50 Dinky Toys must be won! See inside

meccano magazine

May

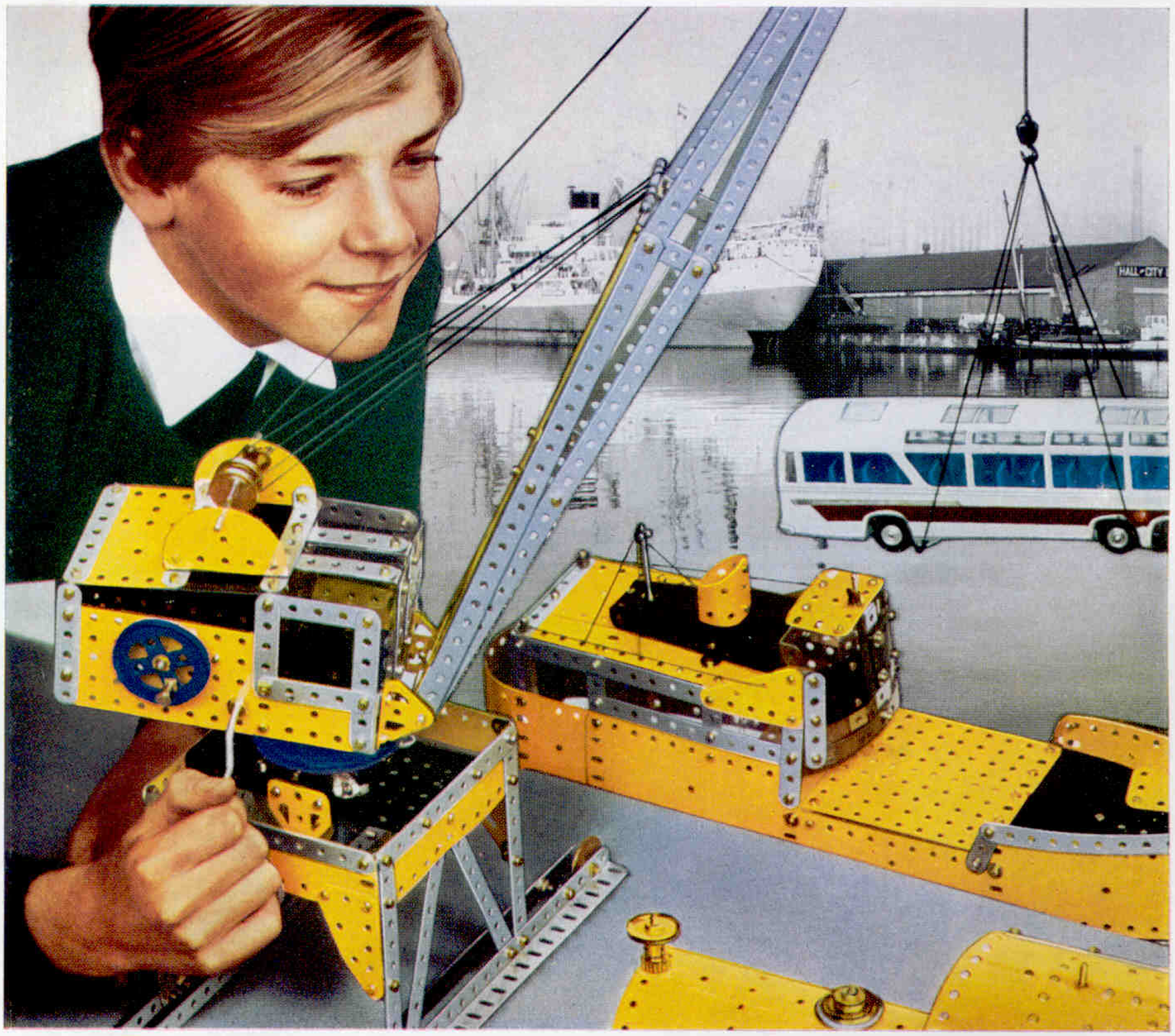
1s.6d.

the practical boy's hobbies magazine

1965

IN THIS ISSUE

- Build your own model bridges
- Details of the world's largest plane



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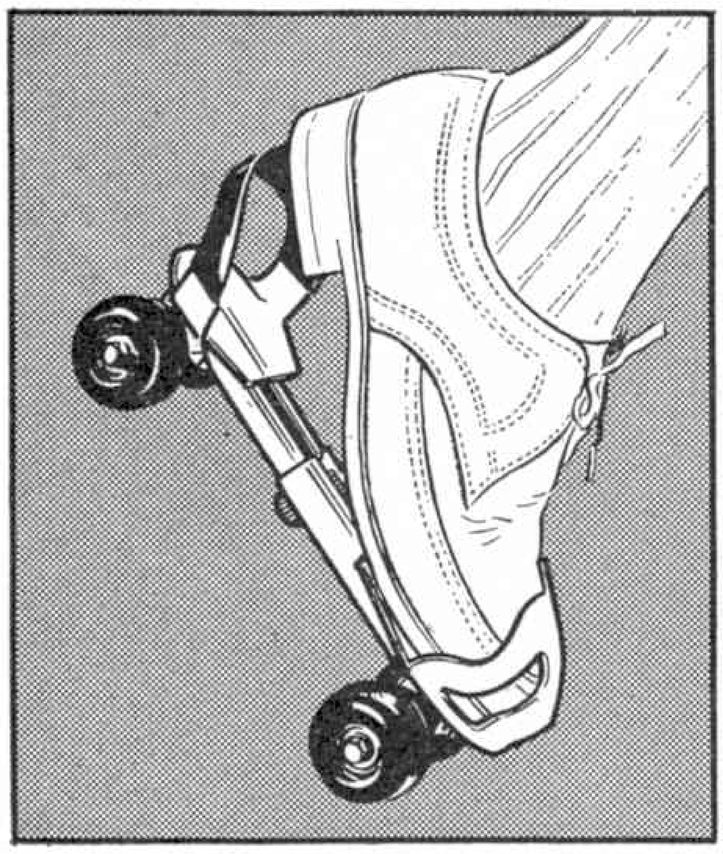

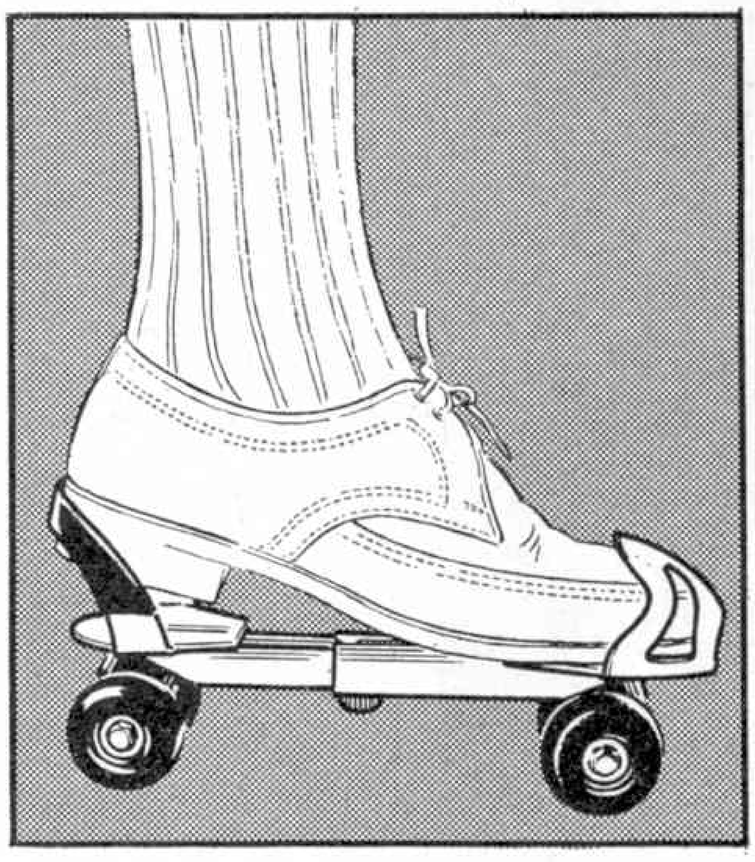

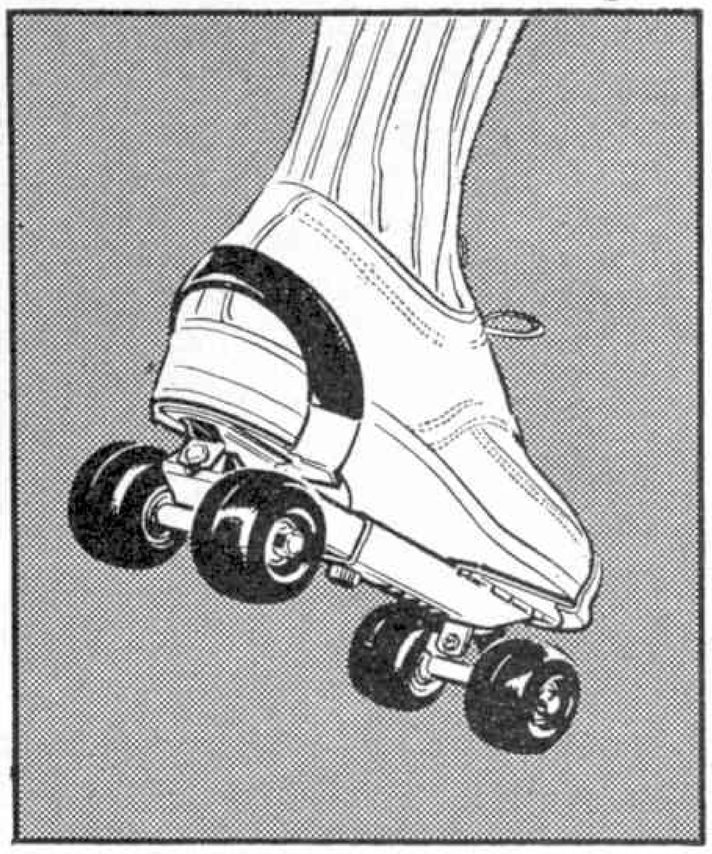

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May 1965 · Vol. 50 · No. 5 · Monthly

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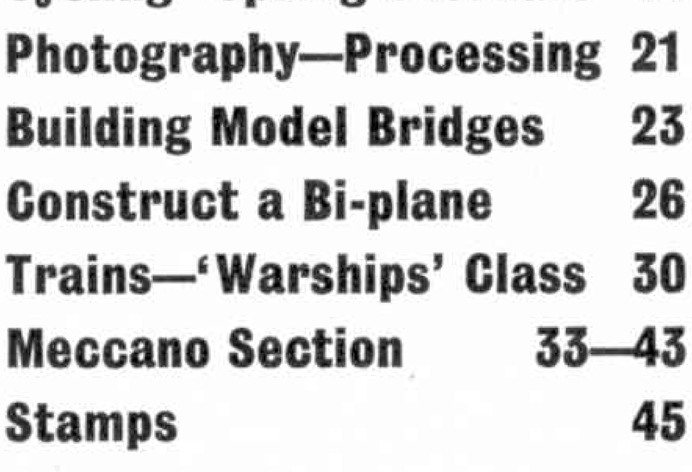
Front Cover: The Disneyland 'Highway in the Sky' was the first passenger-carrying monorail to operate daily in America. It began operations in June 1959 and in its first four years carried more than 11,000,000 passengers and travelled 225,000 miles. Based on the Alweg Monorail System, the trains run on a concrete beamway and are electrically powered. Operating speed is 45 m.p.h., although the trains would be capable of 80 m.p.h. on long straight sections.



50 Dinky Toys must be won

HOW would you like to win one of the latest Dinky Toys absolutely free? Each month in Meccano Magazine there will appear a competition, the prizes for which will be FIFTY brand-new Dinky Toy models! There will be no charge to enter the competitions, all you have to do is fill in your name and address, plus details about the make and model of a car silhouetted in the competition. The first fifty correct entries to arrive at Meccano Magazine's offices will each win a Dinky Toy prize!

This month's competition appears on page 43, so don't delay, send in your entry right away! Don't forget, the first fifty correct entries win the competition, so it is very important that you post your entry as soon as possible. Names and addresses of the winners will be published next month, in order for you to check whether you have won a prize. If your name appears, then write in to claim your award.

As you can see, to win a prize in our monthly competitions, it is essential that you buy the magazine as soon as it appears at the newsagent's shop. Therefore, to avoid disappointment, place a regular order for Meccano Magazine and ensure that you get your copy regularly each month.

Special Photographic Section

Now that Spring is here, Summer can't be far behind. This means that amateur photographers will be loading fresh film into their cameras and taking family snapshots or photographs of their favourite subjects. However, how many of these photographers ever really get the best from their photographs? Normally, they are rushed through on a 24-hour printing service and the results are quite disappointing. Yet, for a surprisingly small outlay, an amateur photographer can develop and print his own films and obtain far better results.

Next month, there will be a special Summer Photography section dealing with the problems involved in taking, developing and printing your own photographs. The equipment required need not be terribly expensive and the end results are far more satisfying than the mass-produced 24-hour prints which you receive from your local chemist.

If you are thinking of buying a camera or interested in processing your own films, be sure to buy and read next month's Meccano Magazine. I am sure you will find the photographic section extremely interesting.

Advertisements and Reader Enquiries

Before signing off, I would like to mention our two special services for Meccano Magazine readers. The first is the advertisement service which gives readers the opportunity of obtaining additional information about any products they see advertised in the magazine.

At the back of the magazine is a form which lists advertisers and if you require further details about a certain product, all you have to do is place a tick against the name of the manufacturer on the form and send this form into our readers' enquiry service at Meccano Magazine. You will, in due course, receive all relevant information.

Finally, there is the readers' sales and wants column. This provides the opportunity for buying or selling all manner of hobbies' equipment. You may be searching for some obsolete Hornby three-rail units or wishing to sell your old stamp collection. Whatever your problem, it is quite likely that by advertising in our sales and wants column, you will find a solution.

There is an easy-to-enter order form to fill in and the cost is very reasonable. Thousands of hobby enthusiasts read this special advertisement section, so why not take advantage of the column to sell that unwanted train or car layout?

The Editor

Imagine a train flying! This is the

The world's

PRESIDENT Johnson has given the U.S. Department of Defense the go-ahead to build the largest aeroplane in the world and not just one but a fleet of fifty-eight, sufficient to equip three U.S.A.F. squadrons!

How large will this giant 'plane be? Well, the biggest airliner yet flown is the Russian Tu-114, powered by four 14,795 h.p. turboprop engines and with seats for 220 people. The new American aircraft will be able to carry 600 passengers, but is intended primarily to haul military cargoes weighing up to 110 tons over a non-stop range of 5,000 to 7,000 miles.

The heaviest tanks will fit into its vast fuselage and still leave room on one side for a Jeep to be driven past. The cargo hold will, in fact, be wider than two removal vans side-by-side and about 40 yards long, with a cabin for the crew and 100 passengers on a separate deck above it.

A sideways-hinged nose-door and a ramp built into the bottom of the rear fuselage will enable vehicles and freight to be loaded at one end while unloading is being completed at the other end, to speed turn-round at airfields.

As in the case of merchant ships, the larger an aeroplane can be built, the more efficient and cheap to operate it becomes. With this in mind, the Douglas Aircraft Company began designing a massive transport 'plane for the U.S.A.F. as long ago as 1951. Known as the YC-132, it would have had a loaded

Loading of the huge C-5A will be through front and rear openings in the 40 yard long fuselage.

A drawing of the proposed freighter showing lorries being unloaded. The actual aircraft will have only four jet engines.

size of America's C-5A . . .

largest 'plane

weight of half a million pounds, including nearly 90 tons of payload. After six years of work this project was abandoned, at a time when the U.S. Government was trying to cut its spending on military equipment.

The new transport will be nearly half as big again as the YC-132, with a maximum take-off weight of 725,000 lb. It was known originally as the CX-HLS, standing for Cargo Experimental—Heavy Logistics System, but now has the official designation C-5A. Preliminary design work has been under way for nearly four years and three companies, Boeing, Douglas and Lockheed, have produced detailed proposals of the kind of aircraft they believe would do the job.

On this occasion, the 20-wheel gear was produced simply by replacing each of the aircraft's normal wheels by a twin-tyre unit, giving four wheels side-by-side on the nose unit and eight-wheel main bogies, all with low-pressure tyres.

On the C-5A, each row of wheels might be mounted on a special extendable axle, enabling them to be spread apart when the undercarriage was down. This would spread the aircraft's weight over a still greater area, without requiring a larger-than-usual space in which to house the wheels when they were retracted in flight.

Walking aircraft

It would also be possible to raise one row of main wheels on each side of the aircraft while it was on the ground. This would permit wheels to be changed without the need for jacks. In addition, if the aircraft became bogged down in soft ground, it could "walk itself out". First one row of wheels would be raised and a supporting surface placed under it. The wheels would then be lowered, lifting the aircraft in the process. The second row would be raised in turn and similarly supported. The aircraft could then be taxied forward under its own power.

The 707 prototype has also been used to test a special high-lift wing flap system that would reduce considerably the landing run of the C-5A. This utilises both leading-edge and trailing-edge flaps, and air from the jet-engines is blown over the trailing-edge flaps to increase their effectiveness at low forward speeds.

With the system in operation, the landing speed of the 707 was reduced to 90 m.p.h., compared with 150 m.p.h. for a normal big jet airliner. On one occasion, a stalling speed of only 75 m.p.h. was attained—low enough for the aircraft to qualify as the world's slowest jet transport when at one time it had been the fastest!

As a result of research already done, the Department of Defense believes that the C-5A could be designed, built, tested and put into service by 1968 or 1969. It will carry three times as much cargo as the Lockheed C-141, the largest military transport in service today and will be able to accommodate all types of equipment used by an Army division. At present, the C-141 can carry only 30 to 40 per cent of this equipment.

It will cost $750 million to develop the prototype, to which must be added the cost of the 58 production aircraft that will be needed.

Basic design

Nothing is yet known of the Lockheed design. The Boeing and Douglas projects are very similar in general appearance, with a high sweptback wing, four turbo-fan engines in underwing pods and a swept tail. They look like scaled-up versions of the Boeing 707 and Douglas DC-8 airliners, which is hardly surprising in view of the vast experience gained with these aircraft.

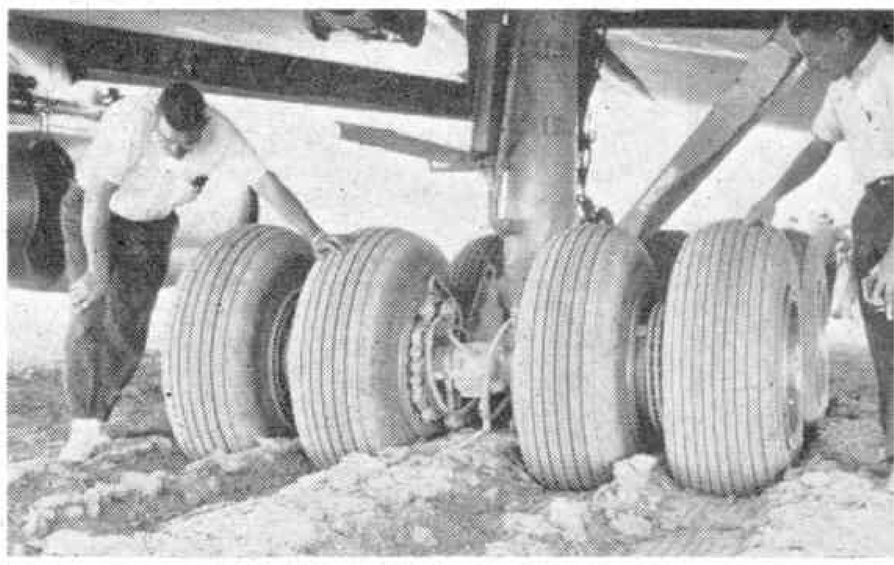
However, unlike big jet airliners, the C-5A will not fly only to places with large, well-equipped airports. America realises that many of the areas to which it might want to fly troops, equipment and supplies at a moment's notice in an emergency are far from major airports, so the C-5A is being designed to take off and land on temporary airfields close to combat areas.

Boeing calculated at one stage that the aircraft's immense weight would have to be spread over 40 tyres. Its latest design utilises only 20 tyres and this has enabled the weight of the aircraft to be reduced.

Many of the new ideas are already being tried out on the eleven-year-old phototype of the Boeing 707. A programme of landings and take-offs has been completed at Harper Dry Lake, California, in conditions varying from firm ground to a surface so soft that it would barely support a motor car.

by John W. R. Taylor

Above and Below: A Boeing 707 tests a new undercarriage assembly for landing the C-5A on unmade landing strips.



The fuselage diameter of the gigantic C-5A aircraft.

Take a Tip

In a hurry to get back to his home base, a U.S. Navy pilot recently took off at night without running through the full pre-flight check list. Soon after becoming airborne, he realised that there was something wrong with his Crusader fighter. Looking backward, he discovered that he had taken off with his wingtips folded. Fortunately, the Crusader seemed to handle quite well with its wings "clipped"; so he climbed to 10,000ft. and performed some "negative-g" manoeuvres which flicked the wingtips down. He then flew home as if nothing had happened—all of which proves how sturdy the Crusader is and how lucky some pilots can be when they are flying.

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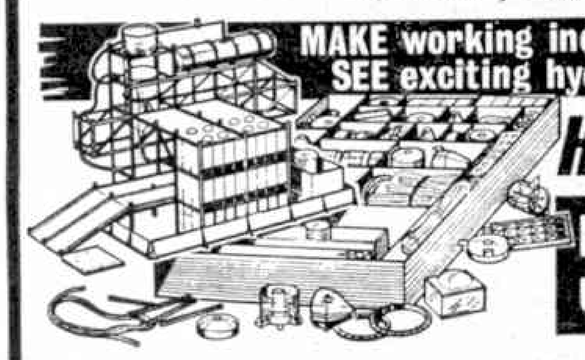

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SOLAR ENGINE

Perpetual Power in a bulb! **12/6** P&P 1/6

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Miniature Submersible WATER PUMP

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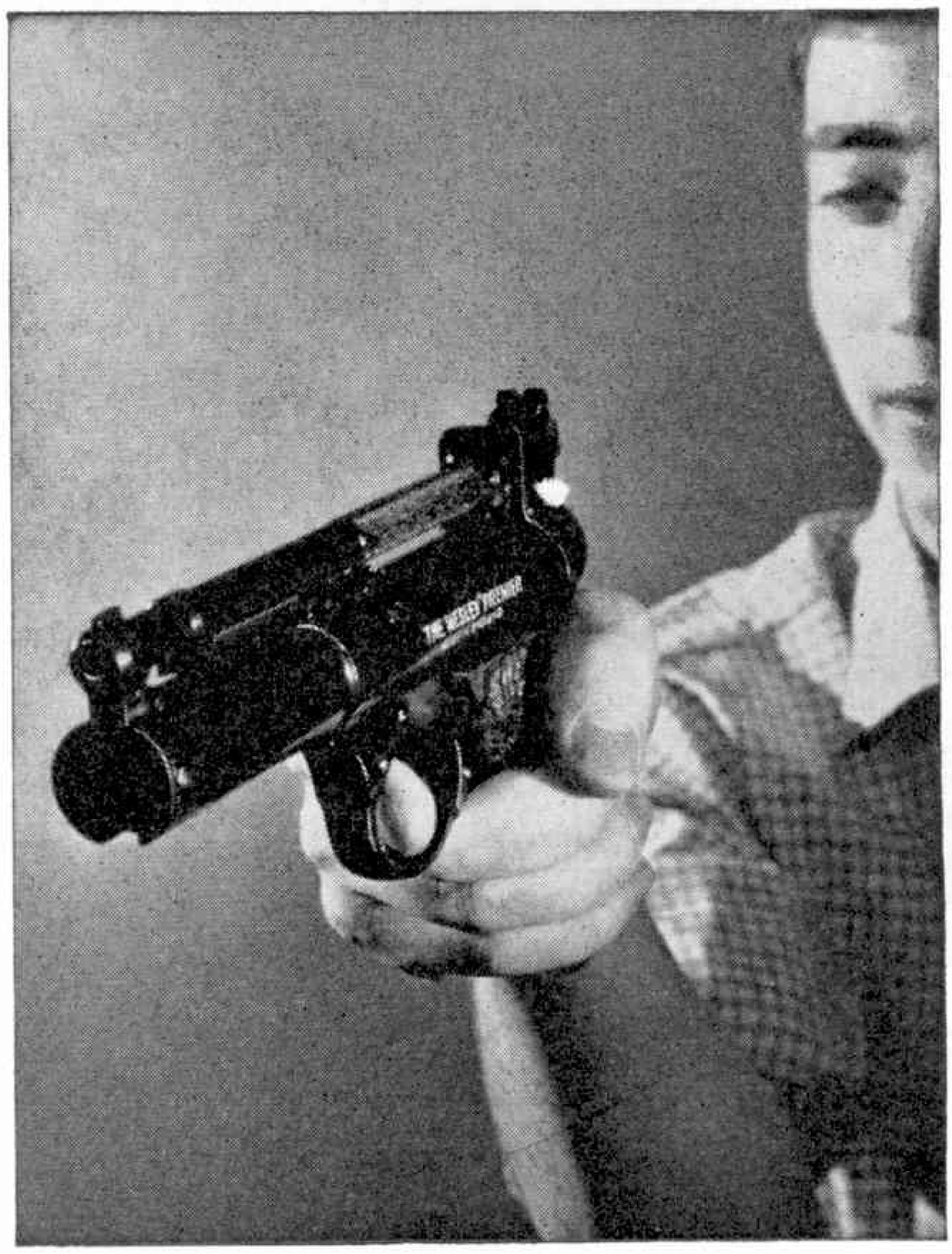

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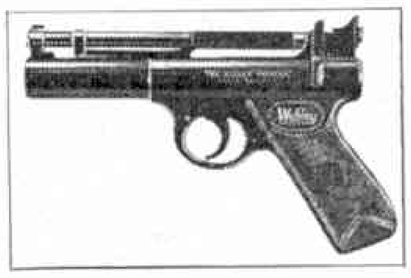

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mailbag

Anything interesting . . . write about it to the editor

RETIRED FROM SERVICE—After over 60 years service, this veteran locomotive has recently been withdrawn from service. There were once about 70 of these small tank locomotives working in southern England, but now the class is extinct.

Fortunately, one of them is now being restored to its original livery at Stratford, London. The photograph of 30025 was taken near Southampton.—*A. McIntyre, Southampton, Hants.*

SIXPENNY SIGNPOST—A most curious signpost can be seen pointing to Sixpenny Handley at the intersection of the A354 and B3081. The odd name of this village, abbreviated to 6d Handley, is derived from an amalgamation of two ancient hundreds, "Saxpena" and "Hanlega".

The signpost is also interesting because, like most signposts in Dorset, it tells you exactly where you are and how to find the location on a map. The number 011166 is the normal Grid reference.

To make it even more difficult for a motorist to get lost, there is also an A.A. box, No. 172, at this crossroads. Finally, if all other information fails, then the signpost tells you that the police station is not far away.—*J. C. D. Smith, Chedzoy, Bridgewater, Somerset.*

HAUNTING AT WEST BOW—Long ago, at a place called West Bow, which is in Edinburgh, there stood a haunted house belonging to a Major Weir. He was a tall, dark man, clad in a cloak and never seen without his black staff.

He has remained one of the city's most infamous characters since the middle of the 17th century. He was executed in 1670 and his sister, Grizel, was also tried for witchcraft and was sentenced to be hanged in the Grassmarket.

One of the most interesting points about the Major's history are the properties said to have resided in his staff. According to the tales which were told at that time, he could send his staff out on its own to bring back any message he required. It could deliver a letter or go abroad to collect one. It could even answer a knock on the door of its master's home at West Bow and often ran ahead of the Major, as a link boy, while he travelled the neighbourhood.

For more than a century after the Major's death, his house remained a place of fear. No one dared approach it, let alone enter it, since there had been well-founded reports that his apparition haunted it and might be seen, after dark, flitting noiselessly about its precincts. Sometimes, from the apartments occupied by he and his sister, bright lights were switched on at the witching hour and sounds of dancing and riotous behaviour could be heard within. Major Weir's enchanted staff could also be seen parading its desolate apartments.

Bold was the inhabitant who, after dusk, could pass by the Bow without fear of encountering the Major's staff and lantern, journeying by themselves; or the spectral coach that conveyed the notorious brother and sister on their evil journeys.

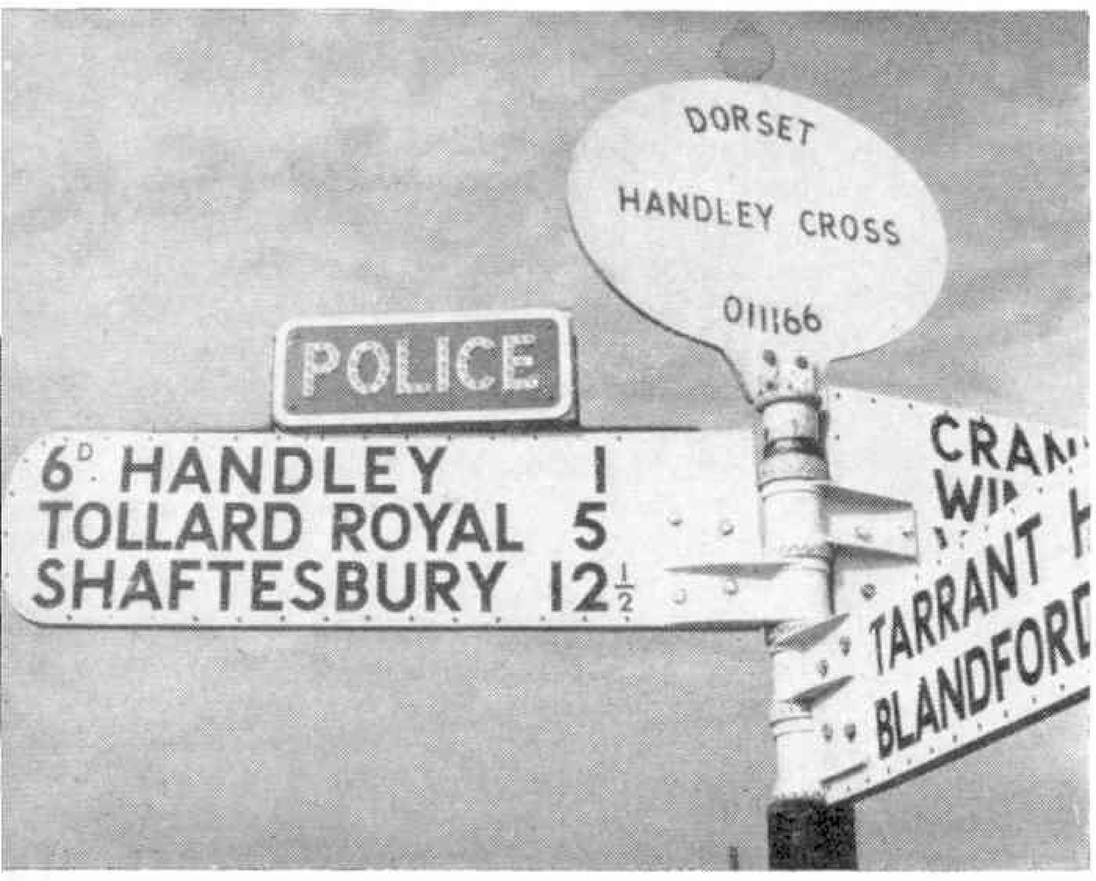
The Major's ghost might be seen treading the dark, cobbled causeways of the Old Town in the small hours, preceded by his phantom staff and lantern. His coach could also be heard as it rattled through the the night between the Lawnmarket and the West Bow, drawn by six black horses with fiery eyes.—*D. J. Hunter, Edinburgh, 3.*

INDUSTRIAL LOCO—Last year, I spent my holiday at Matlock, in the Peak District, with a friend. During our stay, we were privileged to visit the power station at Spondon, situated just south of Derby, and a most instructive afternoon was enjoyed.

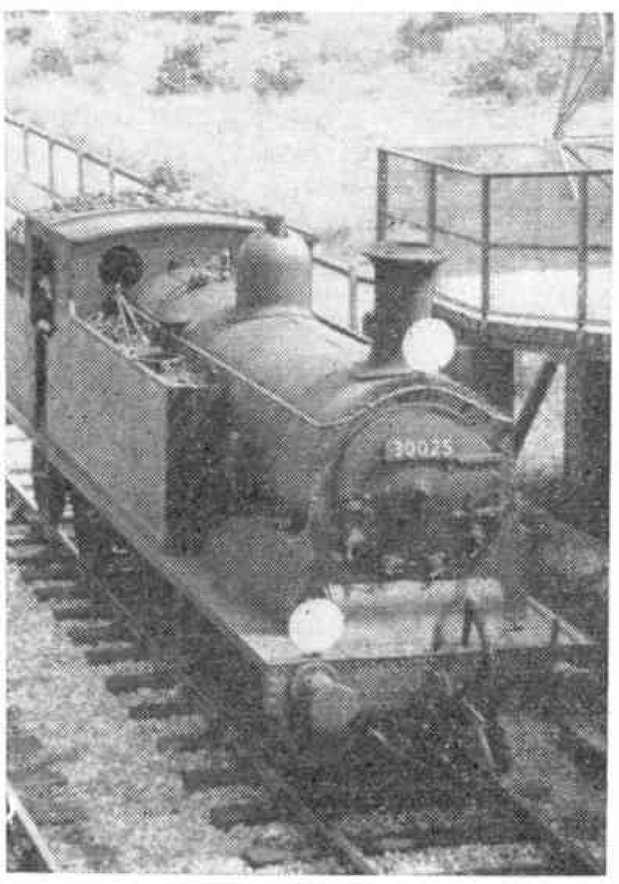
The power station owns three electric locomotives which were made by English Electric Company in 1935, 1939 and 1946. Our guide informed me that much of the building was carried out by Messrs., Baguley of Burton-on-Trent. The highlight of the trip was a ride up and down the yard on No. 3, a photograph of which is shown here.—*D. Taylor, West Hendon, London, N.W.9* (14 *years*).

A COMIC ADVERTISEMENT—I found this comic advertisement in a local newspaper:—"Young mother urgently needs clothing and equipment for a new baby: also four-year-old (boy) cheap but clean please."—*M. Coles, Bitterne, Southampton.*

An unusual signpost to be seen in Dorset

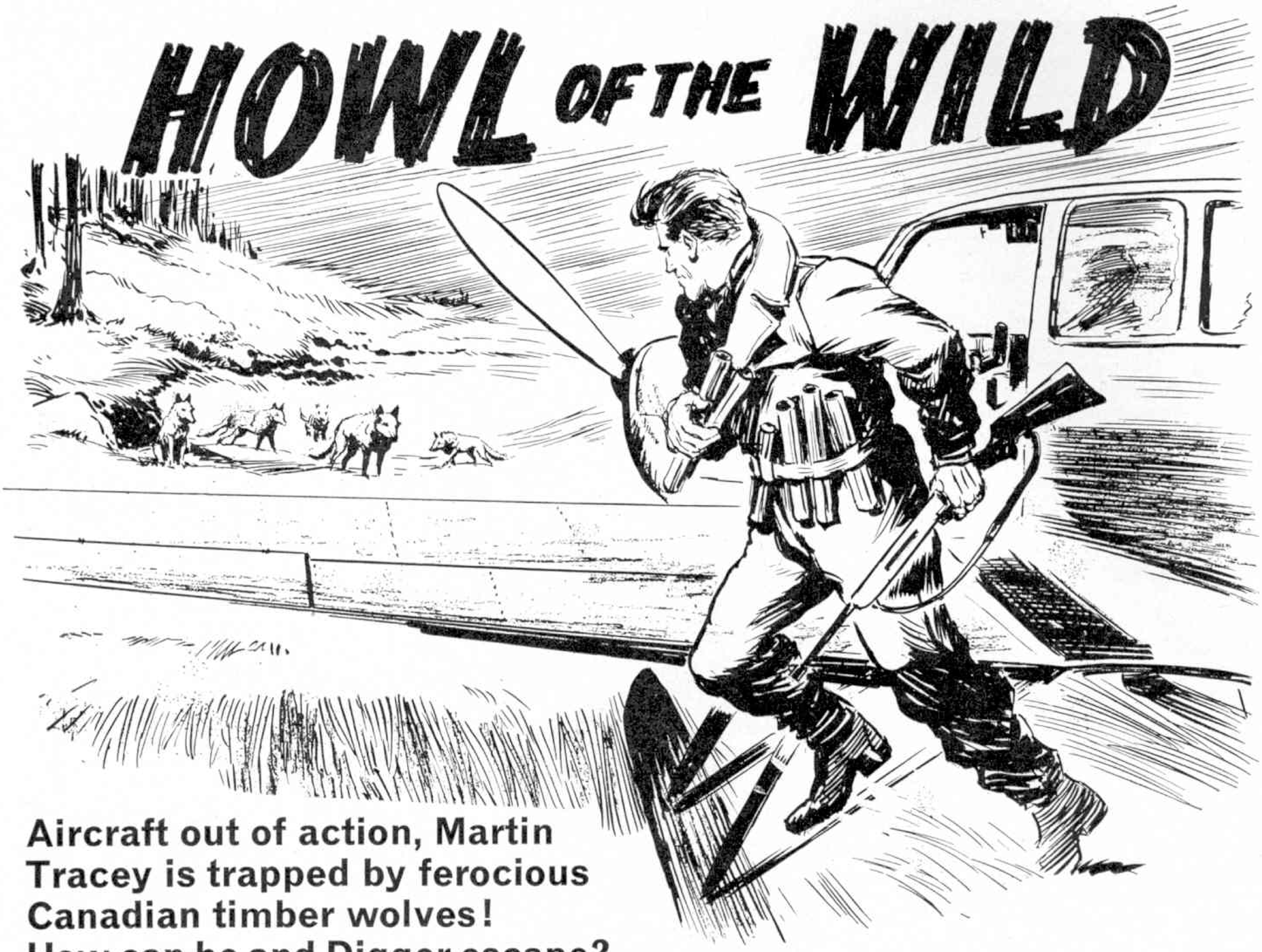


Sixty years of fine service



A power station's locomotive

HOWL OF THE WILD



Aircraft out of action, Martin Tracey is trapped by ferocious Canadian timber wolves! How can he and Digger escape?

THE blizzard smashed down from the Arctic Circle with a sudden, stunning violence. It tore across Hudson's Bay and howled over the bleak, snow-covered land to the south. It lifted odd trees clean from the ground, hurled animals off their feet and it crashed full into the single-engined spotter aircraft flying over the desolate waste.

Martin Tracey was taken completely by surprise. The Beechcraft was flung upside down as the blizzard hit it and it took all of his skill to bring the little aircraft back on an even keel. Digger Ames caught his head a tremendous crack against the back of his seat, despite the safety straps holding him down and, for a few minutes, he sat dazed.

Then, as his head cleared, he flashed a quick glance at Tracey and laid his hands on the duplicate control column ready to help the pilot. But with the initial surprise over, Martin Tracey needed no assistance.

He slammed the throttle wide open and headed straight into the heart of the blizzard trying to gain enough height to fly over the storm. But, as he climbed, another hazard presented itself. A great cloud of snow, forming up with the wind, blotted out the sky ahead of the aircraft.

Snow clogged the screen wipers, forced its way through the windows and doors and made the conditions three times as dangerous as they had been. Tracey flipped the heater switch to force the full output of the cabin heater on to the Perspex screen and cut in the de-icer jets. The screen began to clear, but it did not help a great deal as the dense blanket of snow completely hid the ground. Tracey Martin was flying on instruments—safe enough, but not comfortable under these conditions.

Return to base

'Let's get back,' he shouted to Digger Ames. Digger grinned agreement, worked over his chart for a minute, then passed a slip of paper with a course written on it.

'This is going to be fun,' grunted Tracey. 'We're going on the reciprocal and turning in this gale is not going to be easy.'

It was a powerful understatement. The turn would have to be made on as wide a circle as possible and, because of the gale, any banking would have to be kept to the absolute minimum or the force of the wind would flip a wing up and the whole aircraft would quite probably go completely out of control.

Tracey eased the rudder-bar a little—just enough for the Beechcraft to respond without skidding. More throttle, a little more rudder . . . coming round nicely . . . more than 20 degrees of the turn had been made. Then suddenly, the engine misfired. Just one quick cough and it picked up immediately, but even such a momentary hesitation made the aircraft buck as the wind took over for a split-second.

Control was regained instantly and as Tracey continued the turn, Digger Ames anxiously checked the instruments. The manifold depression gauge was flickering intermittently. From 18 inches it flew back to 14 inches and back again to the proper reading. Digger stared at it for several seconds, then turned to Martin.

'Trouble, mate,' he announced. 'It looks as though the air intakes are choking up. I reckon the snow might be doing it. If it is, we've got the choice between the engine running too rich or the snow melting and fouling the fuel supply. Either way, we'll have to land.'

Martin Tracey stared at him and

whistled. 'Land, eh?' he asked. 'That's asking a lot, Digger. If I try to land upwind and the engine goes, we'll flip backwards. If we land downwind, the gale will push us all over the place as the speed drops. Add to this the fact that I cannot see more than a few feet in front at any time . . .'

Even as he was talking, he had made up his mind—to land downwind. And land quickly, too, because the engine had coughed again and once more the Beechcraft shuddered violently. Tracey kicked the rudder-bar hard over and the aircraft skidded hard round till its tail was in the wind. The air-speed rose as the 'plane was pushed along by the tearing gale. Tracey pushed the throttle wide open and eased the control column forward to lose height.

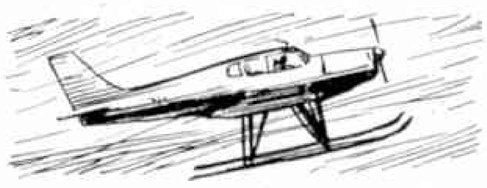
A place to land!

The altimeter could not be relied on completely at very low altitudes, so both men peered anxiously through the screen and windows to get a glimpse of the ground. Then, in a sudden clear patch, Digger gave a yell, 'I can see the deck —straight there—look!' He pointed violently and Tracey nodded.

Throttle closed, stick back a little and there was the snow-covered ground rushing up. The skis on the Beechcraft bit clumsily into the snow and the aircraft skidded wildly over the surface as the gale buffeted it along. Although they were slithering badly, they were at least on the ground—and only just in time, because the engine was now misfiring badly.

'Anchor out, Digger,' rapped Tracey suddenly. Digger nodded and slid a side-window open and threw out an anchor on the end of a nylon rope. The flukes of the anchor bit into the snow behind the Beechcraft and the braking effect was immediately apparent. Slowly, ever so slowly, the aircraft's wild sliding settled down to a steady course, while the speed dropped till, after a few minutes, it stopped completely.

'Phew,' gasped Digger. 'That was close.'



'Well, Digger,' said Martin. 'Here we are and here we stop until the blizzard dies down. Then we either fix the engine or radio for help. But right now, we certainly can't fix the engine and I don't suppose you can get anything out on the set.'

He was right, of course. To go out in that appalling wind and snow was asking for certain death and the transmitter in the aircraft needed a long aerial thrown out which was again impossible until the blizzard had blown itself out.

The two men settled down to wait. For half-an-hour they chatted, then Martin Tracey sat bolt upright. 'Digger,' he rasped, 'it's getting cold in here.' Even as he spoke, he noticed a fine film of ice settling over the inside of the screen.

'You're right, mate,' replied Digger. 'There's no heater now the engine has stopped. See if the motor will start and idle enough to get the heater working again.'

Martin Tracey jabbed the starter switch and the big propeller ground slowly round, fired, missed, fired again and then just went on groaning round.

'No good,' said Martin. 'It won't work at all. Look, Digger, we will have to keep warm or we might freeze to death. I'm not kidding.' He took Digger's hands in his and the two men pumped their arms backwards and forwards until the violent exercise brought the warmth back to their chilled limbs.

For all the effort, they found the chill spreading back within moments of stopping the arm-pumping and Martin Tracey began to grow seriously alarmed. The danger of the cold was very real and even more dangerous was tiredness. If they dozed off, they could literally never wake up . . .

The two men carried on their arm-pumping for ten minutes on and off for an hour, then Digger protested. He was tired, he complained, and Martin had to agree. But it was a bad sign. Once they became tired, they might want to doze and that could be dangerous.

The blizzard stops

Martin voiced his thoughts to Digger and, while he was speaking, he realised Digger was no longer listening. He was scrubbing the ice off the Perspex and looking wildly out.

'Martin,' he shouted, 'the snow has almost stopped and I think the wind's dropping, too.'

Tracey slid a side window open and looked out. Digger was right. The blizzard was blowing itself out at last. The relief was so great that the two felt warmer immediately and the tiredness vanished.

After another half-an-hour, the snow had stopped completely and the gale had dropped to no more than a keen wind.

'O.K., Digger,' said Martin Tracey, 'let's wind the aerial out and you contact base while I have a look at the engine.'

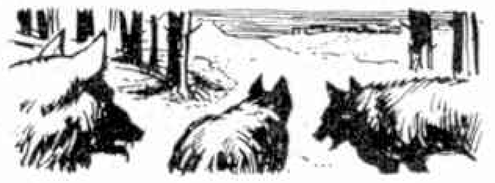
Digger Ames slid his door open, pulled out a telescopic aluminium rod from under his seat and jumped down into the snow. He slogged through the snow for fifty yards or so, opened the rod right up, hooked the end of the aerial to it and jammed one end in the snow.

With the aerial about fifteen feet high, Digger returned to the Beechcraft and switched the set on. A horrid thought struck him . . . perhaps the battery had been run down when Martin tried to sart the engine. But there was plenty of power left and, after a couple of minutes, he had contacted the base. A few crisp sentences explained the situation and gave their position.

Base took it in their stride. Call back in half-an-hour and if the engine was still out of action, a rescue aircraft would come out for them. About three hours.

Digger climbed out of the 'plane again and went round to the front where Martin Tracey was checking the engine.

'You were right, Digger,' he scowled. 'The air intakes are chock-a-block full of snow. It's got past the filters somehow and I'll bet there is half a ton inside the carburetters. We won't start this crate in a month of Sundays.' He slammed the engine hatch down and climbed down the ladder.



'Not to worry, Martin,' grinned the exuberant Digger. 'I'll call base again and they'll have another kite out here in two or three hours.' He stared at Tracey who was standing with his head on one side obviously paying no attention. Then Digger realised what he was doing and why. He heard the eerie howl of the wolf, the Canadian timber wolf and, as he heard the blood-chilling noise, he saw six . . . a dozen . . . twenty dots on the skyline. There was a pack of wolves and they running straight towards the Beechcraft.

Both men scrambled back into the 'plane and watched. The wolves loped towards the aircraft at the tireless, steady run they can maintain for hours on end and, when they were fifty yards away, they stopped and began to pace restlessly up and down. The timber-wolf is a frightening creature, often compared with an Alsatian dog, but there is little resemblance. The wolf is much bigger, a different colour, has much shaggier hair and a different head. There is a vague resemblance physically, but the vicious, dangerous wolf bears no relationship at all to the intelligent Alsatian dog.

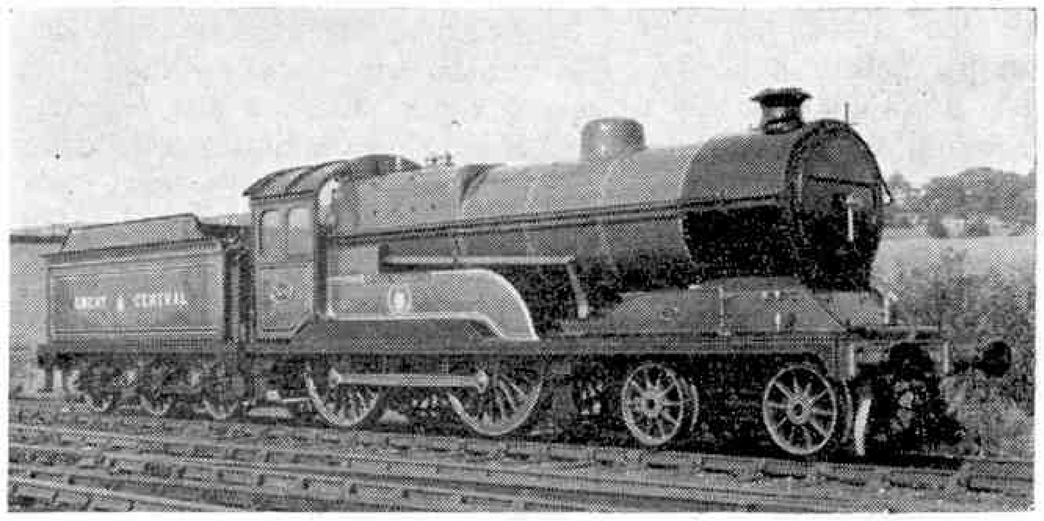
The sight of the wolves moving round the aircraft brought a chill to Digger's heart. They were quite safe inside the 'plane, but they had three hours to wait and the tension would be mounting with those creatures outside. And there was the cold. The brief spell of activity outside the aircraft showed the only way to keep warm was to be moving and the deadly chill of the Canadian winter was growing as the day become older.

He was broken out of his miserable circle of thought by the sight of Martin Tracey leaning out of the side window. For a second, Digger wondered if the other man had lost his reason, then a vicious whip-crack made him jump. Martin had taken the rifle from the rack and was firing at the wolves.

One animal jumped in the air as the slug smacked into him. Digger's eyes

Continued on page 32

Spend a day in the past



It's all change at Clapham if you'd like to travel back in time. Because, here, at the Museum of British Transport—you can see history on wheels. Such giants of yesterday as 'Butler Henderson'—shown above—which once held iron sway over the old Great Central tracks. Vehicles, too, of lesser pedigree . . . bone-shaking horse buses—trams which screeched like raucous birds. And, there are aristocratic things—sumptuous saloons created for Queens—a railway Director's mother-of-pearl pass. Even grim relics—notices threatening stone throwers with transportation.

Yes, a visit to this exhibition is a fascinating experience—a marvellous idea for a Saturday or at Easter.

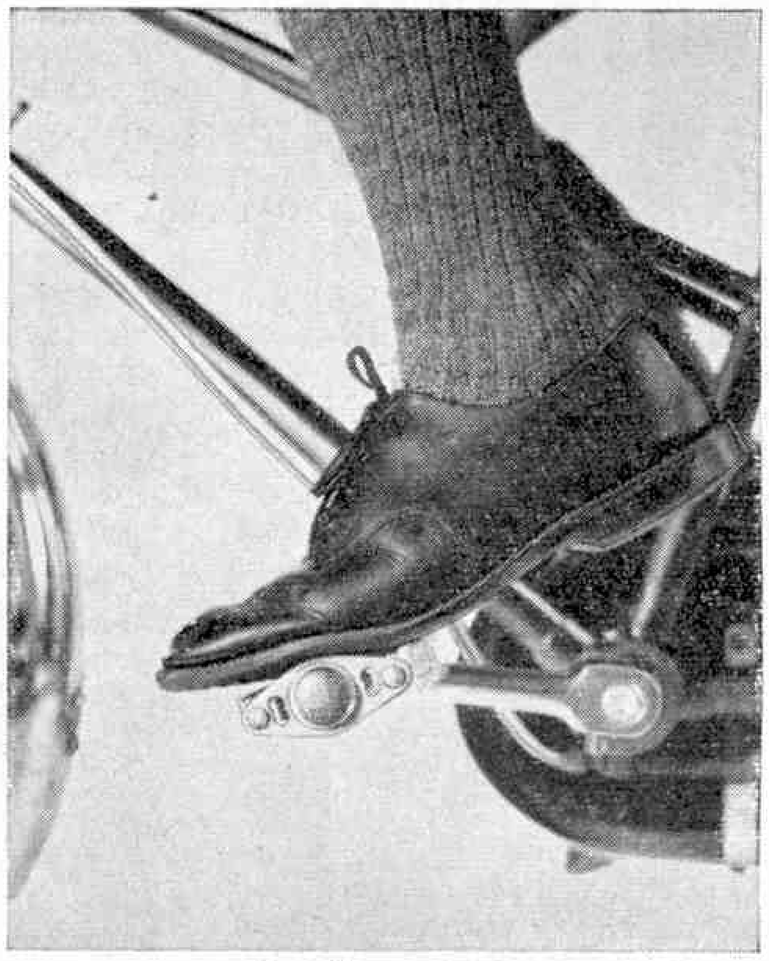
It's open 10.00—17.30 Mondays to Saturdays (including Easter Monday but NOT Good Friday)

It costs 1s 6d for boys and girls under 15 years; 2s 6d for adults. Reductions for school parties.

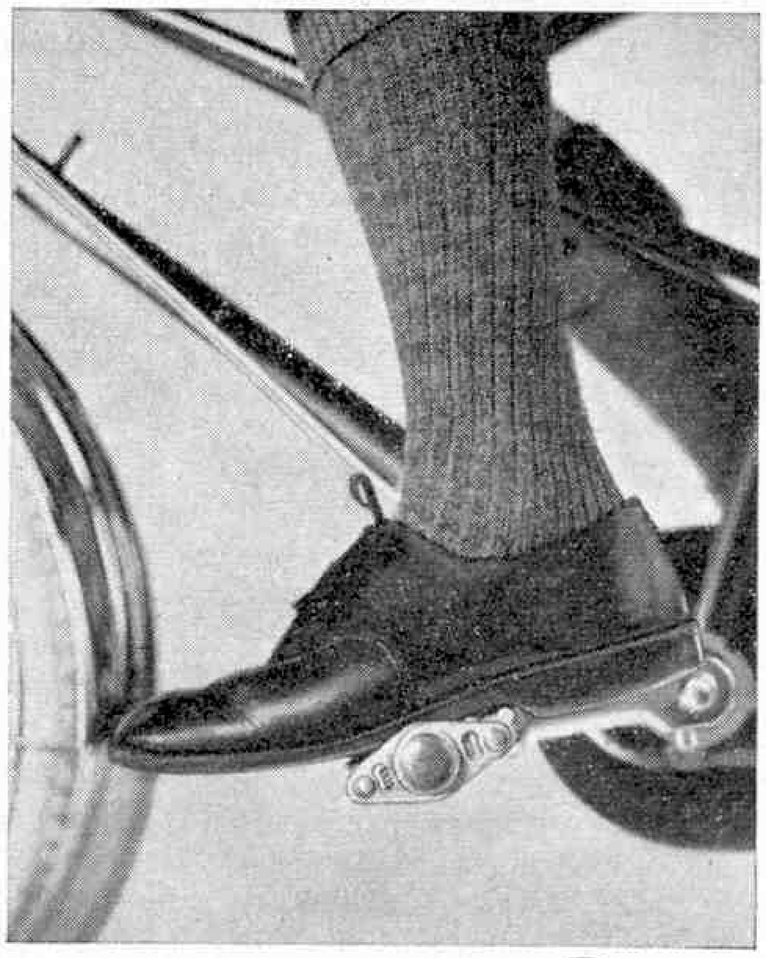
It's easy to get to: *By Underground:* Northern line to Clapham Common. *By Bus:* 35, 37, 45, 88, 118, 137, 155, 181, 189 and *by Green Line:* 711, 712, 713, to Clapham Common station *or by British Rail:* Clapham (South London Line), Clapham Junction, or Balham, then by bus.

Visit also: The Railway Museum, York.
The Great Western Railway Museum, Swindon.

Museum of British Transport
Clapham High Street, London, SW4



right . . .



or wrong?

If you've entered for the National Cycling Proficiency Test, you'll know that the lower picture shows a wrong method of pedalling—dangerously wrong. The cyclist is not in full control, and risks catching his toe behind the front wheel when cornering. The top picture shows the correct method—ball of the foot on the pedal, feet parallel, and a steady, 'ankling' action.

Published in the interests of safe cycling by the makers of the world's **safest** *tyres.*

DUNLOP

Have you a problem—in science, history, literature or any other subject—to which you cannot find the answer?

Ask Tom Sheridan and he will do his best to answer it. If he cannot, and he thinks one of our readers might be able to help, he will print your query in this feature. Questions should be sent on postcards bearing your full name and address (but these will not be published if you put them in brackets and just add your initials or a pen name). Address them to Tom Sheridan, *Meccano Magazine*, Thomas Skinner and Co. (Publishers) Ltd., St Alphage House, Fore Street, London, E.C.2.

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

Long-service sleuth

Q. *When was the first Sexton Blake story published and who wrote it ?—'New Fan,' Morden, Surrey.*

A. The popular detective, whose adventures have been resumed in pocket-book form, made his bow in 1893 in 'The Missing Millionaire'—wearing elastic-sided boots and carrying a walking-stick. First boys' paper to feature him was *The Marvel;* later he appeared in the *Union Jack, Detective Weekly* and *Sexton Blake Library.* More than 500 million copies of his recorded exploits have been sold, in several languages. Among the writers who kept him going in earlier years were Edgar Wallace, Peter Cheyney and John Creasey. Biggest contributor was George Hamilton Teed, with 299 stories; another was Edwy Searles Brooks, well-known for his *Nelson Lee* stories.

First thirteen

Q. *Which of the first* 13 *American states were founded by the British ?—S. K., Edgbaston, Birmingham.*

A. Of the first 13 provinces, English emigrants colonised Virginia (1607), Massachusetts (1620). New Hampshire (1623), Connecticut (1633), Maryland (1636), Rhode Island (1663), North and South Carolina (1670), Pennsylvania (1681), and Georgia (1732). New York (1618) was founded by Dutch, Delaware (1626) by Swedish, and New Jersey (1670) by both Dutch and Swedish settlers.

Density and S.G.

Q. *What is density and what is specific gravity ?—Peter Dunbar, Middlesbrough.*

A. Density is the amount of mass or matter in a unit of volume of any substance and is usually expressed in grams per cubic centimetre (c.c.). The unit of density for solids and liquids is that of distilled water. Specific gravity (S.G.) is the relative weight of a body compared to the weight of an equal volume of water, at a temperature of 4 deg. Centigrade, which is that of its maximum density. In the case of gases, air or hydrogen are used as standards. In the metric system, the numbers expressing specific gravity and density are conveniently the same, or related by the power of 10, but in the British system this is not the case. What you must remember is that S.G. is a *ratio*, which is stated as a number, density is stated as mass per given volume.

Pennies worth pounds

Q. *Is it true that a* 1953 *penny is valuable ? —Peter Barnett, Solihull, Warks.*

A. Yes; it was Coronation Year and nearly all those minted are in collections. Pennies minted in 1950-51 are also scarce, and there are none in circulation for the years 1923-24-25, 1933, 1941-42-43, 1952, and all the years from 1954 to 1960. A 1950 penny in perfect condition will fetch £1, and a mint 1933 penny is so highly prized that it can change hands at £350. For further details, see the 1965 *Standard Catalogue of British Coins* issued by B. A. Seaby Ltd., 65 Great Portland Street, London, W.1, who buy and sell rare coins.

For butterfly breeders

Q. *I want to start breeding butterflies this summer. Where can I purchase eggs ?—David Gregory, Market Drayton, Salop.*

A. The Butterfly Farm, 41 Salisbury Road, Bexley, Kent, or Worldwide Butterflies, Charmouth, Dorset, should be able to help you. And we have to thank several readers who offered to help reader K. Ralph, Barrow-in-Furness, in his quest for stick insects, which may be obtained from the Southern Hamster Club, whose secretary is Mr. F. Middleton, 16 Brook Road, Loughton, Essex.

Strong pullers

Q. *What is the most powerful railway engine in the world ?—G. M., Bo'ness, West Lothian.*

A. The world's most powerful *steam* engines, reckoned in tractive effort, are the class Y6b 2-8-8-2 locos built at the Roanoke shops of the Norfolk and Western Railroad in Virginia, U.S.A. With an overall length of 114 ft. 10½ in. (including tender), and weighing 442 tons, they have a tractive force of 152,206 lbs. But, because of the number of multiple-unit driving axles that may be controlled by a single crew, the steam locomotive is fast giving place to the diesel-electric in the race for more pulling power. Whereas a typical 4-8-8-4 steam loco such as the Union Pacific 500-tonner of 7,500 h.p. gives a tractive effort of 135,000 lbs., a 6,000 h.p. four-unit diesel-electric can produce 230,000 lbs. of tractive force.

Extended meal

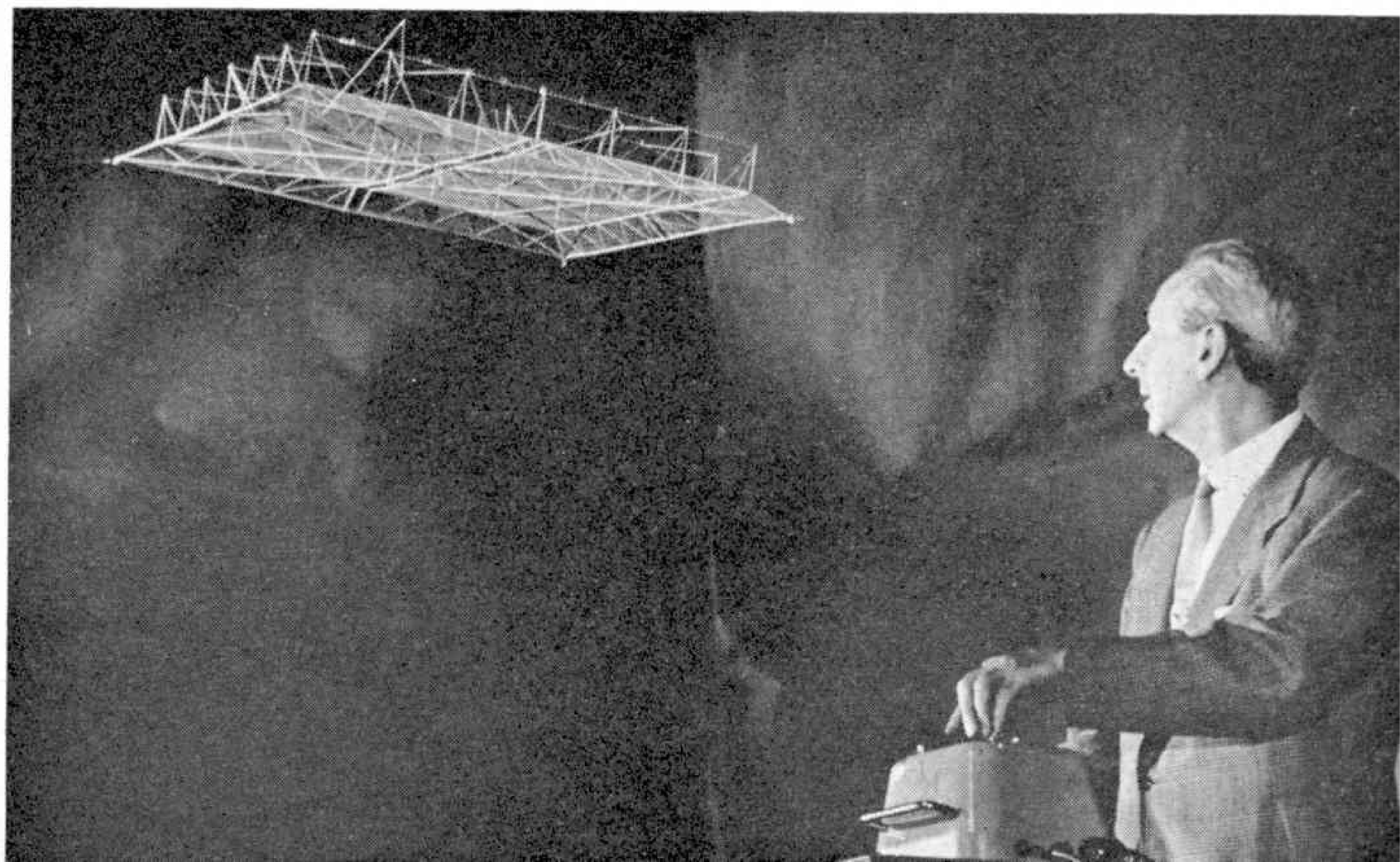
Q. *Who holds the world's record for eating sausages ?—'Fat Boy,' Redditch, Worcs.*

A. Richard Shelton, an undergraduate of St. Andrews' University, Scotland. On April 16 last year he ate 162½ ins.of sausage in less than a quarter of an hour, breaking the previous record of 92 ins.

The Ionocraft

Q. *What can you tell me about a new type of aircraft which is powered by ions ? 'Futurist,' Runcorn, Cheshire.*

A. Major Alexander de Seversky, the veteran American aviator, has been working for several years on a new kind of soundless aircraft with no moving parts. It is powered by an ionic engine, which emits a stream of electrically charged particles, generated by high voltage potential, to give continuous thrust. Such a craft—foreseen by science-fiction—could travel at several hundred miles an hour and operate 60 miles up. It might also be used as a communications relay platform. In the picture, the 70-year-old inventor demonstrates the vertical take-off and hovering abilities of a model 'Ionocraft'. (*See photograph below*)



by **Jerry Ames**

Grand-Prix Champions

Jack Brabham was World Motor Racing Champion in 1959 and 1960 using Coventry Climax engines.

The curtain drops on Coventry Climax racing

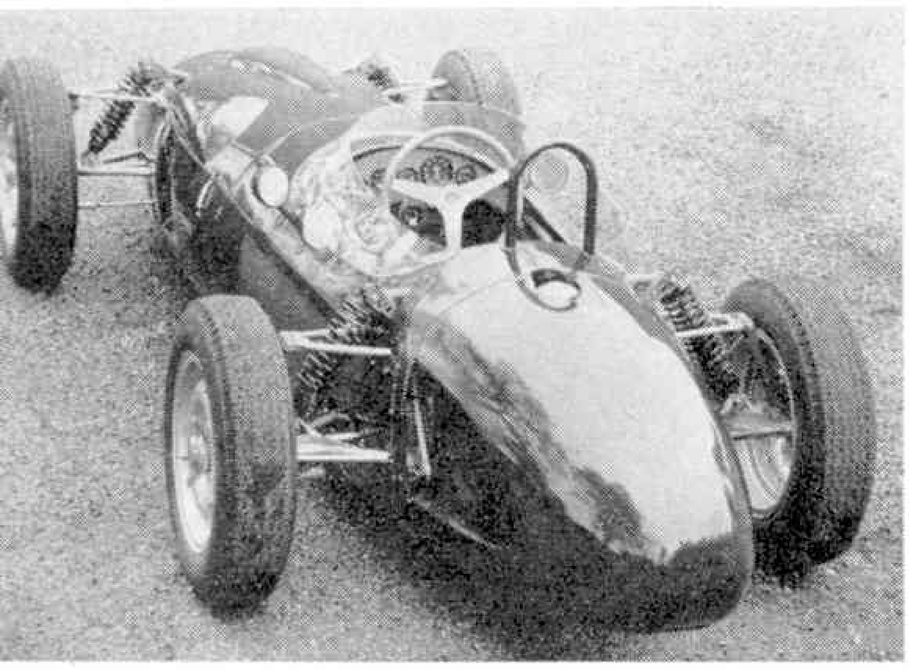
BRITISH cars and engines have been far more successful in Formula One Grand Prix racing during the past seven years than those of any other nation. But the future is not quite so bright, for Coventry-Climax have decided to pull out of racing, leaving BRM as the sole upholder of British prestige as far as engines are concerned.

Before the curtain drops on Coventry-Climax remarkable competition achievements, the firm will have produced its most exciting engine of all, a brand-new and, as yet untried, flat 16-cylinder Grand Prix power unit. This has been especially designed for the closing stages of the present 1½ litre unblown Formula, ending on December 31st this year.

Coventry-Climax engineers told me that although the overall length of the "16" is only 1½ inches more than last seasons' V-8, it will be producing approximately 225 break-horse-power and given time, might be expected to develop about 240 b.h.p. Whether this will be possible during its short six or seven months racing life is hard to say.

Only four of the new, 16-cylinder engines will be built, one each will be supplied to Cooper, Lotus and Brabham, the fourth is to be retained by Coventry-Climax as a spare. The power comes in at 8,000 r.p.m. and reaches its maximum at 12,000 r.p.m. so it will obviously show up to advantage on circuits where lap speeds are in excess of 100 miles-an-hour.

It is hoped to give at least one engine its first try-out under racing conditions in the Daily Express Trophy Race at Silverstone on May 15th, where it might well set up a new lap record. But, the main object will be to eliminate any possible faults in good time before the Belgium Grand Prix, held one month later over the fast Spa circuit. Here the race average is more than 130 m.p.h. Other races where the new power unit might be expected to do well are the British Grand Prix and also the Italian Grand Prix over the fast Monza circuit.



Guinea pig for 1966 BRM? This four-wheel drive Ferguson could be the forerunner of the new 3-litre class being developed this year for next season's Grands Prix. . .

Flat-16 specification

The new flat-16 has two banks of eight cylinders, horizontally opposed with two of the cylinders firing at the same time. Bore and stroke of each cylinder is 54.10 by 40.64 mm, to give a capacity of 1,500 c.c. Drive for the camshafts and main auxiliaries such as ignition, is through a train of gears from the centre of the 10 bearing crankshaft. This method was first used by Alfa Romeo and Bugatti more than 30 years ago. The Coventry-Climax engine will use Lucas fuel injection and twin eight-cylinder transistorised ignition systems. The Vee-shaped eight-cylinder engines will also be used during 1965 and these now develop a little over 210 b.h.p. However, cars with the flat "16" units could have an even lower overall height than last year's machines to give better streamlining.

The cost of racing

A major reason that has led to the withdrawal of Coventry-Climax from Formula One racing is the enormous development cost of building three-litre unblown engines for the new 1966 Formula. At the moment, current V-8 engines are sold to Grand Prix constructors at £5,000 each, but Coventry-Climax say that they are still losing money at this price. For 1966 requirements, engine costs may well go up by as much as 50 per cent. Then, however good new 3 litre engines might prove to be, they could easily be priced well beyond practical limits for constructors like Brabham, Cooper and Lotus.

With the additional cost of four-wheel drive, expected to feature on most cars under the new Formula, Jack Brabham has already hinted that, unless he can buy more

economical power units, he may drop out of Formula One racing in 1966. Meanwhile, although John Cooper proposes to use the new 3-litre, 16-cylinder BRM engine now under development, he is of the opinion that both Cooper and Lotus may only enter one car in each Grand Prix. So it looks as if BRM will be the only British firm able to run a full team against overseas opposition in 1966. Therefore, the prospects of British teams gaining World Championships after this season, are bound to be lessened.

Meanwhile, what of Coventry-Climax, now a part of the Jaguar organisation ? They have several new production engines under developmen., plus others for Daimler and Jaguar, as well as full order books for their fork lift trucks and smaller engines for industrial purposes. Thus without racing commitments, they will now have more time to devote to their main object of designing and building production engines.

The Coventry-Climax story

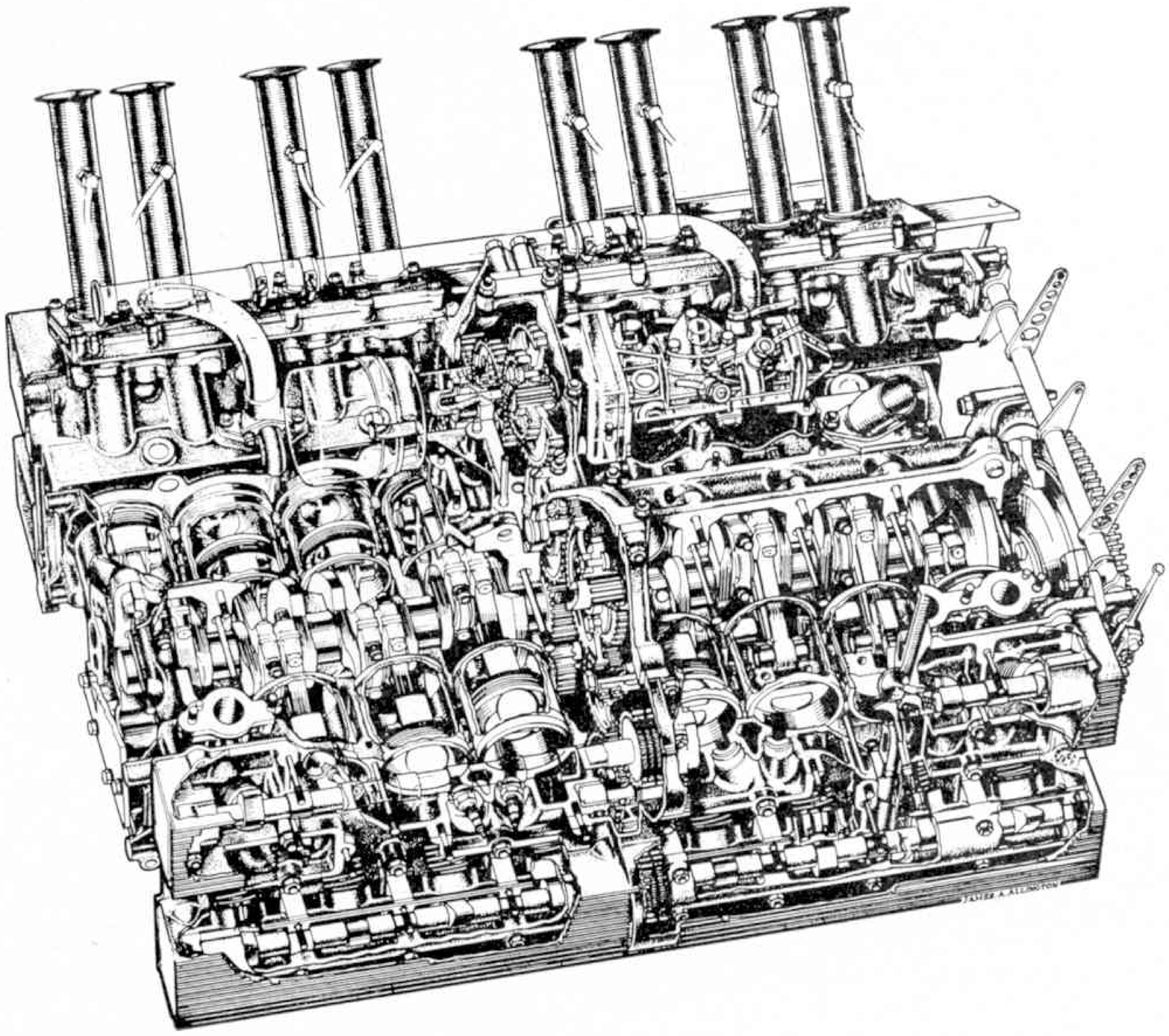
Coventry-Climax is Britain's oldest firm of specialist engine builders, founded in 1903 by H. Pelham Lee, father of the present Chairman. Until 1917, their engines were known as Coventry-Simplex and were used to power a variety of motor cars, also the snow tractors of Sir Ernest Shackleton's 1914 Trans-Arctic expedition.

A 1400 c.c. Coventry-Simplex side-valve engine was used in the very first experimental Aston Martin, fitted to a small Isotta-Frachini chassis in 1914. The car being developed and going into production only after the Kaiser War. Coventry-Climax engines were also fitted to a number of British touring cars from 1921 onwards including Clyno, AJS, Crossley, Triumph and at a later date, to Marendez Special and Vale Special sports cars.

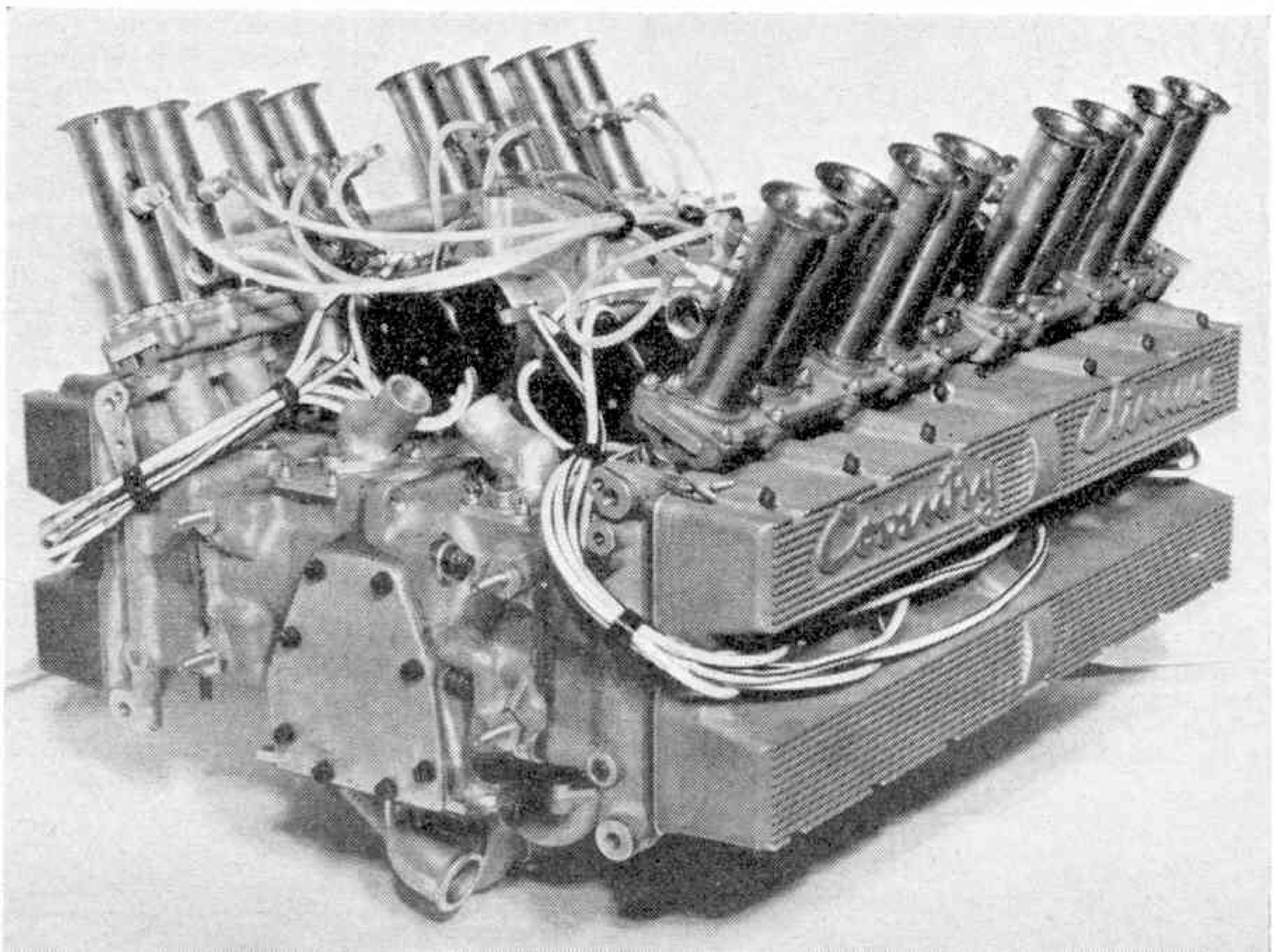
The first racing engine of 1022 c.c. was running in April 1951 and shortly afterwards bored out to 1097 c.c. Richard Steed was the first to fit a Coventry-Climax engine to a Lotus and within a few years, twin overhead camshaft 1½ litre racing engines were scoring many wins. This led John Cooper to stretch its capacity first to 2 litres and then to 2·2 litres and by 1959, Coventry-Climax came up with their first pukka Grand Prix engine of 2½ litres. With this engine developing 239 b.h.p., Jack Brabham, in a works Cooper, won the World Championships of 1959 and 1960.

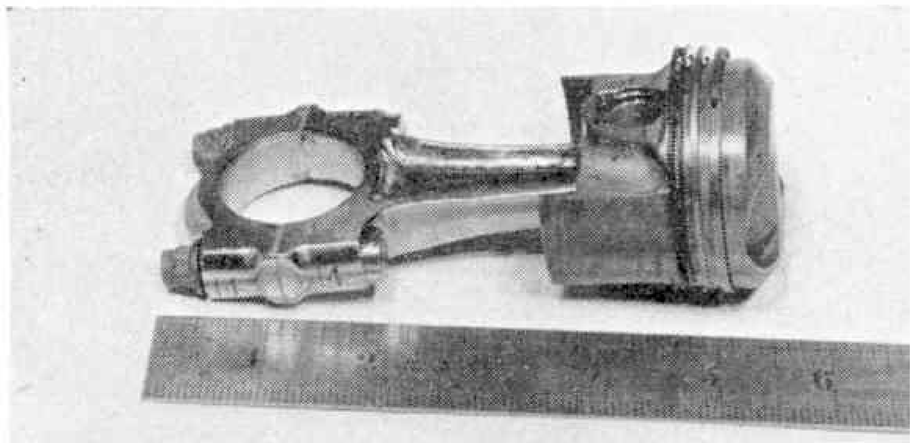
For 1962, Coventry-Climax backed the racing teams with 1½ litre V-8 engines and with this power unit in his 1963 Lotus, Jim Clark won seven out of ten major Grands Prix, to become World Champion, gaining Coventry-Climax the Ferodo Gold Trophy.

Since 1958, Coventry-Climax engines have helped to win three World Championships for drivers and constructors, 34 victories in World Championship events and 86 wins in International Formula One races—a record unparalleled by any other power unit in the world. For 1965 the prospects look equally promising, even if there remains a dark cloud of doubt on the horizon when 1966 dawns.



A sectionalised illustration showing the complexity of the 16-cylinder Coventry Climax racing engine, probably the last!





Small, short stroke pistons are needed to obtain the fantastically high operating speeds of the present-day racing engines. This unit is made to operate at 12,000 revolutions-per-minute.

On the left: The flat 16-cylinder, 1½ litre Coventry Climax racing motor which will power this year's Grand Prix racing cars. However, only three units will actually be raced in Cooper, Lotus and Brabham.

Members of the Roding Boys' Society—Science and Amateur Radio

SHORT WAVE LISTENING

by **F. C. Judd, A.Inst.E.**

MANY who take up short-wave listening as a hobby eventually become licenced radio amateurs, although listening to the thousands of radio stations dotted about all over the world is, in itself, a fascinating and absorbing pastime. Short-wave listening can be divided into two distinct classes (1) listening to and logging the broadcast short wave stations of foreign countries and (2) listening to the radio amateur transmitting stations, which are to to be found in almost every country.

The short wave's are divided into 'bands', a particular band being allocated to each service whether it be amateur radio, broadcasting stations, ships or police. You will find, for example, that the short wave broadcasters are mainly to be found in little groups around 49, 41, 31, 19 and 16 metres, whilst the amateur bands are located on 160, 80, 40, 20 and 10 metres.

When you use a short-wave receiver, always tune slowly and carefully around the bands because, owing to the very sharp tuning, it is quite easy to miss a rare and interesting station. You may have to listen patiently for a while in order to identify a particular station, especially foreign broadcasters, who can usually be identified by their 'signature tunes' or 'interval signals' or announcements in English. The World Radio Handbook is very useful in this respect as it lists practically all the short wave broadcast stations, their identification sounds and call signs.

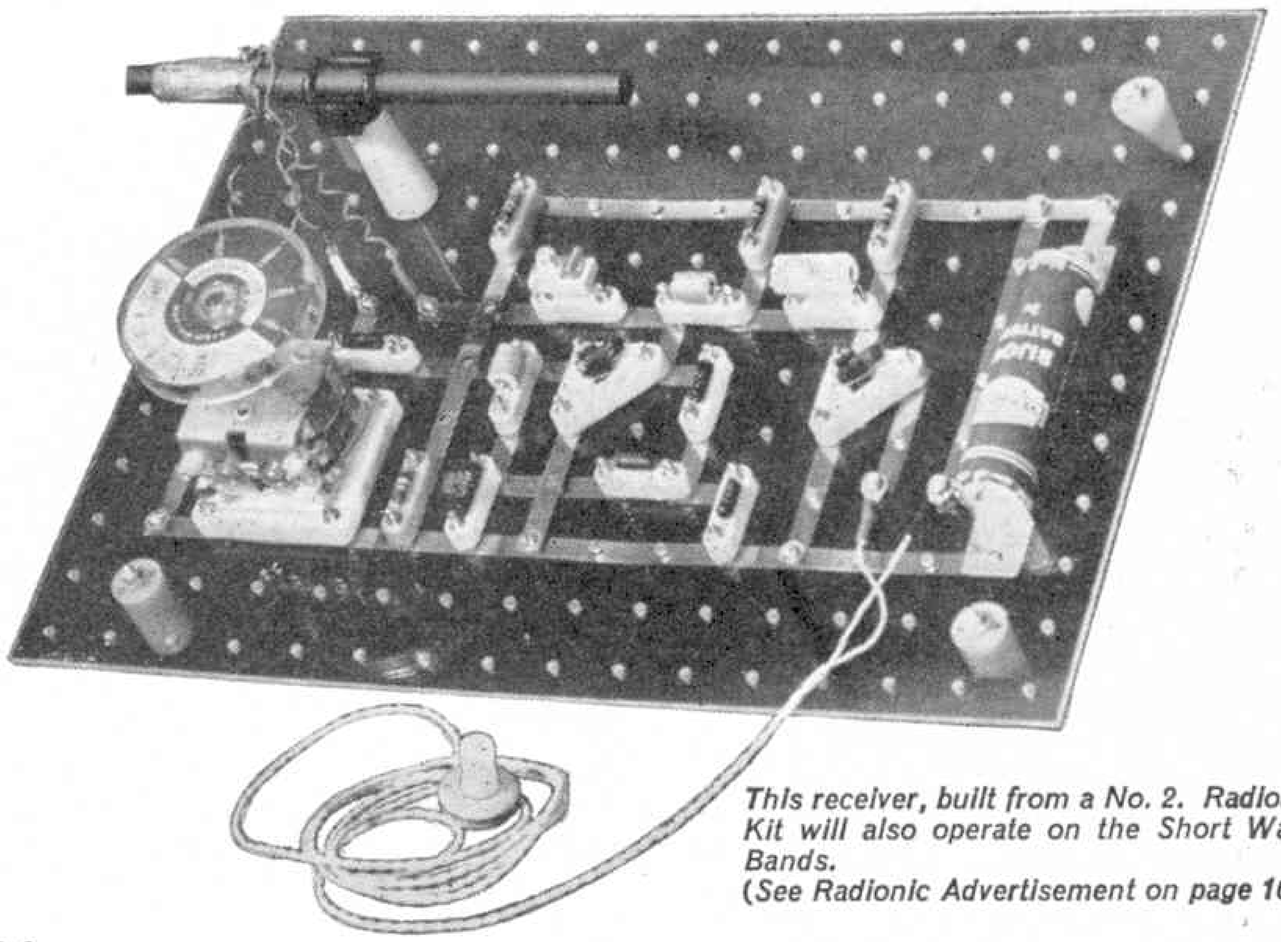
Most broadcasters welcome reports on reception and in return send a card confirming the report. These cards are frequently used by radio amateurs as well and are known as 'QSL' cards. QSL being an international code (from the "Q" code) and means "I confirm receipt of your message". Collecting QSL cards is quite interesting too, for many of the cards have highly original designs relating to the station.

Reporting your contact

Most short wave broadcast stations have special programmes in English, details of which can usually be obtained by writing to the stations concerned. Listening to and logging the amateur radio stations is even more rewarding, especially when they happen to be in what is generally called a "rare country". This means that the transmitter concerned may only operate for a short period, so the chance of even hearing it is fairly remote.

Most amateur radio stations welcome reports and will send you a QSL card in return, but be sure your report is a sensible and useful one. Don't just tell the station (broadcast or amateur) that you heard it on your short wave radio. If you are a very great distance from it, your report may be valuable, but do give accurate details as to the time and date etc., your exact location and if you base your report on the following, you will have a better chance of collecting a QSL card.

1. Call sign of the station you are reporting to.
2. Your name and address (ISWL or RSGB number if you are a member).
3. Type of receiver and aerial you use.
4. Weather conditions.
5. General conditions on the band you were listening on i.e., lively (lots of stations being received) or quiet (only one or two other stations receivable).
6. If an amateur station, give call sign of any other stations in the contact.
7. Date and time (B.S.T. or G.M.T.).



This receiver, built from a No. 2. Radionic Kit will also operate on the Short Wave Bands.
(See Radionic Advertisement on page 16.)

I.S.W.L. Short Wave Listening Certificates
H.A.S. (Heard all states—U.S.A.)
H.A.C. (Heard all Continents)

8. Signal strength and details of modulation (clearness of speech) etc.
9. If signal was fading (QSB).
10. Frequency or at least the waveband or wavelength.

If you join the Radio Society of Great Britain or the International Shortwave League, you can obtain special reporting forms and send these out too. You can also use the QSL Bureau's of these organisations who sort and send your cards to the correct addresses and collect, sort and send incoming cards for you. Both the organisations have competitions in short wave reception and many attractive certificates can be won.

If you decide to become an ardent short wave listener, it is worth while joining the R.S.G.B. or I.S.W.L., who not only provide a QSL Bureau but also issue a monthly magazine with up to date news of amateur radio and short wave listening activity.

The Radio Clubs must not be forgotten because these cater especially for the short wave listener and also the radio amateur. Regular meetings, a club magazine, lectures and demonstrations are usually provided for all members and some clubs have their own transmitters and call signs. Most of the clubs also arrange courses in radio and morse code for the amateur licence examination but more about this later.

Short-wave radio receivers

Early short-wave receivers were bulky affairs using large coils and, of course, they employed radio valves which required sizeable high tension batteries. One of these, built in about 1925 is shown on the right.

Nowadays, we have special communication receivers which cover all the short-wave bands (right) and although these are widely used by professional and amateur radio services, they are nevertheless very costly. How then can one get started on short wave listening without spending a good deal of money? The modern counterpart of the short-wave receiver pictured here can be built easily from basic components, but better still from one of the 'radio kits' which are now available.

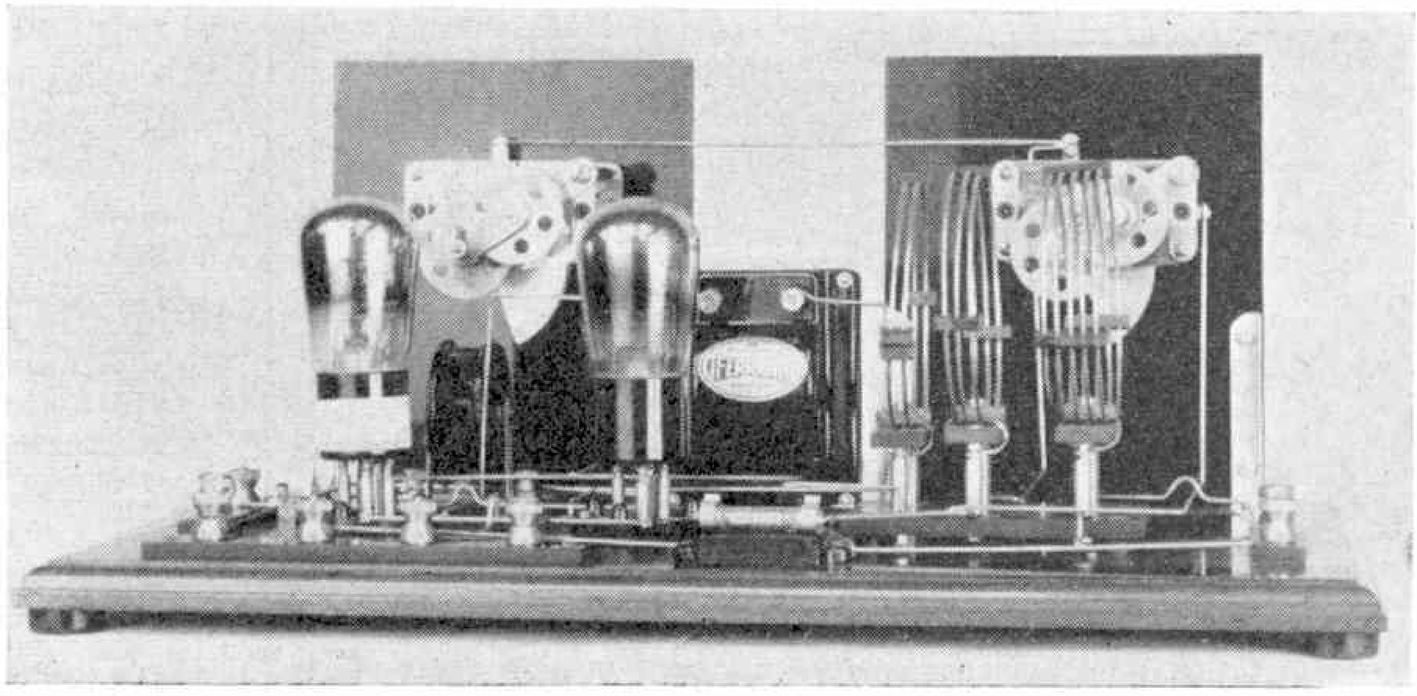
One of these is kit No. 2 by **Radionic** which will build 20 or more different radio receivers. Most of these are for medium or longwave reception, but circuit No. 20, for instance, can be made to operate on the more interesting short-wave bands.

The circuits built up from these kits require no soldering because all the components and transistors etc., simply bolt on to a special board. The components are connected by brass strips and when finished a complete receiver looks like the one shown on the left. With each kit you get circuit cards and connecting plans, booklets on construction and use and details for making coils to cover short waves; plus, of course, all the necessary components and transistors.

Finally, here are details of where to get more information about short-wave listening.

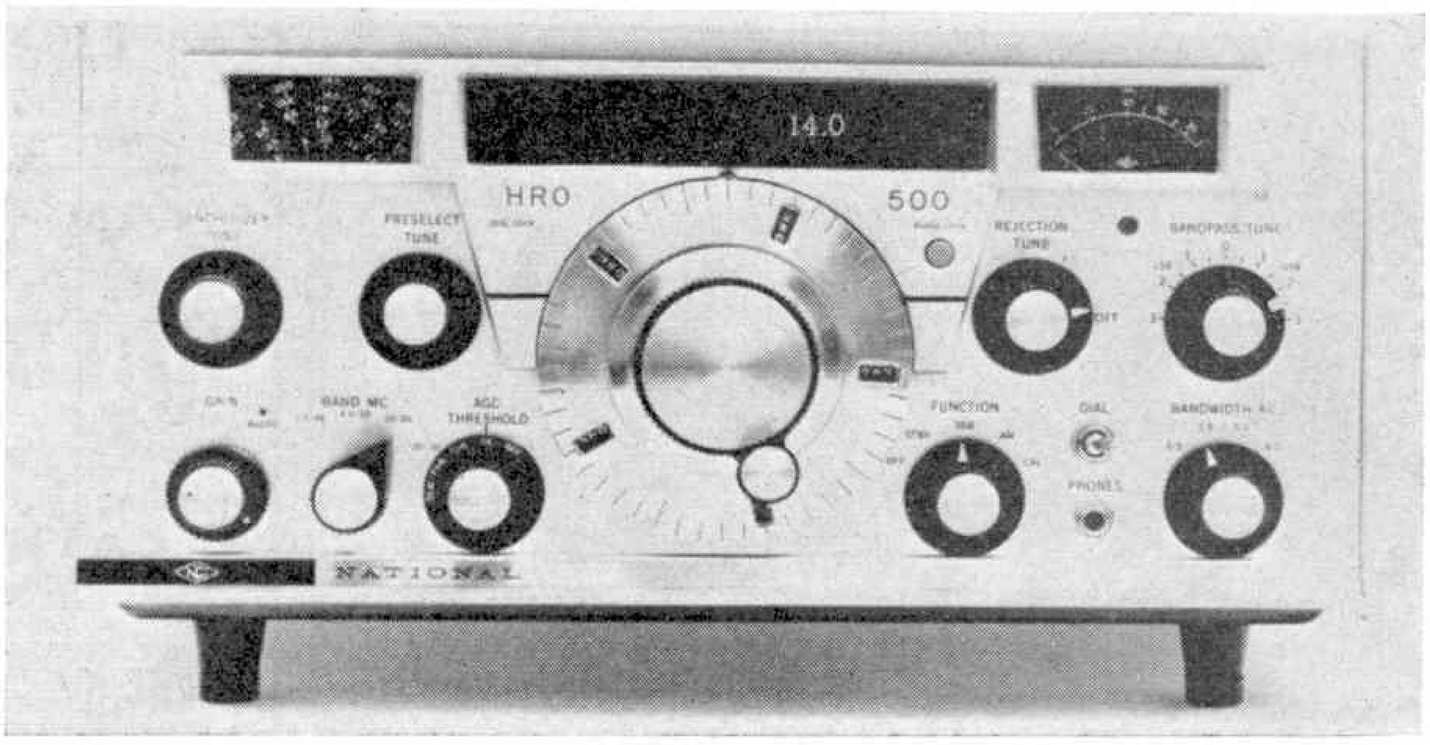
1. Radio Society of Great Britain (leaflets and booklets) free.
   28, Little Russell Street, London, W.C.1.
2. The International Shortwave League (leaflets about membership) free
   19, Gladwell Road, London, N.8.
3. The Radio Amateur Operators Handbook (price 5s.)
   (Data Publications, 57, Maida Vale, London, W.9)
   Contains amateur prefixes, codes, charts, maps etc.

The two societies mentioned above will be pleased to send you details about membership if you write to them. Meantime, to be a good short-wave listener, you should be able to read Morse code and if you learn it now you may find it valuable later if you decide to go in for Amateur Radio transmitting. This subject I will deal with later and next month will be introducing electronic musical instruments such as the electric organ and electric guitar.



Above: A two-valve short wave receiver, 1925. (Photo Science Museum).

Below: A modern communications receiver showing the contrast old and new.



Codes used in amateur and short-wave listening

The 'Q' Code

The "Q" Code used by amateurs is largely the same as the official "Q" Code used by commercial services. Some of the following symbols are used exclusively in amateur work, and we list the abbreviations in more common use among the amateur fraternity.

QRA	Location (address)
QRB	Distance (miles)
QRG	Frequency (kcs)
QRH	Frequency varies
QRJ	Weak signals
QRK	Signal strength
QRL	Busy
QRM	Radio interference
QRN	Atmospheric interference (static)
QRO	High Power
QRP	Low power
QRQ	Send faster
QRS	Send slower
QRT	Close down
QRU	Nothing further
QRX	Wait
QSB	Fading
QSL	Verification (of reception)
QSO	Contact
QSP	Pass on (message)
QSV	Series of V's
QSX	Listen for
QSY	Change frequency
QSZ	Double sending
QTH	Position (longitude, latitude, or town)
QTR	Exact time

N.A.T.O. Services Telephony

A — Alpha	N — November
B — Bravo	O — Oscar
C — Charlie	P — Papa
D — Delta	Q — Quebec
E — Echo	R — Romeo
F — Foxtrot	S — Sierra
G — Golf	T — Tango
H — Hotel	U — Uniform
I — India	V — Victor
J — Juliet	W — Whisky
K — Kilo	X — X-ray
L — Lima	Y — Yankee
M — Mike	Z — Zulu

The RST System

Readability

1. Unreadable
2. Barely readable, occasional works distinguishable
3. Readable with considerable difficulty
4. Readable with practically no difficulty
5. Perfectly readable

Signal Strength

1. Faint, signals barely perceptible
2. Very weak signals
3. Weak signals
4. Fair signals
5. Fairly good signals
6. Good signals
7. Moderately strong signals
9. Strong signals
8. Extremely strong signals

Tone

1. Extremely rough hissing note
2. Very rough AC note, no trace of musicality
3. Rough, low-pitched AC note, slightly musical
4. Rather rough AC note, moderately musical
5. Musically modulated note
6. Modulated note, slight trace of whistle
7. Near DC note, smooth ripple
8. Good DC note just a trace of ripple
9. Purest DC note

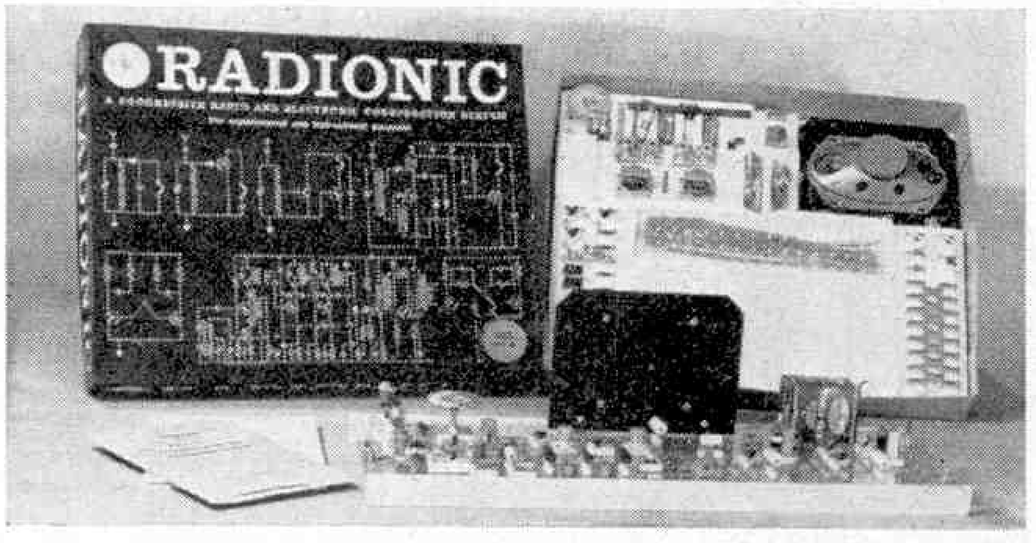
(If the note appears to be crystal-controlled add an "X" after the appropriate number. If the note is chirpy add a "c" after the tone number, i.e. 579c.)

Example: A signal that is perfectly readable, moderately strong, and with the purest DC note (with crystal characteristics) woul be reported as RST 579x.

(Courtesy of Data Publications Ltd.)
Amateur Radio Operators Handbook

RADIONIC

THE UNIQUE AND BRILLIANTLY SIMPLE RADIO AND ELECTRONIC CONSTRUCTION SYSTEM



A No. 4 Set and Six Transistor Superhet

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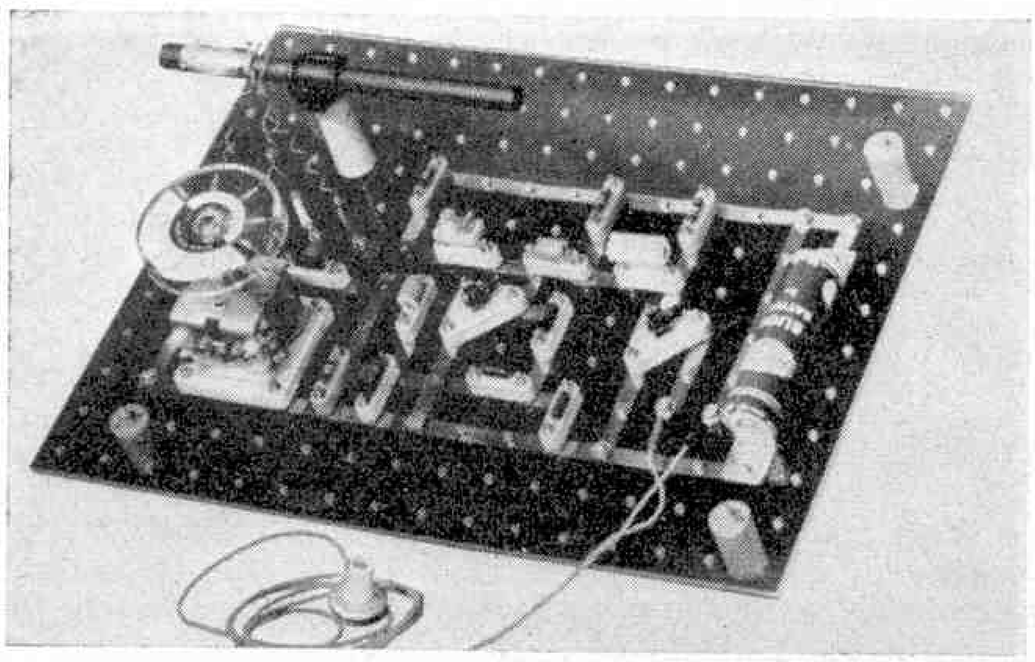
The quality is high, which is why hundreds of educational establishments—Universities, Schools, Technical Colleges, the Armed Forces—already use Radionic for instruction. Radionic has been selected for display in all the British Design Centres and features in many Sound and Television broadcasts.



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No. 2 Set £6 - 19 - 6d. 20 Circuits (Earphone)
No. 3 Set £10 - 19 - 6d. 22 Circuits (7" × 4" Loudspeaker output)
No. 4 Set £14 - 19 - 6d. 26 Circuits (include 6 Transistor and reflex superhets)

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- BASIC COMPUTER CIRCUIT
- BASIC RADIO RECEIVER
- MORSE CODE OSCILLATOR, ETC., ETC.

Send for Free Brochure to: RADIOSTRUCTOR, Dept. K20, Reading, Berks.

A GUIDE TO AMATEUR RADIO

TENTH EDITION

BY PAT HAWKER, G3VA

An 80 page RSGB publication designed to assist the newcomer to learn more about the hobby and how to obtain a transmitting licence. It also contains details of essential pieces of radio equipment and describes in fairly simple language basically how it works.

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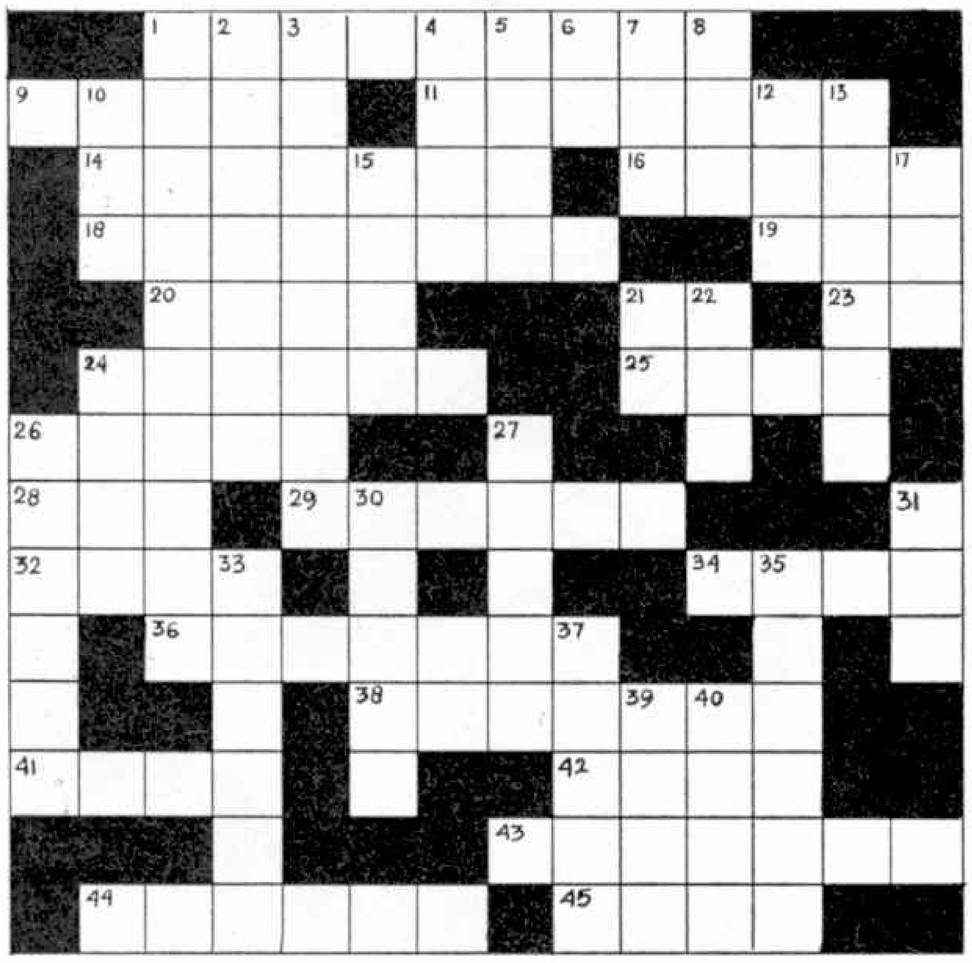
Information on how to become a member of the RSGB, plus a free copy of the monthly journal, the RSGB *Bulletin*, may be obtained from:

RADIO SOCIETY OF GREAT BRITAIN Dept. M.M.
28 LITTLE RUSSELL STREET, LONDON, W.C.1 HOLBORN 7373

Puzzle Page

Turn to page 36 for answers to the puzzles on this page

Crossword Puzzle No. 6



Across

1 Made with oranges
9 Part of theatre
11 Ailment
14 Sneer
16 To destroy
18 Sensible
19 Biblical name
20 Pastime
21 Not down
23 One
24 To hate
25 Half
26 Females
28 Monkey
29 Strong beat!
32 Canvas home
34 Manner
36 Light knocking
38 To confide
41 Lessen
42 Native of N. Africa
43 Supports the mast
44 Female relative
45 Requirement

Down

1 Administration
2 Stir up
3 Army term
4 Eastern port
5 Italian money
6 Like
7 Atmospheric moisture
8 Good for listening
10 Fast plane in initial stage
12 Observe
13 Creamy cake
15 Departs
17 Relatives
21 We
22 Animal friend
24 Drug
26 Popular Australian flower
27 A colouring substance
30 Aspires
31 Poem
33 Thin candles
35 To make a higher offer
37 Corn
39 Impel
40 A herb

Tricky Teasers

Good companions here, or most of them are! All the people or things in each of these four groups have something in common, *except one*, in each case. Can you spot the odd men out?

(1) Sink, Cupboard, Chair, Table, Sideboard, Wardrobe, Dresser, Couch, Carpet.
(2) Portia, Falstaff, Brutus, Bottom, Hathaway, Desdemona, Malvolio.
(3) Cricket, Billiards, Archery, Hockey, Croquet, Bowls, Tennis, Soccer.
(4) Orange, Pear, Apple, Strawberry, Plum, Cherry, Damson, Blackcurrant.

● ● ● ●

If you like mathematical teasers, here's one: A goods' train and a passenger train pass each other in 10 seconds when going opposite ways, or in 90 seconds if the fast train is overtaking the other. As the slow train is three times as long as the express (whose speed is 50 m.p.h.) find the length of the express.

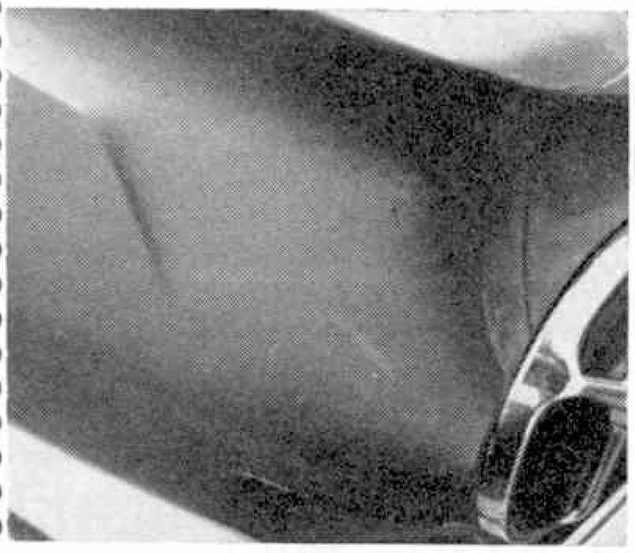
● ● ● ●

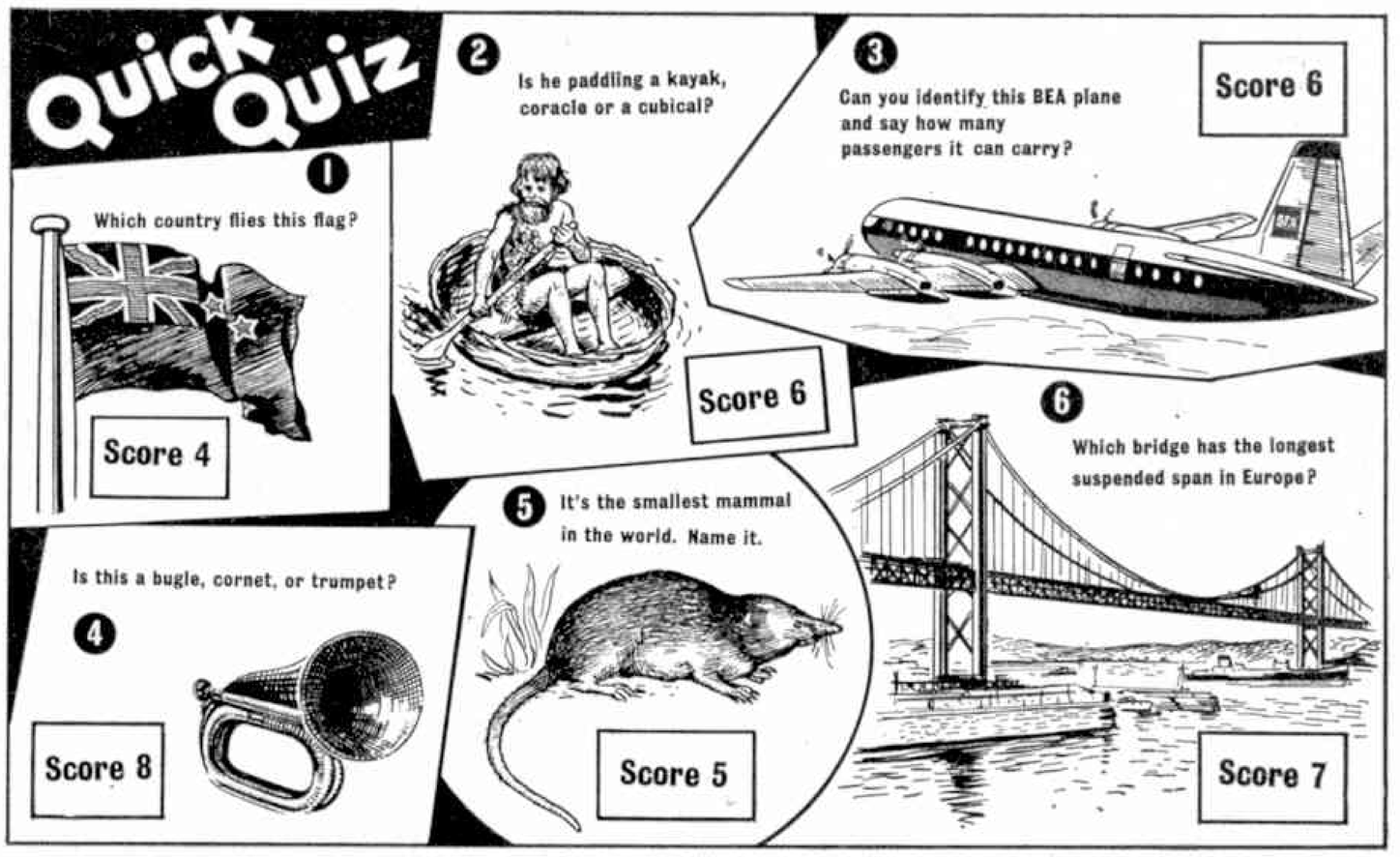
'Why, of course—anyone can put arithmetical signs between the numbers 987654321, in that order, so that the total is 100,' said Cliff, when asked to do so by Terry.

'All right, then,' said Terry, 'do it with one minus sign and three plus signs only.' Cliff was stumped. Are you?

Car Quiz No. 7.

What is the name and model of this popular British family saloon, which was acclaimed the motor car of the year?





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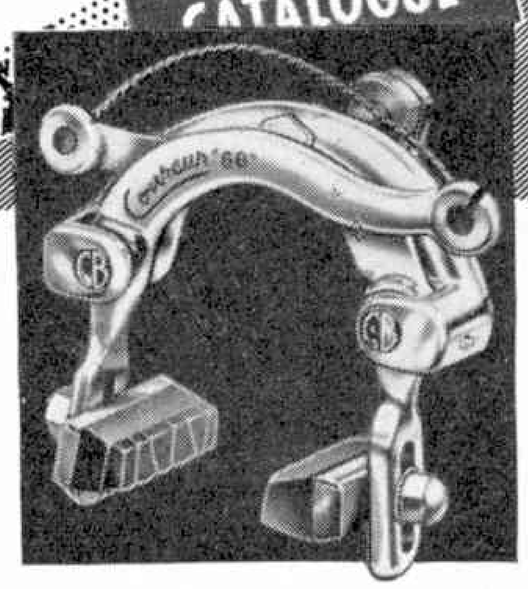

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Your Spring Overhaul

THE sunshine and showers of April bring out more than the flowers, they also bring out the cyclists and what a sad sight their bikes make! Whether they have been ridden all Winter in dreadful weather conditions or smeared all over with grease and stowed in the garden shed, a Spring overhaul is necessary.

To do the job properly, you will have to completely dismantle the bike. Make sure, at the outset, that you have all the necessary tools—plenty of spanners to fit all the nuts, a good screwdriver, tyre levers, a hammer and punch for the cotter pins, cone spanners for the wheels and a special big spanner or adjustable for the head nut and the bottom bracket. In addition, you will need an assortment of tins for the bits and pieces, plenty of rag, some oil, a can of grease and plenty of paraffin.

Start by taking off the saddle and seat pillar together. Take off the brakes at the pivot points and then the handlebars, extension and brakes can all be lifted off as one. To loosen the handlebar extension, unscrew the expander bolt a couple of turns and then tap it down with a small hammer. This will release the internal expander and the extension can be lifted clear of the head tube.

Take off the chain by undoing the spring clip and put it straight into a tin filled with paraffin. Take off the cranks and chainwheel for cleaning and lubricating. Take the wheels out of the frame and, to do a really thorough job, it is also advisable to take off the mudguards.

The larger jobs of dismantling the headset and the bottom bracket can now be tackled, the balls and races being put into separate tins and covered with paraffin. Treat the wheel hubs and the pedals in the same way.

Cleaning under way

Start cleaning operations by using a stiff brush to clean the mud from the inside of the mudguards. The celluloid type can afterwards be washed in warm water and detergent. The alloy type are best restored to a bright finish with the aid of wire wool and metal polish.

Accumulated mud can be washed off the frame with warm water and the thick grease which sometimes accumulates around the bottom of the frame tackled with paraffin. Use fresh paraffin to clean inside the bottom bracket and to clean off all the old grease and dirt from the head races.

All the small parts in their paraffin baths can be cleaned up and dried, still keeping them all separate. The chain is best tackled with paraffin and a toothbrush then, when clean, hung up to dry.

Use paraffin again on all the chrome parts —cranks, chainring, hubs, rims and perhaps handlebars and extension. Hard rubbing will usually cope successfully with all the traces of rust, but if not, gentle application of wire wool will get rid of it.

Pump up the inner tubes and hang them in a corner to test for punctures. Check round the tyres for embedded flints and treat any cuts and gashes with rubber stopping. Take the brakes to pieces and clean them up.

Now everything can be examined for wear. Inspect all the ball bearings for any signs of pitting and look for the same thing in all the ball cups and races. Wheel and pedal cones should be carefully checked in the same way. Always replace if doubtful.

On the brakes, the items which will probably need replacement are the brake blocks and perhaps the cables. In any case, grease the brake cables before replacing them in their outer covers. Examine the teeth of the chainring and rear sprocket carefully for wear. This will be denoted by "hooking". Check that all the three or five pins are present in the chain wheel.

Wear in the chain will be apparent, if it can be stretched to any marked degree lengthways or if it can be bent in a small radius curve sideways, denoting play between rollers and end plates. If the chain is satisfactory, immerse it in a bath of warm grease, ready for replacement on the bike.

Start reassembly with head races and the bottom bracket. Make sure each cup has its correct complement of balls, set in clean grease. Adjust the left hand bottom bracket cup until the spindle can be turned in the fingers without any tight spots being felt and at the same time there should be no end play.

Wheel spindles must be put back in the hubs, again with balls set in clean grease and carefully adjusted. Make sure that the fixed cone, the one which screws right up to the stop on the spindle thread, is on on the right-hand side of the bike, facing forwards.

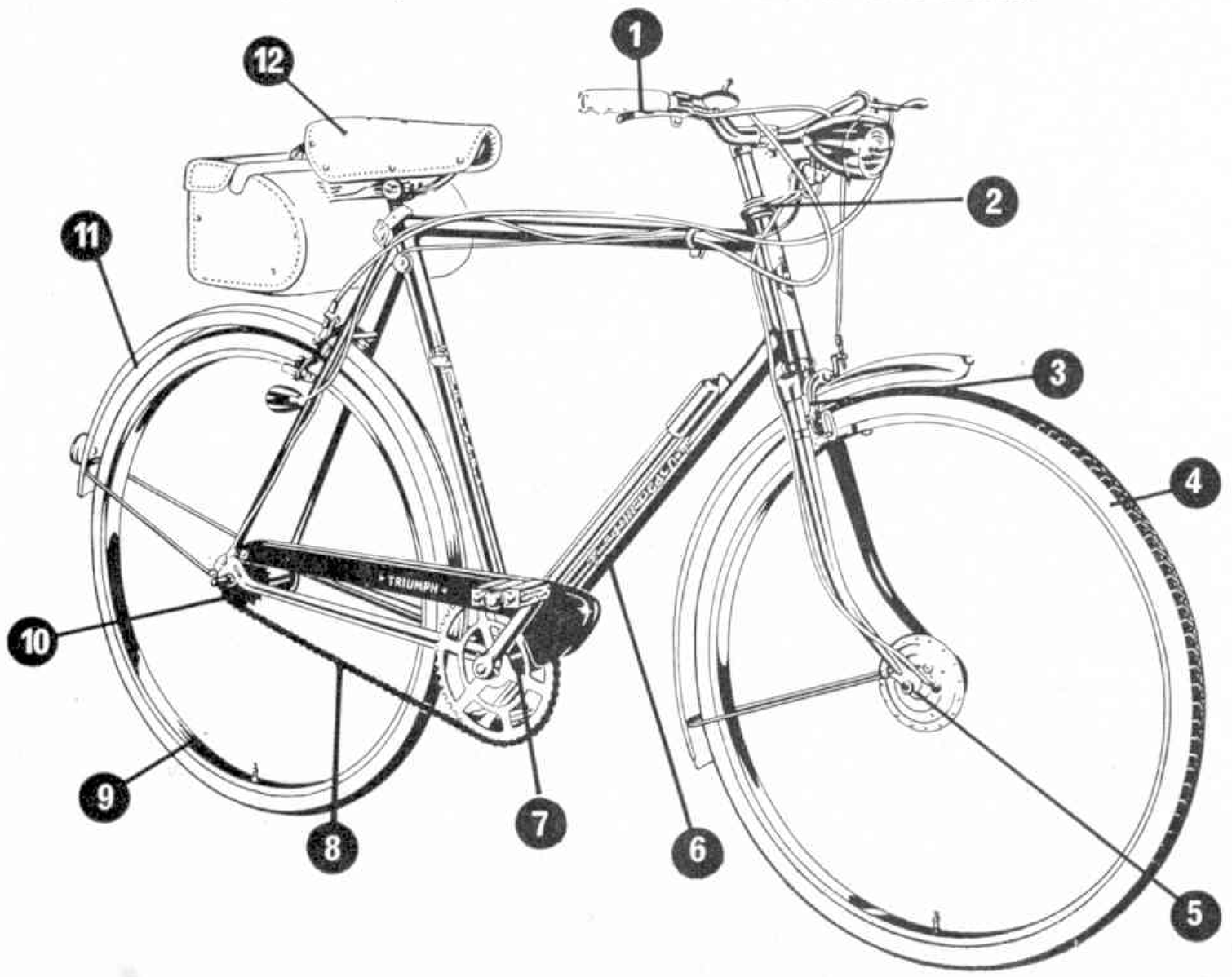
Before replacing the tyres and tubes, spin the wheels and check for any slight rim defects or missing or broken spokes. Use a spoke key to true them up, not forgetting to file off any protruding spoke ends. Replace the tyres and tubes, making sure that the rim tapes are properly installed first. Pump up the tyres and put the wheels back in the frame temporarily.

Now tackle the chainring and cranks. If the cotters were carefully extracted, you may not need new ones. If you do fit new cotters, make sure they are accurately filed to fit. The pedals can go back next—properly cleaned and adjusted.

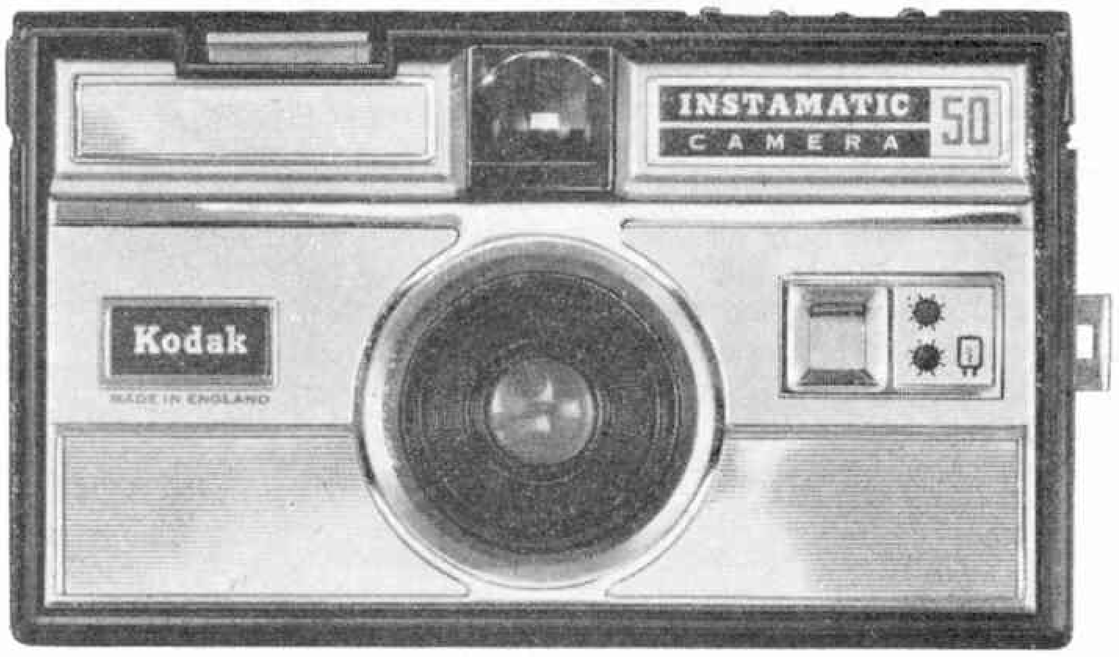
Loosening the wheels in the frame, if necessary, the mudguards can be replaced. Then, while the rear wheel is loose in the rear drop out, replace the chain. Remember, allow ¾ inch slack.

Saddle and pillar and handlebars and extension go back last, greasing them before they go into the frame. Finally, the brakes are carefully adjusted. Before taking the bike out on the road, methodically check every nut and bolt. A final clean and polish and you are ready for the Summer cycling season.

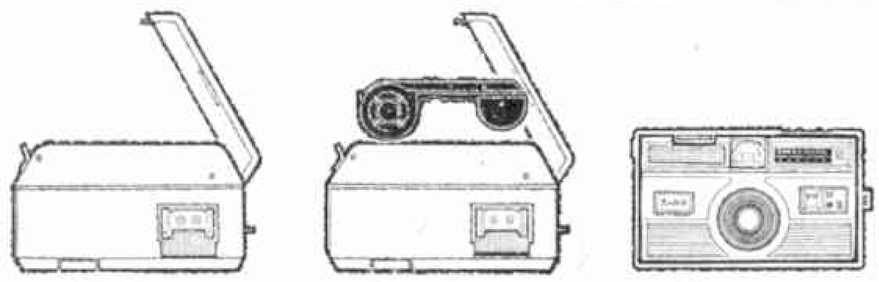
1, Check levers for smooth operation. Also, cables must not be frayed. 2, Dismantle head bearing for wear check and greasing. 3, Clean and grease brakes, renew blocks if worn. 4, Pick all flints from tyres. 5, Service front and rear wheel bearings. 6, Wash greasy frame with paraffin and then warm, soapy water. 7, Dismantle bottom bracket to grease and check for wear. 8, Take off chain to clean and soak in molten grease; check for wear. 9, Check wheels for loose spokes and buckling. 10, Gears should be checked for adjustment and sprockets for hooking. 11, Clean celluloid mudguards with water and detergent; alloy with metal polish. 12, Worn saddles should be renewed for comfort and safety.



THE FASTEST CAMERA IN TOWN



The Kodak Instamatic 50 camera. The camera with the famous cartridge load. Just open the back, drop in the film cartridge, snap shut, wind on and shoot. Easier and faster on the draw than any other camera, it takes perfect colour or black-and-white snaps. Also has flash contacts for indoor picture-taking. So round-up an Instamatic 50 camera. It's only £3.0.1.



To load: open the back

Drop in the cartridge

Snap shut. Wind on. Shoot!

KODAK KNOW ABOUT PHOTOGRAPHY

'Kodak' and 'Instamatic' are registered trade marks of Kodak Ltd

by **Paul Dong**

Photographic processing

MANY people know that film must be processed in the dark and how to load a film into a developing tank, but what about the actual processing ? The first essential of good processing is cleanliness, not just keeping the dirt and dust off your equipment and negatives, but chemical cleanliness. The film and paper is treated in two main solutions, the developer and fixer. Both of these chemicals are relatively harmless if kept separate, but developer mixed into the fixer will reduce its efficiency and fixer dropped in the developer will kill it completely.

Developer

Before using any developer, read the instructions and make sure that it is suitable for your film. The very fast film, i.e. Kodak Royal and Pan Ilford HPS, must be developed in the chemicals recommended on the film leaflet, otherwise they may be badly affected by chemical fogging.

Two of the factors which influence choice of developer are film speed and the grain of of the resultant negative. Fine grain films will only give good results if developed in fine grain developer, which often lowers the effective speed of the film. A different developer would improve the speed but at the same time increase grain effect.

There are developers on the market which are part way to perfection such as Microphen, which will give good film speed and relatively fine grain. By increasing the development time increased speed can be achieved but, as it is increased, so the grain suffers.

Grain

What is fine grain ? What is a normal negative ? The image on a roll of film is produced as follows. A sensitive emulsion of silver halides in gelatine is placed on film. When the exposed film is placed in the developer, the exposed grains of salt are converted into grains of silver, the unexposed grains being removed later in the fixer. The size of the grains is set in manufacture and cannot alter whatever happens during processing. However, some developers have the effect of making these grains club together, giving the effect of larger grain. Therefore, a fine grain developer is one which stops this lumping action.

A normal negative is one which will give a print on normal paper with the correct contrast. This print and, of course, the negative, should have detail in the shadows and the highlights (light areas). At the same time, there should be black and white in the right place on the print and negative, not just a range of muddy greys.

If we take the correct development time for the print or film, at a temperature of 68°F or 20°C, and increase this temperature, we will get a darker more contrasting result and the opposite for lower temperatures. So, if the temperature is not stated on the instruction leaflet, we have to alter the time to give us the correct result. This correction will allow us to process black and white film and paper at any temperature between 60 and 70°F.

Mixing the chemicals

When making-up the developer from the powder in the packet, the instructions should be closely followed. When two or more packets are involved, they must be completely dissolved in the correct order as the second or third packet usually contains a chemical which, once dissolved, will prevent any others from doing so.

Correctly dissolved developing-solutions will keep for a considerable length of time before they decompose, but one thing which will speed decomposition of any chemical is excess heat. Therefore, do not mix any chemical in water higher than 125°F. unless instructions read otherwise.

Fixer can be purchased either as a powder or a solution and should be dissolved according to the instructions supplied, keeping a strict eye on maximum temperature, which is much lower than those for mixing developers, usually 80°F.

Processing

As already mentioned, the developer temperature is very important, so before starting your processing, take the temperature and if below 60°F., stand the bottle in warm water. The fixer should also be heated to roughly the same temperature as the developer, using the same method. The temperature of the fixer is not critical, but if it is too cold, more than 5° below the developer, you may get cracks in the film's surface. The water used for rinsing the developer from the film should also be warmed.

The final washing water can be at normal temperature if the fixer contains hardener, as most mixtures do these days. The hardener is there to prevent cracks on the surface and other small damages to the negative. However, it only hardens slightly and the negative is still prone to scratches if badly handled.

Fixing your film

After the film has been in the fixer for five minutes, you can open the tank and have a look. It will probably still have a creamy appearance but this is caused by the unexposed and undeveloped grains of silver halide, which have to be cleared. The idea is to leave the film in the solution until it has cleared and then give a further five minutes. The whole fixing operation taking ten to fifteen minutes, depending on the state of the fixer and providing you make the correct strength.

The film is then washed in running cold water to remove all chemicals and hung up in a clean, dust-free place to dry. The water may leave small marks on the film where droplets form during drying, but this can be avoided by giving it a quick rinse in water containing three drops of wetting agent before hanging.

When the film is dry, it can be printed; processing the paper in a similar way but this time with a safelight on and in a dish. The same fixer can be used, but the developer should be one specially made for paper which takes about two minutes to penetrate as against six to twenty minutes for film developers.

There are several points to watch when handling undeveloped film or paper. Firstly, the fixer should be kept well away, otherwise splashes will give small clear areas where it touches the film. Therefore, wash the thermometer and your hands after touching any solution. Finally, wash your hands and dry them thoroughly before handling the film. The natural grease from the hands will form a barrier on the film and prevent the action of the developer.

These three prints were made from one negative on soft, normal and hard paper. A negative which has been slightly underdeveloped will give a soft print on normal paper and a negative overdeveloped a contrasting print. This can be corrected in printing by using hard for soft negative, soft for contrasting negative.

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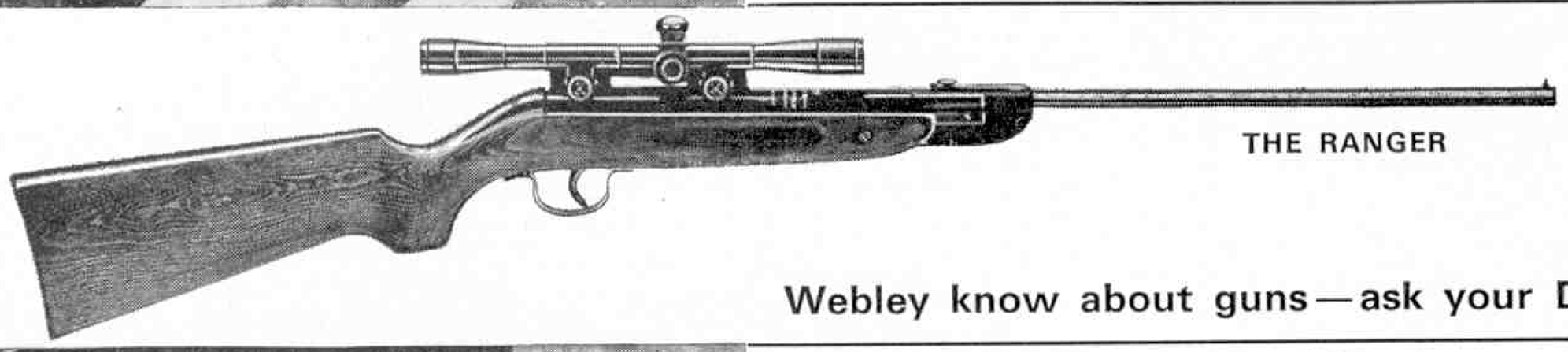

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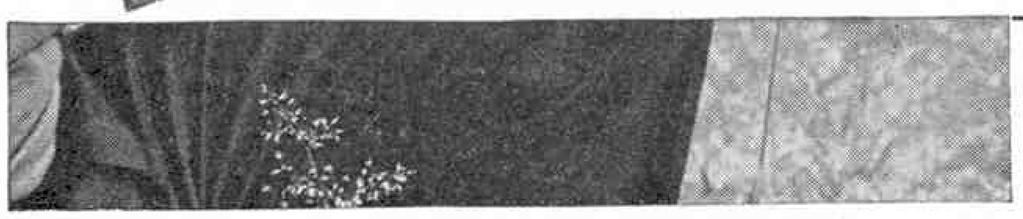

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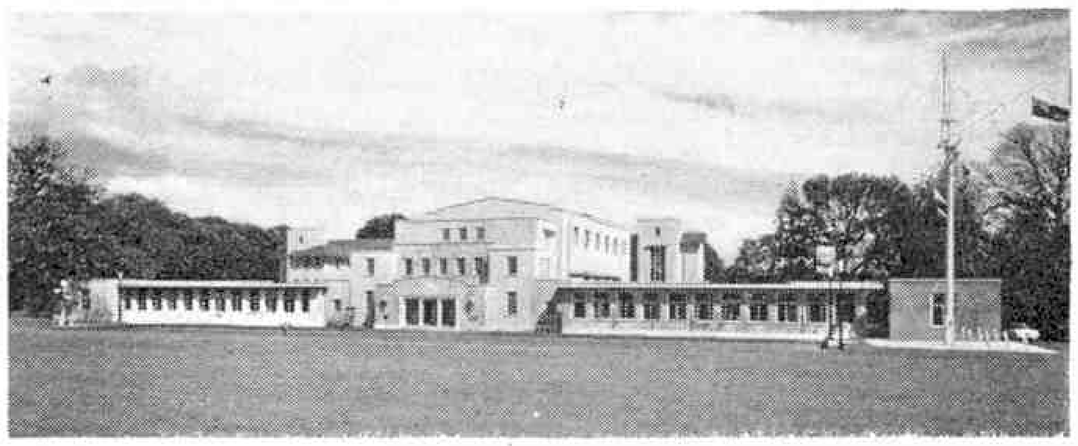

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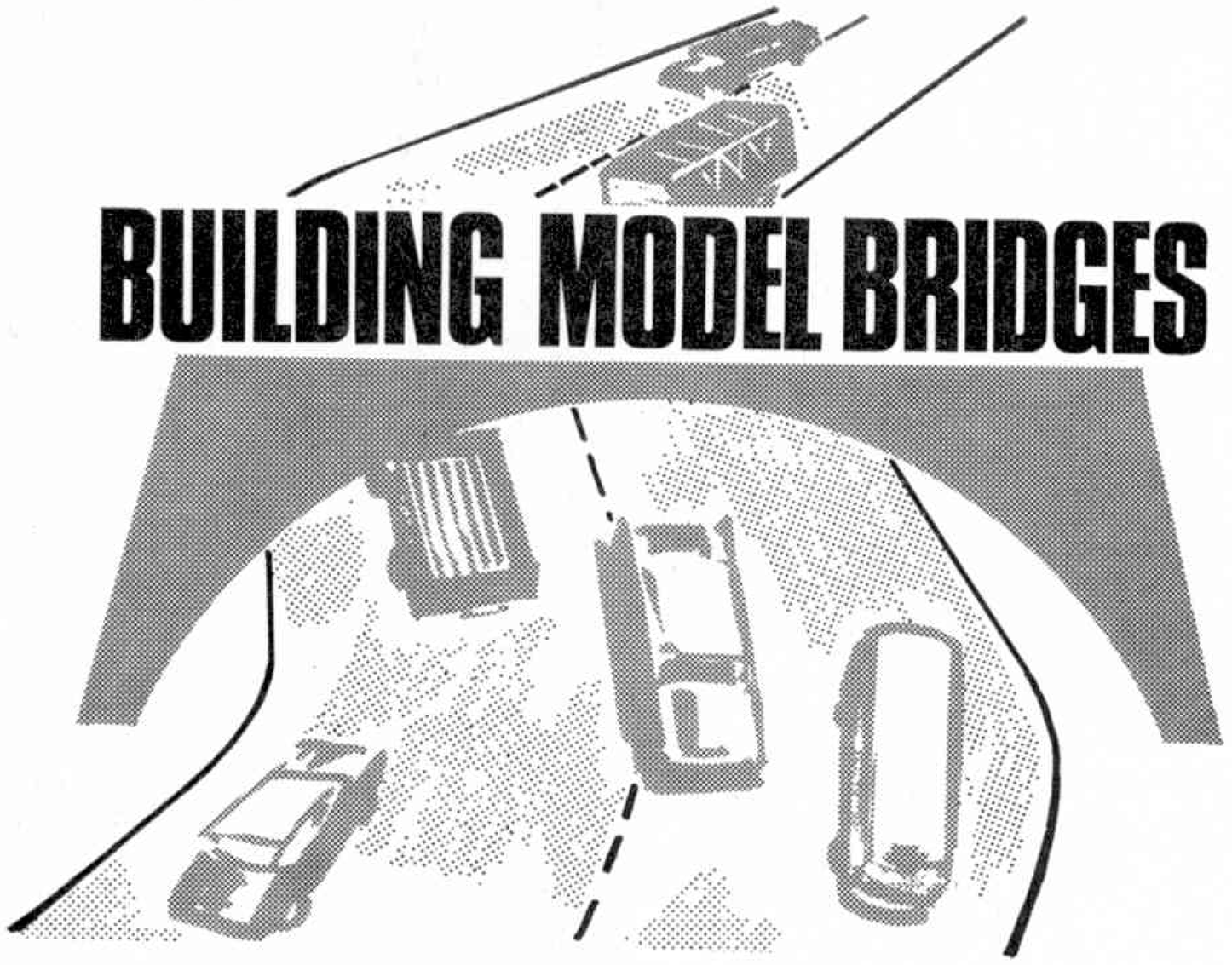
BUILDING MODEL BRIDGES

by **Linesman**



MANY of the road bridges crossing the railway lines of Britain, are easily built in model form for layouts using the simplest of tools and the cheapest of materials. This month's project, a model of the road over rail bridge at Hendon, is one which can be completed in quite a short time using two different thicknesses of cardboard, styrene sheet, balsa wood and Polyfilla for the road surface. The tools required are few and every enthusiast should have most of them in his kit.

The first step in the construction of the bridge is the marking out of the two bridge side pieces. I used $\frac{1}{16}$th inch thick cardboard, which I was only able to buy in large sheets, approximately 3 ft. by 2 ft. These I cut to a more convenient size.

Before marking the shape of the bridge on to the cardboard, it might be as well to make a rough drawing of the bridge to suit the location in which it is to be used. The dimensions given in this article can, however, be followed and the resulting bridge fitted with retaining walls to suit the type of embankment or ground.

When making the drawing, I found it useful to have a photograph of the type of bridge I wanted to model. This could then act as a guide for structural details, such as girdering, brick piers, etc.

Keep it square!

The various components should be reproduced on $\frac{1}{16}$ in. thick cardboard using both inch and millimetre rulers. It is essential that all lines be at right angles to one another and, although not absolutely necessary, you may find a set square of help when doing this. Two sides will be required, each 13½ ins. by 5 ins. and a rectangle of that size is marked on to the cardboard. The bridge portals are then marked on, leaving a gap in each side for the ends of the girders underneath the parapet of the bridge; $\frac{1}{16}$th inch thick card is very heavy material and a heavy duty modelling knife is essential. I used the eclipse 44 multiple tool to reduce the number of cuts per line.

A steel straight edge will be necessary to act as a guide for the knife and when cutting, constant pressure should be kept on the knife to ensure an even cut. Several strokes will probably be required before the card separates and you will find that a block of wood underneath will help to prevent any damage occurring to the table or work surface. Do not in any event risk tearing the card because this makes it difficult to lay the brickpaper evenly.

When both sides of the bridge have been removed from the sheet of card, the smaller lightweight modelling knife can be used to clean up those corners where slight furring of the cardboard may have occurred. Any burrs on the edges should also be removed, since this will show through on the brickpaper.

Dealing with one side of the bridge at a time, buttresses measuring 5 ins. by 16 mm. should be cut from $\frac{3}{16}$th inch thick balsa sheet. It would be as well to cut a sufficient number for both sides of the bridge and you will need twelve pieces in all, which are glued into position at each end and also along the bridge side. I used 'Uhu' glue for this to ensure a positive joint.

The buttresses on either side of the tunnel portals should be flush with the elongated slots for the girder and care should be taken to position the buttresses in the vertical. It would be as well, in fact, for the set square to be used for this. A wrongly positioned buttress can ruin the appearance of the finished bridge and it is well worth taking extra care when glueing them in place.

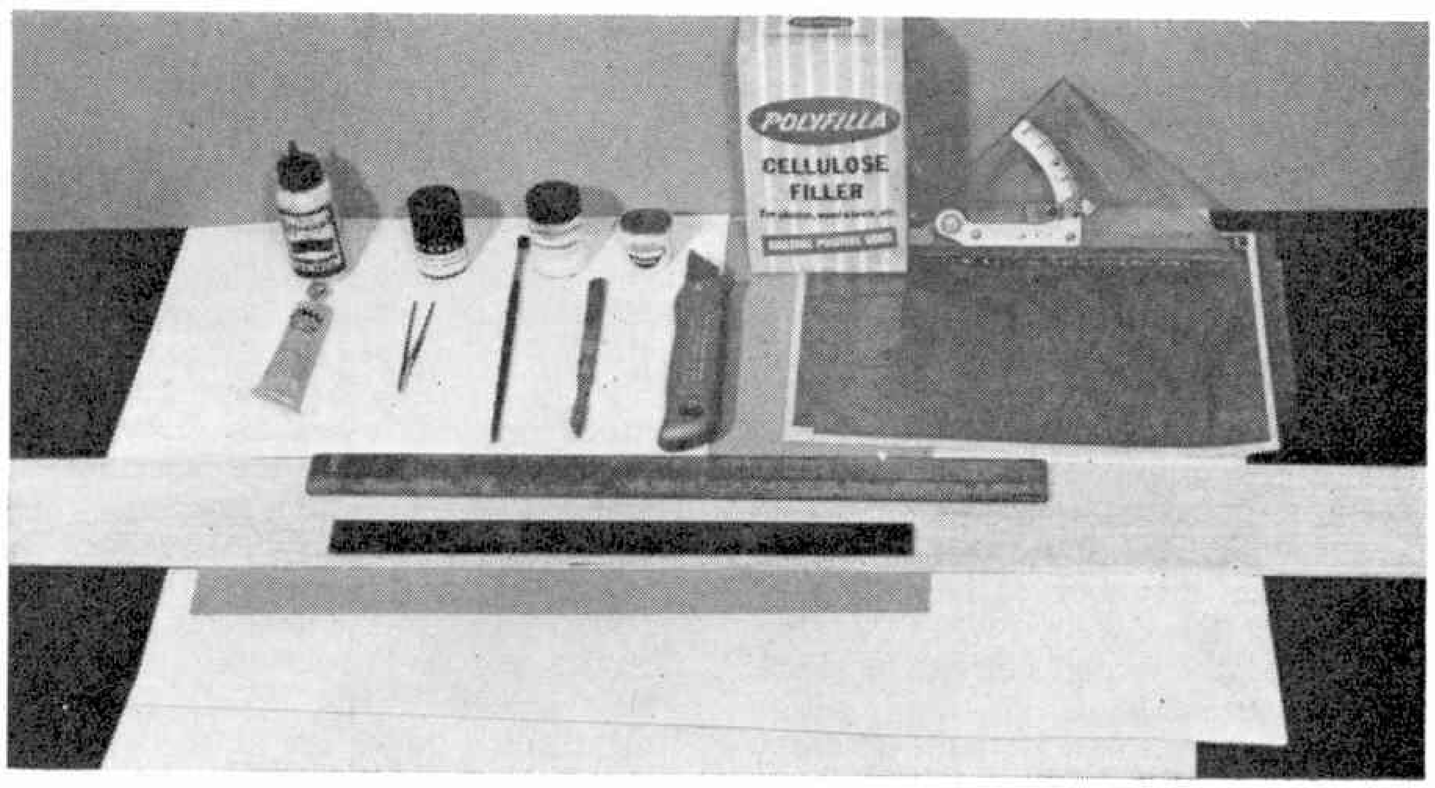
Once they are firmly fixed into position, brick overlays can be added on the upper portions and also on the bridge parapet. You will notice from the photographs that the overlays include two distinct thicknesses of brick and naturally, the widest is the first to be added. The parapet, being the easiest, is dealt with first and you will need two pieces of $\frac{1}{32}$ in. thick card, 112 mm. long by 16 mm. wide, which are glued flush to the bottom of the two parapets.

The $\frac{1}{32}$ in. thick cardboard that I used, turned out to be slightly over this dimension and the resulting layers of cardboard on the bridge parapet look quite effective. I would therefore advise you, whenever possible, to use cardboard between $\frac{1}{32}$ and $\frac{1}{16}$ in. thick.

For a positive joint between the two surfaces of card, I relied almost entirely upon Lepage's 'Bondfast' glue, which is normally a white opaque substance, but when dry becomes transparent, with a surface that does not shine. The glue also has the further advantage that it does not shrink.

Once the brick overlays have been laid on the parapet wall, the top portions of the buttresses can be dealt with. The

Materials required for bridge construction. Sheets of $\frac{1}{32}$ in. and $\frac{1}{16}$ in. card, $\frac{3}{16}$ in. balsawood, red brick paper, grey and black poster paint, Bondfast and Uhu glue. Tools required—tweezers, paint brush, modelling knives, set square and rulers.



front surfaces of these also have two layers of brickwork and once again, the widest is glued on first. For the six buttresses on one side, you will need six pieces of $\frac{1}{8\frac{1}{2}}$ in. thick cardboard, 16 mm. long by 16 mm. wide.

Tweezers are useful

The thinner pieces that are laid over these are also 16 mm. long, but 8 mm. wide. When these are dry, the sides of the buttresses can be dealt with and since this task is a little fiddly, you may find a pair of tweezers of help. The inside edges of the four end and two inside buttresses, require a total number of six pieces of $\frac{1}{8\frac{1}{2}}$ in. cardboard, 16 mm. long by 8 mm. wide. These must have a piece cut out to allow for the single overlay of brick on the front of the buttress.

When doing this, I have found it best to place the piece of card in the required position, scribing the portion to be removed with a modelling knife. In this way you will be certain of the overlay being the correct shape. The inside faces of the buttresses on either side of the tunnel portals have a double thickness of cardboard, as on the bridge parapet and you will find it necessary to lay three separate pieces, two for the lower portion and one for the upper—each 8 mm. long by 5 mm. wide.

All that now remains is for the lower brick overlays to be placed into position and you will need, for the front surface of the buttress, six pieces of $\frac{1}{8\frac{1}{2}}$ in. thick cardboard, each 16 mm. long by 16 mm. wide, Each buttress should also have, on its lower end, two pieces of $\frac{1}{8\frac{1}{2}}$ in. thick cardboard 16 mm. long by 6 mm. wide. When all these components have been glued to the assembly, the first side can be left to dry, while work begins on the other side.

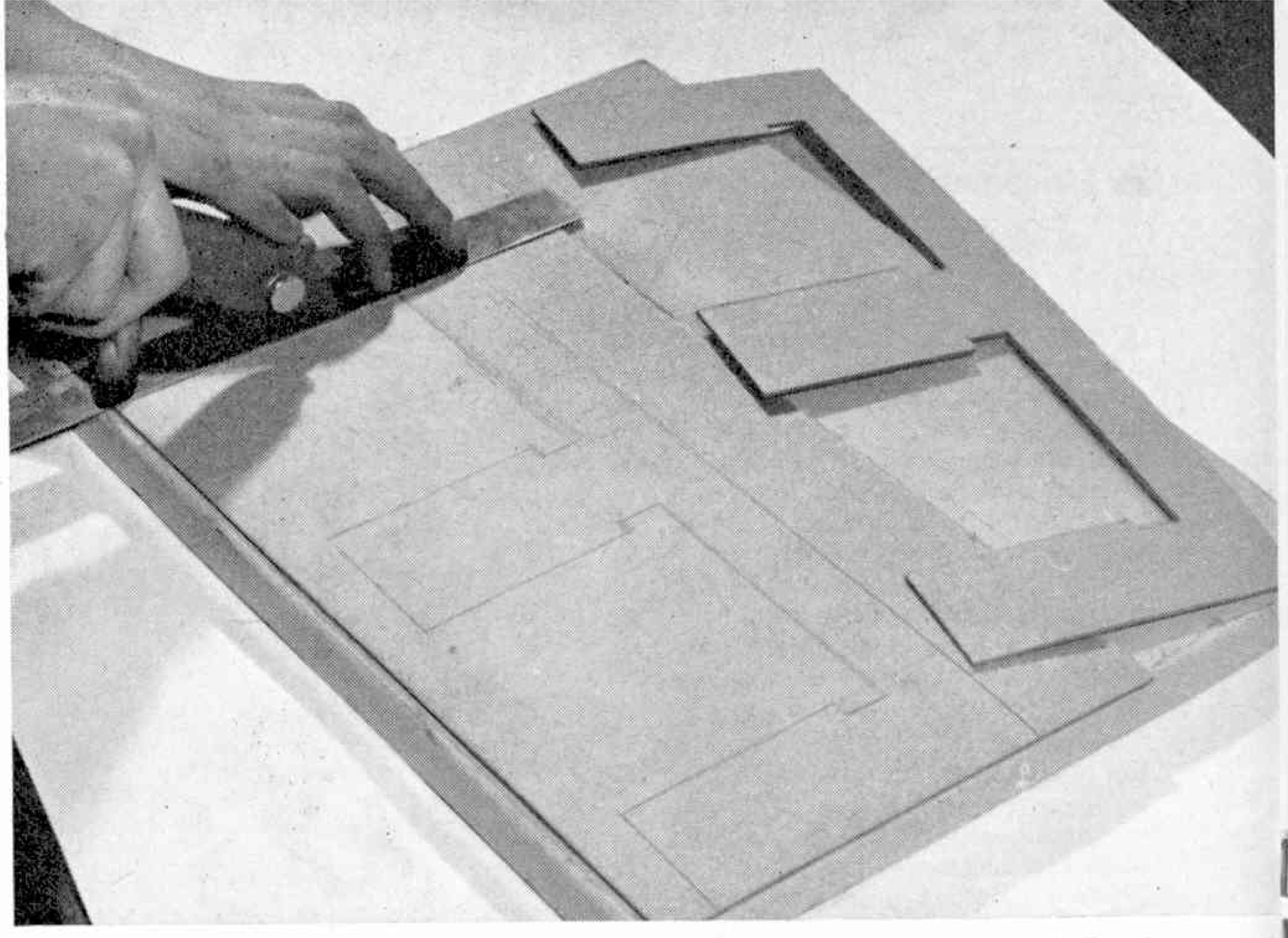
Positioning the roadway

Using $\frac{3}{16}$ in. thick balsa wood sheet 3 in. wide, the roadway which is $13\frac{1}{2}$ in. long, can be cut out. A total number of six spacing pieces will be required, also from $\frac{3}{16}$ in. thick balsa wood—two $3\frac{7}{8}$ in. long by 3 in. wide and four $3\frac{1}{4}$ in. long by 3 in. wide. To join the two sides together, I would suggest placing the bridge face down on the working surface, glueing the roadway into position at the bottom of the parapet.

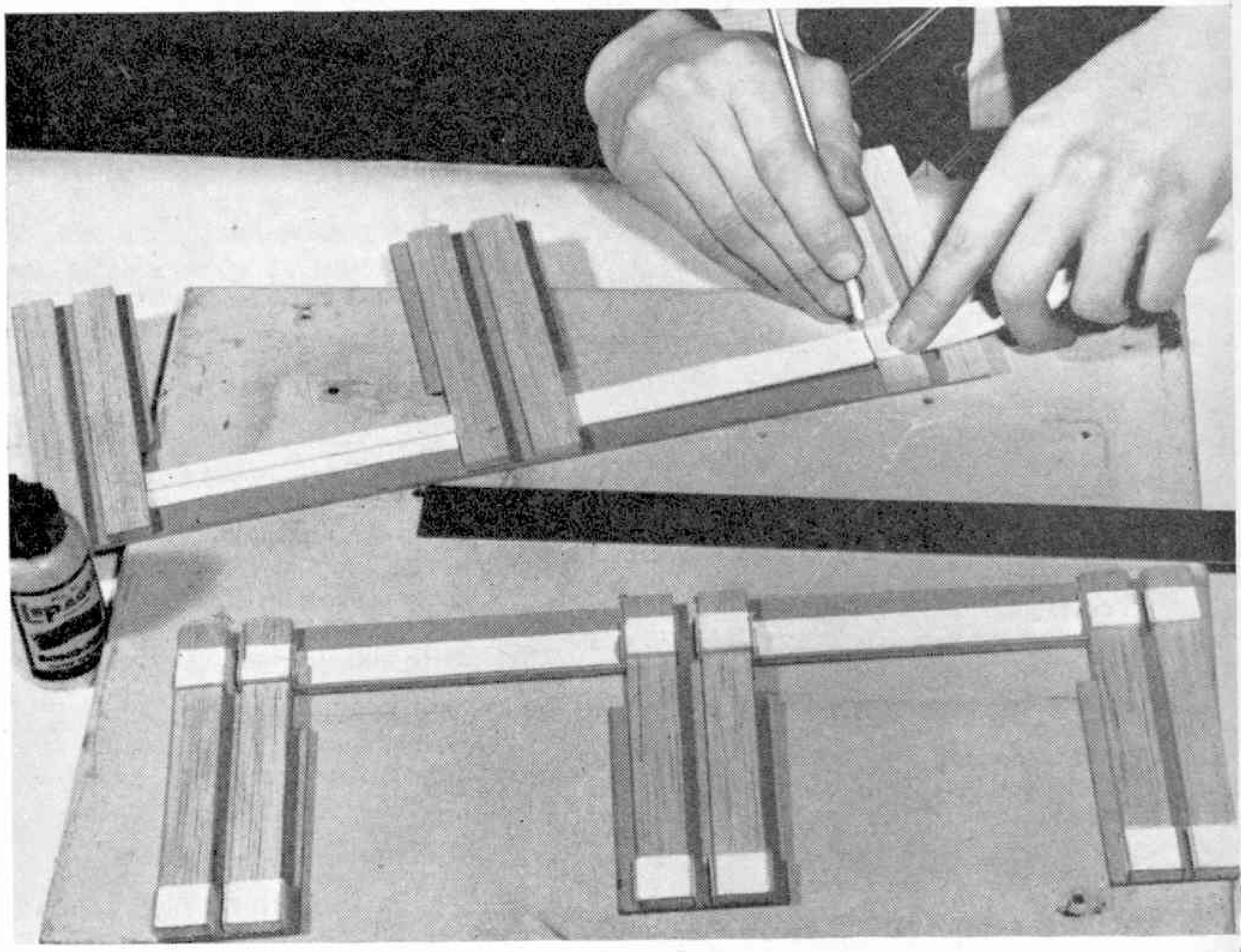
This should be followed by the two end pieces, which fit underneath the roadway and then the four intermediate pieces, which are glued flush with the side portals of the bridge. A gap should be left above the intermediate spacing piers for the girders which are added later.

Once again I used the set square for checking that all members are absolutely upright. If necessary, blocks of wood may be leaned against the spacing pieces to make sure that they do not fall over while the glue is drying. When the glue has set hard, the second side can be glued on to the assembly.

The girders can now be built up from 30 thou. thick styrene sheet and for each



Above: The first operation is the cutting of the two sides from $\frac{1}{16}$ in. card. Here the heavy duty knife and steel rule is used. The light knife later removes any burrs.
Below: The buttresses along the side of the bridge are glued into position and the brick overlays ($\frac{1}{32}$ in. card) are glued over both the parapet walls and buttresses, as shown on lower bridge side.



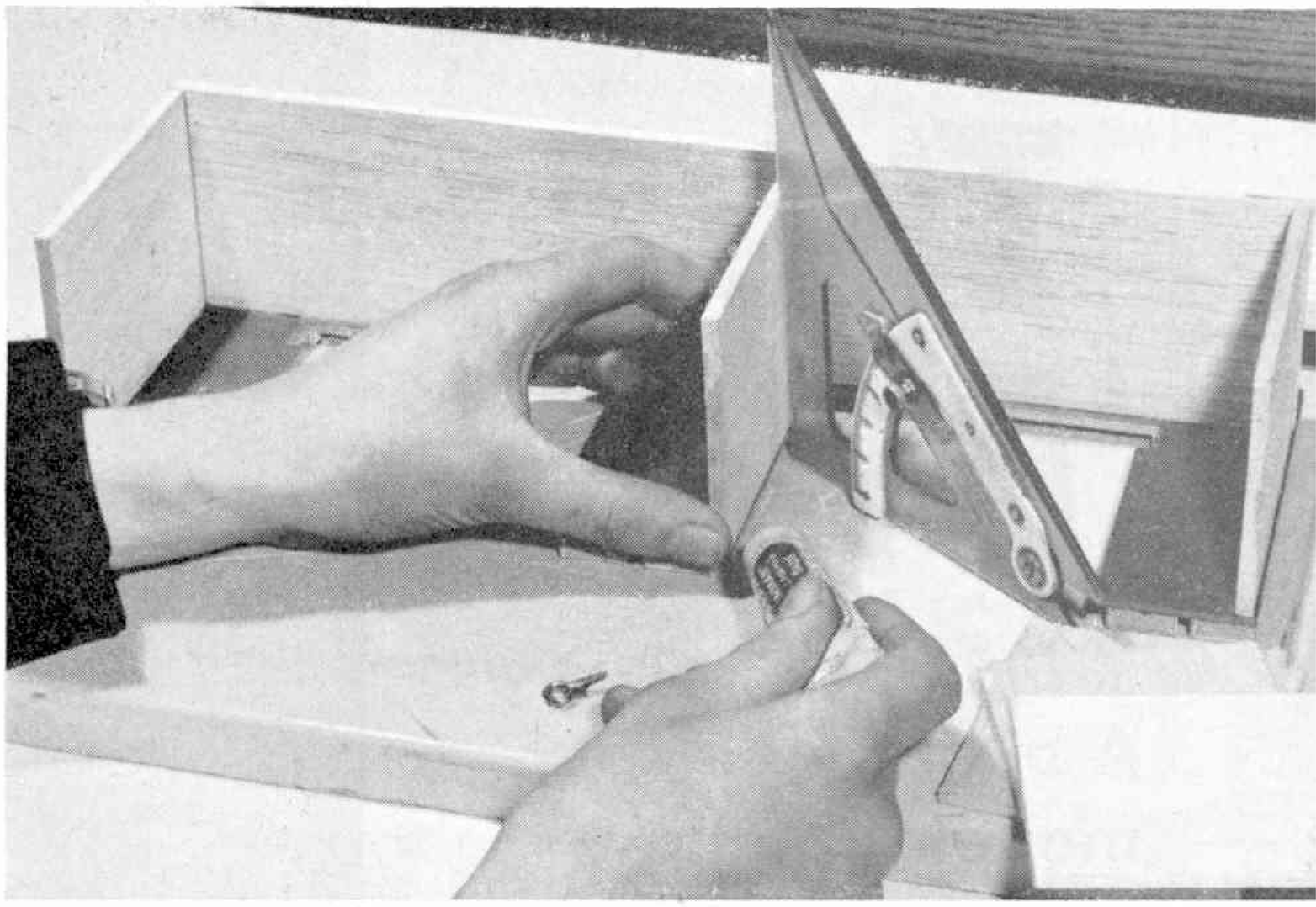
girder you will require the parts indicated on the component list accompanying this article. The first step in the construction of the girder is to lay either the top or bottom member flat on the work bench, laying it edgeway on the intermediate member. Then, while holding it in position, the plastic sheet solvent is brushed along the joint with a paint brush. This is repeated for the other member of the girder and when the whole assembly has dried, the eight strengthening pieces are glued into position along one side of the girder assembly. When the complete unit is dry it can be glued in place on the bridge.

After all four girders have been placed in position, the brick papering of the structure can begin. For the bridge shown in the photograph, I have used one of the brickpapers available from the 'Superquick' range. For a bridge of the type we are building, an ordinary red brick is probably the most desirable. Begin the papering with the parapets of the bridge, working from the top downwards and taking care that all cuts in the brickpaper are clean.

The edges of the two brick overlay courses should have their own strip of brickpaper laid on and you will find that a strip of paper one brick deep will be quite sufficient for this purpose. Once the two parapets have been completed, the buttresses can be dealt with, preferably from the top, so that some form of continuation between the brick courses of the parapet and the brick overlays over the buttresses is assured.

Continue in this fashion until both bridge sides have been completed and then begin on the walls of the tunnel portal. When the brickpaper has dried, the black poster paint can be used, in diluted form, to cover the while lines between the sheets of brickpaper.

I have deliberately dirtied up the bridge with a weak solution of black poster paint, since this does tend to hide any inaccuracies in the sizes of the various pieces of brickpaper. It is also more realistic, for most bridges, especially those situated in towns, are extremely dirty.



Finishing the model

Only the roadway and the inside parapet walls now remain to be dealt with and I would suggest that the inside parapet walls are the first to be cut from $\frac{1}{32}$ in. thick card. Before glueing them into position, it is advisable to glue the two pavements which are cut from $\frac{1}{32}$ in. card, into position first. The walls should then be glued, edgeways on top of the pavements, to bring them flush with the top of the outside parapets. Twelve buttresses for the inside walls should be cut from balsa wood and glued into position with 'Uhu' glue.

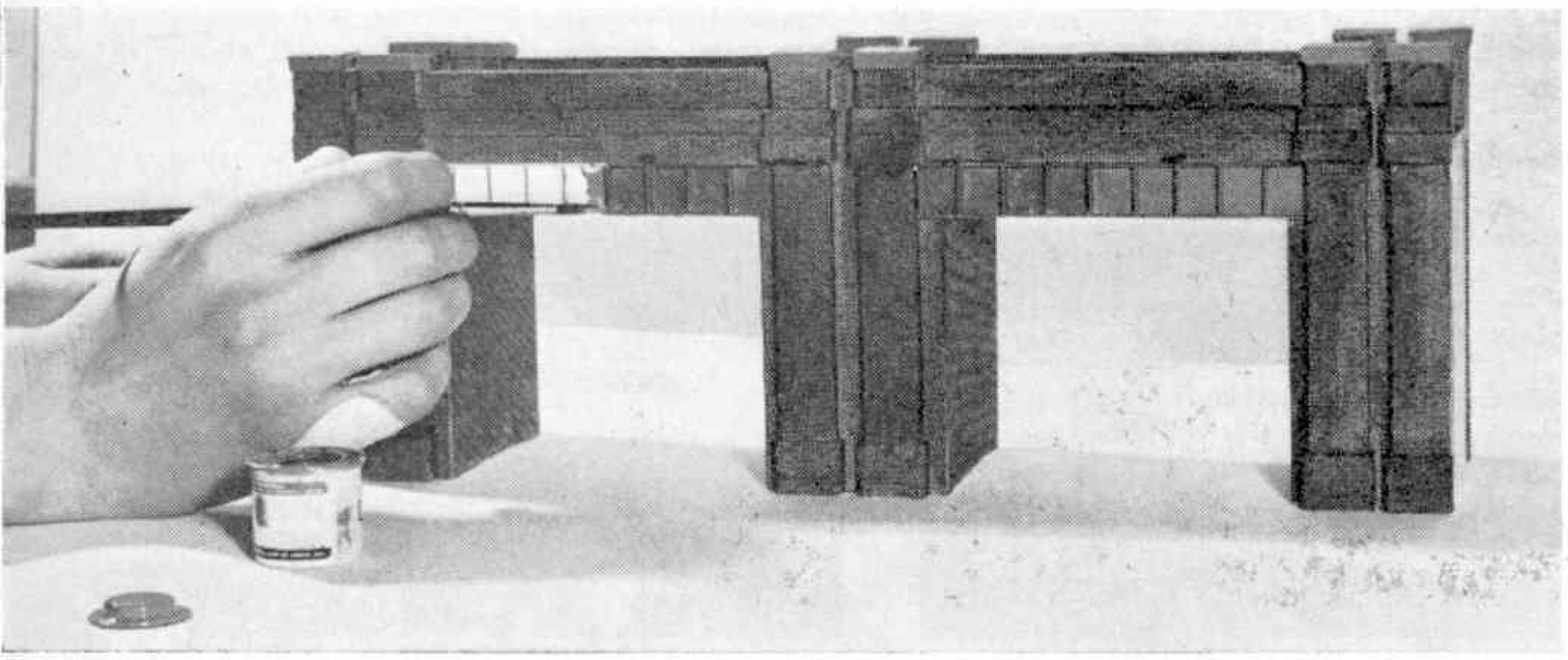
When dry, the two inside walls can be covered with brickpaper and while the glue is setting, the capping stones, which are cut from $\frac{3}{16}$ in. thick balsa wood, can be placed on top of the twelve buttresses.

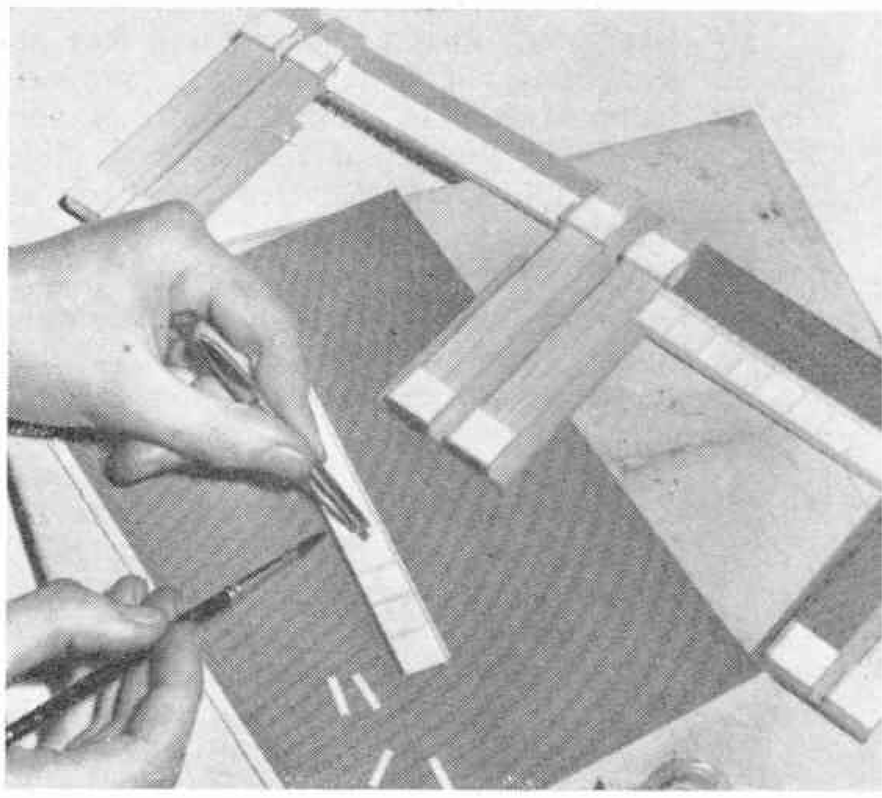
If the roadway is to look effective, it should be covered with a stiff mixture of plaster or Polyfilla to give a slight camber in the centre of the road. When this is dry, approximately two hours, the surface can be painted either grey or black.

According to the location of the bridge, its ends should now be blended into the layout by fitting appropriate retaining walls to suit existing embankments or any other scenic effects that the layout may have.

COMPONENT LIST FOR BRIDGE

12 pieces $\frac{3}{16}$th thick balsa wood 5 in. long, 16 mm. wide. Buttress.
24 pieces $\frac{1}{32}$nd thick card 16 mm. long, 16 mm. wide. Buttress brick overlays.
20 pieces $\frac{1}{32}$nd thick card 16 mm. long, 6 mm. wide. Buttress brick overlay sides lower.
4 pieces of $\frac{1}{32}$nd thick card 112 mm. long, 16 mm. wide. Parapet brick overlay.
4 pieces of $\frac{1}{32}$nd thick card 112 mm. long, 8 mm. wide. Parapet brick overlay, 2nd thickness.
12 pieces of $\frac{1}{32}$nd thick card, 16 mm. long, 8 mm. wide. Buttress brick overlays, upper second thickness.
12 pieces $\frac{1}{32}$nd thick card, 16 mm. long, 8 mm. wide. Buttress sides inside upper.
8 pieces of $\frac{1}{32}$nd thick card, 8 mm. long, 5 mm. wide. Buttress sides outside upper.
16 pieces of $\frac{1}{32}$nd thick card 8 mm. long, 5 mm. wide. Buttress sides outside upper, first and second thicknesses.
2 pieces $\frac{1}{16}$th thick card $13\frac{1}{2}$ in. long, 5 in. wide. Bridge side.
1 piece of $\frac{3}{16}$th balsa $13\frac{1}{2}$ in. long, 3 in. wide. Roadway.
4 pieces of $\frac{3}{16}$th balsa $3\frac{1}{4}$ in. long, 3 in. wide. Intermediate spacing pieces.
2 pieces of $\frac{3}{16}$th balsa $3\frac{7}{8}$ in. long by 3 in. wide. End spacing pieces.
8 pieces of 30 thou styrene sheet 112 mm. long, 6 mm. wide. Top and bottom girder members.
4 pieces of 30 thou styrene sheet 112 mm. long, 14 mm. wide. Girder spacing member.
32 pieces of 30 thou styrene sheet, 14 mm. long, 3 mm. wide. Girder vertical members.
2 pieces $\frac{1}{16}$th in. card $13\frac{1}{2}$ in. long by $\frac{13}{16}$ in. wide Inside parapet wall.
12 pieces $\frac{3}{16}$th balsa wood $\frac{13}{16}$th in. long 16 mm. wide. Inside parapet wall buttresses.
2 pieces $\frac{1}{32}$ in. card $13\frac{1}{2}$ in. long, $\frac{1}{2}$ in. wide. Pavements.
12 pieces $\frac{3}{16}$th in. balsa wood $\frac{5}{8}$ in. long 18 mm. wide. Buttress capping stones.



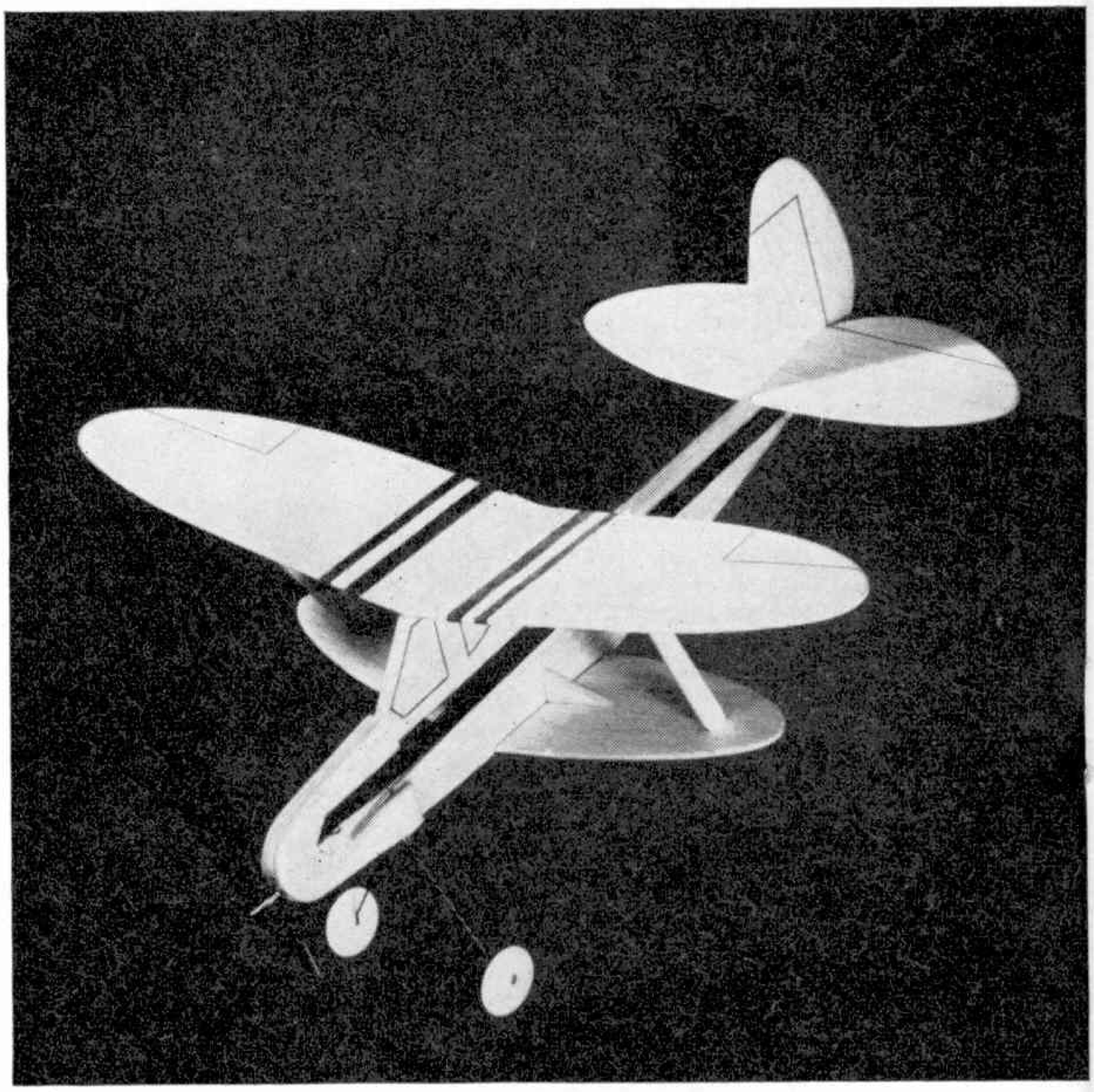


Top: Next, the spacing pieces can be glued on to one of the sides. The two end pieces are glued on first, followed by shorter pieces. When glue has set the second side is added.

Above: The four styrene girders are positioned under the bridge parapet and joined by solvent such as Synthigoo. Construction of the girder begins with the upper edge having vertical pieces glued edgeways on followed by lower edge. Finally strengthening pieces are added on one side.

Left: After girders are glued, the inside parapet walls, pavements, buttresses and capping stones are affixed The unit is then covered with brick paper, except for roadway, capping stones pavements and girders Diluted black poster paint is used to give a 'weathered' appearance and girders painted with a flat grey oil paint.

The 'Finch'



A beginner's model biplane built especially for Meccano Magazine by Ray Malmström

BIPLANE models always arouse interest on the flying field because, like their full-size counterparts, they are something of a rarity. A properly trimmed biplane, climbs well, is very steady in flight and has a good glide. The little Finch featured here has all these biplane virtues and, moreover, it is very easy to build.

To commence construction, cut the fuselage shape from $\frac{1}{8}$th sheet balsa. Bend the undercarriage wire to shape and slip into position (front 'v' cut in fuselage). Secure with thin strips of tape, cemented firmly in position. Note the forward slope of the legs called 'rake'. Bend over the ends of the axles to retain the wheels.

Next cut out two nose pieces (A) from $\frac{1}{8}$th sheet. Add one to side of nose and place the 20 s.w.g. (standard wire gauge) bush into the slot in the nose. Cement it in and then add the other nose piece A. Hold pieces in place with modelling pins until set.

Cut the upper (X) and lower (Y) wing mounts from $\frac{1}{8}$th sheet and cement accurately into their respective fuselage slots. Bend the rear rubber motor anchorage and skid and slide over rear part of fuselage (rear 'V' cut in fuselage). It is secured by a skin of cement. Add the reinforcing tape pieces to fuselage at places shown. Sandpaper round edges of nose pieces.

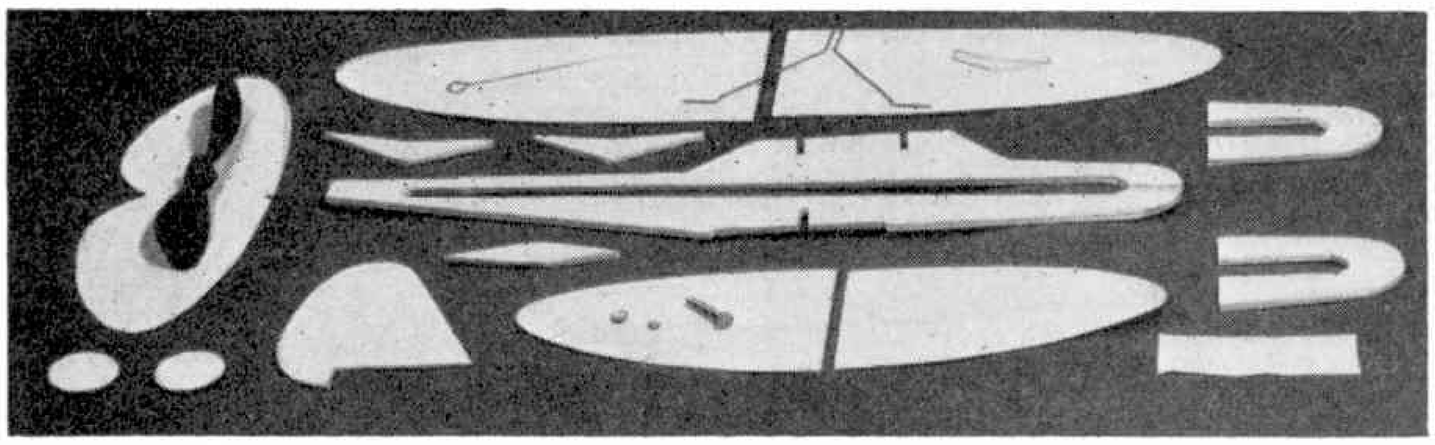
Cut tailplane and fin from $\frac{1}{16}$th sheet, sandpaper edges to section and cement in position, tailplane first. Bend the propeller driving shaft hook and insert into bush from the *rear*. Slip on two cup washers and then the 5 in. diameter K.K. plastic propeller, from your model shop, price 11d. Bend the front end of the shaft over as shown to engage the propeller. The fuselage of your Finch is now complete.

Fitting the wings

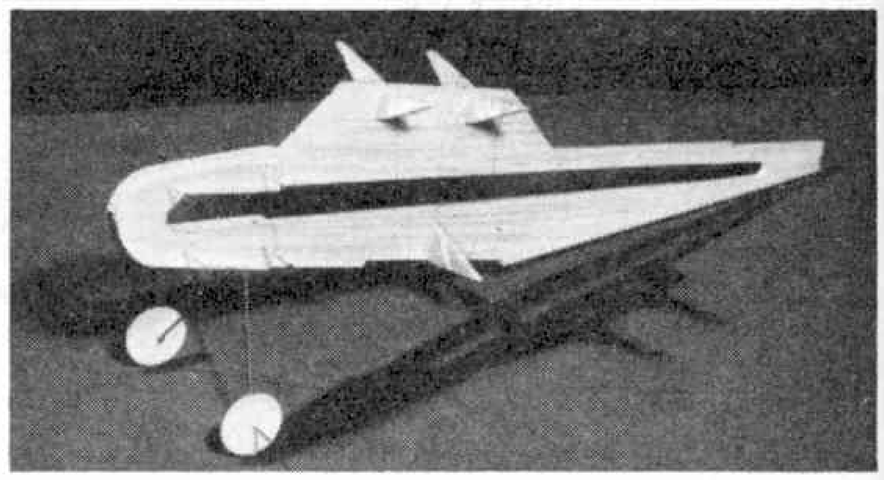
Cut wings from $\frac{1}{16}$th sheet. Mark the position of the interplane struts on the wings with a soft pencil. Lightly sandpaper the wings to sections shown on side view, using only very fine sandpaper. The method of obtaining the upward slope of the wings (dihedral angle) is shown in the 'easi-build' sketches and photographs. The jig pieces M and N are cut from $\frac{1}{8}$th or $\frac{3}{16}$th sheet. Use plenty of modelling pins to keep the wing panels in the correct positions while drying. Add strips of tape along the centre sections of both wings.

When wings are ready, cement them to the upper and lower wing mounts and fuselage. Please check for correct alignment of both wings to each other and to

Few components are required to assemble your model biplane as shown below.



Nose and undercarriage in position. Note wing mounts.



5"dia. KK plastic prop

Cup washers

20 swg brass bush

Fuselage (in heavy outline) 1/8 sheet

Prop driving shaft 20.swg. wire

Nose piece A 2 rqd 1/8 sheet

Interplane struts. 2 rqd 1/8 sheet

Nose piece A

Note forward slope of undercarriage

Nose pieces A 2 rqd

Tape

Strut section

Use colour ball pens or felt markers for decoration

DO NOT DOPE

Chamfer strut ends to fit wing angles

Lower wing

Y

Show direction of grain

Tailplane

Cement skin

Skid front view

Skid 20.swg. wire

Cut jigs from 1/8 or 3/16 sheet

Lower wing dihedral jig N

Upper wing dihedral jig M

RM. 1965.

Centre line of wings and tailplane. All above parts 1/16 sheet

Tape on centre sections of upper and lower wings

Lower wing here

Lower wing outline

Lower wing mount 1/8 sheet

Undercarriage 20.swg. wire

Fit 1"dia. plastic wheels

Strut Lower wing.

BALANCE POINT

Strut Upper wing

Tailplane outline

Top wing outline

Top wing

Reinforcing tape

Round-off all edges

Use medium grade balsa wood for all parts

Fin 1/16 sheet

Top wing here

Join AA to AA to complete fuselage

Upper wing mounts 1/8 sheet 2 rqd.

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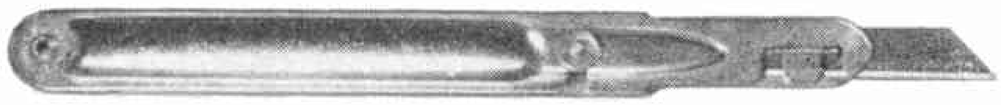
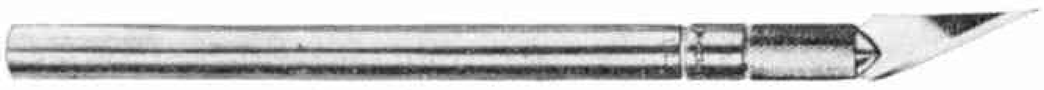
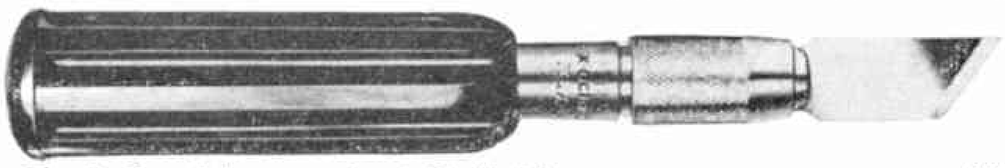
FOR THE KEEN YOUNG CRAFTSMAN



No. 1001 General Purpose Knife (with blade) 2/-
Spare blades (packet of 3) double-edged 1/4



No. 1. Slim aluminium handle 5" long (with blade) 4/6



No. 5 For all heavy cutting (with blade) 8/10

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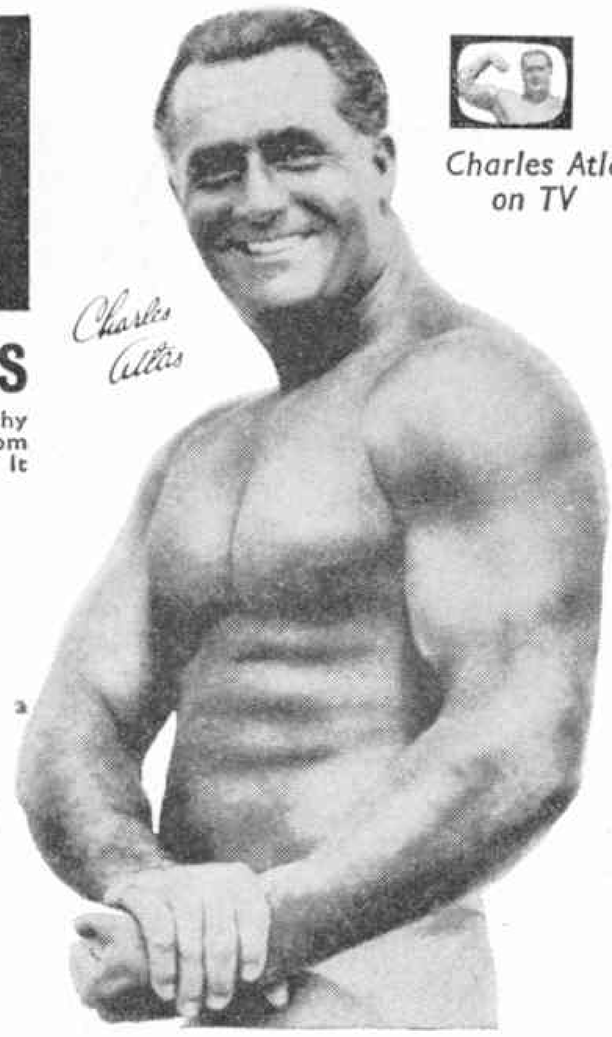

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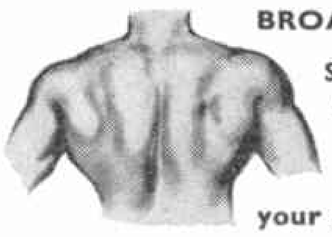

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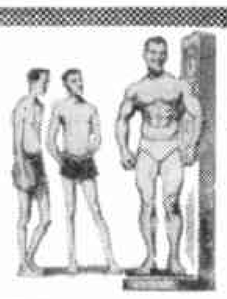

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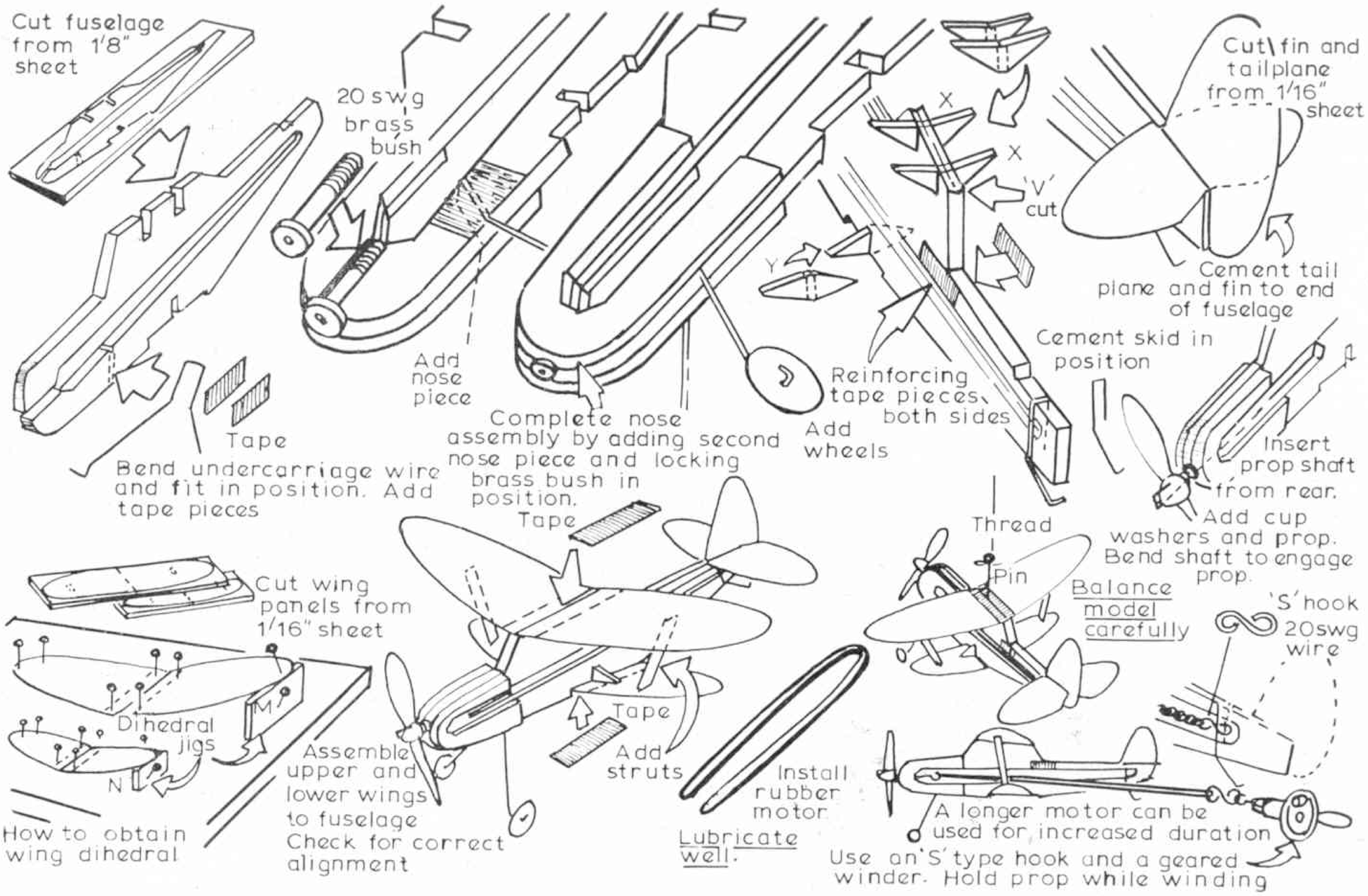


the tailplane. If your wings are twisted or warped your Finch will not fly! When the wings are dry, cement the interplane struts, cut from $\frac{1}{8}$th sheet and sandpapered to section, between the marks on the wings. Pin in position until set.

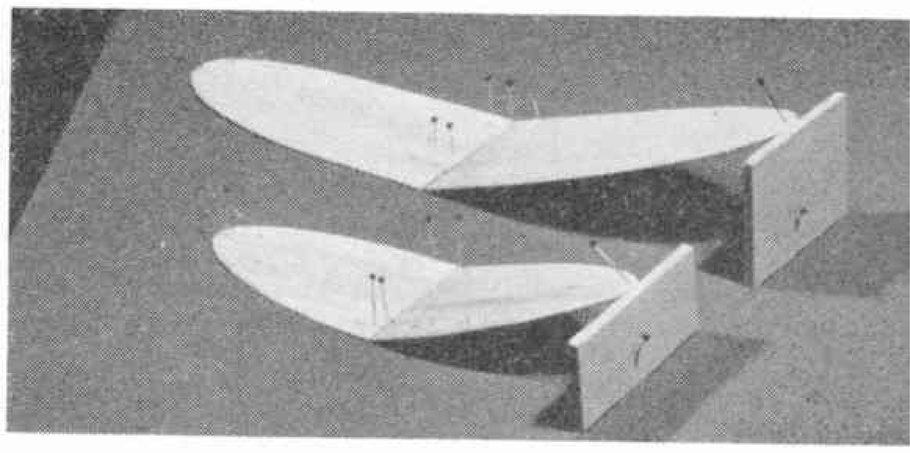
Power for the model

Now for the rubber motor. You can choose either a 20 in. length of $\frac{3}{16}$ in. wide strip rubber, which you thread through the rear anchorage wire, tie and slip on to the driving shaft hook, or a 40 in. length of $\frac{1}{8}$ in. wide strip, which you make into a loop and then thread through the rear anchorage, slipping the two loops on to the driving shaft hook.

The first motor is best for testing. It will take up to 450 turns and your model will fly at a good height. If you use the second motor you can only put on about 225-50 turns, but you will get a very rapid climb, a short cruise and a long glide down.

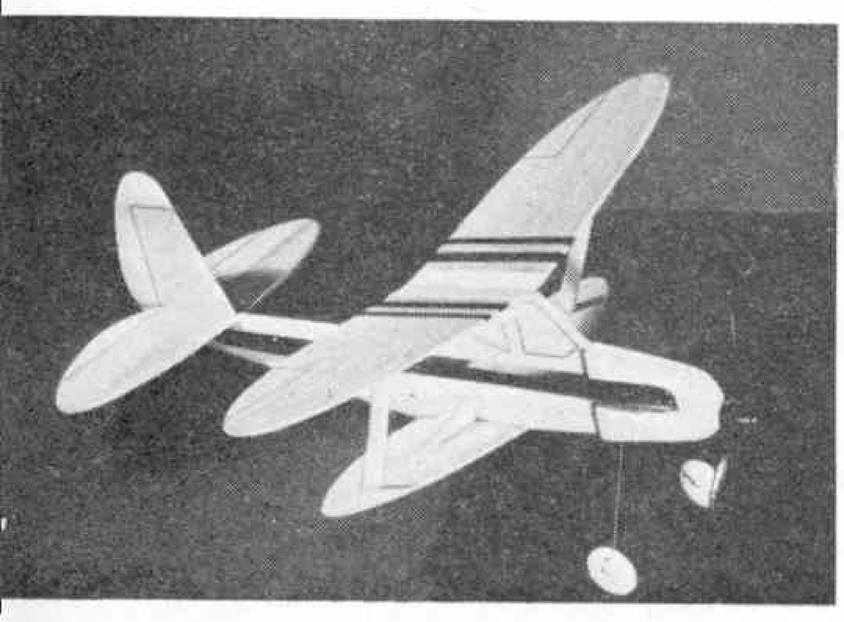
Both motors *must* be lubricated with rubber lubricant, 4d. a tube, and with the rubber motor in position, you must balance your model. This is important and must be done before any flying is attempted. Suspend the model from the balance point marked on the plan. It should hang level. If it is nose or tail heavy add small pieces of Plasticine to nose or tail to achieve correct balance.

Choose a calm day and some long grass for flight testing. Glide test first. Face into wind and launch. If your model dives, bend up the rear edges of the tailplane slightly. If it climbs too steeply and falls backwards (stalls), add weight to the nose. Correct turns to left or right by slightly bending the rear edge of the fin on the opposite direction. Now wind up your motor by putting about a quarter of the number of turns previously mentioned. If flight is successful add 20-30 extra turns on each subsequent flight, up to the maximum.



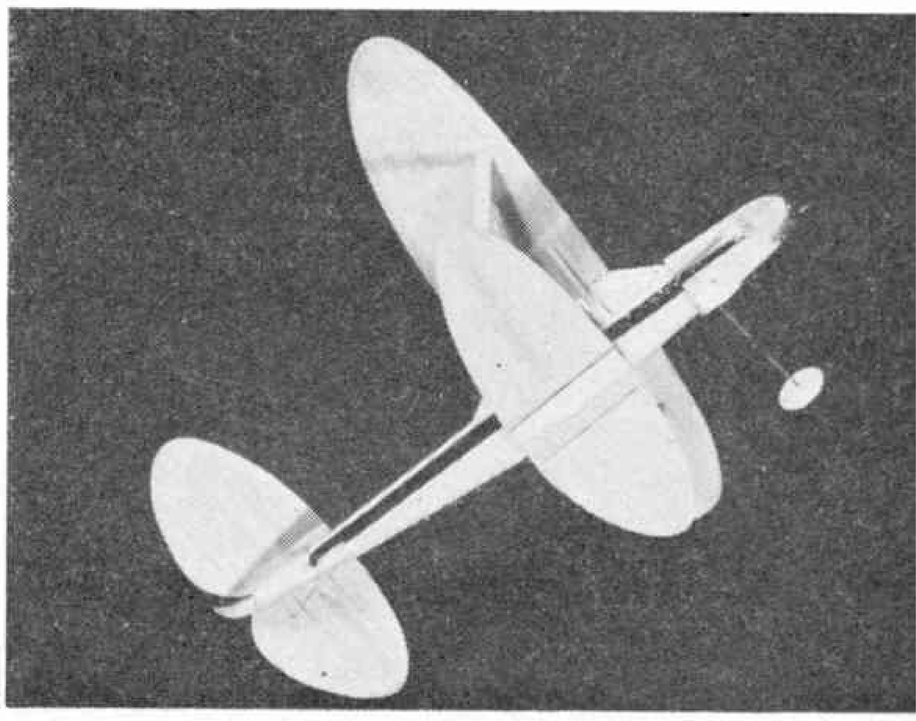
Above: Jigs being used to build in the wing dihedrals. Below: Underside view showing the tape across the lower wing of the model

Decoration is applied with felt or ball point pen



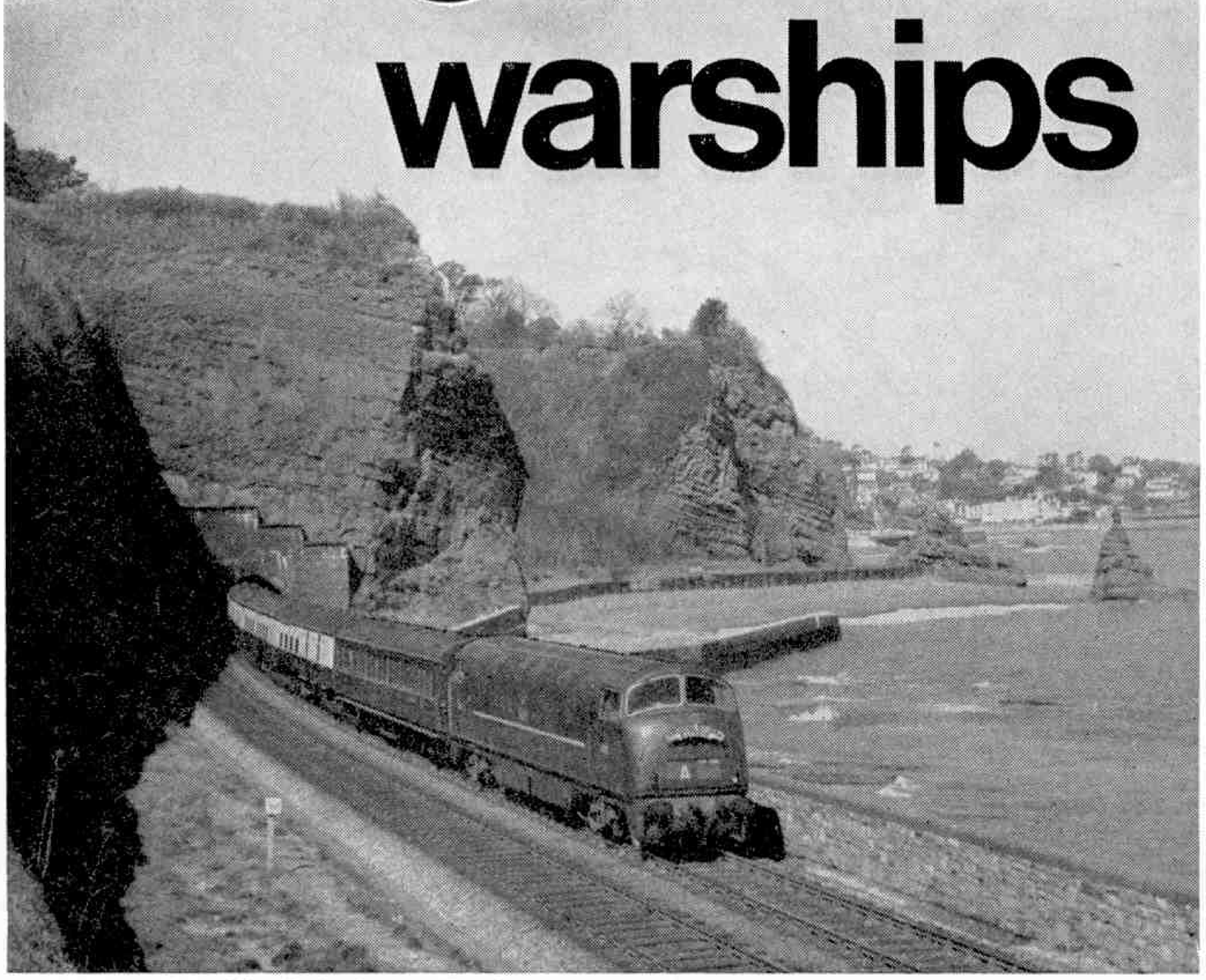
Materials required

1 Sheet $\frac{1}{8}$ in. by 3 in. by 36in. medium balsawood.
1 Sheet $\frac{1}{16}$ in. by 3 in. by 36 in. medium balsawood.
20 in. 20 s.w.g. piano wire.
1 20 s.w.g. brash bush.
2 20 s.w.g. cup washers.
1 K.K. 5 in. diam. plastic propeller.
2 1 in. diam. lightweight plastic wheels.
9 in. Linen tape $\frac{3}{4}$ in. wide approx.
20 in. $\frac{3}{16}$ in. wide rubber strip or 40 in. $\frac{1}{8}$ in. wide rubber strip.
1 tube balsa cement.
1 tube rubber lubricant.



by **Michael Rickett**

western region warships



Warship by the sea! The 'Centaur' pulling the 'Torbay Express' in August 1961.

THE modernisation programme of British Railways brought with it many new forms of motive power. The Western Region in particular is noted for the three types of diesel-hydraulic locomotive now in use on their main lines. In fact, these are unique to the Region, especially in the West of England and South Wales, where they are often used to haul the more important main line trains from Paddington.

The 'Warships' are one of the three classes of diesel-hydraulic locomotives in operation and the name 'Warship' is derived from the names of the locomotives. These are, with one exception, named after naval vessels such as the 'Ark Royal', 'Active', 'Victorious' and 'Steadfast'. Their names are also responsible for making the class one of the most popular types of diesel locomotive in service on B.R. There are a total of seventy Bo-Bo type 4 'Warship' locomotives, divided into thirty-seven built in British Railways workshops and thirty-three built by the North British Locomotive Company.

The 'Warships', which were the cause of much controversy among railway enthusiasts when they were first introduced in 1958, have an unusual appearance compared with the more conventional 'Bull-nose' English Electric Deltic and type 4 locomotives, which are to be seen on the East Coast route.

They are, however, far from unsightly and although the inside framed wheels on the two bogies tend to give the locomotive a 'naked' appearance, the general outline of the body is sufficiently different from other diesel locomotive designs to be quite pleasing.

Revolutionary equipment

Another interesting point about the 'Warships' is that when the first locomotive in the class appeared in 1958, the traction equipment was completely revolutionary. The method of transmitting the power from the diesel engines to the final drive and from there to the axles, was carried out, not electrically or mechanically, but hydraulically!

The system, which was previously untried in this country, was first developed by the German Federal Railways for their 'V.200' class of locomotives. Experience gained by the Germans during the trials of the 'V.200' class was made available to the Western Region, when the 'Warships' were in the design stage and this no doubt helped towards eliminating many of the teething troubles usually associated with a new type of locomotive.

Diesel electric and diesel hydraulic locomotives of the 'Warship' and 'Western' classes differ principally in the methods used to convey the power generated by the diesel engines to the driving wheels of the locomotive. As the name implies, diesel electric locomotives have a diesel engine which drives a generator, which in turn supplies power for the traction motors connected by gearing to the wheels. Diesel hydraulics have two engines, each connected to a hydraulic transmission which operates, through gear trains, the final drive of the locomotive, which is yet another train of gears.

Principles of power

The basis of the hydraulic transmission is a torque converter, which is really similar to a simple reaction turbine using oil as the medium in place of steam. On the 'Warship' diesels the two hydraulic transmissions have four speeds and together with the torque converter, has mechanical change gears in permanent mesh. Gear changing is accomplished by special over-running dog clutches, designed to reduce both noise and wear when gear changing is effected.

Hydraulic pressure is used to withdraw the turbine blades in the torque converter when gear changing is in process and this is done automatically.

The control mechanism for gear changing is operated by oil pressure and is automatic, gears being selected according to the locomotive and engine speeds. If the reversing handle in the cab is operated while the locomotive is moving, no reverse gear change will take place until the locomotive stops.

The engines, two Maybach 'MD 650' type 'tunnel' engines, are pressure charged by single-staged exhaust gas turbochargers, a system intended to increase the power of engines of a given size. Both engines have twelve cylinders, divided into two banks in a V formation. Also, each individual cylinder head has three inlet and three exhaust valves. All rocker arms have an automatic hydraulic adjustment, which ensures that no backlash is present in the valve motion. A special heat exchanger is provided for cooling the piston oil and it is thought that this probably helps to keep a very low cylinder wear rate.

Engine speed control is electrical and six speed notches are provided for the driver, the actual speeds being readily adjustable if required. In common with other diesel locomotive types, the diesel hydraulics are provided with a vacuum controlled air brake system. This is operated from the driver's vacuum valve, which applies the train brake and which also makes a proportional application of the locomotive air brake.

Independent braking

The locomotive brake can be applied by use of the driver's air brake valve should circumstances warrant an application of the locomotive brakes alone. However, it is rare for this to be done, unless an unbraked goods train is being pulled. A 'passenger/goods' cock is provided in each cab which, when placed in the 'goods' position, slows down the normal proportional brake application. This is used when an unbraked or partially braked train is being hauled and it helps to prevent unbraked stock from running into the locomotive.

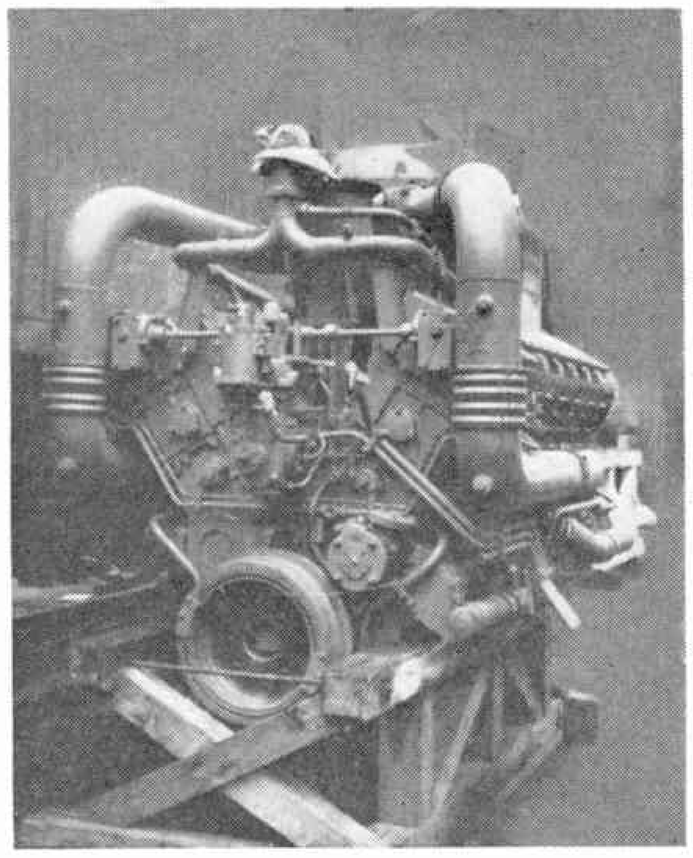
A 'driver's safety device' is also included in both cabs and this applies the locomotive and train brakes if the driver fails to press down the control foot pedal or the main control handle. On release of either of these, a brake application is made after a delay of about five seconds. The application takes place in two stages, between which a delay occurs, allowing bunching of the train before the brake is fully applied.

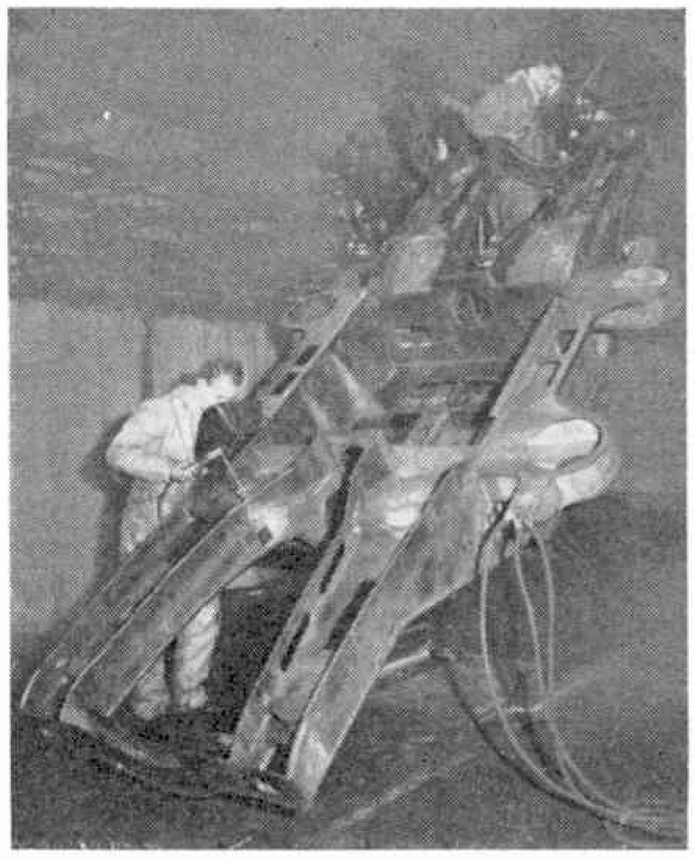
Whilst on the subject of controls, it might be as well to mention the comprehensive system of electrical controls and warning devices that are fitted in the locomotive cabs. The main controls, warning lamps, gauges and brake handles, are grouped conveniently together on the driver's desk, while other gauges and warning lamps, not necessary for driving purposes, are situated on the other side of the cab. The main controller or power handle is the only one used by the driver, apart from the brake handle, for controlling the speed of the loco.

All gear changing is done automatically and the reversing handle, which is removable in the neutral position, is used as a master switch, which when removed, renders all controls dead. The engines are started with the reversing handle in either the forward or reverse position and the air handle may then be used for controlling the speed of the engines. No power is transmitted to the rail wheels, however, until the power switch is operated.

Automatic safeguards protect the engines and transmissions against excessive oil temperatures and also against loss of oil pressure, excessive temperature of cooling water and overspeeding. Two general warning lights, one for the engine and one for the transmission, light up if a fault occurs. The actual engines or transmissions are safeguarded by warning lights on the right-hand side of the cab, each cab containing warning lights for the engine and transmission nearest to it.

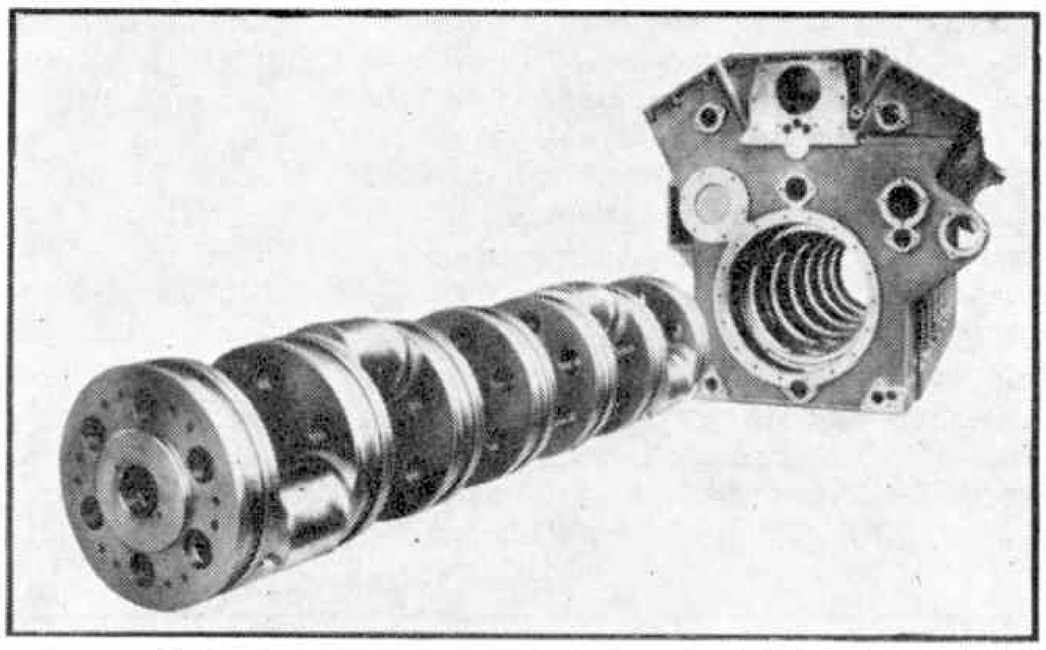
Instruments on the driver's desk indicate locomotive speed, degree of vacuum and air pressure. Failure of air pressure of vacuums brings the speed of all engines to idling.





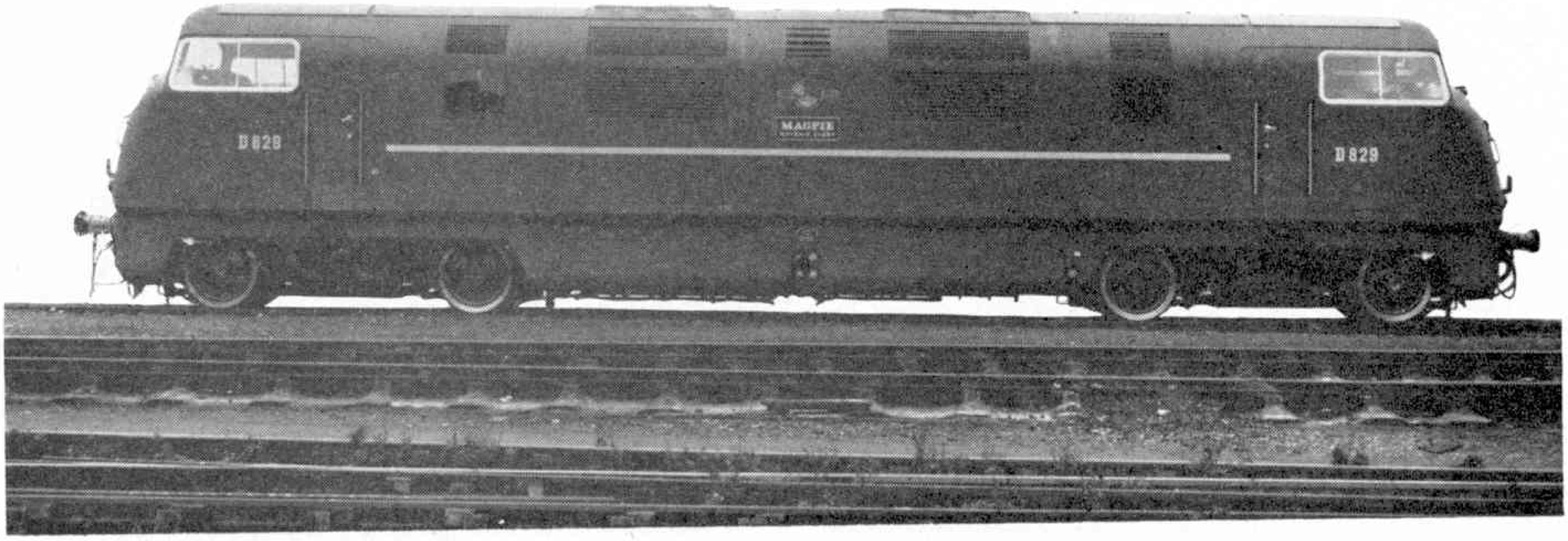
Above: One of the two V-12 cylinder 'Warship' engines from D800 'Sir Brian Robertson'.

Above right: One of the all-welded construction bogies for the D800.



Right: A photograph of the Maybach crankshaft from one of the diesel units.

The 'Warship' diesel-hydraulic locomotive No. D829 'Magpie'



Howl of the Wild—from page 9

bulged at what followed next. The wolves near the wounded beast fell on him and ripped him to pieces. They must have been nearly starving and gave Martin and Digger a grim warning of what would happen to them if they left the safety of the aircraft. It was possible that Martin Tracey had been mistaken in shooting the wolf, because it had given the others a reminder of the taste of blood . . .

Mistake or not, the crack of the rifle was a comforting sound and Tracey shot six more of the lean killers before putting the gun back in the rack 'What's up?' asked Digger. 'Losing your touch? Give me the rifle and I'll plug a few.'

Out of ammunition

Tracey shook his head and grinned crookedly. 'No more ammunition. Some clot left the one clip in the magazine and the bandolier has been forgotten.' Digger didn't like this news at all. There were more than a dozen hungry, excited wolves outside the Beechcraft, the rescue 'plane was two hours away and the cold was making his teeth chatter while a deadly, numbing chill was spreading up from his feet.

The two pals tried stamping their feet, but the confined space in the cabin prevented any sort of exercise. Martin Tracey switched on the landing lights but the wolves were not to be frightened by that. The situation was becoming desperate in the extreme. To get warm, the two *had* to leave the aircraft to walk round but the wolves prevented any possibility of that.

Tracey was gravely worried. The chance of death had now become a probability rather than a possibility and while he was the last man to sit tamely waiting for the end, the alternative of the wolves was too much to contemplate. Then he sat bolt upright, an idea, a desperate idea, had come to him.

Tracey's brainwave

He wriggled out of his seat and stumbled awkwardly to the rear of the cabin and fumbled in a locker to return with half a dozen tubular objects clasped in his arms.

'Flares? Why have you got the flares out?' asked the puzzled Digger.

'Just an idea,' replied Martin. He jammed four of the flares into the belt of his flying-suit and kept the other two under his arm. Then he picked up the rifle and, before Digger had chance to argue, he had opened the door of the aircraft and jumped out. The sudden move made the wolves retreat a short distance before they regrouped and slowly advanced again.

But, in those vital thirty seconds, Tracey had jammed two flares tail-first into the snow and smashed the rifle butt on to the percussion cap. The flares burst into noisy, sizzling flame and Tracey hit them as hard as he could with the rifle. The flares sailed a dozen feet towards the wolves who bolted, panic-stricken, for some distance. The respite gave Martin time to ignite two more flares and follow up his advantage.

The wolves retreated even further and, even when the flares had burnt out, kept a respectful distance. Digger had joined Tracey and both of them took the chance to dance about, waving their arms and shouting. The exercise kept them warm while the activity and noise baffled the wolves.

Inevitably they began to move in again, but two more flares sent them scurrying away. Yet another pair of flares were sent bounding over the snow and these decided the leader of the pack. He moved slowly further away and then broke into a trot. The rest of the pack followed him, leaving a jubilant Martin Tracey and Digger Ames behind them.

Rescuers overhead

Tracey grinned happily and lifted a warning hand. 'Listen,' he said. This time the noise Digger heard was the nicest music he had ever heard—the steady drone of an aircraft.

'Tell you what, Dig,' said Martin, 'let's have a party. We'll set off the rest of the flares so that those jokers have no excuse for missing us. And I'll tell you something else. Our next trip is going to be in England—all the wild animals are in the zoo there!'

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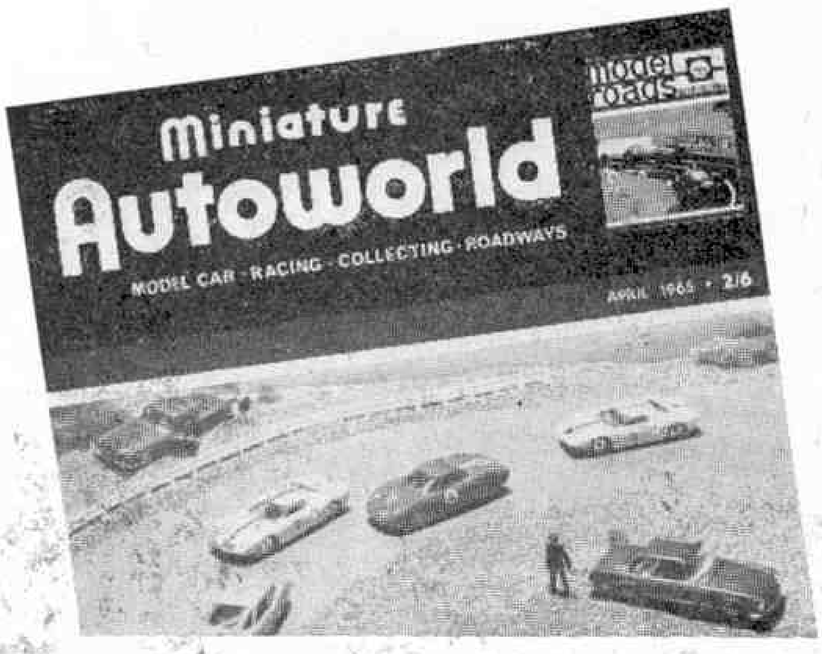

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Showman's Traction Engine

by **Spanner**

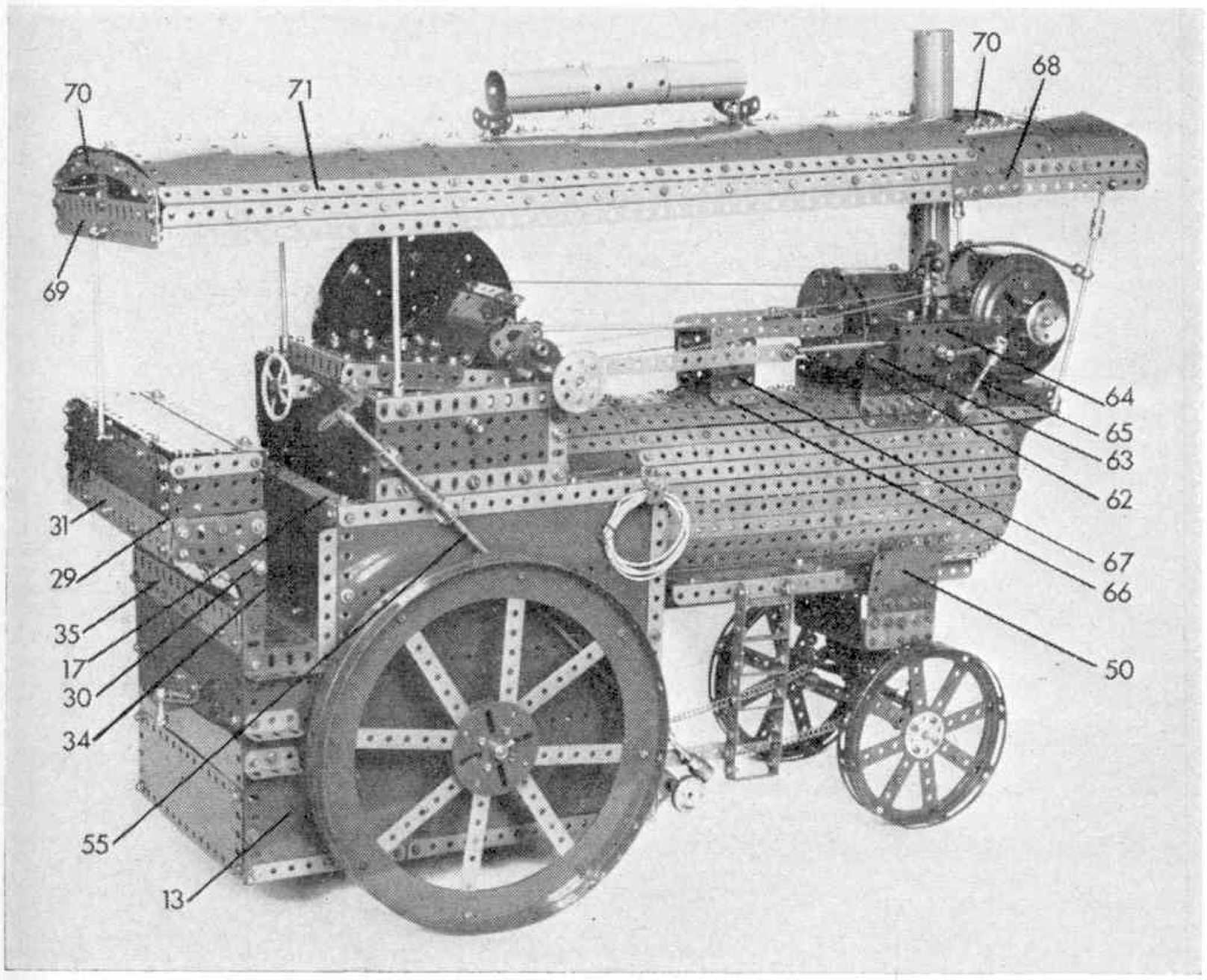
TRACTION Engines have always been popular with model-builders and although they are now a very rare sight indeed, at one time there were many different types of engine in existence. Perhaps the most famous of all was the Showman's Engine, for this accompanied circuses and fairs all over the country. Not only was it used to haul wagons from one site to the next, but it powered a generator which was used to supply electric for sideshows, etc. I have received many requests for a model based on this type of machine, so here I give full building instructions for a large Showman's Engine which I am sure you will find interesting.

The Boiler

Twenty-nine 12½ in. Strips are bolted to a Hub Disc and two Circular Girders. Two 12½ in. Angle Girders 1 are fixed to the bottom of the boiler leaving a gap, equalling the width of one Strip, between them. On top of the boiler the uppermost nine Strips are extended by 5½ in. Strips 2 overlapping five holes. At the front of the boiler, Flexible Gusset Plates 3, braced by 2½ in. Strips, are fixed and they are joined across the top by a 4½ in. × 2½ in. Flexible Plate and a 4½ in. Strip 4. Girders 1 are then extended by 9½ in. Angle Girder 5, overlapped eight holes.

At the front, the boiler consists of a Toothed Disc, Part No. 168d, held in place by two 2½ in. Strips. A 1 in. Bolt is passed through the centre hole and holds a ¾ in. Washer and two Collars, one of which has a Long Threaded Pin fixed in it and the other, a Threaded Pin. The front should not be fitted until the model is completed, so as to allow easy access when the top fittings are being secured.

The completed Meccano model of the Showman's Traction Engine.



The Body

Both the sides of the body are similarly constructed. A framework is made from three 9½ in. Angle Girders 6, 7 and 8 and a built-up angle girder 9, which consists of a 7½ in. and a 5½ in. Angle Girder joined by a 2 in. Angle Girder. The framework is filled-in by four 9½ in. Strip Plates 10, which overlap one hole, the gap at the bottom being filled by two 5½ in. Flexible Plates. A further 9½ in. Angle Girder 11 is bolted to the end of the built-up angle girder 9 and a 5½ in. Angle Girder 8. The resulting space is filled in by three 2½ in. × 2½ in. Flexible Plates 13. In effect, these fill a space which reaches up to a position eight holes from the top of the Girders. The Strip Plates 10 are braced inside by two 9½ in. Angle Girders 14 and 15, which are fixed seven and eleven holes from the bottom respectively. The sides are then joined together by 7½ in. Angle Girders 16, 17, 18, 19 and 20, Angle Girder 20 being bolted to the Angle Girder 14. A sixth 7½ in. Angle Girder 21 is also bolted to the Angle Girder 14.

The boiler and body can now be joined by bolting Girders 5 between Girders 20 and 21, and by bolting the Hub Disc at the rear of the boiler to Angle Girders 18 and 19. The front of the body is filled in by two 7½ in. × 2½ in. Strip Plates 22, a 4½ in. × 2½ in. Plastic Plate 23 and a 5½ in. × 1½ in. Plastic Plate 24. A 2½ in. × 2½ in. Plastic Plate 25 is bolted to a 2½ in. × 1½ in. Plastic Plate and together they are bolted between the Strips 2 and Angle Girders 7. A 4½ in. Strip 26 and two 2 in. Strips are then bolted across the back.

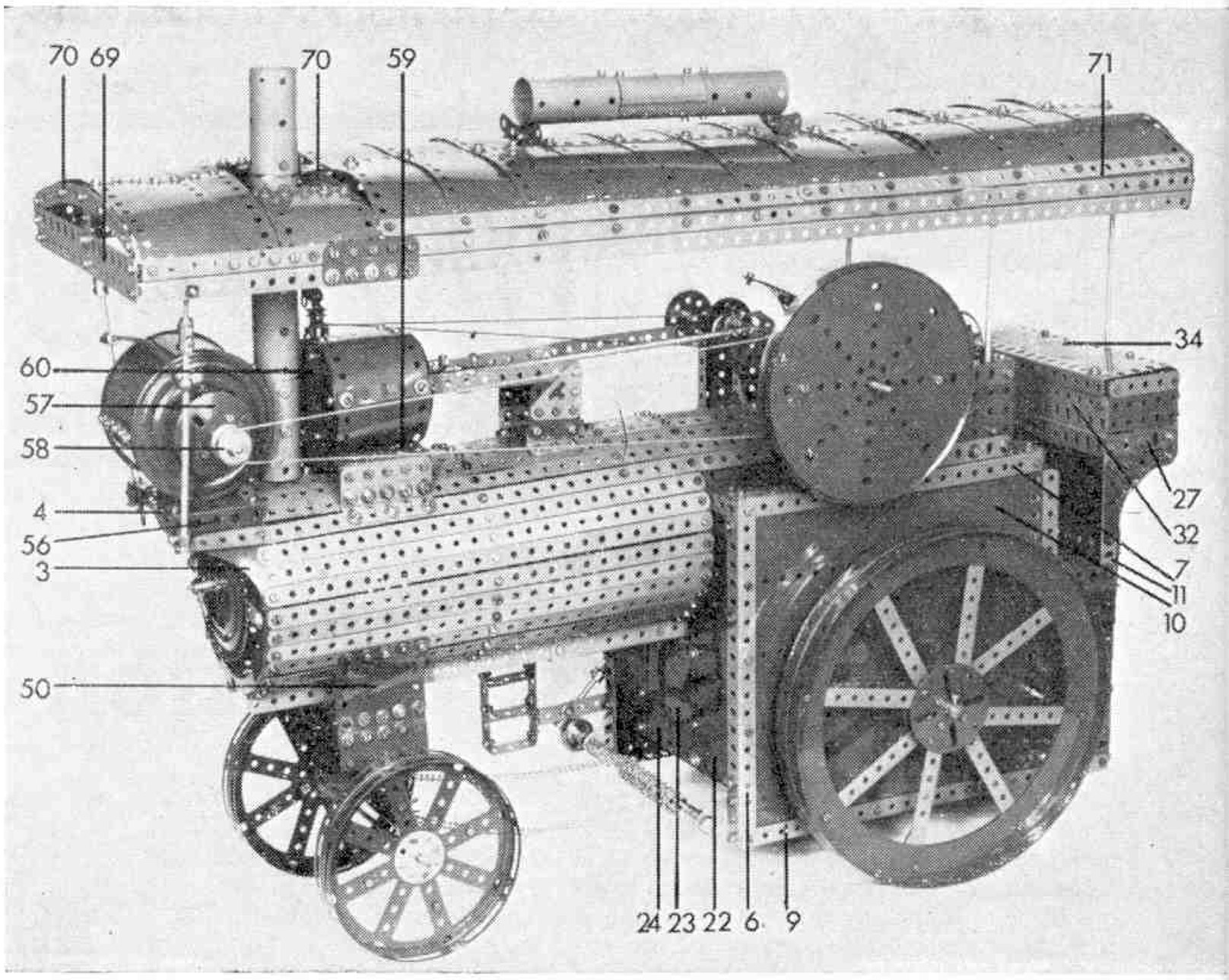
At the rear of the body, two 2½ in. Angle Girders 27, joined together by two 7½ in. Angle Girders 28 and 29, are bolted to the top of Angle Girders 7. 1½ in. Corner Brackets are bolted to Girders 27 and 29 and also to Girders 27 and 28, behind the Flexible Gusset Plate 30, which is fixed to the Angle Girder 11 and the Angle Girder 27 by Fishplates.

Next, a $7\frac{1}{2}$ in. Flat Girder 31 is bolted, with a $7\frac{1}{2}$ in. $\times 2\frac{1}{2}$ in. Strip Plate, to the Angle Girder 29. The top of the Plate is edged by a $7\frac{1}{2}$ in. Strip. Two $2\frac{1}{2}$ in. $\times$ $1\frac{1}{2}$ in. Flanged Plates, edged by $2\frac{1}{2}$ in. Strips, are fixed to the Strip Plate and bolted to their other flanges is a second $7\frac{1}{2}$ in. Flat Girder 32. Another $7\frac{1}{2}$ in. $\times$ $2\frac{1}{2}$ in. Strip Plate 33, with a $7\frac{1}{2}$ in. Angle Girder bolted to it, is fixed to the top by hinges.

To fill in the driver's compartment, two $5\frac{1}{2}$ in. $\times 2\frac{1}{2}$ in. Flat Plates 34 are bolted to Angle Girder 17. They in turn have a $7\frac{1}{2}$ in. Angle Girder bolted at the bottom which has two $5\frac{1}{2}$ in. $\times 2\frac{1}{2}$ in. Flat Plates fixed to it to form the floor. The underneath of the coalbunker is filled-in by bolting four $3\frac{1}{2}$ in. $\times 2\frac{1}{2}$ in. Plastic Plates to the Flat Girder 35 and these are held behind a $7\frac{1}{2}$ in. Strip fixed to the Flexible Gusset Plates 30 by 1 in. Angle Brackets.

Crank Shaft and Gear Train Casing

A $5\frac{1}{2}$ in. Angle Girder is bolted to each Angle Girder 7, then a $7\frac{1}{2}$ in. Angle Girder 36 is bolted between Angle Girders 7 as shown. Girder 36 is connected to the $5\frac{1}{2}$ in. Angle Girders by $2\frac{1}{2}$ in. Angle Girders and the side is filled in by a $5\frac{1}{2}$ in. $\times 2\frac{1}{2}$ in. Flat Plate 37 which has a $5\frac{1}{2}$ in. Angle Girder fixed along the top. The $5\frac{1}{2}$ in. Angle Girders are joined at the rear by another $7\frac{1}{2}$ in. Angle Girder and the back is then filled in by two $5\frac{1}{2}$ in. $\times 2\frac{1}{2}$ in. Flat Plates, which are fixed to the Flat Plate 37 by $1\frac{1}{2}$ in. Angle Girders. Corner Brackets should be used at the front to strengthen the structure. A right-handed and a left-handed Flanged Bracket are bolted to Angle Girder 36 and each is extended one hole by means



Drive for the model is supplied by the E15R Electric Motor.

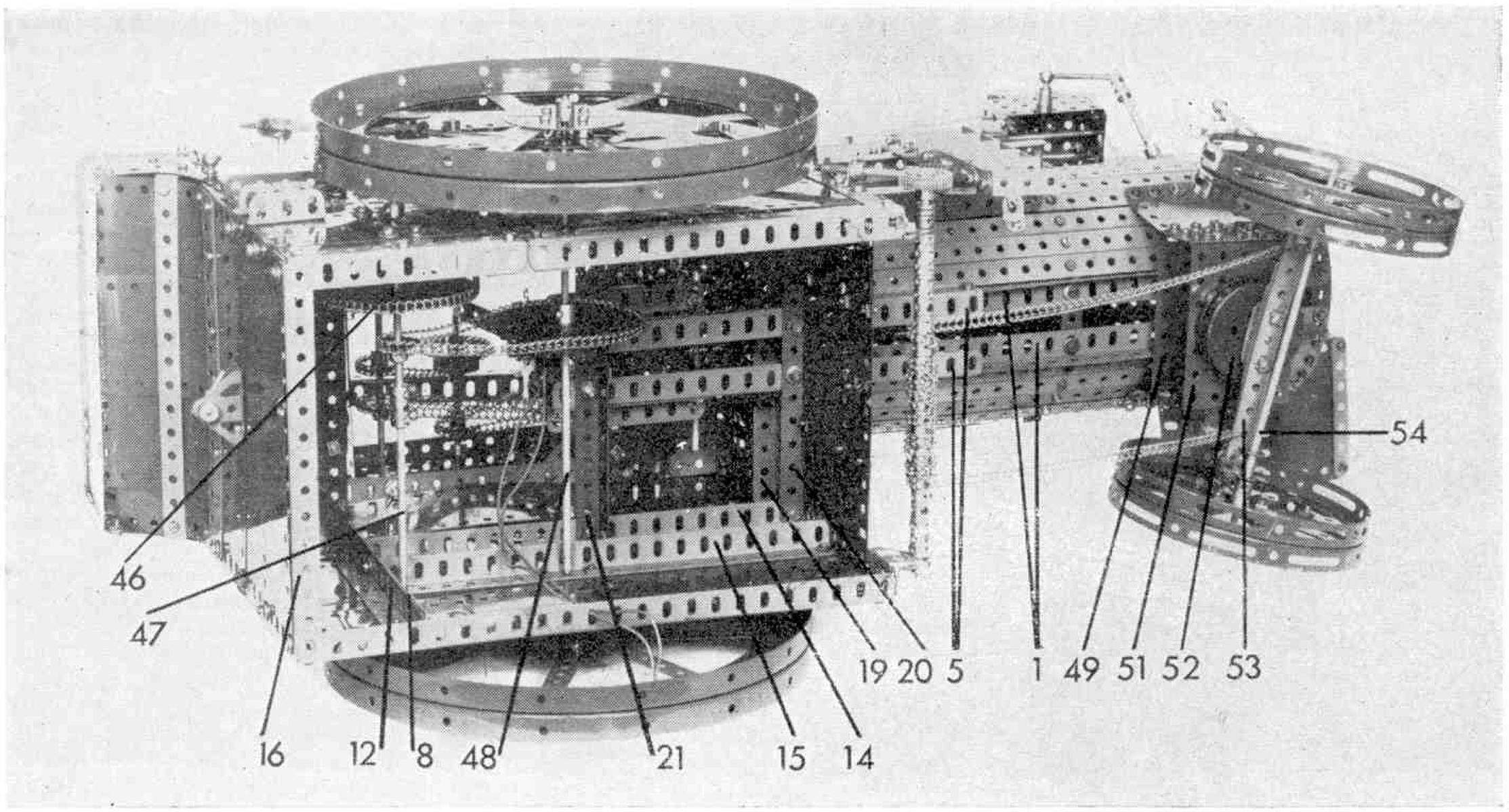
of a 1 in. Strip. They are braced by $5\frac{1}{2}$ in. Angle Girders 38, which are fixed between the Flanged Brackets and the Angle Girder at the back of the gears casing. These Flanged Brackets will later hold the Crank Shaft.

Power unit and Drive to Rear Wheels

Power is supplied by an E15R Electric Motor, housed in the body, which is supported on two $3\frac{1}{2}$ in. Angle Girders 5. An extension switch for the motor is formed by locknutting a $5\frac{1}{2}$ in. Strip to the Motor switch. The Strip should be bent sufficiently to enable it to be locknutted to the 1 in. Bolt fixed to Bush Wheel 39. Bush Wheel 39 is fixed to a $2\frac{1}{2}$ in. Rod, carrying a $1\frac{3}{8}$ in. Steering Wheel and a Collar, which is journalled in two Double Bent Strips.

A $\frac{1}{2}$ in. Pinion on the Motor armature shaft meshes with a 57-teeth Gear on a 4 in. Rod journalled in the side plates of the Motor. On the opposite end of

An underside view of the model showing front wheel and steering arrangements.



the Rod is a ¾ in. Pinion which meshes with a 50-teeth Gear Wheel also on a 4 in. Rod journalled in the top holes of the Motor side plates. On both Rods, the Gears are spaced from the Motor by Collars. On the same side as the 50-teeth Gear is a ¾ in. Sprocket Wheel, linked by Chain to a 1 in. Sprocket Wheel 40 on an 8 in. Rod 41. The Rod is held in place by Collars.

On Rod 41 is a second 1 in. Sprocket Wheel, joined by Chain to a 1½ in. Sprocket 42 on an 8 in. Rod 43. Also mounted on Rod 43 is a 1 in. Sprocket Wheel 44 and a ¾ in. Sprocket Wheel 45. Sprocket Wheel 45 is, in turn, connected by Sprocket Chain to a 3 in. Sprocket Wheel 46 on a compound rod 47 formed from two 4½ in. Rods joined by a Coupling. A ¾ in. Sprocket Wheel on rod 47 drives, by Sprocket Chain, a 3 in. Sprocket Wheel on an 11½ in. Rod 48.

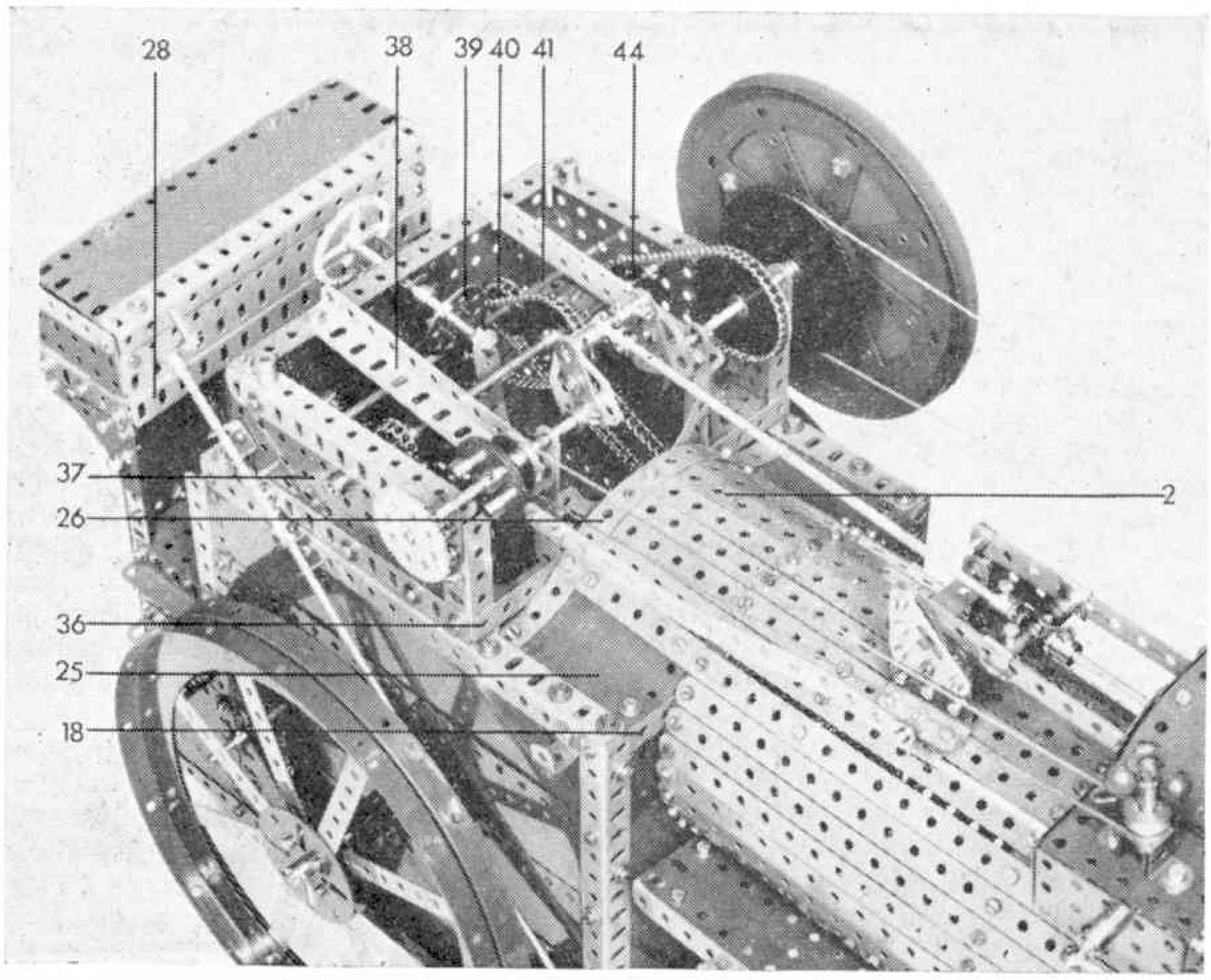
The Wheels and Steering Assembly

Both rear wheels consist of two Face plates joined by ¾ in. Bolts passed through the four inside holes. Between the Face Plates are Collars and a 4½ in. Strip is placed on each side of the Collar. The eight Strips are then bolted alternately in between two 9⅞ in. Flanged Rings. After this the wheels are fixed to Rod 48, being spaced from the sides of the body by a Double Bent Strip.

The front wheel mountings are formed as follows: A 3½ in. × 2½ in. Flanged Plate 49 is fixed to the Angle Girders 1 by 1½ in. Bolts, but are spaced apart by a Collar and three Washers. A 2½ in. Flat Girder is fixed to the Flanged Plate and butt-jointed to this by a further 2½ in. Flat Girder is Plastic Plate 50, which is also fixed to the side of the boiler. A second 3½ in. × 2½ in. Flanged Plate 51 also has 2½ in. Flat Girders attached to its Flanges. The Flat Girders are then bolted to the Flat Girders on Flanged Plate 49.

Next, two 1⅛ in. Bolts are passed through opposite holes in a 2 in. Pulley and three Washers are placed on their shanks. They are then locked in position with Nuts. The Pulley is fitted in Wheel Flange 52, so that the Boss and the 1⅛ in. Bolts protrude through the holes, and is locked in position by Nuts. A 1½ in. Strip is then placed on the shanks of the Bolts. A 2 in. Rod is passed through the Boss of the 2 in. Pulley and a Collar placed on it to hold the 1½ in. Strip in place.

On the other end of the Rod, a Double Arm Crank is fixed so that its Boss rests on the 2 in. Pulley and a 1 in. Rubber Ring is slipped over it to rest on the Pulley. A bolt is placed loosely through each arm of the Crank from below, the shank projecting upwards. The Rubber Ring can now be slipped underneath to hold the Bolts in place. Twelve Balls are placed round the edge of the 2 in. Pulley so that they rest against the Rubber Ring and a second Wheel Flange is placed on top so the bolts resting on the Rubber Ring pass through. The Bolts are then passed through the centre holes in Flanged Plate 51 and fixed in place.



A close-up of the body of the model showing the gearbox.

A 1½ in. Strip, three 2½ in. Strips, two 3½ in. Strips and three 5½ in. Strips 53 are mounted on the shanks of the 1⅛ in. Bolts in the Wheel Flange. A 1 in. Bolt is passed through the centre hole of a Double Bracket, so that the bolthead lies between the lugs and it is secured with a nut. A Collar is placed on it and it is then passed through the end hole in Strips 53 and held with a nut. A Handrail Coupling is mounted on the top. A similar arrangement is fixed to the other end of Strips 53. An 8 in. Rod 54 is passed through the two Double Brackets and is held in place by Collars.

Two Hub Discs bolted face to face, with a Bush Wheel bolted to the centre, are secured on the ends of Rod 54 to serve as front wheels. The steering shaft consists of a 11½ in. Rod 55, which is joined to a 3½ in. Rod by a Short Coupling. It is journalled in three Double Brackets fixed to the side of the body and held in place by Collars. The steering handle is a Double Arm Crank with a Threaded Pin secured in one hole. At the other end is a Worm which meshes with a 1 in. Gear Wheel on an 8 in. Rod. The Rod is supported in two Trunnions, bolted to the Angle Girders 6, and has eight Couplings secured on it. The 1 in. Gear is spaced from the Trunnion by a Collar and four Washers. A length of Sprocket Chain is wrapped eight times round the Couplings and the ends are tied to Strips 54 with Cord. The Grub Screws on the Couplings should grip the Sprocket Chain so that when the steering handle is turned the Chain will be pulled and the wheels will turn.

The dynamo base is a 3½ in. × 2½ in. Flanged Plate 56, which is fixed to the front of the boiler by four 1⅛ in. Bolts. Its sides are Ball Flanged Discs joined by four 2½ in. × 1 in. Double Angle Strips and two 3 in. Screwed Rods. A 6½ in. Rod is passed through the centre holes and is held in place by Collars. A Boiler End 57, fixed to the side of the Dynamo by two 1⅛ in. Bolts, a Washer and a Collar, are also mounted on the 6½ in. Rod, along with two ¾ in. Flanged Wheels 58, placed so that their Flanges touch. The Dynamo is completed by a 4½ in. × 2½ in. and two 2½ in. × 2½ in. Plastic Plates. They are not secured at the bottom but merely rest on the base Plate.

Four 2½ in. Cylinders, forming the chimney, are joined by Fishplates and are attached to the boiler by two Angle Brackets. The chimney should be fixed so that it lies flush against the dynamo. A 3½ in. × 2½ in. Flanged Plate 59 has a 2½ in. Flat Girder bolted to each flange. These Flat Girders are, in turn, bolted to two 2½ in. Angle Girders fixed to the boiler. The Angle Girders should be bent so that the Flat Girders will be perfectly vertical, thus forming the base for the cylinder. Two 2½ in. × ½ in. Double Angle Strips are bolted to the Flanged Plate 59 through the third row of holes in from each side. To their lugs are bolted a 3 in. × 1½ in. Flat Plate 60 and two Semi-circular Plates one each side of the Flat Plate, at the front and, at the rear a 2½ in. × 1½ in. Flat Plate and two Semi-circular Plates. A 1½ in. × ½ in. Double Angle Strip 61 is bolted across the middle holes. Two two sides are joined at the top by two 2½ in. × 1½ in. Plastic Plates, which are bolted to Angle Brackets fixed to the Semi-circular Plates, at the same time bolting in place two 2½ in. × 2½ in. Flat Plates which fill in the sides.

On the right-hand side of the cylinder, a $2\frac{1}{2}$ in. $\times 2\frac{1}{2}$ in. Flat Plate 62 is bolted to the base and to the Angle Brackets which hold the Plastic Plates down. This is the support for the steam chest and the same nuts which fix it to the Angle Brackets also hold a $2\frac{1}{2}$ in. $\times 1\frac{1}{2}$ in. Flanged Plate in position. The Flanged Plate has a $1\frac{1}{2}$ in. $\times 1\frac{1}{2}$ in. Flat Plate 63 bolted to each lug. The two Flat Plates are joined by a further $2\frac{1}{2}$ in. $\times 1\frac{1}{2}$ in. Flanged Plate 64. The top is filled in by a third $2\frac{1}{2}$ in. $\times 1\frac{1}{2}$ in. Flanged Plate and, to it, is bolted a Double Bent Strip. The shaft of the Governor, a 2 in. Rod, is passed through this and held by a Collar at the bottom and a $\frac{1}{2}$ in. Pulley with boss on top. A Rod and Strip Connector is placed on top of the Rod and a $\frac{1}{2}$ in. Bolt carrying two small Hooks is fixed in it. A 2 in. Rod is placed in the Handrail Support and a Coupling is fixed on its end. A $2\frac{1}{2}$ in. Rod 65 is secured in the Coupling and is held at its other end in a Rod Socket which is bolted through a Double Bracket and a Double Bent Strip fixed to the boiler.

Two $1\frac{1}{2}$ in. Angle Girders 66 are fixed to the top of the boiler by $\frac{3}{4}$ in. Bolts, but are spaced from it by five $1\frac{1}{2}$ in. Strips. They have a $1\frac{1}{2}$ in. $\times 1\frac{1}{2}$ in. Flat Plate 67 bolted to them. The Angle Girders should be bent so that the Flat Plates are vertical. The Flat Plates are extended by $1\frac{1}{2}$ in. Corner Brackets and these are connected to the lugs of the $1\frac{1}{2}$ in. $\times \frac{1}{2}$ in. Double Angle Strips 61 by $4\frac{1}{2}$ in. Strips.

The Canopy

Each side of the framework consists of two $24\frac{1}{2}$ in. Angle Girders, joined as shown and each of these is extended by two $5\frac{1}{2}$ in. Angle Girders, joined in a similar manner. The two sets of Girders are placed end to end and 'butt-jointed' by a $2\frac{1}{2}$ in. Flat Girder 68. The resulting 30 in. compound girders are connected by five $7\frac{1}{2}$ in. Angle Girders, one at each end, one at each side of the chimney-space and one through the twenty-sixth hole from the rear. The structure is strengthened at two diagonally opposite corners by a $1\frac{1}{2}$ in. Corner Bracket. One flange of the two end Girders points downwards, but those of the others point upwards.

A Trunnion, to which is bolted $1\frac{1}{2}$ in. Strip, carrying a 1 in. $\times$ 1 in. Angle bracket, is fixed to the centre of each $7\frac{1}{2}$ in. Girder. The top lugs of the first, third and fourth Angle Brackets point towards the rear, whilst those of the second and fifth point forwards. The third, fourth and fifth Angle Brackets, are joined by a compound $24\frac{1}{2}$ in. strip, made up from two $12\frac{1}{2}$ in. Strips. A $7\frac{1}{2}$ in. Flat Girder 69 is bolted to each end $7\frac{1}{2}$ in. Angle Girder.

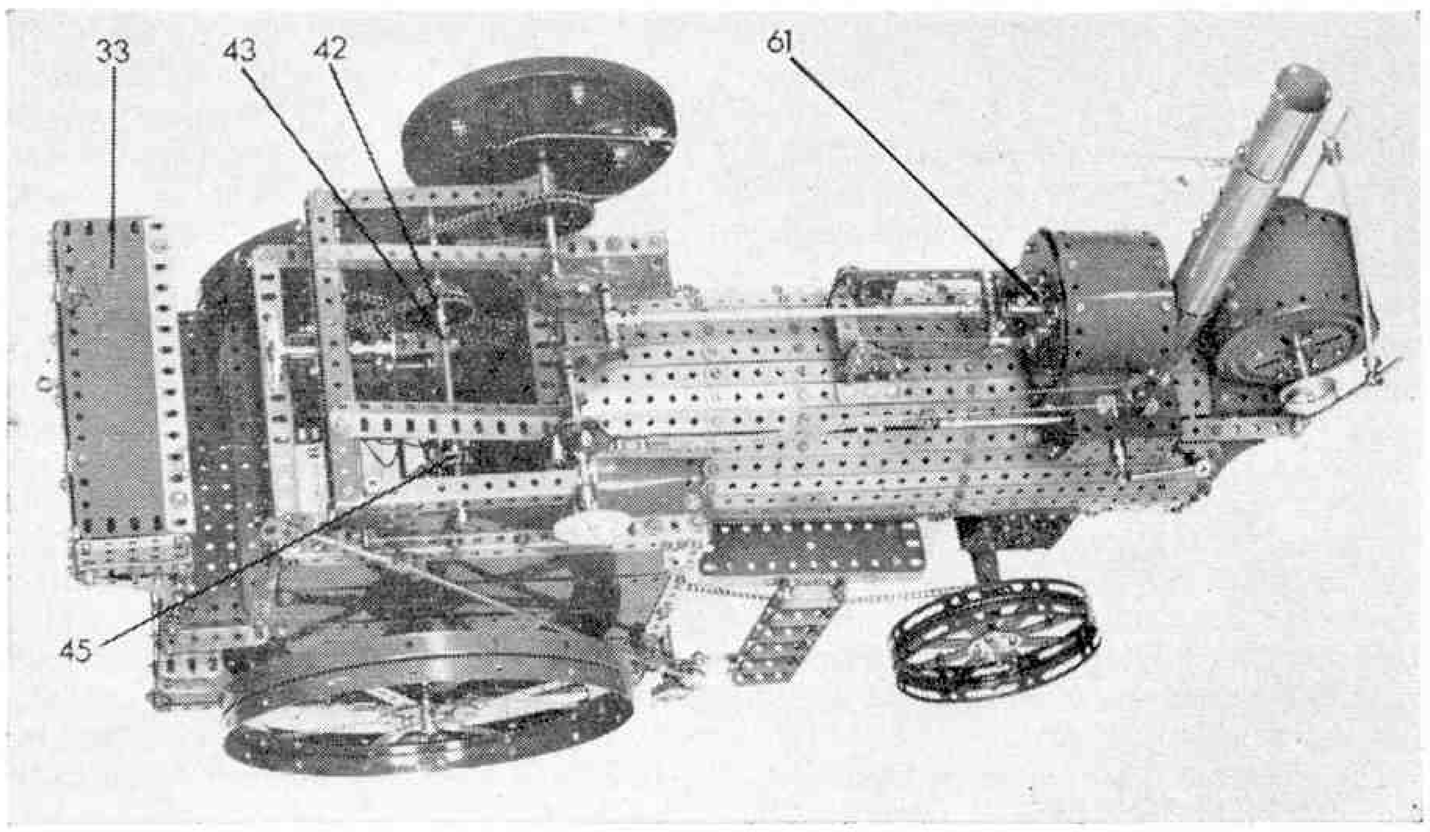
Four compound $7\frac{1}{2}$ in. curved Strips 70, built from two $5\frac{1}{2}$ in. Curved Strips, are bolted to the $1\frac{1}{2}$ in. Strips carrying the Angle Brackets and their ends are joined to the $7\frac{1}{2}$ in. Angle Girders and the Flat Girder at the end, by Fishplates.

The canopy is covered by twenty-eight $4\frac{1}{2}$ in. $\times 2\frac{1}{2}$ in. and two $2\frac{1}{2}$ in. $\times 2\frac{1}{2}$ in. Plastic Plates, arranged as can be seen. The Plates to the rear of the chimney-space are connected to the upper flange of the compound angle girders by Obtuse Angle Brackets, but those to the front of the space are bolted directly to the flanges. Three $2\frac{1}{2}$ in. $\times \frac{1}{2}$ in. Double Angle Brackets are bolted to the $7\frac{1}{2}$ in. compound curved strips beneath each $2\frac{1}{2}$ in. $\times$ $2\frac{1}{2}$ in. Plate to give support to the Plates. A further compound $24\frac{1}{2}$ in. strip 71 is fixed in place by the same bolts holding the Obtuse Angle Brackets.

A chimney extension is built up from three $2\frac{1}{2}$ in. Cylinders, joined by Fishplates and is fixed to the canopy by two Reversed Angle Brackets to both of which is bolted a $2\frac{1}{2}$ in. Curved Strip.

Finally, the completed canopy is joined to the engine with Rods of various lengths as shown. Working from the back forwards, the lower rod fixtures are one Handrail Support, two Rod Sockets and two Cranks. The canopy-supports are held in position at the top by, from the rear, a Handrail Support, four Collars —two on each Rod, one above and one below the flange of the compound girder —and a further two Handrail Supports.

The Traction Engine seen from above with the canopy removed.



Parts required

35 of No. 1	1 of No. 26	6 of No. 111d
3 of No. 1b	1 of No. 27a	2 of No. 114
11 of No. 2	1 of No. 27d	2 of No. 115
21 of No. 2a	2 of No. 31	1 of No. 115a
1 of No. 3	1 of No. 32	1 of No. 116a
1 of No. 4	815 of No. 37a	4 of No. 118
6 of No.5	715 of No. 37b	2 of No. 125
3 of No. 6	280 of No. 38	4 of No. 126
17 of No. 6a	1 of No. 38d	1 of No. 126a
4 of No. 7	1 of No. 40	1 of No. 130
2 of No. 8	6 of No. 45	15 of No. 133
14 of No. 8a	4 of No. 46	5 of No. 136
19 of No. 8b	9 of No. 48	5 of No. 136
13 of No. 9	10 of No. 48a	2 of No. 136a
2 of No. 9a	2 of No. 50	1 of No. 137
5 of No. 9b	5 of No. 51	1 of No. 139
9 of No. 9d	2 of No. 52a	1 of No. 139a
2 of No. 9e	5 of No. 53	1 of No. 146
4 of No. 9f	2 of No. 57c	1 of No. 162a
16 of No. 10	1 of No. 58	1 of No. 166
5 of No. 11	30 of No. 59	4 of No. 167b
7 of No. 12	3 of No. 62	2 of No. 168a
7 of No. 12a	2 of No. 62b	1 of No. 168b
2 of No. 12b	13 of No. 63	4 of No. 179
29 of No. 12c	1 of No. 63d	1 of No. 185
2 of No. 13	6 of No. 70	1 of No. 189
3 of No. 13a	1 of No. 72	6 of No. 190
1 of No. 14	1 of No. 73	1 of No. 191
2 of No. 14a	6 of No. 74	4 of No. 192
2 of No. 15	2 of No. 80a	2 of No. 194
6 of No. 15a	8 of No. 89	9 of No. 194a
3 of No. 15b	2 of No. 90	7 of No. 194b
1 of No.16	2 of No. 94	29 of No. 194c
1 of No. 16a	1 of No. 95	1 of No. 194d
1 of No. 16b	1 of No. 95a	2 of No. 194e
1 of No. 17	2 of No. 95b	8 of No. 195
3 of No. 18a	2 of No. 96	7 of No. 196
1 of No. 19 b	3 of No. 96a	2 of No. 200
1 of No. 19c	8 of No. 103f	4 of No. 201
2 of No. 20	5 of No. 103k	2 of No. 212a
2 of No. 20b	4 of No. 109	4 of No. 214
1 of No. 22	6 of No. 111	7 of No. 216
1 of No. 23a	11 of No. 111a	1 E15R
1 of No. 25	32 of No. 111c	Electric Motor

Answers to puzzles on page 17

Tricky Teasers

A. (1) All items of furnishing, except sink.
(2) All characters in Shakespeare's plays except Hathaway who was his wife.
(3) All played with a ball except archery.
(4) The fruits all grow in Britain except the orange.

B. 110 yards.

C. 98—76+54+3+21=100

Quick Quiz

1. New Zealand
2. Coracle
3. Vanguard. 119/132 passengers
4. Bugle
5. Pygmy shrew. (2 in. long)
6. New Forth road bridge

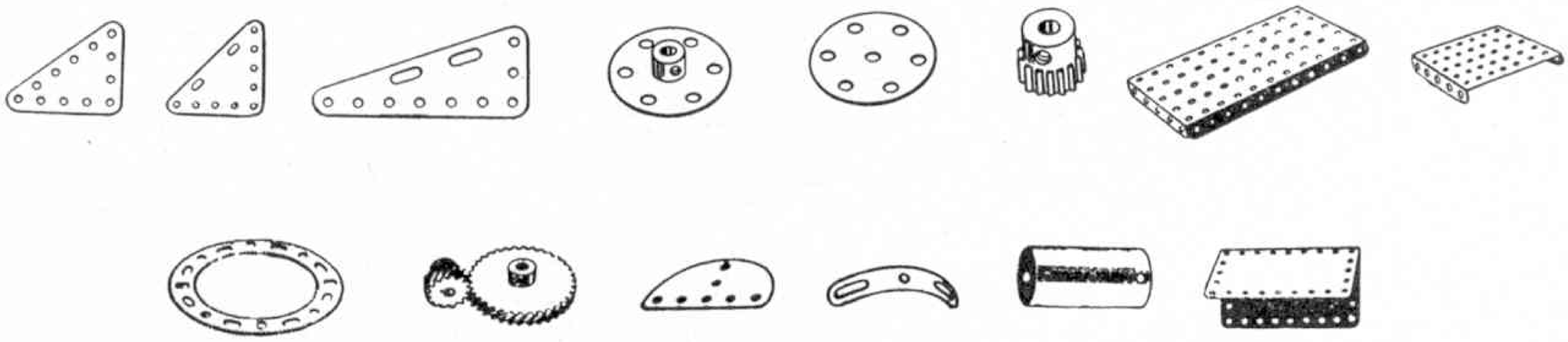
Score: 30 or over, excellent
25 or over, good

Car Quiz

Ford Consul Cortina

Crossword Puzzle No. 6

■	■	M	A	R	M	A	L	A	D	E	■	■
S	T	A	G	E	■	D	I	S	E	A	S	E
■	S	N	I	G	G	E	R	■	W	R	E	C	K
■	R	A	T	I	O	N	A	L	■	■	E	L	I
■	■	G	A	M	E	■	■	U	P	■	A	N
■	D	E	T	E	S	T	■	■	S	E	M	I	■
W	O	M	E	N	■	■	P	■	■	T	■	R	■
A	P	E	■	T	H	R	A	S	H	■	■	■	O
T	E	N	T	■	O	■	I	■	■	M	O	O	D
T	■	T	A	P	P	I	N	G	■	■	U	■	E
L	■	■	P	■	E	N	T	R	U	S	T	■	■
E	A	S	E	■	S	■	■	A	R	A	B	■	■
■	■	■	R	■	■	■	R	I	G	G	I	N	G
■	S	I	S	T	E	R	■	N	E	E	D	■	■



Dealers who specialise in Meccano spare parts

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

C. G. MARSHALL
Maxwell Road
BEACONSFIELD
Telephone: 1092

BATESON'S SPORTS DEPOT LTD.
58 Abingdon Street
BLACKPOOL
Telephone: 24061

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402 Wimborne Road
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Telephone: Winton 309

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Telephone: 2-6185

BARRETT'S LTD.
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Telephone: 6161

GORDON EASTON & CO.
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CARLISLE
Telephone: 22947

R. M. HILL & SONS
36/40 Castle Street
CARLISLE
Telephone 21621 and 21122

W. PAINE & CO. LTD.
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CHATHAM, Also at Strood and Grays
Telephone: 45215

DOLL'S HOSPITAL (YOUNGSTERS)
55 Hallgate
DONCASTER
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FLETCHERS (Sports) LTD.
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GLOUCESTER
Telephone: 22974

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Pymble (SYDNEY) N.S.W.

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

NEW ZEALAND

BUNKERS LTD.
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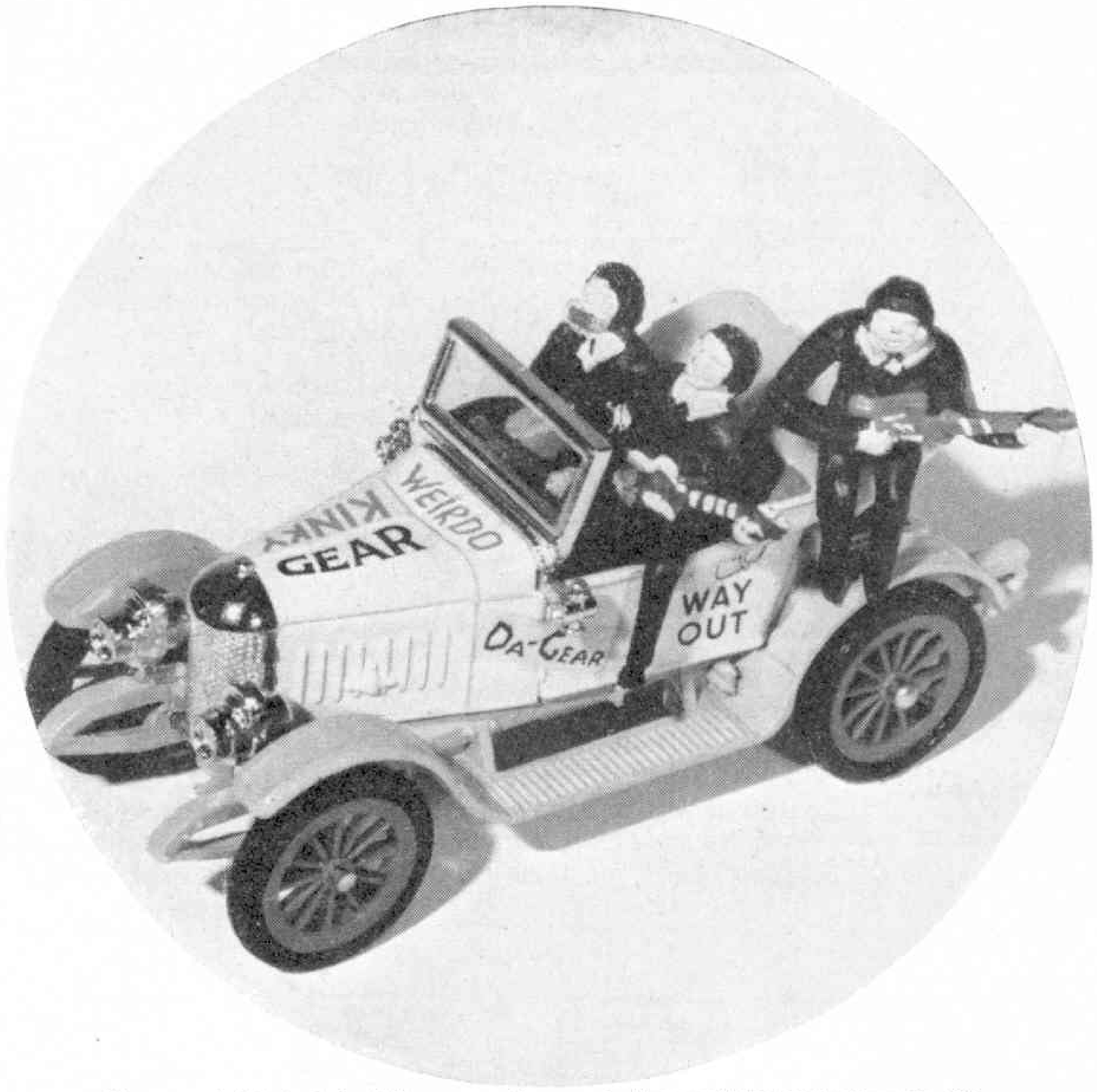
HASTINGS
Telephone: 84-283 (Mail orders welcomed)



It's way out, fab, in fact, all the gear as they say in Liverpool! It's Dinky Toys No. 486 'Dinky Beats' Morris Oxford.

IT had to happen! With Meccano Limited being based in Liverpool and Liverpool being the centre of the current 'beat' music craze, it was only a matter of time before Dinky models became involved with the 'Mersey' sound. The result is Dinky Toys No. 486, the 'Dinky Beats' bull-nosed Morris Oxford.

A traditional version of the bull-nosed Morris was introduced last February, but the 'beat' version is hardly recognisable as the same model. Naturally, the basic shape is unchanged, but the overall appearance is totally different. To begin with, the colour-scheme of the traditional release has been changed from a fairly respectable yellow body on a deep blue chassis, to a dazzling pink body on a bright turquoise chassis.

MERSEY BEAT IN DINKYLAND

Also, cleverly 'daubed' on the body, in various-coloured lettering, are slogans in popular 'beat' language, such as 'Fab!' 'Gear!' and 'Way Out', not forgetting 'Weirdo!' and 'Kinky!'.

Like the earlier version, the headlamps, sidelamps and radiator-grill are 'brass' finished, but the raised khaki hood has been replaced by a representation, in yellow polystyrene, of a folded hood.

Inside the model, other details are vastly different. The staid Edwardian gentleman in February's Morris has been replaced by three members of the fabulous 'Dinky Beats'. They are dressed in character, from their long hair to their black lapel-less jackets and narrow trousers. The driver is apparently playing a mouth-organ, while his two passengers are each equipped with a bright red guitar.

Passengers aboard

It is not strictly correct to describe the group as being inside the car, for although the driver is correctly seated, the front seat passenger is resting his foot outside and the third member is sitting on the hood with both legs stuck outside. This might not please the accident prevention people, but it certainly adds to the appearance of the model and, after all, it is a model. In my opinion, it is 'the gear', as they sometimes say here in Liverpool.

Commercial Artic. Model

Our second new release this month is a further addition to the commercial vehicle range of Dinky Toys. Marketed under sales No. 914, it is officially termed as an A.E.C. Articulated Lorry, being based on the A.E.C. Mercury Tractor. Complete with the tractor is a long detachable trailer equipped with an opening tailgate and an auxiliary, retractable 'undercarriage'.

This is to allow the trailer to remain level when detached from the tractor but, when the tractor is coupled-up, the undercarriage folds upwards out of the way. Also supplied is an imitation 'canvas' cover made from unbreakable polystyrene, which fits on to the trailer. When fitted, it appears extremely realistic.

Automatic coupling

A cleverly designed, yet amazingly simple coupling arrangement is built into the model. Basically, it consists of a hook laid flat in a recess in the tractor chassis and pivotted so that it can move from side to side. Leading into the recess is a guide trough running to the back of the chassis.

When the tractor is backed on to the trailer, a knob underneath the trailer

Geoffrey Walker and brother, Christopher, are both keen Dinky Toy collectors as can be seen in the photograph below.

floor runs up the guide trough and pushes the end of the hook aside to slip into the recess. The hook then swings back, thus holding the knob in place. To disconnect the two sections, the trailer is lifted so that the knob is raised out of the recess.

Overall, the complete model is $8\frac{5}{16}$ in. long, the individual lengths of both the tractor and trailer being $4\frac{3}{10}$ in. and $5\frac{1}{6}$ in. respectively. The cab is fitted with windows, seats and steering wheel, in addition to the new 'Hi-Lite' headlamps. Tractor finish is in red with British Road Services transfers applied in the correct positions, while the trailer is silver grey. The removable cover is coloured green and has 'British Road Services' in large letters along each side. Identical words also appear on the cab, above the windscreen.

Versatile load-carrier

In real life, the Mercury tractor is the one really standard item. The trailers are available in all sorts of different forms, ranging from petrol-type tankers to ordinary wagons similar to that supplied with the Dinky Toys model. This incidentally, is produced to our own design and is not based on any particular prototype.

Although the actual vehicle is described as being an A.E.C., this company produces only the complete chassis. The bodywork and fittings are provided by Park Royal Vehicles Ltd., of London, and Charles H. Roe Ltd., of Leeds, both of whom are closely associated with A.E.C.

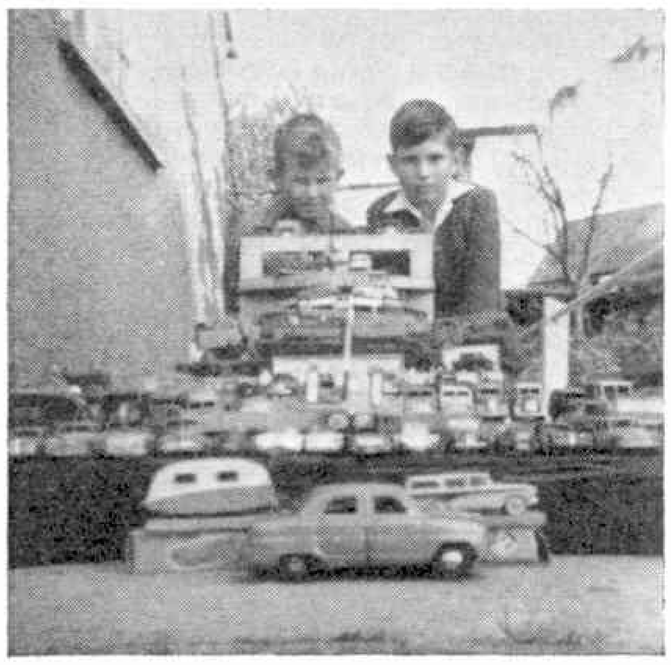
Before finishing, I should like to apologise for a mistake which I made in these pages last month. You may remember that I quoted the licence number of the Vauxhall Victor 101 as being MTB 217C and that of the Austin 1800 as INJ 483C. In actual fact, the two are numbered INJ 483C and UVR 576B, respectively.

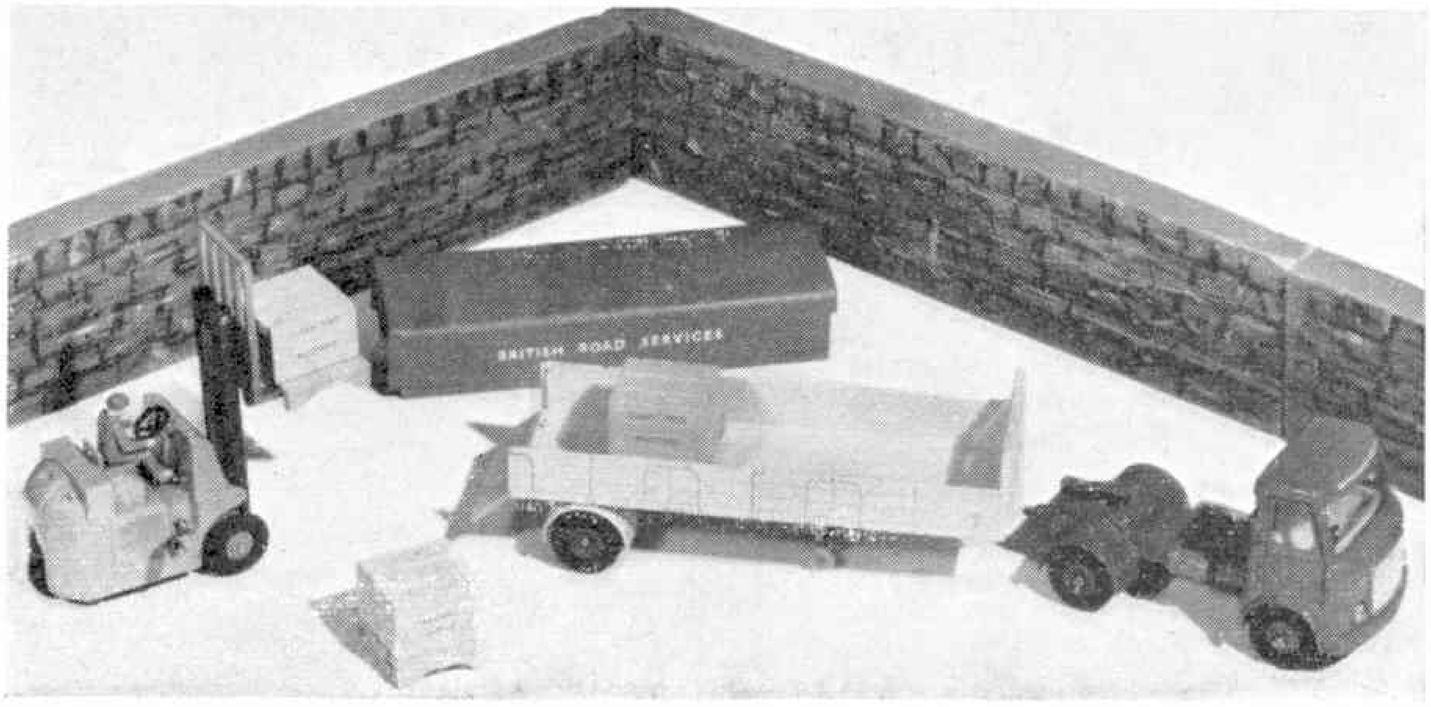
I will end with my annual hints to those of you who will be playing with your models in the garden or on the beach during the summer. Do not oil the wheels before starting, as oil attracts grit which soon clogs the bearings. In fact, it is a good idea to wipe off all traces of any oil you might have applied earlier, no matter how long ago you did it. If you should get a model wet, dry it as soon as you can and, in any case, wipe all wheels and axles before putting your models away each time you finish with them. This will prevent the parts turning rusty.

One of the latest exciting Dinky Toys is this model of an A.E.C. articulated lorry, loaded and ready to travel, the trailer has a removable plastic imitation 'canvas' cover with B.R.S. printed on the side.

Above: The real-life A.E.C. Mercury Tractor on which the latest Dinky Toy is modelled.
Below: The trailer of the lorry can be disconnected as on the actual lorry!

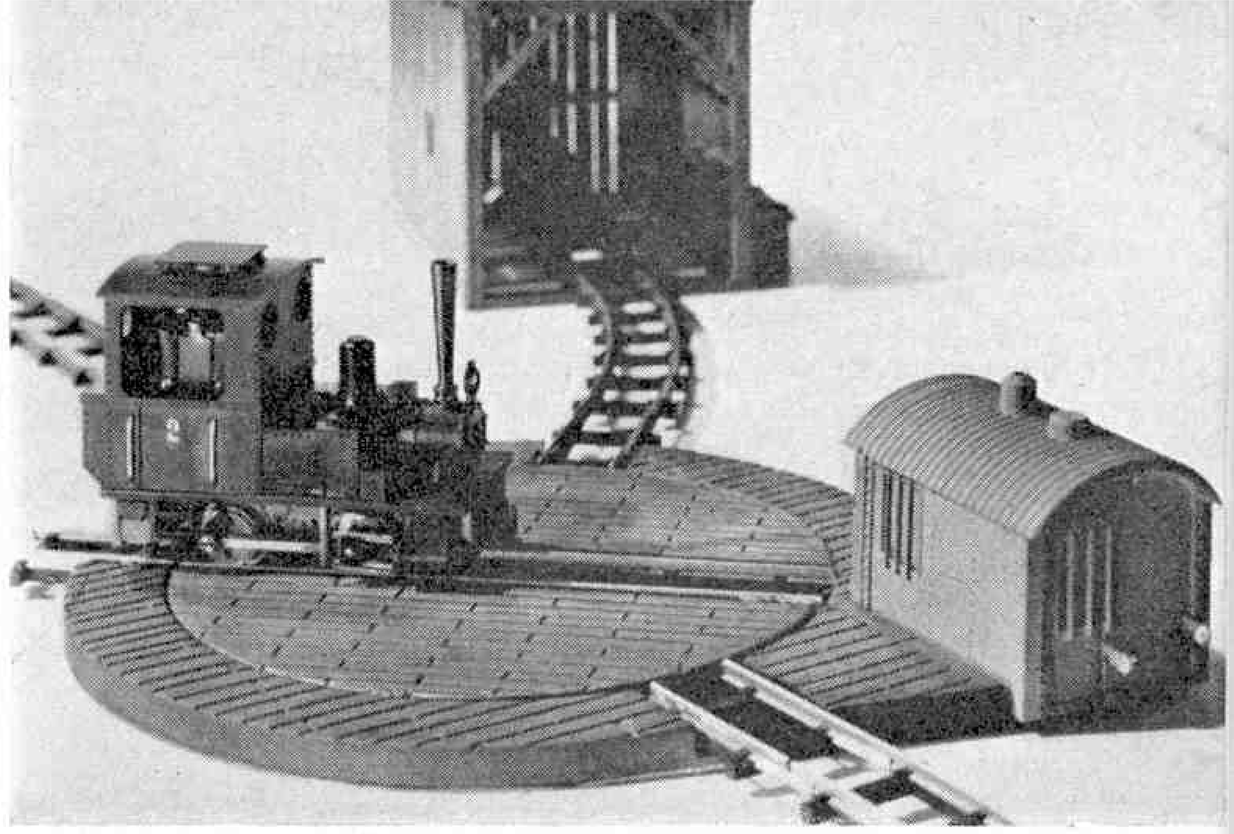
Trevor Payne and brother, Keith, come from Churchill in Oxfordshire and also have a fine collection of Dinky Toy models.





WINDOW SHOPPING

at the Nuremberg Toy Fair



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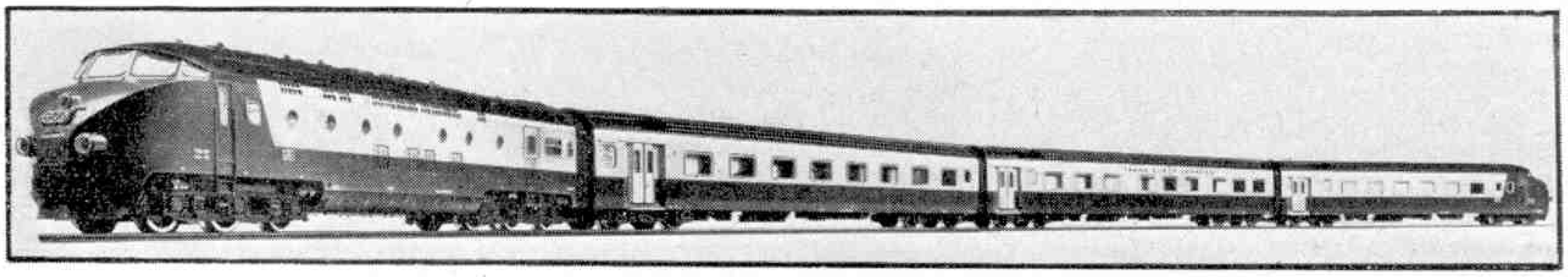

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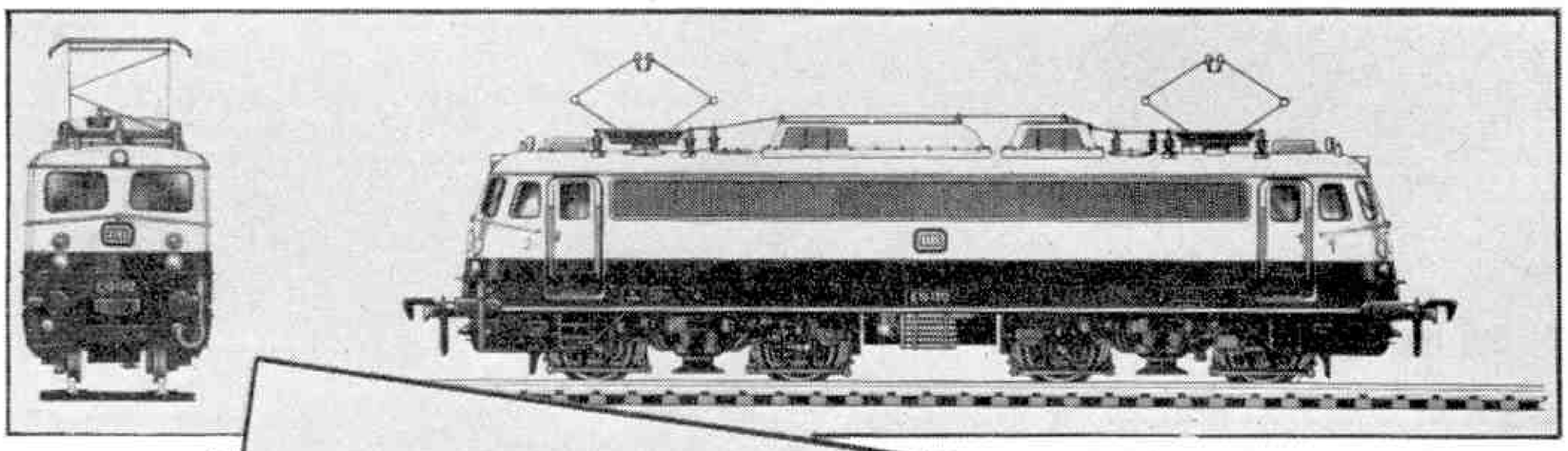

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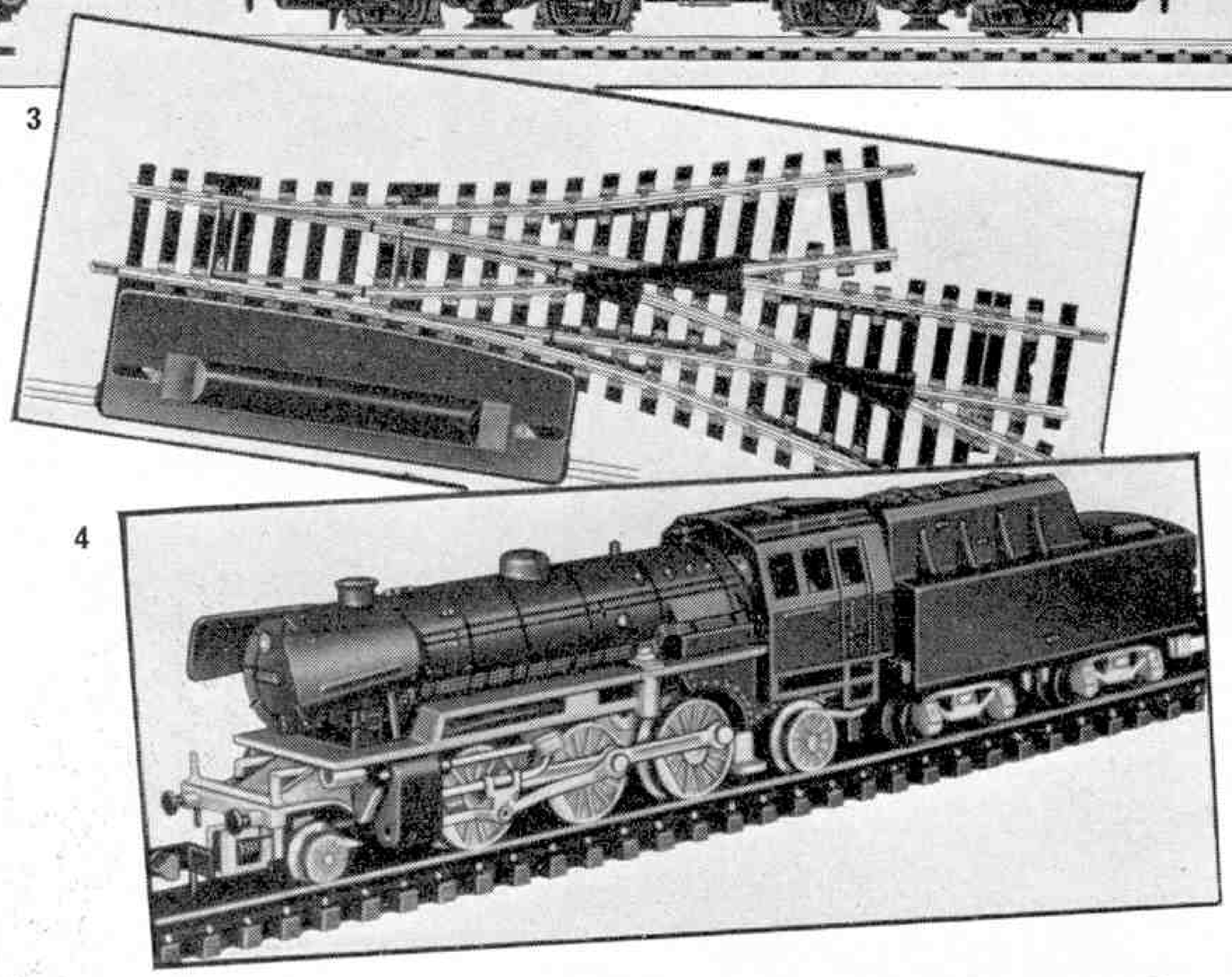

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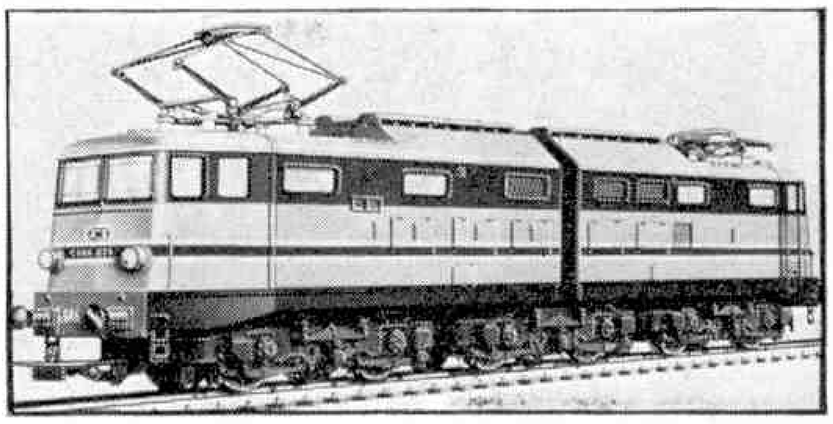


5

PROBABLY the greatest show of toys and models in the world, the Nuremberg Toy Fair would prove of great interest to all model railway enthusiasts' Below are shown a few of the new models which were on display and although the accent is on model trains, future issues will contain details of other models seen at the exhibition . . .

1 One of the most impressive displays at Nuremberg was the layout for the "Egger-Bahn". This is in "000" gauge, but as a working industrial railway or narrow-gauge light railway, it looks absolutely in place on a "00" system. Egger-Bahn have some excellent projects which will shortly be on the market, for example; the automatic turn-table as illustrated. Available through Richard Kohnstam Ltd., 13-15a High St., Hemel Hempstead.

2 Among several new products, Marklin introduce the Dutch/Swiss Trans-Europ-Express "Edelweiss". This consists of a driving car, two 1st. class carriages and a restaurant car. It is finished in the original colours of plum and cream and has three white head lamps and two red tail lights, which change with the direction of the train. Marklin models are sold in this country through Richard Kohnstam Ltd., 13-15a, High St, Hemel Hempstead.

3 Fleischmann have introduced a new, three-way point and several new locomotives and carriages among which is a model of the latest German class E.10 painted in cream and blue for use with the "Rheingold" set, which includes a 'vistadome' car. Fleischmann models are available through King Charles Sports Centre, whose advertisement you will find on page 18.

4 "000" or as it has come to be known "N" gauge, was very much to the fore on the Arnold stand. These models are imported into England by the Pritchard Patent Product Co. of Seaton, Devon, who make some English bodies to fit on the German chassis. The illustration shows a new model of German 2-6-2 class 23. This is metal and has three working head-lights.

5 Rivarossi were exhibiting their new model of the latest Bo-Bo-Bo articulated express locomotive of the Italian State Railways, series E.646. This is a splendid model in green and grey with working pantograph. Also on the stand was a new model of an Italian diesel railcar. This was in light green and orange and can be seen on many local lines in Italy. Rivarossi models are available in this country through Pritchard Patent Product Co., Seaton, Devon.

by **Spanner**

TOYS IN MECCANO

ONE of the main advantages of Meccano is that within a box of Meccano components are literally hundreds of different toys! Whether you want a working model of a motor car, swing bridge or aeroplane, you can build it with Meccano. This month, for the younger Meccano modellers, I am showing how to build two toys which can provide hours of fun, the first being a target pistol, which fires washers, and the second, a skittle game.

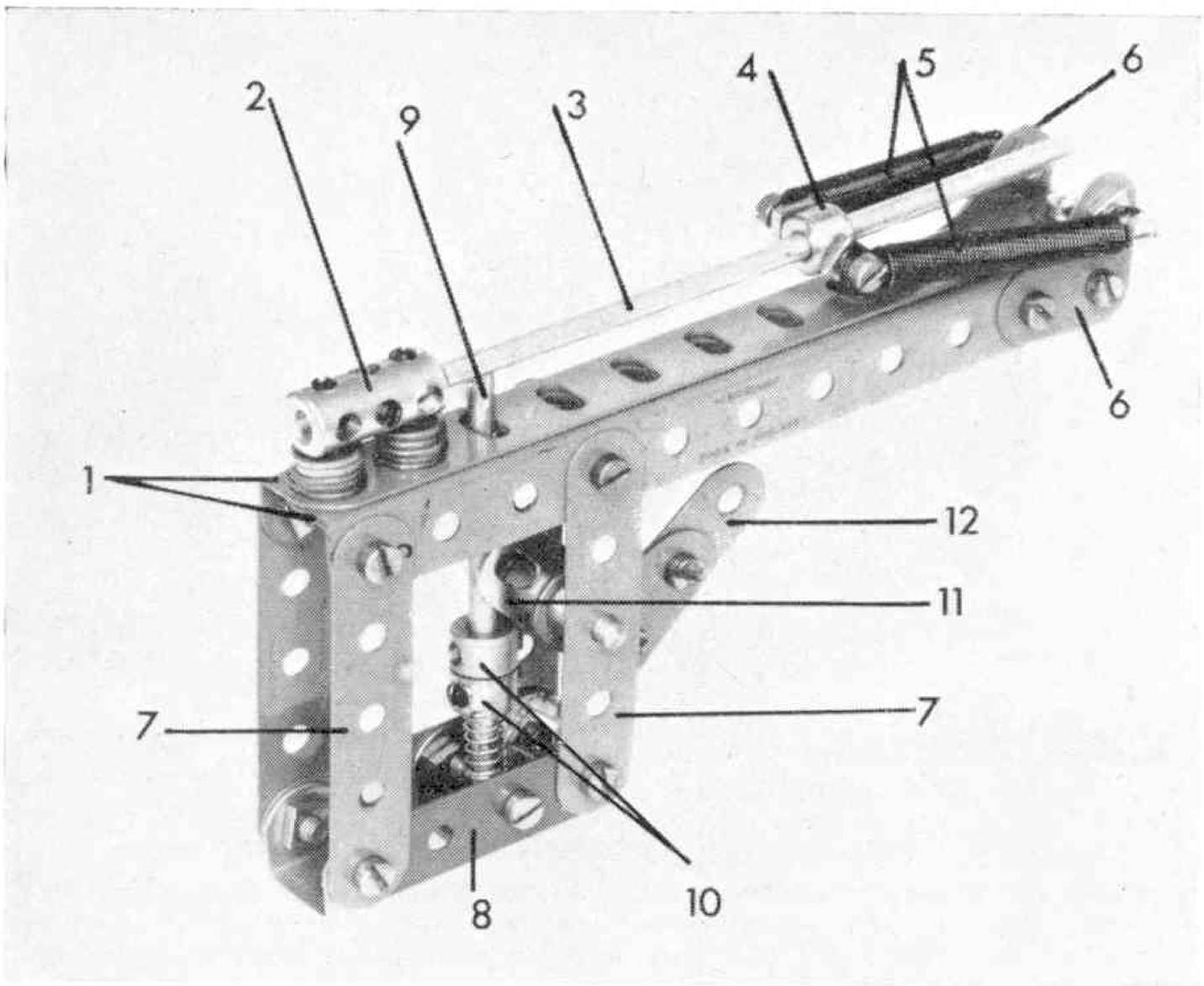
Both models fall into the toys' category and both are easily constructed in under an hour. The first model I will describe is the target pistol and the building instructions are as follows:

Two 5½ in. Angle Girders 1, to which a Coupling 2 is fixed by two ½ in. Bolts, are joined together to act as a barrel. Washers on the shanks of each bolt space the Couplings from the Girders. A 5 in. Rod 3 carrying a loose Collar 4 is secured in the Coupling. Two Tension Springs 5 are then mounted on bolts fixed in the tapped bores of Collar 4. Each bolt is prevented from locking the Collar to Rod 3 by a nut on its shank. At their other ends, the Springs are mounted on ⅜ in. Bolts held by nuts in 1 in. Corner Brackets 6, fixed to Girders 1.

To complete the handle or butt, two 2½ in. Strips 7 are bolted to one flange of each Angle Girder 1. These Strips are connected by a 2 in. Strip 8, then each side of the butt is joined at the bottom by three ½ in. by ½ in. Double Brackets.

A release mechanism is built-up from a 3 in. Rod 9, mounted in the barrel and the centre Double Bracket of the butt. This Rod carries two Collars 10 and a Compression Spring, fitted beneath the lower Collar and arranged in such a way as to ensure that the Rod is forced upwards. The mechanism is actuated by a trigger, built up from a Double Arm Crank 11, extended by a 1 in. Corner Bracket and a 1½ in Strip 12. The Double Arm Crank is mounted, together with a Collar and a Washer, on a 1 in. Rod 12, journalled in front 2½ in. Strips 7.

When the trigger is pulled, one arm of the Crank pushes against the top Collar on Rod 9, thus forcing the Rod downwards. To load, the trigger is pulled, Collar 4 forced back to Coupling 2, and the trigger released. Rod 9 is then forced upwards by the Compression Spring and holds the Collar in place. The Washer to be shot is slipped on to Rod 3.



A simple target gun which fires washers from your Meccano outfit. It's quite safe!

Parts required

4 of No. 5	1 of No. 16b	1 of No. 62b
2 of No. 6	1 of No. 18b	1 of No. 63
1 of No. 6a	23 of No. 37a	2 of No. 111a
2 of No. 9	19 of No. 37b	2 of No. 111c
3 of No. 11	16 of No. 38	1 of No. 120b
1 of No. 15	2 of No. 43	3 of No. 133a
	3 of No. 59	

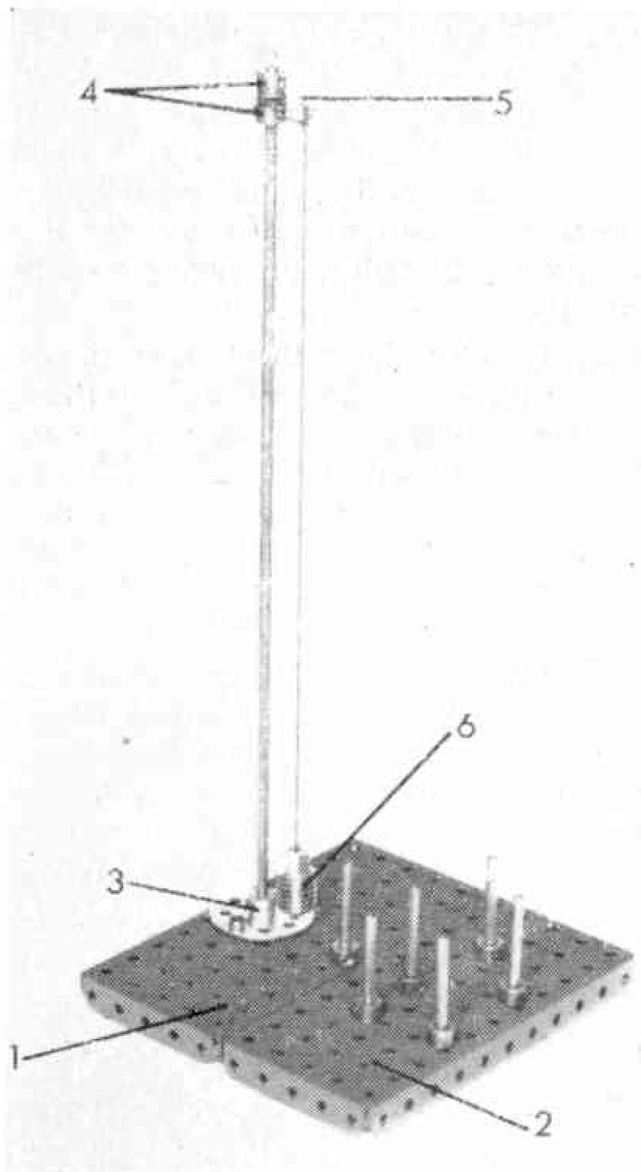
Making skittles

Skittles, the forerunner of ten-pin bowling, has been an English sport for hundreds of years. A novel variation on the full-size game is table skittles and my other model is a simple Meccano version of this skilful amusement.

Two 5½ in. by 2½ in. Flanged Plates 1 and 2 are bolted together to form the base. An eight-hole Bush Wheel 3 is bolted to Plate 1, a Washer on the shank of each Bolt being used to space the wheel from the Plate. An 11½ in. Rod is fixed in the boss of Bush Wheel 3 and, on the top of this Rod, are mounted two Collars 4, two Washers and a Fishplate 5.

The Washers are held between the Collars and the Fishplate is placed between the two Washers, but care must be taken to ensure that the Fishplate is not held tightly. A length of Cord carrying a Worm 6 is tied to Fishplate 5. I secured the Worm to the Cord by passing the Cord through the Worm and then tying a Washer on the end.

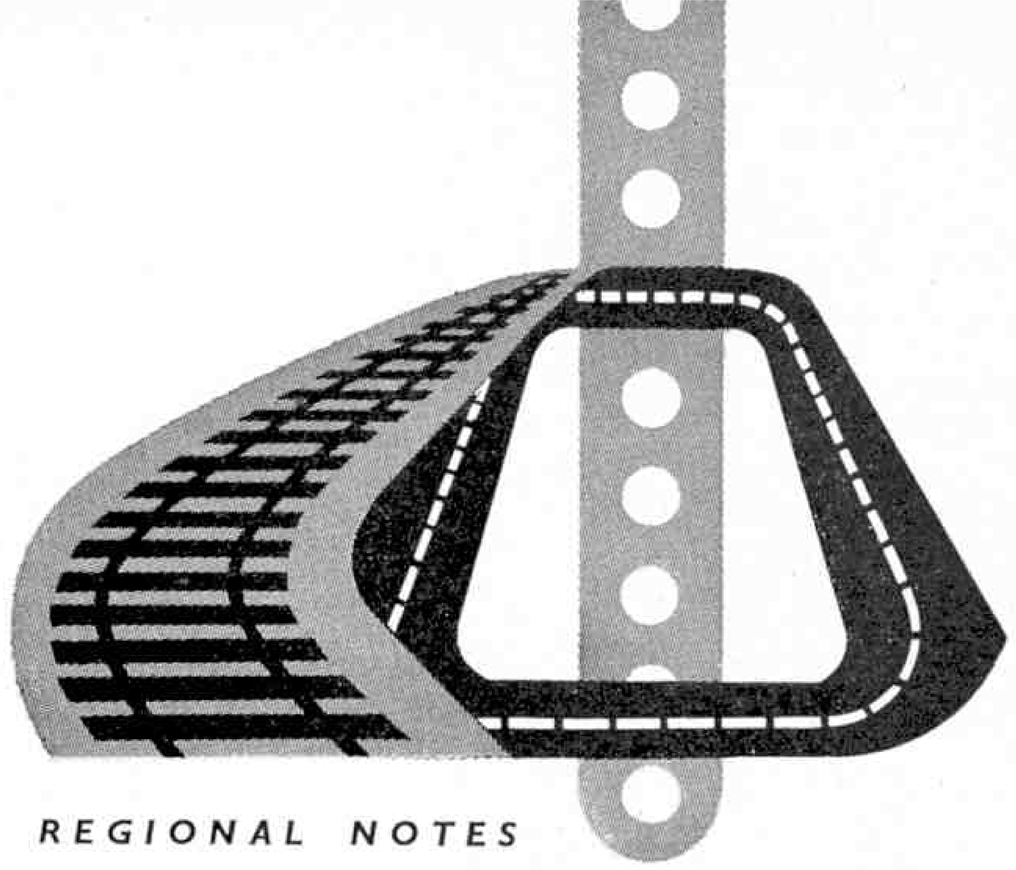
Each skittle consists simply of a 1½ in. Rod held in a Collar. For the purpose of the model illustrated, I built up six skittles and the following parts required list has been prepared accordingly. You, of course, may not wish to have this amount.



A game of skittles can provide hours of fun and is very simply made in Meccano.

Parts required

1 of No. 10	1 of No. 32	5 of No. 38
1 of No. 13	4 of No. 37a	1 of No. 40
6 of No. 18a	4 of No. 37b	2 of No. 52
1 of No. 24		8 of No. 59



REGIONAL NOTES

Around the SOCIETIES

Cyclists' Touring Club

MAY IS THE MONTH when the Cyclists' Touring Club organises no fewer than 29 regional heats of the British Cycle Tourist Competition for cycle tourists throughout the country. On May 9, ten of these heats will be held, with three in the London area.

The B.C.T.S. is the only national event in which all classes of cyclists, young and old, can compete together. It is a test of general, cycling ability, covering cycle control, road courtesy, map reading and countryside knowledge. Speed does not enter into the competition, although many racing cyclists do take part.

London cyclists have the largest choice of heats, with six to choose from, but there are ample opportunities in the Midlands and the North (both Lancashire and Yorkshire have three heats). Altogether, this year's local heats come within reach of almost every cyclist, from South-West (Devon) to Scotland (Glasgow).

The travelling expenses of all finalists will be paid by the Cyclists' Touring Club, from whom entry forms and details of local heats are available. Entry form, listing dates and organisers of regional heats, and competition rules is available from Mr. C. M. Nattress, of 7, Moor Edge, Crossgate Moor, Durham City.

The Model Railway Club

THE CLUB FIXTURES arranged for May 1965 are as follows:- May 6, Track Night (All Groups), May 13, Track Night (G.W.R.), May 20, Annual General Meeting, May 27, Track Night (L.M.S.). The above meetings take place at the Club's headquarters, Keen House, Calshot Street, London, N.1. Please address all enquiries to the Hon. Secretary, Mr. J. E. Geach, of Keen House, Calshot Street, London, N.1.

Norwood M.R.C.

A VARIED PROGRAMME consisting of track construction and operating night on the club layout together with talks, slide shows and other events to interest members. It has been proposed that an 18 mm Gauge layout be built to cater for those members interested in the scale. The Club would be pleased to hear from anyone in the district interested in E.M. modelling and willing to assist in this new project

Instead of a public exhibition during 1965, there is planned a private show and social 'get together', which will be arranged at Norwood later in the year. New members are always welcome and the Hon. Secretary, Mr. L. Bramma Smith, of 40 Harrow Road, Carshalton, Surrey, will be pleased to send details of the Club's activities on application. Meetings are held every Tuesday in the Club's headquarters in the Crypt of St. Lukes Church, West Norwood, S.E.27.

Railway Preservation Society

THE RAILWAY PRESERVATION SOCIETY has recently sponsored a non-partisan national association of railway preservation societies, in an attempt to promote some degree of co-operation and co-ordination in what had become a hopelessly confused situation. A quarterly meeting is held at each Headquarters of the associated groups in turn, where common problems can be discussed and information exchanged. It also gives an opportunity for the various societies to meet each other socially.

A quarterly journal 'The Railway Preservation Forum', is published in order that the various preservation interests can report their views. The Societies affiliated at the present time are, The Dowty R.P.S., The Yieldingtree Museum Trust, The London R.P.S., The Princess Elizabeth Locomotive Society, The Keighley and Worth R.P.S., The Scottish R.P.S., The Middleton Railway Trust, The West Midlands R.P.S. and the Wainwright Class C Preservation Society. It is also expected that a number of others will shortly be affiliated with the Association.

Twickenham and Dist. M.R.C.

THE NEW SECRETARY of the club is Mr. J. D. Christie, of 33 Avondale Gardens, Hounslow, Middlesex, and all enquiries concerning membership should now be addressed to him.

Welshpool and Llanfair

IT WAS RECENTLY DECIDED that the response to the appeal for money to repair the Banwy bridge, badly damaged in the floods of last December, was sufficiently encouraging to justify putting the work in hand. It cannot however, be emphasised too strongly that £500 is still needed and that unless this sum is forthcoming in the near future the repair work will have to be stopped. Essential parts of the job will be carried out by the 8th Railway Squadron, of the 16th Railway Regt. Royal Engineers, who are based at Longmoor Camp. It is hoped that they will be able to start in the second half of March.

A substantial labour force will be required to help with the work and any volunteers, robust and over 17 years of age, will be very welcome. Anybody available and willing to help for a whole week—Monday

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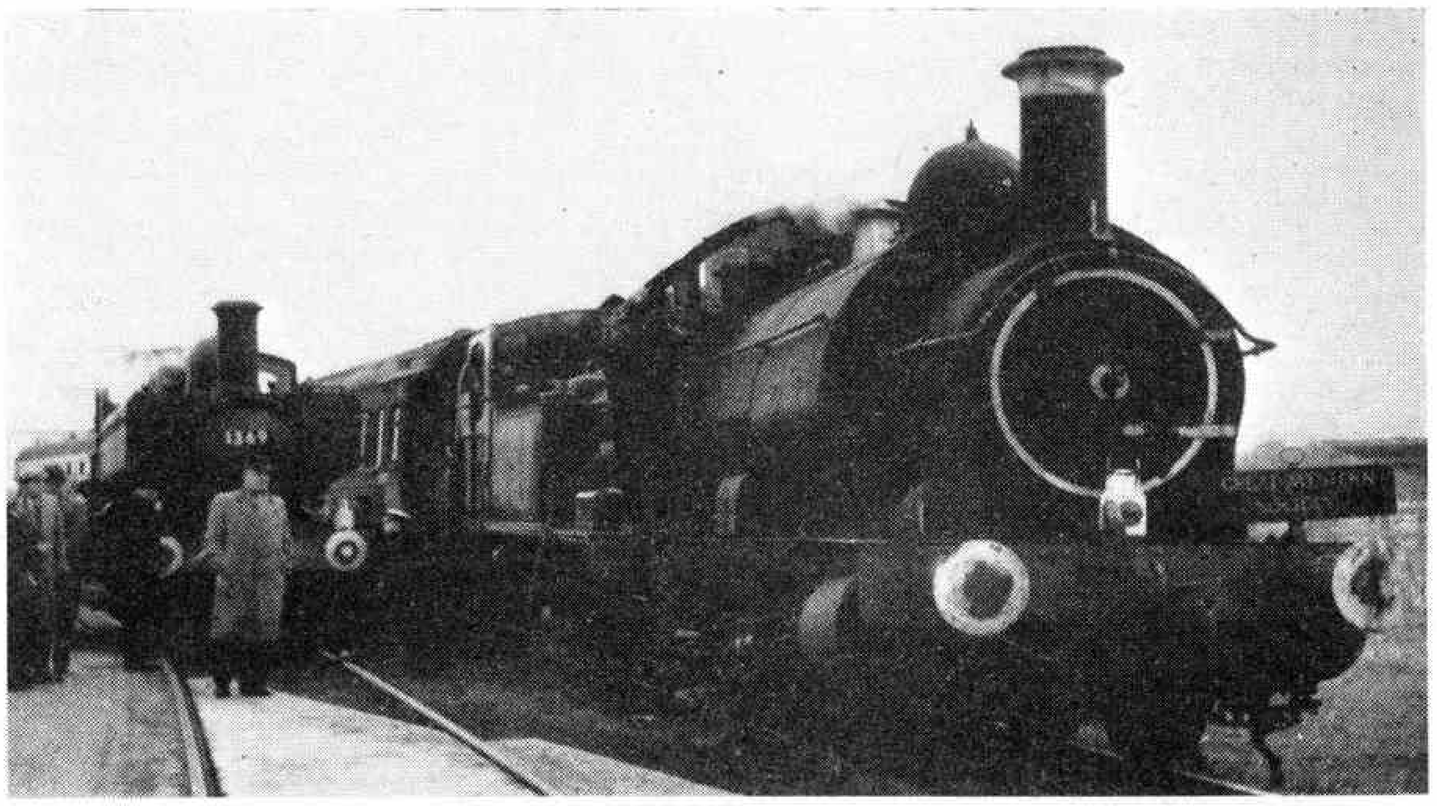
to Friday or Saturday (approx. dates April 4 and 11) should get in touch as soon as possible with the General Manager at Llanfair Station. (Telephone Llanfair Caereinion 441). A contribution towards expenses will be paid.

Talyllyn Railway Cent.

THE MIDLAND AREA of the Talyllyn Railway Preservation Society is arranging a number of exhibitions to mark this year's centenary of the Talyllyn Railway. The first of these will be held in the Museum of Science and Industry, Newhall Street, Birmingham 3, from March 6—May 11. The centrepiece of the display will be the railway's original locomotive 'Talyllyn', which will also be 100 years old this year and is still in regular use on the line. She is being re-painted especially for the occasion.



Locomotives of the Great Western Preservation Society at Totnes

North End Portsmouth M.C. H.R.C.

THE CLUB CONTINUES TO EXPAND and now has ten members. Mr. Enfield has completed one of the 'Circular' tracks on the large layout, while Messrs. Kinchen and Williams have added more buildings and electric lamps in the Shopping Centre on the small layout.

Outside the Estate Agent's office on the small layout is a Jaguar 'E' type (Dinky Toys No. 120), a Mercedes Benz (Dinky Toys No. 186), and a Morris Mini Traveller (Dinky Toys No. 197). Several new Dinky Toys have also been added to the layout, including the 'Brinks' Security Van, and the 'Bullnose' Morris. We still require more members, and anyone who is interested in model railways should write to Mr. R. Enfield, of 42 Falmouth Road, Paulsgrove Nr. Cosham, Portsmouth, Hants.

Dinky Toy enthusiasts should contact Mr. J. R. Kinchen, of 79 Fortunes Way, Bedhampton, Havant, Hants, (D.T.) and Meccano modellers to:- Mr. J. Frood, of 66 Stakes Hill Road, Waterlooville, Hants. Please enclose an S.A.E. when writing to any of the above addresses.

E. Pennines Ass. of Railway Modellers

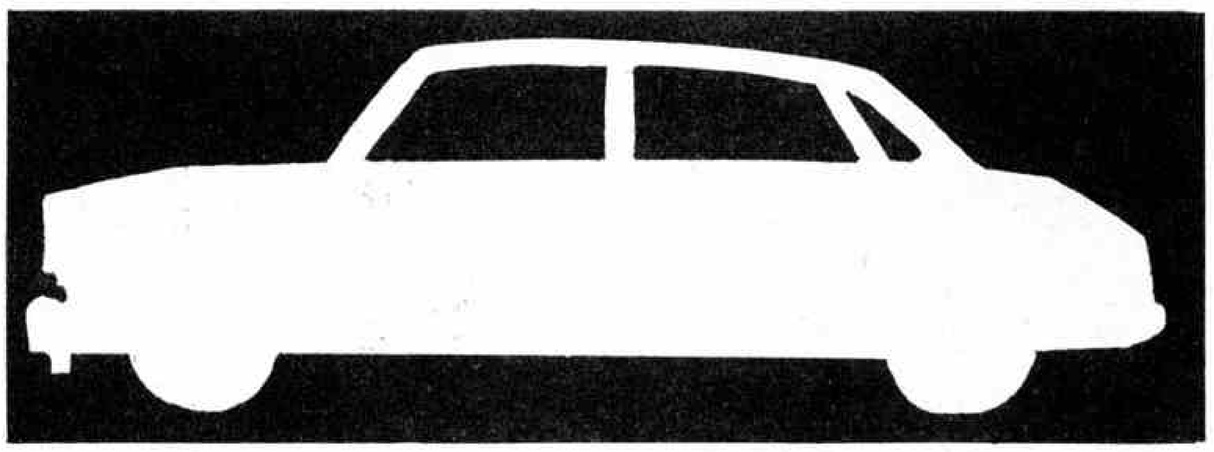
THE PROGRAMME FOR MAY AND JUNE is:- May 30 Railway Modellers' Conference at Granby Lodge Hotel, Scarcroft Road, York, at 2.15 p.m. June 8-13 (Whit week) Sheffield Model Railway Enthusiasts' Exhibition, Burngreave Vestry Hall, Sheffield. Further details of the above activities may be obtained through the Hon. Secretary, East Pennines Association of Railway Modellers, Mr. A. Bradbury, of 30 Moor Lane South, Ravenfield, Rotherham.

car outline COMPETITION

50 Dinky Toy Models to be won!

To:—Meccano Magazine: Competition A, St. Alphage House, Fore Street, London, E.C.2.

Just fill in the form here, stick it on a post-card and send it to us. The names of the senders of the first 50 correct answers will be published in the next issue of Meccano Magazine. The winners will then be expected to write to us to claim their prize. The competition will be judged by the editor of Meccano Magazine. His decision will be final and no correspondence can be entered into



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• Early pre-war and early post-war and obsolete French Dinky toys and SOLIDO models. Monsieur Jean-Jacques Moreaux, 18 Bis rue de Bellefond, Paris IX°, France.

• Br. Cols. Israel foreign, wants invited advertiser. 15 Queenhill Ave., Leeds 17.

• Bargain Stamps approvals. Suitable for beginners and medium collectors. R. Burton, Braeside, Fawdon Lane, Newcastle-upon-Tyne 3.

• "M.M.'s" 1944-1948 inclusive, offers all or part. Woolhouse, Fotherby, Louth, Lincolnshire.

• Meccano Magazines for sale. Bound, good condition, 1928 to 1931 inclusive. Separate volumes or complete. Offers? Michael South, 34 Devonshire Road, Sutton, Surrey.

• Dublo 3-rail comprising: A3 power control unit, 4 locomotives, 2 mint condition rolling stock, accessories; £10 o.n.o. Pell, 41 West Bosk Lane, Otley, Yorkshire.

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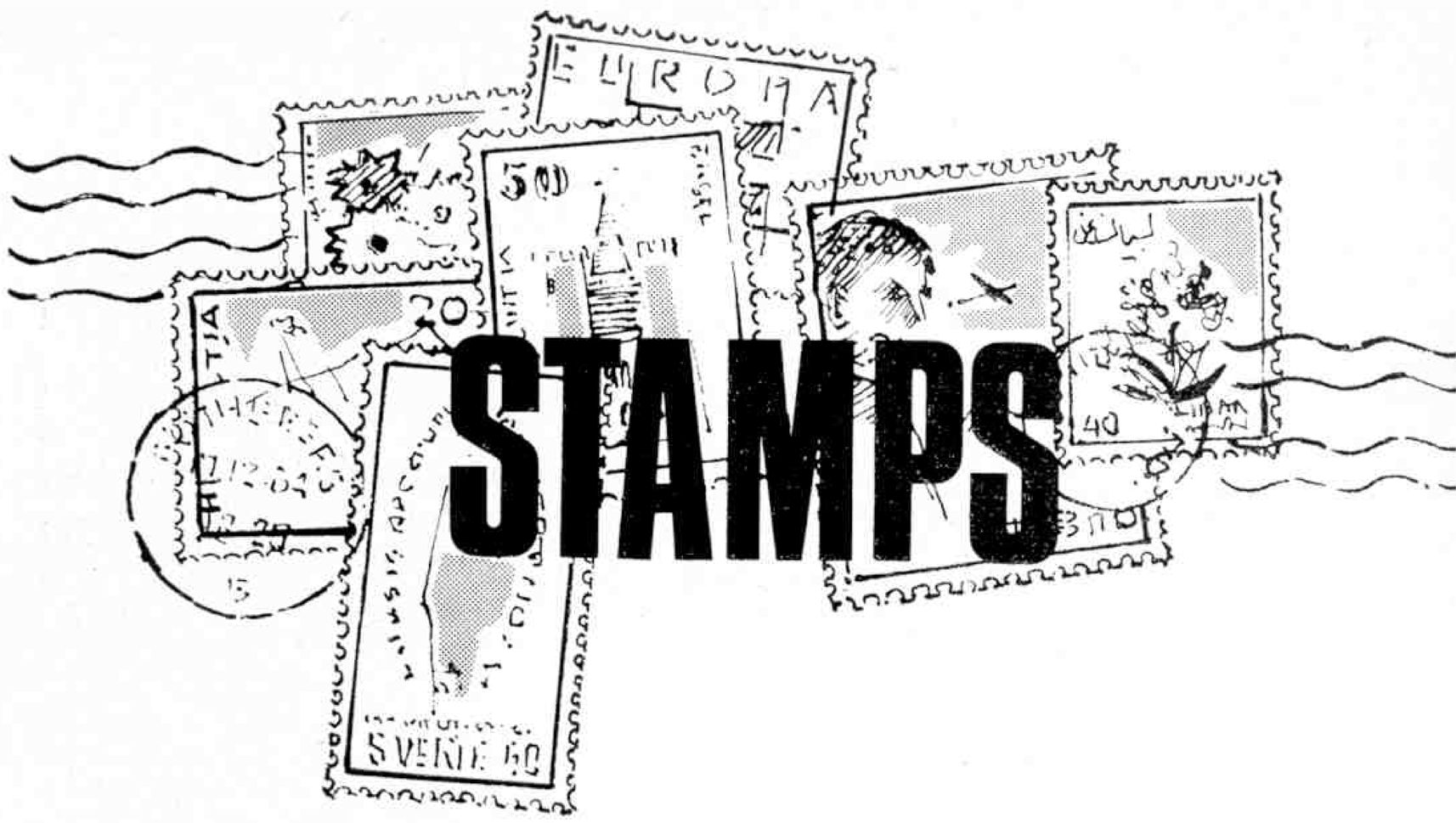
•"M.M." for April 1964. Bailey, Pedlars Haven, Feelmodeston, Fakenham, Norfolk.

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

• Pre-war Dinky Trains and Tootsietoy Cars. Gilmour, 16 Great Lawn, Ongar, Essex.

• Wanted, Peco conversion wheels for converting Hornby-Dublo to run on Trix. Replies to Box 2.

Continued on page 46



by **F. E. Metcalfe**

The Arabian Gulf

WHEN this part of the world was known to us as the Persian Gulf, it was our own British stamps, overprinted, which were used. However, oil has changed all that, for even the name of the district has been altered and small territories are springing up like mushrooms, issuing sets of stamps by the minute, some of which are very attractive. (Fig. 1)

One of these oil rich territories, namely Ajman, is actually offering prizes to a total of £2,000 for those who write the best articles on Arabic Stamps! If you want to enter the competition, just write to the Postmaster at Ajman, Arabian Gulf for details.

Masada

Many readers will probably have heard of the excavations that are taking place at Masada, which was the last defence stronghold of the Jews against the Romans. The story of that event makes fascinating reading. High above their enemies, the Jews felt fairly safe, but the Romans built a ramp and finally conquered the city to find that all the inhabitants of Masada were dead. They had realised what would happen to them if they had been taken alive!

To commemorate the excavations, Israel has issued a set of three stamps which are very attractive. The 0.25 shows Masada from the West: the 0.36, the lower portion of the Northern Palace and the 1.00, a general view of the Palace. A fine little set and not very expensive either. (Fig. 2)

The River Country

And now a few lines about a country, 'which is mostly a river,' as an Irish friend of mine put it, when describing two sets of stamps which appeared in one day. There was a time when one was surprised if a country issued one set of stamps in two years, but all that has changed, for it has been found that governments not only gain lots of publicity from postage stamps but also a profit to boot. (Fig. 3)

Anyhow, on February 18, Gambia issued two sets of stamps to mark the country's Independence. One set was of four values, specially prepared for the event, and the other was a case of overprinting its current set with the inscription INDEPENDENCE 1965. It is proposed to replace the overprints at the end of the year with an entirely new issue, a policy which seems to be general in these new African countries. Unfortunately, this is not a good policy in the long run, for collectors' pockets run dry of money to buy an unlimited supply.

I mentioned a country which was mostly a river and this description gives a very good picture of Gambia, which is not much more than two strips of land on either side of the River Gambia, on the West coast of Africa. The river is about 300 miles long and Gambia never exceeds 15 miles at either side of the river. Sometimes it is as narrow as seven miles. The capital is Bathurst and with a population of a mere three hundred thousand, it may find independence very difficult. Perhaps, like Tristan da Cunha, stamps will help provide the answer to economic problems.

Crested Cranes

Uganda, which is on the East side of Africa, is, as far as size is concerned, a very different country to Gambia. I suppose the real fascination which Africa holds for many people is its wild-life. I have seen a little of it and a thing which has always struck me, is how different animals and snakes appear in their natural habitat as compared with their appearance in a zoo.

I once saw a green mamba, at least that's what I thought it was, sliding along and although such a reptile in a zoo looks horrible, to me it did not look at all out of place as it slid away. However, it isn't snakes but birds that I want to mention here.

Recently, Uganda held an International Trade Fair and to mark the event, two stamps were issued on February 20. The design was the same in each case and a Crested Crane was the bird depicted on the stamp. (Fig. 4)

It is a really magnificent bird, only to be found from the Nile Valley down as far as Central Africa. They live for quite a long time and are handy about the back yard, for they will gobble up the small snakes etc. with gusto. Whether they would tackle a mamba or not I don't know, but they wouldn't be as scared as I was during my encounter.

Tip of the Month

I mentioned last month the stamps which our own post-office is to issue this year. As I have already said, this is a quite different policy to that which until recently prevailed at St. Martin's le Grand and it is quite evident that we will regularly be getting special issues with pictorial designs.

Why should I be mentioning these issues again ? Well, these stamps have a tremendous effect on collectors. There was a time when our own stamps were anything but popular, even among British collectors. That is rapidly changing and I am going to suggest that if you go in for mint and used copies of the definitives, as well as special issues of the present reign, in the long run, your collection will more than pay for its keep. Also, by keeping your eyes open, you might find one of those rarities as did a Scottish boy, who noticed that one of the colours on a 6d. stamp was missing and, sticking the stamp on an envelope, addressed it to himself and later sold it at a London auction for, I think, £375. Pity he didn't buy the rest of the sheet.

4

3

2

1

Continued from page 44

Radio Equipment

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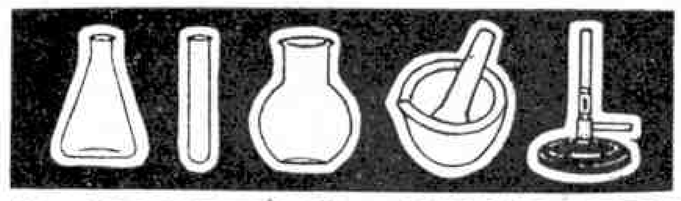

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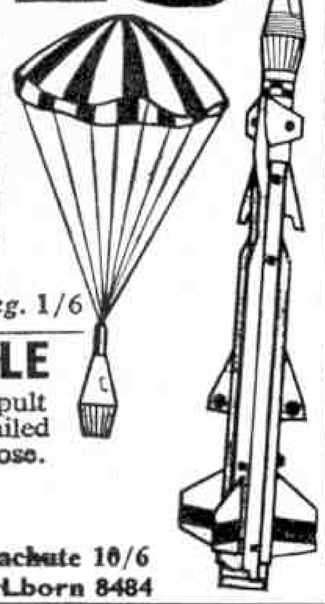

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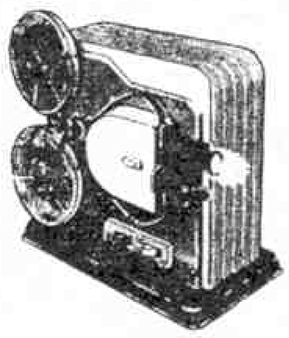

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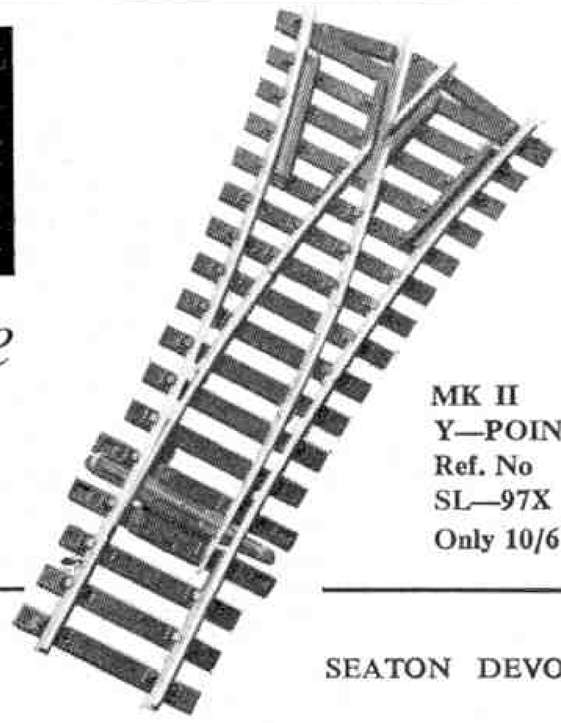

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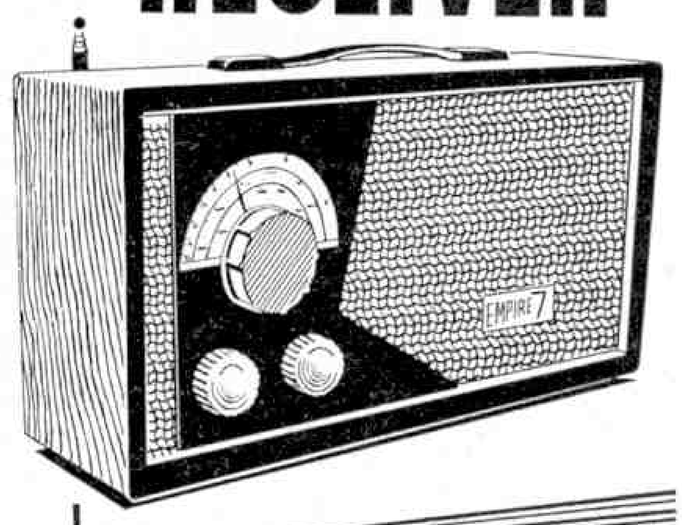

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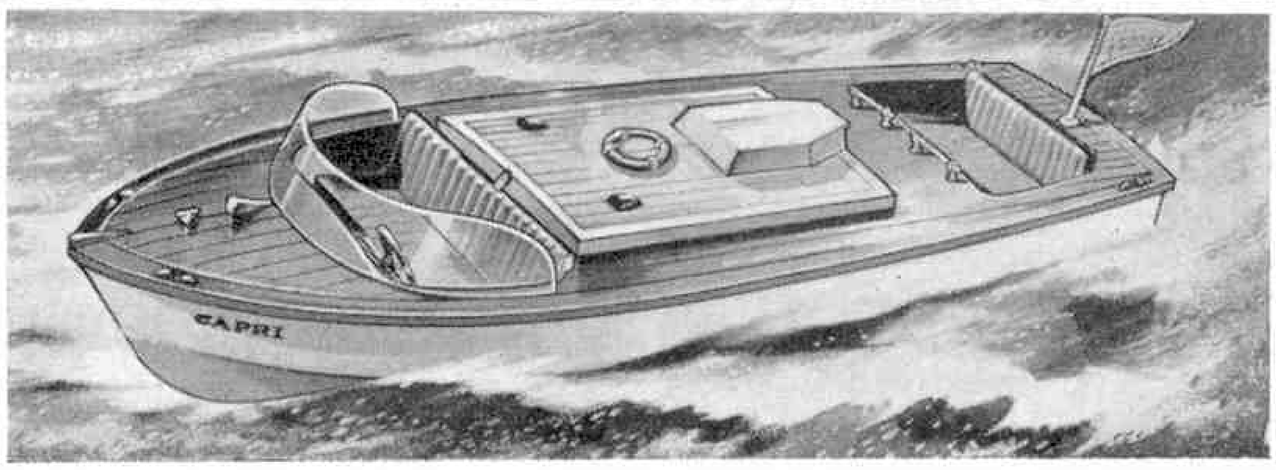

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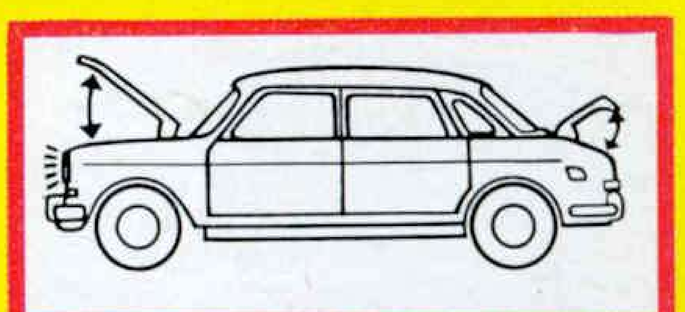

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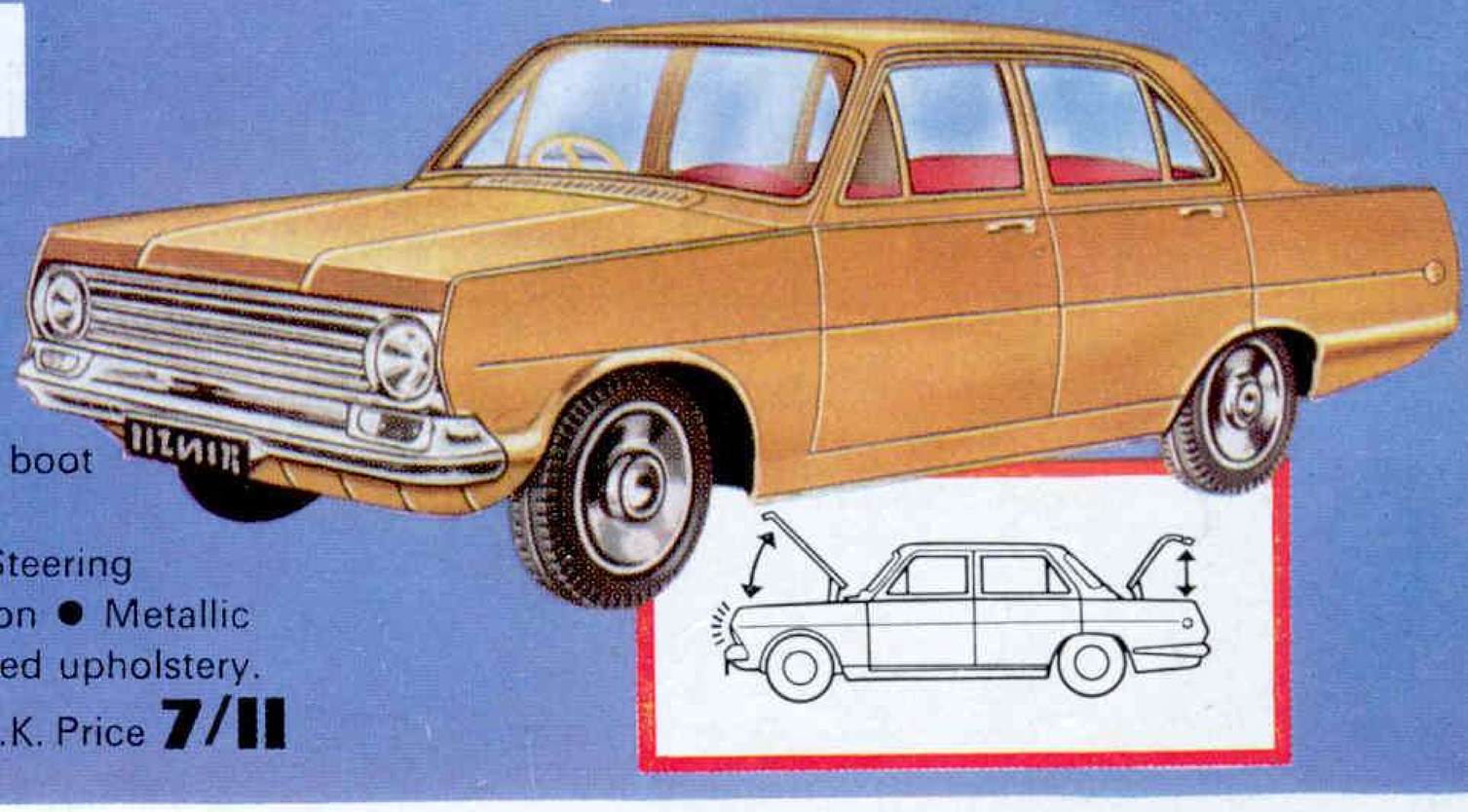

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