VOL. XLVII. No.6. JUNE 1962

MECCANO MAGAZINE

1/3

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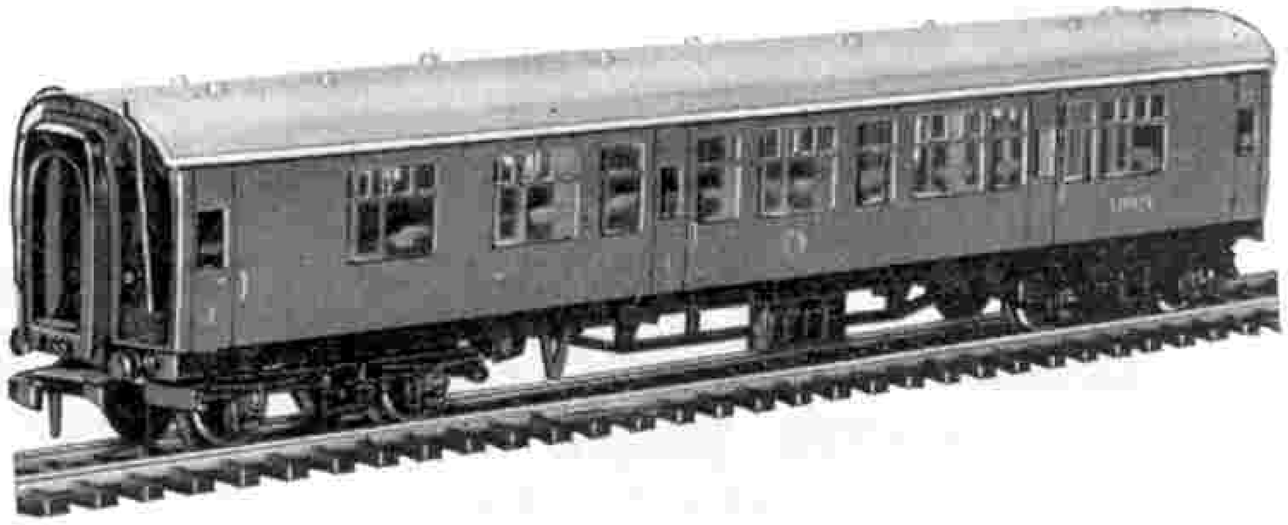

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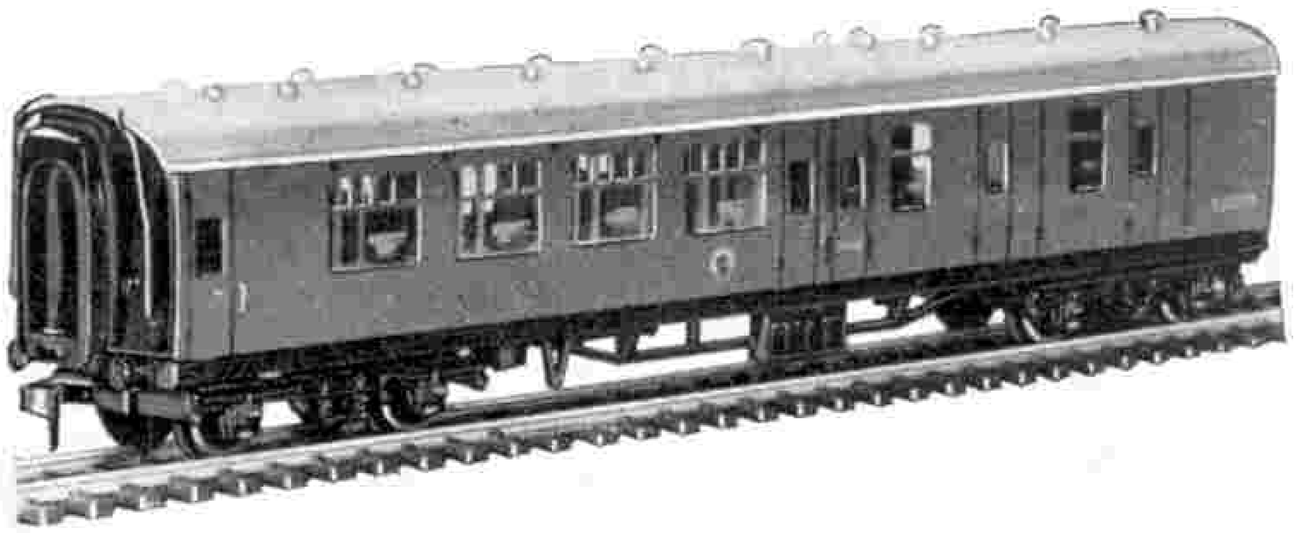

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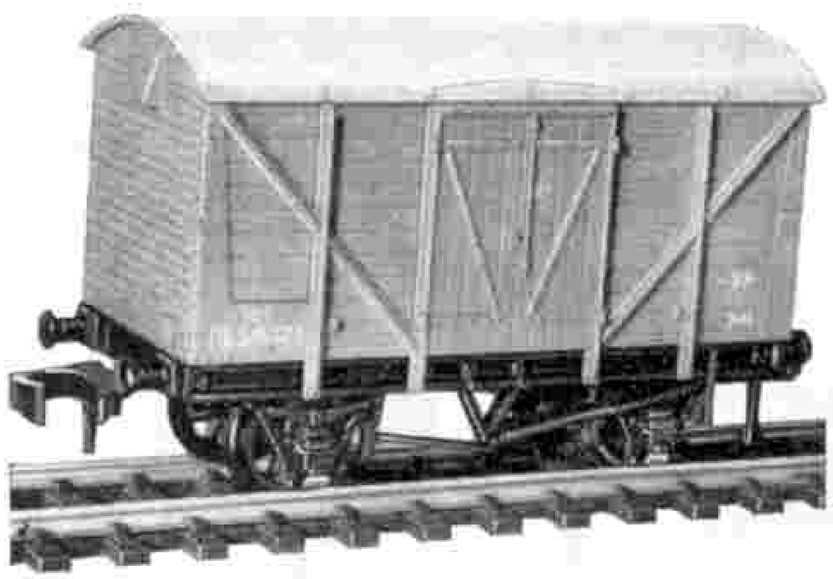

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The Packing Van is used with the Breakdown Crane and other vehicles to form a realistic Breakdown train. It represents the van that carries timbers, known as "packing", used for various purposes in breakdown work. Detailed bodywork in red plastic, die-cast base, nylon wheels.
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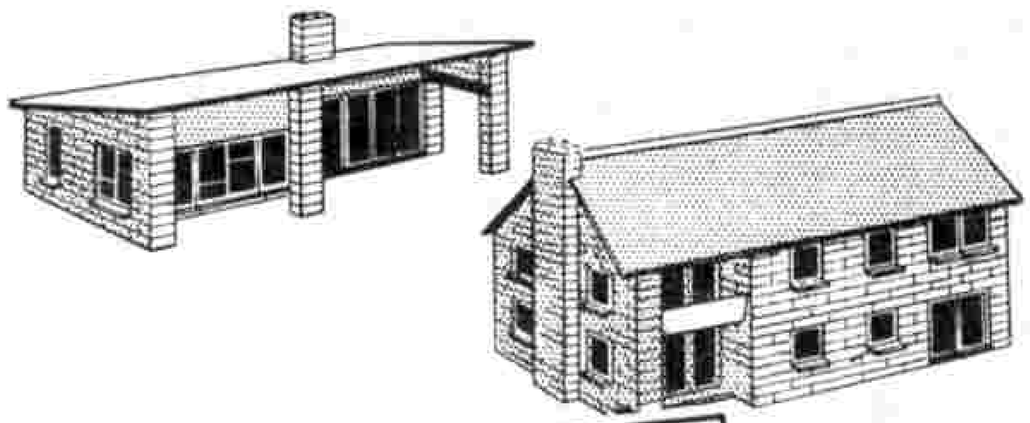

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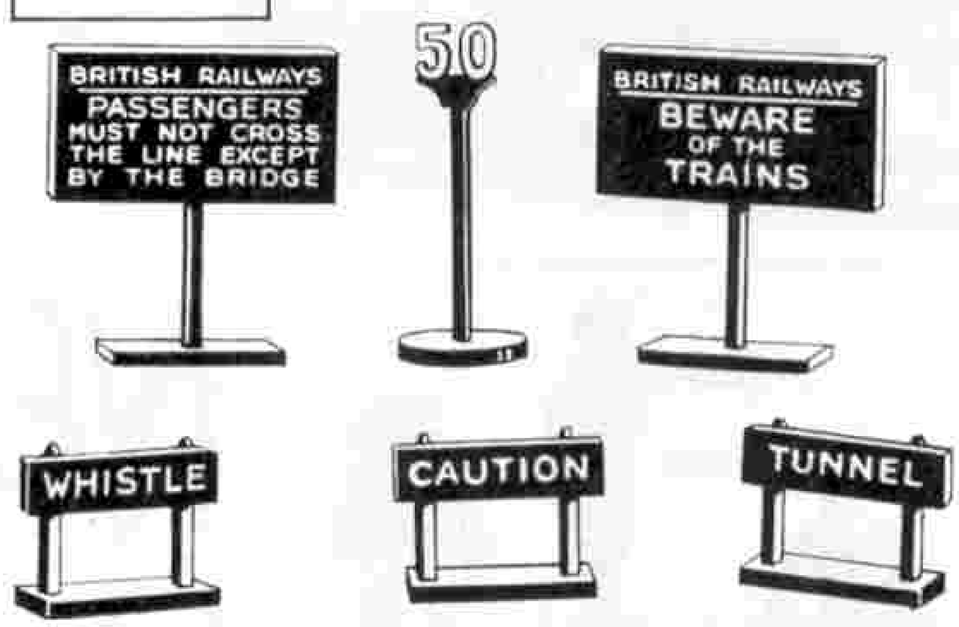

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Uses of these Notices are described on Pages 246-7

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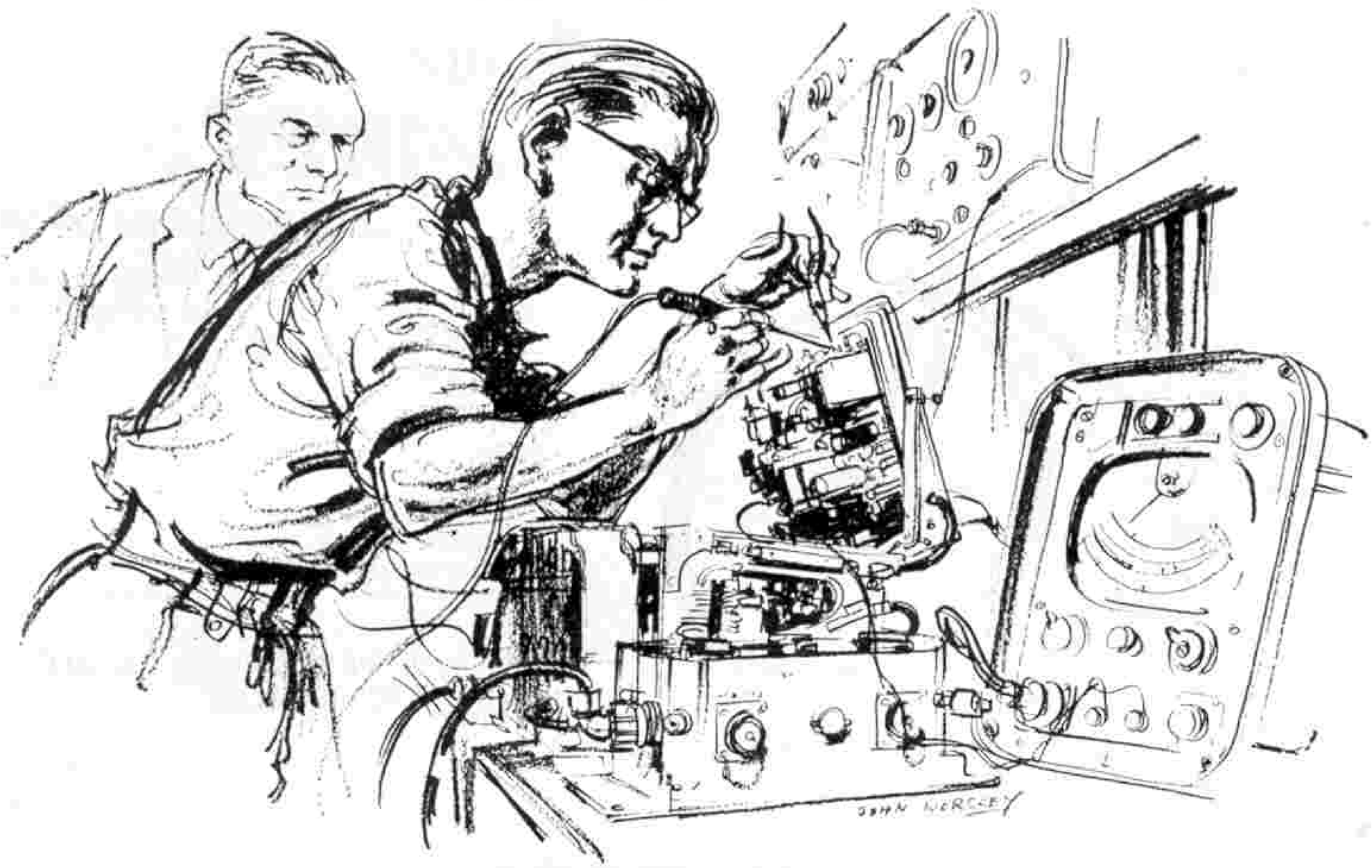

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Look for these "bubble packs" in your local toyshop . . . they are available at the same prices as the respective models in cartons.

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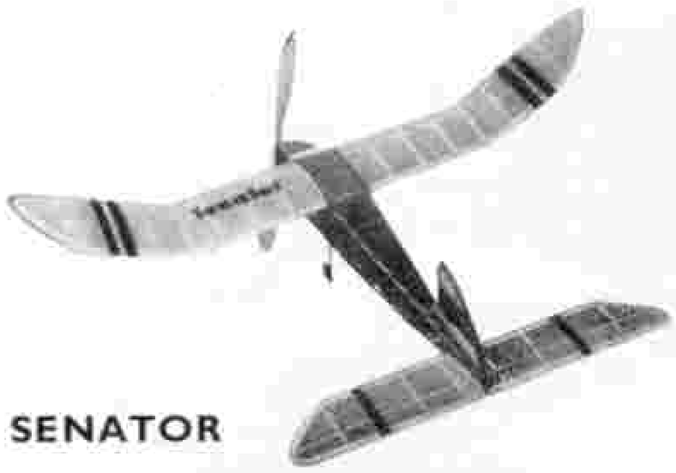
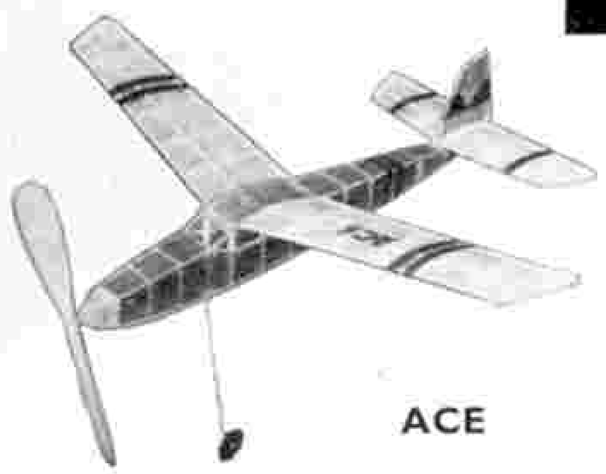
KEILKRAFT RUBBER DRIVEN MODELS



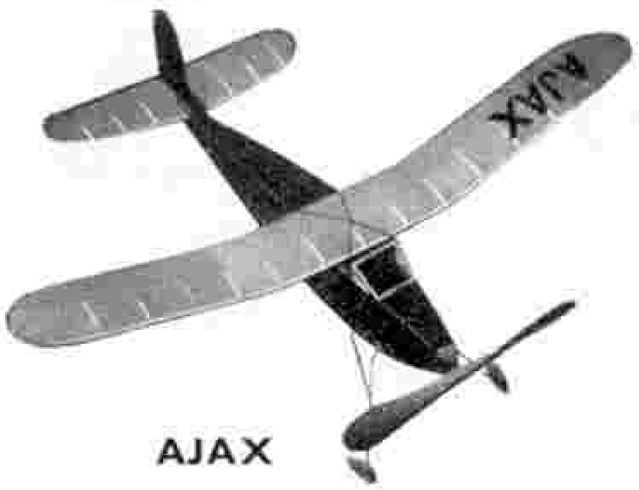
SENATOR

Novel contest model which is capable of a fine performance. Features a single leg undercarriage. Wingspan 32 in. **8/5**



ACE

Sleek cabin model. Construction is very simple, and the number of cut out sheet parts have been kept to a minimum. Wingspan 30 in. **7/4**



AJAX

A well established K-K favourite. Kit contains clearly printed sheet, propeller, plastic wheels, tissue, celluloid, wire, etc. Wingspan 30 in. **8/11**

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The pleasing lines of this model have made it one of the most popular in the K-K range. Performance is outstanding. Wingspan 32 in. **10/6**

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PIXIE

An attractive semi-scale design with realistic cabin, knock-off wings and plastic propeller. A very interesting model to build. Wingspan 23 in. **6/5**

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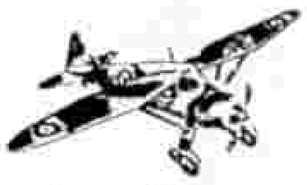
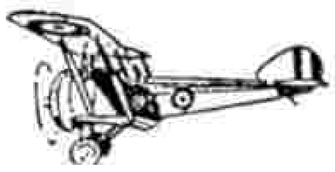


Lysander



Sopwith Camel

Fairey Gannet

Auster Arrow
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Fairey Gannet
Fairey Junior
Messerschmitt M.E.109
Focke-Wulf 190
Spitfire
Hawker Hurricane
Ju 87b Stuka
Luscombe Silvaire
Lysander
Globe Swift
Mustang
Nieuport (1914–1918)
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from PARIS

A separate range of Dinky Toys is made by Meccano (France) in Paris. Several of these French miniatures have been imported into the U.K., and they are illustrated here. Ask your Dinky Toys dealer to show them to you.

★ ★ ★

581 Berliet Flat Truck with Container
The container is detachable and is fitted with sliding door. U.K. Price **8/11**

579 Simca Glaziers Lorry
U.K. Price **8/6**

893 Unic Pipe Line Transporter (with windows). U.K. Price **12/9**

LOADS FOR YOUR LORRIES

Here are some fascinating accessories from our Works in France. They may be used most realistically with Dinky Toys lorries and wagons, and with Hornby-Dublo electric trains. They are made in plastic, and the cases are splendid imitations of wooden packing cases, one side of which is removable. The barrels consist of two halves which can be fastened together and opened by pressing a small "bung" in the centre, and the bottles may be removed from the containers in which they are placed.

846

847

849

850

846 Oil Drums (pack of six) U.K. Price **1/4**

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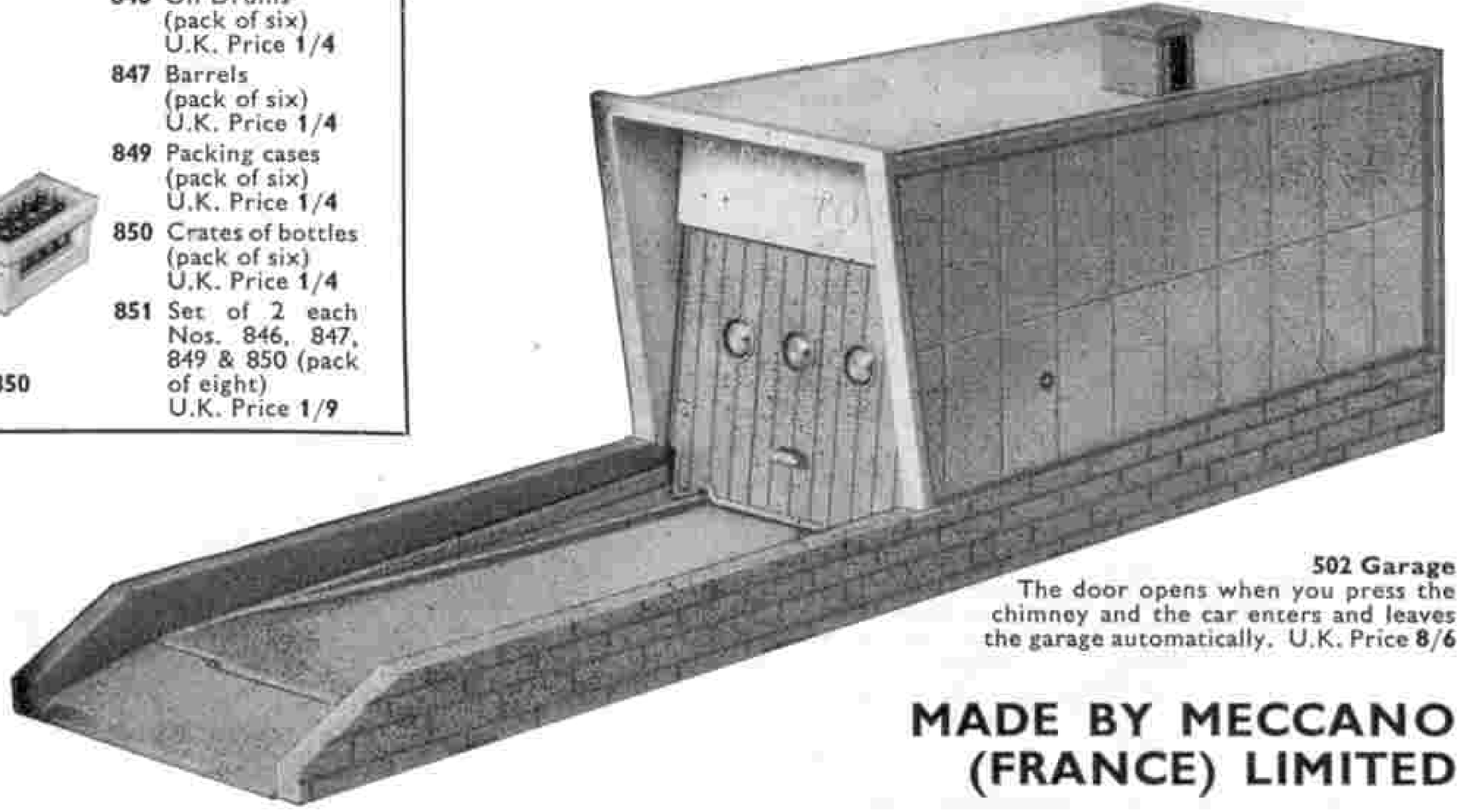
851 Set of 2 each Nos. 846, 847, 849 & 850 (pack of eight) U.K. Price **1/9**



502 Garage
The door opens when you press the chimney and the car enters and leaves the garage automatically. U.K. Price **8/6**

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MECCANO MAGAZINE

Volume XLVII No. 6 June 1962

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ERNEST MILLER

WELL, here we are at the half-way stage of another year, with the thought of holidays uppermost in many minds. The prospect of the annual break brings happy anticipation for most of us, but for some readers of the *M.M.* who are in their vital year at school the next few weeks can be very important, and possibly rather anxious, ones. To all who face examinations, the passing of which can have so important a bearing on future plans, I wish the best of good fortune.

Our picture this month is a rather unusual one and shows a view inside the Ropery at Chatham Dockyard where the original rigging was made for Nelson's flagship *Victory*. The Ropery will form the subject of a pictorial feature by John Topham in next month's *M.M.* In this issue you will find a description by the same contributor of the line fishermen of Gourdon, on the north-east coast of Scotland, and many of you will remember his previous contribution, in the April *M.M.*, on ranching in Scotland.

Finally, I wish to draw readers' attention to the first *Road and Track* article by our new motoring correspondent, Mr. Jerry Ames. This will be found on page 228. Mr. Ames has been associated with motor racing since 1925 and has known most of the great racing drivers, including Malcolm Campbell, Segrave and Parry Thomas of the older generation right up to such present-day stars as Fangio, Moss and others. He has acted as pit manager at races on the continent, including Le Mans, and on British tracks, is a former editor of *Autocourse* and has written for many national and Sunday newspapers. He is a present contributor to many important magazines in this country and America and writes, for the world's press, a last-minute round-up before each major Grand Prix. In addition, Mr. Ames writes on regular weekly road tests, which include all the latest cars, for more than 50 provincial newspapers, plus technical and other motoring features for the Central Office of Information. He has raced at Goodwood, Silverstone and other circuits and his six-year-old son is already learning to drive on a private roadway at home.

THE EDITOR

Next Month: A FRENCH RAIL TOUR

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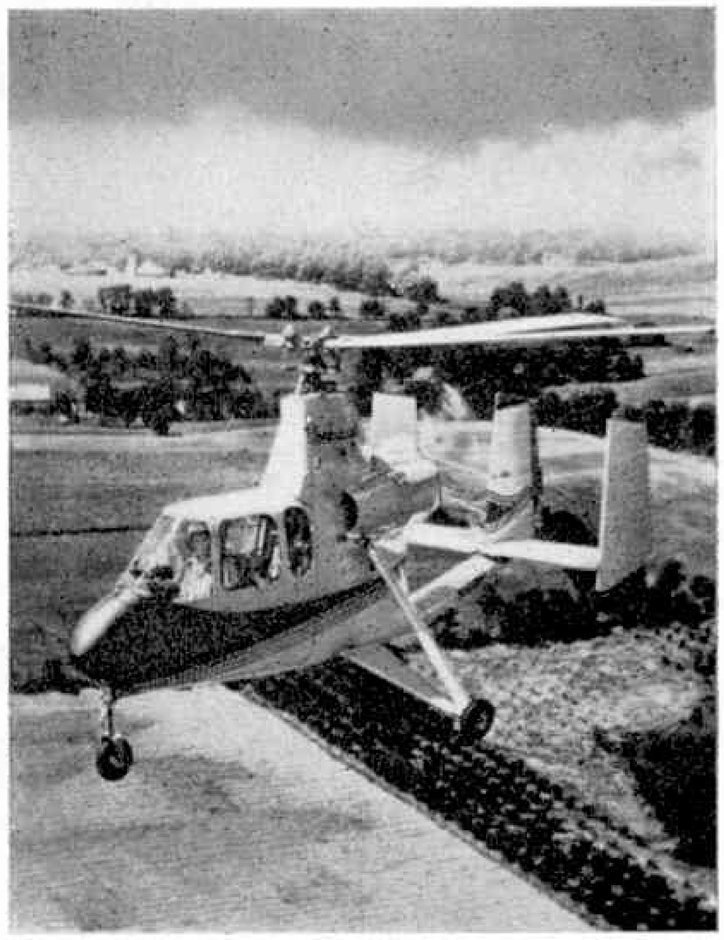
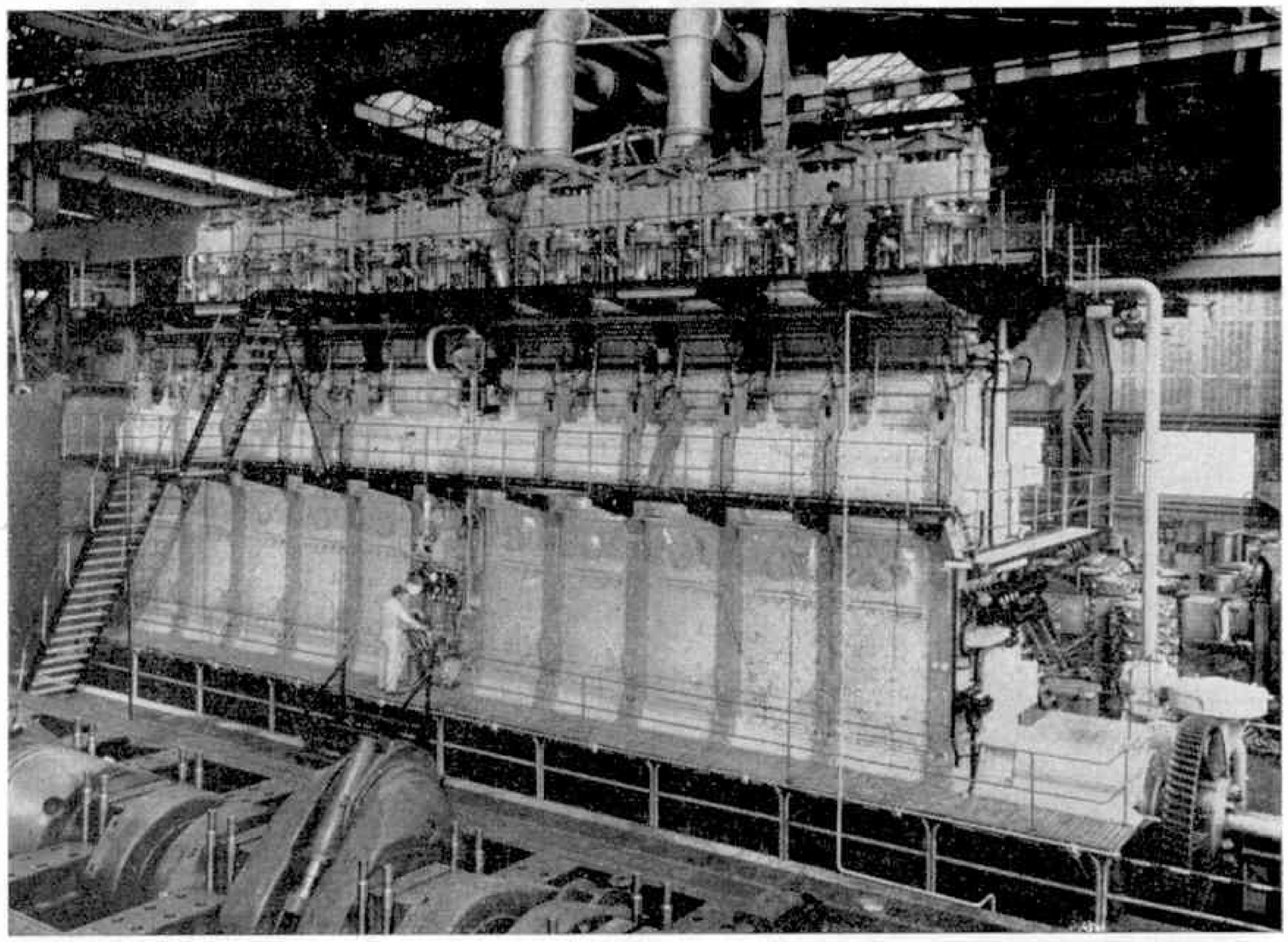
OUR FRONT COVER

There is no kind of flying more interesting and exciting than cruising along a few hundred feet above the ground, but most modern aircraft travel so quickly that scenery and buildings flash beneath their wings before passengers have time to study them properly. The pilot of the Umbaugh 18 two-seat autogyro, illustrated on this month's cover, is luckier. He can maintain height at forward speeds as low as 20–25 m.p.h. If he wants a closer look at something, he can land almost anywhere. Yet, when he is in a hurry he can fly at 100 m.p.h. for over three and a half hours.



THE WORLD'S MOST POWERFUL DIESEL ENGINES

DESCRIBED BY
R. M. E. DIAMANT

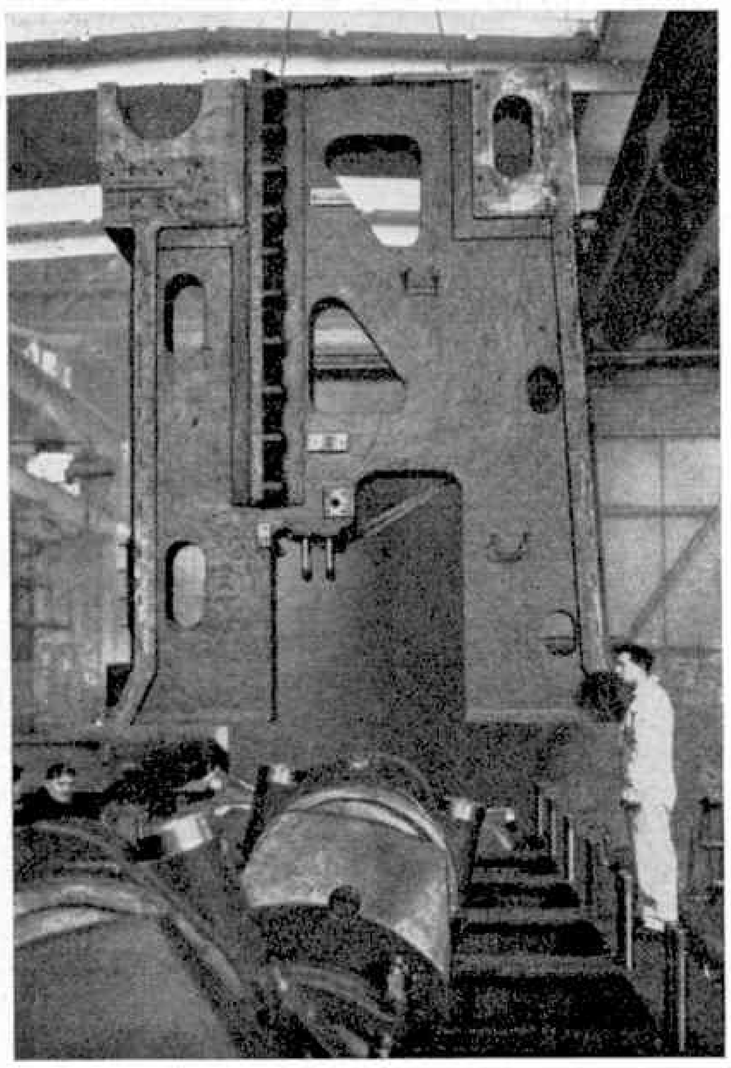


An impressive view of the Gotaverken large-bore diesel engine. All the pictures illustrating this article appear by courtesy of A. B. Gotaverken, Gothenburg.

AT A. B. Gotaverken, Gothenburg, Sweden, they are now building the most powerful diesel engines in the world.

These monsters have a bore size of no less than 850 mm., which means that each cylinder has a diameter of almost three feet. Such engines are made with varying numbers of cylinders in line, the maximum constructed being twelve. Each cylinder represents a power output of 2,100 brake horsepower. Thus, a bench of twelve such bores in line can give about 25,000 brake horsepower and two such benches side by side give an output of 50,000 brake horsepower, sufficient to drive the biggest tankers ever built.

The weight of such a gigantic diesel engine is, naturally, also enormous—1,100 tons for an engine with twelve cylinders, but on the other hand the weight per horsepower developed is quite low, only about 100 lbs. The length of this engine is 81 feet, the width 26 feet and the height 40 feet.



The frame columns of the huge engine are box-section castings. Here, one weighing 20 tons is being lifted.

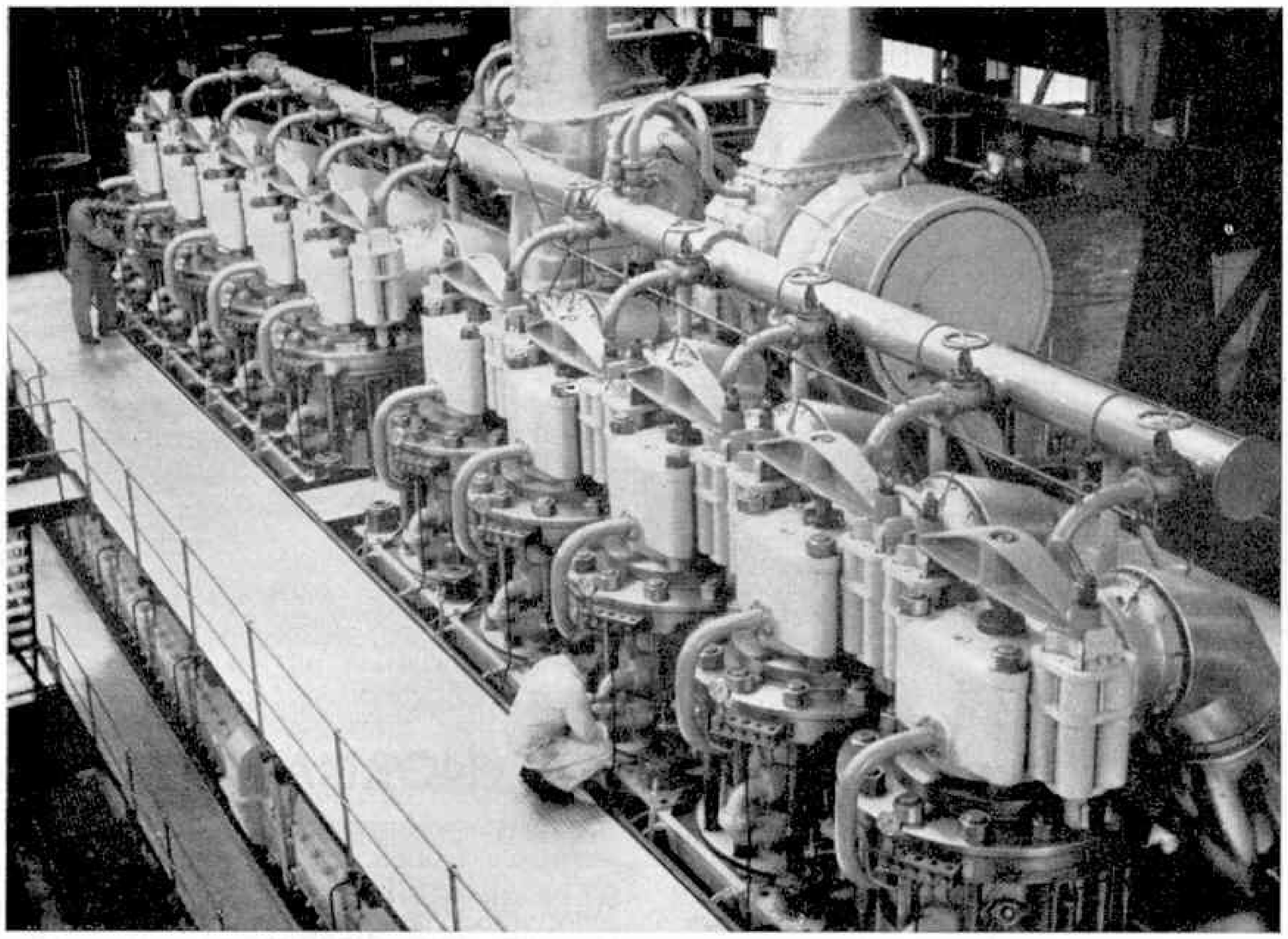
In design, the engine is a two-stroke type, and if one can excuse the parallel it resembles in many ways the little pip-squeak engines used for driving model aeroplanes. It is a single acting engine with a crosshead, with uniflow scavenging through ports encircling the cylinder liner and a single exhaust valve in the cylinder head.

While the exhaust valves are actuated by cams on the crankwebs, a single camshaft is employed to operate the fuel pumps. The separate scavenging air pumps for each cylinder are driven by arms attached to the crossheads and the turbocharge system is of the constant pressure type. A scavenging air belt is formed by the interconnecting cast iron plates on which the cylinder blocks are resting.

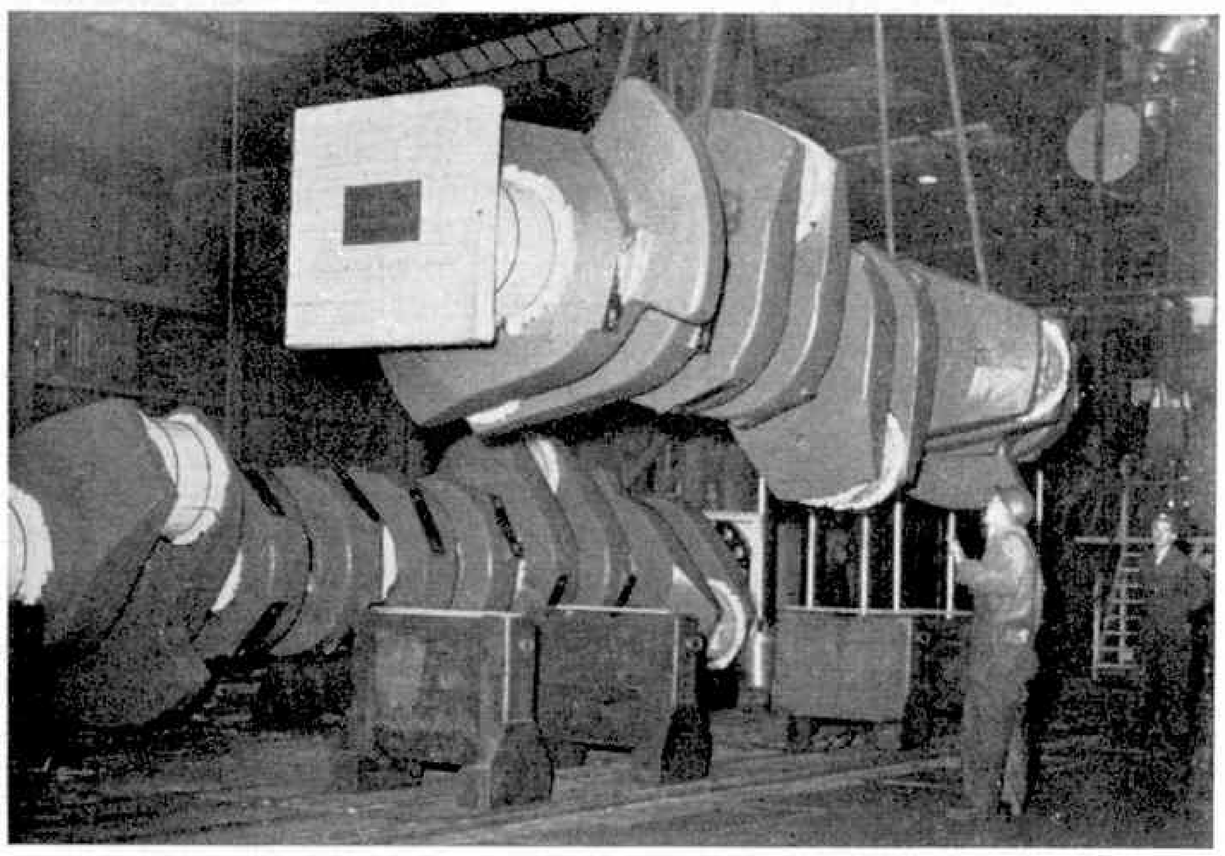
The engine has a welded bedplate with columns and cast iron cylinder blocks. The cylinder blocks themselves are joined together with studs, and the various frame units are attached to the bedplate by means of tie-rods extending from the top of the cylinder blocks to the underside of the steel castings. The last-named are incorporated in the transverse girders of the bedplate and form the bearing seatings. The tie-rods are pre-tensioned to no less than 125 tons.

The crankshaft is made in two main sections with an additional thrust shaft, the three parts being connected by couplings with fitted bolts. The pin and webs for each throw are formed from a single steel casting, which is shrunk on to the main journals of forged steel. Both crankpins and main journals are drilled to make channels for lubrication. Each crankweb is fitted with a cast steel camholder, to which the cam segments for actuating the exhaust valves are fastened.

The crosshead is a steel casing, which incorporates the white metal



Above: A view taken from the top of a large-bore engine.



Suspended in mid-air is a crankshaft weighing 180 tons for the large-bore type engine.

faced guide shoe and is drilled for the passage of oil to the bearing surface. The crosshead pin, of chromium-plated steel, is drilled throughout its length in order to reduce its weight and to allow it to be cooled, as well as to provide an oil passage to and from the piston. Cooling oil is supplied from a telescopic pipe by way of the cast steel arm attached to one end of the crosshead pin, and is discharged through a steel bend at the opposite end of the pin.

Single-piece forgings of low alloy chromium-molybdenum steel constitute the pistons, and each piston carries six piston rings together with two lead-bronze wear rings. Efficient cooling is achieved by oil forced against the underside of the piston crown through a labyrinth insert.

The cylinder liners consist of vanadium-titanium cast iron, a material which has been found to be particularly resistant to wear. The liner top is shaped to form a flange with ground faces, which is clamped between the cooling jacket and the cylinder head. The cooling jacket itself is of cast iron.

The cylinder head consists of a two-part cylinder cover and an exhaust valve housing, held together by four strong studs, so that the whole can be lifted off and replaced as a unit.

The lower, water-cooled section of the cylinder cover carries the central exhaust valve, three fuel injection valves, an air starting valve and a relief valve. The upper half is made of cast steel to withstand bending stresses. The whole cover, together with the cylinder liner and cooling jacket, is held down against the cylinder block by twelve heavy studs whose nuts bear against the steel upper part of the cover. The valve housing is of cast iron and is water cooled.

So far as the fuel injection system is concerned there is one fuel injection pump for each cylinder, the pump plungers being actuated by cams through rollers and springs. The fuel injection pumps have a common camshaft which is driven from the crankshaft by a strong duplex chain transmission.

Compressed air is used to start the engine. The servo system which controls starting and reversing is of the pneumatic type, the air supply being regulated by mechanical valves actuated by cams on the shaft of the control wheel.

Turbocharging is by the constant pressure system, with the blowers acting in series with reciprocating scavenging air pumps on each cylinder. For the twelve-cylinder engine there are two turbochargers. The air compressed by the turbocharger is forced through an intermediate seawater cooler into the airboxes mounted on the diaphragm frame of the scavenging air pumps. The valves of the diaphragm consist of thin steel springs.

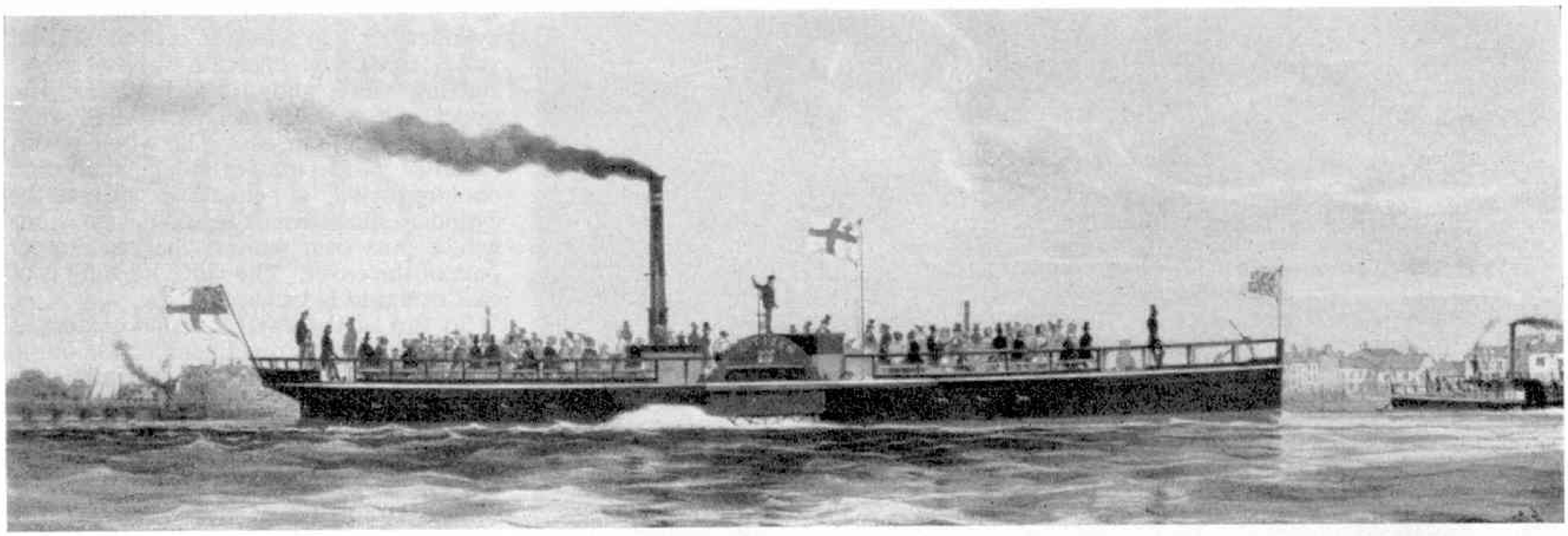
The double-acting reciprocating pumps, which are driven from cast steel arms bolted to the crossheads, supply air to the scavenging air belt. It then enters the cylinder through ports equally spaced around the lower part of the liner. Swirl imparted to the air as it passes the ports contributes to good combustion.

The large Gotaverken engine operates at a much higher pressure than other marine diesel engines. The mean indicated pressure is no less than 139 lbs. per square inch, which naturally means that the engine operates at a high efficiency.

With the large bores employed the piston speed is kept low; for example, the mean speed is only 19 feet per second, which keeps the rate of wear of pistons and cylinder liners to a very low level.

R.A.C. ACCOMMODATION BOOKLET

The Royal Automobile Club has just published a free 64-page booklet *Supplementary List of Small Hotels, Guest Houses and Farmhouses; also Establishments Offering Bed and Breakfast Accommodation.* It is invaluable for road users seeking accommodation other than that provided by appointed and approved hotels which appear in the handbooks of the motoring organisations. None of the establishments listed is officially appointed by the R.A.C., but it is hoped they will meet the needs of members. The booklet is obtainable from all R.A.C. offices.



LONDONERS complain of their traffic problem, of crowded trains, packed buses and congested roads, but how best to provide transportation for the City's workers has always been a matter for public concern. A pattern, akin to that we know today, took shape after the 1860's, as trams began to replace horse buses and the railway network grew.

WHEN THE RIVER CARRIED LONDON'S TRAFFIC

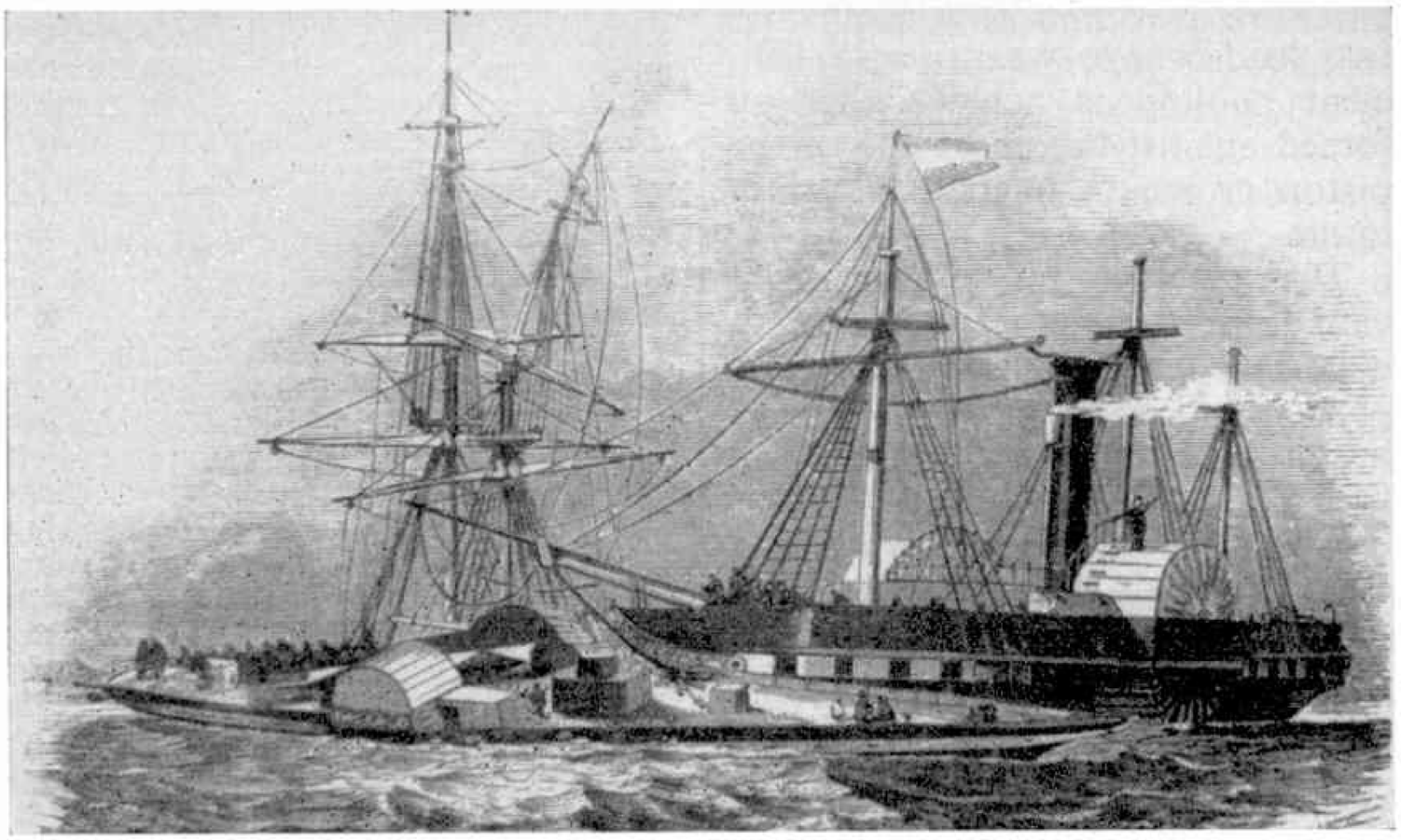
BY NORMAN JONES

During this period the South Eastern and Metropolitan District Railways began to cater for the London Bridge, Charing Cross and Westminster traffic, while Cannon Street Station was opened in 1866. Previously, much of the City traffic used the river, in spite of the fact that it was then very much of an open sewer. Moreover, the main thoroughfares did not directly touch the river's course, but it still managed to be an important artery for east–west traffic. Reports, written during a very dry summer in 1858, tell of "an intolerable stench in the House of Commons", arising from the foul state of the river, into which raw sewage was discharged. Just the same, the waters were thronged with paddle steamers, and these provided excellent ferry services of which thousands of Londoners took advantage every day.

Many writers have paid tribute to the railway personalities of the last century. Every enthusiast knows the name of Brunel, of the Great Western, Francis Webb, of the London and North Western, and railway promoters like George Hudson. Who is not familiar with the story of the *Rocket* and of *Locomotion?* The story of the paddle steamers is every bit as fascinating.

The first paddle steamers built looked very like their ancestors the sailing ships, for they had clipper bows, bowsprits and figureheads. Outwardly, indeed, they differed from the full-rigged ships only by the presence of a pair of paddlewheels, sometimes smack amidships, at other times set rather well forward, and a tall, slender funnel, on which a sail might be set.

The first passenger-carrying steamer on the Thames was *Marjory*, which on January 23, 1815, began a service between Wapping Old Stairs and Gravesend. At first, the steamers served the estuary and Kent Coast resorts, and had much to do with making Margate popular with trippers; yet, in turn, the attractions of the resort greatly assisted the development of the steamboat industry. The short-distance, cross-stream ferry services were



The picture at the top of the page, from a coloured lithograph by J. C. Ogle, dated about 1846, shows the paddle steamer Citizen "A". The illustration on the left depicts a collision in the Thames between "The Emerald" and the "John Bull". It appeared in the *Illustrated London News* of December 20, 1845. These illustrations and that on the following page appear by courtesy of the National Maritime Museum.

begun later. The London–Gravesend run was, and still is, known as the "long ferry". The "short ferry" is to Woolwich and Greenwich.

At this point, mention must be made of the General Steam Navigation Co. Ltd. Although this concern did not participate in handling the inter-city traffic, it played a most important part in exploiting and demonstrating the possibilities of steam navigation. In 1824, when London Bridge was being built, and Hyde Park changed from a royal to a public park, twelve months before the advent of *Locomotion* and the Stockton and Darlington Railway, a group of businessmen combined to form the General Steam Navigation Company.

A river steamer *Eclipse*, probably owned by one of these gentlemen, was hired by engineer John Rennie in 1819, when he demonstrated to the Admiralty the advantages of using steamboats as tugs.

Following the opening of London Bridge, in 1831, companies to operate short-distance, cross-stream ferry services began to come into being. About fourteen concerns had operated paddle steamers, on a variety of runs, by 1846. Plying up stream were vessels of three companies, the London and Westminster Steamboat Company, the Iron Steamboat Company, and the Citizen Steamboat Company. The first-named was formed in 1835, and its fleet of eight vessels worked between Old Swan Pier and a landing stage at the southern end of Westminster Bridge. The funnels of the Westminster steamers were painted black with a white band and decorated with ornate, open-work, bell-mouth tops. The boats bore the names of flowers, such as *London Pride* and *Camelia*.

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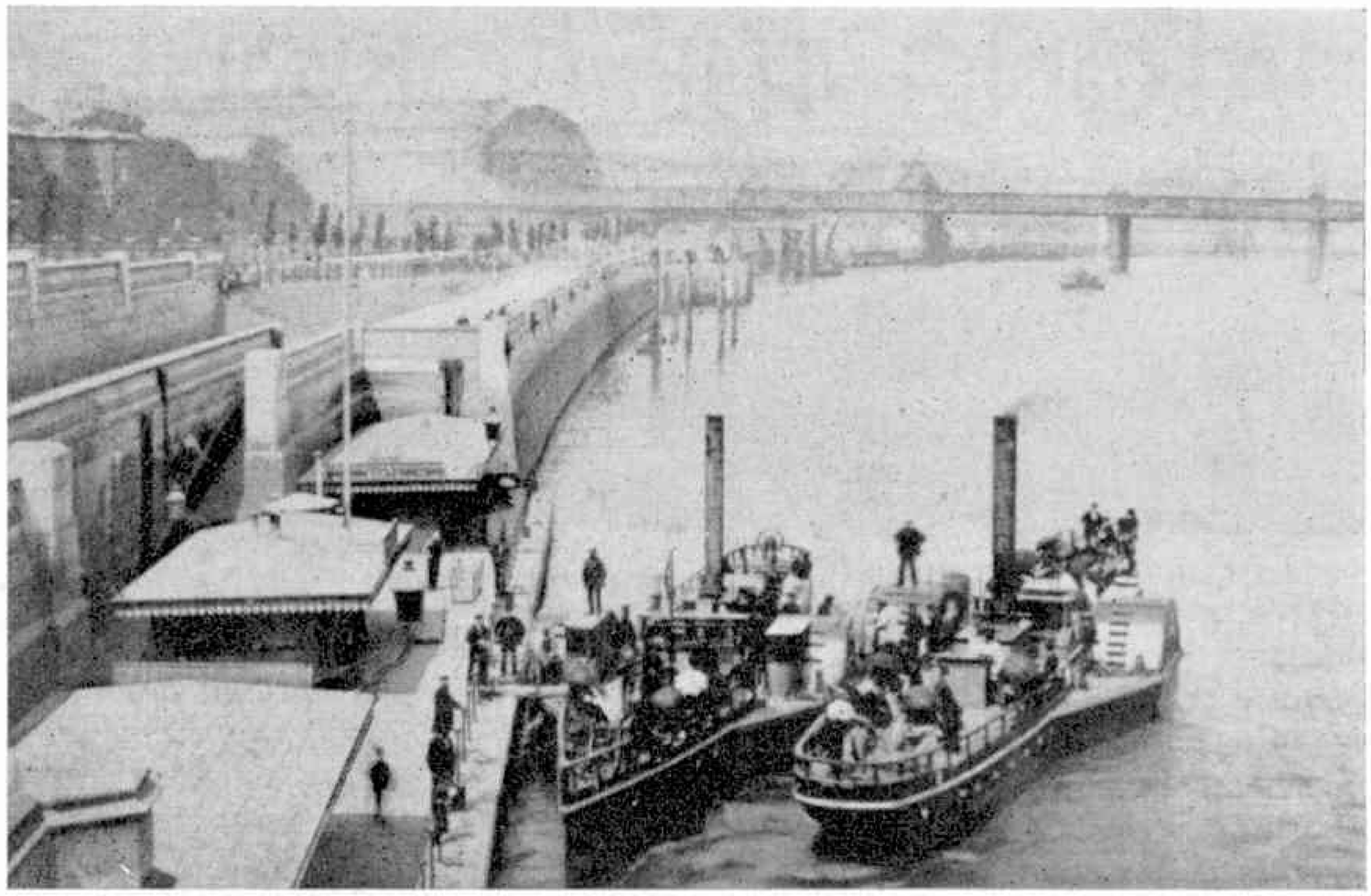
It was in 1838 that the Iron Steamboat Company began its service to Chelsea and Kew. This company's vessel *Daylight* was the first iron-built ferry steamboat. A rather odd sequence was observed in naming the boats, the names being painted on the paddle-boxes. After *Daylight* came *Moonlight*, *Sunlight* and *Starlight*. In 1839 *Bride* and *Bridegroom* appeared, with *Bridesmaid* bringing up the rear and then, after a lapse of another three years, along came *Matrimony* and *Wedding Ring*.

The last steamboat company formed to work steamers on the Thames (until an amalgamation of smaller concerns 30 years later) was the Citizen Steamboat Company of 1846, which put some eighteen steamers on the Chelsea–Kew run. The vessels were iron-built and flush-decked, with below-deck, fore and aft cabins. Most of the paddle steamers on the ferry services were constructed to this layout. The Citizens ships were painted black, their funnels being of the same colour, with two red bands and the usual open-work top. The City Arms were painted on the paddle boxes and the boats were named after City companies.

The ancient Guild of Watermen, who had previously provided all the ferry services the population of London required, did not approve of the new steamers, for they felt that both their livelihood and their riparian authority were menaced. In 1834, when the Woolwich Steam Packet Company started a service between Charing Cross and Strothers Wharf, Woolwich, members of the Watermen's Guild formed their own company, the Watermen's Steam Packet Company, which began operations in earnest in 1840. This company owned about a dozen vessels, which were painted green overall, with black funnels. Waterman steamers were named after birds—*Teal*, *Widgeon* and so on.



A photograph which was taken about 1900 showing the Thames Embankment and Westminster Pier with Charing Cross Bridge in the background. Note the captains of the two vessels standing on the paddle boxes.

About 1850, the Eastern Counties Railway, which later became part of the Great Eastern Railway, started a ferry service between North and South Woolwich. In this instance opposition from the Watermen was appeased by the clever move of employing members of the guild as officers on the steamers. All the Watermen's paddle steamers competed strongly with their competitors, and there were some exciting races.

One ferry steamer line, known as the Dyers Hall Company, met with some very bad luck. Running as the Halfpenny Steamers, and based on Dyers Hall Wharf, near London Bridge, these vessels were double-ended, and were among the first known to be fitted with dual expansion, or compound, engines. They were good, very fast boats, said to have had a top speed of about 14 knots. Unfortunately, in August 1847, an engineer on their *New Cricket* screwed down the safety valves then went off duty and forgot to warn his relief. The boiler, as boilers will, objected to this treatment, and showed its resentment in the customary way. Unhappily, of 150 people on board, seventeen were killed, and many more were injured, in the explosion that followed. The public lost confidence in the Halfpenny Steamers and ceased to patronise them. Shortly afterwards the company went into liquidation.

At this time fifteen steamers were plying, every hour, between London Bridge and Westminster. The fare was one penny and the sail took about fifteen minutes. Some steamer lines operated excursions far down river. Of these, only the General Steam Navigation Co. Ltd., which at a very early date had a dozen steamers on the London–Thanet run, and the Medway Steam Packet Company of 1837 (now the New Medway Steam Packet Company) which linked Chatham with Sheerness, are still in existence.

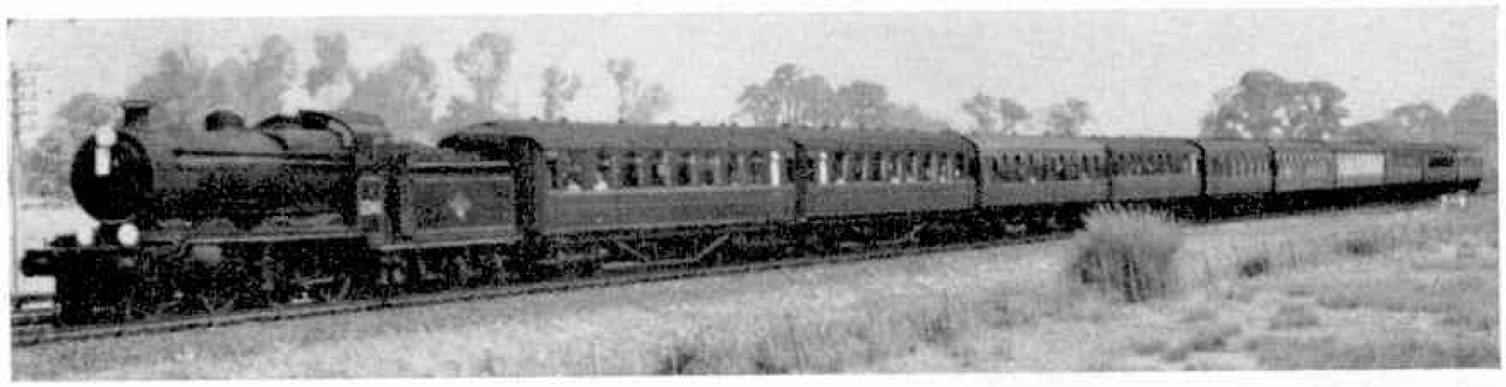
There was much variety among these colourful vessels. On the "long ferry", in 1833, where the steamers of the Star Steam Packet Company, and the Diamond Steam Packet Company—formed in 1836—ran very gay steamers, their funnels being painted in patterns of large, black and white diamonds. The service was to Gravesend and back. In 1845 the Diamond Company's *Emerald* collided with the Hamburg Packet, *John Bull*. Fortunately no lives were lost and the passengers were taken off the damaged vessel by the *John Bull* and a Blackwall Railway steamer.

Paddle steamers were handy craft for ferry services on the busy Thames, and they remained in favour for many years, despite the acceptance generally of the superiority of screw-driven craft. There were many types of these Thames paddlers. Some were double-ended and had rudders at bow and stern. By locking one or other of the rudders and transferring the helmsman to the other end, forward simply became aft. Some vessels could go ahead on one engine, while going astern on the other, and this enabled the type to turn, as it were, on a sixpence.

Propulsion was non-standardised; there

(*Continued on page 249*)

ALONG THE CONQUEROR'S COAST



ONE of the best-remembered dates in English history is 1066, the year of the Norman conquest. This is always associated with Hastings, the historic Cinque Port and hilly resort with St. Leonards-on-Sea adjoining. It is thought that the landing of Duke William of Normandy, the Conqueror, nearly 900 years ago, actually took place further west between what is now Bexhill-on-Sea and ancient Pevensey, and that the battle was fought on the heights a few miles inland.

R. A. H. WEIGHT DESCRIBES A RAIL JOURNEY IN EAST SUSSEX

Years ago, a railway-produced pictorial poster depicting the tourist attractions in and around Hastings, Bexhill, and other places in the vicinity described the area as "*The Conqueror's Coast*". This article is about the present, not the past, but the same description will serve!

Sussex, that large county bordering on the English Channel, has its biggest towns on the coast. In this article we are concerned with its eastern half—where I happen to live—in which much fine scenery is visible from the various railway routes. Frequent train services to and from the principal resorts, intermediate and costal stations, employ quite a variety of motive power; some are steam, more are diesel and electric, with electric traction on the usual S.R. third-rail system predominating.

* * * *

We begin our westbound investigation of the coast lines at Ore, easternmost of the five stations within the Hastings–St. Leonards group, served by diesel and steam trains on the Ashford (Kent)–Hastings service. It is also the starting point in our direction of the frequent electric stopping trains to Eastbourne and Brighton, and of the faster main line services to London, both of which follow the same route as far as Lewes. After a short downhill run comes Hastings Station, with four tracks on each side of two long island platforms signalled for either-way departure; then Warrior Square, the principal St. Leonards station, situated between two tunnels and dealing with considerable passenger traffic.

Hastings and St. Leonards travellers to and from London enjoy a unique and exceptionally liberal train service, because there are two routes, of more or less equal importance, having different types of traction. Each provides six-car set multiple-unit corridor trains, for the most part on an hourly basis, many including Pullman-car or buffet-car restaurant facilities, with diesel-electric propulsion for the shorter and quicker Charing Cross service, and electric to or from Victoria.

Either way, calls are made at principal stations, and thus much intermediate business is handled. Extra trains run morning and evening on slightly different and faster schedules and they carry hundreds of season ticket holders, many of whom, between London–Hastings–Bexhill–Eastbourne, etc., travel 60 miles or more each way daily.

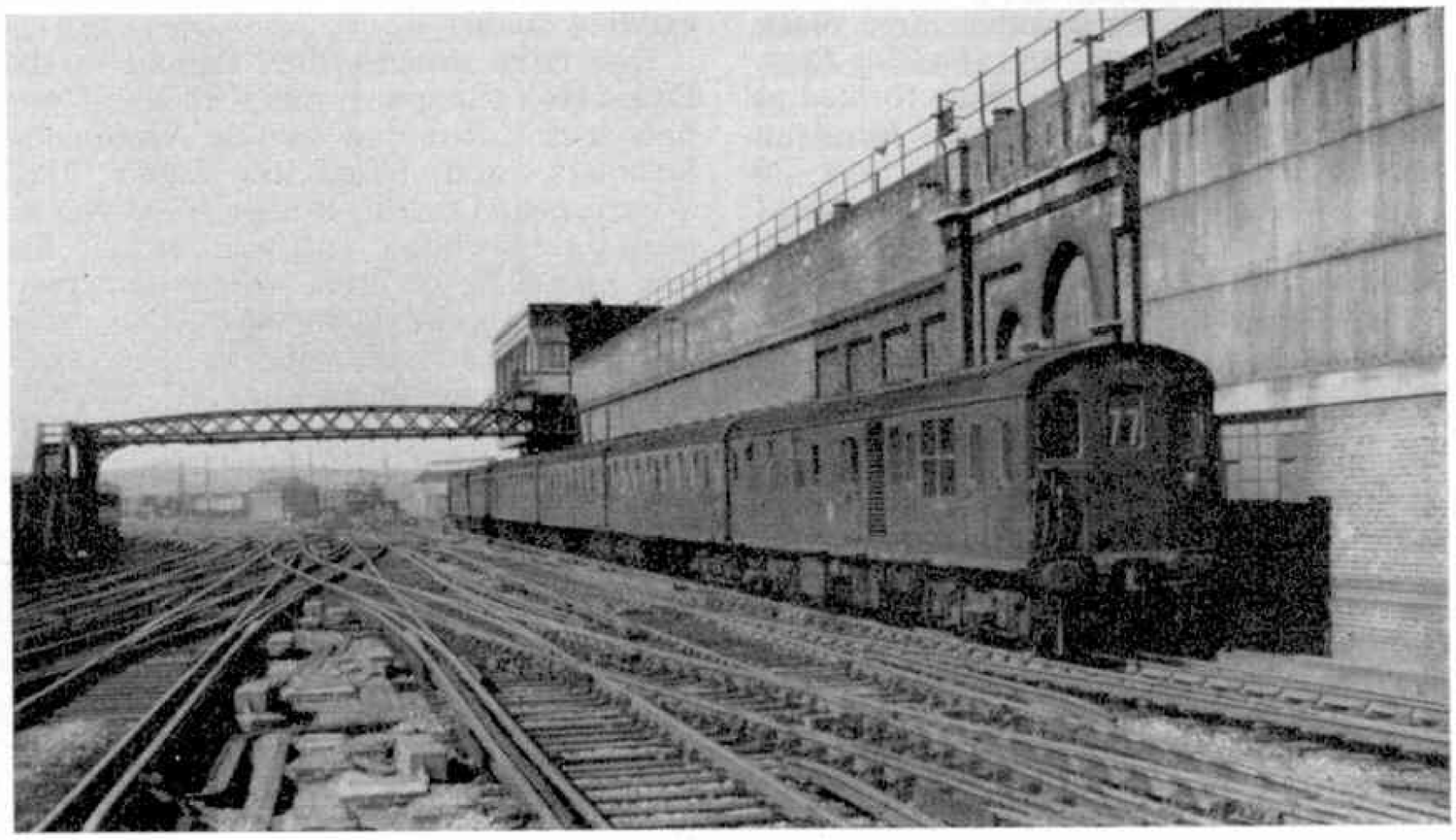
On many up journeys a fast diesel train is preceded by a slow one calling at all stations to Tunbridge Wells, where, arriving within a few minutes of each other, the two are combined to go forward as a 12-coach formation to London. Similarly, in the down direction, a slow portion detached at Tunbridge Wells follows the faster one from there to Hastings.

At Bo-Peep Junction (named after a now-modernised Inn) the Charing Cross line diverges inland, uphill; that in the Brighton direction continues close to the sea. Almost at once on those respective routes will be noticed the two remaining Hastings stations—West St. Leonards, and St. Leonards, West Marina, which were once on rival railways. Alongside the latter is St. Leonards Motive Power Depot, long the home of Schools class and other powerful locomotives, now just a watering and turning point mainly for freight engines. Beyond are sidings, a modern carriage-washing plant, and large diesel train sheds. Steam is disappearing.

* * * *

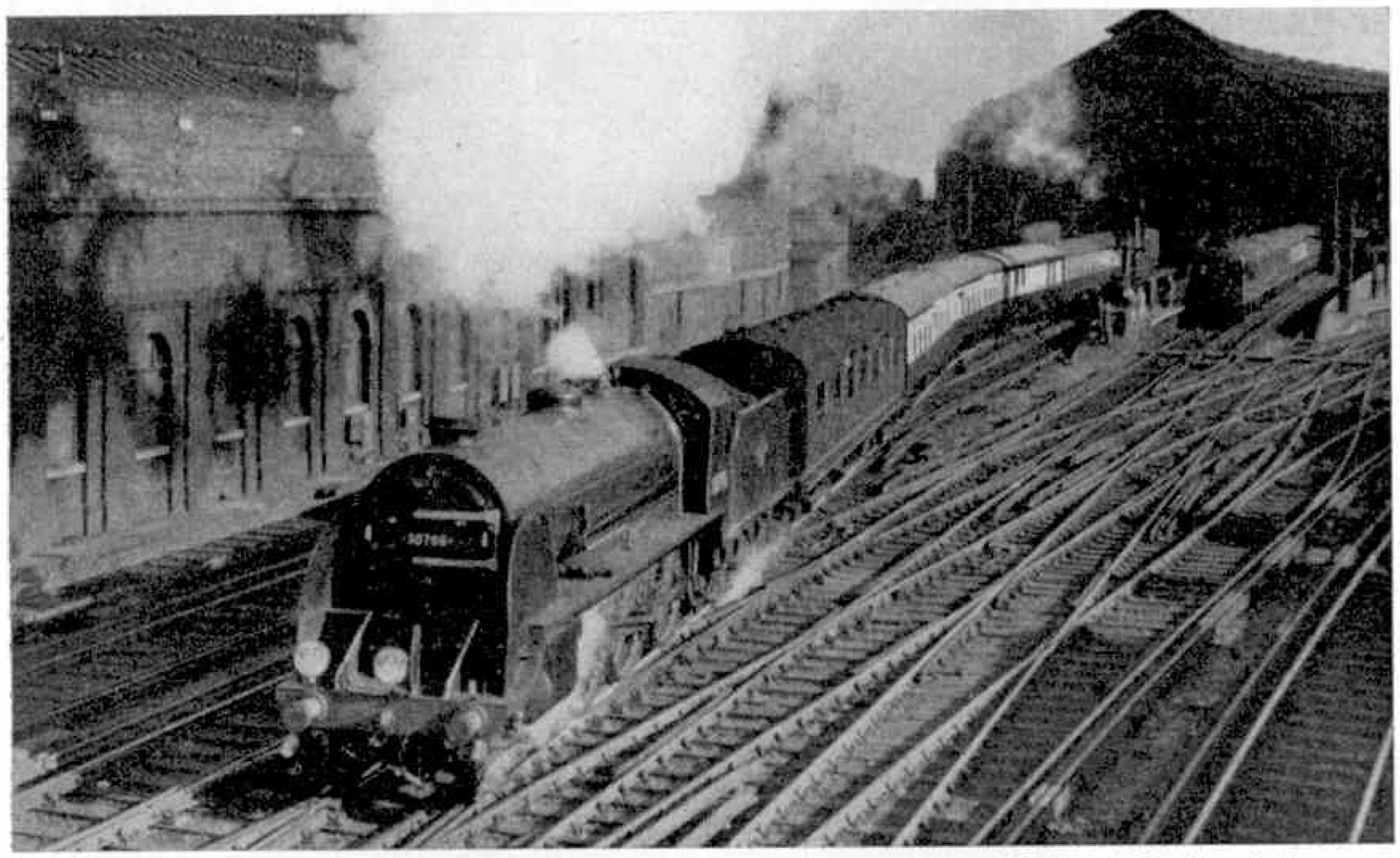
After Bexhill Central may be seen the West terminal station on the inland side served by two-car set diesel-electric trains connecting with the main Tunbridge Wells–London route at Crowhurst; several small halts, and Cooden Beach and Pevensey stations. A good many level crossings occur throughout the area.

Approaching Polegate there is a wide triangle of tracks, the base being the direct line taking us straight to that



The upper photograph, by W. M. J. Jackson, shows a K class 2-6-0 No. 32343, a type not much used on passenger working, near Glynde with a Hastings-Manchester train. In the lower picture a Hastings-type, diesel-electric set train is passing the former locomotive works at Brighton. This Sunday working from Tonbridge is now unusual.

station. This line is little used apart from the busiest summer days as the normal procedure is for electric passenger trains to run into Eastbourne and out again, traversing the two sides of the triangle, passing or calling at Hampden Park Station twice in the process. This makes an exceedingly busy two-mile stretch as the up and down tracks carry, on average, at least fourteen trains an hour, including short trains to and from the single-track "Cuckoo Line", branching off at Polegate for Hailsham towards Tunbridge Wells, West. Incidently, through St. Leonards Warrior Square, over the one-and-a-half miles east of Bo-Peep Junction ten trains an hour are usual. On both sections these movements are supplemented at busy times by light engines, empty carriage or freight movements.



An R.C.T.S. special including a Pullman car leaving Brighton behind 4-6-0 No. 30796 "Sir Dodinas le Savage." An electric train for Victoria is alongside an adjacent platform. This picture and the lower photograph on the opposite page are by S. C. Nash.

Eastbourne terminus has four spacious platforms, but that number is not too many for summer use. The skeleton engine shed, severely damaged by enemy action during the war and not completely restored, services locomotives and houses some overnight, according to present limited steam requirements.

On we go again, round the western side of the triangle, further inland among the Downs. After Polegate, perhaps having sighted the "Long Man of Wilmington"—a huge figure cut in the chalk hillside on the left—and having called at two more widely separated country stations, the Seaford–Newhaven branch joins on the south side as we approach Lewes, a notable county town, which has a ruined castle such as those at Hastings and Pevensey.

Local electric sets, as well as the Continental Boat Expresses between Newhaven and London which are generally hauled by electric locomotives, traverse this branch. The Sussex Ouse is crossed, then comes a marshalling yard, with freight activity probably visible, as the train runs cautiously into Lewes Station from which three radiating routes diverge on extremely sharp curves.

Non-electrified tracks seen heading north, and to our right as we arrive, carry Brighton-Uckfield trains towards Tonbridge, or trains to London via Oxted. There are bright flower beds and nurseries at the lineside supplying plants for other S.R. stations, etc. At Lewes there are seven through platform lines divided into two groups shaped roughly like the sides of a "V". We go to the left on the Brighton line side; trains travelling in the Haywards Heath (London main route) direction go to the right.

Our line now climbs through downlands to a short tunnel; thereafter we are soon decending on the edge of hilly Brighton, past housing estates and the junction for the local Kemp Town goods branch once frequented by the push-and-pull trains operated by small tank engines. The journey from Ore, over 40 miles, has taken about 80 minutes, averaging around 30 m.p.h. thanks to rapid electric acceleration, but there are eighteen stops.

All S.R. country multiple-unit trains carry prominent front-end numbers indicating their route and service. These are for staff information mainly and are not often announced to the public, but regular travellers soon get to know them and appreciate their value, particularly where a number of services use one station. Normally the one code number is displayed in both directions, but to avoid confusion at Eastbourne or Hampden Park, where for a short distance either-way trains use the same track, those to Brighton are "18" and those towards Hastings "16". On the trip just described our headcode number was 18. From Ore–Hastings as far as Eastbourne, through trains to London (Victoria), carry "58"; onward from Eastbourne, and all the way on the return journey the standard "52" is indicated. The code numbers are used again on different parts of the system for non-conflicting routes; for instance, "16" is also Victoria–Worthing–Littlehampton.

Brighton is a vast and populous seaside resort, and in addition an educational, shopping and light industrial centre. Its main terminal station is the biggest and busiest on the Southern outside London. Indeed, in terms of regular all-year train working it is one of the busiest anywhere in provincial Britain, having for long periods every weekday, including off-peak hours, a train in or out approximately every two minutes! During the two peak evening hours there are at least 70, averaging one every 1¾ minutes. Activity is similarly intensive on summer Saturdays and certain holiday occasions, yet into it all extra electric and longer-distance steam excursion specials, or the like, have to be sandwiched.

The bulk of the services at Brighton are electrically operated, and in many cases soon restarted from the platform at which they arrive. They operate on a regular-interval basis. Several trains can arrive or depart at once, for there are ten platform faces, not all of full length. Timekeeping is usually good and many thousands of regular travellers to and from London or elsewhere use the station daily.

* * * *

The Brighton approach lines and train services are in three groups. From left to right looking out of the station they are:

West Sussex coast route from Portsmouth – Chichester – Worthing; also Horsham (local, steam) and a few long-distance steam trains via Southampton. These arrive round a sharp curve past the locomotive depot are obliged to use platforms 1 and 2, or the inner half of No. 3, involving some close margins.

The main London lines. These run straight ahead and are equipped with modern colour light signals throughout. They carry non-stop trains—which cover the 51 miles in an hour, or just under—and many others, and the platforms chiefly used for these services are 4–7.

The East Sussex group. These include trains from Seaford, and from the Uckfield and Oxted line, as well as those from the Hastings direction which this article has described. All arrive in platforms 8–10, although Nos. 6–7 can be used if necessary. When departing these trains curve away to the east on a viaduct directly after passing the once-famous locomotive works adjacent to platforms 9–10. This building is now let to a firm of motor manufacturers.

* * * *

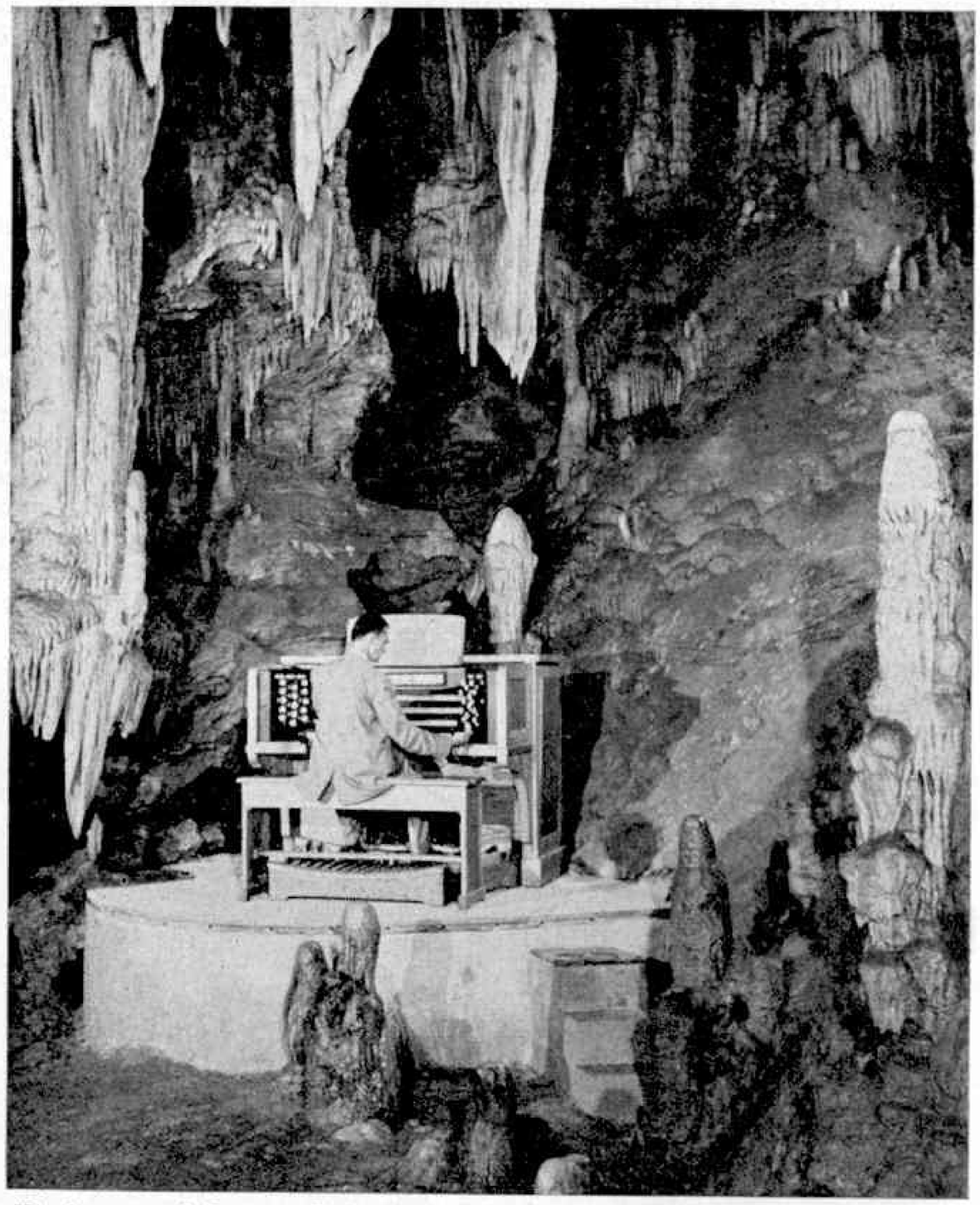
Except in winter, there is one daily steam train each way 'twixt Eastbourne–Brighton–Redhill. This is part of a through service to and from Reading, Oxford, Birmingham and Wolverhampton. Its extraordinary (*Cont. on page 258*)

THE STALACPIPE ORGAN

TAKE the curiosity of a small boy and the scientific imagination of his father, set them to work in caves 200 feet below the earth of Virginia, U.S.A., and the result is the Stalacpipe Organ—a remarkable musical instrument that actually plays its notes on rock. The Caverns of Luray were discovered as long ago as 1878, and ever since then visitors have flocked to see the rock formations in this subterranean wonderland. From the moment

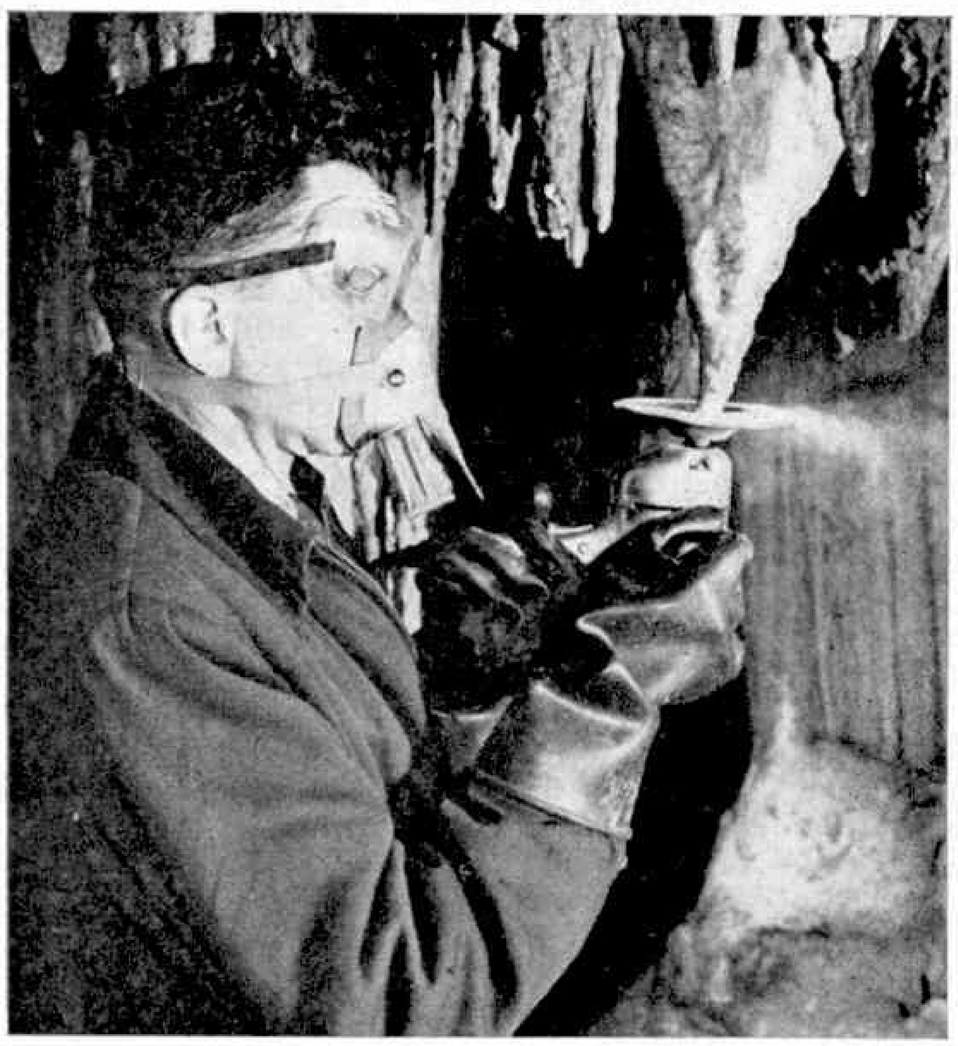
BY SIDNEY ALLINSON

one descends a long flight of steps, the cool depths of Luray make one feel transported into the exotic splendour of the Arabian Nights. Nature partitioned Luray Caverns into a series of gigantic rooms. These are connected by passageways radiating from a central hall like spokes from the hub of a wheel. The caves were carved through limestone by underground rivers millions of years ago. At one time, the caverns were charged with volcanic mud and acid which eroded the stone into many grotesque shapes. When the mud was flushed out, these shapes remained to contrast with later stalactite growths.



The inventor of the great Stalacpipe Organ, Mr. L. W. Sprinkle, is seen here at the console.

The pointed rocks are formed from dripping limestone water, built up at the rate of one cubic inch every 120 years. Those pointing downwards are called stalactites and those growing upwards are stalagmites. An elaborate lighting system enhances the natural splendour of Luray's glittering rock formations. This display is known as the most remarkable in the world. Older rocks are brown, yellow and red, while new stalactites form dazzling points of pure white, delicate pink and light blue. Many of these peaks are massive growths, like the 35-foot high Empress Column and the 65-foot high mass of snowy alabaster called the Double Column. The Cascades resembles foaming torrents of milky rock frozen into billowing ripples. There are also Titania's Veil, the Throne Room, the Frozen Fountain and the mirror-like Dream Lake. Everywhere one can see countless stalactites jutting down from the ceiling—it is estimated there are more than 40,000 pendants above the Imperial Spring alone.



Grinding the stalactites with an aluminium oxide disc rotating at high speed.

* * * *

When young Robert Sprinkle bumped his head on a stalactite in Luray Caverns a few years ago, the deep tone fascinated him and his father, Mr. L. W. Sprinkle, an Air Force electronics scientist, who at once became interested in the novel idea of creating a device to play music on the rocks.

Many unprecedented problems had to be solved. For instance, how did one go about tuning stalactites? A system of grinding them was worked out, with aluminium oxide grinding discs rotating

at high speed. These sanding tools are designed to wear down even tempered steel, yet stalactites are so hard that the discs wear out rapidly.

A set of thirteen English tuning forks is used for prospecting suitable rocks before precise tuning is accomplished with a system of oscillators amplified in such a way that they can be heard above the grinding, which goes on until wavy effects disappear. The hard rocks stay perfectly tuned in their natural air-conditioning of a constant 54 degrees Fahrenheit. Further grinding improves tonal quality by eliminating unwanted harmonics.

The notes themselves are produced by rubber-tipped, magnetic plungers striking stalactites, each plunger being bracketed to the rocky wall near its tuned stalactite. Resonant rock foundations for brackets must be avoided, as they give off unwanted tone when the plunger springs back into position. Each plunger is electronically controlled by a solenoid switch coupled to the organ console.

The console of the Stalacpipe Organ was especially made by the Klann Organ Supply Company, of Wynesboro, Virginia. It has unique features called for by the subterranean installation. Volume-control switching cylinders are actuated by pedals and the organ draw-knobs have numbers, rather than the usual names, to designate ranks of stalactite notes. Its organ division names are "Pedal", "Harmonic" for softer effects, "Solo" for particular tone qualities and "Echo" for distant effects. High above Cathedral Cavern is the control room, which holds the terminal board and control panel to which wires are directed from each octave chassis and the automatic player.

So that the organ may be played without an organist, Mr. Sprinkle designed an automatic control. This is a plastic endless belt, 40 inches wide, which rolls over an aluminium cylinder. As the belt moves, tiny metal brushes touch the cylinder through holes in the belt corresponding to pre-selected notes, triggering the correct solenoids. The action of this apparatus moving the thin plastic belt with its perforations is similar to that of old-fashioned player-piano rolls. During the melting of a musical composition into a plastic belt, the recording musician takes his post in the stalactite area and keeps in telephone contact with the operator at the control board. With the switch turned to continuous operation, the passage of music is repeatedly played while instructions concerning volume level are telephoned back. When the final setting of the volume switches is made, the positions are used as a visible reference and corresponding volume holes are melted through the plastic. When the switches are pushed down, the "electric memory" takes over and music from then on is completely automatic.

Recorded on plastic for automatic playing, "A Mighty Fortress is Our God" was the first hymn performed in July 1956, under test. Since then, many other classical and religious tunes have been recorded to be played for the entertainment of visitors. During a performance, one stands "inside" the organ itself. It is a strange but moving experience to be surrounded by stalactites giving off their individual tones. The deep, rich cadences swell out in every musical variation, from the volume of a magnificent choir to the pure, isolated tones of a solo flute.

Complete stereophonic sound is achieved by the different positions of stalactites in the caverns. Probably no other organ in the world has a greater area in which to achieve its echo effects. It is the only musical instrument of its kind in the world, and the biggest ever constructed, covering more than three acres.

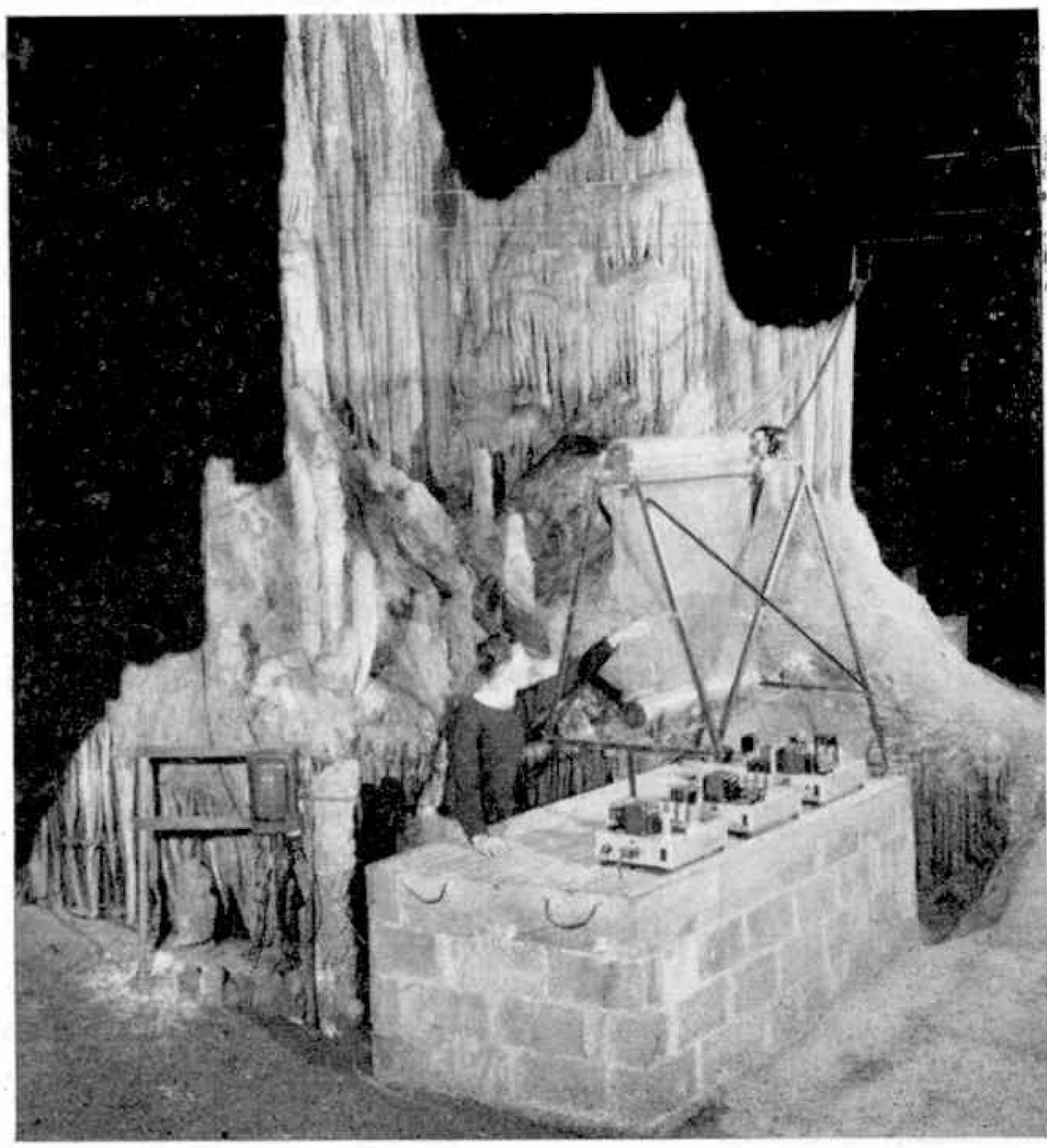
The visitor stands surrounded by music in any section of the caves, to marvel how modern electronics draw from ancient colourful rocks the tones which have remained imprisoned for centuries and which now produce a symphony of beautiful music in these magical Caverns of Luray.

MOTORING BOOKSHELF

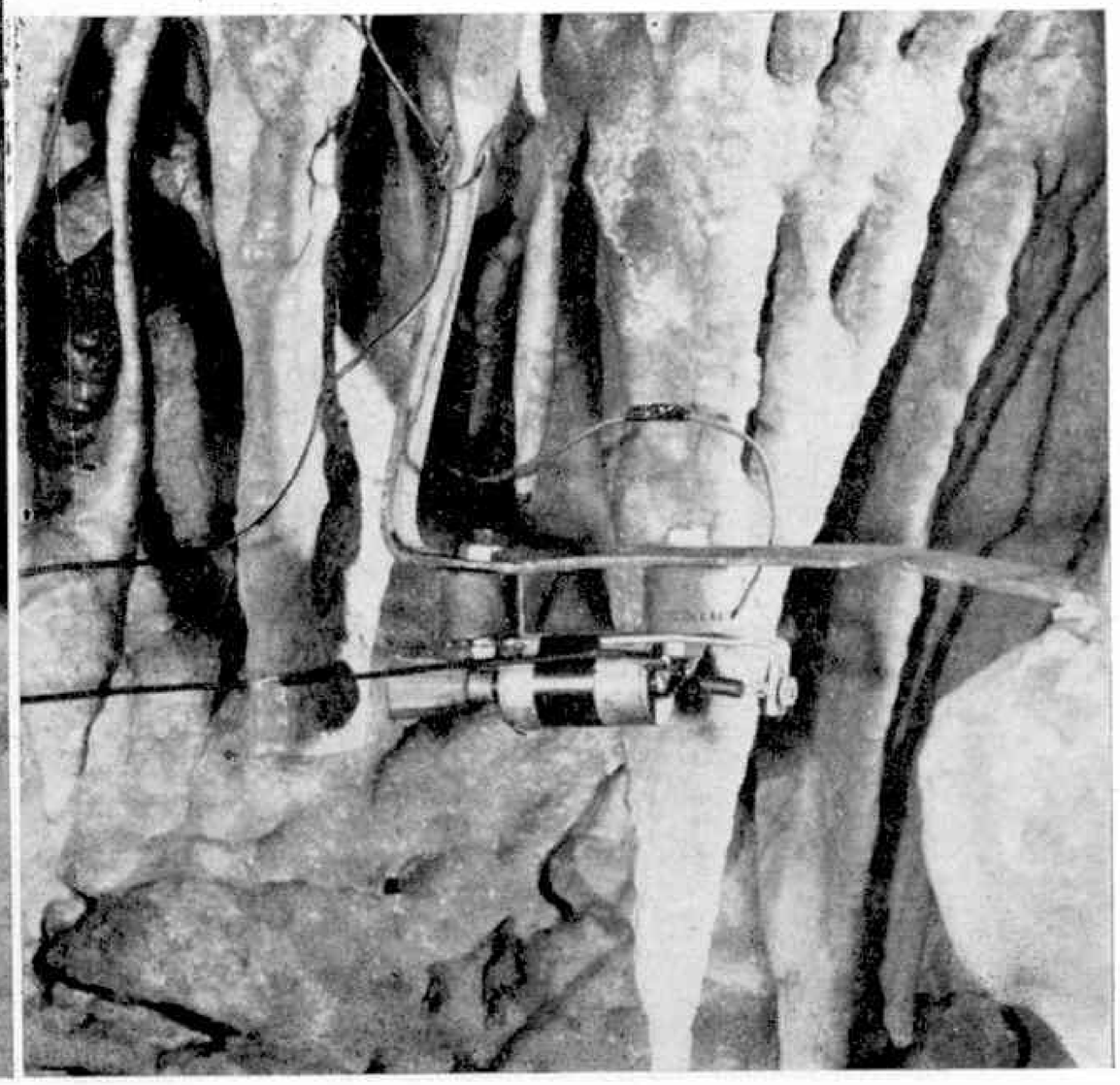
The new *Autocourse Annual* provides an intensely interesting review of last season's racing, with information about drivers and technical details about cars. A very comprehensive survey, profusely illustrated, includes full lap charts of every driver in all big races. Price 40 shillings.

Less ambitious, but equally good value, is *Motor Racing Year—1961*, by John Blunsden and Alan Brinton. Covering all aspects of racing from saloons to Formula One, it is well illustrated and makes an ideal birthday gift for young enthusiasts. Price 12/6.

J.A.



The Stalacpipe Organ can be played without an organist. The plastic endless belt rolling over an aluminium cylinder (left) constitutes an "electric memory" and when this is operating the music is completely automatic. Below: One of the solenoids used in the construction of the organ.



ROAD AND TRACK

All Change At Ferrari

The Renault Floride Caravelle four-seat coupé pictured by the banks of the River Loire.

IF you drive along the splendid *autostrada* south of Milan for a little more than one and a half hours, you will arrive at the bustling town of Modena, once a famed centre of the Italian wool trade. Today, it is better known as the spiritual home of Italian motor racing.

In 30 years the two leading Italian racing stables, Ferrari and Maserati, have made Modena a centre of fast motoring in Northern Italy. Modena is also the birthplace of Enzo Ferrari, who forms the subject of our "Racing Personalities" feature this month, and it was to his native town that he returned, after leaving Alfa Romeo, to found the famous Scuderia Ferrari, in 1929. Within a few years it became the official racing organisation of Alfa Romeo, employing great drivers like Nuvolari, Varzi and Chiron.

By JERRY AMES

By the time war was over and Alfa Romeo had officially retired from Grand Prix, Enzo Ferrari was successfully racing cars under his own name and has since continued to keep the flag flying for Italy wherever there is motor racing.

Although very few Ferrari production cars are seen on the roads, everybody interested in motoring knows the name and has a healthy respect for it, so it came as something of a shock to learn that six of Enzo Ferrari's leading technicians left the firm while his Formula One cars were still being prepared for the 1962 season. Included among the six were the Chief Engineer, Carlo Chiti, responsible for designing last year's all-conquering rear-engined Formula One cars, Giotto Bizzarrini, technical development engineer, who perfected the famous Testa Rossa V–12, Romolo Tavoni, works-team racing manager since 1956, and sales director Girolamo Giardini, who had been with Ferrari for 20 years.

The six technicians who left Ferrari have been absorbed into a new company formed by one of the wealthiest men in Italy, Count Giovanni Volpi, and are already busy designing a new Formula One machine for the World Championship of 1963.

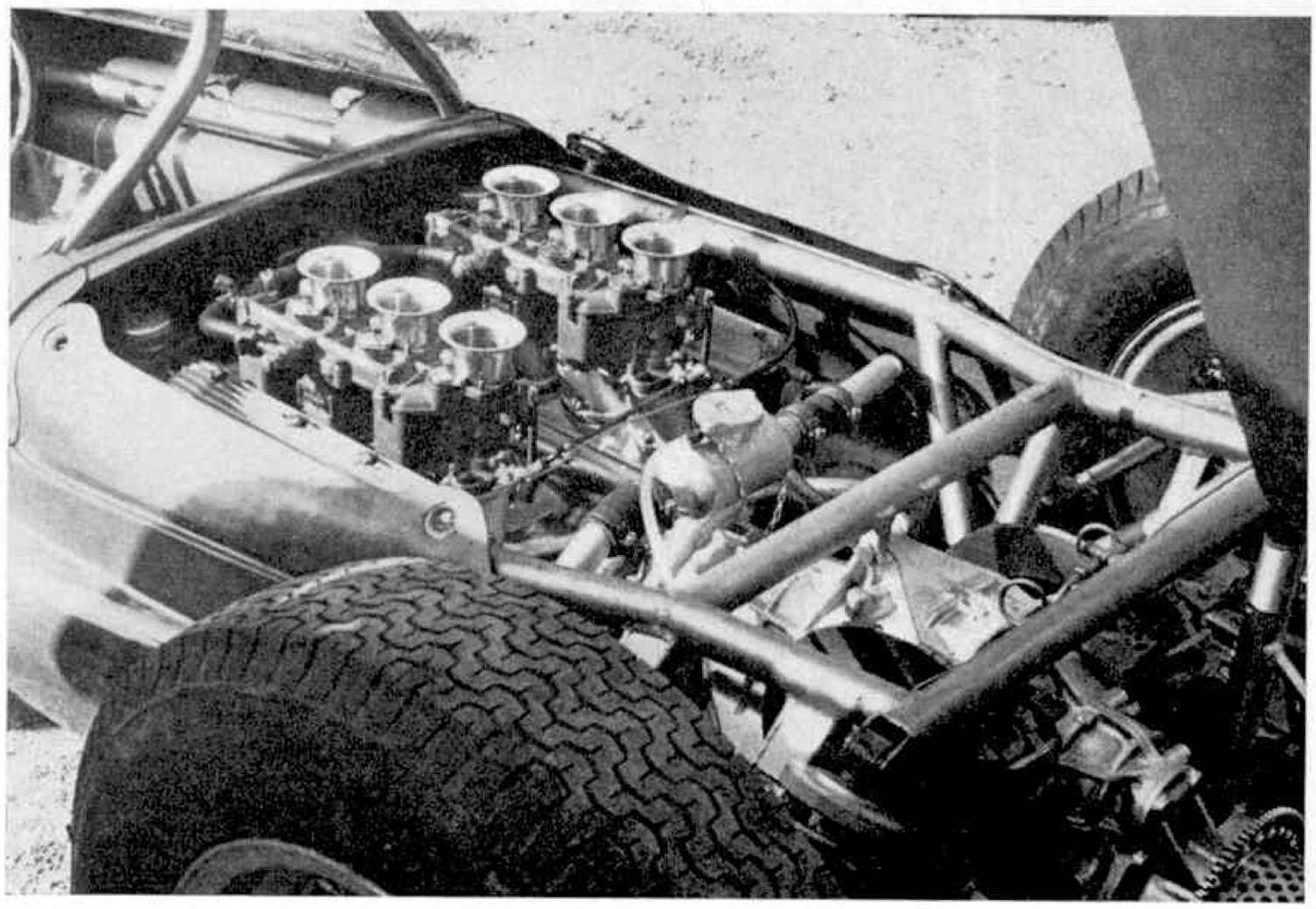
From headquarters in Bologna, Count Volpi, who controls the Scuderia Serenissima, says prototypes of his new Formula One machines will be ready for testing before the end of the year. In the meantime, his stable has acquired a number of first class racing cars to be run in important races this year, largely with the object of knitting the team together and finding out well beforehand any weakness in the organisation.

Backed by such a powerful financial and design organisation, the new team is obviously a force to be reckoned with in future Grand Prix racing. Certainly, Count Volpi is not letting the grass grow under his feet, and has already been in touch with several top drivers whom he would like to sign up for 1963.

A BORN FIGHTER

Meanwhile, what of Enzo Ferrari, always a man of action and a born fighter? He has taken on Jano, long recognised as one of the best designers in Europe. Although it is a year or two since I last saw him, Jano must be getting on in years and is probably about the same age as Ferrari. Years ago, when Alfa Romeo were racing, the two worked together. Jano began his career in the racing shops of Fiat in 1927, soon afterwards moving to Milan, where he became head of the Alfa Romeo racing department and produced the famous Monoposto Alfa. After the war he designed the Formula One Lancia, eventually handed over to Ferrari, which supplied the inspiration for his current V–6 racing engines. Almost the

The present V6 Ferrari engine used for Formula One racing. Picture by courtesy of "Motor Racing".



Racing Personalities

ENZO FERRARI

Enzo Ferrari. Picture by Alan Brinton.

ENZO FERRARI has more Grand Prix racing experience than any other competitor in present day Formula One racing, so it is hardly surprising that the cars bearing his famous black Prancing Horse on a yellow shield still present the most formidable threat to any team. That Prancing Horse emblem was originally the battle symbol of Francesco Baracca, one of the great fighter pilot heroes of World War One, and when he was shot down in flames it was the only part of his 'plane to remain unscathed. It was eventually passed to his parents. Quite unexpectedly the Prancing Horse came into Ferrari's life after he had won the Circuit of Savio race at Ravenna, in 1923, in a works Alfa Romeo. After a tremendous battle, Ferrari was given a wonderful ovation by an enthusiastic crowd; suddenly, into his hand was pressed the emblem of a prancing horse. Baracca's parents explained that it had always been carried by their son in his aircraft, and they would like Ferrari to carry it in his racing cars as a mark of esteem for his courage and audacity. So touched was the young Ferrari that he proudly accepted the badge as his talisman.

Born at Modena on February 20, 1898, the son of a small machine tool maker, Enzo Ferrari learned engineering at his father's garage. Came the 1914 war and he immediately enlisted, proudly adding among his qualifications—"mechanic". In the way of the Services, his sergeant made use of his engineering ability by giving him the job of shoeing mules!

After the war Ferrari worked in a garage at Turin where he made friends with two great Italian drivers, Bordino and Nazzaro. Then he joined Alfa Romeo at Milan, first as an engineer and works driver, later as team organiser. When the famous Milanese firm withdrew from racing, they invited Ferrari to continue on their behalf, with their support. Thus was born the legendary Scuderia Ferrari, which at one time or another won almost every important Grand Prix in the world.

However, it was not until 1940 that the first Ferrari cars appeared—sports two-seaters. In 1948 Ferrari raced his first Grand Prix cars, 1½ litre F.1 machines with two-stage supercharging. The following year they began scoring and have proved a thorn in the side of most teams ever since.

Ferrari has great admiration for British drivers. Peter Collins, Mike Hawthorn and Stewart Lewis-Evans were all at one time on the Ferrari payroll, as were Fangio, Ascari, Musso Trintignant, Taruffi and Gonzales; in fact, pretty well every leading Grand Prix driver with the exception of Stirling Moss who, before his recent accident, had refused offers from Ferrari.

This year's Ferrari team includes World Champion Phil Hill and several promising young drivers who should be good once they gain more experience. However, the new season's F.1 Ferrari should be as fast as anything on the circuits today, but in his far-seeing manner Enzo Ferrari is already looking ahead and making preparations to counter the new British Grand Prix engines, plus a very real future threat from Japan. I wish more British engineers would take a leaf from Ferrari's book.

last of the old school, Ferrari and Jano between them must have more racing experience than any other organisation in Europe and, believe me, that counts for a great deal in motor racing. Already a 1962 prototype Ferrari has had its first outing and has won the Brussels Grand Prix against stiff opposition from the V-8 BRM and Lotus.

While Coventry Climax and BRM are still struggling to lick their 1962 V-8 engines into shape, Enzo Ferrari is already building his 1963 Formula One prototype, due to be race tested in the Italian Grand Prix at Monza in September. He proposes using a new straight eight, air-cooled, twin overhead camshaft engine with desmodromic valves designed in conjunction with Gilera, the famous Italian motor-cycle firm. On the bench, this 1½ litre power unit has been giving 215 b.h.p. and runs up to 11,000 r.p.m. Roller bearings are used throughout, carburation is by four double choke Webers, and the head features two plugs per cylinder.

The new engine will be behind the driver, but fitted across the chassis. As in the 1956 eight-cylinder Grand Prix Bugatti, power take-off will be from the centre of the crankshaft.

A BUSY WEEK

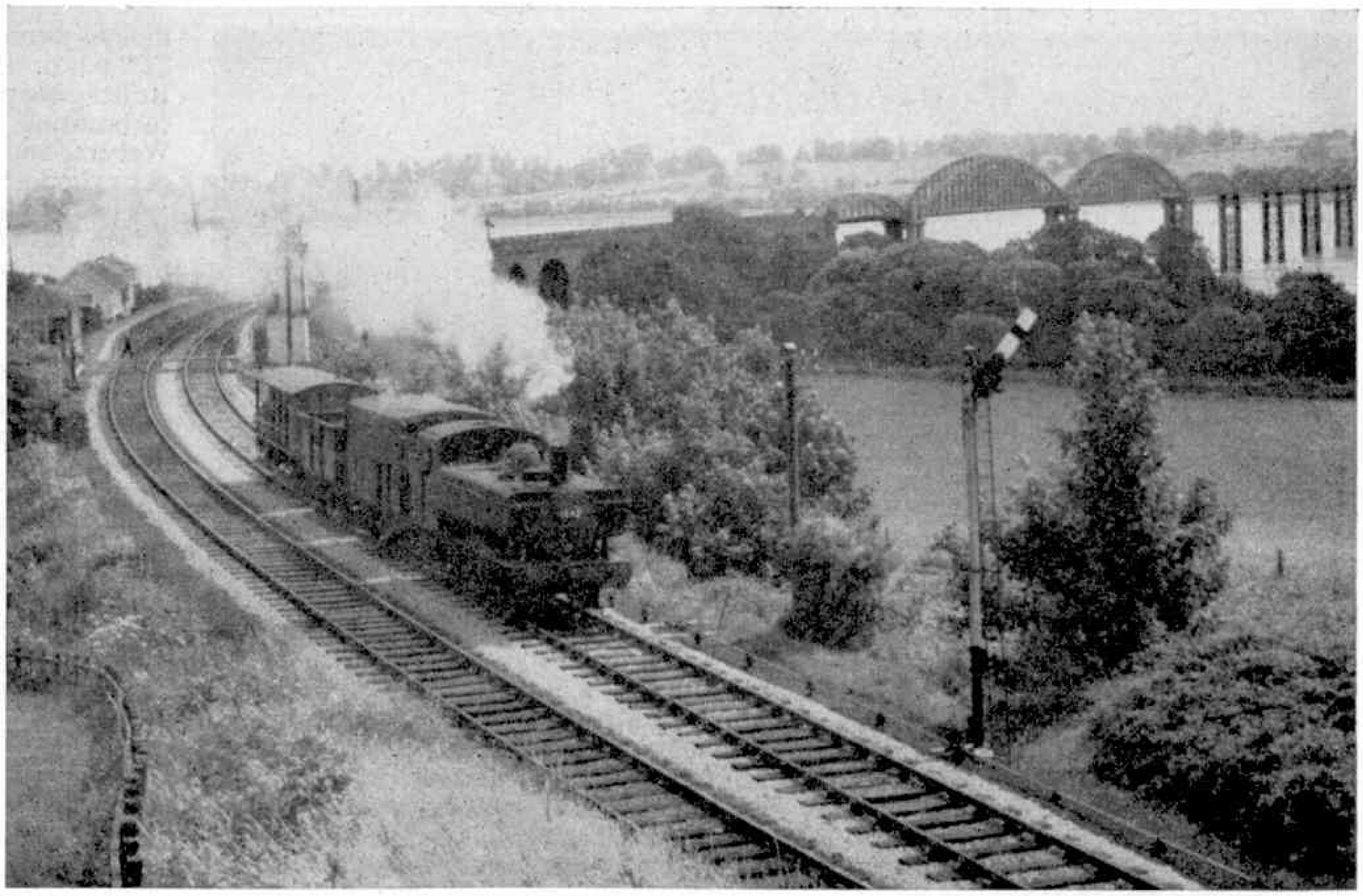
Every week, I drive a variety of interesting cars, but one recent week seems to have constituted almost a record; within six days I drove a 1½ litre Volkswagen, the new Renault Caravelle, a DB.4 Aston Martin, an MGA, and the new Ford Zodiac and Zephyr, while at the time of writing my garage holds a Sunbeam Alpine hardtop and a Mini-Minor. During this time my journeys have taken me as far afield as the château country south of Le Mans, Paris, Silverstone and Brands Hatch.

I liked the new Renault Caravelle, which I collected in Paris. It is a modified four-seater version of the smart Floride, and after riding some distance in the back I can testify it really is a four-seater. The rear engine is a brand new four-cylinder design of 956 c.c. and with 9.5 compression develops 51 b.h.p. at 5,500 r.p.m., enough to give a top speed of 87 m.p.h., with over 32 m.p.g. Having a five-bearing crankshaft, it is beautifully smooth right up to maximum revs and I cruised at 80 m.p.h. for many miles along those straight French roads. Like the 4L Renault, it has a sealed for life water cooling system.

The floor gear lever is a little floppy, like most Renaults, but there is synchromesh on all four forward ratios and so, of course, you need never miss a gear. New is the use of Lockheed 10.2 inch disc brakes on all four wheels, which provide pretty good retarding from any speed. Suspension, as on previous Renaults, is independent all round and provides a stable ride over a (*Continued on page 258*)

The new Mark III 100 m.p.h. Ford Zodiac, which has a full six-seat body.

THE SEVERN BRIDGE



ALTHOUGH it is a familiar feature to most people who are interested in railways or engineering works, the Severn Bridge, in Gloucestershire, is not perhaps as widely known generally as one would suppose. Although its construction ranks as a major engineering feat, the bridge itself for a long time basked in the shade of near-anonymity. Often, when I have mentioned the Severn Bridge to people travelling in that part of the world they have told me that while they have crossed into Wales by the Severn Tunnel, or have perhaps used the Aust Ferry to cross the River Severn, or indeed are fully aware that a new road bridge over the Severn is to be opened in a few years' time, they have not known of the existence of a bridge across the river in that area.

Yet, this little-known bridge was to hit the headlines—at least so far as the local Press was concerned—in October 1960. In that month, one of the piers and two spans at the leading end of the bridge collapsed after the pier had been struck by an oil tanker, during thick fog, while the vessel was endeavouring to find the entrance to the Gloucester and Berkeley Ship Canal.

From that date until the present the bridge has been closed for railway traffic and one wonders whether the British Transport Commission will consider the expenditure of re-connecting the bridge spans in the days when rail traffic is declining in various parts of the country.

As originally constructed the bridge consisted of a series of bowstring girders, 21 in all, plus a swing bridge carrying a single track railway line linking Sharpness, south of Gloucester, on one side of the River Severn with Lydney on the other bank.

Coming from the Lydney side of the river there is one span of 134 ft.

By R. E. TOOP

6 in., two which are 327 feet long, five which have a length of 171 feet and thirteen measuring 134 ft. 6 in. Finally there is the swing bridge 196 feet long over the Gloucester and Berkeley Ship Canal. The bridge spans are preceded by twelve stone-built arches at the Lydney end and there are two arches similarly constructed at the Sharpness end.

The bridge, which is 70 feet above high water mark at its highest point, was opened on October 17, 1879—strangely enough exactly one hundred years after the opening of the first iron bridge in the world which was also over the River Severn, at Ironbridge, Shropshire. The first train to cross the Severn Bridge on the opening day fired its own "21 gun salute" as detonators had previously been laid, one to each span. On the return journey passengers who wished to do so were allowed to walk from the site of what is now Severn Bridge Halt back across the bridge to Sharpness.

Provision was made on the swing bridge span for double track but traffic has never necessitated this being laid. This span swings on a pier erected between the canal and the river itself, and is worked by a steam engine which is enclosed on top of the girders above the railway line. A reserve boiler is provided in case of emergency.

Before the accident to the bridge in 1960 the route to Lydney was used on a number of Sundays in winter as an alternative route while the Severn Tunnel was under repair. On Saturdays during summer, certain trains from Wales to the South and West of England were diverted by way of the bridge to ease the congestion on the direct line to Wales. British Railways also proposed to re-route some freight traffic which now makes use of the Severn Tunnel, but since the dislocation of the spans Lydney Town and Severn Bridge Stations are temporarily closed to traffic. For the moment, at all events, only three trains each day are in operation between Berkeley Road Station, which is the junction for the main Bristol to Gloucester line, and Sharpness.

In the above photograph, taken before the accident to the Severn Bridge, which is seen in the background, 0-6-0 Pannier Tank No. 1642 is seen travelling between Sharpness Docks and Lydney. The tablet for single-line working has just been handed over to the signalman at Severn Bridge Box. Photograph by the author.

The Fishermen Of Gourdon

A PICTORIAL SURVEY BY JOHN TOPHAM

LINE fishing, as practised by the men of Gourdon on the north-east coast of Scotland, is a family co-operative effort. In the vessel *Emulate II*, where these pictures were taken, the four members of the crew as well as their families all participate in the profits. Each man is responsible for baiting his line of 1,200 hooks.

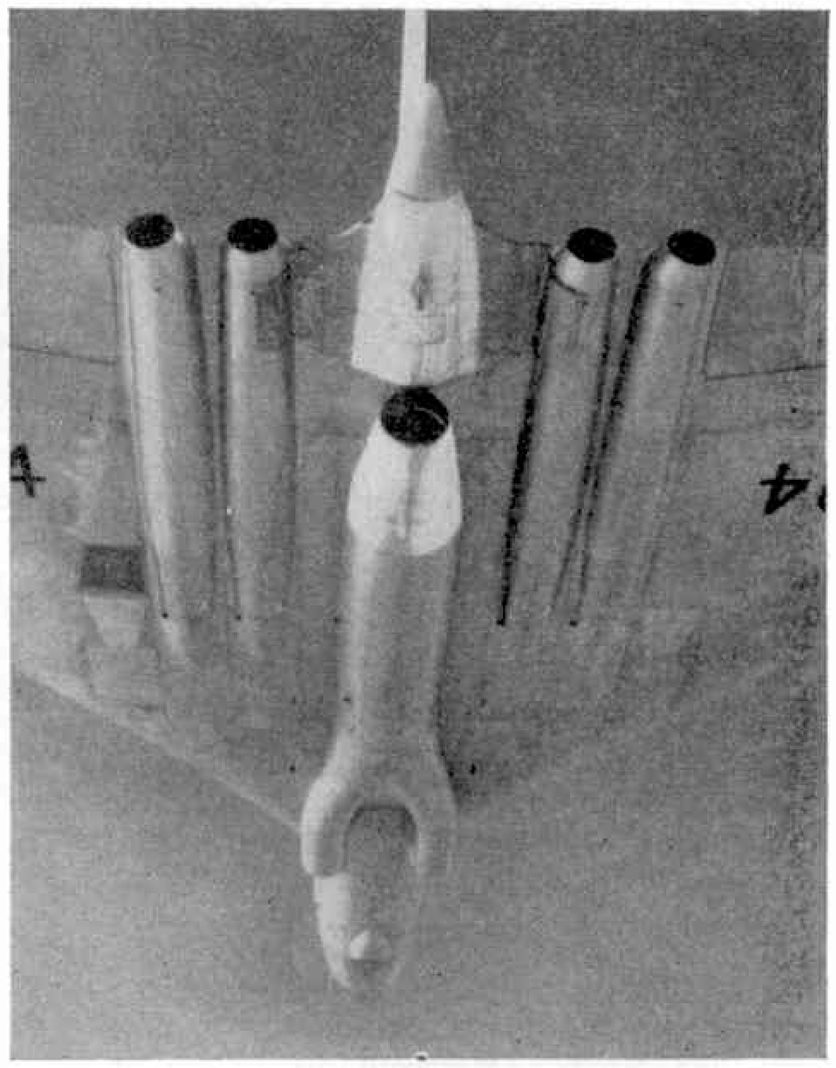
Let us sail with *Emulate II* about two o'clock in the morning, her crew and their families having previously baited the lines with mussels. Each man carries his line in a type of basket and also brings along his share of tea and food. When fishing starts, a float carrying a stake with a candle lantern at the top is fastened to the line and cast adrift. One man then places a steel pipe over his arm and pays out the line—baited hooks and all—which is a very tiring and dangerous job. As each length of line nears its finish the next man's line is joined up and the process is repeated until the whole of the line, with its 4,800 hooks, has been fed into the sea, with a float on the last portion.

After a break for refreshments the crew tackle the much more strenuous job of hauling in the line, removing the fish from the hooks, and dropping them into baskets. Once the fish have been boxed and the lines re-arranged, the crew make for harbour. Reaching port they set to work—having already cleaned up their boat—to unload their catch ready for the auctioneer later in the day. Then off they go home, each carrying his line on a "waggon" — a sort of reconstructed perambulator.

Right: The "Emulate II" setting off to refuel for one of her trips. Below: Hauling in the line.

Below: As the ship sails back to port her crew get to work on the line repairing hooks, etc. Right: The end of a night's fishing—but the crew are going home to rebait the lines.

Engines For Secret Bomber Start Flight Tests



Underside of the Avro Vulcan XA894, showing the supersonic Bristol Siddeley Olympus engine.

THE Avro Vulcan bomber is often seen carrying a Blue Steel stand-off bomb under its fuselage, so we might be excused for thinking that the object shown under Vulcan XA894 in the picture on the right is some strange new secret weapon. In fact, it is only part of a secret weapon, for it contains one of the Bristol Siddeley Olympus turbojet engines which will power Britain's new TSR–2 supersonic bomber. No details of the power of the TSR–2's engines may yet be published, but Bristol

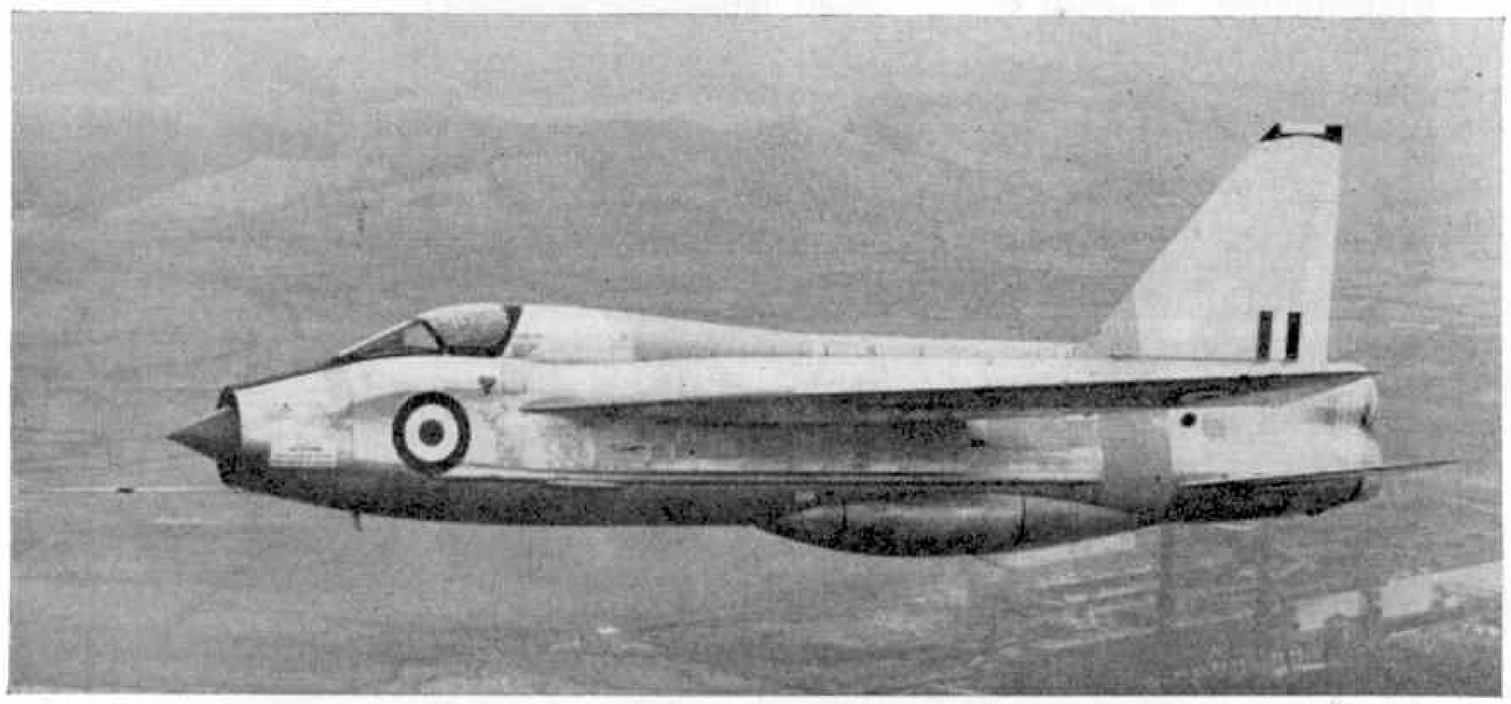
AIR NEWS
By
John W. R. Taylor

Siddeley are known to have tested on the ground a version of the Olympus giving over 33,000 lb. of thrust with reheat. This makes it the most powerful engine in the world, and there seems no reason why Vulcan XA894 should not be able to fly on the power of the underslung Olympus alone, with its four normal jet-engines shut down.

The twin air intakes for the test engine are interesting, as there would be little point in fitting them unless the TSR–2 also used a similar type of intake. The aircraft's design is still highly secret, but it is intended to fly at twice the speed of sound and to be able to operate from much smaller airfields than other bombers. The prototype will fly next year.

WING SHAPE CHANGES

Sharply swept-back wings are best for flying at high speeds, but they often cause handling problems at low speeds. The Germans decided to try to overcome this drawback in 1944 by fitting the Messerschmitt P.1101 fighter with variable-sweep wings. This means that the P.1101 would have taken off with its wings moderately swept; the pilot would then have operated a control in flight to move the wings back to an angle of 45 degrees for high-speed cruising.



Powered by two Rolls-Royce Avon 300-series turbojets, the English Electric Lightning T.Mk.5 is pictured here in flight.

The P.1101 never flew, but the prototype was taken to America after the war and the Bell Company used it as the basis for their X–5 research aircraft. The X–5 flew well, changing its wing-shape in flight many times.

Now the variable-sweep idea is being revived in a big way in the United States and in Britain. Boeing and General Dynamics have both entered variable-sweep designs for a competition for a new fighter-bomber code named TFX which will be used by the U.S.A.F. and U.S. Navy. Republic and Fokker have suggested the use of variable sweep-back on their D.24 Alliance design, which is in competition with the Hawker P.1127, and other types, for a big contract for a vertical take-off fighter for NATO air forces. And the British Aircraft Corporation have been given a Ministry of Aviation contract covering the preliminary design of a variable-sweep aeroplane, although there is no intention of building it at present.

FRAGILE FREIGHT

All kinds of precious cargo are sent by air nowadays, from gold coins to pedigree greyhounds, but probably the most valuable freight ever to travel on board any airliner was carried recently by a Boeing 707 of El Al. Flown from New York to Lod Airport in Israel, it consisted of twelve stained glass windows depicting the Tribes of Israel.

The windows are the work of Marc Chagall and were given by him to the State of Israel. The aircraft carrying them made one of the smoothest-ever landings and the windows, all of which arrived intact, are now being installed in the Synagogue of the Hadassa-Hebrew University in Jerusalem.

USING SUPERSONIC BANGS

Most people complain about the supersonic bangs made by aeroplanes flying through the sound barrier, but apparently even shock-waves, which cause the bangs, can be put to good use.

To prove this, two F–106 Delta Dart supersonic fighters were flown over Glacier National Park, Montana, at 9,000 feet with the sole object of producing

bangs. Officials claimed afterwards that the shock-waves packed the snow more firmly and lessened the danger of avalanches. In view of the number of people killed by avalanches last winter, folk living in mountainous regions might be well advised to send for the local air force regularly—after investing in a good pair of ear-plugs!

LATEST LIGHTNING

The lower illustration on page 232 shows the new T.Mk.5 version of the English Electric Lightning, which made its first flight at Filton Aerodrome, Bristol, on March 29 this year. Almost the only external difference compared with earlier marks of Lightning is the larger, square-tipped tail fin, but internally there are many changes which make it far more efficient and formidable.

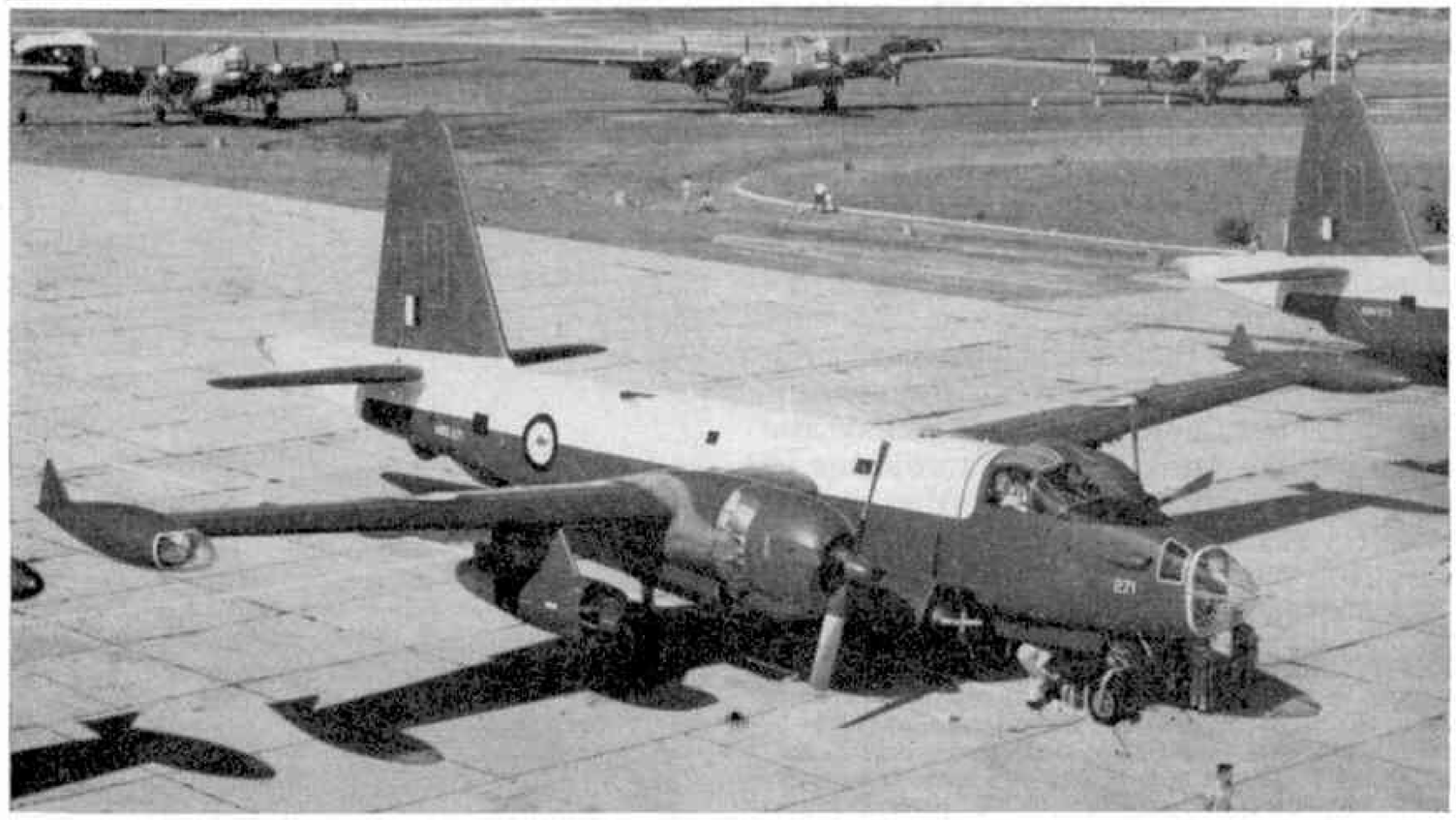
The T.Mk.5 is a two-seat version of the single-seat Lightning F.Mk.3 interceptor, and can be used operationally as well as for training pilots in the latest fighter techniques. Like the Mk.3, it is powered by two of the new 16,000 lb. thrust Rolls-Royce Avon 300-series turbojets and can carry de Havilland Red Top air-to-air missiles, which are much-improved developments of the Firestreaks carried by the Lightnings at present in service with Fighter Command.

AERIAL SHARK PATROLS

Thousands of Australian surfers along a 50-mile strip of coastline near Wollongong, New South Wales, enjoy a new kind of safeguard against sharks. The eighteen beaches in the area are patrolled from the air by a Cessna lightplane. When its pilot, Mr. Tony Bevan, spots a shark below him, he reports its presence by two-way radio to the nearest of fifteen surf clubs. Within seconds, a surfboat is on its way to drive off the shark, often without the surfers even being aware of what is happening. However, if the shark is close to the shore, the aircraft dives low, with siren screaming, as a warning for bathers to scurry from the water.

Mr. Bevan began his aerial patrol unofficially seven years ago. Since then, with the co-operation of BP Australia, it has developed into an efficient, versatile service. On call seven days a week, it helps with many other emergencies such as bushfires, police searches, sea rescues and flying doctor missions like carrying blood for urgently-needed transfusions from Sydney to Wollongong. Nor is this service unique any longer, for BP Australia have helped to organise other aerial shark patrols at Adelaide, Perth and Melbourne.

Left: The machine that made history—the Arcopter Gem II which crossed the frozen Mississippi.



Below: Seen after its arrival at Townsville is one of the Neptunes for the R.A.A.F. base there. In the background are Lincoln bombers.

IT'S A GEM!

The strange-looking vehicle in the top picture on this page made history recently by crossing the one-mile-wide Mississippi River at a time when ice and snow had closed the river to boats. Designed and built by William R. Bertelsen, a doctor, it is known as the Arcopter Gem II and is a form of hovercraft or ground-effect machine (GEM). The air cushion which supports it is supplied by the forward-mounted propeller, which also moves the craft along.

A 115 h.p. Lycoming aero-engine gives the Arcopter Gem II a speed of 75 m.p.h. and enables it to travel up to twelve inches above the surface. The reason for this comparatively high cruising "altitude" is that the slipstream from the propeller passes over an arc-shaped wing (Arc-o-*pter*, from the Greek word *pteron* meaning a wing). This wing adds considerably to the "lift" provided by the air cushion.

In the test over the Mississippi, Dr. Bertelsen flew the 1,200-lb. two-seat Arcopter Gem II over ice floes, solid ice and open water. Then he stopped the machine and let it float on the water before starting again, climbing on the air cushion back over the edge of the ice. He finally drove the machine up the sloping shore for an amphibious landing. At the time an earlier ground-effect machine built by Dr. Bertelsen, named the Aeromobile, was giving hourly demonstrations at an Industries Fair in New Delhi, India.

AIRLIFT FOR MUMS

More than 50,000 boxes of spring flowers were flown from the Channel Islands to Britain by Silver City Airways, in March. Because of extra demands by florists to meet Mothers' Day orders, more than 7,500 of the boxes were carried in a period of 48 hours.

This giant airlift of daffodils, iris, freesia and carnations for the Mums of Britain was made to Hurn Airport, Bournemouth, in Superfreighters.

R.A.A.F. NEPTUNES

There was great excitement at Townsville R.A.A.F. Base, Australia, on March 10, following the arrival of the first three of the twelve Lockheed P2V-7 Neptunes which are replacing the veteran Lincoln bombers of No. 10 Squadron. The aircraft, which had flown 7,720 miles from San Francisco, are of the very latest type, carrying highly-advanced submarine detection and tracking gear, rockets, homing torpedoes, mines, and cameras for photographic reconnaissance.

Purchase of the Neptunes, at a cost of over £10,000,000, is part of a major R.A.A.F. re-equipment programme.

FOR GALLANTRY

THE STORY OF THE GEORGE CROSS

Brave men—and women—have been found in every day and age, in every walk of life, in war and in peace. This article describes individual deeds of heroism which brought awards for their bravery to men of the R.A.F. and Commonwealth Air Forces during the second world war, and since.

BOMBS were actually falling on London, and the sound of gunfire could be heard as a background, when the late King George VI broadcast to the nation, announcing a new award—The George Cross—"for acts of the greatest heroism or most conspicuous courage in circumstances of extreme danger. . . the decoration to be placed immediately after the Victoria Cross and before all other medals, orders and decorations." The announcement added that with the introduction of the G.C., the award of the Medal of the British Empire for Gallantry (E.G.M.), instituted in 1922, would cease. Winners of the E.G.M. then living received the George Cross in exchange. The award of the G.C. was actually introduced on September 24, 1940, to mark outstanding acts of gallantry by civilians, as well as by members of the Services, during World War II.

By Flight-Lieutenant Leslie Hunt

Sixteen of the eighteen R.A.F. holders of the E.G.M. exchanged their medals at Buckingham Palace but, of the next 24 George Cross medals to be awarded to members of Air Force units, no fewer than eighteen were posthumous awards to airmen—and airwomen—who died before they could be decorated. Today there are, in fact, sixteen living R.A.F.—W.R.A.F. holders of the medal.

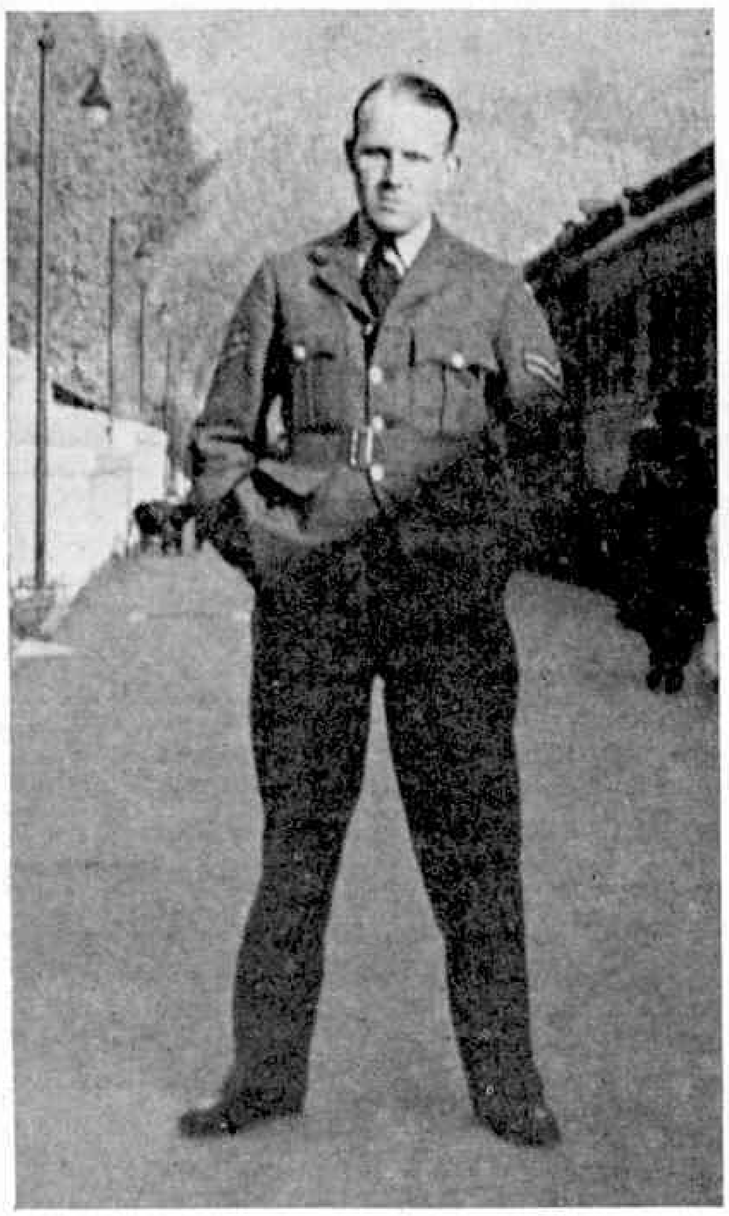
* * * *

The Royal Air Force was still regarded as a young brother of the Army and the Royal Navy so it was not surprising that many of the airmen who won this new award were in their teens—or barely out of them—when they were put to the supreme test, emerging triumphant and adding fresh laurels to the traditions of the R.A.F. Indeed, one of the earliest winners of the Empire Gallantry Medal—

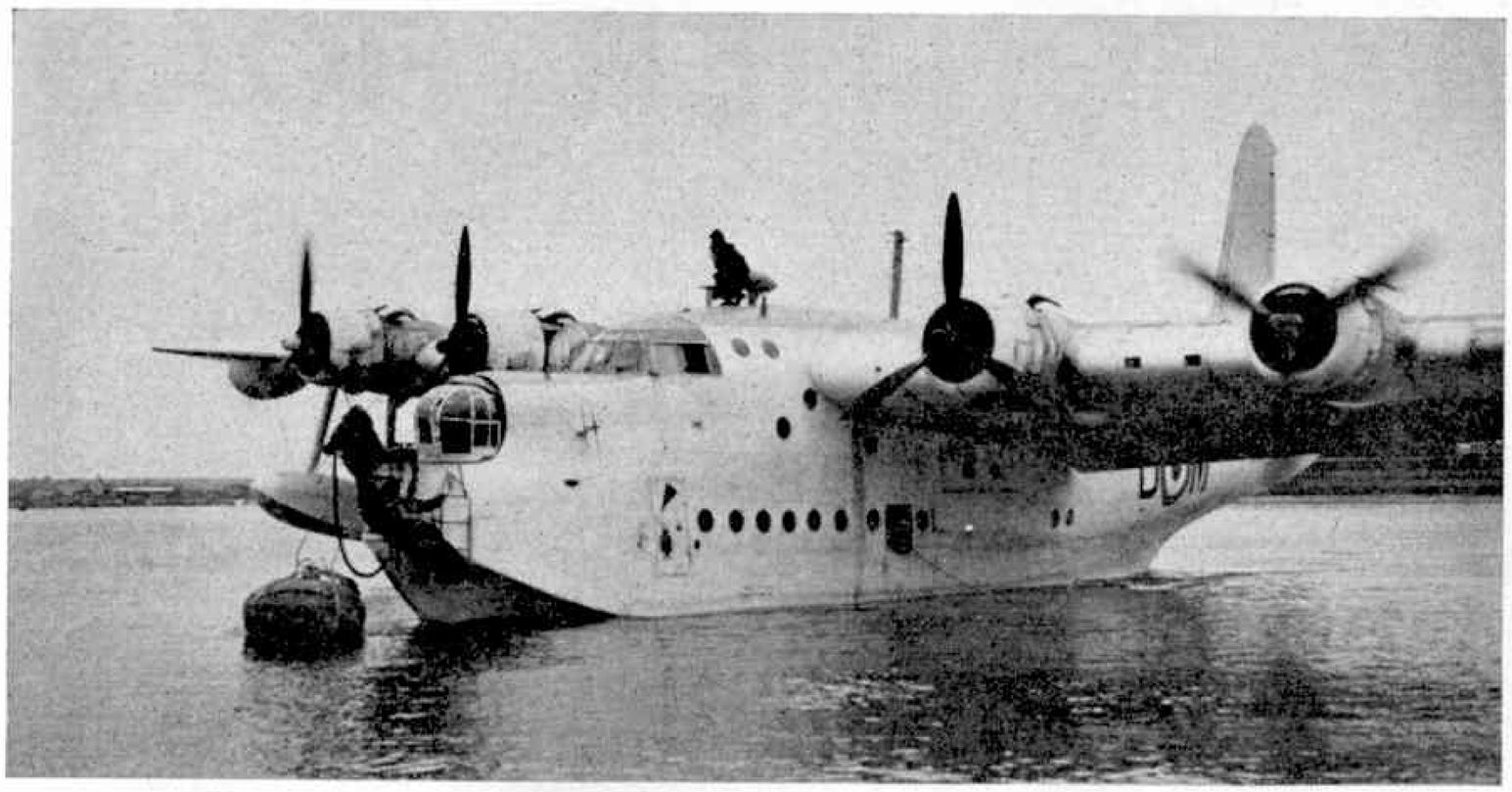
Group-Captain Neil McKechnie who won the E.G.M. as a cadet.

Neil McKechnie—was still a cadet at Cranwell when he performed a feat of great bravery.

On June 20, 1929, McKechnie was just landing from a training flight when he



In spite of severe burns Sergeant John Beckett (left) calmly drove a blazing petrol wagon 400 yards to save the lives of others. His picture appears by courtesy of the Air Ministry. Bottom right: L.A.C. K. M. Gravell who ignored his own injuries to try to help a trapped pilot. (R.C.A.F. picture).



A Sunderland Flying Boat at her moorings. It was on such a machine that Aircraftsman Ivor Gillett was working when he gave his life in an attempt to save that of another airman. Air Ministry photograph.

observed that another aircraft had crashed and burst into flames some 200 yards away. He ran to the machine and pulled out the pilot, saving him from certain death. McKechnie suffered severe burns in the course of his heroic rescue. Both rescued and rescuer rose to the rank of group captain but McKechnie died bombing Konigsberg in 1944 when, as a station commander, he did not *have* to fly operationally, but set an example—so typical of one who had many times risked his life for another. Group Captain Giles, the pilot he saved, who, like McKechnie, was a cadet at the time—said that had McKechnie lived he would have reached the very highest rank in the Royal Air Force.

In November 1941, the first G.C. to go to a Commonwealth Air Force (one of four destined to be awarded to the Royal Canadian Air Force) was won by leading Aircraftman Karl Mander Gravell, a young Canadian from Vancouver who was training as a wireless operator-air gunner at No. 2 Wireless School, Calgary. He was in a Tiger Moth, flown by Flying Officer James Robinson, when it crashed and burst into flames on impact with the ground. Gravell managed to extricate himself from the blazing wreckage, but in spite of intense shock caused by the loss of one eye and severe burns his only thought was for the welfare of his pilot. Ignoring his own injuries and the fact that his clothing was on fire, he attempted to pull the trapped pilot clear. Gravell subsequently died, but had he not considered his pilot's safety before his own he would probably not have lost his life.

The second R.C.A.F. George Cross was also gained in Canada, on May 14, 1943, at No. 4 Air Observer School, London, Ontario. A student-navigator, Leading Aircraftman Kenneth Spooner, was undergoing training in an Avro Anson when the pilot fainted at the controls. As the aircraft dived towards the ground Spooner, who had received no pilot training whatsoever, took over the controls and kept the aircraft steady while three members of the crew, also students, baled out. A few seconds later the aircraft crashed into Lake Erie and the pilot and Spooner were killed.

* * * *

When the war ended, the world learned of incredible bravery, under torture, shown by men and women in Nazi and Japanese

L.A.C. Kenneth Spooner, who enabled three men to escape from a crashing 'plane at the cost of his own life. (R.C.A.F. picture).

prisoner-of-war camps. Many books have been written about these heroes and heroines and the stories of Wing-Commander Yeo Thomas, G.C., M.C., and of a young W.A.A.F., Nora Inayat-Khan, G.C., Croix de Guerre, have been filmed and shown on television screens.

One airman whose story is not so well-known gained a posthumous G.C. for his courage in bolstering morale in the Shamshuipo Camp, Hong Kong, by organising illicit wireless messages, and maintaining contact with the loyal Chinese outside the wires for the purpose of obtaining medical supplies and escape materials. Given away by a careless member of the Chinese organisation, Flight-Lieutenant Hector Gray suffered the dreaded water torture, was stretched and beaten until, having failed to gain one single piece of information from him, the Japanese shot him. A fellow prisoner had to carry Gray to the place of execution because he was unable to walk unaided.

Hector Gray was the only airman to take part in the world record flight from Ismailia, Egypt to Darwin, Australia, in a Vickers Wellesley machine in 1938. For this feat, the officers on the flight received the Air Force Cross and Gray the Air Force Medal. Subsequently commissioned, he went first to Singapore and then to R.A.F., Kai Tak where he was captured when Hong Kong surrended on Christmas Day, 1941.

Just before the war ended in Europe a Liberator of No. 159 Squadron crashed into the Burma jungle while on a secret mission. The young wireless operator, Flight-Sergeant Stanley Woodbridge, of Essex, became the main target for Japanese interrogation and torture, for they knew he was the one man in the aircraft who was in touch with the pro-Allied forces fighting behind their lines. Although savagely beaten, he steadfastly refused to talk and was later executed. At the Japanese War Trials, in Rangoon, even his former enemies praised the conduct of this most courageous airman, and as a direct result of the evidence given a posthumous G.C. was awarded in 1948.

A year earlier, on March 28, 1947, a Lancaster of No. 38 Squadron was being refuelled at Ein Shemer, in the Middle East, when a fire broke out in the refuelling vehicle. The flames enveloped the driver, Sergeant John Beckett, and set the front of the Lancaster alight. There was a grave danger that 2,000 gallons of petrol would catch fire and destroy the twenty aircraft parked alongside. In spite of very severe burns, Sergeant Beckett calmly drove his blazing vehicle for 400 (*Cont. on page 258*)

Flight-Lieutenant Hector Gray, whose unfailing courage bolstered up morale in a Hong Kong camp for prisoners of war. He was later shot by the Japanese.

A UNIQUE FRONTIER ROAD

• All over the world, down through the centuries, the spirit of the pioneer and frontiersman has opened up barren wastes and remote places for the onward march of civilisation. Buildings, bridges, and railways are among the many memorials to their skill. One unusual tribute to the determination of such men still exists in British Columbia, where the terrors of an all-devouring swamp were not allowed to prevent the creation of a link between two frontier settlements. The story of this achievement is told below.

BY FRANCIS DICKIE

FRONTIERSMEN made trails across North America. Following them, the pioneer settlers turned these trails into communicating roads, which became more and more suitable with passing years. The invention and rapid improvement of the automobile, however, demanded ever-improved highways. Today, in North America, one of the world's finest roadway networks has pushed back the wilderness. Only in places in Alaska, in the far North-West of Canada and in some areas on the Pacific Coast of British Columbia do "frontier" roads remain.

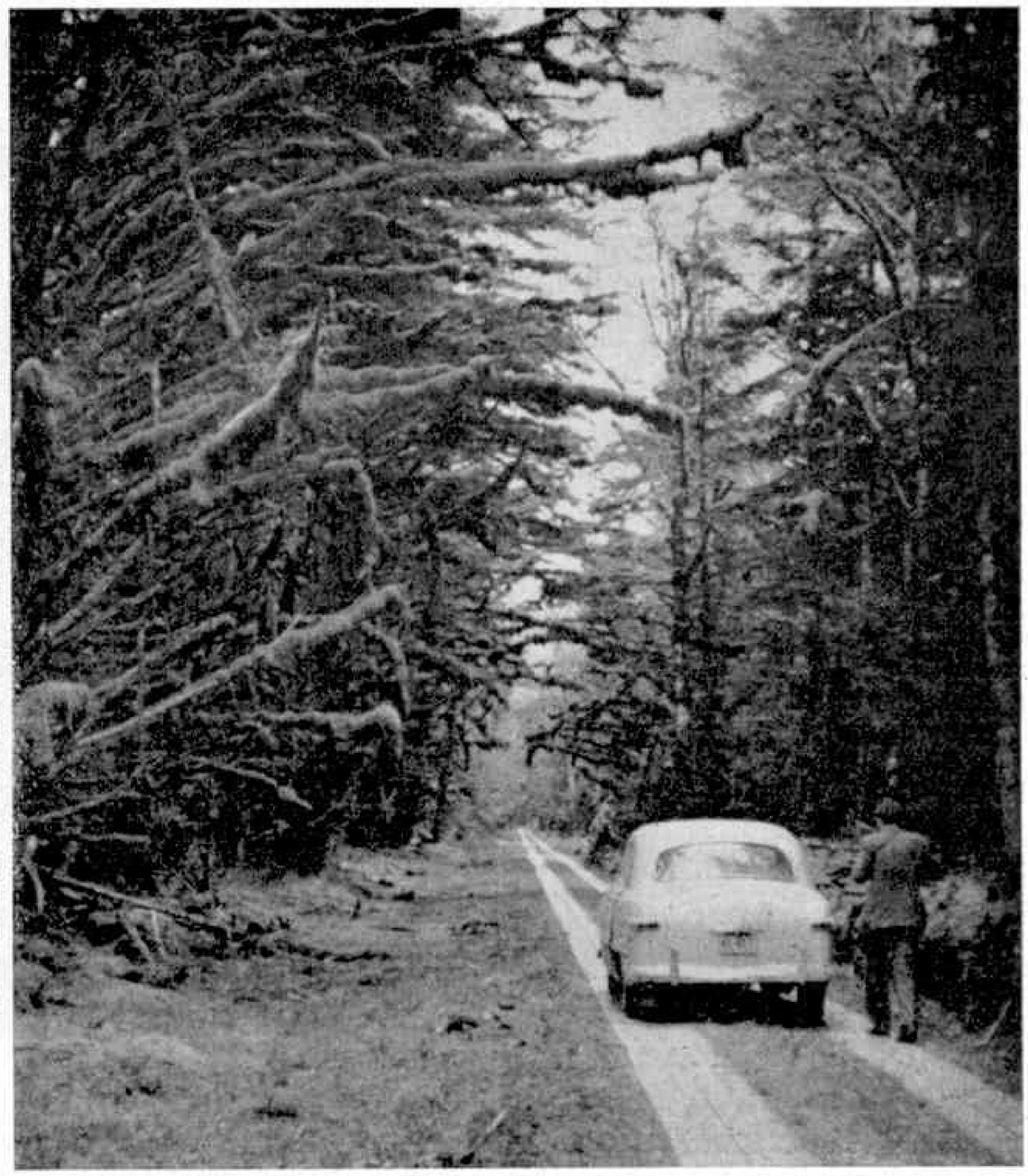
In British Columbia, traffic on the most amazing of these frontier roads has ended. This route is unique in the world and it possesses a length only possible in a region incredibly rich in timber resources.

It was built in 1920 on Graham Island, a rugged wilderness of forest, muskeg and mountain. There, two busy frontier settlements had been established — Tlell and Port Clements. Transportation between these two points and the country beyond was urgently needed. They were only fourteen miles apart, yet could not be connected directly by an ordinary type of road because quaking bog covered the whole of the intervening distance. This was of such a dread nature that it could swallow up man, animal or vehicle in a matter of minutes.

Thus it seemed that the two frontier hamlets were forever condemned to communication only by means of lengthy detours. Fortunately, some of the pioneers already had considerable experience with bog conditions. Near their homes they had laid down single lines of planks, over short distances, which supported people walking. Out of such circumstances was born the idea of conquering the fourteen miles of muskeg to carry far heavier loads.

In the region were great evergreen forests, with two small sawmills supplying the limited demand of the scattered pioneers for sawn timber. The lumber

Left: Magnificent timber made possible the world's longest plank road over ground on which no other type of road could be built. Below: Traffic from both directions on the straight "one-way" plank road was made possible by "sidings" within sight of each other. Pictures by courtesy of the British Columbia Forest Service.



A horizontal monument to hard work and ingenuity—another view of the plank road (above) as it bridges the muskeg barrier. British Columbia Government photograph. Right: Taking a picture of the last automobile to travel over the world's longest plank road. Photograph: Provincial Archives, Victoria, B.C.

was, in fact, so far from world markets that it was available at a sufficiently low cost to make possible the idea of constructing a plank road fourteen miles long.

A plan of action was drawn up and the Government undertook the cost. Big trees were felled. The logs, taken to the local mills, were sawn into two-inch planks sufficient to cover the distance. Smaller trees of approximately similar circumference were cut into pieces about twice the length of an ordinary railroad sleeper. At one edge of the muskeg, a few of these long sleepers, or ties, were first rolled out on to the quaking surface by the use of long pikepoles, being pushed into positions roughly an equal distance apart.

With a short foundation thus established, the first planks were then slid over the top of the sleepers. Thus, a few yards at a time, this, the world's most unusual road, was rolled into position, and the worst obstacle the wilderness could offer was conquered by this means. What is more, the road proved that it could sustain vehicles carrying heavy loads.

While the right of way was very narrow, a method was worked out by which the route carried two-way traffic with the least possible interruption. "Sidings", consisting of wider planks, were laid down short distances apart, each being plainly visible from the one next to it. Thus, a driver could wait at any given siding on seeing that another vehicle was heading in his direction on the narrow section.

But it was a surface which, because of its narrowness and great smoothness, demanded careful driving, particularly on rainy or frosty mornings when the planking was slippery. Fast driving and a skid could send an automobile over the edge into the bog, with some danger to the lives of its occupants. Even a lesser slip could result in one or more of a vehicle's wheels being caught in the gap left in the centre of the roadway for reasons of economy. It was an exceedingly difficult place in which to get a car back on to the road, and a vehicle thus straddling the route would tie traffic up for a long time.

Yet, this length of fourteen miles holds what is probably a highway record: in 34 years, no one was killed, or even badly injured, on it. And so cheap was lumber in this island wilderness at the time the road was built that the Government Public Works Department's figures give the cost of material as only 8,505 dollars and 72 cents.

In its early days, the highway was used only by wagons and bicycles. In such an isolated community, where there were few forms of enjoyment, the planking was hailed with great joy by cyclists, and greatly increased the sale of cycles in the region until the first cars arrived.

The smooth miles, almost without gradients, offered an attractive surface for young people on bicycles. One sunny summer Sunday a young man and his girl friend were on their machines, one on either side of the planking running parallel with the opening in the centre of the roadway. As they rode along, side by side, yet with a "gulf" between them, the young man, gazing fondly at his companion, allowed his front wheel to swerve. The wheel crashed into the centre opening and struck one of the ties so forcibly that the impact threw the man over the handlebars. So deep was his dive into the engulfing bog that only his legs remained above the surface. In two or three minutes he would have been completely sucked under. The girl leapt from her machine, threw herself face down on the planking, braced her toes against the edge, caught his legs and pulled him to safety.

An even more remarkable happening, which was also marked by a happy ending, involved 15-years-old Gordon Travers. Gordon was walking to Tlell when he came up behind a truck which was halted while the driver ate his lunch on the front seat of the vehicle. The truck's tail-gate was partly down, jutting outward, and the boy, in his desire to get round the vehicle on the narrow road, momentarily forgot the open space of bogland. He stepped down into it—and began to sink with frightful rapidity.

Then, almost unbelievably, his life was saved. His chin struck the protruding tailgate and this halted his downward progress for a flash of time which was still sufficient for him to recover from his first paralysing panic and grab hold of the tailgate. He hung on until his shouting brought the driver to his rescue.

The passage of years brought an increase in the number of settlements. Towns and villages required modern highways as a link between them, and the growth in the speed and power of automobiles meant that detours no longer mattered as they did in the frontier days. And so the day came when the (*Cont. on page 258*)

TWO NEW ITEMS FOR THE KEEN COLLECTOR

Minicab With That Up-To-The-Minute Flavour

Service Station Staff To Aid Layout Realism

DINKY TOYS NEWS

By The Toyman

I DO not know if readers will agree with me but I always regard June as the true start to the holiday season. I realise, of course, that schools generally do not break up until next month, but I think it is now that people really begin looking forward to the long summer holidays—I know I did when I was at school. But, although summer means a rest from their labours for millions, it also means extra work for others who are busy catering for the holidaymakers' needs. Among these busy people are taxi drivers who, at this time of the year, are constantly in demand carrying passengers and their luggage to and from railway stations, airports, bus depots, landing stages, etc.

It is, therefore, most appropriate that the latest Dinky Toys model to be released should be the Minicab, based on that famous French car the Renault Dauphine. It is No. 268 in our list and you see it illustrated in the two pictures on the right.

A close-up (right) of the Minicab waiting to fill up at a Petrol Pump Station. Below: Bayko is used in conjunction with the new Minicab and the latest Dinky Toys figures in this scene.

Pictured here with his real car is Frank Fenech of Malta, who is a Dinky Toys enthusiast.

For those readers who have not seen an actual Minicab, or a photograph of one, I should explain that it is a standard version of the popular Renault Dauphine, finished in red, which not only carries passengers but also makes its mark as a form of outdoor advertising. Along the sides of the vehicle and the edges of the roof are advertising panels. These, together with the attractive colour of the vehicle itself, make it a very notable—and noticeable—form of transport, and the Dinky Toys model will add that up-to-the-minute touch to your road scenes.

The Minicabs also usually carry the name of the firm to which they belong and the Dinky Toys model is a replica of those operated by Welbeck Motors Ltd., of London, who have given Meccano Ltd.

Good use has been made in this photograph of the new Service Station Personnel mentioned in this month's Notes. All the eight figures in the Set are in evidence. Note particularly the effectiveness of the two mechanics, the one kneeling, the other on a skid, who are attending to the Triumph Herald at the right of the picture.

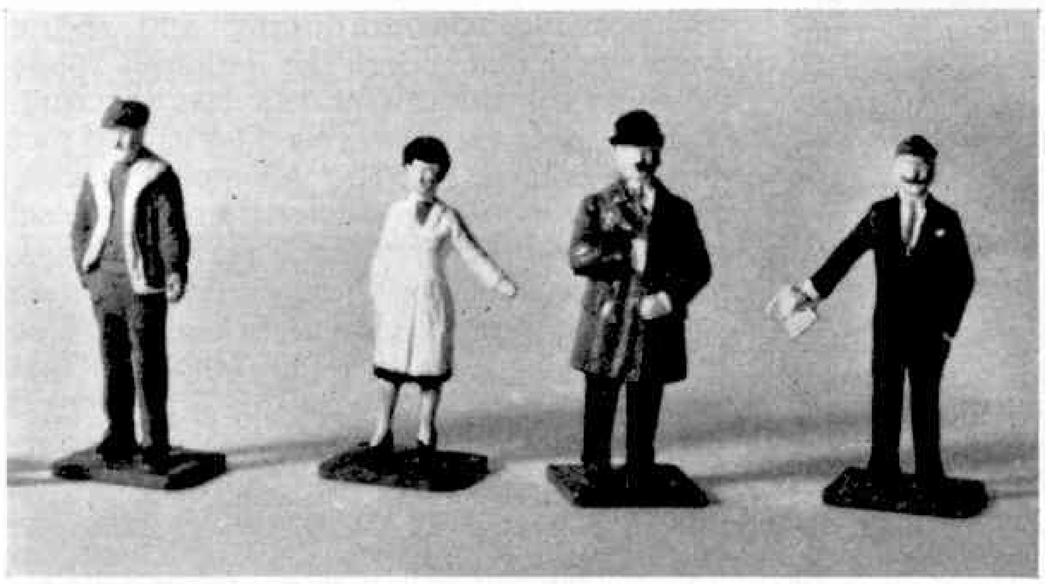
most useful assistance in the development of the model itself.

The Renault Dauphine—on which, as I have stated, the Minicab is based—is manufactured by S.A. des Usines Renault, Billancourt, France, and is powered by a rear-mounted, 4-cylinder engine of 845 c.c. capacity which gives a brake horse power of 30 at 2,500 r.p.m. It has an overall length of 12 feet 11 inches, an overall width of 5 feet and a height of 4 feet 9 inches. Its wheelbase is 7 feet 5 inches, its maximum track 4 feet 1 inch and its turning circle 29 feet 6 inches.

Incidentally, the advertisements on the Dinky Toys Minicab are as follows: One on either side of the roof showing the name and telephone number of the owners of the vehicle, Welbeck Motors; one on the roof front for H.P. Baked Beans; one along the offside of the car for Kenwood, manufacturers of such items as domestic mixers; one on the lid of the boot for Britax Safety Belts and, finally, one along the nearside of the body for Meccano.

The Dinky Toys miniature is $3\frac{11}{16}$ inches long and $1\frac{5}{16}$ inches wide, with an overall height of $1\frac{1}{4}$ inches. The wheelbase measures $2\frac{1}{16}$ inches.

Another new addition to our range this month is a set of Service Station Personnel, Dinky Toys No. 009. This consists of eight miniature figures designed specifically for use with the Service Station (Dinky Toys No. 785) but which can, of course, be used in a general sense to enhance the appeal of outdoor and indoor schemes.



A close-up of four of the figures which constitute No. 009 Service Station Personnel. They are, from left to right, driver in brown leather flying jacket, woman receptionist, city-type customer and car salesman.

The figures in the set include a mechanic kneeling down, with arms open as if he were taking a wheel off a car; a mechanic lying on a skid, and carrying a spanner and wrench for working underneath a car; a mechanic carrying an oil can and cloth, and a mechanic holding two cloths, or leathers, with one arm extended as if cleaning a car. In addition, there is a receptionist (or saleswoman) in white overall, a car salesman who is dark-suited and hatless, a "city type" figure, with overcoat and bowler-hat, and a driver wearing a leather flying jacket and cloth cap. All these models have a most distinct air of realism.

So much for the "people" themselves; now let me draw your attention to the scenes which illustrate their use not only with the Service Station but also in a general way. The bottom right illustration on the previous page shows a Minicab stopped in front of a house, waiting for a customer—your "city executive"—who is walking down the path.

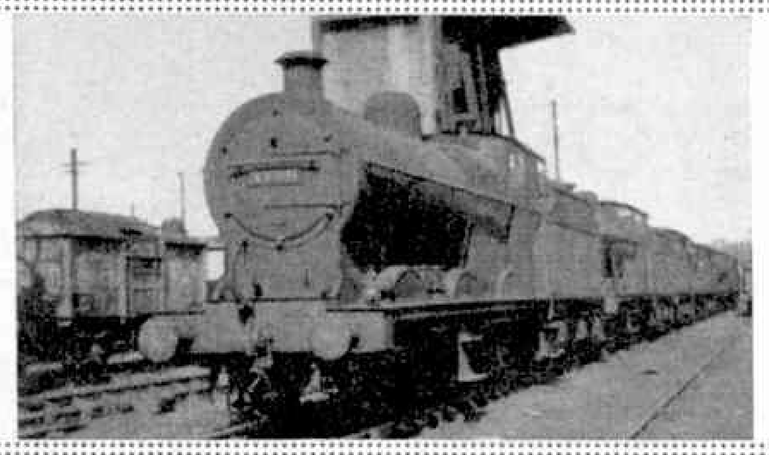
The house itself is made from Bayko and I have introduced the buildings made with this constructional toy to let you see how effectively they blend with Dinky Toys layouts, with the Pavement Set and with the figures mentioned in this month's Notes. The country bungalow, on the left, can be built with a No. 12 Bayko Outfit and the semi-detached house on the right with a No. 14 Outfit. Another model from Outfit No. 12 can be seen in the right background of the top picture on this page. There is no doubt about it that the use of houses, churches, shelters, garages, etc., which one can construct from Bayko, provide colourful and impressive backgrounds which will add greatly to the enjoyment of planning and operating Dinky Toys layouts.

The general impressive view which one can obtain is typified by the picture at the top of this page in which the Bayko building lends support to the Dinky Toys Service Station, the Dinky Toys Petrol Pump Station B.P. and various models. These include the figures we have been discussing together with the Jaguar "E" Type (No. 120), the Dinky Toys Breakdown Lorry (No. 430), the Mercedes-Benz 220SE (No. 186) and the Triumph Herald (No. 189).

Week by week, (*Cont. on page 259*)

RAILWAY NOTES

Contributed by R. A. H. Weight



Along Anglo-Scottish Express Routes

KING'S CROSS is the London terminal of the East Coast Route services to and from Edinburgh (Waverley), Aberdeen and the Western Highlands. The station in part is over 100 years old, but has been extended and refurbished several times. There are now eight long main line platforms in the chief section, plus another eight shorter, adjacent ones mainly accommodating suburban or secondary services. Departing trains almost immediately face a one-and-a-half mile climb through Gas Works and Copenhagen Tunnels. Between those triple bores, each accommodating in all six tracks, comes the busy Belle Isle network of crossover lines, with connections to the locomotive and goods yards. Here, too, on a high viaduct the L.M.R. North London line passes over, carrying local electric trains, and a variety of cross-London and main line freight services. In addition it forms a valuable connecting link to and from other Regions or routes.

During the past few years I have described traffic features of the principal intermediate and junction stations: Peterborough, Grantham, Doncaster, York, Darlington, Newcastle. More recently, in the December 1961 *M.M.*, I included details of time-gaining runs on the southbound *Talisman* and *Elizabethan*, which were respectively hauled by Type 5 Deltic diesel and A4 steam locomotives.

SUNDAY TRAVEL EXPERIENCE

My first northbound journey along that route by a heavy ordinary express with English Electric Type 4, 2,000 h.p. diesel-electric haulage was in the Sunday 4.30 p.m. (at present 4.15) from King's Cross as far as York. We had "13-on", about 470 tons full, behind No. D238 working through to Newcastle (home shed) with a King's Cross crew. After a good start, with Potters Bar passed in eighteen minutes and speed dropping only from 60 to 52 m.p.h. up the 8-mile rise thereto, came signal checks, then a diversion to slow line at Welwyn Garden City, as our usual track was occupied by a ballast train.

During Saturday nights and Sundays, when trains are fewer, much track relaying takes place together with all sorts of maintenance and structural engineering work required to sustain the high standards of British permanent way, and after fast travel between Hitchin and Huntingdon, with 90 m.p.h. maxima, came another diversion to the slow line. It was fascinating to see the modern track-laying machines, and portable equipment on wagons, and to observe, as we passed gently by, the new concrete-sleepered lengths of long-welded rails which had been winched into position. By then, the stretch of new track was almost complete after a long day's work affecting both fast lines, which in that part of the area are the two centre tracks. The replaced sections of rails with sleepers had mostly been loaded ready for transport back to depot for possible re-conditioning and re-use somewhere else where the demands made on them by traffic would be less exacting.

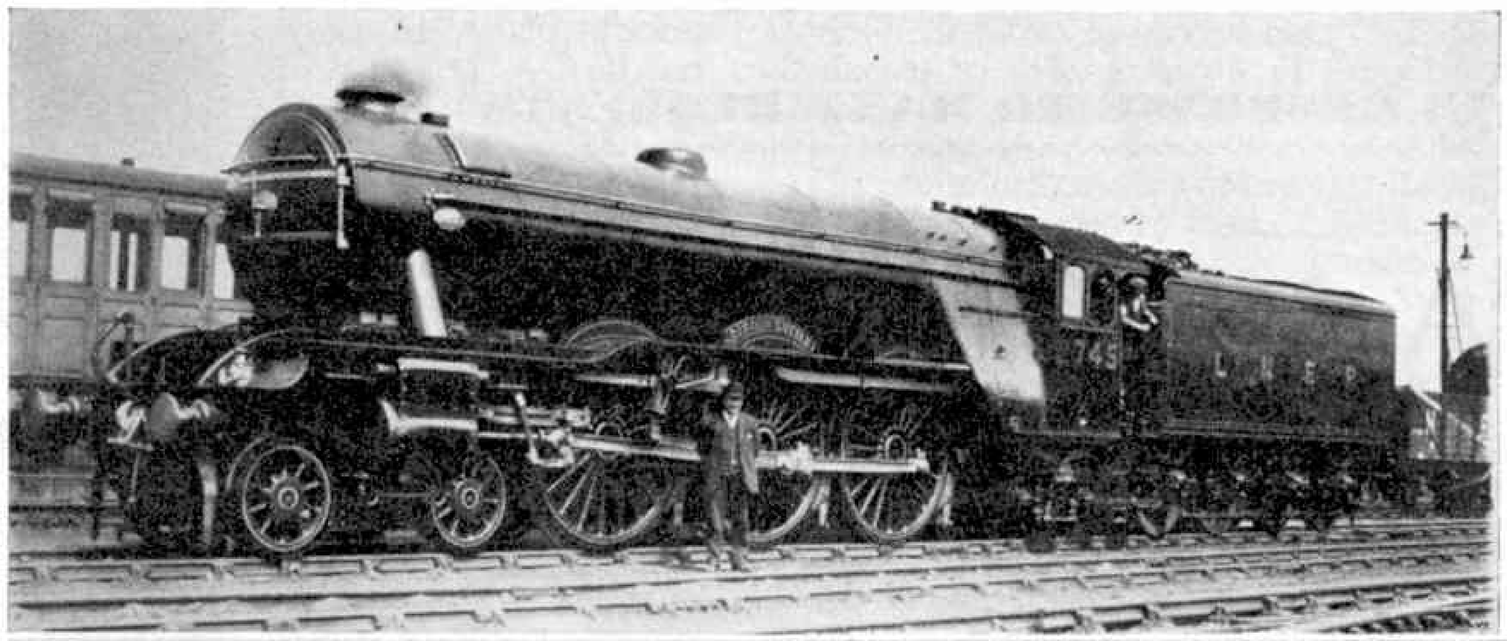
The Leeds express preceding us had met similar delays, but the A3 steam Pacific hauling it would be slower than our diesel in regaining speed with a fairly heavy load, so we were stopped outside Peterborough and suffered more signal checks for some miles. After restarting late from our first booked call at Grantham, No. D238 raced away over the ensuing 20 or more favourable miles, with speed which soon reached 80–81 m.p.h., and Retford (33 miles) was passed in 30½ minutes! A liberal margin is allowed in G.N. Line Sunday timetables to cover delays or complete diversions caused by heavy engineering work, but not much of it was needed that evening, and we were early into Selby, N.E.R., with its junctions for the Leeds, Bridlington and Hull routes. We left Selby on time and another 14 miles' running brought us into the great station at York, where I saw some diesel and steam excursions on their way back from Scarborough.

WAVERLEY ROUTE THRILLS

Much fine, even wild, scenery in Scotland and parts of Northern England, within view from the trunk route trains, has its special attraction, but it also involves steep gradients and sharp curves.

Above: Deltic diesel-electric No. D9010 arrives at King's Cross with the up "Talisman". Photograph by M. Edwards. At the head of the page you see a line of L.M.R. 4F 0–6–0s at Stoke, photographed by John Corkhill.

(Right): "Captain Cuttle' as L.N.E.R. No. 2745, photographed when the author made the footplate journey described in this month's notes. (Below) An up express between Grantham and Stoke in charge of No. 60062 "Minoru," an A3 in modernised form with double chimney. Photograph by T. G. Hepburn.



These add to locomotives' burden, as well as to the observant traveller's interest! For instance, the southbound course to Carlisle from Glasgow (Central) or Edinburgh (Princes Street) includes long, hard pulling to get over Beattock Summit, 1,015 feet above sea level, but there are considerable sections where high speeds may be sustained. The roughly parallel line from Glasgow (St. Enoch), the *Sou' West*, a good deal of which was described by my old friend G. H. Robin, in the April *M.M.*, has plenty of ups-and-downs, too. Again, conditions on the "Waverley Route", formerly North British Railway, then L.N.E.R., with its sheer lengths of unbroken steep gradients, curvature and lack of level stretches, make it an even stiffer proposition and the most difficult double-track main line of its kind in Britain, 98 miles long. Of the few express passenger trains using it the two principal ones leave Edinburgh (Waverley) at 10.5 a.m. and 10.5 p.m., bound for the Midland route to London (St. Pancras) via Leeds. The former is *The Waverley*, an English journey on which I reported in the May 1961 issue; the night service is a sleeping car train which also conveys important mail, parcel and perishable traffic.

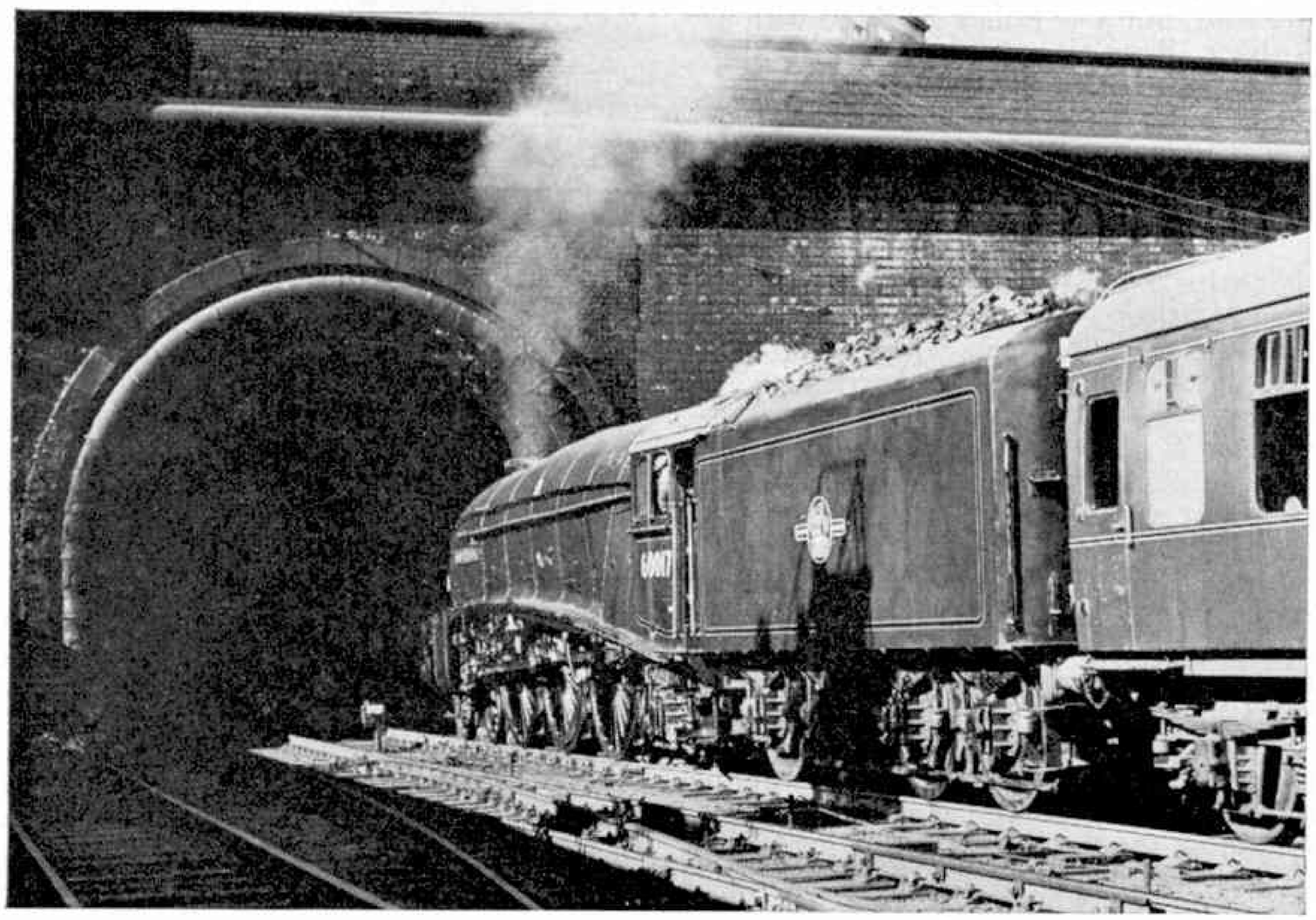
With this night express in the early days of the A3 Pacifics I was privileged to ride in the expert and friendly company of Driver and Fireman Kettle, father and son, on No. 2745 (now 60091) *Captain Cuttle*—as they genially described it, "The Kettles and the Cuttle!" The load was nearly 400 tons, including a tail of fish vans as far as Carlisle, quite a tough assignment of which the splendid engine and crew proved to be entirely masters.

The Southbound East Coast line is used by Waverley Route trains for a short distance out of Edinburgh to Portobello, where we diverged inland past Niddrie Yards towards great open spaces. Soon came an eight-mile rise mostly at 1 in 70 to Falahill, in the Lammermuir Hills, about 900 feet above sea level, passed two minutes early at 25 m.p.h. During the climb the maximum steam admission to the cylinders had been 35 per cent. of the piston stroke—or little more than half full-forward gear—with regulator open wide and boiler pressure maintained at over 200 lb. per square inch, not much below the rated maximum of 220 lb. After coasting down the gentler side of the Falahill gable—as it appears on the gradient profile—with brake applications to steady speed round many curves, we pulled up in Galashiels exactly to time. Here our load of passengers and freight increased. A shorter and quieter stop was made at Melrose, close to the famous ruined abbey, in the Scott country, and lovely upper Tweed Valley. The skilled driver made every effort to provide steady running, starting and stopping so that passengers might settle down to sleep as smoothly as possible.

Myriads of stars were visible on that summer night, but there was no moon to light up the vast landscape. So, for many miles nothing was visible from the footplate except signal lights heralding stations, mostly dark and deserted, or signal boxes where the man on lonely duty facilitated our safe passage. There were 60–65 m.p.h. maxima, then more coasting

(*Continued on page 258*)

A striking shot by Bishop E. Treacy of No. 60017 "Silver Fox" entering Copenhagen Tunnel with a train for Newcastle.



IN RESPONSE TO MANY REQUESTS

A MECCANO WALL CLOCK

I HAVE received so many requests recently for details of clock mechanisms that I am reprinting here details of a Meccano Wall Clock featured as the "Model of the Month" about five years ago. I am doing this in order to satisfy the hundreds of correspondents who write to me on this subject, and I hope that those readers who saw the original article will forgive me repeating the model.

The Wall Clock illustrated here is one of the easier Meccano clocks to build and adjust, and it should appeal to all who are interested in this kind of model-building.

The Clock Frame

Each side of the frame consists of a 9½″ Angle Girder 1, a 7½″ Angle Girder 2 and a 7½″ Angle Girder 3 connected at their upper ends by a 3½″ Angle Girder, and level with the lower ends of the 7½″ Angle Girders by a 3½″ Strip. The side is braced by a 5½″ Strip.

BY SPANNER

The two sides are connected by four 3½″ Strips and a 9½″ Strip bolted to the Girders 1. Three of the 3½″ Strips are numbered 4, 5 and 6, and the 9½″ Strip is indicated at 7. The upper ends of the Girders 3 are connected by a 3½″ Angle Girder, with 2″ Strips bolted between it and the 3½″ Angle Girders of the sides. The lower ends of the Girders 3 are connected by a 3½″ Strip, and 3½″ Strips are arranged between the Girders 3 and the upper 3½″ Angle Girder to brace the rear of the frame. The front of the frame is braced by 3″ Strips bolted to the Girders 1 and to the 3½″ Strip used to connect their lower ends. A Semi-Circular Plate 8 is attached to ½″ Reversed Angle Brackets bolted to the Girders 1. Four 3½″ Strips numbered 9, 10, 11 and 12, are fixed between the Girders 2.

Arrangement of the Gearing

The driving shaft is a 2″ Rod 13 mounted in the Strips 4 and 9. The Rod carries a Ratchet Wheel 14 and a 57-tooth Gear 15 fixed in place, with a loosely mounted 1½″ Sprocket 16 placed between them. An Angle Bracket is lock-nutted to the Sprocket Wheel but is spaced from it by a Washer. A short length of wire is cut from a Heald, and is shaped so that when one end is bolted to the Sprocket 16, the other end passes through the free hole in the Angle Bracket and presses the latter part against the teeth of the Ratchet Wheel 14. The piece of Heald acts as a light spring and can be replaced by a length of spring wire if desired.

The Gear 15 drives a ½″ Pinion on a 2″ Rod that carries also a 57-tooth Gear 17. The ½″ Pinion engages another 57-tooth Gear 18 on a 3″ Rod fitted with a ½″ Pinion 19. The Gear 18 is loose on the Rod, but a 1″ Pulley 20 fitted with a Rubber Ring is pressed against the Gear to provide a light friction drive.

The Gear 17 drives a ½″ Pinion on a 2½″ Rod mounted in Strips 7 and 11 and held in place by a Collar. The 2½″ Rod carries a 2½″ Gear that engages a ½″ Pinion on a 2½″ Rod 21 supported in the Strips 6 and 12. A 50-tooth Gear on Rod 21 drives a ¾″ Pinion 22 on a 2″ Rod that also is mounted in Strips 6 and 12. The last-mentioned Rod carries a 2″ Sprocket 23 that forms the escapement wheel.

It should be noted that Washers are placed at suitable positions on the Rods to ensure that the various Gears and Pinions do not rub against the frame or each other. The exact positions and the number of Washers used are best found by experiment, as individual models may vary slightly in this respect. It is essential for the complete gear train to be perfectly free-running, and it is advisable to duplicate the grub screws in the Gears and Pinions in the main gear train to avoid any tendency to slip.

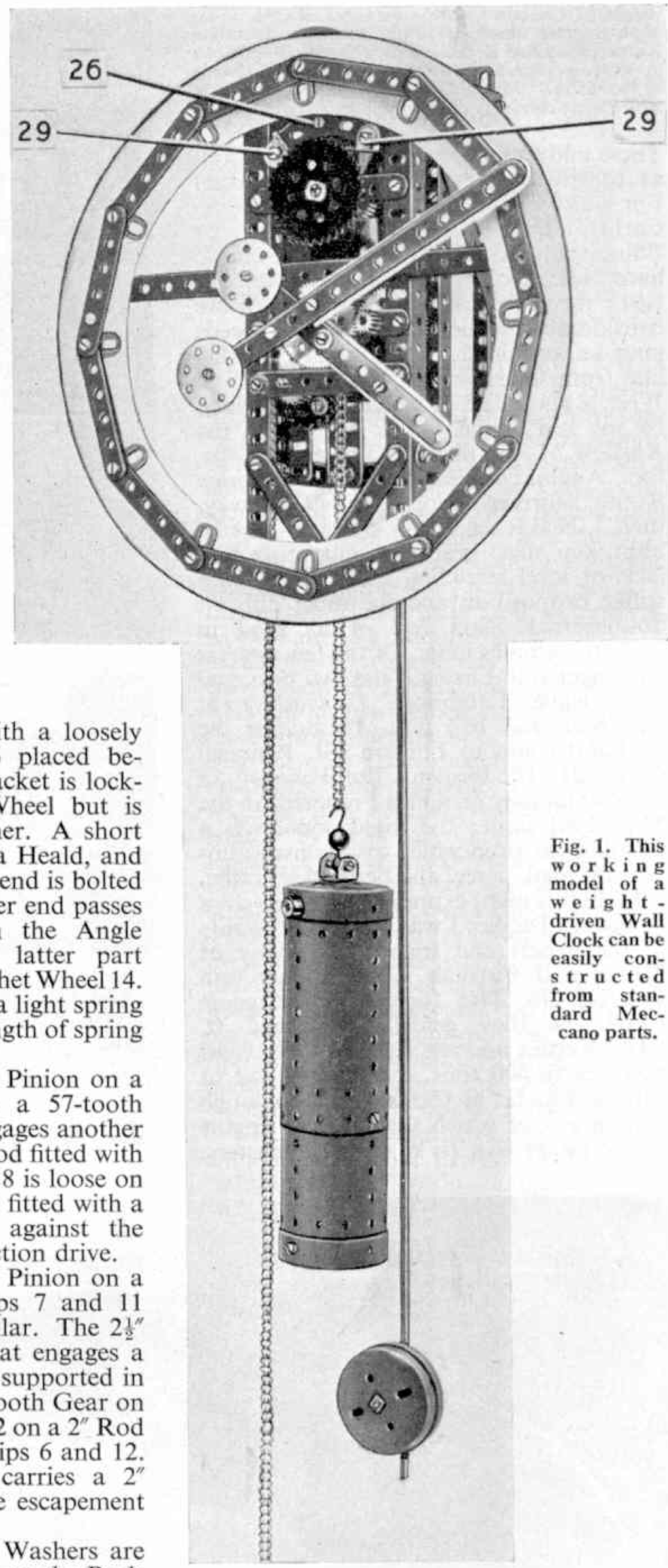


Fig. 1. This working model of a weight-driven Wall Clock can be easily constructed from standard Meccano parts.

Details of the Hands

The hour hand is a 5½″ Strip bolted to a Single Bent Strip that is fixed to a 60-tooth Gear. A Wheel Disc is attached to one end of the Strip, and a piece of white cardboard can be bolted to the other end to outline the hand. The 60-tooth Gear is mounted freely on the 3″ Rod that carries the Pinion 19, and it engages a

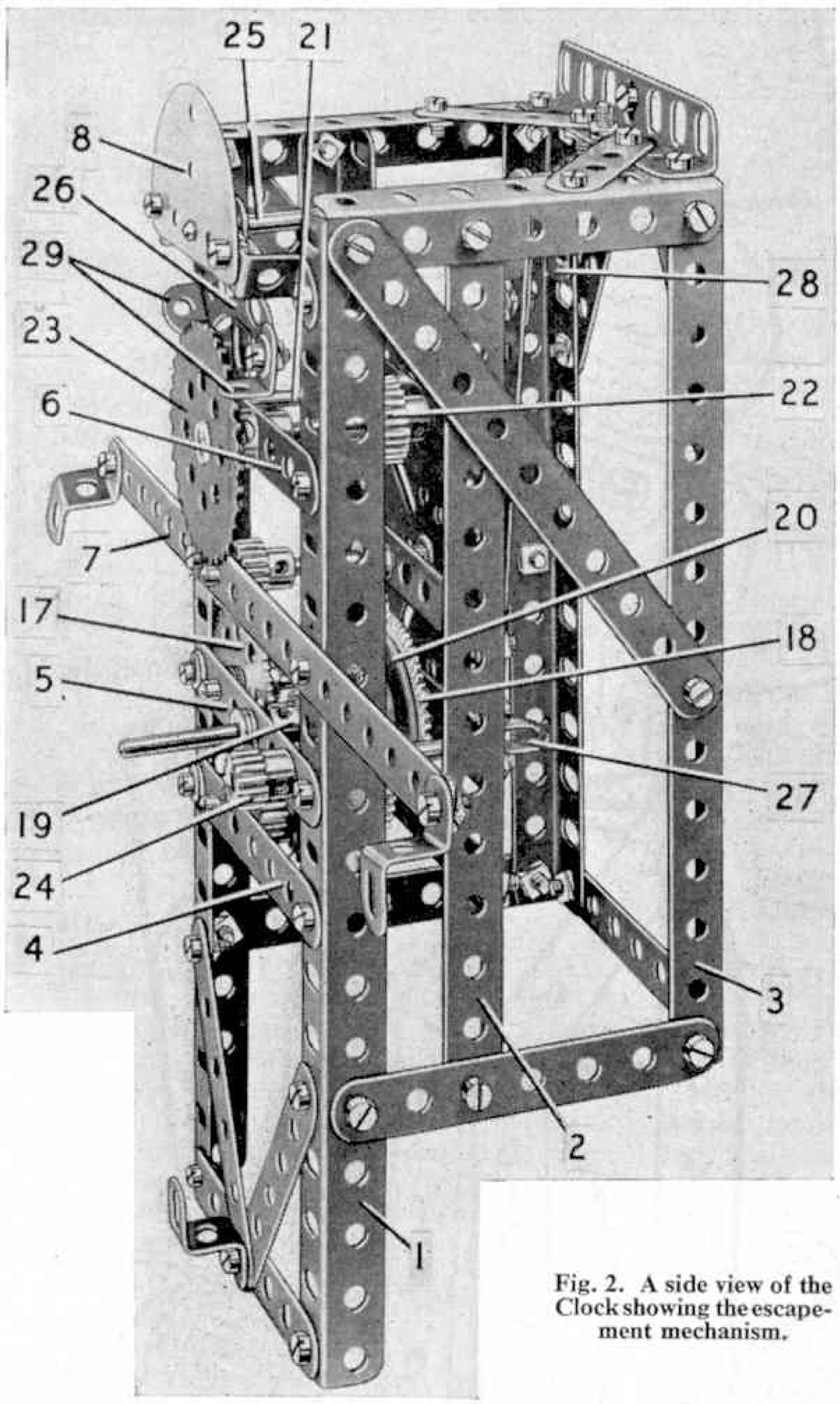


Fig. 2. A side view of the Clock showing the escapement mechanism.

which an Angle Bracket 27 is bolted. A Rod and Strip Connector 28 is placed on Rod 25, between one of the Cranks and the Angle Bracket that supports the Rod.

Two Angle Brackets 29 are fixed to the Curved Strip 26, in the positions indicated in Figs. 1 and 2.

The Clock Face, Weight and Pendulum

The clock face consists of twelve 3″ Strips bolted to a ring of white cardboard as shown in Fig. 1, with Fishplates held by the bolts used to connect the Strips together. The face is bolted to ½″ Reversed Angle Brackets fixed to the Strip 7 and to the 3½″ Strip between the lower ends of the Girders 1.

The weight consists of two Boilers bolted together to form a long cylinder. A Boiler End is attached to one end of this, and the cylinder should be filled with suitable ballast to form a weight of between 4½ lb. and 5 lb. A Boiler End, to which a Double Bracket is bolted, is fitted over the upper end of the cylinder and is held in place by a 2½″ Rod and two Collars. A small Loaded Hook is placed on a ¾″ Bolt held in the Double Bracket by lock-nuts, and is connected to a long length of Sprocket Chain. The Chain is passed round the 1½″ Sprocket 16.

The pendulum consists of two 11½″ Rods and a 3½″ Rod joined by Rod Connectors. It is passed through the Angle Bracket 27 and is inserted in the Rod and Strip Connector 28. The bob weight is formed by a Boiler End and a Wheel Flange held together by a 1″ Screwed Rod. A nut is placed at one end of the Screwed Rod, which then is passed through the Boiler End, the Wheel Flange and a ¾″ Washer and screwed into a Collar. The Collar is placed on the lower end of the pendulum and is fixed in position by its grub screw.

Adjusting the Mechanism

The positions of the Angle Brackets 29 must be adjusted so that as the Curved Strip 26 is rocked by the swing of the pendulum the Angle Brackets allow the escapement wheel 23 to rotate one tooth at a time. One Angle Bracket should just clear the teeth of the wheel when the other is fully engaged between two teeth. This adjustment is very critical, and it may be necessary to experiment for a while in order to find the best setting for the Angle Brackets. Once this setting is obtained and a smooth, even escapement movement results, the bolts holding the Angle Brackets should be tightened firmly to prevent the Angle Brackets slipping.

The timekeeping of the Clock can be adjusted by altering the position of the bob weight on the pendulum. Raising the weight will speed up the mechanism if the Clock is losing time, but if it is gaining the weight should be lowered.

Parts required to build the Meccano Wall Clock: 1 of No. 1a; 1 of No. 1b; 4 of

(*Continued on page 258*)

7/16″ Pinion 24 on a 2″ Rod mounted in the Strips 5 and 10. A 57-tooth Gear on the 2″ Rod meshes with the ½″ Pinion 19. This gearing provides a 12:1 ratio between the 3″ Rod and the 60-tooth Gear that carries the hour hand.

The minute hand is a 7½″ Strip bolted to a Double Arm Crank, which is fixed at the end of the 3″ Rod. The Strip is fitted with a Wheel Disc and can be outlined with white cardboard in the same way as the hour hand.

The friction drive between the Pulley 20 and the Gear 18 allows the hands to be moved without affecting the main gear train.

The Escapement Mechanism

A 4″ Rod 25 is mounted in the Semi-Circular Plate 8 and in an Angle Bracket attached to the rear of the clock frame by a ⅜″ Bolt. The Angle Bracket should be spaced from the frame by Washers until Rod 25 is horizontal. Two Cranks are fixed to the Rod so that they hang vertically. One of the Cranks carries a 2½″ Stepped Curved Strip 26 and the other supports a 5½″ Strip, to the lower end of

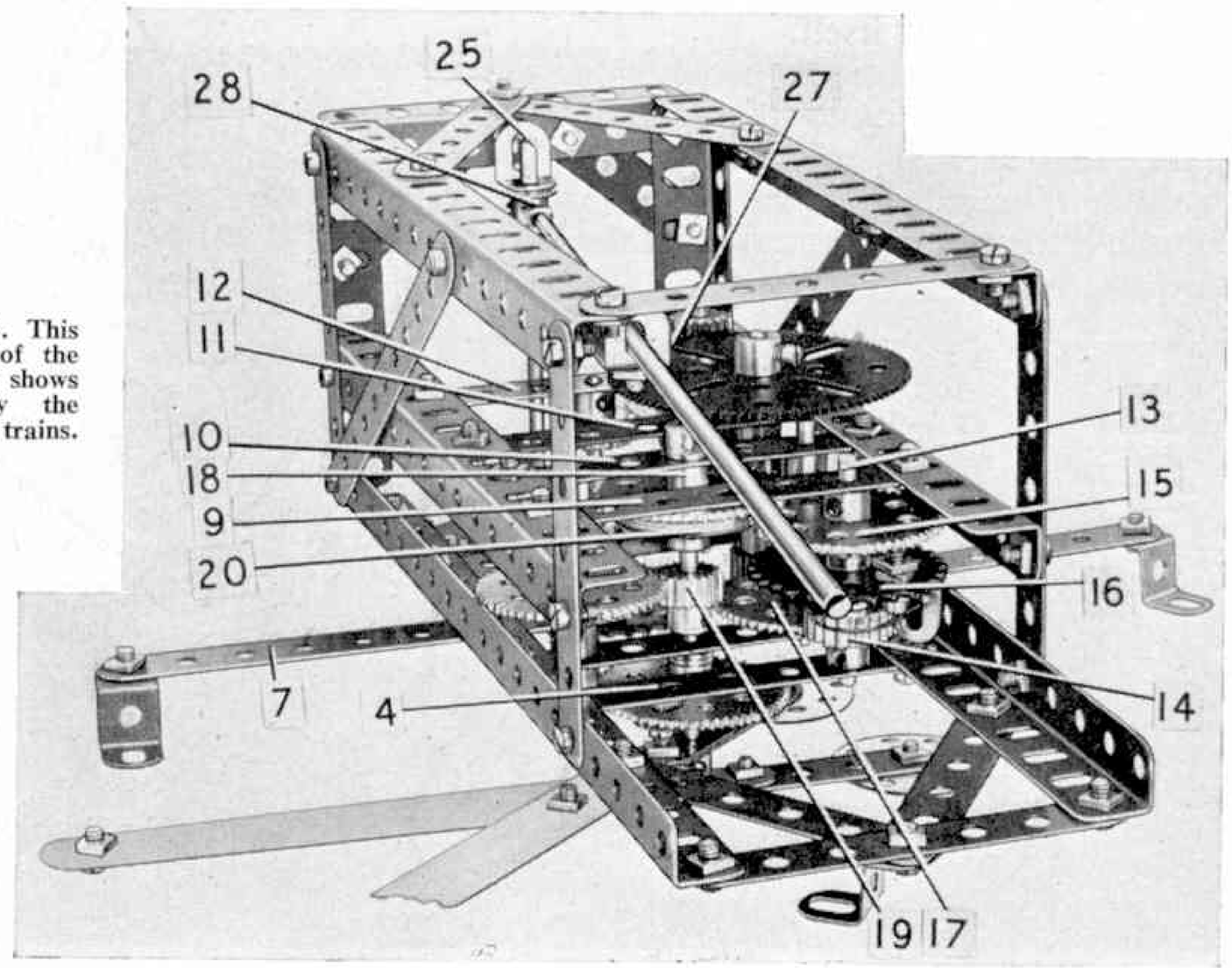


Fig. 3. This view of the Clock shows clearly the gear trains.

NOVELTY MODEL FOR JUNIORS

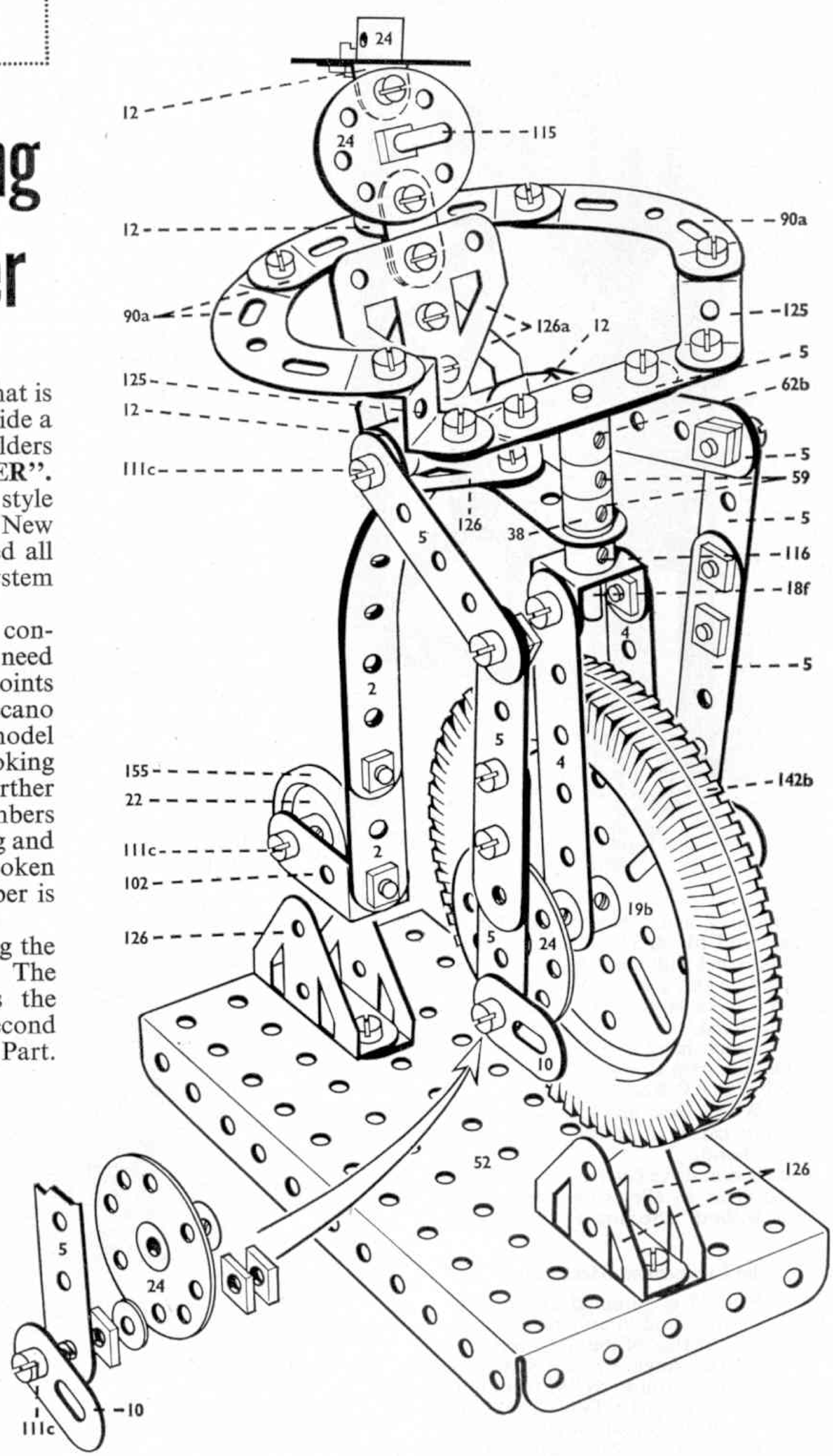
A Penny-Farthing Cycle And Rider

HERE is an attractive little model that is easy to put together and will provide a lot of fun for the younger model-builders when completed, writes **"SPANNER"**. The model is illustrated in a similar style to that adopted in the 1962 Meccano New Model Books, except that it is printed all in black instead of the two colour system used in the new books.

The drawing shows the details of construction quite clearly and there is no need of written instructions. One or two points must be mentioned however. The Meccano parts used in the assembly of the model can generally be identified simply by looking at the illustration, but to help still further in most cases the actual catalogue numbers of the parts are printed on the drawing and linked to the parts concerned by broken leader lines. In some cases the number is printed on the part itself.

Below you will notice a panel listing the parts required to build the model. The figure in the first column denotes the quantity required and that in the second column is the catalogue number of the Part.

2 – 2	3 – 90a
2 – 4	1 – 102
7 – 5	5 – 111c
3 – 10	1 – 115
4 – 12	1 – 116
2 – 18a	2 – 125
1 – 19b	5 – 126
1 – 22	2 – 126a
4 – 24	1 – 142b
42 – 37a	1 – 155
32 – 37b	



WITH THE SECRETARY

Club and Branch News

NEW MECCANO CLUBS RECENTLY AFFILIATED

WOODLEY C.E. SCHOOL (READING) M.C.—*Leader:* Mr. H. W. Mason, Woodley C.E. (Controlled) School, Church Road, Woodley, Reading, Berks.

SHEBBEAR COLLEGE (BEAWORTHY) M.C. —*Leader:* Mr. H. C. Parr, Shebbear College, Beaworthy, N. Devon.

HORNBY RAILWAY COMPANY BRANCH RECENTLY INCORPORATED

NO. 581 TWICKENHAM AND DISTRICT—*Chairman:* Mr. J. D. Christie, 33 Avondale Gardens, Hounslow, Middlesex.

CLUB NOTES

NORTH END (PORTSMOUTH) M.C.—The Club and the associated H.R.C. Branch were recently visited by a party of boys from the Alverstoke Branch of the National Children's Home. After examining the Meccano models and operating the layout, the boys were served with tea and biscuits. *Secretary:* Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.

NEW ZEALAND

CHRISTCHURCH M.C. — The annual meeting was well attended, 18 of the 21 members being present. Most of the officers were re-elected, with Mr. C. E. Saunders continuing as President. He presented the Meccano Guild Merit Medallion to John Curtis. An interesting programme has been drawn up for the first session of the new Club year, and it has been decided that, at the end of that year, a certificate be presented to the winner of the most points for games and competitions held during the period.

Home-built working Meccano models were brought to one meeting and proved to be well up to standard. Subjects chosen included a Meccanograph, breakdown lorry, ships and articulated trucks. It has been decided that the senior members, in turn, will explain to the juniors the principles of the various mechanisms used in Meccano model-building. The Leader, Peter Satterthwaithe, gave the first such talk, his subject being *Pulleys*. *Secretary:* David Archer, 33 Evesham Crescent, Spreydon, Christchurch 2, New Zealand.

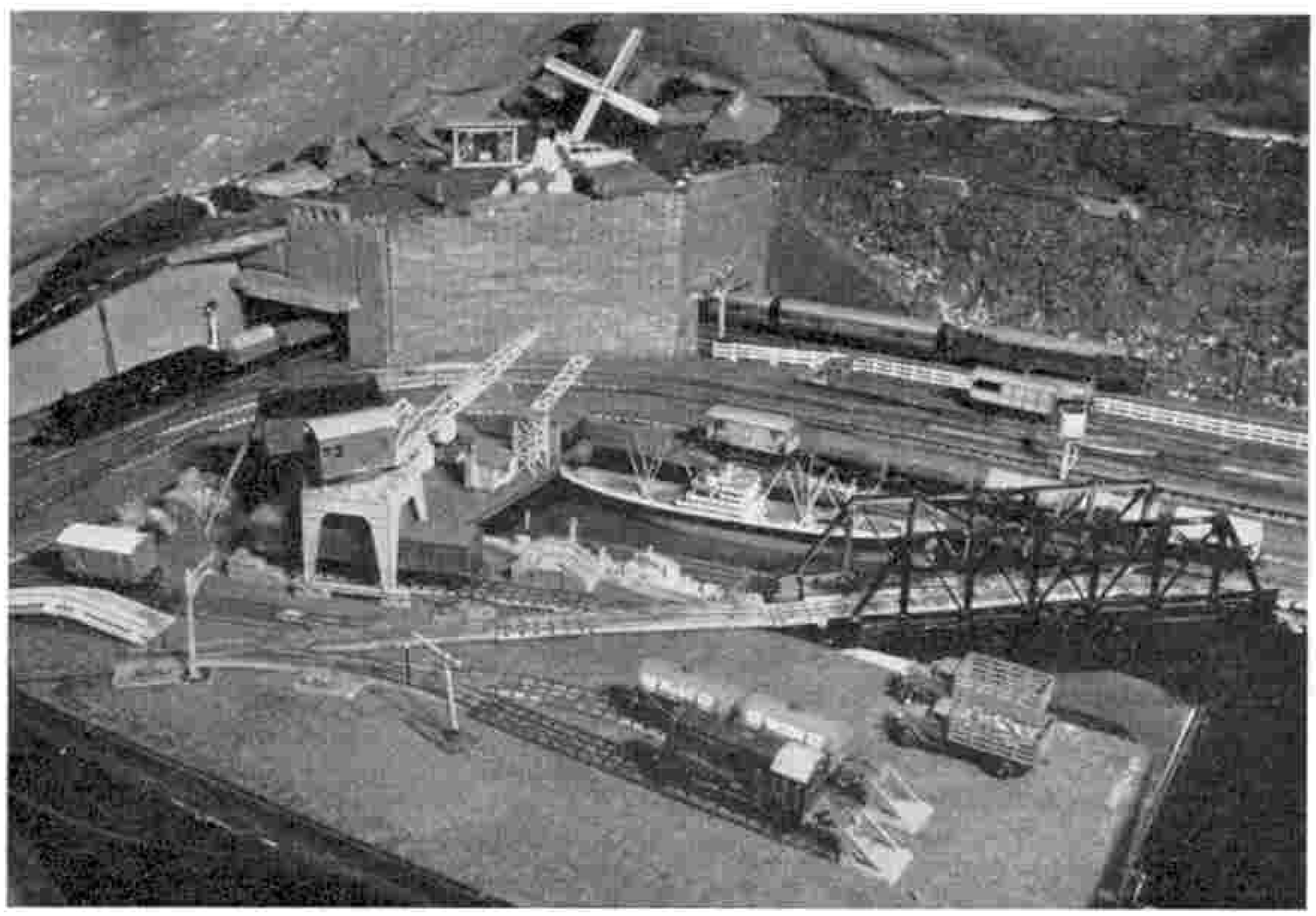
ST. JOHN'S (ROSLYN) M.C.—A model-building competition has been arranged in which each member will be limited to 15 Meccano Parts (excluding Nuts and Bolts). At one meeting the President, Mr. S. R. Harbour, gave an interesting talk on the 1962 Waiora Scout Jamboree which he attended, and Mr. W. Earl described his visit to the 1962 Grand Prix at Ardmore, Auckland, illustrating his talk with colour slides which were passed round among the audience. A new library system is to be inaugurated. It is planned to hold a mystery all-day cycle run on a Saturday soon. *Secretary:* M. J. Salinger, 8 Maheno Street, Dunottar, Dunedin, New Zealand.

BRANCH NEWS

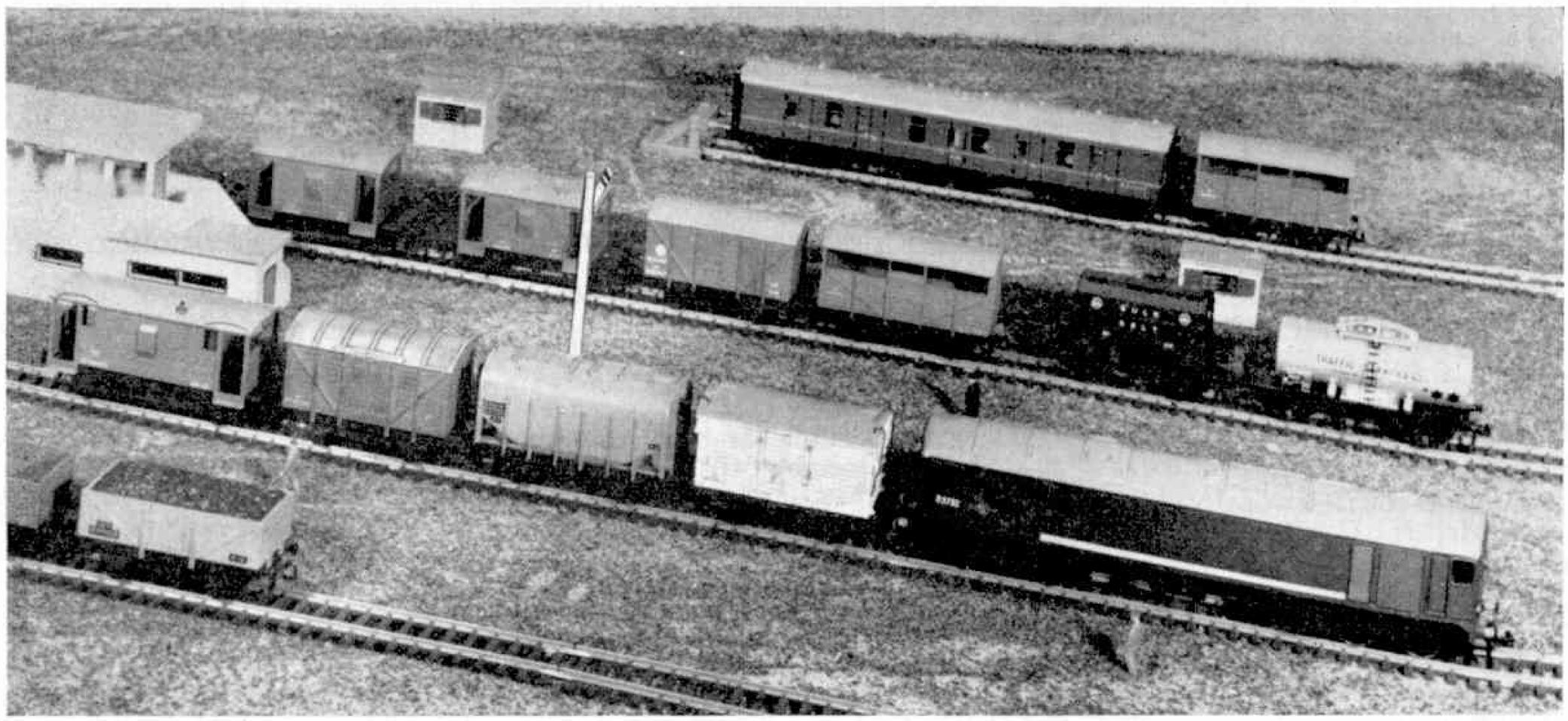
NEWPORT C.E. JUNIOR BOYS' SCHOOL—The Branch now has 15 members, and meetings are very well attended. The Branch layout has been re-planned in five sections and extended to include a new branch line, with separate controller. The branch line and *Mineton*, one of the main line stations, were used in the Branch display at the Isle of Wight Industries Fair held at Warners Holiday Camp, Ryde, on April 9 to 14 last. The Branch's stand was open each day from 12 noon until 5.30 p.m. Three members attended to operate the layout, one of them working as controller and the other two being responsible for *Mineton* and *St. Giles Bay* stations respectively. A timetable of eight passenger trains and two goods trains made up each working "day", the complete cycle of operations taking six minutes. The stand always attracted a good crowd. *Secretary:* Graham Elderfield, Newport C.E. Junior Boys' School, West Street, Newport, Isle of Wight.

AVIARY MODEL RAILWAY CLUB (LEEDS) —Operations on the Branch layout have continued. A quiz at one meeting was greatly enjoyed. Recently members attended a film show held in another part of the premises in which the Club now has its quarters. The film was shown by Wallace Arnold Tours Ltd., and dealt with touring holidays in Great Britain, Europe and Russia. A competition to raise funds took the well-known form of guessing the number of peas in a jar, and the prize was an Easter Egg decorated by one of the senior members. *Secretary:* Ian Witham, 69 Salisbury Road, Leeds 12.

LUTON COUNTY SECONDARY TECHNICAL SCHOOL—There has been a good deal of activity, centred mainly upon developing the layout. Hills and tunnels have been constructed, and new roads laid down. A display of model railway engines was assembled as part of a Branch display on the occasion of the school Speech Day. *Secretary:* David Clark, Barnfield Avenue, Luton, Beds.



This view of the fine Hornby-Dublo layout of the Keswick (Wembley) H.R.C. Branch No. 580 shows the dock area. The far corner is effectively filled by a tunnel, from the left-hand portal of which a freight train hauled by a Hornby-Dublo 2-8-0 Locomotive is emerging. The passenger express leaving the right-hand entrance of the tunnel is headed by a Hornby-Dublo Co-Co Diesel Locomotive. This enthusiastic new Branch was incorporated into the parent Hornby Railway Company in February last.



A New Diesel Train Set, And Lineside Notices

THE introduction of a new Train Set into the Hornby-Dublo System is always of interest to those of my readers—and I think this means most of them—who follow successive developments in the Hornby-Dublo range. I am, therefore, glad to be able to tell you in this month's Notes something about the Co–Bo Diesel-Electric Goods Train Set which is a new item in the programme for this year.

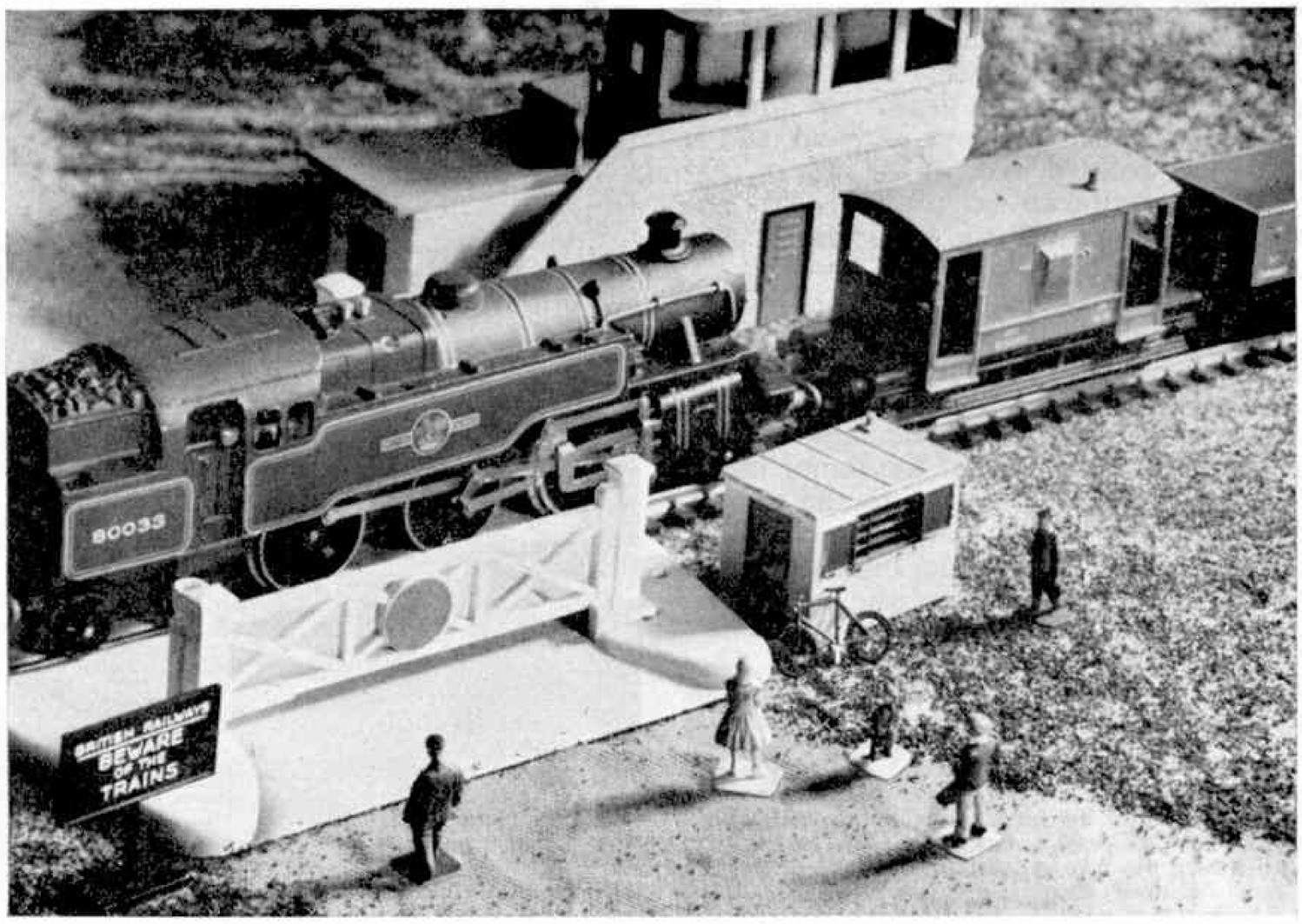
HORNBY RAILWAY COMPANY

By the Secretary

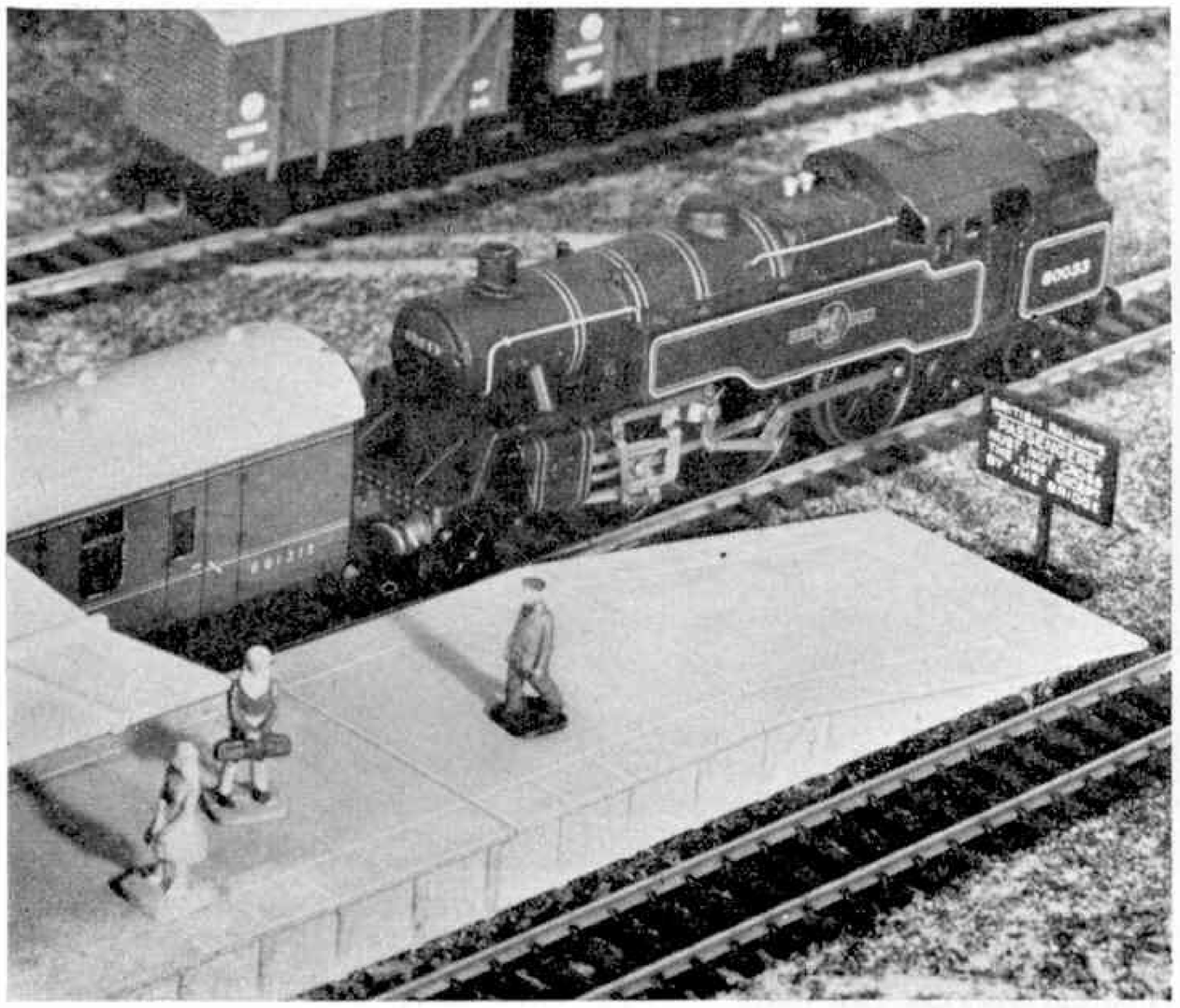
Ever since the appearance of the first Hornby-Dublo Diesel Locomotive—the well-known Type 1 Bo–Bo—there has been a diesel-hauled Goods Train Set in the system. Now a change has to be recorded; the Co–Bo Diesel Locomotive introduced for separate sale in the late autumn of last year now makes its appearance in a Goods Train Set, the components of which you can see in action in the picture above.

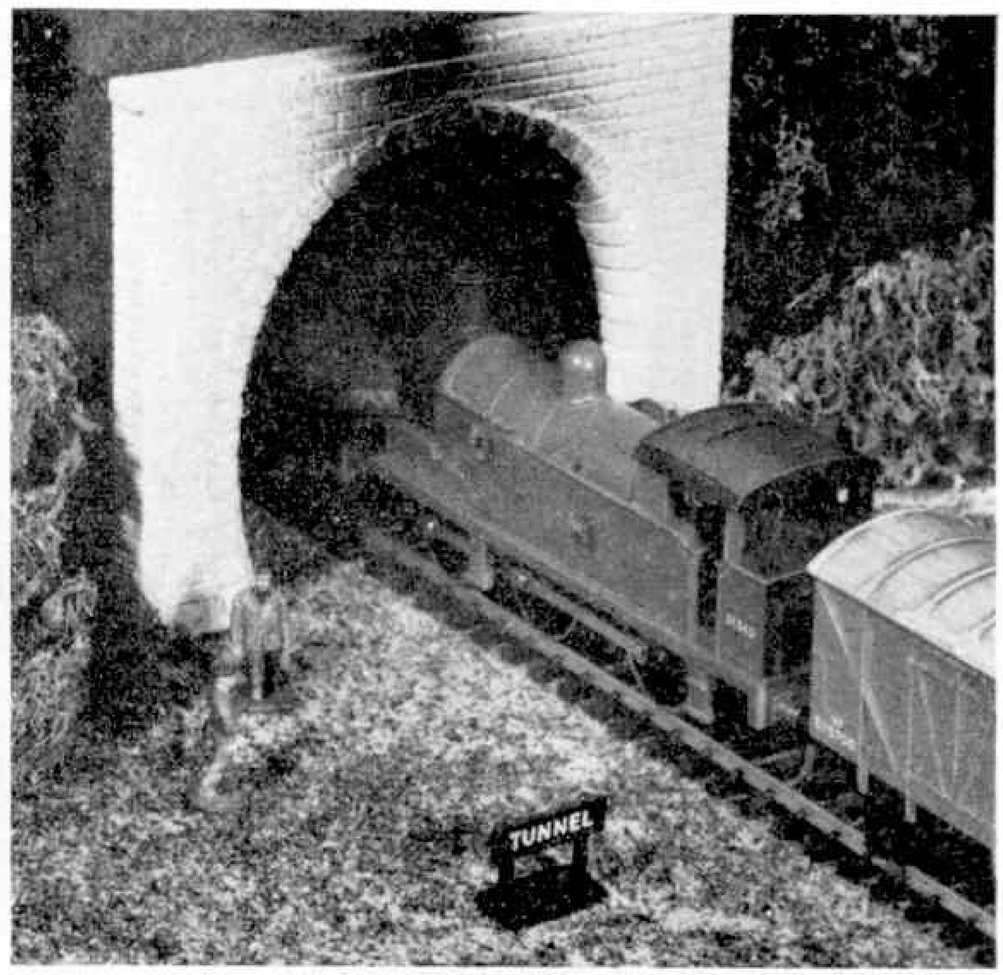
As compared with the former Train Set with Bo–Bo Diesel, the composition of the train has undergone a slight change and only vehicles likely to be found in a fast freight train are now included. The Refrigerator Van, the Bulk Grain Wagon, and the 12-ton Ventilated Van will be familiar to all Hornby-Dublo owners. So will the Goods Brake Van which is of typical L.M.R. character, but, in keeping with the modern trend, its livery has been altered from the standard grey previously used to bauxite brown.

It can now represent a goods brake suitable for running in brake-fitted fast freight trains. This is a development many of you have been anxiously awaiting, and in its new finish the L.M.R. Goods Brake



The Co–Bo Diesel (top picture) speeds on its way with the vehicles included in the new Hornby-Dublo Diesel-Electric Goods Train Set described in this month's Notes. Right: The warning board, one of the Lineside Notices mentioned in this article, adds realism to a Level Crossing scene.





(Left:) At the platform end, another of the Lineside Notices gives passengers a familiar reminder about crossing the line. (Above) On a single line branch, the Hornby-Dublo 0–6–0 Tank approaches a tunnel duly distinguished by one of the Lineside Notices.

Van will strike an up-to-date note in your sidings. At the same time, the markings on the vehicle have been altered. The designation *20T*, indicating that the vehicle is a 20–tonner, and the running number *M 730973* appear towards the left-hand end of each side. At the other end is the official tare weight, *20–0*.

Anyone beginning his miniature railway career with this Train Set is making a good start, for the powerful Diesel that heads the train is fitted with the remarkably efficient Ring Field Motor, the capabilities of which will already be well-known to most of you. The Set provides a train of up-to-date character, representative in its way of the numerous fast goods trains, many of them diesel-hauled, now plying their busy way along the main lines of British Railways.

Some of these are named, such as the *Condor*, the fastest freight service in Europe, which operates overnight between Glasgow and London. It is of interest to know that Co–Bo diesel locomotives of the class represented by the Hornby-Dublo Locomotive we are talking about have taken part in the working of this train. In both directions the *Condor* provides a special high-speed container service, with road motor collection and delivery at each end, for a wide variety of products.

Contrast with nicknames

There are other named freight trains too, such as the E.R. *Lea Valley Enterprise* and *The King's Cross Freighter*, the official titles of which make a contrast to the nicknames long used by Western Region staff to distinguish some of their fast freight services. To quote just a few, *The Meat* clearly indicates the purpose of one train, while *The Early Bird* and *The Moonraker* certainly suggest the small hours when these trains are busy.

In our remaining pictures this month you see illustrated three of the six plastic items contained in the No. 5037 Set of Lineside Notices, now becoming available. In the Level Crossing scene at the foot of the previous page a familiar note is struck by the warning "*Beware of the trains*" on a typical notice board. The board itself and its supporting posts are black, and the lettering is in white, which shows up well against the dark background. This black-and-white colour scheme is maintained in all the components of the Set.

Among the best known station notices for the benefit of travellers are those which refer to crossing a railway. Where platforms are connected by means of a footbridge or subway—and most of them are—passengers are expected to use these and so keep out of harm's way. Walking over the track, even by the porters' foot crossing, is not encouraged, so one of the Hornby-Dublo Lineside Notices warns, *Passengers must not cross the line except by the bridge*. If you make use of this notice, then you should provide the attractive standard Hornby-Dublo Footbridge, which has been in the range for quite a long time.

On journeys by train over certain routes you may have noticed that lineside boards mark the approaches to tunnels, giving their names and their lengths. These are of interest to the traveller, but they are also useful to the engineering staff on the line, for they are particularly concerned with tunnel maintenance. So, to engender further realism the Set of Hornby-Dublo Lineside Notices includes a tunnel board. This has no specific name on it, it simply says *Tunnel*, which is sufficient for miniature railway purposes.

There are two other boards, of similar dimensions and type to that shown in our tunnel picture. One of these carries the word *Caution*, and can be used in a variety of ways. For instance, it can warn drivers of places where they must take special care, such as in locomotive yards, where clearances may be restricted. It can also be used to warn staff on the ground in places where their view of any moving engine or train may be obstructed.

A companion notice to this bears the word *Whistle*, which is clearly an instruction to engine drivers. Its use will be specially appropriate at the head of the locomotive yard, where engines may have to wait before the Points can be set for them, to make their way out to the main line. The sounding of the whistle in such circumstances tells the signalman that the engine is waiting for him to make the next move. And it might be used just outside the shed building, so that an engine moving inside will give warning to the staff.

Speed restriction sign

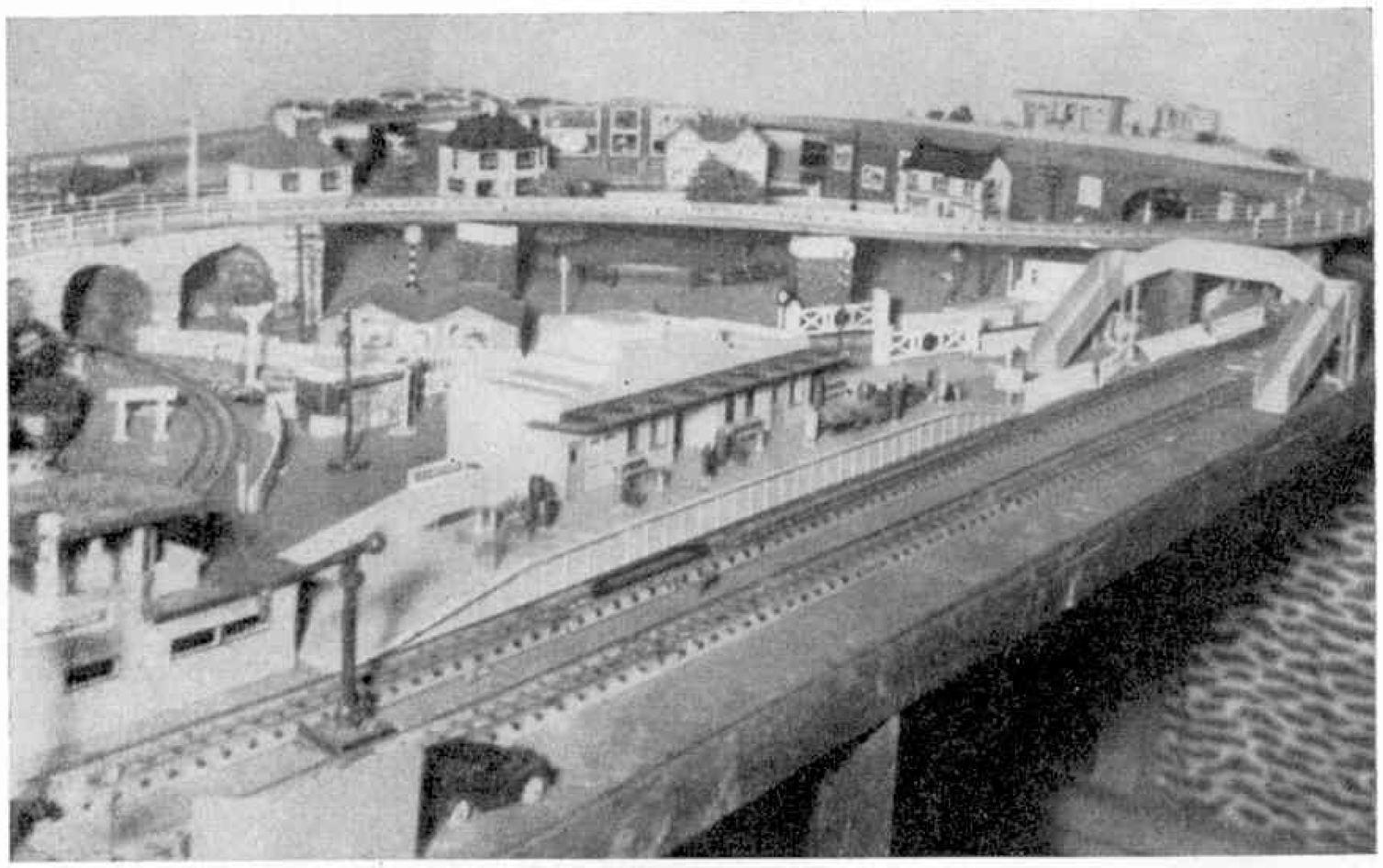
Finally, there is that most interesting item the speed restriction sign; one can hardly call it a board because it consists of cut-out figures mounted on a post at a convenient height for sighting. The figures relate to the maximum speed allowed owing to the presence of curves, or junctions — or to some similar condition — where a speed restriction is in force.

Each of the notices in this Hornby-Dublo Set has a base so that it can stand up properly on your baseboard or railway table. Those of you who are fortunate enough to have actual baseboard layouts will find no difficulty in securing these notices in place, as holes suitable for pinning them down with small nails are provided. I am sure that lineside effects on many Hornby-Dublo layouts will soon be improved by the use of the components from this new Set.

Scots Reader's

3-Rail Scheme

Individuality The Keynote



Part of the Hornby-Dublo layout of Stuart H. Watson (H.R.C. No. 312783) described in this article.

WHEN Stuart H. Watson (H.R.C. No. 312783) of Kingussie, Inverness-shire, who is the owner of the Hornby-Dublo layout shown in the picture on the right, sent me details of his Three-Rail system he added that he considered his railway to be a little different from many others that have been described in these pages. He is quite right, although, of course, most layouts do have some individual feature. However, the track formation used by Stuart is unusual in certain details.

The layout consists basically of a double track main line for continuous running. Crossover Points link the up and the down tracks at each end of the station shown in the foreground of our picture. There are other connections too, and it is in the arrangement of these that the layout takes on its individual character. Points lead off the inner main line and give access to two intersecting reverse loops, which together form a kind of figure-eight section. One of these, after crossing the other in the centre of the layout by means of one Diamond Crossing, enters the side of a tunnel already carrying the two main lines at this point. Inside the tunnel it is led over the inner main track by another Crossing and joins the outer track, under cover as it were, the junction being concealed from the onlooker.

On top of the tunnel is situated the

BY LAYOUT MAN

station you can see in the background of the photograph. This station is reached by a high-level line that starts at base level on the outer track at the opposite end of the layout and makes its way upwards by means of a gradient to the station. It then follows a winding course and is carried over much of the baseboard track, finally making its way down to base level again and joining up with the inner main circuit.

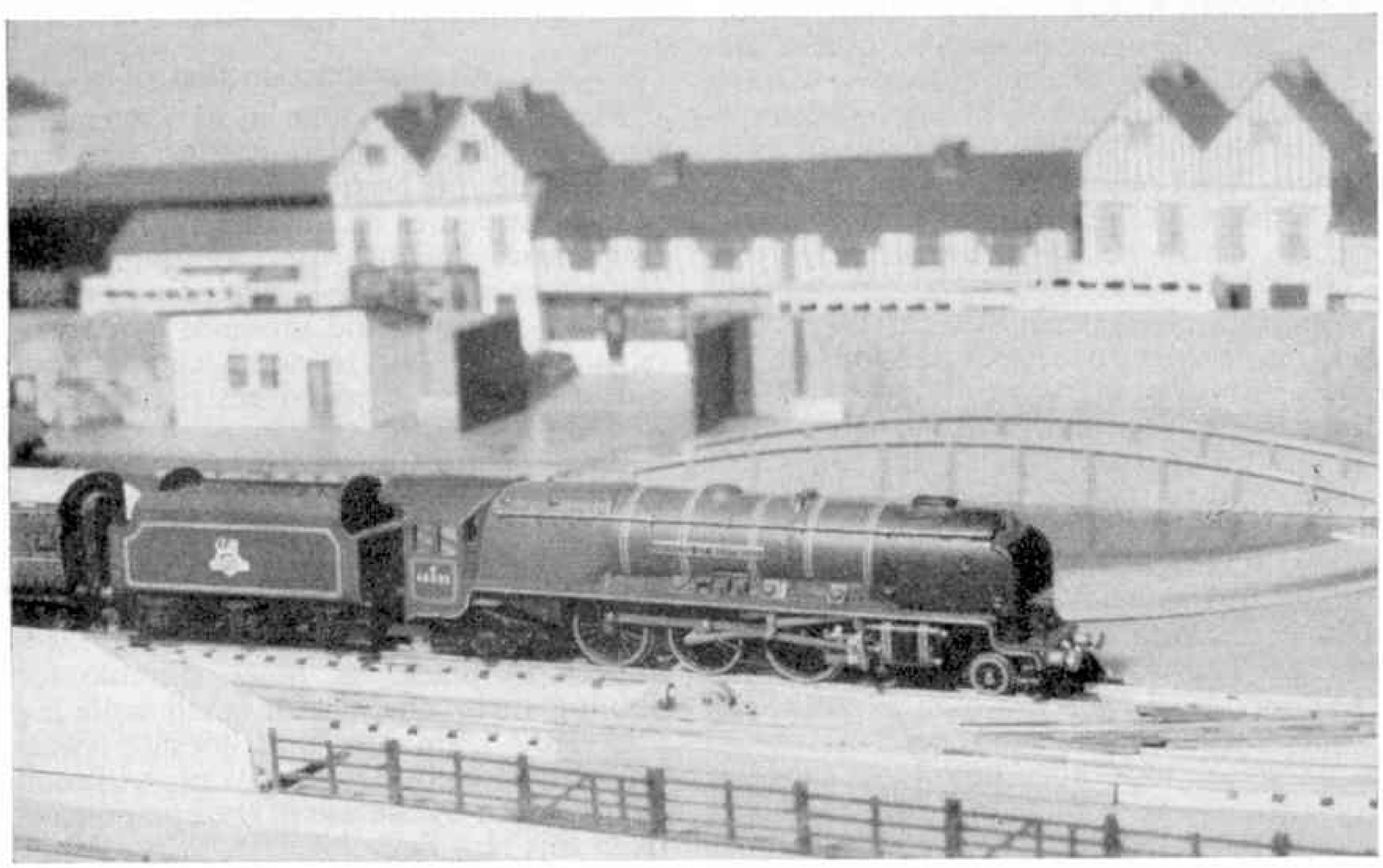
The elevated track is carried on wood strips of suitable width, and for much of its course these are supported by piers formed of wooden blocks finished off with printed brick paper. The curving section of the high-level track, which is clearly shown in our picture, crosses the centre of the figure-eight already referred to by means of a viaduct of several arches.

As can well be imagined, operating possibilities are considerable, owing to the variety of routes that are available for a train, whether it begins its journey on either the outer or the inner main line. Certain movements involve "wrong-line working" for short distances, but the presence of the two sets of crossover Points between the main lines makes it readily possible for a train to regain its proper track.

* * * *

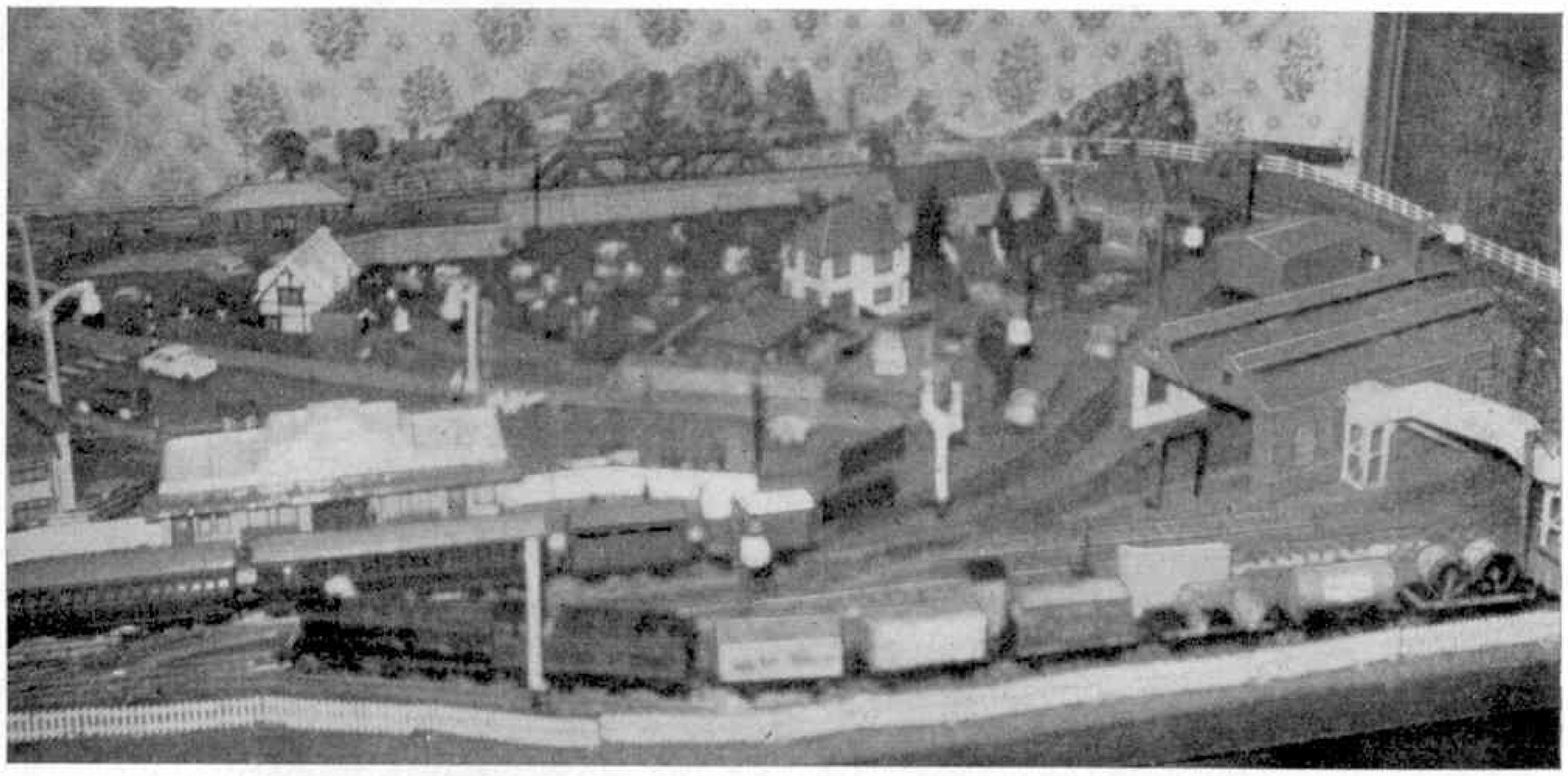
As sometimes happens on a layout where the accent is on continuous running, with numerous variations of route, there are not many sidings. There is, however, a two-road engine shed, as well as a track that is useful for the storage of rolling stock or for freight loading purposes, as necessary.

At the time when Stuart provided me with details of his layout there were three Hornby-Dublo Locomotives in use—a *Silver King* 4–6–2 as formerly standard in Hornby-Dublo Three-Rail, a Bo–Bo Diesel and a 2–6–4 Tank. The last-named engine, and the Diesel, are employed principally for freight traffic, long-distance through runs with passenger trains being handled very appropriately by the A4 *Silver King*.



A fine impression of power and speed is given by Hornby-Dublo "Duchess of Montrose". The railway is that of G. A. Rogers, of Bilbrook, near Wolverhampton.

In this picture "Bristol Castle" is busy on the Hornby-Dublo layout of Glyn Davies, described in these notes.



Most of the lineside accessories are the standard Hornby-Dublo items, and prominent in the foreground of our picture is the Lineside Apparatus of the T.P.O. Mail Van Set. There is a mail bag hanging on the lineside standard, waiting to be picked up by the mail train, while a Dublo Dinky Toys Royal Mail Van stands near to the apparatus, ready no doubt to take to the postal depot the mail bag that will be discharged from the train. There are numerous realistic touches of a similar nature and it is almost superfluous to say that Stuart obtains plenty of enjoyment from his railway. The development and operation of the system is, in fact, his favourite pastime.

Another Hornby-Dublo railway that gives its owner lots of fun is that shown in our next picture. This belongs to Glyn Davies, of Pendleton, whose mother, Mrs. J. Davies, in forwarding the photograph, tells me "He lives and loves trains". This is scarcely surprising when you see the complete nature of the layout, which is not a big one, but which, within a baseboard area of 6 ft. by 4 ft., includes many features of interest. It has double track main line, two stations, locomotive yard and siding, and a miniature road system that makes its way across the centre of the countryside in the middle of the layout board.

Very effective use is made of lineside buildings, while miniature figures, animals and cars add a splendid aura of "life" to the system generally. There is a varied selection of rolling stock, both passenger and goods.

WHEN THE RIVER CARRIED LONDON'S TRAFFIC

(*Continued from page 223*)

were oscillating, compound and side-lever engines and even boats powered by Newcomen atmospheric engines, although these had been mostly replaced by mid-century. One or two were without condensers, consequently discharging their exhaust directly to the funnel and puffing like railway locomotives.

The early inter-city steamers had few navigating aids and their crews did not wear uniform. "Call boys" were placed at the engine room hatches. Their task was to shout down, to the engineer, the orders of the skipper who, in the earliest paddlers of all, simply stood on one of the paddle boxes. On later boats a very simple bridge was erected for him between the two paddle boxes. The wheel and helmsman were right aft, among the passengers, and a large notice was displayed requesting that people should not engage the steersman in conversation.

The companies working these ferry services were at their most prosperous about 1850. From then on, times became increasingly difficult for them; fewer people were travelling, despite the fact that fares were low and the services speedy. The various owners thought that by amalgamation they could lower their costs and improve still further the facilities they could offer to the public and so, in 1876, the Woolwich, Citizen and Waterman concerns—principally—combined to form the London Steamboat Company with a fleet of 70 vessels.

Unfortunately, in 1878 the new company's *Princess Alice* was involved in a shocking disaster. Originally built by Caird and Company of Greenock, in 1865, for the Wemyss Bay Railway Company, and then named *Bute*, the *Alice* was nearly 220 feet long. Weighing 171 tons, she was flush-decked and twin-funnelled. On September 3, 1878, 900 passengers left London Bridge for Sheerness. Returning home the excursion steamer, at about 8 p.m., collided with the collier *Bywell Castle*. The *Princess Alice* broke in two, and in five minutes 700 lives were lost.

After this tragedy, which was due to an error of navigation aboard the pleasure steamer, public patronage of all the river excursion steamers severely declined. Then, in 1884, another company was formed to take over the assets of the London Steamboat Company. This was the River Thames Steamboat Company, but their operations were not successful either, and on June 1, 1886 the business was offered for sale by tender. No purchaser, however, came forward.

So matters continued until the end of the century, and then in 1902, the Thames Steamboat Company announced that all services would cease. Some people still thought that the inter-city steamers performed a useful service, and in 1904 the London County Council obtained powers to enable them to operate steamer services on the River Thames which, it was hoped, would help to alleviate traffic congestion in the city. The council's fleet of 30 specially-built vessels commenced operations in June 1905. King George V, then Prince of Wales, opened the service. The opening ceremony did not go well, and unfortunately, indicated the future history of the steamers. On the first day there were delays, collisions and minor damage to the steamers, the catering arrangements were exceedingly bad, and to make matters worse, there was heavy rain—and some critics seemed to think that the L.C.C. was responsible for that, too!

The first winter during which the steamers worked, that of 1906 to 1907, was foggy; the summer that followed was wet! Punctuality was poor and mishaps were frequent. In May 1907, the venture was abandoned and fourteen of the L.C.C. steamboats were taken over by the City Steamboat Company, who worked them on the river until the outbreak of war in 1914.

During the last war, ferry steamers again plied on the river, in September 1940, when the Port of London Authority and the London Passenger Transport Board, at a time when land services had been disrupted by Nazi bombing, jointly ran passenger-carrying steamers of various types between Westminster and North Woolwich, calling at the intermediate piers of Tower Bridge, Cherry Gardens, Tunnel, S.W. India Dock, Greenwich and Brunswick. The journey took two hours, twice the time necessary on land, and the service was twice interrupted by mines in the river. Consequently, patronage was not very good, and the service was withdrawn on November 2, 1940.

Monthly Feature For Two-Rail Enthusiasts

A LAYOUT FOR GOODS TRAFFIC

OUR Two-Rail layout this month is designed mainly for the operation of goods trains. It consists of an oval track with an inner loop line from which a branch leads to a two-road engine shed. A group of five sidings leading from the upper track form, in effect, a miniature marshalling yard where shunting operations can be carried out. Travel on the layout should be clockwise, so that an engine disposing of a train can back it into the sidings and, by means of the Uncoupling Rails, detach various items of rolling stock. The trains can be re-made in any order desired.

Alternatively, an engine bringing in a train can shunt the vehicles off into the various sidings and after having done so, can then proceed to the engine shed. A fresh engine can then pick up the train and traverse the main line for as many circuits as the operator desires. This procedure can be repeated any number of times. To vary the

By "LINESMAN"

running a little, perhaps some wagons could be shunted into the long siding which leads from the lower main track. As a matter of fact a whole train, complete with engine, could be side-tracked here while a passenger train traverses the main line.

Two Isolating sections are available and these are situated on the main line. By means of one or other of them an engine or train can stand while another engine carries out movements to and from sidings which necessitate it entering the main line. The Single Isolating Rails are wired with the Points, the wiring being shown separately in this month's diagram.

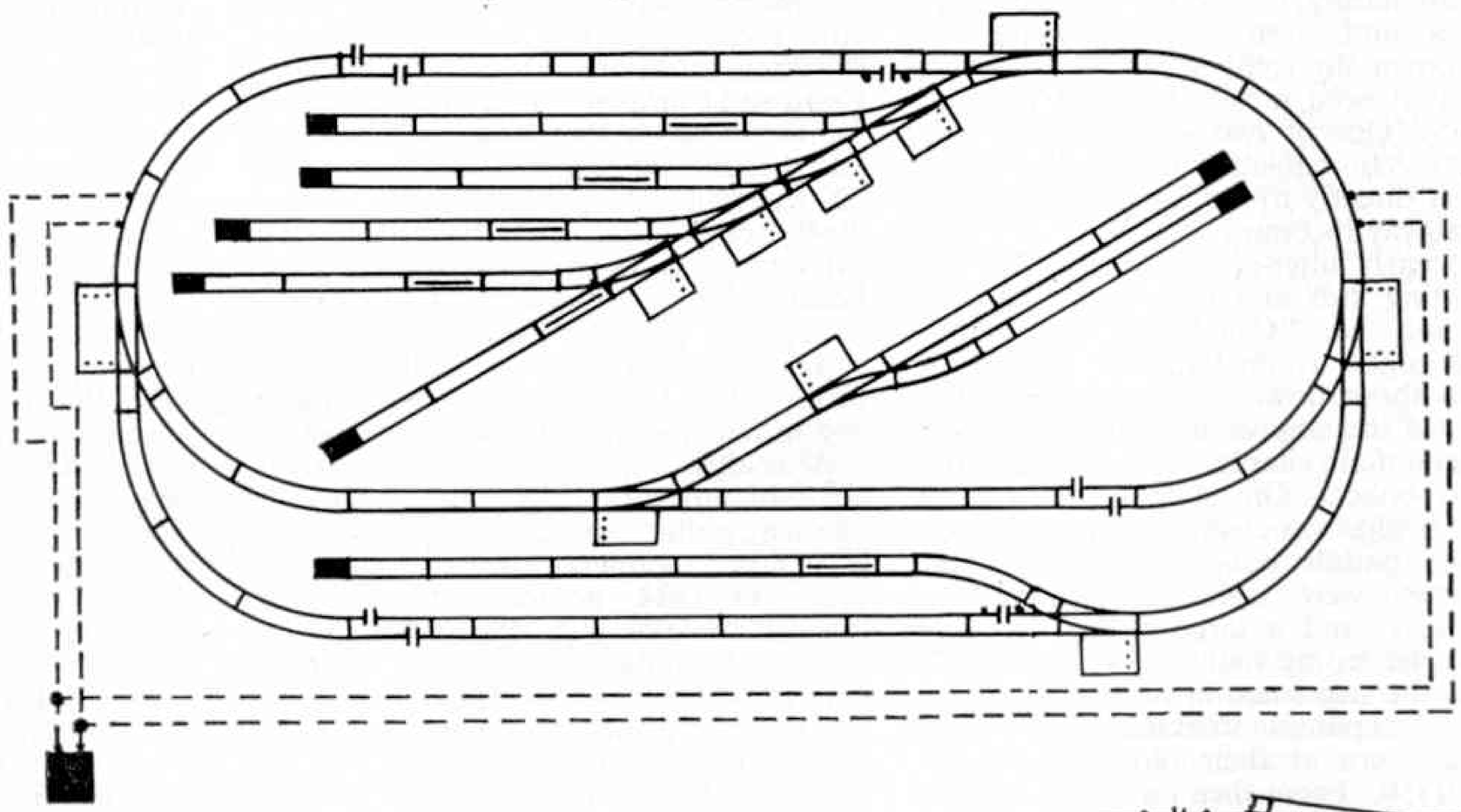
In order to make for easier operation, the Points controlling the inner main loop should be Electrically Operated. If the wiring shown in the appropriate diagram is followed you will find it allows for the two Points to be worked simultaneously by the one 1614 Switch. The Power Control Unit used must have an output for working accessories as well as one for operating a train.

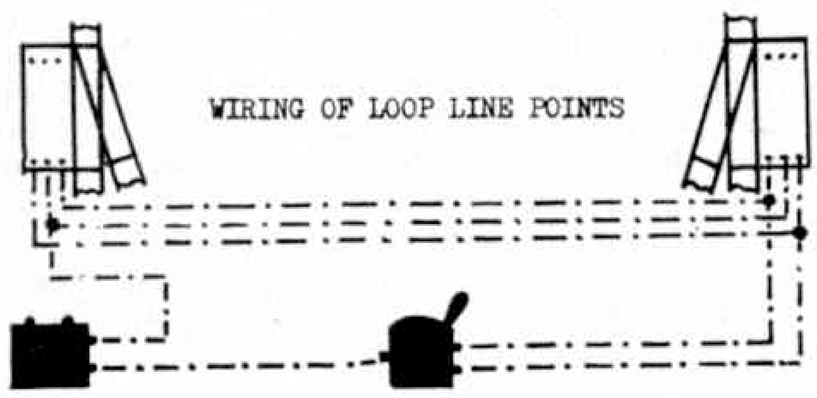
The whole layout, including Control Unit and accessories, will fit on a baseboard measuring 7 ft. 6 in. × 4 ft. 6 in.

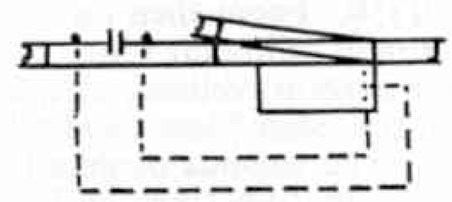
A general diagrammatic view of this month's layout, showing separately the system of wiring points and the Single Isolating Rails.

ITEMS REQUIRED

15	Curved Rails	2710
2	Curved Terminal Rails with Suppressor	2714
1	Curved Half Rail	2711
10	Curved Quarter Rails	2712
28	Straight Rails	2701
8	Straight One-Third Rails	2703
10	Straight Two-Third Rails	2702
3	Straight Short Rails	2706
2	Straight Two-Third Single Isolating Rails	2738
3	Straight Two-Third Double Isolating Rails	2739
6	Uncoupling Rails	2745
2	Left Hand Switch Points	2729
6	Right Hand Switch Points	2728
1	Left Hand Point Electrically Operated	2732
1	Right Hand Point Electrically Operated	2731
1	Switch	1614
8	Buffer Stops	2450
1	Power Control Unit	



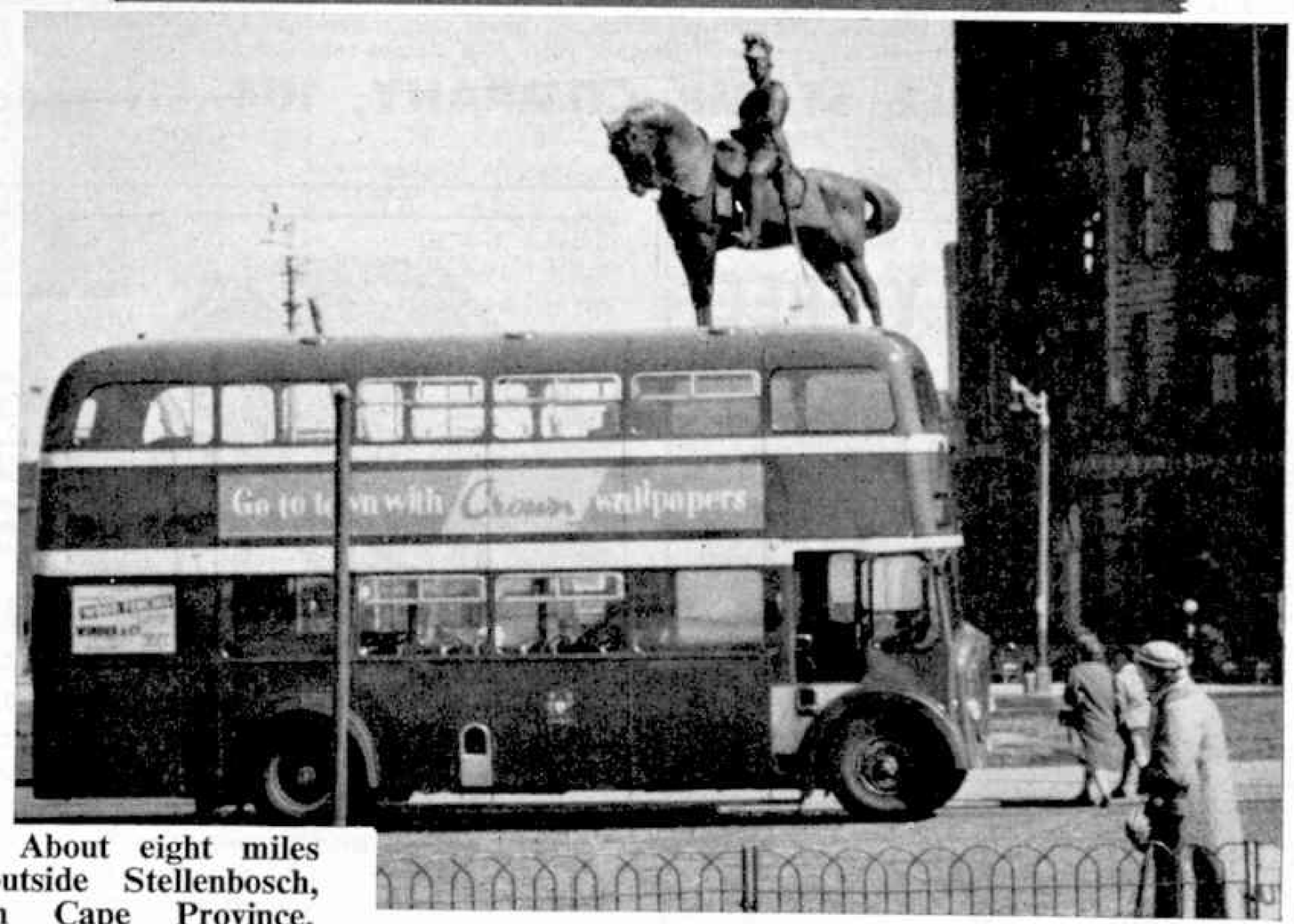




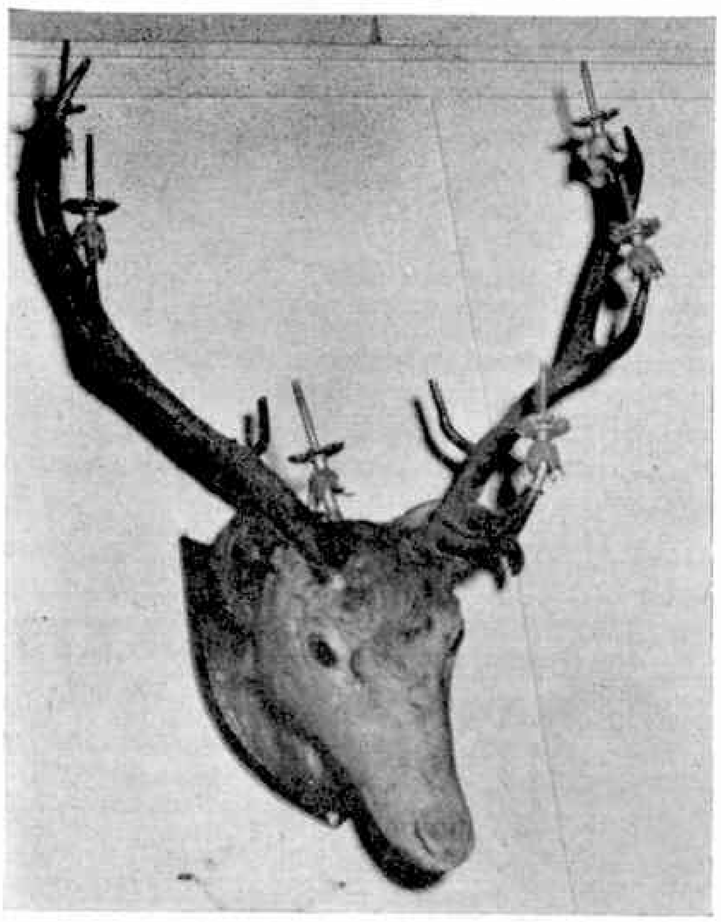
WIRING OF SINGLE ISOLATING RAIL

OF GENERAL INTEREST

At one time, trade signs over shops were quite commonplace, being generally in the form of a Red Indian, a Blackamoor page, or a Highlander. Very few remain, but *M.M.* readers living in or visiting London can see a splendid example in Brompton Road over a clock shop and jewellers on the right of the road going towards Knightsbridge. The figure is of a naval officer of the Nelson period, complete with sword, using a sextant—or "shooting the sun" as it was once termed. Picture and details from *M.M.* reader Cyril M. Rowson of Liverpool.



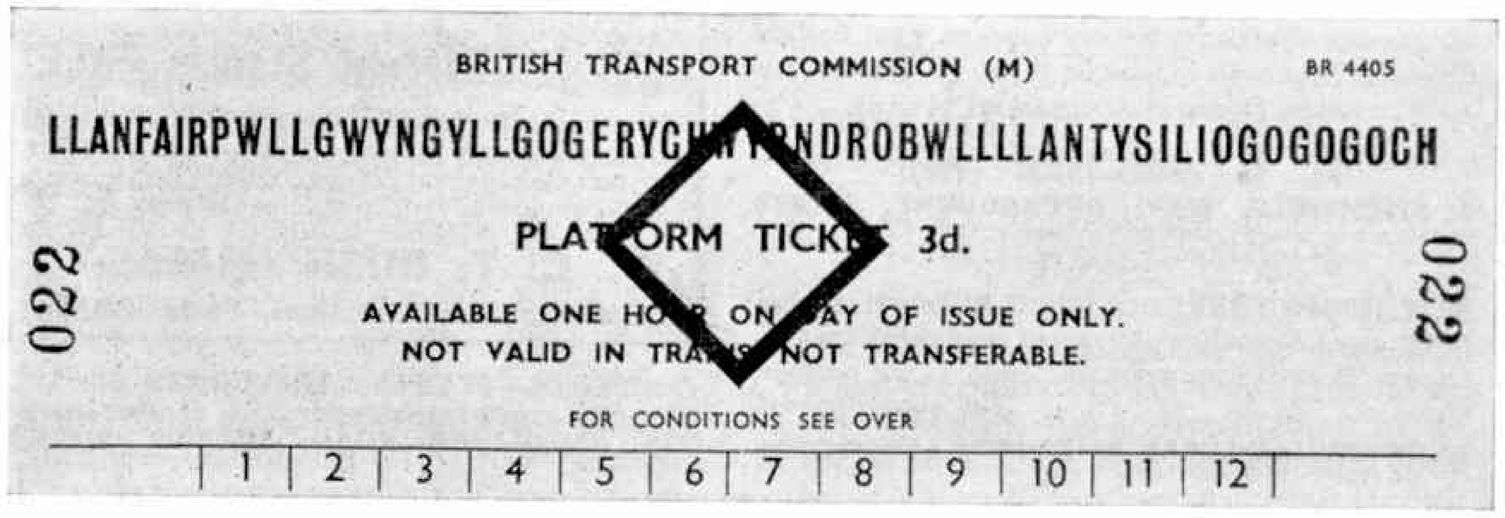
Maybe the conductor called out "Room on top!", but this is ridiculous . . . Whoever heard of a horse standing on top of a bus—and going the wrong way into the bargain? This unusual photograph of the King Edward VII statue at Liverpool Pier Head comes from James J. Brennan, of Liverpool 4.



Stags' heads are familiar trophies, but few can have served such a strange purpose as that shown here. The metal tips on each antler once flickered with the glare of gas jets, for this head was one of a collection which, during the later years of last century, were installed to decorate and illuminate the private theatre of Tettenhall Towers, near Wolverhampton, then owned by a Colonel Thorneycroft. On gala nights, these heads provided 870 lights to light auditorium and stage. The Towers was demolished in 1944, but the Gas Authority rescued this unusual piece of Victoriana, and it is now a prized possession in the West Midlands Gas Board's private museum.

About eight miles outside Stellenbosch, in Cape Province, writes C. F. Heyns, a South African reader, is an iron cannon (right) on a high hill. It was placed there in 1776 and to this day the hill is known as "Kanonkop", meaning "Hill of the cannon." At Cape Town there was a similar cannon on a hillside, with others at strategic points inland. When a sailing vessel on its way to or from India was sighted, the cannon at Cape Town was fired. The shots were heard at Stellenbosch and the cannon there was fired. This process was continued until the news reached farmers in outlying areas. On hearing the shots they proceeded to Table Bay with vegetables and livestock for the visiting ship.

The world's biggest platform ticket is now available for the station with the longest name. The illustration below shows the special ticket—actual size is six inches by two—introduced in response to requests from visitors and enthusiasts for a ticket bearing the full name of the famous station in Anglesey.



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50	Great Brit.	4/-	25	Roumania	2/6
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FOR OTHER STAMP ADVERTISEMENTS SEE ALSO PAGE 255

For Stamp Enthusiasts

Ninety-Nine Islands

By F. E. Metcalfe

IT is about an archipelago of ninety-nine islands—in other words Seychelles—that I am writing this month, or rather about its stamps. Ever since that special issue last December, commemorating the centenary of Seychelles first post office, and about which I wrote in my April *Stamp Gossip*, there has been an increased interest in Seychelles stamps. The big colourful issue released on February 21 this year is adding to that interest to such a degree that now is surely the time to give a brief survey of Seychelles philatelic history.

But before we get down to stamps, I would like to write a few words about those ninety-nine islands, situated in the Indian Ocean, which make up the country under review. A Portuguese navigator, one Pedro Mascaregnas, is said to have been the first European to discover the islands; surely not the first human being to visit them, of course, for Arabs and Persians must have sailed in those parts long before that. Anyhow, little happened in the Seychelles for a couple of centuries after the visit of Mascaregnas, beyond the fact that the islands provided shelter for pirates who, it is said, infested the Indian Ocean.

During the middle of the eighteenth century the British and the French were fighting one another as to who should hold sway in that part of the world, as the Indian Ocean was the route to the East (there was no Suez Canal then) and the French had some advantage, being in possession of nearby Mauritius. About that time they set out to explore the archipelago, and that was when it was given its present name, after the then French Controller-General of Finance, Vicomte Moreau de Séchelles.

Little was done, however, in regard to inhabiting the islands until 1768, when the French made attempts to establish a spice industry to compete with the Dutch East Indies (with no "fridges", it was very necessary to "combat" high meat with plenty of pepper and suchlike). Came the war ten years later between the French and ourselves, and during this period a French slave ship is said to have hoisted a British flag as it approached Mahé, the principal island, believing that we were by then in possession. The inhabitants, fearing the worst, set fire to the spice plantations, and that was that. Things dragged on until early in the nineteenth century when we gained possession of both Mauritius and Seychelles—but not before there had been plenty of argument about the situation, and this brings me to the stamps.

The first records concerned with postal matters in Seychelles are dated 1850. That was when an official from Mauritius was sent over to Victoria, the capital on Mahé, and on December 11, 1861, the first Seychelles post office was opened. The stamps were similar to those used in Mauritius, but a special cancellor—"B64"—was used, and Mauritius stamps with that cancellation are much sought after by collectors of Seychelles stamps. They are not outstandingly rare, as this arrangement went on until 1890, but if you happen to have any of such on cover, with nice clear cancellations, keep them like that, for they are certainly nice property.

The next philatelic move was an announcement in the Seychelles Government *Gazette* of April 5, 1890, to the effect that Seychelles postage stamps were on sale, and that after three months Mauritius stamps, hitherto all that were available, would no longer be valid in Seychelles for postage. By modern standards and taste, those first stamps were anything but attractive as all they bore, in a sea of detail, was the head of Queen Victoria. They were the "head" type, as these stamps are known to collectors.

Seychelles continued with head type stamps (with the exception of the KGV Jubilee and the KGVI Coronation stamps) until 1938, first with those already mentioned—with the Queen's head—followed by stamps of the same design but bearing the head of King Edward VII, and then the head of King George V. From 1893 until 1902 the then current stamps were overprinted with other values, and just as happened last year when the stamps of the southern African protectorate were overprinted, they caused a lot of excitement among old collectors. Some of the stamps are indeed rare.

In 1938 came the semi-pictorial issue of King George VI, to be followed in 1952 with another definitive issue on more or less the same lines. When the time came for a new issue, to mark the change in Sovereign, the same designs were used again, with the Queen's portrait substituted for that of her father, King George VI. Of course, there were the usual "Victory", "Royal Silver Wedding" and "U.P.U" issues, but these did not differ in design from those issued by other colonies to commemorate these events, and there is no need to detail them.

This brings me to the handsome issue of February 21 this year. Although the designs of Seychelles stamps were indeed dull until 1938, the new issue surely makes up for all that drabness. The Seychelles now has a set (in what might be described as glorious Technicolor) of fifteen values, the designs of which cover every phase of island life; and the surrounding seas are not overlooked either, as on the 70c. stamp we get a fine picture of the sail-fish (*Histiophorus gladius*). This is a fish which grows up to 20 feet in length and provides much sport for those who like to indulge in such a pastime. When the fish is in a calm sea it may laze on the surface with its huge fin erected like a sail—hence its name.

In this latest set we get birds, plants, buildings, etc., and while the colours may look a bit garish I found, after I had mounted my set, that a really wonderful page had been added to my album. You will discover the same thrill if you treat yourself to a set. Summing up, there are more interesting countries than Seychelles, perhaps, but you will find it difficult to get a more interesting set than this new one for the ninety-nine islands.

Stamp Gossip

Beautiful Designs

WITHOUT a doubt stamp collectors have, indirectly at any rate, been responsible for a development of art in miniature. Not long ago I had a look at a collection of modern Austrian stamps

which had been gathered with great care by a quite young collector who, without having much money to spend, had achieved something which absolutely charmed an artist who was looking at the collection at the same time as myself.

I thought of this when, quite recently, I received a large envelope from the Austrian Post Office. (The gorgeous stamps on the envelope meant that yet another young collector would not give me any peace until I had given it to him, much to my regret, really). It contained details of the service which the Austrian Post Office gives to collectors, as well as to dealers, who want to buy current stamps of that country. Also, there were several illustrations of these stamps, and I must say the beauty of most of them really took my breath away. I wanted to rush off and order all that were still current, and I think you would feel the same way if you could see those illustrations. And I think you can see them if you write to the Osterreichische, Post - Briefmarkenversandstelle, Vienna, Austria, and ask for details (with illustrations) of Austrian stamps available for sale. And if, when you see what is on sale, you can resist buying, or collecting modern Austrian stamps, you are a better man than I am, Gunga Din!

STAMPS IN ORBIT

I looked in a stamp dealer's window the other day, and what a display of stamps there was devoted to the exploits of the American and Russian spacemen. Needless to say most of the stamps had not been issued in honour of Gagarin, Titov and Glenn, but rather with the object of gathering collectors' loose cash. There was one stamp, however, which did not come into this category—the 4c. issued by the United States to commemorate the triumph of their own Glenn. All the world must give full credit to the American Government for their display of courage in hiding nothing from the world when they were planning to send Glenn aloft. Their failures as well as their success were there for all to see. But there *was* a little secret—the Post Office had prepared a stamp to be issued when success came, as come it did, and the stamp, which is illustrated here, is distinct from so many of the "Astronaut" issues which filled that shop window.

And here is an interesting point. Discussing these latter stamps with the dealer, I mentioned that no doubt it would only be the very young collector who would buy them. "Not on your life", was the reply. "As a matter of fact, young collectors are particularly keen on our own Commonwealth stamps, especially those of the KGVI–QEII period. On the other hand, the percentage of grown-ups who buy 'special' stamps is larger." A case of pop commandeering Tommy's train, I suppose.

NATIONAL DAYS

The days when stamps were merely produced for strictly postal purposes is long past. Even our own Post Office, the most conservative of all when it comes to issuing new stamps, has long since departed from the plan, and of course most other postal administrations are simply falling over one another in their efforts, by means of attractive scraps of paper, to celebrate all kinds of events and, of course, to get collectors to pay for the publicity. A popular event which many countries mark with a special issue is National Day. This generally refers to the anniversary of the day on which independence was achieved. The Singapore stamp reproduced here was issued to mark the third anniversary (on June 3) of the attainment of full self-government. The design is quite interesting, which is why I picked this one out, the official description being that it illustrates the role of labour in nation building. As a set of two will cost only a copper or two no one can accuse the Singapore Post Office of trying to "milk" collectors, which is another reason for mentioning this issue.

"STAMPEX" SHEETS

No doubt a number of *M.M.* readers visited the "Stampex" Exhibition held at Central Hall, London, during March last. I hope, too, that they also attended the exhibition of stamps held at the British Museum at the same time, to mark the tenth year of Queen Elizabeth's reign. This stamp show in that august building was a real triumph for the museum authorities in general, and for Mr.

(Continued in column two, next page)

By E. W. Argyle

Locomotives On Stamps

A FAMOUS American railroad incident is recalled by the stamp shown above, issued by the U.S. Post Office in 1950 to honour American railwaymen. The big Rogers-built 4–6–0 locomotive on the left is No. 382 of the Illinois Central R.R. which, on April 30, 1900, headed the "Cannon Ball Express" out of Memphis, with Driver "Casey" Jones (shown in centre of stamp) at the controls. She left Memphis at 12.35 a.m.—one and a half hours late—for Canton, and at 3.52 a.m. approaching Vaughan, Missouri, on a concealed bend, ran into the rear of a freight train, just after the driver had told his fireman to jump. Jones was killed—the only casualty. On the right of the stamp is a streamlined modern diesel-electric of a type used for hauling the fastest express trains in the U.S.A.

Götthard Line express locomotive No. 11,852 of the AE8–14 type is depicted on this Swiss stamp. This locomotive was completed in 1914 and was jointly built by the Swiss Loco Works at Winterthur and the firm of Maschinen Factory Oerlikon.

1,000 Stamps at **2d.** each. In the comfort of your own home you can select the stamps of your choice from a box containing 1,000 British Colonials and Foreign, mint and used at 2d. each. If under 16, parents' approval essential.

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FOR OTHER STAMP ADVERTISEMENTS SEE ALSO PAGE 252

MASSIVE WELDING MANIPULATOR

A massive welding manipulator has recently been installed in the works of Fairey Engineering Ltd., Stockport, by Donald Ross & Partners Ltd., of Crawley, Sussex. This positioning equipment is known as a universal ring type manipulator and is designed to facilitate the welding of a number of huge fabrications for the new Trawsfynydd nuclear power station, in North Wales.

The manipulator is of the ring chassis type and consists essentially of two large rings mounted on a roller bed set and connected by a central member. A turntable is mounted on the central member and the manipulator can handle components weighing up to fifteen tons and up to 20 feet in diameter. The equipment is so designed that the roller bed set can handle loads up to 50 tons in conjunction with another roller bed set.

Push button controls are provided to manipulate the workpiece through 360 degrees on either axis for manual or automatic welding. The equipment also incorporates a variable speed motor so that it can operate in conjunction with an automatic welding machine mounted on a boom.

Stamp Gossip—

(Continued from previous page)

MacKay in particular. But it is the miniature sheets issued by the sponsors of the "Stampex" Exhibition about which I want to write, as more than one young collector has asked me what is their postal status? The short answer is none, though pukka stamps are illustrated, and as collectors' items, particularly in the U.S.A., they are quite popular.

The illustrations on the sheet released this year were five British, and so popular were the sheets that sales exceeded 110,000, which is more than are the total sales sometimes of quite attractive postage stamps; but I know which I prefer, although there is one point to remember. This yearly London stamp exhibition is very beneficial to the hobby of stamp collecting, and when you buy one of these sheets (which only cost about 1/6) you are not only obtaining a nice bit of printing, if I can put it like that, but actually making the exhibition possible on its present large scale.

THE TIP OF THE MONTH

I was discussing with a dealer the interesting and inexpensive stamps which India issues from time to time. I knew that being so cheap they were popular (for that means that even junior collectors can afford to buy them) but I was quite surprised when he told me how large his sales have become, and it was he who suggested that some of the earlier special issues of this great country would be well worth buying at present prices. Mind, while there is no difficulty in getting these stamps when they first appear—and used of the earlier issues seem to be about in plenty—the earlier mint stamps, to which the dealer was referring, are undoubtedly getting more difficult all the time to obtain cheaply, so what about it?

VETERAN AND VINTAGE—IN PUBLIC TRANSPORT

There has been, in recent years, a considerable increase in the number of transport enthusiasts interested in the preservation of obsolete vehicles, and due to the efforts of various individuals and groups many trams and buses have been saved from the oblivion of the scrap heap. These vehicles will help to give future generations some idea of the means by which people travelled to and from work, or on pleasure trips, in the first 60 years or so of mechanical traction, although a few horse-drawn trams and buses are included in the collections.

Veteran and Vintage by David Kaye, who each month contributes "Calling All Bus Spotters" to the *M.M.*, is just the book to appeal to the devotee of public passenger transport. It contains 55 illustrations, the majority of which show preserved trams, buses and trolleybuses. Most of the illustrations are accompanied by a description of the vehicle concerned, with brief historical notes. In addition, there is an appendix of vehicles that have been preserved, giving their ownership and, in some cases, their location. The book is published by Ian Allan Ltd., at five shillings.

BOOK REVIEWS

* * * *

Locomotives of British Railways, by H. C. Casserley and L. L. Asher (Spring Books, 21/-), forms a pictorial record of all steam locomotives that passed into the ownership of British Railways at the formation of our nationalised railway system, and those built subsequently up to March 1960, when the construction of new steam locomotives ceased. The origin and history of the various classes in numerical order, region by region, is briefly covered, so that the book is most useful for reference, but undoubtedly its chief appeal lies in the variety and scope of the illustrations which for the most part are from photographs by H. C. Casserley. These include the various classes of locomotives not only in their accepted standard forms, but also illustrations showing examples of modifications, variations and so on.

Many of the engine classes shown have become extinct since nationalisation, so the book forms a useful and attractive record of the now-disappearing steam locomotives. Twenty thousand of them were taken over by British Railways; only seven thousand are expected to remain by 1963, a sobering thought for the steam lover, for whom the book will be a permanent reminder of so many old favourites.

* * * *

M.M. readers who are photographers will find *Photographers' Dictionary* by Maurice L. Haselgrove (Arco Publications, price 18/-) most useful.

The book is divided into two parts. In his Introduction the author gives a clear and concise account of the whole process of photography, ranging from descriptions of different kinds of cameras and details about taking pictures to instructions for developing films and making enlargements from your own negatives. In the extensive Dictionary section, photographic terms are dealt with in detail and much useful information is given. Even such "mysteries" as *Mired* values in colour photography are clearly explained.

The book is well illustrated with line drawings and photographs. **C.J.S.**

Specially For Photographers

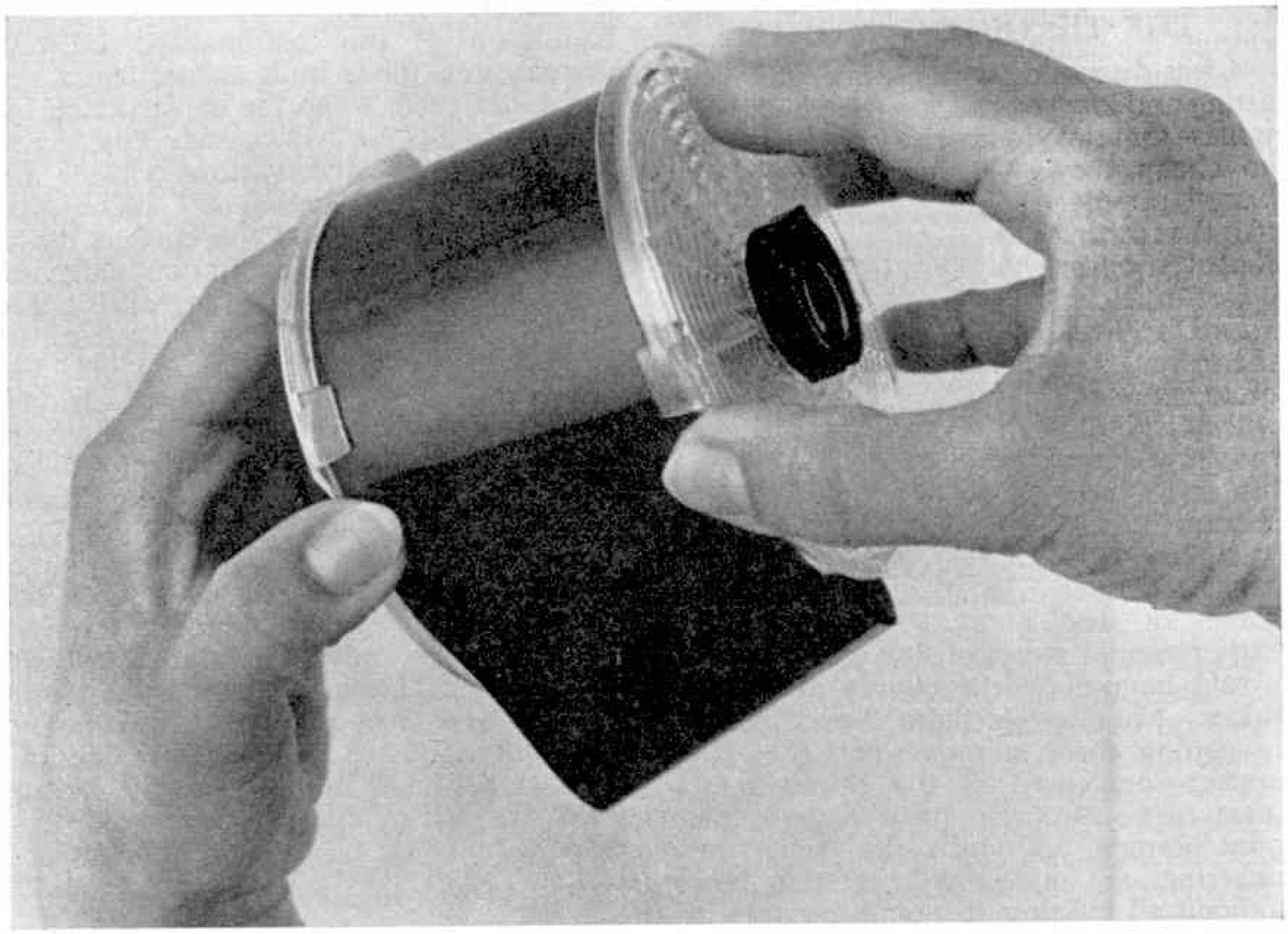
By H. G. FORSYTHE

FURTHER STEPS IN DEVELOPING

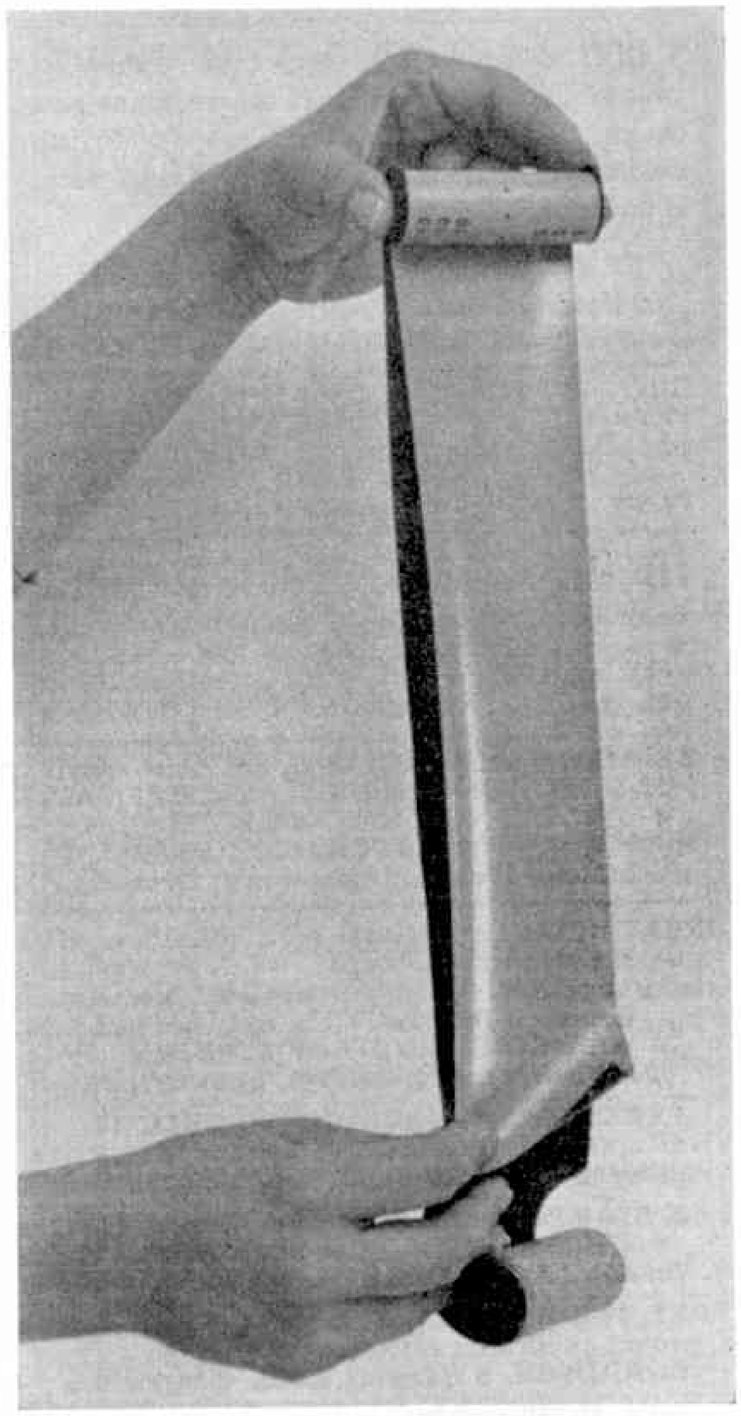
TO develop a film, the first step is to load it in your tank *in total darkness*. If you have never done this before, try some practice runs with an old film, in the light, to get the feel of your equipment. A roll film consists of two parts—the sensitive film itself and the backing paper. Backing paper has the numbers printed on it and the film is attached to it by a piece of adhesive tape at one end. There is no backing paper on 35 mm. film; it is protected instead in a small tin casette.

Your first job, in the dark, is to separate film and backing paper or remove the film from its casette. Then load it on to the spiral spool of the tank. Tanks differ slightly in methods of loading, so read the instructions carefully first. As soon as the film is securely on the spiral spool, put it in the tank and put the lid on firmly. Now everything else can be done in ordinary light. Here, step by step, is your processing guide:

1. Make up your developer and fixing solutions according to instructions enclosed in the packets. Make sure the quantity of each is right for your tank.
2. Measure the temperature of the developer. For best results it should be within the range 65 degrees–75 degrees F. Cool or warm it as necessary.
3. Look up the recommended developing time at the temperature of your developer for the type of film you are using. These figures are usually found in the instruction leaflet provided with the developer.
4. Pour in the developer quickly and smoothly through the hole in the lid. *Note the time.*
5. Agitate the developer according to the instructions provided with the tank, first for about 30 seconds, as soon as pouring in is complete, and thereafter for about ten seconds every minute during development.
6. At the end of development time pour away the developer as quickly as possible *without removing the lid.*
7. Pour in water to rinse the film. Agitate for about a minute.
8. Pour rinse water out.
9. Pour in the acid-fix solution. Fix for about fifteen minutes, agitating the solution from time to time.
10. Pour fixer out. (Note: Fixers can usually be used more than once, as can some developers. If you wish to keep these solutions, make sure you have some clean bottles which can be securely stoppered.)
11. Remove the lid of the tank and wash the film. If you have a piece of rubber tubing, attach it to the tap and let water flow into the centre hole of the film spool. Wash for at least 30 minutes in *running* water.
12. Carefully remove the film from the spiral spool, taking care not to touch the emulsion surface while it is wet.
13. Attach clips to top and bottom ends of the film and hang it up to dry in some dust-free room or cupboard.
14. When dry, cut the film up into individual negatives or strips of negatives and store them in suitable envelopes.



Loading a film on to one type of developing tank spool. This operation must be done in total darkness.



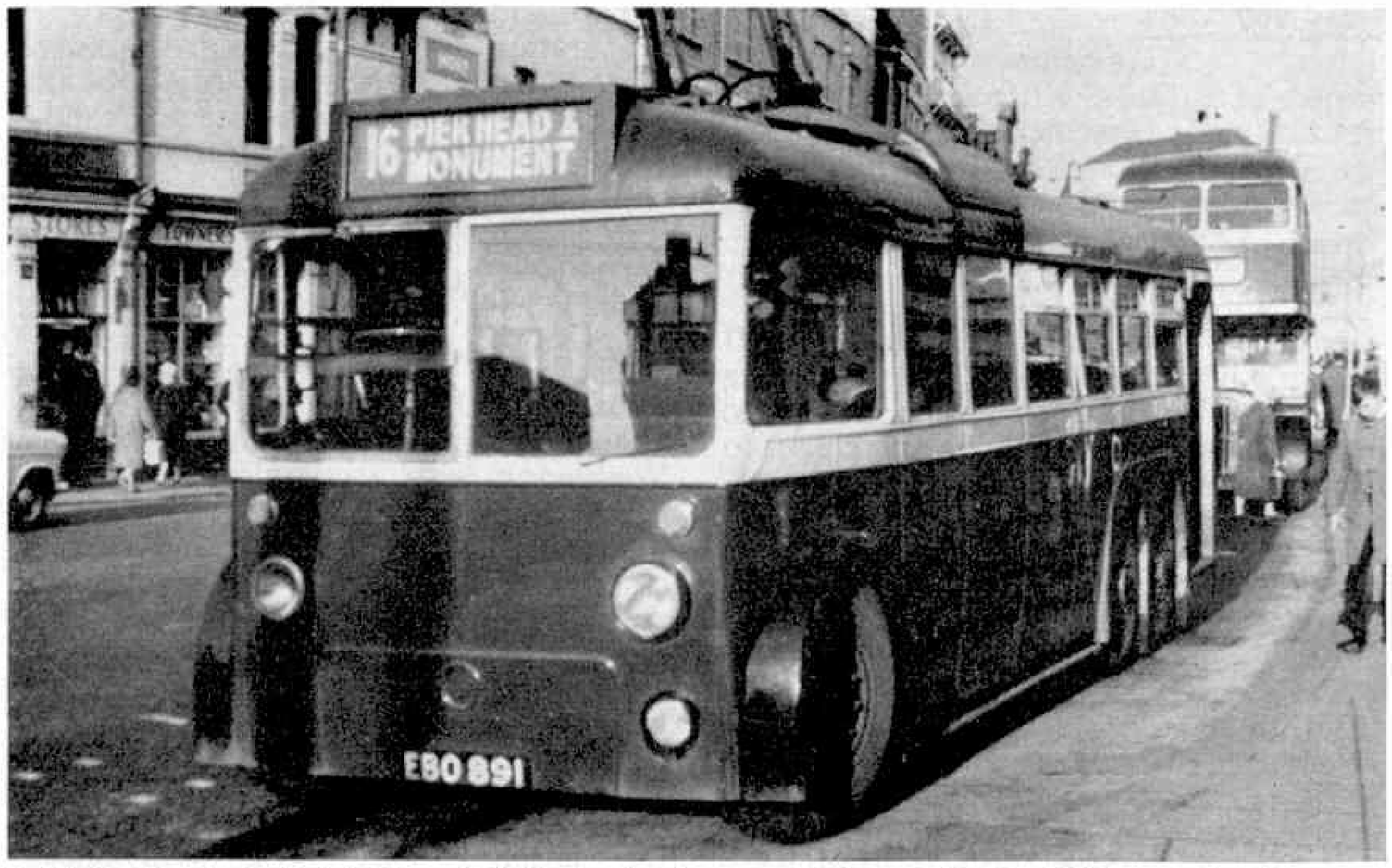
Inside a roll film. The sensitive film itself is coiled inside the backing paper.

The following hints may be helpful to you: Exposure right, but negatives too dense and contrasty—cut development time by 25 per cent. Negatives too thin, but full of detail—increase development time by 25 per cent. Streaky marks that look like streamers—insufficient agitation during development. Film has a milky appearance—not long enough in the fixer, or fresh fixer needed. Film has "tear drop" or smeary marks on the surface—these are drying marks; try a drop or two of wetting agent or detergent in the final rinse.

Next month: Making and using a Meccano Sports View Finder.

CALLING ALL BUS SPOTTERS

A Matter Of Choice



Britain has few single-deck trolleys. This illustration shows one of six owned by Cardiff Corporation Transport Department.

IN February's *M.M.*, I asked for your votes for the seven main varieties of low bridge double-decker bus now in production. Since I wrote those notes Dennis Bros. have announced that they are ceasing production of the "Loline" after the present orders have been completed. This is a pity, since they came third in the list so far as your popularity poll was concerned.

Rather to my amazement, B.T.C's ubiquitous "Lodekka" proved to be your first choice. The Bridgemaster occupied second place and the Loline was third. The four other makes concerned were Fleetline, Wulfrunian, Lowlander and Atlantean.

Now let us look at some of your reasons for the choices made. Nigel Chapman of Leamington Spa feels that the Loline and Lodekka are more manœuvrable and points out that they have less overhang than other models. Trevor Tyman of East Stanley, Co. Durham states that with their low height of 12 ft. 5 in. these two vehicles are able to go almost anywhere that single-deckers can. Although Thomas Cooper of Thulston, Derbyshire, placed these two versions well down on his list, he feels that the Loline has the edge on the Lodekka since the former can be fitted with more types of engines (including "the excellent A.E.C. AV 590") and is available with a semi or fully automatic gearbox.

BY DAVID KAYE

Turning to the A.E.C. "Bridgemaster" Thomas Cooper praises its suspension system and likes its integral construction, but wishes it could be fitted with gearboxes more suited to city work. That is why this particular correspondent places the Guy "Wulfrunian" at the head of his list, for it combines air suspension with disc brakes, automatic gearbox and maximum seating capacity. P. R. White of Grimsby considers that both the "Wulfrunian" and the Daimler "Fleetline" suffer from the disadvantage of having the driver's attention distracted by boarding passengers, as they enter the vehicle immediately opposite his seat.

The Albion "Lowlander", still being so new, appears to be rather an unknown quantity, and I would be glad to hear from any reader who has been fortunate enough to ride on one of these vehicles. The Leyland "Atlantean", it seems, is one of those vehicles which you either adore or else think unsightly, with its great capacity and its huge 11.6 litre engine at the rear.

Perhaps the last word ought to go to T. Coughlin of Stanford-le-Hope, Essex, who rather blows all these previous remarks sky high by writing, "In my opinion, none of these vehicles solves the problem of the low bridge. Why do we have to have double-decks, anyway? On the continent hardly any double-decks are used, and as for these monsters, I think they are the cause of jams." I wonder, though, how London would like to cope with a massive fleet of 45 foot single deckers to move the rush hour traffic?

* * * *

Before the second world war, several seaside resorts ran Shelvoke and Drewry "Freighters." I know that they were run at Bournemouth, Plymouth, Rhyl and Worthing, two of the cars from the last-mentioned town being shipped to Jersey in 1932, for service in St. Helier. Does

(*Continued on page 259*)

One of the 15-inch gauge tramcars which operates on the Modern Electric Tramways at Eastbourne, referred to in last month's Notes. This is a replica of a Blackpool "boat" tram. Photograph by E. Wren.

Road and Track—

(*Continued from page 229*)

variety of surfaces. After spending a night at the famous Hostellerie du Prieure overlooking the banks of the Loire, where the food and wines are magnificent, I hurried back to England.

* * * *

My next drive was in the new Mark III 100 m.p.h. Ford Zodiac, which made a very good impression. Power of its 2.6 litre, six-cylinder engine is increased to 114 b.h.p., giving lightning acceleration, comparable with many sports cars. This new Zodiac goes from a standstill to 80 m.p.h. in only 26 seconds. Along the M1 I recorded a maximum of 103 m.p.h. and cruised for mile after mile at 90 m.p.h. Vacuum servo assisted brakes with 9¾-inch front discs are well able to cope with frequent hard braking.

This new Mark III Zodiac is a major break-through by Fords in luxury motoring at a challenging (after-Budget) price of £1,070 15s. 3d., tax paid. There is a choice of Borg Warner automatic transmission or a four-speed, all-synchromesh, manual gear box, with steering column control, but the clutch pedal has rather a long travel.

Distinguished by its smart, new-style, full six-seater body, with modern front grille and four headlamps, this is easily the best equipped and most luxurious car Fords have ever built.

Along the Conqueror's Coast—

(*Continued from page 225*)

feature is that twice within 30 miles on the S.R. it reverses direction and receives a fresh engine at the other end. This happens at Redhill owing to the junction layout there, and at Brighton terminal.

On summer Saturdays many regular or relief holiday services running into Brighton and out again, and some which reverse at Eastbourne, present a variety of carriage stock, and pose not a few operating problems as they mostly travel nearly the whole length of the main Victoria tracks. By means of the West London labyrinth of connecting lines from Clapham Junction through Olympia, they proceed, for example, northbound via High Wycombe towards Birmingham, W.R. or Sheffield E.R. by the ex-Great Central route, or through Willesden Junction L.M.R. for Coventry and beyond.

For Gallantry—(*Continued from page 235*)

yards until he knew the fire could do no further damage. Then he collapsed. He died after a fortnight's fight for his life, having saved not only the aircraft but the lives of all in the vicinity.

It was not until March 26, 1950 that another George Cross came to the R.A.F., this time following an outstanding display of gallantry at the flying boat base, Seletar, where young Aircraftman Ivor Gillett was seriously wounded when the Sunderland on which he was working, in preparation for an anti-terrorist patrol, exploded at her moorings. A lifebelt was thrown to him but he was seen to hand it to a seriously-injured corporal in the water, enabling the rescuers to save this man's life. In the meantime, Gillett disappeared. Two days later his body was washed ashore.

* * * *

The most recent George Cross to be awarded to the R.A.F. was appropriately won in the air, on August 13, 1951. A Wellington with a complement of navigators under special training was flying high over Yorkshire. A young Air Training Corps cadet was seated in the rear of the aircraft, having his first air experience in the capable hands of Flight-Lieutenant John Quinton, D.F.C., a wartime night-fighter ace who had only rejoined the service six weeks earlier. Without warning, there was a terrible crash—another aircraft had collided with the "Wimpey", which broke up in mid-air. As the wrecked bomber spiralled towards earth, Quinton, with superhuman speed, clipped on his own parachute to the cadet's harness and pushed the boy through the gaping hole in the fuselage. All eight officers in the Wellington were killed and Derek Coates, the cadet, was the only survivor. From his hospital bed he selected the photograph of Quinton as the man who had saved him. At the inquest, the Coroner said of Quinton, "He was a very gallant gentleman."

* * * *

The story of the George Cross awards to the men and women of the Royal Air Force and the Royal Canadian Air Force is a glorious page in our history—one of great self-sacrifice and courage, and from torture and certain death from which these heroes did not flinch. Most of them lost their lives, and in dying left us an example we would do well to emulate, for as St. John said, "Greater love hath no man than this, that a man lay down his life for his friends."

Railway Notes—

(*Continued from page 241*)

down to the Teviot Valley and to Hawick, where the water tank in the corridor tender was re-filled. A shunting engine gave assistance in rear just to get us under way on to the severe, winding eleven-mile ascent, amid desolate mountain terrain, to Whitrope Tunnel and the summit just beyond, where the weather can be appalling! Harder work for locomotive and fireman was involved than on the climb to Falahill; yet, with similar speeds and handling, with something to spare, we were over the top in 26 minutes.

* * * *

Now came a long, thrilling descent, with numerous brake applications, when we seemed to be hurtling down the very slopes of the Cheviots in the midnight blackness, with the Kettles in calm and competent control. So we came into the Lowlands. Twenty miles of varying speed, with changes of regulator and reversing screw according to the grades, brought us across the English border and the outpost lights of Carlisle.

Finally, after crossing the main Glasgow lines by flyover bridge and threading its way, with signal checks, through various junctions, *Captain Cuttle* was pulled up in the long No. 2 platform at Carlisle, used for either way expresses, within a minute of working time, which was then less than it is now. The engine was detached, ready to return to Carlisle Canal Shed after its round trip to Edinburgh and back—a strenuous journey for both engine and crew.

The A3 locomotives continued to be a mainstay of the "Waverley" until quite recently, when diesels began to take a greater share in the workings, but ex-L.N.E.R. Pacifics are still seen.

A Unique Frontier Road—

(*Continued from page 237*)

last vehicle made its run along the plank highway. A public thoroughfare of this type will probably never exist again, even in the remote Queen Charlotte Islands for there, today, the price of lumber has risen to the point where a 14-mile plank road would be too costly an enterprise.

Now, this gleaming white route of fourteen straight miles has become Canada's most remarkable monument—and probably its only horizontal one. It may still be traversed by the curious visitor, by old residents, or by those who once lived there and return after many years, driven by nostalgia.

A ghostly remnant now, it will long continue under the summer sun, or the glitter of frosty mornings, cutting a straight line to the pale horizon, always bright against the grim line of the evergreens.

While it cannot endure in such a manner as the Appian Way, it will linger in the memory of many a frontiersman and pioneer in British Columbia as a helpful pathway, and the most unusual one on which he has ever travelled.

A Meccano Wall Clock—

(*Continued from page 243*)

No. 2; 13 of No. 3; 14 of No. 4; 2 of No. 6; 2 of No. 8a; 4 of No. 8b; 3 of No. 9b; 12 of No. 10; 1 of No. 11; 5 of No. 12; 2 of No. 13; 1 of No. 15b; 1 of No. 16; 3 of No. 16a; 1 of No. 16b; 4 of No. 17; 1 of No. 22; 2 of No. 24a; 1 of No. 25; 4 of No. 26; 1 of No. 26c; 1 of No. 27; 4 of No. 27a; 1 of No. 27d; 1 of No. 27c; 87 of No. 37a; 79 of No. 37b; 20 of No. 38; 1 of No. 38d; 1 of No. 57c; 8 of No. 59; 2 of No. 62; 1 of No. 62b; 1 of No. 82; 1 of No. 90a; 2 of No. 94; 1 of No. 95; 1 of No. 95a; 1 of No. 101; 1 of No. 102; 1 of No. 111; 1 of No. 111a; 4 of No. 111c; 3 of No. 125; 1 of No. 137; 1 of No. 148; 1 of No. 155; 2 of No. 162; 1 of No. 212; 2 of No. 213; 1 of No. 214.

Calling All Bus Spotters—

(*Continued from page 257*)

any reader know of any other vehicles of this make, or the whereabouts of any of these unique buses now?

I am hoping to have a column devoted to our overseas readers during the autumn. I already have some letters from which I hope to quote, but I should be glad to hear from other enthusiasts overseas in the next three or four weeks.

Finally, the illustration at the top of this month's Notes is provided by one of our readers, Michael J. Cornick, who lives at Langstone, near Newport, Mon. It shows one of the six single-deck Cardiff trolley-buses used on a route which passes under a very low bridge, and is thus quite appropriate for this issue. Glasgow has some single-deck trolleys, too, but they are a very rare breed these days.

Dinky Toys News—

(*Continued from page 239*)

M.M. readers write to me from places all over the world and my concluding paragraph this month concerns one such overseas enthusiast, 18-years-old Frank Fenech of St. Julian's, Malta, whose photograph you see on page 238.

Frank tells me that he is still keen on keeping his collection of Dinky Toys up-to-date but now possesses a real car which he bought a few weeks ago. You see him standing with his hand on the steering wheel in the picture referred to. In a recent letter Frank informed me that he was going to Italy to undertake a six-months' course of study.

"What makes you think you would make a good draughtsman?"

Fireside Fun

No Can Do!

The English can't do it.
WHAT?
The Americans can't do it.
WHAT?
The Russians can't do it.
WHAT?
Answer: Scratch their backs with their elbows.

"Was it necessary to stand back to admire your window display?"

"Lady," said the young boy, "will you give me a penny if I make me little brudder imitate a hen for you?"

"What will he do," smiled the lady, "cackle like a hen?"

"Nah, none o' them cheap imitations. I'll have him eat a woim."

* * * *

A finicky diner had found fault with everything placed before him. Finally, he asked the exhausted waiter, "Have you any wild duck?"

"No, sir," sighed the waiter, "but we can irritate a tame one for you."

* * * *

Salesman: "May I have a few minutes of your time?"

Prospective client: "Yes, if you will be brief. What can I do for you? I'm a man of few words."

Salesman: "Just the man I'm looking for. My speciality is dictionaries."

First Farmer: "Well, since Tom has a Science Degree, can you see any change in the way he ploughs?"

Second Farmer: "No, he ploughs the same. It's the way he talks."

First Farmer: "That so? How do you mean that?"

Second Farmer: "Well, when he gets to the end of a row, instead of saying, 'Whoa, Haw, or Gee,' he says, 'Halt Rebecca, pivot and proceed.'"

* * * *

Long Time No See

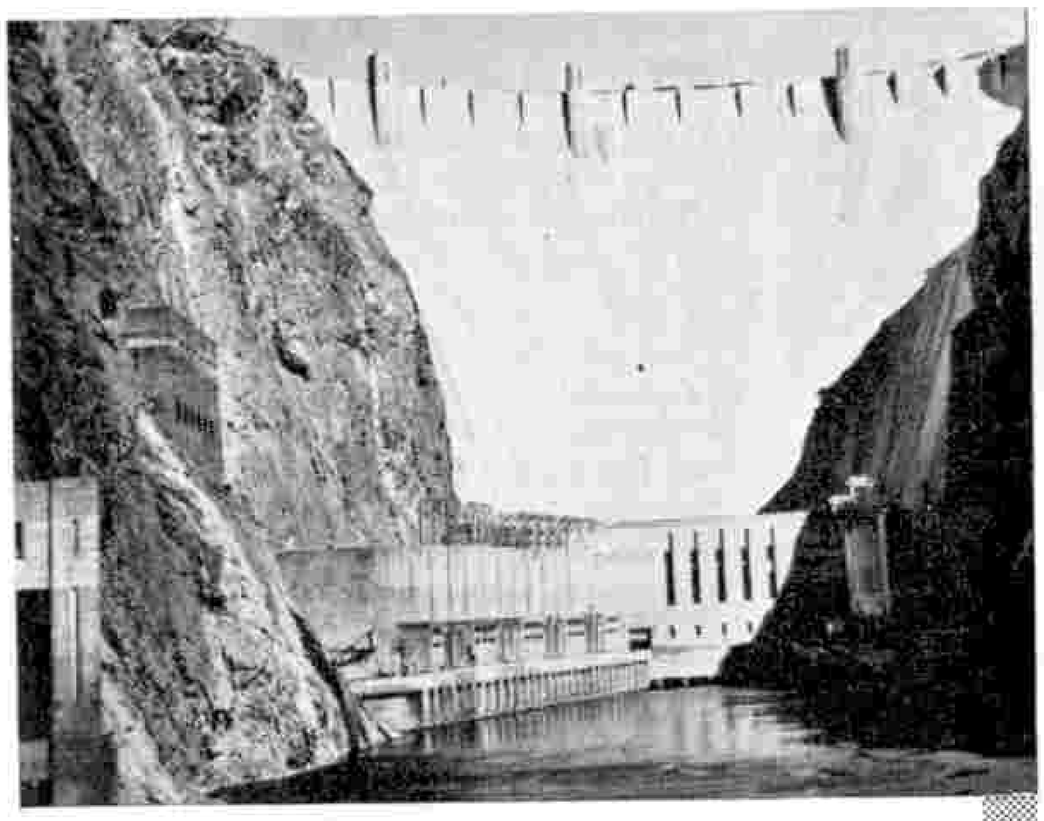
Before the tribunal in Godthaab, Greenland, an Eskimo was being accused of murder. "I would like you to tell me," said the Judge, "what you were doing on the night of Oct. 11 to April 3."

* * * *

Tom was taking the written part of his examination as a candidate for the police force. He hesitated on one question after another until he came to a real puzzler. It read, "If you were alone in a police car and were being pursued by a desperate gang of criminals in another car doing 60 miles an hour on a lonely road, what would you do?"

Tom thought for a minute and then wrote down, "70".

FICTION TO FACT



Taming Nature. Magic and nature, so important in many of Shakespeare's plays, come together in "The Tempest", when Prospero raises a magic storm to shipwreck his wicked brother.
Today, man uses many forces of nature. He stores up energy from the sun, drives electricity generators by wind, and builds great dams to harness the dashing rivers. Recently, scientists have even discovered how to produce rainfall to save crops threatened by drought. Prospero's magic art is fast becoming today's science!

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Although man cannot quell tempests, he can protect himself against the elements. For instance, Dunlop makes inflatable liferafts for safety at sea, and on land Dunlop rubber boots and "Weathermaster" car tyres help to overcome bad weather conditions.

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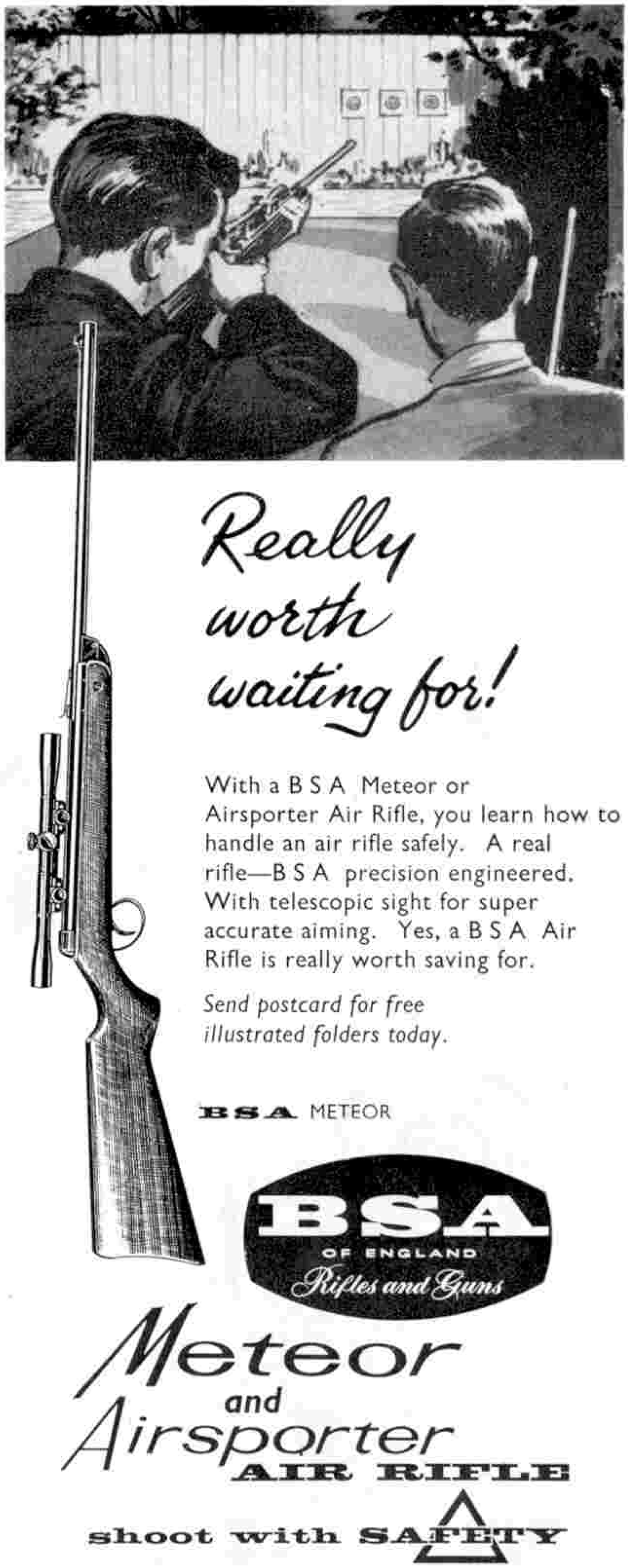

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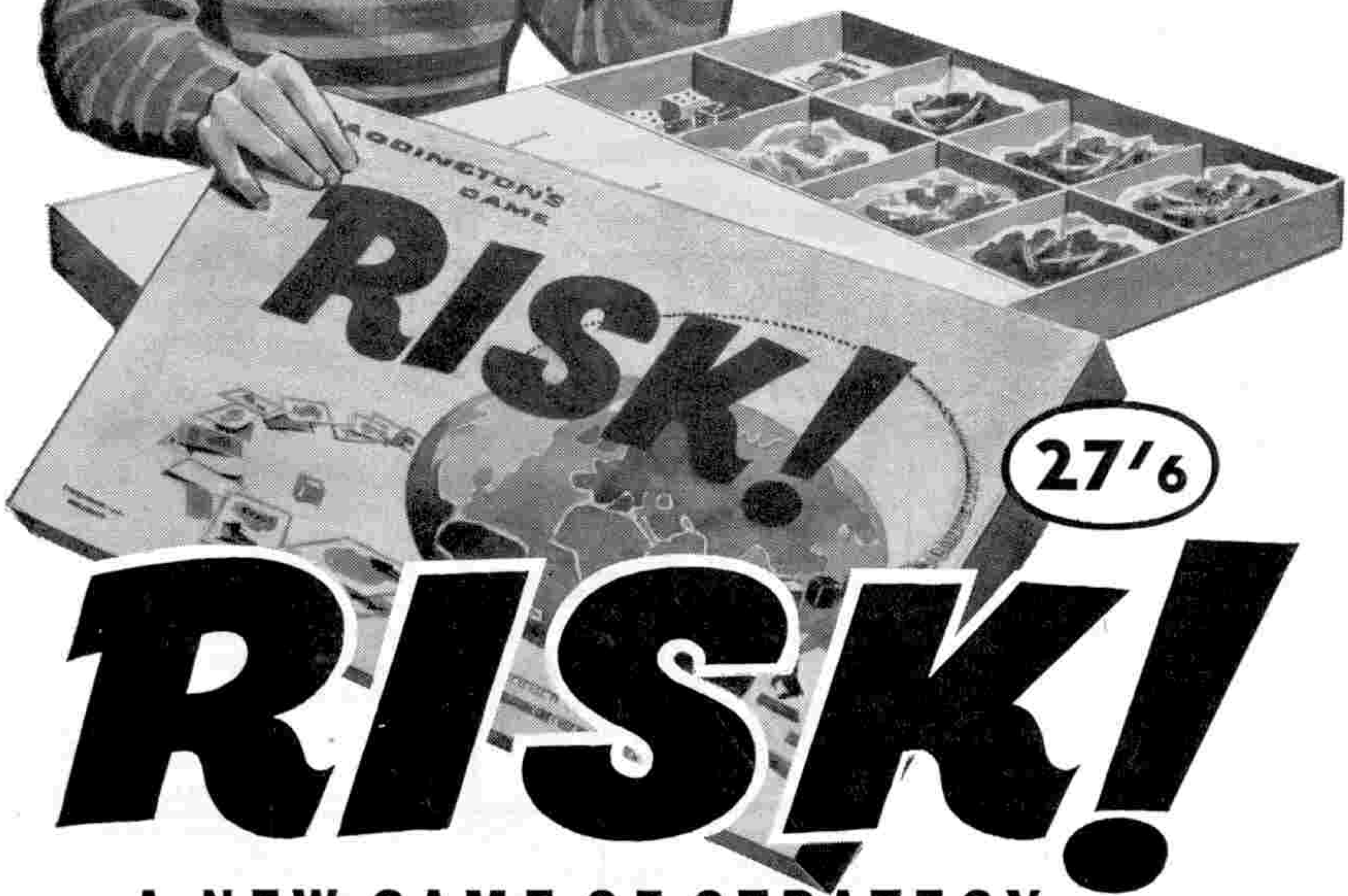

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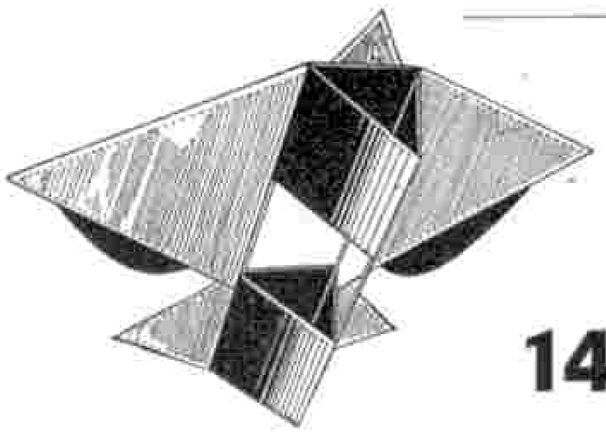

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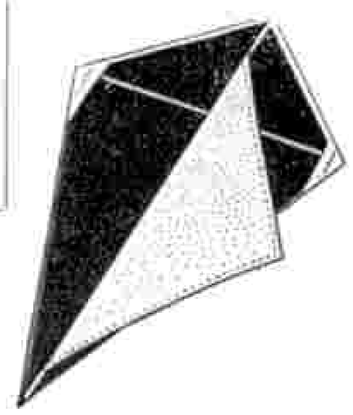

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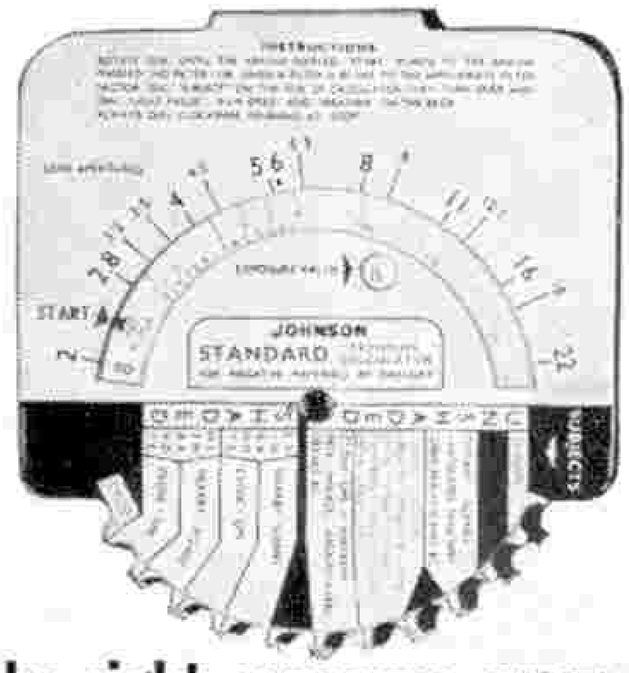

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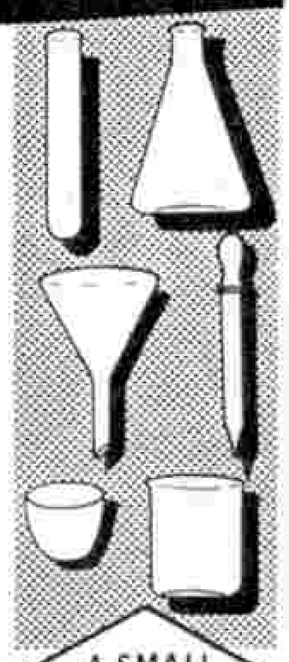

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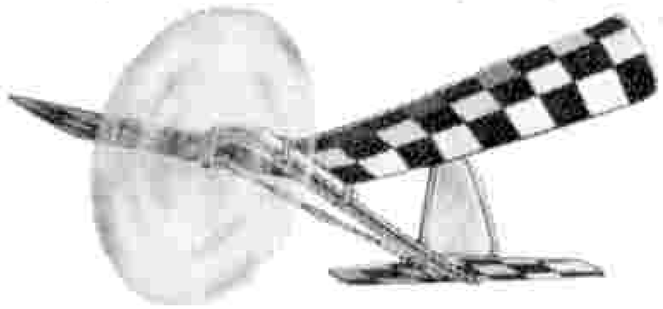

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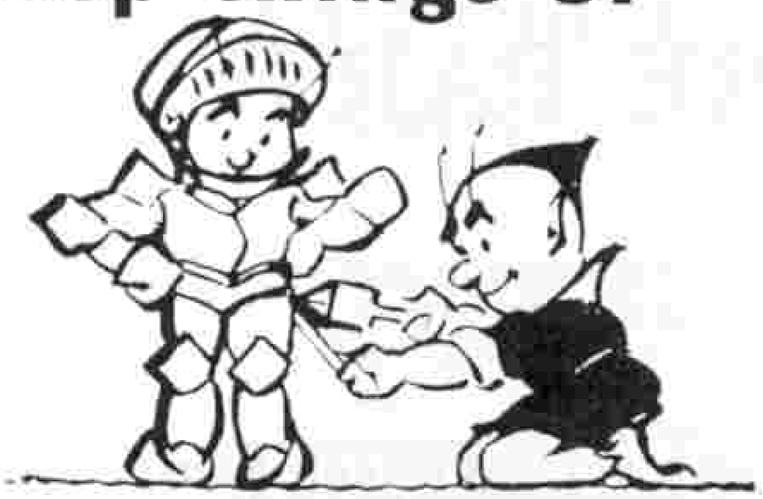

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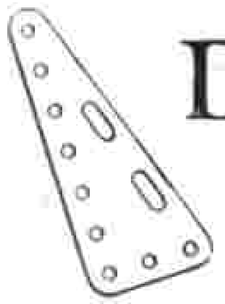

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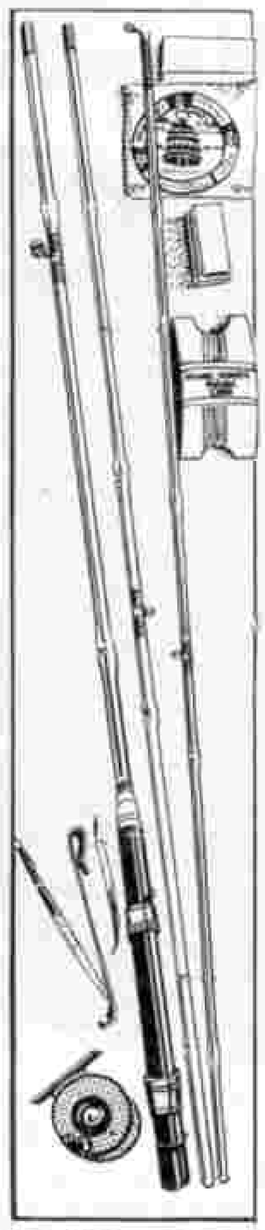

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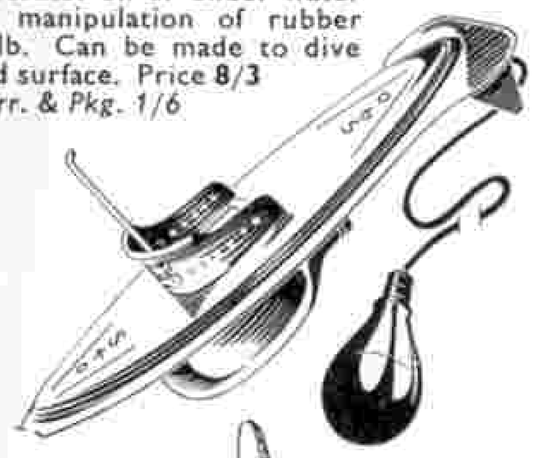

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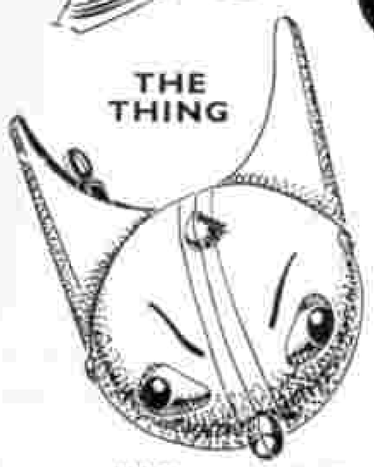

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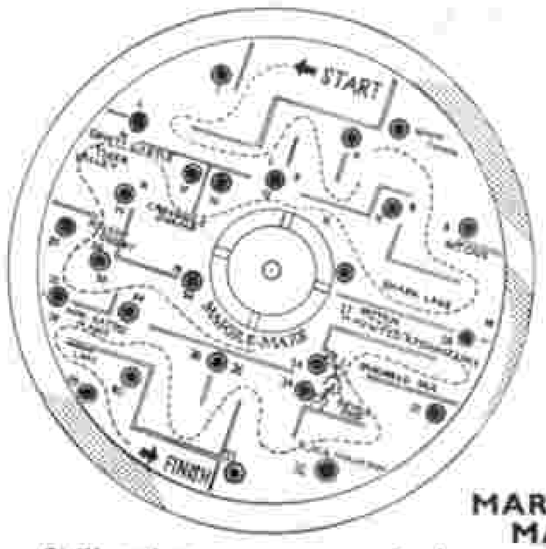

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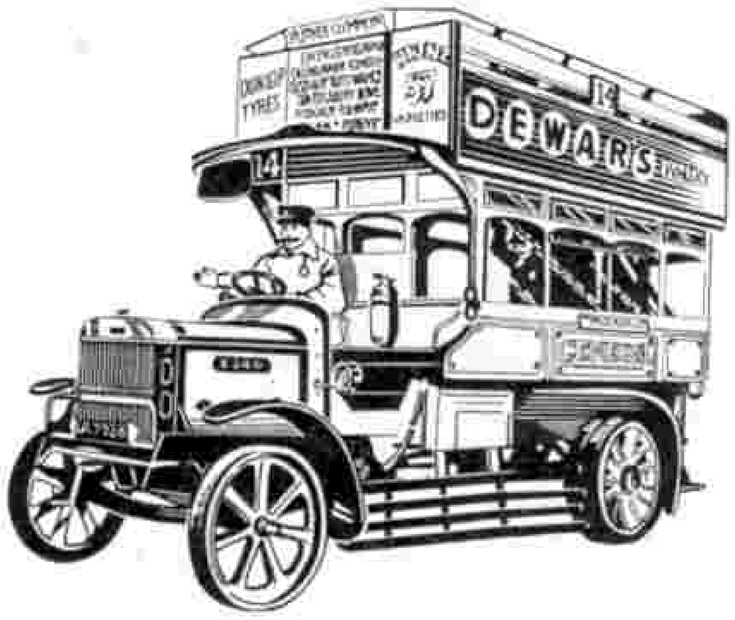

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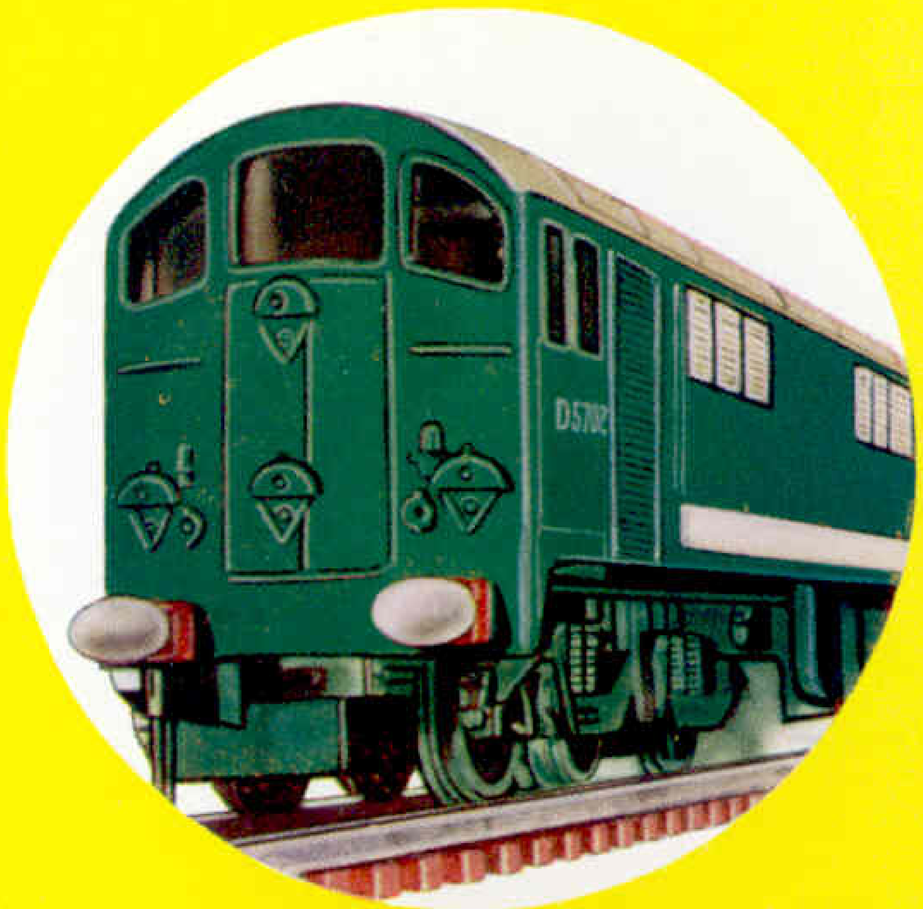

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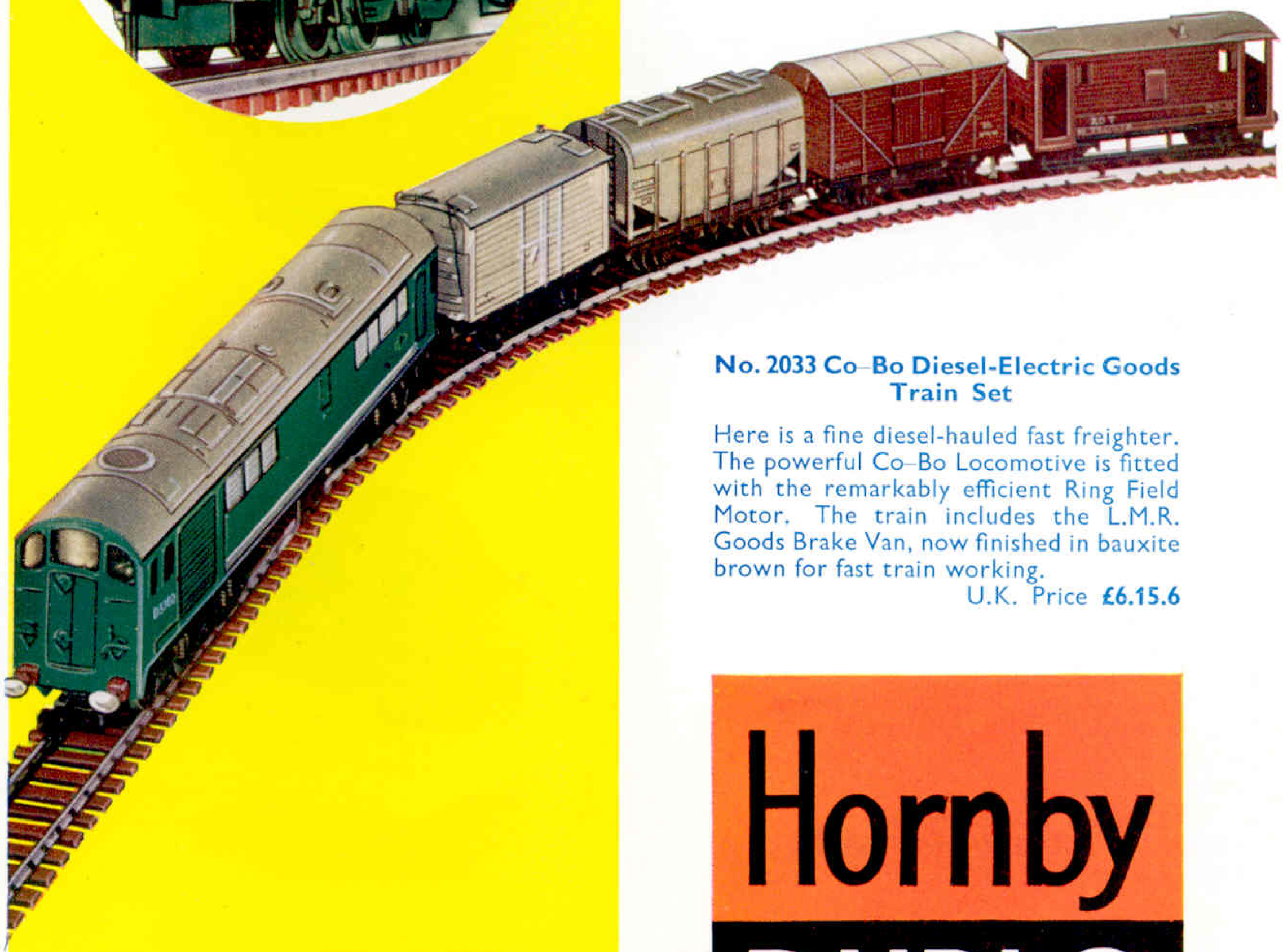

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