Fly the supersonic Concord! Details inside

meccano magazine

March

1s.6d.

the practical boy's hobbies magazine

1965

IN THIS ISSUE

- Build a radio controlled boat
- News of the latest VTOL aircraft

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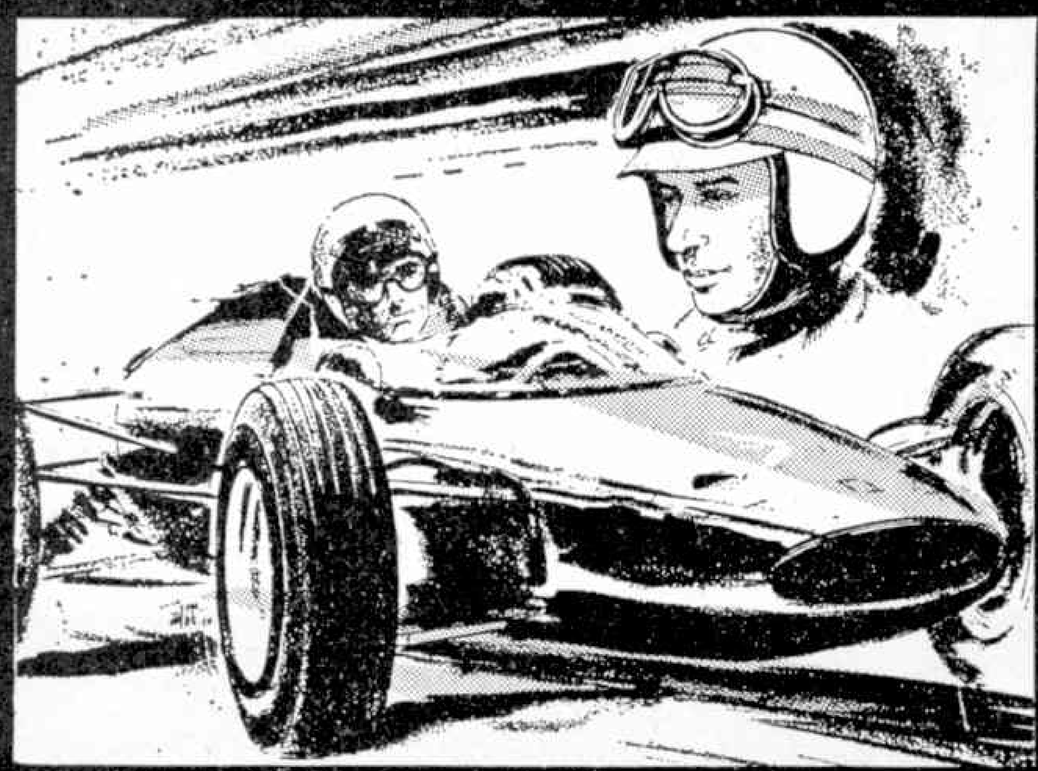
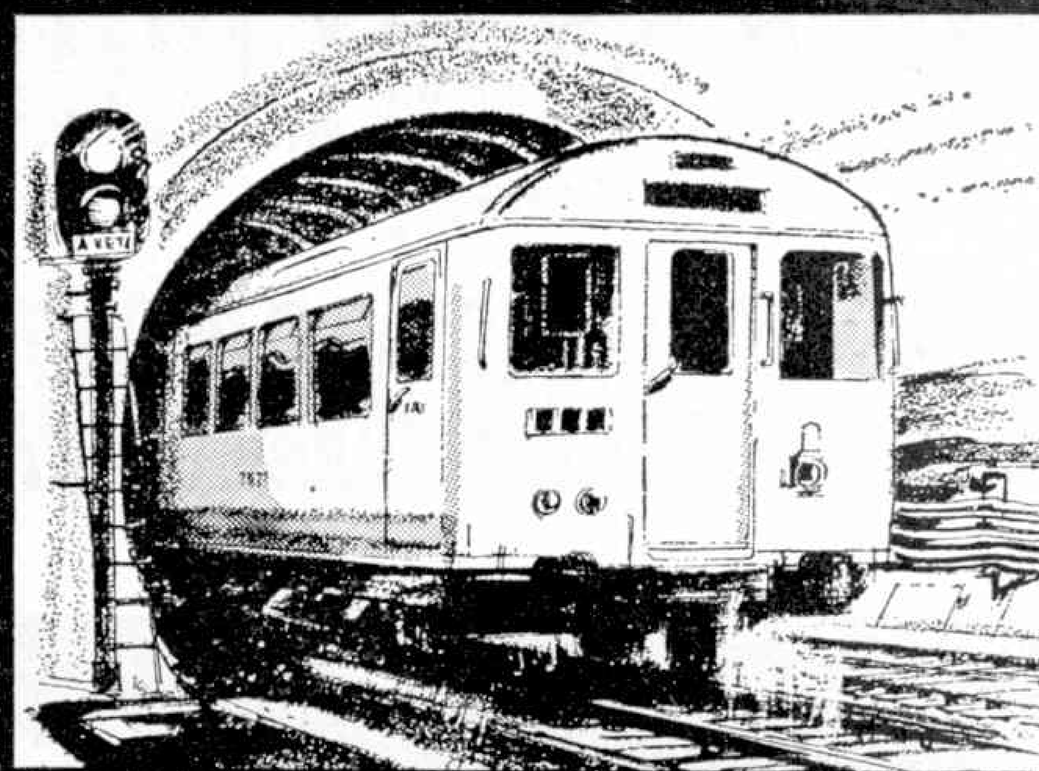


1964 WORLD CHAMPION

Amazing John Surtees. Already the holder of seven World Motorcycling Championships, he is now the World Champion Racing Car Driver! He is, in fact, the first person to carry off the 'double' on two and four wheels. And yet until 1959 he had never even seen a car race! John Surtees, like the winners of every World Championship Grand Prix over the last six years, sped to victory on Dunlop tyres.



RIDING ON RUBBER

When next you ride on a London Transport silver train you may notice how smoothly it glides along. This is because the newest trains are fitted with Metalastik suspensions—made by a Dunlop Company. Made of rubber bonded to metal, these suspensions not only reduce noise and vibration but are lighter and need no oiling. They are also used on underground trains in Stockholm.

CRAFTY IDEA

Boat owners often make their decks and cabin roofs extra smart and weatherproof with Dunlop Trakmark. This is a canvas-backed plastic sheeting which is simply stuck onto any surface. It is made in many gay colours, and now Dunlop have introduced two new patterns which are coloured and grained to look exactly like Teak or Mahogany wood planking. So a craft can be made to look luxurious at very low cost.

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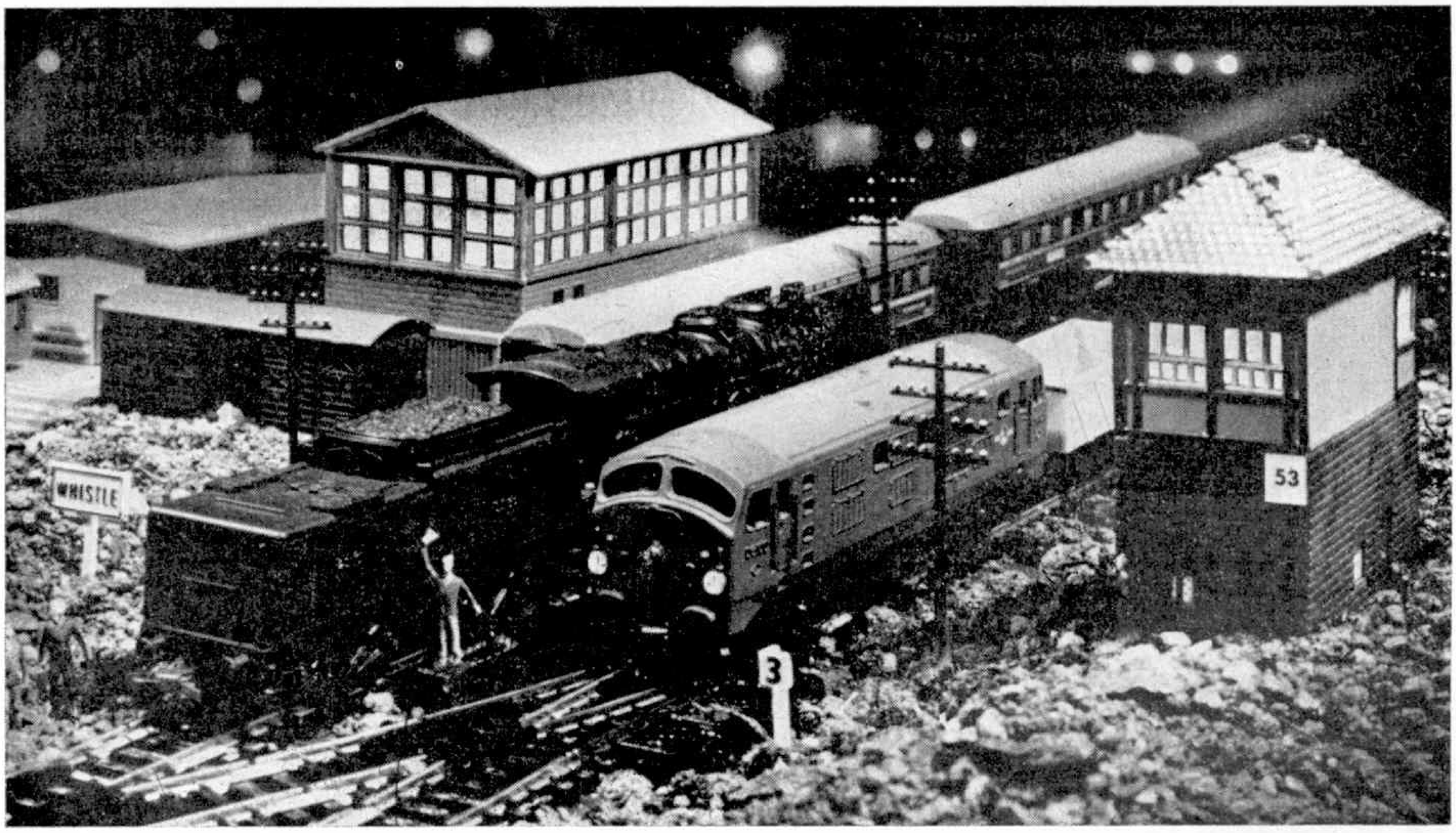

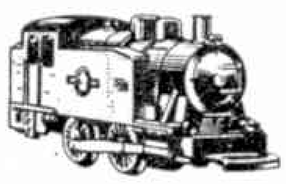

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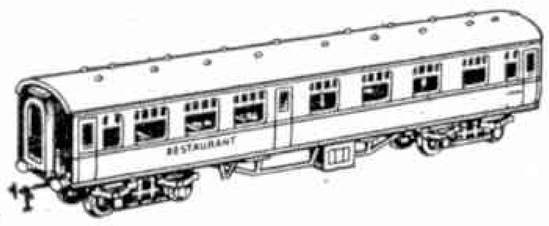

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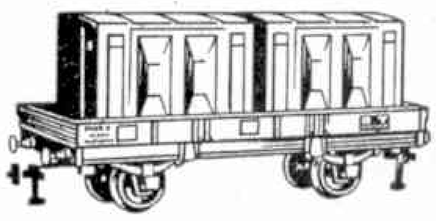

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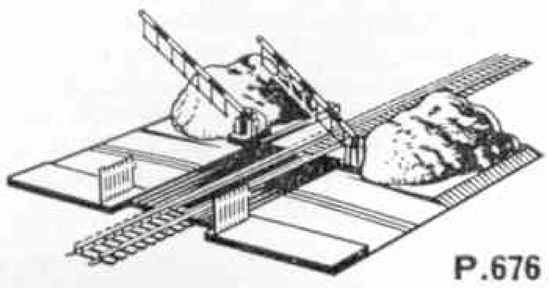

P.676

Here are just a few examples from the Playcraft Railways range :
P.831 *Tank Loco 35/-*
P.345 *B.R. Restaurant/Kitchen Car 9/-*
P.642 *Cement Wagon 5/-*
P.676 *Power operated Level Crossing 25/11*

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meccano magazine
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March 1965 · Vol. 50 · No. 3 · Monthly

A Service to readers

RECENTLY, I had the pleasure of meeting many of you at the Schoolboys' and Girls' Exhibition at Olympia in London. Readers young and old flocked on to the Meccano Magazine stand at the exhibition and plagued the staff with questions about the magazine, Meccano products and other items they had seen advertised in our pages. In many cases we were able to answer their queries, but unfortunately, when it came to products other than those produced by Meccano Ltd., we were stuck.

The reasons for the inability to answer what must seem simple questions are, of course, obvious. It is impossible to know all about every product advertised in the magazine. However, should you read an advertisement, find it interesting and wish to know more about the product, then you can write to us for further information.

A reader's enquiry form is featured at the back of this issue which lists all of the advertisers in the magazine. All you have to do to obtain complete information about the product in which you are interested is to tick alongside the manufacturer's name and send the form into Meccano Magazine at the above address.

While on the subject of advertising, I would like to point out that Stern-Clyne, one of Britain's most well-known suppliers of electronic hobbies' components, mentioned that they were able to supply all equipment referred to in our radio-controlled boat articles. Unfortunately, although they are able to supply many of the individual components, the actual kit mentioned in the articles is not available from Stern-Clyne. However, Mr. F. C. Judd, our radio electronics expert, will shortly be reverting to the more normal hobby of radio electronics and in this case, Stern-Clyne will be able to supply all components mentioned.

Large scale modelling

For 55 years, Bassett Lowke of Northampton have run a shop at 112 Holborn, London, opposite Kingsway Underground Station. During this period they have specialised in steam locomotives with gauges suitable only for use in the open air. Ideal, in fact, for running in the large back gardens of the old Victorian houses.

However, the demand for the larger working models has dwindled considerably and although Bassett Lowke will continue to supply the larger model components for the enthusiast, the organisation has been taken over by Beatties of London. This means that, in future, added emphasis will be given to the smaller gauge sets.

A new Editor

After many years of producing Meccano Magazine, Geoffrey Byrom has unfortunately left the editorial chair. It will be an extremely difficult job to replace him, for I, Charles Deane, have stepped into his shoes as Editor and already I am discovering the many problems which he has had to overcome in producing a magazine each month.

I would like to take this opportunity of thanking all readers for your support in the past and hope that I can serve you in the future as well as Geoffrey Byrom has managed to serve you in the past.

The Editor

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Front Cover: *The boat featured on this month's cover is the actual model which was built by our electronics expert, Mr. F. C. Judd. Full details of how this model was built, plus the principles of radio control have been shown in the past two issues of the magazine.*

Buried beneath the Arctic Ice Pack, the U.S.S. Nautilus made history by reaching the North Pole under water!

UNDER THE NORTH POLE

THE United States Submarine Nautilus was the first vessel to prove that atomic power could safely be used to propel vessels over and under water. In fact, with her first charge of atomic fuel, a piece of enriched uranium weighing about eight pounds, the Nautilus travelled 60,000 miles, a distance equal to nearly three times round the world at the equator!

It was during this 60,000 miles that the Nautilus made the historical trail-blazing undersea journey beneath the ice-pack of the Arctic to open a new route through the North West Passage. A northern route between the Atlantic and the Pacific oceans has long been the goal of seafarers throughout the centuries. But only five surface ships have ever managed to thread their way between the icebergs and islands of North America to complete the crossing from one ocean to the other.

With a speed of approximately 20 knots when submerged, the Nautilus only took four days to complete the journey. During this time the vessel travelled underwater from the Bering Strait, off Alaska, to surface between Greenland and Spitzbergen.

This was in August 1958 and since then at least four other United States submarines have made this exciting voyage. In fact, the largest vessel of the fleet, the United States Submarine Triton, remained under water for 84 days to complete the first submerged journey *right around the world.*

Oddly enough, with all the present-day navigation aids fitted to atomic submarines, it was with the help of a log book compiled 150 years ago by a British navigator, that a shorter and less round-about route was discovered through the legendary passage.

In this instance, it was the U.S.A. Seadragon that made the Under Pole trip from Portsmouth, New Hampshire, to Honolulu, a distance of 8,000 miles that began on August 1st, 1960, and ended September 14th, just 45 days later.

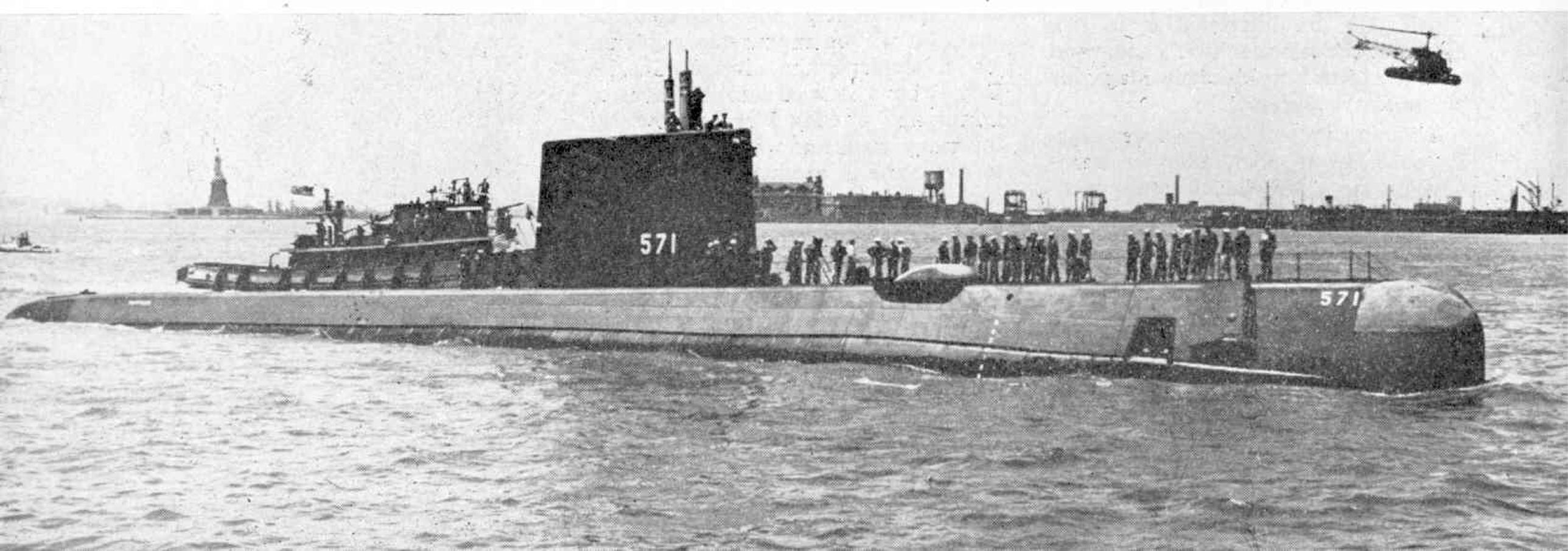
During this trip, Seadragon not only visited the North Pole under water, but also dived deeper than any submarine had been before. In Baffin Bay, she went under one iceberg that was 1,400 feet long and extended 300 feet down into the sea.

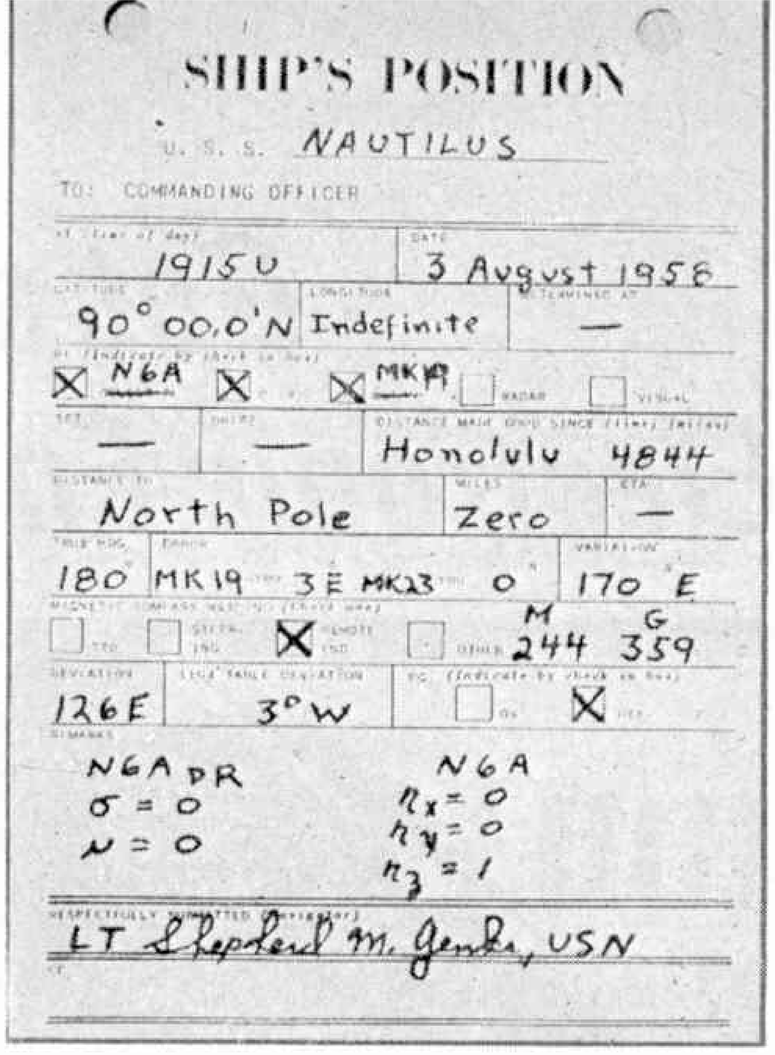
Principles of Power

All of these epic voyages by the American atomic submarines have only been made possible by one item, the nuclear reactor power unit. Only with this amazing invention of this scientific age could a vessel travel 60,000 miles without refuelling. If normal fuel oil was used to propel the vessel, using a conventional engine, approximately 3,000,000 million gallons would have been required.

Surprisingly, the principle of the nuclear power unit is relatively simple. The nuclear reactor itself can be likened to a fire which superheats liquid sodium metal under pressure. This sodium metal is then pumped through pipes to a heat

USS NAUTILUS—The first vessel ever to make the under sea journey beneath the Arctic ice pack thus establishing a Northern Route between the Atlantic and the Pacific.





SHIP'S POSITION

U. S. S. NAUTILUS

TO: COMMANDING OFFICER

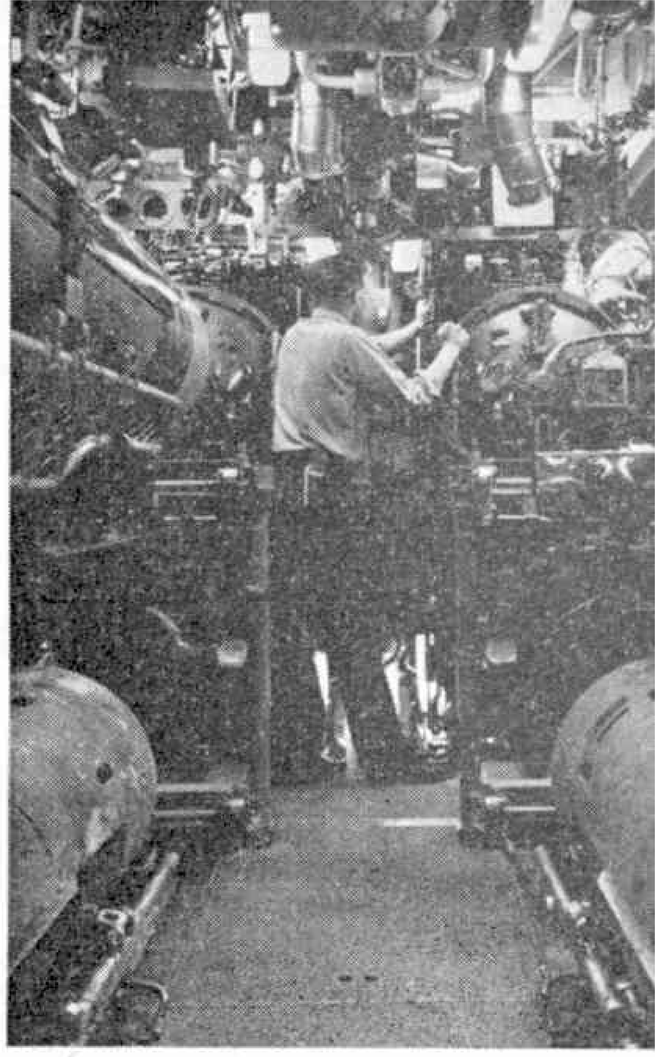
1915 U		3 August 1958
90° 00.0' N	Indefinite	—
X N6A X	X MK19	RADAR VISUAL
—	—	Honolulu 4844
North Pole	Zero	—
180	MK19 3E MK23 0	170 E
		M 244 G 359
126E	3° W	X

REMARKS

N6A DR
$\sigma = 0$
$\mu = 0$

N6A
$n_x = 0$
$n_y = 0$
$n_z = 1$

LT Shepherd M. Genke, USN



Left: Checking the operation of the inertial navigational system which is used to assist in exactly positioning the craft. Middle: the ship's log as repeated to the Captain at the North Pole. Right: Routine checking of instruments as the submarine speeds beneath the Arctic towards the North Pole.

exchanger or boiler, where it turns water in the boiler into steam. This steam then passes on to drive a turbine, which in turn drives the propeller, via a reduction gearbox. The 'used' steam from the turbine then travels to a condenser unit where it is turned into water before recirculating into the heat exchanger.

This recirculation of liquid sodium metal and water, in both the nuclear reactor and heat exchanger, means that the power unit will run until the atomic material in the reactor is exhausted and, as already mentioned, this takes some considerable time. In fact, it has been proved that the modern submarine's performance is only really limited by the human crew. The strain of being submerged hundreds of feet below water in a confined space is considerable and, consequently, modern submarines have to provide as many of the 'home' comforts as possible for the men on board.

Entertainment beneath the sea

Film shows, libraries, entertainments and, in some cases, even a daily news sheet are provided to allow the crew to relax in their off-duty periods. During the Triton's eighty-four day journey beneath the sea, only twice did the vessel broach or raise her conning tower above the sea's surface. The first time was off South America to transfer a sick member of her crew to a U.S. cruiser and the second time, after circling the earth, was near Spain. With only the conning tower above water, the Triton's commander, Captain E. L. Beach, transferred a bronze plaque honouring Magellan to a U.S. destroyer. This was especially made to commemorate the trip and was to be placed on a monument to the explorer in Cadiz.

The morale of the men aboard the Triton remained high throughout the cruise, although each man had been examined prior to the trip to test his ability to adjust to close association during long confinement. However, no round-the-world trip would seem complete without some 'sightseeing', and this was accomplished at frequent intervals by raising the periscope to carry out the photographic assignment. In fact, whenever the sight was interesting, the captain permitted Triton to linger long enough for all aboard to see the sights above the sea. Apart from the radio broadcasts received aboard ship, this was the only contact the men had with the outside world. The opportunity to see sunshine, islands, cities, small boats and human beings created some excitement on board the Triton.

What will be the next fantastic feat of the nuclear powered submarines of the United States? This is difficult to say, but apart from their importance as an efficient machine of war, they have also been extremely important in developing and proving a completely new method of propulsion. Already work has started on building atomic merchant ships, and experiments are being carried out to discover how atomic power might be applied to aircraft. How long will atomic flight take? Only time will tell!

The watch crew keep close watch on the controls as the ship passes under the ice cap.

Underwater Song Fest: Members of the Crew gather for close harmony in the Chief Petty Officers' mess.

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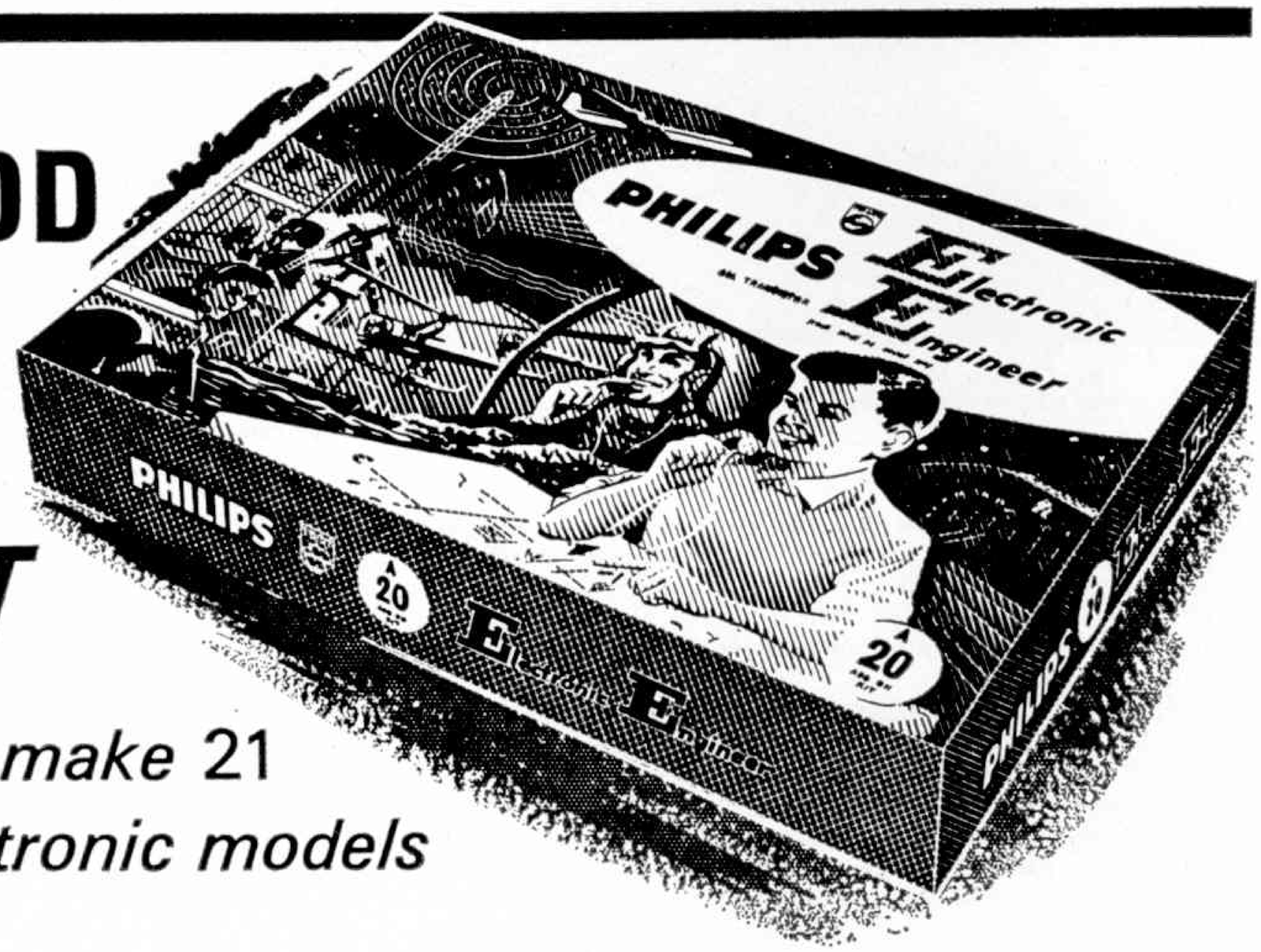

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NOTE: You cannot use the A20 kit without the basic Philips EE8 kit. If you haven't got an EE8 kit, what a lot you're missing! Makes 8 super working models from 1 kit. Complete 100-page manual. No soldering. Absolutely safe. No previous experience necessary. **EE8** Price **99/11.**

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(EK04)

mailbag

Anything interesting . . . write about it to the editor

LONDON'S POLITEST CLOCK—London's politest clock is the sign of a hat shop in the Old Kent Road, London. Its dial is surmounted by a figurehead of a man wearing a bowler hat. Punctually at one o'clock each day, the hat is raised to passers-by. The clock illustrated in the photograph here is outside the store which was established over 100 years ago in 1851.—*R. D. Barrett-Lennard, London, S.W.5.*

ELECTRICS ENTHUSIAST—I am fifteen years of age and I have been interested in Radio Electronics for a number of years. In the December issue of your magazine you described how to build a volt/ohm meter. This I have done, although I have made a few alterations with regard to the outward connections of the ohms reading sockets. Instead of running the 10, 50 and 100 volts connections to their individual sockets, I connected the leads to a four-pole, single throw switch. This modification has proved very successful and I have also housed the unit in a Perspex case, 2 inches by 4 inches by 6 inches.—*J. Duggan, Normanton, Yorks.*

A WOODPECKER SPOTTED—Many different varieties of birds visit the bird table in my garden, so I borrowed my father's camera to take some photographs of them. I soon had photographs of the blue tit, the great tit and also, the nuthatch. However, it took me two days of patient waiting to get this photograph of the greater spotted woodpecker.—*T. Fryer, Horsham, Sussex.*

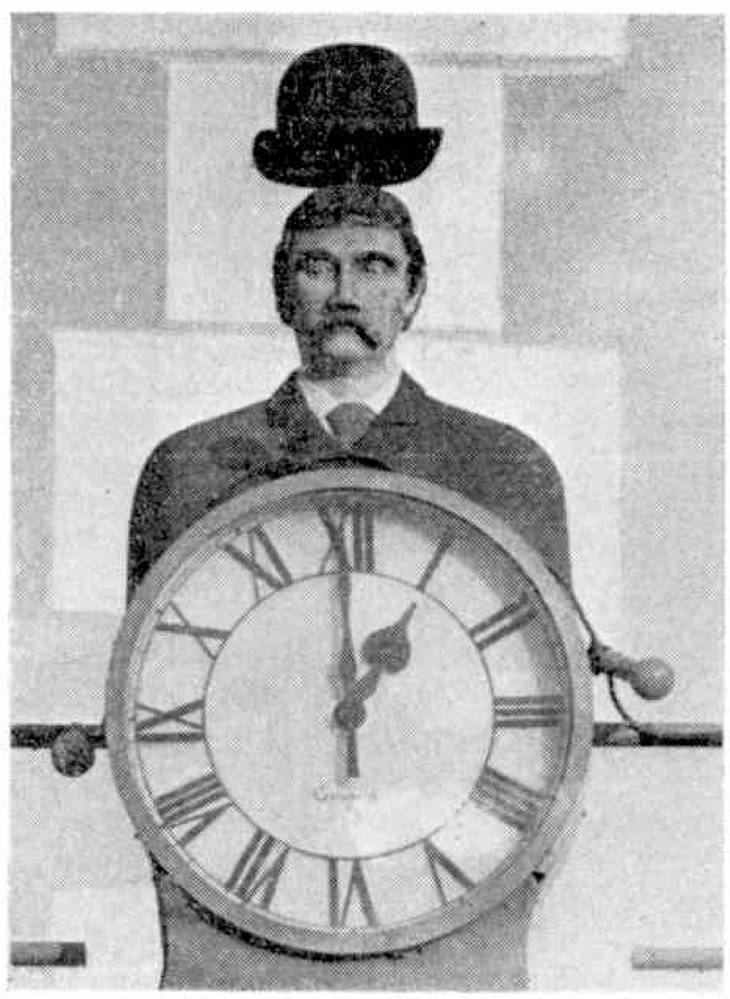
Congratulations on your patience and thank you for sending in a superb photograph of the woodpecker. By the way, readers, Master T. Fryer is only ten years old!—Ed.

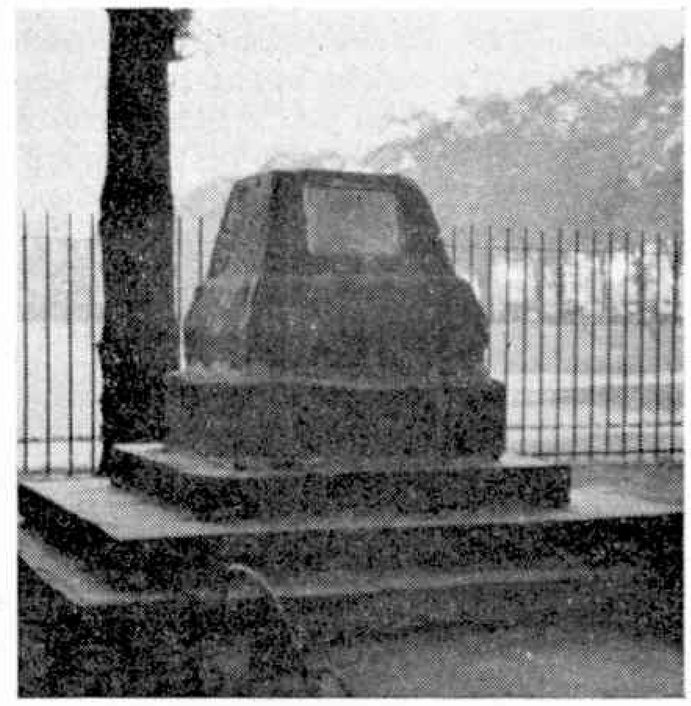
RELIC OF THE PLAGUE—In the Arboretum at Derby may be seen a curious memento of the Great Plague of 1665. It takes the form of a rough, worn stone which went by the name of the Headless Cross. This stone formed part of an ancient cross at the upper end of Friar Gate, and was used by the inhabitants of Derby as a market stone during the visitation of the plague. It was to that point that the market-people, having their mouths primed with tobacco as a preservative, took their provisions for sale and stood at a distance from the townspeople with whom they were to traffic. The buyer took the goods, and deposited the money for them in a vessel filled with vinegar, set for that purpose.—*A. B. Longbottom, Aston-on-Trent, Derbyshire.*

A RELIGIOUS CURIOSITY—India offers several oddities of interest to foreign visitors and tourists. Among them is one which is a unique religious custom observed by the Hindus of Orissa and Bengal after the celebration in October, of one of their major festivals called 'Dusserah' or 'Durga Pujah'.

During the festival, which lasts for ten days, beautiful clay images—not unfrequently life-size and most realistic—of important deities of the Hindu pantheon are modelled and then installed in roadside stalls and shrines. Thousands of sightseers visit them and comment appreciatively on the artistic design, dress and ornamentation of the images. Some of them are actually redolent of the ancient classical Greek and Italian statuary in the chaste simplicity of design and the dynamic sweep of the lines of movement, if the images happen to represent action of some sort.

The strange thing is that after these lovely statues have been worshipped and admired over ten days they are all taken in ceremonial procession to the nearest river and after being disrobed and shorn of all their costly ornaments they are *immersed in the waters forever*. Again vast throngs watch this 'immersion ceremony', which might go on even a whole day. And the following year sees the building of more images some even more artistically wrought than preceding ones. One wonders why this queer custom is followed, uninterruptedly, year after year, considering all the time, labour and expenditure involved in making and installing the images.—*F. W. Saunders, Stewart School, Cuttack, India.*





Above: The Headless Cross at Derby which was the site of the market during the Great Plague.

Extreme left: The Woodpecker is caught making yet another peck.

Left: London's politest clock raising his hat at 1.P.M.

FACTS ABOUT RADIO CONTROL

Part III by **F. C. Judd A.Inst.E.**

THE invention of 'printed circuits' has greatly simplified the construction of radio and electronic equipment, for all one has to do is to fit the components to the appropriate holes and solder the wires. Printed circuit boards consist of a paxolin board coated on one side with a thin layer of pure copper. The 'circuit', which is the actual wiring between the components, is first printed on to the coppered side with a special acid resisting ink. The whole board is then put into an acid solution, which dissolves away the unprinted parts of the copper. Finally, the acid resisting ink is washed off, leaving the bright copper connections all over the board. Holes for the components wires are drilled and the component values or numbers are printed on the reverse side.

The complete kit for a printed circuit radio control receiver is shown in Fig. 1. This is the Macgregor transistorised carrier wave receiver, which was chosen for the Graupner Chris Craft motor launch described last month.

The construction of this receiver is simplicity itself and the kit is, of course, complete with a comprehensive instruction booklet which contains all the necessary wiring and installation plans. However, to emphasise the simplicity of printed circuit construction, I have included Fig. 2, taken from the instruction book, for this shows the layout and physical size of this little receiver.

How the Receiver Works

The Macgregor carrier wave receiver is ideal for beginners and most suitable for medium-sized model aircraft and boats, for it weighs only 1¼ ozs. It is extremely sensitive because it employs a super-regenerative' oscillator - cum-

Fig. 1 The Macgregor printed circuit radio control receiver kit

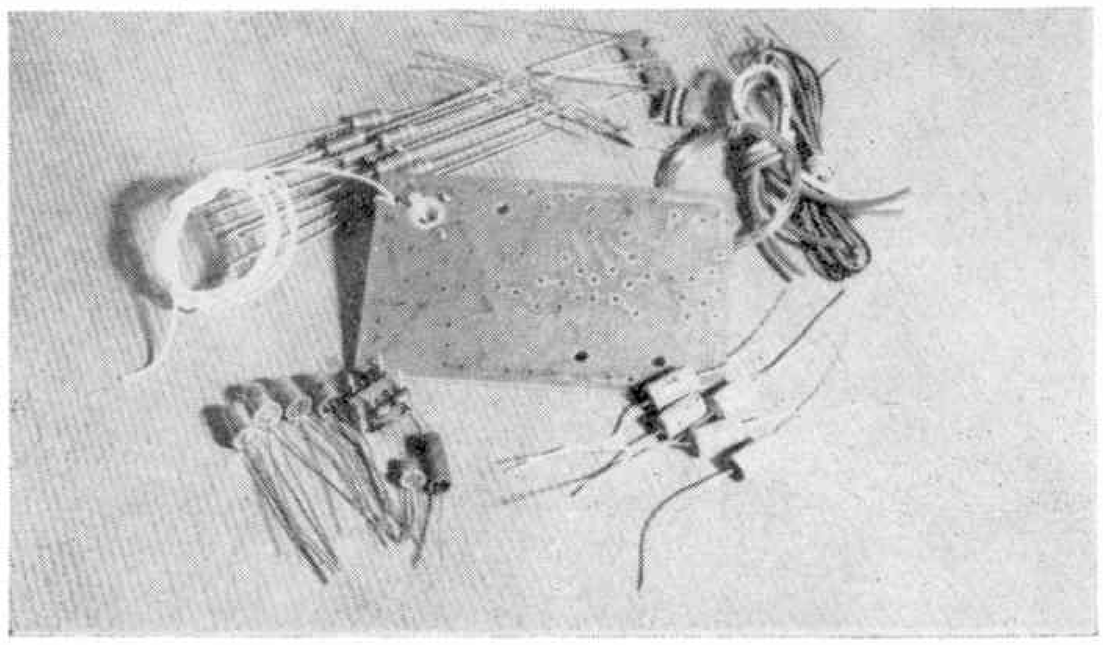
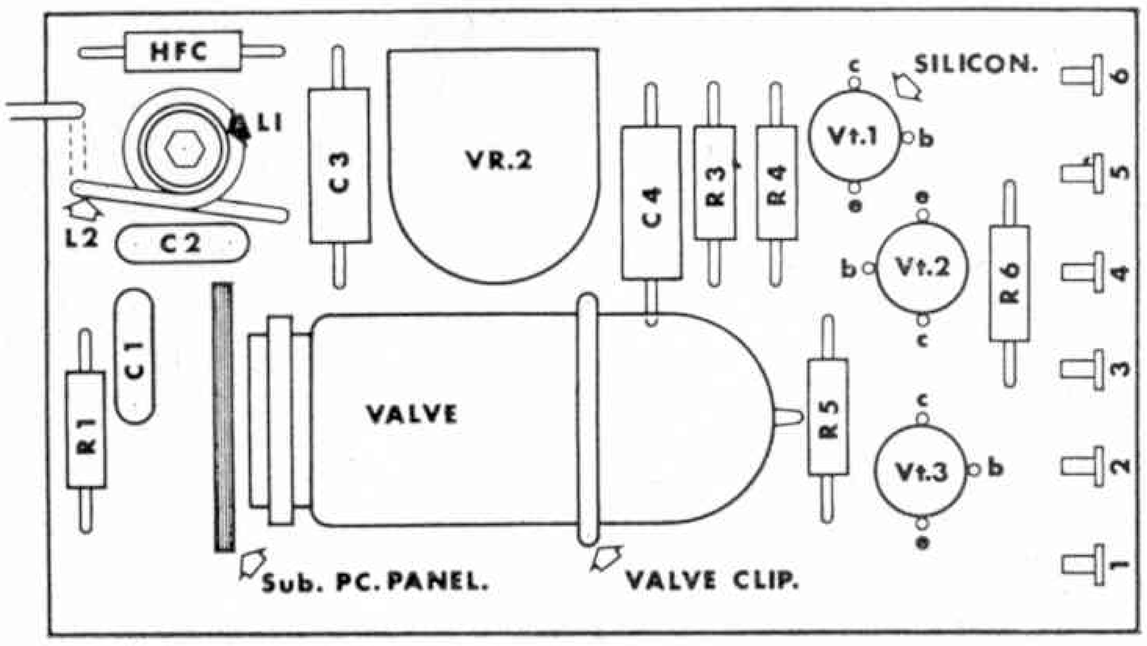


Fig. 2 Actual size of the Macgregor radio control receiver



detector. It will respond to the average radio control transmitter at several hundred yards and requires only an 0-5 mA meter to tune and test it for correct operation. Apart from being simple to construct and adjust, this receiver employs a silicon transistor instead of a relay to directly control a steering and engine actuator such as the 'Kinematic' system, also described last month and which is recommended for the Chris Craft launch.

The receiver will operate with any carrier wave transmitter and here I have chosen the Macgregor transmitter which also employs a printed circuit and is therefore easy to build. Both the receiver and the transmitter can also be modified for simple tone operation if desired at a later stage.

The receiver operates from dry batteries, which include a 1·5 volt cell for the detector valve heater, a 22 volt high tension supply for the valve and transistor amplifiers and a 4½ volt battery for the actuator. Current consumption from the batteries is quite low, so the receiver is economical as far as running costs are concerned.

Now a word about printed circuit soldering. This requires great care but a good deal of guidance on soldering is given in both the receiver and transmitter instructions. The makers say that many of the receivers sent to them for servicing have failed only because of poor soldering. It is therefore important to observe the rules of good soldering, which are the use of an electric iron with a 'pencil bit' about $\frac{3}{16}$ inches in diameter. The tip should be kept meticulously clean and tinned and only resin-cored flux should be used. This is supplied with the transmitter and receiver kits.

Installing the receiver

The photograph (Fig. 3) shows how the receiver is mounted in a block of foam plastic glued between two wood strips across the hull. One of the strips is part of the deck support, so it is only necessary to make one more and glue in position. The block of foam plastic is hollowed out with a model knife, just deep enough to let in the receiver. This will help protect the receiver from shock if the model should go head-on into a hard bank. Some boating ponds have concrete surrounds!

Just to the left of the receiver can be seen a solder tag strip, which is most useful as a joining and distribution point for the various connections to the batteries, actuator and on/off switch. These tag strips can be purchased from most radio component dealers and greatly facilitate the wiring. The receiver on/off switch is a double pole type and can be mounted at almost any convenient point near the receiver. (In the photograph, it is just to the right of the receiver, below the tag strip.)

The Kinematic actuator does not really need an on/off switch, but as a precaution against the receiver being accidentally left switched on, or short circuits, I included a switch for the actuator battery. The same applies to the drive motor, so a double pole switch was employed to break (a) one side of the 4½ volt actuator battery and (b) one side of the drive motor accumulator.

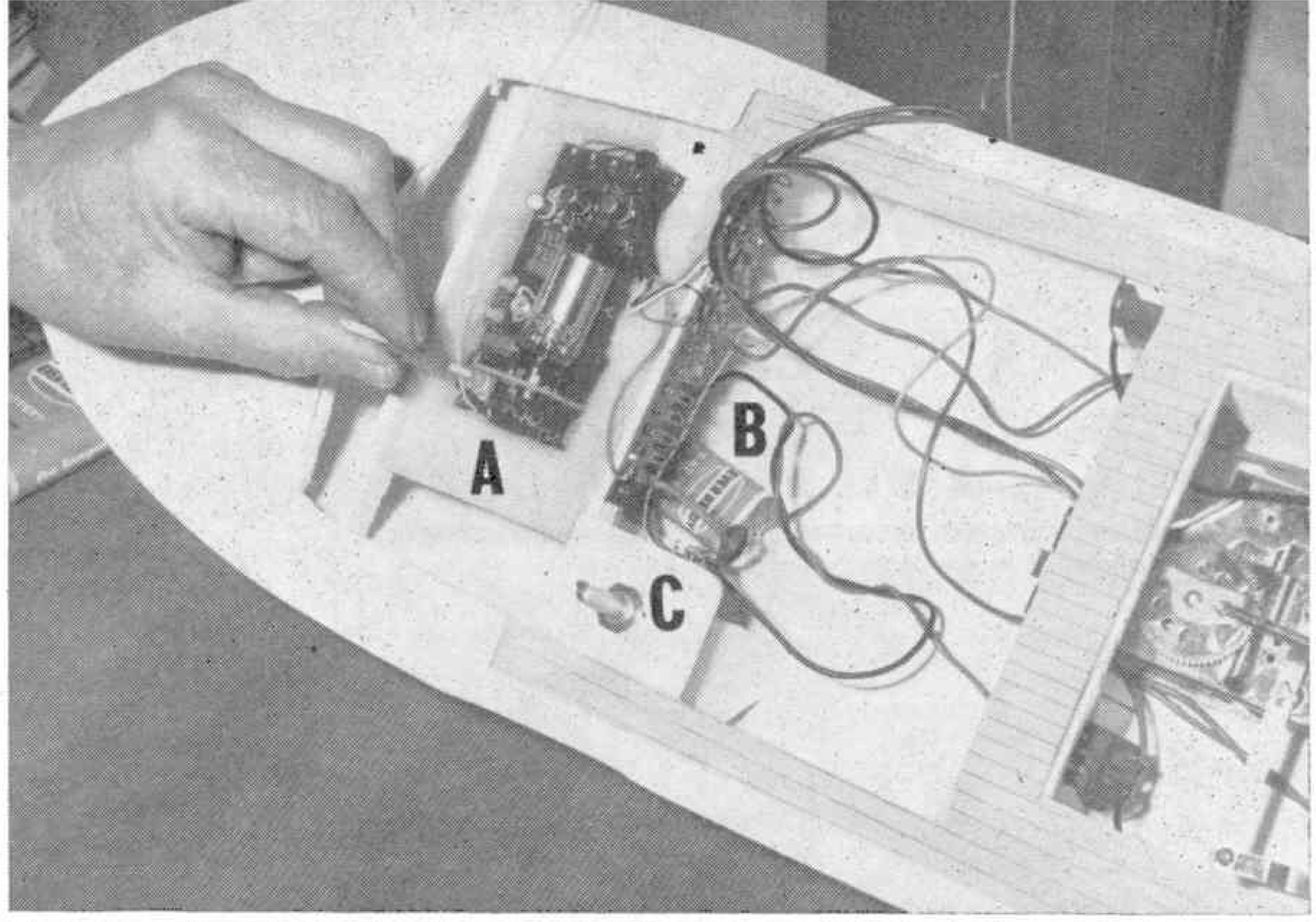
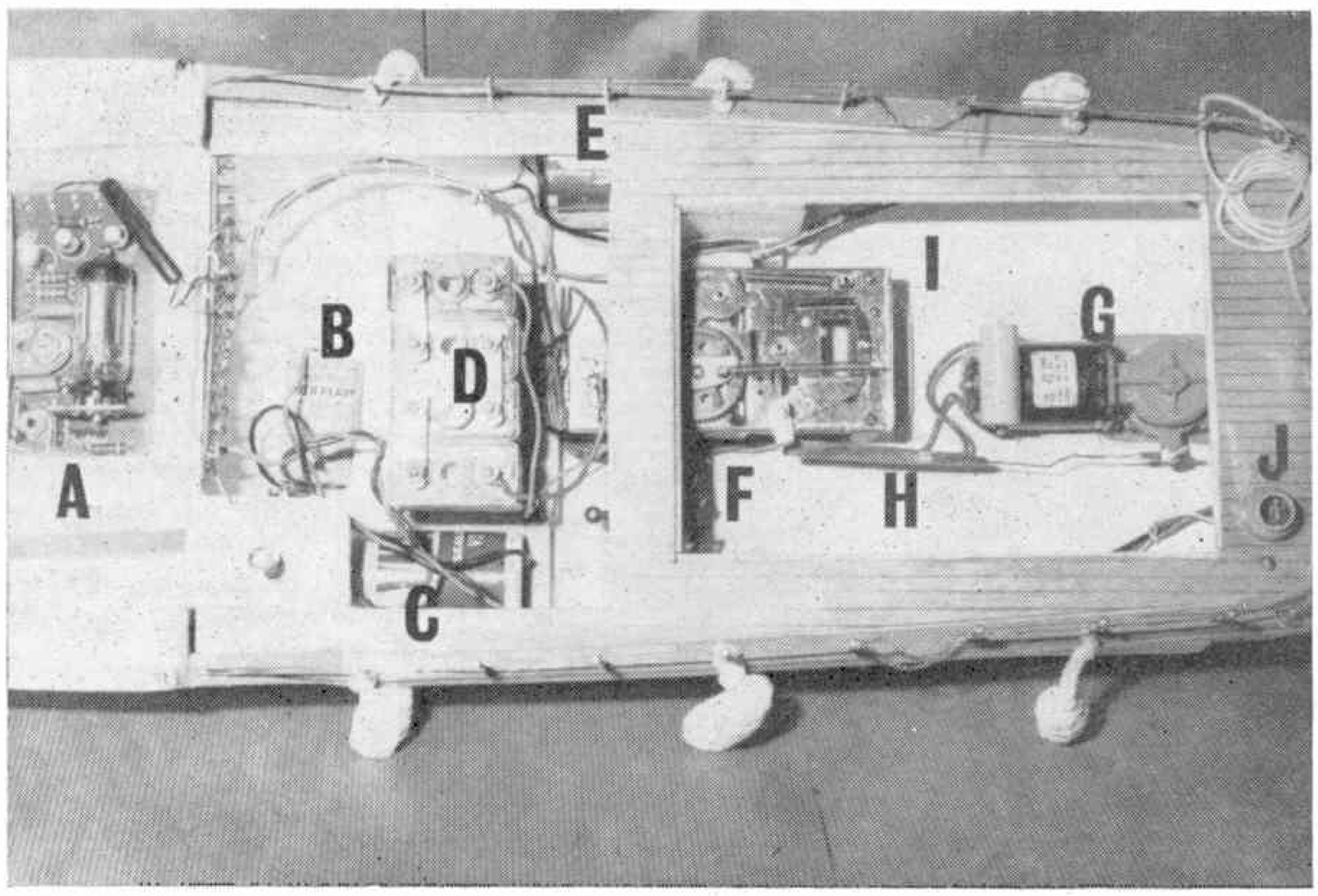


Fig. 3 The radio control receiver is mounted in a foam plastic block, glued between two strips of wood across the hull. A. Receiver. B. Tagstrip. C. Off/On switch

Fig. 4 The complete radio control system. A, Receiver. B, H.T. Battery (receiver). C, L.T. Battery (receiver). D, Drive Motor Accumulator. E, Actuator Battery (4½ volts). F, Kinematic Actuator. G, Bongo Drive Motor. H, Actuator to Steering Coupler. I, Motor Suppressor Capacitor. J, Meter Socket.



This brings me now to the distribution of the batteries and drive motor accumulator (or dry battery). It is most important that the position of the batteries are as shown in Fig. 4. Each battery can be held in position by pieces of balsa wood glued on to the hull, with special plastic glue only as supplied with the Chris Craft kit.

Before any radio or actuator tests are carried out, the model should have received its final coat of paint and preferably one coat of yacht varnish all over. If the painting has been completed, the model can now be floated in a bath of water to check that it does not list one way or the other. Squint along the top of the model to see if it sits upright in the water. Also, the waterline should slant slightly upward out of the water toward the bows. The position of one of the batteries may be altered a little to facilitate accurate trimming.

Next month I shall have a few words to say about the accumulator or dry battery for the Bongo drive motor and will also deal with the radio control transmitter and testing out the complete system. *Readers who contemplate taking up radio control are advised that a special Post Office licence is necessary for the operation of a radio control transmitter, but more about this later.*

The Macgregor Carrier Wave receiver kit Mk. 2 described in this article costs £2 19s. 6d. The Macgregor carrier wave transmitter Mk. 2, which will be described next month, costs £4 5s. 0d.

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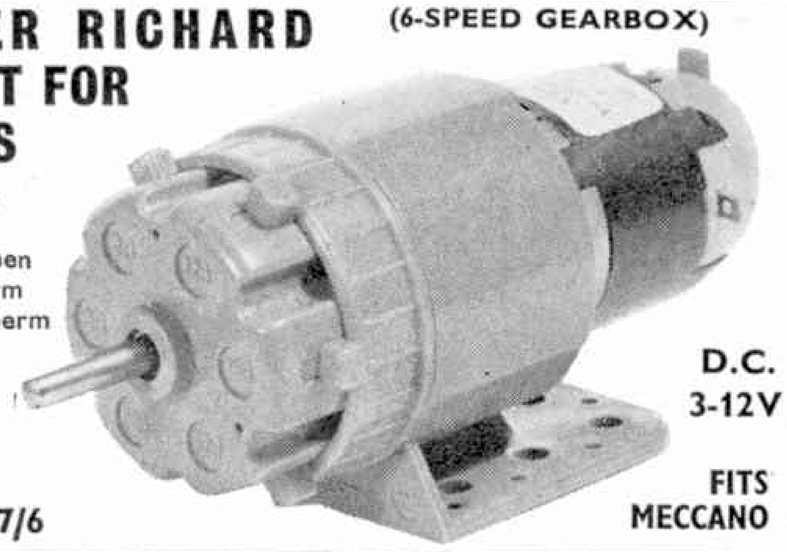

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Cycle Care

WORKING ON THE WHEELS

WE all break spokes from time to time — it's almost inevitable — but how the repair job is tackled depends to a great extent on the effect the breakage has had on the wheel. If a bad buckle develops in the rim, then something must be done right away. When on a run, with no spare spokes, some crafty work with a spoke key, loosening up spokes on the other side of the hub, can get the wheel true enough to get home. Although, if you have a spare spoke—they are always worth carrying in your tool kit — putting it in place of the broken one will probably cure the trouble completely.

Should the broken spoke have little or no effect on the truth of the wheel, you can as a temporary measure, secure the broken end of the spoke by twisting it between other spokes or take it out as shown in Fig. 1. This is done by bending the broken spoke into a crank shape and unscrewing it out of the nipple.

The job of replacing a spoke is quite a simple one. Start by taking the wheel out and stripping off the tyre, inner tube and rim tape. Insert the spoke through the hole in the hub flange first. Make sure it goes in the right direction—the head should point in the opposite direction to the two on either side. Slope the spoke in the direction of the hole in the rim and it will be seen that it crosses another spoke about three or four inches along its length. Pass the new spoke behind this other spoke and push the end through the hole in the rim. Screw on a new nipple, using a screwdriver in the head.

Put the wheel back in the forks and hold it firm by tightening up the spindle nuts. Spin the wheel. By holding a piece of chalk level with the brake blocks, you will be able to mark accurately the place where the wheel is out of true as the wheel spins (Fig. 2). Where only one spoke has been broken and replaced, tightening or loosening the new one should true the wheel. A typical spoke key used for this job is shown in Fig. 3.

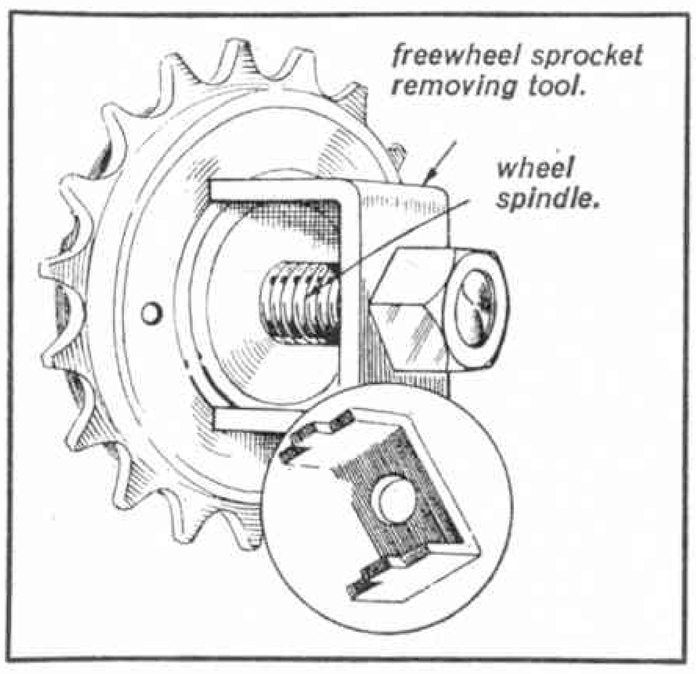
The final job and the most important one is to use a narrow three-cornered file to remove any excess length of spoke which protrudes through the nipple into the rim. See Fig. 4.

If the wheel is out of true because it has been in a collision, straightening will probably be a little more involved. A number of spokes will probably need adjustment. The thing to remember here is to do part of the truing by loosening spokes. If all the work is done by tightening, part of the wheel will become overstressed and more spokes will break.

There is a lot of skill involved in wheel building and truing — especially lightweight wheels which are quite highly stressed. Whenever possible, enlist the aid of a professional cycle repairer. It is only when the trouble is minor—just one spoke broken—or there is no cycle shop near, that it is worth while tackling the work yourself.

When buying replacement spokes, make sure they are the right length. If you have rims and hubs of standard size, this will be easy because the cycle dealer will be able to tell you the size. If they are not standard, you will have to measure the length. Get this exactly right as spokes are sold with length variations as small as $\frac{1}{16}$ in.

The gauge (thickness) of the spoke is also important. Endrick rims are usually spoked with 14 gauge plain spokes. *Plain* means the spokes are the same thickness all the way down. Lightweight wheels are spoked with double-butted 15/17 gauge. This type of spoke is very slender in its centre portion and thicker at the hub and rim ends.



Replacing spokes on the freewheel side of the back wheel presents a problem. To do the job correctly, the freewheel has to be removed. This can be got off by using a hammer and punch on the slots in the freewheel body, but this method is not likely to be very satisfactory, unless the punch is in skilled hands.

Another method is to use a special dog. This is U-shaped with two protruding tongues. These locate in the slots in the freewheel body and the dog is locked to the freewheel by tightening down the wheel spindle nut. The dog is then held in the vice while the wheel is turned to unlock the freewheel.

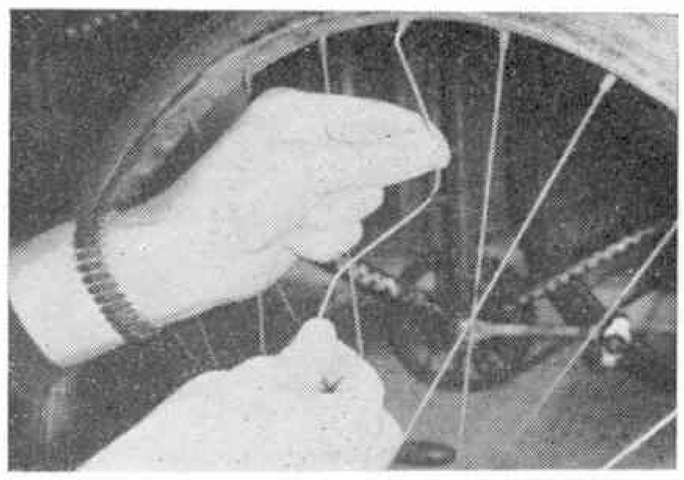


Fig. 1—Method of unscrewing a broken spoke from the wheel.

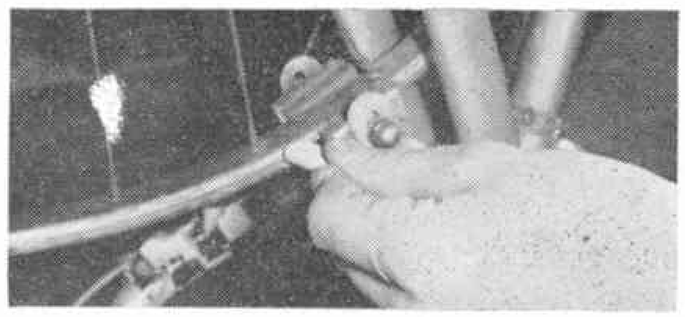


Fig. 2—Using a piece of chalk, steadied by the brake block to mark the buckled area on the rim. The chalk marks as the wheel spins. Tighten spokes opposite side of chalk marks and loosen on the same side as the mark.

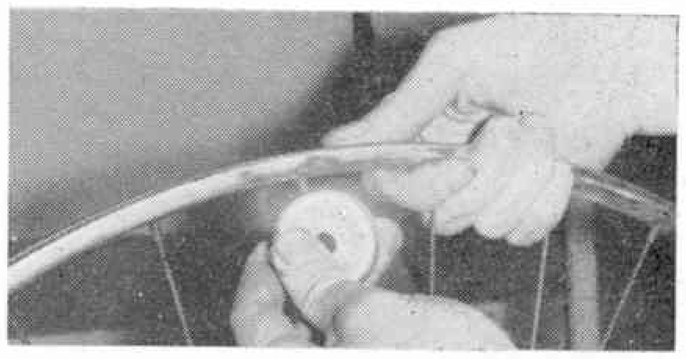


Fig. 3—A typical spoke key in use. Different size notches are cut to fit different size spokes.

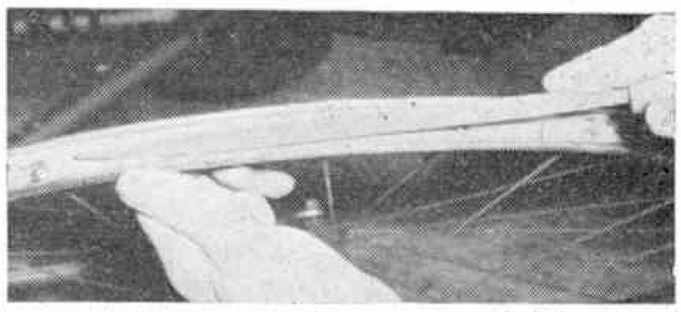


Fig. 4—Using a narrow three-cornered file to smooth off protruding spoke ends. This will stop spokes puncturing the inner tube.

In an emergency on the road, new spokes can be inserted the wrong way round to avoid taking off the freewheel. This will enable the bike to be ridden home in order that a proper job can be done.

Don't be tempted to ride around too long with spokes missing from a wheel. The other spokes are under added strain and more breakages will soon follow. Never be tempted to make repairs without removing the tyre and tube. Although it is possible to screw in a new spoke this way, the odds are you will end up with a puncture to add to your other troubles.

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THE CONCORD

Meccano Magazine presents the model of tomorrow! Build this Concord for flight or display

ALTHOUGH the new Concord has yet to fly, there can have been few aircraft that have aroused such world-wide interest. Designed to fly at supersonic speeds, the Concord will 'shrink' the earth to a size that is impossible even with present-day jet-airliners. Be the first to build a model of this beautiful streamlined delta-wing aeroplane. The model has been designed so that you can fly it as a catapult-towline glider or, if you prefer, as an eye-catching display model for your den. Carefully painted and mounted on its specially designed stand it will attract lots of attention, and amply reward you for your efforts.

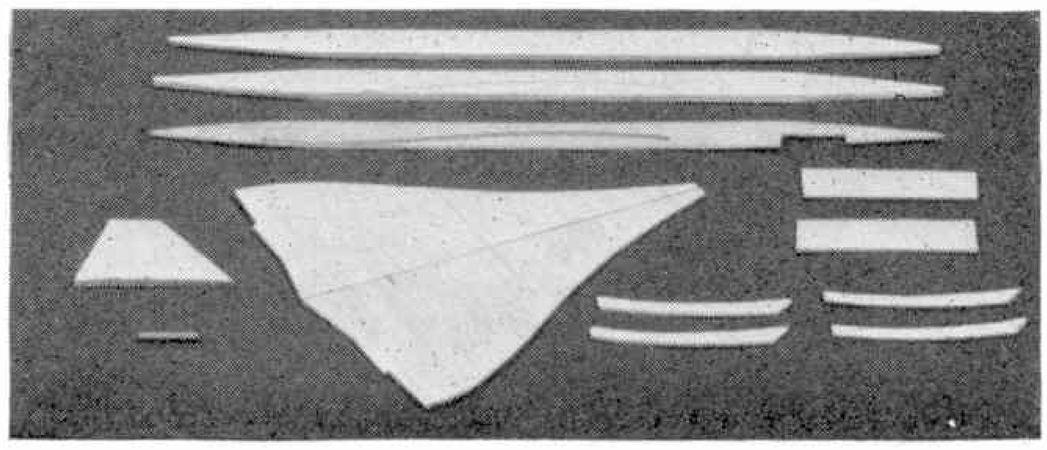
Begin by cutting the three fuselage shapes, two of $\frac{1}{8}$th inch sheet balsa and one of $\frac{1}{16}$th inch plywood. Cement these together and when dry, cut out the wing slot with a fretsaw. Take your time over this operation. Sandpaper the fuselage shape to the correct section and then give two coats of clear dope.

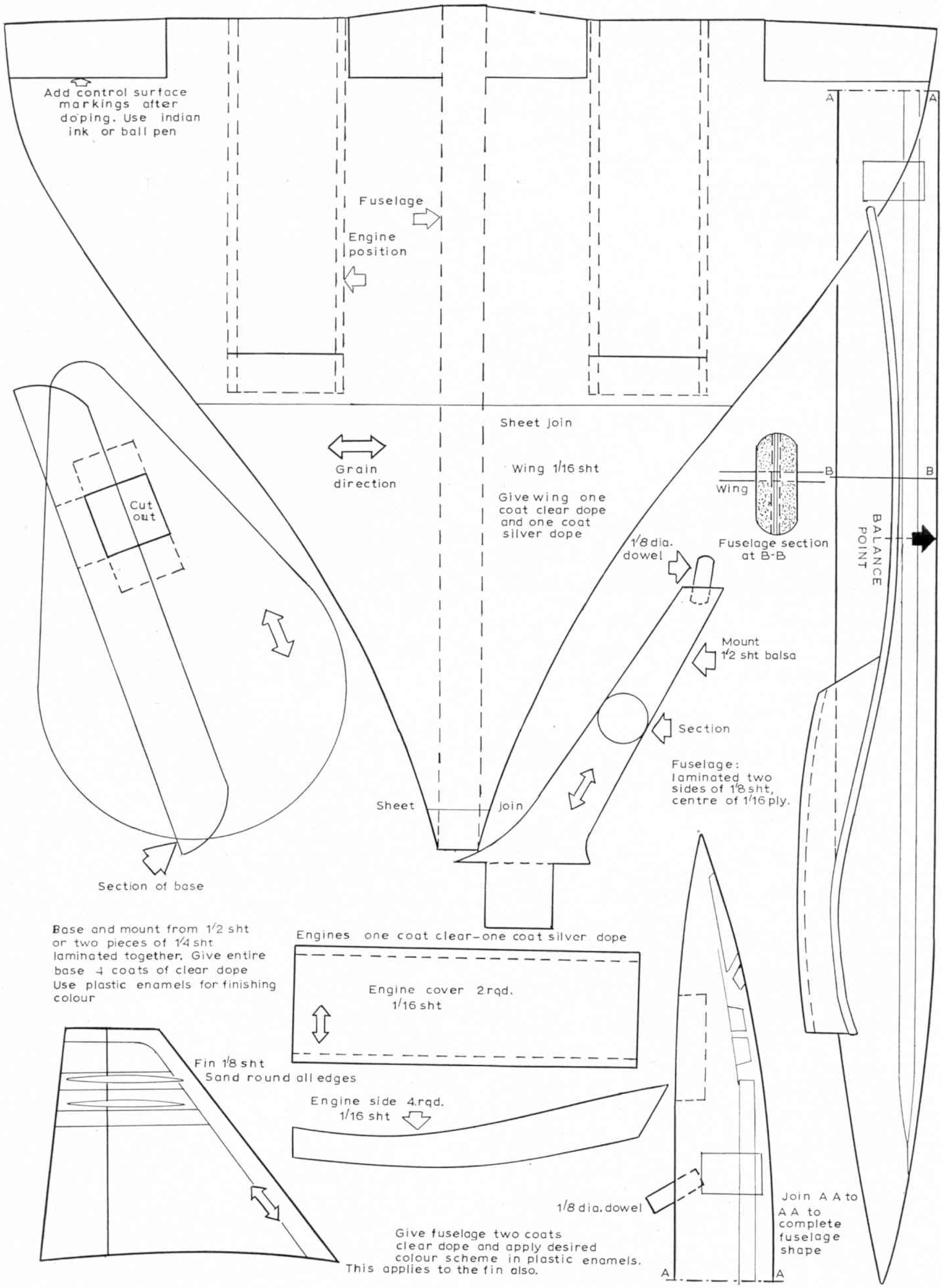
Join three pieces of $\frac{1}{16}$th inch sheet and trace on the wing shape. Cut out and round off the edges. Give one coat of clear dope and then sandpaper *very* lightly. Slide the wing into the wing slot. The wing will automatically take on the right curvature. Check that it is at right angles to the fuselage. Plastic wood can be used to form a smooth fillet at the wing-fuselage joins. Cut out the engine pieces and cement in place under the wing. Cut out the fin, round off the edges and cement to the fuselage. Make sure it is upright. Add the $\frac{1}{8}$th inch diameter dowel rod which is used for catapult launching.

If you intend to fly your Concord, it is important that you balance your model correctly. When suspended from the balance point (on the plan), the model should hang level. You will probably need a small piece of lead or folded cement tube, pushed into the nose weight recess, to obtain correct balance. It is very unlikely you will need weight at the tail end.

Test glide your Concord by launching it with wing parallel with the ground, fairly smartly into wind. Do not throw it, and choose long grass or soft ground for all tests.

Concord components—note grain direction across the wing form




Add control surface markings after doping. Use indian ink or ball pen
Fuselage
Engine position
Sheet join
Grain direction
Wing 1/16 sht
Give wing one coat clear dope and one coat silver dope
Cut out
Wing
Fuselage section at B-B
1/8 dia. dowel
BALANCE POINT
Mount 1/2 sht balsa
Section
Fuselage: laminated two sides of 1/8 sht, centre of 1/16 ply.
Sheet join
Section of base
Base and mount from 1/2 sht or two pieces of 1/4 sht laminated together. Give entire base 4 coats of clear dope Use plastic enamels for finishing colour
Engines one coat clear-one coat silver dope
Engine cover 2 rqd. 1/16 sht
Fin 1/8 sht Sand round all edges
Engine side 4 rqd. 1/16 sht
1/8 dia. dowel
Join A A to A A to complete fuselage shape
Give fuselage two coats clear dope and apply desired colour scheme in plastic enamels. This applies to the fin also.

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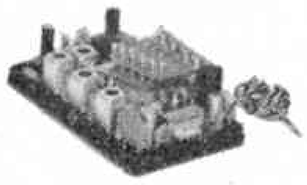

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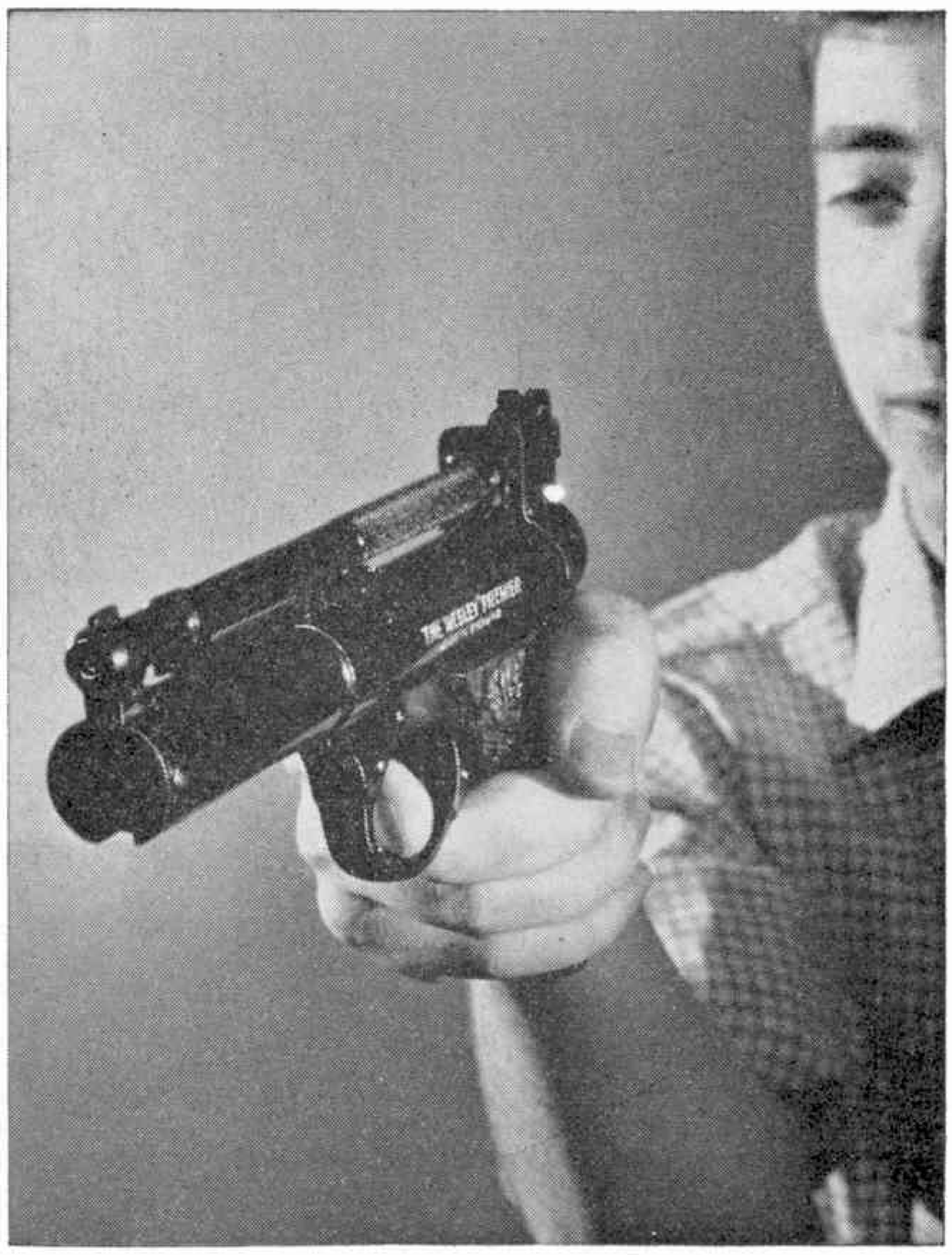

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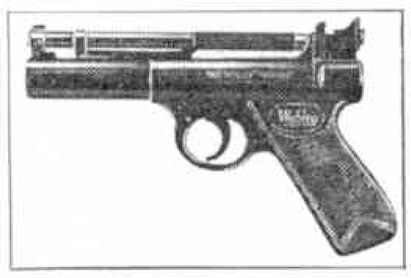

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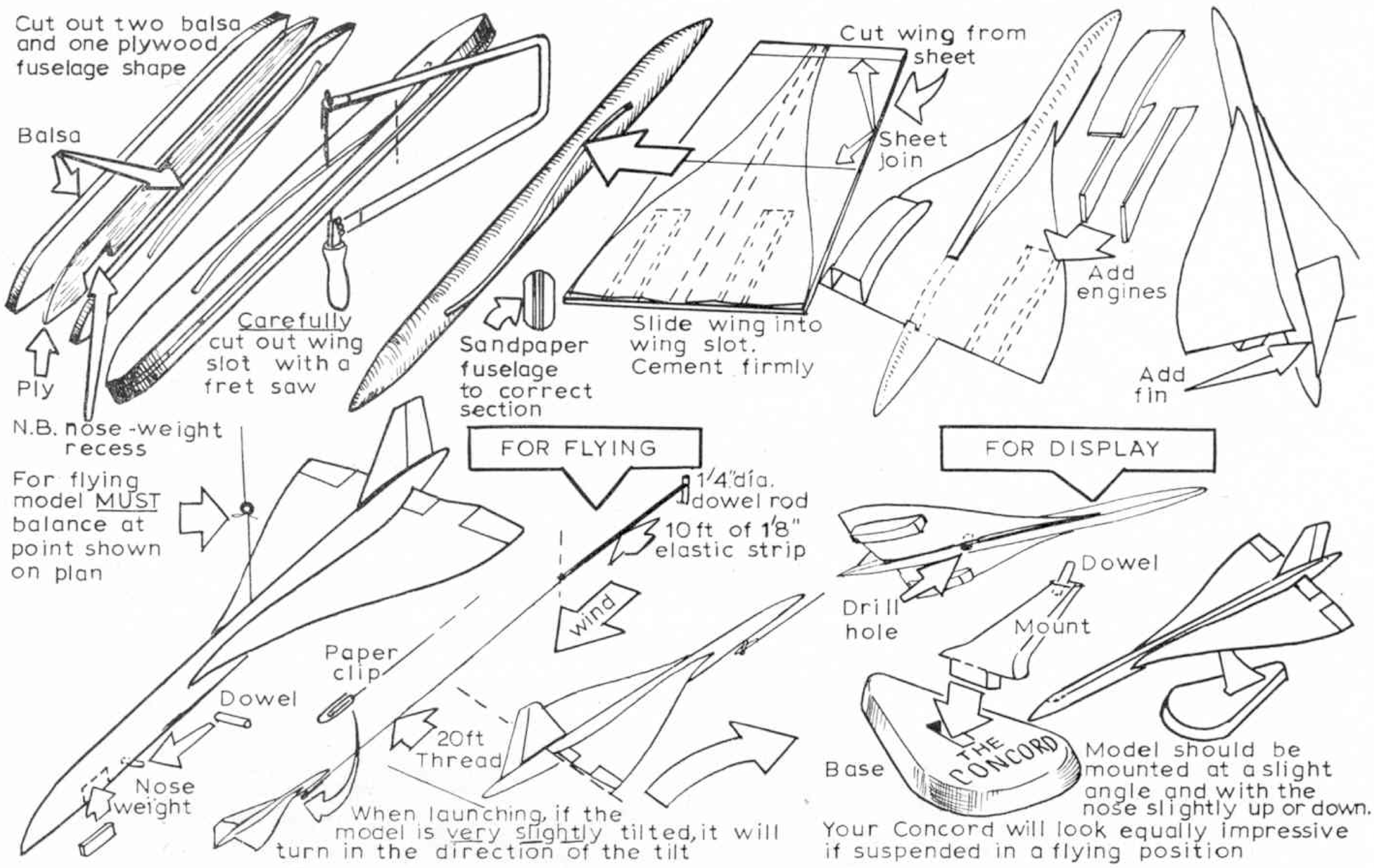


From shoulder height it should land about 12 to 15 feet away. The glide must be *straight*. If it banks left or right add a tiny amount of Plasticine to the edge of the under-surface of the *opposite* wing tip.

Now you can make up your catapult-towline. Use 10 feet of $\frac{1}{8}$th inch strip rubber, from your model shop, and tie one end firmly to a dowel rod or stick. To the other end tie 20 feet of strong thread. At the end of the thread tie a small paper clip. Push the dowel into the ground—long grass or soft ground, please! Slip the paper clip on to the launching dowel in the nose of your Concord, pull back and release.

Do this very gently at first to see how your model behaves in a fairly high-speed take-off. Slightly tilting the wing will cause the model to bank round in the direction of the tilt. This bank will often prevent the model stalling off the line and diving into the ground. Remember, using a catapult towline with a fast flying model such as the Concord does need practice. With experience you should get some pretty spectacular flights with Concord.

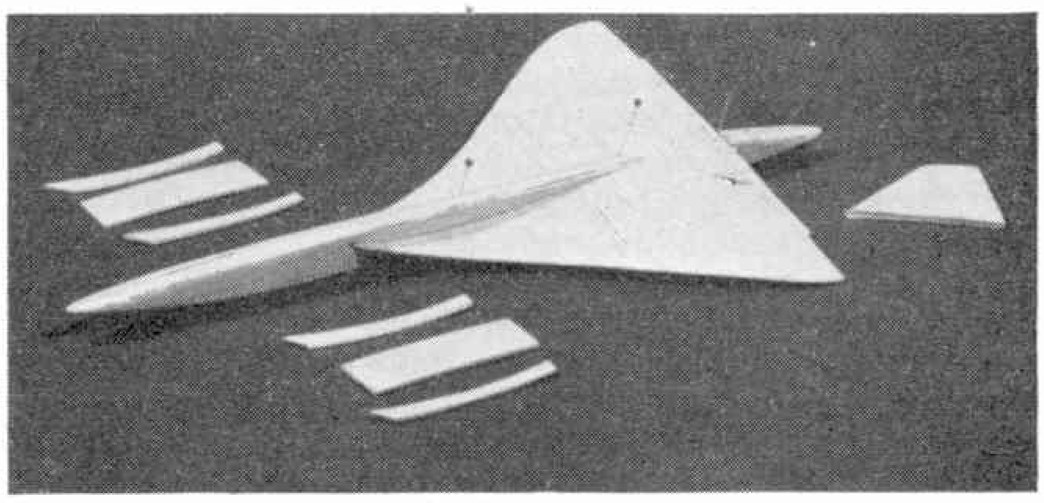
If you decide to build your Concord for display, be extra careful over your painting. Use quick-drying plastic enamels (small tins 9d. to 1s. 0d.). Our Concord is painted in the colours of the British Overseas Airways Corporation. A white fuselage top, dark blue band and silver on the lower part of the fuselage. The fin is dark blue with white trim and wings and engines silver.

Several of the world's airlines are interested in the Concord, so you might like to choose the colour scheme of, say, Air France or Air India. If you are not good at painting straight lines, bands of colour can be cut from strips of painted paper and carefully cemented in place. Build the special stand (as shown on plan) and give it four coats of clear dope, lightly sanding between each coat. Then, finish the stand with plastic enamel in a shade that will harmonise with your model. Add the name Concord to the front of the stand. Finally, fit your Concord on to the top of the stand as shown. Built as a display model the Concord is certainly 'tops'.

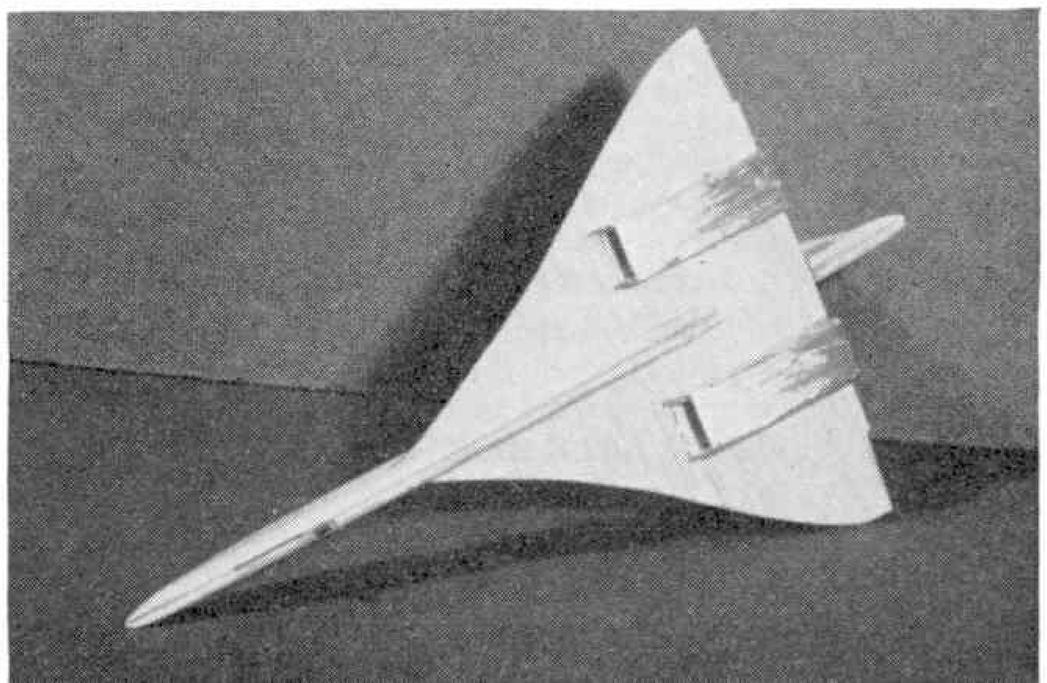
by **Ray Malström**

Materials list

1 sheet $\frac{1}{8}$ by 3 by 20 in. balsawood.	10 ft. $\frac{1}{8}$ in. strip rubber.
1 sheet $\frac{1}{16}$ by 3 by 25 in. balsawood.	20 ft. thread.
1 sheet $\frac{1}{2}$ by 3 by 10 in. balsawood.	1 paper clip.
1 piece $\frac{1}{16}$ by 1 by 15 in. plywood.	1 tube balsa cement.
2 in. piece $\frac{1}{8}$ in. diameter dowel rod.	1 small bottle clear dope.
6 in. piece $\frac{1}{4}$ in. diameter dowel rod.	Plastic enamels (colours as desired).



Above: Wings held with modelling pins while the cement sets
Below: Engine casings assembled on the wing structure



Crash Landing! Martin Tracey and Digger Ames are surrounded by hostile natives! How can they escape

DOWN IN THE BUSH

'I'M going to pancake her!' Martin Tracey yelled above the clattering roar of the misfiring helicopter engine to Digger Ames, who was crouched over the radio trying to get through the crackle of static.

Digger glanced up briefly from his set, nodded and fastened his safety belt as the 'copter swung viciously to one side. As the machine lurched, he could see the green forests of Central Africa below him, stretching endlessly to the horizon. For a couple of seconds he toyed gloomily with the thought that he and Tracey may have to walk through those forests if the 'copter could not be repaired on the ground.

The two airmen were miles off course in the most disastrous episode of their exciting freelance flying career. Briefed to demonstrate a heavily modified helicopter, that sprayed mosquito breeding grounds with a fine mist of paraffin, trouble stalked them from the start.

They had only left the airfield in the Congo for half an hour, when the radio had broken down and even the astonishing talent of Digger Ames could not repair it properly. Then the valve controlling the paraffin ejector had jammed shut and the half a ton of pressurised paraffin could not be released. At this stage, a disgusted Martin Tracey decided to call the whole operation off and return to base.

The way the compass started jerking as he turned the helicopter had warned him more trouble was imminent, but even he had not expected the fury of the tropical storm which burst on them. A hurricane-force wind smashed into the helicopter with such stunning violence that the machine could not fly into it.

Caught in a storm

Tracey could do no more than keep the 'copter on as level a keel as possible and let the storm blow it. For over an hour he had battled at the controls, while Digger Ames fought a losing battle with the radio and his navigation. The compass was swinging wildly round the card and it was impossible to see through the blinding rain to get any form of visual fix.

As the fury of the storm slackened off, the valiant engine started to tire. It coughed and spluttered so that the giant blades of the helicopter jerked spasmodically and threatened to shake the aircraft to pieces. They had to land and quickly, before the machine broke up in mid-air.

'Straight down, Martin!' yelled Digger, suddenly pointing violently at the side of the 'copter.

Tracey glanced through the perspex cowl and nodded as he saw the minute clearing Digger was indicating. Closing the throttle, he eased the control column forward and the helicopter side-slipped downwards in the strange, ungraceful descent of the type. When the machine was only twenty feet off the ground, the engine cut finally, but Martin Tracey was already prepared for it and had jammed the helicopter blades in fine pitch so that the machine windmilled down with the blades acting as a form of air-brake.

Even so, it landed with a jarring crash that made the undercarriage hiss up to the full extent of its giant shock-absorbers.

'Strewth!' gasped Digger. 'That little bump's just about finished this rotten radio right off, I reckon.'

Tracey grinned. 'Didn't do the chopper much good, either,' he replied. 'Let's have a look at the engine and see if we can fix it. If we can't, we had better get our hiking kit out.'

He glanced ruefully at the light canvas shoes he was wearing—they would not last five minutes in the jungle and his clothes were equally unsuitable. They had no food and no water. They did not know where they were and, just as drastic, the airfield staff did not know where they were.

They could be two hundred miles away from base and their sole equipment consisted of a rifle, three clips of ammunition and a smashed aircraft. Tracey suddenly shook himself to get rid of these gloomy thoughts.

'C'mon then, let's check the engine,' he said, sliding the door open and jumping out. Digger unlocked the emergency panel and pulled out the massive toolkit, then followed Martin, who had climbed on top of the 'copter to check the rotor blades. 'Nothing smashed here,' shouted Tracey. 'It's the engine at fault and that's something.'

Impossible repairs

Digger grunted. He sometimes lacked Martin's superb optimism in the face of trouble and he wanted a close look at things before he committed himself.

'Engine only, eh?' he grunted. 'I wouldn't mind betting it's seized up solid.' Still muttering to himself, he lifted off the cowling and started his usual thorough check.

In less than a minute, he looked up from his work. 'The fuel pipes are full of water,' he announced. 'That storm must have worked inside the gas tank and swamped all the filters.'

Tracey regarded him thoughtfully for a second or two. 'So, what do we do?' he asked. 'Can't we clean the fuel system out and start the engine again?'

Digger laughed harshly. 'Yep, we could', he agreed. 'We could drain the tank into a big container and wait till the petrol settles out on top of the water. While it's doing that, we could dismantle the pipe-line, the filters and the carburettors. Then we could dry 'em out and refit everything. Then we could drain the water from under the petrol, pump the petrol back into the tank and the engine would probably start.

'Only there's a couple of snags and number one is that we haven't anything to drain the gas tank into. Secondly, if we had, we couldn't pump back into the chopper because there's no pump and third, it's going to take days to dry the pipe-lines out without any compressed air to blast all the moisture through.'

Martin gazed at him without speaking. He knew Digger well enough to realise he wasn't joking. What he was saying meant that the pair would either have to march back to base, and that was next to impossible, or hope that a search aircraft would spot them. In his heart of hearts, he knew how unlikely that was. In his old R.A.F. wartime days, he and Digger had searched the Channel for hours trying to spot a ditched Mosquito or its dinghy. Although they had known the position of the aircraft when it ditched, they never found the dinghy or the crew.

Here, their position was unknown and the chances of spotting a helicopter down in a tiny clearing was even less than that of locating a bright orange dinghy on a contrasting grey sea. Things were not very bright. And Martin knew full well just how slim their chances were.

Under Attack

The two men looked at each other. Then, like a bolt from the blue, something flashed between them and hit the side of the helicopter with a vicious clang. A broad-headed spear thudded to the ground and Digger sprang to one side in a subconscious reflex bound. 'Cripes, we're under attack!' he gasped, in a thick Australian accent that showed his tension. 'That's all we want now, just to make life really different.'

He suddenly realised that Tracey had vanished and for a second he wondered if a second spear had dropped him. Then Tracey appeared from inside the aircraft with the rifle in his hand. As his feet touched the ground, he had rammed a clip of cartridges into the magazine, slapped the bolt in and out and fired a shot into the bush.

There was no reaction—he had not expected one, but at least it showed the unknown attacker that the two were by no means defenceless. The crash of the rifle brought an uncanny silence as all the wild life round them went quiet. Then, as the ordinary sounds of the jungle started up again, the two men heard the faint throb of drums starting.

Even in 1965, civilisation has only just started to touch the great African continent and, away from the main towns and areas of population, life carries on much as it did two thousand years ago. Small tribes, numbering from one to five hundred natives, live in complete isolation from each other, prevented from communicating by the unbelievable denseness of the jungle.

Under the great trees, the forest is as quiet and as dark as a tomb. Sunlight never filters through the dense foliage at the tops of the trees and without a compass or other aids to navigation, a man can become utterly lost in half a mile. He may find his way back to his own village or he may stumble on another—but the chances are that he will walk and walk until he collapses with fatigue. And then the creatures of the jungle move in . . .

Because of this fearful isolation, the African tribesman finds it virtually impossible to welcome strangers. He treats them as enemies and there is only one way to treat an enemy in the bush. It was all part of the ill-luck that had dogged the flight that had caused Martin Tracey to crash-land near a village—a village that was hostile by sheer virtue of its environment.

The rifle would keep the tribesmen at a safe distance for a while, but there were only three clips of ammunition and the natives, with all the time in the world to spare, could afford to wait until those three clips were used. Then they would attack!

Martin Tracey and Digger Ames were men who had been in deadly danger many times in their lives, but never in a situation so appalling as this. Brave as they were, both were conscious of a tremor of fear as they scanned the blank face of the jungle.

Then, Tracey suddenly had one of his ideas that always seemed to come to him when he was really up against trouble.

'Digger,' he snapped, his voice hard and curt as the thoughts surged through his brain, 'take this rifle and keep your eyes peeled. I'm going to be busy for a few minutes.'

He handed the puzzled Digger the Lee-Enfield, grabbed the toolkit and vanished under the helicopter. The clink and creak of the tools were the only sounds for ten minutes, then. 'Come here and give us a hand.'

Digger ducked under the 'copter and looked at Tracey who was working at the end of the paraffin tank bolted to the belly of the machine. 'Take that end,' said Tracey, 'and help me down with this cylinder.'

The long tank was unbolted at Digger's end and, as Tracey slackened off the straps at the other end, the cylinder began to sag. The weight of the thing was incredible and Digger was glad of Tracey's help.

The secret weapon

With one hand resting on the ground, the two men took the strain of the other end and Tracey knocked the last bolt off the retaining strap. The weight of the cylinder tore it from their grasp and it landed with a thud on the soft ground, but the fact that the other end was already down relieved most of the impact and no damage was caused.

'Phew!' gasped Digger. 'What's all this in aid of?'

Tracey grinned. 'Help me roll it from under the 'copter and you'll see,' he replied. In spite of its weight, the cylinder was easy enough to roll and, once it was clear of the helicopter, Tracey examined the jammed valve. All that was wrong with it was a thick layer of dust blown up from the airfield as the rotor-blades had lifted the machine up. A quick wipe with a rag, a turn of the spanner and a fine mist of paraffin hissed out.

Tracey turned the valve shut and

(continued on page 24)

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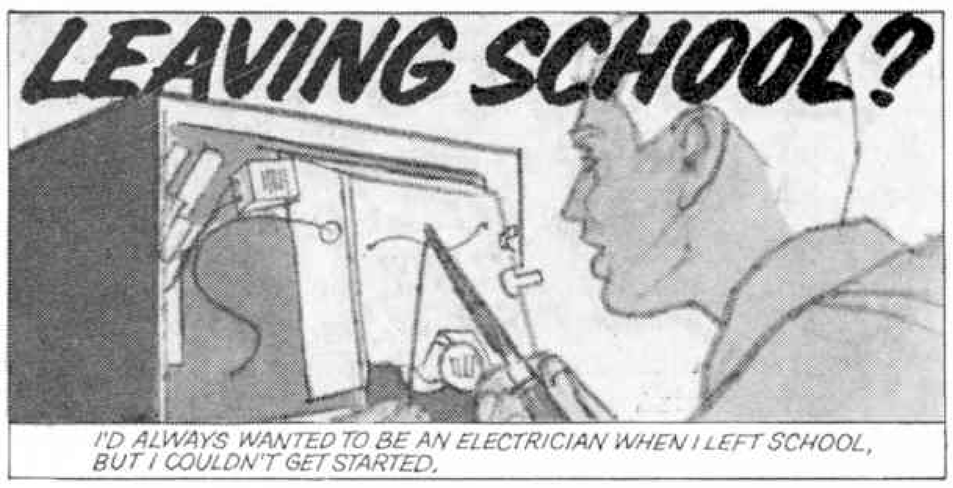

I'D ALWAYS WANTED TO BE AN ELECTRICIAN WHEN I LEFT SCHOOL, BUT I COULDN'T GET STARTED.

'I TRIED FOR AN APPRENTICESHIP WITH MY BROTHER'S FIRM, BUT THERE WERE NO VACANCIES. THEY ADVISED ME TO TRY ANOTHER FIRM

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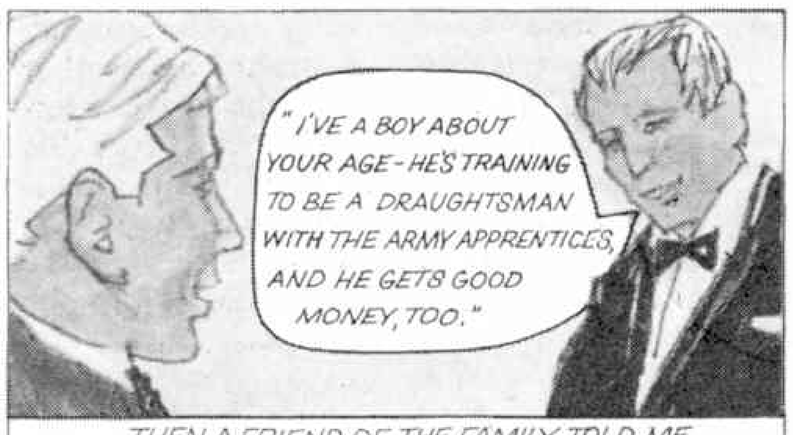

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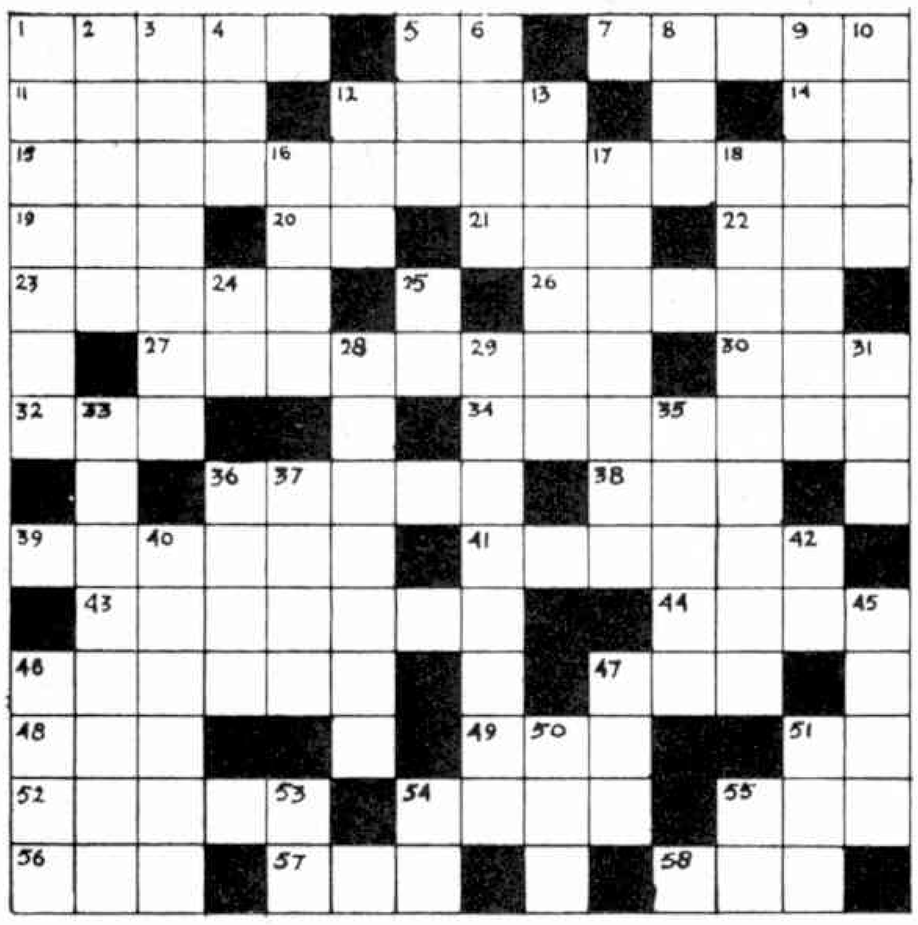
Puzzle Page

Turn to page 30 for answers to the puzzles on this page

Crossword Puzzle No. 4



CLUES ACROSS

1. One of the Seven Dwarfs.
5. Personal pronoun.
7. Land of the Toreadors.
11. ——— of Wight.
12. Immense.
14. Compass direction.
15. Used as a bridge.
19. Favourite drink.
20. Pronoun.
21. Watering place.
22. A good draw!
23. ——— Welles.
26. Stop!
27. Enfold.
30. Neckwear.
32. Agreeable word.
34. From outer space.
36. Small piece.
38. French refusal.
39. Brook.
41. Native of Whitstable.
43. Explanations.
44. Jacob's brother.
46. To feed up.
47. Donkey.
48. Girl's name.
49. Aged.
51. Like.
52. Areas.
54. Electric power connection.
55. Polite form of address.
56. For danger.
57. Pair.
58. Lubricates.

DOWN

1. Past.
2. Flower.
3. Satisfies.
4. Boost.
5. German.
6. Potential chickens.
8. In favour of.
9. That lazy feeling.
10. Strictly for the birds.
12. A successful 'pop'.
13. Spanish for 7 across.
16. Sharp at the point.
17. Inns.
18. Unpleasantness.
24. Not off.
25. Either.
28. Easy on the ear.
29. Fake.
31. Finale.
33. No exit.
35. Wagers.
36. Resting place.
37. Bag.
40. Slow up.
42. Title for artists (abbrev.).
45. Russia.
46. Fright.
47. Increase.
50. Edge.
51. To be ill.
53. An abbreviated street.
54. Move on.
55. Yes, in Spain.

TRICKY TEASERS

Which is larger in area—a triangle having sides measuring 5 ft. by 5 ft. by 8 ft. or one measuring 5 ft. by 5 ft. by 6 ft.

● ● ● ● ●

A squad of soldiers had to cross a river. There was no bridge, none of the men could swim and the only means of getting across was a small boat owned by two boys. The boat was only big enough to carry TWO BOYS or ONE SOLDIER but no more. How did the soldiers get across?

● ● ● ● ●

QUICKLY—how much is a fourth of a fourth of a fourth of four shillings?

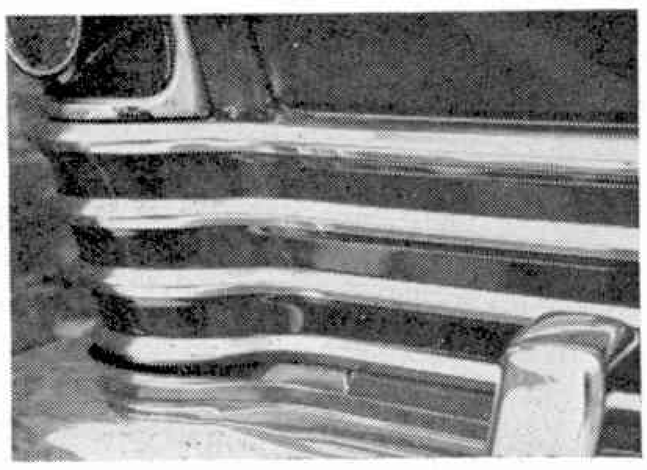
● ● ● ● ●

The captain had a brother—yet the captain's brother never had a brother! How do you make it out?

● ● ● ● ●

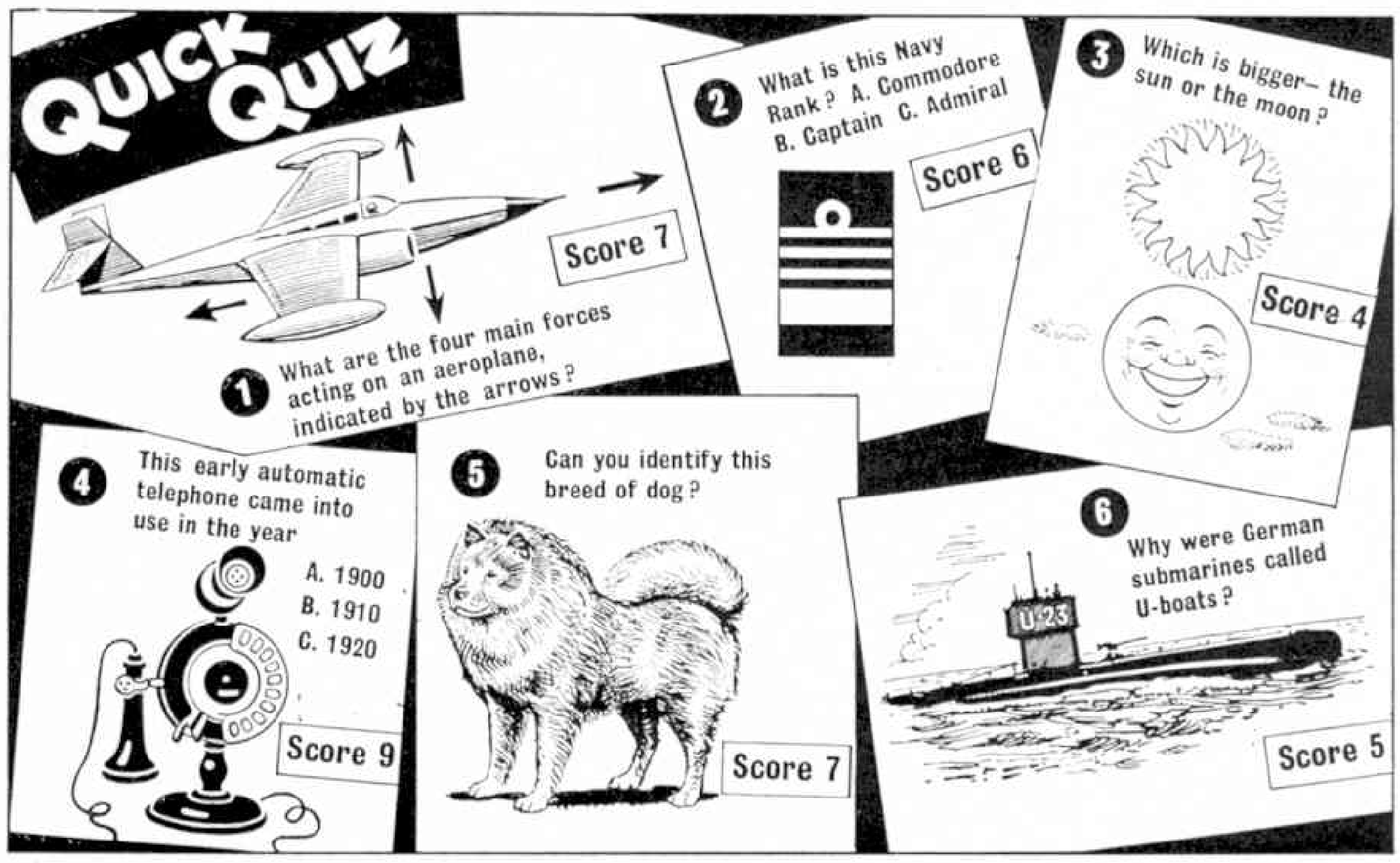
In six months from January 1st, 1964, a tree doubled its height, and in the next six months it grew half as high again. If the total growth for the twelve months was 15 feet, how tall was the tree on January 1st, 1964?

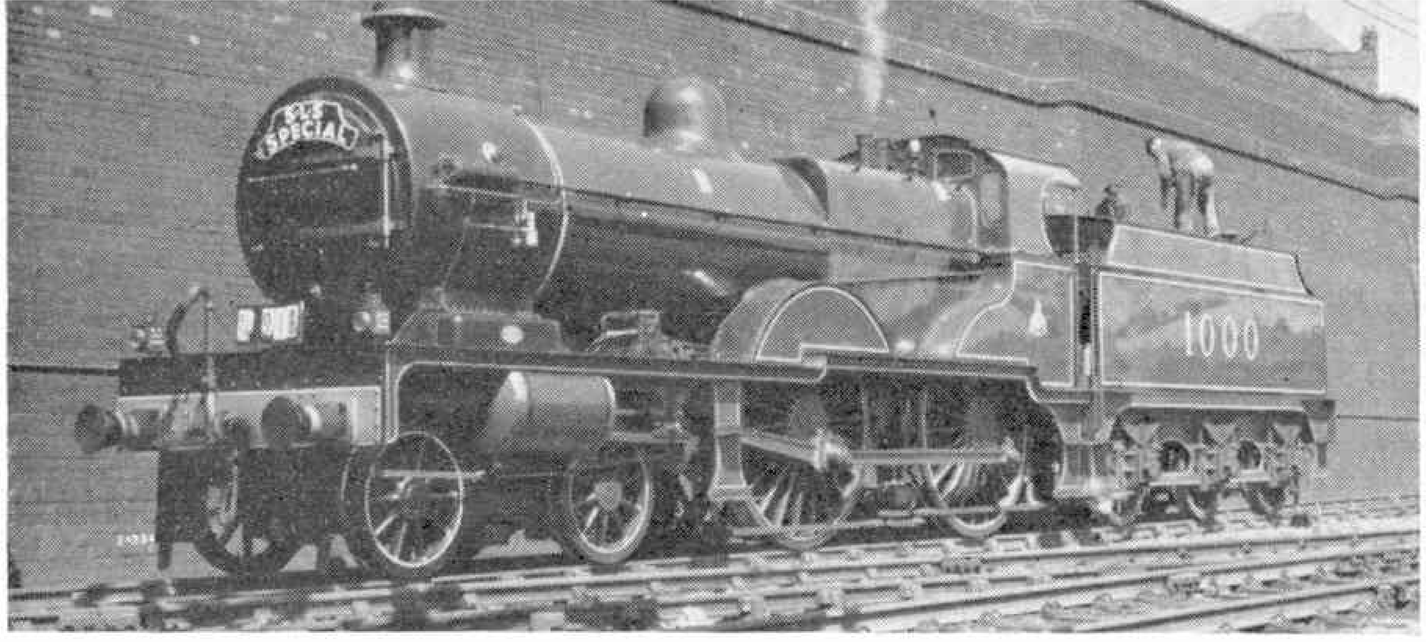
● ● ● ● ●



Car Quiz No. 5

There is no mistaking this distinguished boot decoration on this car. What is the name, model and mark number of this popular British saloon car?





Midland Compound No. 1000 as restored to 1914 condition. (*Photograph by K. Field.*)

THE MIDLAND COMPOUNDS

DURING the early part of this century, efforts were made to improve the basic design of the steam locomotive and the outcome of experiments was that there appeared several types of Compound locomotive. However, this idea of compound locomotives never really became as popular as it might have and although a number of steam locomotives still operate on British Rail, none are of the compound type.

If you are wondering what exactly is a Compound locomotive, the following should give you some idea. With a normal locomotive, the steam works in its cylinders by simple expansion. Admission and exhaust of steam from the cylinders is arranged by the action of valves and valve motion, under the control of the driver. Having done its work, the steam is exhausted from the cylinders through the blast pipe and chimney.

In a Compound locomotive, the expansion of steam is carried a stage further and once exhausted from one or a pair of high-pressure cylinders, it is admitted to secondary cylinders at a lower pressure and in greater volume than before, where it is possible for it to expand still further to do an extra amount of work.

The idea of compound working is to make greater use of a given amount of steam and secure economy in coal and water. The two stages of expansion just described, are carried out in what are known respectively as high- and low-pressure cylinders. The final exhaust from the low-pressure cylinders travels through the blast pipe and chimney in the normal way.

Compound locomotives were used over a period of many years on several railways in this country, although the only really successful group of engines to work on this principle on our railways were developed by the Midland Railway. These were subsequently adopted as a standard 4-4-0 class by the L.M.S., until a total number of 245 were in service. This explains the name 'Midland Compounds', often used to refer to the class as a whole, but which only really applies to the former Midland Railway engines. The only remaining Midland Compound can be seen on exhibition at the Transport Museum, Clapham, London.

First in Service

The first two Midland Compounds entered service in 1902 and three others appeared during 1903. They were M.R. Nos. 2631-2635 and all incorporated the Smith system of compounding, so-called from the name of its originator; Mr. W. M. Smith, Chief Locomotive Draughtsman of the former North Eastern Railway, where the system was applied to a 4-4-0 engine.

In both the N.E.R. and the Midland engines, three cylinders were used—one high-pressure cylinder between the locomotive frames and two low-pressure cylinders outside. All three cylinders were in line and connected to the leading coupled axle. The high-pressure cylinder was connected to the crank axle and the low pressure cylinders to the crank pins of the leading driving wheels.

Each cylinder had its own set of Stephenson link motion and in the first two Midland Compound locomotives—Nos. 2631 and 2632—the motion of the high-pressure cylinder was controlled independently from that of the two low-pressure cylinders. The driver was therefore able to vary the degree of expansion in both the high- and low-pressure units affecting the proportions of power developed by each.

Easy starting was not a strong feature of earlier two- and three-cylinder Compound systems, but the Smith system, in which boiler steam was admitted to all three cylinders on starting, was of considerable improvement.

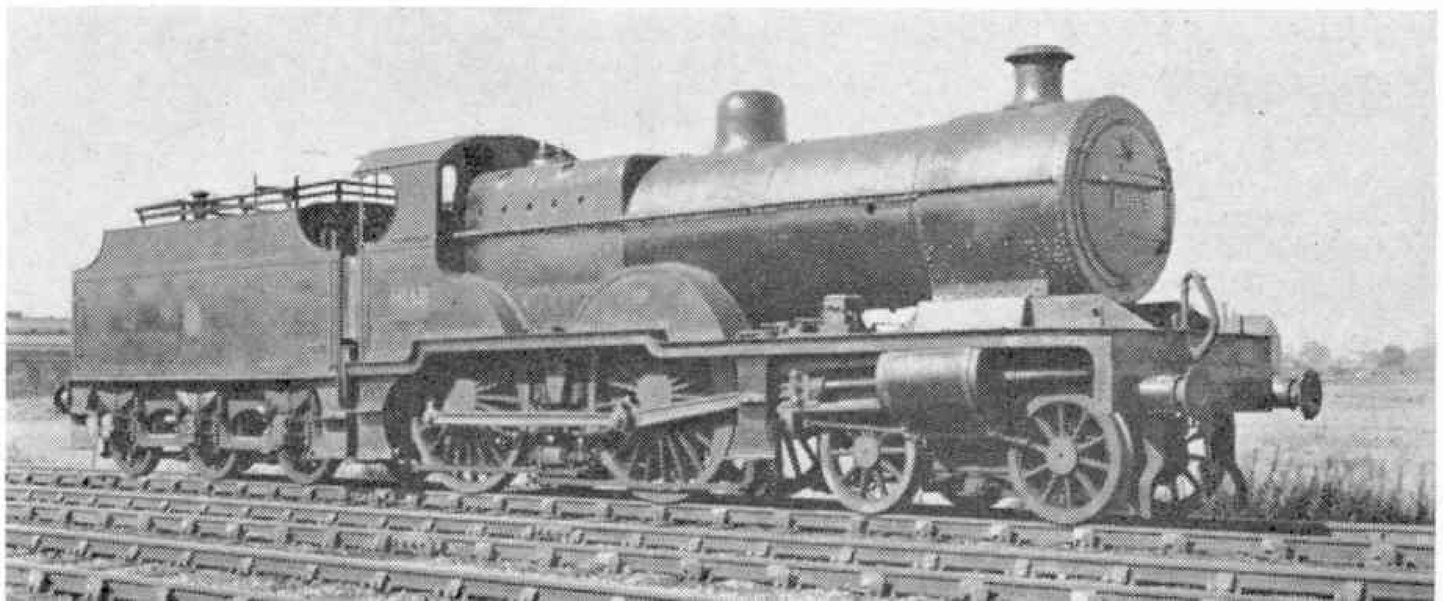
The five Smith Compounds on the Midland Railway were quite successful, but they required a high degree of skill on the part of the locomotive drivers, especially the first two types, due to their independently controlled high- and low-pressure motions.

Thus, when further Compounds were built at Derby, the Chief Mechanical Engineer, Mr. R. M. Deeley, felt that some further simplification of the system might be applied with advantage. Forty engines were subsequently built to the modified design, the last five appearing in 1909.

The reducing valve arrangement of previous Compound types was absent in the Deeley design and a special form of regulator valve in the dome, was substituted. This had three steam ports—one connected to the low-pressure cylinders by means of a small auxiliary steam pipe—a small 'jockey' valve on the back of the main regulator valve. Thus, when the regulator handle in the cab was moved by the driver on starting, the valve gradually uncovered two of the ports—one leading to the auxiliary pipe. Steam was therefore admitted to all three cylinders, but since the non-return valve arrangement of the Smith system was retained on the high-pressure cylinder, the high-pressure piston 'floated' with steam on each side.

The 'Deeley Compound' locomotives worked on starting, as two-cylinder simple engines, with the low-pressure cylinders doing the work and the high-pressure piston just 'floating' in its cylinder. Further movement of the regulator handle caused the 'jockey' valve to close the auxiliary port, causing steam to be admitted directly to the high-pressure cylinder alone, bringing compound working into operation. This arrangement was retained on all sub-

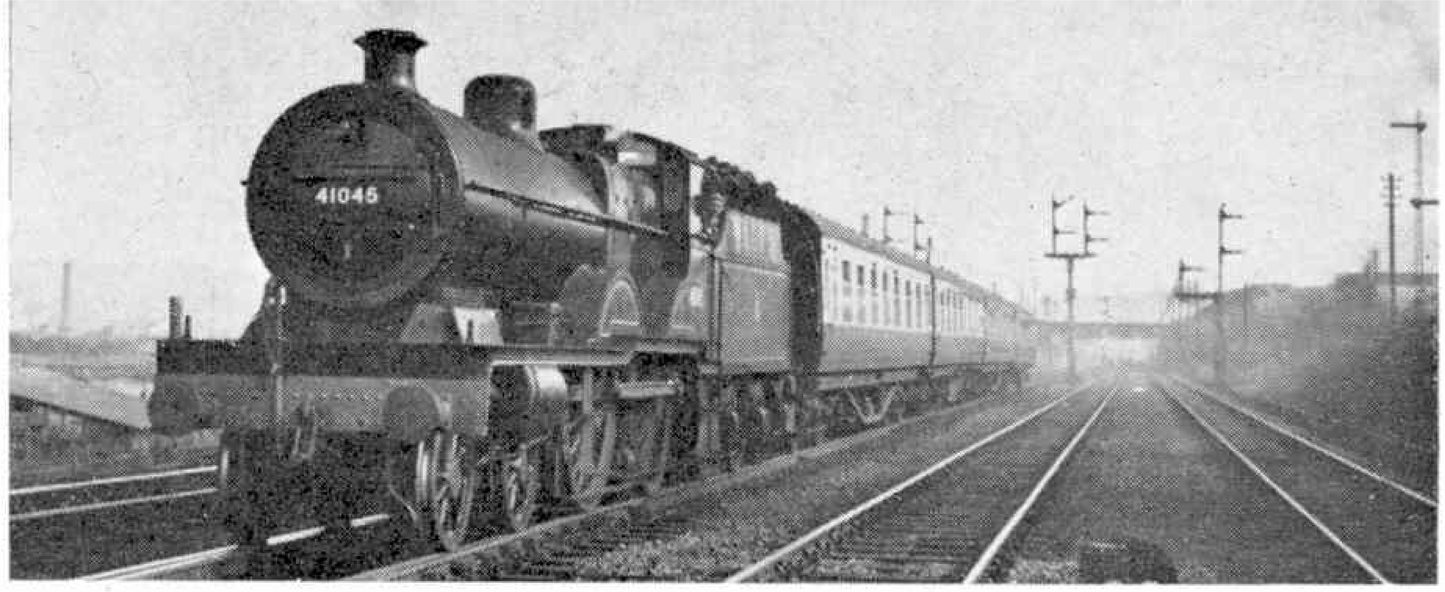
L.M.R. No. 41168, the last Compound to remain in regular service. (*Photograph by B.R. London Midland Region.*)



sequent Compound locomotives, including those built by the L.M.S. The original Smith Compounds that became Nos. 1000-1004, were also altered to the modified system introduced by Deeley.

The Compound locomotive in Clapham Museum, is one of a type of engine fitted with superheaters and this class of locomotive was subsequently adopted as one of the early standard classes of the L.M.S. The first engines, beginning with No. 1045, appeared in 1924 and differed slightly from the Midland Railway type. The driving wheel diameter was slightly reduced and the cylinders were, at first, larger in diameter.

The tender, although similar in general design to that used by the Deeley Compounds, was of slightly smaller capacity and had a shorter wheelbase. Right-hand drive, as was usual on the Midland railway, was retained, but later members of the class were modified for left-hand drive, as was standard on the former L.N.W.R., Lancashire and Yorkshire, and Caledonian Railways.



This Leeds-Morecambe stopping train made a suitably light duty for Compound No. 41045. *(Photograph by W. Hubert Foster.)*

Compounds on Derby-Bristol run

Apart from the appearance of Compounds on these sections of the L.M.S., another result of the multiplication of the class was their use on Midland Railway routes previously unknown to them, such as the Derby-Bristol main line, where class 2 and 3, 4-4-0's were usually to be seen. This led to the allocation, for the first time, of Compounds to Derby, which may seem rather curious since the Compound locomotives originated from this works. The reason for this can be explained by the turntable at Derby shed, which was not able to take a Compound locomotive because of the large tender.

Compound locomotives met with a mixed reception on other lines, where they were regarded as 'foreigners'. They were certainly not popular on the former L.N.W.R.—at least during their earlier days on that section.

With the passing of time and with the introduction, from about the middle 1930s onwards, of large numbers of very powerful and capable 4-6-0 locomotives, the Compounds were superseded—even on the Midland Railway routes, particularly when accelerated services on the Midland Railway were introduced during 1937.

Although ousted from many of the more important main line services, they continued to give good service on less exacting duties. During the difficult post-war period, the declining standards of steam locomotive maintenance and the problems involved in fitting 4-4-0 locomotives of moderate size into common-user duty diagrams, plus the fact that many powerful 4-6-0 locomotives were available, made it inevitable that withdrawal of the Compounds should begin when it did, in 1948.

The Midland Railway locomotives, with their 7 ft. driving wheels, were the first to suffer and all Standard Compound locomotives subsequently followed their Midland Railway predecessors to the scrap heap. The last to be withdrawn, No. 41168, is shown in one of our pictures. No. 1000 was stored for some time before its restoration and in this form was used for working railway enthusiasts' specials.

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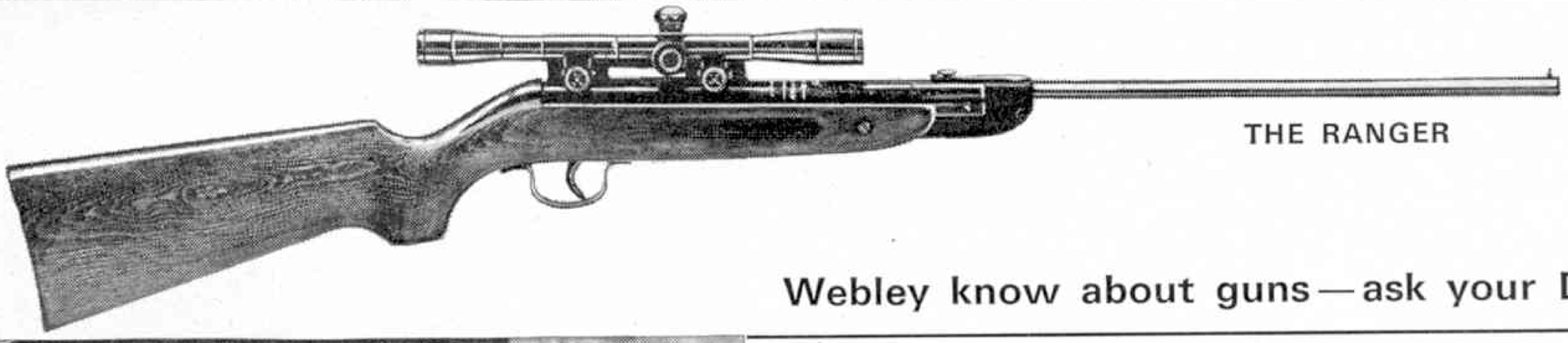

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The World of SPEED

'WHAT'LL she do, Mister?' is the first question most boys ask the owner of a fast car. A question put forward just as often today as it was more than sixty years ago, when grown men first challenged one another to see how fast they could travel in their motor cars over a measured distance.

At first, victory in this race against time, over the flying mile or kilometre, went to electric cars. Then came the turn of steam and finally, in 1902, both were ousted by petrol engines whose reign lasted until July 1964, when Donald Campbell, in his turbo-powered Bluebird, officially took the unlimited class record to 403 miles-an-hour.

For more than forty years the World's Record for the flying mile or kilometre has been popularly dubbed the World's Land Speed Record. It was a title dreamed up by British newspapermen in the days when Malcolm Campbell, Segrave and Parry Thomas fought speed duels on the sands of Britain and America. The title caught public imagination, dramatising the daring attacks by bold men attempting to be the first to break 200 miles-an-hour on land, an honour finally gained by Segrave. But until 1964, the World's Land Speed Record was never recognised officially.

Over the years, the rules governing World Records have been unrelenting, vehicles had to be steered in an orthodox manner, while a transmission had to form a link between engine and driving wheels. In other words, thrusting the car forward by means of pure jet or rockets was out. The vehicle was expected to bear some relation to a type of motor car that might one day be used on roads. Personally, I think this has been a good thing, despite record breakers growing bigger, better and more powerful with almost each attempt, it has led to useful development in tyres, brakes, suspension, gear boxes, transmissions, cooling systems and dozens of other items that have helped to benefit present-day motorists.

Pure jets accepted

Suddenly, all this has been thrown overboard. In response to a good deal of clammering from record contenders in the United States, plus a certain amount of commercial pressure, the F.I.A., the world governing body of motor sport, has relaxed its hitherto jealously preserved rules, recognised a World's Land Speed Record and will in future permit such vehicles attacking it to be purely jet propelled, without any link between engine and road wheels.

However, there are still two classes of record, one for motor cycles or three-wheelers and the other for four-wheeled vehicles. Both claimed speeds must be an average of runs in each direction, as indeed has been the case since January 1911. At the beginning of the year, Craig Breedlove held the three-wheeler record he set up on October 15th, 1964, in his vehicle *Spirit of America*, with a mean average of 526·28 m.p.h. In fact, he became the first man to exceed 500 m.p.h. on land, one of the greatest milestones in the history of motoring. I think his backers, Shell and Goodyear, also deserve a tribute for their part in pioneering this venture.

The World's Land Speed Record is now held by a jet propelled four-wheeler, for on October 27th, 1964, Art Arfon's *Green Monster* went one better to cover

Donald Campbell after his record breaking run

the flying mile at a mean average of 536·71 m.p.h., which sounds fantastic on paper and appears to make a nonsense of Donald Campbell's more modest 403 m.p.h.

In my opinion, one should hand bouquets to all three drivers, for what each has attempted and succeeded in doing requires the utmost skill and personal courage. Indeed, during the actual record-breaking runs, both Donald Campbell and Craig Breedlove got into difficulties and were only pulled out of trouble by quick thinking. Both Breedlove's braking parachutes were ripped off at over 400 m.p.h., and his vehicle skidded for *six miles*, finishing up in a pool of brine on Bonneville Salt Flats, leaving only the tail fin showing. Breedlove had to swim to safety.

Of all the record attempts, only Campbell was actually *driving* his car, making adjustments to the power of his machine with his throttle foot, as required by the nature of the course at Lake Eyre to keep Bluebird under enough control to hold his speed. This is, of course, a far more difficult job than that required by the American drivers, who were simply thrust forward by jet propulsion and unlikely to be bothered by wheelspin which can cause the vehicle to skid whilst accelerating.

With Donald Campbell's last run, it seems we have reached the end of an era, when Land Speed Record breakers were *driven* and fully controlled by their drivers. Looking back to the early days, record attempts were in many ways far more eventful. At first, they were run on public highways—the last of this kind being in 1924, when the French police sportingly diverted the early morning traffic so that E. A. D. Eldridge could break the record at 146 m.p.h. in the big Fiat at Arpajon near Paris.

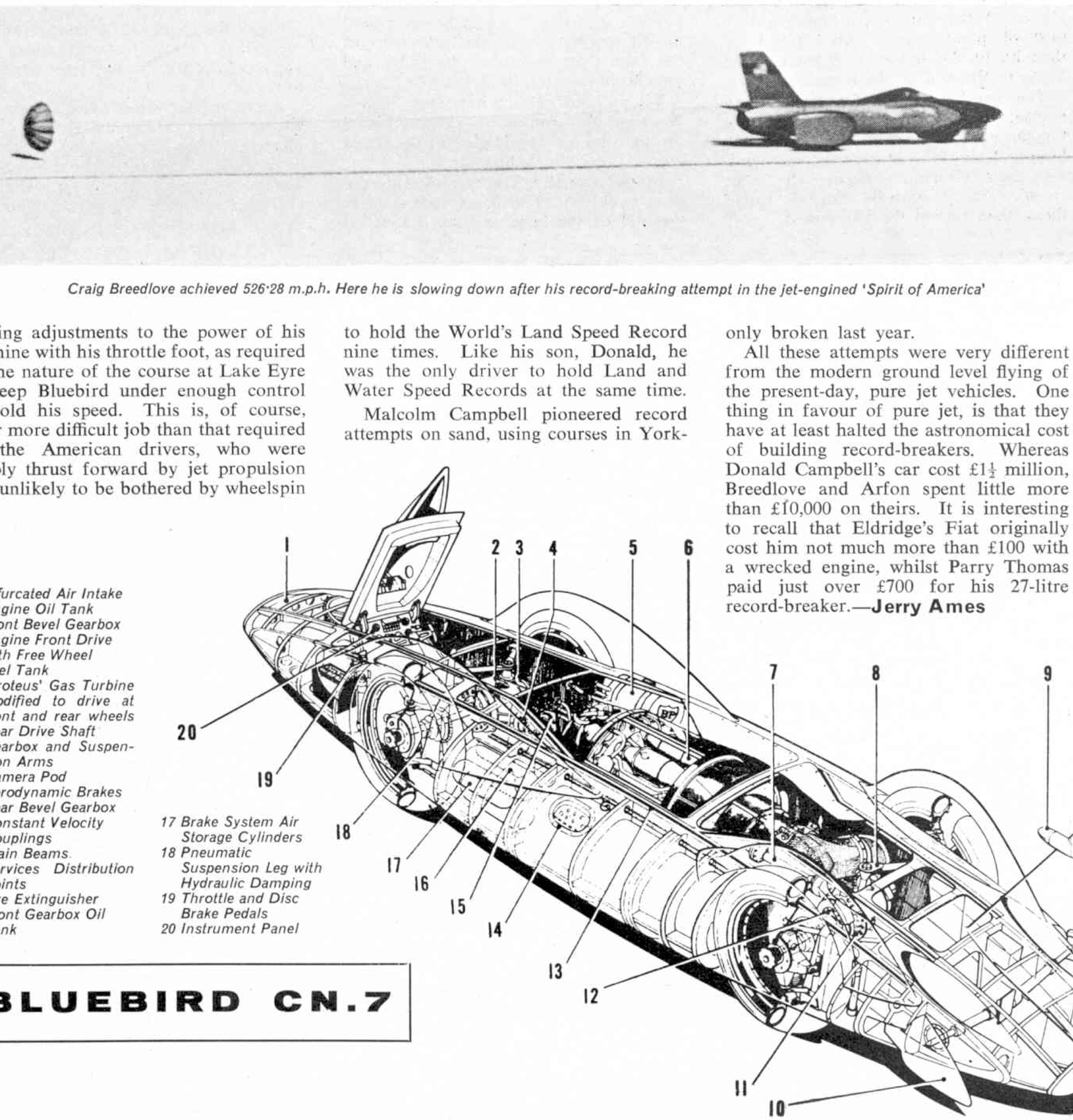
Then there were records taken on tracks, the last at Brooklands being in 1922 by K. Lee Guiness in the big 350 h.p. 12-cylinder Sunbeam at 133·75 m.p.h. The car was later sold to Malcolm Campbell, who began his record-breaking career with it and became the only man to hold the World's Land Speed Record nine times. Like his son, Donald, he was the only driver to hold Land and Water Speed Records at the same time.

Malcolm Campbell pioneered record attempts on sand, using courses in Yorkshire, Denmark, Wales, America and South Africa. At one time he even considered Lake Eyre in Australia, but turned it down as being too much of a problem. The first man to break the 200 m.p.h. barrier was Major H. O. D. Segrave, Britain's one-time top road racing driver, who took his first Land Speed Record in 1926 in a 4-litre Sunbeam at Southport sands.

Parry Thomas was another great driver who twice held the record around 170 m.p.h. and then lost his life attempting to beat these speeds at Pendine Sands, Wales.

More than ten years later, at Bonneville Salt Flats, there was a never-to-be-forgotton duel between those two fine sportsmen George Eyston, who designed and built his own car, Thunderbolt, in less than a year, and John Cobb, whose 394 m.p.h. record set up in 1947 was only broken last year.

All these attempts were very different from the modern ground level flying of the present-day, pure jet vehicles. One thing in favour of pure jet, is that they have at least halted the astronomical cost of building record-breakers. Whereas Donald Campbell's car cost £1½ million, Breedlove and Arfon spent little more than £10,000 on theirs. It is interesting to recall that Eldridge's Fiat originally cost him not much more than £100 with a wrecked engine, whilst Parry Thomas paid just over £700 for his 27-litre record-breaker.—**Jerry Ames**



Craig Breedlove achieved 526·28 m.p.h. Here he is slowing down after his record-breaking attempt in the jet-engined 'Spirit of America'

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2 Engine Oil Tank
3 Front Bevel Gearbox
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5 Fuel Tank
6 'Proteus' Gas Turbine modified to drive at front and rear wheels
7 Rear Drive Shaft
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12 Constant Velocity Couplings
13 Main Beams.
14 Services Distribution Points
15 Fire Extinguisher
16 Front Gearbox Oil Tank
17 Brake System Air Storage Cylinders
18 Pneumatic Suspension Leg with Hydraulic Damping
19 Throttle and Disc Brake Pedals
20 Instrument Panel

BLUEBIRD CN.7

spoke to Digger. 'Get that armoured hose from the chopper,' he said, 'and I'll fix it on to the end of the cylinder.'

A mystified Digger climbed into the helicopter and brought out a twelve-foot length of metal hose, which Tracey bolted to the valve of the cylinder. As he was doing it, Digger Ames touched his shoulder.

'Those drums, Martin,' he said 'They've stopped!'

He was quite right. The menacing throbbing had stopped completely and the silence was even more frightening. It meant that the tribe's warriors were gliding silently through the jungle to attack the unknown white men.

For the first time in over half an hour, Tracey smiled and it was a smile of genuine amusement. 'Let 'em all come, chum. We are now armed to the teeth —and here's our secret weapon. One flame-thrower!' He patted the hose he was holding and flipped his lighter open. He eased the valve open until a tiny mist of paraffin came from the hose, then he lit the lighter and touched the flame to the end of the hose.

The paraffin caught fire and Tracey opened the valve wider. A roaring tongue of flame seared out from the hose and played over the trees surrounding their clearing. Easing the hose round, Tracey squirted fire all round them, then turned the valve shut.

'That's a new one on those jokers, I'll bet,' he said.

Digger laughed out loud in sudden relief. Apart from the devastating effect of the flame-thrower as a straightforward weapon, the shocking sight of a column of searing flame roaring through the jungle would have deterred the best disciplined troops in the world.

For the first time, Digger realised they had not seen the tribesmen, although he knew they had been closing in. Now, equally certainly, he knew they were in headlong flight even though he could hear nothing.

'What we'll do is douse all round the clearing with paraffin,' said Tracey, 'and if they come in again, we'll squirt the flame round and set the jungle on fire. It's too green to burn badly, but it will keep them away and the smoke will choke them.'

He opened the valve again and a jet of paraffin spray hissed out into the jungle. Round and round he went until the air was heavy with the sickly reek of the fuel, then he closed the valve and put the hose carefully down.

For an hour nothing happened, then— zzzzzipppp! Another spear hissed through the air and landed in the moist ground near the helicopter.

Almost casually, Tracey picked up the hose and lit it. The flame roared from the end of the hose and, as it touched the paraffin-drenched jungle, fire exploded all round the edge of the clearing. This time, the tribesmen did not worry about keeping quiet. The two airmen could hear their shouts of fright as the jungle blazed.

'Switch off, Digger,' said Tracey quietly. 'They won't come back now.' Once the flame-thrower stopped, the fire in the jungle eased off a little, although the flames still crackled in the undergrowth and huge clouds of smoke billowed skywards. For an hour, the fire continued. Then, as the initial undergrowth burned right out, the flames dwindled and finally died. The ground would be too hot for anybody to cross for some time and the two men were able to relax their guard.

'All we have to do now is wait for the place to cool down, then we start walking, I guess.' said Digger.

Tracey grinned. 'You can if you want to. I'm going by air.' He pointed up at a helicopter hovering a short way off. 'There's the spotter. The pilot must have seen all this smoke from fifty miles away and the bright lad came to see where the fire was.'

An hour later, Tracey and Digger were sitting in the mess at the airfield. 'Three choppers with troops and mechanics have gone to bring our old bus,' said Tracey putting his feet up on a chair.

Digger grunted happily. 'For my money, they can leave it there!'

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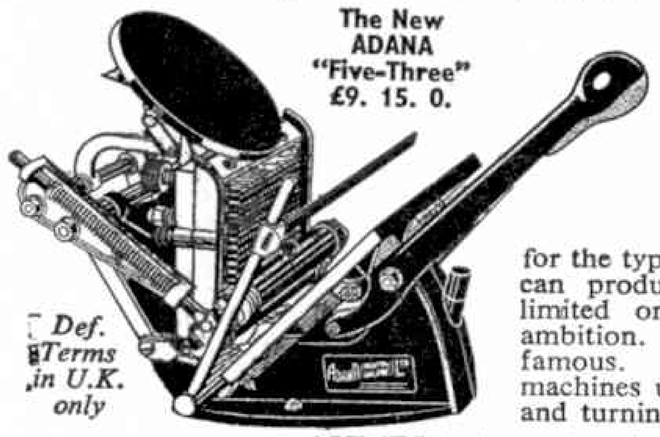

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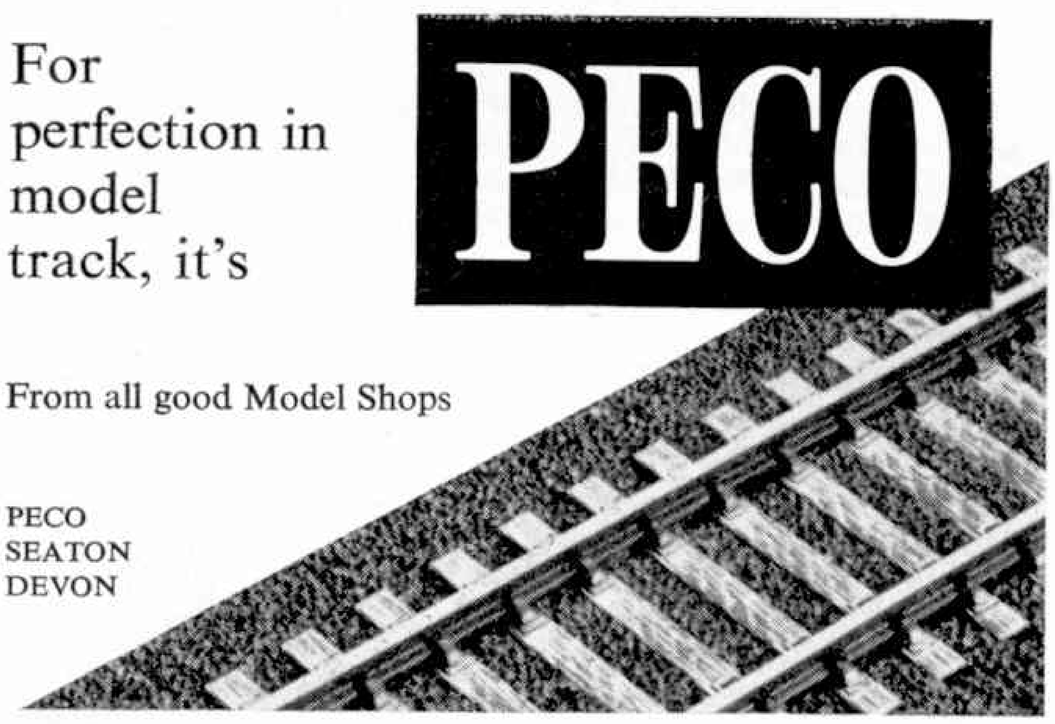

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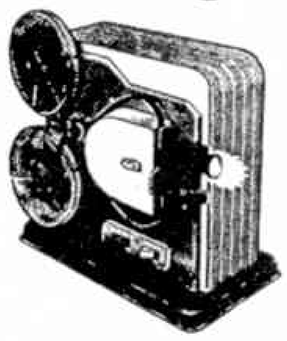

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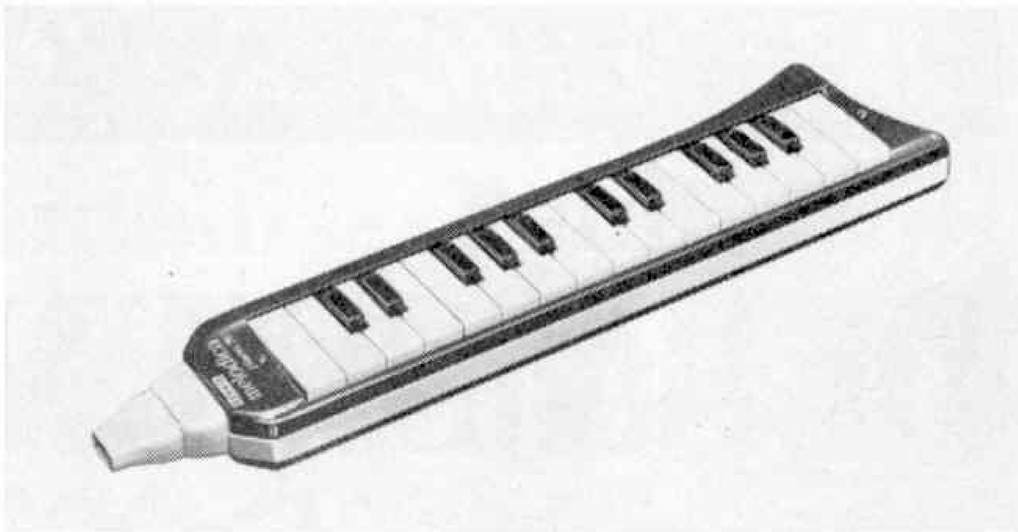
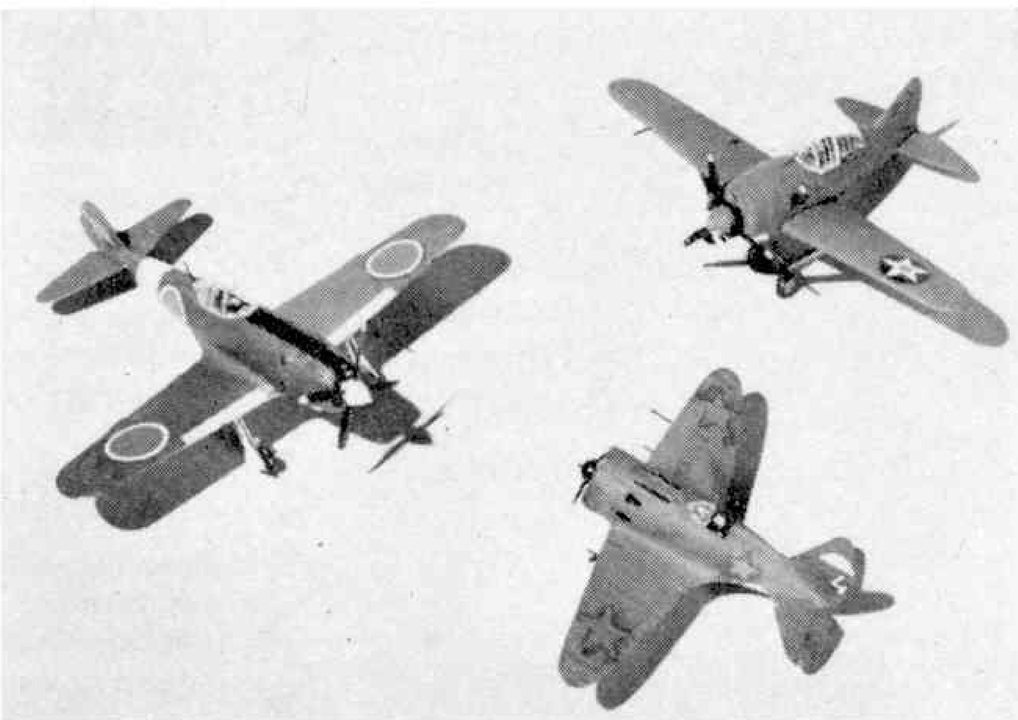
kits and models on the market

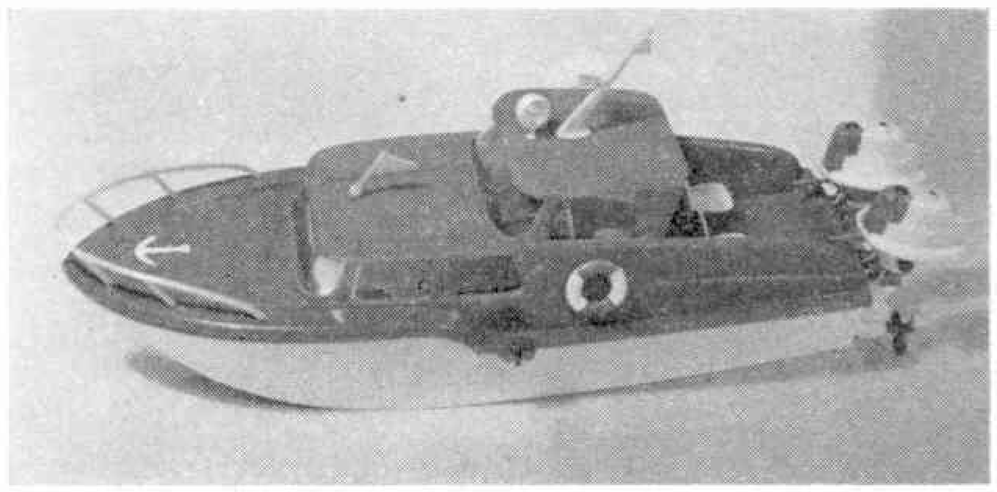


The Melodica Piano is a new and fascinating wind instrument produced by the well-known harmonica manufacturers, Hohner Ltd. The instrument is easy to learn and the keyboard is played just like a piano. Also, being quite small, you can carry it anywhere. The model shown, complete with a twinlock case, costs **£6 10s. 0d.** A range of these instruments are available from **£3 10s. 0d.** to **£6 15s. 0d.**

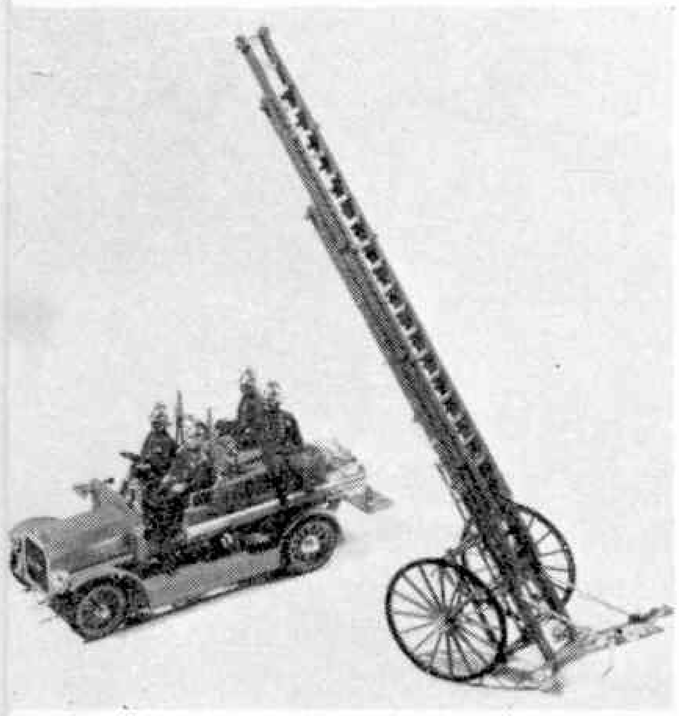


Revell (Great Britain) Ltd., recently announced the release of three new World War II 1·72nd scale model aircraft kits. The Polikarpov 1-16, the Nakajima Ki 84-1a Hayate and the Brewster Buffalo F2A-1 are moulded Polystyrene, ready-to-assemble kits. The Polikarpov first saw action in the Spanish Civil War and was the first monoplane fighter with a retractable undercarriage. The Brewster Buffalo, which was eventually used by seven different airforces, was the first monoplane fighter to see service with the U.S. Navy. Finally, the Japanese Hayate proved the greatest single upset to the Allied airforces operating in the Pacific during the war, as its manoeuvrability and speed of climb were outstanding. All of these kits include propellors, opening canopy, a pilot figure and can be constructed with wheels up or down. The price of each kit is **2s. 11d.** Polystyrene cement is not supplied with the kits.

A new model in the 'Matchbox' series is a reproduction of the attractive and unusual German Hatra Tractor Shovel. The model costs **2s. 0d.** and is catalogued under the new number 69. Design features include a fully-operating bucket, which revolves through a complete circle, special 'balloon' tyres on wide-rim hubs and a fine paint finish in 'Matchbox' style. The length of the model is $3\frac{1}{8}$ inches and it is scaled 100 to 1.



Just the job for the young power boat enthusiast, this 13-inch long model Viking Outboard Cruiser is complete with twin outboards, giving an excellent turn of speed and, of course, twin engine reliability. Power is supplied by three U2 batteries, fitted in spring-loaded clips, mounted inside the hull. The deck and superstructure lift off as a single unit to provide access to the battery compartment. When in position it is locked tightly and positively in place by the port and starboard navigation lights. The 'Viking' is modelled on the latest fast cruiser lines, with ample cabin space and a large cockpit furnished with control pedestal and wheel, helmsman's seat and two aft-facing passenger seats. The outboards are pivoted for steering adjustment and angle of tilt. Each outboard has its own start-stop switch. This realistic model sells for **32s. 6d.** complete, less batteries, and is distributed by Ripmax Models & Accessories.



This latest **six shilling** kit from Airfix is a replica of the first motor fire engine in the City of Coventry fire brigade. The kit contains 144 polystyrene pieces, full assembly and painting instructions and transfers enabling the engine to be completed in City of Coventry or London Fire Brigade livery. The finished model represents a 1914 Dennis Fire engine.

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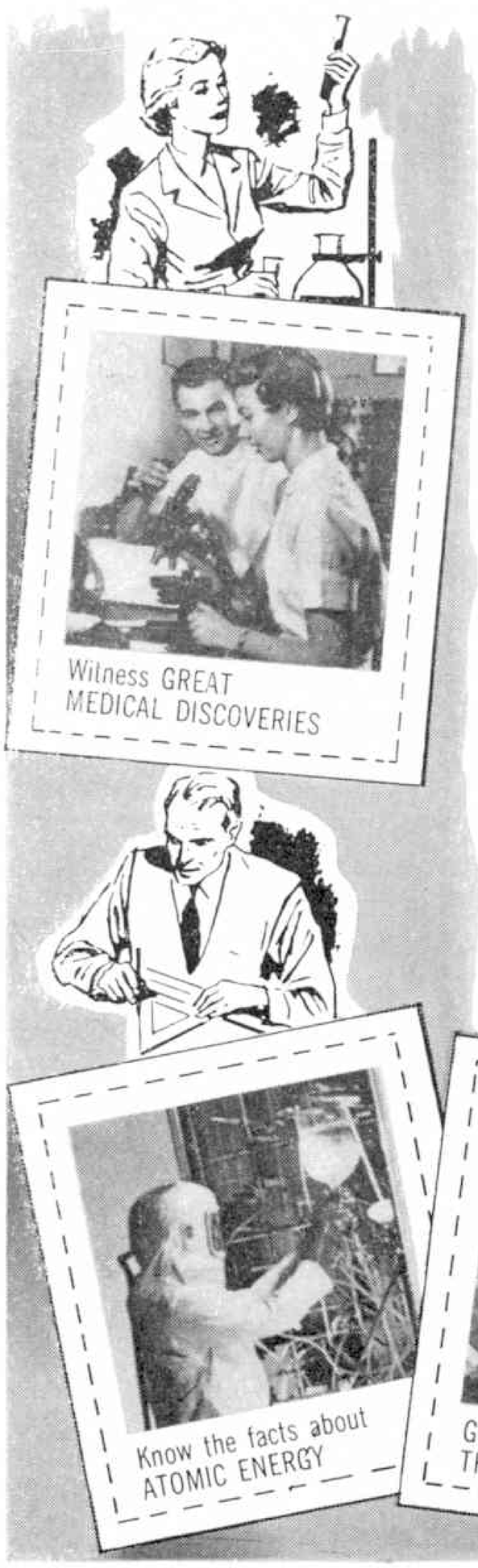

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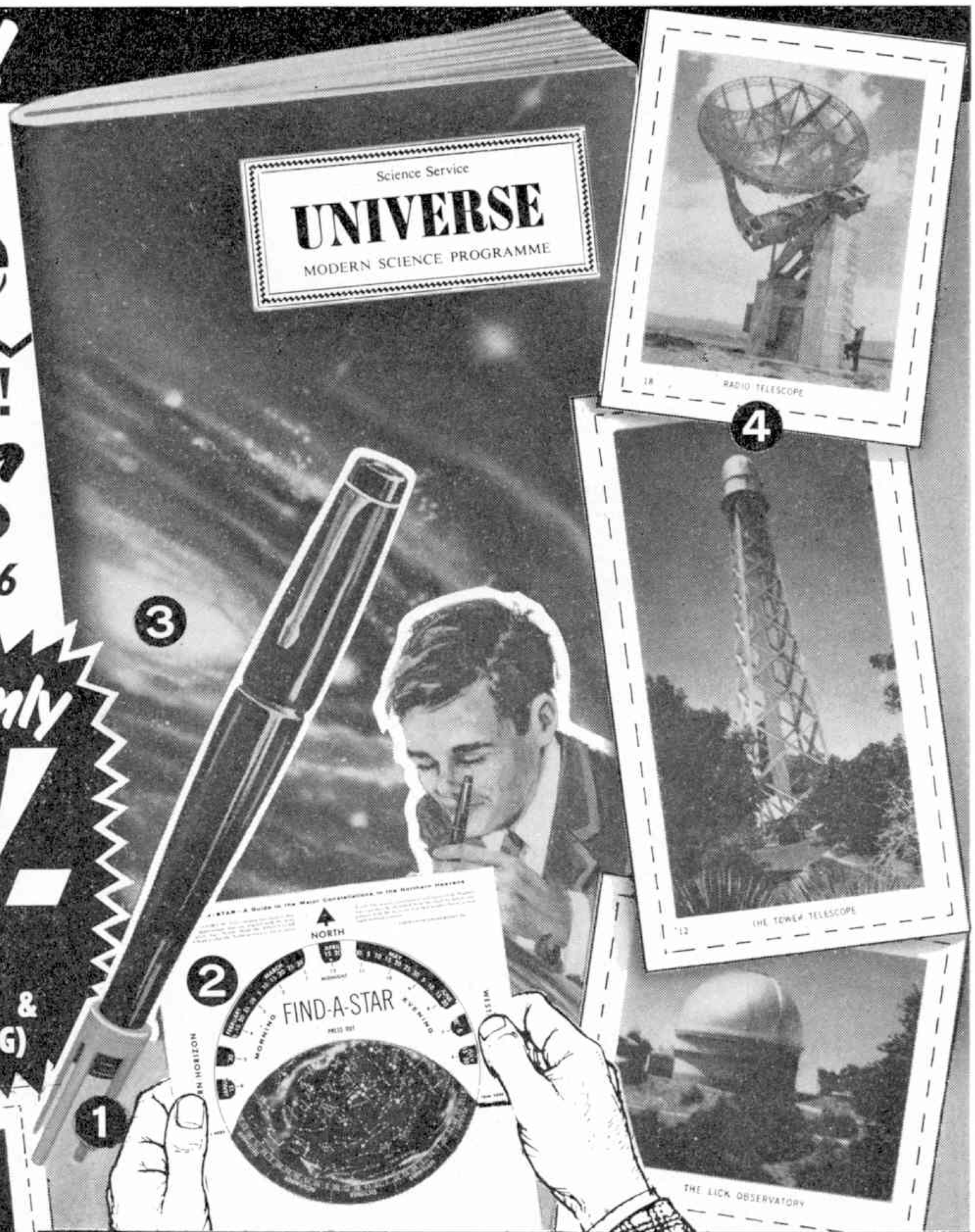

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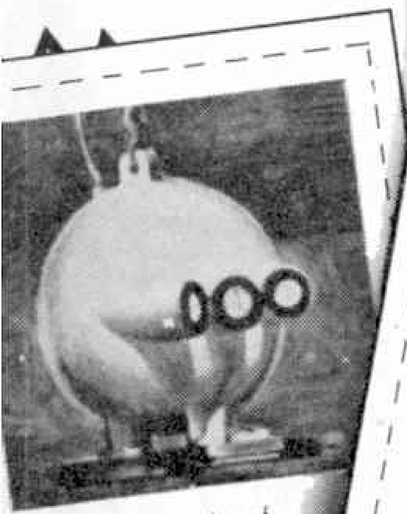

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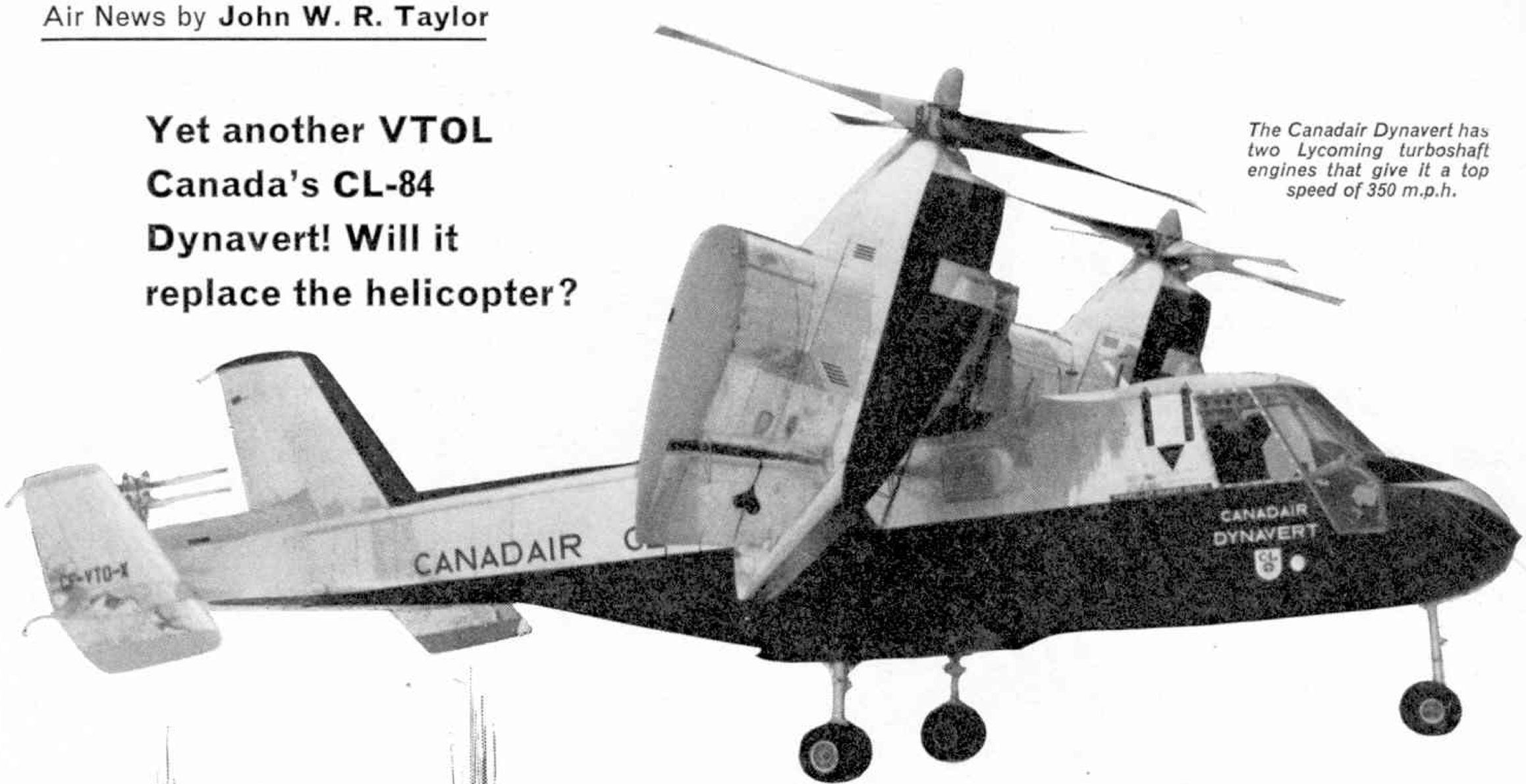
Yet another VTOL Canada's CL-84 Dynavert! Will it replace the helicopter?



The Canadair Dynavert has two Lycoming turboshaft engines that give it a top speed of 350 m.p.h.

IT'S STRAIGHT UP!

MOST modern fighters and bombers fly at two or three times the speed of sound, but high speed is not always the most important requirement for combat aircraft. Sometimes it is more useful if they can take off and land in front-line areas, where there are no proper airfields, or fly slowly when searching for and attacking enemy troops.

For this reason, helicopters have been used widely in warfare during the past fifteen years, in places like Malaya, Algeria and Vietnam. They can go almost anywhere, putting down troops, equipment and supplies in places where no aeroplane could land, carrying wounded soldiers to safety, making reconnaissance flights and even attacking the enemy with rockets, machine-guns and guided missiles.

Unfortunately, the war in Vietnam has shown that helicopters are not always fast enough or manœuvrable enough to dodge the enemy defence and their rotors are more vulnerable to ground fire than are the fixed wings of an aeroplane. So, designers all over the world are working on new kinds of aircraft that combine some of the helicopter's 'go-anywhere' capability with higher speed. Two of the latest results are illustrated here.

A tilting wing is the secret of the new Canadair V/STOL Dynavert

Canada's first VTOL

Canadair's CL-84 Dynavert is the first V/STOL (vertical/short take-off and landing) aircraft built in Canada. It left the factory on December 9, 1964, and should have flown by the time this issue is printed. Its early flights will be made as an ordinary fixed-wing aeroplane, but it has a tilting wing and will eventually be able to take off and land vertically.

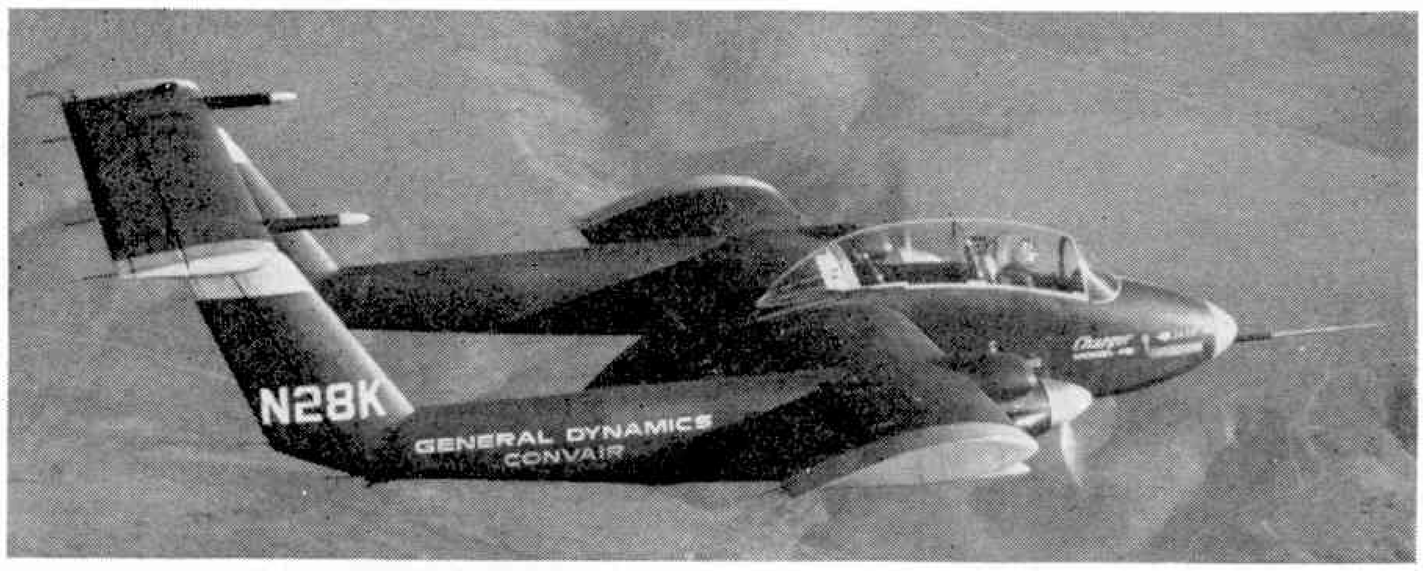
The CL-84 is powered by two 1,400 s.h.p. Lycoming LTC1K-4A turboprop engines, driving special, four-blade propellers which operate as rotors when the wing is tilted upward. This enables the aircraft to take off vertically like a

helicopter and two small, horizontal tail rotors keep it level during this stage of its flight, when the ordinary tail control surfaces are ineffective.

After take-off, at a safe height, the wing will then be gradually tilted downward, causing the aircraft to accelerate. Then, in cruising flight, the wing will supply all the lift needed to keep the CL-84 in the air, leaving the propellers to provide forward thrust. This should give the CL-84 a top speed of 350 m.p.h., which is much faster than any helicopter can fly.

With the wing tilted midway between vertical and horizontal, the CL-84 will be able to take off after a forward run of only 500 ft., carrying almost double the payload that it can lift vertically off the ground. This is made possible by large trailing-edge flaps, which deflect the propeller slipstream downward and give a tremendous increase in lift at low speeds. Canadair expect that the CL-84 will also be able to fly very slowly with the wing in the mid position, making it an ideal reconnaissance and search-and-rescue 'plane.

The prototype CL-84 spans 33 ft. 4 ins., has a length of 45 ft. 6 ins., and will have a loaded weight of 12,200 lbs. for VTOL take-off or 14,700 lbs. for STOL operation. Its maximum payload is 3,100 lbs. (VTOL) or 5,600 lbs. (STOL), enabling it to carry twelve passengers as a transport aircraft. It could also be fitted with a heavy load of weapons for ground attack or helicopter escort and other military duties, and Canadair have designed an improved version as their entry for a competition to find a new Advanced Aerial Fire Support System (AAFSS) for U.S. Army aviation units.



Americas COIN Aircraft

AMERICA'S latest ground attack aircraft is the General Dynamics/Convair Model 48 Charger, illustrated above. Built as a private venture, it is intended for what is called COIN (counter-insurgency) duties. This might involve flying ashore from an aircraft carrier in some remote part of the world, to deal with a local uprising or invasion of the sort that happened in Korea in 1950. Vertical take-off is not considered essential for this job, but the Charger has both leading-edge and trailing-edge flaps and can take off and land in under 500 ft. with a full load of bombs, rockets and machine-guns.

Powered by two 650 s.h.p. United Aircraft of Canada T74 turboprops, the Charger has a top speed of 317 m.p.h. and can patrol for up to two hours over a battle area. It has a crew of two and, although it spans only 27 ft. 6 ins., has a rear fuselage compartment big enough to carry six paratroops or 2,000 lb. of reconnaissance cameras or supplies. Its wheel undercarriage can be replaced by floats in areas where it would be easier to operate from water than from land.

The Charger was designed originally to meet a U.S. Navy requirement. Convair decided not to wait for the result of the official design competition and began work on the prototype in the Spring of 1964. As a result, the Charger was completed by September 1964 and will have been flying over six months by the time North American fly their very similar NA300 aircraft which won the competition.

It is too early to know whether this enterprise will be rewarded by large contracts for the Charger. However, it is the kind of aircraft that air forces all over the world will need in future to deal with the small local campaigns that are far more likely than an all-out nuclear war.

Jets on the Highway

There cannot be many places in the world where a "policeman" halts a row of jet fighters to let motor cars pass over a cross-roads. This does happen in parts of Sweden, as you can see from the photograph on the right.

The reason is that the Royal Swedish Air Force makes use of the ordinary main roads as runways in some parts of the country. This not only increases its mobility, but lessens the chance of an enemy knocking out the air force by attacking its bases at the start of a war. It would first have to find the fighters, parked under trees, in side roads and in small open hangars in apparently-open country.

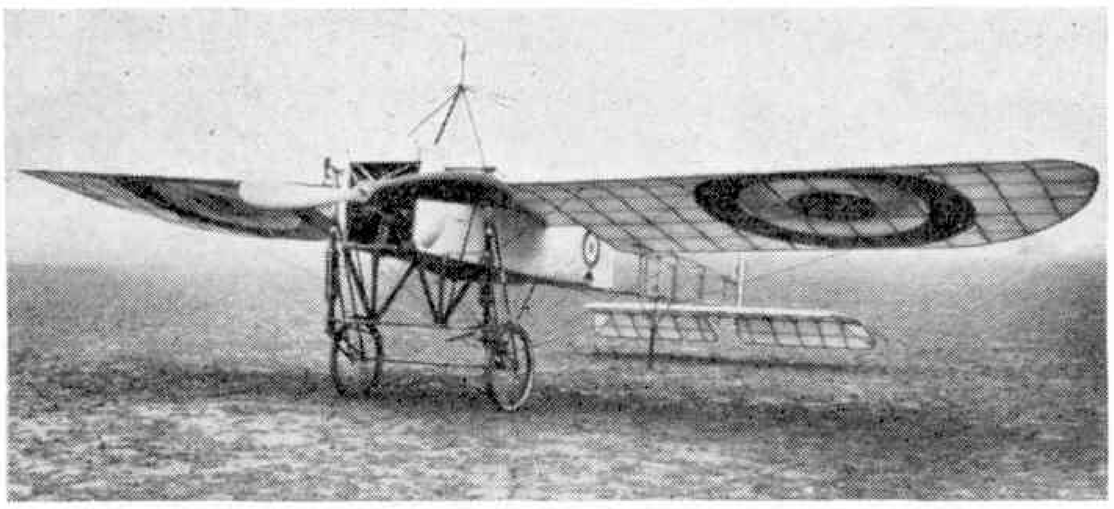
Aircraft movements hold up the traffic in Sweden

Golden anniversary for R.A.F. Roundel

The red, white and blue roundel of the Royal Air Force became 50 years old on December 11, 1964. It was introduced by an order from the General Headquarters of the British Expeditionary Force in France early in the First World War, which laid down that all aircraft of the Royal Flying Corps in the field were to be so marked. Before that, British aircraft had been marked with a Union Jack.

It was found from experience that when seen from a distance this could be confused with the German black cross. In any case, ground troops tended to regard all aircraft as hostile and fire on them regardless, and it was felt that a change might improve the position.

French aircraft were already marked with concentric red, white and blue circles, with the red outermost. Britain decided to adopt the French marking, with the colours in the reverse order, and this insignia is still used today.



One of the First World War aircraft with Roundel

Music in the Air

In-flight entertainment seems to be growing, at least in America. The latest United Air Lines news item states that, in addition to Jetarama Theatre with full-colour wide-screen movies, its trans-continental airliners will in future offer passengers a wide range of stereophonic music and special tape-recorded programmes for children. All of which sounds like a new kind of sonic boom!

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SALES

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

• Any Tri-ang Series 3 Curved Track Sidewalls R90/1, and R90/2. Straight Track Sidewalls R89; also High Level Piers R74. Please write, stating quantity and price. Teall, Stonehouse, Bearley, Stratford-on-Avon, Warwicks.

• "M.M.'s" 1/61, 2/64; Dinky Army Models wanted; Lesney Y-11 Steamroller. Watson, 148 Green Park Road, Halifax.

• McCoy 5 c.c. Glowplug Engine, Air-cooled. S.A.E. S. T. Purcell, The Service Station, Charlton, Horethorne, Nr. Sherborne, Dorset.

• Collection of Matchbox Labels, also Albums, Catalogues of Matchbox Hobby 1959-63. Send S.A.E for list. Smith, 12 Clarence Road, Lowestoft, Suffolk.

• Hornby Clockwork "0" Gauge layout; Single Track Oval with Locomotive, Carriage and Goods Sidings, 2 Locomotives, 10 Carriages, 18 Goods Wagons, and all Hornby accessories. All in new condition; sell for £15 or nearest offer. Also, Hobbies Wooden Fretwork Workbench. Size 3 ft. 6 in. by 1 ft. 9 in. by 2 ft. 6 in. with hardwood vice and detachable legs; sell for £6 or nearest offer; in new condition. Moffatt, Serpentine Cottage, Serpentine Road, Kendal, Westmorland.

• Mint King George VI. 221 Stamps, catalogue value £7 11s. 0d.; price £2 17s. 6d. Mrs. Forrest, 13 Saxholm Dale, Bassett, Southampton.

• "M.M.'s", complete years 1929, 30, 31, 32, 33, 34, 47, 48, 49, 50, 54, 55, 57, 58. Part years 1928, 46, 51, 52, 53, 56, 59, 60, 61. Details, offers. Gibson, Brooklyn, Daleside, Gerrards Cross, Bucks.

• Meccano Sets 1 to 5, Bayko Sets 11 to 15, both with Accessory Sets; Hornby "00", 2 and 3 rail, Track, Rolling-stock, etc.; Circuit 24 Sets and individual items. All half price. Taylor, 66 Walten Rd., E. Molesey, Surrey. MOL. 1691.

• Mr. Jacques Amartin, 231 Bld. Saint Germain, Paris, would like to thank all those readers of "Meccano Magazine" who replied to his advertisement. He is dealing successfully with one of them. He is unable to reply to all the others who wrote to him and would like to send them his kindest regards.

WANTS

• "M.M.'s", good condition, 1916-29 and 1962-3, complete vols. or single copies, reasonable price given. Smith, 12 Clarence Road, Lowestoft, Suffolk.

• Meccano Standard Mechanisms 1951, and Gears Outfit "A" books. Also other obsolete literature. Your price paid. M. Green, 120 Broadway, Manchester 10.

• Wanted pre-war Dinky and Tootsie Toys—whole collections bought. Top prices paid. Write or phone 89183, evenings. K. Wootton, 30 Barchington Ave, Torquay, Devon.

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

• Obsolete Dinky Toys, etc. Highest prices, single or collections. Pinnock, 6 Stream Farm Close, Lower Bourne, Farnham, Surrey.

• Pre-war "M.M.'s" required, particularly March, April, 1930. State price. W. Charleson, 9 Argyle Road, Chadderton, Oldham, Lancs.

• Lego, Dinky Toys wanted. Tamarisk, Tilsworth Road, Stanbridge, Leighton Buzzard, Beds.

• Collector urgently requires "Meccano Magazines" 1924, February, November, December; 1925, January, February, April, May, June, October, November; 1926, January, December; 1927, July, September; 1929, February. Must be in excellent condition or will take whole years if bound. Also, any years before 1924; Prize model leaflets, obsolete parts, etc. Requires 10 set or larger. Must be perfect. You may state your price, however high. D. Stephenson, Stoneycroft, Station Road, Earl Shilton, Leicestershire.

• Meccano T.20 Transformer. Must be in good condition. Willmott, 26 Station Road, Holt, Norfolk.

• Meccano part No. 167 Geared Roller Bearing complete. State price and condition. E. D. Barclay, 28 Rosenheath Road, London, S.W.11.

• Pre-war "M.M.'s" containing history of Meccano. Decooman, Gullegemstraat, 61, Heule, Belgium.

• Following prices paid for cased coin sets—1911, £40; 1927, £60; 1937, £30; 1950, £10; 1951, £20; 1953, £10; £7 for any Maundy set; top prices for other English, Canadian and American coins. D. H. Woodberry, 104 Risca Road, Rogerstone, Mon.

• Wanted: All issues "M.M." before 1950. Also used or obsolete Meccano parts, leaflets and related items. Please quote in U.S. dollars, including packing and shipping. H. Schenck, RD 4, Potsdam, New York, U.S.A.

Answers to Puzzles on Page 19

Quick Quiz
1. Thrust, lift, weight, drag.
2. Admiral.
3. The sun.
4. 1910.
5. Samoyed.
6. U represents Unterseeboot.

Score 35 or over: Excellent.
30 or over: Very Good.
25 or over: Average.

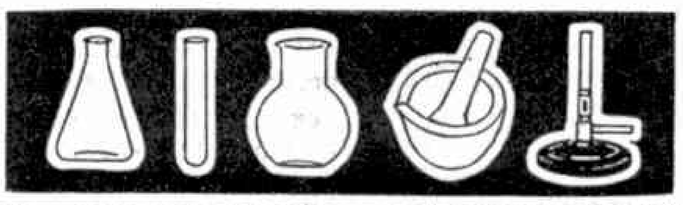
Tricky Teasers
A. Both the same.
B. The two boys take the boat over to the far bank, one gets out and the other brings the boat back and hands it to a soldier, who crosses. The boy on the far bank brings the boat back. The initial procedure is now repeated—the two boys crossing together and one of them bringing the boat back for the second soldier, and so on.
C. Three-farthings.
D. The captain was a girl—Captain in the Girl Guides.
E. Seven feet six inches.

Car Quiz No. 5.—Ford Zodiac Mk. 3.

Crossword Puzzle No. 4

H	A	P	P	Y	■	H	E	■	S	P	A	I	N
I	S	L	E	■	H	U	G	E	■	R	■	N	E
S	T	E	P	P	I	N	G	S	T	O	N	E	S
T	E	A	■	I	T	■	S	P	A	■	A	R	T
O	R	S	O	N	■	O	■	A	V	A	S	T	■
R	■	E	N	S	H	R	I	N	E	■	T	I	E
Y	E	S	■	■	A	■	M	A	R	T	I	A	N
■	N	■	S	C	R	A	P	■	N	O	N	■	D
S	T	R	E	A	M	■	O	Y	S	T	E	R	■
■	R	E	A	S	O	N	S	■	■	E	S	A	U
F	A	T	T	E	N	■	T	■	A	S	S	■	S
E	N	A	■	■	Y	■	O	L	D	■	■	A	S
A	C	R	E	S	■	G	R	I	D	■	S	I	R
R	E	D	■	T	W	O	■	P	■	O	I	L	■

Chemical Spares



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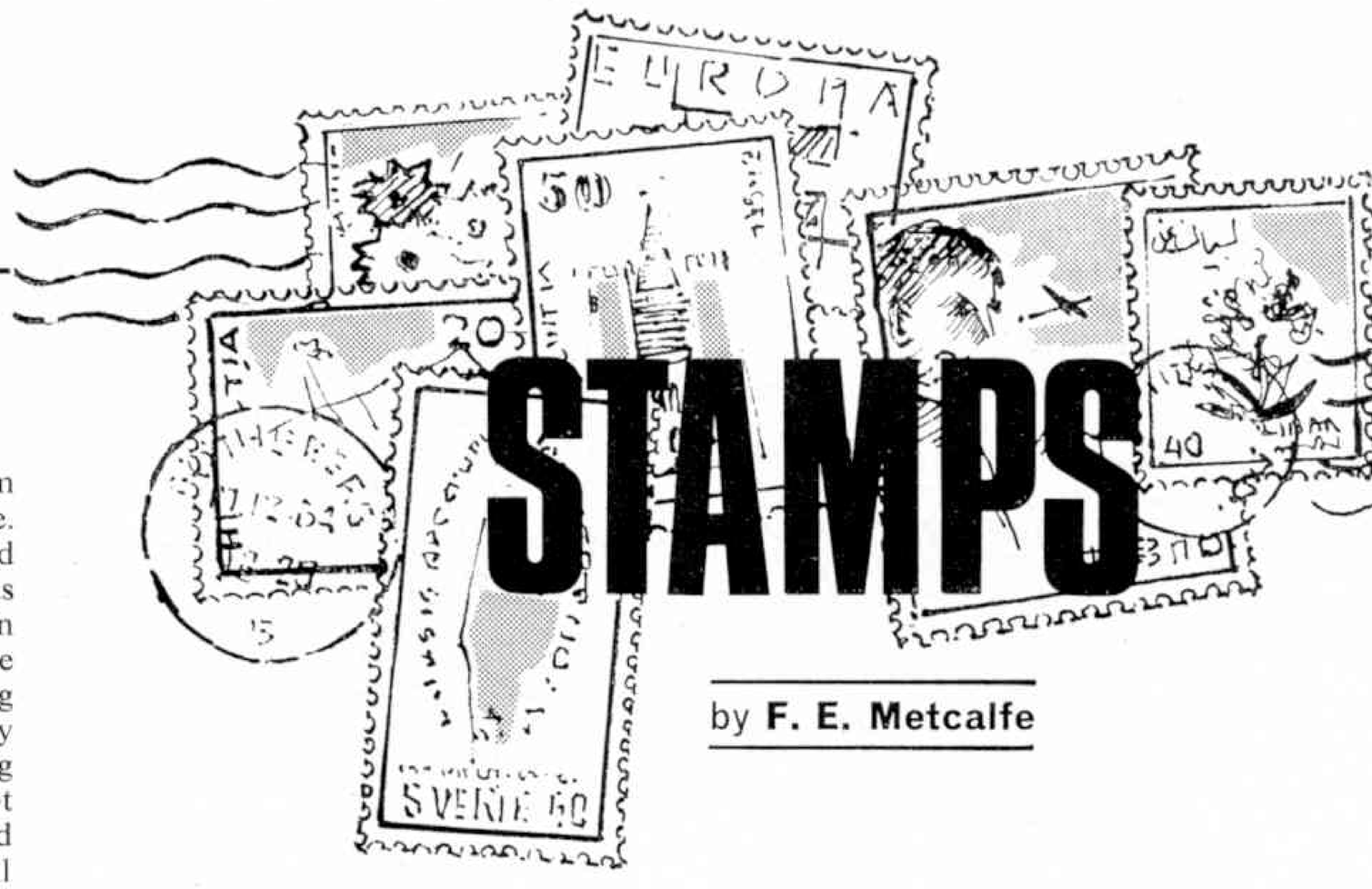
Continued on page 50



STAMPS

by **F. E. Metcalfe**

What to collect

RECENTLY, I received a letter from a young reader living in Hampshire. He wanted to know what stamps would be issued during 1965 and 1966, for, as he put it, he had become interested in stamp collecting. Well, in spite of the long experience I have had 'messing about with those bits of paper', as my mother used to put it and not being blessed with second sight, I could not answer that query even if I had had enough paper available to dot down all the issues which will appear between now and the end of next year.

I gave what answer I could and, thinking about that letter, it struck me that there may be many others who might like a few lines on the why and wherefore of what is undoubtedly the most popular indoor pastime almost the world over. Now first of all, the hobby has completely changed its character during the past few years and those who have not changed their ideas with it can quite easily give advice which, in the long run, is harmful rather than helpful.

For instance, nothing infuriates me more than the suggestion that, to start, you should buy the biggest packet you can afford. If you do anything of the kind, and continue adding any stamps which come your way to the general collection on which your 'biggest packet' has started you off, sooner or later you will come unstuck. In my early collecting days the majority of collectors, including myself, were forming general collections. In other words, all was grist for the philatelic mill, even cut-outs from stamped postcards.

7,000 a year

This was because there were relatively few stamps in those days. However, this lack of stamps has changed considerably for postal administrations issue, if memory serves me correctly, about 7,000 new stamps a year. Thus you will see how impossible it is to keep up and there's the snag, for when it gradually dawns on a collector that he is getting nowhere, he naturally becomes discouraged. If he then takes to a dealer the contents of his 'biggest packet', plus the stamps he has subsequently acquired, he is likely to be in for a shock if that dealer does not want his stamps at any price, as is often the case.

Now don't get me wrong. If you are going to take up stamps seriously, by all means gather all stamps that come your way, but *only* as a sideline. Some stamps, particularly those issued at the present time, are attractive enough to be collected for themselves alone. This brings me to the question of thematic collecting, i.e. collecting by subject—flowers, ships, trains, etc.

This type of collecting is very popular today, although unfortunately, there are no real subject stamp catalogues issued in Great Britain. However, Gibbons Simplified Catalogue, which illustrates all stamps, is a magnificent job. Alas, in spite of its cheapness for what it is, a copy costs 35 shillings, but if you can nudge uncle to fork out the cash to buy this catalogue, then you are on a winner; that is, of course, if you wish to go in for subject collecting.

Commonwealth issues

Then there are our own Commonwealth stamps, which are naturally tops in popularity with us. If these stamps are your cup of tea, then there is Gibbons Part 1 (cost 27s. 6d.) which covers all Commonwealth issues. But even this may be too wide a field for you to tackle, so there are the stamps of the last reign (KGVI) and the present one (QEII). Their popularity is growing all the time and not just in Great Britain.

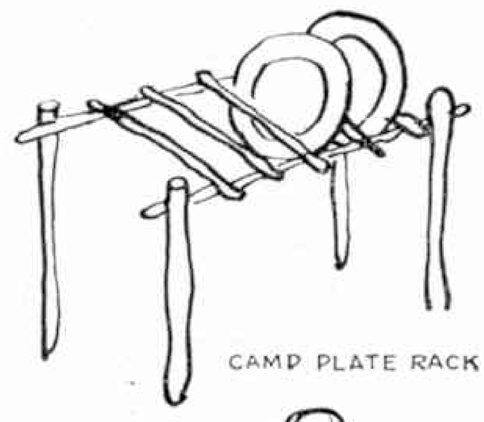
Until this year, Gibbons issued what they called their Two Reigns Catalogue, covering the KGVI-QEII period, but they have now dropped it. However, you need not go without a catalogue for these popular stamps, for there are the Commonwealth KGVI Catalogue (price 9s. 6d.) and the Commonwealth QEII (price 10s. 6d.). The latter is issued yearly and such is the popularity of the stamps it deals with, that three printings have been necessary to cope with this year's demand. The 'KGVI' catalogue appears every other year and four printings of that work have been called for.

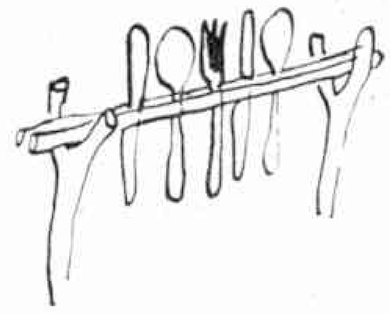
Summing up, there are far too many stamps being issued for any real progress to be made if you are collecting generally. But if you don't take the process of gathering them too seriously, by all means take and mount those that come your way. As you cannot get anywhere collecting all of them, then you must concentrate and a theme or two based on our own Commonwealth stamps of the KGVI and/or QEII periods are well worth consideration.

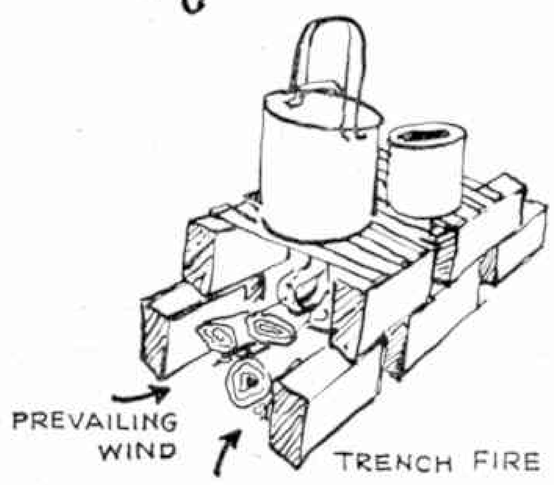
But, whichever stamps you finally decide to collect, don't rush into it in bull-at-a-gate fashion. If you have no books on the subject, you might go to the public library. You will find that the more you know about the hobby, the more fascinating it will become. Remember, it is not just a pastime for a few youngsters. People in all walks of life are under its spell.

Theme collecting is one of the most satisfying methods of collecting stamps. Here are shown flowers, Commonwealth animal and bird selections from various countries.

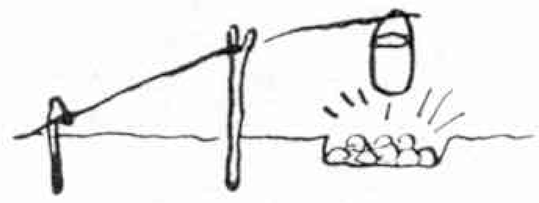
Camp fire cooking







Do-it-yourself ideas



THE first step to successful camp cookery is to realize that if you are camping Spartan style, the kind of fire you need for frying, boiling and roasting food is a very different one from the kind you sit around for singsongs last thing at night.

When finding a place for your camp fire, try to ensure that when you break camp, nobody will know that the spot has been a temporary kitchen. The ability to leave no trace of past inhabitation of a site is the mark of the expert camper.

You start by lifting a piece of turf about two feet square. Cut four or five inches into the turf and then roll up the section carpetwise — so that when you leave, it can be replaced without notice. To this end, the turf should be stored in a shady spot and watered each day.

The most suitable natural fuel for a camp fire is ash, with beech, oak and birch in second place. Never, of course, plunder a hedge for firewood, nor take living wood from a tree. Most fair sized trees have some dead wood within picking height and you can usually rely on such timber being dry enough to burn properly.

Always see that you have plenty of wood to hand before you start cooking. It is a good rule to assume that when the pile looks big enough, you go away and get exactly twice the quantity. The first estimates of the amount of wood required are usually wrong.

Keep the wood pile tidy, stacking each twig according to size and length and if your camp is to be of several days' duration, it pays to erect a shelter to protect dry wood from sudden showers.

Start building your fire by thrusting a short green stick into the ground and building a pyramid of fine twigs around. Follow by a layer of slightly thicker ones and then thicker still for the outermost layer. Fir cones can be a useful source of additional kindling but only, of course, if they are properly dried out.

The Fire Trench

A slightly more elaborate method of making a camp fire is to dig a fire trench, which is then lined with bricks. The brick lining helps to make the pots stand more steadily. A fire trench should be wider at the windward end—and if a two layer brick construction is used, there should be a space between the bricks to allow for ventilation.

No sensible camp cook wastes firing and fire economy can be achieved by simple planning. Use the start of the fire for boiling water and indeed, when you are not cooking, there should always be water on the fire ready for washing or washing-up.

Never attempt true cooking until the fire is a mass of glowing embers. You can partially control the fire by placing two or three twigs, thickest part first, into the fire in a star formation, pushing gradually more and more of the twig into the burning area until it is entirely consumed.

For cooking over a wood fire an iron 'dixie' pot is, although old-fashioned, still the most reliable piece of equipment. Aluminium saucepans may be lighter to carry to camp, but it is difficult to control food temperature with this sort of gear.

Simple Camp Oven

You can make an effective camp oven out of a biscuit tin. Tip the lid inside the tin, diagonally. Place the tin on its side, so that the lid will act as a reflector of the heat from the fire. Stand it at the end of a trench fire, so that glowing embers can shine into it.

It is possible to use such an oven directly over the fire, but if you use this method, you have to remember that the oven floor gets extremely hot and food can easily burn.

A biscuit tin oven gives better results for roasting meat or baking cakes than an upturned iron bowl over a meat dish on hot embers, which is another method of outdoor roasting with the minimum of cooking equipment.

Using a Paraffin Stove

A slightly more complex cooking device for the camper is the paraffin pressure stove. The best size of stove for the person who wants to travel light, is the half or pint capacity unit.

To get a paraffin stove going, set up the stove, clear the burner jet, place the windshield in position and proceed as follows:

Fill the spirit cup with methylated spirit, taking care not to overspill. Alternatively you can use two of three pieces of a solid fuel tablet. These can be bought for approximately 2s. 6d. See that the pressure release screw in the filler cap of the stove is loose, light the fuel and close the metal draught shield. Allow to burn until about two thirds of the igniter fuel is gone and then tighten the vent screw in the filler cap.

Leave until the spirit is nearly exhausted, then pump gently once or twice to light the escaping gas. If it lights properly with a hissing blue flame, a few more strokes of the pump may be given.

Most stove lighting failures are due to impatience and should, at the first pump or two, paraffin rise instead of vapour, the vent screw should be quickly opened to release pressure and the priming process repeated. *Under no circumstances light a stove inside a tent!*

What's Cooking?

Having built your camp fire or lit your stove successfully, you will be wondering what to cook.

Sausages are a favourite camp fire food. Prick them carefully and impale them on a stick—a willow twig is especially good for this purpose. Peel back the bark and use like a toasting fork, turning the sausages round and round over the hot ashes until done.

Potatoes should also be pricked before cooking and a tip which ensures quality finished potatoes is to wrap them in clean wet paper before putting them among the hot ashes.

If you are carrying your provisions along with the rest of your gear on your back, or on a cycle—think about the most compact form in which you can carry menu essentials. For example, packet soups are more space saving than tins. Crispbread, such as Ryvita, represents the same food value as a loaf in much less room, while a small carton of honey has more sweetness and energy than a large pot of jam.

Instead of liquid milk take Marvel. This is a granular form of milk which retails at 2s. 1d. a pack and makes three and a half pints of milk.

Finally, no matter what you decide to stock your camp larder with, when shopping, calculate on serving each camper with almost twice the amount of food they would want at home!

by **Sonia Roberts**

LAST month we looked at some of the trouble spots on second-hand cameras, now we take a look at some of the accessories and darkroom equipment to check for faults.

One of the most expensive and delicate accessories is the exposure meter, which can be easily ruined by dropping, or getting it filled with water or grit. When looking at meters, use plenty of commonsense and you will not go far wrong. Try taking readings of various subjects and see what results you get.

If a friend has a meter which you know is working, take this along with you to compare the two. You may get slightly different results from different makes, but you will get a good indication of what is happening. Make a point of checking the highest film speed available on the meter. There are a great number of old ones on the market which are not scaled high enough for present-day films. A meter which looks new can be 15 or 20 years out of date.

Another accessory used with the camera is the tripod. This should be completely rigid when erected, as collapsing tripods can cause quite a lot of damage. Particular attention should be paid to the type that is made of tubular metal and has small pins which pop out to hold the leg open. The springs are liable to be weak or broken with disastrous results. Unfortunately, they are not easy to repair. The best buy is the tripod that has a locking device to prevent the legs splaying out too far, if you can't get one of this type, fit a safety chain on the legs to stop them spreading.

Flash Units

Flash guns vary considerably according to make, a lot of them having reflectors which are next to useless. The best check is to take a test shot with them, to make sure that they do not have a 'hot spot', i.e. the picture is brighter in the middle than the corners. The same applies to photoflood reflectors.

There are two methods of supplying power in flash guns and the simplest is the ordinary torch battery. To test this type, put a torch bulb of the correct size across the bulb carrier and a screwdriver across the plug, which goes on to the camera. If the bulb lights, the wiring is all right.

Capacitor flashguns require a special test bulb which can be obtained for a few shillings. If one is not available, you can test by placing an insulated screwdriver across the bulb holder and another across the plug, which should produce a fat spark. Don't do this too often as you may damage the wiring.

Electronic flash is a different kettle of fish. From the amateur point of view it either works or it doesn't. For goodness sake don't meddle with it and don't start trying to test it with screwdrivers. The operating voltages of electronic flash units vary, but they can be up to twenty thousand volts and insulated screwdrivers are normally only effective up to 500 or 5,000 volts.

The amperage in these units is usually very low and they are quite safe in normal use, but faults and prying fingers can cause remarkable unpleasant results. The capacitors will hold a charge, sometimes lethal, for several days.

When I buy any darkroom or studio equipment, I always check it thoroughly for electrical faults first. In many cases, I have to have it rewired. However, if you are in any doubt, or have not had considerable experience in working with electricity, give the job to someone who has. It is quite common to buy equipment wired by amateurs that could be deadly, and even new equipment has been known to come from abroad with the colour code wiring incorrectly attached.

Enlarger Faults

One piece of equipment that has simple wiring is the enlarger. When buying check that the column is not bent or dented and that the head moves smoothly up and down.

The lens should be clean and free from scratches and chips and the iris control free but not loose. The baseboard, lens panel, negative carrier and condensers or diffusion screen should all be parallel, if not, something is bent. Check the lens panel for undue movement and the focusing movement for wear. Some types allow adjustment for this, some don't.

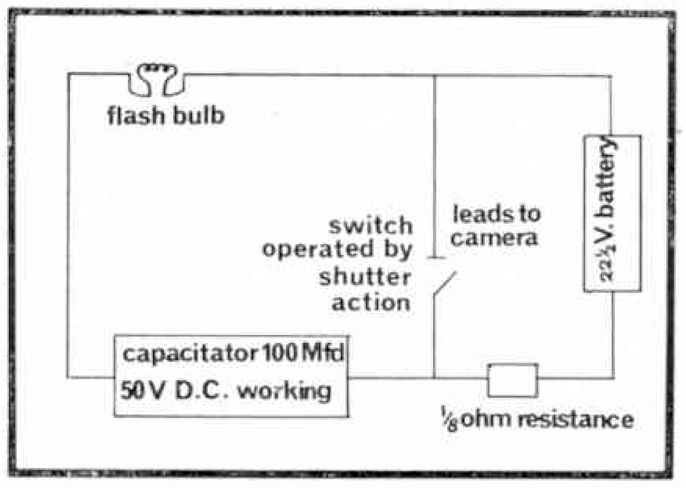
Flood lamps should have the wiring checked and make sure that the stands are solid when erected. Lamps which fall over and stands that collapse are dangerous. While checking the wiring, have a look at the bulb holders. The plastic types distort and crack with the heat of the bulb and may need replacements.

Print dryers again are mainly an electrical problem, but make sure that glazing plates are not scratched or bent and that the cloth is not stained.

Developing tanks must be checked for cracks and distortion due to being dried by heat. If the spiral is bent, it is useless. Enamel dishes should be checked for chips which will allow the chemicals to react with the metal underneath, rusting away the dish and affecting your chemicals.

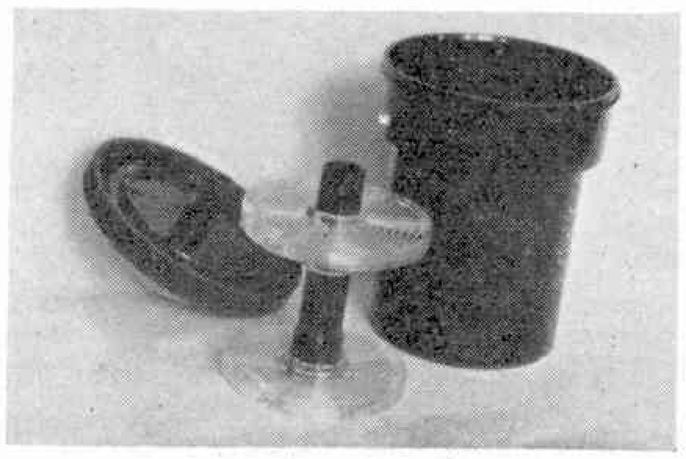
Well, as you can see, buying second-hand is largely a matter of commonsense, coupled with a slight knowledge of photography and your own requirements. Next month, I shall be dealing with colour films and how to use them.

Paul Dong

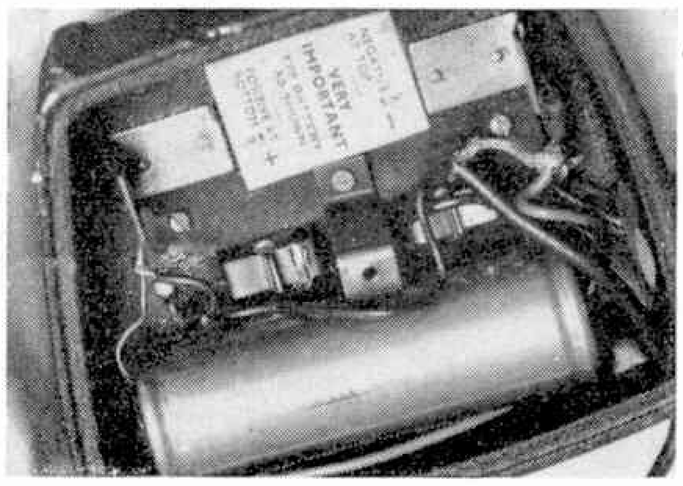


Ordinary flashguns can be adapted to capacitor use by the addition of capacitor (100 mfd 50v D.C.) and ⅛th ohm resistance wired as per diagram. The bulb, when inserted, completes the circuit through the resistance which keeps the current below that required to fire the bulb and capacitor which stores up the energy. When the firing circuit is completed, the current is released without the resistance, firing the bulb. Bulbs should not be left in this gun longer than necessary as the battery is constantly discharging when the circuit is complete.

Developing tanks should be checked for cracks and distortion of the spiral. This type has ball bearings to assist loading of film and these should be free, not seized.



The inside of a capacitor flash-gun. Care should be taken with insertion of battery. If it is connected the wrong way round the capacitor will be burned out.



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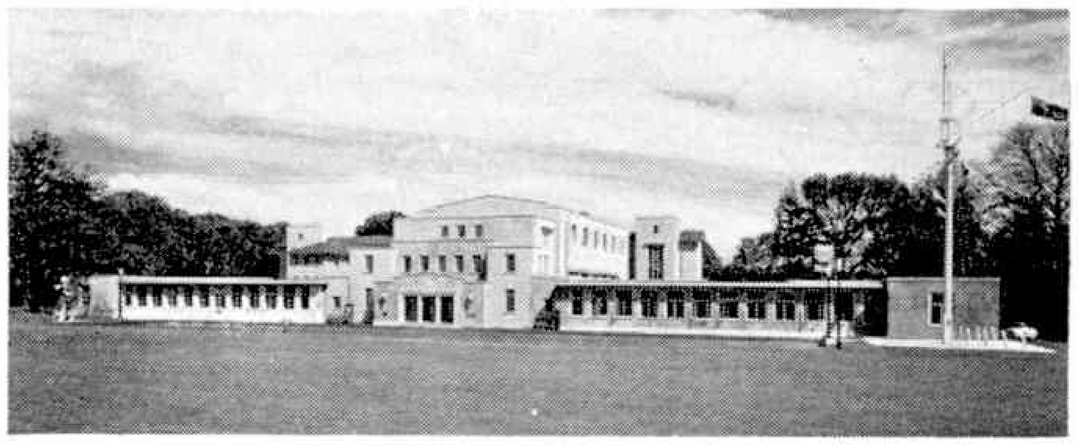

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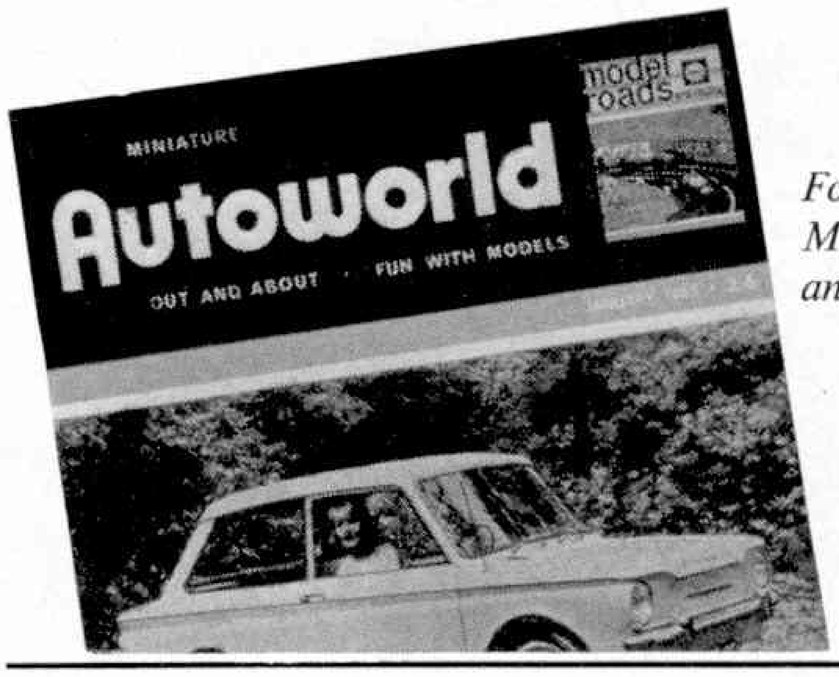

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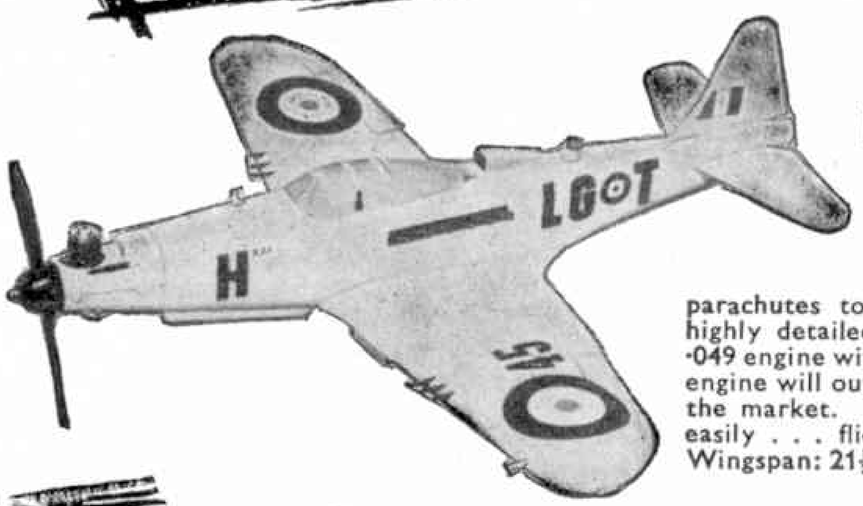

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You may submit as many questions as you like. We will deal with as many as possible each issue.

By the left

Q. *How many people in* 100 *are left-handed?—'One of them', Brentford, Middlesex.*

A. According to a recent survey, there are 200 million left-handed people in the world, and they are on the increase. It has also been estimated that seven in every 100 men and four in every 100 women are left-handed; and the trait is four times as common among twins as among other children. Contrary to tradition, there is no evidence that it indicates backwardness. Among famous people who did not find it a handicap were Michelangelo, Leonardo da Vinci, and Alexander the Great. An American psychologist who studied the subject for 25 years concluded that left-handed people were often sensitive, imaginative and creative; and that if children were allowed to follow their own inclinations without interference, 34 in every 100 would become left-handed.

Colour TV

Q. *How long has colour television been possible?—S. D. F., Leyton, E.*10.

A. As long as 1928, the British pioneer John Logie Baird demonstrated a colour television picture. In September, 1940, the Columbia Broadcasting System of America gave the first public demonstration of its three-colour TV system. In April, 1956, the first public test transmission of colour TV was made by the BBC from Alexandra Palace.

Off the map

Q. *Is there an actual place called Shangri-La, or is it a myth?—'Curious', Sidmouth, Devon.*

A. It is a purely fictional region, somewhere beyond the Himalayas, created by the novelist James Hilton in his book, *Lost Horizon*, published in 1933. The name has come to indicate any unattainable land of peace and contentment.

Lens lore

Q. *Can you recommend a good book for beginners on the microscope?—D. J. S., Ludlow, Salop.*

A. Take a look at *How to Use a Microscope*, by Walter Shepherd, recently published by Weidenfeld & Nicolson at 15s. It's a guide for youngsters on different kinds of instrument, lighting, sectioning and so on.

Lingual lab

Q. *What is a language laboratory?—'Ignorant Antony', Shepshed, Leicester.*

A. A classroom for language teaching equipped with tape recorders and other electronic aids. One of the biggest in the world is in the new Foreign Language Centre at Yale University, Connecticut. The classroom (*see picture*) has booths for 116 students, who can dial the lessons they wish to take in any of 20 different languages, as you dial a telephone number. A tape recorder plays the lesson into the student's earphones, in which he can also hear his own voice so that he can compare his pronunciation with the recording. The system, with a stock of 5,000 tapes, can give up to 60 lessons simultaneously, while an instructor in a soundproof booth can communicate with one or more students.

Trembling world

Q. *How many people are killed by earthquakes every year?—P. McQ., Peterlee, Durham.*

A. The average annual death roll is between 20,000 and 30,000. About a million earthquake shocks are recorded every year, of which some 200 have serious consequences.

Root sign

Q. *Why is the sign* $\sqrt{\ }$ *used to indicate 'square root'; who introduced it and when?—R. P., Worcester Park, Surrey.*

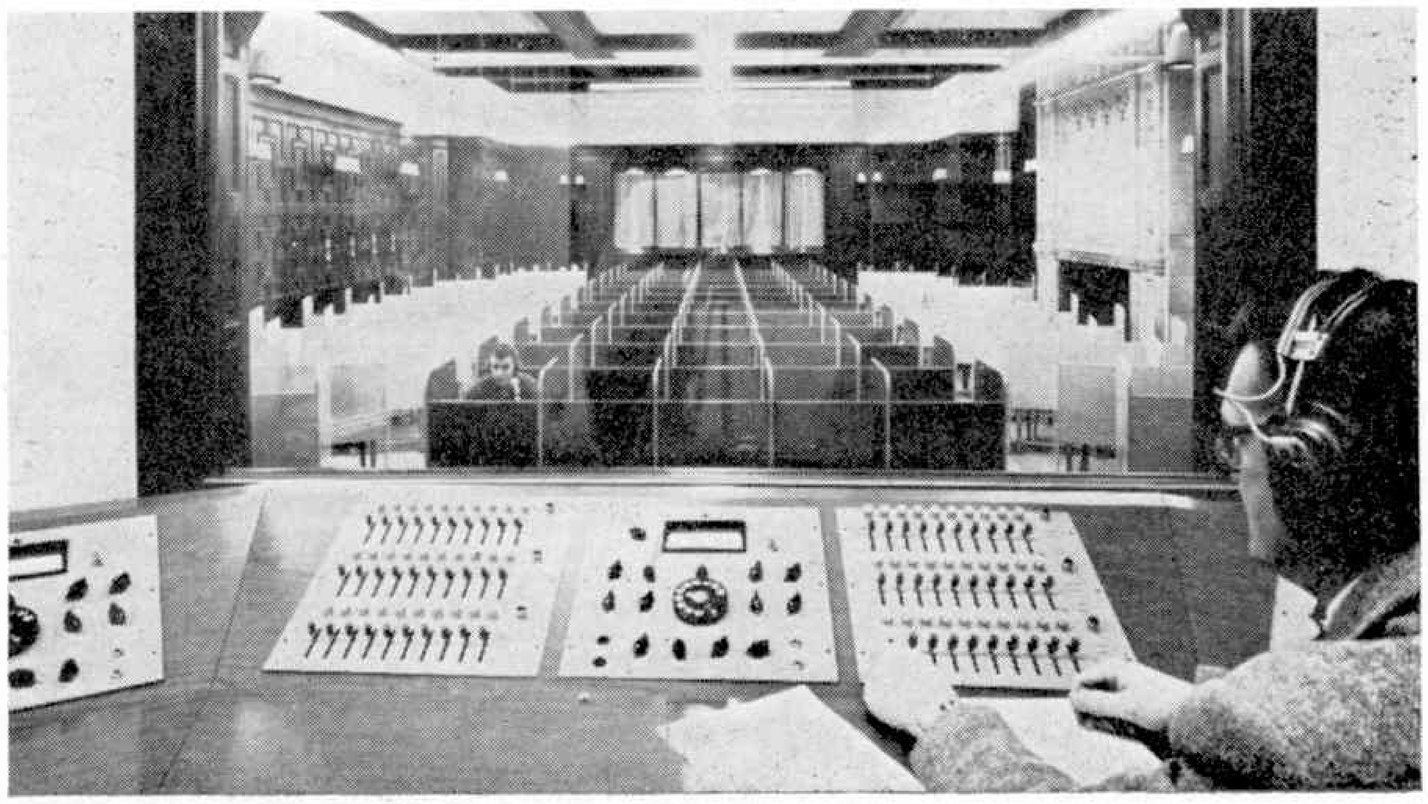
A. The ancient mathematicians used to write out the word for 'root'. The symbol commonly used by Latin writers in medieval days was ℞, a contraction of *radix*, which was also used in physicians' prescriptions. The radical sign first appeared in print in the work of a German mathematician, Christopher Rudolff, in 1525. But European writers generally were slow to accept this sign, which was changed when the book appeared in an edited version in 1553. Subsequently, various forms were used in manuscript for the letter *r*, and many complicated symbols were favoured before a simple method for indicating a root was developed, including the letter *l*—for *latus*, or side, meaning the side of a square. Not until the 17th century was the radical sign generally adopted, with variations.

Biggest star

Q. *Can you tell me which is the largest star known?—P. B., Old Windsor, Berks.*

A. The largest measured star is the double-star Epsilon Aurigae. Its primary component has a diameter of about 1,800 million miles—some 2,000 times that of the Sun. If we could fly round it at 1,000 m.p.h., it would take us about 6,300 years, compared with the single day it would take to circle the Earth. Yet it is so tenuous that its total mass is only 18 times that of the Sun, and its surface temperature is a mere 1,200 deg.—remarkably low for a star. By contrast, the smaller member of the system is a particularly luminous yellow supergiant with a candle-power about 60,000 times that of the Sun and nearly 30 times its mass; its diameter is over 150 million miles. On a clear night, it is quite conspicuous near Capella. The system is 3,400 light-years away from us.

Learning a foreign language with the aid of the language laboratory.



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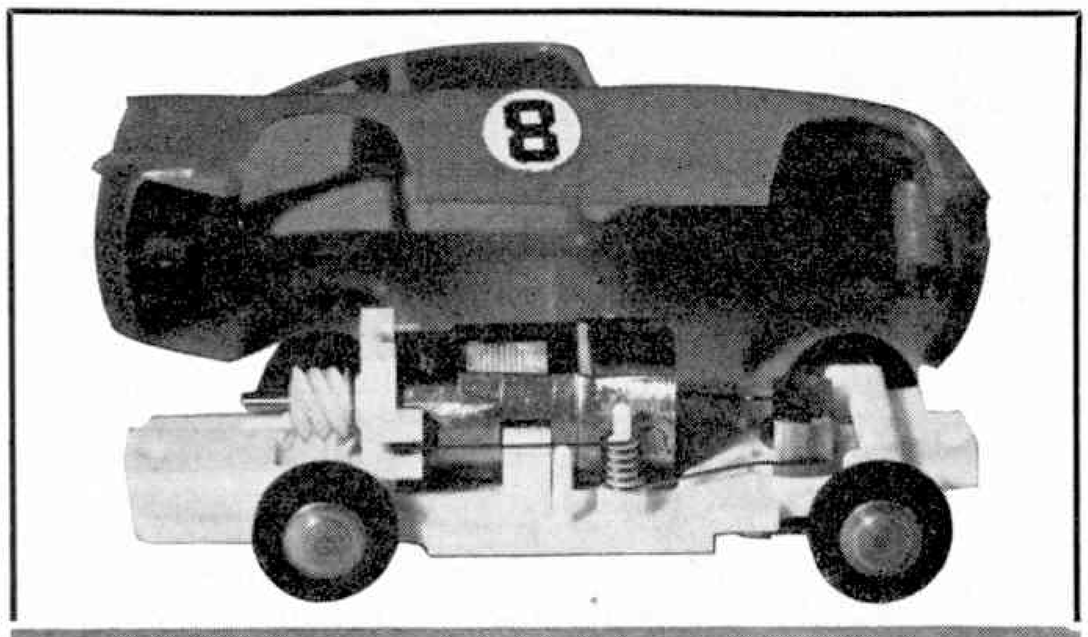

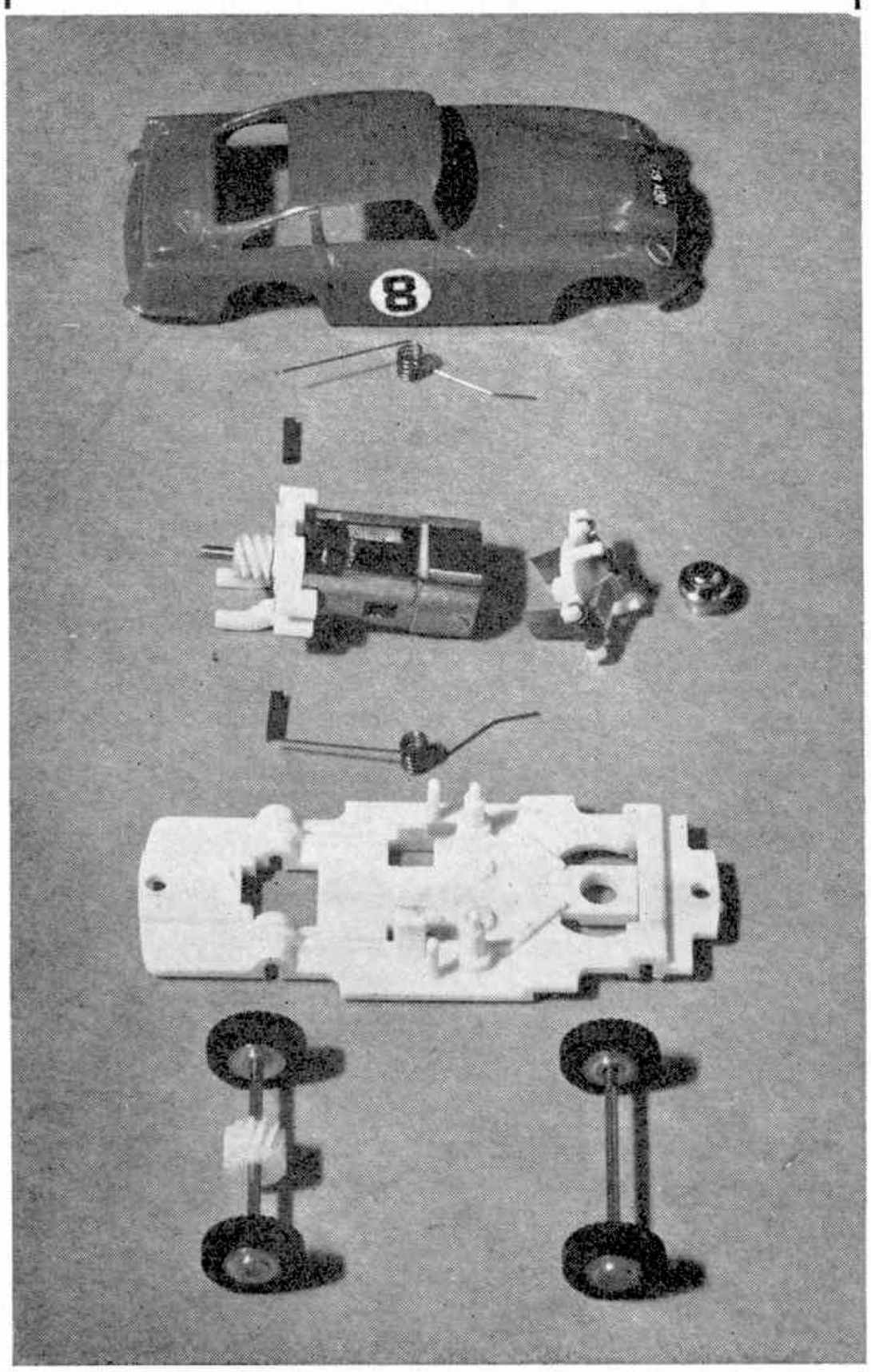

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MECCANO

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HORNBY LOCO SURVEY

by **Linesman**

THE standardisation of locomotives is a much discussed topic and one which has been known to cause many heated arguments among railway enthusiasts. At one time, the various railway companies built small numbers of locomotives intended for specific duties and it was quite normal for individual railways to own many different types of locomotive.

The London and North Western Railway was perhaps the greatest of all the protagonists of standardisation and it built only a limited number of different types of locomotive, but in often large numbers. This policy has been adopted by British Rail and differs only in the respect that modern diesel and electric locomotives have replaced the steam engine.

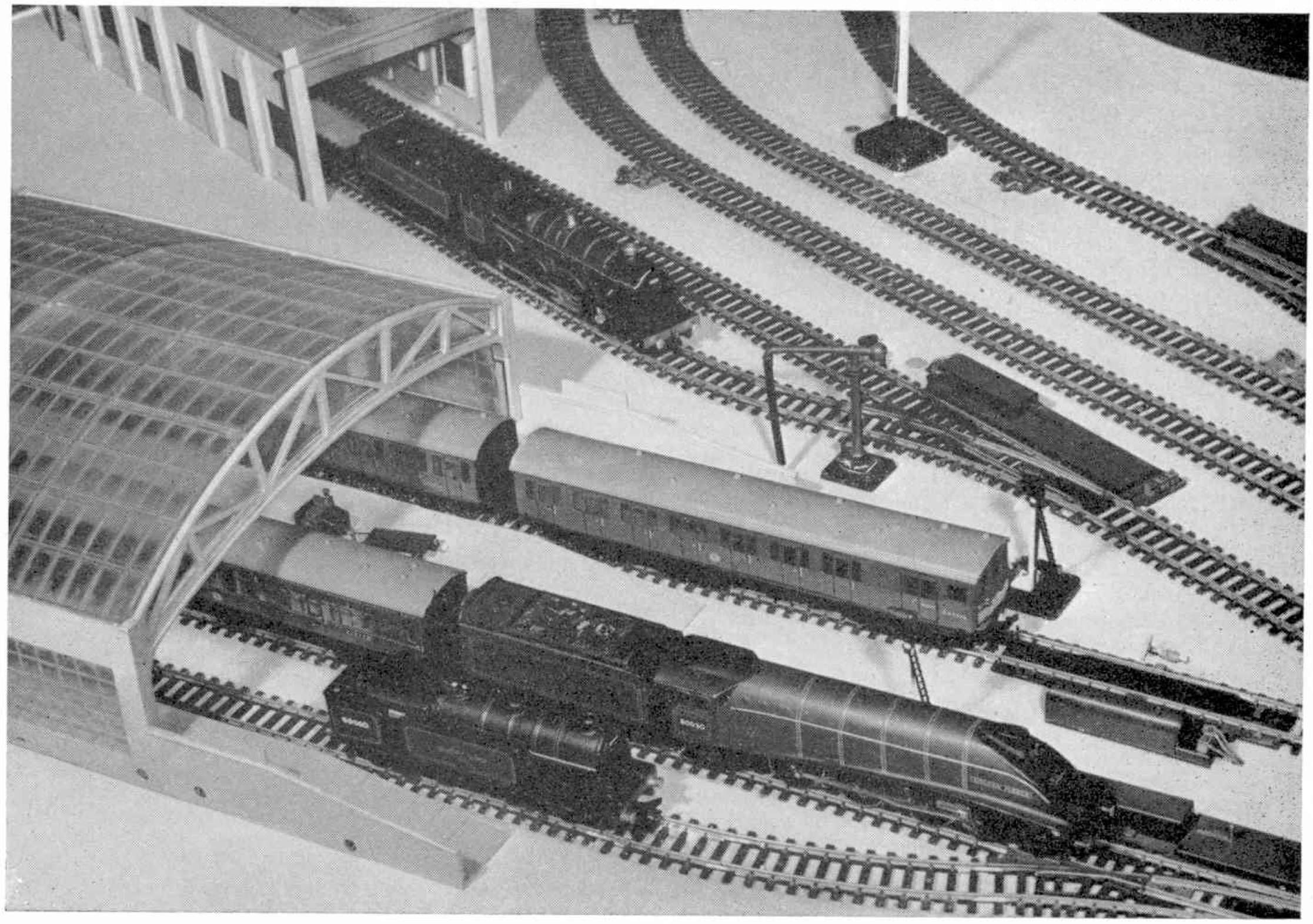
Surprising though it may seem, however, standardisation has not reduced to a really marked extent the numbers of different types of locomotive to be seen on our railway system. There are, at present, fifty-seven types of diesel locomotive, not counting the various types of multiple unit stock and the many electric and steam locomotive types.

The policy of standardising loco stock has long been accepted by Meccano Limited in the Hornby-Dublo range and to satisfy the majority of enthusiasts, locomotives likely to be seen in as many districts as possible have been built.

Modern Electric Power

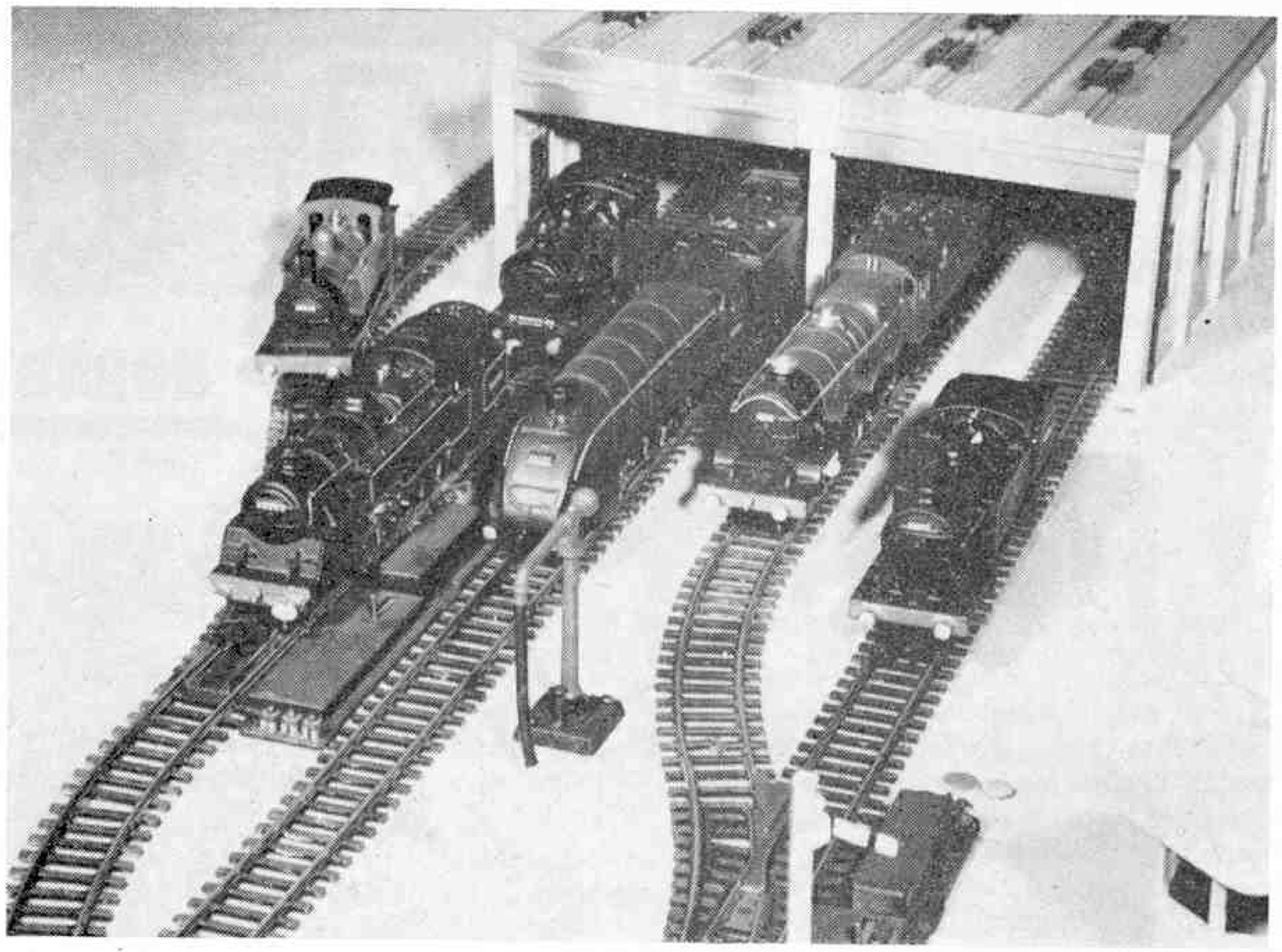
As on British Rail, diesel and electric outline engines have gradually had their effect on the Hornby-Dublo range and locomotives in the express category now include a model of the Liverpool-Euston pantograph locomotive and also models of this type 5 and type 3 Co-Co diesel-electric engines.

'Golden Fleece' is seen here moving slowly out of the terminal station with its train of British Rail corridor coaches. In front can be seen an 0-6-2 Tank locomotive patiently waiting for the Electric Motor Coach Set, which can be seen behind 'Golden Fleece , to draw out of the station.

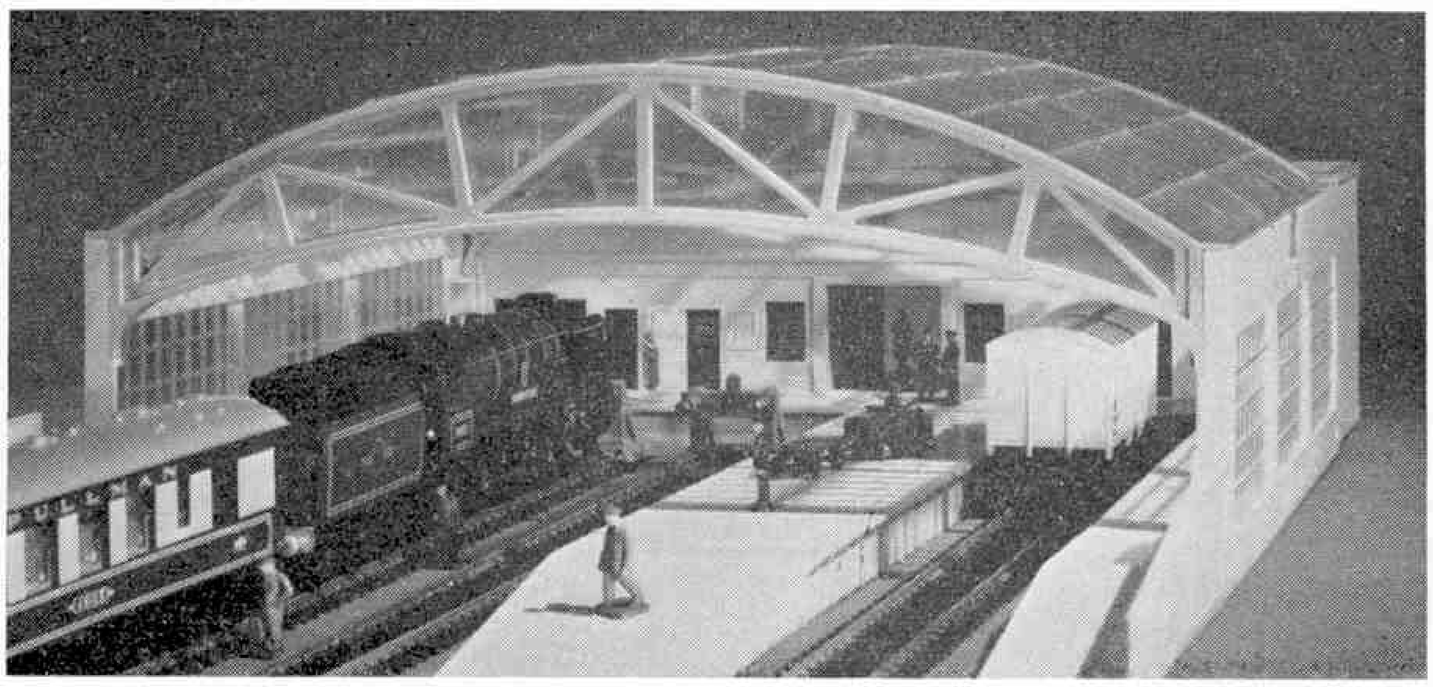


The pantograph electric locomotive (Hornby-Dublo No. 2245) has a Bo-Bo wheel arrangement and two driving cabs. The actual locomotive was first supplied to B.R. in the latter half of 1960. The locomotives are capable of tremendous feats of strength and are now scheduled to run at over 100 miles-an-hour on the route between Liverpool and Nuneaton.

The most impressive feature of these locomotives is their acceleration rate—a rate that can only be described as phenomenal. The Hornby-Dublo model is fitted with pantographs for collecting current from a catenary. It can also, of course, operate from the track in the normal manner.



An impressive shed scene showing from the left to the right 0-6-0T (Hornby-Dublo No. 2206), 2-6-4T (Hornby-Dublo No. 2218); behind an 0-4-0T (Hornby-Dublo No. 2001); 'Golden Fleece' (Hornby-Dublo No. 2211); 'Cardiff Castle' (Hornby-Dublo No. 2221); 0-6-2T (No. 2217).



The West Country Locomotive 'Barnstaple' (No. 2235) at rest in the Terminus Station (No. 5083)

Deltic on the East Coast run

The two Hornby-Dublo express diesel locomotives are both of the diesel electric type and one is a model of the famous Type 5 'Deltic' locomotive (Hornby-Dublo No. 2234). This actual locomotive was built by English Electric at the Vulcan Foundry Works, and were only delivered to the Eastern, North Eastern and Scottish Regions of British Rail, where they can be seen hauling the East Coast expresses from London to Scotland. This type of locomotive is the production model of the prototype English Electric 'Deltic' which, you may recall was painted in a most distinctive blue livery. All subsequent locomotives of the type, however, are painted in the livery shown on the Hornby-Dublo model, which is two distinctive shades of green.

An interesting point is that twenty-two were originally intended to replace fifty-five steam engines on fast passenger services, which, incidentally, had their timings reduced by between forty and sixty minutes. One of the particularly fast runs is made over the 106 miles from Hitchin to Retford at a start-to-stop average speed of 72 m.p.h.

The second type of diesel electric locomotive to be featured in the Hornby-Dublo range was first supplied to B.R. in 1961 and is the English Electric type 3 Co-Co locomotive (Hornby-Dublo No. 2232). A total number of 279 of these engines are in use on British Rail and in general outline they resemble the Deltic locomotive. Their top speed is 90 m.p.h. and they are often seen hauling express and other passenger trains, although a large number are confined to working on the Eastern and North Eastern Regions.

Before the introduction in large numbers of diesel and electric locomotives, steam engines were responsible for many of the more important express trains and nearly all the secondary passenger trains. The Hornby-Dublo range includes models of a number of locomotives that once pulled such famous trains as the 'Royal Scot', the 'Caledonian' and others; although, in reality, the types of steam locomotives concerned have been reduced almost to the point of extinction. Those locomotives that still remain are used on either goods trains or shunting duties.

Many enthusiasts feel that a model railway is not complete without examples of historic locomotives such as the A4 and 'Coronation' class Pacifics. Models of these famous locomotives are included in the Hornby-Dublo range and, using the many Hornby-Dublo components, it is quite possible to rebuild, in miniature, many of the famous pre-war trains.

The 'City of London' Locomotive belongs to the 'Coronation' class of Pacific, which includes others, also carrying the names of famous cities. These powerful four-cylinder locomotives were employed on the West Coast route between London and Scotland, although they were often to be seen at Liverpool and Manchester and at other famous stations on the London Midland line.

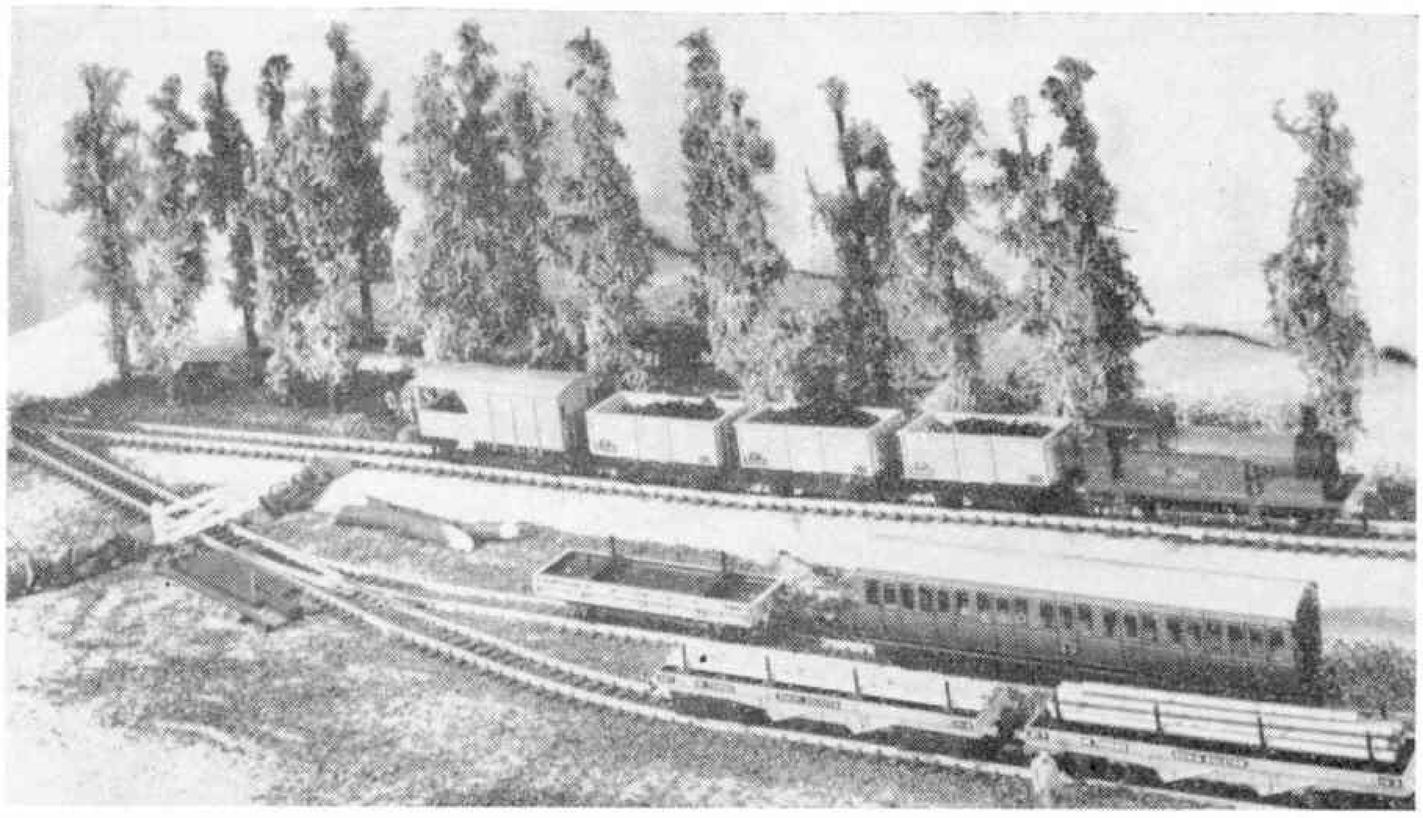
Nineteen-fifty-seven saw the introduction of 'The Caledonian' train service which had its timing specially adjusted for one day. The train reached Euston thirteen minutes early—a really splendid performance in view of the normal speed timing. Even more startling was the performance, about a month later, of No. 46244, 'King George VI', when it reached Euston in only 6 hours 3 mins. —no less than thirty-seven minutes early. The average speed of this run of slightly over 116 miles from Stafford to Watford was eighty-three m.p.h.

Among the more renowned locomotives of the Great Western Railway is the 'Castle' class of locomotives, built at Swindon works before the last war. This type has always been a firm favourite of railway enthusiasts and they, once again, are represented in the Hornby-Dublo range, this time by 'Denbigh Castle' (Hornby-Dublo No. 2221), which forms part of the 'Red Dragon' train set. The Castle locomotive took its present form as long ago

as 1907 from its predecessor, the 'Star' class locomotives.

Before the introduction of the 'Deltic' and other diesel electric locomotives, the A4 Pacific locomotives were supreme on the East Coast run between London and the North. This route has long been famous and was the result of an alliance between the Great Northern, North Eastern and North British Railways in the middle of the last century. The routes of these railways provided a through journey between London-King's Cross and Edinburgh, Glasgow, Perth, Dundee, Aberdeen and other Scottish cities. It is now a joint route of the Eastern, North Eastern and Scottish Regions of British Rail and it still maintains the remarkable reputation it has enjoyed for so many years.

It is perhaps most famous of all for its fast, named trains—among them, the 'Flying Scotsman'. This train was nearly always hauled by an A4 Pacific, until the 'Deltic' locomotives relieved them from this duty. Alas, the A4 Pacific locomotives are now being scrapped, but enthusiasts are fortunately able to reproduce in miniature this famous locomotive and its train, using the Hornby-Dublo 'Golden Fleece' Locomotive (Hornby-Dublo No. 2211).

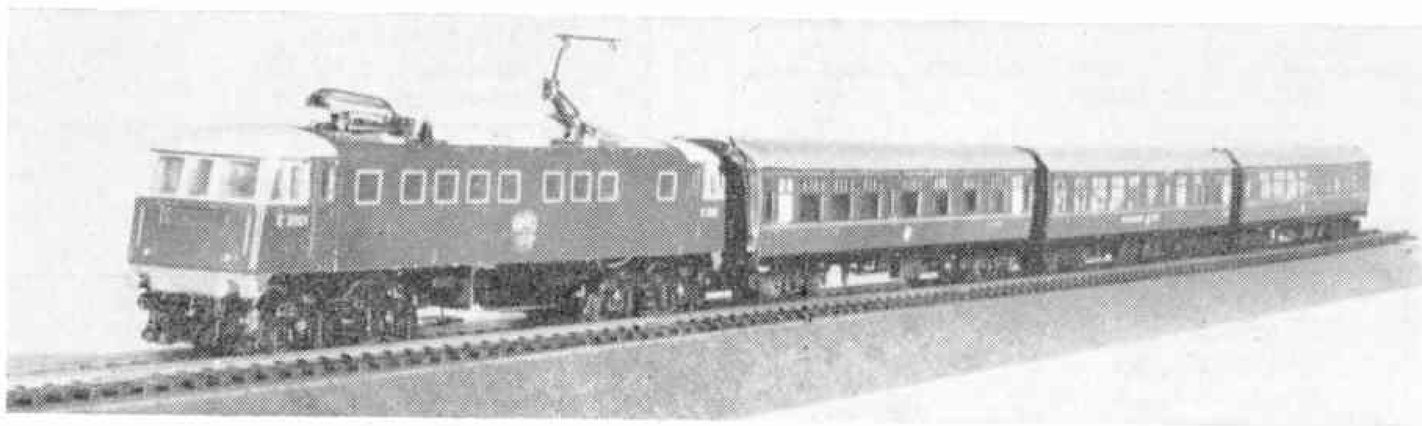


An attractive scene showing the 0-6-0 tank locomotive with a short train of goods wagons.

Services on the Southern Region

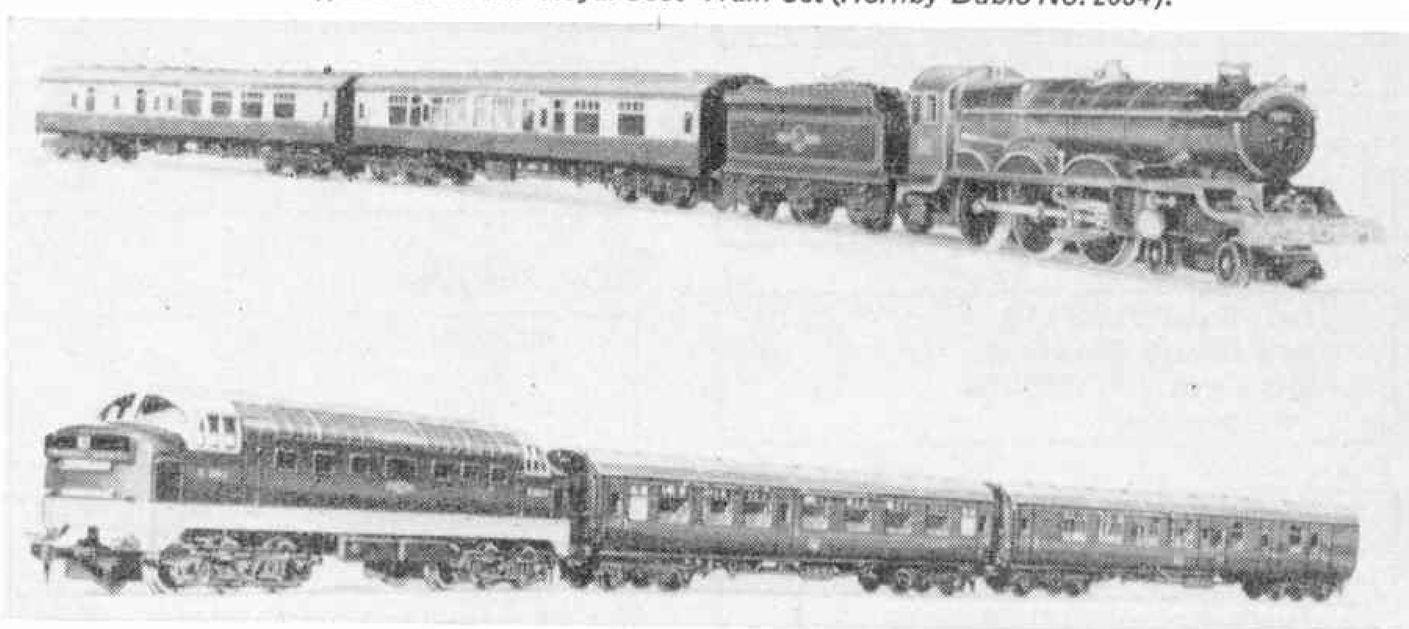
As originally built, the 'West Country' Pacific type were fitted with streamlined housings, which were later removed to form the modified 'West Country' class (Hornby-Dublo No. 2235). These locomotives were used on the Southern Region boat train services and also for the Atlantic Coast Express Service over the 259¾ miles between Waterloo and Padstow. Many of the more important trains on the Southern Region were pulled by 'West Country' Pacifics—among them the 'Bournemouth Belle', which is reproduced in set form in Hornby-Dublo. This is the most attractive of Hornby-Dublo train sets and consists of the 'Barnstaple' locomotive and three beautiful Pullman Coaches.

Whilst talking about the Southern Region, it would be as well to mention the diminutive Hornby-Dublo 0-6-0 tank locomotive (Hornby-Dublo No. 2206). This is a model of the R1 locomotive introduced by the South Eastern and Chatham Railway in 1900 for use at Folkestone on the boat train services. One last item intended for Southern Region enthusiasts was the Electric Motor Coach Set (Hornby-Dublo No. 2050), which is intended to represent Suburban electric practice for outside third rail systems, although in general design and appearance it is rather similar to the 'Watford' stock.



The latest addition to the Hornby-Dublo range of locomotives; the Electric Pantograph Locomotive (Hornby-Dublo No. 2245), with a train of British Railways standard coaches.

Two of the Hornby-Dublo Train-Sets. Above is the 'Red Dragon' Train Set (Hornby-Dublo No. 2021), and below the 'Royal Scot' Train Set (Hornby-Dublo No. 2034).



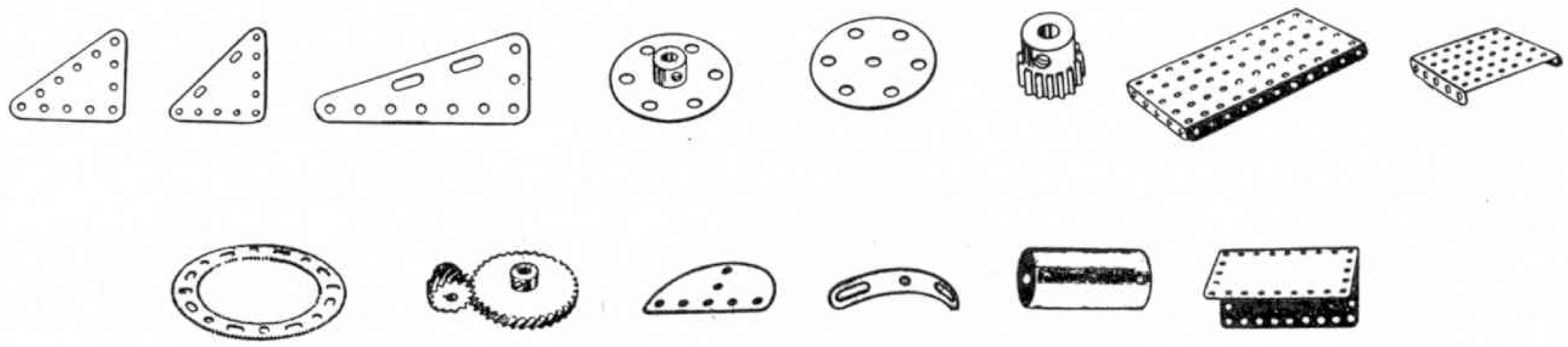
Freight and Shunting duties

For the movement of freight, Hornby-Dublo provides a model of the L.M.R. 2-8-0 heavy freight locomotive, which was first designed by Sir William Stanier in 1935 (Hornby-Dublo No. 2224). For diesel locomotive enthusiasts a model of the Metro-Vickers Type 2 Co-Bo is made (Hornby-Dublo No. 2233). These two locomotives can be said to represent two quite different eras in freight operation, although the 2-8-0 locomotive is still used quite extensively on the London Midland Region. The Co-Bo locomotives are more or less restricted to the North and are very rarely seen in other parts of England.

For shunting and general duties, the 0-6-2 tank locomotive is perhaps the most popular of all in the Hornby-Dublo range and it may be of interest to readers to know that this useful locomotive resembles the N1 class, originally designed for use on the Great Northern Railway. Both it and the 2-6-4 Tank are good all round performers and both are capable of hauling passenger trains as well as small goods trains. The 2-6-4 tank is a model of the B.R. standard class and quite large numbers of them are still in evidence in both England and Scotland.

The Diesel Electric 0-6-0 shunting locomotive (Hornby-Dublo No. 2231) has for a number of years given a modern appearance to many goods yards and, in point of fact, these efficient locomotives have rapidly replaced the older steam tank engines.

Both on the prototype and in its model derivatives, the modern appearance of diesel and electric locomotives has a great deal to commend them, for, far from removing interest, they should help to provide new ideas.



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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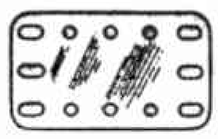

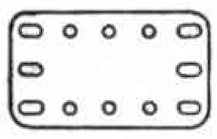

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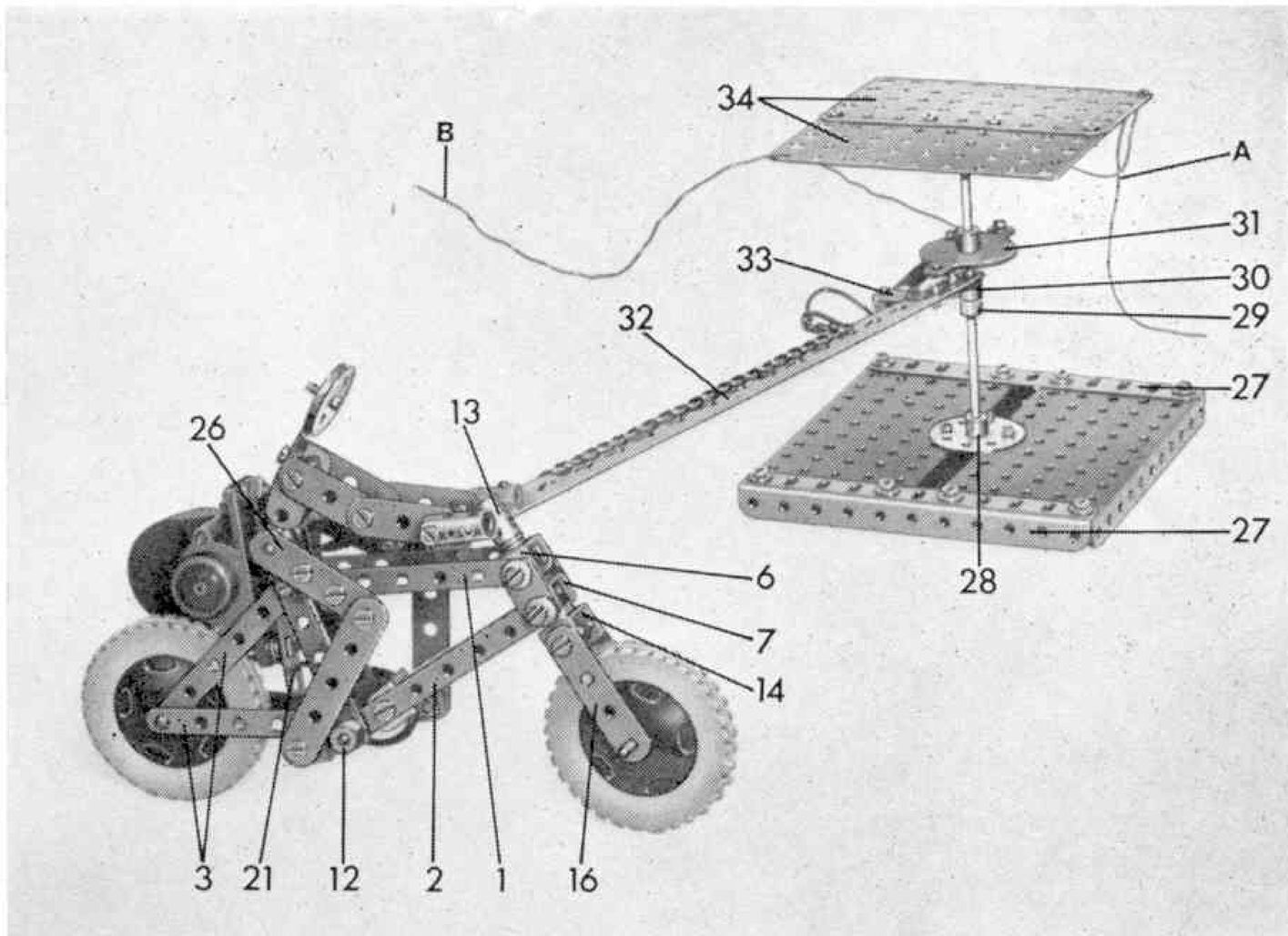
Meccano Trick Cyclist



This intriguing model in Meccano is self-propelled

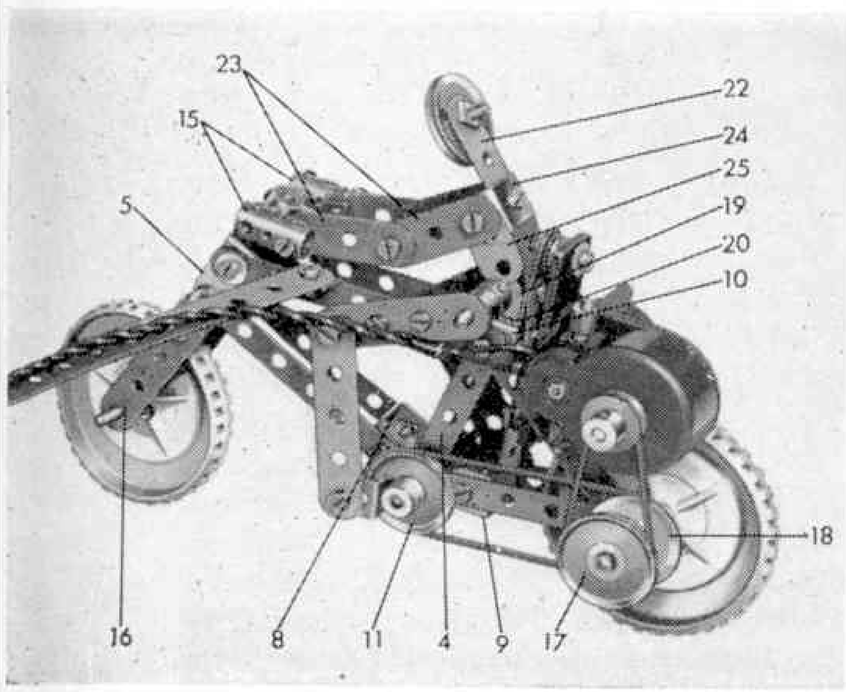
FEATURED here is an amusing model which shows that even a few Meccano Electrikit parts can greatly increase the scope of standard parts. By using only a Commutator, a 1½ in. radius Wiper Arm and an Insulating Fishplate, it has been possible to animate this cyclist, so that he 'pedals' his way round the central stand. The platform on the top of this stand, incidentally, is for the battery powering the Emebo Motor, which actually drives the model. Construction is as follows:

The Cycle

The frame consists of two similarly constructed sides each built up from two 3½ in. Narrow Strips 1 and 2, two 3 in. Narrow Strips 3 and a 2½ in. Narrow Strip 4. Strips 1 and 2 are connected at the front by a Fishplate 5, at the same time bolting two ½ in. by ½ in. Double Brackets 6 and 7 in place. These Double Brackets, along with Double Brackets 8, 9 and 10, hold each side of the frame together. A 1½ in. Rod is journalled in the frame, as shown, being held in place by a 1 in. fixed Pulley 11 at one side and a Collar 12 at the other.

Another 1½ in. Rod is mounted in Double Brackets 6 and 7 and is held in position by a Short Coupling 13 above Bracket 6 and by a Large Fork Piece 14 beneath Bracket 7. Both the Coupling and the Fork Piece are spaced from the Brackets by three Washers. A further 1½ in. Rod, carrying a Coupling 15 at each end, is secured in the upper transverse bore of the Short Coupling, while the lugs of the Fork Piece are extended by 2 in. Strips 16, to complete the front fork.

Close-up view of the cycle and cyclist



Both wheels are represented by 2½ in. Road Wheels, the front mounted on a 1½ in. Rod, and the rear on a 2 in. Rod which also carries two 1 in. Pulleys with boss 17 and 18.

The Cyclist

A Double Bracket 19 and an Angle Bracket 20 are bolted to Double Bracket 10, then a 3½ in. Strip 21 and a 2½ in. Strip 22, curved slightly, are fixed to the other lug of Angle Bracket 20. At its other end, Strip 21 is fixed to Double Bracket 9. Each arm is formed from two 1½ in. Strips 23, attached to Strip 22 by another Double Bracket 24, at the same time bolting Fishplates 25 in position. Strips 23 are connected to Couplings 15 by ½ in. Bolts.

Journalled in the lugs of Double Bracket 19 is a 2 in. Rod, held in place by a Crank at the right-hand side and a Collar and a Crank at the left-hand side. Both Cranks are extended by 2 in. Strips 26 to each of which a 2½ in. Strip is lock-nutted. The other ends of Strips 26 are lock-nutted to Angle Brackets, one of which is fixed to the boss of Pulley 11 and the other to Collar 12. A 1 in. loose Pulley on a ⅜ in. Bolt represents the head.

The Motor

An Emebo Motor is fixed by ½ in. Bolts to Strip 21, but is spaced from it by three Washers on the shank of each Bolt. A ½ in. Pulley on the Motor shaft is connected to Pulley 17 by a 2½ in. Driving Band and Pulley 18 is connected to Pulley 11 by a 6 in. Driving Band.

Two 5½ in. by 2½ in Flanged Plates are connected by two 5½ in. Angle Girders 27 and an 8-hole Bush Wheel 28. A 5½ in. Rod carrying a Collar 29, a Crank 30 and a Commutator 31, is fixed tightly in the boss of the Bush Wheel. The Collar and Commutator are fixed on the Rod, but the Crank is free to turn.

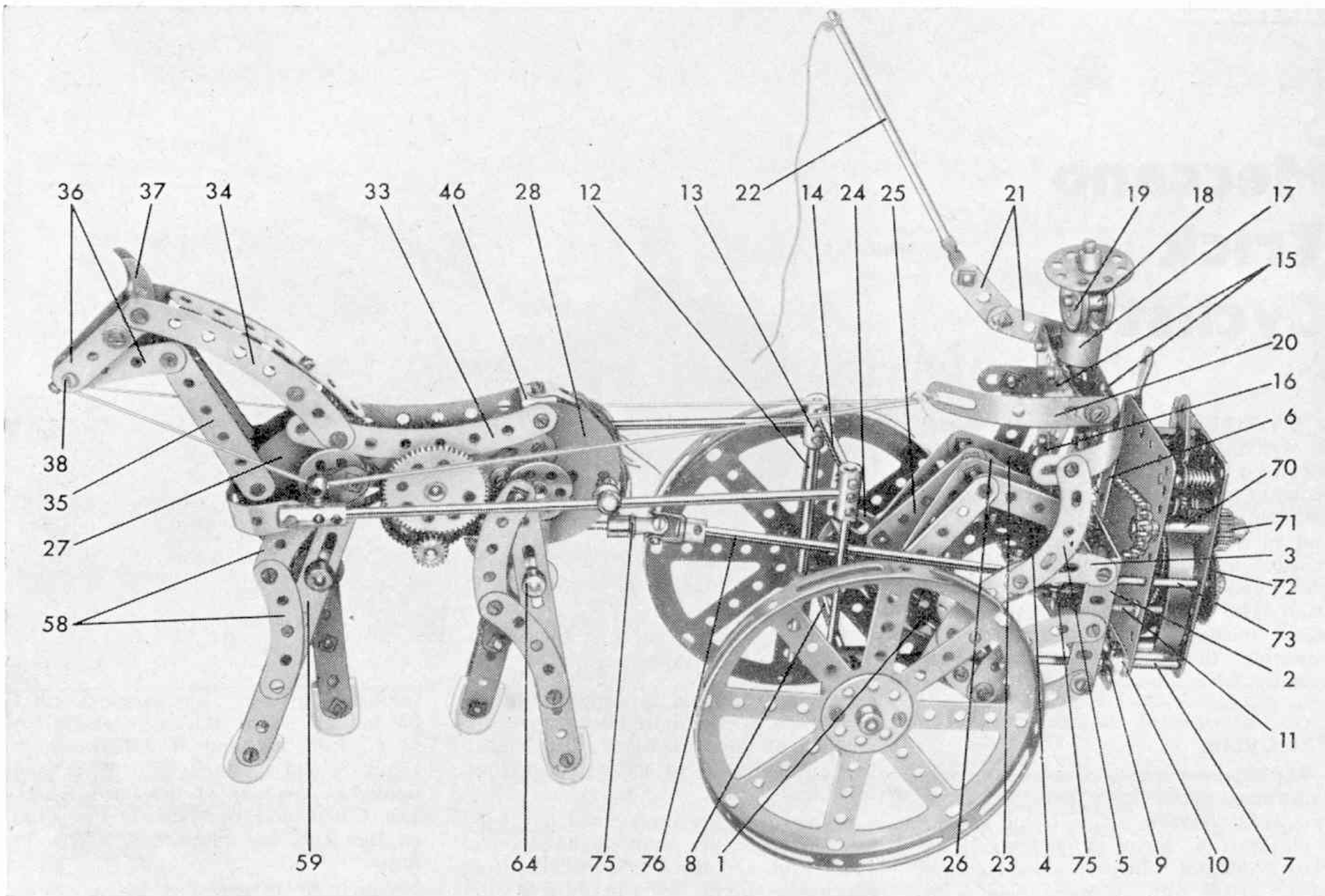
Crank 30 is extended by a 12½ in. Strip 32, to which an Insulating Fishplate 33 is bolted. A 2½ in. Wiper Arm is secured through the other hole of this Fishplate and is arranged so that it is in constant contact with the Commutator. Strip 32 is fixed to left-hand Strip 1 by an Angle Bracket. Two 4½ in. by 2½ in. Flat Plates 34 are bolted to another 8-hole Bush Wheel which is fixed to the top of the 5½ in. Rod.

Wiring Connections

A lead A is taken from one terminal of the battery and is earthed by connecting it to one of the bolts fixing Plates 34 to the Bush Wheel. The other battery lead B is taken from the Bolt holding the Wiper Arm, is run along Strip 32, and is connected to one terminal of the Motor. A lead from the other terminal of the Motor is earthed by connecting it to a bolt held in Strip 32.

Parts required

1 of No. 1;	1 of No. 22a;	1 of No. 116;
1 of No. 3;	2 of No. 24;	1 of No. 186;
3 of No. 5;	61 of No. 37a;	1 of No. 186a;
4 of No. 6;	50 of No. 37b;	2 of No. 187;
4 of No. 6a;	33 of No. 38;	2 of No. 235;
2 of No. 9;	2 of No. 52;	4 of No. 235a;
4 of No. 10;	2 of No. 53a;	4 of No. 235b;
7 of No. 11;	3 of No. 59;	1 of No. 513;
4 of No. 12;	3 of No. 62;	1 of No. 532;
1 of No. 15;	2 of No. 63;	1 of No. 551;
2 of No. 17;	1 of No. 63d;	1 of No. 558;
4 of No. 18a;	3 of No. 111a;	1 Emebo
3 of No. 22;	3 of No. 111c;	Electric Motor



The unique model of a Horse and Chariot. For full building instructions read this article.

BUILD A HORSE AND CHARIOT

NOVEL animated Meccano models have always been a particular favourite of mine. The Horse and Chariot I describe here is, I think, unique, in that the Chariot is actually pulled along by the walking movement of the horse. A No. 1 Clockwork Motor fixed to the rear of the Chariot provides the power for the model.

Everybody claims that you cannot put the cart before the horse but, for building instruction purposes, I have done just that. If you study the photographs you will see that two legs have been removed in two of them. This has been done in order to simplify decription.

The Chariot

Two 3½ in. by 2½ in. Flanged Plates 1 and 2 are connected at each side by two Curved Strips and a 3 in. Stepped Curved Strip 3, this last extended by a Fishplate. A seat is provided by a compound 3½ in. by 1½ in. flexible plate 4, built up from two 2½ in. by 1½ in. Flexible Plates fixed to Curved Strips 3 by Angle Brackets, at the same time bolting 2½ in. Curved Strips 5 in place. Strips 5 are joined by two Formed Slotted Strips which are connected to Plate 2 by a 4½ in. Strip 6.

Mounted in Plate 2, as shown, are two 5½ in. Rods 7, each carrying a Coupling at its forward end and a Collar behind the Plate. A 6½ in. Rod 8 is journalled in the transverse bores of these Couplings, being free to turn, but held in position by Collars. A 3½ in. Strip 9 is slipped on to Rods 7 and is held against the Collars by a Crank 10 on each Rod. Also mounted on the Rods is a No. 1 Clockwork Motor which is bolted to Cranks 10. In addition, the Motor is fixed direct to Plate 2 by two 1⅛ in. Bolts 11.

Fixed in the forward transverse bore of each Coupling is a 4½ in. Rod 12 which also carries a Coupling 13 at its upper end. Couplings 13 are connected by a 3 in. Rod 14. Hub Discs, bolted to 8-hole Bush Wheels secured on Rod 8, represent the Chariot wheels.

The Charioteer

Two 2½ in. Triangular Plates 15 are bolted, one each, to two Flat Trunnions 16, then both constructions are connected by five Double Brackets, one placed at each corner, and the last in the centre of the upper sides of the Triangular Plates. Three Washers are placed on a 1⅛ in. Bolt, which is then pushed upwards through the last-mentioned Double Bracket. A Chimney Adaptor 17 is added, and the Bolt is screwed into one side of the boss of a 1 in. Pulley 18. A 1 in. loose Pulley 19 is fixed to Pulley 18 by a ⅜ in. Bolt, a Washer being used as a spacer, and a hat is supplied by an 8-hole Bush Wheel held by another ⅜ in. Bolt screwed into the other side of the boss of Pulley 18, a Collar separating the Bush Wheel from the boss.

The left arm is represented by a Formed Slotted Strip 20, while the right arm is built up from two 1½ in. Strips 21, extended by a Rod and Strip Connector. Fixed in this is a 5 in. Rod 22, to which a short length of Cord is tied, to serve as a whip.

Each leg is formed from a 2 in. Strip 23, bolted to the respective Double Bracket, to which a 2½ in. Strip is attached by a ⅜ in. Bolt. A Fishplate 24 and another 2½ in. Strip 25 are bolted to the other end of the first 2½ in. Strip. Fastened to Strip 25 by two Nuts on the

already-mentioned $\frac{3}{8}$ in. Bolt is a $1\frac{1}{2}$ in. Strip 26.

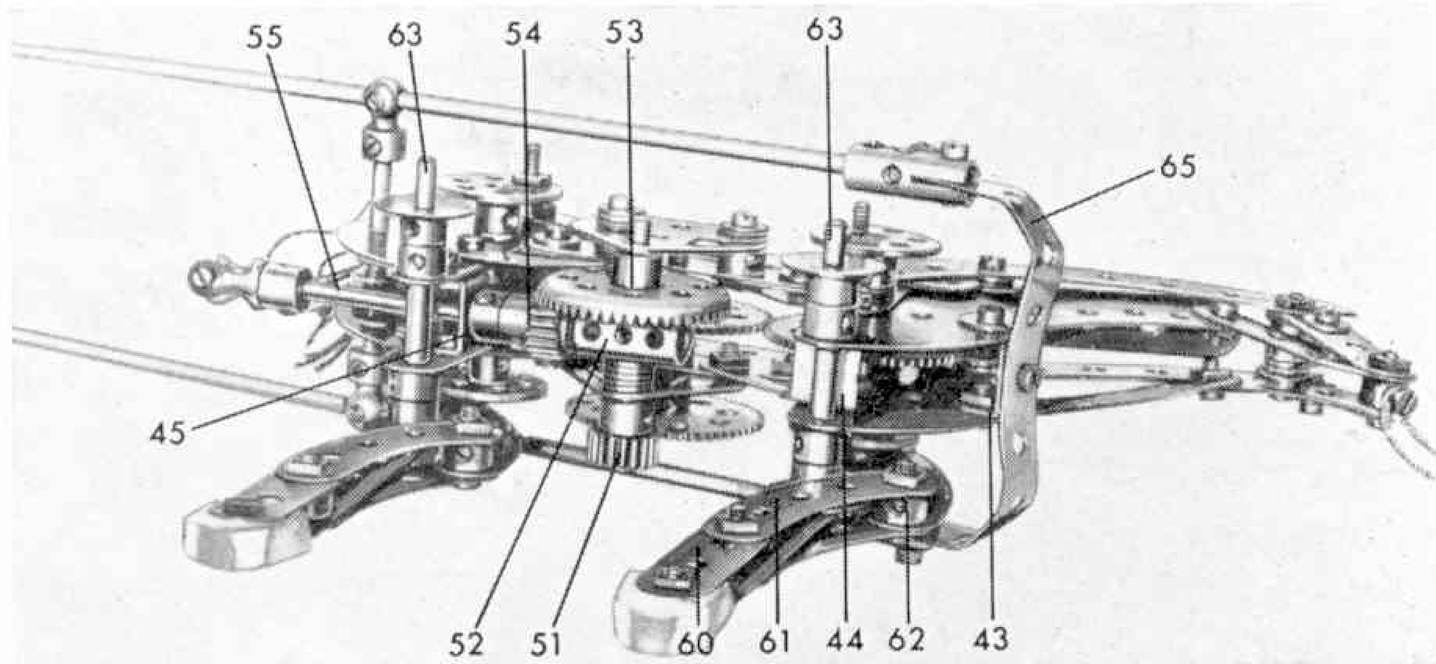
The horse

Both sides of the body, neck and head, are similarly built. Two Semi-Circular Plates 27 and 28, each extended by a Flat Trunnion 29 and 30 (this last extended by a $2\frac{1}{2}$ in. Strip 31), are connected by a $2\frac{1}{2}$ in Strip 32 and a 4 in. Stepped Curved Strip 33, the latter extended by another 4 in. Stepped Curved Strip 34. A 3 in. Strip 35 is bolted to Plate 27 and this is connected by two 2 in. Strips 36 to Curved Strip 34, at the same time fixing a Pawl without boss 37 in position. The sides and head are connected by a $\frac{1}{2}$ in. Bolt 38, on which a Collar is mounted, a $\frac{3}{4}$ in. Bolt on which a Threaded Boss 39 is mounted, and a Double Bracket 40, to which a $3\frac{1}{2}$ in. Strip is bolted.

A Flat Trunnion 41 is fixed direct to left-hand Strip 32, while another Flat Trunnion 42 is secured to right-hand Strip 32, but is spaced from it by a Collar on each $\frac{1}{2}$ in. Bolt. The two sides are now connected by four Double Brackets 43, 44, 45 and 46.

Journalled in Semi-Circular Plates 28 is a $1\frac{1}{2}$ in. Rod that carries a 1 in. Bush Wheel 47 (Elektrikit Part No. 518) at each end, and a 57-teeth Gear Wheel 48 in the middle. This Gear is in constant mesh with another 57-teeth Gear 49 on another $1\frac{1}{2}$ in. Rod, held in place by a further 57-teeth Gear 50. Gear 50, in turn, is in mesh with a $\frac{1}{2}$ in. Pinion 51 on a 2 in. Rod, mounted in the apex holes of Trunnions 41 and 42. Also fitted on this rod are five Washers, a Coupling 52 and a $1\frac{1}{2}$ in. Contrate Wheel 53. In mesh with Contrate 53 is a $\frac{1}{2}$ in. Pinion 54 on a 3 in. Rod 55 which is free to turn in Coupling 52 and Double Bracket 45, being held in position by a Collar 55. Two Washers separate Pinion 54 and Coupling 52.

Gear Wheel 49 is in constant mesh with yet another 57-teeth Gear 56 on a $1\frac{1}{2}$ in. Rod, journalled in Semi-Circular Plates 27. Another two 1 in. Bush Wheels 57 hold this Rod in place.



An underneath view of the Horse.

Four legs are built up, the two left being identical, as also are the two right. Two $2\frac{1}{2}$ in. Curved Strips 58 are joined together as shown, and bolted to a $5\frac{1}{2}$ in. slotted Perforated Strip 59. A 2 in. slotted Perforated Strip 60 and another $2\frac{1}{2}$ in. Curved Strip 61 are, in turn, joined together and connected to slotted Strip 59 and Curved Strip 58, but are spaced from them by a Collar 62 on the shank of each $\frac{1}{2}$ in. Bolt. A piece of rubber eraser, shaped as shown, is bolted between the ends of slotted Strips 59 and 60. All four legs are similarly built except that both the left and right pairs have slotted Strips 60 and Curved Strips 61 on the inside.

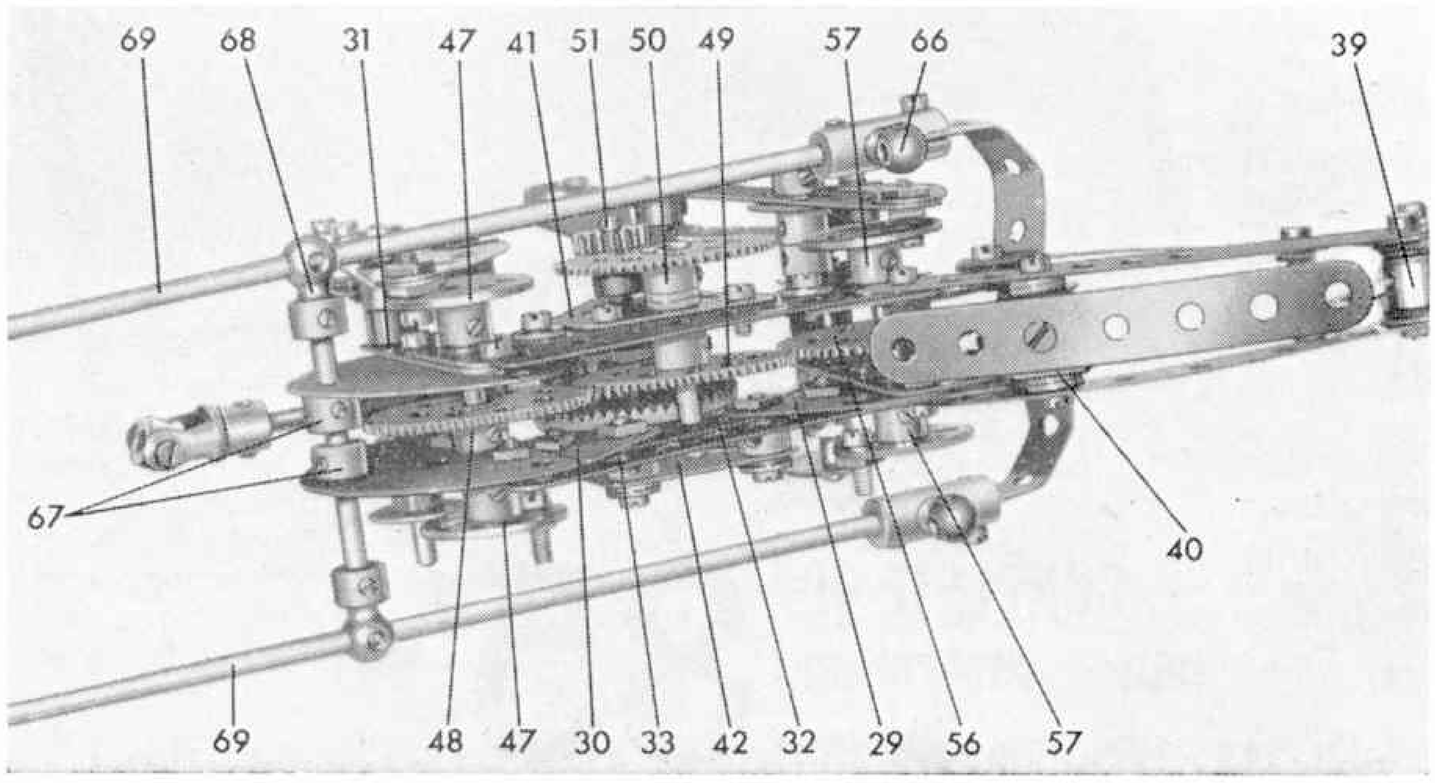
Two $2\frac{1}{2}$ in. Rods 63 are mounted, one in Strips 31 and the other in the bottom holes of Semi-Circular Plates 27, both being held by two Collars at each end. A $\frac{3}{8}$ in. Washer is placed on the ends of both Rods and the respective legs fitted by means of the upper slotted holes in slotted Strips 59, Collars 64 holding them in place. At their tops, the legs are lock-nutted to 1 in. Bush Wheels 47 and 57, but care must be taken with the 'timing'. The bolt fixing the left foreleg to the Bush Wheel must be at 3 o'clock when that holding the left hind leg is at 9 o'clock. At the same time, the bolt holding the right foreleg must also be at 3 o'clock when that holding the right hind leg is at 9 o'clock. A tail is provided by several short lengths of Cord tied to an Obtuse Angle Bracket bolted to Double Bracket 46.

The Harness

A $4\frac{1}{2}$ in. Strip 65, carrying a Strip Coupling at each end, is bent to shape and bolted to Double Bracket 43. Screwed into the centre transverse tapped bores of the Strip Couplings is a Handrail Support 66. Lengths of Cord are then taken from a bolt in the horse's 'nose' through the Handrail Supports and tied to Formed Slotted Strip 20, to serve as reins. A 2 in. Rod, held by two Collars 67, and carrying a Handrail Coupling 68, at each end, is mounted in Plates 28. The horse is now harnessed to the chariot by two 8 in. Rods 69, secured in the Slotted Coupling, Handrail Couplings 68 and Couplings 13.

All that now remains to be done is the gearing down of the Motor and the coupling-up of the drive to the horse. A $\frac{3}{4}$ in. Sprocket Wheel on the Motor output shaft is connected by Chain to a 1 in. Sprocket Wheel on a 2 in. Rod 70, journalled in the Motor side plates and held by a $\frac{3}{4}$ in. Pinion 71. This Pinion is in mesh with a 50-teeth Gear 72 on a 2 in. Rod 73 that protrudes through Flanged Plate 2. Rods 73 and 55 are connected, via two Universal Couplings 74 and 75, by a $5\frac{1}{2}$ in. Rod 76.

The Horse viewed from above.



Spanner

Parts required		
2 of No. 2a	1 of No. 25	1 of No. 96
2 of No. 3	2 of No. 26	1 of No. 96a
2 of No. 4	1 of No. 27	5 of No. 111
8 of No. 5	4 of No. 27a	11 of No. 111a
6 of No. 6	1 of No. 28	12 of No. 111c
4 of No. 6a	119 of No. 37a	3 of No. 111d
4 of No. 10	82 of No. 37b	2 of No. 118
10 of No. 11	51 of No. 38	8 of No. 126a
4 of No. 12	4 of No. 38d	2 of No. 136
1 of No. 12c	1 of No. 40	2 of No. 136a
2 of No. 13a	2 of No. 53	2 of No. 140
1 of No. 14	4 of No. 55	2 of No. 147c
3 of No. 14a	4 of No. 55a	1 of No. 164
1 of No. 15	31 of No. 59	2 of No. 188
2 of No. 15a	2 of No. 62	1 of No. 212
3 of No. 16a	5 of No. 63	4 of No. 214
2 of No. 16b	2 of No. 63b	3 of No. 215
3 of No. 17	2 of No. 72	4 of No. 518
3 of No. 18a	2 of No. 89a	1 No. 1 Clockwork Motor
1 of No. 22	4 of No. 89b	4 pieces rubber eraser
1 of No. 22a	12 of No. 90	
3 of No. 24	6 of No. 90a	
	1 of No. 94	

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AROUND THE SOCIETIES

Manchester Exhibition 1964

THE SHOWPIECE of the Manchester Model Railway Society's exhibition at the Corn Exchange, Hanging Ditch, Manchester, was a model of the Isle of Man railway system, including six of the stations—Ramsey, Douglas, Port Erin, Union Mills, Foxdale and Peel. Each station was built by a different member of the Society in his own home and the entire layout was assembled shortly before the exhibition. The six members responsible for building this superb layout were Jim Lawton, Jim Edgar, Gordon Brown, Bill Tait, Harold Brown and Ken Ball and when assembled, it measured 34 feet by 6 feet. Apart from the gauge 1 'live' steam track, the Isle of Man model was the longest exhibit in the hall.

Great care was taken to reproduce as faithfully as possible the prototype track formations and station buildings. The track used on the layout was GEM TT, 12 mm. gauge, and the models were all built to OO scale, which gives the correct proportions for a three-foot narrow gauge line. The coaching and wagon stock were the work of the members and nearly all were home-built using Triang clerestory coaches as a basis.

The Isle of Man Railway had fifteen engines all alike, making the task of modelling the railway reasonably simple, since the white metal kits produced by GEM could be used in quantity.

The scenery on the layout was especially attractive and was built using a wide variety of methods, some of which have already been described in the 'Meccano Magazine'. However, one method which has not been illustrated, involves the use of cork bark to represent rock faces, and lint, glued to the sub-structure with sawdust sprinkled on to provide a grassy effect.

To prove that models of the modernised British Railway system can be attractive, the Macclesfield Model Railway Group built and exhibited a most interesting TT gauge layout. This was the group's third exhibition layout and the standard of scenery construction was extremely high. Basically, the layout had a double track main line, which made two complete circuits of the layout and which was correctly signalled with modern colour light signals. It also had overhead catenary fitted, but at the time of the exhibition, it was not in working order.

The Manchester M.R.S. competition stand also held many attractions for those enthusiasts who, in common with many Society members, take pleasure in hand-building their own models. All items exhibited on the stand were of a very high standard and one which was especially attractive was a model of a Midland Railway 'N' type 0-6-0 tank locomotive built by John Noble to 'S' gauge. This model deservedly won the 'Pochin' cup, the 'Young' award and the 'Championship' cup. Also exhibited on the stand was a very fine train of eleven scratch built pre-group goods vehicles, including a Maryport and Carlisle Railway brake van and a number of other wagons from the Furness Railway, Maryport and Carlisle Railway, Highland Railway and the Great Northern Railway. A rather unusual exhibit on the competition stand was a group of twelve miscellaneous railway buildings built by Pat Garland. These won a diploma, as did the Maryport and Carlisle horsebox built by Mr. P. A. Millard. The 'Bolton' trophy was awarded to Mr. L. W. Arnold for his model of an L.M.S. 'Royal Scot' locomotive in 7 mm. scale.

Another competition, making its first appearance at the Manchester Show, was organised by 'The Railway Modeller' Magazine for outstanding models of modern B.R. rolling stock and equipment. The finest exhibit in this category was a model of a section of catenary with an electric multiple unit set built by Mr. P. L. Shaw. This deservedly won the second prize and was only just beaten by a model of East Didsbury station building by Mr. A. P. Mayne. The third prize went to Mr. A. C. N. Herd for his fine models of B.R. type 4 and 5 locomotives.

As always, the Manchester Exhibition was an outstanding success and the many display working models to be seen were greatly admired by members of the public.

Mon. Railway Society

FOLLOWING A RECENT MEETING of interested parties, a model railway section of the Monmouthshire Railway Society was formed to cater for enthusiasts in the Newport and South Monmouthshire area. Construction of a OO gauge layout is due to commence shortly and this will be housed in the M.R.S. headquarters at the Central Y.M.C.A., Commercial Street, Newport. The success of this venture is dependent on the support received during the next few months and modelling enthusiasts in the Newport and S. Monmouthshire area are therefore requested to support the Society. All those interested should send a stamp addressed envelope to the Hon. Secretary, Mr. A. R. Musker, 1 Groes Road, Rogerstone, Mon.

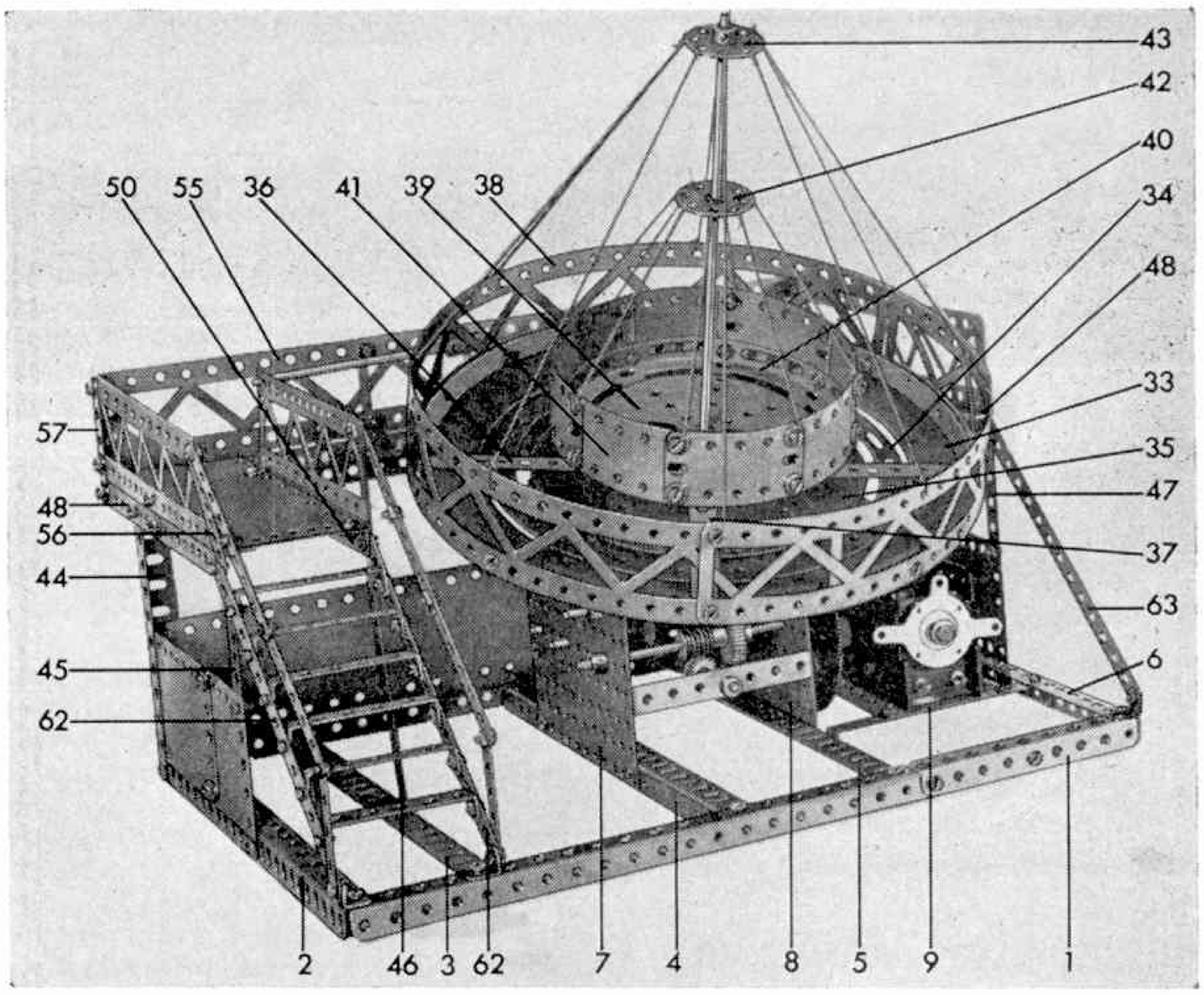
Welshpool and Llanfair

ONE OF THE RESULTANT CASUALTIES of the extensive flooding of December 11 and and 12, was the Banwy Bridge, over which the Welshpool and Llanfair Light Railway runs. A preliminary report on the bridge states that one of the masonry piers is tilted at an angle of 20 degrees and that the girders carrying the track are about five feet out of alignment. The Preservation Company that operates the railway, is thus faced with immense problems—both on the operating side and financially, since only part of the track will be available for the 1965 season. The income of the company is derived from members' subscriptions, passenger rates, donations and sales and the revenue is, at the present time, only sufficient to cover operating costs, normal maintenance and salaries. It is therefore quite impossible for any work involving capital expenditure to be done. Every effort is being made to keep the line going, but if it is to survive, additional money must be obtained to repair the Banwy Bridge. Our chairman, Sir Thomas Salt, has launched an appeal asking for donations both large and small—all will be most gratefully received and should be sent to the Secretary at the Company's Registered Office at 118 Colmore Row, Birmingham 3.

W. of Eng. Tran. Museum

APPROXIMATELY 70 VINTAGE road vehicles form the rather unusual collection owned by the West of England Transport Museum. The exhibits are housed in a large building some miles from Exeter and include items ranging from buses to motor cycles, steam rollers to fire engines and hearses to charabancs. It is hoped to open the museum to the public on certain days during 1965, although the eventual aim is to keep the museum permanently open. At present many of the vehicles are in need of restoration and an affiliated Society—the Vehicle Preservation Society of the South West—intends to help in the work of restoration, both physically and financially. Membership is open to persons of all ages and costs 15s. for a full member, and 10s. 6d. for a junior member. There is also a trade membership scheme for companies in the motor, engineering and allied trades, whereby a subscription of £1 10s. is charged. Employees of firms enrolled in this way are eligible for full membership as individuals at the reduced rate of 7s. 6d. per annum. Further details are obtainable from Mr. R. C. Mitchell, of 153 Bitton Park Road, Teignmouth, Devon.

by **Spanner**



This novel roundabout is based on a large display model built by Mr. Sidney Whiteside, of Clitheroe

Build a Contra-rotating

THERE are numerous models which appeal especially to Meccano builders and among the most popular of these are fairground attractions.

Last year we featured several machines that could be seen in an amusement park and many enthusiasts wrote to tell us how much they had enjoyed building them. Here, therefore, we enlarge the group with a Contra-Rotating, Tipping Roundabout.

Basically, it consists of two rotating platforms, one turning clockwise while the other turns anti-clockwise. As both turn, they slowly tilt forward, return to the horizontal, then tilt forward again and so on. The roundabout is based on a splendid model described and built by Mr. Sidney Whiteside, of Clitheroe, who has been a keen Meccano enthusiast for many years. Mr. Whiteside's structures, always first-class, are frequently displayed at local exhibitions.

Here are the building instructions for this very interesting model.

Base framework

A base framework is built up from two compound 14½ in. angle girders 1 each formed from a 12½ in. and a 4½ in. Angle Girder, connected at intervals by five 12½ in. Angle Girders 2, 3, 4, 5 and 6. The various spacings between the girders are clearly shown in the first illustration on this page. Two 5½ in. by 3½ in. Flat Plates 7 and 8 are bolted in position, one to Girder 4 and one to Girder 5, then two 4½ in. by ½ in. Double Angle Strips 9 are secured between Girders 5 and 6. Plates 7 and 8 are, themselves, connected by two 3½ in. by ½ in. Double Angle Strips 10.

Gear arrangement

Fixed on a 6½ in. Rod 11, journalled in Double Angle Strips 10 and held in place by a Collar and a Face Plate 12, is a ½ in. Pinion 13. This Pinion is in constant mesh with a Worm which is secured, along with a 1 in, Gear Wheel 14, on a 4½ in. Rod, mounted in Plates 7 and 8 and held by a Collar and 3 in. Gear 15. Gear 15 is, in turn, in constant mesh with a ½ in. Pinion 16 on another 4½ in. Rod 17. Also mounted on Rod 17 is 2 in. Gear 18 in mesh with another ½ in. Pinion 19 on a 5 in. Rod that carries a 3 in. Pulley 20 at one end.

At this point, a cross arrangement is constructed, with two 7½ in. Angle Girders 21, joined by four 2½ in by ½ in. Double Angle Strips and a 2½ in. by 2½ in. Flat Plate 22, forming the vertical arm, and two 1½ in. by ½ in. Double Angle Strips, joined by a 2½ in. Strip 23, forming each horizontal arm. Two 2½ in. by 2½ in. Flat Plates 24, strengthened by a 2½ in. by ½ in. Double Angle Strip 25, are also bolted in place. The whole arrangement is pivotally connected to the gear box by a 4½ in Rod, carrying a 1 in. Gear Wheel 26 and a ⅞ in. Bevel Gear 27, which passes through Plates 7, 8 and 24.

Gear 26 is in constant mesh with Gear 14, while Bevel 27 is in mesh with another ⅞ in. Bevel Gear 28 on an 11½ in. Rod journalled in Double Angle Strip 25 and Plate 22. Fixed to the other end of this Rod is a 1½ in. Contrate Wheel 29, which is in mesh with two ½ in. Pinions 30, each mounted on a 2½ in. Rod, journalled in the Double Angle Strips of the vertical arm of the cross arrangement. Also fixed on each of these 2½ in. Rods is a 1 in. Pulley with Rubber Ring 31. Two 2 in. Rods 32, themselves carrying a 1 in. fixed Pulley with Rubber Ring, are mounted, as shown, in the horizontal arm of the cross arrangement. In the illustrations, only one Pinion 30 can be seen. The other is diametrically opposite to it, hidden by the gearing.

An E15R Motor is now bolted to Double Angle Strips 9, and a 10 in. Driving Band is taken from a ½ in Pulley on its output shaft to the 3 in. Pulley 20.

As I stated earlier, two moving platforms are incorporated in the model, one large and one small. I will deal first with the larger: a 9⅞ in. diameter Flanged Ring 33, a 7½ in. diameter Circular Strip 34 and a 6 in. diameter Circular Plate 35 are joined together by a 9½ in. Strip 36 and two 3½ in. Strips 37. Three 12½ in. Braced Girders 38 are then fixed to the vertical Flanged Ring 33 by ⅜ in. Bolts, but are spaced from it by three Washers on the shank of each Bolt. The complete platform is loosely mounted on the 11½ in. Rod, being spaced from Plate 22 by a Collar and a Washer. A Compression Spring is slipped on to the Rod.

The smaller platform

To build the smaller platform, a 4 in. diameter Circular Plate 39 is bolted to a Hub Disc 40, the flange of which is extended by eight 2½ in. by 1½ in. Flexible Plates 41. The whole is then fixed tightly on the 11½ in. Rod by means of an 8-hole Bush Wheel, bolted beneath Hub Disc 40. This platform should be so placed as to force the Compression Spring against the larger platform, which, in turn, is forced against the Rubber Rings on Pulleys 31.

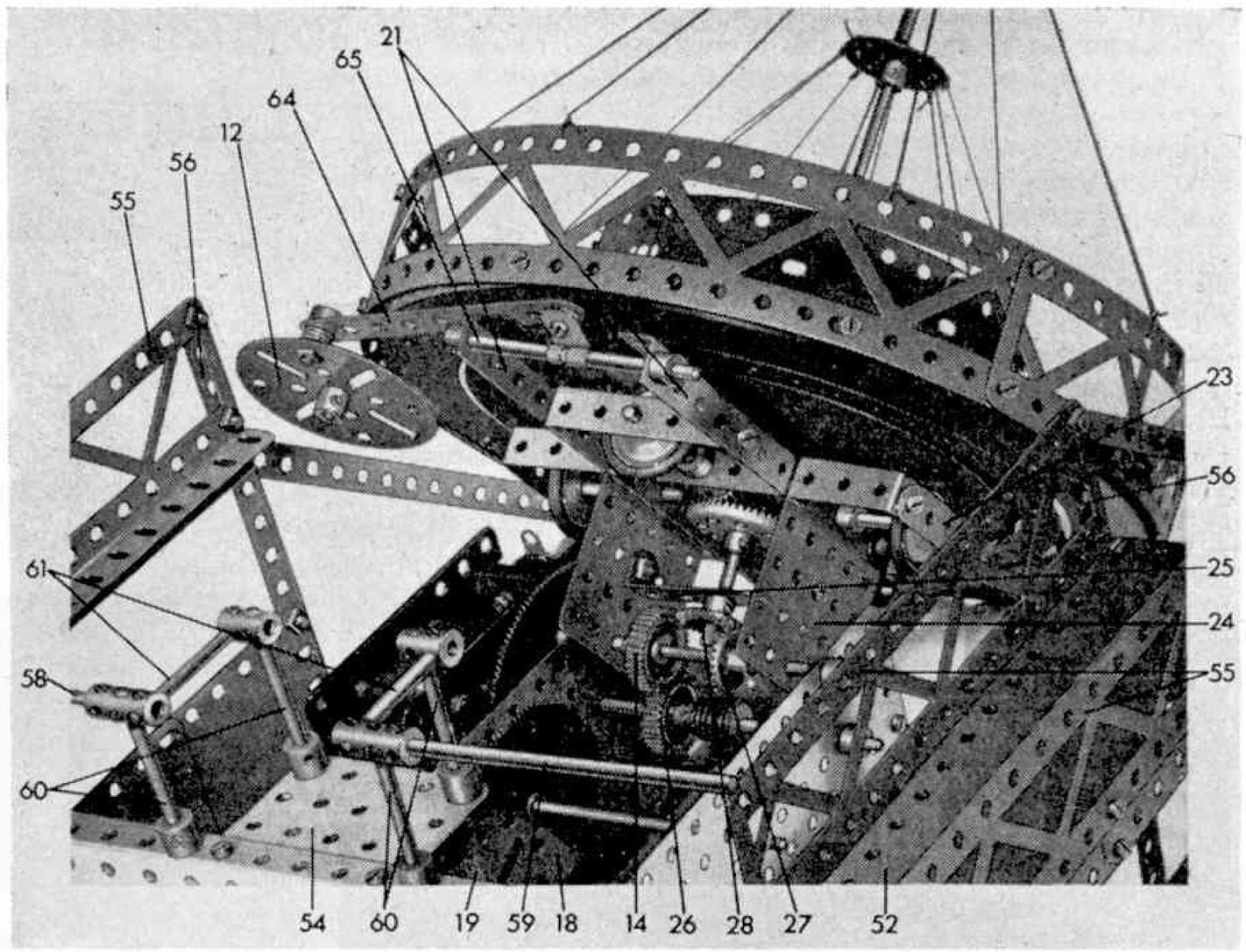
Mounted higher up the 11½ in. Rod is another 8-hole Bush Wheel 42, connected to Plates 41 by eight lengths of Cord. At the top of the Rod, an 8-hole Wheel Disc 43, free to turn, is held in place by two Collars. This is connected to Braced Girders 38 also by eight lengths of Cord.

Two 5½ in. Angle Girders 44 are bolted

to the rear corners of the base framework and three 7½ in. Strips 45, 46 and 47 are attached, one each, to Girders 2, 3 and 6. Girders 44 and Strip 45 on one side, and Girder 44 and Strip 47 on the other, are both connected by a 9½ in. Angle Girder 48, protruding rearwards five holes. Both Girders 48 are joined by a compound 14½ in. angle girder 49, constructed from two 9½ in. Angle Girders. A 7½ in. Angle Girder 50 is bolted to Strip 47 and this is connected to right hand Girder 48 by a 12½ in. Angle Girder 51.

A catwalk is formed from a 9½ in. and a 12½ in. Strip Plate 52 and 53, bolted to Angle Girders 48, 49, 50 and 51, and a 2½ in. by 2½ in. Flat Plate 54, a safety fence being provided by four 9½ in. Braced Girders 55, attached to the Angle Girders by three 2½ in. Strips 56 at the front and two 2½ in. Angle Girders 57 at the rear.

Handrails are represented by a 5½ in. Rod 58, a 4 in. Rod 59, four 2½ in. Rods 60, fixed to the catwalk by Rod Sockets, and two 2 in. Rods 61. The Rods are joined together by two Couplings and two Short Couplings, as shown. Access steps are built-up from two 7½ in. Strips 62, connected at intervals by six 2½ in. by ½ in. Double Angle Strips, with each



In this view the tipping linkage has been disconnected to show the underside of the rotating platforms

Roundabout

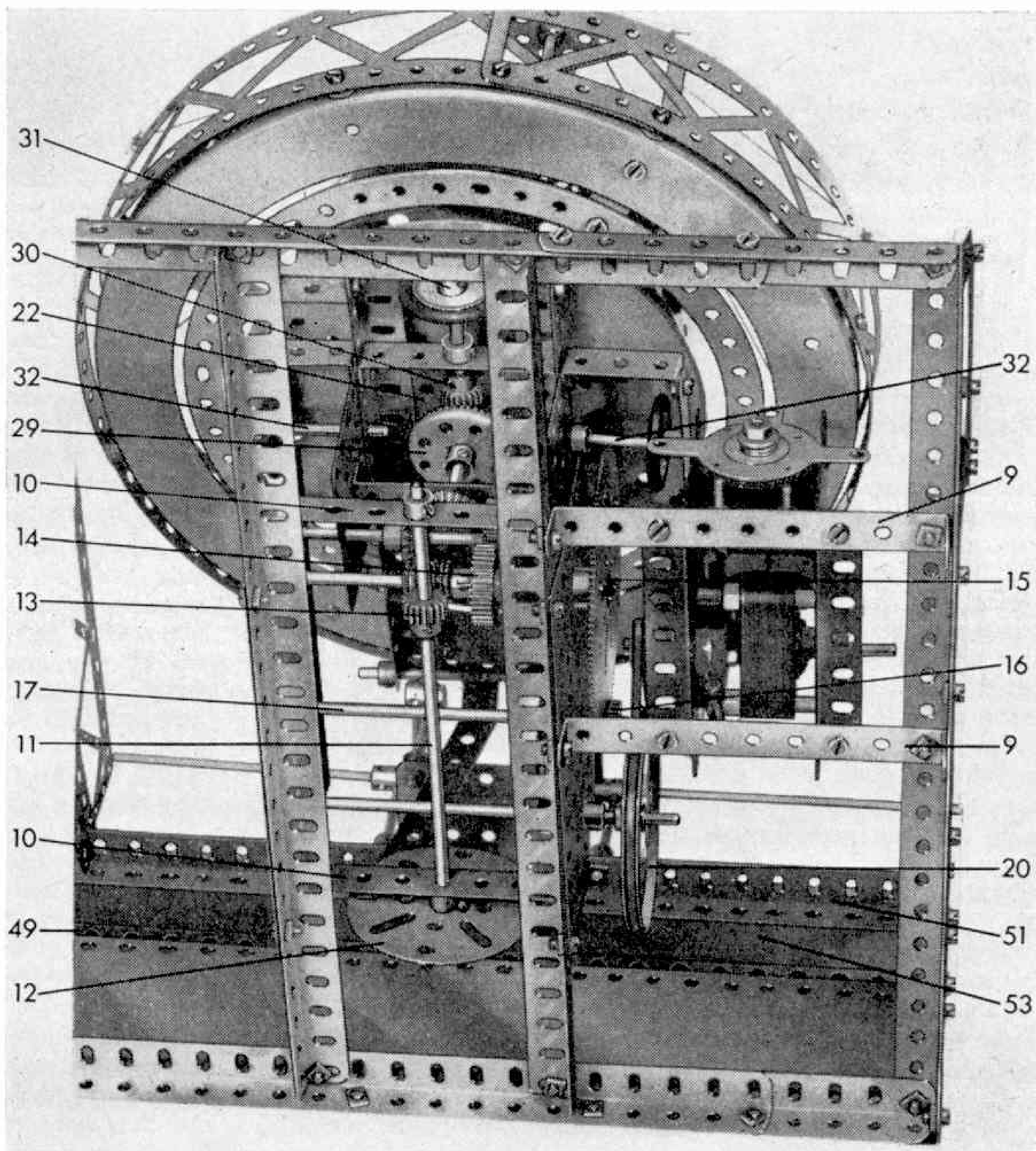
of two banisters being formed from a 2½ in. and two 4½ in. Narrow Strips. The 2½ in. Narrow Strips and a 7½ in. Strip 63 are fixed to compound angle girder 1 by Angle Brackets.

All that now remains to be completed is the linkage which causes the revolving platforms to tip. A right-angled Rod and Strip Connector, to which a 4½ in. Strip 64 is lock-nutted, is mounted on a 3½ in. Rod 65 held in Girders 21 by Collars. Strip 64, at its other end, is pivotally connected to Face Plate 12 by a Threaded Pin and a Collar.

Parts required:

1 of No. 1a	2 of No. 24	1 of No. 99b
6 of No. 1b	1 of No. 24a	1 of No. 109
1 of No. 2a	5 of No. 26	9 of No. 111c
2 of No. 3	1 of No. 27b	1 of No. 115
1 of No. 4	1 of No. 27c	1 of No. 118
3 of No. 5	1 of No. 28	1 of No. 120b
8 of No. 8	2 of No. 30	1 of No. 145
4 of No. 8a	2 of No. 31	1 of No. 146
3 of No. 8b	1 of No. 32	1 of No. 146a
2 of No. 9	172 of No. 37a	4 of No. 155
2 of No. 9a	157 of No. 37b	1 of No. 167b
2 of No. 9d	68 of No. 38	4 of No. 179
3 of No. 10	1 of No. 40	1 of No. 186b
4 of No. 12	4 of No. 48	8 of No. 188
1 of No. 13	11 of No. 48a	4 of No. 191
1 of No. 14	2 of No. 48b	3 of No. 196
2 of No. 15	2 of No. 48c	1 of No. 197
3 of No. 15a	2 of No. 52a	1 of No. 212a
1 of No. 15b	16 of No. 59	2 of No. 235
1 of No. 16	2 of No. 63	2 of No. 235d
2 of No. 16a	2 of No. 63d	2 of No. 235f
8 of No. 17	4 of No. 72	1 E15R
1 of No. 19b	3 of No. 99	Motor
4 of No. 22	4 of No. 99a	

An underneath view of the model showing the construction of the gearbox and position of Motor



Theme collecting of Dinky interesting hobby! Here's

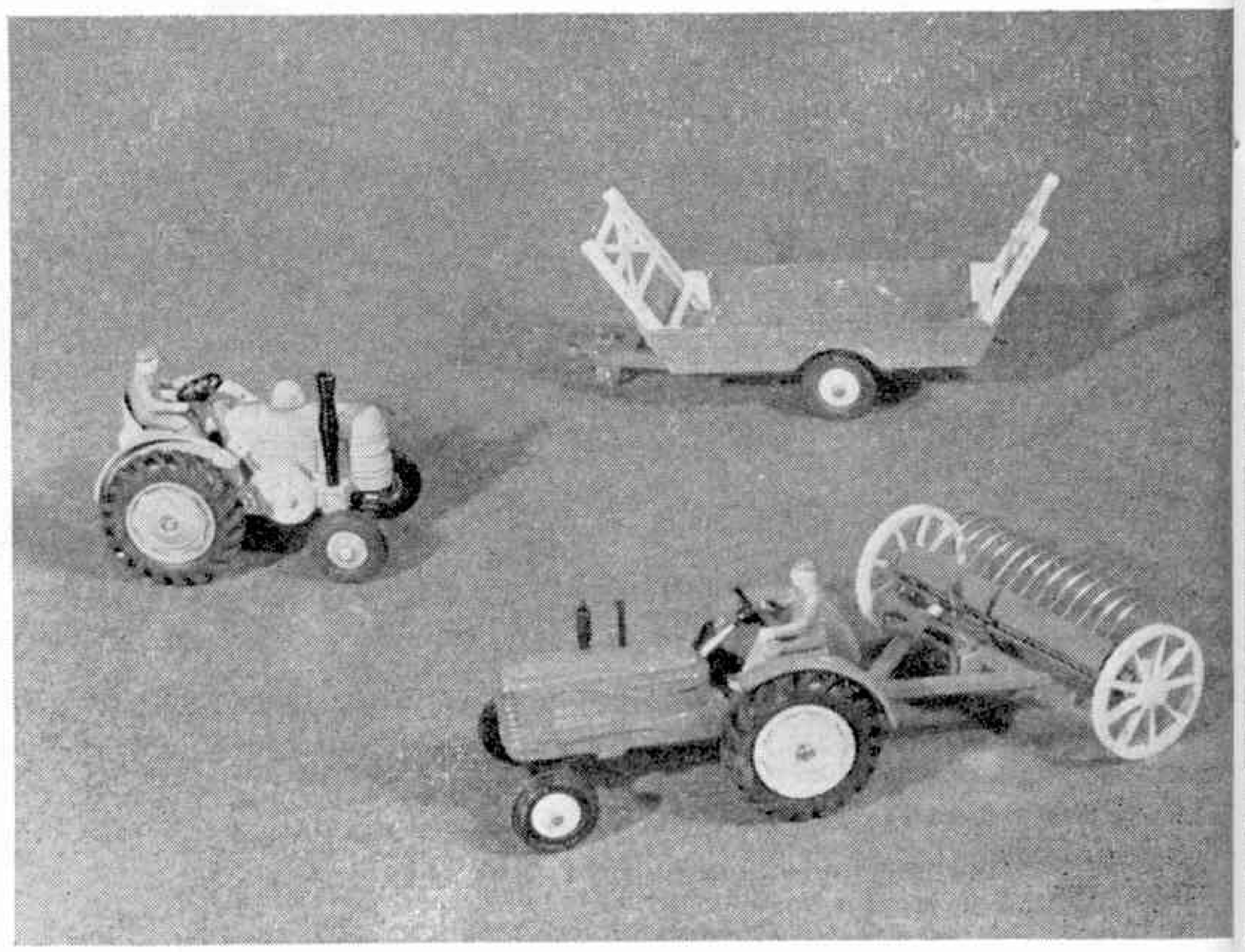
CLASSIFY

by **Chris Jelley**

HOW do you collect Dinky Toys? Do you simply buy haphazardly as new models come on to the market, or do you specialise in collecting certain models? For example, some collectors specialise in obtaining sports cars, others buy only military vehicles, while some enthusiasts select models which are sensible additions to a model railway layout.

Dinky Toy collecting can be a serious business and very enjoyable if you decide to build 'theme' collections. However, before you decide to embark on series or theme collecting, much careful thought must be given to the matter before you actually start buying. It is not advisable to draw out all your pocket-money and go charging down to the nearest model shop to buy everything in sight. If you did this, you would soon be in financial difficulties. There are more than 150 models in the current Dinky range, varying in price from 3s. 0d. to almost 30s. 0d., which will give you some idea of how much

The 'public service' group includes, not only buses, but anything that performs a public service. Here we have No. 978 Refuse Wagon, No. 292 Atlantean Bus and No. 289 Routemaster London Bus.



Country collectors often try for farm machinery. Shown here are No. 320 Halesowen Harvester Trailer, No. 301 Field Marshal Tractor, and No. 300 Massey-Ferguson Tractor with a Hayrake No. 324.

it would cost. It is far better to begin slowly, but sensibly and gradually build up your collection.

Distinct Groups and Subdivisions

A study of a Dinky Toy catalogue, which your local dealer will be pleased to supply, will show that models fall into as many as ten distinct groups: saloon cars, sports cars, racing cars, commercial vehicles, army equipment, farm equipment, public service vehicles, emergency services, aircraft and engineering site equipment. At least one of these groups, the emergency services, can be sub-divided into police, ambulance and fire service vehicles and there are several other models which do not come under any heading. For the sake of argument we will gather these under 'miscellaneous', incidentally, in 'public service', I not only include buses, but also such items as refuse wagons.

I cannot, of course, list every model in every group. In any case, it is not necessary, as the majority of models automatically fall into their respective sections, but there are a few that might cause confusion. The Standard Atlas Kenebrake, No. 295, is one example. Is this a commercial or a public service vehicle? It could be either. Again, what about the Foden Dump Truck? Would this come under 'public service', having a bulldozer blade, or under 'engineering site'? The A.A. Mini Van is another, 'public service' or 'commercial'?

These three examples alone, show that the hobby is not all plain sailing. A good deal of thought can be involved.

Of all the groups, the hardest to define is 'miscellaneous'. In many cases, the only way of placing a replica in this category is by first ruling out all the others. Obvious candidates, however, would be television equipment and 'oldies' such as the Model T Ford. If enough of the latter 'veteran' type are produced in the future, these could, of course, form a group of their own; but until then, I do not recommend isolating them.

Two further members would be No. 177 4-Berth Caravan and No. 796 Healey Sports Boat on Trailer, although most other possibilities rely on your own individual judgment, depending on the job for which you feel they are generally used. For instance, I am inclined to place the Universal Jeep, No. 405, in 'miscellaneous', yet you might prefer 'commercial'. In some instances, it is plainly a matter of opinion.

How to begin

Assuming you have decided to take up serious collecting, how would you go about starting? I have already pointed out the inadvisability of buying every model that comes along and have explained about the various different groups. The idea is to choose any single category—whichever appeals to you most—and concentrate on only collecting models in that range. It sounds easy, but don't be misled. Several factors must be taken into consideration.

Each group contains many individual Dinky Toys and it will not be possible to purchase them all at once. Consequently, you must first decide whether it is better to try for a few of the more expensive ones, or many of the cheaper ones.

Toys can provide a very how to form your collection

YOUR DINKIES

Examples from the 'army' section: from the back, No. 689 Medium Artillery Tractor, No. 693 7·2" Howitzer, No. 686 25-pounder Field Gun, No. 687 Trailer for 25-pounder Field Gun, No. 688 Field Artillery Tractor, No. 670 Armoured Car.

You must also remember that the range of available models does not remain unaltered for long. New miniatures are constantly being introduced and old ones withdrawn. Try to get those that you think might quickly disappear from the market because, once a Dinky has been withdrawn, there is little chance of it being re-introduced.

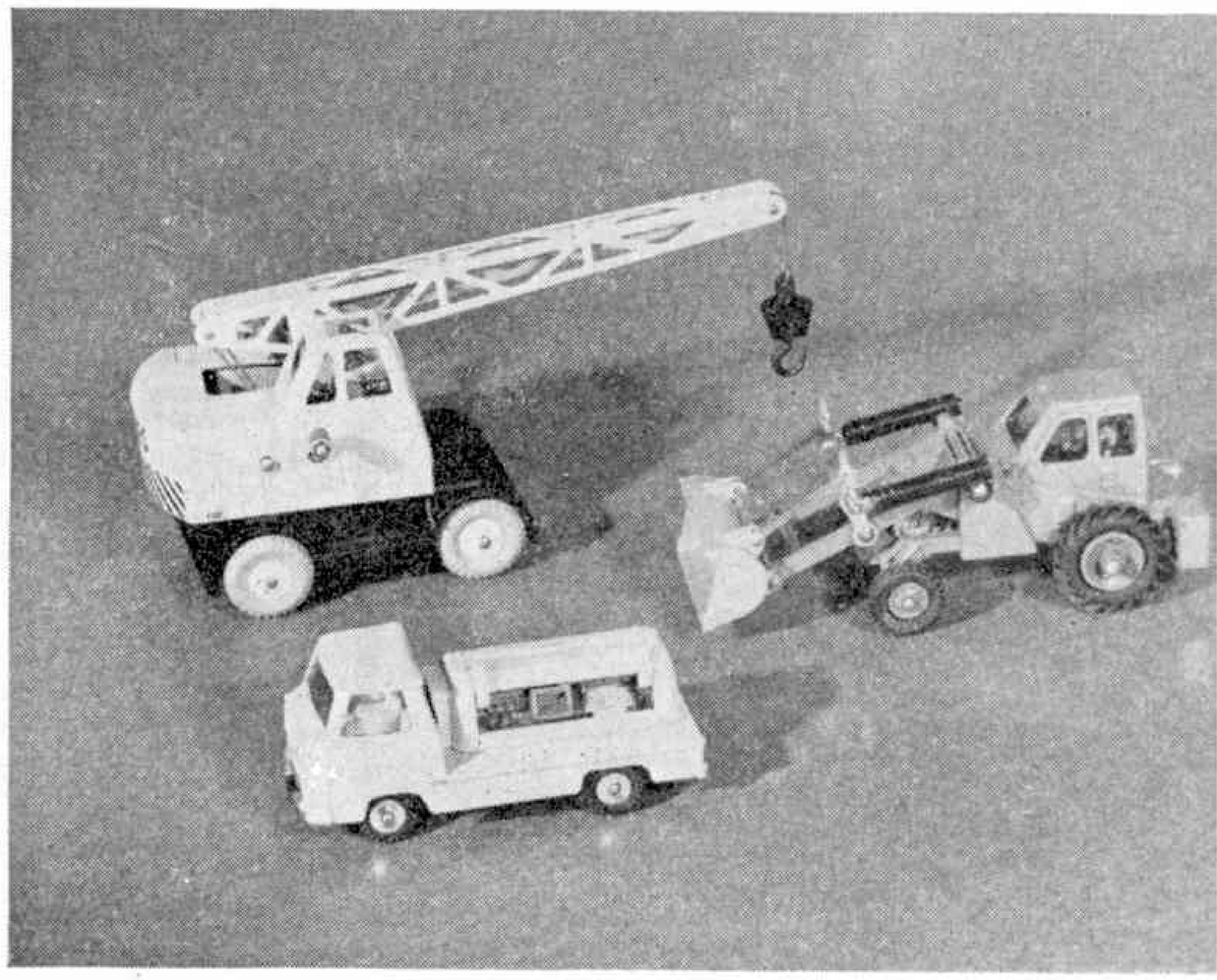
You might ask how you are expected to know which models are likely to be withdrawn. A fair question, but there is a way that, while not being 100 per cent successful, acts as a very good pointer. Production of Dinkies usually ends for one of two reasons: either the real-life vehicle becomes so obsolete as to make continued manufacture of a die-cast reproduction impracticable, or the tools used in manufacture wear out.

This means that you need to keep an eye on the full-size motoring world to find out what is happening, while at the same time studying the current miniature range. Naturally, the tools for those models which have been in production longest stand most chance of wearing out first. I therefore suggest that these be given priority.

Increased difficulty

Even if you manage to acquire all current replicas in the chosen group, you cannot sit back and relax, for it is then that the hobby become more difficult. The reason? The only way to add to your collection is to go for obsolete models and it is no easy job. As soon as a Dinky Toy is withdrawn, collectors everywhere snap up the last models remaining in the shops, with the result that it virtually disappears from the market. This is when collecting becomes really interesting. You must search out obscure little shops, where you might find a forgotten 'gem' in old stock. But, most important of all, you should enter the second-hand market; search the classified advertisement section of magazines; contact other collectors; arrange exchanges and always be on the look-out for a chance to buy what you need. The classified section of the 'M.M.' is of enormous help in all these matters.

If you are successful in completing, as far as possible, your particular group, you can branch out by moving on to another category. The same suggested rules, of course, still apply and you have the additional interest of watching for new releases falling into the first section. Having finished group No. 2, you can try a further group, then another and so on, until all types are covered.



Engineering site machinery has a special appeal to many collectors. This picture shows No. 971 Coles Mobile Crane, No. 437 Muir-Hill 2-WL Loader and No. 436 Atlas Copco Compressor Lorry.

There are many sorts of collectors operating today, but Dinky Toy collectors have a distinct advantage over most of them—they are able to use their collections in all kinds of different ways to increase the pleasure which can be had from the models. With your own collection, for example, you can take a piece of hardboard, paint roads on it, add houses, trees, hills and other scenery and end up with a really good layout.

Photograph your collection

Or, if you are interested in photography, you could take table-top pictures of various models in realistic scenes such as have often appeared in these pages in the past. I, myself, am always interested to see good table-top photographs and am pleased to publish them here, if the opportunity arises. There is no doubt about it—collecting Dinky Toys can be fun!

Before signing off, I must explain why I have departed from my usual practice of describing the month's new Dinky Toys and the actual cars on which they are based. It is not, as might be thought, that we have no new models for March, a glance at the advertisement pages will show that two are scheduled for release, but simply that, at the time of writing, I do not have enough material and photographs on hand to give you all the customary information. Rather than skimp my job, therefore, I felt it would be better to wait, and report all the facts and figures next month. Besides, it has given me the opportunity to cover a subject which, I am sure, is of interest to many readers.

Continued from page 30

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March

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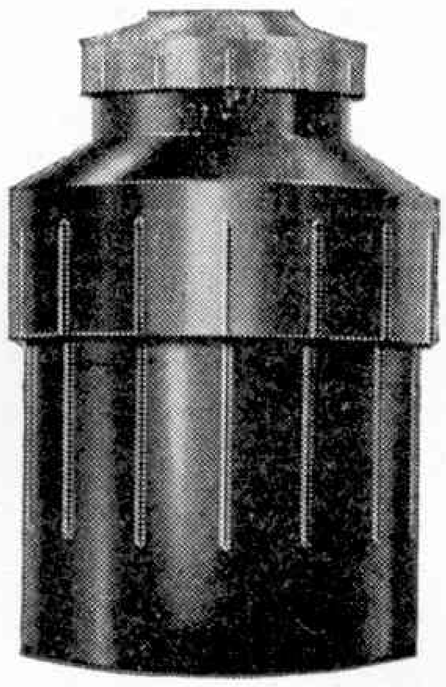

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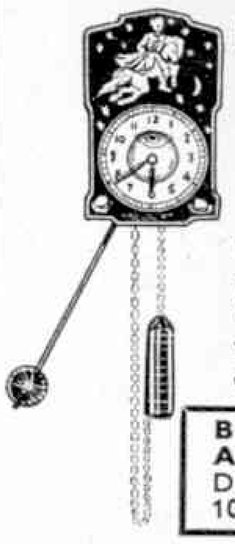

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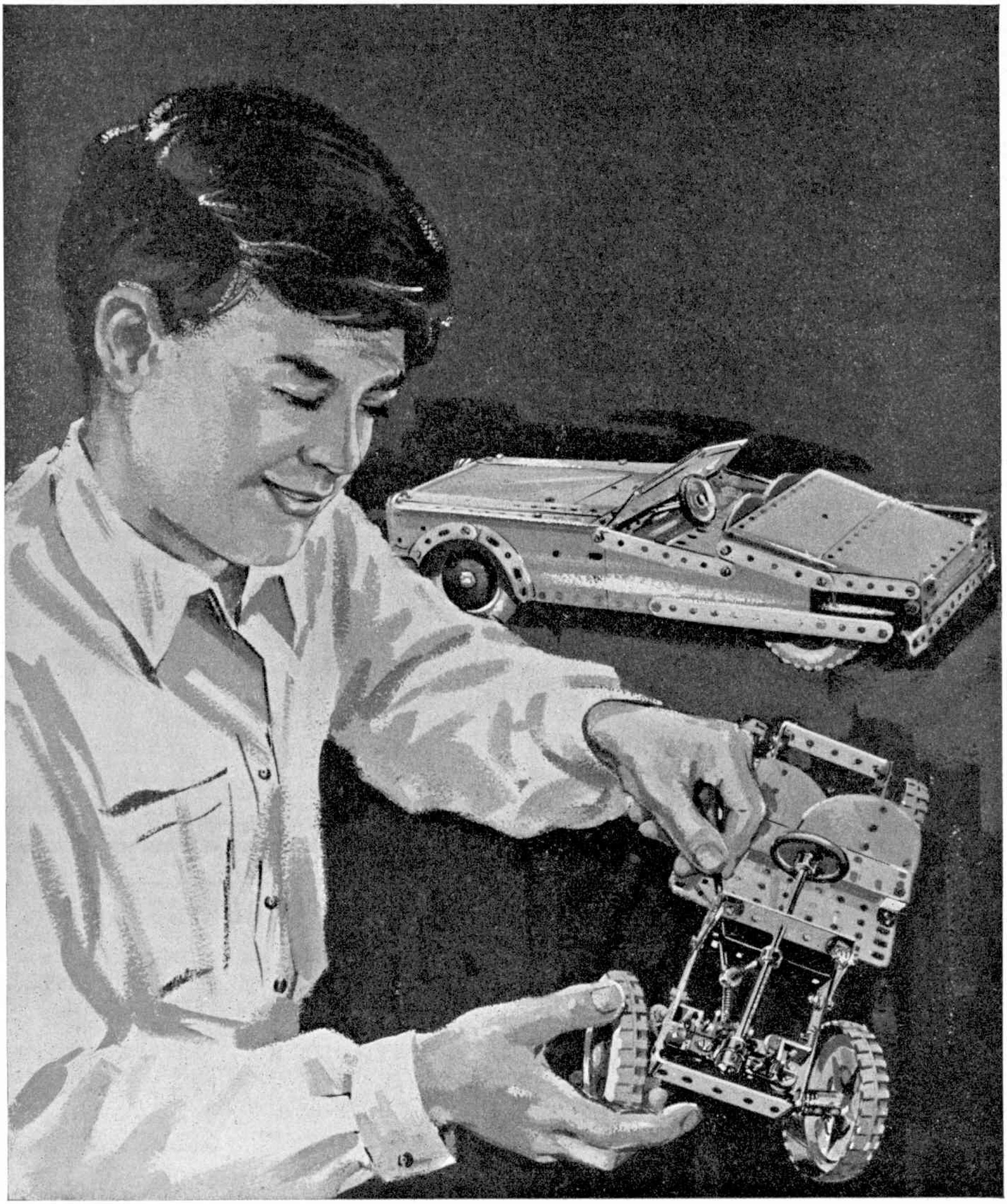

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