VOL. XLII. No. 5 MAY 1957

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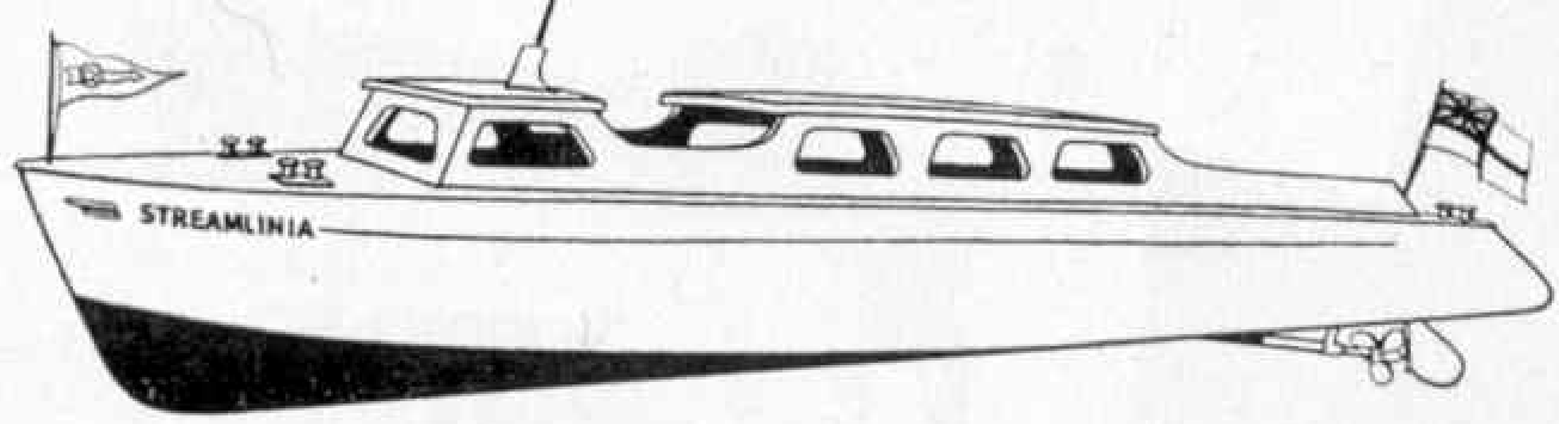

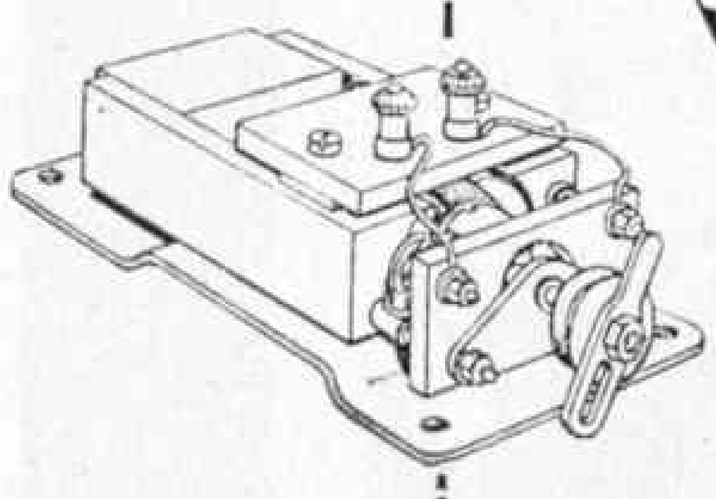

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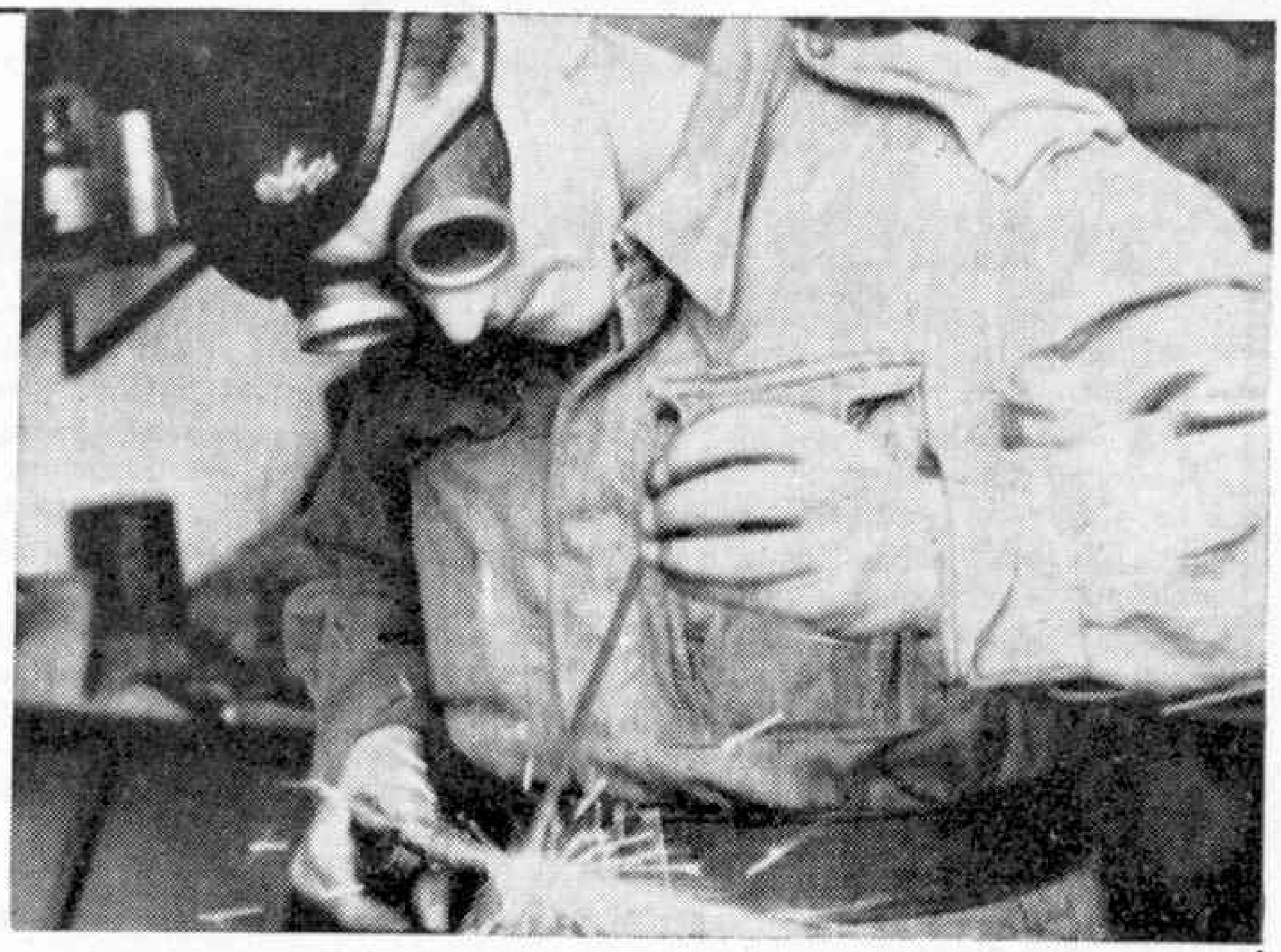

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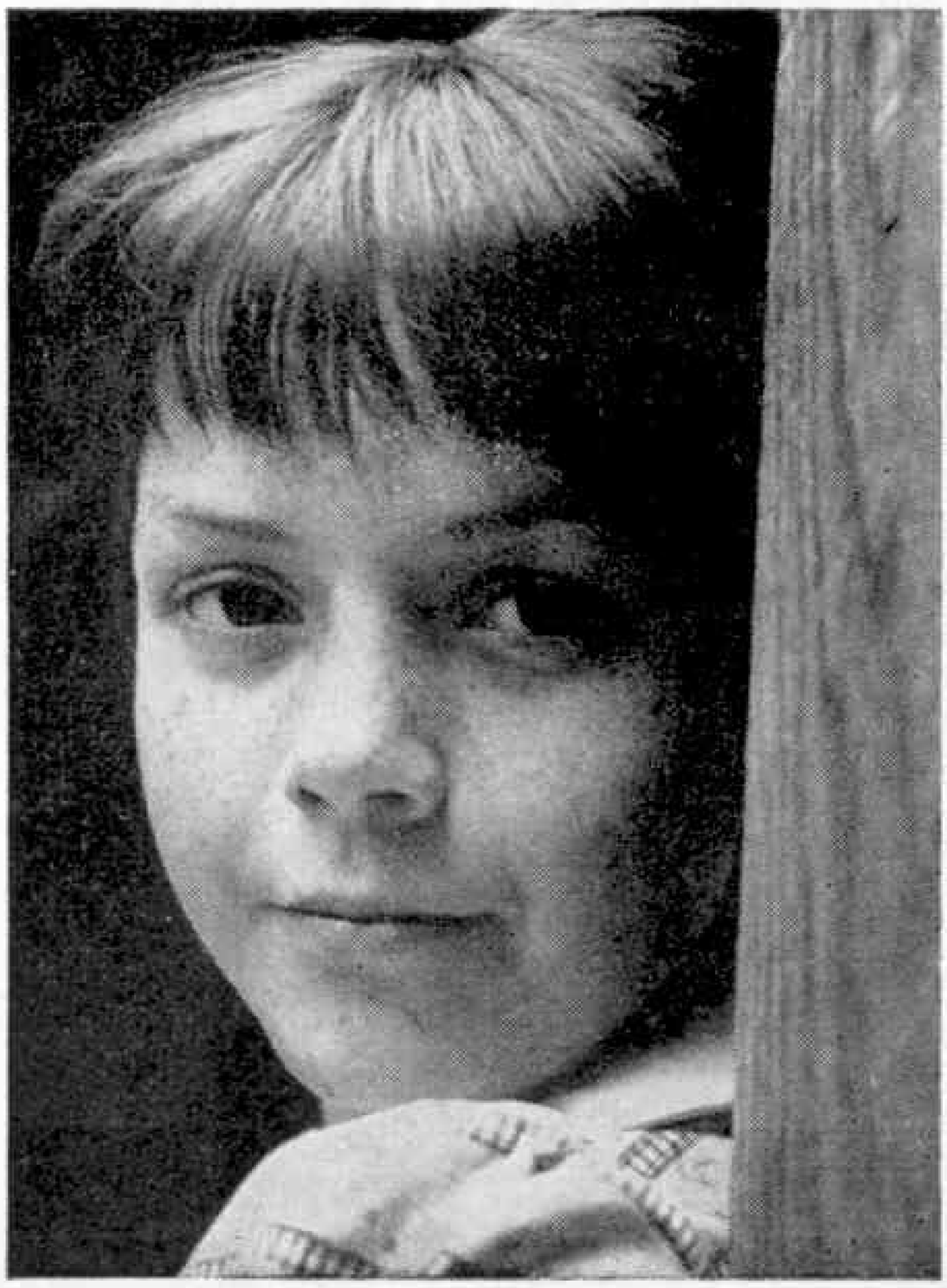

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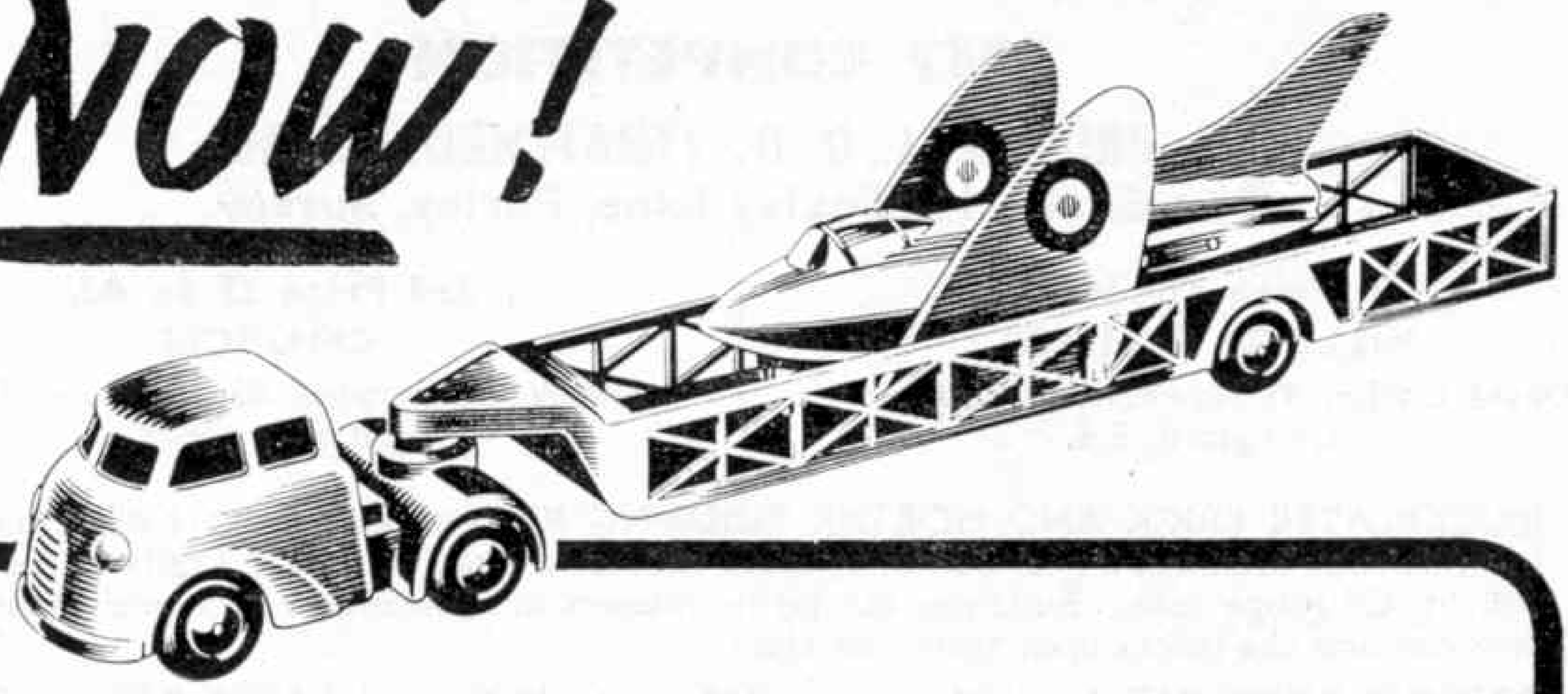

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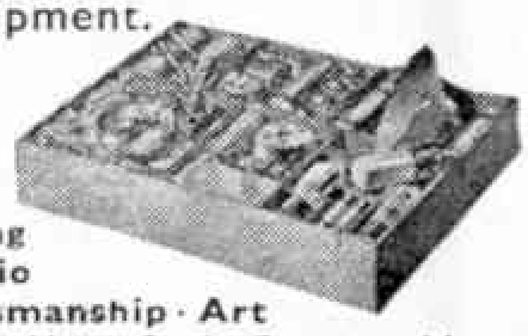

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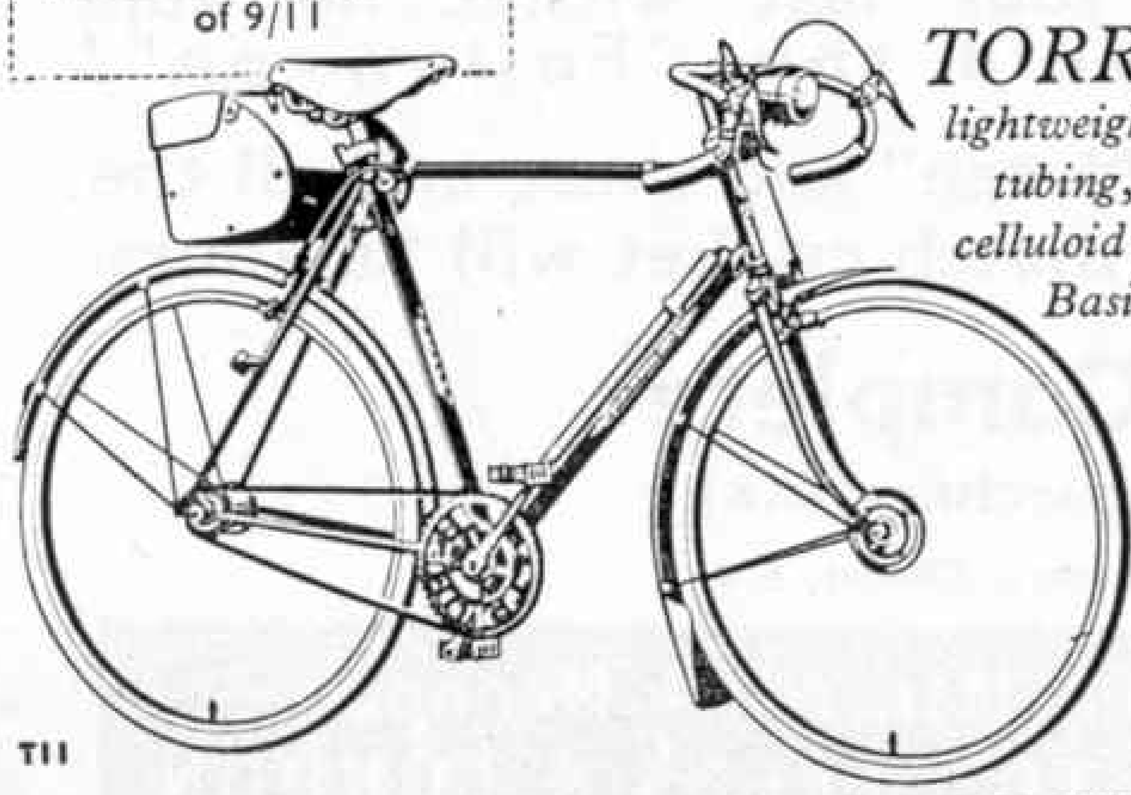

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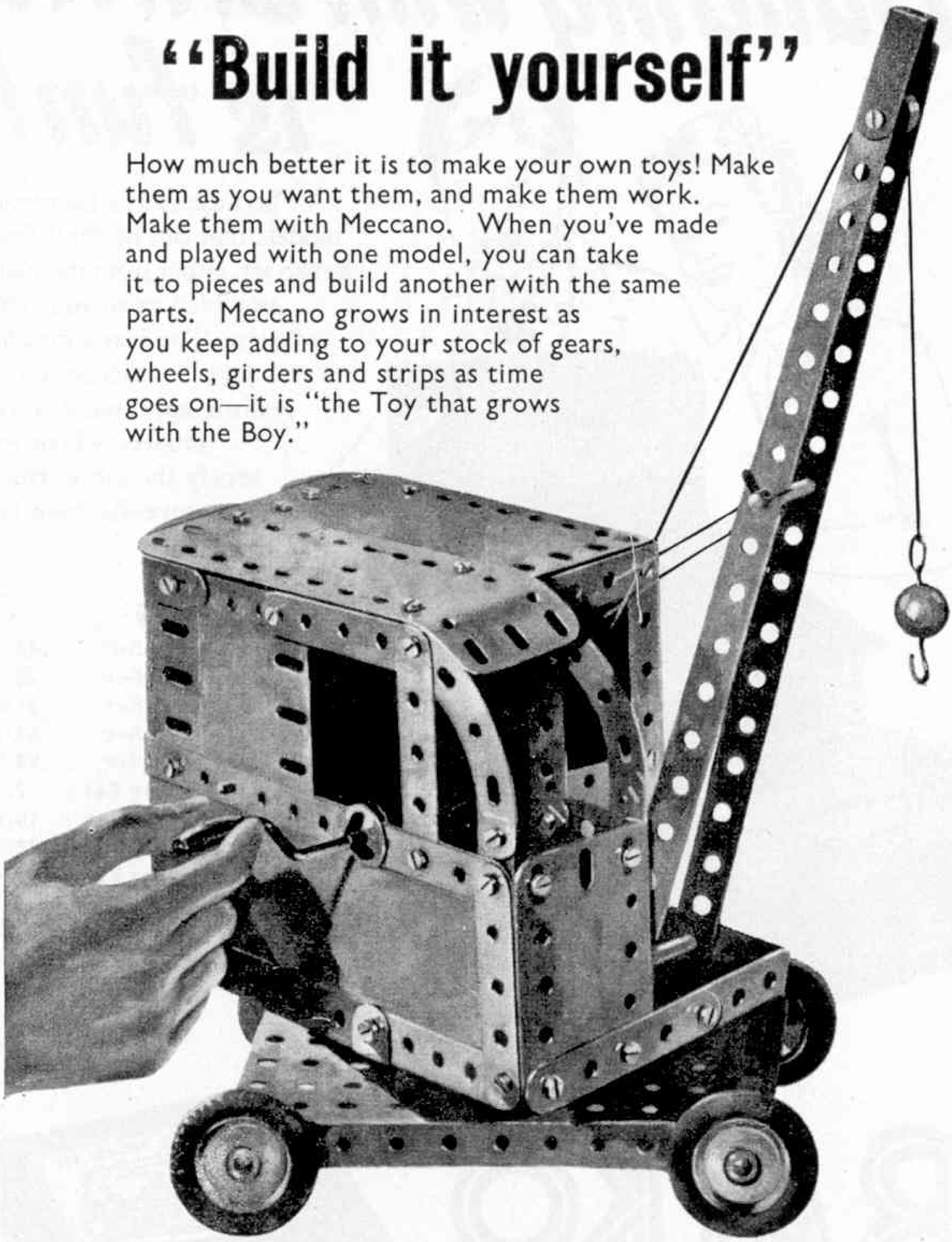

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MECCANO MAGAZINE

Editorial Office:
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EDITOR : FRANK RILEY, B.Sc.

Vol. XLII
No. 5
May 1957

The Roving Eye

My picture this month shows the latest version of the B.B.C. Roving Eye, one of the wonders of Television. In *Road and Track* this month Peter Lewis gives some very interesting details of this remarkable vehicle, with a picture showing observers and producer actually at work within the van, seated just behind the central mounting used for raising the television camera above the roof.

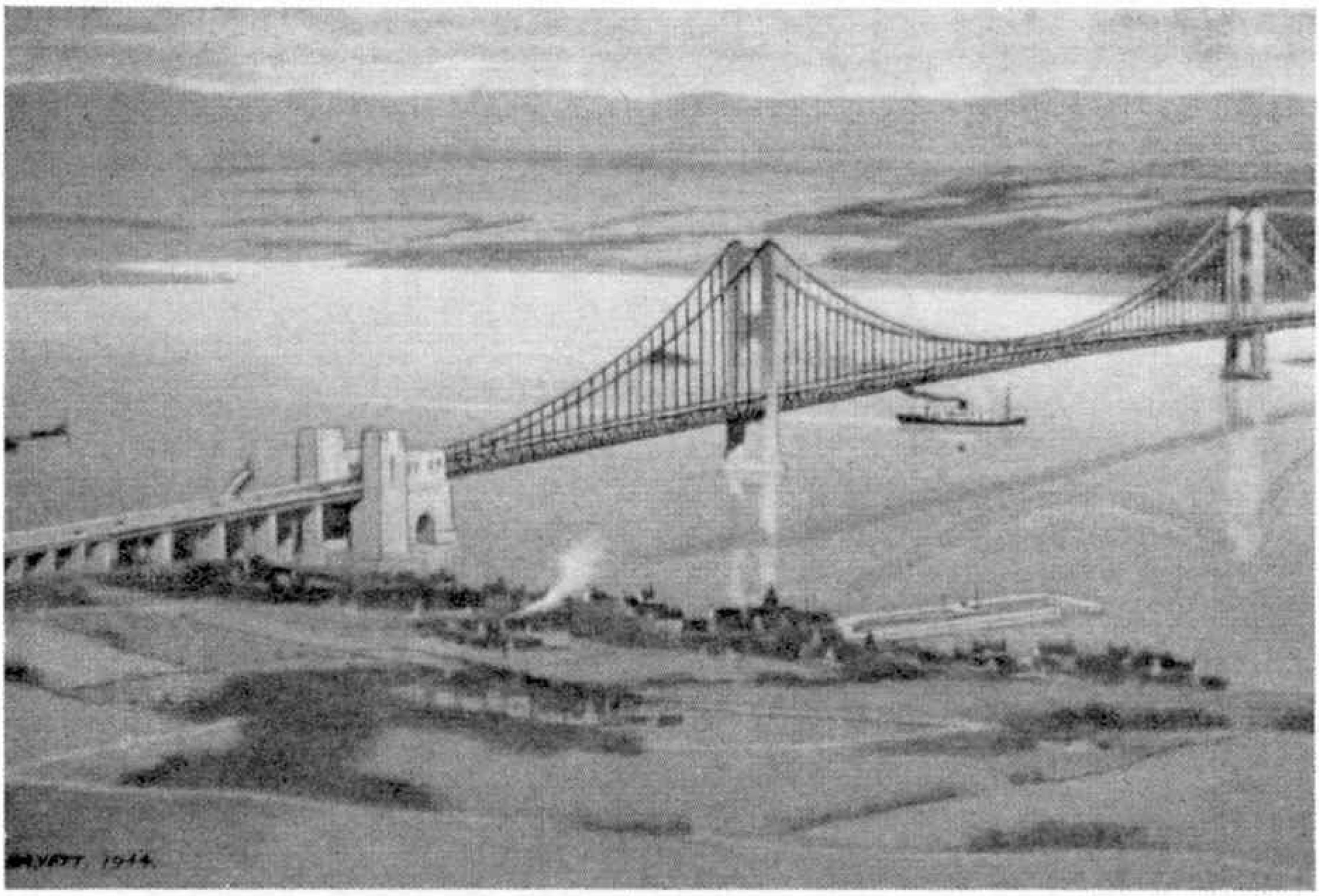
I think the time has come to take a closer look at an atomic power station. So I have arranged for the inclusion in the next issue of the Magazine of a description of the new power station to be built by the South of Scotland Electricity Board. It will have two reactors, with a generating capacity of 360,000 kW.

This station is to be constructed by the G.E.C. Simon-Carves Atomic Energy Group. The article will give readers pictures of the very core of the reactor, where the atoms of radioactive material break up in a chain reaction, and of the arrangements that will be made for using the heat generated within the core for raising steam to drive turbogenerators. It will be well illustrated, and will give an overall view of this new and highly important way of generating the power that is becoming more and more necessary to us. The future indeed will be the Atomic Power Age, and there is sufficient suitable radioactive material in the world to keep us supplied with power for a thousand years or even more.

There will of course be many other fine articles dealing with topics of the kind that *M.M.* readers look for. One in particular will be a little startling to many of you, for the roving eye of the Magazine has unearthed the story of a pioneer who seems to have been the first Flying Scot, and *may* even have been the first in the world to achieve powered flight. Some of our pioneers never become well-known, and many who do are too easily forgotten. Here is the story of one of the former who should certainly be recalled.

The Roving Eye ready to rove! This is the B.B.C. Roving Eye Mark II, with the camera and its operator ready to take the pictures that we see on our television screens. B.B.C. photograph.

The Editor



Firth of Forth Road Bridge

By the Editor

THE pictures at the head of these pages combine to give a panoramic view of the Firth of Forth. This stretch of water narrows after flowing past the great naval base of Rosyth, and at North Queensferry a rocky promontory juts out from its northern shore. It is there that one of the most famous bridges in the world was built—the great railway bridge on the East Coast Route to Perth, Dundee and Aberdeen.

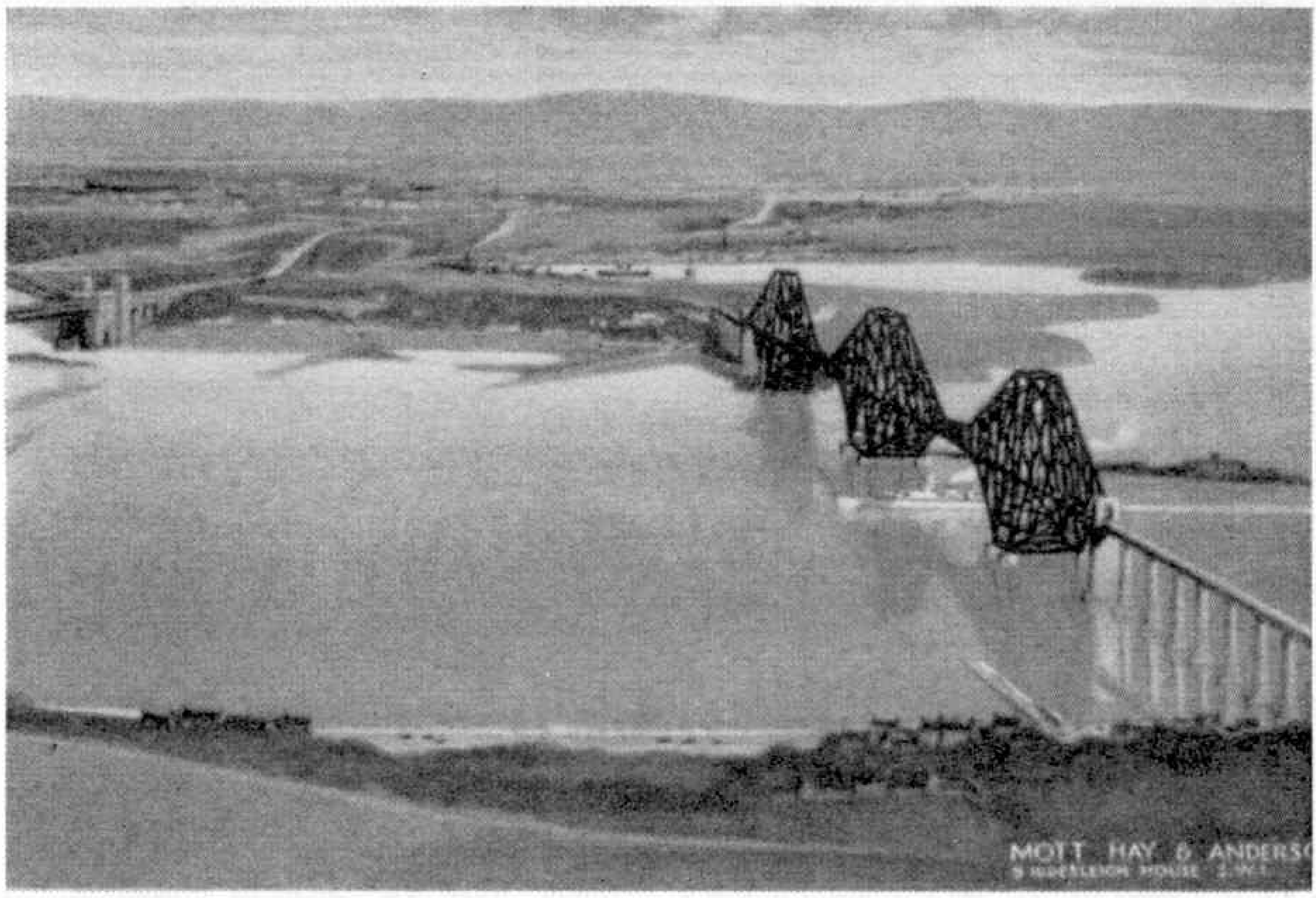
The Forth Bridge, as it has been known since its opening in 1890, is one of the most massive structures of this kind ever built. It is a cantilever bridge, and its immense tubular and lattice girders form three giant networks of steel that at their highest points are 361 ft. above water level.

This splendid bridge you will see on the right in the picture, but on the left is another that as yet does not exist. It is the proposed road bridge across the Forth, plans for which have now been approved. Some preparatory work has already been begun, and it is expected that the main work will start soon. The bridge is expected to be completed in five to six years, and its estimated cost is over £14,000,000, inclusive of the necessary approach roads.

The need for a road bridge across the lower reaches of the Forth has been recognised for many years. Road traffic was comparatively light when the Forth Bridge was constructed. With its growth, the need for a road bridge to give ready access to Fifeshire and the north of Scotland became imperative.

A road bridge was built across the River Forth between Kincardine, in Fifeshire, and Higgins Neuk, in Stirlingshire, in 1936, but this left the Firth into which the river widens without any crossing except by ferries, and the capacities of these are limited.

It is a delightful experience to cross the Forth by the ferry at South Queensferry, which plies alongside the massive railway bridge between that place and North Queensferry. The crossing indeed gives passengers wonderfully impressive views of the immense structure that towers above them. Now about a quarter of a mile upstream there is to be constructed the splendid bridge seen on the left in my picture. It will be in complete contrast



with the railway bridge, a giant mass of more than 54,000 tons of steel, for it will be a suspension bridge, a light and graceful structure with tall towers, one near each end, and cables passing over them from which the roadway is suspended.

Britain can claim to have been the pioneer of this type of bridge in the modern world, for the earliest famous suspension bridges built were those across the Menai Straits and the mouth of the Conway River. Both of these were designed by Telford, one of Britain's greatest engineering pioneers. They were built over 130 years ago, and while by modern standards they are modest in size—the Menai Straits Bridge, the larger of the two, has a span of 550 ft.—they certainly compare in interest with any of the much larger structures of this type since built because of their historical importance.

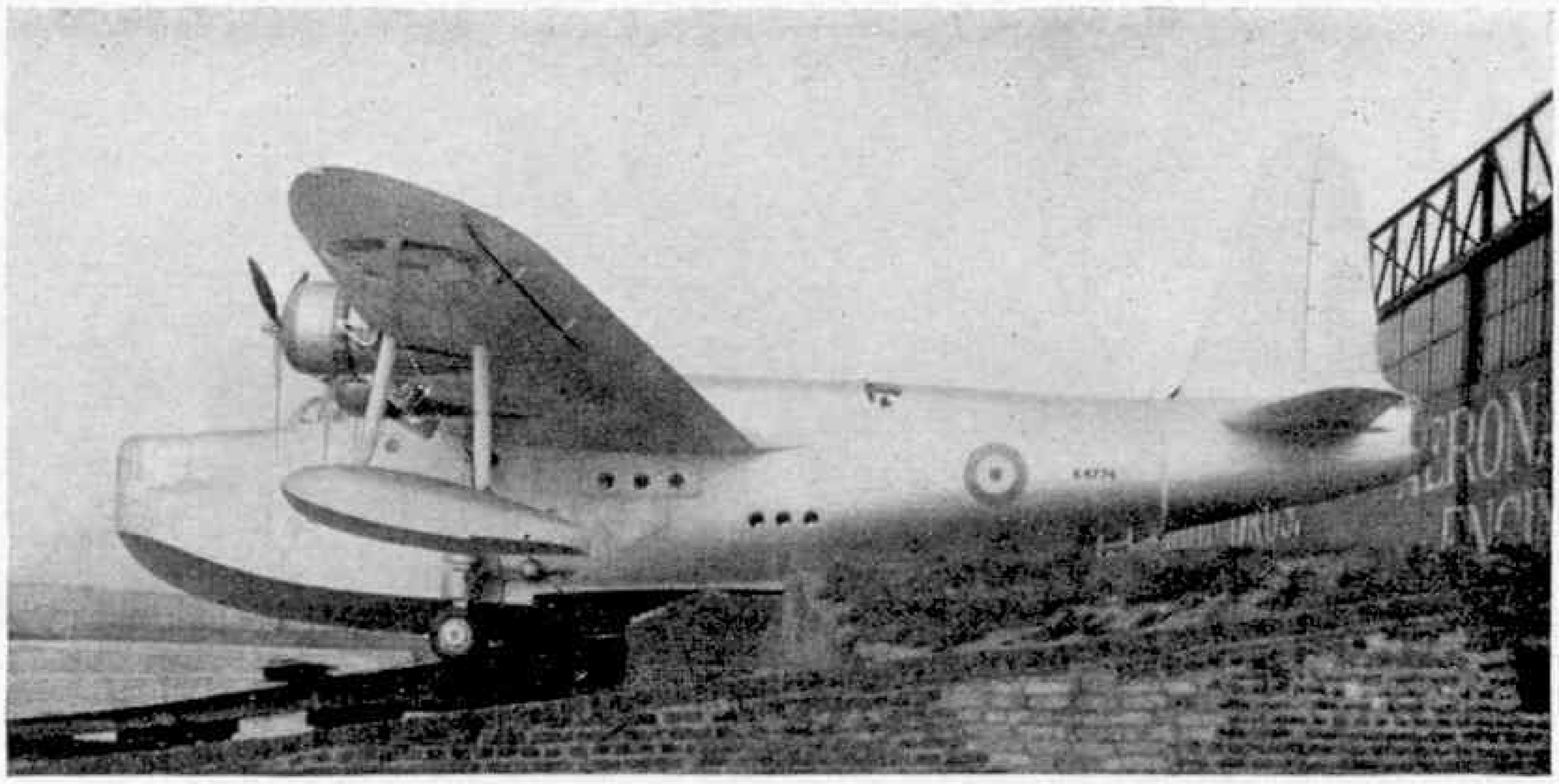
The greatest suspension bridge in the world today is the Golden Gate Bridge at San Francisco, which has a suspended span of 4,200 ft., or more than three-quarters of a mile. Other mighty suspension bridges in the United States are the George Washington Bridge across the Hudson River in New York, which has a span of 3,500 ft., and a bridge now being constructed across the Mackinac Straits, in the state of Michigan, the span of which will be 3,800 ft.

This latter bridge will probably be completed before the Forth Road Bridge is built, so that the latter with its central span of 3,300 ft. will rank as the fourth longest span bridge in the world, for no other bridge of any type will then have such enormous spans as these. Incidentally, Great Britain may have another of these giants, for the proposed Severn suspension bridge will have a span of 3,240 ft.

Each of the two suspended side spans of the proposed bridge will be 1,260 ft. long, giving a total suspended length of 5,820 ft. The main towers will be about 500 ft. high, and each of the two main cables passing over them, from which the deck of the bridge will be suspended, will be 2 ft. 5 in. in diameter. The deck is to be of steel, with a thin asphalt covering, and there will be two carriageways, each 24 ft. across. These are also to be a 9 ft. cycle track and a 6 ft. footpath on each side.

The north approach viaduct will be over 600 ft. in length, while that on the southern side will be more than 1,250 ft. long. The full length of the bridge, including the approaches, will be almost a mile and a half, and roughly six miles of new approach roads on the north side and four miles on the south side are planned.

The consulting engineers for the scheme are Messrs. Mott, Hay and Anderson, London, who kindly supplied my picture.



Farewell to Flying Boats

By John W. R. Taylor

IT is always sad to see any aircraft reach the end of its useful life and be sent off to the scrap-heap; but the farewell ceremony held at Pembroke Dock in South Wales on 31st January this year was particularly moving. It marked not only the disappearance from service of the last home-based Sunderland flying boats, but the approaching end of all R.A.F. flying boat activities. Only No. 205/209 Squadron, based at Seletar, Singapore, still flies Sunderlands, and no replacements are being built or even designed.

The picture at the head of this page shows K4774, the very first Sunderland of 1937.

There has never been a time in the history of the Royal Air Force when it has been without water-based aircraft. Even in the 1914–18 War the Royal Naval Air Service—which was combined with the Royal Flying Corps to form the R.A.F. in April, 1918—had its squadrons of big twin-engined Curtiss 'boats. Re-designed at Felixstowe by John Porte and fitted with Rolls-Royce engines, they fought gallant actions against German submarines in the North Sea and even shot down three Zeppelins.

Between the two world wars flying boats were the aircraft traditionally used by the Royal Air Force for "showing the flag," and many great flights were made. On one of them, in 1927, four Supermarine Southamptons flew 28,000 miles in formation from Plymouth to Singapore, round Australia, back to Singapore, on to Hong Kong and then back once more to Singapore. Except for a faulty primus stove and a few barnacles, the only trouble was caused by tar oozing from refuelling lighters in the tropics and marking their immaculate white hulls.

The 1930s were the golden years of flying boats, when they not only flew with the R.A.F. but were chosen by Britain's national airline, Imperial Airways, to operate *all* services throughout the Commonwealth.

With their Short Empire 'boats, Imperial Airways set standards of performance, reliability and comfort that gave them undisputed leadership in the air. And when the R.A.F. asked in Specification R2/33 for a new patrol-bomber flying boat, it was logical for Short's to base their design on the Empire 'boat.

Militarisation of the design was not easy. More powerful engines had to be fitted. Then the whole interior had to be re-designed to accommodate gun positions, bombs, radio and other fighting equipment instead of luxury seating for passengers. At the same time, the design of the hull was improved.

One of the main problems was to find a place for the bombs and depth charges, because performance would have suffered

if they had been hung under the wings, and it was not considered practicable to cut holes for bomb-doors in the bottom of the hull. In the end, it was decided to carry the bombs inside the fuselage on racks which could be slid out on rails under the wings when the target was approached.

The result looked very different from an Empire 'boat and surprisingly "fierce," with a two-gun turret on the blunt nose, a four-gun tail turret and two open single-gun positions in the top of the fuselage behind the wing. It seemed a big, sturdy, reliable machine and it was, with a loaded weight of 44,600 lb., a span of 112 ft. 10 in., four 1,010 h.p. Bristol Pegasus 22 engines and sufficient fuel to fly 2,600 miles at 178 m.p.h. with a two-ton payload.

Such performance was excellent at that time and the R.A.F. ordered the aircraft into large-scale production as the Sunderland 1—a decision for which they later had good reason to be thankful.

Although the prototype did not fly until 1937, production 'boats were in service a year later, the first squadron to receive them being No. 230 which was, with No. 201, also the last unit to fly Sunderlands in the U.K. in January of this year. And by the time war started in 1939 Coastal Command had 39 Sunderlands, plus two twin-engined Lerwicks, and 59 veteran biplane flying boats of doubtful value.

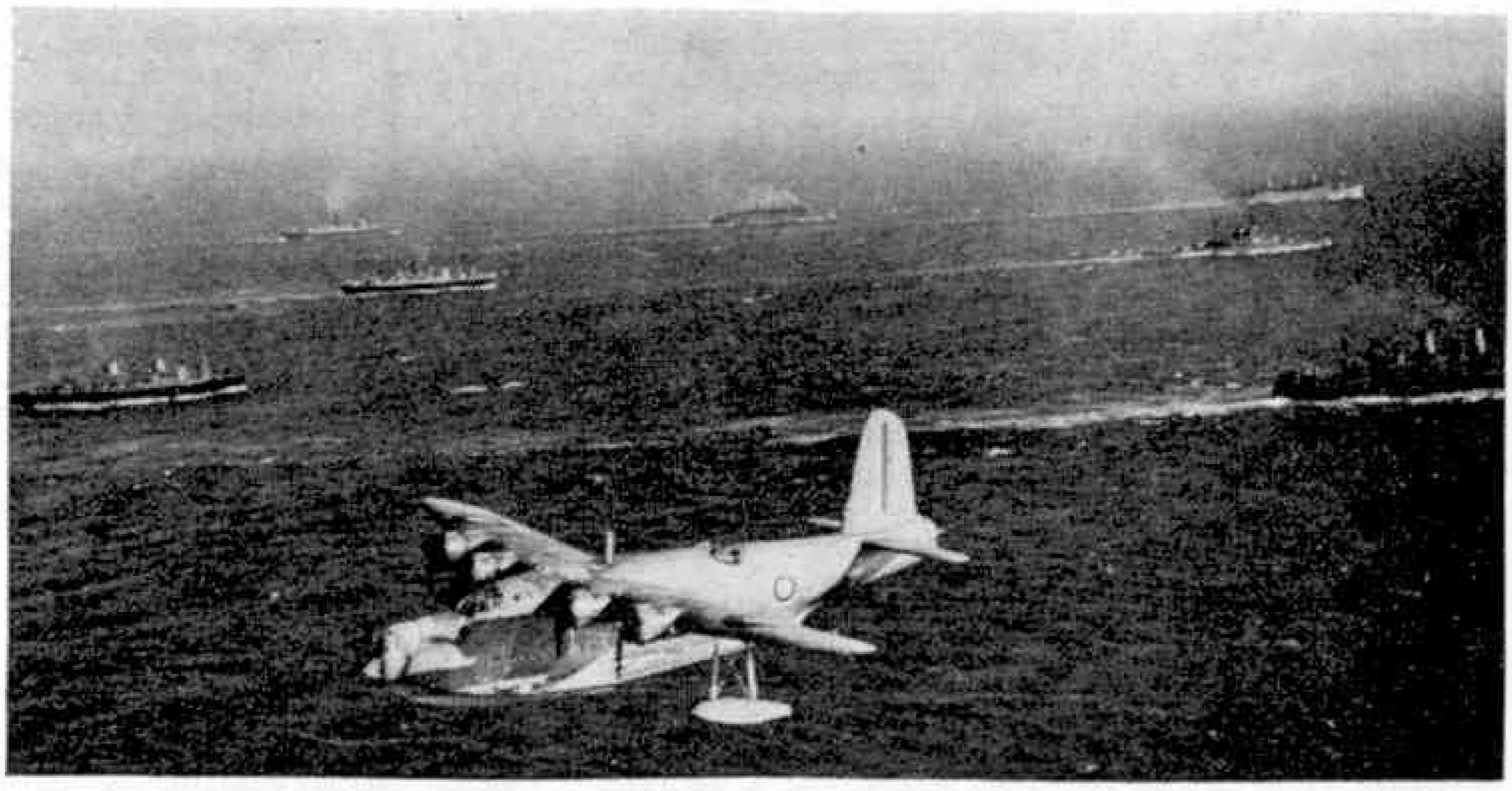
It was not long before the Sunderlands were in action. In fact, they were the first aircraft mentioned by name in an Air Ministry communique in World War II.

They earned this honour on 18th September, in 1939, when three of them picked up a radio message that the s.s. *Kensington Court* had been torpedoed by a German submarine and was sinking. When they arrived at the scene of action, they found 34 survivors crowded in two lifeboats.

Despite a heavy swell, two of the Sunderlands were put down near these boats, while the third circled overhead in case the submarine re-appeared. Unfortunately, the lifeboats could not approach the aircraft in such a sea, or they might have smashed against the hulls and caused serious damage; but this did not deter the aircrews, who organised a shuttle service with rubber dinghies and eventually took off and returned safely to their base with 21 rescued seamen in one 'boat and 13 in the other.

Bearing in mind that the civil Empire flying boats carried only 17 passengers, the addition of such a load to a crew of seven and heavy operational equipment might have seemed hazardous. But on later occasions Sunderlands carried far bigger loads when they were sent to Norway, Greece, Crete and the Far East to rescue soldiers and civilians from the advancing enemy. The record was probably held by the crew that flew to safety no fewer than 87 men in a single trip—six of them in the toilet—an achievement which necessitated a take-off run of about five miles!

Other exploits by Sunderland crews included what must be an all-time record for duration of a single operational sortie. Normally, these 'boats could remain on patrol for 14–16 hrs., on anti-submarine convoy escort and reconnaissance duties far out over the Atlantic and Indian Oceans. But Air Cdre. "Kelly" Barnes and

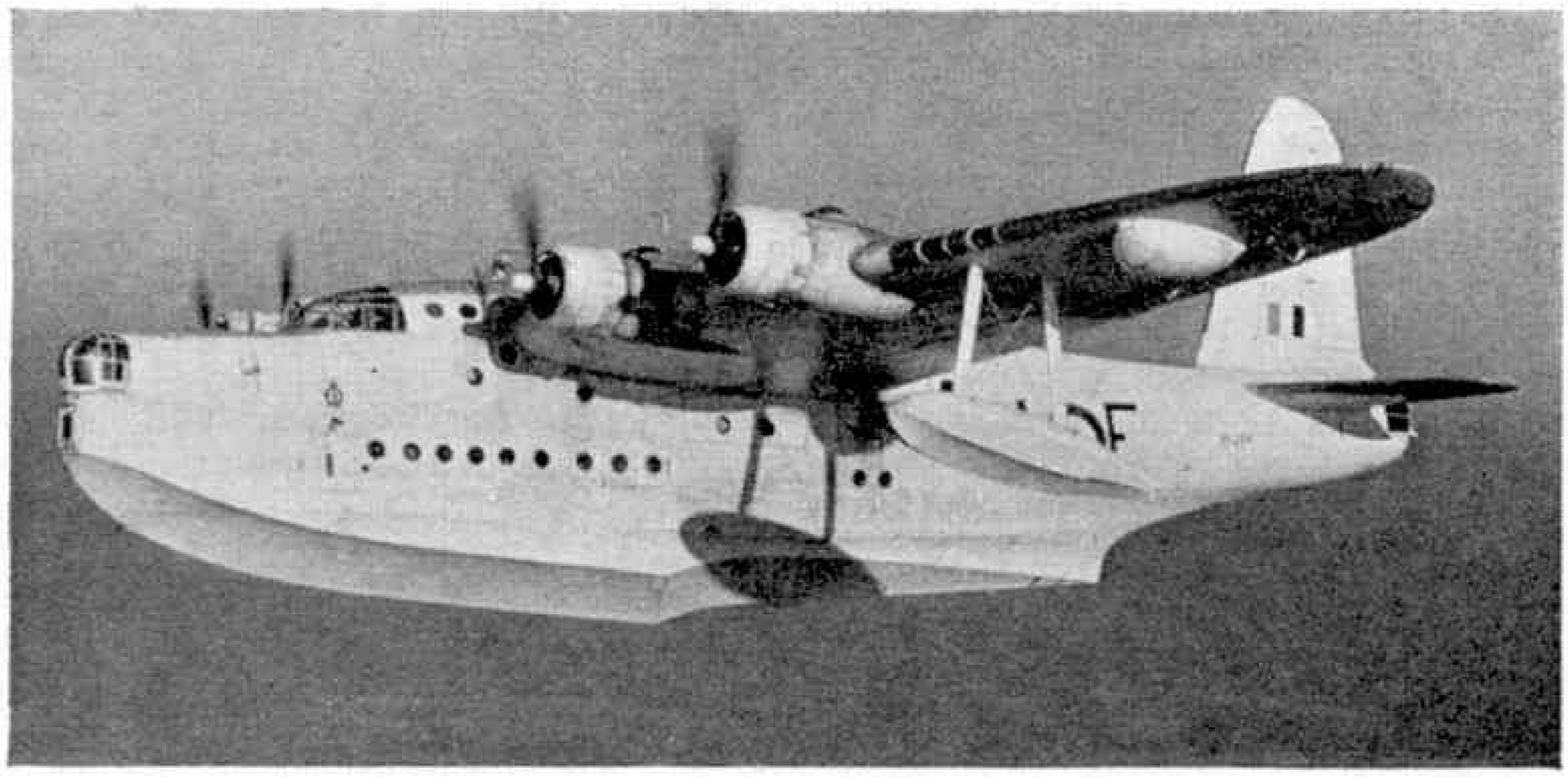


Sunderland flying boat on convoy patrol during World War II. Note the camouflage and beam guns. Imperial War Museum photograph.

his crew are said to have stayed out for seven days on one occasion.

It appears that they became bored after a few hours of patrol, with nothing hostile in sight, and decided to alight in mid-ocean in the hope that the situation might improve. With plenty of food and drink in the galley and room to go for a walk in the big hull, they suffered little inconvenience.

Eventually, they resumed their patrol, alighted again on the calm sea, and continued doing this until they decided it was time to go home.



One of Coastal Command's last Sunderland Mk.5's, powered by 1,200 h.p. Pratt and Whitney engines, and weighing 65,000 lb. The underwing blisters accommodate search radar. Photograph reproduced by courtesy of "Flight."

All this may sound good fun; but, in general, the war was a grim one for the flying boat crews of Coastal Command. Their most consistent enemies were boredom and the strain of watching constantly for a tiny periscope or a tossing lifeboat in a vast emptiness of ocean, which led one pilot to believe he saw a motor-cyclist riding along 450 miles out to sea from the Irish Coast.

Any change from the monotony was normally unpleasant, because the enemy feared the ever-watchful Sunderlands and did their best to destroy them. Often, a single 'boat was pounced upon by a swarm of enemy fighters; but the battle was not one-sided.

In April 1940, for example, a Sunderland was attacked by six powerfully-armed Junkers 88 twin-engined fighters while escorting a convoy to Norway. The first two Ju.88s came in with guns blazing, were engaged by the flying boat's beam and rear gunners and promptly retired to safety. Five minutes later, the other four enemy machines dived on the Sunderland. The rear gunner held his fire until the first was within 100 yards, then opened up with his four machine-guns and the Ju.88 crashed in flames. The next was damaged so badly that it crashed in Norway and, after trying unsuccessfully to drop bombs on the flying boat, the rest made off.

A few weeks later, the same aircraft was attacked by four Messerschmitt Me.109 fighters, one of which it shot down. As a result, the Germans soon had such a healthy respect for the Sunderland's ability to defend itself that they called it the "Flying Porcupine."

There are countless other stories of Sunderlands in action in World War II—of how they guided surface vessels to the aid of torpedoed seamen; of the pilot who dived his crashing aircraft into the submarine that had shot it to ribbons; of the crew that ran out of fuel far from land, rigged up a sail consisting of the cockpit awning fixed to a dinghy oar and radioed that they were sailing home at one knot and were scheduled to arrive in three days' time; and of many other exploits, both grim and gay.

Suffice it to say that they played an outstanding part in keeping open our Atlantic life-line in World War II, and that, afterwards, a Sunderland was the only craft able to carry a doctor to the stricken H.M.S. *Amethyst* while she lay still at the mercy of the Communist Chinese guns that had shelled her in a region devoid of airfields; and also that a Sunderland squadron from Hong Kong was the only R.A.F. unit that could be sent into action in the first three months of the Korean War, because no airfields were available for landplanes.

Remembering all this, it is difficult to believe that only 721 Sunderlands were

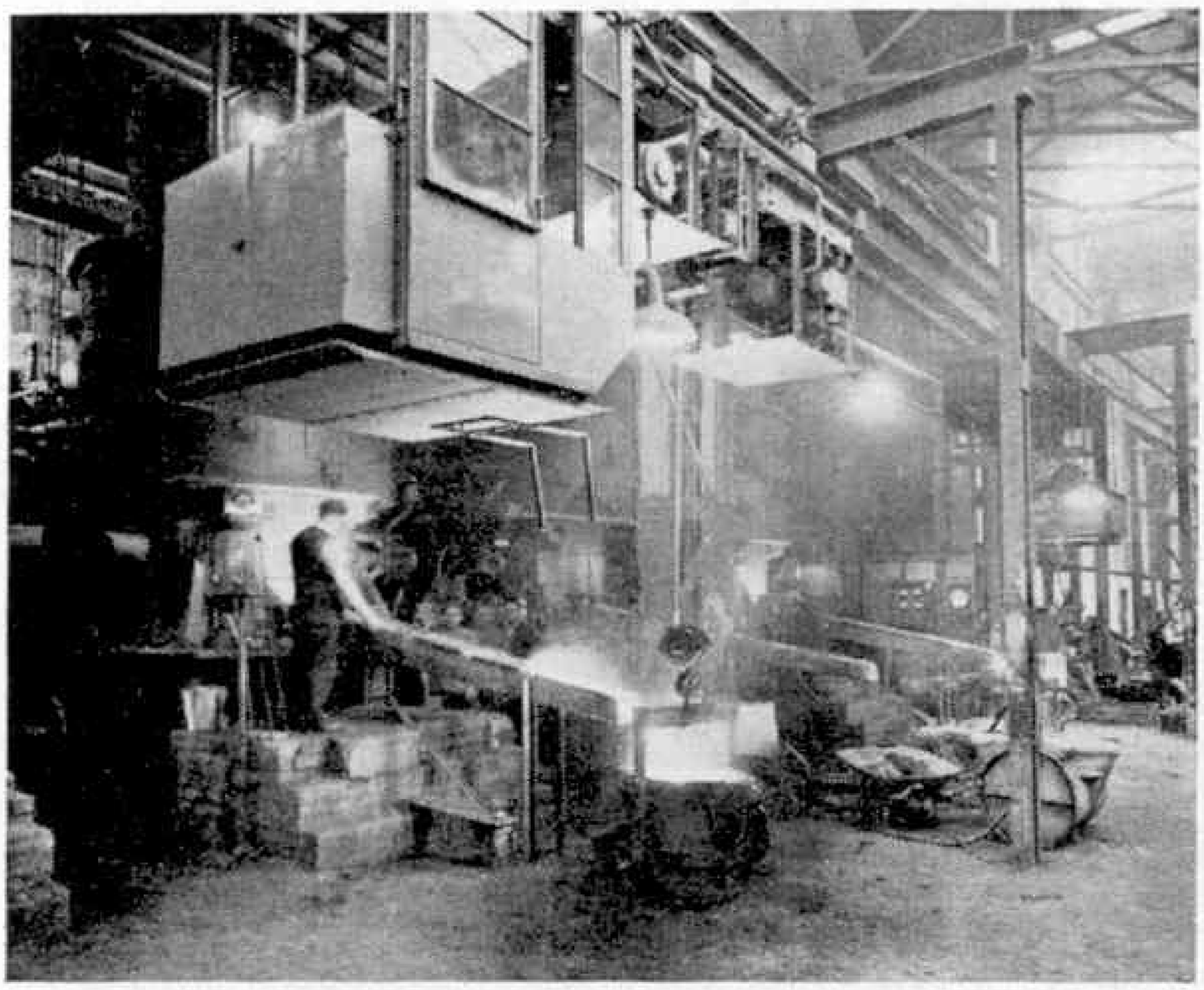
(*Continued on page 259*)

Mechanised Motor Cylinder Casting

Pouring Ladle and Mould Conveyor Kept in Step

By the Editor

OUR cover this month shows a colourful scene in a modern mechanised foundry. The casting of motor cylinders is in progress, and Chromidium, an iron specially refined by the manufacturers, is being poured from a ladle carried by an overhead crane. The moulds in which the cylinders are cast are on a moving conveyor, which means that during the pouring the crane must keep in step with the conveyor. Otherwise the metal might be poured, not into the proper opening of the mould, but over the top of it or even on the floor. Here there is no risk of that, however, for an ingenious electrical device keeps crane and cylinder mould travelling at precisely the same speed while the molten metal is being poured.



Charging the crane ladle with molten "Chromidium," a specially refined iron, for casting motor cylinders. For this illustration, and for the photograph on which our cover this month is based, we are indebted to the Midland Motor Cylinder Co. Ltd., Smethwick.

Before seeing how this device works, let us see exactly how the casting is carried out. The mould boxes are carried on a conveyor circuit to the pouring point, and after this the further movement of the conveyor allows the castings to cool down sufficiently, so that they can be removed. The empty mould boxes are then returned, still on the conveyor, to the place where they are prepared for a further casting. The necessary molten iron for casting comes from a furnace of a type suitable for the frequent tapping involved in a scheme of this kind. From it the molten metal runs into a ladle suspended from an overhead crane, which carries it to the pouring point, where its track runs parallel to the conveyor.

The process is practically continuous, and the purpose of the device already referred to is to improve and simplify the equipment and control during the pouring. The foundry shown on our cover is in the works of the Midland Motor Cylinder Company Ltd., Smethwick, and there the British Thomson-Houston patented Selsyn Synchronising scheme has been installed for this purpose.

The Selsyn is a special type of electric motor, so designed that two or more machines can be so operated that the angular motion of one is transmitted electrically to the other. In its simplest form a Selsyn system consists of a transmitter and a receiver between which there is this electrical tie. Generally both Selsyns are excited from an alternating current supply. In this instance there is a transmitter Selsyn that is driven at the appropriate speed from the drive for the conveyor carrying the moulds. The motor of the crane, which drives it along its overhead rail, acts also as the receiver Selsyn, with the result that on synchronising, which is done by just moving a switch, the two moving parts, one the conveyor carrying the moulds and the other the crane carrying the ladle from which metal is poured, move along at exactly the same pace.

In operation, it is only necessary to travel the crane alongside the conveyor until

(Continued on page 259)

Railway Notes

By R. A. H. Weight

Big Things planned for 1957-8

The British Transport Commission announces that considerable deliveries of electric and diesel equipment for railway operation are expected during this year and next. Further progress is being made in many aspects of the modernisation and improvement plans already mentioned in these pages.

Work is starting this year in connection with the electrification of the Colchester-Clacton-Walton E.R. lines in Essex, as well as those between Manchester and Crewe, L.M.R., which are to be trial sections for the high voltage A.C. traction system. Preparatory structural work is also in hand on a number of routes scheduled for early electrification. These include the main and London suburban branch tracks from Liverpool Street to Chingford, Enfield, Hertford and Bishops Stortford and to Fenchurch Street from Southend-on-Sea; extensions in Kent from the present electrified limits at Sevenoaks, Gillingham and Maidstone to the Kent coast for express and stopping services; and an area covering Airdrie, Helensburgh, Cathcart, Neilston, etc., from Glasgow.

While orders for steam freight and mixed traffic locomotives are being completed, 100 of diesel main line types will probably be placed in service. Twenty separate electric locomotives are in hand as well as large numbers of electric train sets having traction motors at each end.

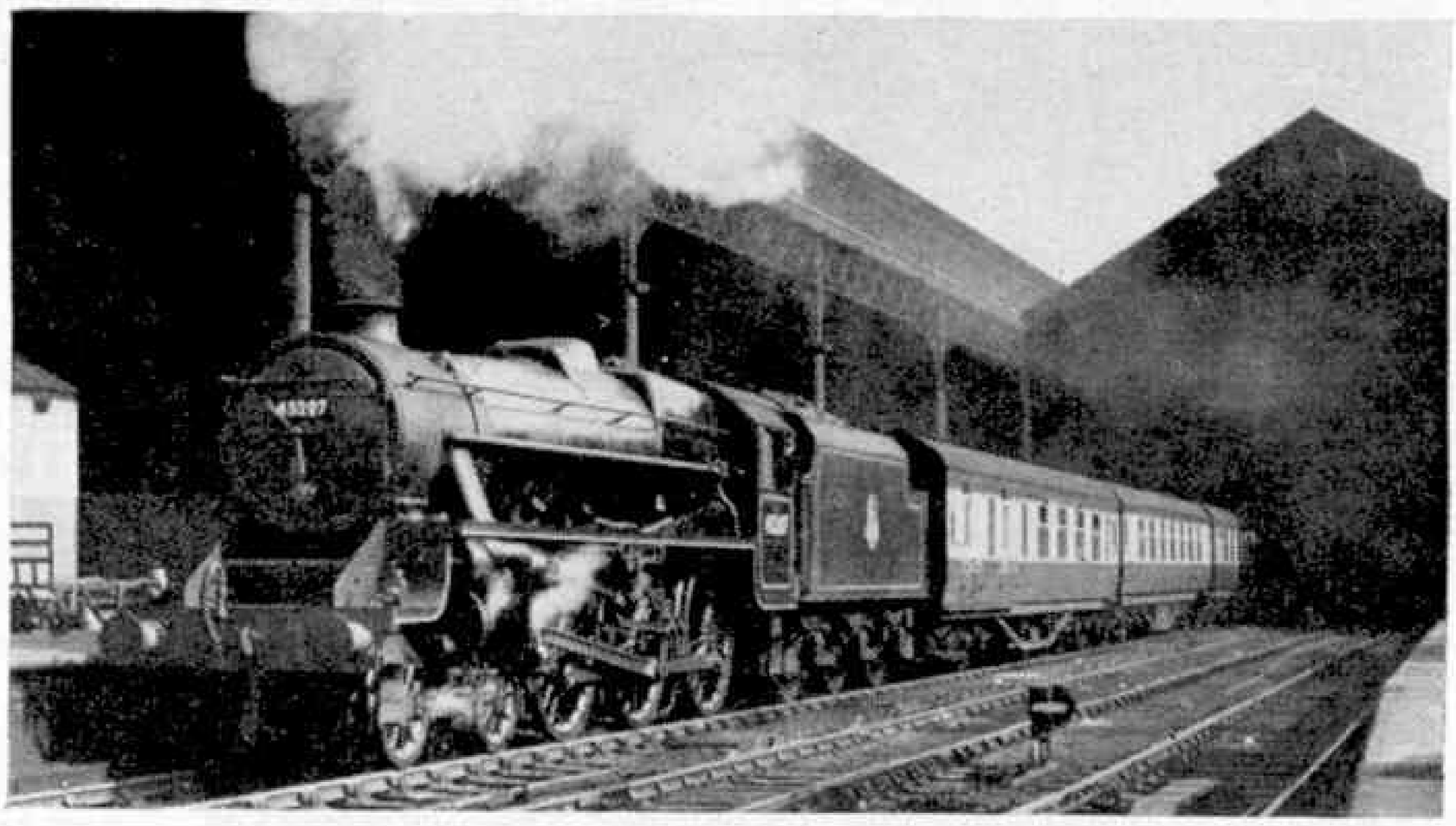
Over 200,000 freight vehicles will be built or converted, capable of running in continuously braked goods trains with the vacuum pipes connected to the engine. Other features being studied or developed in this connection include automatic couplers, quicker-acting brakes and roller-bearing or otherwise improved axle boxes.

To avoid conflicting movements on the level at the busy main line junction stations on the West Coast trunk route from Euston, Bletchley (south end) and Rugby (north end), flyover bridges are to be constructed carrying certain branch tracks over the through ones. More connecting or relief lines will be laid down near Edinburgh, Fenny Compton, Stratford-on-Avon, in S. Wales around Briton Ferry, Port Talbot and elsewhere.

Fast Travel on the Eastern Region

Many of the first series of ex-L.N.E.R. Gresley Pacifics, now class A3 and in service for 30 years or more, are still rendering fine service on principal expresses. For example, No. 60055 *Woolwinder*, stationed and manned at King's Cross, twice logged when hauling the 1.5 p.m. to Leeds as far as Grantham with a 12-coach train weighing over 400 tons, was checked by signals while getting out of London on the rise to Potters Bar. Thereafter a clear road was enjoyed, apar from a track repair slowing and the customary gentle running through Peterborough. The arrivals at Grantham were 1½ and 7 min. before time respectively, improving on the schedule of the heavier *Flying Scotsman* and in the second instance also on that given to, say, the *White Rose* or the *Yorkshire Pullman*, which pass Grantham at speed. The maximum attained on the first trip was 80 m.p.h., and the minimum up the long rise to Stoke Signal Box, Lincs., 100 miles from London, was 50; on the second, when the prowess of the locomotive and footplate crew were being displayed to grand advantage, the corresponding figures were 93 and 56 m.p.h.! Grantham, 105½ miles, was reached in 112 minutes on that occasion.

The streamlined A4s are roughly 10-15 years younger and still capable of some of the finest performances. On a Sunday southbound 12-coach express from Yorkshire that had been diverted and delayed on account of signalling and reconstruction work, *Silver Link* made a wonderful start from Peterborough, passing Biggleswade, 35¼ miles, in 32¼ min. There were three more slowings plus a short stretch of slow line running, but arrival at King's Cross was only a few minutes late. On the 8-car, 330-ton, northbound *Tees-Tyne Pullman*, No. 60021 *Wild Swan* had been stopped near Huntingdon owing to overheating trouble on a freight train ahead, so passed Peterborough 10 min. late. It is reported that the whole of this deficit was recovered, notwithstanding additional speed restrictions. Minimum uphill speeds were well over the mile-a-minute rate and maxima over 90 m.p.h.



The 2.30 p.m. express for Leeds and Bradford leaves Liverpool, Exchange, in charge of B.R. No. 45207, one of the familiar "Black Fives" of the London Midland Region. Photograph by S. Creer.

Other King's Cross A4s have also effected remarkable time recoveries with the light but very fast *Talisman* express, bound for Edinburgh and calling only at Newcastle, where engines are changed.

One of the most recently constructed 4-6-2 type, A1 No. 60157 *Great Eastern*, bringing the 500-ton southbound *Flying Scotsman* from Grantham to King's Cross after working through from Newcastle on another London duty, suffered many slowings owing to repair work or adverse signals, but took every opportunity of lively running when there was a chance. King's Cross was reached within 2 hrs. and ahead of time on the winter schedule.

New and Altered Locomotives

Lately added to stock were steam locomotives, class 5 4-6-0 Nos. 73162-3, allocated to 50A, York, and Nos. 73145-6, beginning a series of 10 for the Scottish Region having Caprotti valve gear, 65B, St. Rollox sheds, Glasgow. Class 9 2-10-0 No. 92120 was allocated to 18B, Westhouses and Nos. 92121-2 to 15A, Wellingborough. Class 4 2-6-0 No. 76079

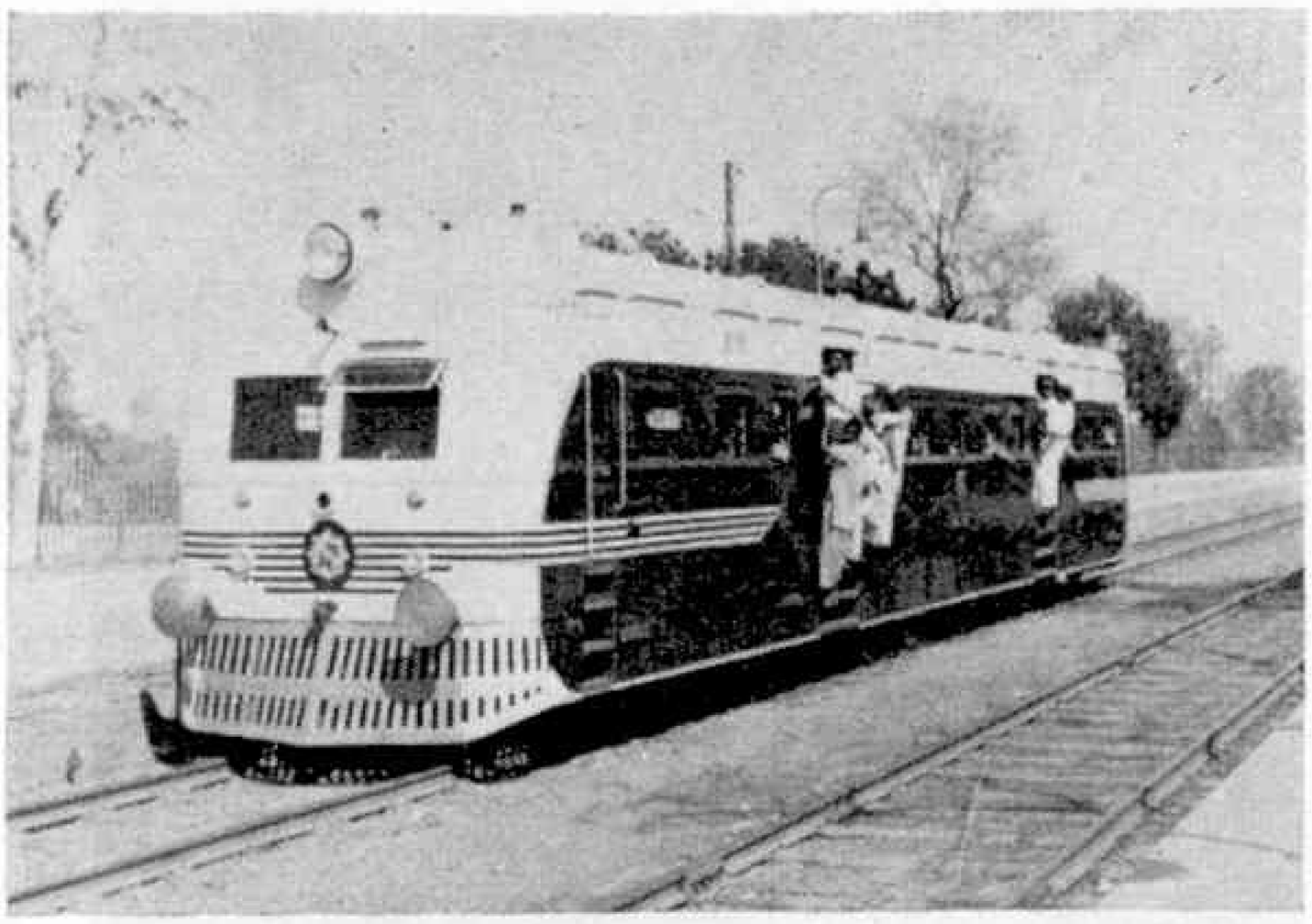
went to 10D, Sutton Oak and Nos. 76080-1 to 24D, Lower Darwen.

Other additions were diesel-mechanical shunting engines numbered 11163-4, to be stationed respectively at 32A, Norwich, and 41A, Darnall, Sheffield.

The old 4-4-0 *City of Truro*, lately returned to Swindon from York Museum, has been repainted as G.W.R. 3440 (its original number) and is booked for various Society specials this spring and summer.

W.R. light pannier 0-6-0T No. 1646 has made the long journey, hauled in freight trains, from Croes Newydd, N. Wales, to the north of Scotland for service on the Dornoch branch in place of the last ex-Highland Railway 0-4-4T No. 55053, lately withdrawn. There was no suitable locomotive in the vicinity. Believed to be the first W.R. type engine to work in Scotland regularly, No. 1646 is allocated to 60C, Helmsdale.

W.R. 2-6-0, 9302, has been renumbered 7324. Their 0-6-0T No. 5752 has been transferred to the London Transport Executive, like No. 7711.



Full up, and overflowing! A well loaded diesel railcar arrives at Mogul Pura, Pakistan. This and the illustration below are from photographs by G. Massy-Collier.

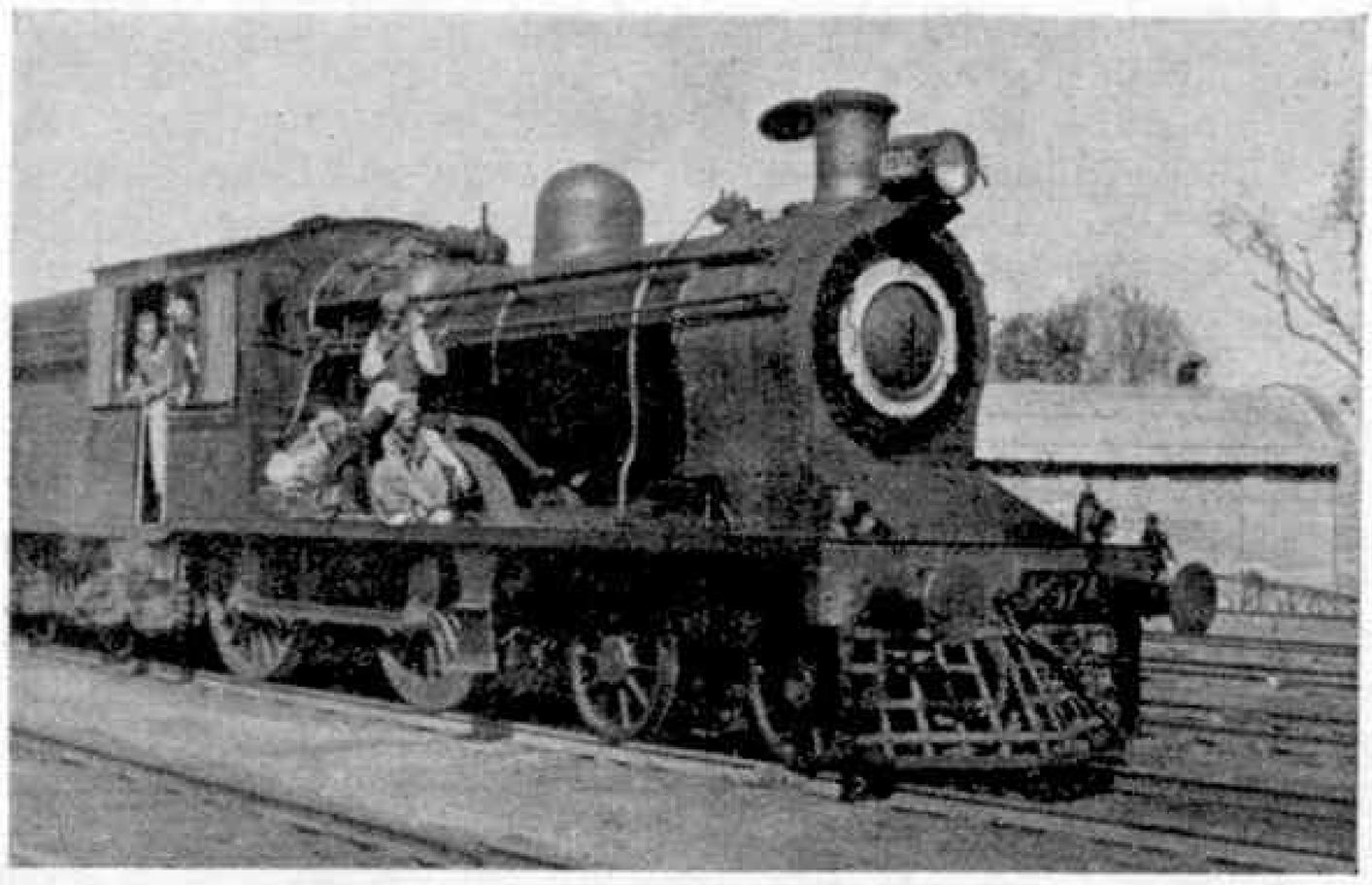
Scottish 2-6-2T No. 67619 is now V3 instead of V1 class.

Rebuilt Merchant Navy Pacifics No. 35023 *Holland Afrika Line* and No. 35026 *Lamport and Holt Line* have entered traffic. The latter is now stationed at Exmouth Junction in exchange for No. 35001 *Channel Packet*, moved to Stewarts Lane, London.

Locomotive Variety at Glasgow, Queen St.

During one of the busy periods in late afternoon at this rather cavernous terminus, Mr. G. H. Robin noted in quick succession ex-L.N.E.R. engines A3 No. 60098 *Spion Kop*, on the *North Briton* express bound for York and Leeds, via Edinburgh, and B1 4-6-0 No. 61147, heading the 4.7 p.m. express to Kirkcaldy and Leven, on the Fife Coast. Director 4-4-0 No. 62674 *Flora MacIvor* took the 4.30 through train to Perth via Alloa, and V1 2-6-2T No. 67671 assisted the Dunfermline train up the steep initial climb, the through locomotive being B.R. 2-6-0 No. 76074.

Another modern standard engine, class 5 4-6-0 No. 73077, took out the 3.46 p.m. Fort William and Mallaig train, to traverse the wild and grandly scenic West Highland route. In contrast, former North British Railway 0-6-2Ts were performing customary shunting and assisting duties.



A cheerful group of Pakistani railwaymen ride to work aboard a 4-4-0 Locomotive of obviously British origin.

More named Trains

There is no doubt that a named train attracts attention and is popular, especially when it is composed of a smart locomotive and carriages or Pullman cars with distinctive head or roof boards. With H.M. The Queen's permission, the Western Region has given the name *The Royal Duchy* to the long-standing expresses leaving Paddington at 1.30 p.m. and Penzance at 11.0 a.m. These trains serve principal stations on their daily runs between London, Devon and Cornwall and their coaches are painted chocolate and cream, as is the case with an increasing number of W.R. titled expresses.

More detail will be given when the summer train services are fully announced of the *Caledonian*, which it is intended to run on a high speed schedule from Glasgow, Central, to London, Euston and back from Mondays to Fridays, commencing in the middle of June. Other named expresses operating only during the summer season, some very popular and famous, will soon be reappearing.

Illumination of York Station

The great station at York, N.E.R., one of the largest and most important in the north of England where many lines, train services and locomotive movements converge, has been provided with a most effective new lighting system employing the cold cathode method of illumination by means of fluorescent tubes. These are suspended from or mounted on concrete pillars, and provide almost a daylight effect with the liberal supply of clearly visible station name plates and other notices. The entrance portico and concourse approached from the city and its ancient walls stand out more prominently than ever, now that the old gas lamps have been swept away.

New Training School at Derby

A new Training School was recently opened at Derby Carriage and Wagon Works to provide preliminary practical and theoretical instruction for apprentice trainees. The School is fitted out as a complete workshop with widely varied equipment, and will accommodate 90 pupils.

In Jersey green lizards are found commonly on the sunny slope of Bean Port Bay, but they are very shy and are well camouflaged.

My Green Lizard

By
L. Hugh Newman,
F.R.E.S.

WHEN I was quite young I lived on Sark, in the Channel Islands, for nearly a year. I had just left school and joined my father, helping to run his Butterfly Farm at Bexley, Kent. Our most famous client was the late Lord Walter Rothschild. On one of his visits he told us that he was looking for somebody to go and live on the Channel Islands for a whole season and make a complete collection of all the butterflies that are found there. I persuaded my father to let me take the job, and looking back on it now I suppose it was the happiest time of my life.

Naturally I had always hankered to go back again, but it was nearly 25 years before I fulfilled that wish. This time I chose to go to Jersey, because to a naturalist it is the most interesting of the Channel Islands. When England had already become separated from the Continent, Jersey was still part of Europe, all a very long time ago, of course. But it meant that certain animals and insects that are common in Europe, but missing in England, could be found on Jersey.

Now I wanted to see some of these creatures for myself, if not in England at least on British soil, and the one I was specially interested in was the Green Lizard. And so one sunny May morning I took a plane and landed on the Channel Islands again. On the very first afternoon, when I went for a walk, I noticed a sudden movement on top of an old stone wall, and there sat a most beautiful lizard, about seven or eight inches long and of a bright emerald green. I stood and watched it for a long time, and it looked back at me with its beady eyes. Then a passing car frightened it and the creature slipped away into a crevice.

After that I looked out for lizards everywhere I went. I soon discovered their favourite places. As you might expect, they seemed to like the sunny southern slopes best of all. There was one rocky promontory near the water where I found a big colony of them, and old garden walls were good places too. The males were large and bright green, with blue throats, because this was the courting season. The females seemed to be a little smaller and not quite so bright in colour. The young immature lizards were brown.

I made a point of going to the Museum in St. Helier. There I had a long talk with the curator and asked him a lot of questions about the lizards. One very interesting thing he told me was that the lizards occur also on some small uninhabited islands between France and Jersey, which are only occasionally visited by fishermen. Out there they grow unusually large because they find such a lot of food. Unfortunately I did not manage to make a trip to these islands. It would have been great fun to see a green lizard a foot long.

I mentioned to the curator that I was very keen to take one of these reptiles back with me to England, but he told me I would not be allowed to do it without an export licence. So many lizards had been sent away from the island that people began to be afraid they might be exterminated. I was going home the very

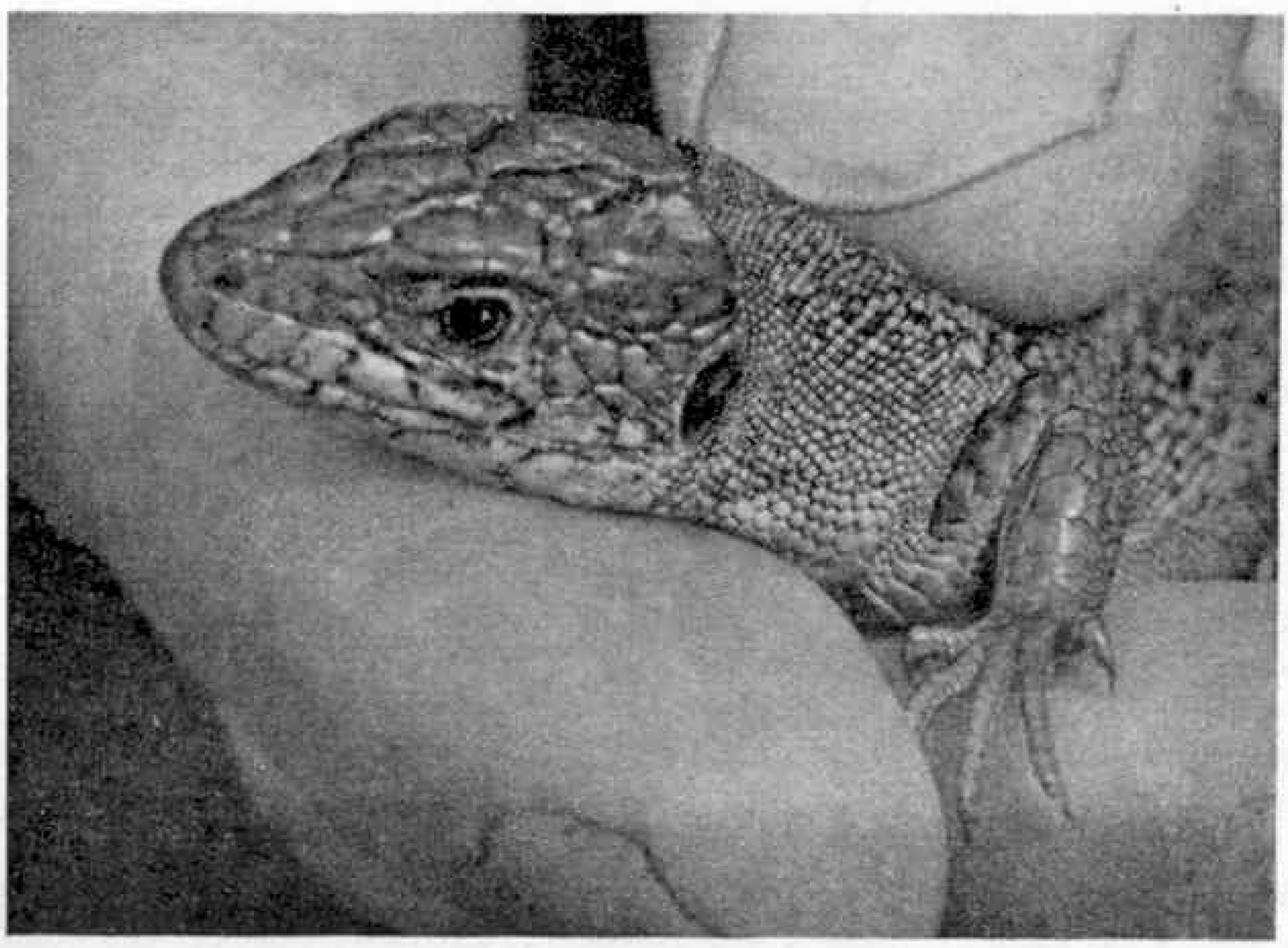
A pair of green lizards sunning themselves on a rock.

next day so there was not much time to arrange things, but he promised to ring up the authorities and see what he could do. I told him what time my plane was leaving and then I went off to try and catch a lizard.

It is peculiar that when you do not want something you see plenty of it, but cannot find it when you go out deliberately to get it. I took a friend with me, and we walked all over the headland where the lizards lived without seeing one. It was rather a dull day and they were all in hiding. We scratched about with sticks, and turned over stones and searched under gorse bushes until I got a crick in the back.

I had almost given up hope when the sun broke through and that did the trick. In a very short while lizards began to appear all over the place. But do you think we could catch one? Not on your life. I even tried with my butterfly net, but the agile creatures always got away by wriggling under the frame. At last my friend got one by trapping it in a corner between two rocks and grabbing it with his hand. It struggled fiercely, but he managed to pop it into the box we had brought with us and I quickly shut the lid. I did not have time to look at the lizard very carefully, but I noticed it was not very big. But at any rate I had one, and that was the main thing.

Next morning the licence had not come, but I decided to take the lizard with me to the airport just in case there was a chance of taking it through the Customs. If not I had decided to let it go. I had already gone inside and had my luggage weighed, and was waiting to go through the Customs, when suddenly there was a roar outside and a motor cycle drew up. A young man came running in with a large official-looking envelope in his hand. The export licence had arrived!



Close-up of a green lizard's head.

As soon as I got home to Kent I rigged up a roomy cage with sand, sods of grass and some big stones to make it look as much as possible like a hillside in Jersey. I stood the cage in a warm sunny spot in the garden and released the lizard in its new home. It was a female, so the family decided to call her Lizzie. Not very original, I am afraid, but at least it was feminine!

At first she was very shy and rushed in behind the stones as soon as anybody came near. I

hunted about for spiders and woodlice, and the children caught flies and put them in the cage, but she did not take much notice of them. I was beginning to be a bit worried, because the weather was warm and sunny and she ought to have been hungry. Then my wife said "What about some worms from the garden?" With a fork I turned over the compost heap and soon found three rather small worms. I put them on a flat rock in the middle of the cage and stood back and waited.

Lizzie came out from her hole and she saw the wriggling worms at once. She stopped dead and stared at them for about a minute. Then she made a sudden dash and grabbed one. She did not swallow it right away but started to shake the worm about, just like a terrier shakes a rat. She dropped it and picked it up several times and went on shaking it until at last she got hold of one end and managed to swallow the worm. She went on to the next one and the third as well—obviously she had been hungry.

After that we gave her worms every day and she began to be less shy and came out of hiding as soon as we brought her food. Then one day my wife caught a big bluebottle on the kitchen window and decided to offer it to Lizzie. The lizard was sunning itself on a stone and did not move when she opened the cage door. She offered the fly and after eyeing it for a moment Lizzie darted forward and took it from her hand. Our pet was tame at last, and after that first venture she would nearly always take food from our hands.

In the autumn Lizzie turned very sluggish and did not show herself for days on end. When the weather got really cold she went into hibernation and did not move at all. We let her sleep on until Christmas, when I began to worry in case she would die during the winter and decided to try and wake her up. I brought the cage right indoors, but still nothing happened.

In the end we decided to try artificial sunshine by putting an electric light bulb inside the cage. I switched on the light and moved the bulb so that it was near the corner where Lizzie was sleeping. There was not a sign of life for the first hour, but a couple of hours later I found my pet basking close to the bulb and looking very much awake. From then on we lit her private "sun" each day for two or three hours.

Mont Orgueil Castle, in the grounds of which the rare wall lizard can be seen.

When the spring came Lizzie moved out into the garden again and we refurnished her apartment with fresh grass and clean sand. She soon began to eat enormously and she then shed her skin. It did not come off in one whole piece like the skin of a snake, but rubbed off in bits and pieces. She looked rather tatty for a while, but when the last shreds had rubbed off her new spring suit was very bright and glossy.

Early that summer we adopted a stray cat. It quickly discovered Lizzie and used to sit by the cage gazing at her. Then one day the cat pounced on the perforated zinc top of the cage. It gave way, the cat fell into the cage and made a grab at the lizard. Luckily she escaped under a stone, but in the general commotion she dropped her lovely long tail. This, by the way, is not such a painful business as it sounds. A lizard's tail grows in such a way that it can be shed in a moment if it is necessary. It usually happens if the creature is grabbed by the tail, but it can drop off even if it is not touched. If a lizard is badly frightened it will leave its twitching tail behind, to distract the enemy, and make a dash for safety.

The loss of her tail did not trouble Lizzie. She went on eating heartily and soon a new

(*Continued on page 259*)

Automatic Car Parks

By the Editor

I DO not need to tell you that the parking of motor cars is one of the greatest problems of the present day. A solution of the difficulty must be found if traffic is to flow quickly and easily. One way of course would be to forbid parking in the centres of large cities and towns, but this could only be practised as a last resort. New parking grounds must be found there, and the only ways to do this are to go underground, or to erect many storied buildings in which cars can be parked.

There has been no lack of suggestions for multi-storey car parks, and one of the most interesting designs yet produced is Griggs Rotapark, a picture of a model of which is seen on this page. This is simple in action, and can be made fully automatic. It can be erected as a skeleton steel framework, without floors or walls, or it can be built as a semi-open unit, or with concrete floors and curtain walls.

The central feature of the Rotapark is a group of four lifts, arranged like a cross on a circular base. Outside each lift is a turntable. Each floor of the structure takes the form of a rotary platform, divided into four sections, one for each lift, the platform turning through a maximum of a right angle so that it can bring any parking stall to the associated lift as required. There are 32 stalls on each floor, so that a 10-storey Rotapark will accommodate 320 cars. Incidentally, it is stated that taking 320 cars off the road would be equivalent to leaving Piccadilly free of parked cars.

To park a car the driver takes it on to one of the turntables, leaving it there locked and with the brakes off. The turntable turns automatically to bring the car in line with a parking dolly in the lift. The attendant hands the driver a ticket indicating the lift and section served, the floor his car is to be parked on and the stall on that floor it is to occupy. Buttons are then pushed by the attendant to start the automatic parking operation. The first button starts the rotary platform on the floor indicated so as to bring the indicated stall into position opposite the lift. The second button sends the parking dolly out from the lift and under the car, which it then takes into the lift. This rises to the correct floor, on reaching which the dolly moves out into the parking stall, and deposits the car on U-shaped channels there. The dolly then returns to the lift, which descends to the ground floor.

All these movements, and those in reverse by which a car is brought out, require only 53 seconds. A further refinement that is suggested is complete electronic control, the driver on leaving his car on a turntable just inserting a perforated disc given him on entry in a mechanism at the lift entrance. His car is then parked in the selected stall automatically.

The erection of Griggs Rotaparks has been proposed by Lex Garages Ltd., London. One for 320 cars is estimated to cost about £200,000. Lex Garages are also interested in underground car parks, and the first of these to be built in London is planned for Finsbury Square. This will accommodate 350 cars, and four ramps will be incorporated, two for entry and two for exit, with staircases for pedestrian access.

Road and Track

By Peter Lewis

WE shall miss the green works Jaguars this year, with "Lofty" England controlling operations from the pits and Mike Hawthorn leading the team, and I for one hope that it will not be too long before Sir William Lyons decides to race his cars again. Certainly the Le Mans 24 Hour Race will not be the same without the "Jags."

The main responsibility for carrying British racing green in 1957 will be borne by the works Aston-Martins. The Feltham *equipe* intend to carry out a full season of racing, which means we shall see the cars, driven by Roy Salvadori, Noel Cunningham-Reid and Les Leston, on British circuits and abroad as well, at Le Mans, at Spa this month in a 150-mile sports car race, in the gruelling 1,000 Kilometre Race around the notorious Nurburgring and in the Swedish Grand Prix.

Aston-Martin are racing an entirely new car this year, known as the DBRI/300. It has a 3-litre engine in the chassis of the 2½-litre prototype that raced at Le Mans last year, and went extremely well for twenty-one of the twenty-four hours before retiring with transmission troubles. The maximum power of the DBRI/300 engine is 250 b.h.p. at 6,300 r.p.m. Three double-choke Italian Weber carburettors are used. The compression ratio of the engine is 9 to 1, and as the car weighs only 1,765 lb. it should be most impressive in action. In this country we shall certainly see the DBRI/300 at the Aintree British Grand Prix Meeting, and possibly before that.

The Aston-Martin photograph on this page is of the new left-hand drive car, the DB2-4 Mark III, which was shown for the first time at the recent Geneva Motor Show and is for export only. It does not surprise me to learn that the overseas demand for Aston-Martins has always been high, nearly eighty per cent. of total sales, and that most of the cars go to America, where the price of this latest model is 6,950 dollars.

I have so often maintained that racing improves the breed, and this new Aston-Martin is no exception. The six cylinder, twin overhead camshaft engine of 2,922 c.c. has a new cylinder head, with valves, ports and cam profiles all developed from the race winning DB3S.

The car can also be fitted with Girling disc brakes on the front wheels at extra cost. This is another example of safety through speed, for it was Aston-Martin who pioneered Girling disc brakes on their sports racing cars and have developed this highly desirable form of braking in the most exacting race conditions. The export Aston-Martin is the second production car to have Girling discs, as they were previously fitted to the Triumph TR3. When I drove a TR3 at Goodwood last October and tried the new disc brakes I was amazed by their forceful yet remarkably steady application from speed, and had complete confidence in them.

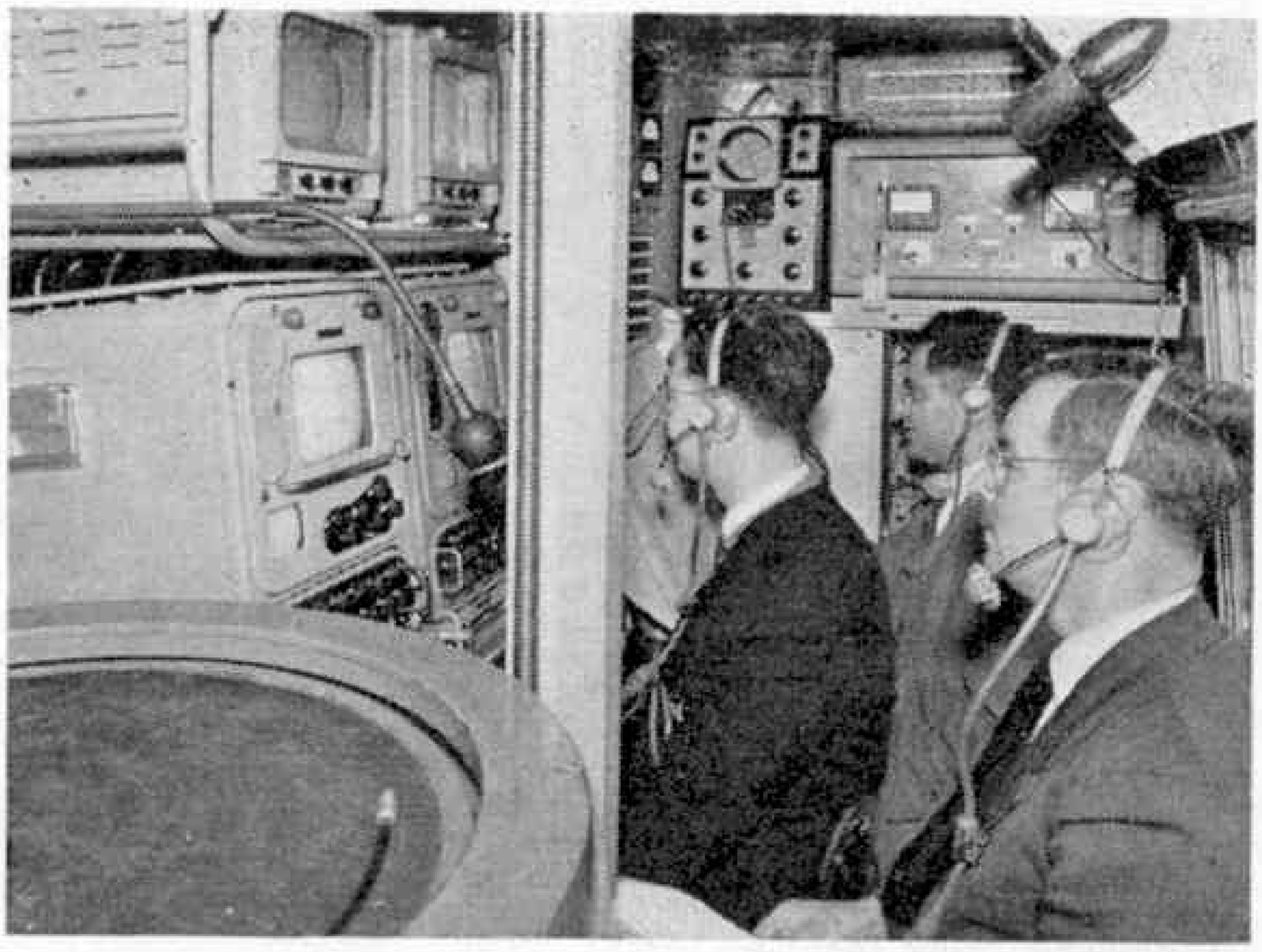
Speed with safety. The new Aston-Martin DB2-4 Mark III, which is for export only.

The Girling disc brake, pioneered and brought to its present state of development during the last six years, is a metal disc, joined to the road wheels, and revolving freely between pincer-like friction pads. When pedal pressure is applied, the pads close on the disc.

These brakes have a tremendous advantage over drum brakes in that they

dissipate heat more readily. Braking generates heat, which must be disposed of rapidly or it will cause physical changes in the lining material, resulting in loss of braking power. An ordinary drum brake is enclosed, whereas with a disc brake, five-sixths of the friction area is exposed to cooling air.

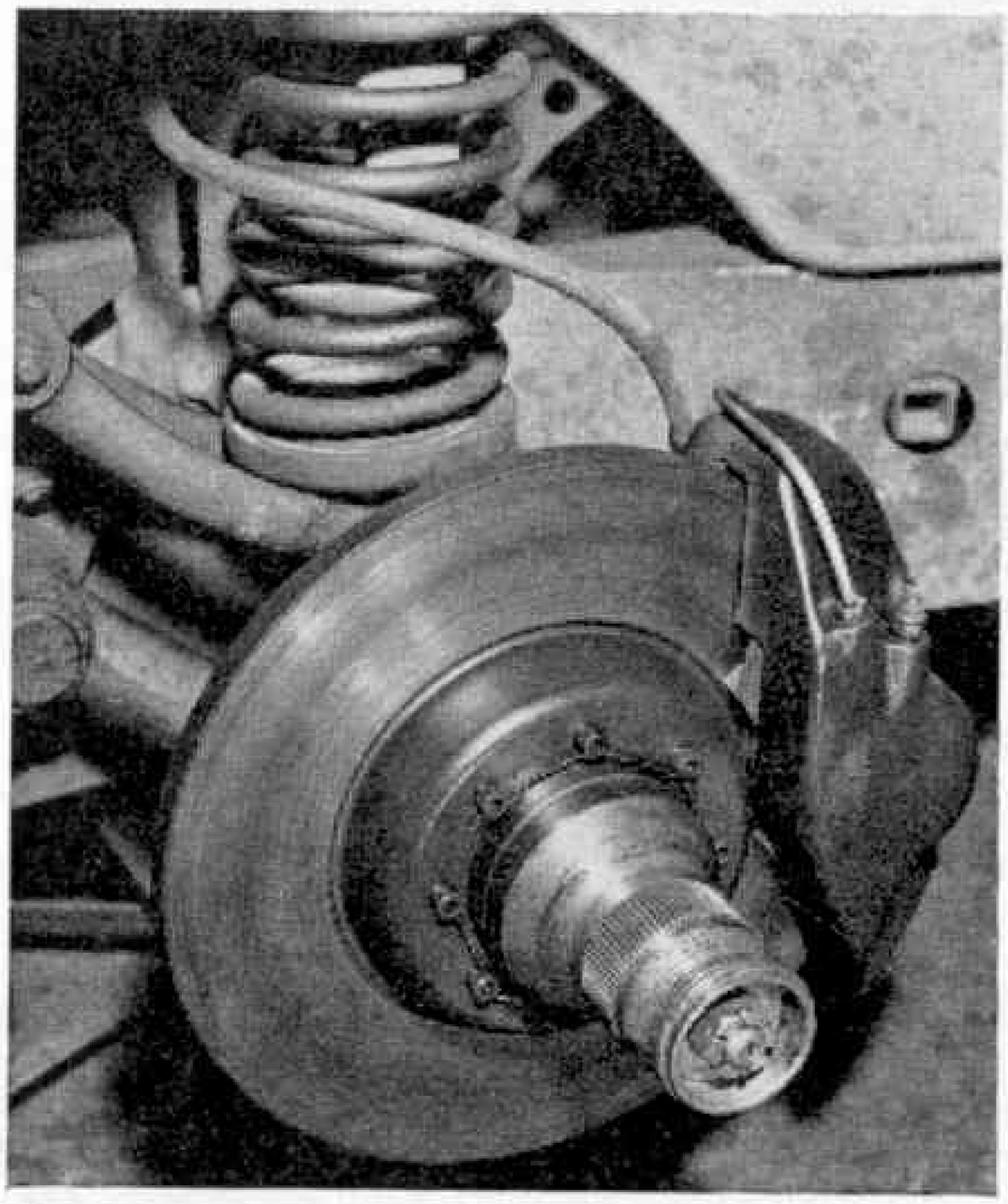
Disc brakes have several other advantages over the drum. For instance, they are self-adjusting and need no attention until the pads are worn through, while the pads themselves have at least twice the life of ordinary drum linings. For disc brakes the future seems full of promise and I am sure the day is not far off when they will be a standard fitting on the ordinary family saloon.



Operators in position in the B.B.C. Television Service Roving Eye Mark II. From left to right they are the vision operator, sound operator and producer. B.B.C. Photograph.

Roving Eyes

The Rootes Group, which loaned that ingeniously designed Mobile Workshop to Stirling Moss for three seasons, has recently supplied nine Karrier "Bantams" to the Television Outside Broadcast Department of the B.B.C. Four of them are Roving Eye vehicles, and their main feature is a three-stanchioned ring camera mounting.



The powerful and reliable disc brake is becoming more and more popular. The secret of its success is the speed with which heat developed by braking is dissipated.

The operator's platform is about three feet above the floor and above it is an aperture in the roof. The camera, on its mounting, can be raised electrically above roof level and panned through a full circle. There is a mounting for another camera beside the driver's seat so that pictures can be taken forward through the windscreen, while under the scuttle is a monitor screen that can be seen by the commentator, standing behind the driver.

Two engineers and the programme producer, with a mass of equipment including mixer controls, sit behind the central camera mounting, and signals from these camera vehicles are transmitted via six foot aerials directionally stabilised by gyroscopes working through electric motors housed in the rear compartments.

The bodies of these compact and cleverly designed vehicles were built by Mickleover Transport Limited of London on the Karrier "Bantam" chassis. The Rootes power unit, a 2,266 c.c. four cylinder petrol engine with a four speed gearbox, gives 53.5 b.h.p. at 3,000 r.p.m. The engine has been developed from the same basic power unit as that of the Humber Hawk and Mark III Sunbeam. One of the vehicles is illustrated on p. 213.

The maximum speed of the Roving Eye vehicles, with their crew and very heavy load of equipment, is in the region of 50 m.p.h. and petrol consumption ranges from 15 to 25 m.p.g. An interesting feature of the engine is the use of full length porous chromium cylinder bores, designed to prolong engine life under conditions of constant stopping and starting.

Air News

By John W. R. Taylor

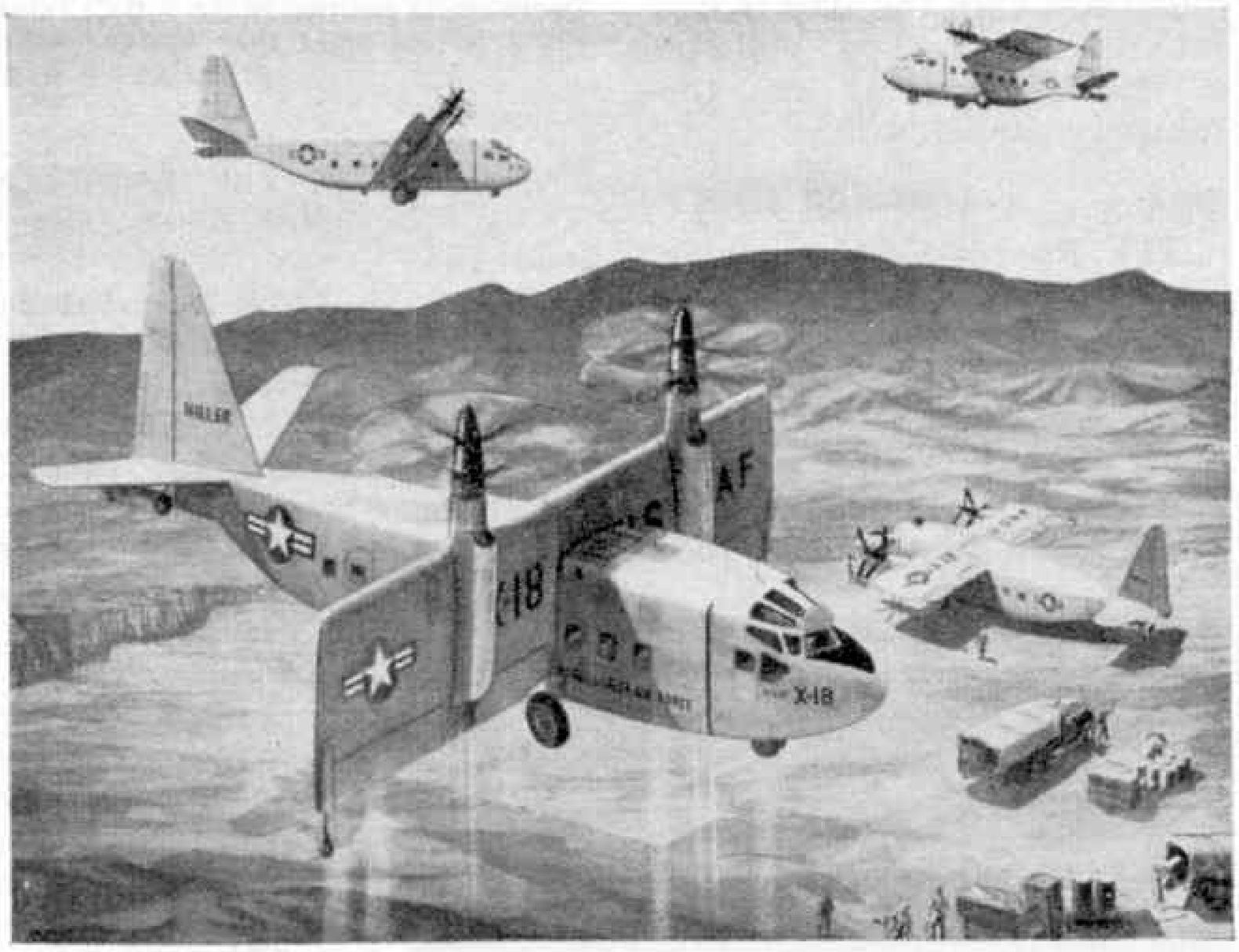
Aircraft with Tilting Wings

Latest idea for achieving vertical take-off and landing without the use of helicopter rotors is the tilt-wing aircraft. Nor is it merely the brainwave of a part-time inventor, for at least two major U.S. companies have been given contracts to develop aircraft of this type, and a drawing of one, the Hiller X-18, is reproduced on this page.

It seems to have the fuselage of one of the two Chase YC-122 Avitruc 30-seat light transports that were built for the U.S. Air Force several years ago. This would be logical, because Hiller could save a great deal of time and money by mounting their experimental wing on an existing fuselage. Two powerful turboprops are fitted in place of the YC-122's normal piston-engines, and the wing span is considerably reduced because it has to provide sufficient lift only for cruising flight.

For take-off, the wing will be turned until the engines are pointing vertically upwards, and the propellers will lift the machine into the air like the rotors of a helicopter. At a safe height, the pilot will turn the wing through 90 deg. until it is in a normal position. Such a transition is claimed to be possible without any control problems, and the two small jet engines under the tailplane will probably be used only for "steering" while the wing is vertical, as there will then be no slipstream over the rudder.

A tilt-wing aircraft will have a better payload and considerably higher cruising performance than a helicopter, although it will not be able to hover so efficiently. There might be control difficulties if one engine of a twin-engined tilt-wing aircraft failed during take-off; but on the whole it should offer greater safety than a helicopter.



This artist's drawing of the Hiller X-18 tilt-wing research aircraft shows, in the centre foreground, the X-18 demonstrating its vertical take-off ability with the wing in the vertical position. In the upper left the X-18's wing is in the transitional phase from the vertical to forward flight, while the upper right shows the 'plane with its wing in forward flight position.

Most Powerful Turbojet

Britain's leadership in aero-engine design has been shown once more by the announcement that the de Havilland Gyron turbojet is giving, with reheat, a thrust of 25,000 lb. So far as is known, no other jet engine in the world can develop so much power.

The Gyron was designed originally as a private venture, and it was not until the prototype engine had proved its tremendous power capabilities that the Government awarded de Havilland a development contract. Since then Gyrons have completed thousands of hours of test-bed running and have also been flown extensively in the Short Sperrin bomber prototype.

No details may yet be given of production aircraft in which the Gyron will be fitted; but de Havilland have pointed out that it would form an ideal power plant for a supersonic bomber, an interceptor fighter able to fly at three times the speed of sound, or a long-range guided missile.

Helicopter Formation Flight

Sabena opened their new Brussels-Paris helicopter service in a most impressive manner on 3rd March last, by flying seven of their 12-seat Sikorsky S-58s in formation between the two cities. The service, which links the Allee Verte in the heart of Brussels with the Place Balard in central Paris, is operated five times daily on weekdays in each direction and once on Sundays.

Back-to-Front Rockets

Rockets have been used for many years to assist heavily-loaded aircraft into the air, particularly from the decks of aircraft carriers. The Royal Norwegian Air Force have now reversed the process by firing rockets of this kind forward instead of rearward, to slow their aircraft after landing.

The use of forward-firing rockets enables an F-84G Thunderjet fighter to be brought to a halt within 2,000 ft. As a result, the R.N.A.F. can now land their F-84Gs quite safely on the short (3,758 ft.) runway of their maintenance base at Kjeller. Previously, aircraft due for overhaul or repair had to land at the airfield at Gardermoen, where they were dismantled and taken by lorry to Kjeller.

Viscounts Ahead of Schedule

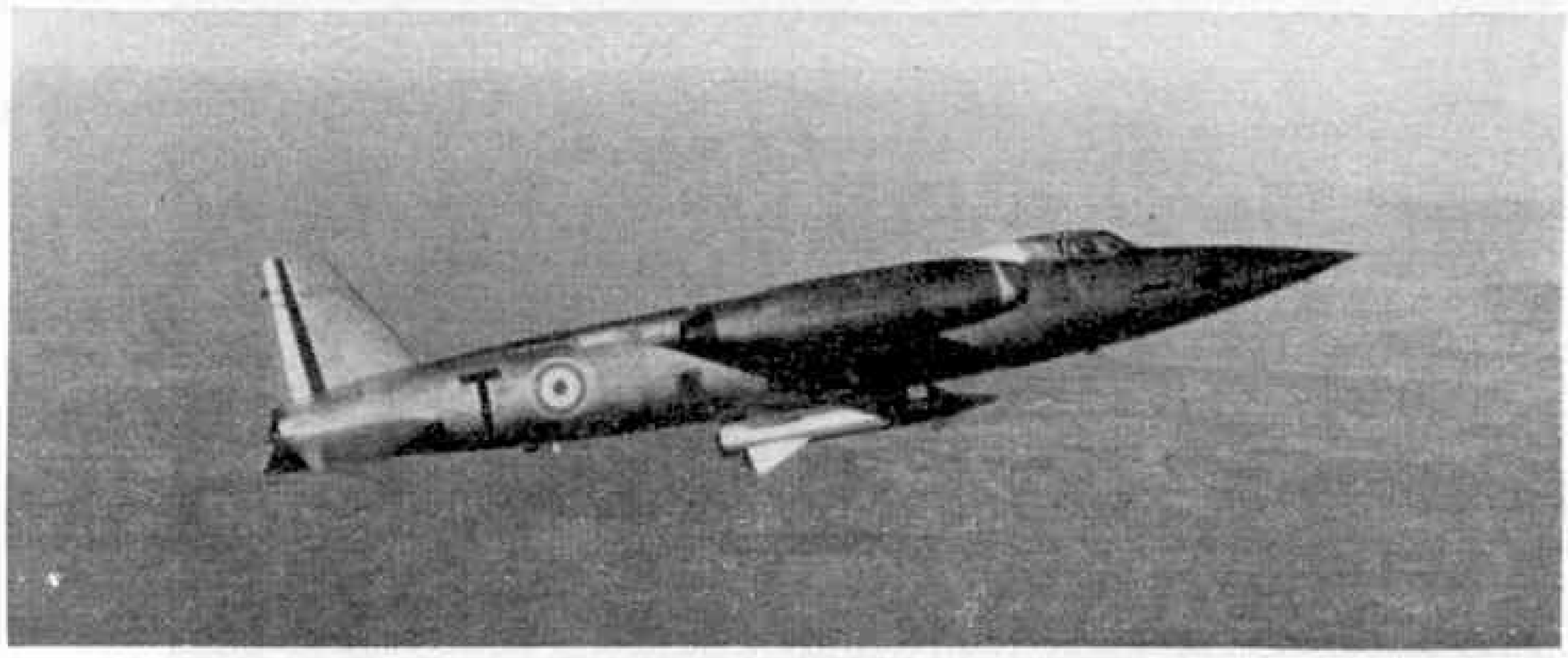
British companies are often accused of being slow to deliver aircraft, so it was good to learn recently that the last of the 60 Vickers Viscount turboprop air liners ordered by Capital Airlines of America in 1954 completed its production test flights about six weeks ahead of the contract date. It was a particularly interesting machine, being the first Viscount to carry storm-warning radar in its nose—an installation which changes slightly the shape of the nose-cone.

Last July, Capital ordered a further 15 Viscounts, for delivery by August this year.

Progress with the Trident

The French Ouest-Aviation company continue to report excellent progress with their S.O.9050 Trident II lightweight interceptor, and the latest photograph, reproduced on this page, shows one of these aircraft with a powerful air-to-air guided missile mounted under its fuselage.

Newly-released performance figures credit the Trident with a top speed of more than 1,300 m.p.h., the ability to take off and land in only 550 yds. and to climb to almost 50,000 ft. in 2½ min. from a standing start. The Viper turbojets mounted on its wing-tips enable it to cruise at low speeds for quite long periods, and it can accelerate rapidly to supersonic speed at any moment by switching on the 6,600 lb. thrust SEPR 631 rocket motor in its rear fuselage.



The French S.0.9050 Trident II cruising on jet-power with an air-to-air guided missile mounted under its fuselage.

When sufficiently-accurate guidance systems have been developed, Ouest-Aviation plan to instal them in an advanced version of the Trident, take out the pilot, and turn it into a high-performance pilotless ground-to-air missile.

Sky-Writing Brought Up-to-date

A completely new idea in aerial advertising has come from Japan. A smokescreen is spread several thousand feet above the ground by a helicopter, to form a screen on to which a giant film projector flashes 90 ft. high pictures and words.

New Safety Device

A tiny piece of equipment, made from an ordinary hypodermic syringe, is helping to avoid the possibility of engine failure on jet and turboprop air liners.

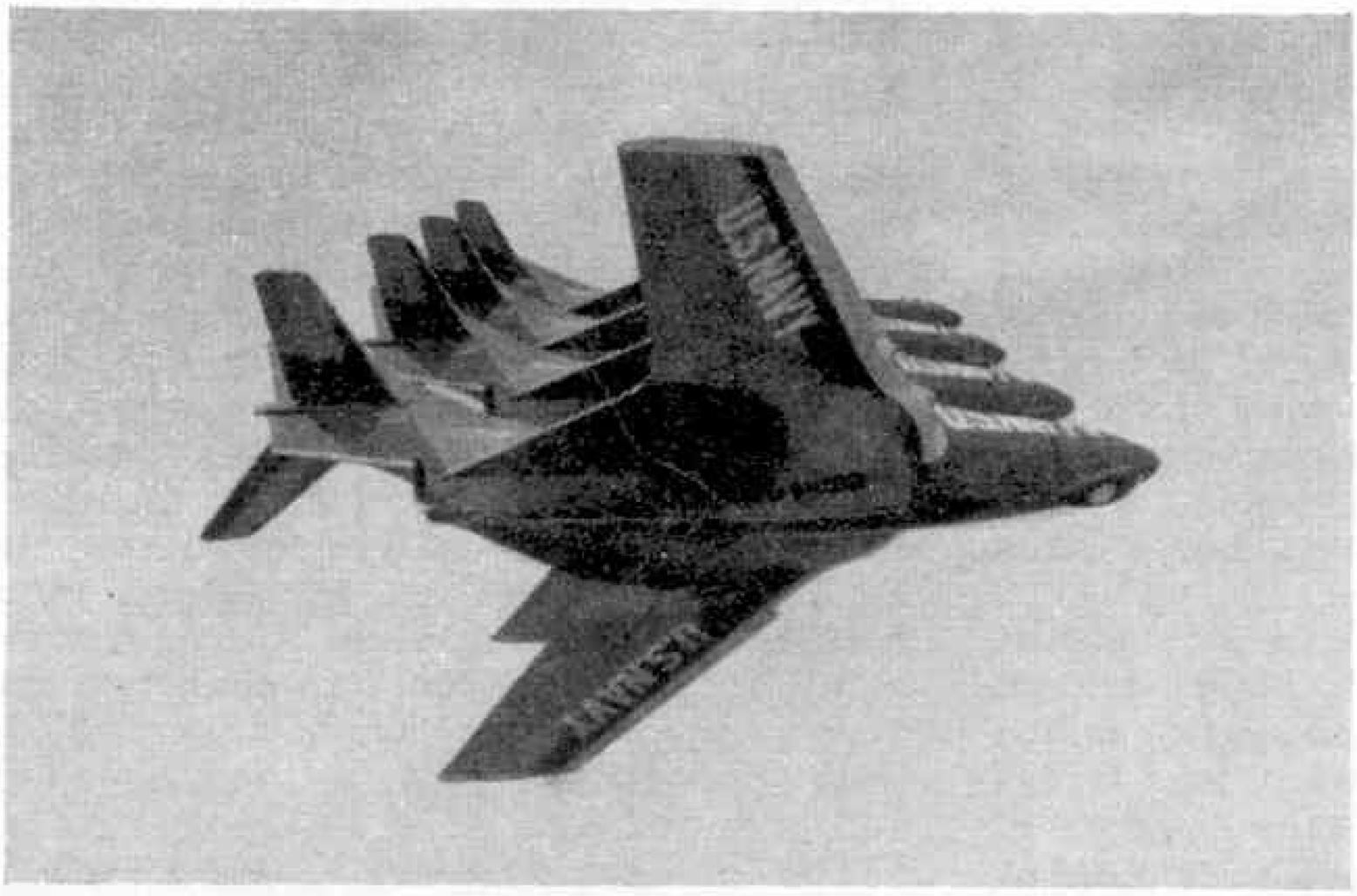
Devised by the Shell company's Thornton Research Centre, it can detect the presence of as little as .003 per cent. undissolved water in aviation turbine fuel. This is very important, because jet aircraft fly at heights where the air temperature may be anything from minus 10 to minus 70 deg. F., and if the fuel in the tanks is allowed to cool below zero any undissolved water will freeze, forming ice that may block the filters in the fuel system. Cut off from its fuel supply, the engine will then stop.

This possibility is remote on aircraft like the Viscount, which has a heater to keep the fuel warm. Use of the Shell detector to make sure that fuel delivered to the aircraft is virtually free of undissolved water will go further towards removing the danger completely.

All-Through Jet Training

As expected, the Royal Air Force have decided to adopt the Hunting Percival Jet Provost T.Mk.2 as their next dual-control basic trainer, following highly-successful service tests with a batch of these aircraft at the R.A.F. Station Hullavington. Pupils who flew these little jet-planes from their first day in the air reached after 80 hrs. the standard of skill normally reached after 120 hrs. in piston-engined Provosts, and their repertoire of aerobatics was not only more extensive but flown with more accuracy and dash.

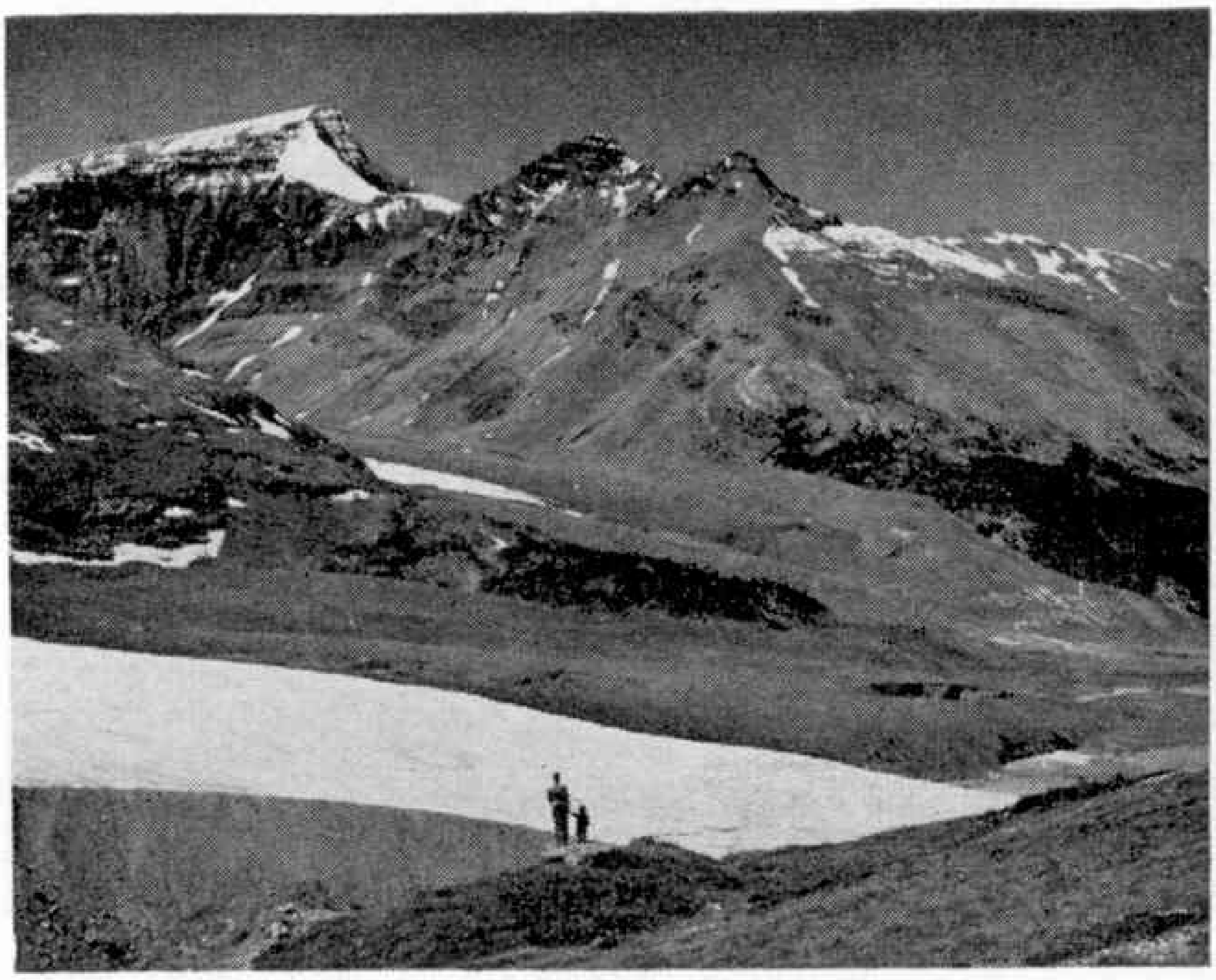
The results of the service tests have silenced completely those critics who predicted that a 330 m.p.h. aircraft with a 1,750 lb. thrust Viper engine and retractable undercarriage would be too much of a handful for a new pupil. Nevertheless, the R.A.F. deserve to be congratulated on their courage in taking this further step at a time when other air forces have not even dared to follow their earlier replacement of low-powered primary trainers by the 550 h.p. Provost.



Formation flying by the "Blue Angels" aerobatic team of the U.S. Navy, on Grumman F9F-8 Cougar jet fighters.

The "Blue Angels"

This remarkable photograph shows the standard of formation flying achieved by the U.S. Navy's official aerobatic team, the *Blue Angels*. Regular performers at American air displays, they fly 710 m.p.h. Grumman F9F–8 Cougar sweptwing fighters, powered by a 7,250 lb. thrust Pratt and Whitney J48–P–8 turbojet and so equipped that a coloured spray can be streamed from their wing-tips during the performance.



Athabasca Glacier, with Mount Kitchener in the background, a scene in Jasper National Park.

Rocky Mountain National Parks

By W. H. Owens

IF you lived in Canada you might spend your holidays exploring in the great National Parks of the Rockies, which contain some of the world's most thrilling scenery. More and more young Canadians are doing so every year. Against a background of snow-capped mountains, glaciers, lakes, forests and waterfalls, there is every kind of recreation to enjoy. You can go boating or canoeing on the mountain lakes and tarns, swim in pools fed by hot mineral springs, or climb rugged peaks that soar up to 10,000 feet or more into the sky.

There is a chain of mountain camps stretching for hundreds of miles along both slopes of the Rocky Mountains. Some of them are in wild and beautiful regions reached only by trail, afoot or on horseback, and consist of log cabins around a main building in the woods or on the shore of a lake. Excursions by horse or pack-pony along the trails, which wind far from civilisation to ever finer viewpoints, are a big attraction for young explorers who make their headquarters at one of the mountain camps.

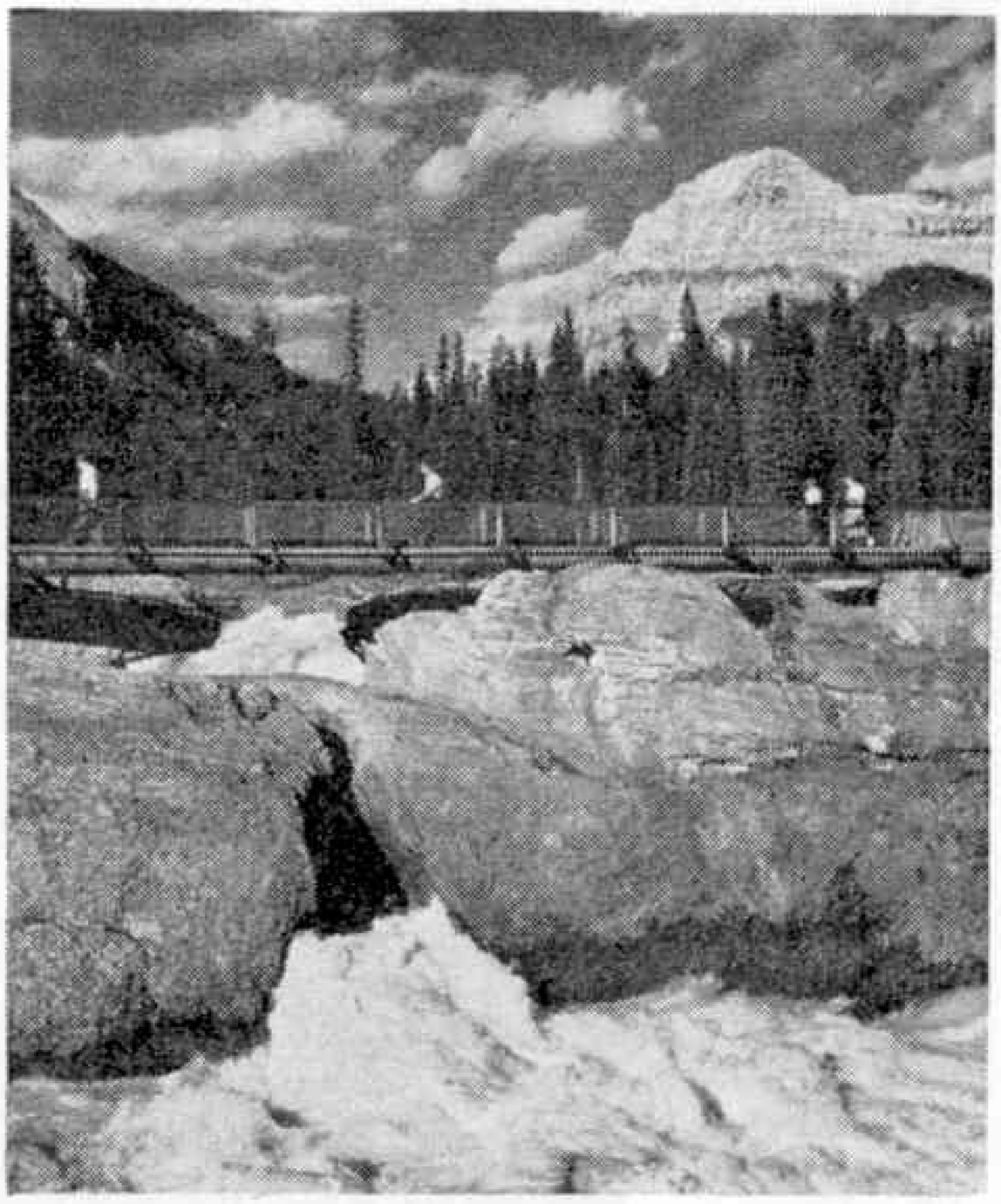
On the Alberta or eastern side of the great Continental Divide are Banff National Park and Jasper National Park, linked together by a modern highway that brings some of the most breath-taking scenes of the Canadian Rockies into close view of the traveller. Not so long ago this route was impenetrable save to trail riders or explorers on foot. The 186-mile Banff-Jasper Highway plunges through a primitive wilderness, flanked by towering peaks and by glaciers that descend in frozen cataracts from the vast Columbia Icefield, said to cover more than a hundred square miles. Even in midsummer tourists stop by the road to enjoy snowmobile trips on the icy tongue of the Athabasca Glacier.

In some places the Banff-Jasper Highway reaches a height of nearly 7,000 feet above sea-level as it crosses the mountain passes. Many of the peaks visible from the road rise to well above 10,000 feet and are eternally snow-capped. At other points the tourist can stop to explore deep canyons, and experience the thrill of watching great waterfalls roaring out of the rocky chasms. The strangely silent mountain lakes reflect faithfully the colour and shape of the rugged peaks and the ever-changing sky.

Banff is the oldest and perhaps the most varied of all the National Parks. It contains what has been aptly described as a "sea of mountains," upon which, as elsewhere in the Rockies, many daring climbs have been recorded by members of the Alpine Club of Canada during its annual summer camps in Alberta and British Columbia. While there remain many unconquered peaks to challenge the expert mountaineer, the beginner has a wide choice of climbs to test his skill and endurance.

The founding of Banff National Park—the first of nearly thirty that span the Dominion today—followed the discovery,

A natural bridge over the Kicking Horse River, in Yoho National Park, British Columbia.



by railway surveyors, of mineral hot springs on the slopes of Sulphur Mountain above Banff town site. That was just over seventy years ago. From an initial 10 square miles surrounding the springs, the Park has since grown to 2,564 square miles. The hot springs are still a popular attraction. Three of the five principal springs now supply swimming pools and baths that are much used by tourists and campers. A natural curiosity at the Cave and Basin Springs is a cave in the shape of a huge vase. This was formed by the action of a subterranean hot spring which bubbles up in the centre of a large pool.

Across the Continental Divide from Banff is the Yoho National Park, entered by way of the Kicking Horse Pass. The pass is a famous name in railway history and achievement, for it takes the Canadian Pacific trans-continental line through the central Rockies en route for Vancouver. Almost a century ago this region was thoroughly explored by an expedition led by Captain Palliser. The geologist accompanying that expedition was Sir James Hector, who discovered and named the Kicking Horse Pass after he had suffered a kick from one of his pack animals.

The Indian word "Yoho" is really an exclamation, meaning "It is wonderful." And there could hardly be a better description for these 500 square miles of glacier-riddled peaks, spectacular waterfalls and canyons, and alpine lakes of unbelievable colouring. The Kicking Horse River is the main artery of travel through Yoho National Park, and is followed by the motor highway and the railway. At one point the original Canadian Pacific line followed such a steep gradient that trains had difficulty in surmounting it. So it was replaced in 1910 by famous spiral tunnels which—a superb engineering feat—carry the line through rock tunnels over a double loop switchback.

Kootenay National Park, linked to Yoho on the south, was established thirty-six years ago to preserve the beauties of the Banff-Windermere Highway. This was the first motor road constructed through the central Rockies. Today it is a link in the 5,000-mile

The Great Divide in Kicking Horse Pass, altitude 5,332 ft. Streams with their sources on one side of this line flow to the Pacific Ocean, those starting on the other to the Atlantic.

coast-to-coast Trans-Canada Highway which is now in course of completion. Kootenay is in effect a national highway park, extending back about five miles either side of the road over a distance of sixty miles or so. Its outstanding attractions include an amazing iceberg lake, radium hot springs, waterfalls in abundance, and wild life of all kinds in the deep evergreen forests ranged along the foothills of the mountains.

Interesting wildlife is of course a feature of all the Rocky Mountain Parks, for they provide sanctuary conditions for animals and birds alike. So you may come upon black and grizzly bears, the swift-footed mountain elk, cougar and mule deer, and also the smaller wild species like the beaver, marten and marmot which inside park boundaries are safe from the trapper. Alpine flowers thrive too, and in the higher and remoter valleys it is common to find whole meadows and slopes thickly carpeted with them, particularly in the late spring.

Atop of Sulphur Mountain, in Banff National Park.

Largest of all these playgrounds of the Canadian Rockies is Jasper National Park, Alberta, extending over some 4,200 square miles to the north-west of Banff. In this Park there are still great tracts of mountain wilderness into which few alpinists have penetrated, and which remain just as they were before the coming of the white man to North America. Yet for all its remoteness Jasper has more historical associations than most other sections of the Rockies, and is closely linked with the earliest days of Canadian discovery.

One of the first white men to visit what is now the Jasper Park area was David Thompson, a celebrated explorer and geographer of the early nineteenth century. His crossing of the Athabasca Pass in 1811 opened up a travel route followed for many years afterwards by fur traders and others on their way to and from the Pacific coast. Right at the summit of the snowy pass is a small lake known as the Punch Bowl, near which Sir George Simpson, Governor of the Hudson's Bay Company, treated his followers to wine during his crossing in 1824. About two years afterwards the Athabasca Pass was abandoned as a travel route in favour of Yellowhead Pass farther north, and the latter was chosen in 1911 as the better route for a railway.

The Athabasca Valley also figured in the commercial rivalry for the traffic in furs—a struggle that was finally ended in 1821, when the North West Company was merged with Hudson's Bay Company. Jasper Lodge, which still stands and gives the Park its name, was a trading post of the former nearly a century and a half ago.

Away to the west, in the Selkirk Mountains of British Columbia, the C.P.R. line to Vancouver crosses the 500 square miles of Glacier National Park. This is the only one of Canada's National Parks served exclusively by the railway, since no motor roads have been constructed across its rugged terrain. Visitors, who are mostly alpinists or winter sportsmen, detrain at Glacier Station, from which a whole series of park trails radiate to camp-sites and places of interest.

Mount Revelstoke Park, the last link westward in this chain of National Parks, is at a general elevation of 6,000 feet above sea-level. So visitors to this thrilling corner of British Columbia can literally enjoy the unique experience of holiday-making above the clouds while keeping their feet on the earth.

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.

Aircraft Refuelling in British Somaliland

While flying as passenger in a Valetta aircraft from Nairobi, in Kenya, to Aden, a touch down was made for refuelling at Hargheisha, in British Somaliland. I was interested to see the method of refuelling employed. Although a little primitive, it seemed completely effective and entirely suited to a small African airfield.

The small bowser, its tank protected from the direct rays of the Sun, was towed into position. The fuel was then forced up the pipe by operating a hand pump at one end, and was fed to the wing tanks through a chamois filter, which is incorporated in the bucket-like affair that can be seen in the photograph reproduced at the foot of the page.

The operation took about half an hour, just time to stretch one's legs and enjoy coffee and biscuits.

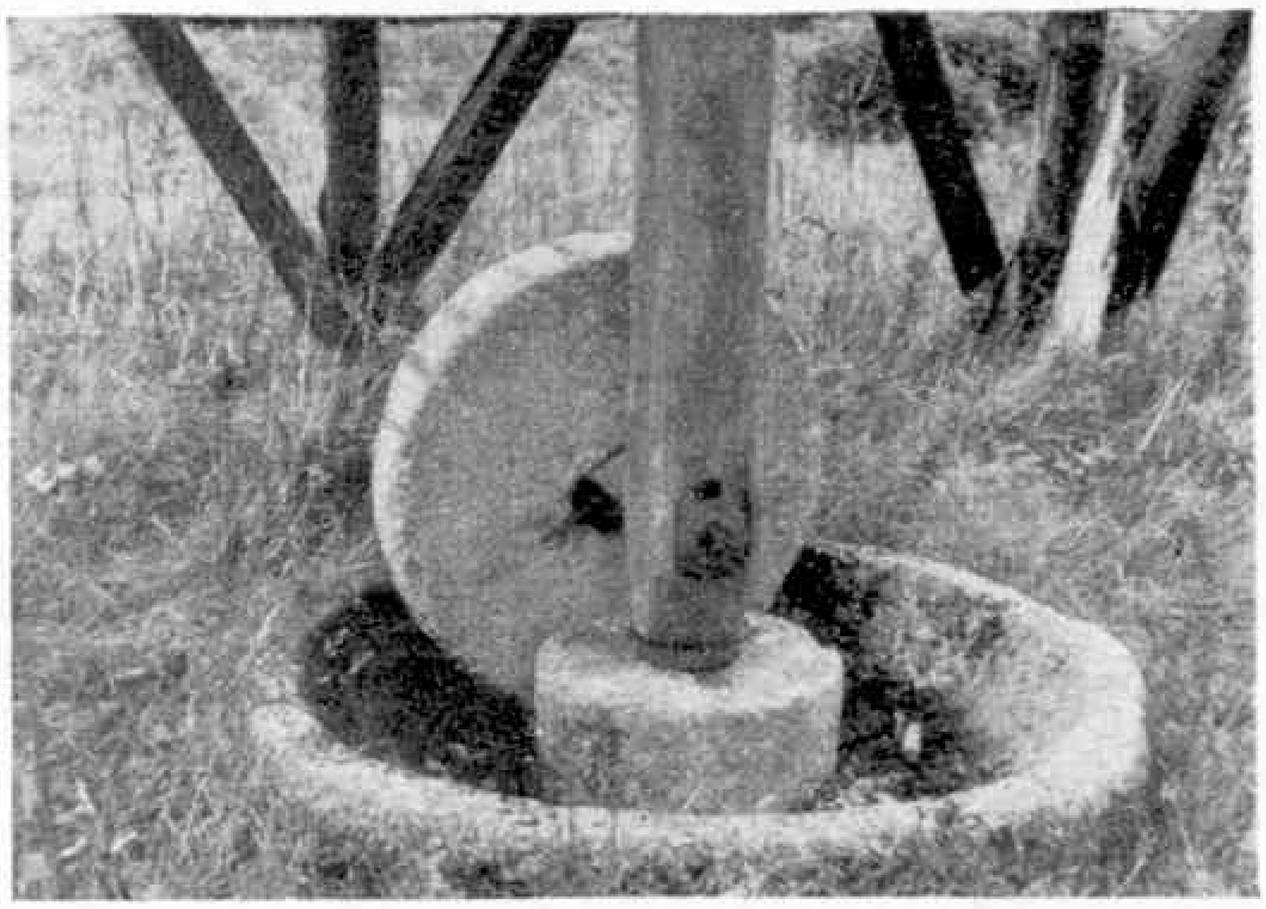
F. R. JOYNSON (Harrogate).

A Cider Press on Dartmoor

On one of my weekly Dartmoor rambles I came across the cider press illustrated in the photograph reproduced on this page. It is near the reservoir at Burrator, which supplies water to Plymouth.

The press consists of a stone roller rotating in an annular groove in the circular base stone. Attached to the rotating stone is a long wooden rod, to which a horse or an ox was harnessed, thus providing the necessary power to drive the crushing wheel.

The rotating wheel is provided with a series of serrations, which grip and crush the apples. Although the shed in which it is housed has long since fallen into decay the actual mechanism is in reasonably good order. In certain districts there are actually a few presses of this kind that could still be put to work. Some of these have even outlasted the adjoining orchards!



A disused cider press on Dartmoor. Photograph by D. Pemberton, Plymouth.

The uses of these presses were not confined to the making of cider. They were also used for the making of dyes from the bark of trees, and even for the pulping of rags, etc., for paper production.

D. PEMBERTON, (Plymouth).

A Valetta aircraft being refuelled at Hargheisha, in British Somaliland. Photograph by F. R. Joynson, Harrogate.

HAVE YOU JOINED YET?

THE DINKY TOYS CLUB

Founder and President : ROLAND G. HORNBY

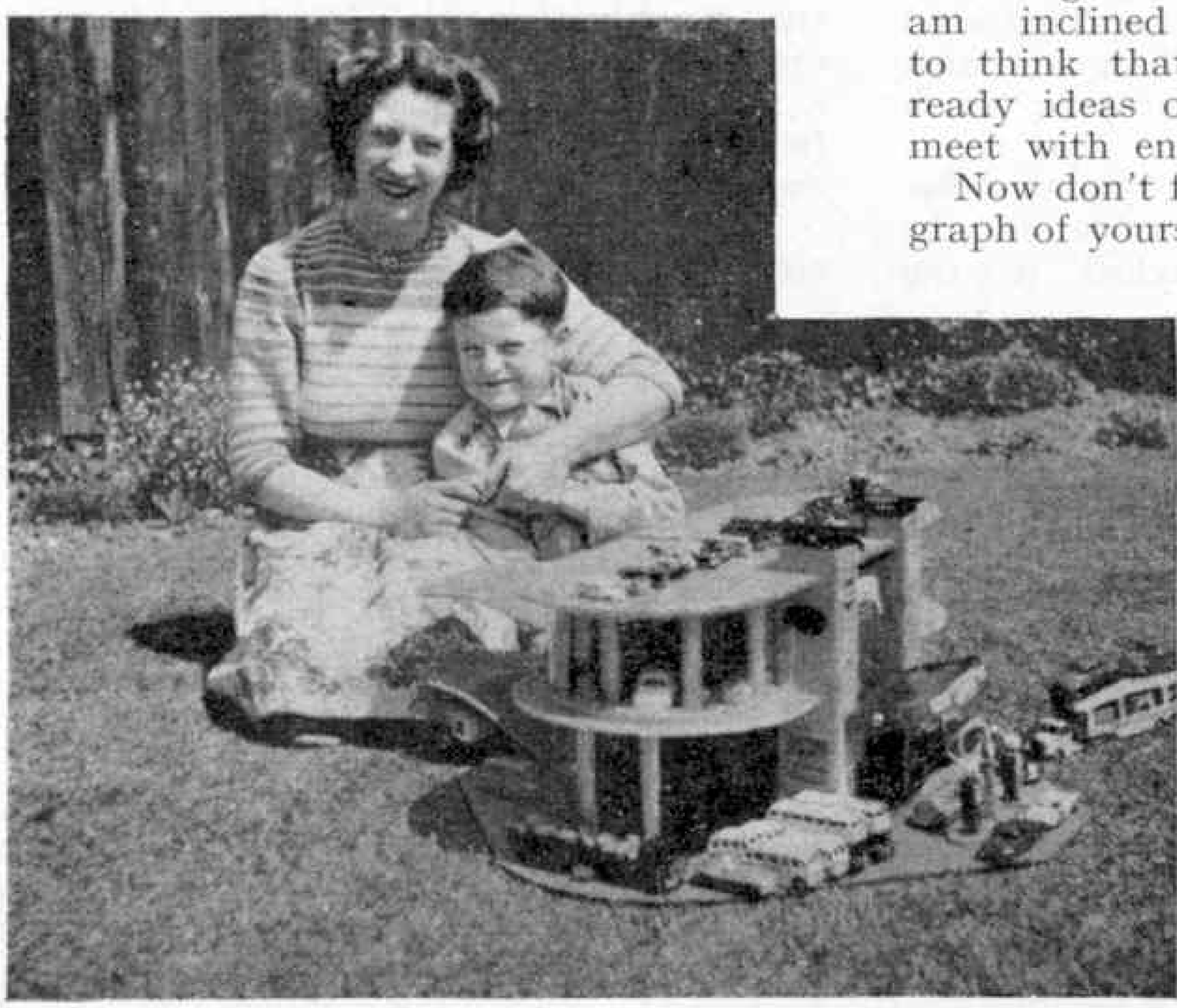
HAVE you sent in your application for membership yet? If for some reason you have not, make up your mind to do so now. Just write to the Secretary, Dinky Toys Club, Binns Road, Liverpool 13, enclosing a postal order for 1/- to cover the cost of the handsome enamelled Badge and Certificate of Membership.

And now, here are two keen Dinky Toys owners who *have* joined and are enjoying it. Paul Smart, who lives at Quinton, Birmingham, is very lucky indeed, for his father has made a really splendid model of a modern garage for his collection of Dinky Toys vehicles. Paul is seen with his mother and the garage in the lower illustration on this page, and I am sure that you will all agree that his father has made a really excellent job of that garage.

The other picture on this page shows a very keen two-year-old member James Gudgin, who lives at Reading. He already has over 75 Dinky Toys, and as he is too young to write to me himself, his elder brother took on the job of secretary! I gather that young James also has an eye on his brother's Hornby Trains and is delighted when he can get at them on his own—although I am inclined to think that his somewhat rough and ready ideas of railway operation do not meet with entire approval!

Hi There! This cheerful two-year-old is James Gudgin, Reading, owner of over 75 Dinky Toys and a proud member of the Club.

Now don't forget—if you have a photograph of yourself playing with your Dinky Toys send it to me. I may be able to use it in the Magazine. Also, if you have any good ideas or know of some novel Dinky Toys game that you would like to share with your fellow members, write and tell me all about them.



This fine model of a modern motor garage was built by the father of young Paul Smart, Birmingham, who is seen here with his mother. The garage makes a splendid setting for Paul's numerous Dinky Toys vehicles.

MECCANO MAGAZINE

Junior Section

owners do not seem to bother. Those who just run their trains as fast as they can miss many of the finer points of model train operations.

The station board seen in the picture at the foot of the page, which has been sent me by Mr. L. Hunt, is clearly the result of an effort to provide guidance for all-comers, for it is in five languages. It was made as a guide to an R.A.F. station during the war, and is still there to serve the railway to Singapore. On the right is the Chinese version, and below the English one are renderings in Malay, Tamil and Siamese respectively.

Patrick Woodworth, who lives in Bray, in Eire, is seen above absorbed in the running of his elder brother's Hornby-Dublo trains. He is only 5½ years old, but with his brother he has some really good times working trains at scale speed, with the whole family joining in the fun. This is a subject about which some Hornby-Dublo

Easy Model-Building

Spanner's Special Section for Juniors

Swing Boat—Shipyard Crane

THE simple model Swing Boat shown in Fig. 1 can be built from parts in Outfit No. 1 and construction should begin by bolting a $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate to each of the longer flanges of a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate. Then fix a $5\frac{1}{2}''$ Strip 1 to each side and connect their upper ends with a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip. Now pass a Crank Handle 2 through the lower holes of the Strips 1 and the centre holes of the Flexible Plates, and fit a 1″ Pulley to the plain end of the Crank Handle to hold it in place.

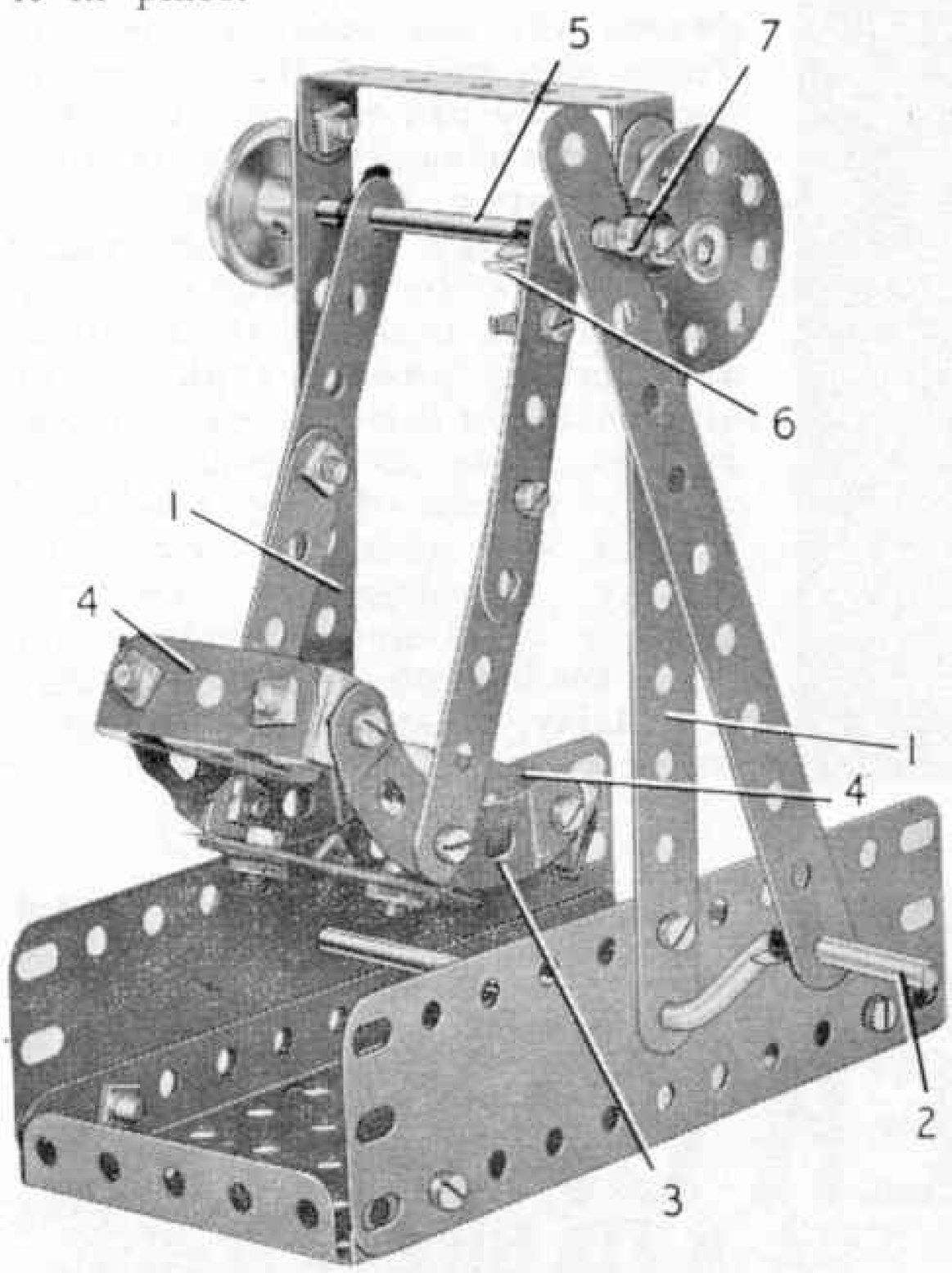


Fig. 1. This simple Swing Boat can be built from parts in Outfit No. 1.

Each of the arms supporting the Swing Boat is made from two $2\frac{1}{2}''$ Strips overlapped two holes. Bolt each arm to a $2\frac{1}{2}''$ Stepped Curved Strip 3, and connect the Curved Strips by Angle Brackets to Trunnions 4. The bottom of the Swing Boat is made from two Flat Trunnions fixed to Angle Brackets attached to the Curved Strips by the same bolts that fix in place the arms.

Pass the upper ends of the arms over a $3\frac{1}{2}''$ Rod 5, and use Spring Clips to hold them in place. Now bolt an Angle Bracket 6 to one arm and press it against the lugs of one of the Spring Clips as shown. Fix a 1″ Pulley and a Bush Wheel on the Rod and bolt a Fishplate 7 to the Bush Wheel. After this pivot a $5\frac{1}{2}''$ Strip on a $\frac{3}{8}''$ Bolt held in the Fishplate by two nuts, and pass the lower end of the Strip over the Crank Handle, using a Spring Clip and a Washer to prevent the Strip from sliding over the bend in the Crank Handle. The model is then complete.

A list of the parts required to build this model will be found on page 259.

Outfit No. 5 contains all the parts required to build the Shipyard Crane shown in Figs. 2 and 3. The main members of the Crane tower are four $12\frac{1}{2}''$ Angle Girders. These are connected at their upper ends by four $5\frac{1}{2}''$ Strips and four $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates. Four of the bolts used for this purpose support also Obtuse Angle Brackets, and to these are attached $5\frac{1}{2}''$ Strips 1. The lower ends of the Girders are connected by four $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plates and two $5\frac{1}{2}''$ Strips, one of which is indicated at 2. A $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate 3 is bolted between the Strips 2.

The Strips 1 are connected in pairs by $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips. Then $2\frac{1}{2}''$ Strips 4 are bolted to the lugs of the Double Angle Strips. A 3″ Pulley 5 is fixed to Angle Brackets bolted to the Strips 4. Two bracing strips, each made from $2\frac{1}{2}''$ Strips, are attached to the Strips 1 as shown.

Each side of the boom or jib is formed by built up strips 6, 7 and 8. Strip 6 consists of a $5\frac{1}{2}''$ and two $12\frac{1}{2}''$ Strips. Strip 7 is made from two $12\frac{1}{2}''$ Strips and strip 8 is formed by a $5\frac{1}{2}''$ and a $2\frac{1}{2}''$ Strip. The outer ends of strips 6 and 7 are connected by a $1\frac{1}{2}''$ Strip, and a Flanged Sector Plate 9 is bolted in position. One half of a Hinged Flat Plate is bolted to the rear end of strip 6.

The sides of the boom are connected at the front by two $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle

Strips, by two similar parts between the halves of the Hinged Flat Plate, and by a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flanged Plate bolted between the Flanged Sector Plates. A 3″ Pulley 10 is bolted to the lugs of Double Brackets attached to the $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flanged Plate. A Rod fitted with a Road Wheel is passed through the Flanged Plate and the Pulley 10, and is fixed in the boss of the Pulley 5.

Two $12\frac{1}{2}''$ Strips 11 are bolted to a $1\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip fixed to the front of the boom, and they are connected by Double Brackets to the strips 6. The Strips 11 form rails for the travelling carriage, and stops are provided by Fishplates at the ends of the Strips. The carriage is formed by two $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips connected by Fishplates, with 1″ Pulleys fixed on 2″ Rods. A 1″ fixed Pulley 12 and a 1″ loose Pulley 13 are placed on a $1\frac{1}{2}''$ Rod held in the carriage by a Spring Clip. A $3\frac{1}{2}''$ Rod held at the front end of the boom by Spring Clips, carries a $\frac{1}{2}''$ loose Pulley 14.

The carriage is traversed by turning a Bush Wheel fitted with a Threaded Pin. The Bush Wheel is fixed on a Rod 15 carrying a $\frac{1}{2}''$ Pinion that drives a 57-tooth Gear on a Rod 16. A length of Cord is tied to a Driving Band looped round the rear of the carriage, and is passed four or five times round Rod 16. The Cord is passed along the boom over the carriage, round Pulley 14 and then is tied to the front of the carriage, the Cord being pulled tight in order to stretch the Driving Band. Another length of Cord is tied to a Crank Handle 17, passed over Pulley 12, round a 1″ loose Pulley 18, over Pulley 13, and then tied to the front of the boom. Pulley 18 is mounted on a $\frac{1}{2}''$ Bolt attached by nuts to two Flat Trunnions. A small Loaded Hook is similarly mounted on a second $\frac{1}{2}''$ Bolt.

The sides of the control cabin are $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates strengthened by $2\frac{1}{2}''$ Strips and bolted to the boom. The front and the floor are further $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates supported by Angle Brackets, and the back is a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate. The roof consists of two $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Triangular Flexible Plates.

Three Road Wheels are fixed on a Rod mounted in the halves of the Hinged Flat Plate. A $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate, two Semi-Circular Plates and four Wheel Discs are bolted to the Double Angle Strips at the rear of the boom. The Road Wheels, Wheel Discs and Plates serve as ballast weights to balance the boom.

(Continued on page 259)

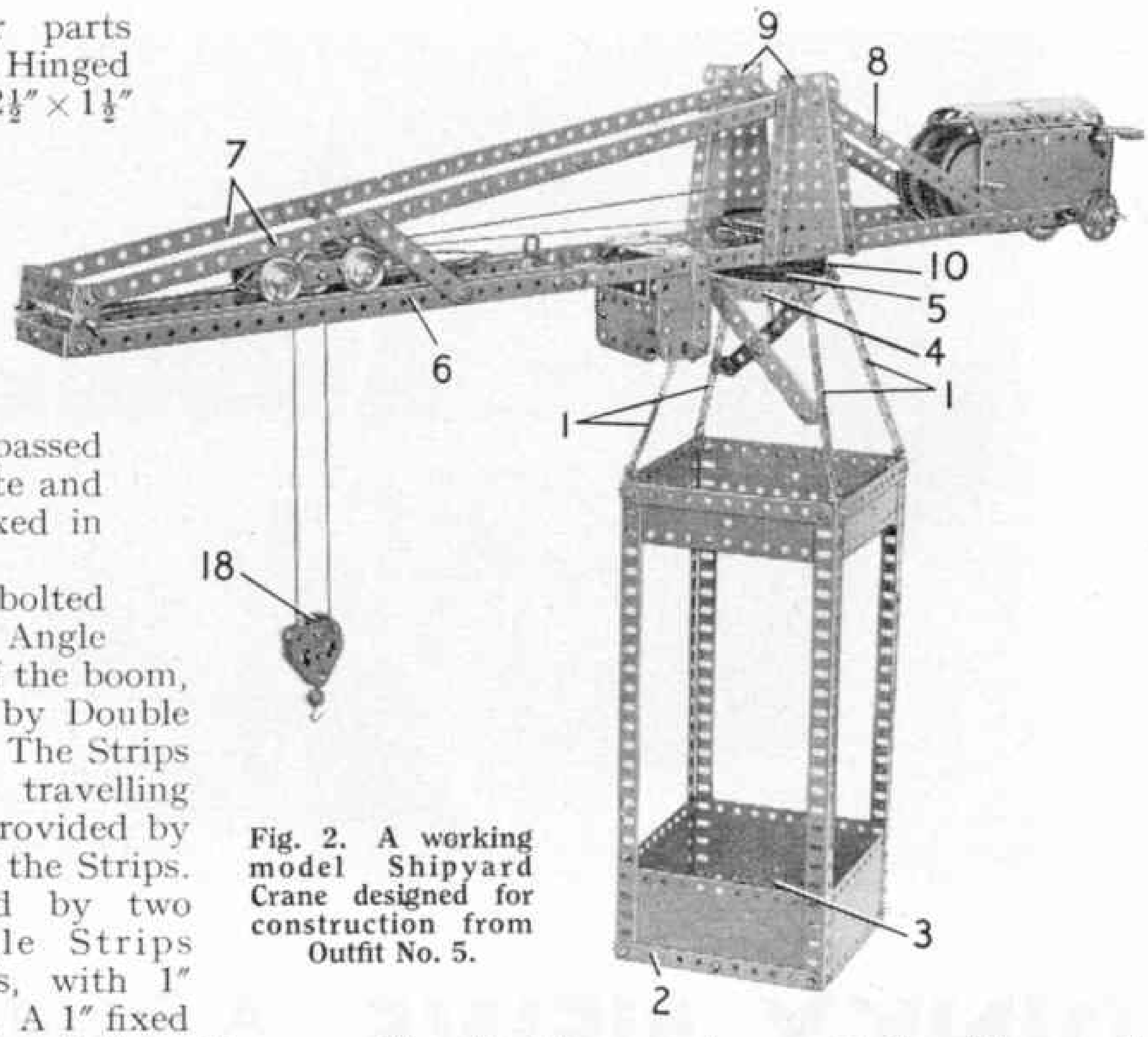
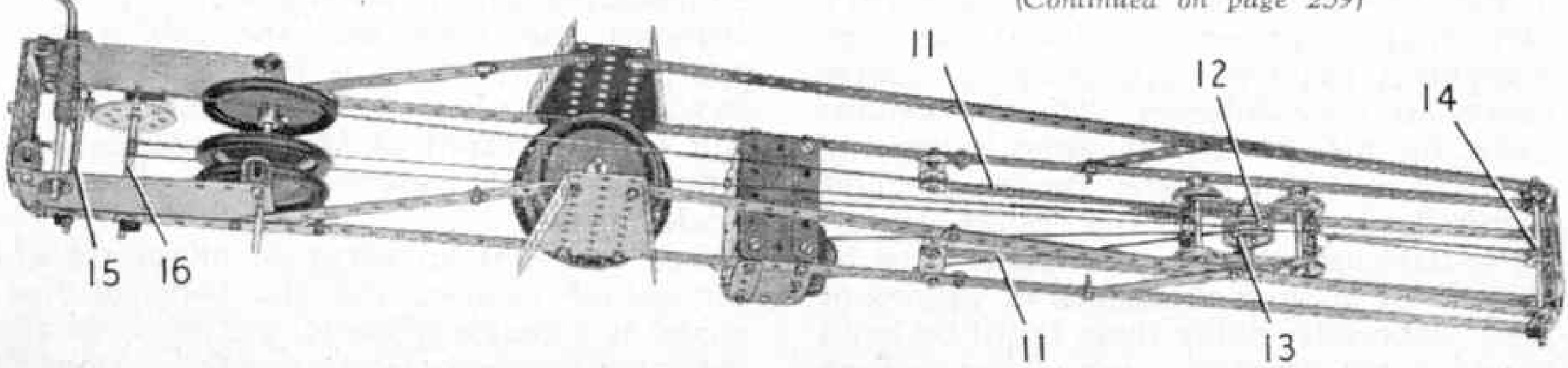
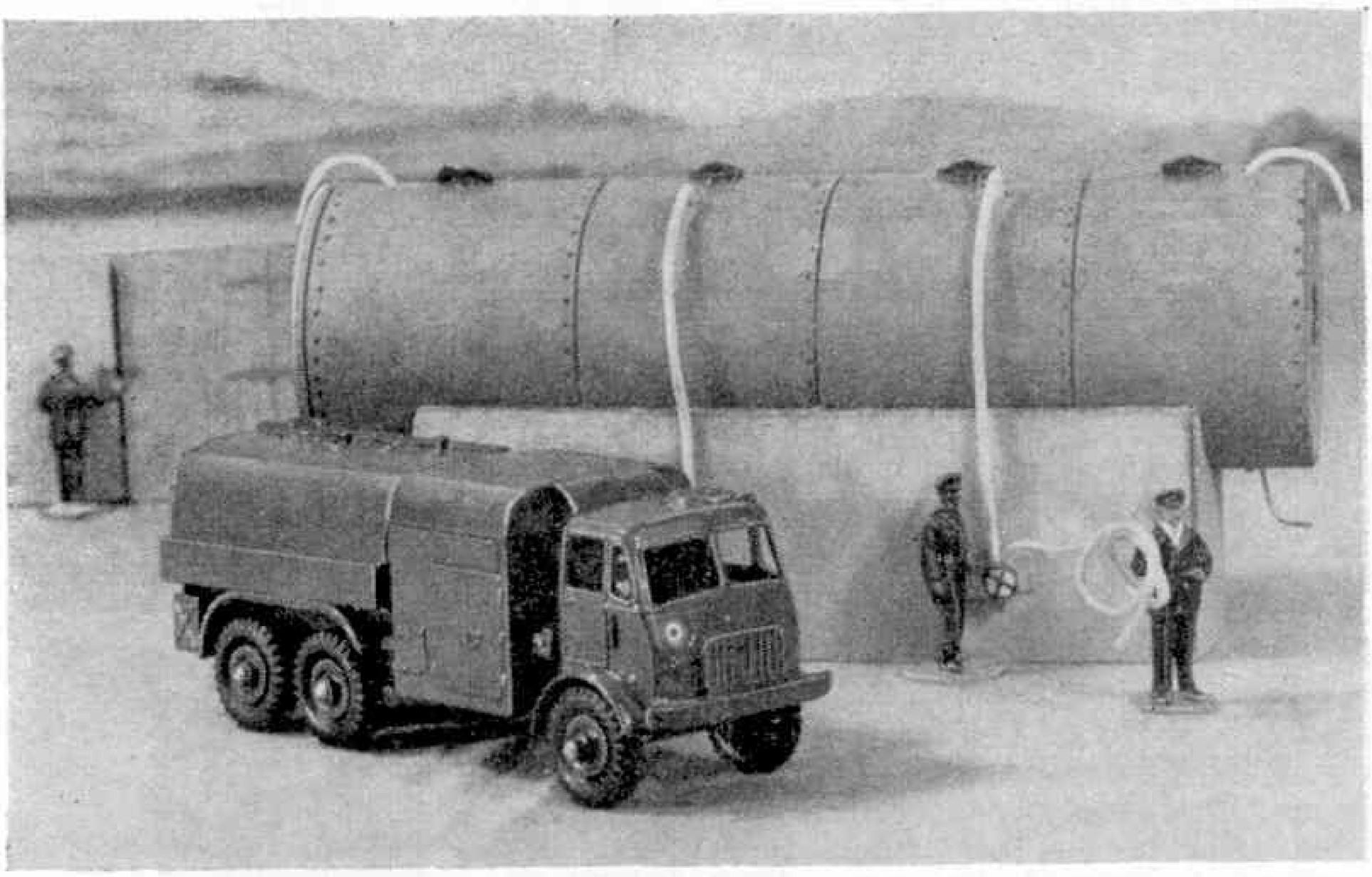


Fig. 2. A working model Shipyard Crane designed for construction from Outfit No. 5.

Fig. 3. The Crane boom removed from the tower to show the carriage rails and details of the operating mechanism and cords.





DINKY NEWS

A Pressure Refueller and a Brooke Bond Van

By **THE TOYMAN**

THE new Dinky Supertoy I want to bring to your notice this month is something of an innovation in the range, for it is finished in Royal Air Force blue and carries the familiar R.A.F. insignia on the front of the cab. The new model is Dinky Supertoys No. 642, Pressure Refueller, and a general picture of it appears on the opposite page.

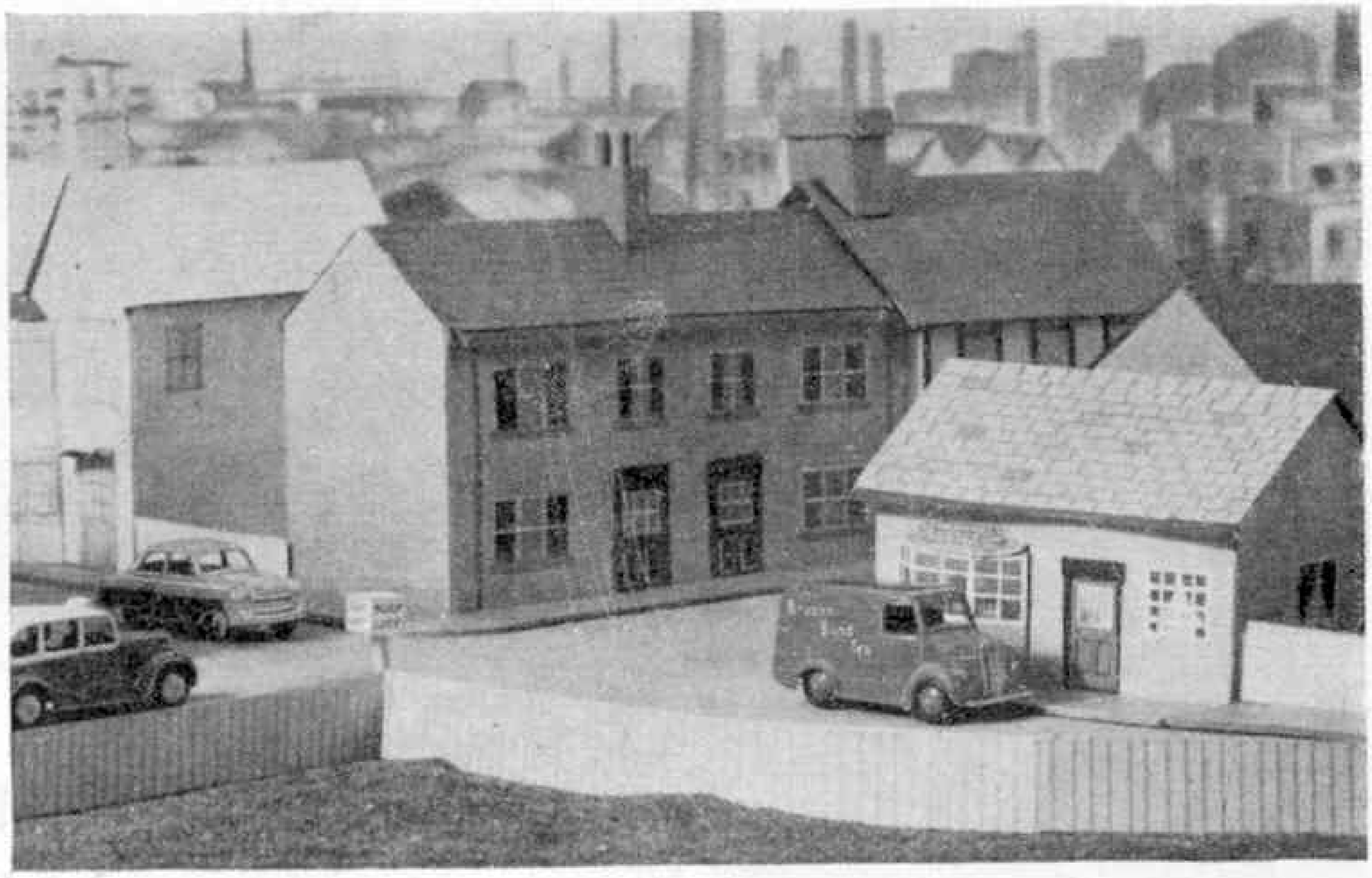
In the earlier days of flying fuelling aircraft was a comparatively simple business and little in the way of special equipment was needed. Indeed very often a few cans of petrol tipped into a filter leading direct into the aeroplane's fuel tank represented almost all the equipment required. Nowadays of course things are very different. The tremendous thirst for fuel of modern aircraft engines, and the ever increasing range of flight required, mean that the tanks of an up-to-date long distance aeroplane must be capable of holding thousands of gallons of fuel. Naturally, filling these tanks by hand is out of the question, and special fuelling tenders have been developed.

The new Pressure Refueller (Dinky Supertoys No. 642) at a fuel storage tank. It is finished in R.A.F. blue and as will be seen is finely detailed.

The new Dinky Supertoys Pressure Refueller represents one of the up-to-date machines available at modern aerodromes for refuelling aircraft speedily and safely. Actually, the name "refueller" does not cover all the duties of the vehicle, as it is so designed that it can also be used to empty an aircraft's fuel tanks in case of emergency.

Our model represents a Royal Air Force pressure refueller built on a Leyland Hippo chassis of basically commercial design. It is a six-wheeled vehicle with both rear axles driven, and it carries an insulated tank of 2,500 gallons capacity. Between this tank and the cab is the pumping unit, which is driven from the auxiliary gear-box fitted to the vehicle and has an output of 500-600 gallons per minute. It is capable of handling all grades of fuel.

Our model is an accurate miniature of the actual vehicle, and the body of the model is a really splendid casting with all the main features clearly marked. Among the details included are the hose boxes



In the foreground of this realistic town setting is the new Trojan 15 cwt. Van 'Brooke Bond' (Dinky Toys No. 455), which is the most recent in the range of Dinky Toy goods vehicles.

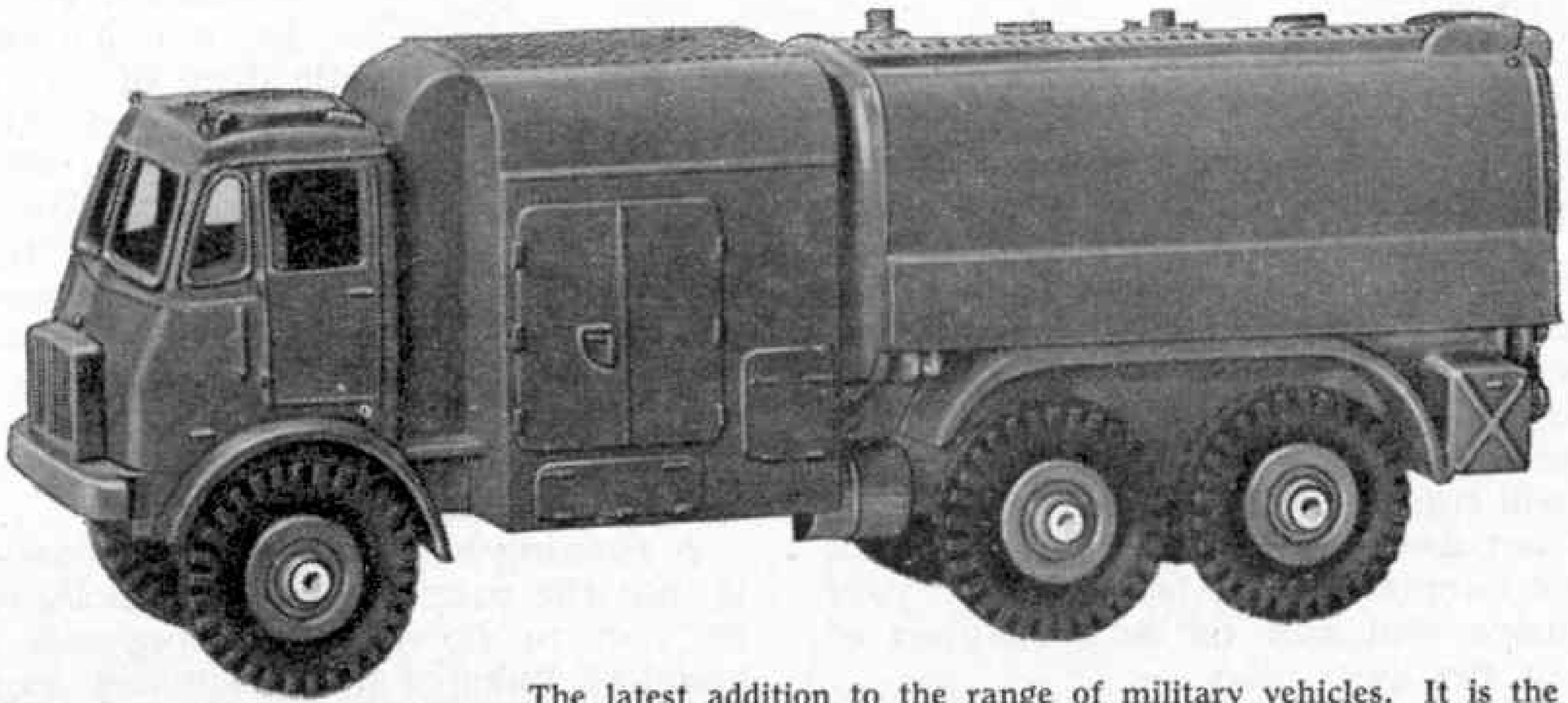
along each side of the tank, the ladder and the catwalk along the top of the tank, the tank manholes, the doors and footwalk of the pump compartment, and the usual cab details. The sturdy, distinctive radiator of the prototype is accurately reproduced, and a miniature driver, wearing R.A.F. blue of course, is seated in the cab. The leading rear axle is mounted in elongated bearings, so that the wheels remain in contact with the ground despite minor irregularities of the surface.

One of my pictures shows the Pressure Refueller alongside a large storage tank, ready to drive away after filling up. A storage tank of the kind I have used makes an attractive addition to a layout, and it is good fun to run hoses between the Pressure Refueller and the tank, but a surface tank is not really necessary. Most large aerodromes have underground fuel tanks, so if space on your layout is limited a manhole cover marked on the baseboard is quite sufficient to indicate one.

The range of vans in the Dinky Toys series is increasing steadily, and this month a new version of the Trojan 15 cwt. Van is available. This popular model can now be obtained finished in an attractive shade of red, with the words 'Brooke Bond Tea' in white on each side. The Trojan 15 cwt. Van 'Brooke Bond' is Dinky Toys No. 455.

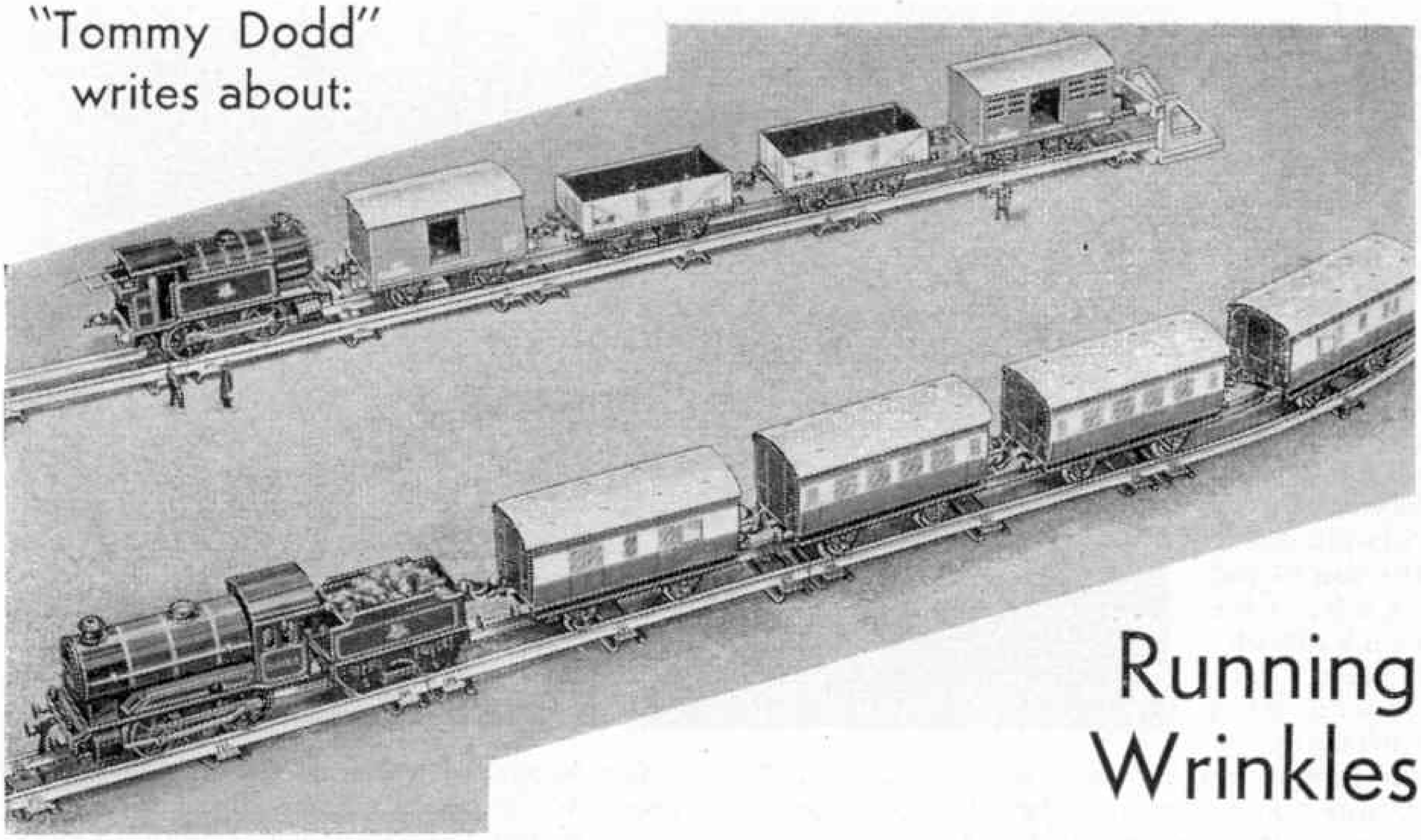
One of the essential services in a modern community is the speedy and efficient delivery of foods and other goods to shops, and for this purpose vans of many different kinds are required. With the vans now available in the Dinky Toys series it is possible to arrange a really comprehensive delivery service in miniature.

My picture of the latest Van shows it in a typical street setting. You will notice that the foreground is very simple and represents open ground such as a park.



The latest addition to the range of military vehicles. It is the Pressure Refueller (Dinky Supertoys No. 642).

"Tommy Dodd" writes about:



Running Wrinkles

A FAVOURITE question with Hornby engine drivers, especially the younger ones, is "How many turns of the key should I give my engine?" This is quite a reasonable enquiry, but the answer varies according to the type of engine, so that no figure can be given for the number of turns. But let us see what can be done to enable the owner of a Hornby locomotive to find the answer for himself. He will find this interesting and from it he will learn a good deal about his locomotive and its capabilities.

There is little chance of a youthful engineman overwinding the spring of his engine, as its resistance increases as it is wound up. It is not a bad idea to ask Father, who will always be willing, to give the engine its full wind, counting the turns of the key required. Then if for ordinary running you make it a rule always to give about two turns less than this when starting from a completely unwound condition, you will be on the right side.

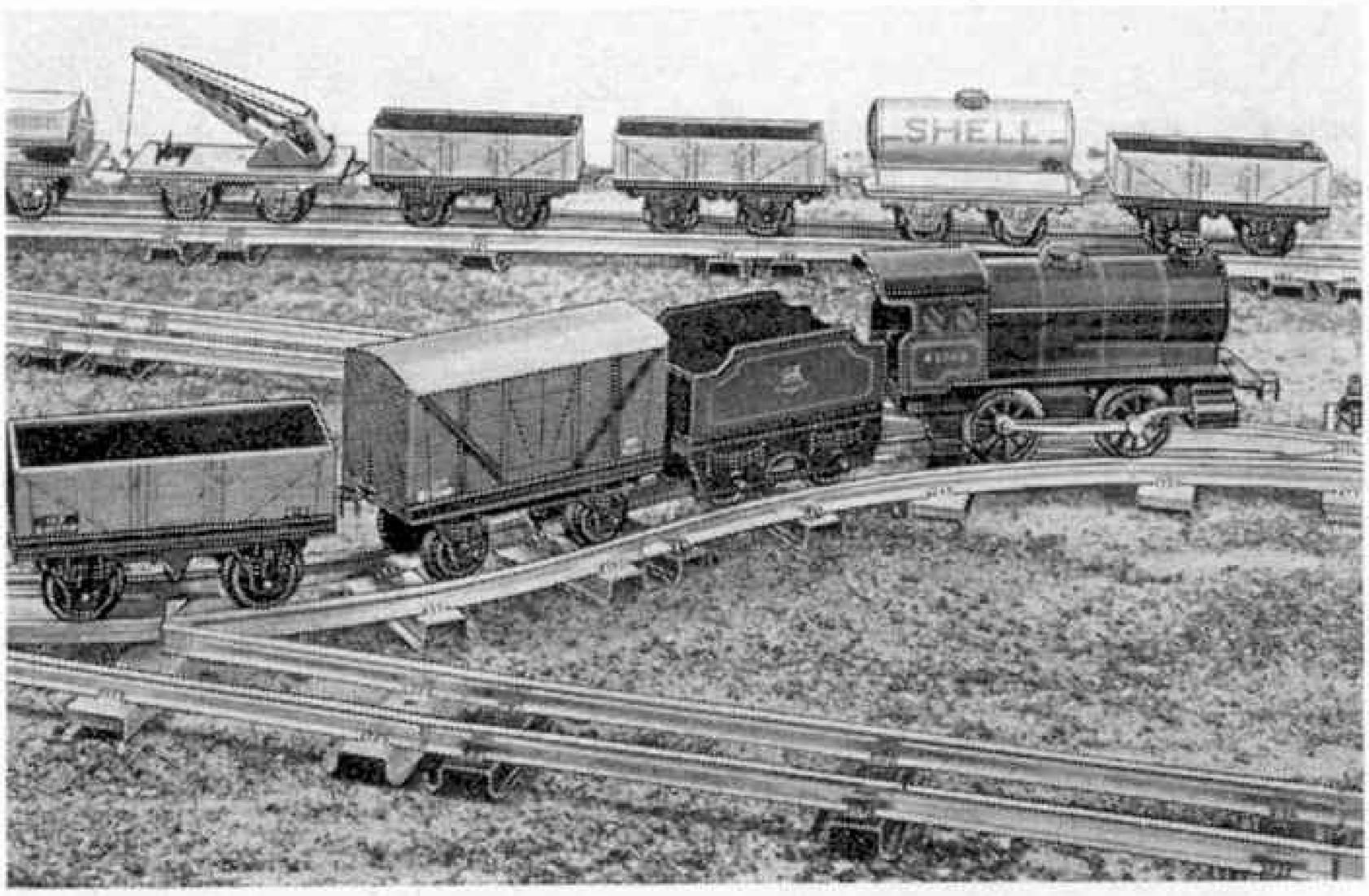
Above, a Hornby Passenger train passes a siding in which a No. 40 Tank is assembling empty wagons to form a train.

You can take this a bit further by giving the key of a completely unwound engine a definite number of turns and seeing how far it will run. You can in fact work out a rough but useful figure for the number of feet, or circuits of the layout, that your locomotive will run on any number of turns of the key.

Do not forget that once the engine is in use on the track it nearly always has some "wind" left in it when it is stopped at the station or in the sidings. This should be allowed for when rewinding, but with practice the Hornby engineman soon becomes familiar with the needs of his engine, or engines if he has more than one. Different engines on the same railway will need slightly different treatment, and one can only become used to their requirements with practice.

Just as a new or repaired engine has to be "run in," that is allowed some time to settle down to the job, so the Hornby engine driver has to become acquainted with his engine. I know that I have talked about this on various occasions, but there is no harm in repeating that a little drop of oil—really a little drop—applied here and there at regular intervals does make all the difference to the running of a locomotive. And don't forget coaches and goods wagons. They too want similar attention. Running generally is much sweeter when the Chief Mechanical Engineer of a Hornby railway gets down to this business. But use a light machine oil a good grade such as is used for sewing machines or bicycles.

A running hint that is worth passing on is that the couplings of all vehicles should be free to do their job properly. The coupling links of the automatic couplings fitted to the standard Hornby stock should



Here the No. 30 Goods Train runs gaily through the Points forming a crossover between two running tracks.

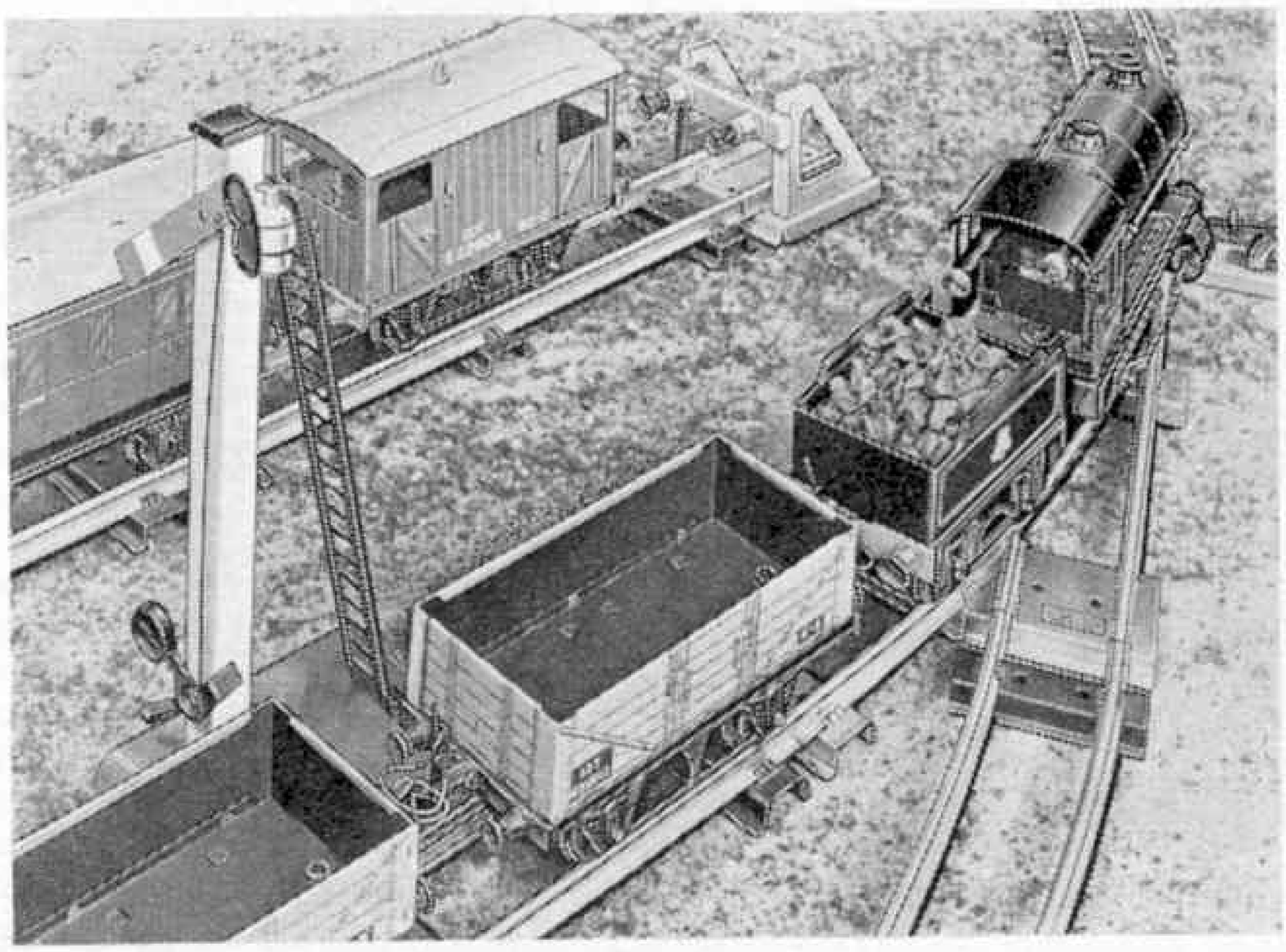
work easily, and so should all couplings intended to have side movement. So a drop of oil on the coupling pivots from time to time is decidedly a good thing, particularly when the layout includes any reverse curves like that shown in our second illustration. There a No. 30 Train is passing from one track to the other through two 1 ft. radius Points forming a crossover.

Make sure too that couplings are properly adjusted for height. They can sometimes get bent through careless handling or rough usage, and this should always be avoided. Those of you who have Nos. 20/21 Trains do not have to worry about the freedom of the couplings, as these are formed in one piece with the bases of vehicles. But their adjustment for height is still important.

There are always some fresh running schemes that you can try. You will remember that recently I spoke about trains of empty wagons. Well, the picture at the head of the opposite page shows a No. 40 Tank with a train of empty stock. Notice that the doors of the two vans are opened, as they are sometimes seen in sidings. They must be closed before the train finally moves off; otherwise it will be stopped on the way for this little job to be carried out.

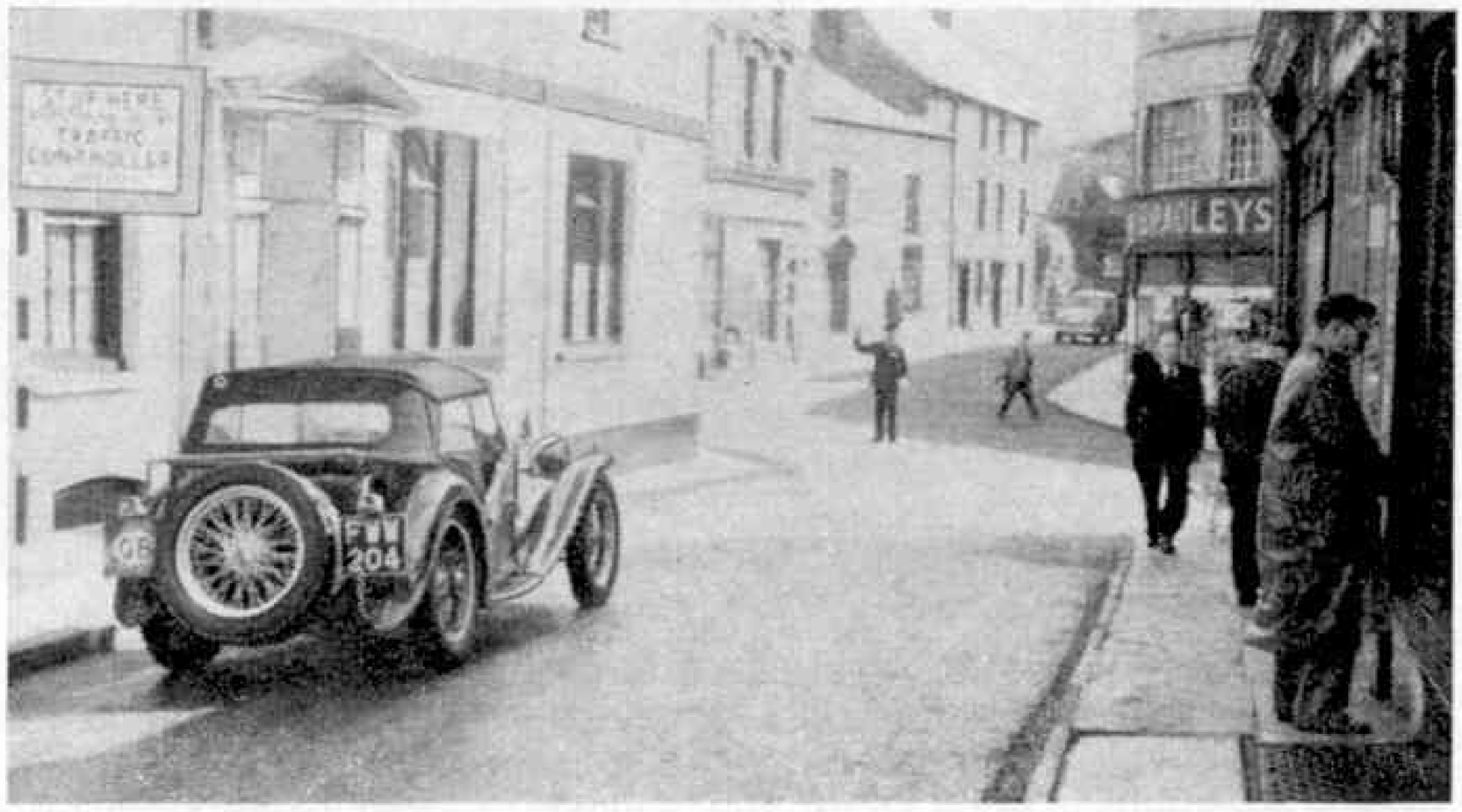
There is another point of interest in this picture. It concerns the passenger train. This is made up of No. 51 passenger stock, with a Passenger Brake Van at each end of the train. This not only gives a neat and well balanced arrangement, but avoids the need for re-marshalling before the return journey from a terminal station. Passenger trains in miniature are relatively short, consisting of only a small number of vehicles, but if they don't have the Brake Vans at the ends of their trains they look odd.

Mention of the Brake Vans reminds us that they can be used for the running of parcel trains, which form quite an important part of railway business. The No. 51 Vans shown, with perhaps a No. 41 as well, together with an ordinary Goods Van, will make quite an attractive formation.



An empty wagon train leaves the yard, the Signal shown allowing the train to gain the main line.

Of General Interest



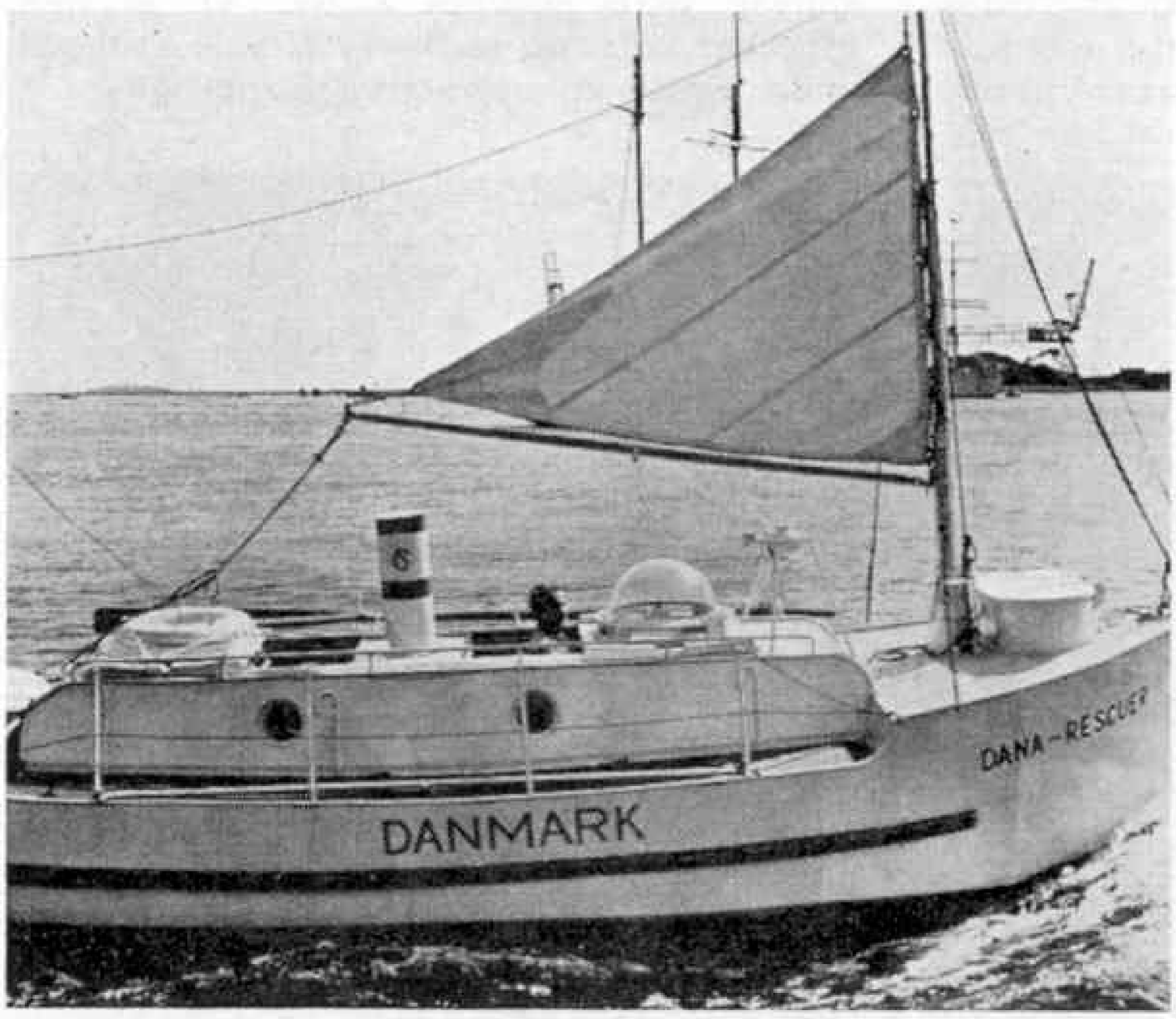
Cross roads in Brecon, with a "warden" on duty controlling the traffic at this busy spot. Photograph by Michael A. Arnold, South Kensington, London, S.W.7.

AT first glance it might be thought that the picture on the right shows traffic control of a very ordinary kind in action. But there is a difference. The photograph was taken last August in Brecon, the county town of Breconshire, in Wales. There wardens, who are known as Traffic Controllers, are put in control of a busy and dangerous crossing in the centre of the town. This leaves the police to carry out their ordinary duties. It has been suggested that a system of this kind could profitably be brought into use elsewhere in order to relieve pressure on the police and at the same time help to keep down road casualties.

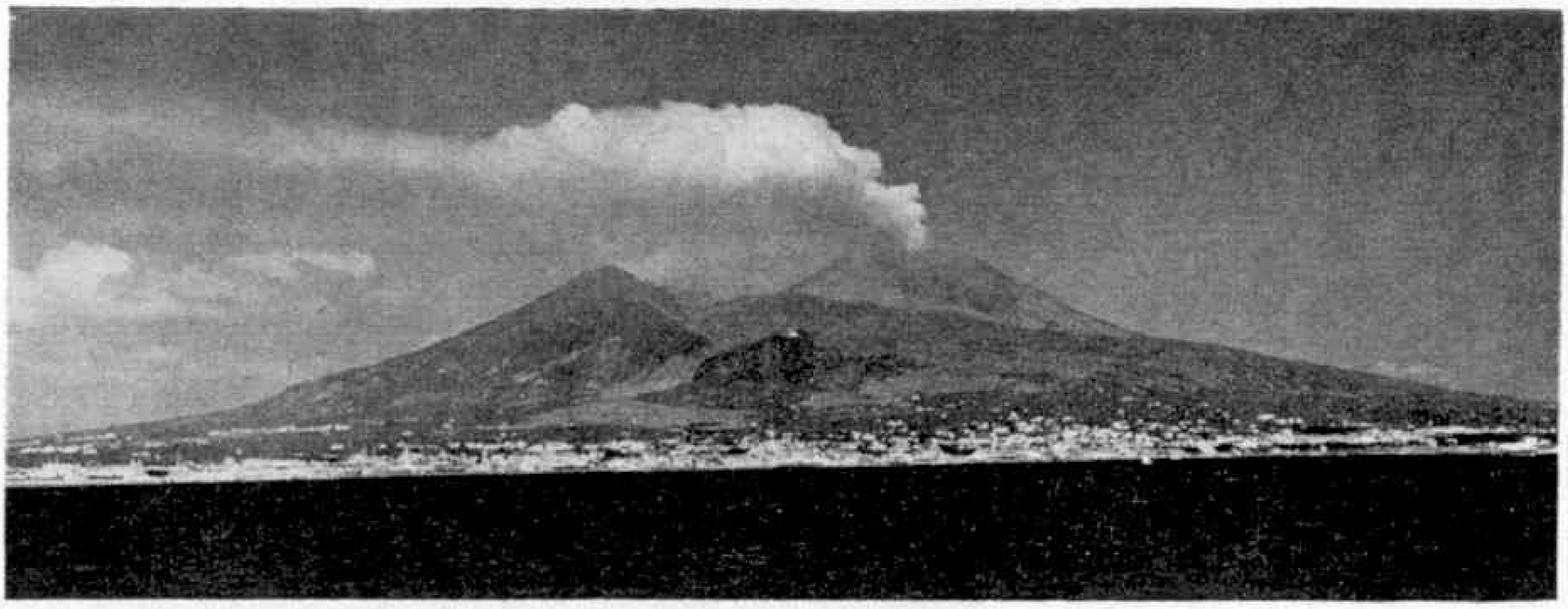
The picture at the foot of the page shows a life-boat, the *Dana Rescuer*, but this is a life-boat with a difference. It can be completely sealed against all weathers, and even the helmsman is given the protection of a transparent plastic dome, from which he has an unimpeded view all around him. It is intended for service as either a coastal or ship's life-boat.

This life-boat is Danish in origin and its builders claim it to be unsinkable. It is 23 ft. long, with a beam of 8 ft., and can hold 30 people. It is fitted with a 58 h.p. diesel engine and its tanks can carry 570 gallons of oil, but it does not depend entirely on its engine for power, as it has an extending mast on which a sail can be hoisted.

The life-boat has been coated with "Epikote" resin paint to give it toughness and resistance to rough weather and extremes of temperature. It is sailing round the world as a demonstration of its capabilities. The tour will occupy about a year.



A life-boat that can be completely closed against the weather. It is of Danish construction. Shell photograph.



Volcanoes

By Eric N. Simons

MY interest in volcanoes dates back to the time when, as a boy, I read that fascinating story by Jules Verne entitled *A Journey into the Interior of the Earth.* If you've read that yarn, you'll remember that the adventurers go down the throat of an extinct volcano, and discover a life going on in the bowels of the Earth that is all unsuspected by those above. After I'd read that book, it was my life-long ambition to look into the crater of a volcano. Eventually I did—that of Vesuvius.

Climbing the slopes of this volcano is an unusual and somewhat awe-inspiring experience. For a time the slopes of the mountain may be green and fertile, but once a certain point is reached, all plant life vanishes, and you come to a region of ash, slag and lava, brown, grey and dead, like an enormous colliery pit heap. Rising sharply out of this is the plumed cone of the volcano, steep-sided and bare. The higher you go, the wider becomes the marvellously blue expanse of land and sea below. At the top, you walk along a reddish, ashen path to the very edge of the crater.

In winter, it will probably be filled with a mass of steam, out of which comes a deep rumble every now and then, and the rattle of stones being thrown violently into the air from the mighty throat at your feet, and falling back again. On fine days, you will see in the very middle of the giant crater, which is more than a mile wide, the central cone, about two hundred feet in height, tinted with the colours of many oxides, yellow, red, black, blue, making a wonderful sight. From this emerges a column of smoke and vapour, and the showers of stones I have mentioned.

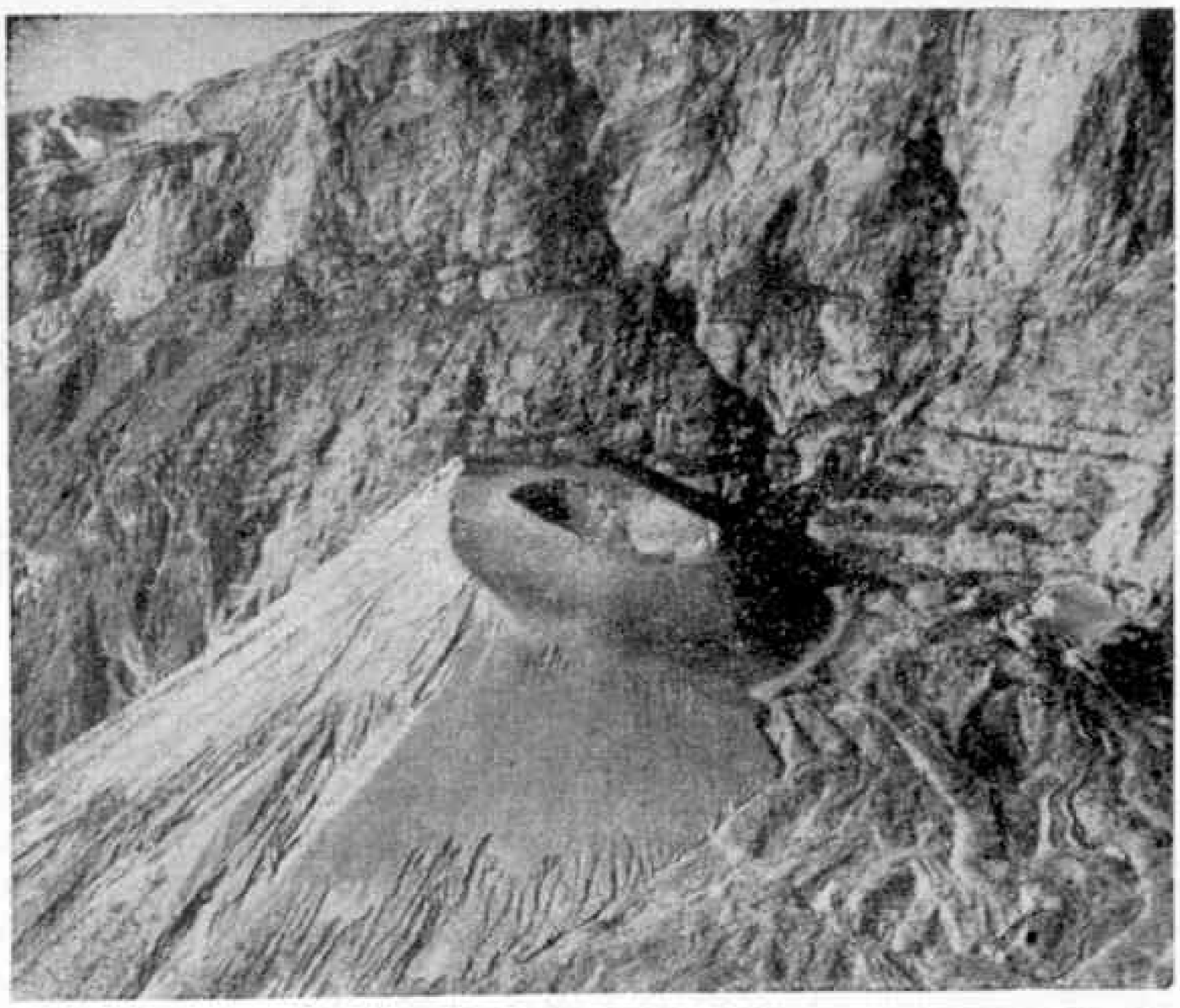
By way of a narrow track, you can wind your way down into the very crater itself. It is hot to your feet, and there are little holes in the rock in which you can thrust strips of paper, and see them catch fire. The booming of the mountain is locally termed "the snoring of the old devil." Whiffs of gas occasionally catch your throat and make you cough.

Above is a picture of what is perhaps the best known of volcanoes, Vesuvius, in the Bay of Naples. Its most famous eruption occurred in 79 A.D., when enormous quantities of ash and lava were thrown out and the cities of Pompeii and Herculaneum were buried. Before that catastrophe the volcano appears to have been dormant, but it has been active ever since. An outbreak in 1631 killed between 3,000 and 4,000 people.

Volcanoes are among the most awe-inspiring of Nature's marvels. The Romans believed them to be the home of the god, Vulcan or Volcanus, as they called him, the god of fire or devouring flame from whose name the word volcano is derived. They are really openings in the crust of the earth through which hot material from below is forced upwards into the outer air, in the form of either great masses of heated vapour, clouds of dust, showers of ashes or mud, or streams of molten lava. They are of three kinds—those, such as are found in the centre of France, that do not erupt any longer, and are called extinct volcanoes; those that sleep for long periods, then suddenly erupt; and those capable of erupting at any moment.

Krakatoa, a volcano of the East Indies, was asleep for two hundred years before, in 1883, it broke out with such terrible force that 35,000 people lost their lives. It is an example of a dormant volcano. Volcanoes liable to erupt at any moment, such as Vesuvius, Etna, Stromboli, and Hecla in Iceland, are called active. Even those volcanoes we call "extinct" or "dead" may not really be so. They are only given the name because in our historical record they do not appear to have erupted, but they may some day break out again and do tremendous damage. A Japanese volcano called Bandaisan erupted in 1888 after having, it is believed, been perfectly quiet for over a thousand years.

What is a volcanic eruption like? Usually, when one is about to take place, a number of small earthquakes are felt in the region of the volcano concerned, and these may spread to even greater distances but are never so severe as the really great earthquakes. These quiverings of the earth and tremblings of the volcano may go on for some weeks or months. Then, on occasion, great roars are heard from the mountain itself, as if guns were going off inside it, or thunder rolling below the surface of the earth.



An aerial view of a volcanic crater, that of Mt. Meru, in Tanganyika.

Little streams flowing round about begin to dry up, and some dry up completely, though now and again a few may swell into larger streams.

The next sign is that the floor of the crater of the volcano begins to be pushed upwards, and vapour rises in jets through any fissures or holes. Some volcanoes have their craters filled with water, making a mountain lake. When these are going to erupt, the lake water begins to get hot, and may even boil, giving off masses of steam. The cones of some volcanoes are covered with snow, and their imminent eruption is indicated by the rapid melting of the snow on their cones, which may cause floods in the valleys below.

Now comes the eruption itself. The first and most striking thing is the enormous amount of material thrown out, consisting either of steam alone, or of steam and chemicals or steam and ashes. In a fierce eruption, the vapour is thrown up like a huge pillar or column, reaching as high as the clouds, and even higher still. Such emissions have been known to reach as high as eight miles up. As the steam or vapour reaches its highest point, it may form little balls of cloud, or spread out like a great opened

Here is the fuming central cone in the immense crater of Vesuvius.

umbrella, or have a cap, like a mushroom.

In less fierce eruptions, the vapours may be given off in quick puffs, which form clouds that drift away; or they may collect into a number of huge masses of cloud. Sometimes they take the form of huge swirling rings, like smoke-rings, tinted white, yellow, brown or black, according to the quantities of dust and dirt carried. Then comes the next stage in the eruption. Dazzling flashes rip through the clouds and columns of vapour, and the seething lava, white-hot and shining, in the crater of the volcano, casts a fierce, red light, reflected from the clouds above. The molten lava rises or breaks through the crater wall, to pour out over the slopes of the mountain and down into the valleys. These are usually inhabited, despite the danger, because volcanic soil is highly fertile, so that even after the eruption, people insist on going back and farming there again.

A volcanic crater with a lake in it. This is the crater of Kelut, Java.

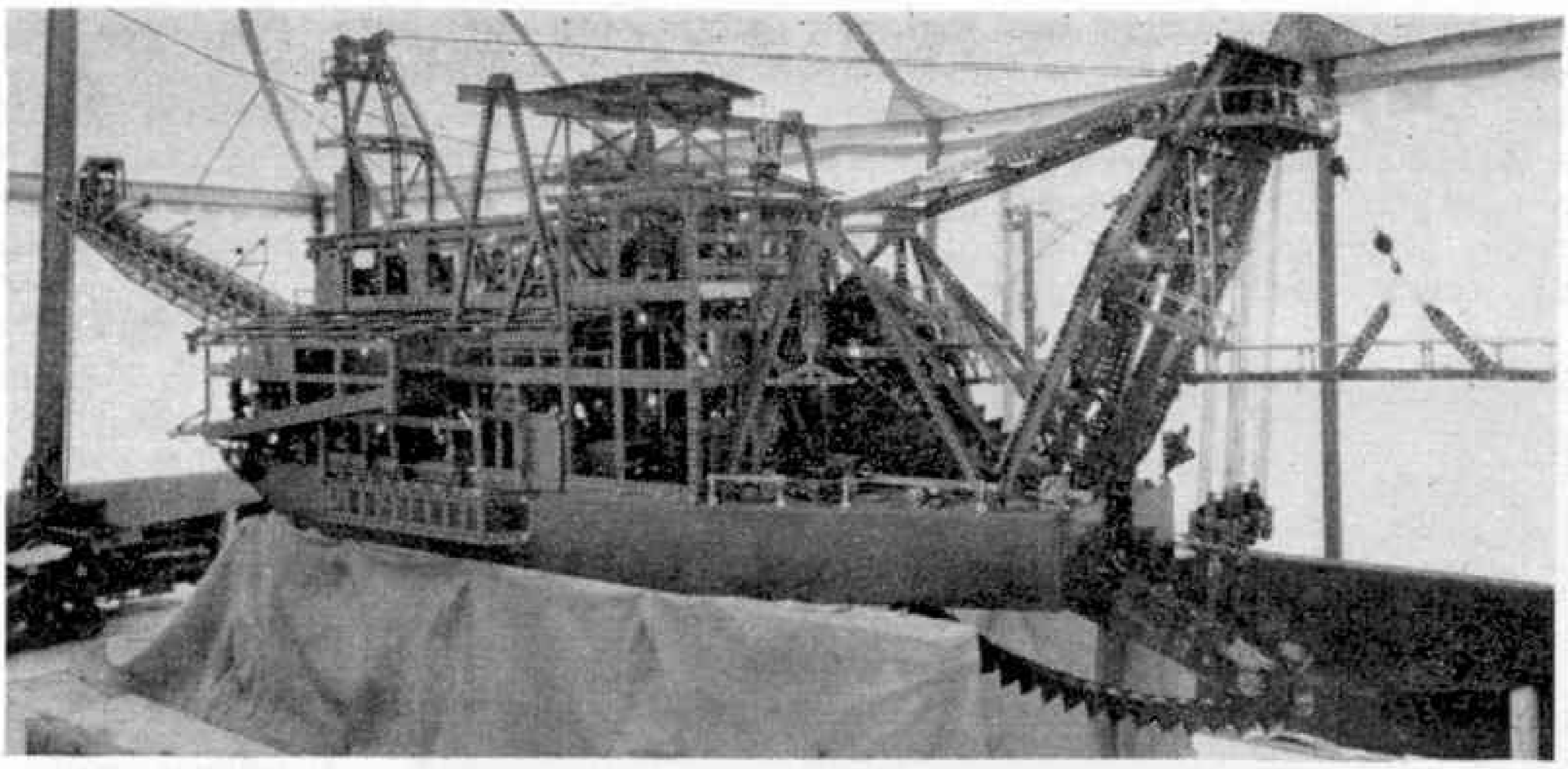
The steam issuing from the volcano is water turned by intense heat into vapour. This vapour as it reaches the cold air above, is turned back again into water, and falls as rain. Eruptions are, therefore, almost always followed by tremendous downpours. If there is much dust and ash as well, mixed with water, a river of hot mud is formed, which streams down the sides of the mountain and pours over the land. These streams of hot mud are hated more intensely by those who live on or near a volcano than the lava, which does not flow so quickly, and gives them more time to get away to safety.

A volcano in eruption continues to throw out cinders, ashes and dust. The sky is darkened, and soon the countryside for miles around is covered with a film of fine ash. It sifts through every chink and crevice of buildings. Trees, fields and houses are blanketed with it. The dust itself is hot and injurious, choking all who breathe it.

Pompeii was buried by this falling ash during the eruption of Vesuvius in the year 79. After one eruption in the Island of St. Vincent, over three million tons of volcanic dust fell on the surface of Barbados, one hundred miles away. In a Mexican eruption, more than two million tons of dust were hurled twenty thousand feet into the air, *i.e.* more than three miles up. Volcanic dust has been known to travel over a thousand miles before falling.

After the dust comes the terrible, white-hot lava, which moves slowly and cools quickly, so that it is less difficult to avoid than the mud streams. It does not always destroy. It has been known to surround trees without damaging them, though it burned up the undergrowth. When the flow is even, its surface is smooth and shining, but it may be turbulent, in which case it wrinkles, becomes rough and bubbly on the surface. Going down the mountain side it may travel at forty miles an hour, but unless the slopes are steep, it quickly loses speed. As its pace slackens, it forces to the front a mass of glowing slag lumps as it advances slowly, groaning and grating as the lumps rub on one another.

About 450 volcanoes have been active since records were first made. Most of these occur round the shores of the Pacific Ocean or along a line through the Netherlands East Indies swinging upward to northern Burma. This distribution suggests that there are beneath the Earth's surface more or less local reservoirs of the molten material thrown out by volcanoes. Sometimes this finds its way outward through deep rifts in the crust, and the process is connected with that of mountain building in the past.



The splendid working model of a Gold Dredger referred to on this page. The model is fully detailed and was built by Mr. B. Huffam, Ikamatua, N.Z.

Among the Model-Builders

By "Spanner"

A Fine Model Gold Dredger

In the January 1956 *M.M.* I included an illustration and some details of a monster model gold dredger on the construction of which Mr. B. J. Huffam, Ikamatua, N.Z. has been working for some considerable time. Recently I heard again from Mr. Huffam and he tells me that his giant model is now practically completed. An illustration of it in its present state appears at the head of this page. The model is over 14 ft. in length, weighs over 4 cwt., and is built to a scale of ½ in. to 1 ft. Its many different operating mechanisms are powered by no less than 10 Electric Motors, each independently controlled from switches, and there are 50 electric bulbs to supply illumination.

The dredger bucket drive is by means of belt and compound reduction gearing giving a ratio of 2,100:1 and drives the buckets with great power. The model has 26 stairways, walkways fitted with handrails, and sliding and hinged doors, and 14,000 nuts and bolts hold its 45,000 parts together!

When in operation the model presents a most realistic and striking appearance with all its motors droning, winches and buckets on the move and its 50 electric lights blazing. It gives a vivid impression of the tremendous power of the real gold dredger on which it was based.

A Built-up Flanged Wheel

In large models of locomotives and other models designed to run on rails it is necessary to build up flanged wheels of suitable size. Generally the parts used for this purpose are a Face Plate and a Wheel Flange, providing a wheel 2½″ in diameter, or a 6″ Circular Plate and a Hub Disc. Quite often, a flanged wheel larger than a Face Plate but smaller than a 6″ Circular Plate is required, and some readers have suggested we should introduce new parts to enable a wheel approximately 4″ in diameter to be assembled.

Fig. 1. A built-up 4 in. flanged wheel that will be found useful in locomotives and other models designed to run on rails.

These readers have overlooked the adaptability of

Meccano parts, for it is already possible to make a 4″ flanged wheel using a 4″ Circular Plate and a Ball Thrust Race Flanged Disc. The general arrangement of a wheel made with these parts is shown in Fig. 1, and it will be seen that the Circular Plate and the Flanged Disc are simply bolted together, ⅜″ Bolts being used for this purpose. A hub for the wheel can be provided by a Face Plate or a Bush Wheel attached centrally to the 4″ Circular Plate.

Three Speed and Reverse Gear-Box

The mechanism is shown in Figs. 2 and 3 and is mounted on a Face Plate 19, which supports a 3½″ Screwed Rod 17. A nut is positioned on the Screwed Rod about ½″ from one end, a Washer is placed next to the nut, and the Screwed Rod is passed through one of the slotted holes in the Face Plate. Six Washers and a 1½″ Double Angle Strip 13 are then placed on the Screwed Rod, and two Fishplates are bolted to the Double Angle Strip so that they project as little as possible beyond its ends. Two Washers are placed on the Screwed Rod, and a "spider" 25 from a Swivel Bearing serves as a nut to lock the assembly together. The centre bore of the spider must be exactly in line with the holes in the lugs of the Double Angle Strip. The Screwed Rod is fixed as near as possible to the centre of the Face Plate, and two Fishplates are bolted to the Face Plate to provide bearings for the layshafts.

The bearing member at the other end of the mechanism consists of a Double Arm Crank 15, two 1½″ Strips and two Fishplates arranged as shown. The assembly is attached by nuts to the Screwed Rod 17 and a 3″ Screwed Rod 18.

The input shaft is a 2½″ Rod mounted in the boss of the Face Plate. It carries a pinion 26 from a No. 1 Clockwork Motor, and a ½″ Pinion arranged about ¾″ from the Face Plate. The input shaft extends only half way into the bore of the ½″ Pinion, and the other half of the bore supports the inner end of the output shaft 4, which is a 2½″ Rod. The output shaft carries a ½″ Pinion placed next to the ½″ Pinion on the input shaft, a ¾″ Pinion and two Washers.

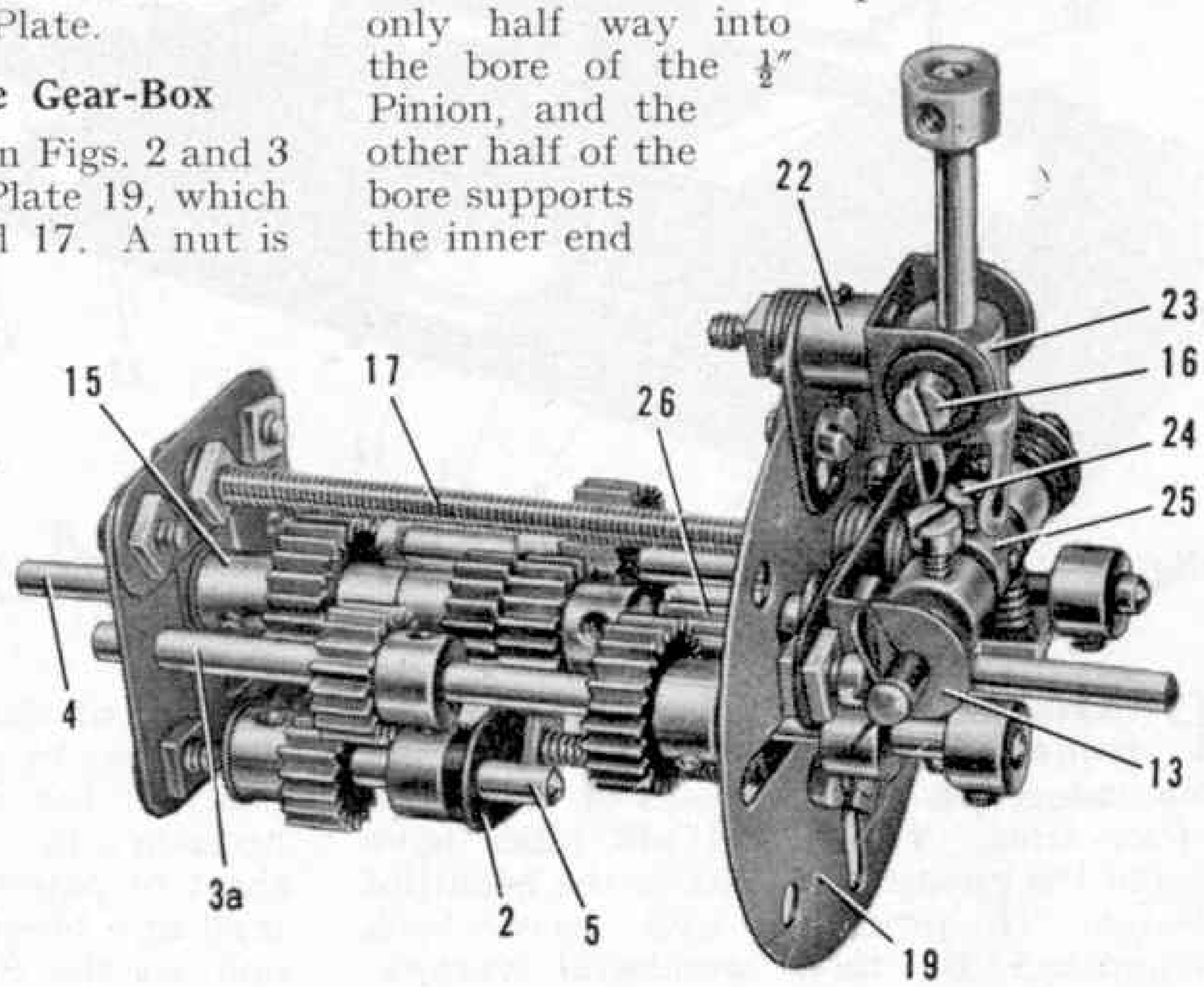


Fig. 2. A compact three speed and reverse gear-box fitted with a neat selector mechanism. It was designed by N. Gottlob, Hjortekaer, Denmark.

A 4″ Rod 3 carrying a Collar, a ¾″ Pinion and a ½″ Pinion is arranged as shown. This Rod when moved to the left (Fig. 2) engages second gear, and when it is moved to the right top gear is obtained. The 4″ Rod 3A carries a ¾″ Pinion and a ½″ Pinion as shown, and when it is moved to the right (Fig. 1) first gear is engaged.

A reverse ½″ Pinion is fixed on a 1½″ Rod 5, which is supported in two

(Continued on page 259)

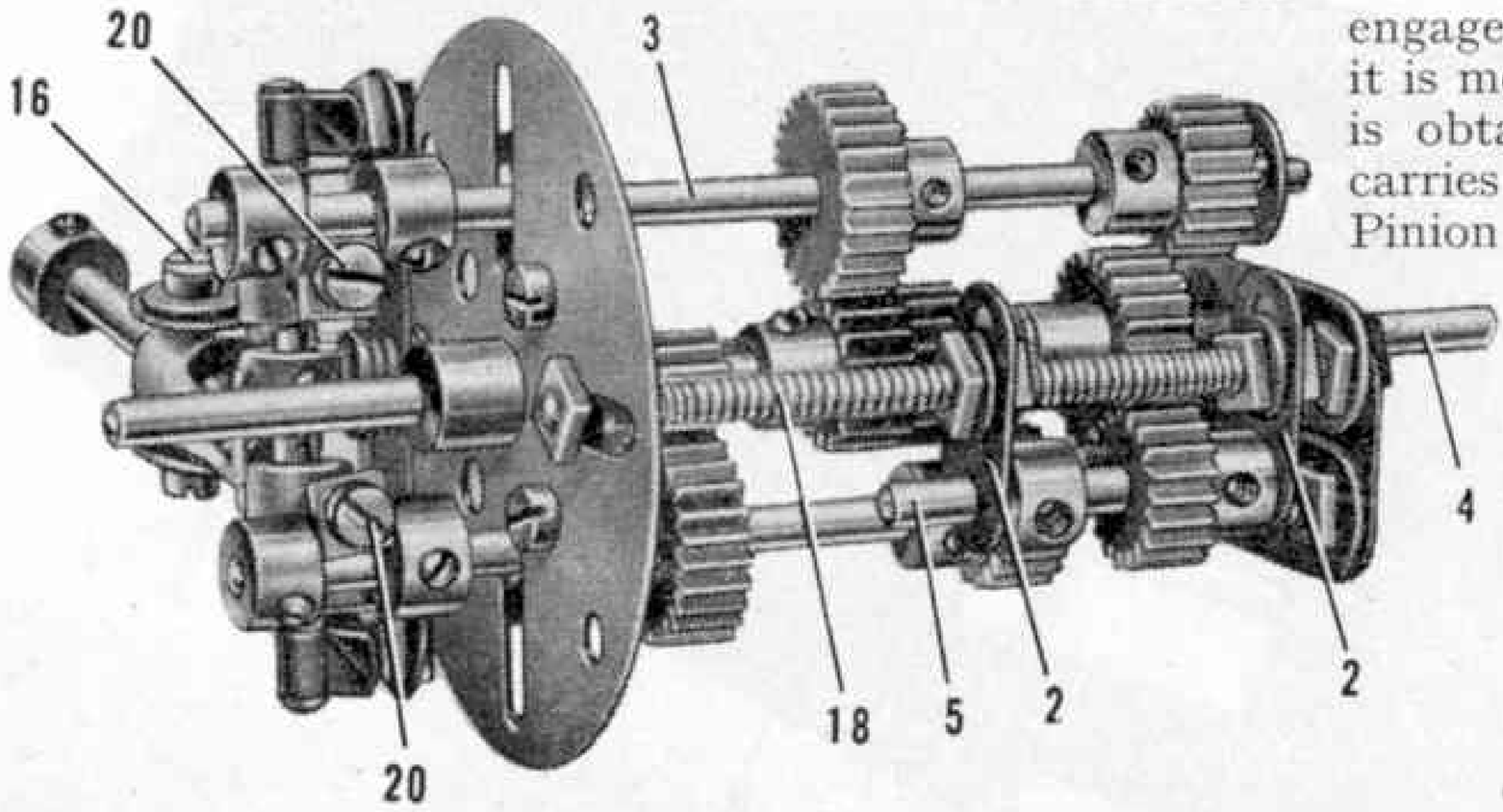


Fig. 3. Another view of the gear-box showing the selector mechanism from underneath.

MODEL OF THE MONTH

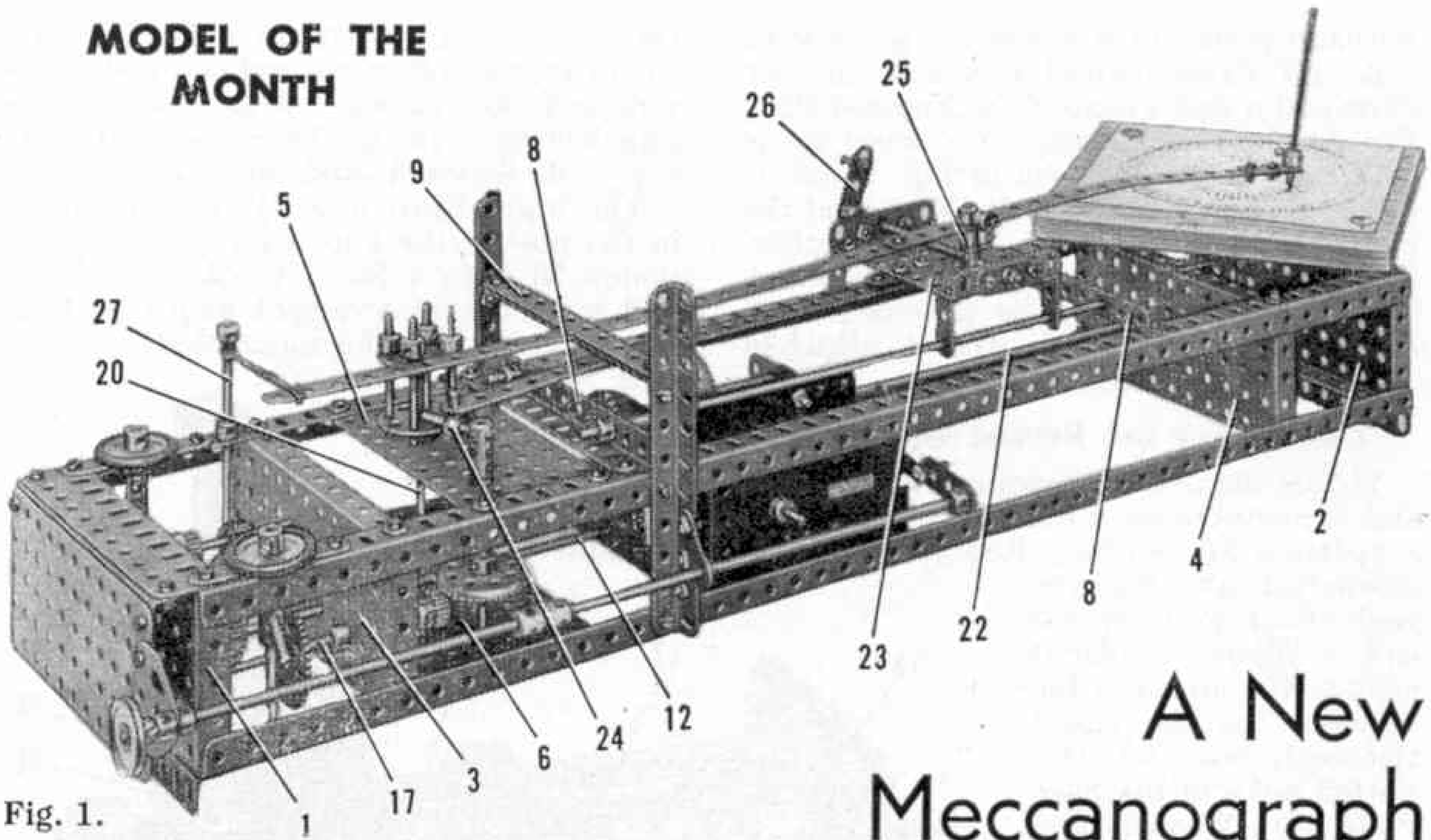


Fig. 1.

A New Meccanograph

PERHAPS the most popular Meccano model of all time has been the Meccanograph. It is a model of which one never tires. Young and old alike have found the greatest pleasure in the beautiful designs it produces, and have been astonished by their wonderful variety.

Now we have a new and improved electrically operated version as the "Model of the Month" for May. It is illustrated by the pictures on these pages. When it has been constructed all that is necessary to produce a design is to pin a sheet of paper to its table, fix a ball pen refill in a holder provided on the pen arm, and set the Electric Motor running.

It is not difficult to see how this splendid model works. When the Motor is switched

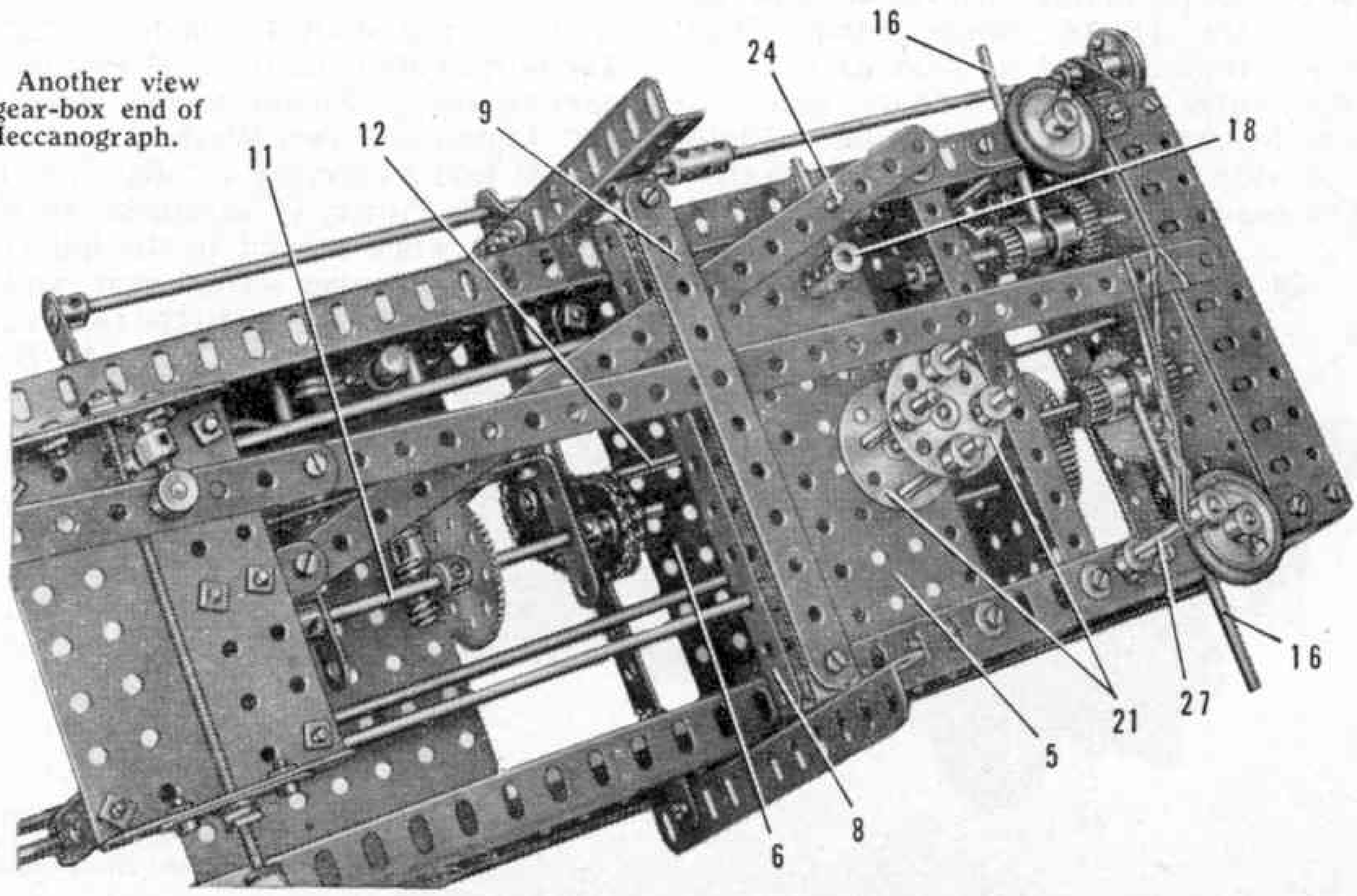


Fig. 2. Another view of the gear-box end of the Meccanograph.

on, the table carrying the paper revolves and the pen moves sideways to and fro across the paper. With these two movements alone an amazing number of different designs can be made by just varying the relative speeds of the table and the pen arm, or by altering the position of the arm. Giving an additional movement to the pen arm by means of a sliding carriage moving forward and backward along guide rods gives a vast number of still more elaborate designs.

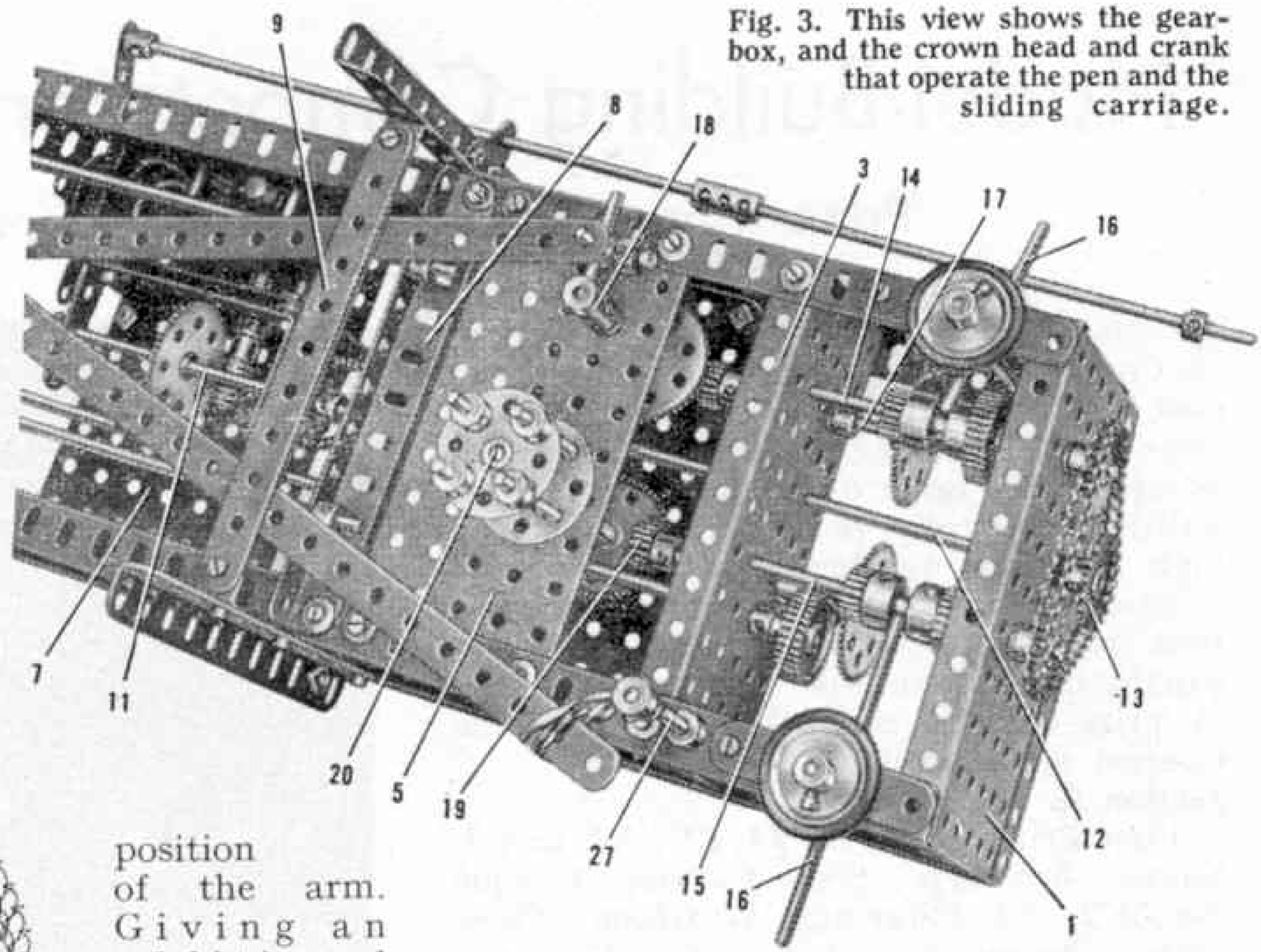
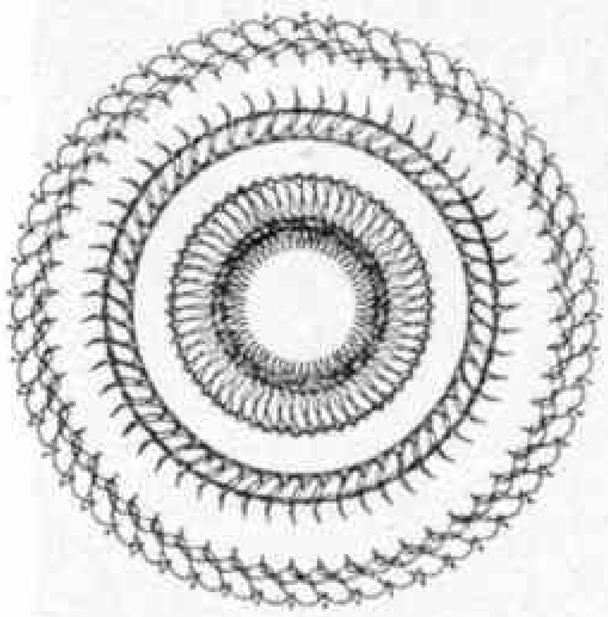


Fig. 3. This view shows the gear-box, and the crown head and crank that operate the pen and the sliding carriage.



One of the very many beautiful patterns that can be produced on the Meccanograph.

And there are other ways of varying the designs. These are explained in the instructions for building the model, which can be obtained by writing to the Editor, enclosing a 2d. stamp for return postage. The main Meccano Agents in Canada, Australia, New Zealand, South Africa, Ceylon and the United States of America are provided with copies of the current "Model of the Month" instructions, and readers in those countries can obtain copies by writing to their Agents and enclosing stamps for return postage.

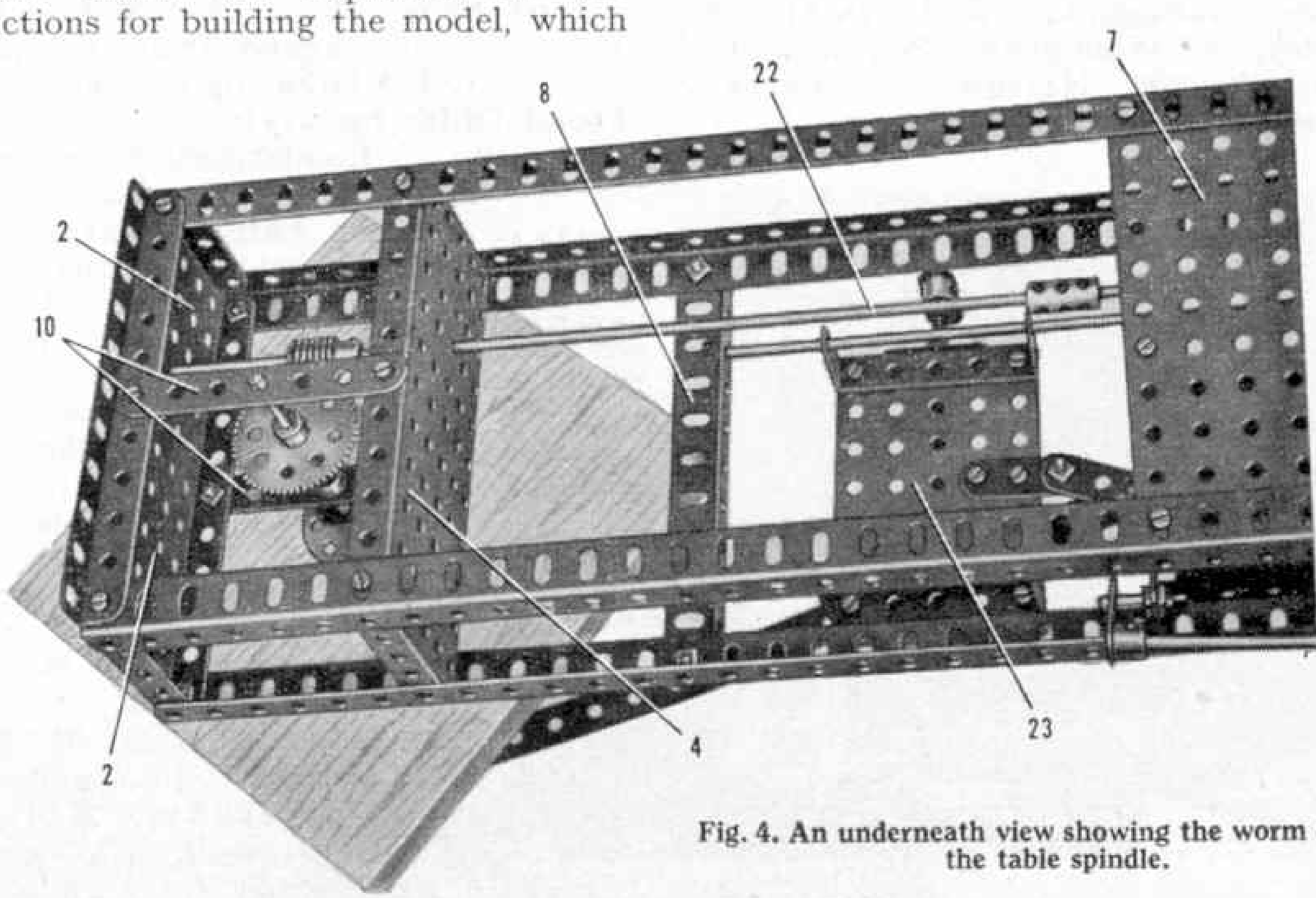


Fig. 4. An underneath view showing the worm drive to the table spindle.

Model-Building Competition Results

Prize-winners in the "Winter" Contest

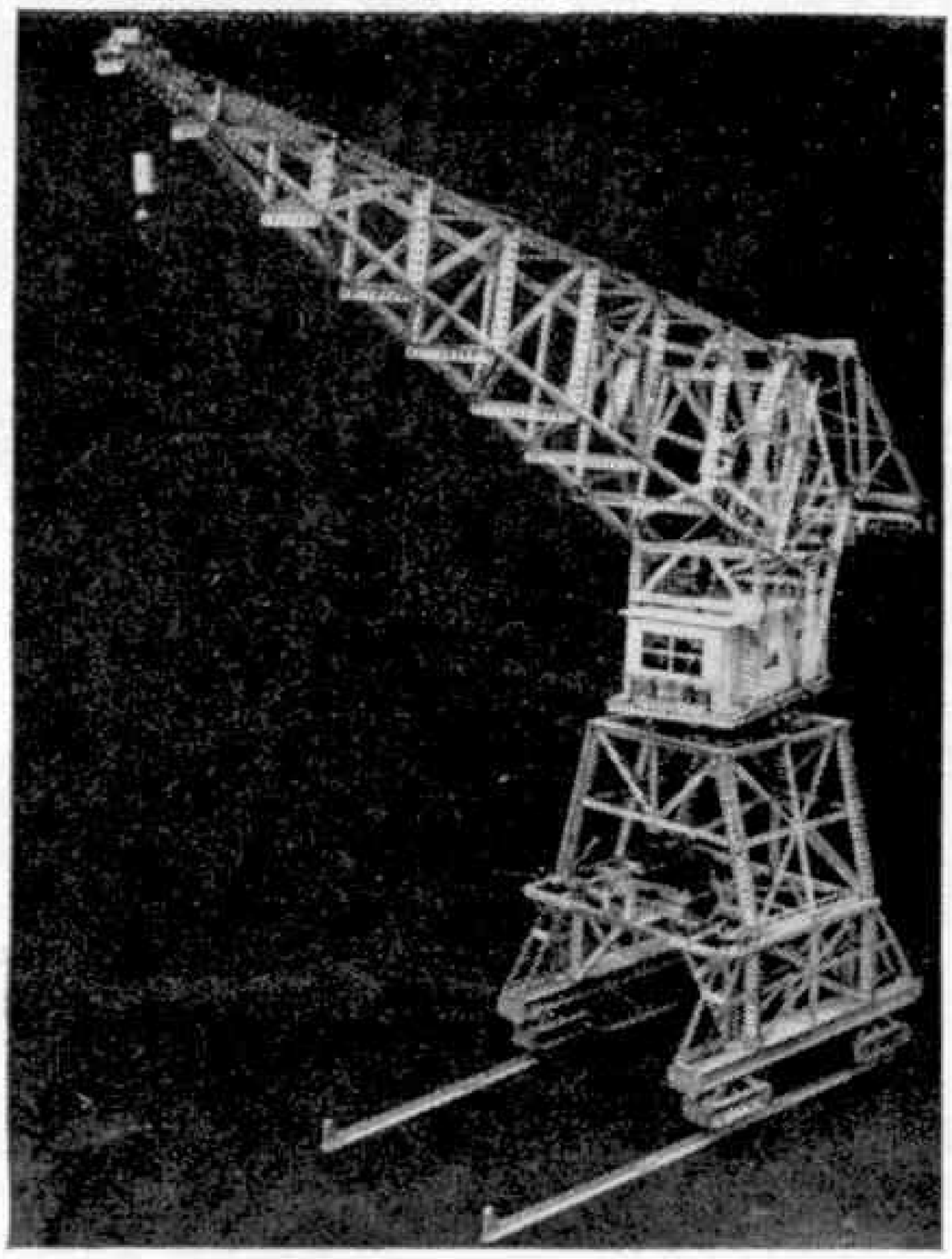
THE "Winter" Model-Building Competition, which ran throughout the past winter months, was one of the most successful in recent years and an exceptionally large number of entries was received. Equally pleasing was the very high standard reached by many of the competitors in their work and the models that received the prizes were all well-worthy of their success. The complete lists of prize-winners in each Section of the Contest are as follows:

Section A.

First Prize, Draft for £4/4/–: W. and J. Slosse, Antwerp. Second Prize, Cheque for £2/2/–: I. Perryman, Worthing. Third Prize, Cheque for £1/1/–: G. B. Stead, Bradford.

Ten Prizes each of 10/–: F. and M. Mahnen, Luxembourg; J. Spiers, Worcester; J. Saliot, Reading; A. Obaid, Dacca, Pakistan; C. Hilsden, Alfreton; J. M. Skeffington-White, Harrogate; J. Macdiermid, Nottingham; S. J. Ashton, Manchester; S. J. Morris, Wolverhampton; The Boys of St. Charles' Seminary, Tabora, Tanganyika Territory.

Ten Prizes each of 5/–: P. Goldsmith, Hornchurch; A. Mullarny, Dublin; D. Short, Coatbridge; M. C. Thew, Paignton; D. R. Brookes, Southampton; P. L. J. Allcock, Annesley; F. Willingham, Bournemouth; R. G. Benson, Harrow; S. Turner, Manchester; K. Wyatt, Bebington.



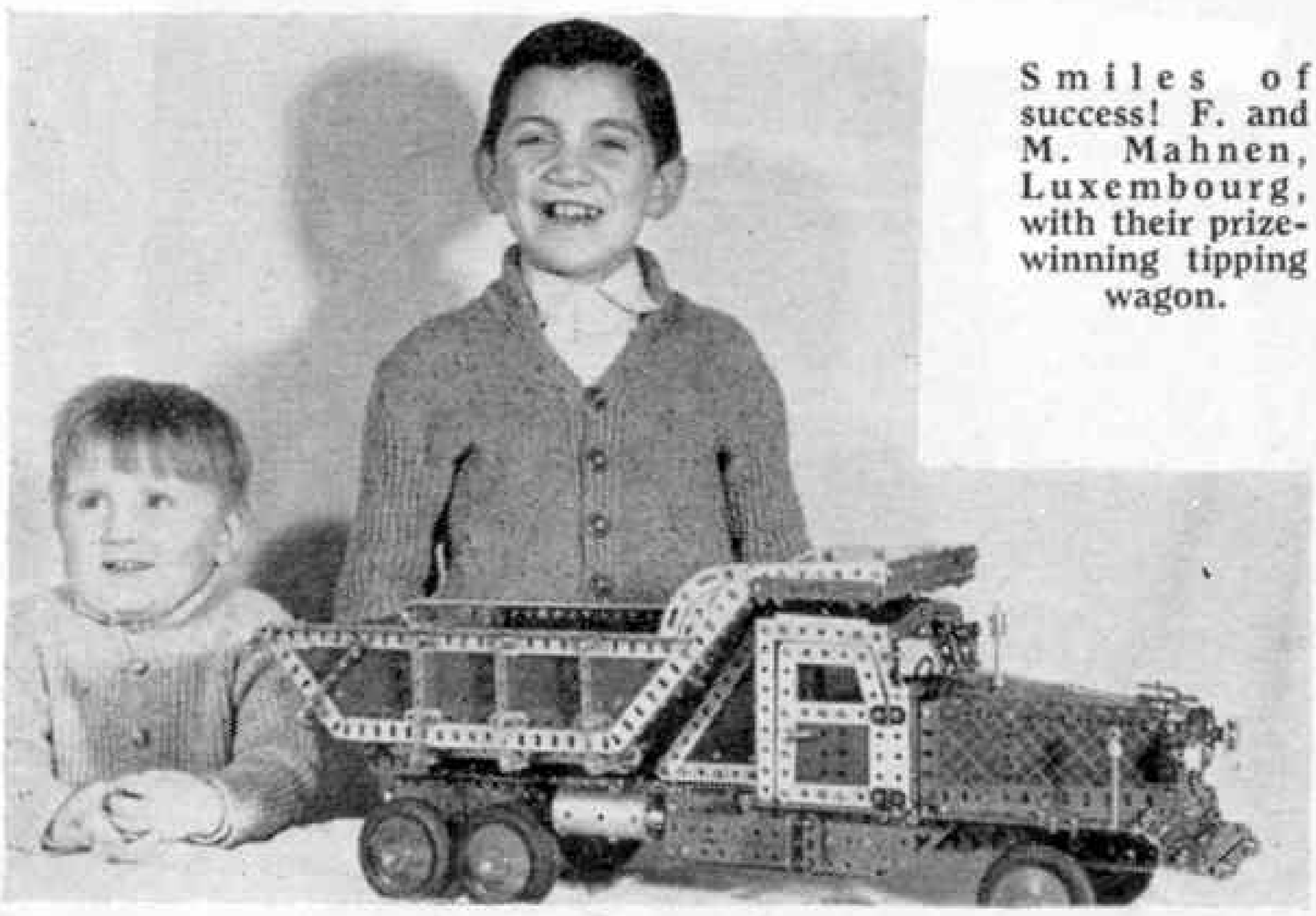
This fine shipyard crane won First Prize in Section A for W. and J. Slosse, Antwerp.

Section B

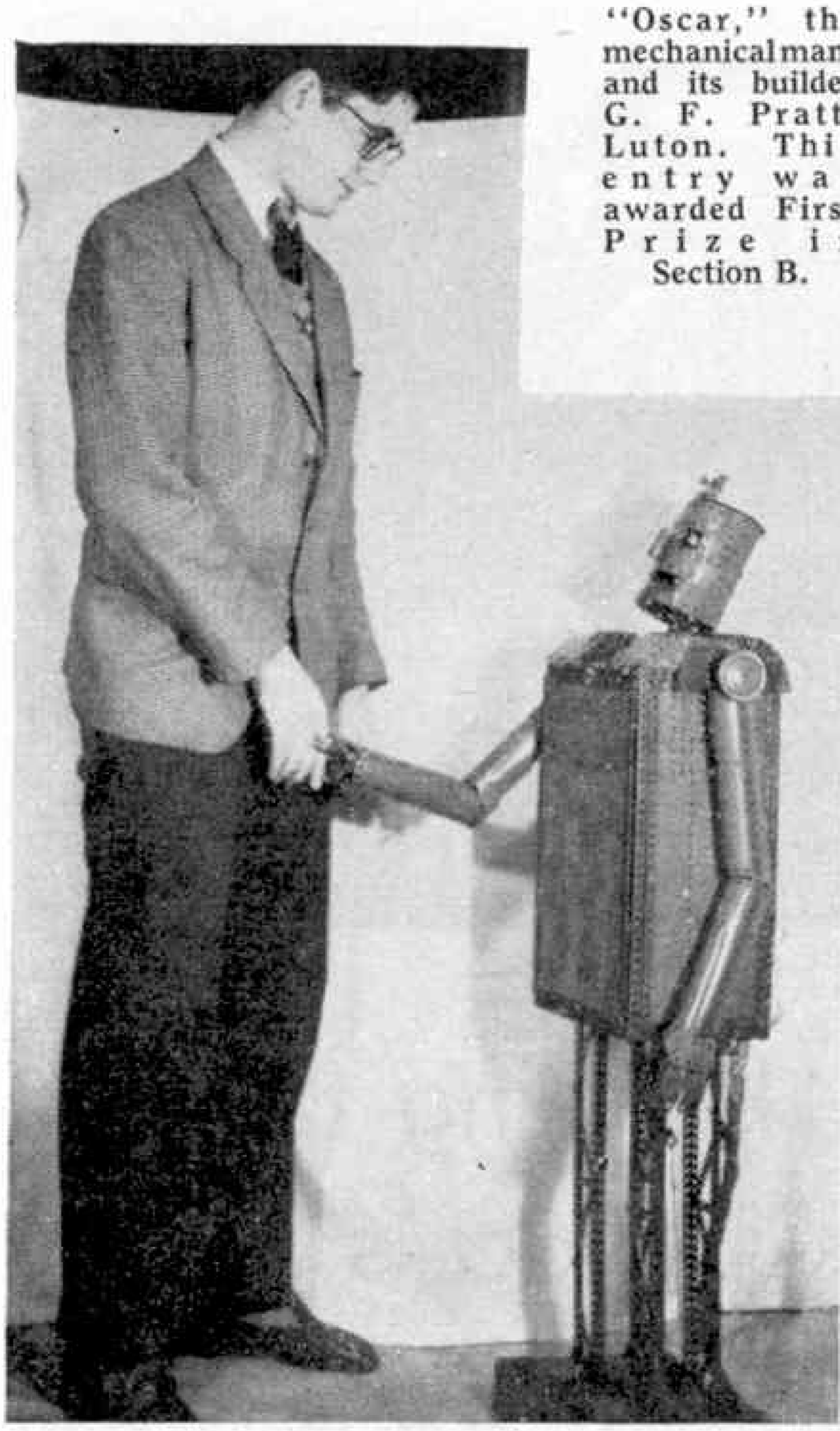
First Prize, Cheque for £4/4/–: G. F. Pratt, Luton. Second Prize, Cheque for £2/2/–: J. T. Clarke, Derby. Third Prize, Postal Order for £1/1/–: Z. A. de Beer, Rondebosch, South Africa.

Ten Prizes each of 10/–: A. Parish, Wakefield; A. Evans, Haywards Heath; J. C. Robert, Santiago, Chile; H. W. Henry, Rochester; H. L. Thomas, Herne Bay; W. A. Tillick, Marton, New Zealand; F. S. Rouse, Cheltenham; E. Feldmann, Leeds; B. W. Rowe, Newton Abbot; R. M. Minshull, Macclesfield.

Ten Prizes each of 5/–: R. O. Felius, Pynacker, Holland; K. Leach, Morecambe; N. M. Miller, Bath; G. J. Spangenberg, Rotterdam, Holland; C. Russell, Haddington;



Smiles of success! F. and M. Mahnen, Luxembourg, with their prize-winning tipping wagon.



"Oscar," the mechanical man, and its builder G. F. Pratt, Luton. This entry was awarded First Prize in Section B.

B. C. Cox, West Bromwich; K. Fulford, Leeds; P. Goodman, Market Harborough; J. Kinnaird, Haddington; J. Larry, Carshalton.

Three of the many attractive and distinctive models entered in this Competition are illustrated on these pages. One of these is a massive and excellently proportioned travelling shipyard crane. This fine piece of work was turned out by a Belgian competitor W. Slosse, Antwerp, assisted by his 8-year old brother Jos. I think everyone will agree that both these boys deserve congratulating on their work, which brought them the First Prize in Section A. The model is based on an actual crane in use at a shipbuilding yard near Antwerp.

Second and Third Prizes in this Section were awarded for a model of a 4–6–4 tank locomotive by Ivan Perryman, Worthing, and a racing car by G. B. Stead, Bradford.

Two brothers from Luxembourg, F. and M. Mahnen, sent in the fine model tipping wagon illustrated at the foot of the previous page, and it won for them an award of 10/–.

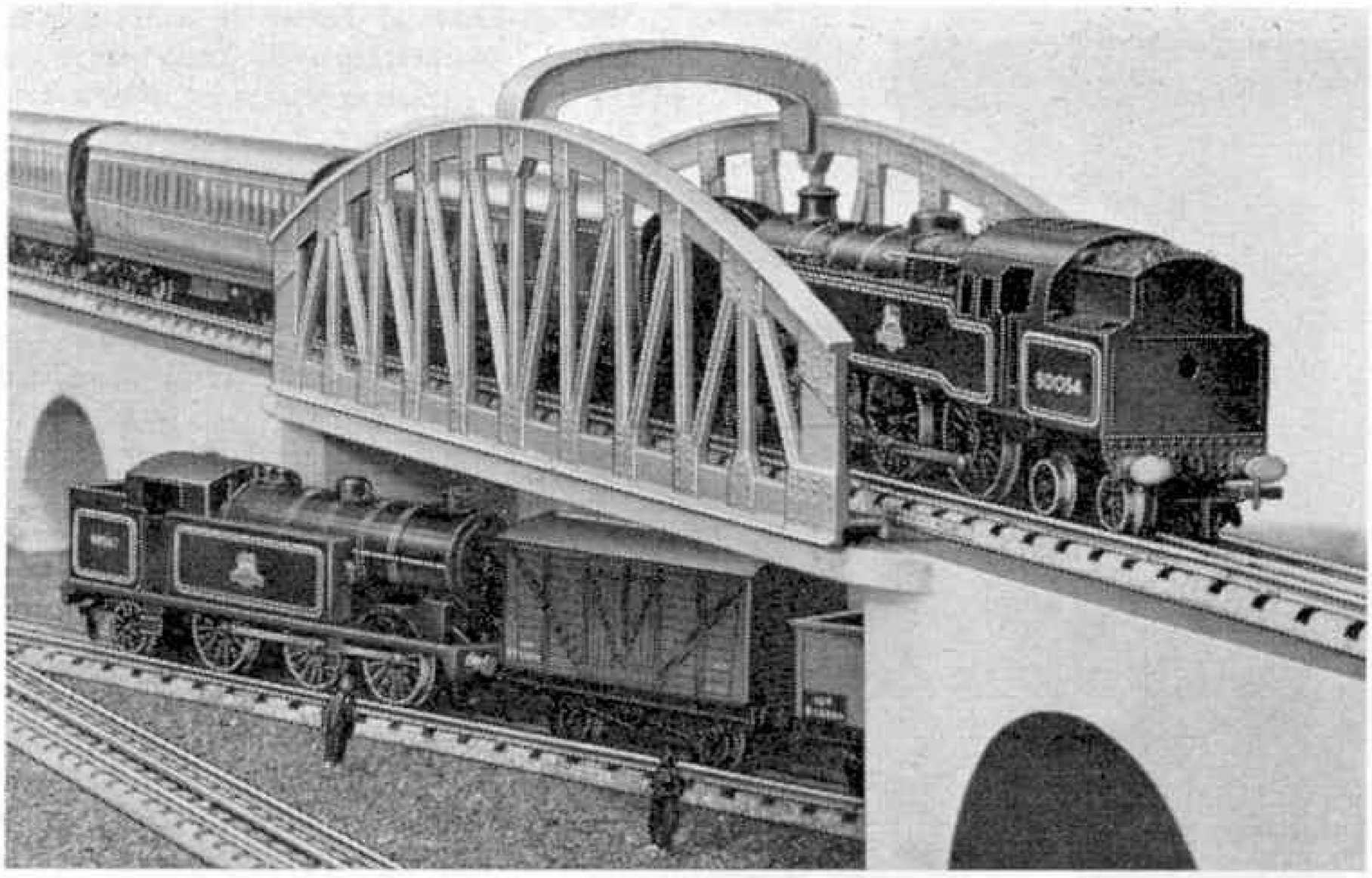
Just as the Section for younger competitors was outstanding in the high average quality of the entries, in Section B the most noteworthy features were the originality and detailed workmanship displayed by many of the models. An excellent example of a model showing these qualities is the fascinating mechanical man "Oscar" shown with its builder, G. F. Pratt, Luton, in the illustration at the head of this page. "Oscar's" interior is a maze of ingenious and tricky mechanisms, which enable this 4 ft. robot, to walk forward, backward or to turn, nod his head, raise and lower his arms, flash his electric eyes and even fire firework rockets from a launching ramp held in his left hand. All of these movements are remotely controlled from a selector mechanism housed in a control pedestal, and derive their power from three Electric Motors and one Clockwork Motor.

Meccano Model-Building Competition

A Last Reminder

The General Model-Building Competition announced in the February *M.M.* closes for entries at the end of this month, and intending competitors should prepare and send off their entries without delay to make sure they reach us in good time. The models may be based on subjects of any kind, and there are no restrictions on the number or the range of parts that may be used to build them.

The actual models must not be sent. Photographs or drawings of the models are all we require, and each competitor's age, name and address must be written clearly on the back of his entry. There are two Sections of the contest; Section A for competitors under 12 years of age on 31st May and Section B for competitors aged 12 or over on that date. The following prizes will be awarded in each Section. First, Cheque for £4/4/–; Second, Cheque for £2/2/–; Third, Cheque for £1/1/–. Ten prizes of 10/– and ten prizes of 5/–. Entries must be sent to *February General Model-Building Competition, Meccano Ltd., Binns Road, Liverpool 13,* and they must be posted in time to reach us on or before the 31st May.



Over the Girder Bridge comes the Hornby-Dublo 2-6-4 Tank running bunker first. Below the 0-6-2 Tank is working a local goods train.

HORNBY RAILWAY COMPANY

By the Secretary

Running the Locals

ALTHOUGH most Hornby-Dublo owners are interested chiefly in the running of long distance main line trains, there are layouts on which a special feature is made of the operation of local and suburban services. On some systems the long and the short distance services are worked quite successfully, but not necessarily at the same time, because it is more convenient to work the busy locals and to dispose of these trains before the main line services begin. This at least appears to be the rule where there is only a single operator. But where several owners run trains together, it is usually simple to work out a running programme that gives plenty of both main line and local trains running all the time.

Hornby-Dublo Tank Locomotives are well suited for the running of local trains and work of a general character. In fact, on one or two layouts that I have seen or heard of tank engines alone are in use. They are compact and so do not occupy a great deal of track or platform space, which is useful from the layout point of view.

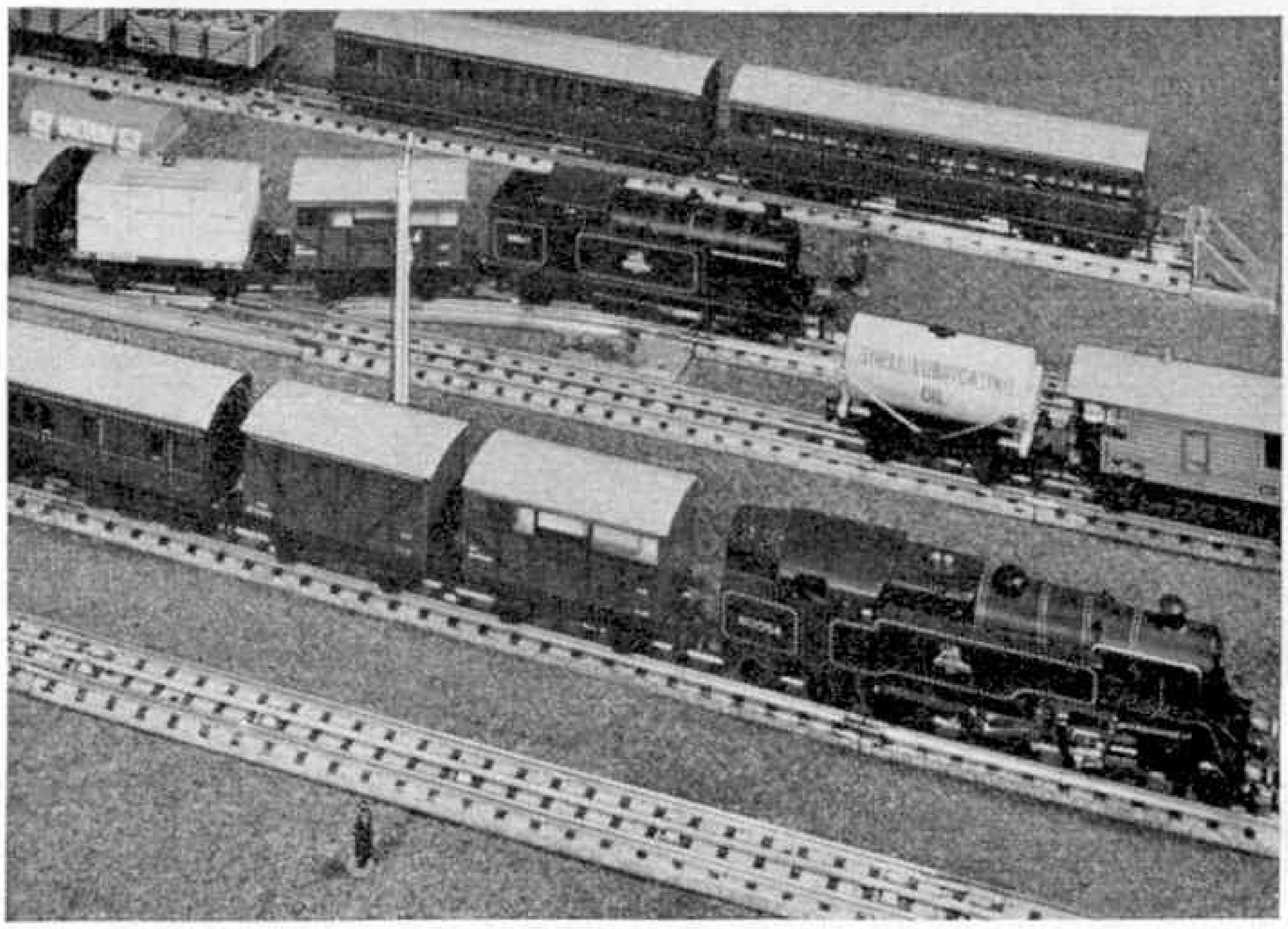
Another point to watch is that where it is intended to make a feature of suburban train running, the layout must be so arranged that the traffic can be handled quickly. It should be possible to detach the engine of an arriving train and dispose of it readily, so that it can either run round the train for the return journey or wait until another engine has come on at the other end of the train.

Space naturally influences the precise nature of the station and layout arrangements, but I think that you are all familiar with the arrangement of what we may call buffer stop sections, and certainly you will not need telling much about loop lines for running round purposes. A buffer stop section is formed by the use of an Isolating Rail, and between this and the Buffer Stops there should be a sufficient length of track for an engine to stand. The D2 Switch connected to the Isolating Rail makes it possible for the engine to be held there after being detached from its train, for which purpose an Uncoupling Rail should be placed next to the Isolating Rail. Then when the train comes in the engine is brought to rest with the couplings between it and the end coach just clear of the uncoupling ramp, so that when the engine is set back slightly with the ramp raised it will become detached from the train. It can then draw forward into the isolating section and be switched out.

This is just one detail of the arrangements needed for the rapid handling of traffic, but good use can be made of similar sections elsewhere on the layout so that engines can be held in strategic positions while other moves are going on. Careful placing of Uncoupling Rails in relation to isolating sections is necessary, and no doubt one or two experimental layouts will have to be tried out before the final scheme is settled on.

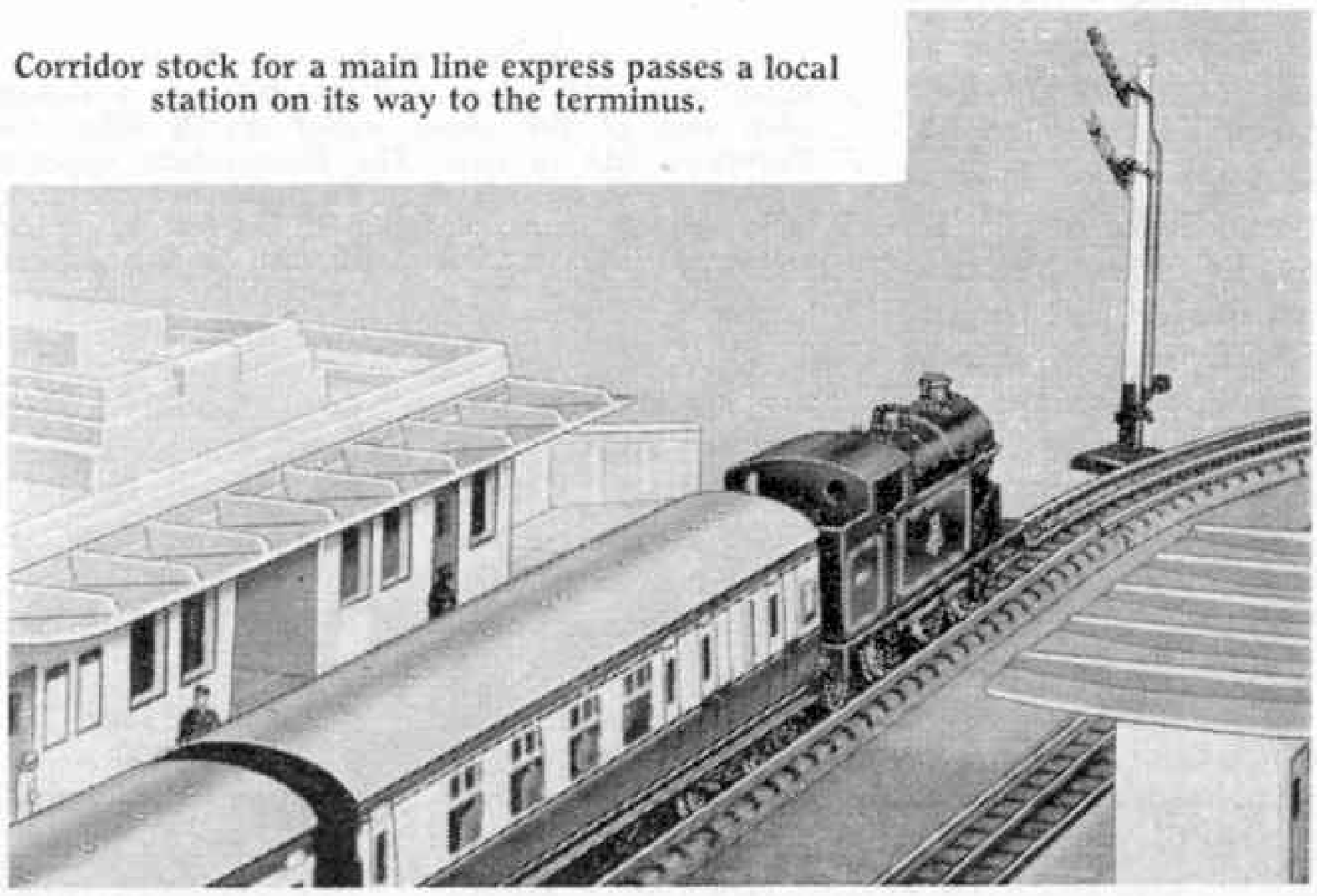
For the average suburban train the Hornby-Dublo D14 compartment Coaches are just what we need. I think that most Hornby-Dublo layouts include some of these characteristic vehicles. They are not as long as the D12 Corridor stock, which is an advantage in loops or stations when space is a pressing matter. For certain outer suburban or residential trains you can use D12 Corridor Coaches and a set of these hauled by a 2-6-4 Tank has a very fine appearance. It may be convenient too for the operator to employ a set train of Corridor stock for a suburban working in one direction as a ready means of bringing the coaches to the departure point for a following main line run. Similar arrangements can apply in the reverse direction.

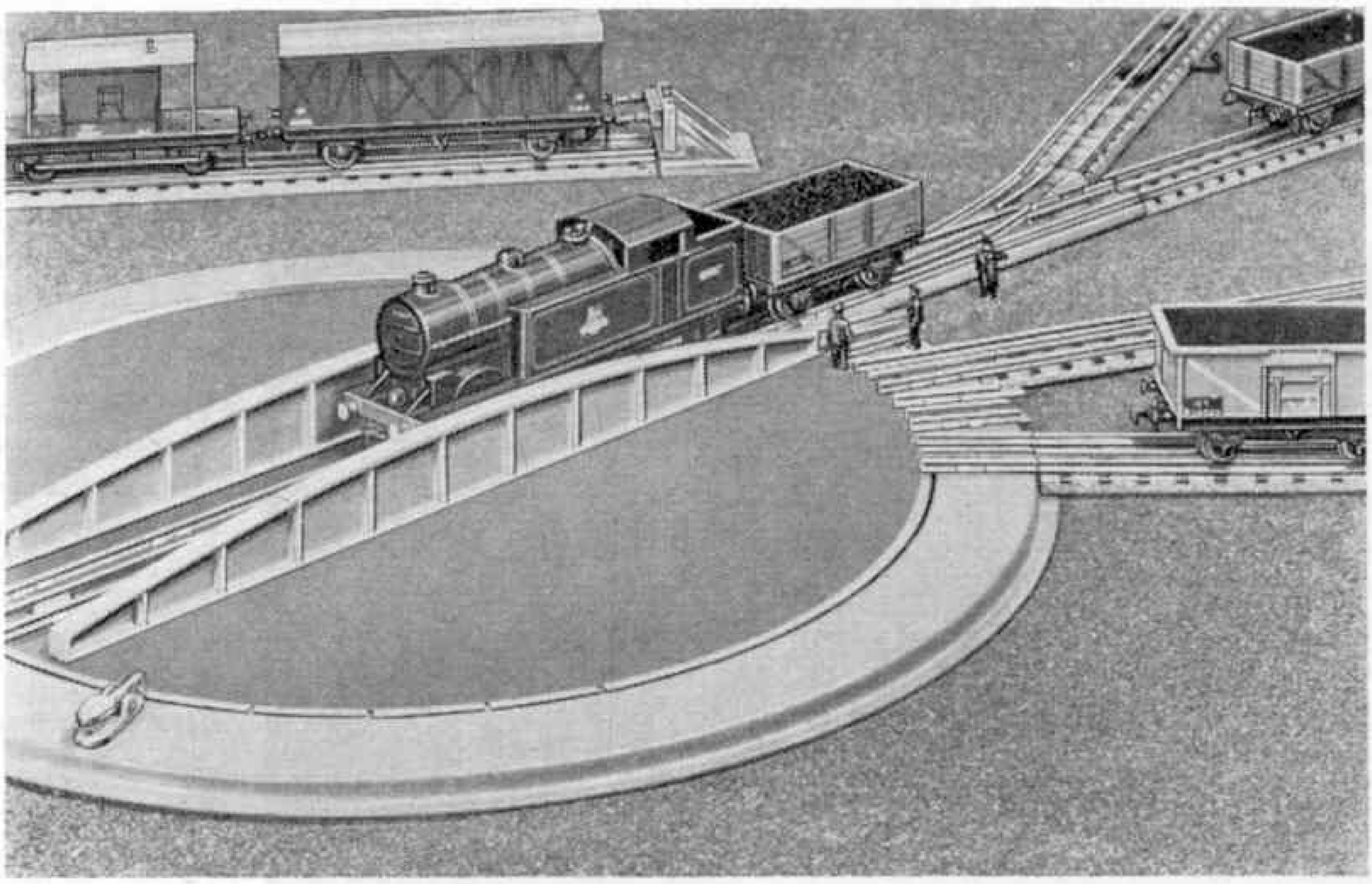
In addition to passenger trains, local goods work forms an important part of railway operation and this can be particularly fascinating in Hornby-Dublo. The assembling of a local goods to serve different stations "down the line," the coupling and uncoupling arrangements called for when wagons are taken on or put off at different places can be really good fun, even if the operations only take place in the same sidings because the railway is necessarily a continuous one within a fairly restricted space. An engine can start off with just a Goods Brake Van and pick up different vehicles at successive stops. Then, after a journey, the same vehicles can be left in the sidings in a different order, to be picked up next time a local goods is worked.



Goods and passenger trains appear in this picture, with various items of stock on other tracks.

Corridor stock for a main line express passes a local station on its way to the terminus.





"On the Shed" in Hornby-Dublo

ON the Shed is a railway term meaning about the engine shed premises or yard, and therefore off the main line. Engines come "off the shed" when they leave for duty and go "on the shed" when they return. Hence the title above for this talk, mainly about shed topics for Hornby-Dublo.

The introduction of the Hornby-Dublo Turntable has given a special interest to locomotive shed or yard matters, as in real practice a turntable invariably forms part of the equipment of a locomotive shed, or Motive Power Depot, to use the official title. A turntable is, as its name implies, primarily the means of turning an engine round at its journey's end, so that it can head the return train chimney first. This applies specially to tender engines. Tanks are not always turned at the ends of their trips, but this depends a great deal on the layout of stations, etc., and the arrangement of engine duties.

As most of you already know, the Hornby-Dublo Turntable has a single approach track and five outlet tracks, but there is no need for you to use all the outlet tracks if the layout does not call for this. Any of the short outlet lengths not required can be left unconnected, as two of them are shown in the illustration above. In this picture the layout is such that the Turntable track is being used to help transfer a loaded Coal Wagon from one road to another. We can imagine that it is part of a train that has arrived with supplies for the engines. Similarly there can be outgoing traffic in the form of ashes.

The picture at the head of the page shows a wagon being propelled across a Turntable into a siding, with two of the short outlet tracks from the Turntable not in use. The illustrations opposite suggest arrangements of the Turntable in association with engine sheds, a topic of interest to model railway owners that is dealt with in this article.

The use of the Turntable to move an engine and wagon from one track to another is quite reasonable and instances of this kind of thing happen regularly in full size practice. The conditions of a particular situation always determine the manner in which any equipment is used.

The diagram on the next page shows an interesting instance of a "different" Hornby-Dublo Turntable layout. Conditions may make it necessary for engines to run on to one end of the Turntable and run back off the same end on to the engine roads or shed. So here we have what is normally one of the outlet tracks used for approach purposes from a running track,

and three of the remaining four outlet tracks are connected up. One is left spare or unconnected for possible future requirements.

On the opposite side of the Turntable base, what is normally the single approach track forms a short spur ending in a Buffer Stop at the right hand end of the diagram. You will notice that a Straight Half Terminal Rail is placed there. This is necessary because although the Turntable track is fed direct from the main track when it is in alignment with the road leading from the Points, it needs a feed in the Buffer Stop road, that is normally the approaching track. Otherwise it would not be possible to run an engine from the Turntable on to the three off-going tracks.

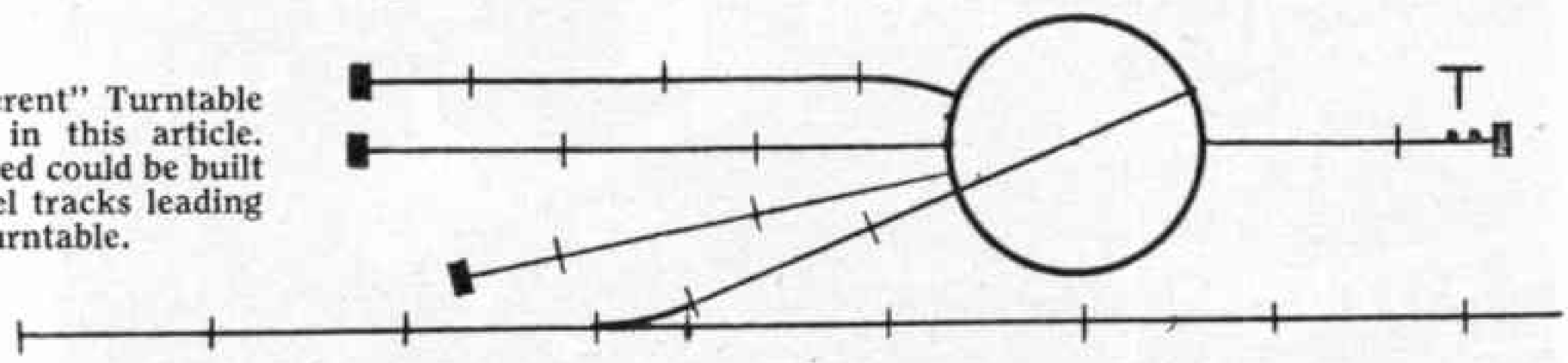


Diagram of a "different" Turntable layout referred to in this article. A straight engine shed could be built over the two parallel tracks leading from the Turntable.

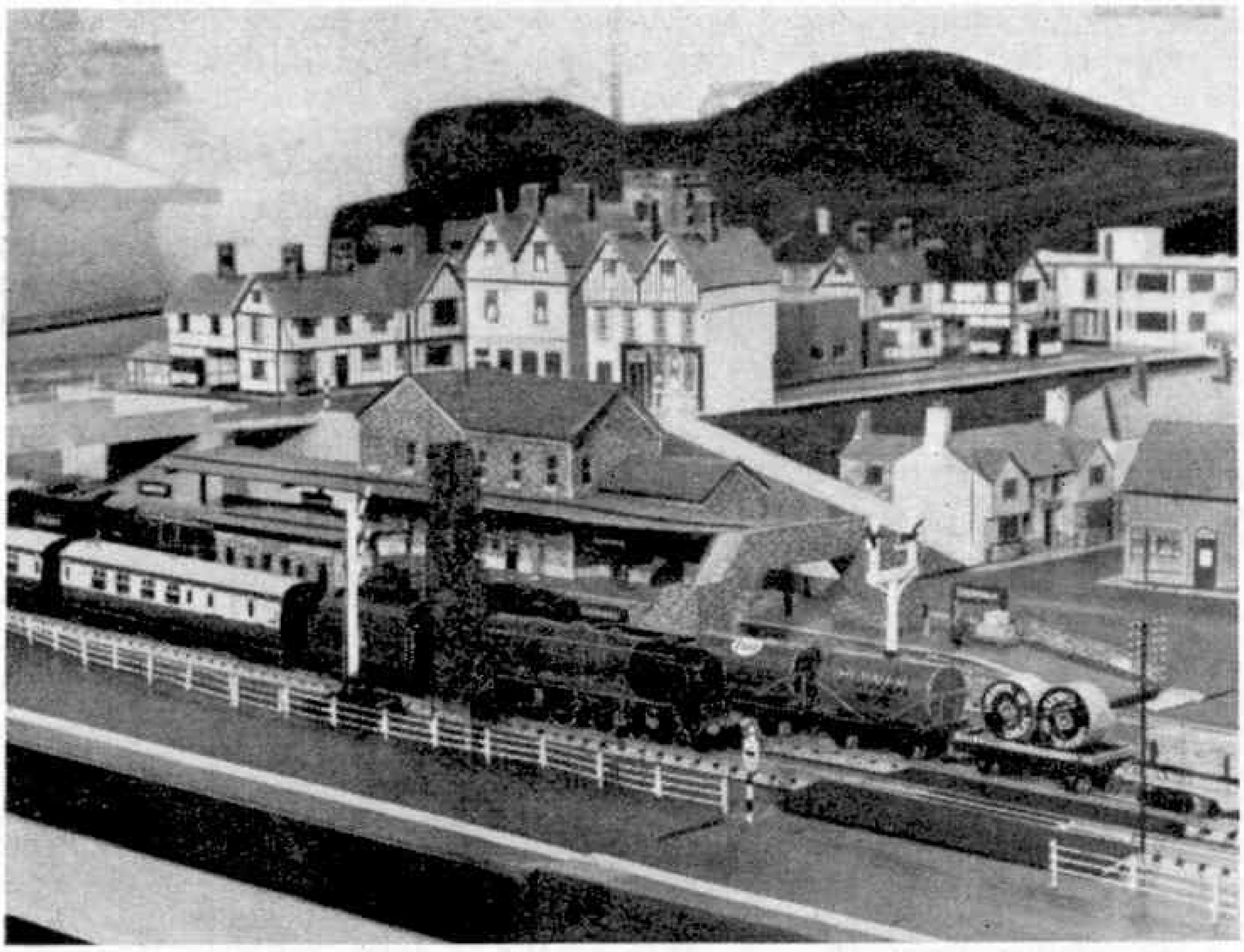
Many Hornby-Dublo owners who have a Turntable endeavour to provide a shed to accommodate their engines. This is not really a difficult matter for those who like to make at least some of their own buildings, especially if some particular form of building is required. Wood, or a combination of wood and card, can be employed successfully and some really good results can be obtained if care is taken.

Where the engine roads are made to run parallel to one another, as two of them do in the diagram, the shed can be a plain rectangular building. Its actual style can be varied to suit the requirements of the owner, but there should be, if at all possible, a peaked section of roof over each track, with a smoke trough arrangement running the length of the roof. Alternatively, separate smoke chimneys can be provided.

To finish off the wood or card walls, paint or the brick papers that can be bought at most shops catering for the miniature railway hobby can be used. Don't forget to provide a few windows or openings in the side walls. The shed staff need some light on the job. Besides, it is always pleasing for the Hornby-Dublo Motive Power Superintendent to catch glimpses of his engines through the openings.

Where the tracks radiate from the Turntable like the spokes of a wheel, a shed of somewhat different form can be constructed. This type is usually known as a roundhouse, although oddly enough not all roundhouses are really round! Below is a Southern Region shed that could readily be reproduced in miniature. The general design is simple. There are no doors to worry about and the number of bays can readily be varied to suit the number of engine roads passing inside. The sheeting forming the frontage shown will no doubt suggest the use of corrugated card to the builder. Intermediate columns can support the roof as they do in our picture.

At Guildford, in the Southern Region of British Railways, tracks radiate from the turntable to serve an engine shed of the roundhouse type. Photograph by S. Creer.



A fine model railway panorama, showing part of the layout described in this article.

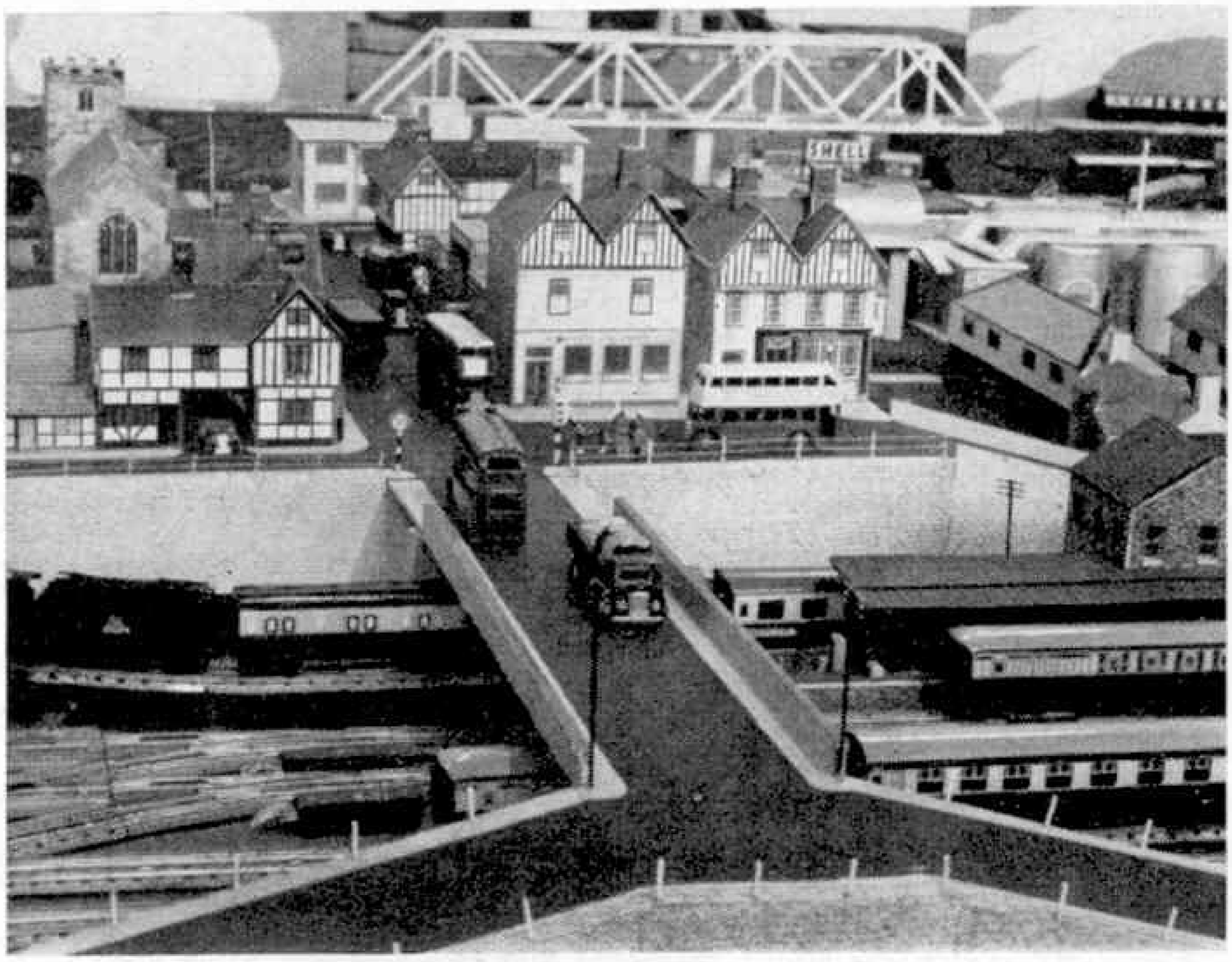
Hornby-Dublo at Broken Hill

IN Broken Hill, Northern Rhodesia, there is considerable Hornby-Dublo activity, and in this our correspondent Mr. J. P. Perkins has been a prime mover. With the aid of a few friends of similar interests he arranged a display for charitable purposes, and details of this, together with the photographs from which the accompanying illustrations have been prepared, were left at H.R.C. Headquarters by Mr. Perkins when visiting our works while on leave in this country last year.

The system is a splendid example of a combined town-and-train layout, and perhaps its greatest merit is that the railway fits splendidly into the general scheme of things instead of being merely a collection of tracks with lineside effects added. As is usually desirable for demonstration or exhibition purposes, the railway is continuous. It has four main running tracks. The outermost pair run more or less along the edges of the 16 ft. by 8 ft. baseboard, which the illustration above shows to be made in sections. Across the ends of the board there are moderate gradients on the outer pair of tracks, to raise their level sufficiently to justify the use of the well-constructed girder bridge that can be seen in the background of the upper illustration on the opposite page.

The inner pair of main running tracks follow a course parallel to the outer pair, but do not stretch so far across the width of the board, so there is room for two branching tracks at normal baseboard level that pass under the girder bridge. This gives a very effective arrangement. These branching tracks are actually dead-end roads used for the making up of trains, but that is not apparent from the side of the layout from which it is normally viewed when on show. These sidings are in fact hidden from the onlookers, as when through the bridge they turn to run parallel to the raised section, but behind it. The shelf on which the various controls are mounted is behind the sidings, so that the operators work from the back of the railway.

There are connections between the inner and the outer sets of running tracks, these coming just to the left of the road level crossing shown in the first illustration. To the right of the crossing, as viewed by the readers of these pages, are further Points leading to an engine shed, with a triangular layout for turning purposes, carriage sidings and one or two railway buildings, stores and so on.



A view across the town that provides the main scenic attraction of the layout, which includes road and rail bridges.

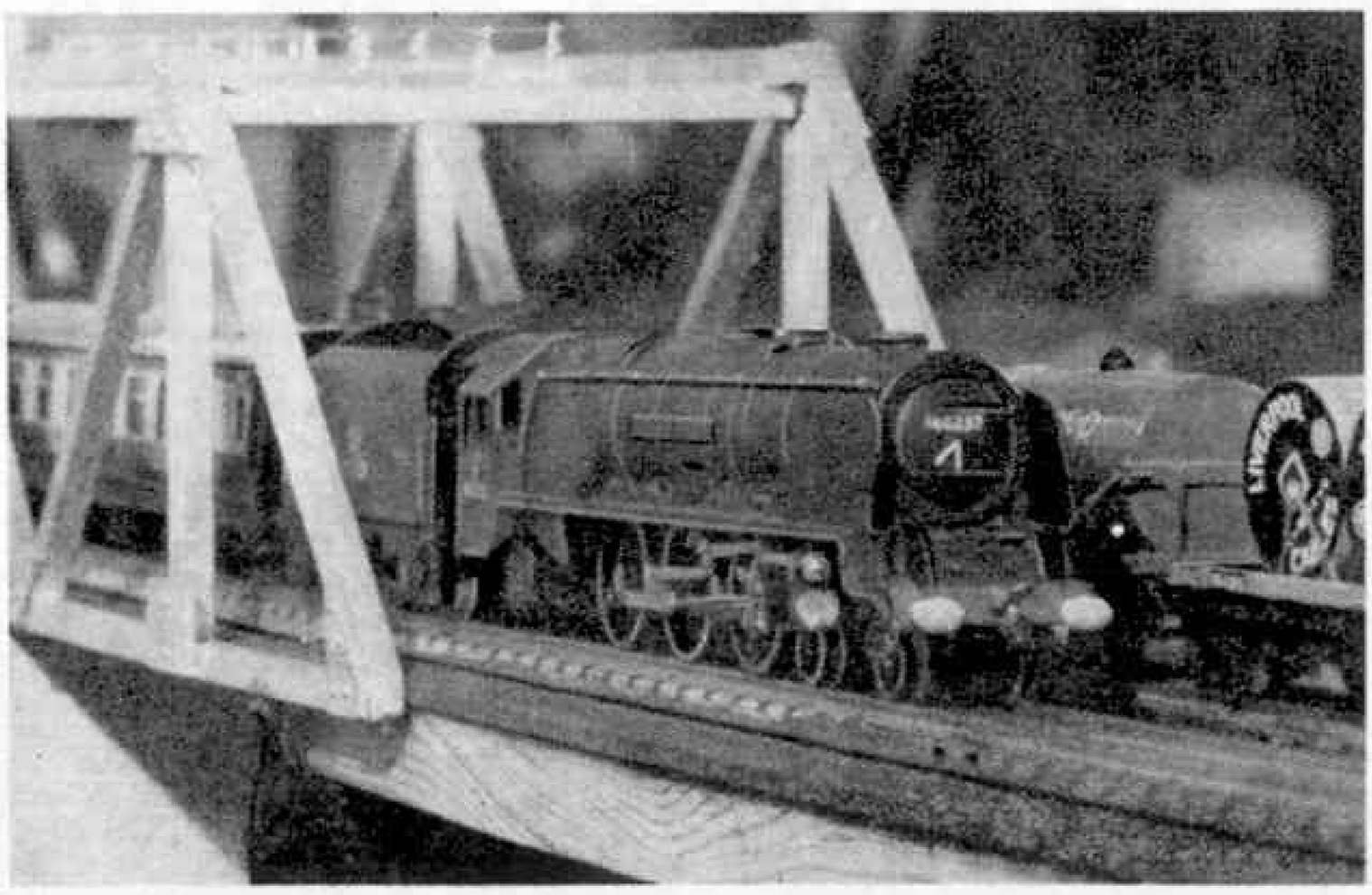
The raised part of the township served by the railway is prominent in our illustrations, this section being towards one end of the whole system. By the inclusion of this feature, the dead level appearance that many layouts present is avoided. Below the town, at baseboard level, are further buildings, most of these being devoted to industrial purposes. The tanks of an oil storage compound can be seen at the right of the upper illustration on this page, the premises having rail sidings close by where Tank Wagon traffic is handled. There is in addition an engineering works and an attractive feature in the shape of a chocolate factory—with no output! The latter is served by rail, a siding curving into the building from the adjacent marshalling yard.

Road transport plays an important part in general activities on the layout, and so there is a bus garage in which the familiar Dinky Toys No. 290 Double Deck Buses and other public transport vehicles are to be found. As can be gathered from the road bridge scene above, the road system is not too crowded, which is a good point if the various features of a display of this kind are to be properly appreciated.

The road bridge leads across the railway from the raised township and the ramps shown bring the road down to baseboard level. Another means of access to the town from this level can be seen behind the railway station. The separation of the industrial features from the residential section is a good idea, and seems to give a more spacious effect than would be obtained if works and houses were mingled.

As with many of the lineside effects the main station, named *Lichfield*, was built specially for the layout. There is another station, *Westbury*, and this consists of the standard Hornby-Dublo Main Line Station and Island Platform used together.

The layout is a joint affair, with four partners sharing in the concern. The equipment includes 27 engines and 137 items of rolling stock.



"Duchess of Montrose" coming off the girder bridge with a train. Right hand running is the rule on this layout.

Club and Branch News

WITH THE SECRETARY

PHOTOGRAPHERS TO THE FORE!

The Easter holiday just passed will have been the occasion for many amateur photographers to get out their cameras again and resume their favourite hobby—if indeed they have not by now made it an all-year pursuit.

Club and Branch members who are photography enthusiasts can turn their skill to good advantage during the summer months by taking pictures of their fellow members either suitably posed for the occasion or engaged in any of the outdoor recreations indulged in during the summer Sessions. Rambles, cycle runs, games in the parks or recreation ground, treasure hunts, visits to places of interest—all these outdoor activities abound in opportunities that will richly reward the Club or Branch photographer ready to spot and take advantage of them. The results of his camera "shots" will be of great interest to his fellow members, and the best of the photographs should certainly be sent along for me to see. If suitable for reproduction in the *M.M.* I will be delighted to use them in this way.

H.R.C. BRANCH RECENTLY INCORPORATED

No. 563, Liverpool Institute Models Society—*Chairman:* Mr. J. D. Wray, B.A., 35 Borrowdale Road, Sefton Park, Liverpool 15.

CLUB NOTES

Consett and District Y.M.C.A. M.C.—Early this year a start was made on the construction of a large Meccano blocksetting crane, which will have a 6 ft. boom. Mounted on the pivoting axis of the crane will be a small service crane arranged to be operated from the gear-box of the main crane. The whole of the pit bottom of the model colliery is being relaid, and conveyor belting installed. The conveyor will feed two hoppers, which in turn will load the skips. Three members are busy building a model threshing machine. Club roll: 22. *Secretary:* T. H. Porter, 38 Backstone Road, Bridgehill, Consett, Co. Durham.

Mile End (Portsmouth) M.C.—The seventh Anniversary Party, attended by members and parents, was a great success. Model-building activities have increased, and another competition is being arranged. Preparations are in hand for another Open Night. A General Meeting has been held to discuss outings during the summer months. Club roll: 26. *Secretary:* Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.

SOUTH AFRICA

Cape Peninsula M.C.—An Exhibition was held on Saturday 26th January last in the Rondebosch Boys' Preparatory School, in aid of the School Centenary Fund, and raised £20. The excellent display included 26 Meccano models, a model railway layout, and a puppet show. The Exhibition was open during the afternoon and evening, and there was a steady stream of visitors. Members have been putting in some "overtime" on Saturday afternoons carefully stocking the recently completed Meccano cabinets with the Club's Meccano parts. Typed stock lists are being prepared. Many members took part in a recent visit to a newly-established modern bakery, where they were greatly interested to see the mechanised methods now employed in the quantity production of loaves and cakes. Immediate plans include a lecture on *Excavators* and a Film Show. *Leader:* Mr. Z. A. de Beer, "Royston", No. 3 Stanford Road, Rondebosch, South Africa.

BRANCH NEWS

Edlington County Secondary School (Doncaster)—Track running to operation cards is worked at most meetings, and operations successfully completed are recorded on a chart. Thus each member can see at a glance how far he is "qualified" to operate the layout. Hitherto much of the equipment used at Branch meetings has been loaned by members, but now all of this has been bought by the School, and thus has become the Branch's own property. The layout being used will be developed as funds allow. *Chairman:* Mr. K. J. Templeman, 86 Florence Avenue, Balby, Doncaster Yorks.

Mr. Arnold L. Coe, who has been the Secretary of the Hale End (London) H.R.C. Branch No. 551 since its incorporation nearly three years ago, an event that owed much to his initiative and enthusiasm.

Hale End—The Branch has been offered the use of more convenient quarters in a Church Hall, and members are looking forward to the transfer. One advantage will be better facilities for storing equipment. The first task after the move will be repairing and renovating the baseboard, preparatory to putting down a new layout. Additional track is being bought. *Secretary:* A. L. Coe, 463 Hale End Road, Highams Park, London E.4.

Mile End (Portsmouth)—Separate meetings are held for passenger and goods operations (both clockwork and electric), as it is not practicable on the Branch layout to carry out both types of railway working on the same night. The Branch is co-operating with the associated Mile End M.C. in the production of a Club and Branch Magazine, and it is hoped that when this is in circulation it will help in increasing the Branch membership. *Chairman:* Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.

Kidderminster—The programme being followed includes a Talk by several members on their Hornby-Dublo and Hornby Clockwork locomotives, and the problems that arise in designing layouts for home use. An outing to London that will incorporate visits to the four main line terminals there is planned, also a visit to the Model Railway Club Exhibition, London, during Easter week. *Secretary:* A. J. Potter, 35 Woodfield Crescent, Kidderminster.

Farewell to Flying Boats—(*Continued from page 218*)

built, in Mk. 1, 2, 3 and 5 versions, and that the last came off the assembly line as long ago as October, 1945. Seldom has so much been achieved by so few aircraft, and even when the last of them are retired by No. 205/209 Squadron, and by the Royal New Zealand Air Force and French Naval Air Service with whom they still fly, many people will remember with affection the might, majesty, domination and power of the last and greatest of Britain's wonderful military flying boats.

Mechanised Motor Cylinder Casting—

(*Continued from page 219*)

the ladle is in the pouring position, and then to move the switch to bring about synchronising. On this conveyor and crane move at the same speed, so that the pouring position is maintained whatever the conveyor speed may be. The controls for this matching or synchronising scheme are very simple. This greatly reduces the strain on the crane operator, and also allows high speeds in operation to be maintained.

My Green Lizard—(*Continued from page 224*)

tail began to grow. Then, early next summer she managed to escape into the garden. The cage had been standing in its usual place, but when I went to feed her she was not there. I found the hole she had gone through, but there was no sign of her, and naturally enough she did not come when I called. A couple of weeks later my wife saw her. She was sitting in the garden frame, looking sleek and glossy, but she would not let herself be caught.

After that we saw her again two or three times, but she had become wild and was very shy. Obviously she was well and happy, so we decided to leave her and let her manage on her own. She had been a pet for a long time and given us a lot of pleasure. We did not begrudge her freedom, but we sometimes wondered whether she was lonely. For, of course, she would never find a mate in England.

Easy Model-Building—(*Continued from page 237*)

Parts required to build the Swing Boat: 3 of No. 2; 4 of No. 5; 1 of No. 10; 7 of No. 12; 1 of No. 16; 1 of No. 19s; 2 of No. 22; 1 of No. 24; 4 of No. 35; 25 of No. 37a; 22 of No. 37b; 3 of No. 38; 1 of No. 48a; 1 of No. 52; 2 of No. 90a; 2 of No. 111c; 2 of No. 126; 2 of No. 126a; 2 of No. 189.

Parts required to build the Shipyard Crane: 10 of No. 1; 14 of No. 2; 2 of No. 3; 12 of No. 5; 2 of No. 6a; 4 of No. 8; 4 of No. 10; 4 of No. 11; 12 of No. 12; 8 of No. 12c; 1 of No. 15b; 4 of No. 16; 2 of No. 17; 1 of No. 18a; 1 of No. 19g; 2 of No. 19b; 5 of No. 22; 2 of No. 22a; 1 of No. 23; 1 of No. 24; 2 of No. 24a; 2 of No. 24c; 1 of No. 26; 1 of No. 27a; 8 of No. 35; 118 of No. 37a; 108 of No. 37b; 12 of No. 38; 1 of No. 40; 1 of No. 48; 8 of No. 48a; 1 of No. 51; 1 of No. 52; 2 of No. 54; 1 of No. 57c; 2 of No. 111a; 6 of No. 111c; 1 of No. 115; 2 of No. 126a; 1 of No. 186a; 4 of No. 187; 4 of No. 188; 4 of No. 189; 2 of No. 190; 4 of No. 192; 1 of No. 198; 2 of No. 200; 2 of No. 214; 2 of No. 221.

Among the Model-Builders—

(*Continued from page 247*)

Fishplates 2 fixed between nuts on Rod 18. The angle of the Fishplates is adjusted so that the Pinion on Rod 5 can be meshed with both the ¾" Pinion on the output shaft and the ½" Pinion on Rod 3A.

Rods 3 and 3A are each fitted with two Collars arranged so that a nut on a Bolt 20 engages between them. *Two Washers are placed between the inner Collar and the Face Plate.* The Bolts 20 are fixed by nuts in Collars mounted on 1" Rods supported in the lugs of Double Angle Strip 13 and in the spider 25. Spring Clips are placed on the ends of the 1" Rods, and are prevented from turning by bolts fixed in the Fishplates attached to Double Angle Strip 13. The two Collars are fixed on the 1" Rods by ordinary bolts and the spider 25 is fitted with one of the special bolts from a Swivel Bearing. The special bolt must not grip the 1" Rods.

The gear change lever is a 1½" Rod held in a Small Fork Piece 23, which pivots on set screws 16 passed through a Large Fork Piece 22. The Large Fork Piece pivots on a Threaded Pin passed through a Fishplate bolted to the Face Plate.

Stamp Collectors' Corner—

(*Continued from page 261*)

solely with the stamps concerned.

One reader asked me recently what a "sweat-box" was. Actually it is a handy gadget, for those who are well up in the hobby. Unused stamps with several bits of mounts stuck on the back are anathema to collectors in these days, but with the use of a sweat-box you can get rid of these unwanted mounts without disturbing the gum too much. But a certain amount of skill is needed, so as these comments are meant mostly for beginners, I will not go into details just now, but sometime in the near future, I will explain how to use these useful, if not very elegantly named accessories. The perforation gauge I referred to last month.

There is one other point. If there is a stamp society in your town or district, why not join? You will find the meetings not only enjoyable, but helpful. Collectors are always willing to help a beginner, and there are so many things that cannot be explained on paper, but soon become clear when you see what other collectors do.

I have mentioned that one is inclined to spend more money on stamps than one can afford to completely disregard. Next month I will discuss the question of stamps as an investment.

BROCK BOOKS COMPETITION

An interesting Brock Books Competition has been organised by The Brockhampton Press Ltd., Leicester, and will run for at least a week during the period 24th April to 11th May, 1957, inclusive. Any reader under 14 years of age is eligible. A large four-colour poster will be displayed in booksellers' windows, together with 46 Brock books. On the poster are 18 clues referring to book jackets. Competitors must identify the jackets, and write the correct numbers against the title of the appropriate books on the entry form, which they can obtain from the bookseller. Then they must write an account—differing in length according to the competitor's age—saying which is their favourite book, and why.

There are over 300 prizes to be won in this contest. The first prize for boys and girls of 14, 13 and 12 years of age is a portable Pye radio receiver worth 17½ guineas.

The Competition is advertised on page xi of this issue.

TRACTION ENGINE RALLY

The Andover and District Model Engineering Society is holding a Traction Engine Rally at Finkley Manor Farm, Andover, Hants., on Saturday, 11th May, 1957. The Rally will open at 12 noon, and it is expected that there will be upwards of twenty steam traction engines. It is hoped also to have some veteran cars there. Other attractions will be a passenger carrying, miniature railway of 7¼ in. gauge, and a fine display of models in a large marquee. The Rally Secretary, Mr. G. Howell, of 5, The Crescent, Andover, will be pleased to give further particulars to readers who hope to be able to visit the Rally, and who will write to him for them.

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Stamp Collectors' Corner

By F. E. Metcalfe

THE KIT BOX

I have gone into the why and wherefore of stamp collecting, during the past few months, and now it is necessary to deal briefly with the tools that a collector needs.

First and foremost comes the question of albums. Most youngsters are presented at one time or another with a printed album, with spaces all lined in, showing where the stamps should be placed. Such albums may be all right for the very young, but I am completely against them for anyone who has the slightest pretension to being a collector, as distinguished from a mere sticker-in of stamps.

Most of the fun of the pastime lies in arranging your stamps to your own liking, once you have obtained them. One of the two principal reasons why people get tired of stamp collecting—the other is through buying a loose lot of stamps, in a packet, which come from any or every country—is that just mounting stamps in a space already provided soon palls on one. So get a loose leaf album. One with a spring back is perhaps the most handy, for then one can slip pages in and out with the least trouble.

I have pointed out already that none can get anywhere trying to collect generally, so we will assume that a group of countries only is being collected. Suppose that the "QEII" British Commonwealth issues are the ones selected. You will then form your collection on the lines I previously indicated, but for new readers let me recapitulate briefly.

Get your set of stamps, of a particular country. Write or print neatly and carefully the name of the country on the top of the page. Add any details you wish, such as date of issue, watermark, etc., and after setting out the stamps to your liking, carefully mount them. Unless your set is complete, take care to leave space below for any higher values or varieties you are likely to obtain later on. Try to avoid mixing used stamps with mint, and if your set consists of stamps in the latter state, do take the greatest care over the mounting.

First of all use only the finest peelable mounts. The best cost very little more than do the rubbish.

Be careful not to make them too wet, or the stamps will stick to the album pages and will be no longer mint when you try to remove them. Of all the hints I can give, none is more important than the one about taking the greatest care to mount mint stamps carefully, so that they can be removed from the album at will without damage to them.

A pair of tweezers—in the U.S.A. they call them tongs—is necessary for handling stamps, if they are not to be soiled by handling. Even if the hands are carefully washed before starting to mount, they soon gather dust. That easily gets transferred to stamps, and soon our specimens are so grubby that they no longer rank as mint.

Incidentally, I should stress the importance of storing one's albums correctly. Never leave them flat down. Always keep them upright. If your album is laid flat, the stamps gradually get pressed on to the pages and become stuck down if there is the slightest moisture about. How many times have I seen the dire result of leaving albums flat in a drawer!

Why all this insistence on the condition of one's stamps? The fact is, that if you once become really interested in the hobby you will spend a good deal more on your stamps than you are prepared to throw away. In other words, you wish to maintain as much of the selling value of your stamps as you can. That is putting it plainly. Now if your stamps become dirty or damaged—I am referring mostly to unused stamps now, but faulty handling of used can lower their value just the same—they lose a lot of their value on resale. Collectors are becoming more particular in regard to condition every day, so dealers have to take care that they only buy the best.

A stock book is needed to keep loose stamps, before they are mounted, or for duplicates. You know the kind of thing I mean. Each cardboard leaf is traversed by strips, which make long pockets in which you can slip your stamps, but again be careful. See that the stamps slip in cleanly, with none of the perforations doubled back.

You will want a catalogue to cover the group of stamps you collect. For foreign you could not do better than use a Gibbons Simplified to cover the stamps of the whole world, or one of their sectional catalogues for foreign stamps, their Part 1 for all colonials, or their "Two Reigns" for KGVI and QEII groups together. The "Commonwealth" Catalogues can be used for either of those two latter groups separately, and for QEII group alone the "Commonwealth" is the only catalogue dealing

(Continued on page 259)

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For other Stamp Advertisements see also pages 260 and xviii

Stamp Gossip

ODD SHAPES AND SIZES

It is not so long since a collector showed me what he called his "Odd Shapes and Sizes" collection. Every stamp in it differed from the orthodox square or oblong shape. The stamps were not particularly well arranged, yet even one not a collector would be interested to see it, once it was explained that all the stamps it contained were genuine postage stamps. It would strike the layman at once how lacking in imagination our own postal issues are compared with some issued abroad.

To start such a collection should not be very hard, for there are many oddly shaped stamps about. One is illustrated here. The bird shown is described as a pepper bird, whatever that may be. It will be fun to find out, and it is the interesting pieces of information that one gathers when making up such a collection that adds to the value of one's task. I am a great believer in the local reference library. You'll find in yours details as to what a pepper bird is, with much more information about birds, etc., depicted on some of the other stamps.

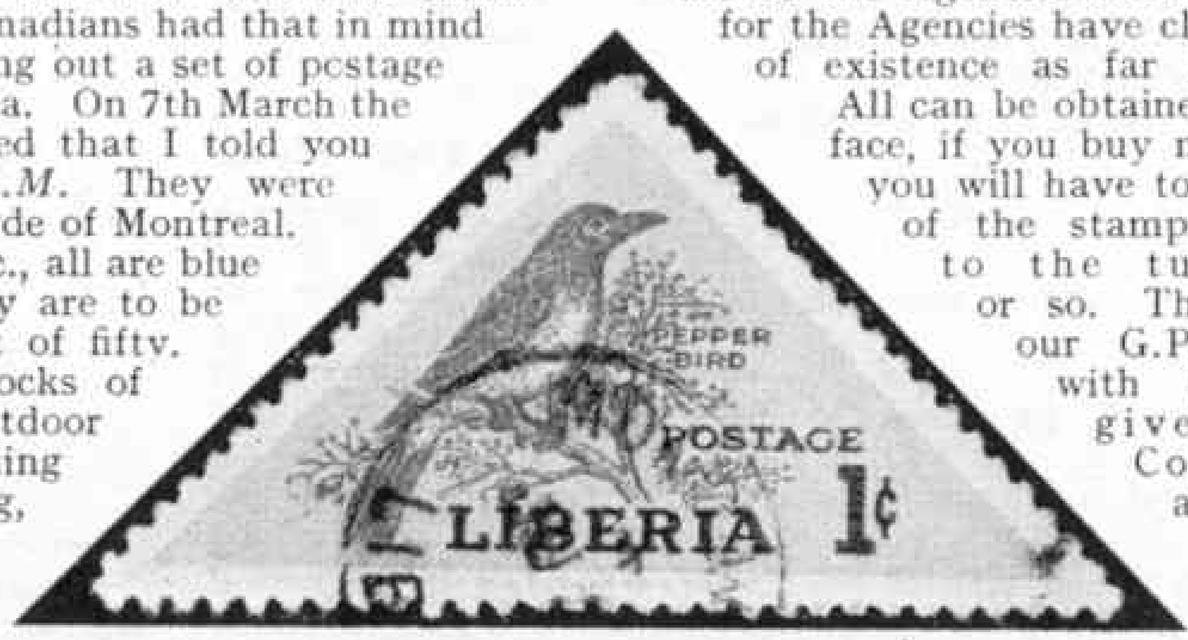
SUDAN

There was a time, even since the war, when Sudan was one of the most popular of countries with British collectors. Not only were Sudanese stamps attractive, but there were plenty of varieties in the way of scarce perforations, etc. Now that popularity is on the wane, mostly because Sudan has left the Commonwealth.

One of a set of three stamps issued to commemorate that breaking away is illustrated on this page. There are still close commercial ties between Britain and Sudan, which means that there are plenty of used stamps about of the latter country, and as even high values are to be obtained cheaply, some collectors will still go in for them. But I am afraid that never again will their former popularity be regained.

OUTDOOR RECREATION

We in Britain, overlooking our own latitude, are inclined to think of frost and snow when we think of Canada, and maybe Canadians had that in mind when they decided to bring out a set of postage stamps to combat that idea. On 7th March the four stamps duly appeared that I told you about in the March *M.M.* They were designed by Lawrence Hyde of Montreal. All have a face value of 5c., all are blue and, strangest of all, they are to be found on the same sheet of fifty. So collectors can get blocks of four. The subjects are outdoor sports, one stamp depicting hunting, another swimming, another skiing and the fourth fishing.



As usual, the designs are delightful, and I don't think I will get any stamps this year that I will like more. I am sure that you will agree when you see the stamps. Make sure that you get your block, and if you can get one nicely cancelled, so much the better.

JAMBOREE

As most scouts who are collectors will know, our Post Office is to issue a set of stamps to commemorate the Jamboree to be held in Wales later in the year. The Boy Scouts Association is said to be sponsoring a set of three first day covers, each of which will bear a set of three stamps to be released for the occasion.

There is quite a discussion going on, at the time these lines are being written, as to whether the 6/6 to be charged for each cover is not too much in view of the fact that the stamps will only have a face value of 1/9½—the values are to be 2½d., 4d. and 1/3. I do think the price is on the high side, but a cover, along with a mint set, will make a nice album page, and the cause is a good one.

THOSE IMPERFS

The discovery, a month or two ago, by the popular press that an imperforate sheet of British stamps was worth several thousand pounds, gave many people the idea that any slight abnormality meant a fortune to the owner. Now of course a lot know better. Yet the newspaper publicity did set everyone on the hunt. Some varieties of importance that might otherwise have gone un-noticed were rescued, and gained a few pounds.

Many readers of the *M.M.* have only a hazy idea of what some of these philatelic tit-bits look like, so I am asking the Editor to illustrate a block of current Great Britain 3d. stamps that is partially imperforate, and which would have put any one of us who had had the good fortune to find it up to the extent of a couple of hundred pounds or so. It was part of a purchase made in the Old Kent Road.

THE MONTH'S TIP

I am not going to refer to a single stamp this time, but to all the stamps with the Queen's portrait—both watermarks—that were overprinted for use in the Morocco Agencies. Some of the stamps are already obsolete and, alas, all ended their postal usefulness as far as the Agencies were concerned on 30th April, for the Agencies have closed down after a century of existence as far as Tangier is concerned. All can be obtained at not a great deal over face, if you buy now. If you wait, I think you will have to pay a lot more, for some of the stamps were only overprinted to the tune of about 40,000 or so. This I know officially, for our G.P.O. kindly supplied me with the figures, which are given in detail in the Commonwealth Courier, and later will be published also in the Commonwealth Catalogue.

"You're fired!"
(By courtesy of "The Commercial Motor")

* * * *

Called away urgently for a couple of days, the bachelor slipped the following note under his neighbour's door:

"Dear Mrs. Jones, Will you please put a little food out for my cat each day? He will eat anything, but don't put yourself out."

* * * *

"Waiter," commanded a man in a restaurant, "bring two plates of guiseppe verticelli."

"Pardon," said the waiter gently, "but that's the proprietor."

* * * *

Father (to small son): "When I was your age I was glad to get dry bread to eat."

Son: "Really? Well you're much better off now that you're living with us, aren't you Daddy?"

* * * *

Son: "I want to ask you a question, Father."

Father: "What is it?"

Son: "If the Egyptians wrote on stone did they need a hammer to break the news?"

* * * *

"My brother has a gold medal for running five miles, and another for ten miles; a silver medal for swimming; and badges for boxing and rowing."

"He must be a wonderful athlete."

"He's no athlete at all. He runs a pawnshop."

* * * *

Holdup man: "Stick 'em up, or else."

Victim: "Or else what?"

Holdup man: "Don't confuse me—this is my first job."

* * * *

Editor: "Adolphus, would you like to take a day off?"

Office Boy: "Thank you very much, sir. Very much obliged, sir."

Editor: "Well, take it off that calendar, it's the 15th today!"

Fireside Fun

Barber: "Is there any particular way you'd like your hair cut?"

Customer: "Yeah, off!"

* * * *

A negro was in court because he'd hit a man.

Judge: "Did you hit him in defence?"

Negro: "No, I hit him on de nose. I knocked him over de fence!"

* * * *

Stern Father: "When I was your age I thought nothing of a ten mile walk."

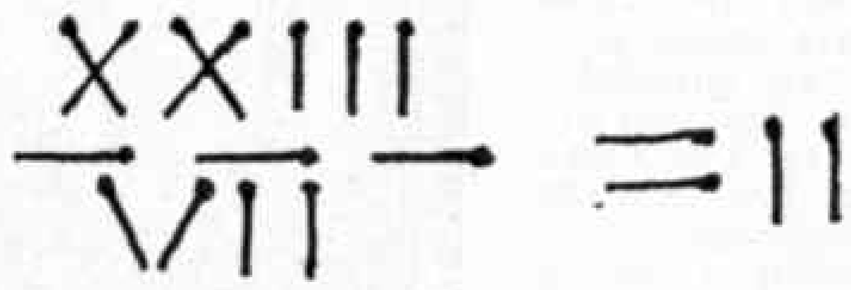
Lazy Son: "I don't think much of it myself, Dad."

* * * *

BRAIN TEASERS

A MATCH PUZZLE

The sketch below shows a number of matches arranged to form a simple arithmetical sum. It will be seen, however, that the sum is incorrect as 23 divided by 7 does not equal 2. By moving only one of the matches and rearranging it elsewhere, however, the sum can be made correct. See if you can spot which is the match to be moved, and where it must be placed in order that the sum makes sense.



* * * *

NAME THE ANIMAL

By adding one half of twenty to nothing it is possible to form the name of an animal. Can you discover how it is done?

* * * *

ANSWERS TO LAST MONTH'S PUZZLES

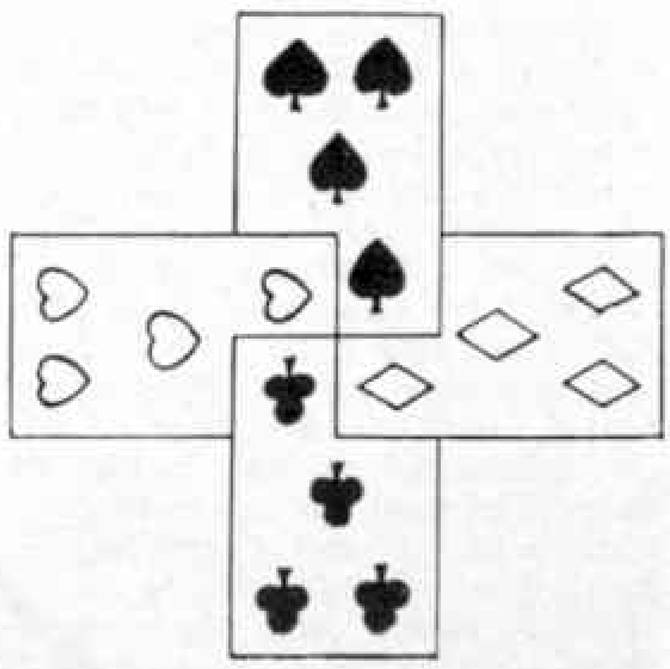
What Am I?

The answer to this puzzle is a Match.

* * *

The Four "Fives"

The diagram alongside shows the manner in which the four playing cards have to be arranged in order to leave only four pips visible on each of them.



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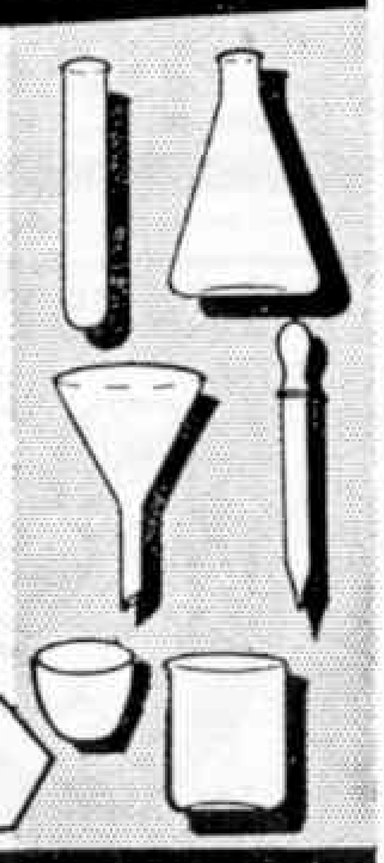

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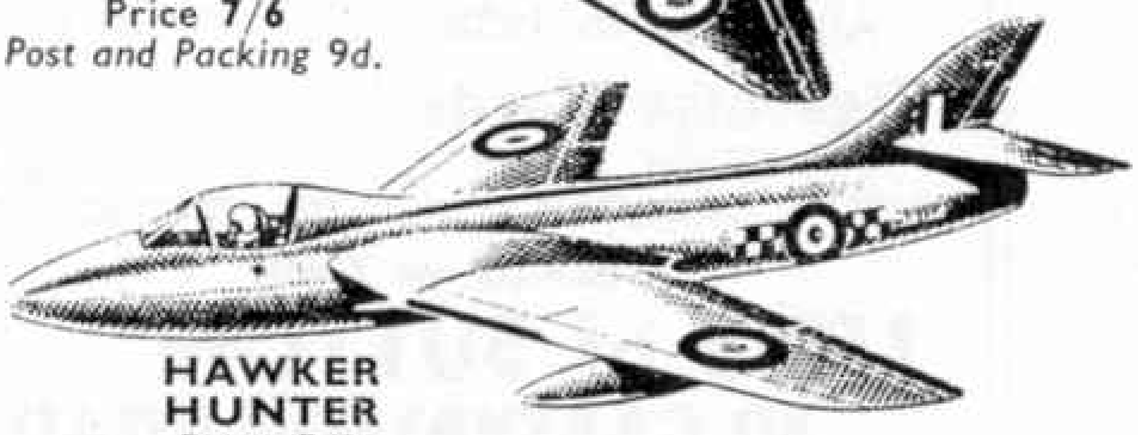

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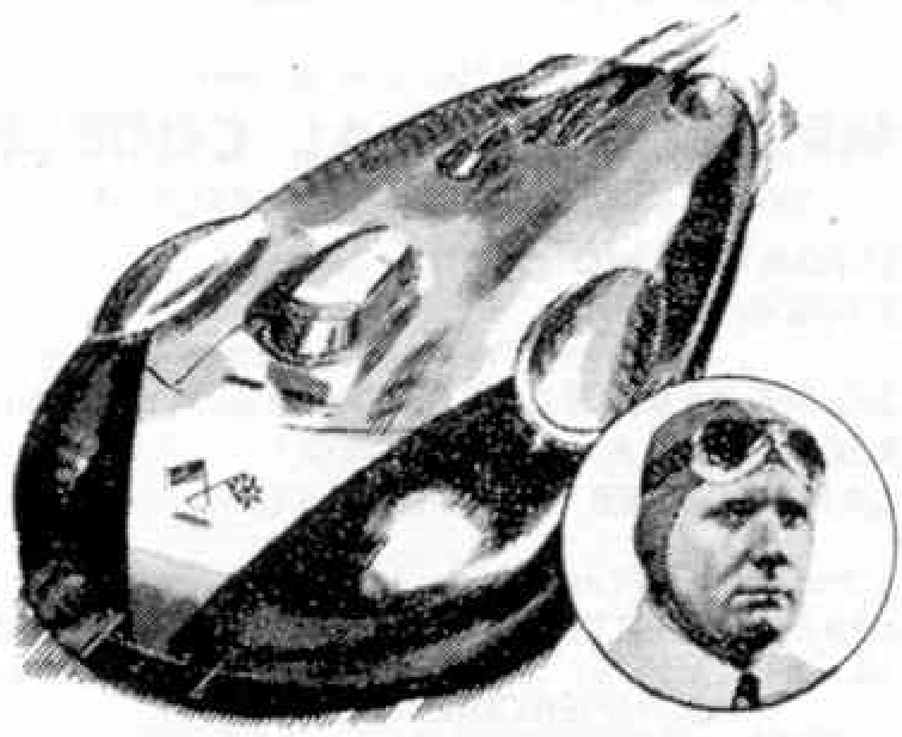

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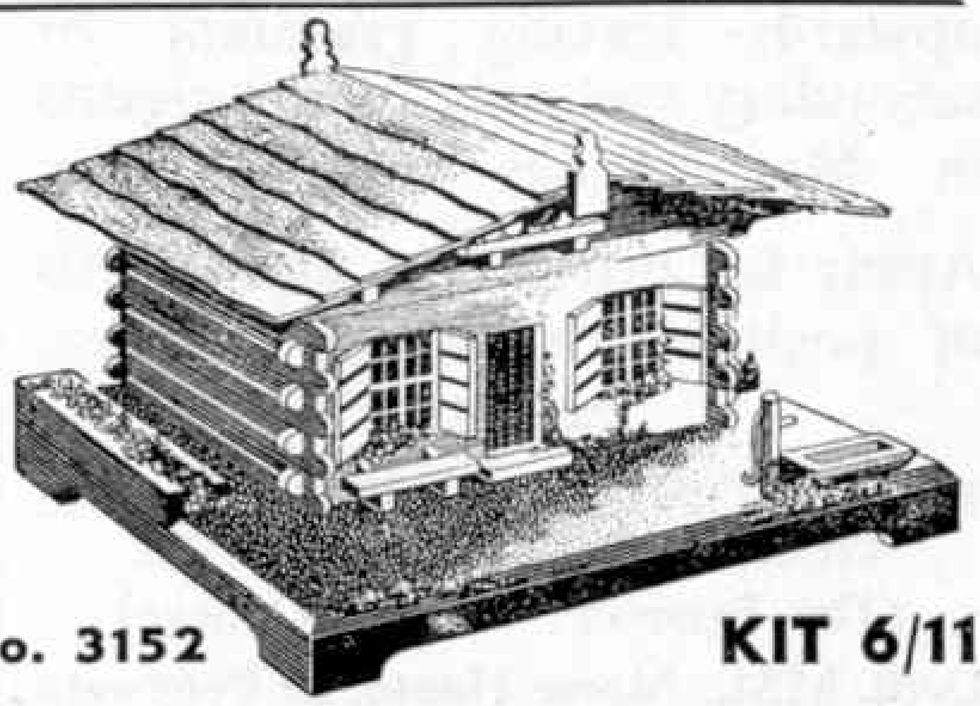

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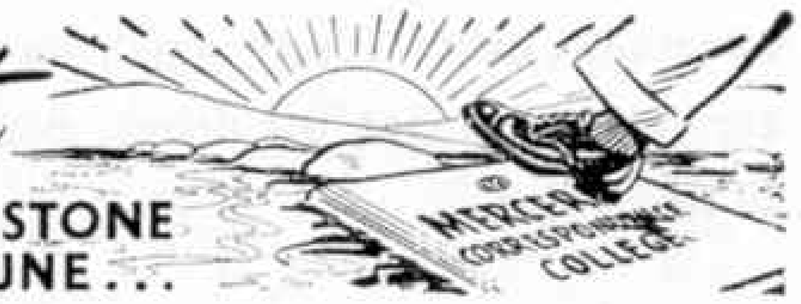

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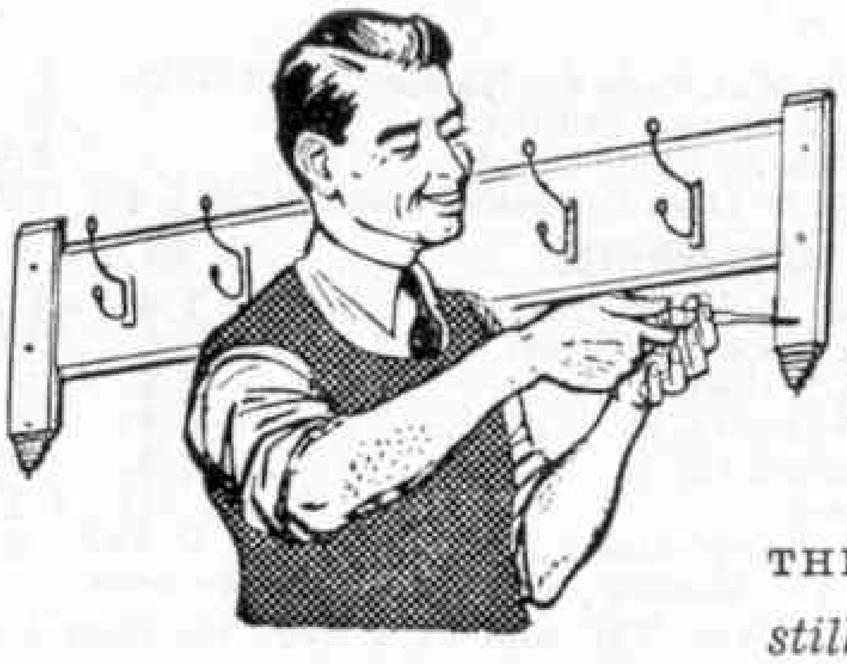

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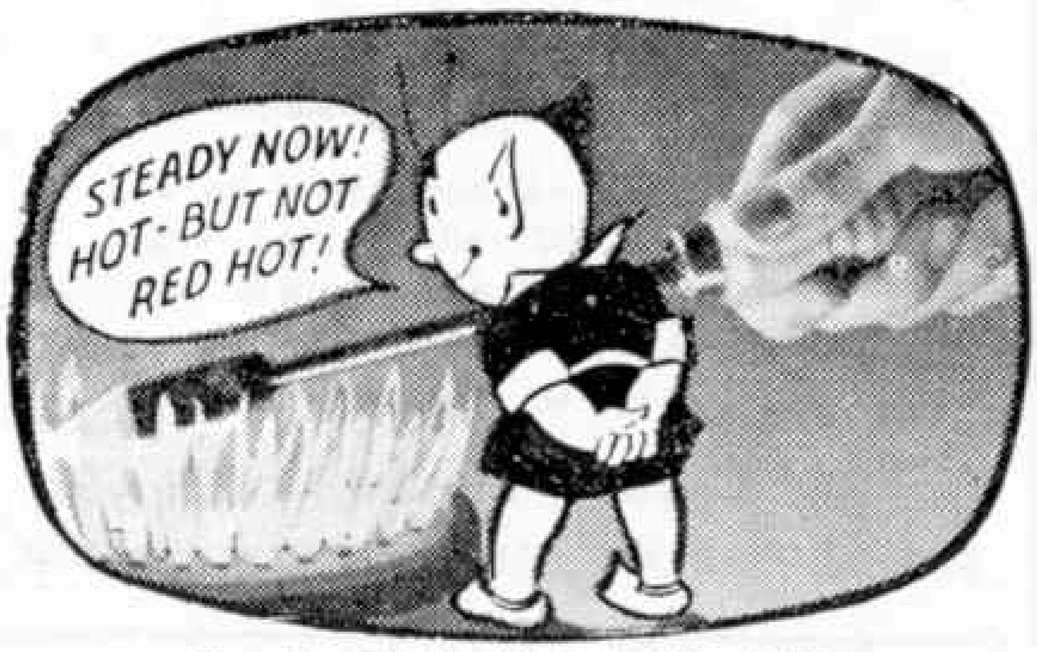

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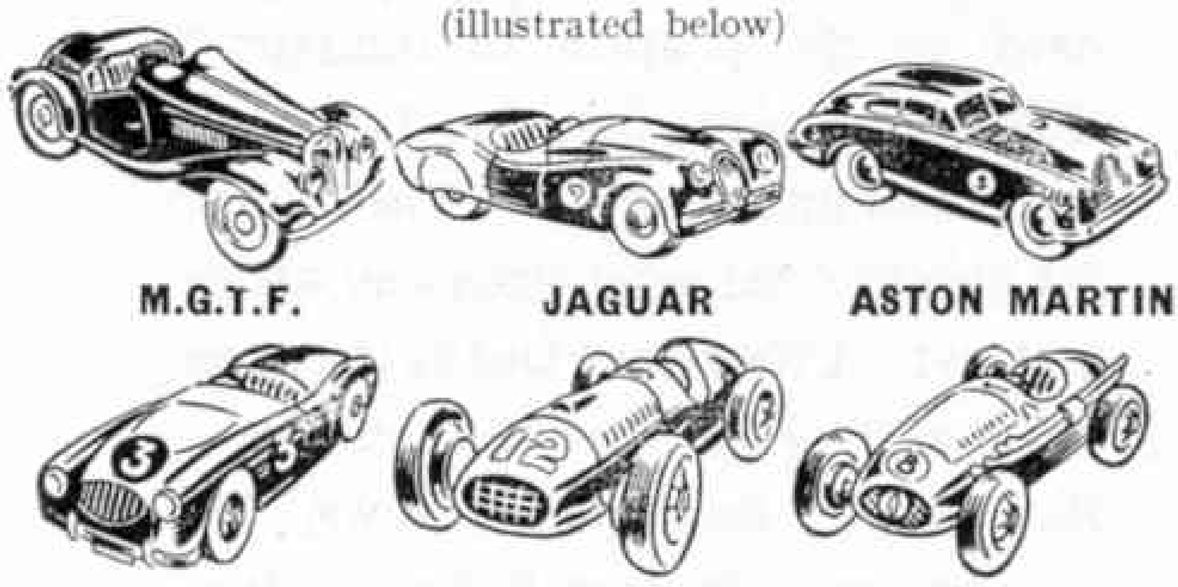

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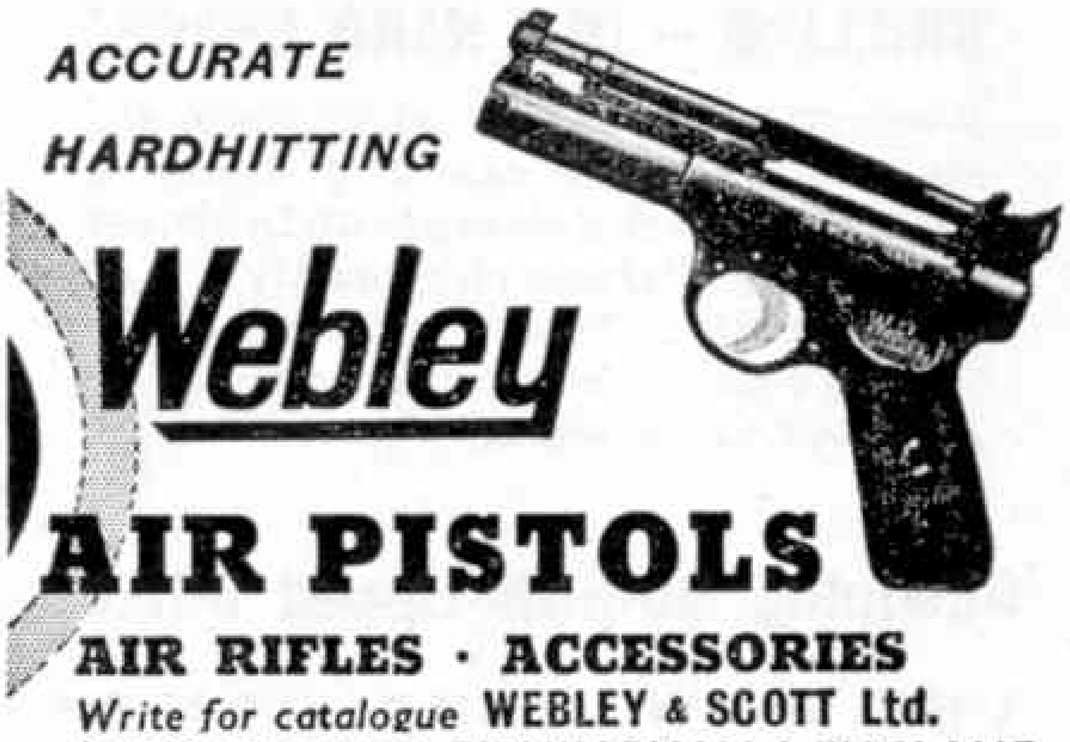

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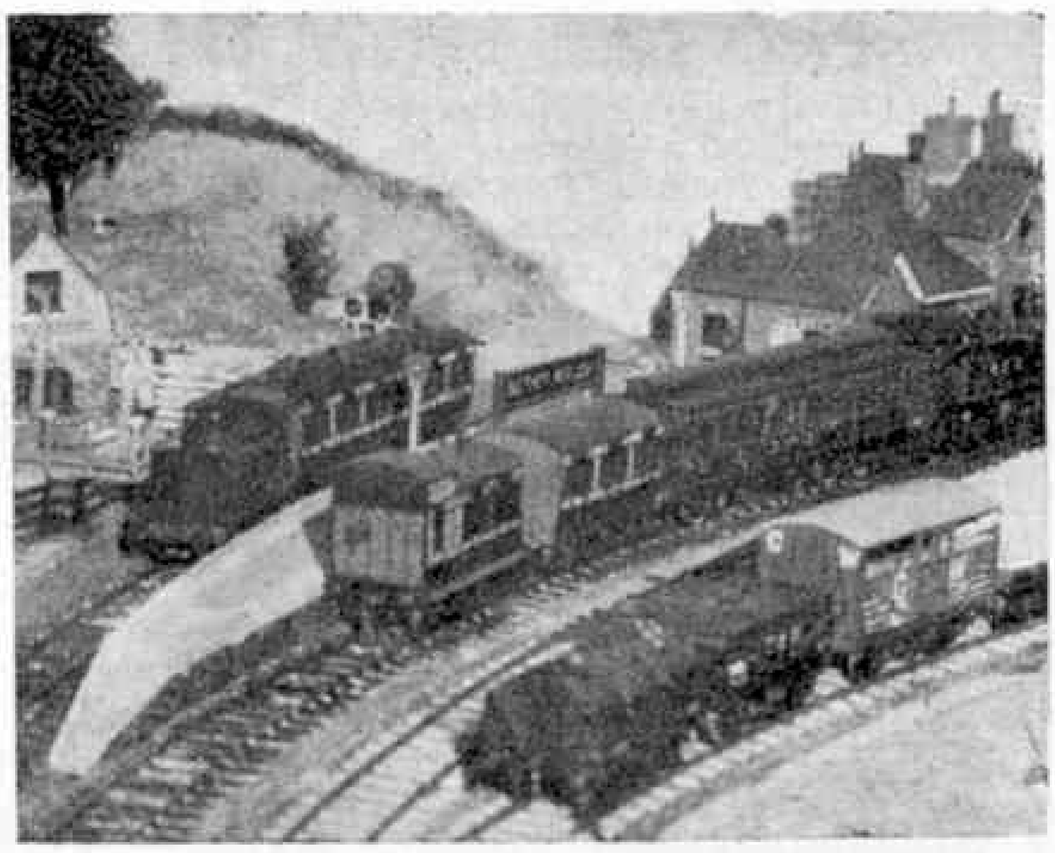

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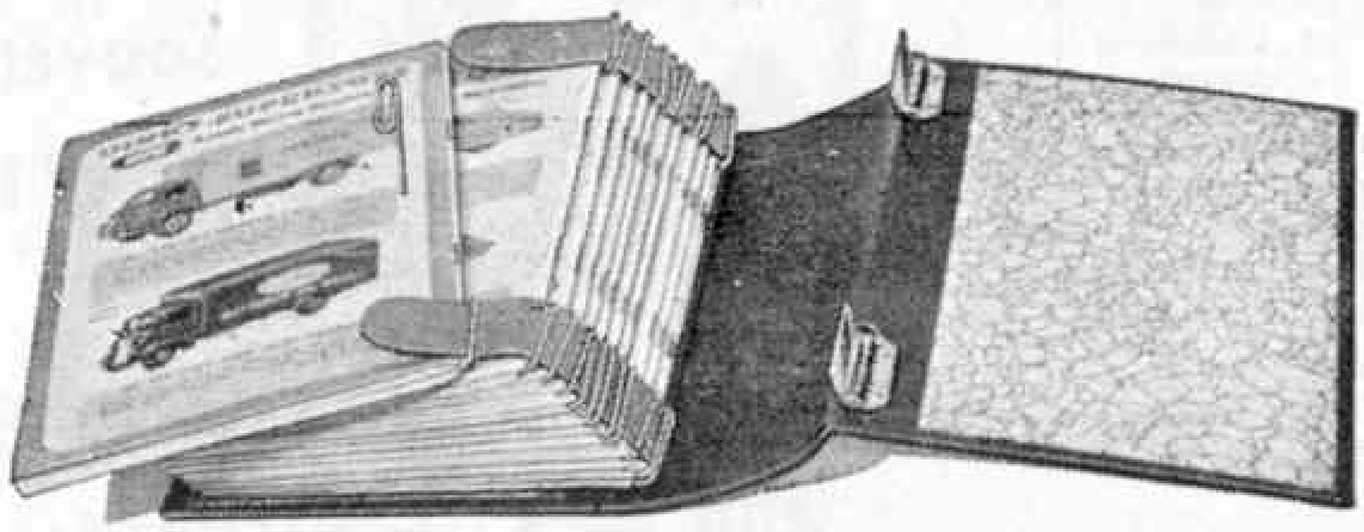

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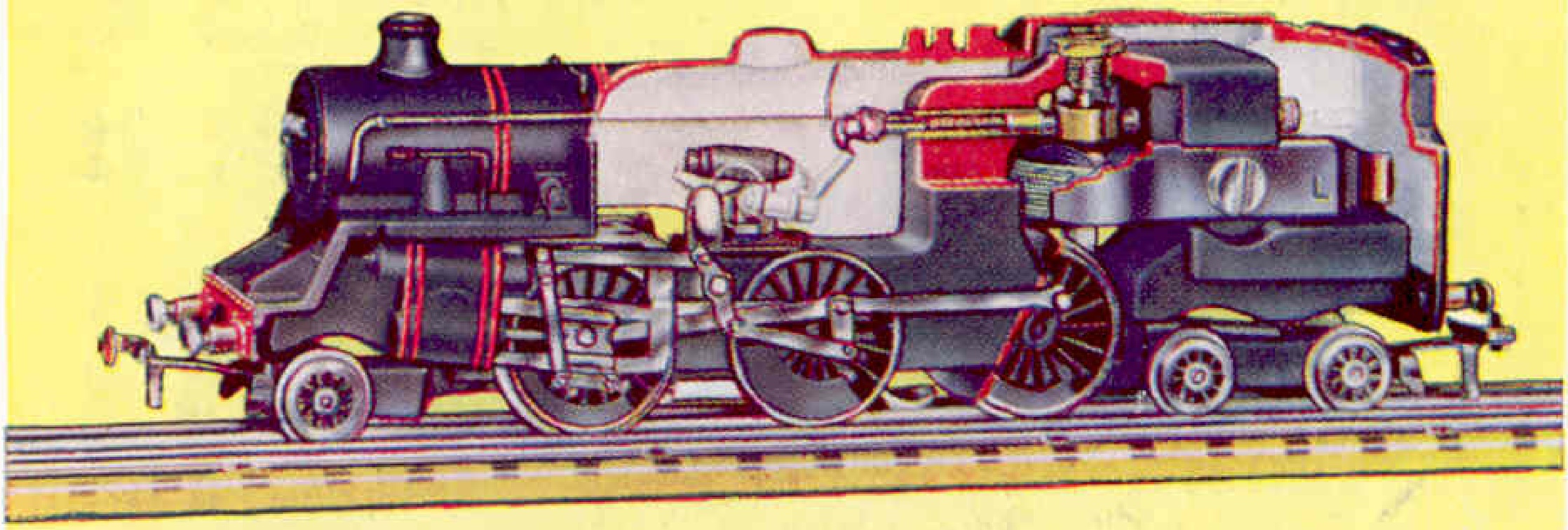

This cutaway view of the 2-6-4 Tank Locomotive shows the neat arrangement of the permanent magnet motor, and the T.V. and radio suppressor

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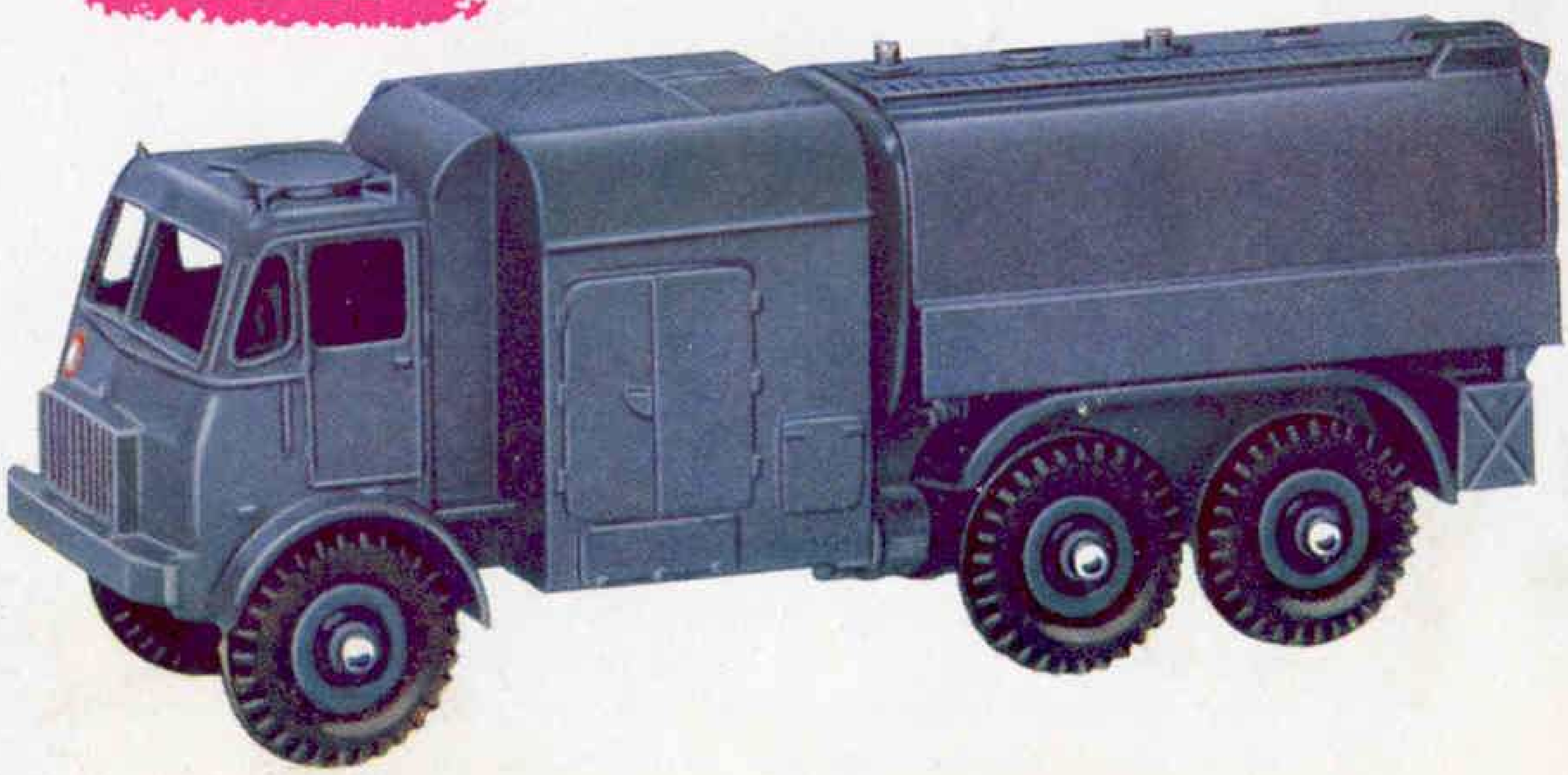

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MODEL OF THE MONTH

MECCANOGRAPH

Illustrated in the May 1957 issue of the Meccano Magazine

Construction of the Frame

The frame consists of four 24½" Angle Girders connected at each end by 5½" x 2½" Flanged Plates 1 and 2, and with further 5½" x 2½" Flanged Plates 3 and 4 bolted between the Girders. Two 5½" x 2½" Flat Plates 5 and 6, a 5½" x 3½" Flat Plate 7, and two 5½" Angle Girders 8, are attached to the frame as shown. A 5½" Angle Girder is fixed across the lower Girders of the frame at each end. Two vertical 5½" Angle Girders are bolted to the frame, and these support Angle Brackets to which are attached two 5½" Strips 9, spaced apart by a Washer on each of the bolts fixing them in place. Two 3½" Strips 10 are bolted between the flanges of the Plates 2 and 4.

Arrangement of the Drive and Gearing

An E20R(S) Electric Motor is bolted to the Flat Plate 7, and a Worm is fixed at one end of its armature shaft. The Worm drives a 57-tooth Gear on a Rod 11, which is supported in the lugs of a 3" x 1½" Double Angle Strip spaced from the Motor side-plate by Washers on ⅜" Bolts. A 1" Sprocket on Rod 11 is connected by Chain to a similar Sprocket on a Rod 12, mounted in the Flanged Plates 1 and 3 and held in place by Collars. Rod 12 carries a second 1" Sprocket 13, and this is connected by Chain to further 1" Sprockets on two 4" Rods with Keyway 14 and 15. Rod 14 carries a Socket Coupling fitted with a ½" Pinion and a 1" Gear, and Rod 15 is similarly fitted with a ½" Pinion and a ¾" Pinion. The Socket Coupling assemblies are made to turn with the Rods with Keyway by Key Bolts screwed into the Pinions to engage the keyways. The sliding movement of each assembly is controlled by a lever 16 formed by a Rod in a Coupling. The Coupling is fitted with a 1" and a 2" Rod, which are mounted in 2½" Strips bolted to the frame. A 1" Pulley with Rubber Ring is pressed against the upper edge of the frame by a Compression Spring, placed on the 1" Rod between the Coupling and the Angle Girder. The Motor switch is controlled by a hand wheel connected as shown in Fig. 1.

The gear assemblies enable the speeds of the drives to the sliding carriage and to the pen arm to be changed. By sliding the Socket Coupling on the 4" Rod with Keyway 14, its ½" Pinion can be engaged with a 57-tooth Gear on a Rod 17, or its 1" Gear can be meshed with a similar Gear also fixed on Rod 17. Rod 17 carries a ½" Pinion that drives a 1½" Contrate on a vertical Rod fitted with a Coupling 18.

The ½" and ¾" Pinions in the Socket Coupling on the 4" Rod with Keyway 15 can be meshed with 57-tooth and 50-tooth Gears respectively on a Rod carrying a ½" Pinion 19. The Rod is fitted also with a 7/16" Pinion placed between the 57-tooth Gear and the Flanged Plate 3, and the ½" Pinion 19 drives a 1½" Contrate on a vertical Rod 20. Rod 20 carries at its upper end two 8-hole Bush Wheels 21, arranged so that 2" Rods fitted with Collars can be mounted in them.

The Design Table and its Drive

The 7/16" Pinion on the same Rod as the Pinion 19 drives a 1" Gear on a long rod 22, which is supported in the Flanged Plates 2, 3 and 4, and is made from 11½" Rods joined by a Coupling. Rod 22 carries a Worm that engages

a 57-tooth Gear on a Rod supported in the Strips 10. The latter Rod is fitted with a Bush Wheel, to which is screwed a flat piece of wood about 7" square.

The Sliding Carriage and the Pen Arm

Two $2\frac{1}{2}$" x 1" Double Angle Strips are bolted to a $3\frac{1}{2}$" x $2\frac{1}{2}$" Flanged Plate 23, and the assembly is arranged to slid freely on two $11\frac{1}{2}$" Rods held by Collars in the Girders 8. A $1\frac{1}{2}$" Strip is bolted to the Flanged Plate, and a $9\frac{1}{2}$" Strip lock-nutted to the $1\frac{1}{2}$" Strip is passed over the shank of a Handrail Support 24 fixed on a $1\frac{1}{2}$" Rod held in the Coupling 18.

A 5" Screwed Rod is supported in $1\frac{1}{2}$" Strips bolted to the flanges of Plate 23 and is held in place by lock-nuts. A Short Coupling 25 is threaded on to the Screwed Rod and a 1" Rod is fixed in it. A handle 26 is formed by a Threaded Crank locked on the Screwed Rod by a nut. The pen arm consists of a $12\frac{1}{2}$" and a $9\frac{1}{2}$" Strip bolted together and it pivots between Collars on the Rod in the Short Coupling 25. The pen is a ball point pen refill held in a Crank at one end of the arm, which is passed between the Strips 9 and is pulled against the Collars on the Rods in the Bush Wheels 21 by an elastic band. The elastic band is looped round the end of the arm and round a Rod 27 held in the frame by Collars.

How to Vary the Designs

The pen arm should be adjusted so that the ball pen refill bears lightly against a sheet of paper pinned to the design table. The patterns produced can be varied by altering the gear ratios by means of the levers 16, by altering the numbers and the positions of the Rods in the Bush Wheels 21, by turning the handle 26, by adjusting the position of the pen arm on its pivot, by varying the position of the $9\frac{1}{2}$" Strip on the Handrail Support 24, and by sliding the Handrail Support on its Rod. To enable the positions of the Handrail Support and the pen arm to be altered easily, quick release bolts can be made by fixing a Collar on a $\frac{3}{8}$" Bolt that forms the locking screw. A bolt screwed into the Collar makes a convenient handle.

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3	"	"	3	4	"	"	26	1	"	"	63d
4	"	"	5	1	"	"	26c	3	"	"	70
3	"	"	6a	1	"	"	27	1	"	"	80
4	"	"	7	4	"	"	27a	1	"	"	94
7	"	"	9	2	"	"	28	5	"	"	96
2	"	"	12	3	"	"	31	1	"	"	103
5	"	"	13	2	"	"	32	4	"	"	111a
1	"	"	13a	84	"	"	37a	1	"	"	111c
1	"	"	14	79	"	"	37b	2	"	"	115
3	"	"	15	40	"	"	38	2	"	"	120b
1	"	"	15a	1	"	"	45	1	"	"	126a
2	"	"	15b	2	"	"	46	1	"	"	133a
2	"	"	16	1	"	"	47a	1	"	"	136
1	"	"	16a	4	"	"	52	2	"	"	155
6	"	"	17	1	"	"	52a	2	"	"	171
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