VOL. XLVIII Nº5 MAY 1963

MECCANO MAGAZINE

1/3

HORNBY SPEEDBOATS

ELECTRIC AND CLOCKWORK MODELS

Model No. 10 ELECTRIC MOTOR LAUNCH 'CAPRI'

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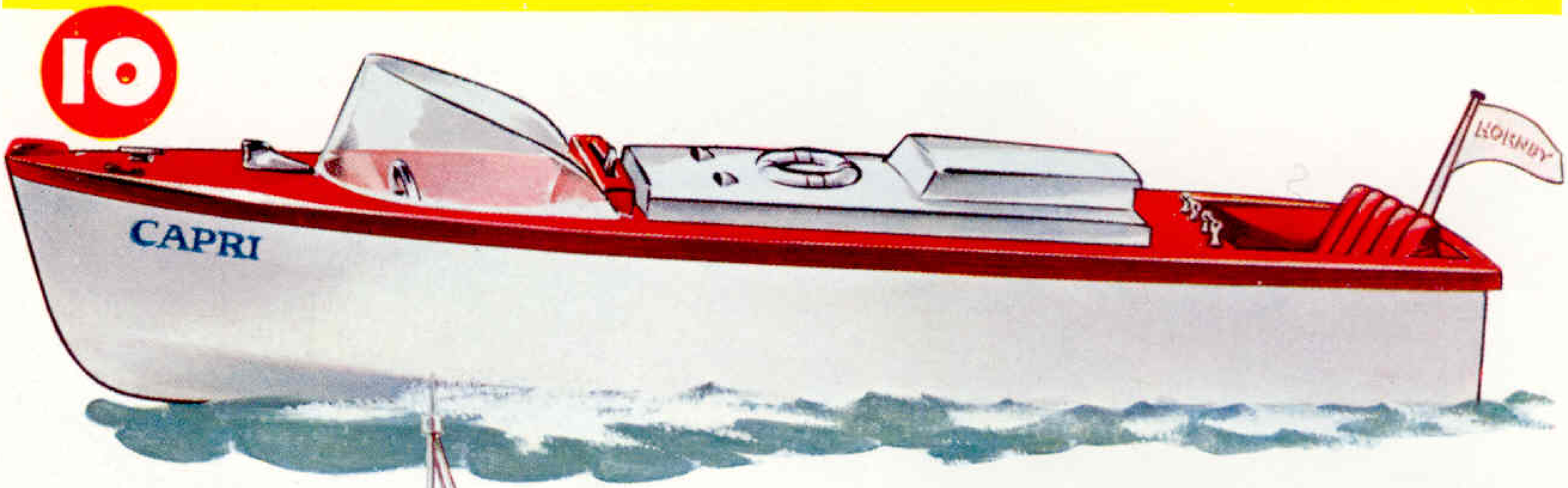

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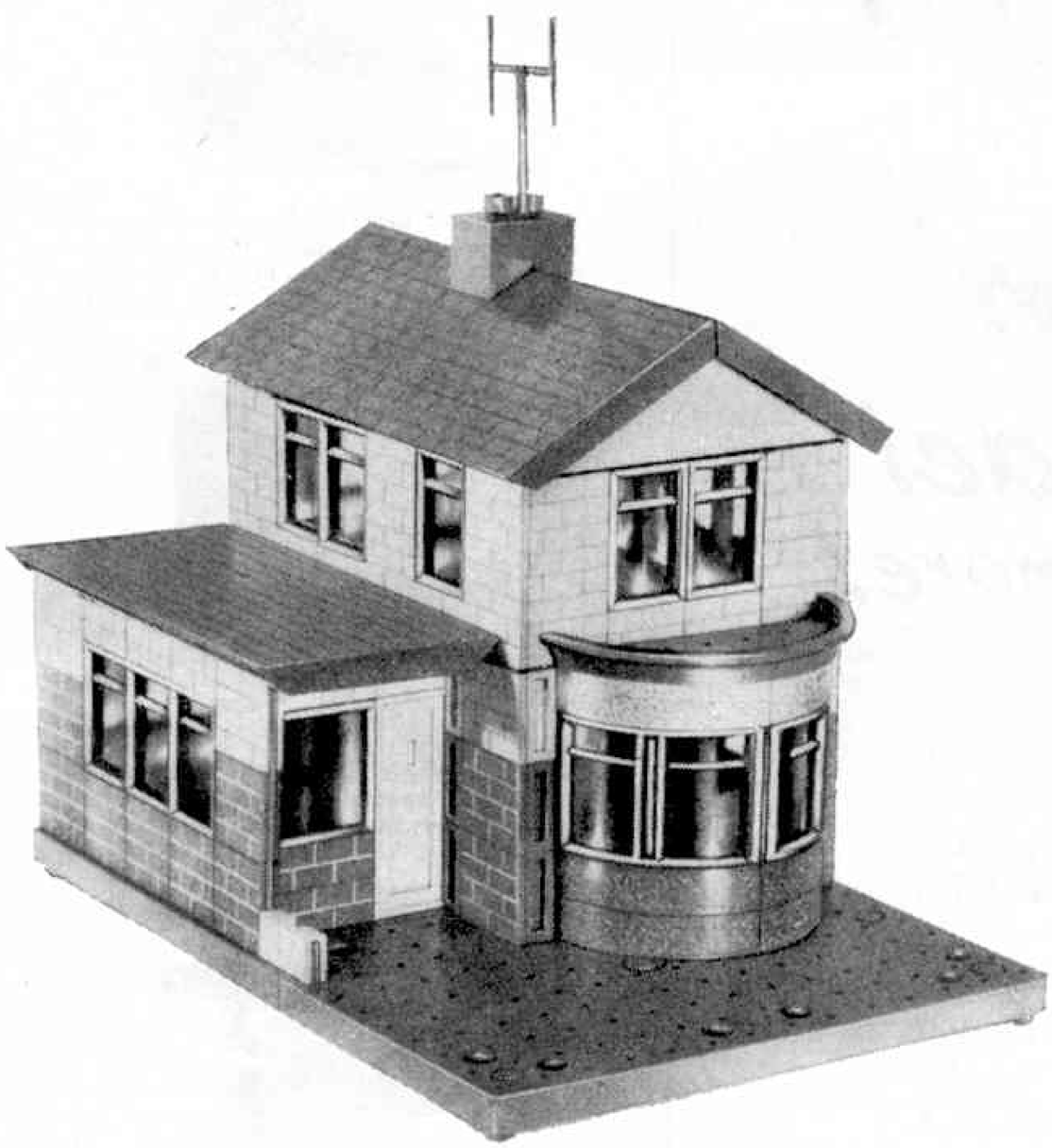

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No. 12c Accessory Outfit ..		12	3
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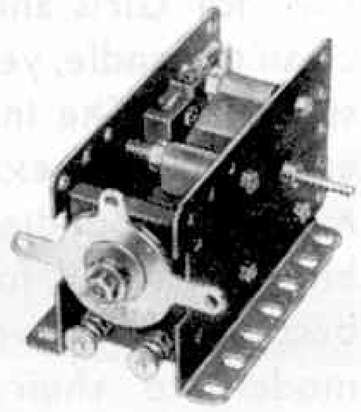

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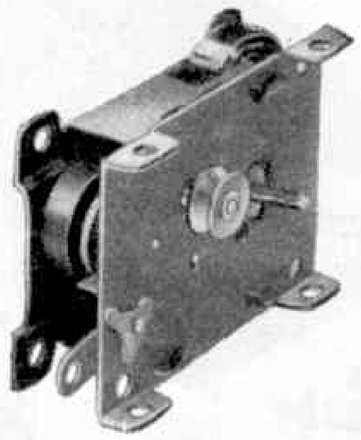

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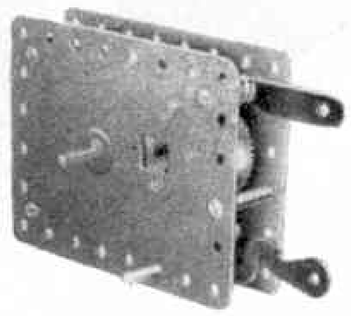

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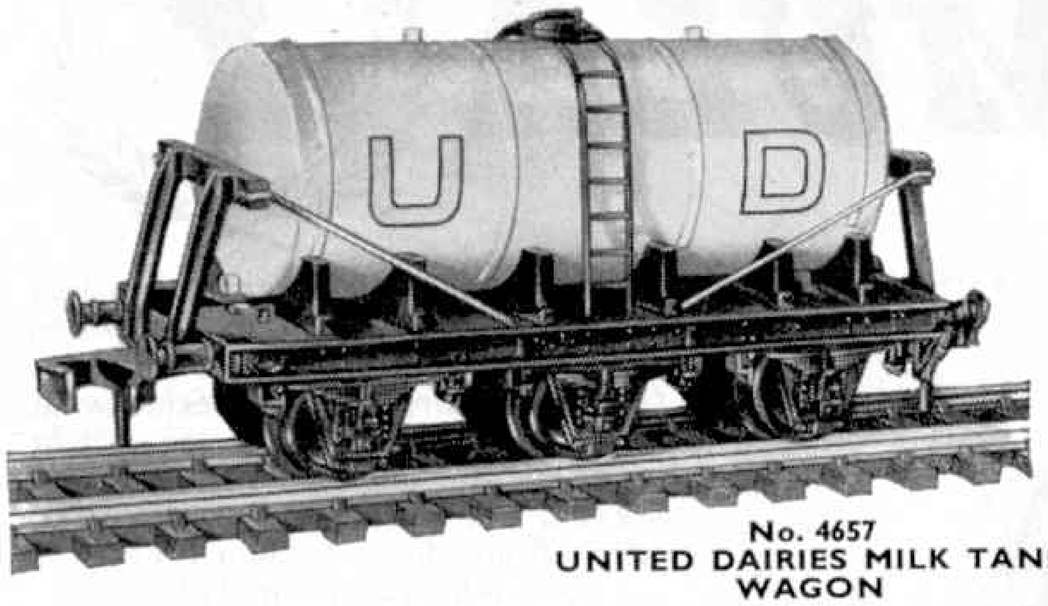

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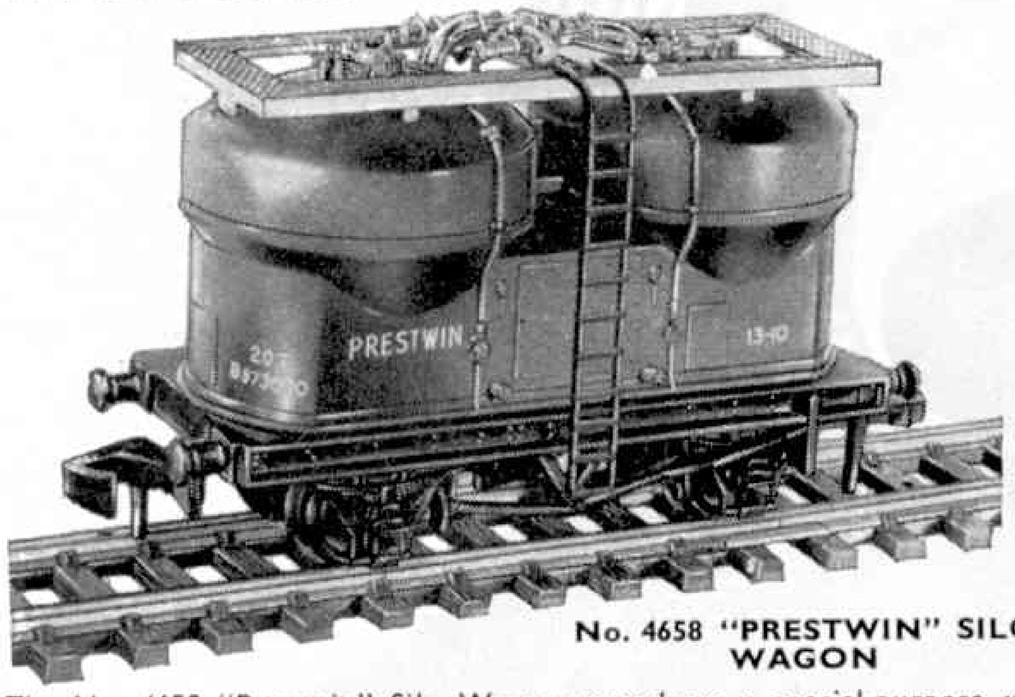

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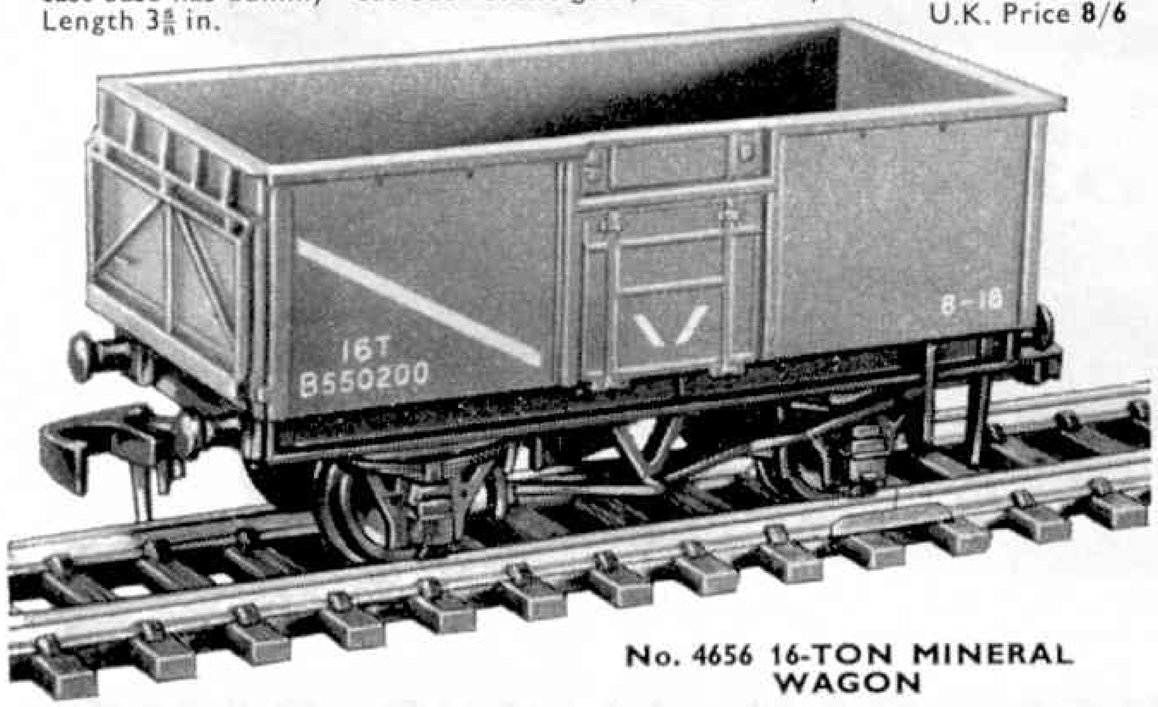

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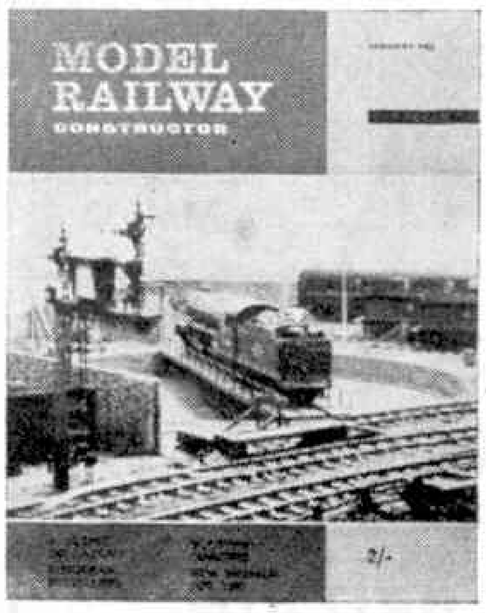

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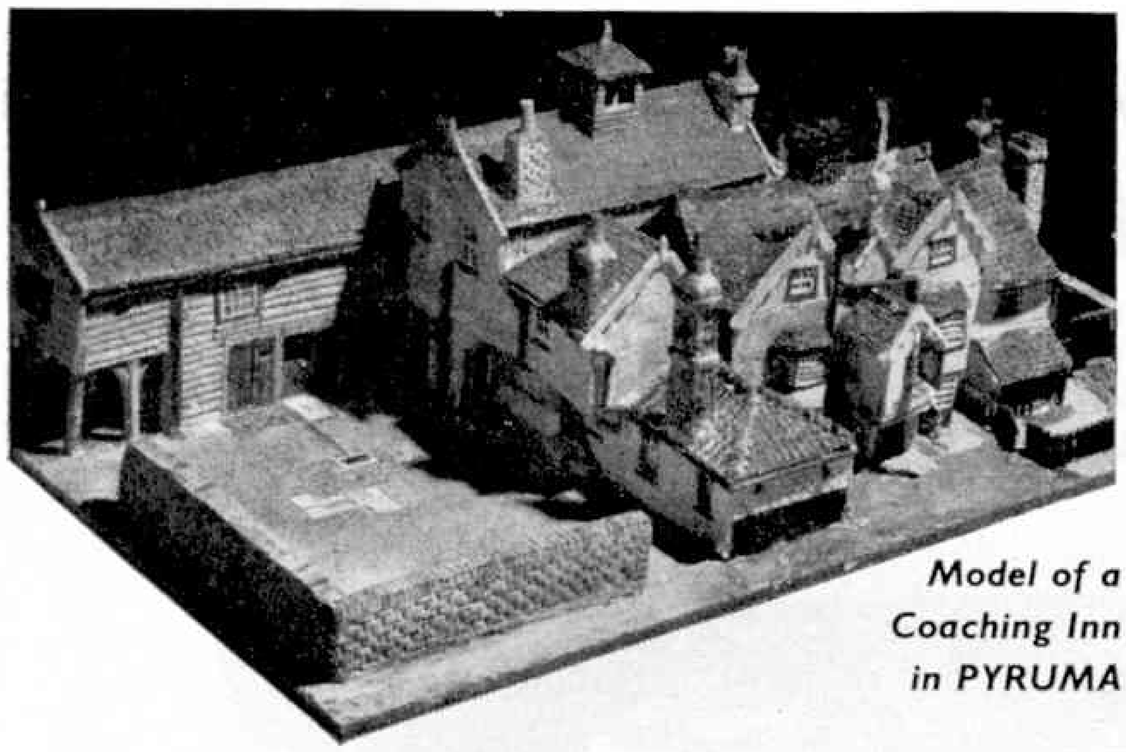

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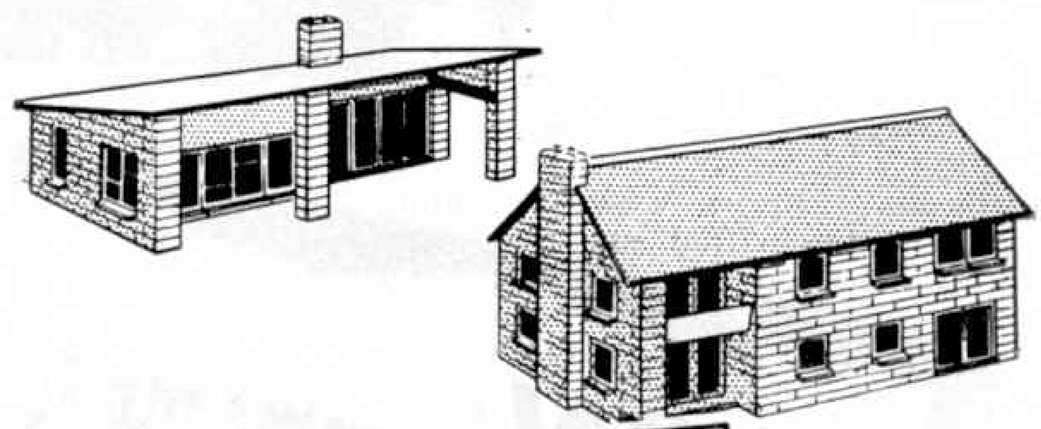

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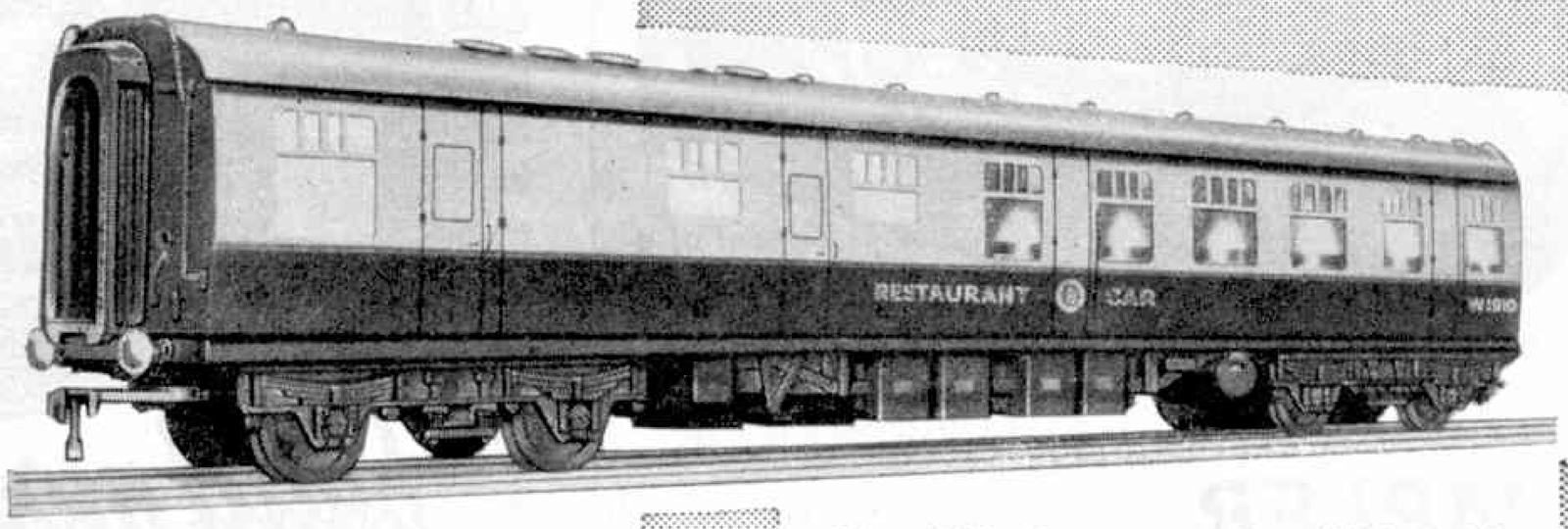

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No. 4071 Restaurant Car B.R. with interior fittings.
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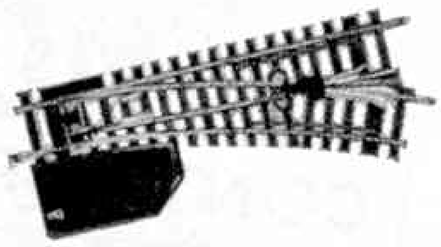

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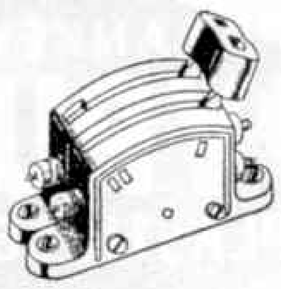

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MECCANO MAGAZINE

Volume XLVIII No. 5 May 1963

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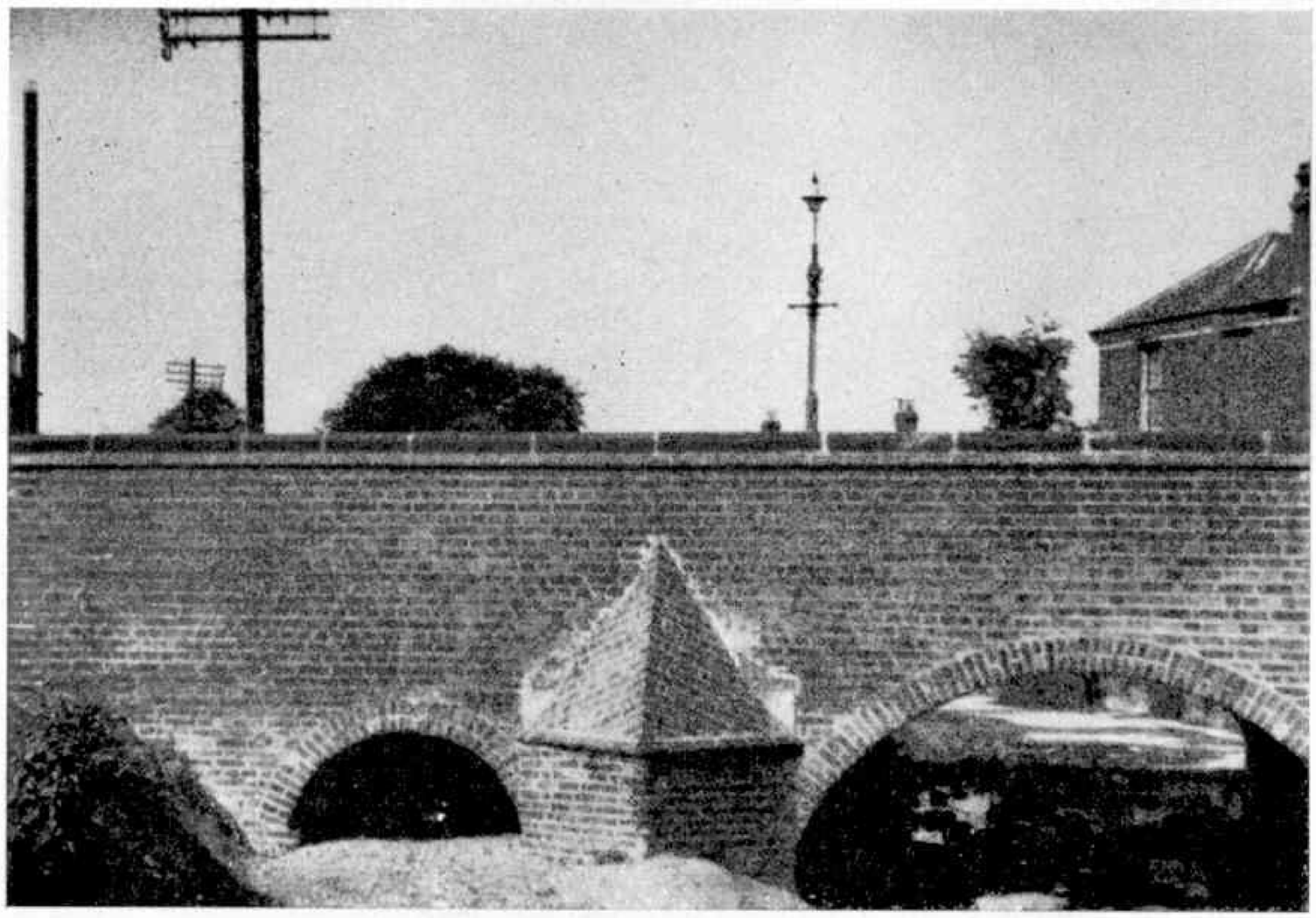


ONE would not have thought that time, that precious commodity of the present age, mattered all that much in what we regard as the leisurely days of the last century, but this month's picture proves that the race against the clock is not the prerogative of the modern world. The illustration, sent by Mr. Arthur Gaunt, one of the *M.M.'s* best-known contributors, shows the bridge at Syston built 160 years ago to carry stage coaches and other traffic over a brook between Leicester and Grantham. Speed was essential even then if traffic on that route was not to be seriously hindered. One man, when challenged to erect such a bridge in the shortest possible time, planned to carry out the contract in just over a week. First, he collected all the materials he needed—thousands of bricks and tons of stone. He had these piled up where they would be most readily at hand when required, then enlisted three bricklayers and six labourers, choosing men capable of working at high pressure for long periods. Each was carefully briefed about what he had to do and the job was organised like a military operation. And as the villagers watched agog, the new bridge sprang up under their noses. In nine days it was completed. As the years sped on into the present age it carried far heavier traffic than its builder could ever have envisaged. Well did it earn its title—the nine days' wonder.

I am sometimes asked why the *M.M.* does not carry a Letters-to-the-Editor page. Well, many years ago it had such a feature, but in time correspondence became so heavy that we formed, within the Magazine Department, an Information Service which now handles a vast quantity of letters from all parts of the world. These normally deal with matters of special significance to the correspondent concerned, and do not possess a great deal of general appeal. However, if readers feel they would like to put forward their views on various topical subjects, limiting their remarks to not more than 200 words, I am prepared to consider publishing a selection of letters as opportunity allows. Perhaps you will let me know what you think of the idea.

THE EDITOR

Next Month: A GIANT WALKING DRAGLINE

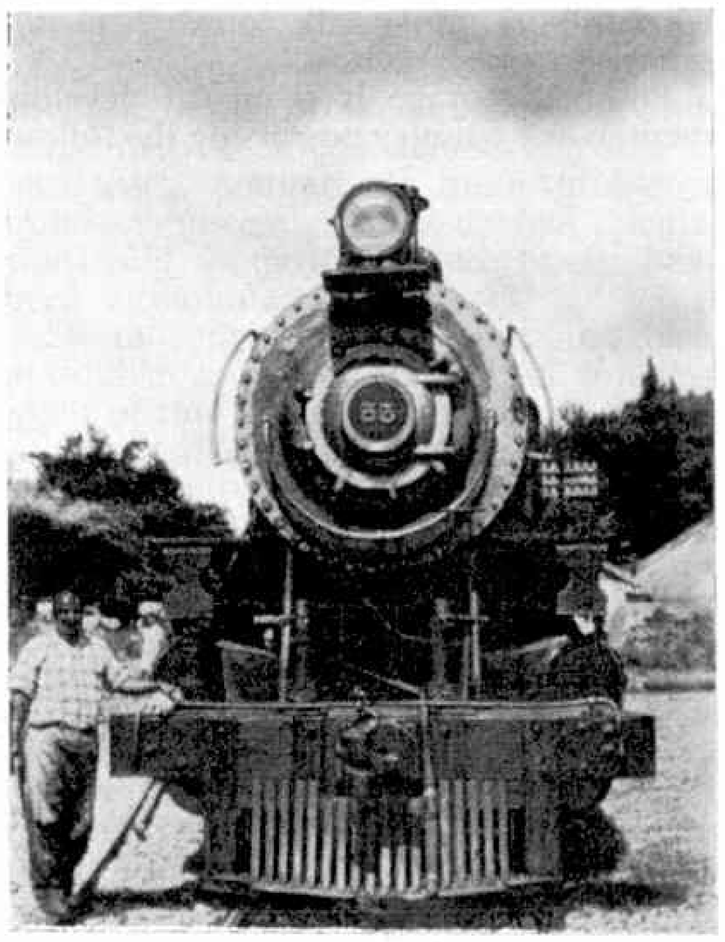
THIS MONTH'S CONTENTS INCLUDE—

	Page
CRUACHAN HYDRO-ELECTRIC SCHEME .. .. By J. C. Welbourn	190
THE FRIENDLIEST LINE IN THE WORLD .. .. By H. G. Forsythe	198
CATTLE KINGS OF THE OUTBACK .. .. By E. R. Yarham	202
TRACKSIDE NEWS	206
MECCANO MODEL-BUILDING ..	214

OUR FRONT COVER

Seen on our front cover this month is a Class M3 4–8–0 oil-burning locomotive of the Jamaica Railways. You will find the story of this intriguing line inside this month's issue. The locomotive on the cover, No. 55, was built by the Canadian Locomotive Co. Ltd. in 1944 and her total weight is 120 tons 14 cwt. Driving wheels are of 44-inch diameter.

Our picture shows the locomotive at the head of a mixed train at Gregory Park Station, six and a half miles from Kingston. The driver, posed in front of the engine, was checking it while waiting for the "all clear" to proceed to the next station on the single-track main line.



The Cruachan Hydro-Electric Scheme

By

J. C. WLEBOURN

IN North Argyllshire, on the slopes of Ben Cruachan (3,689 feet) where the average annual rainfall is some 90 inches, the North of Scotland Hydro-Electric Board will soon reach the half-way mark in the task of building the Loch Awe hydro project. This project, the total cost of which is in the region of £24,500,000 is made up of two orthodox hydro-electric developments and the Cruachan pumped storage development. The last-named scheme is the biggest and most up-to-date undertaking of its sort in the world.

When complete, the entire project will have a total installed capacity of 440,000 kilowatts and will produce some 557 million units of electricity each year. Of this, 40,000 kilowatts, producing annually 127 million units will be contained at Loch Nant and Inverawe, the two orthodox developments. The remainder of the plant capacity and an additional 430 million units will come from the pumped storage section.

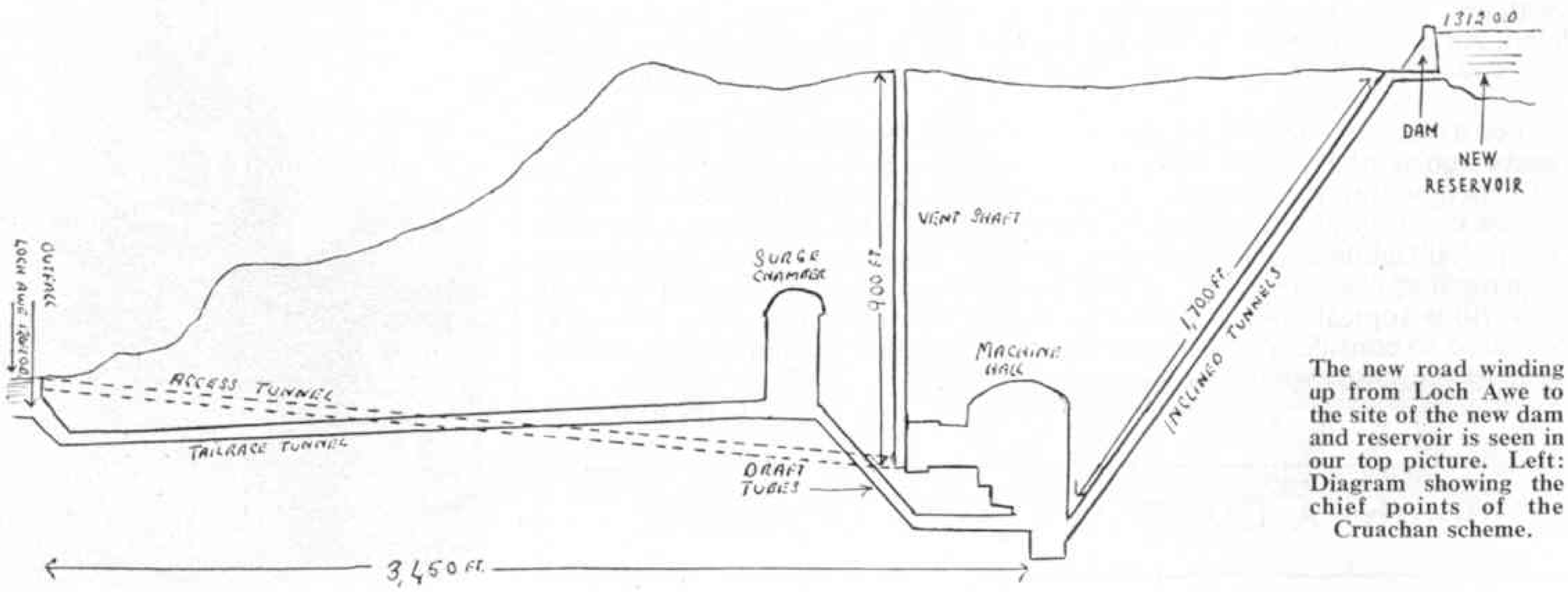
Pumped storage is a logical development in any country possessing the following essential requirements—high efficiency thermal and nuclear power stations, large natural water resources and mountainous country all of which must be sited reasonably close together and not too far from main centres of electricity production and consumption so that there are no heavy losses in transmission.

High efficiency thermal and nuclear stations operate economically only when their rate of generation remains constantly high. This means that if such stations are damped-down, at night or at week-ends—the two off-peak periods when electricity consumption is low—the fuel and time required to bring these stations back to the high output for which they are designed is such as to make them quite uneconomic. The alternative to damping-down is simply to run to waste the surplus off-peak output of these stations.

Scotland now has in operation several high efficiency thermal stations. Very soon at least two other major high efficiency thermal stations and one large nuclear station will come into operation. When each of these is working, Scotland will have a surplus of electricity at off-peak periods.

Several years ago, with this off-peak surplus in mind, and aware that Scotland also possesses the other essentials required for pumped storage generation, the Cruachan scheme was planned. All the surplus electricity required to operate it will be produced in the south of Scotland. It will be collected at a point just north of Glasgow and, from there, transmitted for 53 miles over double-circuit 275 kV overhead lines to Cruachan. There it will operate four pump-turbo-generators soon to be erected in a large underground power station at present being excavated from solid granite deep in the heart of Ben Cruachan. These four machines, each capable of a power equal to that of the *Queen Mary*, have a total installed capacity of 400,000 kilowatts.

The machines themselves will pump water from Loch Awe up two shafts each 1,700 feet long, and inclined at an angle



The new road winding up from Loch Awe to the site of the new dam and reservoir is seen in our top picture. Left: Diagram showing the chief points of the Cruachan scheme.

of 55 degrees to the horizontal, to a reservoir formed behind a new dam now being built, almost 1,300 feet above sea level, in a corrie on the shoulder of Ben Cruachan.

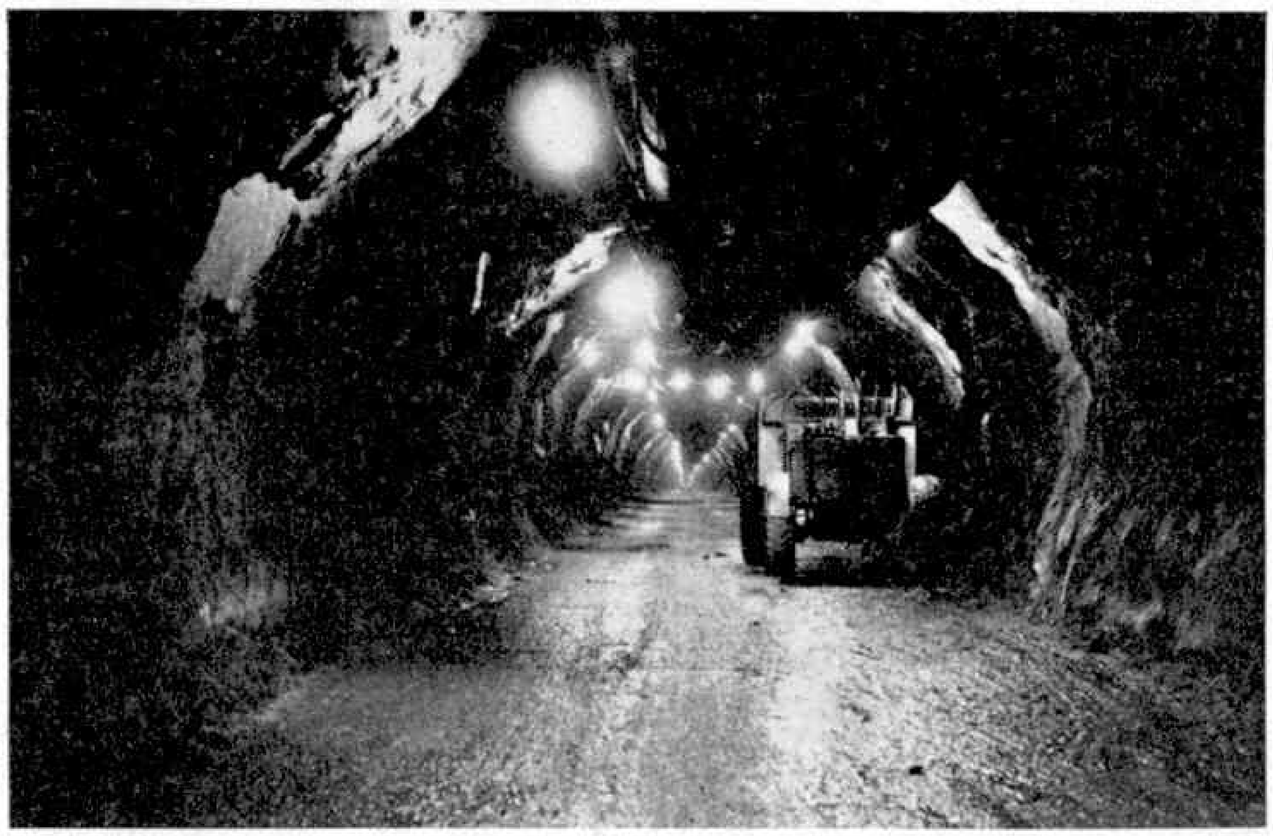
Loch Awe, which is 120 feet above sea level, is 24 miles long and has a surface area of 22 square miles, is large enough to permit great volumes of water being pumped from it without any noticeable draw-down. The new reservoir on Ben Cruachan will have a top water level of 1,312 feet above sea level and will fluctuate considerably.

The cycle of the operation will be pumping with surplus power at night and week-ends to produce peak energy the following day.

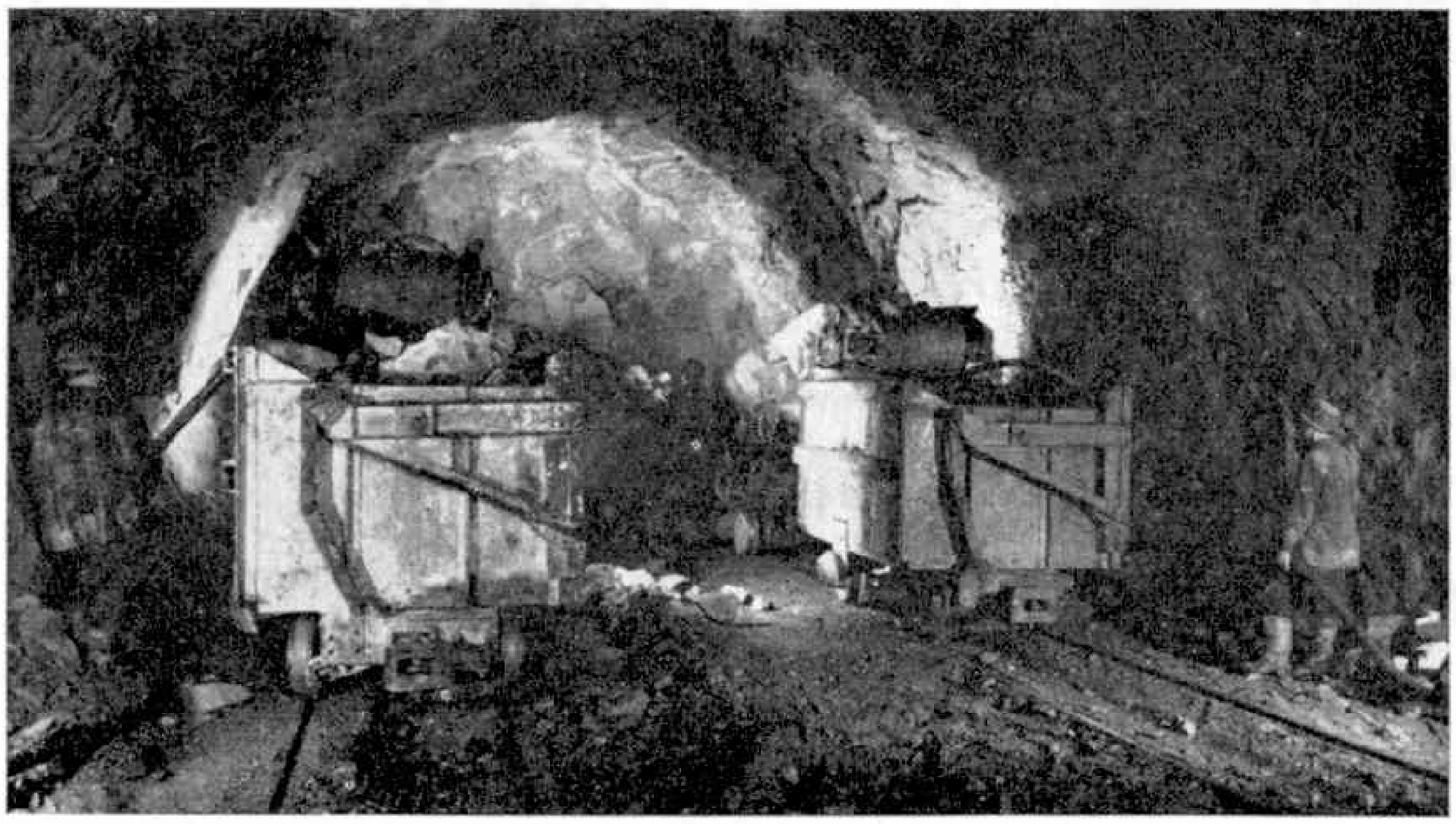
At these times of peak demand in the south of Scotland, water pumped from Loch Awe will reverse its flow and pass from the new reservior on Ben Cruachan, down the two shafts, through the pump-turbo-generators—producing electricity as it goes—returning finally at slow speed through a long tailrace tunnel and an outfall from the underground power station to Loch Awe.

This peak electricity will return to the south of Scotland over the same 53 miles of overhead line to the collecting point near Glasgow from where it will be distributed. In other words the surplus electricity produced in the industrial belt of Scotland will be used to "store" electricity, in the form of water, high up in Highlands until such times as the stored electricity is needed in the industrial areas.

Stripping the top soil at the site of the Cruachan dam. When rock foundations are completely bare, work will start on the erection of the massive buttress dam, 1,100 feet long and 150 feet high.



Looking down the access tunnel which leads from the surface of the Cruachan underground power station. The tunnel is almost two-thirds of a mile long and is cut from solid granite.



Tunnellers at work in a heading of the Cruachan underground power station. When all the underground work is complete, about 200,000 cubic yards of rock will have been excavated.

This peak load power produced by pumped storage will be invaluable in meeting sudden and urgent demands for power in Central and South Scotland. A station such as Cruachan can leap from a standing start to full output in four to five minutes and be shut down just as quickly.

Simple though it may seem, this highly imaginative scheme marks a very definite advance in electricity supply development and is among the present major constructional projects in Western Europe. The plan involves great technical achievements by civil, electrical and mechanical engineers.

The major technical breakthrough at Cruachan is the development of the reversible pump-turbo-generators capable of pumping such massive quantities of water to a maximum height of 1,207 feet. Intricate design problems had to be overcome in perfecting machines capable of such work. Similarly, hydraulic problems, quite unappreciated when the first calculations and model tests were made, have been surmounted.

So that British industry should have a double spearhead skilled in building plant of this sort, which more and more countries all over the world are undoubtedly going to require before long, the Hydro Board gave the contract for two machines to the English Electric Company, Limited and two to A.E.I. Ltd., thus making it possible for both companies to gain invaluable experience at Cruachan.

After careful surveying, and long-term inquiries into rainfall and drainage over the entire area, the first actual work undertaken was the building of an access road up the side of Ben Cruachan to the

(*Continued on page 213*)

WEATHER VANES AND "TELLY" MASTS

By H. I. O'Hara

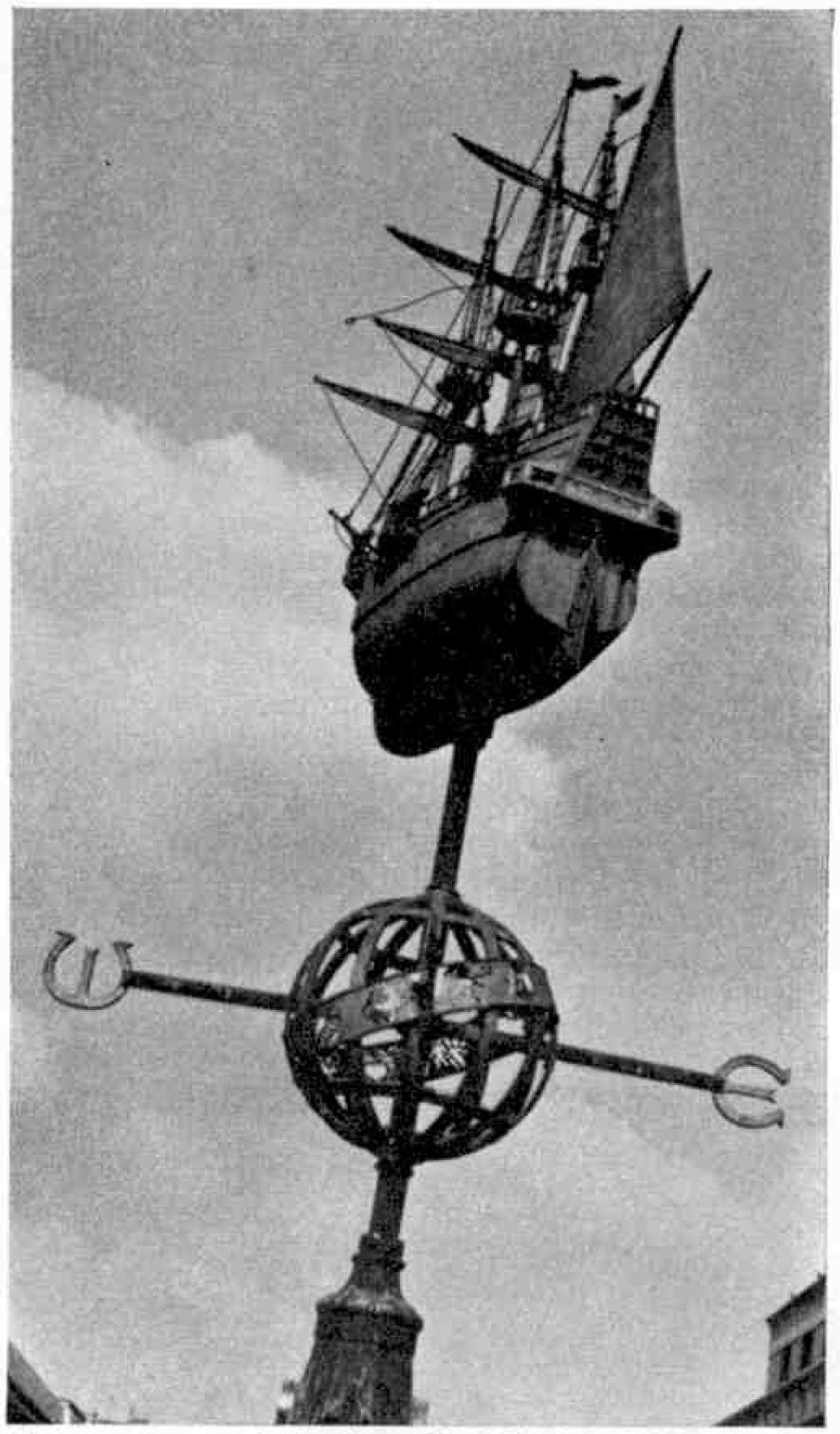
NOW that we have the Air Ministry Weather Shop and the agreeable gentlemen of radio and television telling us what the weather will do in the next 24 hours, who pauses to stand and stare at the weather vane to see which way the wind is blowing, or even bothers to set it right with a drop of oil or a fresh coat of paint?

The original use of the weather vane is lost in the mists of antiquity, but it seems likely that it was primarily used as a type of "house flag" bearing the owner's coat-of-arms, or a pictorial indication of his profession. A yacht indicated the home of a seafaring man and a bull or horse that of a farmer, and so forth.

Early vanes did not always have the cardinal points of the compass fixed on the rods, which adds to the belief that they were not originally designed as weather indicators, but more for the sake of ornamentation or as sign posts.

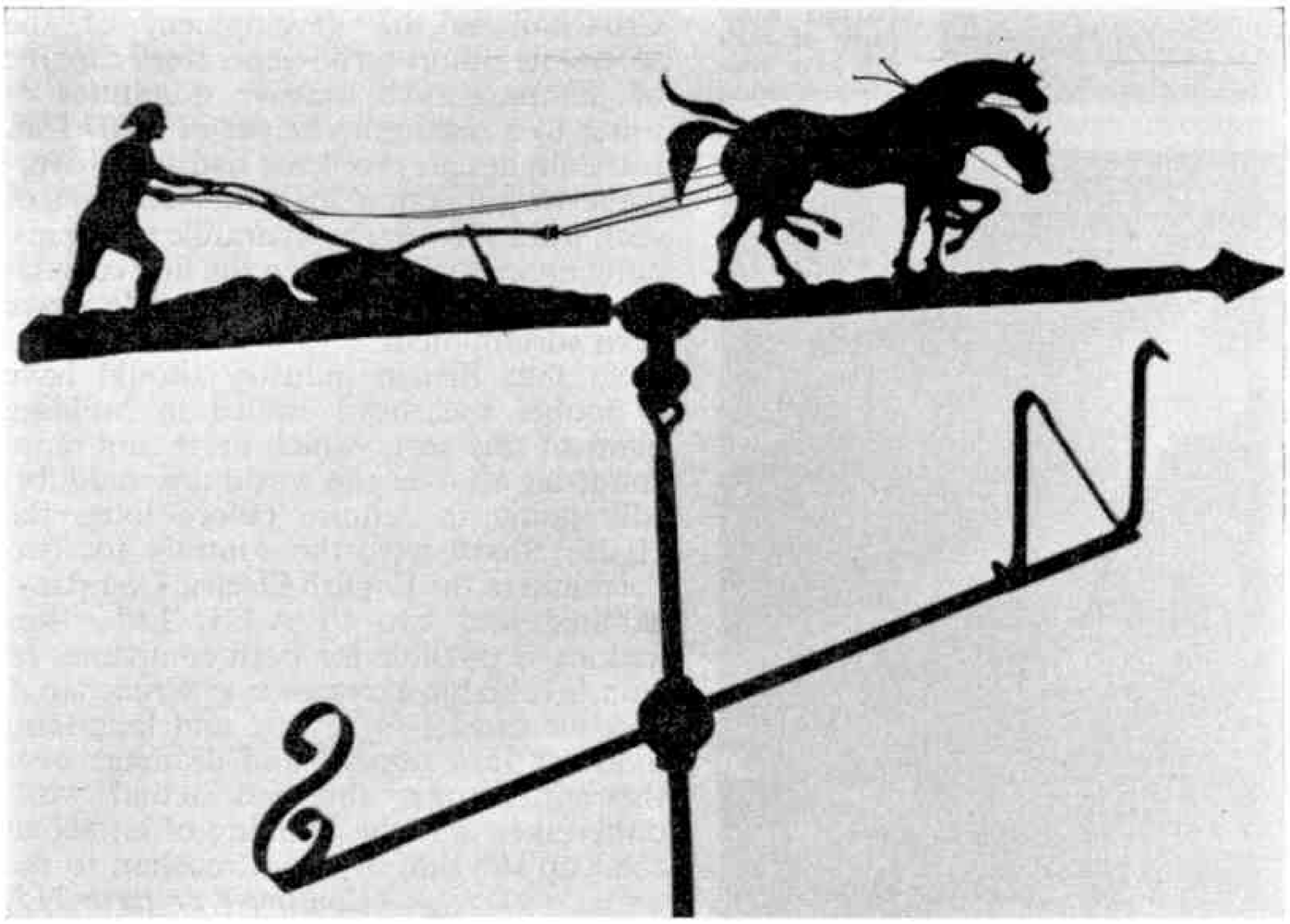
Made from copper or flat sheets of iron, the supporting rod would often be gaily decorated with elaborate scroll work, sometimes topped by crown or coronet according to the lineage of the people living in the house.

To change these standards into movable objects capable of showing the direction in which the wind blew was a simple matter, but of great importance to country folk in assessing the possible vagaries of the weather according to any given direction of the wind.



This weather vane in the form of a fully-rigged ship stands on the top of a famous London store. The illustrations to this article are by courtesy of the British Travel and Holidays Association.

An excellent example of the work of the local blacksmith, Gilbert Hodgson, is this weather vane at Warcop, in Westmorland.



The oldest weather vane in England is that of Etchingham Church, Sussex, which is dated 1387 and made of copper. It is shaped in the form of a banner, with a design resembling the coat-of-arms of the Etchingham family who built the church in 1363.

As might be expected, weather vanes on buildings near the coast, such as in the North Foreland area, were chiefly composed of nautical motives. Further up the estuary, at Gillingham, a retired ship's carpenter from the Merchant Navy designed himself a most unusual vane depicting a ketch-rigged type of ship such as were afloat at the end of the last century. The hull was carved from wood, the sail and pennant being made of flat metal and the rigging of wire. Both hull and pennant were painted maroon, the sail white and the ship was so erected as to face her bows into the direction from which the wind blew.

Legend has it that a retired Royal Naval Officer living nearby attempted to outdo the merchant seaman and erected a horse rampant on a lengthy pole, but this proved unsuccessful and the sailing ship remained unchallenged.

Perched on top of a famous store in London's busy Regent Street, a vane in the form of a fully-rigged galleon rides into the teeth of the

wind. Its supporting rod is decorated with an open-work globe, encircled by a band bearing the signs of the Zodiac.

Weather vanes on country houses are often portrayed in the form of dragons, serpent heads with protruding tongues, or wyverns. These last-named—which were symbolic of the Devil—are also heraldic animals variously described as being "winged dragons with eagle's feet and bearing a serpentine forked tail".

Farmhouse weather vanes, on the other hand, naturally depict some aspect of farming so that a dairy herdsman might have a metal silhouette of a prize bull or cow twirling this way and that on his roof, or another would inform the world of his profession by a vane displaying a metal outline of a farmer with his horse and fully laden hay wagon.

In the village of Warcop, Westmorland, two picturesque "silhouette" vanes are the work of the local blacksmith, Gilbert Hodgson. On the roof of the village school an elderly gentleman, clutching his hat and waving what appears to be an umbrella blown inside out, chases a small animal whose ears are also caught by the wind. The smithy roof is adorned by a ploughman tilling the fields with his team of horses.

Unique among country weather vanes is that on a building at Crab Farm in Shapwick, Dorset. Built in 1865, it measures nine feet in length and records an event of unprecedented peril in the lives of the villagers.

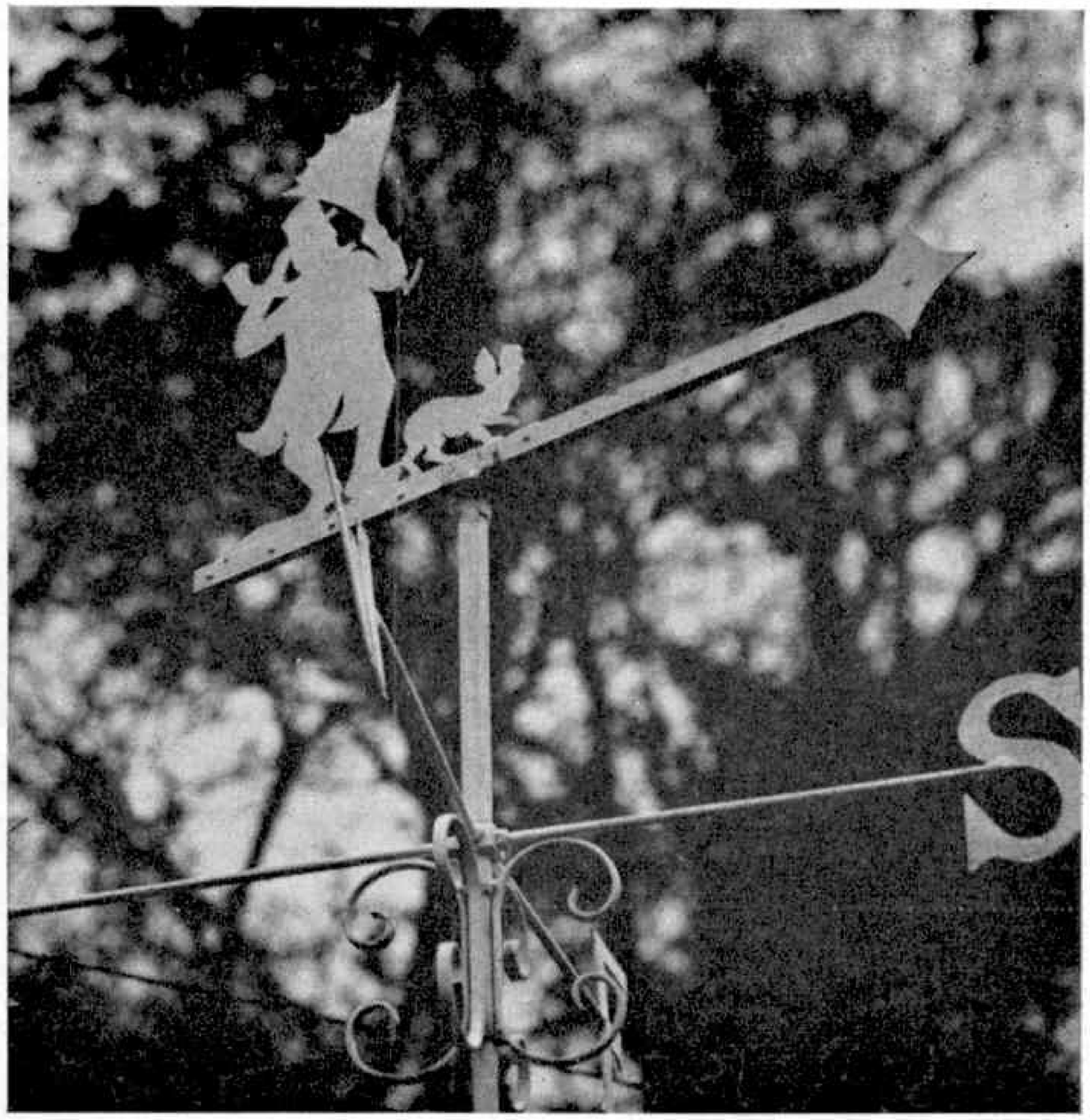
According to local legend a shepherd and his dog came across a crab lying on the Downs at Badbury Rings. Such was the man's fright at seeing the creature that he ran to the village to spread the news of his discovery. Alarmed, the villagers armed themselves with pitchforks and staves and set out to inspect the marine monster, followed by the oldest inhabitant riding in a wheelbarrow. So great was their terror on seeing the crab that they all turned tail and fled back to the village, barricading themselves behind the doors of their homes till danger was past!

Three of the men who took part in this adventure are graphically portrayed on the vane. The foremost lies flat on his back in fright, another stumps along on a wooden leg, and the oldest inhabitant in his wheelbarrow brings up the rear. Only the shepherd's dog regards the scene with detached canine calm.

Weather cocks, as their name implies, must bear the figure of a cock and were the oldest form of wind indicator to be used on the churches. One wonders whether this has any connection with St. Peter's triple denial of Christ before cockcrow on the eve of the crucifixion.

The oldest weather cock in England is that on the Church of Ottery St. Mary in Devon. The cock is dated 1335 and made of copper, two tubes being cunningly placed inside the body of the bird so that the wind whistling through gives the impression of a cock crowing.

A modern master thatcher in Barton, Warwickshire, places a straw weather cock on roofs he has finished rethatching as a trade mark for a good job well accomplished.



Another "silhouette" vane from Warcop. This stands on the roof of the village school.

Just as the old weather vanes were a guide to their owner's lineage or profession centuries ago, so the modern television mast acts as a guide to the householder's preference for a particular channel, since the masts are quite distinctive in shape.

It may be argued further that more can be deducted from a study of these forests of masts, since some roofs have as many as three or four, varying in shape from large St. Andrew's crosses to capital aitches or pronged gridirons. By this means the passer-by can determine not only the householder's tastes in television viewing, but the actual date on which he first installed his set, since constant improvements and alterations have greatly changed the designs of early masts compared with those in use at the present time.

THE GREAT NORTHERN RAILWAY OF IRELAND

(E. M. Patterson, Oakwood Press, 36/–)

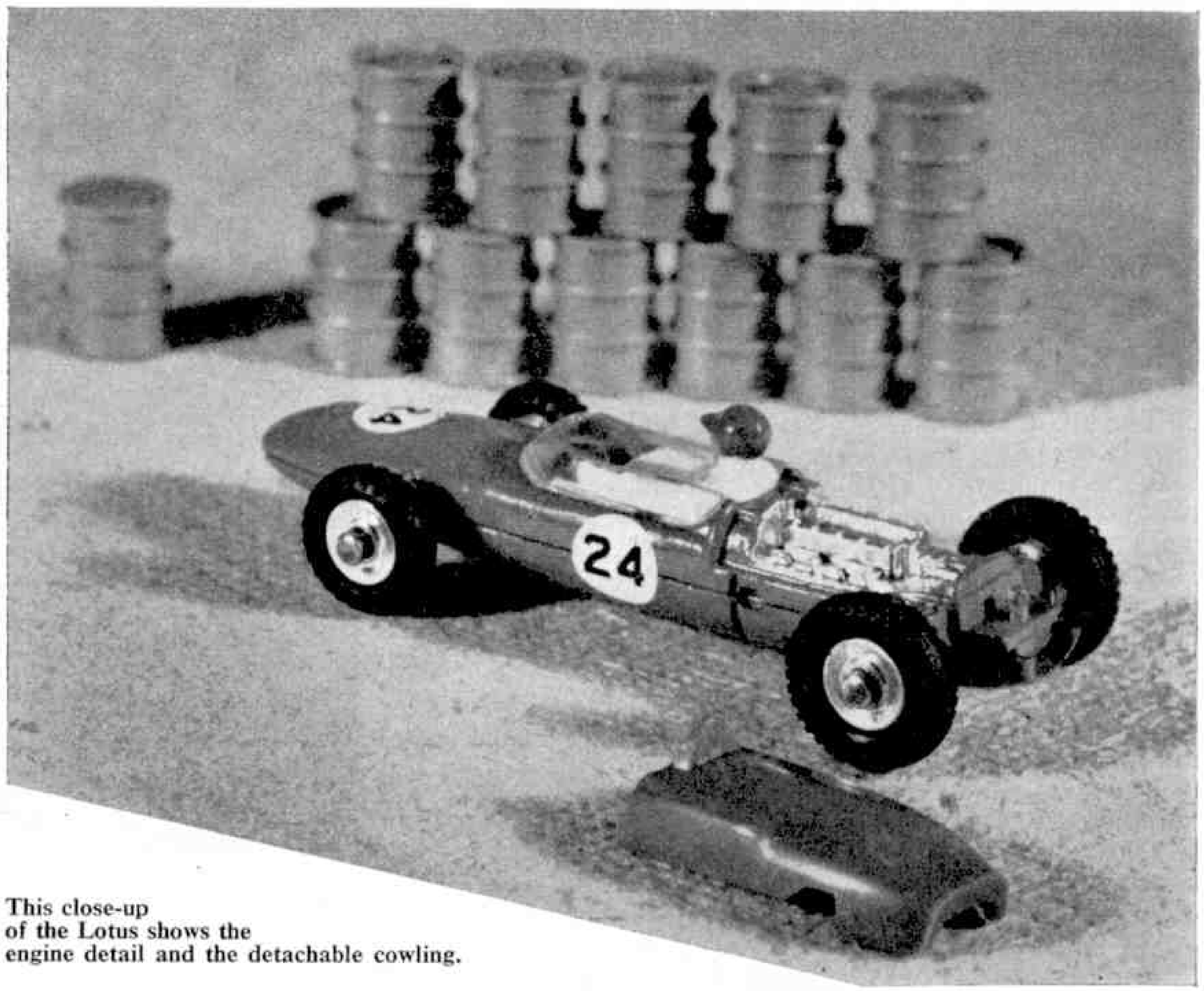
The author of this book, Dr. Patterson —from time to time a contributor of the *M.M.*—has made a special study of Irish railways. The results of much experience and research are seen in the present book, in which he has built up a complete picture of activities in all fields of the Great Northern Railway of Ireland, and the part it played in the life of the districts it served. The Great Northern was the second longest, the most prosperous and the most enterprising of the Irish railway systems.

The story is well told and numerous maps and diagrams illustrate particular features of individual chapters. After a gradual process of amalgamation of smaller systems, the Great Northern proper was formed, and developments during the whole of the period are well covered. Following its rise to a period of prosperity, political and economic matters gradually affected its fortunes, with the result that extensive closures were enforced, and finally, in 1958, what remained of the system was divided for administration between the nationalised transport bodies of Northern Ireland and the Irish Republic. Gradients, track and signalling are dealt with, and there are well-illustrated sections dealing with locomotives, railcars and railbuses, pioneer work in diesel traction, and road services, coaches and freight stock.

The chapter on train services provides a useful study of the facilities operated over the years, and, unusually perhaps, there is a section on accidents and lesser mishaps. The final years of the Great Northern under a nationalised board are summarised, and the end of the text is followed by a series of appendices, and an index, invaluable for reference. There is also a bibliography that will interest those who wish to extend their study of the line from these sources.

The illustrations include not only locomotives and trains but one or two early views of stations, as well as engineering, and other structures of more modern character.

Smart Lotus Makes A Trio Of New Dinky Toys Racing Cars: 3 in 1 Convertible



This close-up of the Lotus shows the engine detail and the detachable cowling.

THIS month, I expect most of you are eagerly awaiting the further new addition to our racing car range, not only because we have already released two models which I, personally, think are two "masterpieces in miniature" but even more so because your interest will have

Dinky Toys News

By The Toyman

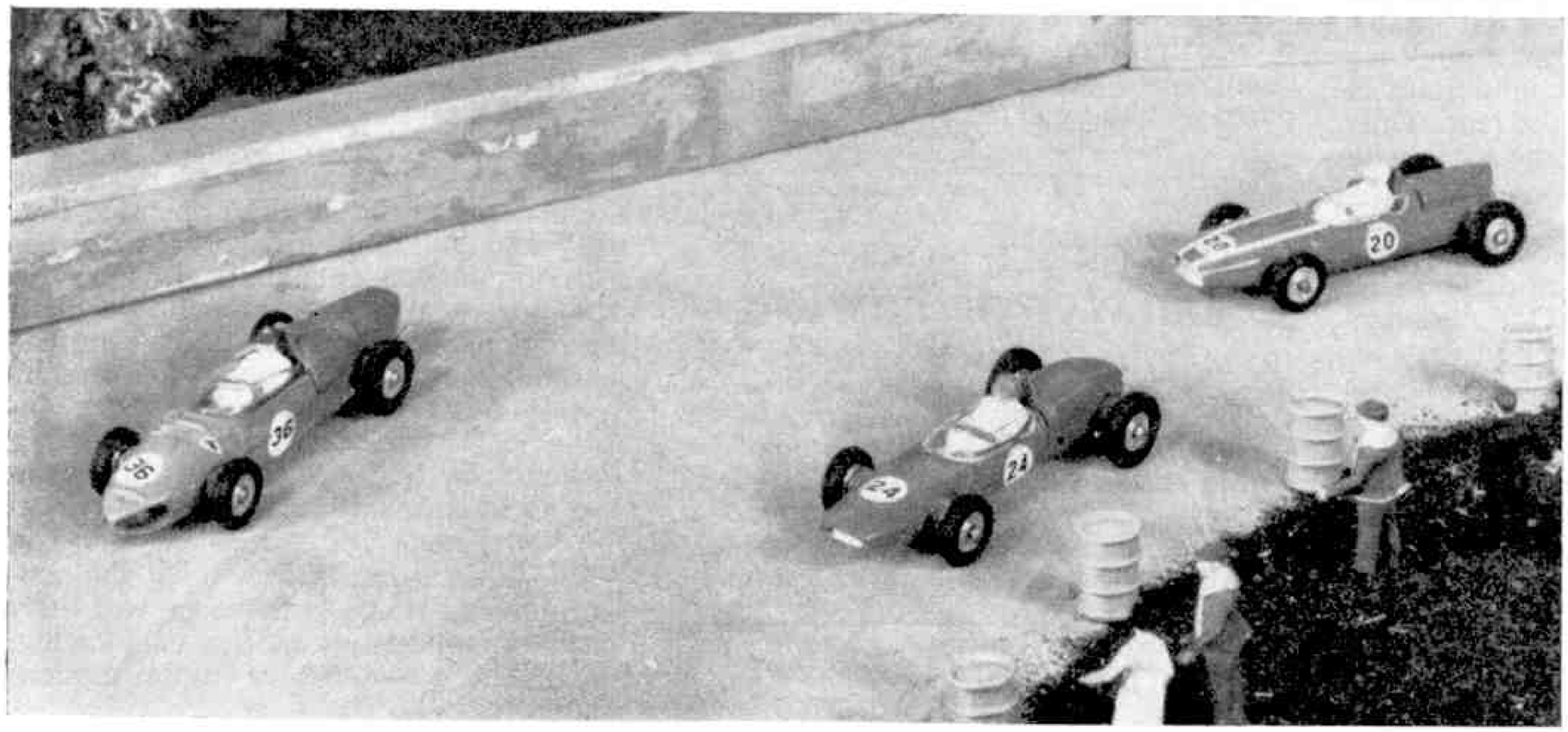
been deeply aroused by the current car-racing season, now well under way.

It may be an idea to review, quickly, some of the main Formula One sports and grand touring races which have already been held both here and abroad this year. The first was on March 30, at Snetterton and this was followed the next weekend, April 7, by the Brussels Grand Prix. On April 15 there was the Pau G.P. in France and the Goodwood Easter Meeting in this country, followed on the 21st by the Imola and Syracuse Grand Prix events in Italy and Sicily respectively.

April 27 saw the Aintree 200 and the day after that the United Nations' Grand Prix was held in New York. This month there are only three major Formula One races—the B.R.D.C., at Silverstone, the Rome Grand Prix and the Monaco Grand Prix. This last-named event is particularly important as it is the first of this year's World Championship races.

To turn, now, to the Dinky Toys replicas of famous Formula One racing cars, as you know we introduced in March the Ferrari and, in April, the Cooper. What could be more natural, therefore, than for the Lotus to appear on the scene this month? Of course, you will already have recognised it from the illustrations on this page but what you will not be able to see from the photographs is that we have based our model on the Coventry Climax-engined version of the prototype.

In these pages last month, you may

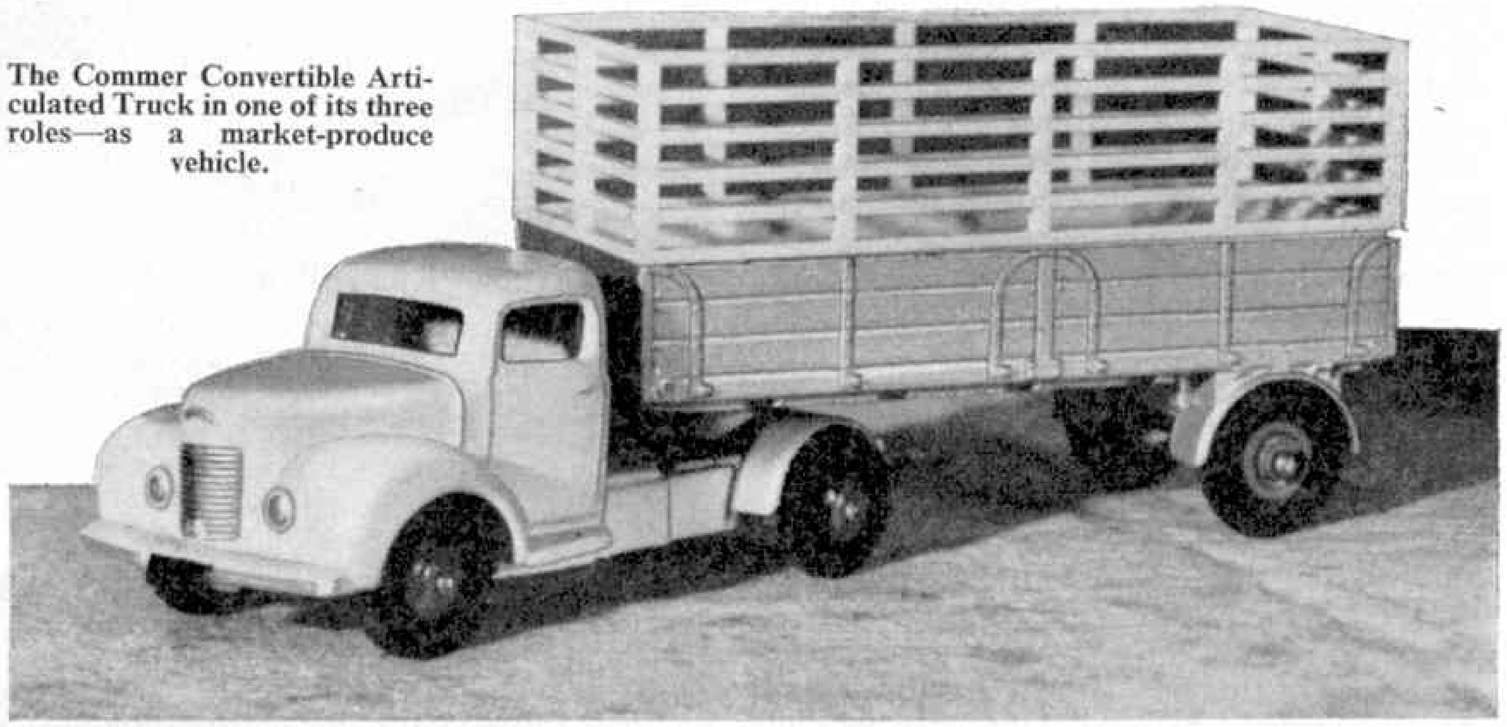


The race is on and Ferrari, Lotus and Cooper jostle for the lead. All these fine racing cars are among the recent Dinky Toys releases.

remember, I explained that some manufacturers often do not use their own engine in a car but fit one from a firm who specialise in a particular type of engine—such as Coventry Climax. Lotus, in fact, do both, using their own engines in some cases and Climax engines in others. The engine represented in the Dinky Toys model has a total capacity of 1,497.8 c.c. Maximum power output at 7,500 r.p.m. is 151 b.h.p. and the compression ratio is very high indeed, being 10.7 to 1. The fuel system utilises two Weber twin-choke carburetters, unlike the Cooper which has four, as I stressed in my April notes.

Moving away from the engine, the chassis of the Lotus is what is officially termed a multi-tubular space frame, which means that it is built up from steel tubes of varying diameter in place of, say, heavy H girders. Those of you who studied mechanics at school will know that a length of tubular steel is very strong indeed and yet is reasonably light when compared with the H girders which were used in many of the older cars. The body is made of green fibreglass, the colour actually being in the material itself and not sprayed on to it.

Perhaps the most important and striking aspect of this particular racing car is the gearbox which can be removed, literally, in a matter of minutes enabling all the cogs and gear wheels to be checked, regularly and relatively easily, for wear. In all, Lotus produce one of the best Formula One racing cars in the world—



The Commer Convertible Articulated Truck in one of its three roles—as a market-produce vehicle.

something which is proved by the fact that they were second in line only to B.R.M. last year for the World Championship manufacturers' award.

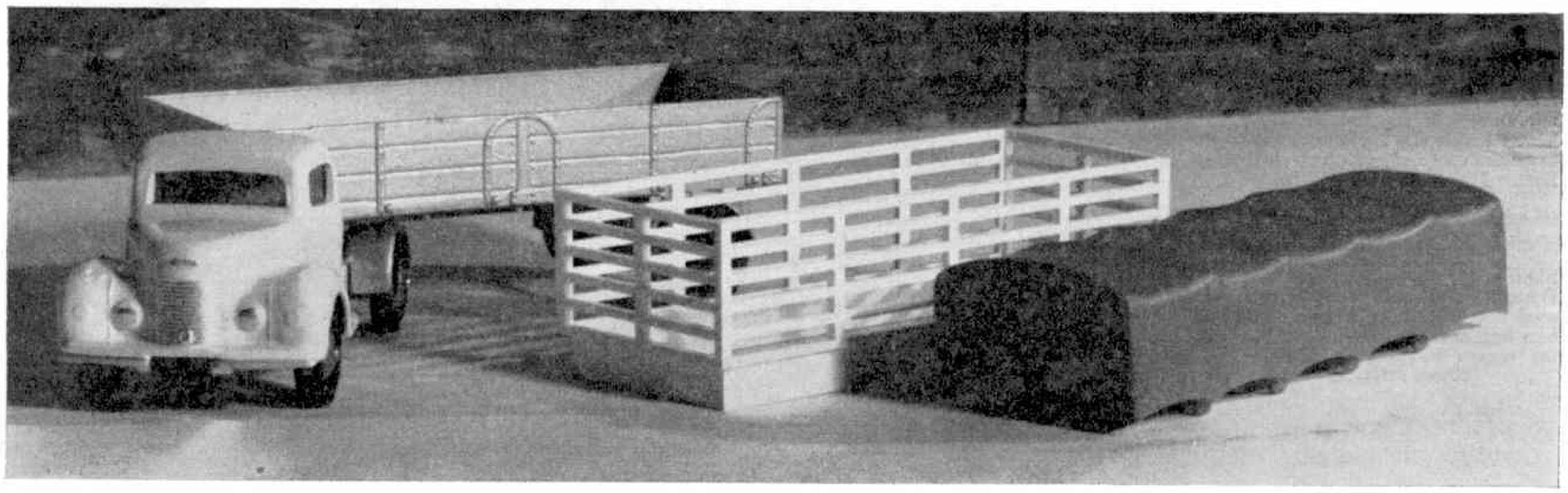
Of course, the Dinky Toys Lotus, No. 241 on our lists, cannot qualify for any world championship event, but I am sure that, if a championship were held in the miniature world, our model would be well to the fore simply because it is a first class replica which will appeal both to the serious collector and those youngsters who seek play value in their models.

Finished—as I stated earlier—in racing green, it is equipped with four-wheel suspension, windscreen and red-helmeted driver. The moulded polythene engine cowl, situated behind the driver, lifts off to expose a detailed, aluminium-painted replica of the Coventry Climax engine. On most real racing cars the rear wheels are bigger than those at the front and this effect has been obtained on the Dinky Toys model by using larger tyres on the back wheels. For the benefit of those of you who buy this model and find, sometime in the future, that you have lost a tyre and would like to replace it, I will give the tyre sizes and catalogue numbers. Those on the front wheels are ½″ in diameter, No. 091 (60036) and those on the rear wheels are 9/16″ in diameter, No. 090 (60790).

Now I must move on to deal with this month's other release. Perhaps it would be better to say "releases", for it is, in effect, three models for the price of one. Numbered 424 in our lists it is the Commer Convertible Articulated Truck, a title which is rather lengthy but is very descriptive, for the vehicle is an articulated wagon which is well and truly convertible!

The basic model can be seen illustrated at the bottom of this page and consists of the Commer tractor unit, finished in a light yellow gloss, attached to the detailed, silver-coloured trailer. In real life this would be used for carrying bricks, sand and gravel, or similar loads. By raising the sides of the trailer unit with the white polystyrene side extension (seen centre in the bottom picture) the model is turned into a farm produce wagon used for

Lorry on which you can ring the changes seen, firstly, with covered top, and (below) as an open vehicle with its two detachable fittings.



carrying all types of vegetables, etc., to and from the market. Finally, if the framework is replaced by the royal-blue polythene canopy (extreme right in the illustration) the truck becomes a fine covered wagon in which goods that could be affected by weather—such as wool or cloth—would be transported. I know that owners of this model will have "loads" of fun with it!

Last month, these notes included an artist's sketch of our very attractive new model of the Vauxhall Victor Estate Car but, effective as it was, I know that readers like to see our latest products against realistic backgrounds. So it is that I am including studio shots of the Vauxhall which show to advantage the neat lines of this useful car. Just how well it will fit into open-air layout schemes you can judge for yourself.

Finally, regular readers of the *Meccano Magazine* know that we often place great stress on road safety, a vital matter to everyone, and one in which Dinky Toys models can play a part. In the next month or two I shall be running in these pages at least one competition based on road safety.

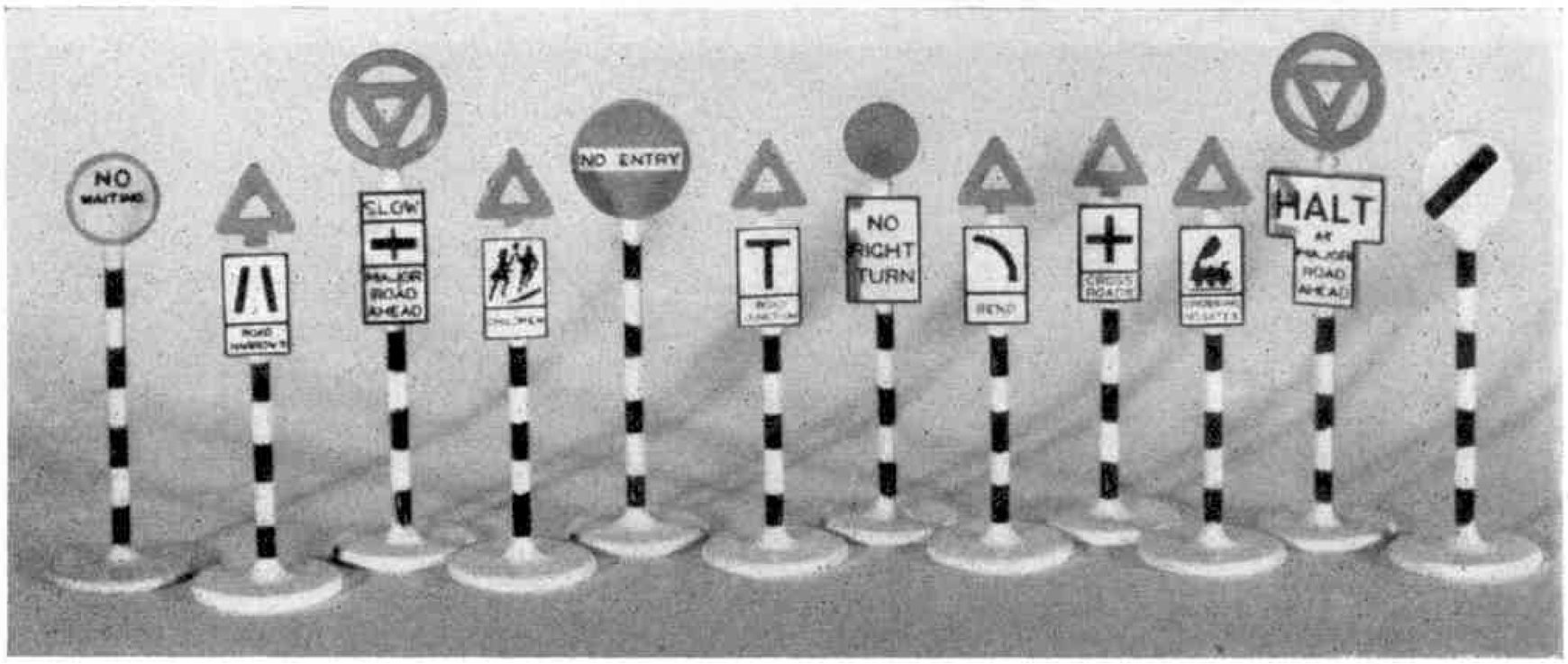
Some readers may already know that Road Safety authorities in Britain are this year organising a special campaign. Some of the posters that are to be issued concern lane discipline, how to see and be seen when you are on the road, the necessity for checking lights, tyres, steering and brakes every week, and the need for those who ride motor-cycles and scooters always to wear a helmet.

As the months of July, August and September approach the campaign will pin-point the vital matter of turning right, which is one of the greatest causes of road accidents. It is a fact that children being taught road drill at school probably have a greater awareness of the dangers of turning right than do many adults.

It is not, for instance, generally recognised that in turning right responsibility rests with the driver who is about to make that turn.

It is his job to see that on-coming traffic is cleared before he attempts to turn, and not expect any oncoming vehicle to stop and allow him to proceed.

Ideal for camping holiday scene in miniature, the graceful Vauxhall Victor Estate Car is pictured (top) in close-up and (centre) with Dinky Toys figures and a home-made tent.



Signs of the times—a selection of Dinky Toys Road Signs which are used not only on collectors' layouts but, in more serious vein, for the urgent business of teaching road safety.

Tulips By The Million

NOBODY knows exactly how many tulips are grown each year in the Spalding area of Lincolnshire, but at least 12,000,000 boxes of these and other choice flowers are sent from the district every season. The industry provides employment for more than 5,000 workers, and this month the gaily-coloured tulip fields will be attracting thousands of sightseers.

Tulip Time, indeed, has now become an established annual institution in Lincolnshire, and the Spalding neighbourhood is a tourists' Mecca each spring. The big event of the season is the mile-long parade of tulip-decorated floats on a four-mile route, with all the colour and the spectacle of 6,000,000 tulips.

The date is dependent on the weather, but this year's flower pageant is provisionally scheduled for Saturday, May 4. The floats will also be on view the following day.

A highlight of the programme is the crowning of the Tulip Queen, and the ceremony has helped to make the festival one of the most popular annual customs in Britain today.

By ARTHUR NETTLETON

So many people tour Tulip Land at this period that traffic chaos would occur if an official route covering the area were not arranged. It has to be about 45 miles long to accommodate the thousands of vehicles comfortably, and it is selected each year by the police and the highway authority, before being passed to the Ministry of Transport for final approval.

The growth of the Lincolnshire tulip industry itself is a romance of modern times. Ninety years ago, a handful of pioneers realised that spring flowers were a saleable commodity, and during the next few years about 1,000 acres were given over to the cultivation of such blooms.

At first, they were grown in the open, but the industry progressed to the provision of glasshouses. Forced cultivation enabled trade to expand greatly, and its growth was further fostered by the adoption of cold storage for the scientific pre-planting treatment of bulbs. Thus forced tulips and daffodils from Lincolnshire came to be in great demand in all the country's markets.

The prosperity of the industry was also aided by the discovery that the loamy soil around Spalding promotes the growing of bulbs equal in quality to those imported from Holland.

* * * *

A big part of the Lincolnshire tulip trade is in bulbs, rather than in cut flowers, for it has become increasingly recognised that bulbs grown in the southern half of the county are excellent for planting in private gardens and public parks.

In London, Hyde Park and Regent's Park are among the public gardens that are planted every year with masses of tulip bulbs from Lincolnshire.

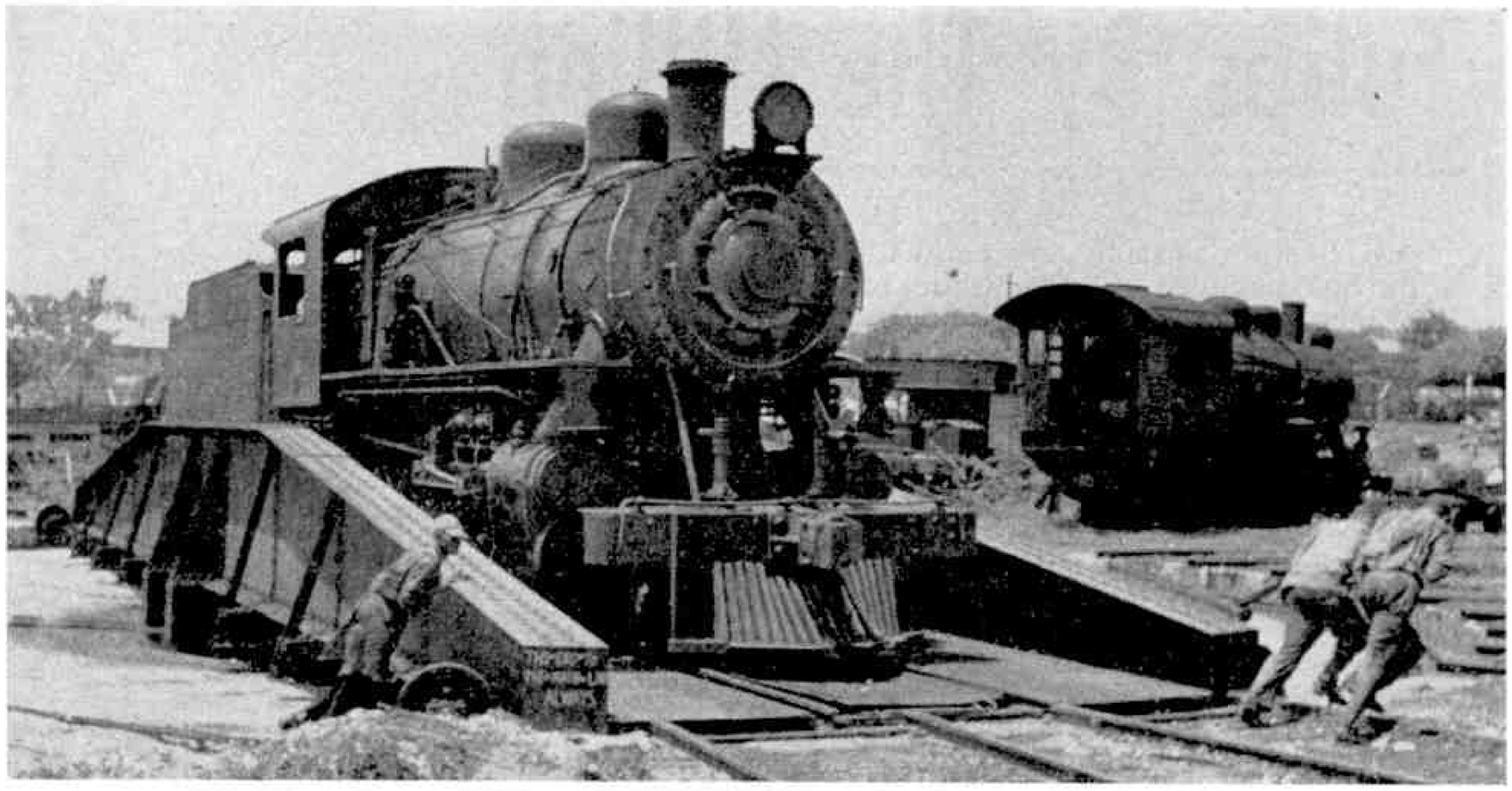
The Spalding forced flower season usually starts in early January, and is followed in late spring by the appearance of exquisite flowers in the fields. But the story of the tulip cannot be told without referring to the Dutch bulb industry. Strangely, the tulip was first used in Europe as a vegetable! Various ways of cooking the bulb were tried, and it was sometimes pickled as a delicacy. Some years later the blooms, which had originally reached Europe from Asia Minor in the sixteenth century, became the rage of the fashionable world. Fantastic prices were paid, in Holland, for prize tulip bulbs by horticulturalists anxious to profit from the swiftly-developing popularity of the flower.

Ordinary people, too, sought to cash in on the boom, everyone hoping to make quick money by trading in bulbs. One tulip bulb changed hands for 5,500 florins, which was about £370 in our currency, and there are records of a coach and horses, and even a flourishing brewery being bartered for such bulbs.

Then came a crash, and many people were ruined overnight. Out of the catastrophe, however, emerged the stable, healthy tulip-growing industry of today.

Left: Two good friends surrounded by the beauty of one of Britain's glorious tulip fields. Above: One of the decorated floats that are a feature of Spalding's flower pageant. Photographs by courtesy of the "Lincolnshire Free Press" Ltd.,

H. G. FORSYTHE DESCRIBES THE RAILWAYS OF JAMAICA. HE CALLS THEM . . .



"THE FRIENDLIEST LINE IN THE WORLD"

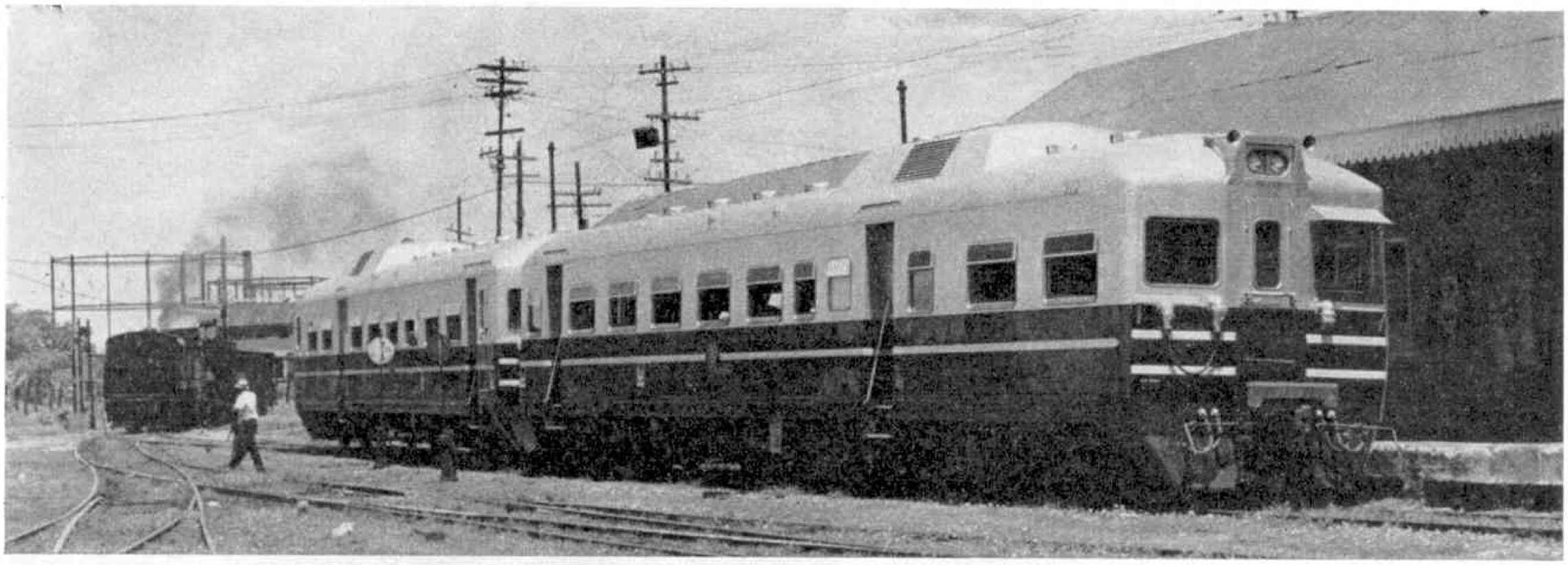
THE Port Antonio train was, as usual, late—very late, but nobody seemed to mind. At Darling Spring Halt, in the heart of Jamaica's lush green countryside, the friendly crossing keeper told me, "The afternoon train goes through anytime between four and six". I was there to photograph that train. I hoped it would arrive while the light was still good; luckily, it did. With a rumble and a roar and an ear-splitting whistle it thundered out of a tunnel, a fine old Canadian-built 4–8–0 at its head. The train consisted of two box cars and three coaches, two second class, one composite 1st and 2nd. They were old coaches—built at least 60 years ago—made of wood with platforms and steps in the American Old West style.

Those elderly coaches are not the only aspect of Jamaican railways reminiscent of one-time American practice. Train control on the single track main lines, is on the block telegraph system. All trains are controlled by the dispatcher at Jamaica Railway Corporation's headquarters at Kingston Station. The dispatcher is in contact by means of the telegraph with all the stations along the line. To allow a train to proceed from one station to another — Maggotty to Appleton, for instance, on the Kingston–Montego Bay line—the stationmaster at Maggotty telegraphs through to Appleton to see if the line is clear and whether the stationmaster there will accept the train. If Appleton accepts the train, the stationmaster at Maggotty telegraphs the dispatcher for his permission to send on the train. If all is well, the stationmaster then makes out a clearance card to give the driver of the train. Trains are not allowed to move without appropriate cards.

Signalling at stations is done by hand-held flags or lamps. Often, trains are held up outside stations while stationmaster, staff and a boy or two round up and chase away various livestock which are grazing near the line or may have strayed on to it.

At busy stations there is an additional safety precaution—the Pilotman. There is only one Pilotman at each centre and trains are not allowed to move in the station area unless he is

At Kingston Motive Power Depot steam locomotive No. 55 (above) is turned by hand outside the Roundhouse. Left: View from the cab of an English Electric diesel-electric locomotive, looking back along the train in the mountain section of the Kingston–Montego Bay line. All the illustrations are by the author



aboard. He is, in fact, a living "staff". This practice originated in England many years ago. As traffic increased the live member of the railway staff who acted as Pilotman was replaced by the token, or "staff", for single-line working, hence the origin of the name.

Other responsibilities of the Pilotman include setting and locking the points for incoming trains before walking up the line to meet them.

The Jamaica Railway Corporation, like most other railways, is in the process of dieselisation. Latest additions to stock include some specially-designed Metropolitan-Cammell diesel-hydraulic railcars powered by Rolls–Royce engines. There is also a small stud of very efficient 750 h.p. English Electric mixed traffic Bo–Bo diesel-electrics.

I made an exciting footplate trip on one of these on the 113-mile Kingston to Montego Bay line, passing through some of the most difficult mountain sections in the world. The summit of the line at Greenvale is only 1,705 feet, but to get there the line has been literally hacked out of the mountain side. With incredibly sharp curves and 1 in 30 gradients the line is a challenge even to the best motive power.

We had approximately 200 tons behind us, and once or twice the diesel almost ground to a stop on the sharp curves as she climbed, with the ammeter reading close to overload limit. On through the hills we struggled not far from the mysterious district of "Look Behind". It was hot work, too. On several occasions along the route the water for the cooling system had to be replenished.

Goods traffic on the J.R.C. includes bananas, sugar cane, alumina, jute, oil and a host of other commodities. Forming a unique feature of mixed trains on market days are the special market cars—modified box cars fitted with seats and windows. These dual-purpose vehicles carry passengers as well as the goods, such as farm produce and poultry, they are taking to market.

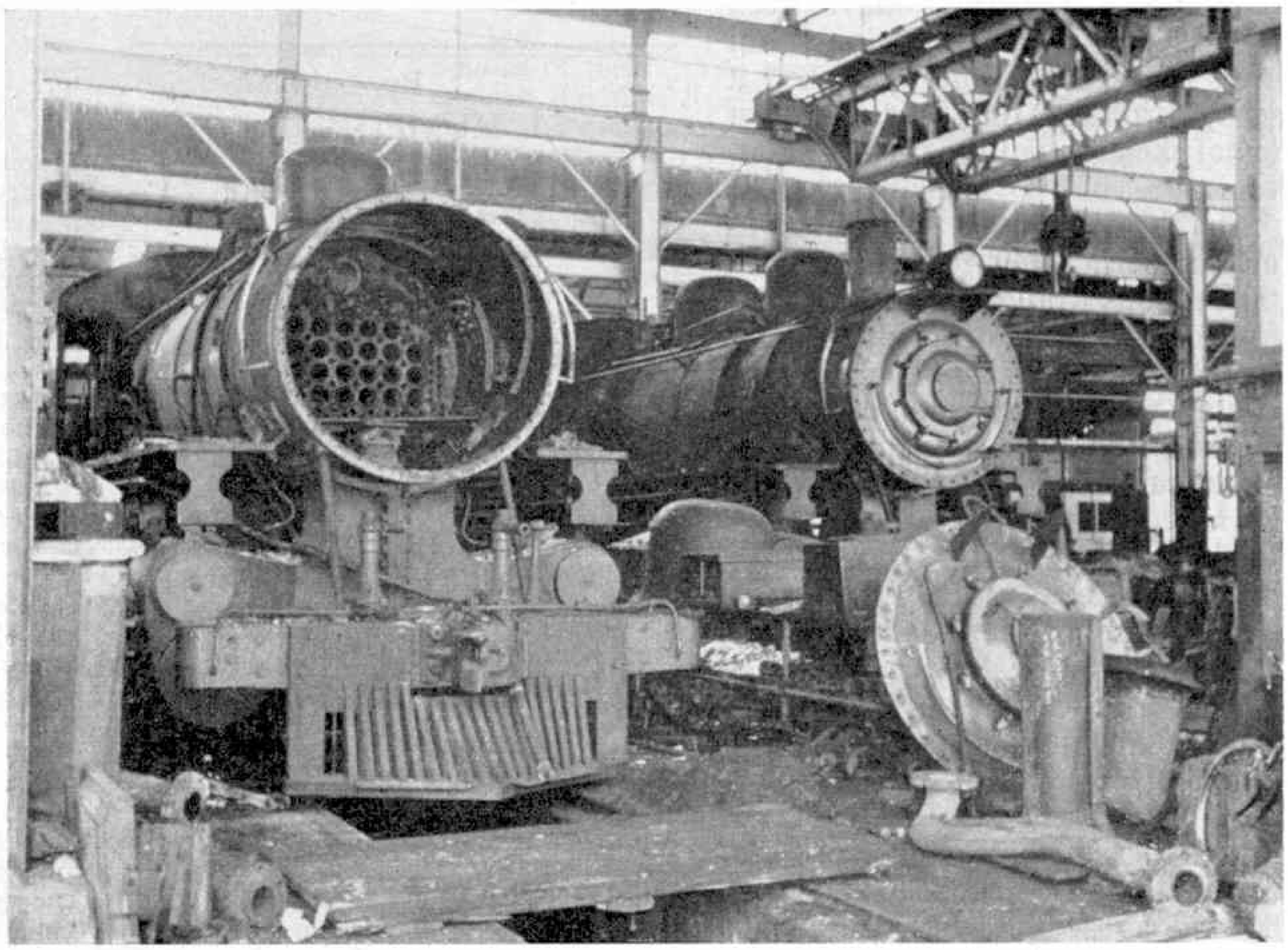
Let us imagine we are on the 2 p.m. Port Antonio mixed train a few minutes before leaving Kingston Station. The oil-fired 4–8–0 has just backed down from the shed and is coupled on to the box cars up front. A shriek on the whistle, lots of shouting from the guard and station staff, and we're off!

Through the yards we go, but almost at once we slow for a stop at Greenwich Farm Halt. Here, it seems, there is a little delay. Someone rushes past carrying an iron bedstead to load into one of the box cars; there is a lot more shouting. Off again and soon we come to open country and at 40 m.p.h. are passing through the great Caymanus Estate, where we see sugar cane growing up on either side.

Next stop is Gregory Park. On the passing loop is the diesel railcar from Montego Bay. Here we see the stationmaster hand the clearance card to our guard who, in turn, passes it to our driver.

Further on we come to Spanish Town. One time Jamaica's capital, the town is now an important railway junction. Here we branch off northwards along the Rio Cobre Gorge towards Bog Walk. Now the scenery becomes truly magnificent as

(*Continued on page 217*)



Top: The diesel train from Montego Bay arrives at Kingston Station. These Metropolitan-Cammell railcars are the latest thing on Jamaican railways. Right: At Kingston, the Jamaica Railway Corporation has well-equipped workshops. Here two steam locomotives are undergoing heavy overhaul.

SPACE NOTES

The Problems Of Working In Orbit

This nut and bolt tool for use in space has a reactionless ratchet drive and a connection to the work-piece. Photograph by courtesy of the American Machine Foundry.

CONSTRUCTING space stations in orbit, or carrying out repairs on a space-ship during its journey, will be experiences quite unlike any that Man has yet undergone. In normal large-scale earthbound construction work a major problem is positioning items during the bolting up, riveting or welding processes. Girders must be held in position by cranes while being connected up, and structures must be built in a certain manner, otherwise at some point during erection the structure will become insufficiently strong and will collapse. Indeed, this underlines the big difference between earth and space structures—on earth they withstand gravitational forces, in space they do not. A space station, for example, is virtually just a flimsy container for instruments and men. The largest forces on it are due to the pressure of the air inside it, and from a structural point of view it is probable that the shell need be not more than a few thousandths of an inch thick.

Inflatable structures have been proposed for space stations, but even if this technique is applied it seems probable that some form of metal skeleton will be used for convenience. This skeleton would probably be sent up in sections in un-manned carrier rockets, and all the sections would then be collected together while in orbit and assembled. Present-day guidance is good enough to place two satellite vehicles in orbit very close together, as the flights of the Russians Nikolaev and Popovitch demonstrated.

The movement of quite large items in space is an easy matter, as a small impulse—applied say, by a rocket motor—will set an object moving and it will only be stopped by a similar impulse applied in the opposite direction. This gravity-free, friction-free environment means that normal spanners, screw-drivers and other such tools cannot be used, as the user has no purchase; in other words, the mechanic would himself turn around a nut instead of tightening it up!

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

To overcome this problem the American Machine and Foundry Company has developed a whole range of special space tools specifically for in-flight engine repairs, but there is no doubt that they will have wider applications. The basic idea is to provide a purchase for the user by means of an outer casing (in the mechanic's left hand in my first illustration) which is clamped to the job, and a box-type spanner moving inside it. The handles are large to enable the tool to be used by an operator in a space-suit.

FIRST TEN SATURNS

So far, all the major American space launchings have been made by modified military booster rockets. Saturn is the first large launch vehicle designed and developed specifically for space launchings. It was initiated by the Army Ballistic Missile Agency in mid-1958, and responsibility for it was transferred to NASA's Marshall Space Flight Center in 1960.

Saturn is really a series of vehicles rather than just one, and although its major application will be in the Apollo programme (for landing men on the Moon) it will be called upon during its development to launch other payloads as well.

The first ten vehicles will have the description Saturn C–1 and will comprise two or three stages. The bottom stage, known as S–1, is powered by eight Rocketdyne H–I engines. This is an advanced version of the engine used in the Jupiter and Thor missiles; it develops 188,000 lb. thrust and runs on liquid oxygen and kerosene fed from nine separate tanks—one 107 inches in diameter surrounded by eight of 70-inches diameter. The centre four engines are fixed in direction, but the outer four can gimbal through a total of 15 degrees for control purposes.

With so many engines it is always possible for a failure to occur in one of them. The propellent supply lines of all the engines are, therefore, interconnected and

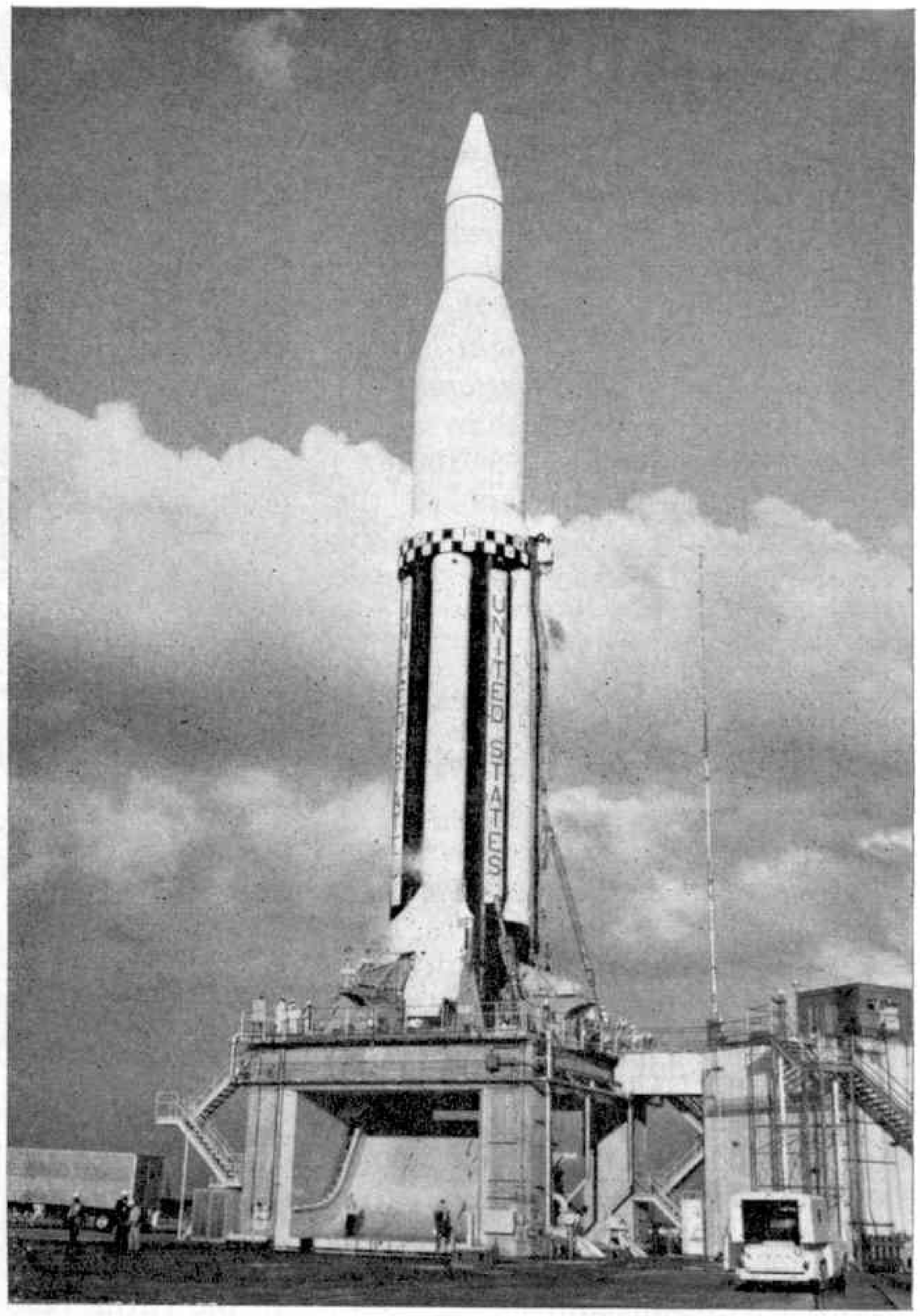
there are arrangements to cut off the fuel supply to any engine in the event of its failure. Burning time of the other engines will then be increased, and in most instances it will still be possible to complete the mission.

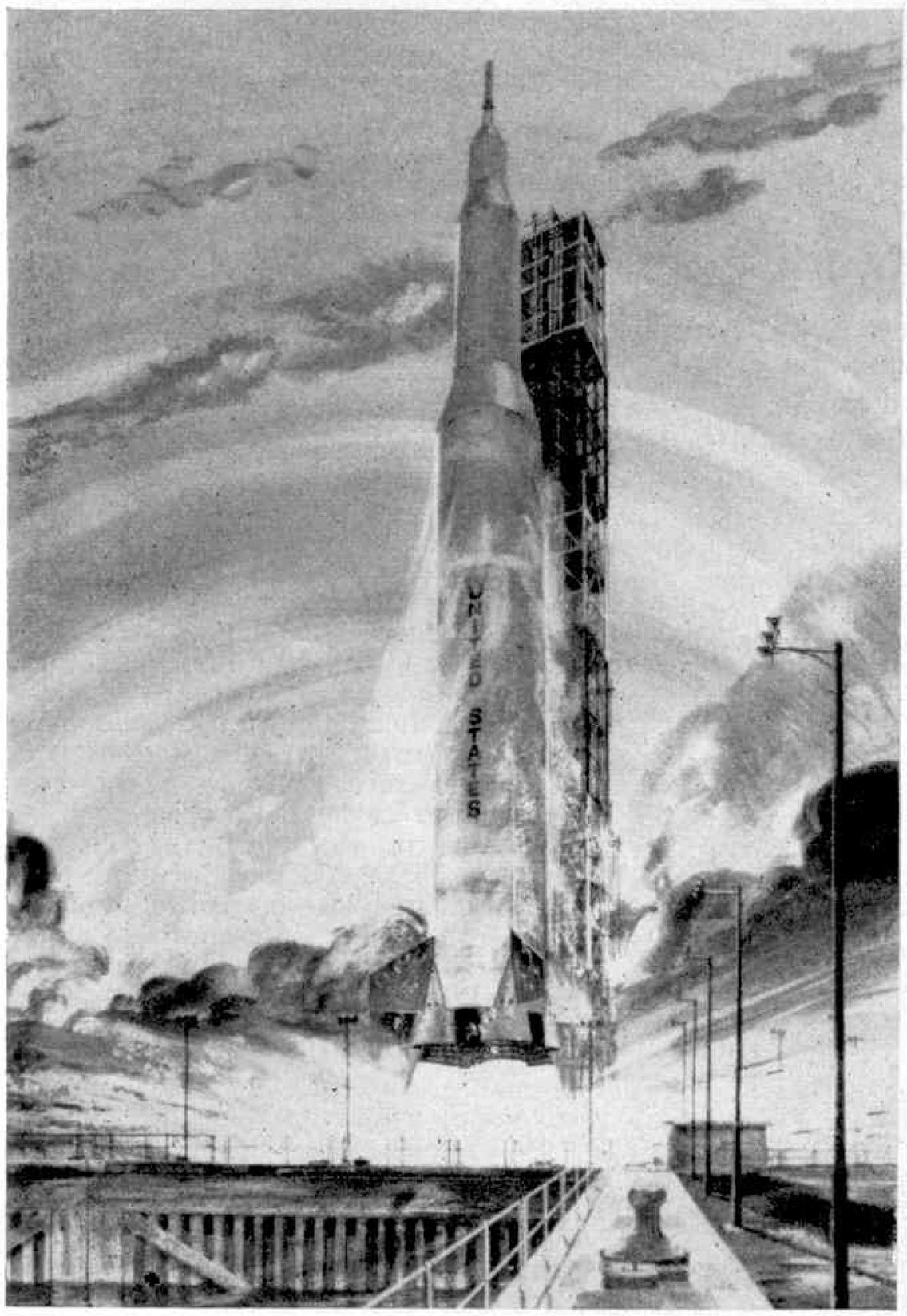
The second stage (known as S–IV) is being built by the Douglas Aircraft Company. It is powered by six Pratt & Whitney liquid oxygen/liquid hydrogen engines producing a total thrust of 90,000 lb. In later C–1 flights a third stage (the S–V) will be added. This will employ two Pratt & Whitney RL–10 liquid oxygen–liquid hydrogen engines each producing 15,000 lb. of thrust.

The first four flight tests—three of which have already been successfully accomplished—use a live first stage only, the upper stage being a dummy. For the second and third tests the dummy load was 95 tons of water, which was deliberately blown up at an altitude of 65 miles to form the biggest and highest artificial ice clouds ever produced. (The cloud from the first test was eight to ten miles in diameter within three seconds of its release.) There will be a further firing of a C–1 vehicle with dummy second stage, and two firings with live second stages, this year.

Finally, during 1963–4, a dummy Apollo spacecraft will be orbited on four occasions. The vehicle which will be used to launch the final Apollo lunar landing vehicle is known as Advanced Saturn C–5 and will be much larger than Saturn C–1. The first stage of this vehicle will use five Rocketdyne F–1 liquid oxygen/kerosene engines each developing one and a half million pounds of thrust. The second stage, S–2, will also have five engines, this time Rocketdyne J–2s each giving 200,000 lb. of thrust and using liquid hydrogen and liquid oxygen. These two stages together will be capable of placing a 40-ton payload in a 300-mile earth orbit. For the Apollo project a further stage will be added using a single J–2 engine. The whole vehicle with payload will stand 350 feet high, and the first firing is scheduled for 1965.

Right: Saturn C–1 with dummy top stages on the launch pad. Picture by courtesy of the National Aeronautics and Space Administration, U.S.A. Below: This artist's impression of an Advanced Saturn at the moment of launching was provided by the Boeing Company.





RETURNS FROM SPACE RESEARCH

Vast sums are being spent on space flight, and the amount increases each year. One often hears or reads of how much could be achieved in some other field with only a minute fraction of the expenditure. With so much starvation and illness in the world, it seems impossible to justify the billions that it will cost to put a man on the moon, and no matter how enthusiastic a space fan one may be it must be admitted that the tremendous programmes now under way are largely political in conception.

Nevertheless, the practical returns are almost certain to be enormous, and even to date many very useful developments have appeared as a direct result of the space programmes. Here are some of them: Special space suits are making it possible for stroke victims to walk; X-ray equipment developed for Polaris rocket motor examination is being employed in industry—it uses only one-thirtieth of the previous exposure; a process for making flour of high nutritive value has come out of space food research; portable radios can now be powered by solar cells developed for satellites. Such "extras" will undoubtedly continue to come from the space programmes and may turn out to be more important than the main objectives—it has happened before!

CATTLE KINGS OF THE OUTBACK

"From camp to camp and from run to run
they battle hand to hand
"For a blade of grass and the right to pass
on the track of the Overland."

SO sang the Australian poet, Andrew Barton ("Banjo") Paterson, of the drovers in the Great Inland of Australia—the Never-Never Land of the "Cattle Kings".

By
E. R. YARHAM

The homestead buildings of one of Australia's cattle stations. This photograph, and other illustrations to this article, appear by courtesy of the Australian News and Information Bureau.

Now, one of the Commonwealth's most famous stock routes, the Birdsville Track, has been added to the nation's growing list of tourist attractions. The first organised party set out recently from Marree, on the Central Australian Railway, the railhead for the big mobs of cattle coming down the track from the north-east corner of South Australia and the adjacent border country in Queensland.

The 350-mile track touches the homesteads of six cattle stations and a small wayside store which has shortened its 31-letter aboriginal name to Mulka, which is perhaps just as well for the postman.

The Outback cattle country is still the same beautiful, endless, silent, pastel-shaded land it was when the explorers first set eyes on it last century, except that the beasts have come. Every man, woman and child—white or black—in the cattle belt has more than 70 square miles of living space, but it is a country that cannot be trusted; many a man has lost his life in the effort to travel from one water-hole to another.

It is a land of isolation, simple living, hardship, and, above all, courage. In spite of its dangers, those who live there for any length of time seldom leave; it is said that anybody who lives in the Never-Never, never, never leaves. That is how it got its name.

The cattle country takes up nearly one-third of the vast continent, and its friendship and hospitality are proverbial. It is nothing for a travelling stockman to "drop in" and stay for a week, then leave against the wish of his host. In that land men are equal; white and aboriginal drovers ride side by side; white children and piccaninnies grow up together.

Many of the cattle stations cover vast areas. A man has been said to have no room "to swing a cat" when he had only 200 square miles, and a 1,000-square-mile station is small. In some stations it is possible to travel 150 miles as the crow flies without leaving the property.

Stations in the Northern Territory comprise 36,000,000 acres, or more than 56,000 square miles—bigger than England and Wales. The Alexandria Station, which incidentally is the biggest cattle property in the world, covers more than 11,000 square miles. Herds of beasts numbering fewer than 3,000 are regarded as small, and a herd is not looked upon as large until it tops 10,000 head.

Here is a land where fortunes are won—and, in times of drought, lost. The pioneers made their homes in the heart of the continent. They needed cattle which boasted a tough constitution, like their own, and they got them. There were

A view of one of the pleasant streets of Winton, centre of a large pastoral district which carries both sheep and cattle.

black-humped cattle from the Cape of Good Hope and brindles from India; their flesh was as tough as their tawny hides, but they had the merit of breeding regularly and prolifically.

By 1800, there were just over 1,000 cattle in the colony. Governor King laid plans for building up a great industry and wrote that the time was not far distant when Australia would be supplying England with fresh meat. One of the families destined to make this dream come true was the Duracks, who became kings in the grass castles of their enormous pastoral leases.

Just over 100 years back, Patsy Durack, aged eighteen, who had just arrived with his family from Ireland, took over the responsibility of supporting his newly-widowed mother and his six brothers and sisters. He struck out for the Ovens goldfield with a drayload of stores which he sold, using the proceeds to equip and work a claim. Eighteen months later he had cleared £1,000 and spent it on his first land and stock.

When Patsy died in 1898 his name had become a byword in three states for pioneering tenacity, honest dealing and fabulous success. His first land was in New South Wales; ten years later, with his brother-in-law John Costello, he battled and won out against drought and disaster in Western Queensland until, by the end of the 'seventies, they had extentended their operations throughout the state.

In 1881, with his brother Michael, he planned the expedition which Michael led to explore the Kimberleys, and five years later he was a leading figure in the organisation of one of the longest and most successful of the pioneering cattle treks. He sent 8,000 beasts across the continent to stock the new Kimberley leases. After two years and 3,000 miles of droving over waterless deserts, through fever-ridden jungles, crocodile-infested rivers and aboriginal ambushes, 4,000 of them arrived. At the time of his death the Kimberley properties covered 12,000 square miles.

The cattle still travel the stock routes in great droves, although the time is coming when more and more will be removed by aircraft down to the markets. Some go by rail, but at present most of them are driven all the way to the coast, anything up to 1,500 miles. The drovers are tough men who eat rough "tucker", sleep hard, and are up for hours on night watch. Not a bath for weeks and anxiety all the time that is their lot.

Drovers say that, unlike sheep, cattle are "dead crafty"; they will sneak out of camp in the middle of the night without making a sound, yet by day they will shake the ground with their hooves. In the darkness they will call softly for their mates. When the drove starts out the cattle are wild; then they gradually settle down to the routine of the track, until something frightens them. If they get on "drummy" ground the resonant tread of their own hooves fills them with fear and they take off.

The need for better communications is among the cattle country's important requirements. Last September it was announced that another £A2 million was to be spent on cattle roads in Western Australia, Queensland and the Northern Territory. These roads will speed up the movement of cattle by rail, ensuring that they arrive at their destinations in good condition, and are intended to increase the annual turn-out of cattle for export.

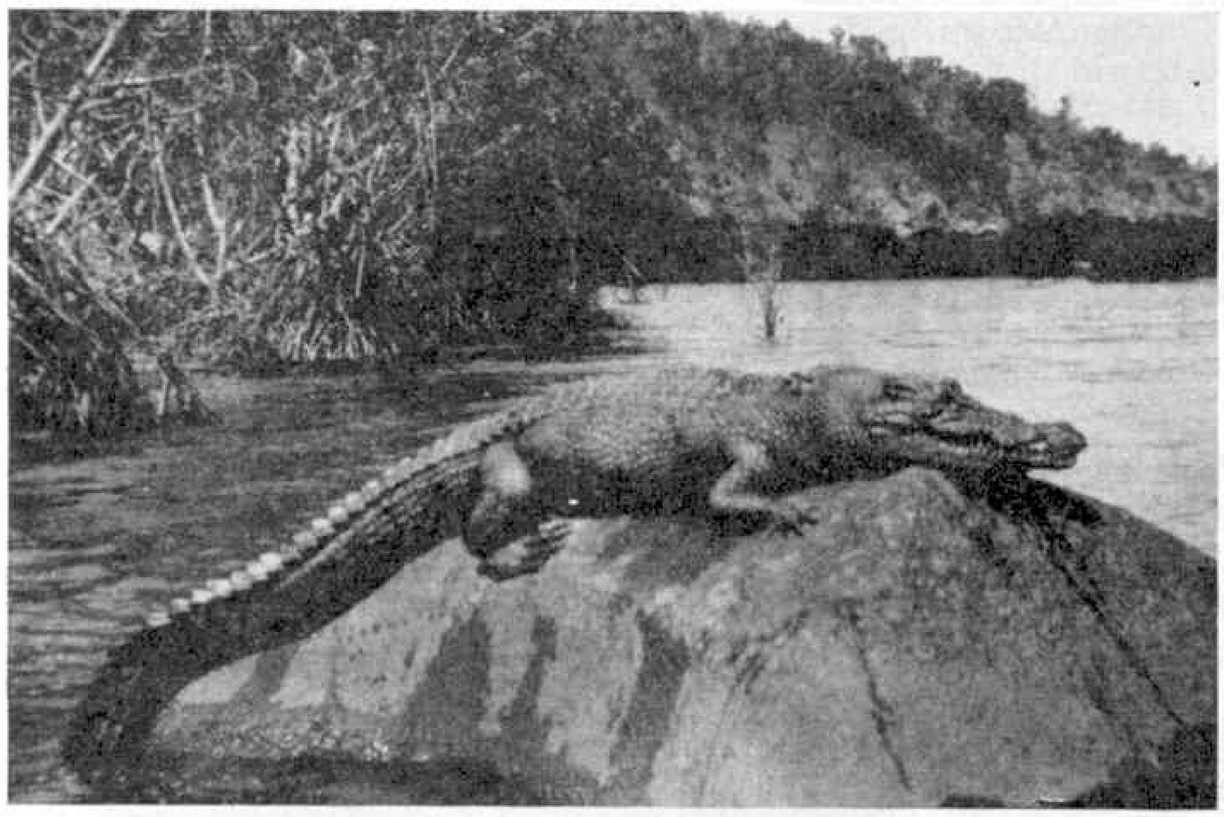
THE STORY OF WALTZING MATILDA

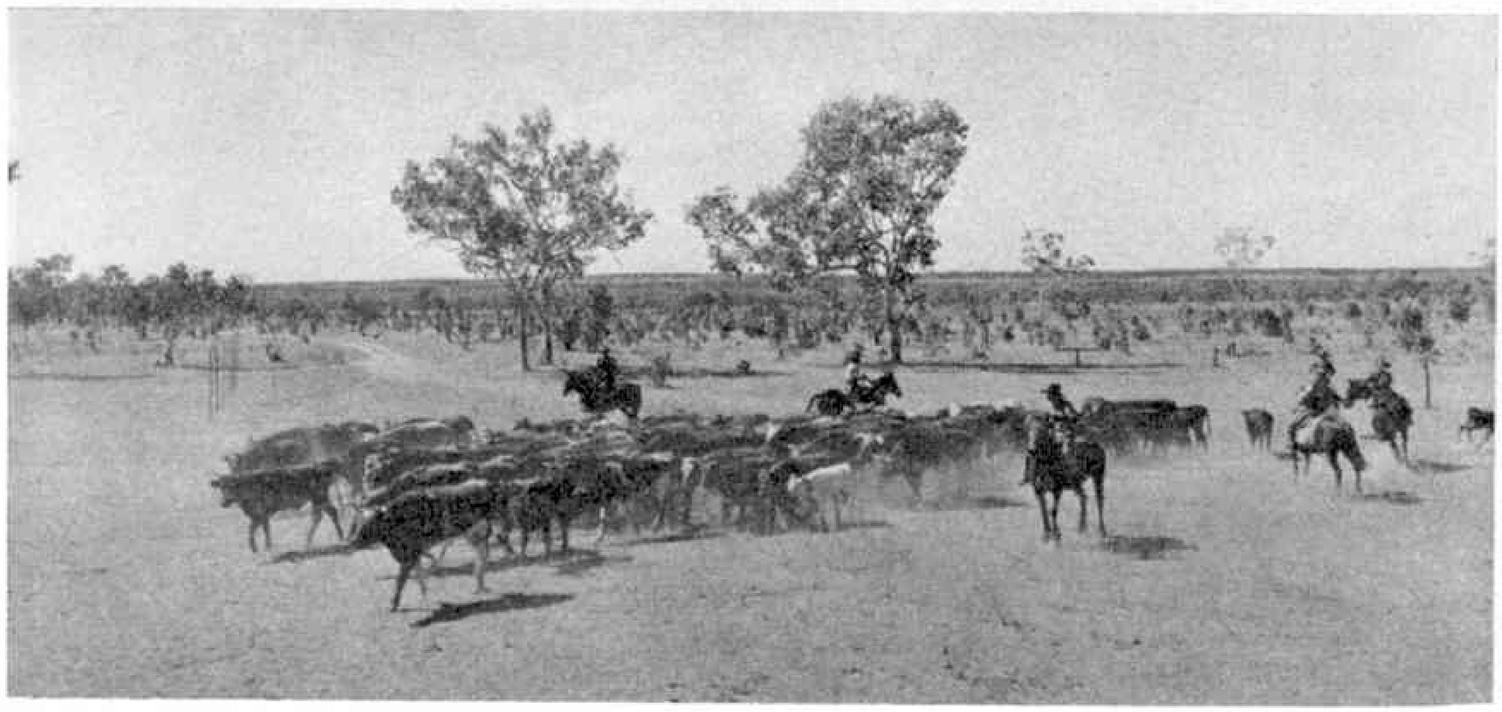
The Queensland outback, with its "coolibahs" and billabongs", is immortalised in a song which was on everybody's lips during the last war, and which has often been called Australia's unofficial national anthem—"Waltzing Matilda".

The words were written by poet and balladist "Banjo" Paterson—already referred to at the start of this article. In 1895, while he was visiting Dagworth Station, some 60 miles from Winton, he heard Christine Macpherson, the daughter of the manager of the property, playing on an old autoharp a tune she had heard the previous year at a race meeting in Victoria. It has been identified as a march "Craigielea" arranged from an old Scottish ballad which, in turn, is believed to be an adaptation of a marching song which was popular among the soldiers of Kent going to Marlborough's wars.

Paterson began to think out lines of his own for a tune which he found fascinating, and a tale often told in that part of the world gave him an idea for a lyric. In the early 1890's, accompanied by two mounted policemen, Christine's father had come across a swagman camped under a coolibah (gumtree) beside a billabong (waterhole) about to cook a sheep. When confronted by the policeman and asked where he had obtained the sheep, the swagman had jumped into the water in an attempt to swim to the other side and escape. But he had been pulled down by the weight of his clothes and drowned.

This story, and the chance remark by John Carter, overseer of Dagworth, that he had seen "a couple of swaggies waltzing Matilda by a billabong"—meaning that he had seen two men carrying their swags and bedding rolls which appeared to waltz from side to side on their backs as they walked—inspired Paterson to compose the words.

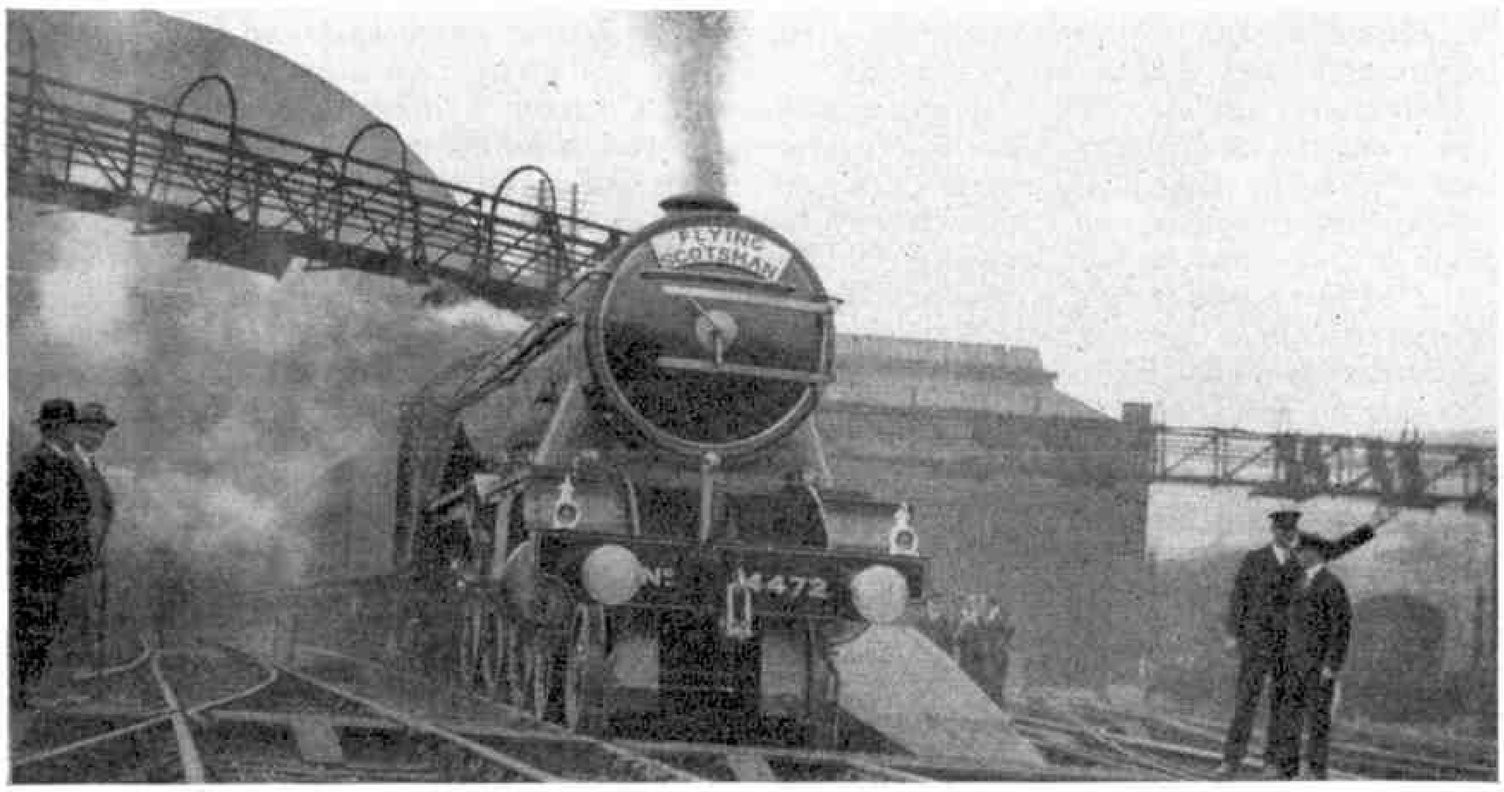




Left: This man-eating crocodile was basking on a rock in North Queensland when it was snapped by a photographer. Below: Aboriginal stockmen with a herd of cattle they have mustered on a training station run by the Department of Native Affairs.

RAILWAY NOTES

Contributed by R. A. H. Weight



Engine With A Wonderful History

I AM sure that readers of the *M.M.* were delighted to hear the news that the locomotive *Flying Scotsman*, which is not to be confused with the famous Anglo-Scottish express train whose centenary was recently celebrated, is not to be broken up, but will be available from time to time for hauling special trains. Most readers in this country will know that Mr. A. F. Pegler, who is a business executive and a member of the Eastern Region Board, purchased the *Flying Scotsman* locomotive for £3,000. She will be maintained at Doncaster on his behalf after restoration to her original condition as L.N.E.R. 4472. The engine's B.R. number was 60103.

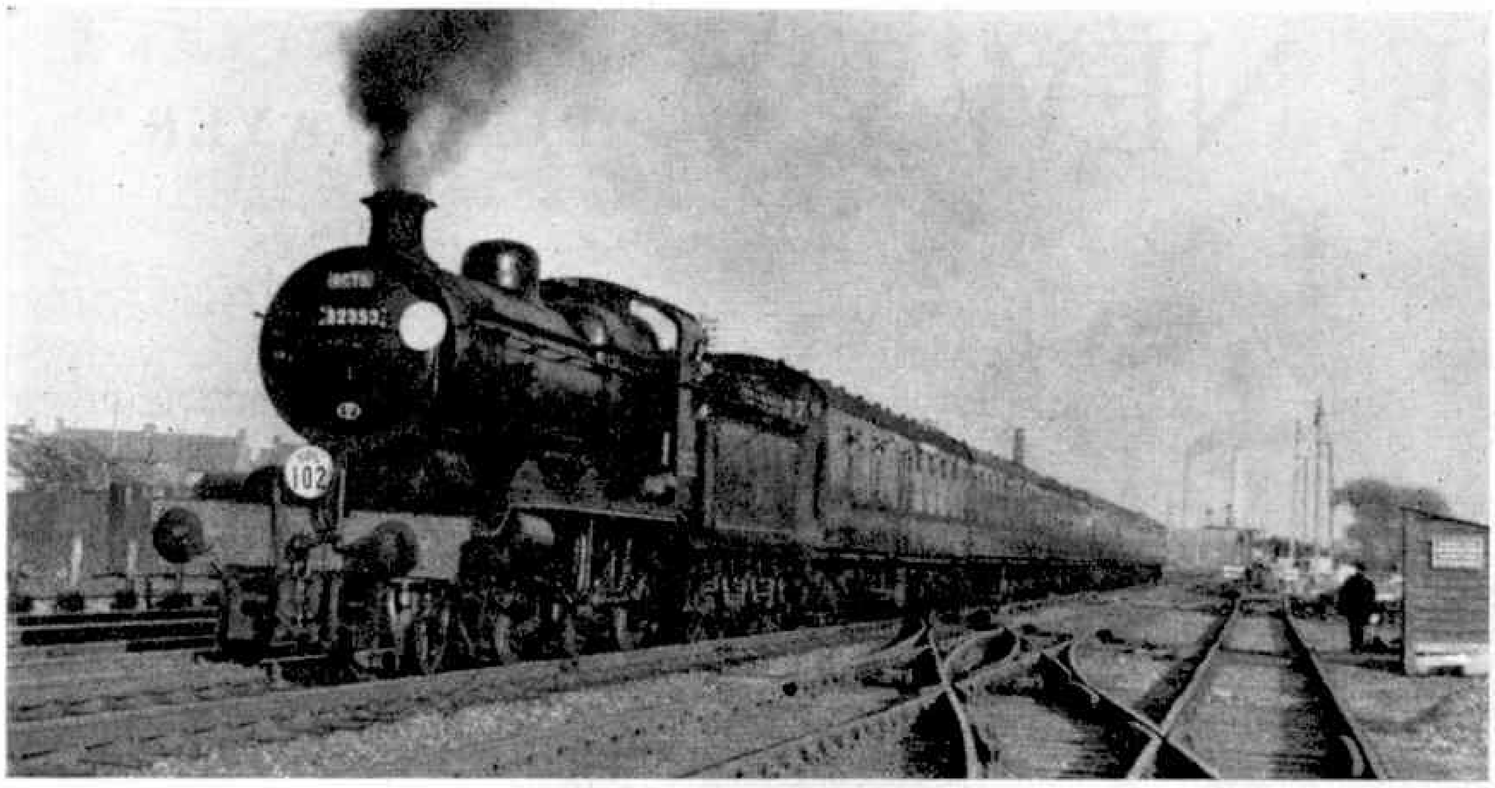
The locomotive *Flying Scotsman*, which entered service early in 1923, was the third Gresley Pacific to be built, its predecessors being *Great Northern* and *Sir Frederick Banbury* which were completed before the Great Northern Railway was merged into the L.N.E.R. group. The *Flying Scotsman* became extremely well-known both at home and overseas, as she was a shining and prominent exhibit through the 1924–5 seasons at the vast British Empire Exhibition at Wembley. After taking part in the making of the film *Flying Scotsman*, which was made on the Stevenage–Hertford line and was shown in cinemas over a wide area, she was one of several Pacifics to be equipped with the new, unique, corridor tenders allowing drivers and firemen to be changed half-way in the course of the 393-mile, world-record, non-stop run between London and Edinburgh inaugurated on May 1st, 1928. The non-stop run became a summer feature in both directions until 1961—apart from the war years and just afterwards—the schedules becoming increasingly faster.

No. 4472 made the first northbound run in 1928 and the venture aroused great interest. I was one of a huge party of officials, sightseers and photographers who watched her initial departure on the famous occasion.

Flying Scotsman also made the first northbound journeys in several succeeding seasons, and I well remember that of 1933 which is depicted in one of the illustrations on this page. I watched the train from my home—at that time my "recording station" for engine numbers, times, and

Above: The "Flying Scotsman" at the start of the first London–Edinburgh non-stop run of the 1933 season. Photograph by courtesy of British Railways, Eastern Region.

The end of the story. Class A3 4–6–2 locomotive No. 60103 "Flying Scotsman" about to make its last run in B.R. service, at the head of the 1.15 p.m. London–Leeds express. The engine took the train as far as Doncaster. Photograph by S. Creer.



R.C.T.S. Special en route from Brighton to London Bridge via Dorking, seen near Shoreham. The train is headed by K class 2–6–0 locomotive No. 32353, built in 1921. The illustrations on this page are by S. C. Nash.

loads—which was situated about five and a half miles out from King's Cross.

In 1934, when streamlined high-speed expresses and also the A4 Pacific design were under consideration, *Flying Scotsman*, hauling a four-coach special test train, achieved the amazing time of only 2 hr. 32 min. along the 186 miles from King's Cross to Leeds. She was handled on that occasion by my late friend Driver Sparshatt who was ably assisted by Fireman Webster. The non-stop return trip took only five minutes more, although two more carriages were added, making a load of 205 tons.

While descending Stoke Bank, south of Grantham, No. 4472 attained the first authentic British record of 100 m.p.h., the maximum speed being recorded precisely by instruments in a dynamometer car next to the engine. Careful precautions were taken to ensure clear signals throughout, and speed restrictions were then considerably fewer than is usual today.

Commencing a few years after the record run, 51 Pacifics of the first two series numbered 2543–82; 4471–81; (lately B.R. 60044–83; 60102–12) were gradually merged into the A3 class, with boilers having a higher steam pressure and increased superheating surface, and with cylinders slightly smaller in diameter than originally, thus making them even finer performers throughout the East Coast route. More recently double blast pipes and chimneys were fitted, and trough-type smoke deflectors were added to a number of them, including *Flying Scotsman*. Some people thought that the latter features rather spoilt the handsome appearance of a noble class.

Although the A4 Pacifics and, during the last few years, Deltic and other large diesels, had taken over many of the chief express duties, A3s have often proved to be highly capable performers almost to the end—and some are still running.

In the very cold weather of last January *Flying Scotsman*, making what was announced as her "last revenue-earning journey", hauled a substantial load on the 1.15 p.m. express from King's Cross. With her new owner on the footplate she attained a maximum speed of 90 m.p.h. and reached Doncaster five minutes before time.

'MID SNOW AND ICE!

The exceptionally long and severe winter, with its blizzards, heavy snowfalls and continuous frosts, taxed all transport services to the utmost and brought a good many to a temporary standstill. On a few exposed or high sections of British Railways trains were engulfed by snowdrifts, and in the worst cases were only freed after the combined efforts of determined men aided by locomotives, snowploughs and shovels.

Alternative routes to those blocked by snow were improvised so that limited long-distance and other services could be maintained as far as possible, even during the worst conditions. On one occasion, for instance, *The Royal Scot* travelled from Glasgow via Dumfries to Carlisle, then on to Newcastle and along the East Coast route to King's Cross, instead of to Euston. During this bad weather, unusual steam and diesel locomotives were noted, sometimes in odd combinations. Many found themselves in difficulties because of the oil, water, brake gear and heating apparatus being frozen. Water troughs were frozen solid; many points, signals, tunnels and electrified tracks were severely affected by ice, as were most of the passenger and freight rolling stock.

Yet such was the good work achieved by the railways that for thousands of people travel to and from work or school was almost normal.

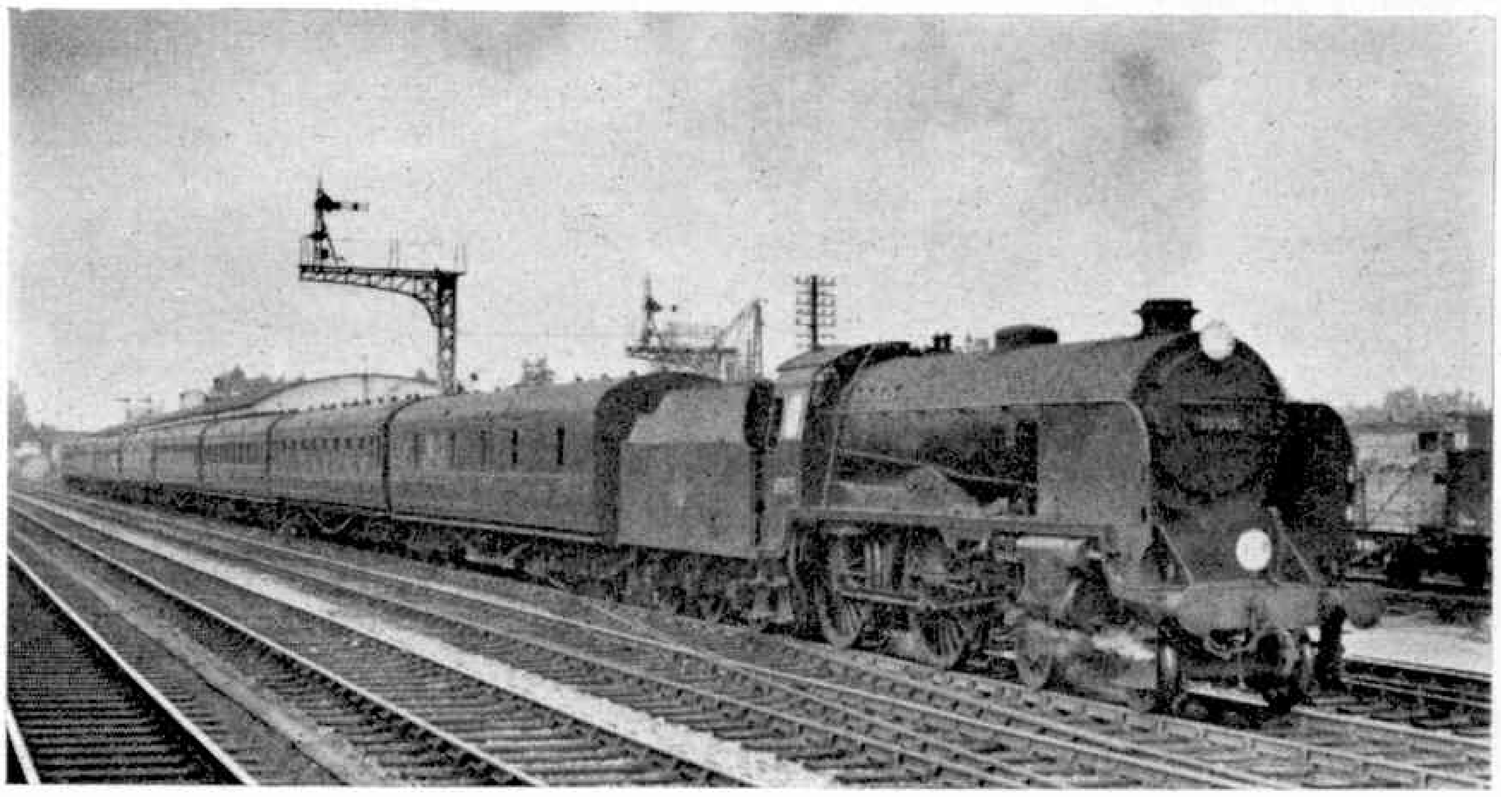
THE DISAPPEARING 4–4–0

During the first part of the present century, 4–4–0 locomotives were an ever-present sight on many a British railway. They were built in many sizes and types for handling all kinds of trains, from the express to the more humble "perishable". For instance, the large and powerful Midland Railway, and the less extensive South Eastern and Chatham Railway (respectively merged in 1923 into the L.M.S. and Southern groups) relied entirely upon 4–4–0s in working the principal passenger services. So, to a more modest extent, did a number of the old-time companies such as the Furness, North Staffordshire, Cambrian and Great North of Scotland.

Bigger and gradually more powerful six-coupled express or mixed traffic locomotives, and 2–6–2 or 2–6–4 tank engines sounded the knell of the 4–4–0, apart from some secondary or stand-by duties.

The S.R. "Schools", introduced as late as 1930, probably ranked as the biggest and most powerful 4–4–0 class in the world. Designed for the London–Tunbridge Wells–Hastings service, involving steep gradients, sharp curves and restricted clearances in tunnels, they served as a successful mainstay until complete dieselisation in 1958. Years ago they performed splendidly on the Waterloo–Portsmouth and Bournemouth expresses. Since that time they have been employed in many

(*Continued on page 228*)

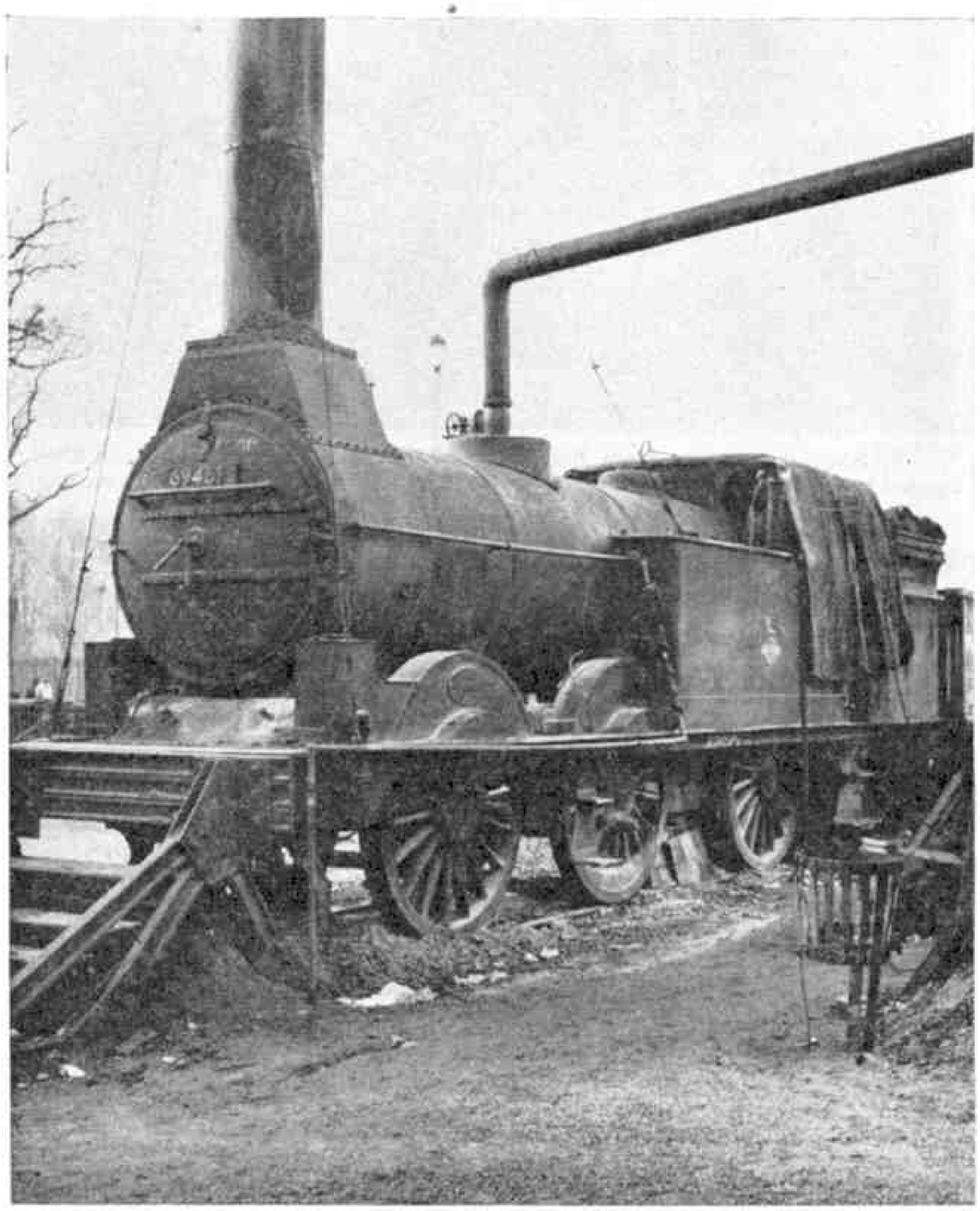


Excursion to Farnborough, September 10, 1961, in connection with Air Display. The locomotive is Schools class No. 30905 "Tonbridge".

TRACKSIDE NEWS

By "PLATELAYER"

● *A new series of articles designed to inform, as well as to entertain, our readers. News, gossip, and historical notes will be included.*



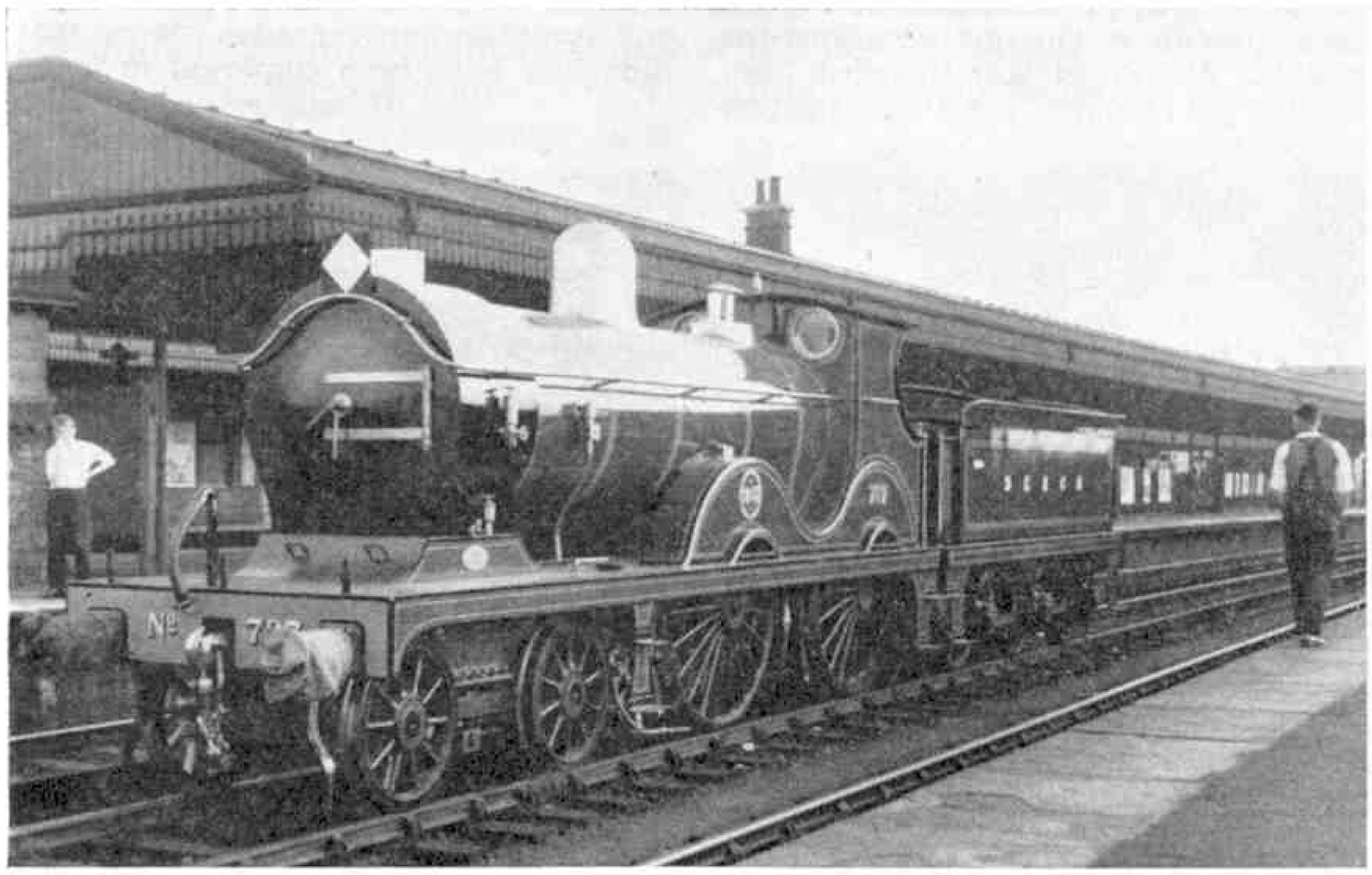
OUR railways are often, unfortunately, a target for vandals. One example of the damage that their stupid actions can lead to occurred on the last day of February, when 800 feet of overhead wire was brought down, between Bowling and Kilpatrick, by the pantograph of the locomotive hauling the 8.15 train from Helensburgh. It was later discovered that a stone thrown by some individual had broken a horizontal strut tube insulation on a back-to-back cantilever mast, the overhead equipment being fouled in consequence. Vandalism of this kind not only occasions serious delay, but causes very serious damage.

* * * *

In 1901 Wainwright, then Locomotive Superintendent of the South-Eastern and Chatham Railway, designed a beautiful locomotive designated Class D. This type, of which 51 were built, was of the 4–4–0 wheel arrangement. Between 1921 and 1927, 21 were rebuilt with superheaters, piston valves and other modifications, and these formed the D1 class. One engine, No. 1747, was scrapped prior to 1940, but the rest of the rebuilt locomotives came into B.R. stock, eleven still remaining in 1961. Of the rebuilt stock, only Nos. 1742 and 31737 were retained by B.R. No. 31737 or 737 is now preserved and this is now in the B.T.C. Museum at Clapham.

* * * *

While looking through the office files the other day I noticed the picture you see at the top of the page. The photograph was sent to us by Mr. M. Edwards of Southend, who took the snap during March 1960, at Shoeburyness. The locomotive used to be an N1 0–6–2T, No. 69461, originating from the Great Northern Railway and built by Ivatt. Engines of this class were originally built between 1906 and 1912, and totalled 56 in all. Condensing apparatus was fitted to many of them for working through the Metropolitan tunnels. However, since 1959 all the engines of this class, except No. 69461 have been withdrawn. The survivor is working in her old age heating coaching stock at Shoeburyness carriage sidings.



The 97-years-old Metropolitan Railway steam locomotive No. 23, which has been in the British Transport Museum at Clapham for the last two years, has been loaned for the Underground Centenary Exhibition which is to be held there, this month, at Neasden Railway Depot.

The 45-ton No. 23, affectionately known by her drivers as "the old girl", was taken by road on a Pickfords heavy transporter lorry. The road journey from Clapham to Neasden, via Wandsworth, Kew and the North Circular Road, took four hours.

Number 23 was built in 1866, and hauled Inner Circle trains until the line was electrified in 1905. She finished her active career hauling repair trains used by the Underground Railway engineers.

(*Continued on page 228*)

Top: Class N1 0–6–2 Tank No. 69461, which is being used as a relief stationary boiler for heating carriages at the sidings at Shoeburyness. Photograph by M. Edwards, of Southend-on-Sea. Left: The preserved S.E.C.R. class D 4–4–0 No. 737 photographed at Clapham Junction on its way from Ashford to Nine Elms. It is now in the British Transport Commission's Museum at Clapham. S. Creer, of Carshalton, took this picture.

Tape Recording On Holiday

THE development of the battery-operated portable tape recorder, especially of the small transistor type, has revolutionised the world's attitude toward do-it-yourself sound recording. More and more people "take tapes" with as little concern as they would "take snaps".

A FURTHER ARTICLE IN THE SERIES

BY GORDON E. GOMPERS

Recording the youngster's comments on the holiday scene. Just what did she say about it? Illustration by courtesy of Grundig (Great Britain) Ltd.

However, there is a difference. If you want a pictorial record of your holiday, all you need do is to photograph your subjects, and then hand the used film over to a chemist or a photographic dealer to be developed and printed for you. When you get the prints, you mount them in an album and add suitable captions. But the editing of an audio record of your holiday can only be done by you.

If you intend to have a properly-edited audio record with a commentary added to explain the sounds, with due observance of chronological order, then the sounds recorded on holiday should have the same quality as the commentary—which, doubtless, will be recorded on a mains machine when the holiday is over.

Here, one should avoid the temptation to do things on the cheap by using a cheap transistor, and instead employ a really good battery portable, and this, in point of fact, will not be all that much cheaper than its mains counterpart. Remember, you dub the sounds recorded during your holiday on to the same tape as that on which you are doing your commentary. So if a perfectly good portion of your commentary is followed by an obviously poor example of your holiday recording, the effect will be a trifle odd, to say the least.

I know from personal experience that the reproduction qualities of, say, a 25-guinea battery portable are comparable to those of a 35-guinea mains machine.

* * * *

If you are accompanied on your holiday by a friend, or other member of the family, who is interested in photography, then an interesting and rewarding partnership can be developed. As your friend is taking the visual picture, you can be taking a sound "picture". Then, when you get back home the visual picture can be projected on to a screen, accompanied by the correct audio background. Although coloured transparencies are the easiest media of projection, ordinary photographs can be projected on to a screen by means of an episcope.

Of course, to carry the marriage of an audio-visual record of one's holiday to its logical end, one must tackle the synchronisation of re-recorded sound with moving pictures. This is something that I cannot even begin to deal with here, since the technology of audio-video synchronisation is more than a subject by itself. So I will conclude this article with a consideration of the value of an audio record of a holiday without any visual alliance—the sound and nothing but the sound!

* * * *

I remember discussing this with a friend of mine, well up in his audio technology but not blessed with any great imagination. "Yes," he remarked, "tape recordings are very nice for a holiday if you are going to a country like Spain, where there are many interesting sounds, but supposing you are going to Eastbourne?"

Well, what about Eastbourne? It is as good a place as any in which to record interesting sounds. For instance, there is the carnival, as it makes its happy way along the front; there are the open-air bandstands; the alfresco concert parties at The Oval—and those little Salvation Army groups who hold their services on the beach. Or, perhaps, you can record interesting non-musical sounds, such as the jarring noise of the miniature trams, or the general hurly-burly of the amusement park. And Nature itself is never silent, you know—not even at Eastbourne.

A TIME FOR SECRETS AT MONTE CARLO

At a ceremony at The Dorchester, London, on March 5, Sir Alfred Owen, C.B.E., became the tenth holder of the Ferodo Trophy, as head of the team which successfully brought world championship honours to the B.R.M. racing car.

IF you like your motoring mixed with sunshine, and the sparkling blue waters of the Mediterranean for a background, then a visit to Monte Carlo is indicated. Flowers, sunshine, music and the sea; the gay little Principality of Monaco has them all, and if you pick your date carefully, there is an exciting motor race, too—the Grand Prix de Monaco. This year, it takes place on May 26, a perfect time to visit Monte Carlo. At least, that is what much-travelled motor racing people say and, to prove they mean it, you will find them packing the hotels and quiet cafes round about that fascinating resort. Within two minutes, you can rub shoulders there with more famous racing drivers, top engineers, team managers and the thousand and one personalities of all nations who make up the colourful motor racing circus than at any other circuit in Europe.

ROAD AND TRACK

By Jerry Ames

If you have never been there, the Monaco Grand Prix is a must, like the Boat Race or your first visit to Lords, and it is even more fascinating than Paris in the spring.

Nowhere else will you find such an array of exotic cars from the lordly Rolls-Royce (with four headlamps, of course), the scarlet Alfa Romeo coupé or the fierce-sounding *Gran Turismo* Ferrari to the more humble, but popular Mini-Cooper.

Mechanics in charge of Grand Prix racing do not have much time to enjoy the pleasures of Monte Carlo. This year, they may have even less, for so many Formula One cars are new.

Will Ferrari send his new, scarlet machines with V–6, V–8 or V–12 engines? No one will say until the teams arrive and then a great deal depends on practice times, but they like to play cat and mouse with one another, keeping other teams guessing and springing last minute surprises.

Is Colin Chapman taking the much modified Monocoque Lotus with fully automatic transmission? Ask him and he will suddenly remember an urgent appointment at the other end of the town. "Tell you at practice, old boy." Has John Cooper brought along the new Formula One Cooper with Hydrolastic suspension? "Well, as you can see," he'll say, hiding as much of the car as possible with his body, "it isn't much different from last year". And so it goes on, but this is all part of the game before a big Grand Prix.

Tony Rudd of BRM smiles quietly; he will be more willing to talk after practice about how much weight they have pared off the BRM, but he cannot hide its new streamlined body.

Ask that chap with the beard who has been poking under bonnets. "Good heavens, it's Stirling Moss. He's bound to know, but he won't say much before practice".

There's burly Walter Hassan of Coventry-Climax, bending down examining one of his new short-stroke engines with Lucas fuel injection. "How much power *does* the new Coventry-Climax engine give?" "Just a bit over 200 b.h.p. at 10,000 r.p.m.," he'll tell you, but the exact figures he keeps to himself. No sense in broadcasting them to the opposition, is there?

Even lap times can be misleading during the first practice. A driver will go flat out for half the circuit, slow for the remaining portion. By doing this he discovers what *he* wants to know without revealing too much speed and acceleration to rival teams; for as soon as anyone takes a car round the circuit, stop watches click, and lap times can be revealing.

But there is no more foxing on the last day of practice. Every driver means business because it is the final lap times that decide positions on the starting grid and, in a race like the Grand Prix de Monaco, run through the streets of Monte Carlo, where there is a corner to be taken every ten seconds, those who can draw clear of the pack on the first lap may gain a useful advantage.

One of the tricks most teams use to put up a fast practice time is to send the car out with only a couple of gallons of fuel in the tank. Being more than 20 gallons light makes an enormous difference to the

weight of the car, improving braking and acceleration no end; that is how many of them achieve those phenomenally fast times during practice.

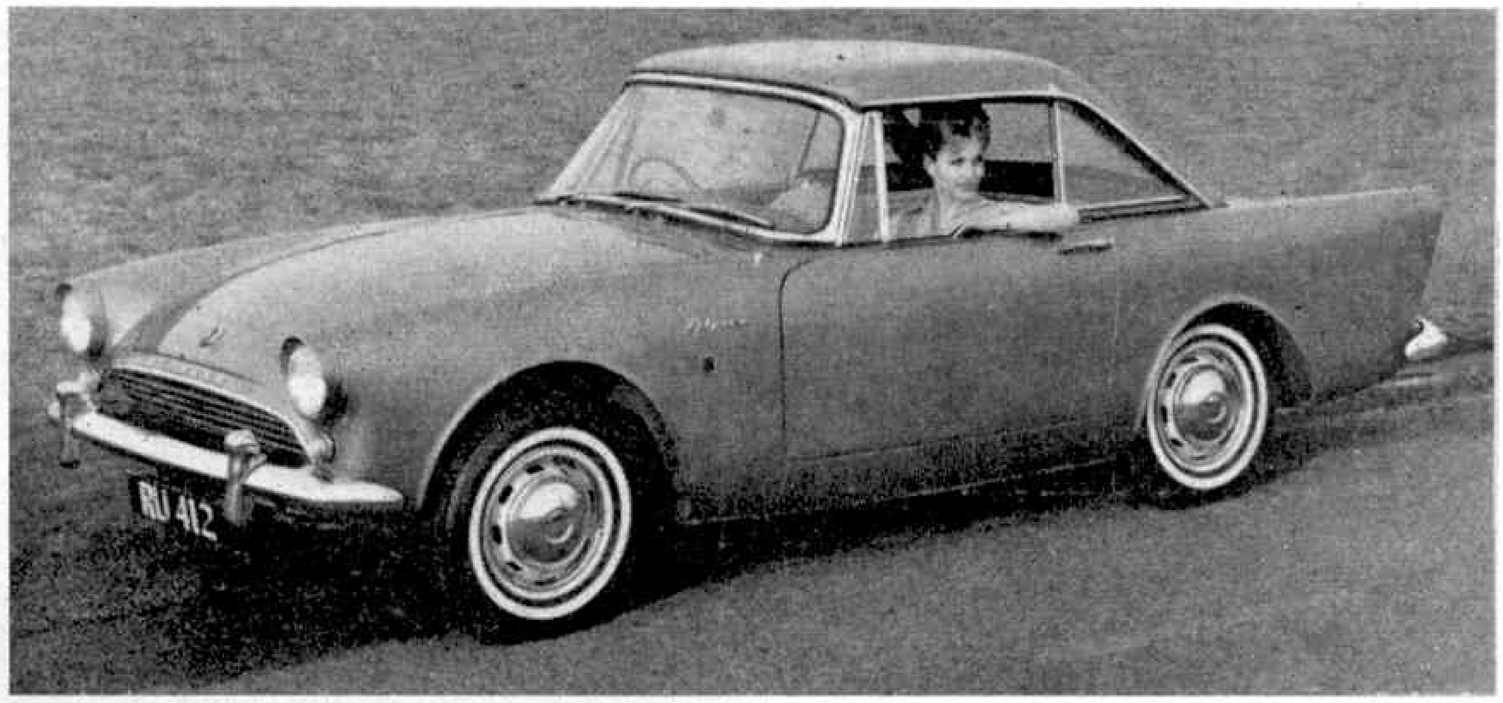
So you see there is a lot more to motor racing than meets the eye, and it can be every bit as interesting to watch practice as the race itself, especially in an event like the Monaco Grand Prix.

RACE FOR ENGINE POWER

Meanwhile, those at home are busy on the design of new multi-cylinder engines. Ferrari has a V–16 under construction for 1964, nor will BRM be left behind in the race for engine power. Now that Coventry-Climax have been absorbed into the Jaguar empire they, too, should have more money for the development of a multi-cylinder racing engine.

For an alternative to Monte Carlo for excitement try Silverstone on Saturday, May 11. Most of the top names in motor racing will be there at the wheel of Grand Prix cars; indeed, some teams use the British Racing Drivers' Club International Trophy as a try-out for the new season's cars for, if something is wrong, there is just time to make the necessary modifications before the cars leave for Monte Carlo.

The big International May meeting at Silverstone, sponsored by the *Daily Express*, is one of the most popular British race meetings of the year, because there is such a variety of events from saloon car racing, guaranteed to make your hair stand on end, to Formula Junior and the bigger Grand Prix cars. You certainly get value for money. One of the entries is almost certain to be an exciting new 120 m.p.h. Mini, with engine at each end, built by Paul Emery. With 200 h.p. and a total weight of 13½ cwt., this is a Mini that can out-accelerate an "E" Type Jaguar. It will shortly be going into production with a smart G.T. body.



The attractive and powerful Sunbeam Alpine Gran Turismo.

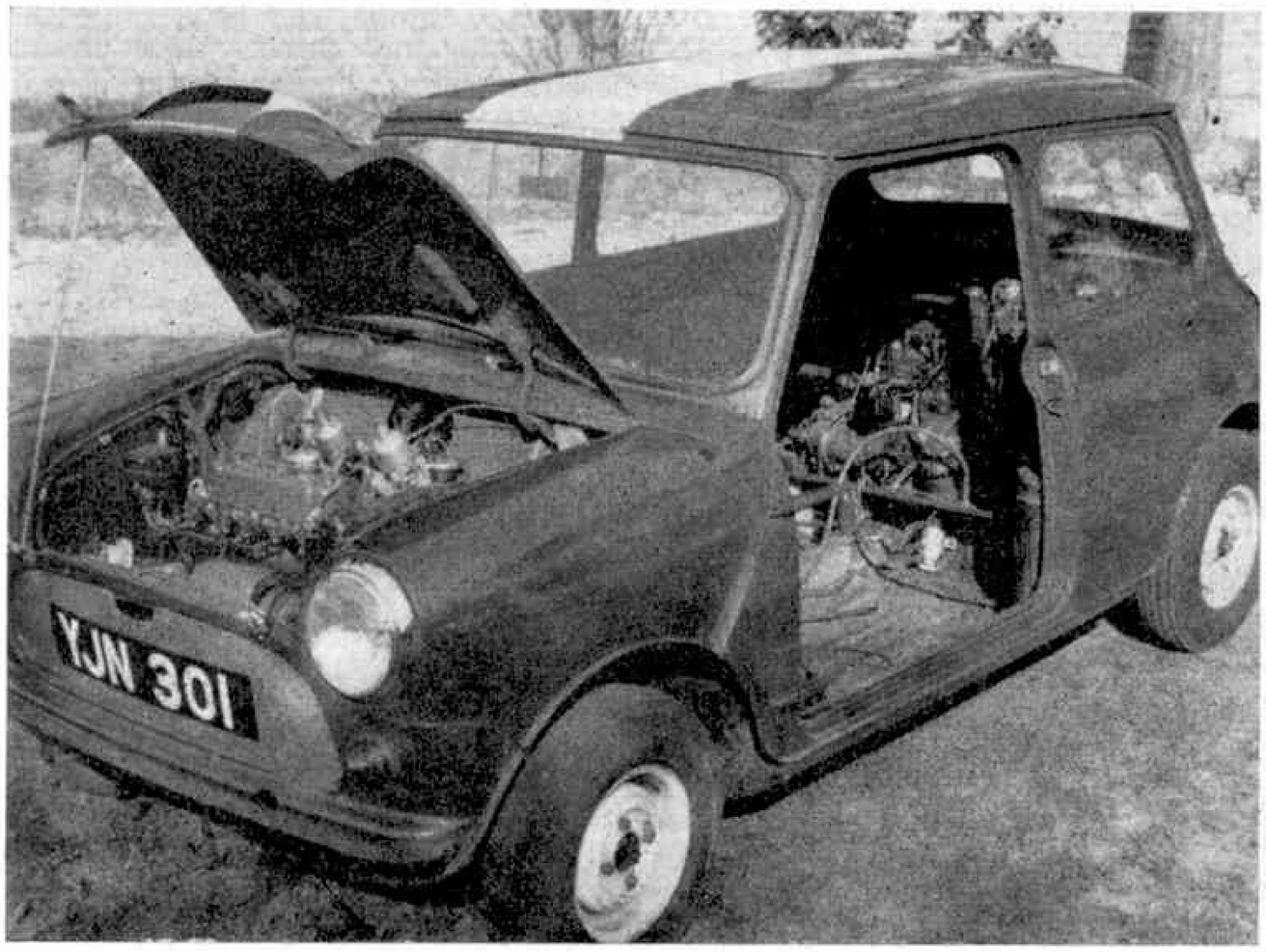
Each month more and more new cars are being announced. Recently we had the estate version of the Super Cortina from Fords, together with their *Gran Turismo* Capri. Outwardly, this car does not look very different from the normal model, but things have gone on under the bonnet to boost its performance.

ADDING EXTRA SPEED

The G.T. Capri has a double choke Weber carburettor, 9 to 1 compression ratio, different camshaft, larger exhaust valves and a new four-branch sweeping exhaust manifold, all of which add nearly another 10 m.p.h. to maximum speed, which now closely approaches 95 m.p.h. So the new Capri not only looks fast, but is fast. Detailed attention has been paid to brakes and transmission to bring them into line with the increased performance.

Next on the scene is a more powerful version of the Triumph Herald 1200, known as the 12/50. Power goes up from 39 b.h.p. to 51 b.h.p. net, its top speed being 82 m.p.h. One of the most attractive features in the eyes of fresh air motorists is the sunshine roof, a standard fitting—the first, I believe, since pre-war days. In view of the extra performance disc brakes are standard.

New from Rootes is the Series 111 Sunbeam Alpine with power increased to give a genuine 100 m.p.h. Two versions include an open sports tourer and a smart new Alpine G.T. Power goes to 80 b.h.p. and the disc-drum brakes now have servo assistance. Special attention has been paid to driving comfort, for in addition to new competition type seats, steering column and foot pedals may be adjusted to suit individual drivers; in fact, there are no fewer than 64 different combinations.



A probable entry for the Silverstone May meeting is the exciting 120 m.p.h. Mini built by Paul Emery, and pictured here.

TRACTION ENGINE RALLY AT ANDOVER

The Andover and District Model Engineering Society are again holding their annual Traction Engine Rally this month and, as before, it will take place at Finkley Manor Farm, near Andover, Hants. The date is Saturday, May 11, and the gates will be opened at noon. The official opening ceremony will be performed by Muriel Young, the well-known TV and radio personality, and the programme will begin at 2 p.m. Admission: Adults 2/– (including programme); Children 6d. Car Park: Cars 2/–; Motor Cycles 1/–. Bus services from Kennedy's, West Street, Andover.

As always, there will be a fine turnout of steam traction engines, and the full programme of events for them will include an obstacle course, engine rally race, musical chairs, ladies' steering contest and, of course, the Grand Parade of veteran and vintage cars. A steam threshing demonstration will be another interesting event, and the model engineering exhibition is a certain attraction. A new feature will be an "old engine driver's re-union tent", where these "old boys" can meet and chat with old friends.

The Rally Secretary, Mr. G. Howell, of 5 The Crescent, Andover, will be pleased to give further particulars to readers who hope to be able to visit the rally and who will write to him for them, enclosing a stamp for reply.

BRITISH ENGINE POWERS THE LATEST JUGOSLAV JET-PLANE

The new two-seater aircraft Galeb, pictured above, is suitable for light ground attack duties as well as for training.

WE know very little about military aircraft production in Jugoslavia, so it was a pleasant surprise when I received the photograph reproduced at the top of this page. It shows a new two-seat aeroplane named the Galeb (Seagull) which has been designed as a standard basic flying and weapons trainer for the Jugoslav Air Force.

AIR NEWS

By John W. R. Taylor, Editor of "Jane's All The World's Aircraft"

Like its British and Italian counterparts, the Jet Provost and Aermacchi MB 326, the Galeb is powered by a 2,500 lb. thrust Bristol Siddeley Viper 11 turbojet engine. This should give it a top speed of around 500 m.p.h., making it suitable for light ground-attack duties as well as training.

The layout of the Galeb is conventional, with unswept wings, a retractable tricycle undercarriage and wing-tip fuel tanks. The crew of two sit in tandem, on ejection seats, with a separate hood over each cockpit. The armament consists of two 0.50-inch machine-guns in the nose, with pylons for rockets or bombs under the wings.

If flight tests prove the Galeb to be as good as it looks, the Jugoslavs may well find an export market for it in countries that have not yet bought Jet Provosts or French Fouga Magisters.

The pallet-loading system used for the Douglas DC-8F "Jet Trader" ensures speedy handling of cargo. This illustration shows how the goods are loaded from a pallet transporter truck on to a fork lift vehicle which then elevates the pallets to the level of the aircraft's cabin floor.

STANDING ROOM ONLY

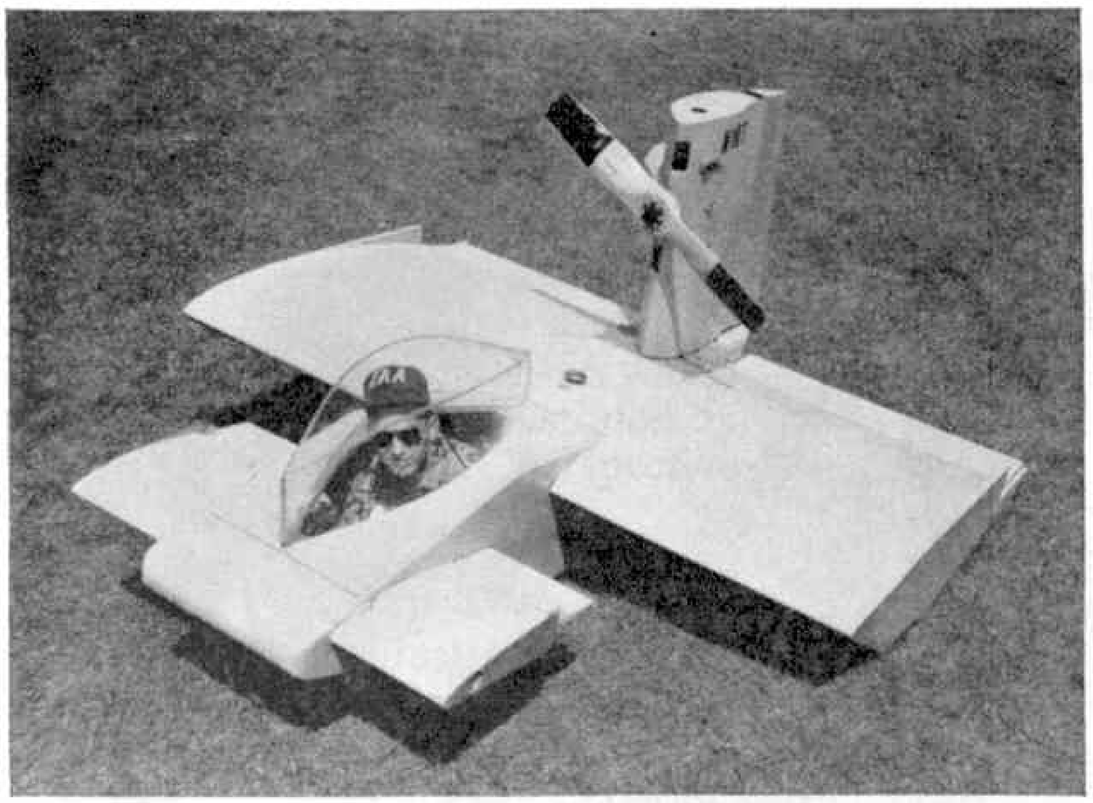
When Morocco was swept by disastrous floods in January, U.S. Army helicopter crews carried to safety more than 1,000 of the victims.

So desperate was the plight of the refugees that they were allowed to pile on board the aircraft until the cabins were full, regardless of the number of seats available. This led to some remarkable examples of overcrowding, but the record must surely have been set by the pilot of a Bell UH-1B Iroquois who took off with 32 Moroccans and three other crewmembers on board. The normal payload of a UH-1B is seven passengers and a crew of two.

NEW JET FREIGHTER

A few weeks ago I was invited to look over the first Douglas DC-8F Jet Trader, which was about to enter service on Trans-Canada Air Lines' Montreal-Prestwick-London route. It is an impressive aircraft, powered by four 18,000 lb. thrust Pratt & Whitney JT3D turbofan engines and able to carry a mixed payload of twelve and a half tons of cargo and 117 passengers.

I watched a demonstration of the special pallet-loading system which the airline has devised to ensure speedy handling of freight. First of all, an 11 ft. 8 in.-wide door on the port side of the front fuselage opened upward and a big fork lift truck took up position under the open doorway. A lorry then backed up to the fork lift, carrying two 5,000-lb.



Above: One of the strangest light aircraft ever built is the "Pea Pod", erected by Terrance O'Neill of Indiana, at a cost of 800 dollars. It is made mostly of plywood. In our remaining picture a 204B helicopter referred to in this month's Notes is seen leaving with a heavy load of components for cable pylon construction work. The photograph, which appears by courtesy of Bristol Siddeley, was taken on a lake-side at Rossaga, just south of the Arctic Circle.

pallets of freight on roller conveyors attached to its 20-ft. deck. One after the other, the pallets were slid off the lorry and on to the fork lift, which raised them to the level of the aircraft's cabin floor.

To facilitate handling of the heavy pallets inside the aircraft, ball carriers are mounted on the floor just inside the doorway. These enable the pallets to be moved easily in any direction on to roller conveyors which run the full length of the cargo hold. With their aid, the two pallets were pushed into the required position and lashed down within minutes. The ball carriers were then removed, the door was closed, and the aircraft was ready for take-off.

Five Jet Traders have been ordered by T.C.A., the first two of which will be equipped to carry mixed loads and the others will carry only passengers. During this summer, even the mixed-load aircraft will have their cargo hold reduced in size to carry only two pallets of freight and 135 passengers; but there is space for a further 8,000 lb. of cargo and baggage in holds beneath the floor of the passenger cabin.

Obviously, T.C.A. hope that these 580-m.p.h. aircraft will attract sufficient freight traffic to permit their eventual use in the rôle for which they were designed—carrying more freight and fewer passengers. The problem, as always, is to convince shippers and exporters of the immense advantages to be gained by sending their goods by air.

MEET THE PEA POD

Some strange-looking aircraft have been built—and flown—by members of America's Experimental Aircraft Association, but the one illustrated at the top of this page must surely be the weirdest of all. Known as the Pea Pod, it has been built by Terrance O'Neill of Fort Wayne, Indiana, at a cost of 800 dollars and fourteen months of spare-time work. The airframe is made largely of plywood, with foam-plastic filling, and the power plant is a 35-h.p. Kiekhaefer, mounted in the tail-fin.

The Pea Pod is only nine feet long, with a wing span of eight feet and an empty weight of 200 lb. Being so small, it cannot be fitted with a seat and the pilot lies on his stomach with his head inside the plastic canopy.

If it flies, Mr. O'Neill expects it to have a top speed of about 135 m.p.h. and to land at 55 m.p.h. We can only hope, for his sake, that it will.

BUSINESS AS USUAL

In spite of temperatures of around minus 10 to 14 degrees C. and winds gusting up to 50 knots, an Agusta–Bell 204B helicopter transported 220 tons of constructional material for a hydro-electric project in Norway last winter. The operation was carried out in the Rossvaten area, some 100 miles south of Bodø, near the Arctic Circle, and involved carrying under the fuselage heavy loads of angle steel for cable pylons, pneumatic compressors for drills, cement, sand, and even huts big enough to sleep four men.

The helicopter, seen in the right-hand picture at the top of this page, is operated by Helikopter Service A/S, a Norwegian charter organisation with headquarters in Oslo. It is powered by a Bristol Siddeley Gnome shaft-turbine and is able to lift cargoes of up to 3,300 lb., making it the most useful aircraft in the company's fleet.

During 1962, this one Agusta–Bell 204B carried 3,840 of the total of nearly 4,900 tons air-lifted by Helikopter Service aircraft. On one occasion in the summer (when there is almost continual daylight in Northern Norway) it was in the air for twelve and a half hours out of twenty four.

WHO WANTS CAVIAR?

Many people cannot eat the kind of food normally provided for airline passengers in flight, either because they are on a diet or for religious reasons. To meet their needs, the airlines usually arrange special, personal menus.

Scandinavian Airlines System have now gone one better. Realising that the average young passenger would much prefer hot dogs to caviar, they carry on their long-distance flights supplies of food and drink calculated to bring meal-time delight to all lucky boys and girls on board their aircraft.

These new menus for children include scrambled eggs for breakfast, hot dogs for snacks and ice-cream or strawberry shortcake for dessert. To keep the junior passengers happily occupied between meals, S.A.S. already provide all kinds of games and amusements, ranging from paper doll stewardesses to toys, pilot badges and story-books.

WORLD'S LOWEST FARES

The biggest problem facing world airlines today is to find ways of filling all empty seats on their new and costly jet and turboprop aircraft. Traffic has increased more slowly than expected and, on average fewer than half of the available seats on each airliner were filled in 1962.

Last month, B.E.A. introduced a bold new idea known as "standby fares" which may help to (*Cont. on page 228*)

ELECTRIFYING NEWS FOR ALL KEEN MECCANO ENTHUSIASTS!

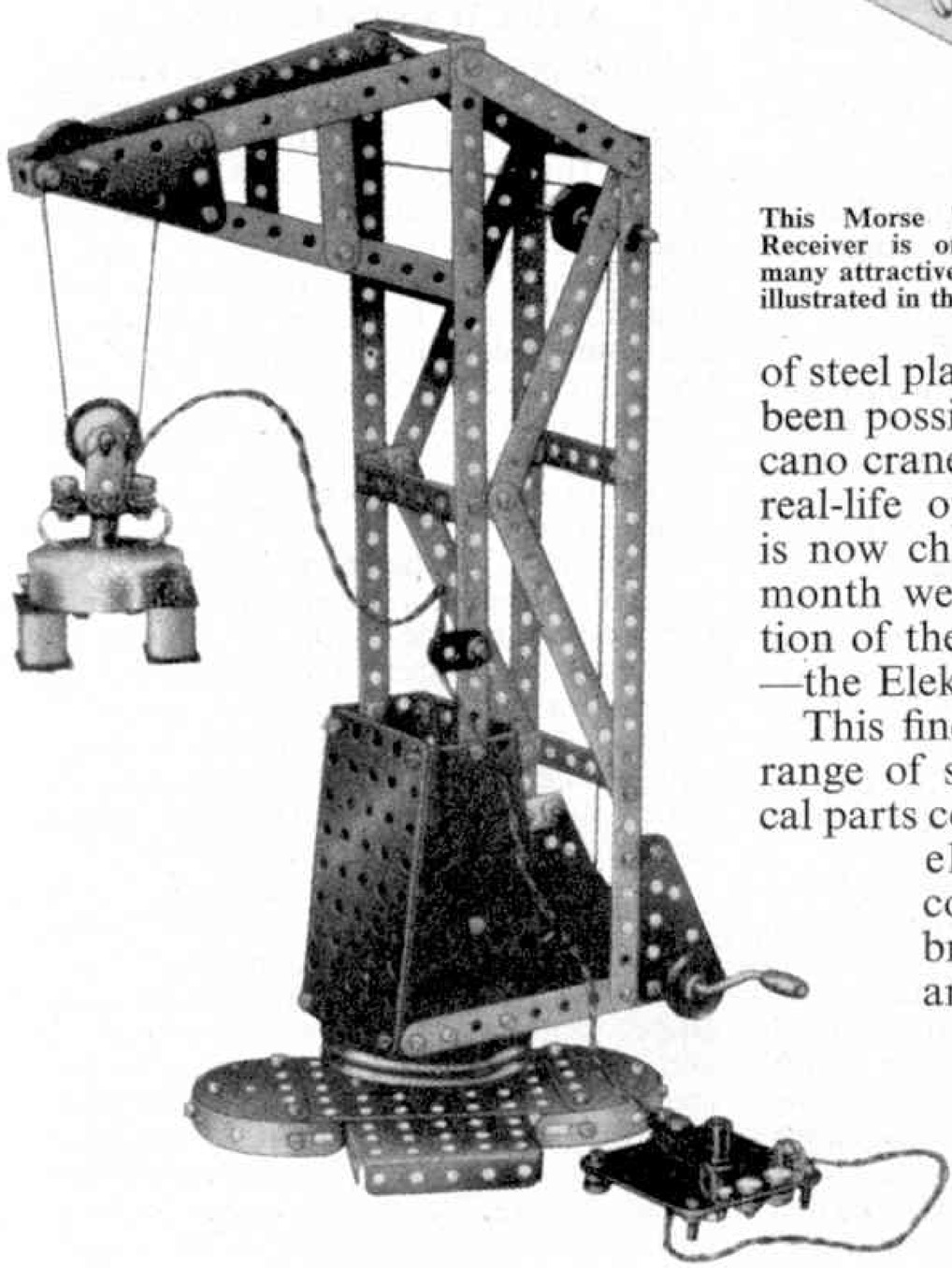
Introducing "Elektrikit"

DOWN comes the crane-lifting tackle until it rests on the heavy steel girder lying on the ground. The crane driver flicks a switch, moves a lever—and the girder is hauled aloft, held firmly in the grip of a powerful electro-magnet.

Although such incidents as this are common in metal stockyards, shipyards, and other places where cranes are used to lift and transport heavy loads of steel plates and girders, it has not been possible in the past for Meccano crane builders to emulate this real-life operation. This situation is now changed, however, for this month we announce the introduction of the latest Meccano product—the Elektrikit.

This Morse Telegraph Receiver is one of the many attractive electrical models illustrated in the Elektrikit Book.

This fine new Kit contains a big range of specially-designed electrical parts comprising permanent and electro-magnets, coils, commutator and wiper brushes, insulating plates and other parts, lamps and holders, etc. which can be used with Parts in a standard Meccano Outfit 3 or one larger, to build up electrical apparatus of all kinds—including powerful electro-magnetic hoisting tackle for cranes.



Electro-magnetic hoisting gear made with Elektrikit Parts, fitted to the model Forge Crane shown in the Meccano Model Book for Outfit 4.

The Elektrikit Parts can be applied in many ways to electrify standard models shown in the ordinary Model Books. In addition, the Parts can be used to build completely new types of electrical models such as Morse telegraph sending and receiving apparatus, synchronous and other types of motors, electric bells, switches, electric engines, voltmeters and ampmeters. Big Wheels, Flyboats, Traction Engines, etc. can be built from a standard Outfit and then fitted with electric lights, while experimentalists will find the special

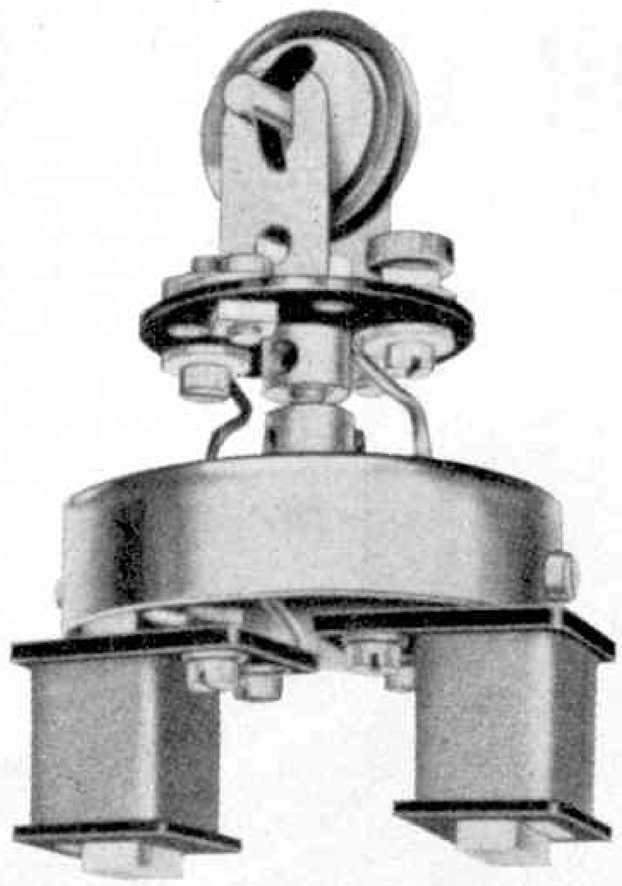
Elektrikit parts of value in electric clocks and electrically controlled gear-boxes, etc.

The Elektrikit is designed for use with a standard Meccano Outfit No. 3 or one larger and comes complete with a very attractive Book of Electrical Models in which the models are clearly illustrated by means of pictures and perspective line drawings.

On Low Voltage

The models illustrated in the Elektrikit Book are designed to work on low voltage, between 4 and 15 volts Direct Current or Alternating Current, so no danger is involved. Some of the models can be worked from a single 4.5 volt battery. A Hornby II Power Control Unit is ideal for use with the Elektrikit as it supplies a D.C. output variable from 6 to 12 volts and also an A.C. output at 15 volts.

No Meccano model-builder should be without an Elektrikit. It greatly increases the model-building scope of a standard Outfit and adds considerably to the pleasure of model-building. So go along to your dealer today and ask for full details of this fine new Elektrikit!



Electro-magnetic hoisting gear built with Elektrikit Parts.

The Cruachan Hydro-Electric Scheme—

(*Continued from page 191*)

site of the new dam. At the same time, work began on the driving of an access tunnel, almost a mile long, into Ben Cruachan to the site of the underground power station and its associated works.

The new access road, 10 feet wide and three miles long, with an average gradient of 1 in 14, climbs easily into magnificent country previously visited only by shepherds and mountaineers. The fact that the only railway line, and the main road, to Oban, one of Scotland's principal holiday resorts, circles the foot of Ben Cruachan made the job of the roadbuilders more difficult. All rock blasting had to be done in such a way as to prevent stones avalanching down the mountainside.

It is the underground station, however, which presents the most intriguing section of the entire project. When it is complete the overall dimensions of this station will be 298 feet long by 77 feet wide, with a maximum height of 115 feet—dimensions approximately similar to those of the new Coventry Cathedral.

The arch of the massive roof is complete. Except where bad rock makes reinforcing necessary to prevent cave-in, the roof and walls of the new station will be left completely bare. Carefully illuminated, the visual appearance of this vast expanse of natural rock, housing four huge turbines, will be most dramatic.

Two overhead travelling cranes each capable of carrying 110 tons will be installed. They are needed for the erection of the plant and, subsequently, for repair and maintenance work.

While excavation proceeds, the air is filled ceaselessly with the roar of drills as the tunnellers drive forward, and with the noise of great dump trucks, each carrying three cubic yards of rock, charging up and down the access tunnel to tip their load of spoil into Loch Awe. Contact by speech is impossible among men working underground and, in the fume-laden atmosphere, even powerful electric lights burn dim.

From the underground power station pilot tunnels lead off to ancillary workings and to the main transformer hall. The work of excavating this hall is now almost complete and from it a combined cable and ventilating shaft is being bored upwards to the surface almost 900 feet above. When finished, this shaft will be 13 feet in diameter. Piercing upwards through solid granite to such a great height, and in such confined conditions, achieving a seven to eight foot "climb" every twelve-hour shift, represents a major tunnelling achievement.

Adequate ventilation of the underground station is essential because heat losses from the four machines will equal the heat given off by 12,000 one-bar electric fires.

When all underground work is finished the tunnellers will have excavated approximately 200,000 cubic yards of rock.

The dam on Ben Cruachan forming the new top level reservoir will be of the massive buttress type 1,000 feet long and with a maximum height of 150 feet. This dam, and a chain of aqueducts being built round the peak of the mountain, will also collect the rain which falls on the top. Indeed, the rainfall by itself will provide 50,000 million units of the electricity included in the scheme's total output.

The first power is expected to flow from Cruachan in 1965. By 1966, the project will be in full production.

BOOK REVIEW

Science and the Builder by Donald Grattan (Bell, 17/6) describes the part played by science and technology in the work of the modern builder and civil engineer, whose tasks range from building houses and many-storied blocks of flats to vast works and big stores; from erecting bridges to constructing tunnels, and from building dams and harbours to great motorways. The author who, as Senior Assistant in the B.B.C. Schools Television Department is engaged in the organisation of broadcasts on Mathematics and Engineering Science, devotes much of the book to new houses. He deals with the principles of construction, the testing of materials and structures (here he describes visits to research stations to see some of the surprising experiments carried out there), and the less exciting but essential problems of water supply, lighting and heating.

Turning to bridge construction, he describes the problems which confront the bridge engineer, and the new techniques and materials now used in building these structures. He goes on to deal similarly with the construction of new roads—from motorways to fly-overs—and to describe some of the difficulties which have to be overcome in driving long deep tunnels.

The text is supplemented by helpful diagrams and 16 full-page half-tone illustrations showing various aspects of civil engineering.

THE GAME OF CROQUET

In his interesting article *Ball Games Through the Ages*, in the *M.M.* of February last, Mr. F. W. Robins remarked that "pall mall and Croquet were post-medieval, and are now virtually dead". This view is not shared by John Jaques and Son Limited, of Thornton Heath, the manufacturers who introduced Croquet to this country in the middle of last century, and who are still the leading manufacturers of Croquet equipment. They assure me that the game is still "very much alive", and that a ruling body—the Croquet Association—had been in existence for many, many years. They add that the official game is played in a number of Clubs in this country, and that Croquet is also played extensively in Australia, New Zealand, South Africa, and in the United States.

A MODEL FOR OLD MECCANO BOYS

"SPANNER'S" NOTES FOR ADVANCED BUILDERS

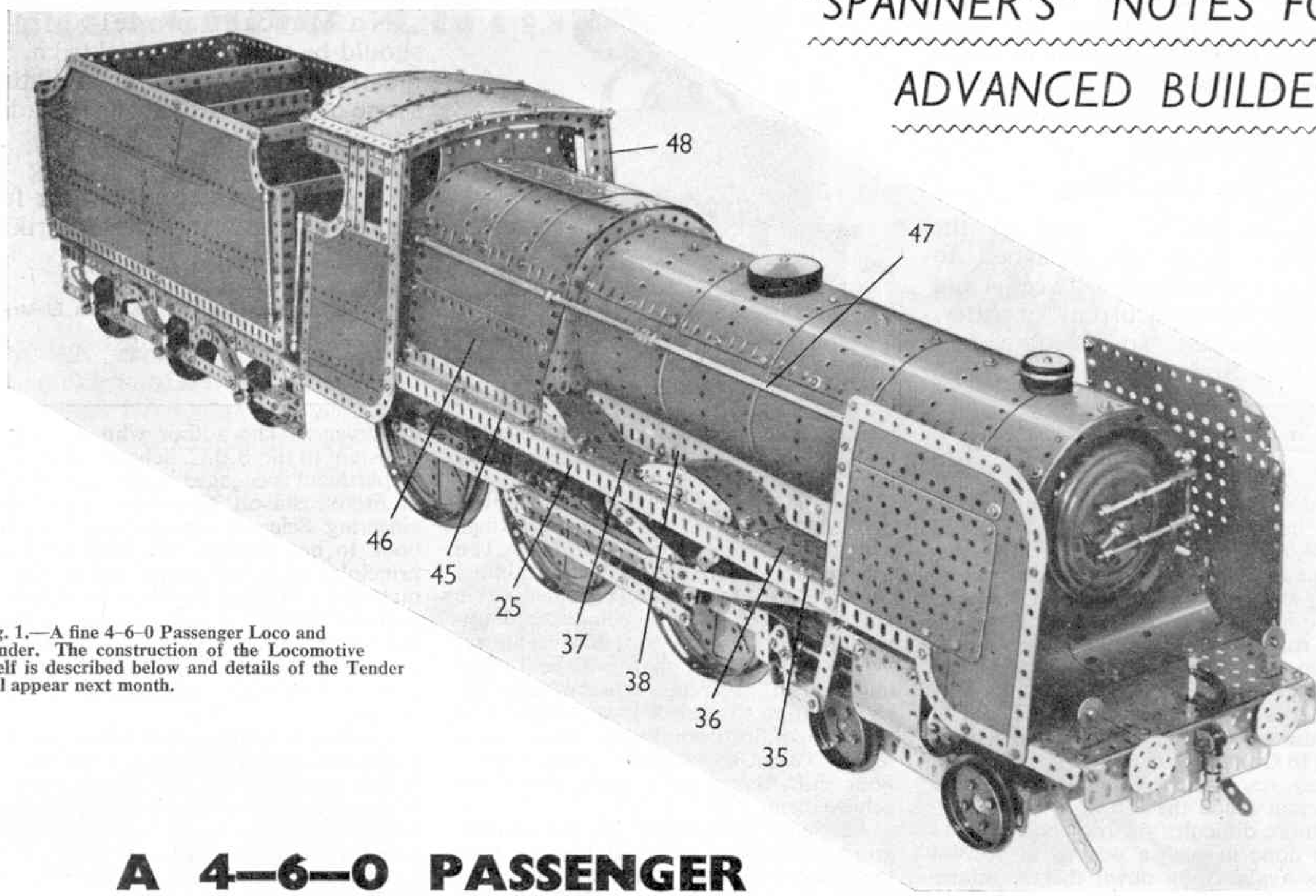


Fig. 1.—A fine 4–6–0 Passenger Loco and Tender. The construction of the Locomotive itself is described below and details of the Tender will appear next month.

A 4—6—0 PASSENGER LOCOMOTIVE

IF you are one of those older and very fortunate Meccanoites who possess massive collections of Meccano Parts, possibly you may be one of those who have been writing letters complaining that I have been starving you of large advanced models into which you can get your teeth!

Well, while I am always delighted to hear from anyone interested in Meccano, I don't want you to get your teeth into me. That would never do. And so, in response to your prompting—urging might be a better word—I ask you this month to bring out your Outfits and get cracking on the giant 4–6–0 Passenger Locomotive and Tender shown complete in Fig. 1. This model should surely be big enough for the most ardent enthusiast, for overall it measures roughly 5 feet and it weighs I don't know how many pounds! Further, it is interesting mechanically on account of its valve motion, etc., and I am sure you will find that building it is quite a challenge. It is powered by an E15R Electric Motor.

The constructional details of the Locomotive itself, including a list of the parts required, are described in this article. Details of the construction of the Tender will be given next month, together with further illustrations of it and a list of the parts required.

Construction of the Locomotive (Main Frames)

Both frames being similar, only one side will be described. A 24½″ Angle Girder 1, and a compound angle girder 2 made up from an 18½″ and a 12½″ Angle Girder overlapped five holes, are joined to each other by four 5½″ × 2½″ Flat Plates and one 2½″ × 2½″ Flat Plate. The 2½″ × 2½″ Flat Plate is extended by bolting a 4½″ Flat Girder and a 9½″ Angle Girder 5 in the centre holes. A 3½″ Flat Girder 6, supporting a 2½″ Angle Girder 7, is attached to the angle girder 2 by 2½″ Strips. At each end of the Flat Girder 6 a 2½″ Stepped Curved Strip is bolted. The front one is secured by a 1½″ Strip and a Fishplate attached to a 1½″ Strip that also has a 4″ Stepped Curved Strip bolted to it. The two frames are joined together with 4½″ Angle Girders 3, 8 and 11, a ½″ Strip 9, and a 8½″ compound angle girder 12 attached to a 4½″ Angle Girder bolted on the upper flange of the angle girders 2. At the front of the angle girders 2, a 3″ Angle Girder with a 2½″ Flat Girder attached is bolted, so as to extend the angle girders 2 by one inch. An Obtuse Angle Bracket is secured to the front hole of the 2½″ Flat Girder (this will later be used as an attachment for the boiler). The six driving wheels are built up as shown and are fastened to 5½″ Rods, care being taken to see that the wheel cranks on one side are set at 90° to those on the other side of the locomotive. A 3″ Sprocket Wheel 14 is fastened to the centre Rod.

The E15R Motor is bolted to two 4½″ × 2½″ Flat Plates, which are secured to the angle girders 2. A ¾″ Sprocket Wheel

on the armature shaft drives a 3″ Sprocket Wheel on Rod 15, which supports a ¾″ Sprocket Wheel that drives the Sprocket Wheel 14. Two 7½″ Strips 16 are loosely attached to the Double Arm Crank on the first and second wheels from the front by means of Pivot Bolts. The Strips are spaced from the Crank bosses by Collars. The Double Arm Crank on the centre wheel carries in its boss a 1½″ Rod, on which is a Collar, the Strips 16, three Washers, a 12½″ Strip 17, and a Crank 18.

Remember—next month's* M.M. *will contain full details of how to build the Locomotive Tender.

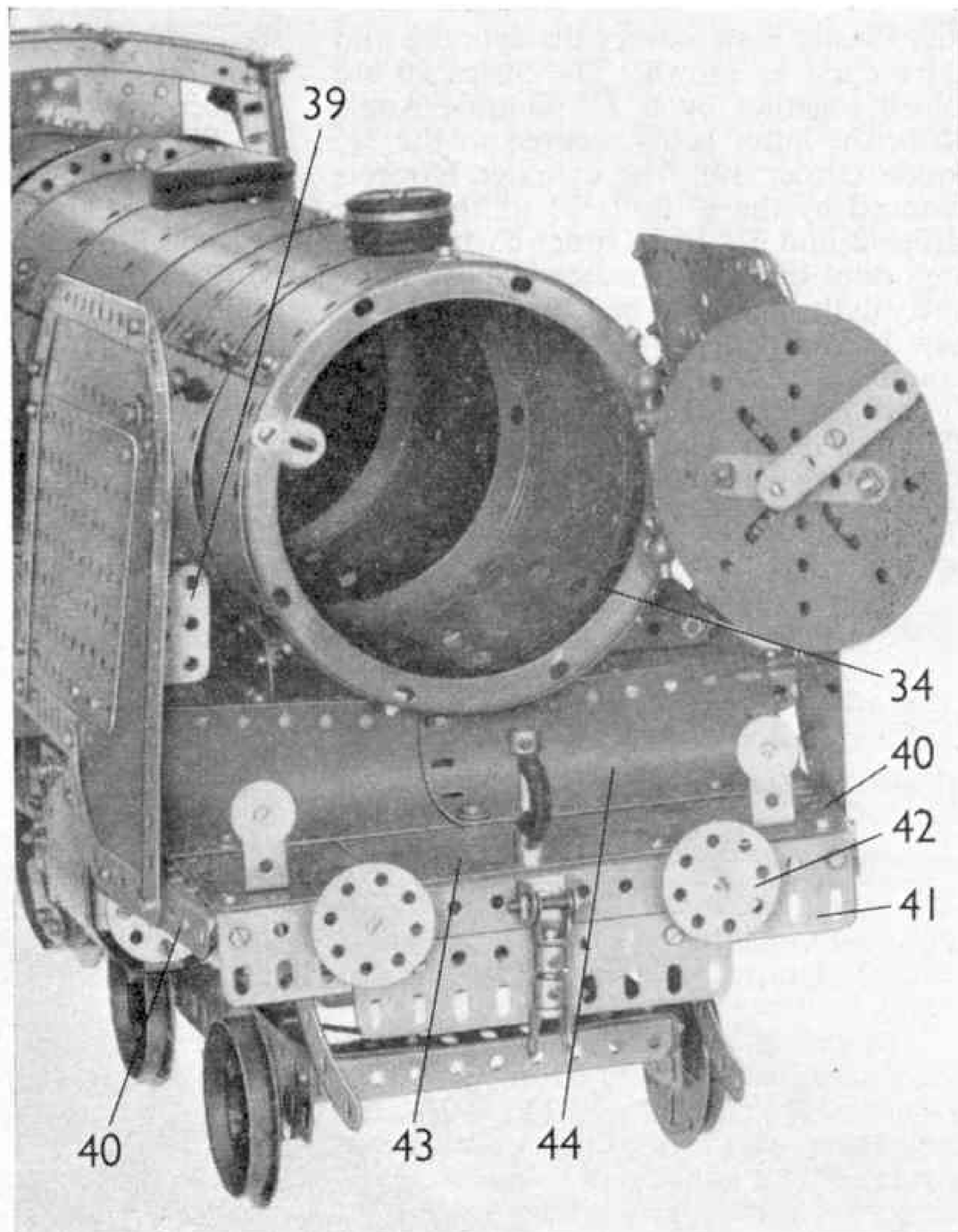
Valve Gear, Connecting Rods, etc.

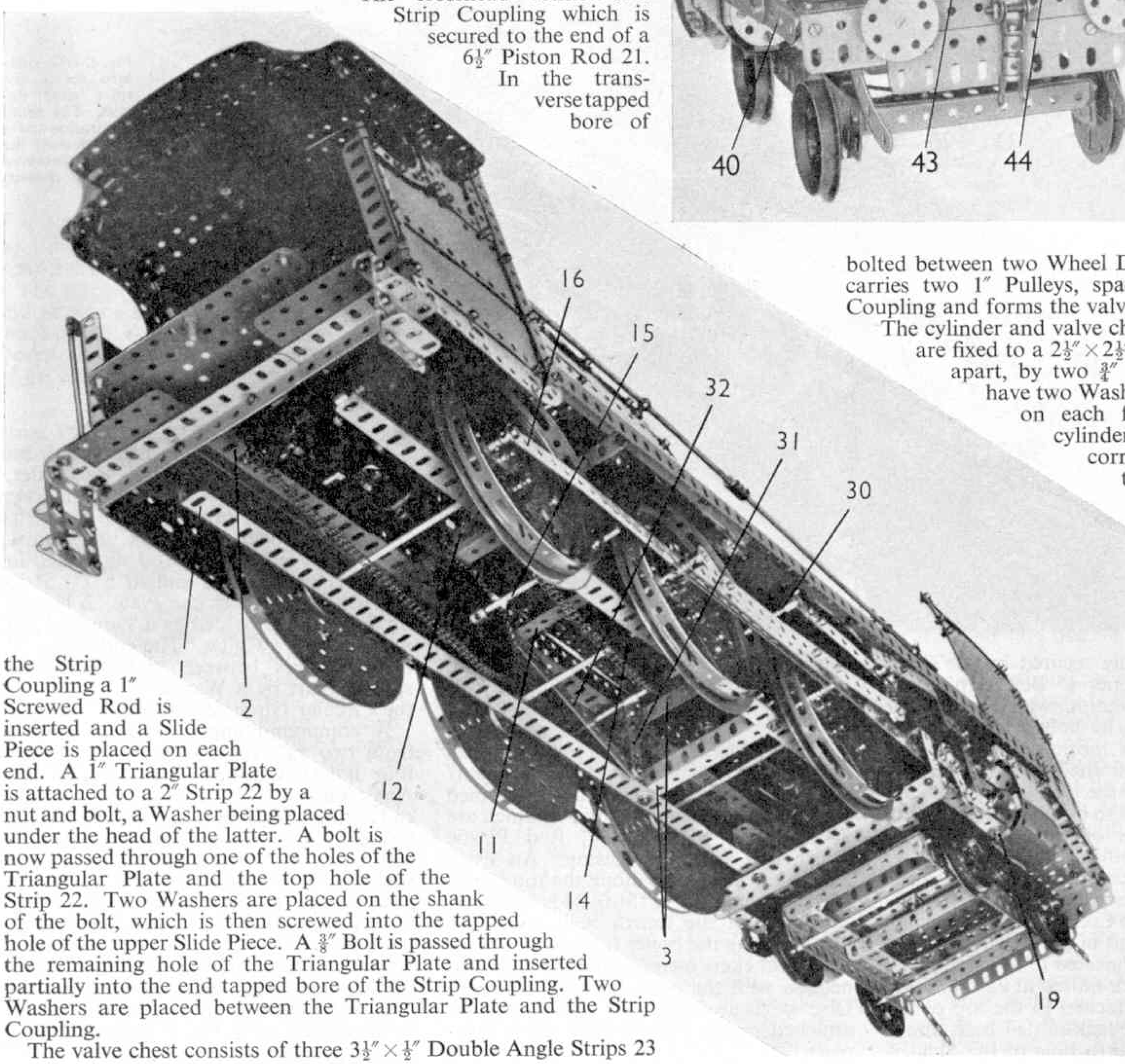
The Crank 18 must be set at a slight angle so that its end describes a circular path about the driving wheel centre. Each cylinder consists of three 2½″ × ½″ Double Angle Strips bolted between two eight-hole Wheel Discs. Two ½″ × ½″ Angle Brackets 19 are secured to the rear Wheel Disc by the bolts which hold the Double Angle Strips, and are diametrically opposite one another in a vertical plane. The 4½″ Strips 20 are attached to the Angle Brackets 19, a Washer being placed between one of the Strips and the Angle Bracket.

The "crosshead" consists of a Strip Coupling which is secured to the end of a 6½″ Piston Rod 21. In the transverse tapped bore of the Strip Coupling a 1″ Screwed Rod is inserted and a Slide Piece is placed on each end. A 1″ Triangular Plate is attached to a 2″ Strip 22 by a nut and bolt, a Washer being placed under the head of the latter. A bolt is now passed through one of the holes of the Triangular Plate and the top hole of the Strip 22. Two Washers are placed on the shank of the bolt, which is then screwed into the tapped hole of the upper Slide Piece. A ⅜″ Bolt is passed through the remaining hole of the Triangular Plate and inserted partially into the end tapped bore of the Strip Coupling. Two Washers are placed between the Triangular Plate and the Strip Coupling.

The valve chest consists of three 3½″ × ½″ Double Angle Strips 23 bolted between two Wheel Discs. A 5″ Rod carries two 1″ Pulleys, spaced apart by a Coupling and forms the valve rod.

The cylinder and valve chest on each side are fixed to a 2½″ × 2½″ Flat Plate 2 in. apart, by two ¾″ Bolts 58, which have two Washers and a Collar on each for spacing the cylinder block the correct distance from the main frames. A 4½″ × 2½″





Figs. 2 and 3.—The upper picture shows the details of the smoke-box and front buffer beam. On the left is an underneath view of the complete locomotive.

Red Plastic Plate covers the cylinder and valve chest as shown. The Strips 20 are joined together by a 1½″ Double Angle Strip, the latter being secured to the 7½″ Angle Girder 10. The cylinder block is fastened by the ¾″ Bolts 23 to the angle girder 2 and 3½″ Flat Girder 6. It is very important that the crossheads move quite freely in the guides. The 12½″ Strip 17 may now be inserted in the slab of the Strip Coupling.

The "expansion link" 24 consists of two 2½″ large radius Curved Strips connected together by ⅜″ Bolts and spaced apart by four Washers on each of the bolts. A Fishplate is rigidly secured by the lower ⅜″ Bolt. The upper ½″ Bolt is pivotally attached to a Trunnion, which later in the construction will be bolted to the Angle Girder 25. The motion of the return crank 18 is transmitted to the expansion link by means of the Strips 26, which are pivotally attached to both the return crank and the Fishplate on the expansion link by lock-nutted bolts. A 3½″ Strip 27 is pivoted in the second hole from its upper end on a set-screw that is inserted in the tapped hole of the Collar, this Collar being secured on the end of the valve rod. The 3½″ Strip 27 is connected to the 2″ Strip 22 by a 1½″ Strip lock-nutted at each end. A 7½″ Strip 28 is attached to the top of the 3½″ Strip 27 by a lock-nutted bolt, and a ⅜″ Bolt in the fourth hole of the Strip is secured in the boss of the Slide Piece. The Strip must be bent slightly. The end that projects beyond the Slide Piece slides in the Slide Piece pivotally attached to the 3½″ Strip 29 bolted to a Crank fastened on an 8″ Rod 30. Another Crank extended by a 2½″ Strip 31 is secured to the Rod 30 between the frame. A 12½″ Strip 32 with a Threaded Boss pivotally attached to it by a nut and bolt at one end is lock-nutted to the 2½″ Strip 31. The Threaded Boss is screwed on to a Screwed Rod 33 operated by a Double Arm Crank and Threaded Pin fixed on its end in the cab interior. The bogie can now be built and attached to the Strip 9 by a Slide Piece, 1″ Rod and a Collar.

Boiler

Three Circular Girders (and a Hub Disc at the end nearest cab) are evenly spaced inside the boiler. They are joined together by compound strips to which are also secured the 5½″×2½″ Red Plastic Plates that form the casing. An extra compound strip runs along the top centre of the boiler and a 4½″ Strip 34 is bolted on each side in the fourth hole, the inner bolts holding the boiler fast to the Obtuse Angle Brackets mentioned earlier in connection with the main frames. The Hub Disc is secured to a 4½″ Angle Girder attached to the main frames by a Fishplate.

The steam dome is represented by two 1½″ Tyres, one around a 1½″ Pulley, held in position by a Conical Disc. Three 1″ Pulleys fitted with Rubber Rings, two Wheel Discs and a loose 1″ Pulley with Rubber Ring, represent the smoke stack and are held in place by a 1⅛″ Bolt and a nut.

The smoke-box door is made by bolting together a Ball Thrust Race Flanged Disc and a 4″ Circular Plate. Four Collars are screwed onto the Bolts passed through the Flanged Disc, and these support two short Rods, each of which is fitted with a Coupling. The Couplings pivot on a 2″ Rod fixed in Handrail Supports attached to the front Circular Girder. A catch for the door is provided by a 2½″ Strip bolted to a Crank. The Crank is fixed on a 1″ Rod supported in the Flanged Disc and in a 2½″ Strip bolted across the Circular Plate. A handle on the Rod is provided by a Threaded Pin screwed into a Collar. The end of the 3″ Strip engages between two Fishplates, spaced apart by a Washer and bolted to the Circular Girder as shown.

A compound angle girder (made up from two 5½″ Angle Girders overlapped four holes) is bolted to the end of the Angle Girder 13 by Fishplates. At each end of the compound girder a 24½″ Angle Girder 25 is bolted and this is also secured to the angle girder 12. On each side a 5½″×2½″ and a 2½″×2½″ Flat Plate 35 and 36 are attached to the Angle Girder 25. A further 2½″×2½″ Flat Plate 37 is bolted in position. Between the plates 36 and 37 and the angle girder 12, a 5½″×1½″ Flexible Plate is attached by Obtuse Angle Brackets. Two 4″ Curved Strips bolted to a 1″×½″ Angle Bracket complete the wheel guards.

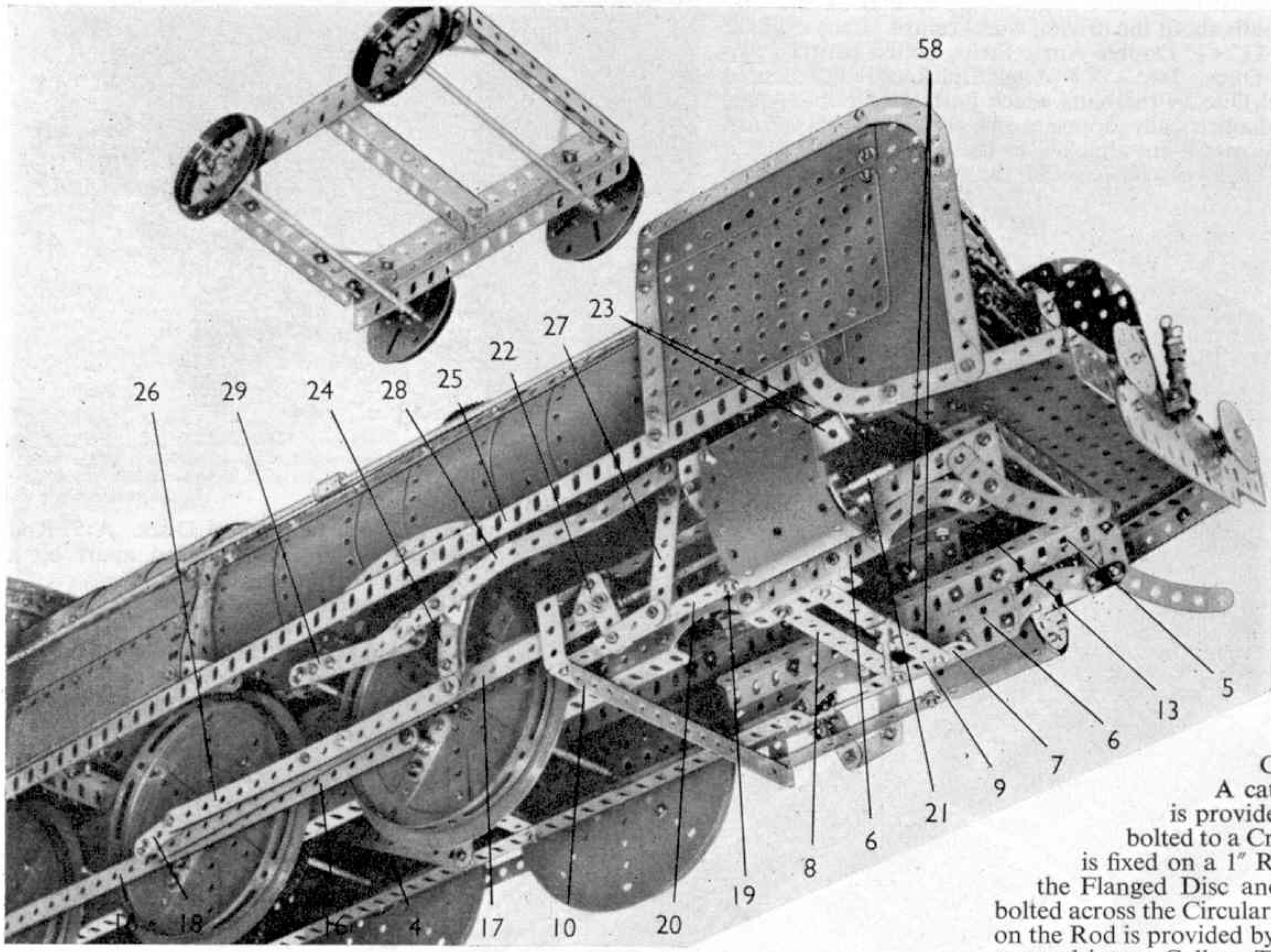


Fig. 4.—This picture shows the valve gear details. The small illustration above is a view of the bogie removed from the chassis.

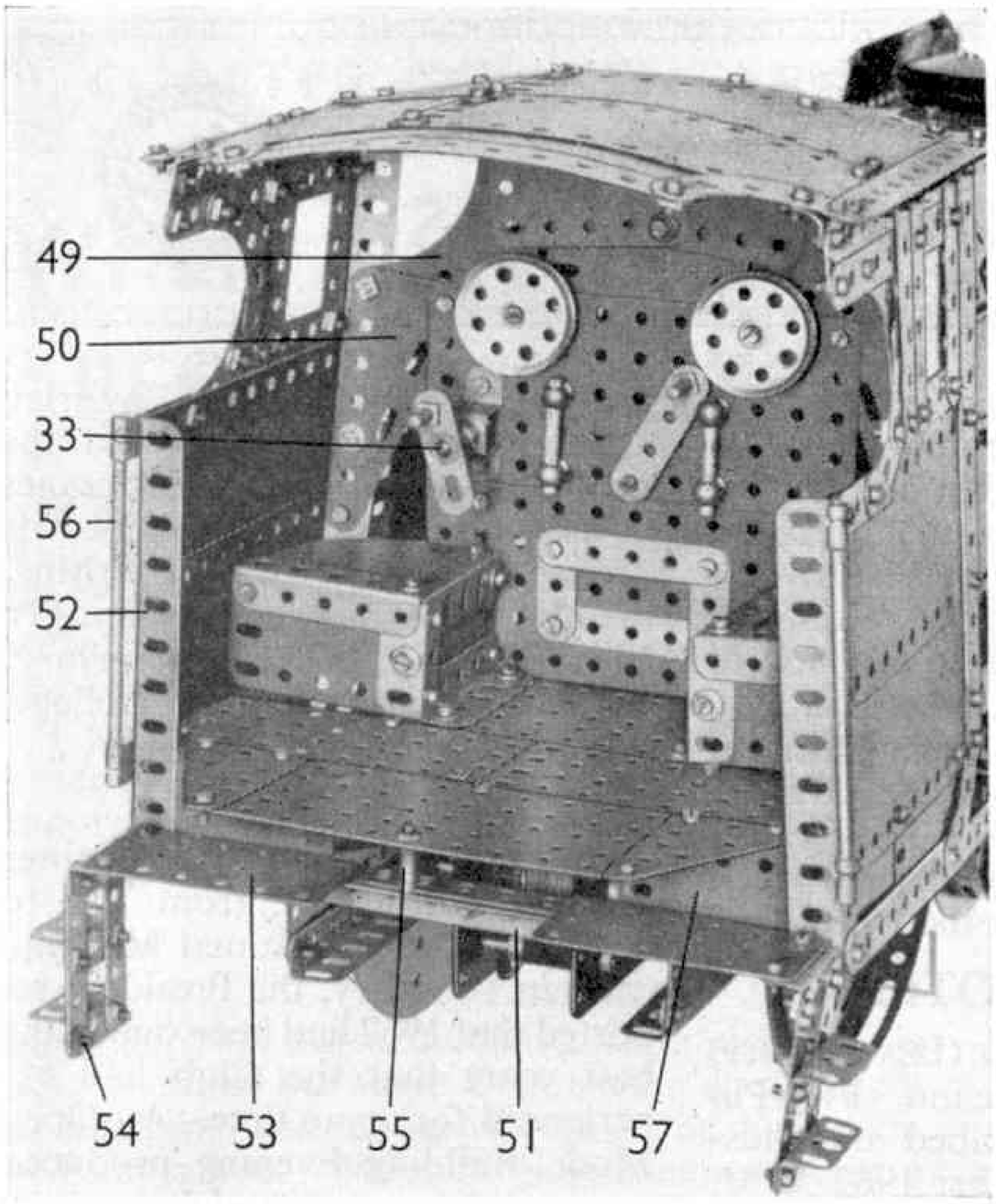


Fig. 5.—The interior of the cab.

A $12\frac{1}{2}''$ and a $4\frac{1}{2}''$ Flat Girder 38, overlapped four holes, are fixed by Angle Brackets to the Plates 35 and 37.

The smoke deflectors can now be built and attached to the model. Two Corner Brackets 39 bolted on each side of two Double Brackets are secured on each side of the boiler.

Front Footplate, Buffer-beam and Firebox

At the bottom edge of each smoke deflector a $3\frac{1}{2}''$ Angle Girder 40 is bolted. These are connected together by a $7\frac{1}{2}''$ Angle Girder that supports a $7\frac{1}{2}''$ and a $4\frac{1}{2}''$ Flat Girder 41. The Wheel Discs 42 are fastened in position by a $\frac{3}{4}''$ Bolt that has two $\frac{1}{2}''$ loose Pulleys on its shank. The lamps, coupling, etc. are shown clearly in the illustrations, and are bolted to two $5\frac{1}{2}'' \times 3\frac{1}{2}''$ Flat Plates 43 overlapped seven holes. Two $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Red Plastic Plates 44, curved as shown, are bolted to the Flat Plates and rest on the front Angle Girder.

At the rear end of the boiler four $2\frac{1}{2}''$ Curved Strips and six $2\frac{1}{2}''$ Strips are attached to Angle Brackets bolted to the Hub Disc. Then a $7\frac{1}{2}''$ Angle Girder 45 is bolted to the Angle Girder 25. Two $7\frac{1}{2}'' \times 2\frac{1}{2}''$ Strip Plates 46 are bolted to the Angle Girder on each side. These are connected together by three $5\frac{1}{2}'' \times 2\frac{1}{2}''$, three $4\frac{1}{2}'' \times 2\frac{1}{2}''$ and two $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Red Plastic Plates bolted together and attached by Angle Brackets to the boiler and the cab. Two $11\frac{1}{2}''$ Rods 47 joined by a Coupling are fixed to the boiler with Handrail Supports.

The Cab

A $7\frac{1}{2}''$ Angle Girder 48 is secured to each Angle Girder 45 by an Angle Bracket. The upper ends of these Angle Girders are joined together by two $5\frac{1}{2}''$ Curved Strips overlapped seven holes. Next, the sides of the cab are built as shown in Figs. 1, 3 and 5, and the cab roof is attached by Obtuse Angle Brackets. A Flexible Gusset Plate 49 and a $3\frac{1}{2}'' \times 1\frac{1}{2}''$ Triangular Flexible Plate 50 are bolted to each Angle Girder 48. These are connected together by a $5\frac{1}{2}'' \times 3\frac{1}{2}''$ and a $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plate. The floor of the cab consists of Flat Plates attached to the sides by Angle Brackets. The "boxes" inside the cab are built with Angle Girders and Flexible Plates. The gauges, starting handle, etc. can now be added. An $8\frac{1}{2}''$ compound angle girder 51 is secured to the Angle Girders 52. The $3'' \times 1\frac{1}{2}''$ Flat Plate 53 and the steps 54 are now bolted to the angle girder 51 and a Threaded Pin 55 is fixed in the centre of the cab floor.

The $4\frac{1}{2}''$ Rods 56 are fixed to the cab by Right-Angle Rod and Strip connectors. Bolted to the angle girder 51 are two $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates 57. The cab windows are filled in by Transparent Plastic Plates.

When the model is completed make sure that all moving parts work smoothly and freely with the aid of a little oil, before attempting to switch on the Motor.

Parts required for the 4–6–0 Passenger Locomotive only: 8 of No. 1; 5 of No. 1a; 9 of No. 1b; 17 of No. 2; 11 of No. 2a; 6 of No. 3; 6 of No. 4; 19 of No. 5; 7 of No. 6; 10 of No. 6a; 4 of No. 7; 2 of No. 7a; 2 of No. 8; 2 of No. 8a; 8 of No. 8b; 8 of No. 9; 9 of No. 9a; 2 of No. 9b; 2 of No. 9c; 8 of No. 9d; 8 of No. 9f; 13 of No. 10; 5 of No. 11; 33 of No. 12; 4 of No. 12b; 19 of No. 12c; 2 of No. 13; 1 of No. 13a; 3 of No. 14; 5 of No. 14a; 2 of No. 15; 2 of No. 15a; 1 of No. 16a; 2 of No. 16b; 5 of No. 18a; 3 of No. 18b; 3 of No. 21; 4 of No. 22; 4 of No. 22a; 4 of No. 23; 5 of No. 24; 12 of No. 24a; 622 of No. 37a; 583 of No. 37b; 236 of No. 38; 2 of No. 38d; 1 of No. 43; 1 of No. 45; 2 of No. 48; 6 of No. 48a; 6 of No. 48b; 9 of No. 50; 5 of No. 52a; 4 of No. 53a; 25 of No. 59; 6 of No. 62; 7 of No. 62b; 5 of No. 63; 2 of No. 63c; 1 of No. 64; 11 of No. 70; 8 of No. 72; 2 of No. 73; 4 of No. 74; 2 of No. 77; 1 of No. 80c; 2 of No. 82; 2 of No. 89; 2 of No. 89a; 7 of No. 89b; 11 of No. 90; 14 of No. 90a; 1 of No. 94; 2 of No. 95b; 2 of No. 96a; 2 of No. 103; 5 of No. 103c; 2 of No. 103d; 2 of No. 103f; 3 of No. 103k; 4 of No. 109; 9 of No. 111; 9 of No. 111a; 20 of No. 111c; 2 of No. 111d; 4 of No. 115; 2 of No. 116a; 6 of No. 118; 2 of No. 126; 9 of No. 133; 9 of No. 136; 4 of No. 137; 2 of No. 142d; 3 of No. 143; 6 of No. 146; 1 of No. 146a; 4 of No. 147b; 4 of No. 155; 1 of No. 168a; 1 of No. 179; 1 of No. 187a; 13 of No. 188; 7 of No. 189; 2 of No. 190; 10 of No. 192; 2 of No. 193a; 10 of No. 194c; 2 of No. 194d; 27 of No. 194e; 4 of No. 195; 2 of No. 201; 4 of No. 212a; 4 of No. 221; 2 of No. 224; 1 E15R Electric Motor.

"The Friendliest Line in the World"—

(*Continued from page 199*)

flatlands give place to hills and we begin to climb. We plunge through tunnels hewn in solid rock and, every so often, catch glimpses of the river far below.

At Bog Walk chickens flutter off the line as we approach. Here our engine does a little shunting and some passengers change trains. On a siding a little railcar, full of school-children, waits to go to Linstead.

Then we really take to the hills. Our engine tackles 1 in 30 inclines with thunderous exhaust. Trees growing picturesquely right over the line get their topmost leaves blasted off as we pass beneath. On the downgrades we seem to fly along, lurching on the bends with the ring and shriek of flanges hard against guide rails in our ears.

Harewood Halt, Richmond, Highgate, Albany. Familiar names but what different countryside! Through banana plantations, past tall coconut palms, breadfruit trees, mangoes and bamboo, the train moves on.

At every station there is much activity. Stops are always longer than scheduled, but who cares?—there is so much to see. We are a bit late but we'll get there just the same.

There is no dining car on the train, but at every station there is fruit in plenty to buy, and on board there is always an unofficial "refreshment officer". Somehow he manages to serve every conceivable soft drink *on ice*, yet he can provide hot patties, too. These are like Cornish pasties, but are filled with curried meat.

Now we are leaving the hills and for the last 25 miles our route lies along the coast. Sometimes the line is built right along the water's edge and, if we are lucky, we may see a fine sunset over the Caribbean Sea. We reach Annotto Bay, Windsor Castle, Buff Bay, St. Margaret's Bay, then, at length, Port Antonio, our terminus and the end of our never-to-be-forgotten trip on the friendliest line in the world.

WITH THE SECRETARY

Club and Branch News

A SPORTING MECCANO CLUB

Proof that Meccano-minded boys also take a deep interest in sport was provided on my most recent visit to St. Annes Y.M.C.A., three or four weeks ago, when I was just in time to see two teams of boys leaving to play Soccer matches in Ireland. I am pleased to say they both won!

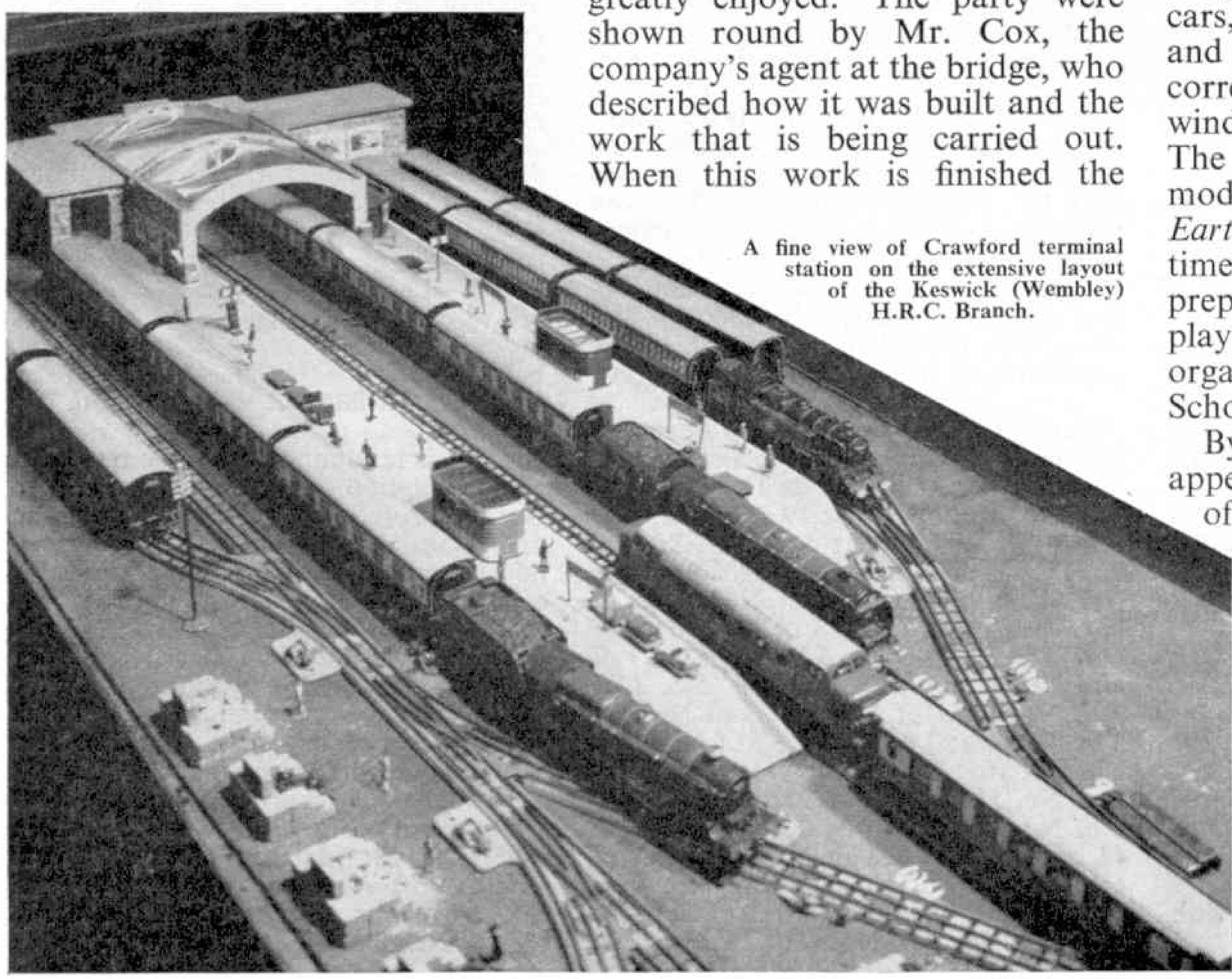
Both St. Annes teams contained youngsters who show a deep interest in the Meccano Club there and in the wonderful Hornby Railway layout which the Y.M.C.A. have organised.

Readers of this page may know that the Club opens its railway layout to the public during the summer months. Many letters of appreciation have been received by the Secretary of this Y.M.C.A. Mr. Harry Richards, and by the local Publicity Department, about this highly attractive exhibition. During the coming summer the Meccano section of the Club are also to display models in the train room so the public will have the chance to see with what enthusiasm and ability they, too, go about their work.

Without question these boys on the Fylde coast have shown just what can be accomplished when shoulders are put to the wheel.

CLUB NOTES

SHEBBEAR COLLEGE (BEAWORTHY) M.C. — The Meccano Five-Pin Bowling Alley described and illustrated in the December 1962 *M.M.* has been built by the Secretary, and has provided much fun. An outing to Barnstaple to see the bridge that the Cleveland Bridge and Engineering Company Ltd. are restoring was greatly enjoyed. The party were shown round by Mr. Cox, the company's agent at the bridge, who described how it was built and the work that is being carried out. When this work is finished the bridge will have a Victorian appearance. He also showed the members one of the largest cranes in use on the job and explained its operation. At the time of writing, members are busy constructing a Meccano Big Wheel. *Secretary:* M. R. J. Kent, Shebbear College, Beaworthy, N. Devon.



A fine view of Crawford terminal station on the extensive layout of the Keswick (Wembley) H.R.C. Branch.

NEW ZEALAND

CHRISTCHURCH M.C.—Meetings are held fortnightly, from 7.15 to 9.30 p.m. At the Annual Meeting, early in February, the President reported that 1962 had been one of the best years that the Club had experienced for some time. An Open Model-Building Evening produced a splendid array of models, and the judges had a difficult task in assessing the merits of the models. These models included a showman's traction engine, a motor chassis, delta-wing aeroplane, several types of cars, a tractor and manure spreader, and a motor scooter which was correct in every detail, including windscreen and good springing. The subject for the next Club model-building competition is *Earth-Moving Machinery*. At the time of writing members are busy preparing working models for a display the Club had been invited to organise at the Riccarton High School.

By the time that these notes appear in print Robert Boundy, one of the Club's two Vice-Presidents, will have returned from a two month's trip round Australia. He will be giving a talk to the Club on his adventures, and will illustrate it with slides. It will be interesting to discover if he has gained any new ideas for Meccano models from his travels.

Secretary: Mr. P. Satterwaite, 7 Huia Street, Riccarton, Christchurch 4.

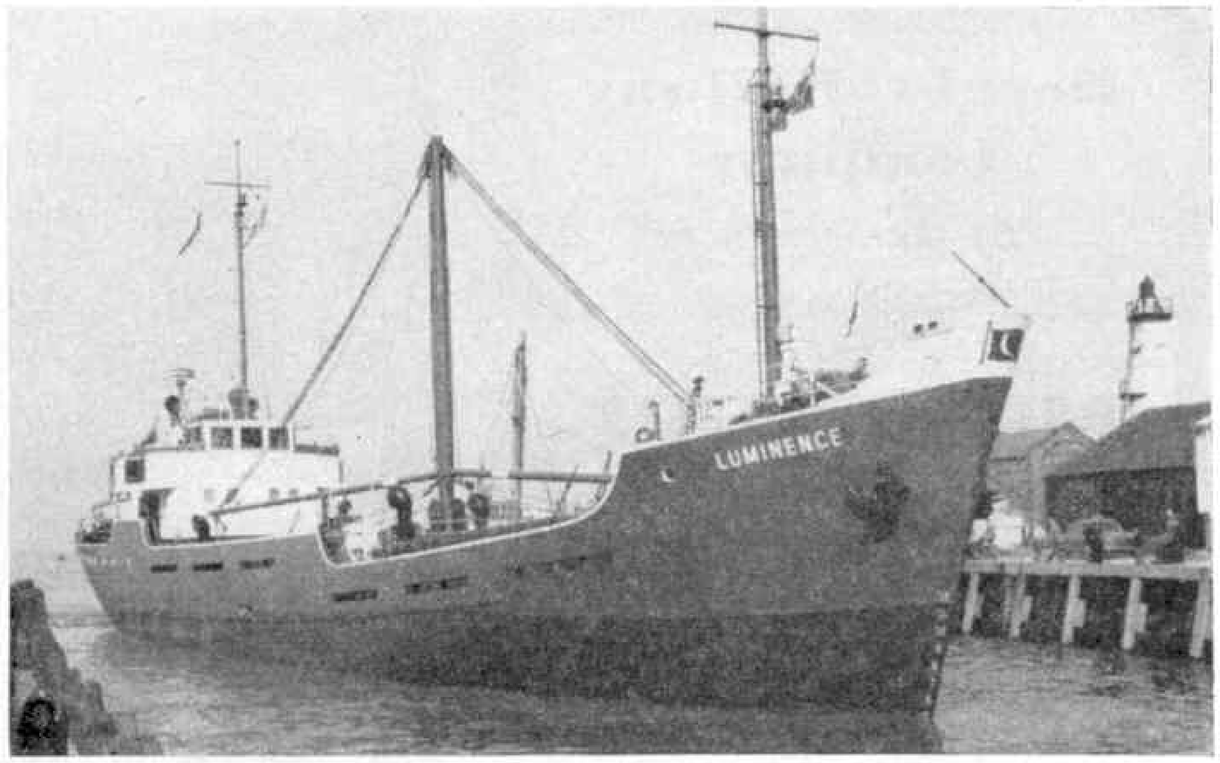
COASTER COMMENTARY

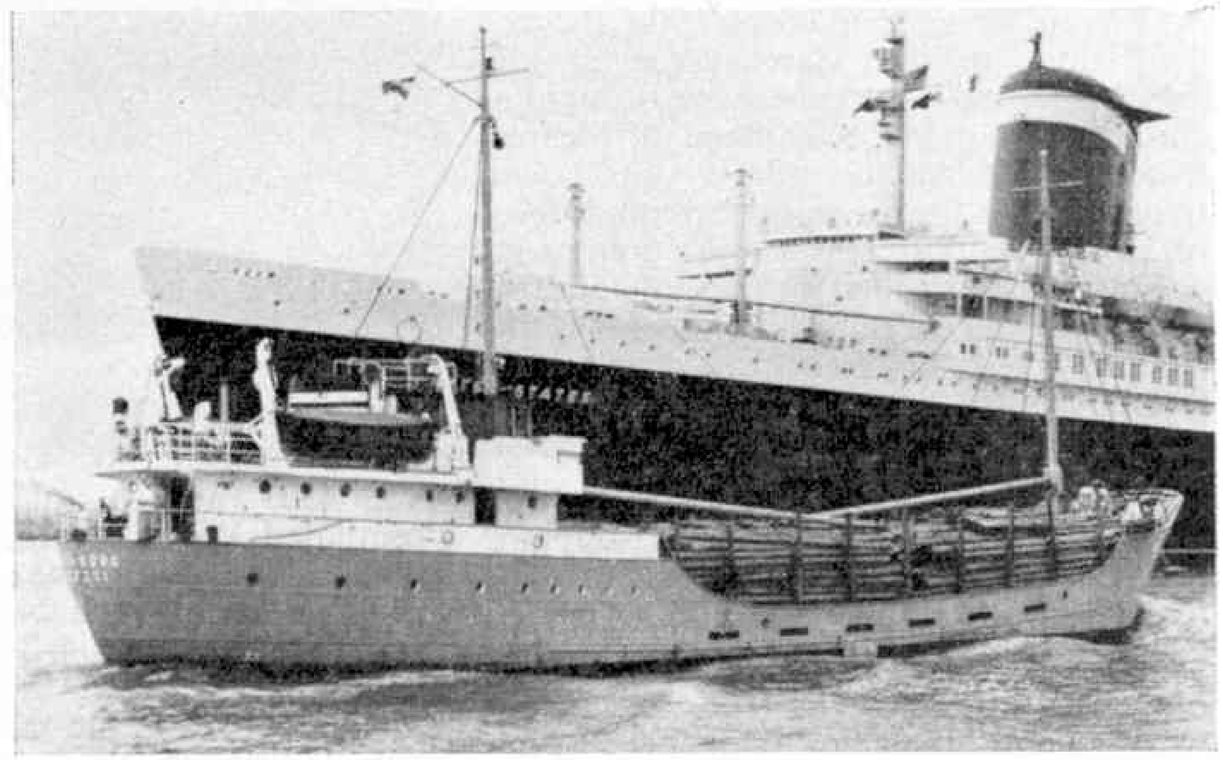
WHEN A SMALL SHIP BECOMES A LINER

By ROBERT GORE

IN the minds of many people, the word liner immediately conjures up a vision of one of the big, ocean-going cargo or passenger-carrying vessels usually associated with the great ports of the world.

I wonder if you have ever considered that the criterion of a liner is really not the size but rather the duties undertaken. It is true that the mammoth ships are normally on regular trading routes (i.e. on a *line*) but there is no reason at all why a small coaster cannot likewise claim the distinction of being a liner. Many of these are on repetitive voyages between ports of all sizes at home and/or abroad, and I would like to introduce to you two of these liners.





Top: The m.v. "Luminence" returning from a voyage to Denmark. Above: Dwarfed by the mighty "United States" is the 473-ton vessel "Maasburg".

A few years ago, when there were labour difficulties in the Thames, trade was dispersed to other not-too-distant wharves having good transport connections with London and, in some cases, these temporary measures became permanent where they were found to be convenient. About this time, the London and Rochester Trading Company started to develop trade with Denmark by commencing weekly sailings in both directions between Whitstable—famous for oysters and yachting regattas—and Esbjerg, a straight-forward route as you will see from a map.

For this service, which was inaugurated in April 1959, the shipowners chose their m.v. *Luminence* (558 gross tons). A wide range of cargoes was carried and in order to preserve the imported Danish dairy produce a refrigerated section was constructed in the hold. To avoid interruption in the sailing schedule, this was done in port during two consecutive weekends by men working through the night to complete the insulated chamber and fit the electrical freezing plant. It so happened that the *Luminence* was suitably equipped electrically, the steering gear, winches and other machinery being so powered.

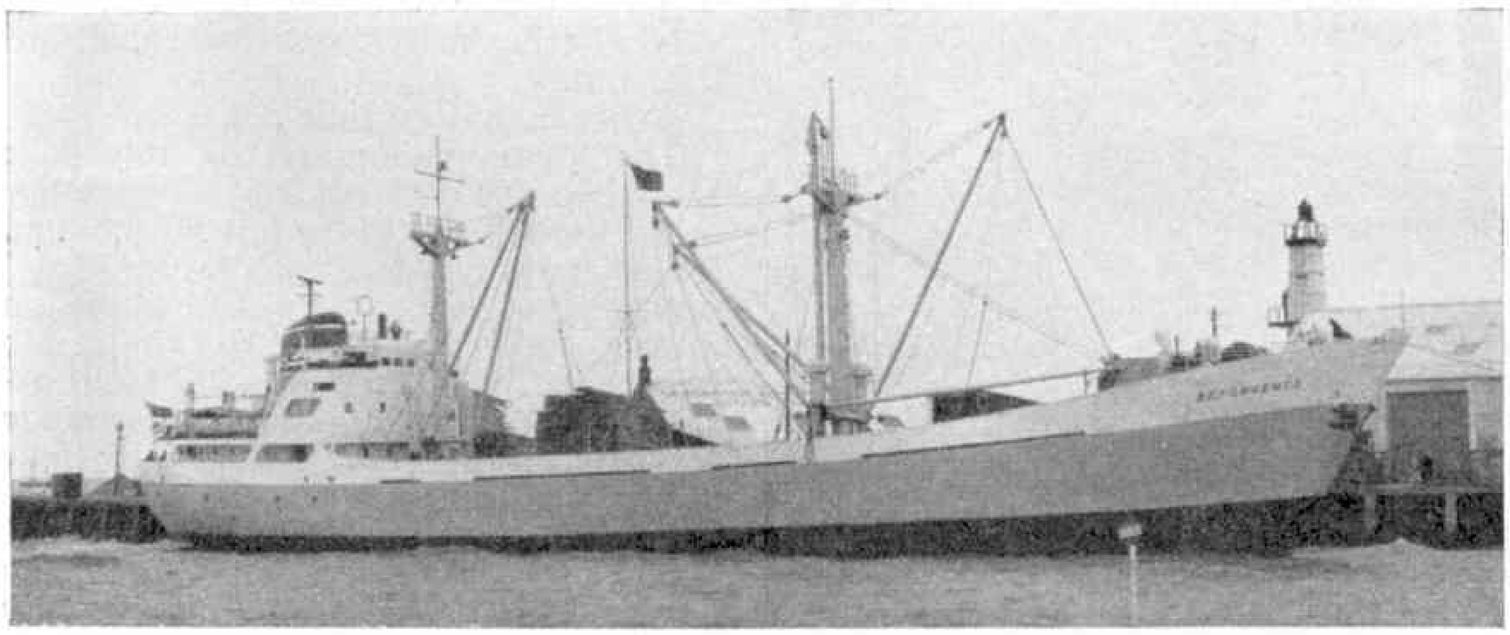
As with most new projects, it took time to become established but recently it was apparent that a bigger ship would have to be introduced since *Luminence* was running to capacity. In looking for a suitable replacement, the company found the 500-ton m.v. *Signorita* with 14,320 cubic feet of deep freeze and 36,700 cubic feet of ordinary cargo space. This ship was built in 1958 and under the Swedish flag sailed between New York and Bermuda with the appropriate name of the *Bermudian*. Subsequently, on changing hands, she was renamed *Signorita* and until being laid-up at Helsingborg last June was tramping round the Baltic.

* * * *

In accordance with the custom of naming additions to their fleet, her new name had to begin with "R" because the owners are progressively moving through the alphabet, as far as the first letter is concerned, with all names ending in "*-ence*", thus, the ship became *Resurgence*, following *Quiescence*. Other features of the fleet include the replica of the house-flag—a white crescent on a red ground—carried on the funnels and golden brown hulls which the *Resurgence* has yet to have painted. You may have noticed that although *Resurgence* is the larger vessel she has a smaller gross tonnage. This peculiarity arises because gross tonnage is really a measurement of capacity (where

100 (*Continued on page 228*)

The m.v. "Resurgence" berthed at Whitstable. Among her seven derricks is one capable of lifting fifteen tons.



Hornby Railway Company

By the Secretary

MINIATURE TRAIN FORMATIONS

MY notes on miniature train formations in the March issue of the *Meccano Magazine* have brought a comment from Mr. S. F. Page, of Sleapshyde, near St. Albans, who is well known to our readers for his realistic photographs of Hornby-Dublo Trains and equipment.

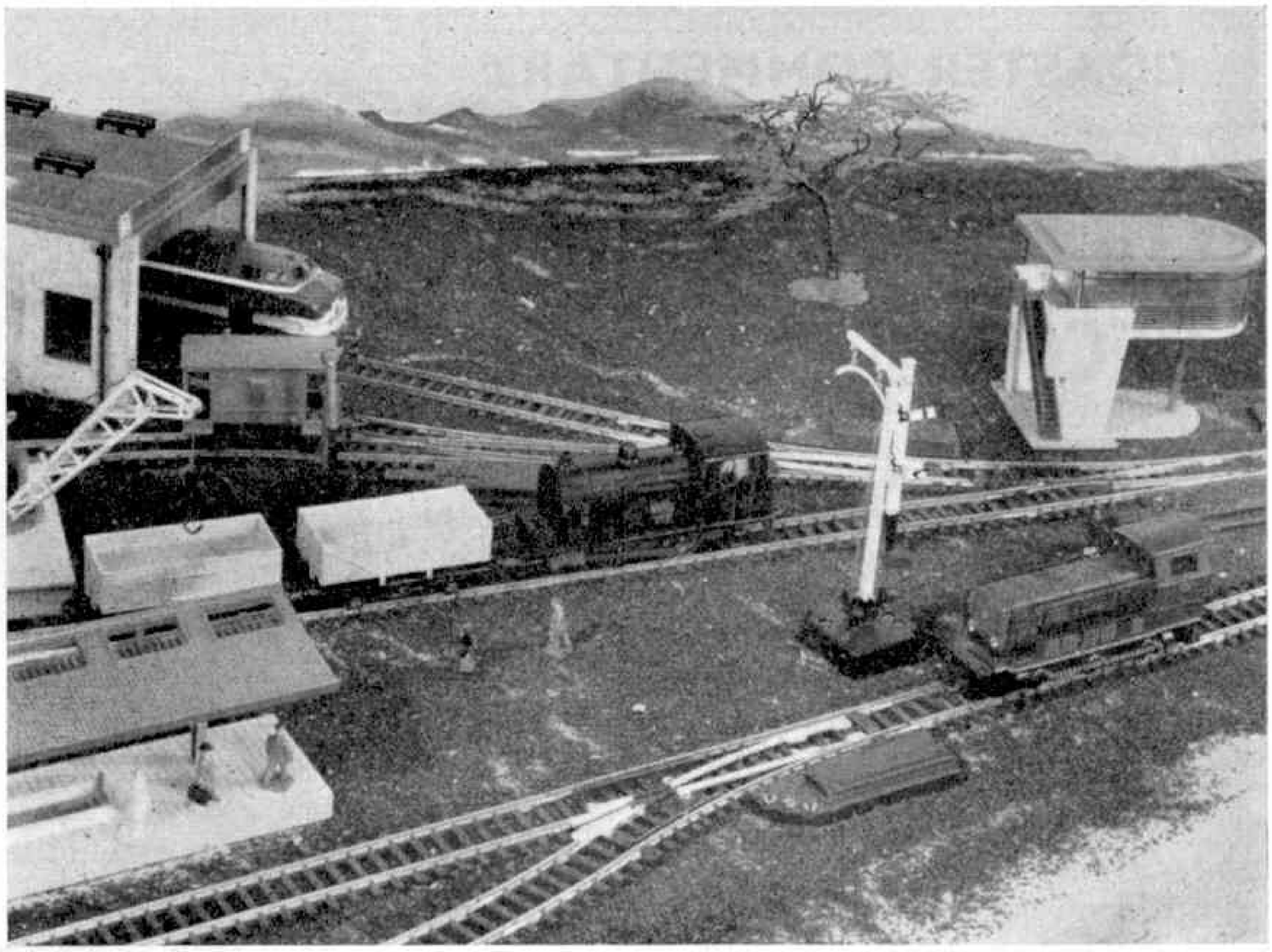
Mr. Page gives it as his opinion that my comments in March help to put the running of both model passenger and freight trains on a correct basis, adding greatly to the realism of a layout built around Hornby-Dublo models.

He adds, "The modern concept of British Railways train running enables one to make the best possible use of a wide range of rolling stock. In the case of my L.N.E.R. Hornby-Dublo Two-Rail layout, which is basically run to correct working and timetables, high speed trains haul at express speeds." (A scene from this layout was illustrated on page 123 of the March issue of the *M.M.*)

"From the port area of the layout," adds Mr. Page, "freight vans such as the Blue-Spot Van No. 4300, Banana Van No. 4301 and a quantity of 12-ton Ventilated Vans No. 4325, together with a No. 4311 Goods Brake Van are formed up twice during each 24 hours' timetable behind a B.R. class 4 2–6–4 Tank Locomotive No. 2218.

This represents the rapid movement of imported perishable freight from ship to distant customer in the shortest possible time, and directly conforms to the special trains such as the Eastern Region's "Night Importer" trains.

Rapid sorting of such trains at exchange sidings means that siding tracks must be cleared to accept the train on arrival. Shunting operations are then speedily carried out and the trains are re-formed to complete delivery by early the following morning, so that the produce can be moved to the markets."



Hornby-Dublo and HOrnby-acHO items have been blended here to make an attractive scene.

To assist those interested in correct running of such a train formation, the following is an extract from an L.N.E.R. layout timetable covering an area which includes a port and the following "towns" —Longdon, Newborough, Easthyde and Smallford.

Train formed up ready for departure from the port area at 8.30 p.m. Longdon arrive 10.30 p.m. Longdon wagons shunted into bay.

Longdon depart 10.55 p.m.

Newborough sidings arrive 12.55 a.m. Wagons shunted and marshalled to form trains for Easthyde and Smallford. Locomotive moves away to depot shed to prepare for return journey.

Newborough. Depart for Easthyde 1.30 a.m.

Arrive Easthyde sidings 4.00 a.m.

Newborough. Depart for Smallford 2.20 a.m.

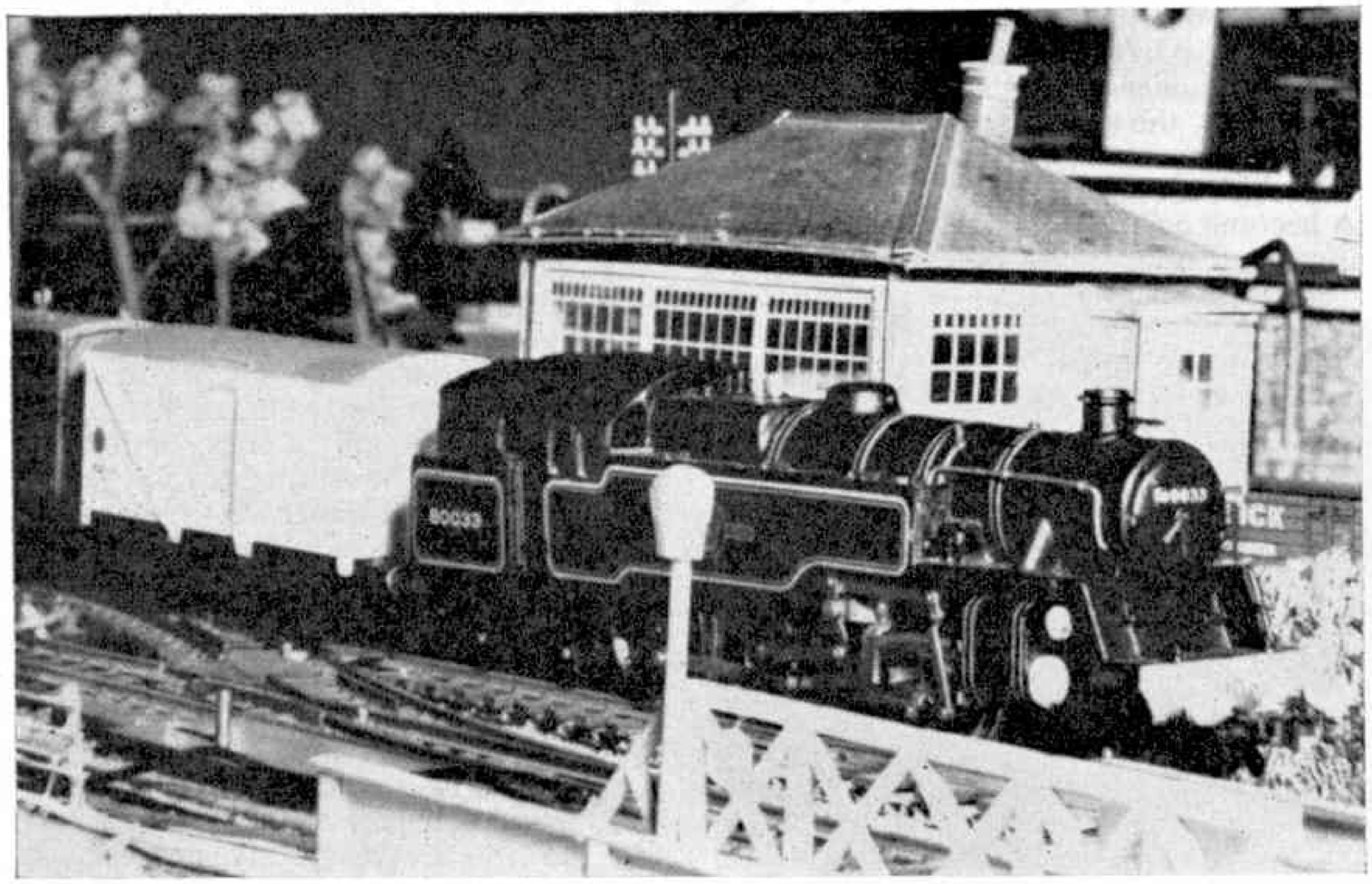
Arrive Smallford siding 3.30 a.m.

The lower photograph on this page shows No. 80033 class 4 2–6–4 locomotive at the head of one of the fast northbound freight trains on Mr. Page's layout.

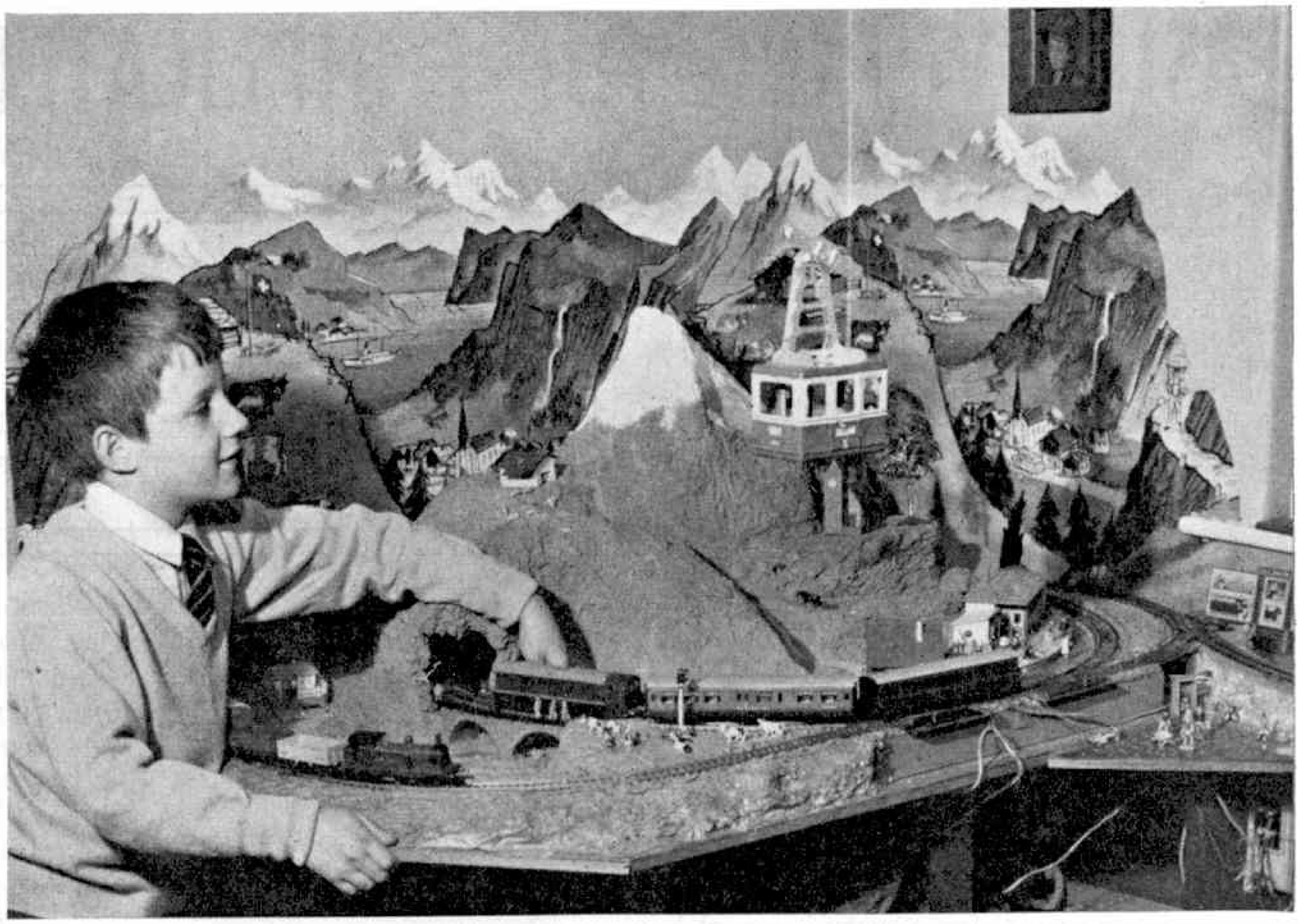
Now let us turn to the picture at the top of the page which shows Hornby-Dublo items used side by side with HOrnby-acHO locomotives and accessories made by Meccano (France) Ltd. and now available in this country.

In the foreground the French Diesel Shunter is about to enter a station. The beautifully-cast (*Continued on page 228*)

Eating up the miles—a fast freight train hauled by a Hornby-Dublo 2–6–4.



A SWISS SCENE WITH HORNBY-DUBLO



THERE can be no two ways about it—modelling scenery to go with miniature rail layouts is not only fun in itself but it gives an intensely appealing atmosphere to any particular scheme. Our top picture this month is an example of what can be achieved in this way. It shows part of a layout owned by eight-years-old Michel Meakin of Bramhall, Cheshire. Since Michel has an English father and a Swiss mother, what could be better than combining two typically English trains—one pulled by a Hornby-Dublo 0–6–0 Tank Locomotive and the other by a Bo–Bo Diesel Electric Locomotive — and authentic-looking Swiss scenery?

By "LAYOUT MAN"

As Switzerland has more bridges and tunnels than any comparable railway system—it has 46 miles of bridges and 176 miles of tunnels out of a total track length of more than 3,000 miles, Michel wanted to include examples of each in his layout. Both can be seen in the picture.

The bridge is built over a mountain torrent which, after passing an electrically-operated watermill, empties itself into a kidney-shaped lake, which in the picture is hidden by the goods train climbing the incline in the foreground. This train is on the outer oval of the layout, in the centre of which is a circular track that is tunnelled under the snow-covered Matterhorn—cleverly made of plaster!

The centre track is served by a Swiss village station, but to the right of the layout is a four-foot-long single track which passes a Hornby Suburban Station and terminates in a Hornby Engine Shed.

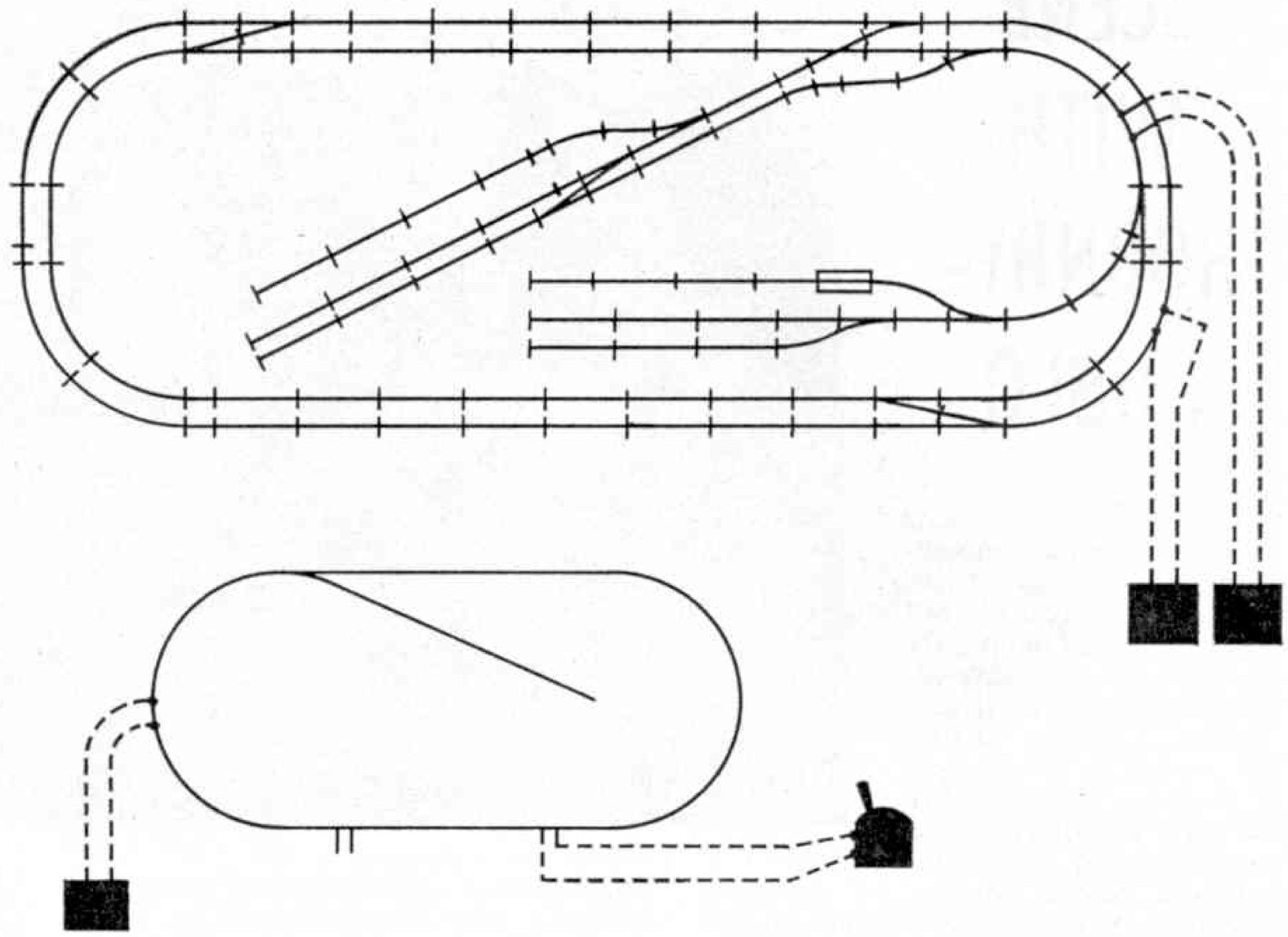
Dominating the layout is another Swiss import—a battery-operated aerial cableway. Hung on nylon threads, it takes passengers leaving the train on an alpine flight to an upper terminus nearly 8 ft. above floor level.

The whole layout is of intense interest not only to Michel's family but to their friends as well. There is never a lack of visitors to the Meakin household whenever Michel's railway is in operation, and the aerial cableway has a particular fascination of its own.

Now I want to draw your attention to the photograph at the bottom of the page, which represents quite a different scene. However much we hide our minds to it, accidents will happen, on the railways as well as on the roads. Since the Hornby-Dublo system is based on a realistic approach to railways it is natural that a breakdown crane should be included in the rolling stock, and you see one in use in our picture. It shows a scene on the Hornby-Dublo layout of Mr. R. A. Power of Cheltenham. I chose it because of the very effective way in which the breakdown crane has been used and because this picture, like the one above, illustrates that the use of suitable background material can give a vivid approach to miniature railways.

EASIER WIRING FOR COMPLICATED LAYOUTS

THE SIMPLEC SYSTEM



AS you learned from the *Meccano Magazine* last month, the Hornby-Dublo Two-Rail system now includes a range of Points known as Simplec Points.

The Simplec system, as the name implies, provides greater simplicity in wiring because of the incorporation of a "divided" frog in the Points. We shall, therefore, starting next month, publish a "progression" that describes the growth of a layout in a series of logical steps. Each month two plans of a layout will be shown, one for the present system of wiring, and one showing the ease with which a Simplec layout is wired.

This month we show a quite ambitious system wired for Simplec Points. The great appeal of this system is that no Double Isolating Rails are required in the normal course of wiring a layout, nor are Single Isolating Rails except in the case of a reverse loop or where a dead section is required.

Now look at the diagram above. You will see that only two feeds are placed on the main lines—one for each line. I have refrained from showing any additional accessories on this month's layout so that the reader may more clearly see the basic wiring.

The layout is a rather interesting one, for the two main line ovals may be used for two trains independently controlled from each other. The three upper tracks are probably better used for a station, one track for each main line, and an additional one to act as a reserve or goods platform. The lower three sidings are ideally situated for goods storage with possibly a goods shed on one road. Notice I have placed an Uncoupling Rail on the topmost siding of the three, to allow shunting movements to be executed. Alternatively, the three lower sidings may be used as an engine, or motive power, depot.

Let us consider a typical movement assuming the above plan has been followed. A main line train draws in to the outside lower siding in the station, followed closely by a short, local goods train, halting in the reserve road, or goods bay. Because the goods train will have had to reverse in order to enter the station (two-track working) the locomotive will now be at the front of the station siding. It is, therefore, a simple matter to uncouple the locomotive from the train, and return it, via the crossover at the upper left corner of the layout, to the motive power depot. With the goods locomotive safely out of the way, the locomotive on the head of the passenger train may now be uncoupled and run round its train.

On this particular layout the running round operation is a particularly interesting one. The locomotive having negotiated the crossover in the station, it will be found necessary to run backwards on to the main line, reverse and run forward to the crossover mentioned previously at the top left-hand corner of the layout. After negotiating the crossover the engine is run forward until the main line station switch point is reached, then reversed to couple up to the other end of the main line passenger train. If a spare locomotive is readily available, a considerable saving of time is experienced by simply running the locomotive from the sheds to the rear end of the train. The train may then be drawn away, leaving the original locomotive standing at the end of the platform, ready to run back to sheds or to the reserve platform to await another train.

Single Isolating Rails may be placed in the locomotive sidings in order that isolation for additional locomotives on the siding may be achieved.

The layout described requires a baseboard measuring 10 ft. × 4 ft. 6 in. and two controllers should be used for preference, as operations can be intensely interesting when two locomotives are capable of being controlled independently of each other. If the operator wishes, the whole layout may be operated from just one power unit. This is simply done by connecting the wires from both Terminal Rails to the appropriate terminals on the power source.

The use of Single Isolating Rails is briefly outlined in our smaller sketch. If

(*Continued on page 228*)

MONTHLY FEATURE BY "LINESMAN"

ITEMS REQUIRED

13	Curved Rails	2710
2	Curved Terminal Rails with Suppressor	2714
11	Curved Rails, Large Radius	2719
1	Curved Terminal Rail with Suppressor, Large Radius	2721
4	Curved Half Rails	2711
4	Curved Quarter Rails	2712
46	Straight Rails	2701
5	Straight One-Third Rails	2703
15	Straight Two-Third Rails	2702
4	Straight Two-Third Double Isolating Rails	2739
5	Short Rails	2706
1	Left-Hand Diamond Crossing	2735
1	Uncoupling Rail	2745
5	Right-Hand Points	2728
7	Left-Hand Points	2729
6	Buffer Stops	2450
2	Power Control Units	
1	Straight Terminal Rail with Suppressor	2707

The O.M.O.—An Economic Sign Of The Times

THE One-Man-Operated bus has always been with us, especially in rural areas, and in recent years has gained a firm foothold in many of our towns and cities—an economic sign of the times.

I can remember, as a small boy, being fascinated by watching the two Southdown Leyland "Cubs", with their 20-seater bodies, running on services 72 and 73 at Horsham. The driver-cum-conductor had a leather bag and bell punch slung over his shoulder, and resting near his seat was that cumbersome object the ticket rack. Such vehicles could be found in Southampton running on routes 8, 10 and 10A,

Calling All Bus Spotters

By David Kaye

and similar capacity Dennis buses were employed by Brighton, Hove and District (now a 100 per cent. double-deck company) on their routes 2A (Rottingdean–Woodingdean) and 9 (Portslade Station–Mile Oak). Another operator was Southern Vectis, who favoured the Dennis, with their various snouted babies—the Dart, Ace, Mace and Pike.

Perhaps the most used O.M.O. vehicle of all time came in with the second world war. This was the Bedford "OWB", which was followed by its post-war counterpart the "OB". Portsmouth Corporation still run OWBs on their service 22 between Wymering and Drayton, and it seems strange, in 1963, to see their utility Duple or Mulliner bodies.

In Walton-on-Thames a local garage runs four OB buses on its station route, but normally it is in country market towns that this type still gives valiant service to the scattered farms and hamlets round about. These Bedfords increased the conception of the O.M.O. as a 26–29 seater vehicle rather than one holding only 20 passengers. Since 1950, however, the tendency has been to increase seating in all vehicles so that duplicates during rush hours can be cut to a bare minimum.

London Transport operated "Cubs" in the late 'thirties, but after the war they changed over to 26-seat Guy "Vixens" with bodies built by E.C.W. Later still, some RF class A.E.C. "Regal" IVs were converted to O.M.O. and since then one country route after another has changed over to O.M.O. RF working.

With the introduction of the R.M.C. class of double-deck coaches on routes 715, 715A, 716, 716A, 718, 719, 720 and 720A last autumn, more Greenline RFs have been released for conversion to O.M.O., and these are replacing the GS class, since they can carry 39 passengers.

Southdown has recently converted its batches of central and rear entrance (1500–39) "Royal Tigers" to front entrance O.M.O. buses. Sometimes these work with a conductor, as on route 21 (Brighton–Shoreham Beach), but on other occasions they work one of the many routes converted entirely to O.M.O. (e.g. 11, 51, 54, 62, etc.). Services 30, 32 and 36 run by this company have a two-man crew from Brighton as far as Haywards Heath, and then are O.M.O. north and east of the latter town!

Since 1957, Reading Corporation has built up a fleet of 24 A.E.C. "Reliances" with Burlingham bodies (Nos. 5–28). These vehicles have dual entrance and exit, and although this reduces the seating to 34, there is also room for 26 standing passengers during rush hours. Portsmouth have two similar batches of Leyland "Tiger Cubs" and "Leopards". The former (Nos. 16–25) have Weymann 32-seat bodies and the latter (Nos. 131–42) have 42-seater bodies by the same builder (in this case, however, only sixteen standing passengers are carried).

This Reading Corporation A.E.C. "Reliance" No. 7 (NDP 425) with a Burlingham standee-type body shows one modern trend in One-Man Operation in our bigger towns. Surfleet Transport photograph.

With the advent of the 36-foot single-decker, many double-decker routes are being converted to O.M.O. Even with 30-footers, Portsmouth converted double-deck trolley routes 7/8 and 15/16 to O.M.O. Other operators only convert at certain times, as we have seen in the case of Safeguard and Delaine. Silver Star Motor Services convert all their routes to O.M.O. after 7 p.m. and all day on Sundays.

At the opposite end of the scale the mini-bus has come into the O.M.O. field, but has not so far found much favour with large and medium-sized operators. P.M.T. have two (M1/2, 272/3 SEH), which are Commer B.11s with Martin Walter "Utilabus" bodies. Morris J2 have been purchased by Bartons (Nos. 826, 467 DRR) and by Bere Regis & District (MPR 461, NFX 106 and OPR 654), while Silver Star have a Trojan (41, 367 BAA). Bere Regis have in addition two Bedford CAVs (MPR 176/7) with Martin Walter C11 bodies.

There have been experiments with O.M.O. double-deckers—even a London Transport trolleybus was converted to this type of vehicle—but so far all have been failures.

TEXACO TANKER

Vickers-Armstrongs (Shipbuilders) Limited have received an order for the construction at their Naval Yard, Newcastle upon Tyne, of a 61,000 tons dead weight, turbine driven, crude oil carrier, for the Regent-Texaco Group. The order is a very useful addition at the present time to the work load on the North-East Coast, and represents employment at Naval Yard for some 600 men over a period of sixteen months, and a further 100 men covering the main machinery.

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FOR OTHER STAMP ADVERTISEMENTS SEE ALSO PAGE 227

For Stamp Enthusiasts

Land Of The Thunder Dragon

By F. E. Metcalfe

THE exciting title above is the local name for Bhutan, and I can just imagine a young stamp collector—and perhaps one not so young!—saying when he reads it that this is just the country whose stamps he would like to collect. Well, it would not be a bad idea really, as although there are not many Bhutan stamps, the first set having appeared as recently as late last year, no doubt that shortage will soon be remedied, and all kinds of interesting designs used for future issues, as is the fashion nowadays. And, my word, what a country to provide intriguing stamps!

That is all very well, you may say, but just where is Bhutan? All that I knew about it until I looked things up was that it is somewhere in or around Northern India. I delved into some up-to-date records, and among the facts I gleaned is that Bhutan is a small country, only about 200 miles by 90 miles in extent, situated in the Himalayas, and thus more or less surrounded by those fantastic snow-capped peaks. The population is said to number around three-quarters of a million, but a proper census has never been taken.

The Bhutans are of a similar race to their neighbours the Tibetans. They are well-built, tall and liberty-loving, and living as they do mostly an agricultural life it is not surprising that they are a healthy and happy lot of people. Their religion is Lamaism, and they take it seriously, too; in fact, it impinges on every single act they undertake, even the issuing of new stamps, as I will explain later on.

I expect that as time goes on Bhutan stamps will probably depict some of the wonderful animals that are to be found in that country. Wonderful indeed, for in the forests bordering the Indian plains there are elephants, rhinoceros, leopards, bison, tigers, bears, etc. Just imagine what a wonderful natural zoo for such a small country, and, as I have already

indicated, what a gallery of subjects for a set of animal stamps. If ever such an issue does materialise, cannot you just imagine how thematic collectors will rush to buy? And the stamps would be well printed too, as unlike the old Indian Native States issues, which were mostly printed from native paper on local presses, Bhutan is doing things in style, and is going overseas to get some of the world's finest stamp printers to do the job.

Actually, animals play a great part in Bhutan's life. The country's national favourite is the yak, and a fine specimen is depicted on their first set of stamps. Yaks are found in a wild state high up among the majestic Himalayan peaks. This is where the sportsmen can track them down, but, holding the religious beliefs which the Bhutanese do, I think they will have another name for hunters who can find pleasure in killing such creatures, or any other of Bhutan's wonderful wild animals.

I am afraid that up to the present Bhutan has not built up much of a philatelic history, for, as I mentioned at the beginning of this article, it was only last year that its first set of postage stamps was issued. By the way, I should also have mentioned that Bhutan is a kingdom, and a happy one at that. The favourite sport is not cricket or tennis, but archery, and one of the stamps of the first set shows an archer with his bow and arrows. The issue last year of Bhutan's first definitive set of stamps was an important step, and it was left to the Buddhist lamas and oracles to fix the most auspicious day for the release of the set. They chose October 10.

Here I must explain that, prior to that date, Bhutan had for centuries had a mail service, but the prepayment of mail was only noted by postal markings until about seven years ago when revenue stamps began to be used for the purpose. I have never seen any of the envelopes with these revenue stamps affixed, but they would be very nice to have.

Bhutan has also issued its first set of

commemorative stamps, and last December three stamps appeared to mark the country's link with the Colombo Plan. The design is the same on all three stamps. An ancient warrior's helmet with flaps and warrior's shield, with long sword and ceremonial dagger (not forgetting the all-important drinking horn) are depicted, as can be seen from the illustration here.

Those sets are all that Bhutan has contributed to date as space-fillers for our albums, but small in numbers as these contributions are, taking everything into consideration I cannot think of any stamps that are more interesting. By starting with that tight little kingdom's postal issues now, you will be getting in on the ground floor, so to speak. This generally means a cash saving in the long run. Good hunting in Bhutan, the Land of the Thunder Dragon—but for stamps, not animals!

Stamp Gossip

Thematics

EVEN those with only the sketchiest knowledge of stamp collecting know what is meant by thematics—or "topicals", to use the American term. It is the collecting of stamps according to the subject of the design, not the country of origin. This type of collecting is very popular, with flowers, animals, birds, fishes, etc. the most sought after subjects. Yes, and it is also true that grown-ups as well as juniors are enthusiasts.

It was from an adult enthusiast that I recently received a letter telling me that he was going in for thematic collecting in a rather big way, as the various subjects which he had adopted for his own collections were very popular, and he felt that if he ever came to sell out he would be all right. But, he continued, a friend who is an old hand at the game had rather shaken his confidence by assuring him that the collections he was forming would only be of ephemeral interest; that the thematics vogue would pass, and then a collection made up of odd sets, and worse still odd stamps, would have a poor re-sale value indeed. Would I, asked my correspondent, give him my opinion, and perhaps refer to the matter in the *M.M.* for there were others, as he knew, situated as he was, and a word of advice might be useful to many.

My own view is that the average thematic collector does not spend a great

deal of money on the hobby, and if he limits his expenditure to what he can easily afford to spend on having his fun, then he cannot go very far wrong. But apparently my correspondent is not in that category, so comments made on this point in a U.S. weekly journal might be worth mentioning here. The writer in the American newspaper referred to the present popularity of thematic collecting, and went on to say that nothing is more moribund or as commercially unappealing as last year's "topicals" than perhaps last week's newspaper, and that, when the dust settles, what will matter is the inherent philatelic value of the stamps concerned, which will not be as "topicals" but as parts of Vatican City, Israel, Germany, British Colonials, etc. Well, take your pick of his opinion and mine—but I think there may be something in what that American writer contends.

TELECOMMUNICATIONS

No doubt countries like Ethiopia are progressing fast. Even so, we still associate lion hunts and romantic castles more with such a country than we do stamps being issued to commemorate the tenth anniversary of the Establishment of the Imperial Board of Telecommunications of Ethiopia. Yet, the stamp illustrated here is one of a set of three issued for precisely that purpose. Yes, it's a changing world all right, and in the stamp field nothing has changed more than Ethiopia, for this country is really "going to town" with its many new and interesting stamps.

PHILATELY

As stamp collectors know, philately is a rather synthetic word used to denote the study of stamps, but more than once I have been asked by non-collectors "What is there to study?" That is probably a fair question from those who have never been bitten by the collecting bug (it isn't such a painful bite, really), but I was surprised recently by a collector of some years' standing—and grown-up at that—who asked me precisely the same question.

You might be interested in the reply I gave him. First, I asked if he had copies of all the stamps in the then recently issued "National Productivity Year" issue. Yes, he replied—all three. I countered that by telling him that, as a philatelist, I had seven stamps, and I went on to explain why. First of all, there were the three stamps of different face value and design, without and with the phosphor

lines—that made six—and these stamps will all find their way into the catalogues, and this will have some effect on the subsequent demand. Not of course that such stamps will be scarce, nor that there is anything particularly philatelic about collecting the six stamps. However, examining the 2½d. value without lines and comparing it with the one with phosphor lines I noticed that the green portion of the latter (the portrait, etc.) differed enough in colour from the former for it to be fairly certain that two different printings were involved. So I got hold of complete sheets and, examining the phosphor ones, found that some of the values had been heavily retouched to repair damage. As the retouches only occurred on the phosphor prints it could be established that the first printing had been used for the "no lines", and the second for the phosphor. Now perhaps not all of the second printing had been used for the latter, and, sure enough, later supplies turned up showing that this was the case. So in my collection I have two copies of the 2½d. "no lines" stamp from each of the two printings, and it has all been quite a lot of fun. That's philately.

FREEDOM FROM HUNGER

Stamp collectors seem fair game for lending their aid, or rather the contents of their pockets, for every possible good and not-so-good cause. It was not surprising, therefore, that the United Nations asked the various countries to bring out yet another set of stamps to aid the "Freedom from Hunger" campaign. Most countries have responded, and varied indeed are the designs, even if all are for the same cause. And what about these designs? Some of them at least are original as, for instance, the single stamp issued by Israel. Eire also issued a pair of fine "Hunger" stamps in the usual good taste which that country always exercises.

THE TIP OF THE MONTH

When the Empire Games were held in Australia last November, both the host country and Papua and New Guinea issued sets of stamps to commemorate the event. I do not just know why Papua and

(*Continued on page 228*)

By E. W. Argyle

The Royal Navy On Stamps

H.M. Sloop Merlin

ON September 10, 1798, the Merlin, *a vessel carrying eight 18-pdr. guns, with a crew of 50 men, under the command of Captain J. R. Moss, and assisted by a number of small boats and rafts armed with whatever guns they could obtain, defeated a superior Spanish force attacking St. George's Cay, British Honduras. The stamp illustration of the* Merlin *was drawn to specifications supplied by the Admiralty, as no authentic picture of the vessel exists.*

H.M.S. Hyacinth and H.M.S. P712

THE stamp design depicts the capture of the Italian submarine Perla *off Palestine on July 9, 1942, by H.H.M.S.* Apostolaris *of the Greek Navy. This Greek ship was formerly H.M.S.* Hyacinth, *a corvette of the Flower class, built in 1940 and transferred to the Greek Navy in 1942. The captured Italian submarine* Perla *(620 tons; built in 1936) was completely reconditioned and became H.M.S. P712. Later she was transferred to the Greeks and renamed by them H.H.M.S.* Matrozos.

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FOR OTHER STAMP ADVERTISEMENTS SEE ALSO PAGE 224

New A.A. and R.A.C. Travel Guides

The 1963 edition of the Automobile Association's Foreign Touring Guide, which covers 21 European countries and more than 1,500,000 square miles of touring ground on the Continent, is now available.

The guide has been brought into line with the A.A. Members' Handbook by the inclusion of population figures after place names. This will help to give members an indication of the facilities likely to be available at the next town en route. Each of the 21 countries has its own notes on roads, travel, recreation and food, a distance chart and, where applicable, details of ferry services and toll roads.

Strip maps at the back of the book pinpoint the principal Customs offices and frontier crossings. In addition, there are 40 pages of motoring maps showing through routes, main roads and special motor roads.

A brand-new *Guide to Europe* is included in the 1963 edition of the R.A.C. Continental Handbook, also published recently. Colourful and attractive, the book contains nearly 700 pages of facts, figures and information about touring in Europe.

Completely revised and re-written from previous editions, it contains scores of new and useful features specially arranged for quick and easy reference. Outstanding are 24 maps, printed in full colour, whereby every place mentioned in the handbook can speedily be found by means of handy reference numbers. The maps also indicate all motorways, main and minor roads, distances, ferries, airports and mountain passes. Greece is included for the first time, as the flow of British motorists to that country increases. Useful details about each country are given under new, quick-reference headings.

The R.A.C. Continental Handbook and Guide to Europe is on sale at all bookstalls or from any R.A.C. office, price 12/6. It is available to R.A.C. members at 7/6.

* * * *

RAILWAY BOOK REVIEW

The Highland Railway by H. A. Vallance (David and Charles Ltd., 25/–), is a revised and extended version, incorporating additions and corrections, of the first edition published in 1938. The amendments incorporated have been made more readily possible by reference to records now held in the Archivist's Department of British Railways, a facility not available when the original material, from which the first edition sprang, was prepared more than thirty years ago.

The Highland was a unique line in many ways. Because of the nature of the terrain traversed, much of it wild and sparsely populated, its engineering features were considerable and a great deal of main line mileage was single track. Again, owing to its geographical position, services were more liable than most in these islands to interruption on account of severe weather, particularly snow. Yet, the Highland maintained a reasonable level of train services and proved an essential link in a transport system that gave invaluable service during two world wars.

The book deals completely with the various aspects of the Highland, its "political" history and development, its train services and its operating problems. With reference to the last-named, special attention is given to the measures employed to counter the snow menace. Engines and stock have a chapter to themselves, but the details relating to goods vehicles are somewhat scanty. However, as an account without frills of the Highland Railway itself, and developments through the L.M.S. and B.R. periods to date, the book can be recommended. Illustrations are adequate.

Railway Notes—

(*Continued from page 205*)

secondary and cross-country duties and were finally in use around the Central and Western Divisions.

No B.R. 4–4–0s now remain in regular service, although a selection are being preserved for exhibition. Locomotives so preserved will be restored to their original livery—indeed some have already been so treated—and some will occasionally haul special trains.

Trackside News—

(*Continued from page 206*)

The last Lancashire and Yorkshire Railway 0–6–0 was withdrawn at the end of December last year. The locomotive in question, B.R. No. 52515, was built to the design of G. Hughes, in November 1906, as L. & Y. No. 898 and was the first of a total of 22 engines to be built to this design. Number 898 was renumbered 12515 by the L.M.S. in 1924 and 52515 by B.R. in January 1951. This engine was the first to be superheated on the Lancashire and Yorkshire Railway, but in 1927 the superheated boiler on this class of engine was replaced by a saturated one.

Fitted with a boiler of this type No. 52515 was very similar to the 0–6–0 locomotives which had previously been designed by Sir John Aspinall.

The new design for British Railways was shown to the public at an exhibition at the Design Centre, Haymarket, London, from February 26 to March 23. The exhibition, opened by Dr. Beeching, chairman of the British Transport Commission, consisted of models and pictures showing the various designs which are intended to give B.R. that modern look. A wide field was covered and among items on display were new designs for passenger coaches, ships, station wagons, furniture and uniforms.

British Railways revealed their ingenuity by exhibiting a full-size mock-up of a new carriage embodying such new features as a jack-knife door, draw-across blinds, improved seating and lighting, and double glazed windows.

The exhibition, to which admission was free, was organised by the Council of Industrial Design and the British Railways Board.

Air News—(*Continued from page 211*)

solve the problem. Under this scheme, a passenger who is willing to take a chance on getting a seat, without reserving a place on a particular flight, can buy a standby ticket, either in advance or on the spot, at one-third less than the standard fare. He then checks in at the air terminal at the normal time and, if there is an empty seat on the aircraft, travels out to the airport with passengers who have booked in the normal way.

"Standby" passengers can, if they wish, make their own way to the airport; but empty seats are offered first to those who report at the in-town terminals, to reduce congestion at the airports.

As the first stage of their experiment, B.E.A. are offering "standby" fares on their London–Belfast, London–Edinburgh and London–Glasgow non-stop services, which were flown with more than 300,000 unsold seats last summer. The cost works out at less than twopence a mile in some cases, which is lower than any other air fares in the world.

Coaster Commentary—

(*Continued from page 219*)

cubic feet equals one gross ton) not of weight, and due to *Resurgence* being a shelter-decker, and to the somewhat involved rules of measurement, certain parts of the ship are excluded from the calculations.

The *Resurgence*, now under the British flag, has an international character, for her main engine is German, with an Italian auxiliary, and the refrigeration machinery is both Danish and Swedish. She is also one of the very few Italian-built coasters operating round these shores, the only other known to me being the 310-ton *Celebrity*, the latter's sister, the *Capacity*, having gone to the breakers two years ago.

Miniature Train Formations—

(*Continued from page 220*)

plastic body and the moulded side frames of the engine give it a fine appearance. Between the locomotive and the French-type Island Platform is one of the new Hornby-Dublo Simplec Points, set for the platform road.

In the middle foreground are some of the components of the "ready to run" No. 20001 Hornby Electric Tank Goods Set which recently made its debut. The locomotive, as you can see, is occupied with shunting duties with the aid of the three items of rolling stock included in the Set. The engine, having just detached the brake van in the motive power depot sidings, is proceeding to shunt the two wagons into a goods shed siding. In the background, the attractively-coloured French-made main line diesel peeps outside the motive power depot.

Stamp Gossip—(*Continued from page 226*)

New Guinea felt it necessary to do so, but there it was, and now it is gradually becoming obvious that these two sets are going to prove a good deal more scarce than one would have envisaged. Australia uses a lot of stamps and so even those belonging to special issues, which only have a short life, generally turn out to be quite common. But there do not seem to be many of the "Games" 2/3d. value about, and nicely-cancelled copies are well worth hanging on to, indeed, they are even worth going after.

Easier Wiring for Complicated Layouts—

(*Continued from page 222*)

your layout consists of a small loop and siding (as shown) and it is desired to have two locomotives operating simultaneously,

"Come out—stupid reptile!"

the ideal method is to wire up as shown in the sketch, using a 1616 Switch. A locomotive may then be held in the section of track between the two Isolating Rails when the Isolating Rail switch is on, while an additional locomotive emerges from the siding. Care must be taken to ensure that the Isolating Rails are placed sufficiently far apart for a whole train length to fit in. I would suggest a minimum distance of two feet. This procedure may be used on much larger layouts. It does in fact replace the former combination of a Double and Single Isolating Rails, which are used in conjunction with each other to serve the same purpose where the "live frog" point is in use.

Next month our layout will be a simple oval with a siding from which we shall build a large ambitious system in six or seven progressive stages. The wiring of the new system will be dealt with thoroughly. Also as I mentioned at the beginning of the article, the plans will be duplicated to show the wiring for both new and old systems.

A Cup Final—Old Style—

(*Continued from next page*)

the game was a very fast one. Finesse, of course, was entirely absent, but each player was clever in dribbling and controlling the ball.

There were no such things as fouls, and the players were allowed to indulge in any amount of "genuine" roughness. In this particular match, one of the Royal Engineers broke his collar-bone but he played on until the end of the game, which the Wanderers won by one goal to nil.

A few days before this historic match took place the majority of the men in the Wanderers' side played in a special seven-a-side game which was known as Seniors v. Juniors. This was something like a game. Records show that it started at 10 o'clock in the morning and went on until 4 o'clock in the afternoon, during which time no fewer than 47 goals were scored!

A CUP FINAL —OLD STYLE

KENNINGTON 90 years ago was very different from the Kennington of today. Then it was part of rural England, and its peace was never disturbed by the hooting of motor horns and the rumblings of buses. Occasionally a hansom cab or two might be seen, and now and again one could hear the blast of a post-horn announcing the passing of a stage coach.

The Oval was different, too, and far from being one of the sacred homes of cricket it marked the scene of what might be regarded as the first Cup Final.

By
Geoffrey J. Matson

This took place on March 16, 1872, and caused no small amount of consternation among the few people living in the district. Dozens of hansoms and private landaus—more than they had ever seen on one day before—rolled up throughout the morning, and eventually there were a thousand spectators crowded into the Oval ground. It was a very exclusive attendance, for at that time football was scoffed at by the masses, and only met with favour in the public schools and a few of the most exclusive clubs.

* * * *

There had been no knock-out contest to decide who should meet for this first Cup Final, it was merely a game played between two football teams for a "cup". The teams taking part were the Wanderers—made up of old members of the public schools and universities—and the Royal Engineers.

The players had no set position on the field as they have today. Each team consisted of a goalkeeper, a back, a half-back and eight others who wandered about just as they liked. The dress, too, compared with today's standards, was very unorthodox. Each man wore a pair of long, white flannel trousers, the bottoms of which were tucked into the top of his socks, a white shirt, a small "pill-box" cap, and brown boots fitted with ugly iron spikes. The goalposts were of wood, and instead of a wooden crossbar a length of tape was stretched from upright to upright.

* * * *

It can easily be imagined that the movements of the players were somewhat hampered by their long trousers, but in spite of this handicap records are agreed that (*Continued at foot of col. 3 of previous page*)

Fireside Fun

It was the custom in an Irish village for visitors to offer a half-witted lad a sixpence and a copper penny and the village fool always took the penny, because, it was believed, it was the larger.

One day an English visitor asked him, "Why do you always take the penny, John? Don't you know the sixpence is worth far more?"

"Sure, man, I know that," replied the fool, "but I wance took the tanner and they would niver try me again."

A shipyard worker was teaching a woman riveter what to do.

"I'll hold the rivet," he said, "and when I nod my head, you hit it with the hammer."

She did.

He left a widow and three children.

* * * *

Said the countryman about his neighbour with large feet, "He'd a bin a tall 'un if 'e 'adn't 'ad ower much turned up at the bottom."

* * * *

"Patrick," said the priest, "whisky is your worst enemy."

"But, Father," said Pat, "wasn't it only last Sunday you were telling us to love our enemies?"

"It was," said the priest, "but I didn't say anything about swallowing them."

"Go back—the engine's caught fire!"

Jack: "Listen you, I'm a boxer. I box guys and lay 'em out."

Mike: "Yeah? Well, I'm an undertaker. I lay 'em out and box 'em!"

* * * *

Judge (during dispute over an eight-day clock): I award the clock to the plaintiff.

Defendant: Then what on earth do I get?

Judge: You get the eight days.

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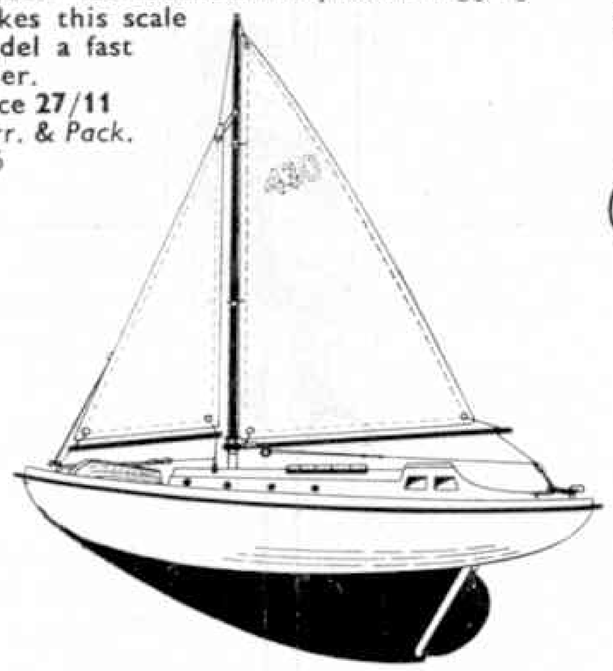

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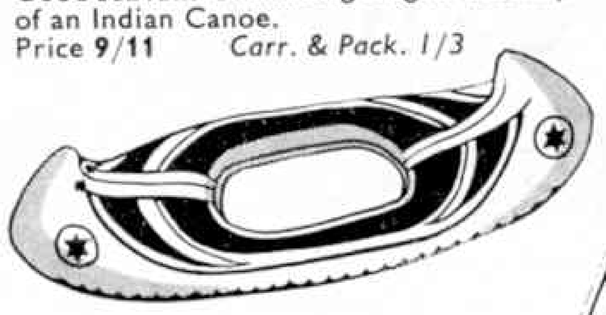

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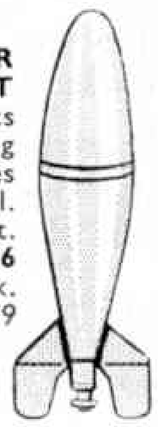

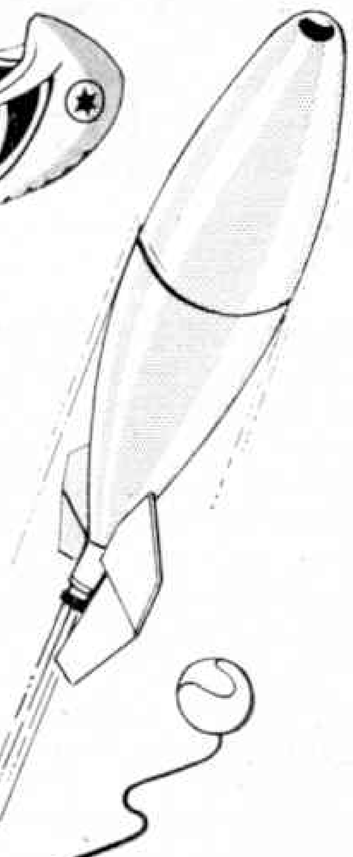

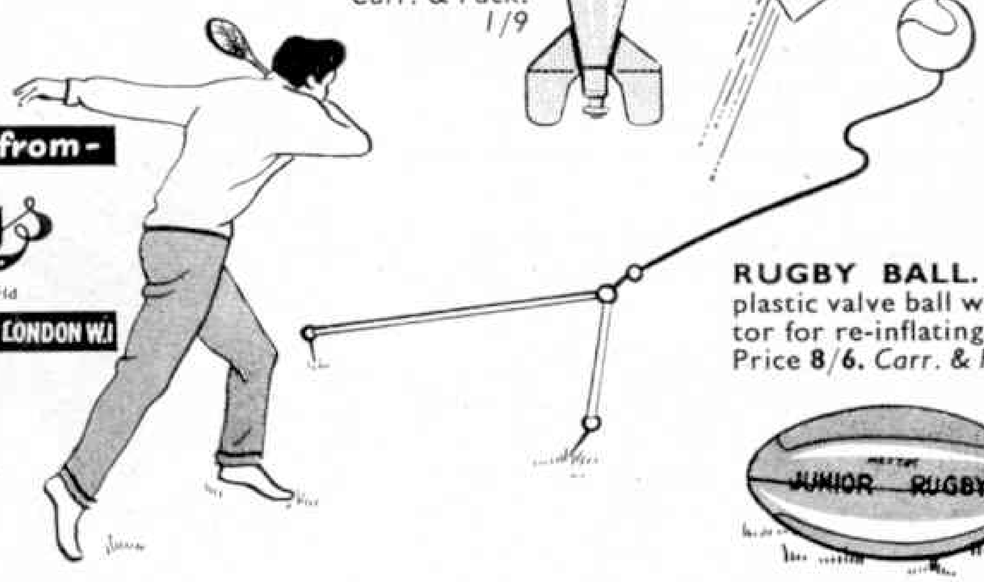

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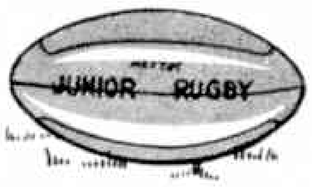

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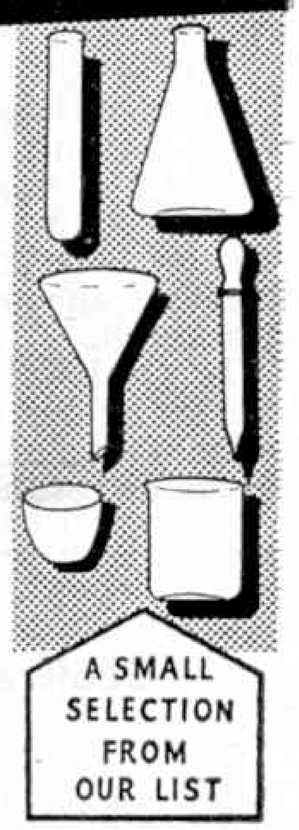

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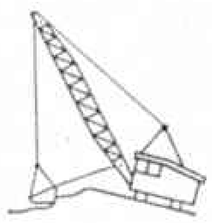

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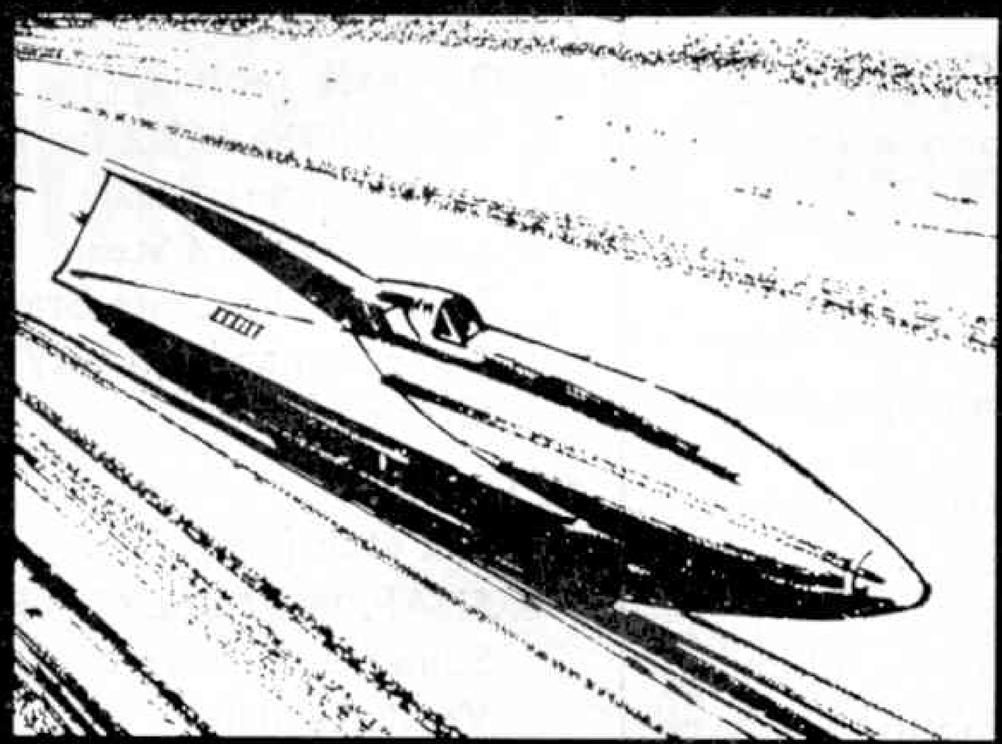
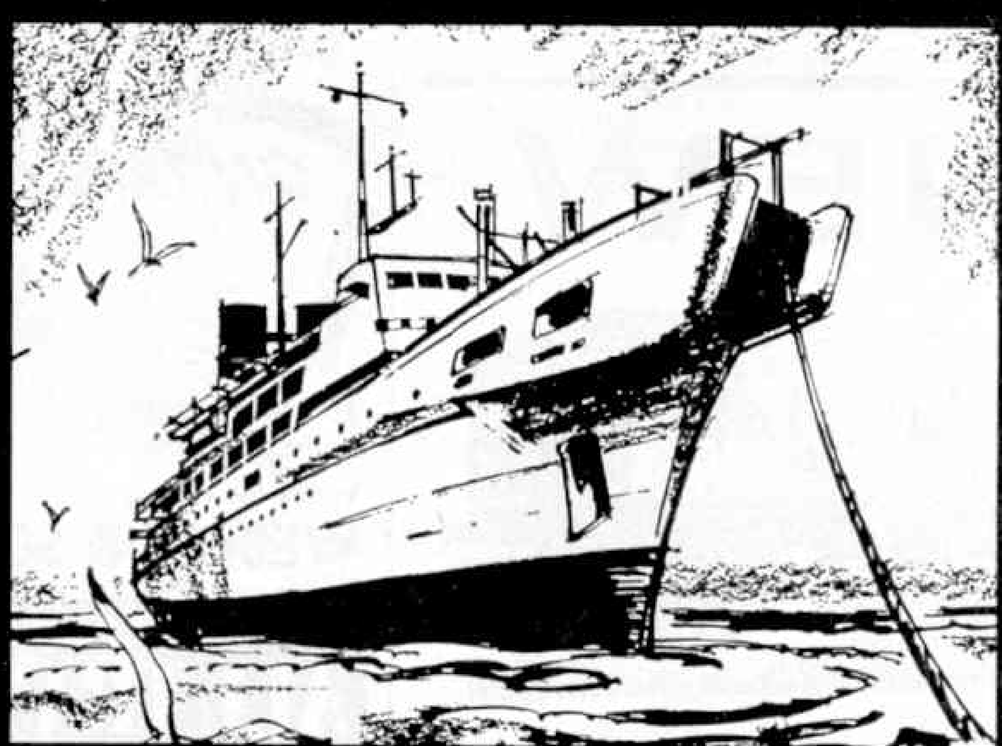


WAFER THIN TYRES!

Half a millimetre! That's how thin the treads were on the Dunlop tyres fitted to Bill Johnson's Triumph Streamliner when he took the motorcycle world speed record at 224.57 m.p.h. Centrifugal force would have ripped off a deeper tread.

CRISS-CROSS QUIZ!

How much "cat-gut" has been used by Dunlop in stringing their Maxply Fort tennis rackets? Over a million of these famous rackets (used by over 100 players at Wimbledon each year) have now been made—and, believe it or not, the total length of "cat-gut" would reach across the Atlantic to America and back again!



PILCHARDS PIPED ASHORE!

To unload big catches from the boats, the South African fishing industry uses 10" diameter suction hoses made by Dunlop. The fishermen, who have to wade knee-deep among fish, wear Dunlop rubber boots, and in the processing plant the fish are carried on Dunlop conveyor belts.

LAYING SAFE!

The new C.S. "Mercury", the world's fastest ship for laying under-sea telegraph cables, is equipped for extra safety with Dunlop "Seafarer" self-inflatable liferafts made of fluorescent water-proof fabric. Each raft is designed to carry up to 20 men, they are specially insulated to give protection at temperatures as low as −40°C.

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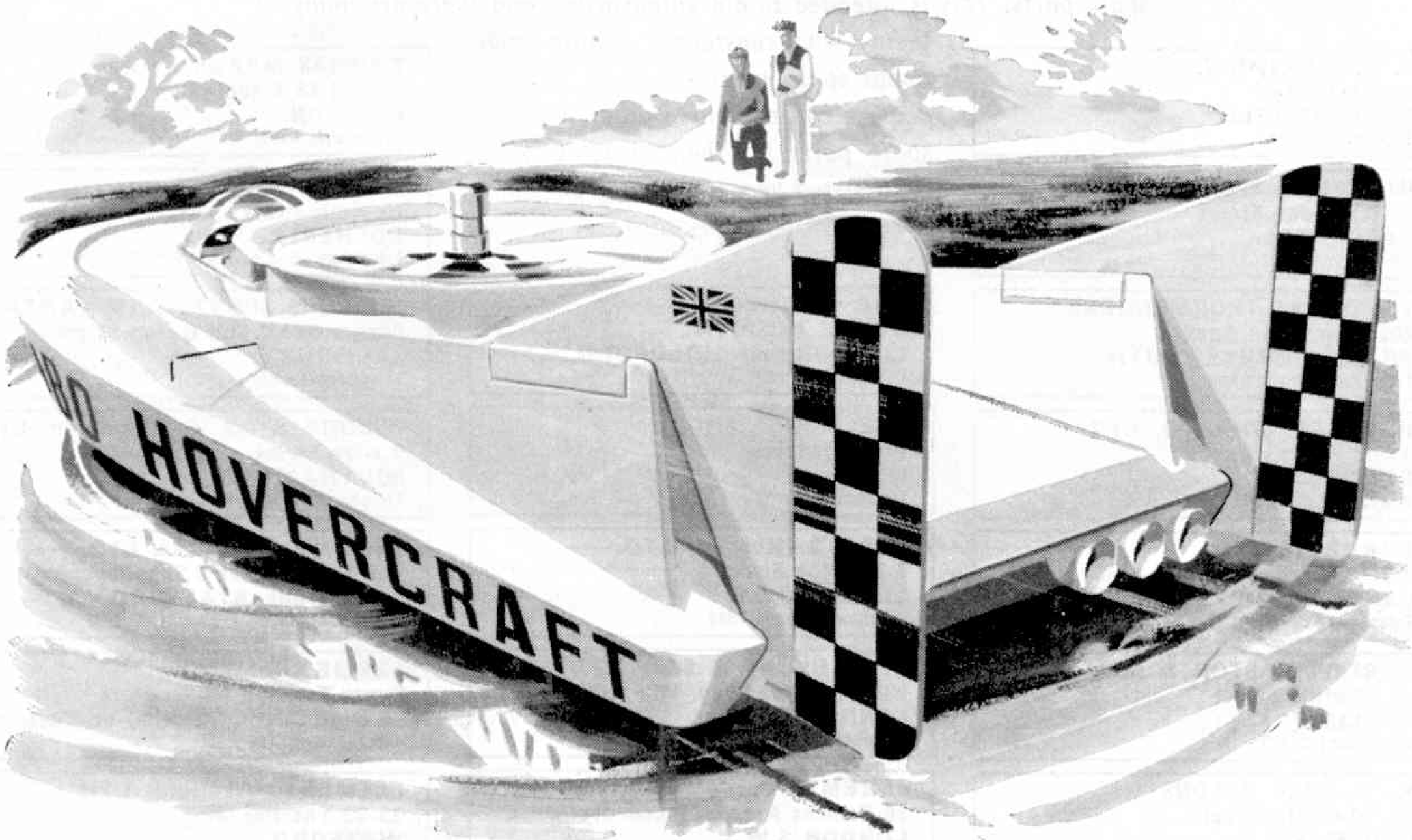

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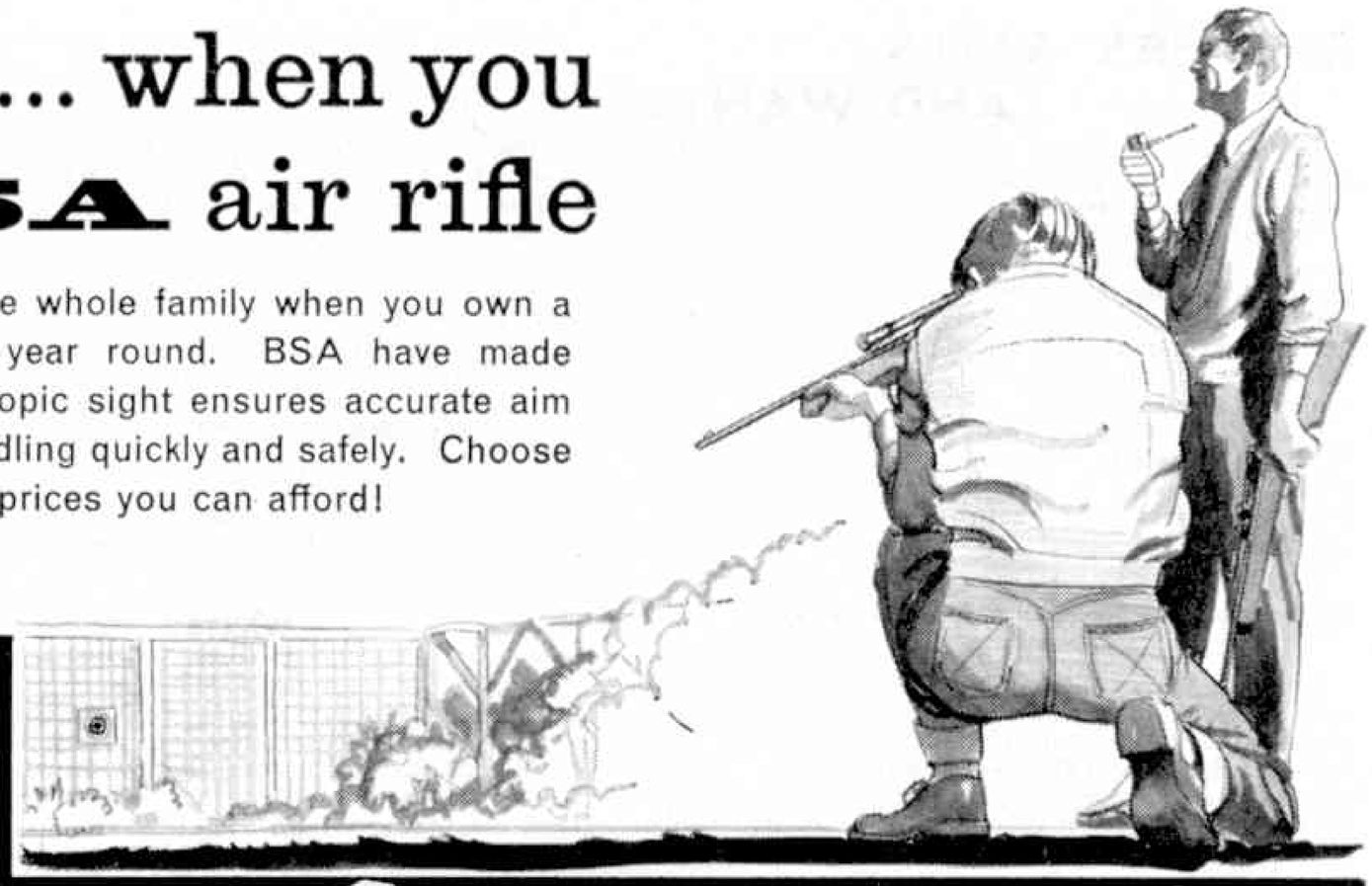

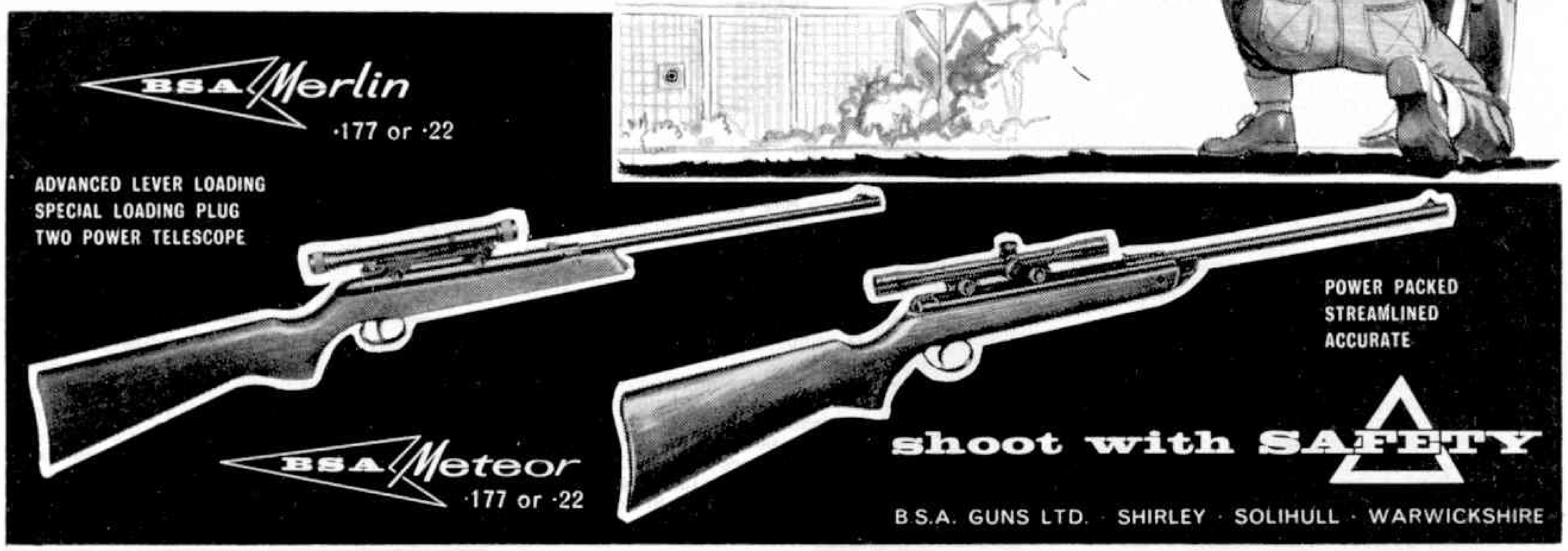

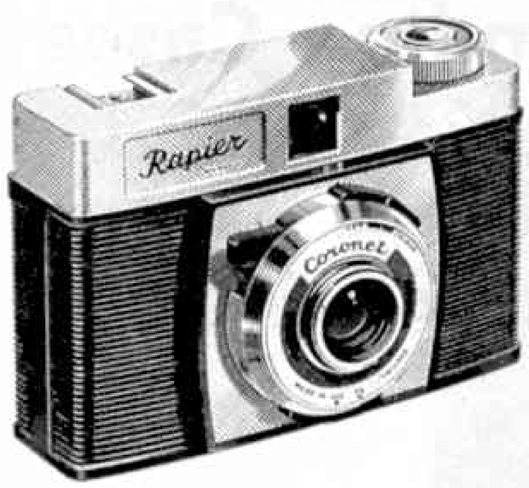

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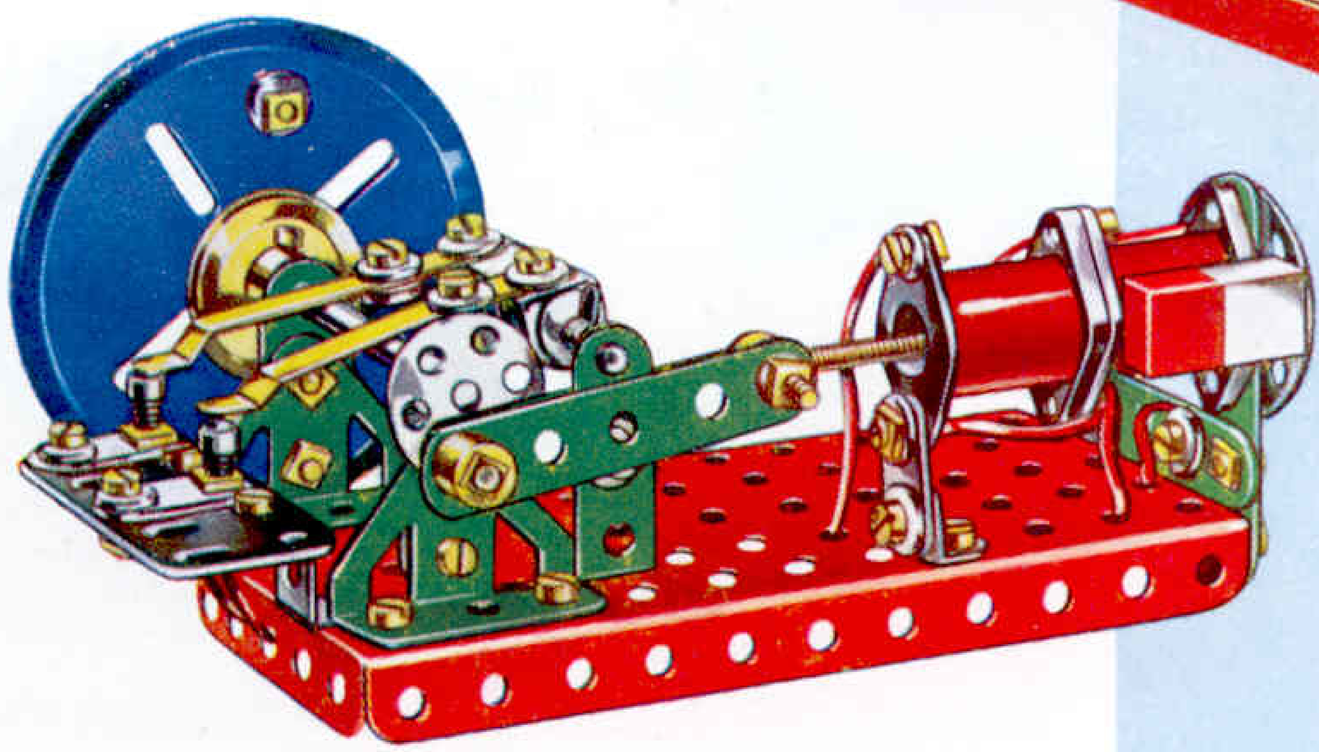

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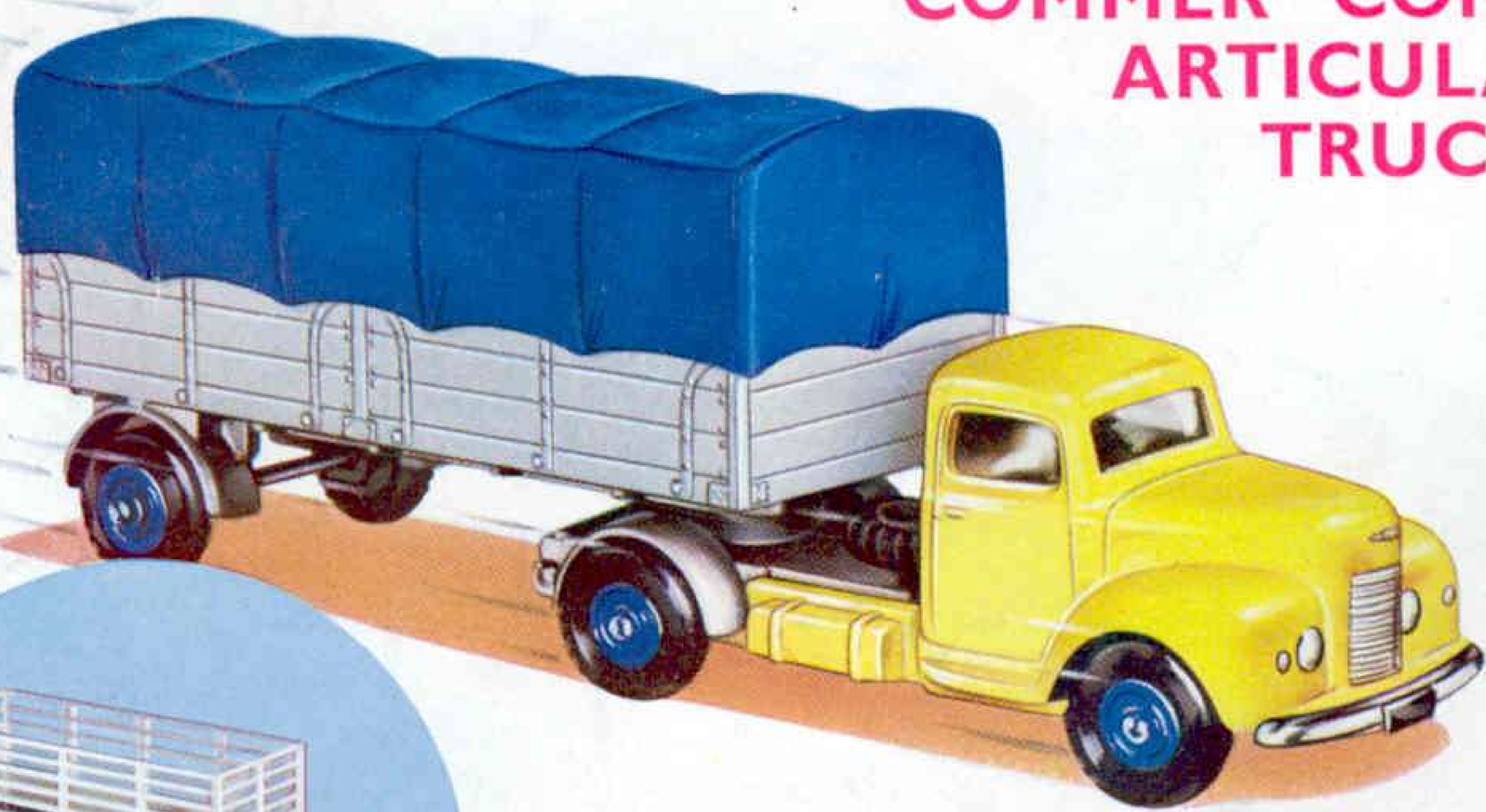

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