VOL. XLVII. No. 7 JULY 1962

MECCANO MAGAZINE

1/3

TORBAY EXPRESS

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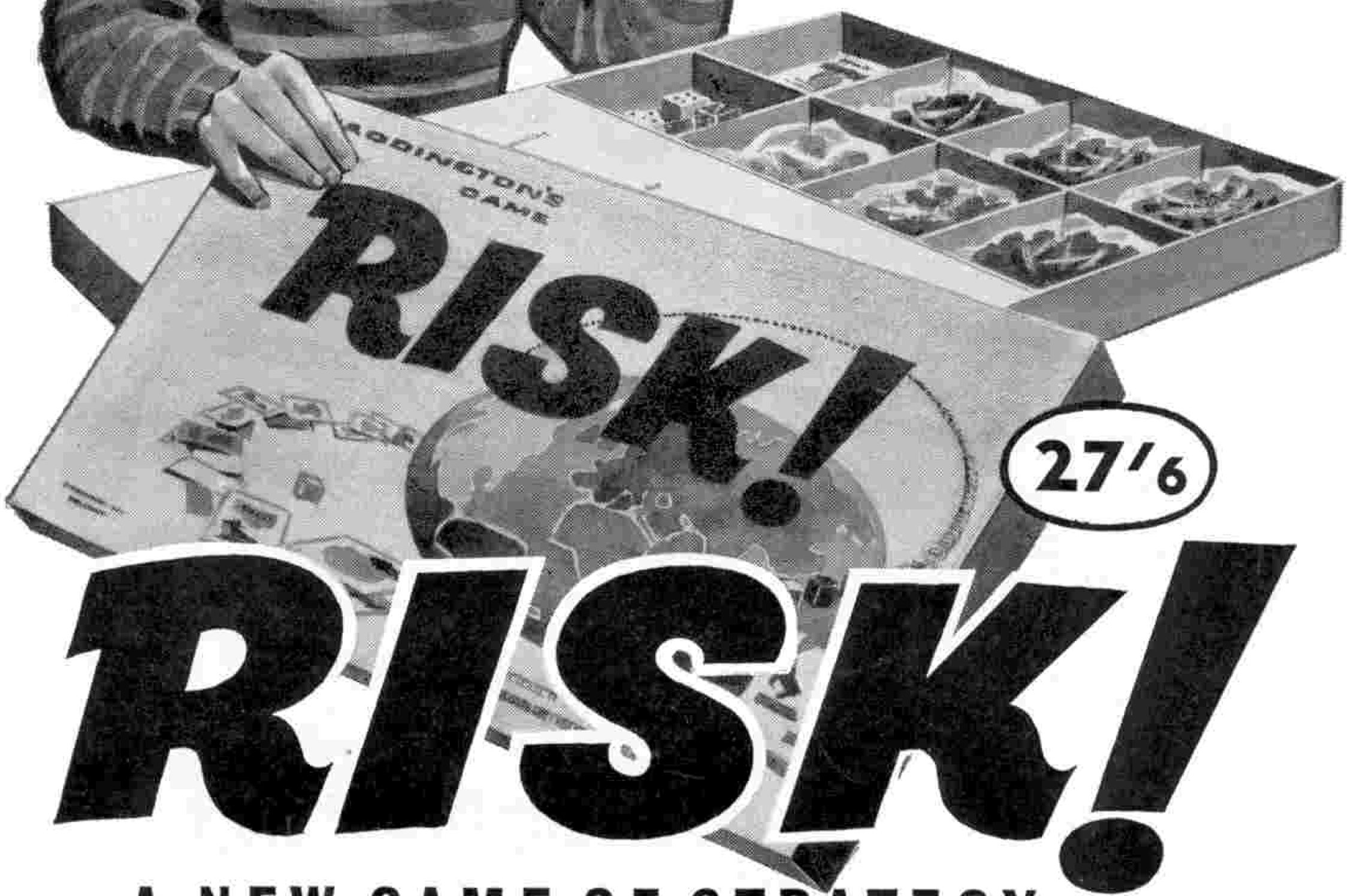

27/6

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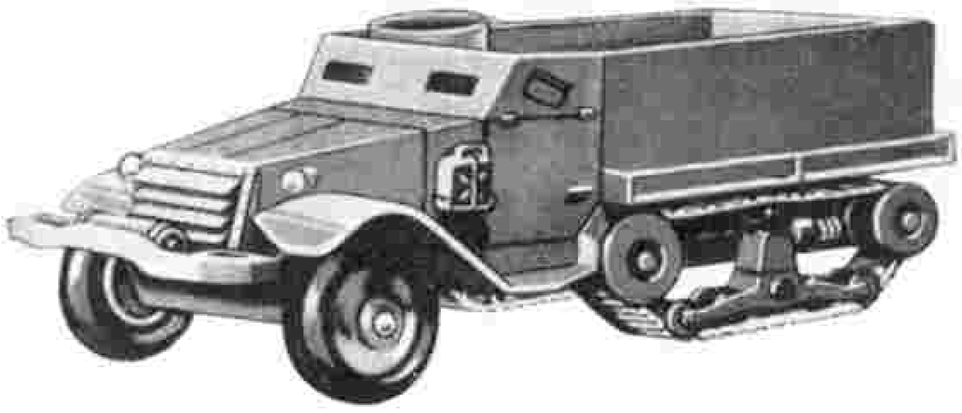

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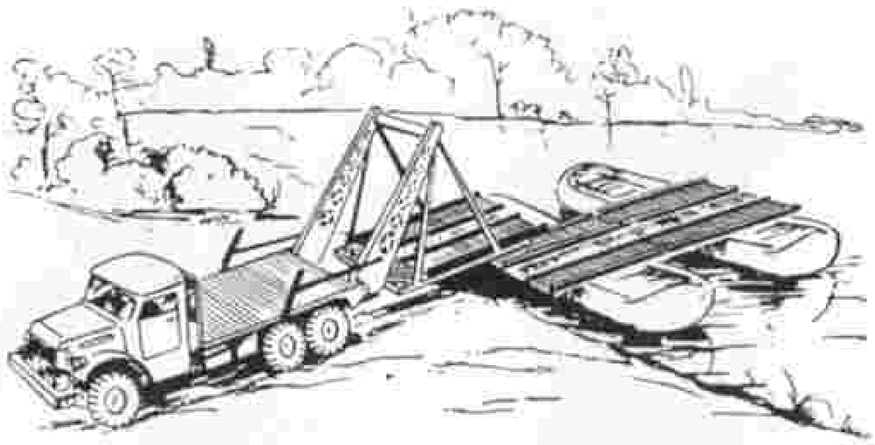

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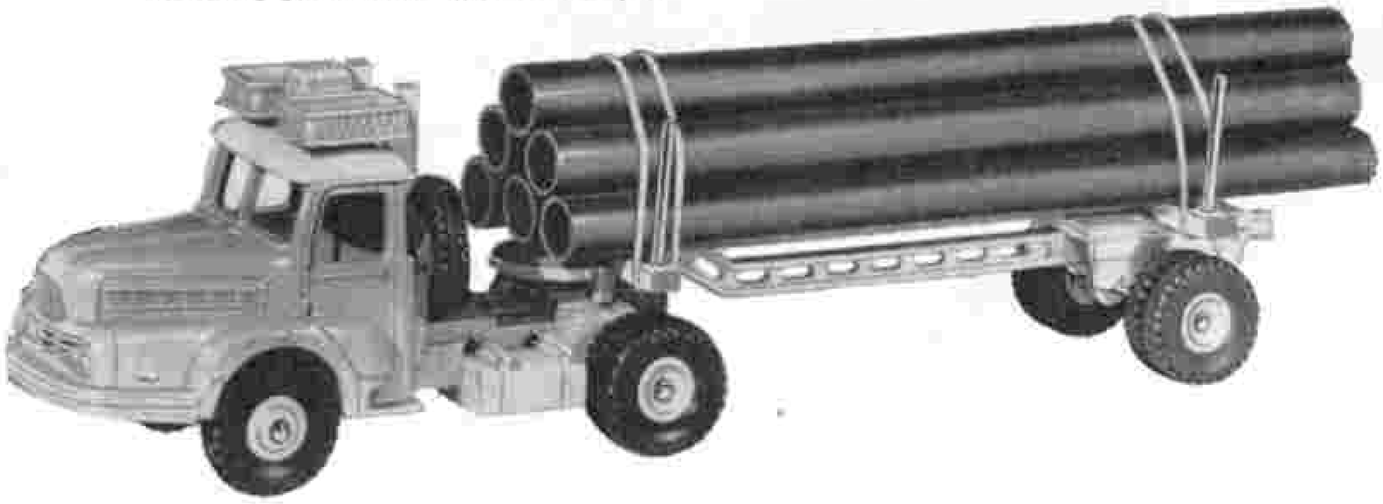

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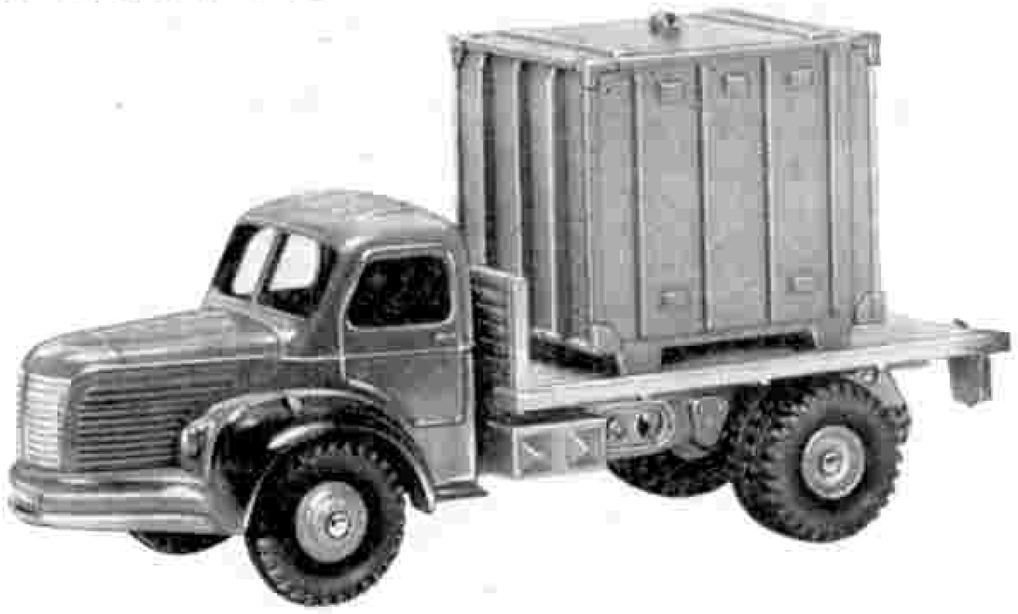

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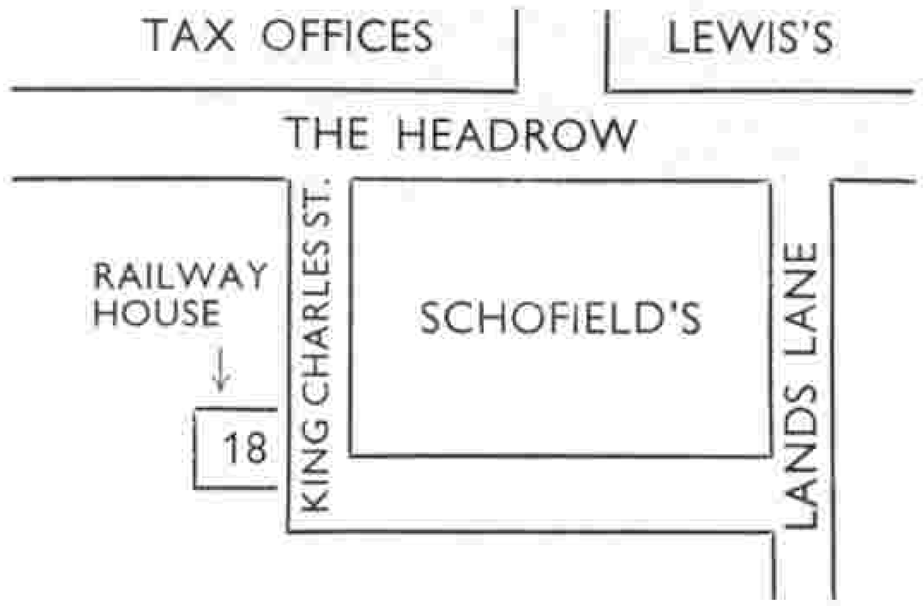

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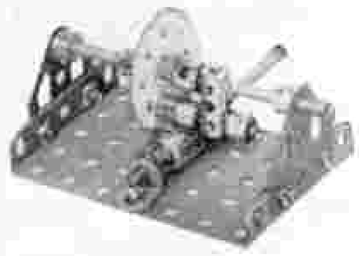

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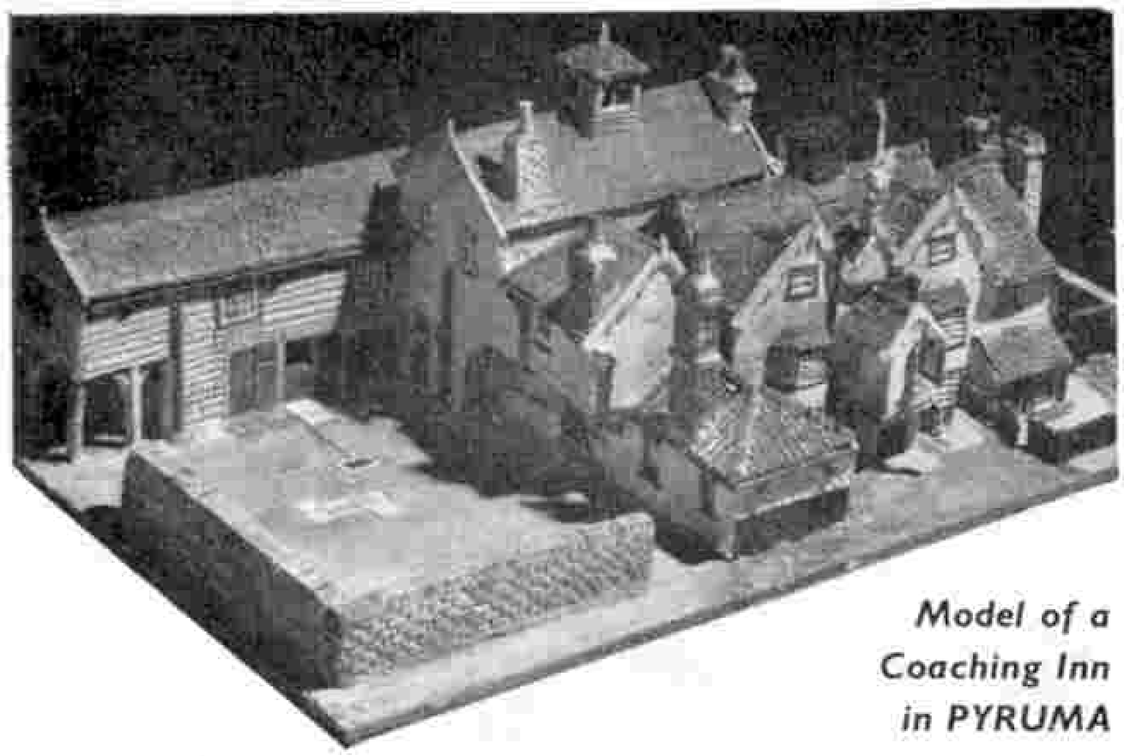

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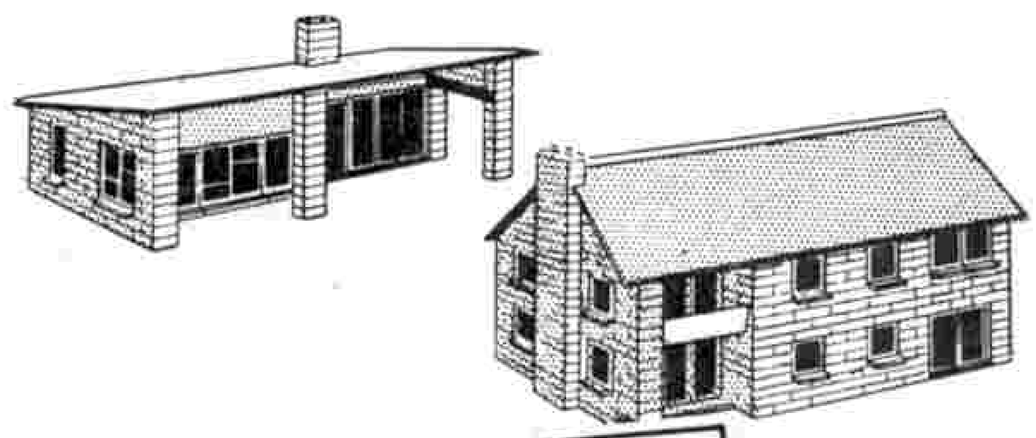

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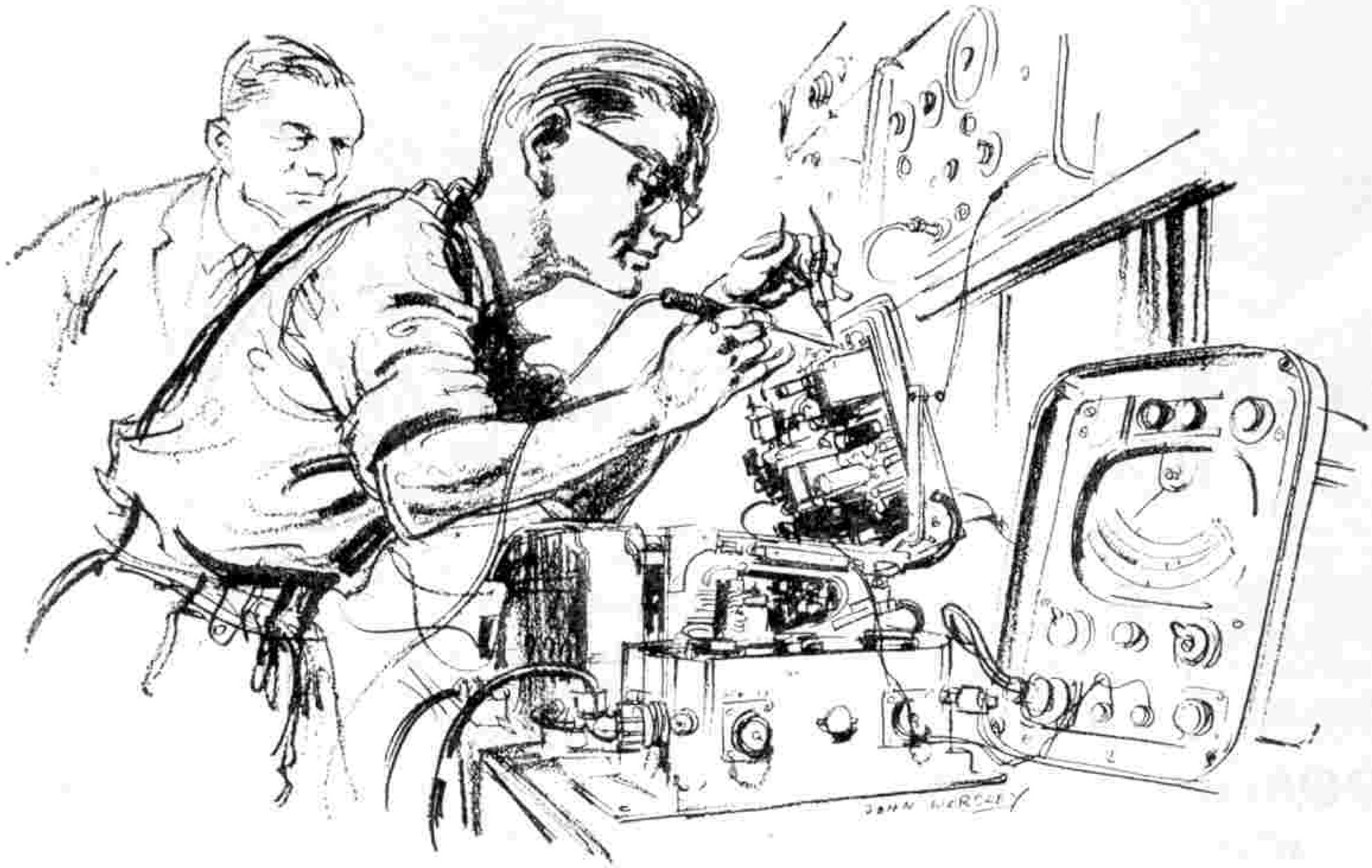

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MECCANO MAGAZINE

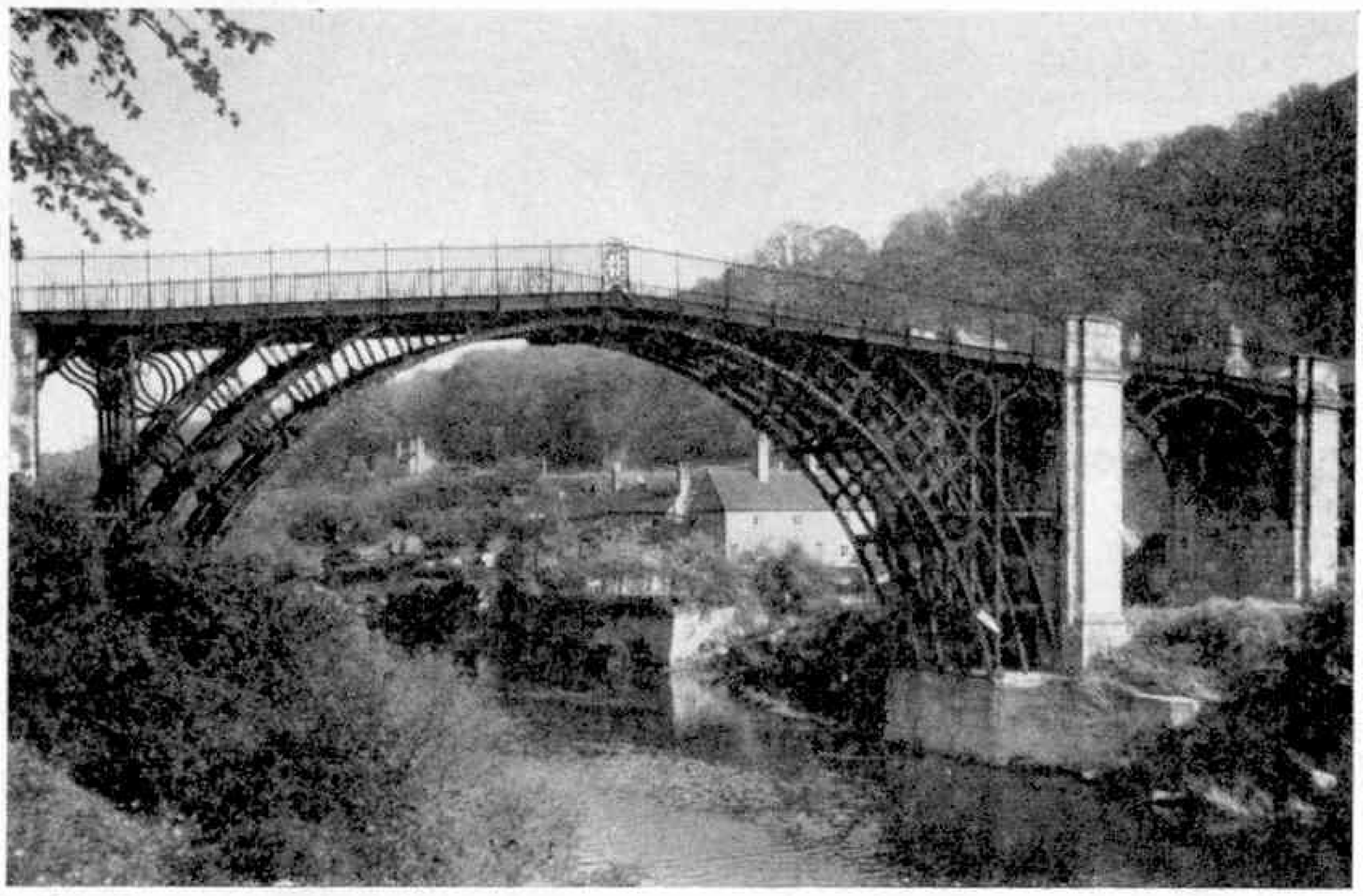
Volume XLVII No. 7 July 1962

Registered at the G.P.O., London, for transmission by Canadian Magazine Post.

EDITORIAL AND ADVERTISING OFFICES:
LIVERPOOL 13, ENGLAND.
Telegrams: "Meccano, Liverpool."

Editor:
GEOFFREY BYROM

Asst. Editor:
ERNEST MILLER



MENTION by Mr. R. E. Toop, in his article on the Severn Bridge last month, of the first iron bridge to be erected in the world reminded me that a photograph of this interesting bridge was sent to me some time ago by another *M.M.* correspondent, Mr. Cyril R. Rowson of Liverpool. I thought there must be many readers who would like to see this structure, which spans the limestone gorge of the River Severn at the town of Ironbridge in Shropshire, and so I have included it as this month's Editorial picture. From a distance the bridge looks like some outsize Meccano model, with its many graceful iron girders which were made at nearby Coalbrookdale in 1777 by Abraham Darby, the celebrated ironmaster, who was responsible for the actual building of the bridge. It need hardly be said that the town takes its name from this structure, which is 196 feet long, with a central span of 100 feet and smaller spans on either side. When built, the bridge was as great a wonder as John Wilkinson's first iron boat built at Broseley only a few miles away. Half a century later the design and workmanship put into the bridge by Darby was praised by railway engineer Robert Stephenson, famous son of a famous father.

This leads me to another topic . . . . . One is apt to wonder whether the Stephensons, busily building Britain's earliest railways, ever realised what ultimately lay in store in keeping track (if the expression may be excused) of the various trains and their timings. Timetables were, of course, an almost immediate railway adjunct and I have in front of me as I write some fascinating examples that appeared in Freeling's Grand Junction Railway Companion of 1838. As the years advanced, and railways expanded, producing timetables became a highly specialised and, I should imagine, monumental task. Latest news on timetabling comes from Eastern Region of British Railways who state that the Great Northern Line have achieved a notable advance in techniques by the introduction of an electronic computer. Use of such a machine is expected to reduce the process by ten weeks, enabling initial planning to start at a much later date while ensuring that the completed article is available earlier. It will also mean some reduction in the number of staff employed. The computer to be used is a Pegasus Type II machine built by Ferranti. It is expected that it will be in operation in Great Northern House, London, by September.

THE EDITOR

Next Month: THE GLASGOW SUBWAY

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OUR FRONT COVER

Our cover this month, prepared from a photograph by M.M. reader L. H. Tandy, of Malvern, shows the Torbay Express approaching Torquay. The Torbay has long been a well-known titled express and belongs to the select band of W.R. trains distinguished by coaches finished in brown and cream livery. It is one of the many services between Paddington and the West of England specially associated with holiday travel, and it must, in its time, have carried many thousands of people on such happy occasions.

For many years 4-6-0 Stars, Castles and Kings gave distinguished service on the train, which is now in the hands of diesel-hydraulic locomotives, such as the "Warship" heading the train on our cover.

There's A BOOM In Boomerangs

AN Ulsterman has discovered the secret of making boomerangs. Yet Mr. Claude Austin, of Londonderry, has never been to Australia, historic home of the weapon, and he first saw an aborigine throwing boomerangs in the course of a demonstration as part of a film of the Queen's visit to the Commonwealth.

Mr. Austin is a keen woodworker, and he thought he would try to make a boomerang himself. Numbers one to 39 were failures, but the fortieth prototype circled round and came whizzing back to land at his feet. Now he has produced more than 800 boomerangs from planks of veneered mahogany and obechi veneered wood. Some

By E. R. YARHAM, F.R.G.S.

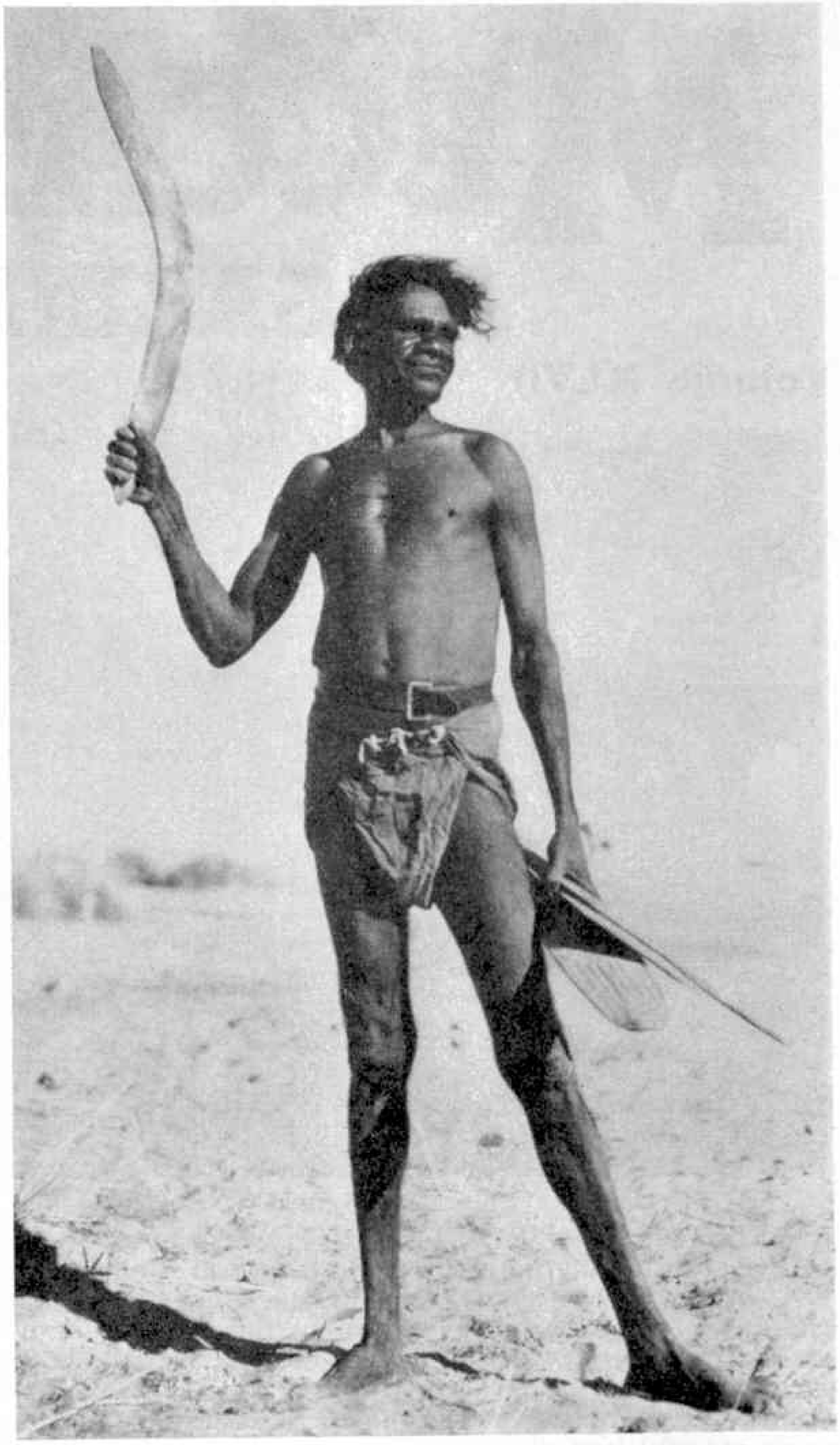
he sent to the Commonwealth for tests and an expert has reported, "They fly just as well as, if not better than, those made in Australia".

As a matter of fact, there has recently been an upsurge in the manufacture and sale of the traditional Australian weapon —but not at home. Boomerangs are now being produced cheaply in such widely-scattered latitudes as those of Japan, France, England and America. The Japanese even produce diagrams with their models to show customers how to make the boomerang return round a rock or over a bridge. Ever business-like, the Americans are reported to be selling them in three weights, for dad, mum and junior.

Boomerangs can, of course, be bought in Australia as well, but in these days even the people who live there—the white folk, that is—have to scout far and wide, and possibly pay an extortionate price, to get a genuine native-made one. Those on sale in some souvenir shops are just about as genuine as a good many "oriental" articles that originated in Birmingham. The really keen seeker must go off into the outbacks to find a genuine boomerang maker. At one time, the aborigines would come down to the trans-Australian train stops waving boomerangs and crying, "Gibbit two bob!" But it seems they do not bother to do this nowadays. Perhaps even they have "never had it so good!"

It is still the honoured custom to present distinguished visitors to the Commonwealth with a real native-made boomerang. When England's famous cricket captain Len Hutton—now Sir Len Hutton —was out there in 1955, an aborigine travelled over 100 miles to present one to him.

Princess Alexandra received one from a seven-year-old aborigine at Gympie, Queensland, where she watched the performance of an ancient ceremony. When the Queen was there, a 50-year-old native, Charlie Williams, carved his finest boomerang as a present for her and also painted her portrait on it. Charlie, who is employed by the Victorian Police as a tracker, spent all his spare time over a period of some six months in fashioning the boomerang.

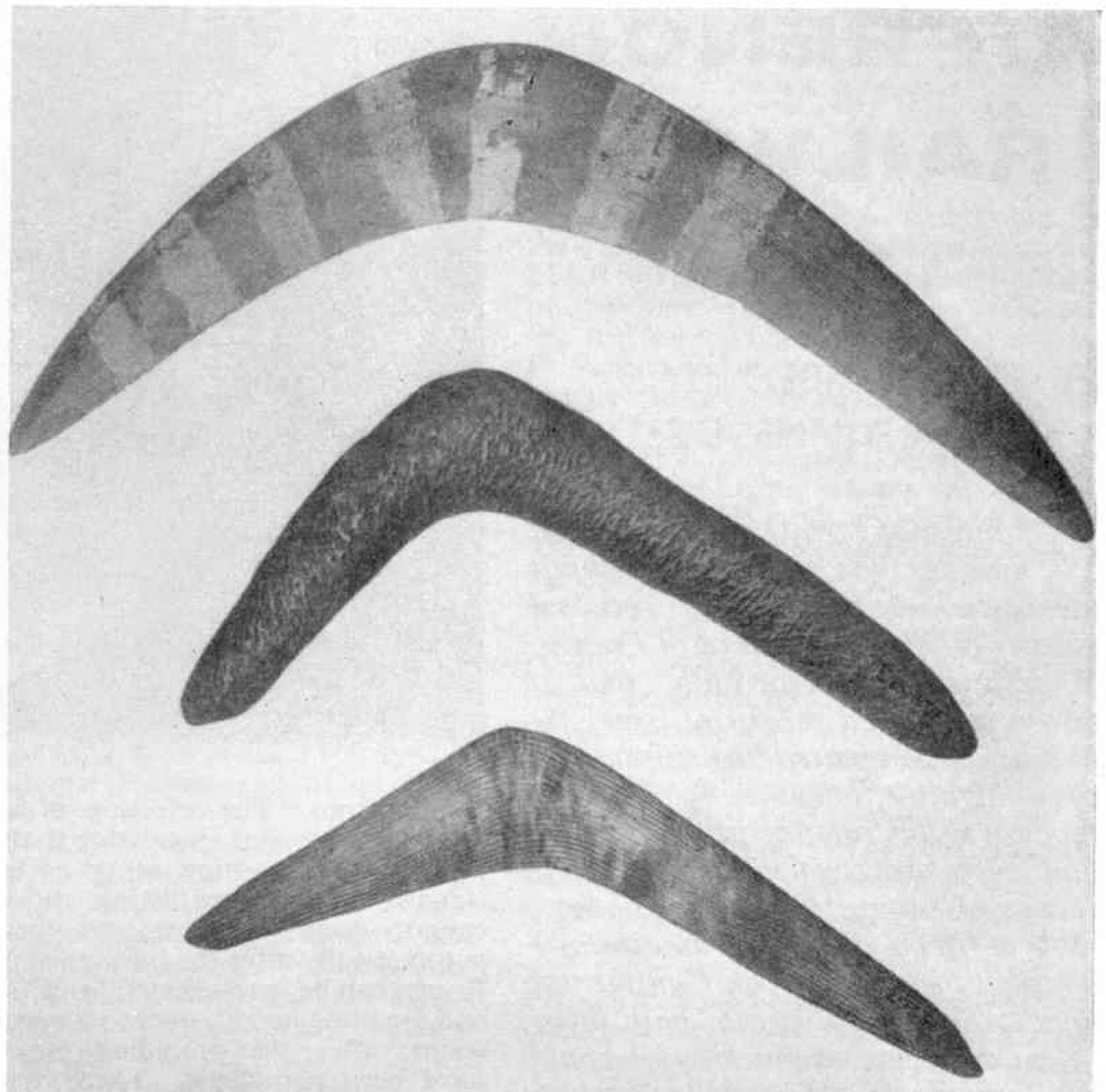


Standing ready to throw a boomerang of the returning type, this aborigine of the Kimberley region of tropical Western Australia holds in his left hand more boomerangs and a small wooden shield. This picture, and the illustrations on the next page, appear by courtesy of the Australian News Information Bureau.

The Queen and the Duke of Edinburgh witnessed a boomerang performance which for sheer virtuosity was almost uncanny. The performer was Joe Timbery, a stocky, dark-skinned man of aboriginal descent. Joe threw his boomerang so that it skimmed breast-high for 40 yards, then suddenly climbed 100 feet into the air, swung round in a wide loop and spun backwards towards the thrower, losing height rapidly. As the gyrating missile approached him it slowed down abruptly, then hovered over him, its blades turning slowly. Joe, who by this time had dropped to the ground, reached up and neatly caught it with his bare feet.

Not to be outdone by the aborigines, white men have studied the aerodynamics of the boomerang, and have raised themselves to an adroitness equalling that of the natives. Boomerang throwing has, indeed, become almost a passion with some Australians—even among those of academic achievement. For instance, Mr. Austin has been corresponding with Mr. J. McDonald, Director of Education in New South Wales, who has a 168 yards-around-a-pole-and-back throw to his credit. Another expert is the former head of the School of Public Health and Tropical Medicine in Sydney, Professor Harvey Sutton, whose skill with the boomerang is stated to be the equal of that of any aborigine.

A third is Frank Donnellan, a Sydney printer, who was taught by the natives when a child. He has experimented with various materials for boomerangs and has perfected a plastic one. His ambition is to see boomerang-throwing become a world-wide sport. In some ways he is the most astounding boomerang exponent of

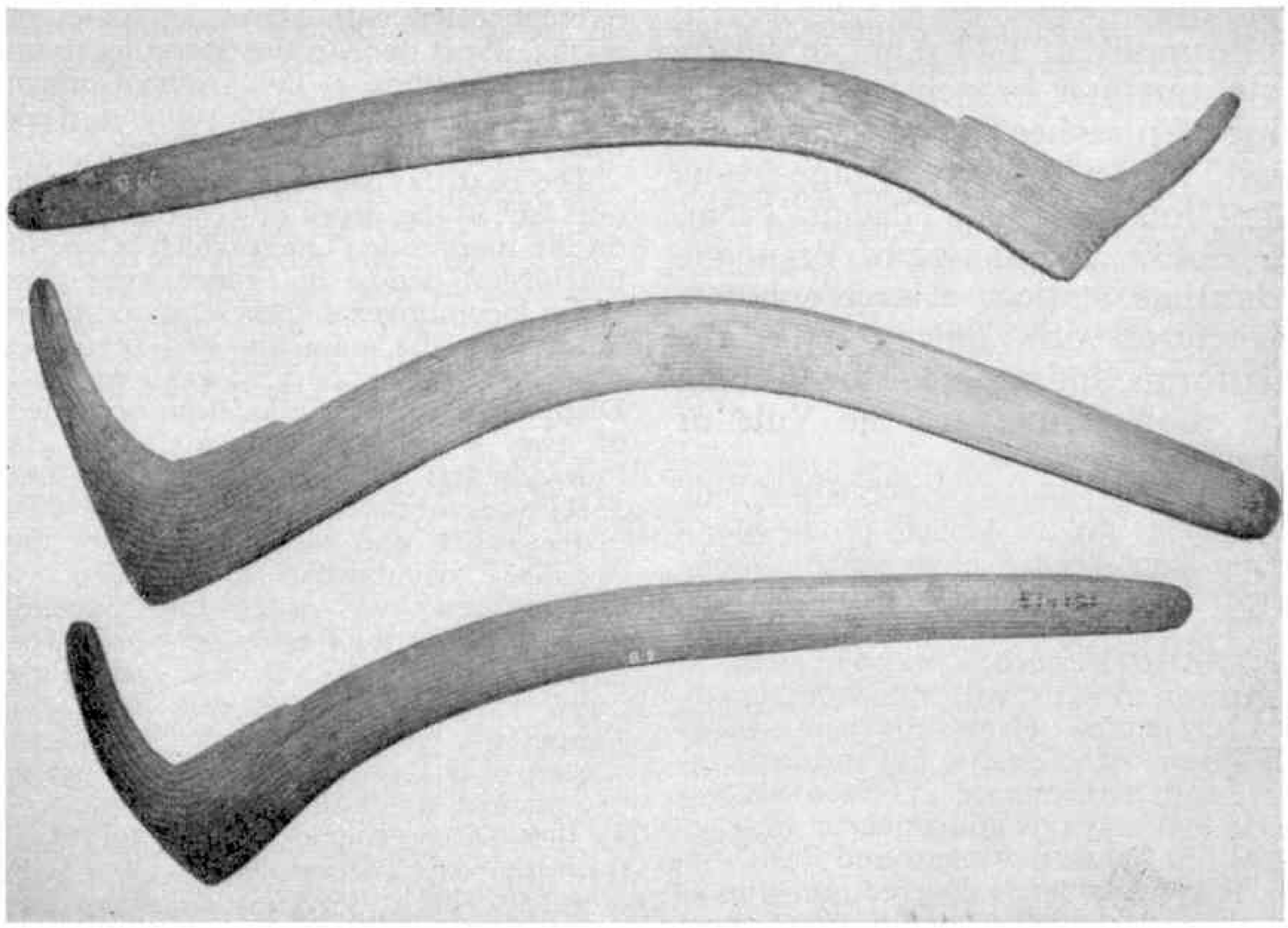


all, and his famous William Tell throw is a highlight of his entertainment. Donnellan throws a boomerang and then places an apple on his head. The projectile curves back, and two out of every three times will knock the apple from its perch.

There is, of course, more than one kind of boomerang. With a light one it is common to find a native who can throw it in a great circle and then catch it between the hands on its return. The heavy hunting boomerang is thrown to kill, and never returns; on occasion, three kangaroos have been disabled by a single throw. With such a weapon, numbers of surfacing fish can be stunned, and, thrown into a rising flock of wild ducks, it is like whirling death following them in relentless pursuit.

An authority on the weapon, Dal Stivens, has written of its devotees: "I have watched thrilling contests between these naked, chocolate-skinned masters of the art. They can make the boomerang climb to 150 feet at the top of its loop, then, on the return, swoop back and forth in front of the thrower like a giant butterfly dipping from flower to flower. Or they'll make it go into a hawk-like hover flight. Half-way back, the boomerang steadies itself in the air and, still spinning rapidly, drops slowly down until it nearly reaches the ground. Then it turns and comes at full speed back to the thrower.

"I have seen ricochet throws, where the boomerang strikes the ground 50 yards out, bounces into the (*Cont. on page 282*)



An Arunta tribesman, Central Australia (top, left) demonstrates how his forefathers used the war boomerang. (Top right) Three illustrations of the returning or come-back boomerang carved out of wood and measuring 18 inches and three feet in length. One end is slightly longer than the other, the upper surface cambered and the underside flat. (Lower right) The non-returning or war boomerangs which measure between three and five feet in length. Some types, like those used by aborigines in Western Queensland and the Northern Territory, had viciously hooked ends. It is believed that when such a boomerang was thrown at an adversary the hook would catch the edge of his shield so that the bladed edge swung round and killed him.

A FRENCH RAILWAY TOUR

DESCRIBED BY
M. A. TIMMS, B.Sc.

OF the many railway systems of Europe that had to be rebuilt after the war, none has received greater publicity than that of France. Widespread electrification, and a new world speed record of over 200 m.p.h., have created the impression of a highly-efficient network, with modern trains running at high speeds and with praiseworthy punctuality. It was on August 10 last year that, with a friend of similar interests, I boarded the nine o'clock Continental boat train from Victoria, both of us intent on seeing as much as we could of France, the French and their railways.

Promptly at 1.43 p.m., in steady rain, our first French train, consisting of nine heavy bogie carriages, two four-wheeled luggage vans and four-cylinder "Pacific" No. 231G.139, pulled out of Boulogne Maritime Station, a large concrete structure with offices over the platforms, and steamed slowly along the cobbled quay to the Ville or Town Station.

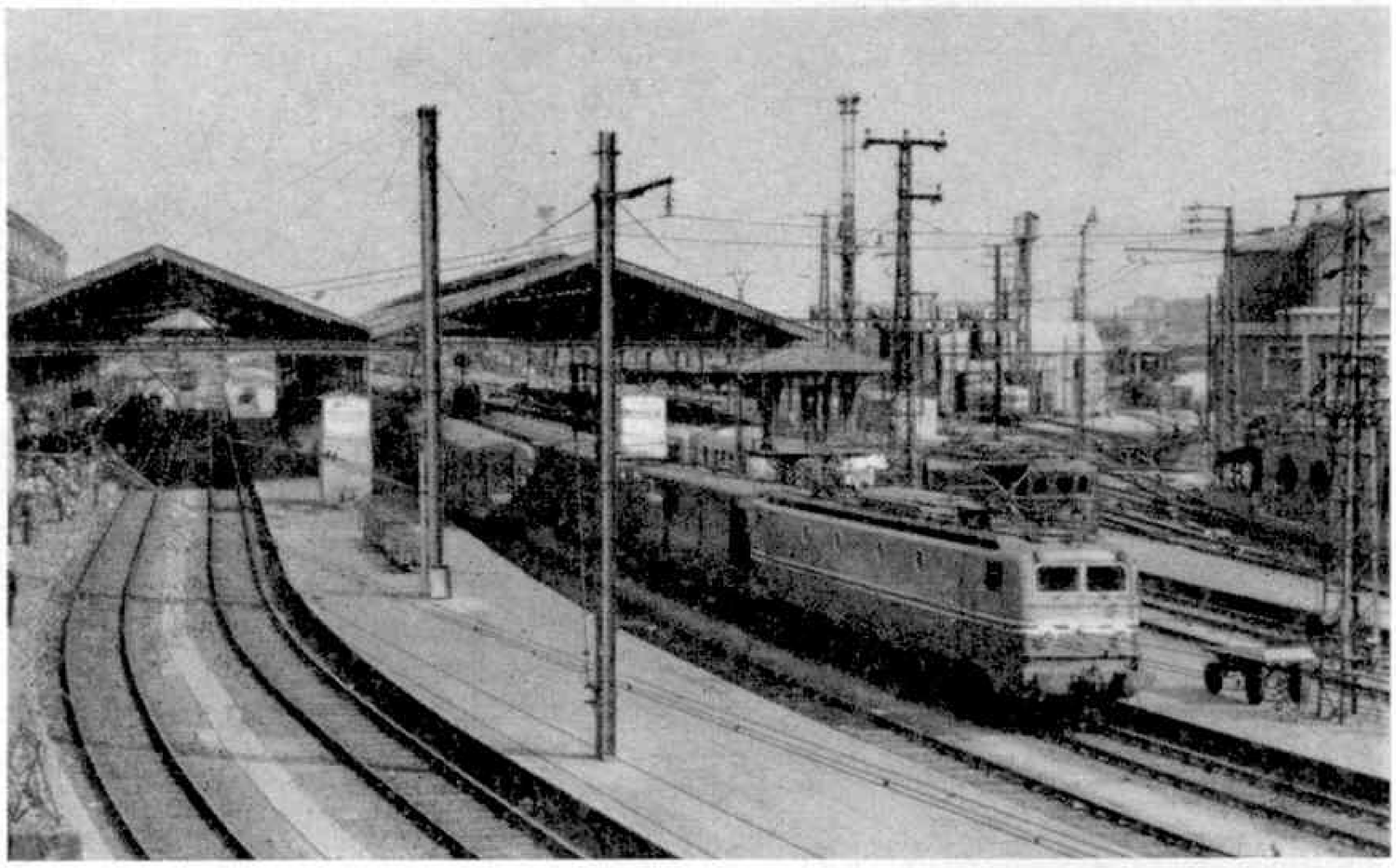
With a maximum of 73 m.p.h., the journey as far as Amiens produced no really high speeds. Here we joined the line from Lille, which is electrified on the 25 kV single-phase A.C. system. With No. BB16011 attached, we were away on a fast run to Paris, with speeds frequently in the eighties. Heavy bridge works at Creil resulted in delays, but the acceleration and performance at speed was so good that only one and a quarter minutes were lost between Amiens and Paris, the 131 kilometres being covered non-stop at an average speed of 67 m.p.h., with a load of 413 tons tare.

TRAFFIC CONTROL

A visit was made to the signalbox at Gare du Nord. The *Poste No. 1* at this station is similar to the more modern installations in this country, with route relay interlocking, and facilities for setting up some 490 routes, using 319 push-buttons. The selection of a route sets all points and signals for that route, protects it by setting other points and signals so that conflicting movements cannot occur, and restores the route automatically after the passage of a train. Routes can be "pre-selected" and "stored', and are presented in order to the incoming trains, after the preceding movements have been completed. There are some 6,000 relays distributed in 83 racks, and interconnected with about 375 miles of wiring. Next door to the operating room of the signalbox is the Traffic Control office, which regulates the running of all trains between Paris and St. Denis.

The next day we rose early and made our way to the depot at Les Batignolles, on the Region de l'Ouest which is one of the biggest depots in France, supplying steam locomotives and diesel autorails or railcars for the main line and suburban services to Cherbourg, Le Havre and Dieppe. The steam allocation consisted of two wheel arrangements only—38 four-cylinder "Pacifics" of the 231D and 231G types for the main lines, and 2–8–2Ts of the 141TC and 141TD classes for the "banlieue" or suburban services.

After lunch we visited La Chapelle, main depot for the Region du Nord. The selection of locomotives here was much more varied, and included some of Chapelon's famous "Pacifics," various classes of 2–8–2Ts for suburban work, two ancient 4–6–0s stationed at Creil and an 0–6–0T of American origin left over from the war. There were also some very large semi-streamlined four-cylinder compound 4–6–4s fitted with mechanical stokers. The 25 kV electric machines for the services to Amiens and Lille are also kept here, and there were two varieties in evidence—Bo–Bos with individual motor drive to each axle, and B–Bs, with only one motor to each bogie, driving the two axles through gearing. The B–Bs are fitted with an arrangement for selecting either of two different gear ratios, for freight and passenger working respectively.



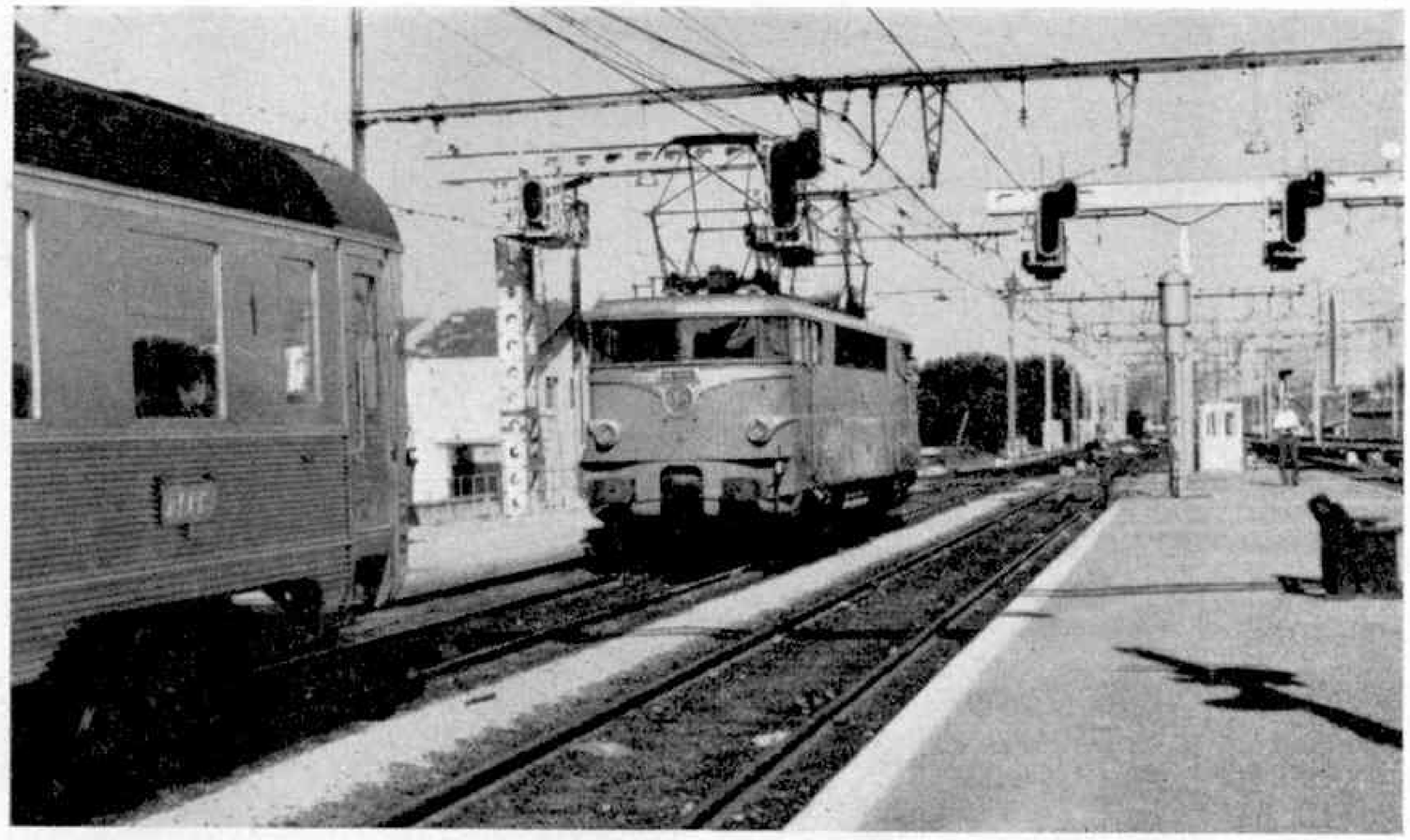
Toulouse Station, showing 1,500 volt electric locomotive No. CC 7115 with a train alongside one of the centre platforms.

Our last visit in Paris was to Villeneuve where we enjoyed a very thorough tour. Apart from the depot, which is the principal one for the Region du Sud–Est, there is a small but well-equipped workshop, with a wheel-lathe and a wheel drop, plus the usual machine tools. This depot maintains the 1,500-volt D.C. locomotives which work the services over the main line to Lyon, Avignon and Marseille, including the world's fastest train, the famous *Mistral*. There were 2–Do–2 and Bo–Bo types to be seen, as well as modern stainless steel multiple-unit electric sets, and bogie and four-wheeled diesel shunters.

MOUNTAINOUS AREA

Saturday and Sunday were spent sightseeing—even the most ardent enthusiast could hardly fail to do this in Paris—and our journey South started on Monday, the 15th, when we caught the 9 a.m. train from the Gare d'Austerlitz. This took us as far as Langogne, in the Auvergne, the mountainous area in Central France. For the first 200 kilometres, as far as Vierzon, the train of twelve coaches and three vans was electrically hauled by No. CC7119, but for the remainder it was steam-worked, by a large 2–8–2 as far as Clermont-Ferrand, and by another to Langogne.

Next day, we made our way further south, to St. Cecile, and from there visited the metre-gauge line to Florac, a single, winding, grass-grown track clinging precariously to the side of a narrow valley. The passenger services on this line were worked by neat little diesel autorails, and the freight by two six-coupled diesel tractors, but we saw two most interesting 2–4–4–0T "Mallet" engines derelict at



A view of Avignon Station, with 1,500 volt electric locomotive No. BB 9235 about to couple to the up "Mistral" for the run to Paris—the fastest regular timing in the world.

Florac. The entire journey southwards from Clermont-Ferrand to Nimes, including the metre-gauge section, was made through the most magnificent mountain scenery, with the single line passing through many short tunnels and impressive gorges, and over viaducts with swiftly-flowing, rocky, rivers far below.

The Wednesday was spent in Nimes, visiting the depot in the morning, and the extensive Roman ruins in the afternoon. The depot is of medium size, with two roundhouses, and contained a most interesting collection of locomotives, steam, diesel and electric. There were 2–Do–2 1500-volt locomotives of about 1930 vintage, modern Bo–Bos, diesel autorails and locomotives, and American-built oil-fired 2–8–2s of the 141R type as well as some Pacifics and at least one ancient 2–8–0.

The 141Rs were to become our constant companions throughout the South of France. We were able to climb aboard some of the engines and afterwards had the privilege of meeting M. Bagoud, the Engineer (Rolling Stock and Traction), Nimes who answered our many questions in English.

CRISP EXHAUST BEAT

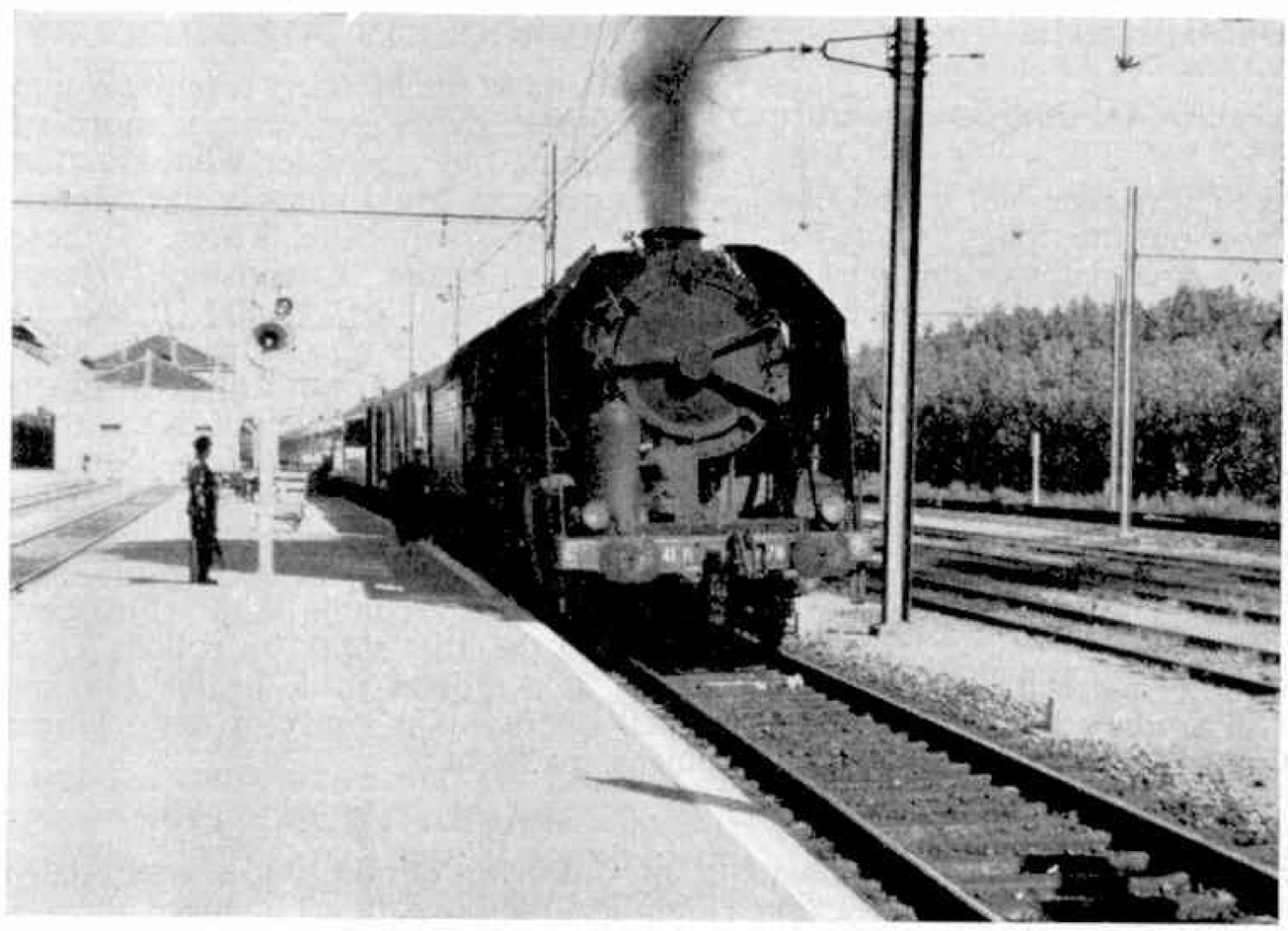
On Thursday we progressed eastwards along the South Coast to Nice, calling en route at Marseille, to visit the signal box, a large route-relay-interlocking affair, similar to that at the Gare du Nord. The scenery on this section was delightful, the flat reddish, land of Provence alternating with the tree-covered cliffs, white, red-tiled, houses and the deep blue of the Mediterranean. The crisp exhaust beat of the 2–8–2s as they pulled smartly away from the stations and guided us through this beautiful landscape made it a journey to remember.

And so, after a visit next morning to the depot at Nice, on we went to Avignon, which was reached by a circuitous journey on the Saturday. We left Nice early, on the metre-gauge Chemin de Fer de la Provence. This privately-owned concern has an unexpectedly large and impressive station on the north side of the town, and owns four Bo–Bo diesel locomotives, an eight-coupled diesel tractor, and twelve modern Renault autorails, one of which conveyed us through staggering mountain scenery to Digne, a journey occupying nearly four hours. From here a modern S.N.C.F. "Panorama" railcar, bound for Geneva, was used as far as St. Auban, from whence we travelled in six-wheeled stock hauled by a 141R to Marseille.

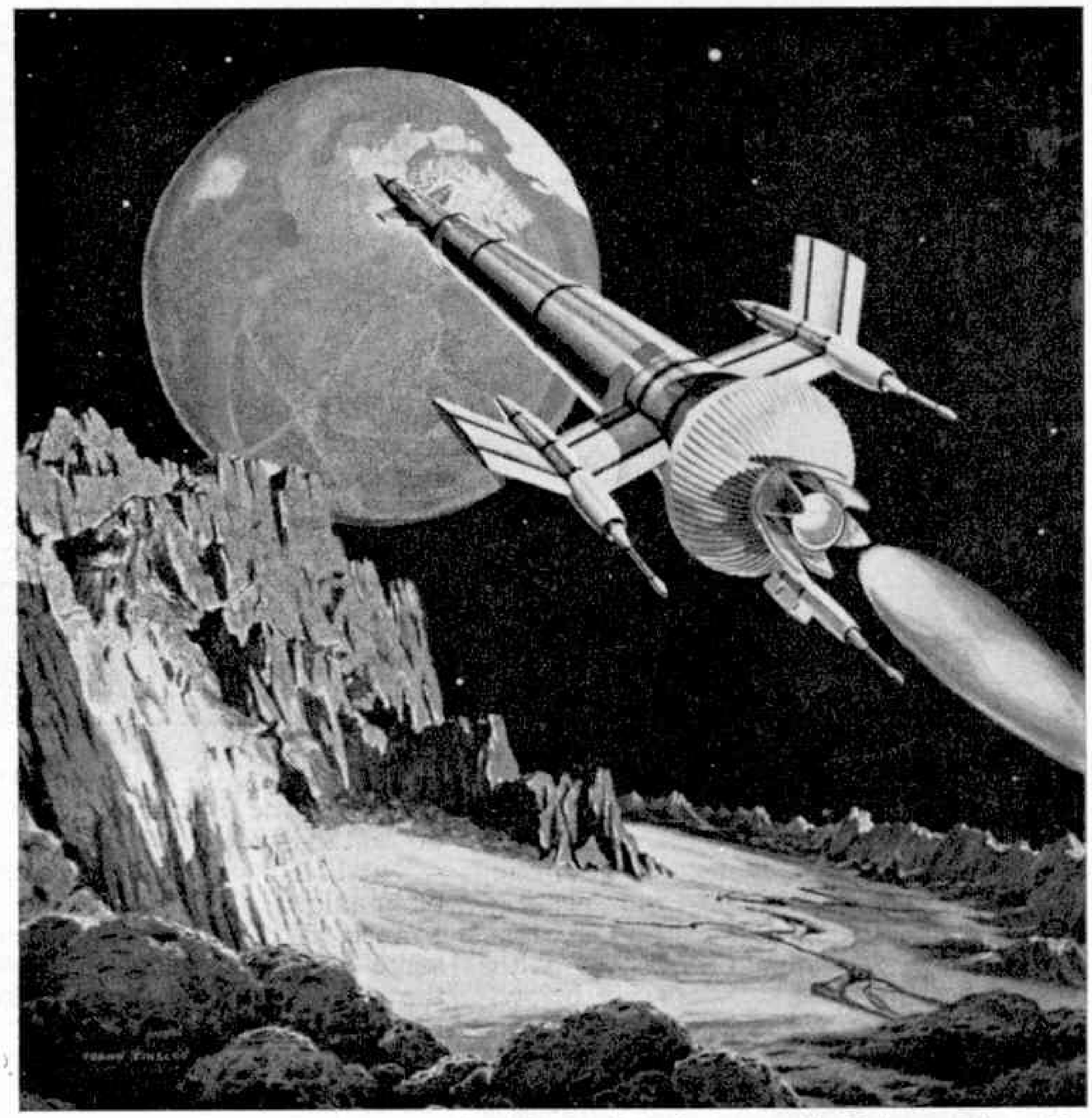
The last stage that day was undertaken in German rolling stock, on the Milan–Strasbourg express, which conveys through carriages to Frankfurt and Wiesbaden. Sunday was passed sightseeing in Avignon, a town of great historic interest. The following day found us travelling westwards over the flat coastal plain towards Perpignan, our scheduled stop for the next two days. As far as Montpellier transport consisted of three railcars, with an extra added as far as Nimes. No multiple-unit working was used—each motor car had its own driver, a practice common on rural services in France. Surprisingly, no multiple-unit electric trains were seen in this area, all local services on the electrified lines being worked by autorails. A Co–Co electric with a heavy main line train took us from Montpellier to Narbonne, and the last few miles across the salt marshes to Perpignan were completed behind one of the ubiquitous 141Rs.

(*Continued on page 298*)

(Below) An oil-fired steam 2–8–2 of American build, No. 141 R 778 ready to depart for Marseille from Avignon. At the time of the tour described here Avignon marked the limit of the electrified section from Paris. (Right) The signal cabin at Marseille, which the author visited. The route from Avignon and Paris is now electrified to Marseille.



FLIGHT TO MARS



Nuclear-powered Mars Snooper preparing to land on Mars' outer satellite Deimos. (Picture by courtesy of American Bosch Arma Corporation and Frank Tinsley).

THE twelfth of February, 1961, saw Man's first attempt to break away from the Earth-Moon system. Although the Russian Venus probe, launched on this date, was tracked only a short distance, it marked the beginning of a new phase in the exploration of space. The Moon can be reached at any time, as it circles the Earth at an approximately constant quarter of a million miles and the journey time is measured in days, but the planets all circle the Sun at different distances and at different speeds, so that to get from one to another is not such an easy matter. Mars circles the Sun in just under two Earth years and at its closest is 35,000,000 miles from us. To make the trip from Earth one must start out as Earth and Mars are reaching their closest point—or opposition. The ship will arrive as the Earth is receding and the return journey will be possible only when another opposition is due to occur—a total time of over a year.

It is clear that a great deal of experience will be needed in hopping to and from the Moon, and in more extended near-space trips, before manned flights to the planets can be undertaken. We must rely on robot ships to obtain all our first-hand information for some decades to come.

There is, however, one big difference between sending automatic ships to operate on the Moon and to operate on any of the planets. The Moon, so far as radio communication is concerned, is right next door. A radio message takes about a second and a half to travel from Earth to Moon, so that exploring vehicles could be directly controlled from an Earth control centre. But Mars, even at opposition, is three minutes distant by radio which would mean a six-minute delay between the transmission of a signal from a robot explorer and the receipt of a reply. Robot planetary explorers must, therefore, be completely automatic and be provided with instructions covering all conceivable circumstances.

Because of the distances involved even the most minute initial error can cause a planetary probe to miss its objective completely, so that it will be a great achievement to send a vehicle to Venus or Mars and track it all the way.

The first experiments to be carried out will be quite simple ones—the measurement of radiation and magnetic force in interplanetary space and in the vicinity of the planets. Perhaps the Russians will make another attempt soon—we certainly know the Americans will. They have plans to launch two Mariner A Venus "fly-bys" this year.

Space Notes

BY

J. HUMPHRIES, B.Sc.(Eng.)
A.M.I.Mech.E., A.F.R.Ae.S.

Further tests next year will enable the designers to sort out the "bugs" ready for the landing of a small capsule on Mars in 1964. The basic question concerning Mars is, "Does life exist there?" and the experiments for the Martian probes will be largely designed to try to answer this. An early vehicle will carry an infra-red spectrograph to determine the existence of organic molecules. Since the atmosphere is clear, close-up photographs of the surface can be taken and transmitted back to Earth.

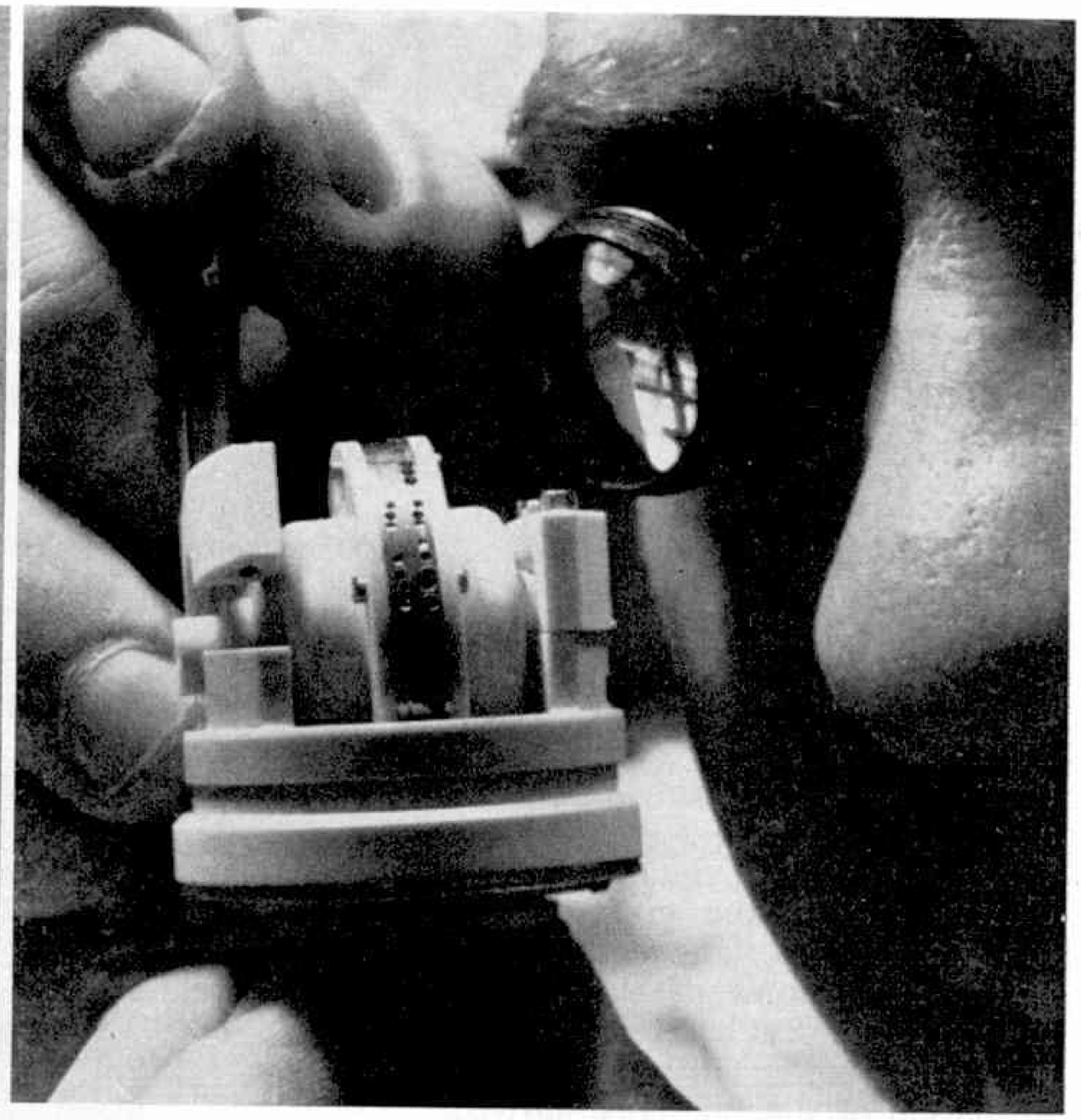
In all probability manned exploration of the planets will not be accomplished until nuclear rockets have been well developed. One idea for a nuclear-propelled reconnaissance craft is shown above. This space-ship is designed to fly in either direction—nose-first as a space rocket and tail-first as a ram-jet aeroplane. Power for both is provided by a single nuclear reactor using hydrogen as the propellent for the rocket and air from the atmosphere for the ram-jet. Travel to Mars, braking for landing and take-off are accomplished by rocket. As the ship approaches the Earth's atmosphere it turns tail-first, the "petal-doors" enclose the rocket nozzle and the ship is transformed into a high speed ram-jet aeroplane.

RETRO-ROCKETS FOR MERCURY

A picture of the Mercury satellite would be identified by 99 per cent or more of our readers, but I wonder what fraction of one per cent could identify the "Retro-rocket" shown opposite. Three of these were used to brake "Friendship 7" from its orbital speed of 17,400 ft/sec to 16,900 ft/sec. This was sufficient to send the capsule into a path towards Earth decelerating to subsonic speed in less than ten minutes. Each rocket is only 15 inches long and 12 inches in diameter, delivering 1,000 lb. of thrust. They have a vital role to play in the recovery of the capsule, and to ensure the reliable and consistent operation of the solid propellent each rocket is wrapped in a heater blanket which maintains a constant temperature during the flight.

SPACE GYROSCOPES

In order to obtain the exceptionally high accuracies required in space shots a



Above: Retrograde rocket engine for the Mercury manned capsule showing igniter leads and heater blanket. Three of these engines were used to brake "Friendship 7." Thiokol Chemical Corporation photograph. Right: Except for the balance wheel (marked with tiny holes) all parts of this space gyro are made of a virtually indestructible ceramic. Illustration by courtesy of Minneapolis-Honeywell Regulator Co.

fixed reference is needed within the vehicle. This is usually achieved by means of what is known as a stable platform. Such a platform is kept in a fixed position in space by means of gyroscopes. The accuracy of guidance depends on how completely this platform can be kept in a steady position relative to space and this, in turn, depends on the reliability of the gyroscopes. The most important part of a gyro is its bearings; the friction in the bearings makes the gyro drift, so that a search for friction-free bearings is one of the most important aspects of gyro research.

Extreme accuracy is essential in gyro construction and requirements are so rigid that even a microscopic speck of dust can mean the difference between success and failure of a Moon probe. Even with the most modern manufacturing and inspection techniques the rejection rate of the final product is high—over 100 precision gyros were bought for one satellite programme in order to get five acceptable units.

A new space-guidance gyroscope ten times more accurate than present production models has been designed by Minneapolis–Honeywell. This gyro uses ceramic construction and gas bearings so that drift is virtually eliminated. The spin motor, bearings and gimbal are all made of gem-hard aluminium oxide. The shafts of the spin motor act as bearings and it is supported on helium gas. The complete unit is only $2\frac{3}{4}$ inches long and $2\frac{4}{5}$ inches in diameter. It weighs half a pound.

FOR RAIL ENTHUSIASTS

Talyllyn Railway Publications 1962

The Talyllyn Railway Official Guide for 1962 well maintains the high standard of its predecessors. It is a 40-page booklet, with attractive coloured cover, full of information concerning the railway, with a map and numerous illustrations, five of which are new this year. The official timetable for this season, which runs to September 29 shows that an extra train put on last year to connect with a B.R. excursion is now included in the timetable for most of the season, although the B.R. excursion no longer runs. This has resulted from local demand and is a tribute to the enterprise of the owners of the line, the Talyllyn Railway Preservation Society.

The official guide costs 1/–, the timetable costs 1d. and there is an additional 6d. coloured postcard in the attractive series published by the Society. Copies of each of these items can be obtained from R. K. Cope, "Brynglas", Beckman Road, Pedmore, Stourbridge, Worcestershire.

New York Trip is First Prize

How would you like to win a free trip to New York on the *Queen Mary*, with your father or companion of your choice? This is the fascinating first prize in the Revell "Spot the Ship" contest, details of which will be found elsewhere in this issue. One hundred of the new Revell *Queen Mary* kits will be awarded as consolation prizes.

This exciting contest, introduced by the well-known hobby kit manufacturers, opened on June 1 and continues until August 1. The rules are simple. You name the six famous ships from the Revell range that are illustrated in silhouette on the entry form and write in your own words (not more than 12) why you prefer building Revell models. Entry forms are obtainable from Revell model dealers.

Every entry submitted, and there is no limit to the number you can send in, must be accompanied by a box end from one of the Revell ship kits included in the contest, or the new Revell kit of the *Queen Mary*. As there are two box ends to every kit, two people can enter the contest with one kit.

This is a wonderful opportunity to see the fabulous sights of New York (think of the stories you will be able to tell your friends when you return) and to visit the famous Brooklyn Navy Yard as the guest of Revell.

THE STORY OF SLATE

● Caernarvonshire, says the writer of this article, has the biggest slate quarries in the world. In this intriguing account he outlines the skills of an ancient craft and points out that slates from the quarries of Wales occupy places of honour all over the globe.

SLATE quarrying is the great industry of North Wales. It is the very life-blood of the people of Gwynedd; to them it means employment. To the rest of the people of Britain slate means a roof over their heads—one which will last for a hundred years.

My story will tell you how slate is blasted out of the great Welsh mountainsides in slabs and finishes up as neat pieces of slate on a million roofs. But before I go on to this, I had better tell you how the formation of slate actually started, millions of years ago.

Written by

Emyr Jones

Illustrated by

E. Emrys Jones

Mud or sediment was swept down by large rivers on to the bed of the sea. Later, other rocks were formed on top of the layers of mud which gradually hardened under great pressure. Fierce heat from volcanic eruptions baked the compressed mud until it became solid rock, or slate as we know it today.

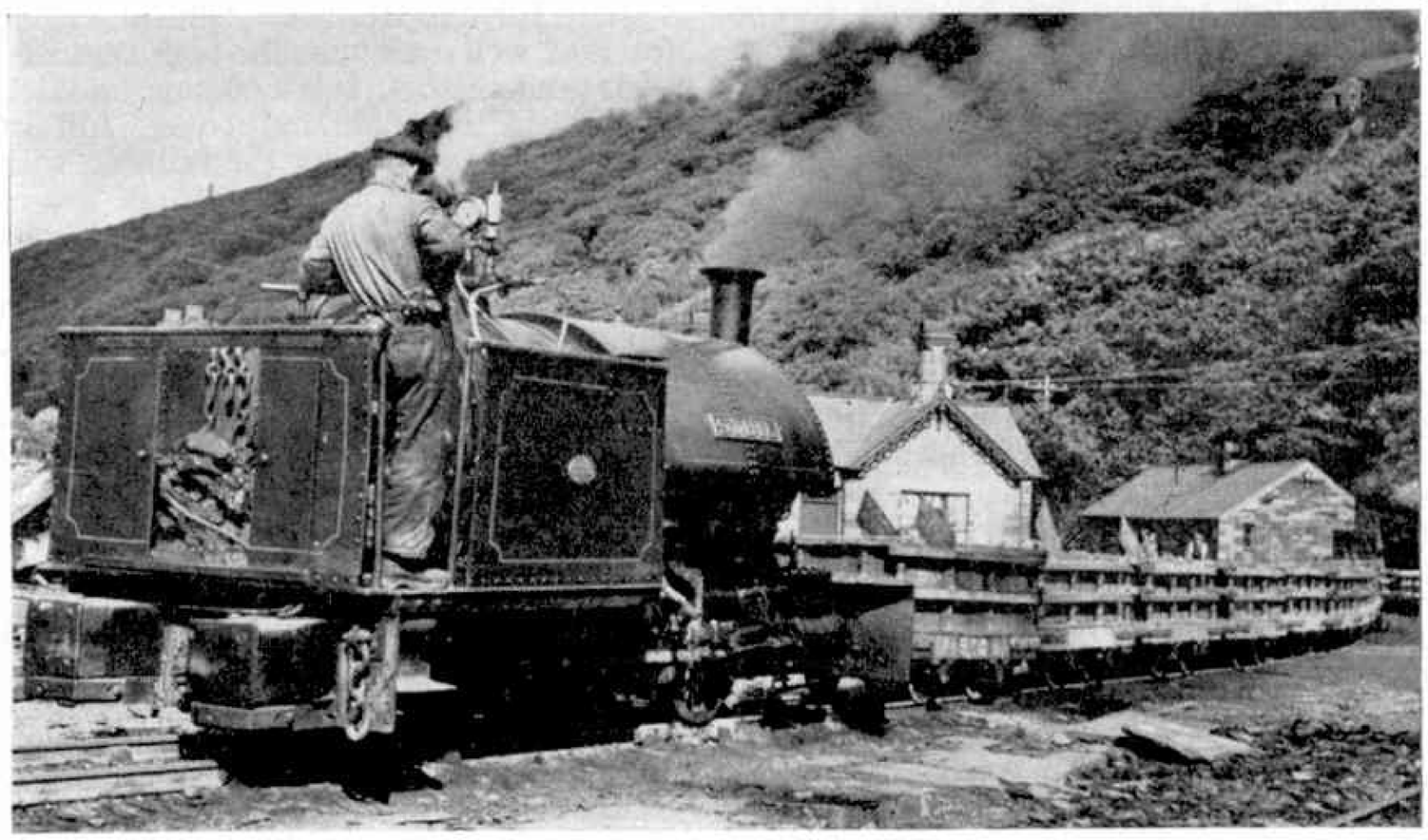
Many mountains are solid slate with a covering of soil and rubble; the Elidir Mountain at Llanberis is an example. I should mention that slates have a variety of colours; they are mostly greyish-blue but may also be red, green, or mottled according to the nature of the mud from which they originated.

The biggest slate quarries in the world are the Dinorwic Quarries, at Llanberis, and the Penrhyn Quarries at Bethesda; both are in Caernarvonshire. These are "open" quarries and are worked in galleries or "ponciau" as they are called.

The Dinorwic Quarry, which at one time employed about 2,500 men, is worked on the open slopes of the Elidir Mountain and covers about 700 acres. The galleries are like giant stairs, each about 30 feet deep reaching to a height of more than 1,000 feet above sea level. The slates are loaded on wagons and sent down the inclines, three wagons at a time to the lower part of the quarry. Until recently, they were taken by the quarry train to Port Dinorwic, and from this little port steamers would carry the slate to the big ports of Britain where it was re-exported, or delivered by rail to different towns up and down the country. Nowadays, the slates are taken direct from the quarry to the housing site, but a small percentage go by rail from Llanberis.

One of the reasons why slate is so expensive to produce is the fact that a vast amount of waste has to be cleared to expose the actual slate, which is in the form of a huge rock. When the quarryman reaches the rock face he bores a hole into it with a pneumatic drill and then charges it with explosives. "Black Powder" is always used to blast good rock as it does

A worker on the rock face drills a hole in the slate rock ready for a charge of "Black Powder." Notice the galleries or "ponciau" in the background.



The "Sybil", one of the little engines that haul the wagon loads of slate.

Left: Dressing the slates. Here you see the dresser, astride his bench, wielding his special knife of tempered steel. Right: A dressing machine as used in the larger mills.

not damage the slate as gelignite or dynamite would. Preparing these charges requires considerable care and skill, for if the explosion is too violent valuable slate may be damaged.

Blasting takes place at a fixed hour, when a hooter is sounded. This is a warning for all men to cease work and take cover in their specially-constructed shelters. A second hooter is sounded three minutes later and the charges are fired, always with a match or a lighted cigarette, and not by electrical means as in a coalmine.

After lighting the fuse, the men run to join their fellow workers in the shelter. Then, during the next five minutes, the whole quarry is shaken by a series of explosions and many tons of rock are sent crashing to the bottom of the gallery. The peace hooter or "Corn Heddwch" is sounded exactly eight minutes after the first one, indicating that blasting is over.

When the quarryman emerges from his shelter, he at once starts work on the detached masses of rock. The huge blocks are split into slabs about three inches thick and are then "pillared"—cut with the grain into pillars between twelve and fifteen inches wide according to the size of the slates expected from them. All this work is done with a heavy chisel and a three-pound hammer.

The pillars and blocks are then loaded on to a trolley and the load, weighing about two tons, is taken by miniature railway to the mill or dressing shed where it is unloaded. Next, the slabs of slate are placed on tables and cut, by circular saw, to the required lengths. The saw turns in a trough full of water which prevents it from becoming too hot, for excessive heat would ruin the slate. The water also helps to keep down the dust which is so harmful to the men's health.

Now comes the most intriguing part of all the splitting of the slate. This calls for a very high degree of skill and accuracy. The "splitter" sits cross-legged on the splitting block, which is a low stool or the stump of a tree trunk. The only tools used for splitting are two or three flat chisels about three inches wide and a small mallet made from African oak. First of all the quality and cleavage of the block must be considered. If it is good, healthy slate it is split in half so as to get two thicknesses of eight slates, i.e. a total of sixteen slates from the block. If, on the other hand, the slate is of a harder nature, or has any flaws in it or defects which might affect the splitting process, it is then divided into three parts, giving a total of twelve rather thicker slates. The chisel is placed firmly on the edge of the block of slate and tapped sharply and deftly with the mallet. An even crack appears and after a few more taps the block splits open. This is repeated, but as the layers become thinner, the two thinner chisels come into use. Usually, six slates can be split from a slab one inch thick. All this, as you can imagine, is highly-skilled work.

The sheets are then placed on a small stool by the side of the dressing bench ready for trimming, or dressing, into shape and size. Dressing is usually done by an apprentice, but the quarryman is very versatile and equally skilled in all processes both on the rock face and in the "mill".

The dressing bench consists of a long, iron blade fixed into a solid plank of wood which is similar to a railway sleeper, with two short legs fixed at one end to give the bench a slight gradient. The dresser sits astride it and uses a dressing knife, which is a heavy blade of tempered steel, over a foot long, having a short wooden handle. He places the thin sheet of slate on the sharp blade which runs along the top of the dressing bench, his left knee taking the weight of the slate and his left hand holding it steady. He then cuts a straight base at one side, his experienced eye guiding him to form a perfect right angle. The slate is then measured with a special stick which is about 30 inches long and has a thick nail protruding near the end. Notches have been cut into the bench woodwork, at intervals of an inch up to 14 inches and then at two-inch intervals up to 24 inches, which is the maximum size for most slates in common use. Again, the quarryman's eye is almost infallible as he quickly marks the required measurement without apparently even looking at the notches, and completes the operation by trimming carefully along the notch-marks.

In the larger "mills" dressing machines with revolving knives are used. Although these are speedier, they are not always so successful where harder and thicker slates are concerned and they can be very wasteful.

Slates are classified according to size, and bear very dignified names: "Queens", "Princesses", "Duchesses", "Countesses", "Ladies", etc. The largest-size slate is the "Queen" and measures up to 40 inches. The smallest is 9 × 4½ inches. This is the size of a brick face and is therefore used by builders as a damp course between layers of bricks.

At the end of each day, the slates are taken out of the shed and stored outside in neat rows according to size and quality. As he works on a monthly contract the quarryman "sells" his stock of slates to the management at the end of each month. The slates, of course, have to be counted and this is done in threes, each three being known as *mwrw*. The origin of this goes back to the days when slates were handled by sailors from the Continent who were accustomed to trading in fish, especially herrings, which they counted in threes.

(*Continued on page 299*)

FIRST OF BRITAIN'S BIG JETS COMPLETED

This photograph clearly shows one of the distinctive features of the VC10, the mounting of the 21,000 lb. Rolls-Royce Conway 42-1 turbojets in pairs on either side of the rear fuselage.

BY the time you read this issue of *M.M.* the prototype Vickers VC10 jet-liner G–ARTA, illustrated at the top of this page, should have made its first flight. It will be an exciting moment for British aviation, as the VC10 is our first "big jet", able to compete on equal terms with the best U.S. types such as the Boeing 707 and Douglas DC–8. In some ways it will be even better; for example, it will be able to operate from shorter runways than the 707 and DC–8 and will make its first flight from the runway at Vickers' Weybridge factory, which is only 1,400 yards long.

The VC10 is impressively large, with a wing span of 140 feet and length of 158 feet. Its tailplane towers above the ground to a height equal to that of a four-storey building and indeed the span of its tailplane is ten feet greater than the *wing* span of a Hunter fighter.

AIR NEWS

By

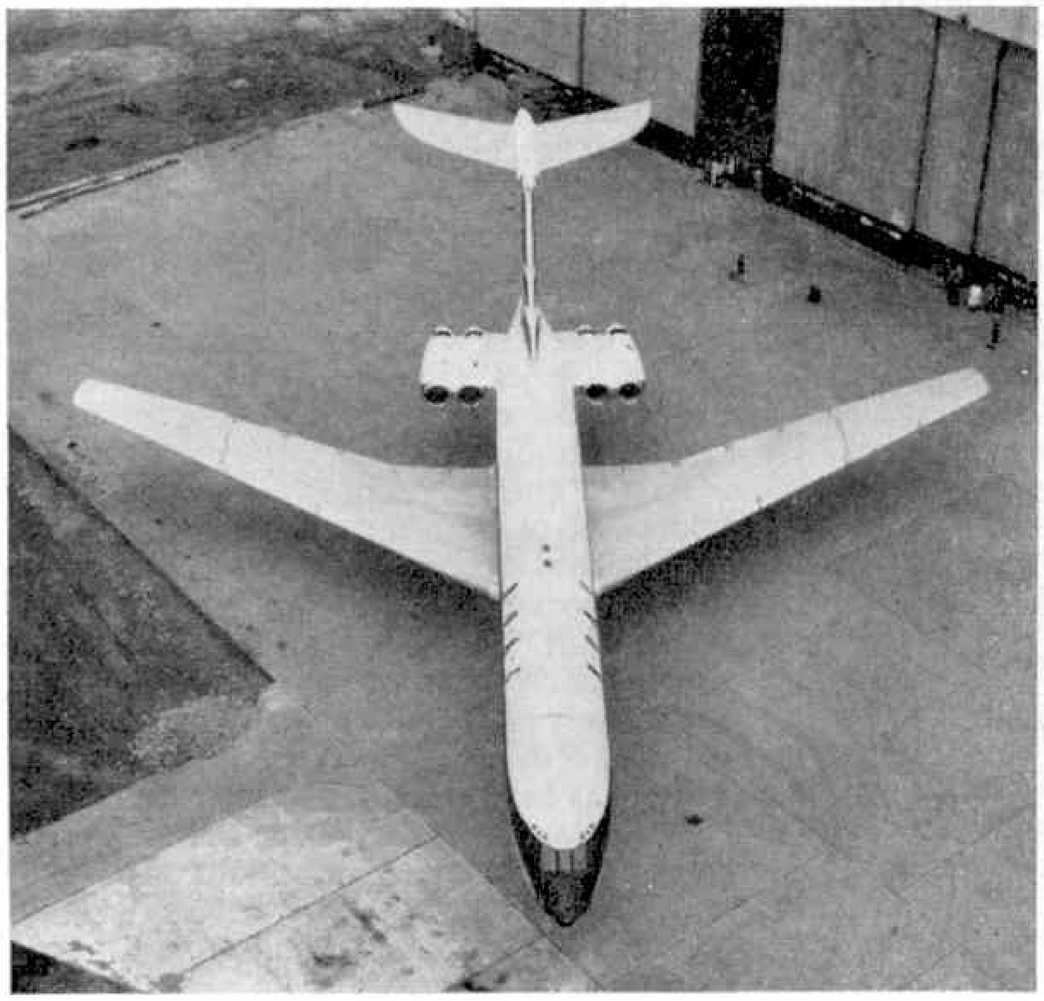
JOHN W. R. TAYLOR

In its initial form, the VC10 has a maximum take-off weight of 299,000 lb., or more than 133 tons. Of this total, the aircraft accounts for less than half. The maximum fuel load of 17,940 gallons weighs about 63 tons and is equivalent to the total weight of a fully-loaded Vanguard airliner. The maximum payload is 17 tons, equal to three of London's Routemaster double-decker buses or, more factually, 150 passengers and baggage, plus four tons of freight and mail.

A distinctive feature of the VC10 is its engine arrangement, with four 21,000 lb.-thrust Rolls-Royce Conway 42–1 turbojets mounted in pairs on each side of the rear fuselage. They will give it a maximum cruising speed of over 600 m.p.h. and the ability to fly 4,400 miles with a full payload. Not only will it be 15–20 m.p.h. faster than competitive jet-liners, but it will also come in to land much more slowly. In fact, its landing speed will be much the same as that of the small turboprop Viscount. This is one of the greatest possible safety features.

The first of 12 VC10s for B.O.A.C. already has its wings, engine nacelles and fin fitted. The second and third are on the final assembly line and deliveries will begin at the end of next year. The first of B.O.A.C.'s 30 Super VC10s, with 13 ft. longer fuselage, loaded weight of 144 tons and 22,500 lb.-thrust Conway 43 engines, will follow the VC10 into service in late 1964.

The towering size of the VC10 is made clear in this picture. Notice how insignificant in size are the people in the background when compared with the huge machine itself. The 'plane's height above the ground is that of a four-storey building.



Continental piston engines are shown here being assembled at the Rolls-Royce Light Aircraft Engine Department, at Crewe.

Right (top): An unusual picture indeed—the Victa Airtourer 100 amid fields and pastures green. One of the impressive features of this clever little aircraft is its suitability for use from improvised airstrips. Below: Training plays a large part in the activities of the two Hastings squadrons based at Colerne. Here, two aircraft are seen on a close formation flying exercise.

BABY ROLLS-ROYCES

In the case of both cars and aero-engines, Rolls-Royce have a reputation for building the biggest and best. However, they are also producing some of the smallest British-built aero-engines nowadays, and the lower picture on page 270 shows engineers at work on some of these in the company's Light Aircraft Engine Department at Crewe.

About eighteen months ago, Rolls-Royce acquired rights to manufacture the complete range of American Continental piston-engines of from 65 to 390 h.p. At present, production at Crewe is being concentrated on the 95, 100 and 145 h.p. engines, with four or six horizontally-opposed cylinders, and deliveries will begin this year. It will be the first time for many years that such highly efficient engines for light aeroplanes have been available in the U.K.

"TIGERS" TAKE OVER

No. 74 Squadron of R.A.F. Fighter Command, the famous "Tiger" Squadron, has taken over from the "Blue Diamonds" as the leading aerobatic team for 1962. It is the first time that a unit equipped with supersonic Lightnings has been chosen for the job, and is a great tribute to the handling qualities of these 1,500 m.p.h. aircraft, as well as to the men who fly them.

Formed in July 1917, No. 74 Squadron flew S.E.5As in France in the first world war. Its pilots included the great Major "Mick" Mannock, V.C., who destroyed 73 enemy aircraft, and its aggressive spirit soon earned it the nickname of "Tiger Squadron", which has stuck ever since.

Today, the tiger's head badge is carried proudly on each side of the tail fins of No. 74's Lightnings, with the appropriate black and yellow squadron markings on the nose. Otherwise, the aircraft have a natural metal finish. Nine of them were rolled in formation during last year's S.B.A.C. flying display. It will be interesting to see the extent to which No. 74 will be able to match the varied programme of aerobatics given in recent years by R.A.F. Hunter squadrons. But we should never forget that its main job is to defend this country and that, even when it gives its displays, it will always be fully operational and ready to go into action at a moment's notice.

STILL GOING STRONG

In this jet age, it is easy to forget that piston-engined transports still carry a large proportion of the world's passengers and freight. Even R.A.F. Transport Command still operates squadrons of piston-engined Hastings and Beverleys, as we are reminded by one of the illustrations on this page.

It shows one of the Hastings transports from the R.A.F. Station at Colerne, which is perched high on the hills to the east of Bath. There are two Hastings squadrons at this base, Nos. 24 and 36, and their aircraft can be recognised by the Arms of the City of Bath emblazoned high on their fin in recognition of the fact that Colerne was granted the Freedom of the City as a token of the close links between the R.A.F. and the local people.

The two dozen aircraft belonging to these units complete as many as 1,400 flying hours each month, airlifting men and materials to any spot on the globe where they might be required. They now carry two underwing fuel tanks outboard of their 1,800 h.p. Hercules engines to give them increased range.

AUSTRALIA'S AIRTOURER

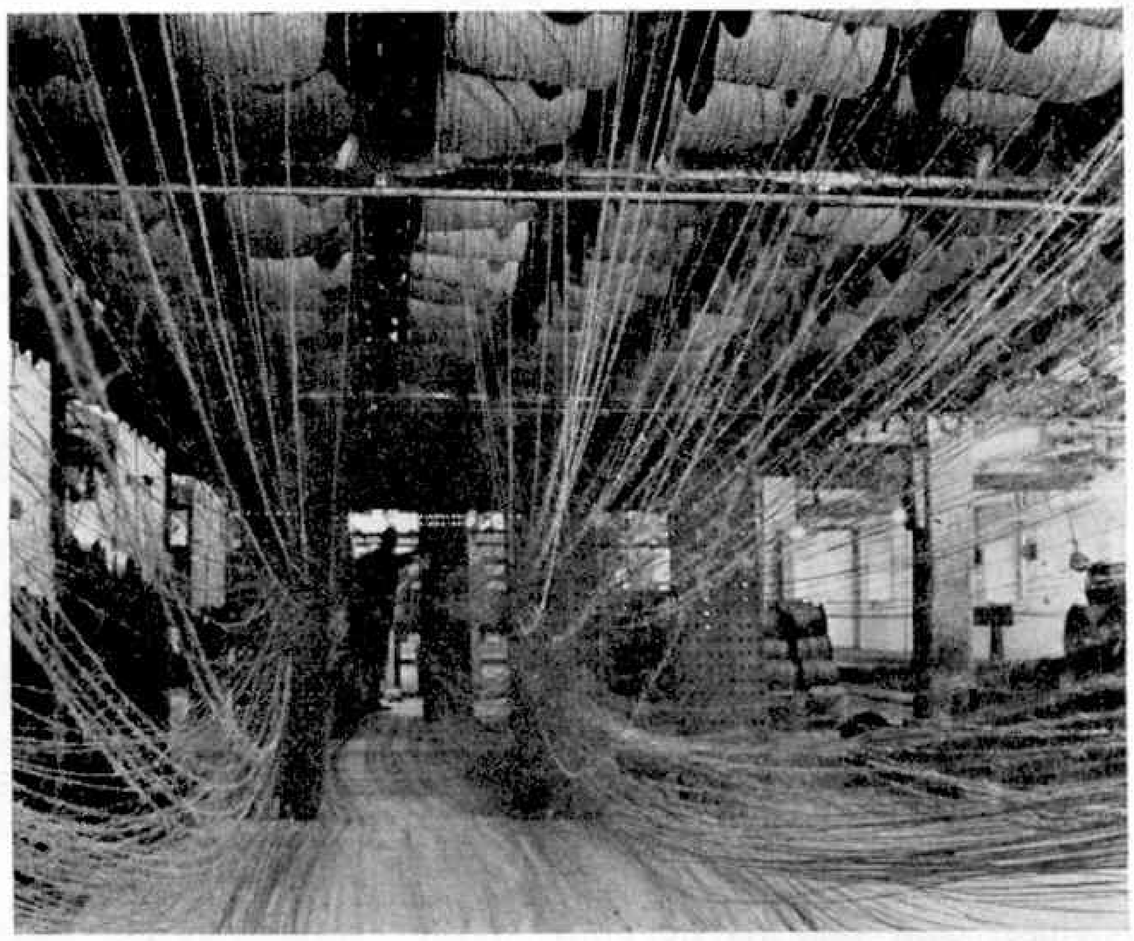
We do not hear much about Australian-designed aeroplanes, so the picture of the little Victa Airtourer 100 accompanying these notes is particularly welcome. The story of this two-seat lightplane began when the Royal Aero Club of London organised a design competition for such aircraft in 1953. The first prize was won by Polish-born Henry Millicer, who was then Chief Aerodynamicist of the Australian Government Aircraft Factory, Melbourne. It was quite an achievement, as there were 104 entries for the competition, but nothing further was heard of his design, which he called the Airtourer, until a privately-built wooden prototype flew for the first time in April 1959.

In the following year, Mr. Millicer became Chief Designer of the newly-formed Aviation Division of Victa Ltd., a company famous for its two-stroke engines and lawnmowers. He redesigned the Airtourer for quantity production as an all-metal aircraft, and Victa are to build it in two versions, with 100 h.p. Continental 0–200A and 115 h.p. Lycoming 0–235

(Continued on page 282)

Chatham Dockyard Ropery

A Skill That Goes Back Over The Centuries



IN the Ropery at Chatham Dockyard they recently finished making fresh rigging for Nelson's flagship, Victory.

It was at Chatham where the original rigging was made in 1759. Now Victory *is used as a naval Museum at Portsmouth.*

The present building which houses the Ropery in the Dockyard was established in 1785, a few years after the original building. But it has changed very little, for the methods of making rope have remained much the same over the centuries except for the introduction of power for the looms and other machinery.

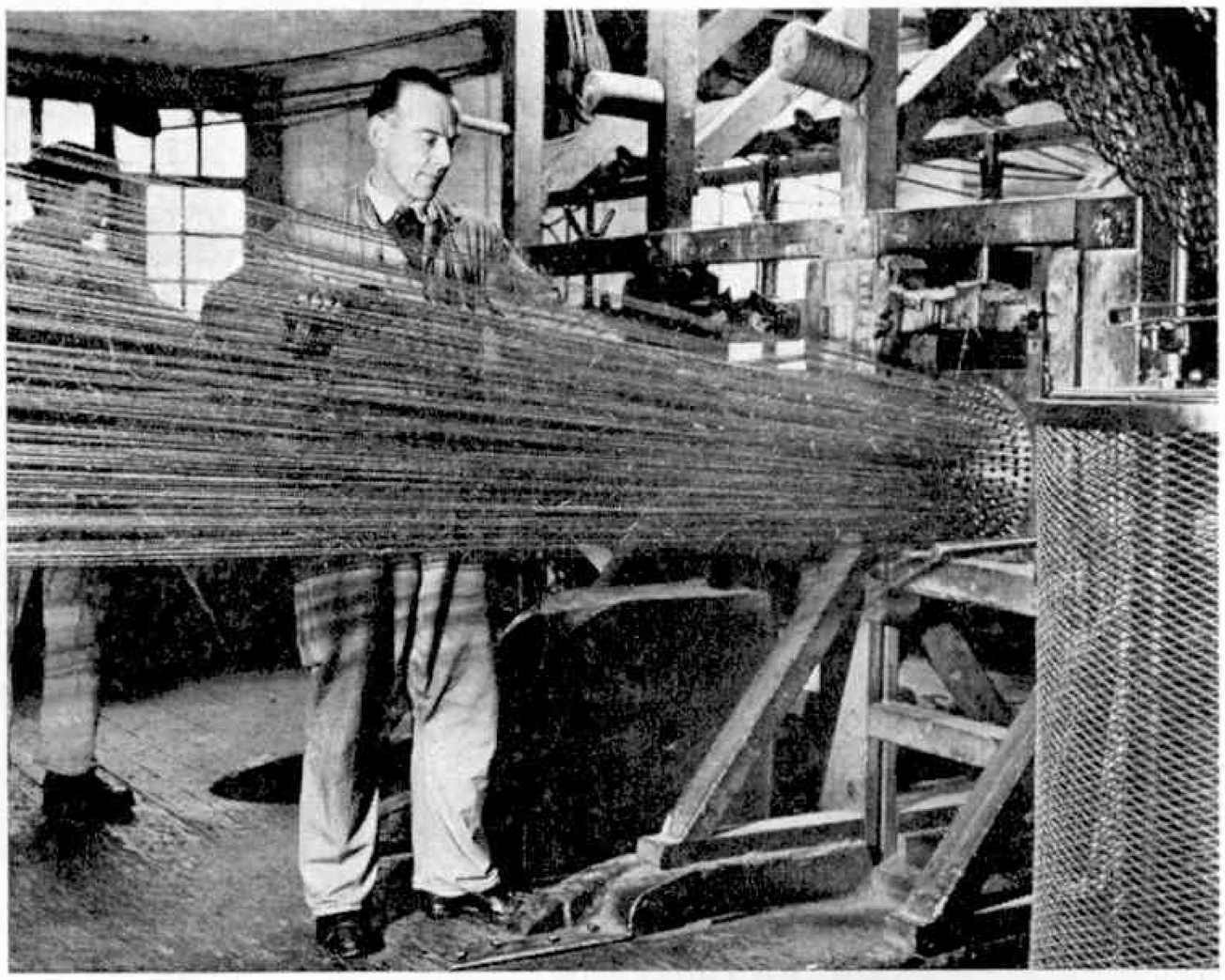
In the present building much of the original woodwork in the floors and ceiling remains, and great care is taken not to lose anything of its ancient style. The Ropery is one of the Dockyard's showpieces and is a "must" in the itinerary of visiting V.I.P's.

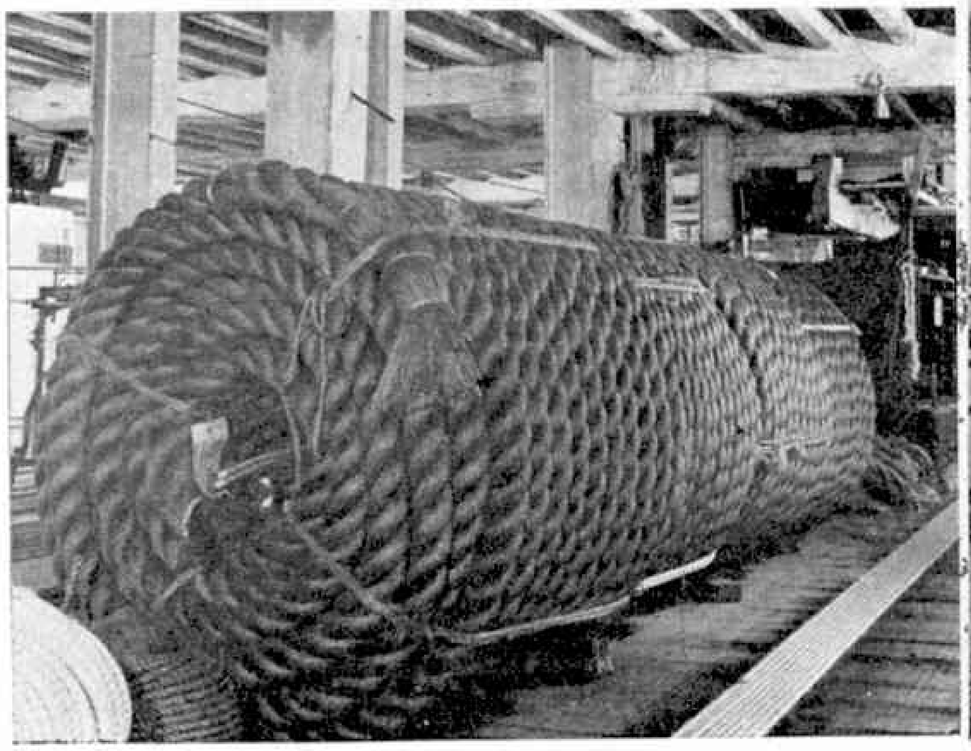
It also has a great practical value, for the department makes all the ropes required by the Royal Navy, except for a small amount of small-gauge cordage which is made by civilian contractors.

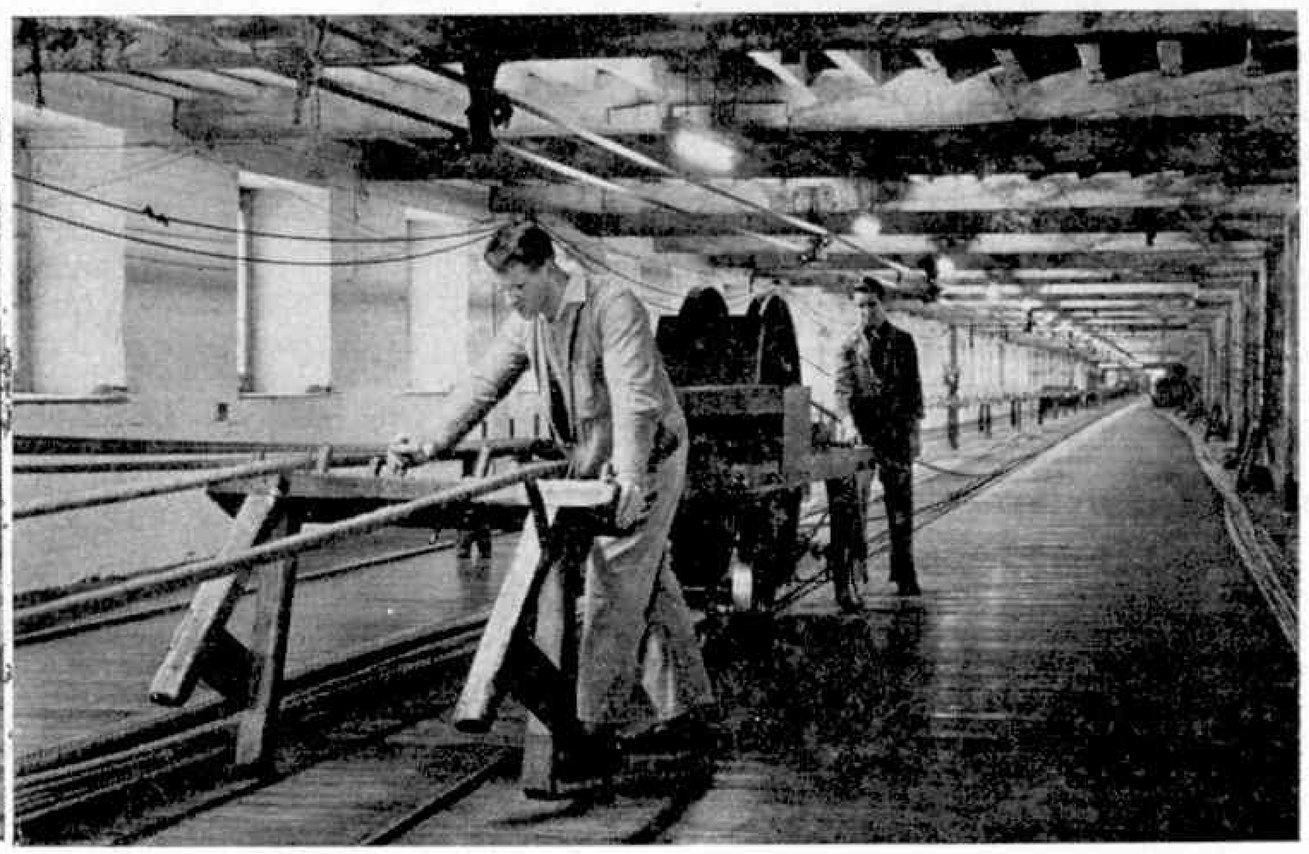
PICTORIAL SURVEY BY JOHN TOPHAM

The Ropery handles requirements which vary from ropes of ⅝ inch circumference to ropes with a circumference of two feet. The order for the Victory *weighed eight-and-a-half tons and the ropes varied in circumference from 2 inches to 19.*

Now to the four pictures, which take you behind the scenes in the wonderful building where the centuries-old craft of rope-making for the Royal Navy is still performed. Top: From bobbins set in a frame on the ceiling a maze of strands leads down through the "formers" into the forming machine ready for the laying of two five-inch sisal ropes. Centre: A closer view of the strands as they pass into the forming machine. Bottom (right): A trolley draws the ropes from the forming machine, the strands having now been twisted into ropes of 5-inch circumference. This floor is 1,128 feet in length and it is estimated that men working on the forming trolley walk up to 15 miles a day along what is known as "the rope walk". Bottom (left) Completed rope being stacked.





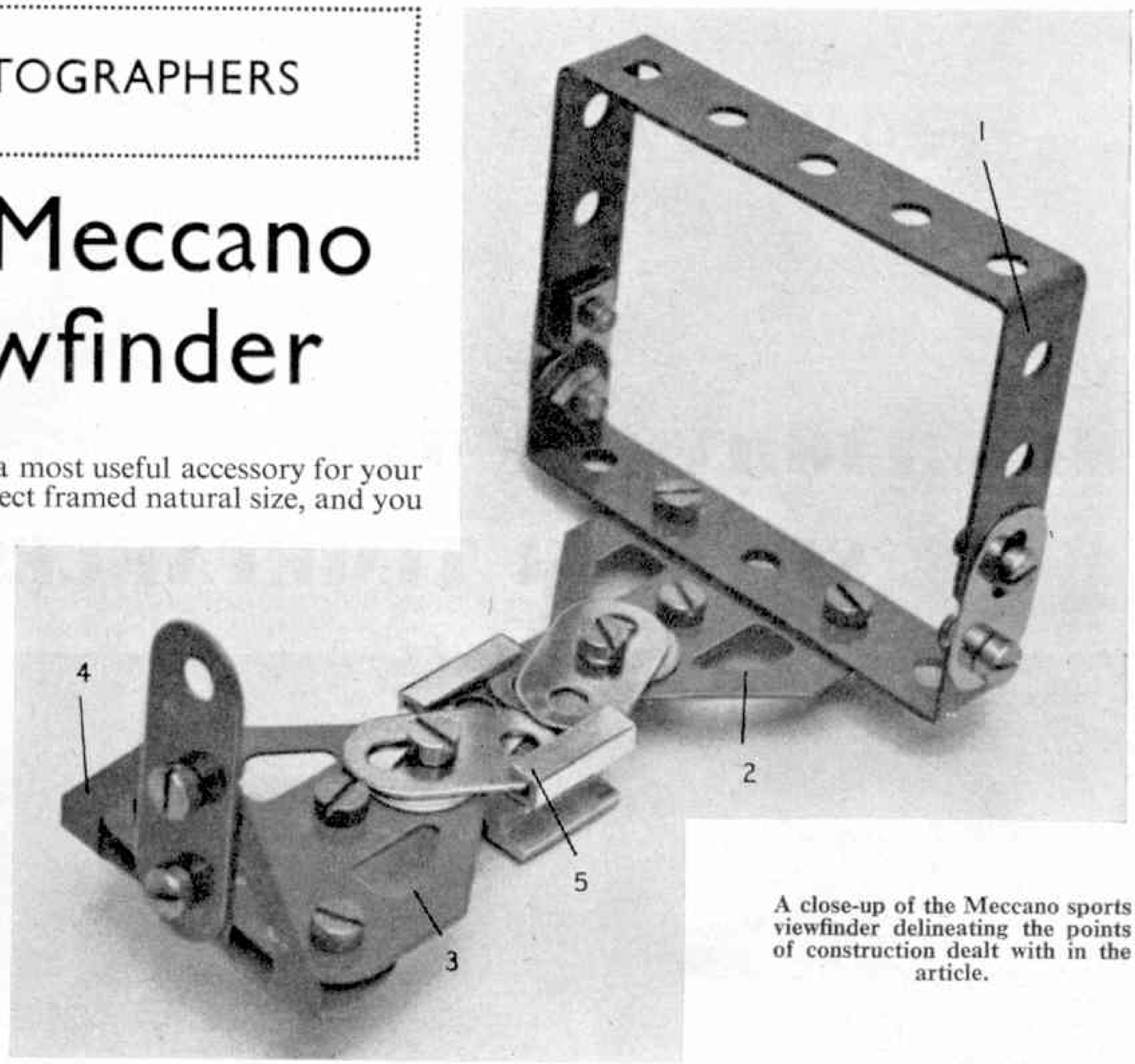


SPECIALLY FOR PHOTOGRAPHERS

Building A Meccano Sports Viewfinder

A DIRECT-VISION or sports viewfinder is a most useful accessory for your camera. Through it you can see your subject framed natural size, and you can use it to aim your camera just as you would aim a gun. This kind of viewfinder is ideal for action photography.

A sports viewfinder consists of a metal frame of the same proportions as the camera's picture size. A sighting hole is placed at such a distance from the frame that when you bring your eye close up to the hole you can see, bounded by the metal frame, the view that your lens "sees".

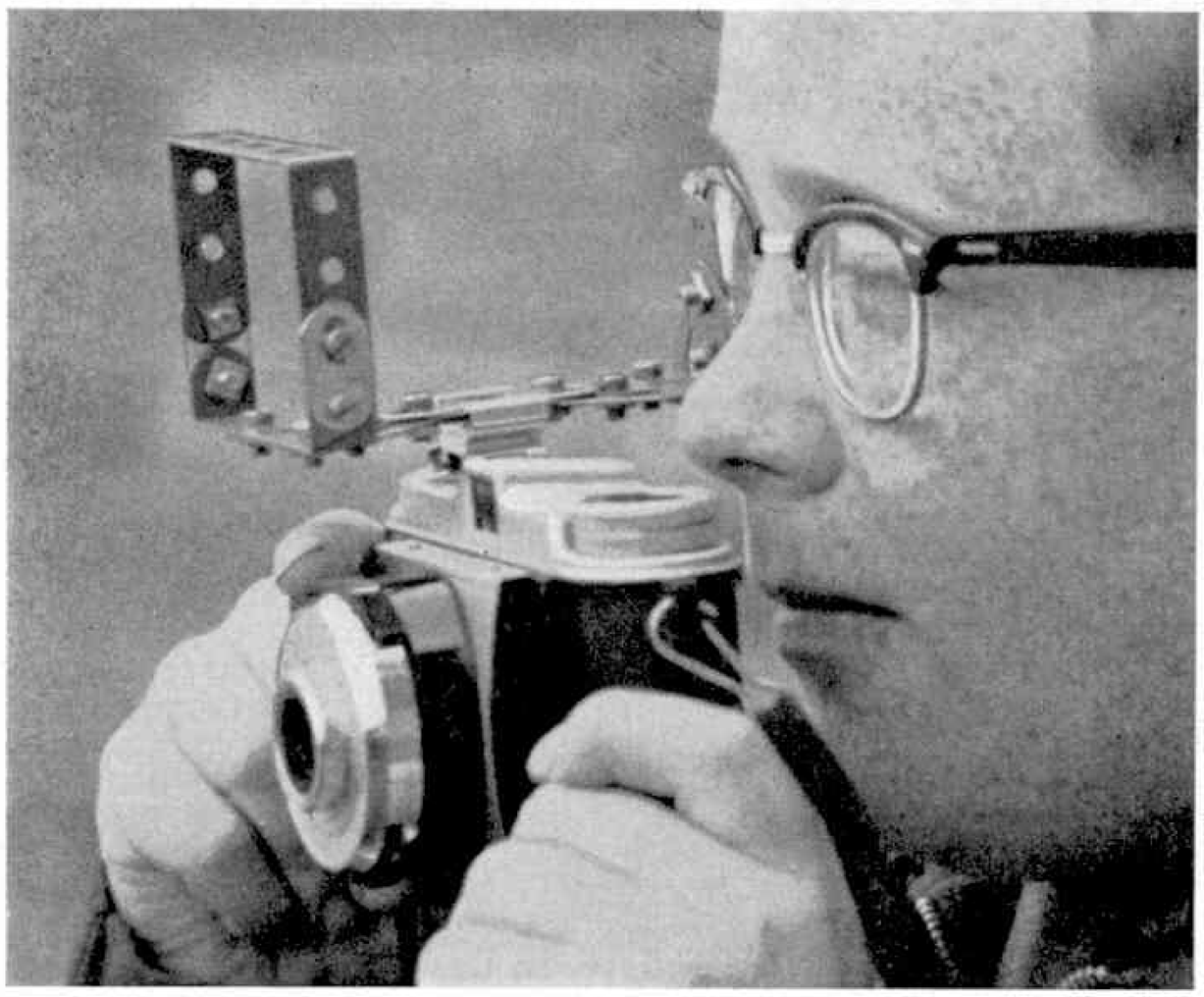


A close-up of the Meccano sports viewfinder delineating the points of construction dealt with in the article.

By H. G. FORSYTHE

A Meccano sports viewfinder suitable for most cameras can easily be made and, as our illustrations show, very few parts are needed. The size and proportions of the viewfinder will differ slightly depending on the kind of camera you have. Obviously, if your camera takes a $2\frac{1}{4}$ inch square negative, then the frame must be square. The viewfinder described this month is suitable for a camera, such as the Coronet Viscount, taking a rectangular picture.

The frame (1) of this finder is constructed by bolting together two Double Angle Strips (one $2\frac{1}{2}'' \times \frac{1}{2}''$ and one $2\frac{1}{2}'' \times 1\frac{1}{2}''$) with Fishplates. The frame is bolted securely to a Flat Trunnion (2) to which is attached, by means of two bolts, a $2\frac{1}{2}''$ Perforated Strip in such a way that the Strip projects at right angles from the bottom of the frame. Another Flat Trunnion (3) is bolted to the opposite end of the Perforated Strip. A Trunnion (4), to which is bolted a $1\frac{1}{2}''$ Perforated Strip, is now bolted to the Flat Trunnion as shown. The free hole of the $1\frac{1}{2}''$ Perforated Strip serves as the sighting hole and it must be positioned so that it is *exactly opposite* the centre of the viewfinder frame. One way of adjusting the position of the Strip, if this is necessary, is by placing washers between the Trunnion and the Flat Trunnion. It is most important that the viewfinder is securely bolted together and that all parts are straight and properly squared up.



How to use the Meccano sports viewfinder as an attachment to your camera.

Attachment to the camera can be made in several ways. Most cameras have accessory shoes for attaching flash guns, etc. If you attach to your viewfinder an accessory *Shoe and Foot*—obtainable for a few shillings from your photographic dealer—you can then slip the viewfinder on and off the camera as required. The *Shoe and Foot* can be fixed to the viewfinder by using four Fishplates. The Fishplates should be pressed into the shoe part (5) of the *Shoe and Foot* as shown. Leave the bolts loose. On tightening these the viewfinder will become locked firmly in the shoe.

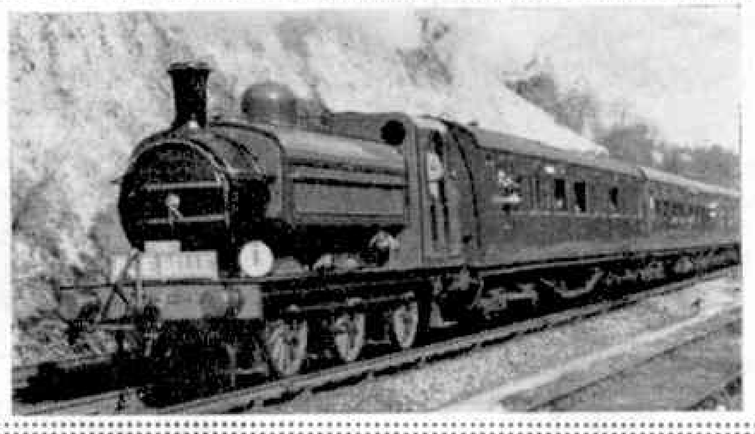
When building a viewfinder for your own camera it is helpful to compare the view seen by the viewfinder of the camera with the view seen through the sighting hole of the Meccano Viewfinder, making appropriate alterations, such as moving the sight backwards and forwards, until the two views correspond as nearly as possible.

With the Meccano Viewfinder in position, place the camera on a tripod, Meccano Camera Stand, or other firm support. Now carefully compare the

(*Continued on page 298*)

RAILWAY NOTES

Contributed by R. A. H. Weight



HIGHLIGHTS OF THE SUMMER TIMETABLES

"*FASTER than ever*", says the announcement recently received from B.R. Scottish Region of their summer service improvements now in operation. Each-way travel is possible in a level three hours between Glasgow (Buchanan Street) and Aberdeen, with stops at Stirling, Perth, Forfar, Stonehaven. Named expresses on that route are the *Granite City*, *Bon Accord*, *St. Mungo*, *Grampian*. Following successful test runs, ex-L.N.E.R. A4 Pacifics may be seen more frequently thereon. The three-hour Edinburgh–Aberdeen quickest trains will continue.

One can also journey by observation car train over a splendidly scenic course between Glasgow and Fort William in four hours. Five hours is the time taken between Glasgow or Edinburgh and Inverness, through Highland mountain territory, while five hours travel over the far north single line by the *Orcadian* links Inverness with Wick or Thurso.

Britannia class 4-6-2 No. 70039 "Sir Christopher Wren", eagerly watched by platform observers, leaves King's Cross with a train for Cleethorpes. Photograph by M. Edwards. At the top of the page is an unusual visitor to the Brighton main line, ex-G.N.R. saddle tank No. 1247 in original livery, with a special excursion to Sheffield Park. Photograph by S. C. Nash

Connections to and from other towns have been greatly improved, apart from the sweeping accelerations south of Edinburgh on the main East Coast route to London mentioned later. A fresh sight-seeing attraction is a diesel tourist train between Glasgow (Queen Street) and Oban, via Loch Lomond-side, Crianlarich, Loch Awe and Connel Ferry. Many routes concerned are steeply graded, as I pointed out last month.

Type 4 diesel locomotives are in use on many of the principal Scottish passenger and fast freight services. Smaller type 2 units, singly, or in pairs for multiple working, are also employed over a wide area.

For the first time, three trains are providing in both directions six-hour Edinburgh–London (King's Cross) Monday – Friday services, at an overall average of 65½ m.p.h. These are: *The Flying Scotsman*, quickened by fully an hour in its centenary year, the afternoon *Talisman*, and the *Elizabethan*.

The two first-named call at Newcastle, being booked to cover the 268 miles to and from King's Cross in just over four hours. The up and down morning *Talisman*, the *Heart of Midlothian* and the *Anglo-Scottish Car Carrier* are other East Coast day expresses that are considerably speeded up, as are some of the heavy night trains. Among Yorkshire or Newcastle services that are faster this summer are the 9.40 a.m. Newcastle–King's Cross; the *Yorkshire Pullman* southbound and the *Tees–Tyne Pullman* each way.

SPECTACULAR TIMING

The last-mentioned is given the spectacular southbound working time of 35 minutes start to stop for the 44 miles, largely level and straight, from Darlington to York, where an extra call is made to take up passengers. The average speed of 75½ m.p.h. is decidedly the fastest ever in Britain. Three other expresses are now allowed only 37 minutes for that run, averaging over 71 m.p.h.

The 72 m.p.h. Hitchin–Retford sprint by *The West Riding* and the 65–67 m.p.h. timings introduced last September remain in force, so that with numerous current

additions the E. and N.E. Regions present a unique total of mile-a-minute or faster start-to-stop schedules. Several of these journeys are on the G.E. Line. Not only is the two-hour Liverpool Street–Norwich best timing restored in both directions, on a more frequent, regular-interval basis, but two stops are made, at Colchester and Ipswich. The 50-minute allowance for the 51¾ miles down from London to Colchester, including a good deal of climbing, is indeed a striking innovation intended, of course, for diesel haulage.

Sharply timed semi-fast Norwich trains alternate with the expresses; fast connections are provided via Norwich to and from Yarmouth (Vauxhall), with through carriages for some journeys. Hourly Liverpool Street – Colchester – Clacton trains operate during the summer on a route intended for full electrification next year and, as elsewhere, there are many extra holiday services on Saturdays and busiest days.

I am sorry to see that the train names *East Anglian*, *Broadsman and Norfolkman* have been withdrawn.

The L.M.R. expresses to and from Euston continue to be allowed extra time to cover slowings or diversions due to electrification and modernisation work. Compared with last winter, however, Euston–Manchester, and Liverpool, principal trains including the *Lancastrian*, *Mancunian*, *Shamrock*, *Red Rose*, *Merseyside Express* and southbound *Comet*, have been accelerated in varying degrees up to a maximum of 25 minutes. The best Liverpool or Manchester to Euston services take 3 hours 40 minutes.

Type 2 diesel No. 5335 is seen speeding towards London with an express passenger train in this B.R. Eastern Region photograph.

WESTERN TIDINGS

The revised standardised London–Bristol, and West of England services as introduced last autumn are being continued, affording fast timing to and from more of the principal intermediate stations by means of additional stops. For instance, the down *Torbay Express*, featured on the *M.M.* cover this month, now calls at Reading, Westbury, Taunton, Newton Abbot, as well as at Exeter, Torquay and stations beyond on the branch to Kingswear (for Dartmouth by ferry). It also conveys through carriages detached at Newton Abbot for Plymouth–Penzance. The schedule in the up direction is similar. Although still a very good train it is not the quickest on the London–Devon, etc. route.

In the August 1960 *M.M.*, I described a fine run from Exeter to Paddington, then booked non-stop, when a mile-a-minute average was maintained, with a slightly early arrival, although we had been pulled up by signal on Wellington bank, Somerset. The locomotive was Warship diesel No. D820, *Grenville*, with "10-on."

The de-luxe diesel *Bristol Pullman* journeys provide fast travel to and from Bath Spa, where a new station entrance and booking offices, etc. have been under construction. Mr. B. C. Bending reports an afternoon run from Bath to Paddington, including a stop at Chippenham, in 98½ minutes, with arrival four and a half minutes early, after an easy finish. Going down the same morning on the *Bristolian*, non-stop to Bath, the overall time for almost 107 miles was only 95 minutes, five minutes under schedule. The 9-coach train was headed by No. D859, *Vanquisher*. An exciting Pullman trip of my own was described in these notes last January.

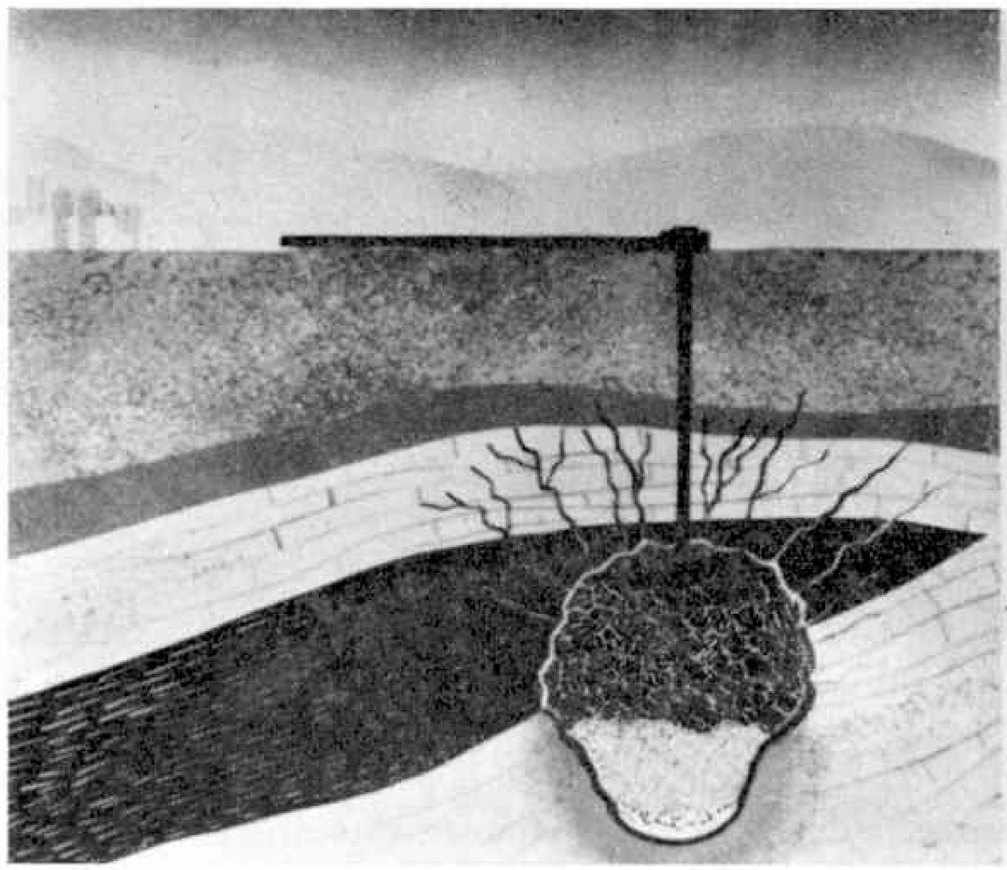
From logs I have received lately it is evident that when conditions are favourable, the King and Castle four-cylinder 4–6–0s still are often masters of the present loads and timings on the Paddington–Birmingham route to the north, where they have been familiar for many years. A double-chimney Castle, No. 5036, *Lyonshall Castle* on the *Cambrian Coast Express* with "11–on," 390 tons full, gained over two minutes from Paddington to the first stop, at Banbury, and was just about on time all the way on to Shrewsbury, recovering loss by repair slowings.

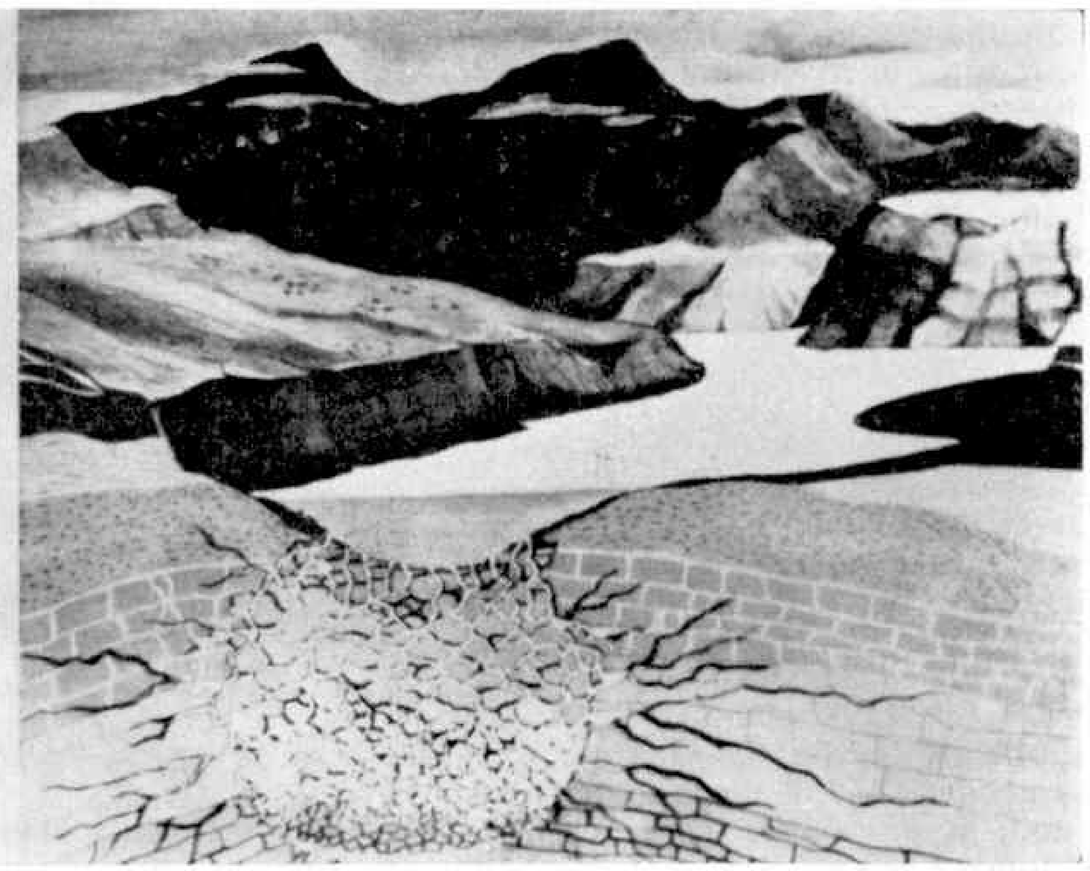
After reversal and reduction of load, No. 7803 *Barcote Manor*, in beautiful condition, did very well over the scenic, steeply-graded ex-Cambrian line towards Aberystwyth. This journey was recorded by Mr. Norman Harvey. The more powerful 4–6–0 No. 6026, *King John*, with "9-on", had an easier task on the 3.10 p.m. down, being allowed 98 minutes for the 87½ miles to first call, at Leamington Spa and attaining a maximum speed of 84 m.p.h. before Bicester.

It is expected that a considerably faster service south of Wolverhampton and Birmingham will be introduced next autumn, intended for operation by "Western" class 2,700 h.p. diesel-hydraulic locomotives. Those so far in service include Nos. D1002–3, respectively named *Western Explorer*, *Western Pioneer*. Nos. D860–3, respectively named *Victorious*, *Vigilant*, *Viking*, *Warrior*, are further additions to the B:B 2,200 h.p. series.

A new diesel locomotive depot is to be built at Cardiff on the site of Canton steam depot. It will play an important part in the scheme for replacing steam by diesel power, in South Wales.

This fine action shot, by M. W. Earley, shows W.R. No. 6838 "Goodmoor Grange" climbing a steep bank in South Devon with the Plymouth section of the up "Cornishman".





AN EXPLOSIVE WAY TO PROSPERITY?

IF it is possible to "make the world's deserts blossom like a rose", to locate and channel everywhere unlimited supplies of water for agricultural, domestic and industrial uses, to extract oil from rock and shale inexpensively in oil-short countries, is it conceivable that these mighty tasks should be made possible by using just one type of explosive power? According to the U.S. Atomic Energy Commision, the answer is a virtually unqualified "Yes"—by using carefully devised and controlled underground atomic explosions.

To investigate the possibilities, the commission has initiated a scheme of research work which has been named "Project Ploughshare", appropriately so since it envisages the peaceful use of nuclear energy as a tool to unlock the earth's wealth for man's benefit, truly the only worthwhile use for the awesome power of atomic and hydrogen bombs!

By
JOHN DRUMMOND

In a world which is already suffering the effects of water shortages, the possibility that underground atomic explosions may open up new courses for underground rivers, as well as freeing water from hidden underground reservoirs, is something which clearly promises to solve problems in every region, agricultural and industrial, at present having inadequate water supplies. For instance, by this means irrigation schemes for desert and arid lands could be put in hand at a fraction of present-day costs.

Yet, this is but one of the exciting possibilities which scientists working on this project believe will be made possible by controlled nuclear explosions. Such explosions could be used, they say, to unearth valuable stores of minerals and ores, either by deep underground explosions to aid mining operations, or by blasting off the earth cover. The significant factor in such operations is that the cost would merely be one-tenth of the expense normally involved by using TNT.

What a boon to countries possessing minerals and ores which hitherto have not been economically worth working!

Possibly the most interesting and significant prospect is that of extracting oil from rock and shale. This would be achieved by the use of nuclear explosives to fracture large masses of oil-bearing shale and so enable the oil to be released by conventional pumping methods.

Perceive what this would mean to countries who have insufficient oil for their requirements. Engineers say that there is enough oil underground to meet all requirements for centuries—if we can tap it. But vast quantities lie in shale and rock, much of it in countries lacking oil. How the economy of such countries would prosper if methods involving atomic blasting were able to recover this oil inexpensively.

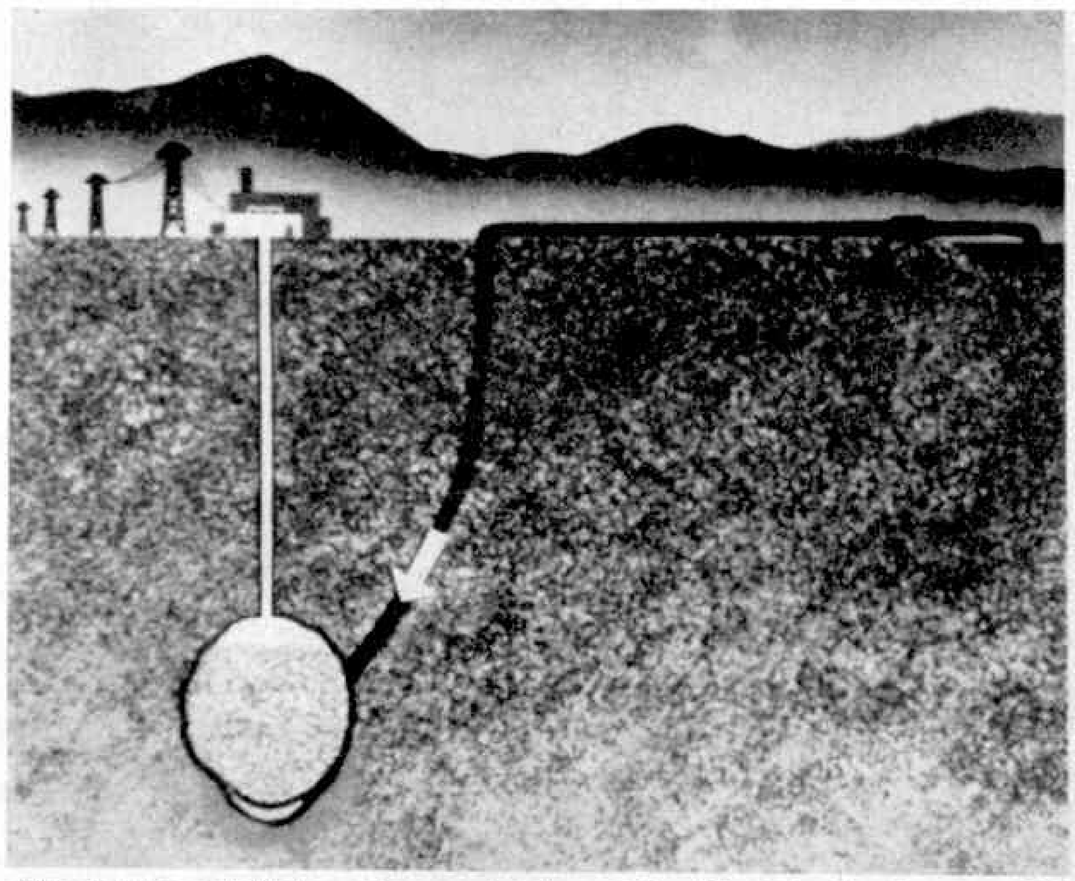
Similarly, it is believed that the economic exploitation of oil in existing regions of tar and sand, the best known example of which is the Athabasca tar sands in Alberta (Canada), could be achieved by using controlled underground nuclear explosives.

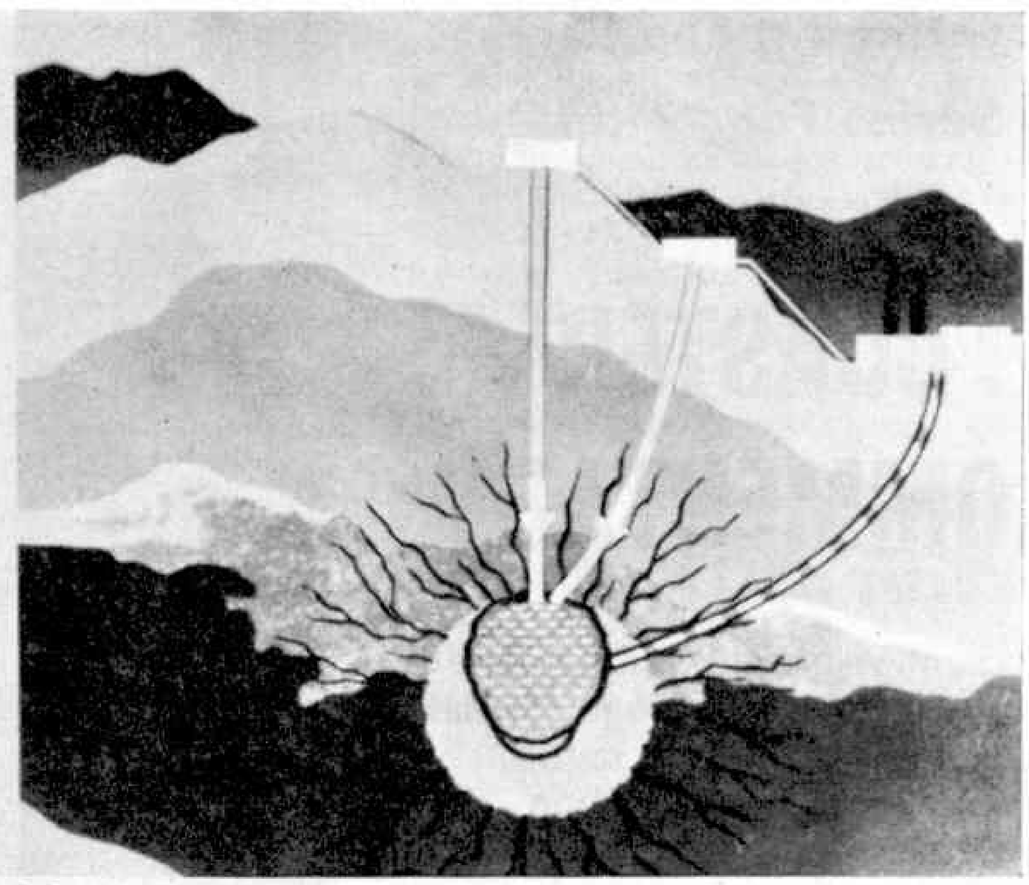
Then there is the possiblity of being able to store up the heat of nuclear explosions deep underground and to use it, just as volcanic heat is used in some parts of the world, to produce power. The research scientists concerned estimate that a blast 3,000 feet underground in a suitable geological rock formation would produce about 8,000 million kilowatts of electrical power, at a cost considerably less than one penny per kilowatt.

They visualise harnessing the stored-up heat, either to make electric power or for industrial needs, by using some kind of "transfer agent", as, for instance, nitrogen carbon dioxide or water.

If such a technique can be perfected, the experts claim, then it would clearly be possible to manufacture vast quantities of radioisotopes at a fraction of present costs. The beneficial results of having adequate supplies of radioisotopes would soon be observed in medicine, industry and agriculture. In other words, higher health

Top illustration (left): How an underground nuclear explosion is used for the recovery of thick oils and tars deep in sand and shale beds which cannot be mined economically by conventional methods. (Right): An atomic water control method involving the use of a nuclear explosion to dig a reservoir for storage of excess river water. This storage device would eliminate overflow and the resultant erosion as well as crop damage caused by floods.





The drawing at left shows the completely contained blast that has been set off far below the earth's surface. The blast is utilised by piping water (arrowed) into the mass of crushed rock where the tremendous nuclear heat turns the water into steam. This is then piped to an overhead electric generating plant which you see represented in the illustration. Right: How an underground nuclear explosion could be used for the recovery of ore. Two pipes (the vertical shaft and that on the immediate right) would carry solvent material to the explosion area. The ore, dissolved by the solvent, would then be piped (shaft shown extreme right) to an overhead processing plant. Similar procedures could be used for mining a wide variety of minerals.

standards and increases in industrial and agricultural efficiency and productivity would inevitably follow.

A further potential use for controlled nuclear explosions would be the excavating and deepening of harbours, canals, and rivers, and the removal of obstacles—such as falls and rapids—which at present hamper development in many regions through lack of adequate means of transport. Such engineering feats would improve communications on land and sea, thereby opening up vast areas of the world to trade and development.

Are these schemes mere fantasies in the minds of over-optimistic research scientists? Are they possible? What about radiation risks?

Experimental subterranean atomic explosions already carried out prove that such schemes are possible and with negligible radiation risks. For instance, when the "Rainer" project was carried out in the United States, in 1957, energy equivalent to 1,700 tons of T.N.T was released in a chamber constructed deep underground, and all but a negligible proportion of radioactivity was trapped in melted rocks.

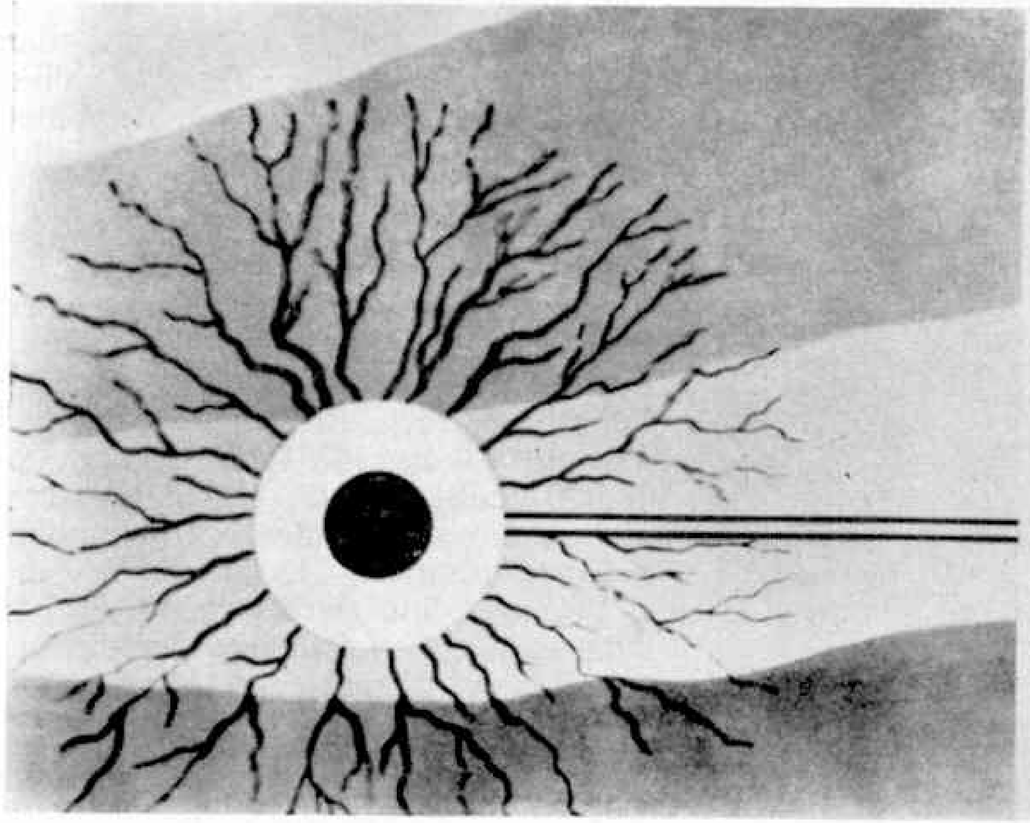
In view of the enormous power involved, this is truly remarkable. Proof of this power was given in a scientific paper presented at a meeting at Dallas later that year. In this paper it was stated that the explosion was strong enough to (a) vaporise the rock for the first three feet from the blast chamber, (b) melt the rock out to a distance of 15 feet, and (c) crush the rock out further to a distance of 130 feet from the explosion centre.

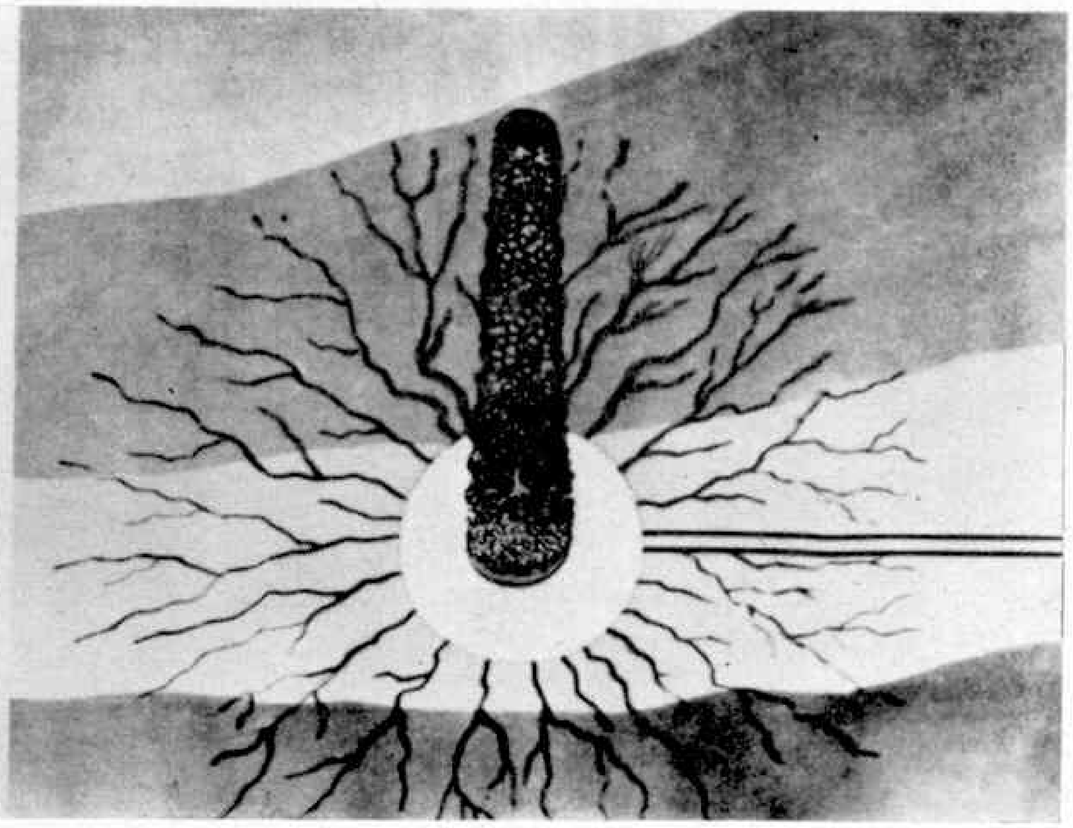
It is admitted, however, that there are still many complex problems to solve before all the engineering feats mentioned here can be achieved—problems demanding continuing intensive research. Much remains to be learned about underground explosions, whatever form of power is used.

Of such problems, outstanding and of first importance is that involving the development of absolute safeguards to ensure that radiation does not enter the atmosphere when nuclear energy is being used.

Because the potential benefits are so great, it is clearly necessary that the peaceful uses of nuclear energy, as envisaged in "Project Ploughshare", should be subject to international agreement and to adequate international control and supervision—a point of policy which the U.S. Government has already initiated.

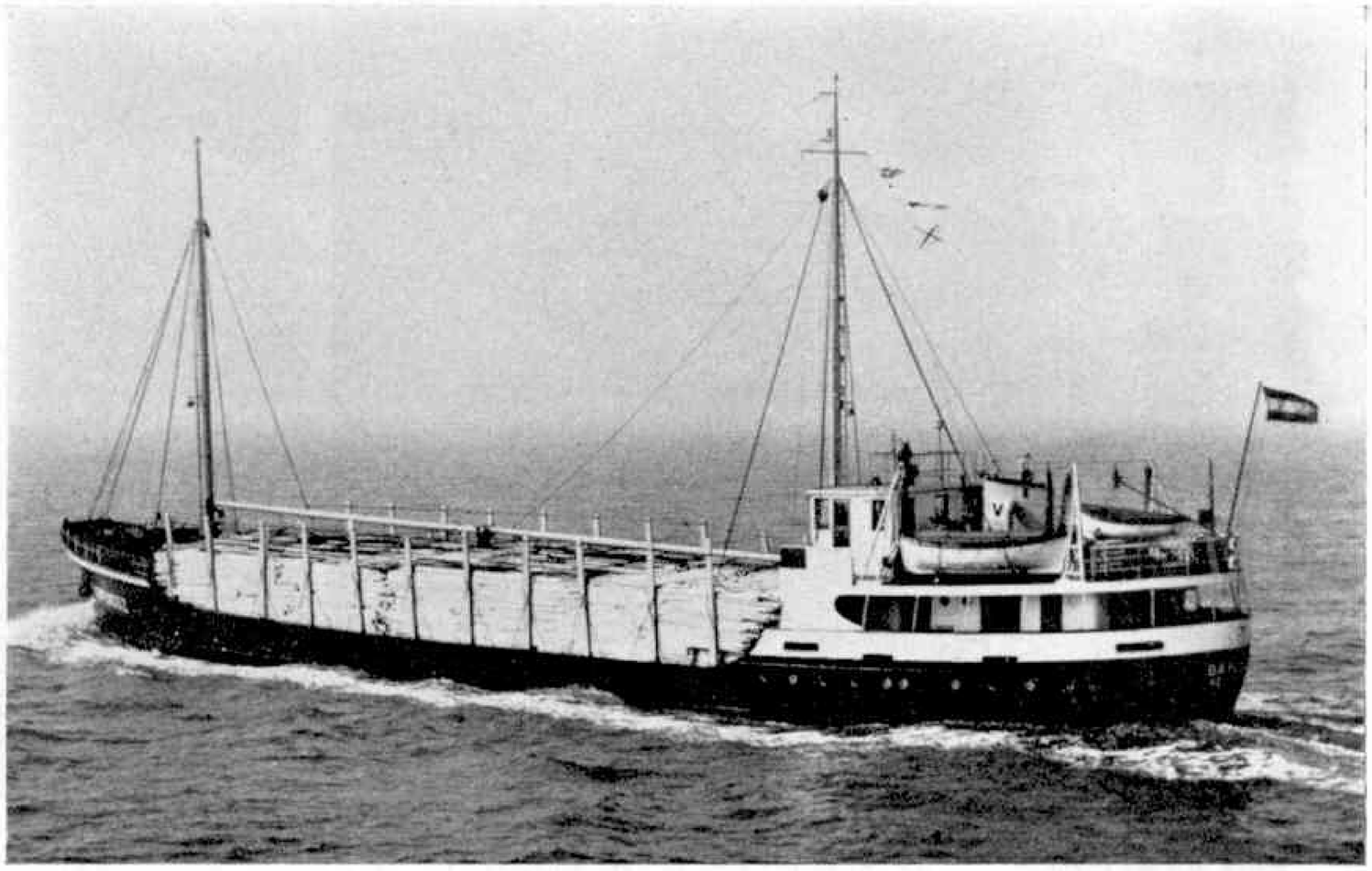
How an atomic explosive is placed under a mountain at the end of a tunnel dug into the mountainside (illustration at left). The black centre represents a hollowed-out explosion chamber surrounded by a spherical cavity, or bubble formed by rock that is vaporised and melted by the explosion's intense heat. The illustration at right shows what happens after the bubble of molten rock cools. Rock rubble, loosened by the underground blast, causes the roof of the bubble to cave in and fills the cavity.





Continuing The Latest Series For "M.M." Readers . . .

COASTER COMMENTARY



This picture of the 500-ton "Barendsz", which bears a name famous in Dutch maritime history, was taken by F. G. Sherlock of Warsash, Hants.

IN recent years, shipping generally has been struggling against hard times, and the coaster section has been no exception. Some shipowners have gone out of business altogether and others, in an attempt to alleviate difficulties and to carry on trading, have depleted their fleets by selling their older, and uneconomic, vessels.

Many ships have gone to the scrapyard but a few old-timers are still trading and they will be readily recognised by their vertical stem, counter stern, tall narrow smoke stack and general absence of streamlining.

You will have guessed that this type of funnel belongs to coal-fired ships, whereas on modern motor ships it is sometimes difficult to see even a small exhaust pipe which, after all, is all that is necessary. Most modern funnels are false in that they are merely casings through which the pipes pass, but they also contain such things as water tanks, clothes drying room, stores, etc. The funnel continues to exist as a façade presumably because, like a house, a ship looks rather odd without a chimney!

By ROBERT GORE

Since the 1930's, the Dutch coasting fleet has grown and with it has come increased efficiency by the adoption of the diesel engine. Other improvements have gone hand in hand and it is fair to say that the design of British coasters (and those of other nationalities) has been influenced by the Dutch vessels which trade extensively with our ports. Nevertheless, British, Scandinavian, German, French, Spanish, and other coasters have still retained a degree of individuality in their appearance, but one type which is little changed is the British coastal collier.

In the May issue of the "*M.M.*" there was a picture of the 350-ton *Lireco* which had one mast mounted between two hatches. The top illustration this month is of a slightly larger vessel, the *Barendsz*, also having two hatches, but served by two 3-ton derricks fitted to masts positioned against the forecastle at one end and the front of the superstructure at the other, so leaving a clear space between. In addition to having a full hold, this enables a deck cargo to be carried; you see timber piled high above the gunwales.

Timber is often stowed in this manner and although the *Barendsz* is of well-deck construction, viewed in poor visibility, or at a distance, she could give the illusion of being a flush-decker.

This ship was built in Holland some eight years ago and is propelled by a 4-stroke, 8-cylinder engine giving a service speed of 10 knots. For the technically minded here are a few more particulars: Length 183 feet, breadth 29 feet 8 inches, draught 11 feet 8½ inches, cargo space 38,000 cubic feet. Navigational aids include direction-finder, echo-sounder and radio-telephone.

You will find timber being discharged from coasters at the large docks, such as the Surrey Commercial Docks on the Thames and at the smaller ones like Boston, King's Lynn or Ramsgate, to mention just a few.

"M.M." reader Arthur T. Day of Ashton Vale, Bristol, sends this picture of the m.v. "Raket" of Groningen, Holland, leaving Bristol for Swansea after unloading a cargo of cases of condensed milk brought from Londonderry. Mr. Day writes, "Although the Avon Gorge is thickly wooded just here, the photograph was taken only a few hundred yards from the built-up border of the city of Bristol".

Atlantean Bus, ABC Control Room—And More Exciting Models From France

THERE is so much good news for Dinky Toys collectors this month that I scarcely know where to start these notes. Two fine new British models are available and in addition we are pleased to announce that twelve models made by Meccano (France) Ltd., at their factory at Bobigny, near Paris, are being made available in this country in addition to French models already on sale here. Of these models, several are illustrated in these pages and all are illustrated in the special advertising section elsewhere in this month's *M.M.*

An announcement that will bring special delight to the endless thousands of Dinky Toys collectors who are interested in all forms of road transport is that we have put on to the market a miniature of that very fine vehicle the Leyland Atlantean Bus, which you see illustrated in the scene below. The second British model to be made available this month is one which will bring a feeling of elation to those who study the ramifications and the growing importance of television. It is a Mobile Control Room in ABC colours, and this also is illustrated.

Turning first to the Atlantean, some interesting figures have been provided for me by Leyland Motors Ltd. about this distinctive vehicle, one version of which—"The Gay Hostess"—was referred to in May by the Editor in his monthly chat.

To many of us who live and work in the North the Atlantean is very much part of the everyday scene. Liverpool will have a fleet of over 200; Wirralians see them on various routes in Wallasey in the neat sea green and pale yellow livery of that

DINKY TOYS NEWS

By The Toyman

Corporation; they are mobile in Maidstone, distinctive in Devon and conspicuous in Cardiff. If further alliteration may be permitted I should add that there is also a galaxy in Glasgow.

Figures available at the time these notes were written show that the Maidstone and District Motor Services operate 143 Atlanteans and Devon General 56; the West and Welsh Omnibus Company Ltd., Cardiff have 66 and Glasgow has a fleet of 151. One hundred and five Atlanteans are operated by the Potteries Motor Traction Company, Ltd.; there are 77 in

In this Bus Depot scene Atlantean Buses are lined up in front of the main building. The picture shows the minute detail of the models and the transfers are clearly shown on the bus which is just pulling out into the roadway. Notice that the garage is the Service Station (Dinky Toys No. 785) which has been provided with a suitable "Bus Depot" sign.

Newcastle-on-Tyne; the Northern General Transport Company, who are North-Eastern operators, have 87, and the Ribble Motor Services, whose operations are countrywide, run 171 of these popular vehicles. So you will realise that, in producing this model, we have put on to the market one that is seen throughout the country and which can be used with great advantage on any Dinky Toys Layout.

The actual Atlantean has 78 seats and is a low-floor, double-deck, rear-engined bus. It is about 30 feet long and 8 feet wide with an overall height of 14 feet 4 inches when unladen. One of its most attractive features is the folding entrance–exit door placed at the front, which is power-operated. Motive power for this vehicle comes from a Leyland diesel engine which develops 125 brake horse power at 1,800 r.p.m.

The riding qualities are excellent and the fitting of the engine at the rear means that noise is virtually eliminated from the top saloon and greatly reduced on the lower deck. The vehicle has an epicyclic gear box and a centrifugal clutch giving two-pedal control, with air brakes, and the Ribble Company state in their staff bulletin that it has been voted the "easiest-to-drive" vehicle they have ever had in their fleet.

The Dinky Toys model based on the Atlantean is $4\frac{3}{4}$ inches long, $1\frac{1}{4}$ inches wide and $2\frac{9}{32}$ inches high, with a wheelbase of $2\frac{9}{16}$ inches. It is equipped with windows, seats, steering wheel and driver, and is finished in a striking colour scheme of red and cream. It carries an advertising sign for "Regent" along each side and on the bottom panel on either side is a "Corporation Transport" emblem. I am sure that this new bus, based on a prototype which is already famous, will prove an extremely popular addition to Dinky Toys layouts.

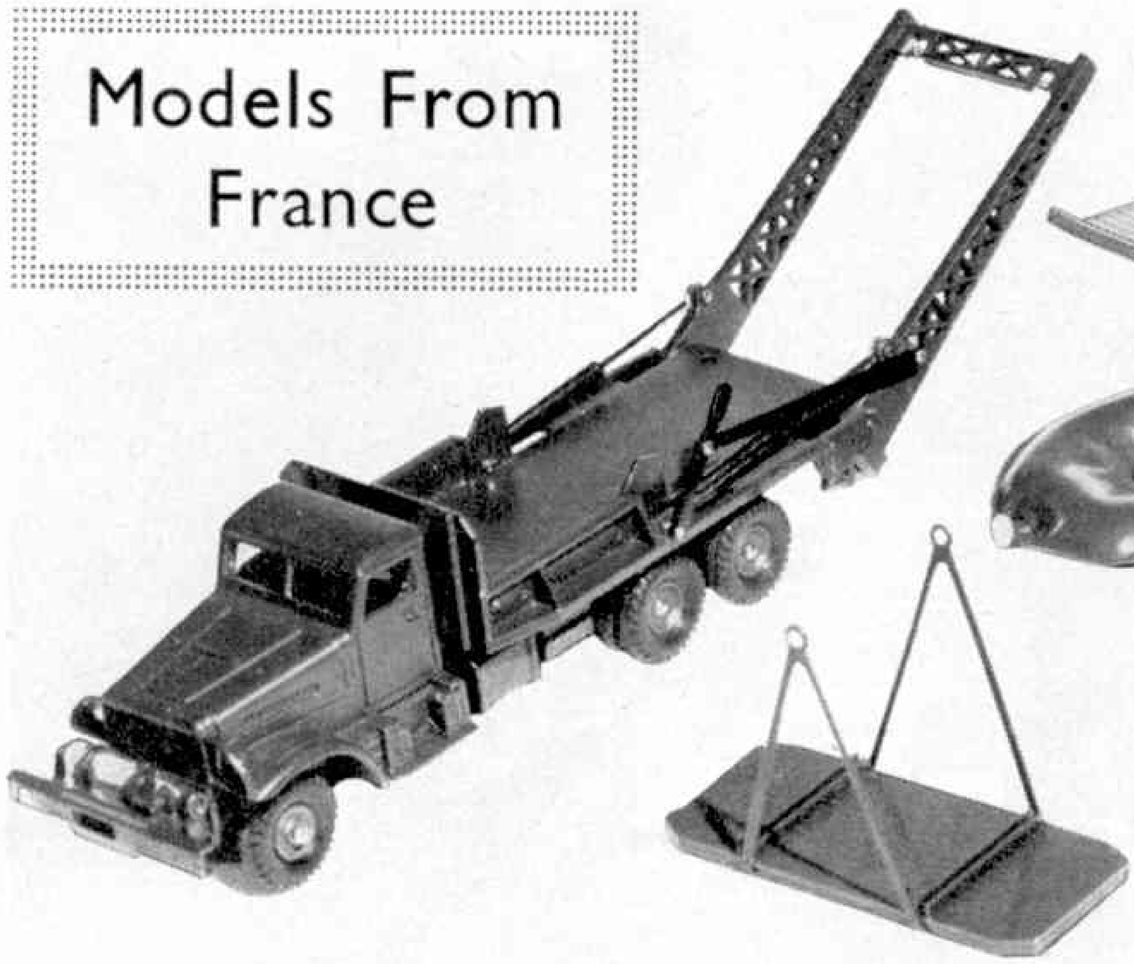
A close-up of the new ABC Television Van showing the television cameraman at work.

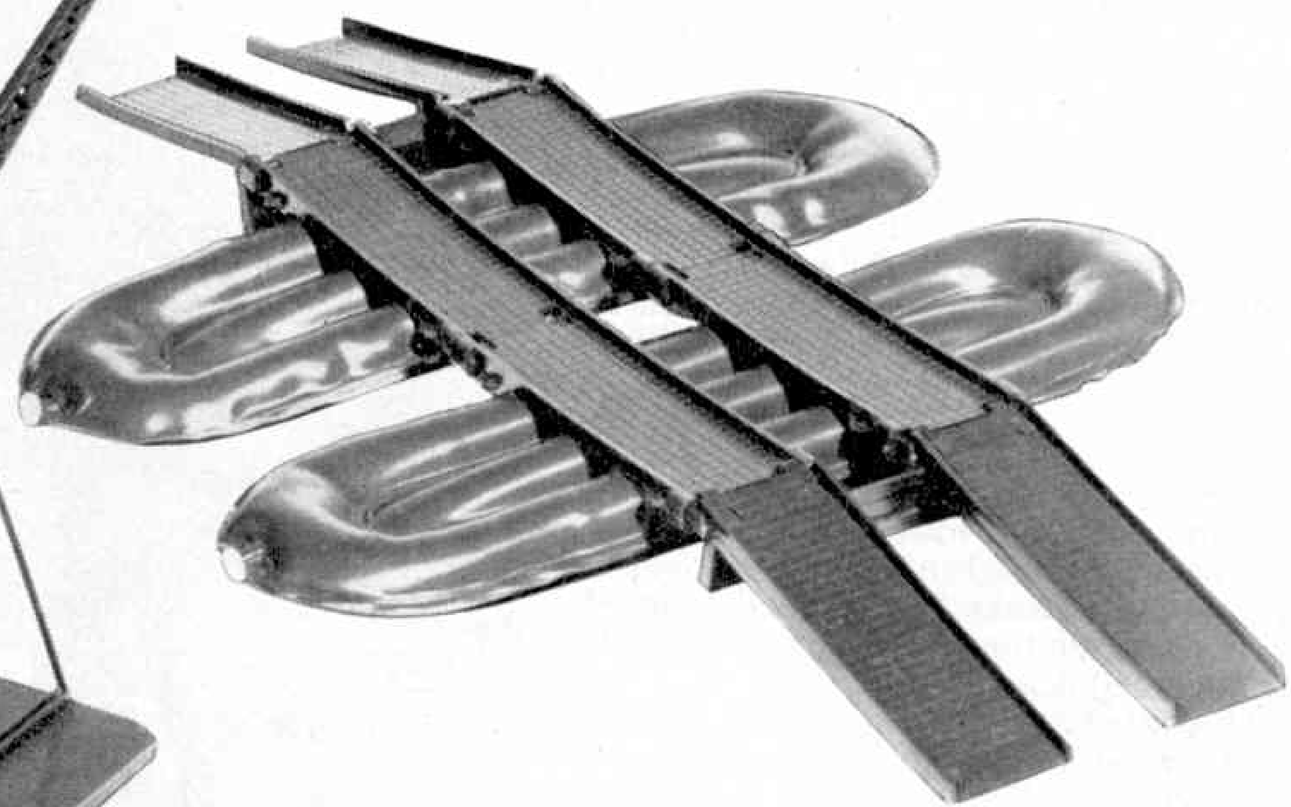
Now let us turn to the ABC T.V. Control Room which is the sister model to the ABC Transmitter Van released in May. In real life, these two vehicles provide coverage for outside events such as races, football matches, motor cycle scrambling, track events, etc., although, of course, more than one camera may well be used.

Our model of the Control Room, which is No. 987 in the Dinky Supertoys list, is $5\frac{5}{16}$ inches in length and $1\frac{3}{4}$ inches wide, with an overall height of $2\frac{11}{16}$ inches. The wheelbase is $3\frac{1}{4}$ inches. The vehicle is finished in the correct ABC colours which are gay and attractive. The lower part is grey and the upper part light blue, with a red stripe running the length of each side and across the back, making an effective division between the two other colours. The roof is meticulously detailed and is silver in colour. A further touch of realism is added by the ABC insignia on either side of the van in royal blue, red, white and yellow, with appropriate

In this reconstruction of a scene from the Army Trials, an Army Covered Wagon (Dinky Toys No. 623) is climbing a hill while the television camera covers its progress. In the top left-hand corner is the Transmitter Van.

Models From France





The various units which make up the Brockway Military Truck are clearly shown in this picture which reveals the method of bridging by means of pontoons.

The Brockway Military Truck "tidied up" and ready to proceed to another point where its specialised services are required.

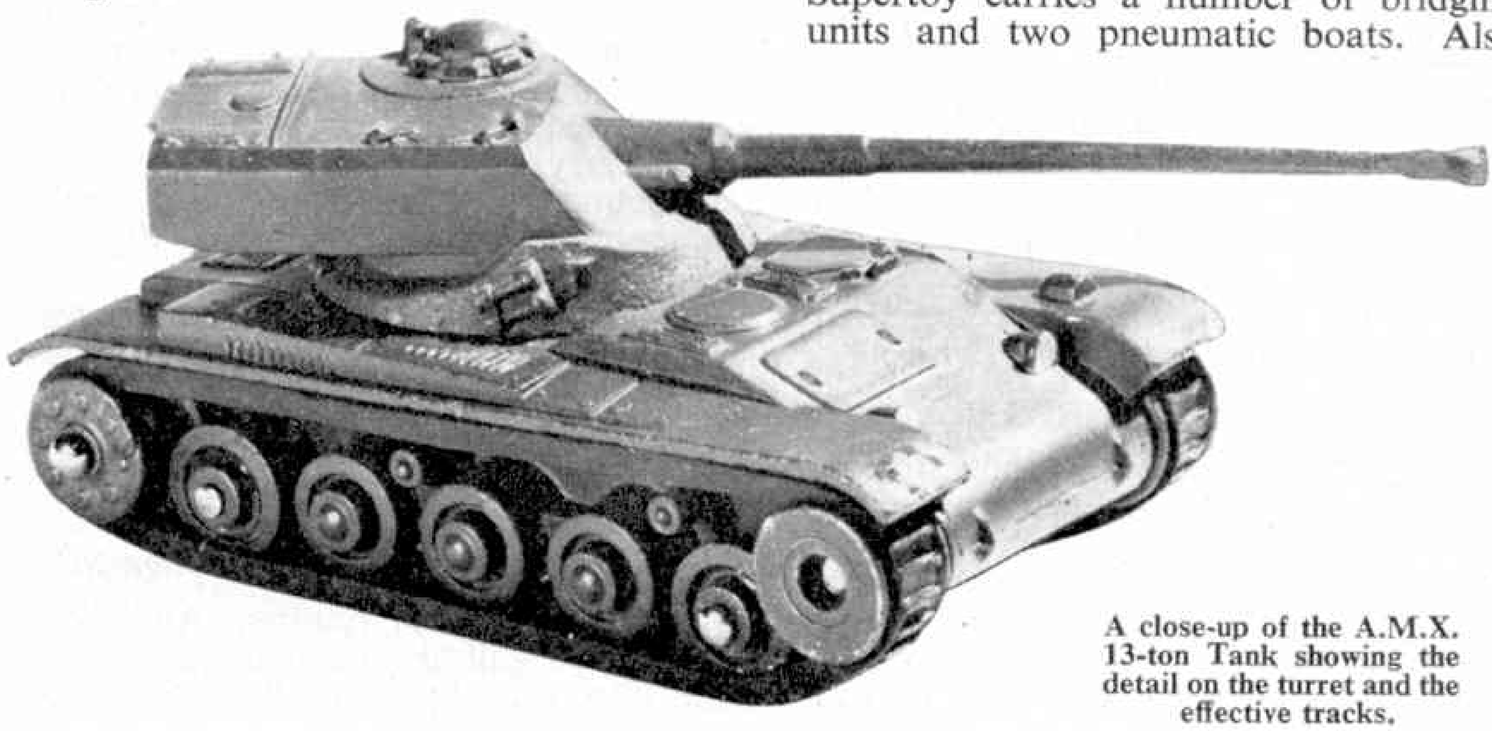
lettering on either side, across the front and on "roof boards." The windows of the driver's cab are clear glazed and those in the body of the vehicle are opaque.

That deals with the model itself, but there is a wonderful little extra which gives a great deal of added appeal to this Supertoy. What is it? Nothing less than a television camera and its operator. The camera, which stands firmly on a tricorn base, is very finely detailed and, as in the case of the vehicle itself, has the lettering "ABC T.V." on each side. The grey-suited cameraman is equipped with earphones and is moulded in camera-operating stance so that, when placed behind the camera, he appears to be shooting a scene in most realistic fashion. Finally, the camera is connected to the control unit by plastic cabling, as can be seen in the illustrations on the previous page. The connections stand out quite effectively, as you can see, even against the background of the lower picture which represents a scene from the Army Trials.

No doubt the majority of readers have seen these trials on television but, for the benefit of those who have not, I should explain that a course is laid out over rough and difficult terrain which incorporates a very stiff section and often has a stream crossing it. Points are awarded on a timing system which is of a somewhat complicated nature. The trials take place not only between different Army groups but also between the three Services, as well as civilian clubs, and the vehicles used range from small jeeps to 10-ton wagons.

And now I want to draw your attention to the new models from France to which I referred at the start of this article. The twelve models concerned will all be coming over from Paris and their descriptions and numbers are: No. 884 Brockway Military Truck with Pontoon Bridge; No. 555 Ford Thunderbird; No. 817 A.M.X. 13-ton Tank; No. 550 Chrysler Saratoga; No. 815 Panhard Armoured Car; No. 822 Half-Track M3; No.563 Renault Pick-Up; No. 553 Peugeot; No. 535 2C.V. Citroen; No. 894 Car Transporter; No. 561 Citroen Delivery Van and No. 518 Renault.

Several of these are illustrated in this month's notes and I will give you a brief description of those pictured here. First let us deal with the Brockway Military Truck, which is a bridging unit for use with land forces. This is a six-wheel vehicle and the real one has a winch at the front, a crew of three and carries two boats or pontoons across which bridging units may be laid. Each pontoon will support a weight of eighteen tons and can be inflated in ten minutes. The Dinky Supertoy carries a number of bridging units and two pneumatic boats. Also



A close-up of the A.M.X. 13-ton Tank showing the detail on the turret and the effective tracks.

How important scenery can be on a road layout is shown in this studio picture. Winding road runs through the rural part of the Continent. Five Dinky Toys complete the picture, four of them from France. They are the Renault Pick-Up, the Peugeot, the Ford Thunderbird and the Chrysler Saratoga.

provided is a picture which, when used in conjunction with the toy itself, represents the crossing of a river. The miniature pontoons are fitted with a valve which stops the air from escaping. They can be deflated by pushing in the valve with a matchstick.

No. 817 A.M.X. 13-ton Tank is another French vehicle which will attract a large number of collectors. The actual vehicle is constructed at a town near Paris and it is a light tank used in the aid of forward troops. The Dinky Toys vehicle is fitted with a realistic track and the turret pivots through 360 degrees.

Illustrated in the country scene on this page are four more models from Paris with an English Dinky Toy (at the top of the picture) keeping to the right because, of course, it is being driven on a Continental road. The French Dinky Toys concerned are the Renault Pick-Up (left centre) and the Peugeot (right centre), while at the foot of the picture are the Ford Thunderbird (left) and the Chrysler Saratoga (right). The prototype Thunderbird is powered by a special V8 engine of 300 horse power. With passengers it weighs two tons, but automatic transmission and power-assisted steering make it easy to handle.

The Dinky Toys model is the convertible, with driver, and is a faithful reproduction of this fascinating car. Detail includes a neatly-suited driver, steering wheel, dashboard and seating with imitation upholstery. The model, which is finished in a neat red, with blue interior, has springing and steering. Similarly fitted with "fingertip" steering and wheel springing the Chrysler Saratoga is finished in a striking shade of lilac with the hood outlined in black and with a bright red interior. Typically American in design and in its bright colouring it boasts the prominent rear fins of its type and gives a look of power which is imparted to the actual car by a V8 engine.

Air News—(*Continued from page 271*)

engines. The first 100 h.p. Airtourer 100 (VH–MVA) flew on December 12, 1961, and has proved highly successful. It is fully aerobatic, with a top speed of 133 m.p.h. and a range of 800 miles at 126 m.p.h. Fuel consumption is nearly 30 miles to the gallon, which is better than that of some family cars.

FERRY FIGURES

Judging from last year's results, the air ferry Superfreighters operated by Silver City Airways and its French associate, Compagnie Air Transport, should carry more than 100,000 cars over the Channel this year. Figures just issued show that the two companies ferried 96,272 cars in the twelve months up to the end of March 1962, compared with 87,466 in the same period of 1960–61. Of this total, about 16,888 were export cars, going to overseas buyers, an increase of 4,346 over the previous year.

Between them, the Superfreighters of S.C.A. and C.A.T. made 43,064 cross-Channel flights. About 73,300 of the cars were carried on the short routes between Lydd (Ferryfield) Airport and Calais and Le Touquet, in France. Another 14,482 flew between Hurn (Bournemouth), the Channel Islands and Cherbourg. The number of passengers carried on all routes rose to a record 238,748, but the number of bicycles went down by six per cent.

There's a Boom in Boomerangs—

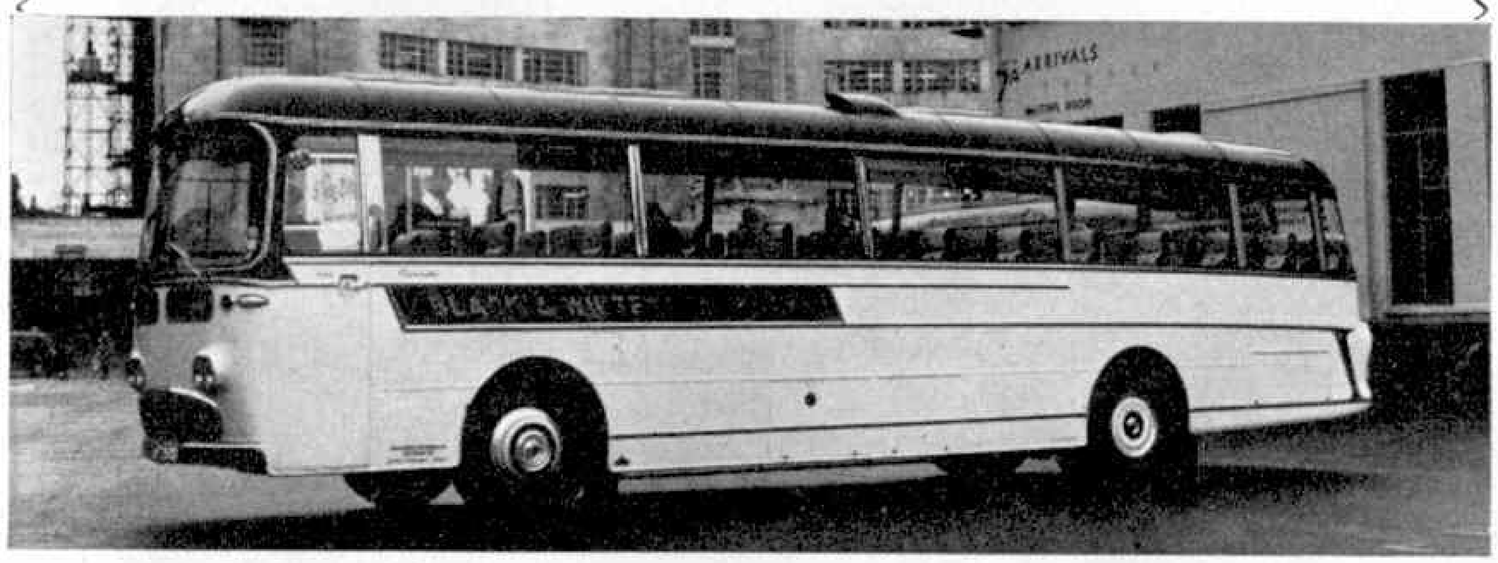
(*Continued from page 263*)

air, then circles and returns. And dive throws—the gull-like boomerang curvets high into the sky, side-slips down to within a few inches of the ground, then planes up into the thrower's hand."

An English soldier, Colonel L. Peyton, told of a thrilling experience he had while boomerang throwing in the darkness. The point of each weapon was held in a flame by an aborigine until it was red, then the boomerang was hurled. Its course was traced by flying sparks. Colonel Peyton picked up one which landed at his feet and kept it as a souvenir of the exhibition. He examined and measured it carefully. This boomerang is shaped as a curve and measures round the outside 2 feet 4 inches, having a breadth of $2\frac{1}{4}$ inches in the centre. It tapers to 1 inch or $1\frac{1}{4}$ inches at the rounded points. The thickness of wood in the centre is between $\frac{3}{8}$ and $\frac{7}{16}$ inch, and the diameter of curve measures, to the inside edge, $3\frac{1}{4}$ inches.

Some boomerangs measure as much as three feet around the outside, and the angle between the arms varies from 90 to 120 degrees. The shape closely resembles the swept-back wings of a jet aircraft.

Calling All Bus Spotters



David Kaye Takes You On The 8th. British Coach Rally

"Yes, we turn left on to the B2042."

"Take her up to 35 for this stretch!"

"We have 50 seconds to cover about a half."

SUCH was the kind of intercom jargon between the two navigators and Driver G. Bone in charge of entry No. 1 in the eighth British Coach Rally on the morning of Saturday, May 5, as Bedford 8260 CD, with its comfortable new Duple 41-seat body, belonging to Camping Luxury Coaches of Brighton, sped on its way from London's Victoria Coach Station to its home town, passing en route through the most unusual places.

The 100-mile set route started with a congested central area around the Old Kent Road with a check point at Kidbrooke. Over this initial section speed was limited to a strict average of 20 m.p.h. We never saw this checkpoint—the police had moved it on before our arrival!

The Cheltenham Queen, shown above, was the first of the 36-foot long by 8 foot 2½ in. wide coaches operating from Victoria Coach Station, London. It is a 47-seater and is one of the new underfloor-engined Leyland Leopard coaches now being run between London and Cheltenham by Black and White Motorways of Cheltenham. The coach is seen leaving Victoria Coach Station, London. Bodywork for this vehicle is by Plaxtons of Scarborough.

Then came wide, arterial roads like Rochester Way, but these were soon succeeded by tortuous Kent lanes leading to Meopham, Wrotham and Igtham. Our driver was showing his considerable skill as we drove through congested Edenbridge, but we were forced to follow a driving school car in the next lane for three miles! Occasionally we mistook a turning, such as when we surprised the officials at Felbridge Refreshment Stop by approaching it in the opposite direction to that expected.

The 50 entries had begun to leave Victoria, at two-minute intervals, at nine a.m. and in the course of our half hour's pause at Felbridge I noted the order of arrivals there was: Entry Nos. 2, 1, 6, 3, 5, 9, 4, 12 and 10. Everybody had a look at No. 6—a 36-foot A.E.C. "Reliance" belonging to Sheffield United Tours (330 BWB). Its body by Plaxtons included a kitchen unit at the rear.

* * * *

The second stage of the drive took us through the Sussex countryside and included a sprint up the 700-foot Devil's Dyke in driving rain. This particular achievement concluded a twelve-mile "regularity" time check, which had begun near Hurstpierpoint to ensure that we travelled at exactly 28 m.p.h., a speed which seems very slow indeed when you are seated comfortably in a modern vehicle.

In the afternoon the eliminating driving tests began, and the sprinkling of 36-footers found these difficult. Although the gate in the "park it neatly" section was extended for their benefit, they appeared to get no concessions in the "Wiggle-Waggle" obstacle course. Still, the crowd—watching from the protection of Madeira Drive archways—were most sympathetic to the drivers concerned as they struggled outside in a thick drizzle. Under such conditions Driver Mervyn Pulford, driving 5693 ML—a small luxury Bedford—was not surprisingly the winner of the "Coach Driver of the Year" trophy.

As in 1961 an A.E.C. "Reliance" produced the overall winner in 777 FOH, a Plaxton-bodied coach belonging to Flights Tours of Birmingham. The third main award, that for the *Concours d' Elegance* went this year to the Sheffield United Tours A.E.C. mentioned above.

There were fewer entries this year than last, and there was no sign of foreign competitors or of double-deck buses. Some hitherto staunch supporters did not enter this year, and I sincerely hope that this does not indicate a gradual decline of interest in this important event.

* * * *

M.M. readers will recall that in the May edition of the *Meccano Magazine* we mentioned the extended play record *Sounds of Sheffield Tramways*, the price of which was stated to be 12/8½d. (post free). Owing to the Purchase Tax changes the price of this record is now 12/– with 1/6d. postage, a total of 13/6d. It can be obtained from Davies Transcription Service, 20 Endcliffe Rise Road, Sheffield 11.

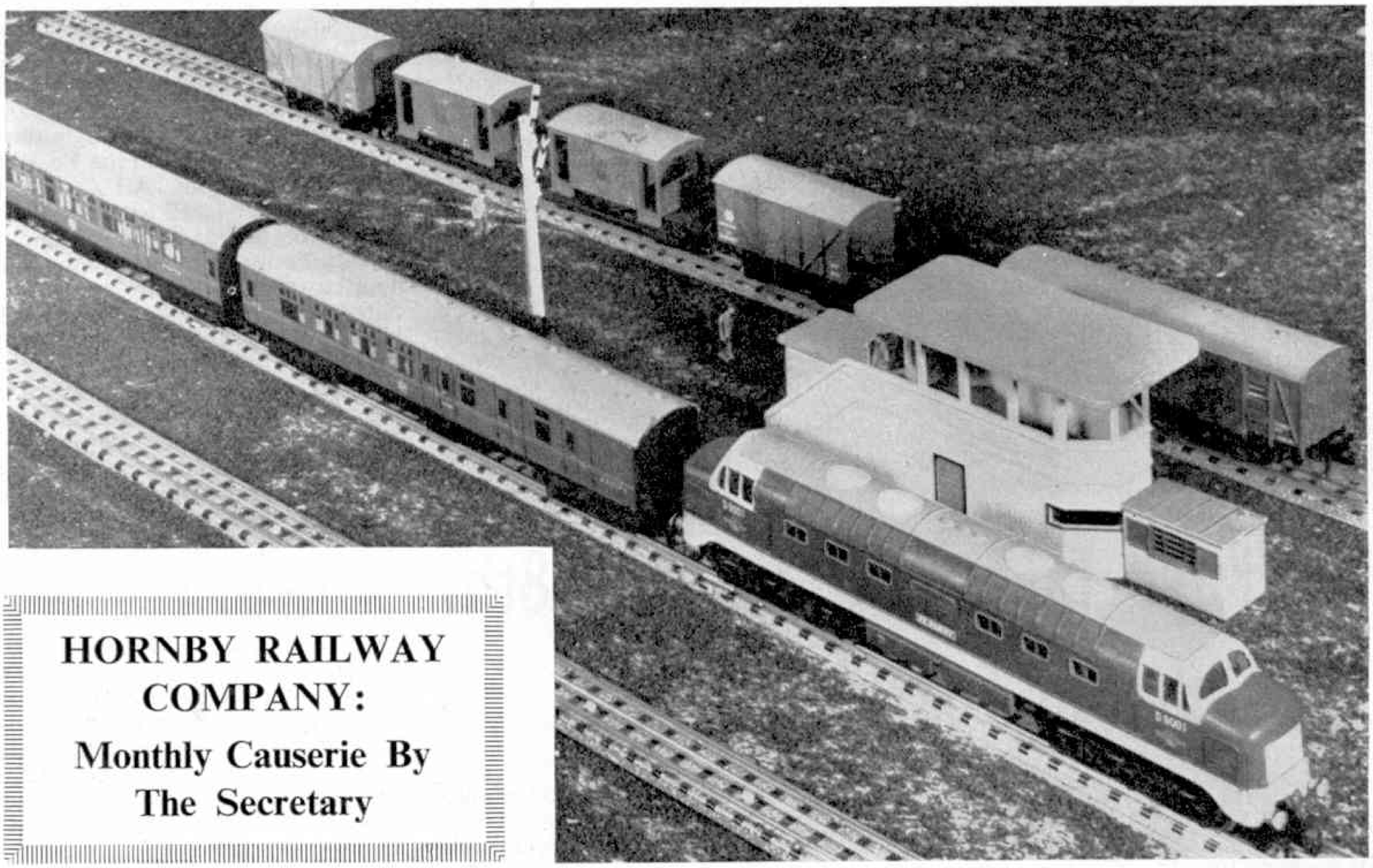
A CONTEST FOR TRAIN SPOTTERS

Western Region of British Railways offer a free trip in the driving cab of a diesel-hydraulic locomotive, at the head of an express train, to three spotters who will put pen to paper to help decide in what colour certain locomotives should be painted.

Now in service on the Western Region are the first of the new, powerful 2,700 h.p. Type 4 diesel-hydraulic locomotives, but they are in trial colours. The shade of *Western Enterprise* (D1000) is "desert sand"; *Western Pathfinder* (D1001) is painted maroon and *Western Explorer* (D1002) green. *Western Pioneer* (D1003) and *Western Crusader* (D1004) are also in green. The locomotives can be seen on trains serving Paddington, Reading, Didcot, Bristol, Plymouth and Penzance.

Western Region now ask locomotive spotters and the more senior railway enthusiasts to write to say *where they saw the locomotives* and *whether they prefer desert sand, maroon or green as the colour to be officially chosen for this class.*

Letters should be sent to the Public Relations and Publicity Officer, Paddington Station, London W.2 to reach him by not later than Monday, July 16. All letters will be placed in a bag, in T.V. "Pencil & Paper" fashion, and the senders of the first three entries drawn out which correctly state where the locomotives have been seen will be offered a ride on a diesel-hydraulic locomotive, with free travel from their home town station to a chosen point and back.



HORNBY RAILWAY COMPANY:

Monthly Causerie By The Secretary

Introducing "St. Paddy" And "Crepello"

THIS month I have to record an event which I know has been eagerly anticipated by many Hornby-Dublo owners, namely the production of the Hornby-Dublo Co–Co Deltic Diesel Locomotive in the colour scheme that is representative of the style and finish now used on the real Type 5 Deltic diesels. In the March *M.M.* of this year, you had a pre-view of this model in a picture showing an advance sample being examined by Lord Brabazon at the Meccano Trade Fair. Now, in our pictures here, you can see, at close quarters as it were, what the production job looks like. I am sure you will agree that the general effect of the Locomotive in its new finish is very fine indeed.

The Hornby-Dublo Co–Co Diesel has always been an effective and powerful locomotive, and I need hardly remind you of the weight-hauling demonstrations that have been carried out with it showing the remarkable efficiency of the Ring Field Motor with which it is fitted. In its latest form, as No. 3234 Deltic Co–Co Diesel-Electric Locomotive, for Three-Rail, and No. 2234, for Two-Rail, what I may describe as the "works" of the Locomotive remain unchanged. But the finish of the housing or bodywork is considerably more glamorous than before.

In the original plain green finish, with grey roof, the Co–Co Diesel Locomotive, in Three-Rail and in Two-Rail form, had much of the impersonal air characteristic of many of the bigger main line diesels on British Railways, but with the additional touches of colour now provided, and with the application of B.R. numbers and names to both Three-Rail and Two-Rail Locomotives, more individuality has been imparted to the engine.

Colour Contrasts

The basic body colour remains as before, B.R. standard green, and this is now carried well up into the curving roof section. The centre part of the roof is finished in standard grey, with the circular fan grids in aluminium. The upper parts of the driving cabs—that is, the sections surrounding the windows—are strikingly picked out in a light grey shade. Along the lower part of the body shell and extending right round the locomotive is a fairly broad section finished in what I think I can correctly describe as lime green. The pale shade of this is attractive in itself and forms a nice contrast to the darker green of the rest of the bodywork. The neat little dash of colour provided by the red-painted buffer casings is still retained.

Hornby-Dublo Co–Co Deltic Diesel "St. Paddy" hauling an express on a Three-Rail layout. The attractive appearance of the Locomotive in its distinctive livery is well shown in this picture.

Visual Warning Indication

As you probably know, names have been applied to some of the real Type 5 locomotives, and this addition has also been made in Hornby-Dublo. Thus the Three-Rail Locomotive now carries on the cab sides the number D 9001, and in the centre of the housing, on either side, appears a reproduction of the nameplate of the real engine bearing the title *St. Paddy*. Lettering is carried out in a buff shade, which also picks out the edging of the nameplate, and the background of the plate is red. The corresponding number for the Two-Rail Locomotive is D 9012, with the name *Crepello*.

Finally, the Locomotive now carries on the face of the bonnet at each end a striking panel of yellow paint, officially

"St. Paddy" and "Mallard," with train name Headboards in position, pose side by side for the camera. Headboards are not provided with Locomotives for separate sale, as explained in the accompanying notes.

known as a visual warning indication, which represents a recent development in real practice to make diesel locomotives and multiple-unit trains more readily visible as they approach. They have no plume of steam to advertise their whereabouts and, in general, lack the "presence" of a steam-hauled train. This indication should be of benefit not only to men working on the line, but to people at level crossings and even to folks on station platforms.

Those wishing to start their railways with a diesel passenger train will welcome the inclusion of the Two-Rail No. 2234 Co–Co Deltic in a named Train Set, No. 2034 *The Royal Scot*, with standard Corridor Coaches in B.R. maroon livery, one First-second and one Brake-second, and the usual set of Rails forming a simple oval track requiring a space four feet by three feet. This fine train is illustrated in our advertising pages this month.

A slight modification in the housing of the Co–Co Deltic Locomotives—and this will be of special interest to those who like operating such titled trains in miniature—is the arrangement of a slot in the upper part of each bonnet face which makes it possible for the Locomotive in the Train Set to carry a new train name Headboard introduced for this type of engine, and provided in the Two-Rail Train Set. The board is formed to include a lug or "hook" that fits into the slot. Unlike the metal Headboards for the steam-type Locomotives in the Hornby-Dublo system, which are individually "tailored" for the distinctive train name labels and the appropriate classes of engine, the board for the Co–Co Deltic is rectangular in shape and is of such a size that it can readily accommodate any of the self-adhesive Train Name Labels for Locomotive Headboards in the Hornby-Dublo range.

The 50 m.p.h. speed restriction sign in this picture is one of the components of the No. 5037 Set of Lineside Notices described in these pages last month.

This has been done to meet the requirements on any Hornby-Dublo layout on which the Co–Co Deltic is likely to be used. Hornby-Dublo owners will certainly wish to give this striking-looking Locomotive as wide use as possible. They are not likely to confine it merely to services representing in miniature those on which the real Deltic diesels are used. So the Hornby-Dublo Deltic is just as likely to be found with trains of Corridor Coaches in B.R. maroon, or W.R. brown and cream, with Pullmans, or perhaps the latest corridor stock in Hornby-Dublo—those in S.R. green that were described in these pages in May this year. After all, big diesels similar in general outline are found nowadays on many B.R. main line routes.

Plenty of Choice

Not many budding railwaymen are likely to rest content with just the two vehicles in the Train Set, and a more impressive formation will certainly result from the addition of say a further Coach or two. Nowadays there is plenty of choice for such additional vehicles. The haulage of such a train would certainly not give the Hornby-Dublo Co–Co Deltic much difficulty and a Diesel-hauled express made up in this manner will be a splendid companion to the Co–Bo Diesel Electric Goods Train which I described last month.

You will remember that last month I told you about the Lineside Notices, No. 5037. One of the components, the 50 m.p.h. speed restriction sign, was not then illustrated so I hope the picture on the left here showing it in use will be of interest.

A THREE-RAIL SCHEME IN TASMANIA

MONTHLY NOTES BY "LAYOUT MAN"

ABOVE you see a view of part of the Hornby-Dublo layout of Frederick L. Phillips of Westbury, Tasmania, a life-long railway enthusiast. This keen *M.M.* reader was, in fact, trained as a locomotive engineer, serving a pupilage at the Inchicore Works of the former Great Southern and Western Railway of Ireland. After some experience on duties of a varied nature in the Locomotive Running Department of that railway, he emigrated to Australia and after further railway service in New South Wales began a business career, in Tasmania, from which he retired some years ago.

It is not surprising that with this railway background and training Mr. Phillips was for a long time an owner, and keen operator, of Hornby Gauge 0 Trains. More recently, with retirement in view, he began to get together a collection of Hornby-Dublo Three-Rail Locomotives, Rolling Stock, Rails and other equipment with the idea of forming a really effective railway system.

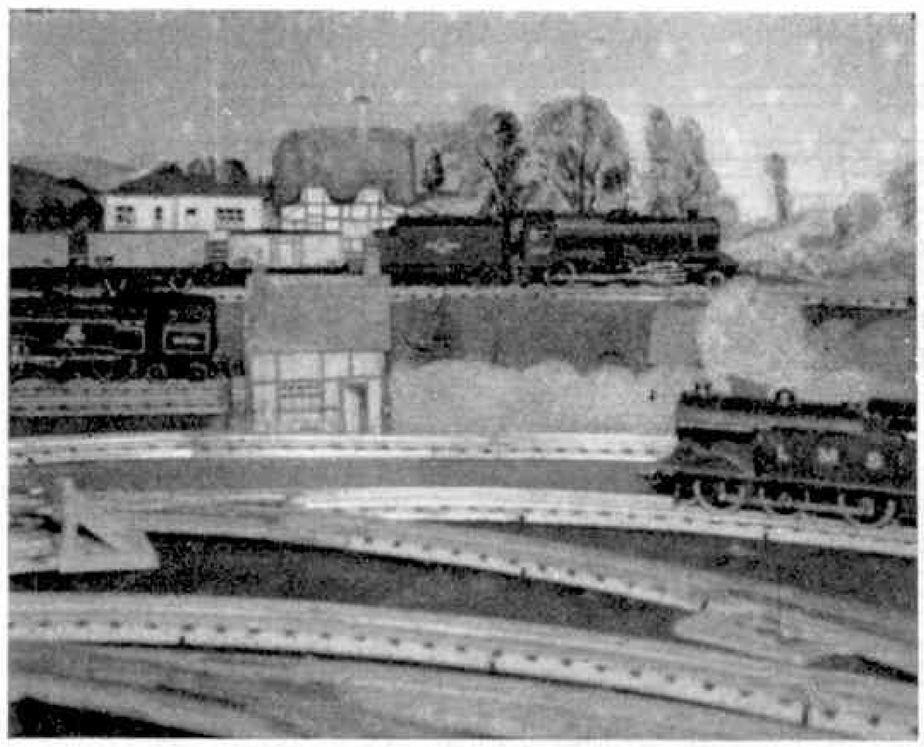
Plenty of space was available for this purpose. The home workshop in which the layout was to be arranged measured 18 feet by 15 feet and in it the railway is now more or less permanently installed on a baseboard nearly ten feet long and six-and-a-half feet wide.

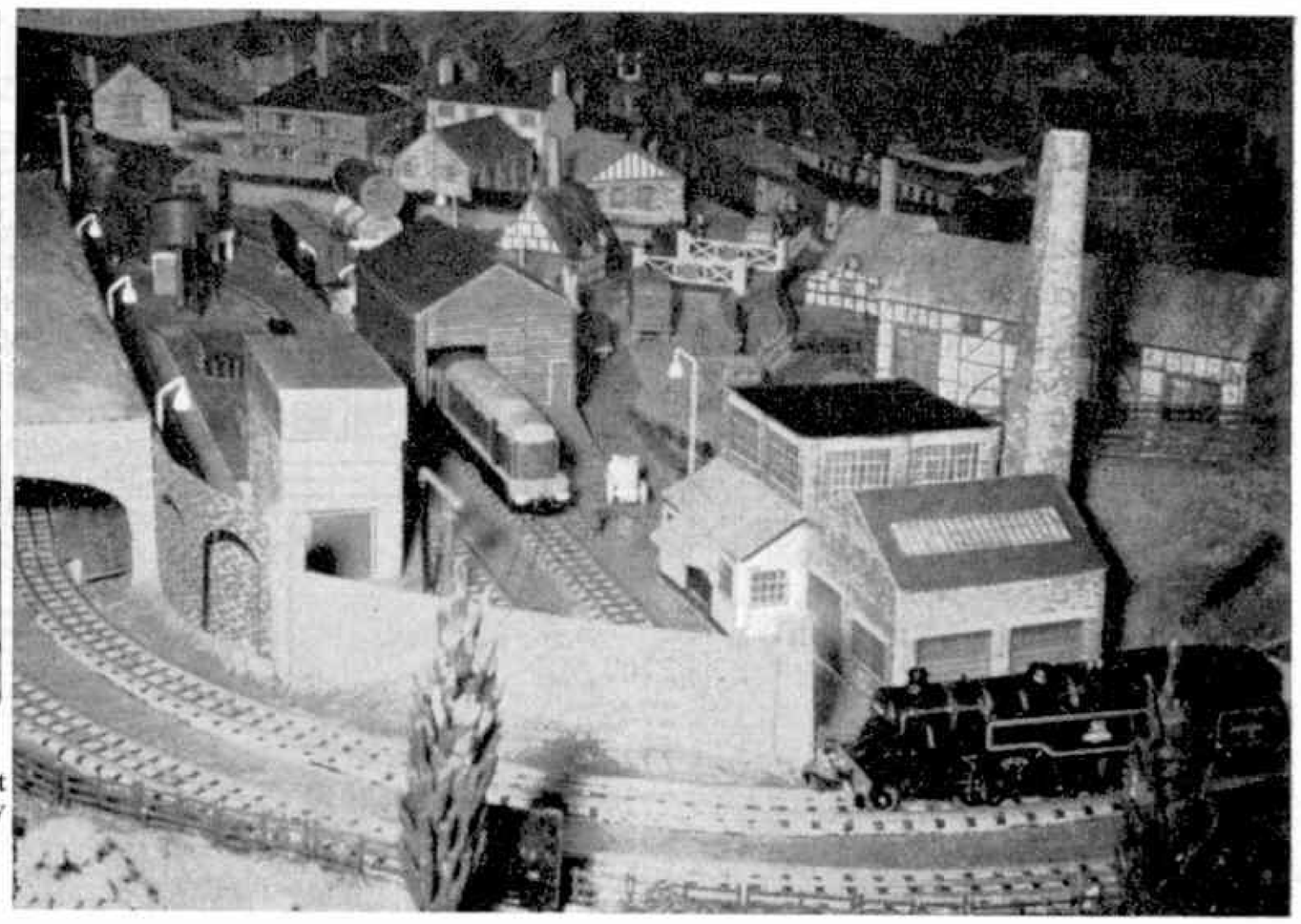
Although the system is extensive, the track layout is fairly simple, which is always desirable if realistic operations are to be obtained. The main line is continuous, so that long non-stop runs can be made, but there are two terminal sections within the main oval track. In view of the earlier service of the owner with the old Great Southern it is not surprising that these two stations are called respectively *Kingsbridge*, which is the name of the Dublin terminus and Great Southern headquarters, and *Rosslare*, after the packet station on the coast of Wexford. There is intermediately on the main line a siding, known for operational purposes as *Kildare Siding*. As the photograph shows, a great deal has been done to develop the lineside and surroundings, while background scenery of varied character gives "depth" to the layout as a whole.

The illustration above shows part of the Hornby-Dublo layout of Frederick L. Phillips, of Westbury, Tasmania, described in this article. Simplicity in operation is a feature, with some remarkably complete lineside and scenic effects.

As might be expected, the train services on this railway represent for the most part the Dublin–Rosslare trains running in connection with the steamer sailings between Rosslare and Fishguard.

In providing locomotives and rolling stock for working them choice has fallen on a Hornby-Dublo Castle Locomotive and Corridor Coaches in Western Region brown and cream, while a T.P.O. Mail Van also is in service. You can, in fact, see this behind the tender of the Castle in our picture. This selection of W.R. stock, which is representative of that of the English partner in the boat services operated to and from Rosslare and Fishguard respectively, is of interest. There is nothing on the market resembling Great Southern locomotives and trains as they were, so the use of W.R. equipment is clearly the next best thing.





(Above) Tracks at two levels are shown in this picture of the layout of J. Harvey, of Croydon. (Right) An effective corner of the railway of J. Vinter, Louth, with diesel and steam power in evidence.

Operations are worked out according to a set plan, so that the trains run with the regularity that is expected of those carrying mail to link with steamer sailings. Goods train workings are dovetailed with them, so that delays to passenger or freight services are avoided and the best use is made of engine power available.

Good use is made of isolating sections, in which trains or locomotives can stand while others carry out their particular movements. Electrically-operated Uncoupling Rails and Points provide convenient remote control of the numerous station and shunting operations involved.

A recent addition has been made in the miniature harbour at *Rosslare* in the shape of an imposing model ship to play the part of a cross-channel steamer. It is not often that a miniature marine installation can be arranged, but here the opportunity has been taken to provide this realistic note. Other harbour and quayside effects help to give just the right air to the proceedings.

* * * *

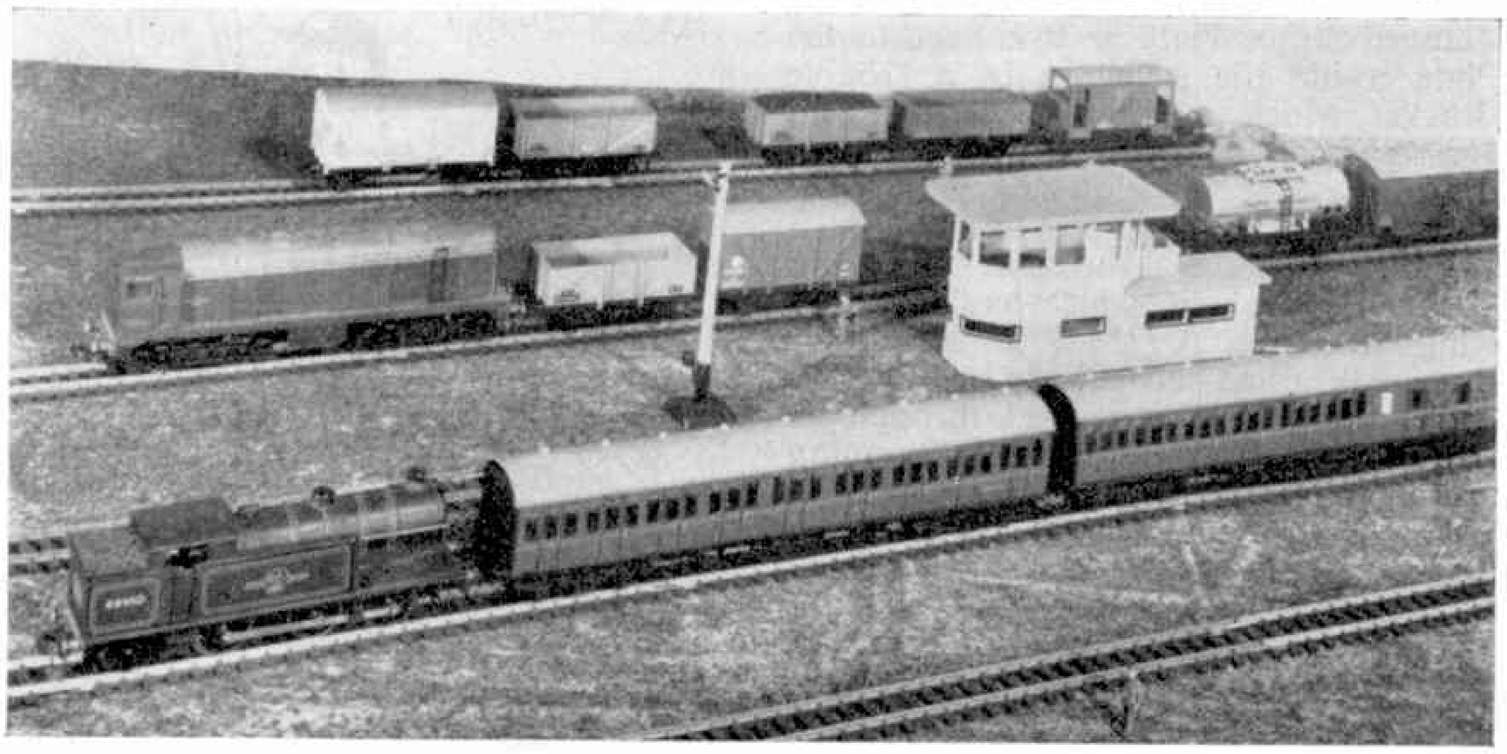
A TANK ENGINE LAYOUT

THE Two-Rail track formation shown this month might be likened to a Hornby-Dublo standard Train Set which has been considerably developed by the addition of Rails and Points. The layout is designed in the usual oval manner, but has two termini which are simply loop lines from either of which a train can depart and make as many circuits of the main line as the operator desires, and can end its journey at the opposite station.

Linesman's Popular Feature For The Two-Rail Enthusiast

A Tank or Diesel Locomotive would be ideal for such a system as this, as there would be no need to turn the engine round at the end of each journey.

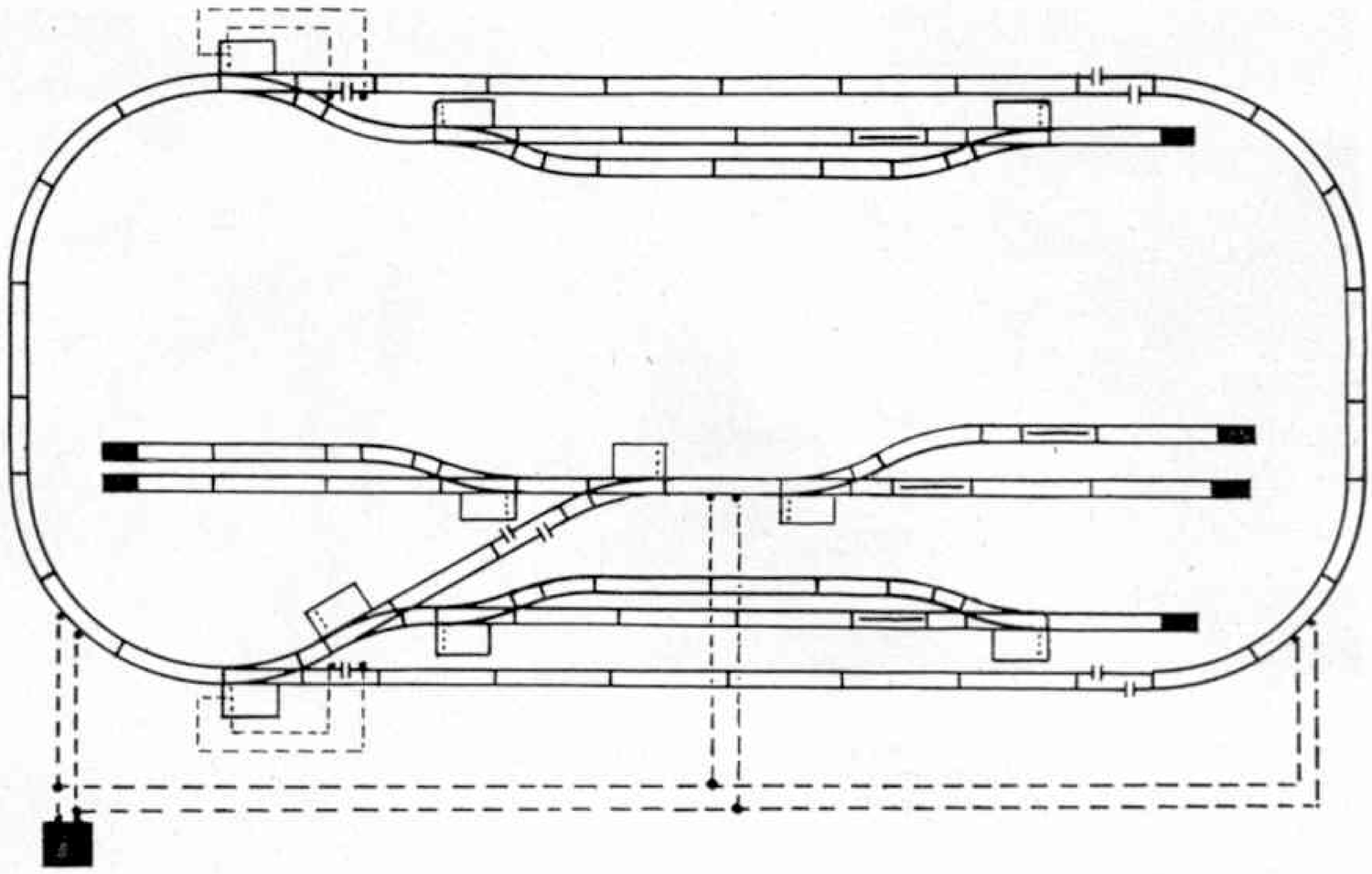
One of the tracks of each terminal loop has an Uncoupling Rail so that an arriving engine can detach its train, run round the loop, re-couple and take the train out again. Both loop points must be switched over together. This practice is representative of many single track branch lines where such a procedure is followed. The straight section of each loop line is long enough to hold two coaches and a locomotive. There is also a small goods yard



A Hornby-Dublo 0-6-2 Tank Locomotive bunker first on a Two-Rail layout, with a train of new-type Suburban Coaches.

ITEMS REQUIRED

12	Curved Rails	2710
2	Curved Terminal Rails, with suppressor	2714
5	Curved Half Rails	2711
10	Curved Quarter Rails	2712
33	Straight Rails	2701
5	Straight One-Third Rails	2703
7	Straight Two-Third Rails	2702
2	Straight Two-Third Single Isolating Rails	2738
3	Straight Two-Third Double Isolating Rails	2739
1	Straight Terminal Rail with Suppressor	2707
3	Uncoupling Rails	2745
5	Right Hand Switch Points	2728
5	Left Hand Switch Points	2729
6	Buffer Stops	2450
1	Power Control Unit	



consisting of a couple of sidings, and two engine shed tracks are included so that Locomotives may be stabled after use.

Two isolating sections are provided on the main line, in each of which an engine may stand either by itself or with a train, while another engine draws out of the sidings or loops on to the main line for the purpose of making a shunting movement. The wiring of the Single Isolating Rails with the Points is shown in the diagram. By switching the Points against the main line, the isolating section becomes dead and the engine will not move.

This layout, complete with Power Control Unit, will fit on a baseboard measuring 8 feet 9 inches by 4 feet 6 inches. Any of the Points can be electrically-operated if desired, although they are shown as being hand-operated on the diagram. One Power Control Unit only is needed, but if electrically-operated Points and other accessories are added to the layout a Power Unit which has an additional output for these will be required.

It will be noted that the goods sidings and the tracks serving the engine shed have their own Terminal Rail, this being a Straight Terminal Rail with Suppressor (Hornby-Dublo component number 2707). A Straight Two-Thirds Double Isolating Rail is used to break the track electrically between these sidings and the Points leading to the lower loop line. This means that there will be no possibility of a short circuit should the Points be set for access to the engine shed while the Points on the lower main line and for the loop are set for the entry of a train into the latter.

Easy Model-Building—

(*Continued from page 294*)

two $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plates 7 to their flanges. Two $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plates 8 are bolted to the Flanged Plate 2. At the top of each fix a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Red Plastic Plate 9 and a $2\frac{1}{2}''$ Strip 10; the Plates 9 can then be joined in the centre and strengthened with a $2\frac{1}{2}''$ Strip 11. A $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flanged Plate 12 is then bolted between the Plates 8 and to this is fixed an Angle Bracket that holds the $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate 13. A Semi-Circular Plate 14 is also fixed to the Plates 8 by Angle Brackets.

A Flat Trunnion is then bolted to the Flanged Sector Plate 6. It is fixed to the Plate inside the structure by a Double Bracket, which is held in place by a bolt 15. A $3\frac{1}{2}''$ Rod 16 is passed through the Flanged Sector Plates 6, and is held in place by a Spring Clip at one end and a 1″ Pulley with boss at the other. It holds a 1″ Pulley with boss, which has a Rubber Ring fitted to it. A $1\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Bracket is bolted between the Flat Plates 7 and a 4″ Rod 17 is passed through its centre hole and through the Flat Trunnion inside. A 2″ Pulley is then fixed to the end. The 2″ Pulley should lie on the Pulley on Rod 16 so that they are in frictional contact, and as a result when Rod 16 revolves the 2″ Pulley and Rod 17 will revolve. A Rod Connector is placed on the Rod 17 and a further 4″ Rod 18 is fixed into it. This Rod has an eight-holed Bush Wheel fixed at the top, and to this are bolted four Angle Brackets which have $5\frac{1}{2}''$ Strips 19 bolted to them. To the Strips 19 are fixed three $12\frac{1}{2}''$ Strips 20 by Angle Brackets. The Strips 20 are bolted in a circle and are braced in the middle by two $5\frac{1}{2}''$ Strips 21, to which are bolted two $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips 22 extended by two $3\frac{1}{2}''$ Strips. The aircraft consist of $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips with $2\frac{1}{2}''$ Strips for wings. Two of the aircraft have two Fishplates for the tail, while the other pair have two Obtuse Angle Brackets. They are suspended as shown in the illustration.

"It's a Hovercraft".

The steps and loading platform are constructed as follows. A Trunnion is bolted to the Flat Plate 7 and to this is fixed a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate 23. Two Reversed Angle Brackets are fixed to the Plate and two $2\frac{1}{2}''$ Strips are bolted to them. The steps are made by threading cord between the Strips. A $3\frac{1}{2}''$ Crank Handle with grip is passed through the Flat Trunnion 3 and through a Fishplate bolted to the Trunnion 4. A 1″ Pulley is fixed to it and Cord is taken round this Pulley and the Pulley on the end of Rod 16.

If a *Magic* Motor is available it can easily be fitted to this model as an alternative method of driving it.

The parts required to build the model Flyboats are: 12 of No. 1; 8 of No. 2; 2 of No. 3; 9 of No. 5; 5 of No. 10; 2 of No. 11; 10 of No. 12; 4 of No. 12c; 2 of No. 15b; 1 of No. 16; 1 of No. 19g; 1 of No. 20a; 3 of No. 22; 1 of No. 24; 2 of No. 35; 82 of No. 37a; 82 of No. 37b; 14 of No. 38; 1 of No. 40; 1 of No. 48; 2 of No. 48a; 1 of No. 51; 1 of No. 52; 2 of No. 53a; 2 of No. 54; 2 of No. 125; 2 of No. 126; 2 of No. 126a; 1 of No. 155; 1 of No. 188; 1 of No. 190; 2 of No. 191; 2 of No. 194a; 1 of No. 213; 1 of No. 214.

HORNBY REPAIR SERVICE

INTRODUCED at the beginning of this year to expedite repairs to Hornby-Dublo Locomotives and Tenders, Hornby Gauge 0 Clockwork Trains and Clockwork and Electric Meccano Motors the Repair Service operated by Meccano Limited has been still further extended within the past two months. A revised list of dealers authorised to offer this service is given below. Firms taking part in the scheme display a distinctive Accredited Service Specialist sign.

Repairs may, of course, still be sent to the Service Department of Meccano Limited at Hanson Road, Aintree, Liverpool.

ANGUS

Dundee—Brian Sherriff, 93 Victoria Road.

BEDFORDSHIRE

Bedford—H. J. Banks, 23 St. Peter's Street.
Luton—Aeromodels, 59 Wellington Street.

BERKSHIRE

Reading—E.A.M.E.S. (Reading) Ltd., The Model Shop, 24 Tudor Road.
Reading Model Supplies, 1 Hosier Street, St. Mary's Butts.

CHESHIRE

Birkenhead—Birkenhead Model Supplies Ltd., 32 Grange Road West.
Moreton—Mortimer Ltd., 254–260 Hoylake Road.
Neston—J. Bailey, The Model Shop, Parkgate Road.
New Brighton—G. Longworth, 78–80 Rowson Street.

CORNWALL

Helston—Eddy & Son (Helston) Ltd., 21 Meneage Street.

DENBIGHSHIRE

Wrexham—Craftoys Ltd., 4 Centenary Buildings, King Street.

DEVONSHIRE

Barnstaple—E Gale & Son Ltd., Joy Street.
Bideford—E. Gale & Son Ltd., 2–3 Mill Street.
Exeter—John Webber (Sports) Ltd., 50–51 High Street.
Plymouth—F. T. B. Lawson Ltd., New George Street.

CUMBERLAND

Carlisle—R. M. Hill & Sons, 36–40 Castle Street.

DURHAM

Durham—C. T. Applegarth, The Model Shop, 92 Claypath.

ESSEX

Chelmsford—Chelmsford Model Co., Baddow Road.
Colchester—West End Cycle Stores, 65 Crouch Street.
Ilford—Pages of Barkingside Ltd., 19 Broadway Market, Fencepiece Road, Barkingside.
Southend-on-Sea—Alco Supplies, 133 Hamstel Road, Southchurch.

GLAMORGAN

Cardiff—James Lendon, 194 Fidlas Road, Llanishen, The Model Shop, 9 Mill Lane
Neath—Pearms Ltd., 16 Alfred Street.

GLOUCESTERSHIRE

Bristol—The White Tree Electrical and Toy Bazaar, 28 North View, Westbury Park.
Cheltenham—I. Newman (Cheltenham) Ltd., 127–9 Bath Road.
Cirencester—S. E. Trinder, The Model Hangar, 71 Cricklade Street.
Gloucester—O. & N. Ash, 106 Westgate Street.

HAMPSHIRE

Bournemouth—Deppers, 918 Wimborne Road.
The Sports Shop, 14 Seymoor Road, Westbourne.
Portsmouth—Robin Thwaites Ltd., The Hobby Shop, 28 Arundel Street.
Southampton—H. I. Dowding & Son Ltd., 265-267 Shirley Road.
Woodkraft Supplies Ltd., 38 Northam Road.

HERTFORDSHIRE

Royston—H. C. Green, 25 High Street.
St. Albans—Bold and Burrows Ltd., 12–18 Verulam Road.
Welwyn Garden City—H. A. Blunt & Sons, Ltd., 38 Fretherne Road.

KENT

Beckenham—Furley & Baker, 69 High Street.
Bexleyheath—W. J. & H. G. Jennings Ltd., Department Store, Broadway
Canterbury—Barretts of Canterbury Ltd., 2 St. George's Street.
Gillingham—J. R. Baker (Gillingham) Ltd., 14 Canterbury Street.
Maidstone—F. T. Gilbert & Son, 116–118, Week Street.

LANARKSHIRE

Glasgow—Caledonia Model Company, 478 Argyle Street.
Clyde Model Dockyard Ltd., 22–3 Argyle Arcade.
Glassfords, 89 Cambridge Street, C.3.

LANCASHIRE

Ashton-under-Lyne—Ashton Model Supplies, 201 Old Street.
Darwen—Arnold Leaver, 65–67 Duckworth Street.
Liverpool—Lucas's (Hobbies) Ltd., 7 Tarleton Street.
Rushworth, The Model Railway Shop, 137a Kensington.
Manchester—Bassett-Lowke Ltd., 28 Corporation Street.
The Sports Depot (Manchester) Ltd., 4–10 Princess Road, Moss Side.
Wigan—J. J. Bradburn, 76 Market Street.

LEICESTERSHIRE

Leicester—North's Toy and Model Stores, 5 Melton Road.
Loughborough—Clemersons Ltd., 43 Market Place.

LINCOLNSHIRE

Cleethorpes—H. Loftis, 196 Grimsby Road.
Lincoln—S. A. Nobbs & Son Ltd., 2 Norman Street and 16 Sincil Street.

LONDON

London—Allan Brett Cannon Ltd., 32 Railway Approach, London Bridge Station, S.E.1.
H. A. Blunt & Sons Ltd., 133 The Broadway, Mill Hill, N.W.7.
Hamblings (Models) Ltd., 10 Cecil Court, Charing Cross Road, W.C.2.
Model and Tool Supplies, 604 Kingston Road, Raynes Park, S.W.20
Models (City) Ltd., 2 The Arcade, Liverpool Street Station, E.C.2.
Palace Model Shop, 13 Central Hill, Upper Norwood, S.E.19.
W. & H. (Models) Ltd., 23 Paddington Street, Baker Street, W. 1.

MIDDLESEX

Edgware—Cresta, 1 Cinema Parade, Manor Park Crecent.

MIDLOTHIAN

Edinburgh—Harburn's Hobbies Ltd., 116 and 122–124 Leith Walk.
Messrs. Donray, 302 Morningside Road

NORTHAMPTONSHIRE

Peterborough—Oliver Carley, 35 Broadway.
Wellingborough—Littlefolk, 24 Market Street.

NORTHUMBERLAND

Whitley Bay—The Whitley Model Shop, 67 Park View

NOTTINGHAMSHIRE

Nottingham—Beecroft & Sons Ltd., 16 Pelham Street.
Gee Dee Ltd., Friar Lane and Goose Gate.

OXFORDSHIRE

Oxford—A. S. Rising, 243 Banbury Road.

PERTHSHIRE

Perth—Bob Croll, 75 High Street.

SOMERSET

Bath—Pram and Toy Shop Ltd., 22–23 Southgate Street.
Cyril Howe's of Bath Ltd., 15 Abbey Churchyard.
Taunton—Westlakes (Cycles) Ltd., Station Road.
Yeovil—H. J. Perris (Retail) Ltd., 9–11 Princess Street.

STAFFORDSHIRE

Burton-on-Trent—J. W. Belfield, 2–4 and 12–14 West Street and Market Street, Swadlincote.
Cradley Heath—Dunns (Cradley Heath and Dudley) Ltd., 65 Lower High Street.
Stafford—John Bagnall, South Walls Road.
Stoke-on-Trent—John Pepper (Hanley) Ltd., 61–65 Piccadilly.
Walsall—S. H. Granger, Caldmore Models, 108 Caldmore Road.
Wolverhampton—A. J. Chamberlain, 39 Darlington Street.

SURREY

Coulsdon—R. Wills (Scientific Hobbies) Ltd., 92 Brighton Road.
Croydon—Priors, 107 High Street.
Guildford—Guildford Dolls Hospital Ltd., 13 Swan Lane.

SUSSEX

Crowborough—Regent House, High Street.
St. Leonards-on-Sea—A. Hammonds, 5/6 Marine Court.
Shoreham-by-Sea—Adur Valley Press Ltd., 16 John Street

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Birmingham—Bearwood Model Supplies, 53 Parade.
Hornton's (Models & Toys) Ltd., 32 Stephenson Street, 2.
The Perrys, 769 Alum Rock Road, Ward End.
J. Williams, 51 Comberton Road, Sheldon.
Sutton Coldfield—W. Gill & Son, The Parade.

YORKSHIRE

Bradford—Bradford Model Railway Centre Ltd., 202 Keighley Road, Frizinghall.
W. Carter, 15 Bridge Street.
Leeds—King Charles Sports Centre, 18 and 20 King Charles Street.
Sheffield—Fred Shaw, 42 Church Street.
The Redgate Co. (Sheffield) Ltd., Moorhead.

CHANNEL ISLES

Jersey—George D. Laurens, 3/5/7 Queen Street.

EIRE

Dublin—Southern Model Railway Co., Lower Leeson Street.

NORTHERN IRELAND

Belfast—The Model Shop, 36 Wellington Place.
Thornton & Co. Ltd., 40/42 Donegal Place.

MECCANO PLATFORM WEIGHING MACHINE

THE necessity for some means of weighing must have been felt by Man from the time he emerged from a condition of primitive savagery. How the earliest weighing operations were carried out we do not know, but it appears certain that the oldest form of scale is the equal-armed balance. From drawings still in existence it is clear that this form of balance was used by the ancient Egyptians, and no doubt the balance referred to frequently in the Bible was of the same type. In all probability the same means of weighing was used in ancient China long before the Christian era, for civilisation in that country had reached a comparatively high standard at the time it was only beginning to dawn in Europe.

Modern weighing machines present such a variety of forms that it is difficult to recognise in some of them any of the characteristics of the simple, old-fashioned scales. In cases where a high degree of exactitude is unnecessary, and where a small compact machine is required, it is customary to make use of a spring balance, which relies for its action on the fact that the extent to which a coil spring is drawn out varies in accordance with the weight imposed upon it, and it is constant for each definite weight. Spring balances, however, have the disadvantage that the springs gradually lose some of their elasticity and become slightly elongated, and consequently they have to be re-calibrated at intervals in order to ensure their continued accuracy.

The majority of balances and weighing machines, therefore, are constructed without using springs of any kind. The more complicated types incorporate a system of levers, but in almost every case the essential mechanism consists of some variation of the original balanced arm.

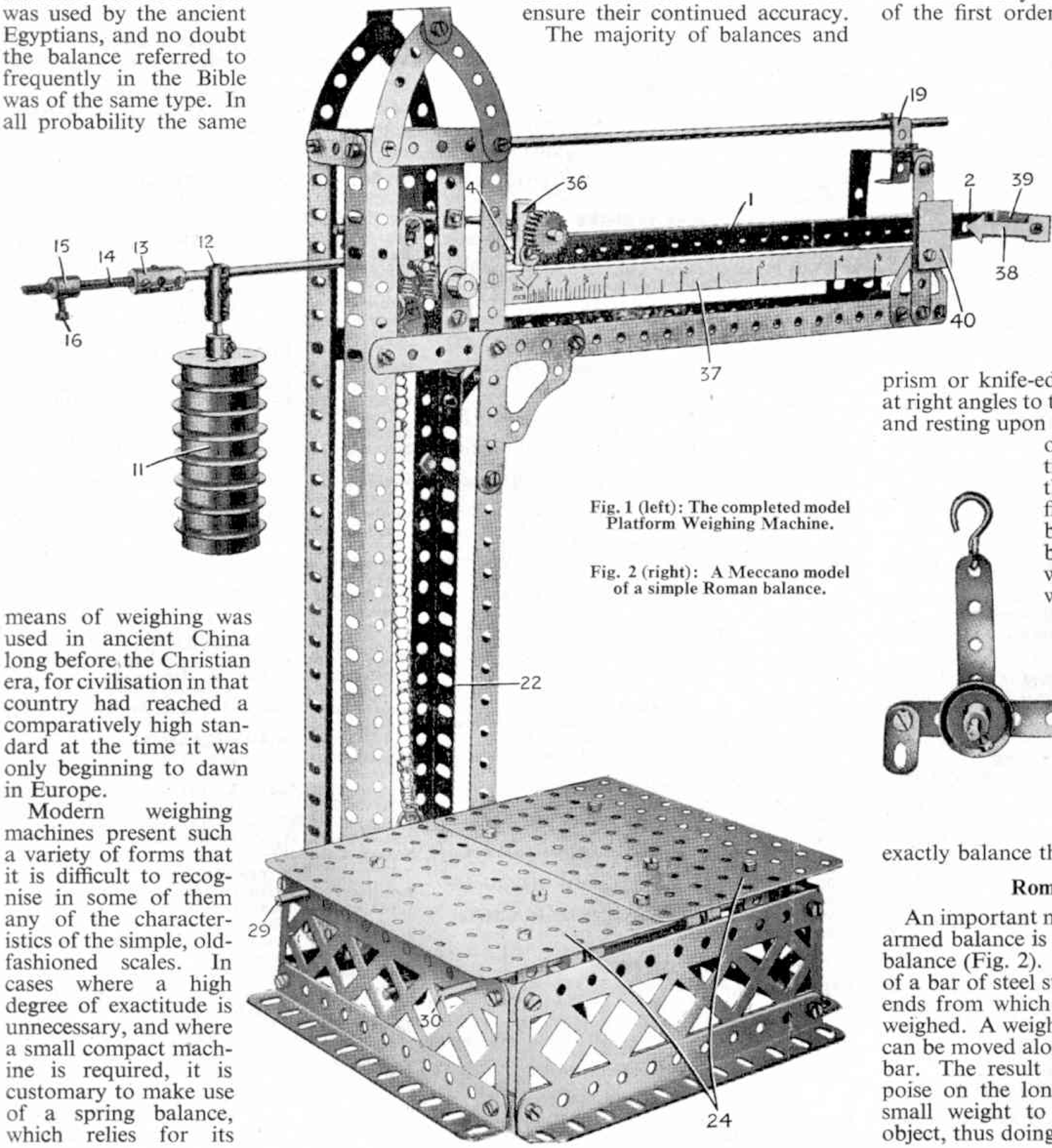


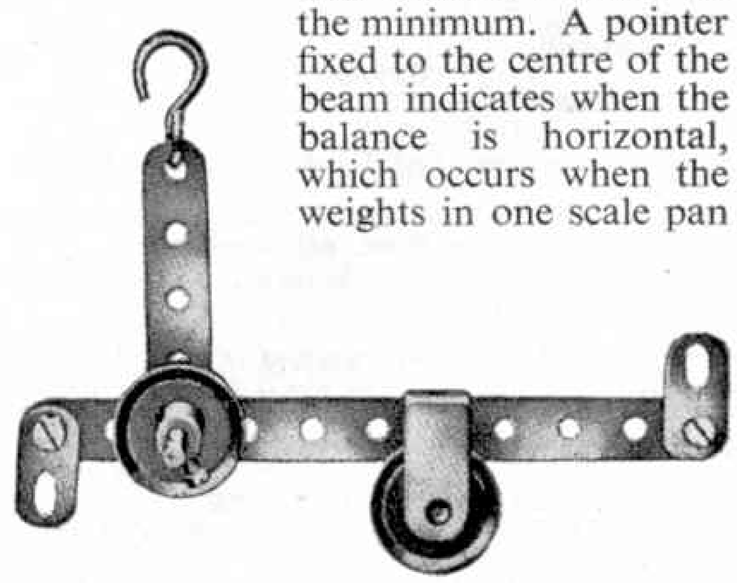
Fig. 1 (left): The completed model Platform Weighing Machine.

Fig. 2 (right): A Meccano model of a simple Roman balance.

The Knife-edge

The ordinary balance consists of a lever of the first order called the beam, supported at its centre on a fulcrum. At each end of the beam is hung a scale pan, one of these pans being for the weights while the other carries the object that is to be weighed.

It is necessary that the beam should be able to swing quite freely on its support, and in order to ensure this, the fulcrum consists of a steel or agate prism or knife-edge, with its sharp edge at right angles to the direction of the beam and resting upon a plane of polished steel or agate. This construction reduces friction to the minimum. A pointer fixed to the centre of the beam indicates when the balance is horizontal, which occurs when the weights in one scale pan exactly balance the object in the other.



Roman Balance

An important modification of the equal-armed balance is the steelyard or Roman balance (Fig. 2). This consists essentially of a bar of steel suspended near one of its ends from which hangs the object to be weighed. A weight used as a counterpoise can be moved along the longer arm of the bar. The result of placing the counterpoise on the longer arm is to enable a small weight to balance a very heavy object, thus doing away with the necessity

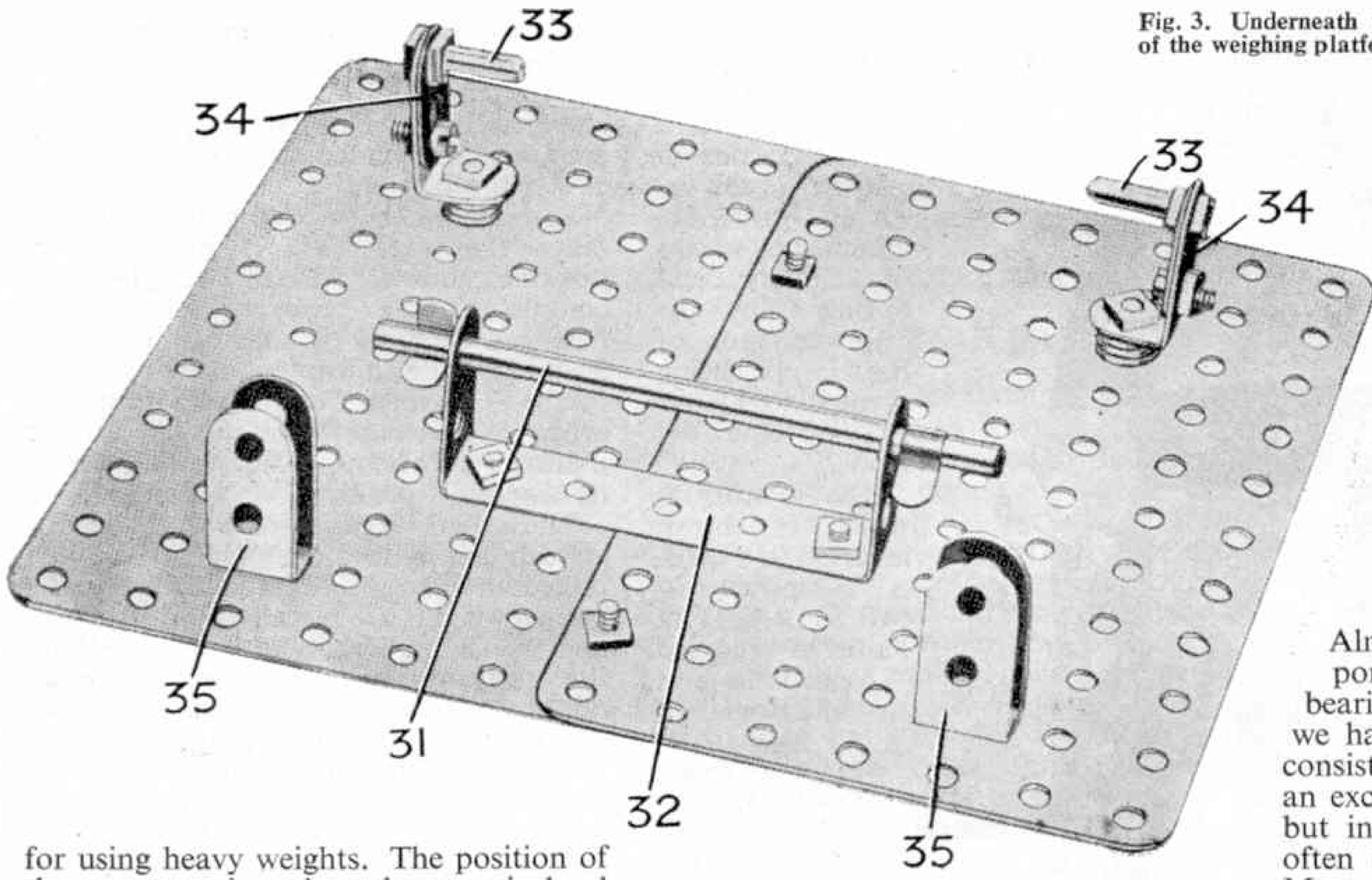


Fig. 3. Underneath view of the weighing platform.

for using heavy weights. The position of the counterpoise when the arm is level indicates the weight of the object balanced on the shorter arm.

From the simple steelyard has been developed the commercial platform weighing machines which are familiar objects in many warehouses and factories.

In this type of machine the object to be weighed is not hung directly from the steelyard, but rests upon a low platform. This arrangement enables heavy and bulky objects, such as sacks full of various materials, to be weighed quickly and with the greatest ease. The whole machine usually is mounted on wheels so that it can be moved about a warehouse as required. Such machines are made in various sizes having capacities of from 3 cwt. to 20 cwt. The same type of machine is used in railway stations, and in other places, without the wheels.

This Month's Model

The Meccano model shown in Fig. 1 closely resembles in principle a machine of this type. If desired the model may be made portable by mounting the base on 1″ Pulleys or Flanged Wheels.

The framework of the model requires no detailed explanation, for it is shown clearly in Figs. 1, 4 and 5. The steelyard 1 (Fig. 1) consists of a 12½″ Strip, and an 11½″ Rod extending along the back of this Strip is attached to it by means of Couplings. The Coupling at the outer end is in a horizontal position, and is secured to the steelyard by means of an ordinary bolt entering one of its transverse threaded bores, the 11½″ Rod being made fast in the longitudinal bore. The 12½″ Strip is similarly attached to the Coupling 5 (Fig. 5), the same bolt serving to attach the Strip and to secure the end of the 11½″ Rod to the lowest transverse hole of the Coupling. The Coupling 5 is carried on the end of a 3″ Rod 6 which is passed through further Couplings 7 and 8 and enters another Coupling in which a 3½″ Axle Rod 10 is mounted. This Rod carries the balance weights 11, which may be secured at any point along its length by means of the Coupling 12 (Fig. 1).

The Rod 10 is extended at its outer end by a Coupling 13 and a 2″ Threaded Rod 14 on which is screwed a Threaded Boss 15. Very accurate balance adjustments can be made by turning this Threaded Boss, and when the steelyard is exactly balanced the Boss is secured in position by the bolt 16.

Knife-edge Bearing

Almost all accurate balances incorporate some form of knife-edge bearing; in the smaller instruments, as we have already remarked, this usually consists of a triangular prism of agate, an exceedingly hard semi-precious stone, but in the case of large machines steel often takes the place of agate. In the Meccano model a very efficient knife-edge bearing is obtained without any deviation from the standard system of parts.

The Coupling 7 (Fig. 5) carries two Centre Forks 17, the points of which rest between the teeth of two ½″ Pinion Wheels. Thus the whole weight of the balance arm, including the load imposed upon it, rests

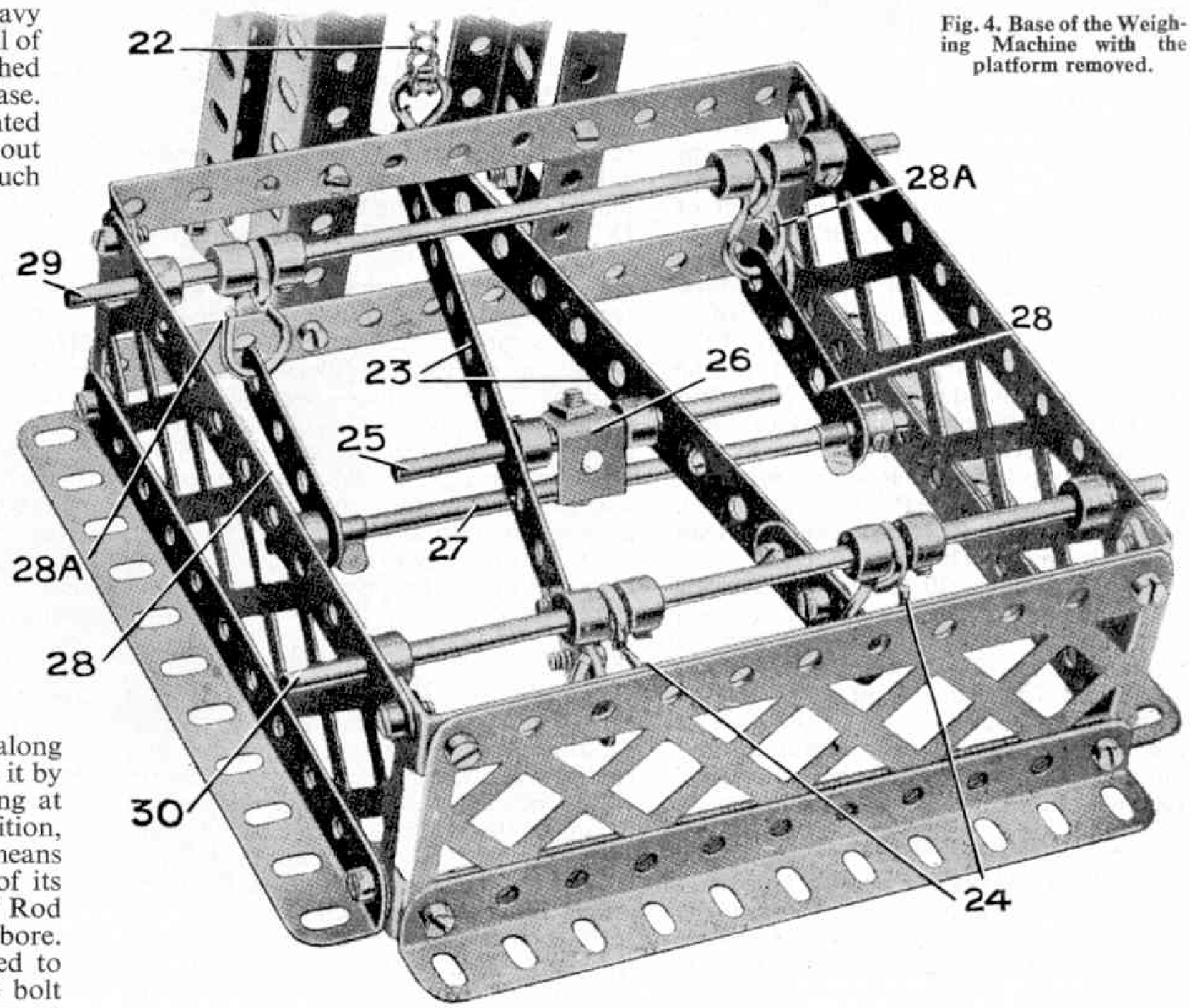


Fig. 4. Base of the Weighing Machine with the platform removed.

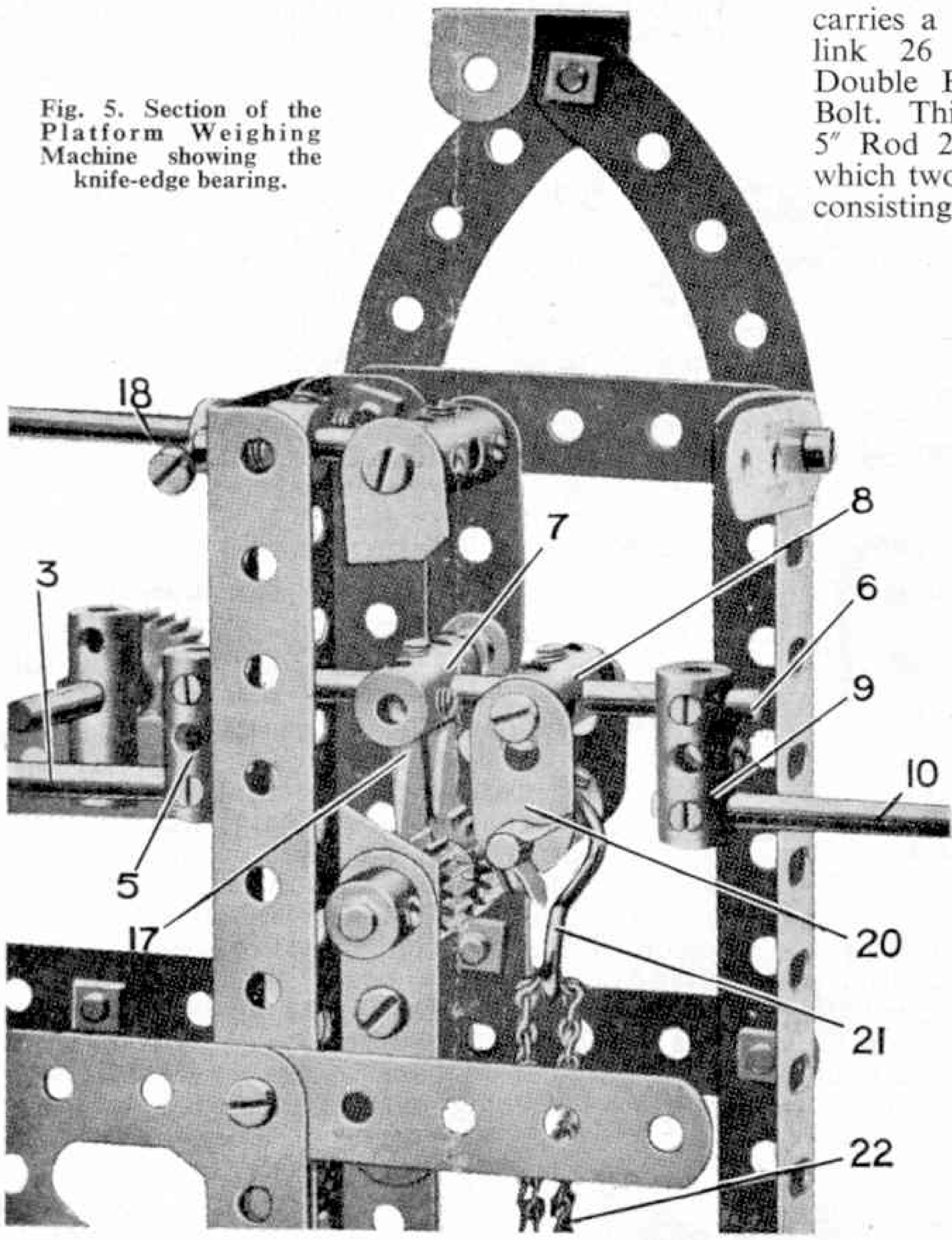


Fig. 5. Section of the Platform Weighing Machine showing the knife-edge bearing.

on the six hard steel points of the Centre Forks, with the result that a delicate balance is obtainable. The two ½″ Pinions are secured to a 2″ Rod rigidly held in two Cranks, which are attached to a pair of 3½″ Strips pivoted to the ends of a Coupling. The central transverse hole of this Coupling carries an 11½″ Rod 18, which passes through the middle hole of a horizontal 1½″ Strip that forms part of the framework. Collars are secured to the Rod 18 on both sides of this 1½″ Strip, but are spaced sufficiently far apart to allow the Rod a certain amount of freedom to pivot. A stop 19 for the Rod 18 is provided at the outer end of the framework (Fig. 1), and consists of a Reversed Angle Bracket to which a nut and bolt are attached.

Two Fishplates 20 (Fig. 5) suspended from the ends of the Coupling 8 carry in their lower holes a 1″ Rod, which is retained in position by Clips. A Hook 21 suspended from this Rod is connected with the levers 23 (Fig. 4) in the base of the model by a sprocket Chain 22 and another Hook, which passes under a 1″ Rod held in the end holes of the levers 23.

Platform Mechanism

The levers 23 are pivoted on Hooks 24 (Fig. 4)which are held in position on the 6½″ Rod 30 by means of Collars. A central 3″ Rod 25 journalled in the Strips 23 is also retained in place by Collars, and carries a special suspension link 26 consisting of a Double Bracket and a ¾″ Bolt. This link supports a 5″ Rod 27, to the ends of which two further levers 28, consisting of 2½″ Strips, are attached by means of Collars and Spring Clips, the opposite ends of the levers being pivoted to Hooks 28a on the 6½″ Rod 29.

The Platform, which is shown inverted in Fig. 3, is composed of two 5½″ × 3½″ Flat Plates overlapped one hole and bolted together. A 2½″ × 1″ Double Angle Strip 32 attached to the underside carries a 3½″ Axle Rod 31, which is retained in position by Clips. When the platform is in position, this Rod 31 rests on the levers 23 (Fig. 4), while two Threaded Pins 33, secured to the 1″ × ½″ Angle Brackets 34, rest on the levers 28.

Four Washers are placed between each of the Angle Brackets 34 and the underside of the platform, and two washers are placed on each of the bolts that secure the Double Angle Strip 32. Single Bent Strips 35 bolted to the 5½″ × 3½″ Flat Plates fit over the Rod 30 in the base (Fig. 4) and form vertical guides for the platform.

The arrangement of the levers underneath the platform is specially designed to make the machine respond to the slightest pressure, and to ensure that the same weight placed on any part of the platform (except at the extreme edges) will produce an equal pull on the Chain 22, whether the load is transmitted through the Chain by way of the Rod 31 and the levers 23 or by the Threaded Pins 33 and the levers 28.

Indicator Details

A weight 36 (Fig. 1), consisting of a Strip Coupling, a short Rod, and a ¾″ Pinion, slides along the steelyard 1 and carries a small pointer cut from cardboard, which indicates the load being weighed by means of the graduated scale 37. A piece of cardboard 38 should be cut in the form of an arrow and bolted to a Reversed Angle Bracket 39 in such a position that it comes to rest opposite a line marked on the cardboard indicator 40 when the steelyard is exactly horizontal. An upper and lower stop should be provided for the steelyard, consisting of a Reversed Angle Bracket and a 1″ × ½″ Angle Bracket respectively. The upper stop is clearly seen in Fig. 1 immediately below the stop 19.

In building the model, care should be taken that each part is in the exact position shown. When the model is completed, the steelyard should be balanced carefully by moving the weight 36, and minute adjustment made by means of the Threaded Coupling 15 until the arrow 38 lies exactly on the line on the indicator 40 when the sliding weight is in its innermost position.

The scale 37 is provided with extensions at each end by means of which it may be bolted in place. To graduate the scale, known weights are placed on the platform and the sliding weight 36 is moved along the steelyard until the arrow 38 points once more to the line on the indicator 40. The exact position of the pointer attached to the weight should be noted on the scale in each case, and the magnitude of the weight marked against it. The need for exactitude, both in calibrating (i.e. graduating the scale) and in the actual process of weighing, cannot be stressed too greatly, for a slight variation on the scale represents a considerable difference in the weight on the platform.

The steelyard is lifted into weighing position by placing the 11½″ Rod 18 under the stop 19 (see Fig. 1). The object to be weighed is then placed on the platform, and the weight 36 adjusted as explained until the pointer 38 is opposite the line on the indicator 40. The pointer attached to the sliding weight will then be found to indicate on the scale 37 the exact weight of the object. When not in use the scales should always be put out of action by releasing the Rod 18 from under the stop 19.

Miscellaneous Points

The model should be oiled at frequent intervals, and all the working parts must be kept clean and perfectly free to move. The Coupling 7 of the fulcrum in particular should not be allowed to touch the suspended 3½″ Strips on either side of it.

The appearance of the model may be improved considerably by filling in the sides of the base and the upright member with a Braced Girder, Strips or Plates, etc. The framework enclosing the steelyard may also be covered with either Strips or Flat Girders. This will not only give the model a more solid and workmanlike appearance, but will also protect the knife edge and the other working parts from possible disarrangement.

In addition to affording a very interesting model to build, the Meccano Platform Scales illustrates clearly and simply the general principles of the lever when used as a mechanical power and as a means of changing the direction of a force. Although the internal arrangements are perhaps a little complicated, it is a model that any Meccano boy can build. It will amply repay the little extra time and concen-

(*Continued in col. 3, next page*)

WITH THE SECRETARY

Club and Branch News

CLUB NOTES

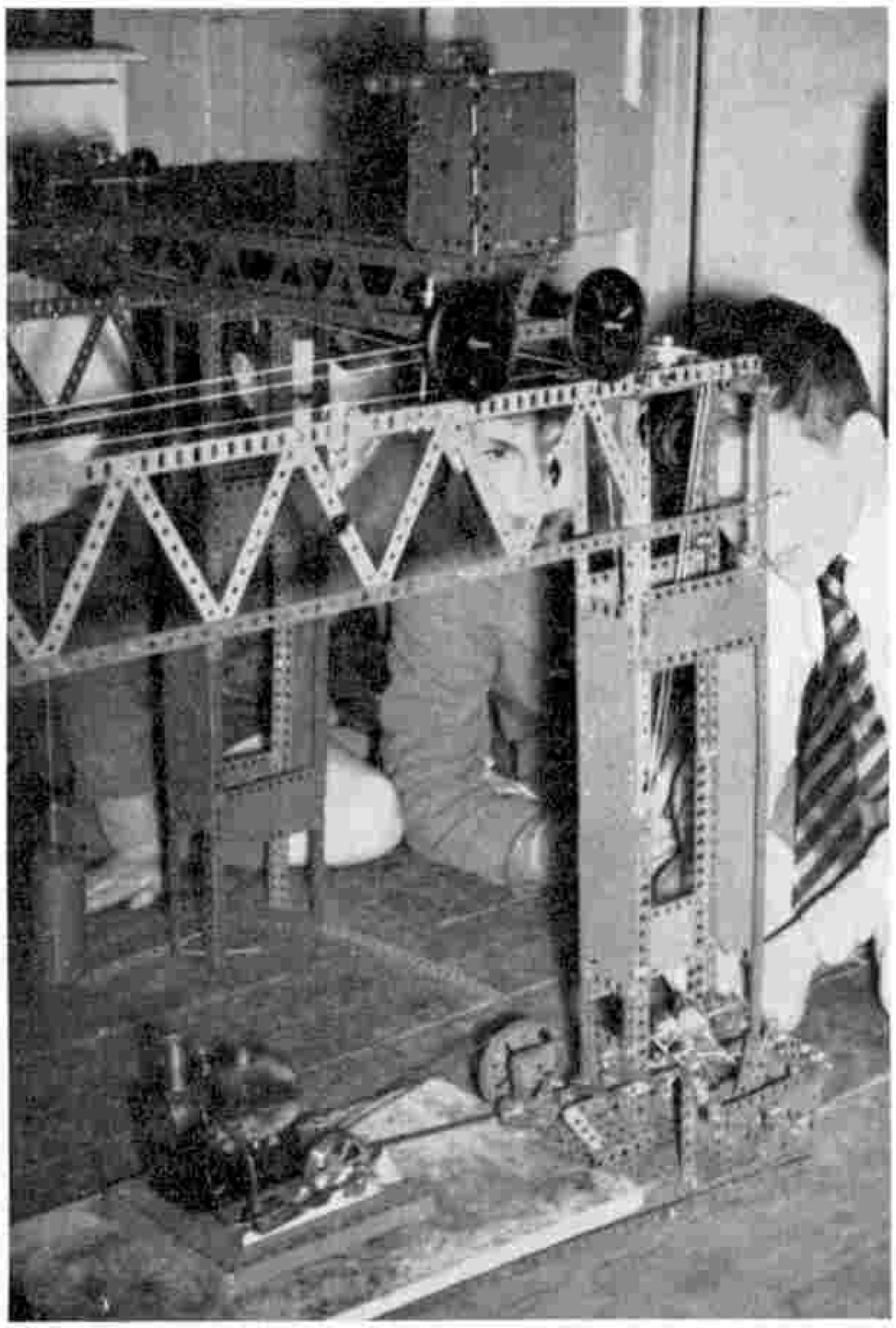
COPDOCK AND WASHBROOK M.C.—The members have been grouped into two teams named *Nuts* and *Screws* respectively. Interesting model-building, quiz and games competitions between the teams are held and are much enjoyed. *Secretary:* R. Soilleux, The Street, Washbrook, Ipswich, Suffolk.

SHEBBEAR COLLEGE (BEAWORTHY) M.C.—The chief feature of recent model-building has been the construction of a large gantry crane driven by a steam engine. It was equipped with a gear-box to operate three different mechanisms to move the crane along the gantry rails, traverse the crane bogie and raise and lower the pulley block respectively. A reversing mechanism by which these actions could be reversed was included, and when required all movement could be stopped by the application of two brakes. On the crane there was a cabin with a sliding door. Another model-building event was a Lorry competition, which was won by Albert Sloman and Brian Petherick. *Secretary:* M. R. J. Kent, Shebbear College, Beaworthy, N. Devon.

WOODLEY C.E. SCH. (READING) M.C.—The Club affiliation certificate is to be framed and hung in the Club room. Points are awarded in the Club model-building competitions, and at the end of term a "Best Model-Building" Cup is presented to the boy who has gained the highest number of points. The subject of a recent model-building meeting was *Model Aeroplanes*, and the results were very creditable to the builders. A party of members went to London and visited the Model Railway Exhibition at Central Hall, Westminster. *Leader:* Mr. H. W. Mason, Woodley C.E. (Controlled) School, Church Road, Reading, Berks.

BRANCH NEWS

NORTH END (PORTSMOUTH)—Model railway activities have been centred on preparations for the Summer Fair. New scenic effects have been constructed for Mr. Enfield's re-built old layout, with the aid of several sheets of green crêpe paper, blackboard paper pasted on cardboard (for roads), and mountain scenery painted on a backcloth. Further features are a goods yard and a model airport. The big new layout which Mr. Enfield is constructing for use when the Branch gives displays in halls other than its own premises, is being made in sections each measuring 4 ft. 6 in. × 2 ft. *Secretary:* Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.



The large Meccano gantry crane built by members of the Shebbear College M.C., Beaworthy, and described on this page. The members in the background are (left to right) Brian Petherick, Martin Kingdom and M. R. J. Kent (Secretary of the Club).

Meccano Platform Weighing Machine

(*Continued from previous page*)

tration that may be required to make it efficient and accurate.

List of Parts required to build the Meccano Platform Scales: 3 of No. 1; 2 of No. 2; 2 of No. 3; 2 of No. 4; 3 of No. 5; 2 of No. 6; 6 of No. 6A; 4 of No. 8; 2 of No.9; 4 of No. 10; 1 of No. 11; 2 of No. 12; 1 of No. 12A; 3 of No. 12B; 2 of No. 13; 2 of No. 14; 1 of No. 15; 3 of No. 16; 2 of No. 16B; 1 of No. 17; 2 of No. 18A; 1 of No. 18B; 8 of No. 20; 1 of No. 25; 2 of No. 26; 8 of No. 35; 78 of No. 37; 14 of No. 38; 1 of No. 46; 3 of No. 48; 4 of No. 48D; 2 of No. 52A; 6 of No. 57; 20 of No. 59; 2 of No. 62; 8 of No. 63; 1 of No. 63B; 1 of No. 64; 2 of No. 65; 1 of No. 81; 4 of No. 90; 3 of No. 100; 2 of No. 102; 2 of No. 108; 1 of No. 111; 1 of No.111A; 2 of No. 115; 2 of No. 126A.

BOOK REVIEWS

The Welsh Highland Railway by Charles E. Lee, F.R.S.A. (David and Charles, price 9/6d.) is based on relevant portions of an earlier work by the same author, *Narrow Gauge Railways in North Wales*, that was published in 1945. The text has been revised and amplified. Not only so, but illustrations additional to those in the original book have been provided, so that considering the nature of the present book, which runs to 48 pages, the proportion of pages devoted to pictures of one kind and another is high indeed. In addition to half-tone reproductions, there are diagrams and sketches, and a map showing the district served by the line, which is made up of several older railways laid to the narrow gauge of 1 ft. 11½ in.

A folding drawing allows the basic details of one of the characteristic locomotives to be followed. As well as the factual account of the line, details of locomotives and rolling stock, time-tables and tickets are included in this fascinating publication.

* * * *

Beginner's Guide to Photography by Edward C. Partridge (Newnes, 10/6) is one of a series of handbooks each dealing with a particular aspect of the photographic hobby and, as the title indicates, is directed primarily to the newcomer. It is written by a professional photographer who knows all the problems and, what is more, the correct answers to them. So his practical advice on choosing the right equipment—from the purchase of a camera to the installation and use of the darkroom—is well worth having. How to use your camera correctly when you have got it, the important matters of exposure, artificial lighting and, subsequently, development are dealt with clearly and adequately. Naturally, colour photography too is dealt with, and the making of enlargements. The book is beautifully illustrated with full-page colour plates, more than 60 half-tone pictures and many line illustrations.

Easy Model-Building In Meccano

By "SPANNER"

THE model illustrated at the top of this month's notes—figure 1—is a form of power hammer known as a trip hammer, and it is quite easy to build. The top of the base consists of a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate to each end of which a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate is bolted. One side is made

A MECHANICAL TRIP HAMMER

up of two $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates and the other side consists of $4\frac{1}{2}'' \times 2\frac{1}{2}''$ and $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates. The sides are edged at the bottom with a $5\frac{1}{2}''$ Strip and by two vertical $2\frac{1}{2}''$ Strips at the ends. At each lower corner an Angle Bracket joins the sides and ends together.

At one end of the base a Flat Trunnion and a $2\frac{1}{2}''$ Strip 1 are bolted on each side, and a Crank Handle, which is held in position by a 1" Pulley and a Road Wheel, is passed through the top holes of the $2\frac{1}{2}''$ Strips. A Bush Wheel 2 is fixed on the Crank Handle and four Fishplates are bolted to it. The Fishplates are arranged at an angle as shown.

Two Trunnions are bolted to the $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate, and a 2" Rod holding a 1" Pulley and two Angle Brackets, is mounted in the upper holes of the Trunnion. The two Angle Brackets are bolted together to form a U-shaped piece and a bolt 3 is used to connect this to the centre hole of the $5\frac{1}{2}''$ Strip 4 that forms the shaft of the hammer. The head of the hammer is a 1" Pulley that is connected to the $5\frac{1}{2}''$ Strip by a $\frac{3}{8}''$ Bolt, held in the boss of the Pulley by its set-screw. The worktable 5 is a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate bolted to a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip that in turn is connected at its lugs to another $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip bolted to the base. The centre of the table is supported by a Reversed Angle Bracket bolted to the base.

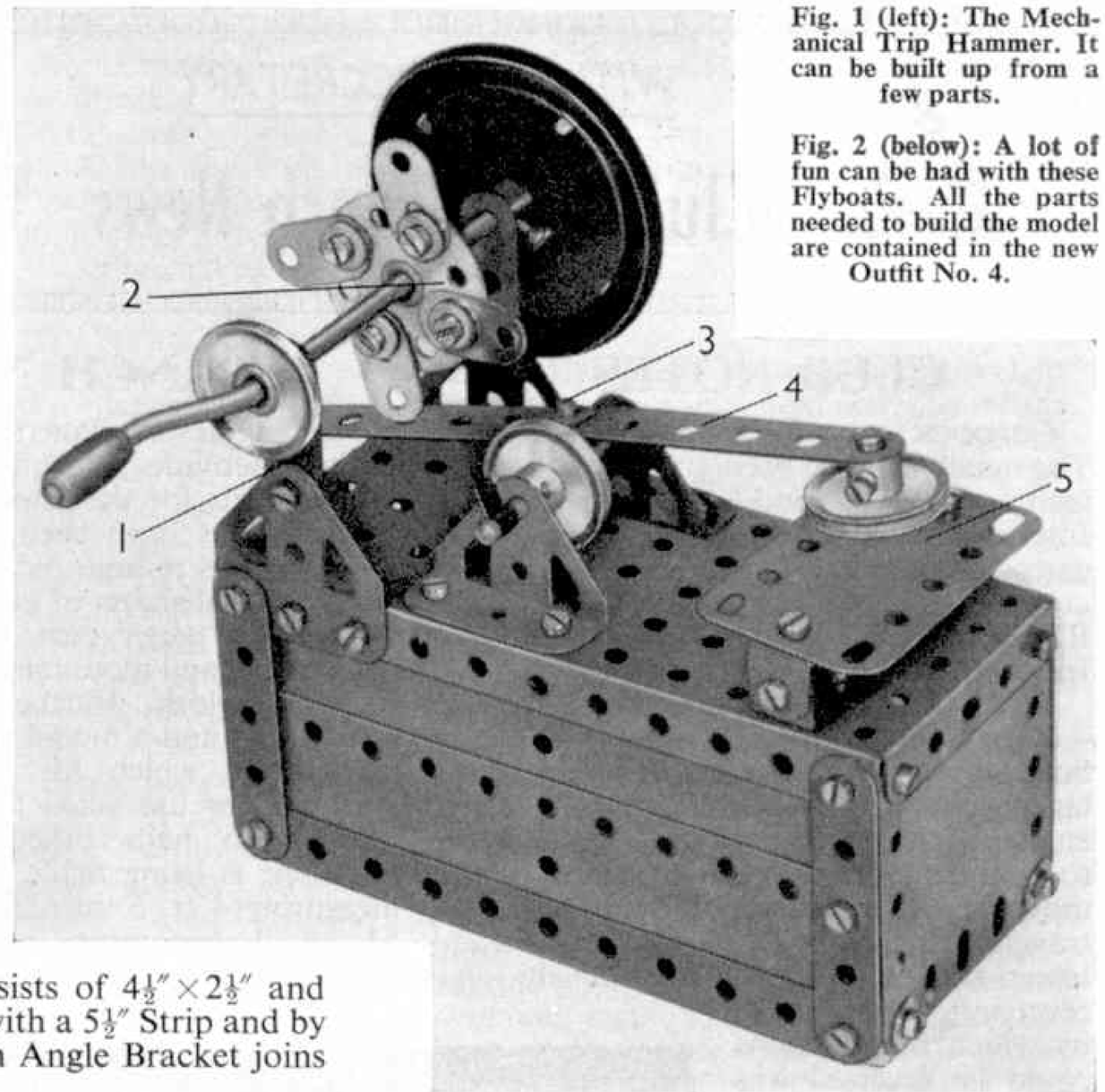
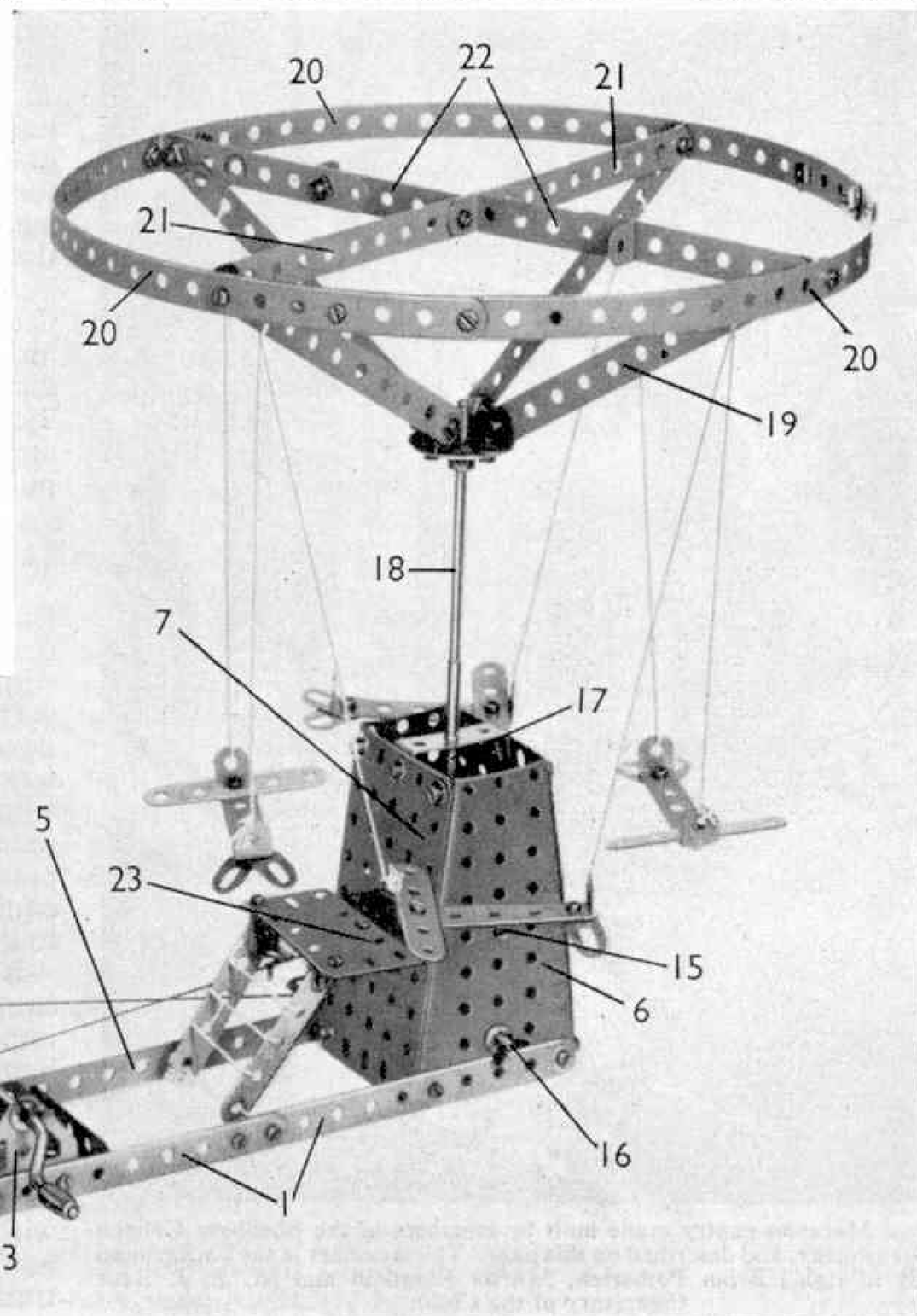
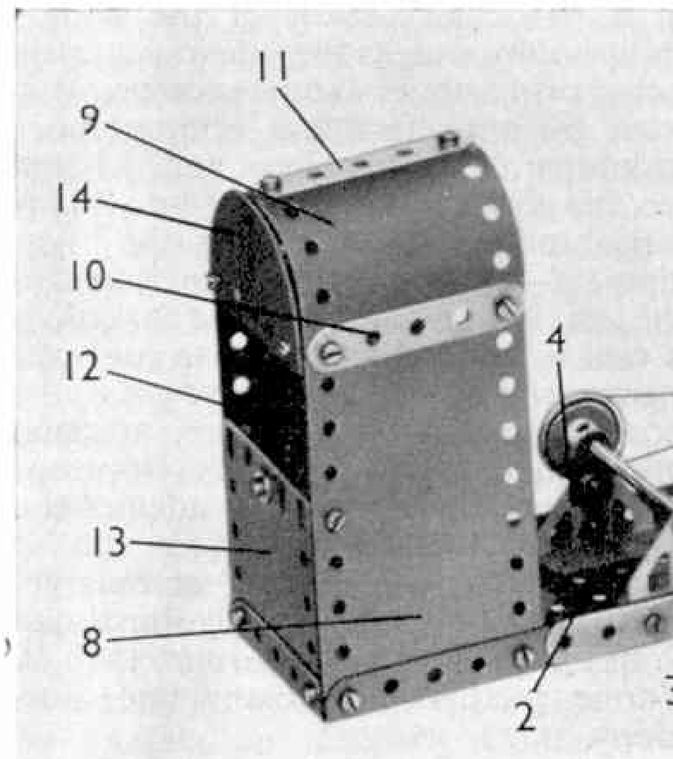


Fig. 1 (left): The Mechanical Trip Hammer. It can be built up from a few parts.

Fig. 2 (below): A lot of fun can be had with these Flyboats. All the parts needed to build the model are contained in the new Outfit No. 4.





The parts required to build the model Mechanical Trip Hammer are: 3 of No. 2; 6 of No. 5; 4 of No. 10; 6 of No. 12; 1 of No. 17; 1 of No. 19g; 3 of No. 22; 1 of No. 24; 2 of No. 35; 41 of No. 37a; 40 of No. 37b; 8 of No. 38; 2 of No. 48a; 1 of No. 52; 1 of No. 111c; 1 of No. 125; 2 of No. 126; 2 of No. 126a; 1 of No. 187; 2 of No. 188; 2 of No. 189; 2 of No. 190; 1 of No. 191.

FLYBOATS

All youngsters interested in fairgrounds—and which youngster is not—will be intrigued with the Flyboats model shown in our second illustration. This is designed for construction from the new Outfit No. 4.

The base of the model is formed by bolting together two $5\frac{1}{2}''$ Strips 1 and fixing them with $12\frac{1}{2}''$ Strips 5 to a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate 2, at the same time fixing in place a Flat Trunnion 3 and a Trunnion 4. Two Flanged Sector Plates 6 are bolted to the ends of the Strips 5 and 1 and are joined by bolting

(*Continued on page 288*)

For Stamp Enthusiasts

Hurricanes and Birds

By F. E. Metcalfe

IT is not so long since I referred to a set of stamps issued by British Honduras to aid those who had suffered so much from the hurricane which, American style, was named *Hattie*. I expect that everybody saw the pictures in the newspapers of the devastation caused by that disaster, and I am pleased to be able to report that the stamps to aid the victims sold quite well. It is a fact that, as they had some connection with a sad event which so stirred the world, the stamps, in general, of this British territory in America have come into some prominence. And now an entirely new definitive issue, depicting many of the wonderful birds to be found in that country, has really brought the stamps of British Honduras into the philatelic picture; so much so, in fact, that one dealer told me that this new "Bird" set, issued on April 2, is selling as no other stamps of the same country have ever sold before. I will deal with the "Bird" stamps in more detail later on in these notes.

I was surprised when news of Hurricane *Hattie* came through, how few people knew where British Honduras is, although the fact that the Central American country

Guatemala has long coveted it and has wanted to rule it has often caused it to be mentioned in the newspapers. But after all, what's one small colony among so many which want to cut adrift? Nevertheless, as I propose to deal with the stamps of British Honduras in general, in view of their topicality, a few lines of geography may not be out of place.

British Honduras lies on the east coast of Central America, with Mexico and Guatemala as neighbours. Little is known of its early history, but hundreds of years ago it was populated by Maya Indians, who have left many ruins which prove what an advanced state of civilisation existed then in that part of the world. This civilisation is said to have reached its peak around the eighth century A.D., but after that it deteriorated and the in-

habitants began to migrate, long before we cultured Europeans arrived to just about finish off that earlier culture altogether.

Columbus discovered the Bay of Honduras in 1502, but the first occupation of the Bay coast was probably by a party of shipwrecked British mariners who, in 1638, settled there and started cutting timber. Mahogany is still an important export. Of course, in time there was the inevitable fight for the territory between the civilised European countries of Spain, France and Britain, and finally, under the Treaty of Madrid in 1670, our occupation was recognised. But treaties were merely scraps of paper in those days—as they are sometimes in ours—and the Spaniards continued to raid the territory until 1798, when the settlers themselves gave the raiders the knock-out at the battle of St. George's Cay; and that was that. A new Constitution for British Honduras was agreed in February 1960.

British Honduras has a long philatelic history. Its first stamps appeared as long ago as 1866, so in another four years it will, no doubt, be bringing out its postal centenary issue. The stamps right up to 1938 were mostly of the head type, although there was a period from 1888 to 1891 when these were surcharged, and some of these are scarce. Coming to 1932, we have a set which shows that hurricane *Hattie* was not the only catastrophe which struck this tiny colony, for in 1932 Belize, the capital, suffered similarly, and a set of five stamps was issued, surcharged to help the relief fund. I do not think they sold very well, for sets are now quite scarce.

The first set of pictorials appeared in 1938. Here I must mention one point to remember about the stamps of British Honduras. The Caribbean dollar in use in the other West Indian colonies is worth only 4/2, but that of British Honduras has a parity of 5/–, but don't ask me why. This first pictorial issue of the KGVI period is a good point from which to start a collection of this colony, for we get some attractive stamps from then on. An

interesting issue is that released in 1949 to mark the 150th anniversary of the Battle of St. George's Cay, an event to which I have already referred.

The next definitive issue was that of 1953 (with some interesting perforation varieties which are easily obtained at present) and it is this issue which has been replaced by the new "Birds" issue, the one so much sought after at the time of writing. Of course, in between we have had the usual special issues—Victory, etc. —but these were the same for all the colonies, and I do not need to give details of them.

As for the "Bird" set, it goes up to $5 (25/–) but don't let that put you off, for the low values are just as interesting as the high ones, and all values show exotic birds, in full colour. Incidentally, these stamps have been printed by the photogravure process, whereas all other Honduras stamps, since the pictorial issue of 1938, were recess printed. The new

method, however, lends itself particularly well to the rich colouring, which such designs need, and the stamps show these birds as they really are.

I mentioned that the top value has a face value of 25/–, but for as little as a shilling or so you can buy the five lower values (adding the higher ones as your pocket money comes in) and they make quite a nice little show. Another interesting point is that the names of the birds depicted are given on the stamps—quite a good idea. Well, there you have a brief picture of the stamps of British Honduras, and if you do go in for collecting some of them you will not find them particularly difficult to obtain.

Stamp Gossip

Keep In Touch

WE are now at the time of the year when the urge to be out-of-doors is the strongest, and, of course, after such a cold and miserable early beginning to 1962 it is only natural that every advantage will be taken to welcome the sun. That's all right, but as I know from correspondence many readers of these Notes collect current stamp issues—mostly of our own Commonwealth—and summer or no summer new stamps have a habit of popping out just as frequently in July as in December. It is also a fact that some of these stamps have a very short life.

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So, if you completely ignore your collection during the out-of-door period, you will find when you come to take up the threads again that new stamps which, when they appeared only cost coppers, may have jumped up to as many shillings.

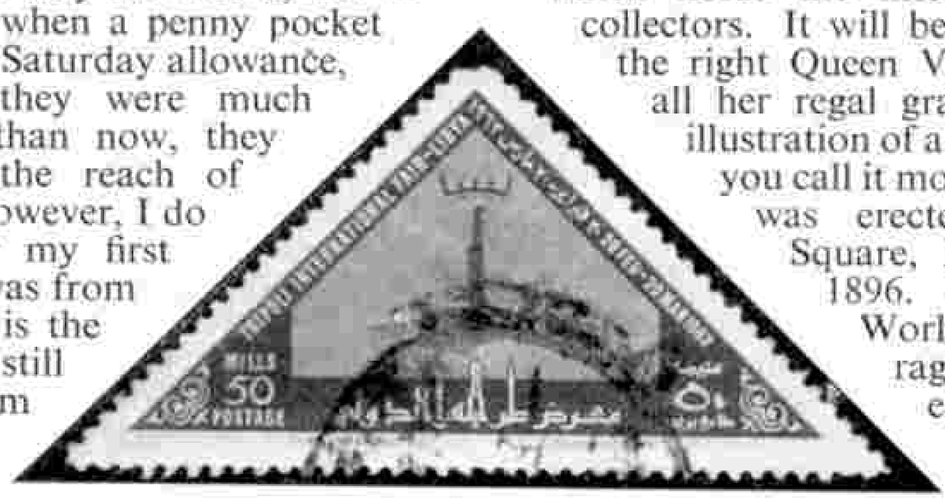
There are those "Malaria Eradication" issues, for instance. Even as these lines are being written there are signs that in a month or two prices of some of these stamps will be well up. So, for our own sakes, let us not forget entirely those "bits of paper" which provide so much fun over most of the year. It is a very good idea to join a new issue service. Why not ask your dealer what he can do for you in that line?

WATER, WATER

I suppose that when these lines appear, particularly as so many people will be visiting Ullswater during summer holidays, there will still be a good deal of discussion as to the rights and wrongs of Manchester's attempt to tap that glorious lake. It is not taking sides to say that few would agree with any plan which would mar the beauty of Ullswater. Yet it is not only in Britain that these water problems arise, for on April 14 last Greece issued a colourful set of seven stamps to commemorate an electrification project which has entailed not just the tapping of a lake for water, but even more drastic changes than those effected at Thirlmere which left that hitherto fine lake virtually a dead sea. Anyhow, Greece seems very pleased about the change, as in their case it means cheaper electricity. I wonder what kind of a set our Post Office would be allowed to issue if our lakes had been so transformed? I don't think one would be particularly popular, even with collectors.

TRIANGULARS

I was quite amazed recently when a young collector showed me his collection of nothing but triangular stamps. I had no idea how many of these there are, and the number is growing, too, so the many who seem to be collecting stamps in this form look like being kept busy. Of course, there are those greatest favourites of all, the "Capes" as they are called, but in my early days when a penny pocket money was the Saturday allowance, even though they were much cheaper then than now, they were beyond the reach of many of us. However, I do well remember my first triangular. It was from Liberia, which is the reason why I still have such a warm spot for stamps from that country. Actually, it was given to me by a friend of the family, and how that poor bit of paper got handled at school as I showed it to anyone who would deign to examine it. I am afraid it got very dog-eared in the process. A similar copy is only catalogued at a few shillings even now. I am a stickler for stamps in fine condition, but dog-eared or not I would give a lot more than full catalogue price to get that particular copy back. I think it went with more stamps sold to buy a pair of skates, long, long ago. I wonder what happened to the skates?



BUTTERFLIES

The collecting of stamps depicting butterflies is very popular, and when you look at such stamps as those issued by Czechoslovakia you cannot wonder, for they are really works of art. Of course, there have been a number of other pretty "butterfly" stamps issued, hence their popularity, but it is the designs of the Czech set which are so worthy of attention, as there is a lot more to these designs than a casual glance reveals. Each stamp depicts a butterfly, which everybody notices, but just examine the backgrounds of the stamps, for they have a direct link with the butterflies themselves. The aim has been—I think with great success—to depict how the countryside looks when the particular butterfly shown is present. Isn't that a wonderful idea? This Eastern European country has issued some very fine stamps, but I think that this "butterfly" issue takes the prize. A used set is quite inexpensive, and well within the reach of all of us.

MORE POSTAL CENTENARIES

That fascinating colony of Hong Kong has now added an interesting set to mark the centenary of its first postage stamps, issued as long ago as 1862. As these new stamps have world-wide appeal, for collectors everywhere go in for "Postal Centenary" issues, there has been a rush to buy. It is the design of the new stamps which holds the interest for British collectors. It will be noticed that at the right Queen Victoria sits with all her regal grace. This is an illustration of a statue (or would you call it monument?) which was erected in Victoria Square, Hong Kong, in 1896. In 1941, when World War II was raging, the Japanese attacked the

(*Cont. in col. 2 next page*)

By E. W. Argyle

Locomotives On Stamps

FOR a number of years now comfortable, diesel-driven rail-car trains, called TEE trains (Trans – Europ – Express) have been plying between various European cities. A newly-issued stamp of Switzerland shows the latest type of electric TEE train, which has been developed by Swiss engineers and designed for four distribution systems. This new electric train can be used on any electrified standard gauge railway line on the Continent and now operates on the sections Zurich – Gotthard – Milan, and Milan–Simplon–Paris.

Australia's first steam railway, between Flinders Street, Melbourne and Sandridge (now Port Melbourne), a distance of about two miles, was opened for public traffic on September 13, 1854. It was constructed and operated by the Melbourne and Hobson's Bay Railway Company and was subsequently acquired by the Victorian State Government. A locally-built train ran on the line until four engines ordered from Robert Stephenson arrived from England. The local engine is shown on the stamp with a modern diesel locomotive.

A French Railway Tour—

(*Continued from page 265*)

Two days in Perpignan were spent largely in sightseeing. Wednesday found us in Cerbere, on the Spanish border, where the five feet six inches gauge track of the Spanish National Railways (R.E.N.F.E.) terminates.

The beginning of the return journey really started with the 8.36 train from Perpignan to Villefranche, on the morning of Thursday, August 25. This is a standard-gauge electrified line, worked by ancient motorised baggage cars, each with four passenger compartments, extra accommodation being provided by attaching four-wheeled carriages as required. Climbing steadily into the Pyrenees, the train passed many little towns perched precariously on hill-tops, each surrounded by fortified walls, with a church or castle occupying a prominent position.

From Villefranche a third-rail electrified metre-gauge line took us through superb pine-clad mountain scenery to La Tour-de-Carol, in the middle of the Pyrenees and on the Spanish border. The summit of the line near Bolquere-Eyne is nearly 5,000 feet above sea-level, and is the highest point on the S.N.C.F. As soon as it had been reached, around tortuous curves, and up gradients as steep as 1 in 25, the motor gears began to grind, and the heat to rise from the banks of resistors under the carriages as the rheostatic brakes were brought into action for the descent. The R.E.N.F.E. runs into La Tour-de-Carol, and there are thus metre, standard and five feet six inches gauges side by side in the station, which is a large, solidly built affair, situated in a depression in the mountains and serving nowhere in particular.

From this point, an all-stations train, hauled by a Bo–Bo electric locomotive and consisting of one bogie, one six-wheeled and one four-wheeled carriage, plus a four-wheeled van, took us on a long, steady descent, mountainous at first but gradually opening out into a wide fertile plain, to Toulouse, where Thursday night was spent.

The last leg of the journey, back to Paris, was a long one, and was accomplished on the 10.8 from Toulouse the next day. A 1,500-volt D.C. electric locomotive No. CC7104 had a load of well over 800 tons as far as Brive, and from there, a reduced load of fifteen coaches, a Wagon-Lit restaurant car and a bogie van, still totalling over 750 tons. We arrived outside the Gare d'Austerlitz before time, but a signal check of nearly four minutes prevented a punctual arrival. The 400 kilometres from Limoges to Paris had been covered non-stop in 3 hours 55 minutes, at an average speed of 64 m.p.h., with maxima frequently in the eighties.

As a final salute, the 7.54 a.m. boat train from Paris (Nord) the next day took us to Amiens, 131 kilometres out, in 67¾ minutes at an average of 72.4 m.p.h., behind 25 kV Bo–Bo No. 16017. This indeed made a fitting end to an eighteen-day tour, in which only once had we been more than a minute or two late.

In spite of the engineering achievements of the S.N.C.F., it is the enormous enthusiasm of the staff which makes the most lasting impression. In some respects French railway development lags behind ours, but it is obvious that the railway system is regarded with pride by all Frenchmen, particularly those inside the industry, who are determined to make it the finest in the world, if it is not that already.

My friend and I wish to offer our gratitude to those members of the French railway staff who were so keen to illustrate to us the results of their enterprise.

Photographers' Page—

(*Continued from page 273*)

views seen by the two viewfinders, making any final adjustments necessary. Remember that the Meccano Viewfinder need not cover the whole of your picture. In fact, it is a good plan to leave a small margin all round to allow for errors. Lastly, do bear in mind that no viewfinder sees exactly the same field as your lens. This is of no importance when subjects are further than five feet away, but must be remembered and allowed for when taking close-ups.

Next month: Boat photography—including exciting action captured with the help of the Meccano Sports Viewfinder.

Stamp Gossip—

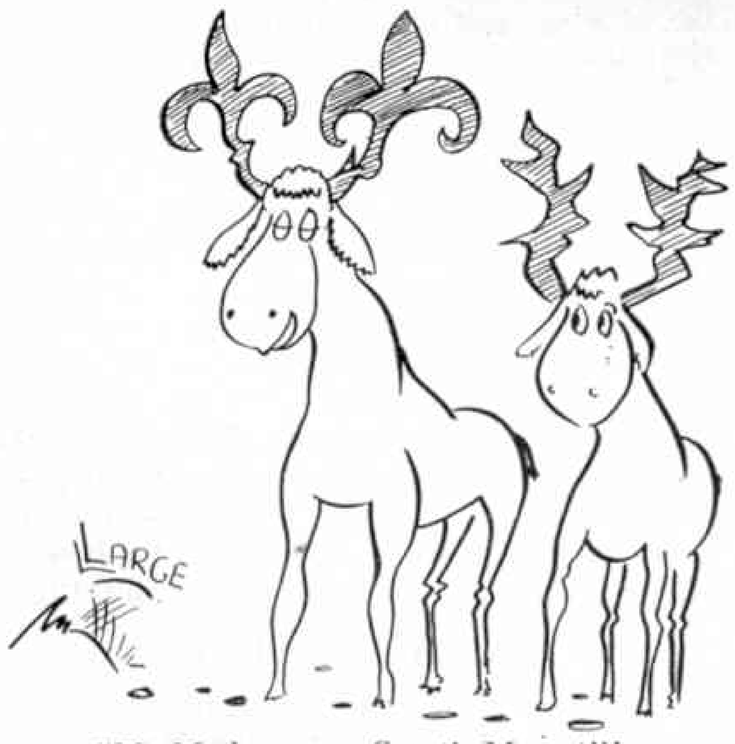
(*Continued from previous page*)

colony and captured it on the Christmas Day of that year. Queen Victoria was one who had to be banished, and her statue, much damaged, was taken to Osaka, Japan, to be broken up for scrap. But it survived, and in 1946 was recovered and repaired, and now stands in the new park, which has been named Victoria Park.

The stamps of Hong Kong are very popular, and shortly an entirely new definitive issue is to be emitted. So in view of all that I shall have more to say about Hong Kong's stamps later on. Meanwhile, don't overlook this "Postal Centenary" set.

THE TIP OF THE MONTH

I have just written about the new "Postal Centenary" set for Hong Kong, and suggested that a set is well worth buying, but my tip this month is to suggest that you might find it worth your while to go a bit deeper with these "P.C." issues for, as I have already remarked, they are interesting collectors all over the world, and you know what that can mean, in time. Start your collection with our own country, for we were the first to issue postage stamps. All we got as a "Centenary" was a very dull set, and that was no thanks to the Post Office, for they fought very hard against the idea. But "P.O." has relaxed a bit since then; there were three special issues last year and another is scheduled for November this year. However, it is "P.C." stamps in general I have in mind and, I repeat, these stamps are well worth consideration.



"My Mother was a Scout's Mascot!"

THE SANDSTONE POST BOX AT SHISKINE, ARRAN

In the May issue of the *M.M.*, we published on page 199 an answer to a query by Bill Reed of Pontefract about an elaborately decorated sandstone post box which he had seen at Machrie Road End, Shiskine, while he was on holiday in Arran. The answer which came from Charles Hendry, who himself lives on the Isle of Arran, was to the effect that the builders of the post box, finishing its erection with a number of days in hand on the time allowed, filled in the remainder of the time by carving the elaborate designs on the stones.

Now comes an alternative explanation of these rather odd carvings from reader David E. Crossland of Nottingham, who writes: "While on a geographical study course in Arran this Easter, I heard an alternative explanation of the carving on the Machrie Road End post box to that put forward by Charles Hendry, from the driver of the bus we hired during our stay —a man who had lived on the island all his life and who knew everyone and everything on Arran. He said that the stonemasons given the job were two brothers, one of whom poached salmon from the Machrie Water. The other made the meaningless carvings, both to make the job take longer, so that his brother could catch more fish, and to keep watch while ostensibly busy at work on the post box."

The Story of Slate—

(*Continued from page 269*)

They employed the same method when counting slates. *Mwrw* is an abbreviation for mor-rif, which means "sea count".

Incidentally, a quarryman's hundred is 128 slates. Orders come for quarters and half . . . a quarter, for example, is ten *mwrw* plus two extra which is 32 slates ($10 \times 3 + 2 = 32$). So you see, four of these make the 128 or "hundred".

After stacking his month's production in the main stacking yard, the quarryman takes a nail and with it inscribes, on the last slate, his works number and a further number which represents the exact total of slates handed over. The whole stock is then carefully checked by an official of the quarry known as the slate examiner, who watches each handful of slates being loaded into the wagons, any defective samples being removed. When loading is complete, both loader and examiner sign their names or put their initials on the side of the wagons.

Reference must be made to the special boards that form the floor of these wagons. They are made of West Indian hardwood, or greenhart. These boards, as you will realise, take a severe pounding from the sharp corners and edges of the slates as they are dropped heavily into position. Ordinary timber would never stand the terrific wear and tear involved.

Although slates are in demand mainly for roofing purposes they have many other uses. They make excellent billiard tables, as they never warp; they are ideal, too, as laboratory tables, since slate is unaffected by acids. Chemical vats also are made from slate, as are a host of sundry items such as door posts, steps, window sills, troughs and cisterns.

Welsh slates occupy many places of honour all over the world. The Houses of Parliament were roofed with slates from the Preseli Mountain. The electric panels on the *Queen Mary* and the *Queen Elizabeth* are slabs from the Penrhyn Quarry, Bethesda, and slates from Oakley Quarry at Ffestiniog were used for the damp-proof courses below the nave of the new cathedral at Guildford.

Why, then, if slate is such a wonderful substance, is there a decline in the slate industry? And why are not all roofs made of slate? The questions are interlinked. In recent years, tiles, asbestos and other materials have been used in the building trade. Further, a roof made with tiles is cheaper than that of slate, which can reduce the cost of a new house, but the fact remains that a slate roof will last longer than a tile roof. Even the Romans found that slates which they discovered in the Caernarvon district were ideal for building purposes. They also realised that slate was impervious to water.

Coming right up to date, after the recent hurricane which caused so much havoc in Sheffield, the quarries of North Wales sent every available slate to Yorkshire to make good the damage to roofs.

Fireside Fun

Two solemn-faced men went fishing in an old launch. For three hours neither of them moved a muscle. Then the one up forward became a bit restless.

"Confound it, George", grumbled his companion. "That's the second time you've shifted your feet in 20 minutes. Did you come out here to fish or to dance?"

"Sorry Mrs. Brown . . . . Your Harry's zip stuck!"

The hotel clerk was losing his patience and so was the gentleman trying to get a room. "Look," said the clerk, "I've told you a dozen times already, we don't have any rooms. We're full!"

"If the Prime Minister came," the visitor persisted, "you'd have a room for him, wouldn't you?"

"Why, of course," the clerk admitted.

"Then let me have his room," said the visitor, "He's not coming."

The Editor of a certain magazine received a letter from Edinburgh which warned, "Gentlemen, if you print any more jokes about stingy Scotsmen, I shall cease borrowing your paper."

* * * *

"You simply must take time for fun and relaxation," the doctor told his patient.

"But doctor," was the reply, "I'm too busy."

"Nonsense!" the doctor said, "the ants are hard-working creatures, but they always take time to attend all the picnics."

* * * *

The older generation thought nothing of getting up at six in the morning. The younger generation doesn't think much of it either.

* * * *

"So you were convicted of burglary twice, robbery with violence three times, and manslaughter once?" asked the magistrate.

"That's right, sir," replied the defendant, "After that I seemed to drift into a life of crime."

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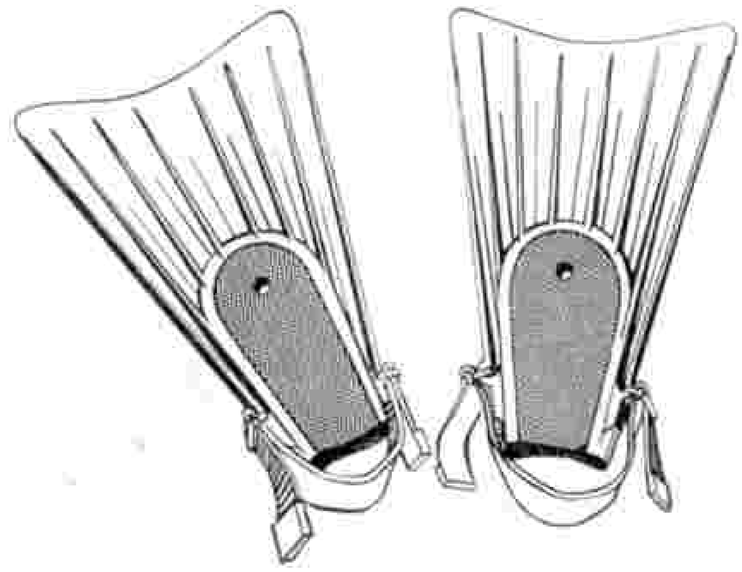

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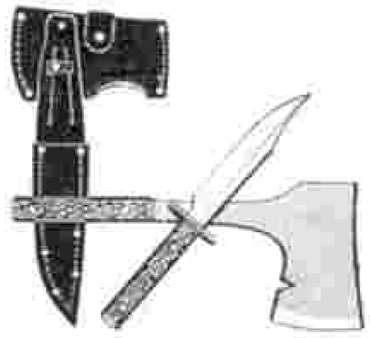

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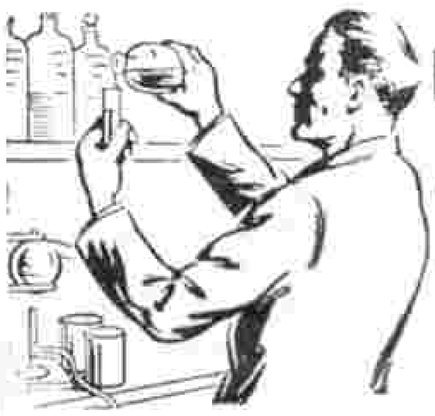

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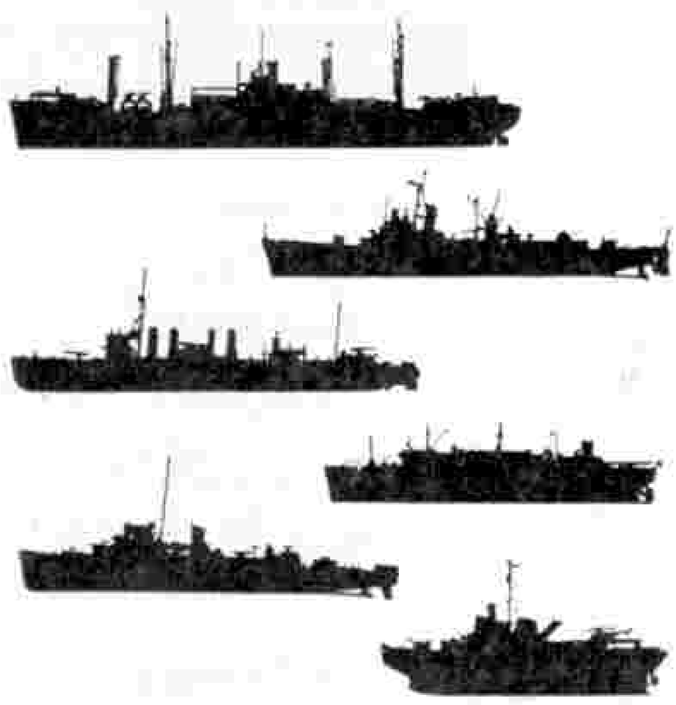

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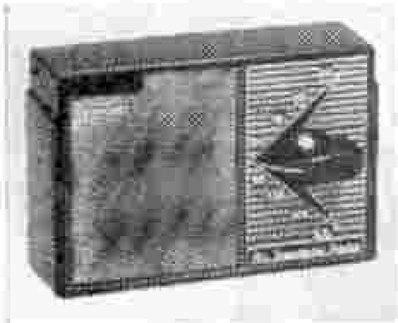

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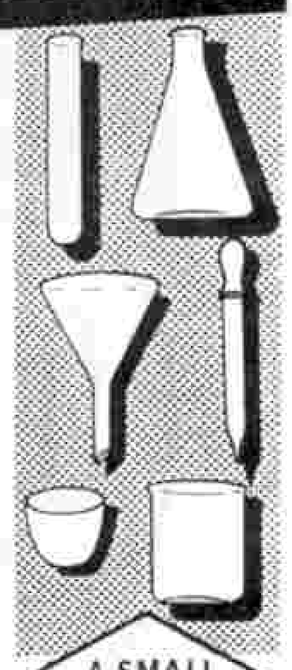

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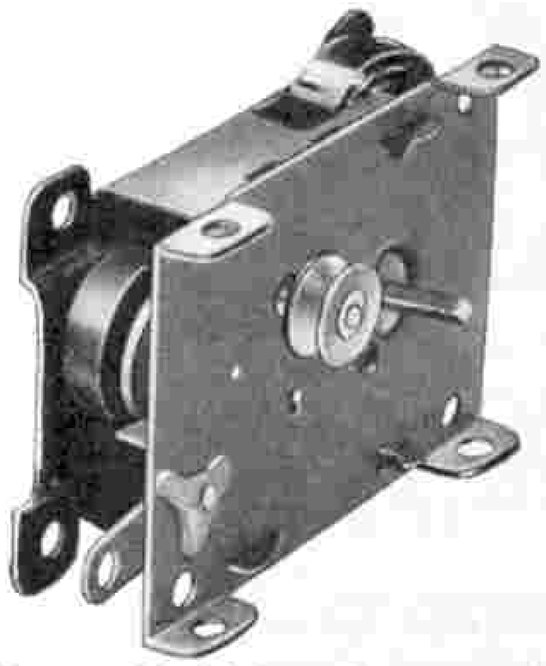

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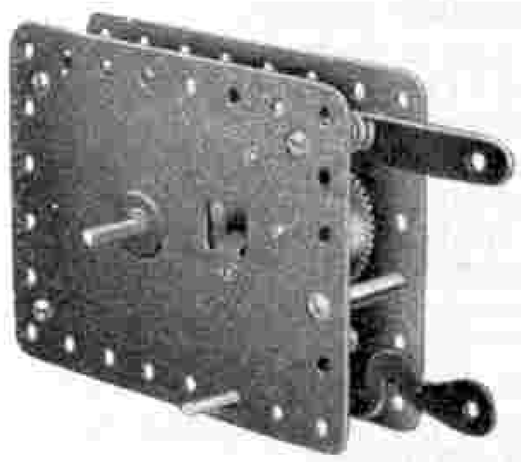

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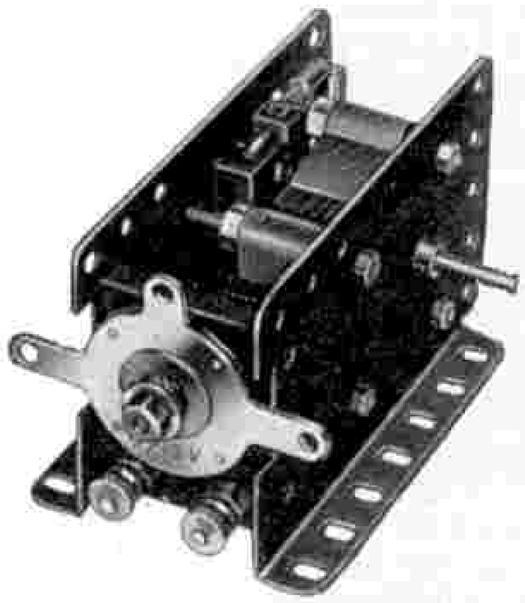
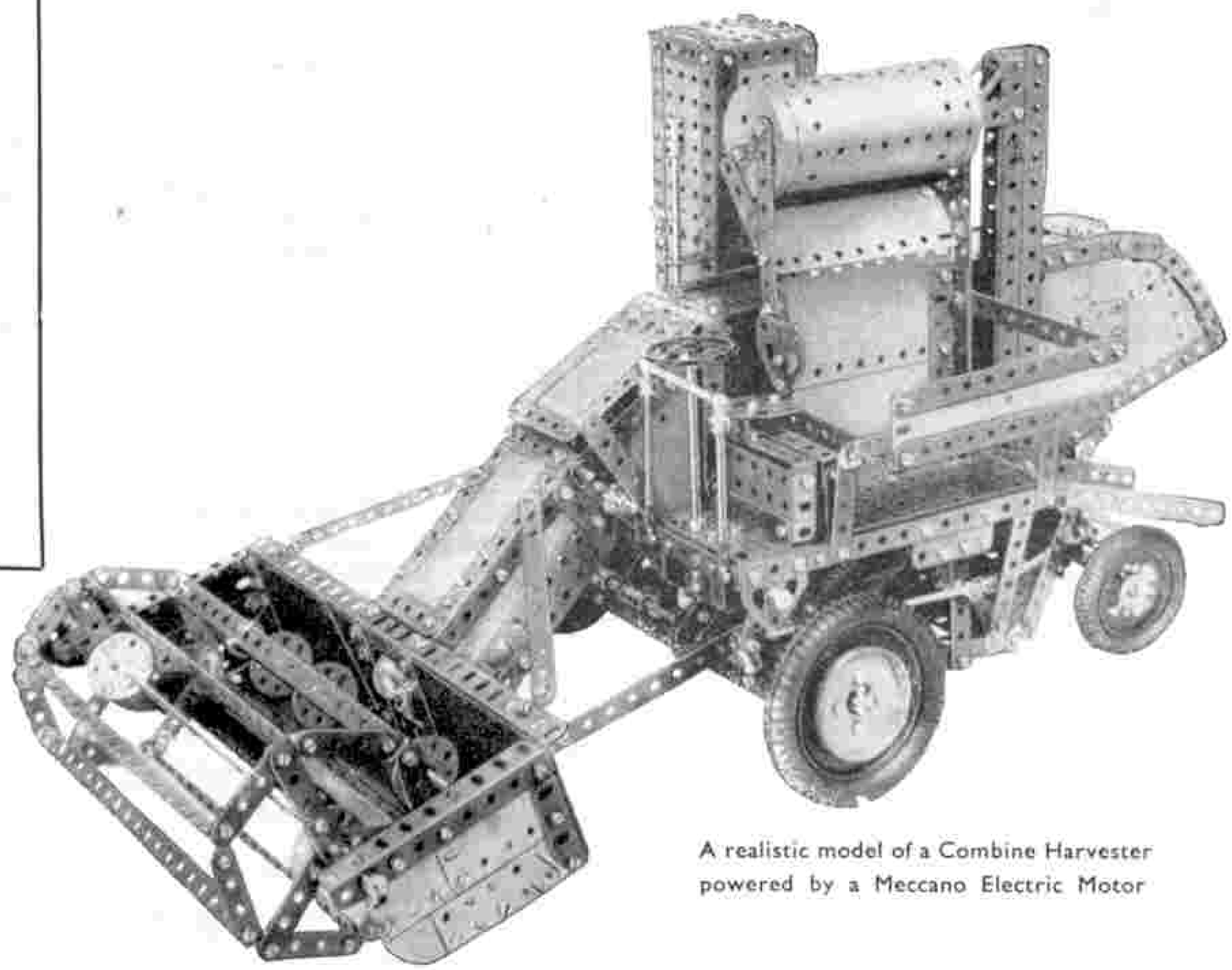


Meccano No. E15R Electric Motor. A powerful 15–20 volt motor with reversing motion. Fitted with TV interference suppressors. U.K. Price **45/6**



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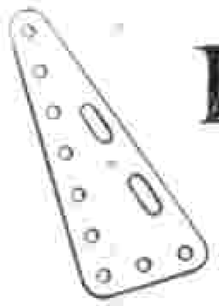

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Listed below are some of the dealers who sell Meccano accessories and spare parts. This is intended to aid enthusiasts—and there are many of them—who are constantly requiring additional spare parts for their Sets. All dealers are, of course, able to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

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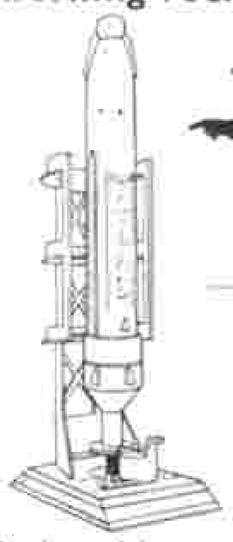

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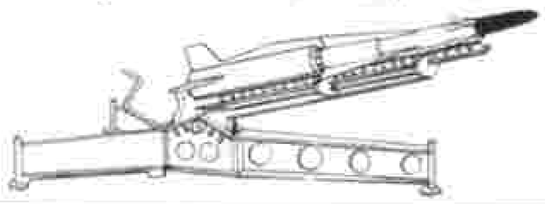

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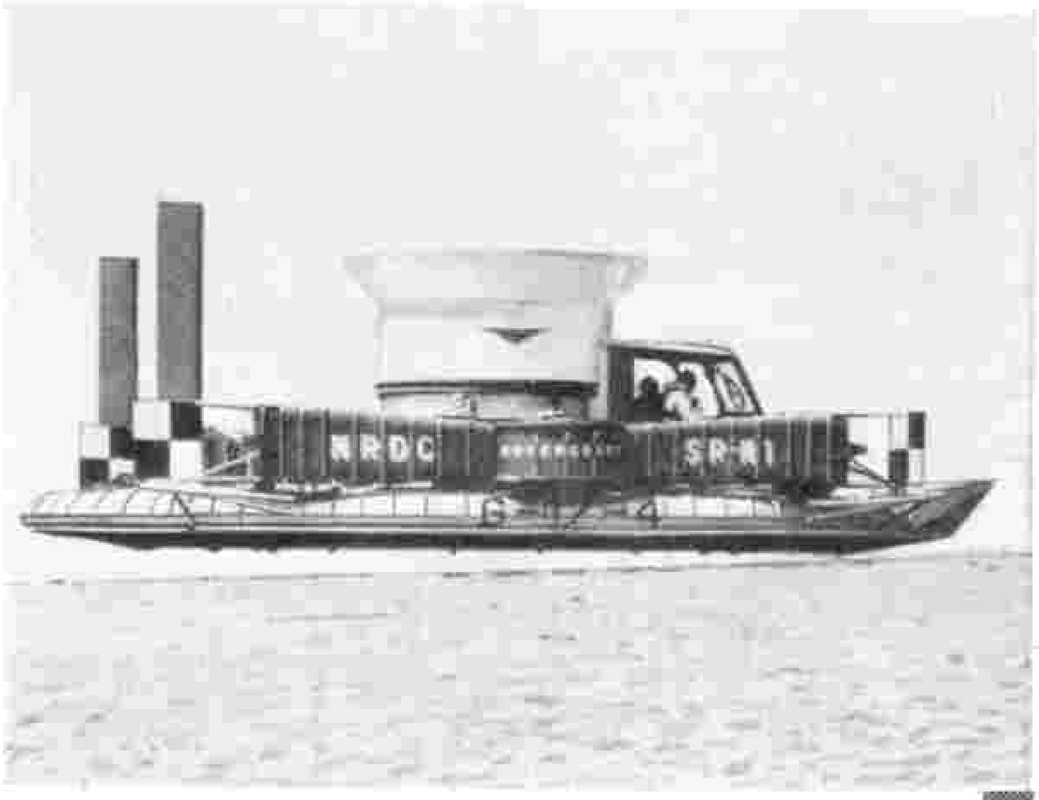

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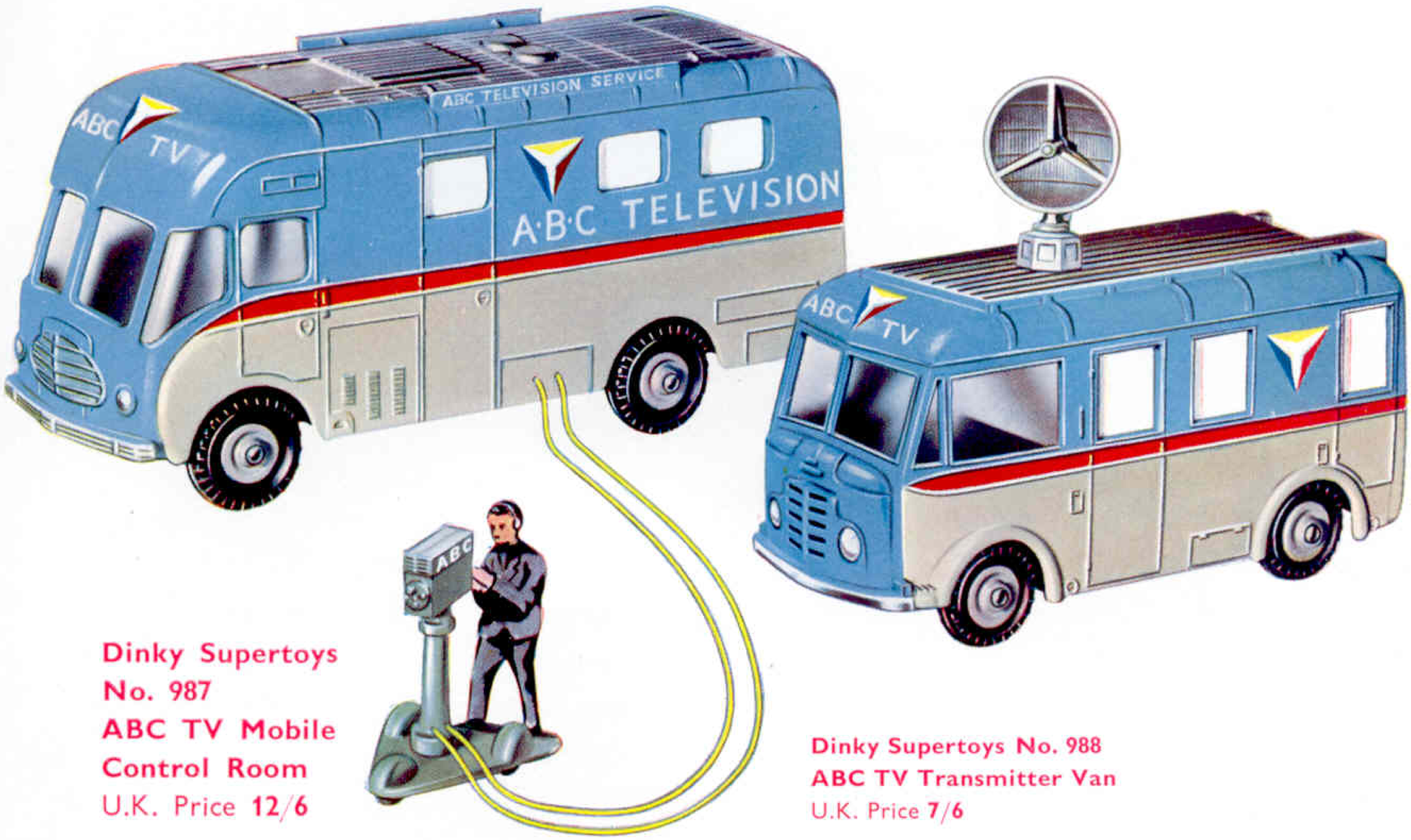

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