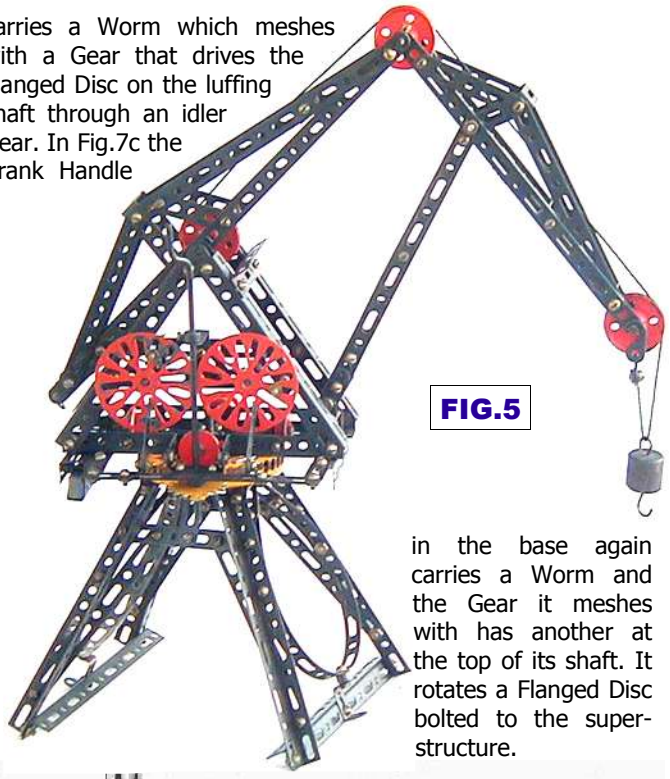


FIG.5

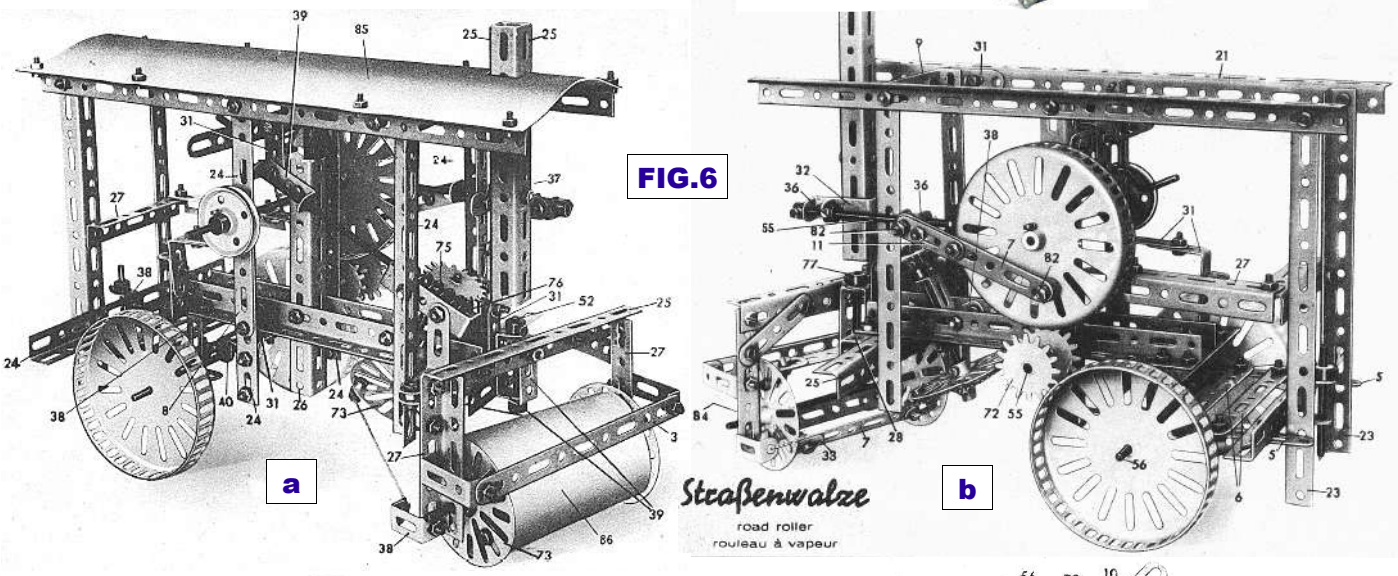


FIG.6

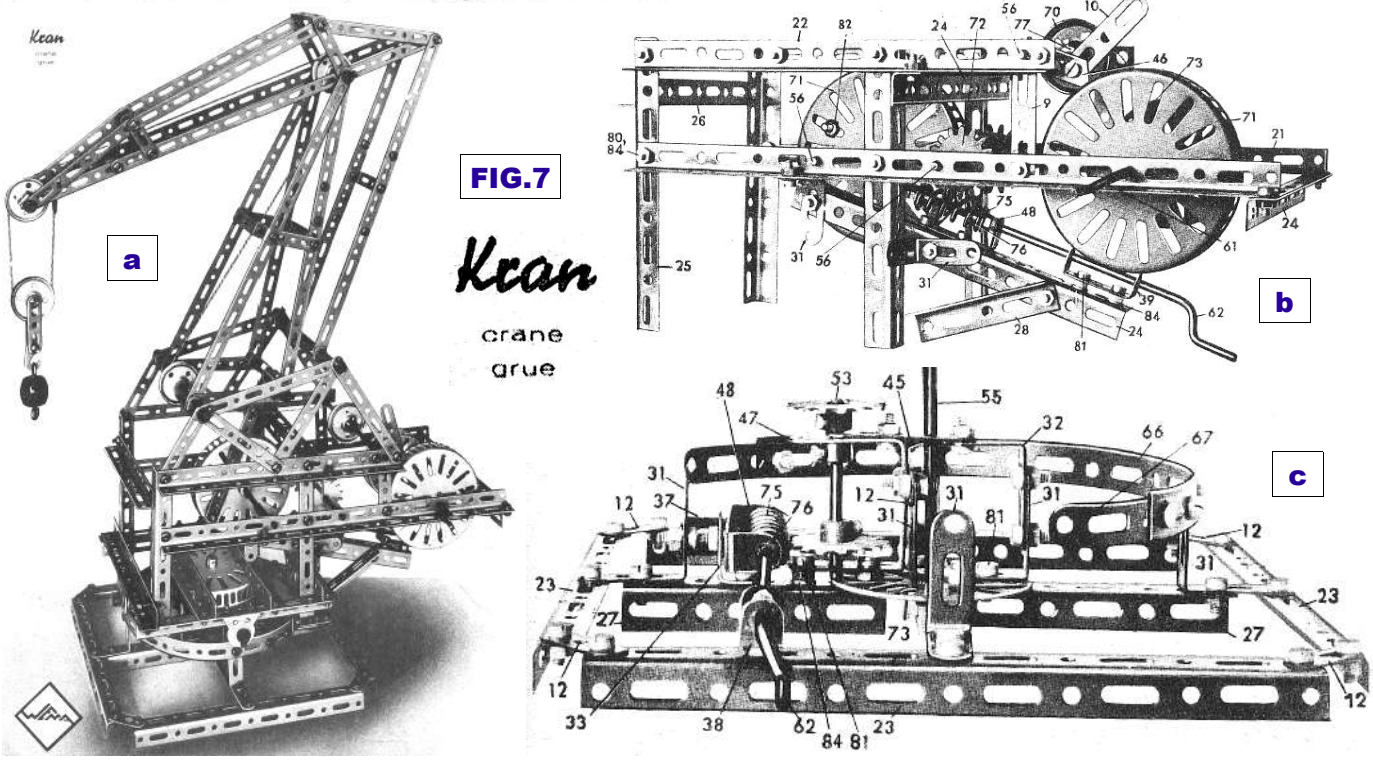


FIG.7