Supplement—Raceways and Model Cars

meccano magazine

September

1s.3d.

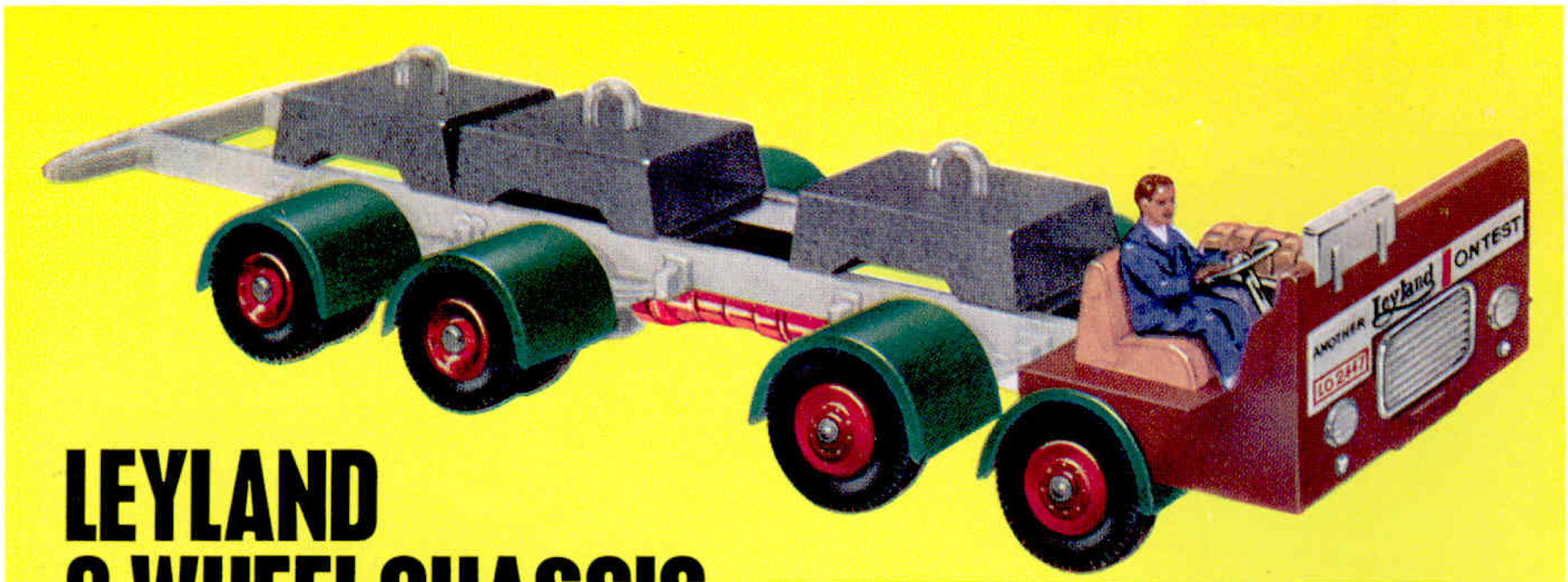
the practical boy's hobbies magazine

1964

IN THIS ISSUE

- **Cycle care—Mend that puncture**
- **The man behind Mercedes**

THIS MONTH'S NEW DINKY MODELS



LEYLAND 8-WHEEL CHASSIS

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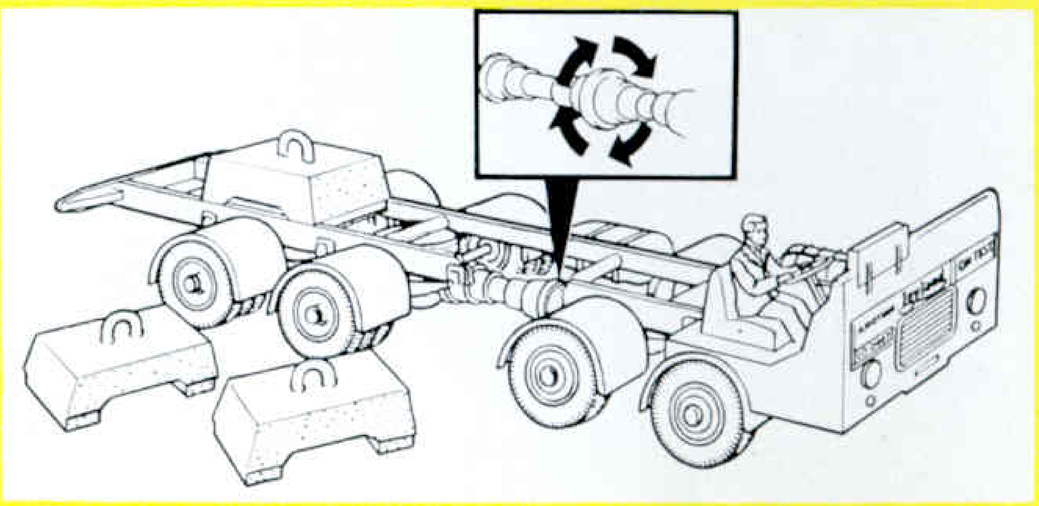

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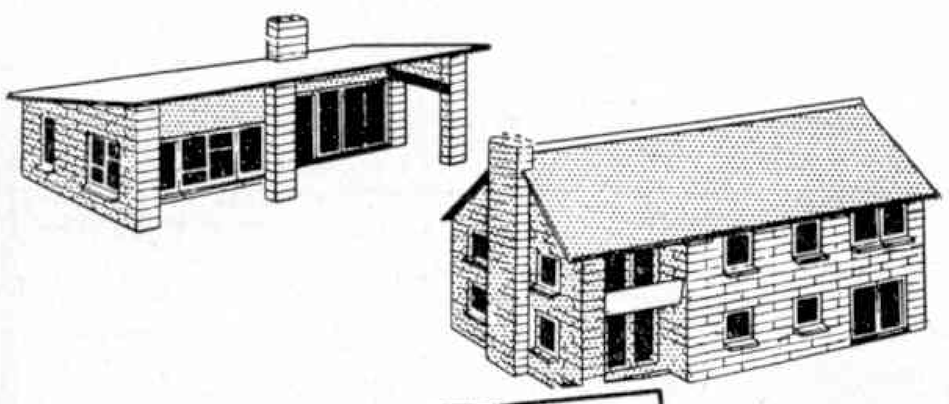

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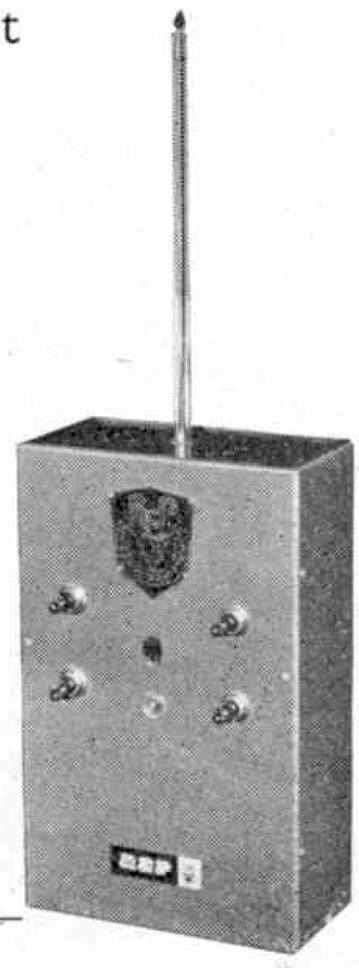

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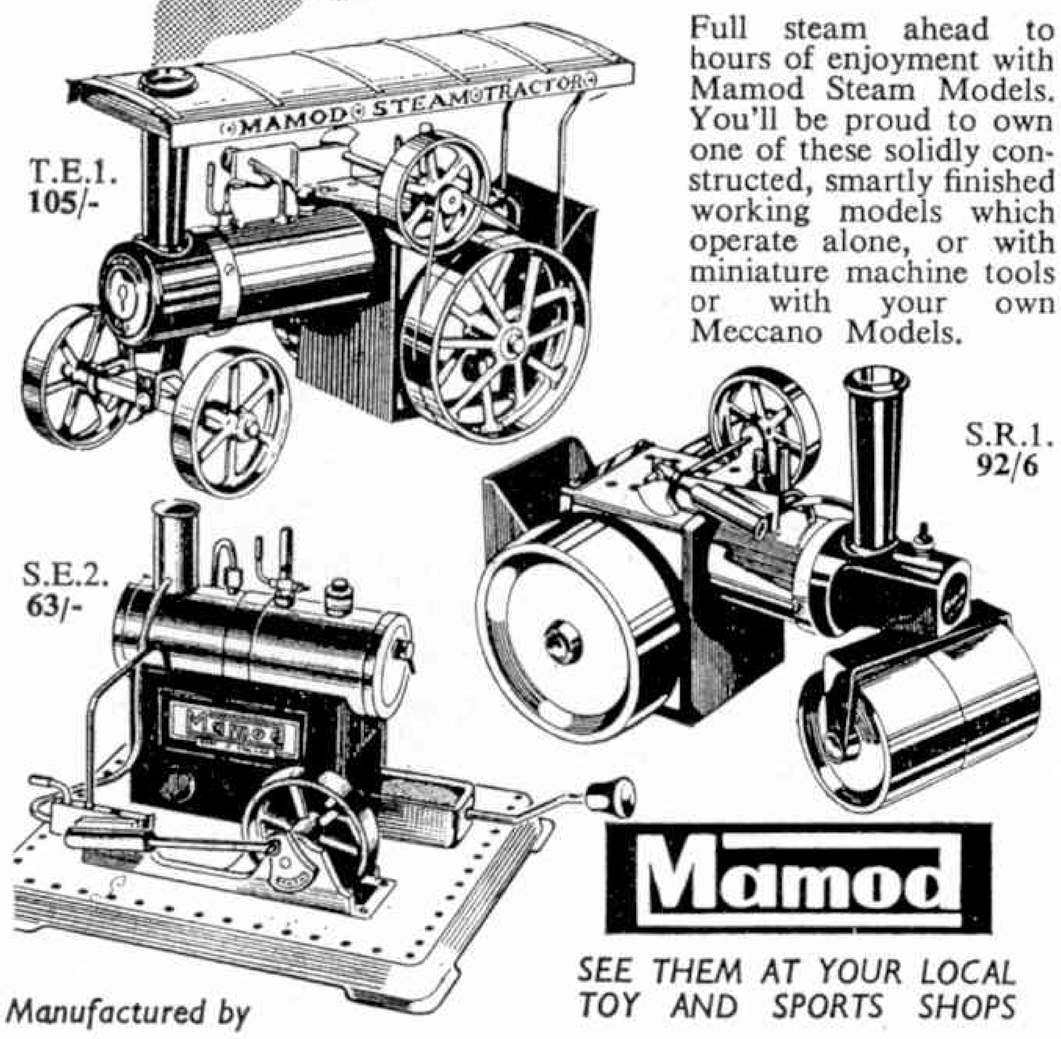

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what's the difference between you and a genius?

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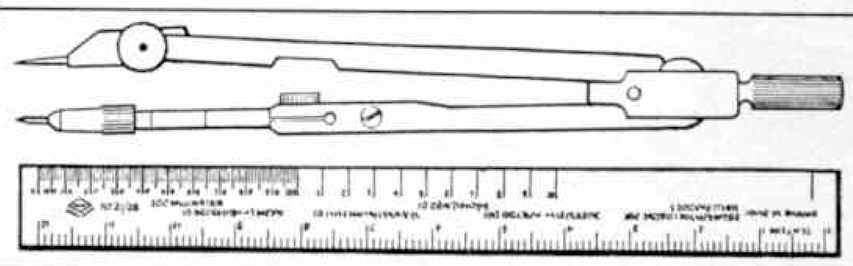
If you want to get ahead make sure you start the term with



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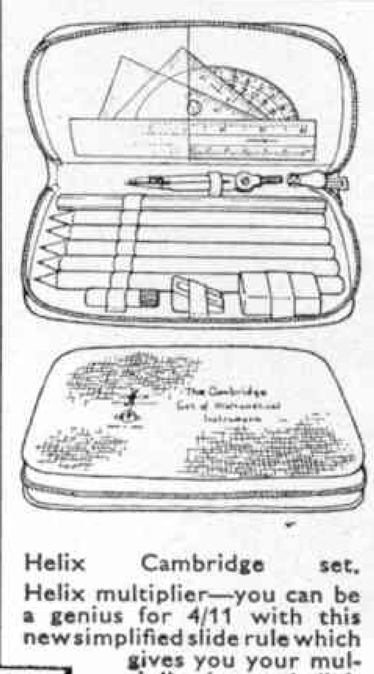

Helix Cambridge set.

Helix multiplier—you can be a genius for 4/11 with this new simplified slide rule which gives you your multiplication and division tables in a split second.

Be smart—Choose Helix and you're half way to being a genius already.

And you'll need set squares, protractors, rubbers, pencil sharpeners, geometry sets (each one has a class time table form and a list of geometric shapes.)

LOOK FOR THE NAME Helix

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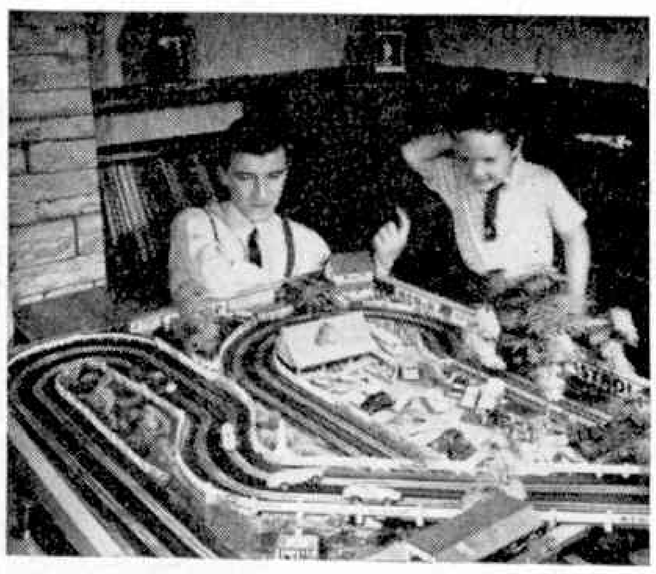
Ordering the Meccano Magazine overseas

Readers overseas can order the *Meccano Magazine* from Meccano dealers or direct from the publishers. The subscription rate for 12 months is the equivalent of 20/- sterling at the current rate of exchange.

Racing in miniature

HOW would you like to be a racing car driver? Just imagine roaring around a motor racing circuit in a racing car at over 100 miles-an-hour just like World Champion Jim Clark! The thrills and excitement of overtaking other cars and carefully judging your speed and controlling your car to sweep around bends must be marvellous. Unfortunately, of course, the majority of us never experience this thrill and we can only watch the racing as a spectator at one of the racing circuits such as Brands Hatch or Mallory Park.

However, a new hobby or sport, which is becoming increasingly popular, is Model Car Racing. This hobby can give you all the thrill of actual motor racing with scale speeds of over 100 miles-an-hour from the tiny, electrically-powered model racing cars. You actually control the cars as they speed around the model racing circuit and it takes a fair amount of skill in 'driving' the models. You can easily run off the track if you 'drive' into a bend too fast and, as some raceway sets allow up to six cars to race at the same time, proper races may take place with six persons each controlling their own car.



Cover picture
Racing in miniature! Kevin Phillips competes against a friend on his father's magnificent Wrenn 152 model racing car layout. For more raceway details see our special supplement.

Full details about these racing sets, plus information on model racing clubs; how to build your own model racing car and a guide as to how you start a model car collection are featured in this month's special Meccano Magazine Supplement. I am sure you will find it very interesting. Personally, I had my first attempt at model car racing only a few weeks ago and I was absolutely enthralled. In fact, I can't wait to get back on the circuit and have a crack at breaking the lap record!

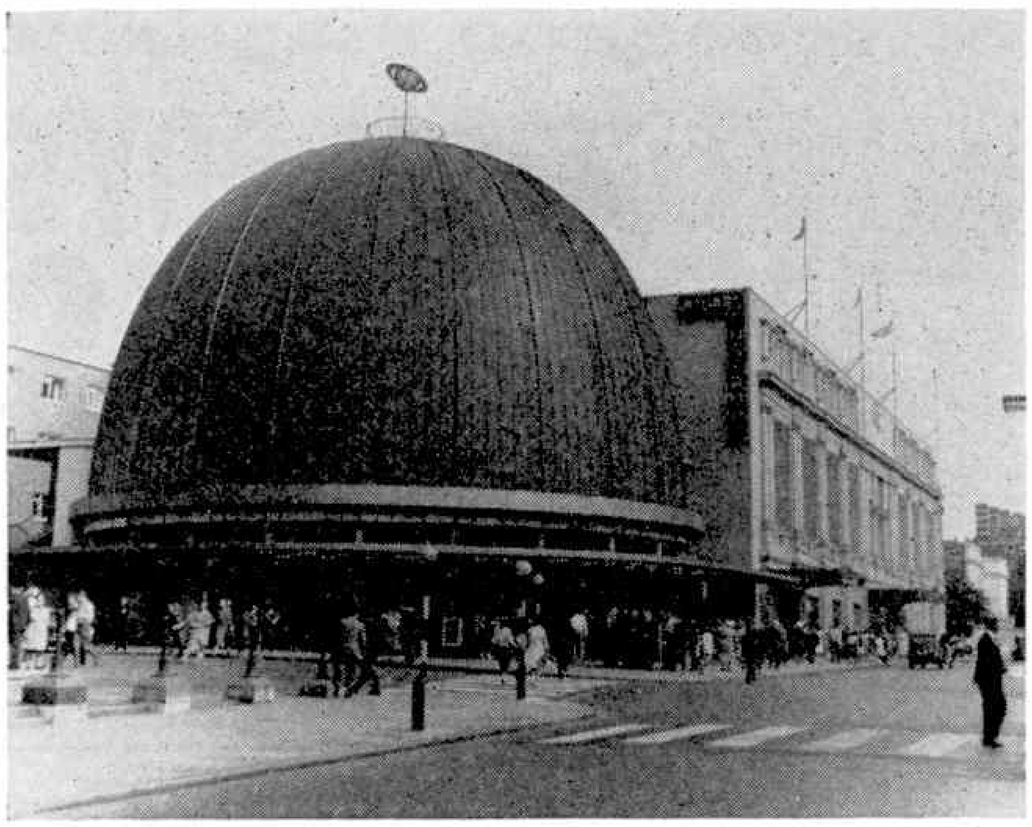
Hobby of the Future

Electronics is day by day playing a greater part in our lives. Wireless, television, tele-communication satellites, tape-recorders, in fact, a host of complicated pieces of electrical equipment are gradually changing our way of life. There is no doubt that electronics is the science of the present and of the future and to keep your magazine completely up to date, next month we are starting a brand-new series of articles about electronics.

How would you like to build you own transistor radio? Perhaps, you need a radio control unit for a model aircraft you have built. These working units and more will be shown in future issues of Meccano Magazine, with full details on how to build them. You won't need to be a mechanical genius, for the step-by-step diagrams and photographs will leave you in no doubt how to complete the work. Make sure you do not miss the first of this new series by placing an order for your copy of Meccano Magazine, now!

Competition Winners

In the July issue of Meccano Magazine we had a competition in which readers had to identify the front cover. The five winners of this competition are:—Brian Clark of Chorleywood, I. Lancaster of Hereford, David Cook of Macclesfield, Tony Gillingham of Wendover and Gordon Seymour of Wolverhampton. Congratulations to these five readers, who will shortly be receiving their prizes.



The dome of the London Planetarium in Baker Street, London.

by **Charles E. Deane**

THE WAY TO THE STARS

HOW often have you wished you could take a voyage into space to look down on the Earth as an astronaut would from his tiny spacecraft hundreds of miles above the Earth's surface? Perhaps you have even dreamed of travelling into the past or future aboard a 'time machine' similar to the fictitious model created by the incredibly imaginative author H. G. Wells?

Believe it or not, but in Baker Street, London, there is a building called the Planetarium, where every day of the week, boys and girls are transported thousands of years into the future or past and on journeys of millions of miles through space!

In reality, of course, they never leave the Planetarium, but inside this unusual building a very exciting demonstration takes place. Within minutes of entering the auditorium, daylight is magically transformed into night. The large dome above the audience changes from sky blue, to dark blue, to midnight blue. Then, as the audience become accustomed to the dark, stars begin to shine from the clear 'sky' above.

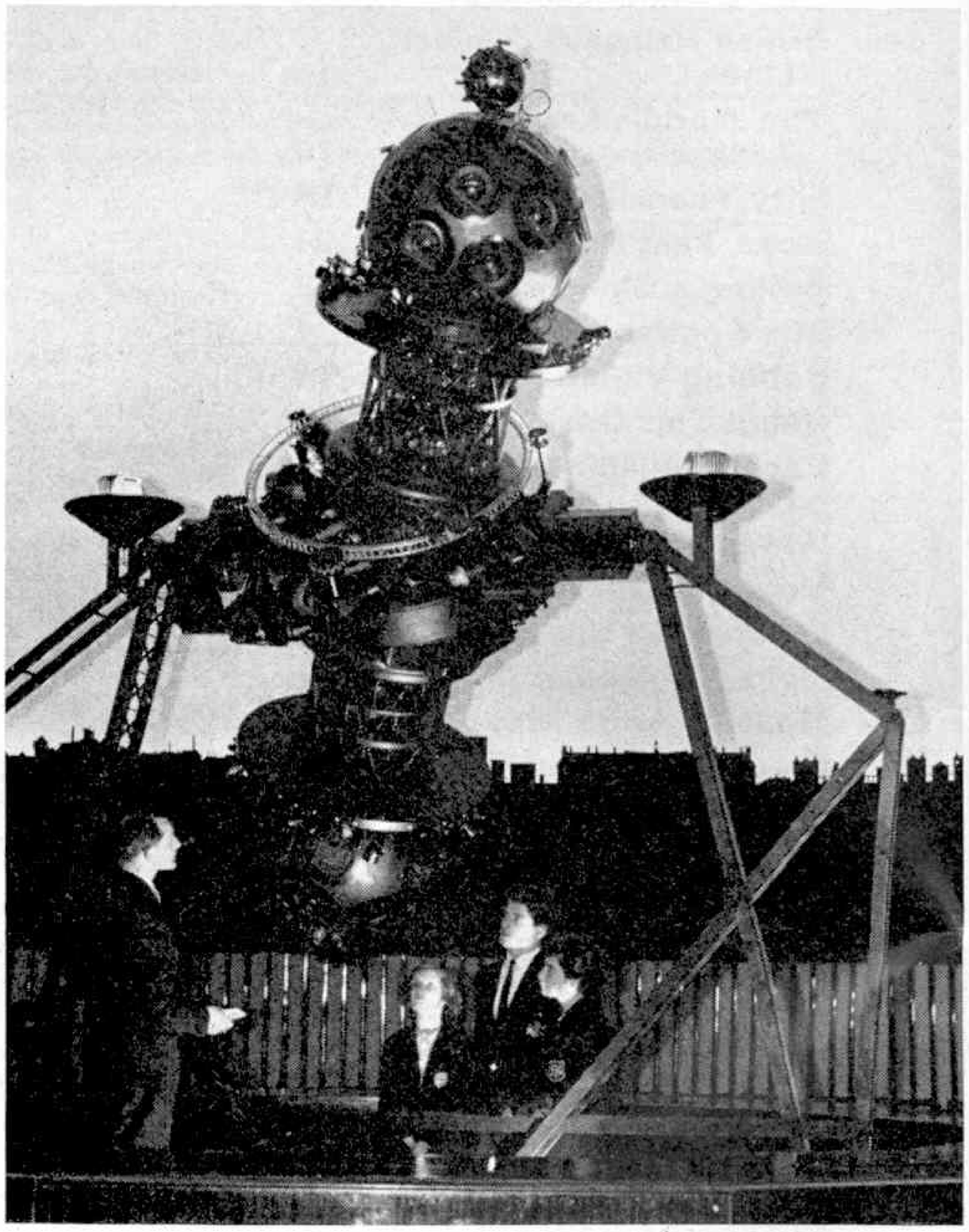
The first effect upon the audience is to stun them into complete silence, then come the gasps of sheer amazement at seeing a perfect night sky in the middle of the day. How then is this transformation from day to night achieved?

Perfect Sound and Projection

Firstly, there is the 67 foot projection dome above the audience. This is specially constructed to absorb all sound in order that when the narrator speaks to the audience, his words do not echo around the auditorium. This sound absorption is achieved by having the dome perforated with tiny holes, approximately twenty million of them, over the entire surface. These holes allow the sound to pass through the dome and be captured by special noise absorption material. They also serve another purpose—that of ventilation. This in turn ensures that the atmosphere inside the dome is practically dust free, a vital consideration where precise light projection is concerned.

The subject of light projection leads to the second and most important piece of equipment which is used to create the illusion of the night sky—the Zeiss Universal Projector.

This instrument is capable of projecting some 8,900 stars, all of them correctly graded according to brightness



The Zeiss Universal Projector which provides the magnificent array of stars on the huge dome above the auditorium.

Cygnus the swan is one of the many constellations projected on to the domed roof of the Planetarium by the Zeiss Universal Projector. The outline of the constellation is depicted by a special projector in the auditorium. In this manner the audience can easily pick out the stars which go to make up the various constellations.

and spaced among themselves according to the corresponding spacings in the actual sky. However, the projector doesn't simply project stars on to the dome. It is constructed in such a way that it may be controlled mechanically in order to 'move' the stars and planets in relation to the Earth, according to the days, months and years.

In other words, if you wished to see how the night sky would appear on a certain date in the year 2000 A.D., the Zeiss Projector can be operated to project that particular sky star pattern for that particular day! This means that you can enter the London Planetarium and within minutes travel from the year 2000 B.C. to 2000 A.D.

With the Zeiss Projector it is not only possible to move backwards and forwards in time, but it is also possible to move out into space. Special equipment allows the audience to see the moon's surface in close-up, with craters and mountain ranges clearly defined. In fact, sitting in the auditorium, one can almost imagine that one is being rocketed into outer space to have a closer look at the stars and planets which make up the Universe. Saturn appears in all her glory with the famous rings which are visible through an astronomer's telescope, Mars is distinguishable by its reddish tinge, while Jupiter appears to have belts across its surface.

Travelling even deeper into space, with the aid of the Zeiss Projector, it is possible to sit 'out in space' in the auditorium and look down at the Earth and all the other planets in the Solar System, orbitting the Sun. Naturally, there are a great number of other planets and stars visible at the same time, but the Zeiss Projector is so accurate, that at any given moment, all fixed stars and planets in the Solar System are set in the correct relative positions.

Bits and Pieces

The Zeiss Universal Projector which creates this fantastic illusion of time and space travel is a masterpiece of modern engineering. It is made up of approximately 29,000 individual components, contains 230 ball-bearings and nearly 200 optical projectors. The dumb-bell shaped assembly is $13\frac{1}{2}$ feet long and weights over 2 tons.

Already I have seen this incredible machine in operation three times and on each occasion I have been held spell-bound by the life-like night scene projected on to the domed roof of the Planetarium. To describe my visits in full, as well as the story of the development of the Zeiss Projector, would take far more pages than are available here. Therefore, I can only suggest that, should you live in, or come to, London, be sure to make your way to the stars via London's Planetarium. Each journey into space takes approximately 40 minutes and on your return to Earth you can go next door to the Planetarium and see the world-famous Madame Tussaud's waxworks. It makes a day's outing in London that you will long remember.

Audience reaction! This photograph, taken by infra-red photography, shows how the audience reacts to a perfect night sky.

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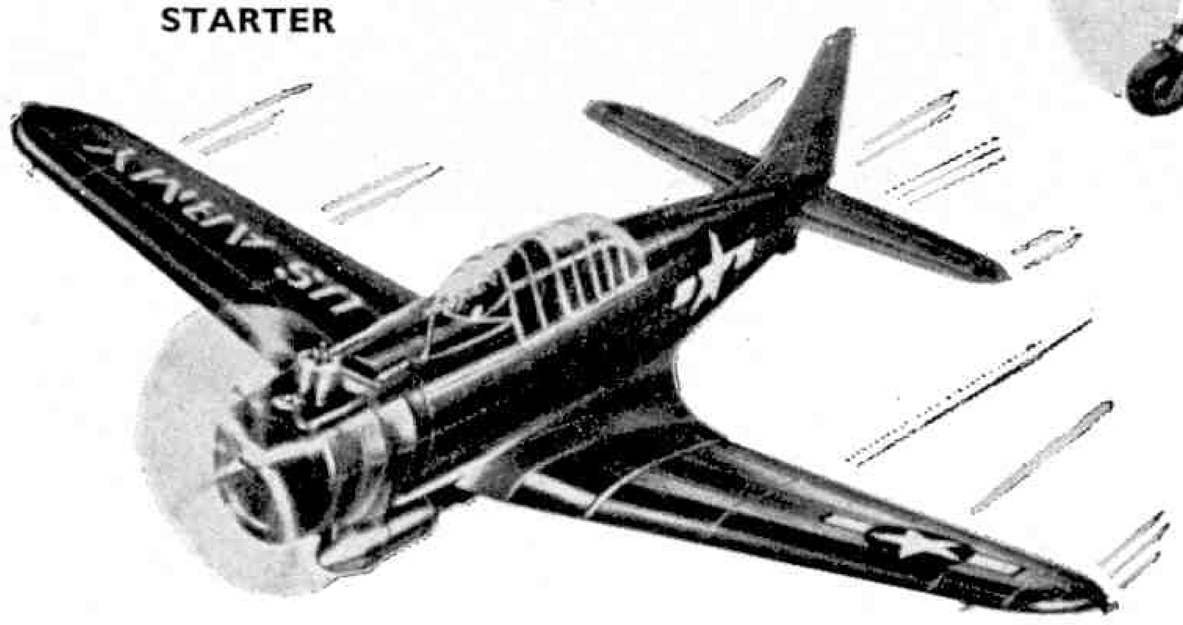

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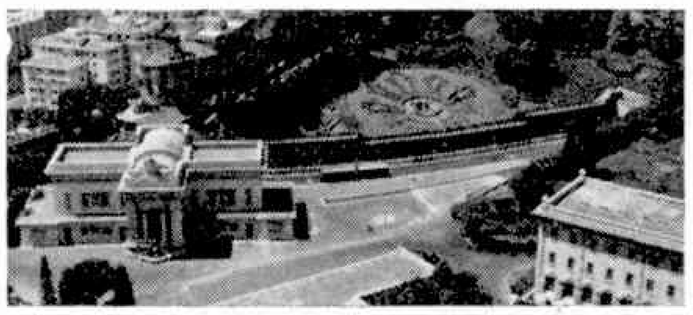
mailbag

Anything interesting . . . write about it to the editor

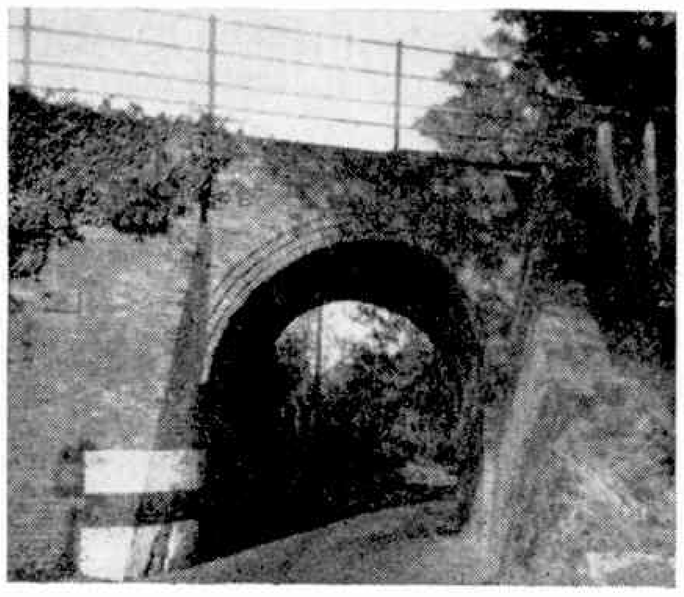
■ *IN THE WIND*—The Marsh Mill at Thornton, near Blackpool (seen in this picture) is about 170 years old, and is a well-known landmark in that part of the world. Since the picture was taken three of the sails have been blown off by the gale force winds, but the mill, which is owned by the local council, is to be renovated and the sails replaced. *M. Durnan, Thornton, Nr. Blackpool.*

■ *THE BURMESE TROPHY*—The Mandalay Bell appeals especially to the Burmese visitors to Windsor Castle. The bell was brought to England in 1887 from the palace at Mandalay, which was then the capital of Burma. It is a trophy from the third Burmese war of 1885, which ended with Upper Burma being acquired by the British. The bell, weighing 4½ hundredweights, was presented to Queen Victoria in 1891 by officers of the 4th Battalion Rifle Brigade (Prince Consort's Own). *R. D. Barrett-Lennard, London, S.W.6.*

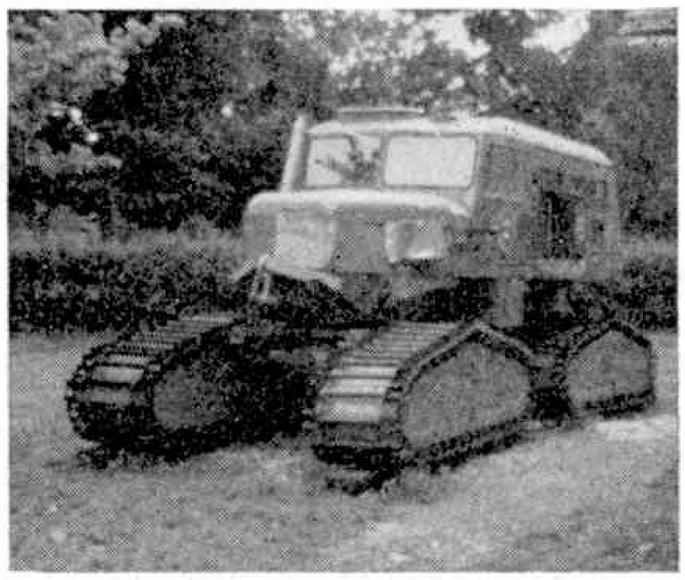
■ *THE SHORTEST RAILWAY*—Looking down from the largest church in Christendom, over the smallest state in the world, we can see the shortest railway system in the world. The Vatican railway consists of 300 yards of double track. From the beautiful marble Vatican station, which was a gift of the Italian Government, the track runs out of the Vatican through two immense steel doors in the south wall; this is the Fabbrica Gate or the "Iron Curtain". The station is only for goods; no passenger train has ever made use of it. Actually, this railway is extremely important to the Vatican as there are no import or export duties to be paid. Also, as there is a 50% reduction on all freight fares for building materials and many other items travelling by the Italian railways to the Vatican, materials for many churches all over Italy are sent first to the Vatican and from there by road to where they are required. *J. C. D. Smith, Bridgwater.*



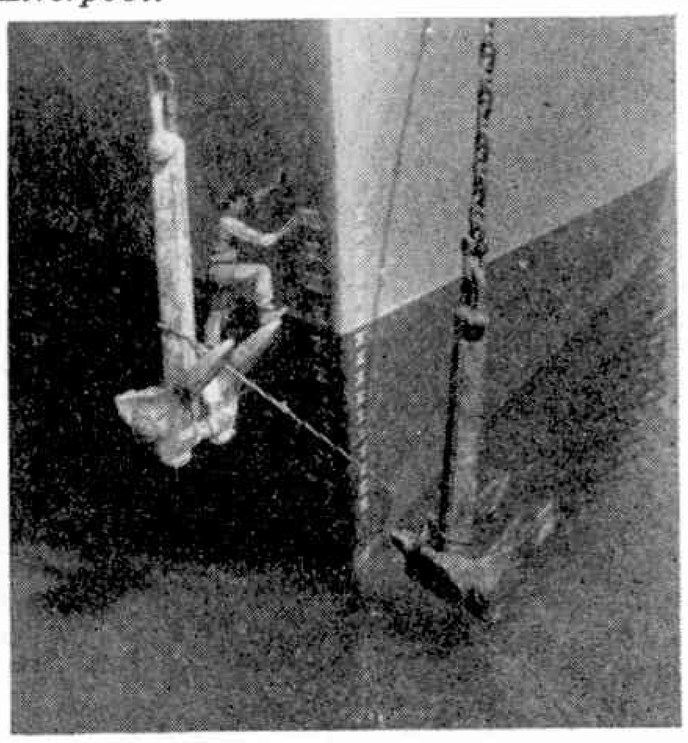
■ *THE OLDEST RAILWAY BRIDGE*—The oldest railway bridge in the world is in Church Street, Whitstable. It was part of the Whitstable-Canterbury Line of the South-Eastern and Chatham Railway Company. It served Whitstable Harbour and transported coal, fish and wheat. Its last passenger train ran in 1929. The bridge was built in 1830 and when it was repaired in 1832 George Stephenson predicted that it would collapse, but when he saw it in 1835 it was still standing. The railway was closed on December 1, 1952. The new Southern Region station of Whitstable and Tankerton stands to the left of the bridge. *Philip Freedman, London, N.2.*



■ *THE SNO-CAT*—My photograph shows one of the actual Sno-Cats used for the crossing of Antarctica in 1958. This particular vehicle was named 'Haywire' and was used by Dr. Fuchs, the leader of the expedition. Four of these Sno-Cats were used on the expedition and they were built by Tucker Sno-Cat Corporation in the U.S.A. The Sno-Cat can travel at 6 to 8 miles-an-hour when loaded and 15 miles-an-hour unloaded. Each of the Sno-Cats towed two sledges on which was carried 2½ tons of provisions and equipment. This actual vehicle may now be seen at the Montague Motor Museum, Beaulieu, Hampshire. *David Jackson, Dibden Purlieu, Hants.*

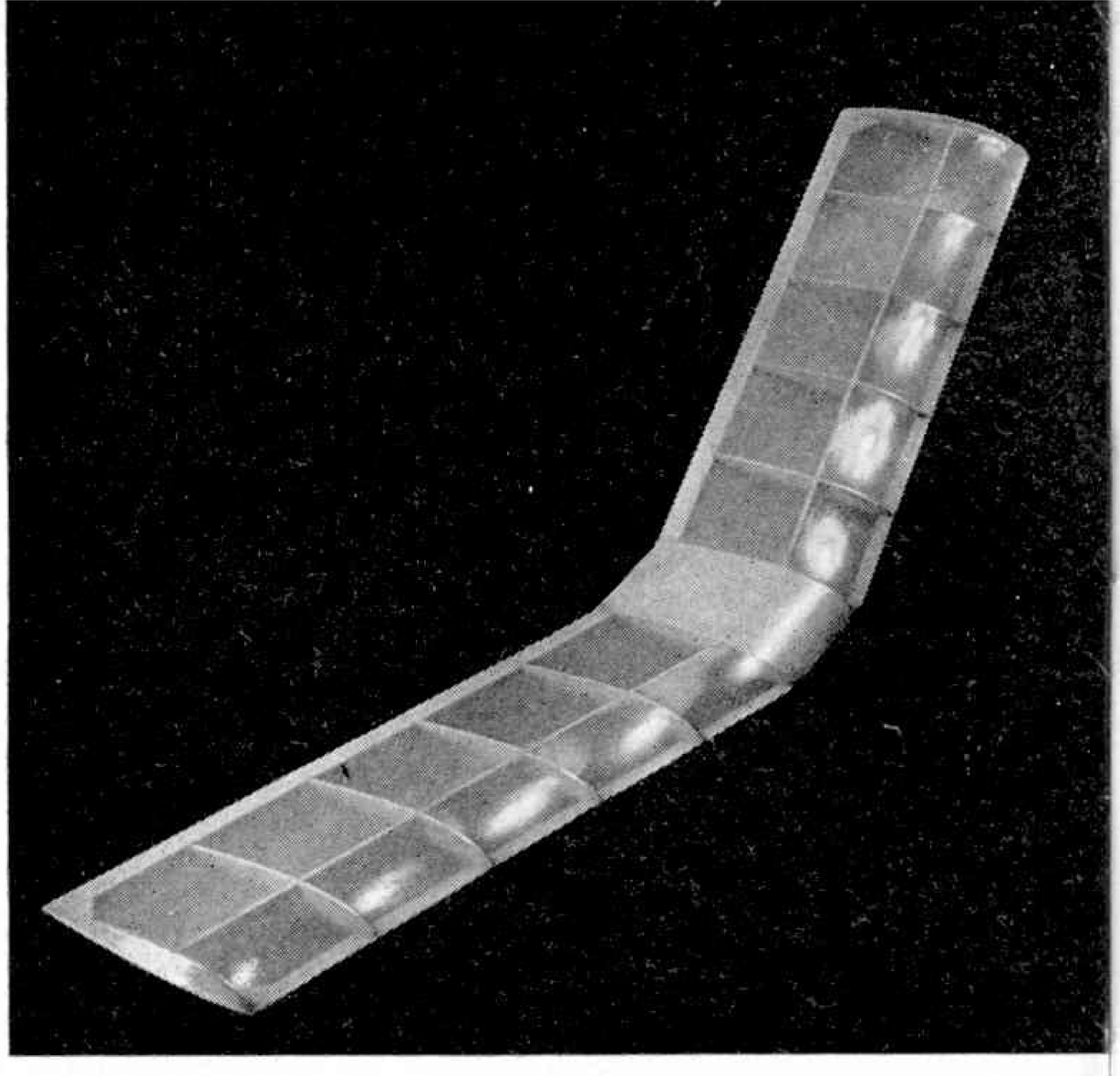


■ *UP ANCHOR!*—Balanced above the waters of the North Queen's Dock at Liverpool this seaman is busy painting on the ship's stem the numerals which denote the depth of water drawn by the vessel. You will notice that to stop the anchor on which he is standing from swinging it is tethered to another anchor on the port side. *T. Taylor, Liverpool.*



Aeromodelling by **John Atkinson**

Tissue covering technique



Wrinkled tissue spoils the looks of a good model aeroplane! John Atkinson shows you how to obtain a perfect finish for your craft . . .

HOW MANY times have you enviously admired a beautifully covered model at a flying meeting or exhibition? One's own efforts so often fall far short of such perfection and yet there is really nothing very difficult in achieving a smooth, wrinkle-free finish. It is only a matter of taking extra care and, most important of all, *not rushing* the job! Once the structure is complete, I know it is a temptation to attempt to complete the covering in the shortest possible time, in order to get the model into the air. However, *do* try to resist it, for you will only be dissatisfied with the end result and wish that you had taken more time.

Besides producing a much better looking model, a good wrinkle-free covering job also considerably increases the model's strength. Flying performance benefits too; a smooth finish being far more efficient than a rough one. There are, of course, one or two 'tricks of the trade' which will simplify this important final constructional stage and these I will try to deal with in the article.

The quality of the finished job is determined long before the first tissue is applied to the framework—the correct preparation of the uncovered airframe being perhaps the most important single factor in achieving covering perfection.

Preparation of the Frame

The first job is to go over the whole frame with fine sandpaper. Flour-paper is best for this, as it is sufficiently smooth to avoid rubbing away too much wood, thus distorting vital shapes and, at the same time, it has sufficient 'cutting power' to remove any irregularities of contour. Examine the structure carefully for small blobs of cement that may be sticking up; these must be carefully cut off.

When you are satisfied that the frame is perfectly smooth, give all the outside parts (those that will be in contact with the tissue covering) a coat of Sanding Sealer. This will, when dry, leave the wood with a rough surface, since it brings up the top fibres, but at the same time it also fills in the balsa wood pores. Next, use the flour-paper again, to give the frame a silky smooth surface with *no* sharp projections.

Model aircraft covering tissue is especially made for the job. The best known brand in Great Britain is Modelspan, which may be bought in a variety of colours and in two grades—lightweight and heavyweight. Free flight models of up to about two feet wingspan generally use the lightweight grade, larger ones can be covered with the stronger heavyweight and sometimes silk or nylon.

The majority of control-line models use heavyweight tissue or nylon, all except the really small aircraft, where weight must be carefully 'pruned'.

There are many ways of actually attaching covering materials to the framework, but the easiest is by means of special tissue paste or one of the dextrine pastes such as Grip-fix.

Never try to cover a double curvature with *one* tissue panel. Such a situation often occurs at wingtips, the upper surface of which should be covered with a separate piece of tissue. By trying to pull the main wing covering tissue down to the tip, wrinkles are almost invariably introduced. The same applies where a dihedral break occurs. A new panel is needed wherever such a contour change takes place.

For a typical wing, you will need four pieces of tissue on its 'upperside'—one for each tip and one for each main panel—and two for its 'underside' which, usually being flat, needs no additional tip pieces.

Cut out your tissue panels a little oversize and note, when doing so, that one side of the tissue is slightly smoother than the other. The smooth side is the outside.

Spread a thin layer of paste over the outline of the framework—not on the ribs—and lay the tissue carefully in place. Gently press it down, easing it outwards, to achieve an overall even tension. The aim is not so much to stretch it *tight*, as to get it *smooth and even*.

When the whole frame is covered and the adhesive is dry, spray the tissue with water. A scent spray or an

artist's cheap fixative spray is ideal. Don't soak the tissue, just dampen it. The covering will now sag alarmingly, but don't be dismayed, for as the tissue dries it will tighten up to a drumlike surface.

Never attempt to hasten the drying out process by applying artificial heat, this can later result in a slackening of the covering or a warped model.

Doping your model

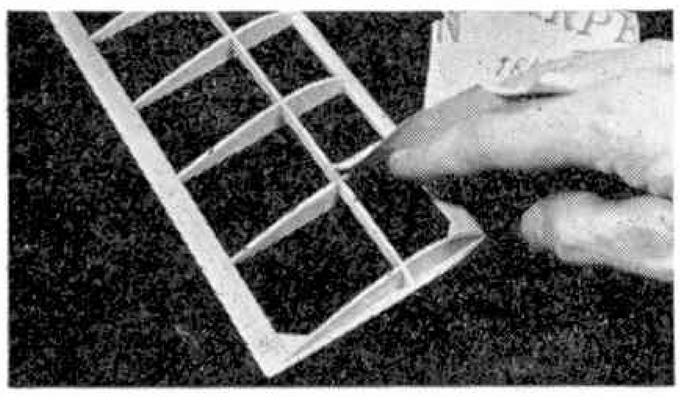
Clear, shrinking dope is next brushed on to the taut tissue. This adds a lot of strength to the covering and fills in the many tiny pores in the tissue. Clear dope has tremendous shrinking power and, as it dries, will tend to distort the framework, unless it is pinned down to a flat surface. Pack the tissue-covered component clear of the surface on which you are working with small pieces of balsa to prevent the dope from sticking. Leave the covered frame pinned out for at least an hour—or longer if you can. Two coats of clear dope are normally required to achieve a good finish.

If you wish to colour dope the model, now is the time to do it. Colour dope has no shrinking powers and so it *must* be applied over a base coat of clear dope. However, bear in mind that it does add a lot of weight to a small model and, wherever possible, should be avoided, if maximum flying performance is required.

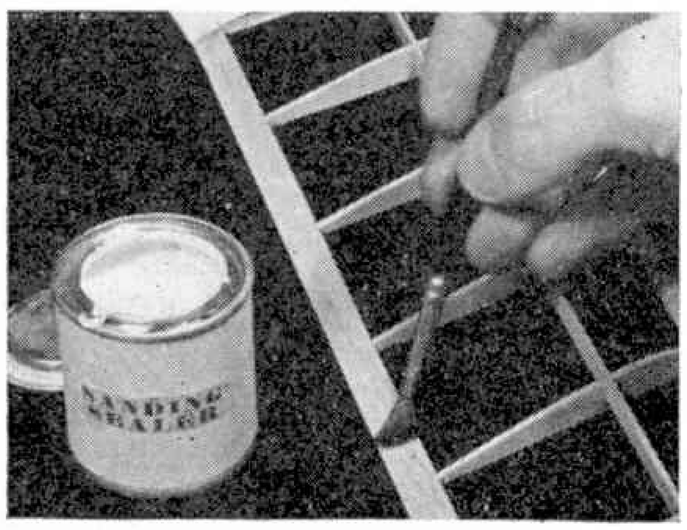
Always use the same type and make of both colour and clear dope. *Never* use different makes as they frequently interact and ruin a good covering job.

If your model is engine-powered, the dope will need to be 'fuel-proofed', the reason being that it is often attacked by engine fuel ingredients. Fuel-proofing is easy to carry out, as the proofer is merely a special kind of clear varnish which is brushed over the entire model. Particular attention must be paid to the engine bay, as it is always soaked with fuel.

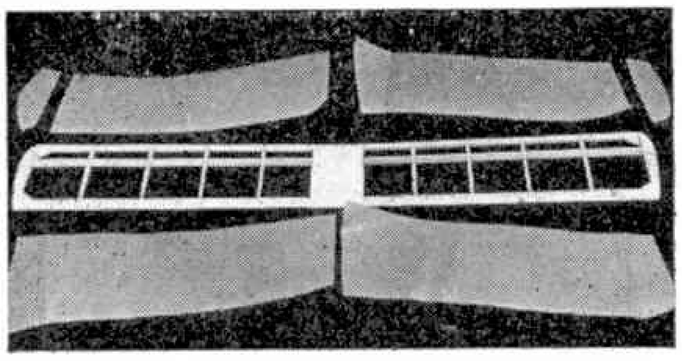
Some new types of colour dope are fuel-proof in themselves and require no further treatment. One of the best of these new colour dopes is Keil Kraft ethylrate dope. Butyrate dopes and some plastic enamels are also fuel-proof, but have certain disadvantages and are often difficult to apply. If you carry out all the work described here, you should have a perfectly finished model aircraft.



Remove the surface roughness of the balsa airframe with flour-paper. This will avoid any bad patches showing on the finished work.

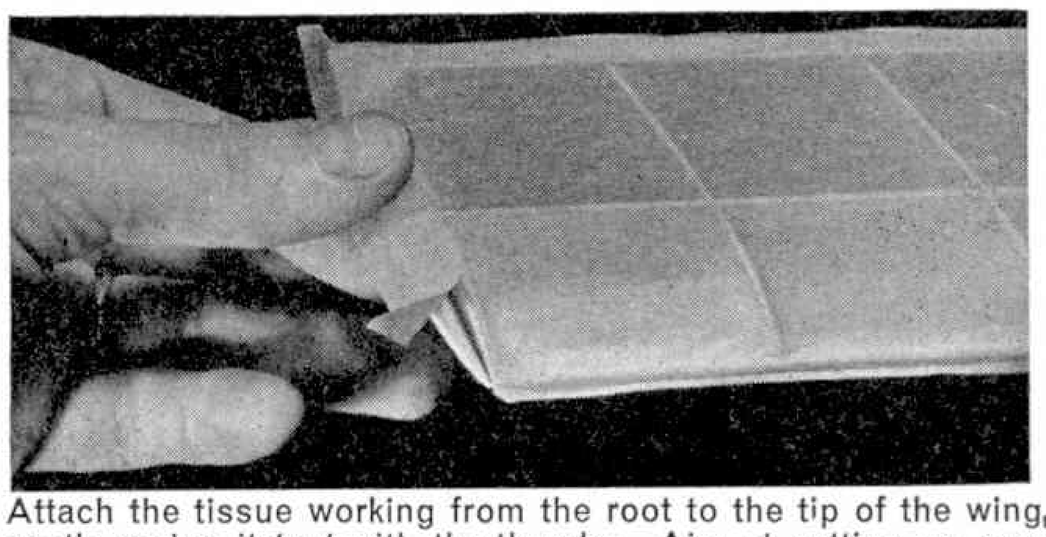


Next give the whole frame a coat of sanding sealer. When it is dry, remove any further roughness by once again using flour-paper.

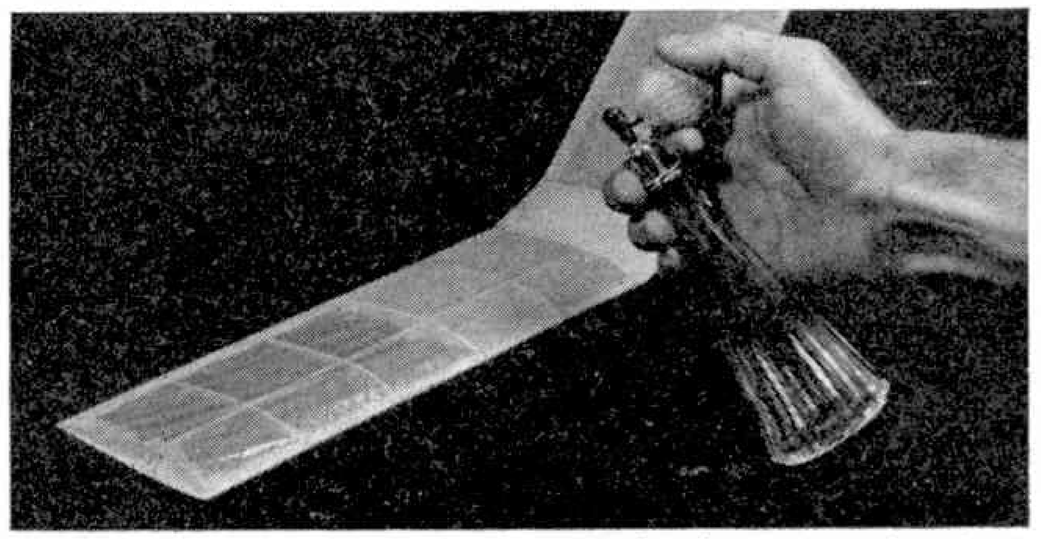


Cut covering tissue panels slightly on the large side. As tissue has a slight 'grain', it should run along the wing from root to tip.

When applying the adhesive, spread it thinly over outline of wing—not on the tissue itself. Grip-fix paste is ideal for most jobs.



Attach the tissue working from the root to the tip of the wing, gently easing it taut with the thumbs. Aim at getting an even covering and not a really tight job. Also, use separate pieces of tissue for tips of wings and other curves.



Next, when the adhesive is completely dry, spray the tissue covering with water. A scent spray is the ideal tool. Make sure you handle the model very carefully at this stage.

When the tissue is dry apply shrinking dope with a broad, soft brush, working quickly. As the dope has a very strong shrinking action, pin down drying framework to stop warping.

Have you a problem—in science, history, literature or any other subject—to which you cannot find the answer?
Ask Tom Sheridan and he will do his best to answer it. If he cannot, and he thinks one of our readers might be able to help, he will print your query in this feature. Questions should be sent on postcards bearing your full name and address (but these will not be published if you put them in brackets and just add your initials or a pen name). Address them to Tom Sheridan, *Meccano Magazine*, Thomas Skinner and Co. (Publishers) Ltd., St Alphage House, Fore Street, London, E.C.2.
You may submit as many questions as you like. We will deal with as many as possible each issue.

Help yourself

Q. *Who first invented self-service stores, and when?—Michael Barker, Pontefract, Yorks.*

A. As early as 1912, some traders in southern California called their stores 'self-service'. But the introduction of the turnstile and check-out system came with the opening of the first Piggly Wiggly self-service grocery store at Memphis, Tennessee, in 1916. The chain, started by Clarence Saunders, eventually grew to 2,660 stores scattered throughout the U.S.A. and doing an annual business exceeding $180 million.

Basket-carriers for customers first appeared in the Big Food Market at Houston, Texas, in the 1920's, by which time supermarkets were common in America. Self-service did not start in Britain until after the last war. In 1952 there were about 1,000 such stores and the number has multiplied every year.

Ruritanian classic

Q. *How many times has the story of The Prisoner of Zenda been filmed?—'Picturegoer', Enfield, Middlesex.*

A. Anthony Hope's best-selling melodrama, published in 1894, was first filmed in America in 1913, with James K. Hackett in the title-role. Another silent version, starring Ramon Navarro, followed in 1922. In 1937 Ronald Colman appeared in the first sound-film version, with Madeleine Carroll as Princess Flavia. A colour-film version was shown in 1952, with Stewart Granger and Deborah Kerr in the lead.

Ronald Colman star of 'Prisoner of Zenda'

Insect hunt

Q. *How many different kinds of insects are there in Great Britain?—S. T. R., Bodmin, Cornwall.*

A. About 20,000 varieties, many of which are peculiar to this country, while some are found only in certain areas. The British Trust for Entomology has recently launched a special survey to determine the exact distribution of certain species and more than 200 British entomologists are seeking the help of amateurs in collecting this information over the next ten years. Dr. Edward Popham, lecturer in zoology at Manchester University, is in charge of the exercise, which is the first of its kind.

Goldfish cure

Q. *What is the best way to cure a goldfish of fungus?—W. Saul, Bushey, Herts.*

A. Fungus disease usually follows bruising or injury, overfeeding, or sudden temperature changes. It appears as a white film or cottony tufts and may cause death in a day or two, though a fish sometimes lives for weeks while the fungus spreads over the body. As soon as the disease is noticed, the fish should be removed from the aquarium and placed in a weak salt solution (1 oz to a gallon) which should be doubled in strength the following day, and, if necessary, strengthened again the third day. The process is reversed when the fish is cured, before it is returned to the main tank. The fish with which it has been in contact should also be given a mild salt treatment. There are other remedies, but this is the simplest and safest.

Roving recorder

Q. *I wish to buy a really portable tape recorder to use on my travels, indoors and outdoors not too expensive, but reliable. Can you recommend one?—F. G., Leatherhead, Surrey.*

A. There are at least a dozen makes of battery portables to choose from, priced between about £15 and £50 and a much wider range for those who can spend up to £150 or even £300. We hesitate to recommend any particular machine without knowing your exact requirements, but you will find them all listed, with full details and prices, in the *Tape Recording Yearbook* (Print and Press Services, London, E.C.4; 7s 6d).

Interviewing Jessie Mathews by tape recorder

Radio boat

Q. *Do you know of any books which would help me to construct a radio control device for a model boat?—R. F. H., Bourne, Lincs.*

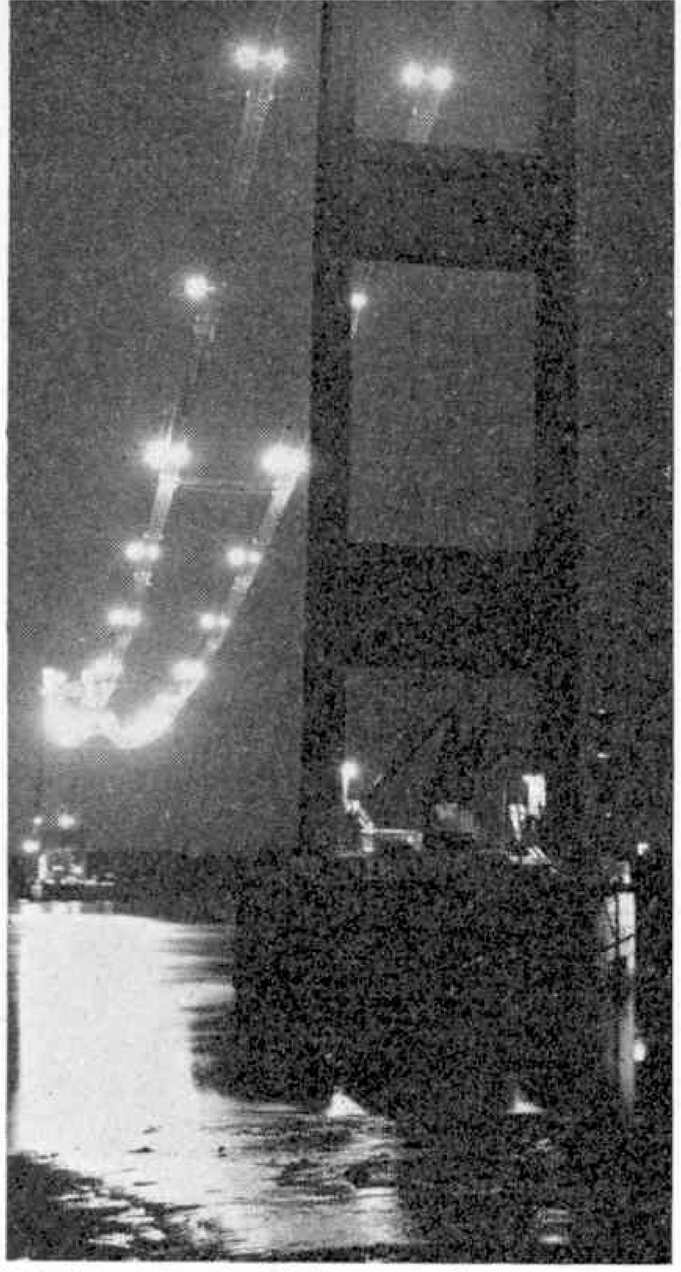
A. Get *Radio Control for Model Boats, Ships and Aeroplanes*, by F. C. Judd (Data Publications, Maida Vale, London), or *Radio-Controlled Models* (Pearson's). The first-named volume costs 15s; the other 12s 6d.

Dawes' Limit

Q. *I cannot find in any of my books a definition of the astronomical term, Dawes' Limit. Can you help?—E. Robinson, Colgate, Horsham, Sussex.*

A. The resolving power of a reflecting telescope, expressed in seconds of arc, may be ascertained by dividing the constant 4·56 by the aperture in inches. This was determined by the keen-eyed English observer, W. R. Dawes, who died nearly a century ago after studying the matter thoroughly. He also discovered one of Saturn's rings and many double stars.

Resolving power is the ability of a telescope to separate close images. Increasing the aperture results in a more detailed image, regardless of magnifying power or definition, which is often confused with resolution. By allowing more light in the image, it also permits observation of fainter objects. For a full technical explanation, see the *Amateur Astronomers' Handbook*, by J. B. Sidgwick (Faber); also *Practical Amateur Astronomy*, edited by Patrick Moore (Lutterworth Press).



Work proceeds 24 hours a day.

by **E. G. Hodgkins**

BUILDING A BRIDGE

WHEN completed, the Severn Bridge will become another of the wonders of this modern, mechanical age. Work began on this giant suspension bridge across the River Severn, near Chepstow, late in 1962 and when it is opened in 1966, it will form part of the M4 London to South Wales motorway. This new motorway will bring Cardiff to within four hours motoring distance of London, a 162 mile journey which at present can take anything up to seven hours.

The Severn Bridge will be the second longest suspension bridge in Europe, having a main span of 3,240 feet and exceeded only by the new Forth Bridge with a main span of 3,300 feet. It will also be the sixth longest bridge in the world—the longest being New York's Narrows Bridge, which has a main span of 4,260 feet. The total length of the Severn Bridge, including the two 1,000 foot side spans, will be 5,240 feet.

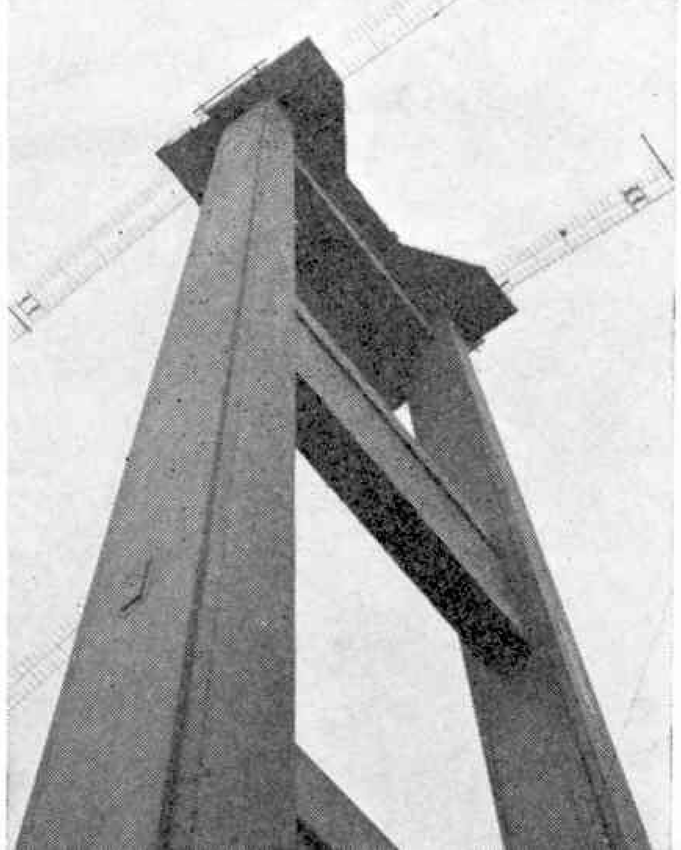
The roadway will be about 100 feet above the river at high water and will consist of a 24 foot carriageway in each direction, with a 12 foot wide footpath on one side and a 12 foot cycle track on the other. These two sections, which will lie outside the vertical suspension ties, will probably be a little unnerving in the high winds that often sweep up the estuary from the Bristol Channel. However, the bridge has been designed to withstand wind speeds of up to 100 miles-an-hour and at the same time carry the full British Standard loading of up to 180 ton vehicles. The roadway is to be built on a welded-steel, box-section deck, which will weigh 11,000 tons. This will be built in sections in a shipyard in Chepstow, floated out to the site, hoisted into position and finally welded into a continuous length.

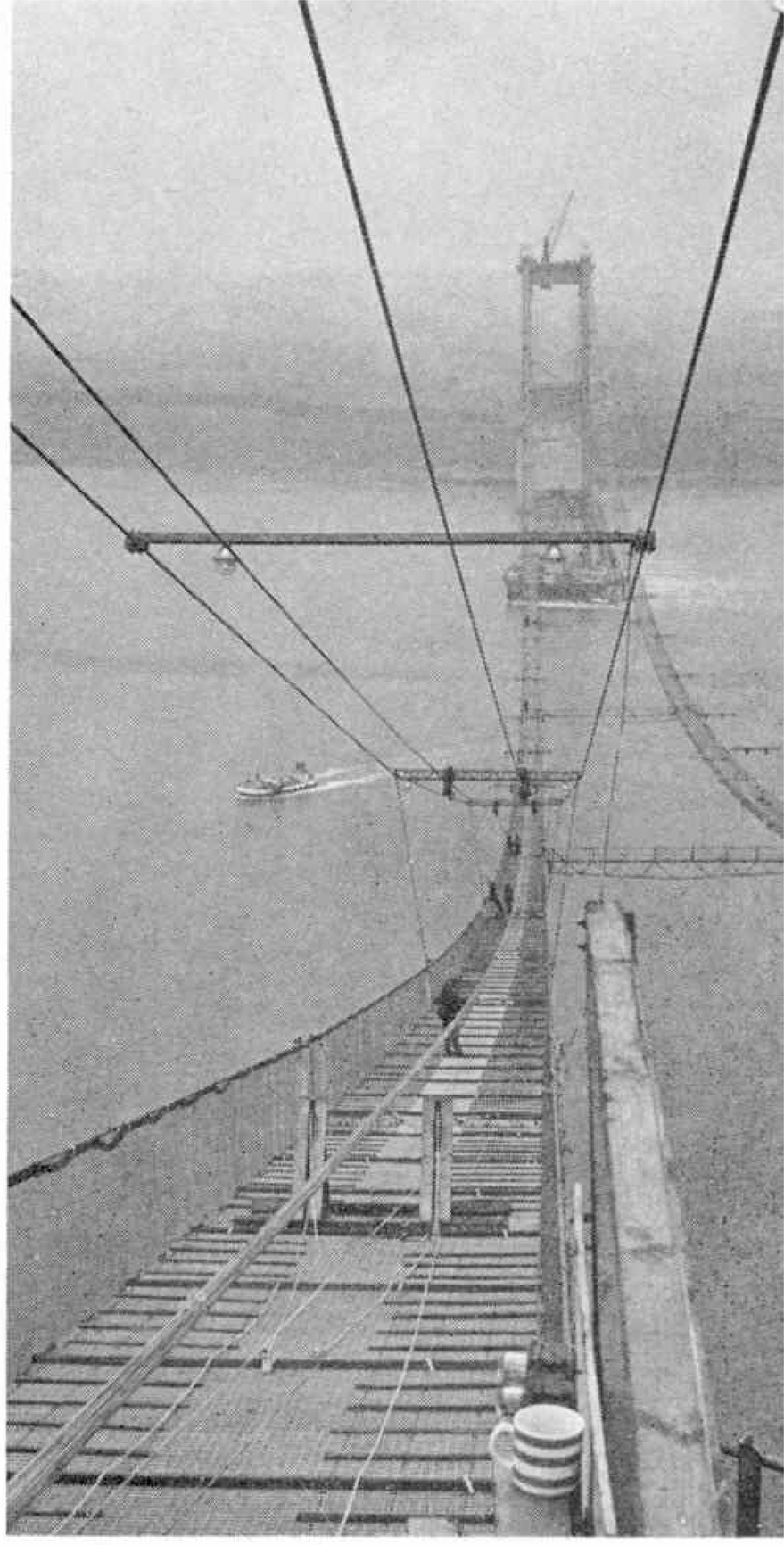
The whole of this weight is to be carried by two cables which will hang from the tops of the two main towers and be anchored in giant, concrete blocks at either end of the bridge. The cables will be about 20 inches in diameter and will each consist of 19 strands, each strand containing 440 steel wires 0·2 inch in diameter. In all 18,000 miles of this wire will be used and will weigh some 4,200 tons. The process of spinning these cables into place, four single wires at a time, was begun early this year and is expected to be completed by late summer. Finally, the deck will be suspended from the main cables by steel wire ropes.

The main towers are already complete and are 400 feet high above their concrete piers. They are constructed from stiffened high-tensile steel and each weighs 1,200 tons. They were built up from prefabricated sections, each piece being lifted into position by means of a climbing crane attached to the tower. This crane is now on top of the tower and will be dismantled and lowered to the ground when the bridge is finished. The concrete piers supporting the towers are 45 feet high, one being built on to a rocky outcrop in the river, the other being supported by deep concrete foundations set into the river bed. 55,000 tons of concrete were used to build these piers.

The anchorage points at the ends of the bridge consist of hollow reinforced concrete blocks 140 feet long, 110 feet wide and 120 feet high, each weighing some 80,000 tons. The cables are anchored into these blocks by means of steel shoes, one shoe for each of the 19 strands in each cable.

One of the two main towers which are 400 feet high and weigh 1,200 tons.





The main span measures 3,240 feet.

During the construction work, wooden piers have been erected to carry men and materials out to the main towers. Each tower has a lift inside it, and a 10 foot wide cat-walk has been suspended just below each main cable, right across the river. These cat-walks are made of wire mesh with a 3 foot high wire parapet at each side for safety. It is on this precarious structure that teams of men are now working in three shifts, 24 hours a day for five days a week, in all weathers, to spin the main cables in position. Over 200 men are employed on this stage of the construction, and those out over the river have to stay at their posts for the whole of their shift, food and drink being brought to them periodically.

When this magnificent bridge is finished and we can cross this treacherous river in speed and comfort we shall gratefully remember these men who are working up on the flimsy cat-walks in wind and rain. We shall also remember the welders who will soon be hanging like flies around the road deck as it is built up over the water. It will be a feat of engineering unequalled in the West Country and will be a blessing to the ever increasing numbers of road users in the area.

by **Jerry Ames**

Stirling Moss at the wheel of the 300 SLR Mercedes which won the 1955 Mille Miglia at a fantastic record-breaking speed of over 100 miles an hour.

THE MAN BEHIND MERCEDES

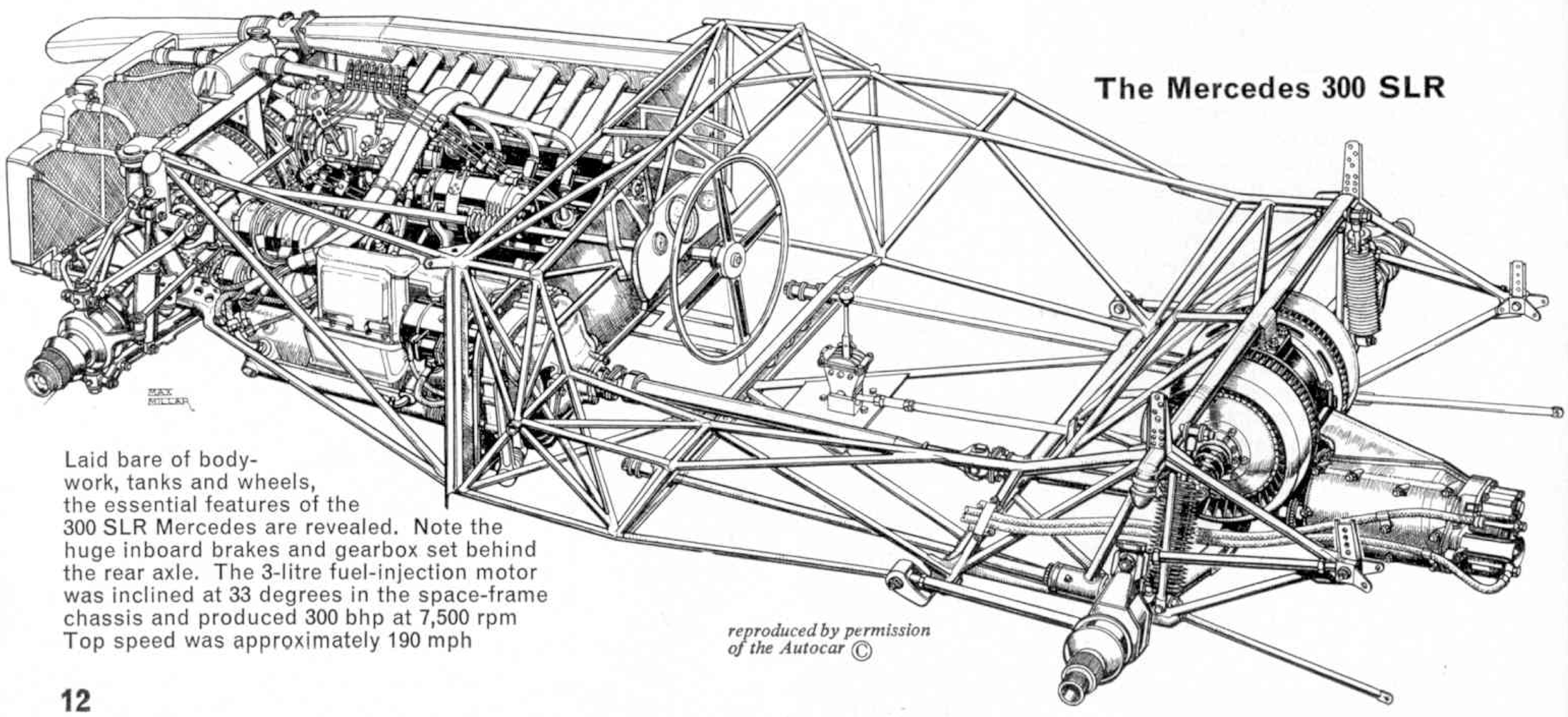
ONE MAN in the German Mercedes team gave the post-war racing fraternity such an object lesson in racing car preparation that even today it is still being digested by development engineers. The name of that man is, London born, Rudolph Uhlenhaut. He is one of the world's great engineers, a kingpin of the Mercedes-Benz organisation and definitely a man to keep your eye on when the firm returns to Grand Prix racing, as it may well do in 1966.

Not only is Uhlenhaut a brilliant engineer, but his exploits as a driver have won him international fame. In fact, although he has never raced, he has broken the Nurburgring sports car record and is one of the few men able to return lap times the equal of Fangio or Moss on a variety of circuits. For all that he is unassuming and very approachable and if he can do a good turn he is delighted. On numerous occasions he has helped British racing teams with advice on technical matters and is naturally a mine of information about spring rates and damper settings concerning the difficult Nurburgring circuit in Germany.

As a driver on the road or circuit, he has few equals. Fortunately for me, I have been his passenger on a number of occasions and never have I sat beside a driver who inspires greater confidence.

On one occasion we looked in on Silverstone Racing Circuit on our way back from Coventry to London in Uhlenhaut's 300 SL Mercedes coupé. He had never seen Silverstone before and wanted to get some first-hand information about the circuit before his Grand Prix team raced there for the first time. After a few exploratory laps at slow speeds, absorbing some of the tricky features of the course, he really began to motor.

On one lap, approaching Stowe corner at 122 mph, he left braking very late indeed. We both sensed he was going to overdo it, but I had complete confidence in Uhlenhaut's ability not to 'lose' the car and was intrigued by the way he handled it. Off came the power, it was



The Mercedes 300 SLR

Laid bare of body-work, tanks and wheels, the essential features of the 300 SLR Mercedes are revealed. Note the huge inboard brakes and gearbox set behind the rear axle. The 3-litre fuel-injection motor was inclined at 33 degrees in the space-frame chassis and produced 300 bhp at 7,500 rpm Top speed was approximately 190 mph

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firmly but gently brought in again and with a deft flick of the wheel he caught the sliding tail right on the edge of the grass.

The only time I felt slightly uneasy was as we were drifting across the tricky, reverse camber at Woodcote Bend on our first quick lap. I glanced across, saw the look of intense concentration on Uhlenhaut's face and noted the obvious enjoyment with which he mastered the twitchy back end through the curve.

Some time later, I enjoyed a run in his famous SLR coupé. This machine was similar in almost every respect to the car which Stirling Moss drove to victory at record speed in the 1955 Mille Miglia. The main difference was the closed coupé body, which gives it a maximum speed of around 190 mph.

As we climbed into the car, which had been left with engine running to get it towards normal working temperature, and pulled down the gull-wing doors, the howl from the trains of gears in the engine reached a deafening crescendo, magnified many times by the enclosed body. This machine makes far too much noise to be used as an ordinary road car.

"Before driving the SLR coupé I notify the police, because of the interest it creates," said Uhlenhaut.

Uhlenhaut at the Controls

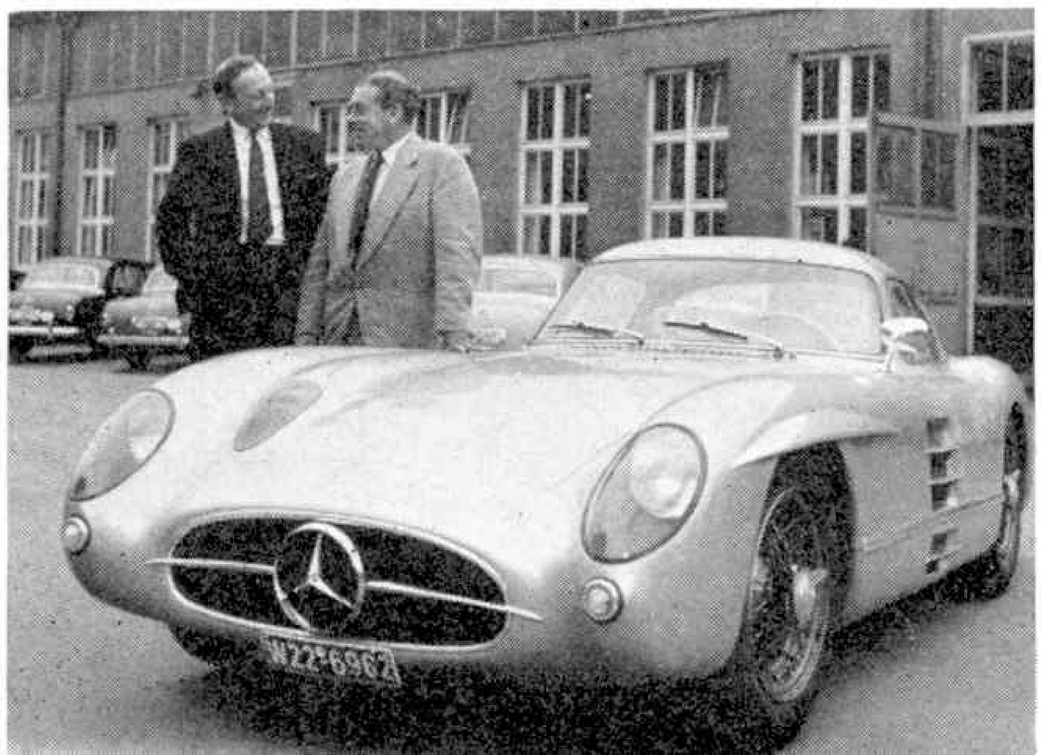
As we nosed our way through Stuttgart traffic, with occasional mild bursts of acceleration, I saw what he meant. Passers-by would stop, stare and point, and drivers of other cars forgot to look where they were going, in their excitement to catch a glimpse of the silver coupé as it sped through the town.

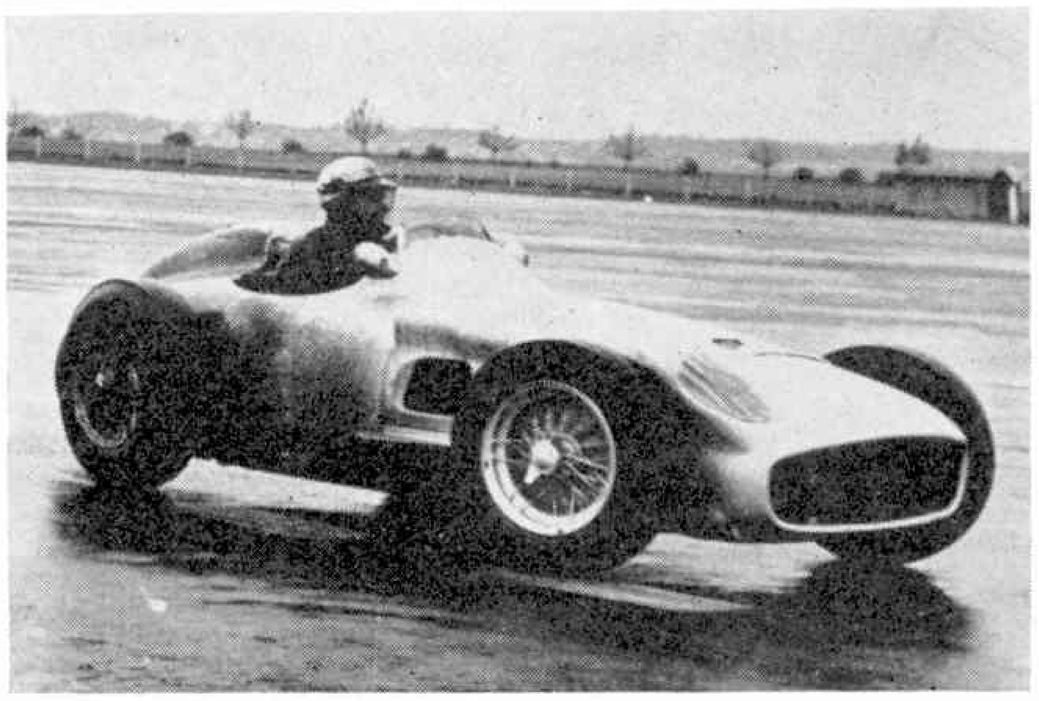
Climbing the winding hill on the outskirts of Stuttgart, towards the autobahn, Uhlenhaut nudged me, excited as any schoolboy as he pointed towards the rev counter and gear lever. Normal conversation was virtually impossible because of the noise. He had throttled back to 1,000 rpm in fifth gear, demonstrating the extraordinary flexibility and power at low revs of the 3 litre twin, overhead-camshaft, straight-eight, fuel injected, racing engine, which could run as slowly as 35 mph in top gear.

"I don't suppose we shall be able to go very fast", he had told me earlier in his office. "Too much traffic on the autobahn these days and too many hazards." By fast driving Uhlenhaut meant speeds of more than 150 mph.

Making our way on to the twin-track autobahn, the silver coupé seemed to come alive with new energy as it

Author Jerry Ames (left) with Herr Uhlenhaut and his coupé.





Uhlenhaut tests the Mercedes short chassis Grand Prix car before handing over to racing drivers Moss and Fangio.

began moving up to 120 mph as easily as the average fast car will reach 70 mph.

Each car ahead of us was overtaken in a tremendous burst of acceleration. It was passed and forgotten long before its driver had time to realise what had left him behind. Then a long straight presented itself fairly clear except for a huge German truck pulling a trailer. It was little more than a speck in the far distance.

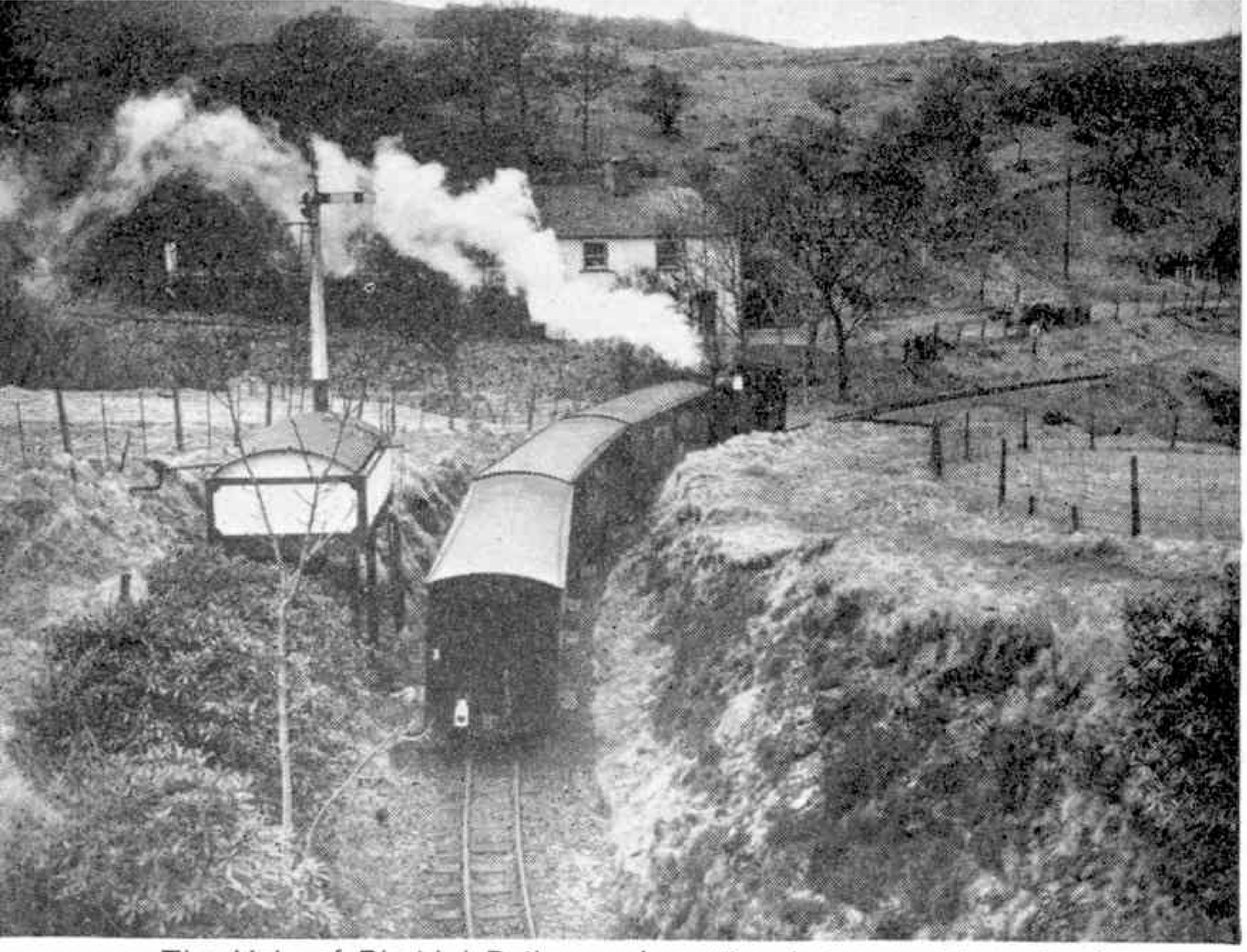
Down went Uhlenhaut's right foot and the car fairly leaped along the road as the engine screamed towards maximum revs in the gears. As top gear was quickly snicked home I again experienced that exhilerating surge of acceleration and by rev counter reading our speed rose to 148 mph.

The truck and trailer were less than a quarter-of-a-mile ahead now, then suddenly, without prior warning, its massive bulk began drawing out to overtake another vehicle and completely blocked the road ahead of us.

In a fraction of a second, power was off the Mercedes and Uhlenhaut's foot was jabbing hard on the brake pedal. As we slowed on full pedal pressure, at the same time going down through the gear box, Uhlenhaut yelled to me, "Impossible to motor fast on the road now." I had to agree, but never for a moment did I doubt his ability to control the situation.

That's what I like about riding with Uhlenhaut, not only is he one of the fastest drivers in the world, but also one of the safest. He will never show off or take an unnecessary risk—two points many road drivers of today could copy with advantage.

Uhlenhaut, son of a German banker, is always good company and in great demand at motoring parties. He has a terrific fund of fascinating racing and technical stories that will keep his audience enthralled, but he never has an unkind word to say about anyone. His outstanding skill brought him rapid promotion with Daimler-Benz and since 1936 he has been a technical director of the racing department, which included the heyday of the powerful pre-war supercharged Grand Prix Mercedes. When Daimler-Benz return to Grand Prix motor racing, we shall be seeing and hearing a great deal more about Rudolph Uhlenhaut, whose racing knowledge and engineering skill will again be one of the team's greatest assets.



The Vale of Rheidol Railway. A cutting between Aberystwyth and Devil's Bridge. Note the narrow gauge of the track

by **Michael Rickett**

BRITISH RAILWAYS' TINIEST LINE

THE VALE of Rheidol Railway has recently been given a new lease of life by British Railways, following a 30 per cent increase in passenger receipts in 1963.

The railway has also been given a new look and visitors to Aberystwyth will find that the coaching stock is now painted a bronze green with 'V of R' painted on the sides. This livery is very reminiscent of that used when the line was owned by Cambrian Railways, prior to the grouping of 1923. It is hoped to effect a further five per cent increase in traffic this year, to help cover the cost of stock maintenance.

The Vale of Rheidol Railway was authorised in 1897, and construction of the line started in 1901, although at first it was found difficult to raise sufficient capital. The contract for the construction of the line was secured by Pethick Bros. of Plymouth. At the time of building, Aberystwyth was well-developed as a seaside resort and the traders and merchants of the town, no doubt realised the advantages to be gained from building a railway link between Aberystwyth and the well-known beauty spot, Devil's Bridge.

There was also a considerable industry in lead mining, which later proved to be a profitable source of revenue for the railway. The only available transport at the time consisted of horse drawn carts, which were both expensive and slow.

The Vale of Rheidol Railway was first projected many years before, in 1861 in fact, when the Manchester and Milford Railway obtained powers to construct a branch from its proposed main line at Devil's Bridge through to Aberystwyth. The project, however, was allowed to lapse and nothing was done by that company.

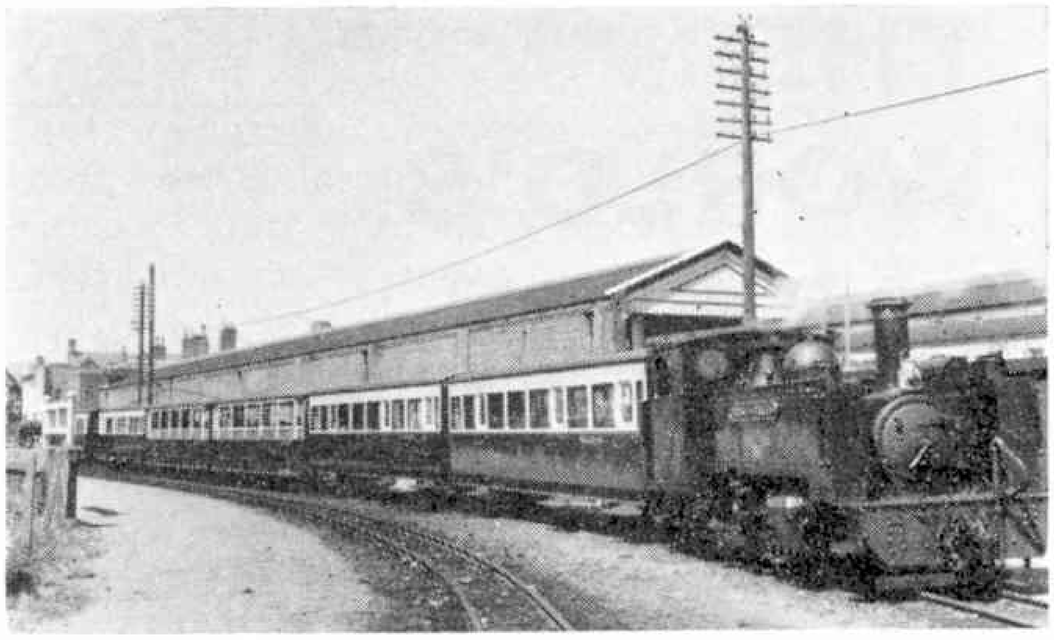
The builders of the present railway were no doubt influenced by the highly successful Festiniog Railway, for when choosing the track gauge it was decided to build the line to the popular 1 ft. 11½ in. gauge. The cost of laying a railway to this track gauge is much less than with standard gauge.

The application to Parliament to build the line was successful and the Vale of Rheidol Railway Company was incorporated by an Act of Parliament on August 6, 1897. This gave permission for the building of two railways of 1 ft. 11½ in. gauge—a main line from Aberystwyth to Devil's Bridge, and a branch to Aberystwyth Harbour. The branch, however, was closed in 1924 and dismantled in 1930.

When the construction of the line began in 1901, difficulty was experienced in attracting sufficient labour. This was neatly solved, however, by the completion of the Birmingham Waterworks in the Elan Valley, which resulted in a large number of navvies being available for building the railway. For the first few years, traffic on the line exceeded all expectations and the initial services inaugurated by the company, resulted in the withdrawal of the horse coach that was formerly the only transport in the area.

The line starts alongside the standard gauge station at Aberystwyth, where a ground level platform is placed. There is also a separate booking office adjacent to the

All aboard! Locomotive No. 8 'Llywelyn' puffs impatiently awaiting the guard's green flag

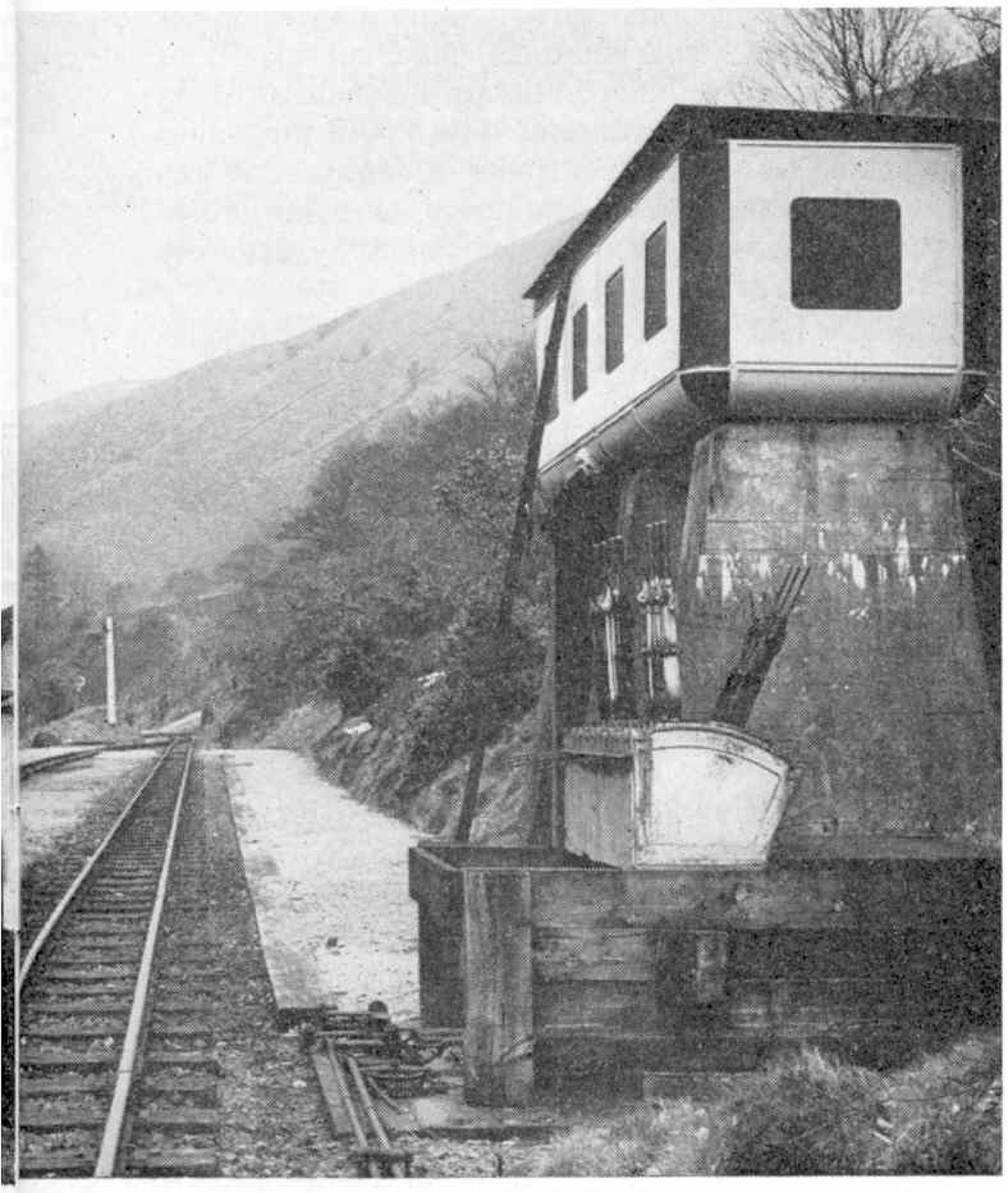


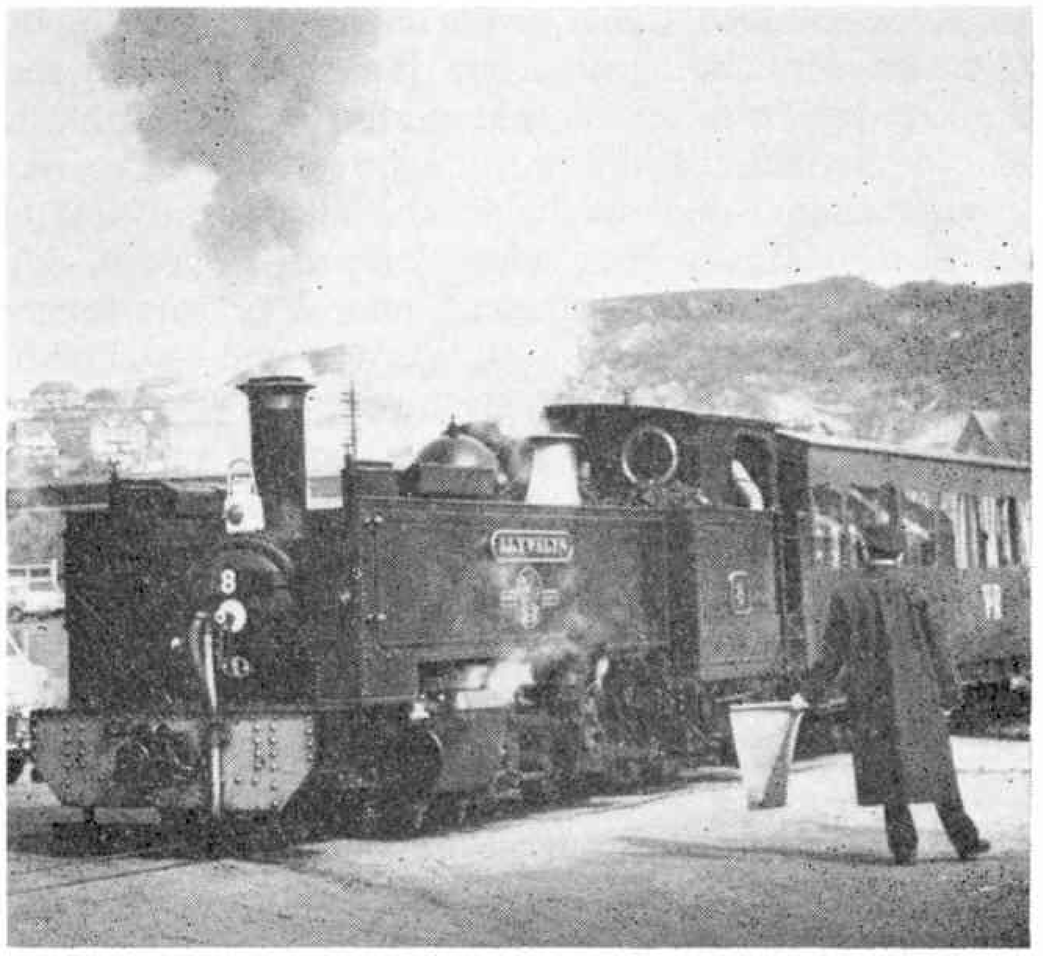
The 2-6-2T locomotive No. 9 'Prince of Wales' of the Vale of Rheidol Railway getting up steam at Aberystwyth

main line office. On leaving Aberystwyth Station, the line passes the site of the former narrow gauge terminus, which was used before the extension to Aberystwyth was built. After passing over a marshland, Glanrafon Halt is reached and then the railway runs alongside the River Rheidol to Capel Bangor.

The remainder of the journey is spent climbing and winding to Antyronen Halt, and then to Aberffrwd, which lies 200 feet above sea level. A continuous gradient of 1 in 50 is experienced, and the railway runs on a rocky ledge to Rheidol Valley Halt. After this, the track rounds a horseshoe bend to arrive at Rhiwfron Halt.

A signal box on the Vale of Rheidol Railway. In the distance, the two tracks converge into single track





Level crossing without gates! One of the railway's staff has to hold up road traffic, while the train crosses the road

Breathtaking views of the Rheidol gorge can be seen from here and on the remaining stretch of line to Devil's Bridge Station.

The success achieved by the railway made it attractive to larger concerns and in 1913, it was taken over by Cambrian Railways. This event marked the turning point in the railway's career, for it had been badly neglected during the 1914-18 war. The goods' services were ended in the middle 1920s, following the closure of the lead mines in the district. and the winter passenger services were eventually discontinued in 1931; a bus service having gained most of the local traffic.

The line was closed for the duration of the Second World War and was re-opened on July 23, 1945. It was nationalised shortly afterwards and formed part of the Western Region until just recently, when the London Midland Region took control of the line.

The three locomotives owned by the railway in 1945 were painted in a similar shade of green to that used by the former Great Western Railway. They were also given names in 1956—Nos. 7 and 8, the Swindon built locomotives, becoming "Owain Glynwr' and 'Llywelyn'. The original locomotive built by Davies and Metcalf took its old Vale of Rheidol name 'Prince of Wales'.

No efforts were made to extol the virtues of tourist travel until 1954 and the future of the line was very doubtful. Fortunately, a substantial increase in passenger traffic in that year prevented the closure of the line. The following year saw an amazing increase in passenger traffic to a total of 23,616 and the railway began to be widely advertised. The appearance of the trains themselves was greatly improved, the coaches being painted in a chocolate and cream livery.

Thanks to the determination of the Vale of Rheidol Railway management, it now seems fairly certain that this highly picturesque route will continue to exist. In the days of Dr. Beeching it has proved, by its sustained effort to increase traffic, that it can survive economically.

THE WORLD'S LARGEST TANKER

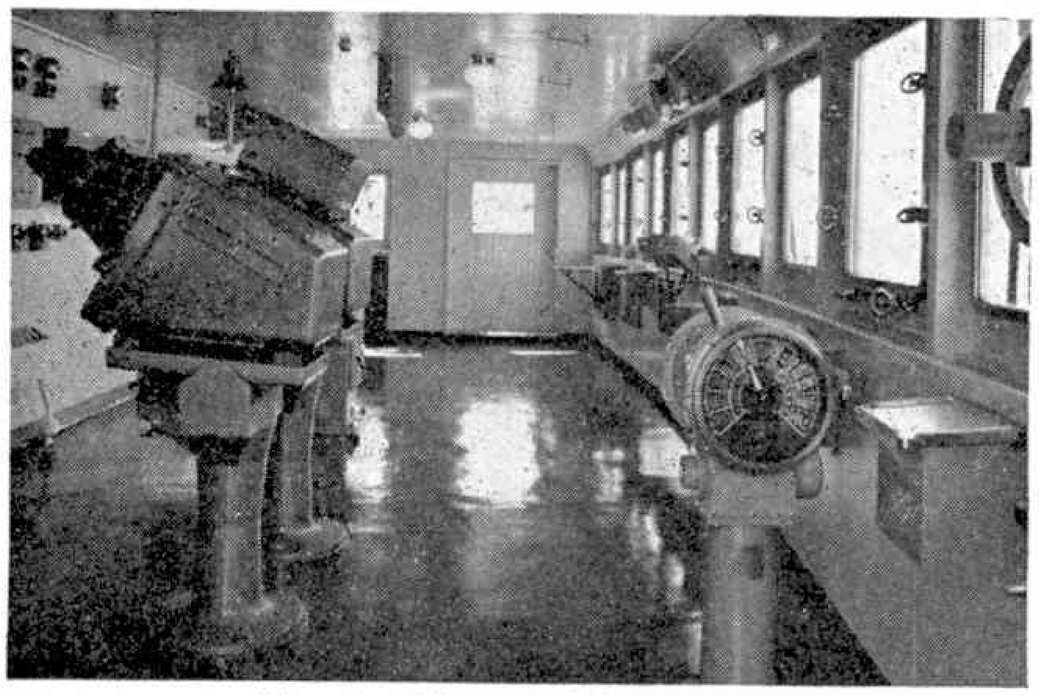
by **G. Woosey**

NOVEMBER 18th, 1961, was a memorable day in the Japanese shipbuilding industry. It was on this day that the keel laying ceremony was performed, according to Shinto manner, of the world's largest cargo carrier. In number four dock of the Sasebo shipyard, owned by the Sasebo Heavy Industries Company Limited, Mr. Idemitsu, owner's vice-president, offered prayers for the success of the construction of *Nissho Maru*, watched by Shinto priests in their white costumes.

This mammoth tanker is the first of two such vessels to be constructed for one of Japan's leading oil companies, Idemitsu Kosan Company. Launched on July 10th, 1962, the *Nissho Maru* was delivered in September of that year to shuttle between Idemitsu's Tokuyama Refinery and Chiba Refinery in Japan and the Persian Gulf. In comparison with the ordinary tankers of 46,000 dwt. on the same route, she can economise 30 per cent of oil freightage.

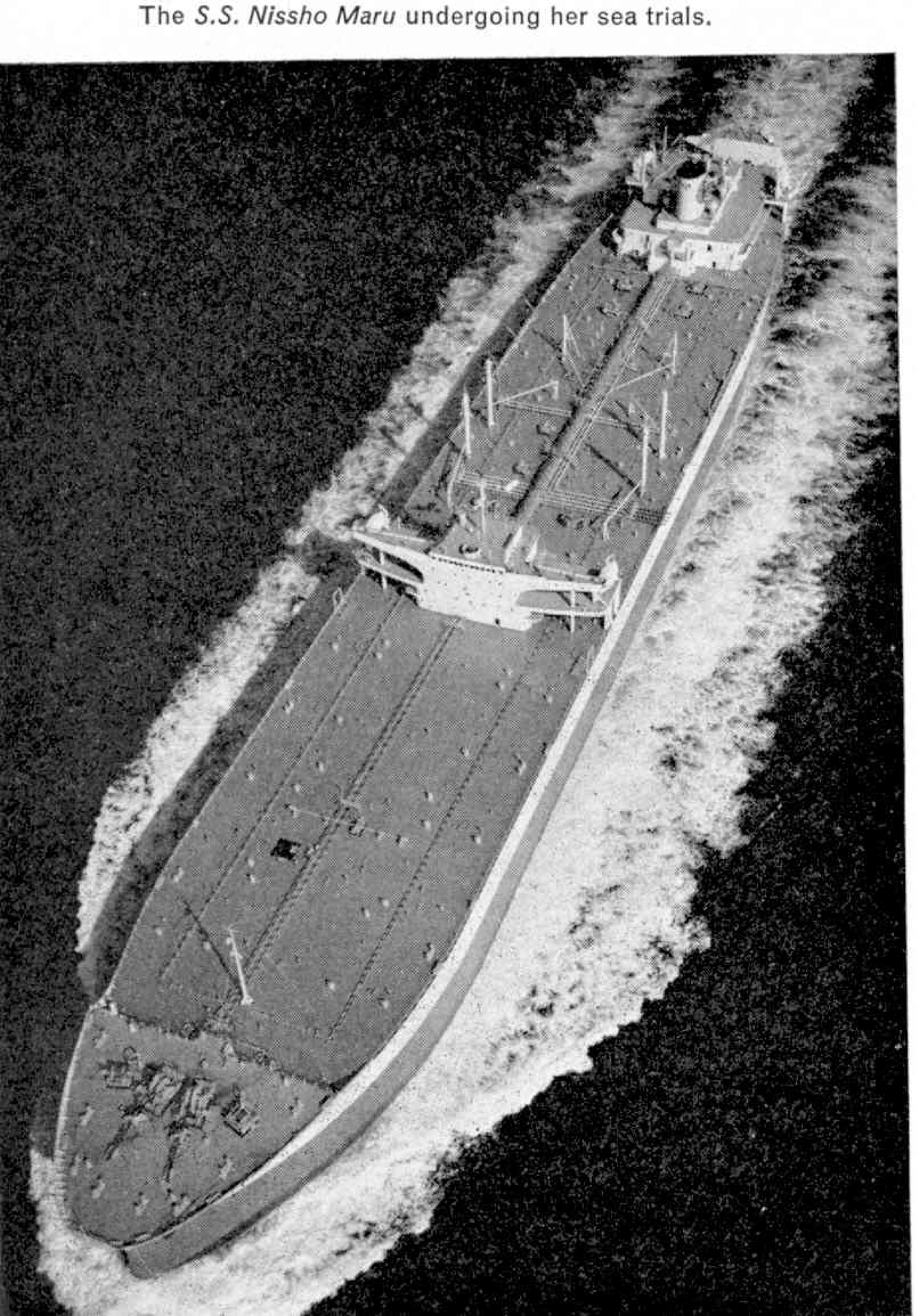
All the skill and enthusiasm of Japanese shipbuilding was used to create this revolutionary tanker to place them higher up the scale of post-war shipbuilders. The *Nissho Maru's* type and lines were decided only after many experiments were held at the test tank of the Japanese Ministry of Transportation. The hull construction and welding were executed following the result of joint research of both Tokyo and Osaka Universities.

In the design and construction of this tanker, special attention was paid to extension of durability, stability



The wheel-house of the world's largest tanker.

The *S.S. Nissho Maru* undergoing her sea trials.



of structure, navigational safety, minimising of maintenance and repairs' cost and time. Other considerations included accuracy in the operation of the main auxiliary engines and comfort for the ship's crew. All these aims were fulfilled by rationalised forms of construction and fitting-out, machinery and equipment with low maintenance and servicing requirements and by extensive use of automation.

Originally laid down with a deadweight capacity of 130,000 tons her particulars are now as follows:—

Deadweight tonnage	132,334·0 tons
Gross tonnage	74,864·7 tons
Displacement	158,000·0 tons
Cargo capacity	6,585,195 cubic ft.
Fuel tank capacity	292,418 cubic ft.
Length overall	954 ft. 9 in.
Breadth	141 ft. 1 in.
Depth	72 ft. 2 in.
Draft	54 ft. 2 in.
Max turbine output	28,000 s.h.p.
Max trial speed (full load) ..	17·19 knots

To attain a speed of over 17 knots, the turbine of this giant tanker turns, through double-reduction gearing, the world's largest propeller. The propeller is made of solid nickel-aluminium-bronze and has five blades, a diameter of 24 feet 3 inches and weighs 36·35 tons. The propeller shaft is of 3 per cent nickel steel and is 4 per cent greater in diameter than normally called for by construction regulations. The 28,000 shaft-horse-power, cross-compound, impulse-type propulsion turbine,

was built by Ishikawajima-Harima Heavy Industries, to designs by the General Electric Company of America. The main auxiliaries comprise two turbine-driven, drip-proof, semi-enclosed type alternators, each having an output of 1·450 kVA, 450 V ac, 3-phase, 60 c/s, and a similar diesel-driven emergency unit rated at 210 kVA.

Following the current trend for increased remote control, the *Nissho Maru* has a considerable part of its supervisory and control instrumentation centralised to facilitate control operation. The major features in this category include, the turbine nozzle valves, which are pneumatically operated by means of a push-button remote control; while the gland-sealing steam pressure is automatically controlled by a hydraulic regulating valve in the case of the main turbine and by pneumatic regulating valve in the case of the generator turbines.

The boilers have automatic air motor-operated soot blowers and fuel shut-off devices which operate automatically in the event of a flame-out. Remotely controlled and pneumatically driven boiler draft dampers are also fitted.

Chemicals are automatically fed into the boiler circuit by a Milton-Roy chemical feed pump, while the main turbine and reduction gear lubricating oil has automatic temperature control. The main circulating water shut-off valve, as well as those for various motor-driven pumps, is also remotely controlled. Engine-room bilges are automatically cleared at five points.

A lift, or elevator, with stops at the upper deck, poop deck, and two engine-room levels, and a loud-speaker system comprising a microphone at the main control panel and five strategically placed loud-speakers, provide the engine-room communications.

Nissho Maru is also equipped with a very comprehensive and up-to-date set of navigational and communication equipment. The navigational aids include magnetic and gyro compasses, automatic pilot, pressure and electric log, echo sounder, D.F. equipment and two radar systems. Loud-hailers, internal telephones, as well as W/T and R/T installation make up the communication equipment.

The main cargo-handling pump-room has four sets of steam-driven pumps, each rated at 57,915 cubic feet per hour with a 273 feet head and a similar number of steam-driven stripping pumps of 10,593 cubic feet per hour with a 273 feet head. Any one of the four main pumps can handle cargo from any one of the four main groups into which the cargo tanks are divided by way of a 15-inch diameter pipeline. The piping system is such that four different oils can be handled simultaneously.

The ship is not fitted with a separate stripping line. List and trim is used to drain residual oil from the wing tanks into the strums of the centre tanks, from where it is lifted through the main pipeline by the stripping pumps. Each tank has an individual vent riser, provided with a breather valve, which stands to a height of three feet above the deck.

Tank-cleaning and gas-freeing equipment includes gas devourers for driving gas from tanks and pipelines, at each of the two cargo loading stations and four portable steam ventilators. A Butterworth system line, which doubles as one of the two hydrant ring mains, is sized to support eight Butterworth machines operating simultaneously.

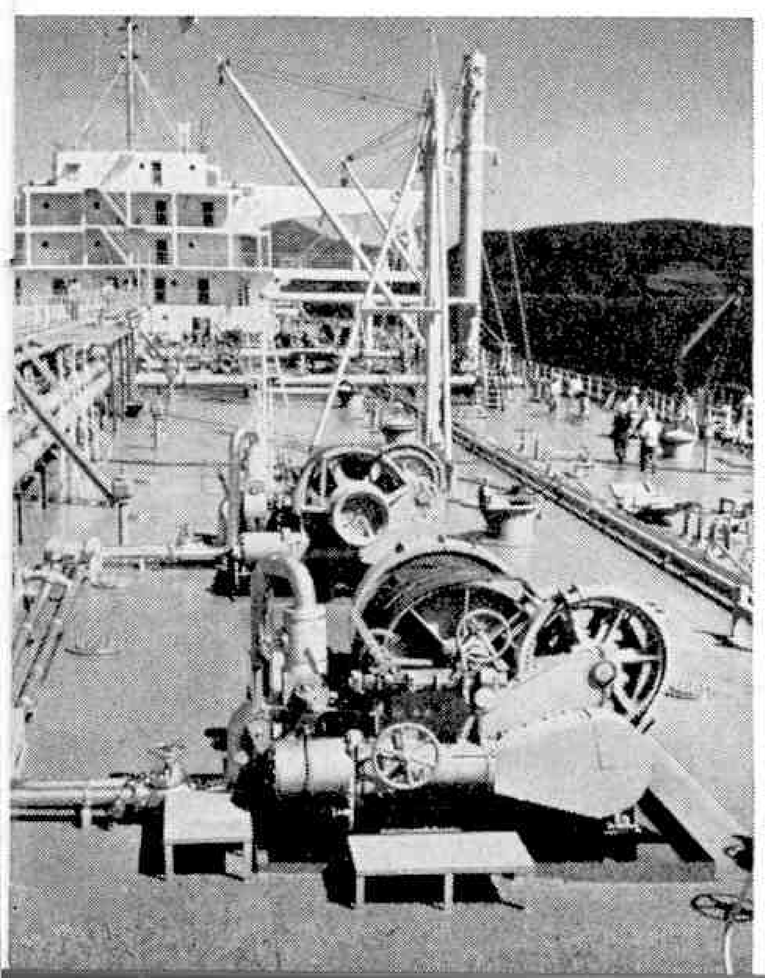
Fire Precaution Equipment

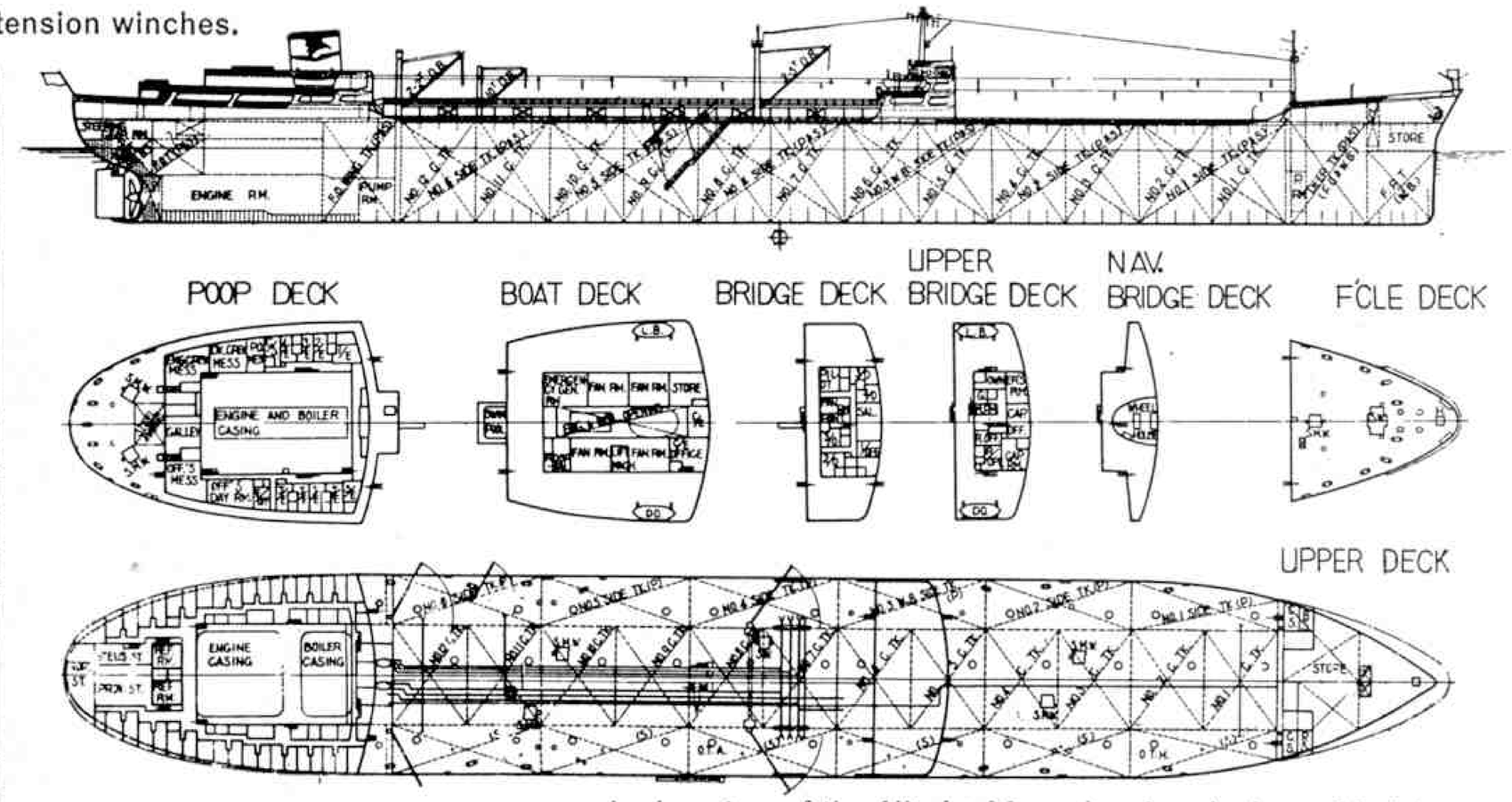
Two steam-smothering lines are located on the upper deck with branches to cargo and fuel tanks, boiler and engine rooms, pump rooms, cofferdams and vital store rooms. A general service pump and a fire bilge pump in the engine-room serve two smothering lines, one of which is normally used for the Butterworth system on the upper deck, with branches into the accommodation. An independent motor-driven fire pump, with a 13,419 cubic feet per hour capacity at 273 feet head, is installed in the engine-room.

To meet the requirements of the U.S. Coastguard, fixed type air-foam smothering equipment is fitted through the engine and boiler rooms.

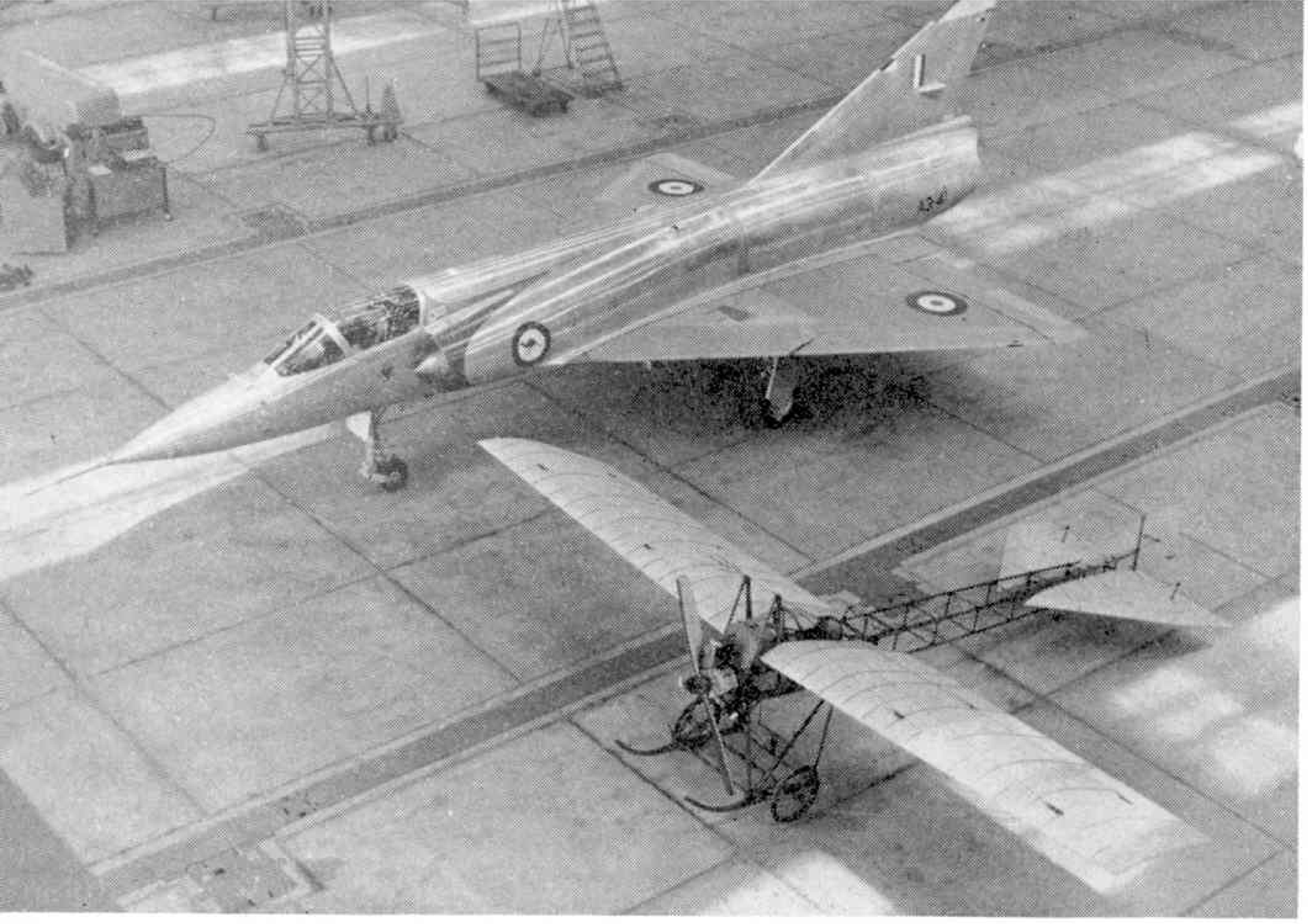
The total complement of this giant tanker is only 48 persons. Each is accommodated in a 2-berth cabin, one berth of which folds away. All quarters are air-conditioned to maintain 86°F with 50 per cent relative humidity at 95°F and 65 per cent relative humidity outside with 86°F sea water temperature. Equivalent winter figures are 68°F and 50 per cent relative humidity with 32°F outside temperature. All partitioning is steel, with a glass-wool lining and cabin furniture is also steel.

Deck area showing the automatic tension winches.





A plan view of the *Nissho Maru* showing decks and holds.



Fifty years of change between the flimsy 59 miles-an-hour Deperdussin of 1914 and the 1,500 miles-an-hour Mirage jet fighter of the Royal Australian Air Force of 1964.

by **John W. R. Taylor**

50 YEARS in the AIR

THIS YEAR the Royal Australian Air Force is celebrating its fiftieth birthday and the picture on this page illustrates dramatically the progress made during its first half-century. Nearest the camera is one of the first military aeroplanes flown 'down under', a Deperdussin monoplane which weighed a mere 500 lb., flew at 59 m.p.h., and cost £500 to buy. Beside it is one of the R.A.A.F's new Dessault Mirage III-O fighters, weighing up to 21,500 lb., capable of flying at 1,500 m.p.h. (more than $2\frac{1}{4}$ times the speed of sound) and costing over £1 million.

The Deperdussin was shipped from England early in 1914, with four other aircraft, to equip a pilot training school for the newly-formed Australian Flying Corps. No great excitement marked their arrival, and the *Melbourne Argus* newspaper of Tuesday, March 3, 1914, commented rather tersely: 'At the end of last week the aeroplanes were taken from Victoria Barracks to Point Cook and, without anyone being informed of the decision, the first flights were made on Sunday'.

It was, perhaps, a little forgetful of the pilots (Lts. Eric Harrison and Henry Petre) not to invite the press to witness the birth of Australian air power; but no-one could ever be certain in those days that an aeroplane would work first time and they may have thought it wiser to test fly the aircraft before demonstrating them in public.

Whatever the truth, it must have been an anxious moment for the mechanics who had assembled the aircraft when the two young aviators arrived at Point Cook, a field on the shores of Port Phillip Bay, 18 miles from Melbourne, on that Sunday morning.

The first machine ready for test was a Bristol Boxkite biplane and, after donning fur-lined jackets, leather helmets and goggles, both pilots clambered on to it, with Harrison at the controls. The engine quickly burst into life, startling the cattle grazing in paddocks nearby, and the watching mechanics and army officers held their breath as the frail-looking aircraft slowly moved forward, gathered speed and lifted itself into the air. It climbed to a height of a few hundred feet, circled the field at 50 m.p.h. and was then brought down to a smooth landing.

Later that same morning, Harrison flew alone in the Boxkite, while Petre put the Deperdussin through its paces. Soon afterwards they began training other pilots at Point Cook and this work has continued right up to the present time. The tiny grass field and handful of tents and canvas hangars of 1914 have been replaced by impressive brick buildings and a fine aerodrome, to which men of all three Australian services go for their basic flying training. Point Cook also houses the R.A.A.F. Academy, the only service establishment in Australia and one of the few in the world where students can gain a university degree.

The men trained at Point Cook have served their country well, not only in two World Wars but in Korea, where the R.A.A.F. was the first Commonwealth air force to fly into action. Today the air force is stronger than it has ever been in peacetime, and its fighter squadrons stand guard as far away as Butterworth in Malaya

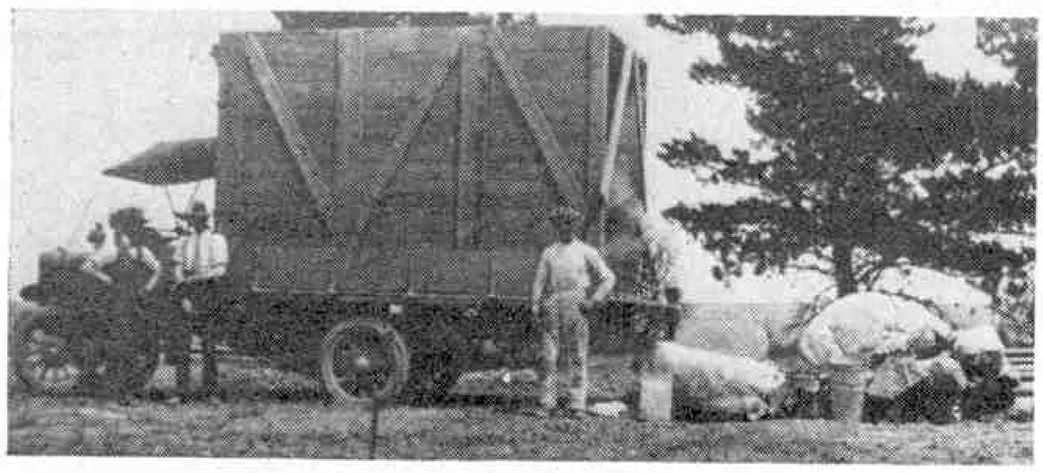
The late Henry Petre, D.S.O., M.C., at the controls of the Deperdussin which he first flew from Point Cook on March 1st, 1914, to make aviation history. This picture was taken three years ago.

and Ubon in Thailand, as part of the South East Asia Treaty Organisation combat forces in that troubled part of the globe.

To mark the R.A.A.F's fiftieth birthday, it was decided to restore to its original condition the Deperdussin which Lt. Petre flew on March 1, 1914. The wings and tail were recovered with fabric, the bracing wires tightened and the propeller restored to its former highly-polished state. The veteran aircraft was then loaded on a truck and taken to the airfield at Avalon, 20 miles away, for its anniversary photograph with the Mirage III-O, before becoming the star exhibit of the R.A.A.F. Museum at Point Cook.

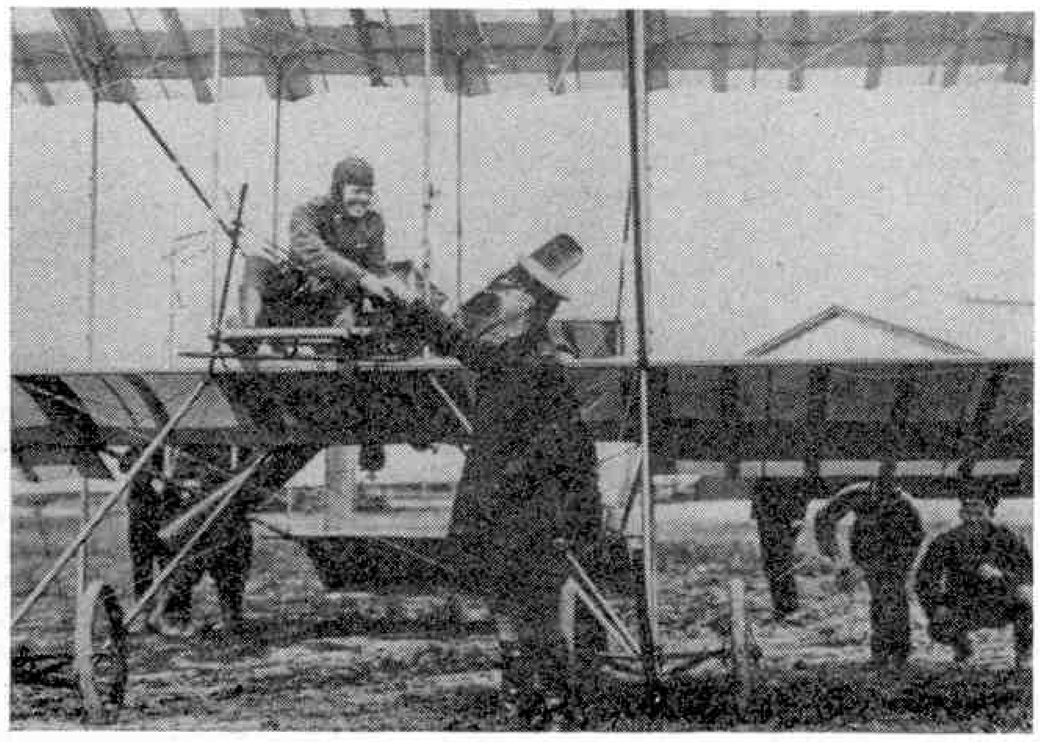
Russians Thaw Out

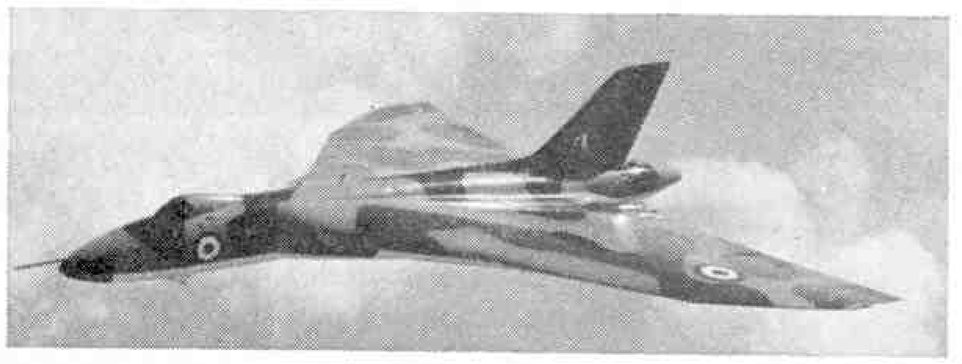
THE RUSSIANS have just released details of a new technique they used earlier this year to clear their northern rivers of ice at one-thirtieth of the cost of using icebreakers. It involved using aircraft to lay a trail of ash that divided the riverside into squares. As every schoolboy knows, a dark surface absorbs heat more than does a light surface. So, when the spring sun came out it cut the ice into pieces along the dark lines of ash, like a knife going through butter. The process took about 18 to 20 days and enabled the rivers Dvina, Amur, Yeniesei and Ob to be opened to shipping much earlier than usual. In places where ice blocks threatened to dam the rivers and cause floods the aircraft dropped salt, instead of ash, to make the ice melt.



This truck, laden with tents, arrived in a grassy paddock, known as Point Cook, on February 28th, 1914, to set up accommodation for a flying school. Point Cook is now the traditional home of the R.A.A.F. and a busy flying base.

Lieutenant Eric Harrison in the cockpit of the Bristol Boxkite which he flew on March 1st, 1914, receiving congratulations from an army official after the first flight.





Bomber in Disguise

KEEN SPOTTERS will be interested in the picture above which shows a Vulcan B. Mk. 2 of R.A.F. Bomber Command in new green and grey top camouflage. This paint-scheme is being applied to Vulcans and Victors following the decision to train their crews for low-level attack duties as well as for normal high-altitude operations. It makes the aircraft much more difficult to spot from above as they race along a mere thousand feet or so above ground level.

High-speed 'Copter

ANOTHER FAST-MOVER is the Bell Model 533 research helicopter shown in the illustration here. It began life as a UH-1B Iroquois of the kind supplied to the U.S. Army in huge numbers, but it has been streamlined by fitting glass-fibre fairings on the fuselage and another large fairing around the main rotor-shaft. A Continental J69 baby jet-engine has been mounted on each side of the cabin and small swept-back wings have been added to off-load the rotor by producing some of the lift needed to support the aircraft in cruising flight. This enables the speed of the rotor to be kept down, so that there is no danger of the blade-tips approaching the speed of sound and running into shock-wave trouble.

A few weeks ago, the Model 533 attained a speed of 222 m.p.h. in level flight, which is just 1 m.p.h. faster than the present rotorcraft world speed record held by the Russian Kamov Ka-22 Vintokryl convertiplane. More powerful versions of the J69 engine have since been fitted and we may hear soon that America has regained the record. If so, it will be a great achievement, as it was once believed that no rotating-wing aircraft would ever exceed 220 m.p.h.

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3711	Half Curve 15" Radius	2/7	1/3	9d.
3712	Quarter: Curve 15" Rad.	2/3	1/6	1/–
3719	Curve 17¼" Radius	3/9	2/–	1/3
3728	Hand Point, R.H.	13/–	6/6	5/–
3729	Hand Point, L.H.	13/–	6/6	5/–
3731	Remote Point, R.H.	24/6		12/6
3732	Remote Point, L.H.	24/6	15/–	12/6
3734	Diamond Crossing, R.	9/11	5/–	3/6
3735	Diamond Crossing, L.	9/11	5/–	3/6
3738	Isol: Rail	3/6	2/6	1/6
3745	Hand Uncoupler	6/6	3/–	1/6
3746	Remote Uncoupler	16/–	8/6	6/6
3400	T.P.O. Set	40/6	20/–	17/6
3450	Buffer Stop	2/8	2/–	1/6
3460	Level Crossing	7/6	5/–	3/6

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WIN

a Philips "Electronic Engineer" constructor kit

AT THIS year's Radio Show, August 26th to September 5th, you will, if you are aged between 11 and 14 years, have a chance to win an exciting new electronic constructor kit. Philips Electrical Ltd. will be holding a competition every two hours, in which the object is to see who can complete the wiring of a kit circuit in the fastest time. The winner will receive a kit as a prize, while the others who finish, and get their circuit working, will earn a certificate. Entry forms will be available at the stand (No. 61) and the choice of competitors will be by ballot.

What do the kits do? Well, they make up into a fascinating range of transistorized devices, such as radios, light or sound sensitive burglar traps, intercoms, morse trainers, an automatic night light, measuring circuits, and even a simple electronic organ. There are two kits; a basic one (EE8), which makes eight different circuits, and a supplementary one (A20) which adds another thirteen possibilities. At the same time, you do not require any previous knowledge of electronics, nor do you have to use a soldering iron or any complicated tools. There is plenty of information, plus tips on experiments, in a 100 page manual which comes with every EE8. Sounds fun? There is a chance to win a kit at the show, so why not go along and try. By the way, starting next month in Meccano Magazine, will be a brand-new series of articles about Radio and Electronics.

Cycle Care

Mend that puncture

PUNCTURES are always a nuisance and usually happen at just the most awkward moment—on a road miles from anywhere or at home on Sunday morning when all the shops are shut. So don't be caught! Make sure your puncture outfit is complete and that you have a pump and a full set of tyre levers.

The method of finding a puncture depends mainly on whether the tyre deflates quickly or whether the leak is a slow one. A tyre which deflates immediately is pretty sure to have something fairly large protruding through the outer cover. Look for nails or sharp pieces of grit embedded in the tread.

With a fast puncture, it is not really necessary to remove the wheel. Just turn the machine upside down, balancing the saddle on something soft to prevent the leather being scratched. Pull out the nail or whatever has caused the puncture and mark the spot with chalk and then remove the tyre in the area of the puncture.

To find a slow puncture, you will have to take the wheel off, the inner tube out, inflate it and submerge it in a bowl of water. A stream of air bubbles will betray the leak.

Use proper tyre levers to get the tyre off. The job can be done with two, but three are better. Hook the levers under the edge of the tyre at about three inch spacing. Then lever them down and hook on to the spokes one at a time. Use the centre lever again, further round, if necessary. Always lever off the tyre on the side farthest away from the chain. The inner tube can now be pulled out. If the puncture is a largish one—and the hole caused by a nail is large—plan to use a large patch. The actual repair procedure is shown in the picture sequence below.

After repairing the puncture and before putting the tube back, pump some air into it and carefully check for any further leaks. Leave the air in the tube and check the rim tape which fits into the well of the rim and which covers the spoke heads. Make sure there are no sharp spoke ends protruding. If there are, a small file will soon reduce them.

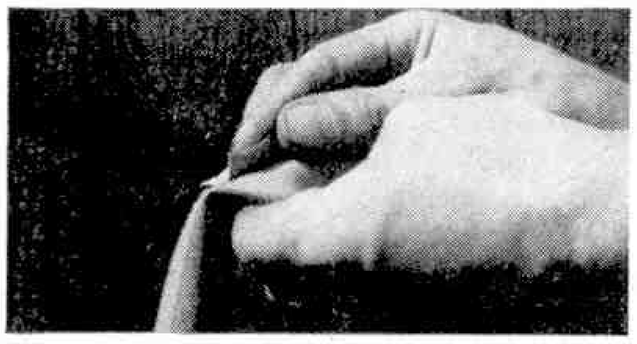
Now, with air still in the tube, start poking it back into the cover. At the same time work the cover back into position over the rim. But do not start reseating the edge of the tyre until the whole of the inner tube has been stowed away without kinking.

Do not let the air out of the tube yet. Start reseating the edge of the tyre behind the rim, *beginning on the side opposite the valve* and working round the rim in both directions. This should leave the bit by the valve. Let the air out of the inner tube and push the valve well up into the tyre. Pinch the two edges of the tyre together so that they bed into the well of the rim and work the remaining edge of the tyre into the rim—*using only the hands*. Do not be tempted to use a tyre lever or you will probably pinch the tube and puncture it again.

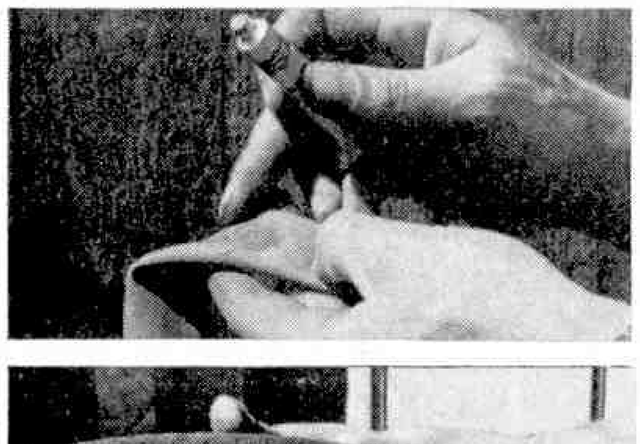
Make a final check round the rim to ensure the tube is not being pinched anywhere and the tyre edge is properly seated by the valve. Then pump the tyre up hard. One more hint—when you dismantle the valve, put the cap, etc. in your pocket and you won't lose them in the grass.

Remember too, it is better to avoid punctures and, with this in mind, always keep your tyres hard and check occasionally around the tread for embedded flints.

Where the puncture is obvious, there is no need to remove the wheel. Get the cover off by using three tyre levers and always remove the tyre on the side away from chain.

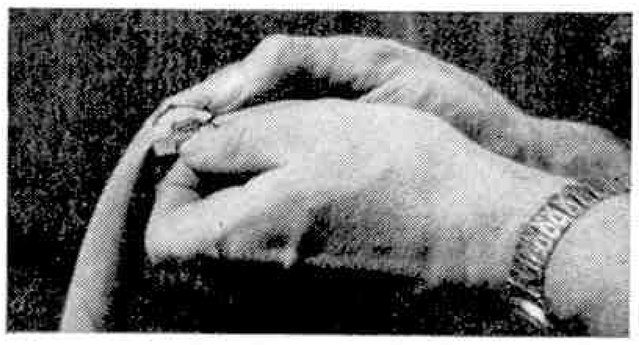


The patch will not adhere on a dirty or a greasy surface. Cleaning the area of the puncture with the piece of sandpaper in the puncture repair outfit is an essential step.

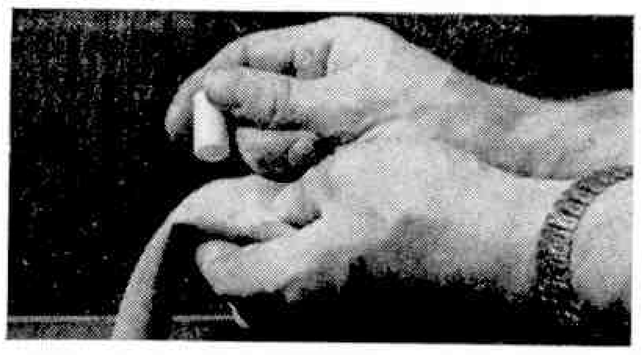


Do not try to stick the patch with anything but a proper rubber adhesive, supplied for the job. Spread the solution thinly and evenly with a finger tip and leave it a while to dry.

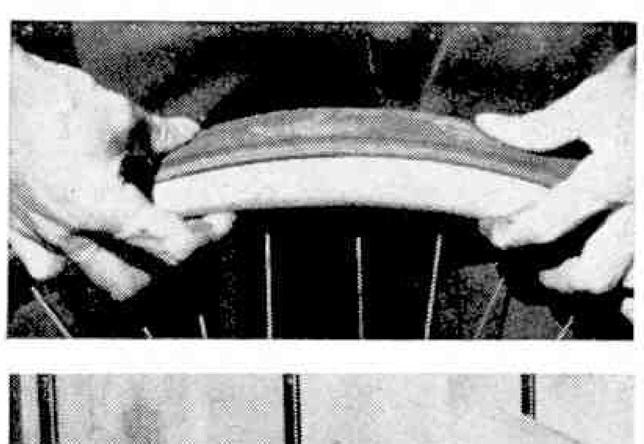
While the solution is drying, run your fingers round the inside of the outer cover to find if there are any flints protruding, which are liable to cause more punctures later.



Apply the patch to the adhesive and press it down smoothly and evenly under pressure for a few moments so that it sticks firmly. This particular patch has a feathered edge.



To prevent any excess adhesive around the edge of the patch from sticking to the inside of the tyre, shake some powdered chalk all around the area and blow away the surplus.



Pump some air into the tube before attempting to stow it back inside the cover. This will prevent it from getting twisted and perhaps kinking and blowing later, when pumped up.

The golden rule when returning the cover to the rim is not to use tyre levers on the last couple of inches. You will almost certainly pinch the tube causing another puncture.

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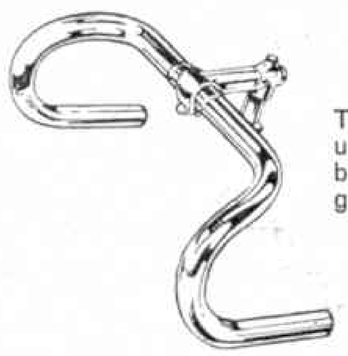

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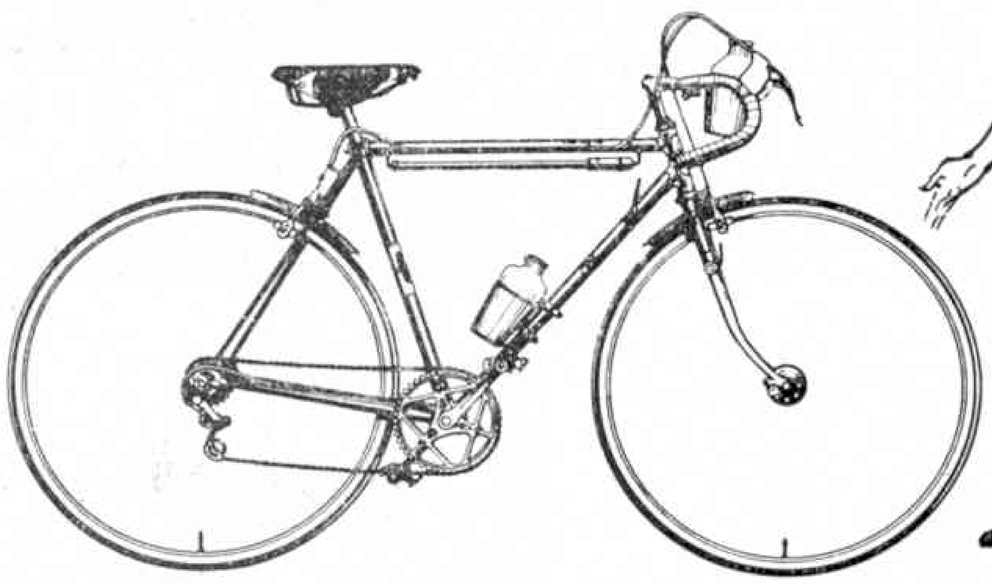

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SUN CYCLES, DOCK ROAD, WORKSOP, NOTTS.

by **Paul Dong**

Take sharp pictures

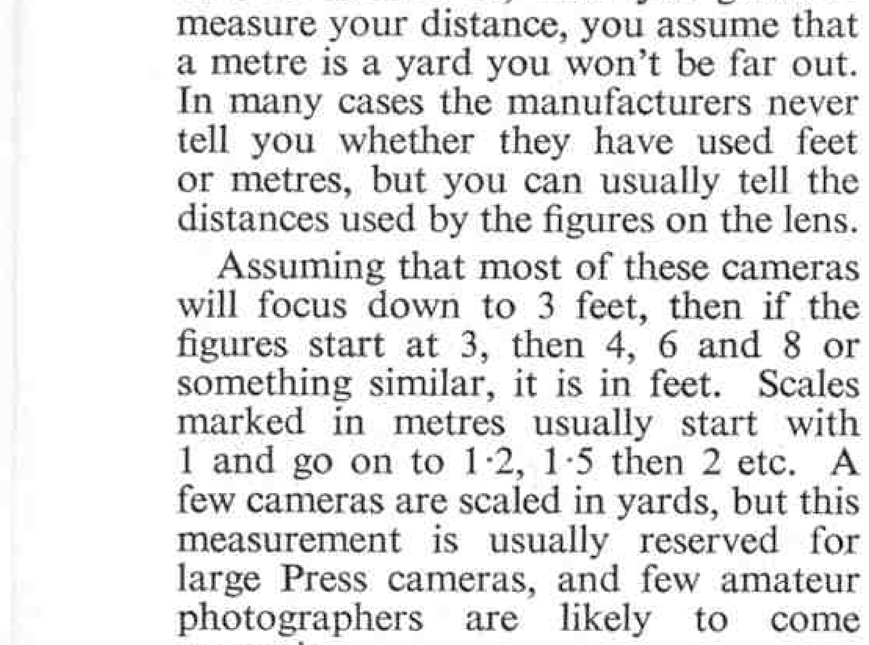
THE THREE main causes of unsharp photos are bad focus, camera shake and movement of the subject. Owners of box cameras are somewhat restricted by the technical capabilities of the camera, as the shutter speed and focus are fixed. All that one can do is make sure that the camera is held steady and that the subject is not moving, or nearer than six feet from the camera. The sharpness of the final result is also affected by the cheaper type of lens used in these cameras.

Owners of the more expensive camera can use the various adjustments provided to correct many of these faults, but care is still necessary, for if you try to take photographs beyond any camera's capabilities you will come unstuck.

Some form of adjustment for focusing is found on all cameras costing several pounds or more. It may be in the simple form of a revolving front lens, which has the focus distances marked around the edge of the lens and a pointer on the camera body. The distances are marked in feet or metres, a metre being just over 39 inches. If, when you guess or measure your distance, you assume that a metre is a yard you won't be far out. In many cases the manufacturers never tell you whether they have used feet or metres, but you can usually tell the distances used by the figures on the lens.

Assuming that most of these cameras will focus down to 3 feet, then if the figures start at 3, then 4, 6 and 8 or something similar, it is in feet. Scales marked in metres usually start with 1 and go on to 1·2, 1·5 then 2 etc. A few cameras are scaled in yards, but this measurement is usually reserved for large Press cameras, and few amateur photographers are likely to come across it.

This type of subject, which stretches from 4 to 30 feet from the camera, needs a small aperture to give greater depth of field keeping the whole subject sharp. Exposed at 25th second, at f22 on H.P.3 film.



This animal wasn't moving very much, so a fast speed was not necessary. However, a fast shutter speed was used in order to use a large aperture, which gives small depth of field and throws background out of focus. Exposed 1·200th at f5.6.

In Close-up

If you wish to get closer to the subject than the focusing will allow, you can use a 'close-up' lens, costing about ten shillings, which will alter the focus of the camera. These are made in three strengths, known as 'dioptres'. The 2 dioptre lens is the best one to start with, as this is a medium-powered one. It will allow a camera normally focusing down to 3 feet to be used at about 12 inches. Full instructions are included with these lenses. However, we will be having a special article on close-up photography later in this series.

On more expensive cameras, the focusing device is coupled with a mechanical device to cut out the guesswork. One of these types of camera, known as a 'reflex', is fitted with a mirror and a ground-glass screen on the top of the camera. The mirror reflects the image from the lens on to the ground-glass screen for you to see if it is sharp. If it is not, you simply adjust the focusing knob until you have a sharp picture. Another advantage with this type of camera is that the screen is usually the same size as the resulting negative, making it easy to see what is in the picture area.

The Rangefinder

Other types of cameras have rangefinders. When you look through the rangefinder, you see either two images of your subject or one image cut in half. You move the control until the images move together and when there is only one, the subject is then in focus. If your camera has no rangefinder, you can buy one for about two pounds which will show you the correct distance on a little dial. You then set your camera focus to the distance shown on the rangefinder to give you a sharp picture. One tip—when buying the rangefinder see that the distances are scaled the same as your camera. You don't want to spend half your time converting feet to metres or vice versa.

Provided you focus correctly by one of the methods described, your subject should be sharp and so will a small area in front of and behind it. The nearer your subject, the greater will be the area that is sharp.

This area, which is known as the 'depth of field,' is also affected by the aperture, one of the controls used when setting the exposure.

As can be seen from the illustrations, this ability to alter the depth of field can be very useful, for if part of the picture, other than the main subject, is wanted, you can make sure to get it into focus. Also, if there is part of the picture that is not wanted, you can throw it out of focus.

It is not possible to lay down exact figures, as the depth varies according to the camera. But, if your camera hasn't got the type of indicator illustrated, then you can find various tables, one of which will apply to your camera, in photographic books.

Hold it Steady!

The next requirement for sharp pictures is to hold the camera steady. It is not easy to do this at shutter speeds longer than 1/25th of a sec., which is that of the average box camera. Therefore, some form of support is needed for long exposures—either a photographic tripod, or any available tree, wall or table, etc.

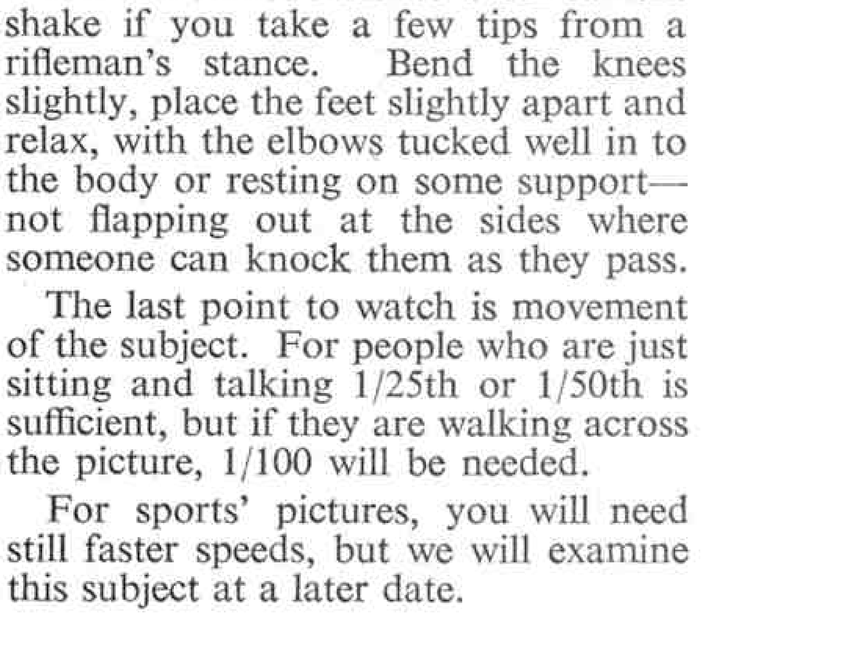
Even at faster shutter speeds such as 1/50th or 1/100th, care is necessary. Make sure that the camera is held comfortably and squeeze the trigger or button—if you jab at it, you are bound to shake the camera.

It is sometimes easier to avoid camera shake if you take a few tips from a rifleman's stance. Bend the knees slightly, place the feet slightly apart and relax, with the elbows tucked well in to the body or resting on some support—not flapping out at the sides where someone can knock them as they pass.

The last point to watch is movement of the subject. For people who are just sitting and talking 1/25th or 1/50th is sufficient, but if they are walking across the picture, 1/100 will be needed.

For sports' pictures, you will need still faster speeds, but we will examine this subject at a later date.

Some cameras have a built-in depth of field indicator. This one is on the Micro-cord camera. Note that with the camera focused at 7 feet, the area that is sharp at f8 is from 6 to 8½ feet, at f16 it would be sharp between 5½ and 10 feet.



by **David Kaye**

Calling all bus spotters

I RECENTLY visited Readings Coachworks, one of the smaller coach manufacturers in Britain. Located near Hilsea Lines, the Napoleonic War defence positions, which line the northern shore of Portsea Island, this company is generally associated in the minds of the spotters with two independent operators—nearby Gosport & Fareham Omnibus Company and the Guernsey Motors/Railways Company. In fact, over the past twenty years, they have built in whole or in part no less than 28 bodies for Provincial (alias Gosport & Fareham), and about the same number for the Channel Island fleet.

During my tour I saw Provincial 72 (HHA 84), an ex-Midland Red Guy 'Arab II' have the top deck swung on a crane on to the lower saloon, which had been assembled at Provincial's Hoeford Depot from parts supplied by Readings. Apprentices were busy with clamps, whilst the experienced eye of their overseer shouted out instructions as he trued up the two decks. No. 72 now has one of the imported German Deutz engines, like several other members of this fascinating fleet, including No. 33 (ACN 172), the chassis of which was awaiting a new Reading body. This was formerly No. 1172 in the Northern General fleet and was originally an A.E.C. 'Regent II'. No. 14, a third Provincial bus at Readings was erstwhile No. 45 (DAA 847), an A.E.C. 'Regent I', which now sports a Ruston & Hornsby engine of most unusual design.

Guernsey Motors No. 96 (14628) had been dispatched that very week by ship from Southampton, whilst sister coach No. 95 (14627) was standing there complete, awaiting the next ship out. Guernsey Railways No. 72 (14626) was in the paint shop, with all the windows protected by newspaper from the sprayer, whilst No. 73 (14651) was nearing completion. These buses can only be 7 feet wide due to the narrow roads, which they will have to negotiate on service, so special Albion 'Nimbus' chassis have to be purchased.

Portsmouth Corporation did buy some Reading bodies just after the last war. Nos. 1-4 were fitted on to Leyland PD1A chassis, and Nos. 199 and 200 on to similar Leyland PD1/1A chassis. A batch of Crossley DD42/5Ts (Nos. 11-15/28) received these local bodies too. Another Hampshire firm, King Alfred of Winchester had Reading bodies for their two Albion CX9 single-deckers HOR 491/2, but apart from these local orders, the only other large or medium size stage carriage operator to purchase a Reading body since 1945 has been West Bridgford U.D.C., who had them fitted to their trio of A.E.C. 'Regent IIIs' Nos. 31-33.

Nevertheless Readings have specialised in producing small 14-seat bodies for airline operators and in recent years have built 14 such vehicles for B.O.A.C., three for Trans-Canada, three for Air India and one for El Al. On my excursion into the workshop, work was in progress on a dapper little coachbody seating 19 persons for Trans-Canada Airways, while nearby, a Bedford VAS1 was receiving a body ordered by a small, Leicestershire, coach operator.

Naturally, Readings do not rely purely on coach and bus construction and inside their workshop were lorries and vans of all descriptions. Some were being rebuilt and others were brand-new vehicles. For any spotter, who has never visited a coachworks, I recommend the experience, provided you do not barge in uninvited. It is best to write to the firm beforehand and if a group of you get together, you will probably stand far more chance of being shown around.

Bobbing Variations

by **John Crossman**

A STYLE of legering known as "bobbing" has been developed by Midland anglers for bream fishing in the lower Severn. Here, fixed-float methods are unsuitable because of the great depth of the swims and the desirability of presenting a stationary bait to the bream hugging the river bed in mid-river.

Briefly, bobbing entails using paternoster terminal tackle above which a grayling-type float runs freely on the line. This arrangement is more sensitive than "straight legering" in which the line is fairly taut between rod-tip and leger; fish taking the bait quickly feel the resistance of the rod and often let go before a strike can be made.

With bobbing, the float, apart from giving a clear and early warning of bites, serves to put an angle or bend in the line. Fish have to straighten this angle before encountering the jarring pull of the rod and consequently they hold on to the bait with greater confidence.

Fig. 1 shows a sensitive variation of bobbing tackle which I have used with success on deep wide waters—not only for bream, but for shy-biting roach.

For rivers of gentle flow a half-ounce Arlesey bomb (a streamlined leger weight) leger is tied to the end of the line by means of a half-blood knot. Eighteen inches above this a simple loop is made on the line, and from this point a 3 ft. hook length is attached (the loop-to-loop knot is best here, as it enables hooks to be changed in a matter of moments). Fig. 2 shows the terminal tackle.

The stop shot—placed well clear of the terminal tackle to avoid tangles—should be of medium size (known as a BB) to prevent the wire split-ring from dropping below it. The use of a split-ring is again a matter of convenience: it permits floats to be changed quickly without having to cut the line.

The plastic disc on the line above the float is made from a tiddlywink. Trim the tiddlywink roughly to size with a sharp knife, round off with sandpaper, then pierce a hole in the centre with a needle. The hole should be just large enough for the line to pass through.

The sliding stop knot (see Fig. 3) is tied with nylon identical to the reel line. This knot dictates the position that the float will take in the water—it can be set so that the float will ride directly over the leger, or even under the rod top.

In rivers of gentle flow a float capable of carrying a load of 3 BB shot will be about right. The float should be of light material—balsa, cork, or quill—so that it surfaces quickly. My favourite float for the job is a small goose quill, the bottom of which is plugged with wood. The fact that the bottom half is heavier than the top ensures that it cocks easily and has stability.

When using this tackle in a river, cast slightly downstream and across, drawing the leger weight back over the ground-baited area. Provided that the stop knot is set at a depth greater than that of the river the float will surface and lie flat when the line is slack. The angler tightens the line until the tip of the float is just showing. Then he is ready for action.

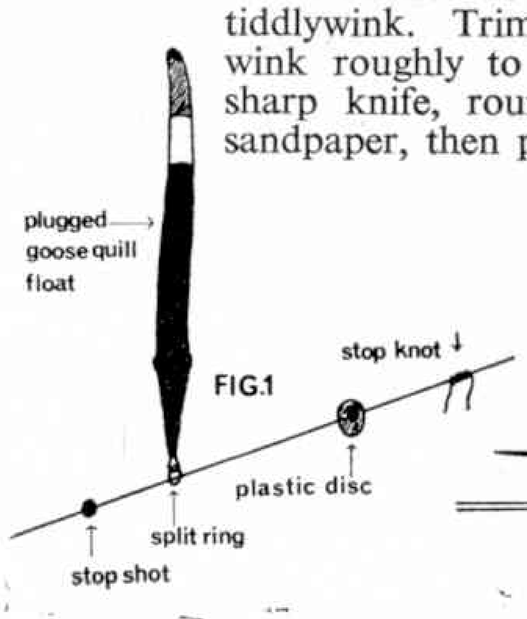


FIG.1

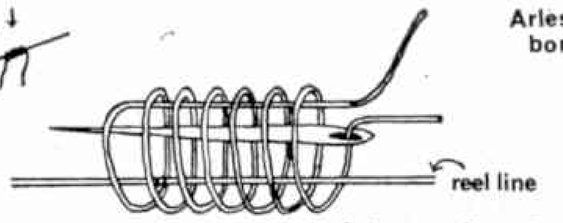


FIG.3 whip six turns · pull needle through & tighten

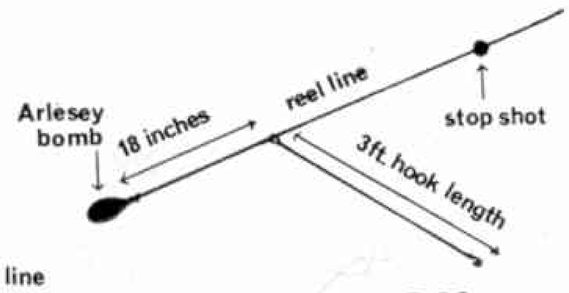


FIG.2

HEARD THIS ONE?

If you know any good jokes which you think will make other readers laugh, write them down on a postcard and send them in to: Meccano Magazine, Thomas Skinner & Co. (Publishers) Ltd., St. Alphage House, Fore Street, London, E.C.2. The best ones will be selected for publication.

He's sunk

Did you know that everything you lose in the armed services you have to pay for? For instance, in the Army, if you lose your rifle you have to pay for it. If you lose a tank, you have to pay for it! Now you know why a captain goes down with his ship!

Swinging the lead

The teacher surveyed the class from his desk and noticed that all but one of the pupils were busy, heads down, writing in their books.

'James!' exclaimed the teacher. 'Why are you not working?'

'I ain't got no pencil, sir,' retorted James.

'That is not the correct way to speak, James,' replied the teacher. 'You should say—"I have no pencil, they have no pencils, we have no pencils".'

'Well, who's got all the pencils then, sir?' queried the lad.

Stung into action

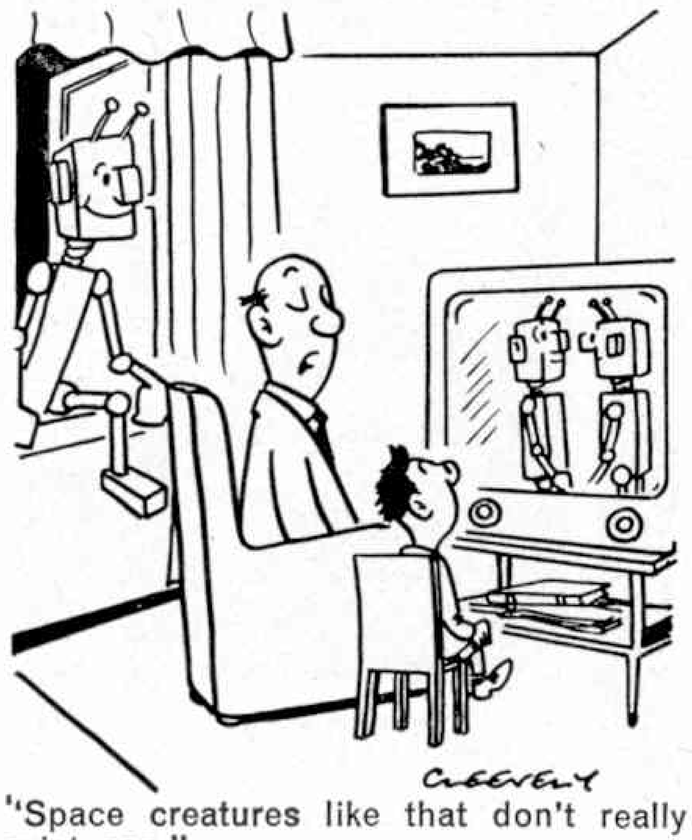
Terry Spinks was thoroughly fed up with a school mate who was always boasting about his possessions; then one morning, Terry's friend started expounding about a bee which he had captured and tamed.

'Every morning at 6 o'clock I let it out of its jar and it flies straight to the park to collect honey,' boasted Terry's friend. 'Then, after loading up with honey, the bee flies straight back to the jar!'

'Huh! I don't believe that story.' said Terry scornfully.

'Oh, and why not?' asked the other lad.

'Well, you know as well as I do—the park doesn't open until 7 o'clock in the morning!' smiled Terry.



"Space creatures like that don't really exist, son."

"Objection! Counsel is putting words into the witness's mouth!"

An elephant problem

If you can get four elephants into a mini-car by putting two in the front and two in the back, how do you get four giraffes in a mini-car?

You can't because it's full up with elephants!

Comic ads

Wanted: A bath for a baby made of plastic or similar material.

For Sale:—1956 Ford Estate Car, one owner recently rebored and carefully run-in. All offers considered.

House wanted by young married couple with copper plumbing, central heating and plenty of cupboard space. One or two bedrooms would suit, plus reception room and kitchen. Phone . . .

Holiday Hotel for families with hot and cold taps and showers fitted in every bedroom. Pets and children welcomed by landlady who loves animals.

Bits and pieces

Did you hear about the man who wanted to buy a new car but could only afford to purchase it on an instalment plan? On Monday he paid thirty bob as his first payment and on Tuesday he received a hub cap!

Who's the King?

A lion was wandering through the forest feeling very depressed, when he came across a tiny mouse nibbling at a nut which had fallen from a tree. The lion stalked up behind the mouse and let out a mighty roar. The mouse almost died with fright at the noise and when he turned to face the lion, he was visibly shaking at the knees. With another mighty roar the lion demanded: 'Who's the king of the jungle?'

'Y-y-you are, oh m-m-mighty king!' replied the terrified mouse, and with that the lion trotted off feeling a little less depressed. But then he started thinking about how any animal could scare a mouse and his mood of depression began to get worse. A few miles further on when the lion was feeling really low, he entered a clearing in the forest and there before him was a mighty bull elephant, calmly picking leaves off a tree with its trunk and stuffing them into its mouth.

'This is my chance,' thought the lion and, stretching his tonsils to breaking point, he let out a fantastic roar which echoed through the jungle. 'Who's the king of all the beasts?' he demanded.

Surprisingly, the elephant didn't bat an eyelid, it simply went on picking the leaves off the tree. Once again, the lion, going mauve in the face, let out another mighty roar. Once again, the same demand. 'Who's the king of all animals?'

This time, of course, the elephant just couldn't ignore the lion's efforts and casually it turned its head, lowered its trunk and with surprising speed wrapped it around the lion's waist. The elephant then hammered the lion against the tree trunk three or four times, tossed the lion in the air and with an air of disgust trampled him in the dust a couple of times.

After all the dust had settled and the lion lay a dishevelled heap on the floor the lion looked sadly up at the elephant and said in a shaky voice: 'Well, really—if you don't know the answer there's no need to lose your temper!'

"I don't want to buy them, thanks. That was a sum in my homework."

Paper modelling

Frame that picture

MODELLING of any nature, whether it be with clay, Plasticine or wax, is always an interesting pastime. One of the more recent hobbies and one which is extremely cheap to put into practise is modelling with paper. You will be surprised at the variety of different objects you can make with a sheet of cartridge paper and a pair of scissors, many of them being not only pleasant to look at but also very useful.

In this article I intend to introduce you to the fascinating art of paper sculpture, providing you with easy-to-follow diagrams and illustrations which will teach you the basics of this unusual art. The first exercises will appear simple, but over the next few months I will show you how to make bigger and more complicated objects.

To make a start, you will need a few simple tools. A sheet of thick, white cartridge paper (price 6d.), a steel rule (about 2/6d.), a pair of scissors, a sharp cutting knife or single-edge razor blade, some Sellotape and a tube of transparent adhesive such as clear Bostik.

A very important precaution you must take before you start work is to see that the surface on which you are working is completely dust free and that your tools and hands are completely clean. There is nothing more annoying than completing a difficult model and finding that it is covered in dirty smudges.

The technique of paper sculpture involves four stages—scoring, cutting, folding and moulding. At this stage we will exclude the last of these four and learn how to master the first three. The object I will show how to make this month is a simple one—a rectangular picture frame for a picture 15 inches deep by 12 inches wide. If you have a different size picture, you may adapt the diagrams to your own measurements.

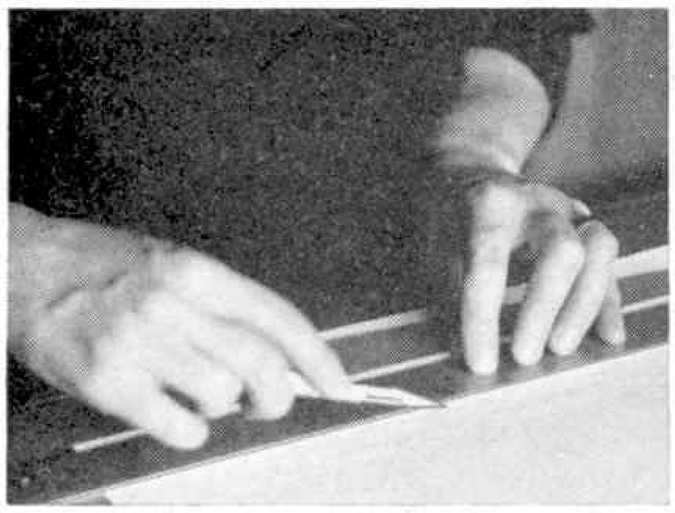
The procedure is exactly the same as making the frame out of wood, except that whereas wood is solid, the frame we shall make is hollow inside. The frame will consist of four sections, one for each side. These will be assembled around the picture and one of the most important points is to see that the corners meet accurately at an angle of 45 degrees.

Firstly, cut two pieces of paper 15 inches by 2½ inches and two pieces 12 inches by 2½ inches Next mark out lightly in pencil half inch divisions as indicated in diagram 1. Cut the ends as and where indicated and on the half-inch division marks, which you have made, score the paper with the blunt edge of the knife. (A word of caution—scoring is half cutting the paper with the purpose of folding the paper neatly. Make sure that you do not exert too much pressure, but don't be discouraged if on your first or second attempt you do cut right through. You will soon learn the right pressure to use on this type of paper.)

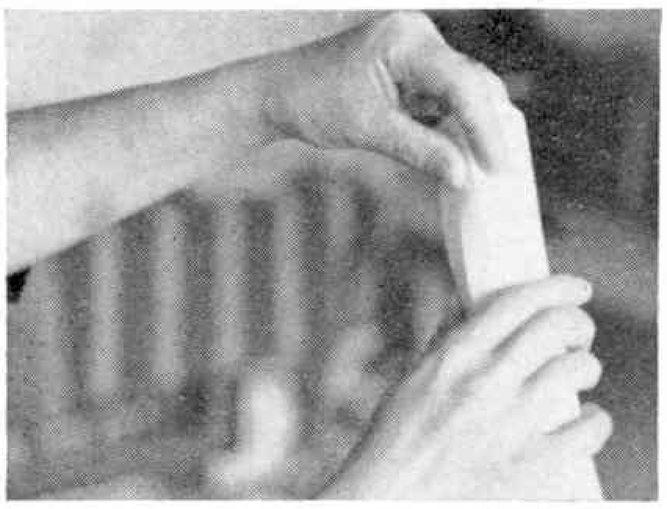
The next step is folding. Remember, you are working in a delicate medium, so gently fold the paper on each of the scores you have made. When you have completed the folding as illustrated, you will have a three-dimensional frame unit for one side of the picture. Flap X is meant for securing it to the back of the picture—see diagram. Now that you have completed the one side, assemble the other three sides in a similar manner.

Joining the units to the picture is the next step. In each case you take the Flap X and join it to the back of the picture with light smears of clear glue or Bostik. Next, secure Flap Y to the front of the picture. Picture A shows a simple rectangular frame made in the manner described. If you wish, you may paint your frame with water colours for added effect.

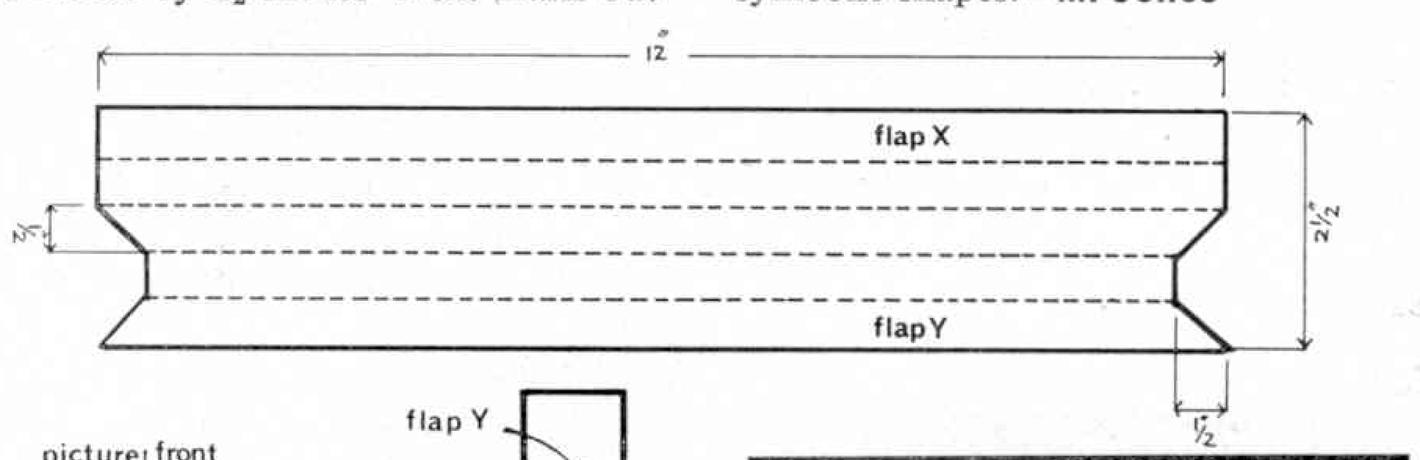
In my next article, I will show you many variations on a similar theme and also how to mould paper to various symbolic shapes.—**M. Jones**



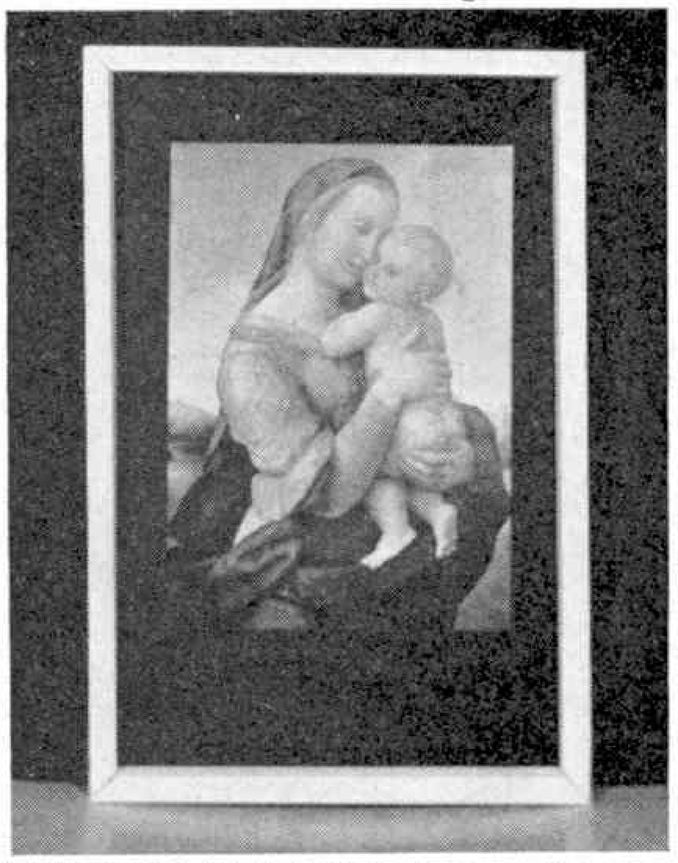
1 Score the paper with a blunt but pointed tool, ensuring that you have a hard, smooth surface beneath the paper for a sharp line.



2 Begin folding at one end of the paper and gradually work along the length squeezing with light pressure between finger and thumb.



3 The completed frame sections awaiting assembly around the edge of the picture.



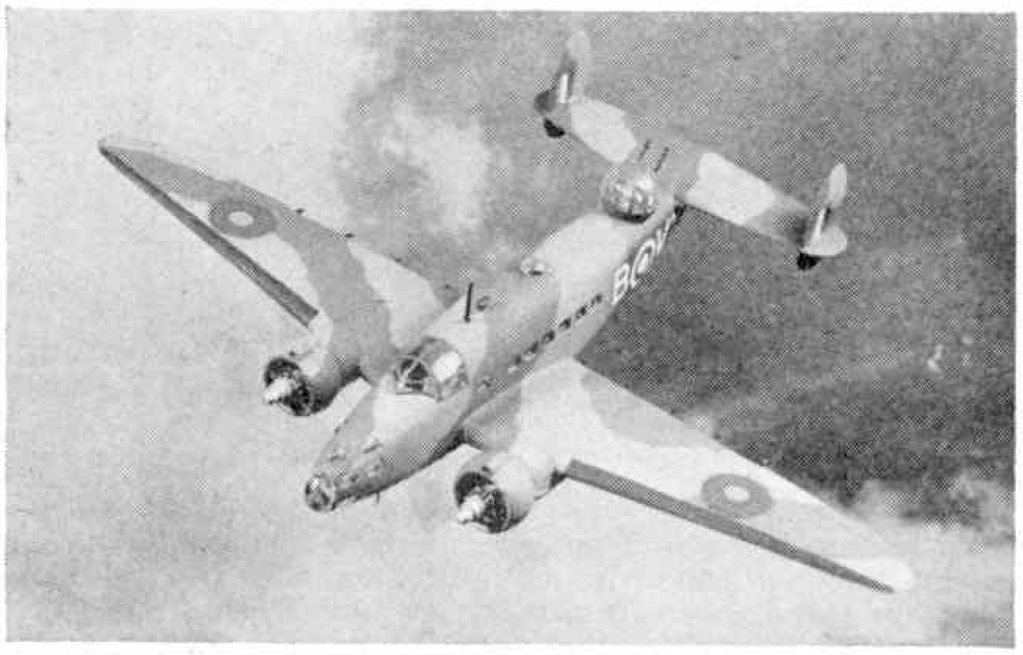
4 The completed picture frame. You can vary the dimensions according to requirements.

window SHOPPING

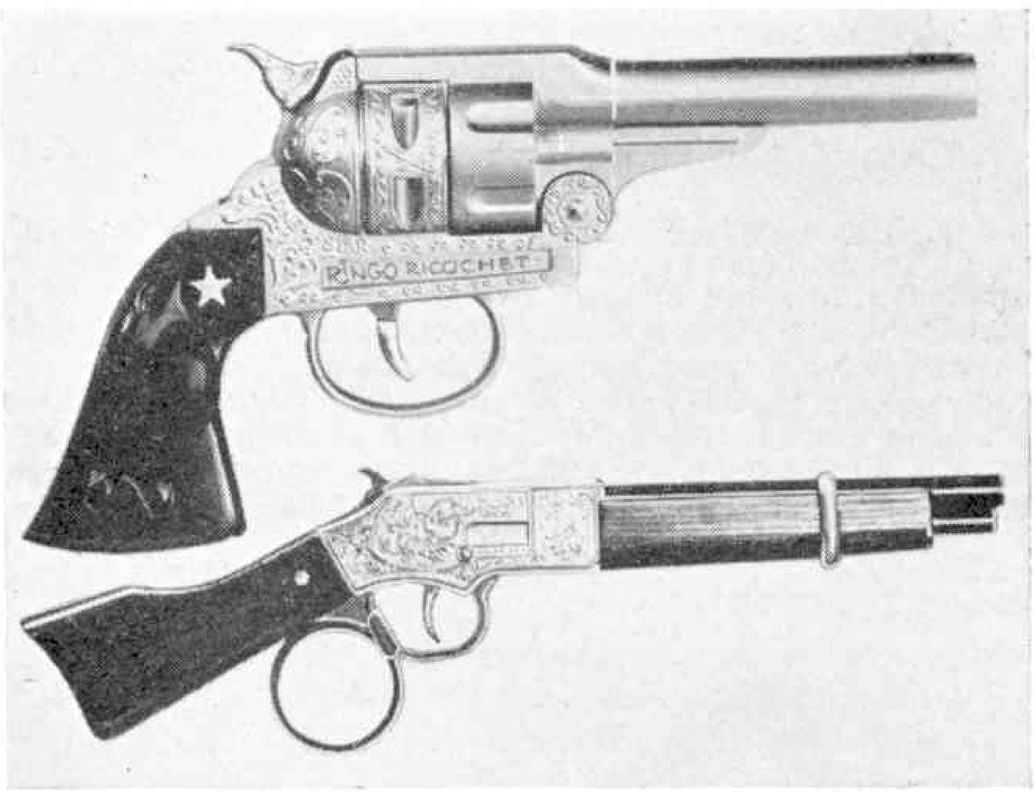
kits and models on the market

If you're a keen collector of toy soldiers and military vehicles, one of the latest Airfix model construction kits will not only supply you with hours of enjoyable, constructional modelling, but the end product can also be added to your military collection. The Airfix Bren Carrier and Six-pounder gun is made up of 45 components and it is to HO/OO scale. The plastic 'package deal' kit costs **2s 0d.**

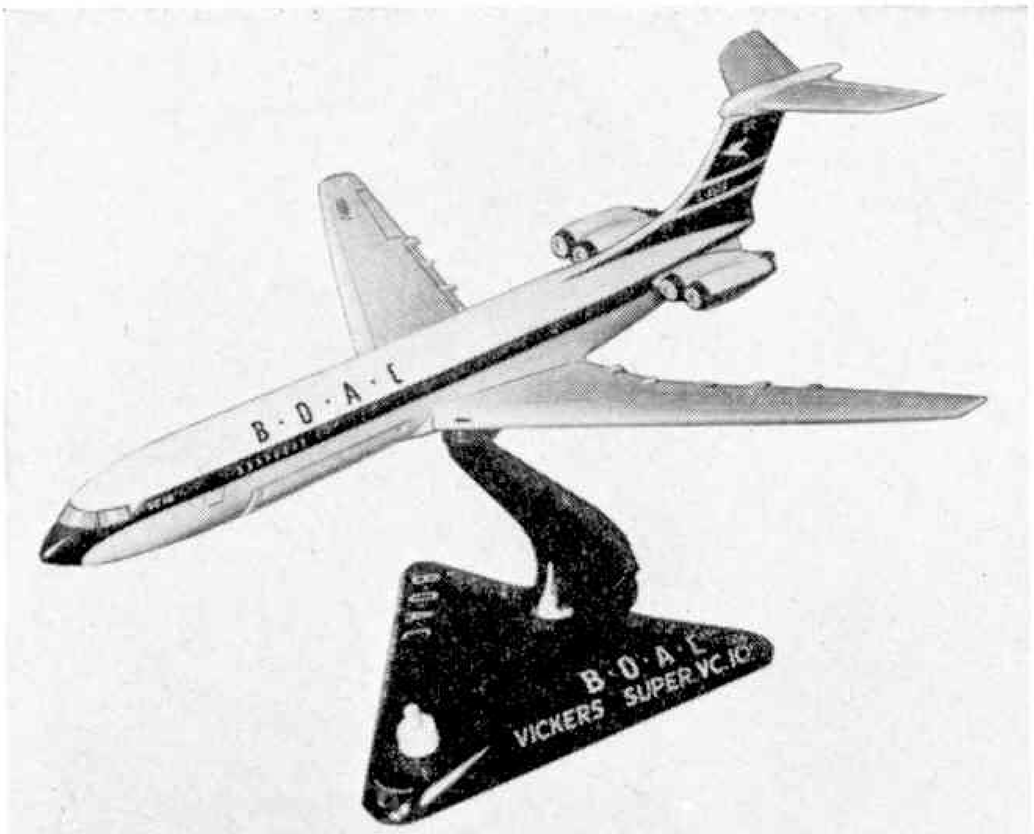
Chemistry is one of the most interesting subjects and to be able to put into practise what you learn at school is often very useful and an extremely fine way of combining work with pleasure. Merit Chemistry Outfits come in various sizes and the No. 2A kit illustrated contains enough equipment to carry out at least 90 experiments. The kits are completely harmless and full instructions are given on how to carry out the experiments. The kit shown is available with either a spirit burner at **33s 6d** or with Bunsen burner at **36s 11d.**



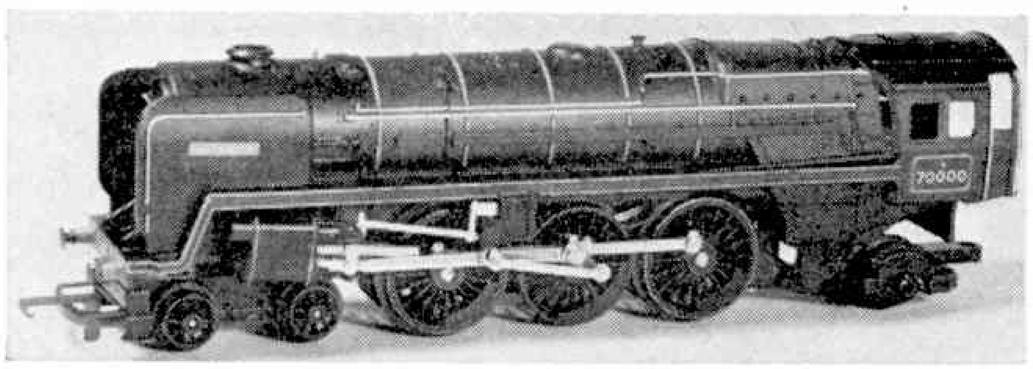
The Lockheed Hudson was the first American aircraft to be used operationally by the R.A.F. in the Second World War. Airfix have now produced a model plastic construction kit, consisting of 85 polystyrene parts, of this aircraft. Included in this 1/72 scale kit are transfers representing the R.A.F. insignia of 206 Squadron, Coastal Command. Cost of the complete outfit is **4s 6d.**



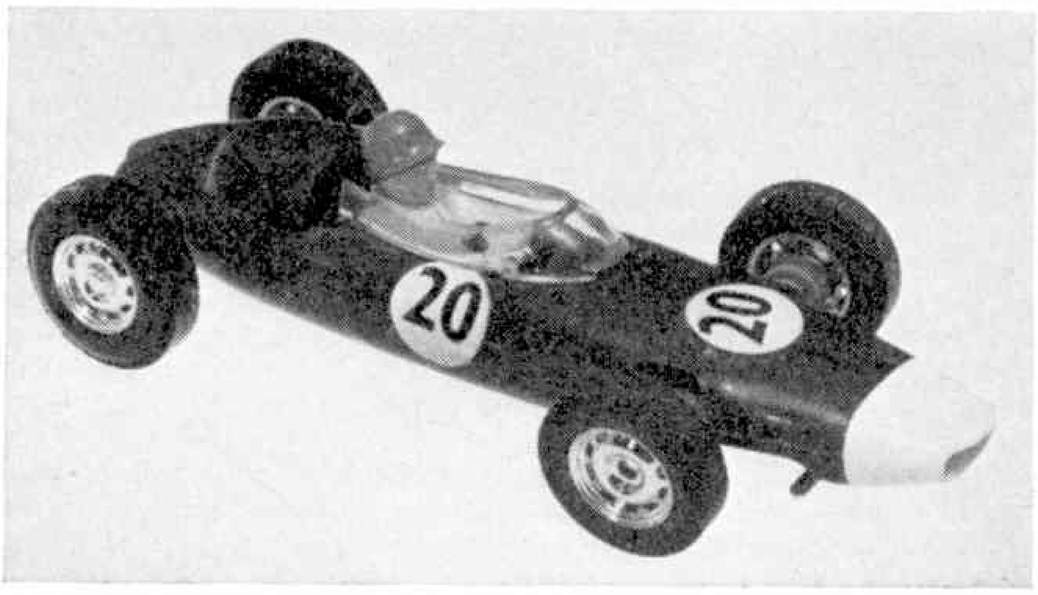
Lone Star Products have recently released two new products. One of them, a 100 shot repeater Sawn-off Shot Gun, is 18 in. long, has a spring open mechanism and is fitted with a patented flip ring for rapid firing from the hip. In the Wild West these guns were worn slung from the hip in a specially designed holster. To keep faithfully to this fact, Lone Star have produced a similar holster, 2 in. wide, fitted with bullet clips loaded with silver 'Gleam' bullets. The cost of the two items, gun and holster, is **26s 6d** or the gun may be bought separately for **13s 9d.** The second product from Lone Star is the Ringo Ricochet pistol which is a ·45 calibre, 100 shot cap repeater. It has a break-open action for loading and one of the special features is the realistic ricochet sound that follows the squeezing of the trigger. Available in the 'Gleam' silver finish it costs **8s 11d** or in blue or black 'gun-metal' finish it costs **7s 11d.**



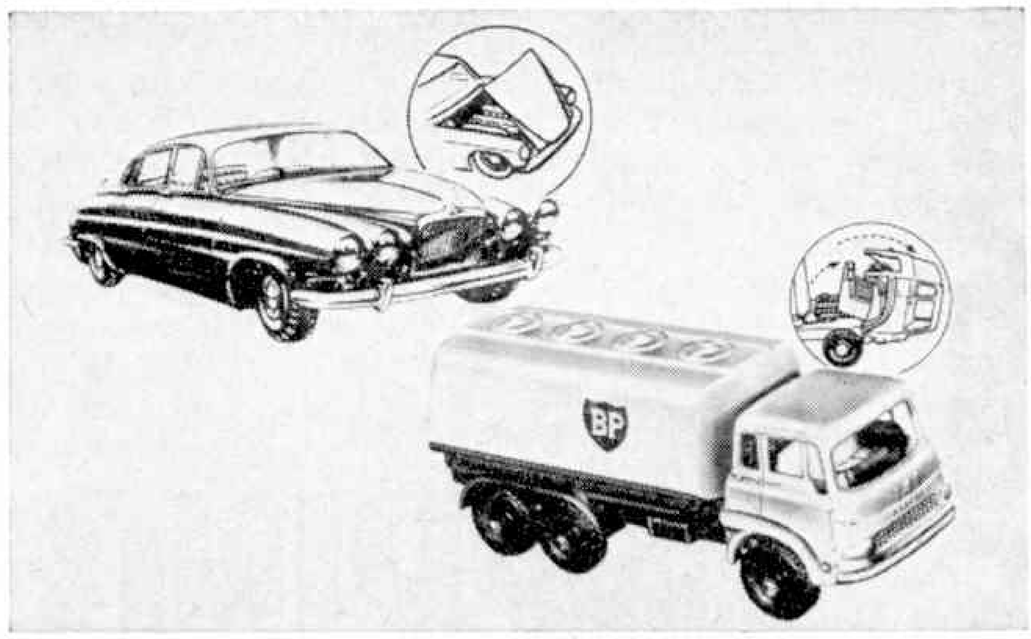
The new Vickers Super VC10 appears to be having quite an impact upon the model aircraft manufacturers as this is the second model kit of this aircraft which has been announced over the past few weeks. However, this particular model, which is produced by FROG, has such refinements as an electric navigation light system, fully movable elevators, ailerons, rudder and flaps and a retractable undercarriage. The model is to 1/144th scale, which gives a wing span of 12 in. The kits consists of 80 parts, including stands and costs **19s 11d.**



Tri-ang, who already make smoke units for many of their OO and TT gauge locomotives, have now gone one step further by introducing into four of their locomotives a new type of unit which is the ultimate in realism. This synchronises the emission of smoke with the speed of a locomotive itself. The four engines concerned are; the 0-6-0 class 3F Locomotive (sales No. R .251S, U.K. price **39s 6d**), the 4-6-0 class B12 Locomotive (R. 150S, price **47s 0d**, the 0-6-0 class 3F Tank Locomotive (R. 52S, price **39s 6d**, and the 'Britannia' Locomotive (R. 259S, **75s 0d.**

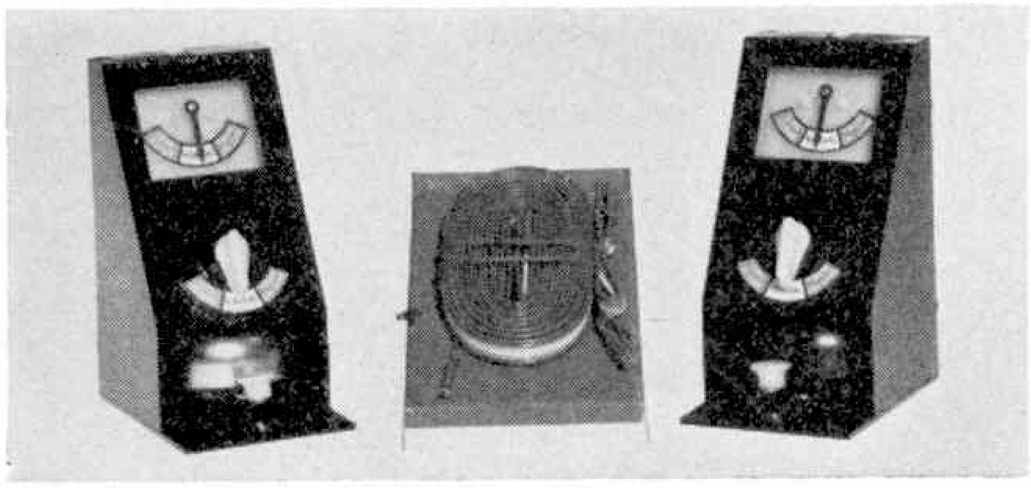


One of the latest Scalextric raceway cars for the model racing car enthusiast is the Formula 1 B.R.M. This model is designated C/72 by Scalextric and is fitted with Ackerman steering and powered by the Formula Junior motor. The model is included in Scalextric sets No. 50 and No. 80 or is obtainable separately from model shops, price **£1 0s 0d.**



Two of the latest 'Matchbox' models to be produced by Lesney Products Co. Ltd., are the 1/85th scale B.P. Tanker and the 1/72nd scale Jaguar Mark X. The tanker is finished in authentic B.P livery with full-colour transfers and has a tilting cab and seat which gives access to a fully detailed engine. The overall length of the model is 3 in. and it costs **1s 11d.** The special features included in the Jaguar Mark X model are all-independent, spring suspension, detailed interior and an opening bonnet which reveals the famous XK twin-cam engine. The overall length is $2\frac{3}{4}$ in. and the cost is **1s 11d.**

Model layouts of raceways and train sets can often be improved by the addition of scale scenery. Any sort of layout, from a tiny front garden to an ambitious landscape, can be built up from the miniature 'Floral' garden packs manufactured by Britains Ltd. Although large packs are available, most model-makers will probably want to start with the small junior pack which costs **5s 11d.** The five smaller packs illustrated contain items from a garden seat and two chairs to a scale garden wall. These additions to your scenic layout cost **1s 11d.**



Bell signal sets have been an essential part of the railway system for many years. The device is used on railways to make possible communication between two signalmen, who advise each other of the approach of trains by means of the Bell Code. Tri-ang have now introduced a Bell Signal Set (R.T. 268) into their comprehensive range of model railway equipment. The set includes two block instruments and sufficient wire for the bell code to be operated at a distance of up to six feet. Since the set is not connected to the track, it may be used with any gauge and make of model railway. The U.K. price is **45s 0d.** A list of basic bell codes is provided with the instructions.

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MECCANO

DINKY TOYS · HORNBY DUBLO · PLAY-DOH

WEAVE real material with this Meccano hand loom

by **Spanner**

WORKING MODELS, as I have said before, are always more popular with constructors than those static reproductions which, while *looking* very impressive, do not actually do anything. For instance, far more cranes are built than, say, ships, simply because Meccano Cranes can simulate operations of the machines on which they are based, whereas ships cannot. But even the popular model group, itself, can be subdivided.

Two sections that spring to mind might well be termed 'Models simulating real-life operations' and 'Models producing a visible result'. A Counting Machine such as that described in these pages last month, is one example of the latter section and you can see that it does produce a definite result, although, in this case, it is only a mathematical figure. There can be no doubt, however, that the model Hand Loom featured here qualifies for Section Two as it produces an extremely obvious result—real cloth.

Owners of Outfit No. 8 will be able to build the Loom provided that they obtain a few extra parts. These additions are 24 Healds, No. 101, one End Bearing, No. 166, and 24 Washers, No. 38.

At this point, I think I should explain a few technical terms which crop up in the instructions. The 'warp' consists of the lengths of cotton which are wrapped around the warp beam roller, and which are threaded through the Healds, etc. The 'weft' is the single length of cotton which is wrapped around the shuttle. The shuttle itself is the object that is passed backwards and forwards between the 'warp' and is built-up from a Rod, held loosely in two End Bearings that are bolted, as shown, to two Perforated Strips, bent to shape. It is best to saw out the metal between the two centre holes of one of the Strips so that the weft can be passed through the resulting elongated hole.

To make construction easier, I have set out the instructions in sections so that the different parts of the model can be recognised.

Framework

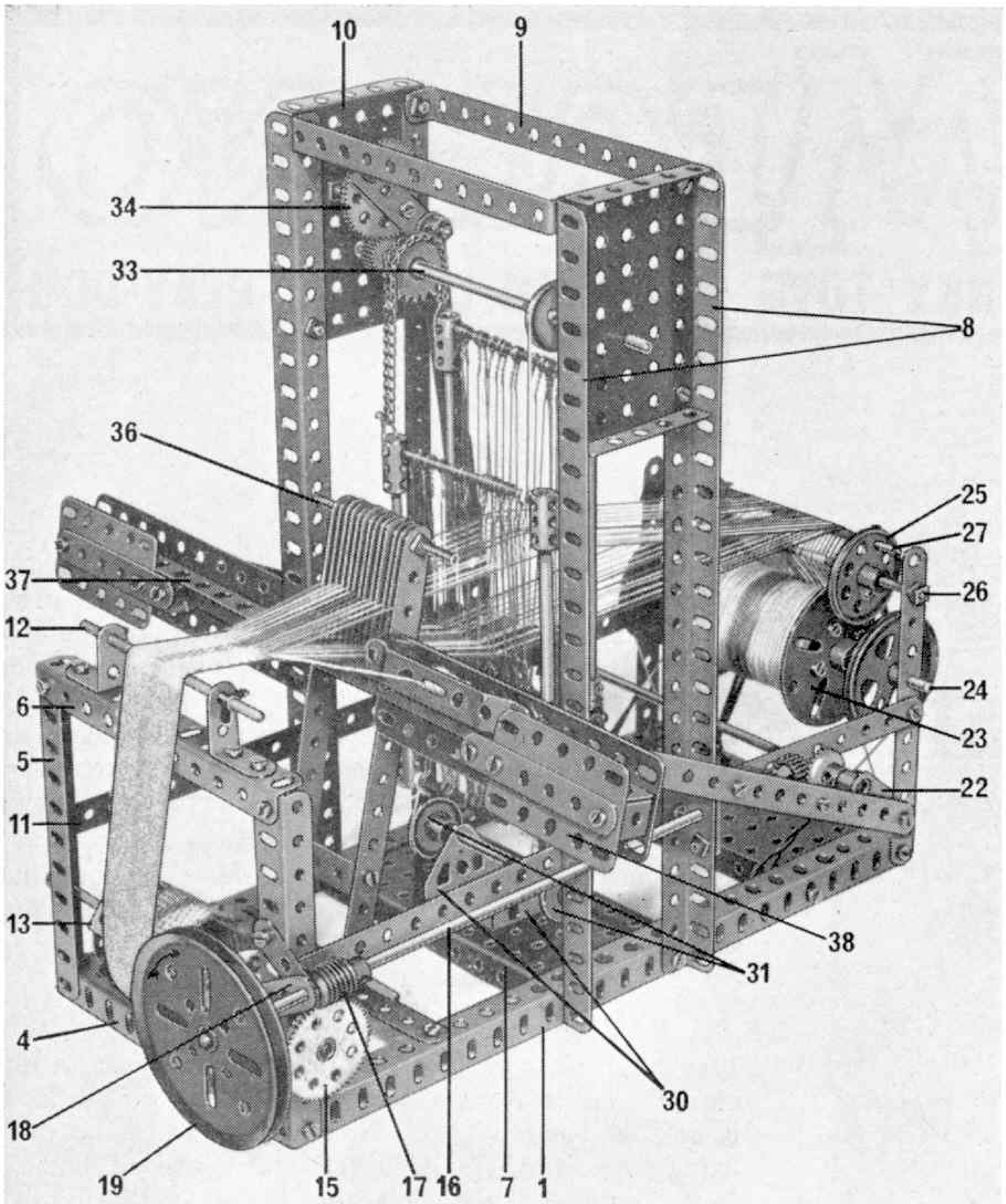
A $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate 2 is bolted between two $12\frac{1}{2}''$ Angle Girders 1 with $5\frac{1}{2}''$ Strips 3 attached at the corners. At the front of the Loom a $5\frac{1}{2}''$ Angle Girder 4 is secured to the Angle Girders 1, at the same time fixing supporting $5\frac{1}{2}''$ Angle Girders 5 and 6 in place. In the centre of the Angle Girder 1, a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate 7, at each corner of which four $12\frac{1}{2}''$ Angle Girders 8 are fixed, is bolted. The top of the Angle Girders 8 are connected together by two $5\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips 9 and two $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plates 10. Two $12\frac{1}{2}''$ Strips 11 are bolted to the Angle Girders 5 and 8 and to the Strip 3. A 4" Rod 12, held in place by Spring Clips, is journalled in two $1'' \times 1''$ Angle Brackets bolted to the Angle Girder 6.

Take-up Roller

Four $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips are bolted between two Bush Wheels 13 and secured to a $6\frac{1}{2}''$ Rod 14 which carries a 57 tooth Gear Wheel 15, spaced away from the frame by three Washers. An $11\frac{1}{2}''$ Rod 16, journalled in two $1\frac{1}{2}''$ Strips 18 and a $1\frac{1}{2}''$ Strip bolted to the Angle Girder 8, has a Worm Wheel 17 and a 3" Pulley Wheel 19 fixed on it. Worm Wheel 17 drives Gear Wheel 15. A $\frac{1}{2}''$ Pinion on Rod 16 drives a $\frac{3}{4}''$ Contrate Wheel on an 8" Rod 20 to which is secured a 1" Sprocket Wheel 21 and Cranks 22 at each end. Collars hold the Rod in position.

Warp Beam Roller

Four $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips are bolted between two Face Plates 23 that are, in turn, mounted on a $6\frac{1}{2}''$ Rod 24. This Rod supports two 2" Pulleys, serving as brake wheels, around which cord is placed, one end



The Hand Loom showing the woven material, the reed and the shuttle.

being anchored to the flange of the Plate 2, and the other tied to a small Driving Band which is looped over $\frac{1}{2}$" Bolts fastened to the inside flange of the Plate 2.

Tensioning Device

Two $1\frac{1}{2}$" Pulleys 25 are secured to a 6" Screwed Rod held at the ends by two nuts locked together. A $4\frac{1}{2}$" Rod 27 is placed between the Pulleys and held by Spring Clips, as shown, after which a $3\frac{1}{2}$" Strip 28, placed at right angles to the Rod 27, is bolted to one of the $1\frac{1}{2}$" Pulley Wheels. A 6" Driving Band anchored to the Plate 2 is attached to $3\frac{1}{2}$" Strip 28 by means of a Loaded Hook. A Double Bent Strip 29 is bolted over Angle Girder 8 and $12\frac{1}{2}$" Strip 11, then two Trunnions 30 are fixed to the centre of the Plate 7, being spaced one and a half inches apart. A 4" Rod carrying two 1" Pulley Wheels 31, is journalled in the apex holes of these Trunnions.

Two similar heald frames are required, construction of which is quite straightforward. Twelve healds are placed on two $3\frac{1}{2}$" Rods, being held in place, on the top Rod, by a Coupling at each end, and, on the bottom Rod by a Swivel Bearing at each end. This latter applies only to one of the heald frames, as couplings take the place of the Swivel Bearing on the other. The Couplings and Swivel Bearings are connected by $4\frac{1}{2}$" Rods.

One pair of Couplings are connected by 27 links of Sprocket Chain, fastened to the Couplings by Cord, as can be seen, while the other pair is connected by Cord only. Special care should be taken to ensure that the heald frames are level. The lower ends of the heald frames are connected by Cord pulled tightly around the Pulleys 31.

Heald Operating Mechanism

Two $1\frac{1}{2}$" Strips spaced two holes apart, are bolted to a 2" Sprocket Wheel, two Washers on the shank of the bolts holding the Strips away from the Sprocket, and a Threaded Pin is secured in the V formed by the Strips. A compound 9" Strip 32, made up from two $5\frac{1}{2}$" Strips, is placed on the Threaded Pin and held by a Collar. The 2" Sprocket Wheel is then mounted on a $1\frac{1}{2}$" Rod, journalled in the Double Bent Strip 29, and is driven by Chain from the 1" Sprocket Wheel 21. A 2" Strip is bolted across a 57 tooth Gear Wheel 34, and this is connected to strip 32 by means of a Threaded Pin, being held in place by a Collar. Gear Wheel 34 is fixed on a $1\frac{1}{2}$" Rod journalled in a Double Bent Strip 35, bolted to one of the Flanged Plates 10. A $\frac{1}{2}$" Pinion on a $6\frac{1}{2}$" Rod 33 engages with the Gear Wheel 34. Also on Rod 33, a 1" Pulley and a 1" Sprocket Wheel are fixed. When the Threaded Pin on the 2" Sprocket Wheel is in the lowest position the back heald frame top should be 1" away from the Rod 33, and the Cranks 22 should be in their most rearward position.

The Slay and Reed

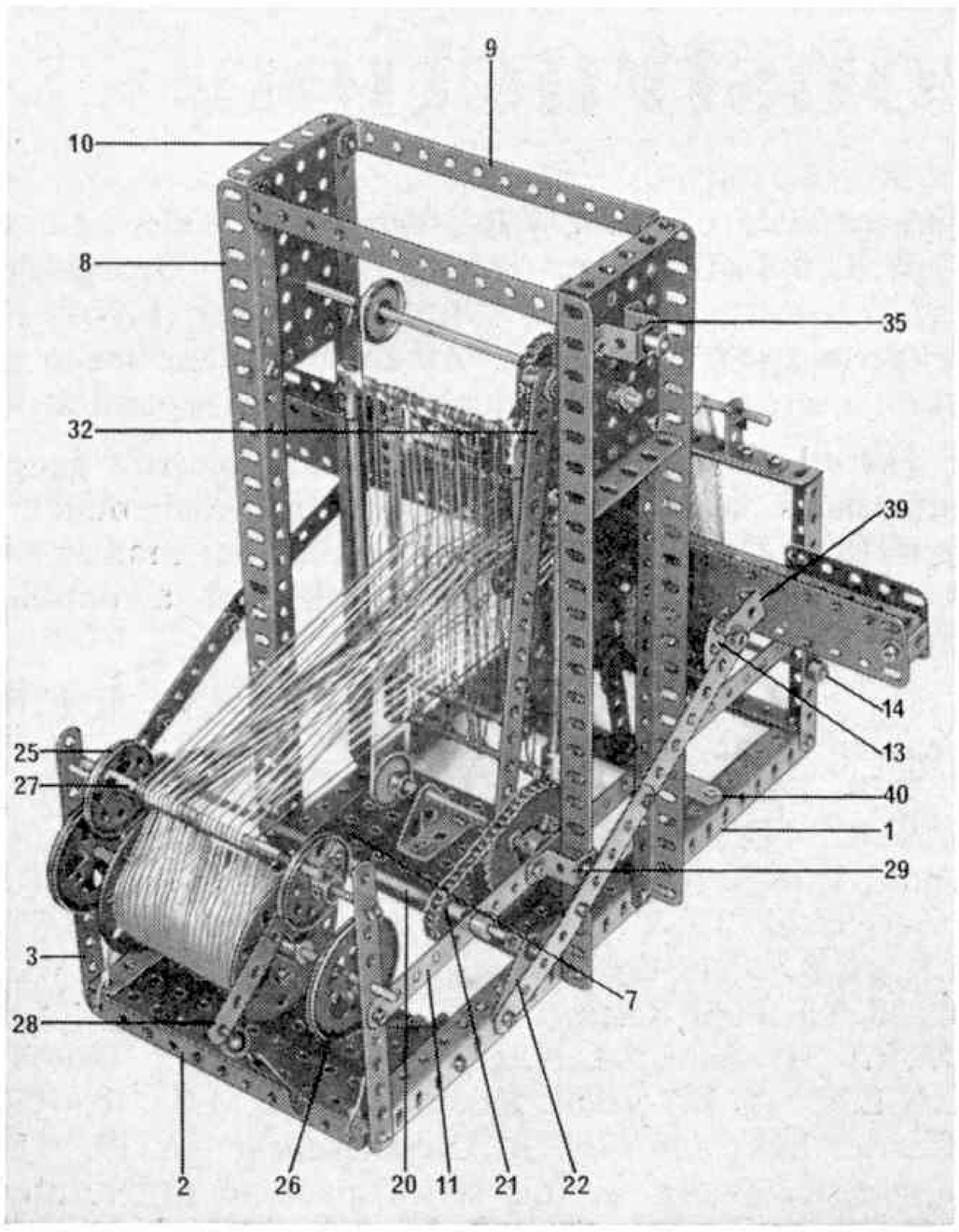
On two 3" Screwed Rods 36 a $5\frac{1}{2}$" Strip, followed by two Washers and a $2\frac{1}{2}$" Strip, is placed. A further $2\frac{1}{2}$" Strip, then two Washers, are added, and this is repeated until eleven $2\frac{1}{2}$" Strips are on the Rod, finishing with two Washers and a $5\frac{1}{2}$" Strip. Nuts are tightened up against the $5\frac{1}{2}$" Strips, which are then extended by $4\frac{1}{2}$" Strips overlapped six holes with a $1\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip bolted between them. A $5\frac{1}{2}$" Strip 40 is attached to the Angle Girders 1 having a $1\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip fixed in the centre of the Strip. The extended Strips of the slay pivot on a $3\frac{1}{2}$" Rod journalled in the $1\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip. Collars are secured on the Rod to hold the extended Strips. The lower Screwed Rod has an Angle Bracket fastened next to the $5\frac{1}{2}$" Strips to secure the built-up 'reed' to a $12\frac{1}{2}$" Angle Girder 37. Two $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates are bolted to the rear of the Angle Girder, the bolts also fixing Double

Brackets to its underside. A 3″ Strip and a 2½×1½″ Flexible Plate 38 are fixed to these Double Brackets. Two 1″×½″ Angle Brackets 39 are bolted to the rear of the slay and are connected by a 13½″ compound strip to the Cranks 22. When the reed is at the back centre, the heald frames are fully open.

The 'weft' thread may be wound on a Rod and pushed through the 'warp' threads, or the built-up shuttle may be flicked by a finger across the reed. Both produce good results.

Preparing to Weave

I recommend 'Lyscordet' Fine Knitting Cotton No. 5 for 'warp' and 'weft'. Take 24 lengths of cotton, two or three yards long and tie all the lengths together in one knot. Pass this knot between two of the Double Angle Strips of the warp beam, and then push the beam axle through the threads in front of the knot, so as to anchor the cotton. Now commandeer a friend, and ask him to hold the threads in one hand and a coarse comb in the other hand. The comb should be held about 2 inches away from the beam. Next, place one thread in each of the comb teeth. With the brake off, carefully wind the threads on the beam, your friend holding the comb and keeping the threads tight until all but about one foot is wound on the beam. Now remove the comb. Making sure the heald frames are level, thread the first strand of cotton through the eye of the first heald on the front frame, then thread the second strand through the eye of the first heald on the back frame. After this, pass both threads through the first dent (hole) of the reed. Repeat this sequence until all the threads have been dealt with, then slide them between two of the Double Angle Strips of the take-up roller and tie them to Rod 14. Place the brake cords back in position. Wind some 'weft' thread on a Rod, or the Rod in the shuttle and turn the 3″ Pulley 19 until the heald frames are fully open. Now pass the weft between the warp threads and turn the 3″ Pulley clockwise again. The reed will then push the weft forward. When the reed reaches back centre, again pass the Rod or shuttle through the warp threads. This constitutes the actual weaving process. The longer you repeat the movements, the more woven material will be wound on the take-up roller.

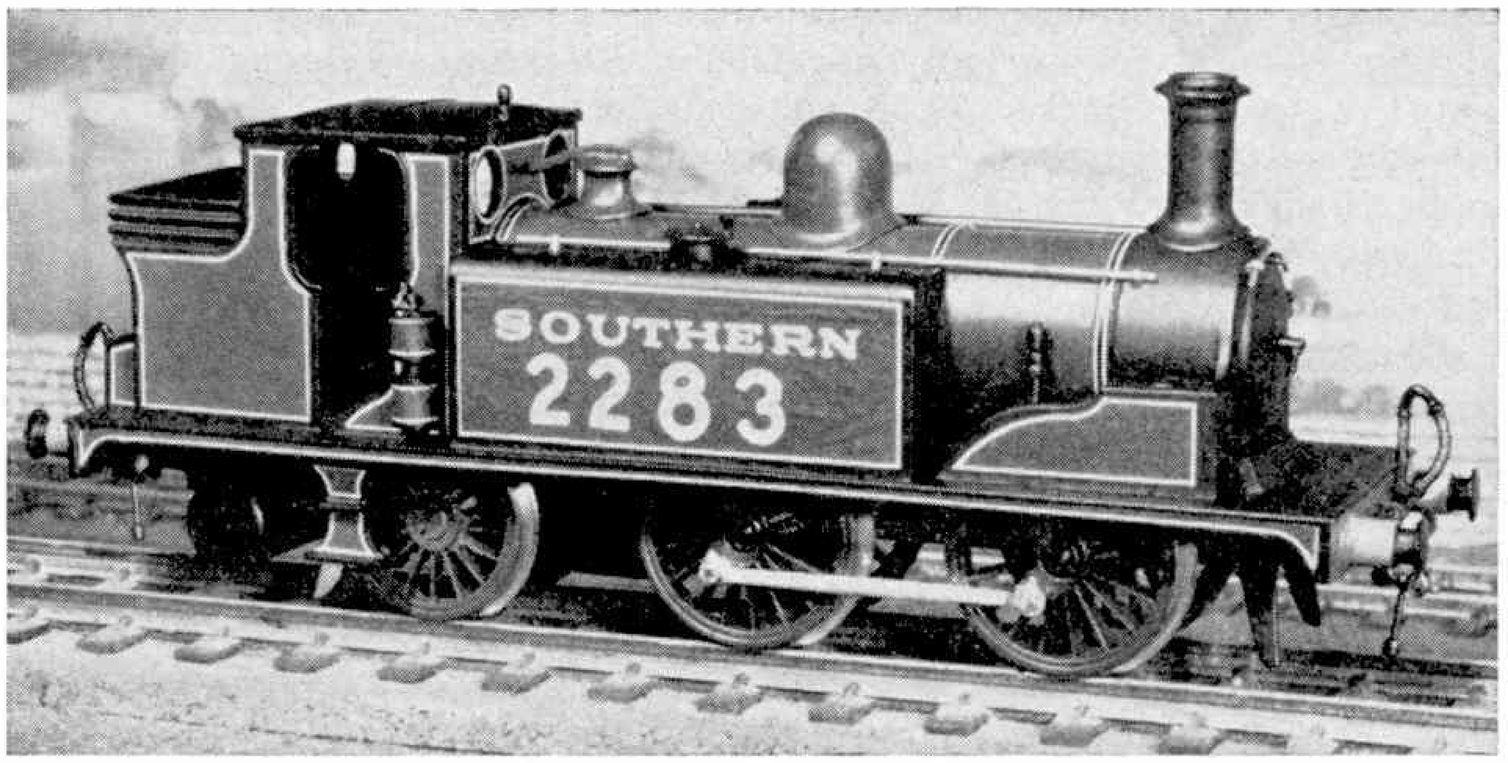


The Loom viewed from its other side showing the warp beam roller and heald frames.

Parts required.—2 of No. 1; 9 of No. 2; 4 of No. 2a; 3 of No. 3; 2 of No. 4; 11 of No. 5; 1 of No. 6; 5 of No. 6a; 7 of No. 8; 4 of No. 9; 4 of No. 11; 2 of No. 12; 2 of No. 12a; 2 of No. 12b; 1 of No. 13; 1 of No. 13a; 3 of No. 14; 2 of No. 15; 3 of No. 15a; 2 of No. 15b; 5 of No. 16; 3 of No. 18a; 1 of No. 19b; 2 of No. 20a; 2 of No. 21; 3 of No. 22; 2 of No. 24; 2 of No. 26; 2 of No. 27a; 1 of No. 29; 1 of No. 32; 4 of No. 35; 110 of No. 37a; 93 of No. 37b; 65 of No. 38; 2 of No. 45; 2 of No. 48; 8 of No. 48a; 2 of No. 48d; 2 of No. 52; 2 of No. 53; 1 of No. 57c; 9 of No. 59; 2 of No. 62; 6 of No. 63; 1 of No. 79a; 2 of No. 80c; 1 of No. 94; 1 of No. 95; 2 of No. 96; 24 of No. 101; 2 of No. 109; 3 of No. 111a; 2 of No. 111c; 2 of No. 115; 2 of No. 126; 2 of No. 165; 2 of No. 166; 2 of No. 186; 1 of No. 186a; 2 of No. 188; 2 of No. 189.

From the series 'Tom the Traveller'—reproduced by courtesy of Presse-Illustrations-Bureau and the Editor of the 'Cork Examiner'

by **Linesman**



A photograph of the completed Wills D.1/E.1 0-4-2T kit. This locomotive has a special chassis supplied by Wills.

Locomotive kit construction

IN THIS, the first of three articles, I want to describe the wonderful range of locomotive kits available to the enthusiast and I also hope to demonstrate how a Hornby-Dublo locomotive chassis can be used in conjunction with them.

Although the Hornby-Dublo range of locomotives is quite large, enthusiasts who already own one of each of the locomotives produced in Hornby-Dublo may wish to enlarge their stud of engines by building one of the cast-metal kits and fitting it on to a standard Hornby-Dublo chassis, or alternatively choosing a kit that already has its own chassis.

Many enthusiasts will prefer to use a Hornby-Dublo chassis with a cast locomotive since it combines the reliability of a Hornby-Dublo chassis with the individuality of a kit, and I am sure enthusiasts will find this series of articles interesting from that point of view alone.

As mentioned previously, other locomotive kits are available with chassis of their own and during this series, I will show you how to build them, as well as showing you how to construct bodies to fit on both Hornby-Dublo and Tri-ang chassis. As a point of interest, Hornby-Dublo chassis are available separately.

The prices of the complete assemblies are as follows:—2-8-0 chassis £3 4s 0d, 0-6-2 chassis £2 3s 6d, Cardiff Castle chassis £2 18s 3d, 2-6-4 Tank chassis £2 18s 3d, 0-6-0 Tank chassis, £1 13s 9d, Golden Fleece chassis £2 12s 3d, West Country chassis £3 12s 9d and City of London chassis £2 19s 3d. All these units are available from our Service Agents and you may also order them through your local Dealer.

All the kits I shall mention in the course of these articles will have one common feature—the low melting point-metal in which they are cast. The material is difficult to solder and it will be found more satisfactory to glue kits together. The firms producing the vast range of kits are Messrs. K's, Wills, Bec and Gem.

The last named firm produces two different ranges of cast metal kits. One is designed for use with TT gauge, and consists of, L.N.W.R. 'Prince of Wales' 4-6-0; G.W.R. 0-4-2T 'Collett' 14XX; L.N.W.R. 'George the Fifth' 4-4-0; L.N.W.R. 'Precursor' and L.N.W.R. 'Experimental' class 4-6-0. All these kits are made to fit on a separate chassis, which is available separately.

The other range of kits is intended for narrow gauge enthusiasts using 12 mm gauge track and building models to a scale of 5½ mm. Two different models are made—'Princess' 0-4-0 saddle tank and a double-ended Fairlie 'Taliesin'.

The kits produced by K's include a 57XX G.W.R. Pannier Tank kit; G.W.R. 63XX, 2-6-0 'Mogul'; G.W.R. Dean goods 2301; G.W.R. 14XX 0-4-2 Tank; G.W.R. 44XX 2-6-4 Tank; G.W.R. 97XX Pannier Tank; L.M.S. (ex-C.R.) 0-4-4T; L.M.S. (ex-L.N.W.R.) 0-6-2 'Coal Tank'; L.N.E.R. (ex-N.E.) J.72 0-6-0T; S.R. (L.B.S.C.) 0-6-0T 'Terrier'; S.R. 0-6-0 Q1; L.M.S. (ex-M.R.) 0-6-0 Kirtley; L.M.S. class 5 4-6-0; L.M.S. (M.R.) 3F Tank; L.N.E.R. J.50 (ex-G.N.) 0-6-0T; L.N.E.R. (G.E.) tram locomotive; L.M.S. Ro-Rail 'Karrier Bus', and G.W.R. Diesel Railcar No. 19. The locomotive bodies in this series made to fit Hornby-Dublo chassis are: the G.W.R. 97XX Pannier Tank; the L.M.S. (M.R.) 3F 0-6-0T and the L.N.E.R. J.50 (ex-G.N.) 0-6-0T. The remainder of the kits made by K's are supplied complete with chassis and motors.

Kits produced by Robert Wills also cover a large variety of different locomotive types and in this range a large number are designed to be fitted on to either Hornby or Tri-ang chassis. The kits available are:—the S.R. E.5 class 0-6-2T (ex.L.B.S.C.R.); S.R. G.6 0-6-0 Locomotive; G.W.R. U.1 0-6-2T (ex-Taff Vale); and an L.M.S. class 5 2-6-4 Tank. These all fit over Hornby-Dublo chassis. Tri-ang chassis of different types fit on a further twelve locomotives, which are:—L.N.E.R. J.39 0-6-0; L.N.E.R. 'Mogul' K.3 2-6-0; L.M.S. 'Crab' 2-6-0; S.R. N class Mogul; S.R. Q class 0-6-0; S.R. E.2 0-6-0T; G.W.R. 9400 0-6-0T; G.W.R. 2251 0-6-0; S.R. 'King Arthur'; L.N.E.R. A2 Pacific; L.M.S. ex-Caledonian 0-6-0T and the L.M.S. 4F Fowler

goods locomotive. Other kits produced by Robert Wills have their own special chassis available separately and these are:—S.R. P class 0-6-0T (ex-S.E.C.R.); L.N.E.R. J.69, 0-6-0T; S.R. 0.2 class 0-4-4T; S.R. M7 class 0-4-4T; the S.R. D1 0-4-2T; and a G.W.R. 1804 0-6-0 saddle tank.

The series of locomotive kits produced by Bec are made exclusively for TT gauge model railways, and include S.R. G.6 0-6-0T; S.R. E.2 0-6-0T; G.W.R. 94XX 0-6-0T; L.N.E.R. J.50/3 0-6-0T; L.N.E.R. J.11/3 0-6-0T; L.M.S. 4F 0-6-0; G.W.R. 22XX 0-6-0; B.R. class 4 2-6-4T; and B.R. 4-6-0 class 5, all of which are designed to fit over Tri-ang chassis. An L.M.S. 4-4-0 2P locomotive is also made with its own special chassis.

As one of our pictures shows, the tools required to build the kits are very simple, and many model railway enthusiasts will already have them. The most important item is, I think, the glue which is used to assemble the kit. A large number of adhesives are suitable for this purpose, including Pafra, White Bostik, Evo-Stik, Araldite and Brictfix impact adhesive. I have used Evo-Stik for assembling the kits illustrated in this article. Also required is a stopper, or filling compound, for covering the small cracks that appear when the parts of the kit are glued together.

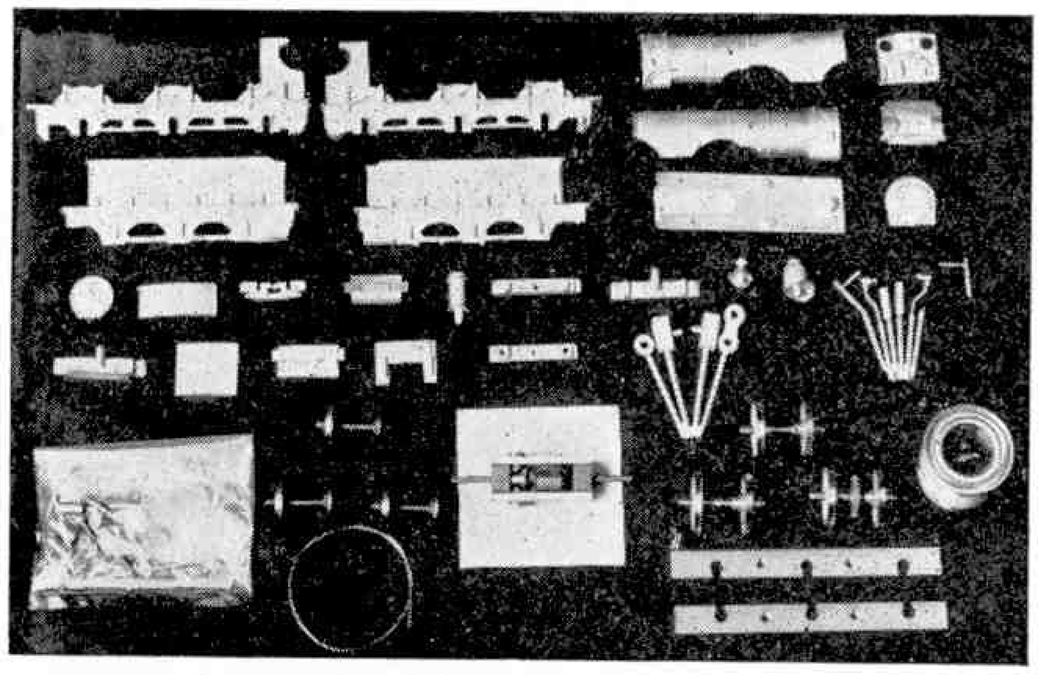
I have used H.M.G. brushing cellulose (illustrated here) although Joyplane filler would do equally well.

For smoothing off the castings and for removing surplus metal, a small number of needle files will be required. I show, in the photograph, a knife edge file and a half round file, although other shapes may be used to advantage. Emery paper is also useful for finishing the castings of the kit before assembly and, more important, before painting. The finest grade of emery paper available should be used.

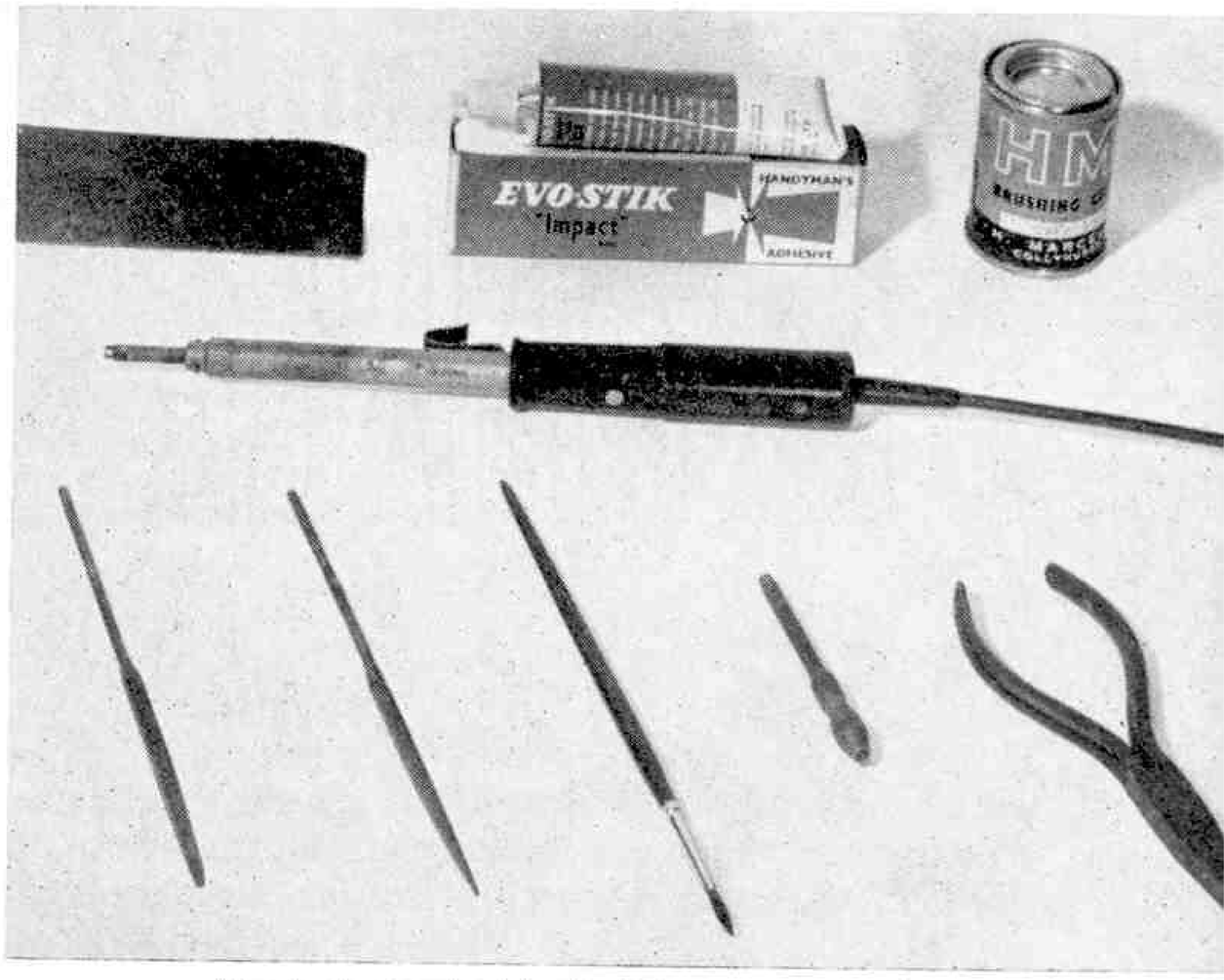
Other tools which will be found useful are, a pair of small pliers, a pin vice for drilling holes for handrail knobs and other fittings and a soldering iron, if the kit has its own chassis.

Although it is not illustrated in the photograph, a modelling knife can be useful when a casting has excessive 'flash'. This can be removed quite quickly with a file, but there is the possibility that the softness of the metal will clog the file teeth when a large area of the metal is being removed.

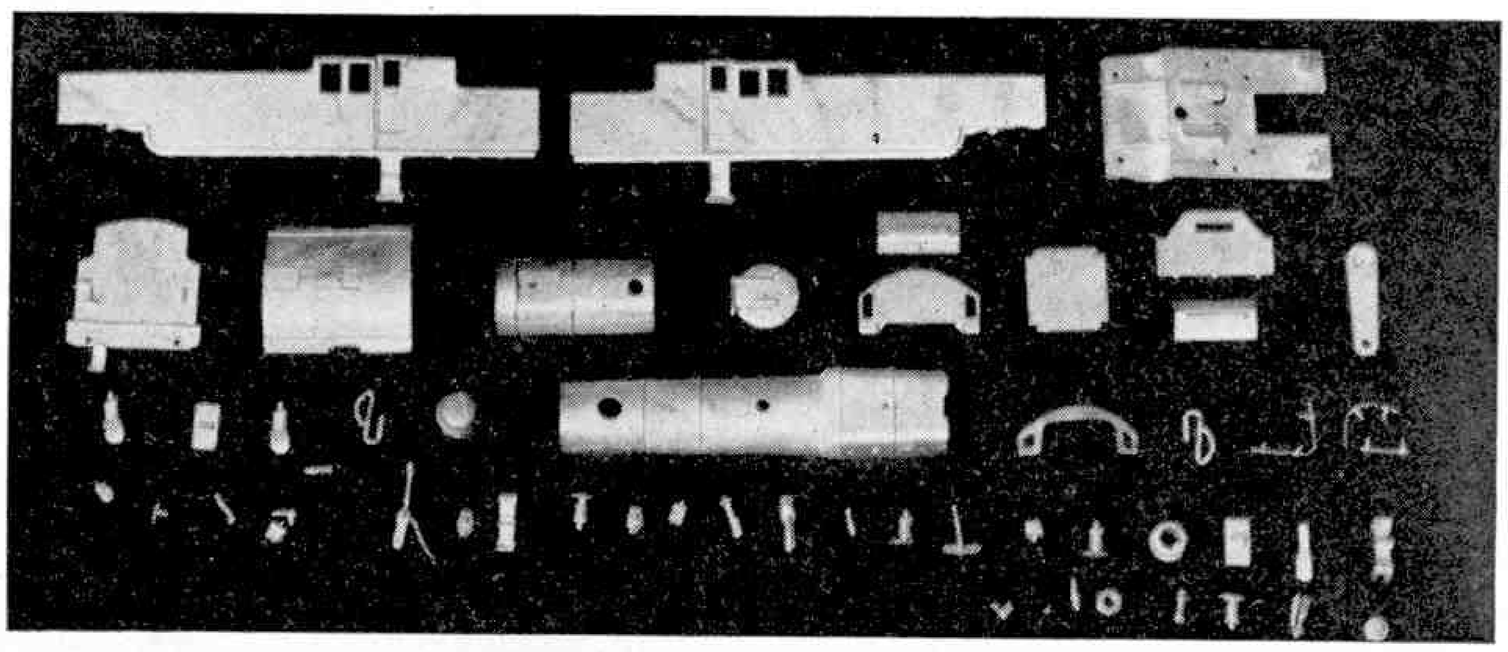
Next month I will describe various stages in the construction of the K's J.50, and Kirtley 0-6-0 kits, the Wills 2-6-4T kit, the Bec J.50 kit and the Gem 'Precursor' 4-4-0.



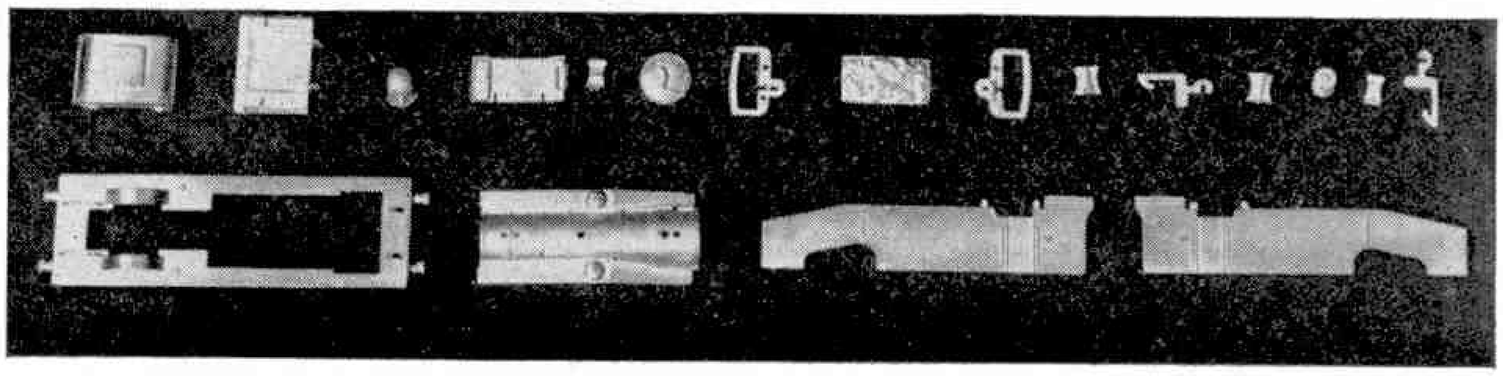
The parts of K's Kirtley 0-6-0 kit. The plastic bag on the left of picture contains all small parts.



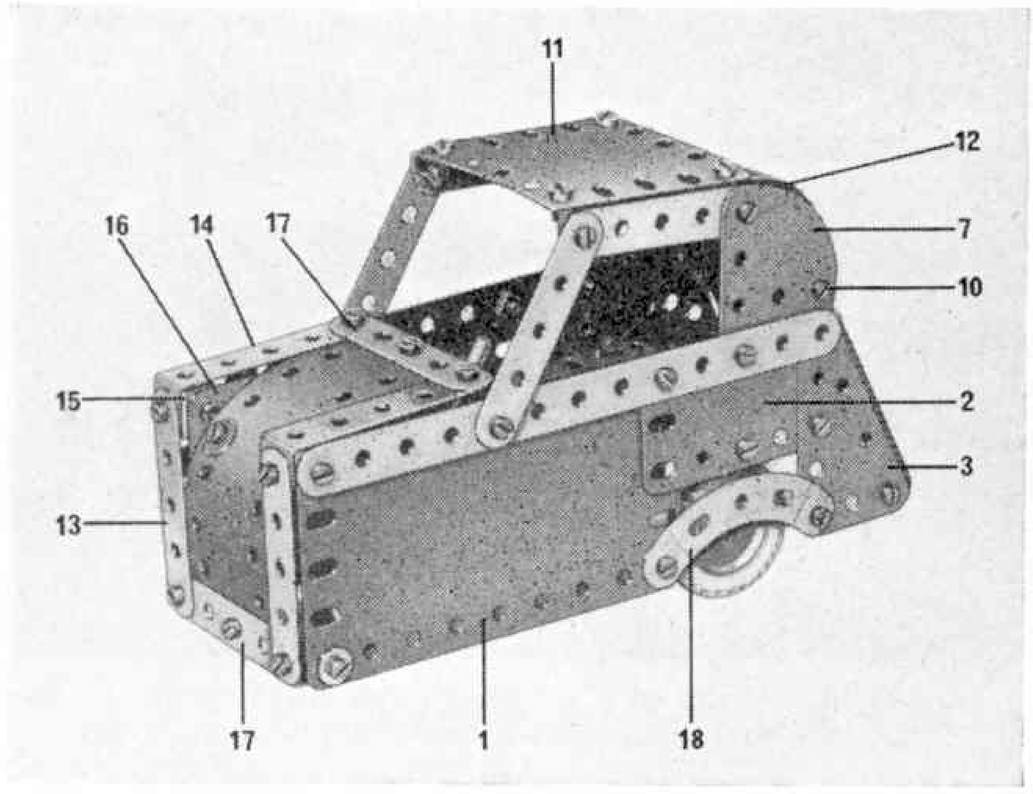
The tools required for building an average locomotive kit. Left to right (top row), emery cloth, Evo-Stik, H.M.G. Stopper. (Centre row) soldering iron. (Bottom row) two needle files, paint brush, pin vice and pair of pliers.



The parts for the Wills 2-6-4T kit. This kit is designed to fit over the standard Hornby-Dublo chassis.



Parts of the Bec TT gauge J.50 0-6-0 locomotive. This kit fits over one of the Tri-ang TT locomotive chassis.



EASY-TO-BUILD INVALID CARRIAGE

by **Spanner**

EVERYONE WHO has built a model car or lorry in Meccano will agree that its authenticity and general appearance are greatly increased if it is equipped with some form of steering mechanism. Working steering arrangements, however, require room in which to operate, besides using several parts which owners of smaller outfits may not have available for use in creating such refinements. This then, places steering out of the reach of many builders who have only a few components at their disposal—at least when building a model with four or more wheels. But there is one group of vehicles ideally suited to simple but effective steering, using few parts and needing very little effort to fit it. The group in question—Three-wheelers.

Most three-wheeled cars, with one or two exceptions, have a single, steered wheel at the front and the normal two wheels at the back. This immediately does away with the need for split front axles, twin swivelling bearings and complicated linkages, as the three-wheeler requires only one movable bearing and a simple connection to a wheel or tiller-type control stick in the cab. Here I give building instructions for such a model based on an invalid carriage of a kind often seen on our roads today.

Each side of this realistic, yet easily-constructed, model consists of a $4\frac{1}{2}'' \times 2\frac{1}{2}''$ and a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate, 1 and 2, and a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Triangular Flexible Plate 3, all of which are edged by a compound $6\frac{1}{2}''$ strip made-up from a $2\frac{1}{2}''$ Strip 4 and a $5\frac{1}{2}''$ Strip 5. A further $2\frac{1}{2}''$ Strip 6 and a Semi-Circular Plate 7 is bolted to the compound strip and these are joined at the top by another $2\frac{1}{2}''$ Strip 8, the Bolts 9 also holding Angle Brackets in place, as does Bolt 10. The roof, comprising a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate 11 and a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Plastic Plate 12, is bolted to the above Angle Brackets.

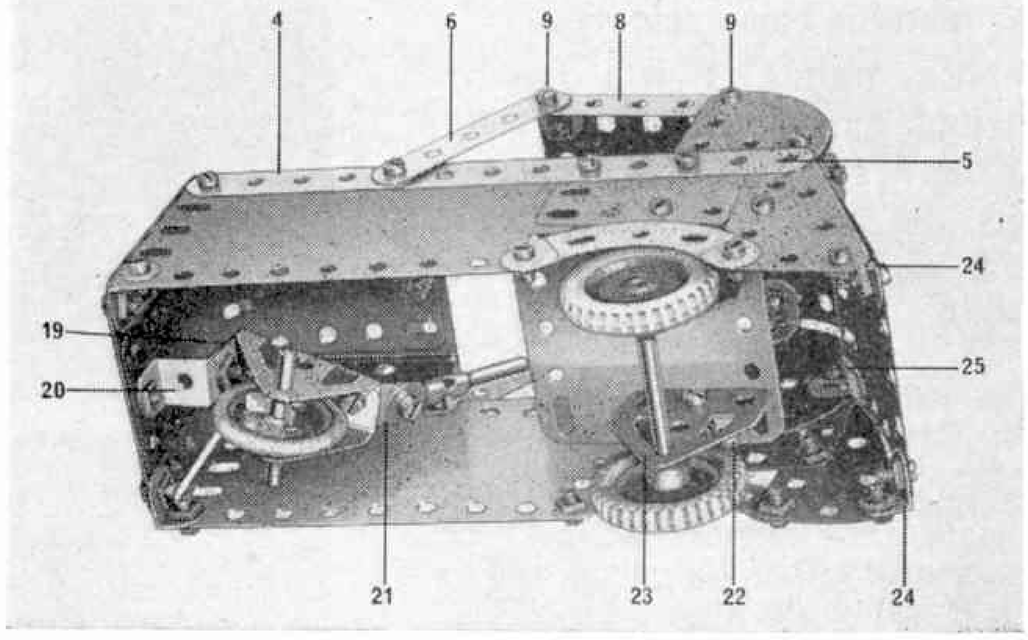
The front wings of the vehicle are formed from a $2\frac{1}{2}''$ Strip 13, bolted to an Angle Bracket at the bottom, and a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 14 at the top. Next, 13 and 14 are both bolted to Double Bracket 15, on one side, while on the other side the double bracket arrangement is built up from two Angle Brackets. A $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Triangular Flexible Plate 16 is bolted to the spare lug of Double Bracket 15 and the two completed wings are connected by $2\frac{1}{2}''$ Strips 17. Two $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Plastic Plates complete the bonnet and a $2\frac{1}{2}''$ Stepped Curved Strip 18 forms each rear wheel arch.

A 1″ Pulley without boss, carrying a Rubber Ring, serves as the front wheel. It is held by Spring Clips on a $1\frac{1}{2}''$ Rod, journalled in two Trunnions bolted together and lock-nutted to an Angle Bracket 19 which is, in turn, fixed tightly to Reversed Angle Bracket 20. The 'joy-stick' type steering column is a 1″ Rod held in a Rod and Strip Connector bolted to an Obtuse Angle Bracket 21 which is fixed to the Trunnions.

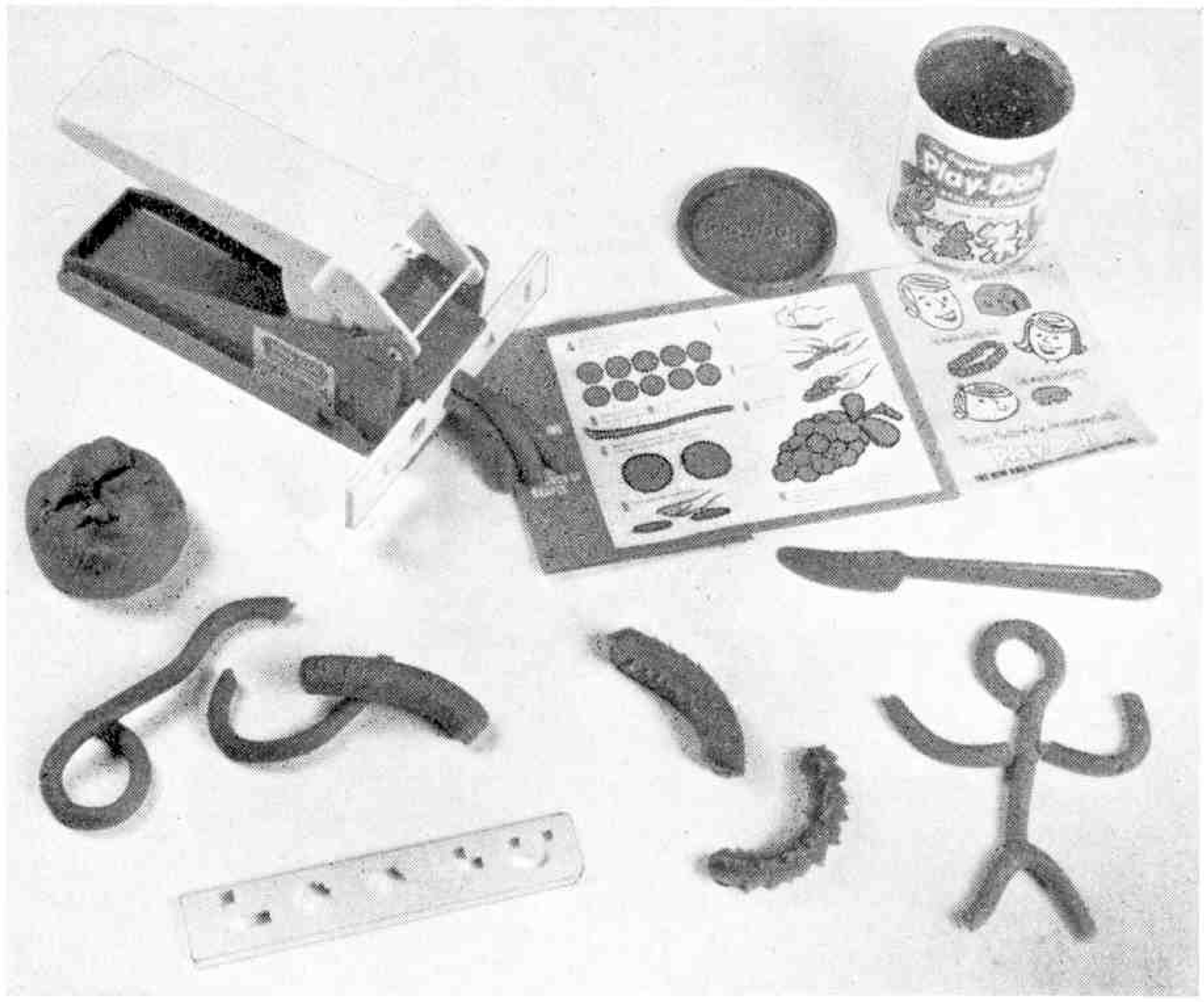
Inside, a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Plastic Plate, bolted to Double Brackets 22 on each side, forms the seat. A Flat Trunnion 23 is fixed to the free lug of each Double Bracket and a 2″ Rod is journalled in the apex holes of these. This Rod carries the rear wheels, which are two 1″ Pulleys with Tyres.

Finally, the boot lid is a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate joined to the sides by Angle Brackets 24 and to the Angle Brackets holding Plate 12, by Obtuse Angle Brackets 25. The boot lid is fixed and cannot be opened.

Parts required.—2 of No. 2; 10 of No. 5; 3 of No. 11; 13 of No. 12; 3 of No. 12c; 1 of No. 17; 1 of No. 18a; 1 of No. 18b; 2 of No. 22; 1 of No. 22a; 2 of No. 35; 57 of No. 37a; 55 of No. 37b; 8 of No. 38; 2 of No. 48a; 2 of No. 90a; 1 of No. 111c; 1 of No. 125; 2 of No. 126; 2 of No. 126a; 2 of No. 142c; 1 of No. 155; 2 of No. 188; 2 of No. 190; 2 of No. 191; 2 of No. 194; 2 of No. 194a; 1 of No. 212; 2 of No. 214; 4 of No. 221.



The invalid chair viewed from beneath.



Play-doh fun factory set can produce simple items such as the stick man illustrated here.

fun with PLAY-DOH

Below is shown the instructions and stage-by-stage assembly of a kitten made in Play-Doh. No special tools are necessary except for a paper clip on which to model the tail of the kitten. For the eyes and mouth use a few dark-coloured beads.

A FASCINATING new product to come from the Meccano factory is Play-Doh, a modelling compound in bright colours from which all manner of things can be made. Shortly, you will be able to buy it from Meccano dealers, in tubs of different colours or in the form of a 'Fun Factory' set where a press, containing dies, has been added to enhance the play value.

By using the 'Fun Factory' you will be able to make a number of interesting shapes, but, of course, you can also use the compound by hand (it does not require kneading but is pliable right from the container), and we give an example on this page of the way in which it can also be used to make freehand models, such as the kitten which is illustrated here.

One of the intriguing things about Play-Doh is that it can be left to set completely hard over a period of two or three days, or it can be put back in the tub immediately after use and, with the lid on, will keep for months on end.

Play-Doh is non-toxic, so that even infants will find it harmless. It can be obtained in red, yellow and blue, which will blend to many other colours and once it has been left to set hard, it can be coloured with crayons. You can also colour it with oil, water or poster paints and the ideal time to use these is 24 to 48 hours after making a particular model.

The Play-Doh 'Fun Factory' will be priced in the United Kingdom at 14/11d, and this will include a 6 oz. tub of Play-Doh and a trimming knife. Three-tub packs of Play-Doh, one red, one yellow and one blue, each tub containing 6 oz., will cost 6/11d in the U.K.

From time to time we hope to publish other ideas on Play-Doh modelling for the younger members of the family.

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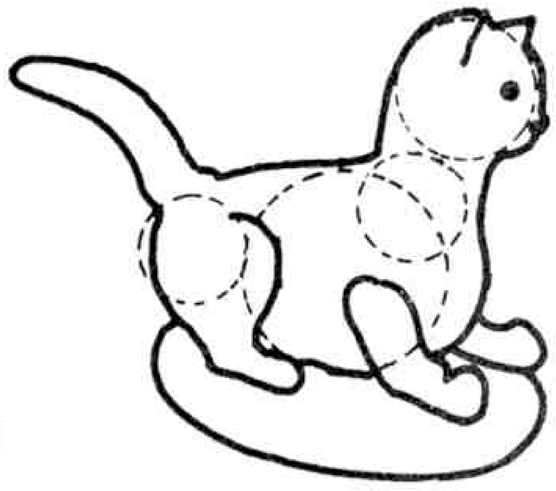

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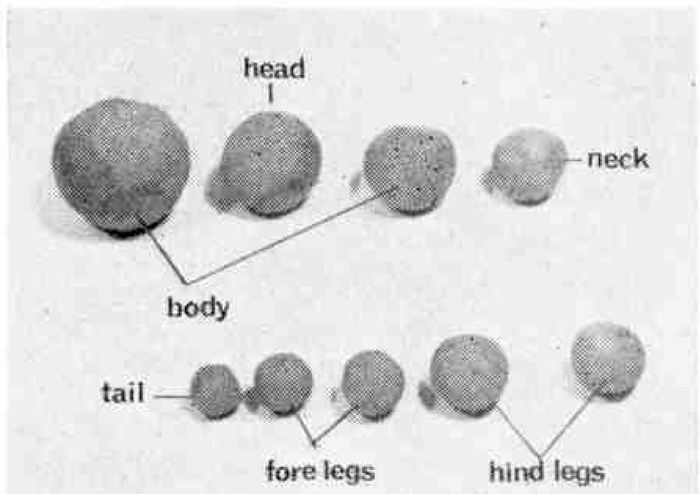

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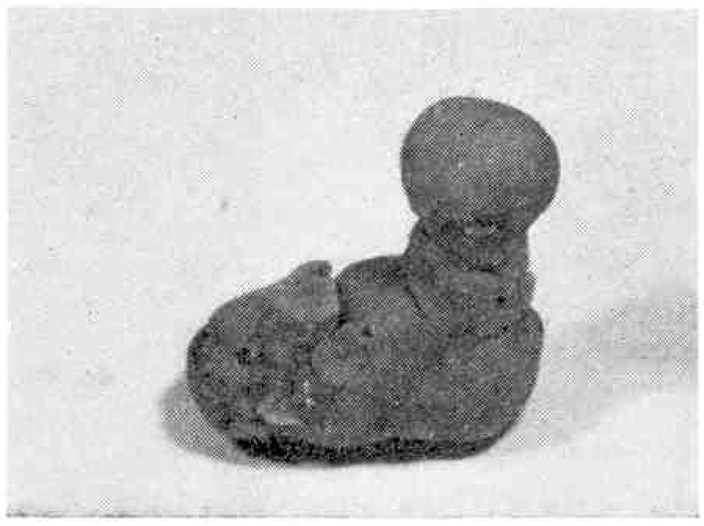

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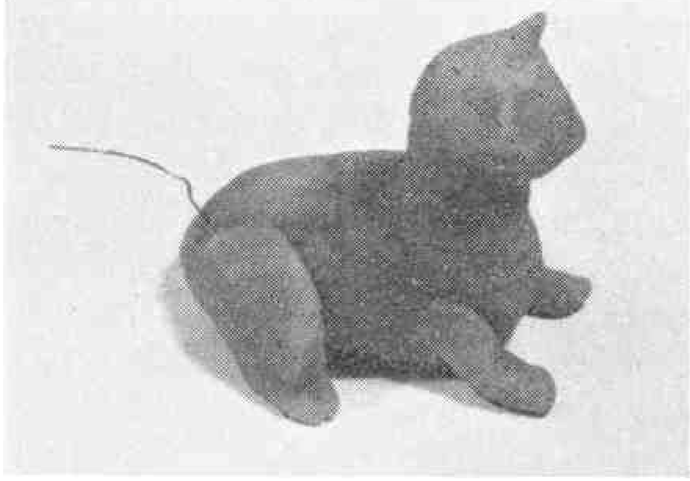

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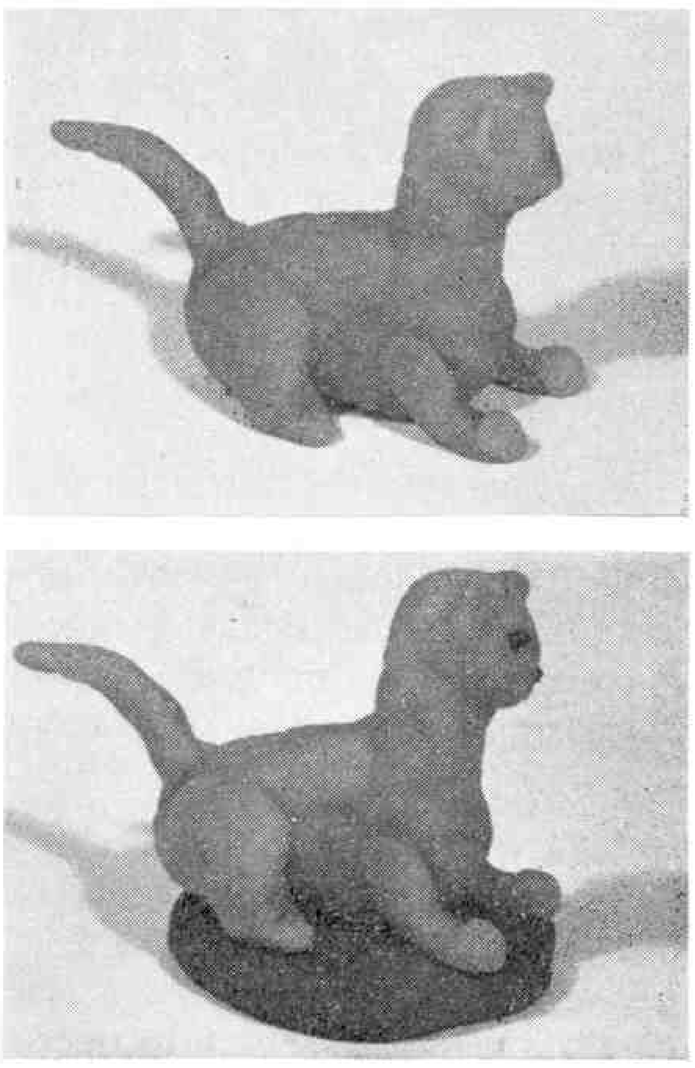
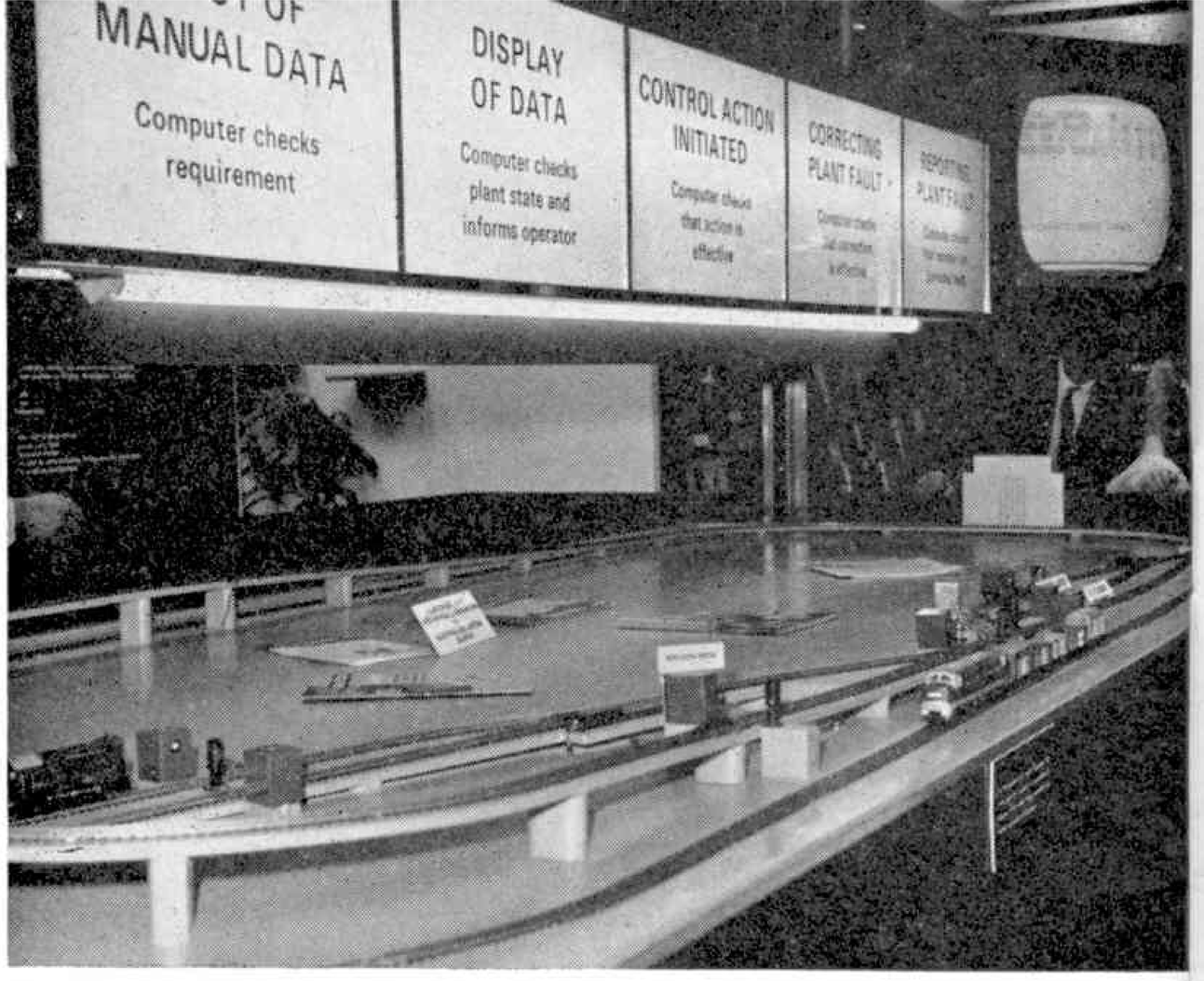


by **The Editor**



Right: A general view of the English Electric-Leo exhibition stand showing the Hornby-Dublo layout. The television screen can be seen in the right corner and the Deltic Diesel locomotive, with trucks, is travelling round the main line.

Shunting Hornby Dublo by Computer

ONCE AGAIN, English Electric-Leo Computers Limited, of Kidsgrove, Staffs, demonstrated their data processing equipment at the Instruments, Electronics and Automation Exhibition at Olympia, earlier this year, by means of a 12 ft. 6 in. by 5 ft. Hornby-Dublo layout supplied by Meccano Limited of Liverpool. Meccano were also technical advisers for the installation of the train sequence.

Regular readers of the Meccano Magazine may well remember how Hornby-Dublo shared an Olympia triumph with a computer at the previous I.E.A. Exhibition in 1962 and this was described in the Magazine at that time. The essential difference at this year's exhibition was that the English Electric-Leo KDN 2 Digital Computer (cost between £20,000 and £25,000), which controlled the operation, was linked to a second computer, made by Marconi, so that information about the train's activities could be displayed continuously to the watching crowds by means of a Marconi Tabular Display 21-inch cathode ray tube. The two machines were, in essence, 'talking' to each other—rather like housewives exchanging the gossip of the day—about the precise state of the layout at any given second.

The purpose of the display was to show how a computer can control any type of individual process and this was demonstrated by using the Hornby-Dublo layout based on a gravity-shunting system which accurately responded to commands to select automatically any three, four or five of eight numbered trucks and re-assemble them in a stipulated order, signalling, at the completion of its programme, that the instructions had been fully carried out. Members of the public surrounding the stand were allowed to nominate their choice of wagons. The layout was fitted with electrically-operated points and a series of precisely-placed photo-electric cells and light sources which are referred to on the diagram.

Main track and sidings

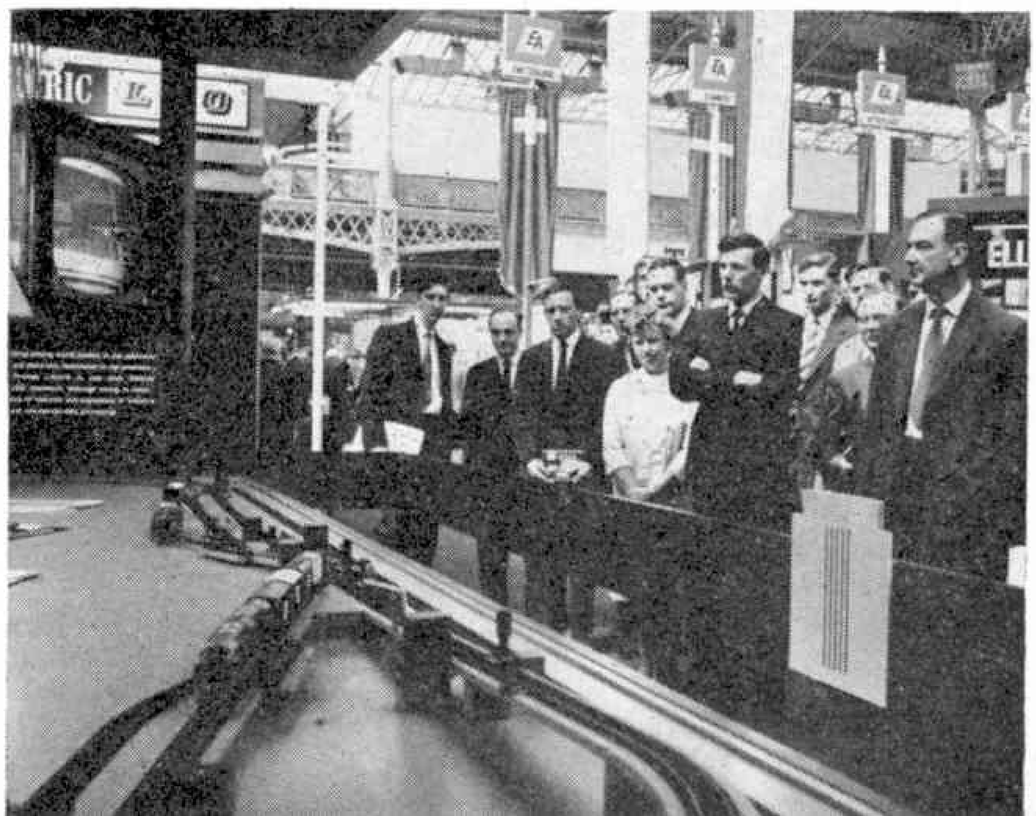
There were two complete tracks, the outer one being the main line, and from the inner track were three sidings, A, B and C, and a gradient section with an uncoupling rail at the hump. The inner track formed a hump marshalling yard. Chosen to operate the train was the Hornby-Dublo Deltic Diesel Locomotive modelled on the type built by English Electric Limited, and there was a Diesel Shunter for emergency use in the sidings. The rolling stock consisted of trucks numbered one to eight. To select a required shunting order, a member of the English Electric-Leo staff operating the board pressed buttons bearing the appropriate three, four or five numbers on the KDN 2 computer digital keyboard. The computer then checked the information for validity; for example, that the same truck had not been asked for twice, that the required train was different from the one already made up, that among the trucks specified were none that did not exist, or that at least three trucks had been asked for.

Record of movements

Although the trucks were clearly numbered, the computer did not read the numbers on the sides, since it could remember at all times where each individual truck was placed; the numbers were there simply so that onlookers could check the correctness of any given sequence. The computer used can, in fact, make 1,000 decisions every second and these decisions, if left to the human element, would take many times longer to determine and, of course, would always be liable to the possibility of error, which was obviated by use of the computer.

The computer was programmed to print the necessary statistics for each day's operations, and a complete log

The Deltic Diesel with a newly made up load of trucks heads outwards past point P7 to the main line.



was kept of all train movements. The total number of demonstrations throughout the six days of the exhibition was 610. During these demonstrations, there were 38,200 speed changes and reversals, and a further item of interest was that there was not one single points failure during the exhibition. This is even more remarkable when the number of points changes is considered—13,920 in all.

Uncoupling operations totalled 7,140, and only 26 double uncouplings were experienced, the majority being deliberately engineered. The number of movements performed by the diesel shunting locomotive—known as 'Charlie'—was 1,540. Over the week's operation, the Deltic-type locomotive travelled 23·4 actual miles or 1,778·4 scale miles. The shunter ran 1·1 miles—roughly 76 scale miles. The fact that the layout operated so satisfactorily was even more remarkable when it is realised that the temperature of the exhibition hall was constantly between 86 degrees and 90 degrees F.

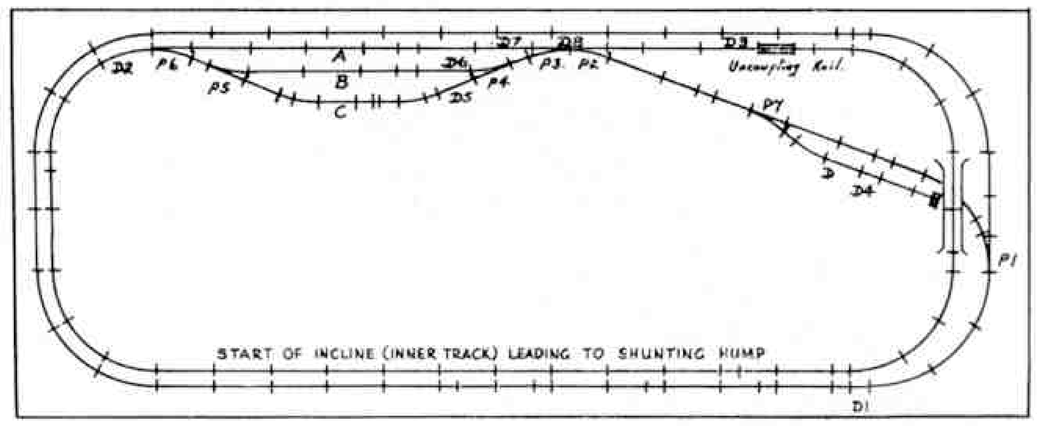
The computer remembered at all times where the trucks were on the layout and obtained this information by means of the eight photo-electric cells, or detectors, numbered D1 to D8 on the diagram. All it required to know before shunting operations began each day was the exact position of the trucks on the layout before it started work. If at any time the computer was faced with a failure or fault which called for operator intervention it printed out a message to the operator telling him the nature of that fault. People watching saw this message flashed on to a closed circuit television screen, so that they also knew precisely why the correct sequence was not being followed.

Use of sidings

The actual sequence of an operation was as follows: A train load, normally of five trucks, ran round the outer main line in a clockwise direction. At a request through the computer keyboard for a different arrangement of trucks, the train came to a standstill after passing detector D1. Points P1 and P2 (see diagram) were re-set and points P3 to P6 were all changed for siding C if the required train needed spare trucks from that siding. The locomotive then reversed and pushed the wagons on to the inner track and through siding C, if this was essential; otherwise it travelled through siding A. It then continued around the inner track until, approaching the uncoupling rail, it reduced speed. While this was being done points P1 and P2 were re-set to straight and points P3 to P6 were changed to the correct siding for the truck about to be uncoupled. Detector D3 gave a signal as the uncoupled truck rolled past it down the hump, stopping the train to prevent a further truck from uncoupling.

The uncoupled truck was recorded as it moved along past detector D8, but if it did not pass that point, the computer printed out that the truck was stranded on the ramp between detectors D3 and D8 and the attention of the operator was needed.

Once it had entered its appropriate siding, the truck passed one of the detectors D5, D6 or D7 and the signal from the appropriate detector started the train moving



The track layout showing the points, photo-electric cells and sidings used.

again to uncouple the next required wagon. Points P3 to P6 were set automatically by the computer for each arriving truck.

So far as the sidings were concerned, wanted trucks in their correct order were assembled in siding A; wanted trucks as yet in incorrect order were in siding B and trucks not required in a particular sequence were in siding C.

The uncoupling process continued until all trucks had entered one or other of the sidings and the Co-Co locomotive then moved down the gradient and entered either siding A (if all the required trucks were already there) or siding B (if this contained trucks which were wanted but were in the wrong order). In the latter case, it took the wagons round again as far as the uncoupling rail and further sorting took place. So the process continued until all the required trucks were assembled in siding A in the stipulated order.

The diesel shunter was only brought into use when a truck did not arrive at detectors D5 to D7 within a limited time after passing D8. In such a case, the computer stopped any further uncoupling and operated points P2 and P7 so that the diesel shunter could run out from siding D and push the missing truck past the detectors into the siding. Since there was no front coupling on the diesel shunter it was able to return to its own siding without coupling itself to the missing truck.

Once a signal was received, from detector D4, showing that the diesel shunter had completed this task and was back at rest on its branch line, the uncoupling procedure continued.

Once a nominated train was finally made up in siding A, with all the wagons in their correct order, the Deltic locomotive entered the siding, coupled up the wagons and passed through points P2, P7 and P1 to the main line. As the completed train left siding A, detector D8 counted the trucks to make sure that the number of trucks was correct. If for any reason the number of trucks was not correct the train stopped, reversed into the siding, found the missing truck or trucks and coupled up with them.

Only when the operation was completed exactly according to the instructions given to the computer did the train return to the main line and there continue to run until the next request for a new selection of trucks was received through the operator's keyboard.

All in all, a fascinating display which spoke volumes for the dependability of Hornby-Dublo locomotives and equipment.

MECCANO SPARE PARTS DEALERS LIST CONTD. FROM AUGUST ISSUE

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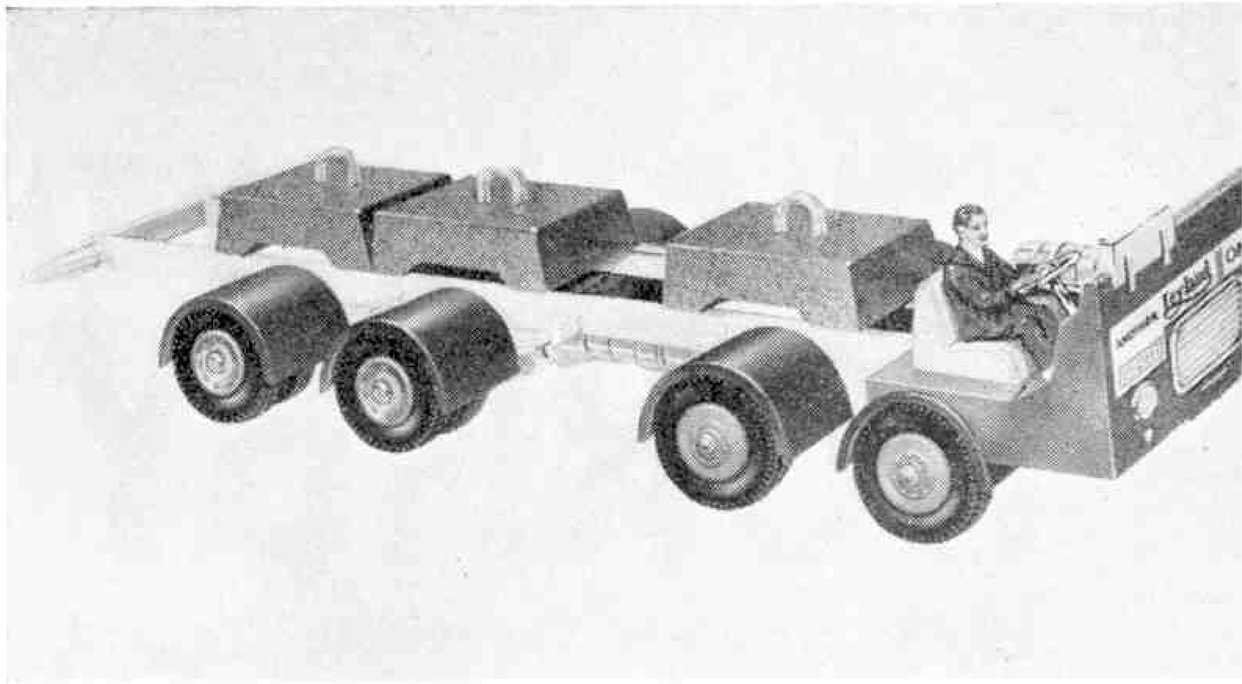
Dinky Toy news by **Chris Jelley**

Leyland Octopus

and Bedford coal lorry



Rotating 'prop' shafts and driver in a temporary cab, in the new Dinky Toys Leyland 8-wheeled Chassis (No. 936).

THERE MUST be very few people, in England at least, who do not often see a bus or heavy lorry. Indeed, most of us travel by bus nearly every day, either to school or to work. But when we see a bus loaded with passengers, or a lorry laden with goods, speeding powerfully along, how many of us realise the amount of work and research which has gone into providing a vehicle that can be relied upon to do its job?

The effective life of vehicles depends mainly upon their chassis, and these, like all machinery, are constantly being altered and improved. We need only compare, say, the present Bedford TK with some of the examples produced before the last war to realise the vast improvements that have been made. However, years of concerted effort are needed before a new chassis appears on the road and even after a first, full-sized prototype has been constructed, the job is far from finished; the chassis must then go 'on test'. This generally means that a temporary driver's platform is fitted, weights equivalent to a heavy load are added and the resulting 'monster' is driven for thousands of miles over every conceivable type of terrain that it is likely to meet in its commercial life. Such exhaustive tests show up any faults which may be present and they can then be put right. No prototype vehicle or machine is perfect at the beginning; therefore, the faults would probably be numerous, and correcting them would be a time-consuming business.

Finely-detailed chassis

This month's first new Dinky Toys release is a model of a test chassis based on the well-known Leyland Octopus—and an excellent model it is, too! Marketed under number 936, and officially termed Leyland 8-Wheeled Chassis, the model consists of a finely-detailed basic chassis, equipped with a temporary test cab consisting of little more than a seat and a platform for the driver. It comes complete with three removable weights that slot between the main chassis numbers, but by far the most important features are the twin propeller shafts, which actually rotate, just like their full-sized counterparts, when the model is in motion.

In spite of the fact that the miniature is only a chassis, the finish is far from drab. The main chassis members are silver-grey, propeller shafts are red, the mudguards green and the 'cab' has an 'undercoat' finish. The ballast weights themselves are solid grey metal. The driver is hatless and wears blue denim jacket and trousers.

Transferred on the front of the driver's platform are the words 'Another Leyland', an 'On Test' sign and the registration number LO.2447. The two last-named items also appear on the rear of the chassis. Approximate overall dimensions are:— length $7\frac{3}{4}$ inches, width $2\frac{3}{16}$ inches, height (excluding driver), $1\frac{13}{16}$ inches, wheelbase $4\frac{13}{16}$ inches.

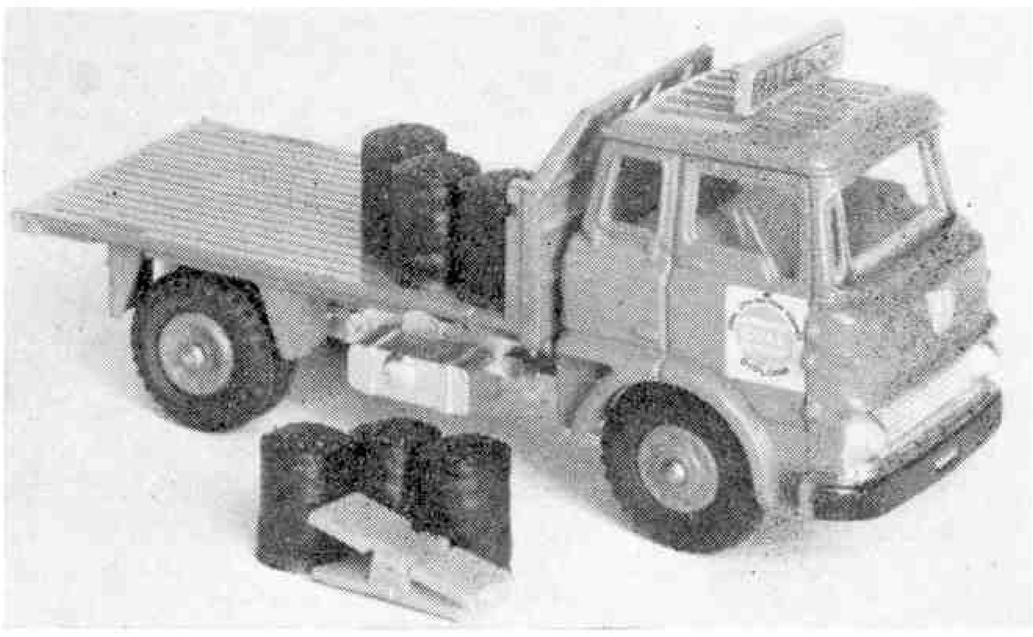
Popular with collectors

Also scheduled for release this month is another addition to our commercial vehicle range—the Bedford TK Coal Lorry, numbered 425 in the sales lists. As is obvious from the name, the model is based on our recently-introduced Bedford TK chassis, which has proved highly successful and, indeed, is our most popular commercial chassis with collectors. This model has been fitted with a flat platform body and a removable headboard on the cab, which bears the name of Hall & Co., who are well-known contractors, particularly in the South of England. On each cab door is the blue and yellow Approved Coal Merchant symbol of the Coal Utilisation Council.

Finish is in all-over bright red, with silver chassis members and radiator grille, and black front bumper. The cab is fitted with windows and steering wheel and has attractive blue seats.

I should also mention that the Coal Lorry comes complete with six imitation sacks of coal and a pair of scales similar to those carried on the back of real lorries. I'm quite sure you will have lots of fun with this model. Approximate overall dimensions:— length $4\frac{3}{4}$ inches, width 2-1/24 inches, height 2-4/10 inches, wheelbase $2\frac{5}{8}$ inches.

Six imitation bags of coal and a small set of scales are sold with the new Bedford TK Coal Lorry (Dinky Toys No. 425).



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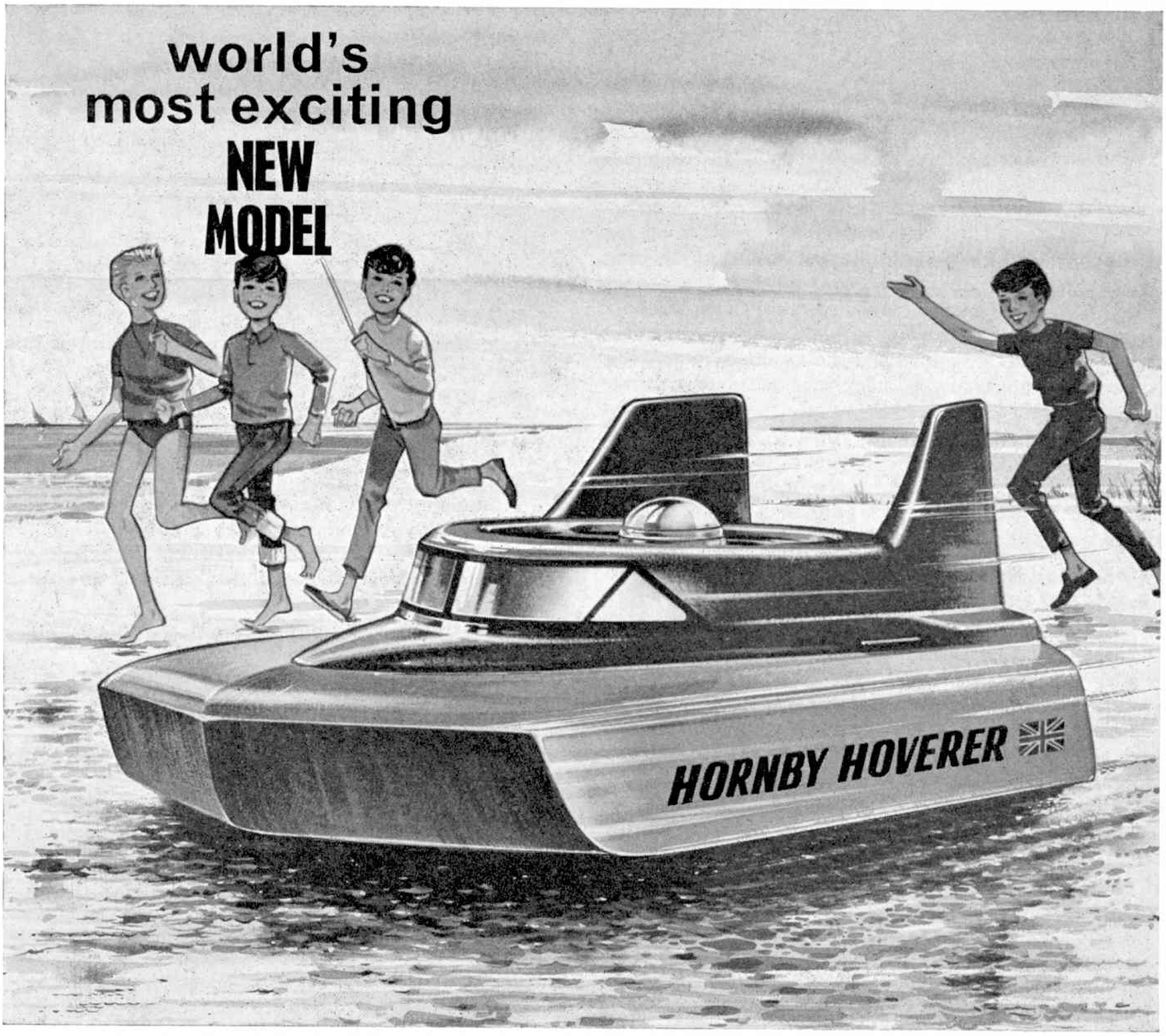
112/6



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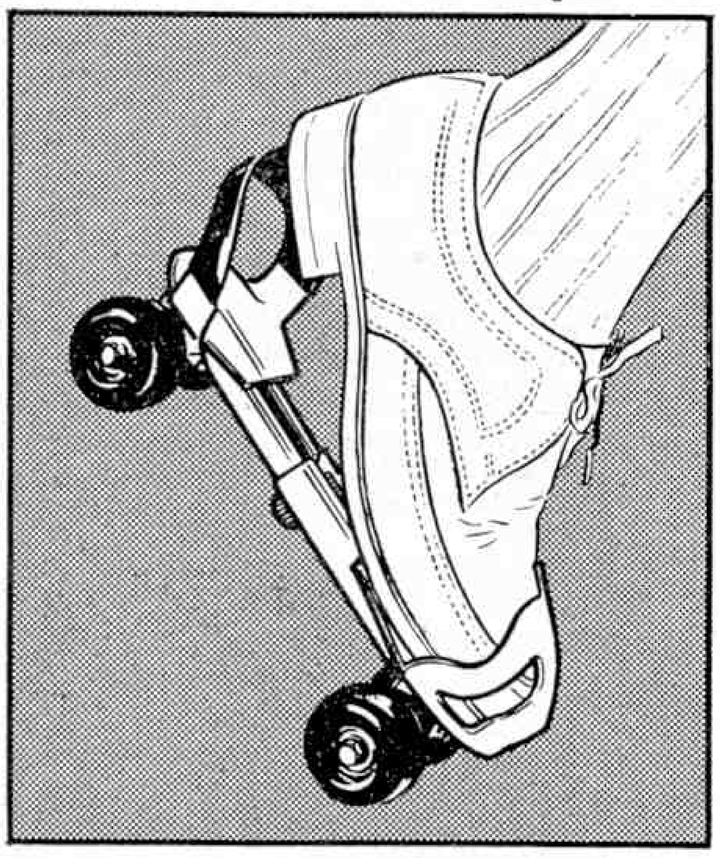

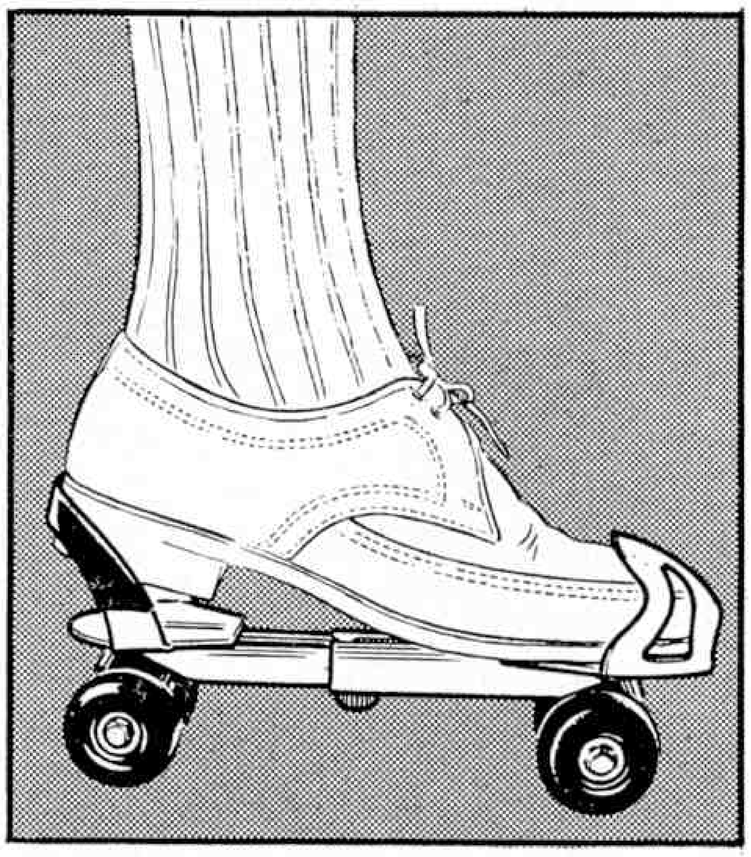

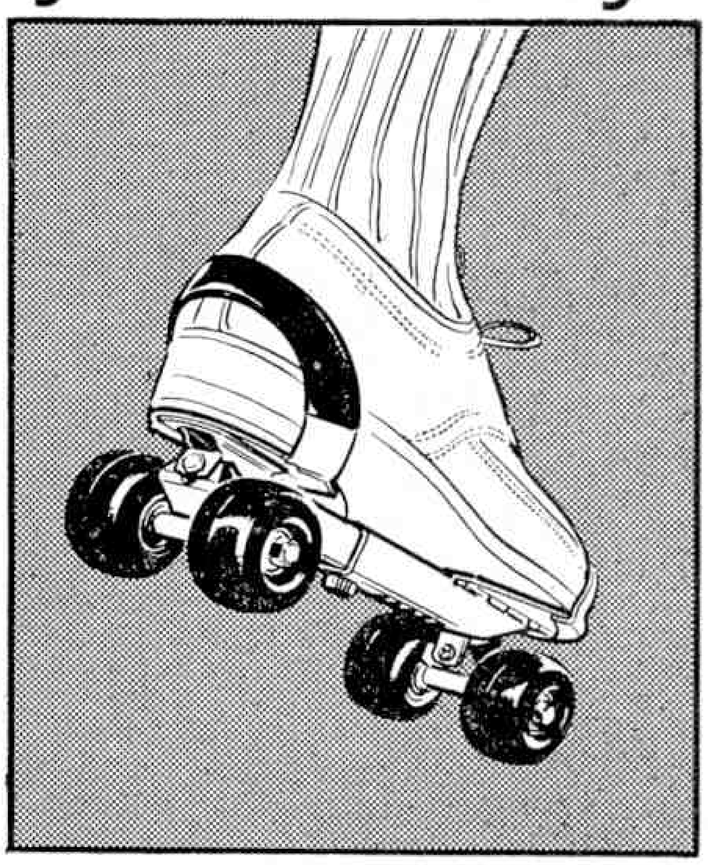

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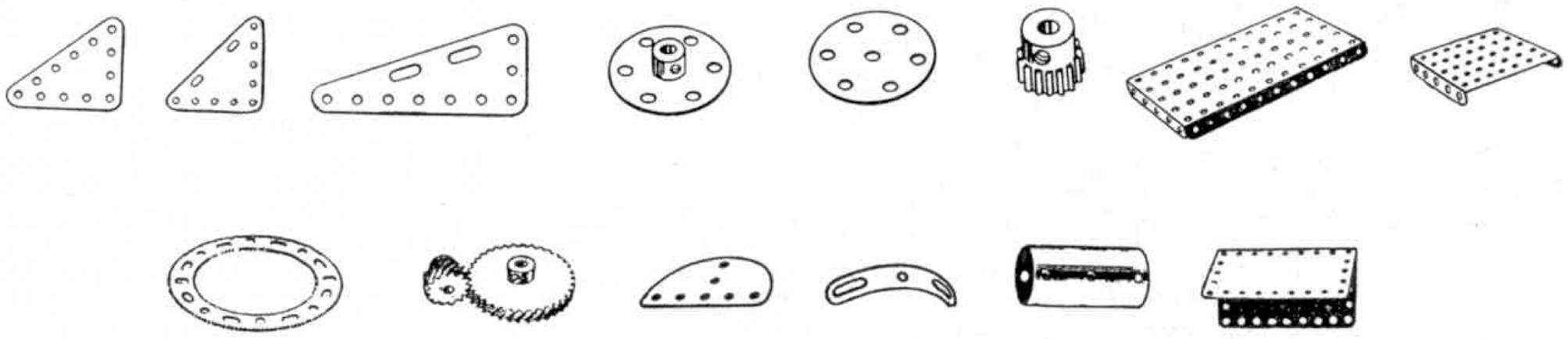

Dealers who specialise in Meccano spare parts

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.

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by **C. E. Deane**

Principles of Internal Combustion Engines

THE INVENTION of the internal combustion engine at the end of the last century completely revolutionised transport throughout the world. It provided a source of propulsion for the first powered flight of an aircraft, made the horse and carriage obsolete and, in fact, brought about a complete revolution in military tactics. One could almost describe the internal combustion engine as the greatest step forward in man's mechanisation since the invention of the wheel!

There are three main types of Internal Combustion Engine—the diesel motor, the four-stroke and the two-stroke. Basically, of course, the diesel engine is a four-stroke motor, the difference being in the method of ignition. With a four-stroke motor, the fuel charge is ignited by a high-tension spark which jumps across the electrodes of the sparking plug. The diesel engine however, relies entirely upon the fantastic temperature build-up created by the compression of air to ignite the fuel charge.

You have all probably at one time or another used a bicycle pump and discovered that the end of the pump nearest the valve gets extremely hot when in use. This is due to the compression of the air inside the pump and in practice is similar to the way in which a diesel engine ignites its fuel.

The first stroke of a diesel engine in which the piston travels down the cylinder, inhales air into the cylinder of the motor through the open inlet valve. In the case of the petrol engine, this air charge is, in fact, a charge of petrol vapour or gas.

Stroke number two is the compression stroke. This means that the piston travels up the cylinder compressing the air or gases above. During this stroke both valves are closed and the air or fuel vapour is compressed into a small area known as the combustion chamber. In the case of the diesel engine, the air is compressed in a space which is twenty or more times smaller than its normal volume. At the critical point, when the heat generated by the compressed air is at its peak, a fine spray of fuel is injected into the combustion chamber. This fuel immediately ignites and the rapid burning of the charge causes terrific expansion of gases in the combustion chamber which forces the piston back down the cylinder.

A similar occurrence takes place inside the petrol engine, except that as the fuel is already mixed with the air in the form of a petrol vapour, ignition is left to a high-tension spark. Therefore, such a high compression of gases is not required as in the diesel motor and the compression area can be as little as six-and-a-half times smaller than the normal volume of the gas.

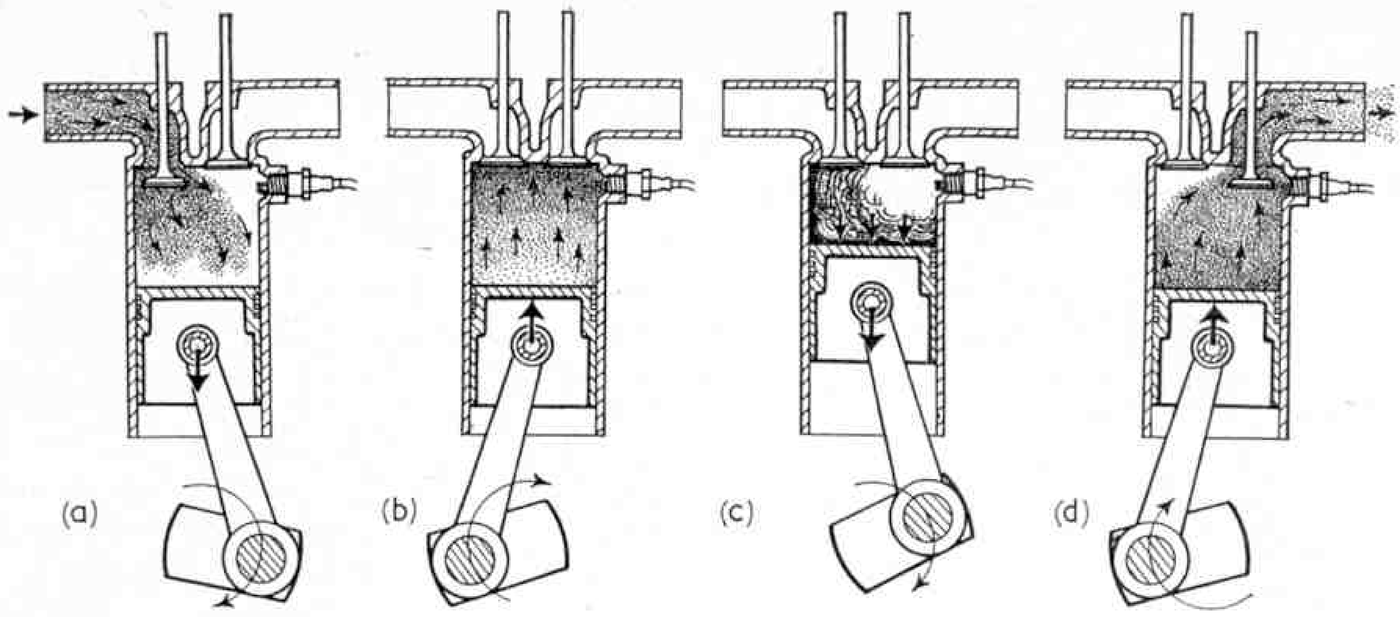
The firing of the fuel, which drives the piston back down the cylinder is known as the firing or third stroke. All that now remains is to discharge the burned gases through the exhaust port when the valve opens on the fourth stroke of the piston. On the fourth stroke, the piston once again travels up the cylinder expelling all the burned fuel and gases through the exhaust port. Then, as soon as the piston reaches the top of its stroke, the exhaust valve closes, the inlet valve opens and the cycle repeats itself. This then deals briefly with the principles of operation of the diesel and four-stroke motors.

Two-stroke operation

The other popular internal combustion engine, which is employed mainly on motorcycles, scooters and mopeds, is the two-stroke motor. This unit is probably the simplest motor of all as it needs no refinements such as valves, oil pumps or camshafts for its operation.

The first stroke of the piston up the cylinder accomplishes two tasks. Firstly, it creates a vacuum in the crankcase of the engine which causes a petroil/air mixture to be drawn into the crankcase. Secondly, the fuel above the piston is compressed in preparation for ignition. When the piston reaches the top of its stroke, a high-tension electrical spark across the electrodes of the sparking plug ignites the charge of fuel. This ignition, which causes rapid expansion of the gases, then forces the piston down on its second stroke.

Whilst travelling downwards the piston compresses the gases below it in the crankcase. Then, as the piston passes an opening in the cylinder wall, the fresh charge of fuel rushes through a transfer passage from the crankcase through the hole above the piston. This next charge of fuel, which rushes into the cylinder, assists in expelling the burned gases from the last combustion through an exhaust port opening in the cylinder wall which was uncovered by the piston just prior to the opening of the transfer port. At the completion of this downwards second stroke of the motor, the cycle begins all over again. The illustrations on this page show in detail all I have attempted to describe in this article.



Four-stroke motor

The first stroke with piston travelling downwards and inlet valve open allows fuel to be drawn into motor.

The second stroke takes place when the piston travels upwards compressing fuel in combustion chamber.

The third stroke, known as the firing stroke, is when the piston travels downwards after the ignition of fuel.

The fourth stroke in which the piston travels upwards, expels all burned fuel and gases from the cylinder.

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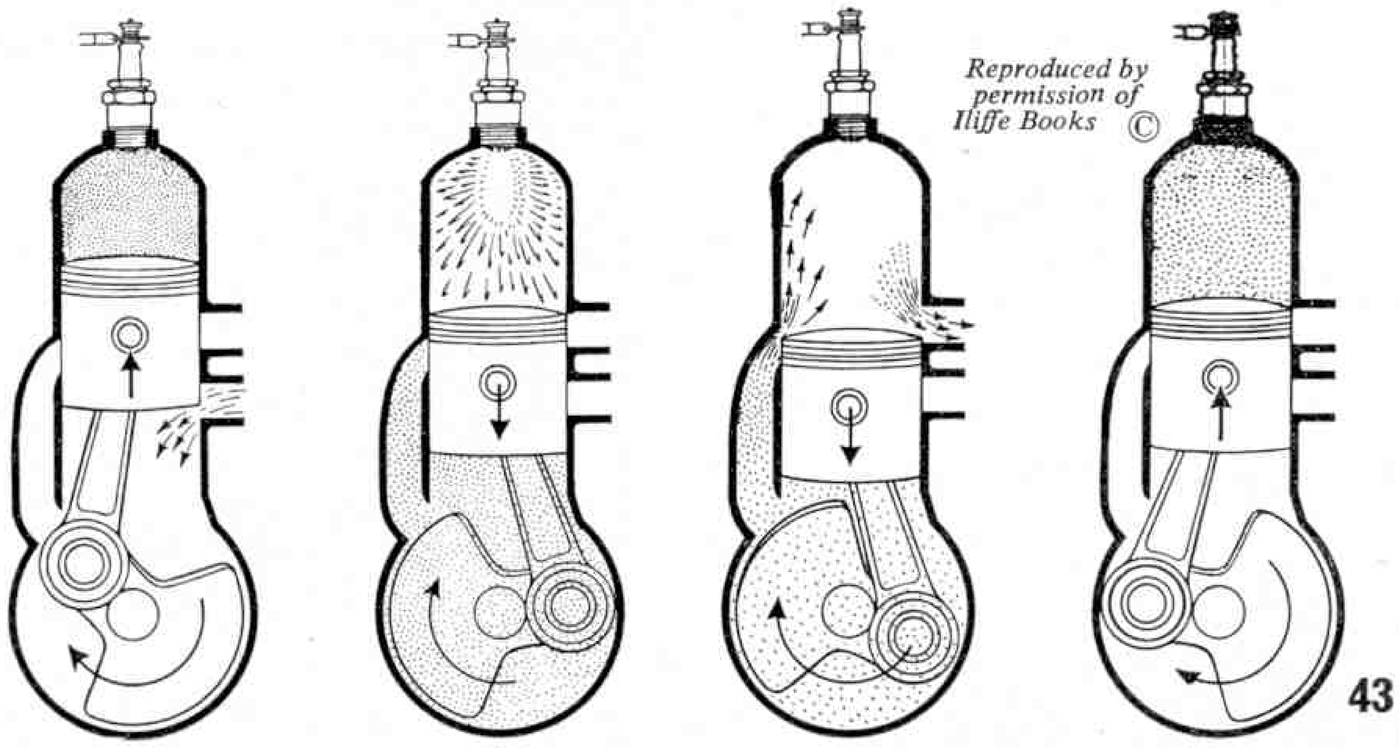
Two-stroke motor

As the piston travels upwards compressing the fuel charge, the inlet port is opened allowing fuel into the crankcase. Fuel is then compressed as the piston makes its downwards stroke after ignition.

As the piston continues its downwards stroke, a transfer port and exhaust port are uncovered allowing fresh fuel into the cylinder and expelling burned gases through exhaust port. Cycle then repeats.



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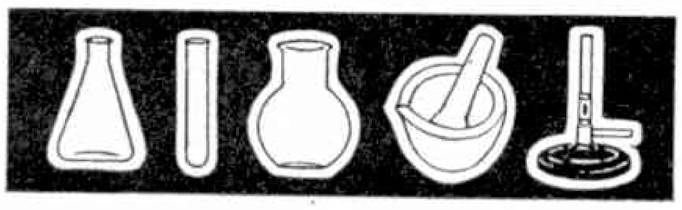
BAYONA STAMP COMPANY (M), 291 London Road, Leftwich Green, Northwich, Cheshire.

classified ads. continued from page 46

Chemistry apparatus



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ALSO 3 RAIL—0-6-2 Tanks **25/-**, 2-6-4 Tanks **37/6**, Silver Kings **45/-**, BoBo Diesels **37/6**, Bristol Castles **45/-**, Dorchesters **57/6**, Rails **2/-** each, Half rails **1/3** (**9/-** dozen), Isolating points **7/6** (four for **£1**), Passenger coaches four for **£1.** Part exchanges.

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Prospectus and further information may be obtained from the Principal.

Robert E. Presswood,
Director of Education,
City Hall, Cardiff.

by **F. E. Metcalfe**

STAMPS

A First Air Service

IT SEEMS a bit late in the day for any country to be only starting its first regular air service now. But when you consider the country concerned, it is perhaps rather wonderful that it is having a service at all. Away, away, in the far South Seas, the Gilbert and Ellice Islands (perhaps only stamp collectors will have a clear idea where they are) is issuing a set of three stamps to mark the air service run by Fiji Airways—yes, you will all know of the Fiji Islands—with the help of de Havilland Heron aircraft, which will make regular fortnightly flights, leaving Fiji, then on to Funafuti, and ending at the G. & E. capital, Tarawa. The round trip will take four days, and this service, for the first time, connects the Gilbert and Ellice Islands' inhabitants with international flights. Stamp collectors, at least, will be pleased, for instead of letters taking many weeks to get to Tarawa, the normal period will be a little over a week now that a regular service has been established.

Halas Lace

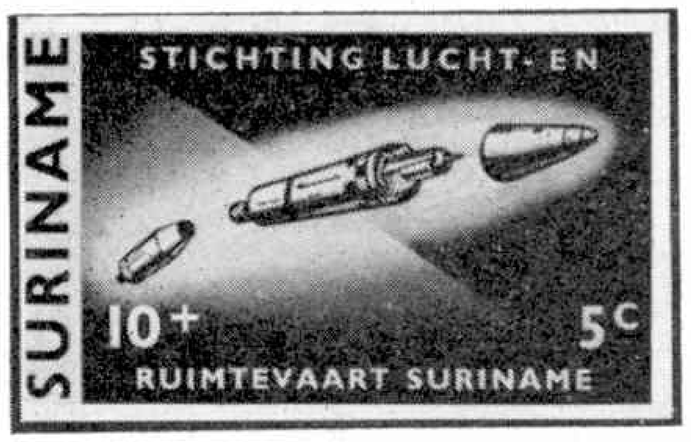
The other day I received a letter from Hungary, which bore the stamp illustrated. The design is delightful, but what's it all about? I can imagine some of you saying. Well, the stamp is one of a set which features pieces of hand-worked lace, which Hungarian peasants take such a pleasure, and use such skill, in making. Halas is an abbreviation of the town of Kiskunhalas. Actually I know it very well, for I used to go there a great deal on business, and on one occasion was given a piece of this precious lace, mounted in a lovely little frame. To my everlasting regret I lost it. Today, Hungary is turning out some of the most beautiful stamps in the world (in great contrast to some which we are bringing out, such as the geographical set) and this is the second time we have had a Halas lace issue. Of course, the Hungarians— a cultured race if ever there was one—have to be on their toes to produce handsome stamps, because philately is booming over there, and it is a pity that I lack space to give more details. Suffice it to say that there are in the country 513 youth philatelic clubs, while the national society has actually 78,000 active members and that, mind, in a country of only 10,000,000 people. Yes, our hobby is booming over there all right.

An Interesting Issue

To Americans and ourselves, at any rate, Belgium has recently (May 19, to be exact) issued an interesting stamp. It was to mark the 150th anniversary of the Treaty of Ghent, signed between the U.S.A. and Great Britain. The U.S. delegation was headed by John Quiney Adams, while our leader was Admiral Lord Gambier, and the actual date of the signing of the treaty of peace was December 24, 1814. A momentous Christmas Eve! In spite of our slight disagreements from time to time, it is hard to believe that we were ever really at war with that huge nation. But surely it was the countries concerned at first hand with the treaty, those who actually signed it, who should have issued the commemorative stamps. Anyhow, somebody thought the event worth remembering, and we can always buy the Belgium stamp, if we wish to mark the event in our albums.

Space Flight

I mentioned earlier the subject of air services in the South Seas, implying that such things hardly fit in with our romantic ideas of such places. But what about space flight stamps for that small American country of Surinam? A set of four values was issued on April 15, and they are proving very popular as are all space flight stamps. But I am afraid the subject is being a bit overdone, for it is mostly countries which have



no real connection with space travel, etc. who are cashing in, philatelically, with enthusiasm. But alas, it is the same old story. There are not enough stamps from the countries which interest us, while there are all too many from the rest. We get the same thing in the British Commonwealth. Perhaps it would be invidious to mention names, but there certainly are sets coming out regularly from some members of the Commonwealth which we could well do without, while we would welcome more issues from countries which are rather more shy.

The Tip of the Month

The Tokio Games are very much in the public eye and stamp collectors are right in on it, for stamps galore are being issued by countries, with and without an interest in the affair. (All postal administrations will have one interest in common at any rate, the profit from selling bits of paper for good money.) However, let us forget that angle and think about these Olympic Games stamps. We all know about thematic collecting, and its growing popularity. Well, one of the most popular subjects of all has to do with these Games issues. They all fit into other 'Olympics' collections and as Olympic Games stamps are being added to all the time, they are really worth taking up. Some are already scarce and expensive, but there are still plenty that are cheap and attractive.

CLASSIFIED ADVERTISEMENTS

Readers Sales and Wants

If you have anything to sell or wish to buy anything, take advantage of the service offered by a small advertisement in these columns.

The M.M. is read by over 100,000 people every month. It circulates in every country where the English language is spoken. If you wish to sell your stamp collection, your rabbits, or your tools, or to purchase a steam engine, a model yacht, or a hundred-and-one other things, you will be able to do so through the columns of the M.M.

The rates are 3d. per word, with a minimum of 3s. (cash with order). Readers' advertisements are published as soon as possible, inclusion in the first issue after receiving them, however, cannot be guaranteed.

SALES

• Stamps. Br. Cols. and Foreign. Advertiser, 15 Queenshill Ave., Leeds 17.

• Tricks, Jokes, Novelties, Masks, Wigs, Beards, etc. Send 6d. stamp for free catalogue. Wrathbaron & Co. (Dept. M.3), Ravenshill, Sutton, Keighley.

• First Day Covers Northern Rhodesia (Zambia) Independence Stamps (Oct. 24th). Complete sets up to 1/-, 1/3, 2/-, 2/6, 5/-, 10/-, and £1, costing 4/-, 5/6, 7/6, 10/6, 16/-, 27/6 and 50/-, respectively. Also, special Commemorative Stamps, 3/- set. Cash with order. Apply: Straight, Box 1454, Lusaka, Northern Rhodesia.

• 2,600 Stamps for sale. Price £20 or highest offer. I will pay postage. Advertiser, John Hardwick, Oldstone Farm, Fownhope, Hereford.

• For Sale—100 M.M.s since 1950; 25/- o.n.o. Good condition. Minic Motorways Trackwork, 30/- (cost £3) o.n.o. Hamilton, 6 Carver Avenue, Prestwich, Lancs.

• Hornby Dublo 3-Rail; all parts sold separately. S.A.E. for details. A. Peapell, 1 South Street, Sherborne, Dorset.

• Obsolete Hornby Dublo 3-Rail, Montrose, hardly used, £12. M.M.'s, 1961-1962, 17/6. Eagle Annuals, 5-11, 17/6. Eagles, 29 Oct., 1960, to present, 35/-. 35 Osborne Road, Windsor.

• For Sale—Mamod Steam Tractor; also Hornby Dublo/Wrenn 3-Rail Layout. S.A.E. for details. P. Calvert, Glencliffe, Grosmont, Whitby, N. Yorks.

• Assorted Dinky Army Vehicles, mint condition. Reversing motor, magic motor. Will exchange for Dinky No. 623 with hood, and Dublo stock. Watson, 148 Green Park Road, Halifax.

• M.M.'s, January 1961-March 1964, good condition, three missing, 25/- carriage paid. Rex, 55 Colvile Road, Wisbech, Cambs.

• For Sale, Triang-Trains—continental train set. Good condition; many trucks and accessories, plus two engines, including transformer; £18 o.n.o. R. Hughes, 313 Alderman Road, Knightswood, Glasgow, W.3.

• Collection of Stamps for Sale, including rare items and choice pieces. Price £17. Apply to J. Dodds, 22 Mountfield Gardens, Kenton, Newcastle upon Tyne.

• M.M.'s, 1947-55 (47-49 bound); good condition. Offers. Ripper, 36 Baronsmede, London, W.5.

• Large British/Indian Stamp Collection, plus Foreign, in separate albums; £15 o.n.o. Model Aircraft Magazines, Oct. 1962-July 1964; 1/6 each. Wood, 57 Trevarthian Road, St. Austell.

•Hokipet Battery Projector, as new; 100 ft. reels 8 mm., £5 o.n.o. Baines, 18/157 Long Nuke Road, Birmingham 31.

• 2,000 Stamps, including British and George VI in album. Offers? John Davies, 34 Poplar Rise, Oakham, Dudley.

• M.M.'s, Jan. 1956-July 1962, Aug. 1959 missing. Offers? Jackson, 68 Yew Tree Lane, Solihull, Warwickshire.

• For Sale, 1960-61 type Meccano Outfit No. 10, packed in Meccano four drawer oak cabinet with extras, which include No. 1 clockwork motor, No. E.15.R Electric Motor with transformer type T.15. Also Meccano Magazines, 1962 and 1963, in absolute mint condition. Offers. Mr. B. Arnold, 3 Princess Street, West Bollington, nr. Macclesfield, Cheshire.

WANTS

• M.M.'s before 1940, in good condition. Your price paid. Also Books of New Models, Prize Models and any other obsolete Literature and Meccano Parts. Super Models Leaflets available for exchange. Albert Fernandez, Luis Maria Campos 1562, Buenos Aires, Argentina.

• British Birds' Eggs wanted. Must not be all the same and must include one Curlew's egg at least. Will pay 5/- per 100. Send to: J. Dodds, 22 Mountfield Gardens, Kenton, Newcastle upon Tyne 3.

• Wanted, Military Dinkies 623, 822. State price. Hyde, 33 Denby Street, Bradford 8.

• Dinky "A.E.C. Monarch Tankers" and any obsolete Dinky Commercial Vehicles. P. J. Davies, 30 Devon Road, Luton, Bedfordshire.

• Wanted, Locomotive Name and Number Plates. Good prices. A. Holder, 8 Kingston Avenue, Grimsby, Lincolnshire.

• Pre- and early Post-war Dinky Toys. Top prices paid. Details to: T. George, 124 North Lane, Aldershot, Hants.

• Meccano obsolete parts and Instruction Books for Outfits 7/8 and 9 ((pre-1954). High prices paid. Details: M. Green, 120 Broadway, Manchester 10.

• Pre-war Mechanical Toys, especially Trains; no objection to faults if repairable. Butler-Edwards, 1 Chesham Crescent, London, S.E.20.

• Urgent, Military Dinkys 623, 673; also Austin Truck. Best price paid. Gerrard, 41 Lansdell Road, Mitcham, Surrey.

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classified ads continued on page 44

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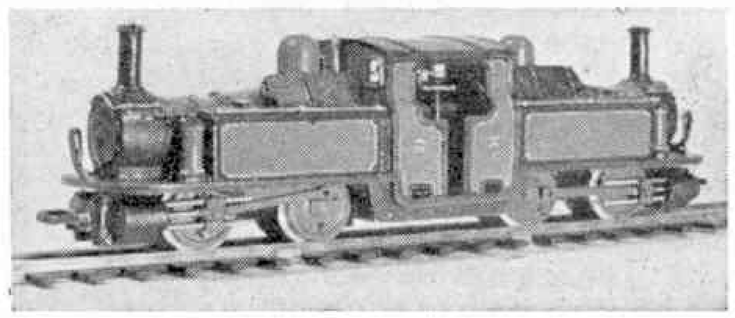

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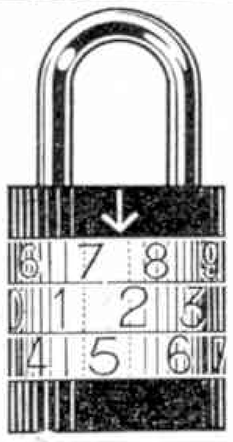

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Corded Fore-End for easy hold

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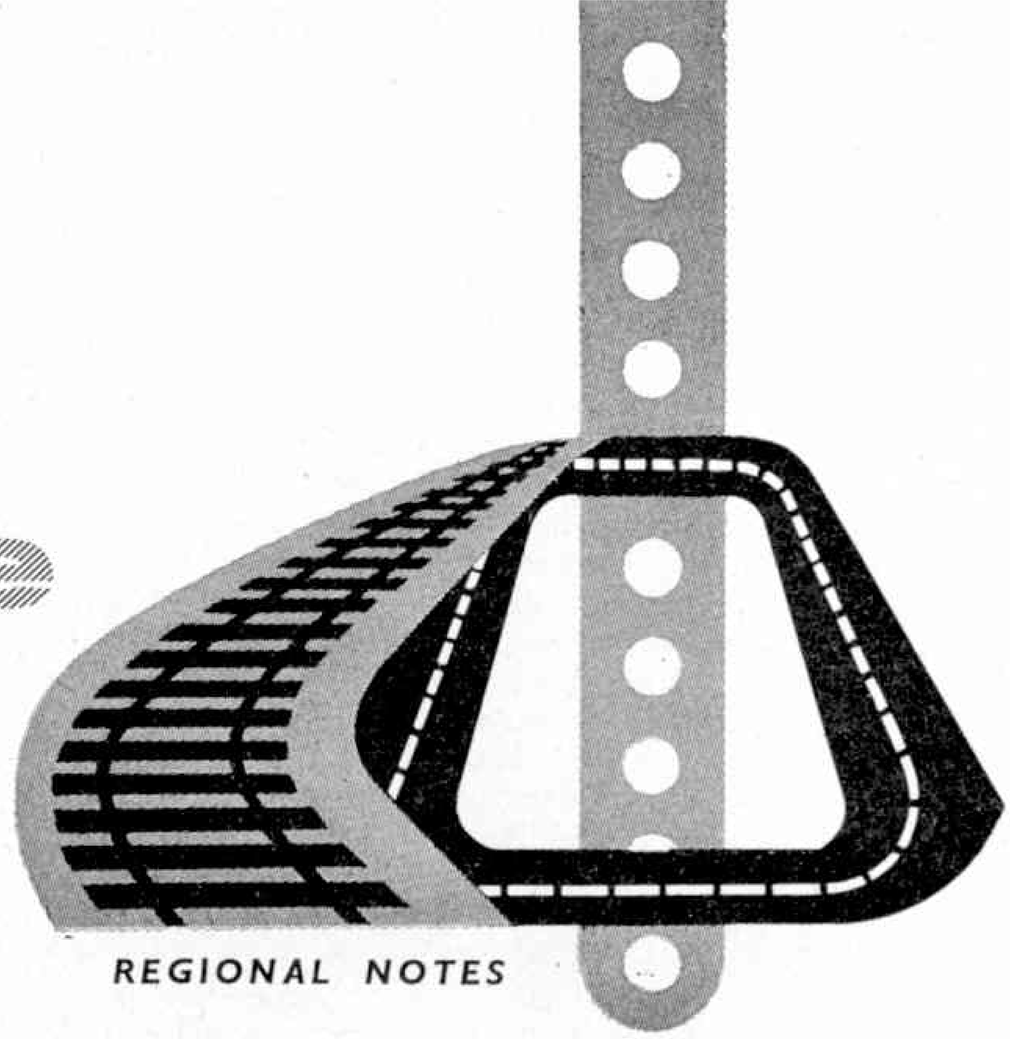
Around the SOCIETIES



REGIONAL NOTES

St. John's, N.Z. Meccano Club

W. J. EARL has gained an American Field Scholarship and will be away over the next year. He received the congratulations of the members at a recent meeting. On the same evening a model competition in which members had a limited time and number of parts allowed was held and proved very successful. Some members have left the club but in their place a number of newcomers have been welcomed. One of these is an adult member, Mr. Harvey, who is already taking a deep interest in the club.

Models recently built include K. Borrell's truck, which has an ingenious suspension system for both front and rear wheels. From a photograph, L. Mills has built a ferry modelled on the new New Zealand inter-island ferry 'Aramoana', which was described in detail in the February 1964 issue of the 'M.M.' Club members have also been busy planning models based on farm equipment. Average attendance of members has been thirteen out of fifteen. Leader, Mr. R. S. Parr, Waikari, Dunedin; Secretary, R. Craigie, Roslyn, Dunedin.

Welshpool and Llanfair Preservation Co.

AN EXTENSION to that part of the railway already restored was recently opened from Castle Caereinion to Sylfaen—a distance of just over one mile. This extension attracts a good deal of attention from passing motorists on the main road (A.458) which runs nearby. Much work, however, remains to be done. The opening up of the new extension was made possible by the work done by a detachment of Royal Engineers from the Army Emergency Reserve. Passenger facilities at Sylfaen Station and elsewhere on the line are in great need of improvement. However, an example of the railway's success is that a record number of passengers travelled over the line at Whitsuntide when every item of rolling stock was pressed into service. This emphasised the need for more coaches if the passenger receipts are to increase.

Anyone interested in joining the Welshpool and Llanfair Preservation Company Limited is invited to write for further details to the Commercial Publicity Officer, 37 Mayfield Road, Sutton Coldfield.

Welsh Highland Light Railway Co. (1964) Ltd.

THE FIRST meeting of the directors of the newly-formed Welsh Highland Light Railway Company (1964) Ltd. took place at Worcester earlier this year. The company has taken over all the objects, assets and liabilities of the Welsh Highland Railway Society, and all members of that society are automatically members of the new company. A large number of decisions on policy were taken, and other items of interest discussed. One which aroused great enthusiasm was the fact that the Birmingham Locomotive Club had offered the company the former Welsh Highland Railway's locomotive 'Russell' as a gift, and had, in addition, donated a substantial sum of money to help towards the cost of conveying the engine to a place of the Company's choosing. Also offers of practical help in the restoration of "Russell" had been offered. The company gladly accepted this gesture, and it is their firm contention to restore the engine to working order as soon as possible. The prospect of 'Russell' once more chugging its way through Snowdonia cannot but thrill all narrow gauge railway lovers.

The society has acquired during its two and a half years of existence, one and a half miles of good quality rail and sleepers, two diesel locos, a petrol loco, wagons and a coach. It also had on loan an Andrew Barclay 0-6-0 steam locomotive. All inquiries should be addressed to Mr. G. S. Chadwick, of 19 Weybridge Park, Weybridge, Surrey.

Kent and East Sussex Railway

Two 0-6-0 saddle tanks, 'Hastings' and 'Charwelton', recently arrived at this railway, bringing the total number of preserved steam locomotives on the line to six. 'Charwelton' was originally built by Manning Wardle & Co. in 1917, and 'Hastings' by the Hunslet Engine Co. in 1888. Both engines were transported by road from the Sproxton Ironstone Quarry in Lincolnshire, where they were working until last October. The other three locomotives at Tenterden, the terminus of the line, are industrial 0-4-0 tanks. 'Gervase' and 'Dom' are vertical-boilered Sentinel designs, donated by the Standard Brick and Sand Co. of Redhill, while 'Marcia', the third locomotive, is a diminutive Peckett side tank, formerly owned by Hardmen & Holden Ltd., of Miles Platting, Manchester.

The Kent and East Sussex Locomotive Trust have also obtained an ex-Midland Railway 4-wheel coach from Woolwich Arsenal, and also hope to have on loan a Manning Wardle 0-6-0 saddle tank, 'Sir Berkeley', which is to be preserved by the Narrow Gauge Light Railway Society. The last surviving locomotive to run on the original Kent and East Sussex Railway, No. 3, 'Bodiam', Brighton Terrier tank No. 32670, has been purchased by an individual member of the society. Inquiries about the locomotive trust should be addressed to the Chairman, K.E.S.L.T., 28 Mount Road, New Malden, Surrey.

1758 Middleton Railway Trust

MORE THAN 1,300 tons of revenue-

earning freight passed over the world's oldest existing railway recently. Heavy trains have been hauled every weekday for the past few months, from two factories on the Middleton line to the British Railways' line at Balm Road.

'John Alcock', the Middleton Railway Trust's well-known diesel, hauls most trains, which are worked by volunteer drivers, who also marshall the vehicles, and do any shunting required in the factory yards. Train crews are formed by students and volunteers and two of the drivers on the line are women. All have passed a stringent test based on the Hunslet Engine Company's drivers' test and on British Railways' practice. Because much of the railway crosses, or runs along a road, drivers are also expected to know the Highway Code.

The heavy traffic of fabricated steel and scrap necessitates much track maintenance, and although the track has improved considerably since the Middleton Railway Trust took over operations in 1960, much work needs to be done, simply to keep up with wear and tear. Any society, or organised party, wishing to visit the line is invited to write to the Publicity Officer, Mr. B. W. Ashurst, of 18 Inglewood Drive, Otley, Yorkshire.

R.C.T.S. and S.L.S.

THE RAILWAY Correspondence and Travel Society and the Stephenson Locomotive Society Joint Committee announces that it has arranged with British Railways for 'The Jubilee Requiem' tour to run on Saturday, October 24. Hauled by an ex-L.N.E.R. 'A4' Pacific throughout, the train will leave King's Cross shortly after 8 a.m. and British Railways state that this will be the last occasion on which one of these famous locomotives will leave a London terminus. In addition to return tickets for adults and children, a strictly limited number of single tickets will be available. Further details, timings and fares may be obtained from Mr. J. S. Davies, of 32 Russell Road, Kensington, London, W.14, by sending a foolscap s.a.e.

Locomotive Club of Great Britain

A SPECIAL train called 'The Pennine Limited' will depart from St. Pancras Station at 0810 hours on Saturday, September 19, and will run to Crewe Works yard via Market Harborough, Seaton, Stamford, Peterborough East, Retford, Sheffield Victoria, Woodhead, Guide Bridge and Wilmslow. When Crewe Works has been visited, the special train will run to Marylebone, via Stoke, Tutbury, Derby Friargate, Nottingham Victoria and Aylesbury. A 'Royal Scot' class locomotive will pull the special train to Peterborough East and to Sheffield Victoria, and then on to Nottingham Victoria and Marylebone. An A1 class Pacific locomotive will take over on the Peterborough East to Sheffield Victoria section of line, followed by an electric locomotive to Sheffield Victoria and to Guide Bridge. Breakfast (8/6d), lunch (13/6d), afternoon tea (4/–), and dinner (15/–) will be available, and must be booked when ordering tickets (no money should be sent). Fares for this 475 mile tour are:—Adults 72/6d; accompanied juveniles 40/–. The fare includes the Crewe Works fee and printed itinerary. Tickets are obtainable from Mr. D. Murphy, of 28 Belgrave Crescent, Donnington, Chichester, Sussex. A 4½d s.a.e. should be enclosed with every application for a ticket. Payment will not be acknowledged unless an additional s.a.e. or stamped postcard is enclosed.

The Birmingham Locomotive Club

THE OUTDOOR visits scheduled for October, November and December, begin on October 11 with a visit to Crewe Works (North and South Sheds), Chester, Croes Newydd, and Birkenhead. This is followed on November 15 with a visit to Burton, Coalville, Nuneaton and Leicester Locomotive Sheds. A visit will also be made on December 6 to Derby Works and Shed. Further details of the above visits and other club activities may be obtained from the honorary secretary, Mr. E. S. Tonks, of 87 Sunnymead Road, South Yardley, Birmingham 26.

North End (Portsmouth) H.R.C.

THE CLUB continues to expand and the miniature bus station is nearly finished. A total of 25 Dinky Leyland Atlantean (red) will be on view at the exhibition planned for September-October. It is hoped that the exhibition will be advertised in the local Press, and by posters in shop windows. Those wishing to join the club are asked to write to Mr. J. R. Kinchen, Jnr., 79 Fortunes Way, Bedhampton, Havant, Hants.

Tyne-Tees Locomotive Spotters Club

THIS CLUB plans to pay three visits during September as follows: On September 5, Sunderland Motive Power Depot; September 6, Carlisle, Kingmoor and Upperby Locomotive Depots; September 12, Nottingham, Annesley, Kirkby-in-Ashfield, Toton, Westhouses and Hasland Motive Power Depots. Information on these tours may be obtained from Mr. B. Wharton, 37 Bevan Court, West Farm Avenue, Long Benton Estate, Newcastle-upon-Tyne 12.

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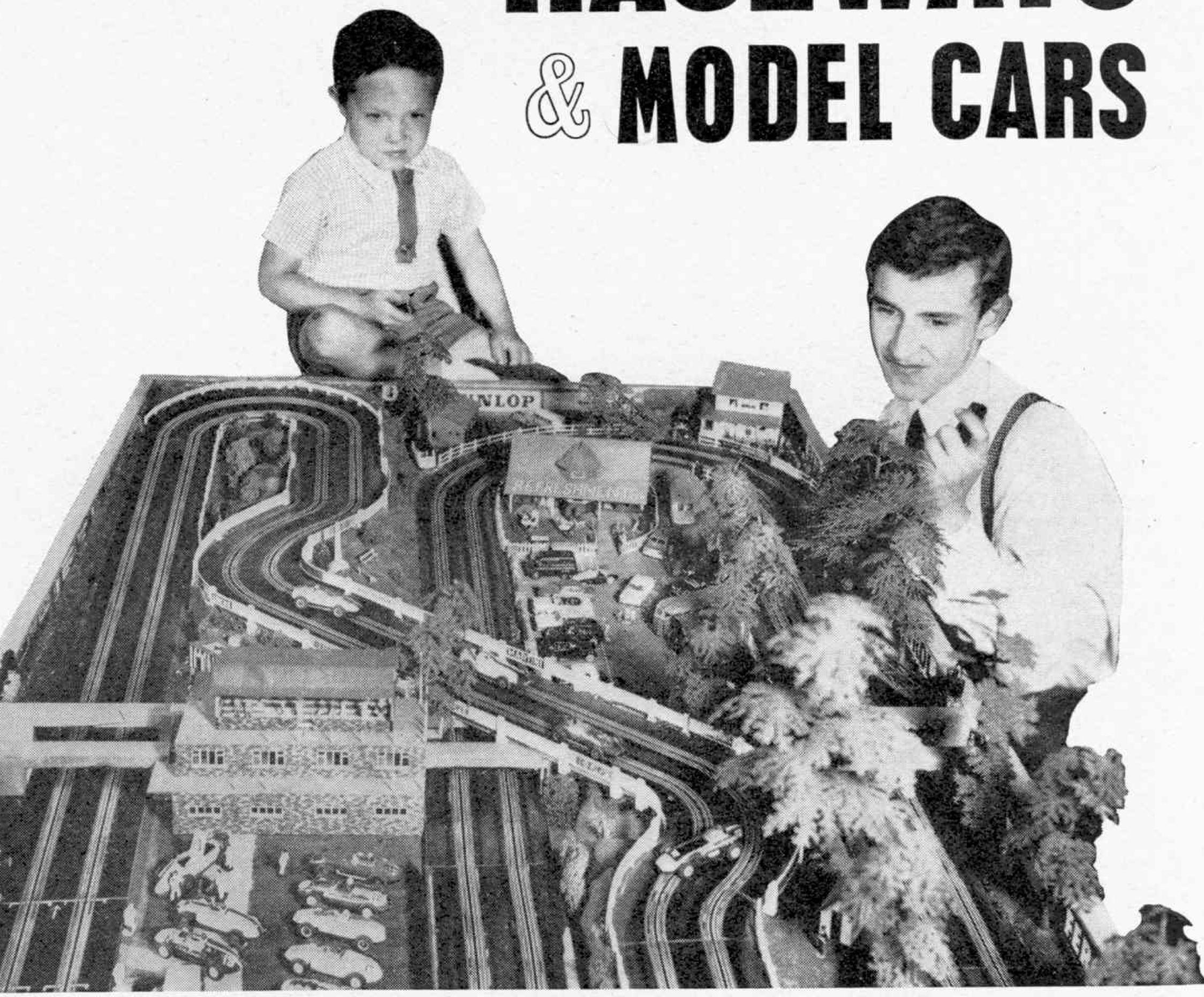
Special supplement

RACEWAYS & MODEL CARS

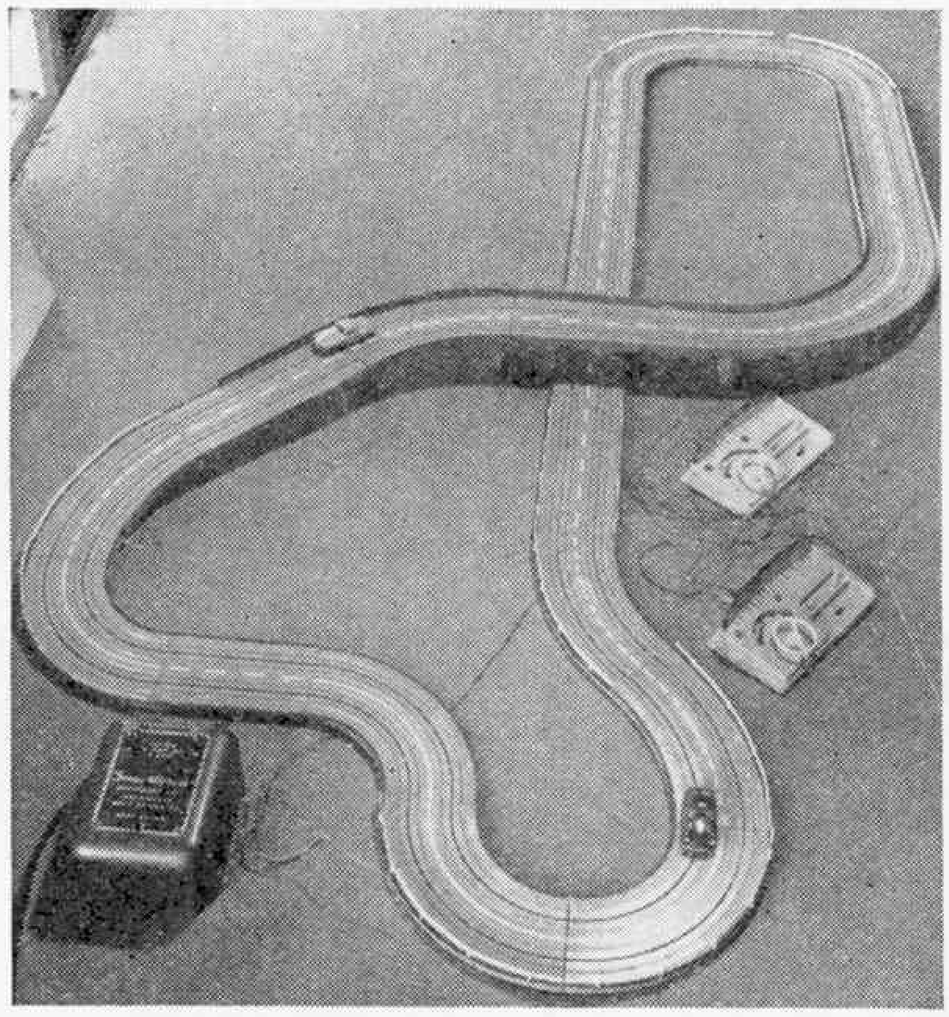


- ★ Survey of the various Raceway Sets on the market, giving details and photographs of the sets, plus the basic prices of the models
- ★ Convert a model car to Raceway specifications. Full instructions on how to complete the work for adding a special model to your collection
- ★ How to start a model car collection. If you are keen on model cars, here's how to start your collection, plus a selection of suggested models and prices

Racing model cars on a miniature race circuit is an exciting hobby for young and old alike. All the thrills and spills of car racing can be simulated in your own home if you own a model racing car layout. In this special supplement we give you all the details about the raceway sets on the market and their prices. Model car racing is a really thrilling hobby. Read all about it inside.

Raceways on the market

In this review of the model racing scene it is proposed to deal with the basic characteristics of the various makes now available although individual circumstances will govern the choice of a potential user.



The Faller Motor Sport layout

Wrenn Formula 152

In this, the smallest of the raceway sets, the cars etc., are made to a scale of 1/52nd full size. In fact, they are the smallest Grand Prix type of car on the market.

A particular feature of the Wrenn system is being able to run more than one car on each lane or slot. This is achieved by having two collector rails on each side of the slot and three positions for the pick-up brushes on the cars.

This arrangement naturally calls for some means of overtaking the car in front. This is effectively achieved by a movable ramp, which lifts the car's guide pin out of the slot at the same time deflecting the vehicle across the track to the other slot. This relatively simple little gadget is built into a section of track known as a deflector. It calls for close co-operation between 'drivers' and 'deflector' if more than one car is involved.

The cars, of which there are six types in various colours, do not have steering, but in this size it is not noticed. Originally they had interrupter type motors and were controlled by an 'on/off' button. They are now being made with an armature type of electric motor, controlled by a variable resistance, which produces a greater degree of control. These Cooper, Vanwalls, Ferraris, etc., motor very rapidly and like all types of racing, model raceway operation needs concentrated attention.

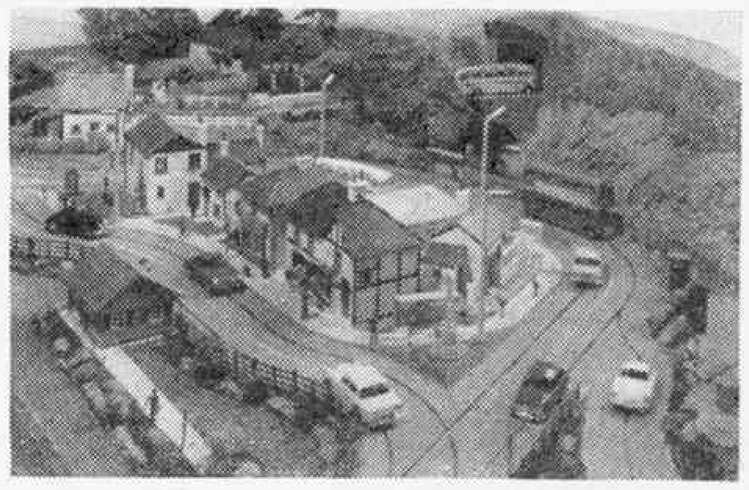
The hard plastic track is made in standard straights and two types of curve to make a four slot circuit. The width of each section is 4 in. Pits, grandstands, figures and barrier rails are produced as accessories to the basic sets and there is also a lap counter unit. The Wrenn system will possibly give you most in the smallest space and the price of the basic set is £5 5s. 0d.

The Wrenn 152 Raceway layout

Minic Roadways

Another of the smaller scale models is the Minic system. Although designed as a roadway system for standard types of vehicles, its wide range of road sections in hard plastic can easily produce a race circuit. The scale of the Minic is roughly the same as OO model railways, so that it may be used in conjunction with them.

A different method of current collection is employed by Minic to other models, for the brass sides of the guide slot form the conductors and the vehicles are fitted with gimbals. These, in case you are wondering, are wheels with a central flange that rides in the slot and separates electrically the two



Scale models on the Minic Roadway

halves of the wheel. The assembly is able to rotate so as to negotiate bends.

The use of gimbals usually means that the vehicle's front wheels are off the ground slightly. Control of the models is by a variable resistance operated by a small wheel, like a car steering wheel. Any car, other than Minic, would need fitting with a gimbal for satisfactory working on a Minic layout.

As there are plenty of touring and saloon cars racing on full-size circuits these days, the Minic range of cars is adequate. The range of accessories available will enable most road features to be incorporated and the cost of a complete basic set is £3 19s. 11d.

The Faller Motor Sport

This recently introduced system is of German manufacture and employs various novel ideas. It is the same scale as Minic, but the tracks are not interchangeable. The width of the Faller sections is $3\frac{1}{8}$ in. and the conductor spacing is different.

The cars, at the moment closed types, are powered by armature type motors driving the rear wheels by means of a layshaft and spur gears. It is a very compact little unit and will fit into G.T. and sports racing bodies quite easily. Steering is not fitted and a central guide pin keeps the cars on course. The pick-ups are flat springs with a controlled movement which helps to prevent breakage.

The track sections clip together with metal pegs which give electrical continuity. The wiring varies from standard British practice in having both negative conductors adjacent.

The controller is like a full-size car dashboard with the steering wheel controlling the speed, it also moves a pointer over a numbered scale to suggest a speedometer. Also incorporated is an 'on/off' switch and press buttons for accessories. A number of roadside accessories will undoubtably make an appearance in due course.

The Faller, in common with the other two makes mentioned, enables one to have quite a comprehensive layout in a very small space. The cost of the basic set is £2 19s. 6d.

Scale Raceway Models

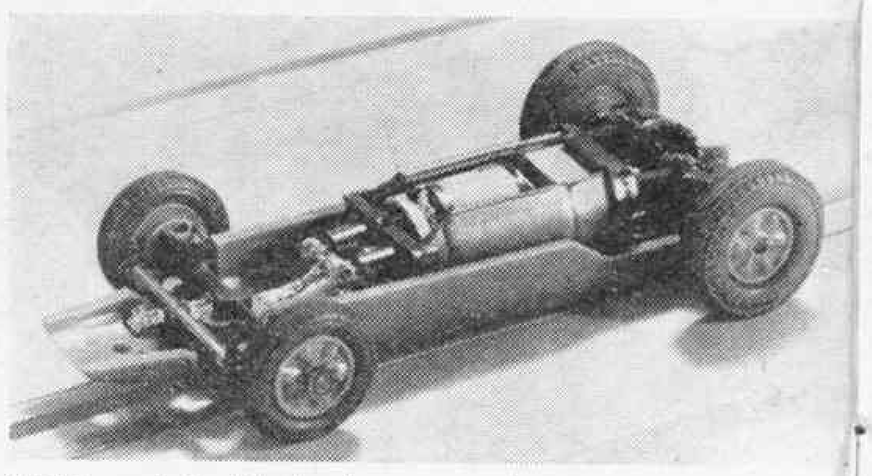
Moving to a slightly larger size car, one comes to S.R.M. These are produced to a 1/40th scale. The cars, formula one G.P. types of B.R.M. Cooper and Lotus having steering and suspension, the rear by the use of nylon and the front using the swing axle idea. They are quite fast and have good road-holding. It is the ability to keep the car on the track that counts rather than flat out speed. The S.R.M. cars help you do this effectively.

Current collection is by copper braids spaced half-an-inch apart either side of the guide pins. To steer the wheels two pins are employed, the front one being attached to the track rod.

These miniature racing cars are well detailed and are the smallest with steering. The track in hard plastic is made in two lengths of straight and three radii of curves. This enables a two, four or six lane circuit to be assembled. There is also a chicane section which causes cars to converge upon each other giving an extra hazard.

Barrier rails are also supplied in the sets and a useful feature with S.R.M. track is the raised lip on the inside edge which prevents wheels sliding off on inside bends.

Car control is by small variable resistances



SRM model with body removed

with a series of fixed positions that allow the car to circulate on its own, providing the speed is not too high. All the components of the cars can be bought separately including the electric motor and the tyres.

Incidentally, the Corgi Silverstone pit and timekeeper sets are suitable for this scale. Also, a number of the all-metal models would fit into the paddock scene, such as ambulances and breakdown vehicles. The cost of the basic S.R.M. set is £4 9s. 6d.

Airfix Products

The next step up from 1/40th is to 1/32nd scale. This is a very popular size and is used as a standard by most of the model racing clubs. There is possibly a wider range of bits and pieces in this size than any other.

Airfix has certain similarities to S.R.M. in that cars are made on a similar principle and the spacing of the conductors strips is the same. In fact, S.R.M. cars will run on Airfix track.

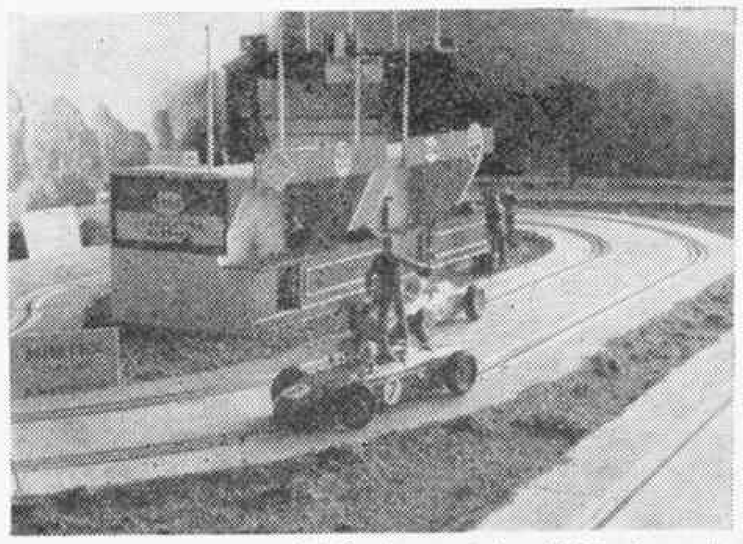
Airfix were one of the first to use a swinging front axle in lieu of suspension to keep all four wheels on the ground. This feature makes for considerably improved handling. Ackerman type steering is fitted with two guide pins, one internal with the axle unit, the other moulded with the forward fitted track rod.

The motor incorporated in the Airfix range has a disc type commutator. This arrangement gives a compact little unit and can be used to motorise the range of static 1/32nd scale cars sold in kit form. A motorising kit may well be on the market, very shortly.

The Airfix cars motor very well and remain cool after extensive running. Individual cars seem to have inbuilt characteristics. For instance, there is a distinct difference in handling between the Cooper and the Ferrari.

Track sections are in two lengths of straight, 7¼ and 14½ in. long, with a standard and outer curve for four slot circuits. Also produced is a chicane and a crossover. The latter gives equal lane length on a two slot track, without using an overbridge. The overall width of the track sections is 6 in. and they clip together with nylon pegs.

Pits and grandstand are obtainable and two additional cars, the pre-war Mercedes and Auto Union. Included in the accessories are plastic blocks and clips that enable the track to be elevated and banked. 1/32nd scale calls for more room, but if you want to go 'pot' hunting with the clubs, it is a good starting point. Cost of the basic set is £4 19s. 0d.



Airfix layout to 1/32nd scale

Victory Industries Ltd.

Victory Industries or V.I.P. raceway sets are also 1/32nd scale, although they use a different type of track construction to most other model layouts. The V.I.P. set is virtually all metal, with the track surface forming the conductor. It has certain problems when endeavouring to set out a complicated system, in that its overall width is 6 in.

There are standard straight and curved sections which limit the layout to a two slot circuit. However, any disadvantage in regard to the track is more than outweighed by the cars. These are based on Formula One cars and are very good.

They have Ackerman-type steering and are well detailed. They can be a bit of a handful to the uninitiated, but once mastered, will hold their own with most of the other 1/32nd scale cars. In fact, V.I.P. cars form the basis of a number of club layouts.

Speed control is by a hand-held variable resistance and the later model has a series of fixed settings and provision for electric braking. The initial cost of the V.I.P. raceway is £8 10s. 0d.

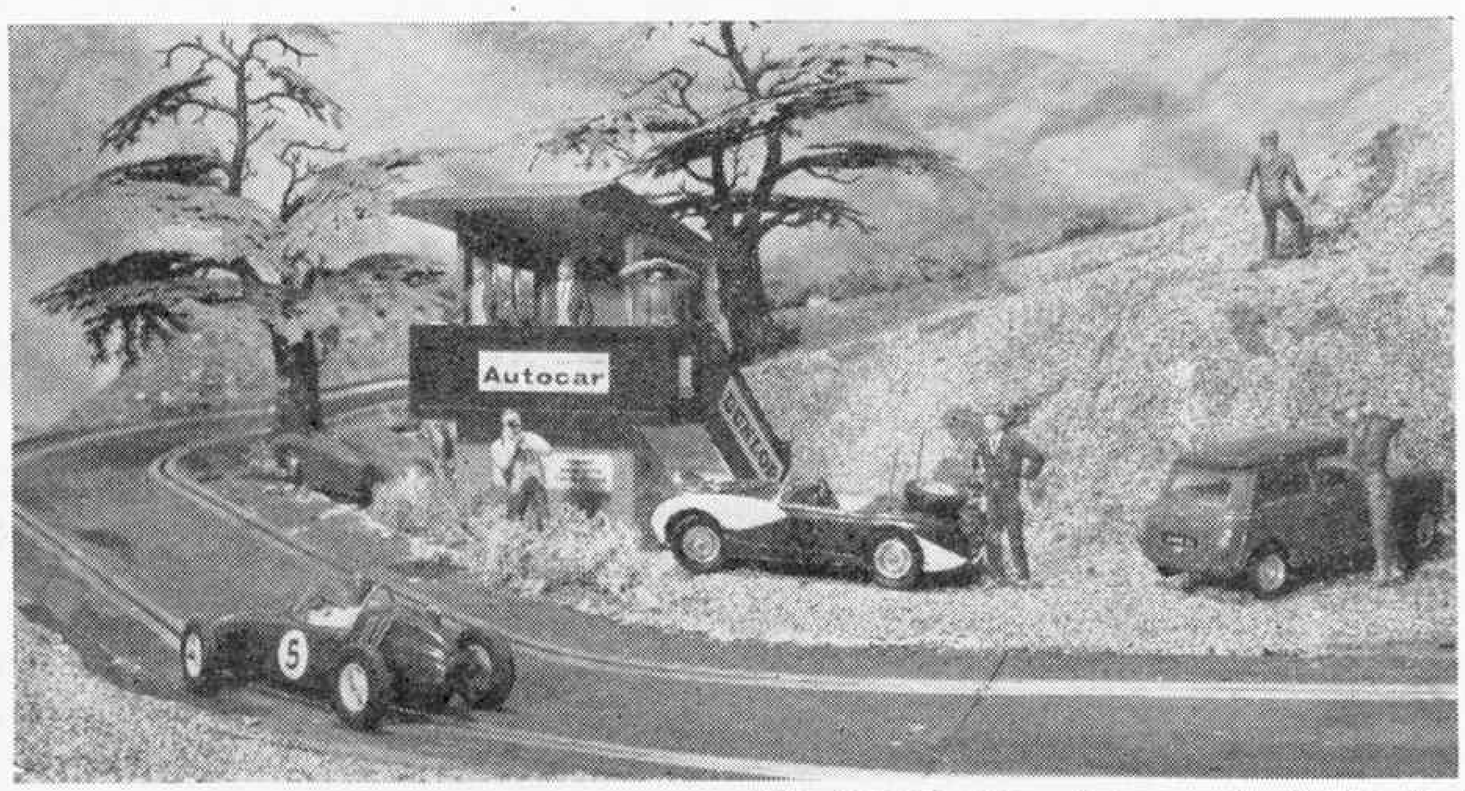
Scalextric

The most comprehensive supplier of raceway components is Messrs. Mini Models Scalextric. Practically everything for the miniature race track is produced, from oil drums to grandstands. The scale, ostensibly 1/30th, varies somewhat and Scalextric are now making 1/32nd size cars.

There have been a number of modifications since the original metal cars made their appearance and with the exception of those known as 'Formula Junior', the cars are non-steering. They travel on a single guide pin and the rear wheels, the front axle having sufficient movement for the wheels to just touch the surface without carrying any weight.

A wide range of cars are made, some having lights installed. Also included in the models is a motorcycle combination and a go-kart. The latter is to 1/24th scale. Control of models is by a hand-held variable resistance, operated by the thumb.

The latest track, known as Plexytrack, is a flexible plastic that allows various contours and bankings to be built. The conductors form the sides of the slots, so that the braid pick-ups on the cars are relatively close together. There are many types of track in straight and curved sections and one point to bear in mind with this system is the question of space. To do justice to the Scalextric range a fair size room is needed.



The VIP Club Special ascending a hill climb

Among the accessories available for the raceway, is a fuel gauge which, in effect, is a spring-loaded resistance that will cut off the current at a pre-determined time. You can then emulate full-size practice by pushing the car to the pits. If you have the space and want everything ready made, then possibly Scalextric is your answer. Cost of the basic set is £3 19s. 0d.

Model Road Racing Ltd.

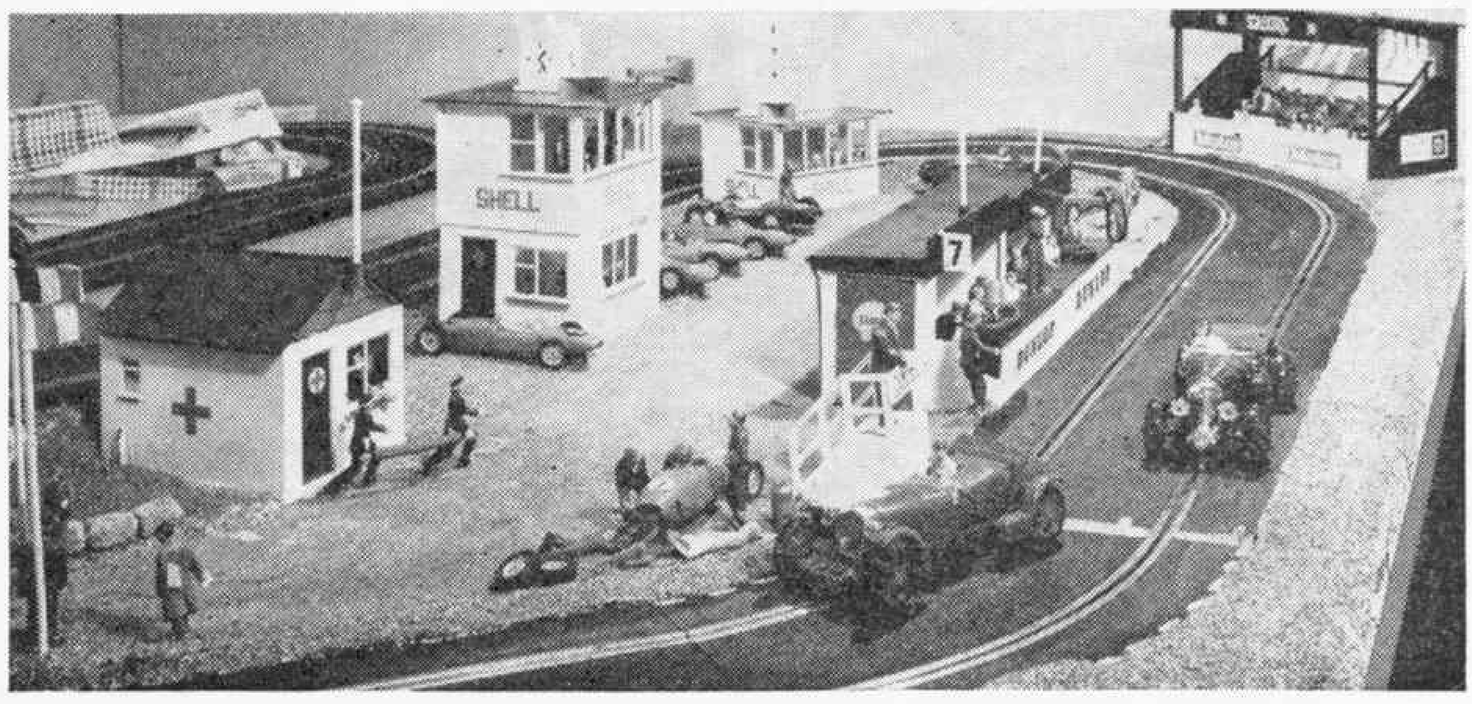
Although they do not supply boxed kits, M.R.R. produce a very wide range of parts for building 1/32nd scale cars and track. They are possibly the oldest firm in the business and have catered for model raceway builders for many years.

The track is constructed from hardboard sections on wood battens, the conductors being strips of metal foil glued each side of the slot. With this method, the slot is the gap between adjacent sections. One feature with this type of track is the increased width allowed on the bends. Most commercial tracks use barriers to retain the outer car.

M.R.R. gives scope for the vehicle to slide to the point of no return. Naturally, this layout requires a bit more space to install, but M.R.R. will cut curves to any radius, which is particularly useful if it is a case of fitting into a confined space.

The speed control is fitted with a terminal for braking. This electrical braking is achieved by utilising the fact than an electric motor, if running only by momentum, can generate what is known as a back electromotive force. This force, being in the opposite direction to the original current, has the effect of slowing down the armature revolutions. Most model shops have stocks of M.R.R. components.

Scalextrix vintage Alfa Romeo and Bentley



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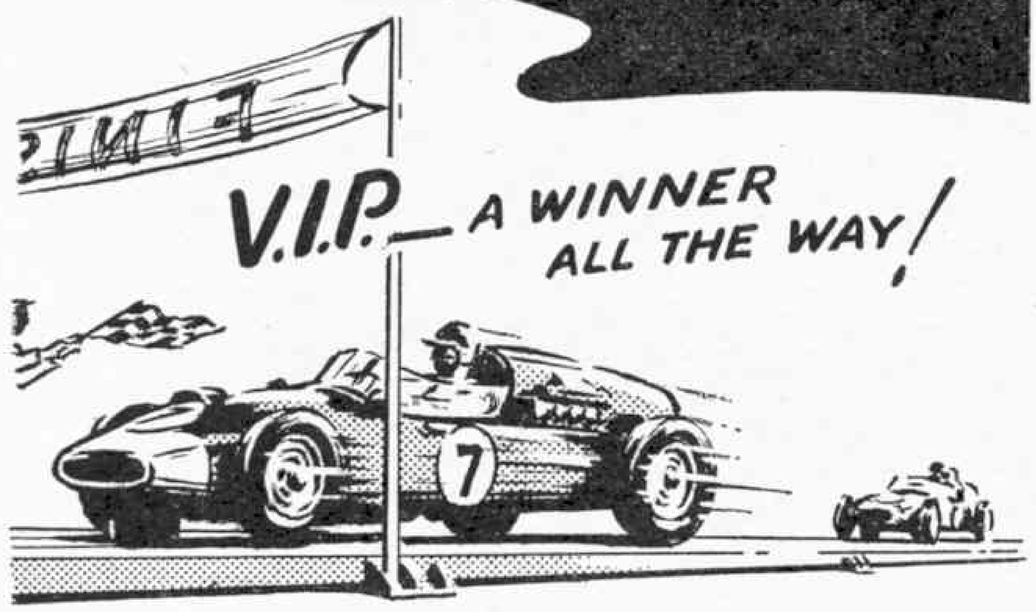

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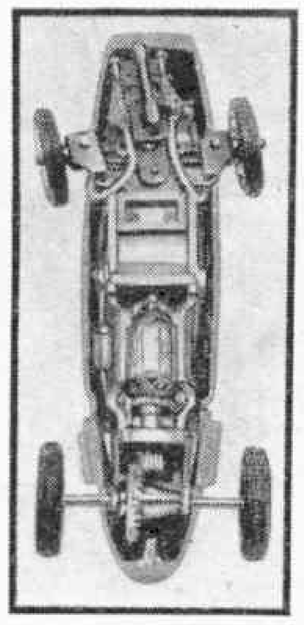

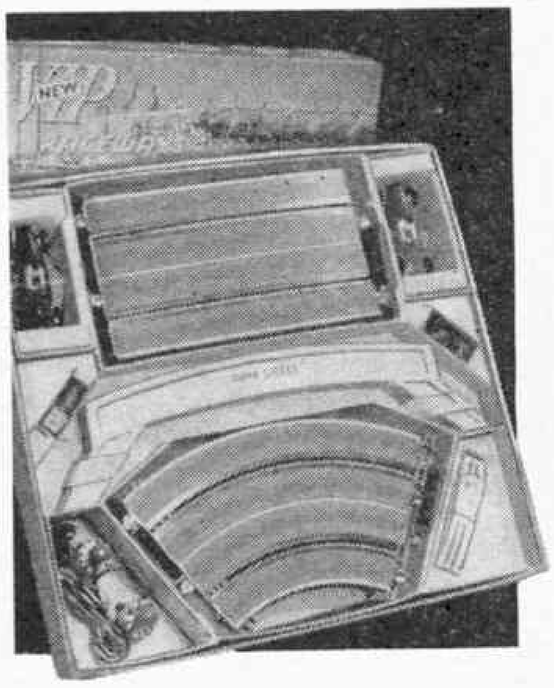

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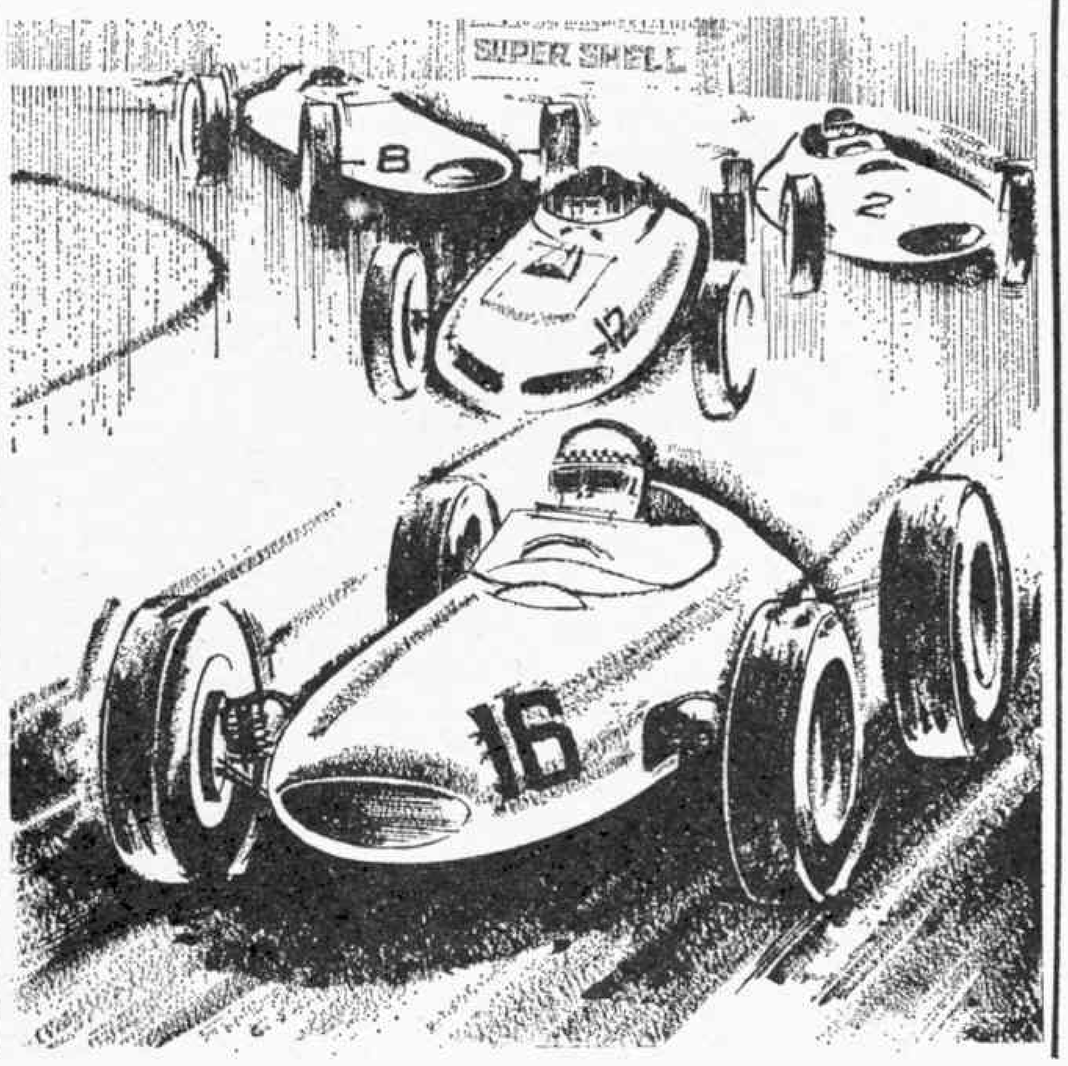

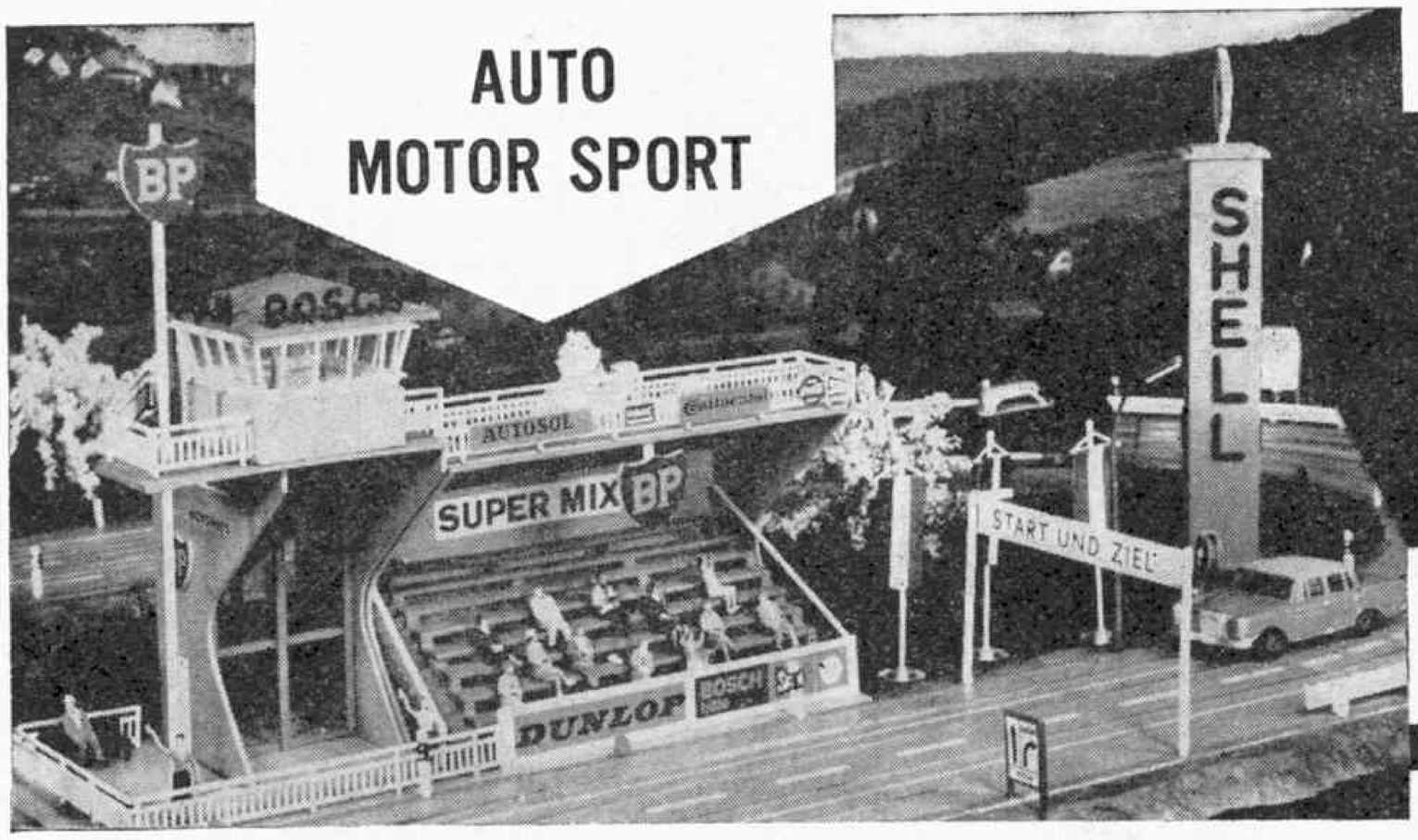

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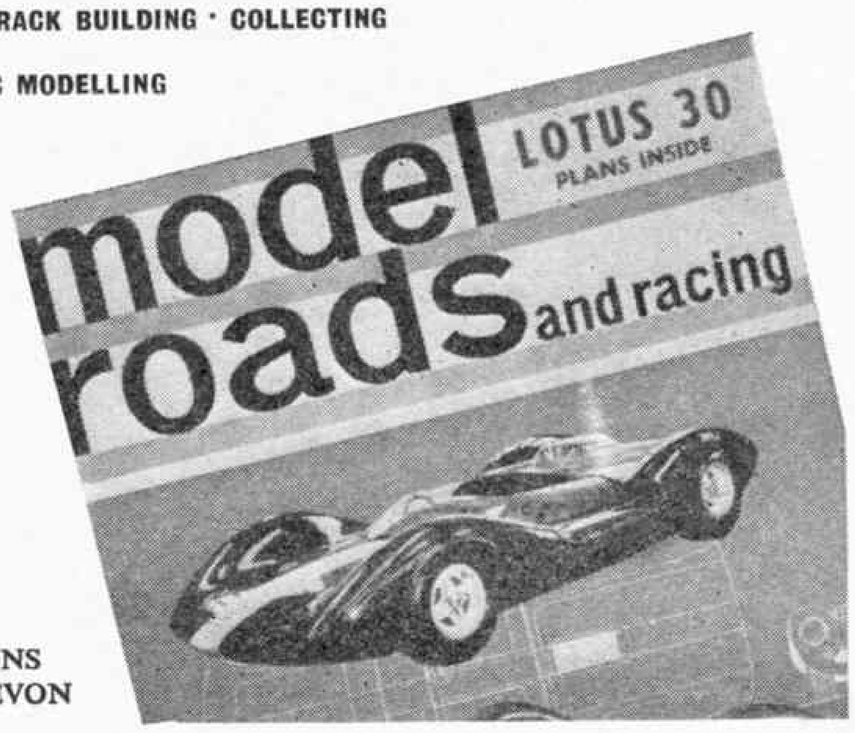

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Converting to Electric

by **T. Lamkin**

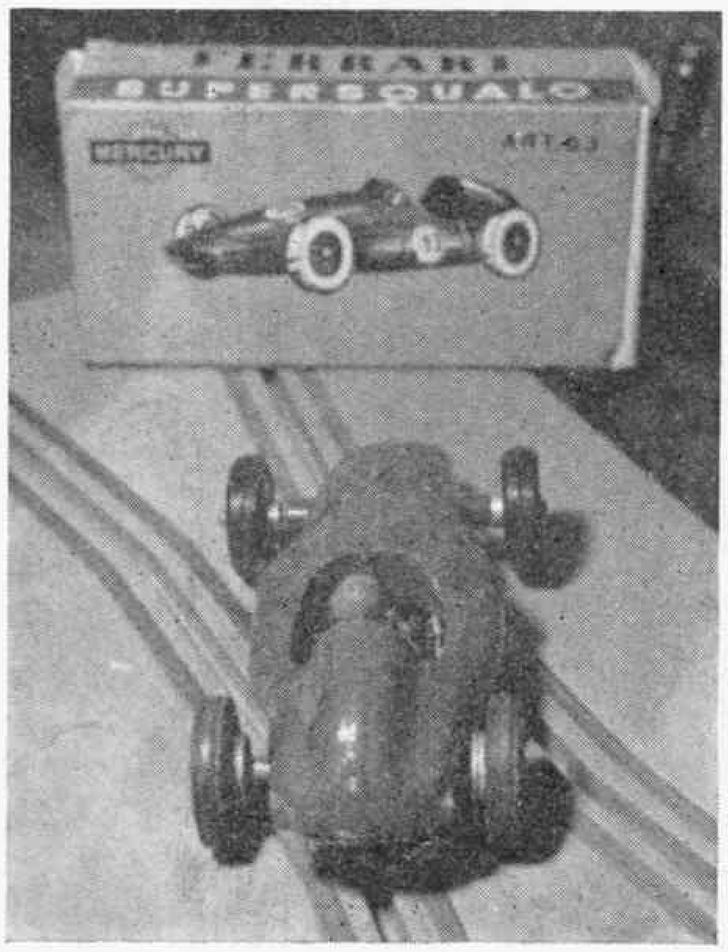
IT IS NOT very long after the purchase of miniature racing sets that many owners wish to increase the 'stables' with sports or touring cars. This article deals with two ways of achieving this—firstly, for touring cars in the popular 1/32nd scale size.

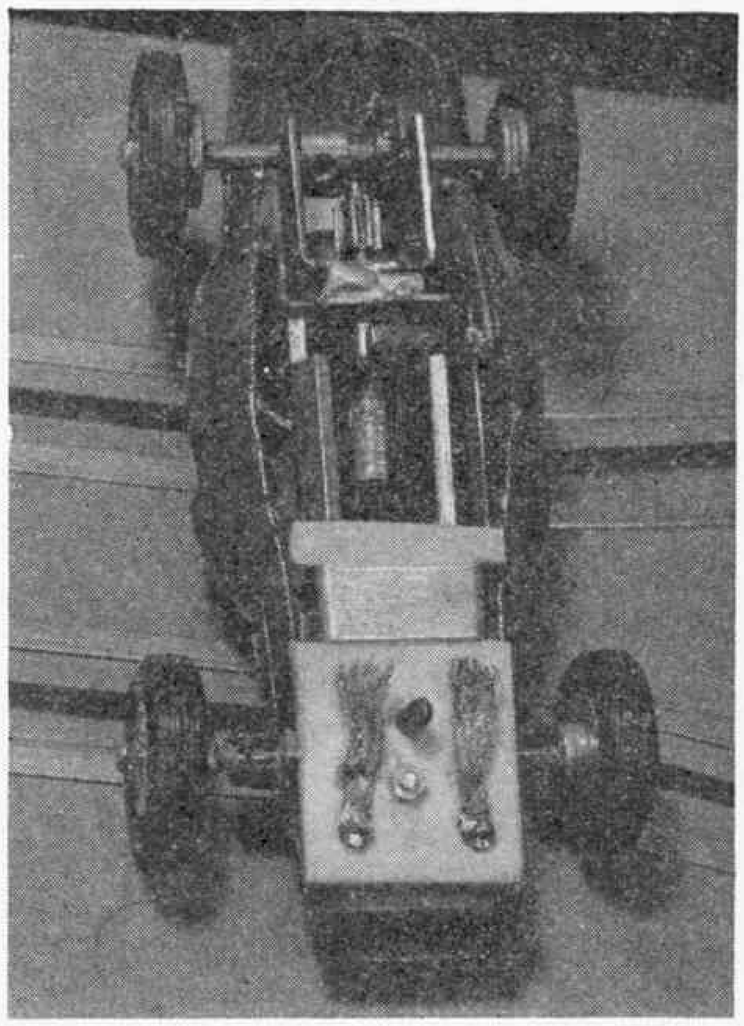
The first problem is to decide which particular model you wish to add to your raceway set and whether it can be converted to incorporate an electric motor in the confined space of its body. Fortunately, the range is very wide and many of the 1/32nd scale models have bodies suitable for fitting to the chassis which is described here. The method we have used is quite simple as all components are standard Airfix assemblies mounted upon a Perspex plate.

Sketch 1 shows the plan and how the various holes clear the guide pegs, motor armature and crown wheel on the rear axle. Besides the actual body, you will need Airfix front and rear axle assemblies, motor, pick-up braids and a piece of Perspex about $\frac{3}{32}$ in. thick, $1\frac{1}{4}$ in. wide and the length of the body of your model. You will also need some thin brass or aluminium sheet and six 8 or 10 BA nuts and bolts.

Cut and drill the Perspex according to the instructions shown here and then make four metal brackets to carry the two axles. The front pair are drilled for the insertion

The Mercury Ferrari converted to raceway specifications and ready to race.





Underside of model showing the pick-up brush fittings.

of the round lugs on the Airfix assembly. This arrangement allows the axle to rock slightly and so compensate for any irregularities on the track's surface. The rear brackets are drilled to provide bearings for the metal axle. The Airfix rear wheels are a push fit and can be slipped off for fitting the axle in the brackets.

When fixing the rear brackets, make sure that the axle is at right angles to the centre line of the Perspex plate. In fact, a line scored on the chassis will also assist in accurately locating the front brackets.

With the back axle in position, the electric motor can be mounted. To give the necessary clearances under the body of the car, it is usual to tilt the motor slightly. This can be accomplished with small wedges of wood or Perspex. The wedges should be the length of the electric motor, about $\frac{1}{4}$ in. wide and taper from $\frac{1}{8}$ in. to nothing. The wedges are glued to the Perspex chassis on each side of the armature opening, tapering to the rear of the body. Incidentally, Evo-Stik is adequate for the task of fixing the wedges in position.

One of the most important points when mounting the motor on the chassis is ensuring that you have the correct alignment. This means that an imaginary line along the centre of the armature spindle would cut through the centre line of the axle and at right angles to the axle. In other words, both shafts must be in the same plane.

Sketch 2 shows the bracket which is made to clamp the motor in position on the chassis. Slight tolerance must be allowed on the bracket in order that adjustment may be made to the meshing of the drive gears. The pick-up braids, which collect the current from the track, are pressed through the two small slits at the front of the chassis, allowing for about half an inch to be bent towards the rear of the model. Reference to your other raceway model cars will give the exact length required. The other ends of the pick-up braids then clip on to the motor connections, which are normally situated near the top of the motor away from the chassis.

In order to fix the body to the chassis, small Perspex blocks should be glued to the chassis to register with the sides of the body. With the chassis held in position on the body by hand, small holes are drilled through the side of the body and the blocks of Perspex on the chassis.

Next thread the Perspex blocks on the chassis to take the 8 or 10 BA bolts. Then enlarge the holes on the body of the car to enable the bolts to pass through and screw into the blocks inside the body.

Motorising Smaller Models

Motorising the smaller all-metal cars, such as the Dinky Toy range, calls for more effort than that required for larger models. Firstly, having purchased your model, it is necessary to investigate the amount of room inside the body. Usually, the bottom of these cars has a flat plate riveted in position. Therefore, to remove this plate, you simply drill away the rivet heads. Also, you will probably have to cut away the rear rivet pillar in order to squeeze in the 'works'. However, as steering is usually dispensed with on smaller raceways, the front pillar can be used to help hold the motor in position, in which case it will have to be drilled and tapped to take a small bolt.

In this type of conversion, the motor invariably becomes the chassis. Therefore, a unit small enough to fit into the body must first be obtained. Although the Tri-ang

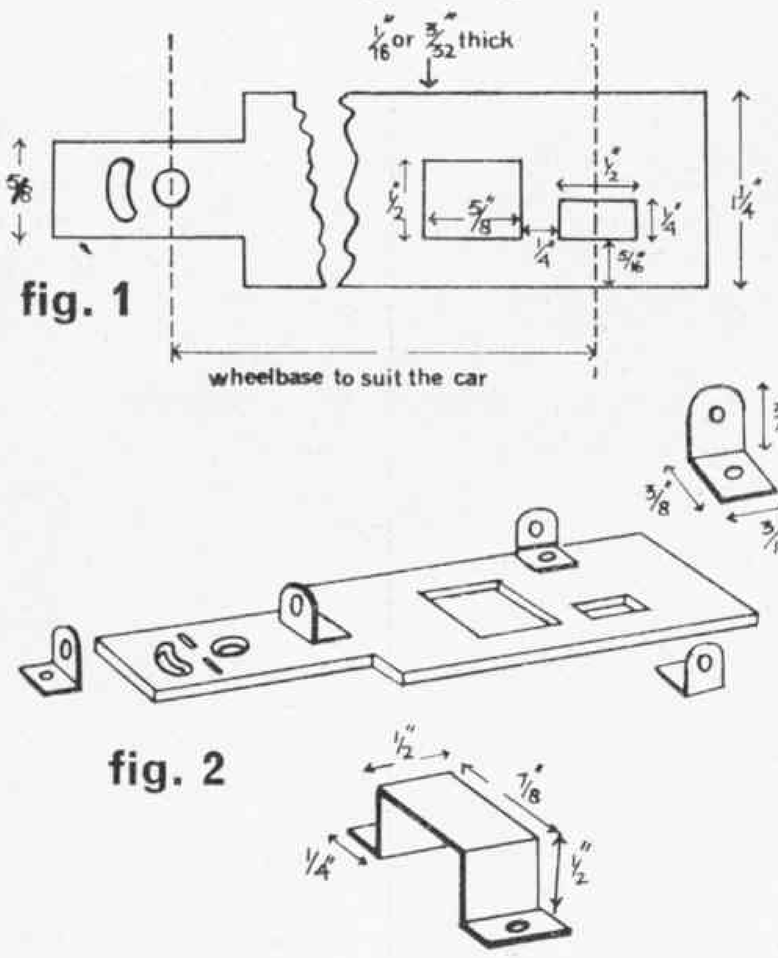


fig. 1

fig. 2

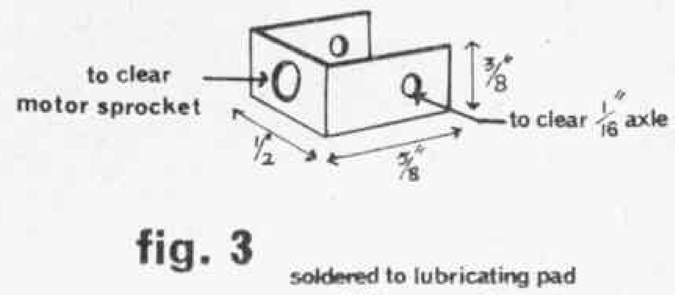
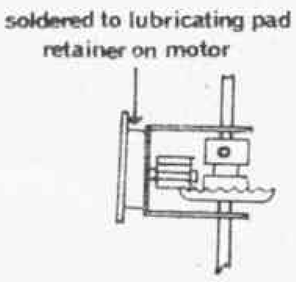


fig. 3



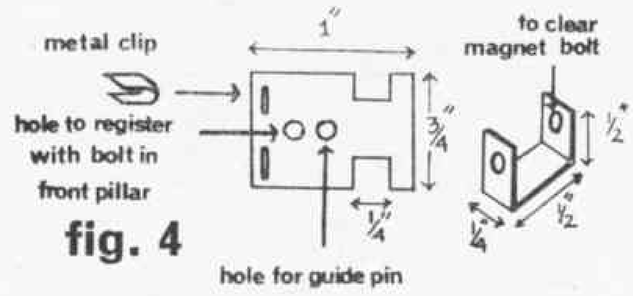


fig. 4

Mark 4 will fit into some cars, being smaller, the Romford Terrier motor presents less problems. However, one point to be remembered is that being smaller it is less powerful, so all surplus weight must be removed from the body of the model.

Before fitting the motor into the body, a mounting will be required to carry the rear axle and contrate gear. This may be made from thin sheet brass as shown in Figure 3. The bracket is slipped over the motor sprocket and soldered to the brass housing of the lubricating pad.

Before soldering, wrap a damp cloth around the motor to keep the heat away from the armature. Also, make sure that your soldering iron is hot enough to do the job quickly.

The drive to the rear wheels is transmitted by an Eldi gear or contrate wheel. The axle, a piece of $\frac{1}{16}$ in. steel rod, $\frac{3}{4}$ in. long, is passed through one side of the bracket, through the contrate wheel and then through the other side of the bracket. A grub screw on the Eldi gear locates the axle mid-way. It may be necessary in some instances to insert small washers between the bracket sides and gear wheel to prevent excessive side-play.

The centre holes on the original wheels of the model may be too large for the $\frac{1}{16}$ in. steel spindle and in this case you will have to obtain a new pair of wheels that fit tightly from you local model shop.

With the motor ready for assembly at the rear of the car, attention may now be turned to the front of the model where a mounting for the pick-up braids and guide pin is needed.

The basis for this mounting is a piece of thin Perspex or Paxcolin as shown in Sketch 4. It is fitted to the motor with a metal clip, using the existing bolt through the magnet. The small metal clips have the motor leads and pick-up braids soldered to them.

The guide pin is made up from a thin plastic knitting needle cut off about $\frac{5}{16}$ in. below the head and glued in position through a hole drilled centrally in the Perspex. The front wheels of the model, which are retained, are held in position by the front mounting when the complete motor assembly is fitted into the body. Small blocks of wood or Perspex inserted in the slots, after the axle is in position, will retain the rear end.

All of the details mentioned here have referred to the conversion of the Mercury Ferrari Supersqualo. Slight modifications will allow these plans to be used in converting many other metal, model racing cars. The main thing in all such conversions is to take care and not rush the job. It is the only way to obtain satisfactory results.

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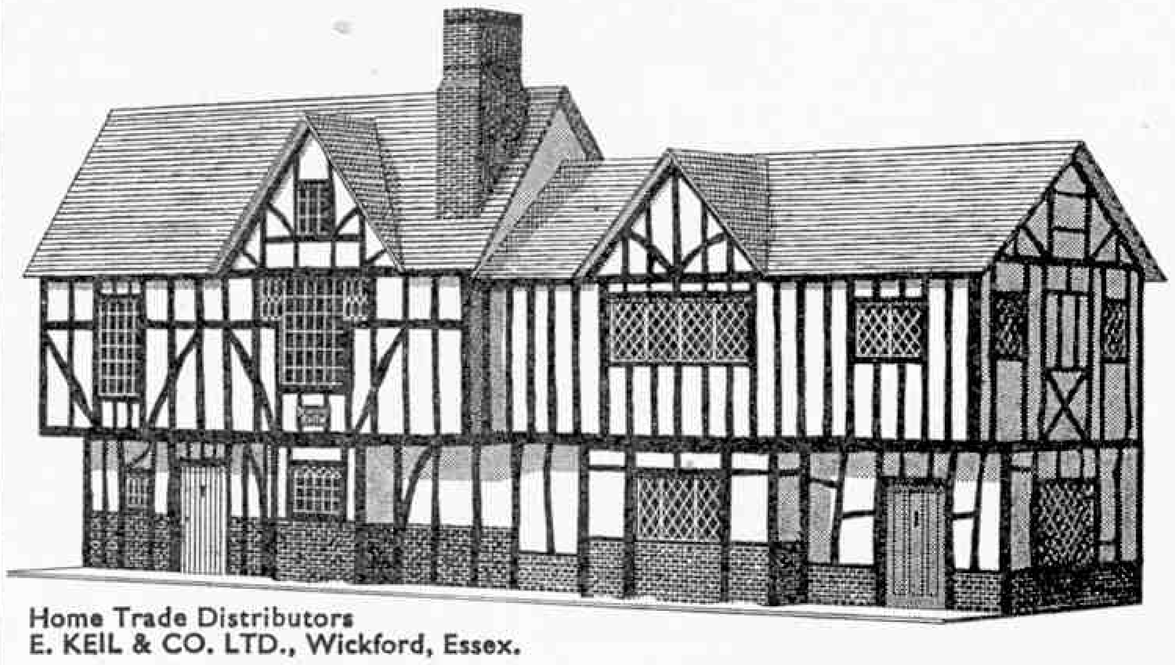

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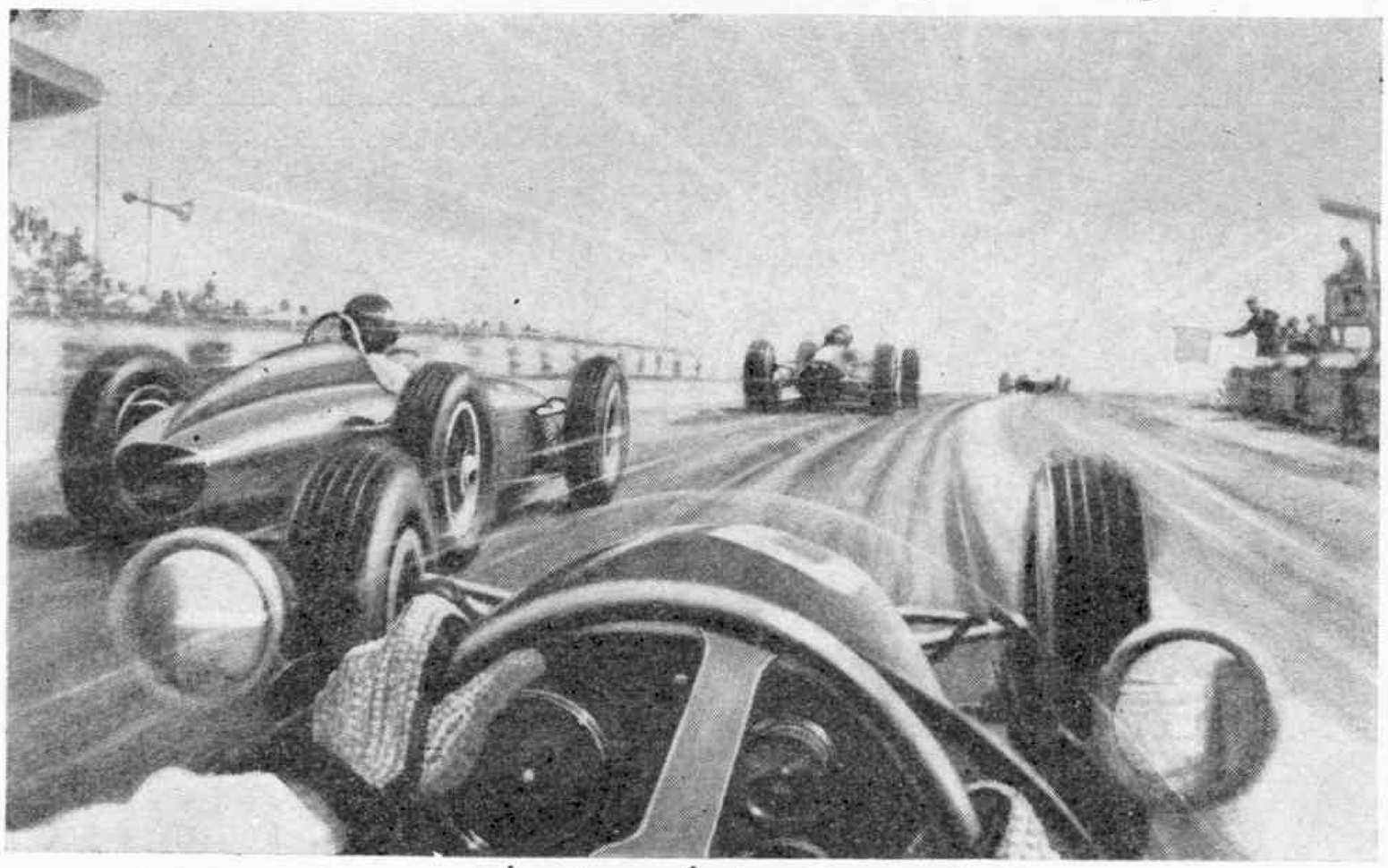

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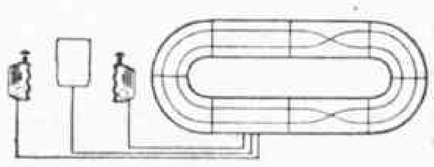

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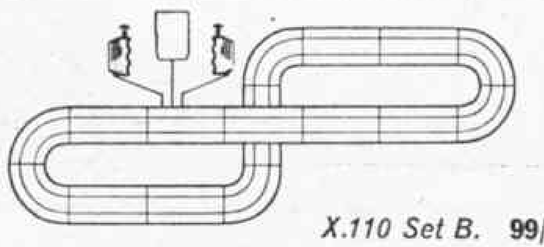

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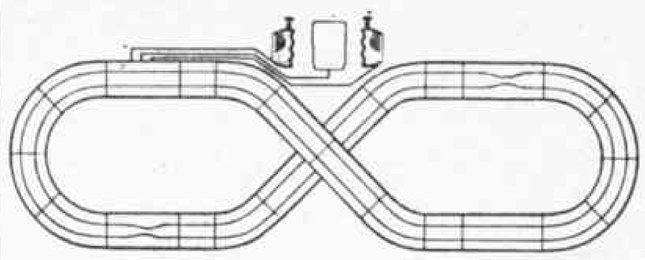

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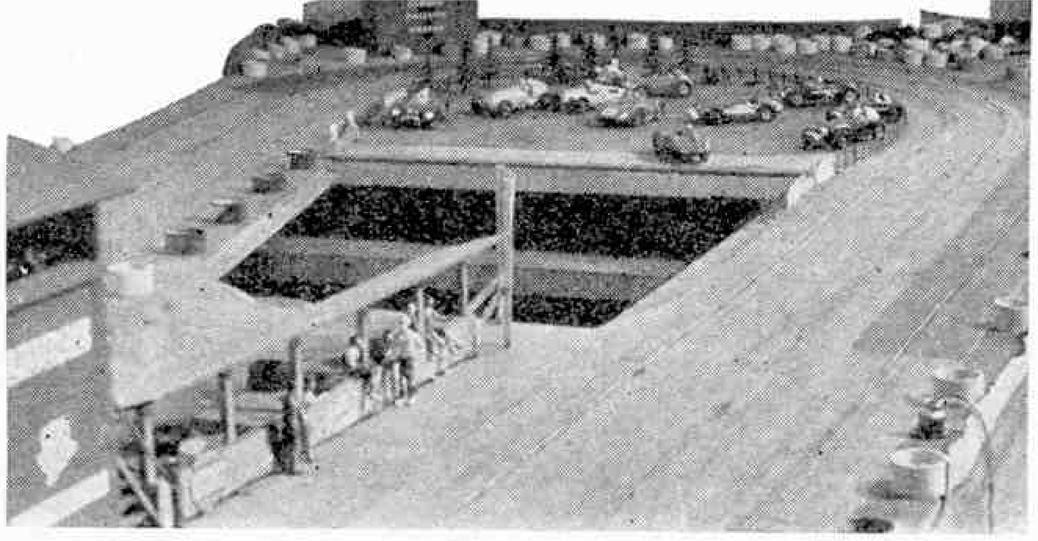


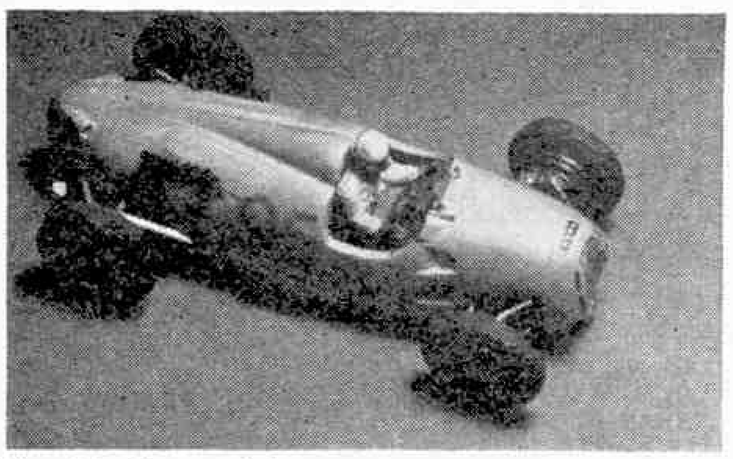
in miniature seen at the clubs

A VISIT to one of the many model racing car clubs on a club racing night is as exciting as a day out at one of the real racing circuits such as Brands Hatch or Mallory Park. In fact, in many instances it is more exciting, for one is able to see in close-up these miniature racing cars dicing at fantastic 'scale' speeds of up to 140 mph.

Surprisingly, the sport of electric model car racing, which is now becoming so popular, started almost 10 years ago, when a group of enthusiasts in Southport, after some experimenting, agreed on what came to be known as the 'Southport Standards' for electric model car racing. It was quite obvious to the Southport enthusiasts that if the sport was to become organised nationally or internationally, it was necessary to get a definite formula accepted.

At the time, the only commercially available equipment was made by Scale Model Equipment (Steyning), who produced a series of kits with wooden bodies, mostly of pre-war racing cars, and very neat nickel silver wheels and fittings. These models were the only ones remotely suitable for the job, so this decided the 1/32nd scale which turned out to be ideal. Although the slot electric conductor principle was originally experimented with, the Southport group finally decided on raised rail conductors. The specification being as follows:

The guide rail shall be of negative polarity, and shall be $\frac{3}{16}$ in. high. The return



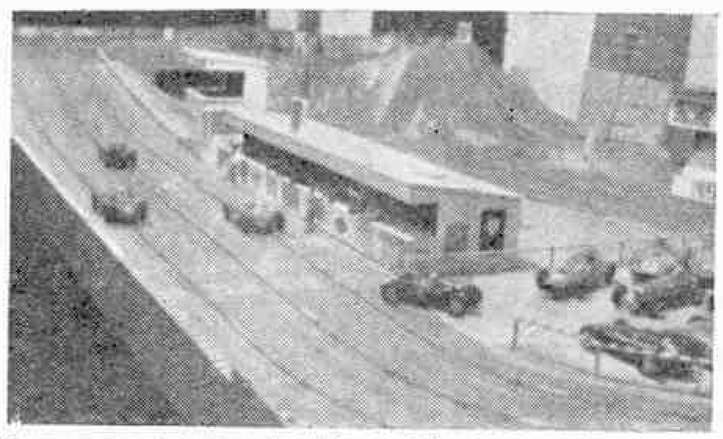
Hand-built model racing car.

rail shall be as near as possible flush with the surface of the track, and $\frac{3}{8}$ in. to the left of the guide rail. The cars shall be 1/32nd scale models of recognised racing and sports cars. Any type of 12 volt direct current motor may be fitted.

The first group of enthusiasts to take up the 'Southport Standard' lived in Worksop, Nottinghamshire, and in 1955 they had a number of three-lane 35 to 50 ft. circuits operating in the homes of the members. Worksop cars took part in the Southport Grand Prix of that year, but not very successfully. The reason for their failure was that the Worksop circuits had a flush return rail of 24 gauge copper and the Southport rail was of 16 gauge wire. This upset the handling of the Worksop cars.

Having sampled the big Southport circuit, however, the Worksop enthusiasts decided that their smaller circuits were quite inadequate and a club was formed to produce something much bigger and more interesting. The layout of the new circuit was discussed for some months before a club building was found and construction started.

Every single feature of the circuit had been exhaustively and sometimes heatedly argued about. Eventually, the intention to provide the best and most varied test of both driver and car was achieved. Equally important was the fact that visiting cars invariably ran well, so that for the first time, drivers were not handicapped when on a 'foreign' track.



Cars coming on to the grid.

When the first National Grand Prix and sports car race was held in 1958, there were 142 entries in Formula 1 alone.

Unlike the earlier Southport Grand Prix, which had been dominated by the home team, the first Worksop Grand Prix was notable for the way in which 'foreign' cars did well in both events. In fact, Colin Sinclair, one of the founder members of the Southport group, led the sports car race for a long time and was only beaten by the writer's Maserati 300S after a stirring 'ding-dong' on the last 20 laps.

About this time, several new clubs were established. There was the 'Oaklands Park' circuit at Birmingham, a three-lane 36 ft. circuit at the home of Stan Whitbread and Southport obtained a second circuit in the home of Walkden Fisher. This was called the 'A.R.R.A.' track and was about 65 ft. per lap. Colin Griffin and 'Don' Doncaster built a three-lane 45 ft. circuit at Rotherham. and the club they subsequently formed ran a successful national meeting at a Sheffield model engineering exhibition.

Circuits were almost invariably hardboard on a strip wood frame, usually with a few gradients introduced and sometimes with carefully completed scenery. The 'A.R.R.A.' circuit was outstanding in this latter respect, where the scenic effect of the Nurburgring had been cleverly suggested.

Earlier experiments had mistakenly assumed that the rough side of hardboard would give better traction. However, with the faster cars this gave the same effect as running a full-size car on cobble stones. The solution was to have the hardboard smooth side up and the 'road' was coated with a special, abrasive paint, which gave almost a year of heavy racing use before any renewals were necessary.

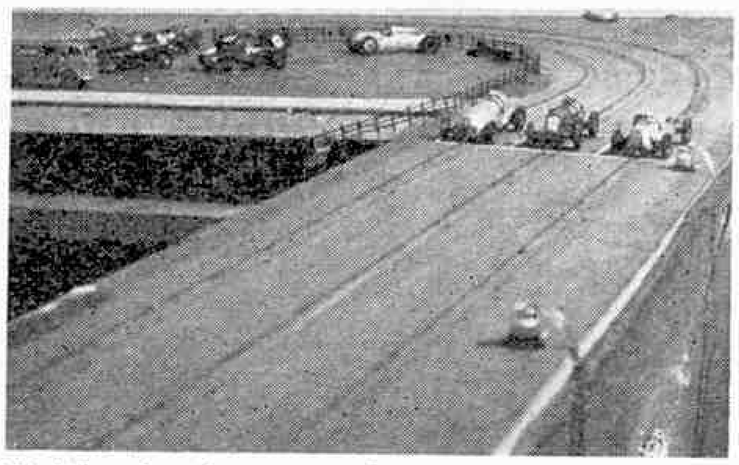
In contrast, the Southport track had a distinctly polished appearance all round and the local enthusiasts got over this by adding weights to their cars at strategic points. This certainly worked on their circuit and led to a controversy between the two clubs on the relative merits of the heavy Southport cars and the lightweight Worksop cars. In Worksop, light weight was taken to the extremes of tubular axles and drilling lightening holes in the gears! This was resolved to the satisfaction of some, at any rate, when the Southport boys found themselves at a distinct disadvantage on the hilly part of the Worksop track.

'Doughey' Baker, who started an offshoot service club at R.A.F. Worksop, and the writer, tried a number of radical layouts at this time, including four-wheel drive, independent suspension at front, rear or both, twin motors in G.T. cars, most of which were fairly successful, but none of which would beat the normal Worksop layout in races.

The Rotherham enthusiasts, Griffin and Doncaster, had at their disposal machine shop facilities and their cars featured such refinements as tiny ball races on all four wheels, centreless ground tyres and balanced wheels. One of Colin Griffin's B.R.M.'s, four-cylinder, front-engine variety, even featured a pivoting front axle, which seemed to give a distinct improvement to the cornering and acceleration of the car. These were probably the fastest $\frac{1}{32}$ electric racers ever made.

The commercial sets that appeared in 1959 used the slot electric conductor principle, presumably for production reasons, and as the slot circuit is slower than rail, the mass-produced cars do not approach the performance of the older hand-made cars, some of which took 50 or 60 hours to build.

When it became obvious that the new, small, rear-engined cars were going to dominate the full-size races, the writer built a small three-lane slot track. This was necessary as the very low ground clearance of these new cars made them impossible to model on the rail principle. The track was again made of hardboard, with an $\frac{1}{8}$ in. slot in place of the rail and the flush return rail of the rail system duplicated on the other side of the slot. The normal type Worksop cars, with the necessary modification, were used. Also, some specially designed slot racers with much reduced ground clearance and lowered centre of gravity, were tried. Both types performed well but, as expected, progress around the slot circuit seemed very slow compared with the speeds that would have been expected from a corresponding rail circuit.



Waiting for the start of the race.

At that time, 1960, the rail clubs were in their heyday, some having meetings every week and a full-length Grand Prix each year. Some enthusiasts would have accumulated a dozen or more highly specialised cars, so it is not surprising that, although the various slot circuits were successful, there was very little support for a complete changeover to the slot system. It wasn't until 1962, when what amounted to a new generation of model car fans arrived on the scene, did the changeover to slot circuit racing take place.

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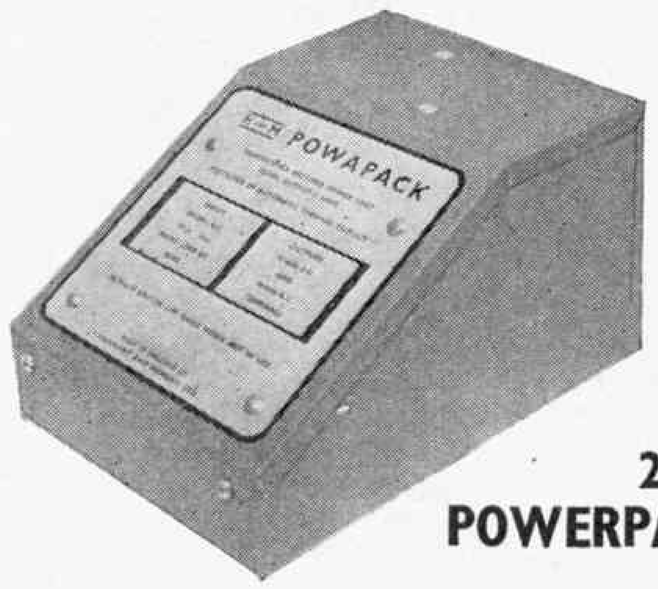

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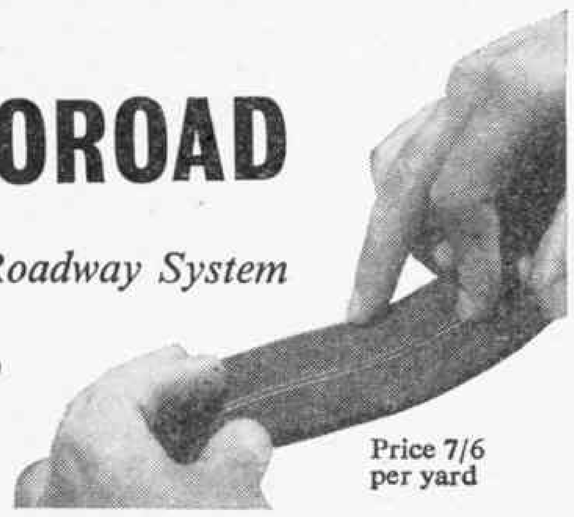

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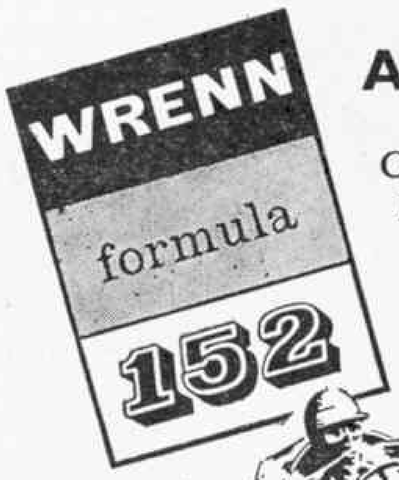

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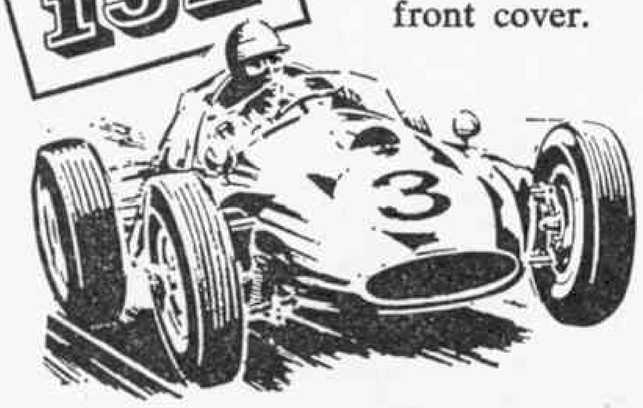

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(Kits assembled ready to run) extra	4	6

● All the above can be used with our chassis. When ordering please state which car you wish to motorise.

Complete Chassis Kit with ×500 Motor and Spur Gears (state car)	22	6
(Kits assembled ready to run)	26	6
New V.I.P. Controller	12	6
M.R.R.C. Controller	9	11

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S.A.E. List

COLLECTING MODEL CARS

Ron Clover gives an introduction to the interesting hobby of collecting model cars, plus details of unusual foreign models . . .

THERE are many people today who want to start a model car collection but don't know where to begin. This is not unusual, for although the hobby started some 30 years ago, it is only during the last five years that it has become a really popular pastime. In many cases, if you were fortunate enough to have been a model car enthusiast some 30 years ago and collected the early Dinkys, it can also be a very profitable one.

The connoisseurs in the model car collecting field have already obtained some very fine and unusual models and by working on some of the earlier cars have added value to their collection. By working on these models, I mean painting, picking out detail and in lots of instances 'chopping' or altering the model to look like a replica of a car which no manufacturer has produced.

One of the best examples of this I know was the French Solida Aston Martin DBR4 being modified to look like the Ferrari 'Berlinetta'. However, I have so far given you the ultimate in model car collecting and something which to set your sights in the future, should you be interested in starting a collection.

Choosing your models

The first step in starting your collection is to try and decide which type of models appeal to you the most For example, Vintage or Veteran, Sports Cars with perhaps a racing and rallying background, modern cars or out-and-out racing cars.

The second and possibly the most difficult decision is to choose the scale you propose to collect. The biggest obstacle for collectors is that there is no such thing as a constant scale even by the manufacturers that are mass producing various models. However, it is generally agreed that the accepted scale today is 1/42nd, although to obtain some models for your collection you may, at a later date, have to purchase 1/40th, 1/41st and 1/43rd scale vehicles. When starting your collection, the models you have already collected or had given to you over the years, may help you with your decision in deciding the type of collection you will build.

However, taking the view that you have never purchased a model car in your life, at the bottom I have given a range of models, under their various headings and have picked out for illustration one of each, which in my opinion, are the best of its type.

I have assumed either that you would base your collection on the 1/42nd or 1/43rd scale. However, if you do that, it should be mentioned that you would be leaving out what is possibly the most sought after range of Matchbox 'Yesteryear' series. This particular range has probably started more people collecting than any other. The two reasons for this, I feel, are the very reasonable price at which they sell and the availability of them in this country. Also, of course, the excellent detail that has been incorporated in some of the models.

Specialising in collecting

Just recently I have come across many collectors who specialise in collecting not just one range or even one type of model. For example, one collector only buys models of Fiats 1/43rd scale, while another collector buys Renaults irrespective of manufacture. Many enthusiasts build up collections that will fit in with their trains 'OO' or 'HO' scale, but by far the most specialised of collectors is the military vehicle collector. I was surprised to discover that they have their own society and monthly magazine and on looking into it further, I have discovered that there are at least four manufacturers who produce models to cater specifically for them. For those interested they are: Denzil Skinner from England, Roskopf Miniaturmodel from Germany, Rocho from Austria, Superior Models Inc. from America.

Besides these few specialists, practically all the leading manufacturers in this country, plus French Dinky and Solido (France), also carry a small section devoted to Army equipment.

The Roskopf range, although plastic, are fairly new in this country, but I am sure they will be an enormous success with the collector. The detail is excellent and the range not only includes tanks and armoured cars, but has a selection of cannons complete with beautifully machined brass barrels.

Modelling kit collection

Although only touching very lightly on part of model car collecting, I hope I have been able to put over the enthusiasm which prevails in this hobby.

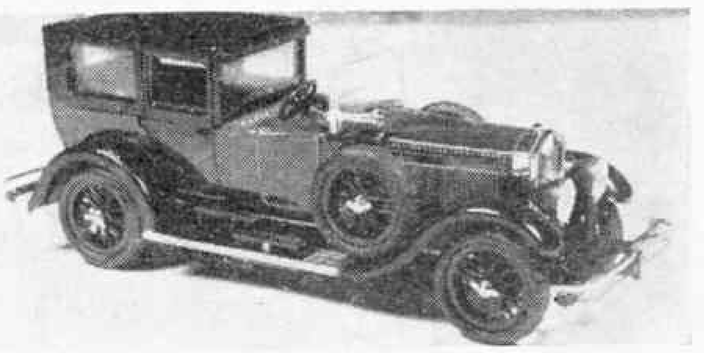
Corgi—Ferrari Formula 1 1961

The sections of model car collecting I have not mentioned include the assembly kits, of which there are many and also miniature motor racing, which seems to be featured more and more in the hobby magazines.

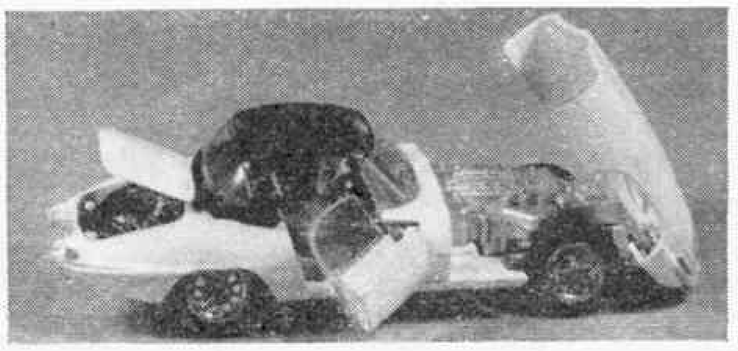
However, from the foregoing, you will see that you have a very wide range from which to choose and once having decided on your approach to your collection, you will spend many enjoyable hours not only looking for many of these models, but keeping a lookout for models which have either just been released or have just become available in this country from abroad.

Solido—SSK Mercedes 1928

Mercury—Maserati 3500 GT



Rio—Issotta Franchini 1927



Tekno—Jaguar E-type

COLLECTOR'S ITEMS

Vintage and Veteran	
Rio—Issotta Franchini 1927	35s. 0d.
Solido—SSK Mercedes 1928	27s. 0d.
Ziss—Opel Doktor 1909	12s. 11d.
Rami—Delauney Belleville 1904	12s. 6d.
Corgi—Bentley 3½ litre 1927	9s. 11d.
Sports & G.T. Cars	
Dinky—M.G.B.	5s. 0d.
Solido—Ferrari 2.2 Saloon	11s. 6d.
Tekno—Jaguar E Type	15s. 0d.
Corgi—Aston Martin Competition	5s. 6d.
Mercury—Maserati 3500 GT	13s. 3d.
Modern Cars (other than Sports)	
Dinky—Morris 1100	4s. 11d.
Spot-On—Volvo 122S	5s. 6d.
Corgi—Ghia	8s. 6d.
Solido—Ford Thunderbird	11s. 6d.
Tekno—Volkswagen	6s. 6d.
French Dinky—Citroen 2CV	10s. 3d.
Mercury—Fiat 2300	15s. 10d.
Racing Cars	
Dinky—B.R.M. Formula 1 1962	3s. 11d.
Corgi—Ferrari Formula 1 1961	4s. 3d.
Solido—Lotus 18	8s. 6d.
Tekno—Cooper/Norton 500	6s. 3d.
Mercury—Ferrari Super Squalo	8s. 3d.

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