VOL. XLVIII Nº6 JUNE 1963

MECCANO MAGAZINE

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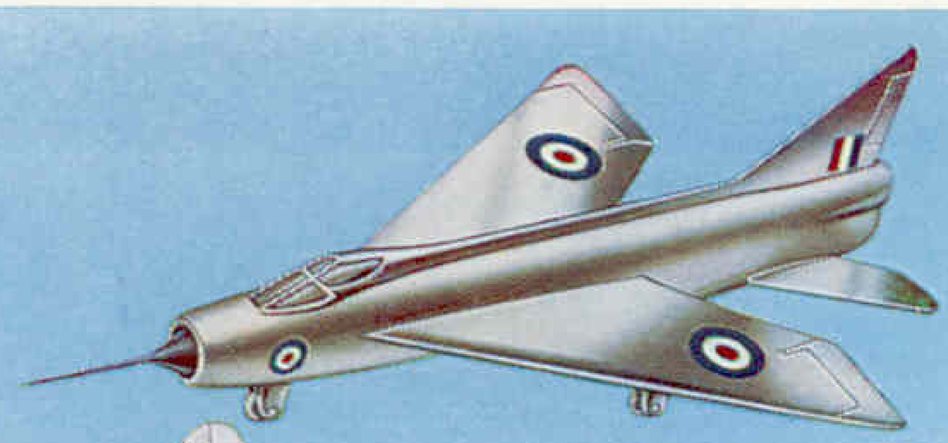


737

708

735

BRITISH AVIATION— IN MINIATURE

Some of the most famous British aircraft of recent years are modelled in the Dinky Toys range. A small selection of them is illustrated here.

	U.K. Price
708 Vickers Viscount 800 Airliner B.E.A. Wing Span 5⅞ in.	5/5
735 Gloster Javelin Delta Wing Fighter. Wing Span 3¼ in.	2/9
737 P.1B Lightning Fighter. Wing Span 2 3/16 in.	2/5
*738 D.H. 110 Sea Vixen. Wing Span 3 3/16 in. ..	3/2
*998 Bristol Britannia Airliner. Wing Span 8⅞ in.	10/6
*999 D.H. Comet Airliner. Wing Span 7¼ in. ..	7/–

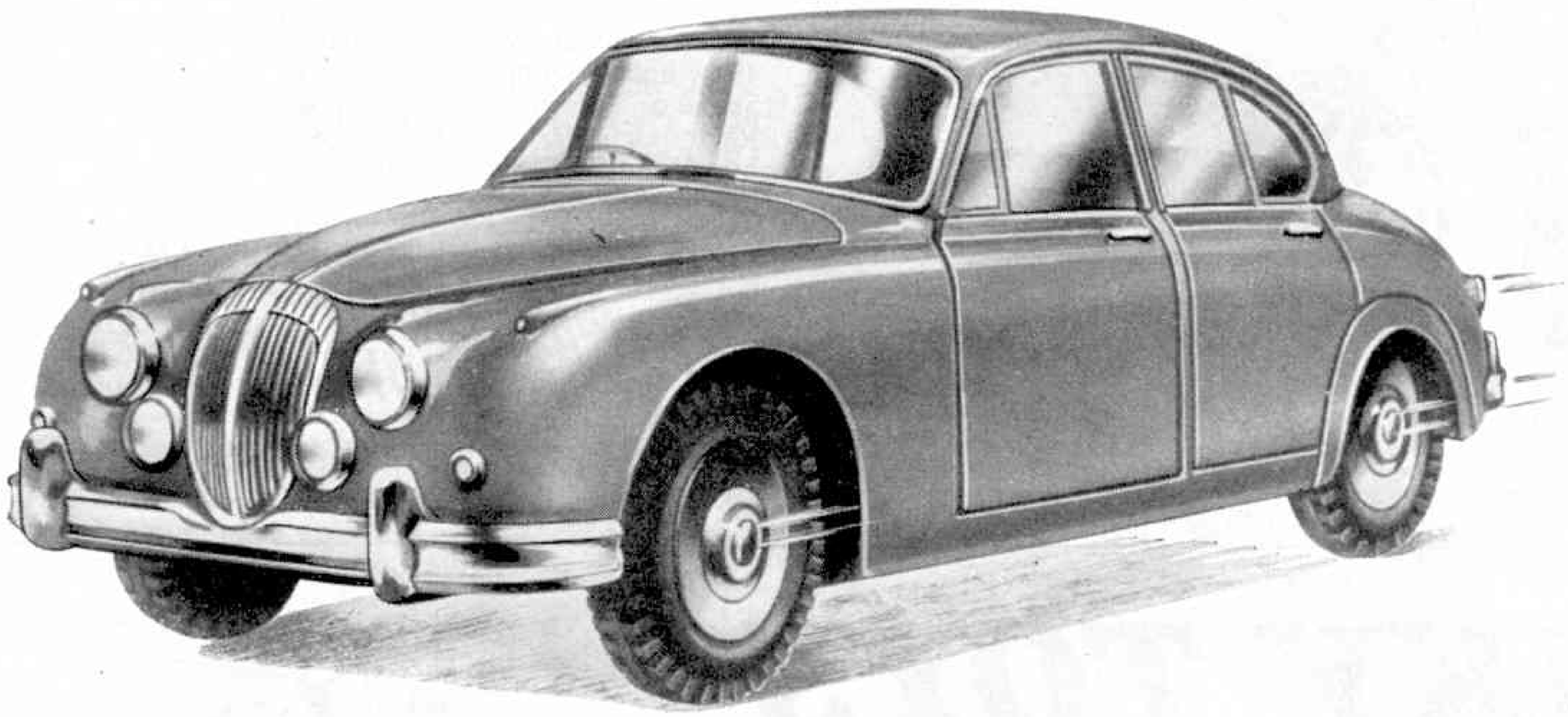
Not Illustrated

DINKY TOYS

MADE BY MECCANO LTD., LIVERPOOL

It's a superb model of the

$2\frac{1}{2}$ litre V8 Daimler



DINKY TOYS No. 146
$2\frac{1}{2}$ litre V8 Daimler

Looks familiar?—This model of a *Daimler*, based on a popular Jaguar design, has all the usual Dinky Toys features —Prestomatic steering, windows, seats, steering wheel, 4-wheel suspension—and an enchanting, blue polychromatic finish. It is destined to be the centre-piece of your collection!

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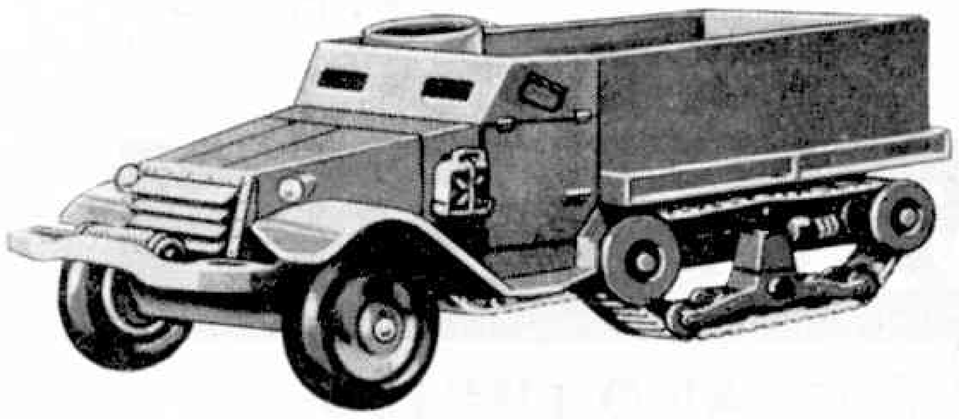
from PARIS

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 some of them are illustrated here. Ask your Dinky Toys dealer to show you the full range.

553 Peugeot 404. Length 4 1/16 in. U.K. Price **5/11**

555 Ford Thunderbird. Length 4 13/16 in. U.K. Price **7/8**



822 Half-track M3. Length 4 3/8 in. U.K. Price **9/11**

550 Chrysler Saratoga. Length 5 1/16 in. U.K. Price **7/8**

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This scale replica from the 2nd World War drops its bomb while flying over the target. The A-24 also features a detailed two seat cockpit, tough nylon prop, and flying lines and handle. All modellers, young and old will be thrilled by her beautiful looks and rugged performance.
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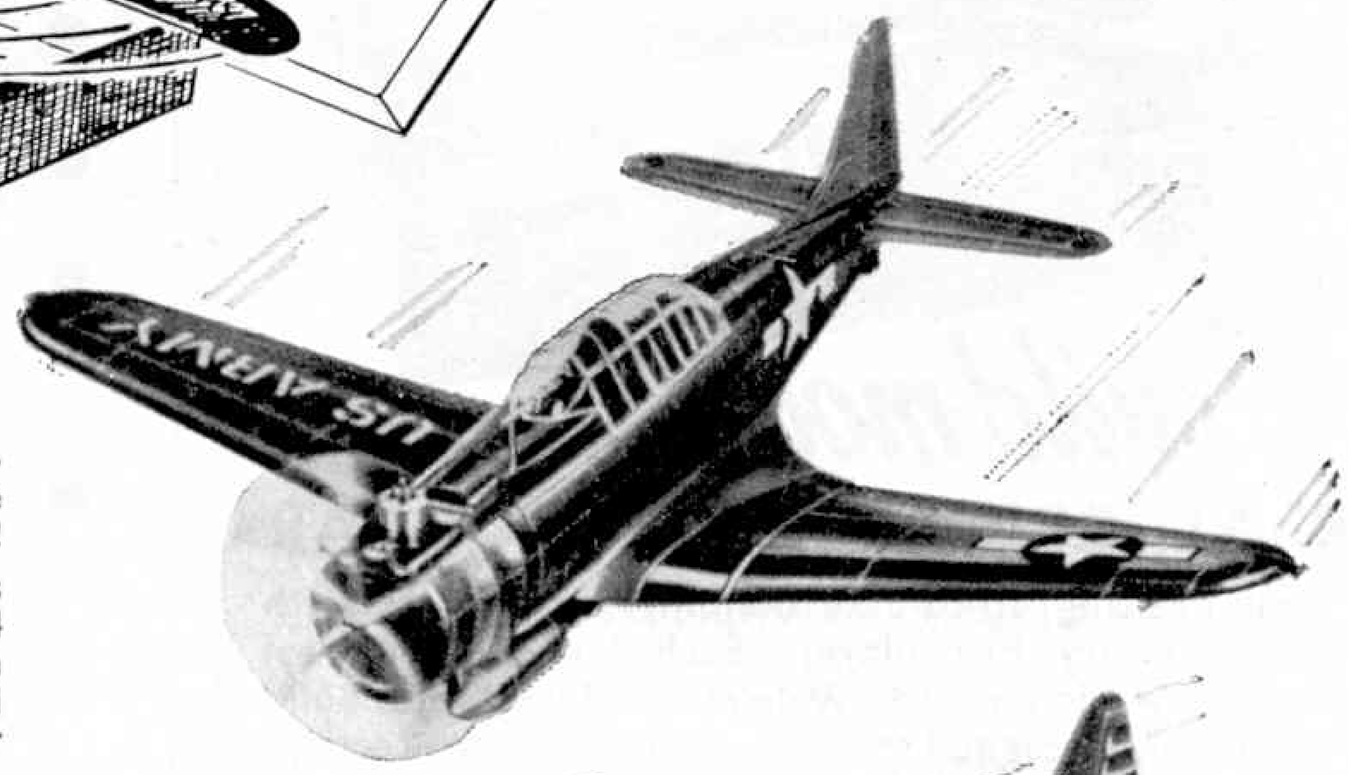

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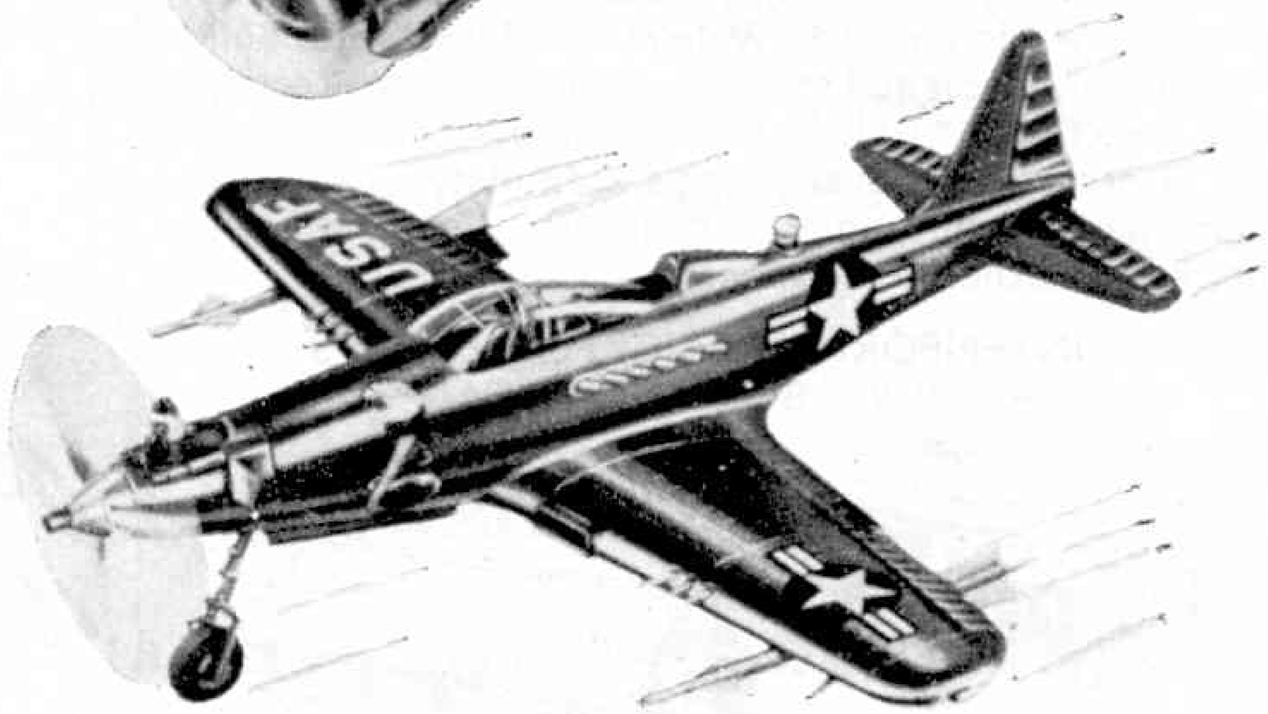

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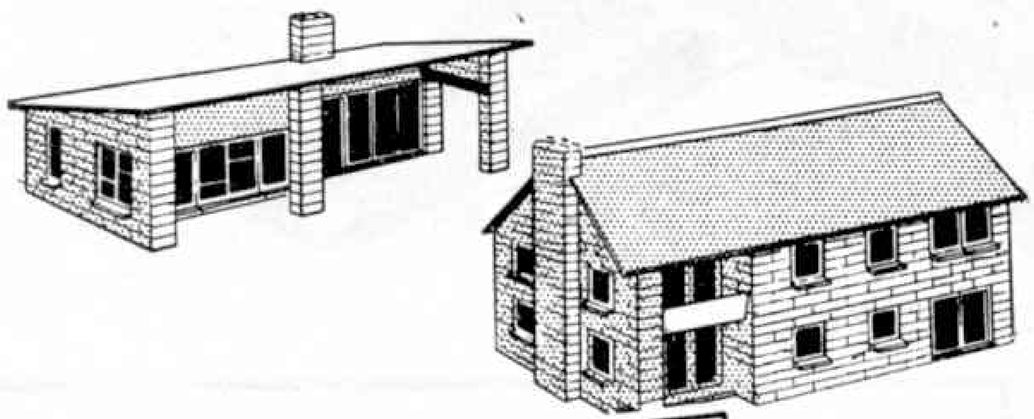

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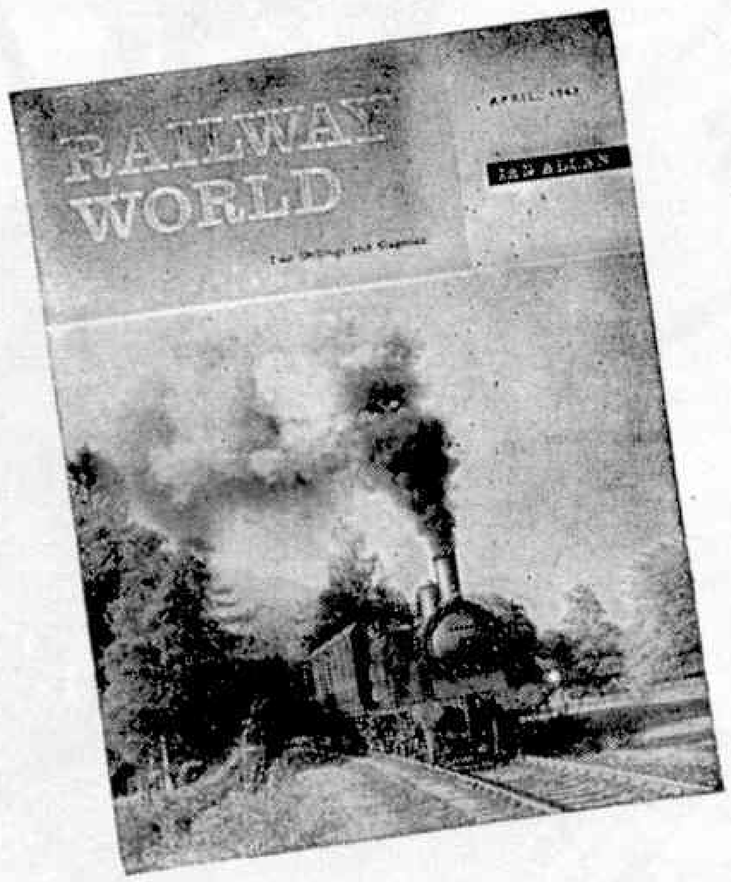

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The *Meccano Magazine* Circular Jig-saw Puzzle is made up with pictures based on the colourful front covers of the Magazine.

The octagonal centrepiece shows the famous West Country Locomotive "Crediton" at speed, and the remaining eight segments show ships, traction engines, trains and yachts, all in beautiful glossy colours. The jig-saw, measuring $20\frac{1}{4}$ inches in diameter, is made of good quality cardboard and contains more than 500 pieces.

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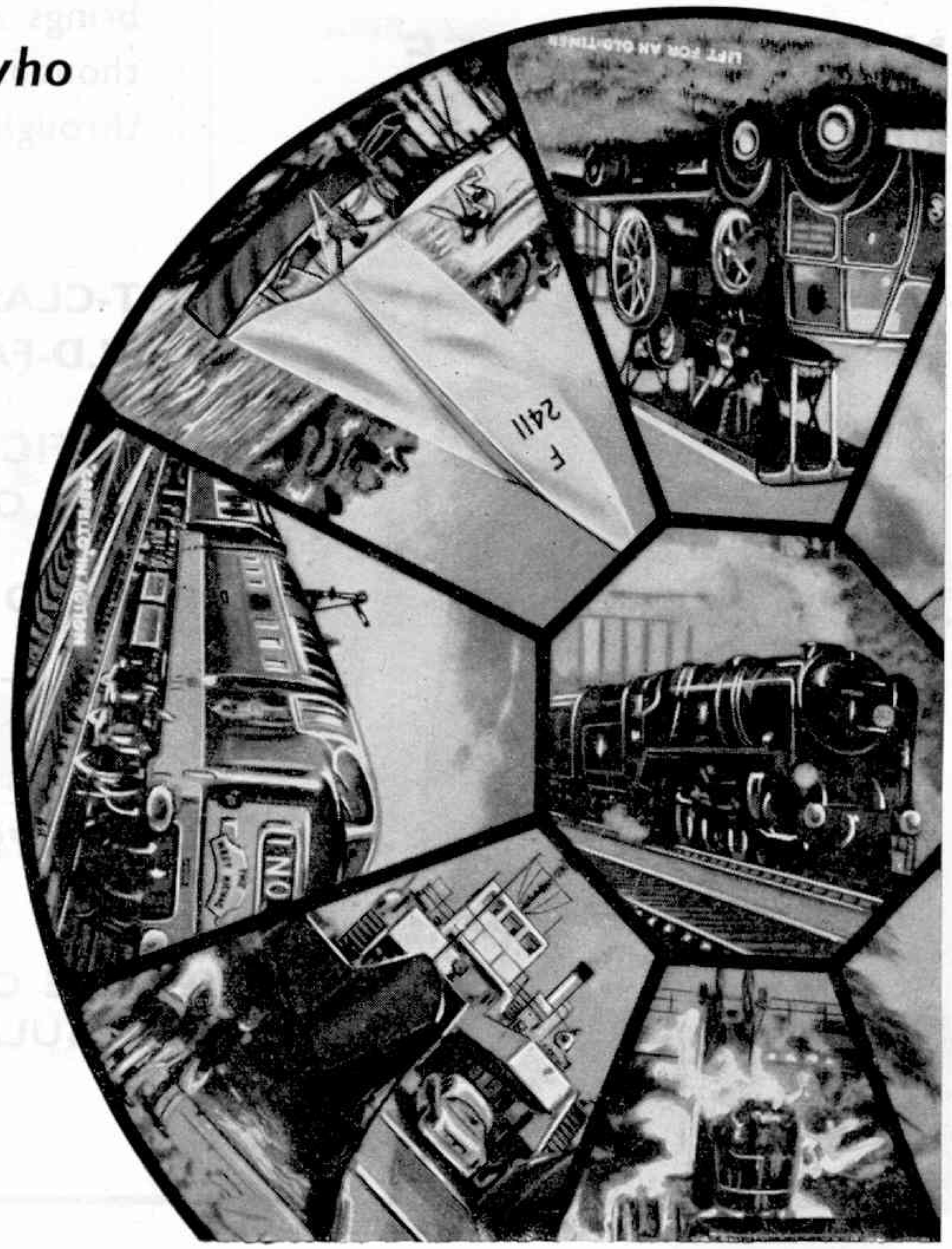

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MANY readers of the *M.M.*, I am sure, will be interested in this month's Editorial picture which illustrates one of the new tree-lopping vehicles operated by London Transport. There are several of these special vehicles, the bodies of which are mounted on Thames Trader 5-ton chassis. They are planned to simplify the work of lopping tall branches which might be a danger to double deck buses and they have taken the place of five other vehicles, 27 years old, which were converted from STL-type front entrance double deck buses. The bodies of the new vehicles were designed in the department of the Chief Mechanical Engineer (Road Services) and built by Marshalls of Cambridge. Immediately behind the cab is a compartment for the crew which serves as a shelter for them in bad weather and as a storage space for tools and equipment. Behind is an open well to carry tree cuttings and foliage. Large double doors for discharging the lopped branches are at the rear. The exterior of the body is panelled in aluminium alloy and the interior in steel.

The crew of the new vehicles reach the working deck by an aluminium ladder which runs from their compartment to a waterproof hatch in the roof. The open working deck extends over the driving cab as well as over the crew section and can be continued, by removable walkways, over each side of the open well. Two drop platforms at working deck level on the nearside allow the operators to get close to a tree and are spaced sufficiently far apart to enable them to be lowered on either side of a tree trunk. A safety switch warning device is built into the drop platforms to warn the driver if he attempts to move off while the platforms are down.

On a different subject, may I draw your attention this month to the fine new *Meccano Magazine* jig-saw puzzle now available in the shops. Based on *M.M.* front covers, it contains more than 500 pieces and measures 20¼ inches in diameter. Details of this attractive puzzle are advertised on the opposite page.

Finally, I want to make a preliminary mention of a wonderful Hornby-Dublo competition which is being run in the latter half of this year. There will be opportunities for both Hornby-Dublo dealers and customers to win magnificent prizes, and full details will be announced later.

EDITOR

Next Month: HIGHWAYS ACROSS THE WORLD

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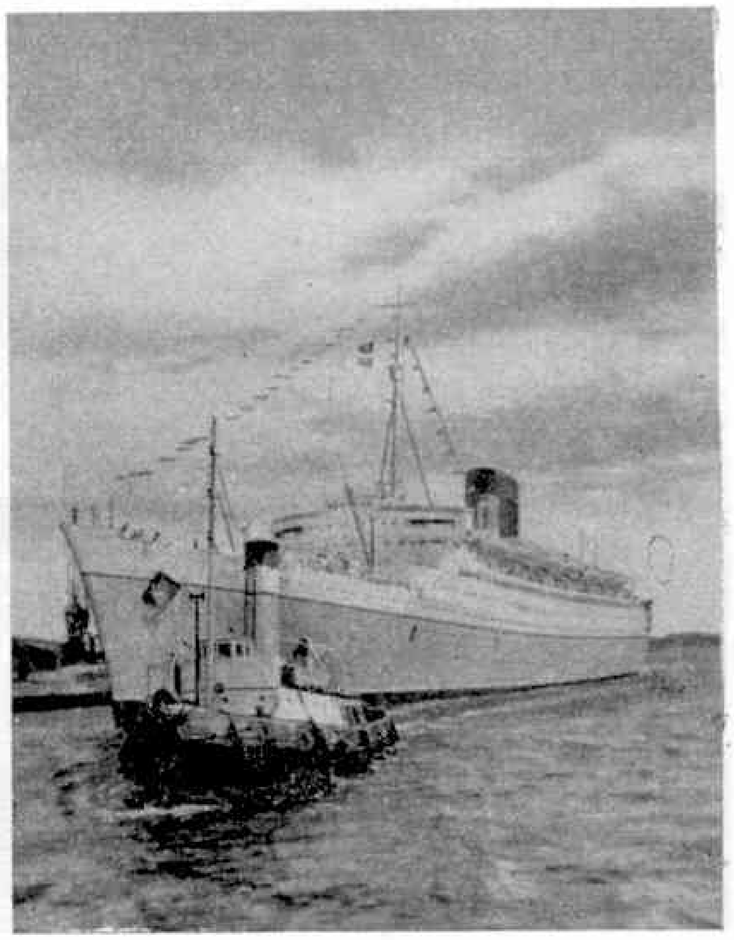
OUR FRONT COVER

The elegant Cunard liner Caronia, *with her rich green colouring, forms the subject of this month's cover. It is from a photograph by Edward Cowin. She is pictured arriving at her berth at Southampton. Built at John Brown's yard on Clydebank, she has a registered tonnage of 34,172. She is due to end a spring cruise to the Mediterranean on June 2, and three further cruises of between ten and twelve thousand miles await her before she starts a 31,500-mile round the world trip at the end of next January. On that journey she will visit twenty of the most exciting ports in the world. Her voyage will take 95 days.*



GIANT WALKING DRAGLINE

THE BIG LADY EATS A MOUNTAIN

A general view of the Rapier W1800 Walking Dragline. All the illustrations to this article appear by courtesy of Ransomes and Rapier, Ltd.

A MECHANICAL mammoth—the "Big Lady", they call her locally—is stalking the Welsh hills. The NCK-Rapier W1800 walking dragline—the largest in the world—weighs 1,790 tons, excluding the bucket, and is 103 feet long.

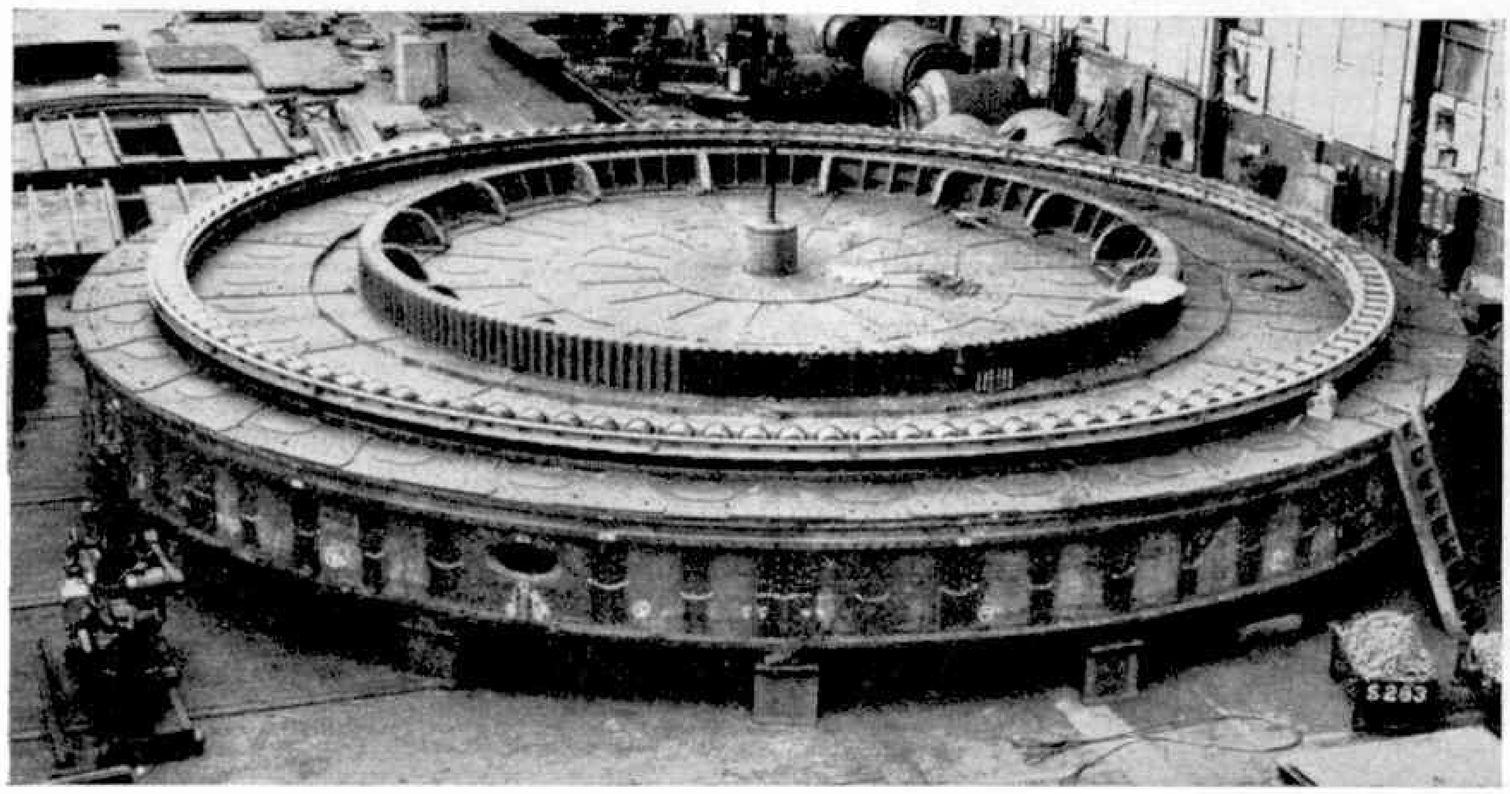
Just over ten years ago Ransomes and Rapier Ltd., who have been constructing walking draglines since 1937, produced a 1,400-ton model, then the biggest in the world. That particular dragline is still in service and her sisters are excavating in many parts of the world. They can move about 30 tons of earth at a bite, but the W1800 can shift twice as much.

The 1,400-ton dragline (W1400) was originally designed to operate in an open-cast iron ore mine at Corby, in Northamptonshire, where the overburden to a depth of 100 feet had to be excavated and dumped in one operation.

Based on the experience they gained with the W1400, the makers created the W1800 type, the first of which has been purchased by the National Coal Board and is in service in the open-cast workings at Maesgwyn Cap at Glyn Neath, in Glamorganshire. The operators of the equipment which, it must be emphasised, removes the overburden—that is, the earth covering the coal seams—and does not dig the coal itself, are George Wimpey and Co. Ltd.

By

L. BRUCE MAYNE



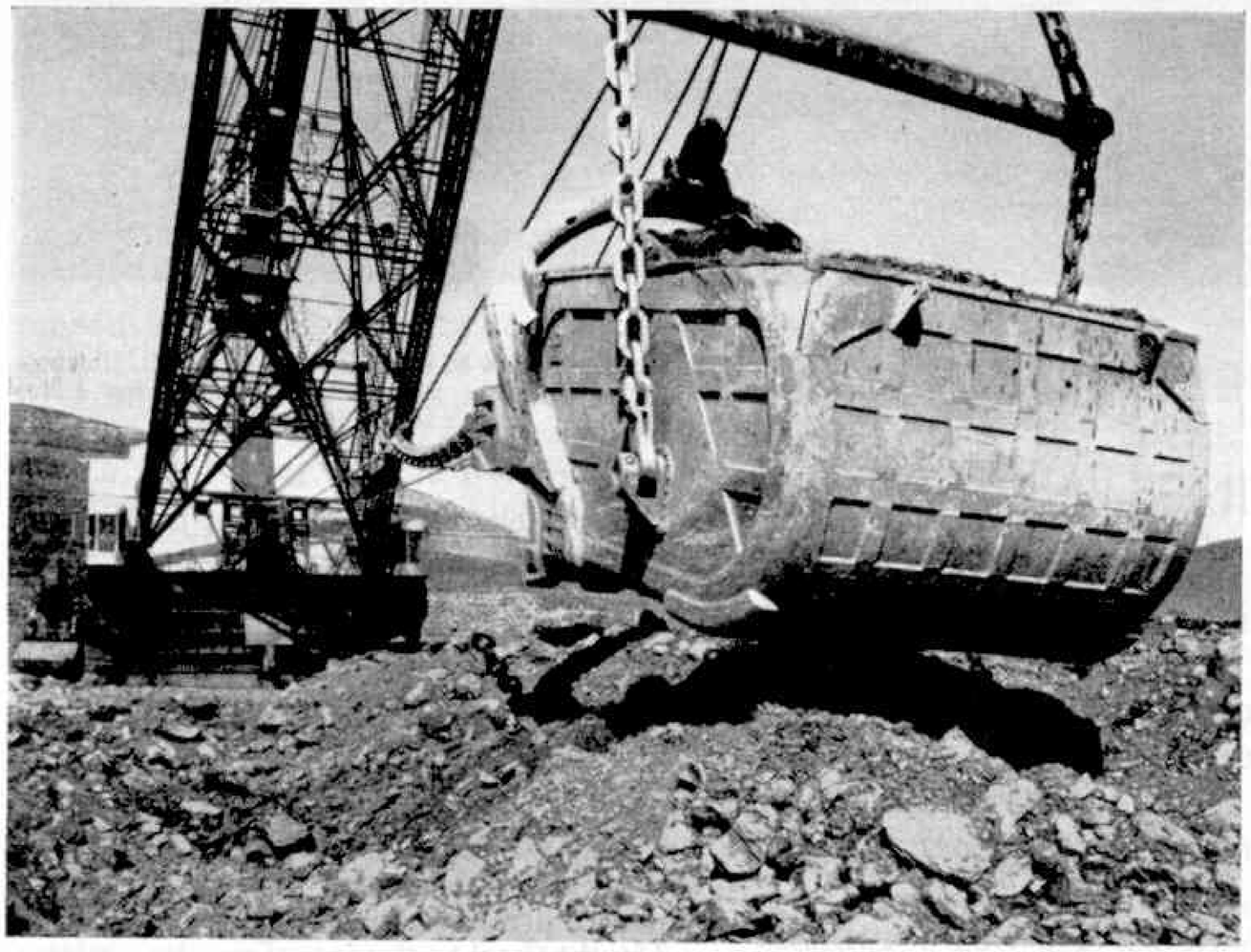
The completed base for the mammoth dragline, with rollers and slew rack in position. This slew rack is more than 32 feet in diameter and the roller path is 48 feet in diameter.

So immense is this machine that when its work has been completed on the present site and it has to be moved elsewhere, it will have to be dismantled and re-assembled on the new site. To facilitate this, the whole machine has been erected from separate units as if built with some gigantic Meccano Outfit. These units—the heaviest weighs 42 tons—are dowelled and bolted. In places flange welding makes for increased rigidity, but the work has been done in such a way that it will not affect the adjoining parts of the main structure when it is dismantled.

The dragline is fitted with a basic boom of 208 feet on which either of two extensions may be mounted. The shorter gives an operating length of 247 feet for working with a 40 cubic yard bucket (a 91-ton load) and a longer one giving a working length of 282 feet using a 30 cubic yard bucket (a 65-ton load).

Despite the staggering weight, depths and heights involved, the complete cycle is carried out in remarkably quick time. When digging a depth of 40 feet—which is deeper than the average house is high—the dragline can load its bucket, hoist it to a height of 40 feet above ground, swing through a 90 degree arc and return to the

The largest single unit of the dragline, weighing 42 tons, leaving the works on a low-loader.



A close-up of the dragline's 40 cubic yard bucket which was manufactured by Hadfields, Ltd., of Sheffield.

original point, all in 64 seconds. Every hour the W1800 can excavate and dump its own weight of earth.

The circular base of the machine, weighing 284 tons, is 55 feet in diameter and is a riveted, welded and bolted construction of rolled steel plates and sections heavily braced and built on radial girders. Around the forged steel centre-post in the base, standing 6 feet 3 inches high and weighing four tons, the superstructure rotates.

The revolving superstructure is a cantilever unit built on a rotating frame 94 feet long.

To "walk", the W1800 uses the Cameron and Heath walking gear, the rectangular shoes being lowered to the ground by eccentric-operated legs. In the walking position, the whole machine is tilted and is slid along the ground in a series of strides each 7 feet 7 inches long.

The shoes are of welded steel plates and sections, and are 55 feet long and 9 feet 6 inches wide. Each weighs 58 tons. The walking speed does not exactly qualify the machine for an Olympic Gold Medal, but to raise the 0.11 m.p.h. which it can achieve four 225 h.p. motor units are employed.

In a machine of such huge dimensions, it is supremely important that the maintenance of the equipment and replacement of parts, when necessary, should be as speedy and as easy an operation as possible. In designing the W1800 the makers have arranged to have the motors used in the hoist and drag drives to be interchangeable. Many other parts are also interchangeable and a minimum number of spare parts may be carried.

To facilitate carrying heavy replacements, etc. an overhead crane operates *inside* the W1800! This 16-ton travelling crane, which is controlled from an underslung cabin, conveys some idea of the huge proportions of the "master" machine which also carries, on its deck, a well-equipped fitters' bench complete with welding equipment.

The giant dragline has two control cabins, the controls being duplicated so that the operator can work the machine from either side, depending on his field of vision. There are hand levers to operate the hoist, drag and walk motions and pedals for swinging. Pistol-grip switches control motion parking brakes and the drag-walk changeover switch. Toggle switches control both the lights on the boom and floodlights.

The "Big Lady" has two sisters, one built for Stewart and Lloyds Ltd. and the other for the United Steel Company at Roxby, near Scunthorpe.

Engineers have progressed a long way from the picks and shovels used by brawny, human navvies. Today, a gigantic, walking, electrically-driven, man-made machine, which not so long ago could only have existed in science fiction, is eating its way through a Welsh mountain.

MORE A.E.C. TRUCKS

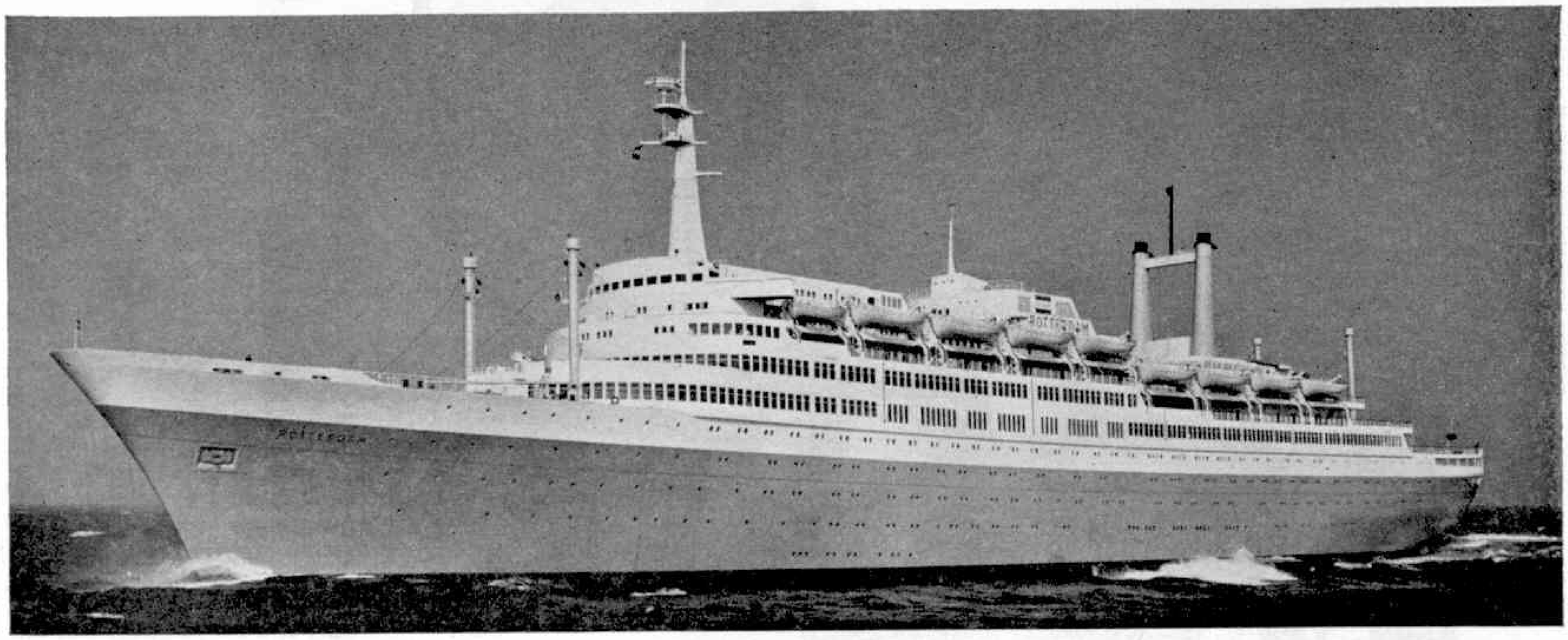
More orders for A.E.C.'s largest selling truck model, the "Mercury", have been received from Scottish operators. William Russell of Bathgate Ltd., who already operate a large A.E.C. fleet, have called for fifteen more "Mercury" tractors to haul semi-trailer outfits. The new prime-movers will be employed on general and long distance haulage duties, mainly on the carriage of agricultural produce from Scotland to London and the South of England.

James Kemp (Leslie) Ltd. of Leslie, another well-known Scottish firm of haulage contractors, have ordered six "Mercury" flat platform trucks. Based on the 17 ft. 3 in. wheelbase chassis the new vehicles will join the Kemp fleet on general haulage work including the transport of paper and newsprint to the south.

All the "Mercury" models destined for Scotland will have 138 b.h.p. diesel engines, six speed constant mesh gearboxes, incorporating overdrive on sixth gear, and direct air-operated brakes.

Also in demand is the A.E.C. "Mammoth Major" eight-wheeled truck. The Road Motor Services division of Rhodesian Railways recently placed repeat orders for nine of these vehicles, which will be operated as truck and trail outfits similar to those already in service. They will be powered by 192 h.p. A.E.C. diesel engines.

A LINER THAT BREAKS WITH TRADITION



A broadside view of the s.s. "Rotterdam". Illustrations by courtesy of the Holland–America Line, Rotterdam.

FLAGSHIP OF THE NETHERLANDS MERCANTILE MARINE

THE most revolutionary liner afloat and flagship of both the 90-year-old Holland–America Line and the Netherlands Mercantile Marine is the s.s. *Rotterdam*. She was built by the Rotterdam Drydock Company Limited and her keel was laid down on December 14, 1956. The ship was launched by Queen Juliana on September 13, 1958, in the presence of 60,000 people and almost one year later the *Rotterdam* made her maiden voyage to New York.

The most striking feature of this ship's profile is the absence of the traditional funnel or funnels which have been replaced by two slim smoke exhausts each 54 feet tall and placed thwartships aft. They are constructed of aluminium and each weighs 22 tons.

There has also been a break with tradition in the design of the ship's interior. Usually, first-class passengers at sea have quarters forward or amidships while the other class or classes are accommodated in the less desirable parts of the ship, aft. It is quite different in the case of the *Rotterdam* where all passengers —first class or tourist—can enjoy run-of-the-ship facilities. Yet, although neither class is confined to one particular section of the ship, they do not mingle and that is achieved by the use of a unique main stairway which is used in combination with six lifts.

The idea of the two-way staircase was conceived some years ago by William H. de Monchy, joint President–Director of

By

Gordon Woosey

the firm, when he visited the Château de Chambord in France. This large Renaissance château, built by Francis I, has a central stairway in two separate overlapping spirals. It was designed so that a person mounting them would not meet anyone descending, and among those who used the stairway were Mmes. de Pompadour and du Barry.

The elevators on the *Rotterdam* have an automatic gear system designed to serve only one class or the other as needed to conform with the stairway arrangement. During winter cruises, where only one class is carried, the whole ship is opened up to everyone.

The present *Rotterdam* is the fifth in the line of that name. The first was built in 1872 and was 253 feet long and of 1,684 gross tons. She had a single funnel and carried a full set of sails in case of emergency. All her 288 passengers were accommodated below decks.

The scion of the *Rotterdams* must surely surpass any dreams the founders of this line may have had. She measures 748 feet overall and has a beam of 94 feet. Other statistics are as follows:

Height (keel to the top of smoke outlets) 163 ft. 6 in.; Height (keel to the top of radar mast) 201 ft. 10 in.; Gross registered tonnage 38,650 approx.; Displacement tonnage 31,530 approx.; Propelling machinery: twin screw, double reduction-geared, triple-expansion turbines; S.H.P. 35,000; Speed (service) 20.5 knots; Total dry cargo 102,000 cubic feet; Total cooled cargo 14,000 cubic feet; Total passengers 1,456; Total complement of officers and men 776.

Passengers have the choice of seventeen well-positioned public rooms, all having their own particular charm. Spacious lounges and smoking rooms afford an uninterrupted view of the sea. Indoor and outdoor swimming pools, a shopping centre known as "Lijnbaan"—after Rotterdam city's great new shopping centre—a beautiful theatre and cheerful nurseries are also provided.

For the teenagers there is a special section of the deck known as the Atlantic Promenade, a recreation centre in the shape of a horseshoe where they can enjoy themselves and make as much noise as they wish without interfering with the

other passengers. Offering a varied selection of games and amusements, including a small dance floor with recorded music, plus an ice bar for snacks, hot dogs and sweets, it has proved popular with young travellers. For the smaller children, replicas of nautical instruments have been installed and are a source of great delight and fascination, providing hours of fun.

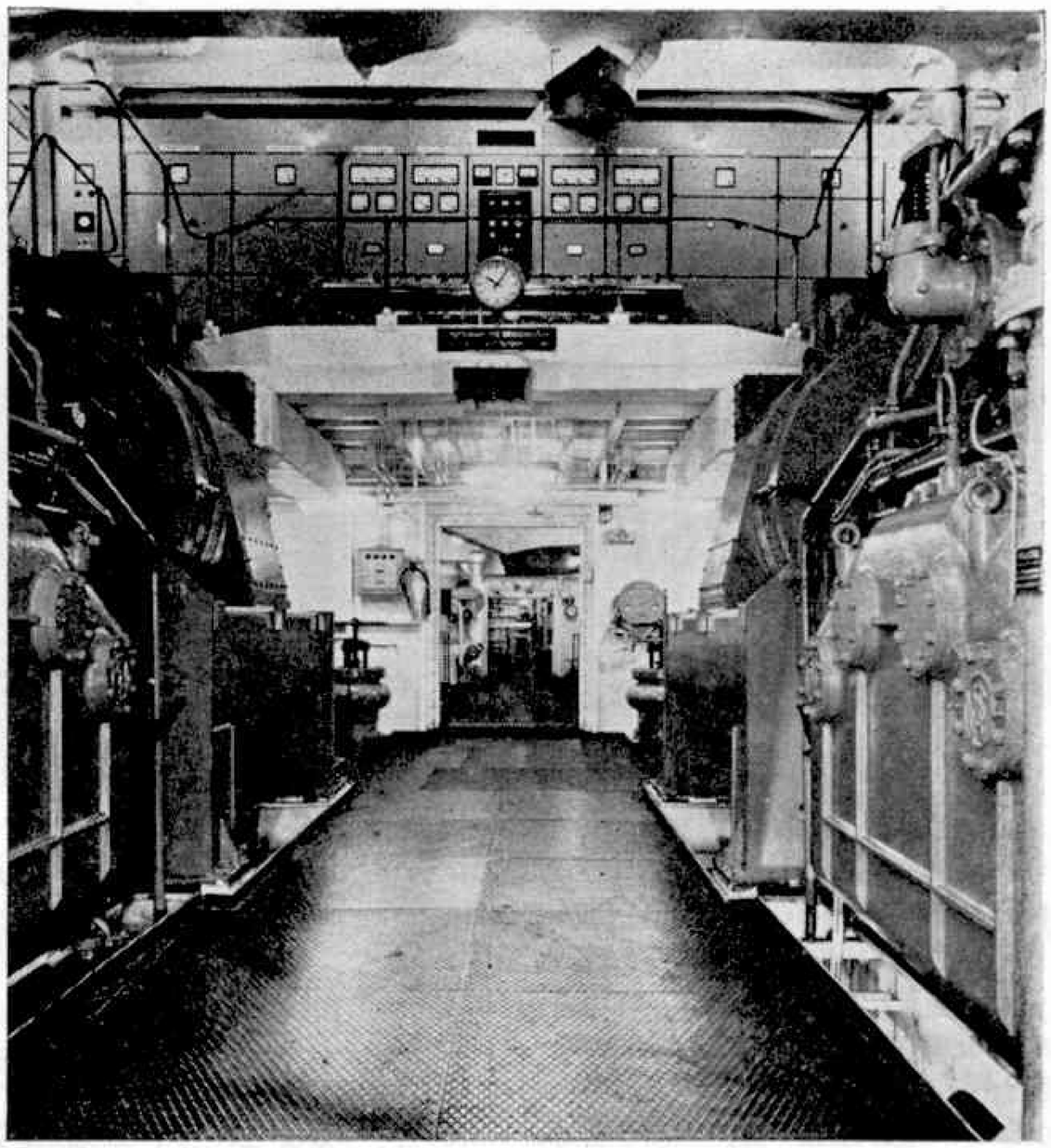
All cabins for the passengers and crew are air-conditioned, with individual controls, and have their own private telephones. All but a very few are equipped with private bath or shower, and toilet.

There is ample deck space with a great variety of activities and deck games for passengers to enjoy. Two public rooms, the theatre-auditorium forward and the Ritz–Carlton room aft, are two decks high. The theatre seats 607 people and is one of the biggest of its kind afloat. To prevent too much rolling the ship is fitted with Denny-Brown anti-roll stabilisers.

Protection against fire is provided in the form of 4,413 sprinklers throughout the ship, fitted in the deckheads. These function automatically as soon as the temperature reaches 80 degrees Centigrade (176 degrees Fahrenheit), providing instantaneous extinguishing of the fire and simultaneous automatic ringing of 94 alarm bells. In addition there are 182 hand extinguishers placed at regular intervals. There are more than 160 fire-proof doors of the self-closing type in transverse and longitudinal fire-proof bulkheads which separate all passenger accommodation from machinery, cargo and service spaces.

Two sets of Parsons' design triple-expansion, double reduction geared turbines develop 35,000 s.h.p. for propulsion. Four turbo generators develop 5,400 kW. 440 volt 60-cycles 3-phase alternating current. Transformers furnish current for lighting at 110 volts A.C., and for heating and cooking purposes at 220 volts A.C.

This illustration shows part of the liner's engine room.



Six alternator sets are installed for the supply of 220 volts D.C. to the anchor winches, capstans, cargo winches and degaussing circuit. A gas turbine-driven emergency generator set of 350 kW. 440 volts A.C. 3-phase 60-cycles is in the deckhouse under the smoke exhausts. Six electric winches, each capable of lifting five tons, are among the ship's equipment.

The distillation plant is able to produce 700 tons of fresh water daily from sea water. The laundry, which uses 120 tons daily, is supplied from storage tanks which hold 1,300 tons of fresh water. There are 27 oil fuel tanks with a total capacity of 3,429 tons, seventeen of which are in the double bottom and ten in the sides of the ship.

There are eighteen sets of gravity-type davits. The lifeboat gear is so arranged that Promenade, Upper Promenade and Boat Decks are clear of all obstacles and entirely available for passengers' use and for deck games. The eighteen lifeboats are of aluminium, and two of these are powered by 40 h.p. diesel engines. The others are provided with hand-operated propellers and their total capacity is 2,246 people.

Two bow anchors and a spare weigh six and a half tons each and, when housed, fit snugly and flush with the hull. Each anchor chain is 165 fathoms in length and weighs 96 tons. The links have a diameter of 3¼ inches.

The two bronze propellers are three-bladed and at full speed make approximately 131 revolutions per minute. Each weighs 23½ tons and is 20 feet in diameter.

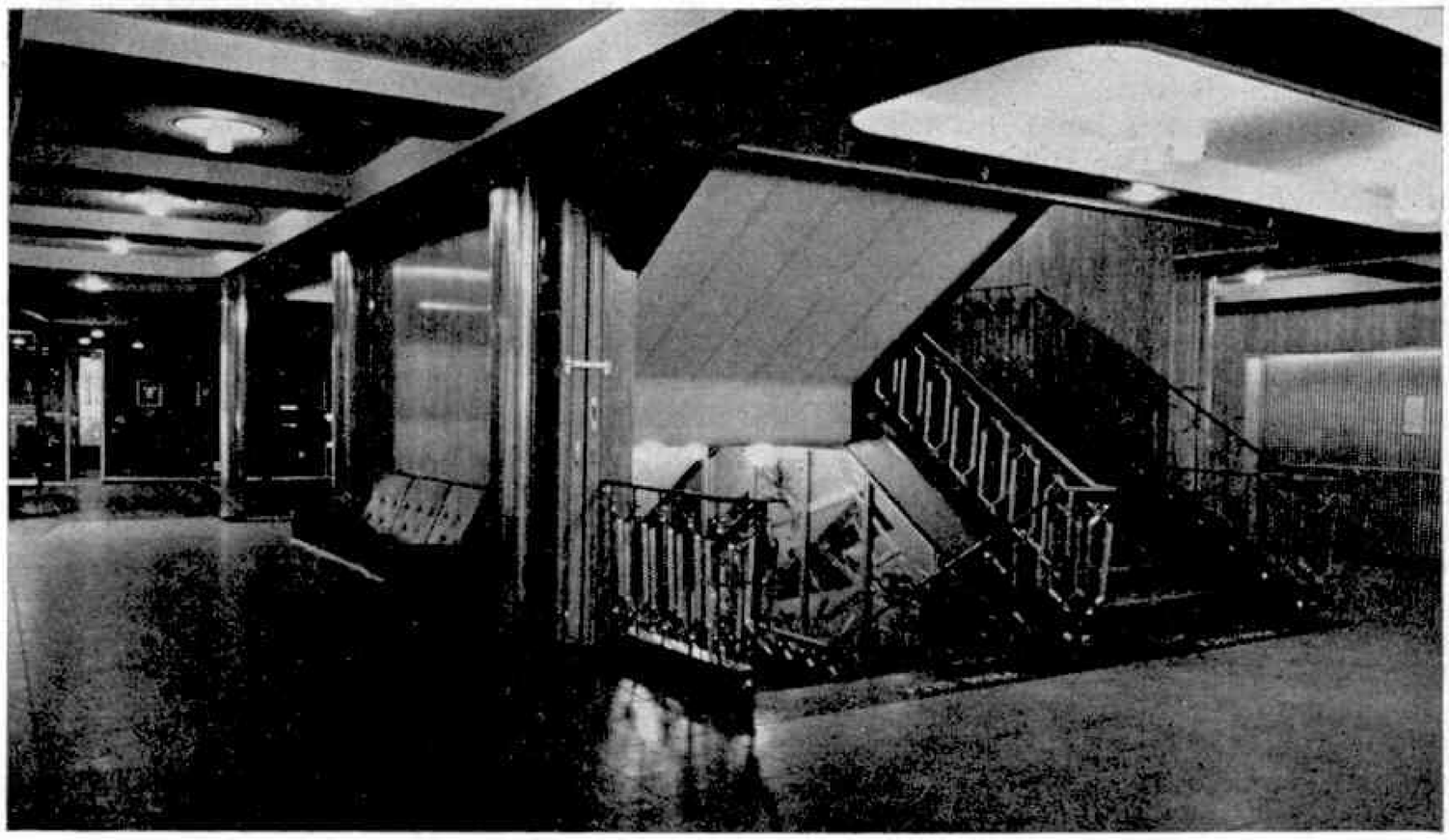
Two hundred tons of aluminium, 260 tons of paint, 230 miles of electric cable, 18,000 tons of steel and no fewer than 29 different kinds of wood were used in the construction of this great ship, the largest passenger vessel ever built in the Netherlands.

Before each Atlantic crossing from Rotterdam, calling at Le Havre, Southampton and New York, the Chief Steward's department has the headache of catering for the seven-day voyage. When she sails, the refrigerated holds set aside on the *Rotterdam* for provisions will contain about 40,000 lb. of meat, 12,000 lb. of game and poultry, 43,000 eggs and 8,000 lb. of sugar, to mention but a few of the items required. The total refrigerating space for cargo and provisions is 45,350 cubic feet. More than 60 domestic refrigerators are installed in the kitchens and pantries throughout the ship for the storage of food and beverages.

The ship has also her own up-to-date printer's shop equipped with a Linotype machine, where the ship's newspaper *Ocean Post*, menus and a programme of the daily events on board are printed.

Since last autumn the *Rotterdam* has embarked or disembarked passengers at the magnificent new Holland–America Line Pier on the New York Water Front. Located on Manhattan's West Side the pier is the most modern in the world.

This view of the unique two-way staircase on the s.s. "Rotterdam" gives a splendid impression of the vessel's spacious accommodation.

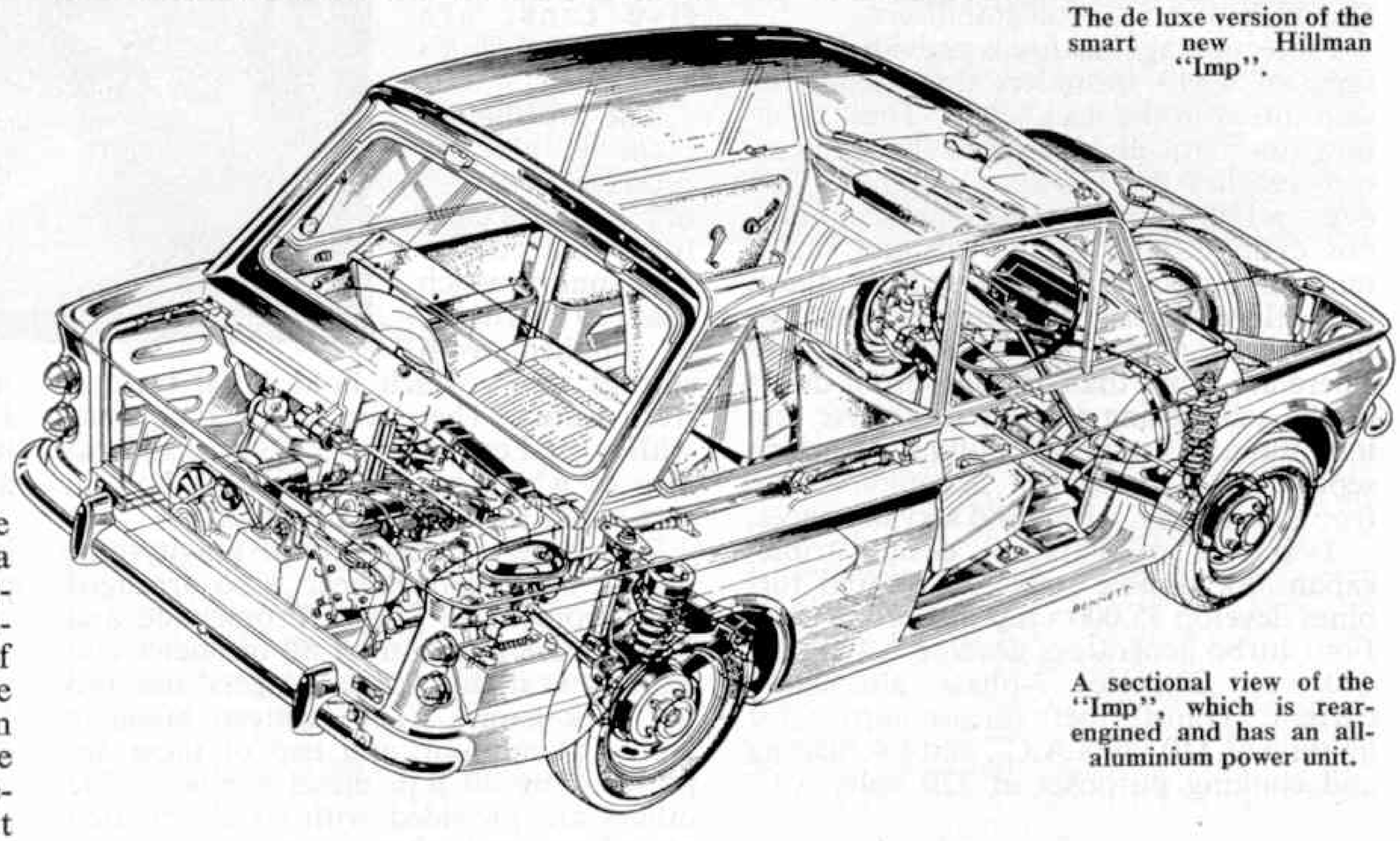


ROAD AND TRACK

By Jerry Ames

Bigger British Interest In Le Mans

The de luxe version of the smart new Hillman "Imp".



A sectional view of the "Imp", which is rear-engined and has an all-aluminium power unit.

A LARGER influx of British visitors will be making their pilgrimage to the charming French town of Le Mans this year. During June the great attraction is, of course, the famous 24-hours race for sports cars, starting at 4.0 p.m. on Saturday, the 14th, and finishing 24 hours later.

The spectacle of cars racing through the night along roads illuminated only by their own headlamps—except for the pits area—is one that has long exercised a special fascination for British track enthusiasts, and nowadays the race organisers expect to cater for some 25,000 of them every year. This year there may be more. The reason—a come-back by Aston Martin, last of the British firms to win the race outright, plus the opportunity of seeing Britain's gas turbine car in action at speed.

A few weeks ago, all competitors were trying out their new cars in public on the Le Mans circuit, the roads being specially closed for the occasion, although official practice for the race does not begin until June 12. This early practice session enables competitors to test new developments long before the race, go home and modify them if necessary—and usually it is—and still leaves designers and mechanics an opportunity to put things right in good time for the race.

It has also given many competitors a splendid chance to try the new Dunlop R.6 racing tyre which to a large extent combines the advantages of wet and dry weather tyres in one cover. This tyre is designed to encourage better roadholding and faster cornering whatever the weather, and there is no doubt the new Dunlop R.6 contributed a great deal to the higher lap speeds achieved.

This early practice can be very revealing. It showed that the latest 3 litre V–12 Ferrari sports car is so far a match for anything seen at the circuit. In the hands of John Surtees it knocked twelve seconds off Phil Hill's record by covering a lap at 133.33 m.p.h. over ordinary roads used by the public for the remainder of the year.

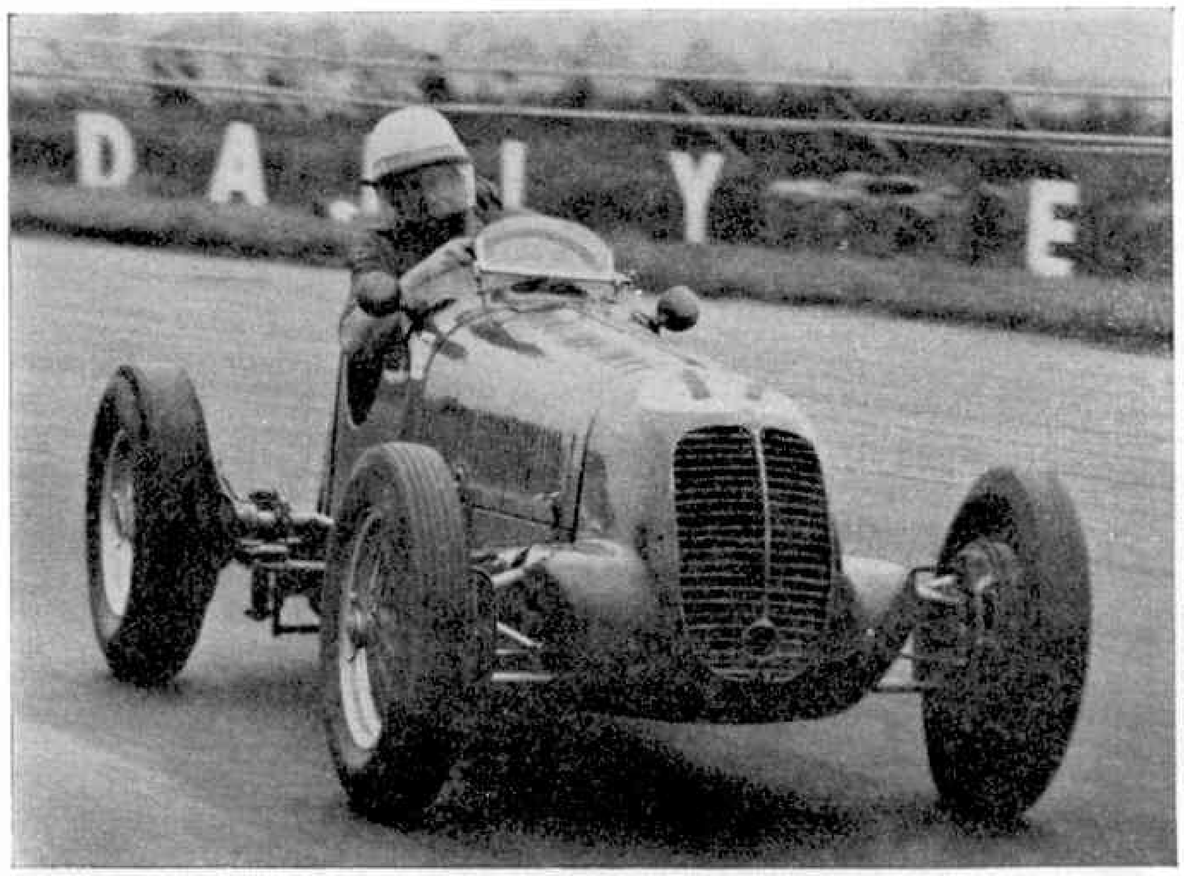
In the G.T. class, last year's prototype 212 Aston Martin, now with modified rear suspension, proved to be only fractionally slower than its rival 4 litre G.T. V–12 Ferrari, but quicker than the 4 litre V–8 Maserati coupé. The Aston Martin team will include last year's World Champion driver, Phil Hill of U.S.A., who has several Le Mans successes to his credit, plus Bruce McLaren and Innes Ireland. The inclusion of so many top drivers in the Aston Martin team is an indication of their hopes at Le Mans.

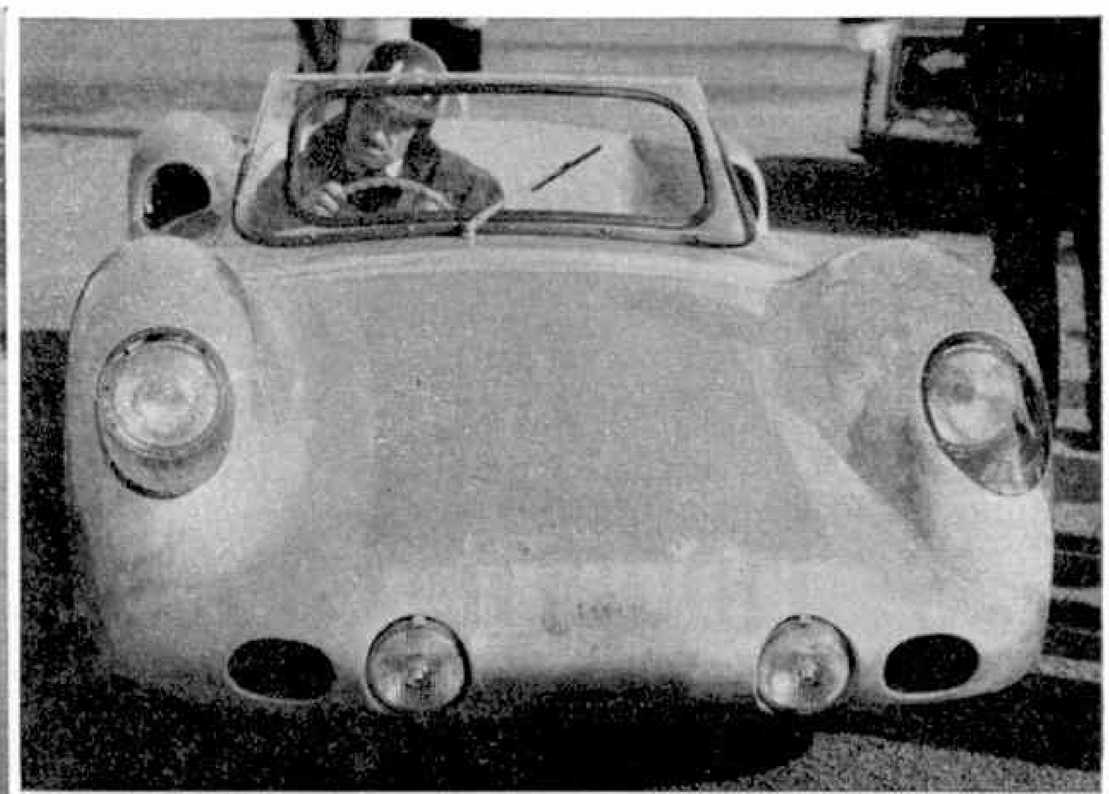
In the class for prototype sports cars, Ferrari will face opposition from three new works-supported Jaguars, to be entered and run privately by the American millionaire Briggs Cunningham. These machines are appreciably lighter than the standard "E" Type Jaguar, and will be powered by the latest aluminium 3.8 litre six cylinder engines with Lucas fuel injection giving well over 300 b.h.p. These cars did not practice.

New also is the completely up-to-date, re-built Lister-Jaguar, with Costin-designed light alloy body, which will be driven by Peter Sergent and Peter Lumsden. During practice with an older engine this car was nearly half a minute slower than the quickest Ferrari, but for the race it will have the latest fuel injection engine with a considerable increase in power.

Undoubtedly the most interesting machine will be the Rover–B.R.M. gas turbine vehicle, although it will really be making only a high speed demonstration to prove the reliability of gas turbine cars. This machine competes in a class of its own, but must cover a minimum of 2,250 miles at an average speed of 93.5 m.p.h. (150 k.p.h.) to win the special prize of £1,820. It will be driven by the present World Champion, Graham Hill, and his team-mate Richie Ginther, of the U.S.A. In practice, the car lapped at 111.98 m.p.h. on four different occasions and reached a timed speed of 149.7 m.p.h. along the Mulsanne Straight.

Graham Hill said to me, "Although the handling technique through corners is





Top: World champion driver Graham Hill at the wheel of the Rover–B.R.M. gas turbine car during tests. Left: Morin Scott, who has formed "Historica Martini" to race famous cars of the old type, is seen here driving a Maserati type 6c 1,500 c.c. super-charged racer at Silverstone. It is understood that this is the actual car driven by Count Felice Trossi in 1935 and 1936 when he was world champion in the voiturette class.

slightly different, it is easy enough to master and gave an arm-chair ride." He added, "To make the drive more interesting I would welcome more power, which the engine could easily be made to give".

The Rover–B.R.M. gets no assistance from the engine in slowing for corners, relying entirely on the large disc brakes at each wheel, which, after an hour's continuous motoring, showed far less wear than expected. This model is not fitted with a heat exchanger as were earlier road cars because it would not give any practical advantage in the race; consequently its fuel consumption went up during trials to 6.2 m.p.g. on Kerosene, which compares with the 8.3 petrol consumption of an Aston Martin.

A rather ugly-looking, experimental bulbous body with high windscreen was fitted to the Rover–B.R.M. for the trials, but this will be replaced by a new body for the race, designed by Norris Brothers, responsible for Donald Campbell's *Bluebird*. The chassis frame is virtually a 2½ litre Grand Prix B.R.M. cut down the middle and widened to provide the two seats required by regulations. The chassis development work has been carried out by Tony Rudd, B.R.M. Chief Engineer, who drove round beforehand in Rover's T.3 gas turbine coupé, a car I have also driven on the road and which I enjoyed handling very much.

The gas turbine engine develops 150 shaft horsepower and at full speed turns over at close on 70,000 r.p.m. This car could well be the forerunner of a special sports coupé for production.

A TOUGH EVENT

Only seven out of 84 starters finished this year's rugged African Safari Rally, rated as the toughest event of its kind in the world. I do not think that anyone would dispute that; therefore, all praise to the Ford Anglia and the Rover 3 litre that figured among the survivors.

The rally was won by a Peugeot 404, a vehicle I was driving last month and one that impressed me by its good handling and extremely lively, economical engine. My test Peugeot with handsome saloon body, in a restrained style by Farina, reached a top speed of 89 m.p.h., would cruise at 70 to 75 m.p.h. and still give 30 m.p.g. It is made by one of the oldest car manufacturers in France.

HISTORIC RACING CARS

Interest in older racing cars has been growing steadily over the past few years, and today these cars have a tremendous following both in Britain and abroad. I was, therefore, delighted to hear from an old friend, Morin Scott, that he has formed Historica Martini, a team to race famous cars, which must be at least twelve years old, in England and abroad. Morin, who some years ago used to race a magnificent 8 litre Hispano Suiza, at Silverstone, now has a superb stable of historical racing cars. His latest acquisition is the 4½ litre V–12 Grand Prix Osca that Bira used to race at Goodwood just over ten years ago. It has a top speed of around 150 m.p.h.

Historica Martini, backed by Martini and Rossi, also includes one of the famous 6 CV 1,500 c.c. supercharged Grand Prix Maseratis, first built in 1935 and raced with success all over Europe by Count Felice Trossi, who was one of the great drivers of pre-war days. The Maserati should have a top speed of around 135 m.p.h.

In my opinion one of the chief reasons for the popularity of these older Grand Prix cars among spectators today is their higher seating position, permitting onlookers a fine view of the drivers in action. Spectators can follow every movement of the driver's hands on the steering wheel,

(*Continued on page 271*)

Pictured here rounding a bend in the East African Safari Rally, rated as the toughest event of its kind in the world, are Anne Hall, of England, and her co-driver Mrs. Lucille Caldwell, of Kenya, in car No. 50—a Ford Cortina. They were the first all-women crew to arrive at the Kampala control. The rally was won by a Peugeot 404.

Recording The Whole Bible On A Grain Of Rice

Magic Of The Modern Camera

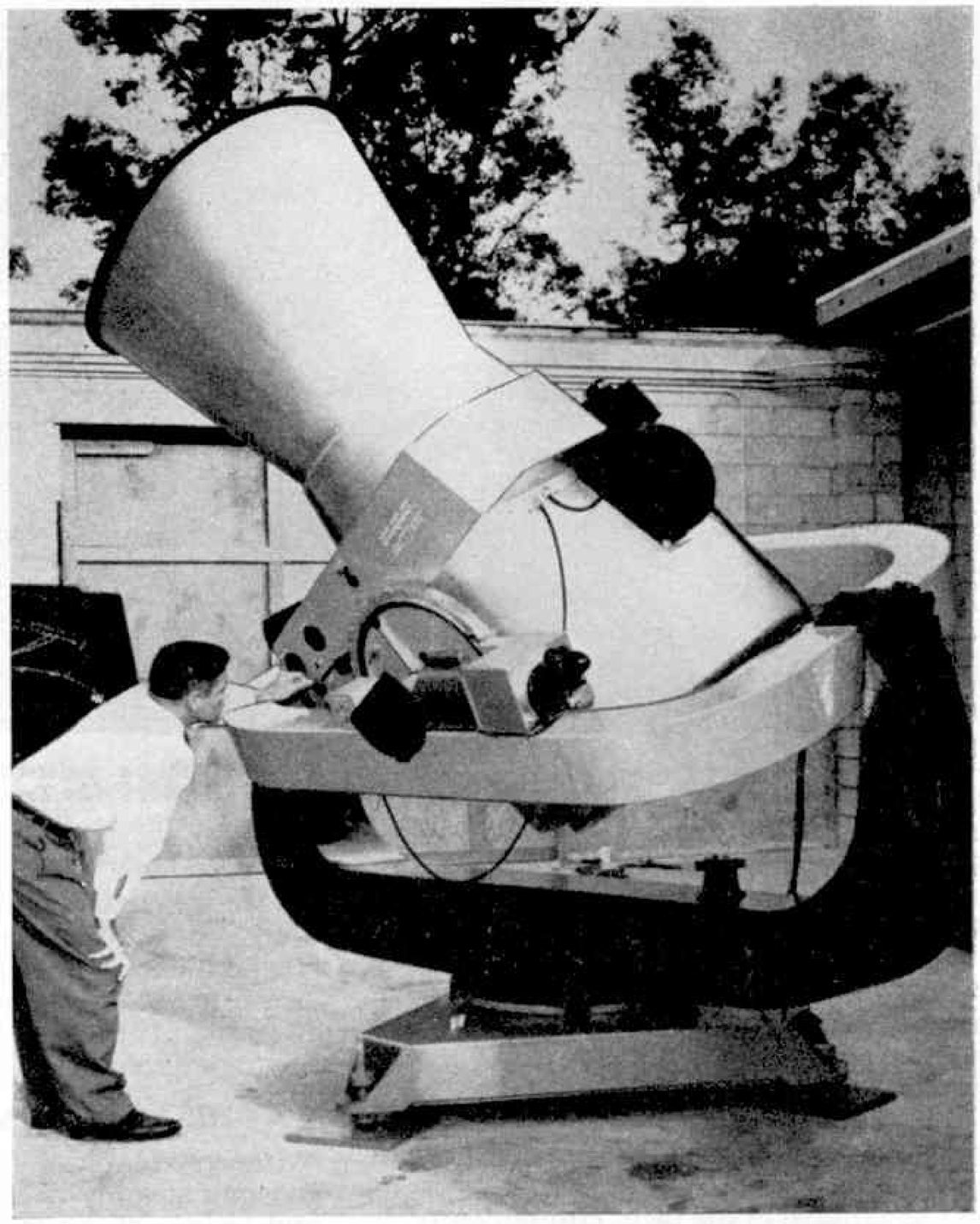
WITH extreme care, it is possible to print the Lord's Prayer on a grain of rice. At first sight this seems an incredible feat of microscopic work, but by using a recently developed camera the entire Bible can be photographed and laid out page by page in half that area.

"And", says Mr. C. S. McCamy, the designer of

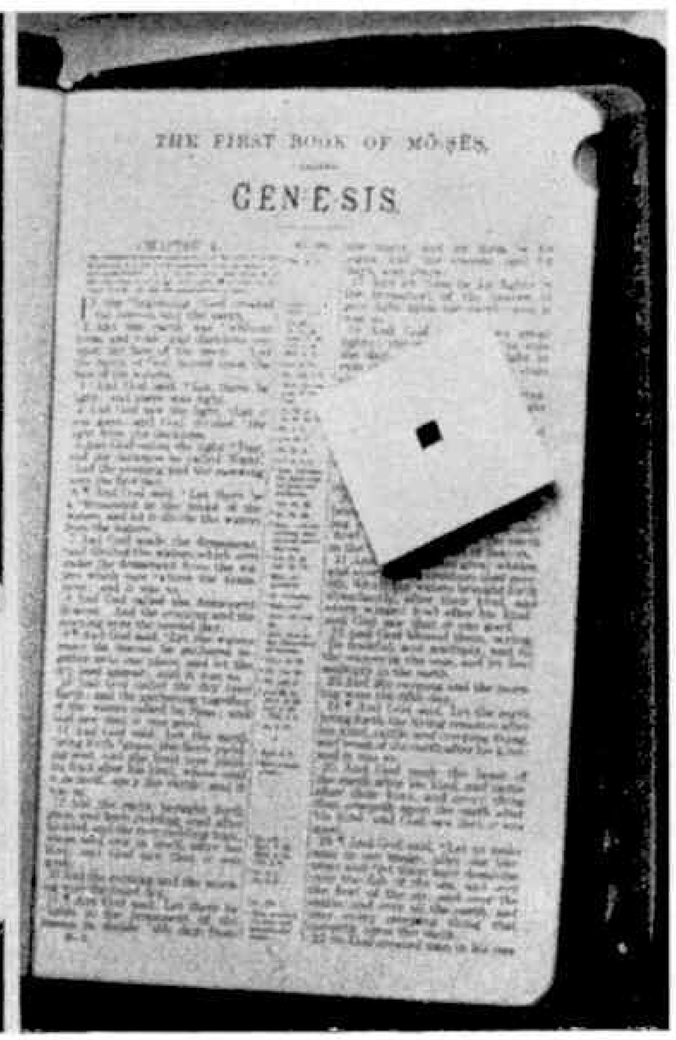
By L. A. REDMAN

this camera, "that is not counting the ends of the grain, where we might put a Concordance and perhaps a few maps of the Holy Land."

Mr. McCamy developed the ideas for his camera at the United States' National Bureau of Standards. In order to prevent the slightest vibrations—they would blur the ultra-microscopic pictures—the camera and object to be photographed have to be mounted in a heavy steel cylinder which is suspended by means of springs.



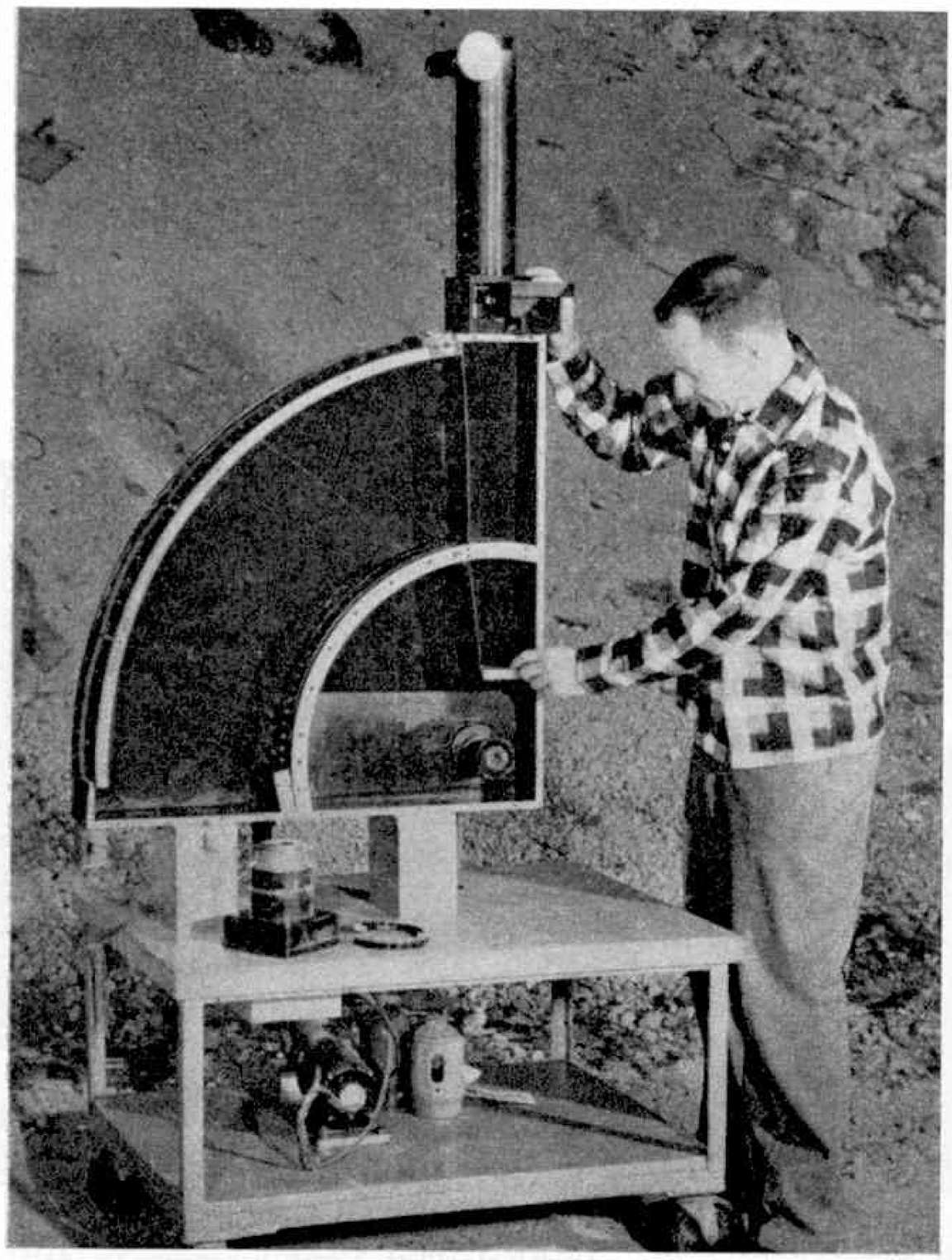
The Baker-Nunn Schmidt-type telescope camera which, equipped with a complex system of lenses, photographs satellites as they orbit the earth. Scientist Dr. Karl G. Hanize is seen adjusting the camera.



Scientists at the United States National Bureau of Standards say the camera seen here, on the extreme left, could record the entire Bible. laid out page by page, within the space of the black square shown on the copy of the Bible at the right of the picture. Operating the camera is technician Barnard Foquet, watched by Mr. C. S. McCamy, who is chief of the Bureau's photographic research section.

The technique of obtaining photographs which are capable of showing such fine detail is called photomicrography. Essentially, all that is required is a camera arranged at the eyepiece end of a microscope so that the image is focused on the film or plate. In practice, many technical refinements are introduced and special methods of illuminating the object have to be used. For example, if a biological specimen is being photographed it must be protected from the heat produced by the lamps which provide the illumination.

There are many uses for photomicrography. Clearly it is important in scientific work where attention to detail is necessary. A less obvious use is simply for storing information. Year after year, a torrent of millions upon millions of words is printed in books, magazines and research journals. How to deal with all this information, so that it can be easily stored and used to best advantage, is becoming an ever-increasing problem. This is where photomicrography comes in. Whole books can be photographed on small pieces of film which can easily be filed away. When anyone wants to look something up, the appropriate film is brought out and viewed on a special projector.



A photographer makes an adjustment to a Brixner camera which takes 35 mm. motion pictures in colour at the rate of 15,000,000 frames per second. This camera can take 96 consecutive photographs during the detonation of an explosive material. The illustrations in this article appear by courtesy of the United States Information Service.

This type of photography is also highly advantageous in police work, where photomicrographs are important in the examination of bullets. Any gun leaves its own particular marks on the bullet when it is fired. If a bullet is found during an investigation, then the gun which fired it can be identified by firing a test bullet from it. Both bullets are then photographed by special cameras fitted to microscopes. These pictures are then enlarged and the tiny scratches on the two bullets are compared. If the scratches are the same this is conclusive evidence that the original bullet had been fired from that particular gun. This sort of evidence is clearly very important, especially in murder cases.

Many other new cameras have been developed recently for special purposes. In fact, if you want to photograph anything, scientists can design a camera to do the job. They can even take photographs without the faintest glimmer of light. The camera used in such cases is called the evaporograph, and could photograph a black beetle in a coal cellar. Instead of using light rays to form the image, the evaporograph camera uses heat radiations. These are focused on to a thin film of oil and the heat evaporates the oil by different amounts; the more radiation falling on one spot the more the oil there evaporates. The image formed on the film thus records the different temperatures of each part of the object being photographed.

You can employ some of these techniques using an ordinary camera. To do this you need an infra-red filter and a film which is sensitive to infra-red rays. On a hazy day it is impossible to get clear pictures because the visible light is scattered by the haze. The infra-red rays, however, can penetrate the haze and so, by using the filter and infra-red sensitive film, a clear picture is obtained.

Infra-red photography can also be used to decipher corrections on documents. Suppose an important document has been corrected by having some of the printed passages blocked out in ink; because of the ink it is impossible to read the original passage. If the document is illuminated by infra-red, and photographed, the infra-red rays penetrate the ink but not the printing underneath it. As a result, the infra-red photograph shows the document as it originally was.

Altered documents and forgeries can also be examined by using ultra-violet rays which have a much shorter wavelength than either infra-red rays or visible light. There are two different methods of taking photographs using ultra-violet rays. The first is exactly similar to that used for infra-red except, of course, that this time the filter only allows ultra-violet to pass and the film is sensitive to ultra-violet and not infra-red. The second method is to illuminate the object by ultra-violet rays. This causes substances sensitive to ultra-violet—e.g. special inks—to glow. This visible light is then photographed in the usual way, the camera being fitted with a filter to cut out the unwanted reflected ultra-violet.

The development of cameras has led to a revolution in astronomy. Not all that long ago people thought of astronomers as people who sat, night after night, with their eye glued to a telescope. Now, looking through a telescope is almost completely a thing of the past for professional astronomers. Nowadays almost all astronomical observations are made by photography and the reasons for this are quite clear: by giving long exposures, stars which are too faint to be seen by direct observation can be photographed. The large Schmidt telescope at the Mount Palomar Observatory in California is used for photographs of this kind. Its light-gathering power is so great that it could photograph a candle flame 10,000 miles away.

In addition to this, many stars can be photographed at the same time. This provides a record of their relative positions which can be compared with records made at regular intervals over a period of months, or even years. Indeed, by using photographic methods many facts about the chemical and physical constitution of the planets and stars can be obtained from the radiations (both visible and invisible) they emit.

A telescope-turned-camera is used for tracking satellites as they orbit the earth. One of our illustrations shows a Baker-Nunn Schmidt-type telescope camera. It is more than ten feet high, and weighs almost three tons, yet is controlled so sensitively by automatically-operated motors that it can follow and photograph satellites with a tracking error of less than one per cent.

Satellites themselves carry cameras which, rather obviously, are operated by remote control. The American satellite Tiros II has two such cameras for photographing cloud formations back on earth. This information is of great value in weather forecasting. In this way it is possible to spot dangerous tornados and hurricanes, track their path and warn people to take safety precautions well in advance. This use of photography from satellites has already saved hundreds of lives in areas where these raging storms frequently occur. In Tiros II one camera is a narrow-angle camera and takes pictures of an area some 75 miles wide; the other, fitted with a wide-angle lens, covers an area some 800 miles wide. Each camera is about the size of a tumbler, and the pictures they take can be stored on magnetic tape for subsequent relay to the ground.

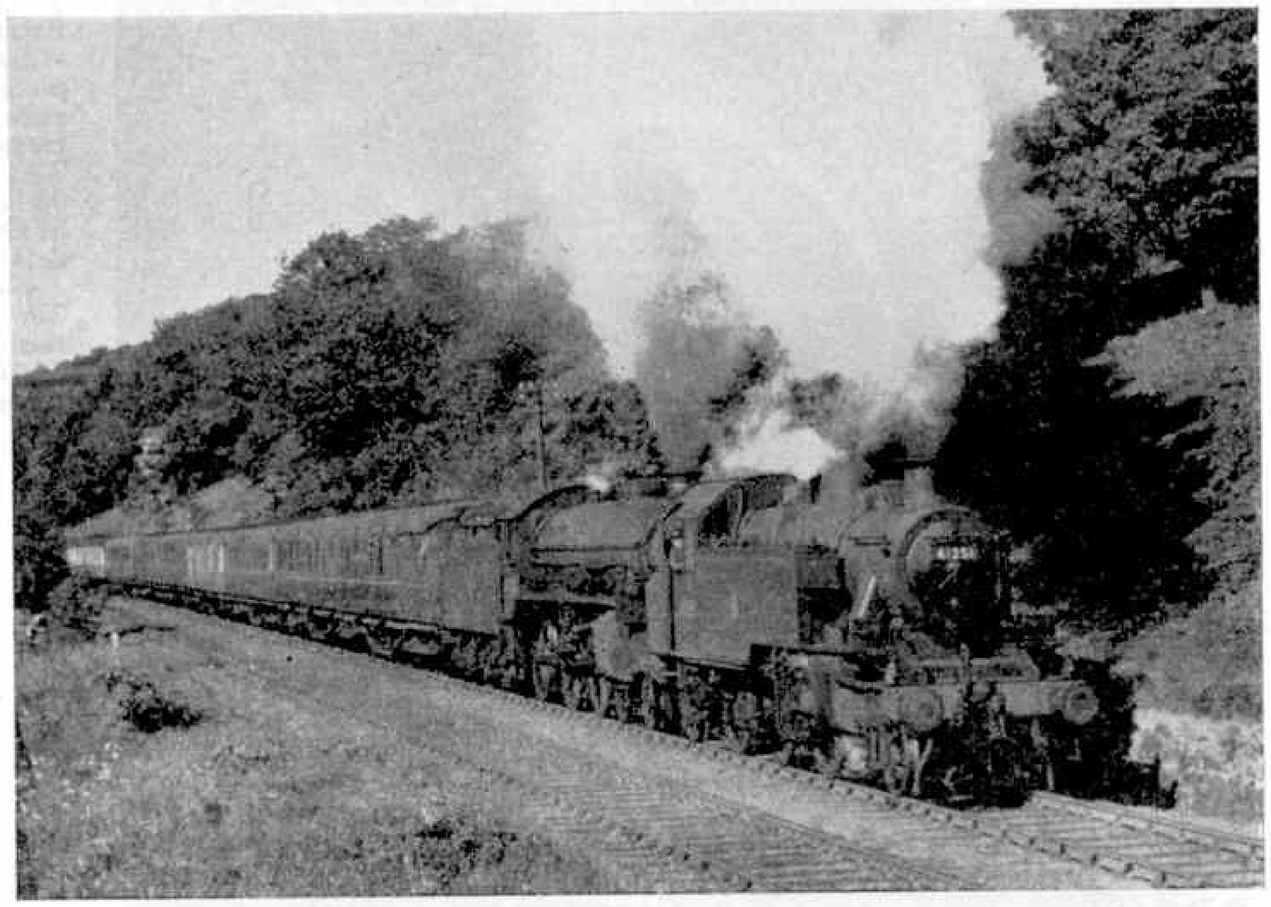
Remote control must also be used for cameras which are designed specially for photographing explosions. Here, the problem is that the explosion occurs in a

(*Continued on page 267*)

RAILWAY NOTES

Contributed by R. A. H. Weight

Designers Aim At More Comfortable Trains And Stations



Double-headed Whitby–Leeds holiday tour train at Goathland. Class 2 tank locomotive No. 41251 piloting class B1 No. 61218. Photograph by C. Ord.

VISITORS recently flocked to the Design Centre in London, attracted by a fascinating exhibition organised jointly by the British Railways Board and the Council of Industrial Design. The centre-piece was a full size mock-up of sections of new main line passenger carriages as now under construction or planned for experimental service.

Improvements and innovations include both compartment and open saloon type first and second class seating, scientifically designed to be restful; better lighting, sound-proofing, heating and ventilation; wider entrances and "panoramic" windows—all of this in vehicles intended to run smoothly on new B4 type bogie wheels. Fittings include (in some of the coaches) removable cushions, storage space beneath seats for luggage, adjustable seats and arm rests, trays or shelves for small items, magazine holders, litter bins, and hygienic and comprehensively-equipped toilet compartments. The whole vehicles, as well as all their fittings down to door handles, ventilators and so on, have been designed to function efficiently as well as to look well.

Class "7F" 2–8–0 No. 53807 passing Radstock with a goods train for Bath. Photograph by J.C.Beckett.

On view, too, were models of road and rail vehicles for all kinds of freight and parcels handling, finished in bright liveries of distinctive character and featuring a freight-arrow symbol together with wording such as "Rail Freight", "Door to Door" (for through load containers), and so on. There were also models of diesel and electric locomotives and trains, together with photographs showing the attractive internal layout of some of British Railways' "baby liners"—the latest ships engaged on cross-channel and short sea route services.

Other things to see in the exhibition were representations of new-style passenger and freight stations, stacking trolleys and trucks, and decorative and more comfortable waiting and refreshment rooms such as are already to be found in various parts of the country.

More controversial, perhaps, was the range of proposed designs and styles for a new series of uniforms to be worn by stationmasters, inspectors, ticket collectors, porters, etc., intended, it was announced, to foster an atmosphere of efficiency, combined with smartness and convenience in use. The porter's outfit consists of a charcoal-grey slip-over with

A Chester–Ruabon–Barmouth train at Llangollen, headed by 4300 class 2–6–0 (Mogul) No. 6301. The illustrations on this page are by B. C. Bending.

fitted sleeves in a contrasting striped material, worn with or without a jacket and with matching grey trousers. Various shades of grey suits are proposed for others to go with new style peak caps, old-gold badges and trimmings. It will be known later if these find general favour.

NEW PLAN

Dr. Beeching's plan, recently presented to Parliament, for re-shaping British Railways, is a long and carefully-argued document—almost a book, indeed—summaries of which readers have probably seen in the Press and also heard on radio and television. His object is to achieve success financially. He writes, "The railways must concentrate on doing the things they are well suited to do . . . their own track and signalling system are expensive to maintain, but when fully and properly used to carry frequent and well-loaded trains, railways can always provide excellent services at good prices . . . we must develop those routes and flows of traffic which railways can move so safely, reliably and quickly . . . ".

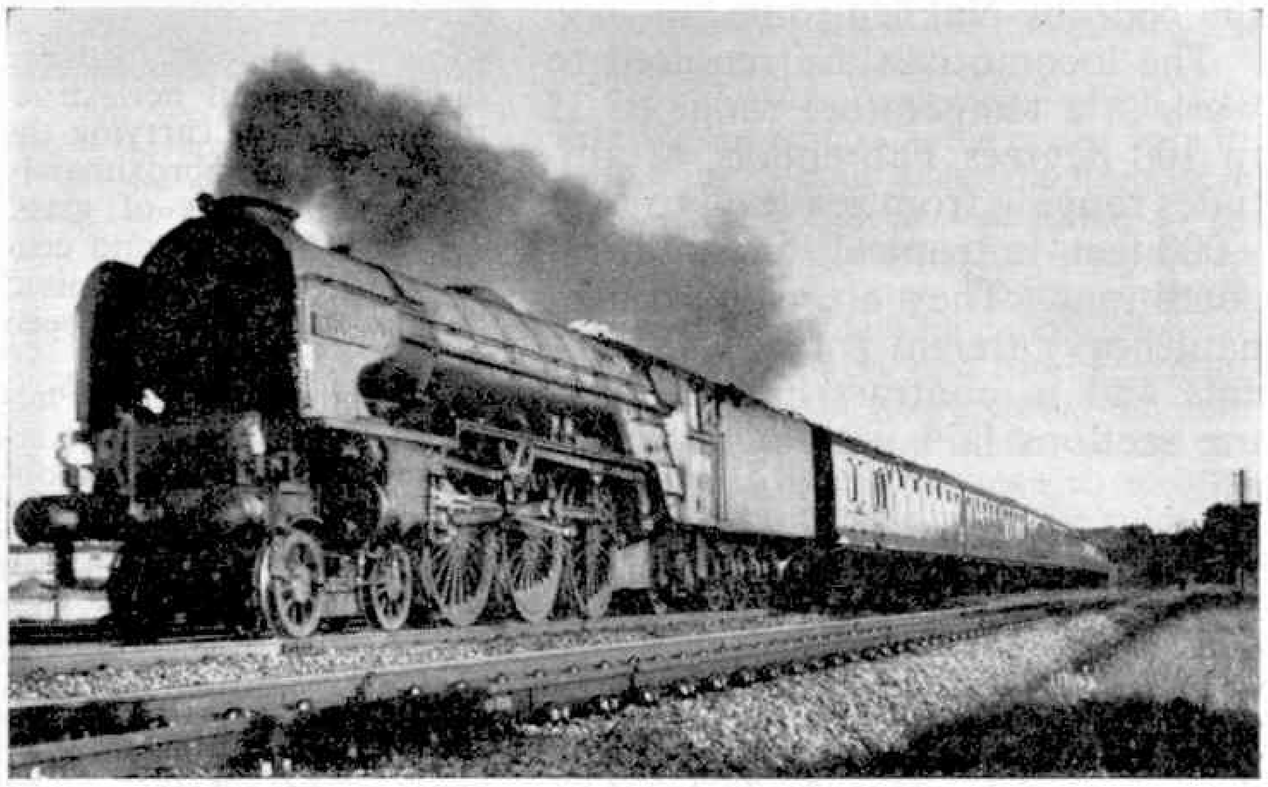
There are proposals to close a number of lines and stations regarded as on the average, or entirely, unremunerative, which are the subject of negotiation and discussion. Many of us hope some of these lines may be reprieved as they provide attractive and most useful journeying. On the other hand, plans are going ahead to effect further speed-up in main line and other passenger services. That will be continued, this summer and after, with a re-organisation of freight and perishable train-running and railhead terminals or loading points, with fast, fully-braked "Liner Trains" conveying block loads on regular timings. Extra holiday trains will be run and a range of cheap "runabout" weekly, day and excursion tickets offered.

LOCOMOTIVE NEWS

Names have recently been applied to main line diesel-electric locomotives as follows: L.M.R. type 4, No. D56, *The Bedfordshire and Hertfordshire Regiment, T.A.*, Deltic type 5, No. D9013, *The Black Watch.*

Additions to the fleet of W.R. type 4, 2,700 h.p. diesel-hydraulic units include Nos. D1012–17 named respectively *Western Firebrand, Ranger, Leviathan, Champion, Gladiator*, and *Warrior*, the last four preceded, of course, by the class name *Western* in each case. Similarly, Nos. D1044–59 have entered service named respectively: *Western Duchess, Viscount, Marquis, Lord, Lady, Monarch, Ruler, Ambassador, Viceroy, Patriarch, Governor, Advocate, Sultan, Chieftain, Nobleman, Empire;* all these names except the first one, which I have given in full, beginning with the class name *Western.*

I mentioned in the *M.M.* of March last the former Somerset and Dorset Joint Line's 2–8–0 engines designed at Derby in 1914 and built there at the headquarters of the Midland Railway as it then was (which incidentally, never had anything larger for its own vast freight traffic over an extensive system than class 4 0–6–0s until after formation of the L.M.S. group). No. 53807, illustrated this month has, like sister locomotives, hauled long-distance passenger trains on busy summer days over the steeply graded Bath–Bournemouth route. The Somerset coalfield is centred around Radstock and is surrounded by rural hills and woods.



Right: A1 class 4–6–2 No. 60130 "Kestrel" forging ahead with a King's Cross–Leeds express near Brookmans Park.

Many readers will perhaps be visiting the active, privately-operated Bluebell Line in Sussex this summer. Since my visit and published account last year an ex–L.B.S.C.R. E4 0–6–2T has been acquired and restored to its original umber livery, its number is 473 and its name *Birch Grove.* This locomotive, assisted by B.R. 2–6–4T No. 80084 (on the main line as far as Haywards Heath), hauled a special train from London to Sheffield Park on this season's opening day; the second engine from Haywards Heath, at the other end of the seven coach train, was green ex–L.S.W.R. 4–4–2T No. 488.

No. 27, 0–6–0T, named *Primrose* for a time, has been repainted in the darker green livery of the old S.E.C.R., with impressive coat-of-arms. In sharp contrast, large main line diesel-electric locomotives are entering service, continuing the series of type 4, 2,750 h.p. D1500 class; type 3, 1,750 h.p. D6700–6800 class, on the E. and N.E. Regions; as well as more L.M.R. E3001 overhead electric units; also W.R. Hymek 1,700 h.p. diesel-hydraulic locomotives numbered D7070 and on.

The Peppercorn A1 series of 49 steam express locomotives appeared in 1948–9, constituting the final L.N.E.R. Pacific three-cylinder design, numbered 60114–62 and all bearing names. They are very powerful and speedy. At the time of writing they share in the few regular remaining steam workings on fast trains between, Leeds–King's Cross, Doncaster–Newcastle, etc.

LONG-LIVED MOGULS

It is rather sad to learn of the withdrawal, among other Southern classes, of the Lord Nelson and King Arthur 4–6–0s,

(*Continued on page 273*)

TRACKSIDE NEWS

By "PLATELAYER"

● *Second in a new series of articles of special interest to M.M. readers who are railway enthusiasts.*

AN order for eleven 1,840 h.p. diesel-electric main line locomotives has been placed with the English Electric Company by the East African Railways and Harbours Administration. The contract is worth about £900,000, and deliveries are due to begin early next year. The locomotives will be made at the Stephenson works of English Electric at Darlington. It is a repeat order, the same firm having supplied ten similar locomotives, also made at Darlington, in 1960–61. These operate on the Nairobi–Nakuru route.

The locomotives are required to work in a temperature range of 35 to 100 degrees Fahrenheit, at altitudes ranging from sea level to over 9,000 feet, in tropical rain and dust conditions. They are called on to haul heavy freight trains up gradients and in contrast have also to use sections laid with light-weight rails.

* * * *

The north end of York Railway Station roof was recently re-glazed with no less than 18,000 square feet of glass (the equivalent in area of more than six tennis courts). The work was completed on the roof over Platforms 8 and 9 and involved the renewal of the old timber lantern-type roof, which was stripped down to the main arch ribs. These ribs were retained to provide support for more than 49 tons of new structural steelwork carrying the weight of approximately 1,200 new panes of glass. New-type external and central walkways of galvanised pressed steel have also been provided.

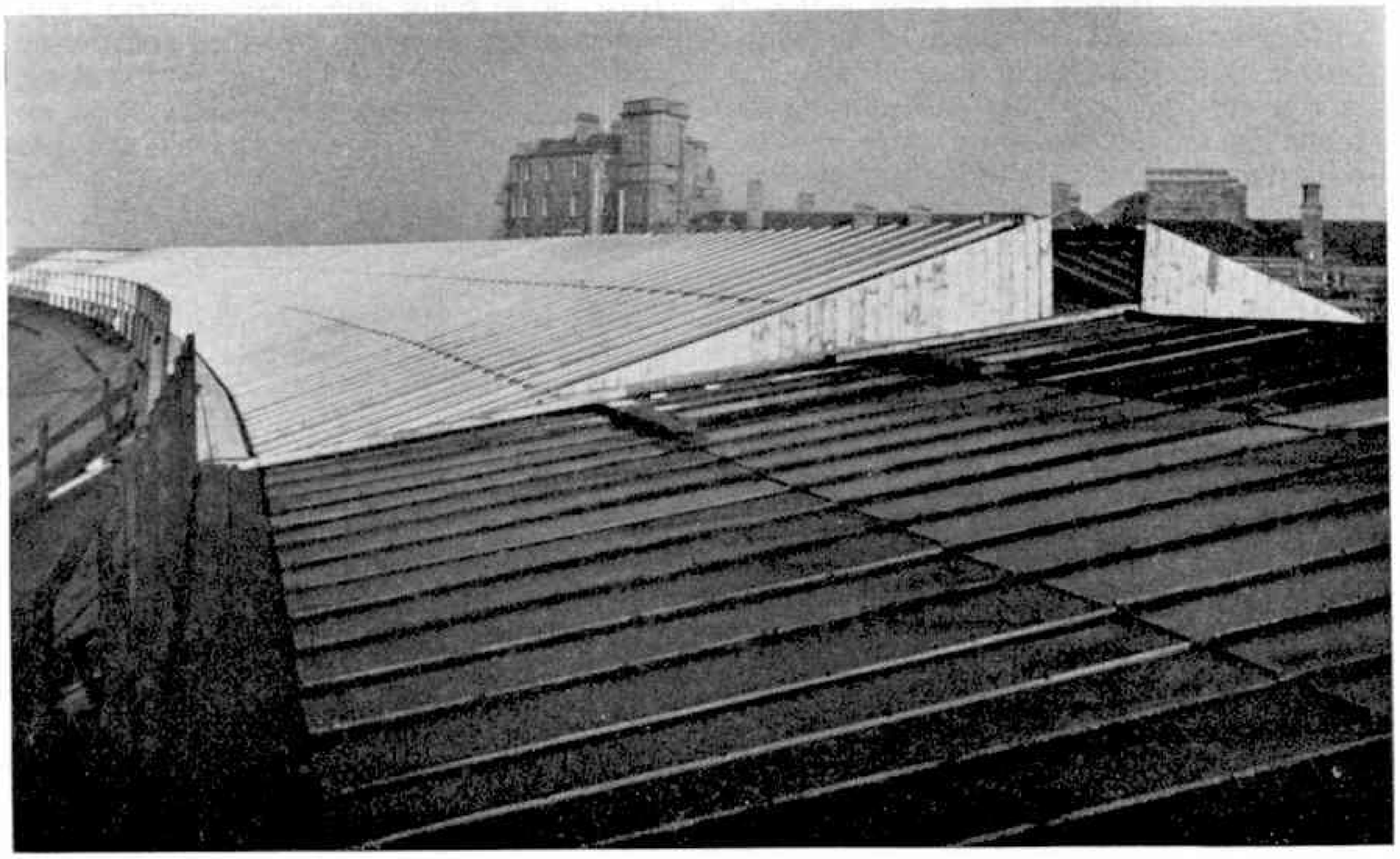
A similar area over Platforms 12 and 13 is to be re-glazed this year and demolition work on the timbers of the existing roof is already in progress.

* * * *

When British Railways (London Midland Region) engineers were engaged in electrifying the main line between Manchester and Crewe, they brought into use a special measuring wheel to determine the length of the signalling cables required. The machine, which you see illustrated, is graduated in divisions of six inches and is accurate within that margin over a distance of 999 yards. The measuring wheel has now been found employment in electrification schemes elsewhere in England.

The special measuring wheel used by British Railways to determine the length of signalling cables. This picture and the other illustrations to this article appear by courtesy of British Railways.

A sea of glass—the new roof glazing over Platforms 8 and 9 at York Station.



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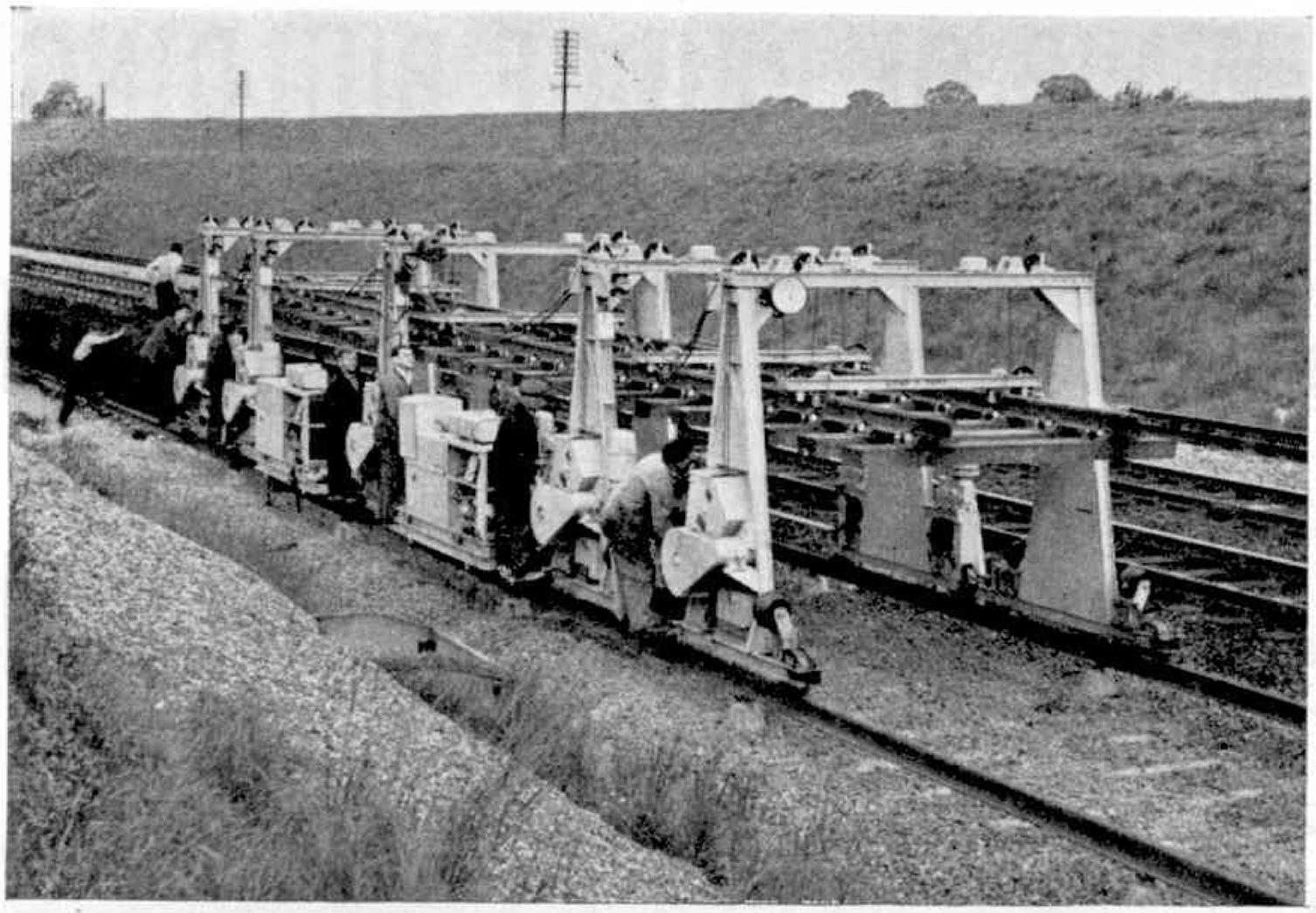
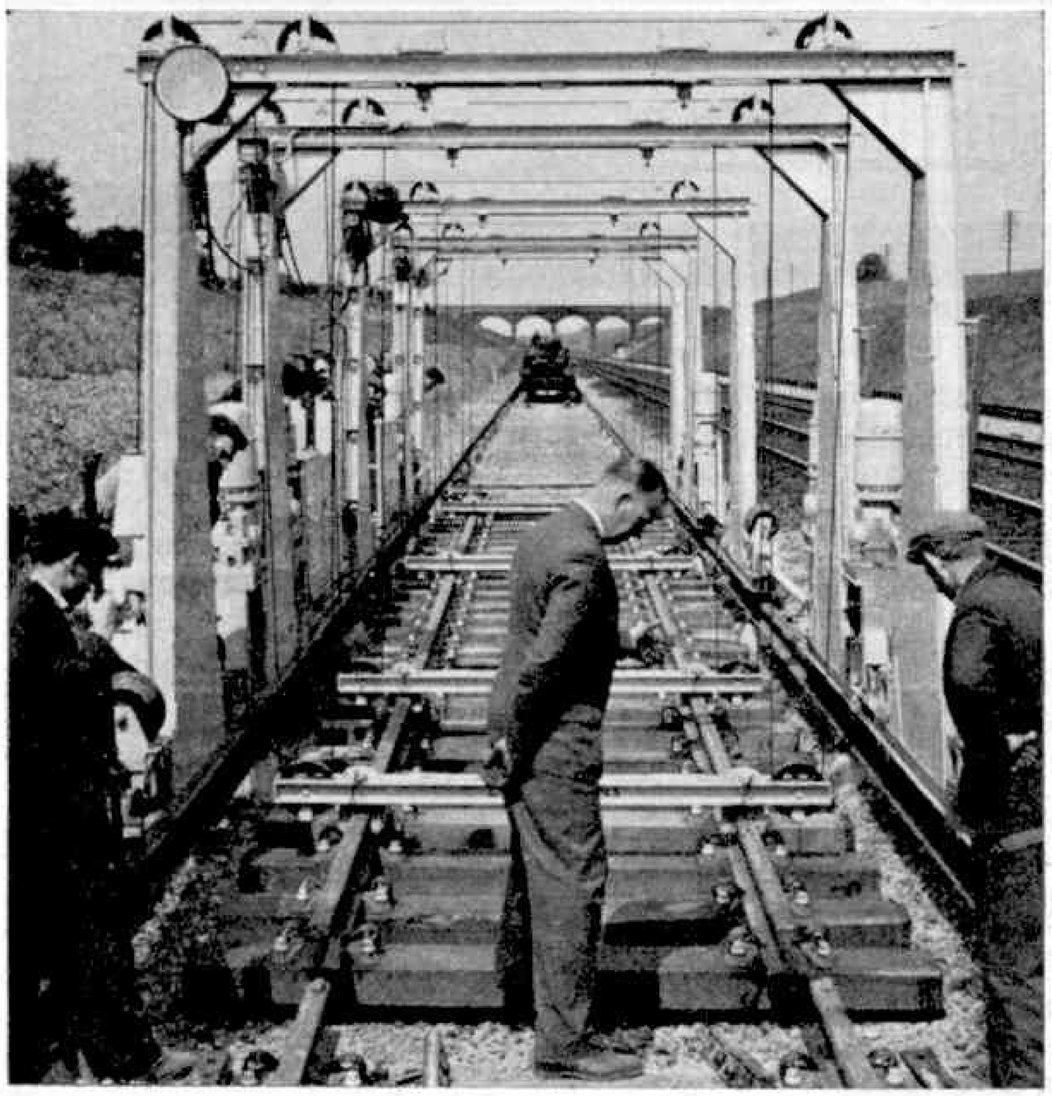
An air-sprung version of British Railways new, smooth-riding B.4. carriage bogie is now being developed by B.R. engineers. This bogie gives promise of even smoother riding and certainly quieter rail travel.

In place of the usual steel coil springs the new bogie has six air bellows which are automatically adjusted—deflated or inflated—to match the weight and load of the carriage. These adjustable "air-cushions" ensure that the carriage, loaded or empty, always rides on correctly-balanced springs. This gives them a distinct advantage over steel coil springs, especially for trains which have to deal with heavy surges of traffic.

Two experimental air-sprung bogies are already in service on a Southern Region buffet car (No. 69000) and eight





In the picture above you see the "Arki-Endon" at work. In this case it is carrying timber-sleepered track. (Left) A section of track being lowered to the ground by the "Arki-Endon". The new section is almost in position.

more are to be constructed to gain further operational experience. If the trials are successful, air-sprung bogies may be fitted to new multiple-unit passenger trains for the London Midland Region's main-line between Euston and North-West England, now being electrified. The new high-speed freight trains may also have air-sprung bogies, although not the type developed for passenger trains.

* * * *

A frequent, rapid train service which will bring High Wycombe within 90 minutes of the centre of Birmingham became available for businessmen in Buckinghamshire and Berkshire when the new Midland to London Airport rail-road service opened on April 1. Principal expresses between Paddington and Birmingham, including the luxury *Blue Pullman*, now call at High Wycombe to connect with the special coach service to and from Heathrow.

* * *

British Railways have recently established what is known as the Central Wagon Authority, which has responsibility for determining the future size of the wagon fleet and also the size and type of containers in relation to commercial requirements.

A similar body to that mentioned above was formed in 1842. It was called the Railway Clearing House. The scheme was formed by the nine principal railway companies to decide on matters of common interest. In the latter part of the nineteenth century, the R.C.H. developed standard wagon specifications which were subsequently adopted.

* * * *

The Midland Area of the Railway Preservation Society are holding an open week-end on June 29 and 30 at their depot at Rugeley Road, Hednesford. The depot will be open from 2 p.m. to 7.30 p.m. on Saturday and from 2 p.m. to 5.30 p.m. on the Sunday.

Attractions will include the preserved L.N.W.R. Webb "Coal Tank" 0–6–2T No. 1054 and vintage rolling stock in a suitable position for photography, together with working model layouts, a photographic display and an exhibition of smaller relics. Refreshments will be available and a small charge will be made for admission. The proceeds will go towards society funds. Further details from Mr. F. A. Lewis, 137, Wolseley Road, Rugeley, Staffordshire.

* * * *

The first London Transport train fitted with automatic driving equipment to go into passenger service began operating on the District Line on April 8. It was No. 123 and it was on the way from Ealing Common to Upminster when the motorman switched over to automatic driving on the section of the eastbound track between Stamford Brook and Ravenscourt Park where the service tests are being carried out.

The line-side equipment which feeds into the running rails the coded impulses picked up by coils under the front of the train, has now been transferred to this half-mile eastbound section from the test track, west of Acton Town, where the initial experiments were conducted.

On the first west–east run under automatic control the guard closed the doors after the stop at Stamford Brook and gave the signal to the motorman to start the train. The motorman cut in the automatic control switch and pushed the illuminated starting button. Automatic driving then took over to start the train, accelerate away, coast, and brake to a halt in correct platform alignment at Ravenscourt Park. Then the motorman switched back to manual control.

* * * *

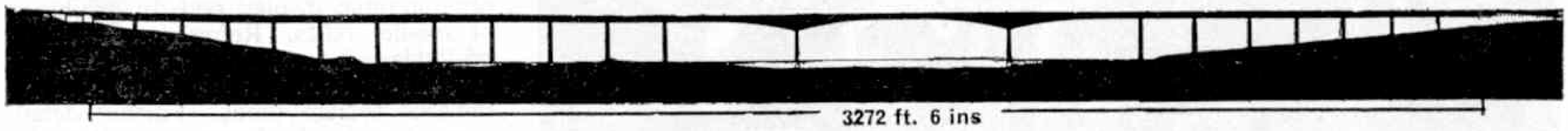
I feel that many readers whose principal interest is railways would welcome a description of the single line tracklayer now in use on the Eastern Region of British Railways. This machine, known as the "Arki-Endon," can be operated without the need to occupy an adjoining line. In principle, it is similar to an appliance used on the Continent, but several modifications have been carried out during manufacture to make it suitable for the Eastern Region, who have pioneered its use in this country.

Considerable benefits are to be gained from the use of this type of machine, for mechanised re-laying by conventional methods occupies two lines, entailing traffic diversions or alternative services which are costly and inconvenient. By using the "Arki-Endon" to re-lay one line of a two-tracked route, single line working can be employed on the other, resulting in great savings. The machine is particularly suitable on the Eastern Region's electrified lines since it can be used under the overhead wires, giving adequate clearance.

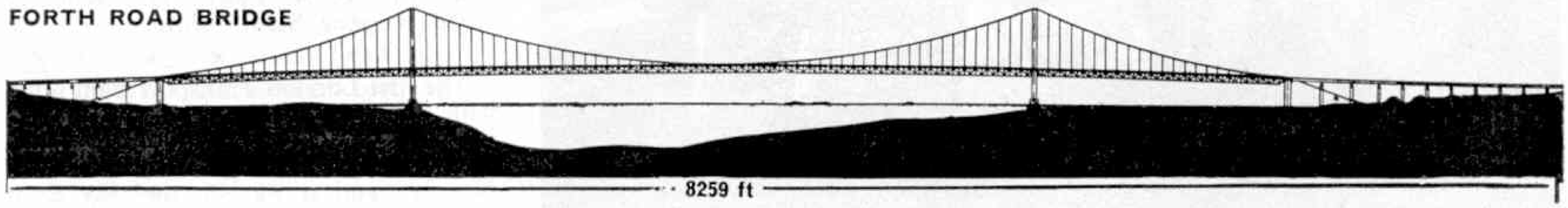
(*Continued on page 273*)

BRITAIN'S NEW WAVE OF BRIDGE BUILDING

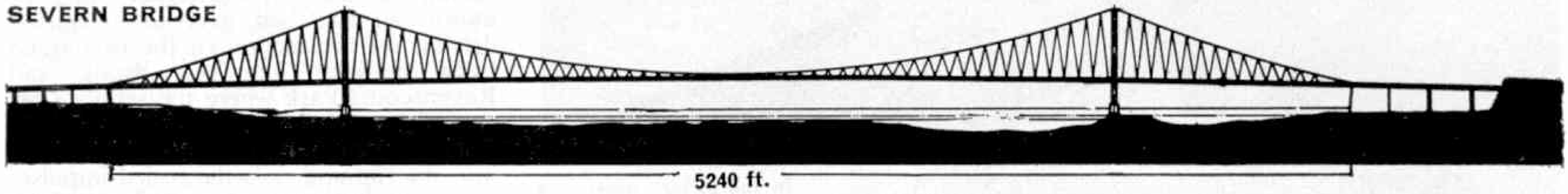
MEDWAY BRIDGE



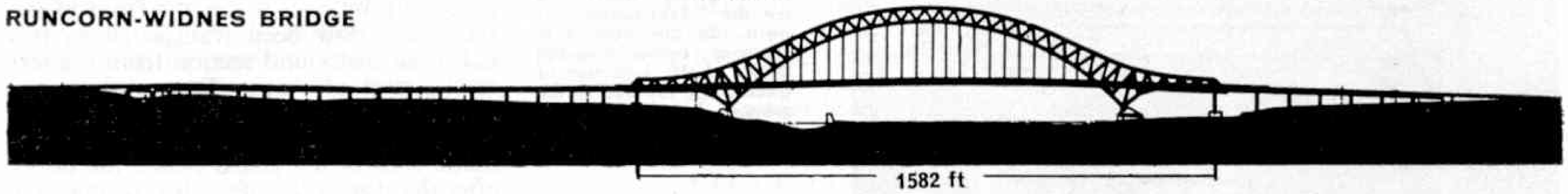
FORTH ROAD BRIDGE



SEVERN BRIDGE



RUNCORN-WIDNES BRIDGE



THE country is in the midst of the biggest bridge-building boom since the middle of the nineteenth century. For more than 70 years, from the completion of the railway across the Forth, no major bridge was built in Britain. Now, with the belated expansion of Britain's road system, more are under construction or newly completed than at any time since the days of Brunel.

They include the Medway Bridge, which has the longest pre-stressed concrete span in the world; the Tay Road Bridge, which will be the longest river crossing in Britain; the Forth Road Bridge, which will be the longest span in Britain and the fourth longest in the world, and the Severn Bridge, the sixth longest span in the world.

By 1966, the new bridges will have cost nearly £60,000,000, a figure which does not include the handsome viaducts and fly-overs of the motorways or the many bridge replacement schemes.

The main difference between this massive programme and the nineteenth century is that the earlier bridges were mainly for railways: the new ones for roads.

The second difference is the use of new materials like high-tensile steel and plastic coatings. The Forth Bridge is famous for its annual repainting; the anti-corrosive treatment of the new road bridge should protect the steel parts for twenty years.

Despite the new techniques, bridge building remains an awesome task. More than 500 feet above the Forth, half-frozen spidermen, in 50 m.p.h. winds, have been spinning 30,000 miles of wire into 24-inch

(*Continued on page 257*)

Reproduced from the "SUNDAY TIMES" by courtesy of the Editor

Bridges pictured above (not drawn to scale) are:

MEDWAY Bridge. Linking East Kent and London by the M2. Length 3,272 feet, 500-foot pre-stressed concrete central span. Cost £2,750,000. To be completed this year.

FORTH Road Suspension Bridge. Linking Edinburgh with Fife. Length 8,259 feet. Central span 3,300 feet. Cost £18m. To be completed end of this year.

SEVERN Suspension Bridge. Linking South-West England and South Wales, reducing some journeys by 50 miles. Length 5,240 feet. Central span 3,240 feet. Cost £16m. Completion date 1965.

RUNCORN–WIDNES Arch Bridge. Linking North Merseyside and Cheshire. Length 1,582 feet. Cost £3m. Completed in 1961.

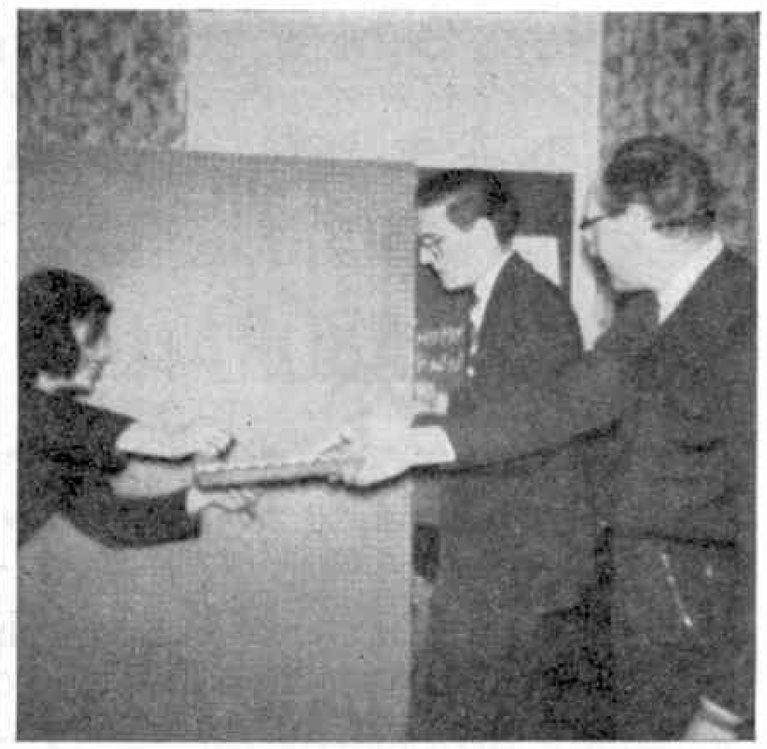
Other major bridges:

TAY Continuous Pier Bridge. Linking Fife and Forth road bridge with Dundee. Length 7,400 feet. Cost £4½m. To be completed in 1966.

TAMAR Suspension Bridge. Linking Plymouth and Cornwall. Length 1,848 feet. Cost £3m. Completed 1962.

RECENTLY FINISHED bridges also include the £750,000 Queensferry bridge, linking North Cheshire to North Wales; the £1¼m. Kingsferry lifting bridge linking Kent to the Isle of Sheppey; and the Barton bridge over the Manchester Ship Canal.

LARGE BRIDGES to be completed by 1966 include the £1½m. cable cantilever bridge at Newport, Monmouthshire; the Wye bridge and Viaduct, linking the new Severn bridge to South Wales, and the £2½m. scheme over Bristol's Cumberland Basin.



The photographs reproduced above were taken during a recent visit by the author to the Brixton Tape Recording Club, London. The first picture (left) shows the general activity typical of any of the Club's meetings, and the other two show some of the members engaged in constructing the large soundproof "box" described in this article.

GORDON E. GOMPERS TELLS YOU ABOUT ANOTHER ASPECT OF TAPE RECORDING

THE COMMUNAL APPROACH

IN this series I have always borne in mind the probably limited funds of my readers. However, the fact that a tape recording enthusiast's financial recources cannot run to such extra gear as parabolic reflectors, mixers, soundproof boxes, etc. does not mean that he cannot enjoy the use of these things on a communal basis. He *can*, by joining a tape recording club, the members of which pool their equipment and personal resources.

Nearly every large town in the United Kingdom now has such a club. Although I myself do not belong to such a club, I often work in close collaboration with the nearest one in my locality—the Brixton Tape Recording Club, London, S.W.2.

This club is fairly typical of others throughout the country, and meets weekly in a large, comfortable room. The fees are: 5/- membership fee on joining; £1 annual subscription, and 1/- attendance fee for every meeting at which one is present. The wives of fully paid-up members are entitled to a reduced annual subscription of 7/6d.

Even after taking into account such factors as money-raising efforts, sale of badges, and the low overheads (the rent of the room is only 7/6d. an evening), the question that immediately occurs to one is: What can any club do on such slender resources? I was pleasantly surprised by the encouraging answer that the Brixton Club provided to this query, and to see how effectively-pooled equipment mounts up. On the one table, for instance, I saw four tape recorders, one of which was an elaborate machine—a Brenell Mark 5M., price 88 guineas—three mixers, a Grundig and home-made equipment; a Hi Fidelity speaker cabinet, and a very elaborate home-made switchboard which enabled almost any kind of mains fitting to get current from the room's one wall plug.

The enormous quantity of home-made equipment at the Brixton Tape Recording Club certainly bears witness to the kind of person the average member is. Most of the men come from the artisan class, with a good sprinkling of electricians and joiners.

* * * *

Some of the do-it-yourself projects in hand are quite big. When I was last there, the members were engaged in finishing a soundproof box. Of course, in this instance the word "box" is very misleading —"a little room" would be nearer the mark. The walls and ceiling of the box were of hardboard on the outside and pegboard on the inside, with foam rubber in between the two, making a sort of sandwich.

Tape recording clubs are very benevolent organisations, and the Brixton one is no exception. Much of their recording activity is turned in charitable directions, and includes taping for the blind, as well as for old people.

For the members' own entertainment there are slide shows, when slides are projected on to a screen, with the appropriate sound accompaniment.

Well, those are some of the activities a tape-recording club can offer you. For only small charges you can have a share of a large variety of equipment; and, by doing constructive work for charity, add a fuller social meaning to your hobby.

* * * *

There is another asset provided by any tape recording club, which we are very apt to take for granted; that is, the people themselves.

No matter how large are the financial resources at the recordist's disposal, there is little hope of being able to do anything creative, or really worth while, on ones' own. As soon as a communal approach is adopted, however, one can contemplate such things as tape plays, tape variety shows, or tape discussion groups.

As an officer of a fair-sized literary organisation, I can generally recruit casts or entertainment talent, quite easily, and perhaps of a higher order than that which the average tape club could provide. Even so, from one aspect the tape clubs can beat any individual's enterprise, whatever his, or her, resources might be. While I have never had any difficulty in recruiting talent for shows of various kinds, I have yet to rope into service anyone who could ever help me out with any of the technicalities—not even someone to take care of the record player! No tape recording club group would be so helpless.

Fine New Centre Will Bring The Answer To Many Problems

£80,000 LABORATORY FOR ASBESTOS RESEARCH

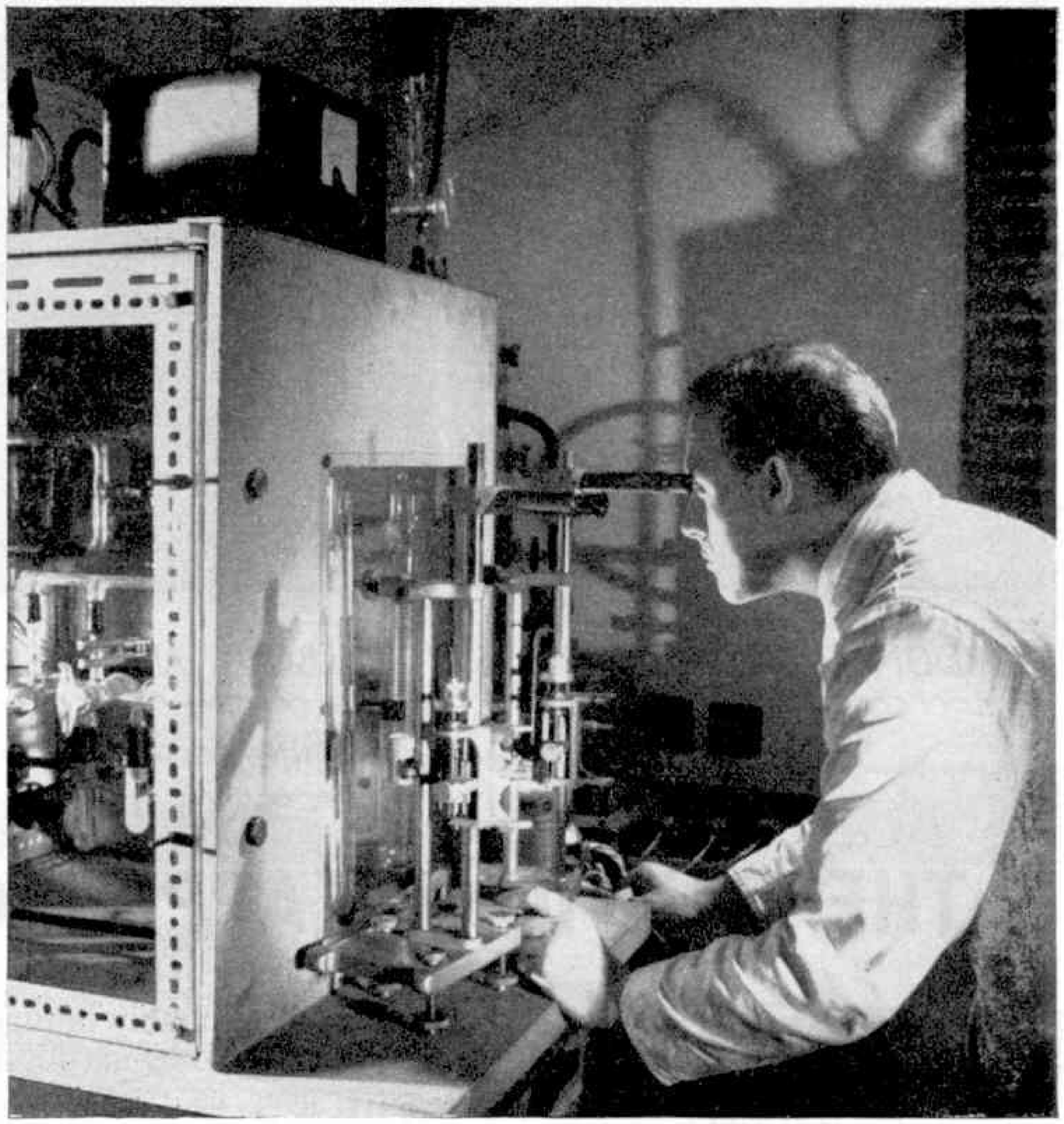
CLAIMED to be the only establishment in the world devoted exclusively to fundamental research on asbestos fibres, a new laboratory was recently opened on the Trafford Park industrial estate, Manchester.

By THE EDITOR

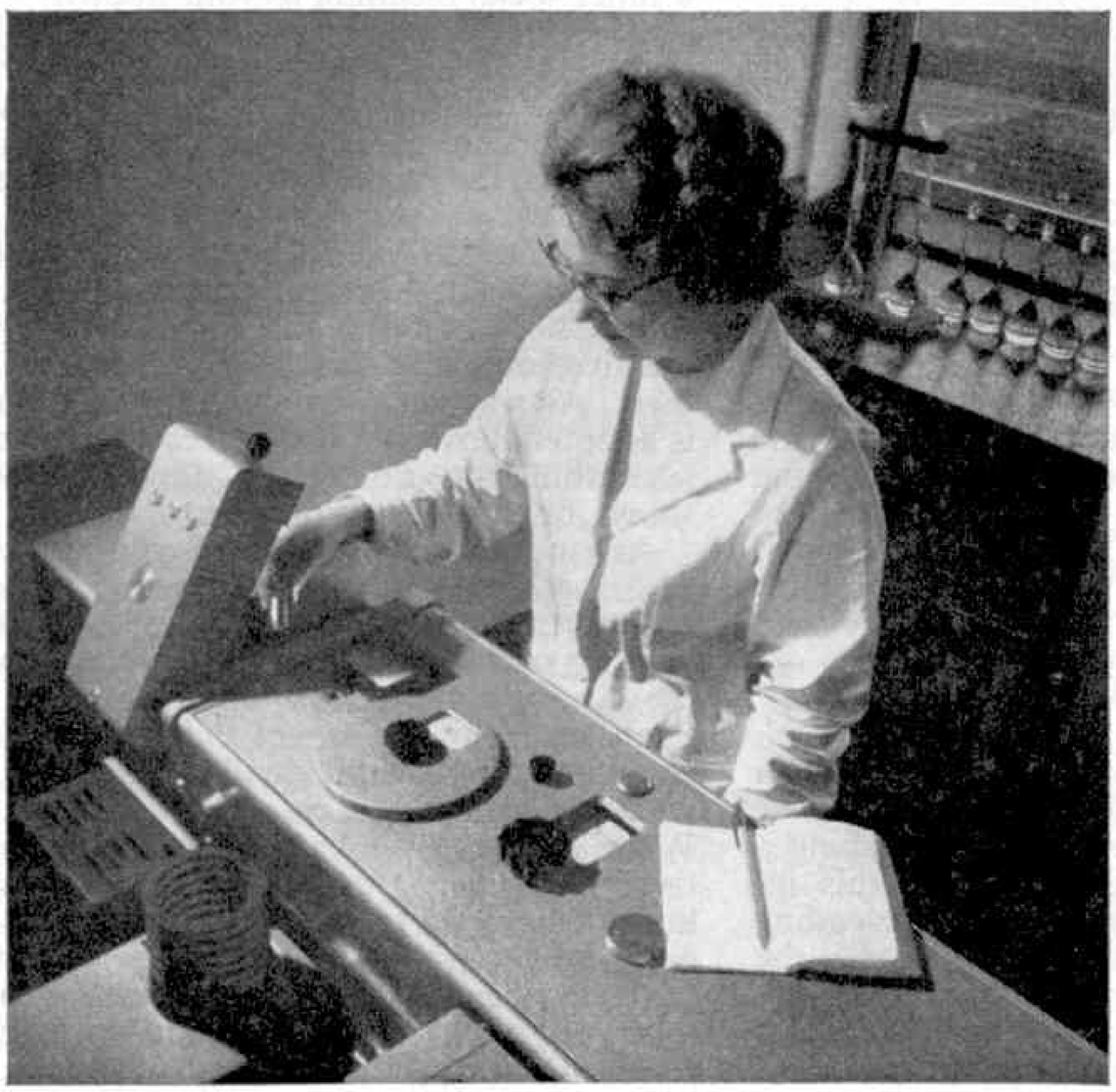
Completed and equipped at a cost of £80,000 it was built by Turner & Newall Ltd. to serve a group of companies who mine asbestos and manufacture it in thousands of different ways.

I was one of a large party of journalists who were invited to the opening and must confess I had no idea, until my visit to the laboratory, in just how many ways asbestos enters our daily life. Most folk know it is a material that resists heat and has other important properties, but how many realise that it can be used for all sorts of modern structures from signal boxes to fish-rearing tanks?

The group of companies with which Turner & Newall are connected not only manufacture and sell a full range of asbestos products but are also interested in light chemicals, insulating products, rubber and allied products for the engineering industry and materials and machinery for the plastics field. But the company's main interest still lies in the mining of asbestos fibre and the manufacture and sale of products that are made from it.



The adsorption properties of asbestos are not only important technologically but can also yield such fundamental information as the mode of packing of the individual fibrils. In the apparatus shown in the photograph, the water sorption of two samples of asbestos is being investigated simultaneously; the operator is recording the extension of a fused quartz spring on which the sample is suspended.



Traditional methods of analysing silicate materials such as asbestos involve tedious precipitations and weighings; in the Turner & Newall Asbestos Fibre Laboratory advantage is taken of modern instrumental methods, of which the spectrophotometer (seen in use here), is an example. It permits rapid and precise determination of many constituents.

The mines are in Africa and Canada, and the chief manufacturing companies are in the United Kingdom, so that geographically there is a wide gap in mining and manufacture. As asbestos fibre itself is a material created by nature, the task of mining it and putting it into the sort of standardised form in which manufacturers like to receive it is indeed a most complicated one.

To quote Mr. R. M. Bateman, Deputy Chairman of Turner & Newall Ltd., who extended a welcome to our party, "Even when those responsible for mining and those responsible for manufacture are part of the same family, and working together as closely as possible, the task remains one to which we have not yet found a complete answer."

Mr. Bateman went on to say that finding that answer was complicated by the fact that each manufacturer might ask for something different, because each attached a different relative importance to various characteristics of asbestos fibre. It was because of this that the firm, nine years ago, first set up the Turner & Newall

Asbestos Fibre Laboratory, the development of which is the £80,000 scheme recently opened. In charge of the scheme is Mr. B. Lincoln, Director of the Laboratory, who has a staff of 22 people working under him.

Mr. Bateman explained, "The laboratory and its staff are in an independent position between the mines on the one hand and the manufacturer on the other. They spend their time developing better methods of testing, analysing and describing asbestos fibres from different parts of the world and already, in their comparatively short life, they have enabled us to understand much more clearly this remarkable mineral with which we work. Although the laboratory is still a very long way from being able to set down on paper a detailed specification and methods of test whereby compliance with such a specification can be proved, nevertheless they have done a great deal to bring mines and manufacturers much closer to agreement than ever was the case before.

"Most of what we discover in our laboratory we believe to be knowledge which we should disclose to anyone who is interested and, therefore, our work here has already been shown to asbestos miners and manufacturers from many parts of the world.

"Our total research expenditure for the whole of our group of companies exceeds £1,000,000 a year."

The new unit is a two-storey building at present consisting of ten individual laboratories with room for future expansion. Most of the equipment is unique, having been specially devised by the laboratory staff; indeed, in some cases apparatus which has been developed and built at Trafford Park has now been purchased by other organisations.

Perhaps before we discuss the work of the laboratory I should amplify my earlier statement about the uses to which asbestos can be put. Asbestos fibres with high tensile strength are employed to reinforce materials like cement and resins; those of sufficient length and flexibility are valuable in textiles; grades with low electrical conductivity and high resistance to acids have a number of specialised uses; and, of course, the thermal properties of asbestos are a vital factor in friction linings, insulating materials and fire protection products. For each of these purposes the material's fine fibrous structure means that it can be processed into an extremely varied range of physical shapes and forms.

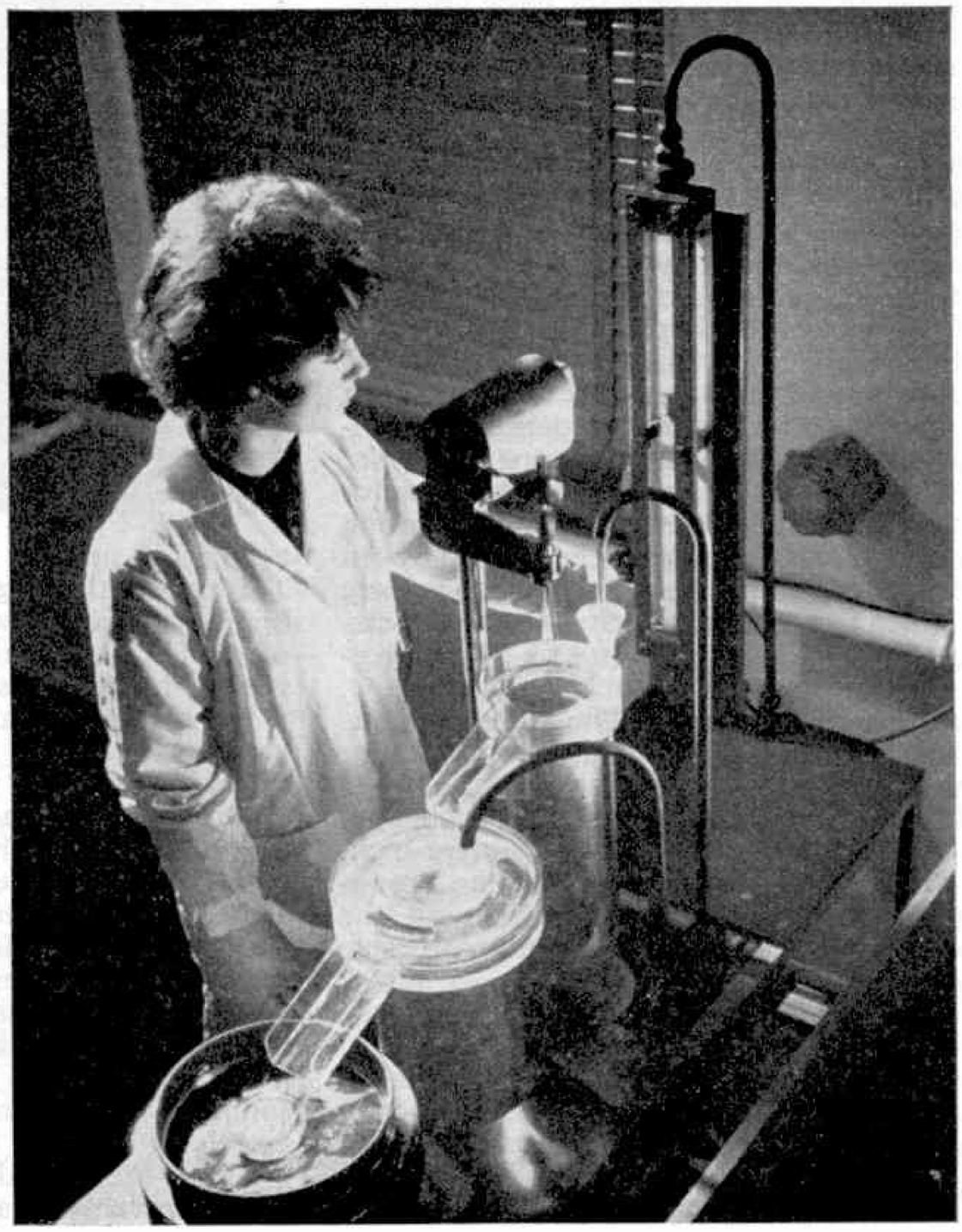
It is misleading, however, to refer simply to "asbestos" since the term covers the whole group of asbestiform minerals which vary a great deal in their chemical composition, mineralogical structure, properties and utility. Of the 30 or more known types, most are of no commercial value while a few find only a limited and specialised application. The great bulk of production is confined to three main varieties, the most familiar and commercially significant of which is chrysotile, or "white" asbestos, which represents about 90 per cent. of the world's output. Deposits are found chiefly in Canada, Southern Rhodesia and Russia and they yield a strong, fine, flexible fibre which is resistant to heat and is a useful electrical insulator. It has a wide range of application including friction linings, asbestos cement and textile products.

Other types of asbestos constitute the amphibole group, the best known being crocidolite, the "blue" asbestos mined principally in South Africa. It is less easily worked than chrysotile, but its tensile strength is generally high and it offers particularly good resistance to acids. Chief applications are in asbestos cement (especially pipes), in chemically resistant products and in certain forms of insulation.

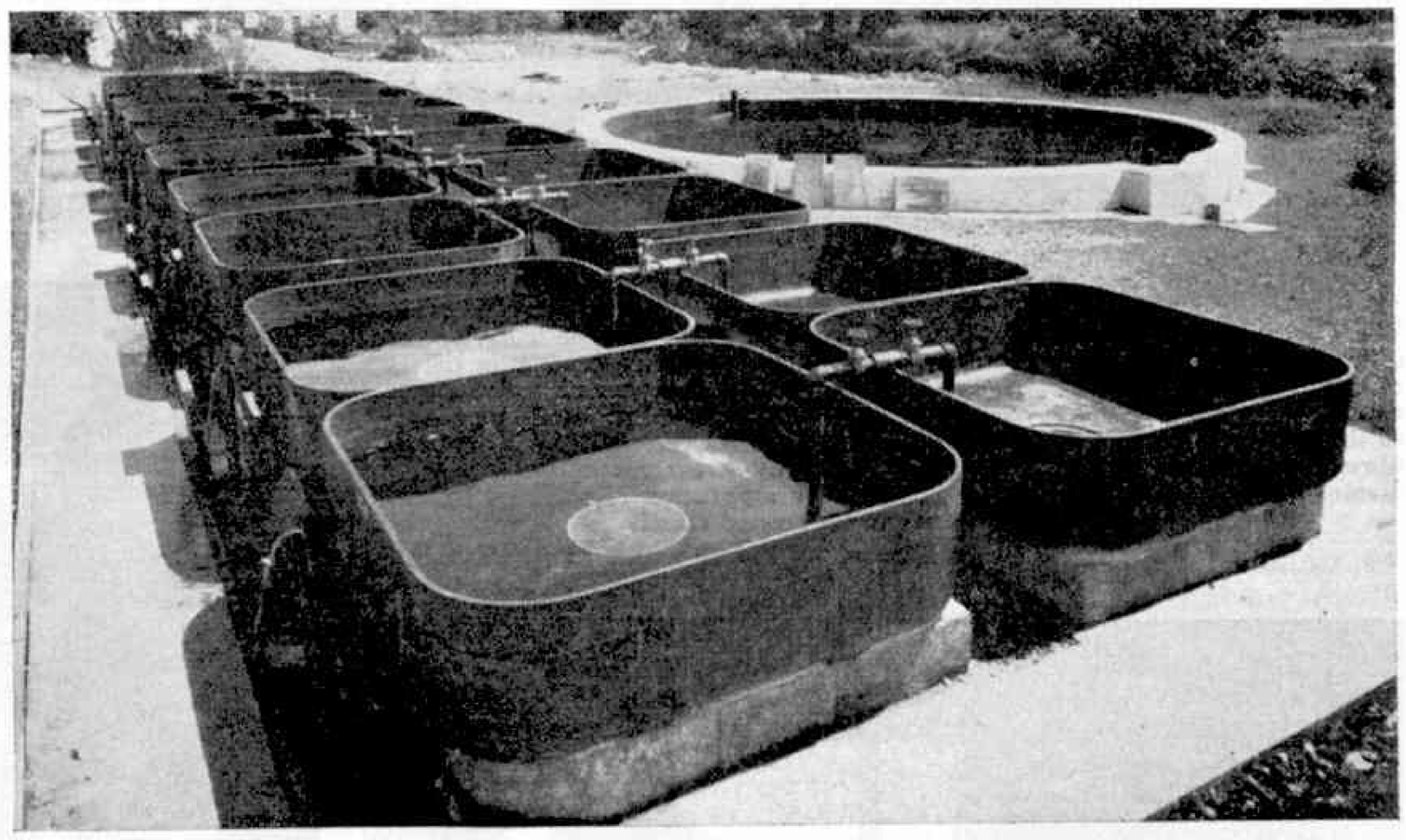
Amosite asbestos, the last important variety, is found only in the Transvaal. It consists of long, spikey fibres well suited to thermal insulation, but otherwise limited by their brittleness. Other varieties of minor commercial value are anthophyllite and tremolite.

The asbestos industry started in the technological revolution of the nineteenth century, emerging particularly from the development of steam power and the internal combustion engine. Like the organic textile fibre industries it worked for a long time with traditional rather than scientifically derived knowledge of the fibre on which it depended. Where the

The Thermobalance (below) is used for investigating not only the behaviour of different types of asbestos at high temperatures, but also for assessing the purity of graded asbestos. The Elutriator (right) is used for diameter classification of asbestos fibres, thus making possible an estimate of the degree of subdivision of the original sample. The Elutriator consists of two vessels in each of which fibres of small diameter are carried upwards by a current of water, larger diameter fibres remaining behind. Progressive separation is obtained by the smaller flow velocity in the second vessel.



Right (top) British Railways, North-Eastern Region, Tollerton Signal Box in which 2,500 square feet of sprayed Limpet asbestos applied to ceilings, walls and steelwork of the control room, fuel store, boiler room, battery room and relay room, provide thermal insulation, condensation control and fire protection. (Below) These fish-rearing tanks at the Maerdy hatchery of the Dee-Clwyd River Board are made of asbestos cement.



need for research was recognised it was met on an individual basis rather than a co-operative one; yet, over the years, the problems facing the product development laboratories have emphasised the growing need for a deeper knowledge of asbestos in all its aspects. For instance, the increasingly severe duties imposed on brake linings and other friction materials demanded fuller knowledge as to how various types of asbestos behave at higher temperatures; the use of asbestos in electrical insulating materials meant that its electrical characteristics, and their variation with environmental conditions, called for detailed study; the development of acid-resistant textiles demanded investigation into the rate of reaction of asbestos with acid solutions. In addition, the many applications of asbestos fibres as miniature reinforcing rods—in asbestos cement and plastics, for example—showed the need for studying their strength, elasticity, and bonding characteristics.

Thus it was that in 1954, with these and many other similar questions in view, Turner & Newall Ltd. founded the research laboratory. The facilities now offered are a recognition of the ever-growing need, not only for basic information about an important industrial raw material, but for high technical standards in producing and marketing it.

What, in fact, is asbestos? It is a naturally-occurring fibre in a mass of chemically related rock. To use it, it must first be separated from the rock, and the completeness with which this can be done is an important part of the studies of the Trafford Park laboratory. Thermogravimetric analysis, mineralogical examination, chemical analysis for the estimation of substances sometimes present in concentrations of less than one part per million, particle size analysis, and selective physico-chemical methods of separating chemically similar particles have all been found necessary in these investigations, which have a particularly important bearing on the use of asbestos as a reinforcement in plastics and rubber.

Few laymen appreciate the enormous tensile strength of some asbestos fibres. They can have tensile strengths of over 500,000 pounds per square inch, i.e. approximately 250 tons per square inch. Thus, they are not only one of the strongest fibres known, but are among the strongest materials commonly available for reinforcing.

Another unique characteristic of asbestos is the extent to which fibres (or, more correctly, bundles of fibrils) can be subdivided; imagine this—one cubic inch of solid, uncleaved chrysotile asbestos contains something like one million million fibrils, and the aggregate area of their cylindrical surfaces is over half an acre! This potentially large surface available for bonding, together with the high strength of the fibre material, also makes asbestos very suitable for use as a reinforcement.

Some of the apparatus at Trafford Park has been specially developed to achieve the speed and high standards of accuracy required for the mass of tests and specific experiments which have to be undertaken. The Turner and Newall Classifier for instance, is concerned with sorting milled asbestos into fibre lengths.

Another important item of apparatus, the Elutriator, classifies fibres according to diameter, thus making possible an estimate of the degree of subdivision of any sample. The Elutriator consists of two vessels in each of which fibres of small diameter are carried upwards by a current of water, larger diameters remaining behind. Progressive separation is obtained by the smaller flow velocity in the second vessel.

A Modified Comb Sorter provides the means by which the length distribution of asbestos textile fibres is measured. The fibres are straightened, inserted into the combs with one end of each fibre positioned on a datum line and, when sorted, are extracted by means of special grippers.

To assess the reinforcement value of those grades of asbestos fibre used in asbestos cement, test sheets are prepared in a small hydraulic press and are subsequently subjected to flexural testing.

Where asbestos is to be used in electrical products, low magnetite content is essential. At the Turner & Newall laboratory magnetite content is measured by observing the out-of-balance current which is

(*Continued on page 271*)

Calling All Bus Spotters: A Further Review By David Kaye

LAST OF AN ISLAND'S INDEPENDENT COMPANIES

About to leave Seafield Garage is one of Seaview Services' pair of lowbridge "Titans". In the background you see an assortment of Bedfords belonging to this operator.

A FRESH spring breeze swept over the pierhead at Ryde as I disembarked from the m.v. *Shanklin* and boarded one of British Railways' small trams, which rattle down this long structure to the Esplanade. However, as I sped landwards I could soon spot the Seaview Services' double-decker bus in its startling livery of two contrasting shades of green and bright vermilion. Perhaps this bold livery is a reflection of both the faith and the fortitude that the company's Managing Director (Mr. J. B. Higgins) and his staff have in the future of the last independent stage carriage operator left on the Isle of Wight.

It was Mr. Higgin's father-in-law, the late Mr. R. Newell, who began the company's sole route between Seaview and Ryde on Easter Monday 1922, employing a converted Ford ambulance for this purpose. The route in question leaves the small seaside resort of Seaview by way of a rather rough-shod toll road from which excellent views across Spithead towards Portsmouth and the Portsdown Hills can be obtained. The bus, after passing the end of the fascinating iron boom that limits Spithead navigation to a comparatively narrow channel, serves a series of three holiday camps (Nosepoint, Puckpool and St. Clare's), not to mention a "self-catering" hotel! At this point it joins the B3330 road, served by Southern Vectis route 7, which runs from Seaview to Ryde via Nettlestone. Passing by the rapidly-developing Appley Hall estate it descends into Ryde along the A3055 road from Sandown, although within Ryde itself it has a different route from that taken by Southern Vectis buses.

By the outbreak of the second world war Seaview Services had become a company and was largely relying on four 26-seater coaches supplemented by an ageing collection of Star, Tilling-Stevens, A.E.C. and Leyland buses. As you can see from the accompanying fleet list, these have long since gone and in the near future the Bedford OBs will also be pensioned off. As with Safeguard and Delaine, Seaview Services have changed over to diesel-powered coaches in the last few years.

During the winter months a skeleton staff of six keep the bus route running with its hourly journey necessitating the use of one of the double-deckers during the main part of each weekday, although early morning and late evening schedules are covered by EDL 475 acting as an O.M.O. bus. However, from Easter onwards additional staff are taken on until, at the height of the summer season, the usual complement is seventeen. At this period a half-hour service is provided into Ryde, with a further change to a 20 minutes service at peak periods, plus duplicates during the mid-day rush hour. In a good season each coach should run about 10,000 miles, mainly on "Round the Island" tours, for which each vehicle is fitted with a modern public address system, frequently used. Mr. Higgins firmly believes that no tour should keep the passengers in the coach for longer than half an hour at a stretch, as there are so many interesting things to see.

Other excursions are run to Blackgang Chine, Alum Bay and those royal buildings —Carisbrooke Castle, Osborne House and Whippingham Church. And, of course, there are the inevitable "Mystery Tours" without which no holiday would be complete. During May, Seaview Services are busy with contract work, including such items as annual treats to groups of old-age pensioners, who travel there from many towns on the mainland. A wall chart lists hundreds of agencies—mainly hotels and guest houses—all over the southern half of England who book seats on Seaview Services' island tours.

Seaview Services maintain their own fleet and I was (*Continued on page 272*)

Seaview Services Fleet List

Registration Mark	*Chassis/Engine*	*Bodywork*	*Vintage*
EDL 475	Bedford OB	Duple C29F	1947
FDL 318	Bedford OB	Duple C29F	1948
GDL 137	Bedford OB	Duple C29F	1949
GDL 538	Bedford OB	Duple C29F	1950
GDL 764	Leyland PD2	Leyland L53R	1950
GDL 765	Leyland PD2	Leyland L53R	1950
HDL 726	Bedford SB	Duple C33F	1952
HDL 728	Bedford SB	Duple C33F	1952
HDL 828	Bedford SB	Duple C33F	1952
UDL 293	Bedford SB1	Duple C41F	1960
UDL 294	Bedford SB1	Duple C41F	1960
UDL 295	Bedford SB1	Duple C41F	1960
WDL 219	Bedford SB1	Duple C41F	1961
WDL 220	Bedford SB1	Duple C41F	1961

JAPAN'S JETS IN SERVICE

A Fuji T1F2 jet trainer of No. 13 Training Squadron, Japanese Air Self-Defence Force.

THE illustrations on this page are among the first to show jet aircraft of Japanese design in military service. They show T1F2 two-seat trainers, built at the Utsunomiya City works of Fuji Heavy Industries, Ltd. Like the Yugoslav Galeb trainer described in *Air News* last month, the T1F2 has a Bristol Siddeley engine—in this case a 4,000 lb. thrust Orpheus 805 turbojet. The Fuji T1F2 was designed to replace the North American T–6G Harvards which have been used for several years by the Japanese Air Self-Defence Force for basic training. The first prototype flew on January 19, 1958, and has been followed by a second prototype and 40 production models. These aircraft each span 34 ft. 5 in., are 39 ft. 9 in. long, weigh 10,670 lb. fully loaded and have a top speed of 485 m.p.h. in level flight.

A second version, the T1F1, has a Japanese Ishikawajima–Harima J3–IHI–3 turbojet of 2,645 lb. thrust, and is the first post-war jet aircraft entirely of Japanese design. The prototype was a converted T1F2 and flew for the first time on May 17, 1960. It has been followed by twenty production models.

AIR NEWS

By John W. R. Taylor

The T1F2s illustrated are in service with No. 13 Training Squadron of the J.A.S.D.F. This unit is so pleased with its new equipment that Fuji hope to extend the usefulness of the T1F2 by producing a fighter–trainer version armed with guns, small bombs, rockets and missiles.

FLYING DOCTORS

Few people enjoy visiting hospitals, so you will probably be surprised to learn that a DC–8 jetliner took off from Johannesburg, recently, packed with people who will spend much of their six-weeks "holiday" inside hospitals and places where drugs and medicines are produced.

The tourists are not over-enthusiastic fans of *Emergency Ward Ten* but doctors and chemists who hope to improve their knowledge and skill by visiting famous hospitals and medical centres in France, England, Holland, Belgium, Switzerland and Italy.

RESCUED BY BOEING 707

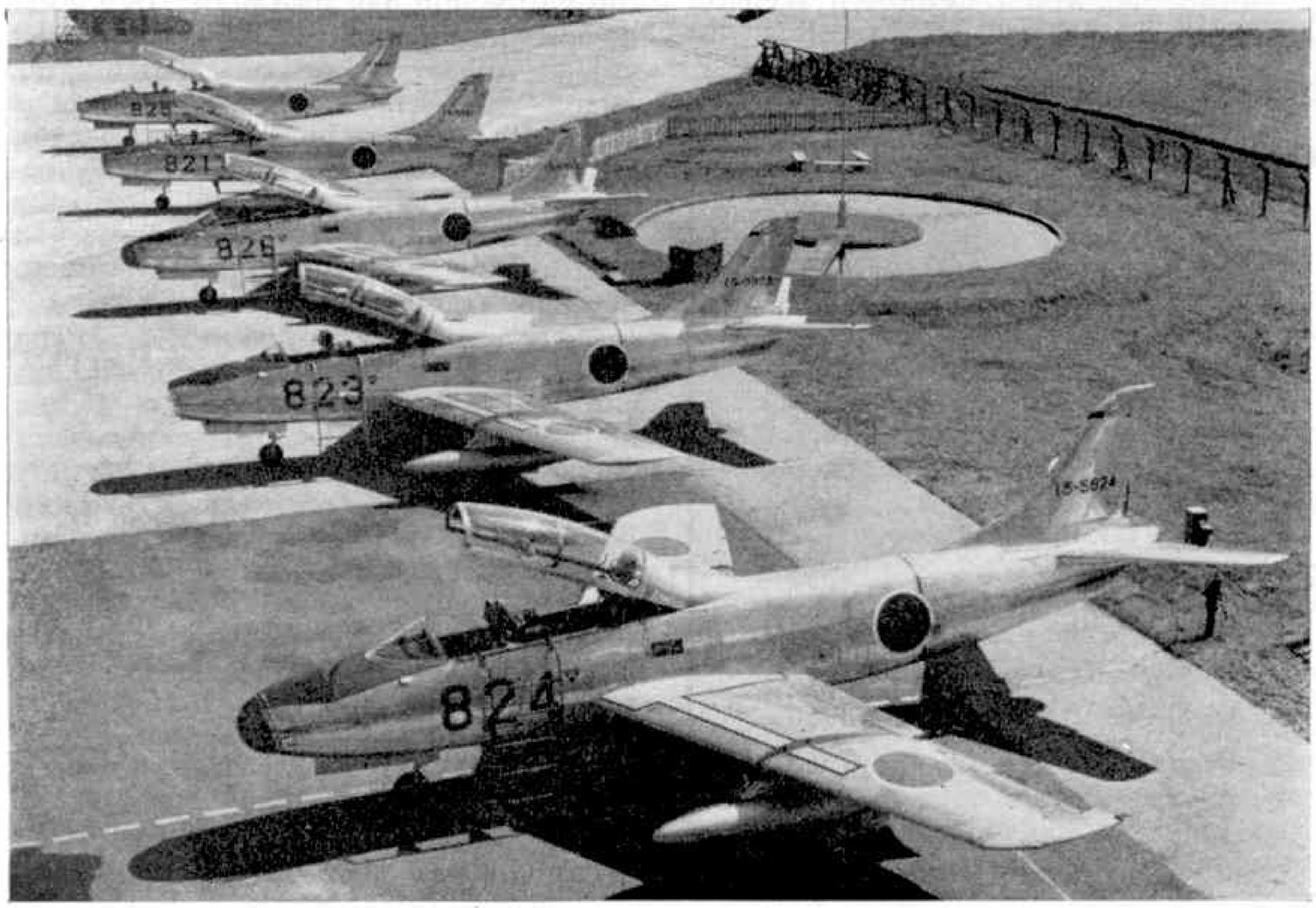
In the movies, it is usually an air force jet-plane that comes to the rescue of an airliner in trouble; but in a real-life story last January a Boeing 707 of Trans World Airlines helped to save a T–33A jet trainer of the U.S.A.F.

It was a dull wintry day, with the clouds down to 600 feet and one mile visibility. The T–33A was on its way down through the murk when its instruments went out of action. Quickly, the pilot pulled up above the clouds and radioed for help. He was lucky, because there happened to be a TWA 707 not far away. An air traffic controller on the ground called up the pilot of the jetliner, Captain Herb Ottewill, and directed him towards the crippled trainer.

Captain Ottewill literally took the T–33A under his wing and gently led it down to within sight of the runway at nearby Columbus (Ohio) Airport, where the trainer landed safely.

WHEN IS AN OTTER NOT . . . ?

Although the aeroplane illustrated at the top of the next page is still called an Otter, it bears little resemblance to the other 430 Otters which have been built by



A line-up of T1F2 aircraft of No. 13 Training Squadron, J.A.S.D.F. This illustration and that at the top of the page are by courtesy of AiReview, Tokyo, Japan.

Normally single-engined, this D.H. Canada Otter has been fitted with two 550 h.p. turboprops and has been modified in other ways for a STOL research programme.

de Havilland Aircraft of Canada.

Its transformation began in the late 'fifties, when de Havilland received a Canadian Defence Research Board contract to investigate the problems likely to be encountered by STOL (short take-off and landing) aircraft. Otter number 3682, belonging to the R.C.A.F., was fitted with special high-lift flaps, a new and angular tail unit and a strange four-wheel undercarriage. D.H. had realised that replacement of the normal tailwheel undercarriage by a tricycle type would enable them to take full advantage of the high-lift devices. This specially-designed four-wheel landing gear gives all the benefits of a tricycle undercarriage without the problems of mounting a nose-wheel under the front fuselage.

Flight tests showed that with the flaps drooped at 60 degrees, the Otter would maintain height at a forward speed of only 40 m.p.h. and land in under 200 ft.

For the latest series of tests, now under way, the Otter has undergone even more startling changes. The original 600 h.p. Pratt and Whitney R–1340 piston-engine has been replaced by two wing-mounted 550 h.p. Canadian Pratt and Whitney PT6A turboprops. In addition, there is a 2,450 lb. thrust General Electric J85 turbojet inside the rear fuselage. It is planned to direct the exhaust from this turbojet forward in flight, to see if this form of thrust reversal can be used to reduce still further the aircraft's safe minimum flying speed and landing run. Standard Otter wings and flaps are fitted at present.

BOUGHT WITH STAMPS

Back in 1961, the Ninety-Nines, an international society of women pilots, heard that a young Korean girl, Captain Kyung O. Kim, was trying to raise money for an aeroplane in which to teach other Korean women to fly. Anxious to help, they decided to pool all the Green Stamps they received when buying goods from their local shops until they had enough to pay for a Piper Colt lightplane for Captain Kim.

With the help of friends, the Ninety-Nines collected no fewer than 3,000,000 Green Stamps, and at the end of last January Captain Kim was invited to New York where she was presented with a brand-new Colt. It will not be used to train mere joy-ride pilots, for Captain Kim earned her rank during the Korean War as a member of the Republic of Korea Air Force, and has no old-fashioned ideas about a woman's place being in the home!

IS IT THE BIGGEST?

According to a note painted on its side the Stratocruiser shown in the lower illustration on this page is the "Largest airplane in the World". Many aeroplanes are longer, or have a bigger span, but certainly none can rival its tremendous girth.

The story of how this particular aircraft developed its "middle age spread" began when Aero Spacelines Inc., of Van Nuys, California, acquired twelve ex-airline Stratocruisers. They knew of the difficulty that the National Aeronautics and Space Administration has in transporting giant booster rockets from factory to launching site, and decided to find out if a Stratocruiser could be made big enough to carry such boosters.

Having worked out the design, Aero Spacelines asked On Mark Engineering Company to perform the actual conversion work. This involved lengthening the rear fuselage by 16 ft. 8 in. and building a huge circular-section "bubble" structure over the top of the fuselage. Nobody would claim that the result improves the aircraft's appearance, but it made its first flight successfully on September 19, 1962, and if the flight tests prove satisfactory there is little doubt that it will be a useful transport aircraft.

At the moment, the original cabin roof is still in place inside the "bubble". When it is removed, the cabin will have an inside height of 20 ft. 4 in., compared with the normal headroom of just under 9 ft. It is also proposed to make the entire tail of the aircraft removable, so that booster rockets can be loaded straight into the rear of the cabin. If the idea catches on, the present engines might be replaced by turboprops, and Aero Spacelines believe they could give the heavily-loaded Stratocruiser a surprising take-off performance by adding two small turbojets in pods under the wings.

DAKOTA TV SATELLITE

The wonderful old DC–3 airliner has been used for so many different jobs since it first flew in 1935 that the addition of one more might not seem very unusual; but I must admit that I never expected the DC–3 to rival Telstar as a TV satellite!

Of course, nobody has put one of these veteran airliners into orbit, but a DC–3 belonging to Trans–Australia Airlines was used in January to relay a direct TV broadcast between Adelaide and Melbourne, a distance of about 405 miles. It was the first time TV pictures had been transmitted live between the two cities.

Technicians had to design special equipment to convert the aircraft into an airborne TV relay station. A telescopic aerial was installed between the main undercarriage legs and was extended downward after take-off. A second antenna was fitted at the rear of the fuselage and heavy-duty generators were mounted inside the cabin to provide power for the additional electronic equipment.

As the DC–3 circled at a height of 12,000 ft. above the South Australian border, its aerials picked up a TV broadcast of the fourth Test Match at Adelaide and relayed it to Melbourne, where cricket fans were able to watch a clear picture of the game.

The Stratocruiser modified for Aero Spacelines Inc., U.S.A., by the On Mark Engineering Company to carry large booster rockets.

Tipping Seats—And Opening Doors—On The New Ford Consul Cortina

This close up of the new Ford Consul Cortina (No. 139 in the Dinky Toys list), shows the back of the driver's seat tipped forward to allow a passenger to enter the rear seats. Note the effectiveness of the opening doors.

OVER the past few months I have been almost buried under mail from keen Dinky Toys collectors living in many parts of the world. Most of your letters have drawn attention to items you would like to see in our huge range of toys, but more specifically they have mentioned something you obviously felt should be included in that range as soon as possible. The chances are that even if you yourself did not write to me on the subject, the same thought might have passed through your mind as you closely studied our monthly releases of new models.

What was this ommision which caused so many enthusiasts to write; what was the model you were hoping we would make? In actual fact it was not one particular car but a range of vehicles. You pointed out that although we were producing wonderfully realistic models of many spectacular British, American and European vehicles we were not making current miniatures of a group of cars we see every day in this country—the intermediate range of comfortable family saloons.

But, unknown to you, we were busily at work on two outstanding vehicles in that range, and our first answer to your pleas came in the form of the Morris 1100, which has proved exceptionally popular with collectors. Now, this month, we produce another up-to-the-minute family car which is a replica of what must surely turn out to be one of the most popular British cars in production today—the Ford Consul Cortina.

And to make its introduction all the more exciting, we celebrate with another Dinky Toys first! Not only is this model fitted with all the Dinky Toys refinements in the way of Prestomatic steering, opening doors and independent suspension but it has front seats that tip forward—which will surely be a source of great delight to its owners.

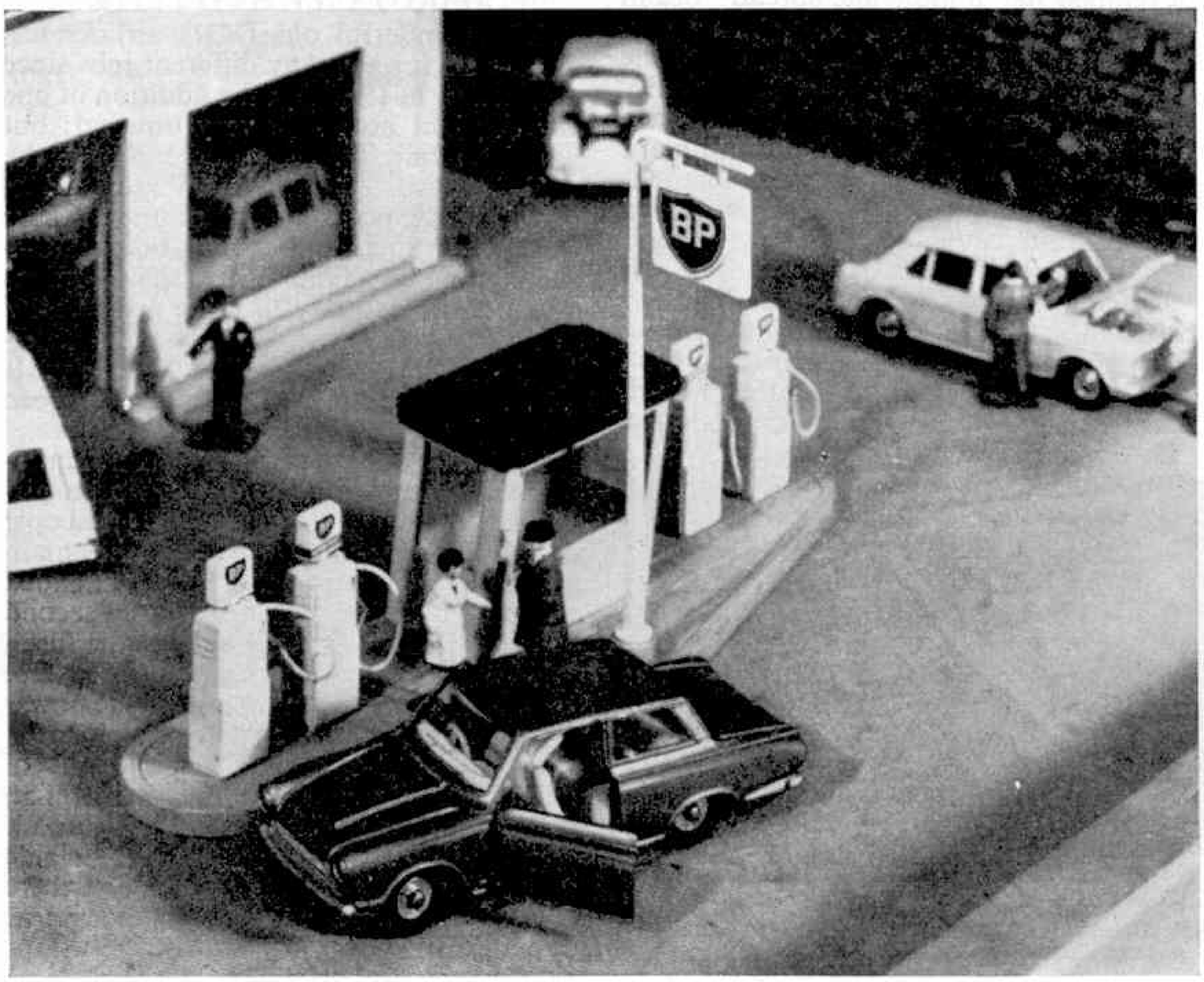
Dinky Toys News

By The Toyman

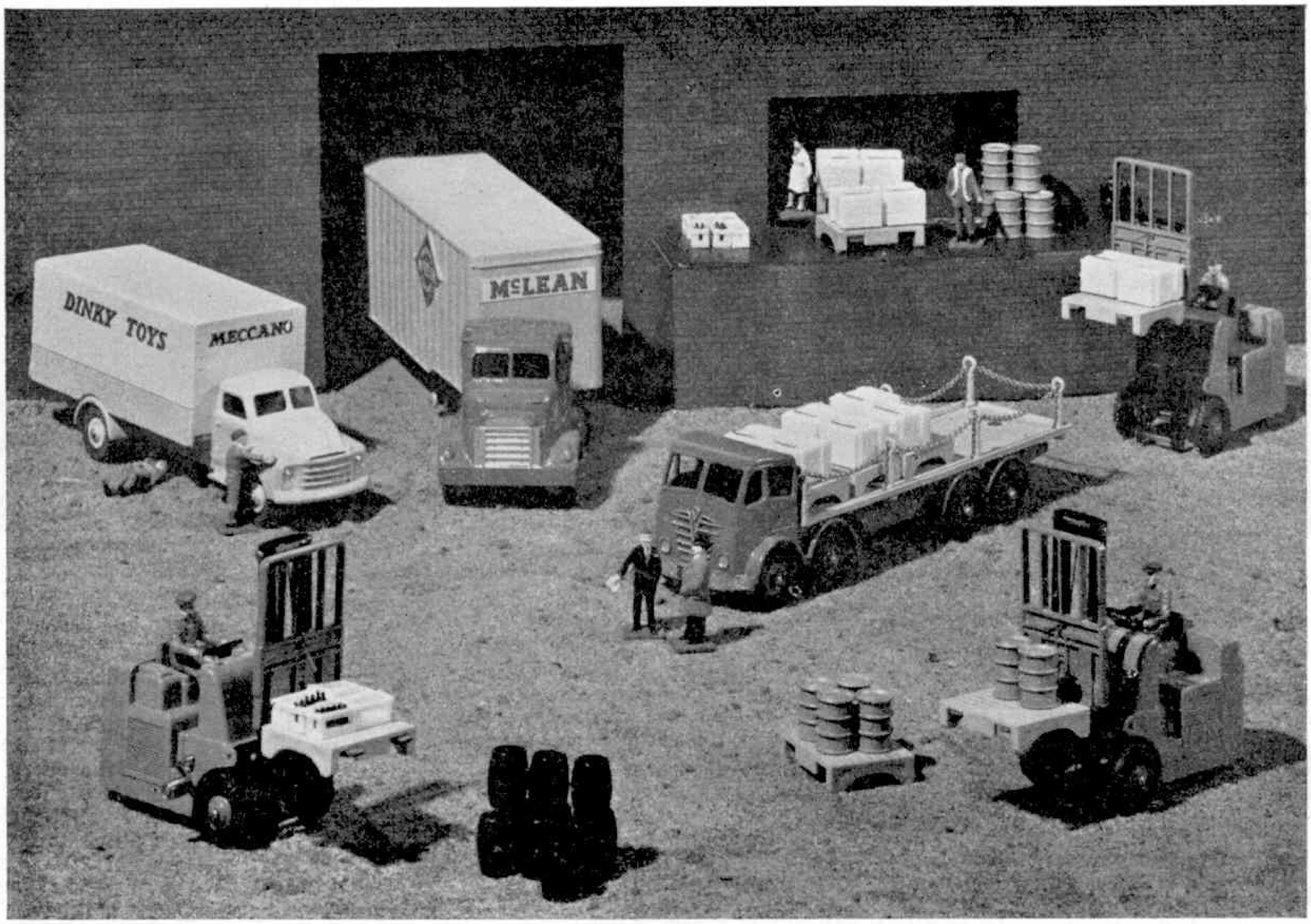
The model, numbered 139 in the Dinky Toys list, is illustrated in the two pictures on this page. As is my usual practice, I give you below details of the prototype:

Manufactured by the Ford Motor Company of Great Britain, whose headquarters are at Dagenham, it has a four-cylinder, overhead valve engine of 1,198 c.c. The engine has a compression ratio of 8.7 to 1, which contributes greatly to the remarkably high power output (53.5 b.h.p. at 4900 r.p.m.) The car has a four-speed and reverse gear-box, itself slightly unusual as there is synchromesh on first gear. A floor gear change lever is standard on all versions except for the de luxe model when a steering column change is optional if a bench-type front seat is fitted.

The Cortina is available with either two doors or four. All windows are filled in with safety glass, so that if, say, the windscreen splinters, the driver can see sufficiently well to get the car home.



A Ford Consul Cortina pulls up for petrol at a service station. The driver who is paying for the petrol has rather carelessly left the off-side door open. In the far background you see Dinky Toys No. 144 Volkswagon 1500 and, on its right, No. 140 Morris 1100 Saloon.



This scene, featuring Dinky Supertoys and Dinky Toys, was specially prepared for the finals of the competition to find the Fork Truck Driver of the Year. The event was held at Brighton as part of the third international conference of the Institute of Materials Handling. Prominent in the picture are three Dinky Toys models of the Coventry Climax Fork Lift Truck (No. 401 in the Dinky Toys list). The other items in use are No. 930 Bedford Pallet-Jekta Van, No. 948 Tractor Trailer McLean and No. 905 Foden Flat Truck with Chains. The figures which give such a realistic air to the picture are from No. 009 Service Station Personnel Set, and the loads being handled by the fork trucks and other vehicles are also available in the Dinky Toys series. Picture by courtesy of Studio Venture, London.

Overall dimensions are: Length 14 ft. 0½ in.; width 5 ft. 2½ in.; height 4 ft. 8¾ in.; wheelbase 8 ft. 2 in.; boot capacity 20 cubic feet. It will seat four or five people quite comfortably and the doors of the two-door version are specially large to allow easy access to the rear seat. In conjunction with the model's opening doors, the tip-up seats of the Dinky Toys version really do break exciting new ground. And as if all its other appealing features were not enough, the model's ultimate touch of perfection is manifest in its magnificent Polychromatic blue finish. If collectors' opinions of this model are the same as mine, I am sure that our dealers will sell all their initial stocks of the Cortina almost as soon as they reach the shop.

ROAD SAFETY CONTEST

The *Meccano Magazine* has always stressed the importance of road safety and so I thought that this month we would have a road safety competition, open to all readers. Here is a short story written by a Road Safety Officer. It concerns a boy called Peter who makes a number of errors on a cycle ride. You have to say *how many* mistakes Peter made, and *what they were*. When you have made a list of them, add a slogan of not more than ten words on the subject of safe cycling, then post your entry to "Safe Cycling, *Meccano Magazine*, Binns Road, Liverpool 13." The first prize will be one of our fascinating new Gift Sets, which blend together the most popular models in the Dinky Toys range. The set consists of one item each of the following: Jaguar Mark 10, Rolls-Royce Phantom V, Rolls-Royce Silver Wraith, Mercedes-Benz, Bentley Series S Coupe, Austin Seven Countryman and four civilian figures from the Dinky Toys Service Station Personnel Set. In addition, there will be many consolation awards consisting of sets of 24 British road signs.

* * * *

Now here is the story; read it through carefully, pick out the errors and list them. *Do not forget* to add your ten-word slogan on safe cycling. Winners will be notified by post.

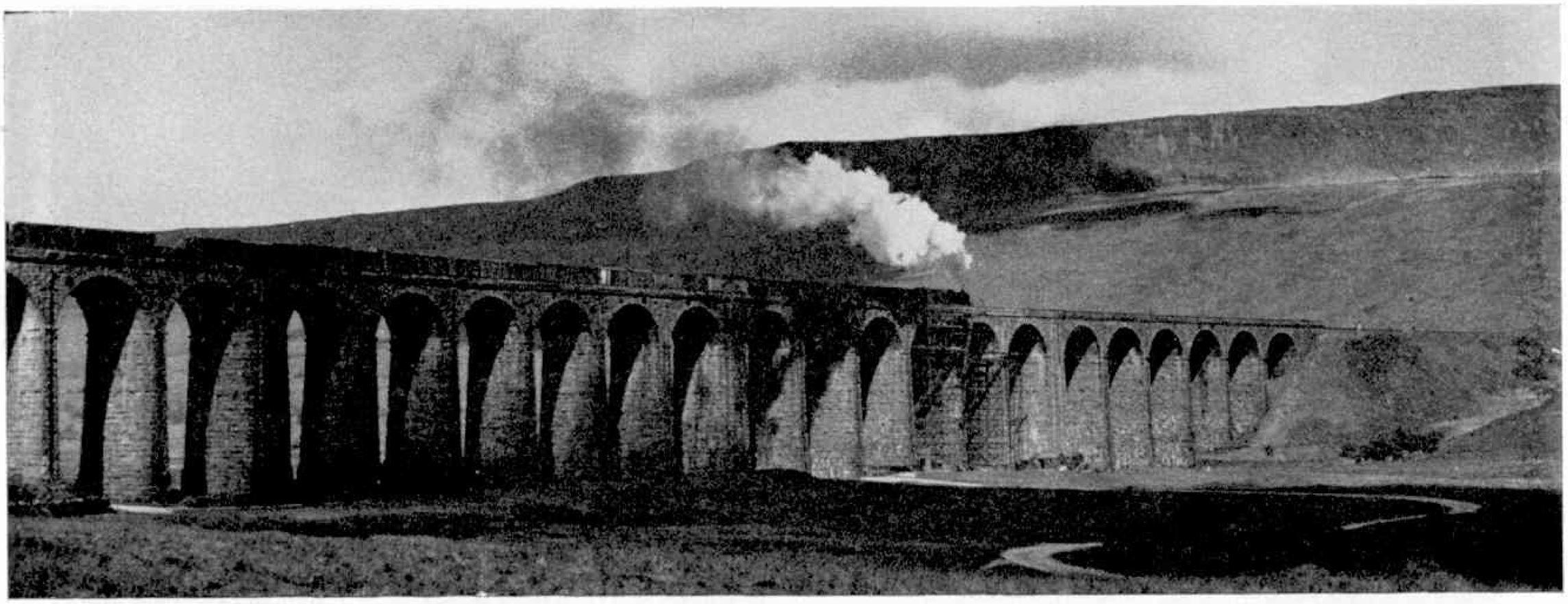
Peter was twelve—in fact, this was his birthday and he was pretty excited about his new bicycle and some book tokens. He knew which books he wanted—he had had his eye on them for some time—and so, breakfast over, book tokens safely in pocket, he wheeled his cycle to the roadway. Jumping on, he quickly rode off towards the main road and, as he was turning into the busy traffic, gave a good clear signal.

Ahead, he spotted two of his friends riding side by side and, catching them up, road alongside them until they reached the bookshop. Laying his cycle carefully down on the kerb, Peter went inside the shop and it did not take him long to get the two books he so badly wanted.

Remounting his cycle, and with the books tucked tightly underneath his arm, he rode off towards the park where he planned to have an undisturbed read. Passing in front of a boy who was walking across the entrance, he was soon lying on a grassy bank and, as he opened one of the books, a bookmark dropped out; on it he read the words, "How good a cyclist are you?"

Do you *know how good a cyclist Peter was? See how many mistakes you think he made on his short journey.*

Closing date for the contest is July 31. The Road Safety Officer who set the competition will also be the adjudicator and his decision will be final.



The Settle–Carlisle railway viaduct at Ribblehead. All the photographs illustrating this article are by Jeremy North.

● FOR 20 MILES OF THE SETTLE–CARLISLE RAILWAY LINE, THE RULING GRADIENT IS 1 in 100. RAILWAYMEN CALL IT . . .

THE LONG DRAG

WHENEVER I think of the Settle–Carlisle railway line, which crosses the mighty Pennines to link Ribblesdale with the Eden Valley, and England with Scotland, my thoughts dwell mainly on the first twenty miles. They are known to railwaymen—and particularly to the hard-working firemen of the steam locomotives—as the Long Drag. Here, the track climbs for more than 700 feet, with a ruling gradient of 1 in 100, to a height of 1,169 feet above sea level. It passes through some of the bleakest country in England, and includes water troughs that are the highest in the world.

About 70 inches of rain a year descend on the permanent way and on the lanky viaducts. A local farmer was not far out when he told the engineers of the 1870's that they would have to build the railway on stilts!

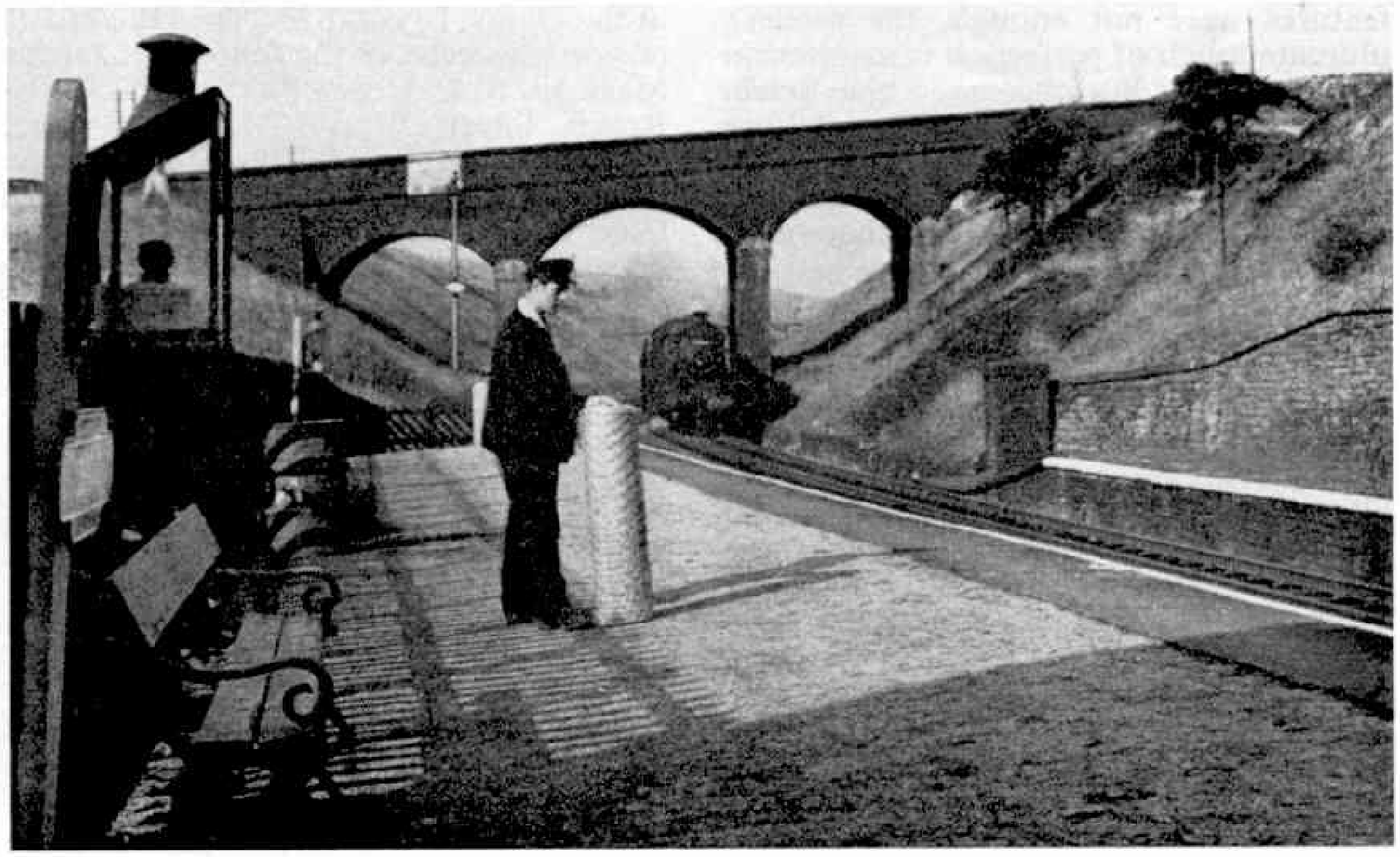
By JEREMY NORTH

At Ribblehead, where a viaduct 1,320 feet long was thrown across the valley, the westerly gales are sometimes so strong that they stop trains as they leave the little station which, by the way, is a valuable weather-recording point for the Air Ministry.

Readers of the *Meccano Magazine* who enjoy journeys by rail in the wilder, remoter parts of England should make an early appointment with the Long Drag, for the line between Settle and Carlisle will lose its passenger trains if the plan recently published by Dr. R. Beeching, chairman of the British Transport Commission, is brought fully into effect, and it may be that the line will be closed altogether in the next ten or fifteen years. When the Drag was blocked by snow during the past winter, its traffic was re-routed through Clapham to Tebay, where it joined the Lancaster–Carlisle railway. It was actually because the old Midland Company could not come to a reasonable arrangement with the London and North Western Railway for using the Lancaster–Carlisle line that, nearly 100 years ago, it planned its record-breaking route northwards from Settle.

Building the Long Drag called for some massive engineering works. It is very difficult to maintain in such wild country.

The platform at Dent Station, pictured here, is 1,150 feet above sea level.



The stationmaster at Ribblehead telephones details of the weather to the R.A.F. Station at Dishforth.

Yet, every 24 hours, there are 100 trains on the line, including crack expresses like the "Waverley" and the "Thames-Clyde", which descend the incline at speeds around 80 miles an hour. Of course, nothing approaching this speed is reached on the way up, and mercifully there are some diesel locomotives today which do away with the job of coal-shovelling. One of the fastest down-trips was undertaken during the last war when some ammunition wagons broke loose near Ribblehead. They stayed on the line throughout their runaway trip—but did not stop until they were between Settle and Long Preston.

The railway—and the Long Drag—begins between these two places with an impressive embankment which lifts the tracks steeply from river level. From the windows of a Carlisle-bound express you look out on banks of naked rock, the result of extensive blasting, during the first few miles. Most of the Drag was constructed by the Midland Railway who tackled the job between Settle Junction and Dent Head viaduct. William H. Ashwell was the contractor's agent. The first sod of the whole 72-mile system was cut at Anley House, below Settle, in November, 1869.

One man who is not daunted by the inclemency of the weather is the stationmaster at Settle, for on the windy and rain-swept platforms he has created a prize-winning garden which usually has a population of flowers numbered in thousands.

A major headache for the builders of the railway was Sheriff Brow, and the viaduct made to take the tracks across the turbulent River Ribble is on the skew. So is the next viaduct, near Helwith Bridge, where the railway actually runs on the site of the old river bed. The Ribble, at that point, was directed into a new course. The wilder country is reached beyond Horton-in-Ribblesdale, from which there is a splendid view of the lion-like Penyghent, 2,273 feet high.

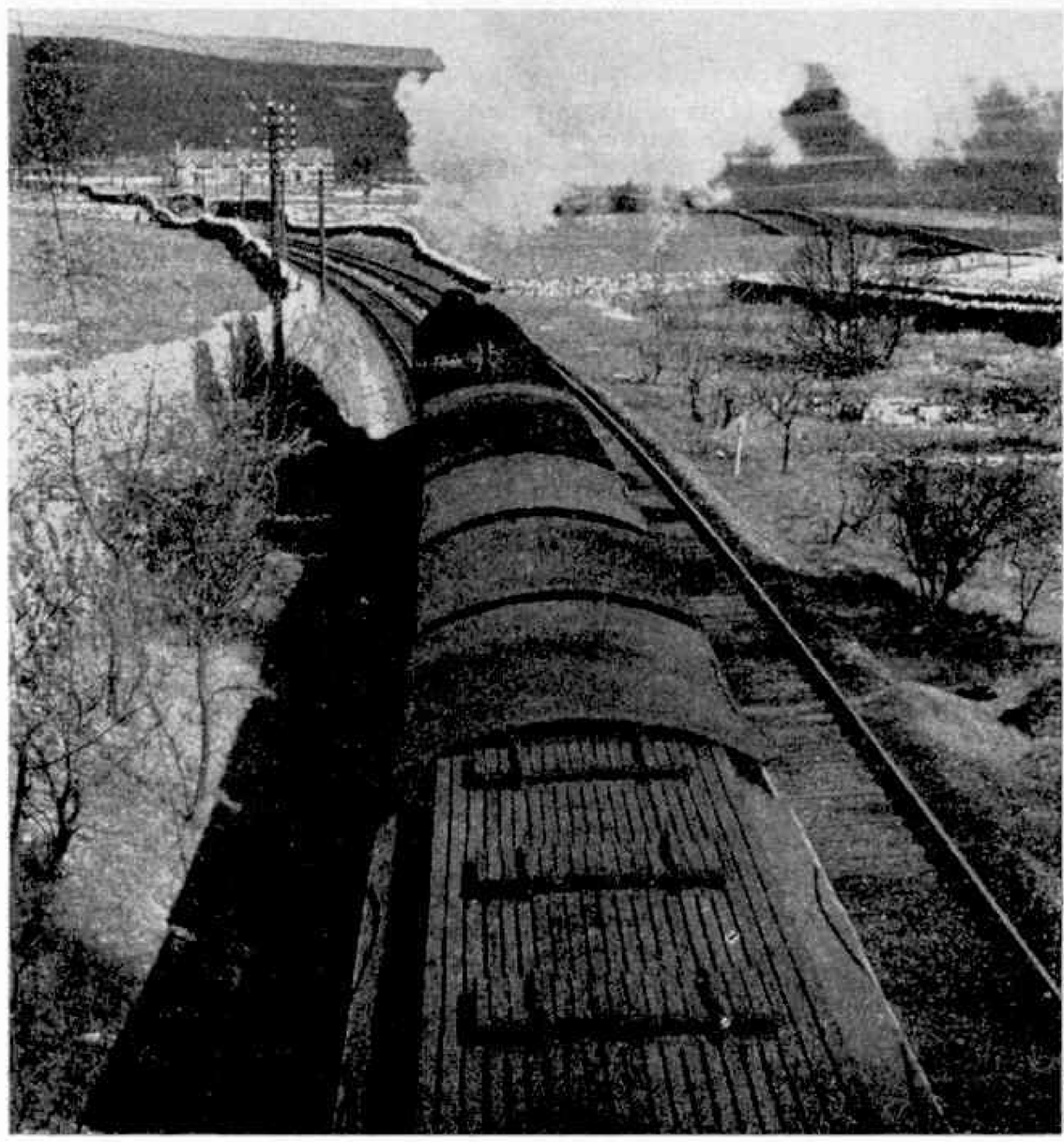
So to Ribblehead, where the station stands at a height of 1,000 feet above sea level and at a point where two valleys meet—those of the Ribble and westward-facing Chapel-le-Dale, up which roar winds with speeds up to 80 miles an hour. Trains leaving the station for the crossing of the 1,320-foot long Ribblehead Viaduct are sometimes battered to a standstill by the gales, and wait helplessly for another train to push them across. This is one case where the old railway rule of "one train, one section" is cautiously waived. Wagon sheets are plucked from their place and blown across the country like leaves. Heavily-laden goods trains are sometimes so short of steam through tackling the Long Drag itself that they rest awhile at Ribblehead to recover before taking on the 1 in 82 gradient to Blea Moor.

The weather is closely noted at Ribblehead, and each hour during the day the stationmaster contacts the R.A.F. Station at Dishforth with coded details relating to local conditions. Knowing the heights of the mountains round about, he can usually judge the altitude of the clouds with accuracy, but if he is in doubt he sends a hydrogen-filled balloon soaring from the platform and times its ascent to the clouds. On the day I visited him the code was 233–8–12–20–70–50–5–8–8–6–11, which meant that all the sky was obscured by cloud; it was drizzling, with visibility at twelve miles and a south-east wind blowing at twelve knots!

The viaduct has 24 spans, and its legs were sunk 25 feet below the level of the surrounding moor to rest on solid rock. About 1,500,000 bricks were used for the arches. Into the structure went local limestone, including pieces weighing eight tons each!

Beyond, cutting through the high and

(*Continued on page 271*)



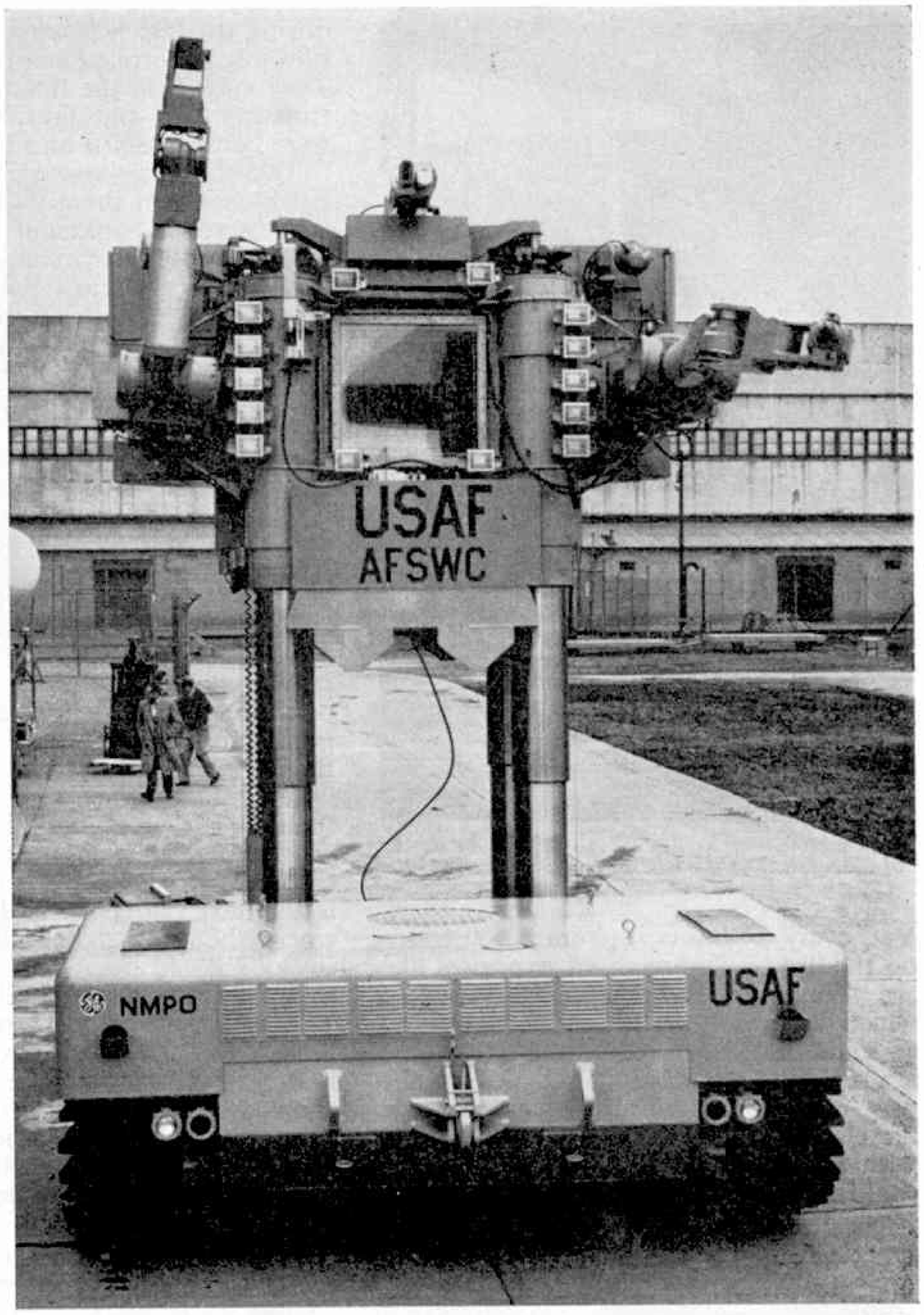
Left: An impressive view of a train on the Long Drag. This section of the Settle–Carlisle route has a ruling gradient of 1 in 100. Below: Another view of the Settle–Carlisle line which runs through some of the bleakest country in England.

Ian Balderstone Invites You To—

MEET THE BEETLE

AN 85-ton giant with 16-foot arms that walks on tank treads, yet can pick up an egg with the touch of a child, was recently shown to the Press in the United States. Called the "Beetle", the huge vehicle has been built for the Air Force by the General Electric Company.

● *Regular readers of the "Meccano Magazine" will remember the article in the February issue describing such incredible machines as "O-Man" and "Yes-Man" which are capable of performing superhuman tasks. In this issue we introduce you to another mechanical marvel of the modern age —"Beetle", whose intricate inside carries about 400 miles of wiring.*



Here is the Beetle, with part of its right arm raised. With a man at the controls inside its 50-ton, lead-shielded cab, the machine can rise high above ground level, and can rotate. Photograph by courtesy of the General Electric Company.

With a man inside to drive it, and to operate its hands and arms, the Beetle can move in close to a radioactive nuclear rocket or reactor to make adjustments or perform emergency operations.

It was demonstrated to a small band of newspaper men prior to a series of functional tests to be conducted by the United States Air Force Special Weapons Centre in New Mexico, in close co-operation with the Atomic Energy Commission. The Beetle will be used in direct support of one of two nuclear rocket development programmes at present under way in America.

The Special Weapons Centre is, in effect, a gateway to the atomic age, for it has an interest in all things nuclear. Assembled at this sprawling installation is a wealth of nuclear scientists and engineers whose expanding test and experimental facilities are designed to explore and control the atom's immense power.

In the rapidly-growing field of space nuclear propulsion, the Centre supports the Project Rover and Project Pluto nuclear rocket development programmes by measuring and analysing radiation during reactor test runs in Nevada. It is in Project Rover that the Beetle will be employed.

The strange vehicle could be used to make adjustments on a rocket reactor without stopping a reactor test run. It might be used to move radio-active waste to a disposal area. Essentially, this is a first generation vehicle. The aim is to use the Beetle to learn how to develop new and different kinds of air transportable handling vehicles. With the possible development of nuclear power for aircraft, such a vehicle will be required to assist in repair and maintenance work.

Although its arms are 16 feet long, and brawny enough to punch a hole through a concrete wall, the Beetle's hands can perform extremely delicate operations. They can, for example, put nuts and bolts together or manipulate hand tools. A special plug on the wrist even permits the use of power tools for nuclear do-it-yourself projects.

The operator sits inside a small cabin protected from harmful radiation by foot-thick lead shielding. The whole cabin, to which the arms are attached, rises on four hydraulic stanchions to a height of 25 feet above ground level, and rotates as required. Protecting the operator from above is a lead hatch that weighs seven and a half tons. The five windows of his cabin are two-foot thick panes of specially-leaded glass.

The Beetle can also "see" around corners and inside hot reactors and power plants with a closed-circuit TV camera. With one of its hands, it simply plucks the camera from a special "breast pocket" and points it at the object of interest. The picture appears on a screen inside the cabin. Although the cockpit in the cabin is no place for those inclined towards claustrophobia, everything possible has

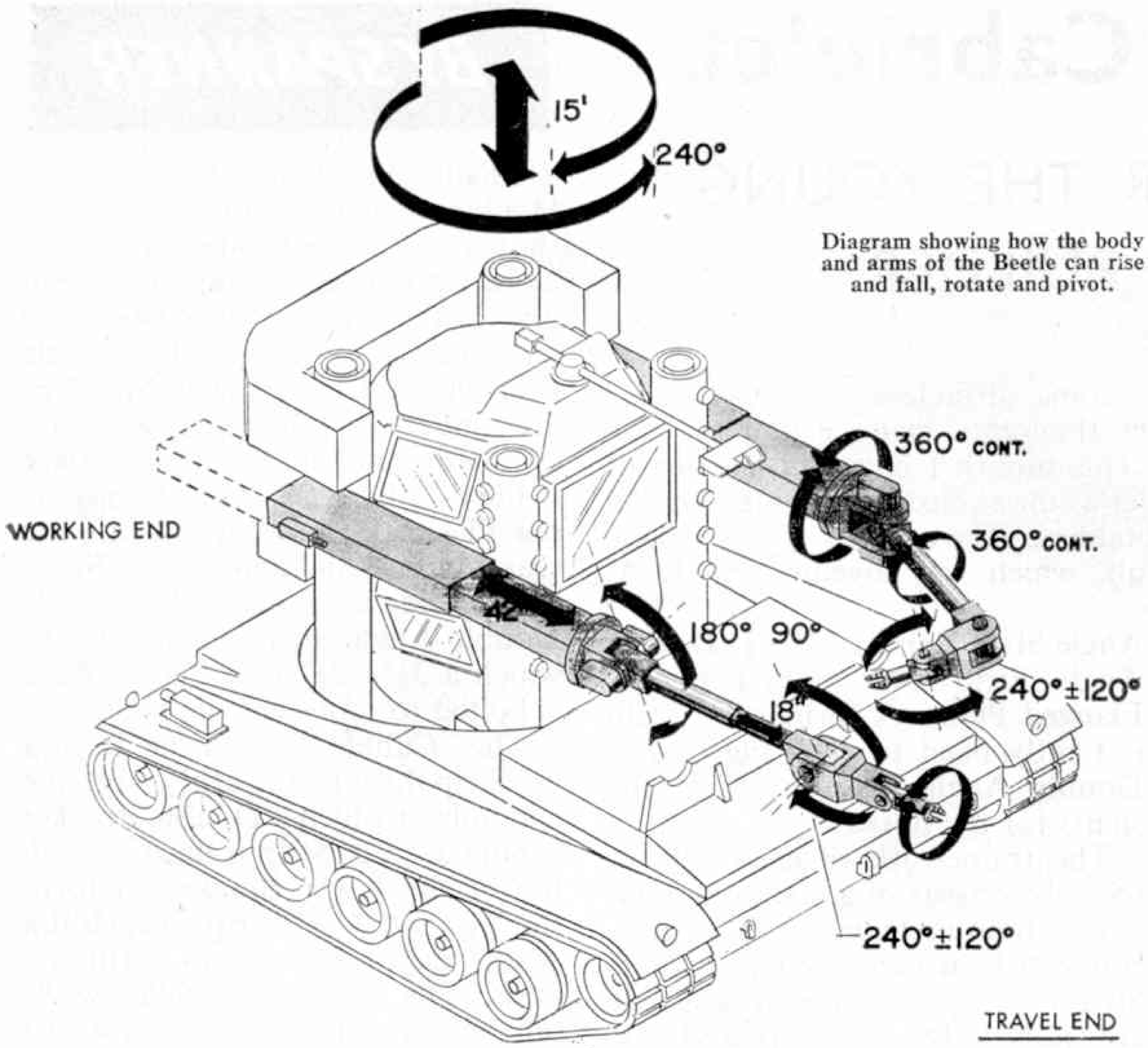


Diagram showing how the body and arms of the Beetle can rise and fall, rotate and pivot.

been done to make the operator comfortable. He has a six-position powered seat, a two-way radio, a Thermos flask for coffee and even a cigarette lighter. In case of trouble, there are three different methods of raising the cabin hatch.

The mechanical arms are controlled from a compact console mounted in the cabin. Each arm consists of a shoulder, upper arm, elbow, forearm, wrist assembly and a hand or remotely interchangeable hook. The arm has eight separate actions, each powered individually by a DC motor —shoulder rotation, shoulder pivot, wrist rotation, and grip. All rotation motions are continuous in either direction.

Brakes and/or irreversible drives are included in all movements to prevent drifting or creeping under load, and to ensure "fail/safe" operation. Dynamic braking is also incorporated in each drive motor to provide smooth deceleration and to prevent over-running during precise positioning operations. Each arm is capable of lifting loads in excess of 100 lb. even when extended horizontally to the full 16 feet, but is characterised by a preciseness of control which permits safe handling of the most fragile objects.

A 500 h.p. petrol engine powers the Beetle. The six-cylinder, horizontally-opposed engine is equipped with a supercharger, and is air cooled. A four-cylinder, 110 h.p. auxiliary engine drives the main hydraulic pump and the AC generator which serves the various systems. An electrical creep drive system for close vehicle positioning is provided and can be used to move the vehicle out of a radiation field. This sort of control is essential when the vehicle may have to be positioned to an accuracy of, say, a fraction of an inch. The Beetle can also rescue another vehicle by towing it.

The operator finds conditions quite comfortable in the cabin thanks to a three-ton air conditioning unit which maintains a humidity controlled temperature of 72 to 76 degrees F. whether the temperature outside is 130 in the shade or 25 below zero. A periscope, which supplements his field of vision, can scan through 180 degrees horizontally and 170 degrees vertically with a magnification of 1.5 and 6 power. The lenses of the periscope and surfaces of the leaded cabin windows are electrically defrosted, and are constantly washed with dry nitrogen to prevent fogging. As long as the Beetle is operating, a radiation detector is at work and the the machine's operator is safe, even when radiation levels outside the Beetle would be fatal.

The many different systems in this amazing vehicle are interconnected by some 400 miles of wiring. Two microphones allow the operator to listen to the sound of his engines, and a public address system lets him talk to people outside—or to sound an alarm siren should that ever be necessary.

An amusing footnote to this report is provided by one of the highly-skilled operators of this incredible machine. He is so impressed by the precision of the Beetle's arms that he says it should be possible to use them to knit the odd sweater while waiting to set about more serious business!

Britain's New Wave of Bridge Building—

(*Continued from page 244*)

diameter cables. In gales one footbridge swings 30 feet out of alignment.

The nineteenth-century bridges have been acclaimed as great works of art. With the exception of the Runcorn–Widnes Bridge, which has come under heavy fire for its dismal appearance, the new bridges are also likely to be magnificent additions to the landscape.

Most of the new bridges are planned primarily to speed the flow of trunk traffic. The Medway Bridge is being built to carry the M2, which will make the Channel Ports more easily accessible from London. In the heart of Bristol the new £2½ million Cumberland Basin Bridge Scheme will supplement the existing swing bridge, seriously overworked by holiday traffic in the summer, and could halve the time needed to pass through the city.

But some of the bridges are expected to have more radical effects on the distribution of population, industry and tourist centres. In East Scotland, the holiday resorts, ports and coalfields of Fife, almost an island cut off to the north and south by the Tay and the Forth, will for the first time have quick road access to Dundee and Edinburgh.

South Wales hopes that the Severn and Wye Bridges will make it easier to attract industry. Also the emergence of a new kind of daily traveller is envisaged—the cross-channel commuter. With land becoming increasingly scarce on the Bristol side of the Severn, commuters could live over the bridge in Monmouthshire. Land values around Chepstow, which will be less than 45 minutes by car from Bristol, have already risen sharply.

* * * *

In places where bridges have now been completed, this changing pattern is already becoming evident. The opening last April of the Tamar Bridge, connecting Plymouth with East Cornwall, has led to a big housing expansion in Saltash, on the Cornwall side, and nearby holiday resorts are expecting a boom. The decision to develop Runcorn, Cheshire, as a new town, was partly influenced by the completion of the Runcorn–Widnes Bridge across the Mersey, putting it within half an hour's drive from Liverpool. Commuting from North Merseyside into Central Cheshire is now easily possible.

One drawback to regular commuter use of the new bridges is that most of them will be toll bridges (average about 5s. for a saloon car, though the Tamar Bridge toll has already fallen to 4s. 3d. because of large usage).

Old-Time Cabriolet

BY SPANNER

A NOVELTY FOR THE YOUNG MECCANO BUILDER

ROAD transport of the past offers some attractive subjects for the Meccano model-builder, and over the years many examples have appeared in the *Meccano Magazine*. This month I have chosen one of the many old-time cabriolet type vehicles as the subject for a simple model that will appeal to the younger model-builders. The original of this vehicle was a forerunner of the Hansom Cab, which was invented by J. A. Hansom in 1834.

The model is not designed for construction from a particular Outfit, but it is easy to build and will, I feel, prove popular with those who possess all the parts listed at the end of this article.

The simple chassis is made up from two $4\frac{1}{2}''$ Strips 1 joined at the front by a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 2 and a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flanged Plate, and at the rear by another $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip. A $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate 3 is bolted to Double Angle Strip 2 and a $1\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 4 is bolted to the Flanged Plate. A further $4\frac{1}{2}''$ Strip is tightly fixed to each lug of this Double Angle Strip to form the shafts for the horse.

The framework of each side of the cab consists of a compound $4\frac{1}{2}''$ strip 5 built up from two $2\frac{1}{2}''$ Strips, connected through the end hole of Strip 1. Strips 5 and 6 on each side are joined by a compound $3\frac{1}{2}''$ curved strip and three $2\frac{1}{2}''$ Strips as shown in the illustration. Each side is filled-in further by two 2″ Strips 7 and 8, a $2\frac{1}{2}''$ Curved Strip 9, and a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Transparent Plastic Plate, the latter forming the window.

The back of the cab can be dealt with in two parts. First, the lower part is made up from five $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips bolted as shown to the rear side frames. A $2\frac{1}{2}''$ Strip is fixed through each end hole of the top Double Angle Strip and these are also bolted to Angle Brackets 10 fixed to strip 5. They are connected at the top by a further $2\frac{1}{2}''$ Strip, and the remaining space is filled-in by a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Transparent Plastic Plate, which forms the rear window, and another $2\frac{1}{2}''$ Strip.

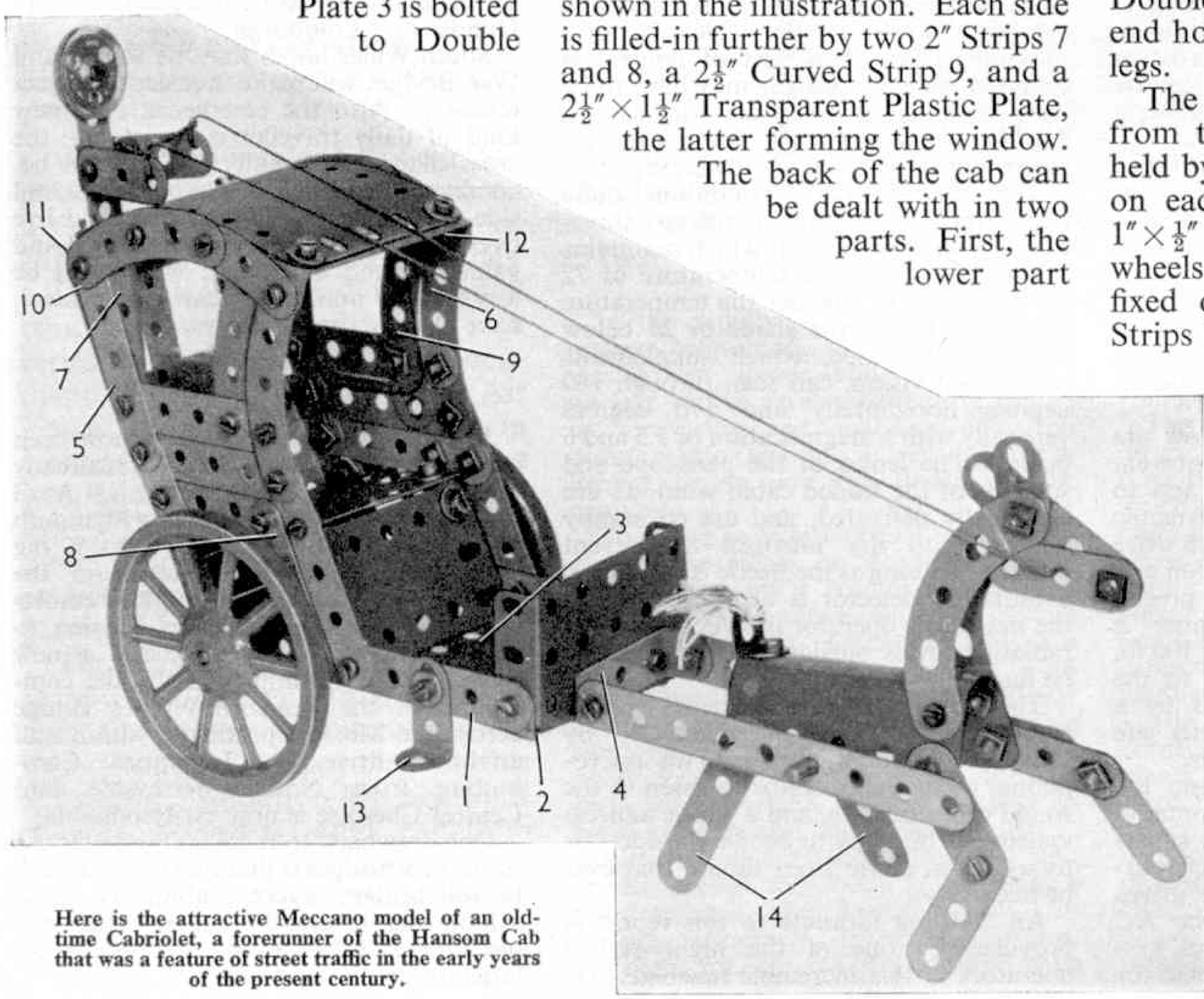
Each side is connected by $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips 11 and 12, to which a $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Red Plastic Plate is bolted to represent the roof.

The "Cabbie" is built up from a $2\frac{1}{2}''$ Strip through the centre and one end hole of which a Double Bracket is bolted. A 2″ Strip is fixed to each lug of the lower Bracket to form the legs and a $1\frac{1}{2}''$ Strip to each lug of the upper Bracket to form the arms. The head is a 1″ Pulley without boss and the whole is fixed to the back of the cab by a $1'' \times \frac{1}{2}''$ Double Bracket bolted through the end holes of the Strips forming the legs.

The seats in the cab are made from two $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates held by Angle Brackets, and a step on each side is represented by a $1'' \times \frac{1}{2}''$ Angle Bracket 13. The wheels are two 3″ Spoked Wheels fixed on a 4″ Rod journalled in Strips 1.

So much for the cab! Now to pass on to the horse, which is very simple in construction. Its body is a U-Section Curved Plate, to two corners of which 2″ Strips 14 are bolted to form legs. At the remaining two corners, two $2\frac{1}{2}''$ compound strips, made up from two $1\frac{1}{2}''$ Strips, are bolted, and bent as shown to form the forelegs. The neck and head are constructed from two $2\frac{1}{2}''$ Stepped Curved Strips and two $1\frac{1}{2}''$ Strips, with two Fishplates for

(*Continued on page 272*)



Here is the attractive Meccano model of an old-time Cabriolet, a forerunner of the Hansom Cab that was a feature of street traffic in the early years of the present century.

A CREEPER TRACK UNIT FOR MECCANO MODELS

"SPANNER" TELLS YOU HOW TO BUILD A VERY USEFUL ITEM

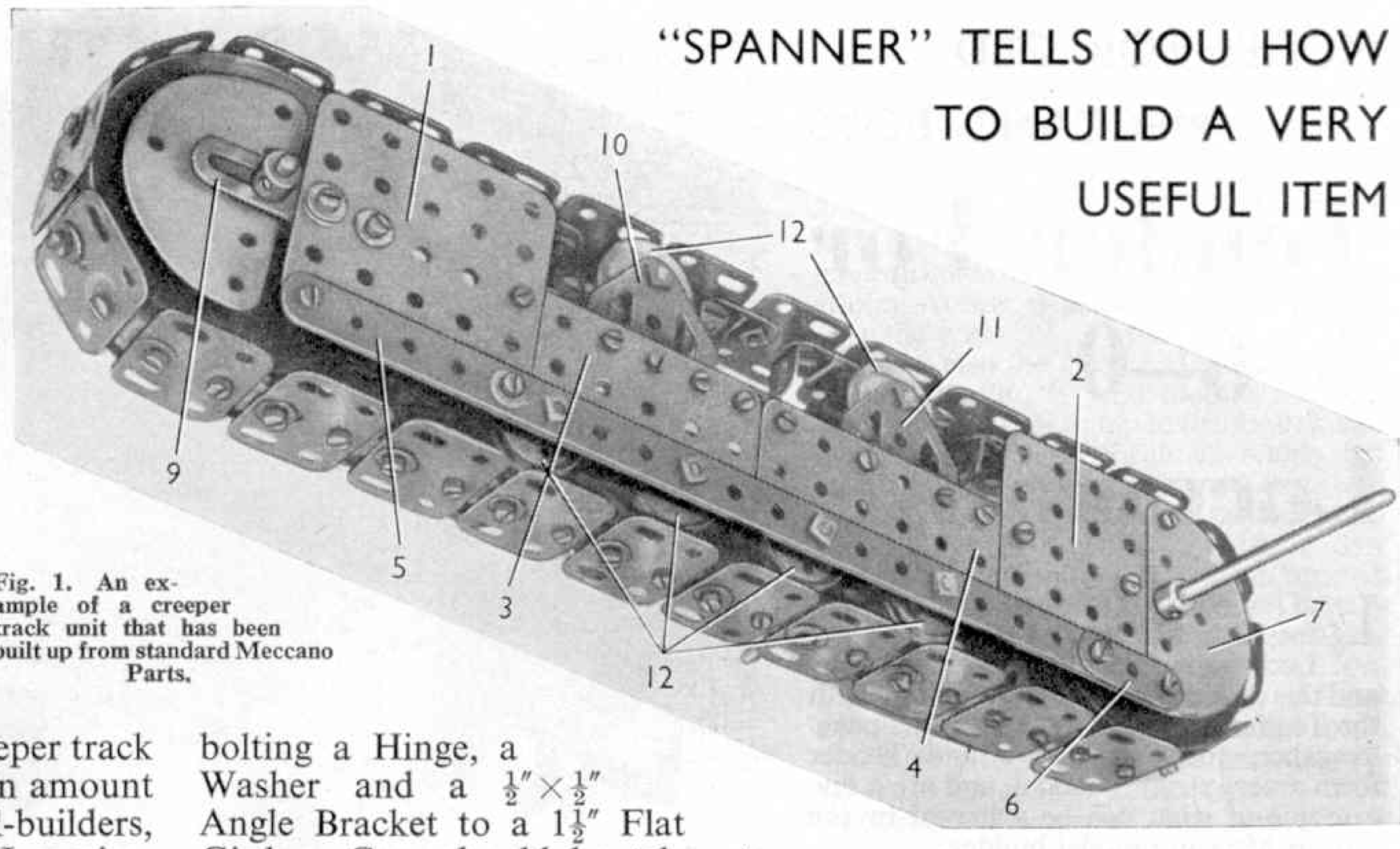


Fig. 1. An example of a creeper track unit that has been built up from standard Meccano Parts.

THE construction of creeper track seems to cause a certain amount of difficulty to some model-builders, judging from the letters I receive. Track of this type enters into the construction of many popular models, including cranes, excavators and tractors of one kind or another, and so I am describing here a very neat system on which it can be built up. It should be realised that any form of creeper track, unless it is just an endless belt arrangement, requires a large number of similar parts, and this could be a drawback for some model-builders, but provided the parts are available the track illustrated here will be found to be both realistic and strong.

The Track

The track itself consists of 26 units, each of which is made by bolting a Hinge, a Washer and a $\frac{1}{2}'' \times \frac{1}{2}''$ Angle Bracket to a $1\frac{1}{2}''$ Flat Girder. Care should be taken to see that all the Hinges are quite free at their joints. The track is supported in a framework that is made up as follows.

The Framework

Two $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plates 1 and 2, and two $3'' \times 1\frac{1}{2}''$ Flat Plates 3 and 4 are joined together and supported by two $9\frac{1}{2}''$ Strips 5 and 8. The Strip 5 is extended by a $1\frac{1}{2}''$ Strip 6. A Semi-Circular Plate 7 is bolted to the $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plate 2. A 2" Slotted Strip 9 is fastened to the end of the $9\frac{1}{2}''$ Strip 8, with Washers on the shanks of the bolts. Two Flat Trunnions 10 and 11 are bolted to the Plates 3 and 4. Six 1" Loose Pulleys 12, each mounted on a $\frac{3}{8}''$ Bolt with a Washer and two nuts, are placed in position as shown. Another similar side is then built and the two are connected together by two $1\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips 13 and 14.

Two 3" Pulley Wheels 15 are fastened together on four 1" Screwed Rods as shown, and are then secured to the Rod 16, Collars holding the unit in position.

Tensioning Device

Two $1'' \times \frac{1}{2}''$ Angle Brackets 17 are bolted together on the shanks of two Threaded Pins 18. To each shorter lug of the Brackets is bolted a 3" Strip 19, which also has a Semi-Circular Plate secured to it. A Coupling 21 is fastened to the Threaded Pins 18 and a Bolt secures a Double Bracket 22 to the centre hole of the Coupling. A 6" Screwed Rod 23 is attached to the Double Bracket 22 by four nuts locked together in pairs on each side of the lug. The Screwed Rod passes through a Handrail Support that (*Cont. on p. 272*)

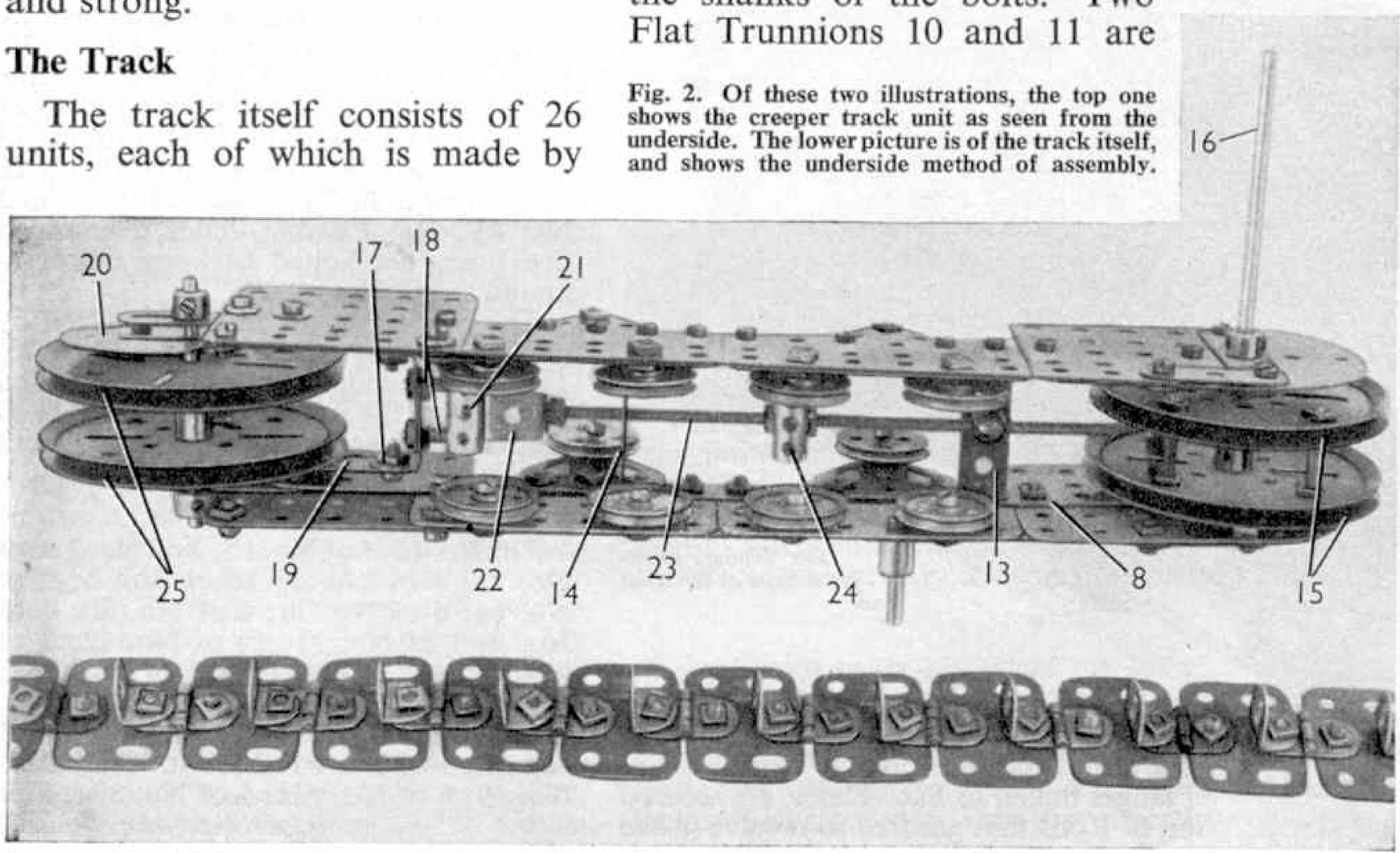


Fig. 2. Of these two illustrations, the top one shows the creeper track unit as seen from the underside. The lower picture is of the track itself, and shows the underside method of assembly.

MODEL FOR OLD MECCANO BOYS

Tender For 4–6–0 Locomotive

LAST month I described how to build the fine Meccano 4–6–0 Passenger Locomotive illustrated in that issue, and this month I am dealing similarly with the Tender, which is shown on this page. Together, the Locomotive and Tender form a very striking model, and are a fine example of what can be achieved by the serious Meccano model-builder.

By "SPANNER"

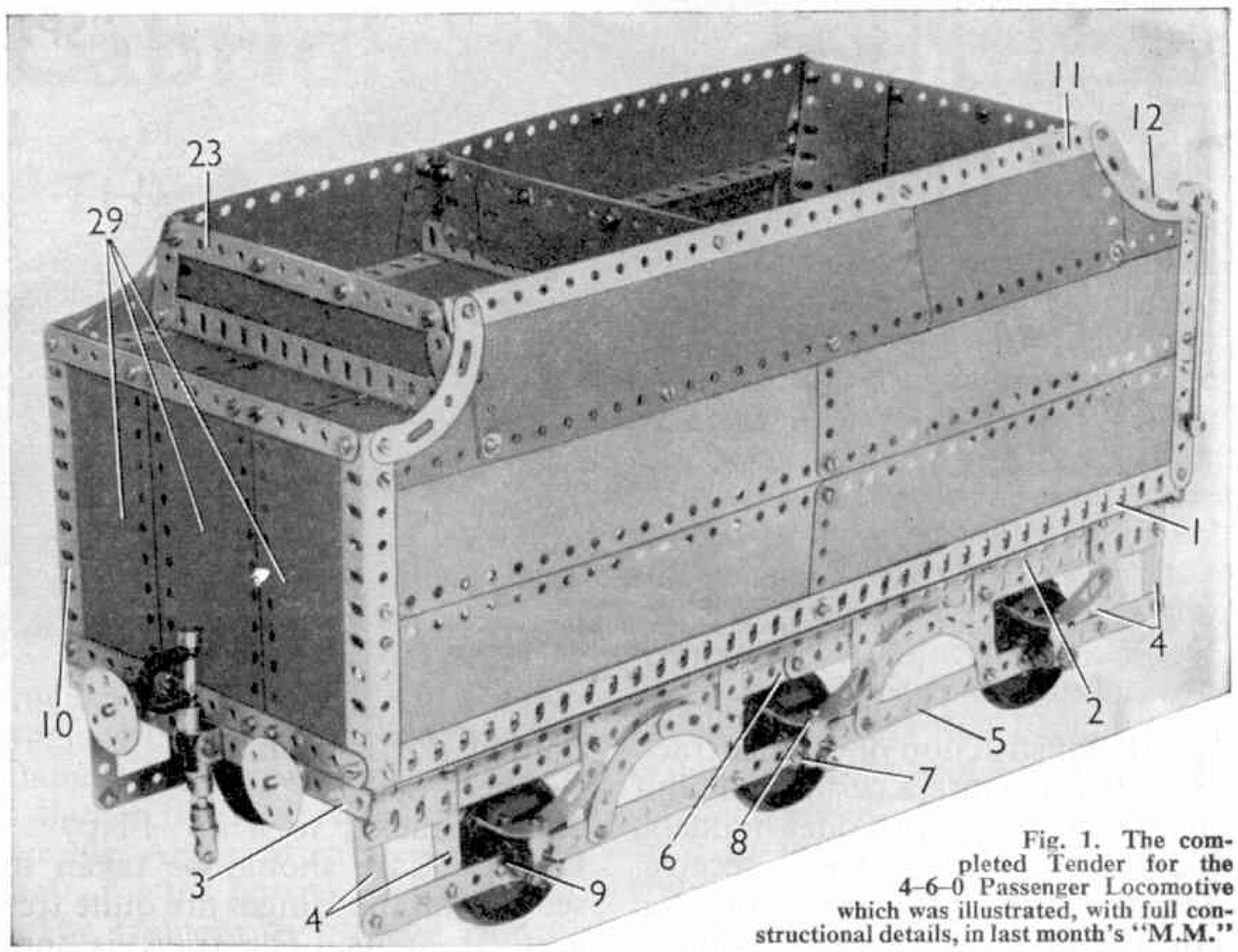


Fig. 1. The completed Tender for the 4–6–0 Passenger Locomotive which was illustrated, with full constructional details, in last month's "M.M."

A list of the Parts required for the Tender is given at the end of this article; those for the Locomotive were listed last month.

Building the Tender

Two 18½" Angle Girders 1 and 2 are placed together to form a reversed angle girder. They are connected to a similar pair by 7½" Angle Girders 3. Eight 2½" Strips 4 are bolted to the Angle Girder 2 to support two pairs of 9½" Strips 5 and 6 and two 2" Flat Girders. Two pairs of 2½" Curved Strips are secured to the Strip 5. Each of the wheel bearings, or axle boxes, is made with a 3" Formed Strip 8 attached to a Threaded Coupling 7 by a bolt, and an Angle Bracket 9 fixed to the Threaded Coupling by a nut and bolt, is bolted to the Strip 5. The built-up wheels, formed from Wheel Flanges bolted to Face Plates, are secured on 8" Rods that are free to revolve in the Couplings. Collars are now fixed at the ends of the Rods.

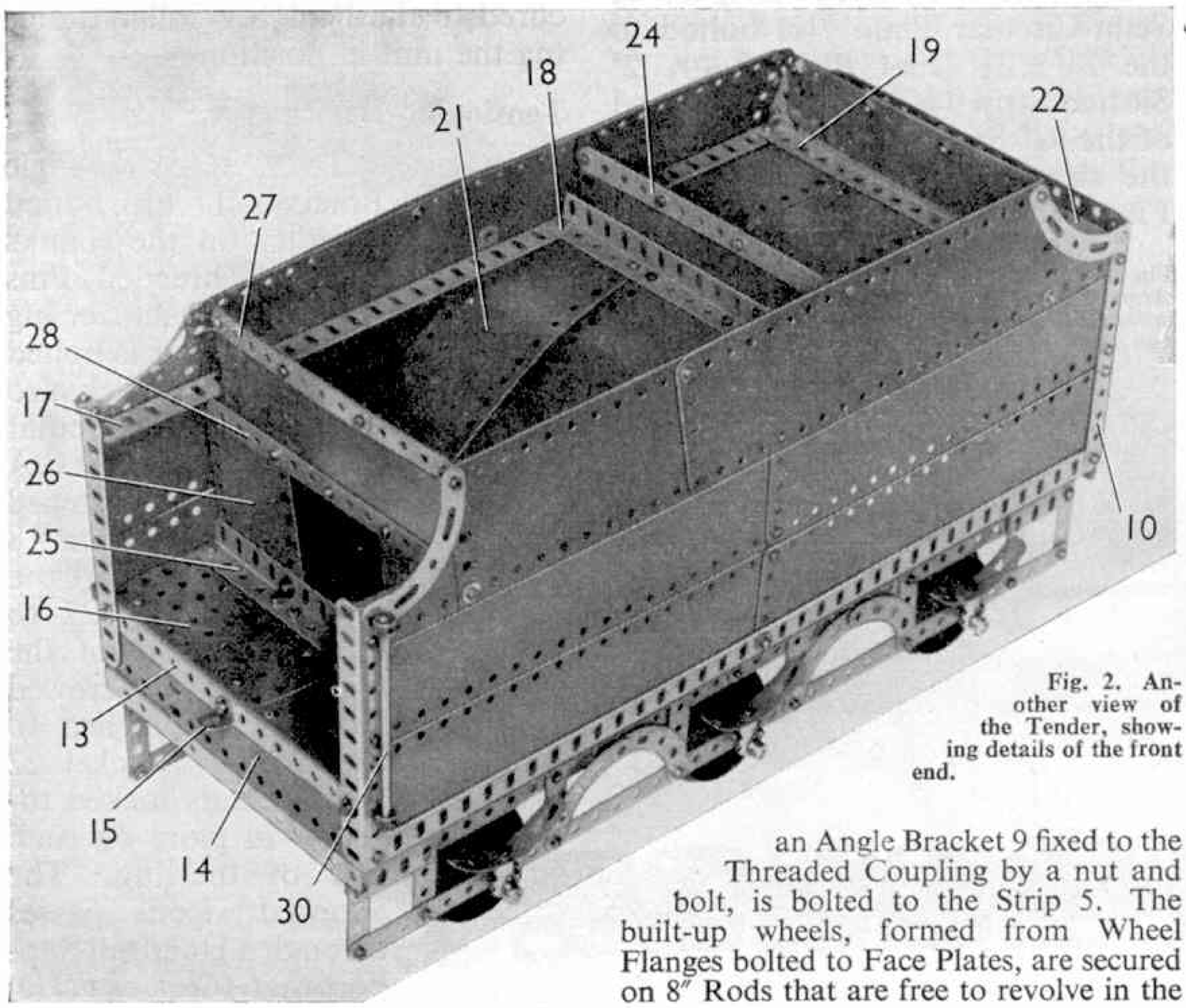


Fig. 2. Another view of the Tender, showing details of the front end.

At each corner of the Tender a 5½" Angle Girder 10 is bolted and the sides are filled in by six 9½"×2½" Strip Plates and two 2½"×1½" Triangular Flexible Plates. Two 3" Curved Strips 12 are attached to the Angle Girders 10 and the compound strip 11. A 7½" Angle Girder 13 supports two 4½"×2½" Flat Plates 16, two 5½"×1½" Flexible Plates 14, and an Angle Bracket 15. At each side an 18½" Angle Girder 17 is bolted to the Angle Girder 10 and the two are connected by 7½" Angle Girders 18 and 19. Three 12½"×2½" Strip Plates 21 are bolted to the Flat Plates 16 and the Angle Girder 18 and are extended by 5½"×2½" Flexible Plates bolted to a 7½" Strip 22. Compound 6½"×1½" flexible plates strengthened by compound strips 23 and 24 are bolted to the Angle Girders 18 and 19. Two 3½"×2½" Flexible Plates 26 are secured to the 7½" Angle Girder 25, and two 4½"×2½" Flexible Plates overlapped five holes are bolted between the compound strips 27 and 28.

The rear of the tender is completed by means of three 5½"×2½" Flexible Plates 29. The buffers, coupling, etc. are now added to complete the model. Two 4½" Rods 30 are held in place by Collars to represent handrails.

Parts Required

9 of No. 1a; 4 of No. 1b; 3 of No. 2; 6 of No. 2a; 1 of No. 3; 16 of No. 5; 2 of No. 6a; 6 of No. 7a; 6 of No. 8b; 4 of No. 9; 1 of No. 11; 14 of No. 12; 3 of No. 13a; 2 of No. 15a; 1 of No. 18a; 1 of No. 18b; 4 of No. 23; 2 of No. 24d; 192 of No. 37a; 194 of No. 37b; 18 of No. 38; 1 of No. 43; 2 of No. 53a; 11 of No. 59; 6 of No. 63c; 4 of No. 89a; 8 of

(*Continued on page 272*)

MECCANO—AND ME

• Recent articles in the "Meccano Magazine" from contributors who have described their interest in the Meccano Hobby have led other correspondents from various parts of the world to write in similar strain. This month we print letters from an "old boy" of the Meccano Guild in Hampshire, a schoolmaster in India and a teenage reader of the "M.M." who lives in Burma. This is what they have to say:

AS far as I can remember, it must have been sometime in 1921 that I first heard the word "Meccano". At that time I was nine years of age. An aunt of mine had bought her son a No. 1 Outfit and suggested to me that it would be a good idea if I also acquired one. I remember that I was attracted by this comparatively new method of model-building and the prospects of adding, set by set or piece by piece, new parts until finally one would have all the components of the largest set then available—a No. 6, I think.

Alas, those years following the first world war were not easy ones for parents, and no boy of my acquaintance was the proud possessor of a No. 6 Outfit. However, there were ways and means and I was lucky enough to get a No. 1 Set that Christmas and I spent many pleasant hours becoming adept with screwdriver and spanner. With the aid of the *Meccano Magazine* I was soon absorbing the mysteries of Gear Wheels, Flanged Wheels, Sprockets and Pawls, etc.

I joined the "Meccano Guild" in, I think, 1922. I was very proud of my triangular badge worn in the lapel and I met many kindred spirits all wearing the same badge and, naturally, possessing the same interest in Meccano. Soon after, I obtained my No. 1a Set by dint of saving every half-penny that came my way.

I was impatient to enlarge my set and started a weekly visit to a local stockist——Percy Kiln of Portsmouth—tightly clutching my few pence to add, perhaps, one flanged wheel or even, on good weeks, two or three parts. I was surprised, as time passed, how the set grew until finally, by 1924, I had more than the No. 4 Set as it was at that time. My father came to my rescue with a fine home-made, wooden, hinged box with three drawers, top layer and lid all divided into compartments to take the many parts I possessed. My younger brother had by this time followed my interest and was the proud owner of a Hornby Clockwork Tank Locomotive in L.N.E.R. colours. Together we must have spent hours and hours building cranes, bridges, etc., incorporating the "0" Gauge lines and generally taking possession of the larger part of the ground floor of the house.

In 1926 I left school and joined the Services. I left my Meccano, so painstakingly gathered together over five years, to my brother and went abroad. I know that he derived great pleasure from it and finally, in 1930, when my brother and I were abroad, my mother—spring-cleaning, no doubt—opened the front door and stopped the first boy she saw who looked "keen" (as she described it later) and made him a present of my Meccano. I only hope this unknown boy derived as much pleasure and interest from it as I did.

It was not until after another devastating war that I began to take a new interest in Meccano—mainly because I was by then the father of two sons and I found that Meccano, Hornby Trains and the *Meccano Magazine* had all taken on a new look from the 1920's. However, my sons have also had their Meccano Sets and one has quite a comprehensive Hornby-Dublo railway system which I have watched expand with more than a little interest. I still find the *Meccano Magazine* interesting. The development and progress of Hornby Trains and Meccano are followed closely.

The Hornby organisation has probably contributed more pleasure and interest to boys of all ages than will ever be realised. I for one am glad that I heard that magical word "Meccano" back in the 1920's.—R. Jolliffe, Bridgemary, Gosport, Hants.

* * * *

I WAS nine years old when my father presented me at Christmas with a Meccano No. 1 Outfit, thereby introducing me to the wonderful world of miniature engineering. Thirty-six years have passed since then (I am now a portly 45-year-old schoolmaster) and Meccano means a lot to me. Yes, a lot, I repeat, for in my leisure time, when I am free from the thraldom of monotonously marking endless pupils' exercise books, homework and preparing lessons, I get down to a joyous spell of model-building with my Meccano No. 7—which stage I have reached in my modelling career by adding Accessory Outfits and extra parts over the years.

I have also the good fortune to possess a Gears Outfit "B" and Meccano Clockwork Motors that animate the models and mechanisms with thrilling reality. I usually build miniatures of machines and machine tools that I see in factories and workshops; these include a Circular Saw with a very slowly moving platform beneath the swiftly turning saw-wheel, a Rotary Crusher (worm-driven) which I saw in a ceramics factory, pumps and so on. Vehicles and stationary models do not appeal to me, so I hardly ever build them.

I eagerly look forward to perusing the *Meccano Magazine* each month and especially "Spanner's" new models. I

must confess, though, that I lack the skill and imagination to attempt the advanced models he suggests which look so tantalisingly complicated to *me*, at any rate.

I feel indebted to the inventor of Meccano, and to all those clever people who are turning it out each day for the endless delight of boys (and girls!), and even for young-at-heart adults, the world over.—F. W. Saunders, Stewart School, Cuttack 1, Orissa, India.

* * * *

I FIRST became interested in Meccano in 1952. At that time I was eight years old and one morning in March my uncle took me to the house of Mr. E. C. Bodd, an Englishman who was teaching in Burma. There I saw a Meccano model of a crane and I was very eager to build it. In this way I became interested in Meccano and somehow always seemed to find a friend who owned a Meccano Set.

During Christmas 1955 great pleasure came into my life when Mr. Bodd gave me a Hornby Clockwork Train Set for a present. As I am very interested in train sets I looked after it well. Then one of my uncles, an engineer with Burma Railway Company, advised me to attend the English School, and I was far from Meccano. However, for a Christmas gift in 1956 I received a Meccano Outfit and so I was able to use Meccano and Hornby Trains together. Then my uncle bought a Clockwork Motor to give me so I was able to drive my model cranes and cars.

In 1957 I moved to another school and one day found a student reading the *Meccano Magazine* in the School Library. After class I asked to see it. He allowed

(*Continued on page 272*)

WITH THE SECRETARY

Club and Branch News

WELCOME TO THE NEWCOMERS

IT gives me great pleasure to inform readers of this page that another Meccano Club and two more Hornby Railway Company Branches are now linked with this headquarters.

The new Meccano Club, recently affiliated, goes under the name of Undenominational School (Worcester) M.C. and its leader is the headmaster of the school, Mr. E. C. M. Baker. We give all the boys there a warm welcome into the Meccano Guild and hope that their new club will have much success.

I am always particularly delighted when any new club or branch is formed overseas, and give a special welcome to the recently-incorporated Montreal Branch of the H.R.C. It is No. 582, and the chairman is Mr. W. R. Evans, whose address is 4569, Wilson Avenue, Notre Dame de Grace, Montreal 28, Quebec, Canada. Most recently incorporated branch of the Hornby Railway Company is one formed by the Parish Church Lads' Club at Chapel-en-le-Frith, Derbyshire. This branch is No. 583, and the chairman is Mr. P. G. Ian Green of 25 Hamfield Road, Chapel-en-le-Frith. To them, as to our friends in Montreal, we send sincere wishes for a successful future.

CLUB NOTES

WELLINGTON SECONDARY MODERN SCHOOL (BURY) M.C.—The term began with some members building models with the Club's No. 1 Outfits, while others used the Leader's larger Outfit to construct a model helicopter. A *Bolton Evening News* photographer took pictures of the members at work and they appeared in that newspaper. You see one of these photographs reproduced on this page. *Secretary*: Barry Senior, 53 Woodman Drive, Bury, Lancs.

AUSTRALIA

MAYLANDS M.C.—The summer holidays over, meetings were resumed at the beginning of March with the membership at 50 and rising steadily. As in the past, the membership is divided into groups, or Factions as they are called, named respectively Green and Gold, Black and Gold, Blue and Gold, Red and Gold. At the time of writing a Factions Exhibition was being planned for early in May, for which Green and Gold faction would build a model rocket range; Red and Blue, a motor show; Blue and Gold, a miniature reproduction of the maintenance section of an airport; and the Black and Gold faction a model dockyard.

The Parents' Committee have already been at work raising funds to defray the cost of the new clubroom, and a cake stall in the Perth Wesley Church grounds raised the sum of about £14 for this purpose. *Secretary:* Mr. Trevor Criddle, 17 Kenilworth Street, Maylands, Western Australia.

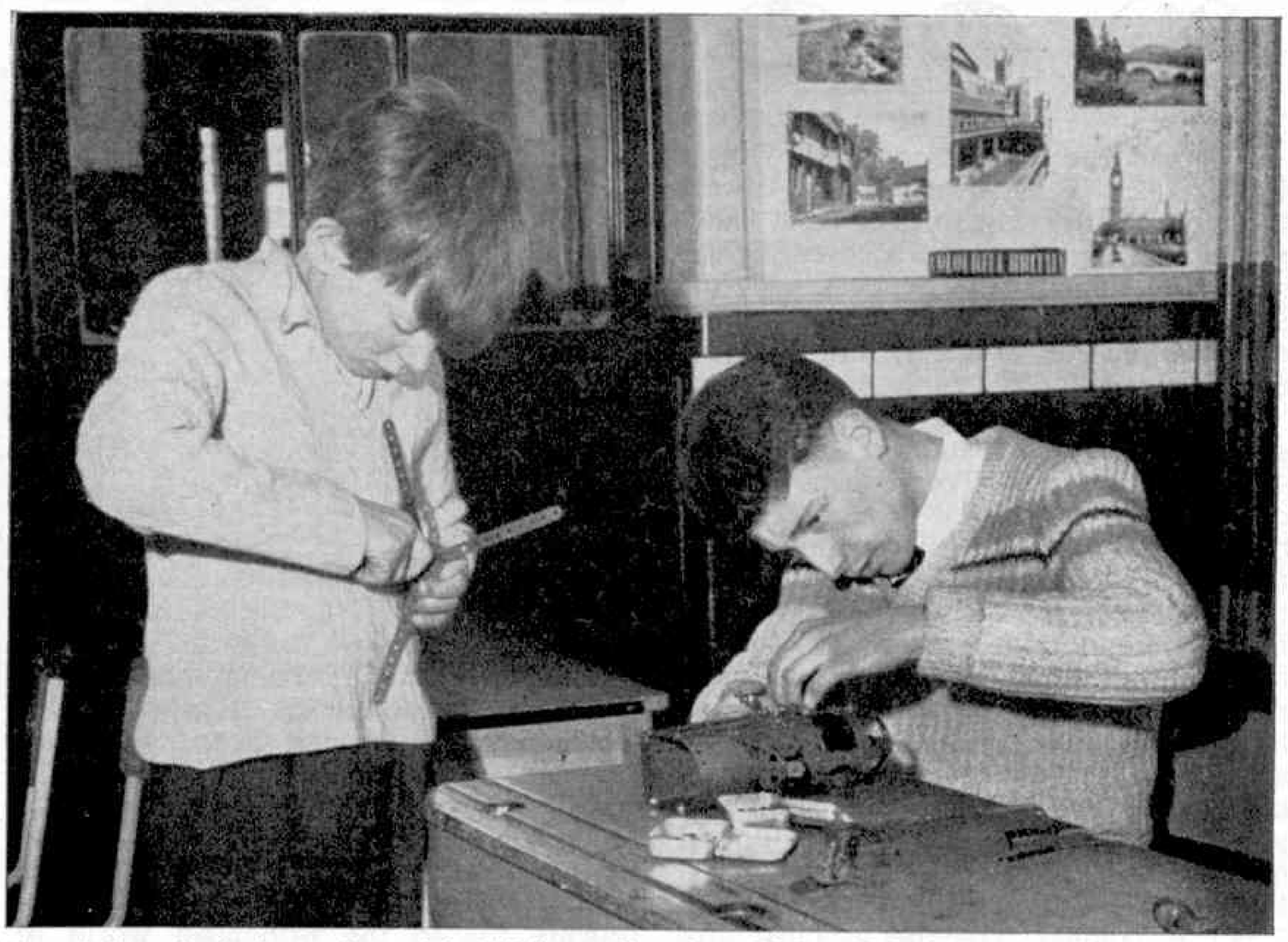
NEW ZEALAND

ST. JOHN'S (DUNEDIN) M.C.—At the beginning of the term it was decided to organise a model-building competition to be held in the Spring, and also to have a Meccano racing car competition in which there would be three sections, with extra marks for the best-built and best-looking model in each section. The sections were, respectively, for models equipped with the No. 1 Clockwork Motor; the *Magic* Motor; and thirdly—and for the first time—models equipped with an Electric Motor. R. McLean won first place in all three sections, with R. Mercier as runner-up in the *Magic* Motor and Electric Motor sections. T. Ferris took second place in the No. 1 Clockwork Motor section. A model aeroplane competition will be held at the end of the term. *Secretary:* Mr. M. J. Salinger, 8 Maheno Street, Dunottar, Dunedin, New Zealand.

BRANCH NEWS

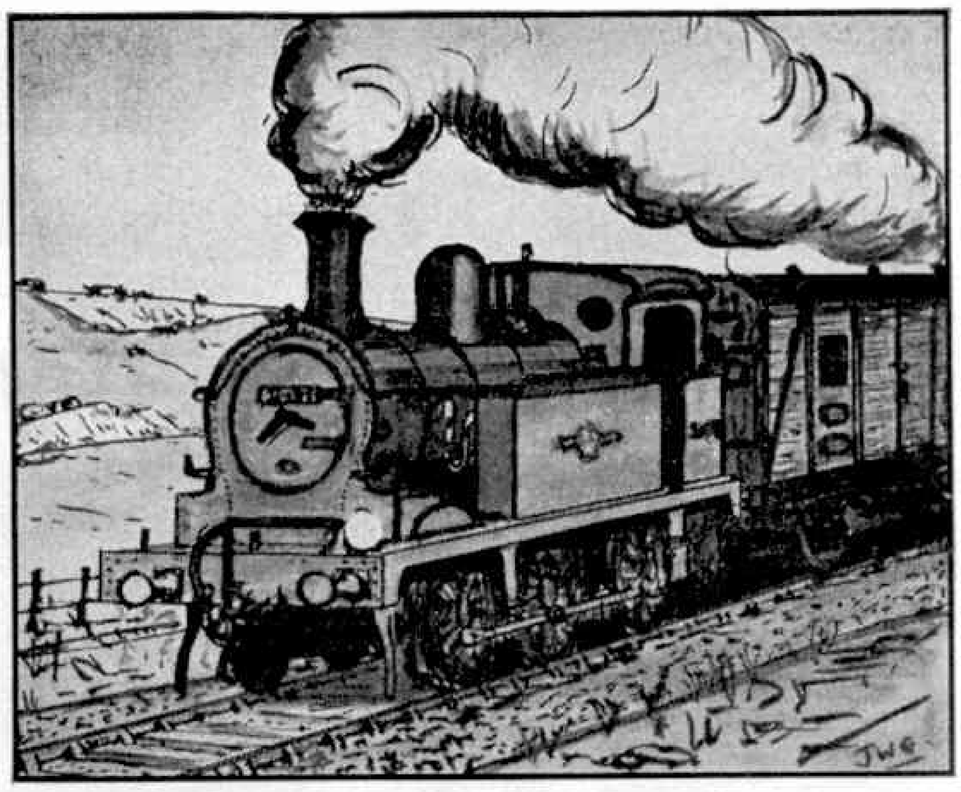
KESWICK MODEL RAILWAY CLUB (WEMBLEY)—Recent additions to Club equipment include five new trucks, two coaches and another locomotive. The layout scenery has been improved by the addition of many new buildings, and these are equipped with lighting so that an effective night effect can be obtained in dark scenes. Some of the members visited the Festiniog Narrow Gauge Railway in North Wales during the Easter holiday, and had a most enjoyable time. Two members have left on leaving the district, and one new member has been enrolled. *Secretary:* Mr. Peter G. Walker, 17 Keswick Gardens, Wembley, Middlesex.

NORTH END (PORTSMOUTH) M.C.—The construction of Mr. Enfield's new layout is now well advanced. Various bankings and cuttings, more electrical points and three more sets of colour light signals have been added, and the eighth section is being assembled. The first stage of illuminating the stations has been carried out, and the result is most effective. *Leader:* Mr. R. G. Enfield, 12 Grasmere House, Allaway Avenue, Paulsgrove, Portsmouth.



Two of the enthusiastic members of the Wellington Secondary Modern School (Bury) M.C. constructing a Meccano helicopter. The youngster on the left is assembling the propeller, while the boy on the right is at work on the fuselage. Photograph by courtesy of Tillotsons Newspapers, Ltd., Bolton.

HORNBY REPAIR SERVICE



THE service operated by Meccano Limited to expedite repairs to Hornby-Dublo Locomotives and Tenders, Hornby Gauge 0 Clockwork Trains and Clockwork and Electric Meccano Motors is being constantly widened in its application. Dealers authorised to offer this service are listed below. Customers may, of course, send repairs to the Service Department of Meccano Ltd., at Binns Road, Liverpool 13, if it is more convenient for them.

ANGUS

Dundee—Brian Sherriff, 93 Victoria Road.

BEDFORDSHIRE

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

BERKSHIRE

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

CHESHIRE

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

CORNWALL

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

CUMBERLAND

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

DENBIGHSHIRE

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

DEVONSHIRE

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

DURHAM

Durham—C. T. Applegarth, The Model Shop, 92 Claypath.
Gateshead 10—Mr. Roy Burn, 1 & 3a Fewster Square, Leam Lane Estate.
Stockton-on-Tees—K. Dean, 41 Bishopton Lane.

ESSEX

Basildon—H. T. Dwyer Ltd., 8–9 Blenheim House.
Chelmsford—Chelmsford Model Co., Baddow Road.
Colchester—West End Cycle Stores, 65 Crouch Street.
Ilford—Pages of Barkingside Ltd., 19 Broadway Market, Fencepiece Road, Barkingside.
Southend-on-Sea—Alco Supplies, 133 Hamstel Road, Southchurch.

GLAMORGAN

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

GLOUCESTERSHIRE

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

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Portsmouth—Robin Thwaites Ltd., The Hobby Shop, 28 Arundel Street.
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Glassfords, 89 Cambridge Street, C.3.

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Darwen—Arnold Leaver, 65–67 Duckworth Street.
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Lincoln—S. A. Nobbs & Son Ltd., 2 Norman Street, and 16 Sincil Street.
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Palace Model Shop, 13 Central Hill, Upper Norwood, S.E.19.
W. & H. (Models) Ltd., 23 Paddington Street, Baker Street, W.1.

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Messrs. Donray, 302 Morningside Road.

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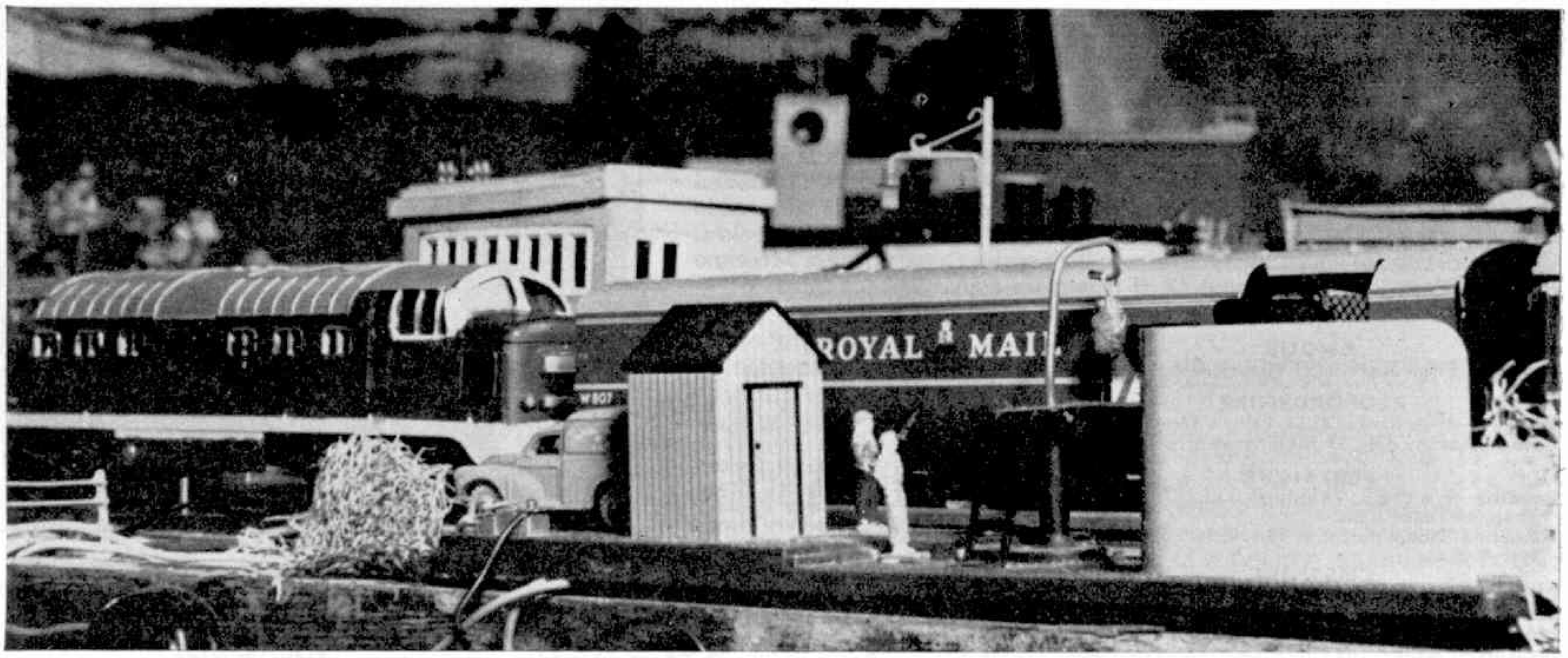


A Royal Mail train on the Longdon, Newborough and Easthyde Railway layout photographed as it is about to collect a mail bag from the lineside equipment. The train is "Deltic" hauled, and just below the locomotive a Dublo Dinky Toys Royal Mail Van waits to take the ejected bags of mail to the local sorting office.

More About Miniature Train Formations

Northbound Night Mail

BECAUSE of the interest shown in my comments on miniature train formations in the recent issues of the *Meccano Magazine*, the Secretary of the Hornby Railway Company has asked me to continue these talks as a series. I am very glad to have this opportunity of telling *M.M.* readers more about the miniature railway I own, and which provides me with an enormous amount of pleasure.

The great thing is that there is so much extra fun to be obtained in following real practice as closely as possible. For instance, one of the most interesting train formations that can be run on any Hornby-Dublo layout of whatever size is the Northbound Night Mail. In the case of an Eastern Region enthusiast, this would need to leave the main station at 8.30 p.m., and an example of running such a train is given in the timetable of my L.N.E.R. layout which has appeared from time to

By S. F. PAGE

time in the *Meccano Magazine*.

This train takes its place in the timetable and is "Deltic" hauled. It comprises two No. 4401 Travelling Post Office Vans, a No. 4053 Corridor Coach Brake/2nd and one or more 12-Ton Vans (No. 4325) used to transport sacks of mail which do not require sorting.

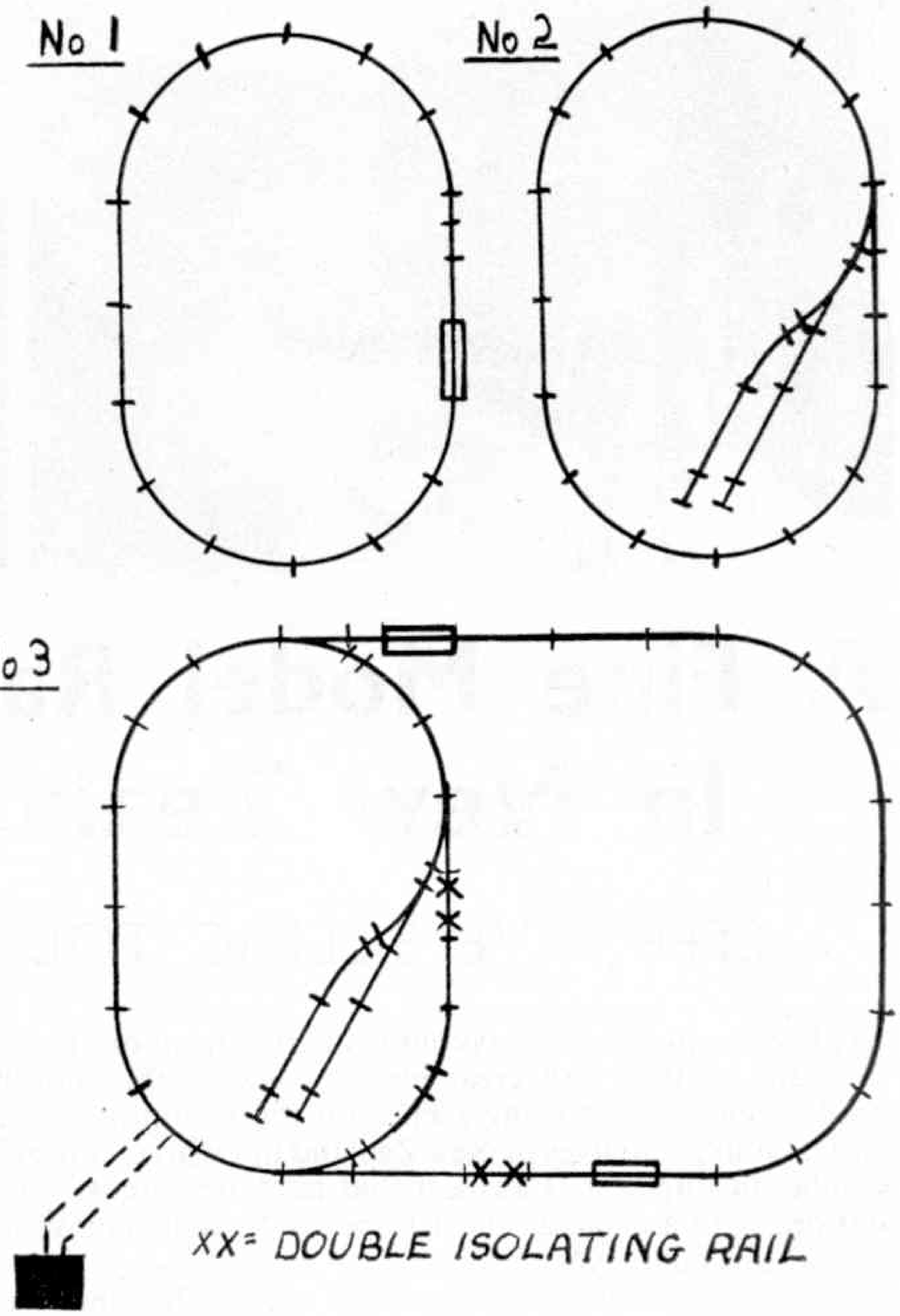
On the Longdon, Newborough and Easthyde layout two sets of Lineside Apparatus (No. 2475) are used, each being operated from a 12-volt car battery under the baseboard and by the press button switch supplied with the sets.

Timetable running is straightforward, since the train makes only one stop of ten minutes at Newborough Junction, where one or more vans are loaded and off loaded with bags of mail. While this is going on, additional vans filled with mail are attached to the rear of the train full of mail for the north.

(*Continued on page 272*)

The Northbound Night Mail on the Longdon, Newborough and Easthyde Railway picks up a mail bag from the lineside equipment as the Deltic locomotive speeds through the night, passing the green signal light. Pictures by S. F. Page.

FROM THE TRAIN SET ONWARDS



YOU will remember that last month I promised to start a short series of articles dealing with the progression of a Two-Rail layout, from the basic circle included in a Hornby-Dublo Electric Train Set to a comprehensive railway system.

The first of these talks must obviously be of a very simple nature, but we shall get to much more advanced layouts later on. This month we will deal with enlarging a basic oval into the layout shown in Diagram 3.

The average Hornby-Dublo Train Set includes eleven 15″-radius Curved Rails, one 15″-radius Curved Terminal Rail and two Straight Rails which, when assembled, form an oval measuring 4 ft. × 3 ft. and this is the quantity of track I shall assume to be the basic oval.

MONTHLY TWO-RAIL FEATURE

BY LINESMAN

I realise I told you last month that, in presenting this series of layouts, I would offer you alternative diagrams showing the appropriate wiring systems, in order that you could compare the Simplec system with that which preceded it. In this month's scheme, however, the wiring in either case is so similar that I thought two wiring plans unnecessary. Figure 3, therefore, not only illustrates the scheme I shall describe but is also a wiring diagram suitable both for layouts fitted with Simplec points and for those that make use of uninsulated (or live-frog) points. The Double Isolating Rails (shown by two crosses) in Diagram 3 are needed only if live-frog points are employed. The Simplec system does not require them.

* * * *

The first step in building our layout consists of enlarging the basic train set circuit to that shown in Diagram 1. To accomplish this, two One-Third Straight Rails, one Two-Thirds Straight Rail and one Uncoupling Rail are required. These are added to the right-hand side of the oval and the existing Straight Rail is moved to the left-hand side.

The oval is now large enough for further development, and so we can move on to stage two (see Diagram 2) which is formed by the addition of sidings within the oval already built. To do this, the two One-Third Straight Rails shown at the top right-hand corner of the loop in Diagram 1 are replaced by a Right-Hand Point. Two sidings continue off this Point and these are assembled by adding a Curved Quarter Rail to the Point already mentioned, and a second Point (also Right-Hand) to the Curved Quarter Rail. The two One-Third Straight Rails already taken off the loop are used at the end of the sidings, as you see from our drawing.

The plan shown in Diagram 3 is the last stage in the evolution of the layout. It shows the addition of a loop from the ends of the oval, forming, in fact, a double oval with internal sidings, All that is needed for this is to insert one Left-Hand and one Right-Hand Point at each end of the loop, as shown. A Curved Quarter Rail will need to be placed after each point to equate its length with that of the replaced Full Curved Rail. The rails required to complete the enlarged track are clearly shown in the drawing itself.

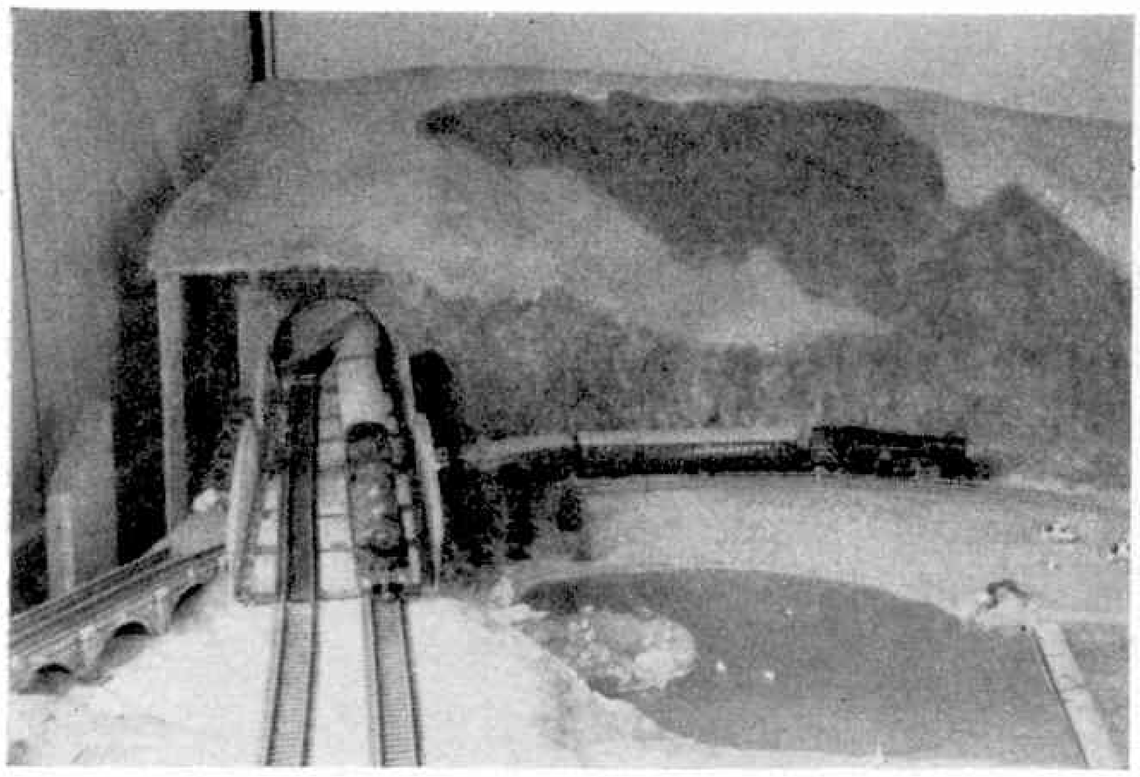
The two sidings can be used as a locomotive depot, since my eventual plan will include a terminal station, through station and a substantial goods depot. Rolling stock may be developed at approximately the same rate as the plan itself and this will ensure that the layout does not become cramped and unworkable because of surplus vehicles.

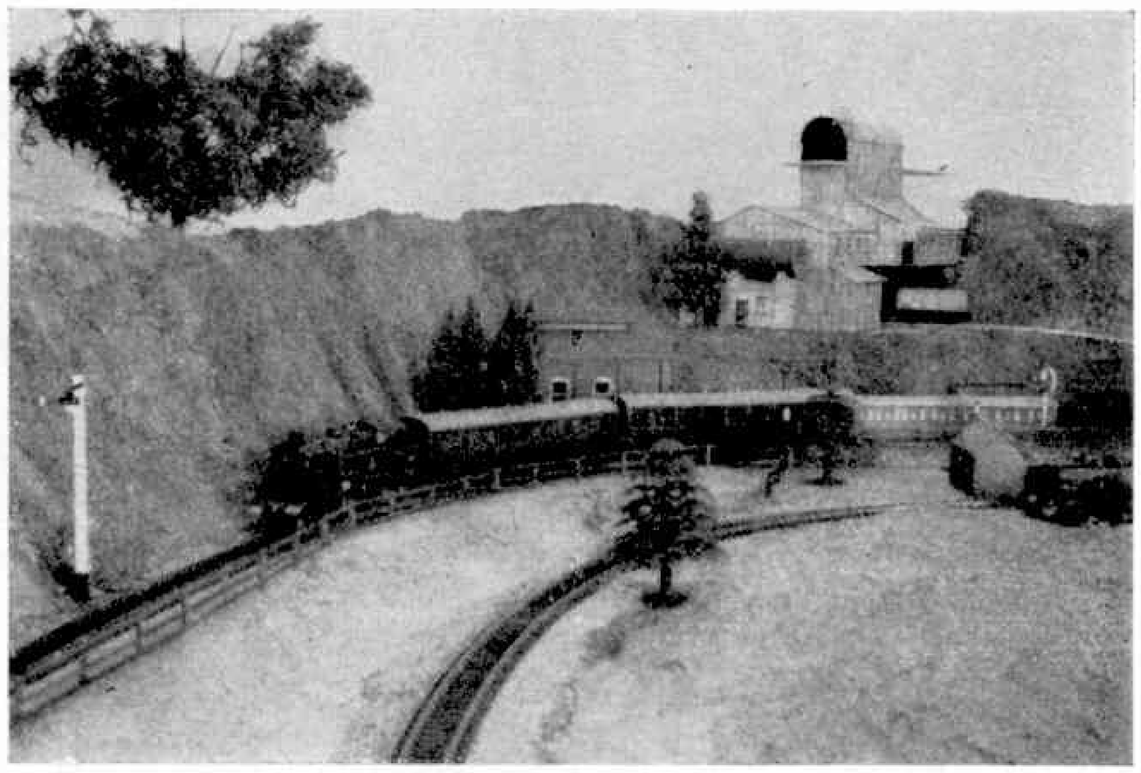
* * * *

Although the use of two locomotives is recommended, they should not be run simultaneously; one should be isolated while the other is allowed use of the main line. If you intend fitting Simplec Points, remember they are self-isolating for the sidings, so that the business of keeping one locomotive isolated is an easy matter. If you are using live-frog points, isolation is achieved by placing a Two-Thirds Single Isolating Rail on one of the sidings. This will enable you to leave a rake of goods wagons or other vehicles on the adjacent sidings.

PARTS REQUIRED FOR ADDITIONAL LOOP AS IN DIAGRAM 3

4	Full Curved 15″ Radius Rails	2710
5	Full Straight Rails	2701
1	Right-Hand Point	
1	Left-Hand Point	
1	One-Third Straight Rail	2703
2	Uncoupling Rails	2745
3	Two-Third Straight Rails	2702





Left: The two-track main line emerges from the tunnel to cross over the branch or local line. A 2–6–4T Locomotive is seen hauling the 5.30 a.m. train to Port Talbot while a "Castle Class" Locomotive hauls a train across the girder bridge. Above: A local train, headed by a 2–6–4T Locomotive, leaves Mossop's Station. The coal mine which is a feature of the layout is in the background.

A Fine Model Railway In New Zealand

EFFECTIVE SCENIC TOUCHES

WE at Binns Road always enjoy hearing from our many friends overseas and so it is with great pleasure that in this month's *M.M.* we reproduce pictures showing scenes on the beautiful layout owned by Mr. N. D. Gouk, who lives in New Zealand but who is currently on six-month's holiday in England. I suspect that his time here will be spent at railway stations with a camera, and I sincerely hope he enjoys himself during his stay in this country.

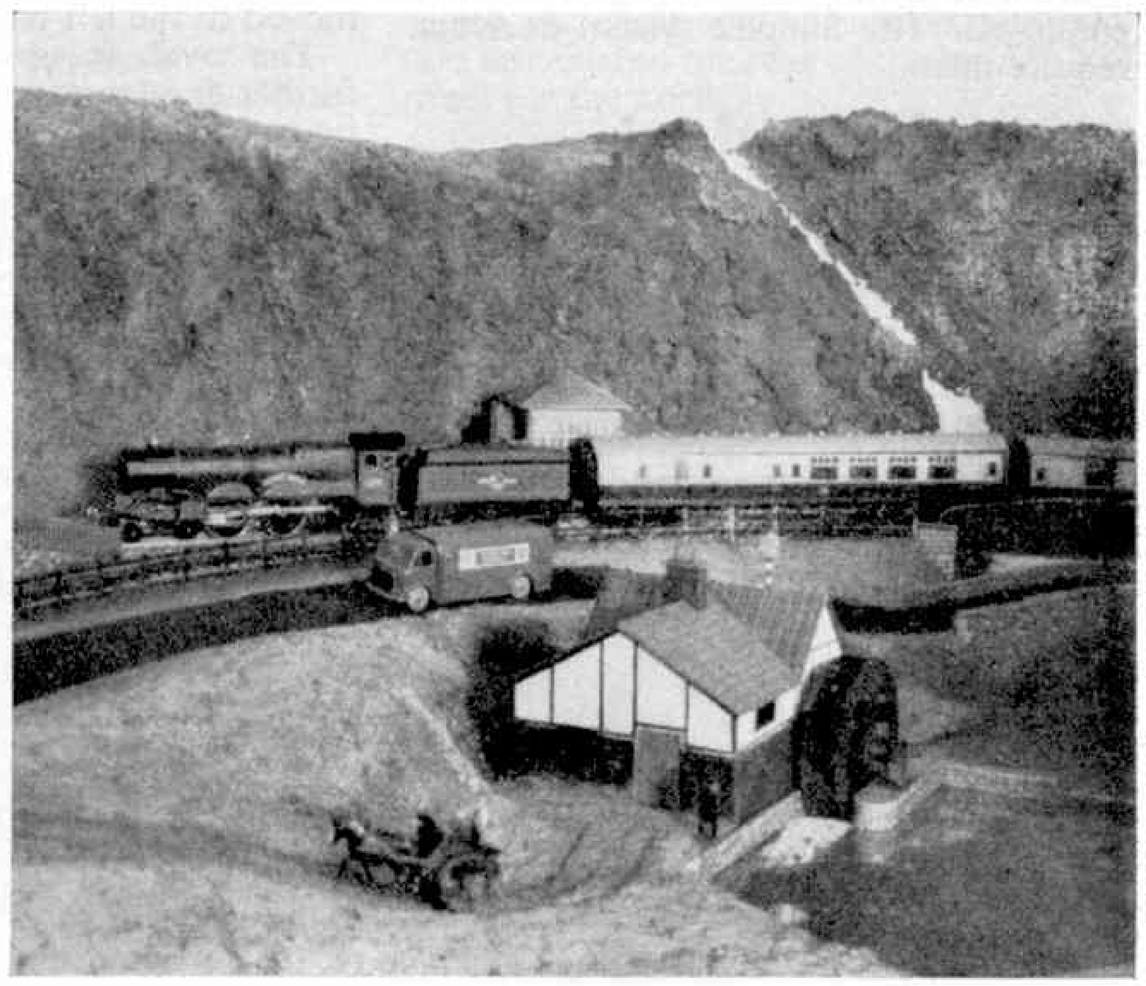
Mr. Gouk's present Two-Rail layout was the direct result of an earlier Three-Rail system which started life about nine years ago on an 8 ft. × 4 ft. baseboard. This layout consisted of two circles, one inside the other with a crossover to provide access between both tracks. A reverse loop and several sidings were run off the inner circle of track providing a scheme which gave Mr. Gouk and his brother many hours of pleasure.

Monthly Notes For Hornby Enthusiasts By Layout Man

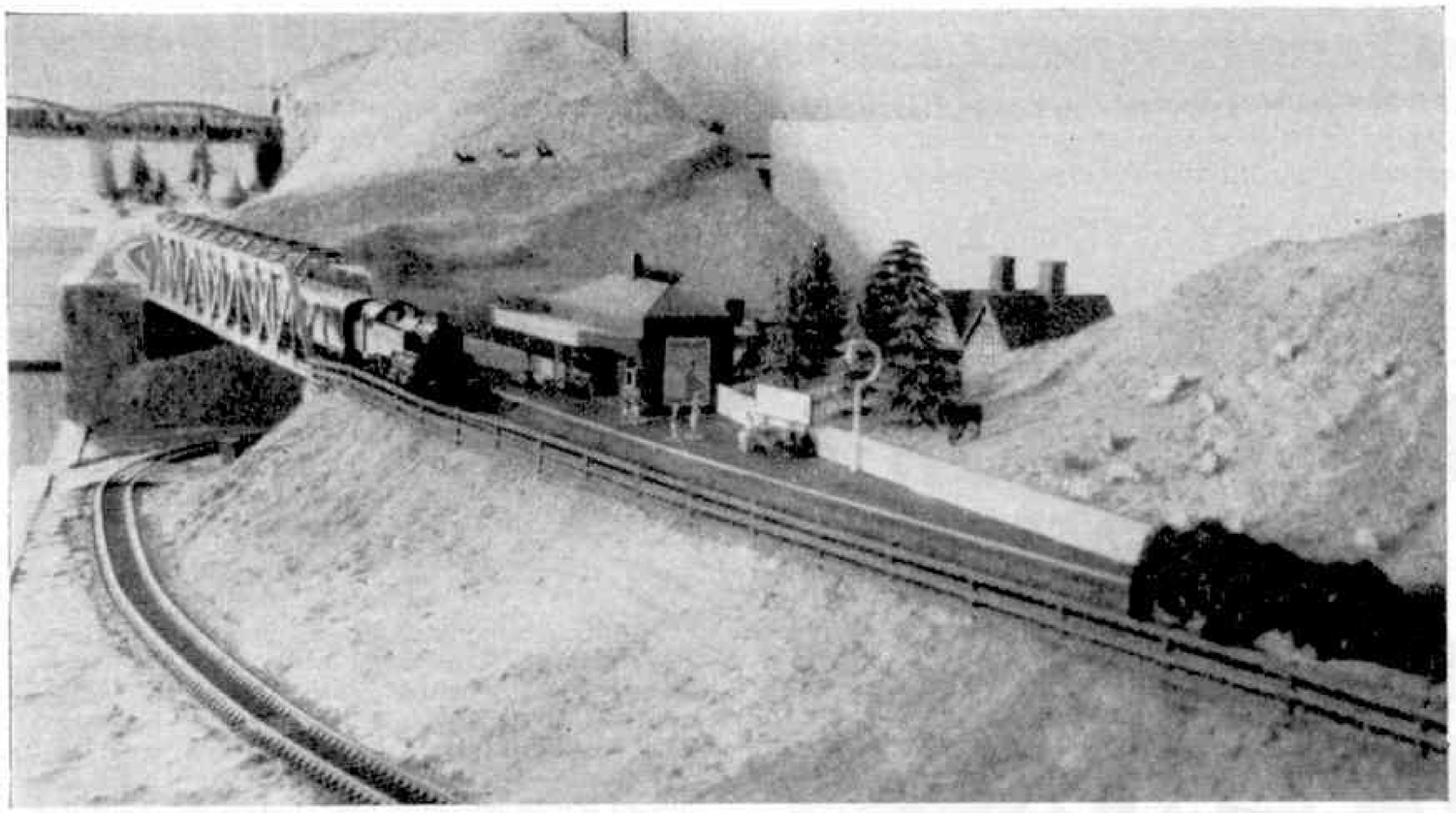
When Mr. Gouk's brother married he found room for the model railway at his new home. Building up again from scratch after the announcement that the Hornby-Dublo Two-Rail system had come into being, Mr. Gouk relinquished any ideas he had held about a new Three-Rail scheme and decided to take the plunge and build a Two-Rail model railway, using Hornby-Dublo rolling stock and Peco Streamlined flexible track.

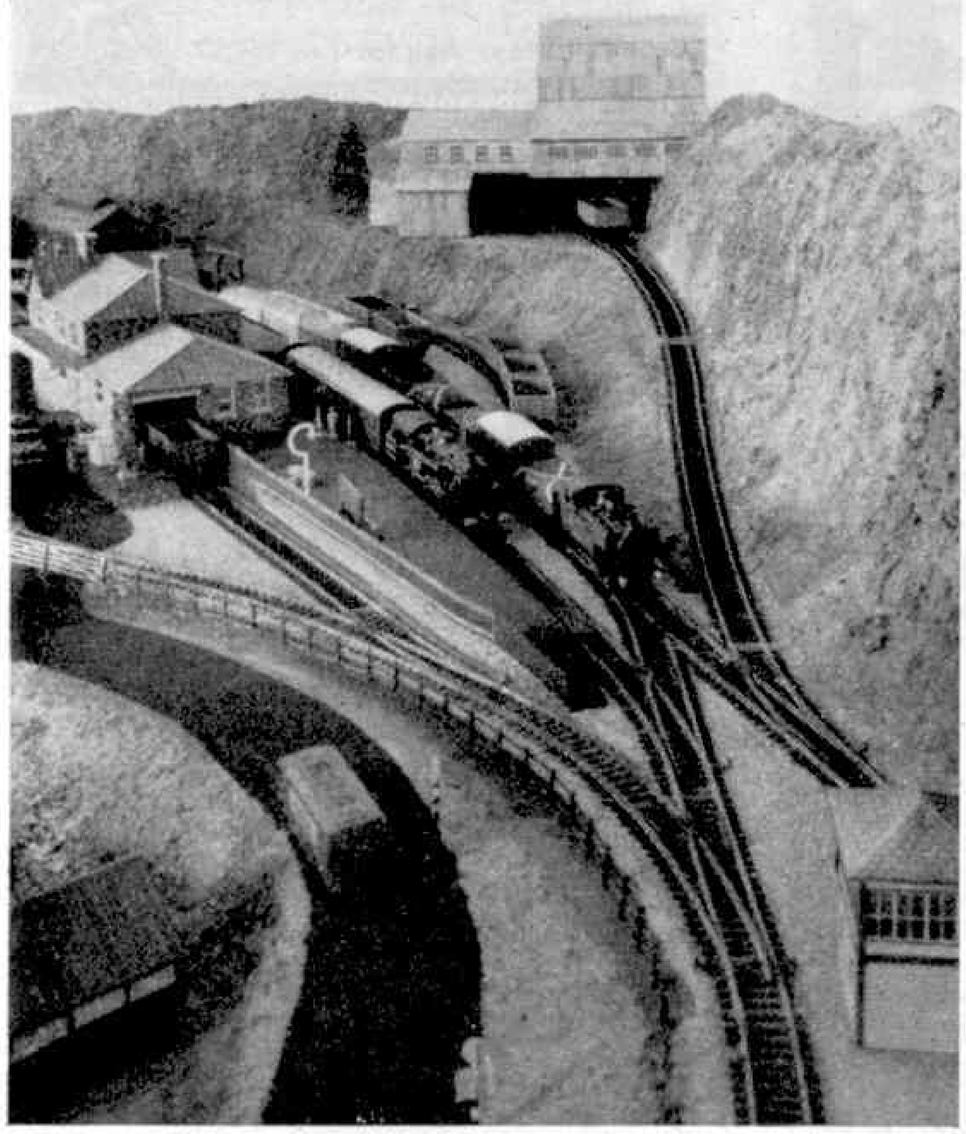
A 20 ft. × 9 ft. shed at the rear of Mr. Gouk's house shortly became available and proved to be very suitable for his model railway requirements. Before construction began he had decided that the new system must allow for continuous and point to point running. He put several experimental schemes on paper before deciding on the one I am about to outline.

The chosen plan proved fascinating to construct and, Mr. Gouk tells me, is most interesting to operate and these two factors are always desirable from a model railway enthusiast's point of view. Basically, the adopted plan consists of two independent continuous tracks both in the form of ovals, one inside the other.



The "Castle" is seen here entering Mossops Station against a fine background of hills. Note particularly the stream on the right in the foreground.





Above: A view of Port Wade halt with a local train just drawing in. The low-level track is the siding which runs to the quay. Left: A close-up view of Mossop's Station at the peak period. A local train is about to leave while the Pannier tank shunts its train. The siding leading to the mine is seen rising into the hills on the extreme right.

One side of the layout runs underneath a long tunnel which extends round the curve almost to the beginning of the next straight section. Half way along the tunnel stretch a branch-line leads from the inner oval, crosses the outer one and then runs parallel to the outer and inner lines throughout the tunnel section. Leaving the tunnel, this branch line then continues in low-level form and finally passes beneath Morningside, the main station of this intriguing railway. On its journey back, the branch line divides into two.

The right hand section runs into Mossop's Station, formed against a gaunt background of hills which tower above the track. At the right hand side of the station are storage sidings which serve a coal mine tucked away in the oval of the hills, and a single track runs up to the line itself.

At the throat of Mossop's Station the left hand track veers sharply away and runs in a shallow curve until sweeping right to a station called Port Wade. Here is a quayside for loading and unloading merchandise, for Port Wade is a small town by the side of a river and backed by hills. Unloading is carried out from railway trucks on the quayside into the occasional merchantman which stops alongside.

At the other end of Mossop's Station the track which had earlier served the coal mine sidings continues on, running roughly parallel with the tunnel section along the straight side of the oval. It passes over Port Wade by means of a bridge then sweeps onward, swinging gently to the right and passing a small lake which runs underneath the two main lines. The branch line also passes beneath these main lines, curving sharply left and continuing to do so until Morningside Station is reached. This station is incomplete in the sense that only the through tracks are laid, but it will eventually include full terminal facilities for the branch lines. The introduction of such facilities will make this station most comprehensive as it already includes a motive power depot with turntable, goods sorting sidings and three platform faces.

As the photographs show, scenery has most certainly not been ignored. Mr. Gouk explains that his objective was to create a scene of distance and perspective, and in this respect I think you will agree that he has succeeded. He builds his scenery by pressing and moulding wire gauze into the contours required, and covering with Plaster of Paris and sawdust, which is then coloured with water paint. Trees, hedges and fences are still to be added when time permits.

Mr. Gouk uses the cab control system on his railway—a system that splits up the track into sections, each section capable of being switched off when not required. The number of trains that may be operated is therefore only limited by the number of controllers and the number of sections. If readers are interested I will explain this system in the *Meccano Magazine*.

The lineside building on Mr. Gouk's layout are mostly home built, with one or two commercially-made models. The locomotive power is all steam outline, and includes the Hornby-Dublo "Castle," the 2–6–4T and two 0–6–0 Tanks. One of the 0–6–0 Tanks has had her body removed. This has been replaced by a K's bodyline kit, just to add a little variety. A large and varied selection of rolling stock is in use on this fascinating New Zealand layout.

Magic of the Modern Camera—

(*Continued from page 239*)

very short space of time. Many other events happen at similar high speeds, and being able to photograph them is very important from a scientific standpoint. High-speed photography can be used in two ways—by taking extremely short-exposure single pictures which "stop" the motion, or by using an ultra-high speed cine-camera, when the rapid sequence of events can be photographed in slow motion. These slow motion films can then be studied and a greater understanding of the event—say the movement of a humming bird's wing in flight—may be obtained. The principles to be applied in this type of photography are to use very bright illumination and very short exposure times so that sharp images will be produced on the film.

As early as 1866, a cannonball in flight was photographed at Woolwich Arsenal. More recently—within the last ten years, in fact—a number of special high-speed cameras have been developed. One of the fastest of these is the Brixner camera. It takes 35 mm. motion pictures in colour at the rate of 15,000,000 frames per second, which is 625,000 times the normal rate for standard film. It is so fast that it can take up to 96 consecutive pictures of a single explosion.

Another high-speed camera, this time for taking still pictures, is the Kerr camera. With an exposure time of only one five-thousand-millionth of a second it can take still pictures of explosion shock waves travelling as fast as 18,000 miles an hour.

We can see from this that the specialised cameras mentioned in this article, and many others, are playing a vital rôle in advancing man's knowledge in the varied fields of science and technology.

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For Stamp Enthusiasts

British Special Issues

By F. E. Metcalfe

WHEN, last year, the Assistant Postmaster-General was opening the London Stamp Exhibition—held annually at Central Hall, Westminster—she remarked that if anyone could think up a good idea for a special issue of stamps during 1962 it would be given consideration. Well, three stamps were issued last November to publicise the "National Productivity Year", but whether it was a good idea or not I don't know. What we stamp collectors did not realise at the time the remark quoted above was made was that it apparently heralded a complete change of policy on the part of the Post Office towards the emission of special stamps. For this year, as we all know, the tally is actually five issues, and the announcement of this programme gave collectors the shock of their lives—I listed these special issues in my March *Stamp Gossip*.

I do not know who was Postmaster-General in 1939, but if he is still alive—and I hope that he is—then he, too, must have got the shock of his life, because when it was suggested, at the time, that there should be a special issue of stamps to mark the centenary of the world's first postage stamp, such was the fuss made that you might have thought an all-round rise in wages was being suggested! I remember one of the arguments levelled against the idea was that the event was only six months away, which did not give the Post Office sufficient time to prepare such an issue. Now, in one sentence, *five* special issues are announced. Verily, this is a changed world!

However, to get back to that first special issue of Great Britain. It would have been no loss, from an artistic point of view, if it had never appeared, for a duller, more drab, set was never turned out by any front-rank Post-Office. The more one knows of our own institution, the more one wants to admire its efficiency, generally speaking, but I will not give it a

single good mark for any of the special stamps which it has issued to date.

Mind you, the designers are working under a certain difficulty, which even that fine artist the late Edmund Dulac said he could not overcome. That is, the Royal portrait must form part of the design—this of course is the tradition and is all-important—and the rest of the design must fit that portrait. Working in such a small field, the artist's scope is thus severely restricted. With a few exceptions the colours are garish, but as a job of printing the stamps are really first class, for firms like Harrison and Sons are really "tops", in world class, for photogravure printing.

Now without a doubt this year's crop of special issues is really going to set modern British stamps "alight", whatever you think of the designs. For whilst fifteen shillings is enough to buy the lot mint (and many of the used will be there for picking up) this will mean that most stamp enthusiasts will be able to afford them. Then the philatelists will get to work, and the inevitable retouches, etc., will be discovered, setting collectors really on the search. The net result cannot be anything other than a tremendous all-round increase in interest in modern British stamps.

Until now none of our special stamps (not counting the varieties, of course) has proved scarce. It could not be otherwise, because they are distributed to all Post Offices (unlike the stamps of countries like France, etc., which make a very limited distribution) and are used extensively. All this means that it will not be a particularly difficult or expensive job to get a complete lot together. It does not mean, however, that some of the stamps are not getting more difficult to find; nor does it mean that all the used stamps you come across will be worth putting in your collection—particularly the higher values, which get used on parcels, for in most Post Offices they use a particularly foul oblong canceller, which kills stone dead any stamp on which it is used.

For instance, I have probably twenty copies of the "National Productivity Year" 1/3d. stamp, and not one is worth

putting in a collection, so horrid are the postmarks. This is a most important point. If you want to form a collection of British special issues (and in my opinion it would be a very good plan to do so) get cracking now, but as far as used copies are concerned do not accept a single one which is not nicely cancelled, as those with heavy cancellations will never be worth keeping. On the question of condition, collectors are becoming more and

more fussy in this respect, which is understandable, seeing that there are so many different stamps to go for. And take care of your mint stamps, too. Reject those with two or three bits of old mounts on them as firmly as you would heavily-cancelled stamps, no matter how cheap they may appear to be.

Just for handy reference I will repeat the details and dates of this year's five issues, which I gave in my March notes. Here they are: March 21, "Freedom from Hunger" 2½d., 1/3; May 7, "First International Conference of Postal Administrations" 6d; May 16, "National Nature Week" 3d., 4½d; May 31, "International Life-Boat Conference" 2½d, 4d., 1/6; August 15, "Red Cross Centenary" 3d., 1/3, 1/6. Total face value of the eleven stamps, 7/7½d. And knowing what a fight our Post Office has put up in the past against every special issue they have released I can hardly believe my eyes when I glance over that list!

Anyhow, *do* think about forming that collection of our special issues, mint and used, and if you do I am sure you will get an immense amount of fun for a very small outlay in cash.

Stamp Gossip

"Locals"

FOR a long time now offshore islands like Herm and Lundy have issued their own stamps for use on mail carried to the mainland. The British Post Office, which claims the monopoly, allows these stamps to be stuck on the backs of letters, but whether they have any authority to forbid them is a moot point. Anyhow, since the two islands named have done so nicely

out of their stamps, others have followed suit irrespective of whether there were any postal service or not to justify their stamps. In some cases there was not, and three sets were recently issued purporting to be stamps for Greek islands. They were issued in Britain at that, but the Greek Post Office soon made a fuss about them, and the labels were withdrawn.

There is also another issue prepared by a small shipping company for use on parcels which they carry between the islands. These stamps are, of course, backed by a service. Since none of these "locals" will, however, be catalogued (apart from possible specialised catalogues) it will perhaps be best to stick to official issues, which will be authoritatively recognised. I have mentioned these stamps because I am frequently asked about them, and what their real status is.

BIRDS OF PARADISE

I do not suppose that many of my readers have read that book *Nat the Naturalist*, which so enchanted me years and years ago. It tells of Nat being taken by his Uncle to Papua to search for birds of paradise. I wonder how many times I read that book, and how I did envy Nat! All that came back to me when I saw the 5d. stamp which was issued by Papua and New Guinea on March 27 last. This fabulous island (which will be in the news a great deal as time goes on) is issuing several interesting stamps this year, including a £1 one which will bear a portrait of the Queen and will certainly be an added attraction to Papuan stamps.

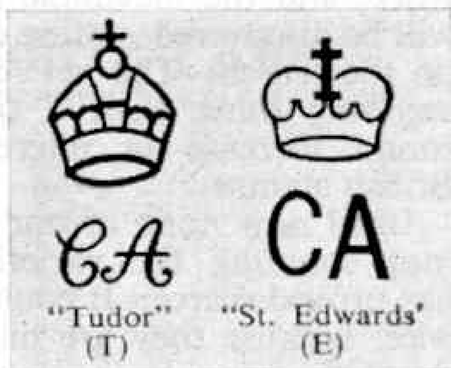
CATALOGUE PRICES

In the old days, when most stamp enthusiasts collected all stamps of all countries as far as they could, catalogue prices were of real importance, as naturally collectors could not pretend to know from their own knowledge what such a wide range of stamps were worth. Nowadays such general collecting is impracticable, owing to the huge number of stamps which already exist, and the flood of new issues coming out all the time. Most philatelists collect only the stamps of a limited number of countries, so they have a fairly clear knowledge of what the stamps in which they are interested are worth. I strongly urge all collectors to "mugg up" on values, especially if they go in for modern issues as these are changing all the time. The collector who possesses this knowledge will not go far wrong, as he could well do if he lacked this know how.

On this point I know of one dealer who is still kicking himself, as he sold a stamp to a customer for £10, and when it was offered in auction a very few months later it made over a hundred pounds. And what about that used corner block of ten Austrian 3kr. stamps of the 1950 issue which sold last year for £1,250? That is about one thousand, six hundred and sixty six times catalogue value, for the stamps were listed at only 15/–. I am not going to claim that anyone could have guessed what such an item would bring, but it does pay you all right to know what you are buying, or selling, and not to be hog-tied to catalogue valuations.

WATERMARKS

I am sometimes asked why British Colonial stamps have different watermarks, both types being apparently current, In fact, I recently received quite a lengthy letter from a collector in which he raised this point, as well as referring to our own British stamps, which I will have to deal with on some other occasion. Dealing with the Colonial stamps of the present reign, when the first issues appeared around 1953 it was noted that the crown of the watermark was of what is known as the Tudor type. Now those who have to do with such things associate the Tudor crown with kings, and so, in due course, when the Queen requested that there should be a change, we then got what is called the St. Edwards type (the illustrations reproduced here are taken from the Commonwealth QEII Catalogue, which shows how the crowns differ). At the time the change only applied to new stamps, for to have used the new watermark on new printings of existing stamps would have been too much of a good thing for collectors, as the new sets of all the colonies were quite as much as the average collector could afford to buy.



The Crown Agents, whose advice is generally accepted by those who have to make the final decision, earned the thanks of collectors for having suggested, at the time of change, that the new watermark should be confined to new stamps until later on when most of the new "QE" stamps had been issued. And now, of course, if they want to make an all-round change, as new printings of existing stamps are required, it will not matter so much.

Next month I will discuss the three watermarks on our own current stamps.

THE TIP OF THE MONTH

Going back a few years, during the reign of the late King George VI, when money was a good deal more plentiful than it is today and there was much less

(*Continued on page 272*)

By E. W. Argyle

The Royal Navy On Stamps

H.M.N.Z.S. BELLONA

THIS cruiser was completed on the Clyde by the Fairfield Engineering Company on October 29, 1943, and is on loan from the Admiralty to the New Zealand Government which pays for the ship's maintenance. She was laid down on November 30, 1939, and her complement number 551. The cruiser has a gross tonnage of 7,400, is 512 feet in length and her main armament is eight 5.25 inch guns and 12 A.A. guns, with six 21 inch-torpedo tubes. Speed: 32 knots.

H.M.S. ALBION

THE Battle of Navarino, depicted on this stamp, took place in 1827 when a combined fleet of Turkish and Egyption warships were annihilated by an allied fleet of British, French and Russian vessels under Admiral Codrington. The stamp shows H.M.S. Albion, *a two-decker, following her engagement with a 56-gun Turkish frigate. The Albion's guns, replying to those of the Turkish vessel, set her on fire and she blew up within five minutes of the engagement opening. Albion was a ship of 1,730 tons, launched in 1802, and had 74 guns, with a complement of 590.*

Road and Track—(*Cont. from page 237*)

which makes car race-watching so much more interesting. Moreover, the driver can be clearly seen and recognised, in contrast with present-day Formula One machines whose drivers lie almost flat on their backs and are practically out of sight in the bottom of the cockpit.

Morin Scott and his historical racing cars are in great demand and have already been invited to race at all the leading British circuits this year, plus Monza in Italy and other continental courses.

BREAKING NEW GROUND

The other day, I had a short run in the Mini-Cooper "S", the hotter version recently introduced by B.M.C. Although the engine was not fully run in, its acceleration was little short of fantastic, appreciably quicker than my own Mini-Cooper, which is no sluggard. I hope to have an "S" type for test in a few weeks. B.M.C. have also promised me a drive in their twin-engined Mini-Cooper, and I am greatly looking forward to it. This vehicle has a top speed of around 110 m.p.h.

Within the next few days, I shall be trying one of the most interesting small cars of the year, the eagerly-awaited Rootes "Imp". This is the new small four-seater, fast family saloon in production at Rootes new Linwood factory, in Scotland. The final testing of this model was Michael Parkes' last responsibility before leaving Rootes to join Ferrari as Chief Development Engineer.

The "Imp", with engine at the rear, breaks new ground in many respects. Its water-cooled 875 c.c. engine is the first all-aluminium power unit in a British production saloon. The use of aluminium not only reduces weight, but permits a higher compression ratio without pinking on normal premium fuel. With the standard 10 to 1 compression ratio, it develops 39 b.h.p. net at 5,000 r.p.m. to give a claimed top speed of 75 m.p.h. with over 40 m.p.g. This power unit marks the return of the single overhead camshaft engine, which I have always considered more efficient than pushrods. Years ago the fast MGs used single overhead camshafts.

Coventry Climax collaborated with Rootes in the evolution of this engine which, with a little tuning, seems to be very suitable for competitions. It is mated to a four-speed gear-box with synchromesh on all forward ratios, and even the gear-box casing is of aluminium alloy. Top gear ratio is 4.1. Steering is by long-wearing rack and pinion, while suspension is independent on all four wheels. The Girling brakes have 8-inch drums, larger than the average small car; kerb weight is 13¾ cwt.; so with nearly 60 b.h.p. per ton it has a good power-weight ratio and should enjoy a brisk performance. Completely new is the pneumatic throttle control to allow quicker pedal pressure response.

Maintenance costs ought to be exceptionally low, as there are no greasing points at all and routine servicing is needed only at 5,000-mile intervals. Two luggage compartments are provided, one at the front and one at the rear.

The "Imp" has all the right ingredients to make up an extremely lively car with good handling, but, as always, the proof of the pudding is in the eating. I will let you know what I think of the "Imp" when I have driven it.

£80,000 Laboratory for Asbestos Research

—(*Continued from page 248*)

produced when a weighed sample of fibre, packed in a standard manner, is introduced into one of two identical inductance coils forming two arms of an A.C. bridge.

Among other things it is important to know, for many reasons, is the degree of resistance which asbestos fibre offers to acids and alkalis. The apparatus used at Trafford Park employs the automatic titration of acid or alkali into a suspension of fibre in boiling water.

Let me, in conclusion, list some of the goods, all containing asbestos in one form or another, which are produced by companies in the Turner & Newall Group; some of them may surprise you. They include asbestos textiles for brake linings, lagging for pipes, electrical insulation material, protective clothing, safety curtains and compressed asbestos fibre for gaskets and jointings.

The use of sprayed asbestos fibres for structural fire protection, thermal insulation, acoustic treatment, and condensation control has been developed by J. W. Roberts Ltd. for steel railway carriages, ships and buildings. The same company machines and moulds asbestos reinforced plastics into bushes, bearings, gears and a wide variety of engineering components.

And there we must leave the story of asbestos. What wonders man can achieve, even in these days when miracles are almost commonplace, by using the raw material that nature provides.

The Long Drag— (*Cont. from page 255*)

lonely fells, where the sheep graze, is mighty Blea Moor Tunnel, 2,629 yards long, and at one point, about 500 feet below ground level. The tunnel was made between 1870 and 1875 and it cost £45 a yard. Hundreds of navvies worked by the light of candles, and this item alone cost the Midland Railway £50 a month. The builders used dynamite, then a new type of explosive, at a cost of £200 a ton.

A track leads over Blea Moor, above the tunnel, and you come across the tunnel's three ventilation shafts, one of them 390 feet deep. When a train has passed through the tunnel the smoking shafts give the appearance of a volcano. In the tunnel itself, moisture and sulphur play such havoc with the track that it is replaced every four or five years. The normal life of a track in the open air is 20-odd years.

Walking through Blea Moor Tunnel with an inspection team one morning, I heard three blasts on a whistle, and someone yelled, "Train on the down!" This actually meant that the train was coming up the Drag, for from the point of view of the tracks, the "up" line is towards London. I felt the compression on my eardrums. There was a shriek from the locomotive, and the sound reverberated through the huge cavern. A giant locomotive thundered past only a few yards away. Then silence—a silence intensified by the smoke which came blowing down from the head of the tunnel, blotting out the friendly circle of daylight. Railwaymen told me that when both lines are in use, and there are many trains, the smoke is sometimes so thick that they cannot see their hands in front of their faces, and they move along the tunnel tapping the line with a piece of stick.

The 200-yards long Dent Head Viaduct has ten arches, the highest of them lifting the tracks 100 feet above the ground. The work on it was temporarily held up by a waterspout in July, 1870. It burst on Blea Moor; a trickling stream became a torrent, and the swollen waters carried railway material down the valley, some of it for five miles. Not far away, although it is rarely seen by casual visitors to the district, is Arten Gill, which is 220 yards long, with a maximum height of 117 feet.

Now the railway is on a ledge cut from the flanks of Widdale Fell, and some 300 feet above the level of the river in Dentdale. The station at Dent, approached from the valley by a steep macadam road, has three lines of railway sleepers as a barrier against drifting snow, and the platforms are 1,150 feet above sea level. Early this year they vanished from sight under huge drifts. The tall, detached building in which the stationmaster lives has double-paned windows to keep out the worst of the weather.

Garsdale Head, the next station, has a turntable which is almost surrounded by up-ended sleepers. They were put in place not long after some men had an engine on the turntable and it was caught by the wind, being whirled round and round. It was stopped only after sand and grit had been poured into the centre well! Near Garsdale, the steam locomotives pick up water from the highest troughs in the world. Keeping them clear of ice in winter is an important undertaking.

The highest building—and the summit of the Long Drag—is the signal box at Aisgill, within a few yards of the spot where Yorkshire gives way to Westmorland in the shadow of Wild Boar Fell. In this district there is the violent Helm Wind caused when cold air rising up the east side of the Pennines meets the warmer air of the Eden Valley. It plucks the waterproof sheets from the goods wagons, and sometimes even forces trains to a standstill. No trains passed the box for two months during the heavy 1947 snowfall, and the box itself almost disappeared under snow.

And there you have the story of the Long Drag—one of the toughest stretches of railway line in England.

Stamp Gossip (*Continued from page 270*)

to spend it on, collectors and, of course, dealers bought heavily any special issues of their favourite countries — Victory stamps, etc. It is only now that the big stocks thus acquired are being cleared out, and prices are beginning to harden in consequence. So if, you have not got these stamps, now is the time to buy, for they will never be as cheap again.

All this has had the effect of preventing dealers, etc., stocking up on subsequent issues, and I am sure that a year or two hence stamps of special issues, still available today at not much above face value, will by then cost a whole lot more. One set I particularly like is the Tanganyika "Republic" issue which appeared as late as December last year and went off sale within a couple of months. Mark my word, such sets are going to more than pay for their keep.

Old-Time Cabriolet—

(*Continued from page 258*)

the ears. The tail is a number of strands of cord tied to an Angle Bracket bolted to the Curved Plate and the reins which the driver is holding also are lengths of cord arranged as shown.

Finally, the horse is held in the cab shafts by a 2½" Rod passed through the centre elongated holes of the Curved Plate and fixed in position by Spring Clips.

Parts required to build the Horse-Drawn Cab: 4 of No. 2a; 17 of No. 5; 8 of No. 6; 8 of No. 6a; 2 of No. 10; 2 of No. 11; 1 of No. 11a; 7 of No. 12; 2 of No. 12b; 1 of No. 15b; 1 of No. 16a; 2 of No. 19a; 1 of No. 22a; 2 of No. 35; 81 of No. 37a; 81 of No. 37b; 10 of No. 38; 1 of No. 40; 1 of No. 48; 8 of No. 48a; 1 of No. 51; 8 of No. 90; 2 of No. 90a; 2 of No. 188; 1 of No. 190; 3 of No. 193; 1 of No. 194b; 1 of No. 199.

Calling All Bus Spotters—

(*Continued from page 249*)

particularly interested in a steep concrete ramp in the open which has been specially designed for M.o.T. inspections and for chassis cleaning, which is done by spraying. A sign of the times is that brush painting has returned in place of paint spraying, since the modern coaches are too long to fit into the old paint shop.

A final note: The once omnipresent Bell Punch tickets are still in use with this operator, but so, too, is the cheap return fare of 1/- for the Ryde–Seaview journey which is the same as on the first journey over 40 years ago! My thanks are due to Mr. Higgins for the frank and kindly way in which he answered all my questions on a very busy morning.

* * * *

The registration mark of Safeguard's new Bedford coach, left blank in the tabulated list in my March article, has now been confirmed as 1920 PJ, and that of Delaine's coach No. 57—another Bedford —listed in my April article is WCT 901.

Meccano Creeper Track Unit—

(*Continued from page 259*)

is bolted in the centre hole of the Double Angle Strip 13. A Coupling 24 locked in place by nuts provides a means of turning the Screwed Rod 23.

Two 3" Pulley Wheels 25 are mounted on a 2½" Rod passed through the 3" Strips and the Semi-circular Plates 19 and 20, and through the slots of the 2" Slotted Strips 9.

The track is placed around the 3" Pulley Wheels, and the Screwed Rod 23 adjusted so that the track moves freely when driven from the Rod 16.

Meccano—and Me:

(*Continued from page 261*)

me to borrow it and I was very happy indeed to see it. In fact, that night I dreamed about it.

In 1958 I had built a good Hornby Railway layout and by then I owned a fine Meccano Outfit. During the following year I purchased a large quantity of Hornby material and operated a railway with Hornby rolling stock and clockwork locomotives. In October, during school holidays, I went back to my native village, taking with me my Meccano Set and Hornby Trains, but on Saturday, October 20, our village was destroyed by insurgents and my Meccano Set and Hornby Trains were also burned. I was very sorry about that, and later left my village for Rangoon. In 1961 I bought a new Meccano Outfit and another Hornby Train Set and was able to build again very happily. In that year I became a member of the Meccano Guild and was able to wear the Guild Badge. Early in 1962 the first Hornby-Dublo 2-Rail items arrived in Burma and I was able to obtain some of them,

In conclusion, let me add that in my view the *Meccano Magazine* is the finest model publication on the market. Now that I am eighteen years of age I find it just as interesting as when I read it for the first time.

May the future generation enjoy Hornby and Meccano products as much as I have done and hope to do for a long time to come.—C. Mya Thaung, Pegu, Burma.

Meccano Tender for 4–6–0 Locomotive—

(*Continued from page 260*)

No. 90a; 2 of No. 103g; 6 of No. 109; 3 of No. 111; 2 of No. 116a; 6 of No. 137; 1 of No. 179; 6 of No. 189; 2 of No. 190a; 2 of No. 191; 6 of No. 192; 12 of No. 196; 3 of No. 197; 6 of No. 215; 4 of No. 221.

Northbound Night Mail—

(*Continued from page 264*)

Changing the load of mail bags is done with the lineside equipment when the train is on the move, and is carried out as required, one in and one out; one in only or one out only.

Having reached its destination, the train is drawn into a carriage siding where the vans are detached and shunted away for unloading. The locomotive departs for its depot, and the three coaches which make up the standard rake are left together to await the next southbound run.

By each set of lineside equipment, staff are stationed to handle the mail bags which are brought from the local G.P.O. sorting office in one or more of the Dublo Dinky Toys No. 068 Royal Mail Vans.

From such running it will be appreciated that any station siding on a layout can house vans used for the transport of mail, and that these can be shunted on to the rear of the Royal Mail Van during its running period on the layout. This makes for very interesting working on any railway scheme, no matter how small it is.

Railway Notes—(*Continued from page 241*)

together with the seventeen K class 2–6–0s (Moguls) which were much older, having been introduced by the L.B.S.C.R. in 1913. Until quite recently the whole K batch remained intact. They were numbered in the B.R. list as 32337–53 and had outside cylinders of large diameter. The last of the series, working a special passenger train, was the subject of one of my illustrations last month.

One of the earliest 2–6–0 designs for standard construction emerged from Swindon, G.W.R. in 1911 as the 4300 class. Large numbers were built during succeeding years, carrying numbers in the 5300, 6300 and 7300 groups, with certain modifications effected. In the main, however, this successful type for intermediate passenger, mixed traffic or freight duties (especially over lines such as in Wales, where there are restrictions on maximum allowable axle weights) has been little changed.

Trackside News—(*Cont. from page 243*)

The machine consists of five portal cranes, power driven and self-propelled. Each portal is fitted with a lifting bale of three tons capacity. The unit travels to and from the re-laying site on two specially modified "Sturgeon" wagons.

While travelling to the re-laying site, the portals sit on their driving wheels on the wagon floors to keep them within the load gauge. After arrival, they are jacked up to sit on free wheels on rails laid to gauge on the wagon floors and along which they are moved, in turn, to one end of the wagons. From that point they run down a ramp on to a turntable which turns them at right angles to the track and then, sitting on their driving wheels, they are run down another ramp on to the guide or service rails on which the appliance works. Generators are fixed in position, electrical connections made, and the machine is ready for work.

The guide or service rails are formed from long-welded rails previously brought to the spot and with which the track will be re-railed after the initial laying-in of 60-ft. lengths of prefabricated track. The 300 ft. long-welded rails are lifted by means of small portals, seven of which are provided with the apparatus, to sit, at about 15 ft. centres, on specially made lifting and traversing jacks also supplied with the equipment. The guide rails, which are laid six inches above the plane of the running rails to line and level by means of a gauge, are held down about every 60 ft. by rail anchors. They are connected together with temporary fishplates. The guide or service rails then act as running rails for the tracklayer.

The appliance can lift a 15-ton load with safety and will deal easily with 60 ft. lengths of concrete-sleepered track having the maximum of concrete sleepers required.

The Arki-Endon track layer is manufactured by Messrs. Heinrich Arneke and Company of Seelze, near Hanover.

Fireside Fun

Boy, applying for position in an office, "I'm pretty smart. I've won a lot of prizes in crossword competitions."

Employer, "Yes, but we want someone who can be smart during office hours."

Boy, "It was during office hours."

A boy from the backwoods had returned, on holiday, from his new school in town.

"Whatja larnin', son?", inquired his pa.

"Well pa, I'm studying algebra."

"That's fine, son," said the old backwoodsman, "say something in algebra."

Not wishing to let his father down, the boy proclaimed solemnly, "Pi-R Square."

The old man exploded, "If that's what they're larnin' ye, ye kin stop school right now! Everyone knows pies are round! Bread are square."

* * * *

Customer: Why is it I never get what I ask for here?

Waiter: Perhaps, madam, because we are too polite.

* * * *

"Mother", said little Johnny, "today our teacher asked me whether or not I had any brothers or sisters, and I told her I was an only child."

"And what did she say?" asked his mother.

"She said, 'Thank goodness!' "

"Get out of my site!!"

A salesman, called up for jury service, asked the judge to excuse him. "We are very busy at the shop," he said, "and I ought to be there."

"So you are one of those men who think the establishment couldn't get along without you," remarked the judge.

"No, your honour," replied the salesman. "I know it could get along without me, but I don't want it to find out."

* * * *

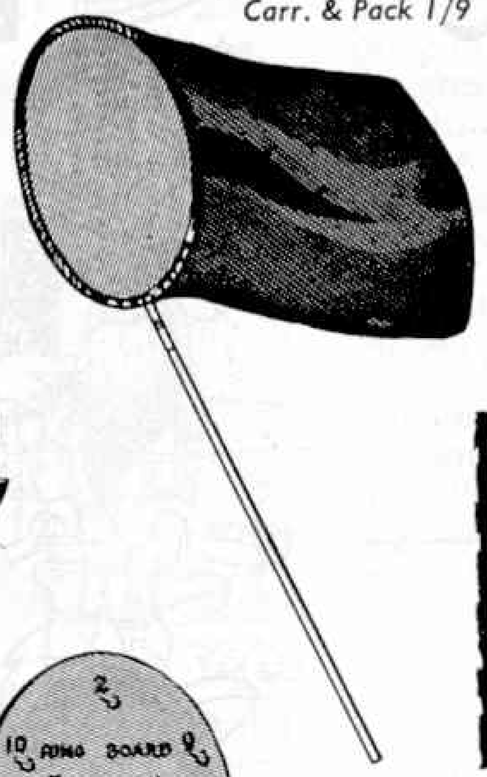
After a rehearsal of his play, which he had watched, the author called the company together and complimented them on their performance.

"Do you know," he said, "it reminds me of a play I once wrote."

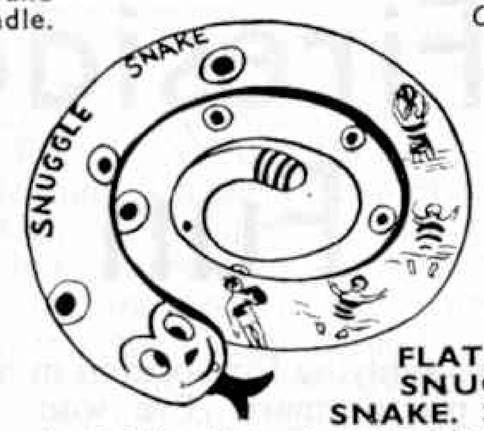
"I believe in teaching them something useful."

PIKE CUT-BOAT KIT. A kit of die-cut balsa parts, with instructions in building a 12 in. sailing boat.
Price **14/11**
Carr & Pack 1/6

BUTTERFLY NET. Robust and capacious net with removable handle.
Price **15/11**
Carr. & Pack 1/9



Price **7/11**
Carr. & Pack 1/3



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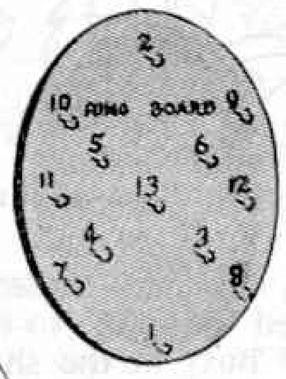

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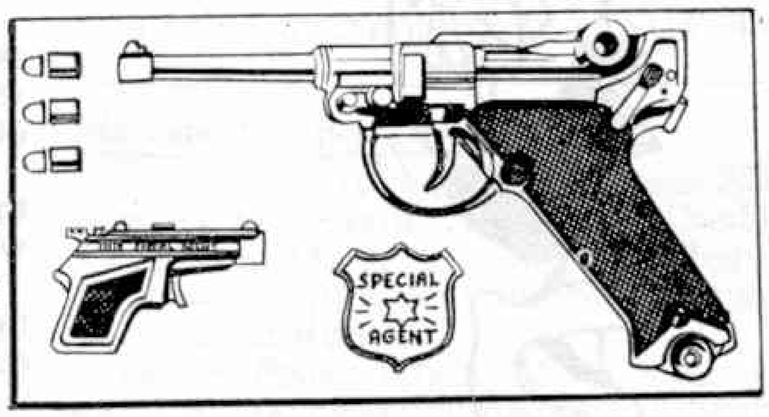

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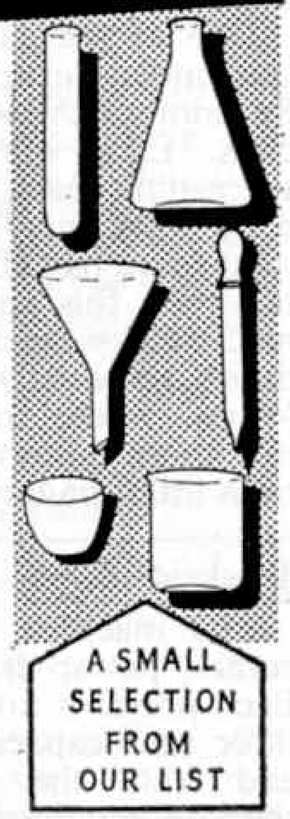

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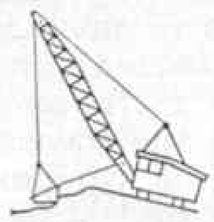

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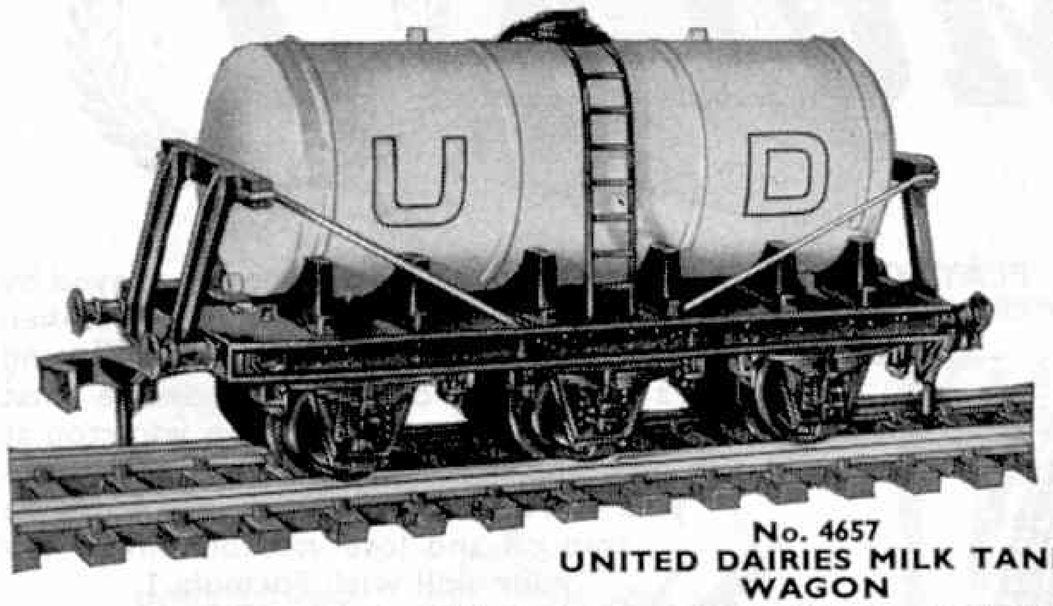

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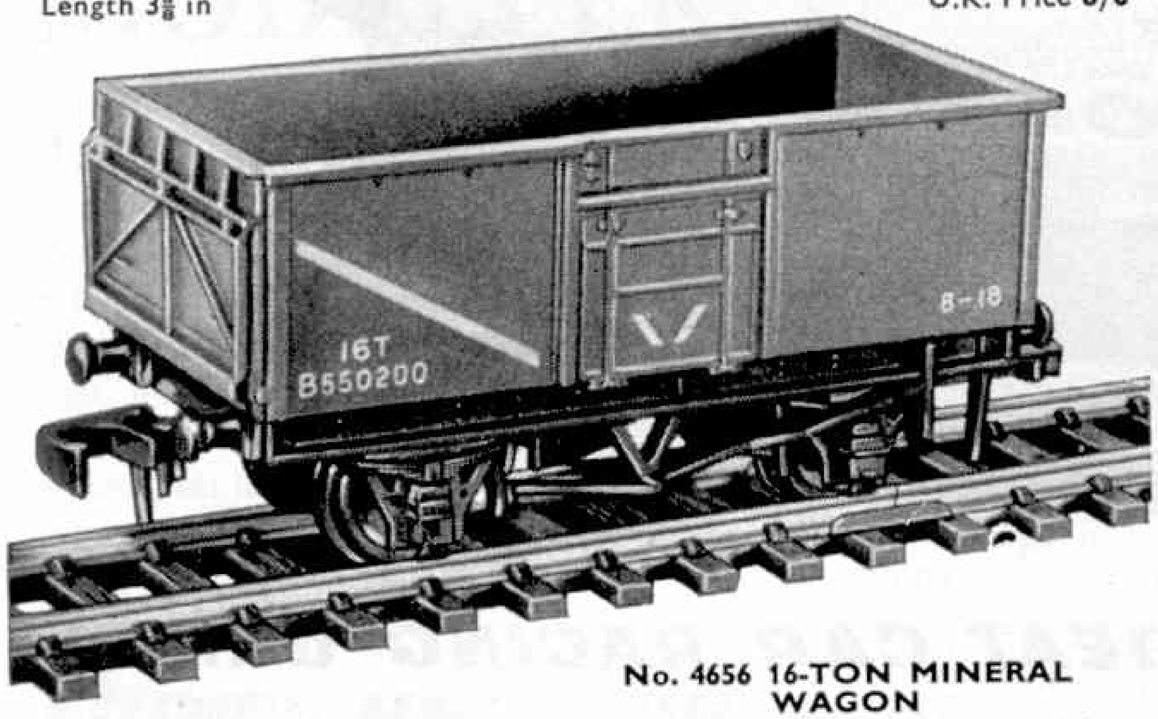

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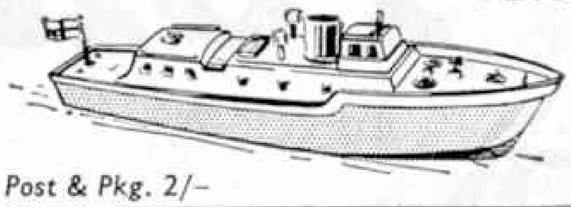

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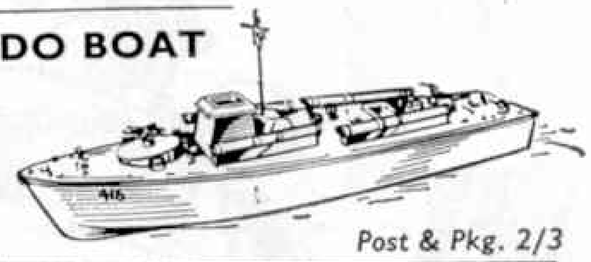

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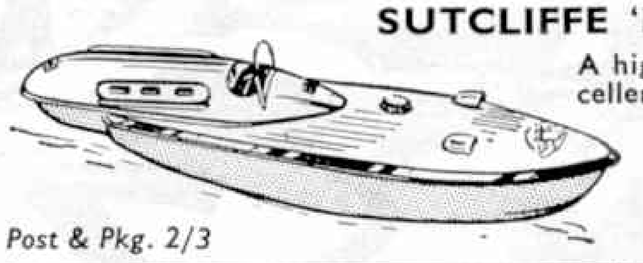

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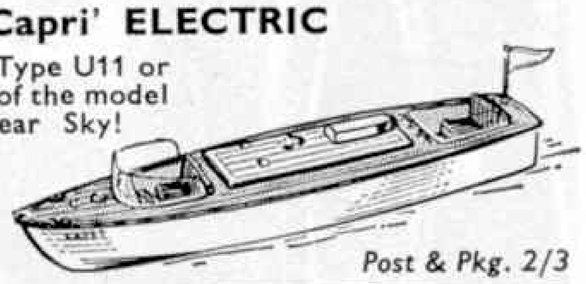

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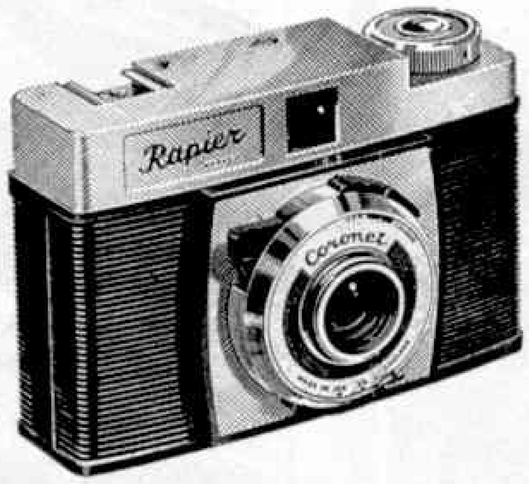

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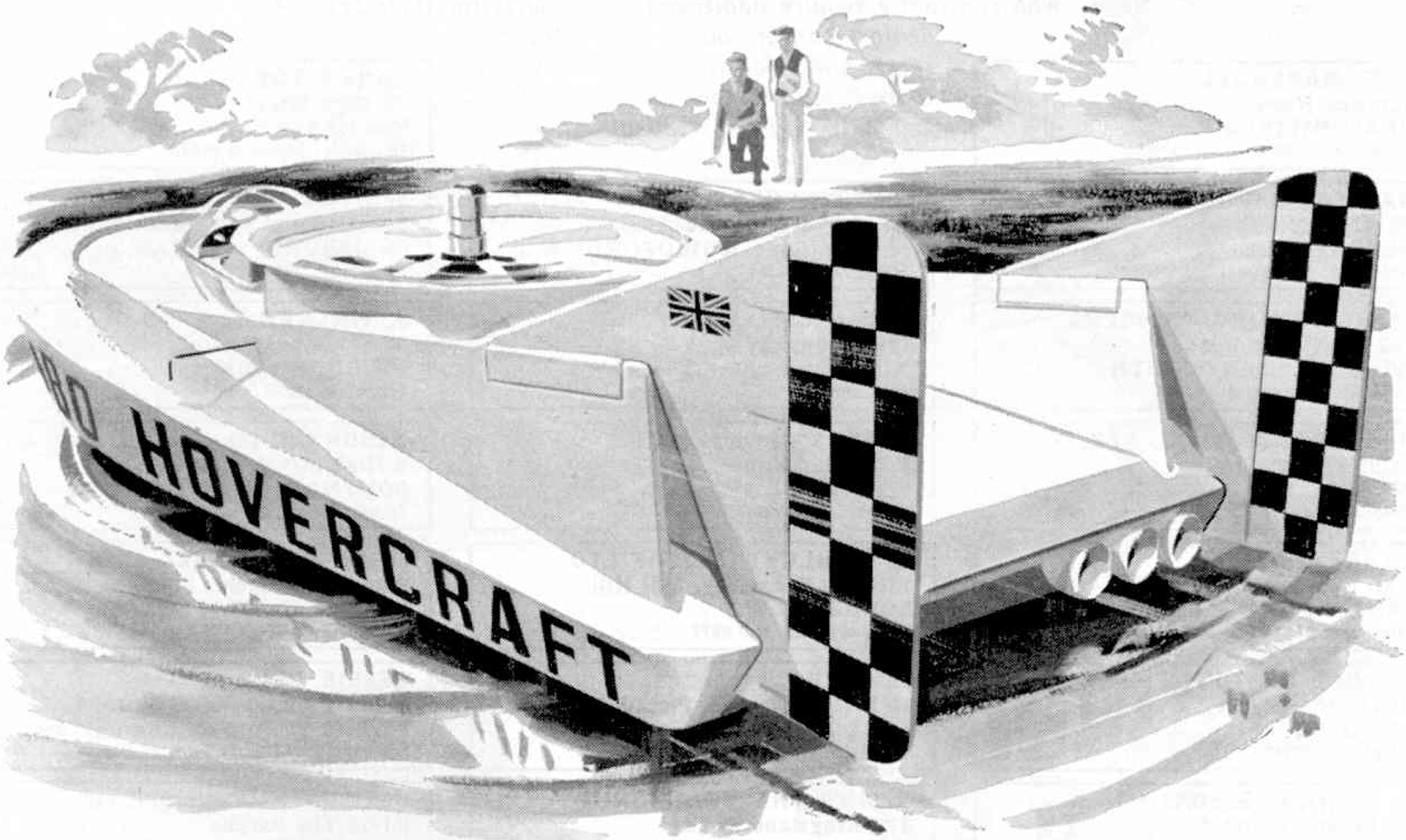

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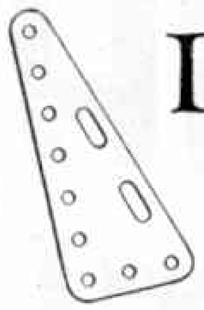

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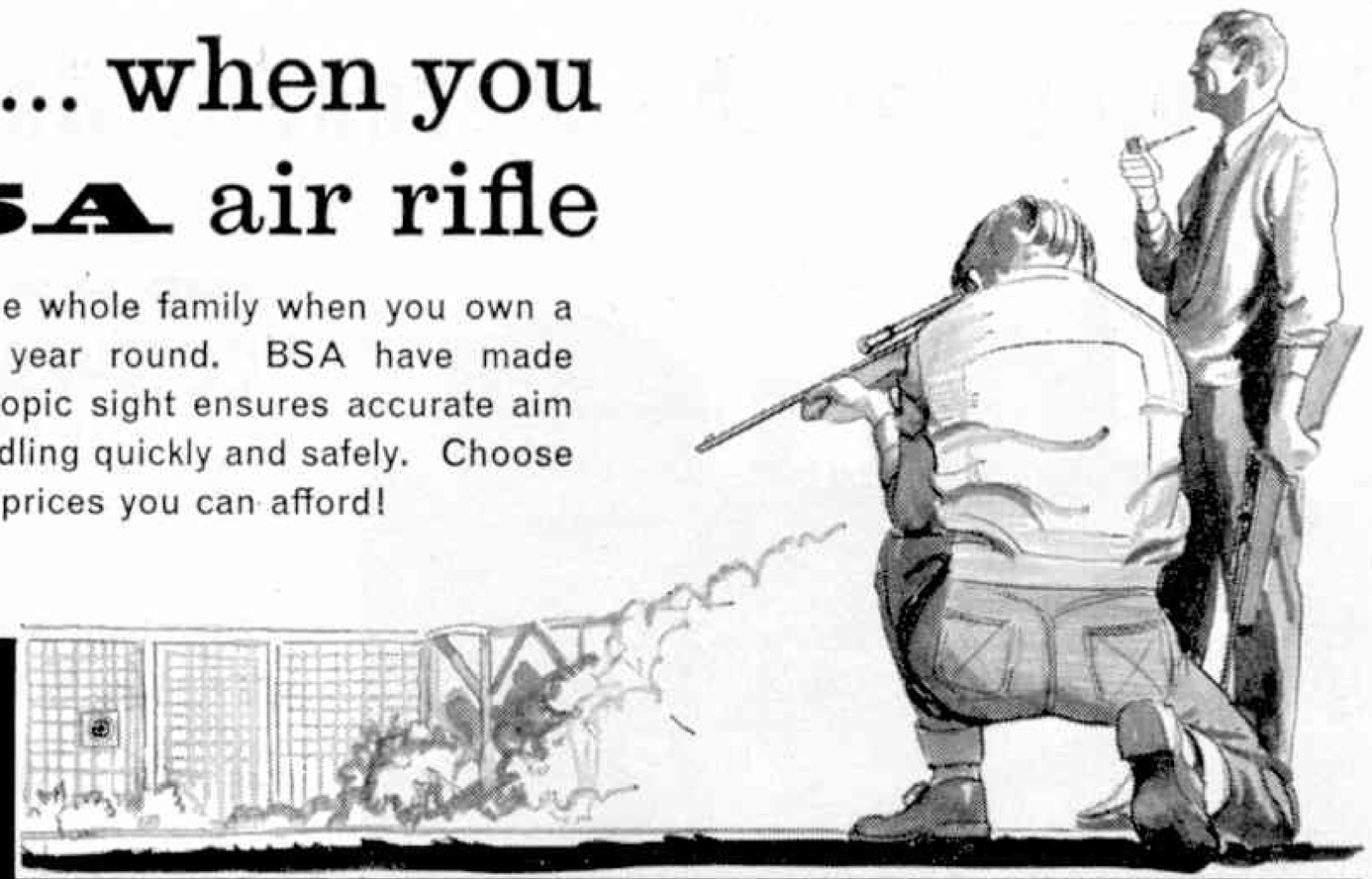

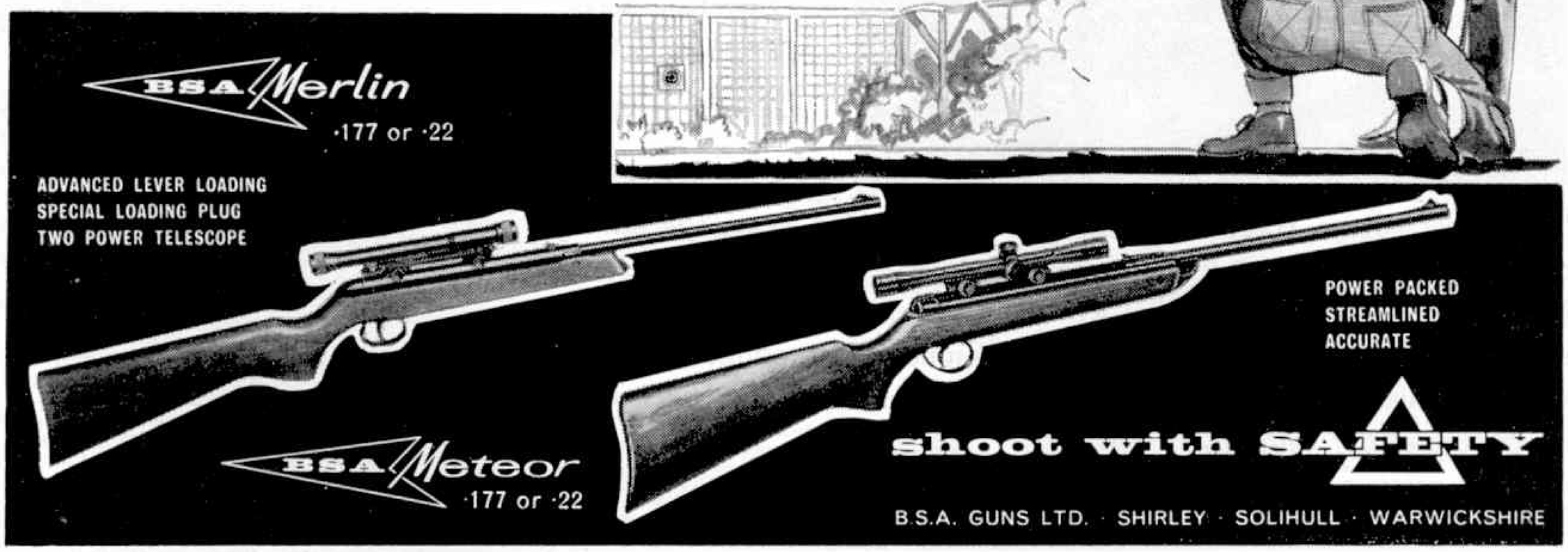

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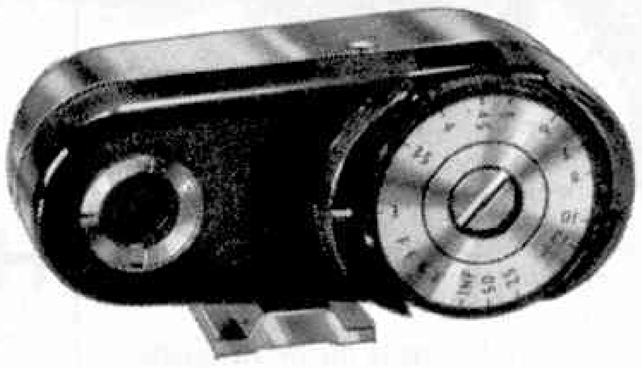

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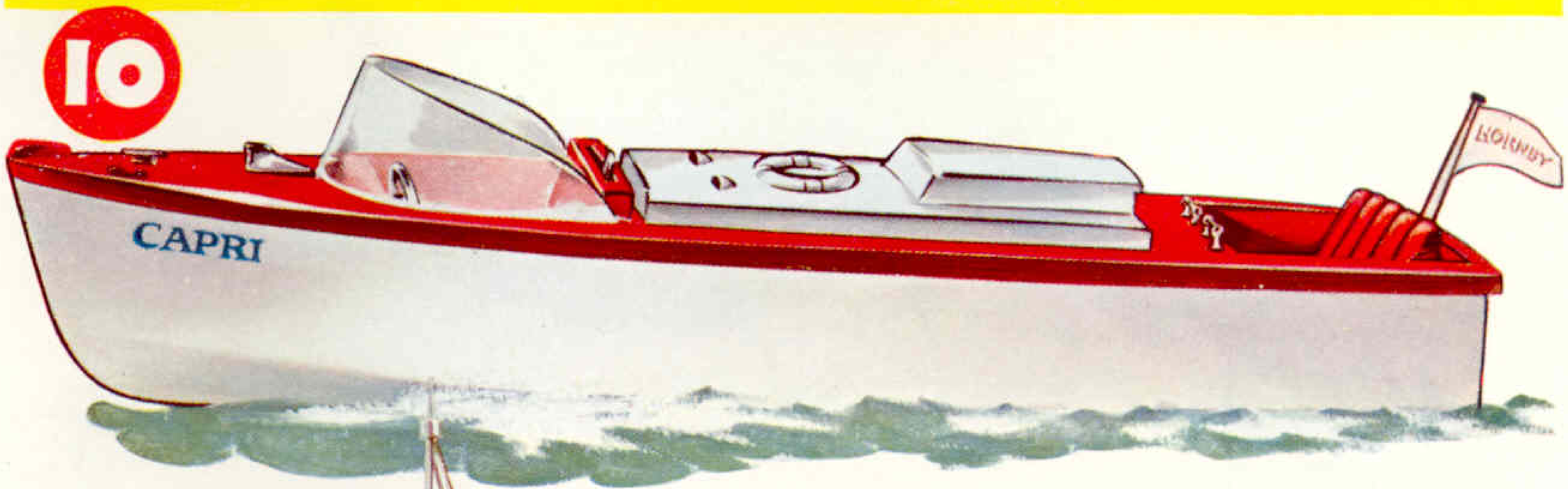
Length $11\frac{5}{8}$ in. Beam $3\frac{1}{4}$ in U.K. Price 17/6



Model No. 5 R.A.F. RANGE SAFETY LAUNCH

With separate fittings which include mast, handrails and searchlight. The prototype is used on R.A.F. bombing ranges to keep stray vessels away from the danger zone. A strong clockwork motor gives a run of 120 to 140 ft. on each winding. Moulded in high-impact Polystyrene which combines toughness and strength with buoyancy and fine detail.

Length 10 in. Beam 3 in. U.K. Price 19/9

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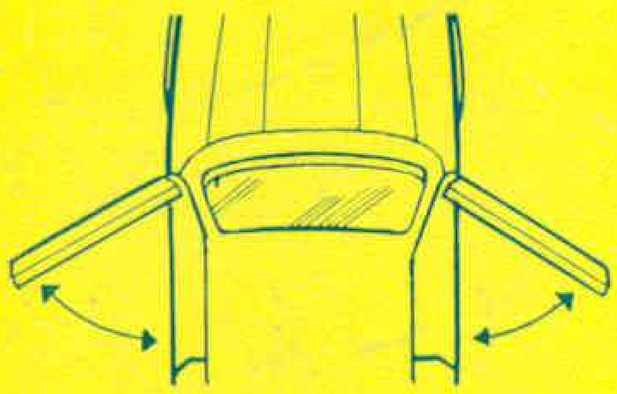
It is almost impossible to lose the key because now you can buy a plastic unsinkable buoy complete with key.

U.K. Price 1/–

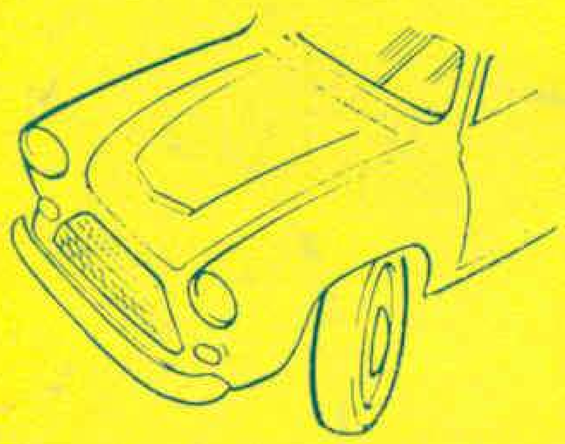
HORNBY SPEEDBOATS ARE GUARANTEED BY MECCANO LTD.

The FABULOUS Cortina

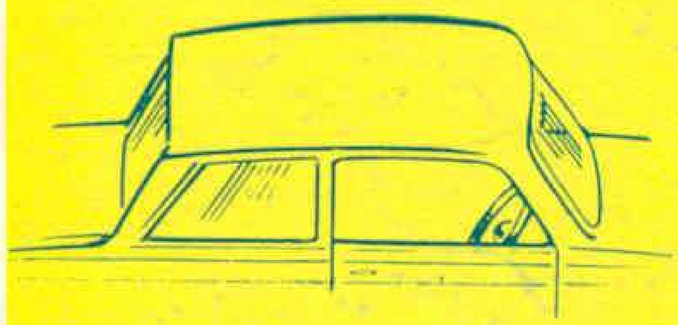
NEW



Look—the Cortina has opening doors!



There's PRESTOMATIC fingertip steering!



And 'glazed' windows!

Thrilling new feature . . . tipping seat backs

The fabulous Cortina—now an exciting Dinky Toy with all these special Dinky features—tipping seat backs, opening doors, Prestomatic fingertip steering, simulated windscreen wipers, 4-wheel suspension, steering wheel and windows. Better be first to own the Cortina!

DINKY TOYS No. 139
FORD CONSUL CORTINA

Length 4 in. U.K. Price **5/3**

DINKY TOYS

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British Road Signs, scaled for use with Dinky Toys, supply an authentic atmosphere for road scenes of all kinds.

AVAILABLE IN FOUR SETS OF 6 SIGNS

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