

A Brief History of English Meccano 1901-1981

by Graham Jost, March 1999 revised July 2009



Frank Hornby M.P.

Meccano, that wonderful, and much imitated, universal mechanical construction system had its genesis in the closing years of the nineteenth century. Its originator was Frank Hornby, who obtained the first patents for his invention in 1901. In the same year the first elementary set went on sale, under the name "Mechanics Made Easy". The name "Meccano" made its appearance in 1907. Regular home and overseas model-building competitions were initiated by Hornby in 1915, the first issue of the Meccano Magazine appeared in 1916, and the world-wide Meccano Guild and Correspondence Club was founded in 1919. Hornby trains, electrical, chemistry and radio sets, Hornby speedboats, aeroplane and car constructor sets and Dinky toys had all made their appearance by the time Hornby died in 1936. With Meccano, he had seen his invention grow to become a highly sophisticated system capable of reproducing virtually every known mechanical device, and to include amongst its achievements an Empire-wide, if not quite a world-wide, brotherhood of Meccano boys.

Having survived the First World War and the Great Depression relatively unscathed, the Second World War marked the beginning of a general steady decline in the fortunes of the company. Meccano manufacture had ceased completely from 1942 in favour of the war effort, and it was 1950 before full Meccano production was achieved again. But by this time new competitors were on the scene. Television, and then Lego, in particular, began to make significant inroads into Meccano's traditional markets. Progressively more difficult times, as evidenced by multiple changes-of-ownership, erratic publication of the Meccano Magazine and desperate sets modifications eventually culminated in the closure of the famous Binns Road factory in November 1979, thus sensibly ending the manufacture of English Meccano.

Frank Hornby himself published a history of Meccano in the Meccano Magazine in 1917, and again in 1932/33. Although providing an invaluable insight into the history and all aspects of Meccano manufacture and marketing at the time, its almost total lack of chronological information is unfortunate.

Mechanics Made Easy and Early Meccano: 1901 to 1914

In building simple mechanical models for his children from sheet metal, Hornby became frustrated that each model required parts that could be used to build that model only - each new model required a set of new parts, involving considerable labour. The inspiration and the means of achieving interchangeability, whereby parts could be assembled in different ways to produce different models, evidently occurred to Hornby during a train journey one Christmas eve. The origin, and subsequently the history of the Meccano system, based initially on no more than ½"-wide strips of various lengths containing holes ½" apart, brackets, 8-gauge axles, wheels and nuts and bolts has been remarkably well documented in the list of references attached.

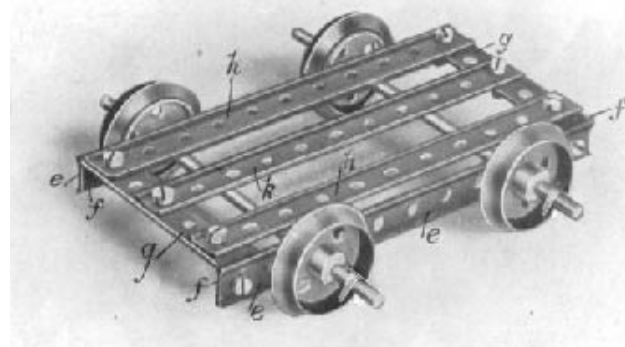
Hornby was born in 1863, and in 1901 he was a book-keeper employed by David Elliott, a meat importer, whose premises were located in James Street in Liverpool, close to the seafront and the docks. The first patents for his novel system were applied for, and granted in 1901, and the first set of Mechanics Made Easy, comprising just 17 different parts (strips, brackets, axles, wheels, nuts and bolts) went on sale later that year. It included a leaflet showing the construction of 12 models and sold for 7/6. The perforated strips were of tin plate, with folded edges and square corners. Wheels were fully machined from brass, and a system of



keys to couple the wheels to grooved axles was used. By 1902, bought-in parts were being packed in rented premises next door to Elliott's firm. For the first model-building competition advertised in 1903, the actual models were to be submitted for judging! An Accessories Box selling for 5/- contained the first gears - pinions, spur gears, contrates and worms. By 1905 five sets were available, each linked to the next by Accessory Sets, the number of different parts now totalling 38. The 12½" Angle Girder appeared. In 1906 a starter Set X was added.

Illustration from an early manual showing folded tin parts

In 1907 Hornby set up a factory in Duke Street, just a few hundred yards away, for the in-house manufacture of most parts. The Meccano name was registered on September 14. In June 1908 Meccano Ltd was formed. The former alphabetical Mechanics Made Easy Sets X to E were now marketed as Meccano Sets I to 6, and a different key fixing for wheels obviated the need for grooved axles - the new system was, however, less positive than the old. Meccano strips now had the familiar rounded ends, and being made of thicker steel, were without folded edges. Nickel-plating replaced the former tinplate finish, and this was to remain the standard finish for most Meccano parts until the introduction of the "New" coloured Meccano in 1926.



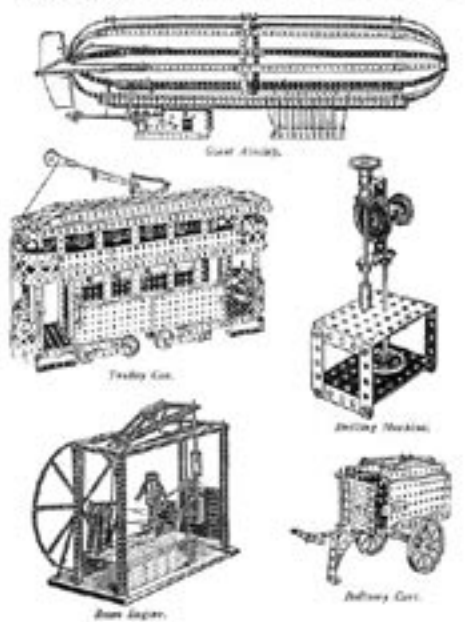
Expanding sales soon necessitated a move to larger premises, and a site in West Derby Road was secured in 1909. Sets 5 and 6 now came in wooden cabinets, the largest set containing no less than 168 12½" Perforated Strips and 245 Angle Brackets. Just one more Angle Girder was added to the system, 5½" long. In 1910 the Hornby System of Mechanical Demonstration was introduced for use in schools, along with the familiar Flanged Plates and the 4" long Flanged Sector Plate. Stamping of some Meccano parts began in 1911, and by this time the first "downsizing" of Meccano sets took place - the 1911 No. 6 Set, for example, had only 48 12½" Strips as against the 1910 set's 168, and 500 Nuts and Bolts as against 950. Meccano (France) Ltd. was established in Paris in 1912, and the first Windmill Sails were introduced. In Germany, Märklin began Meccano manufacture under licence - this association is now remembered mainly for the No. 1 Märklin clockwork motor and the remarkable, and highly prized, three-output-shaft No. 2 or "trinity" motor. Up to this time the securing of wheels to axles still relied on key fixing : the change, begun in 1912, to the (single) tapped boss and set screw system must have met with universal approval - it represented the turning point from which serious Meccano modelling became possible, free from the limitations associated with a fundamentally unsatisfactory, and what must have been a very frustrating, method of fixing of wheels to axles. The total number of different parts in the Meccano system had now grown to about 60. A recently discovered Windmill Set has been provisionally dated at 1913 - as such, it is the first known "one-model" Meccano set. Having outgrown the West Derby Road site, yet another move was made during 1914 to a purpose-built

factory at the address which was to become familiar to generations of Meccano boys all over the world:

Meccano Ltd., Binns Road, Liverpool 13, England.

1913 Windmill set





A few of the Meccano Models that can be built by any boy.

Nickel-Plated Meccano. The First Binns Road Period: 1914 to 1926

With the onset of the First World War supplies of the Märklin clockwork motors from Germany naturally ceased - an alternative US-sourced 4 volt electric motor was soon provided, and the first electric Meccano motor operating directly from the mains also appeared at this time. Apart from cosmetic changes in the finish of some parts, and alternatives for brass bosses in smaller pulleys, wartime production appears to have continued without undue hindrance. The first Book of Prize Models appeared in 1915, along with the Inventor's Accessory Outfit. In 1916 the first "Meccanograph" appeared as a competition entry - it became one of Frank Hornby's favourite models, and Meccanographs remain popular with model builders today. A bi-monthly Meccano Magazine began with the free September/October issue of 1916. The first Curved Strips and the special loom parts appeared during this time, and Braced Girders finally eliminated the need for prodigious amounts of Cord for bracing purposes. Hornby formed the Meccano Guild in 1919: its first affiliate was the Holy Trinity Club in Kent, which prospers still. UK production of the No. 1 clockwork motor began in 1919, and the first (constructional) Hornby trains appeared in 1920. The Meccano Magazine doubled its size

to eight pages, and now cost one penny: it was becoming an effective means of communication between Meccano Ltd. and the Meccano community at large. New parts were advertised for the first time in the Meccano Magazine in 1920, and a column for suggested new parts began in 1921. Electrical parts first appeared in 1920, the Electrical Accessory Outfit containing 15 new parts, as well as an electric motor and accumulator. The first vertical steam engine appeared - its very high price helped to ensure that it soon disappeared again! By 1921 most Angle Girders were available - in view of the large skeletal models up to this time, the extra Girders were a long time in coming, and accounted for the relatively large numbers of strips and angle brackets in earlier sets. Many of the more specialised parts such as Flywheels, Rack Segments and Dredger Buckets appeared during 1921, and in 1922 a Meccano constructional Crystal Set went on sale. "Fabrique en Angleterre" markings on imported Meccano parts were required by French law and date from late 1921 until 1926.

1922 saw the introduction of the famous No. 7 Meccano Outfit. (This outfit formed the basis of what became the L Set of the 1930s and subsequently the No. 10 Set.) With it, many of the major prize-winning models could be built, and it included special loom parts, the complete electrical outfit, a 4-volt electric motor, an accumulator and a clockwork motor. Housed in a stained oak cabinet, the No. 7 was the pinnacle of Meccano ownership, and quite unaffordable to most. The Meccano Magazine

appeared monthly from September 1922. The 7/32" long bolts were first introduced in 1922 in place of the earlier 1/4" - and longer - bolts, but it was not until 1925 that this became standard, thus solving problems of interfering bolts in tight places. The Hub Disc, Circular Girder and Channel Segment appeared in late 1923. Full-colour covers graced the Meccano Magazine from the May 1924 issue. 1925 saw an increase in the size of the No. 7 Outfit and a 96-page December issue of the sixpenny Meccano Magazine. The first painted "New" Meccano parts appeared in 1926 in bright red and pea-pod green, a scheme which was fortunately very short lived. Several new parts during these years brought the total number of parts in the Meccano system, including electrical parts and motors, to nearly 240 by 1926.



Early 1920s "O" set

Meccano in Red and Green - 1927 to 1934

The 1926 colours were quickly replaced by the well-regarded Burgundy red and dark green by mid-1927, and applied eventually to all but the brass and small nickel-plated brackets and washers - nickel-plated parts were still available to order, however, until the mid 'thirties. The later 1920s was a period of prolific introduction of new parts. These included the small Flanged Wheels, several additional Pinions and Gear Wheels, Bevel Gears, Motor Tyres, the Channel Bearing, Fan, Ball Race, the steam-related parts, and such specialised items as the Ships' Funnels (25, no less!), Crane Grab, Digger Bucket, Pulley Blocks, Signal Arms and the Circular Saw - with the exception of just one Ships' Funnel and two of the three Pulley Blocks, all of these latter were to disappear permanently after 1941. With the introduction of the Circular Saw in 1927, the 5½" x 2½" Flanged Plate was provided with a saw slot and guide fence slot - these were deleted along with the Saw itself in 1934. In 1928 the Geared Roller Bearing was introduced, at one pound much the dearest item in the Meccano parts inventory. This was finished in a new colour - battleship grey - along with the Pulley Blocks, the steam-related parts and the Digger Bucket. Single-tapped bosses became double-tapped from 1928.



In 1929 the stained finish for the larger outfit cabinets gave way to enamelled two-tone green, and the second vertical steam engine was introduced. The Meccano Magazine regularly featured No. 7 Set - and larger - models, sometimes over more than one issue. These were subsequently published in leaflet form as the Meccano Supermodels. There were ultimately 37 of these, but several underwent subsequent improvement and reissue to bring the final total up to 42. The model featured in Supermodel Leaflet No. 4, the famous Giant Block-setting Crane became the average Meccano boy's ultimate modelling aspiration. The Depression resulted in some downsizing of the No. 7 Outfit in 1930. The early 'thirties saw the introduction of a plethora of new items: the Motor Car Constructor Outfits, the Aeroplane Constructor Outfits, Hornby Speedboats, the X Series Outfits, Kemex, Elektron, Dinky toys and Dinky Builder. The 1927 red and green Meccano parts finishes were replaced by lighter shades by 1933 - rather similar shades of red and green were to be reintroduced again after the war.

Blue-Gold Meccano - 1934 to 1941



Late 1930s No.4 set with Blue Gold parts

Meccano colours were changed again at the end of 1934. Plates were now blue with gold cross-hatching and Strips and Girders for the home market became gold. These latter remained green for overseas markets where many a youngster in pre-war days could not understand why the colour outfit labels and manual covers showed gold parts which in his set were very clearly green! A notable exception was the Indian market, where imported blue/gold sets and parts were evidently identical to those sold in Britain. The most significant new introductions at this time were the series of Flexible Plates and Strip Plates - at long last models could now be built to look less skeletal and more realistic. The traditional numbering of the outfits was replaced by an alphabetical series, from A to L, omitting I and J. The largest L Outfit was comparable to the earlier No. 7, but with the inclusion of some new parts, most notably the new flexible plates - it is often regarded

as the best of the largest Meccano outfits. The Meccano Lighting Set was also introduced at this time. The Channel Segment was dropped by 1935, being, perhaps, the first significant part to be deleted permanently from the Meccano inventory - up to this time there had been mainly a steady increase in the number and diversification of parts. The vertical (1929) Meccano Steam Engine also disappeared. The introduction of new parts reached its peak by 1935, and included the Helical Gears and Gear Ring after which little was added up to the outbreak of war in 1939. The non-constructional Meccano Sports Car was introduced in 1936. By this time three clockwork, and three electric motors were available. After Frank Hornby's death on September 21, 1936, his elder son Roland took over as Chairman of Meccano Ltd.

In 1937 a new set numbering system from 1 to 10 replaced the not-so-popular alphabetical series. A substantial variety of new models was also included in extensively revised Instruction Manuals. Although the largest Outfit No. 10 was significantly reduced in content from the L Set, it was nevertheless to remain substantially unchanged from its introduction until it was finally discontinued half a century later in 1992. The 6 and 20 volt "cricket ball" motors and the Hornby Dublo railway system made their appearance in 1938. In 1939, the first Meccano theme set appeared, the Mechanised Army Outfit.

The onset of war in 1939 had a progressive effect on the quality and quantity of Meccano products. The Meccano Magazine steadily reduced in size from the heady days of the mid 1930s of 100 and more pages per issue to fewer than 40 after 1941. Nevertheless the full range of Meccano sets was still available as late as 1941. From 1 January 1942, however, all Meccano production ceased, by Government order, the factory transferring to full-time war production. From the same time, the Meccano Magazine format shrank to half size, to remain so until 1961. Remarkably, considering the heavy bombing of Liverpool, the Binns Road factory escaped bomb damage unscathed.

Post-War Meccano - Red and Green - 1945 to 1964



Page from the 1956 Meccano catalogue showing the No. 4 and 5 sets

Post-war production was understandably slow to build up to pre-war levels - it was not until 1950 that the full range inclusive of the No. 10 Set was available once more. In 1948 the No. 1 (reversing) and No. 2 clockwork motors appeared. Gears Outfit "A" was introduced in 1949. By 1950 the No. 2 clockwork motor was deleted, and the E20R electric short sideplate motor introduced. During 1951 and 1952, the Korean war had a detrimental effect on the quality of some Meccano parts, many of which were finished in matt black.

A very limited range of the special pre-war parts was reissued in 1953. Triangular Flexible Plates, the 4:1 ratio gears and 6-hole Bush Wheels were introduced in 1954. Significantly, and at long last, the model-building difficulties associated with the round end holes of all Flexible and Strip Plates were solved by their being elongated from this time - the new parts were included in revised outfits featuring revised models, the first major revision since the war. The traditional No. 10 Set Manual gave way to a series of twelve model Leaflets, later extended to twenty. Manuals, covers and box labels were all revised. 1956 saw the introduction of the Gears Outfit "B", which included the newly introduced Rod with Keyway. The Meccano Magazine began a series of Models of the Month in 1956, which totalled 38 by its close in 1962.

In 1958 the shades of the red and green used since the war became much lighter - these shades continued until the conclusion of the red-green period in 1964. The E20R electric motor was replaced by the E15R, a motor which ran very satisfactorily on 12 volts DC, and for which power supplies were now much more common. The No. 10 Set now came in a much more convenient 4-drawer cabinet, in place of the previous

cabinet with lift out trays. The time honoured lacing of Meccano parts to backing sheets of cardboard was replaced in 1959 for all main sets, except the No. 9 and 10 Sets, by presentation in easily damaged vacuum formed plastic trays in the boxes. The Meccano Mechanisms Outfit was introduced in 1959. It was a stand-alone set, in that a number of mechanisms could be built for demonstration purposes entirely from the contents of the set. For the first time in its history, an issue of the Meccano Magazine did not appear (August 1959), the result of a national printers' strike.

The wartime format of the Meccano Magazine was replaced in 1961 with a much larger format, though still not that of the pre-war size. The larger pages permitted a significant improvement in the quality of photographs. The early part of 1962 saw the introduction of further new parts, new Instruction Manuals and a new compact geared Emebo motor. New parts included flexible Plastic Plates, both transparent and coloured, larger Road and Steering Wheels, single Braced Girders, and Narrow Strips - these latter had been mooted, on and off, for nearly forty years! The new red and green parts were to have a short life in these colours, since a major colour change was to occur just two years later. The new Instruction Manuals made use of exploded views to explain construction details.

The final, and most significant introduction from this period was the Elektrikit, a fine and remarkably comprehensive electrical set which had been based on one introduced earlier by Meccano France. Elektrikit parts are highly valued today for their usefulness and versatility in electrical model building.

Meccano in Yellow, Black and Aluminium finish - 1964 to 1970

The financial fortunes of the Meccano company had been in decline for some time when, in 1964, a take-over offer by the Lines (Triang Toys) Group was accepted. Later that year, another colour change was introduced by the new management: yellow Flexible, Strip and Perforated plates, black Flanged and Plastic Plates and aluminium finish Strips and Girders. These latter were very easily marked, and by 1967 this finish had been replaced by the familiar zinc plating, a finish not without its problems, too. The choice of yellow and black followed typical highway construction equipment colours, and in keeping with this, each set was given a constructional theme name. The sets were packed in formed expanded polystyrene trays contained within sleeve covers.



1965 Ocean terminal - number 5 set

1965 saw the introduction of Conversion Sets in the new colours, and two new motors, the Mamod-manufactured horizontal steam engine, and the Meccano six-speed Power Drive electric motor. Both units proved extremely popular. The Power Drive motor was especially useful in permitting a choice of output ratios from 3:1 to 60:1, but care had to be taken not to damage its plastic gears by overloading, particularly on the highest reduction! The gearbox was available separately. Together with a standard No. 4 Set, it formed the Meccano Power Drive Set. Plastic Meccano was introduced in 1965.

In 1967 a cheaper version of the Power Drive Set, the Junior Power Drive Set, included a simple geared motor which failed to appeal. The Super Tool Set, which also appeared at this time, was not a success. By 1967 the Meccano Magazine, which had been in decline for some time, ceased publication from the August issue to the end of the year, to be relaunched under new management in 1968. The first adult Meccano Club, the Midlands Meccano Guild, was formed in 1968.

Blue, Yellow and Zinc Meccano - 1970 to 1978

Two significant changes were introduced in 1970. First, the black Plates of the previous series were replaced by blue Plates. Secondly, the range of sets was reduced by deleting the old No. 9 Set and advancing all other set numbers by one. The No. 10 Set remained essentially unaltered. The Elektrikit was teamed with a No. 4 Set to become the 4EL Set. A rather basic Electronic Set was introduced in 1970, and was also packaged



1970 No.9 and No 10 sets The number 10 set contents was much as it had been in 1937

with a standard No. 5 Set to become the 5ME Set. The Multi-purpose Wheel and the Large Toothed Quadrant and Pinion were also introduced. Meccano set packaging was now in dark blue boxes containing formed expanded polystyrene inserts, with lift-off lids. Instruction Manual diagrams were of the same exploded type as earlier, but were now in full representative colour. The Caterpillar Track Pack, comprising plastic links and plastic sprockets was introduced, to be followed in 1971 by the Pocket Meccano Set.



Early 1970s number 5 set

1972 saw the introduction of the first "single-model" sets since the Windmill Set of 1913 ! - the No. 1 and the No. 2 Clock kits. Both suffered from ridiculously short running times, and disappointing

timekeeping. The monthly Meccano Magazine ceased at the end of 1972, to be replaced by the Meccano Magazine Quarterly whose first issue appeared in April 1973. The Army Multikit, and the Highway Multikit appeared in 1973. The Multikits proved very popular, and an improved Super Highway Multikit was released in 1974. A scaled-down version of the Army Multikit, the Combat Multikit, appeared in 1975. The oak finish on No. 10 Set cabinets now changed to teak - and extruded aluminium alloy handles replaced the earlier white plastic knobs. The Crane Multikit appeared in 1976, along with the compact and useful Crane motor. An unsuccessful "unisex" packaging exercise for Meccano sets was introduced, and abandoned, during 1977. The E15R motor was phased out, to be replaced by two Märklin motors.

Dark Blue and Yellow 1978/9 - et seq.

The blue/yellow/zinc colour scheme of the earlier 1970s was replaced by a striking one of dark blue strips and girders with mustard yellow plates in 1978. Six new sets (A, and 1 to 5) bearing no relationship to the earlier series, were introduced. Sets 2 to 5 included the Crane kit motor. Only the No. 9 and 10 Sets, in the new colours, were retained from the earlier series, the No. 10 Set now being housed in a three-drawer cabinet fitted with vacuum formed trays. In 1979 the Space 2501 Set was introduced. This made use of several new plastic parts for space-age models, the metal parts and plastic plates being white. No motor was included in this set.. The Meccanoids Set, introduced later in the year, included the Crane motor to power a number of imaginative creatures from outer space. Then, without warning, on Friday, 30 November 1979 Meccano workers were informed that the factory would be closing down as from that day - the incredulity with which this news was received can be imagined. A sit-in by some of the work force was maintained until 12 March 1980. But by this time the futility of the situation had become clear, and after the machinery and stock had been sold and removed, most of the buildings were demolished.



1978 No.3 set manual front cover.

A basic range of one-model Action Packs was introduced in 1980, and revised and augmented in 1981 by the inclusion of three clockwork motorised Action Packs. Limited Meccano production had been revived briefly elsewhere, but by the end of 1981 all UK Meccano production finally ceased.

Postscript

So ended, rather sadly, the production of English Meccano, after more than three-quarters of a century of providing more pleasure to more boys than perhaps could be claimed by any other “toy”. It is testimony to the system that today, more intricate, instructive and ingenious Meccano modelling is being achieved than ever was the case in earlier times. The hobby is now primarily in the hands of adult enthusiasts, and the revitalisation of Meccano Clubs, Meccano exhibitions, extraordinarily high-quality Meccano publications and newsletters from around the world are adding to the knowledge, enjoyment and sense of community that they bring. The Internet is the latest tool that is providing interactive and communicative facility with an ease previously undreamed of for all enthusiasts of this most wonderful of “hobbies for boys”.

References

- Love, Bert and Gamble, Jim. The Meccano System, Hornby Companion Series, Volume 6, New Cavendish Books, London, 1986.
- Hauton, R.R. and Hindmarsh, A. The Development of the Meccano System (DMS), The Meccanoman's Club, Henley-on-Thames, 1972.
- Hauton, R.R. Supplement No. 1 to DMS, The Meccanoman's Club, Henley-on-Thames, 1975.
- Morris, G.M. The Meccanoman's Guide, The Meccanoman's Club, London, 1974.
- Lavers, John. Meccano, the First Century, Books 1, 2 & 3, M.W. Models, Henley-on-Thames, 1996 & 1997.
- Fell, Harry. Chronicle and Listing of All Meccano Parts 1901 - 1979, M.W. Models, Henley-on-Thames, 1996.
- Westwood, John. Meccano Collecting, John Westwood, Streatley, 2nd. Edition, 1985.
- Constructor Quarterly, edited by Robin Johnson, various issues, 1990s.
- Hornby, Frank. The Life Story of Meccano, New Cavendish Books facsimile edition, London, 1976.

▼ 1950s Ad from the Meccano Magazine



The sad sight of the partly demolished Meccano factory Binns Road Liverpool in the early 1980s ▲

Aero constructor set 1937 ►



◀ September 1934 Meccano Magazine



▲ Beautiful example of an unused 1937 export set 8 from Australia

◀ 1934 Dealers Cabinet with the then new blue and gold parts