THE MODEL WORLD AT YOUR FINGERTIPS

MECCANO MAGAZINE

THE MODEL WORLD AT YOUR FINGERTIPS

FREE DOLPHIN 16 PLAN

SPECIAL PLASTIC CONVERSION

JANUARY 1967 TWO SHILLINGS

AVIATION PLASTIC MODELLING AEROMODELLING BOATS RAILWAYS RACEWAYS SCIENCE CYCLING PUZZLES COMPETITIONS

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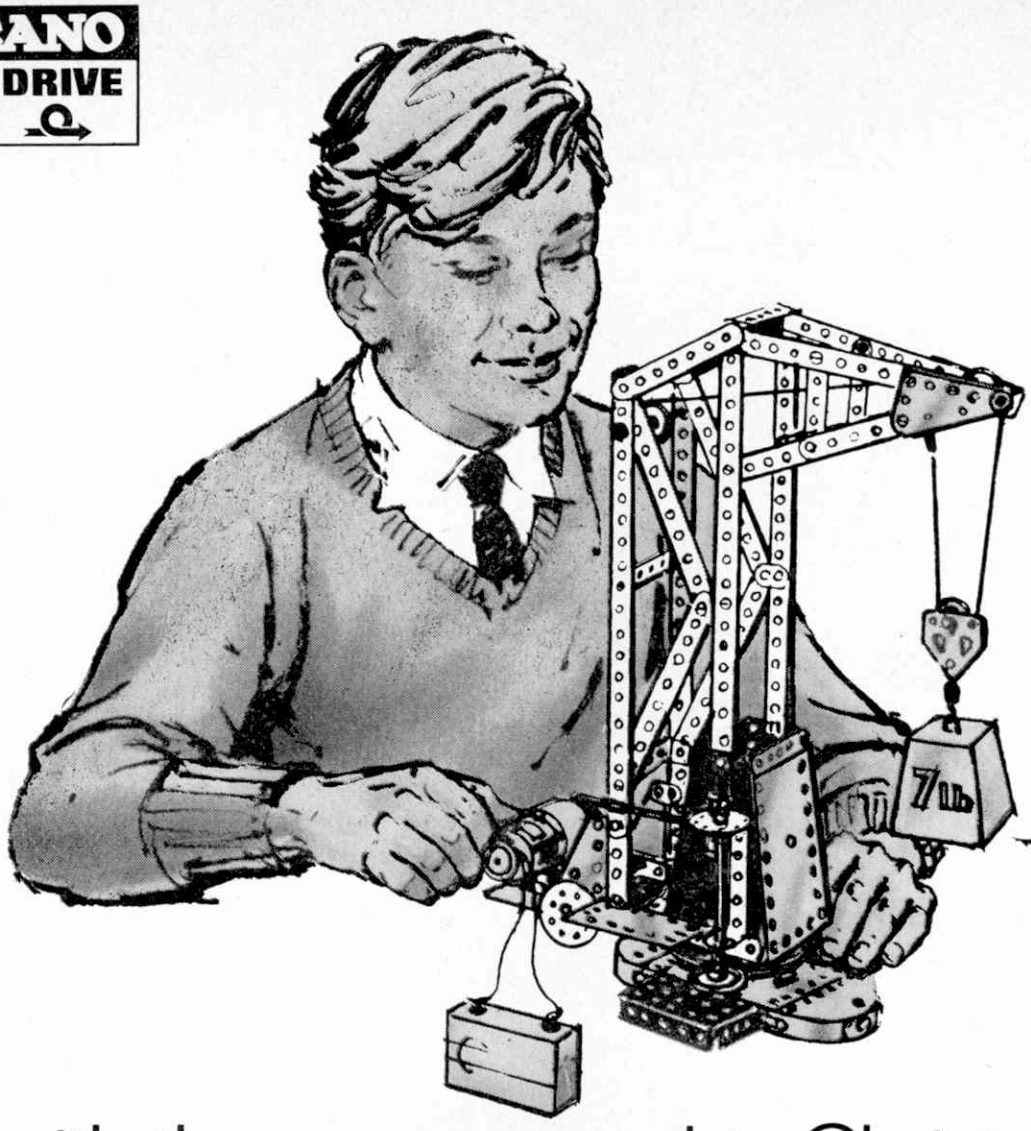

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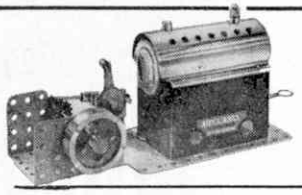

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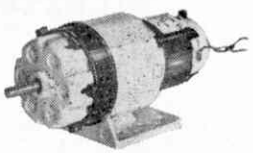

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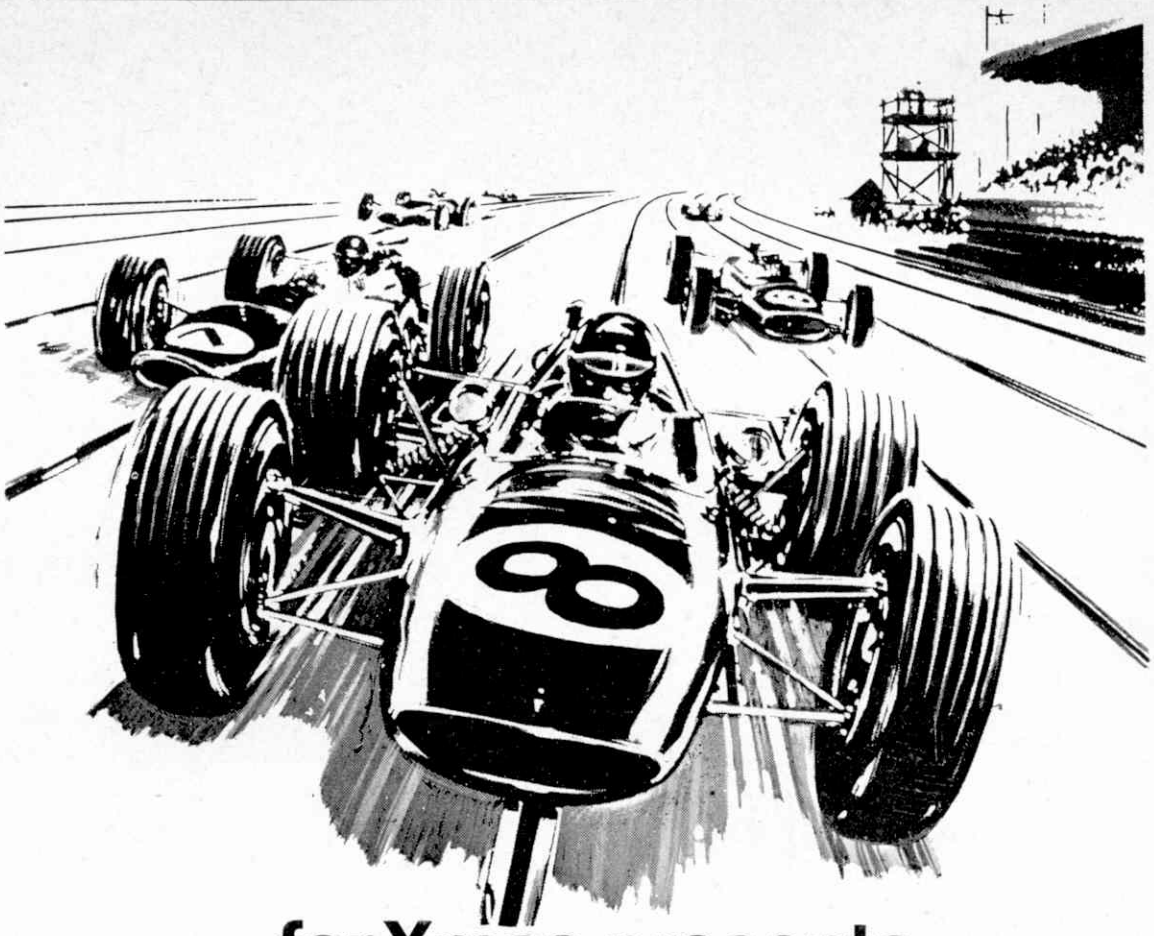

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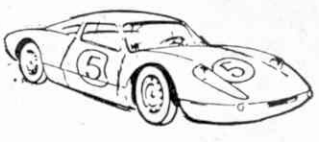

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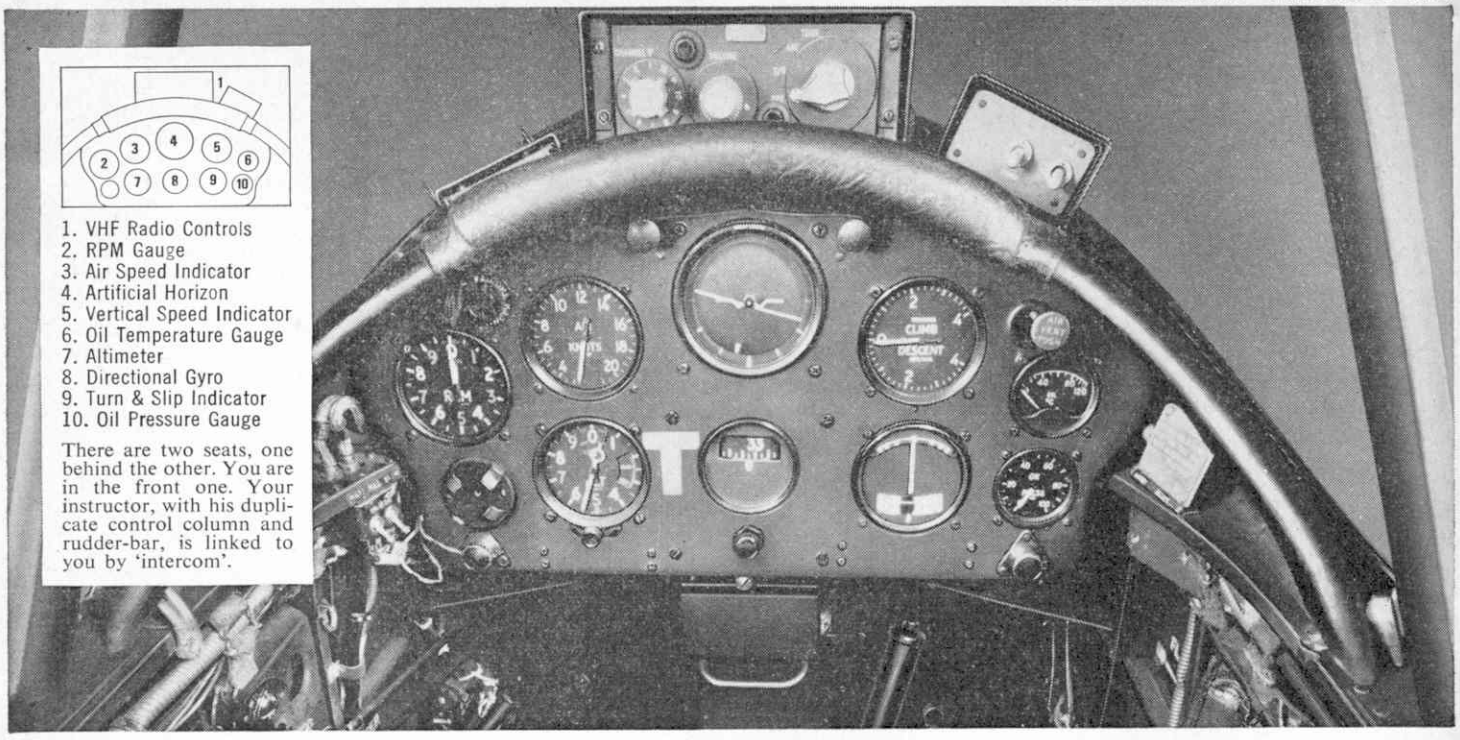

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Pilot's-eye-view of the Chipmunk

–initial flying trainer of the Royal Air Force

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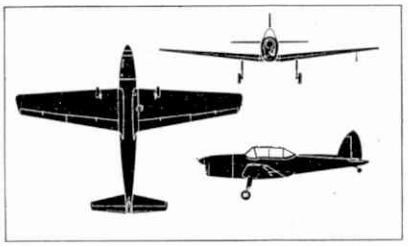

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THE MODEL WORLD AT YOUR FINGERTIPS

MECCANO MAGAZINE

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JANUARY 1967 VOLUME 52 No. 1

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ON THE COVER: The big Air France Boeing 707 waits patiently on the cold winter tarmac as vital pre-flight checks are carried out before another Trans-Atlantic flight.

EVERY January issue is a particularly exciting one for a magazine editor for with this number, the year's programme begins. Provisional plans are already drafted for nearly all our 1967 contents and now comes the fascinating business of seeing them through their various preliminary stages, until the day they finally go to press. Things never go as smoothly as that of course; despite all the careful preparation, things inevitably go wrong! Perhaps its this element of uncertainty that makes my job so fascinating, and there's a real feeling of satisfaction when, difficulties overcome, we put another number 'to bed'. We've lots of exciting things in store for you this year to ensure that Meccano Magazine maintains its position of the 'finest hobby magazine on the bookstall'—those are not *our* words incidentally they repeatedly appear in *your* letters! Make no mistake, they are greatly appreciated by all the editorial staff.

Up until two years ago, an index was an annual Meccano Magazine feature. It used to be printed in every December issue and its omission was particularly regretted by those of you who faithfully preserve, and often bind, your magazines. I know only too well how infuriating the absence of an index can be, trying to trace some particular feature which obstinately remains hidden, despite hours of patient thumbing through dozens of past issues. Now this state of affairs could not be allowed to continue but on the other hand, a reasonably comprehensive index would need two or three valuable magazine pages, and although many would consider the space well utilised, nevertheless a large proportion of our readership who do not preserve their magazine would rather have an editorial feature instead!

So here's our solution—the index for 1966 is being printed as a separate item, and every subscriber will automatically get one, delivered free with next month's issue. Those of you who get your magazines through a newsagent, may obtain an index by sending us a stamped and addressed envelope, and every purchaser of a Meccano Magazine 'Easibinder' (10s. 6d including postage) will receive our index free with his binder—while our stocks last!

Even though the cold weather is now well and truly with us, it is nice to think ahead a little and plan our outdoor activities for the warmer days to come. You can do something practical now to prepare for that scorching summer that's just around the corner, by starting right away with the construction of 'Dolphin 16'—the subject of our January plan. This is a real scale model designed to a scale of 1 in. to 1 ft. (or one twelfth full size) and you can power it with an inboard or outboard motor—or *two* outboards if you want a thrilling wave-hopping performance!

Our recent readership survey in which so many of you participated, yielded some interesting results and in the coming months it will be my endeavour to arrange the magazine contents in accordance with your expressed preferences. There will be no dramatic changes, as most of you like most of what you're getting already, but there will be a few changes of emphasis.

However one new feature which nearly all of you seem to want is a series on 'wargaming and military vehicle modelling'. Next month it starts with a bang! It all sounds very sinister and threatening, however 'wargaming' is simply the new name given to the age-old pastime of playing soldiers—but with rules—and taking advantage of the huge variety of cheap and easily available plastic soldiery and hardware that is now available.

Next Month: The start of a new, regular feature on one of today's fastest-growing hobbies—'wargaming'. John Taylor writes about the Hawker Tempest, and there'll be plans and a plastic 'conversion' feature as well.

Fast Building, Fast running

Dolphin 16

Part 1: The Hull

Build it from this months free plan by Ron Warring

Build it as a powered inboard or outboard or as powered twin outboard. Part 2 will deal with finishing and painting the model. Part 3 will cover engine installation and fitting out.

THE Dolphin 16 is a very popular cabin cruiser made by Brooklands Aviation suitable for both inboard or outboard power. Our model is a faithful replica—1/12th actual size—and like the full size craft you can build it to take either an inboard or outboard motor —or twin outboards, if you like!

The plan sheet shows a side view and plan view of the complete model, with all necessary parts which have to be cut out to shape shown full size. These patterns should be traced off the plan and transferred to the appropriate size balsa for cutting out. Consult the MATERIAL LIST for a general cutting guide.

First thing you have to do is decide whether you want to build an inboard or an outboard powered model. This is because the hull is assembled around a keel member which has to be cut and 'strapped' to take a sterntube if you are going to use inboard power. Alternatively, you can prepare the keel for *inboard* power and blank off the stern tube hole with a piece of ¼ in. sq. balsa and then complete the model for *outboard* power. If you want to change over to inboard power later you have only got to remove the ¼ in. sq. from the keel to fit a sterntube. You might even want to try running the model on both an inboard and an outboard motor together!

The first part to cut and make is the keel. Transfer the pattern shown on Plan A to ¼ in. balsa sheet and cut out carefully. Lay over the side view on Plan A and mark the bulkhead positions and check that the notch lines up with bulkhead 4 position—Fig. 1.

For an *inboard* powered model further work is needed on the keel, as shown in Figs. 2 and 3. You can ignore this and proceed straight to the next step if you are building an outboard powered version.

For inboard power the stern tube has to be fitted through the keel. Mark the position on the top and bottom edge of the keel, as shown in Fig. 2. Join these points to give a line representing the angle of the sterntube. Draw a parallel line the distance away equal to the diameter of the sterntube you intend to use and then cut out the portion between the two lines.

Now assemble as shown in Fig. 3 with the stern tube in place and two straps cemented to the sides of the keel to hold the whole lot together. Pin together so that the assembly sets accurately, noting that the straps should come exactly between bulkhead 3 and bulkhead 4 positions. You can cement the stern tube in place permanently at this stage, but this is not recommended. Withdraw it before the cement sets. You can fit the sterntube finally when the hull is completed as this will make it easier to line up properly with the motor. It will also make assembly of the hull easier if the sterntube is not sticking out.

Cut four 14 in. lengths of soft ¼ in. sq. balsa sheet, noting that in the case of bulkhead 3 you will have to join two pieces of 3 in. wide sheet to get the necessary height—see cutting list. Note also that with the inboard

1 With a sheet of carbon paper between the plan and the balsa wood, the bulkhead patterns are easy to transfer by simply following the outline with a hard pencil. Use a ruler for the straight lines

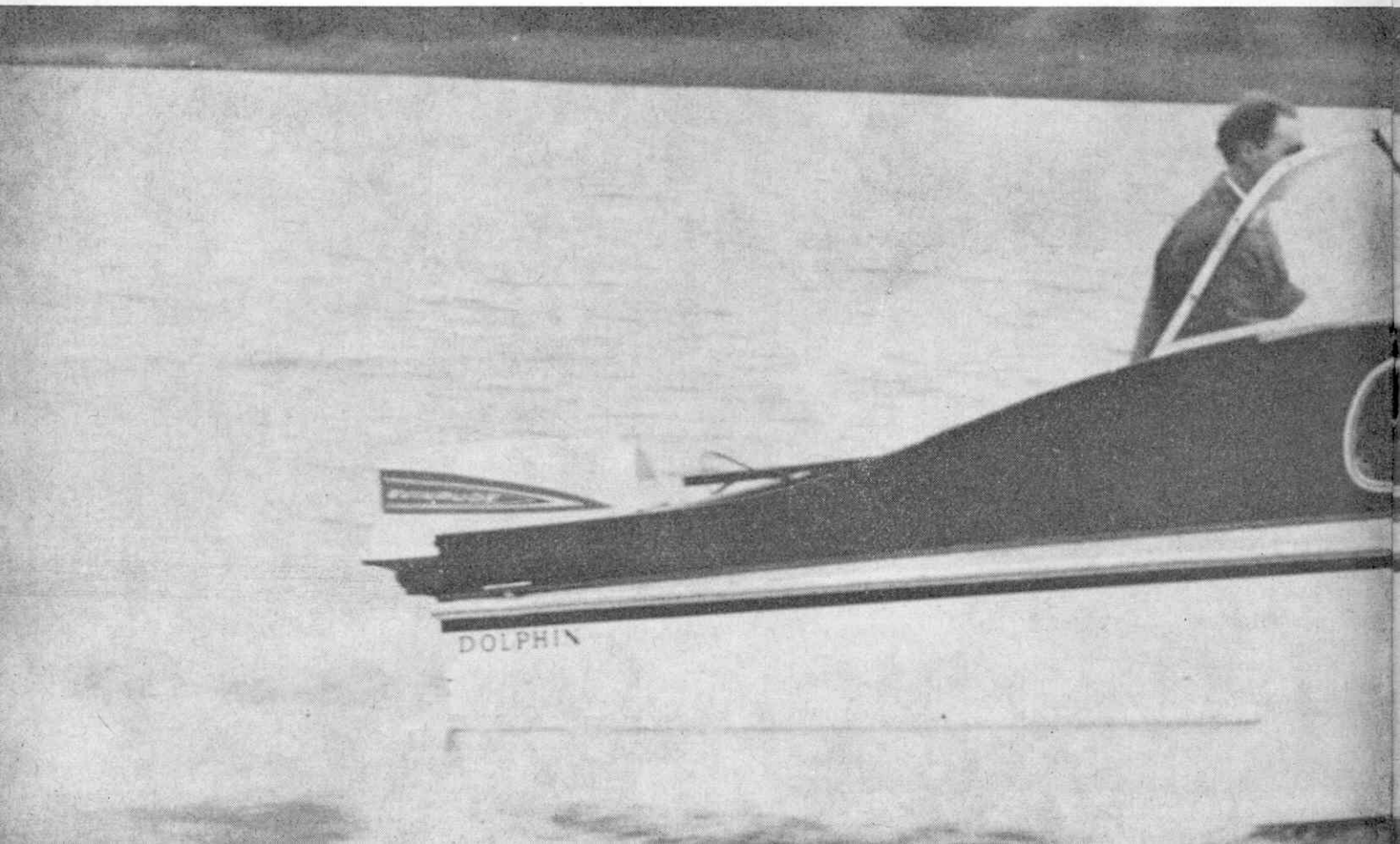
2 Cuts which run with the grain can easily be made with a sharp knife (turn to page 54 to find out how to get one just like ours absolutely free). Use a steel rule as a guide when cutting long 'straights'

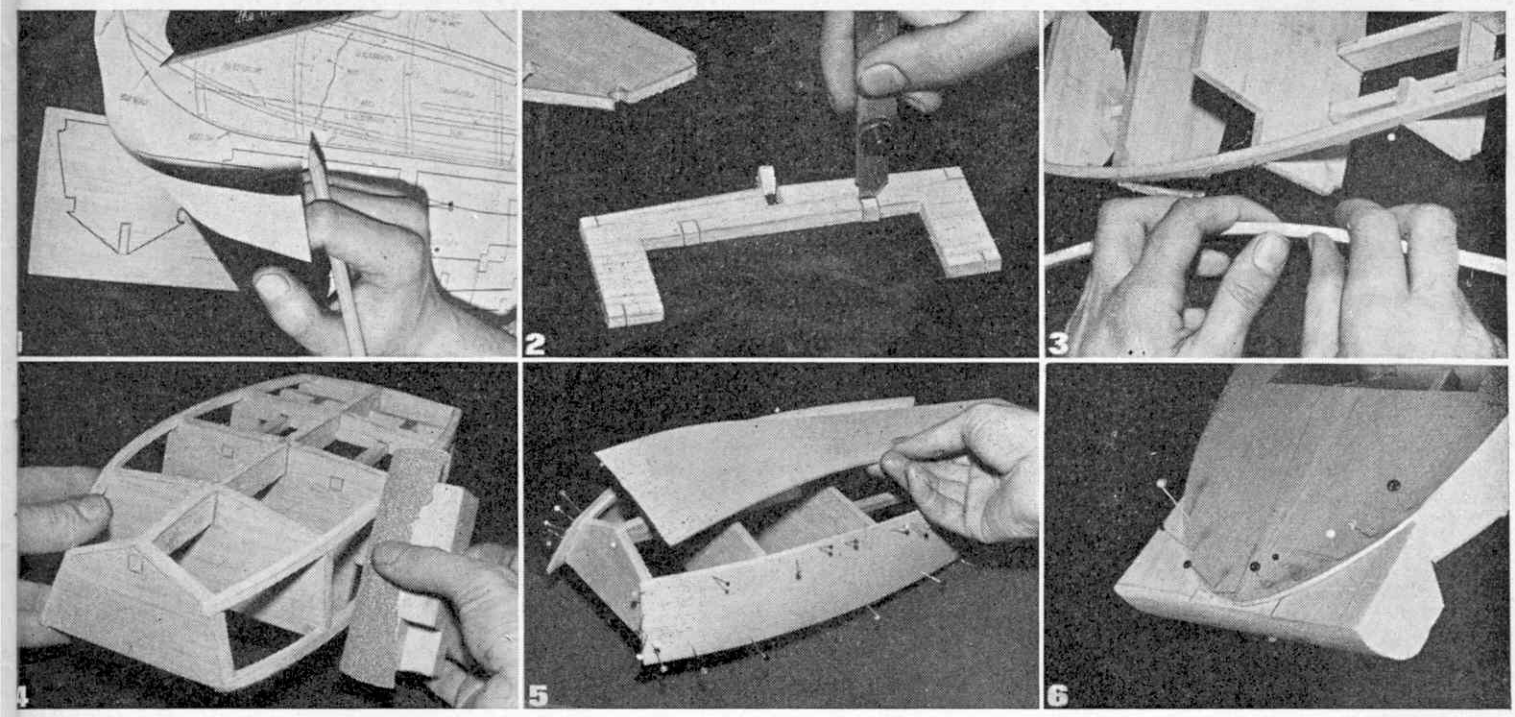
3 Pre-bend the soft ¼ in. square balsa stringers as shown. Select a pliable grade of balsa and if you cannot bend it without cracking it, hold it in the steam from a boiling kettle gently bending it at the same time

4 Use fairly coarse sandpaper wrapped round a block of balsa to shape the stringers and bulkheads in preparation for the outer skinning. The sandpaper block is the most useful 'tool' of all as an invaluable aid to good building

5 Boat hull skins are often sharply curved towards the bows, this curve is best steamed into the wood before attachment to the frame—try it—its easy!

6 The bow blocks are shaped to profile as shown and held in place with pins until the cement sets—it will take several hours on such a big area. The plans specify two bow blocks, although the photograph shows our model with three smaller blocks joined together to build up to the same overall size. Carve and sand them to shape when quite dry





powered model the transom does not have a cutout—see Plan A. These are then cemented in place on to the keel, as shown in Fig. 4, noting particularly the angle of the transom (5).

Cut four 14 in. lengths of soft $\frac{1}{4}$ in. sq. balsa and cement to the notches in the top and bottom edges of the bulkheads—Fig. 5. These form the gunwale and chine stringers and need holding in place with pins until the cement has set. Do not push any of the bulkheads out of line when assembling these stringers.

Now cut and fit bulkhead 6 and add the two $\frac{1}{4}$ in. sq. beams which support the cockpit floor—Fig. 6.

The next stage is to fair off the sides of the framework with sandpaper wrapped around a flat block so that the side panels will fit snugly. The side panels are 14 in. by 3 in. by $\frac{3}{32}$ in. sheet balsa and you can check the amount of fairing off required by offering them up in place. When satisfied with the fit, cement in place and hold with pins until set. Be generous with the cement at this stage. If you have difficulty in bending the panels, the job may be simplified by pre-bending them in the steam from a boiling kettle.

When set, trim off surplus material from the side panels with a knife and fair in the bottom of the hull ready to receive the bottom panels. These are again 14 in. by 3 in. by $\frac{3}{32}$ in., fitted as shown in Fig. 8. Again hold with pins until set and then trim off surplus material. Note that when fitting up the bottom panels

the bottom edge which rests on the keel will have to be trimmed to shape. This is done by offering up in place, marking the cut required and then trying again. It may need several 'trial and error' attempts before you are satisfied with the fit.

The top should not need a great deal of fairing off, but sandpaper down as necessary until the edges of the gunwale stringers blend with the tops of the bulkheads. The top of the transom will have to be chamfered off slightly to compensate for the angle at which it is positioned.

The deck is cut from three panels of $\frac{3}{32}$ in. sheet balsa cemented together as shown on Plan A. Cut out slightly oversize, then cement and pin in position as shown in Fig. 9. When set, trim off flush with the sides.

The next step is to cut the sides from $\frac{3}{16}$ in. sheet, tracing the shape required off Plan A side view. Check that the bottom edge of these pieces exactly match the curve of your deck. If not, adjust as necessary with a sandpaper block. Parts 7 and 8 are cut from $\frac{1}{4}$ in. sheet balsa (Plan B). Cement the two cabin sides to the deck and bulkhead 3, as shown in Fig. 10, and complete the front end with parts 7 and 8 cemented in position.

Cut a panel $4\frac{1}{2}$ in. long by $4\frac{5}{8}$ in. wide from $\frac{1}{4}$ in. balsa sheet for the cabin roof and cement in place—Fig. 11. When set, round off the edges and front with sandpaper.

Cut the two square bow blocks from $2\frac{1}{2}$ in. sq. balsa and cement together. Trace on the profile shape from Plan A and cut the blocks to this shape. Check that this matches the curve of the deck by offering up in place—Fig. 12. When satisfied with the fit, cement the bow blocks in position and leave overnight to set. You can then carve and sand the bow blocks down to final shape, as shown in Fig. 13. If you are in a hurry, fit the bow blocks with impact adhesive—then you can start carving more or less right away!

Very little more needs to be done to complete the hull. Cut out the cockpit floor from $\frac{3}{32}$ in. sheet and cement in place. Cut and fit the well bottom and the two well end pieces to blank off the space between bulkhead 6 and the transom—Fig. 14. Finally, cement the three strakes to the sides. The top strake covers the deck/side joint; and the bottom (chine) strake the bottom/side joint. Use soft balsa which will bend easily to the shape required. The rubbing strake can be of hard $\frac{1}{8}$ in. sq. balsa, or obeche. If the hull is to be tissue or nylon covered it is best to add this strake after covering.

Finishing and painting the model will be dealt with in the next article.

MATERIAL AND CUTTING LIST

Bulkheads 1, 2, 3, 4, 5, 6, parts 7 and 8 cabin roof keel ..3 sheets 36 in. by 3 in. by $\frac{1}{4}$ in. balsa (note join one $6\frac{1}{2}$ in. length and one $4\frac{1}{2}$ in. length for bulkhead 3)

Cabin sides.....18 in. by 3 in. by $\frac{3}{16}$ balsa sheet

Deck.....36 in. by 2 in. by $\frac{3}{32}$ in.

Sides, bottoms, cabin floor.....2 sheets 36 in. by 3 in. by $\frac{3}{32}$ in. (one $5\frac{1}{2}$ in. length for deck)

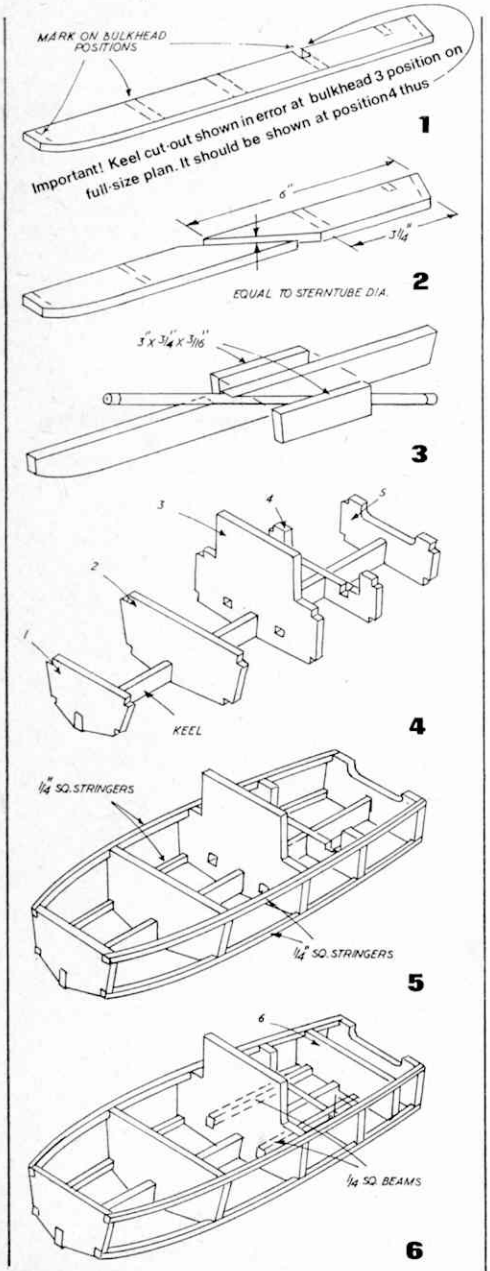
Stringers, beams.....2 lengths 36 in. by $\frac{1}{4}$ in. sq. balsa

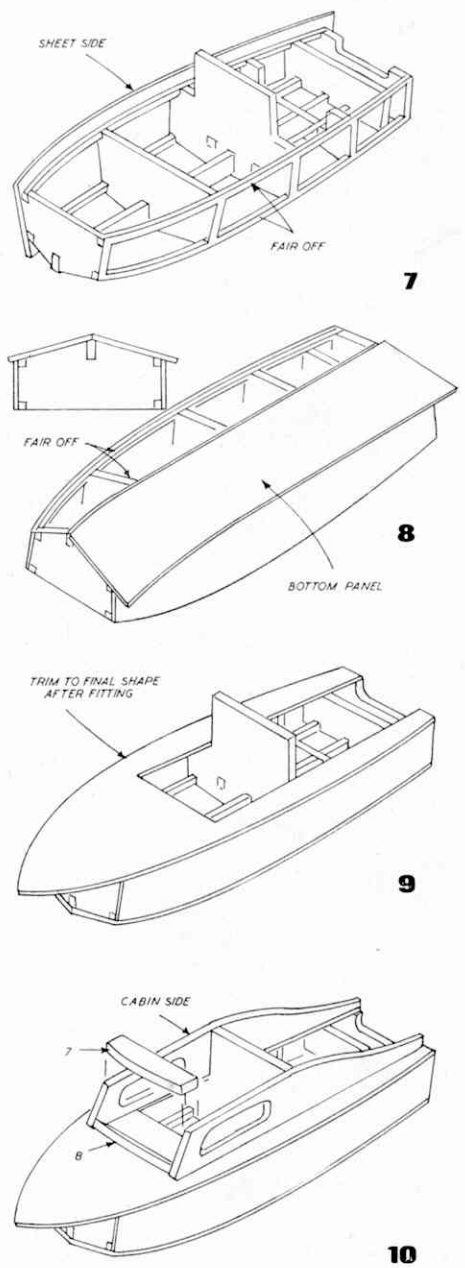
Bow block.....5 in. by $2\frac{1}{2}$ in. sq. balsa block

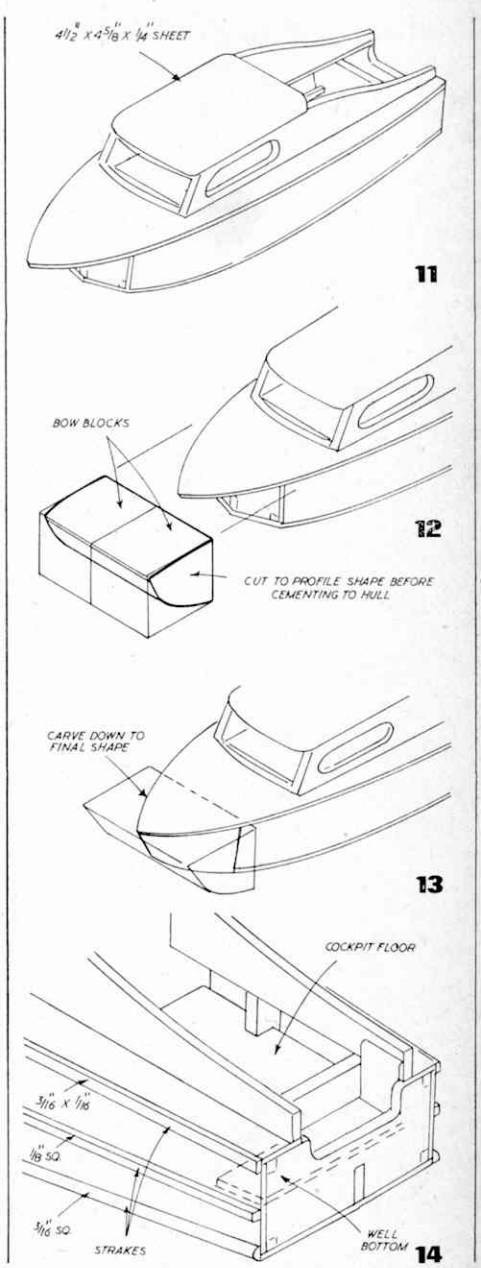
Gunwale strakes..... 36 in. by $\frac{3}{16}$ in. by $\frac{1}{16}$ in.

Chine strakes..... 36 in. by $\frac{3}{16}$ in. sq. balsa

Rubbers.....13 in. by $\frac{1}{8}$ in. sq. balsa or obeche







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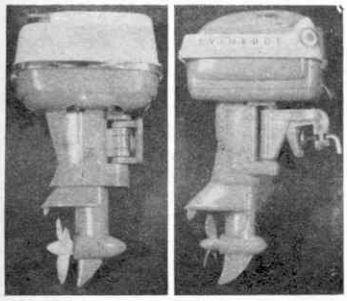


JOHNSON (left) . . . 34/11

A real SCALE MODEL outboard, powerful and dependable with 4½ volt electric motor. Motor is 4½" high and develops a full 2½ ounces thrust. Screw on bracket. An ideal power unit for the outboard version of the Meccano DOLPHIN 16 model.

EVINRUDE (right) . . 36/-

Another SCALE OUTBOARD with the same powerful motor developing 2½ ounces thrust. The Evinrude differs mainly in styling and clamp-on mount. Both have on-off-reverse switch.

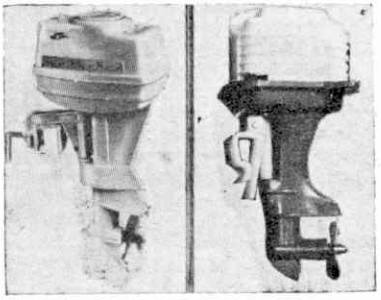
NEPTUN (left) . . . 32/6

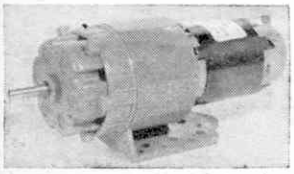
This superb outboard is 5½" high, has 240 degree pivot steering and is fitted with on-off-reverse switch. Clamp mounting bracket.

OB-300 (right) . . 10/6

This inexpensive model is 3¼" high with clip-on transom mount. At the price you can afford to fit twins!

Remember—outboard motors are very simple to install, but generally draw higher current than inboard motors. Use small accumulators for power rather than dry batteries.





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★ **"RMA" Lightweight RUDDER ASSEMBLY 2/9**

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1 LARGE JACKSTAFF (P76)
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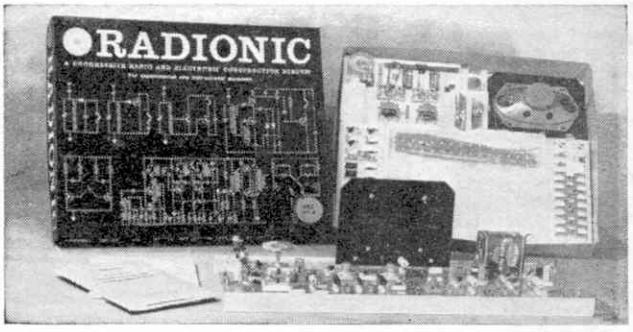

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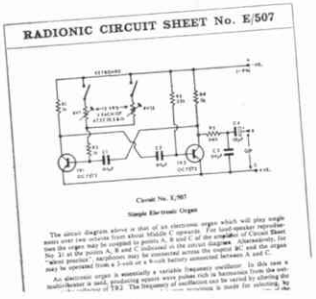

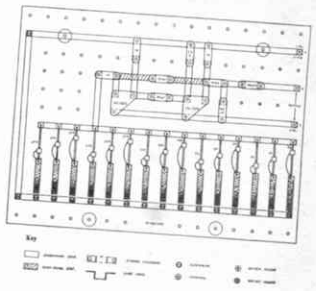

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THE *LAAL RATTY*

by MIKE RICKETT

OF the many struggling minor railways to emerge as a result of the widespread search for mineral ores during the last century, one was a seven mile long line serving the then promising haematite mines at the village of Boot from the port of Ravenglass on the Furness coast.

Among the hills and valleys of beautiful lakeland, Ravenglass, the headquarters of the new railway, was of some significance as a port, although it rapidly declined during the nineteenth century, on the arrival of the main line railways to the area. Ravenglass was also the site, at one time, of a Roman fort which was situated by the estuary. Outside the area of this fort, of which now little remains, is a Roman bath house, one of the tallest ruins in Britain.

It was in this picturesque setting that the promoters of the Whitehaven Mining Company decided to build a railway to transport the haematite ore. It was built to the gauge of three feet, seven miles in length and was opened for mineral traffic in 1875.

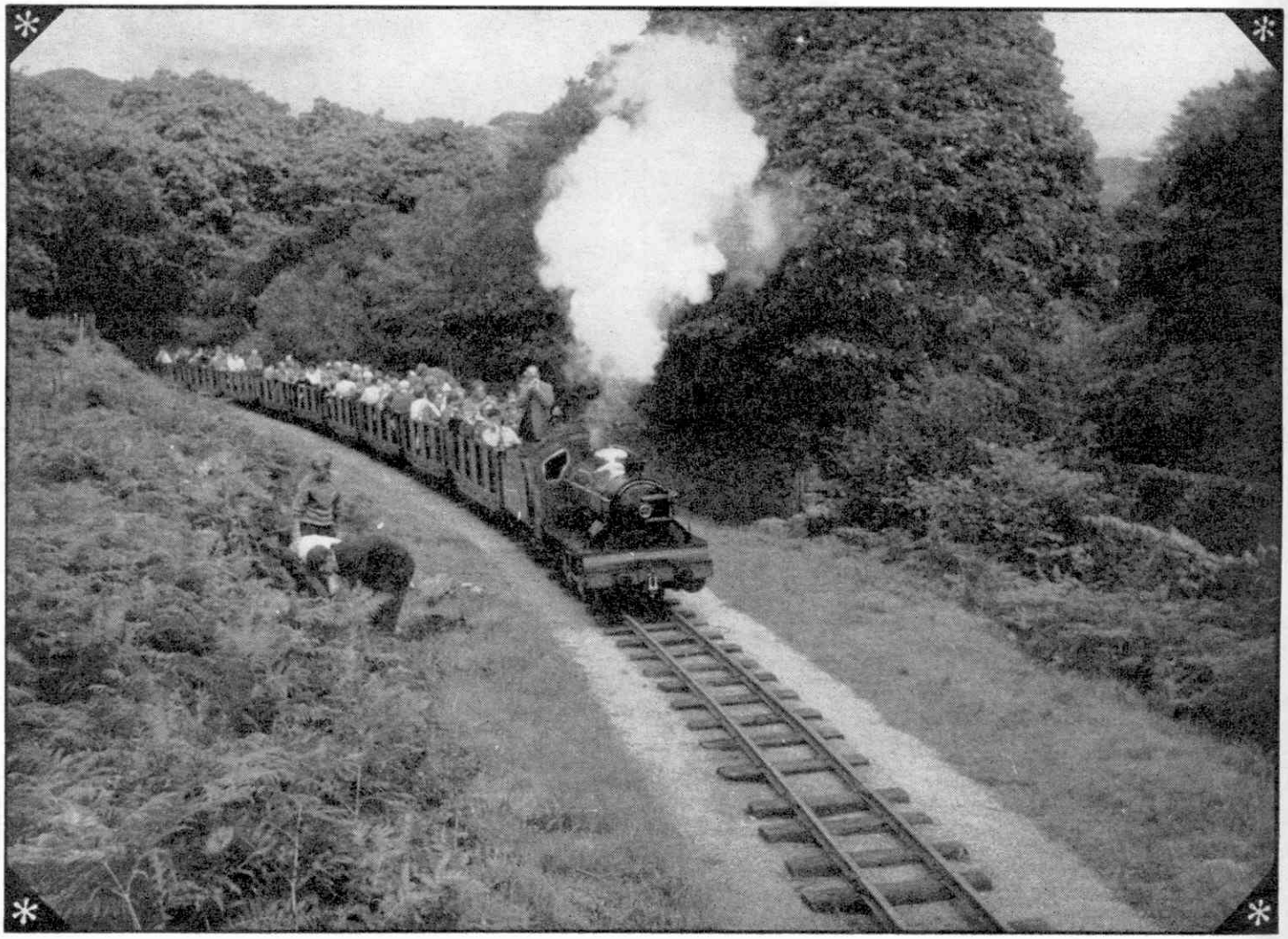
'Owd Ratty' (or 'Laal Ratty') in local language, was then operated on the 'one engine in steam' principle and when, in 1876, a passenger service was introduced, it had only four coaches (all four wheel), one of which was described as a 'Pullman' for first-class passengers. Between 1877-1878 both first and third accommodation was offered and the first train of the day also carried parliamentary fares. Built with formidable gradients, the route takes the railway through magnificent scenery and from the terminus at Ravenglass, the administrative centre of the railway, the train passes over a bridge which at one time carried standard gauge track to the stone crushing plant at Murthwaite. After crossing over this, the line falls sharply on a gradient of 1 in 40 with, on the left, the estuary of the River Mite. It then passes under the main coast road and travels past Muncaster Mill, where there are the remains of a platform and shelter. To the right can be seen a water wheel used, until recently, for grinding corn and cattle feed. A little further on is Mill Wood where the gradient steepens once again to 1:42 as the wood itself is approached and where, because the rails are seldom dry, sand often has to be used. This is one of the more difficult parts of the journey and it was quite usual, in earlier days, for passengers to assist by pushing the train! Beyond is a cluster of farms and houses known as Miteside where waiting passengers had only an upturned boat to shelter them.

For the following two miles, the line runs alongside Muncaster Fell (757 ft.) climbing continuously. Straight ahead is the great peak of Scafell which, at 3,162 ft., is England's second highest mountain. Scafell pike, only 48 ft. higher, is hidden behind it. The remains of the crushing plant at Murthwaite, 2·5 miles from Ravenglass, where stone from Beckfoot Quarry was ground and sorted into various sizes, is about a mile further along the line. London's Waterloo Bridge is built of concrete containing this granite. Murthwaite was also once the home of the railway workshops, now at Ravenglass, so that the only activity of any sort is a concrete block making firm which, incidentally, provides goods traffic for the railway.

After a short run up a 1:47 gradient, the train reaches Walk Mill summit, named after an old fulling mill situated in the trees down by the River Mite. The next point of interest is Irton Road Station, which remains substantially as it was in 1876 and which is located at the western end of Eskdale Green Village. Irton Road is the only spot where two passenger trains may pass and it is for that reason an important centre in the control of traffic on the line.

After Irton Road, the line drops twenty feet as it crosses the valley of the River Esk to Eskdale Green, the next station along the line. Situated at the eastern end of the village, this station serves the Outward Bound Mountain School and is also the centre of volunteer activity because of the new platform that is being built. From here, the line passes under the main road and then up the stiff gradient of 1:36 past Fisherground Corner, to the water tank, fed by a local stream. It then twists and turns its way past Spout House Farm to the area known as Holling Head, recently the scene of extensive earthworks. Until a short time ago a severe reverse curve was situated here which was only eliminated by the building of a cutting requiring the removal of 3,000 tons of earth and rock and the laying of 700 feet of new track, a task of some magni-

Under a banner of white steam, 'River Irt' passes the site of Beckfoot Halt with a heavily loaded down train. Opposite page. Top left: 'River Irt' waits in the sun, seen from the footbridge at Ravenglass. Top right



tude for a miniature railway.

From Gilbert's cutting, as this is now known, the railway runs along a ledge above the valley road with the River Esk visible just beyond. Beckfoot quarry, which provided the life blood of the railway for so many years can be seen just beyond the road. Most trains can be stopped by request at Beckfoot, although it is mainly used as a halt for Ghyll House, a long established C.H.A. centre.

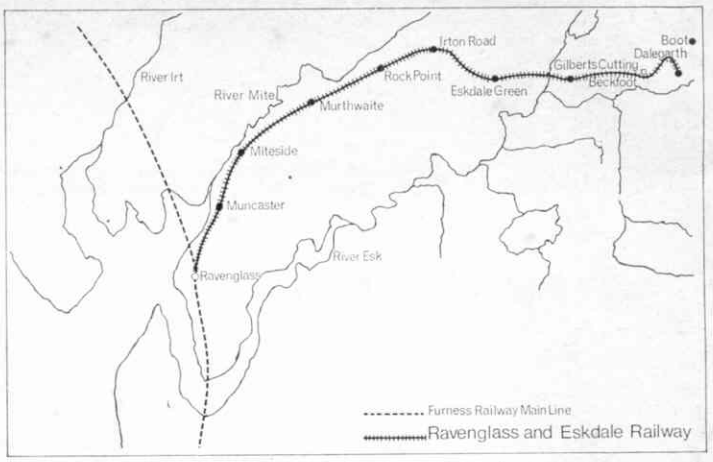
Dalegarth, the present terminus of the line, is situated on the former Ghyll Foss branch, originally built to serve mines on the south side of the valley. The remainder of the branch was abandoned in 1877 when the Mining Company failed, which was the cause of the railway being placed in the hands of the receiver. The branch to Boot where there was a run-round loop and sidings leading to a loading ramp, is also now derelict.

Although the railway is now recognised as a major tourist attraction in the district, the line was not originally built for this purpose. As a 3 ft. gauge railway, its life was destined to be quite short and indeed only two years after it opened, the Mining Company failed and the railway was placed in the hands of a receiver and manager. It continued to struggle on however, and an approach was made to the Furness Railway Company in 1908 to take over the line. This, unfortunately, met with no success and the line remained closed to passenger traffic until its ultimate closure in 1912. The mines at Boot worked only spasmodically from 1908 and did not provide sufficient traffic. By 1915, the 3 ft. gauge track had largely rotted away and become overgrown, and rolling stock was in need of repair and replacement.

Mr. W. J. Bassett-Lowke, the world famous model maker, who had formed the company of Narrow Gauge Railways Limited, then visited the line with Mr. R. P. Mitchell and decided to re-gauge the line to 15 inches. Clearance and conversion started in June and only seven weeks later passengers were being carried as far as Muncaster Mill by the scale model locomotive 'Sans Pareil'. From the time it was opened right through to Boot, the railway had a place in 'Bradshaw' and since the opening of the line, mails were also handled until the contract expired in 1925, when the Post Office began running their own motor vans.

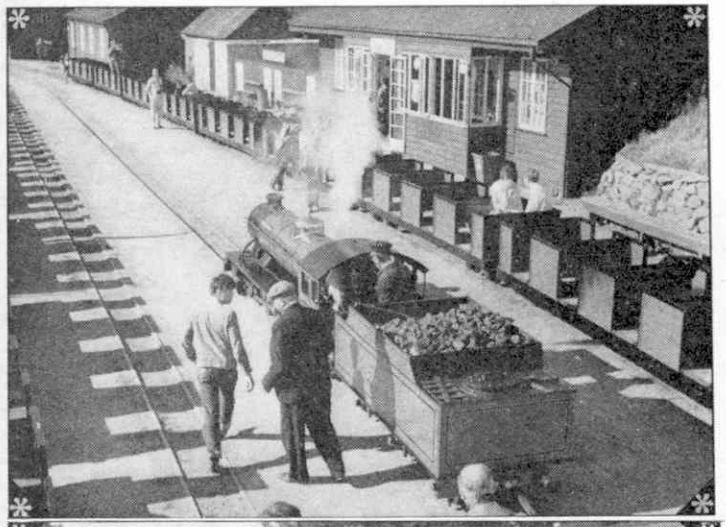
An important development was the opening of a red granite quarry just short of Beckfoot Station in 1922 which was a constant source of revenue. A crushing plant for this industry was also built between Irton Road and Muncaster Mill. Until 1922 coal, coke cattle food,and other general merchandise was carried up the valley, and pit props and sawn timber carried down from Irton Road to Ravenglass. This lasted until the closure of the quarries in 1953 which left 'Ratty' to rely solely on summer passenger traffic. Only five years after its closure, in 1958, the Keswick Granite Company advertised the railway for sale as a going concern. £14,000 was needed and an appeal for funds was launched using all possible publicity. On the very eve of the auction, nowhere near enough money had been raised and the situation was only saved by Mr. Colin Gilbert, who very generously undertook to provide the balance.

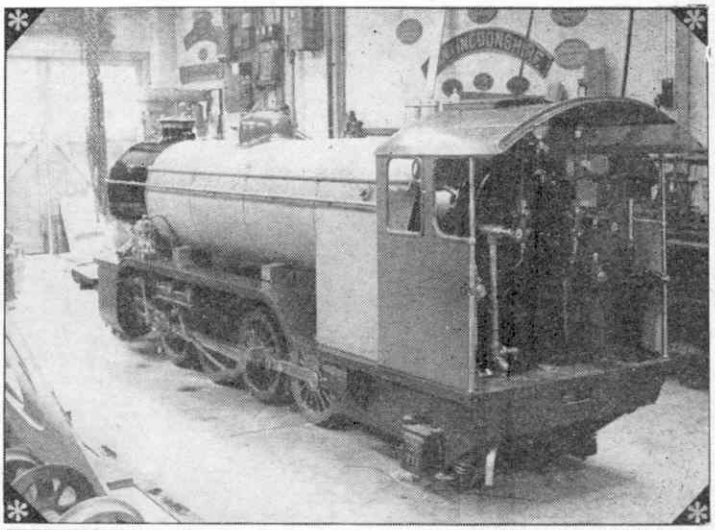
Since then the railway has once again made a fresh start. The Railway Company operate the railway, while the Preservation Society support it in every way they can. Their greatest effort, so far, is the raising of sufficient funds to have specially built a new steam engine for the line. Named 'River Mite', this is at the moment building at York.

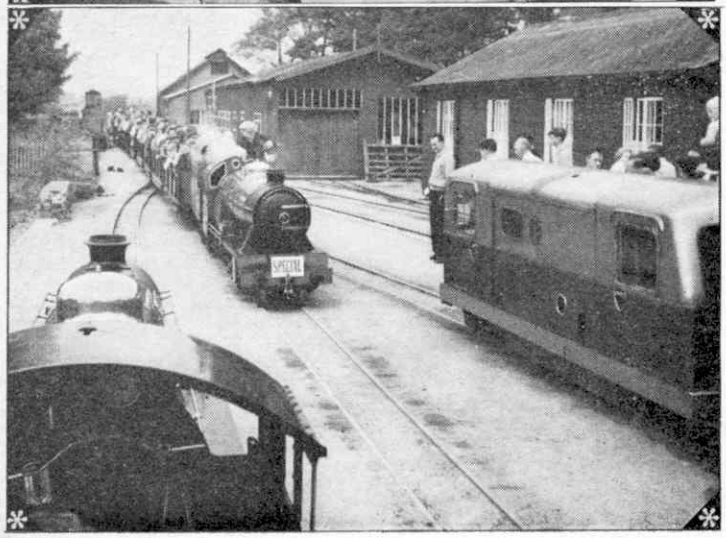


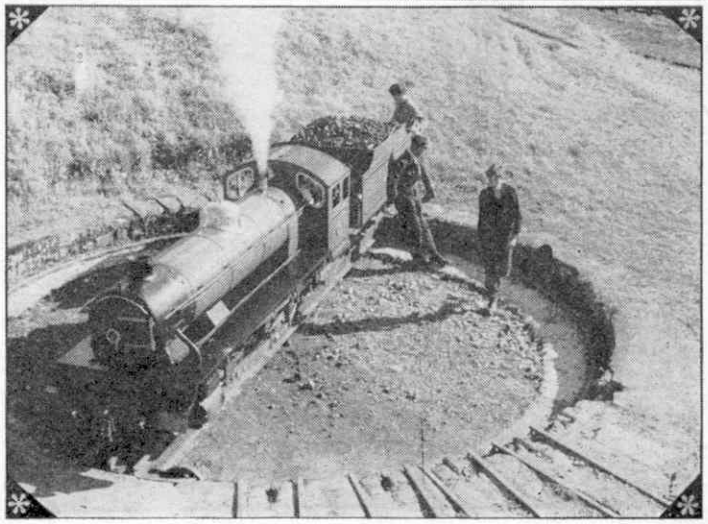
The route of the Ravenglass and Eskdale Railway from the port of Ravenglass on the Furness coast to the present terminus of Dalegarth. The section of the line to Boot is now abandoned

ght 'River Mite' nears completion at Clarkson's Works at York. Bottom left: 'River Esk' arrives with a special, whilst 'River Irt' and 'Royal Anchor' await the road. Bottom right: 'River Irt' on the turntable at Ravenglass









FIRE &

ONE wet and windy night, back in the middle years of the eighteenth century, a young lad sat by the fire of his parents' cottage at Greenock, on the West coast of Scotland. Lulled by the warmth of the fire, he lazily watched the kettle boiling on the hearth. As the kettle came to the boil, he noticed that the lid rose and fell as the steam inside tried to escape into the atmosphere, and as he watched, an idea began to formulate in his mind.

RESEARCH

That young man's name, as all of you will know, was James Watt, who was responsible, perhaps more than any other single person, for the beginnings of the age of steam. The legend of the boiling kettle is a little fanciful, and sometimes gives the impression that Watt invented steam power, which is quite untrue. A steam driven mechanism was built by a Greek called Hero some two thousand years before James Watt was born, and we know that the ancient Egyptians employed the power of steam for opening and closing temple doors by remote control. However, during his lifetime, Watt's patient research and inventive mind made the steam engine a practical machine, and by the beginning of the nineteenth century Watt engines could be found all over the country, pumping water out of pit shafts and driving the machinery in countless mills and factories. Ships also were harnessed to the new power, and steam operated railways began to cover the country, providing swifter and more comfortable transport than had ever been known before. A boiling kettle had heralded a new mechanical age, and the biggest single civilising influence the world has ever known.

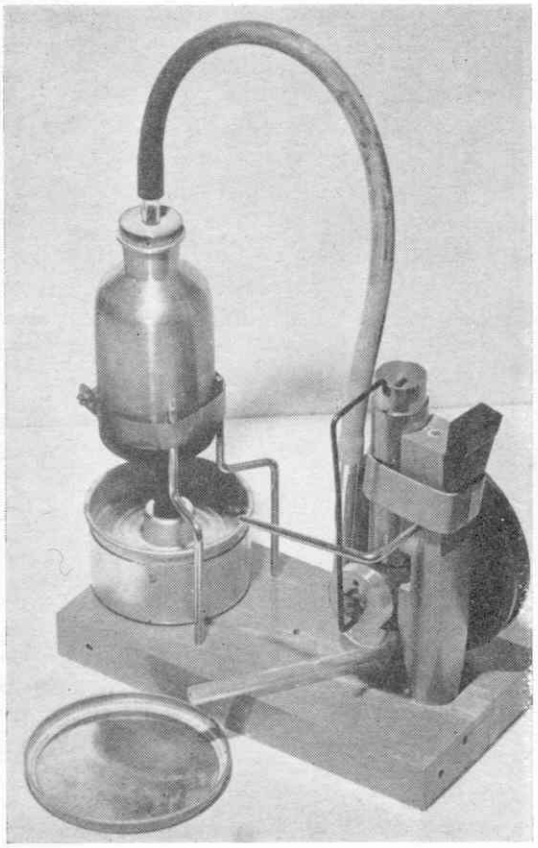
Today steam power is giving way to very much more efficient methods of propulsion in the shape of diesel engines and electric motors, but it seems unlikely that either of these forms of power will attract the enthusiastic following that the steam engine, in all its many guises, has enjoyed for two hundred years. Everyone loves a steamer! Perhaps it is the smell that fascinates, or the sight of complicated valve gear in motion, or the deep exhaust of a big engine accompanied by the 'thump, thump, thump' of a flywheel—but whatever the reason, the fascination is always there. Steam engines of any kind are all too rarely seen these days, but not to worry, we can always build our own.

'Build our own!' I can almost hear your incredulous replies to such a seemingly impossible statement. 'Mother would never stand for a Traction Engine in the garden—think of the smuts on the washing!' But you *can* build a steam engine, if you are content with a small one, and it really works. In the article 'Table Top Science' which appeared in the August issue of Meccano Magazine, we described two Tri-ang Science sets, 'The Young Electrician' and the 'Young Technician'. Now, a much more advanced set is available called the "Senior Technician' which deals with no fewer than 170 experiments in elementary physics, including building a steam engine!

BOILER

The construction of the steam engine can be seen quite clearly in the photograph. *All* the parts

A



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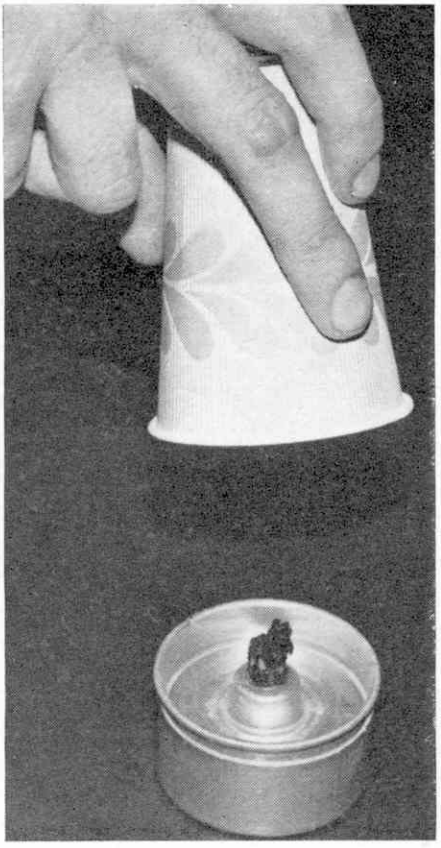

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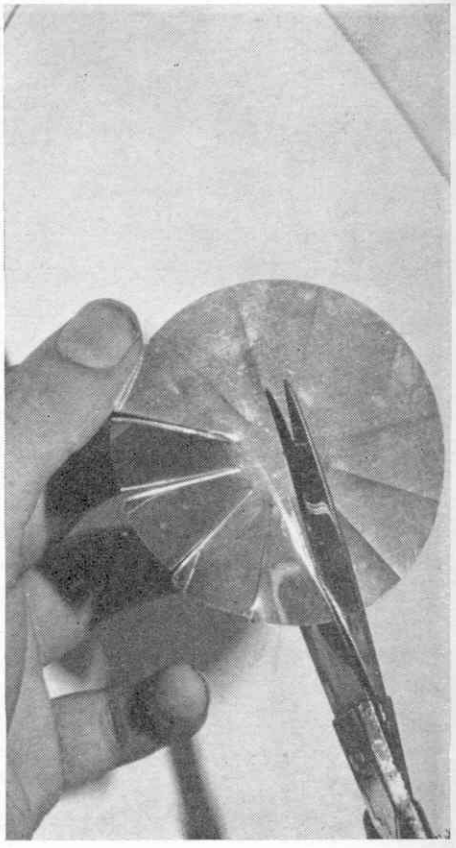


WATER

required are included in the set, and, just like the real thing, the engine consists of three basic units: fire, boiler, and cylinder and flywheel assembly. All these are constructed upon a wooden base, and everything either pushes or screws together—no drilling, hammering, sticking or soldering needed. The 'boiler' is an aluminium flask, held about three inches above the wooden base on steel rods. Underneath the flask, a methylated spirits burner acts as the 'fire'. The cork in the top of the flask has a hole in it, as can be seen in the picture, and through this hole the steam is led to the cylinder by means of a short glass tube and a long length of rubber tube. The cylinder assembly is attached to a wooden peg which is firmly fixed into a hole in the baseboard. The cylinder itself is of brass tube, the piston, which slides quite easily up and down the cylinder, is of aluminium. A rubber bung, which can just be seen in the photograph, closes the bottom end of the cylinder. This bung has three holes in it—two vertical ones, which are steam passages to allow steam to pass into and out of the cylinder, and one horizontal one which accommodates the shaft bearing and the shaft which carries the flywheel and driving wheel of the engine. A bent wire connecting rod transmits power from the piston to the small driving wheel. The shaft and its bearing are really the 'brains' of the whole machine. As steam is led into the cylinder from the bottom it must pass through one of the vertical holes in the rubber bung. But the shaft and its bearing are carried in the horizontal hole which crosses the vertical holes, so the steam only has a free passage to the cylinder when holes in the bearing sleeve and shaft coincide. The other vertical hole in the bung acts as the exhaust. All this sounds very complicated in print, but in practice it works very well—the shaft turning in its bearing sleeve really acts as a sort of revolving tap, admitting steam to the bottom of the cylinder to push the piston up, and when the piston has reached the top of its 'stroke', releasing the steam through another hole into the open air, as exhaust.

Before we raise steam and set the engine in operation it is essential to remember that operating a model like this is, quite literally, 'playing with fire'. Come to some arrangement with the 'household authorities' as to the best and safest place to use it; a concrete or linoleum floor is probably best, and keep well away from curtains and table-cloths and the like—in other words, be very, very careful! It is a good idea to have a paper cup or jam jar close at hand, so that the spirit burner can be extinguished at a moment's notice, by dropping the cup over it and stifling the flame.

Right then, full steam ahead! First, the burner needs filling with methylated spirits (obtainable quite cheaply from a chemist). Not too full, though—about a quarter of an inch is about right. When replacing the top of the burner, don't push it into the bottom part too hard, because if the methylated spirits container is completely air-tight, the spirit will syphon up the wick, and flood the top of the burner, catching fire on the way! So make sure the two halves of the burner are a loose fit. Fill the flask with about an inch and a half of water, replace the cork and light the wick. After only a couple of minutes or so, the engine will begin to come 'alive', and small hissing and bubbling sounds will be heard. Give the flywheel a push by hand, and the engine will start and should run very sweetly indeed for several minutes on one filling of fuel and water. It makes a fascinating sight, with its piston rising and falling, the flywheel turning, and the steam puffing from the exhaust tube. As can be seen in the picture, we placed a tin lid under the exhaust tube to collect the drops of water which form in the cylinder. The engine is not, of course, very powerful, and it is doubtful if it could be used to drive any very complicated machinery, but such is the fascination of seeing it running that it is well worth building for its own sake.

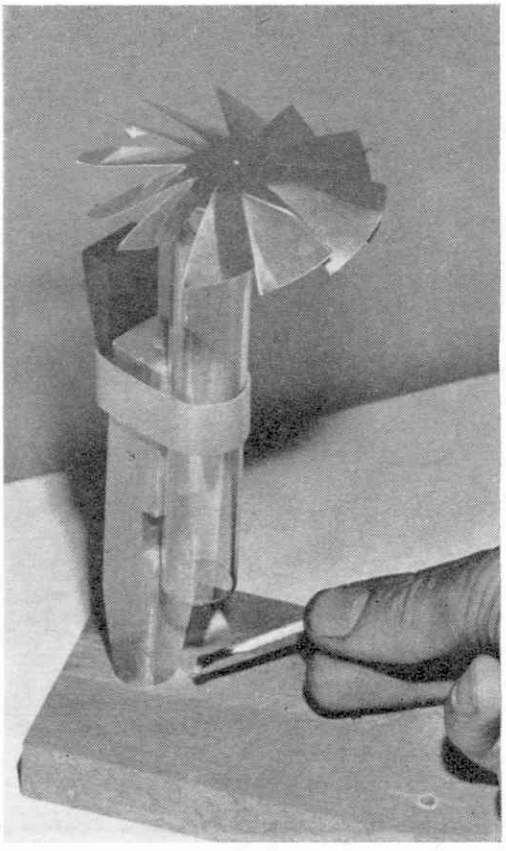
Another form of power used extensively in days gone by was wind. An ingenious wind wheel can also be constructed from the set. One of our pictures shows the vanes being cut in the tin disc provided. Just cut along the embossed lines with an old pair of scissors and the vanes themselves will automatically assume the correct 'set' or angle. The disc is set on the top of a sewing needle which is supported in a vertical position by a rubber band around the end of the glass tube. When a match is held under the tube, the rising air currents will turn the vane-wheel at quite a fast rate.

COOLING

Another of our pictures shows a contraption which looks very like the steam engine, but it is in fact a miniature central heating system! Here, the aluminium flask represents the boiler, the wide glass tube on the left represents the radiator, and the rubber tube the header tank. As the water is heated, it rises from the flask and runs into the top of the wide glass tube. Then it runs down the tube, cooling as it goes, and runs back into the bottom of the flask via the curved rubber tube, completing the circulation. Of course, the whole system must be completely filled with water, and absolutely free of air bubbles. If very small bread crumbs are added to the water, the circulation can be clearly seen.

John Brewer

D



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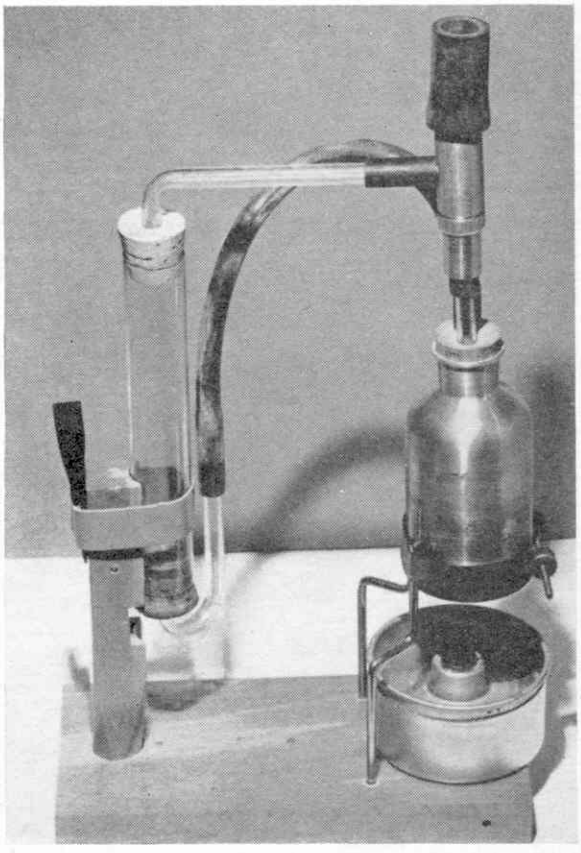


A The complete steam engine in operation. Note that the two halves of the spirit burner are a loose fit

B A paper cup can be used to extinguish the spirit burner

C Cutting out the vanes of the wind wheel

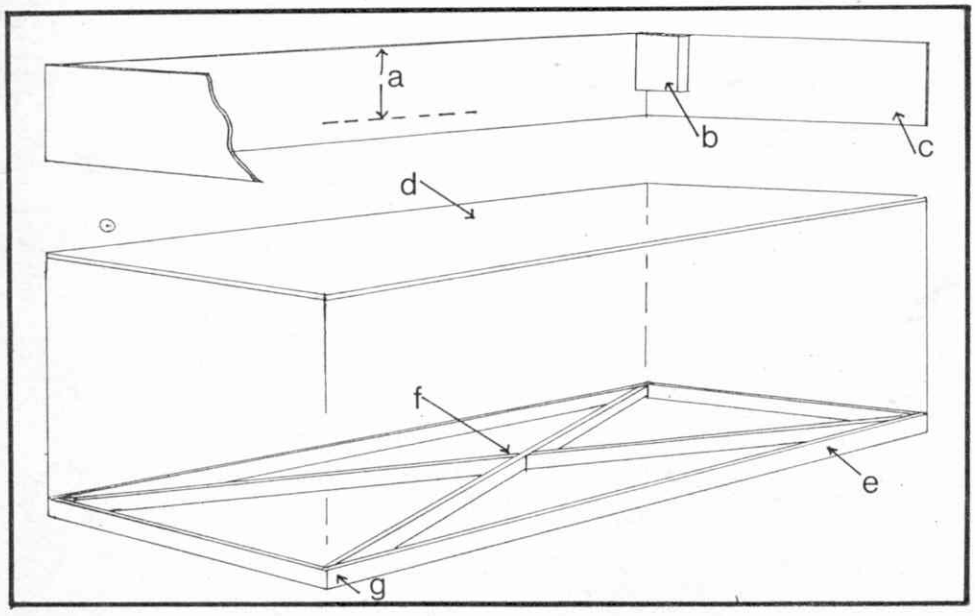
D The wind wheel in operation. It is important that the wheel be balanced on a needle, to keep friction down to the minimum

E The central heating system

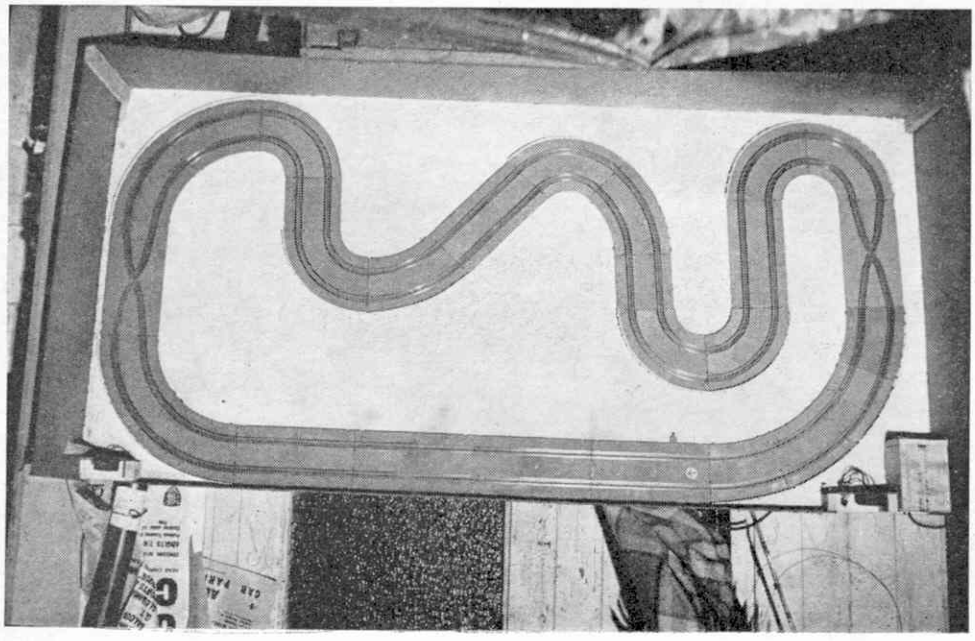
BUILDING A CIRCUIT

PART 1: THE TRACK

This month, Godfrey Arnold starts to build a permanent slot-racing circuit. It will be fully landscaped, and is what many of you have asked for.



A—9 in. above base; B—¾ in. by 1½ in.; C—¼ in. hardboard with smooth side facing inwards; D—ceiling board (Thistle board); E—¾ in. by 1½ in. batten; F—diagonal battens notched at join; G—nail and glue



WHILE much of the fun to be derived from slot racing is in the competition itself many enjoyable hours are spent on the making of cars and track. A simple circuit that has to be assembled before it can be used, and taken up after each racing session, is better than nothing, but is not nearly as convenient as a portable one on a baseboard which has the added attraction that it can have the scenery and other effects that give more interest to even the smallest circuit.

The circuit described in this and following articles is a 1/40th scale layout on a 6 ft. by 3 ft. baseboard using S.R.M. track. There is no reason why Champion should not be used and all the advice given here may be applied to larger layouts in 1/32nd scale. The 6 ft. by 3 ft. size is, however, about the largest that can be handled by one person and it can be managed easily by two; it is also about the largest that will go in and out of most doors.

For a main base I used ceiling board which has a certain amount of rigidity and is not much heavier than hardboard. This was braced with ¾ in. by 1½ in. rough sawn deal, as shown in the diagram, to give a very rigid base. The next step was to make the back and two sides from hardboard to give a height of nine inches above the base; the intruding pieces of wood used to join the corners do not matter and are covered up later. Special nails are available for use with ceiling board and these can also be used for the hardboard.

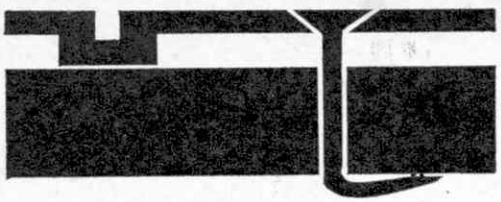
The track was then laid out, the layout having been decided beforehand. This particular circuit was chosen as it gave a fast straight with a tricky 'country section', cross-overs being used to equalise the lengths of the lanes. It is possible to get a much longer circuit into this area using 1/40th scale track and a suitable layout is given in the diagram but in this case I decided to allocate a reasonable area to scenery so that a relatively short circuit us used.

As the track is portable it is essential that the individual sections are fastened down to the baseboard. Various methods can be used, such as wire or screws. I used headless nails, drilling a suitable hole right through the track and baseboard, opening out the hole in the track with a file tang so that the 'head' of the nail was held in the tapered hole but was flush with the track surface. Where the nail could be made to hold in a batten this was done but, otherwise, the nail was bent over beneath the baseboard.

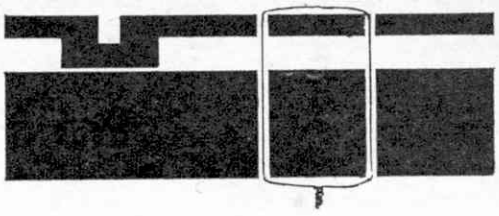
Faulty joints

One advantage of permanent track is that electrical continuity can be assured every time the track is used and, if you have any trouble initially, the small brass connectors of S.R.M. track can be soldered together to make sure that there are no breaks. Before setting up the track clean the faces of these connectors then, when the track is assembled, they can be soldered together, being reached by the tip of the iron via the square holes in the abutments of the track. If it is decided that only those joints that are faulty are to be soldered, connect the power supply, put a car on the terminal section and drive it around until it stops. Mark this point, then push the car around until it starts again and mark this joint. Now make good the FIRST faulty joint, try the car again and remedy all the faults as you come to them. When the car will run satisfactorily the second joint that you marked can be soldered and that lane is finished so that you can now repeat the whole process for the second lane. If the second joint is done initially then it is quite probable that you will end up with one undetected faulty joint that can account for a slight power loss and, more serious, a single failure in the future will lead to a dead section of the track. Soldering all joints is preferable for not only does a higher standard of reliability result but television interference may well be reduced.

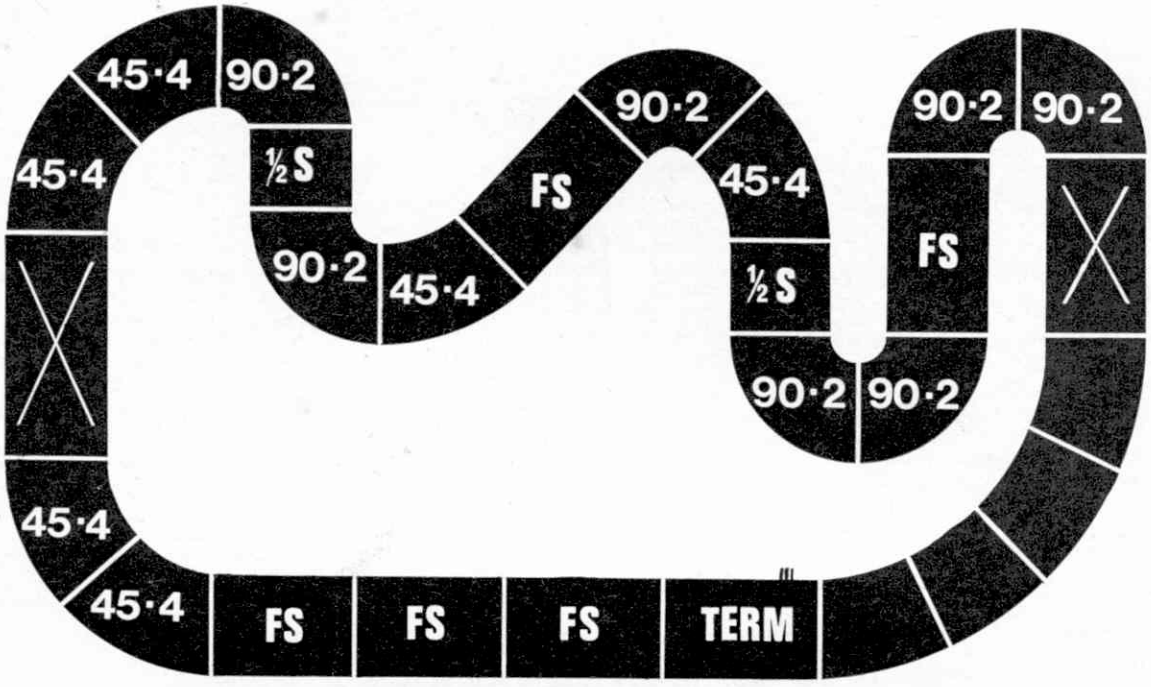
With the track in this state it can be run satisfactorily but next month I will tell you how to wire it up so that all that is needed to start racing is to plug it into the mains.



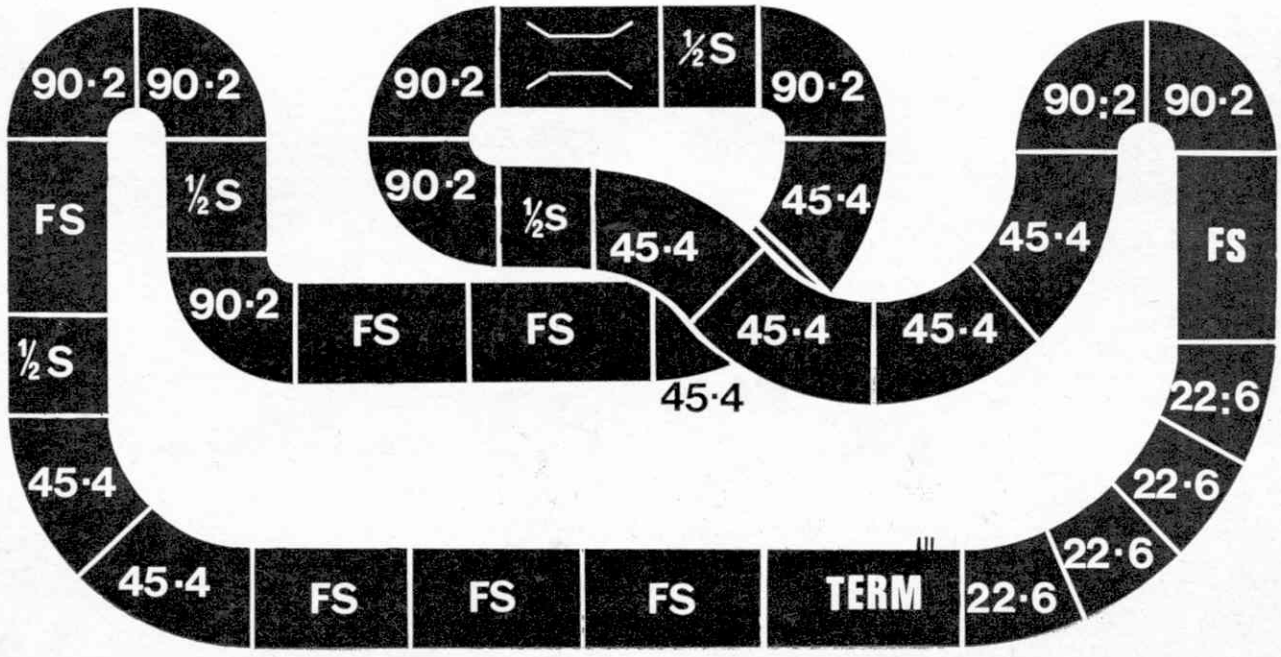
Track Fixing with a Bent Nail



Alternative using Wire



Above: suggested layout plan. Below: alternative layout plan. Key to track parts: Term—terminal straight. FS—full straight. ½S—half-straight. 90·2—90°2 lane bend 45·4—45° 4 lane bend. 22·6—22½° 6 lane bend. ⩢—chicane. X—crossover



The three pointed star

At the turn of a wheel

with Ken Wootton

MAY I wish you all a very happy new collecting year? And I hope you've now recovered fully from the Christmas festivities plus my time travelling! It was a little on the wild side I suppose, still, stranger things happen at sea or so they say. (Don't forget to try my competition, there's just time, somebody's got to win and it could be you.)

Talking of sea, this cold, windy month of January finds us all smothered in thick duffle coats, winter-weight trousers and—for yours truly anyway—fur lined boots, for our visit to the fatherland across the water and a look-see at a few model cars scaled down from the real thing born in the fabulous Stuttgart stable of Mercedes Benz.

I think I'll be weak and begin with my favourite 'Merc', the 300 SL. There are two models of this car in my collection—a hard top and a convertible. The hard top, finished in silver and blue, is from Germany too, and is manufactured by one of the oldest and best firms in the business—Marklin, who began producing Dinky-style toys a year after Meccano, in 1934.

This isn't a history of Marklin, so I won't dwell on it except to say none of those in my collection have modern refinements, not even windows—they don't need them, for the casting detail and paintwork are superb.

The other SL is made by Tekno of Denmark. I don't have this firm's history at my finger tips, but I know they produce some fine stuff. This open 300 SL has opening bonnet with *fully* detailed engine, opening boot with spare wheel (these parts, I might add, fit beautifully with only hair-line cracks to show they operate at all) detailed interior, gear stick, etc., *all* in metal and beautifully done. They also throw in for the money, a lady driver but, much as I loved her, she had to go. Don't like my models with models—if you know what I mean—makes 'em look like toys! This Tekno job also has full detailing on its chassis and, of course, springing. Finished in white with red upholstery it's far superior to any other 300 SL—even the excellent Corgi model.

Now a bit of information about the King Size SL for all you speed and mechanically minded maniacs! The now famous 300 SL (Sport-Light) had a four stroke petrol engine with fuel injection, maximum speed of 145 m.p.h. on a low axle ratio giving acceleration to the order of 0-60 m.p.h in 7·2 seconds, 0-100 m.p.h. in 16·2 seconds and 0-120 in 25·8 seconds but, with a higher ratio, 160 m.p.h. was reached—wow! The engine lay at an angle of 45 degrees, thus necessitating left hand steering which, of course, could not be altered to right hand drive. Wheelbase measured 7 ft. 10½ in. and the car weighed 25½ cwt. The Marklin is the 'Gullwing' model, so called because the doors, instead of opening in the usual manner, opened out and up so that with both doors fully open and the car viewed from the front, the doors looked rather like the wings of a gull! A truly great car and one which I hope will soon become one of the classic cars of this century.

The smaller version of the 300 SL is the Mercedes 190 SL, which was first introduced in 1955. It had an 1897 c.c. engine developing 110 b.h.p. and was a single overhead camshaft four cylinder job but, unlike the 300 SL, the 190's engine—which with its twin carburettors could reach a maximum 118 m.p.h.—was mounted upright.

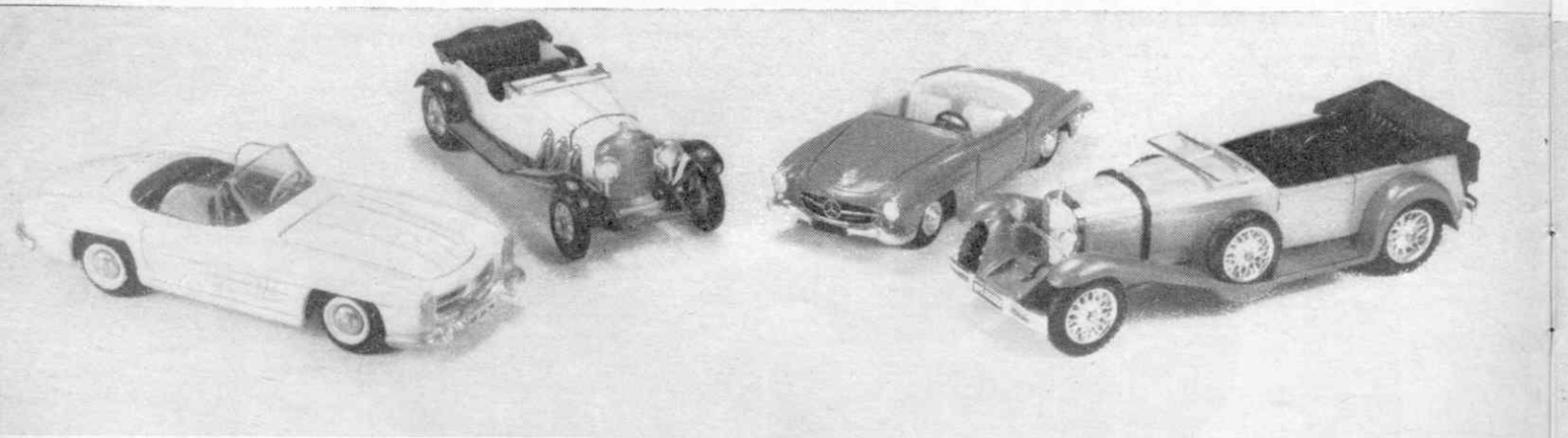
Once more I have two models of this car represented by French Dinky and again Marklin. The Dinky version is a hard top which is painted white and black and of one-piece body construction. It's assembled in the usual manner of early Dinkies, a tin base-plate with projections for the axles to go through which is riveted on to the model fore and aft. As you see the car illustrated here has windows, but originally it was issued without. I have this version, but in my 'swops box', because I feel the former looks superior—something I'm not always sure about—I wonder what those American cars in the November Meccano Magazine would look like with windows, of course it would spoil them as far as originality is concerned and they would lose their value as rare Dinkies, but has anybody ever tried fitting them up?

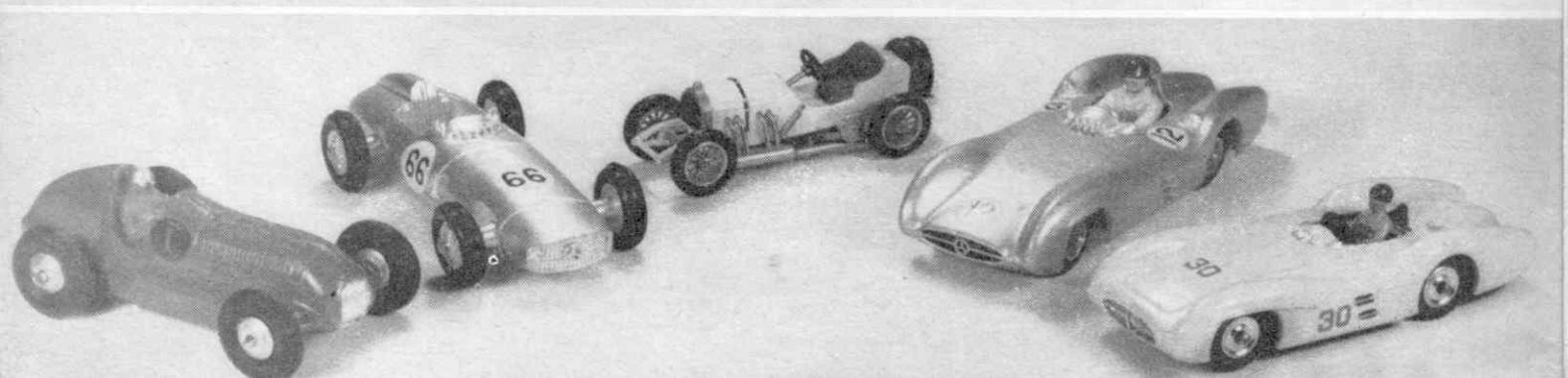
Oh, dear, if I start thinking and dreaming about those pre-war goodies, I'll *never* get this month's article finished, we won't make the printers in time, the Editor will be tearing my hair instead of his own (*most of mine's gone already—Ed.*). and—back to the grindstone!

The Marklin 190 SL has red bodywork with cream interior like the 300 SL, it's a very good casting with no traces of flash and aren't those wheels fine? Rather like a 'super Spot-On' wheel and fitted with beautifully treaded tyres. Another good point about Marklins. If you're a sort of 'Do it Yourself' type and like to get inside a model and do something to it, Marklin make it easy for you by using screws instead of rivets. This is one thing I would like to see universally adopted, but suppose the cost would rise.

Let's go back a few years (O.K. without that old time machine!) to 1908 and 1928. Here we have two Lesneys and a Solido, all varying in scale. Beginning with the Yesteryear 1908 Mercedes Benz Grand Prix Labelled Y.10, it's a great little model with full cockpit detail and even the chain drive clearly shown. This 'Matchbox'

This page top, left to right: Tekno Mercedes Benz 300 SL No. 924; Matchbox Mercedes Benz 1928 30/220 No. Y10; Marklin Mercedes Benz 190 SL No. 8025; Solido Mercedes Benz SSK Torpedo 1928 No. 137. Bottom: left to right: Dinky toy No. 23c Mercedes Benz Racing car; Mercury No. 55 Mercedes Benz F1 Racing car; Matchbox No. Y10 Mercedes Benz 1908; Crescent No. 1284 Mercedes Benz 2·5 litre G.P.; Dinky No. 237 Mercedes Benz 2·5 litre G.P.





should be snapped up by anyone missing it in their collection, as it's well and truly obsolete. Consequently few shops have a sample left. This model is based on the 120 h.p. racing car which made 1908 a happy year for Benz. You can read all about this and other Benz cars and the exciting races they ran, in a book I'll describe at the end of this article.

The replacement Y.10 is a 1928 Mercedes Benz 36/220. This car lacks the spirit and hairyness of Lesney's 08 job and to my mind is a poor yesteryear. It's stove-enamelled white all over (though I painted my mudguards and under carriage cherry red) with red plastic seats. Somehow, they seem to have missed out on this one.

The other 1928 model car is the Mercedes Benz SSK Torpedo from Solido's 'Golden Age' series. This truly is a beauty, with opening doors, tilt seats, dashboard detail which even shows fully detailed dials! Separate leather bonnet strap, chromed parts such as exhaust pipes, bumpers, wire wheels and, of course, the famous 'Merc' radiator. Also included—springing, taxation disc on the windscreen, number plates and 'D' plate for Deutchland on the rear mudguard! If you feel like 'lashing out', despite the squeeze, you get your full money's worth at thirty-five shillings, believe me.

This was modelled, as was the Lesney, from the now classic 1928 SSK 36/220, which had a supercharged engine of 6,789 c.c. developing 120 brake horse power unblown and 180 blown. It was capable of speeds over the 100 m.p.h. mark. Its wheelbase was 11 ft. 2 in. on which it lay, low and sleek. Yes, truly a wonderful car.

Let's sober up a bit now and take a look at some post-war Mercedes. The Mercedes 300 by Marklin, one of their poorer models to my mind and to a larger scale than the 300 and 190 SL's. I suppose this is my reason for disliking the model, for I do like the cars to 'fit in' together, it's unfair though, because we have the usual Marklin good casting plus a nice dark blue paint finish. One thing is missing, which I think could have been incorporated despite the size (other models have it), is the three pointed star mascot atop the radiator.

The 'real car' 300 was a big six-seater with a weight of 35 cwt. and selling in the United Kingdom for £3,301, against the German price of £1,690! It had a 2,996 c.c. six-cylinder single o.h.c. engine, fitted with two carburettors, originally producing 115 b.h.p. but later increased. Maximum speed was 100 m.p.h. Novel feature—the driver, by pressing a button, could control the rear suspension to correspond with the weight being carried. This button was connected to a servo motor which controlled the auxiliary torsion-bar springs, which meant he could maintain the proper camber angle and stiffen the suspension, quite a feature, eh?

Let's go up a bit more in price and class to Mercedes' *big* prestige car, the 600. First introduced in 1963, it comes in two sizes, the saloon and the pullman. This luxurious limousine holds seven to eight people, and contains push button control for the windows, sliding roof, seats, bonnet and boot. The external rear view mirrors can be adjusted without leaving the car, and the price? £9,994, including £1,500 purchase tax! It has a 6,329 c.c. V8 engine giving a maximum speed of 128 m.p.h.—phew, *what* a car!

The Dinky toy version illustrated here is, too, a great car, one of the best of the present day English Dinkies. It features opening boot and bonnet with engine detail. *All* four doors open, with complete interior detail, including chauffeur and passengers. Stove enamelling is in maroon with all chrome trim duly chromed. This is one model which should have the Marklin screws, because I'm going to repaint the whole interior and, if I could take it apart, things would be so much easier— still, I managed it on the Dinky Two-Door Rolls, though the air was a decided blue colour!

Now for a spot of Hairy Stuff with the next three models straight off the track! From three different makers we have the British Crescent Toys 1957 issue 2·5 litre Grand Prix Racer in silver. A nice model with one or two minor details not quite correct. It *does* incorporate simulated wire wheels—standard on all the ten Crescent racers issued—but something rather rare in 1957. The car is fitted with a nice chunky driver who goes well with the model and, for once, I haven't tried to remove him. A big fault here, and on all ten, is the fact that the steering wheels look like flat plates with no detail at all, which gives an impression of the driver just reaching for his dinner! After going to a lot of trouble with the other details, I wonder why they neglected this item?

The Dinky version No. 237 is smaller, painted cream. This, too, has a driver and perhaps is better in some ways, but it's true to say it's 'lost out' on the 'feel' of the thing. It fails to capture the tang of exhaust of the real car, which was so squat it was impossible to mount the engine vertically beneath the bonnet. 'Revving' up to nearly 9,000 r.p.m. this straight eight had fuel injection and ignition by Bosch. The five-speed gearbox, differential and inboard brakes were in one unit driving the back wheels by swing axles. The ducted air scoops you see on the model were for brake cooling.

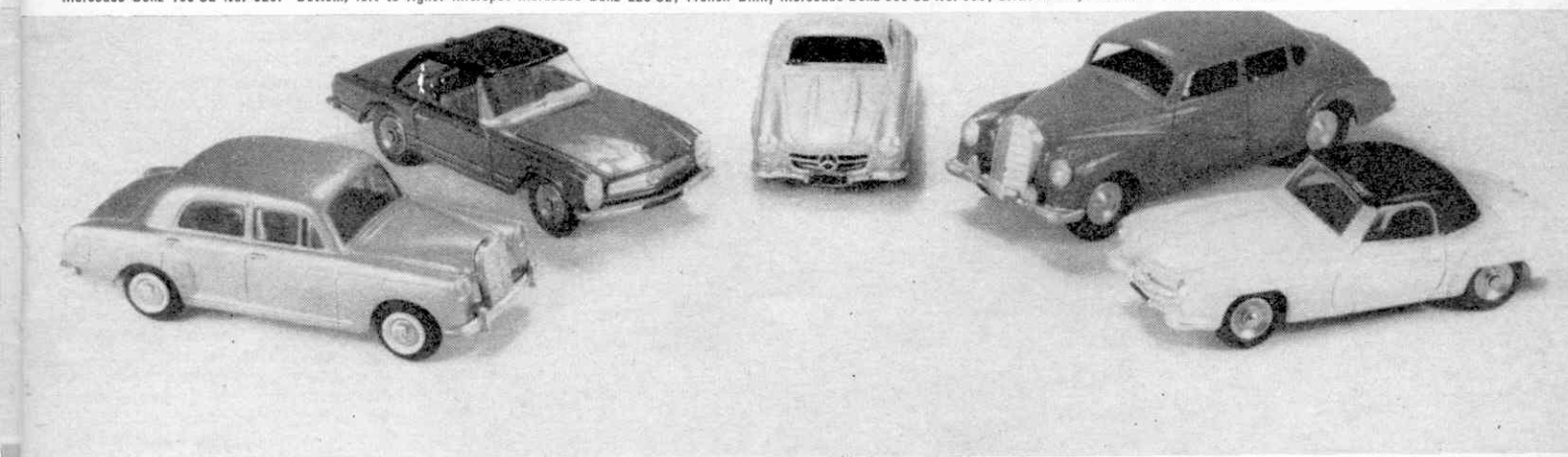
The third G.P. Racer is the Mercedes F.1 by Mercury, of Italy. You can see this model captures the spirit of the track, it's a beauty with excellent detail. Only one thing, there are casting flaws, which mean hairline cracks. These don't weaken the model, just spoil it a little and should be filled. I haven't yet decided to do this on mine, because I really want to retain the original silver paintwork which, of course, is impossible if you start slapping body filler around.

Another super little model is the Mercedes Benz 180 by Tekno, based on the 1953 car which had a 1,767 c.c. side valve engine. This little Tekno from Denmark is a real gem. Beautifully cast bodywork and radiator detail, even to the mascot which the bigger Marklin 300 model lacked. It's painted in Polychromatic Blue which particularly lends itself to this model. All chassis detail is embossed on the cast base-plate (as in the Tekno 300 SL described earlier) and the car sports the 'White Wall Wheels' particular to Tekno. This ranks with the few favourites in my collection.

Another French Dinky car is the Mercedes Benz 300 SE. This, as can be seen from the photo, is another beauty, and to my mind just succeeds in adding strength to my comments about the French Dinky range, some of which were described in a recent edition of the 'M.M.' Casting and paintwork (crimson) is excellent and it's an exact copy of the real car which seems to have been successful in various rallies and races with a top speed from its 3 litre engine of 124 m.p.h.—Congrat's to my favourite Paris factory on another winner for us all.

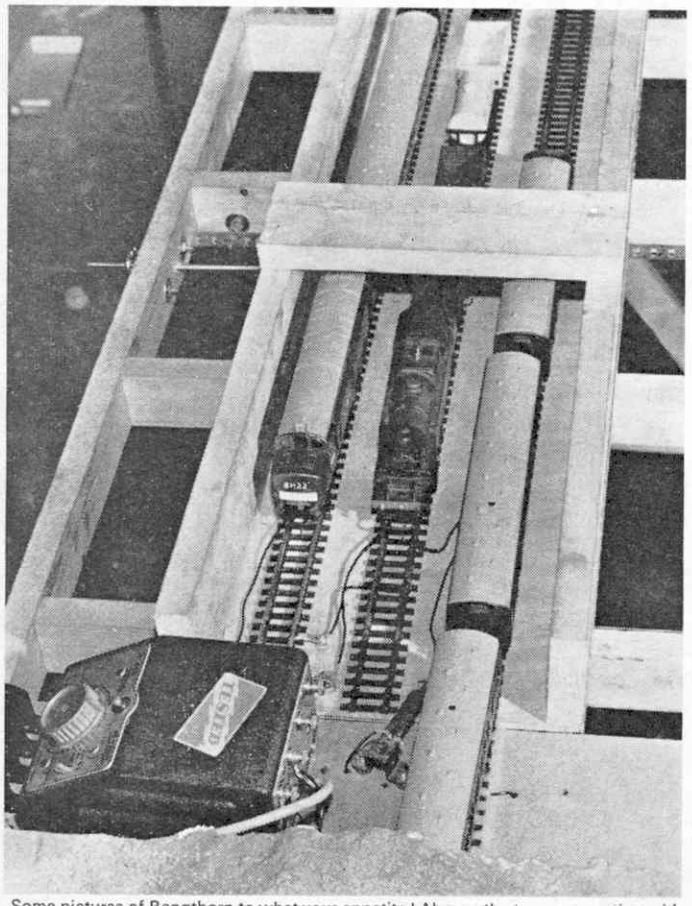
Continued on page 56

This page top, left to right: Tekno Mercedes Benz 180 Saloon No. 723; French Dinky Mercedes Benz 230 SL No. 516; Marklin Mercedes Benz 300 SL No. 8019; Marklin Mercedes Benz 300 No. 8003; French Dinky Mercedes Benz 190 SL No. 526. Bottom, left to right: Micropet Mercedes Benz 220 SE; French Dinky Mercedes Benz 300 SE No. 533; British Dinky Mercedes Benz 600 No. 128



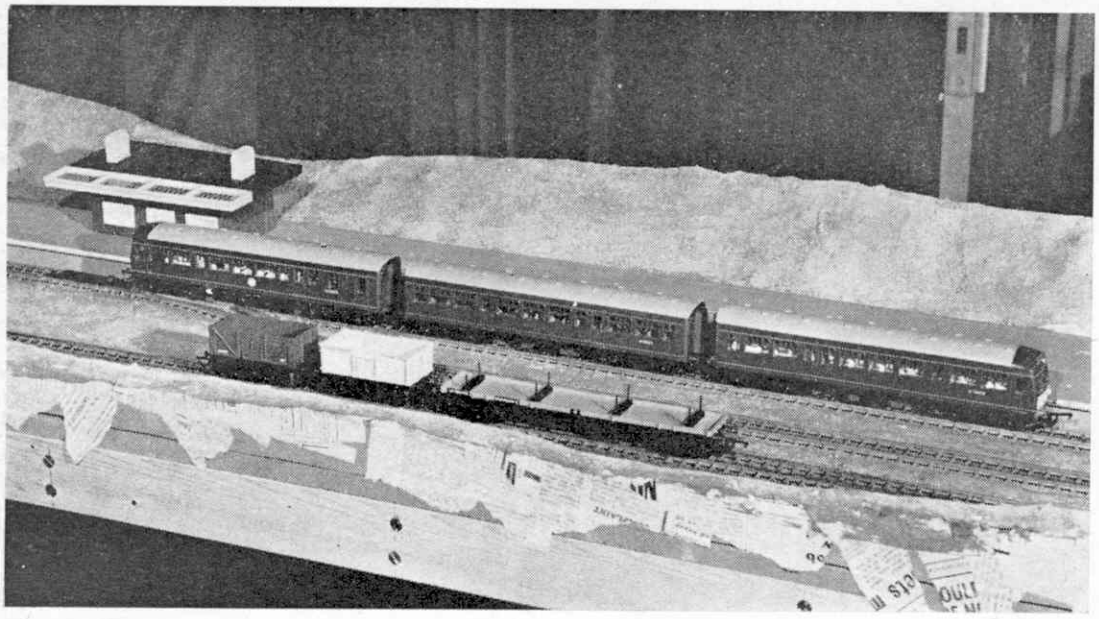
Building 'Bangthorn'

by Mike Rickett



This month, we start a series of articles which will describe in detail every stage of building our branch line, from baseboard right through to scenery and operation. Every station must have a name, and after a lot of thought, and a lot of anagrams based on the words 'Tri-ang Hornby' we arrived at — Bangthorn. Although you won't find it on any map, from December 27th to January 10th, Bangthorn will be quite close to Olympia on the Circle line, as it will form a prominent part of our stand at the Schoolboys and Girls Exhibition. See you there!

Some pictures of Bangthorn to whet your appetite ! Above : the traverser section with a three-car diesel unit just leaving. Below : the same diesel set at Bangthorn station platform. Opposite page : two views of the approach to the station. Compare the pictures with the track plan. Despite the interesting layout, only six points are used



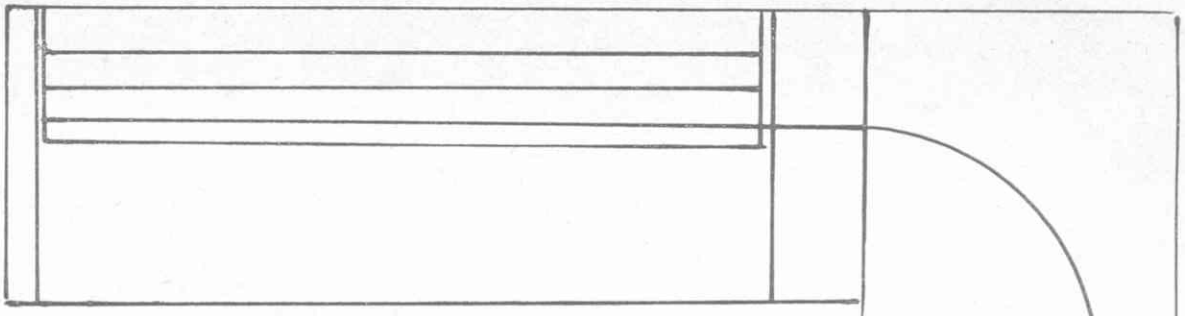
THERE is indeed much to commend branch line practice to railway modellers for, because of the usual problem of space, very few of us are ever likely to have sufficient area, money, or time to build a model that would really do justice to a main line railway. The usual oval or continuous layout needs a lot of space before it becomes really satisfying for any length of time and simply running trains round and round can eventually become a little dull.

Realistic

One of the most important advantages attached to a branch line layout is that it can be made to occupy very much less space than any continuous layout, a consideration of the greatest importance in these days of smaller houses. A layout of this sort also lends itself to timetable or sequence operation, but most important, the construction of more realistic scenery becomes much easier.

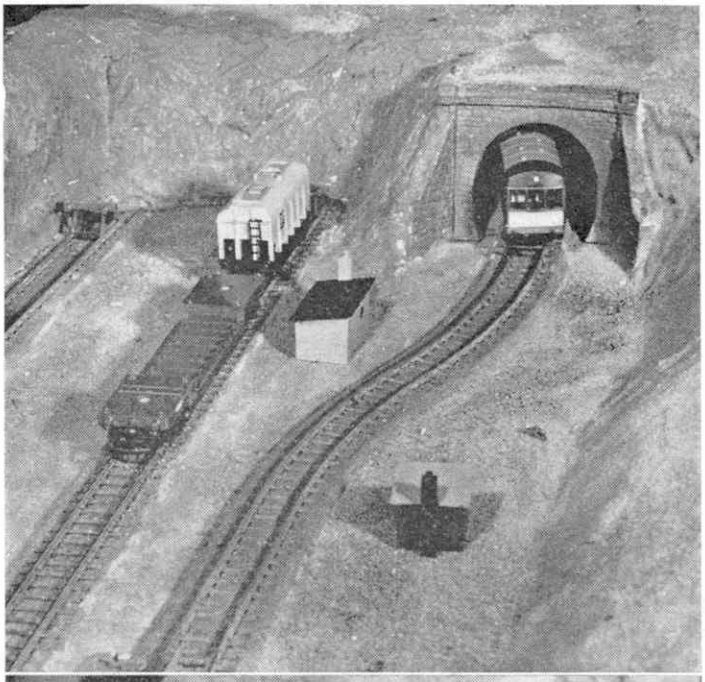
Of the two types of end-to-end layout, the station to storage siding arrangement is both cheaper and less demanding of space. The plan with this article shows an example of such a layout and we shall be showing, during the next five or six months, the step by step construction of it, from baseboards to the finished scenery.

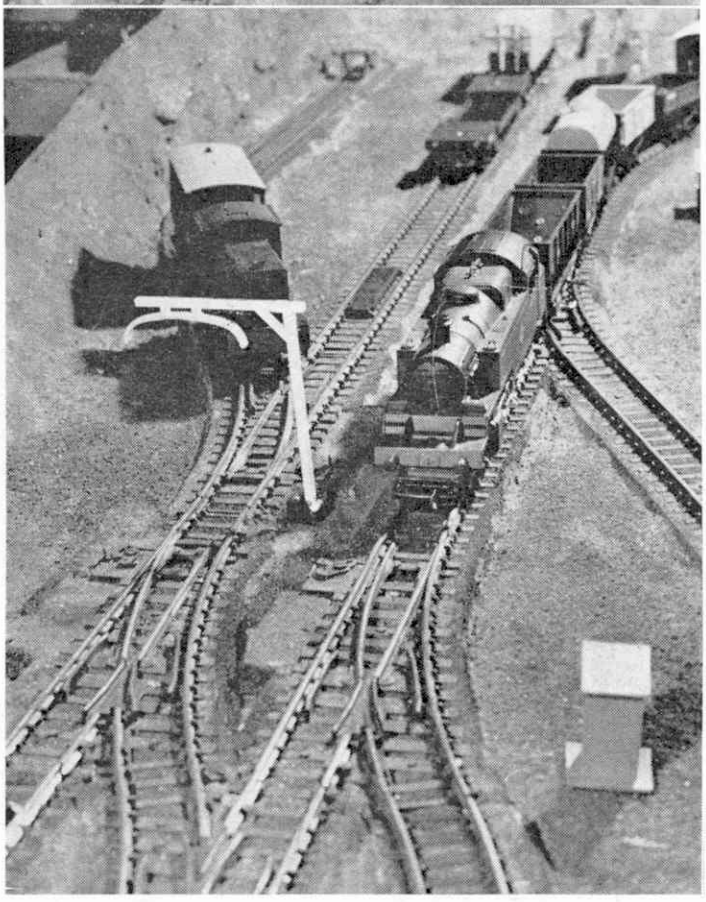
Bearing in mind the size of the average boxroom or bedroom, which is invariably the location for most model railway activities, the layout has been designed to occupy the very minimum of space and it includes a relatively small but quite representative suburban station, running into a set of three storage or 'Fiddle' sidings. It is also specially designed to be dismantled and packed away with relative ease after each operating session. An overall size of ten feet long by six feet wide, the layout is an 'L' shape; one leg for the station and the other for the storage sidings. The layout, as was mentioned above, is semi-portable, and the ten feet long section can be folded over upon itself to form one five feet long section. This makes storage a little easier and to allow the main part of the layout to be folded away in this manner, both the scenery and the baseboard have been carefully planned. Although this does complicate things slightly, we shall give complete instructions, advising the use of tools normally available to most households. Legs are attached to the base board by bolts with wing-nuts and they are also easily



detachable for storage.

The storage sidings were also the subject of much thought and, instead of using the more usual type of storage sidings involving access points, a special traverser section not involving any points and incorporating a 'magazine' capable of storing three trains was designed. The traverser is, in fact, the key to the entire layout, for it makes operation of the station much easier and more enjoyable. It also saves a considerable amount of space. If, for example, three trains have been run in succession from the station into the storage sidings, it would normally be necessary to rearrange the locomotives and rolling stock by hand so that the locomotives once again face in the direction of the station. With the traverser section, however, all that is involved is the lifting out of the 'magazine' section containing the three trains, turning it round and placing it in the opposite direction on the traverser. The whole beauty of the traverser lies in the fact that any number of these 'magazine' sections can be built, each with three trains, so that the variety of operation is only limited by the number of 'magazines' or the amount of rolling stock.





Turning now to the plan of the layout, you will see that from the storage sidings, the train runs into a tunnel and out to the station itself. Only six points are used in the station and the design gives three sidings, one goods unloading bay, a run round and of course a main station platform. All the track is Tri-ang Super 4 and we shall give a components list, detailed plan and wiring diagram in future articles.

As illustrated in the plan, the layout will allow one train to be run at any one time, although of course three trains can be stored and used on the layout. More than one controller is not really necessary since only a maximum of two people can be occupied at any one time, one operating and the other assisting with the traverser section and the uncoupling of trains.

Scenery

Although the first six articles in this series will deal only with those stages in its construction up to the basic scenery necessary, we shall afterwards show you how to 'Gild the Lily' by making other additions, such as trees, line side structures and so on. We will also show you how to devise a timetable and how to get the best possible use from the Tri-ang Hornby range of buildings, rolling stock and accessories.

Searchlight in the Sky

By John W.R. Taylor

Above: the flat nose and matt black colour scheme distinguishes this Turbinlite-fitted machine, which is the subject of Ian Stair's scale plan on page 24. Below right: this is what it looked like from the pilot's seat

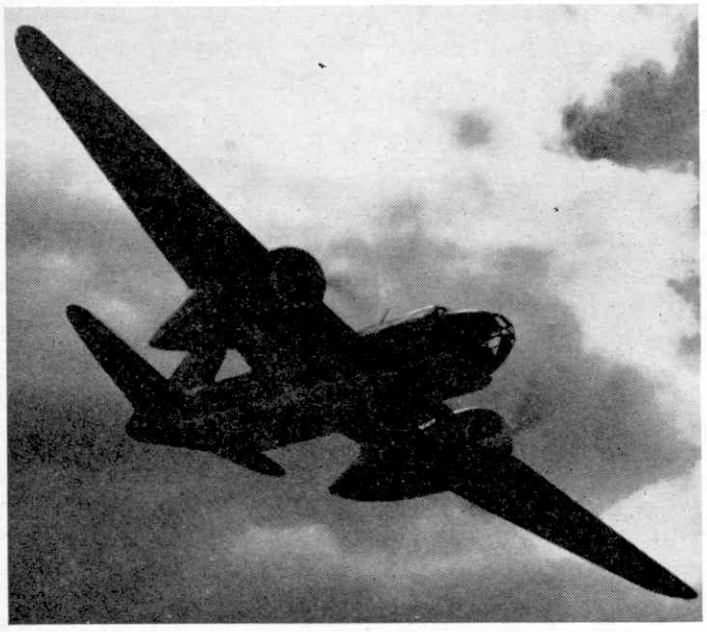
SEARCHLIGHTS, probing the night sky for enemy bombers, were a familiar sight in 1942. However, I was startled one evening when, during a walk by the river at Kingston upon Thames, I saw a searchlight suddenly switched on—not where it ought to have been, on the ground, but several thousand feet up in the air.

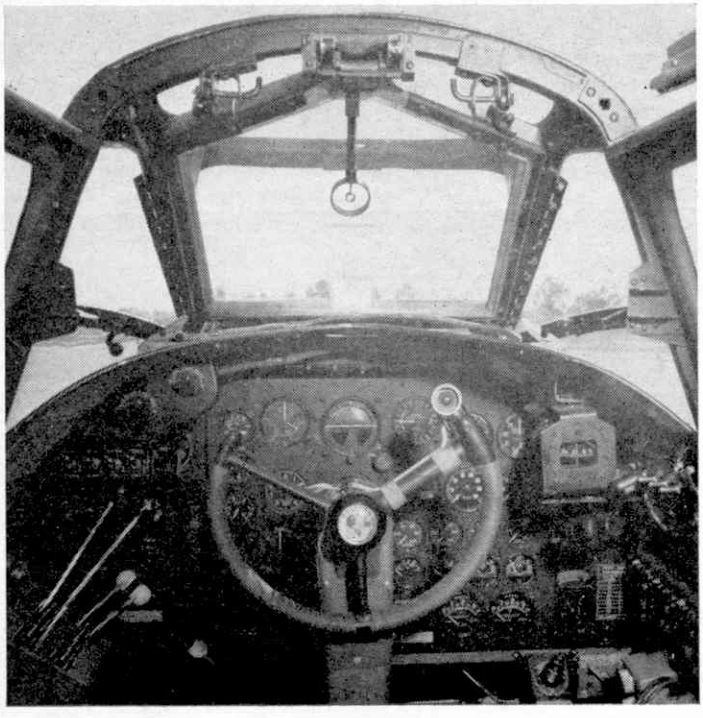
If flying saucers had been in the news at that time, I might have imagined that the Martians, undaunted by Hitler's failure, had decided to invade England. But we were concerned then with large aeroplanes marked with black crosses rather than with little green men with their eyes on stalks! The searchlight that I had seen in the sky was, in fact, only one of many ideas that were being tried out to deal with the German bombers that had trespassed in our night skies for too long.

It was small consolation that the *Luftwaffe* had sought the cover of darkness only because it had been driven from the daylight skies during the Battle of Britain. Bombs are just as unpleasant whether they are dropped by day or night, and at first the enemy had paid only a small price for his heavy attacks on London and other cities.

Between September 7 and November 13, 1940, the *Luftwaffe* had flown more than 12,000 night sorties, directed mainly at London. In all this time, the defences had claimed only 81 German aircraft destroyed —54 by guns, 8 by fighters, 4 by balloons and the rest by other causes. This represented a loss rate of under one per cent of the aircraft sent to attack Britain. As the *Luftwaffe* had more than 1,400 long-range bombers in first-line service, with another 300 a month coming from the Dornier, Heinkel and Junkers factories, it could obviously keep up its raids indefinitely.

Even when R.A.F. fighter pilots were guided by radar stations and the Royal Observer Corps on the ground, it was difficult for them to track down enemy aircraft in the night sky. Consequently, many of the devices tested in 1940-42 were designed to fill the sky with invisible 'curtains' into which the bombers would fly and be destroyed.





One of the first was P.A.C., standing for Parachute and Cable. This consisted of a line of rockets which were fired simultaneously in the path of approaching enemy aircraft. Attached to each rocket was a parachute, with a light steel cable dangling from it. The idea was that the rockets would carry the P.A.C. to a height of about 600 feet, where the parachutes would open so that the cables formed a deadly spider's web of steel in which the bombers would become entangled.

P.A.C. had been used successfully in daylight, before the start of the night 'blitz'. On August 18,1940, a Dornier Do 17 bomber was brought down during a raid on the fighter airfield at Kenley. But the device could be used only against low-flying enemy aircraft and was effective for only the brief period of time taken for the parachutes to descend from 600 feet.

Prime Minister Winston Churchill, backed by the Admiralty, suggested a method of overcoming one of the limitations of P.A.C. Known by the rather unimaginative code-name of 'Mutton', it entailed dropping from high-flying aircraft a series of 'long aerial mines', each consisting of 2,000 feet of piano wire, with a parachute at the top end and a small bomb at the bottom. If any German bomber had been unlucky enough to fly into one of these wires, the pull of the parachute would, in theory, have brought the bomb up against its wing, where it would have exploded and blown the aircraft to pieces.

Test pilots from the Royal Aircraft Establishment, Farnborough, spent many hours flying into unarmed, practice versions of 'Mutton'; but they were the only aircrew to whom the device ever presented any real hazard. The sky is so vast that the possibility of the long aerial mines and enemy raiders being in the same spot at the same moment was remote. Pilots of twin-engined Douglas Havoc Mk. I fighters of No. 420 Flight, based at R.A.F. Middle Wallop, tried desperately to make the idea work, without any success, and it was eventually abandoned. So was a similar scheme which involved hanging a curtain of mines from barrage balloons that were cut adrift and allowed to float into the path of approaching enemy aircraft.

It was against this background of experiment and failure that Wing Comander W. Helmore put forward his suggestion of using airborne searchlights to locate and illuminate enemy bombers, making them sitting ducks for R.A.F. night fighters. G.E.C. were given the task of producing the searchlights, which was known as a Turbinlite. This was no easy job, as a beam of 2,700 million candlepower had to be obtained from equipment compact and light enough to fit into the nose of a high-speed aeroplane.

The problems were solved remarkably quickly, but it had been clear from the start that no fighter would be able to carry radar to track down the target, a Turbinlite to illuminate it *and* armament. It was decided, therefore, to fit the searchlight and radar in the comparatively large Havoc fighter and leave the shooting to the pilots of single-engined Hurricanes who would fly in formation with the Havoc.

Altogether, 31 Mk. I and 39 Mk. II Havocs were fitted with Turbinlites. Vee-shaped A.I. (airborne interception) radar aerials sprouted from each side of their flat noses, and their bomb-bays were packed with batteries to power the searchlight. No fewer than ten squadrons (Nos. 530-539), as well as No. 1422 Flight, operated these aircraft in 1942-43, with little success. The main enemy attack had been called off by then, as a result of the growing losses inflicted on the *Luftwaffe's* night bomber force by the R.A.F.'s radar-equipped Beaufighters and Mosquitoes; the latter aircraft, in particular, were much faster and more effective than the Havoc-Hurricane combinations. One Mosquito Mk. II was fitted experimentally with a Turbinlite; but the airborne searchlight achieved real success only when it was added to the anti-submarine equipment of Coastal Command and used to locate and illuminate surfaced German U-boats at night.

The Havocs used as Turbinlite carriers had an interesting history. They had been ordered originally for the French Air Force, as Douglas DB-7 light bombers. After the fall of France in 1940, they were taken over by the R.A.F., which was so short of night fighters large enough to carry the cumbersome new A.I. radar that it decided to convert the DB-7's for this rôle.

The result was the Havoc Mk. I, powered by two 1,200 h.p. Pratt and Whitney R-1830-S3C4G Twin Wasp engines and carrying a crew of two or three. The version used as a specialised night fighter was armed with eight 0·303 in. Browning machine-guns in a 'solid' nose. There was also an intruder fighter version, with a glazed nose, no radar and only four forward-firing guns, but with accommodation for 2,400 lb. of bombs in its bomb-bay and a single Vickers machine-gun in the rear cockpit.

The intruders gained more success than the night fighters, which is hardly surprising in view of the fact that the DB-7 had been designed as a bomber. They were followed in R.A.F. service by more than 1,200 four-seat day-bombers, known as Bostons, with more powerful engines. By this time, America had entered the war, and when production of the DB-7 series ended on September 20, 1944, a total of no fewer than 7,385 Havocs and Bostons, and U.S.A.A.F. A-20's had been delivered. No other U.S.A.A.F. aircraft in the 'attack' category was built in such numbers.

Data (Havoc Mk. I): Span, 61 ft. 4 in.; length 46 ft. 11¾ in.; height, 15 ft. 10 in.; wing area, 464.8 sq. ft.; weight empty, 11,400 lb., loaded 19,040 lb.; maximum speed, 295 m.p.h at 13,000 ft.; service ceiling 25,800 ft.; maximum range 996 miles.

The lamp that failed

by
J. D. McHard

Despite its two thousand, seven hundred million candle-power searchlight, the 'Turbinlite' Havoc never managed to illuminate the night raiders for long enough to permit the attendant 'Hurricanes' to shoot them down. On the contrary, the 'afterglow' from the Havoc's arc light continued so long after switching off that it made itself a perfect target for enemy gunners!

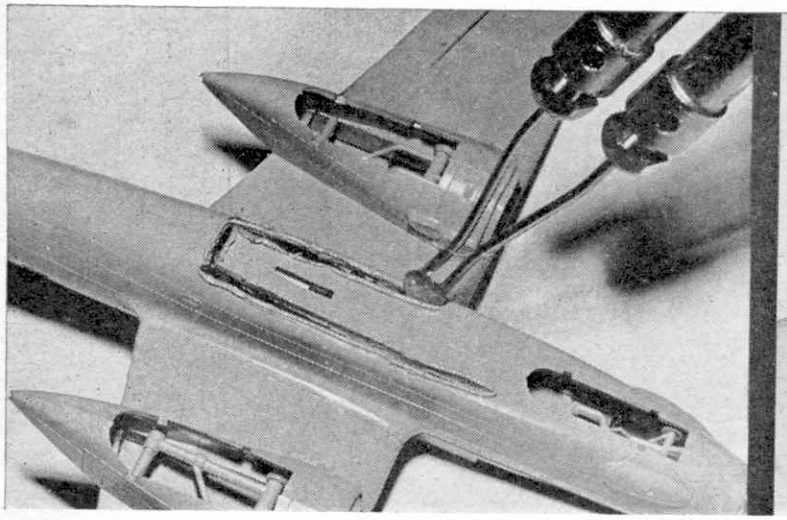
In an effort to overcome this snag, Venetian blind-like shutters were fitted over the light to extinguish the glow immediately, but before this refinement was installed, several Havocs were lost to enemy gun fire.

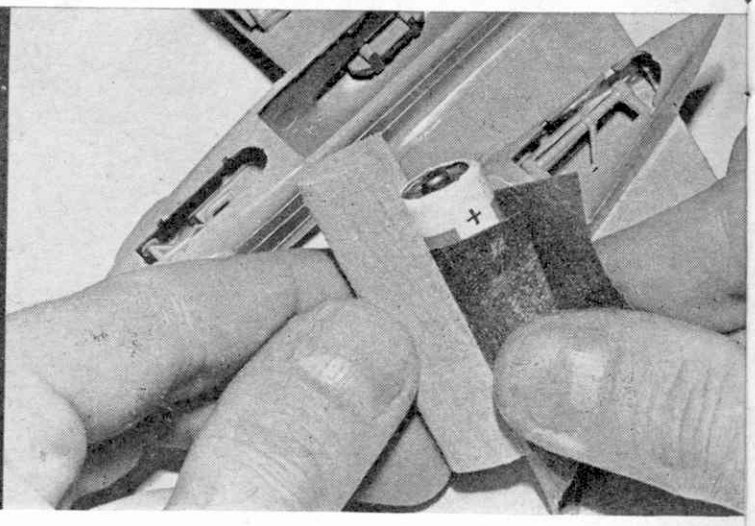
So the flying searchlight was just one more good idea that went wrong, but even so, it makes a most interesting and unusual subject for this month's conversion, using the basic Frog 'Boston' kit as raw material. A pencell works the light —the original one used a ton of batteries!

Of course, there is no need to go the whole hog and actually fit a working light; the job is much simplified if a purely external conversion is done, and many modellers will prefer this anyway. But for those who like gimmicks, it would need a long search to find a more likely subject than this one, with its operating Turbinlite that comes on when the top aerial is pressed. In the next three pages Doug. McHard shows how he tackled this interesting project. Accurate working drawings by Ian Stair appear on page 24 and John Taylor starts the story of this and other 'secret weapons' on page 20.

1. Make a rectangular opening in the fuselage underside $2\frac{1}{4}$ in. long. We used a Weller solder gun with the plastic cutting tip to speed the operation, but you can, of course, do it the hard way with a saw and knife if you prefer! If you decide to use the Weller gun, practice on an old piece of plastic first—it really *does* cut like a hot knife through butter!

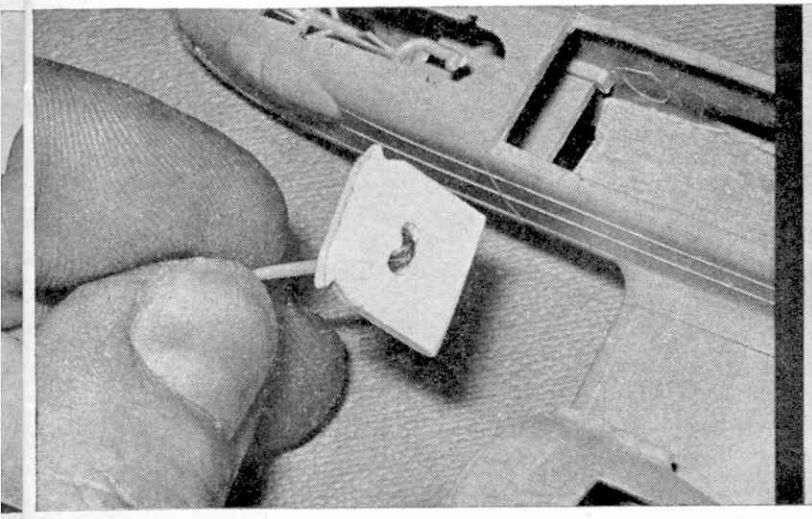
2. File the edges of the opening smooth, and shape from a piece of $\frac{1}{2}$ in. by $\frac{1}{2}$ in. balsa a block to fit neatly into the top half of the fuselage. Using sandpaper wrapped round a pencil, shape the underside of this block to a concave section then cement it in place with a 50/50 mixture of plastic cement and balsa cement. Drill a hole through the block to take a short length of 22 gauge brass tubing to act as a 'bush' for the aerial 'switch'. (See line drawing on page 25.)

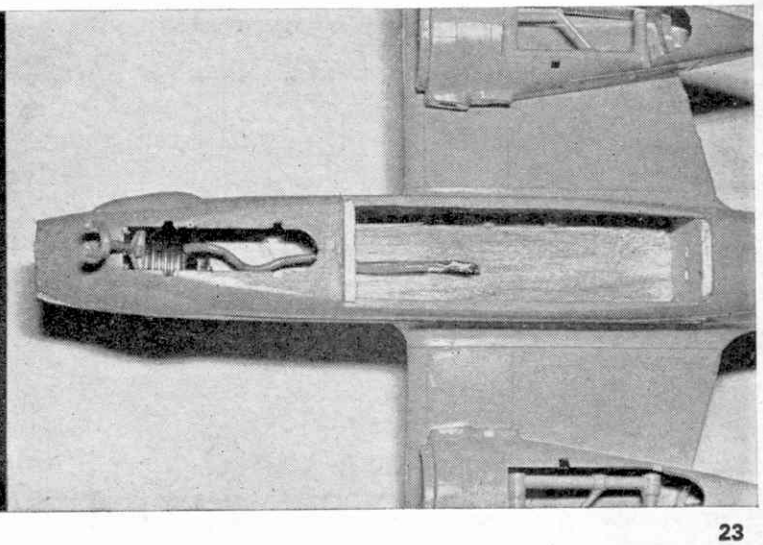


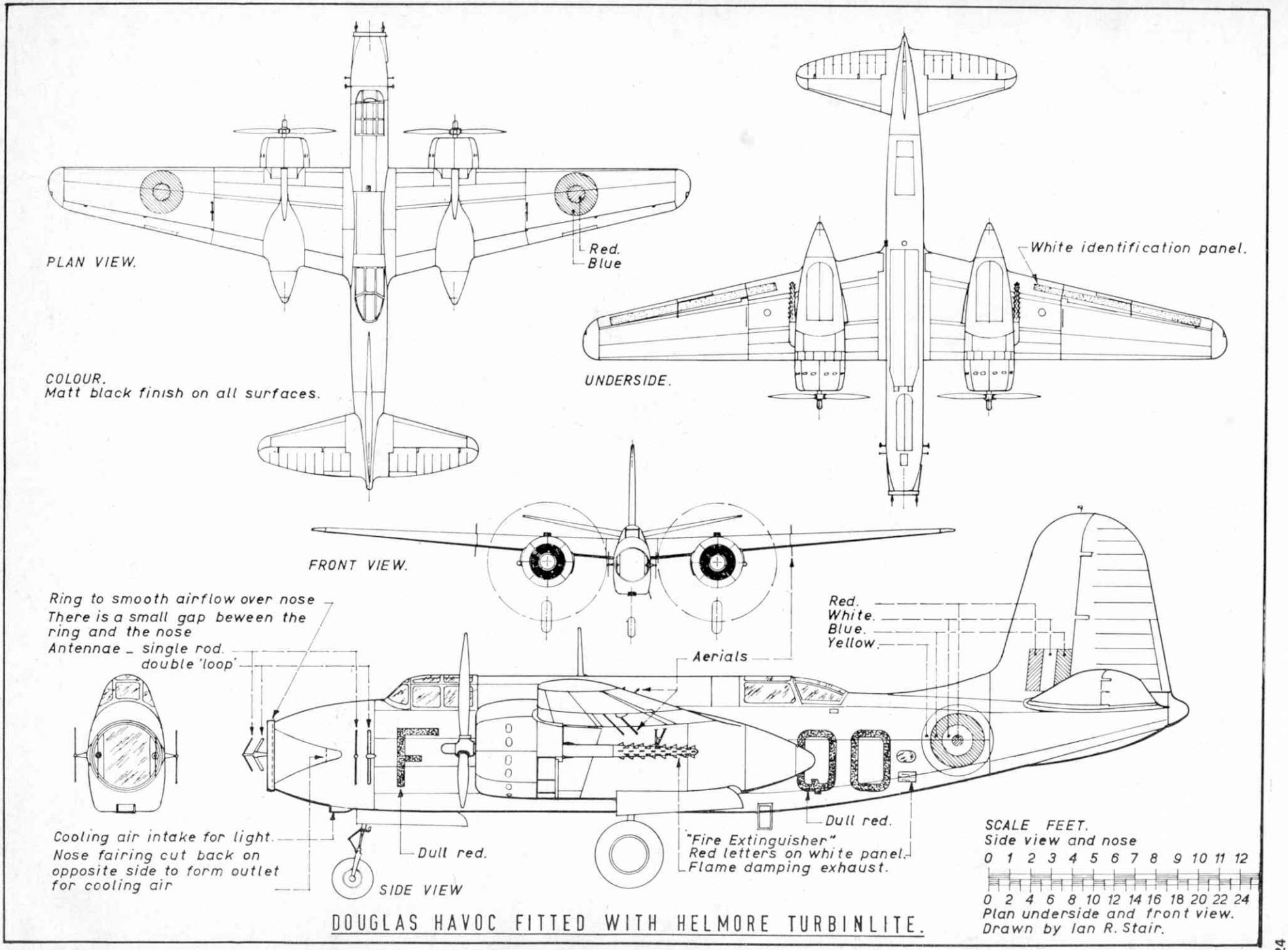


3. With the top block in position, cut a piece of 30 thou. plastic sheet to the pattern shown to form the front end of the bomb bay/battery box. Take a 3 in. long piece of plastic covered radio hook-up wire, bare the end and thread it through the two holes, as shown, to act as the positive battery contact. Now cement it firmly in place, taking the wire forward through the nose wheel bay. Notice that this bulkhead sticks out $\frac{1}{16}$ in. *below* the level of the lower fuselage.

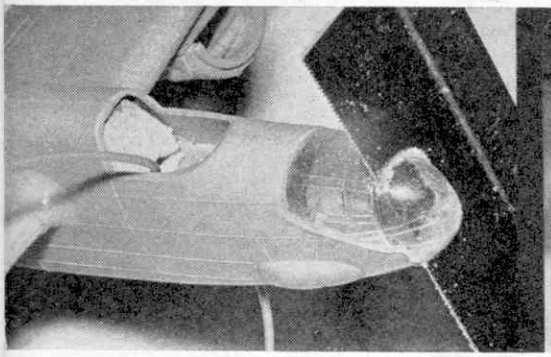
4. The negative battery contact is made with the lower end of a piece of 22 gauge brass or steel wire which is bent to an 'L' shape and forms the top radio aerial. Solder a second length of stranded hook-up wire to the lower end of this 'aerial', laying the wire in a groove cut in the balsa block forward of the aerial hole. The wire is then taken out of the battery box over the cockpit floor and into the nose. The nosewheel can still be retracted if required.



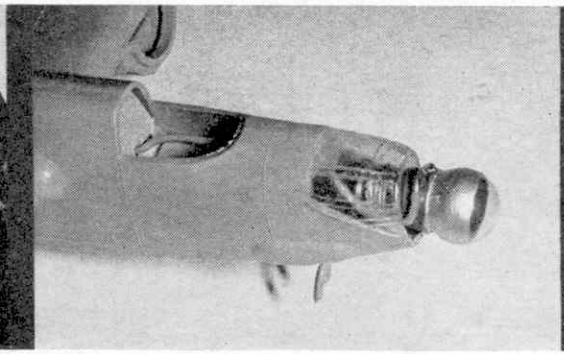




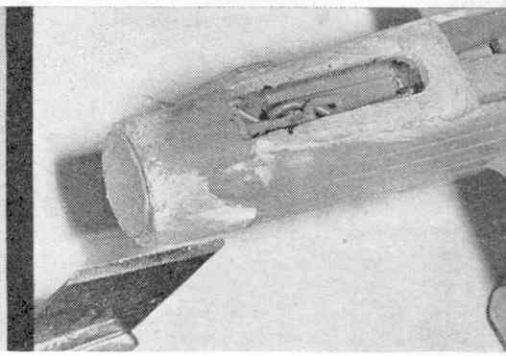
DOUGLAS HAVOC FITTED WITH HELMORE TURBINLITE.



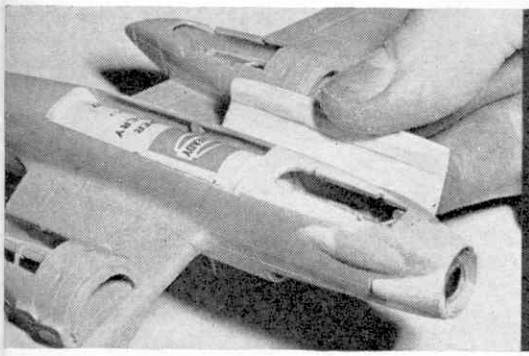
5. Here, you can see the two wires emerging from the battery box. The nose transparency is now sawn off at the point shown after ensuring that the cement holding it is quite dry.

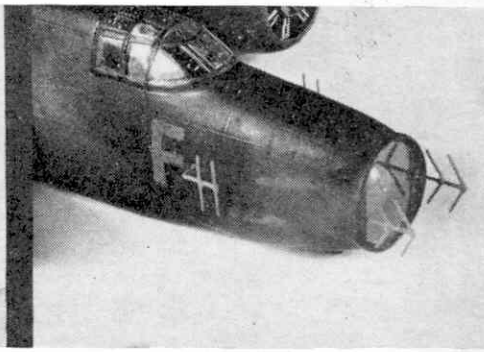


6. The two wires are now brought out through the nose and soldered to a 1·5 volt torch bulb. Clean the metal parts of the bulb with fine sandpaper and use only a mere touch of the soldering iron (which must be very hot) to secure the wires. Paint the rear part of the actual bulb glass with two coats of silver paint to act as a reflector.



7. Push the bulb back into the nose and temporarily cement a ½ in. disc of card to the nose to act as a shaping template. Build up the side contours and the lower fuselage ahead of the raised forward battery box bulkhead with body putty and allow to dry overnight. Build up the putty above the final level required to allow for shrinkage. Sand and carve to shape.



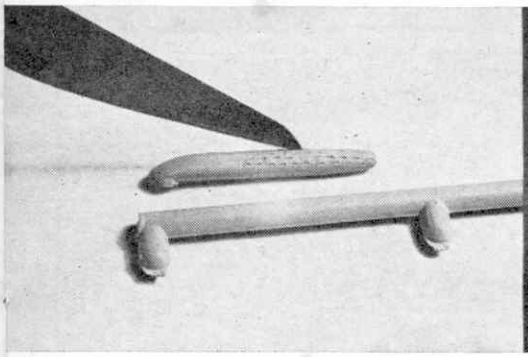


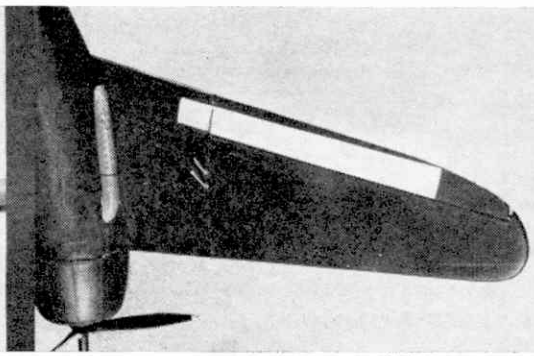
8. Remove the card nose disc after shaping. Bare the battery on one side to allow the negative contact to be made when the top aerial is depressed. A loose battery may be made more secure with a thin wedge of balsa against its back end.

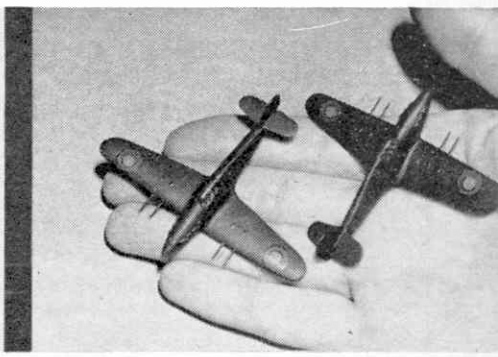
A cover is now made for the bomb bay using 60 thou. plastic sheet on the inner side of which two narrow strips are cemented to clip it firmly in place.

9. After painting, a clear acetate disc is fixed to the nose, and a thin strip of the same material is then formed into a ring which should be a good fit round the disc perimeter. The two pieces are then easily fixed together by running a little Johnson's film cement round the joint which is then effectively welded.

10. The nose aerials are made as shown in the accompanying line drawing or they can be soldered up from thin pieces of brass wire. They are fixed in place by drilling suitably sized holes in which the wire should be a tight fit. Contact adhesive can be used to secure the nose aerials and those on the sides can be fixed from the inside (through the nose wheel bay) with a good dollop of plastic cement.







11. Exhaust flame damper tubes are made from discarded plastic sprue shaped as shown. The exhaust 'fishtails' are simulated by indenting them with a knife blade. They are shown fitted in place in the next photograph.

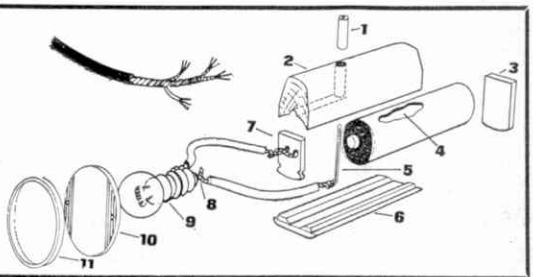
12. Note also the white strip under the wing. The wing radar aerials are also shown here. They consist of two thin pieces of wire threaded through holes drilled right through the wing and then bent backwards as shown both above and below the wing.

13. Photographers may be interested in the two little 'Silhouette' Hurricanes which were used in our heading picture. They were carved from wood, using small drawings found in an aircraft recognition book. The small scale gives an illusion of distance without taking the models out of the depth of field.

New parts required for Turbinlite conversion.

1. Brass tube bush for aerial
2. Balsa block
3. Rear Plastikard bulkhead
4. Part of battery paper removed to bare zinc case
5. Steel wire aerial "switch"
6. Plastikard bomb bay cover
7. Front Plastikard bulkhead
8. Stranded wire soldered
9. 1·5 V bulb
10. Clear acetate disc
11. Acetate ring

The small sketch shows how stranded wire is divided up, twisted and coated in solder after bending to shape to represent the radar aerials. Stretched plastic sprue can be used as an alternative.



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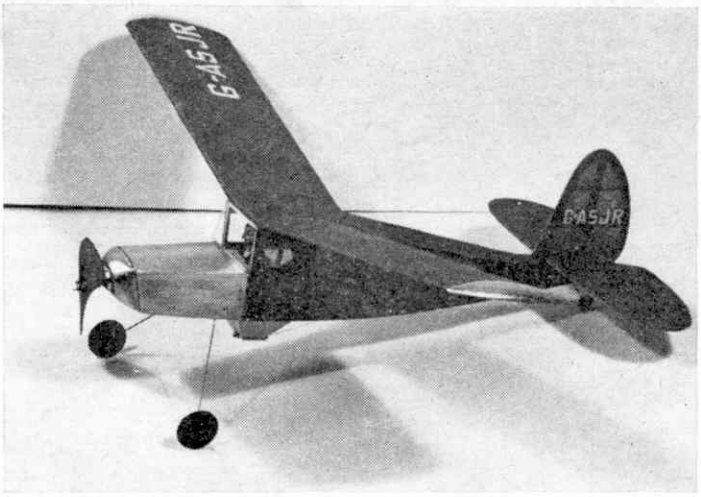


Crop-duster or Leaflet dropper that's

Starduster

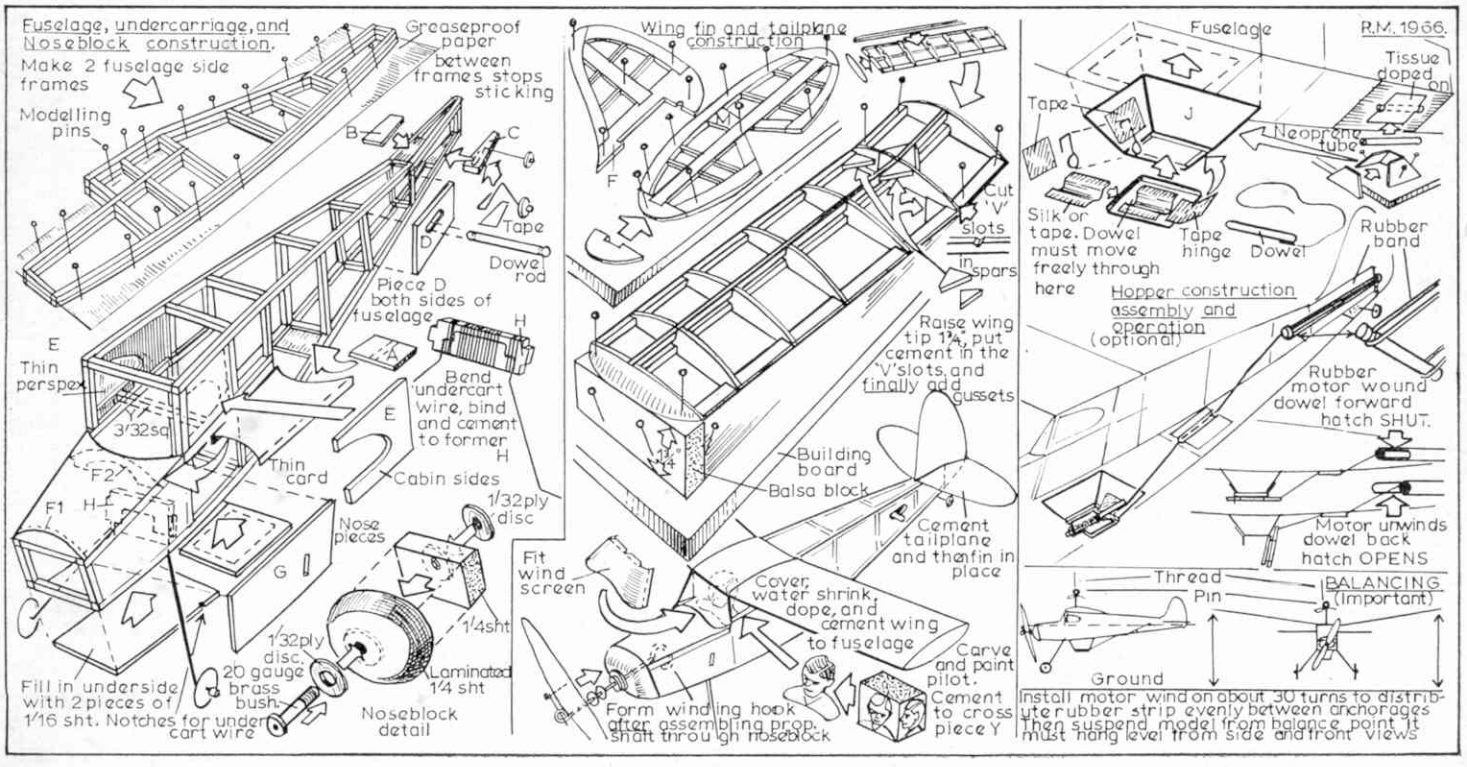
a semi-scale rubber powered model aeroplane by Ray Malmström

'STARDUSTER' certainly is a multi-purpose model. It will out-fly most models of a similar size and power and can, if you wish, be fitted up to do crop dusting over your flying field or even drop miniature leaflets over the nearby village! Building 'Starduster' presents no problems. Follow the 'easi-build' sketches and work from the full-size plans provided and in next-to-no time your 'Starduster' will be ready for flying duties. Perhaps you will prefer to fit the crop-dusting and leaflet dropping unit at a later stage, after you have got to know all about trimming and flying this fascinating little aeroplane.

Make sure your fuselage frame comes out square and is not twisted. Also check for warps in your wing, tailplane and fin. To avoid warps it is best to pin the frames down to your building board, using small blocks of balsa to keep the undersurfaces away from the board while the tissue is tightening. This is especially important at the final doping stage. Be careful to drill the nose block at a slight angle when viewed from the top, as shown on the plan. Cement the tailplane in place, *before* fitting the fin. If, when you come to the important business of balancing your model, you find you need some weight in the nose, fit the small radiator as detailed on the plan. This radiator makes a convenient place to hide a small piece of lead or folded cement tube. Cover the wing with five pieces of tissue, two pieces for the undersurfaces and three pieces for the top surfaces (right and left wing panels and centre section). The pilot is optional, but there is no doubt that he greatly adds to the realism of 'Starduster'. The registration lettering can be painted on with enamel paint (if you have a steady hand!) or you can use waterslide transfers obtainable in sheets from your model shop. Take care at each stage of your building and assembly, do not try and rush the construction and you will be rewarded by a model that not only looks good, but will fly well.

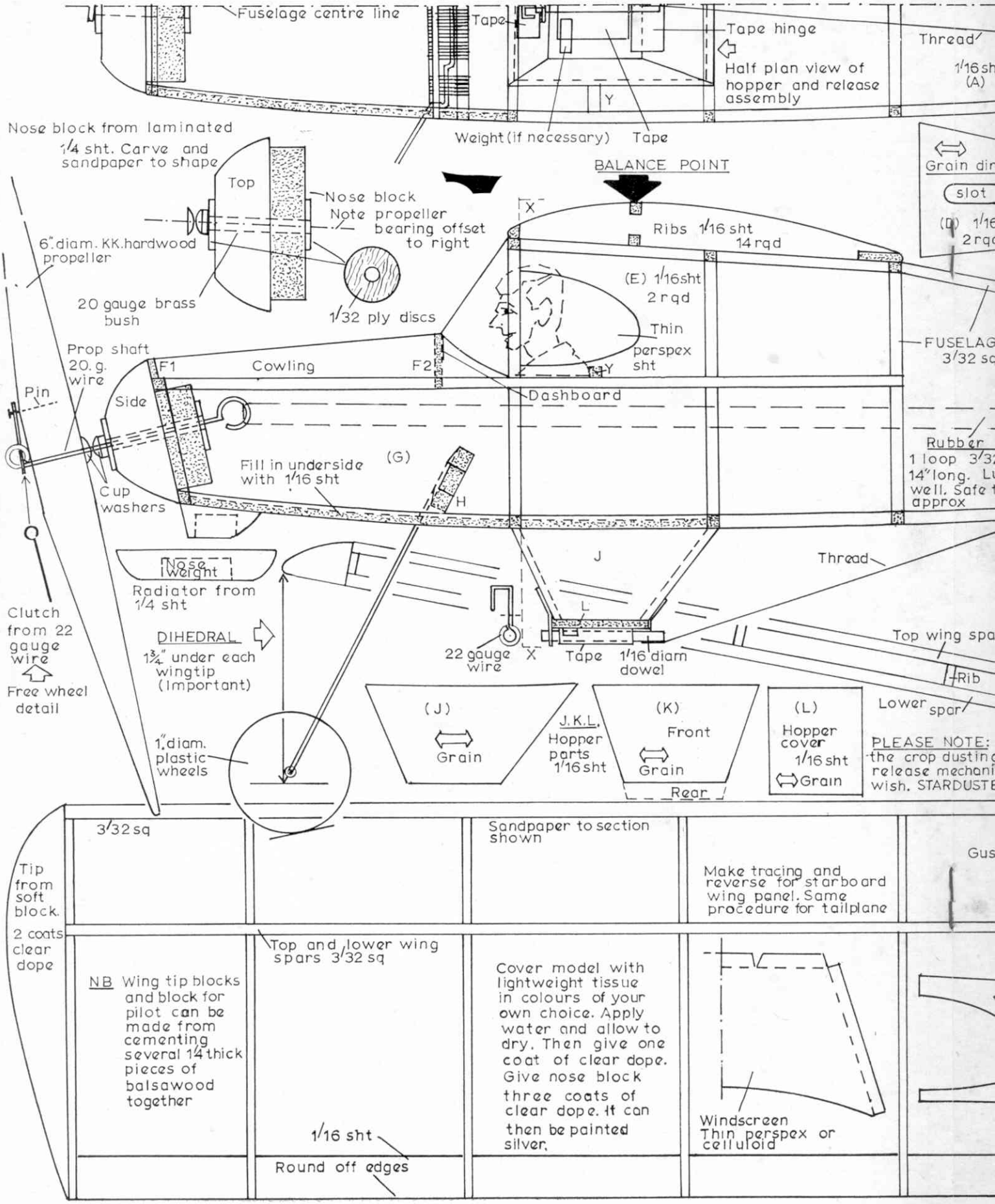
Flying: Install the rubber motor and balance your model as shown. For testing, choose a calm day and some soft grass, then launch 'Starduster' from about shoulder height into the wind. It should glide straight and land about 20-25 ft. away. Turns to left or right can be corrected by *gently* warping the fin in the opposite direction to the turn. (Model viewed from the rear.) If your model stalls (rears up in a steep climb, falls back on its tail and then dives), add some weight to the nose. If it dives straight into the ground without first climbing, gently bend up the rear edges of the tailplane ($\frac{1}{16}$ in. approx.).

Having obtained a shallow straight glide, connect the free-wheel clutch pin with the winding hook on the propeller shaft and wind up the motor about 150-200 turns. Please remember to rub special rubber lubricant (6d. a tube from your model shop) into your motor before putting turns on it. *Never* allow oil to come into contact with rubber or it will quickly perish. Launch gently, as before, but let the propeller spin for a second or two *befor* releasing 'Starduster'. If, under power, your model flies downward into the ground, stick a small piece of $\frac{1}{16}$ in. square balsa strip along the lower edge of the noseblock. If it stalls, cement a $\frac{1}{16}$ in. square strip along the upper edge of the noseblock. These adjustments alter the angle of the propeller driving shaft (as viewed from the side) and will correct a dive or stall under power without affecting the glide adjustments that you made earlier. When you want to use the crop-dusting leaflet dropping equipment make sure that the rear rubber anchorage dowel rod moves easily in its slot, and that the small dowel rod holding the hopper door closed moves freely in its tape mount. A tiny piece of lead cemented to this door will help it to open easily. Make sure there is no cement or dope on the tape hinge. If there is, it will become stiff and the hopper door will not open. For crop-dusting, you can fill the hopper with flour or yellow powder paint (we have also used 'Ready-Brek' and cold-water paste!). For leaflet dropping cut up some small ($\frac{1}{4}$ in. square approx.) pieces of paper, or use small pieces of coloured confetti. As a rule the hopper door opens towards the end of the flight. You will have to make adjustments to the rubber band that operates the rear-anchorage dowel rod to achieve the best moment for dropping. The tighter the band, the sooner the hopper door will open and vice-versa. As we found out when testing the original 'Starduster', this little model is lots of fun, so—good luck and Happy Flying!



Starduster materials list :

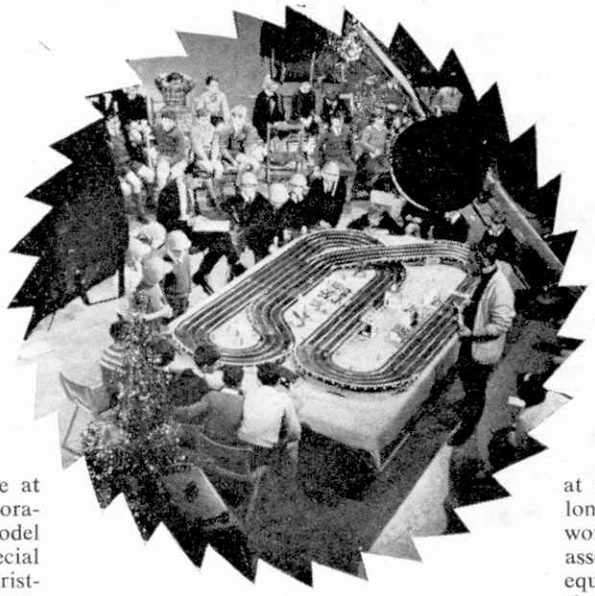
8 lengths 36 in. by 3/32 in. sq. balsa strip ● 1 sheet 36 in. by 3 in. by 1/16 in. balsa ● 1 length 12 in. by 3 in. by 1/4 in. balsa ● 1 small piec
12 in. length of 22 gauge piano wire ● 2 cup washers 20 gauge ● 1 brass bearing bush 20 gauge ● 1 pin ● 1 pair 1 in. diameter p
(colour to own choice) ● Small piece of thin card ● Small piece of thin perspex or clear celluloid ● 1 medium size tube balsa cement
● 30 in. 1/16 in. wide rubber strip ● 1 rubber tube lubricant ● 6 in. diameter Keil Kraft hardwood propeller. ● Powder or poster colour (



● 1 small piece 1/32 in. plywood ● 2 in. length of 1/8 in. diameter hardwood dowel. ● 1 in. length of 1/16 in. hardwood dowel (or rounded matchstick) ● 18 in. length of 20 gauge piano wire ● in. diameter plastic wheels ● Short length of neoprene tubing ● Short length of electric tubing ● 6 in. length of 1/4 in. wide linen tape or silk ● 18 in. thread ● 1 sheet lightweight tissue balsa cement ● 1 small tube tissue paste ● 1 small size bottle clear dope ● Small amount of silver dope (for nose sheeting cowling and noseblock) ● 1 3 in. length approx. (rubber band) poster colour (for pilot if fitted) ● Sheet of waterslide transfers (registration lettering).

Thread
1/16 sht (A)
Neoprene tubing
1/8 diam dowel rod
(B)
C
1/16 sht (C)
3" long (approx) rubber band
(B) 1/16 sht
Grain direction
slot
(D) 1/16 sht 2 rqd
Centre line
Cowling from thin card
Notches in rear dowel for rubber band
Round off all edges
Fin frame from 1/16 sht
Grain
(A)
FUSELAGE FRAME 3/32 sq strip
(F)
Tailplane
(B)
Rubber motor loop 3/32 flat strip 1" long. Lubricate well. Safe turns: 650, approx
Alternative power: 2 loops 1/8 flat strip 14" long
(D)
(C)
Tape
20 gauge wire
3/32 sht
Elec. tubing.
Leave open on underside
Neoprene tubing
Dashboard. Cut from plan
Grain (G)
Nose pieces 2rqd 1/16 sht
slot
F2
1/16 sht
F1
Grain
(F)
1/16 sht
ALL PARTS FULL SIZE
wing spar
Rib
spar
(H) 1/8 sht or 2 thicknesses of 1/16 sht
Thread
Grain
GE NOTE: You need not fit op dusting hopper and e mechanism unless you STARDUSTER flies equally well either way.
1/16 sht gussets
Bind and cement undercart wire to former H
View through X-X
Gussets 1/16 sht
Carve pilot from soft block. Paint with poster paints.
F2
Tailplane frame from 1/16 sht
Round off all edges
(M)
1/16 sht
Grain
Grain
(E)
Electrical tubing. Tight fit on axle.
(K)
(J)
(J)
(L)
(M)
STARDUSTER
Ray Malmström. 1966.

Scalextric on show



THERE'S something about a big store at Christmas time. Bright lights, decorations, Christmas cards and toy and model counters—all combine to create the special magic which never fails to give that 'Christmas feeling'.

If you walk into the model department of a large store at this time of the year, the chances are that you will be confronted by a huge crowd in the middle of the floor. Closer inspection will reveal the centre of all the attention—probably an enormous Scalextric layout!

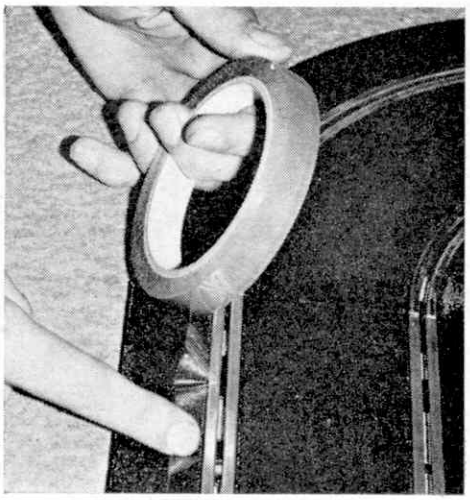
Perhaps you've sometimes wondered why so many shops put large layouts on display. After all, they take a lot of time and work to assemble, and once set up, occupy a great deal of valuable floor space. The reason is, of course, that a working Scalextric layout attracts crowds like bees round a honeypot, and helps to sell Scalextric products. However attractive the boxes, or however bright the pictures in the catalogue, a real working layout is the best advertisement of all. Such advertising techniques are, naturally, not really aimed at established Scalextric fans—they would buy Scalextric equipment if it were not advertised at all! But sales must be made to the general public as well, from the ranks of which a percentage of 'real enthusiasts' will, in time, emerge.

Layouts vary considerably in size, from small two-lane 'demonstration circuits', to enormous four-lane layouts with full scenic effects. One of the largest ever, a six-lane circuit, exhibited recently at a famous Glasgow store, measures thirty feet by ten feet—enough to make the average home racing enthusiast turn British Racing Green with envy! Sometimes, competitive events are held on these big tracks, and draw crowds of spectators. A Sunderland store that recently held such a competition had over two thousand entrants, and the layout proved so popular that the installation of Father Christmas had to be put off for several days!

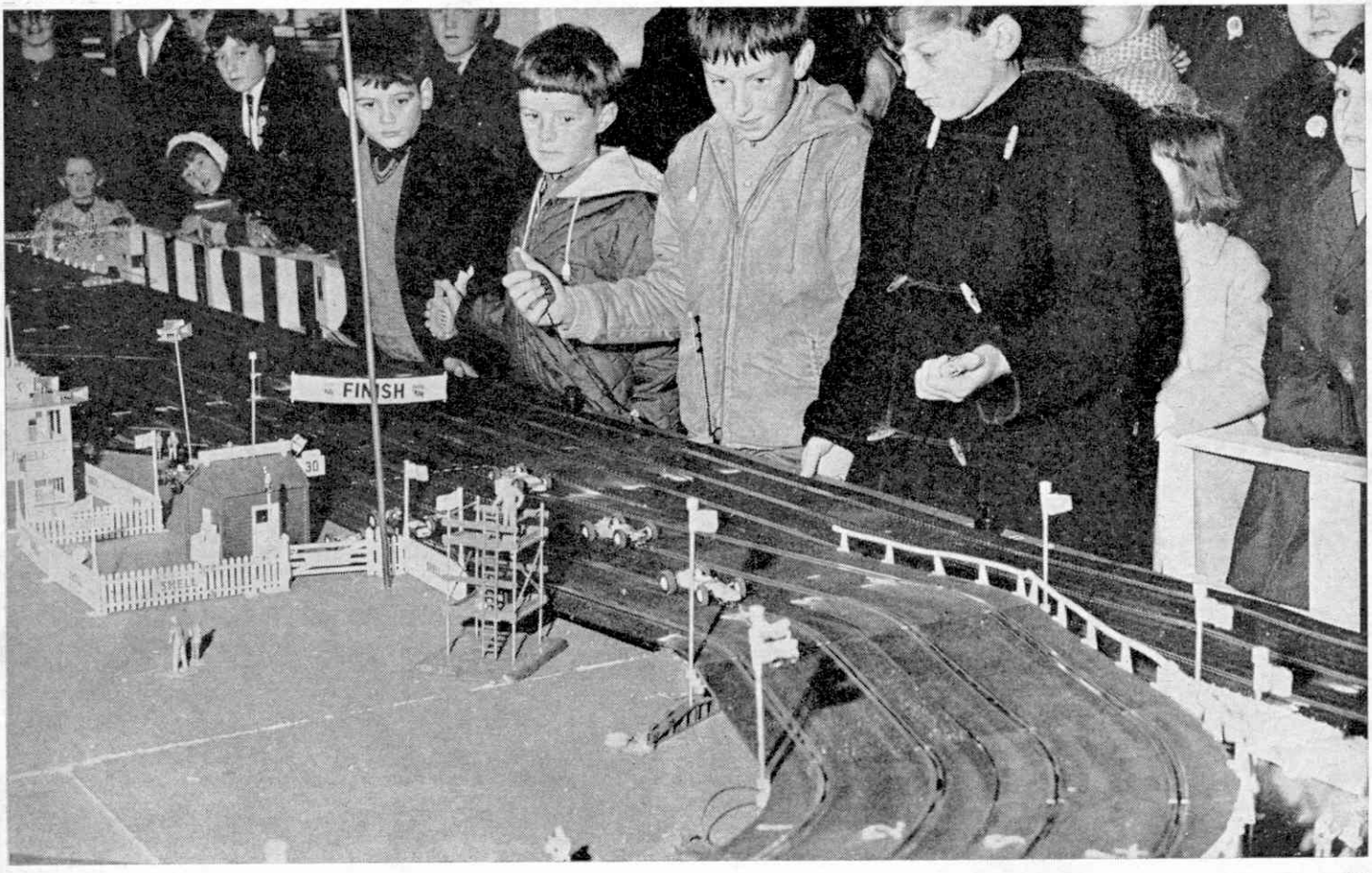
Scalextric has also appeared on television, notably on one occasion when Westward Television televised an exciting competition among teams from local schools. You name the place, and the chances are that, some time, a Scalextric layout has been there—even the second floor restaurant of the Eiffel Tower in Paris!

However envious you may feel when gazing at these huge exhibition layouts, with their long straights and complex flyovers, it is worth remembering that every circuit is assembled from completely standard Scalextric equipment, quite literally straight off the shelf. Not only the track and cars, but also all the 'decorations' including fences, grandstands, press boxes, pits and figures are standard items, and their combined effect on a big layout shows vividly how complete the Scalextric racing system really is.

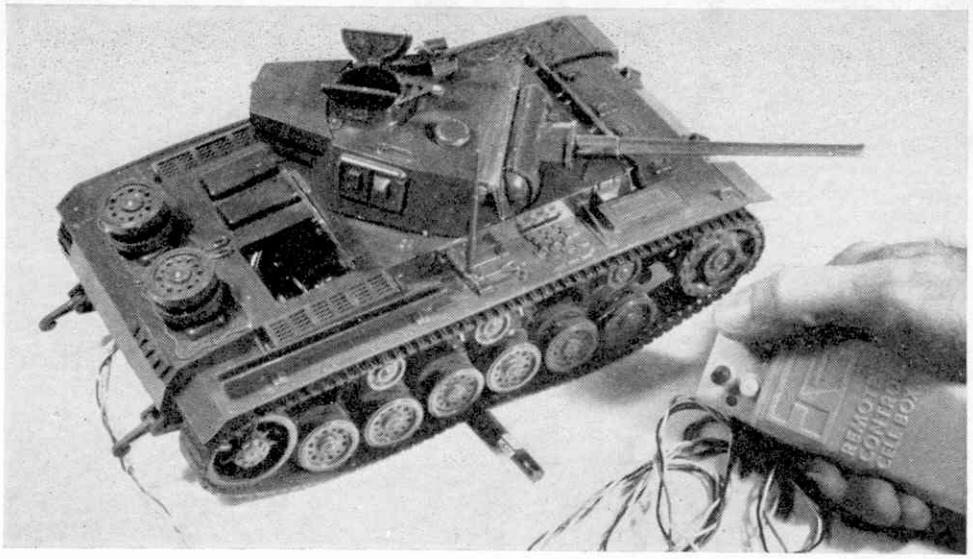
Below: a proud trophy-winner smiles at the camera after a Scalextric event at a large London store. Lower: applying Sellotape to one conductor rail of a section of track. Opposite page: enraptured faces make a frame for this big four-lane exhibition layout in a Northern store



The operation of large exhibition layouts sometimes poses problems that would not normally occur on an ordinary circuit. For instance, staff is not always available to supervise the layout, so the cars have to run themselves. To achieve this, an ordinary Tri-ang Hornby railway controller is wired to each lane, in addition to the usual racing hand throttle. This enables the cars to run unattended on a fixed throttle, but the problem does not quite end there! If the controller is set so that the car will safely negotiate the worst corner of the layout, it will appear to be travelling ridiculously slowly along the straights. It will, in fact, be just 'touring' around the circuit, providing very little excitement for the spectators. The answer to the problem is simple but effective. At all points on the layout where a slow speed is required, such as bad corners, descents from bridges, approaches to chicanes, etc., one conductor rail may be taped over with Sellotape. This cuts off current from the motor, and slows down the car very effectively. If just a light 'check' is required, short pieces of tape about $1\frac{1}{2}$ in. long placed about $1\frac{1}{2}$ in. apart will cause an intermittent break in the current supply to the motor, and the car will lose a little speed. Exact locations for the taped sections can be found with a little experiment, and it is really fascinating to watch a car speeding along the straights and slowing for corners and hazards, with nobody at the throttle! The 'taping' system can be applied with great success to home circuits, although a railway type controller will be needed. Tape one lane so that a car will lap safely at high speed. Then race against it on an 'untaped' lane, using an ordinary hand throttle. You will probably find it quite difficult to beat the 'robot' car! Although invented to enable exhibition layouts to run themselves, the 'taping' system is very useful on home layouts when no human opponents are available.



HAVE YOU SEEN ?



When you're after realism in working models, a good big model will usually beat a good little model. Nowhere is this more true than in the field of armoured fighting vehicles. The latest 1/21st scale 'Tamiya' tank kit is a *very* good model and as you can see it's big too—all of 12 inches long in fact! Its twin electric motors, independently controlled from the hand-held control box, enable the model to be driven forward, to left and right, turn in its own length or reverse. These operations are carried out at a most realistic slow rumbling speed and the twin gearboxes housed within the big hull produce a most realistic roar! Naturally it will also climb over obstacles, and up surprisingly steep inclines. All the lower bogie wheels are fully sprung—look at the one over the pencil—and there are lots of working features such as opening hatches, rotating turret, folding aerial, elevating guns, etc. —Oh yes, almost forgot to tell you that it's a model of the German Pz Kw III medium tank. Ours was not entirely finished when the photo was taken—transfers are yet to be applied and one or two detail parts are still to be fitted; incidentally, assembly is surprisingly straightforward.

You can buy 'Tamiya' tank kits from B.M.W. Models, 329 Haydons Road, Wimbledon, London, S.W.19, and the model illustrated costs **£4 10s. 0d.** including postage and packing.

From tanks to clocks is a big leap, but in model sizes they're both quite absorbing as constructional projects. The ghostly gadget shown in the picture is a fully self-winding clock, built from the Phillips Young Engineer outfit ME 1200. It's been hanging in our workshop for some time now and we are ashamed to confess that we were very surprised to find how well it kept time! When the weight drops to the bottom of its travel it is automatically raised again by a little electric motor (also supplied) without stopping the clock. The whole operation can be observed since all the parts are transparent—even the motor housing! The clock is only one of dozens of suggestions made in the instruction book; others include a working fire engine, six-speed tank, motor pumps and so on. No nuts and bolts are used in the assembly of these tough clear plastic components—merely a very clever self-gripping collet system, steel rods and spring steel pins which also double as gear and pinion teeth; Oh yes, you build up your own gears too!

Only fault we could find concerns the fat instruction manual. The more advanced models certainly need more stage-by-stage assembly sketches or photographs, it's easy to lose the sequence of assembly and imagination is sometimes needed. This, of course, is a fine means of *making* you think about what you're building and when you've finished a model such as the clock, you really feel that you've built it *all* by yourself! However, there must be many youngsters who become frustrated by the sometimes rather sketchy help given by the manual. The only trouble we now find is that we can't build anything else because we like our clock so much, that we don't want to take it to pieces—besides, how would we ever know when it's tea-time? You can't tell the time with a water-pump!

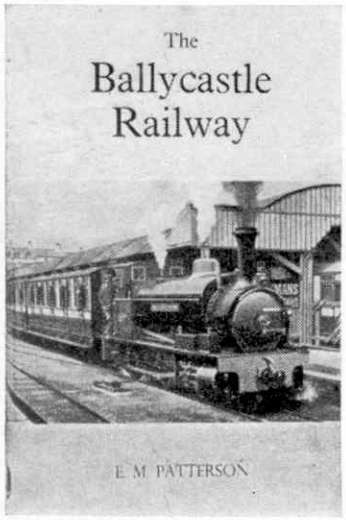
The Young Engineer ME 1200 set comes in a big strong wooden box with sliding lid and costs **£9 17s. 6d.**

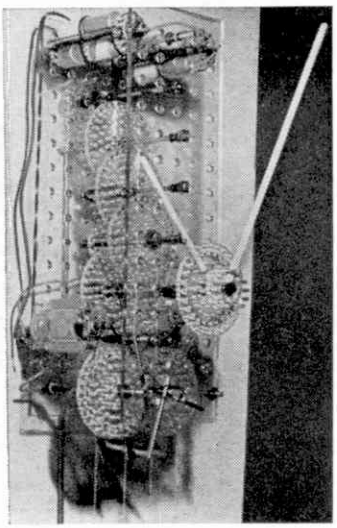
THE BALLYCASTLE RAILWAY
by E. M. Patterson
Published by Davis & Charles (Publishers) Ltd., South Devon House, Railway Station, Newton Abbot. Distributed by Macdonald & Company (Publishers) Ltd., Gulf House, 2 Portman Street, London, W.1.
Price 35s.
Size 8¾ in. by 5½ in. 154 p.p., 20 p.p. half-tone illustrations. 1 colour plate. 10 line drawings.

This book, part one of a history of the narrow gauge railways of North East Ireland, describes in fascinating detail the building, history, and fate of the little 3 ft. narrow gauge railway that ran from Ballycastle to Ballymoney, where it made a connection with the N.C.C. (L.M.S.) standard gauge line from Belfast to Derry.

In common with so many other Irish narrow gauge railways, the Ballycastle line was stricken throughout its career by severe financial hardship caused by sparse traffic subject to upsurges on market days when the company was forced into providing open wagons for carrying 3rd class passengers. The line relied almost entirely on tourist traffic, and also on the transporting of people and produce to and from the market traditionally held at Ballycastle since 1606.

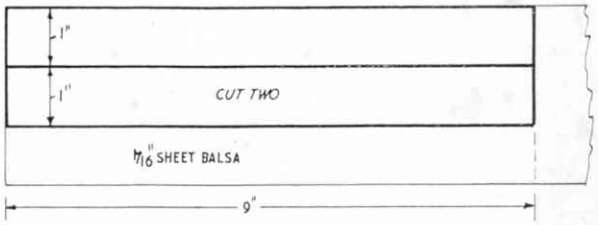
Opened in 1880, the line led an independent existence until 1925 when it became part of the N.C.C., which in turn passed into the control of the Ulster Transport Authority. The Author has written authoritatively on his subject, and includes many details of locomotives and rolling stock. The book will be of undoubted interest to all narrow gauge enthusiasts.





MAKE SIMPLE BOOMERANGS

You may not bag a kangaroo, or even a solitary bushranger, but you can always be sure of getting your own back with one of our easy-to-build boomerangs. Many happy returns!



These two basic models are capable of giving excellent results –the small one for indoor use and the larger model for outdoor launching where there is more space and less chance of hitting someone! Construction is simplicity itself, so start with an indoor model right away . . .

The two parts for the indoor boomerang should be cut from quite light $\frac{1}{16}$ in. sheet balsa. Mark off a 9 in. length on the sheet and then two 1 in. wide strips. Cut out with a modelling knife and check that the two pieces are exactly the same width. Round off the tips with fine sandpaper and then simply assemble the two blades, as shown, with a rubber band.

Your boomerang is now ready for trying out.

For a start, position the blades so that they form a 'cross' with four equal legs—and be sure to get the two blades at right angles. The boomerang will be easier to launch in this form, and will also describe the smallest circle in flight.

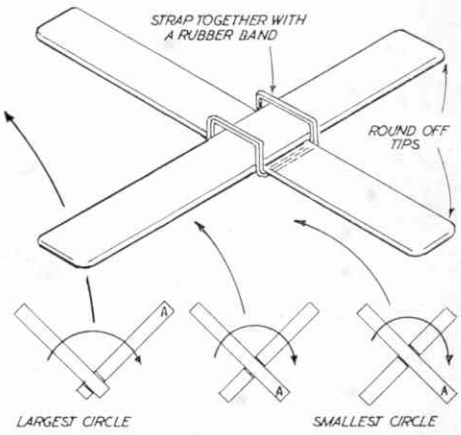
Holding the tip of one blade A (small diagram on the right), throw the boomerang forward with a spinning motion in the direction shown.

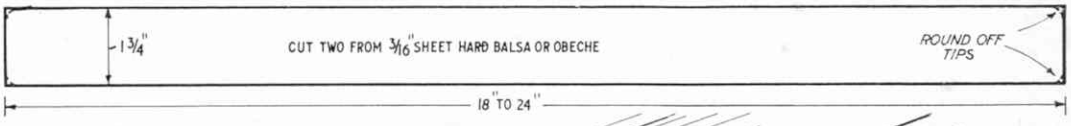
If you are left handed, hold the boomerang by the opposite tip and spin in the opposite direction.

With a little practice you will find it easy to make the boomerang describe a complete circular flight back to your hand—all within the space of a reasonable size room.

To make the boomerang fly in a larger circle, move the position of the blades to that shown in the middle diagram. Launch by tip A, as before.

For the largest circle of all, adjust the blade positions as shown in the left hand diagram. This time it will be easier to launch by holding the tip of one of the longer blades. Also you may find that the boomerang will not describe a proper circle because it is too light. The main thing is that by altering the blade position you alter the flight circle—but bear in mind that the smaller the flight circle (i.e., the nearer the boomerang is to an equal 'cross', the easier it will be to make it complete a circle back to your hand.





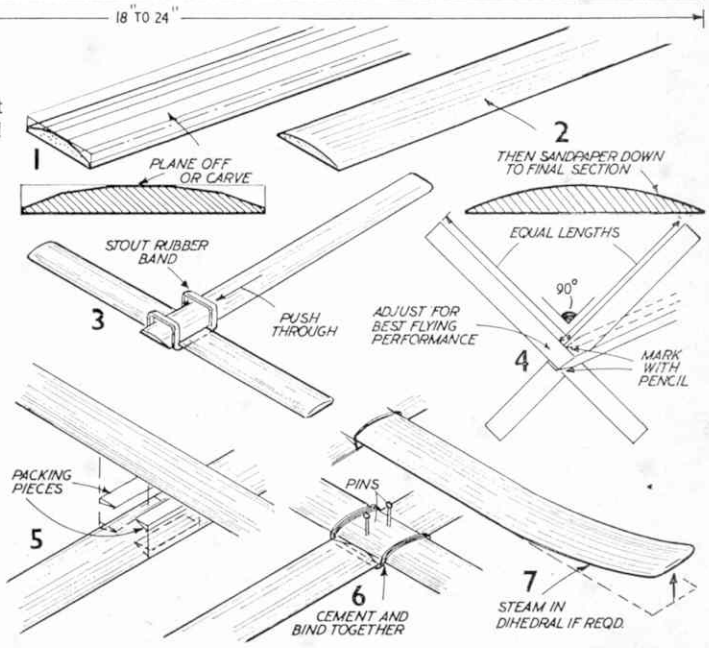
Layout of one blade for the larger boomerang is shown above. Cut *two* from hard $\frac{3}{16}$ in. sheet balsa or $\frac{3}{16}$ in. sheet obeche and make sure that they are identical. You can make the blades any length between 18 in. and 24 in., but the shorter length will be best to start with. You can make a larger one later!

The blades need shaping to an aerofoil section with equal camber (actually an ogival section). The easiest way to do this is to plane or carve down one surface into a series of five 'flats', as shown (1) and then finish off with sandpaper (2). Try to get both blades exactly the same. If you have a letter balance, weigh them as a check. If one blade is heavier than the other, sand more off it until the two blades weigh the same.

Assemble the boomerang like the indoor model, but this time using a really stout rubber band (3). This is only a temporary assembly to enable you to find the best position for the blades to suit your launching technique and the space available. When you have found a suitable set-up, mark the blade position with a pencil (4). Remove the band and shape a couple of wedges to act as packing pieces so that the top blade rests snugly on the cambered surface of the lower blade (5). Then cement the two blades permanently together (6). Use pins to hold until set, and bind the joint with thread for further strength.

If you find that your boomerang falls off to one side and loses height instead of describing a flat circle, try steaming some dihedral into the tip of each blade. Simply hold the blade in the steam from a boiling kettle and gently bend to a curve. Try to get exactly the same curve and tip rise (dihedral) on each blade.

Finally, remember that this model is an *outdoor* boomerang—so only launch it where there is plenty of space.



FUN & GAMES

Follow Up a Very Busy Beeline

YOU may be the one who gets stung if you fail to keep your eye on the proper beeline in the diagram right. How quickly can you trace the bee's erratic course from take-off to landing?

Paths follow sweeping curves and loops, do not veer off at angles. Select one of the five routes indicated by arrows at upper right and follow through as far as possible.

Of course, you'll be attempting to pick up the right trail first try, but don't give up if you fail.

Here is a Game for your Party

AN old-time fortune-telling device is sure-fire entertainment at a party. Fill a tub (or other vessel) with water to about three inches from top. Ask each guest to write a wish on a piece of paper and sign his name to it. Place folded wishes about tub as shown above. Place a lighted candle on a chip of wood in the tub. Give water a stir and see which slips burn. Those that do supposedly are the ones that will come true.

'How Old is Your Brother?'

'HOW old is your brother?' a man was asked. 'Two-thirds of his age is just five-twelfths of mine, and I am nine years older than he is,' was the reply. Give the younger person's age.

See if you can solve this in your head.

Answer: He is 15 years old, the older brother is 24.

Hour Glass Figures

IT'S between 11 and 12 a.m. In 13 minutes it will be as many minutes short of 1 p.m. as it was past 11 a.m. just seven minutes ago. What time is it?

Answer: It is eleven fifty-seven.

Riddle

WHAT occurs once in a moment and not once in a hundred thousand years?

Answer: The letter M.

How Many Hours?

THREE soldiers began digging two foxholes. One, working alone, completed his foxhole, three feet by three feet by three feet deep, in one hour. The other two, working at the same speed, made their foxhole two yards by two yards by two yards deep. How long did it take to complete the latter?

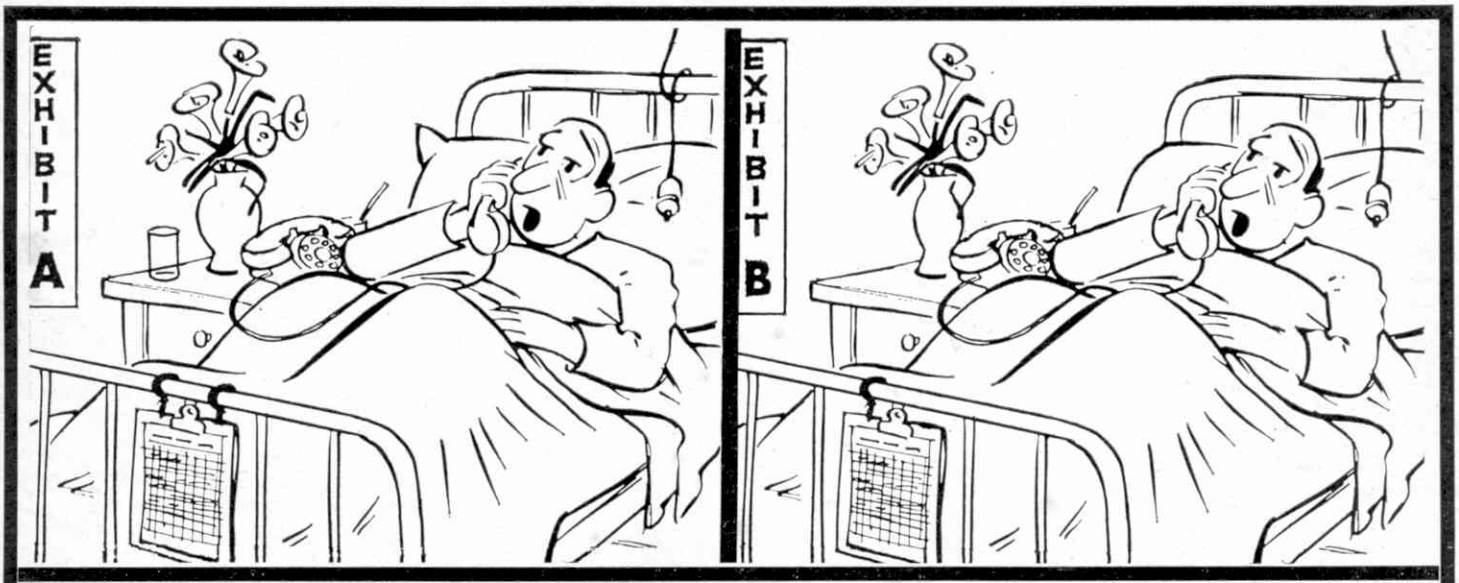
Answer: It took four hours.

Another Party Game

DISTRIBUTE slips of paper bearing nonsensical statements, such as 'Cotton candy makes me itch', 'I like to chase fleas,' etc., Invite two guests to stand before group, engage in conversation and attempt to slip in his particular 'crazy' sentence without attracting opponent's attention.

Smart Gallery Answers

Factual Discrepancy: Two phones occupy one phone cradle. Details: 1. Water glass is missing. 2. Vase is different. 3. Corner of pillow is missing. 4. Clamp is missing. 5. One sleeve is shorter. 6. Buzzer cord is repositioned.



Smart Gallery

USE your wits and eyes to find a single error of factual circumstance in both drawings above, and then look for six differences in detail between Exhibit A and Exhibit B. Solution above at right.

A couple of simple ones

by Spanner

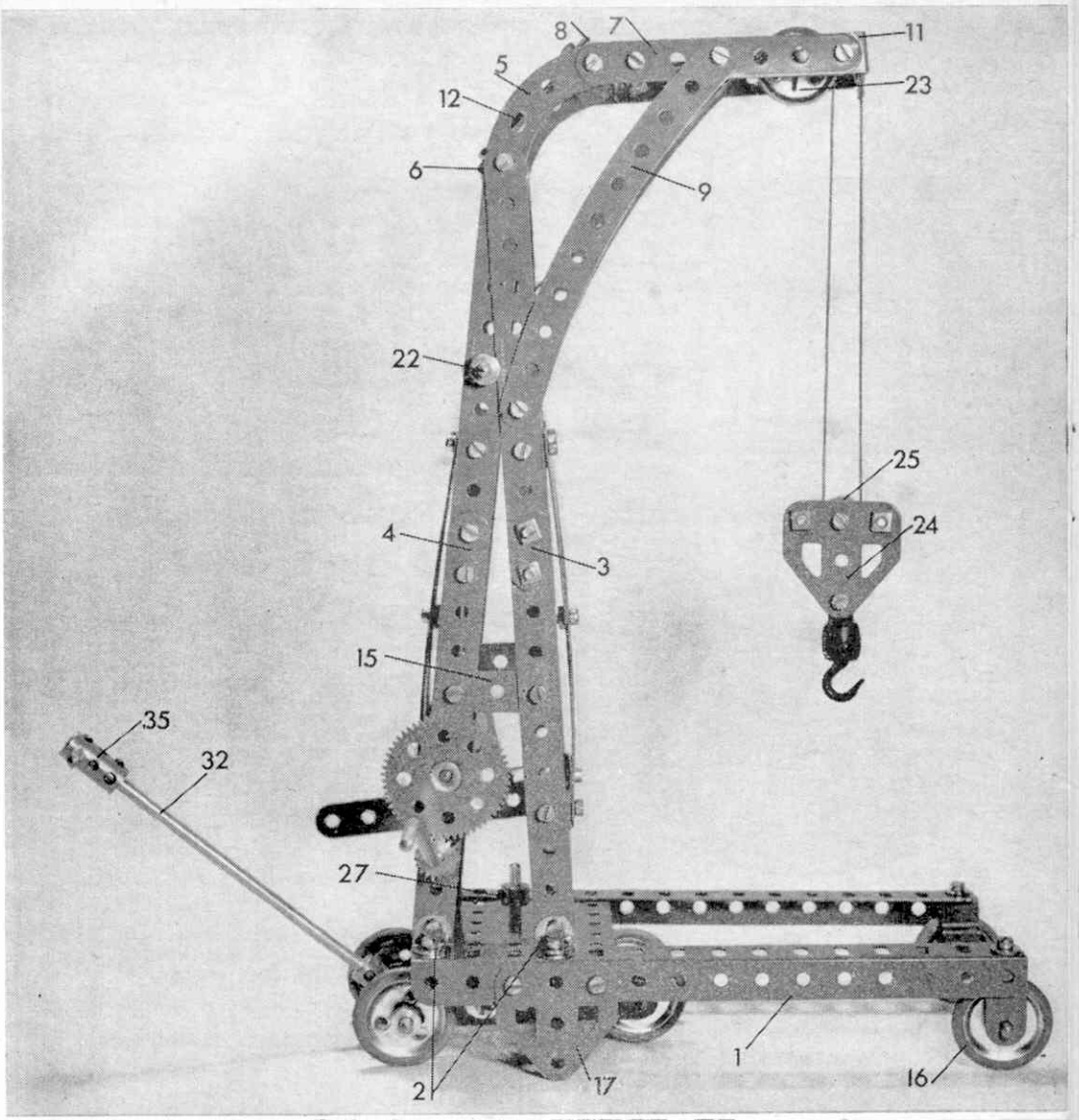
MENTION the word 'Crane' to me and I visualise a slender structure of intricate girder-work, soaring skywards to an immense height and crowned by a long, sweeping jib, cut short at the rear and solidly counterweighted. In other words, I see a huge builder's crane of the type used in the construction of multi-storey buildings, and the reason I do this, no doubt, is because I pass any number of them on the way to the office.

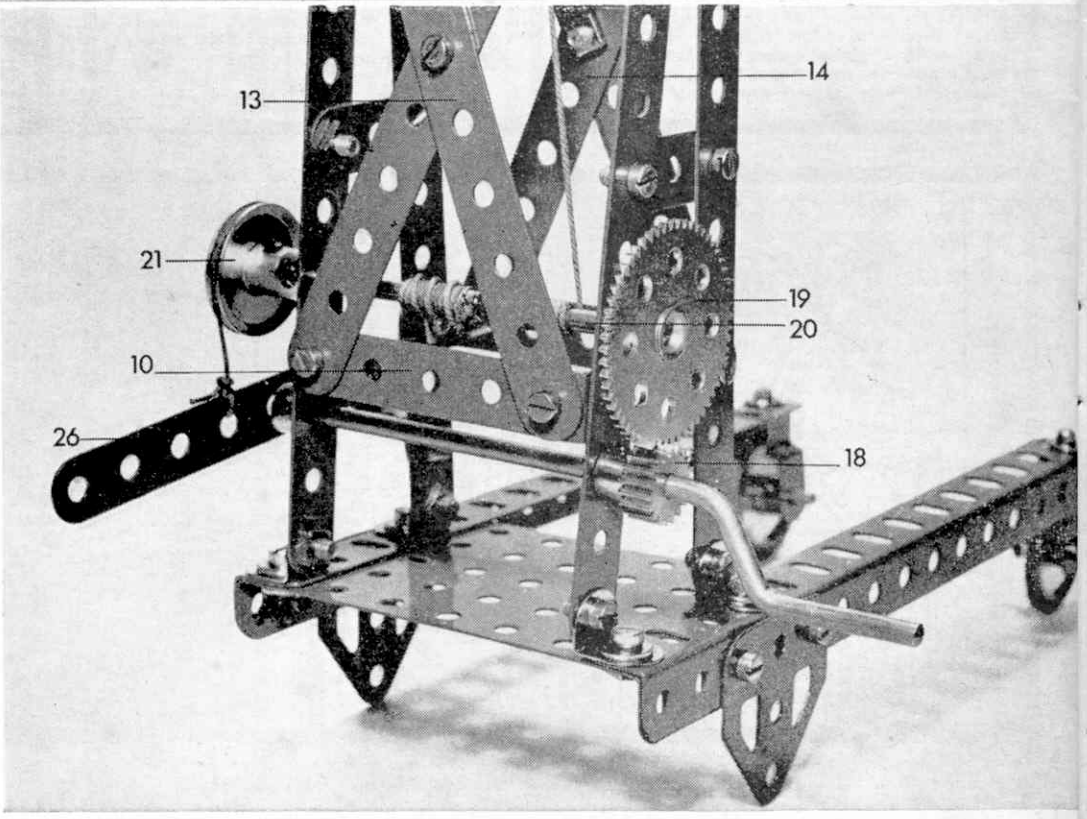
It is perhaps because I think of cranes as giant objects that I was particularly attracted by a little Portable Crane I saw modelled in a very old issue of Meccano Magazine. It seemed to be so much out of the ordinary that I felt it was well worth a second showing, especially as few, if any, of today's readers will have seen it. I therefore built it up, with a few slight modifications, and feature it as the first model in this article.

Portable cranes were, and still are, used extensively in industrial machine shops where, as a rule, there is little room to spare. In such places, a large crane would not only be useless, but would also be very much in the way. A portable crane, however, takes up a minimum amount of space and has the added advantage of being tremendously manoeuvrable. Indeed, it is essential. How else, for example, could a machine tool or casting weighing several hundredweight be brought close up to a specific machine and suspended safely in position until locked in place? It certainly couldn't be lifted by hand!

The Meccano Portable Crane described below is typical of its type and works extremely well. It's by no means difficult to build, although it is a little more complicated than it appears at first glance. Dealing first with the crane, itself, as opposed to the trolley, two 7½ in. Angle Girders 1 are bolted to a 3½ in. by 2½ in. Flanged Plate, at the same time fixing four Angle Brackets 2 in place, two to each Angle Girder. Bolted to each pair of Angle Brackets are two 10 in. compound strips 3 and 4, obtained from 5½ in. Strips overlapped two holes, which are brought together at the top and extended by a 2½ in. Stepped Curved Strip 5, at the same time fixing another Angle Bracket 6 in position. Curved Strip 5 is, itself, extended forward by a 3½ in. Strip 7, the rearmost securing Bolt again fixing an Angle Bracket 8 in place. A 5½ in. Curved Strip 9 is bolted between compound strip 3 and Strip 7 to strengthen the jib.

Compound strips 3 and 4 at each side are now joined by two 2½ in. by ½ in. Double Angle Strips 10,





while 3½ in. Strips 7 are joined by a 1½ in. by ½ in. Double Angle Strip 11. Additional cross-bracing is provided by two 2½ in. Strips 12, bolted between Angle Brackets 6 and 8, and two pairs of 5½ in. Strips 13 and 14. The latter are bolted between Double Angle Strips 10 and Angle Brackets fixed to compound strips 3 and 4, as shown in the accompanying illustration. Note, however, that it may be necessary to bend the Strips slightly to fit. Compound strips 3 and 4 at each side are further braced by a 1½ in. Strip 15.

To the front end of each Angle Girder 1 a Stepped Bent Strip 16 is bolted to provide a bearing for a 1 in. Rod carrying a 1 in. fixed Pulley with Rubber Ring. Flat Trunnions 17 are bolted two holes away from the other ends of the Girders, as can be seen.

Winding Mechanism

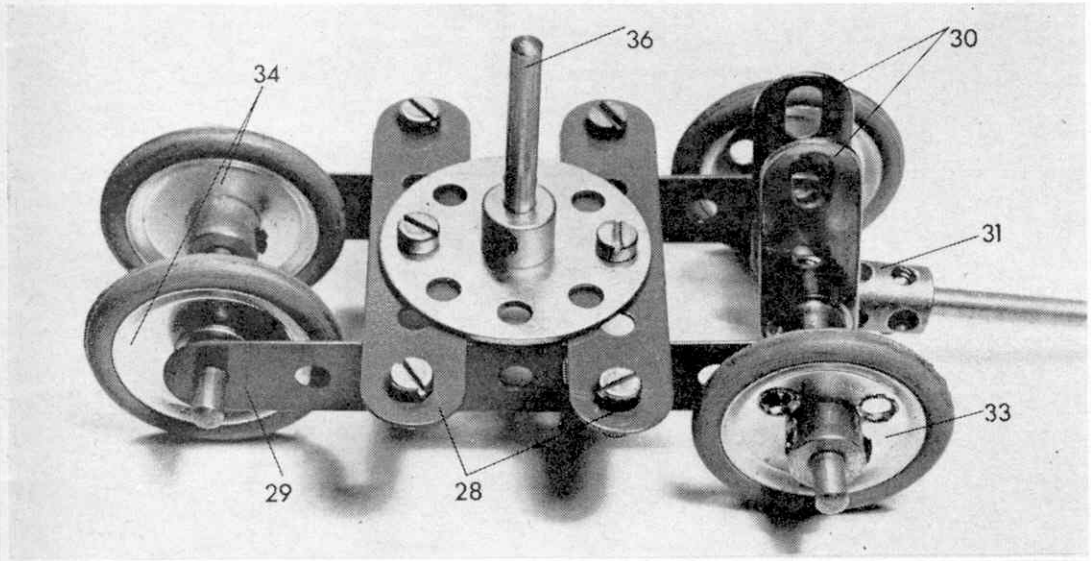
Journalled in compound strip 4 is a 3½ in. Crank Handle, held in position by a ½ in. Pinion 18 and a Collar. The Pinion meshes with a 57-teeth Gear Wheel 19 on a 3½ in. Rod 20, also held in place by a Collar, and carrying a 1 in. fixed Pulley 21 on the opposite end to the Gear Wheel. Another 3½ in. Rod 22, on which a ½ in. loose Pulley is held by Spring Clips, is mounted towards the top of compound strips 4, this, again, being secured by Collars, while a further two Collars hold a 2 in. Rod in the end of the jib. Mounted on this last Rod is a 1 in. loose Pulley 23, which is prevented from sliding about by Spring Clips.

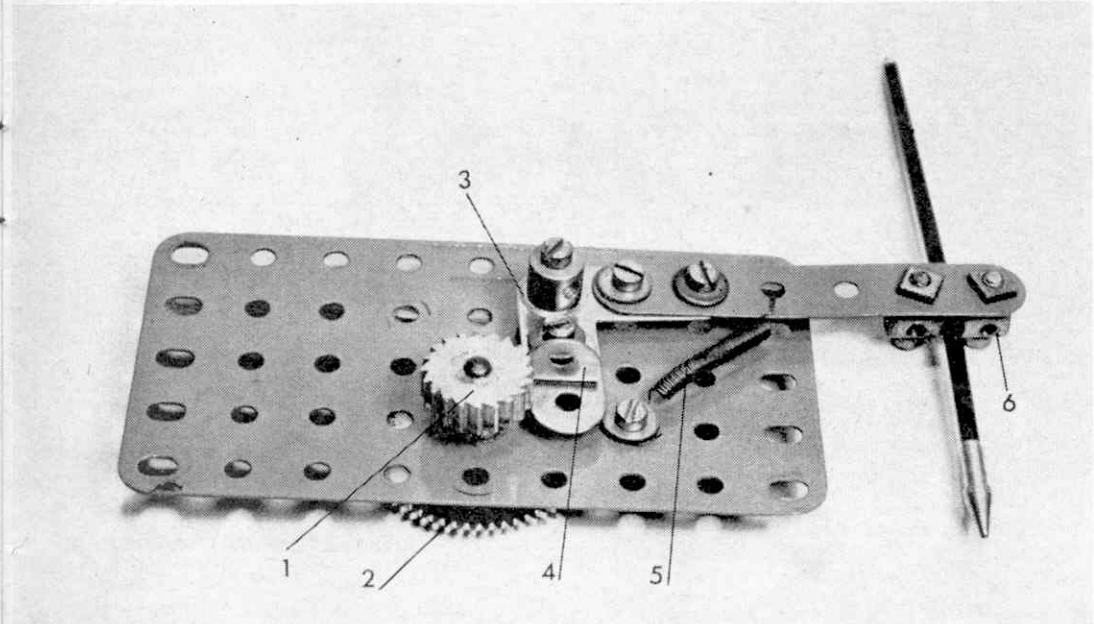
A substantial hook is built up from two Flat Trunnions 24, in the apex holes of which a ½ in. Bolt, carrying a Loaded Hook, is held by two Nuts. At the top of the hook, the Flat Trunnions are held sufficiently apart, by three Nuts on two ⅜ in. Bolts, to allow a ½ in. loose Pulley 25 between them. This Pulley is mounted on a ½ in. Bolt, secured by two Nuts. A length of Cord is now attached to a Cord Anchoring Spring on Rod 20, is passed over Pulleys 22 and 23, is taken around Pulley 25 in the hook and is finally tied to Double Angle Strip 11. A brake is supplied by a short length of Cord, passed round Pulley 21 and tied to a 3½ in. Strip 26. This Strip is lock-nutted to a Double Bent Strip bolted to compound strip 3.

Trolley

At this stage the crane proper has been completed, leaving only the trolley to be built and this is very simple. Two 2½ in. Strips 28 are attached by Angle Brackets to two 3½ in. Strips 29. Securely mounted between the latter, on a 2½ in. Rod, are two Cranks 30 and a Coupling 31, the Coupling being between the Cranks with the Rod passing through one of its end transverse smooth bores. A 5 in. Rod 32 is fixed in its longitudinal bore. Mounted on each end of the 2½ in. Rod, outside the Strips, are two 1 in. Pulleys without boss 33, each loosely held by two Collars. Journalled in the other end of Strips 29 is a 2 in. Rod, held in place by two 1 in. fixed Pulleys 34. Rubber Rings are mounted both on these Pulleys and on Pulleys 33. A Coupling 35, carrying a transversely-mounted 1½ in. Rod, is fixed on the end of Rod 32. Finally, an 8-hole Bush Wheel with a 1½ in. Rod 36 fixed in its boss, is bolted to Strips 28.

The principles involved in the trolley are really quite straightforward. Rod 36 protrudes through the centre hole in the 3½ in. by 2½ in. Flanged Plate and the weight of the crane presses down on the arms of Cranks 30, thus raising the handle formed by Rods 32 and 35. When this handle is depressed, the Cranks lift the crane—and consequently Flat Trunnion 17—off the ground so that the whole model can be towed away. A Collar 27 should be fixed on Rod 36, above the Flanged Plate, to prevent the Plate being raised so high that the arms of the Cranks slip out from underneath it.





Parts Required:

12 of No. 2	5 of No. 22	1 of No. 48
5 of No. 3	3 of No. 22a	2 of No. 48a
4 of No. 5	2 of No. 23	1 of No. 53
2 of No. 6a	1 of No. 24	1 of No. 57c
2 of No. 8b	1 of No. 26	11 of No. 59
16 of No. 12	1 of No. 27a	2 of No. 62
1 of No. 15	4 of No. 35	2 of No. 63
2 of No. 16	84 of No. 37a	2 of No. 89
1 of No. 16b	73 of No. 37b	2 of No. 90a
2 of No. 17	9 of No. 38	2 of No. 111a
2 of No. 18a	1 of No. 40	2 of No. 111c
2 of No. 18b	2 of No. 44	4 of No. 126a
1 of No. 19s	1 of No. 45	6 of No. 155

Dot Machine

Have you ever had to prepare a manuscript or poster which incorporated a load of dotted lines? If you have, you will know that drawing these lines by hand can be a bit of a nuisance, so you should be particularly interested in the other little model featured here. It's what could be described as a 'mechanical dot drawer'.

The model is really very simple in design, consisting of a 4½ in. by 2½ in. Flat Plate, in the centre of the second row of holes of which a 1 in. Rod is held by a Ratchet Wheel 1 and a 50-teeth Gear Wheel 2. Pivotally attached to the Plate in the position shown is a Bell Crank 3, one arm of which is extended by a 3 in. Strip, while an Angle Bracket 4 is bolted to the other arm in such a position that it engages with the teeth of the Ratchet Wheel. It is important to remember that the Bell Crank is loose on the shank of a ¾ in. Bolt, held by two Nuts in the Plate, with three Washers spacing the Bell Crank from the inside Nut.

Angle Bracket 4 is held in constant contact with Ratchet Wheel 1 by a short length of Spring Cord attached to the 3 in. Strip and bolted to the Flat Plate. A penholder of some sort is attached to the end of the 3 in. Strip and a suitable pen is fixed in this. For the purpose of illustration we used a Coupling 6 as the penholder and a ball-point pen refill as the marking instrument, but the best results are obtained from a felt tipped pen. In this event, however, the pen holder would need to be something such as a Small Fork Piece.

To use the model successfully a wooden rule is required. The rule is placed on the paper to be marked and the dot machine is positioned so that the Flat Plate slides along the edge of the rule while Gear Wheel 2 runs along the top of the rule when the machine is pushed along.

Parts Required:

1 of No. 4	3 of No. 37b	1 of No. 111
1 of No. 12	7 of No. 38	2 of No. 111a
1 of No. 18b	1 of No. 53a	1 of No. 128
1 of No. 27	1 of No. 58	1 of No. 148
7 of No. 37a	1 of No. 63	

BUILD a BUG

Of all the great names associated with pre-war motor racing, many still spring easily to mind—Alfa Romeo, Bentley, Mercedes, Auto Union. The latest 1/24th scale kit in the Monogram Classic Car series recalls from the distant past perhaps the greatest of them all—the Bugatti.

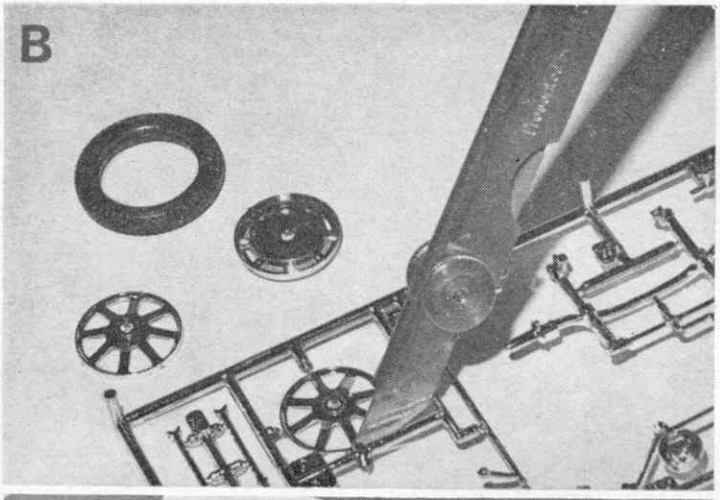
ETTORE BUGATTI was born on September 15, 1881, in Milan. His father was a sculptor, painter, architect, mechanic and silversmith, and his brother also excelled in sculpture. In such an atmosphere it is not surprising that young Ettore grew up with strong creative talents. He served an apprenticeship in a motor-cycle factory, and built his first car when he was only eighteen years old. It was reasonably successful, particularly by the standards of the time, but it did not satisfy the youthful Bugatti who was already beginning to show signs of the meticulous mind and perfectionist attitude towards his work which characterised his cars in later years. In 1899 he built his second car, which ran beautifully at quite high speeds, and from then on he never looked back. Although Italian by birth, he later chose to live in France, where he set up his factory in the town of Molsheim. There he constructed the legions of cars, both large and small, which dominated the race-tracks of the world for so many years and made the horseshoe-shaped radiator the symbol of all that was best in engineering and craftsmanship.

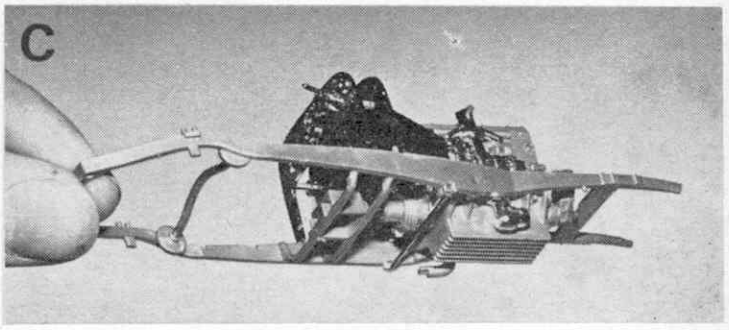
The type 35, which first made its appearance in 1924, is probably the most typical of all Bugatti's cars, and it is for this reason that Monogram have chosen this type from the large variety of Bugattis that were built, all of which would make spectacular models. The 35B itself was a 2.3 litre supercharged version of the type 35. The magnificent engine had eight cylinders in line, an overhead camshaft operating three valves per cylinder. The wheels, which were of cast aluminium with integral brake drums were, perhaps, the most outstanding feature of the car. This method of construction not only ensured that the brakes remained cool under racing conditions, as the heat was conducted away along the large flat aluminium spokes, but also meant that when a wheel was changed at a pit stop during a race, the car received a new brake drum into the bargain!

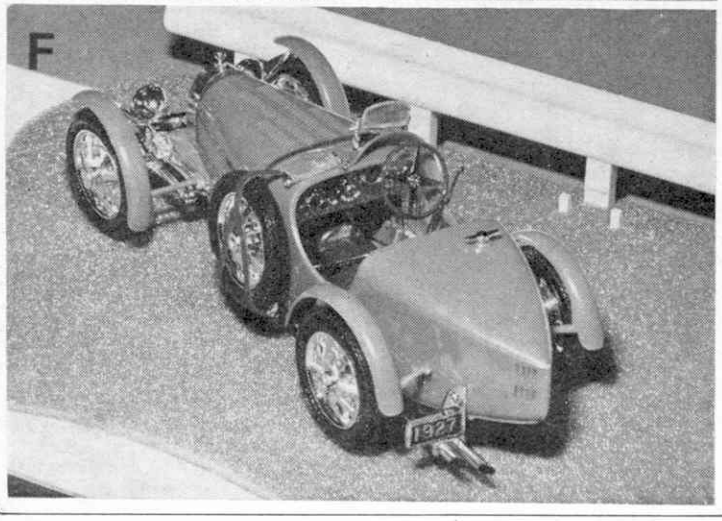
The 94 part kit is very easily assembled, providing that care is taken at all stages of the construction. Having read the very well illustrated instruction sheet, the first thing is to decide which version you wish to build, as the car can be assembled in Grand Prix racing trim or in 'street' condition with wings, lamps and licence plates. A 'chassis only' version can also be built for those who want to gloat over all the fine detail that would otherwise be obscured by the body—but you must decide before you start to build!

Our pictures will give you an idea of the terrific detail that is incorporated in the model, and some of the stages of its construction.

This is one of a series of five Monogram Classic Car kits, which are all built to 1/24th scale. They cost 40s. 6d. each, and further details of these and dozens of other Monogram kits are contained in the Monogram Catalogue obtainable from your local model shop for 1s. or direct from A. A. Hales Ltd., 26 Station Close, Potters Bar, Herts. Price 1s. 6d., post paid.







A. The completed car standing in the paddock, under the watchful eye of its driver. The 'grass', crash-barrier, straw bales and the driver himself are all included in the kit.

B. Detach parts from their sprues only as you need them—that way they just *can't* get lost. Cut them out cleanly with a knife, as shown here. In the background can be seen the three parts that make a complete wheel—inner and outer wheel sections and a really beautiful representation of a 19 in. Dunlop racing tyre.

C. The chassis frame with the engine installed. Note the fine detailing of the heavily ribbed sump, and the blower just visible on the side of the engine.

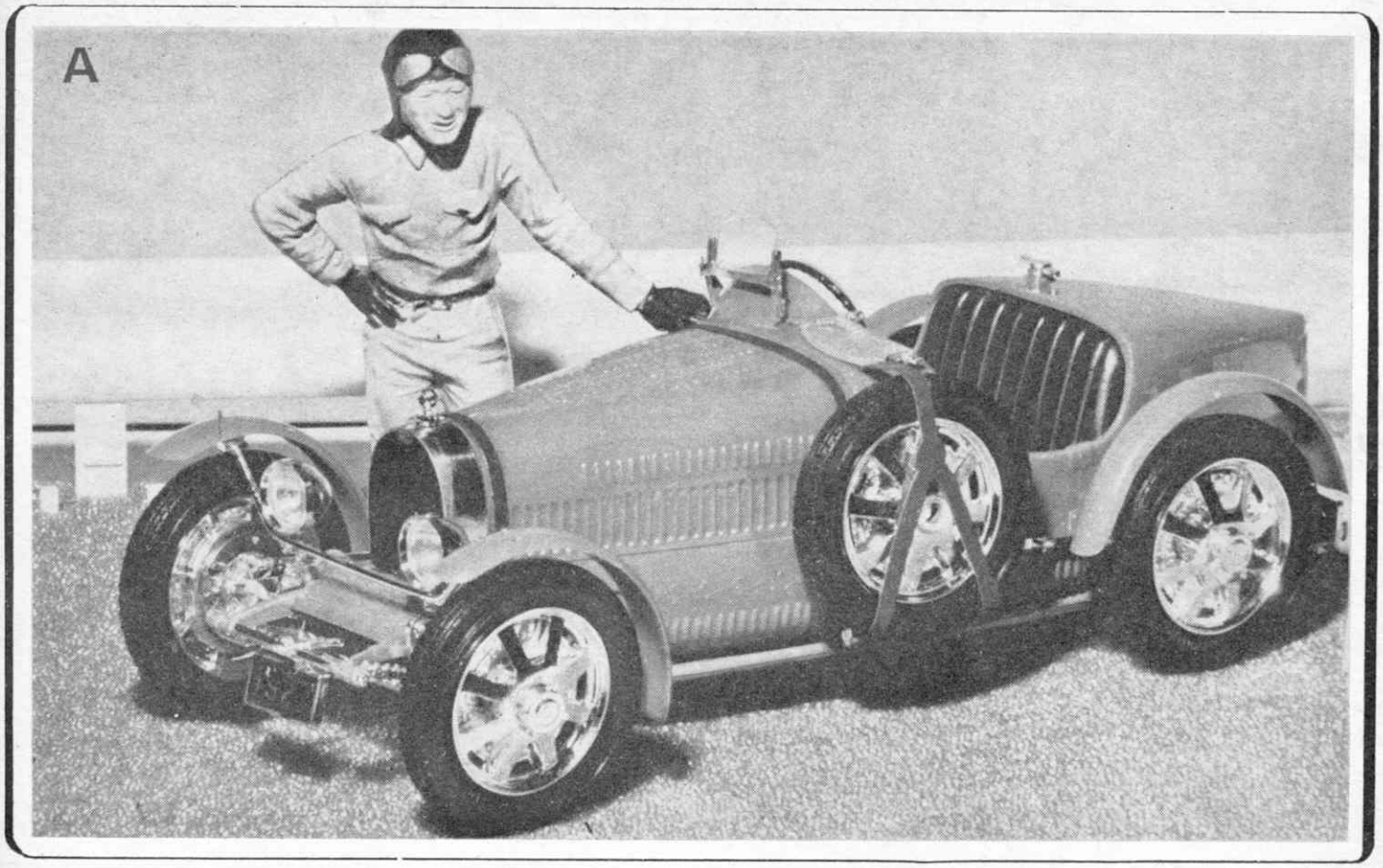
D. The chassis again, with front and rear axle assemblies. If assembled with care, the wheels will run very freely indeed.

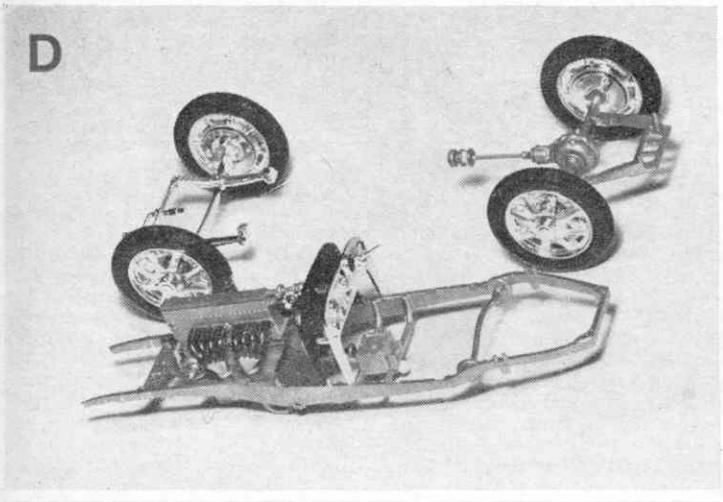
E. The completed car with the bonnet off. The driver's seat and steering wheel have been painted semi-matt brown, the engine exhaust manifold pipes matt brown, and the licence plates matt black.

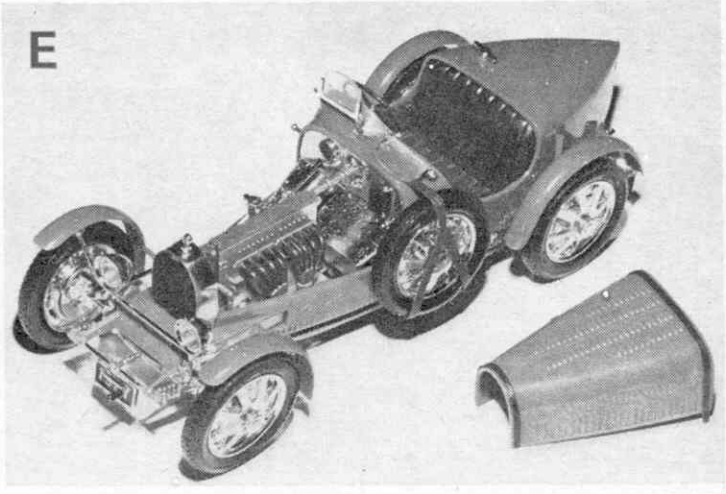
F. The superbly detailed cockpit can be seen to advantage in this rear view of the Bug. The bonnet retaining straps and spare wheel straps really do look like leather.

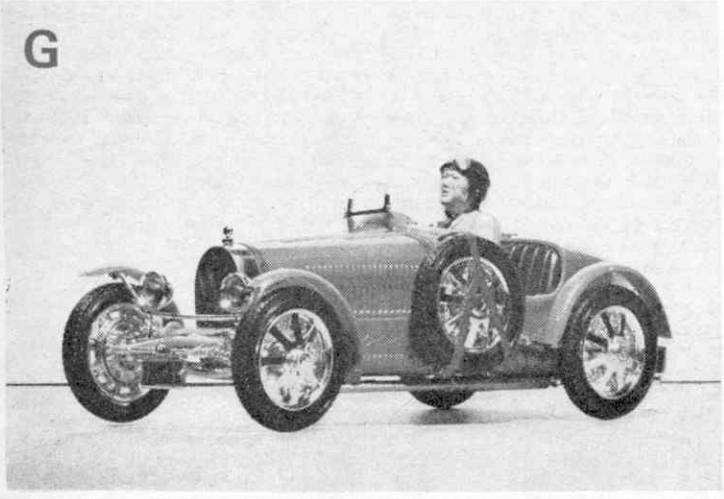
G. To obtain a driver for our car, we took the rather drastic step of sawing off the legs of the figure supplied in the kit! Notice his delighted expression.

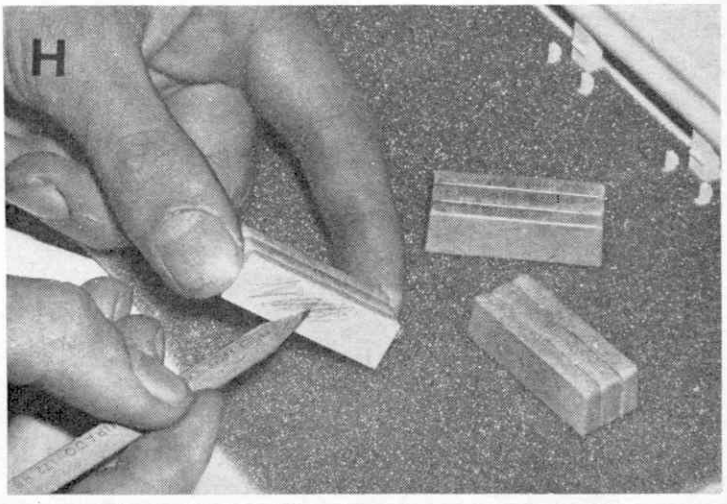
H. The straw bales, as supplied, are a rather bright yellow. We toned ours down a bit by rubbing with a pencil, as shown, and then smearing with a finger. The result is surprisingly realistic.



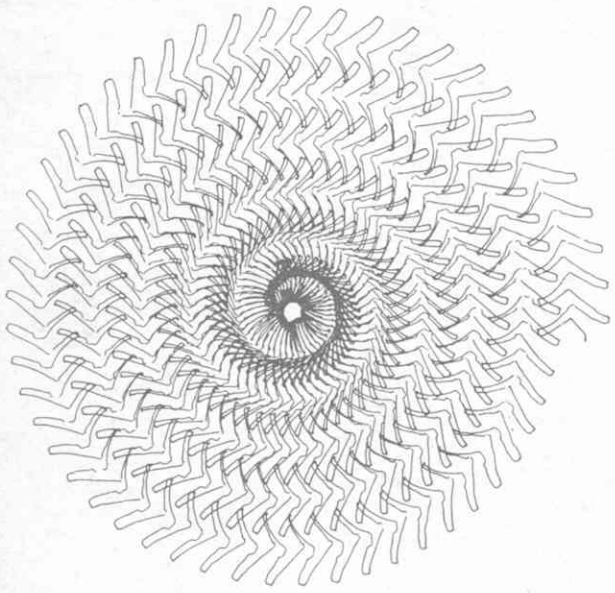






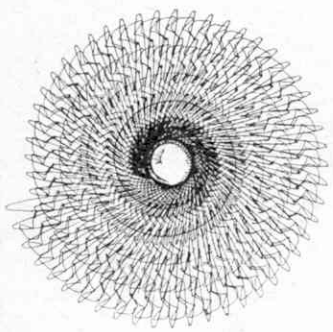


More than a Meccanograph



Fascinating to build, and even more fascinating to operate, the Meccano Spiralograph produces complex spiral patterns to order. You can set the machine to produce a variety of different designs.

FEW Meccano models are more fascinating than those amazing mechanical pattern - producing machines which, for many years, we have identified by the name 'Meccanograph'. I suppose most enthusiasts with enough parts at their disposal have, at some time or another, had a shot at building one of these captivating gadgets, but few designers have managed to produce anything quite so successful and yet so compact as the machines invented by Mr. Andreas Konkoly of Budapest, Hungary. Mr. Konkoly is now a past master of the Meccanograph, having built examples of many shapes and sizes.



He has been written about in Hungarian magazines and has even appeared with his creations on Hungarian television.

Not least, he has provided the M.M. with some very useful material. In August 1965, for example, we published an article entitled 'A Magnificent Meccanograph'. As you will have guessed, the model featured was designed by Mr. Konkoly. Now he has sent us details of another model—this time of a machine he aptly describes as a 'Spiralograph'. Generally speaking, it's very similar to a Meccanograph except that, instead of drawing a regular pattern which ends at its starting point, it draws a pattern that gradually spirals into the centre.

This is a complete departure from the normal run of things and results in some very interesting and unusual designs. Any number of different patterns can be produced, in fact, although it takes a bit of practice to obtain the best combinations. Once we had mastered the operation of the model, we were so impressed with it that we decided to show it —working—on the Meccano Magazine stand at the Daily Mail Boys and Girls Exhibition which will be held at Olympia from December 27, 1966 to January 10, 1967 inclusive. If you pop along we'll be delighted to see you.

Construction of the model is not difficult, but great care must be taken to see that the framework is quite rigid and that all gears and other moving parts run perfectly freely. To begin with a strong framework is built up from two 12½ in. Angle Girders 1 connected through their first, fifth and eighteenth holes by three 5½ in. Angle Girders 2, 3 and 4, and through their twenty-fourth holes by a 5½ in. by ½ in. Double Angle Strip 5.

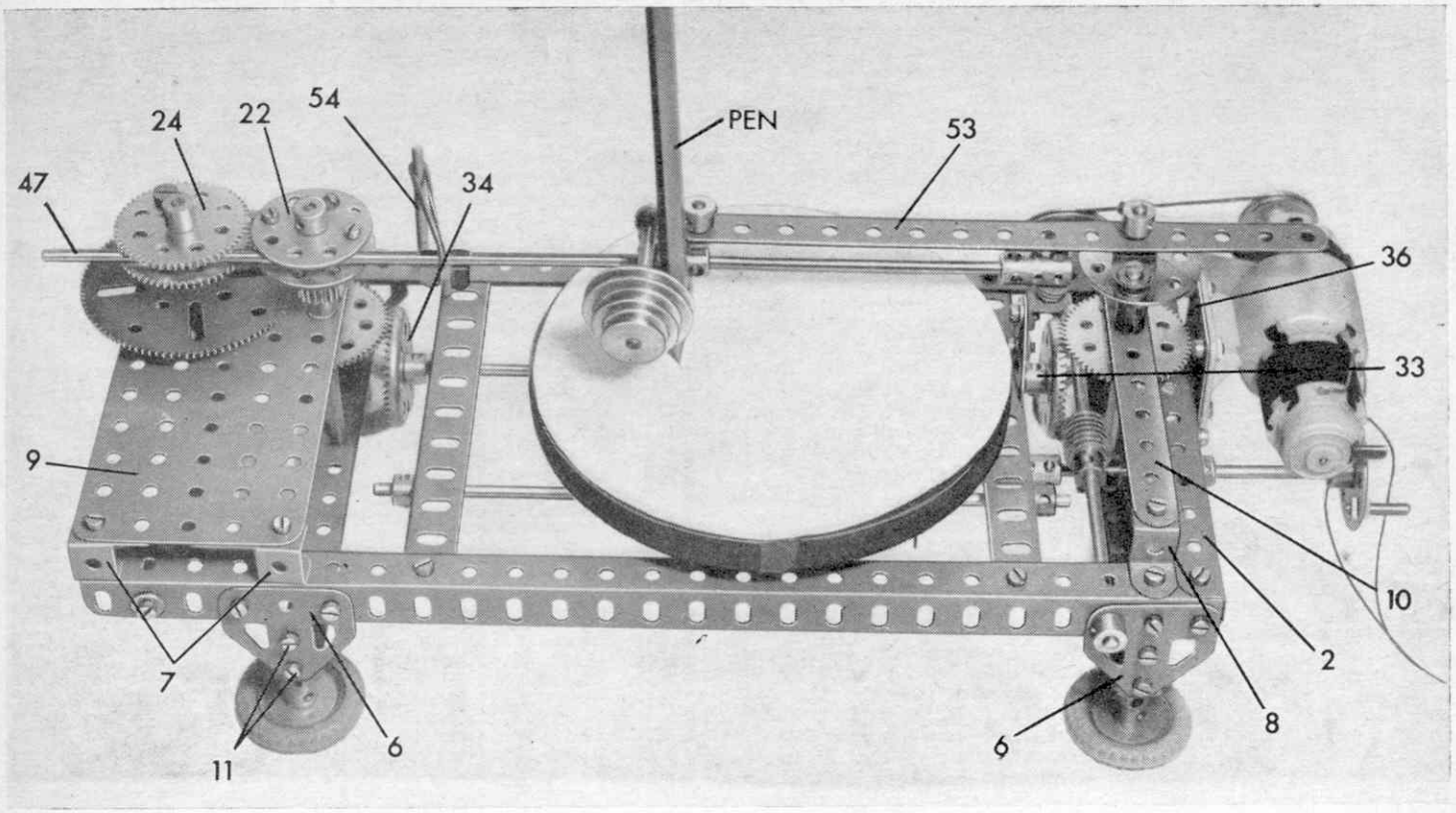
Bolted to the vertical flange of each Angle Girder 1 are two Flat Trunnions 6, while bolted to each horizontal flange are two Double Brackets 7 and a ½ in. by ½ in. Reversed Angle Bracket 8. Fixed to Double Brackets 7 is a 5½ in. by 2½ in. Flat Plate 9, whereas a 5½ in. Strip 10 is fixed to Reversed Angle Brackets 8. A 1 in. by ½ in. Angle Bracket 11 is secured by Bolts 11 through its long lug to the inside of each Flat Trunnion 6, then two 5½ in. Strips 12 and 13 are fixed one to the short lugs of each pair of these Angle Brackets by a ¾ in. Bolt that also carries a 1 in. fixed Pulley with Motor Tyre 14 and a Collar.

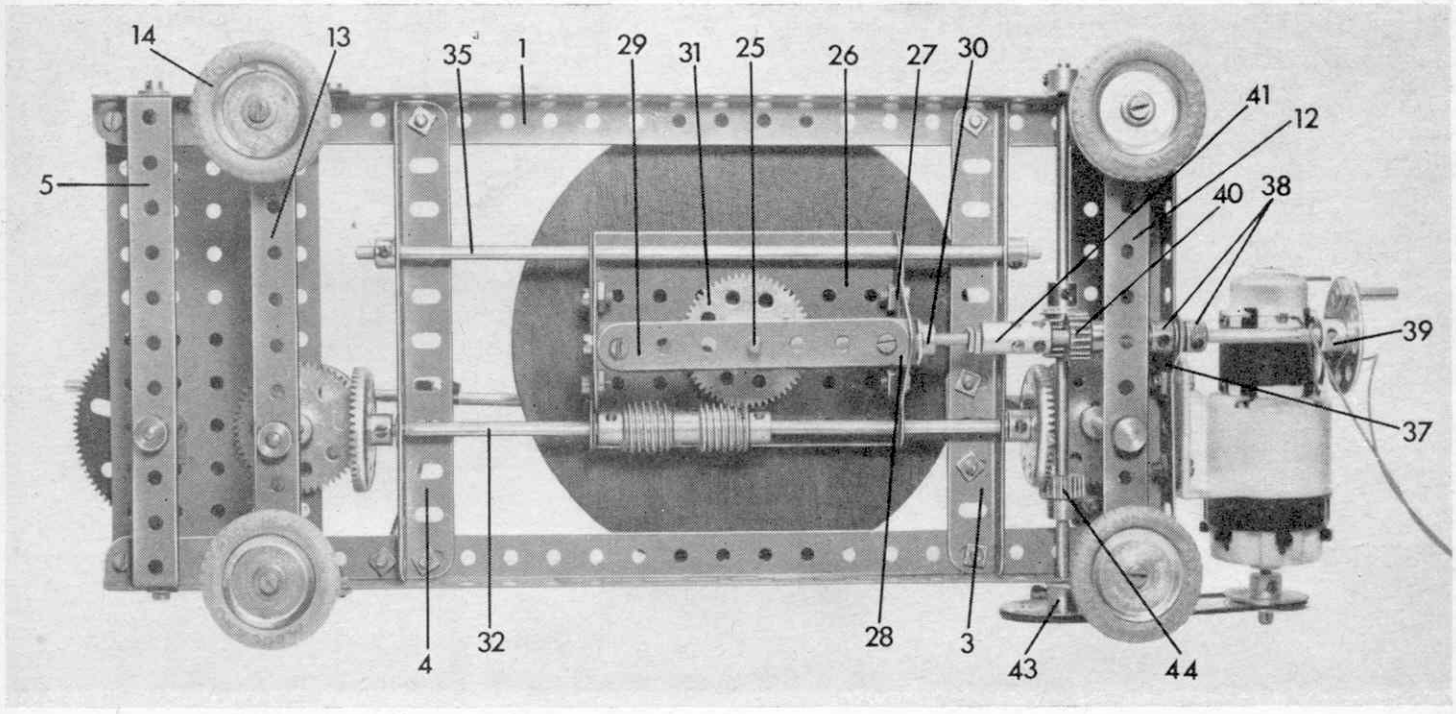
GEARING

Held by Collars in Strips 10 and 12 is a 4 in. Rod carrying a 57-teeth Gear Wheel 15 positioned so that it lies between Strip 10 and Angle Girder 2. A loose Collar 16 and two Washers are placed on the top of the Rod to be followed by a 6-hole Bush Wheel 17, but note that the Rod must not protrude through the boss of this Bush wheel. Fixed by a Nut in the face of the Bush Wheel is a ¾ in. Bolt carrying above the Bush Wheel, in order, a Washer, a Fishplate, a Nut and two more Washers. A Threaded Pin 18 is mounted in the other end of the Fishplate.

Another 4 in. Rod, carrying a second 57-teeth Gear Wheel 19 is journalled in Flat Plate 9 and Strip 13, being held by a Collar beneath the Strip and a ½ in. Pinion 20 above the Plate. Note, however, that the Pinion is spaced from the Plate by a Collar, while another Collar is used to space the Pinion from an 8-hole Bush Wheel 21, fixed above it on the Rod. A ½ in. Pulley without boss is then slipped into the Rod and is held in place by a second 8-hole Bush Wheel 22. The holes in the face of this Bush Wheel must lie vertically above the holes in the face of Bush Wheel 21.

Journalled in Double Angle Strip 5 and Flat Plate 9 is a 3 in. Rod held in place by a Collar and a 2½ in. Gear Wheel 23, the latter spaced from Plate 9 by a Washer. A loose Collar is added to the Rod





to be followed by two 57-teeth Gear Wheels 24 spaced by a second ½ in. Pulley without boss. Here, again, the holes in the faces of these Gear Wheels must be in line with each other. Gear Wheel 23 meshes with Pinion 20.

MOVING WORK TABLE

The actual work table itself is a circular piece of hard wood approximately 5½ in. diameter, and perhaps ½ in. thick, to the underside of which an 8-hole Bush Wheel is screwed. Fixed in the boss of this Bush Wheel, which must lie in the exact centre of the work table, is a 2 in. Rod 25. An arrangement is now built up from a 3½ in. by 2½ in. Flanged Plate 26 to each flange of which a 2½ in. Strip and a Flat Trunnion 27 is fixed. Two Angle Brackets 28, joined by a 3½ in. Strip 29, are bolted through the apex holes of the Flat Trunnions, at the same time securing a Threaded Crank 30 in place at one end. The completed arrangement is then mounted on Rod 25, being held in place by a 57-teeth Gear 31. This Gear engages with two Worms fixed on an 8 in. Rod 32, mounted in Angle Girders 3 and 4 and in the end holes in the flanges of Flanged Plate 26. A Collar is added to the Rod to act as a 'stop', while two 1½ in. Contrate Wheels 33 and 34 are mounted one on each end of the Rod, Washers being used as spacers. Another 8 in. Rod 35, held by Collars in Angle Girders 3 and 4, passes through the other end holes in the flanges of Flanged Plate 26. Contrate Wheels 33 engage with Gear Wheel 15 and Contrate Wheel 34 engages with Gear Wheel 19.

MOTOR AND DRIVE

A Power Drive Unit is bolted, along with a 1½ in. by 1½ in. Flat

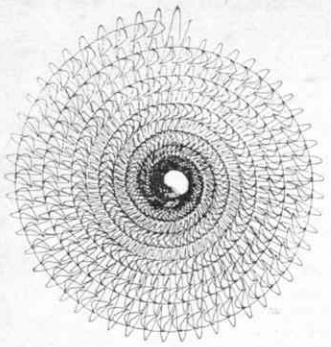


Plate 36, two 1½ in. Strips and a 1 in. Corner Bracket 37, to the vertical flange of Angle Girder 2. Held by Collars 38 in the Corner Bracket is a 4 in. Rod, carrying an 8-hole Bush Wheel 39, a ½ in. Pinion 40 and a Threaded Coupling 41. Fixed by Nuts in the threaded portion of Coupling 41 is a 3 in. Screwed Rod which is screwed into the boss of Threaded Crank 30. A Threaded Pin is fixed to the face of Bush Wheel 39.

Pinion 40 engages with a Worm 42 on a 6½ in. Rod X journalled in Angle Girders 1 and held in place by a Collar and a 1½ in. Pulley 43. Also fixed on this Rod is a ½ in. Pinion 44 that engages with Contrate Wheel 33. Pulley 43 on the other hand, is connected by a 6 in. Driving Band to a 1 in. Pulley on the output shaft of the Power Drive Unit.

PEN ARM

A 1 in. by ½ in. Angle Bracket is bolted to a Trunnion 45 which, in turn, is bolted to the horizontal flange of Angle Girder 3. A ¾ in. Bolt is passed through one end transverse smooth bore of a Coupling 46 and is fixed by two Nuts to the short lug of the Angle Bracket with three Washers spacing the Coupling from the upper Nut. The Coupling must move perfectly freely on the Bolt. Fixed in the longitudinal bore of the Coupling is an 11½ in. Rod 47, the other end of which lies between Bush Wheels 21 and 22 and between Gear Wheels 24.

Loose on Rod 47 is another Coupling 48 to the centre of which a Small Fork Piece 49 is secured by a ⅜ in. Bolt. Mounted in the end transversed tapped bores of the Coupling are a Handrail Support 50, in which a 2 in. Rod is fixed, and a Threaded Pin 51. A Cone Pulley 52 is mounted on the end of the 2 in. Rod to provide a weight for the pen which is held between the arms of small Fork Pieces 49 by a long B.A. bolt and nut. An ordinary ball-point pen is quite suitable for use in the model. Two Washers are placed on each Threaded Pin 18 and 51, then the Threaded Pins are connected by a 7½ in. Strip 53, loosely held on the Pins by Collars. Rod 47, incidentally, is held between Bush Wheels 21 and 22 and Gear Wheels 24 by a Driving Band, slipped over the Rod and caught on a 2 in. Screwed Rod 54 held by Nuts in one Angle Girder 1. Spring Clips prevent the Band from sliding on the Rod.

OPERATION

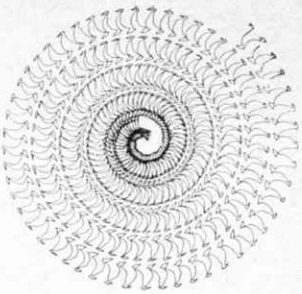
The working theory of the spiralograph is not really difficult to follow. As Rod X revolves, Pinion 44 drives Contrate Wheel 33 and consequently Contrate Wheel 34 also. Contrate Wheel 33, in turn, drives Gear Wheel 15 which causes Bush Wheel 17 to revolve. Threaded Pin 18, attached to this Bush Wheel, acts as a cam which activates Strip 53, and causes the pen holder to move backwards and forwards on Rod 47. At the same time Contrate Wheel 34 drives Gear Wheel 19, Causing Bush Wheels 21 and 22 and Pinion 20 to revolve. Pinion 20 meshes with Gear Wheel 23, therefore, Gear Wheels 24 will also revolve. If Pivot Bolts or ½ in. Bolts are inserted in the holes in the faces of Gear Wheels 24 and/or Bush Wheels 21 and 22, they will cause Rod 47 to oscillate sideways, which movement, of couse, is transmitted to the pen holder.

Assuming that there is a pen in the pen holder, we have seen, so far, how it is moved forward, back and sideways in a regular rhythm. While all this is going on, however, Worm 42 drives Pinion 40 which, in turn, causes the 3 in. Screwed Rod in Threaded Coupling 41 to revolve. As it revolves in Threaded Crank 30 the work table is moved slowly along Rods 32 and 35. The Worms on Rod 32, however, engage with Gear Wheel 31, thus causing the work table itself to revolve. Because of these additional movements the pattern being drawn by the pen slowly spirals inwards to the centre of the paper.

Different patterns can be obtained by altering the positions of the Bolts in Gear Wheels 24 and/or Bush Wheels 21 and 22, or by altering the distance of Threaded Pin 18 from the centre of Bush Wheel 17. In addition, the working length of Strip 53 can be changed or the Strip can even be removed altogether. The quantity of Bolts inserted into Gear Wheel 24 and Bush Wheels 21 and 22 will also affect the pattern as, indeed, will any combination of the foregoing methods. In short, there's plenty of choice.

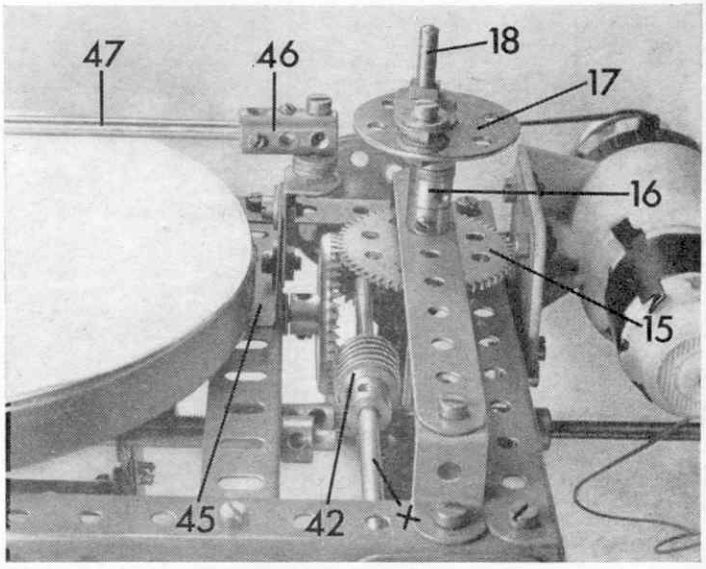
PARTS LIST

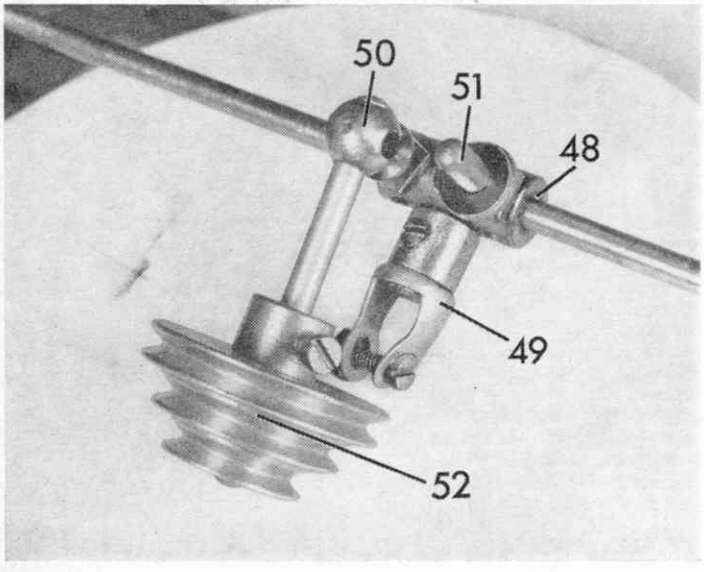
1 of No. 1a	4 of No. 24	1 of No. 74
1 of No. 3	1 of No. 24b	1 of No. 80c
2 of No. 5	3 of No. 26	1 of No. 81
3 of No. 9	5 of No. 27a	8 of No. 111
1 of No. 10	1 of No. 27c	1 of No. 111c
4 of No. 11	2 of No. 28	3 of No. 115
2 of No. 12	3 of No. 32	1 of No. 116a
5 of No. 12b	2 of No. 35	1 of No. 123
1 of No. 13	72 of No. 37a	3 of No. 125
2 of No. 13a	64 of No. 37b	6 of No. 126a
1 of No. 14	14 of No. 58	1 of No. 133a
1 of No. 15b	1 of No. 48d	1 of No. 136
2 of No. 16a	1 of No. 53	3 of No. 147a
1 of No. 16b	18 of No. 59	1 of No. 186
1 of No. 17	1 of No. 62a	1 of No. 186a
1 of No. 21	2 of No. 63	4 of No. 142c
5 of No. 22	1 of No. 63c	1 Power Drive
2 of No. 23	1 of No. 70	Unit

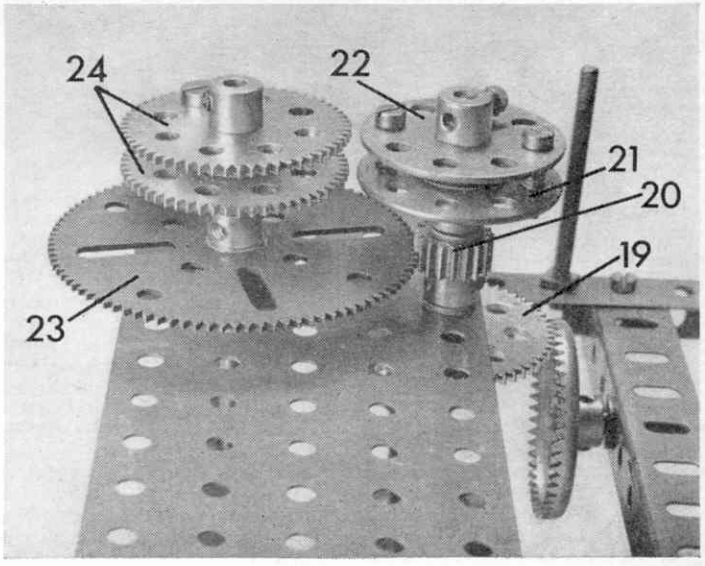


IMPORTANT

The patterns produced by this model should be drawn on 5½ in. diameter discs of plain paper. Meccano Magazine is able to offer specially cut discs to readers at 1s. 3d. for twenty including postage. Write to 'Spiralograph Discs', Meccano Magazine, Thomas Skinner and Co. (Publishers) Ltd., St. Alphage House, Fore St., London, E.C.2.







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It's above argument . . . says Chris Jelley

FREEDOM of Speech is the prerogative of every man, woman and child in Britain, and I don't mind telling you that there has been plenty of free speeches made over the new range of 'Zephyr' and 'Zodiac' cars introduced last year by the Ford Motor Company. In fact, I might even go so far as to vote these latest Fords the most controversial cars of 1966. Everybody seemed to have an opinion of them at the time and these opinions, whether for or against, were certainly strong. Nor did there appear to be intermediate shades of feeling. Depending on your point of view, you either loved 'em or loathed 'em!

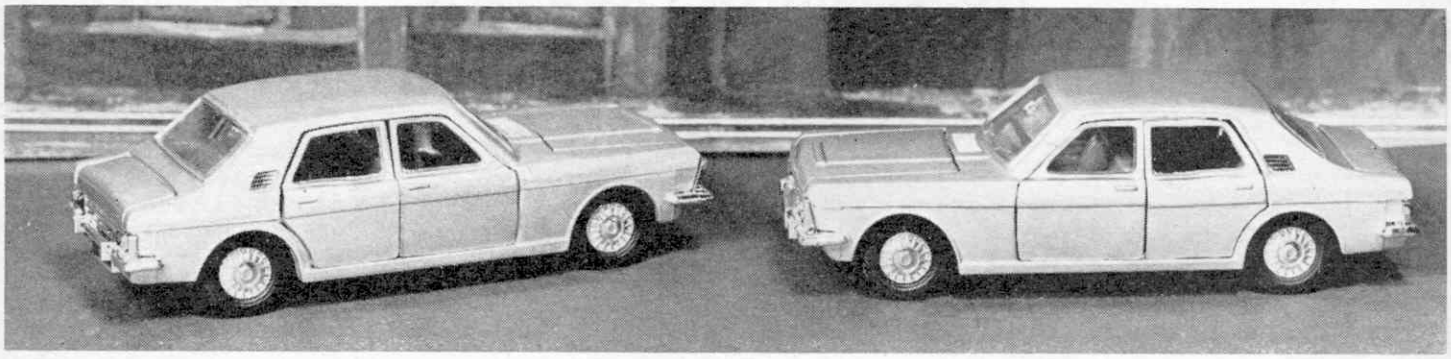
Meccano Limited have now introduced a Dinky Toy version of the Ford Zodiac Mark 4, and I have no hesitation in saying that this will rise above all the arguments surrounding the real-life car. All fair-minded people, I think, will agree that the model is one of the best die-cast toys of its type on the market today, whether they like the original or not. I, myself, am not greatly attracted by the original, but I have been quite captivated by the Dinky.

Carrying Sales No. 164, the action features it incorporates are numerous, including the usual opening bonnet, opening boot, Prestomatic steering and 4-wheel suspension, but the most appealing feature of all is the four complete, correctly-shaped and realistically-opening doors. The Zodiac is actually the first Dinky car to be equipped with four complete opening doors, 'complete', here, meaning doors that incorporate the window surrounds as well as the main door panels. The only thing to remember about them is that, if both the front and rear doors are to be opened, those at the front must be opened first.

Action features are all well and good, but they are only part of the story. Also present are a miniature 'engine', windows, seats, steering wheel, plated radiator-grille and bumpers plus twin, amber-coloured jewelled headlamps, red jewelled tail lamps and simulated amber jewelled direction indicators at the rear. Number plates are also included, while just behind the rear doors appear foil representations of what on the actual car are the exhaust vents for the renowned Aeroflow ventilation system. The wheels, too, are particularly interesting. Besides being plated, they are more or less exact reproductions of the wheels fitted to the original. This means, of course, that they are the new solid type through which the axles do not protrude. Rear-view mirror and windscreen wiper representations appear in the windscreen moulding.

All the above features, alone, add up to make an excellent model, but the final touch is given by a really superb—and authentic—colour finish of metallic silver-grey, off-set by red 'upholstery', including the insides of the doors.

So much for the Dinky Toy. Now, what about the full-size counterpart? As I have already said, this is controversial but, whatever your personal opinion of it, I think you



must agree that it's definitely eye-catching. It's a big car (approximate overall dimensions: 15 ft. 6 in. long by 5 ft. 11 in. wide by 4 ft. 9 in. high) with a distinctive body shape, variously described as 'fabulous' or 'horrible', depending on the point of view of the individual. Power is supplied by a new V-6 engine of 2,994 c.c. capacity that develops a gross output of 144 b.h.p. at 4,750 r.p.m. to give the car a maximum speed in excess of 100 m.p.h.

Transmission on the standard car is to the rear wheels via a 4-speed all-synchromesh gearbox controlled by a floor-mounted lever. A column-mounted gear change, however, is available as an option, as also is automatic transmission and overdrive. Driver/passenger comfort is assured by the extremely spacious and well-upholstered interior as well as the famous Aeroflow ventilation system, exclusive to Fords. All round independent suspension is fitted, this not only making for a very comfortable ride, but also being a very important safety feature, and safety is further increased by power-assisted disc brakes on all four wheels. The spare wheel is mounted beneath the bonnet as far forward as possible—even in front of the engine. Fords claim this forward position also to be 'a major safety factor', but I'm afraid that I don't quite understand why this should be. Taken all in all, though, the real Zodiac is a very sound and powerful car whether you like the 'look' of it or not.

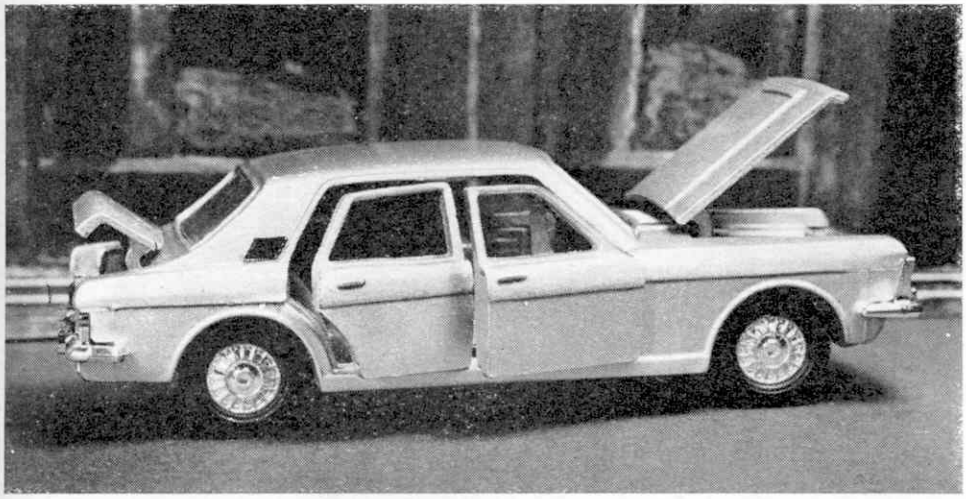
Novel Army Model

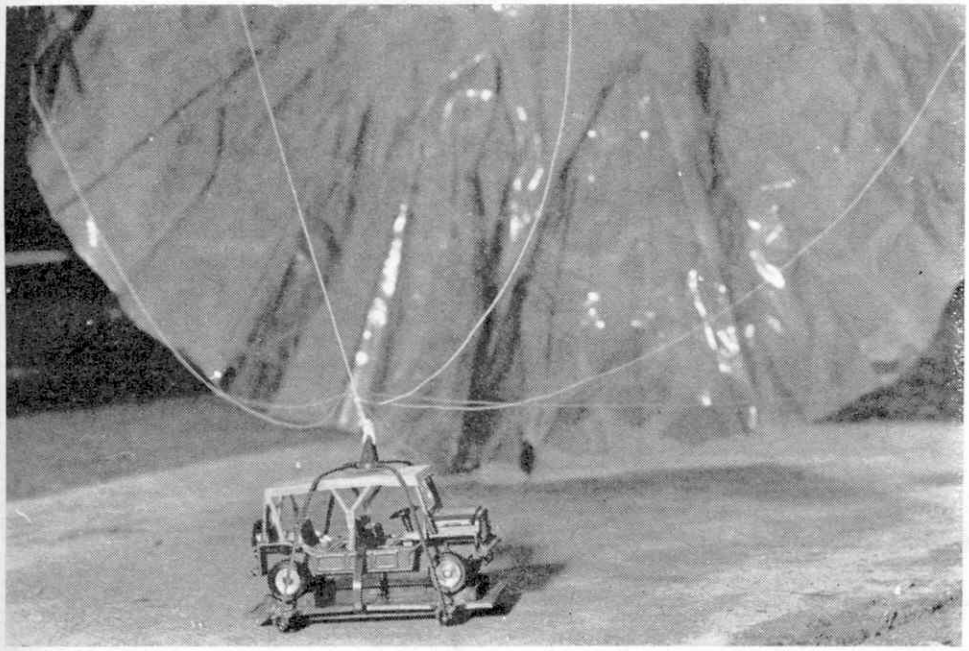
Released with the Zodiac is a very unusual army model which certainly combines authenticity with what can be called 'play-value'—Dinky Toy No. 601 Austin Para Moke. As the name implies, it is a model of the Austin Mini Moke, finished in matt army green, that comes complete with a parachute harness and parachute. You may think that this is going a little too far but, if you do, I must strongly disagree with you. After all, the whole emphasis in the modern army is on mobility, and mobility in this case means the ability to transport troops and equipment over long distances at a moments notice. How better can this be done than by air?

It is generally accepted that some of our most important fighting units today are the various Parachute Regiments, and when they go into action by parachute, they take their equipment with them—by parachute! Alternatively, if ground forces are not in a readily-accessible position and they require additional equipment, it's parachuted in to them. You can see, therefore, that the Para Moke is by no means out of place.

What exactly does the model, as a whole, consist of? Basically it's composed of four parts: a Mini Moke complete with removable 'canvas' cover; a rigid unbreakable platform on which the Moke is held by a nylon strap, the wheels of the Moke engaging in four 'Vee' blocks; a removable 'harness' which clips onto the platform; the actual parachute itself. The Moke, incidentally, is a delightful scale model in its own right being equipped with an opening bonnet, detailed engine and windscreen, but there is no need for me to go into more detail, as I have already described it in a past issue of M.M.

When purchased, the set is ready for operation, except that the parachute must be tied to the harness. I advise you to make a good job of this—I didn't the first time I tested the model and, when I threw it up, the parachute opened with a jerk and pulled clean away from the harness. The Moke came down a lot quicker than the parachute! Luckily, though, no damage resulted. Operation of the set is pretty well self-explanatory but, to be on the safe side, full instructions are given with each model. The best landing or target area to aim for is grass, but both the platform and Moke will stand up to any amount of rough wear so this is not essential. One thing's for sure—you'll have plenty of fun!





Buses for Sweden

THIS picture shows one of 200 special rear-engined Leyland Panther single-deckers which have been ordered by Stockholm Tramways for delivery this year (1967). Stockholm, in common with other Continental operators, is campaigning to attract passengers away from private cars and back to buses by offering them all the comforts of a car, with additional safety devices, without the responsibilities of a car. These new Leylands, with bodywork by Park Royal Vehicles, are just the things to do it. They feature power-assisted steering, fully-automatic gearbox, air suspension, roof level exhaust, public address system, radio telephone and an automatic system for operating the exit doors, controlled by photoelectric cells.

Externally, the bus is reminiscent of those now in use in Continental countries, and is very similar in that it is one-man operated with separate entrance and exit doors, and has room for many more standing passengers than is found on single-deckers in Britain. In fact, it's designed to carry nearly as many passengers standing as seated—32 as against 39! Power is obtained from a Leyland 0 680 diesel engine developing 160 h.p. at 2,200 r.p.m., which is mounted horizontally beneath the floor at the rear of the chassis. The body, overall, is 37 ft. 6 in. long by 8 ft. 2½ in. wide.

It surprised me to learn that Sweden is converting from left-hand driving (British style) to right-hand driving (Continental style) this autumn. A certain amount of confusion is bound to result, making this an ideal time to tempt new passengers onto the buses. It is hoped that the new Leylands will play a large part in persuading car drivers to leave their cars at home and to travel by bus.

Among the model builders

WHEN motorising a hand-operated Meccano Crane, experience shows that it is not sufficient simply to couple a power unit to the winding shaft of the crane. This would work, of course, but would be most unsatisfactory as the direction of travel of the load could only be altered by reversing the Motor, and the speed of operation would be constant unless the speed of the Motor itself could be controlled.

What is required, in fact, is a special gearbox, and Mr. Kenneth Burnett of Hove, Sussex, has designed just such a gearbox, a slightly modified version of which you will see illustrated on this page. It gives three forward and three reverse speeds and has a neutral position that allows the motor to continue running although the Crane is not actually in operation. In other words, once the Motor has been switched on, operation of the model can be controlled entirely from the gearbox.

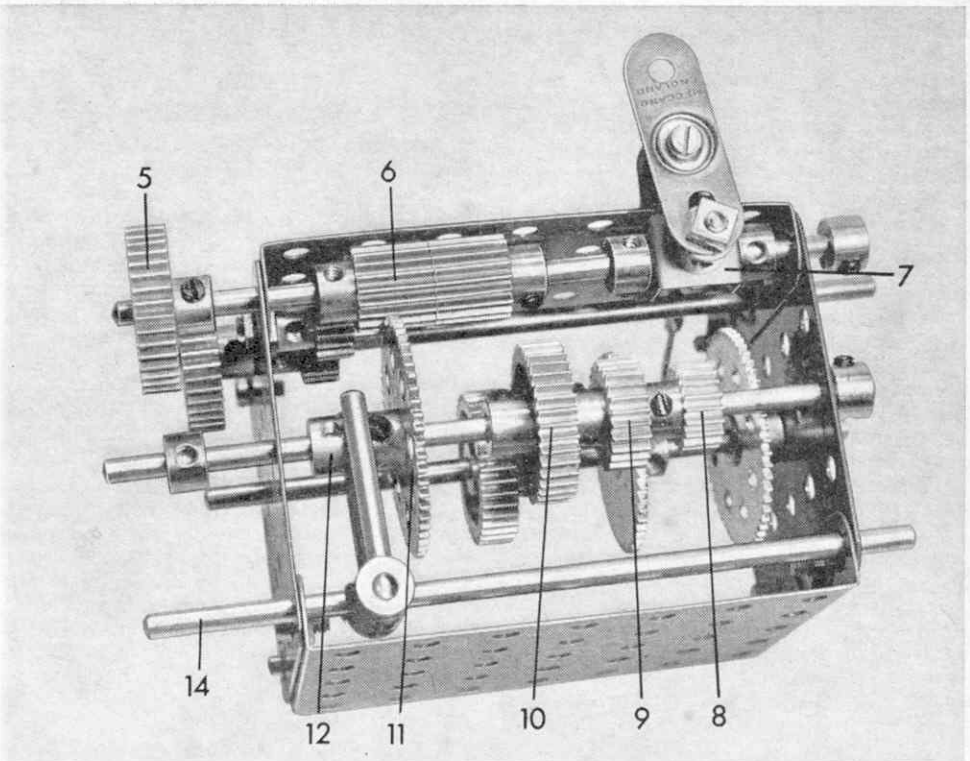
The framework of the unit consists of two 3½ in. by 2½ in. Flanged Plates joined by two 2½ in. by 2½ in. Flat Plates. All the Rods used in the mechanism are journalled in these Flat Plates. The input shaft is a 5½ in. Rod 1 carrying a 1 in. Gear Wheel 2 and a ½ in. Pinion 3, the Gear Wheel and Pinion being mounted one each side of the Flat Plate. Pinion 3 is in mesh with another ½ in. Pinion 4, loose on a ¾ in. Bolt held by Nuts in the Flat Plate.

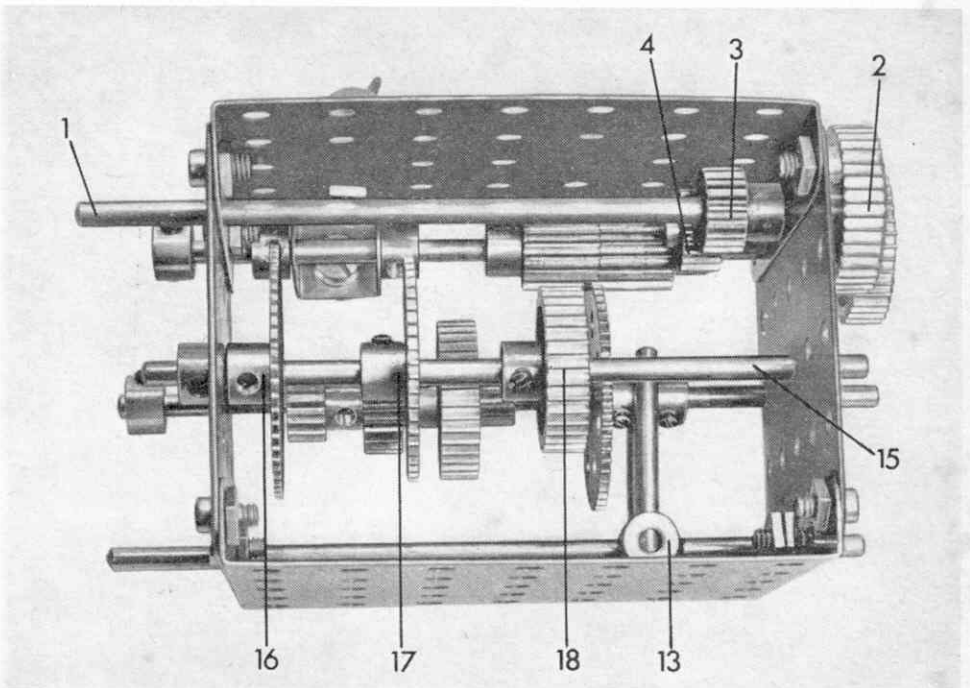
Journalled vertically above Rod 1 is a second 5 in. Rod also carrying a 1 in. Gear 5, in addition to a compound ½ in. by 1 in. Pinion 6 obtained from two ½ in. by ½ in. Pinions. This Rod must be free to slide in its bearings being controlled by a large Fork Piece 7 held on the Rod by Collars. The Fork Piece is lock-nutted to a Double Arm Crank which is, in turn, lock-nutted to a 1 in. by ½ in. Angle Bracket bolted to the Flanged Plate. Gear Wheels 2 and 5 mesh together as also do Pinion 4 and Compound Pinion 6, but the latter two must not be in mesh at the same time as the two former. The Compound Pinion, in fact, should be placed on the Rod so that it meshes with Pinion 4 a fraction after Gear Wheels 2 and 5 come out of mesh. In other words there must be a neutral period. A 'stop' is provided by a Collar mounted on the opposite end of the Rod to Gear 5. Note that the standard Grub Screw in the boss of the inside Pinion included in Compound Pinion 6 must be replaced with a $\frac{7}{64}$ in. Grub Screw, part No. 69c.

The main layshaft consists of a 5 in. Rod that carries a ½ in. Pinion 8, a ¾ in. Pinion 9, a 1 in. Gear Wheel 10, a 57-teeth Gear 11 and a Collar 12. Movement of this layshaft is controlled by two 1½ in. Rods, located between the boss of Gear Wheel 11 and Collar 12, and fixed in the end transverse bores of a Coupling 13 which is mounted on another 5 in. Rod 14. A 4½ in. Rod 15 serves as the output shaft and carries a 57-teeth Gear 16, a 50-teeth Gear 17 and another 1 in. Gear 18. As the main layshaft is moved, Gears 8, 9 and 10 mesh with Gears 16, 17 and 18 respectively, but more than two Gears must never be in mesh at the same time. Again, there must be a short neutral position between each Gear, and it is important to note that a 57-teeth Gear 11 must be in constant mesh with Compound Pinion 6. Collars are mounted on the ends of the main layshaft to prevent it moving more than necessary.

Parts required

1 of No. 12b	2 of No. 27a	1 of No. 63
4 of No. 15	4 of No. 31	1 of No. 69c
1 of No. 15a	13 of No. 37a	1 of No. 111
2 of No. 18a	9 of No. 37b	1 of No. 111a
1 of No. 25	1 of No. 38	1 of No. 116
3 of No. 26	2 of No. 53	1 of No. 147b
2 of No. 26a	7 of No. 59	
1 of No. 27	1 of No. 62b	

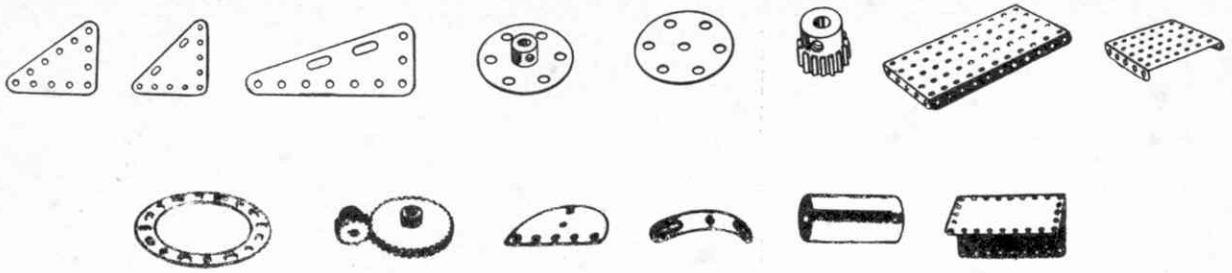




South Midlands Meccano Society

News reached me recently of the third biennial meeting of an excellent organisation known as the South Midlands Meccano Society. It was held at the Society's base at Cheltenham, and was attended by a dozen members from as far apart as Bath, Abingdon and Stratford-upon-Avon, who spent something like six hours studying other members' models, explaining the workings of their own models, exchanging information and generally enjoying the company of fellow enthusiasts.

The South Midlands M.S. originated some three years ago when the organiser, Mr. Esmond H. L. Roden, of Cheltenham, noticed a prize-winning model in an old edition of M.M. that had been built by another Cheltenham resident, Mr. Stanley Rouse. He contacted Mr. Rouse, and the resulting friendship proved so successful from a Meccano point of view that the pair decided to seek out other adults with an interest in the hobby. Cheltenham, however, seemed devoid of further enthusiasts at the time and so they extended their search to within 45 miles of the town, scouring old M.M.'s for names. This was successful and the Society was born, holding its first official meeting in September 1965. It is still very much alive, but there is plenty of room for growth. Anybody interested should contact Mr. Roden, at 25 Cleevelands Avenue, Cheltenham. He will be delighted to hear from you.



Dealers who specialise in Meccano spare parts

Listed below are some of the dealers who sell Meccano accessories and spare parts. This is intended to aid enthusiasts—and there are many of them—who constantly require additional spare parts for their Sets. All dealers can, of course, order Meccano spare parts for their customers, but those listed here are among our spare part specialists.

C. G. MARSHALL
Maxwell Road
BEACONSFIELD
Telephone: 4092

JOHN W. BAGNALL LTD.
18 Salter Street
STAFFORD
Telephone: 3420

BARRETT'S LTD.
2 St. George's Street
CANTERBURY
Telephone: 66161

BEATTIES OF LONDON
5 & 15 The Broadway, Southgate,
LONDON N.14
Telephone Palmers Green 4258

LESLIE BROWN
Super Toy and Model Store
95 High Street, Stockton-on-Tees
Telephone: 67616

Cheltenham Motor & Cycle Co. Ltd.
31 High Street
CHELTENHAM
Telephone: 53099

H. A. BLUNT & SONS LTD.
133 The Broadway, Mill Hill
LONDON N.W.7
Telephone Mill Hill 2877

W. PAINE & CO. LTD.
168 High Street
CHATHAM, Also at Stroud and Grays
Telephone: 45215

JEREMY
16 Princes Arcade, Piccadilly
LONDON S.W.1
Telephone: Regent 1846

YOUNGSTERS (THE DOLL'S HOSPITAL)
55 Hallgate
DONCASTER
Telephone: 2831

F. T. B. LAWSON
New George Street
City Centre, PLYMOUTH
Telephone: 65363

THE GUILDFORD
DOLL'S HOSPITAL LTD.
13 Swan Lane, GUILDFORD
Telephone: 61331

LANE'S TOY SHOP
75 High Street
ROCHESTER
Telephone: Chatham 41870

LUCAS'S (Hobbies) LTD.
7 Tarleton Street
LIVERPOOL 1
Telephone: Royal 7562

WILTONS GAMES/SPORTS STORE
Corner House, Canal/Queen Street
SALISBURY
Telephone: 22984

OVERSEAS DEALERS

AUSTRALIA

NORTH SHORE HOBBIES PTY. LTD.
(Mail Order, Parts and Sets)
8 Post Office Street
Pymble (SYDNEY) N.S.W.

Walter & Stevenson Pty. Ltd.
395 George Street
SYDNEY
Telephone: 29 3566

CANADA

ESBE SCIENCE CENTRE
3431 Bathurst Street
TORONTO, 19
Telephone: 789-3161

NEW ZEALAND

BUNKERS LTD.
P.O.Box 58
HASTINGS
(Mail orders from all countries welcomed)

Sales

• Obsolete Dinkies, pre- and post-war; state requirements. D. Pinnock, 10 Hurstville Drive, Waterlooville, Hants.

• Meccano Magazines, 1957-1964, six missing. Offers: 40 Duff Street, Keith, Banffshire.

• M.M.'s, 1942-1957, complete; further part years, '44, '55, '57, '59, '60, '61, '62, '63, '64; offers preferably for the lot. 25 Burnbreck Gardens, Wollaton, Nottingham.

• Large Tri-ang 00 Layout, three loco's, 40 ft. of track, electric crossing, two transformers; Royal Mail Set, rolling stock, stations, etc., £25 or nearest offer. Also, M.M.'s, May '59 to May '66 inclusive. Offers: A. M. Poolton, 35 Bramley Road, Acocks Green, Birmingham, 27.

• Military Dinky Toys; disposal sale of British and French collection, some pre-war. S.A.E. to: Haines, 29 Summerer Grove, Weeton, Preston, Lancs.

• Aerokits fast Patrol Launch assembled, painted, ready for motorising, with some Ripmax fittings, plans; 30s. plus postage. Templeton, 2 Marylon Drive, Northenden, Manchester 22.

• Obsolete Duchess of Montrose three rail loco, two coaches; good condition. Offers: Whitehead, 310 Edenfield Road, Rochdale, Lancs.

• No. 10 Meccano extras, two transformers, motors. Offers: Thornborough, 30 St. John's Estate, Hadston, Morpeth, Northumberland.

• Coins (English), farthings, crowns; 1860-1966. Start a collection now before withdrawal on decimalization of existing currency in 1970 sends prices rocketing. Send S.A.E. stating requirements. Sanders, 46 Elm Grove, Hildenborough, Kent.

• Meccano 8A, £3; Dinky Builder 1A, 15s.; both new, unused; collect or postage extra. 13 Longley Lane, Lowerhouses, Huddersfield.

• Meccano spares; S.A.E. list. Wanted, Dublo locos. Pitts, 18 Beckett Road, Worcester.

• M.M.'s and Matchbox Labels for sale; S.A.E. list. M. Smith, 12 Clarence Road, Lowestoft, Suffolk.

• Triang 00 Electric Railway, brand new loco worth £4 10s.; Rolling Stock, accessories £10. Also large Meccano set, £5. Needell, Flat 5, Oatlands Mere, Oatlands Drive, Weybridge, Surrey.

• Hornby Dublo Train Set, two locomotives, control panel, station, lots of rail; many other items, £14. Critchell, Birch Hall, Theydon Bois, Essex.

• Large combined Minic Motorway and Railway, £15. G. Entwistle, Rossall Junior School, Fleetwood.

• Train Set, lots of track, one engine; S.A.E. 19 Church Road, Lytham, Lancs.

• Red and Green Meccano for sale, new and used; S.A.E. Wanted, Pre-war Meccano Literature, Magazines, Obsolete Parts. 155 Nutfield Road, South Merstham, Surrey.

• View-master, Mains, Standard Projector, cost £6, sell £2 15s.; excellent condition; one film and p. and p. free; films cost 4s. each, sell 1s. 6d. each; excellent child's Christmas present. A. Brydson, 87 Broughton Lane, Crewe.

• Dinky Coaches, numbers 280 and 281. Please send S.A.E. to "Coaches", 82 Marten Road, Walthamstow, London, E.17.

• Hornby Trains, Royal Scot and tank loco carriages, trucks, station signals, lamp standards, transformer, large layout of rails gauge 0. L. Skinner, "Parkland", 25 Crown Road, Great Yarmouth.

• M.M.'s, Jan. 1951-Dec. 1957, six missing, good condition. Offers: Senior, Barleywood House, Sandal, Wakefield, Yorkshire.

• Meccano Magazines, all issues Jan. '56-Dec. '60, in good condition. Offers to: I. Cobbold, 5 Avenue Road, Stratford-on-Avon.

• Wrenn formula one five two, set three for sale, plus one car, grandstand and pits. Apply: John Miles, 23 Eardley Road, Sevenoaks, Kent. £5 (cost).

• Hornby 00 set extensive three rail system, two electric and eight manual points, 69 pieces rail, four locomotives, 21 pieces rolling stock. All details, write: Booth, Hele House, Taunton.

• 0 Gauge, Train Set, three coaches, 20 wagons, track, accessories. Peel, 28 Hawthorne Avenue, South Shields.

• Breaking large collection, parcels 3s.; Gibbons Simplified Catalogue, 25s.; Elizabethan, 10s. P.P. Hollybank, Pitsford, Northampton.

• Wide selection Red/Green Meccano Parts, mostly new, half list price. S.A.E. list wanted Electrikit E15R and Emebo Motors. Morgan, 66 Babbacombe Road, Coventry.

• M.M.'s, 1958-65 inclusive, '63-'64 bound, mint condition, £3. Grimsay, 102 Thunder Lane, Norwich, Norfolk.

• Stamps for sale, 50 free to each applicant. Bartlett, 20 Northfield Park, Pilton, Barnstaple, Devon.

• Meccano No. 8 with mechanisms set, electric and clockwork motors, £8. Lowton, 31 Stoke Road, Taunton, Somerset.

• Meccano 9 plus red/green many parts, worth £50 sell £20. R. Freeman, 66 Booth Lane, South, Northampton.

• Scalextric 31 set, fair, needs attention; four cars, also accessories, transformer, £5 10s. Slater, Wellside, Livesey Road, Ludlow.

• M.M.'s, 1954-1964, mint condition. S.A.E. list. 188 Coventry Road, Ilford, Essex.

• Meccano Magazines, February to August 1944; June to December 1949, 1950 to 1957 complete; January, June, October, December 1958; April 1959; March to December 1962. Offers: Critchley, 58 Cleveland Road, London, E.18.

Wants

• M.M.'s before 1963; state price. J. Orton, 35 Commercial Road. Brighton, South Australia.

• Obsolete Dinkies and Tootsietoys, pre-1950; single models or collections purchased. D. Pinnock, 10 Hurstville Drive, Waterlooville, Hants.

• Pre-war obsolete Meccano Parts, Nos. 120, 120A, 101, 66, 67, 149, 131, 158A, 158B, 132; Lamp Panel for connecting 100/250 volts motor; Meccano Steam Engine. Write first: M. Viglioglia, Lgo. Paisandu 72, ap. 1403, Sao Paulo, Brasil.

More on page 54

Educational

STAMPS NEWS BY F. E. METCALFE

Abominable Snowman

It had to come some day. We have had almost every conceivable subject depicted on postage stamps, and when a friend was mentioning this fact one day, I remarked that the poor old snowman had never been philatelically honoured. Well, the omission has been remedied, and what country more fitting to do this than Bhutan; that territory in northern India where the monsters are supposed to exist. The stamps are triangular in shape, and the designs are taken from old drawings in Bhutanese manuscripts or from paintings on the walls of dzongs (forts). There are eight stamps and, as the face value is low, quite a few people will want a set, if only for fun. I wonder if there are such things? Those who live where they are supposed to exist have, apparently, no doubts on the subject. But golly, if they are like the stamps depict, I wouldn't like to come across one on a dark night. Incidentally, the Bhutanese name for them is Yeti. That can go down in your album, and also we are told that the Bhutanese do not mind a bit our doubts of the Yeti's existence. They say they are continually coming across tracks in the high passes of the Himalayas.

Kenya's New Issue

Now we are on safe ground, and welcome an entirely new definitive issue for Kenya which was released on December 12. A fine set, which is a real picture gallery depicting many of the wonderful wild animals that roam in that East African country. True, the issue goes up to £1 (which is not overdoing things, for air mail services of today, and Kenya has a very important one, need high values for the heavy postal rates) but you need only start off with the set to 1s., and thus for a modest sum you will get nine stamps, each one illustrating an interesting animal such as a zebra, rhino, buffalo, etc. Yes, a fine set, and one which will be popular all over the world, for animals, as a thematic subject, ranks near the top everywhere. I have just been looking at the stamps again. The top value depicts a lion. Just imagine if lions roamed about our country. I once lived where there were supposed to be plenty of pumas, for instance, but I only ever saw one, though no doubt others had seen me first, and true to type they were not anxious to go on display.

Tristan da Cunha

There must be a number who read these lines who have bought copies this year of the new Commonwealth or Gibbons 'QEII' catalogues. And they will have been surprised to note how prices have risen (in strict relation to the prevailing market for such stamps) for the issues of countries like Tristan. It is fantastic how popular such stamps have become; so will be the new set to be issued on March 1, to mark the 100th anniversary of the visit of the first Duke of Edinburgh. It was quite a normal sort of visit, which would not mean much to the Duke, but for the inhabitants of what is known as the loneliest island in the world it was a great event, and now their descendants will reap quite a nice little harvest, via the postal issue. Good luck to them. I for one will certainly want a set.

Apollo Satellite Station

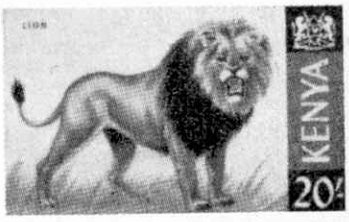
And here is an issue which will certainly appeal to many M.M. stamp collectors. It was issued by Ascension Island on November 7 to mark the opening of the 'B.B.C.' relay station. The equipment was ordered by the Cable and Wireless Group, and supplied by the Marconi Company. The satellite is similar to, though more powerful than, the 'Early Bird'. Another similar satellite will be placed over the Pacific, and incidentally the satellite ground station on Ascension, which is being commemorated by the stamps, will employ an advanced type of low noise receiver, cooled to more than 250°C. below freezing point by helium at near liquid temperatures, and now I had better say no more, for I am already out of my depth.

Ties with Britain

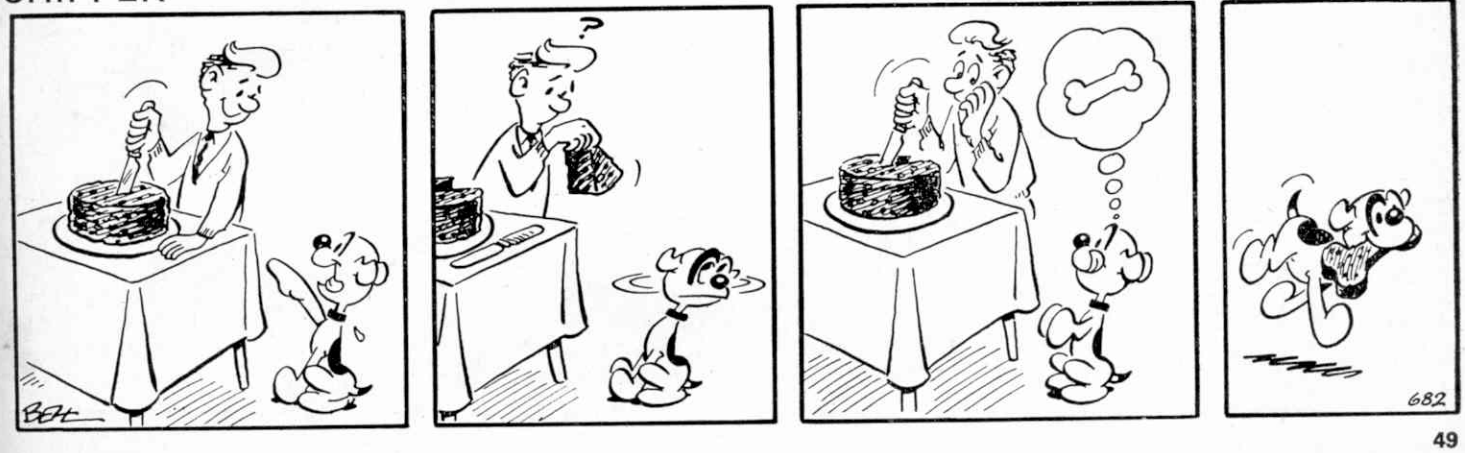
It's nice that somebody still wants us. Turks and Caicos for instance. Anyhow, these West Indian islands issued an interesting set of three stamps on October 1 to mark the 200th anniversary of ties with Britain. The designs are a bit overdone (the designer has tried to say too much) and I have seen better printed stamps, but the cause is a good one (as the post office will think), and coming as they do from such a popular philatelic country (both in the Commonwealth and the U.S.A.), the stamps are sure winners. Actually, Turks get their name from a cactus which grows there (no one seems sure where the name Caicos comes from), and the first European to discover the then uninhabited group was the Spaniard Juan Ponce de Leon. We did not come into the picture until 1585, when Grenville's ships spotted them. The event commemorated is when in 1766 we appointed an agent to ensure the rights of the islands for Britain. Unfortunately, I have no more room for more history. (Did I hear someone say 'fortunately'?) Anyhow, the stamps are worth getting.

The Tip of the Month

It is quite obvious that the average collector cannot go in for all the Commonwealth stamps which are appearing these days, let alone the whole world, which was what very many collectors tried to do in my early collecting days. All this means that we must limit our field, concentrate as it were, if we are to form a collection worth having, or looking at. I read somewhere that such has been the interest aroused by all our new British stamps that perhaps there are a million new collectors in G.B. alone, as compared with, say, a couple of years ago, and most of these new chums are taking G.B. issues as their first and, in many cases, only choice. Now I am not going to suggest collecting our own stamps, though they are well worth collecting, for they have a great future. What I do suggest, however, is that you study your own taste, remembering that each country today issues an awful lot of stamps, and to try and get anywhere with a lot of countries is asking for more worry than pleasure. Concentrate should be the motto.



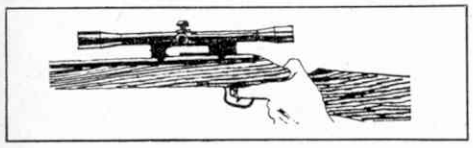
CHIPPER



GETTING THE GUN THE EXPERTS CHOOSE

Over-the-top with a Webley! Officers in Line Regiments in World War I went into action with Webley Mk VI .455 revolvers. Today, modern Webleys are used by two armies and by police forces all over the world.

The Webley Ranger (above) is a target rifle for the shot who is on the way to getting his marksman's badge. Length 39". Weight 3 lb. 14 oz. .177, £7.19.11. Other Webley rifles: MK III .22 or .177, £21.6.5. Falcon, £11.18.7. Jaguar, £6.19.7. The telescopic sight on the Ranger you can buy separately (£3). It's a 4X magnification expert's sight, fits all Webley air rifles. Always use Webley specially-gauged pellets (3/9 for 500) and darts (2/3 for 12), and send four coupons from Webley pellet-tins with 3/- P.O. for the Webley Marksman's badge.

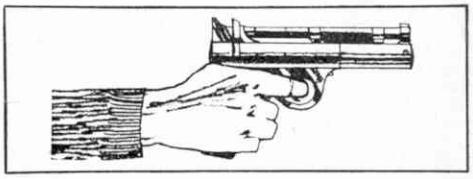


WHAT DO YOU KNOW ABOUT GUNS? What is (1) grouping? (2) bore? (3) choke? Reverse the page to check your answers.

shot pattern.

(1) the accuracy with which you can group a series of shots close together on a target (2) the measure of the centrally bored hole which runs the full length of the barrel. (3) choke in a gun barrel is where the bore is reduced at the muzzle to control the area of the eventual

For the man who prefers to shoot air pistols, Webleys are extremely fast and accurate. Webley Premier .177 or .22, £10.13.3. Junior model £7.2.2. *Handle* these, and the rifles at your authorised Webley shop.



Shoot with safety. Never point a gun, unloaded or not, at anyone. Never handle a gun before checking that it's unloaded. Always carry it so that the muzzle is fully under your control. Never leave it where people younger or less responsible than you can meddle with it. Never leave a loaded gun unattended. Always make sure no-one is behind your target before opening fire.

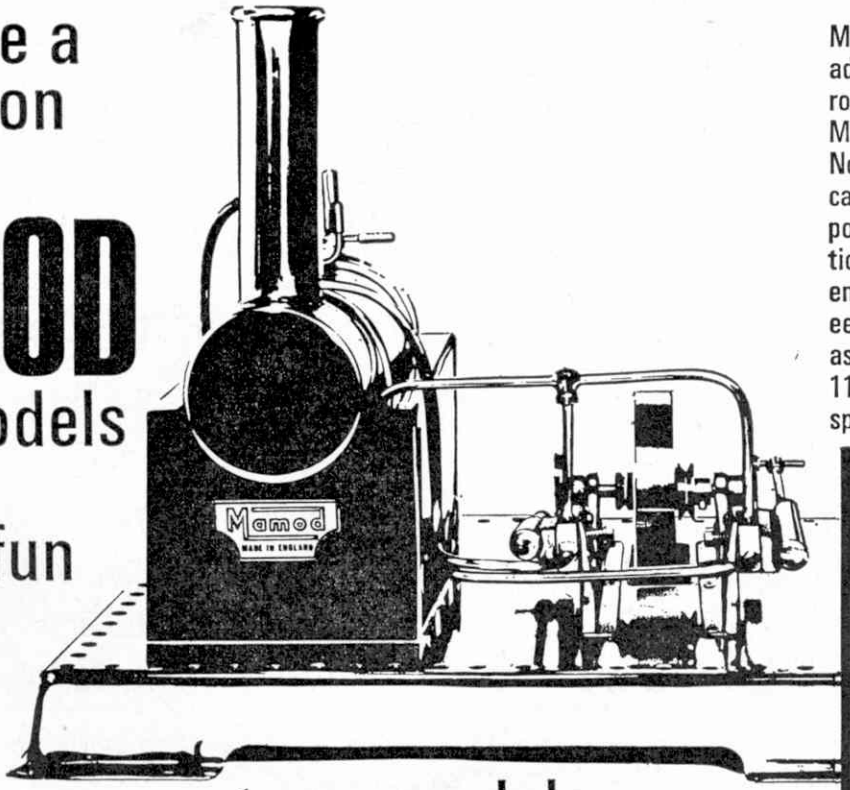
GET A WEBLEY WEBLEY BRITAIN'S BEST GUN

from your Webley shop. Or write for a list, sending 4d stamp, from: Webley & Scott Ltd. inc: W. W. Greener Ltd. (Dept 155), Park Lane, Handsworth, Birmingham 21.

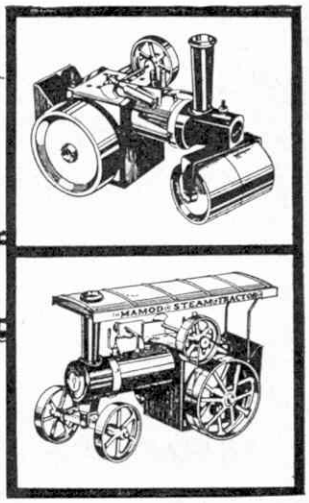
Want to be a construction boss?

MAMOD

Steam Models mean a world of fun for you.



Making runways on an advanced airfield. Hauling rock to build a dam. Driving Mamod Miniature Machines. No end to the things you can dream up for using these powerful steam rollers, traction engines and stationary engines. Precision engineered, they're safe as well as fun. Prices from 35/9 to 111/9 at leading toy and sports shops.

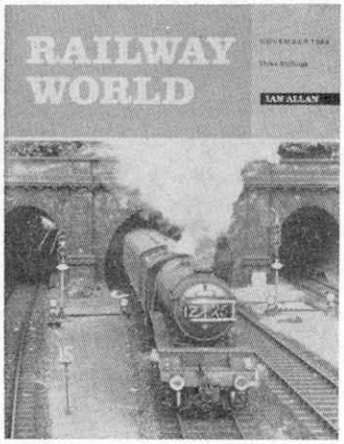


steam models

manufactured by Malins (Engineers) Ltd., Thorns Road, Quarry Bank, Brierley Hill, Staffs.

TRANSPORT PERIODICALS

IAN ALLAN



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If you are interested in steam locomotives and railway history, signalling, rolling stock, architecture, operation, stamps, maps—indeed anything to do with railways, past and present, then RAILWAY WORLD is your magazine. Current news from BR, preservation societies and light railways, locomotive miscellany, feature articles on railway history, development, and operation of yesterday and today combine with the best photographs of trains in action to make RAILWAY WORLD *the* magazine for the enthusiast.

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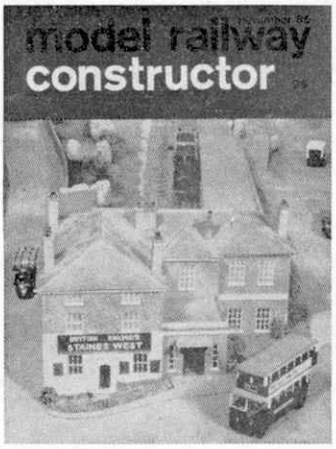

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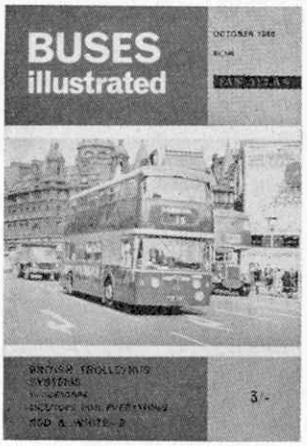

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Apart from the comprehensive news service of movements of public service vehicles in the British Isles, each issue contains illustrated articles dealing with the history of operators, types of vehicles and individual routes of interest. A series appearing regularly is on past and present trolleybus undertakings. Many previously unpublished illustrations of unusual types of buses and coaches.

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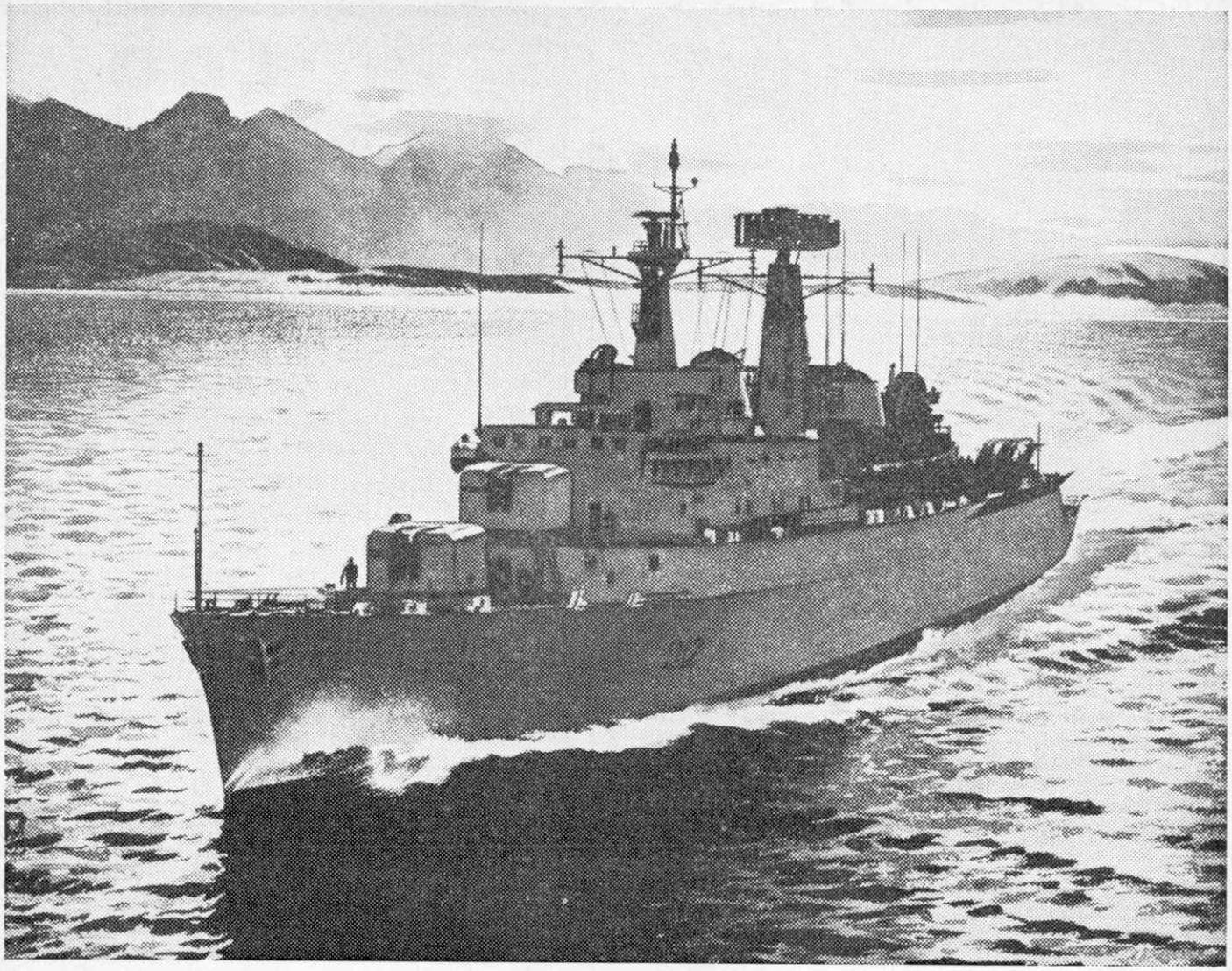

As this Royal Navy destroyer slips away at dawn

Action and adventure lie ahead

Read about life on board – and the great career you'll have.

Where's she going? Sorry, that's secret. Perhaps to the Far East, the Mediterranean or the South Atlantic. But one thing is certain. The men on board are in for an adventurous time.

At sea anything can happen.

Ships may signal for help. Hostile coastlines have to be patrolled. Smugglers intercepted. Battle exercises carried out.

What's she like? She's a guided missile destroyer. She can explode aircraft out of the sky. Seek out and destroy submarines. Search the seas with her helicopter.

She has 60,000 shaft horsepower to send her surging through the waves. Complex electronic radar and automation equipment. Computers. Stabilisers. An automatic pilot.

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You'll also live a varied, active life at sea and ashore; at home and overseas. And you'll enjoy world travel, sport in plenty, fine company and an average of 6 weeks' paid holiday a year.

Post the coupon for full details today.

You can join at 15.

Royal Navy

Royal Naval Careers Service,
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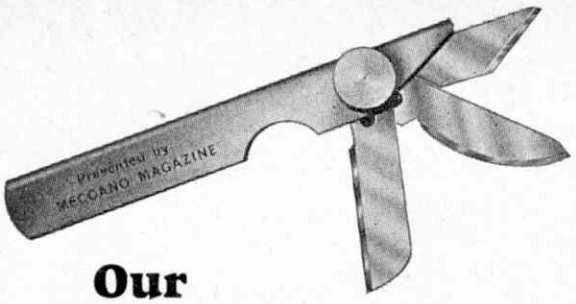

Our Christmas present to all M.M. readers

This super 3-bladed, solid-brass-handled craft knife is yours ABSOLUTELY FREE! All you have to do is to tell a friend (or his dad!) about the great new Meccano Magazine and get him to place a 12 month subscription. When we receive his remittance and the completed form below, we will send *you* your free craft knife. As a special bonus your friend will get a free knife too! What a Christmas Present.

Cut out the completed form below and send it together with your subscription to:—

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to find out more about the many interesting products advertised in the pages of Meccano Magazine. Just tick the squares against the name of the advertiser from whom you would like to receive more product information and post it to:—Meccano Magazine, St. Alphage House, Fore Street, London, E.C.2.

Name .....

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Wants continued from page 48

- Any pre-1965 Meccano Magazines, also manuals, leaflets, etc., and obsolete Meccano Parts. B. Weston, Hawler Road, Glen Forrest, Western Australia.
- Good prices paid for obsolete "Britain's" Fordson Major Tractors, army vehicles and vans; please state condition. Jenkins, 85 Cotswold Avenue, Northampton.
- Wanted, urgently: F15R or F20R Motor; good condition, please. Cooper, 139 Waterside Road, Barton-on-Humber, Lincs.
- Meccano Magazines, January 1960 to May 1960 inclusive, good condition; all replies answered promptly. Channon, 36 Breadalbane, 495 Essenwood Road, Durban, Natal, South Africa.
- Pre-war and pre-1952 cars and military vehicles (Dinky Toys); please state condition and price required. Mills, Loretta Hotel, Llandudno.
- Good prices paid for obsolete die-cast models, Dinky Toys, Tootsietoys, etc.; also early clockwork toys; will buy one or a whole collection. Dr. Gibson, The Green, Anstey, Leicester.
- Tri-ang Mark IV electric motors; also Scalextric set. Details to: Turnbull, 2 North View, Gilesgate, Durham.
- No. 9 or 10 Meccano set wanted for son's Christmas gift; size, condition, price—first letter. Gimnich, 9 Thorington Corner, Halesworth, Suffolk.
- Wanted: Battery operated electric motor to drive load of one man. J. Le Maistre, Les Croix, St. Ouen, Jersey.
- Wanted: Large Meccano outfit, equivalent pre-war No. 7 outfit or larger. Details and price, please: Annable, "Ashfield", Maynestone Road, Chinley, Derbyshire.
- Meccano outfit No. 10; state price and condition. L. Skeggs, 33 Tine Road, Chigwell, Essex.
- Hornby-Dublo, all items required, but locos and tracks must be three rail only; please quote in detail and prices required. Gould, 54 Morris House, Church Street, London, N.W.8.
- Pen friends, interested in stamp collecting, reading, travel and chemistry, aged 14-16. Christopher Marlin, 17 Allchurch Avenue, North Plympton, South Australia.

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Some combinations are just unbeatable.

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This developer is excellent for *every make* of contact and bromide paper. Contains Johnson 142 for prevention of fog and stains, and Johnson 326, a wetting agent. 250 c.c. 4s. 3d.; 500 c.c. 6s. 9d.

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Economical, concentrated acid hardening fixing solution that requires only dilution with water, 1+3. 250 c.c. 3s. 6d.; 500 c.c. 5s. 9d.

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Over five hundred Meccano Magazine readers wrote in to ask about DIGI-COMP on seeing our advertisement in your October edition. Many will by now have spent endless hours amusing themselves and their friends—calculating, playing games of skill, and solving logical riddles with this revolutionary computer-kit.*

A good proportion of our sales have been to boys *who have yet to reach their teens*—and they confirm that the step-by-step instruction manual is easy to learn from; while the special more advanced booklet has been very popular with those who are interested in the technical detail of computer programming. (Cambridge University ordered four!)

Perhaps you were waiting until you had a little spending money. We would be delighted to send off your DIGI-COMP today.

Write to us for full details,

or send cheque/P.O. for 59/11d for DIGI-COMP, or

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I-COR SYSTEMS (Computer Products)

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P.S. If the problem we set still has you guessing, it is true that Jim caught some fish!

Start young with the Army... learn a trade quickly

And have a worthwhile career, with companionship, plenty of sport and travel, security and good pay. If you're between 15 and 17 and dissatisfied with your present job, the Army Junior Entry Scheme could be the beginning of the career you've been looking for.

AS AN ARMY APPRENTICE. There are two kinds of Apprentices; Craft and Technician. We prefer Technician Apprentices to be up to G.C.E. 'O' level or C.S.E. Grade 1 standard in at least two subjects, one of which should be mathematics. Craft Apprentices need no formal qualifications, but both categories must pass the necessary Army aptitude tests. Either way, you can learn a skilled trade (and there are 50 to choose from) in *three* years, or in *two* years for some trades. It takes *five* years in industry! It gives you, in most cases, a Trade Union recognised trade for life! Electronics, radar, aircraft, vehicle maintenance—you name it, the Army will teach you!

OR, if you're not so technically-minded, there are three other ways of starting young with the Army:

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for excitement and adventure and the chance of becoming a high-ranking NCO of the future.

2. AS A JUNIOR TRADESMAN
learning a worthwhile skill such as medical assistant, driver or radio operator.

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Start young with the Army

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Please send me full details of Army Junior Entry

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TOWN .....

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B551202

APPLY NOW FOR ENTRY IN MAY
(You must be resident in the UK)

The three pointed star—continued from page 17

The last French Dinky (which is available over here in the metallic crimson shown, or if you want to leg it to Paris you can have it in silver) reviewed this month, is their model of the 230 SL, which is the lightest car in the present Mercedes range at 2,855 lb. It replaced my coveted 300 SL in 1963 with a debut at the Geneva Motor Show. It boasts a 2,306 c.c. engine of six cylinders with fuel injection, develops 170 b.h.p. and has a top speed, claim Benz, of 124 m.p.h. A nice little car—putting it mildly—but not a little price, for the model on which the Dinky is based, sells here for £3,667. The Dinky version has refinements of springing, opening bonnet, removable top, tilt seats and very good cast base-plate which admirably 'shows the works', what more can I say? Judge for yourselves, it's great! The model car lying in front and to the side of the Dinky 300 SE in the picture and painted cream overall is, according to the base-plate, a 'Mercedes Benz 22'. I feel sure it's the 220 S/220 SE or 65, or its twin. This was a successor—with modern refinement—to the old 220A. Another big smooth rider, only fault with the model is that the axles are too short, consequently, viewed from the front, the wheels are too close to each other and don't appear to lay within the wheel housing properly. Particularly good is the 'chrome' work which appears to be the metal—this is a different colour to Dinky, Corgi, etc., castings—polished, with the painted parts, sprayed around, leaving the bare 'chrome' parts. It's a very good casting, but it's not Tekno, as some of you may have thought, judging by the wheels, it's a Micropet model by Taiseiya Phenix, of Japan. This company has now gone into liquidation.

But the old Micropets are being produced again and reissued by another firm; they're all extremely good. Let me know if you'd like to see and hear more about Micropets.

At the last minute, I popped in another 'Merc' for good measure. Herewith the pre-war Dinky Mercedes Benz G.P. racing car, and very good it is too. Enamelled in darkish blue. With none of today's gimmicks to rely on, nevertheless, it captures the thrill of the moment and the smell of Castrol 'R'—ask your fathers about Castrol 'R', if they've ever been near a race track, they'll remember.

Well, there it is, I think I've waffled on long enough, don't you? And in any case, I'm now getting black looks from my wife for not speaking at all these past two nights!

I'm indebted to David Scott-Moncrieff and his excellent book, 'Three Pointed Star—The Story of Mercedes Benz, 1885-1965', from whence I gleaned the historical and mechanical data. This book was published by Cassell on October 27, 1966, and for Benz lovers I strongly recommend it, for it's a mine of information and makes good reading.

I hope all this starts some of you on a 'Collect Mercedes' hunt!

See you next month.

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DISCOVER THE SECRETS OF THE WORLD AROUND YOU

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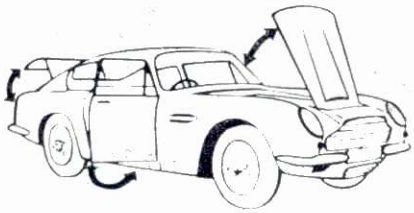
This great new Dinky is an exact scaled-down replica of the world's fastest GT four-seater car. Your Dinky DB6 has lots of 'action' features, including: opening doors, opening bonnet, opening boot, Prestomatic steering and suspension, superb detailed 'wire' wheels, detailed engine, special headlights, chrome bumpers . . . and all the sleek, smart appeal of the real DB6. Join the world-beaters —get a DB6!

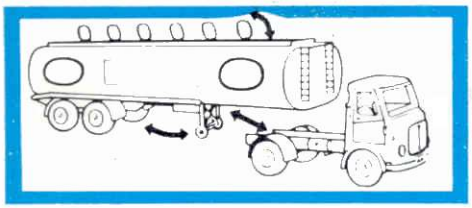
Model No. 153 Length 4⅜" Price **10'9**



GIANT AEC/ESSO FUEL TANKER

A splendid new Dinky version of this 'super' tanker. Fully articulated with locking/pivoting coupling. Sliding release catch uncouples cab. Double-wheel assemblies support tanker body. Folding bogie wheels support the front when it's uncoupled! Extra realistic features include six opening hatches. See the sparkling detail . . . chromed grille and bumper, cab windows and seats. Authentic colours and markings.

Model No. 945 Overall Length 10½" Price **19'11**



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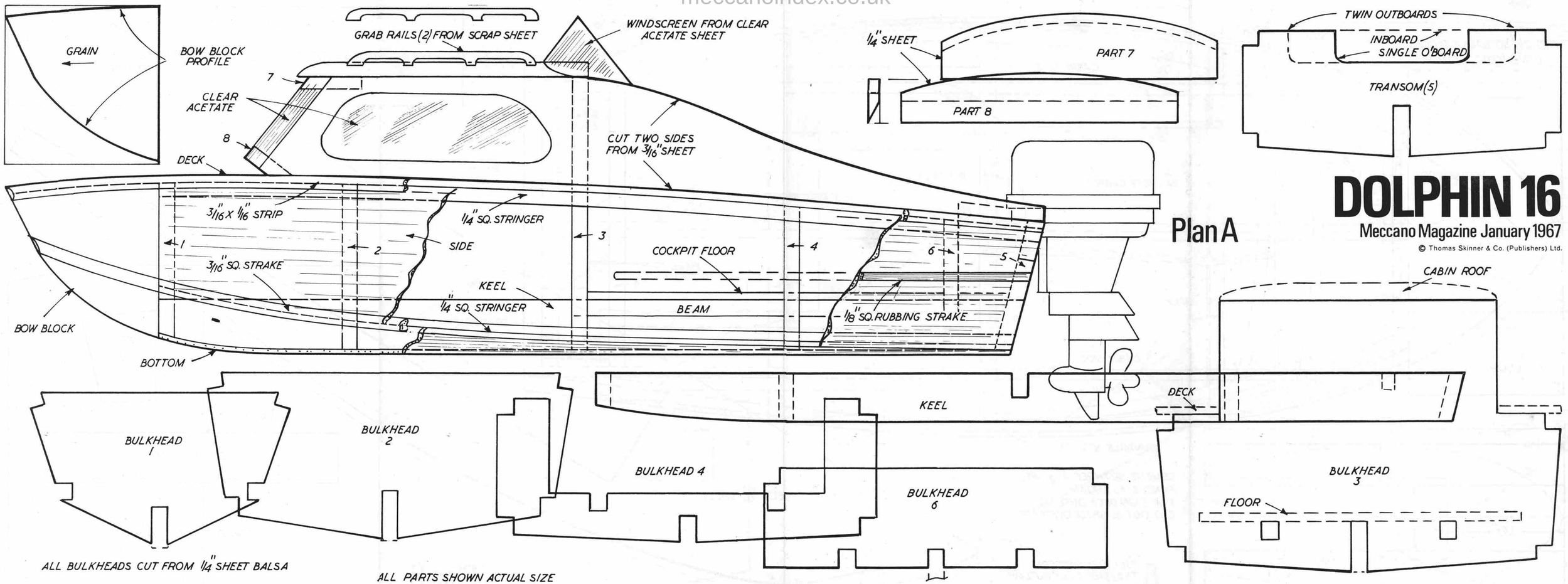
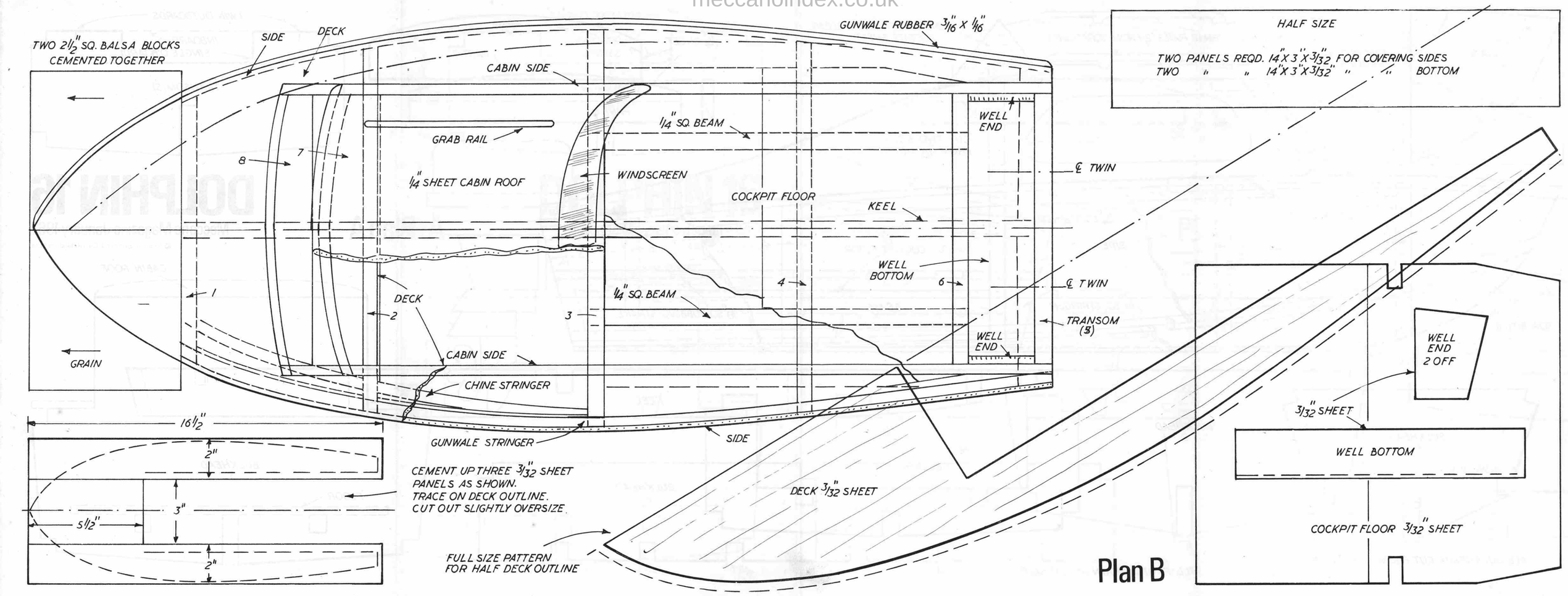


DOLPHIN 16

Plan A

Meccano Magazine January 1967



Plan B