VOL. XXXVIII. No. 11 NOVEMBER 1953

MECCANO MAGAZINE

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See page 544

1/-

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NEW

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SCOUT CAR

Here's a novel newcomer to the ever-growing range of Dinky Toys—a model of a British Army Scout Car, finished in service green with the Royal Armoured Corps sign on the front and rear. These high-speed, light-armoured vehicles which are mainly used for reconnaissance and patrol duties are of increasing importance to modern mechanised units. Many of them are to be seen about the country.

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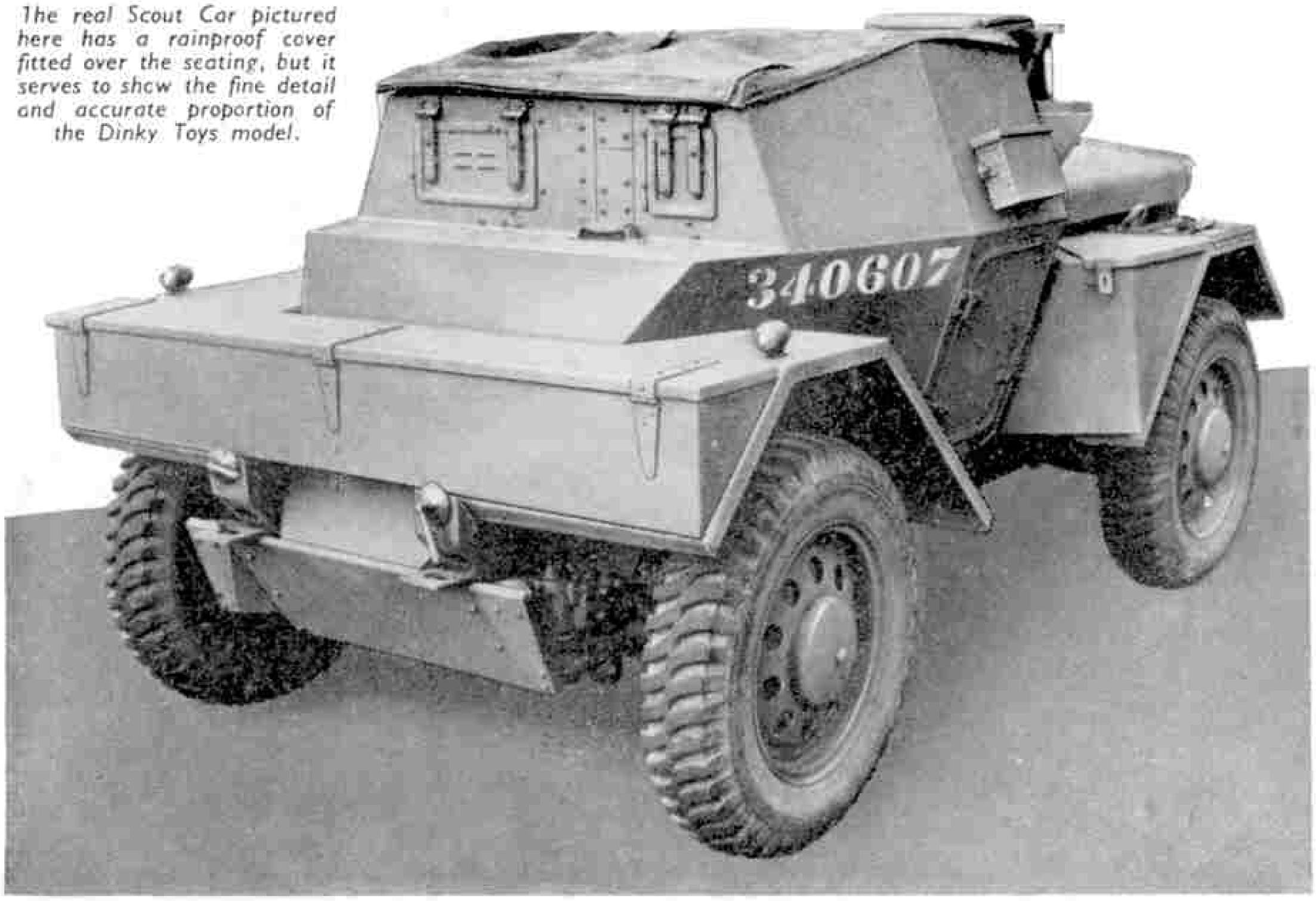

DINKY TOYS

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No. 27n
Field-Marshall Tractor
Length 3 in. **4/4**

No. 30n
Farm Produce Wagon
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No 31c
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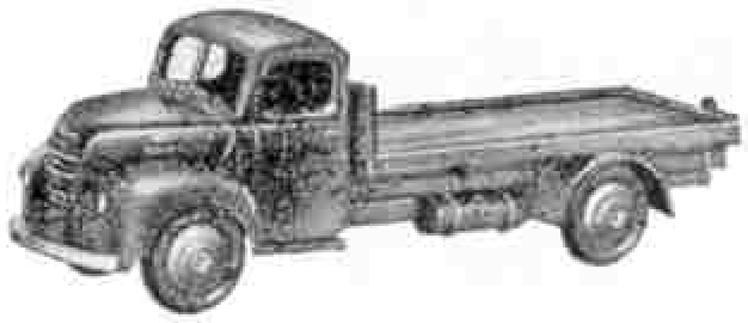
Length 3⅜ in. **2/2**

No. 40j
Austin Somerset Saloon
Length 3½ in. **2/2**

No. 40f
Hillman Minx Saloon
Length 3⅜ in. **2/2**



No. 30r
Fordson "Thames" Flat Truck
Length 4¼ in. **2/4**

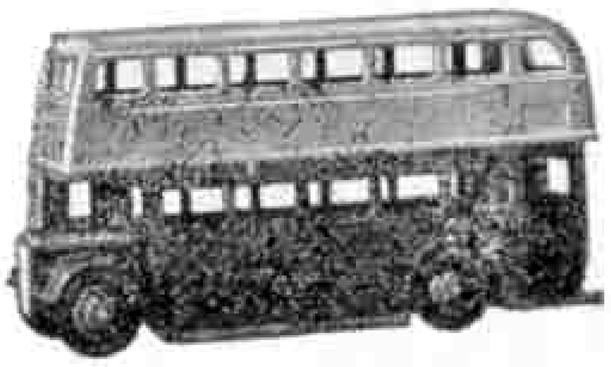
No. 23n
Maserati Racing Car
Length 3¾ in. **2/6**

No. 23j
H.W.M. Racing Car
Length 3⅞ in. **2/6**

No. 23g
Cooper-Bristol Racing Car
Length 3½ in. **2/6**

No. 30h
Daimler Ambulance
Length 3¾ in. **2/8**

No. 25x
Breakdown Lorry
Length 4¾ in. **4/11**



No. 29c
Double Deck Bus
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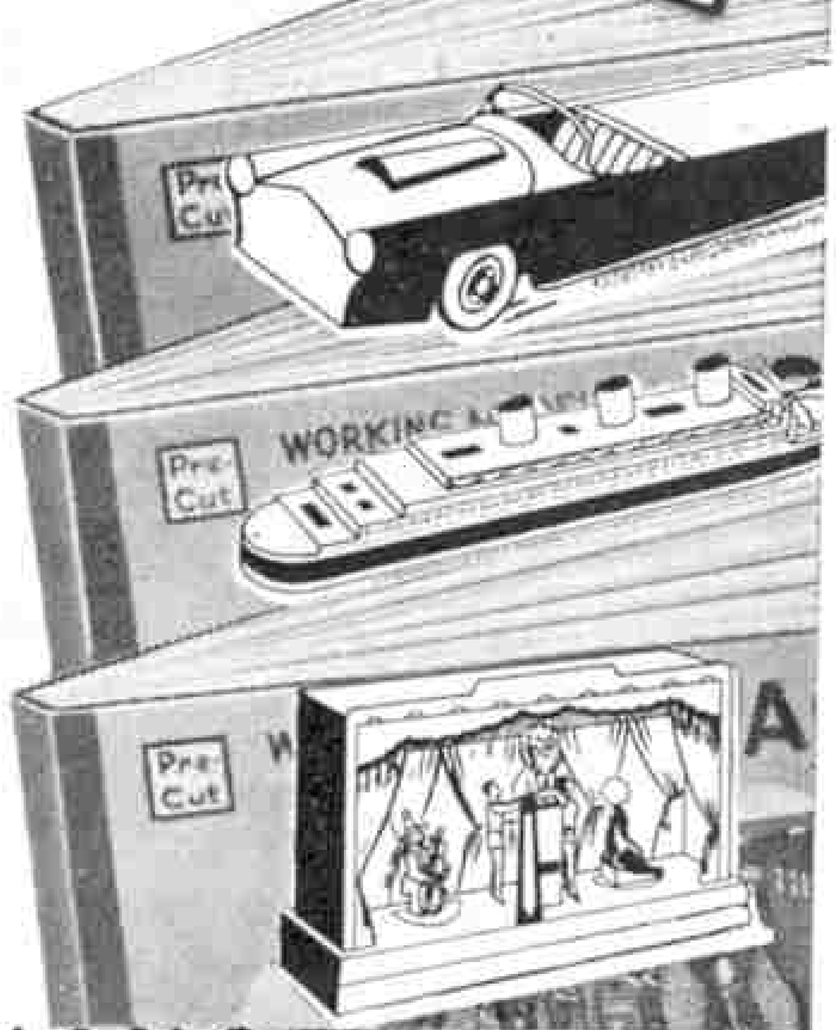

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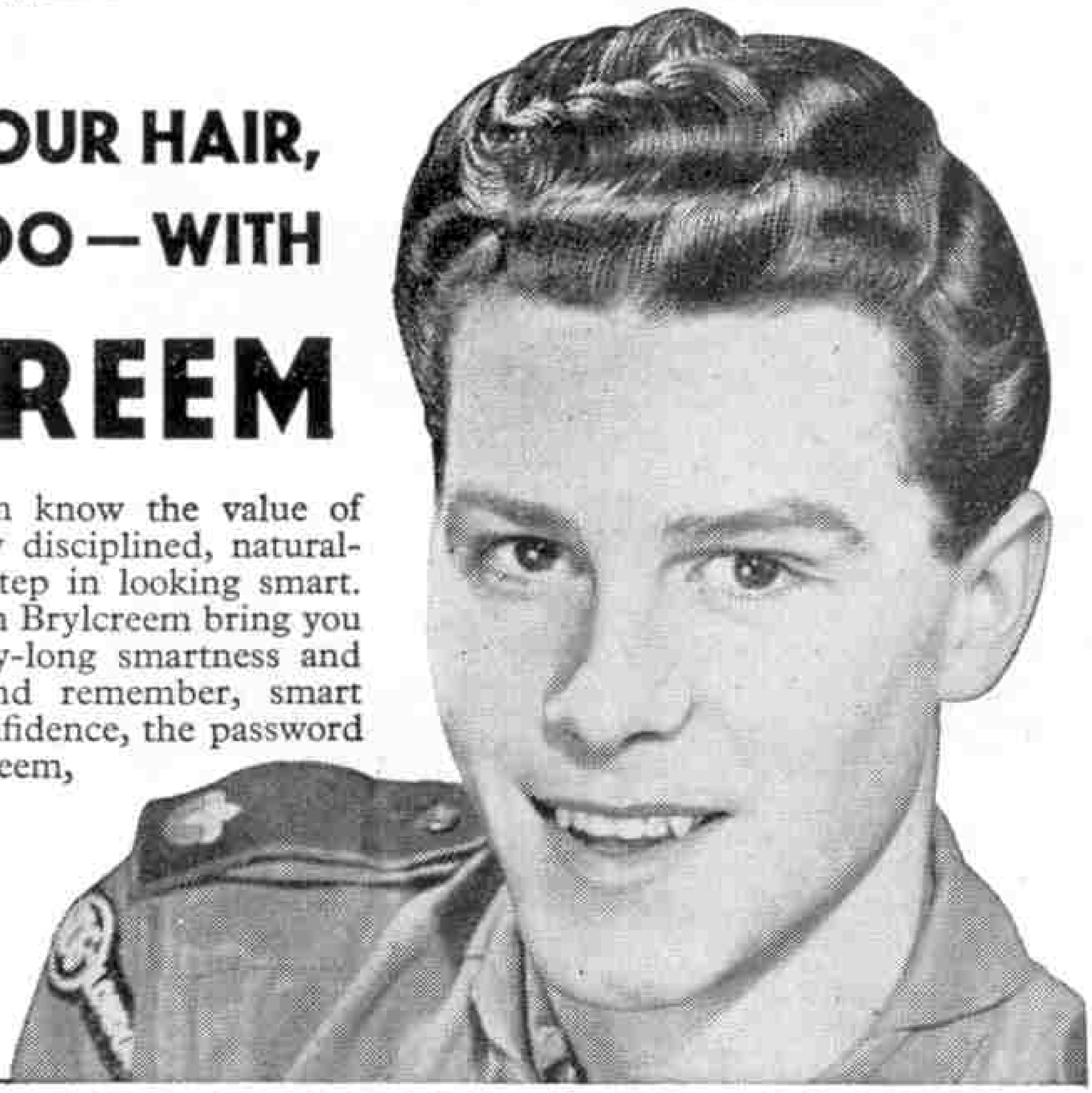

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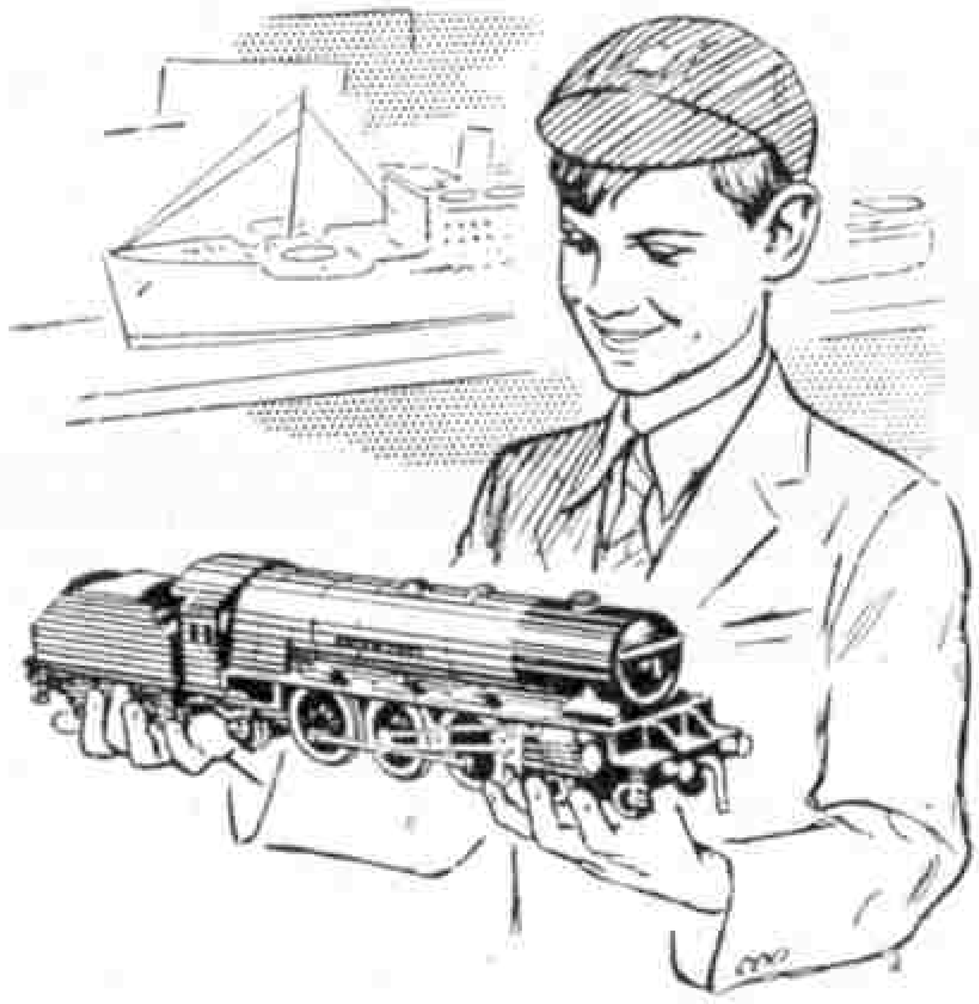

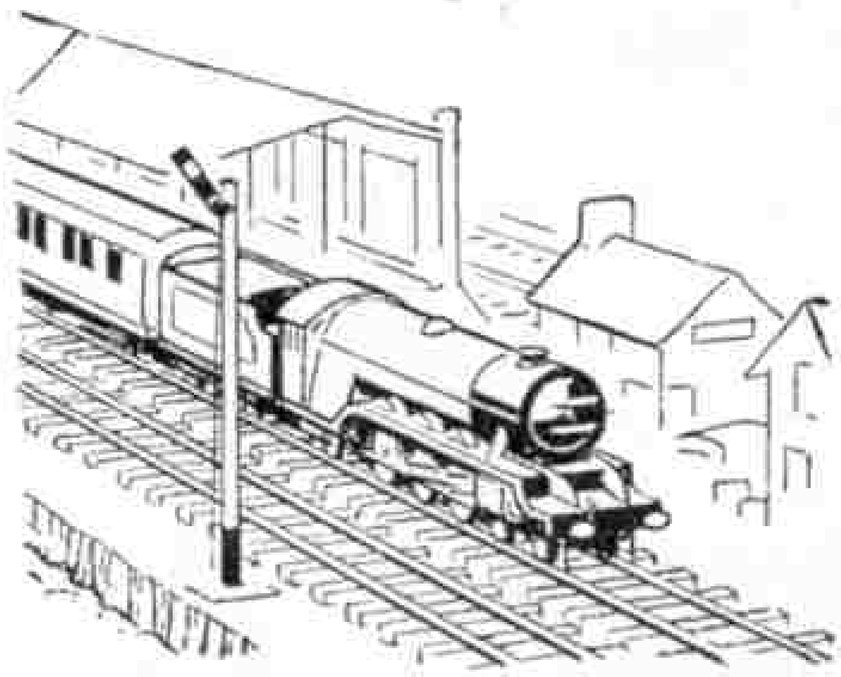

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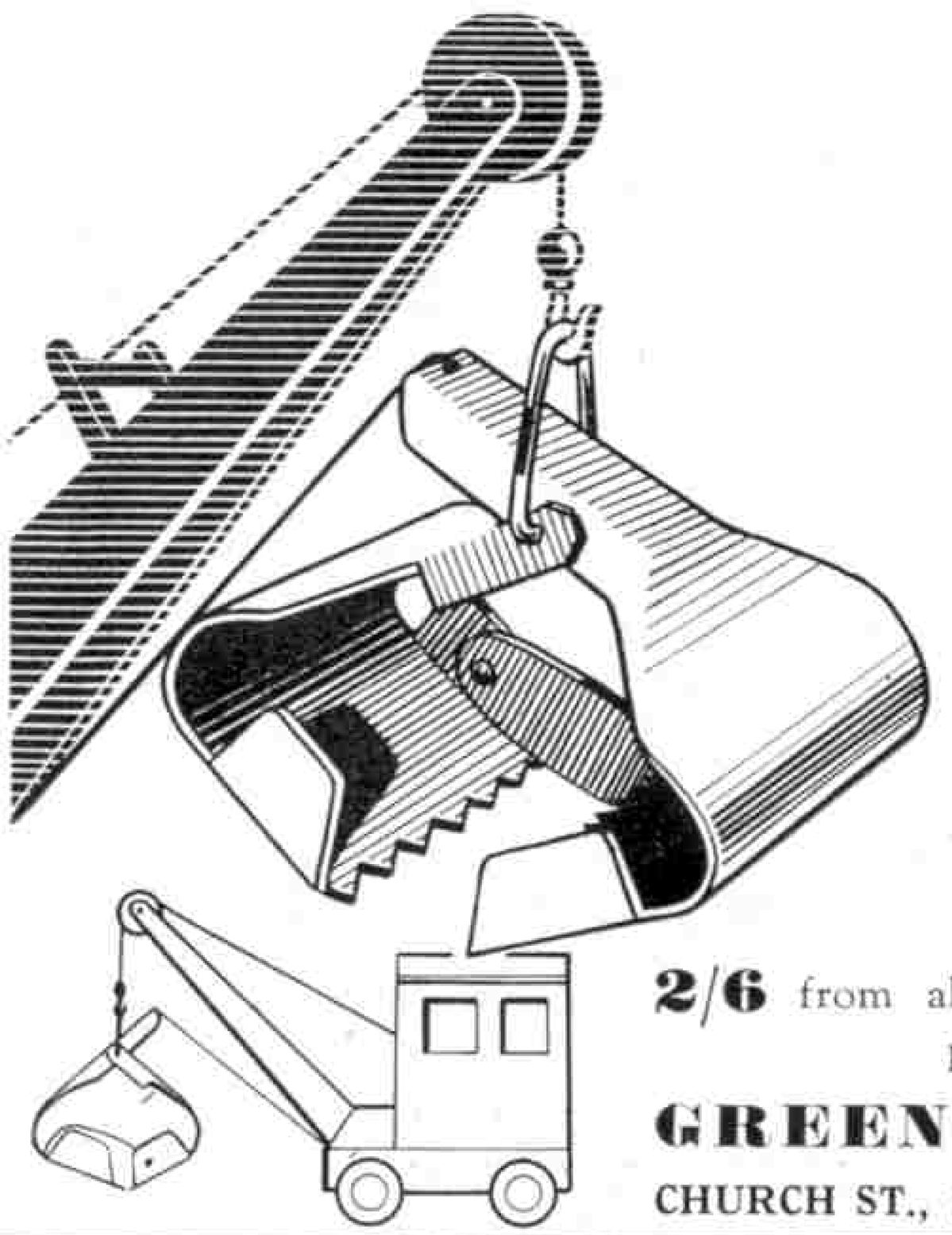

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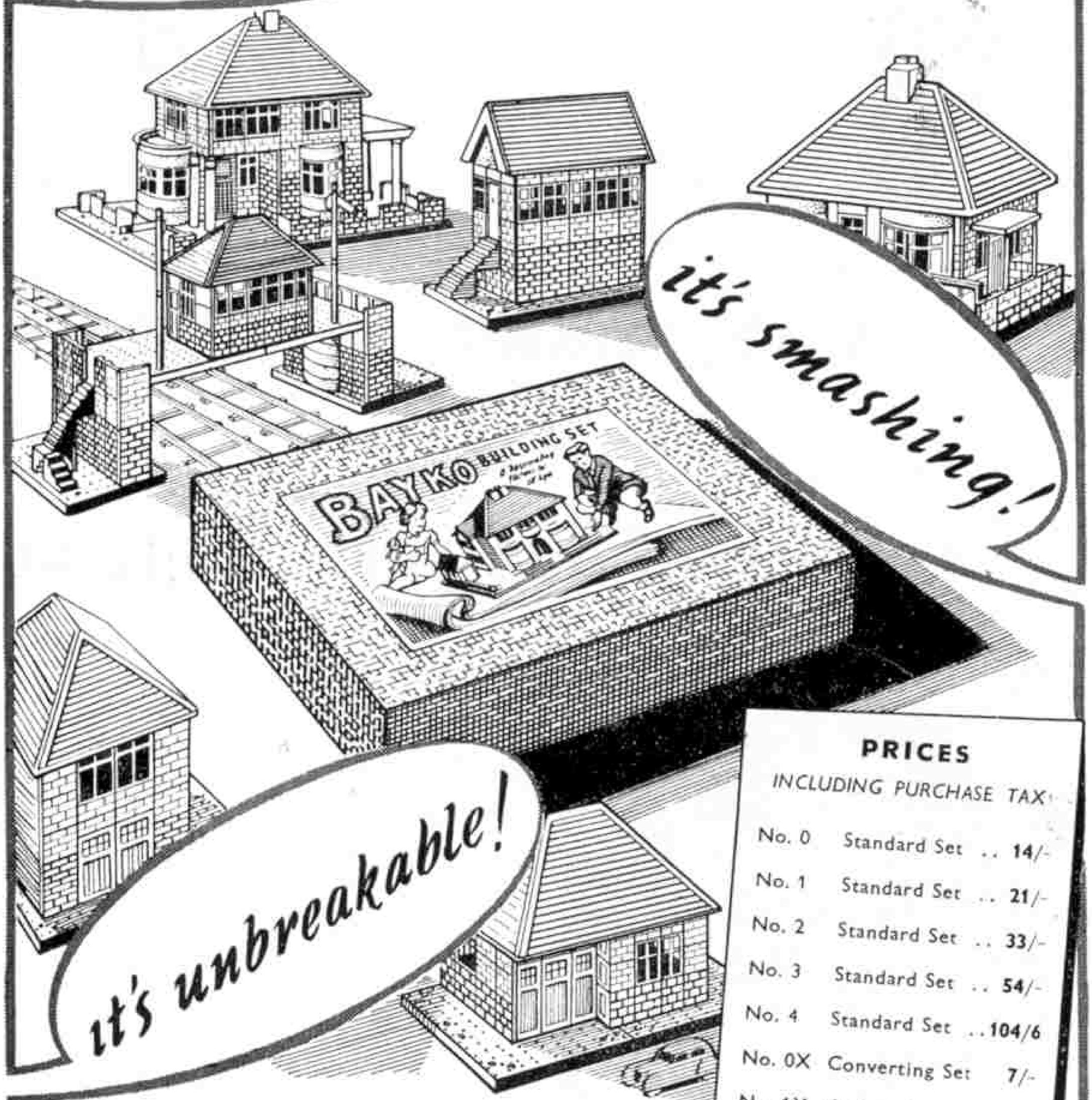

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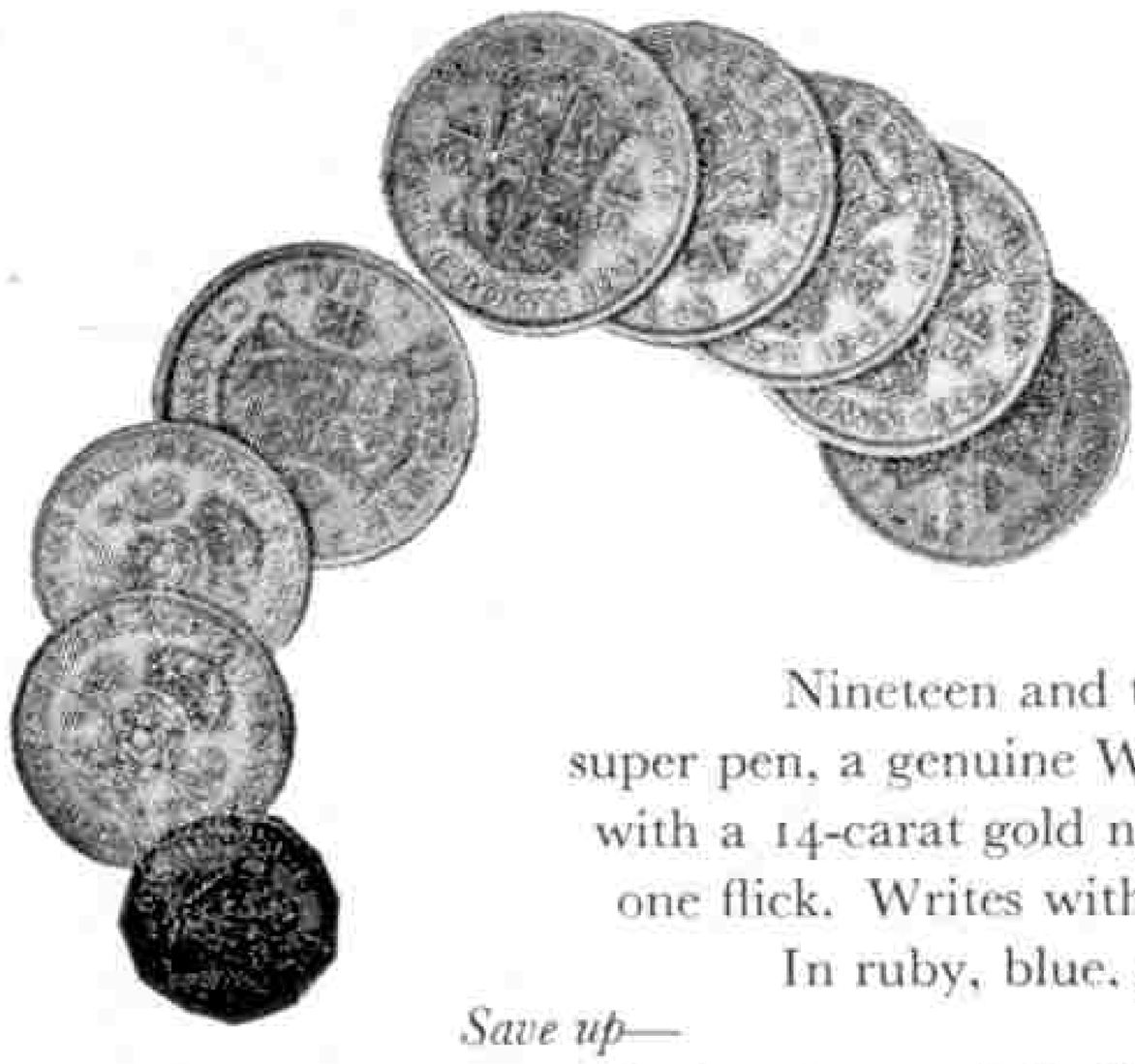

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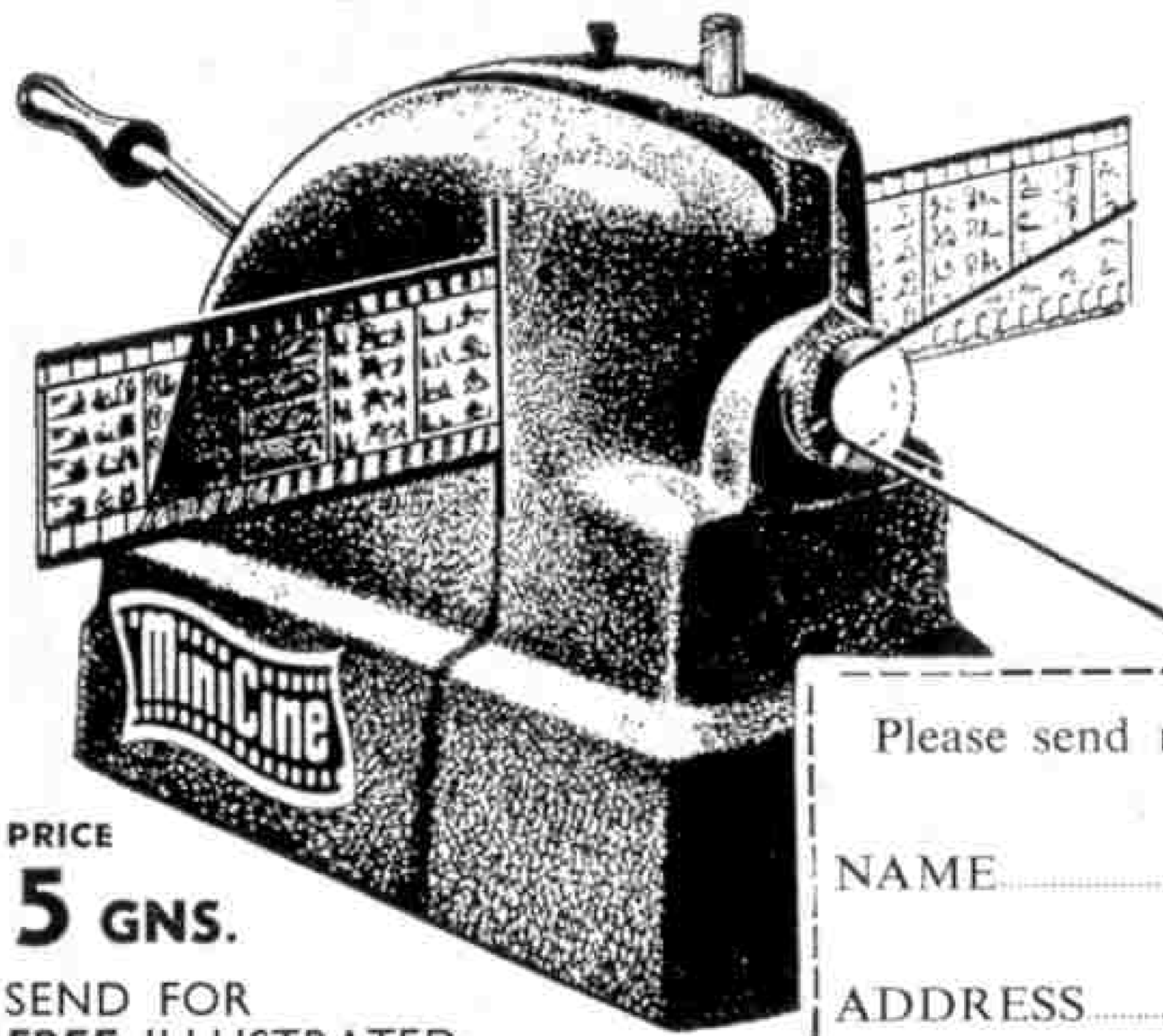

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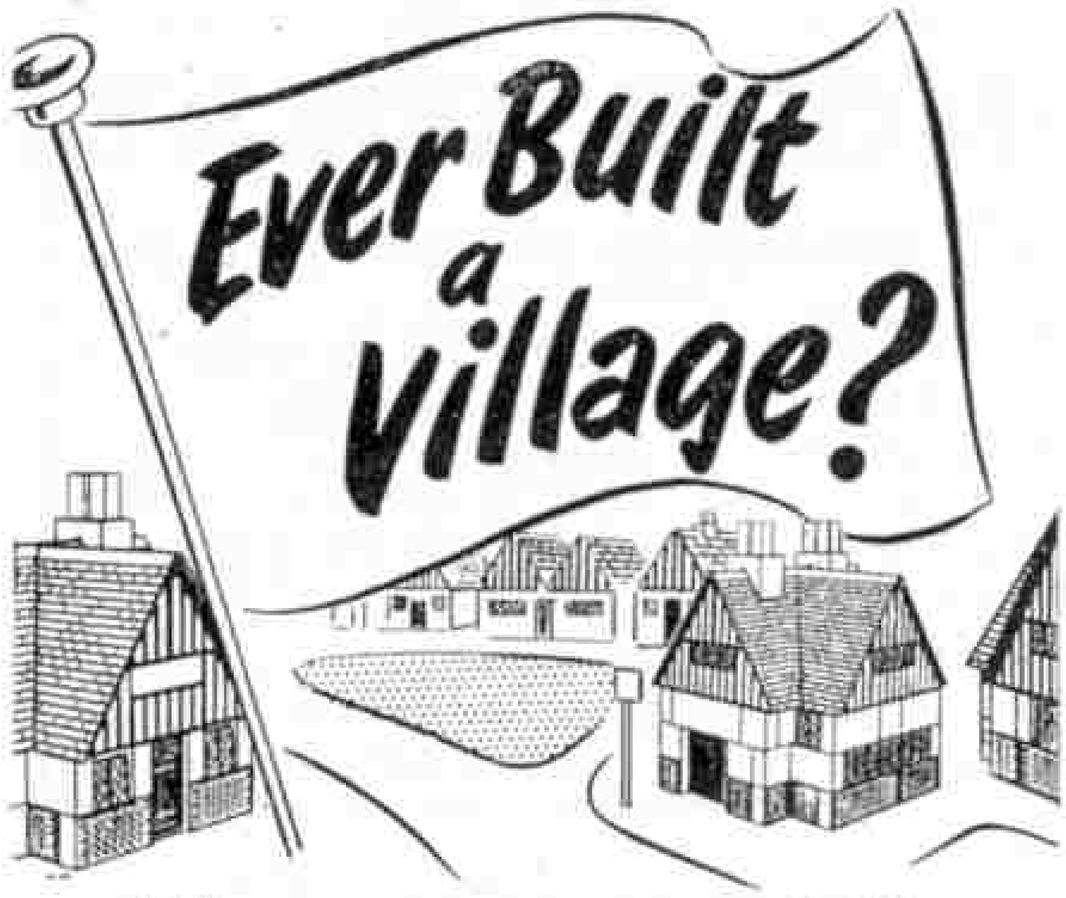

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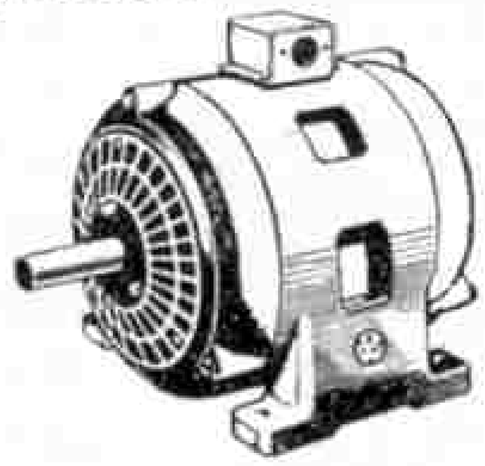

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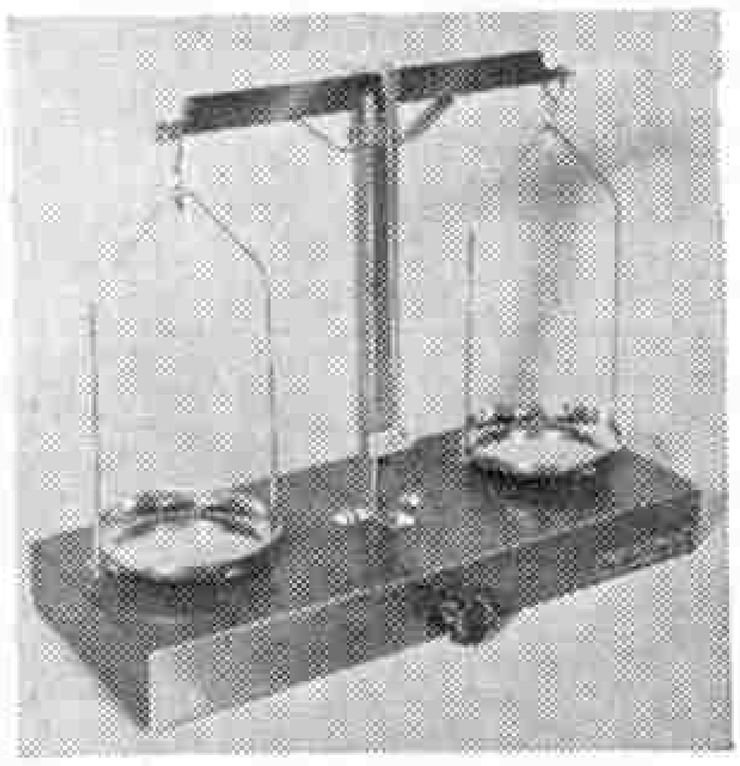

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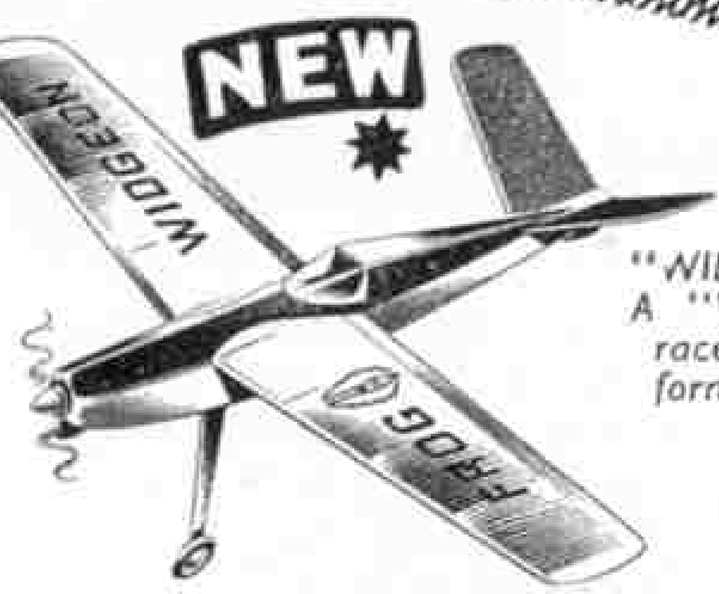

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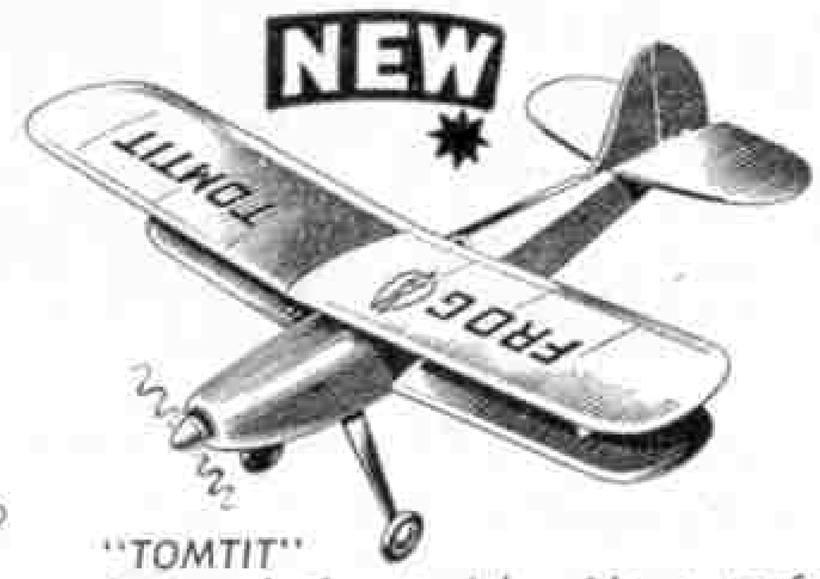

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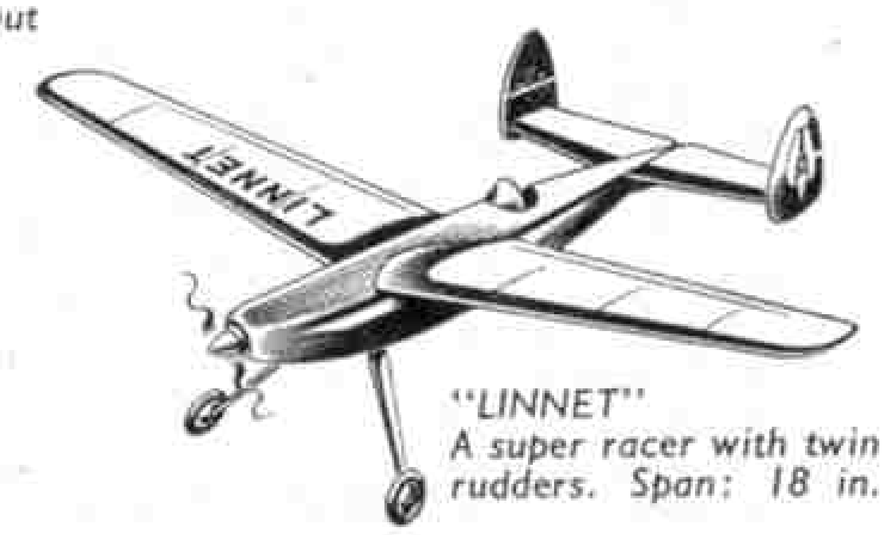
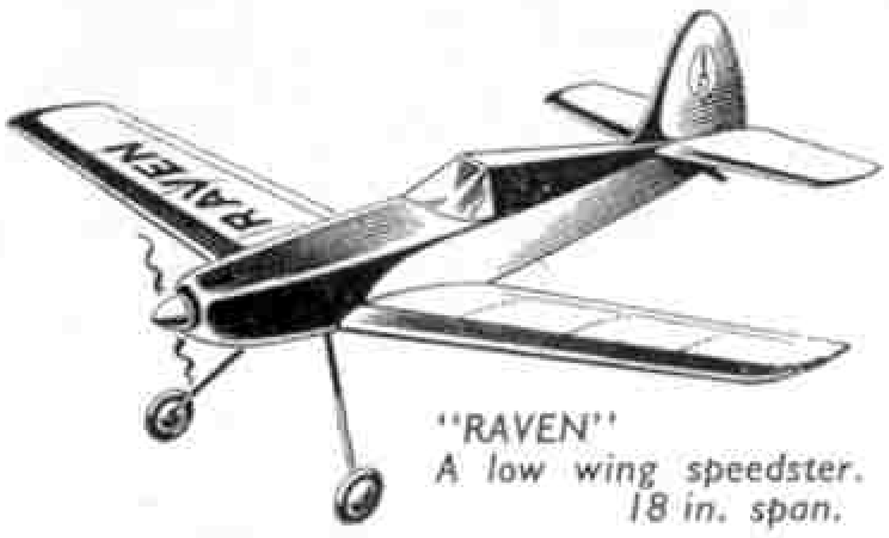


"LINNET"
A super racer with twin rudders. Span: 18 in.



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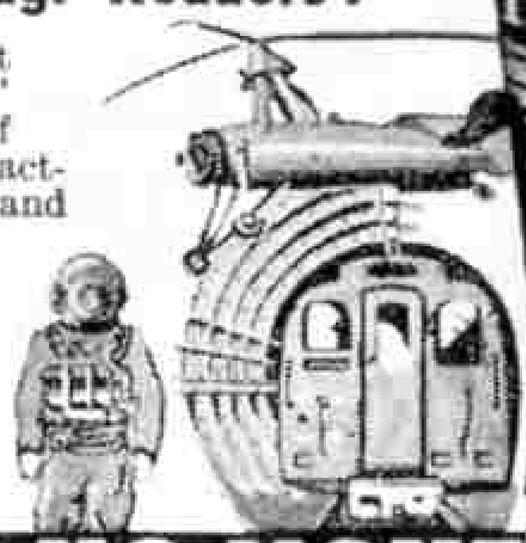

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X.V.Y.,—Nov. 53 .....

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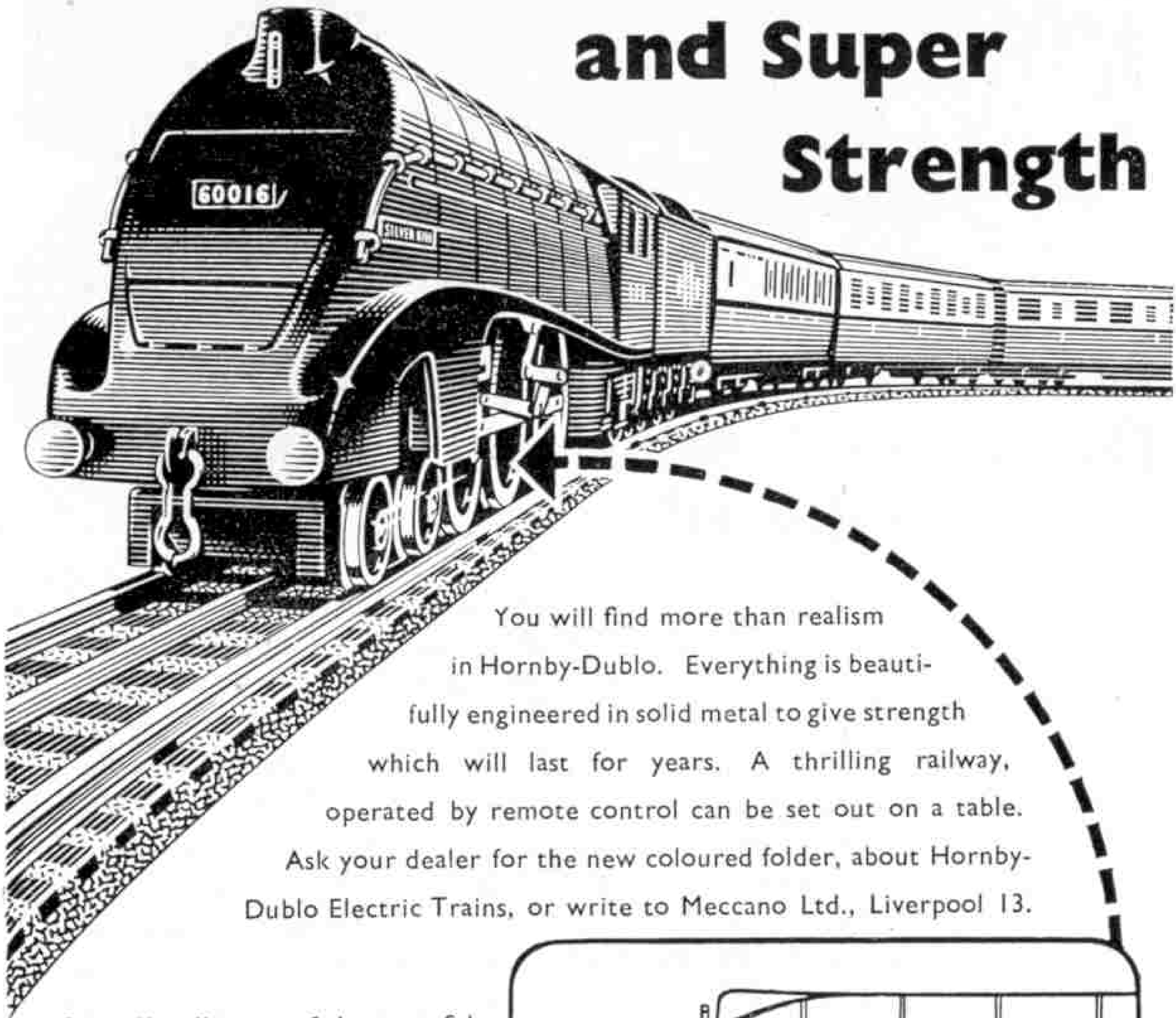

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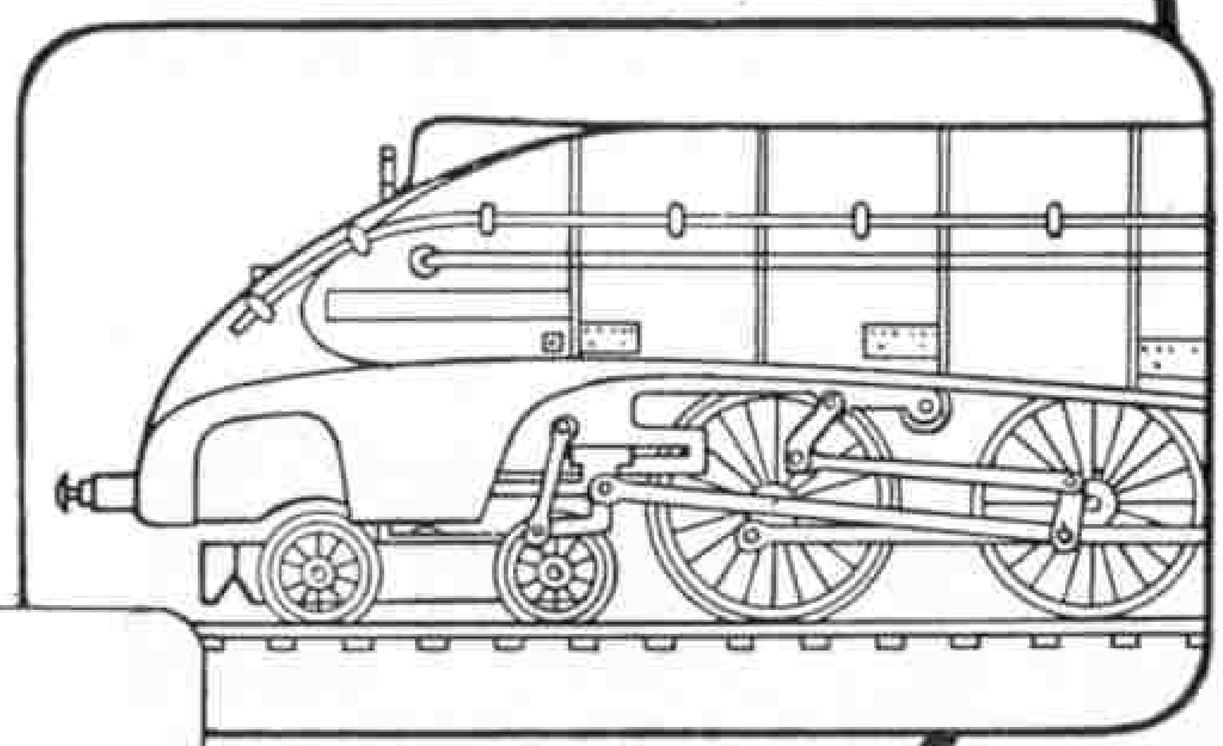
"Silver King" is one of the powerful "Pacific" type express locomotives operated by British Railways. The valve gear and other details are attractively reproduced in this magnificent Hornby-Dublo model.



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Next Month: "MY CHRISTMAS IN PEKING." By B. Llewellyn

MECCANO MAGAZINE

Editorial Office:
Binns Road
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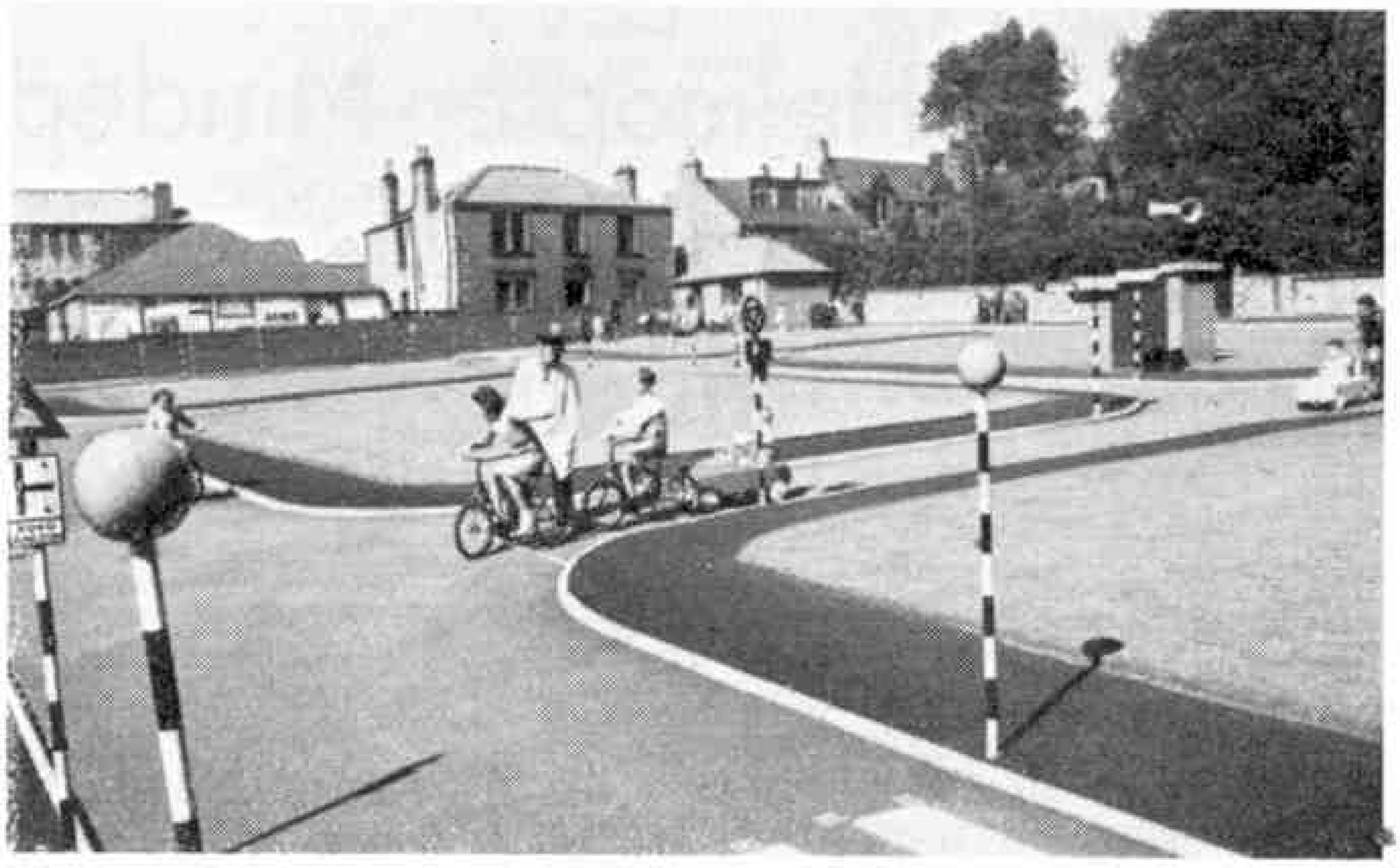
England

Vol. XXXVIII
No. 11
November 1953

Good News

By the time that this issue of the *M.M.* makes its appearance we shall be turning our minds to the coming Christmas season. I told you last month that there would again be a specially enlarged Christmas issue, which of course will be ready on 1st December. In it there will be all the usual good things, such as pictures of new models to build, ideas and suggestions for making Hornby and Hornby-Dublo Train operation more enjoyable, and of course schemes for getting the greatest amount of fun from Dinky Toys. In addition there will be many special articles, among which readers will find one on the carillons that in many places will ring in Christmas, and another on the ghosts that haunt many buildings and houses of Great Britain. I don't really know why ghost stories should be told at Christmas, but I am sure you will enjoy these. One of them at least is unusual, as the ghost is a really pleasant one, and not at all alarming!

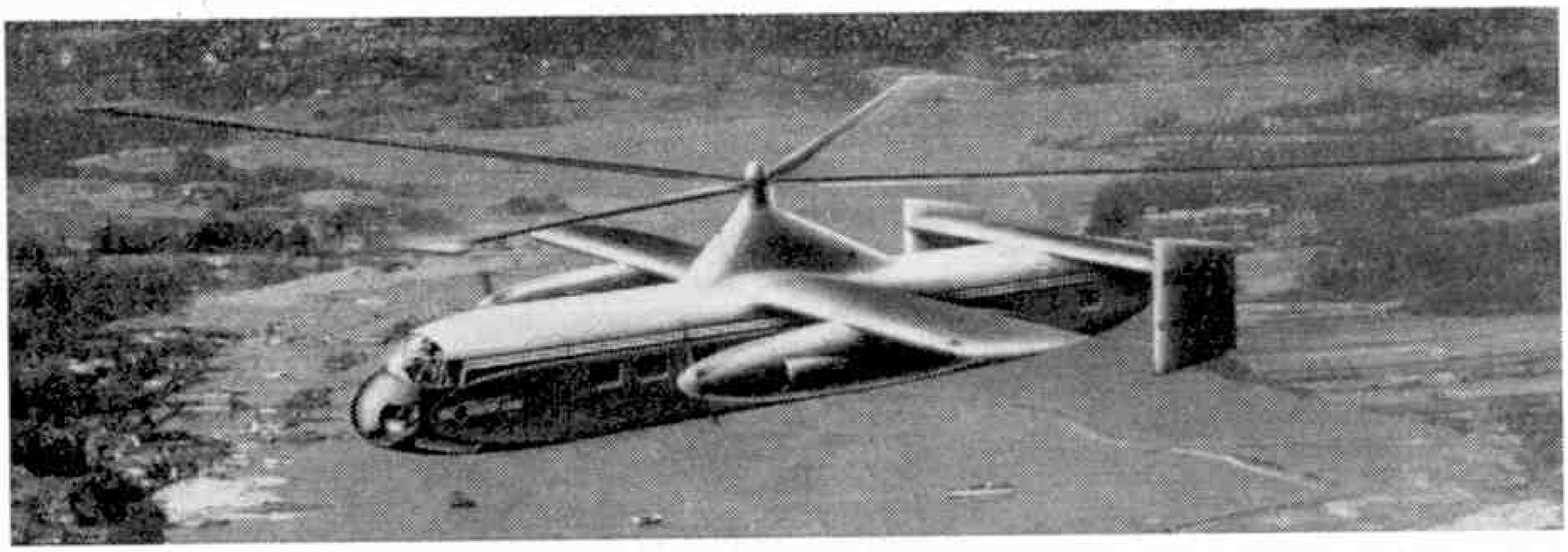
All this for the usual price of 1/–, and just to improve matters generally, the following issue, that for January 1954, also will be a special one, as I told you last month. Now I can disclose my plans for it. One of the most exciting events of January is the Monte Carlo Rally, competitors in which set off from various points, such as Oslo, Lisbon and Glasgow, to travel on difficult roads, often over mountain passes and snowbound, to Monte Carlo in the south of France. In January readers will learn exactly what form this great international Rally takes, and they will be able to read the stories of their achievements in it by such celebrities as Stirling Moss, Ian Appleyard and Jack and Peter Reece, all of them seasoned competitors who know all there is to be learned about the art of maintaining the required speeds over roads covered with ice and snow, and indeed in difficult conditions of all kinds.



Fun on a miniature road system, where children at the same time learn road sense. This system is in Pittencrieff Park, Dunfermline, and there are more pictures, with a description, on page 554.

Let me repeat the warning that I gave last month—be sure that you and your friends have your copies of these issues on order. Otherwise you may find yourselves disappointed when the day of publication arrives.

The Editor



Let's Get Helicopter-Minded

By John W. R. Taylor

THE announcement that the Ministry of Supply have ordered a prototype of the 40-50 passenger Fairey Rotodyne is the best news received from the British helicopter industry for more than five years.

It was back in June 1949 that Faireys first proved the capabilities of their unique helicopter formula by setting up an international speed record of 124.3 m.p.h. with their four-seat Gyrodyne. Since then there have been news items about helicopters in the papers almost every day. Their splendid rescue and supply work during the disastrous floods in Britain and Holland early this year and following the earthquakes in Greece last August drew columns of well-earned praise. A Bristol Sycamore HR.13 led the fly-past by more than 600 aircraft at the Coronation Review of the Royal Air Force at Odiham. A flight of twelve Westland-Sikorsky Dragonflies headed 300 Fleet Air Arm machines in the Naval Review at Spithead. H.R.H. the Duke of Edinburgh has used a Westland-Sikorsky S-55 for official journeys, taking off and landing in the grounds of Buckingham Palace. The *Evening Standard* newspaper even has its own helicopter to speed reporters and photographers in search of news.

It all sounds very satisfactory. But is it? That lone Sycamore in the R.A.F. Review fly-past represented half of Fighter Command's total helicopter fleet at that time. The helicopters used by the Royal Navy and by the Duke of Edinburgh are of American design, although both types are being built in this country under licence. The Army have five Sycamores. British European Airways have two. The grand total of all British-designed helicopters, civil and military, flying at present probably does not exceed 30.

What then has happened to British enterprise in rotating wing flight established pre-war by the Weir W. 6 — first helicopter to fly with a passenger—and by the Gyrodyne in 1948? The hard, unpleasant truth is that for years British companies have had the world's finest helicopter designs on their drawing boards, but nobody has found the money to build them. "Nobody," of course, means the Government, for only the Treasury can find the hundreds of thousands of pounds needed to finance development of modern aircraft, rotating or fixed wing.

American firms have had Government support for years, through military contracts, with the result that Bell alone have produced more than 1,000 of their 2-3 seat Model 47s, which had accumulated over half a million flying hours by the Spring of this year. Hiller, Sikorsky, Kaman, Piasecki and other U.S. firms all have thriving production lines. Their helicopters are not perfect by any means, and are not as advanced as the British designs. But you cannot fly a wounded soldier to safety on a blue-print: so it was left to U.S. helicopters to evacuate over 25,000 casualties in Korea. And Sabena have had to choose American S-55s to operate their pioneer international helicopter passenger services linking Brussels with Holland, France and Germany.

B.E.A. pioneered the use of helicopters

The illustration above is an artist's impression of the Fairey 40 - 50 seat Rotodyne helicopter, which is of size and power sufficient to meet requirements of British European Airways for a large inter-city "Rotor-coach." Photograph by courtesy of Fairey Aviation Co. Ltd.

for day and night air mail services in 1948-50, but it has been left to America and Belgium to capitalise on the idea. In Chicago, Helicopter Air Service Inc. had completed 20,000 hrs. of accident-free flight time with their Bell two-seaters by last Christmas, during which they had flown 1,075,000 miles and carried 9,420,000 lb. of mail. At peak periods, six Bells were landed on the flat roof of Chicago Post Office and 4,500 lb. of mail unloaded in 10 minutes.

In Belgium, Sabena, using three Bell 47D-1s, have carried 21,305,680 letters, totalling about 105 tons in weight, in two years, with only eight flights cancelled, six of them because of fog.

But it is on war service in Korea that helicopters have chalked up their greatest successes, and ensured for themselves a permanent place in military planning. More than 25,000 casualties, many of whom could not have survived an overland journey, were evacuated from combat areas by Bell, Hiller and Sikorsky rescue helicopters. Whole companies of U.S. Marines were carried to almost inaccessible mountain positions by Sikorsky HRS-1 (S-55) helicopters, which laid telephone cables to connect the troops with their H.Q., as they flew. In *Operation Hay Lift*, two regiments of Marines were kept supplied for five days by helicopter. Not a single lorry carried ammunition, food, clothes, wire or petrol to the troops during the period. Instead, the helicopters ferried nearly 1,700,000 lb. of cargo to them in 558 hrs. of flight time, proving themselves far more versatile and less vulnerable to attack than lorries.

The first international helicopter service in the world was inaugurated on the 3rd August last by Sabena, the Belgian airline. In this picture the Sikorsky S-55 used is shown about to land at Rotterdam Heliport before a crowd of about 6,000 people.

As a result of such tests, the U.S. Services are going in for helicopters in a big way. The Army plan to replace nearly all lorries with H-25 Army Mule helicopters in combat zones. The Air Force have ordered hundreds of Piasecki H-21 Workhorses, together with other types, for rescue, supply and liaison duties. The Navy have placed equally large orders for Piasecki HUPs for plane guard duties aboard aircraft carriers and Bell XHSL-1s for anti-submarine operations. The Marines are forming squadrons of assault helicopters. A score of new helicopters are being built or tested for an incredible variety of other duties.

All this is happening right now in America, because the U.S. Services realise that it is better to have a few thousand good helicopters today than a few dozen better ones in

A closer view of the Sabena Sikorsky S-55, showing to advantage the interesting tail rotor. The illustrations on this page are reproduced by courtesy of Sabena.

two years' time. This attitude of mind is reflected in the variety of designs, which come in all shapes and sizes because nobody has yet decided the best layout for a helicopter. The Sikorsky H-5 (S-51), H-19 (S-55) and YH-18 (S-52), Bell H-13 (Model 47) and Hiller H-23 are conventional helicopters, with single main rotor and small tail anti-torque rotor. The Piasecki machines are tandem rotor "flying bananas"; so is the Bell XHSL-1. The U.S. Navy's Kaman HOK-1 liaison and HTK-1 training helicopters have two intermeshing rotors, mounted side-by-side above the fuselage. The Gyrodyne Company's GCA-2C has contra-rotating, co-axial rotors.

The Kaman HTK-1 helicopter. This 3-seat trainer has been adopted by the U.S. Navy. Photograph by courtesy of The Kaman Aircraft Corporation, U.S.A.

In size, U.S. military helicopters range from the tiny Hiller Hornet "flying motorcycle" to the 30 ft. high Hughes XH-17 flying crane, both of which have tip-driven jet rotors. They are, on the whole, good efficient helicopters; but not one of them has the performance or operational efficiency of the Fairey Gyrodyne of 1948.

The reason for this can be explained quite easily.

A fixed-wing light aeroplane such as the Piper Pacer needs only 135 h.p. to carry four people at a cruising speed of 135 m.p.h. A conventional four-seat helicopter needs more than three times as much power as that to take-off and land vertically, yet can cruise at only 85 m.p.h. Its comparatively large engine helps to make it expensive to buy—a four-seater costs around £30,000—and far more expensive than a fixed-wing light plane to maintain and operate.

Realising that helicopters need this expensive ability to take off and land vertically only for a small fraction of their total flying time, Faireys set out after the war to find a way of using the surplus engine power to improve cruising speed in level flight. As a result, they produced what is now called a convertaplane.

The Gyrodyne's Leonides piston engine was geared to drive both the main rotor and a propeller mounted at the end of its starboard stub wing. For take-off, it worked as a helicopter, with most of the power driving the rotor, and only a small amount diverted to the propeller, which acted as an anti-torque rotor. Once airborne, the power was gradually transferred to the propeller and the Gyrodyne flew more or less as an Autogiro, with its rotor auto-rotating freely in the slipstream. This gave it a potential forward speed of 150 m.p.h. and promised improved safety, by off-loading the rotor for most of each flight.

The Gyrodyne's original three-bladed rotor has been replaced by a two-blader with pressure-jet units at the tips. These units are fed with fuel and air through the hollow rotor blades, the air being supplied by compressors driven by the Leonides engine. The result is even simpler and better than before, as no complex drives and gearing are needed between the engine and rotor, and no anti-torque system is required. Two pusher propellers replace the single tractor propeller fitted previously.

A similar system will be used on the big Rotodyne, which will have two 3,000 h.p. Napier Eland propeller-turbines. These will drive auxiliary compressors to supply compressed air to the jet-rotor burners for take-off. In flight, the auxiliary compressors will be de-clutched, the rotor will auto-rotate and the propeller-turbines, operating in the normal way, will ensure high cruising speed. Most of the lift during forward flight will come from the aircraft's fixed wings, which will be a feature of most big helicopters of the future, including later versions of the (*Continued on page 588*)

Links with the Gunpowder Plot

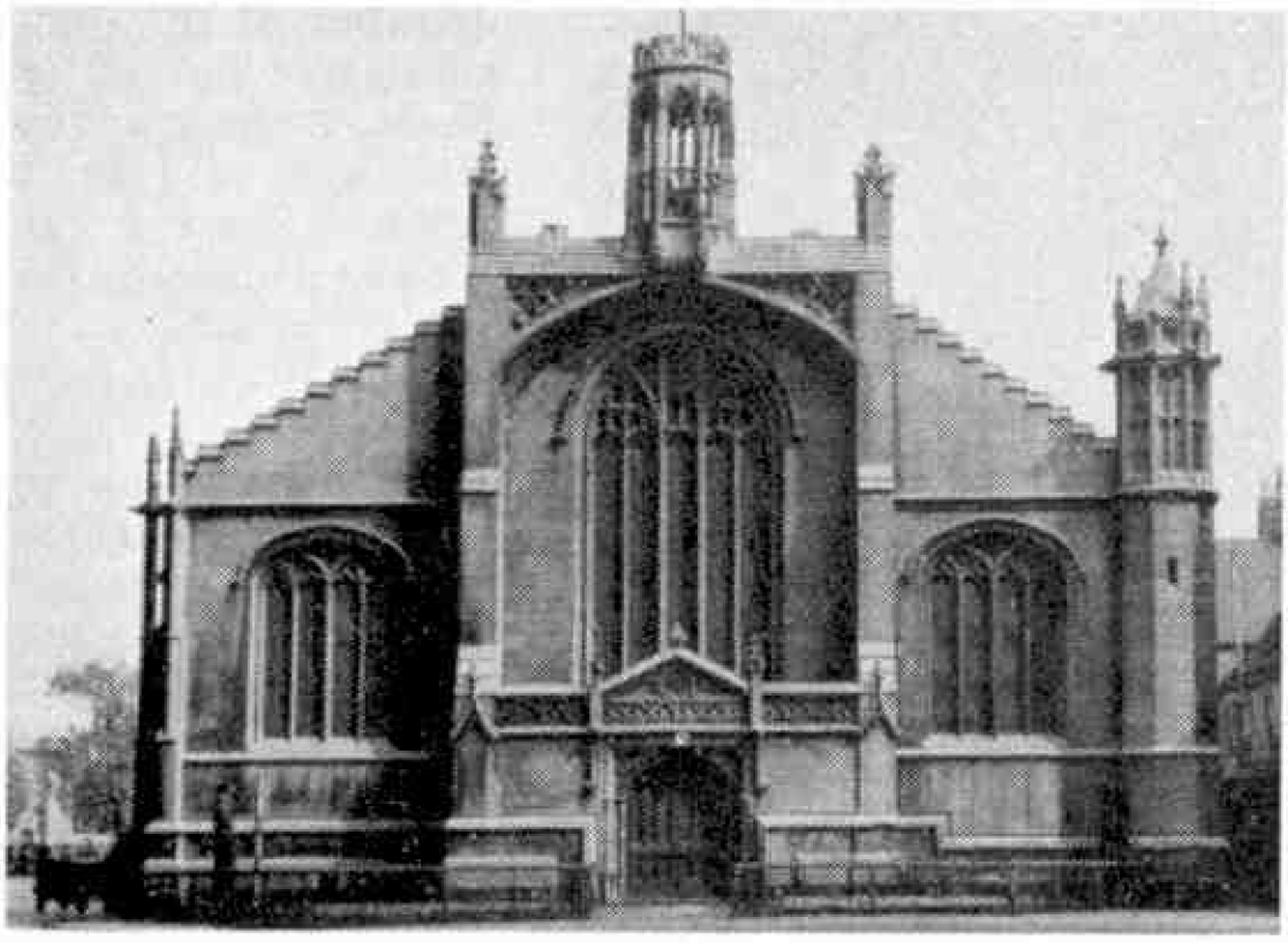
By Arthur Nettleton

NEARLY 350 years have elapsed since Guy Fawkes tried to blow up the Houses of Parliament, yet we still commemorate the event today. The fireworks that we let off each Fifth of November are, of course, a means of celebrating the failure of the Gunpowder Plot in 1605, when the English Parliament had its greatest escape from annihilation.

Further interest is given to the anniversary by the many places and buildings up and down England that are associated with the conspiracy in one way or another. Houses and other buildings, and even churches, in various localities have their memories of Guy Fawkes and his companions.

Although Guy Fawkes is nowadays regarded as the chief villain of the piece, he was not the prime mover. He was, in fact, introduced into the plot only after the preliminary arrangements had been made, when the main conspirators required somebody reliable and audacious enough to carry out their scheme. This is believed to have originated in the mind of Robert Catesby, whose home was the old manor house at Ashby St. Ledgers, Northamptonshire.

Where Guy Fawkes lived as a boy. His home was in Scotton, near Knaresborough. For many years the villagers refused to regard him as guilty and no Gunpowder Plot celebrations were held there.



St. Michael-le-Belfry, York, where Guy Fawkes was baptised. He went to school in York, and some of his fellow conspirators were old school friends.

This Tudor house still stands, and the room where the plotters met to work out their plans is still pointed out. It is a small apartment over the gateway leading to the manor house, and although outwardly there is little evidence of the part it played in one of the most astounding chapters in English history, it must rank as one of the most historic buildings in the country.

But historians state that the conspiracy was not arranged at any one place. The plotters met at various spots and the details took many months to arrange. Clopton Manor, another Tudor home, near Stratford-on-Avon, was the residence of Ambrose Rookwood. He had the confidence of the conspirators, and there is good reason to believe that they occasionally met under his roof.

An old house at Dunchurch, near Rugby, is known as Guy Fawkes House, for it also is reputed to have been used as a meeting place. In the early 17th century it was the Red Lion Inn, catering for travellers on the Holyhead Road, and a sinister feature that doubtless recommended itself to the schemers was a secret escape route. This led to the roof, and then to the stable yard. It would be a useful means of getting away for conspirators such as those who took part in the plot.

They did not disdain to meet in churches, either; and a tiny room over the porch of Stoke Dry Church, in Rutlandshire, is said to have been used by Catesby and others entrusted with the secret. The church itself contains many monuments to the Digbys, and it was Sir Everard Digby who provided most of the money for the Gunpowder Plot. He also arranged for a great hunting meeting on Dunsmoor Heath, near Rugby, on the day when the Houses of Parliament were to be blown up.

This gathering of huntsmen was then to become a revolutionary body, ready to descend on London and take over the government of the country. But, as everyone knows, the audacious plot failed; horsemen from London brought news of disaster instead of success, and Sir Everard and the others had to flee.

What of Guy Fawkes? He has been described as a mere pawn in the conspiracy, for he was a soldier of fortune and was hired to carry out the most dangerous part only after the details had been decided upon. So far from being the deep-dyed rogue we nowadays consider him to have been, he has been given quite a good character by some students of history! One account describes him as "a man of great piety, exemplary temperance, of mild demeanour, an enemy of broils and disputes, and a faithful friend."

Many places connected with him can be found, particularly in Yorkshire. York was his birthplace, and a record of his baptism is to be found in the registers of St. Michael-le-Belfry Church, near York Minster. He attended the same York school as two other Gunpowder Plot conspirators, John and Christopher Wright, though he lost touch with them when his family moved from York to the village of Scotton, near Knaresborough.

He remained at Scotton until he was 21, when he went abroad, and there is a tradition that at the age of 12 or 13 he acted as bellringer at Cowthorpe Church, a quaint little sanctuary just off the Wetherby-Boroughbridge section of the Great North Road. Scotton villagers long refused to regard him as a villain, and until comparatively recent years no Gunpowder Plot celebrations took place there on the Fifth of November!

Another church with which Guy Fawkes was connected was that at Cowthorpe, in Yorkshire, where he is believed to have been at one time a bellringer.

The two Wrights were natives of East Yorkshire, and the places most closely associated with them are Welwick and Skeffling, in the Holderness area. The churches there contain souvenirs of the family. It was John Wright who suggested that a secret oath be adopted by the men admitted into the conspiracy—about fourteen in all—and his brother Christopher was entrusted with the job of collecting the necessary quantity of gunpowder.

Several of the other plotters were Yorkshiremen, too. Thomas, John, and Robert Winter were nephews of Sir William Ingilby, whose castle at Ripley, near Harrogate, is still occupied. Thomas Percy, a further member of the gang, similarly had strong Northern connections. He was cousin to the Earl of Northumberland, who was also embroiled in the plot.

Preparations for its actual carrying out were begun in May 1605, when a house adjoining the Parliament buildings was rented and a start was made on excavating a tunnel to the cellars beneath the House of Lords. The tunnelers remained in the house several weeks, so that suspicion would not be aroused by frequent comings and goings.

But the plot was disclosed to the King and a counterplot was hatched. When the barrels of gunpowder were found in the cellar, they were left undisturbed so that the conspirators might later be caught red-handed.

This is exactly what happened to Guy Fawkes, for although news of the counterplot reached him and he was urged to flee the country, he refused to take this advice and was arrested just as he was about to light the fuse.

Thrumpton Hall, near Nottingham, where there is a secret room reached by a hidden stairway. The owners of the Hall were concerned in the Gunpowder Plot and lost their estates in consequence.

Several places are associated with the subsequent hue and cry for his companions and others involved. Some of them took refuge in secret hiding-places built into large houses. Thrumpton Hall, near Nottingham, has one of these hidey-holes; it may have been used by one of the conspirators. The Powtrell family of Thrumpton were concerned in the Gunpowder Plot and were deprived of their estates as a result.

The secret room is in the basement of the Hall, but it can be reached by way of a hidden stairway which descends from the back of a cupboard in one of the bedrooms. Henry Garnett, a leading light in the deep-laid plan, knew of this hiding-place. Yet he and the other ringleaders were soon hounded- down. The Wrights were arrested at Snitterfield, near Warwick; Catesby and Percy were killed at Holbeche House, four miles from Dudley, while resisting capture. They are said to have stood back to back when the Sheriff's men approached them, so that they were killed with a single shot!

The National Trust properties include a curious structure associated with the Gunpowder Plot. This relic stands at the end of a rough road five miles from Oundle, and is known as Lyveden New Building. It was to have been a fine house amidst lovely gardens, but it was never finished. The Gresham family who planned it were beggared by the failure of the great conspiracy, and the fanciful building is now classed as a "folly." It was begun in 1594.

In some churches, such as the one at Calverley, seen above, it was customary to strike the bells, clashing them all together, on Guy Fawkes Day.

The celebrations that we hold today are amusing and entertaining, but few people know that for 200 years an Act of Parliament existed to make the thanksgiving compulsory, and that for many years town officials were required by law to organise such festivities.

There are still a few places that celebrate The Fifth in an unusual way. At St. Peter's Church, Nottingham, a sermon to commemorate "our deliverance from the Gunpowder Plot" is preached each year. It has been preached annually since 1630, when a certain Peter Jackson left money for the purpose.

Other churches, such as one at Calverley, near Leeds, used to "strike" the bells, that is, ring the scale downwards and then clash the bells together, on Guy Fawkes Day.

Some modern historians have tried to prove that the Gunpowder Plot could never have succeeded, the quantity of gunpowder collected being much too small to do any damage.

DINKY NEWS

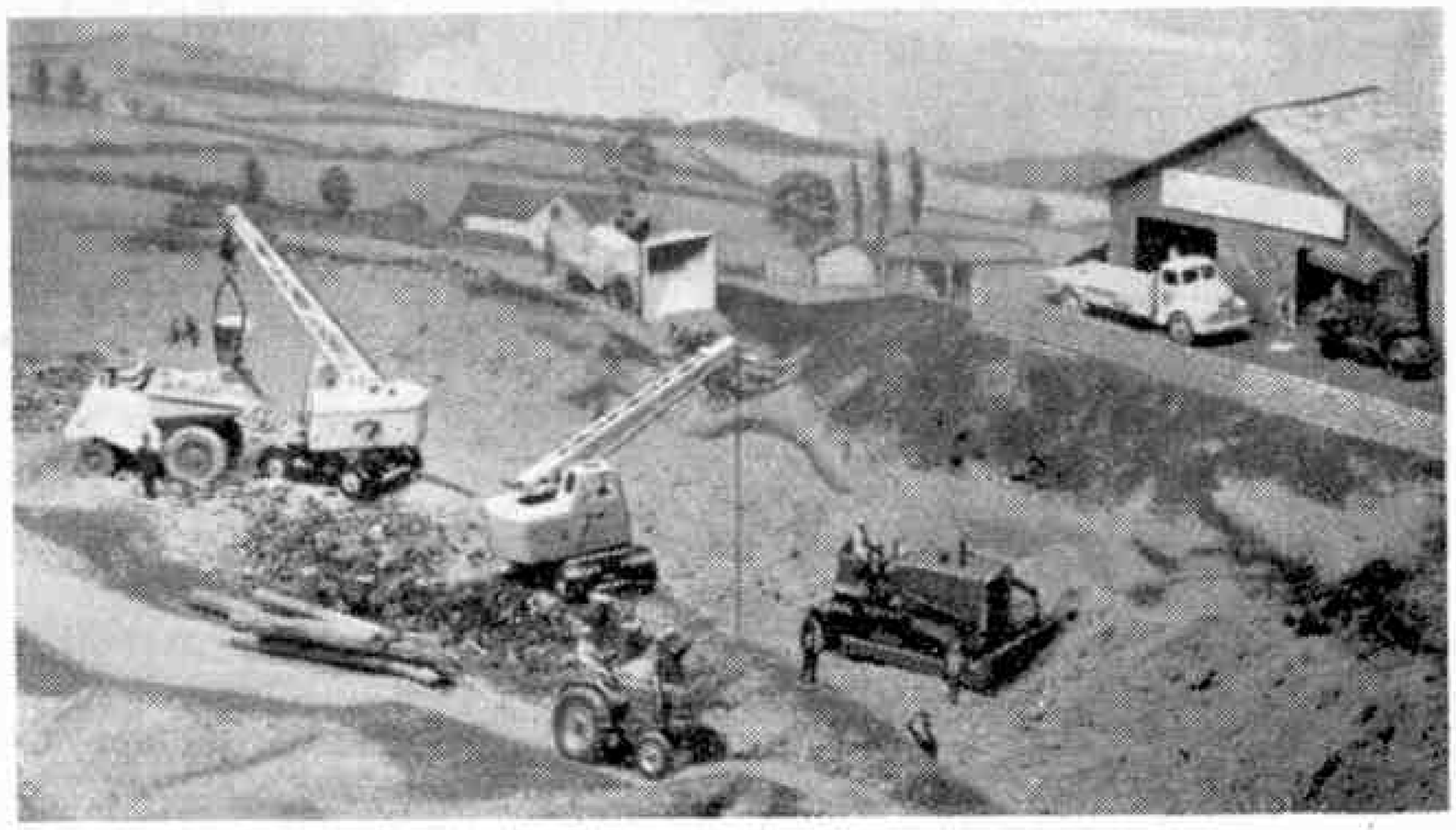
By **THE TOYMAN**

Building A Dinky Canal

THE Dinky Toys Layouts that I have illustrated in recent *M.Ms.* are evidently giving a great deal of pleasure to collectors, and several of them have written to tell me that they have been encouraged by these pictures to experiment with layouts themselves, and that they have obtained lots of fun and added interest from their hobby. It is really surprising how easy it is to arrange realistic scenes, and of almost any kind.

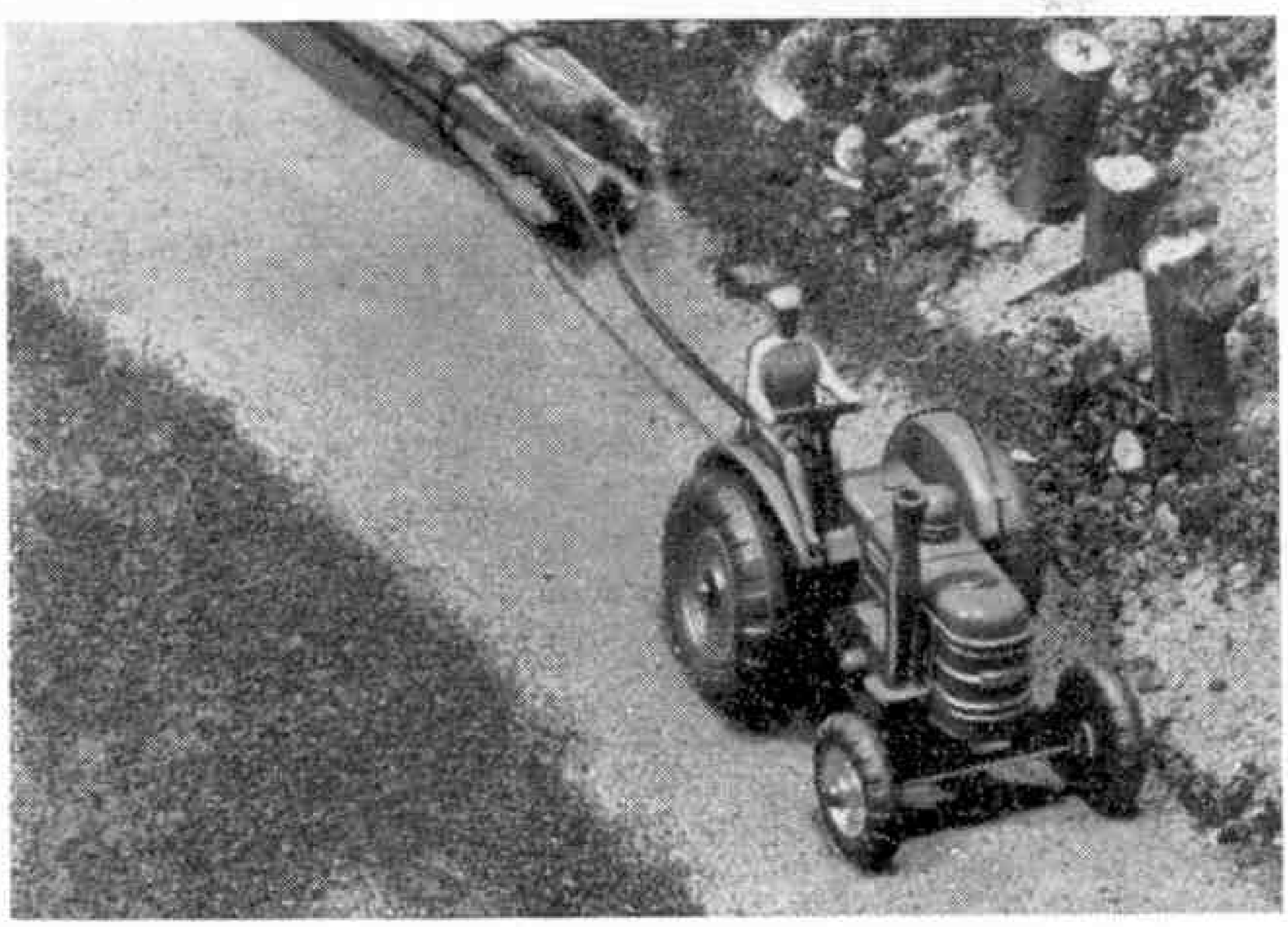
I have already given examples of a small town layout and a farm layout and this month I have chosen something quite different again—building a canal! The upper illustration on this page shows work in progress on the excavation of a section of a canal, and among the Dinky Toys featured in it are the new Field-Marshall Tractor, Dinky Toys No. 27n, the Blaw Knox Bulldozer, No. 561, and the Coles Mobile Crane, No. 571.

I would like to draw special attention to the Field-Marshall Tractor, which was introduced last month. It is shown in the illustrations hauling a load of tree trunks that have evidently been felled because they were an obstruction in the route of the canal. The stumps of the trees also can be seen in the main illustration.



A real novelty for the Dinky Toys layout enthusiast. The scene represents the construction of a stretch of canal, and the new Field-Marshall Tractor is prominent in it as well as the Blaw Knox Bulldozer, the Coles Mobile Crane and other Dinky Toys.

The Field-Marshall Series 3a is a heavy duty tractor powered by a diesel engine, and is designed to have a wide range of uses in agriculture and general work. It has a six speed gear-box, and a power take-off placed in the centre at the rear of the tractor. The Dinky Toys model is a perfectly proportioned miniature of the real thing, and is supplied fitted with a towing hook to enable it to be used with other Dinky Toys models of farm equipment. It is 3 inches in length and is beautifully enamelled in bright orange with silver lining, which are



The Field-Marshall Tractor hauls away the trunks of trees that have had to be cut down because they were on the line of the canal.

the actual colours of the real Field-Marshall tractor.

Well, now for a few words about the making of the canal layout. The scene is laid on a piece of dark-coloured cloth, which is spread over two parallel but curved lines of small boxes or wooden blocks arranged about eight inches apart. The cloth is pressed down into the channel formed by the rows of blocks and is held in place by drawing pins fixed in the baseboard.

Spoil being loaded into a Dumper Truck for removal, during the excavation work.

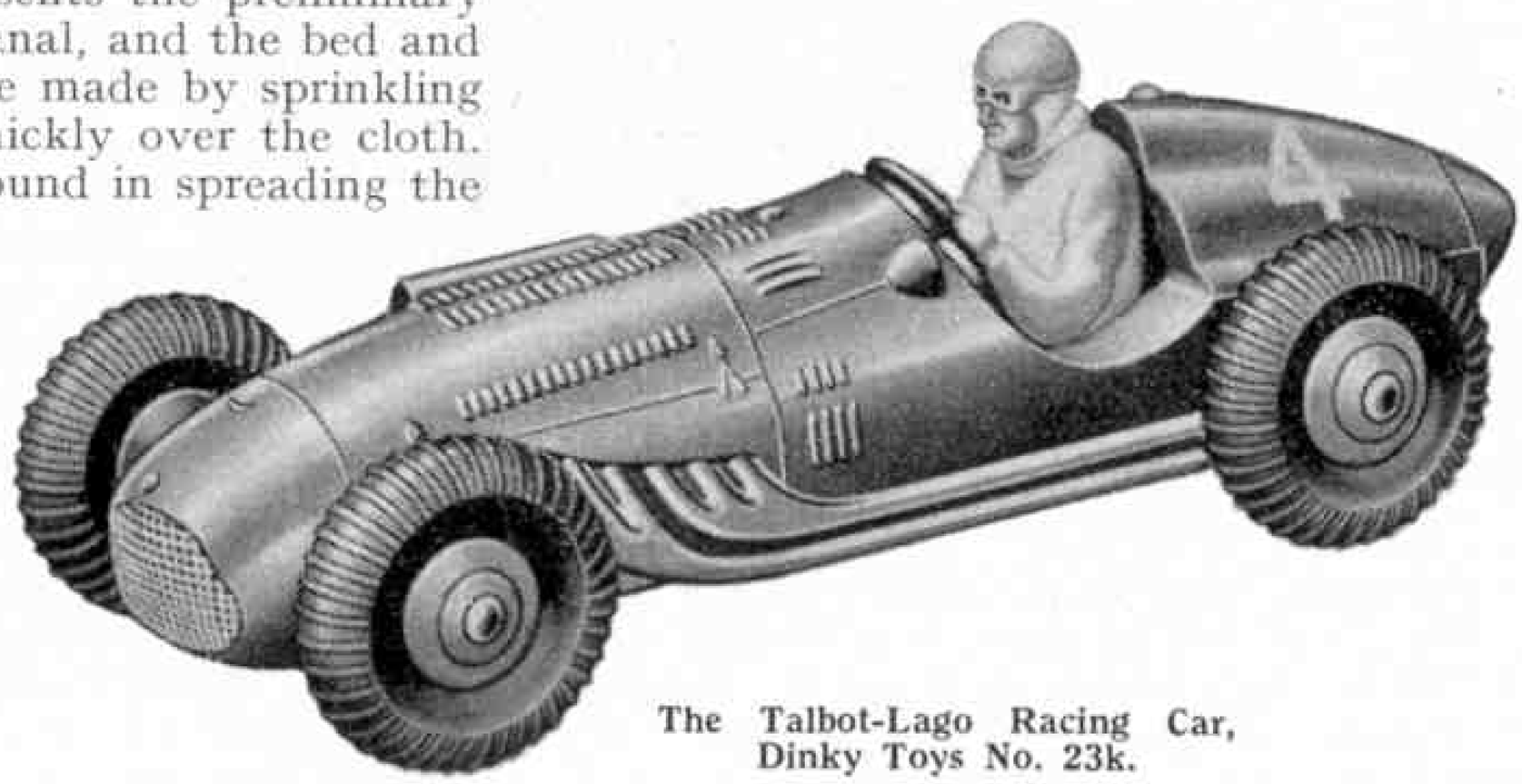
The depression of the cloth between the lines of blocks represents the preliminary excavation for the canal, and the bed and sides of the canal are made by sprinkling coarse sand fairly thickly over the cloth. If any difficulty is found in spreading the sand over the sides of the cutting, the job can be carried out quite easily if the sand is damped slightly before it is applied. The ground on either side of the canal excavation should be rather darker in colour than the actual cutting, and this effect can be obtained by spreading a mixture of sand and fine ashes over the base cloth.

The tree stumps seen in one of my illustrations are short lengths cut from tree twigs and embedded in ashes. It is remarkable how realistically they can be imitated.

As I wanted to use the Coles Mobile Crane on this layout I decided to fit it with a bucket in which to hoist the spoil from the canal excavation. This I shaped from a piece of tinfoil wrapping, moulding it round a Meccano Chimney Adaptor, which was glued inside the completed bucket. The wire used for the bucket handle was passed through the side holes of the Chimney Adaptor. When hung from the jib of the Crane this gave the layout quite a realistic touch, and the result was well worth the trouble taken.

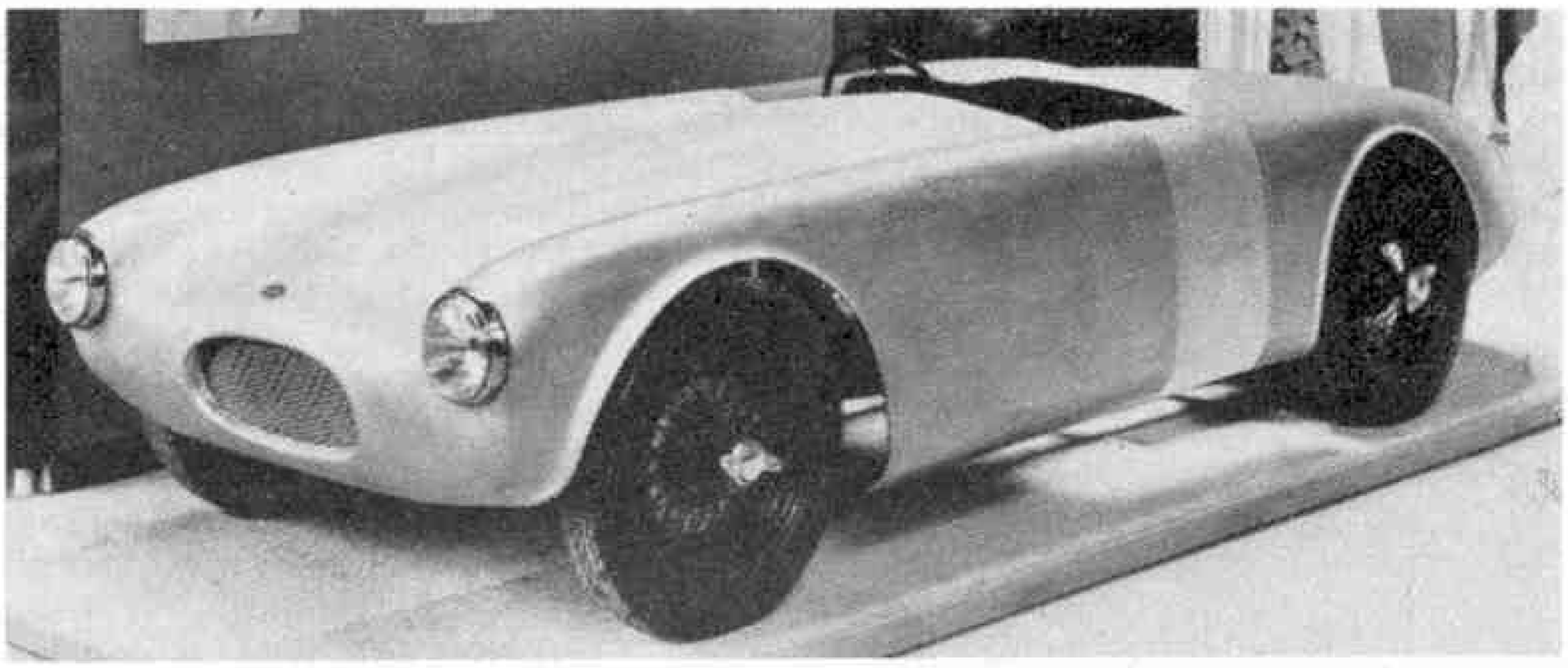
One of the jolly things about construction work is its immense variety, and this makes it possible to arrange many different types of scenes quite easily and from the simplest easy to get materials. I hope more and more collectors will get to work on layouts of this kind and sample for themselves the great fun it is. Now that winter is here again, the making of a simple layout will be found a really pleasant way of spending a long evening indoors, and it will add much to the pleasure obtained from a Dinky Toys collection.

I think every reader spotted the error in last month's *Dinky News*, judging by the number who wrote to tell me that I had mistaken a Cooper-Bristol for a Talbot-Lago. What a reprehensible error! Here is the right picture. I may make another slip, some time or other, so keep your eyes open—although I don't need to tell you to do that!



The Talbot-Lago Racing Car, Dinky Toys No. 23k.

This car body is made of glass fibre mat, bonded with Bakelite Polyester Resin. The illustrations on these pages are reproduced by courtesy of Bakelite Limited.

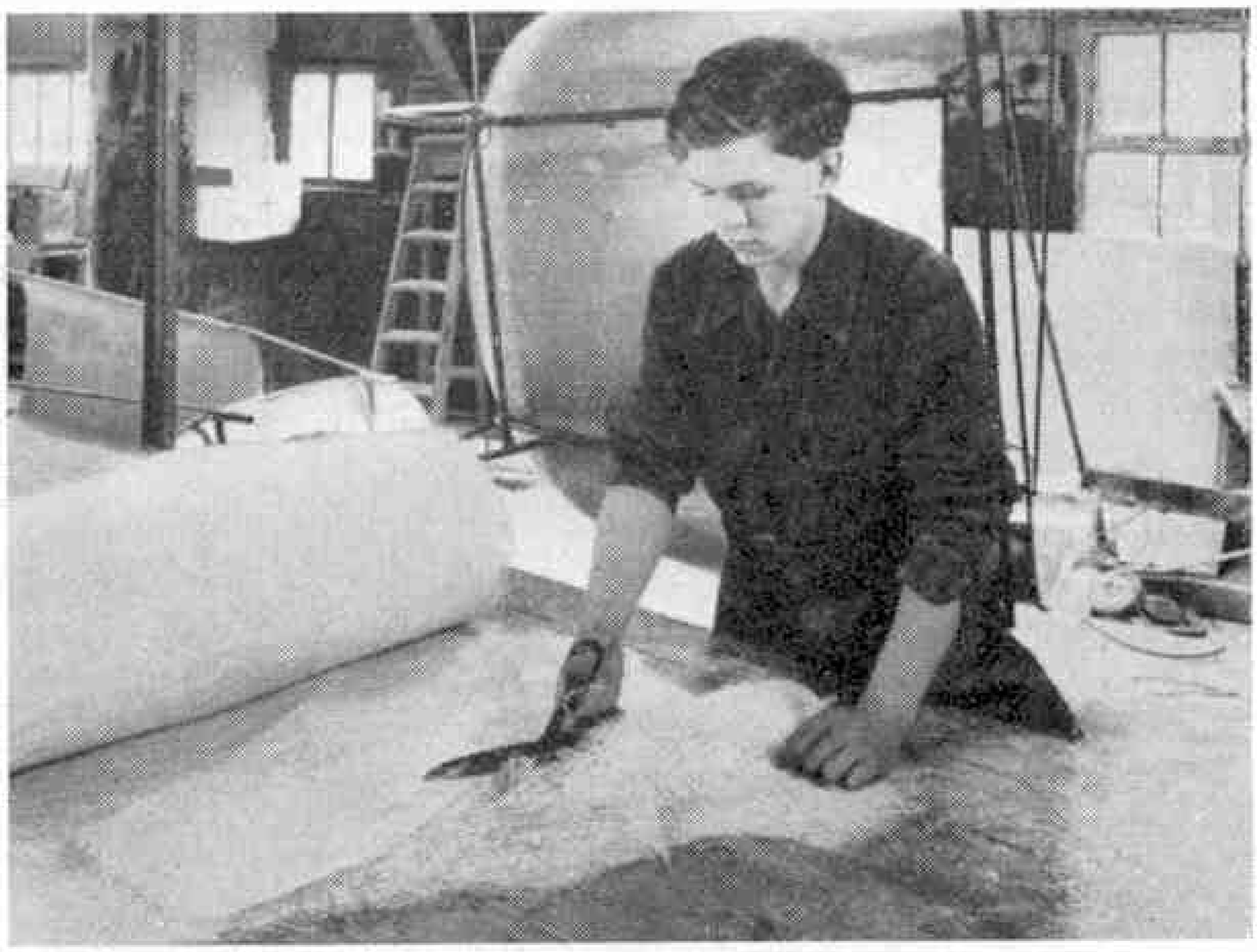


Glass—But Not Fragile

A New Material for Car Bodies

By J. Dewar McLintock

SOME of you may have read somewhat wild-sounding stories in the daily newspapers about "glass" car bodies. One reporter, I remember, described a body which could be crashed against a tree at a fair "lick," and which suffered little or no damage. There were stories about its being possible to aim a good swinging kick at such a structure, to find that a sore toe was the only result . . . !



Here the glass fibre mat is being cut out to pattern in readiness for building up into a car body.

Perhaps you would like to know the truth about the business. Let's start with the kick. At a garage in Windsor recently, I examined one of these bodies, which are actually made of glass-fibre-reinforced resin. A technician obligingly kicked the nose of the aerodynamic body. Nothing happened, so he jumped on the nose. It buckled and caved in, with a cracking sound. While I was wondering whether he had gone a bit too far, he put his foot under the wheel arch and kicked upward, inside the nose. The material unbuckled itself, again with an almighty "crack," and the surface was perfect once more.

To make sure I should go away happy, he found an area on the body where it wouldn't matter—actually the centre of a headlamp moulding, which would have to be cut out in any case—and got to work with a wicked-looking hammer. Very reluctantly, it seemed, the material began to flake and crumble like extraordinarily hard toffee, after he had been doing it for some time. "You see," he said, "You *can* break it . . ." But one does not go about with a hammer, bashing away at a car body, normally. The truth is that this stuff is stronger than wood or aluminium, and as strong as steel, and has the great advantages over all the other materials that it is resilient and non-rusting.

Put simply, non-technically, what this process of laminating glass-fibre and plastic comprises is a kind of superior form of what the makers of papier-mache baths,

basins, toys, etc., have done for many, many years. It is a process of building-up thickness in layers, using a mould that could be either convex or concave, but is usually the latter. Once the preliminaries have been attended to—that is, the determination of the right "mix" and of the method of curing and pressure required, and of course the carpentering of the mould—production of body shells can be left to comparatively unskilled, but intelligent, men or boys.

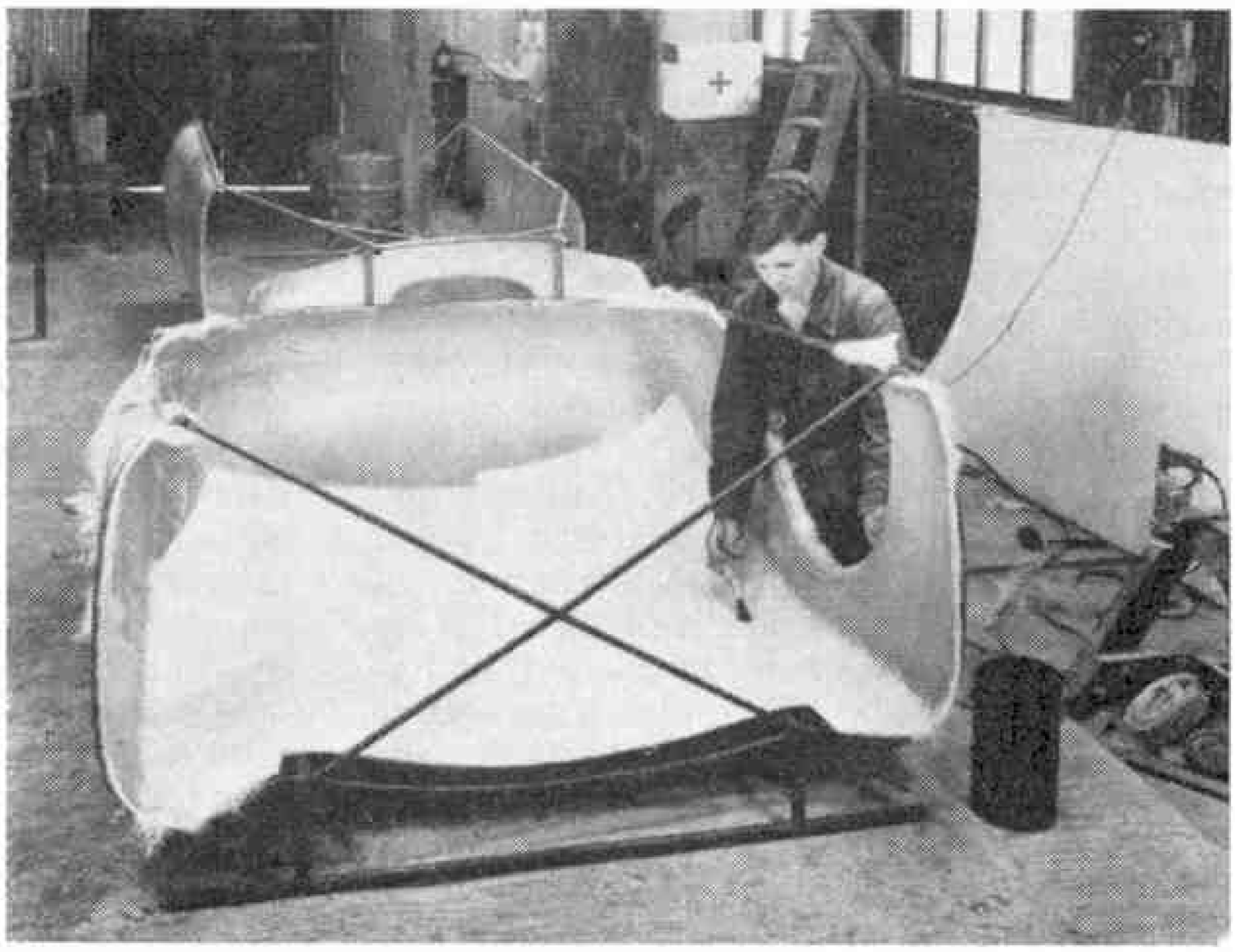
For those of you who *do* want it a little more technically expounded, perhaps I should quote Bakelite Ltd., a company that has done important development work on these projects, and provides resin for many of the makers. The company say "Briefly, the process consists of applying successive layers of reinforcement and catalysed polyester resin. Glass fabric or glass-fibre mat may be used, and the resin may be catalysed with hot or cold-setting catalysts according to the nature of the structure and the equipment available."

What the manufacturer has to do is to make a prototype first, as in almost any production schedule. This will, in all probability, be a normal wood and metal or all-metal body shell, made by hand. From this is copied the master mould, which may be a "reverse" in wood and plaster, or may well be a glass-fibre shell in negative form, if the prototype is very smooth externally. The important thing is that the low-pressure mouldings obtained in this new technique faithfully reproduce the contours of any mould with which they come into contact even under moderate pressure. Thus, if the mould surface is rough, the finished pressing will be rough. If it is smooth, the pressing will be smooth. But, you see, the side of the pressing to which the pressure is applied will not necessarily be very smooth, nor need it be, in most cases.

If some heat is to be used in curing, the maker may incorporate electric heating elements in the mould while he is making it.

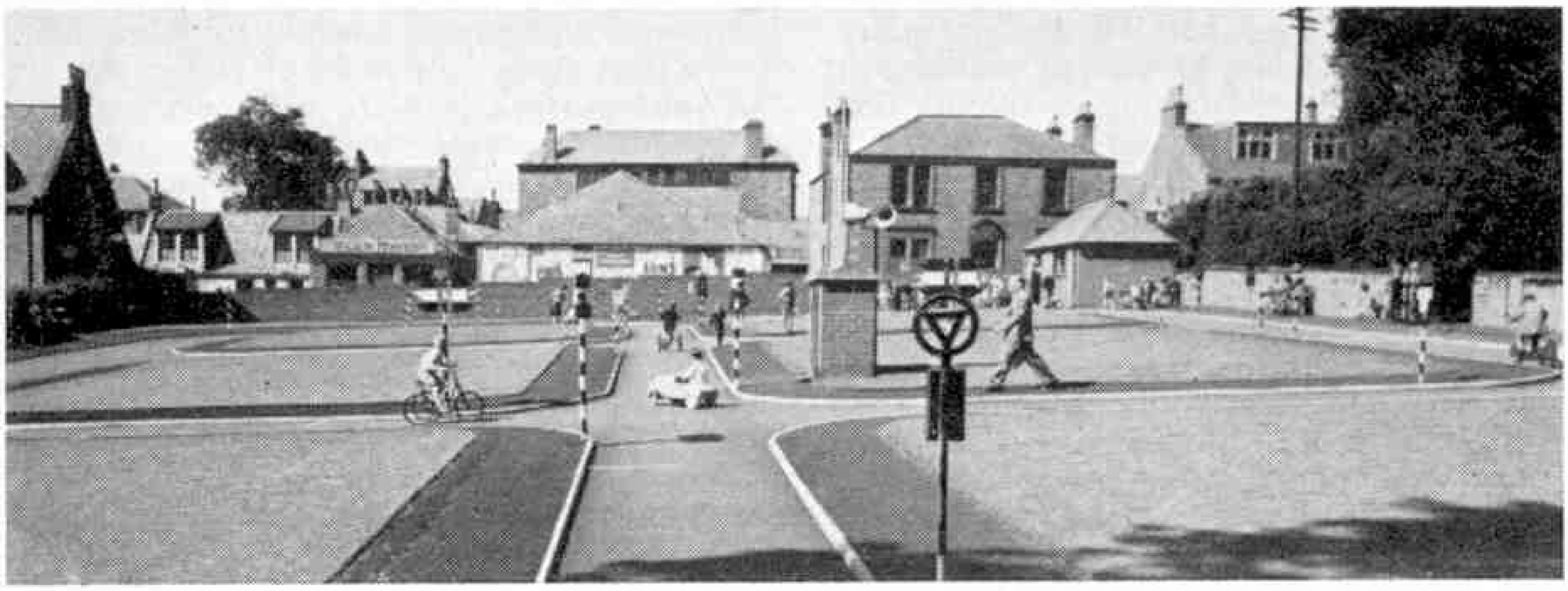
The mould being finished and ready, production of the shells follows the sequence of applying a separator compound —so that there will be no sticking—a coat of quick-setting resin, the resin-impregnated glass-fibre matting, then perhaps another coat of resin. The laminations may be simply squeegeed, or may be subjected to pressure with an inflatable rubber bag, or with a mould and screw clamps, etc.

An interesting thing is that it is possible to incorporate pigments into the resin, so that the structure is given any desired colour. At the Plastics Exhibition in London earlier in the year, some of you may have seen, as I did, a magnificent fixed-head coupé body of aerodynamic type, made in this variety of plastics. Now, I noticed that this structure had a rather pleasant kind of pearly, opalescent pink finish, and I imagine that the required pigmentation had been incorporated in the "mix." However, I have seen the material finished in ordinary cellulose with excellent effect.



Making the actual car body. Successive layers of the glass fibre mat are laid in the mould and impregnated with the resin.

Finally, I think it is worth mentioning that commercial vehicle manufacturers are turning to the use of this new material for doors, bonnets, wings and even complete bus-fronts, whilst there are numerous other possible applications, as you may imagine. It is conceivable, for example, that fuel tanks might be made from laminated fibre-glass plastics. Weight-saving is becomingly increasingly important in the case of passenger-carrying chassis, and this might be one way of assisting. Such tanks have been made for boats.



Road Safety Training

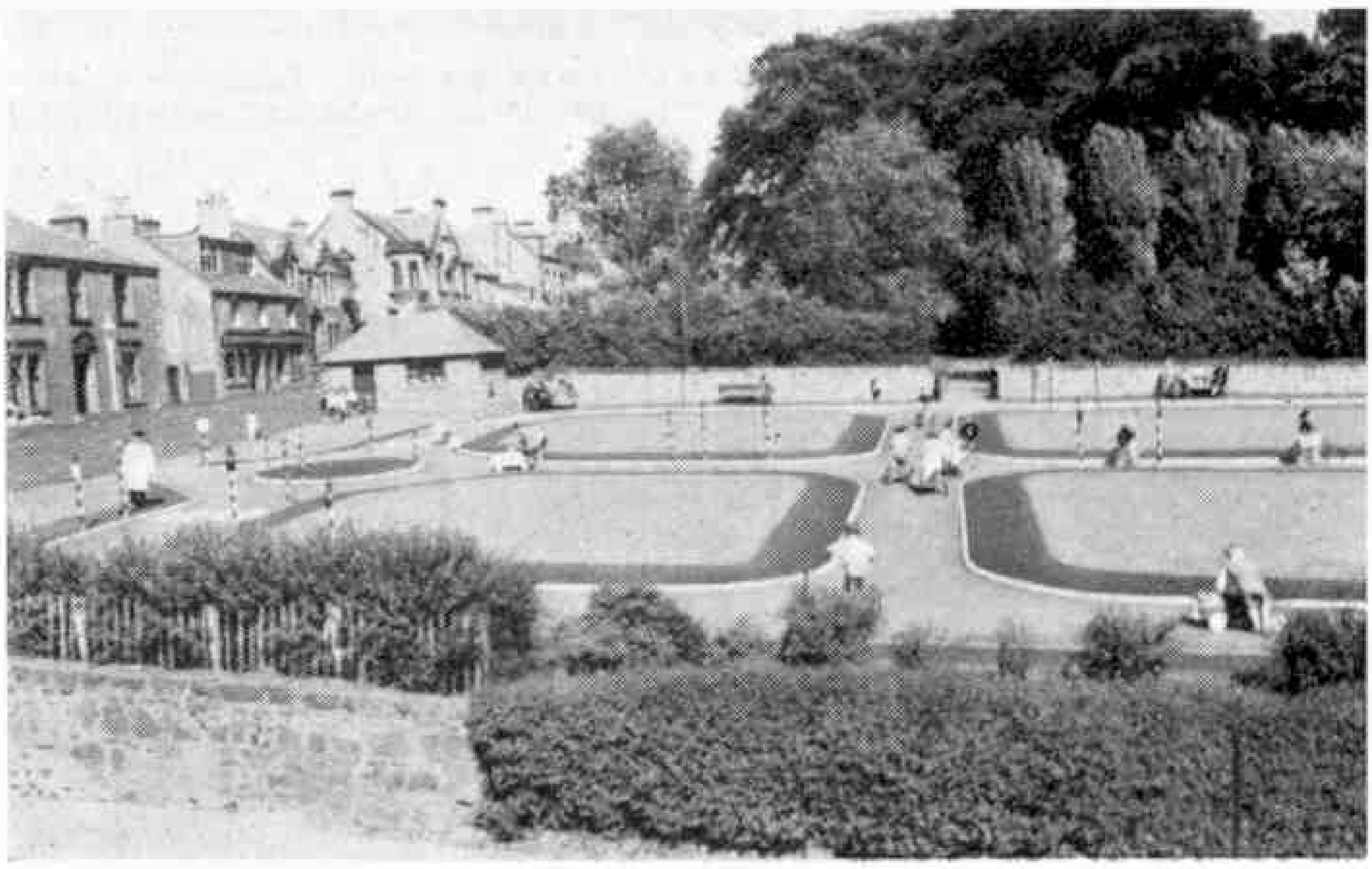
Dunfermline's Model Traffic Area

By the Editor

IN the *M.M.* for July last there was a description with illustrations of a model road system in Queen's Park, Burnley, with traffic lights and road signs, on which children could gain experience in riding bicycles and tricycles in actual road conditions. The appearance of this intensely interesting article brought me pictures of a model traffic area of a similar kind in the historic town of Dunfermline, Fife, which is a few miles north of the Forth Bridge, the giant cantilevers of which are readily visible from many of its streets. This miniature road layout has been in existence for more than three years and is permanent, available for children on every day in the year.

The position of the Dunfermline system is a splendid one, for it has been laid out in Pittencrieff Park, a magnificent open space that is very close to the centre of the town. One road forms a complete circuit of the area, and there are three crossroads, two in one direction and one at right angles, so that there are plenty of corners where children can obtain practice in looking out for road signs and signals and learn to obey them. There is also a roundabout, and every possible road sign has been skilfully worked in.

As will be gathered from the illustrations, the boys and girls of Dunfermline make splendid use of this road system. They thoroughly enjoy themselves and, what is equally important, they learn the good manners towards other road users that are so essential in ensuring that travelling by road is made as safe as possible. They are given guidance by police officers and school teachers, and a control box with loudspeaker equipment is provided, so that errors can be corrected at once.



The pictures on this page, and that on the Editorial page of this issue, are views of the fine model traffic area in Pittencrieff Park, Dunfermline.

Crescent-Wing Bomber

By John W. R. Taylor

NO aircraft company has so much experience of building big bombers as Handley Page Ltd. Little wonder, then, that we all expected something pretty sensational from them when they designed their first jet atom-bomber—and we have not been disappointed!

The H.P.80 Victor, illustrated on this page by courtesy of Handley Page Ltd., is like no other bomber in the world. Every part of it has been designed to combine high speed with great weight-lifting ability, from the tip of its needle-nose to the big tailplane, which looks almost like a small aeroplane poised ready for take-off at the top of the massive sweptback fin.

Most unusual feature of all is the Victor's crescent wing—so called because it is sharply swept-back at the root, less sharply swept in the middle, and still less at the tip. It is this wing, in fact, that has enabled Handley Page to claim that no other bomber can fly as fast, as far and as high with as great a bomb load—a claim that Avro had already made for their Vulcan delta-wing bomber.

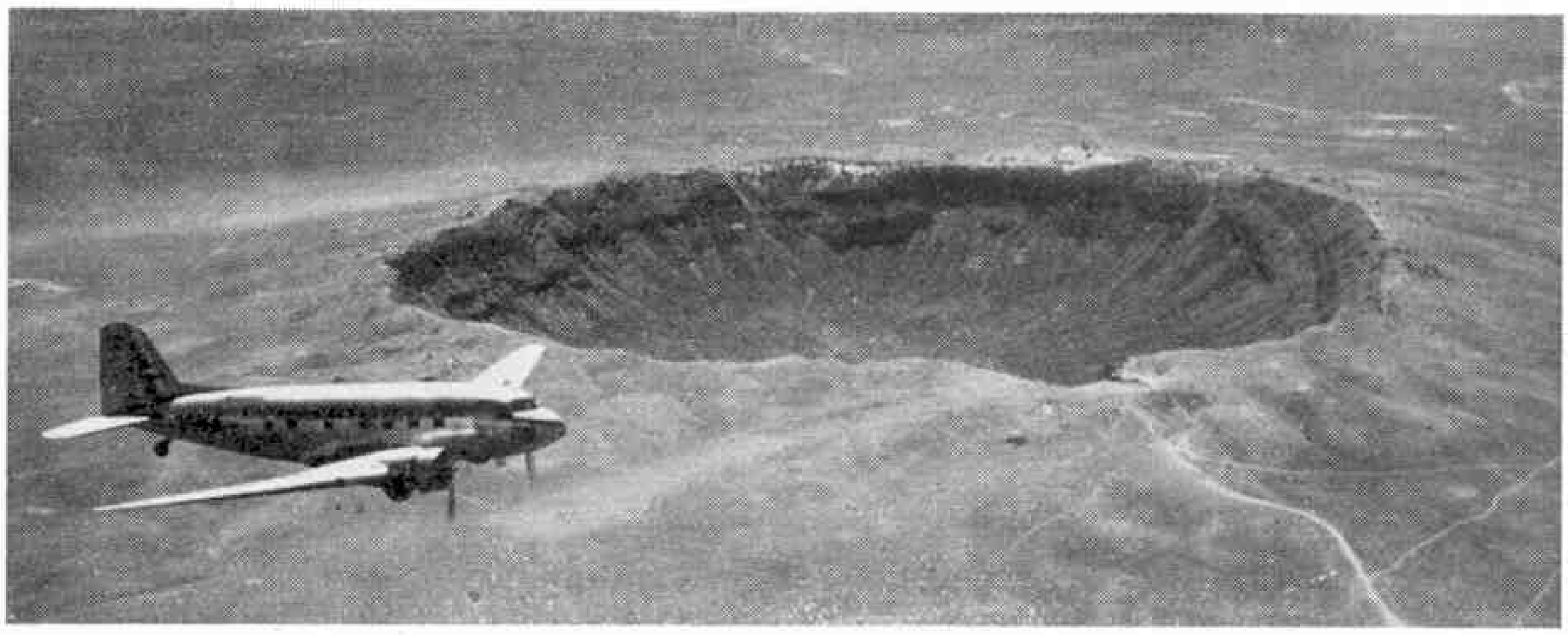
Both the Vulcan and Victor are flying at present with four Armstrong Siddeley Sapphire turbojets of unspecified power; but production Vulcans are scheduled to have Bristol Olympus turbojets. Both will almost certainly fly well over 600 m.p.h., and it seems safe to assume that they can lift a bomb load at least as great as the American B-36, which has carried 42 U.S. tons of bombs over short ranges.

Purpose of the crescent wing, as with the delta, is to overcome some of the drawbacks of ordinary swept wings. Chief of these are that it is difficult to find room for engines and undercarriage in an orthodox thin swept wing, and that in certain conditions of flight there is risk of tip-stalling and flexing of the thin wing, so that in extreme cases the ailerons can become ineffective or even dangerous.

The three sections of the Victor's crescent wing vary in thickness as well as sweepback. The inner section has sufficient sweep to reduce frontal drag and delay compressibility shock-wave trouble, and is deep enough to house engines and undercarriage. The middle piece is still thick enough to offer plenty of rigidity and internal fuel capacity. The moderate sweep of the outer section overcomes tip-stall and distortion worries, despite its thin section. The crescent wing also permits use of a higher aspect ratio (*i.e.*, long "narrow" wings), giving better performance at extreme altitude and improved control during landing and take-off.

Many of the Victor's revolutionary features must remain secret, but photographs show that it has big flaps on the leading edge of its wing as well as on the trailing edge, to improve still further its low speed handling characteristics. And the flat plates standing out from its tail-cone mark the edges of dive-brakes which hinge outwards. The big bulbous nose almost certainly houses a vast array of radio and radar equipment to enable the Victor to find and destroy its target with the latest types of bomb in any weather.

It will be years before we know whether the Victor or the Vulcan is the better bomber. But that matters very little, because the Royal Air Force, knowing that they are better than any other bombers in the world, have ordered both.



Celestial Fireworks

By Leslie E. Wells

IT is often said that a shooting star heralds the birth of a baby. If so, more babies must be born during November than in any other month, for now these brilliant objects—meteors, to give their astronomical title—are more noticeable than at any other time of the year.

Every day of the year something like twenty million meteors smash their way into the Earth's atmosphere, and the annual world downfall is estimated at fifty thousand tons. Of course, thousands of these celestial visitors dissolve into fine dust long before they reach the gravitational pull of the Earth and thousands more hurtle harmlessly into the sea. Nevertheless, some have reached the Earth with varying results.

A few years ago a roadside garage in Colorado, U.S.A., was hit by a meteorite that pierced the roof of a car inside, and came to rest within the cushion of the driver's seat. The driver luckily was elsewhere, but his wife was standing only fifty feet away—and she thought that a plane had come down in flames nearby!

This crater, in Arizona, in the United States, was made by a meteorite and is nearly three miles in circumference. The meteor that created it is believed to have buried itself deeply in the ground, but all efforts to find it have so far proved futile.

Similarly, a year or so ago, a man was riding a motor cycle and sidecar in East Anglia when suddenly a small glowing mass dropped from the sky and landed in the sidecar. Fortunately he was not carrying a passenger.

Recently, at the little village of Beelsby, near Grimsby, England, a meteorite the size of a football stunned two men, scorched the face of another, twisted a weather vane, and tore up a pathway before it buried itself appropriately in the village churchyard.

The heaviest meteorite ever to come to the British Isles was the one that fell at Wold Cottage in Yorkshire in 1795. It weighed just over half a hundredweight. The narrowest escape from a direct hit was that of three children in 1847 at Braunau, Bohemia, when a "space bomb" penetrated a roof and covered their bed with debris.

The height at which meteors are observed is about 80 to 100 miles, and they usually disappear about 30 miles nearer the ground. Their speeds are literally fantastic. At one time it was believed that none travelled at a speed much greater than 25 miles per second, and others were as slow as 10 miles a second. But observations in recent years have led to the discovery of meteors hurtling along at speeds up to and exceeding 45 miles per second.

Some idea of what this colossal speed means may be gathered from the fact that it is equivalent to travelling from London to New York in about 60 seconds, going round the world in 10 minutes, or completing a trip to the Moon in an hour and a half!

Astronomers tell us that meteors are fragments of disintegrated comets. In outer space there is nothing to prevent their progress, but as soon as they reach the Earth's atmosphere terrific friction is set up, with the result that they glow white hot, and many of them indeed burn out long before reaching the ground. These are astronomically called chrondulites.

A meteor that is not burnt up in its passage through the atmosphere falls to the ground as a meteorite. Most meteorites are composed of about ninety per cent. iron and ten per cent. nickel. Those rich in mineral content are worth £10 a ton.

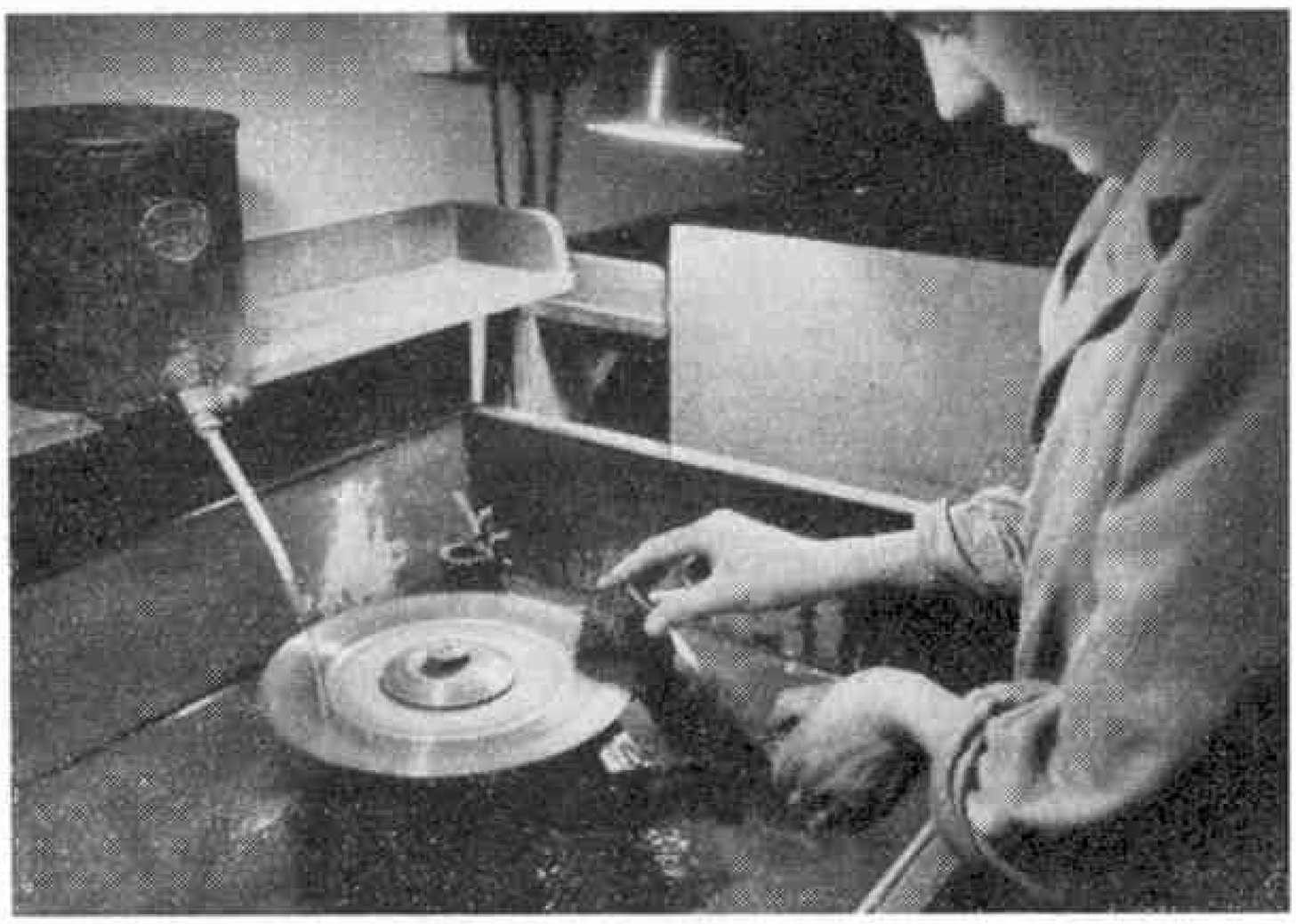
Could a really outsize atmosphere-surviving celestial body hit the earth?

The possibility of a collision is extremely remote, but is by no means an impossibility. The narrowest escape the Earth ever had was on the night of 28th October 1937, when a planetesimal — a small planet—was found to be rapidly coming towards us. Fortunately three days later it passed us approximately 400,000 miles away which was the closest any known heavenly body has ever been to our planet.

What would have happened if this small planet had collided with the Earth? A crater, perhaps 60 miles wide and a mile deep, would have been blasted out. Everything within this area would have been totally destroyed, and all landmarks such as hills, valleys and rivers would have vanished.

If the planet had dropped in the oceans it would have set up a tidal wave on a scale never before known to man, carrying death and destruction throughout the world. It might indeed have even smashed through the thin rind of rocks that envelopes the flaming core of our planet and thereby exploded the entire globe, lighting up for an astronomical moment the dark deeps of the firmament.

The Earth already bears the scars of at least two really hard blows delivered from the heavens in the form of meteors.

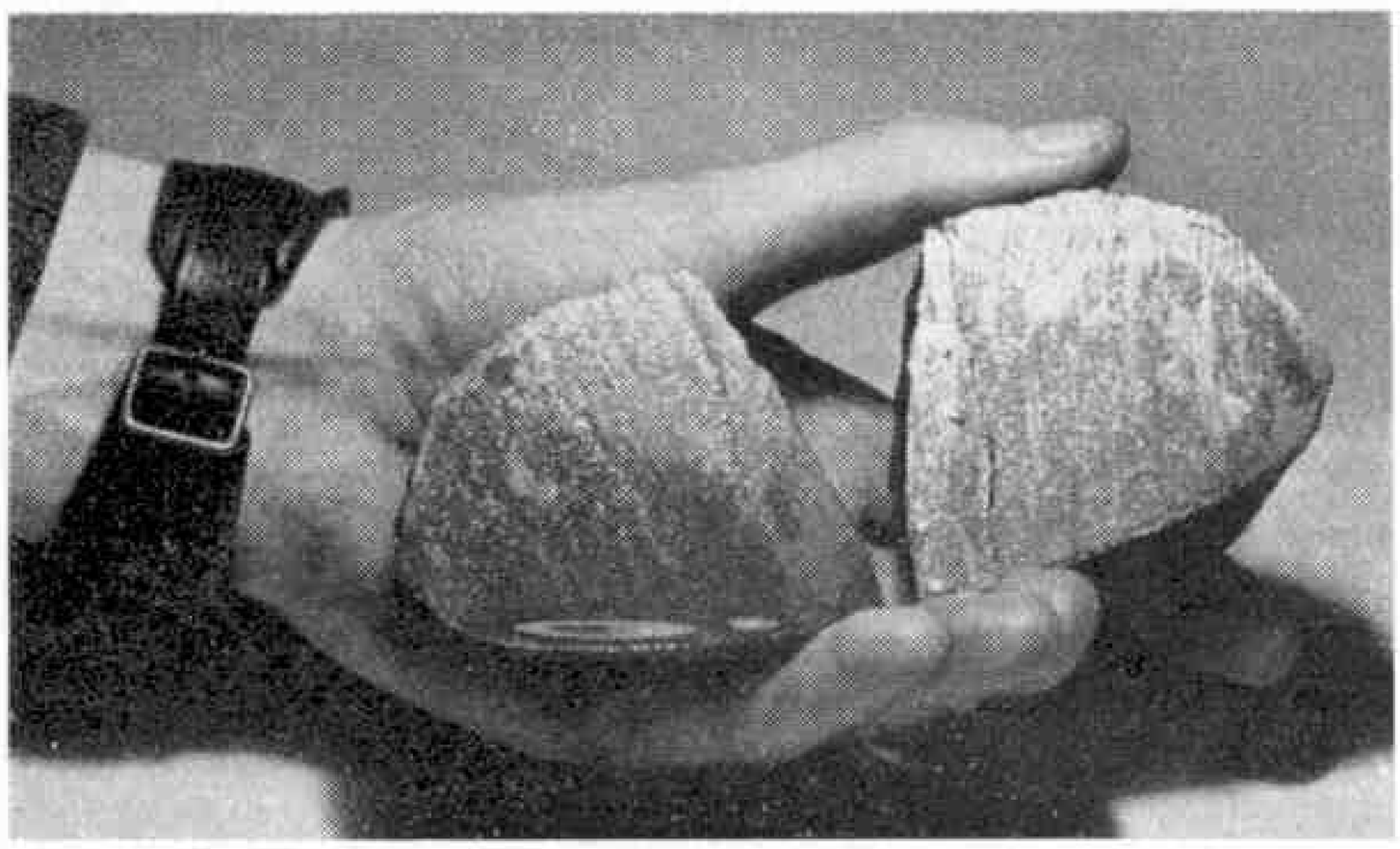


A meteorite found at Beddgelert in January 1950 is here seen being cut into two pieces by a revolving steel plate that has diamond dust forced into the nicks on its edges.

One is in the province of Yenisei in Central Siberia, where in 1908 a huge meteor struck a forest area. No news of what had happened reached the civilised world for three months, as it fell in such an isolated region, but on the night of the fall and for several subsequent nights brilliant green, gold and crimson twilight hues were witnessed in England and elsewhere, caused by fine dust carried high up into the atmosphere by the explosive impact. The meteor devastated many square miles, and left an area as big as an English county a churned-up waste.

The second scar, caused by a more violent impact, is the Great Meteor Crater of Arizona, six hundred feet deep and nearly three miles in circumference.

There is no record as to when the meteor that produced it fell, but this is estimated to have been at least a thousand years ago. It weighed about 1,000,000 tons and penetrated through hard sandstone rock. The radius of destruction must have been serious up to at least 200 miles.



Here are the two halves of the Beddgelert meteorite, which proved to consist chiefly of nickel and iron.

Railway Notes

By R. A. H. Weight

B.R. Steam Locomotives' Improved Performance

We do from time to time hear of locomotive failures or encounter engines that are unable to keep time or haul their loads adequately. Complicated machines liable to heavy stresses and strains cannot always be perfect, especially as they become older or subjected to more arduous work; but the number of mechanical failures is becoming notably fewer while at the same time more traffic is being handled by a smaller total of locomotives.

The latest available statistics covering a four-week period show that there was only one mechanical failure on an average per 32,878 miles run, and some of those reported were quite slight. This compares most favourably with one in 26,319 miles during a corresponding period in 1951, and 32,183 miles in 1952. One of the relevant factors has undoubtedly been the introduction of a standard and periodic system of locomotive examinations providing for better maintenance.

London Midland Travels and Recordings

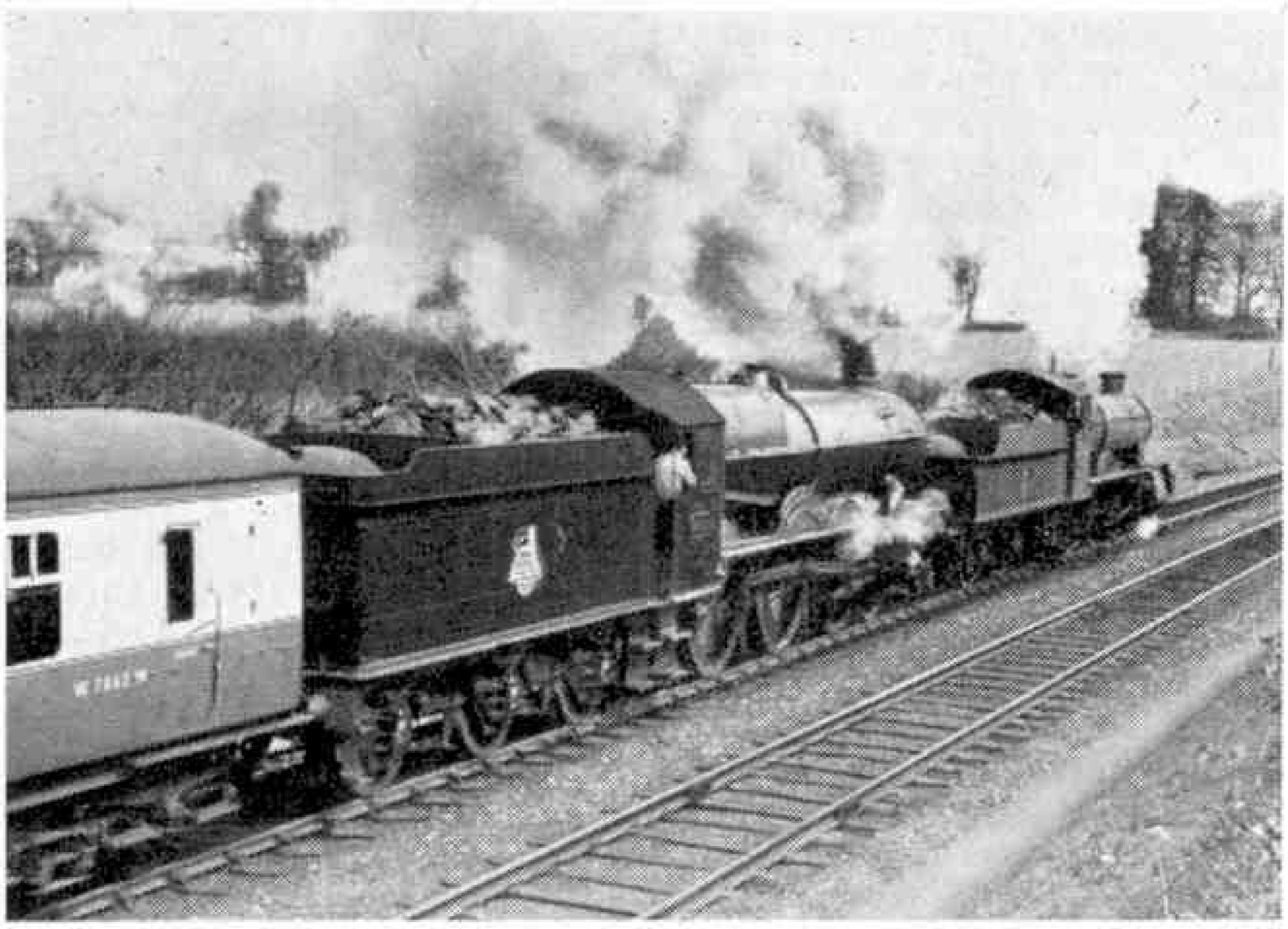
The re-introduction of several 2-hour expresses each way between London and Birmingham on ordinary weekdays last summer has produced much fine running particularly between Euston and Coventry, where overall average speeds of 60 m.p.h. or more are required and often improved upon. The northbound timing of 93 min. for 94 miles includes a passing allowance of only 45 min. for 51 miles between Tring and Rugby.

On a fine warm day I logged the 12.50 p.m. from Euston, travelling most comfortably and partaking of a good lunch meanwhile. The load was about the desired limit for so fast a booking, 11 on, weighing 346 tons tare, or about 365 tons gross. The engine No. 46100, *Royal Scot* was in capable charge of Driver Howe and Fireman Leggatt of Camden shed. Just after Willesden Junction, 60 m.p.h. was attained and until brakes were applied for the slack through Rugby, nearly 80 miles further on, speed remained continuously above that figure, except when a reduction to nearly 20 m.p.h. was necessary at Hemel Hempsted owing to track repairs. This slowing was on the rising grade to Tring and cost more than 2 minutes. Those 51 miles between Tring and Rugby were covered in less than 44 min., speed twice rising to 80 m.p.h. near Leighton Buzzard. Rugby, 82½ miles, was passed in 81½ min. from the start, but this was a half-minute late. A spirited finish however, with more than 70 m.p.h. travel until Coventry was well in sight, brought us to a stop nearly a half-minute early, in 92 min. 35 sec. or about 90 min. nett.

My return express called at Rugby, being allowed 5 min. more overall. The load was 10 coaches including restaurant car set or about 330 tons full; the locomotive was of the type more usual on these fastest L.M.R. services: a 6P Jubilee 3-cyl. 4-6-0 No. 45592, *Indore*, with a Bushbury (Wolverhampton) crew. Starting from Rugby 2 min. late, acceleration was rapid, Wolverton, 30¼ miles being passed in 30 min. and Tring, where the sustained minimum speed at the summit was 58 m.p.h., 51 miles in less than 50 min. By Watford, 65¼ miles in 62¼ min., the arrears had been wiped out and a punctual arrival was easily possible, but we were almost stopped by signal before Harrow. Recovering swiftly we ran gently into No. 1 platform at Euston 1½ min. late, though in no more than 82 min. net for 82½ miles.

Heavier accelerated expresses on the London-Liverpool service have also provided some fine runs. Rebuilt Royal Scot No. 46123, *Royal Irish Fusilier*, in charge of an Edge Hill driver and fireman with 13 coaches on the 10.30 a.m. down *Manxman* sustained very fast travel after Rugby, passing Crewe 9 min. before time and running easily down into Lime Street to arrive 5 min. early in 3½ hours from Euston. In the opposite direction, 4-6-2 *City of Chester* with one coach more on a Camden working, gave a splendid trip over the 158 miles from Crewe to Euston in 161¾ min., including two slowings due to track repairs. The fastest timing allows 165 min. The weekly boat specials on that route in connection with Canadian Pacific liners are titled *Empress Voyager*.

St. Pancras expresses on the Midland Division, with steeper gradients in the Midlands and south thereof, have also been quickened decidedly in some instances.



W.R. No. 6019 King Henry V on the up Cornish Riviera Express is ably assisted up Hemerdon bank by No. 7814 Fringford Manor. Photograph by R. E. Vincent.

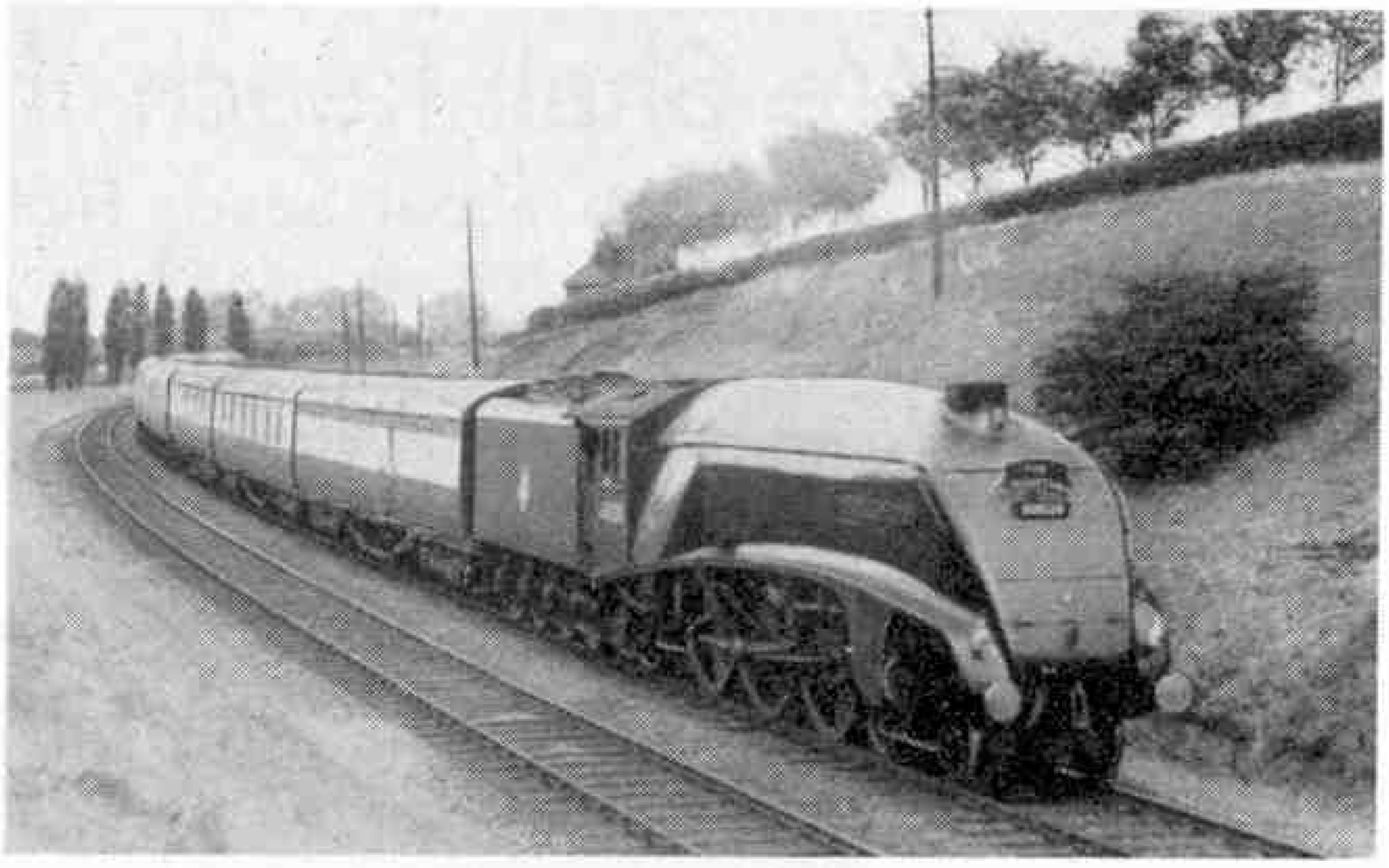
A Jubilee No. 45627, *Sierra Leone*, on the 10.15 a.m. to Manchester Central with 11 on, 355 tons, nicely kept the 78 min. allowance for the first 72 miles to Kettering with good uphill work and a maximum speed of 78 m.p.h. Some of the long-distance trains on this section are double-headed, so are Euston-Birmingham expresses sometimes; class 2 or class 4 (Compound) 4-4-0s assisting. Various combinations of 4-6-0s have been noted during the busy season to and from Carlisle; from Derby or Leeds to Manchester and elsewhere.

Ex-Midland 3F 0-6-0s are employed a great deal on local freight and shunting duty at Carlisle, Class 2 2-6-0s and a B1 4-6-0 from Cambridge have been among locomotive variety noted along the Bedford-Bletchley-Oxford cross-country line. Class 4 2-6-4T from the Midland Division No. 42052 was reported to be frequently in charge of the 10.15 a.m. fast train from York, N.E.R. (where tanks on passenger trains are rather rare) to Leeds and Bradford.

I was interested to see veteran Webb 2-4-2Ts on local passenger trains between Leamington and

Coventry, also Blisworth-Northampton. This class was introduced in 1890. The rather newer ex-L.N.W.R. 0-6-2T passenger class lately designated 2MT is extinct.

New class 5 4-6-0, No. 73033, was recently allocated to 66A, Polmadie (Scottish Region). Later ones of the series have since been completed at Derby. Nos. 80066-8, standard 2-6-4Ts built at Brighton, went to 1C, Watford. Class 4 4-6-0s for this Region have been completed at Swindon up to No. 75039.



The up Elizabethan rounding the curve at Chaloners Whin Junction, South of York. The engine is No. 60028 Walter K. Whigham. Photograph by C. Ord.

Scottish Tidings

The last class of 4-4-0 engines to be constructed for one of the separate Scottish companies prior to the grouping of the railways in 1923 was the Pickersgill Caledonian type of 1916-22, of which there were 48 engines in two series recently numbered 54461-54508. They were stoutly built, having 6 ft. 6 in. driving wheels, piston valves and superheaters. The first to be withdrawn is No. 54481.

Former Great Eastern 4-6-0s of class B12 have been hauling Highlands circular tour specials from Aberdeen. In that area on the Great North of Scotland section, K2 G.N.R. 2-6-0s, Glen 4-4-0s and B.R. 2-6-4Ts have been a good deal in evidence. Along the scenic, and difficult, Fort William and Mallaig lines observers have noted L.M.R. class 5 4-6-0s and class 4 2-6-0s as well as the Gresley Moguls.

A 124-Mile Circular Tour from Kensington (Olympia)

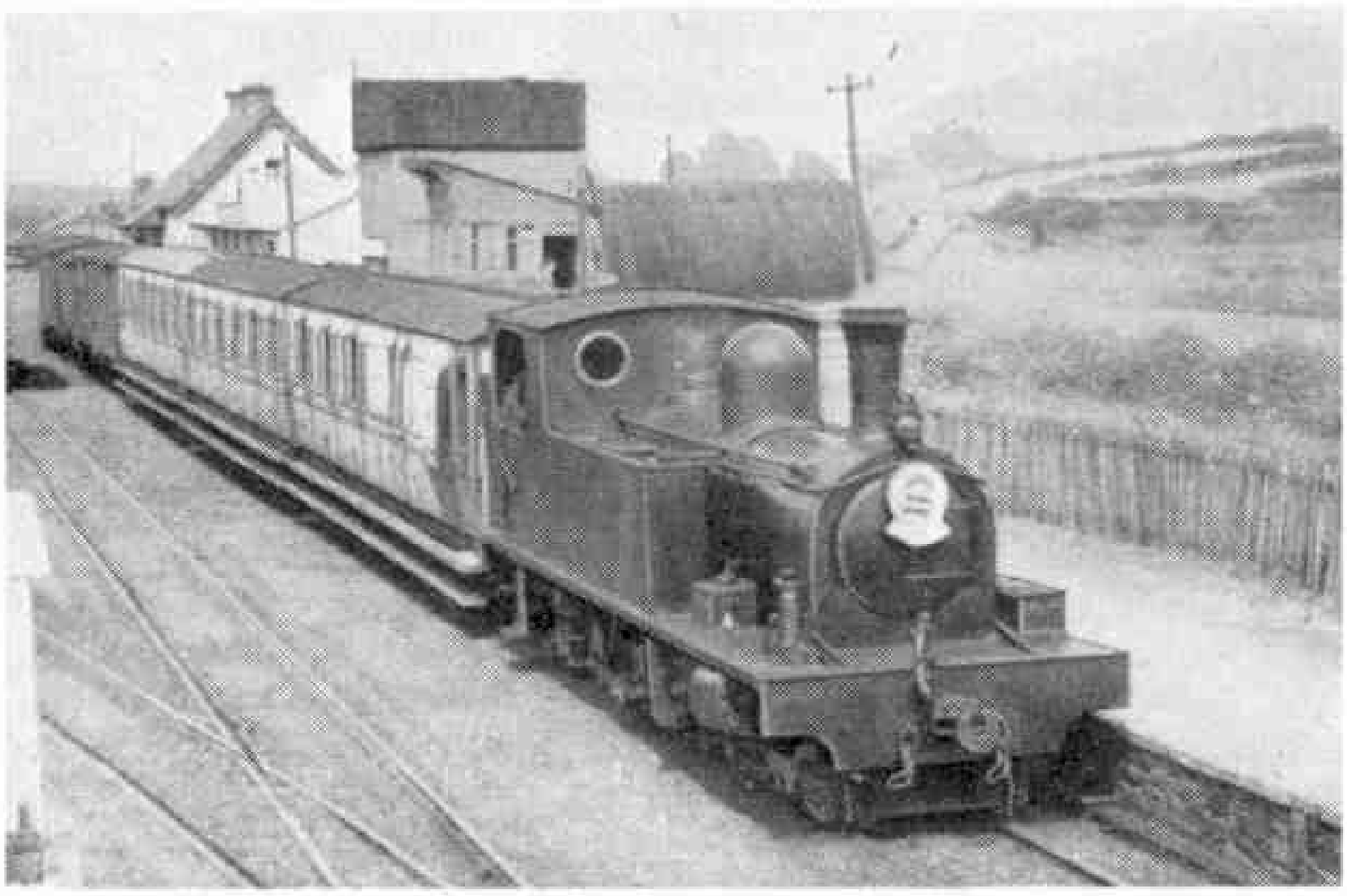
More notable tour or specially timed and hauled special trains have been organised for railway enthusiasts and carried through successfully with good support. A Stephenson Locomotive Society special in September was hauled throughout by newly built Swindon class 4 4-6-0, No. 75034, stationed at Bletchley. It was worked by a Willesden crew with the aid of various pilotmen familiar with sections of the route, which included four different main lines, two single-track connecting routes, the use of three junction spurs to or from main lines seldom or never ordinarily traversed by passenger trains and other decidedly unfamiliar stretches. The start, and the finish, over 5 hr. later, took place at Kensington (Olympia), always busy with such a variety of different lines' freight, parcel and milk trains to a much greater extent than passengers.

The fascinating itinerary took us through Willesden (High Level); Gospel Oak, Crouch Hill - Harringay West; Hatfield; Dunstable; Leighton Buzzard; Bletchley south curve to the Oxford branch and thence by the spur used by parcel trains to Calvert; Aylesbury; Princes Risborough; Greenford. Examples of nearly 50 different locomotive classes were seen as well as some important expresses while on main lines.

Locomotive Miscellany

As 61057 is a blank number, the total of B1 4-6-0s is 409, not 410. The numeration otherwise runs from 61000 to 61409. The 4-6-4, E.R. No. 60700, returned to traffic at King's Cross from Doncaster Works at the end of August. Just after that Britannia Pacific, No. 70008, *Black Prince*, was in emergency diverted to King's Cross with an Ely and Cambridge to Liverpool Street fast train.

No. 2920, *Saint David*, is the only remaining 2-cylinder 4-6-0 of the Saint Class, G.W.R. More electric main line and diesel shunting locomotives have arrived on the E. and N.E. Regions.



The last passenger train to run on the Londonderry and Lough Swilly Railway, a special trip organised by the Light Railway Transport League. The system closed down last August. Photograph by C. L. Fry.

European Railway News

From the Bulletin published by the European Railways' Information Bureau, Rome, I note among interesting reports of reconstruction and progress that the new *Sud Express* from Paris to the Spanish border, where passengers change to another fine train run on wider gauge, has been accelerated to cover approximately 363 miles from Paris to Bordeaux in 5 hr. 10 min. at an average speed of about 70 m.p.h. The train is operated by powerful electric locomotives. When the British *Elizabethan* is not running, this is the longest regular non-stop run in the world and is very fast indeed. After a short stop at Bordeaux a fast run is made to Bayonne, thence to Hendaye and Irun.

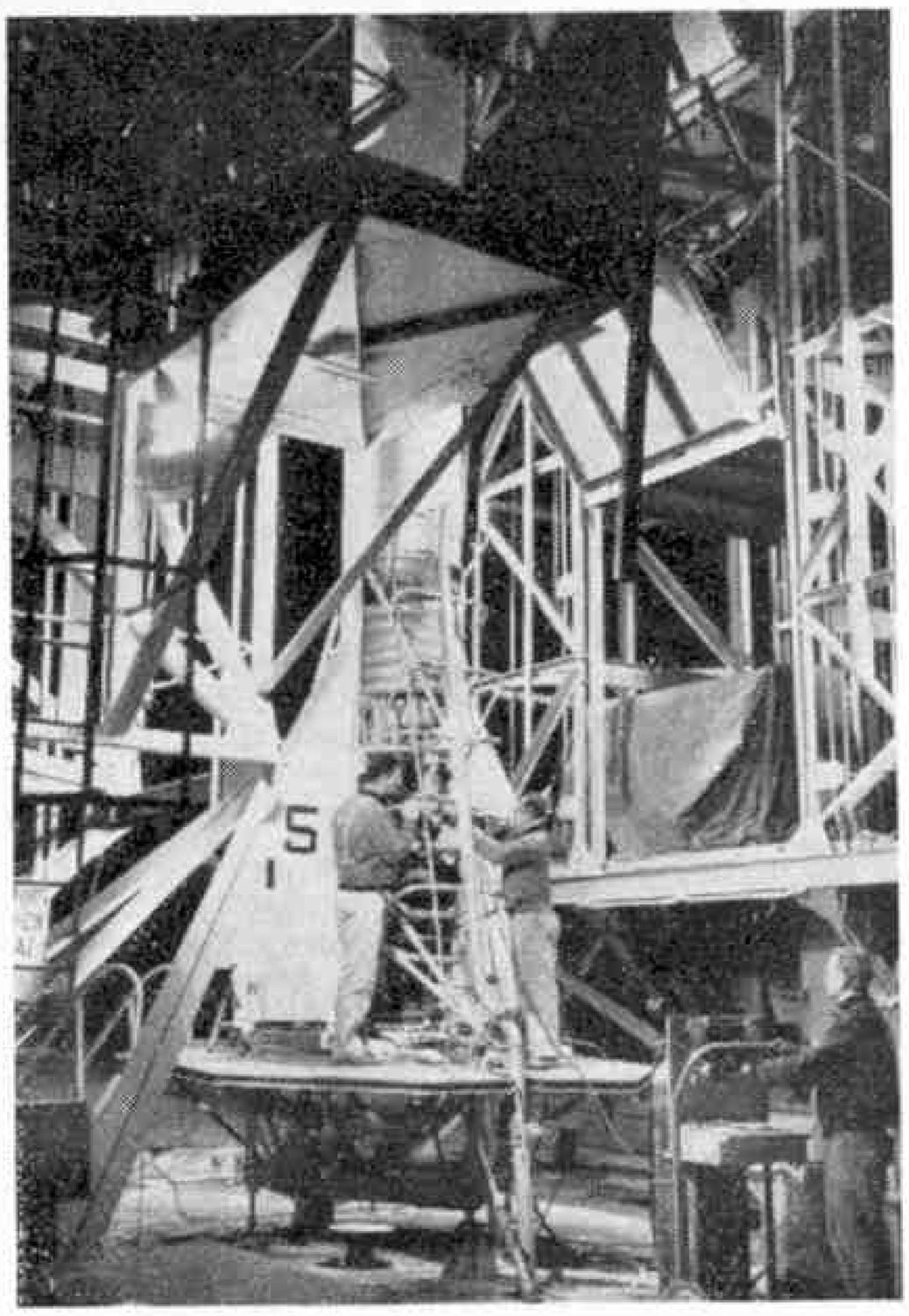
How We Shall Reach the Moon

The Truth about Space Flight

By Eric Burgess, F.R.A.S.
Fellow of the British Interplanetary Society

DURING August two very important gatherings of rocket experts, scientists and engineers took place, one in Oxford and the other in Zürich. At the Oxford Conference, which was held under the auspices of the Royal Society, the use of rockets for the exploration of the upper atmosphere was discussed, whereas in Switzerland the International Astronautical Federation held its fourth congress connected with the technical problems of space flight.

From the large number of papers that were read it is possible to obtain an idea of the present position in practical rocket development and of the possibilities of space ships being constructed in the coming years. For anyone who has been introduced to the idea of space flight through the more lurid popular books and articles that have appeared in large numbers during the past few years, the results of these scientific deliberations are very disappointing. The consensus of opinion is that we are still a long way from space flight, especially manned space flight. Moreover, even when chemical rockets have been perfected and they can carry man into space, there are definite fundamental difficulties that must limit the missions which can be attempted. A borderline case is a journey to the Moon, while true interplanetary journeys, say to Mars or Venus, are completely out of the question.

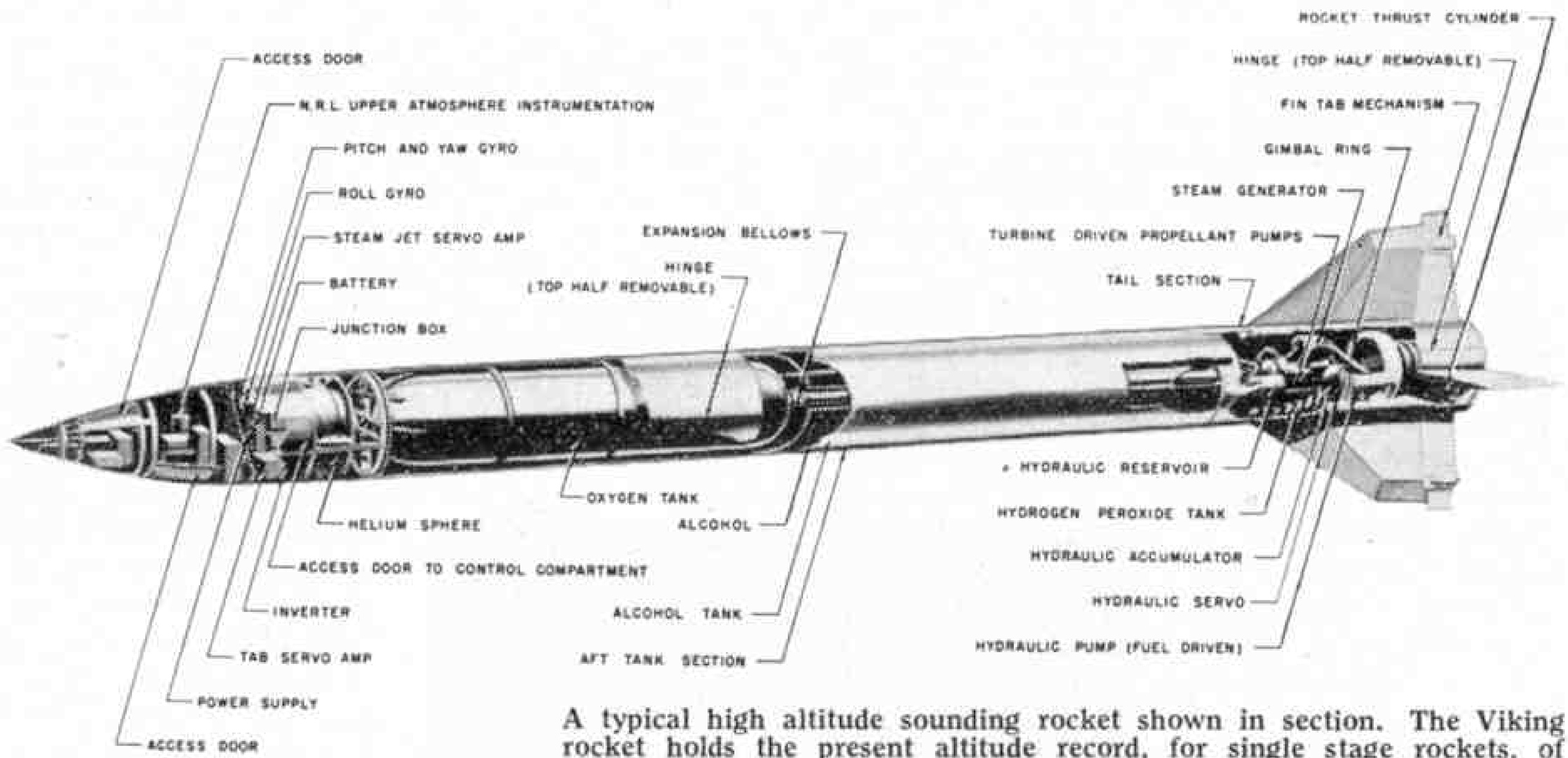


A Viking rocket is readied for its launching. Scientists and engineers from the Glenn L. Martin Company and the Naval Research Laboratory test the motor. The rocket is standing on its tail fins on a launching table beneath a movable gantry from which the servicing takes place. Illustrations by courtesy of the Glenn L. Martin Co.

Despite this limitation to man's interplanetary aspirations, there are still many aspects of space flight which are fascinating and likely to be covered by experiments during the coming twenty-five years. Two United States Navy scientists, Milton W. Rosen and Richard B. Snodgrass have given indications of how experience gained with high altitude rockets should be used in the space flight programme.

Over the centuries the conquest by man of vertical flight from the surface of the Earth has proceeded slowly. First he climbed mountains, and then he evolved machines that could carry him or his instruments high into the atmosphere. But there was a definite limit until he began to use high altitude sounding rockets, which were independent of the atmosphere for their support. In the last few years sounding rockets have increased altitude records tenfold and are expected to do so again within the next decade. This would place man's instruments over 2,000 miles above the Earth's surface.

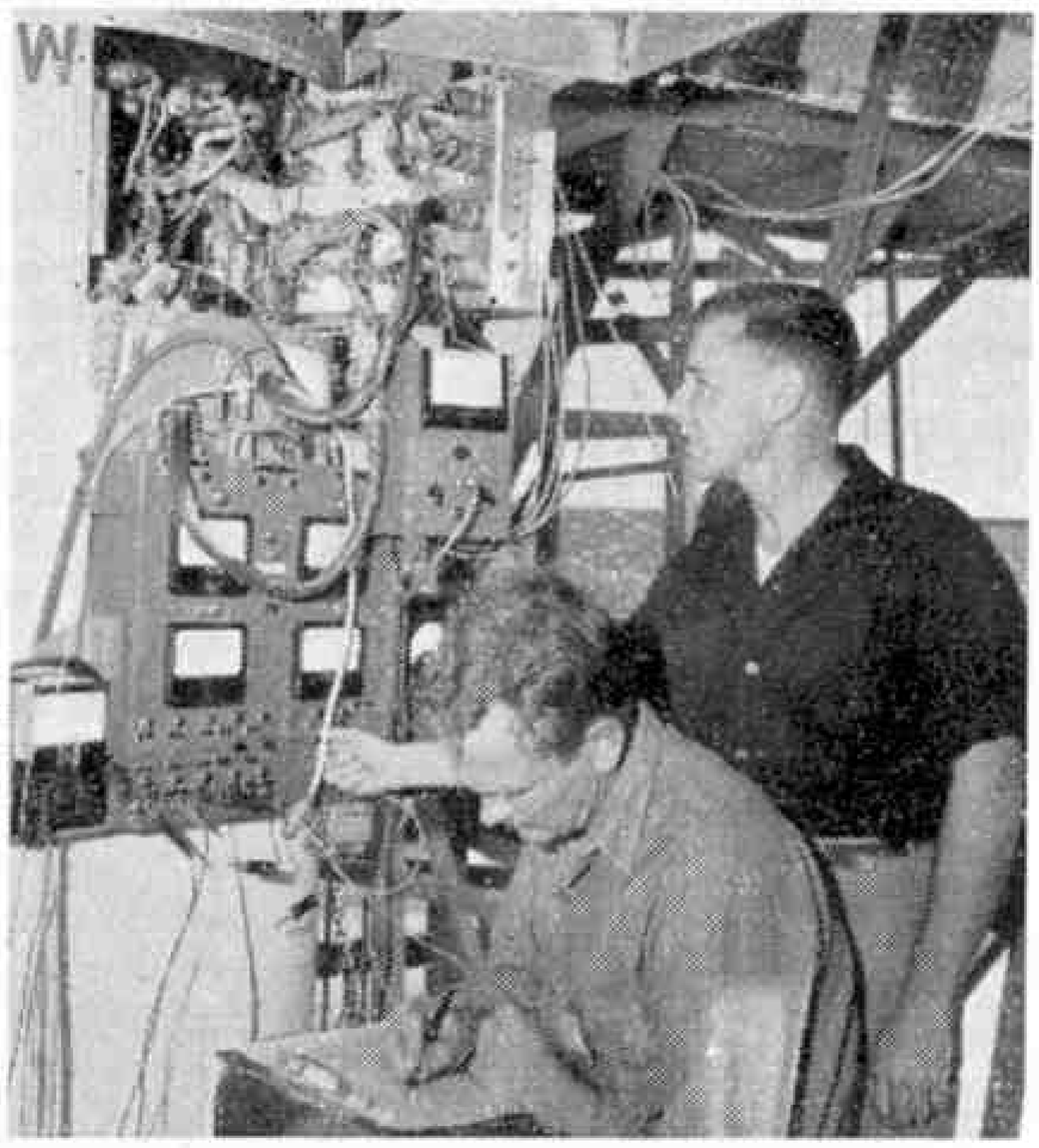
The chief sounding rockets used today are the Viking and the Aerobee, which have carried almost nine tons of scientific instruments to heights ranging from 30 to 136 miles. The sounding rocket is a significant step in the exploration of space, and from it future space vehicles will evolve. Practical experience with these rockets show that they never achieve their



A typical high altitude sounding rocket shown in section. The Viking rocket holds the present altitude record, for single stage rockets, of 135 miles.

full capabilities because of unpredictable variations in construction, adjustment and performance. It is, therefore, dangerous to base schemes for interplanetary explorations on rockets that ignore these practical discrepancies. In some cases the probable error can amount to values that would absorb the whole of the payload if it were carried as reserve fuel for corrections. Interplanetary missions are just not possible on this basis and attempts must be made in the coming years to reduce the probable errors and to increase the margin.

This development work will occupy a great amount of time and material, and consequently the path to space travel is likely to be a little longer and steeper than most people would like to believe it. Nevertheless it can be travelled. The first stage, of course, will be the firing of high altitude rockets to such heights and at such speeds that they will be able to travel round the Earth. This will be possible when a multi-stage rocket can be constructed, the final stage of which will be able to travel at about 18,000 miles per hour. This is just over three times as fast as the best modern rockets.



Now the controls of the Viking are checked. This photograph gives some indication of the complexity of a modern high altitude rocket vehicle containing, as it does, hundreds of radio valves and miles of wiring. It gives some idea why space ships will not be built yet for some considerable time.

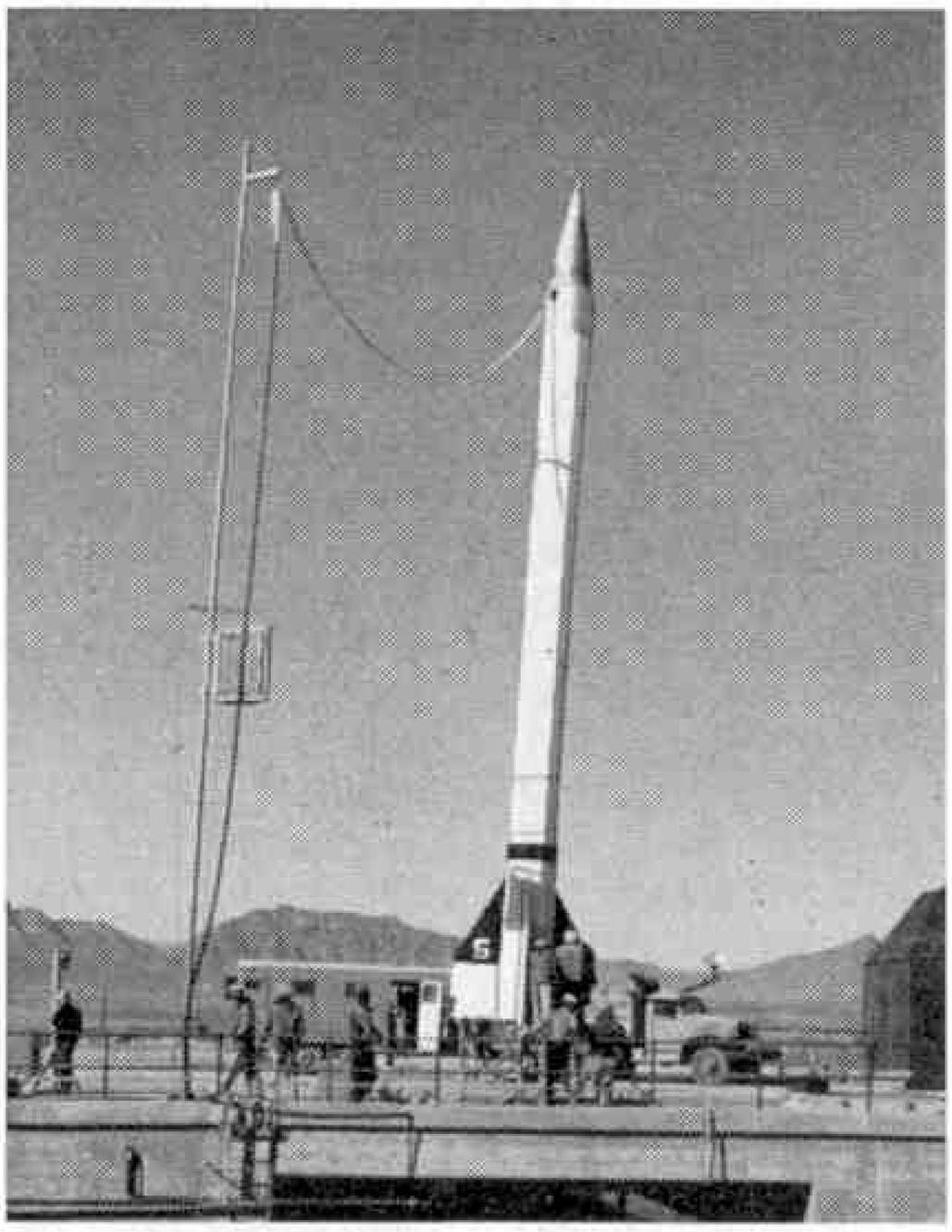
The artificial satellite will accordingly be established by firing a small instrumented rocket into an orbit in which it will circle the Earth. Once it is travelling in that orbit the motor can be shut off. The speed of the rocket will be such that the inward pull of gravity will be exactly counterbalanced by the outward acting centrifugal force. The missile will travel round and round the Earth without further expenditure of power, just like the Moon does.

In the satellite rocket there will be various scientific instruments that will record primary cosmic radiation, the radiation from the Sun and possibly the spectra of other astronomical bodies. This will be very important work, because at the surface of the Earth astronomers and physicists are restricted in their work due to the absorption effects of

the atmosphere. Sounding rockets carry instruments out into space even today, but unfortunately these rockets are only outside the atmosphere for a minute or so. The artificial satellite will be permanently outside the atmosphere and will accordingly have a great advantage over the sounding rockets. All the data collected will be telemetered to Earth so that the scientists will know what is happening to the rocket while it is out in space.

In order to generate power for the radio equipment some kind of solar engine will be employed. This would consist of a large plastic bag, silvered on one hemisphere. When this is expanded in space it will form a large mirror that can concentrate the Sun's rays on to a heating coil. A liquid can then be boiled and the expanding gases used to drive a turbine.

The space station will be developed from the artificial satellite. It will be a manned laboratory in space and will also act as a refuelling base for an expedition to the Moon. The advantages to be gained by refuelling in space are enormous. For example, if we wanted to build a space ship that could take off from Earth and journey to the Moon, land on the lunar surface and then return to Earth, we find that with the best chemical propellants it would weigh many thousands of tons at take off. From the engineering standpoint it would be impossible to construct such a spaceship.



All checked, fuelled and ready for firing. The Viking rocket receives a final inspection before being launched on its path to the frontiers of interplanetary space.

However, if we want to carry the same payload, say a crew of three men, to the orbit around the Earth, we would only need a rocket weighing about 500 tons at take-off. This is much more feasible. Having lifted the men to the satellite orbit it is not very difficult to get them to the Moon from there. Even though the distance is great—238,000 miles—the energy requirements are only about the same as those for the entry into the circular orbit round the Earth. The next stage, therefore, would be to send up several more rockets into the circular orbit and to arrange for the payload of these rockets to consist of propellant. Transfer the propellant to a Moon ship waiting in the orbit and we can have our trip to the Moon.

A project of this nature was outlined at the Astronautical Congress by three British engineers, A. E. Dixon, K. W. Gatland, and A. M. Kunesch. They showed that fifty-three freighter rockets, each weighing 520 tons at take-off and carrying 5.22 tons of payload, would be needed to carry sufficient material and fuel to the orbit for the construction in space of a Moon ship.

The structure of the true space ship would consist of straight members and propellant capsules, which would be assembled in the orbit by three men on the principle of Meccano construction. There would be forty-eight propellant capsules, each being the payload of one freighter rocket, and these would be arranged symmetrically around a centre structure and supported by radial members. A crew chamber would be attached at one end of the centre structure and a motor chamber at the other. The centre structure itself would consist of three built-up frames to which the capsule support members would be attached. The frames would be held in position by a series of longeron members and diagonal members would ensure rigidity.

Once the orbital vehicle had been assembled and the crew of three transferred to it, its motors would be fired and it would accelerate slowly. After its speed had been increased by two miles per second it would break out from the circular orbit around the Earth and travel in an elliptical orbit that would carry (*Continued on page 588*)

BOOKS TO READ

Here we review books of interest and of use to readers of the M.M. With certain exceptions, which will be indicated, these should be ordered through a bookseller.

"TRAINS ANNUAL"

(IAN ALLAN 9/6)

This yearly feast of railway writing and pictures makes its eighth consecutive appearance, with contents as varied as ever. Particularly topical in view of recent accelerations is the section dealing with the Birmingham 2-hour trains. Railway working at Cambridge and York make two separate convincing chapters and there is a specially able survey of the railways of the Welsh Valleys. Then, after reading about Southampton and its railway activities, one can travel in imagination overseas, for the *Simplon-Orient* express and the remarkable series of trains by various routes between Chicago and the Twin Cities of St. Paul and Minneapolis are dealt with in detail.

Footplate riding rather than footplate work is the topic of a fascinating contribution by the Editor, Mr. Cecil J. Allen, and there is a delightful account of the railways of Kent, Surrey and Sussex in the days when steam power was still supreme there. The impact of the serious floods early this year on railways and a comprehensive review of rack-and-pinion systems bring us finally to a novelty in the shape of a short but exciting piece of railway fiction by Hamilton Ellis.

Half-tone reproductions on art paper have superseded the photogravure practice of former editions. There are, as usual, several coloured reproductions, each of which forms an attractive double page.

"MODERN SHIPS"

By P. E. DEAN

"MODERN BRITISH AEROPLANES"

By CHARLES GARDNER

(Temple Press 9/6 each)

The first editions of these two volumes of the Boys' Power and Speed Library were reviewed in the *M.M.* in November and December 1949 respectively. The books have been considerably revised for these second editions, in order to keep pace with the latest developments in their particular subjects.

In *Modern Ships*, for instance, much of the text has been re-written and many of the illustrations have been replaced by photographs of the latest types of liners, coasting vessels, tankers, tugs and other craft. Similarly, although the basic principles of ship and engine construction remain unaltered, the descriptions given of steam engines, turbines, oil engines and auxiliary machinery have been thoroughly revised.

Modern British Aeroplanes covers the exciting progress made during the past five years, and the author explains in an attractive, non-technical way the whys and wherefores of the many new shapes now seen in British skies. Crescent wings, delta wings and sweep-back are described and discussed. Also dealt with is the great progress in the design of airliners, fighters, bombers and engines that has resulted in Britain's world lead in all branches of aviation.

As in the previous edition, he deals also with the simple basic principles of flight, and there are chapters describing the control and operation of fighters and bombers by radar. Many fine photographs and excellent line drawings illustrate the book.

"A.B.C. OF LONDON TRANSPORT VEHICLES"

By E. J. SMITH (Ian Allan 2/6)

In this ninth edition of the handy and familiar "*bus A.B.C.*" a change has been made by the inclusion of trolley buses. Previously trolley buses were in a separate booklet with London's trams, but the latter of course are now no more.

For the London bus enthusiast one cannot imagine a more handy reference book than this, for the different buses, coaches and trolley buses are listed in type order. Fleet numbers and the more easily spotted registration numbers are given, and there are brief technical and other details relating to each different type. Illustrations are plentiful and an examination of these makes one realise the tremendous variety of the London bus.

"TRAINS ALBUM No. 1"

(London Midland Region)

(IAN ALLAN 1/6)

This is the first of a new series of railway photographic booklets following up the well-known and popular *Best Railway Photographs* series by the same publishers. In this we have a pleasing variety of views from the cameras of several different experts. Although express trains are specially favoured the more ordinary locals and freighters do get a show and the locations are well varied. Reproduction is good and there are various shots from unusual angles.

"THE BOYS' BOOK OF SOCCER FOR 1954"

Edited by PATRICK PRINGLE (Evans 10/6)

Here is the ninth annual edition of this now firmly-established book on Association football. It follows the pattern of previous volumes in containing articles on famous clubs and players, articles giving sound advice on various aspects of the game by famous professionals—Stanley Matthews, Nat Lofthouse and Len Shackleton, to name only three—football stories, and Picture Quiz and Crossword features. There are the usual very useful tables of Soccer records, and a wealth of splendid half-tone photographs of famous players and teams in action.

"THE ISLE OF WIGHT RAILWAYS"

By MICHAEL ROBBINS

(The Oakwood Press 7/6)

For its size the Isle of Wight boasts a railway history of surprising complexity. In their independent days the lines of the Isle of Wight were highly individual and even to-day, when they form one system, a detached part of the Southern Region of British Railways, they retain much that is original in character.

This island story in its many vicissitudes is told by the author in an able and painstaking manner. After tracing the stories of the independent lines, especially in their earlier days, due credit is given to the former Southern Railway, which found itself facing the task of unifying the three separate systems that maintained their independence up to the grouping of 1923. During the Southern period many antiquities in the shape of locomotives and rolling stock vanished, to be replaced by more uniform equipment.

There are many excellent reproductions of photographs to bear out the story, while maps and tables relating to the original systems, their own engines and those that have been in the island since 1923, are excellent for reference.

Copies can be obtained from The Oakwood Press, Tanglewood, South Godstone, Surrey, price 7/10 including postage.

"A.B.C. OF CONTINENTAL CARS"

By JOHN G. WANT (Ian Allan 2/–)

This attractive booklet, in the same style as the publisher's *A.B.C. of British Cars*, will be greatly valued by motor car spotters who are able to visit the Continent. It contains over 50 excellent half-tone illustrations of the principal makes of motor cars produced in Czechoslovakia, France, Germany and Italy. The accompanying notes give an excellent description of the main structure of each vehicle, and in some cases the type and power of engine used.

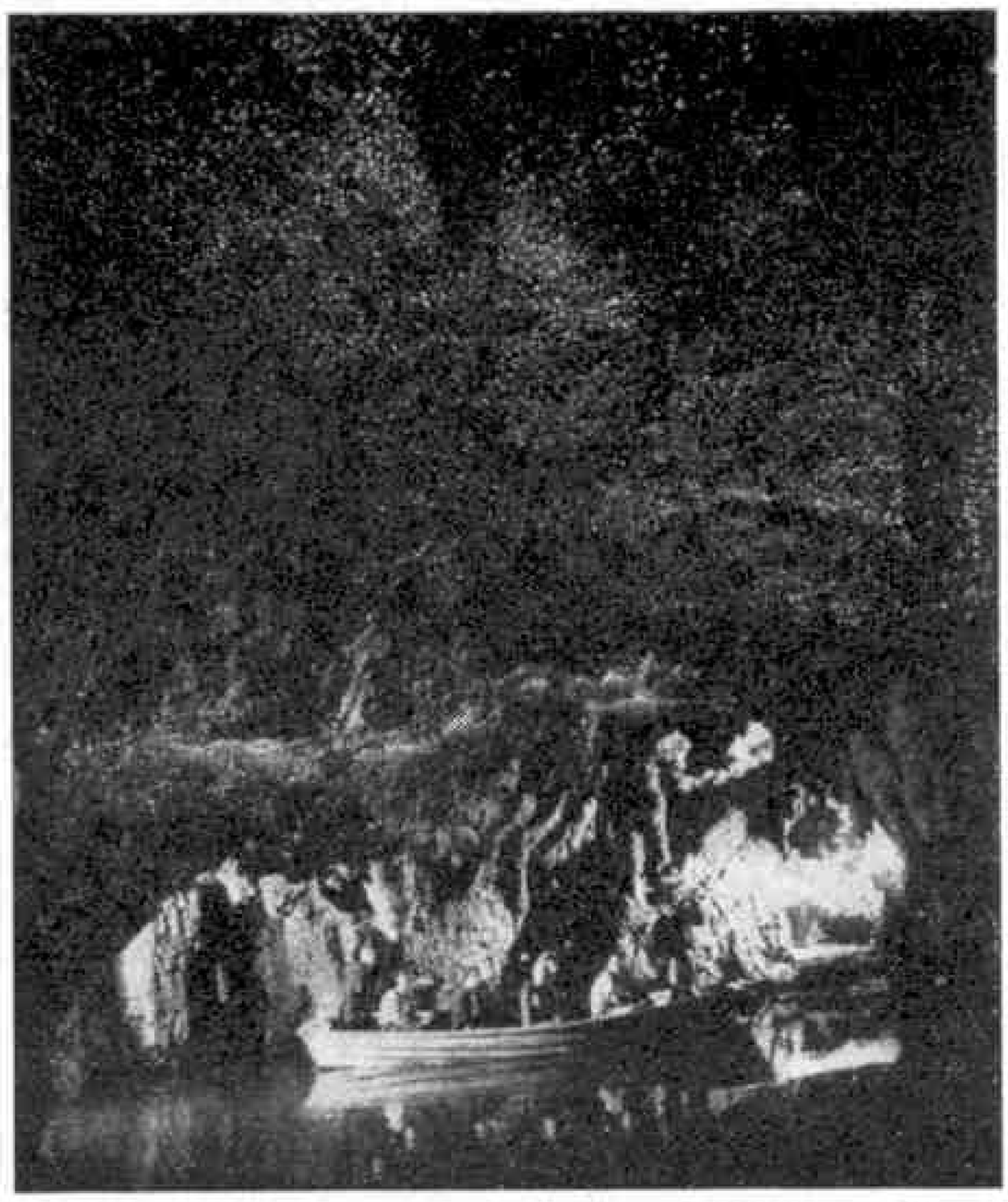
New Zealand's Glow-Worm Caves

Marvels of a Subterranean Wonderland

By V. May Cottrell

LET us join a party of boy scouts and explore the beauties and marvels of a subterranean wonderland in the King Country, a district in the centre of the North Island of New Zealand. Here there are three distinct caves open to the public—Waitomo, Ruakuri and Aranui.

The Waitomo Cave is but a short walk from the Tourist Hotel and so, after dinner, we gathered at the entrance. When the official guide arrived there was an expectant hush as he unlocked the door. He told us that this cave takes its name from the many deep, water-worn, shaft-like holes to be found there, known to the Maoris as *"tomo."* Hence "Waitomo," which means "water entering a hole."



Exploring the glow-worm grotto of Waitomo Cave, one of the wonders of New Zealand. The myriads of tiny twinkling lights on the roof are produced by the glow-worms.

After the usual official warning—"no smoking, no photographs, and no stalactites or stalagmites as souvenirs"—the guide led the way into the cave. We were awed into silence by the majesty of the lofty chambers and long, echoing galleries. The massive dome and remarkable acoustic properties of the Waitomo Cathedral, a magnificently impressive example of Nature's sculpture with its accompanying Organ Loft, where a great pipe organ is faithfully reproduced in the silica formations, were most interesting and inspiring.

But it was in the Sculptor's Studio that the boys were able to give their imaginations free rein. On sighting a small, perfectly formed head, one of them remarked on its amazing resemblance to Bernard Shaw. Our guide agreed that the likeness is indeed so marked that few visitors fail to notice it, but added, with a smile, that the head was probably formed by Nature many centuries before the famous author was born.

In this connection he pointed out two large columns—a stalactite and a stalagmite that nearly meet, the former hanging down from the rock roof and the latter rising from the floor of the cavern. He stated that the tiny space separating them had not noticeably decreased in the last 50 years, so extremely slow is the growth of these limestone deposits. It is estimated that it takes at least 300 years to form a cubic inch, and that Nature's artistic handiwork in the Waitomo Caves has been in progress for not less than 100,000 years—a very long time indeed!

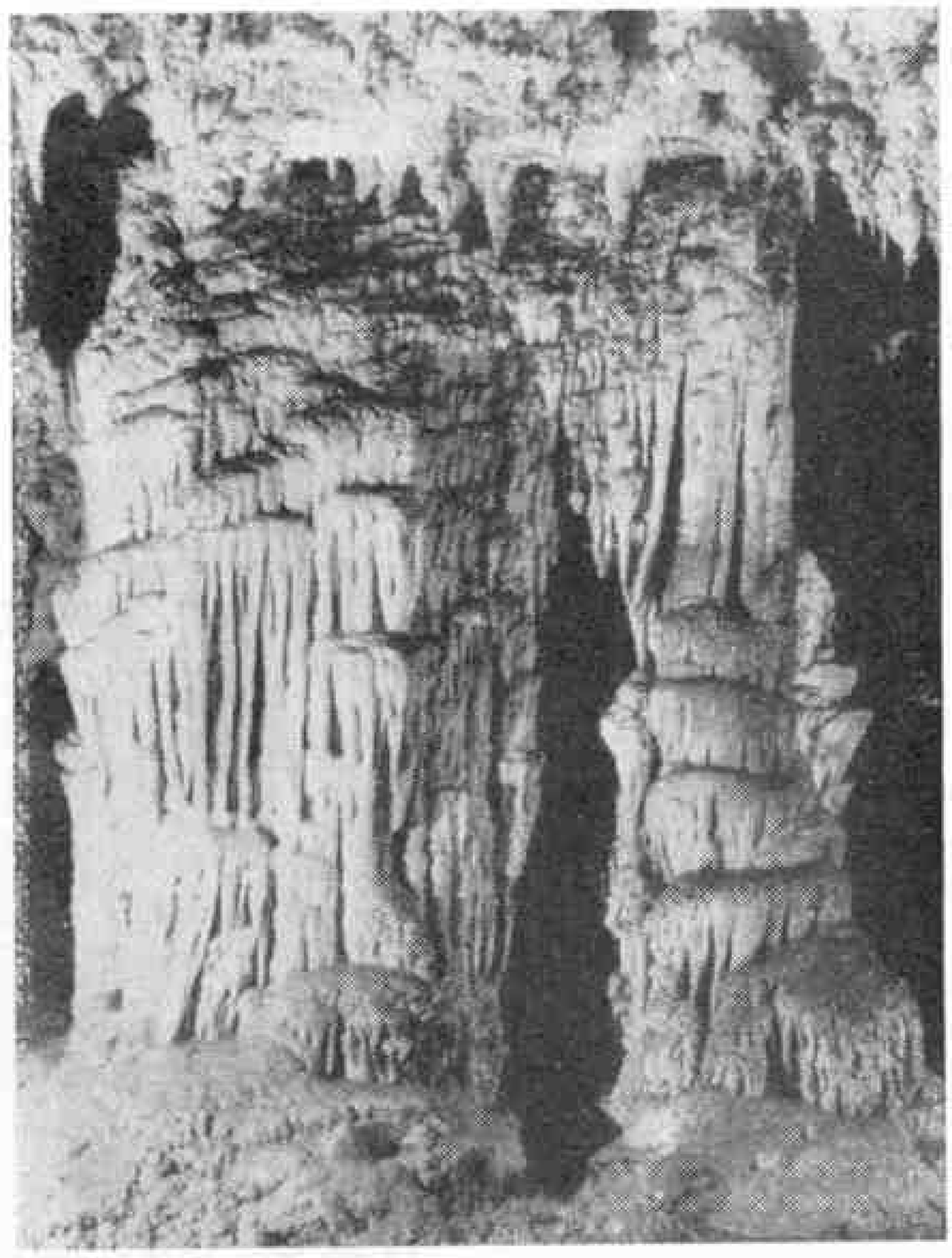
But to return to the Sculptor's Studio. Another amazingly life-like representation is that of a ram lying on a rocky ledge, its head, horns and fleecy coat all easily discernible. Then the boys amused themselves picking out in The Larder silica formations exactly resembling sides of bacon and turkeys, fowls and geese hanging head down. In other parts of these caves we came upon a pair of lovely little doves, and numerous other figures, both animal and human, in great variety. The Blanket Chamber also provides some surprisingly natural-looking blankets, shawls, robes, veils and other drapings in glistening silica, some of them almost transparent in texture. Further on was a group known as The Apostles, small, beautifully modelled figures, dressed in what appear to be Eastern robes, and many other figures, both single and in groups, which the boys amused themselves trying to identify. It was hard to realise that all

these wonders have been brought into being by the ceaseless drip, drip, drip of the mineral-laden water.

One boy, however, not content with all these marvels of Nature and eager for new thrills, wanted to know when we were going to see the glow-worms. The guide told him that we were just approaching a small colony of them and led the way to a little grotto above a muddy pool. Here hundreds of tiny lights twinkled and glowed on the dark rocks, and a curious fringe was draped along a rocky ledge and hung down over the water. The lights were made by a little insect, a sort of super glow-worm. The larva is a slimy, fragile creature with a greyish, segmented, legless and almost transparent body. The lamp is the final segment. The larva constructs a kind of web and glides back and forth within a silken sheath.

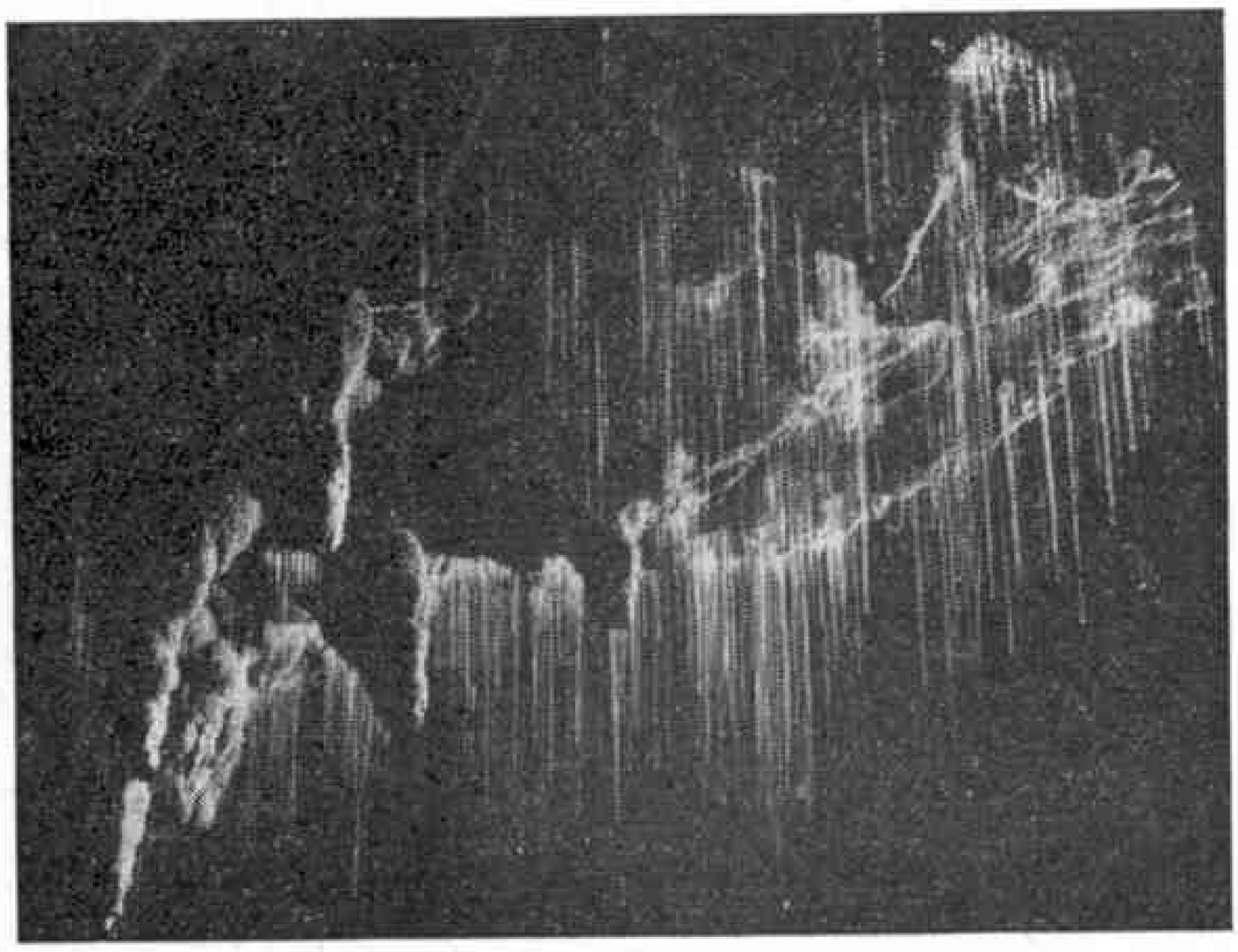
The threads, which form the fringe already mentioned, hang vertically from the sheath. They are a peculiarity of the glow-worm and serve the same purpose as the web of the spider. Tiny midges, hatched in the rich mud of the underground stream, are attracted by the lights and become entangled in the sticky threads. While we watched, many unwary insects were caught and promptly drawn up by the glow-worms. When they had secured their prey they let each thread down again in readiness for the next victim. It is said that each glow-worm puts down some twenty-five of these glutinous threads, and that this particular species is not found anywhere else in the world.

Glow-worms are often observed in the bush after dark, but they are quite different in every way from those at Waitomo, the guide told us as he led the way to the celebrated Glow-worm Grotto. We were warned that we must not talk or laugh there, because the glow-worms dislike noise and put out their lights at once when disturbed. We soon found ourselves in a dimly lit cavern where we all stepped silently into a boat that holds about twenty people. The shaded electric lights were extinguished and the boat was pulled along the dark, mysterious underground river by the guide, by means of an overhead wire.



One of the remarkable limestone formations of Waitomo. The section on the right is known as the Wedding Cake.

Then it was that we entered a real place of enchantment, where the silence remained unbroken, save for the occasional soft splash of drops of water from the rock formations. The roof and sides of the cave glowed and scintillated with myriads of tiny points of light reflected in dim radiance from the still, dark waters of the stream. No words can possibly convey the marvellous effect of the illuminated canopy, and

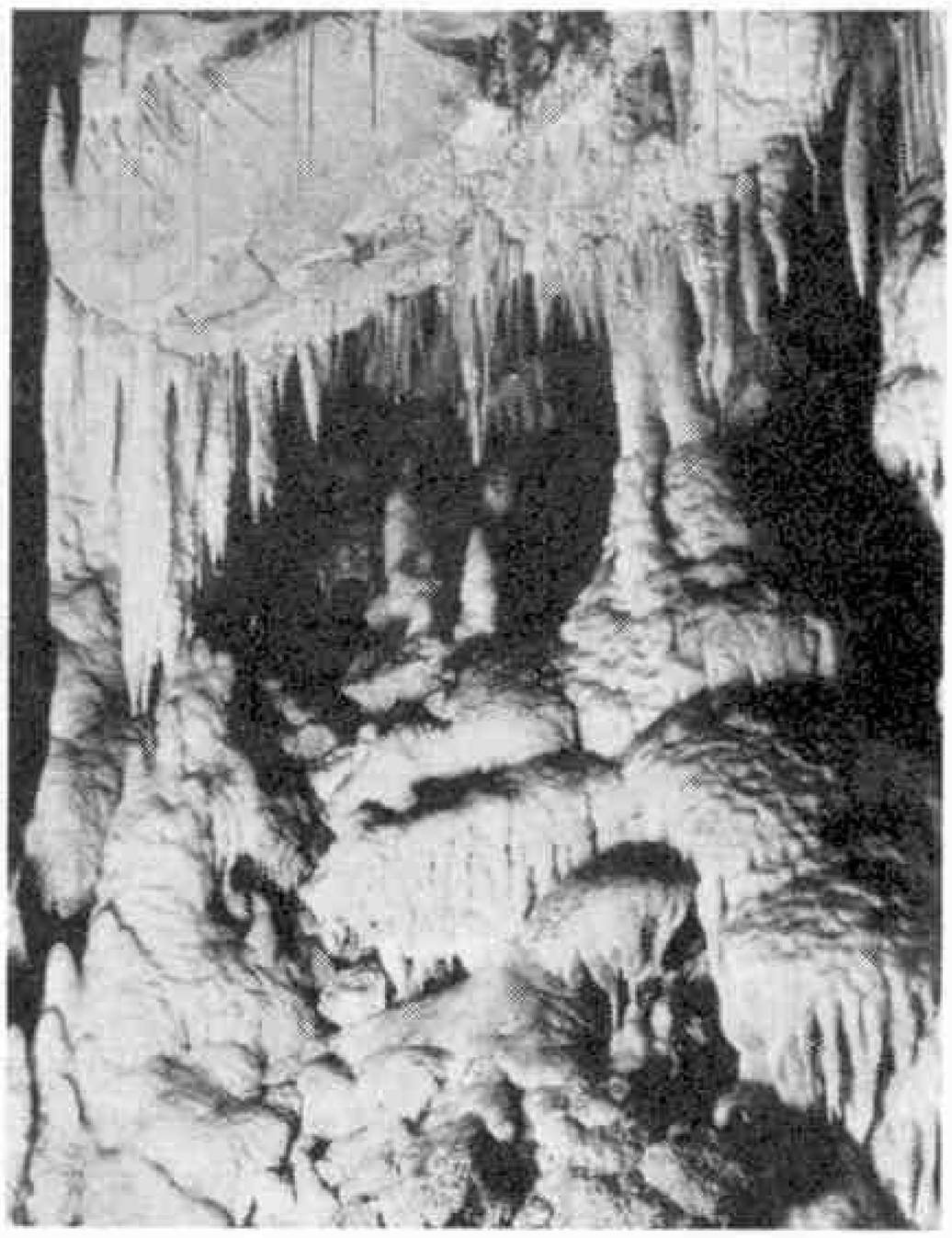


A remarkable picture of the glutinous threads that the Waitomo Cave glow-worms let down to trap unwary midges.

no photograph can reproduce the scene in its strange, mystic beauty. One must really see it to gain any adequate idea of its loveliness and magnificence. It seems incredible that this magical scene in all its beauty is produced by the lamps of such tiny creatures.

Later, as we were making our way out of the cave, some of the boys mentioned having seen larger limestone caves—though none finer—in other countries. But we all agreed that we had never seen anything to equal the splendour of the famous Glow-worm Grotto—it is unique.

Next morning our party explored the Ruakuri and Aranui Caves, some two miles from the Hotel Waitomo. When we reached the entrance to the Ruakuri Cave—which slopes steeply beneath a great cliff and opens into a large hallway—the guide told us that at one time this lofty chamber was used as a Maori encampment. Prior to this, however, a band of fierce, native wild dogs made their home in the entrance, and it is said that a powerful Maori chieftain slew these dogs. Later he was buried above the cave mouth and, for this reason, this cave was *"tapu"* or sacred until comparatively recent times. "Kuir" is the Maori name for "dog," which gives the cave its name—"Ruakuri"—"Cave of the Wild Dogs." It was first explored by a white man, a local resident, in 1904.



About 100,000 years have gone to the making of this wonderful group of stalagmites and stalactites.

This cave is more spacious than the Waitomo Cave and features immense caverns and lofty halls, connected by long, winding corridors. Here are to be found a marvellous array of beautiful stalactites and stalagmites, their enchanting pearly radiance gleaming softly in the electric light which illumines these caves throughout. Particularly fine and striking examples of Nature's artistry in all these caves are thrown into high relief by concealed flood-lighting.

One of the boy scouts said that when his father first visited these caves, some thirty years previously, the only illumination was provided by hurricane lanterns carried by visitors and guides. Magnesium flares were then used to light up especially striking groups of stalactites and stalagmites. This lad also commented on the board duck walks that now protect visitors from the wet ground, saying that his father's party had had to wear the heavy boots always kept at the hotel for visitors in those days, when it was necessary to tramp through inches of mud while exploring the caves.

Perhaps the most remarkable feature of the Ruakuri Cave is the hidden waterfall, the sullen, booming roar of which echoes and re-echoes eerily among the fantastic limestone formations. When asked to guess the height of the concealed fall, the answers ranged all the way from 30 to 100 ft. The guide's statement that the fall was a mere 5 ft. was hard to credit, so great was the volume of sound after being amplified enormously by the long, funnel-like galleries.

On leaving the Ruakuri Cave we had a brief rest in the shade and then set off on a pleasant walk of a mile or so through unspoiled native bush. This brought us to the entrance to the Aranui Cave, which is called after a Maori of that name who discovered it by accident while hunting wild pigs in 1911. This cave is the most beautiful of the trio because of the extreme daintiness and delicacy of the silica formations. Here are to be seen large groups of stalactites and stalagmites as fine as knitting needles, and almost as transparent as crystal. They look like icicles and are very easily broken.

In some instances, however, these limestone deposits attain massive proportions, and one can easily imagine the æons of time that have gone into their fashioning. The largest single stalactite is several feet thick (*Continued on page 588*)

Photography

Reflex Document Copying

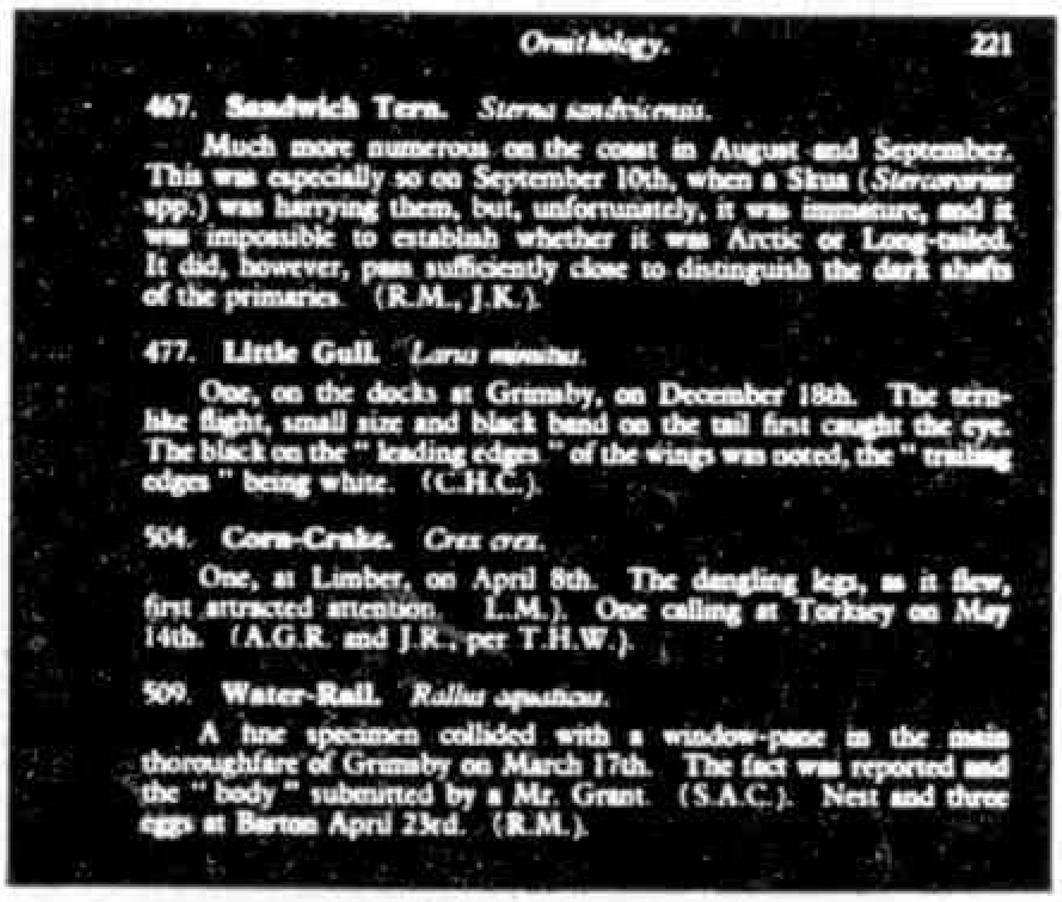
By E. E. Steele

THERE are many attractive branches of photography that can be pursued by the amateur. One of the most useful of them is document copying, embracing drawings, diagrams, etc., which can be quickly and perfectly copied, without even camera or costly apparatus, by the method known as "Reflex" copying. This is just as simple as ordinary gaslight printing, and the whole process can be carried out in weak artificial lighting, or with yellow paper over the ordinary household electric bulb. The only chemicals needed are those used in bromide printing, that is, developer and fixer. The reflex paper is not normally stocked for amateur use, but it can be obtained easily through your photographic dealer.

The process takes its name from a simple principle which had better be explained. If light is passed through a sheet of sensitive paper placed in contact with the original to be copied, the light will be

Clear Road Ahead

Paper negative made as described in this article, the illustrations to which are by the author.



Ornithology. 221

467. Sandwich Tern. *Sterna sandvicensis.*

Much more numerous on the coast in August and September. This was especially so on September 10th, when a Skua (*Stercorarius* spp.) was harrying them, but, unfortunately, it was immature, and it was impossible to establish whether it was Arctic or Long-tailed. It did, however, pass sufficiently close to distinguish the dark shafts of the primaries. (R.M., J.K.).

477. Little Gull. *Larus minutus.*

One, on the docks at Grimsby, on December 18th. The tern-like flight, small size and black band on the tail first caught the eye. The black on the "leading edges" of the wings was noted, the "trailing edges" being white. (C.H.C.).

504. Corn-Crake. *Crex crex.*

One, at Limber, on April 8th. The dangling legs, as it flew, first attracted attention. L.M.). One calling at Torksey on May 14th. (A.G.R. and J.R., per T.H.W.).

509. Water-Rail. *Rallus aquaticus.*

A fine specimen collided with a window-pane in the main thoroughfare of Grimsby on March 17th. The fact was reported and the "body" submitted by a Mr. Grant. (S.A.C.). Nest and three eggs at Barton April 23rd. (R.M.).

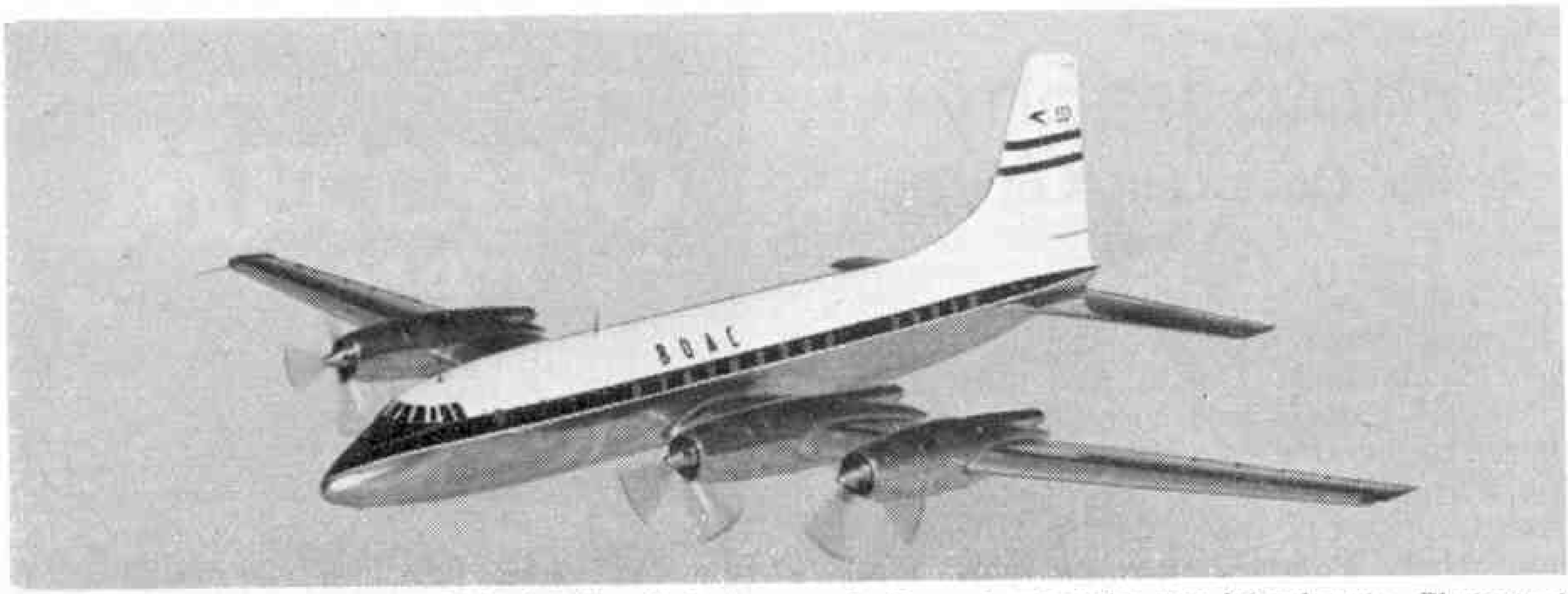
Positive made by the direct method.

reflected from the light parts of the original, fogging the paper black, but the lettering will not reflect any light. Therefore the negative, on development, will show white letters on a dark background, as in the upper illustration on this page. This paper negative, when dry, can be printed on to a further sheet of paper and a positive obtained.

One thing is essential, paper and original must be in perfect contact, or blurring will occur. The paper can be sandwiched between two pieces of glass, clamped together, or a contact printing frame used. The illustration just mentioned was made with an old frame I bought from a local chemist for a shilling. To expose, the loaded frame can be held about 2 ft. from a 100 watt lamp, and sufficient exposure given for the print to develop to right depth in about one minute.

When printed matter is on one side only of the original, a direct copy can be obtained without intermediate negative, but this will have white letters on a black background (see lower illustration). In order to do this, place the original in the frame face up with reflex paper on top also face up, and expose through back of original. Where the original is printed on *both* sides a negative must be made. To do this, place the reflex paper in frame face up with the original face down on top, and expose through back of the reflex paper. To print the negative thus made, place it in the frame face up with reflex paper face down on top, and expose through the negative.

If the original to be copied is faded or yellow, make the negative through a screen of yellow cellophane.



Latest picture of the prototype Bristol Britannia turboprop air liner, showing the new jet exhausts. Photograph by courtesy of The Bristol Aeroplane Co. Ltd.

Air News

By John W. R. Taylor

B.O.A.C. Prepare for Britannia

In preparation for the introduction of their new fleet of Bristol Britannia turboprop air liners next year, B.O.A.C. have appointed Capt. W. B. Houston to be Manager of the Fleet. His duty will be to set up and control the organisation that will plan the Britannia's routes, and put the aircraft into service as quickly and efficiently as possible.

B.O.A.C. have so far ordered 26 Britannias, of which 16 will be Mk.100s, able to carry 63 first-class or 90-93 tourist passengers, and 10 will be of the longer Type 300, with a 5,000 lb. greater payload. B.O.A.C. are also negotiating for three Mk.200 freighter versions, with options on two more freighters and five Mk.250 convertible passenger freighters, making a total potential fleet of 36. The new photograph of the Britannia Mk.100 prototype, G-ALBO, reproduced above, shows that its jet exhausts have now been extended to increase the effectiveness of the additional jet thrust.

More Comets for Air France

Following introduction into service of its three 44-passenger Comet Series 1A jet-liners, Air France have ordered three of the new, bigger Comet 2s. They too will be 44-seaters, but all seats will be adjustable, and they will be able to operate over 2,000-mile stage lengths with full load.

Baby Jets Boost Take-off

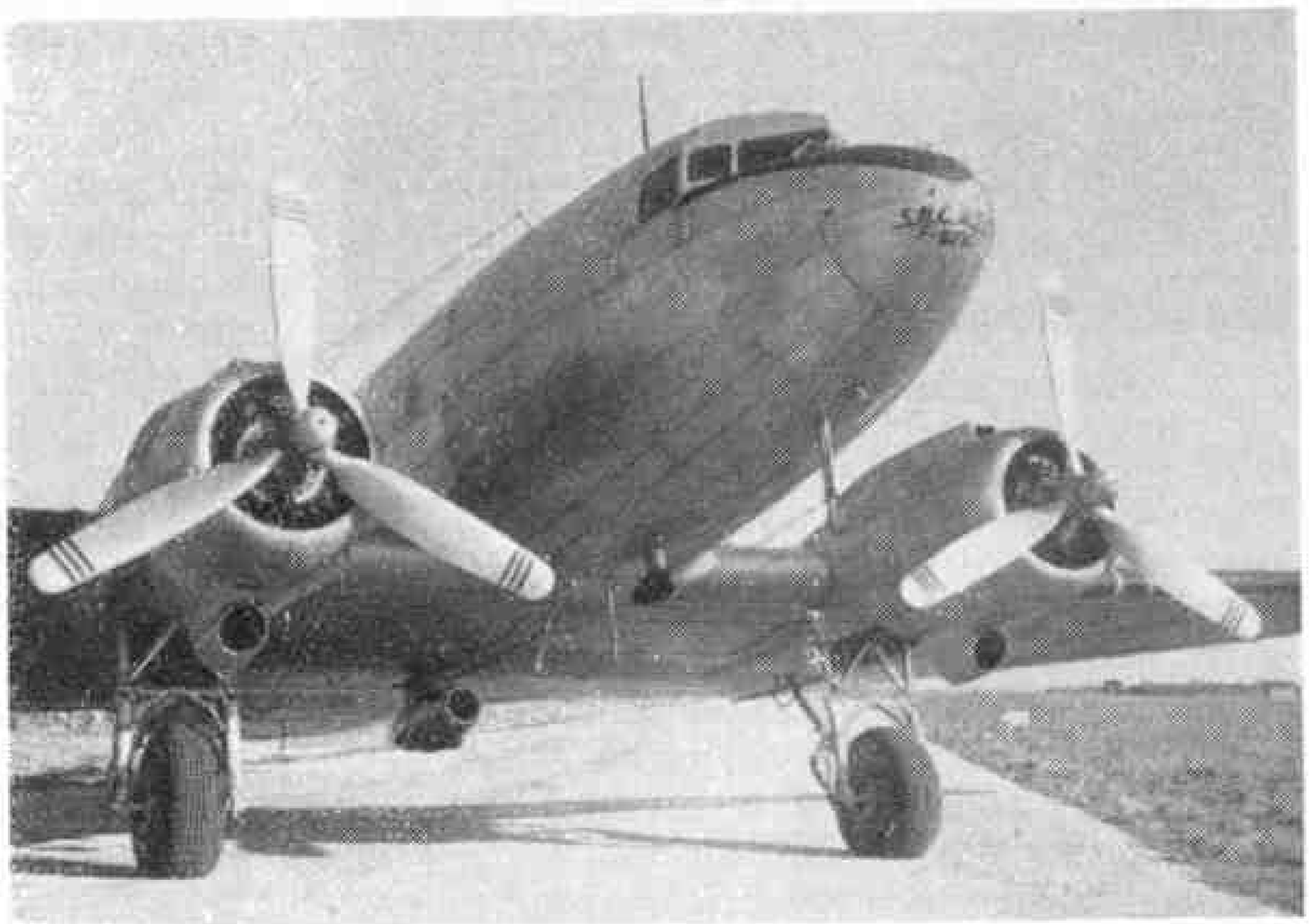
One of the basic facts of aviation is that an aeroplane can fly with a bigger load than it can lift off the ground, which is why so much time has been spent on schemes like flight refuelling, rocket-assisted take-off, and the Mayo Composite idea in which a small, heavily-loaded aircraft was carried into the air on the back of a large, lightly loaded one.

The problem is a serious one for airlines, because the bigger the payload that can be carried, the bigger the profit. Yet international regulations limit the payload to far less than an aircraft can lift off the ground, to ensure safety if an engine should fail during take-off. The problem is even worse in hot countries, where engine power drops off, necessitating still further reduction in payload.

Now the French have come up with the idea of fitting one or two of their superb little Turboméca jet engines to transport aircraft, solely to provide extra power for take-off or high-speed cruising. There is no doubt of the attractiveness of the scheme. With just one 350 lb. thrust Turboméca Palas to boost its normal engine power, a Dakota can take off with 1,895 lb. more payload in complete safety. Addition of two Palas jets to a Curtiss C-46 Commando enables its payload to be increased by 3,500 lb. Yet the Palas weighs only 210 lb. and is simple and cheap to build. The latest version has a streamlined nose and belly air intake to reduce its drag by 25 per cent. It can be re-started in flight even in a heavy rainstorm.

Provosts' Intensive Flying

To prove the capabilities and sturdiness of their new Percival Provost basic trainers, the R.A.F. subjected the first production batch to intensive flying trials, mainly at the Central Flying School, Little Rissington, before delivering them to Flying Training Schools. One Provost achieved what is probably the highest utilization recorded by any aircraft, by completing 200 hrs. flying in 11 days — an average of nearly 20 hours a day.



Turbomeca Palas jet booster fitted under a Dakota transport aircraft. Photograph by courtesy of S.N.C.A.S.O., France.

Sidearms for the Starfire

Fire-power of the U.S.A.F.'s Lockheed F-94C Starfire all-weather two-seat jet fighter has been doubled by the addition of two rocket containers, mounted on the leading edge of its wings. Each of the pods contains 12 Aeromite or Mighty Mouse 2.75 in. air-to-air rockets, to supplement 24 carried in a circle of rocket tubes immediately behind the Starfire's black nose radome. A hit from any one could destroy the largest bomber in service.

Starfires were the first production interceptors to carry no guns, only rockets. They form the major defence force to protect continental U.S. targets against attack by atom bombers, and can operate equally efficiently by night or day, in good weather or bad, as they are guided to their target by radar, which also fires their rockets completely automatically.

Lockheed F-94C Starfire jet fighter with pod containing 12 rockets mounted on the leading edge of each wing, as described on this page. Photograph by courtesy of Lockheed Aircraft Corp., U.S.A.

The Big Noise

Following the success of a little Auster spotter plane fitted with a loudspeaker to broadcast messages to groups of Malayan communist bandits, a Valetta twin-engined transport has now been modified to carry more powerful amplifying equipment, together with four loudspeakers under its fuselage, protected from the slipstream by a large fairing. Output of the airborne Tannoy is 2,000 watts—some 40 times the power of the average public address system—and it can be heard over a radius of one mile when the aircraft cruises 1,500 ft. above the jungle.

New version of the Canadian-built DHC-2 Beaver light transport, powered by a 550 h.p. Alvis Leonides engine. Photograph by courtesy of de Havilland Enterprise.

Most Powerful Aero Engine

Designed to power supersonic fighter planes of the future, the newly-announced de Havilland Gyron turbojet is almost certainly the world's most powerful aero engine. No details of its construction or performance may yet be given, except that it uses an axial flow compressor — a new departure for de Havillands—and combines simple construction with low weight.

The Gyron project was begun as a private venture nearly three years ago, under the leadership of Major F. B. Halford, chairman and technical director of the de Havilland Engine Company. Prototype engines have completed a long period of test running on the ground, giving consistently far greater thrust than has been announced for any other jet engine. As a result, development is now being speeded under Ministry of Supply contract, and there seems little doubt that the Gyron will be one of the outstanding turbojets of the next ten years.

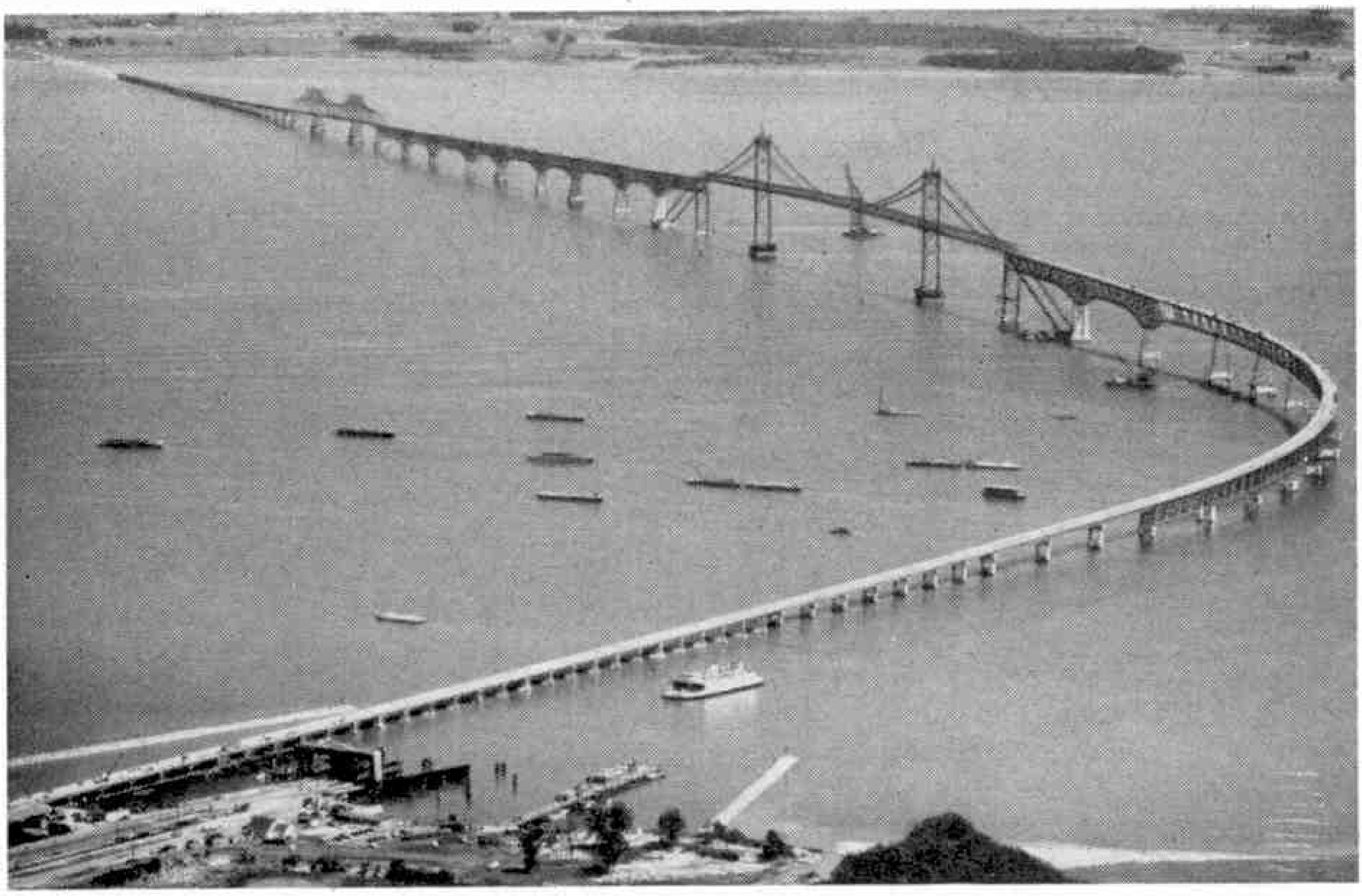
Leonides-Powered Beaver

Another interesting development from de Havillands, shown for the first time at this year's S.B.A.C. Display at Farnborough, was a new version of the well-known DHC-2 Beaver light transport, fitted with a 550 h.p. Alvis Leonides nine-cylinder radial engine. The prototype is shown in the bottom picture on this page.

More than 500 Beavers, powered by American 450 h.p. Pratt and Whitney Wasp Juniors, have been built by de Havilland Aircraft of Canada at Toronto, for delivery to 26 different countries. Substitution of the more powerful Leonides not only improves the Beaver's already excellent performance, but will make it even more attractive in countries where Leonides-engined Provost and Pembroke trainers, Westland-Sikorsky S-51 or Bristol 171 helicopters are in use. It will also help to save dollars.

Flying Doctor Anniversary

This year marks the 25th Anniversary of Australia's famous Flying Doctor Service. Today the Service has 740 outposts linked directly with its nine main inland bases. Communication is maintained through the use of 135 portable radio sets, of which 99 are operated by Government and exploration parties, overland carriers, drovers and others whose calling forces them to lead the life of nomads. Last year, Flying Doctor Service aircraft made 928 flights, on some of which as many as 23 farm stations were visited. Total mileage flown was 253,412.



Chesapeake Bay Bridge

Steel Structure Over 4 Miles Long

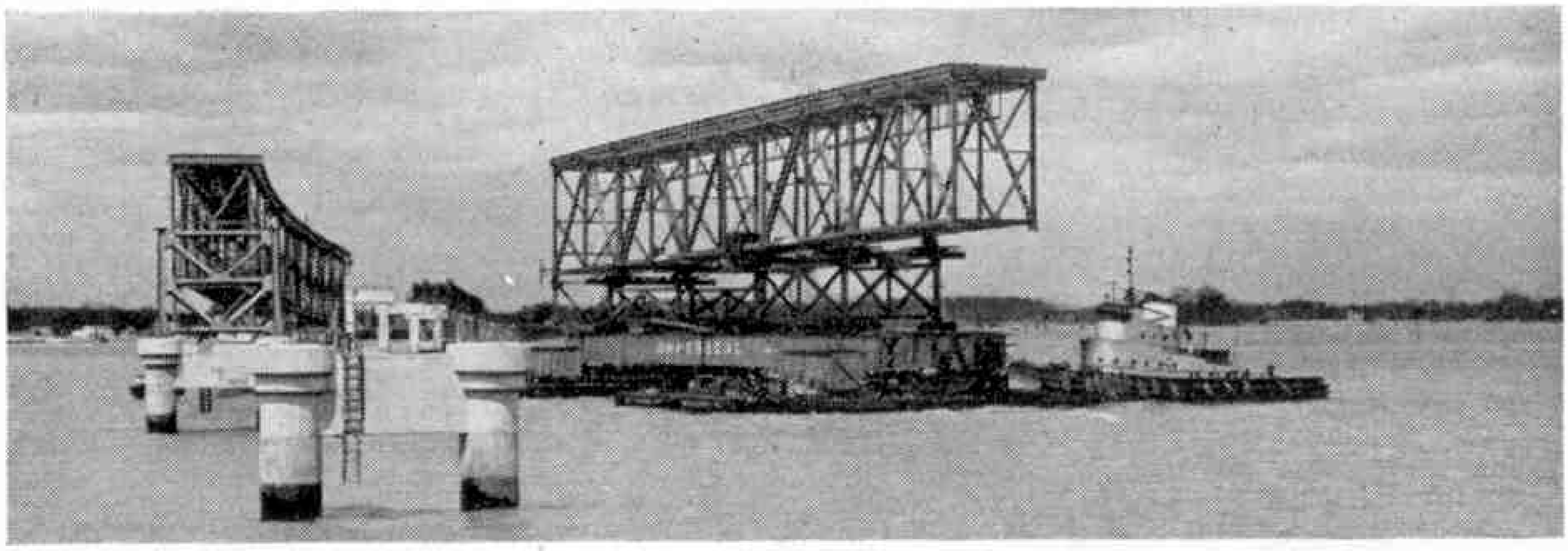
THE bridge seen in the picture at the head of this page crosses Chesapeake Bay, in the United States. The Atlantic coast line of the United States is deeply indented by bays and river estuaries, and great bridges are necessary in developing a good system of roadways along it. The Chesapeake Bay Bridge is one of these. It was authorised, along with three other bridges, as long ago as 1938, but construction was not begun until January 1949, and the bridge was completed in June of last year.

The first thing that will become apparent on looking at the illustration of the bridge is that it is a very long one. But it is difficult to gather from the picture a correct idea of its length. The steel structure is actually more than 4 miles long, and the approaches bring up the total length of the project to well over 7½ miles.

The immense curve of the bridge also arouses interest and curiosity. In general a bridge is thought of as a structure carried straight across a waterway, following the shortest line between its banks. There was of course a good reason for taking a different line in building the Chesapeake Bay Bridge. This was to bring the highest points, in the middle sections, at right angles to the main channels. To have built the bridge in a straight line between the points at which its ends were to be placed would have put it at a sharp angle to the flow of the water of the Bay.

One of the most remarkable features of the long structure is that it can almost be looked upon as an exhibition of different ways of building bridges. A glance at the picture shows that one section of it is a suspension bridge, that is, one of the same type as the Washington Bridge in New York and the famous bridge across the Golden Gate, the entrance to the bay of San Francisco. This part of the Chesapeake Bay Bridge is not as large as those giants, of course. Its main span is 1,600 ft. long, whereas that of the Golden Gate Bridge is 4,200 ft., but with its side spans, each 661 ft, long, the suspension section makes a total contribution of 2,922 ft., or more than half a mile, to the length of the Chesapeake Bay Bridge.

The other sections in this display of bridge design include a cantilever bridge,



which has a main span of 780 ft. and two smaller spans of 470 ft. each. Both this and the suspension bridge have been built over the waterways along which shipping plies.

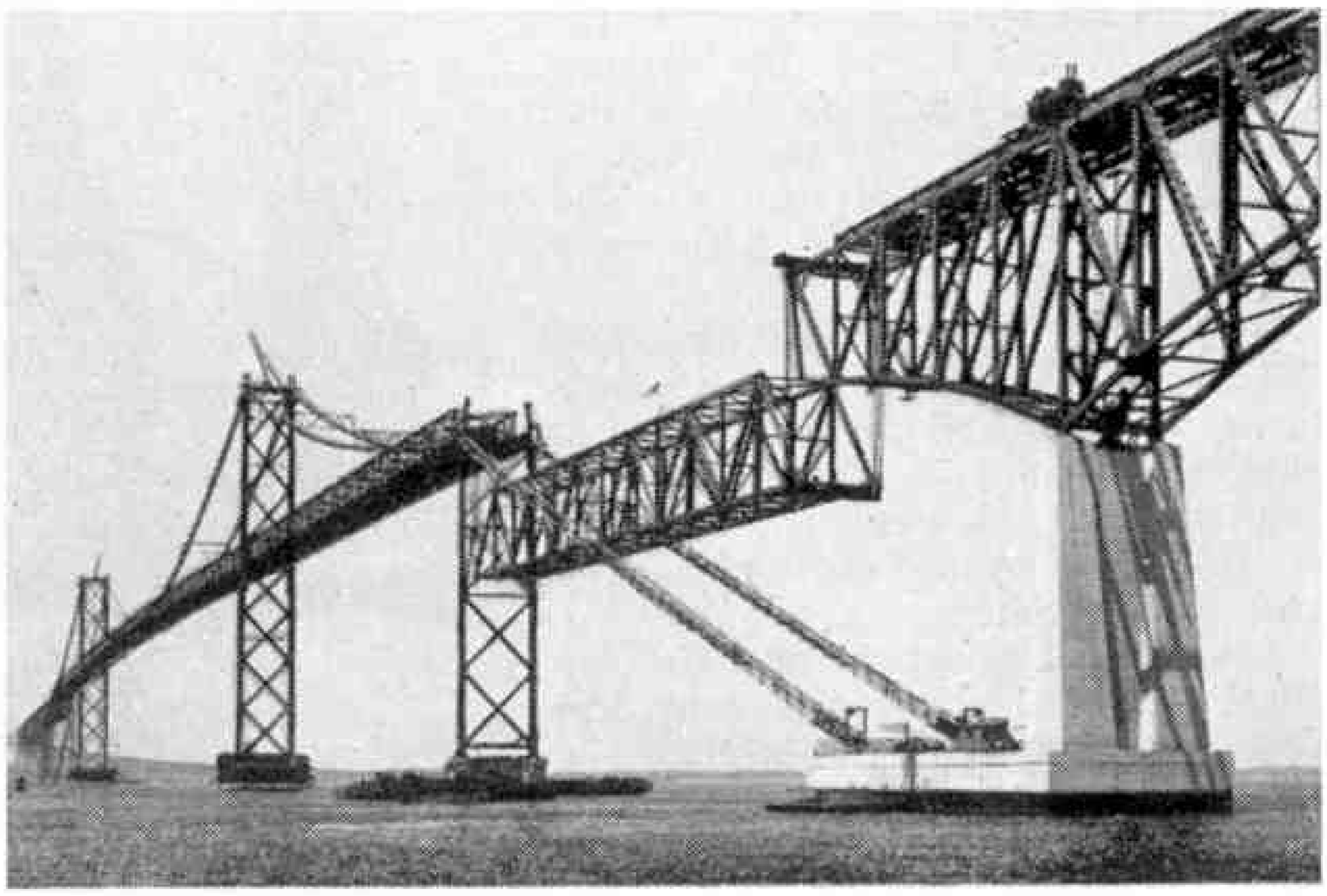
Crossing the Bay from the Western end of the Bridge, traffic runs first over a series of beam spans, each 60 ft. in length, that extend for a distance of 1,842 ft. Then come deck girder spans, which have a total length of 1,318 ft., simple deck truss spans, 2,850 ft., and a length of 1,446 ft. of deck cantilever truss construction, which ends at the suspension bridge already mentioned.

Between the suspension and cantilever bridges there is a length of 4,685 ft., which is only a little short of a mile, built up of deck cantilever trusses, the general form and structure of which is well shown in the illustration. Beyond the cantilever bridge there are more deck girders and beam spans, their total length being 4,503 ft., and a causeway 1,756 ft. completes the structure. The height of the bridge above the water increases from each end towards the navigation channels, and the highest point of the deck is almost 200 ft. above mean low water.

The roadway of the bridge is 28 ft. wide and has emergency footways 18 in. in width on each side, with collision kerbs and hand rails. It is designed to carry 8½ million vehicles a year, and it is officially estimated that by 1961 the number of vehicles using it will have risen to well over five million.

The way in which the bridge was erected is as noteworthy as its design. In most cases what is called falsework is erected to support the steelwork of spans during erection, and this is removed as each span is completed. For most of the Chesapeake Bay Bridge no falsework at all was used. Instead the spans were constructed ashore and each was floated out on barges, guided by tugs, into the position that it was to occupy. When the barges were exactly positioned their holds were slowly filled with water, with the result that the span, carried at a suitable height above their decks, was slowly lowered on to its seats on the piers. The upper illustration on this page shows a span of the bridge being floated in ready for placing in position in this way.

On the opposite page is a general view of the Chesapeake Bay Bridge. Most of its steelwork was floated into position after fabrication, as seen in the upper picture on this page. Below the erection of a truss span is illustrated, and the suspension section over the main waterway of the Bay also is clearly shown. We are indebted to The Engineer for our illustrations of this great bridge.



Among the Model-Builders

By "Spanner"

An Automatic Clutch

Automatic clutches of various types have appeared in the *M.M.* from time to time, their purpose being principally to prevent damage to an Electric Motor by connecting it to the load only when it has attained sufficient speed to exert its full power. Most of the mechanisms mentioned so far, however, are a little too large to incorporate in gear-boxes where space is valuable, and in order to overcome this difficulty G. T. Parkyn, Barnet, has designed the clutch illustrated in Fig. 1. This occupies a space of a little less than $1\frac{1}{2}'' \times 1\frac{1}{2}'' \times 1\frac{1}{2}''$.

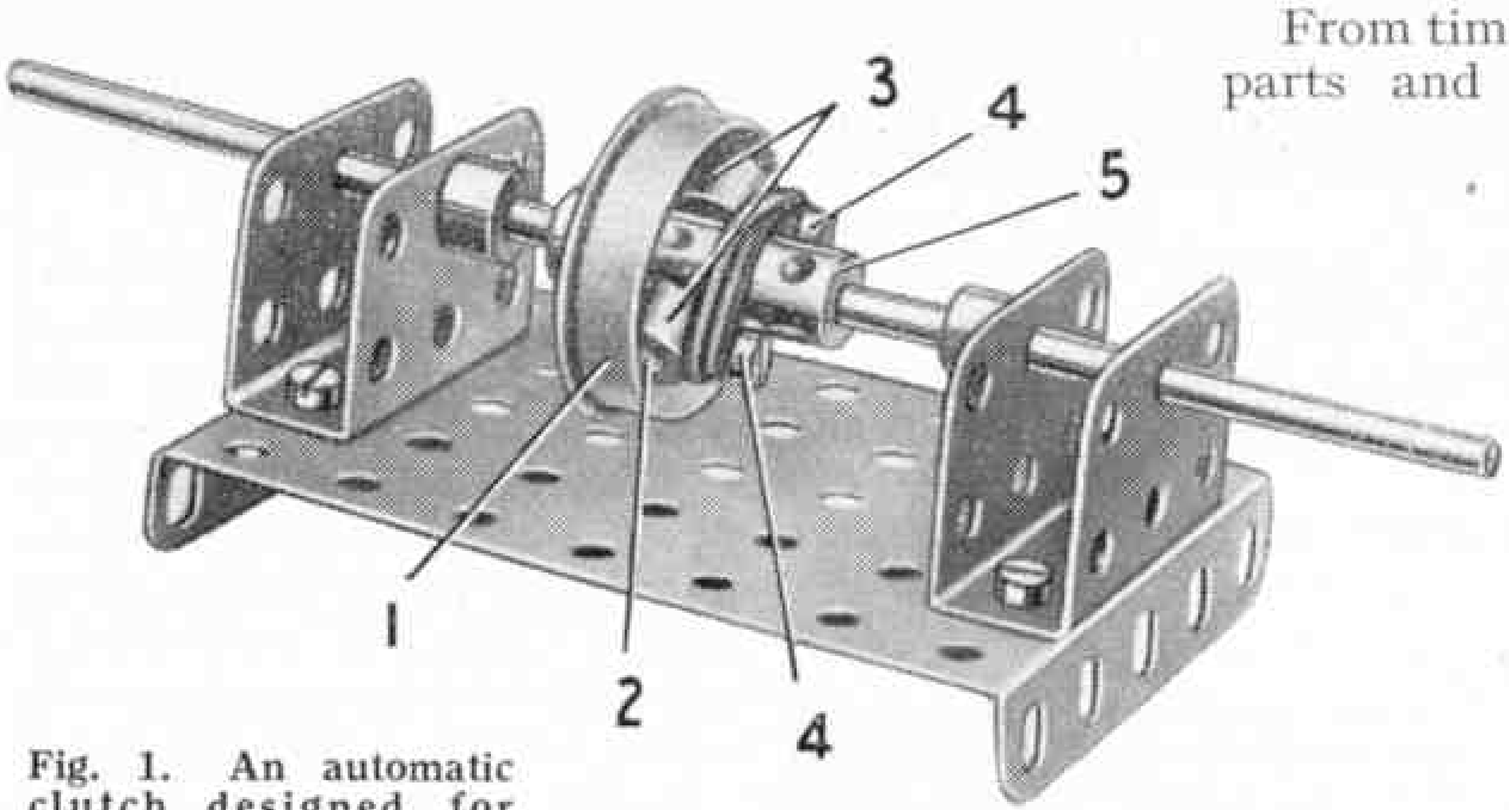


Fig. 1. An automatic clutch designed for coupling an Electric Motor to its load when it has reached working speed. It was designed by G. T. Parkyn, Barnet, Herts.

The driven shaft carries a $1\frac{1}{8}''$ Flanged Wheel 1, and the driving shaft carries a Coupling 5. In the end transverse hole of the Coupling is centred a 1″ Axle Rod 2. The driven shaft projects a little way into the Coupling.

The Axle Rod 2 carries two Collars 3, in each of which a set-screw 4 is locked by means of a Nut, but the set-screws do not grip the Rod. A small rubber band is then placed round both set-screws and the Coupling.

When the speed of the driving shaft reaches a certain rate the Collars fly outward and engage the rim of the Flanged Wheel, and so rotate it.

The working of the mechanism is improved if small pieces of leather are fixed to the outer surfaces of the Collars.

A Novel Use for Meccano

From time to time odd uses for Meccano parts and mechanisms crop up, and recently I heard of another instance where a simple Meccano mechanism built up from a few parts had been made to serve a really practical purpose in connection with a projector for still pictures. The mechanism provides an automatic method of changing the picture slides by means of remote control, and it was devised by members of the Northwood Covenanters Boys' Club, several of whom are keen Meccanoites.

Fig. 2. An Aldis still picture projector fitted with a Meccano mechanism for slide changing by remote control. The mechanism was designed by the members of the Northwood Covenanters Boys Club.

The projector is used to project hymn slides at Sunday School meetings, and a picture of it fitted with the Meccano mechanism is illustrated in Fig. 2. The photograph was sent to me by Mr. Maynard Hackett, Northwood.

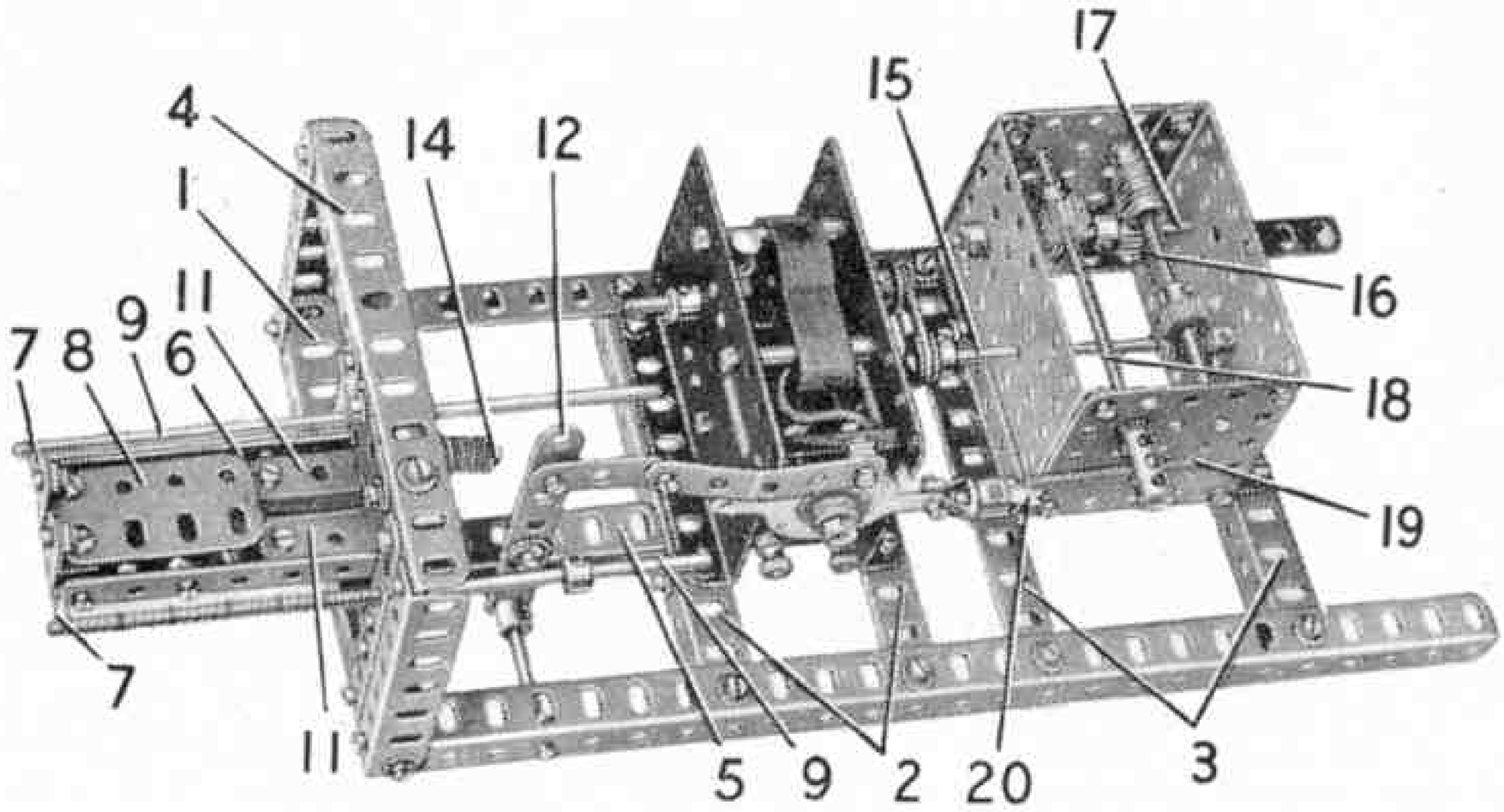


Fig. 3. A "penny-in-the-slot" mechanism designed for use with "peep shows" and similar amusement devices.

A New "Penny-in-the-Slot" Mechanism

The mechanism shown in Figs. 3 and 4 is designed specially for use in connection with miniature theatres and animated displays operated on the "penny-in-the-slot" principle. When a penny is inserted in the coin slide provided, an Electric Motor is set in motion and operates the display for a pre-determined length of time. At the end of a set period the Motor is switched off and the mechanism is automatically reset ready for another coin to be inserted in the machine.

The base of the framework for the mechanism consists of two 12½″ Angle Girders connected by 5½″ Angle Girders 1, 2 and 3. Two vertical 3½″ Angle Girders are fitted to the front of the base, and these are connected at their upper ends by a further 5½″ Angle Girder 4. A 3½″ Angle Girder 5 is attached to the Girder 1 and is connected by an Angle Bracket to one of the Girders 2.

The coin slide is made by bolting two 3½″ Angle Girders 6 to a 2″ Flat Girder, and a 3½″ × ½″ Double Angle Strip 7 is fixed to each Angle Girder. A 2″ Flat Girder 8 is attached by Angle Brackets to 1″ × 1″ Angle Brackets fixed to the 3½″ Angle Girders. The lugs of the Double Angle Strips 7 slide freely over 6½″ Rods 9, which are fixed in Cranks 10 bolted to 3½″ Strips fitted between the Girders 1 and 4. A platform for the coin is provided by a set of nine 1½″ Strips, seen at 11, bolted to each 3½″ Angle Girder.

A 3½″ Strip 12 is bolted to a Crank, which is pivoted on a 2″ Rod supported in the base as shown. The upper end of the Strip is connected by lock-nutted bolts and a made-up strip to the Motor switch. The made-up strip consists of a 2½″ Strip extended by a 2″ Slotted Strip, and the Strip 12 is positioned so that when the coin slide is pushed in, the 3½″ Angle Girders pass on either side of the Strip 12.

When a coin is placed in the slide it rests on the platform formed by the Strips 11. As the slide is pushed in the edge of the coin presses against the Strip 12 and moves it, so that the Motor is switched on. A set of six Compression Springs on one of the Rods 9 returns the coin slide to its normal position, and the coin is removed from the slide by a Pawl 13. The device was built by H. Taylor, Birkby.

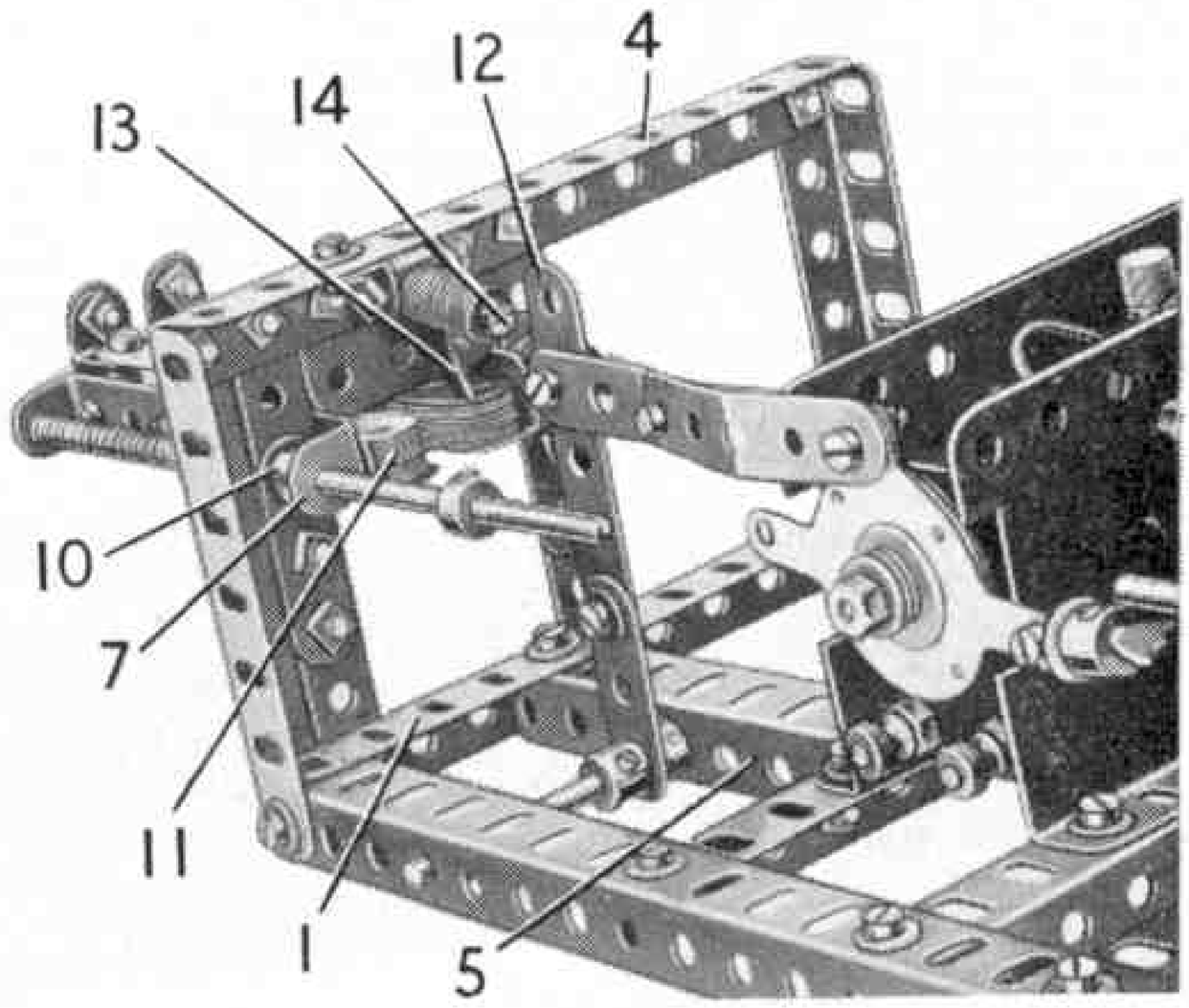


Fig. 4. A close-up of the coin slide of the "penny-in-the-slot" mechanism.

Peter Bowden, Leicester, one of the happy young prize-winners in Section A of the Meccano International Competition.

More Prize-winning Models

By "Spanner"

Entries from the Meccano International Competition

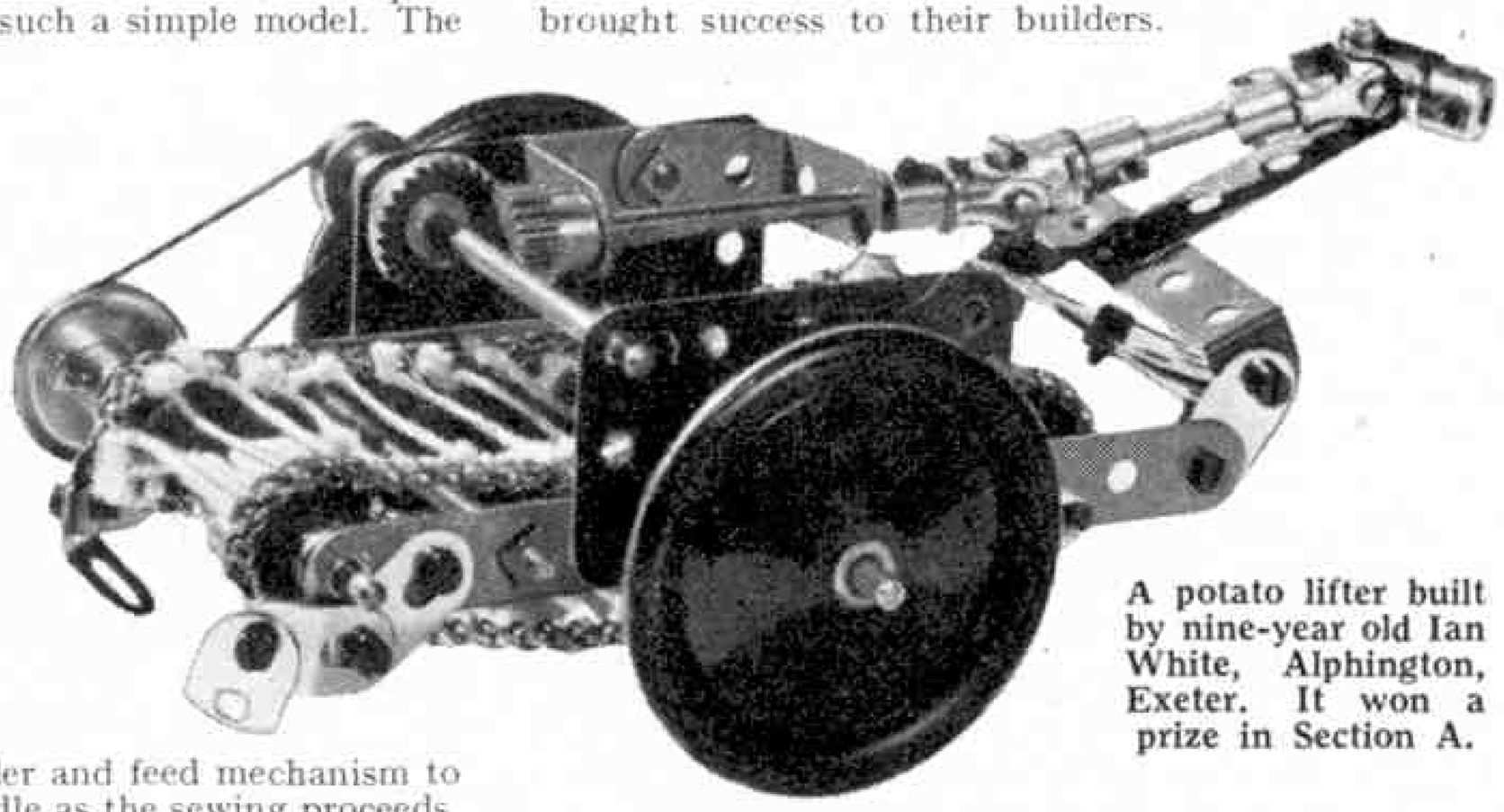
One of the £5 prize-winners in Section B. This is Peter Saunders, who lives at Christchurch, New Zealand.

I HAVE already mentioned the amazing variety of subjects chosen by competitors in the International Model-Building Competition, and the four models shown on these pages are an excellent demonstration of this feature of the Contest.

The potato lifter built by nine-year old Ian White, Alphington, Exeter, is one of the many examples of agricultural machines that were to be seen among the entries. This model won a prize of £2 in Section A. It owed its success mainly to its neat and compact construction, coupled with the fact that the mechanical details were copied as accurately as possible in such a simple model. The potato lifter is intended for operation from the power take-off of the hauling tractor, and in the illustration the drawbar is in the raised position so as to show the arrangement.

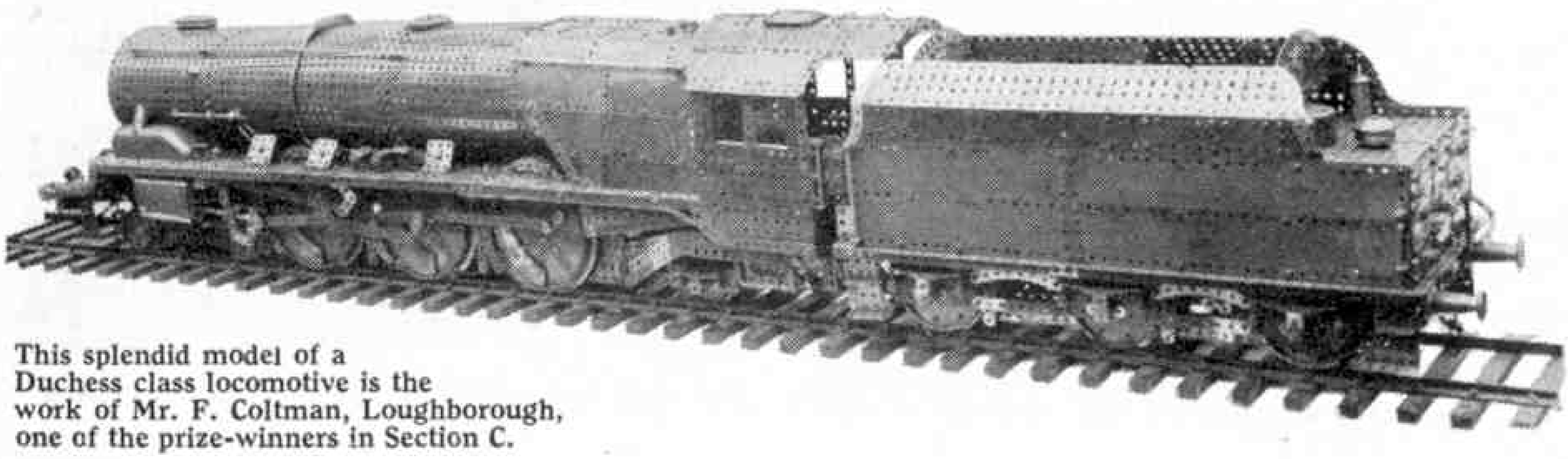
A model of a very different type is the sewing machine built by John Barnes, Ealing, W.13, who was one of the £5 prize-winners in Section B. John is seen with his model, which is hand driven. The mechanical details of the model are most interesting, and include a balance wheel and clutch, geared hand drive unit, needle and shuttle motion, bobbin winder and feed mechanism to feed the cloth under the needle as the sewing proceeds. It is difficult to explain all the mechanisms of this fine model without the aid of illustrations, but I must give a few details of the cloth feed device, as I feel that this is worthy of special mention. The feed teeth are made by bolting a 1½" Gear to a 4½" Strip. This Strip is given an eccentric circular motion, which moves the teeth backward and forward so that they come above the level of the base on the forward movement only. When up, the teeth press against the head foot, and catch the cloth and move it forward. Two distinct mechanisms are used to give the gear its motion, one of them providing the vertical motion while the other gives the horizontal motion. I am hoping it will be possible to describe this model more fully later on, as I think it is one of the best of its type that I have seen.

A fine model of a Duchess class 4–6–2 locomotive built by Mr. F. Coltman, Loughborough, a competitor in Section C of the Competition, was one of many excellent models of this kind that brought success to their builders.



A potato lifter built by nine-year old Ian White, Alphington, Exeter. It won a prize in Section A.

Mr. Coltman's model is shown at the foot of this page, and is 6 ft. 2 in. long, including the tender. Over 2,500 nuts and bolts are used in its construction and it travels on 4¾" gauge track. It has four cylinders, two inside and two outside, and the crankshaft, which is fixed to the first pair of driving wheels, is built up from six Couplings and Rods of various lengths. The driving wheels are 6" Circular Plates fitted with Hub Discs,



This splendid model of a Duchess class locomotive is the work of Mr. F. Coltman, Loughborough, one of the prize-winners in Section C.

John Barnes, Ealing, W.13, and his ingeniously constructed sewing machine. The model earned him a prize of £5 in Section B.

and brakes, operated by a handle in the cab, are fitted to each wheel. Each wheel is mounted in laminated springs formed from Strips.

The motive power is provided by a Meccano No. 2 Clockwork Motor, which is coupled to the second pair of driving wheels through Gears and Sprockets. The reversing lever of the Motor is connected by Cranks and Rods to a reversing screw inside the cab. By turning a handle, which rotates a Worm meshed with a 57-tooth Gear, the reversing gear of the Walschaerts valve motion is actuated—and the Clockwork Motor lever is reversed simultaneously.

The brake lever of the Motor also is linked to a control handle in the cab. A water pick-up scoop is fitted under the tender and this also is controlled from the cab, the interior of which has a remarkably neat and business-like appearance.

There is of course a mass of other interesting detail work, and much of this can be seen in the accompanying illustration.

I come now to a model that to me was one of the most attractive in Section B. It is the remarkably realistic full-rigged galleon shown at the foot of this page. It was built by Brian Gulley, St. Saviours, Jersey, who was awarded 3rd Prize in his Section. The shapely hull is surprisingly neat, and splendid work has been done in obtaining a smooth and realistic outline. Brian is only 14 years of age, so that his achievement in winning a principal prize in face of competition from model-builders up to 16 years of age, is a fine performance. There is plenty of interesting detail in the model, and a feature that I liked was the builder's use of Meccano Plates in making the sails, which have a remarkably real appearance.

Models of various kinds of amusement park machines and devices were numerous in Section B of the Competition and one of the best of these was a giant scenic railway built by Armand Laurent, Lausanne, Switzerland, who won one of the smaller prizes in this Section. The shaping of the runway in this model was its best feature. It was very neatly carried out, but unfortunately it seems that the builder had been rather too ambitious and had made his model too large for the parts at his disposal. This resulted in the supporting structure of the model lacking rigidity and detail, and this detracted from its chances of winning a major award.

One other good fun-fair model I would like to mention is a novel firing range built by 13-year old A. F. Parish, Wakefield, in which the targets are a row of cats' heads. The model is operated on the "penny-in-the-slot" principle. When a penny is inserted in the chute, it operates mechanism that releases five balls, which form the bullets for a pistol pivotally mounted at the front of the gallery. After the balls have been fired, they fall into a tray and cannot be released again until another penny is inserted.

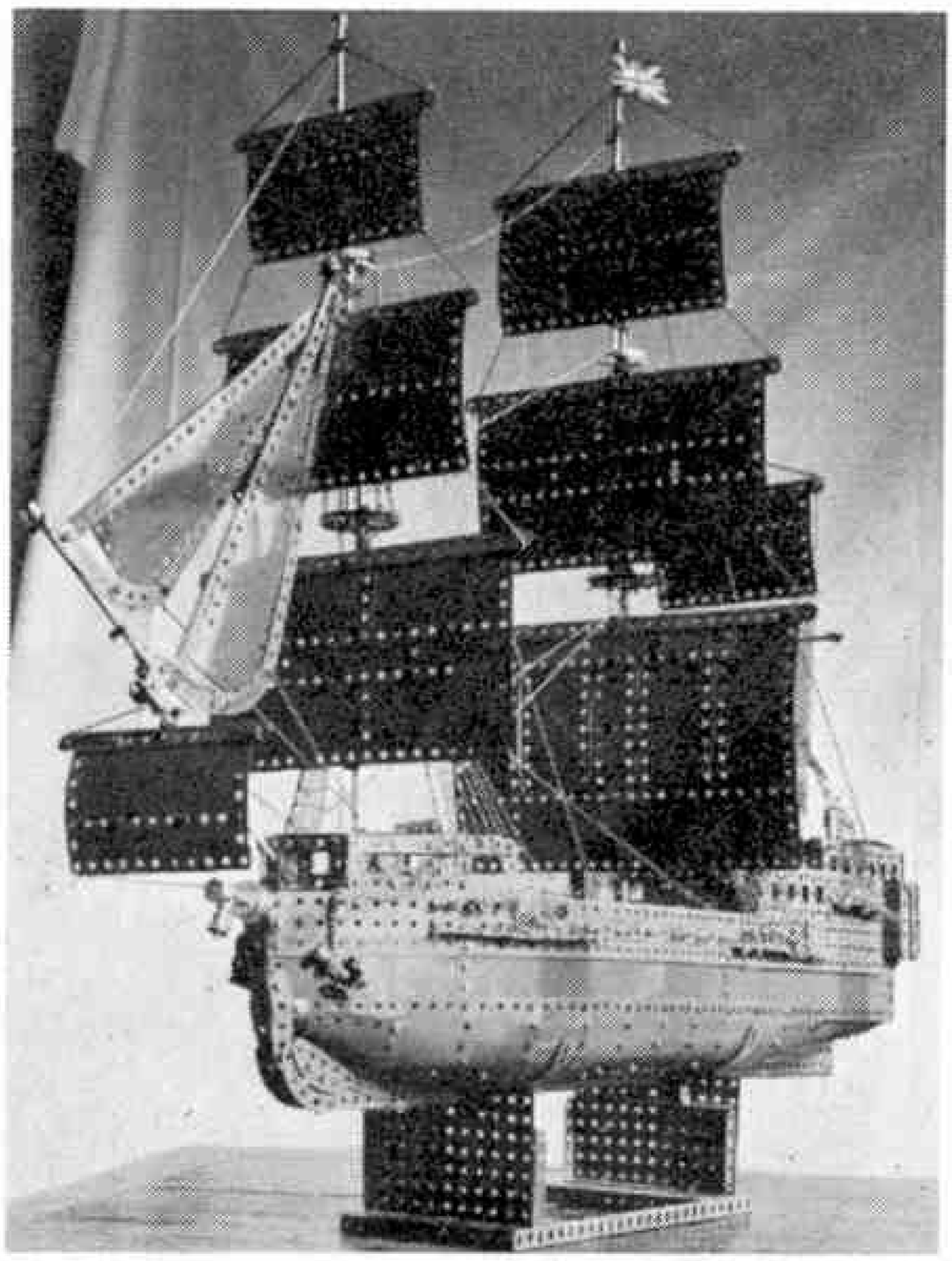
I hope to describe another selection of models from this Contest in due course.

PRIZES FOR MODEL-BUILDERS

We wish to remind readers that the October General Model-Building Competition, of which full details were given in last month's *M.M.*, is still open for entries. In this Contest Cash Prizes are offered for Meccano models of any kind built from any number of parts. The Contest is open to readers of all ages living in any part of the world, and the closing date is 30th January 1954.

The Competition is divided into two Sections: A, for competitors under 14 years of age, and B, for competitors over 14 years of age.

The following prizes will be awarded in each Section, First, Cheque for £5. Second, Cheque for £3. Third, Cheque for £2. Ten Prizes, each of £1, and ten Consolation awards, each of 5/-. A number of Certificates of Merit also will be awarded. Entries must be addressed *"October Meccano Model-Building Competition, Meccano Ltd., Binns Road, Liverpool 13."*



This attractive and realistic model of a full-rigged galleon was built by Brian W. Gulley, St. Saviours, Jersey, and won for him the Third Prize in Section B.

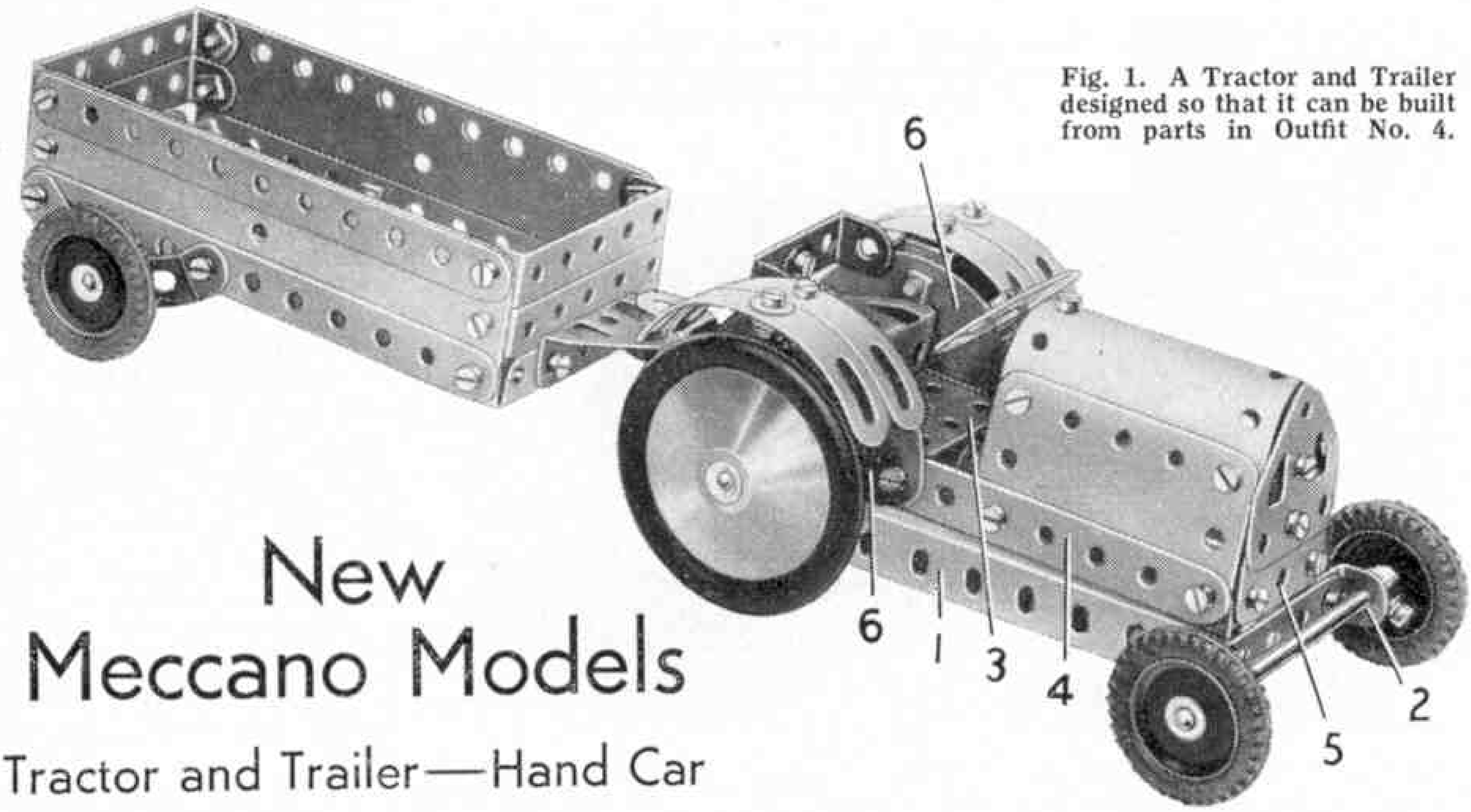


Fig. 1. A Tractor and Trailer designed so that it can be built from parts in Outfit No. 4.

New Meccano Models

Tractor and Trailer—Hand Car

AMONG the hundreds of models that can be built from the parts in a Meccano Outfit No. 4 is the attractive tractor and trailer shown at the head of this page. It is one that I think will prove popular with all who like tackling wheeled models.

In building the model it is best to commence with the base of the tractor unit. This is a Flanged Sector Plate 1, to the narrow end of which a ½″ Reversed Angle Bracket 2 is bolted on each side. Between these parts a 2½″ Strip is bolted, and in them a 3½″ Rod that forms the front axle, is supported. The next stage is to attach a 2½″ × 1½″ Flanged Plate 3 to the Flanged Sector Plate by means of an Angle Bracket, in such a way that two clear holes of the Flanged Plate overhang the wide end of the Flanged Sector Plate.

A 5½″ Strip 4 is now fitted to each side of the 2½″ × 1½″ Flanged Plate, and it should be noted that one of them is connected to the Flanged Plate by an Angle Bracket, while the other Strip is attached by a Double Bracket. Both Strips are connected to the narrow end of the Flanged Sector Plate by Angle Brackets, and the bolts that fix the Strips to the Angle Brackets also hold in place further Angle Brackets that support a Flat Trunnion 5. To this Flat Trunnion a second similar part is bolted to form the radiator. The sides of the bonnet are 2½″ × 1½″ Flexible Plates, which are bolted to the Strips 4 and connected at their upper ends by a U-section Curved Plate.

A Semi-Circular Plate 6 is attached to each of the Strips 4, and the rear axle, which is a 4″ Rod, is supported in them and also in Fishplates bolted to the sides of the Flanged Sector Plate 1.

The mudguards over the rear wheels are Formed Slotted Strips bolted to Fishplates, and they are connected to the Semi-Circular Plates by Angle Brackets.

A seat for the driver is made from a Trunnion bolted to a Double Bracket, which is then fixed to the Flanged Plate 3. The back of the seat is a 1½″ × ½″ Double Angle Strip attached to a Fishplate bolted to the Double Bracket. The steering wheel is represented by a Wheel Disc fixed by

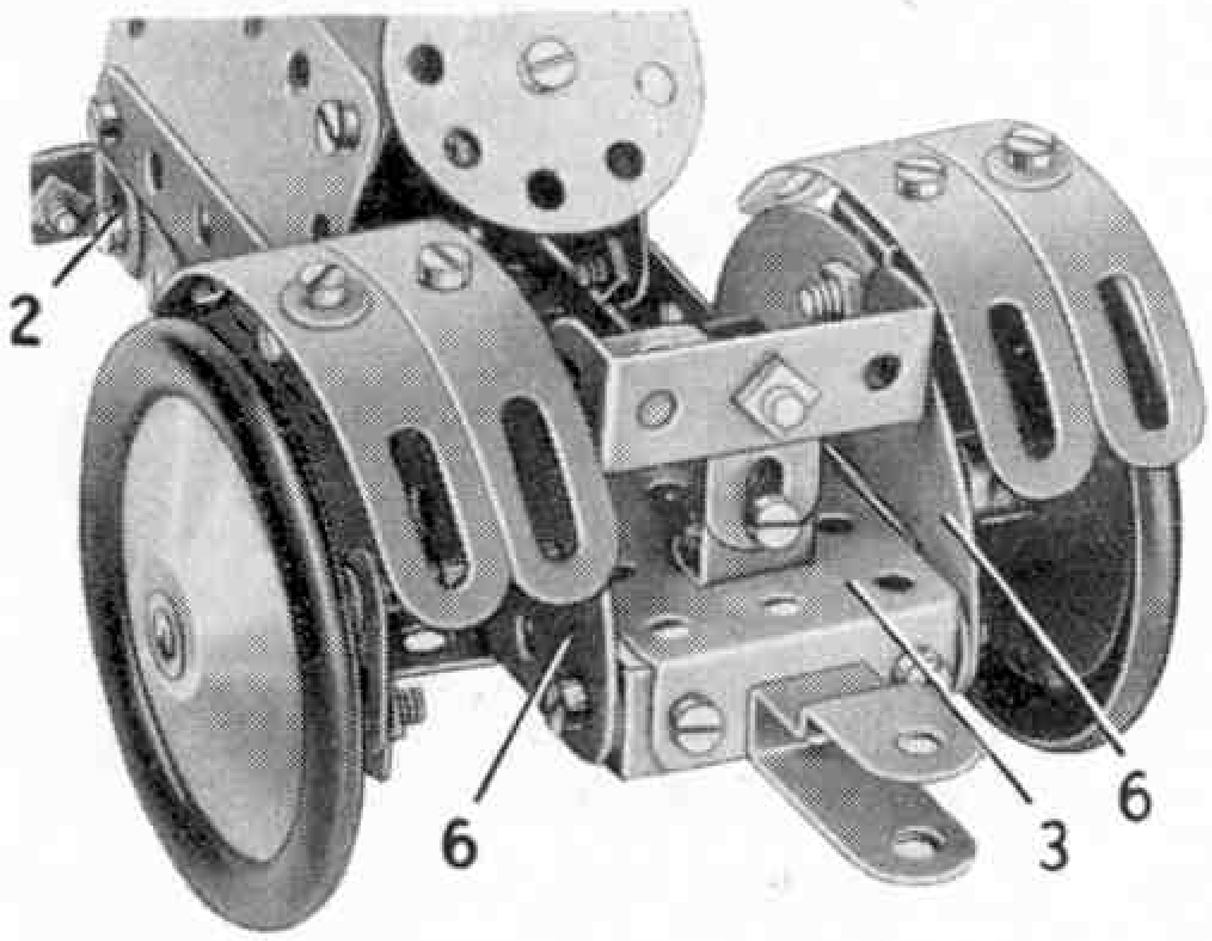


Fig. 2. A rear view of the Tractor unit.

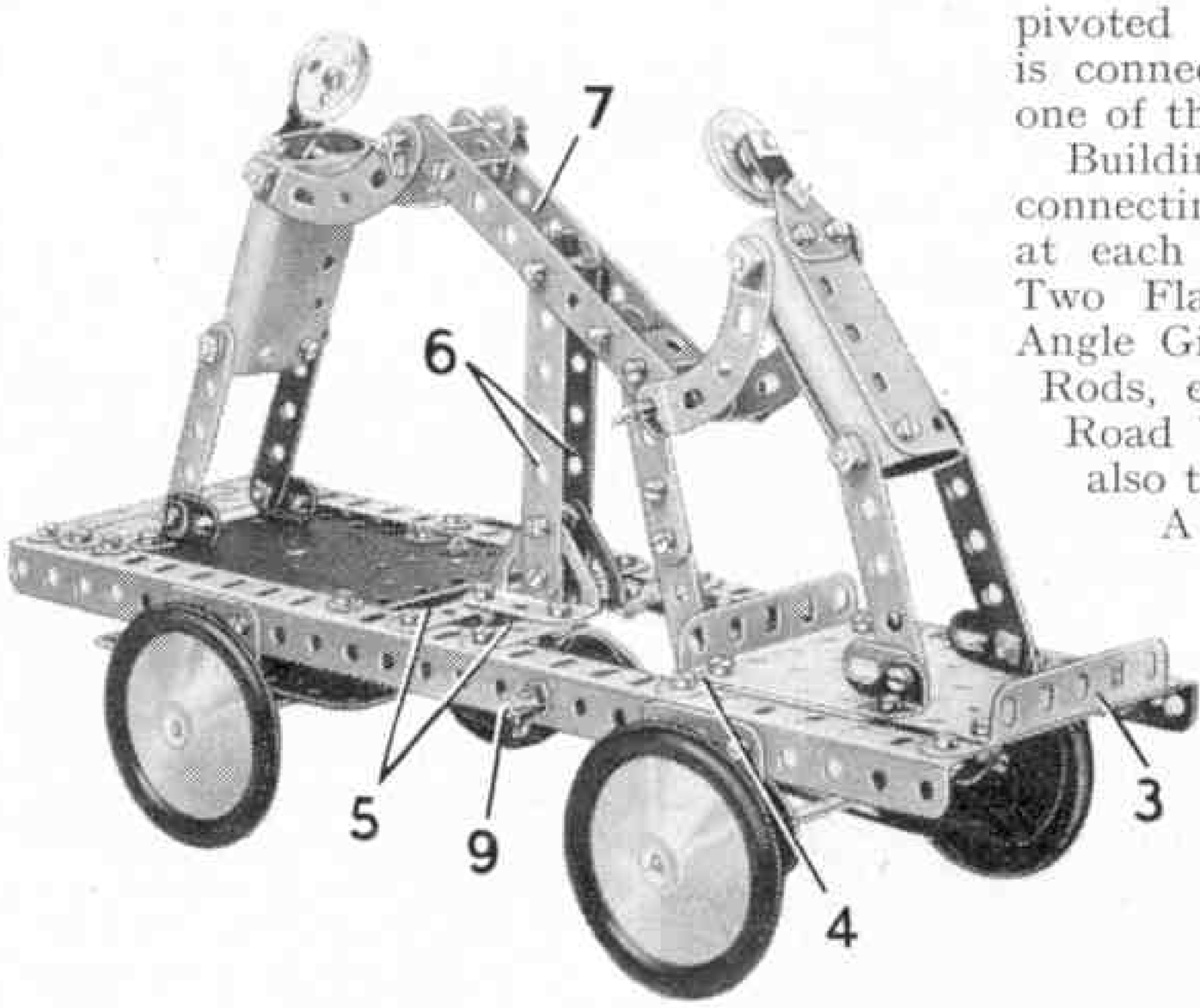


Fig. 3. A model Hand Car of the type once used extensively on American railroads.

a lock-nutted bolt to an Obtuse Angle Bracket that is attached to the rear end of the bonnet.

Having completed the tractor, attention can now be given to the trailer. The floor of this is a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate, and the sides are $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates edged by $5\frac{1}{2}''$ Strips. The sides are connected together by $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips, which form the ends. The wheels are fixed on a $3\frac{1}{2}''$ Rod passed through $2\frac{1}{2}''$ Stepped Curved Strips bolted to the sides. A Trunnion is attached to the front of the trailer as shown, and at its pointed end a $\frac{3}{8}''$ Bolt is fixed. The trailer is attached to the tractor unit by engaging this Bolt in a hole of a Stepped Bent Strip bolted to the rear of the tractor.

American Hand Car

A working model of an American Hand Car is the subject of our second new model this month and it is shown in Figs. 3 and 4. These useful little vehicles are used on railways for carrying inspectors and workmen engaged on the maintenance of the track. The car is propelled by two men working a stout pivoted beam up and down. The beam is connected to a crankshaft that drives one of the wheel axles.

Building of the model is begun by connecting two $12\frac{1}{2}''$ Angle Girders together at each end by means of a $3\frac{1}{2}''$ Strip. Two Flat Trunnions are fixed to each Angle Girder, and these support two $4\frac{1}{2}''$ Rods, each of which is fitted with two Road Wheels. One of the Rods carries also two 1″ Pulleys 1 and 2.

A $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate 3 is attached to the $3\frac{1}{2}''$ Strip at one end of the car or trolley and also to a second $3\frac{1}{2}''$ Strip 4. A No. 1 Clockwork Motor is then bolted to one of the $12\frac{1}{2}''$ Angle Girders in the position shown in Fig. 4, and it is connected to the other Girder by a Fishplate. The space between the Motor and the end of the car is filled by a $3\frac{1}{2}''$ Strip.

Two $3\frac{1}{2}''$ Strips 5 are bolted across the Angle Girders at the centre of the car, and these support two Trunnions, each of which is fitted with a $3\frac{1}{2}''$ Strip 6. The operating beam 7 is pivoted on a 1″ Rod held by two Spring Clips in the top holes of the Strips 6. The beam consists of two $4\frac{1}{2}''$ Strips joined together by Double Brackets.

The body of each of the men is made from two U-Section Curved Plates overlapped and bolted together. His legs are $2\frac{1}{2}''$ Strips *lock-nutted* to the Plates and bolted tightly to Angle Brackets fixed as shown to the trolley platform. His arms are $2\frac{1}{2}''$ Stepped Curved Strips *lock-nutted* to his body, and they are pivoted on a 2″ Rod passed through the end holes of the beam 7. Spring Clips are used to keep the arms in position on the Rod.

(*Continued on page 588*)

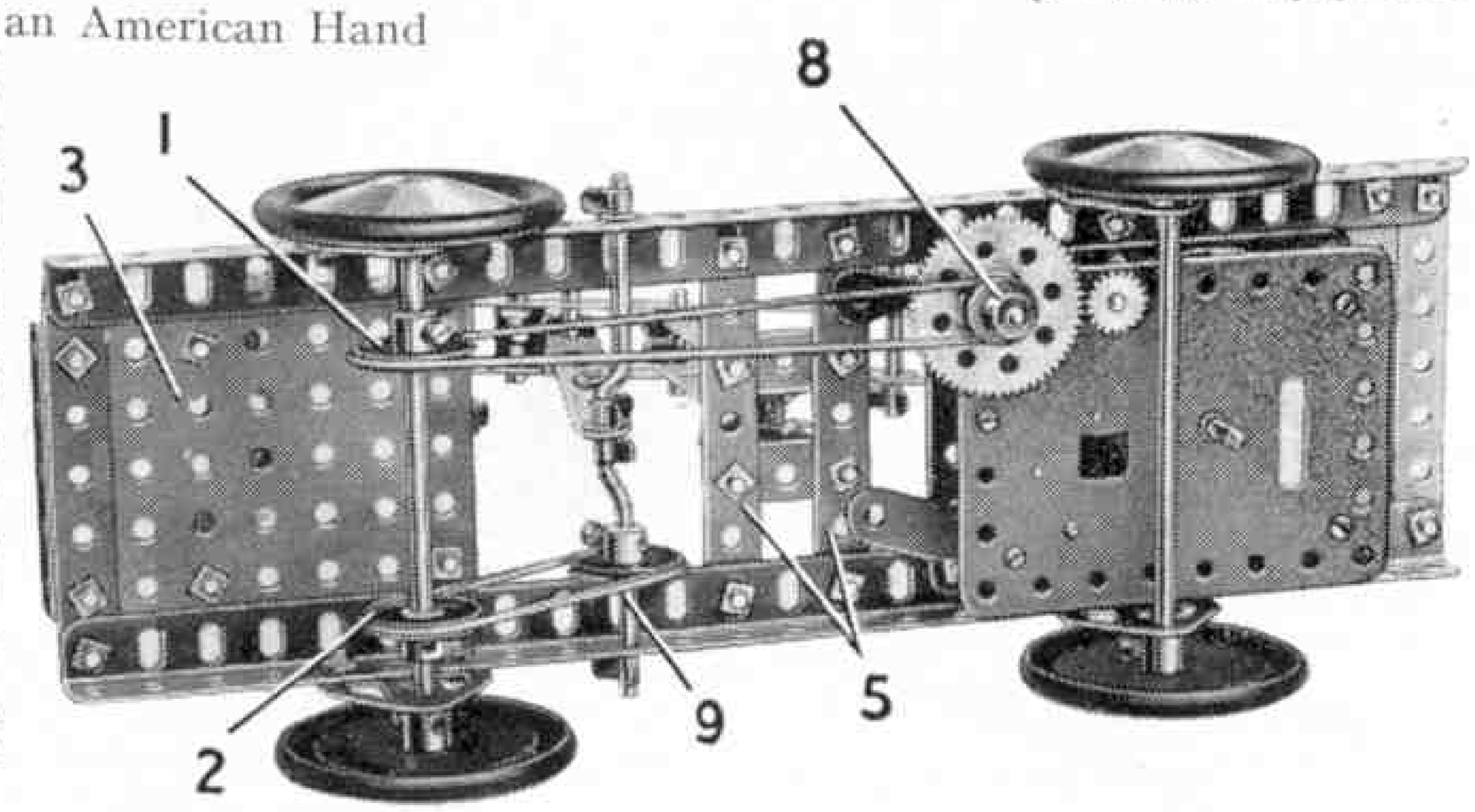


Fig. 4. The Hand Car seen from underneath, showing the drive to the wheels.

Fun with Dinky Builder

By "Spanner"

Old Time Coach—Houseboat

THIS month I am describing two new and simple little models that I hope will please the many thousands of boys and girls who own Dinky Builder Outfits.

The first model is a neat little houseboat of the type often seen moored alongside river banks, and it is shown in Fig. 1. This very simple but attractive little toy was designed by a very young boy who proudly brought it along to our Office some time ago and asked me if I could have it photographed and illustrated in the *Meccano Magazine*. I thought it was an excellent effort for a boy of his age, and I am sure that other Dinky Builder owners will find fun in building it.

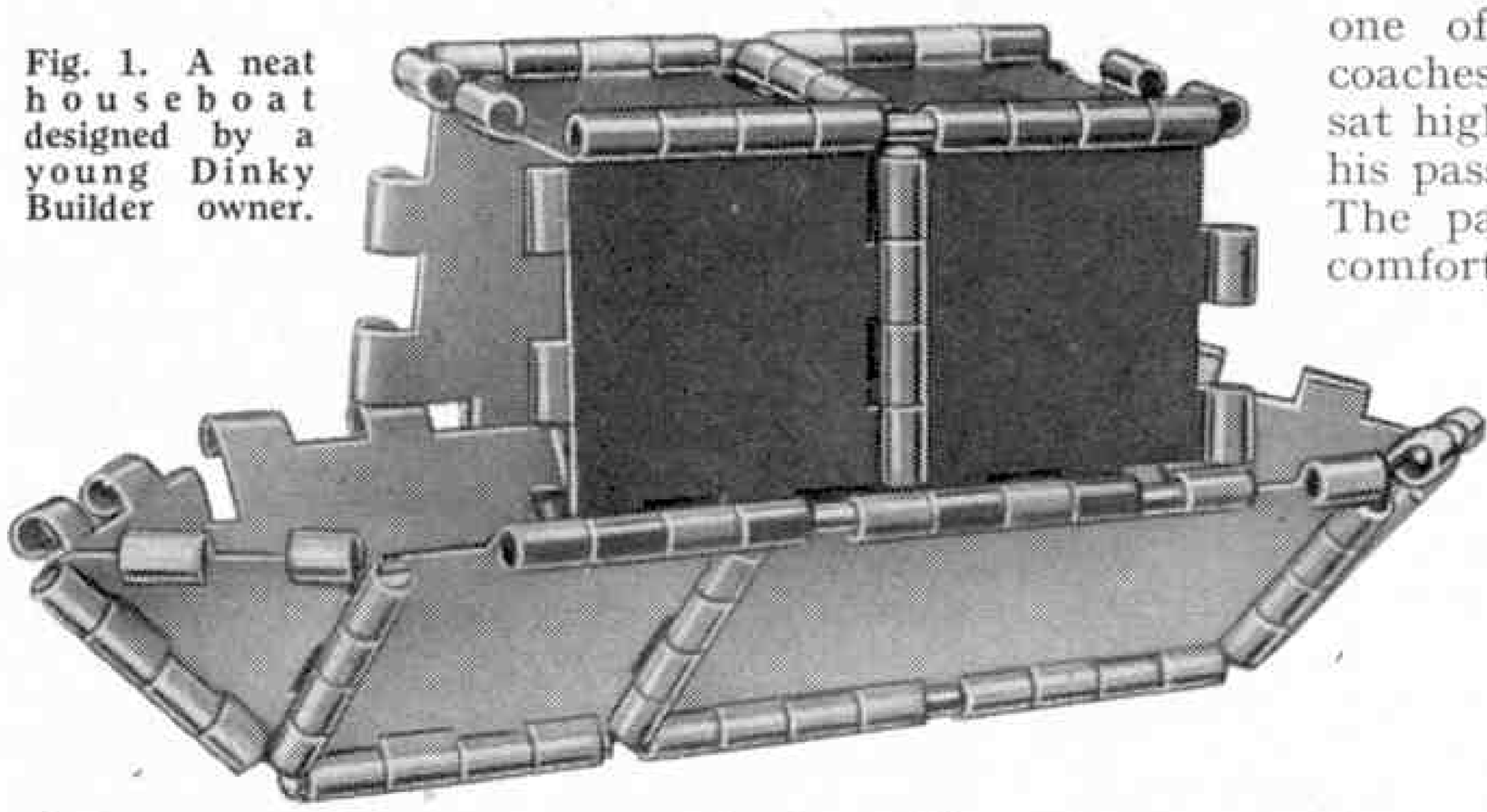


Fig. 1. A neat houseboat designed by a young Dinky Builder owner.

Each side of the hull of the houseboat is made from one Small Square and one Oblong, and each end is formed from two Small Triangles. Six Small Squares are used to form the "house."

The total parts required to build the Houseboat are: 8 of No. 506; 2 of No. 511; 4 of No. 521; 8 of No. 536; 4 of No. 539; 2 of No. 542.

Unfortunately I do not know the present address of the small boy who brought the model to my notice and I hope that if he sees this picture of his model he will write to me, so that I can make some little acknowledgment of his effort.

The second model can be built from the parts in a Dinky Builder Outfit No. 1 and is intended to represent one of the old horse-drawn coaches, in which the driver sat high up at the front, while his passengers travelled inside. The passengers were not too comfortable, I am afraid, for the rough state of the roads at the time these vehicles were in use, and the rather crude springs of these old vehicles, made travelling then anything but a pleasure!

The floor of the coach is a Large Yellow Square, and the front and back each consists of a Large Square. The driver's footboard is an Oblong, and it is supported by 1" Rods inserted in Small Triangles. These Triangles are attached to the upper half of the Square forming the front of the coach, and it should be noted that they are fitted so that the (*Continued on page 588*)

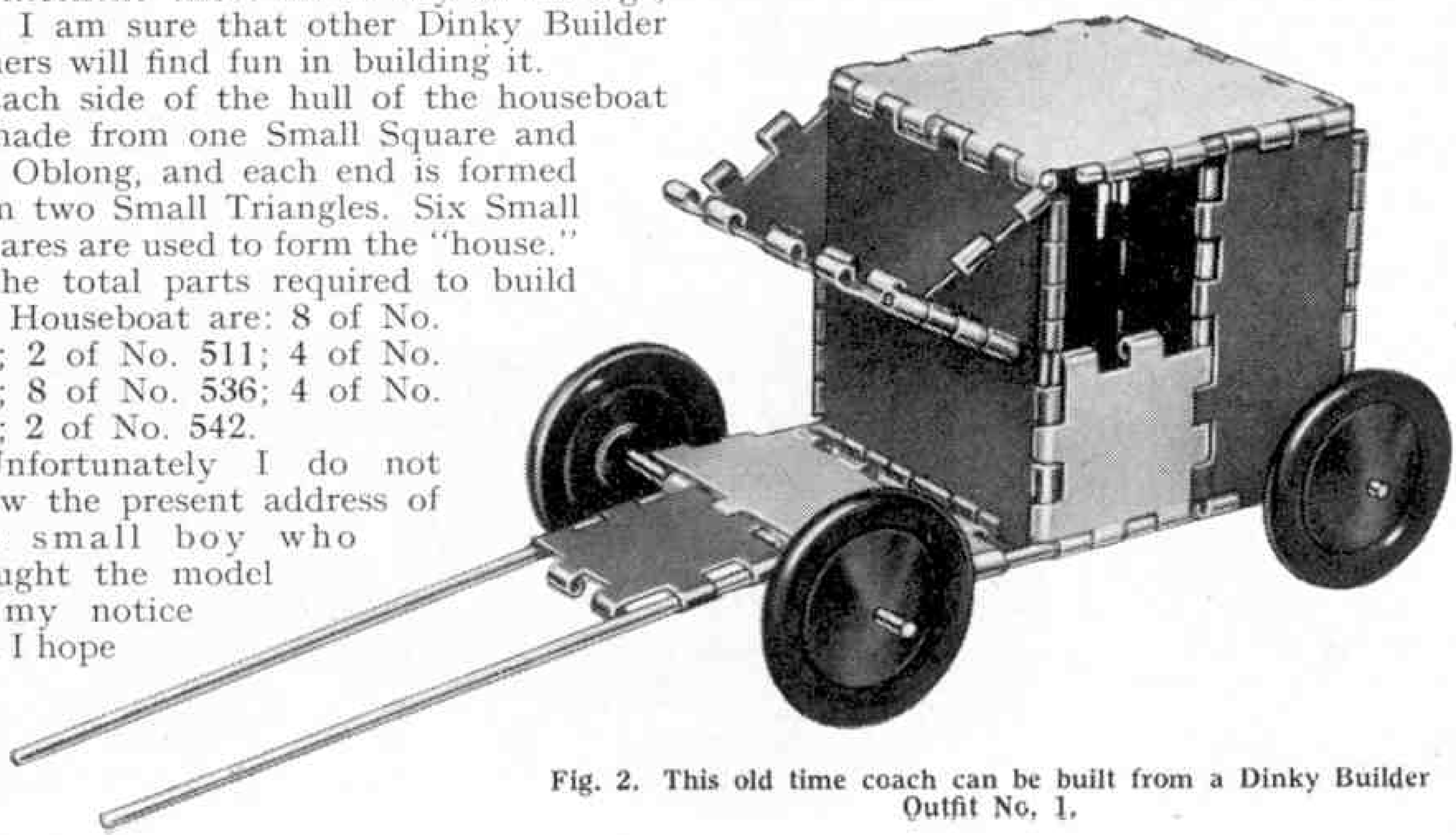


Fig. 2. This old time coach can be built from a Dinky Builder Outfit No. 1.

Club and Branch News

WITH THE SECRETARY

THE VALUE OF EXHIBITIONS

The latest batch of Club and Branch reports to hand includes quite a crop of excellent accounts of highly successful Exhibitions, some details of which are given in the brief summaries on this page. Exhibitions are among the highlights of Club and Branch life, and I am always very pleased to have news of them. They give immense delight to the members concerned, and provide a most enjoyable means of making the splendid work done by Club or Branch better known. The public interest thus aroused is soon reflected in the enrolment of new members, attracted by what they saw at the Exhibition.

So plan your next Exhibition with the double purpose of making your Club or Branch more widely known and appreciated, and of "roping in" many new members.

MECCANO CLUB RECENTLY AFFILIATED

LEADGATE (YORK) M.C.—Mr. J. R. Goodbury, 7 Tees Grove, Leadgate, Consett, Co. Durham.

BRANCH EXHIBITION

A Hobbies Exhibition arranged by the Hindhead and District Branch of the Hornby Railway Company will be held in the Haslemere Hall, Haslemere, Surrey, on the 19th, 20th and 21st November next. It will be open on the first and second day from 2.30 p.m. to 9 p.m., and on the third day, Saturday, from 10 a.m. to 8 p.m. Admission: 1/-.

CLUB NOTES

LEADGATE AND DISTRICT M.C.—A most enjoyable and instructive Visit has been paid to Eden Colliery, where members were shown every branch of the surface installation, including the lamp room, engine houses, and the jigger separators that "weed out" the small coal. Club roll: 7. *Secretary:* J. N. Barron, 4 Garden Place, Leadgate, Co. Durham.

BELGRAVE UNION (LEICESTER) M.C.—The annual Exhibition was an outstanding success and made a net profit of over £36, a record for the Club. The prize-winning Meccano model was a fine mobile breakdown crane, and other good subjects were a diesel locomotive, walking dragline, fretwork machine and a large chairplane roundabout. A novel feature was *Jumbo*, a Meccano elephant that walked, nodded his head, flapped his ears, wagged his tail and blinked his eyes! There were nine "00" gauge layouts and a really large gauge "0" one, and the operations carried out on them were an immense attraction. A Meccanograph did good business at "a penny a time." Another feature that greatly interested the many visitors was a display of photographs recording all the Club's varied activities during the past four years. Club roll: 33. *Secretary:* C. S. Smith, 18 Doncaster Road, Melton Turn, Leicester.

EXETER M.C.—Members are now grouped into two divisions named Nuts and Bolts respectively, with Mr. Hodder, Leader, as "Spanner." Points are awarded at the end of each month, and there is keen but friendly rivalry between the two groups. Club roll: 30. *Secretary:* R. Hawkins, 15 College Road, Exeter.

AUSTRALIA

FREMANTLE AND DISTRICT M.C.—Membership has increased, and enthusiasm is high. Model-building activities have been centred on the construction of models for the Club display at the Royal Show. Club roll: 18. *Secretary:* G. Shea, 12 Ross Street, Palmyra, Western Australia.

NEW ZEALAND

CHRISTCHURCH M.C. — Christchurch South Intermediate School have invited the Club to take part in a Fair. Models being built for this event include a fork-lift truck, electrically-operated Meccanograph, grandfather clock and a railway breakdown crane. *Secretary:* Mr. W. H. Cheeseman, 15 Meadowville Avenue, Spreydon, Christchurch S.W.1, New Zealand.

BRANCH NEWS

MILE END (PORTSMOUTH) — The main activity recently has been an Exhibition arranged in co-operation with the Cowplain Youth Centre and held in their Clubroom. It was very successful, and receipts were well over £7. More Accessories have been bought for the Branch layout, and the model town has been built up, the main addition being a fine factory in which the Controllers are hidden. Interesting lectures have included one on *Old Railway Engines*. The Branch has been honoured by a further visit from an old friend, Mr. G. Broh, who gave an interesting talk on the work of a magistrate. *Secretary:* J. C. Jeffery 52 Elm Grove, Southsea, Hants.

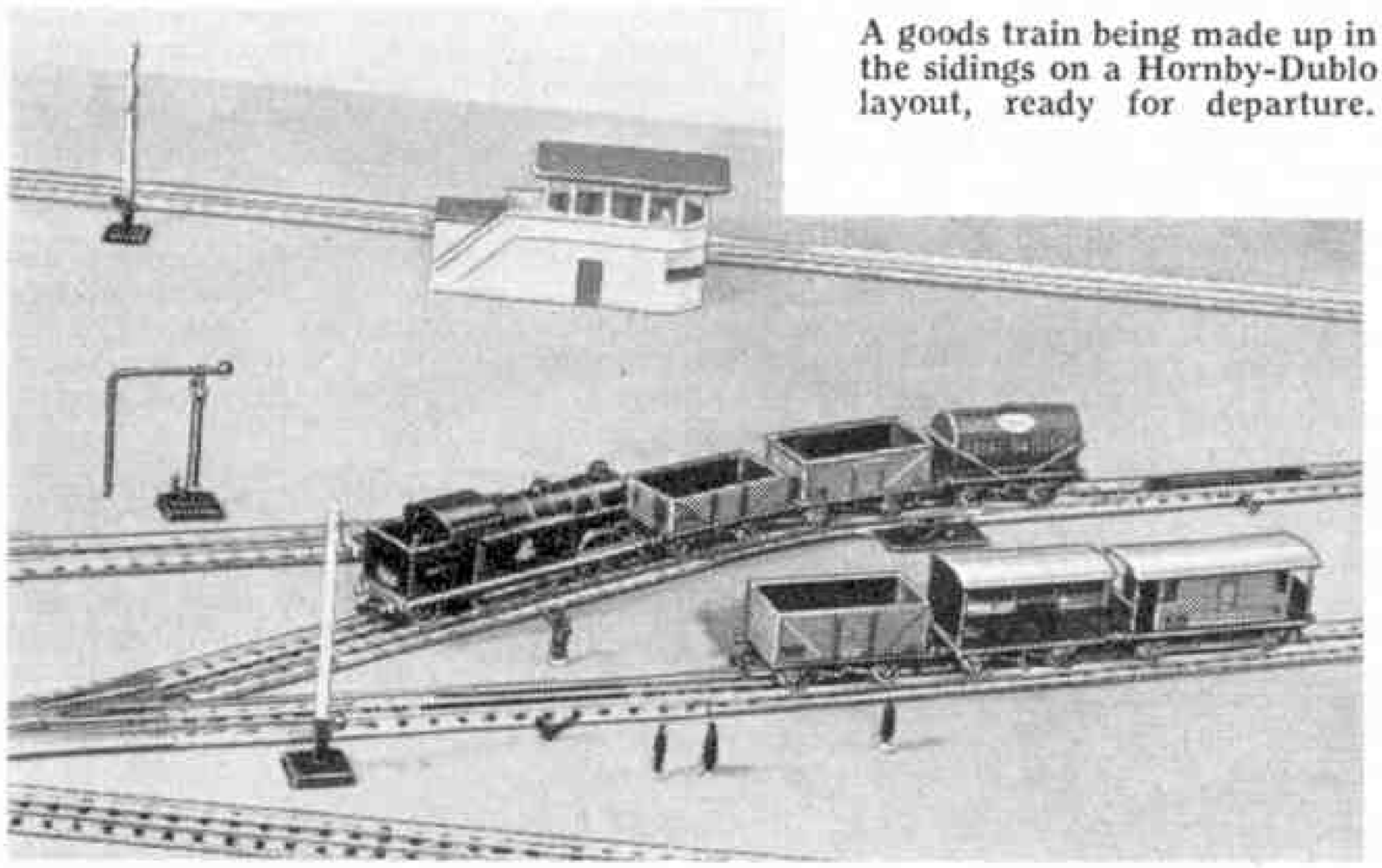
New members of the Exeter M.C., who have entered enthusiastically into the varied activities of this progressive Club, which is run by a Board of Directors elected from the membership. The Cups held by two of the boys are football trophies of the Juventus Club, Exeter, who lent them for display at a recent Exeter M.C. Exhibition.

HORNBY RAILWAY COMPANY

Hornby-Dublo Switch Points in Use

By the Secretary

I EXPECT that most of you will by now have added one or two of the Hornby-Dublo Isolating Switch Points to your equipment. Most Hornby-Dublo owners have, I know, found no difficulty in fitting these into existing layout schemes, because the basic idea of using the Switch Points is simple, and indeed the special advantages they give have increased the interest and the fun of Hornby-Dublo working.



A goods train being made up in the sidings on a Hornby-Dublo layout, ready for departure.

As I explained in my preliminary talk on Switch Points last June, current must be fed to the track at the facing or blade end of the Points, and is then supplied only to the route for which the Points are set. So the position of the Terminal Rail is important.

Now look at the diagram at the foot of the page. As the layout shown on it is continuous we have to see that the current does not feed back round the layout to the trailing end of the Points, for if it did the Switch Points would not carry out their isolating purpose. So an Insulating Tab is placed in the main line, as shown, in order to provide an isolated section between it and the Switch Points.

In practice this means that a train travelling clockwise round the layout will run into this section and be stopped automatically, if the switch rails of the Points are set against it. This might happen when the train has come out of the sidings and the operator has forgotten to restore the Points to their normal position for the straight run. Ordinarily, if he realises this too late the train will be round to the points again and a derailment is likely to follow. With the Switch Points in use, and with the Insulating Tab placed to give a reasonable "over-run" distance, the train will be pulled up in safety. This safety element is one of the advantages of the Isolating Switch Points that does not seem to be fully appreciated, but to secure it a feed-back from the Terminal Rail must be prevented by an Insulating Tab.

In the sidings an additional feeding point to the track becomes necessary so that an engine, having disposed of its train by means of the Uncoupling Rails, can be run into the short length of siding toward the left hand end of the layout. For this purpose an ordinary Isolating Rail is adapted, its two terminals being connected together and to the centre rail terminal of the Terminal Rail. This arrangement is suggested by the solid black markings in the diagram that (Continued on page 588)

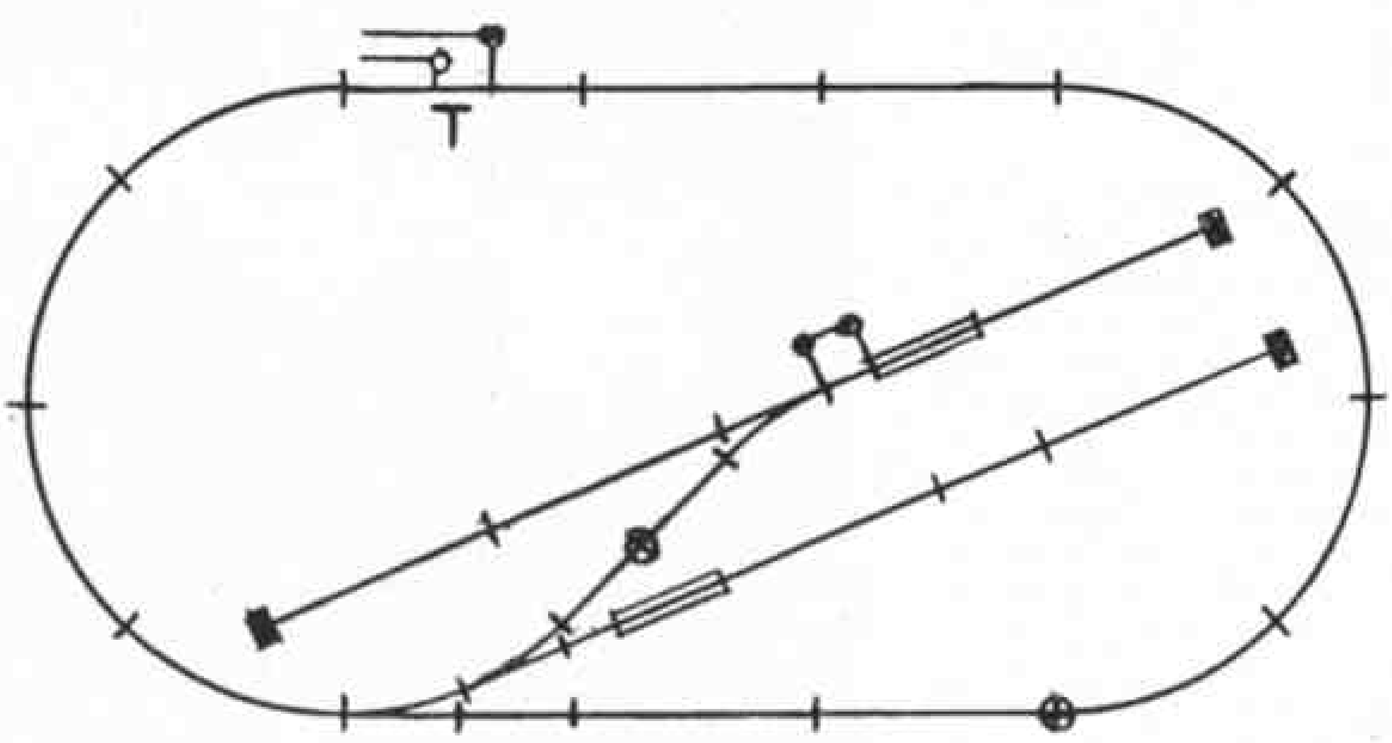


Diagram of the layout referred to on this page.

Variety in Van Trains

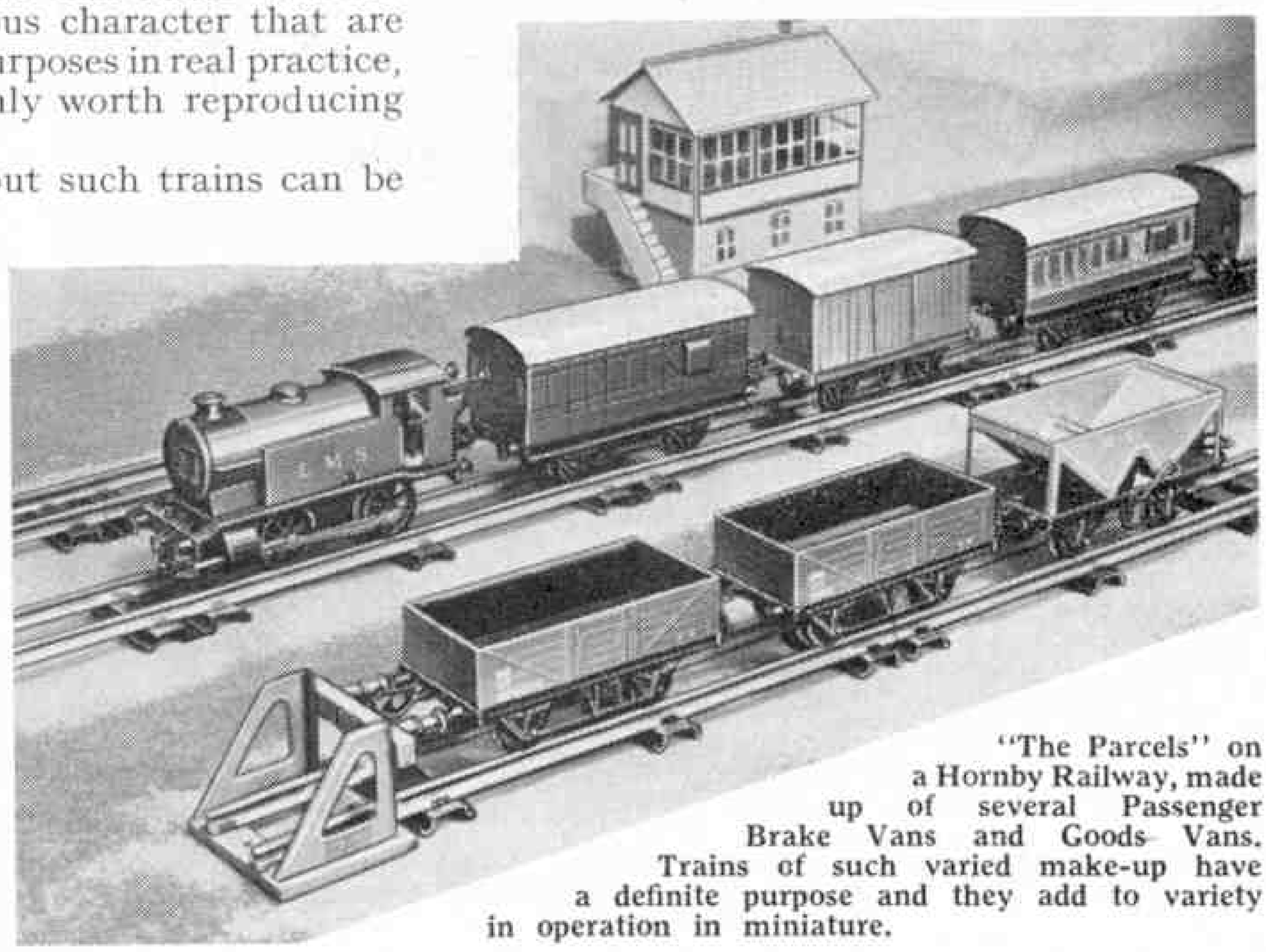
EVEN the youngest Hornby railway owners know the difference between passenger and goods trains. In fact this is one of the earliest things that we learn about trains at all. But in addition to trains that are obviously one or the other, there are some formations that share the characteristics of both type.

We are not thinking of the "mixed" trains, consisting of a passenger coach or two with a few good wagons hooked on behind, that run on some branch lines. Nor do we mean the often weird assemblies of vehicles that the younger enthusiasts sometimes delight in running on their layouts! What we are concerned with are trains of miscellaneous character that are run for a variety of purposes in real practice, and they are certainly worth reproducing in miniature.

On a Hornby layout such trains can be attractive, bringing some variety into operations — and anyway it is always fun to do things that are "a little different!" One thing they do is to give us a chance of rounding up odd vehicles that may have been left here and there on the line as the result of previous operations. Try getting these together, and then using them to represent an empty stock or a milk-and-parcels traffic van train. You will find it really interesting.

Many of the real trains for parcels and milk traffic run regularly and cover quite long journeys. There are local workings of this kind too, especially in the neighbourhood of cities and big towns, so that on many routes *The Parcels* is quite an institution. There are fine subjects for those who are looking for variety. One of them is represented on the Hornby layout in the illustration on this page. The first favourite for trains of this kind is the familiar Hornby Passenger Brake Van, just the thing for representing the coach-built type of van often used for parcels, mail and similar traffic. Then if milk or milk empties form part of the business we need a Hornby Milk Van. With this the enthusiast who likes to play with actual loads can really enjoy himself, for the Milk Cans provided with it can be placed in the Van at one station and taken out again at another, and so on. And the same kind of working can be carried out with the No. 1 Goods Van which, like the Milk Van, has sliding doors, and simply asks for a load.

A recent Meccano introduction can be useful here—Part No. 122, Loaded Sack. This may be rather on the large side, but one or two of them can be used quite well to represent the big canvas sacks used for mails.



"The Parcels" on a Hornby Railway, made up of several Passenger Brake Vans and Goods Vans. Trains of such varied make-up have a definite purpose and they add to variety in operation in miniature.

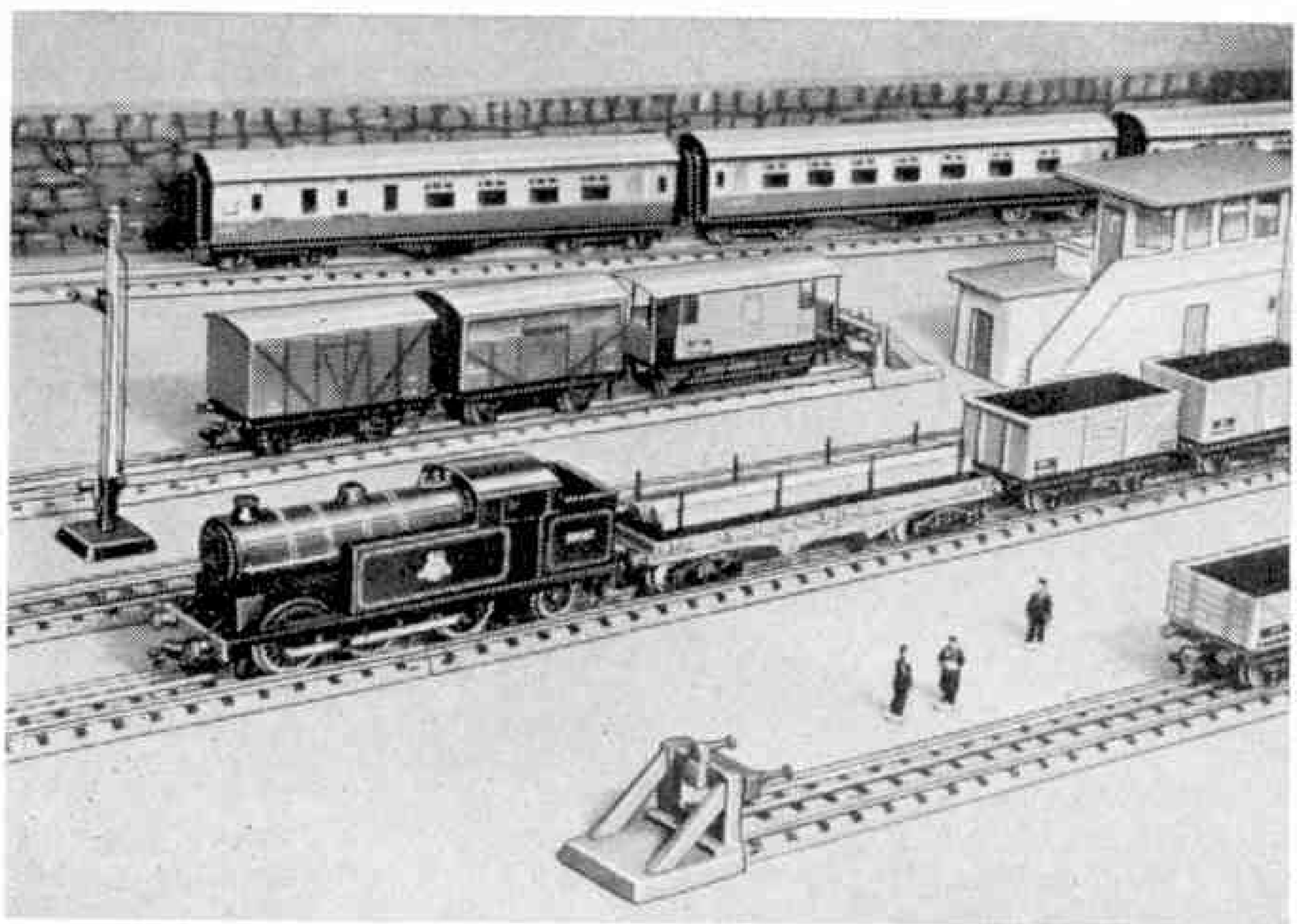
Loading them may be easy, but unloading will probably call for nimble fingers. A piece of wire with a hooked end will be handy for persuading such Sacks or any other item out of the Van on to the platform. If this sort of thing seems to take a long time there is no need to worry. Real trains of this kind often make quite lengthy stops!

A Dinky Toy that is quite useful for schemes of this kind is the B.E.V. Electric Truck (Dinky Toys No. 14A). It is complete with miniature driver, and can be used either on the ground alongside the railway or on the loading platform or "bank" itself.

Seen from the Train!

Lineside Effects on Hornby-Dublo Layouts

NO miniature railway layout really looks well unless the appearance of the lineside is given some attention. A system may be well planned and it may work perfectly, but unless its surroundings look the part it will not appear to be very interesting or attractive. In the matter of lineside scenic effects there is little doubt that the owner of a permanent line has the advantage over the enthusiast who is only able to lay his track down for the period of operation. Still, there is no need for the owner of a portable line to give up hope. There are many ways in which he can improve the appearance of his plain track even without actual scenery.



Up-to-date Hornby Dublo rolling stock appears in this illustration. Particularly notable are the Bogie Bolster and the Mineral Wagons forming the train in the foreground.

Naturally all Hornby-Dublo owners have at least one station, and this usually forms the starting point for the development of lineside effects. If the owner of a portable layout cannot do a great deal in the way of actual scenery he can at least use various buildings and other items in order to provide his line with a suitable atmosphere. Besides, he has the advantage that as he can vary the design of his track within certain limits he can also vary the arrangement of his lineside. In these respects of course the owner of a permanent line is somewhat tied.

In the Hornby-Dublo range there is in addition to the familiar Through Station the corresponding Island Platform which can be used in conjunction with it, or on its own where the layout requirements call for this. Where the two types of station are used together the realistic and popular Footbridge is invariably employed to connect the two platforms. Another item that is usually associated with these is the Signal Cabin, and even a fairly simple layout that has these four items is not badly equipped.

Much in the way of providing lineside effects can be done by means of home construction. Simpler items such as fencing, walls and so on will be found easy subjects to start with. It is surprising what a difference a little fencing or some walls makes to the layout. The boundaries of the railway itself should be clearly defined and a much neater appearance will result when this is done. Most miniature railwaymen will not find it difficult to draw, cut out and stick together the main components of a few simple buildings and to colour them effectively. Thin wood or card can be used for construction material, and if properly made items of this kind will stand quite a lot of handling and will last a fair time.

The owner of a non-permanent railway may not be able to fix his various buildings down, but if each one is arranged as a separate unit on its own base or otherwise, according to its type and size, then the handling of these need cause no more trouble than the ordinary standard accessories.

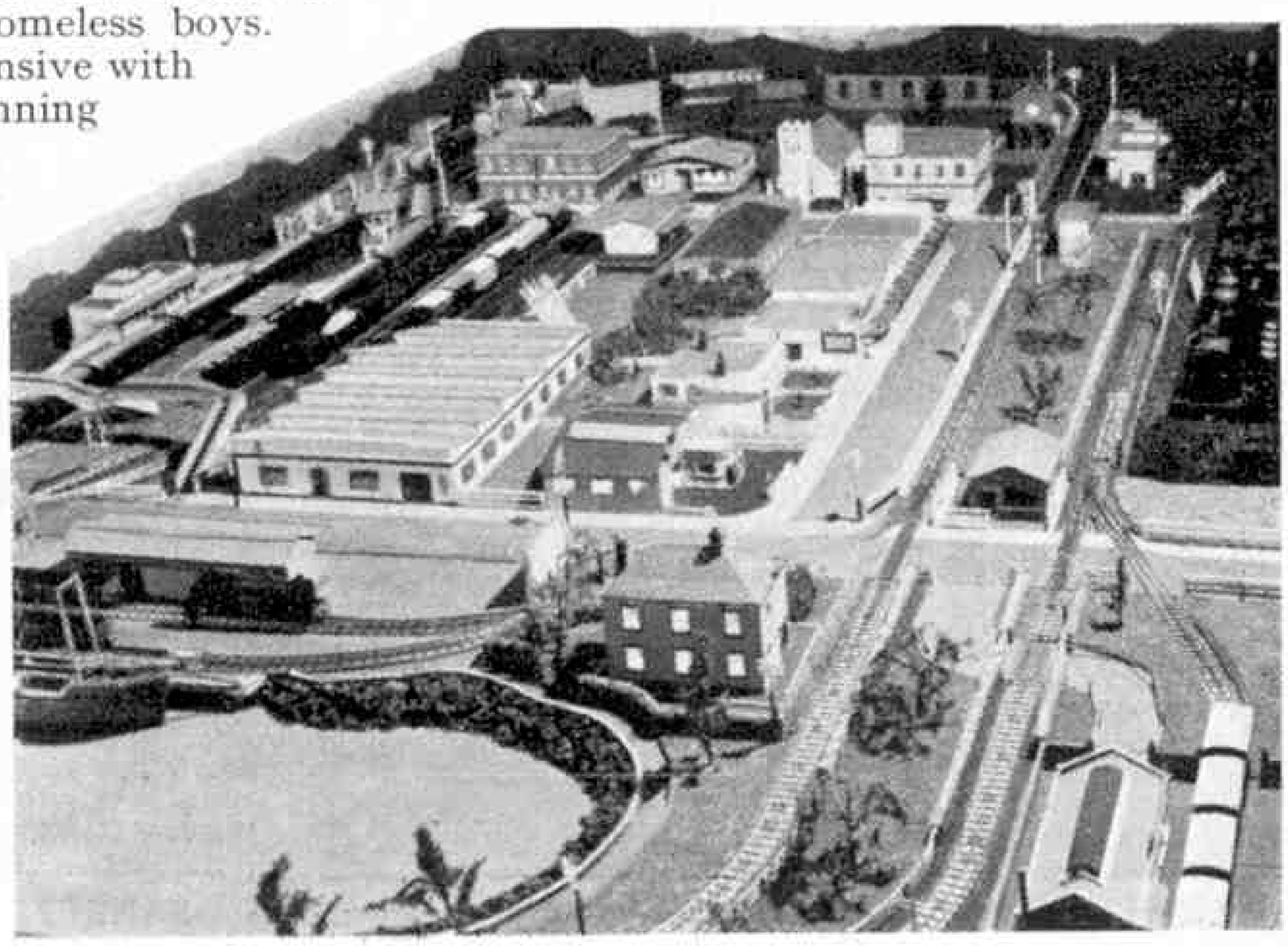
On temporary or permanent layouts very good use can be made of the constructional sets of various kinds, such as the Bayko Outfits that have been recommended in

Part of the Hornby-Dublo layout built up by the boys of St. John's Hostel, Cape Town, South Africa, under the supervision of Mr. A. W. McCay. Photograph by Mr. de Kock Fowler.

the *M.M.* for Dinky Toys layouts by *The Toyman*. Alternatively, there are numerous card cut-out models to be found nowadays and in many cases their scale is suitable for Hornby-Dublo purposes. A splendid instance of the use of such cut-outs is shown in the upper photograph on this page which shows part of the Hornby-Dublo layout set up by the boys of St. John's Hostel, Cape Town, South Africa. It is pleasing to know that the use of Hornby-Dublo equipment and the constructional work associated with the development of a layout have been considered as one of the means of making the Hostel as nearly like home as possible by the responsible authorities, for the Hostel is run for the benefit of homeless boys.

The layout itself is extensive with facilities for continuous running on three combined oval main lines. In addition there is a main terminal station with sidings, locomotive shed and goods facilities. A short loop serving a suburban station forms an alternative route connecting two of the ovals and also provides a means for returning trains to the terminus from which they have originally departed. As can be seen from the illustration, lineside effects are a feature and in the foreground of our picture is the representation of Kruger National Park with a lake and other effects.

A rather more urban style of a layout with various industrial features appears in the picture below, which shows part of a remarkable system developed by Mr. W. Jackson, of Cobden (Greymouth) New Zealand. This occupies a baseboard of 11 ft. by 6 ft. The miniature town has its shipping wharfs, its commercial and shopping areas, each of these being served by the railway. A special feature of the line is its signalling system. Operations are carried out completely by remote control from an operating panel. The marshalling and despatch of trains, shunting and many other typical railway operations can also be carried out. The town includes some 17 separate buildings, many of them hand made, and all electrically lit. Hornby-Dublo Stations and railway premises of all kinds complete the layout.



Part of the comprehensive layout developed by Mr. W. Jackson, Greymouth, New Zealand.

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For other Stamp Advertisements see also pages 586 and xx.

Stamp Collectors' Corner

By F. E. Metcalfe

THE BLACK REPUBLIC

FASHIONS come and go, in stamps as well as anything else, but if in the whole realm of philately there is one popular cult that continues, it is that of Liberian stamps among younger collectors. One has only to look at the catalogue, and see what marvellous stamps this country has issued, to see why this is so.

When I say that the stamps of the Black Republic interest junior collectors, I do not mean to infer that full-fledged philatelists are not interested in Liberian issues. Far from it! Some of the early stamps are highly prized indeed, particularly in the U.S.A., but it is their philatelic attributes that appeal, and not only are most of them expensive, but as far as appearance is concerned they are pretty dull to boot. So we'll not worry ourselves much about these, when the later issues are so attractive and cheap. I'll have a word to say about the why and wherefore of this cheapness, and a word of warning to utter, in connection with it, later on. But let us take a look at Liberia itself before we discuss its many issues.

As most people know, Liberia is a republic lying on the western seaboard of Africa. The name means Country of Freedom, and the name of the capital, Monrovia, is a derivation of the surname of President Monroe of the U.S.A. Early negro settlers from America—descendants of course of African slaves, who were mostly taken there in British ships in the first instance—sailed as long ago as February 1820 to make a landfall at Sherbro Island, to the north of what is now Liberia. A second contingent sailed a year later. Contacting the survivors of the first emigrants, they moved down the African coast, and at the beginning of 1822 landed on an island at the mouth of River Mesurado.

Later they attempted to settle on the mainland. They had a lot of trouble with the natives, but after a pitched battle between the forces, in December of the same year, a peace treaty was eventually signed. Other contingents arrived in due course, and in 1839 they united to form the Commonwealth of Liberia. Be it admitted that for many years after that very little progress was made. More has been done these last few years, and this progress is due to outside influence.

After the first World War I went ashore from a ship I was travelling in that lay out off Monrovia, and found that about all there was to buy was a set of stamps at the Post Office. I should mention, however, before going on, that while the Commonwealth was formed in 1839, the Republic of Liberia was not formed until 26th July 1847. All these happenings

have been depicted on postage stamps, which makes it necessary to touch on them here. The constitution was formed on that of the U.S.A., which had provided the wherewithal to finance the expeditions, and for a long time after the Republic had been formed, there was little or no intercourse between those who had come from America and the natives, who moved back to the hinterland.

American capital has been responsible for later improvements both in the country itself and in the harbour of Monrovia. Large tracts of land were planted with rubber trees, etc., and between twenty and thirty thousand people are employed on these plantations. In return for this help from the U.S.A., Liberia granted air bases, which some day may play a great part in winning more freedom for mankind.

All will admit that Liberia has had a very interesting history, but it is not the political aspect that interests the average junior collector, or indeed most of the seniors, but all those wonderful wild animals that abound in Liberia and have been so extensively depicted on many of her stamps.

The older collectors will remember how proud they were to get their first "three cornered." Even after all these years, they are still only worth coppers. And here I come to the point on the warning I told you about earlier on. No country has issued more colourful and interesting stamps than Liberia, and just from this point of view they are to be recommended for the fun they will provide. But the investment side must be left out entirely, for it has been the custom of Liberia, when replacing one set by another, to cancel the stamps remaining of the displaced set and sell them for an old song.

This means that if you have been so impatient that you have bought a set during its currency, bang will go most of what you paid. But if you will wait, for a few shillings you'll get triangulars, stamps with birds and beasts, etc., etc., in all a really grand lot; but again that warning. Ignore what the catalogue says about their value, for just as you will be able to buy well below catalogue valuations, so you will only get very little if and when you want to sell.

Gibbons list about 800 Liberian stamps, so there is neither room to pick out for mention many of the particular issues, nor any purpose in it. But pick where you will and you cannot go wrong. A set that I rather like was issued in 1918, and somewhere among my philatelic possessions is a set that I bought in Monrovia on the visit I have referred to. Another very interesting set appeared in 1936, to commemorate

(Continued on page 588)

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25 EGYPT	**1/3**
100 B. Cols.	**2/–**
200 B. Cols.	**4/6**
500 All diff.	**4/9**
50 RUSSIA	**2/3**
25 PERSIA	**1/6**
100 F. Cols.	**2/6**
25 Vatican	**3/–**
1000 All diff.	**10/–**

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FREE GIFT OF STAMPS

to every applicant for approval books. The GIFT contains 30 British Colonials including 8 K.G. VI mint—no Great Britain. Good discount is given and a list of 98 Gifts is sent. These can be chosen by you and vary in value according to the money sent for purchases. They include K.G. VI Silver Jubilees; ALL the Colonial Victory sets mint; and Foreign stamps. 3d. postage please.

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For other Stamp Advertisements see also pages 584 and xx.

Stamp Gossip

SHADES AND THEIR MEANING

ODD shades often intrigue a young collector. Now this is a class of variety that is generally considered much more important than slight flaws, for if genuine—and that is the important point—it will denote a separate printing. But it is the easiest thing in the world to change the shade of a stamp. Strong sunlight will in a very short time alter some purple stamps to blue, and most dealers can tell of funny happenings to the colours of some stamps they have exposed to light in their shop windows.

Some collectors will be asking how are they to know that shades which are in the catalogue are not changelings? Simply by the fact that as far as modern colonial stamps are concerned—I am not going to vouch for the old stamps, which were issued before most of us bothered about stamps—unless the particular printing to which a shade belongs is known it is not listed, as far as the Commonwealth Catalogue is concerned. If this work is examined it will be noted that practically all shades have their dates of issue given.

CAPE TRIANGULARS

While for many good reasons KG VI stamps are the most popular of the Commonwealth stamps, we all have a warm spot for such classics as the triangular "Capes," and if they were not so expensive many more would go in for them than do. They have provided enjoyment for thousands, and now they enter the class of antiques, for they first appeared on 1st September 1853. The South African Government has naturally honoured the great occasion by issuing two stamps, one of 1d. face value and the other of 4d. As can be seen from the illustration a facsimile of a "Cape" is incorporated in the design. If we cannot afford one of the old classics, we can surely have a pair of the new!

OLD MANILLA

Nigeria provided us on 1st September with a new set of stamps that is really chock-a-block with interest. Alas, it goes up to £1, but never mind, if you can afford a set up to 1/–, which will only cost a fraction over 3/–, you will get stamps with designs worth all the study you care to give them. The 6d. value shows a head that is called an Ife Bronze, and here is what the Crown Agents have to say about it. "The bronze heads of Ife are Nigeria's greatest art treasure. They were discovered early in the century, and little is yet known about them or their age or origin. Technically and artistically they are in the front rank, and an exhibition of them in the British Museum in 1948 aroused world interest. That depicted in the design is known as *Olokun* and is one of the most famous heads extant. It is not known what the head-dress and crest signify."

Another intriguing stamp is the ½d. value. Those bracelets—manilla means that in Portuguese—are really a form of cash, and they date back 400 years. The smaller bracelets were actually in use as late as 1949, though as long ago as 1919 their use was prohibited to all except natives. Apparently four years ago the Government bought them up . . . thirty million of them. There are plenty of exciting stamps in this set. It looks like being a winner.

CHEWING GUM COUNTRY

Yes, it is British Honduras where chewing gum comes from, or at least chicle, from which it is made. While none of the trees from which the gum is abstracted is illustrated, all kinds of interesting animals and plants are depicted on the stamps of the new set. One very beautiful stamp is described as Blue Butterfly. Would you like the real name? *Morpho peleides, peleides.* What a name for such a beautiful creature. Something not so beautiful is shown on the 1 dol. value—an armadillo. Rather horrid to look at, but oh so very good to eat. The writer remembers catching one down in Patagonia once. And the host would roast it. Very timidly the first mouthful was swallowed. Rather like young pork, it went down very easily after that.

This new British Honduras set, which goes up to 5 dollars, was issued on 1st September, and like that of Nigeria has several designs full of interest. Don't strain your pocket; be satisfied with a short set, if that is all you can really afford. A set up to only 5c. even is worth having.

QUERIES

From the number of queries that come in at this time of the year it is clear that stamp collecting is more than holding its own, but although these queries seem to be many, they all boil down to a dozen subjects or so. Consequently next month I am going to ask the Editor to let me devote a page to the points that seem to worry so many. Thus quite a few will be saved the trouble of writing a letter, and the expense of a postage stamp. Next month if you are in doubt about something, or if you are thinking of taking up collecting for the first time, just see if your problem is dealt with.

TIPS

One or two readers have written to say how they like a tip. Well here are one or two KG VI stamps that you should make sure of having: Grenada 12c., Nyasaland 2d. and 2/–, and—dare I mention it?—the St. Kitts £1.

Let's Get Helicopter-Minded—(*Cont. from page 546*)

Bristol 173.

There seems little doubt that in time the Rotodyne could give Britain world leadership in rotating wing flight. Unfortunately, this is hardly possible with one prototype, and it is to be hoped that the prototype order will be followed quickly by production contracts, especially as it would not be difficult to find military uses for such an aircraft, which can carry vehicles or freight as well as passengers.

Meanwhile, the British Services and airlines ought to be showing more interest in the excellent little two-seat Saro Skeeter training helicopter, the four-seat Sycamore and the 13-seat Bristol 173 which, although more orthodox in concept than the Rotodyne, are second-to-none in their class in the world.

Only by getting large numbers of helicopters into service quickly can our Navy, Army, Air Force and airlines gain that experience in rotating wing flight that they will need in the years ahead. And only by ordering British helicopters can they ensure that our industry will always be able to give them the best helicopters in the world, in sufficient numbers, when they are needed.

How we shall Reach the Moon—(*Cont. from p. 562*)

it around the Moon. This would take place about half an hour after the motors started firing. Then they would be stopped and the vehicles would coast out to the Moon, taking several days to cross the 238,000 miles of space. After circling the Moon and making close observations of the surface, especially of the "back" of the Moon, which has always been hidden from observers on Earth, the space ship would travel back into the Earth orbit. A landing rocket would have to be sent up from Earth to bring back the crew, while the space ship itself would be left circling in its orbit waiting to be refuelled for another voyage. The next time it would probably carry a landing rocket by means of which the space travellers could land on the surface of the Moon.

Fascinating though these projects may sound, we shall have to wait some considerable time before they become reality. For many years scientists will have to experiment with high altitude rockets and with instrumented Earth satellite vehicles. At the same time, rocket propelled aircraft, like those being used experimentally in the United States at the moment, will have to climb higher and higher testing man's reactions at the frontiers to space. Finally they will carry man into the vacuum beyond the atmosphere, ready to start his greatest adventure—space flight.

New Zealand's Glow-Worm Caves—(*C. from p. 566*)

and 12 ft. long. But as Aranui specialises in the more dainty effects we will examine some of these more closely. The delicate tracery of the walls and ceilings of the numerous corridors, and such charming groups as the Bride's Jewels, and the enchanting Crystal Palace set, are most notable.

Our thanks are due to a surveyor, named Fred Mace, for his explorations of Waitomo in 1887, which resulted in the cave of that name being made available to the public. He and his companion, a Maori named Tane Tinorau, made their hazardous way into this gloomy and mysterious underworld by means of the underground stream, on a frail raft made from "*korari*," the dried flower-stalks of the native flax plant. The flickering light cast by their tallow candles made huge, grotesque shadows among the fantastic linestome formations, to the terror of Tane Tinorau who believed that fierce demons inhabited places of this sort.

THIS MONTH'S COVER

Our cover this month shows one of the Bristol Sycamore helicopters in service with British European Airways, and is based on a photograph kindly supplied by the Bristol Aeroplane Company Limited.

Fun with Dinky Builder—(*Continued from page 578*)

hinges face *outward*.

The shafts are fitted in a Small Square that pivots on a 3½" Rod inserted in an Oblong. This Oblong is slipped over two 2¼" Rods, and the free portions of these Rods are then pushed into the lower edges of the main body of the coach.

The following Dinky Builder Parts are required to build the Old Time Coach: 4 of No. 501; 3 of No. 506; 4 of No. 511; 2 of No. 521; 4 of No. 526; 2 of No. 536; 12 of No. 539; 2 of No. 542; 2 of No. 545.

New Meccano Models—(*Continued from page 577*)

The head is a 1" loose Pulley fastened by a ⅜" Bolt to a Fishplate, but spaced from it by three Washers. The Fishplate is attached to a 1" Triangular Plate bolted to the body.

A ½" Pinion on the Motor driving shaft engages a 57-tooth Gear on a 2" Rod supported in the Motor side-plates. The Rod is held in position by a Collar, and it carries a ½" fixed Pulley 8. The Pulley 8 is connected by a 10" Driving Band to the 1" Pulley 1.

The Pulley 2 is connected by a 6" Driving Band to a 1" Pulley on a Crankshaft 9. The Crankshaft is mounted in the 12½" Angle Girders, and it is fitted with a built-up strip made from two 2½" Strips overlapped two holes. The strip is located on the Crankshaft between two Spring Clips, and at its upper end it is pivoted on a 1" Rod held by Spring Clips in the beam 7.

Hornby-Dublo Switch Points in Use—(*C. from p. 580*)

represent the terminals concerned.

With Switch Points this simple layout can be used for two trains without a single Isolating Switch being necessary, the current being supplied to or cut off from the sections concerned merely by movement of the Points. The isolated section in the main line can accommodate one train while another is being put together in the sidings. When the latter is ready it waits clear of the inner Switch Points. The train from the main line can then be put into the first siding and it is isolated as soon as the Points are set for the curve. Once this has been done, the train just made ready can be brought out on to the main line.

Stamp Collecting—(*Continued from page 585*)

the first air mail service. There were six values and all are triangles. A set can be bought for about a shilling and that is a typical price for many of the issues.

Another grand air set appeared in 1938. For some time it looked as though this would keep up its price, but latterly it has gone the way of the rest. Awkward for those who paid a fancy price, but very nice for the junior with more enthusiasm than cash! After all, why shouldn't there be stamps for those who cannot afford to spend a lot on them?

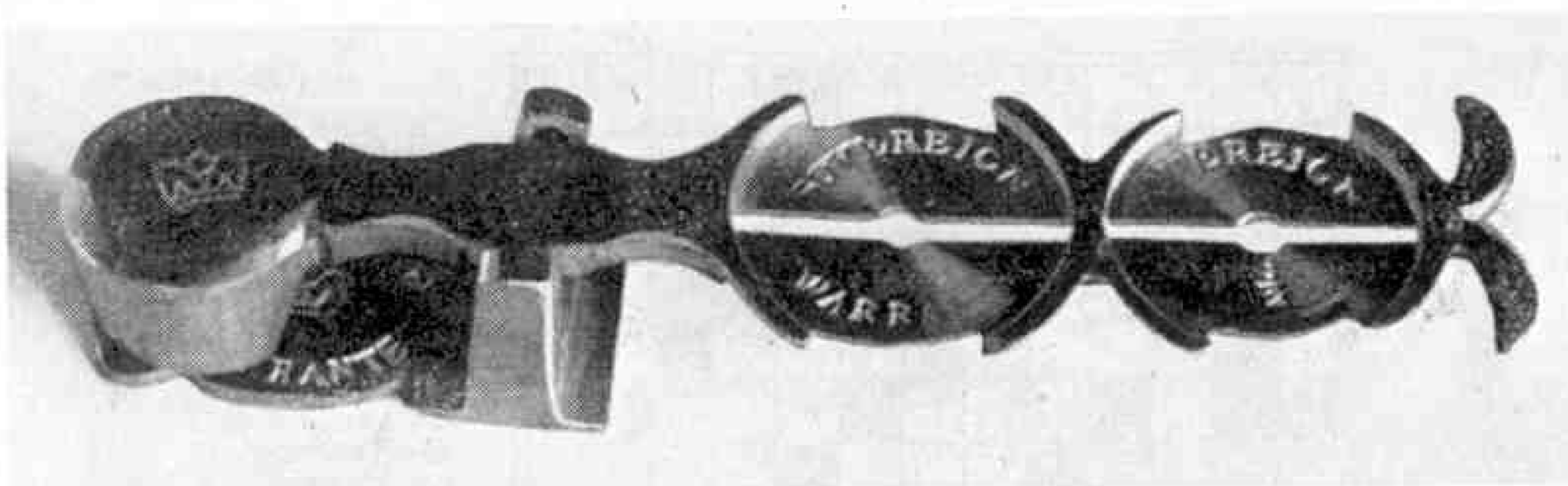
Most of the used stamps on offer are those cancelled to order. The pukka philatelist will have none of these. But most of the modern issues of the smaller colonies are in a sense, postmarked to order, so don't be put off. Collect Liberia, but don't pay fancy catalogue prices, and have a jolly good time with all the wonderful animals prowling about in the designs.

NELSON'S LAMPS

Readers will remember that in last month's issue one of the Nelson Lamps in Trafalgar Square was illustrated, and there was also a short note dealing with this relic. It now transpires that the lamps are not originals from the *Victory*, but are replicas designed by Charles Barry about 1844. This came to light last year, and various books on London of course still contain the version of the origin of the lamps that was given in last month's *M.M.*

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.



Few readers have seen a sovereign balance of the kind shown here. Photograph by F. Watson, Burnley.

A SOVEREIGN TESTER

Prior to the 1914–1918 war, gold coins were in general use in the British Isles, but the coming of the war forced this country to abandon the use of the metal for coinage. The gold coins in existence were withdrawn from circulation and notes issued by the Treasury were used in their place. Children of today will not remember the sovereign and the half-sovereign, although specimens can be seen in museums and some elderly people retained one or two as reminders of "the good old days."

All our coins are made to an exact size and weight. For example, the halfpenny is one inch in diameter and five halfpennies weigh one ounce. The sovereign was no exception, and the small balance illustrated was designed to assist shopkeepers in detecting spurious coins. The box in which it was supplied bore the following reading:

"To Weigh and Gauge Sovereigns and Half Sovereigns. Being made so that no counterfeit can possibly go through the gauges and be of sufficient weight to turn the balance."

F. Watson (Burnley).

A FINE ITALIAN SAILING SHIP

In support of its policy of providing sail training for its cadets, the Italian Navy had two training ships built, one in 1928 and the other three years later. The second ship, the *Amerigo Vespucci* of 3,543 tons gross, is still in service and was a visitor at the Coronation Naval Review.

The ship was built at Castellammare, on the Bay of Naples. She measures 330 feet from stern to tip of the bowsprit, and has a sail area of 22,600 square feet. In contrast to the old seafaring days, when a seaman could tell each rope at a glance, the "marineros" are provided with brass plates on bulwarks and pin rails of the ship to indicate the purpose of each rope. The hull, masts and yards are of steel construction, and accommodation is arranged for 550 cadets and midshipmen.

Training for engineers who desire to enter the submarine service is carried out with the ship's propelling machinery, which consists of two Fiat diesel motors of 1,900 h.p., with electric drive to a single screw shaft.

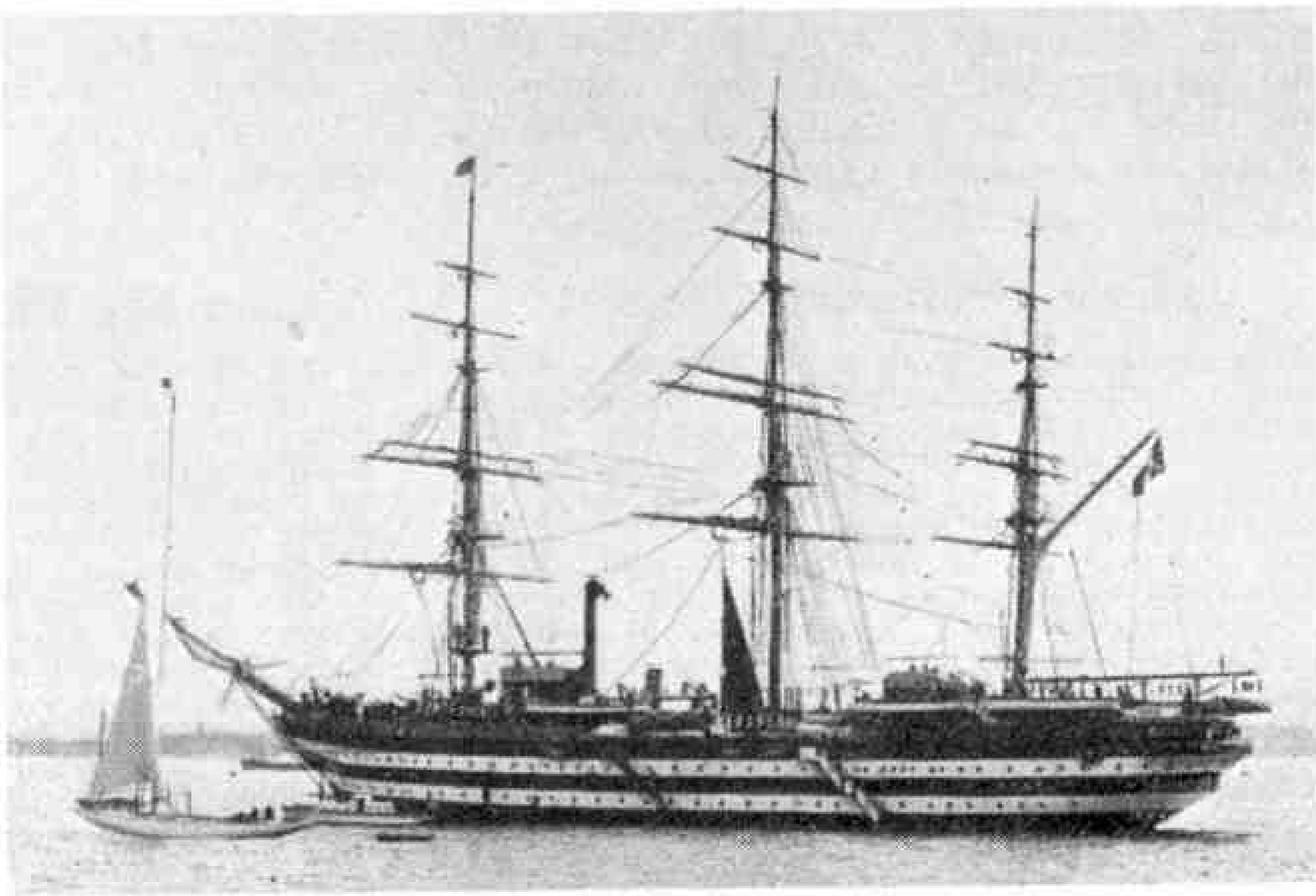
The ship is also equipped with all the latest navigational aids for the training of deck officers, and these provide a striking contrast with the lofty masts and yards.

Each year training cruises take the ship across the Atlantic to America, and sometimes north to the Scandinavian countries.

At the Review by Her Majesty the Queen the *Amerigo Vespucci* provided an interesting sight when her cadets manned ship in the old naval tradition, by standing shoulder to shoulder on the yards.

The first of the two training ships provided for the Italian Navy was the *Cristoforo Colombo*, also built at Castellammare. Like the one shown in our illustration, she had broad white bands on a black hull, so that in general appearance she resembled the larger ships of the time of Nelson, the most romantic period in the world's naval history.

H. A. Breton (Keynsham, Bristol).

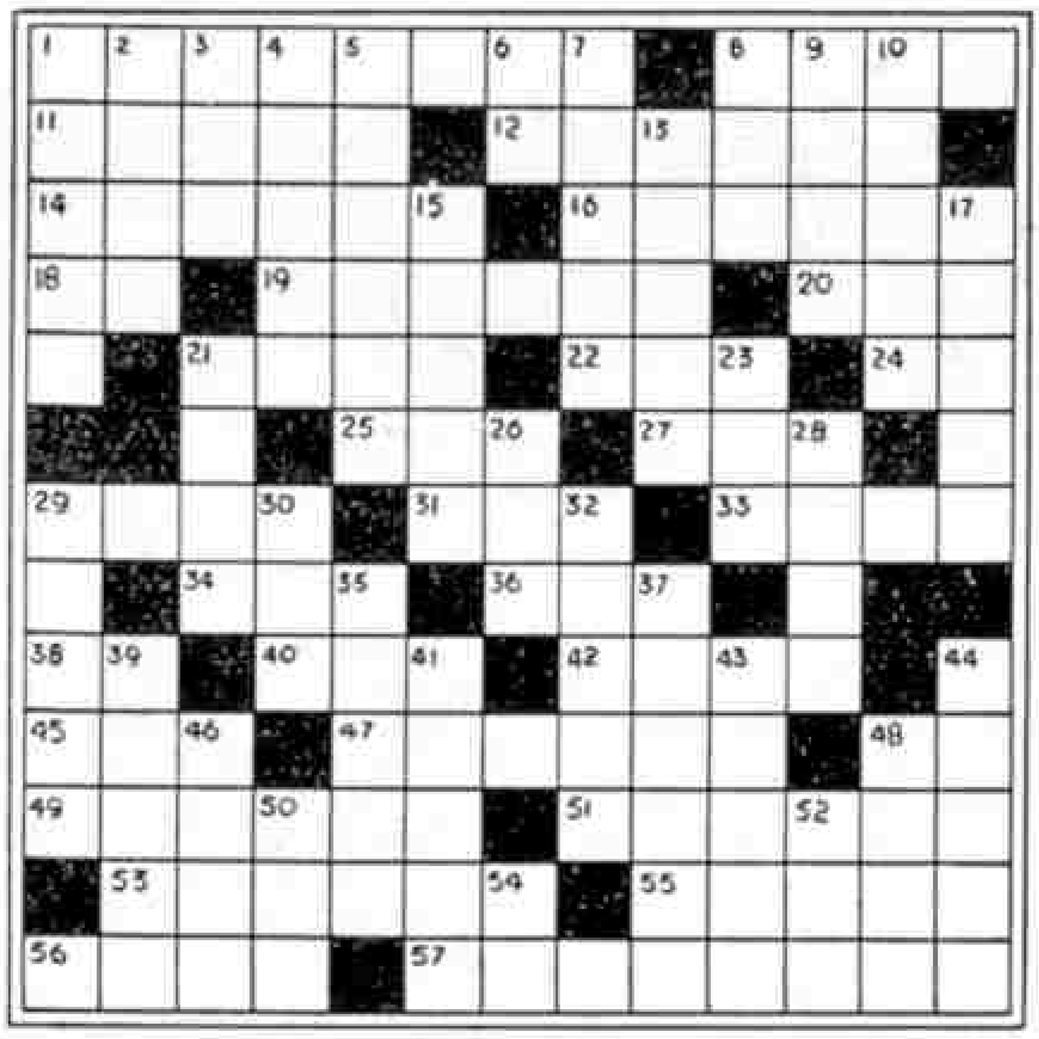


The Italian naval training ship "Amerigo Vespucci," which figured in the Coronation Naval Review. Photograph by H. A. Breton, Keynsham, Bristol.

Competitions! Open To All Readers

Prize-winning entries in M.M. competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.

An Interesting Crossword Puzzle



CLUES ACROSS

1. A renegade
8. Heave
11. French river
12. Science of light
14. Salty
16. No Mum or Dad
18. Indefinite article
19. Public walk
20. The self
21. Valley
22. Finish
24. Exclamation
25. Trinity College Dublin (abb.)
27. Strike gently
29. Cart
31. Small wooden vessel
33. Even result
34. Sleep on it
36. Besides
38. Definitely not
40. Commercial vehicle
42. Skinny
45. Postal authority
47. Gloomy frame of mind
48. Proceed
49. Fungus
51. A cry
53. Acid
55. Believes in God
56. Female birds
57. Seeks advice

CLUES DOWN

1. Endeavour
2. Heraldic fur
3. Lubricant
4. Bird
5. Occupant
6. Preposition
7. Poem
8. A fruit
9. Pain
10. Custom
13. Tendency
15. Upright
17. Not at all
21. Dingy colour
23. Father
26. Confer knighthood
28. Part of grain
29. Wild dog
30. Verily
32. Underground buds
35. Hesitate
37. Tithes
39. Suppose
41. Funny
43. Farewell
44. Used with nuts
46. Norse God
48. A tale of adventure
50. Belonging to
52. Village (abb.)
54. Commanding Officer (abb.)

Here is another of our popular crossword puzzles. There are no traps in the clues, or alternative solutions, and every word used, apart from names, can be found in a standard dictionary.

There are two sections in the competition, for Home and Overseas readers respectively, and in each prizes of 21/-, 15/- and 10/6 will be awarded for the best solutions, and there will be a number of consolation prizes. If necessary the judges will take neatness and novelty into consideration when making their decisions. Do not cut out the diagram. Make a copy of it for your entry, and on the back of it write your full name, address and age.

Entries should be addressed *November Crossword, Meccano Magazine, Binns Road, Liverpool 13.*

Closing dates: Home Section, 31st December 1953; Overseas Section, 31st March 1954.

Railway Painting Contest

It is almost two years since we arranged a railway painting competition, so this month we are giving readers of the *M.M.* another opportunity to show what they can do in this respect. The subject is a wide one—a railway scene of any kind—and it is hoped that there will be a record response.

All entries must be the unaided work of the competitors, whose names, addresses and ages must be stated on the back. Entries must be addressed to *Railway Painting Contest, Meccano Magazine, Binns Road, Liverpool 13.*

In each of the Home and Overseas sections there are two divisions, one for readers under 12 years of age and the other for those above that age respectively. In each of the four sections prizes of 21/-, 15/- and 10/6 will be awarded for the three best entries in order of merit, and other good efforts will be given consolation prizes. Closing dates: Home Section, 31st December 1953; Overseas Section, 31st March 1954.

November Photographic Contest

The eleventh of our 1953 series of photographic contests is a general one in which we invite readers to submit prints of any subjects. Each competitor may submit only one photograph, which must have been taken by him, and on the back of his print must be stated exactly what the photograph represents, also his name, address and age must be given.

The competition will be in two sections, A for readers aged 16 and over, and B for those under 16. Each competitor must state in which section his photograph is entered. There will be separate Overseas Sections, and in each section prizes of 21/-, 15/- and 10/6 will be awarded. Entries should be addressed: *November Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13.* Closing dates: Home Section: 30th November 1953; Overseas Section, 27th February 1954.

Competitors who desire their entries to be returned should note the paragraph at the top of this page.

Competition Results and Solutions

HOME

JUNE 1953 SIGNALLING CONTEST

1st Prize: R. W. Lucas, Sutton Coldfield. 2nd Prize: D. E. Morris, Oswestry. 3rd Prize: J. A. Heywood, Macclesfield. Consolation Prizes: K. J. G. Plampin, Sutton; J. M. Ryan, Cheadle Hulme; P. J. Garton, Aldershot; E. G. Rudkin, Chaddesden.

JULY 1953 CROSSWORD CONTEST

1st Prize: A. Morgan, Aldershot. 2nd Prize: M. Edward, Birmingham 14. 3rd Prize: P. Rumens, Wendover. Consolation Prizes: A. W. Burges, New Malden; J. W. Churchill, Caversham; D. S. Ellis, Ipswich.

JULY 1953 LOCOMOTIVE CONTEST

1st Prize: D. G. Feltham, Bath. 2nd Prize: Wm. Gallon, Gateshead 8. 3rd Prize: A. B. Grandfield, Taunton. Consolation Prizes: D. W. Mitchell, Milnthorpe; P. Johnston, Guildford; D. Pagan, Hexham; T. J. Gladman, London N.5.

JULY 1953 PHOTOGRAPHIC CONTEST

1st Prize, Section A: B. J. Arthur, Bramcote; Section B: D. G. Wright, Manchester 21. 2nd Prize, Section A: J. Balmond, Birmingham 6; Section B: A. Hickey, New Springs. 3rd Prize, Section A: E. Gater, Penkhull; Section B: W. A. J. Brown, Southam. Consolation Prizes: G. Collin, Leicester; M. McDermott, Edinburgh; L. Stone, Leeds 7; A. R. Seymour-Dale, Eastbourne; J. K. Jones, Kegworth; R. B. Sangster, Inverurie; J. Booler, East Kirby; G. Watt, Glasgow W.3.

OVERSEAS

MARCH 1953 DRAWING CONTEST

1st Prize: P. J. Marias, Wynberg, S. Africa. 2nd Prize: F. Cobb, Nairobi, E. Africa. 3rd Prize: P. Vaculik, Jamaica, B.W.I. Consolation Prizes: Jens E. Friis, Port Alice, B.C., Canada; N. Cudby, Mornington, N.Z.; M. Dutton, Clonskea, Eire.

MARCH 1953 CROSSWORD COMPETITION

1st Prize: J. F. Lewis, Wellington, N.Z. 2nd Prize: R. D. Sickling, Tauranga, N.Z. 3rd Prize: D. J. Kilsby, Stratford, N.Z. Consolation Prizes: G. Ellerman, Amsterdam, Holland; P. Griffiths, Muresk, W. Australia.

MARCH 1953 PHOTOGRAPHIC CONTEST

1st Prize, Section A: A. F. Roost, Winnipeg, Canada; Section B: R. Abell, New York, U.S.A. 2nd Prize, Section A: B. Whitney, Winnipeg, Canada; Section B: K. Hammond, Kirkuk, Iraq. 3rd Prize, Section A: T. Wood, Sarawak, Borneo; Section B: W. Edmonds, Capetown, S.A. Consolation Prizes: V. Vitale, Copenhagen, K. Denmark; S. Leah, Port Elizabeth, S. Africa; K. Bozzi, Geneva, Switzerland; M. A. Rose, Wanganui, N.Z.; J. Johnston, Dublin, Eire; I. Moreland, Greymouth, N.Z.

APRIL 1953 NAMED TRAINS CONTEST

1st Prize: L. Cheveaux, Paris, France. 2nd Prize: J. Fielding, Colombo, Ceylon. 3rd Prize: H. Suma, Singapore, Malaya. Consolation Prizes: A. J. Linz, New Orleans, U.S.A.; J. J. Baker, Dublin, Eire.

APRIL 1953 PHOTOGRAPHIC CONTEST

1st Prize, Section A: J. E. Horn, Johannesburg, S.A.; Section B: B. Sugden, Quebec, Canada. 2nd Prize: E. Weir, Melbourne, Australia; Section B: A. D. Mair, Christchurch, N.Z. 3rd Prize, Section A: C. H. R. Azua, Buenos Aires, Argentina; Section B: G. Sweeting, Auckland, N.Z. Consolation Prizes: R. C. Sugg, Dublin, Eire; A. Gravina, Buenos Aires, Argentina; A. Dolby, Palmerston North, N.Z.

SOLUTIONS

APRIL 1953 NAMED TRAINS CONTEST

1. *The Master Cutler*, Sheffield (Victoria) and London (Marylebone), E.R. 2. *The Midlander*, Wolverhampton, Birmingham and London (Euston) L.M.R. 3. *The Night Ferry*, London (Victoria) and Paris, S.R. and S.N.C.F. 4. *The Comet*, London (Euston) and Manchester (London Road), L.M.R. 5. *The Brighton Belle*, London (Victoria) and Brighton, S.R. 6. *The Prospector*, Denver and Salt Lake City, Denver and Rio Grande Western Railroad, U.S.A. 7. *Abraham Lincoln*, Chicago and St. Louis, Gulf Mobile and Ohio, and Chicago and Alton Railroads, U.S.A. 8. *The Royal Blue*, New York, Philadelphia, Baltimore and Washington, Baltimore and Ohio Railroad, U.S.A. 9. *Mistral*, Paris and Lyons, S.N.C.F. 10. *Heart of Midlothian*, London (King's Cross) and Edinburgh (Waverley), E. and N.E. and Scottish Regions.

MAY 1953 SLOGANS CONTEST

1. Morris. 2. Austin. 3. B.S.A. 4. Riley. 5. Vincent H.R.D. 6. M.G. 7. Ariel. 8. James. 9. Ford. 10. Royal Enfield. 11. Lanchester. 12. *Golden Flash*, B.S.A.

MAY 1953 AIRCRAFT CONTEST

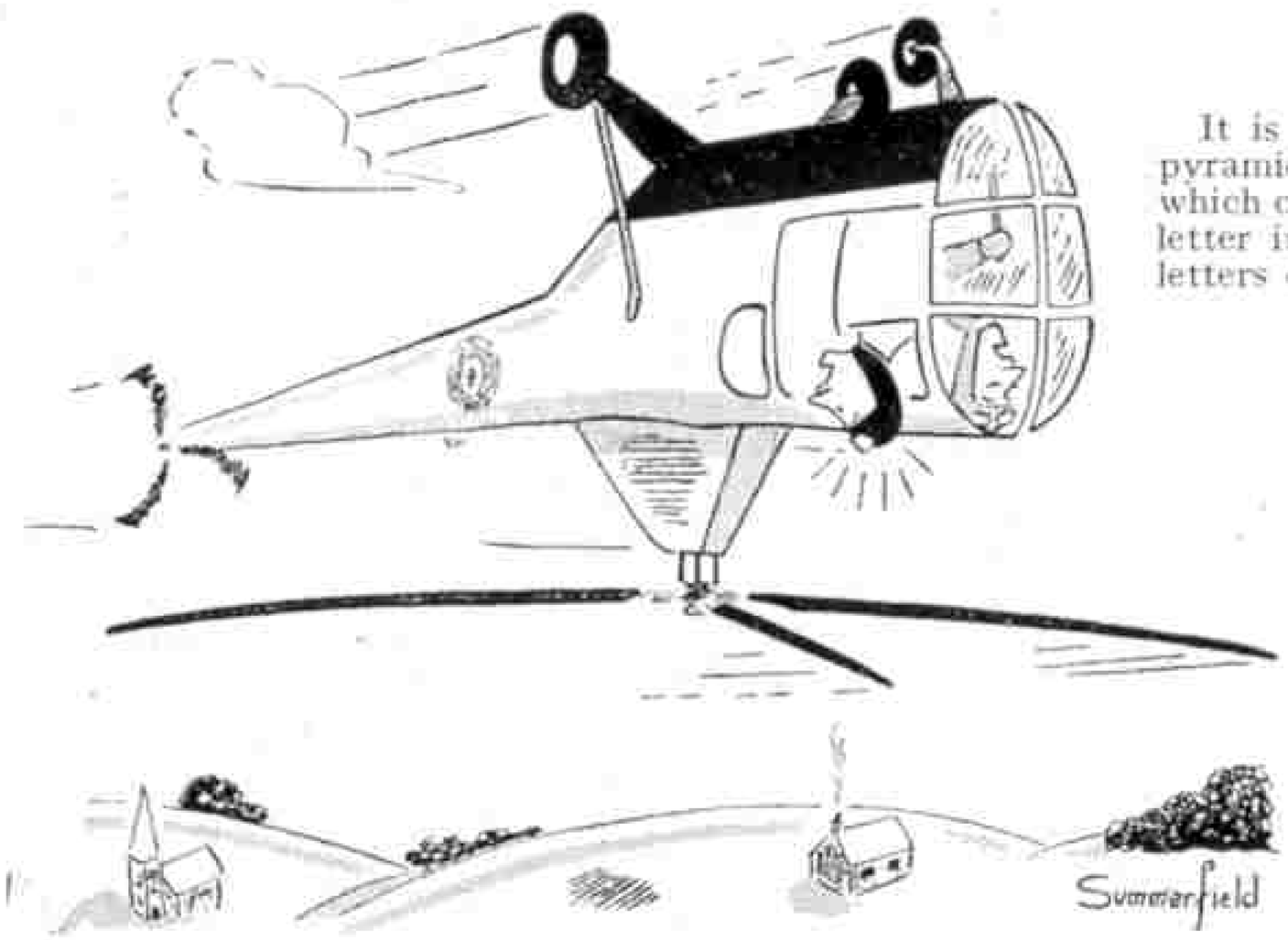
1. Avro Ashton, research, GB. 2. Handley Page Hermes, transport, GB. 3. De Havilland Dove, light transport, GB. 4. Fairey Firefly, trainer/anti-submarine, GB. 5. Short Sealand, amphibian/transport, GB. 6. De Havilland (C) Beaver, light transport, Canada. 7. Curtiss Commando, transport, U.S.A. 8. Short Solent flying boat, transport, GB. 9. De Havilland Heron, feeder transport, GB. 10. Hawker Hunter, fighter, GB. 11. De Havilland Comet, transport, GB. 12. De Havilland (C) Otter, light transport, Canada.

Double the Guard! An amusing snap by J. Balmond, Birmingham. Awarded 2nd Prize in the July Photographic Contest, Section A.

Fireside Fun

Sergeant: "An' what were you in civil life, Jones?"
Recruit: "Well, when my governor died he left me a pot of money, and I'm afraid I ran through it."
Sergeant: "Right. I'll put you down as a brass finisher."

* * * *



". . . . Of course, according to the book, this just isn't possible!"

* * * *

"Where are you going, Bill?"
"Nowhere."
"But you must be going somewhere."
"No, I'm not. I'm coming back."

* * * *

"Hi, you must not smoke in this powder store. The last man who did that blew the place up and killed half a dozen men."
"Perhaps so, but that can't happen now."
"Why can't it?"
"Because there's only two of us here."

* * * *

"So you've left your job, Pat. Was the boss surprised?"
"I don't think so. In fact, he knew before I did."

* * * *

"What do you call that dog of yours?"
"Fish."
"Good gracious, why?"
"Because he won't bite."

* * * *

Customer: "So you're back! Is the strike settled?"
Waiter: "What strike, sir?"
Customer: "Well, what have you been doing since I ordered my lunch?"

* * * *

"I'm head over heels in work."
"Why, what's your job?"
"Acrobat in a circus."

* * * *

Bus Conductor (to lady who has given him four farthings and two halfpenny stamps for a twopenny fare): "Next time, just bring a few jam jars."

* * * *

BRAIN TEASERS

NOTHING LEFT HERE

We really cannot keep away from these division sums. Here is one with plenty of blanks for figures, indicated by asterisks, but only one actual figure. Yet it is easy to construct the actual sum. See if you can do it.

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D.E.B.

ANOTHER WORD PYRAMID

It is a long time since we included one of our pyramids, composed of a series of words, each of which contains the letters in the one above with one letter in addition. In each case the order of the letters can be altered as desired.

1. Vowel
2. Man or boy
3. Woman or girl
4. Cast off
5. Started aside
6. Things are put in them
7. Protects
8. Without a skin

S.W.C.

* * * *

CARELESS TALK

When Jones was telephoning the text of a telegram about a football match, he had reached the word "match" when the operator asked him to spell it out.

"M for Match, A for Arthur, T for Tommy, C for Charlie . . . . " he began.

"C for what?" interrupted the operator.

"C for Charlie; and H for Harry."

The operator said thank you, but there is something queer about the conversation. Can you see what it is?

* * * *

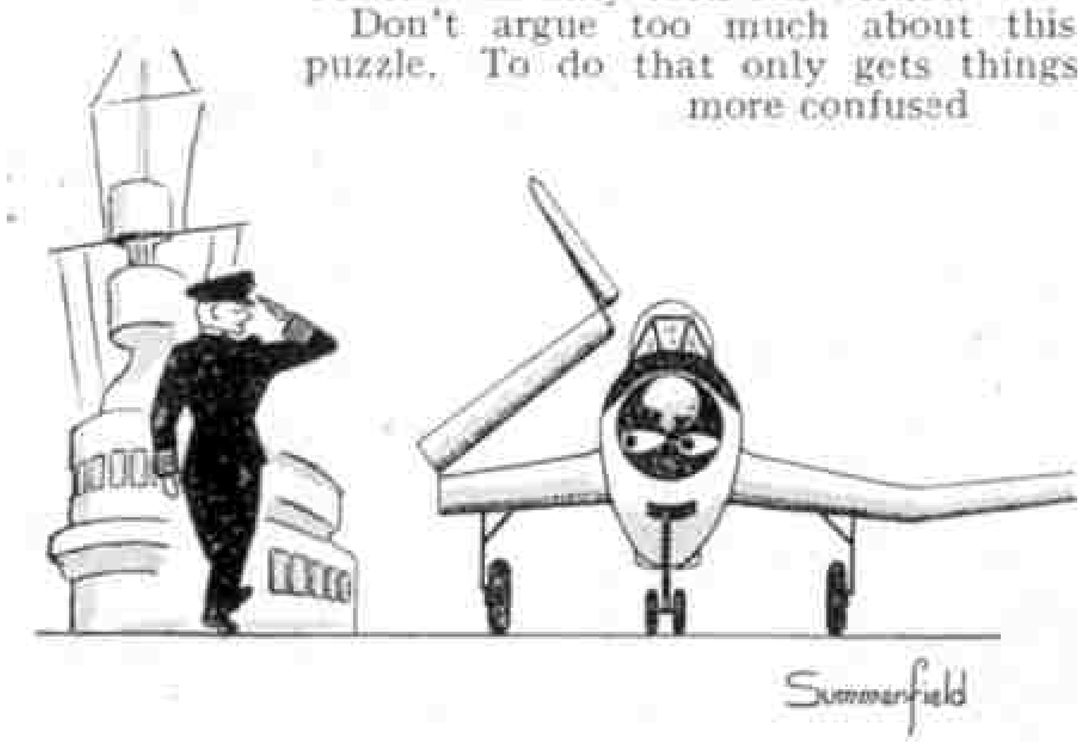
SOLUTIONS TO LAST MONTH'S PUZZLES

The pairs of words wanted in our first puzzle last month are as follows: 1, Flower; flour. 2, Pear; pair. 3, Leek, leak. 4, Bough; bow. 5, Currant; current. 6, Thyme; time. 7, Medlar; meddler. 8, Plane; plain.

The address the postman of our second puzzle read was WARNER, 25 OVERTON STREET, ASHTON-UNDER-LYNE.

The peculiarity of the figures in our cricket match puzzle is that although one of the two bowlers seemed to have done much better than the other, yet the two finished with the same average. This is difficult to explain. Perhaps the best way to look at it is this: if the bowler who took four wickets had had 27 runs scored off him while taking the first of these, this would have brought his average to three. Clearly his remaining three wickets then fell for three runs each, so that his average remained unchanged after reaching that of the bowler who only took one wicket.

Don't argue too much about this puzzle. To do that only gets things more confused



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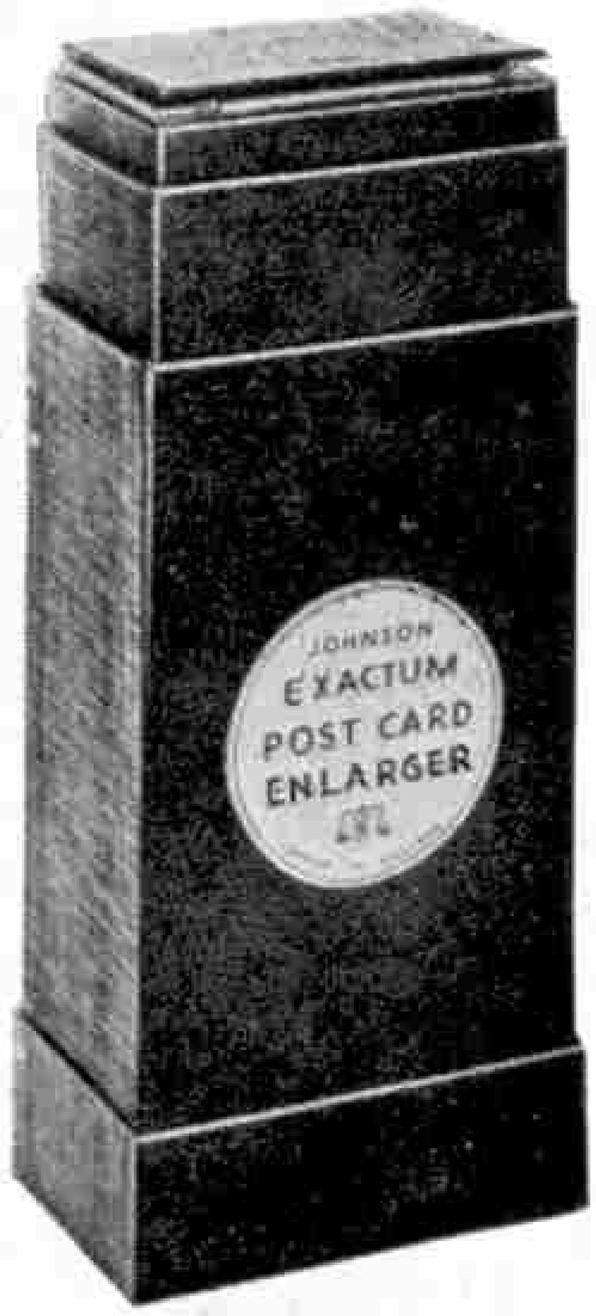

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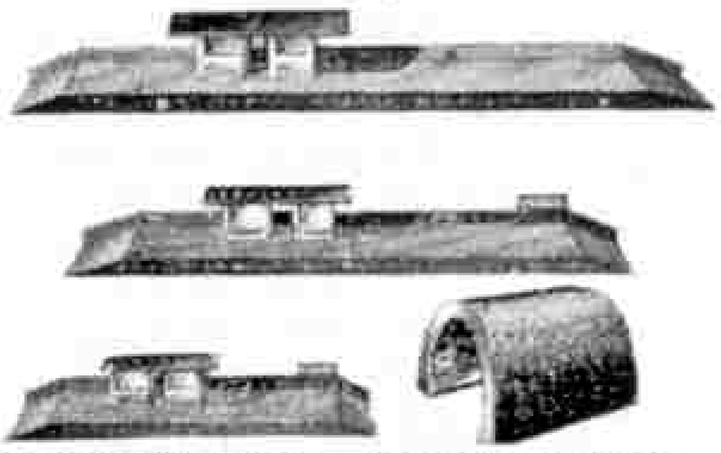

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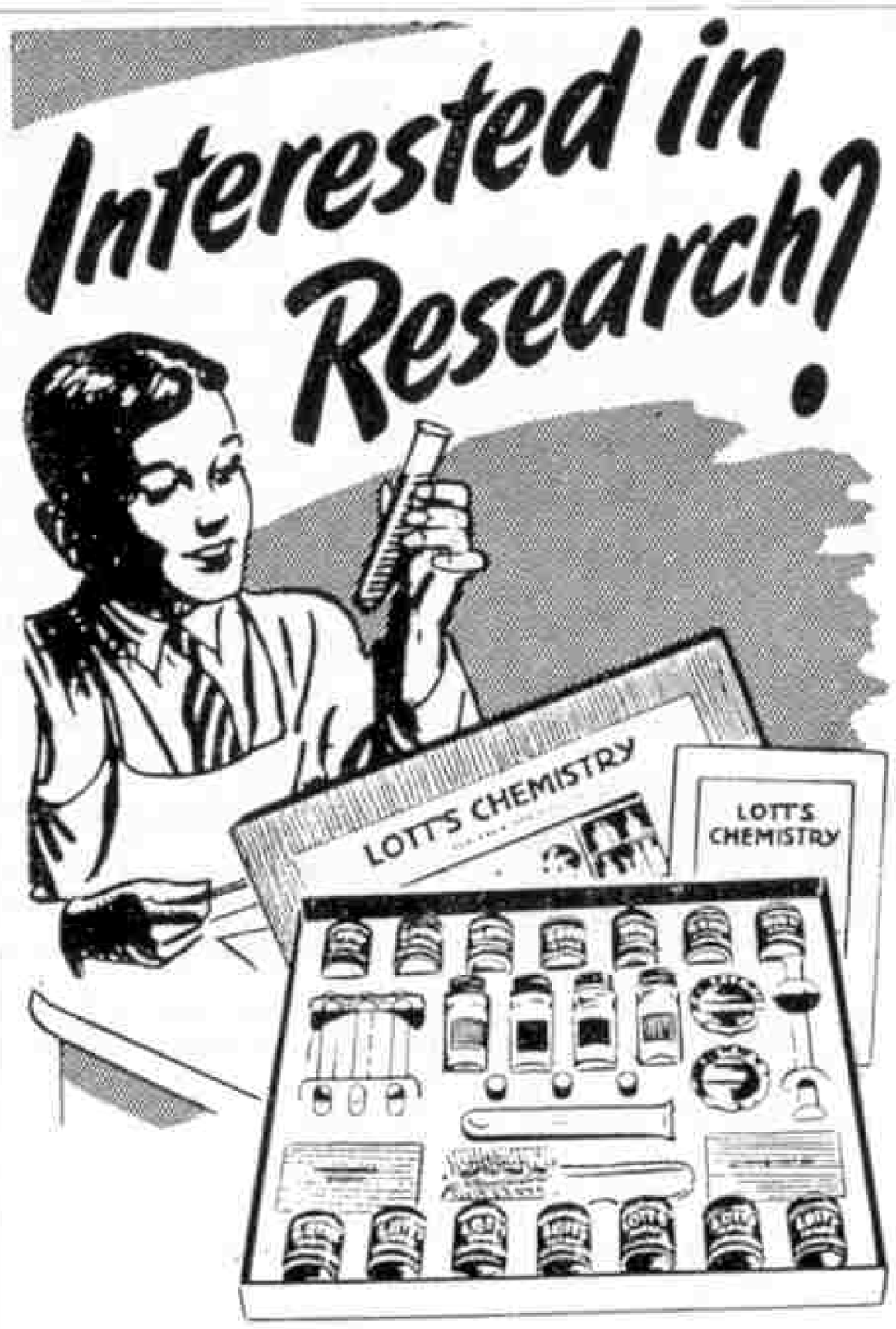

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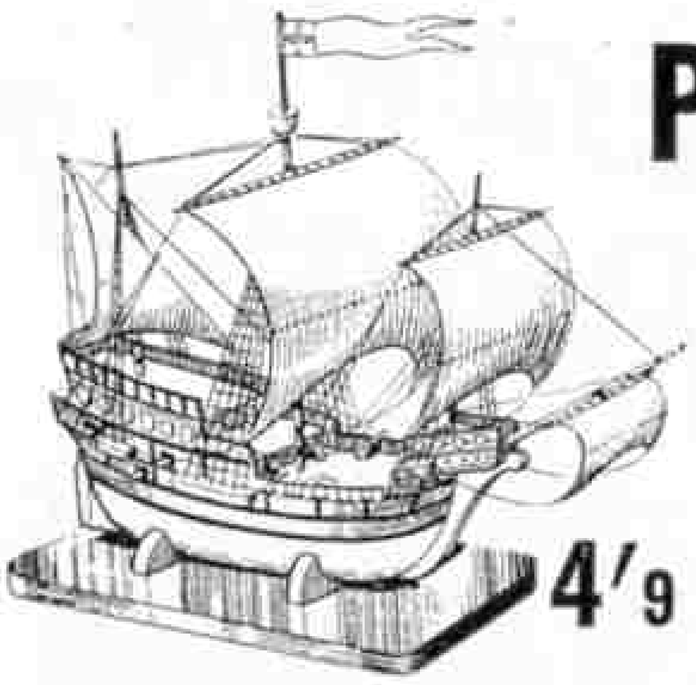

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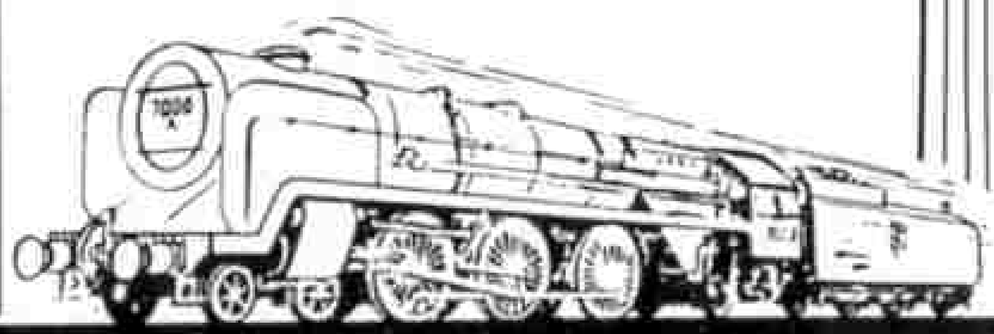

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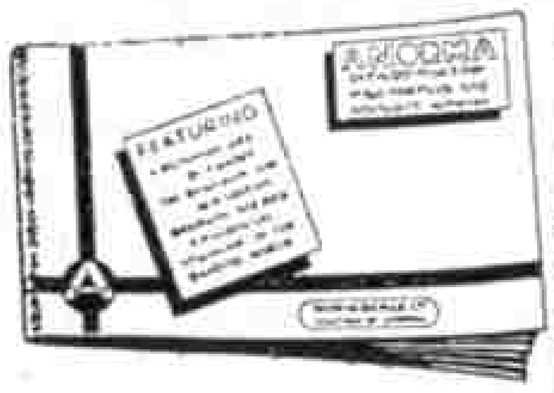

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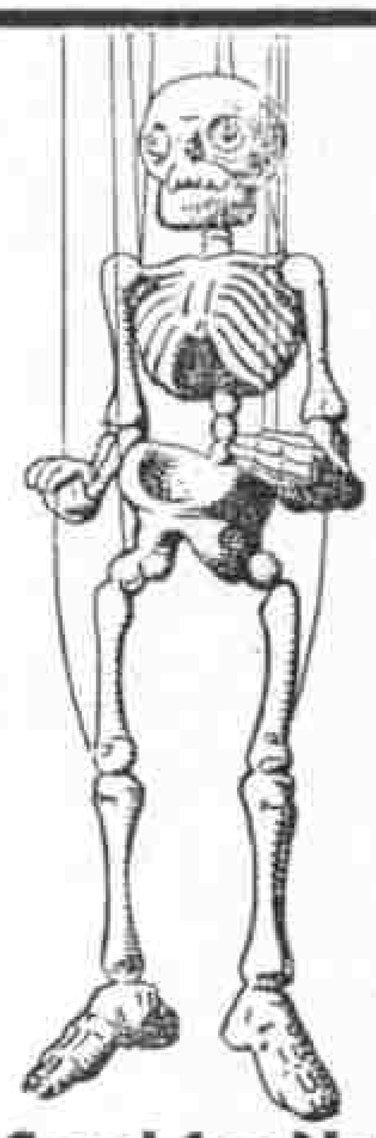

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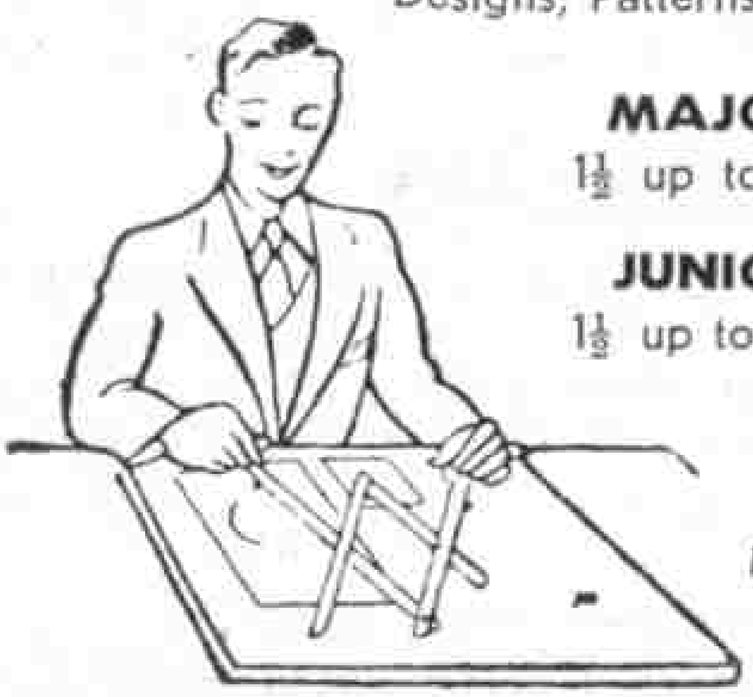

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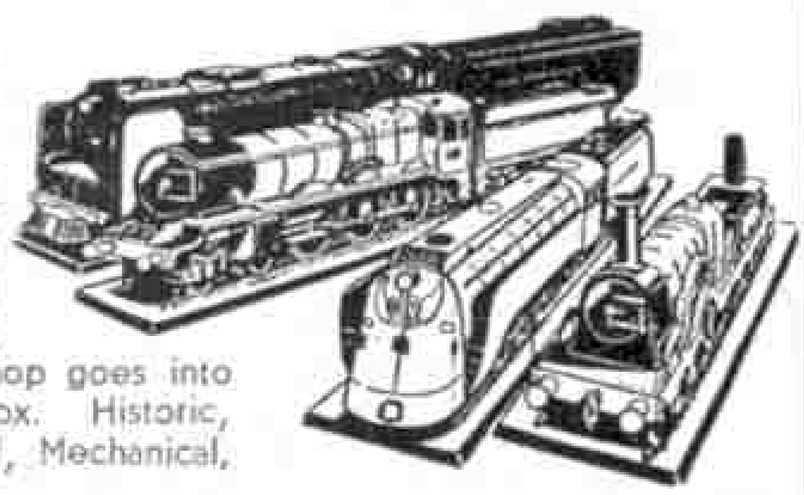

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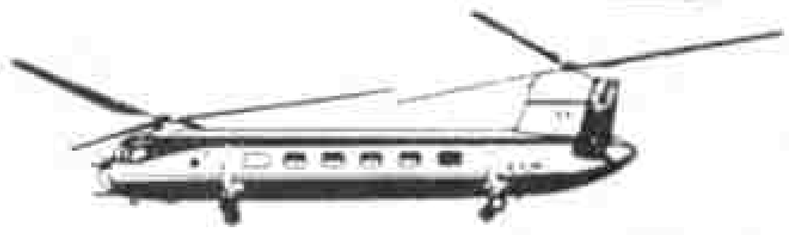

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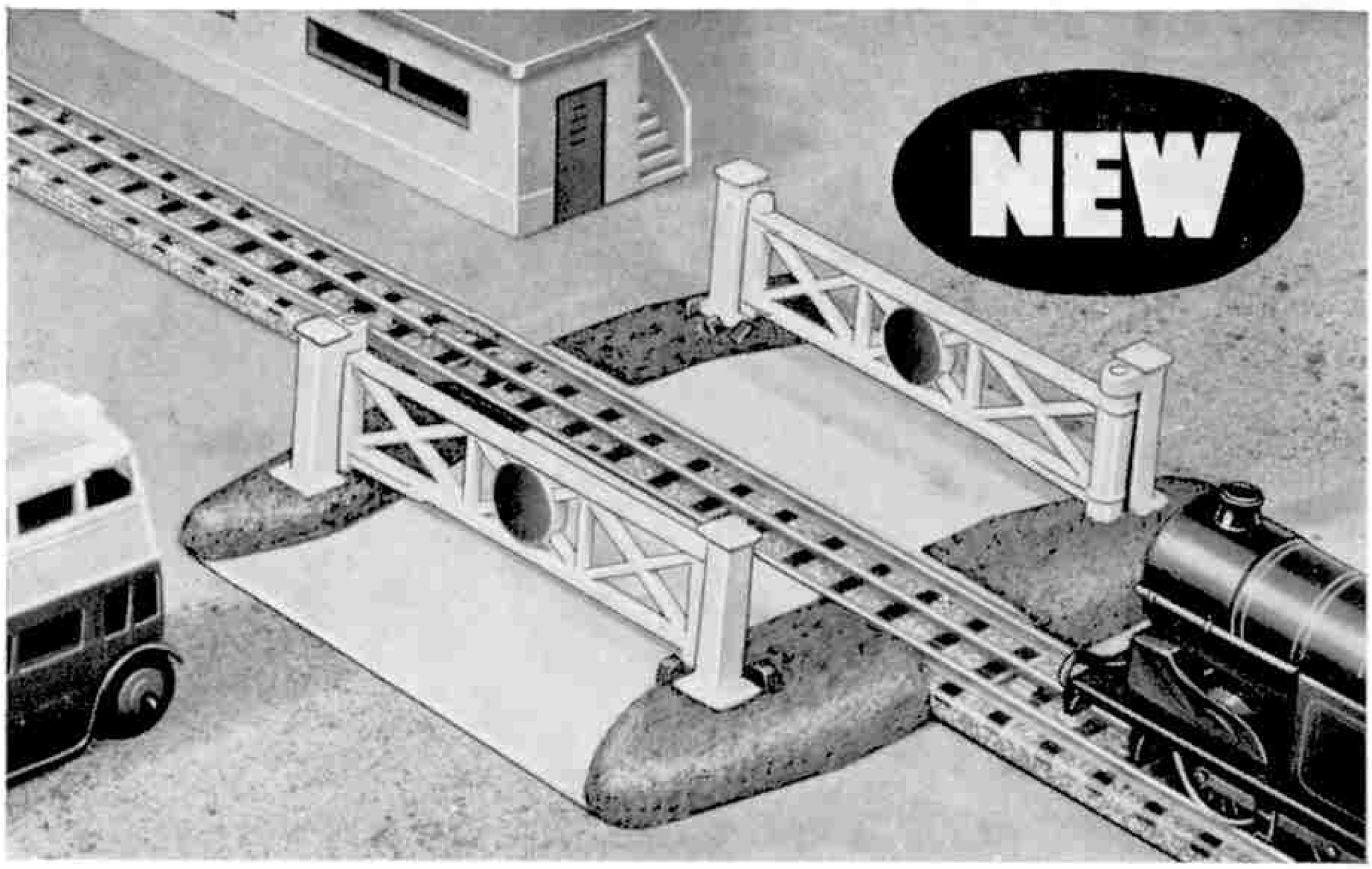

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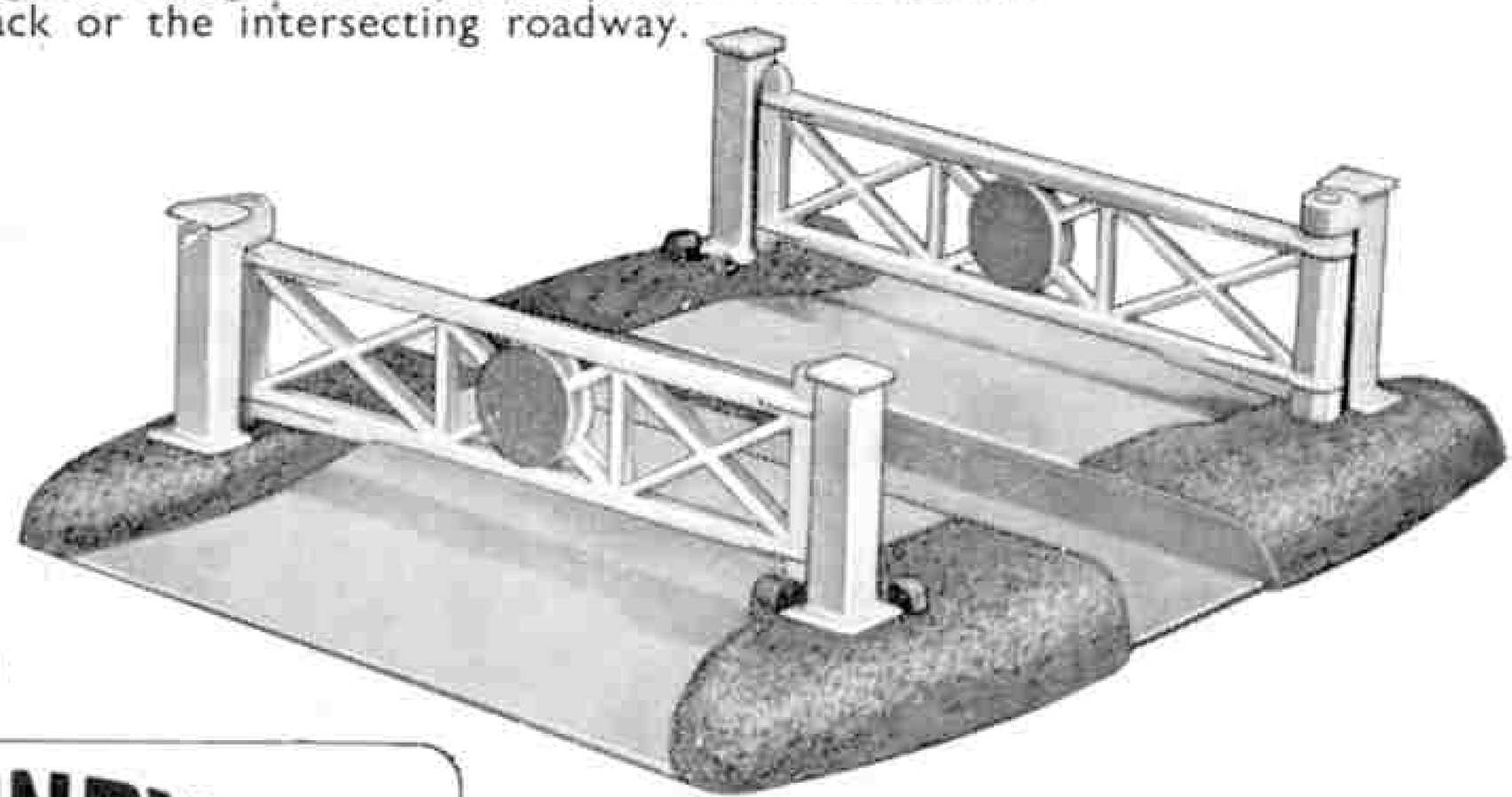

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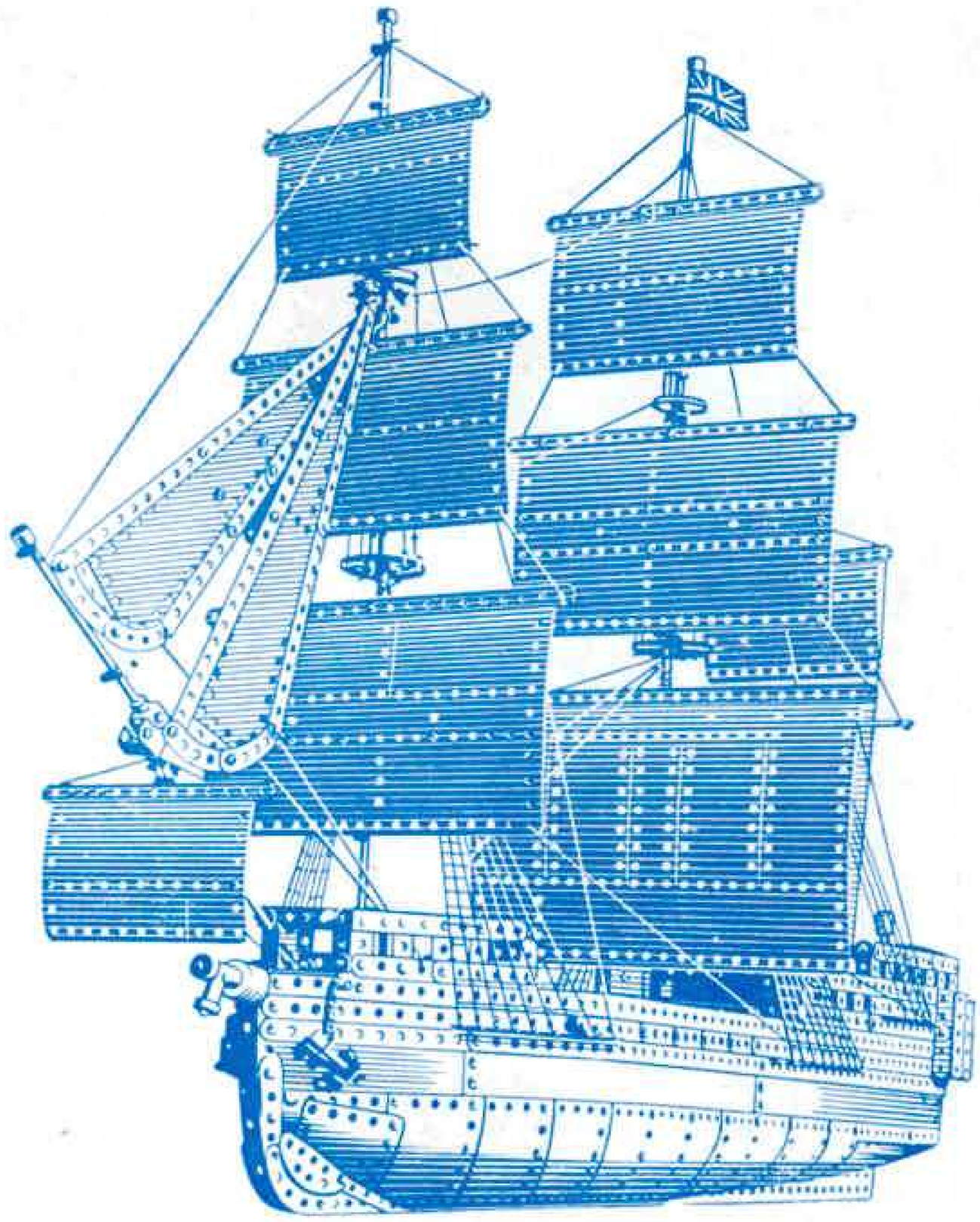

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