VOL. XLV. No. 10 OCTOBER 1960

MECCANO MAGAZINE

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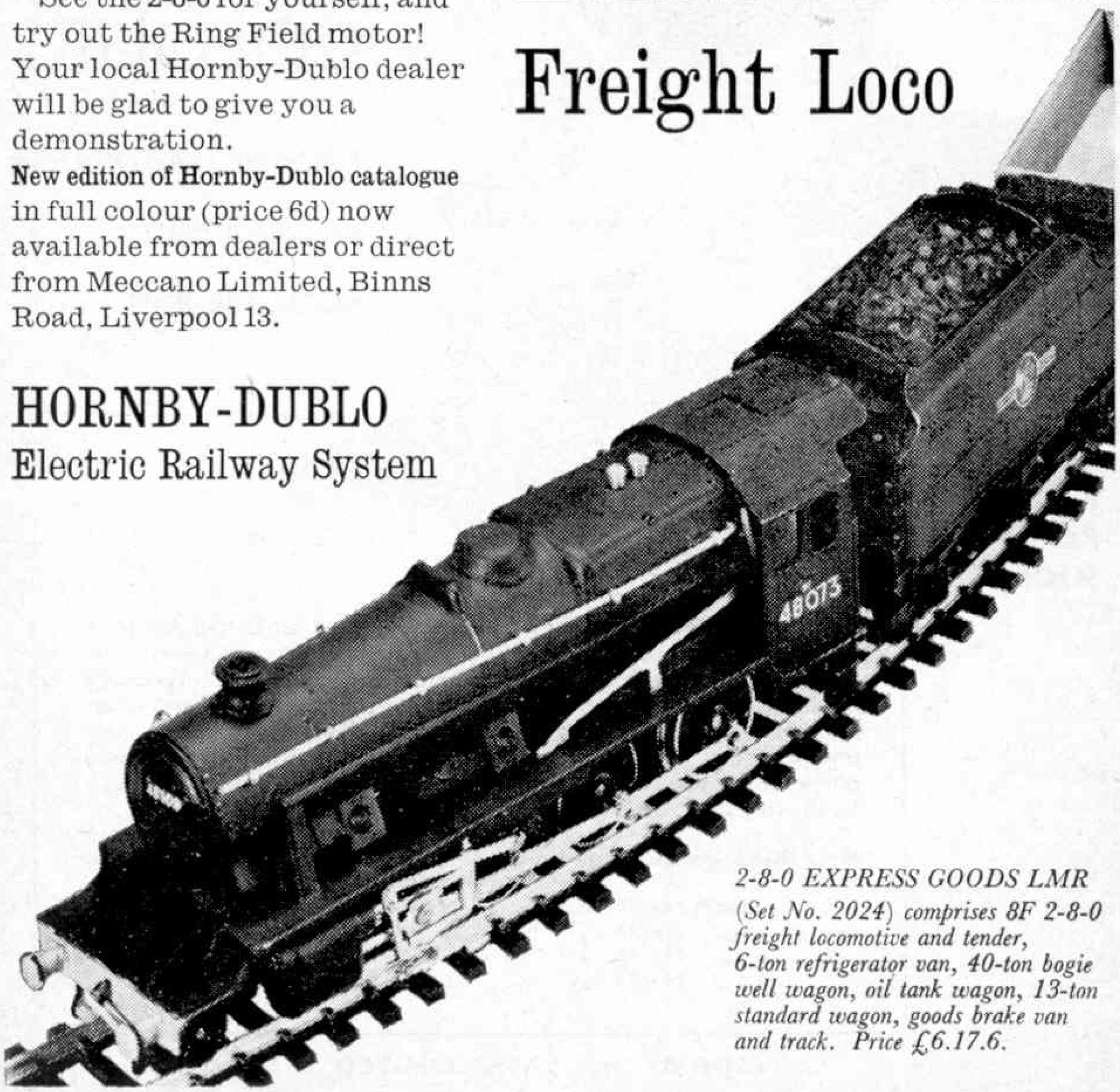

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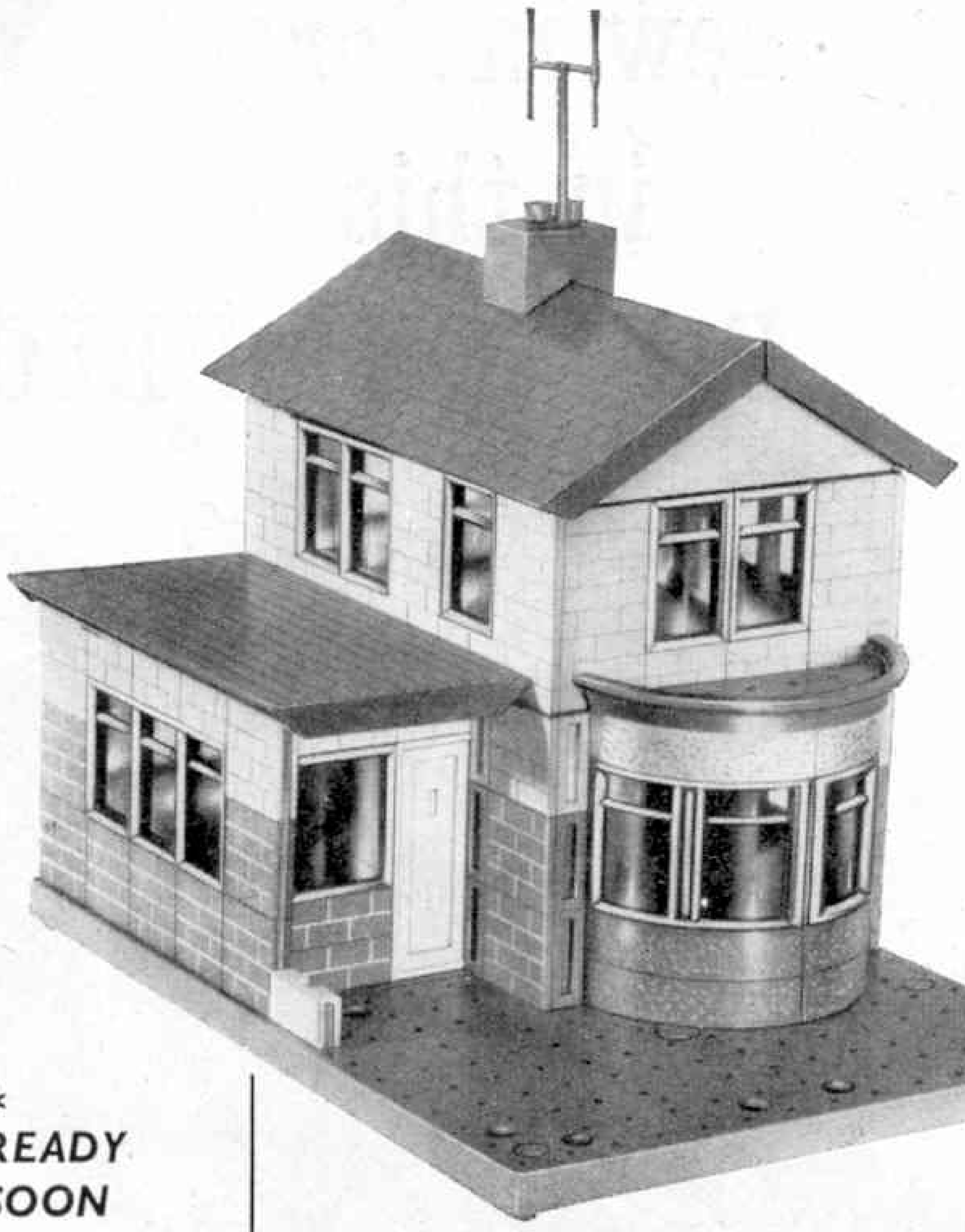

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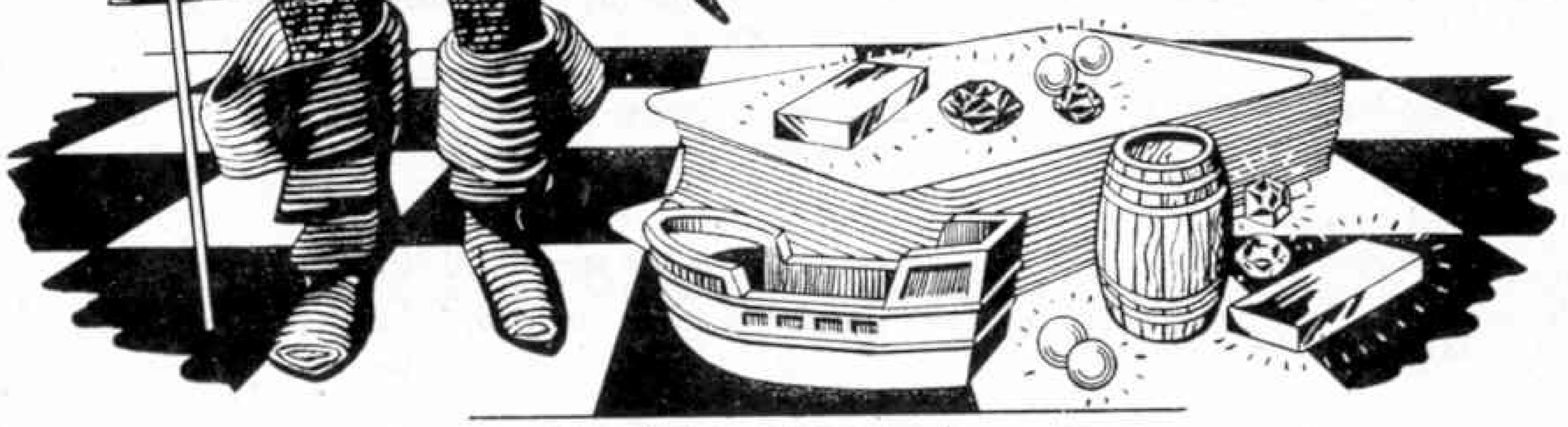

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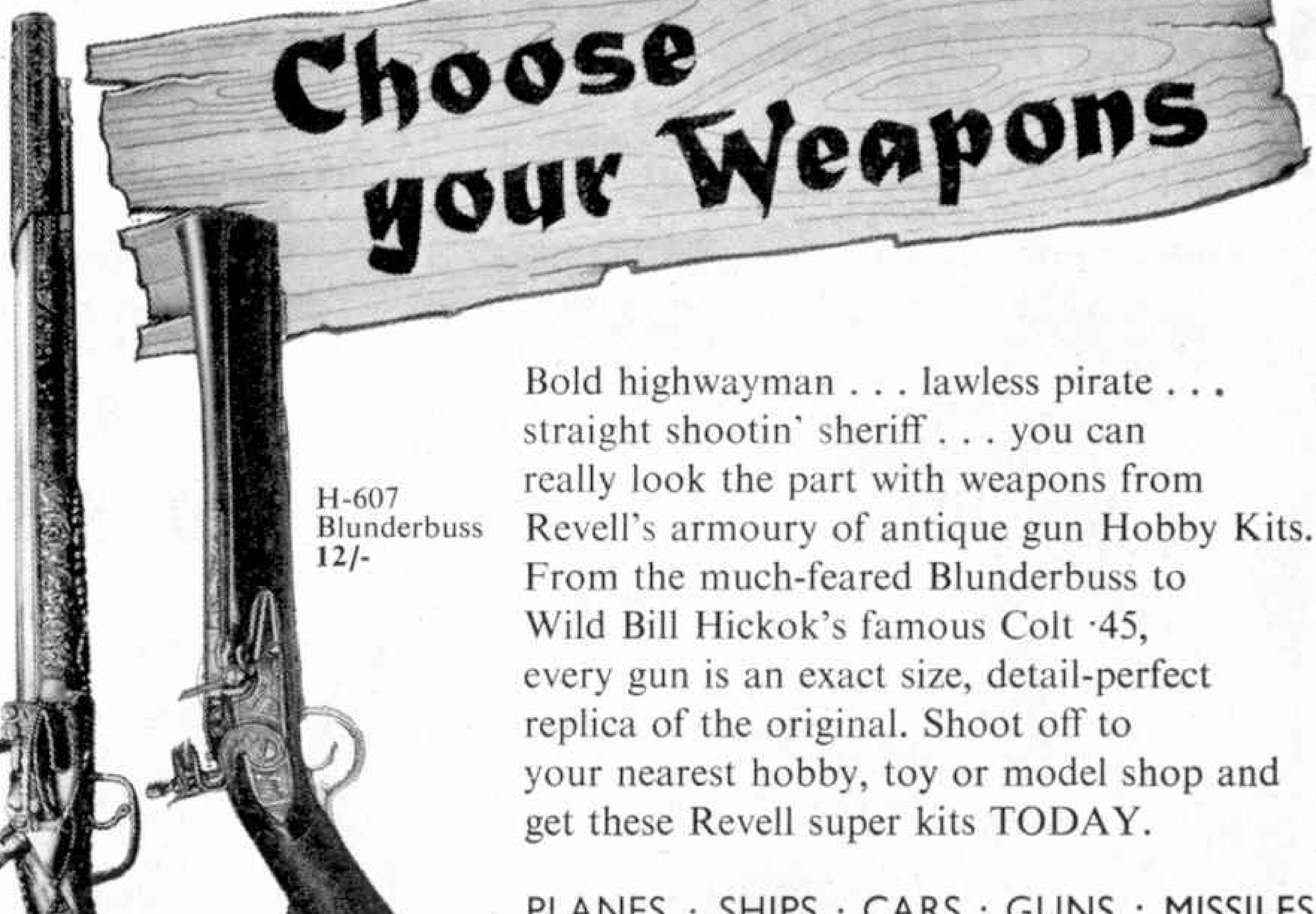

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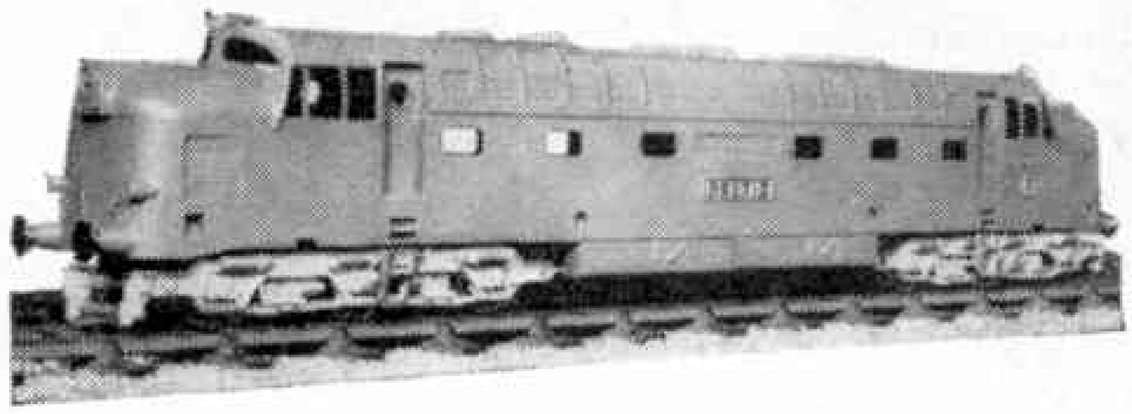

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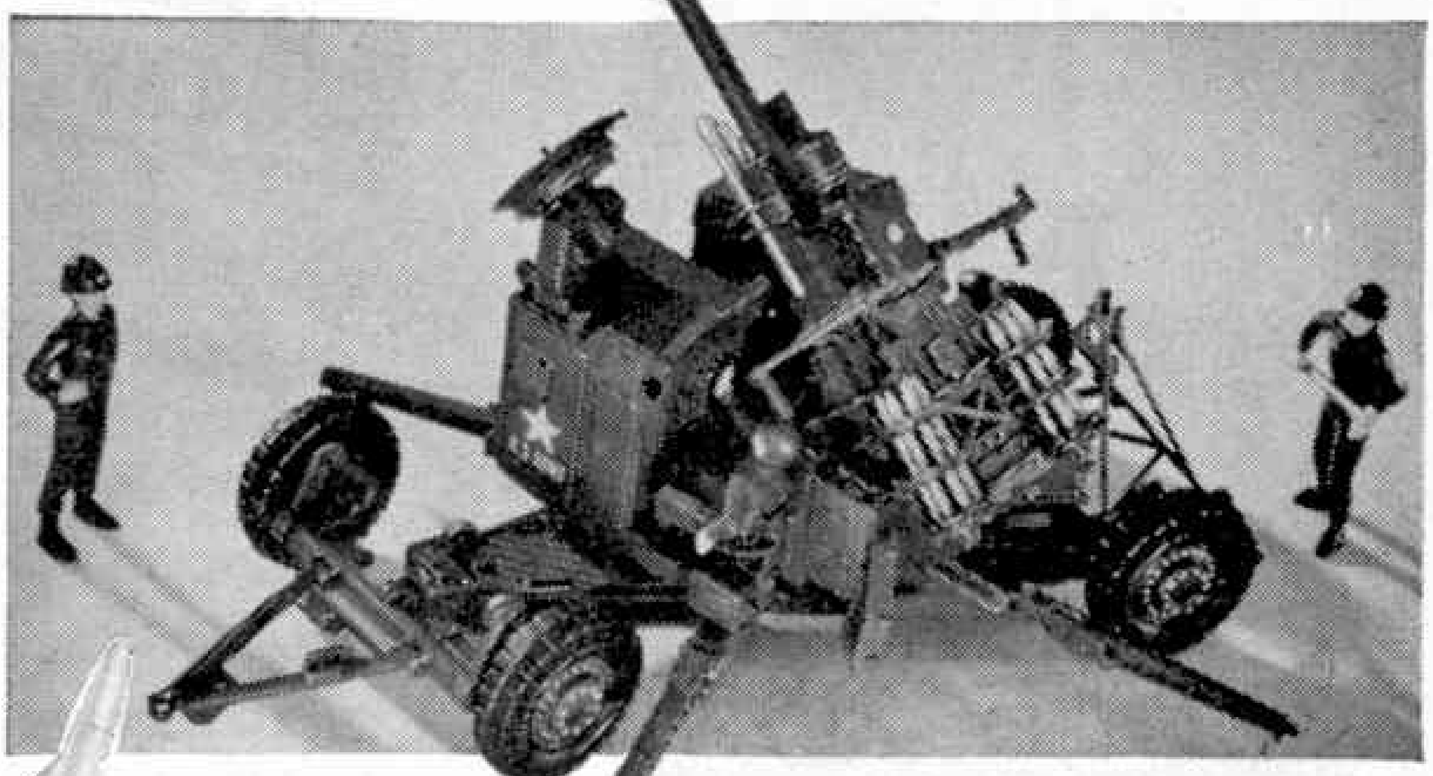

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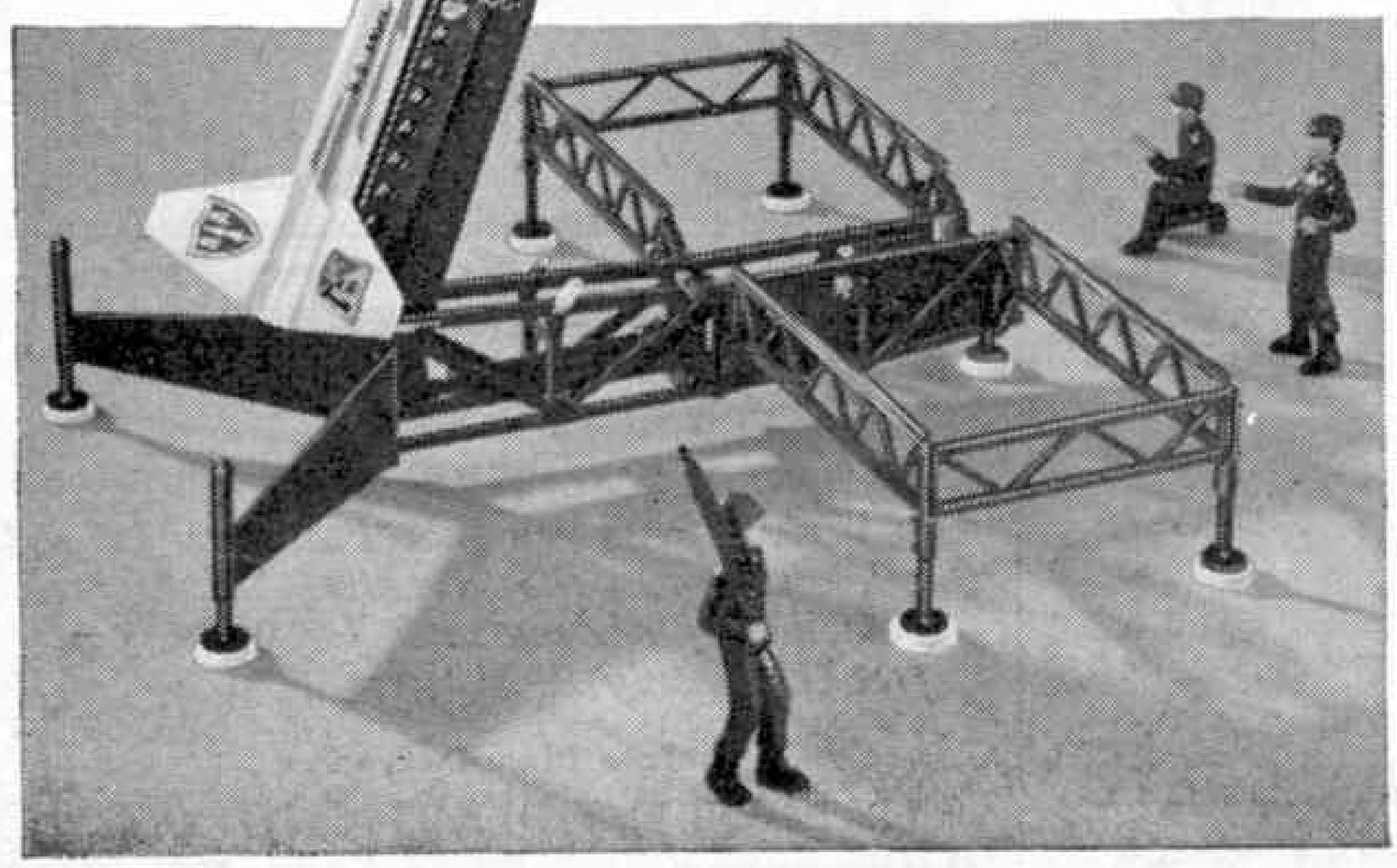

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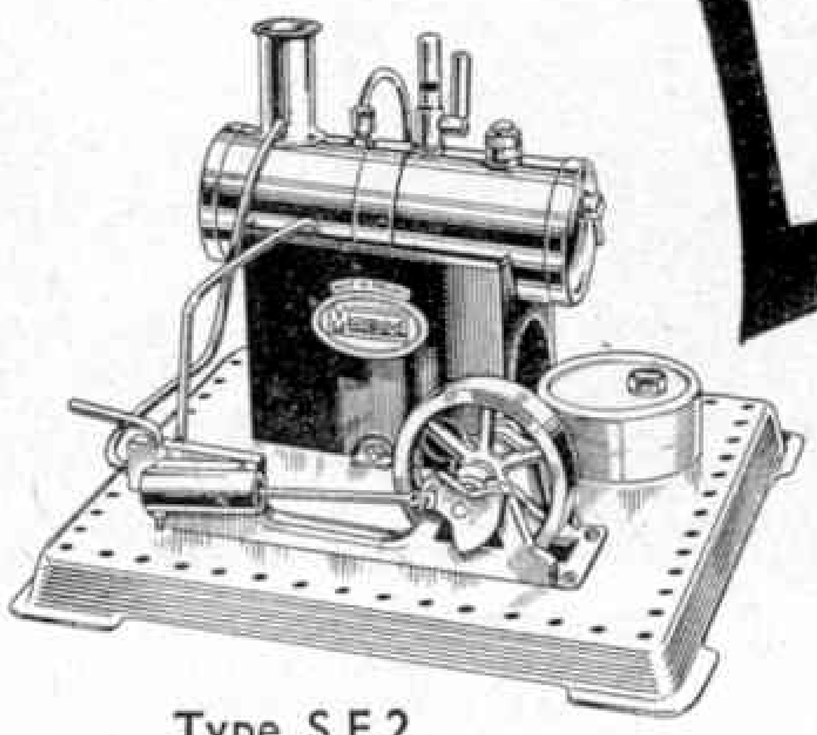

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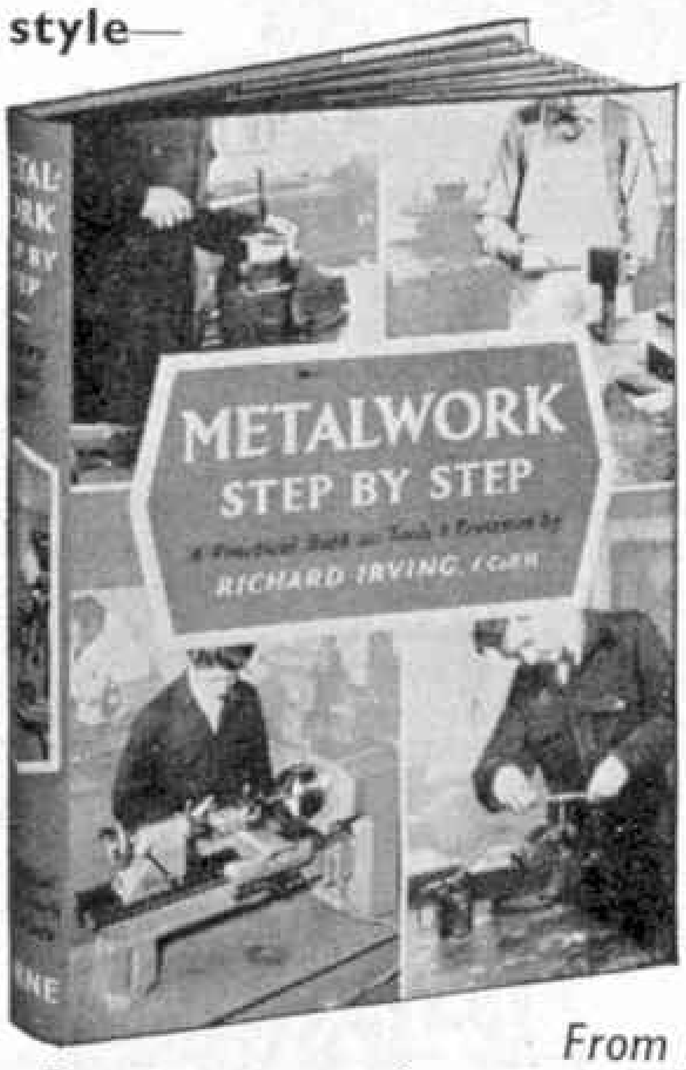

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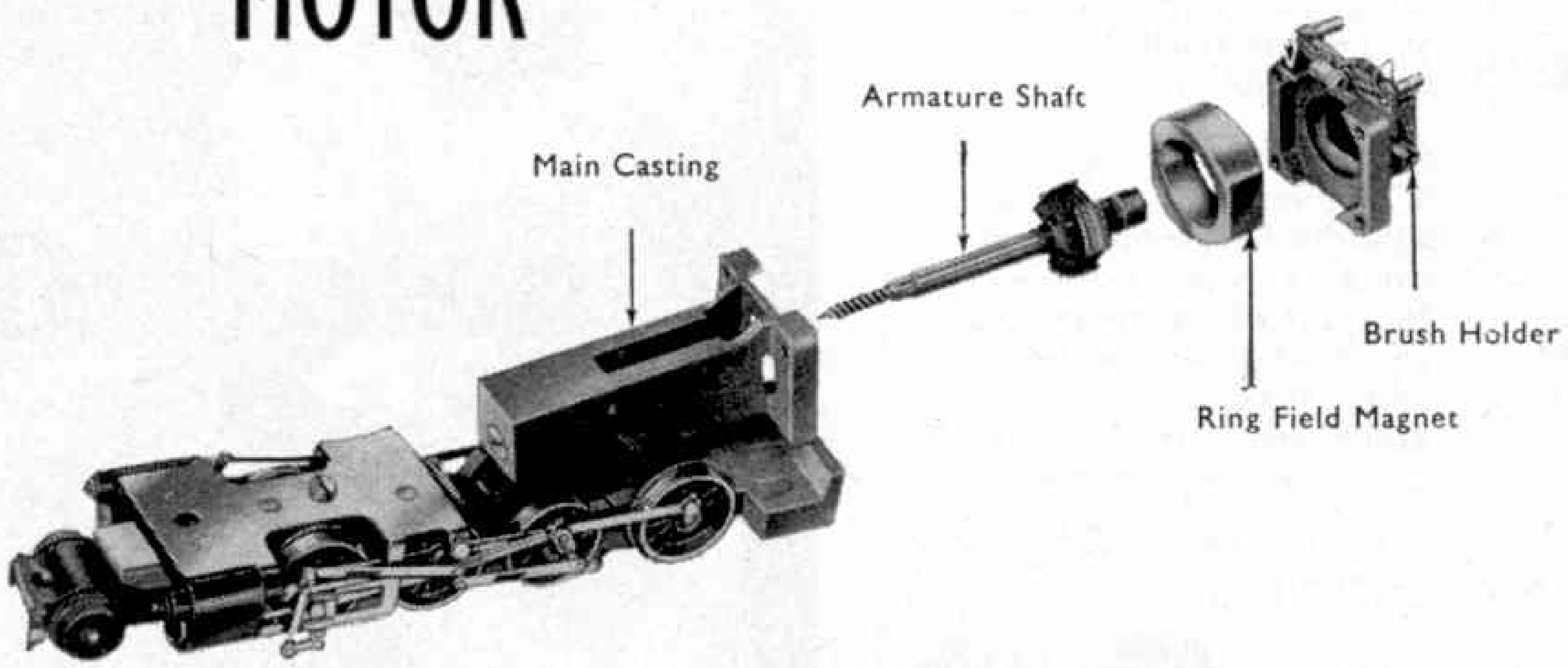
PEAK PERFORMANCE with the new HORNBY-DUBLO RING FIELD MOTOR

Here's great news for all model railway enthusiasts. The new "PEAK-POWER" Ring Field motor is being fitted to several of the new Hornby-Dublo Locomotives for more power, finer control and smoother running.

You must see for yourself what a difference this brilliant piece of model engineering makes. "Cardiff Castle", for instance, will now pull many more coaches at a steady 130 m.p.h. in scale equivalent.



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Next Month: "TURTLIN' OFF THE CAYMANS"

MECCANO MAGAZINE

Editorial Office:
Binns Road
Liverpool 13
England

EDITOR: GEOFFREY BYROM
ASST. EDITOR: ERNEST MILLER

Vol. XLV
No. 10
October 1960

A Hornby-Dublo Endurance Test

AT the time I write these notes, technicians of Meccano Limited are preparing to subject a Hornby-Dublo Electric Locomotive to a most searching and unusual duration test. The purpose of the experiment is to run a Castle class locomotive fitted with the newest Hornby-Dublo motor —the Ring Field—over a distance equivalent to the actual mileage between London (Paddington) and Cardiff, that is, 145.15 miles. Attached to the locomotive for this test will be six standard corridor coaches of the type included in some of the Hornby-Dublo Train Sets and it is estimated that to cover the distance involved the train will have to run continuously for about 100 hours.

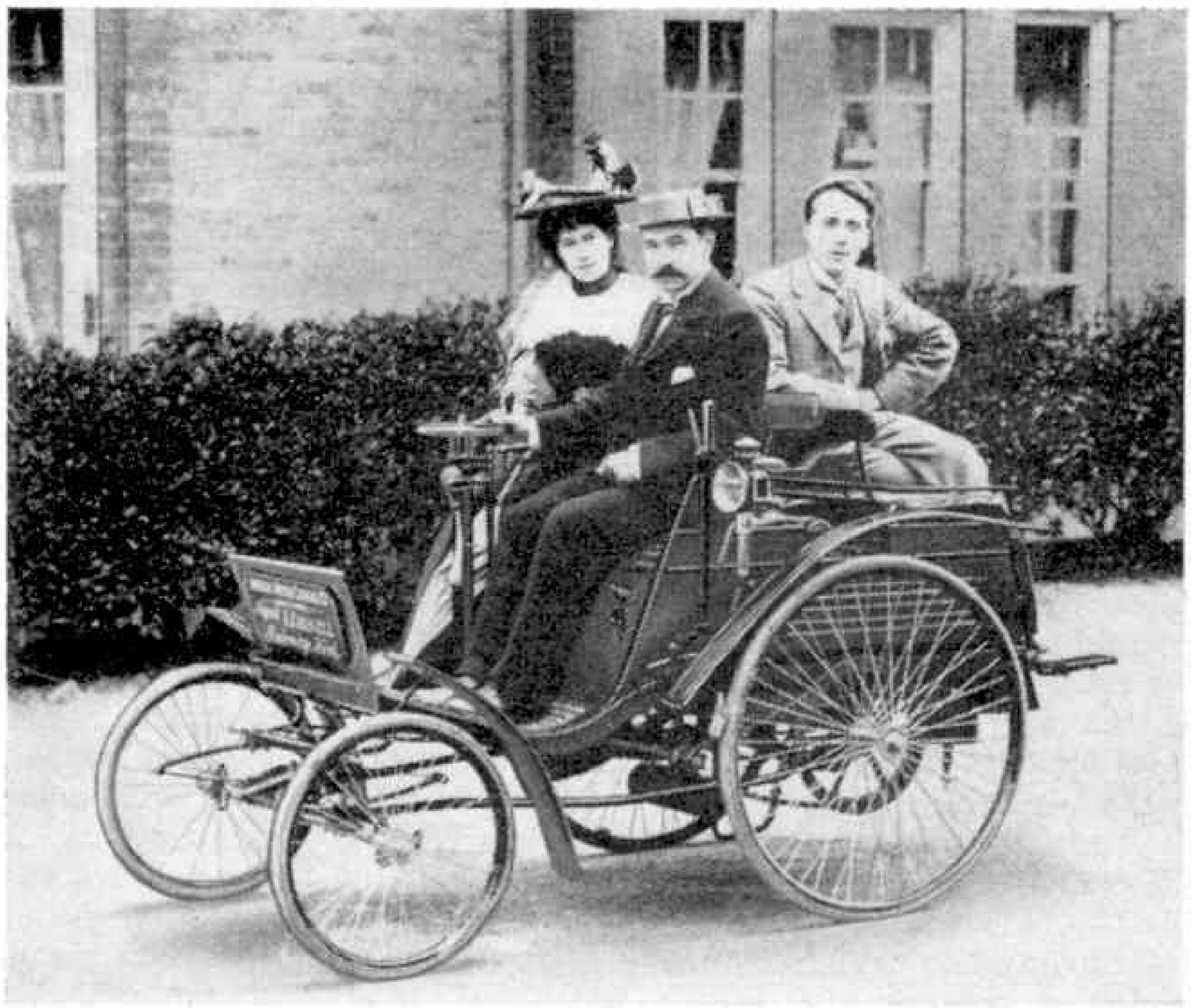
In conjunction with other departments the technical staff of Meccano Limited arranged, for the test, an oval layout, four laps of which represent one scale mile. To cover, on this track, the actual distance between the two cities the train will have to make more than 44,000 circuits of the track.

An illuminated route indicator will show the progress of the train, and the whole test, at the Meccano showrooms in Berkeley Square, London, is to be carried out under "observed" conditions, the layout itself being sealed.

Locomotives with the new Ring Field motor will, of course, pull a greater load than that used for the test run.

Readers who are model railway enthusiasts will realise the extreme severity of the task allotted to this Hornby-Dublo test train. It would be no disgrace if it were to fail; if it succeeds, it will be a magnificent achievement. Fuller details of the test will be available next month.

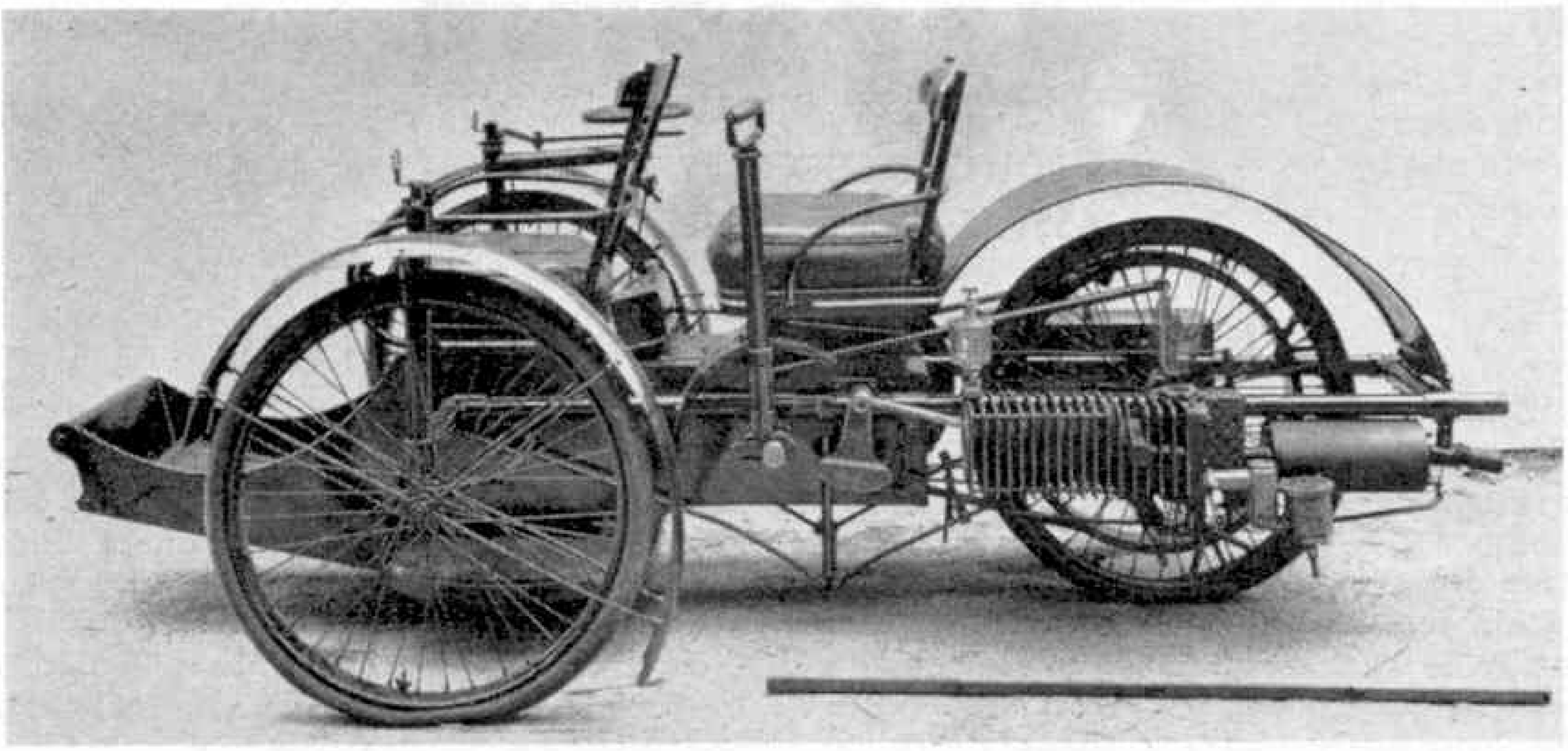
THE EDITOR



The Arnold Motor Sociable of 1897 was one of the aristocrats of the early days of motoring. It is one of the models mentioned in an article on pages 488-9 of this issue which describes Britain's first Motor Show. The picture here is reproduced by courtesy of "The Autocar", London.

Solid tyres and "dust protectors"

THE FIRST BRITISH MOTOR SHOW



The Léon Bollée Tricar, 1896. (Left side). Photograph: Crown Copyright, Science Museum, London.

● ***The International Motor Show, in London this month, will bring before the public all the latest that car manufacturers can offer in the way of sleek design, elegant comfort and controlled power. In contrast, here is a reminder of the days when the motor vehicle was in its infancy.***

By
Leslie E. Wells

SO great have been the changes in the design of the motor car and the internal combustion engine that, even in his rosiest dreams, the most enthusiastic motorist visiting the collection of wheeled freaks assembled at the Imperial Institute, in 1896, for the first British Motor Show, could never have envisaged the engineering achievements exemplified in the modern vehicles at this year's 45th International Motor Show at Earl's Court, London, from October 19 to 29. Sixty-four years ago the idea that the internal combustion engine would excel the horse for either reliability or speed was treated with absolute scepticism, and only the "cranks" dared to predict that horses would be driven off the road—by horse-power.

That first show was organised by the Motor Car Club, a body of such "cranks", to coincide with the introduction of a Bill of Parliament which would permit motor vehicles to use the public highways in Britain *without being preceded by a man on foot.*

The main purpose of the show was to convince the public, and particularly the more influential members of it, that motor cars really were the road transport of the future, and to help secure the passage of the Bill through Parliament.

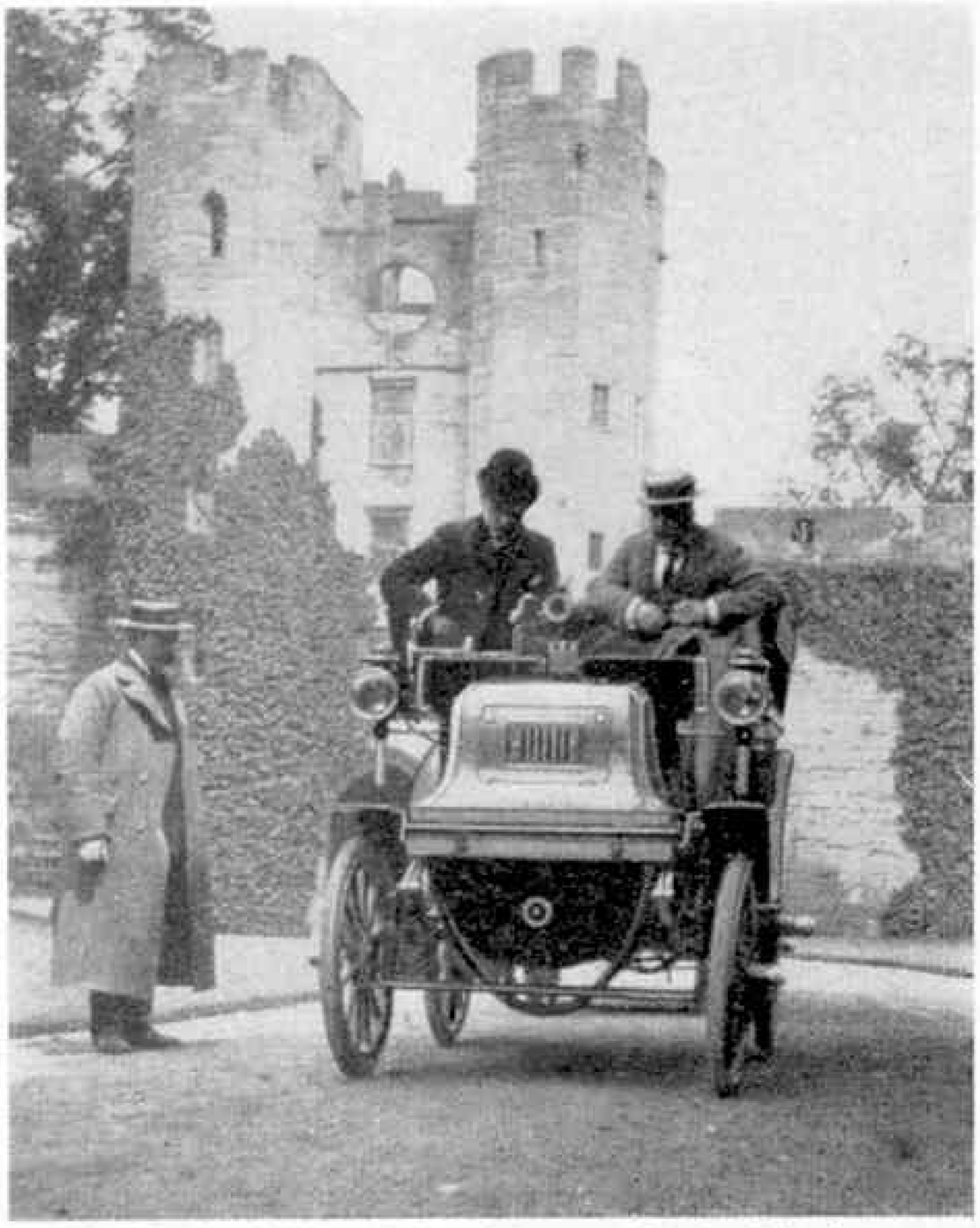
On February 14, 1896, the Prince of Wales (later to become King Edward VII) paid a private visit to the show and had his first trial of a motor car in Britain. On the following day 1,600 people, including Members of both Houses of Parliament, were invited to see the cars and watch them being put through their paces in the grounds of the Imperial Institute. Among them were the Duke of Abercorn, the Marquess of Breadalbane, the Earl of Clanwilliam, the Earl of Clarendon, Earl Denbigh, the Earl of Dunmore, Earl Galloway, and Lords Ampthill, Derwent, Abinger, Digby and Exmouth. Some weeks later the exhibition was thrown open to the public.

One enthusiastic chronicler of the event wrote thus: *"The cars were driven about the grounds at ten miles an hour with ease. There is no horse-drawn vehicle which can be controlled with the nicety and precision of these cars, or within an equally limited space. They careered amongst the spectators and*

climbed a rather steep incline with perfect ease, and were brought to a standstill in a manner which secured the complete confidence of the spectators."

When we recall the amazing variety of strange contraptions included in the first Motor Show one wonders at such confidence, and readily appreciates why the public dismissed motorists as being somewhat crazy. Early motor car design was a strictly individual affair, with a host of fertile brains putting into practice engineering theories more remarkable for ingenuity than efficiency, and the surprising thing is that the motor car progressed at all.

Most of the exhibitors at the first show were still unable to rid themselves of the influence of the horse, and most of the models on view amply justified the story of a woman visitor who gravely asked a salesman why his carriage was shown without shafts. "Body work" consisted chiefly of mounting wagonettes and phaetons on chassis, or the creation of coaches and heavy hearse-like vehicles which were out of all proportion to the low power of their engines.



The Earl of Warwick taking a ride in his Canstatt-Daimler in 1898. Photograph by courtesy of "The Autocar", London.

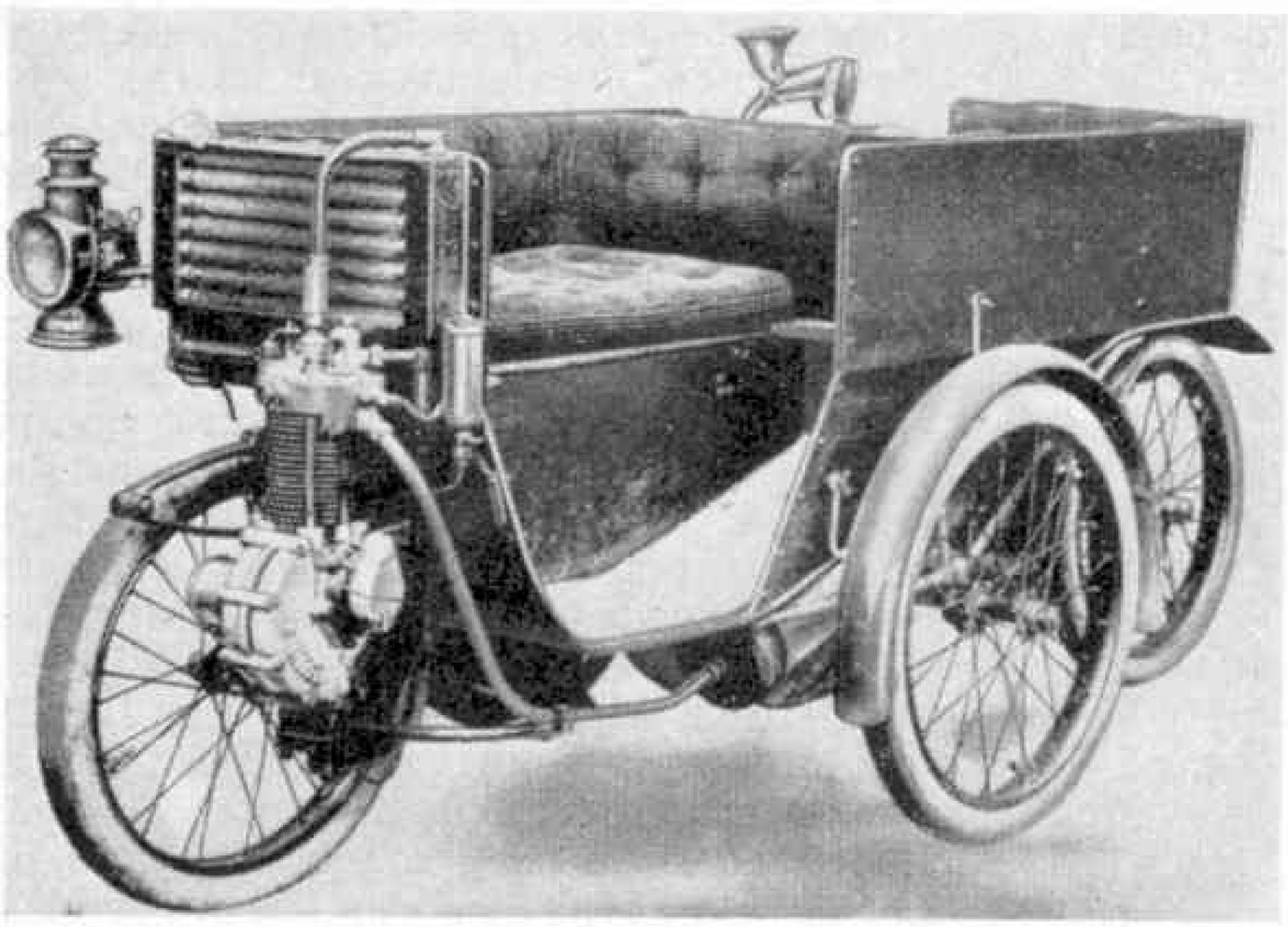
Chauffeur sat astride

This desire to strike a compromise between the stable and the garage was well illustrated by one much-discussed exhibit, a contraption consisting of a two-seater barouche drawn by a motor tricycle, the chaffeur sitting astride the engine on a sort of saddle.

There were, however, some designers who managed to break away from the tradition of the horse, and one or two of the exhibits might claim to have been the forerunner of the modern limousine. In most of these cases, however, the inventors tended to be too original. For instance, there was the diamond-shaped Sunbeam-Mabley, one of the most fantastic vehicles in the history of road travel. It had one wheel in front and another behind, the latter being connected to a tiller for steering; the other two wheels were placed amidships, one on either side of the body, in similar manner to a steamship.

Another equally odd exhibit was the Léon-Bollée Tricar, distinguished by an enormous square cover for its single cylinder, causing several "expert" visitors to reach the surprising conclusion that it was driven by a square piston. The Léon-Bollée had two large wheels in front and a smaller one at the rear.

Although a few models had belt drives, most were chain driven, and one of the most popular of these to be shown at the Imperial Institute was the Motor Sociable, made by Messrs. Arnold & Sons. It held two passengers and had cycle wheels fitted with solid india-rubber tyres



Sunbeam-Mabley motor vehicle. Picture: "The Autocar", London.

(*Continued on page 539*)

The new lighthouse at Dungeness. The separate concrete sections, each of which is 5 ft. high, are clearly seen in the white centred band.

Slim Tower To Guide The Mariners

ENGLAND'S NEWEST LIGHTHOUSE

ON the strange, flat, shingle promontory of Dungeness, which runs out into the English Channel from the coast of Kent, Trinity House are having a new lighthouse built and equipped with modern navigational aids.

It is the first major light to have been built in England for fifty years, and it heralds a new era in the history of lighthouses, for it will be equipped with

By
J. Mannering

navigational aids capable of being operated automatically.

The tower of the new lighthouse rises to a height of 115 feet from the concrete base which is in the form of a spiral ramp. This ramp will contain the machinery room, standby generator and all the electrical controls.

The slender tower is only 12 feet in diameter, and it is made from pre-stressed concrete, its walls being only six inches thick. It is built up from concrete sections each five feet high. These were placed in position by a giant mobile crane, 170 feet high, which was parked beside the tower during its construction, and which is seen in one of our illustrations.

Revolutionary feature

High-tensile steel wires have been passed through holes in these walls, from top to bottom, and then made tight with powerful winches, thus bonding all the sections of the tower strongly together.

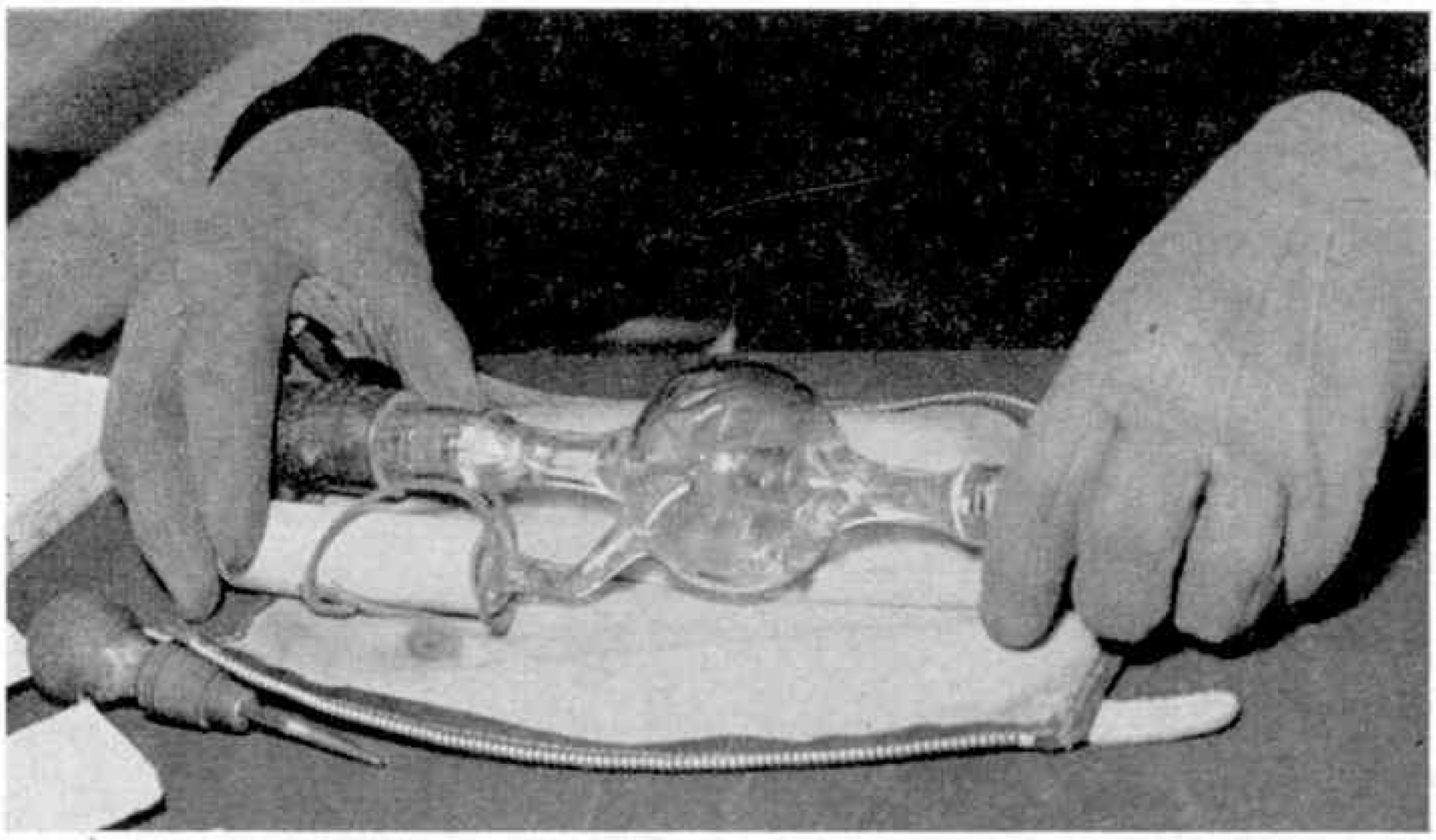
Near the top are the holes for sixty loudspeaker units forming the electrical fog signal, which will be capable of automatic operation, being controlled by a fog detector invented by Trinity House.

One of the most revolutionary features of this fine new lighthouse will be the light itself—a 2kw high pressure Xenon discharge lamp of a type developed by the A.E.I. Lamp and Lighting Co. Ltd. for use with B.T.H. cinema projectors. This new type lamp is only a little over 12 inches in length and weighs just under two pounds.

Principal advantage of the new equipment is the substantial reduction in the size and complexity of the optical arrangement and, further, a reduction of the power needed to operate the light. It is expected that as a result of these additions, considerable simplification in lighthouse structures will result and, indeed, it is possible that eventually sweeping changes in lighthouse design might be brought about.

The reason why Dungeness was selected

for this new, and to some extent experimental, lighthouse is that on this promontory there will shortly be built a nuclear power station, the vast buildings of which will partly obscure the old lighthouse there. This was built in 1904 and is a splendid example of the massive light towers built about that time. It has, close to its base, comfortable quarters for the keepers for, in the days when it was built, even the lighthouses on the mainland were usually very isolated and the lighthouse keepers and their families formed a small community in the midst of wild and inaccessible places.



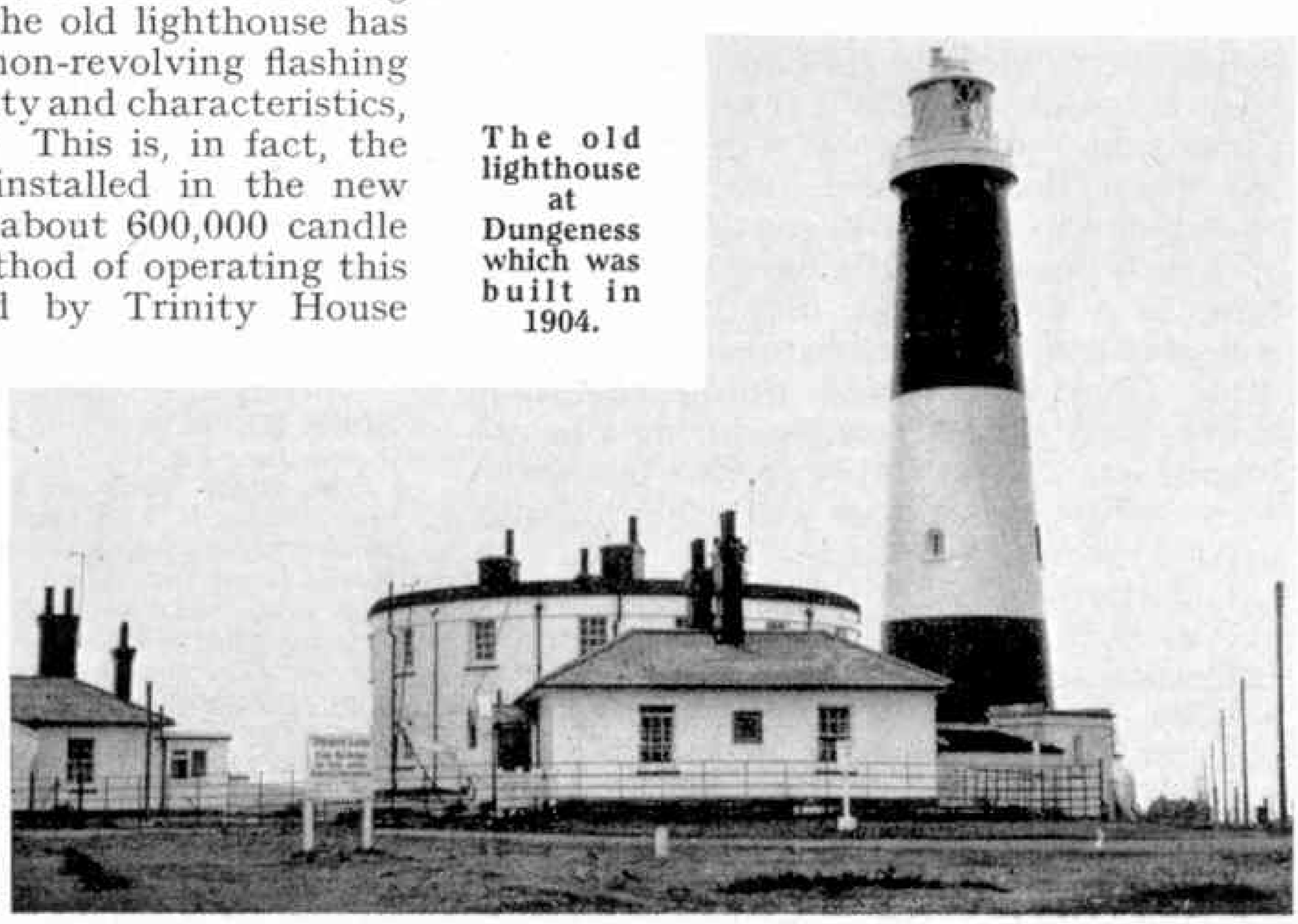
Very little larger than a domestic light bulb the Xenon Lamp shown above will produce 600,000 candle power.

Since January 1959, the main revolving navigation light on the old lighthouse has been replaced by a non-revolving flashing light of similar intensity and characteristics, but whiter in colour. This is, in fact, the type of light being installed in the new lighthouse and is of about 600,000 candle power. A special method of operating this lamp was developed by Trinity House experts and the A.E.I. Lamp and Lighting Co. Ltd.

Some of the older lighthouses around the shores of Britain are equipped with continuously burning paraffin vapour burners with large revolving lenses which condense the light into beams. These sweep round like the spokes of a wheel and are seen as flashes by distant observers. These lenses are formed of panels which contain carefully-ground glass, mounted in gunmetal frames. The whole structure floats in a trough of mercury and is rotated by a mechanism driven by falling weights periodically re-wound by hand. Some of these lenses are 9 ft. in diameter and weigh five tons.

More recent installations have continuously-burning tungsten filament lamps, and in such cases, the revolving lenses are much smaller and are rotated by electric motors, a standby motor being provided in case the one in service should fail. Thus it will be seen that the new type lamp to be used at Dungeness presents a vast step forward in design of one of the most essential features of a lighthouse. The light source of the new lamp, although small, is intense and may be flashed on and off instantaneously at a power of 2,000 watts at the correct intervals which, in the case of Dungeness, is a flash of 1.3 seconds every 10 seconds.

The old lighthouse at Dungeness which was built in 1904.



The promontory of Dungeness, formed entirely of shingle, grows every year, as more and more pebbles are washed up Channel by the easterly drift. The prevailing wind here is westerly, and all the small stones and flints which are washed into the sea, as it pounds against the whole length of England's south coast, tend to be driven, slowly but irresistibly, in an easterly direction. For thousands of years they have piled up in front of the marshland on the Kent and Sussex borders; and the headland of Dungeness is the result.

Over thousands of years

Just why the stones should all be deposited here is not quite understood; but it is probably due to the set of the tides, for it is at about this point that the Channel tides meet those from the North Sea.

In consequence of this slow growth of the land, the lighthouse built in 1904 is now much further from the sea than when it was erected. The new light has been sited some 300 yards closer to the shore, and stands about 150 yards from the sea. In years to come, if the same curious conditions prevail, this tower will find itself further and further from the water.

The old light has always been a great cause of mortality among migrating birds, who, attracted and blinded by the light, crashed into the lantern.

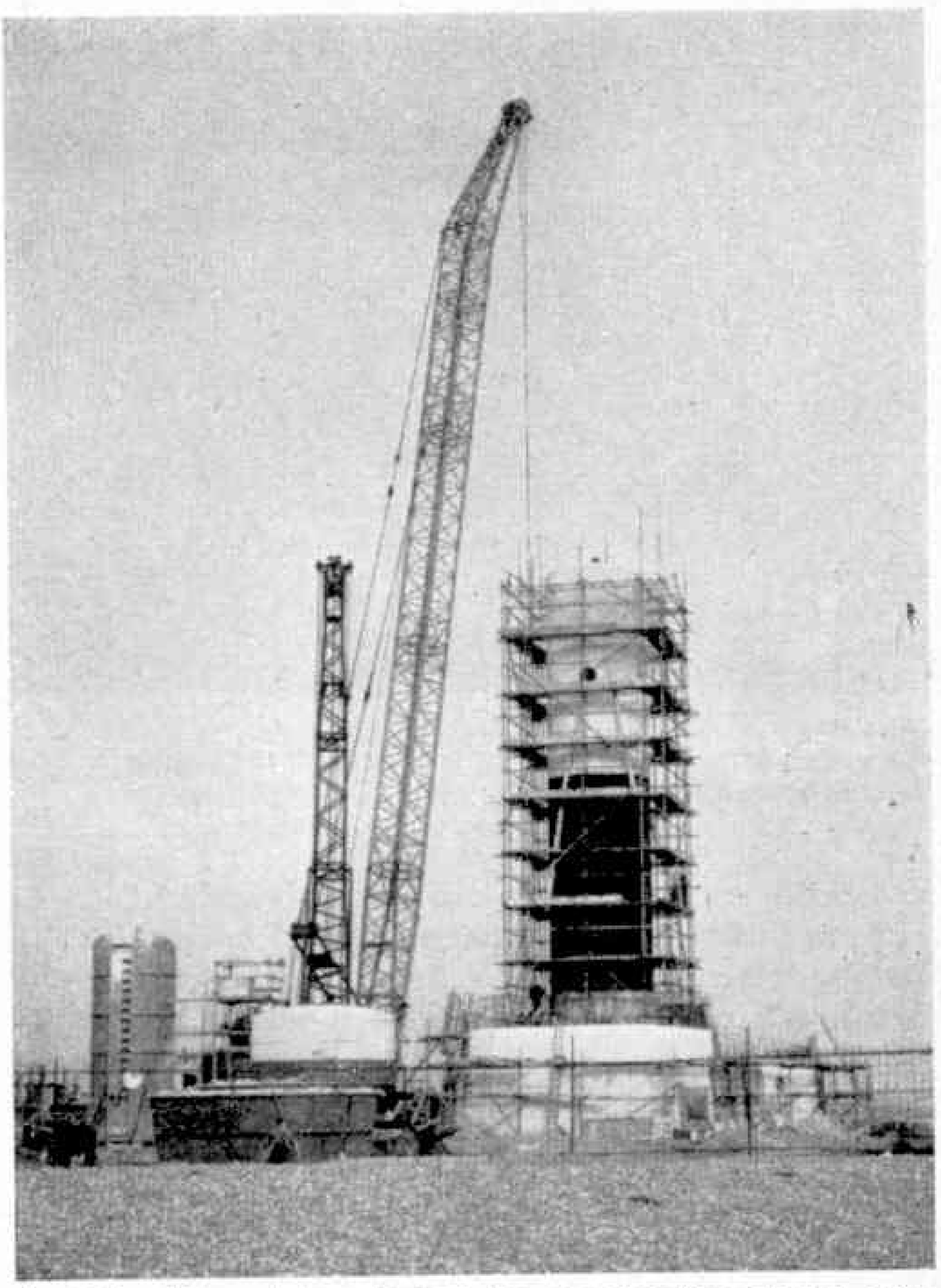
Dungeness is, in fact, on one of the routes taken by birds flying to this country from the Continent. For many years bird perches have been erected round the lantern at migration periods, and in recent years the tower has been floodlit, and this has helped to reduce the casualities considerably.

A well-known ornitholigist has recalled how, as a young man, fifty years ago, he collected several wheelbarrow loads of dead birds from the shingle round the light tower, early in the morning during a heavy migration. It was important to be on the scene before cats, stoats and other animals carried off many of the birds.

Officials of the Bird Protection Society think that, in spite of the increased brilliance of the new light, because it is smaller than the old one it will not perhaps attract so many birds.

It is interesting to consider the very many effects on different creatures which the building of a new lighthouse will bring about. Man has arrived at the stage, when, in endeavouring to perfect all the means to speed up and make safer the various means of transport and communication, he yet takes every care that wild creatures will not be unnecessarily harmed by his activities.

With this great new light throwing its beam over the Channel seas six times every minute, a new chapter in the long fight against the perils of the sea will have opened.



In this picture taken during the construction of the new lighthouse the building itself is dwarfed by the crane which was used for necessary lifting purposes.

BOOK REVIEW

The Boys' Book of the Navy. By Lieutenant-Commander P. K. Kemp, R.N. (Rtd.). (Burke, price 10/6.) A fascinating, up-to-the-minute account of the Royal Navy illustrated with many thrilling pictures and some interesting charts and diagrams. The author, who is Head of the Historical Section and Librarian to the Admiralty, tells the story of some famous actions in which the Navy took part and deals with the vast amount of tasks carried out by the men of the Senior Service. The roles of the Fleet Air Arm and the Submarine Branch are dealt with at length, and the "Little Ships"—motor torpedo-boats, motor gunboats and motor launches—are not forgotten.

John W. R. Taylor tells the story of

the world's greatest aerobatic team . . .

The Black Arrows

"*GOING down for Wine Glass loop . . . looping, now! . . . Wine glass. Go! . . . Reform Big Nine. Go! . . . Smoke on. Go! . . . Smoke off. Go! . . .*"

Such radio messages would have little meaning for the owners of the hundred thousand upturned faces on the aerodrome below. But the pilots of the glossy black Hunter fighters the crowd are watching react instantly to each instruction.

The display is on—and Treble One Squadron flash past, white plumes streaming behind. Copyright, Air Ministry photograph.

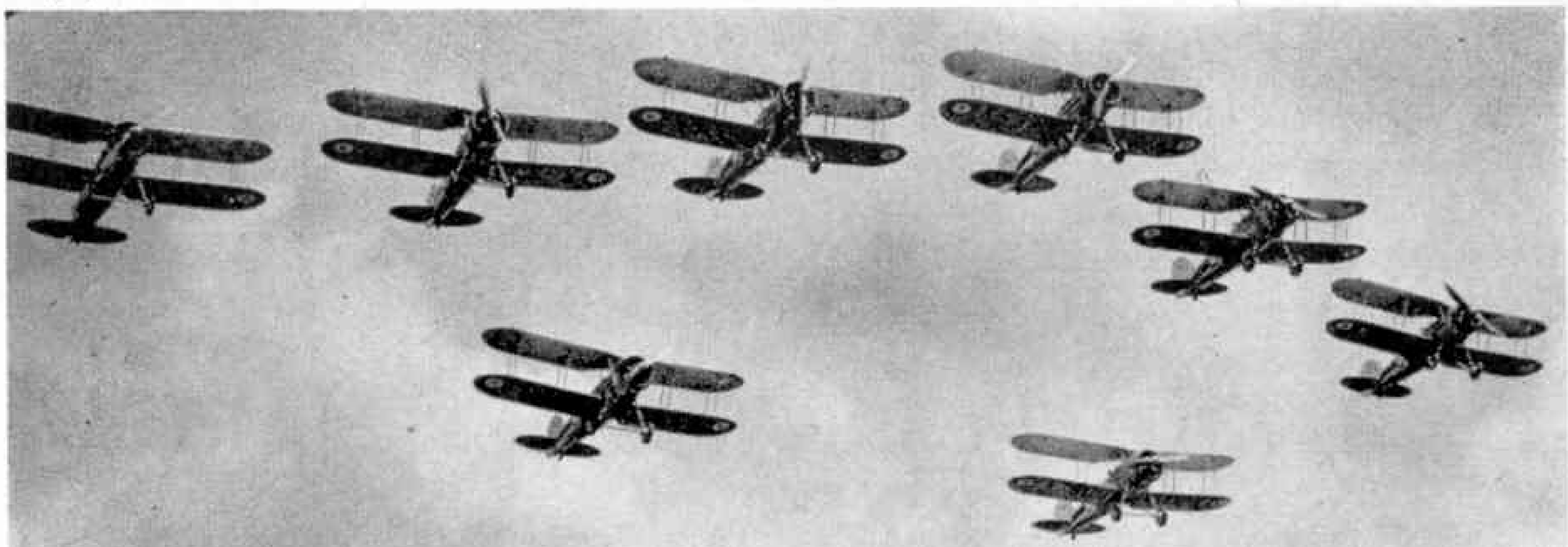
Using gentle movements of throttle lever, joystick and rudder bar, they follow their leader through a succession of breath-taking aerobatics. So perfect is their formation-keeping, even when they change from one pattern to another during a loop, that the spectators know they are seeing the greatest aerobatic team in the world in action, although few realise how much skill is needed to keep a seven-ton fighter steady in the battering slipstream of aircraft in front.

The climax of the show is near. At the same moment, all nine pilots switch on their smoke generators and leave behind curving white rainbows as they sweep up, over and down, breaking formation in a spectacular "bomb-burst" as they dive in all directions across the boundary of the airfield. Simultaneously, there is an ear-shattering roar as seven more black Hunters, streaming smoke, race in low and climb up into the centre of the trails left by the first group, performing an upward "bomb-burst" that leaves the sky filled with a cat's-cradle of white plumes.

Who are these men who fly with such fantastic precision? The French christened them *les Flêches Noir*, the Black Arrows, when they first stole the show at the Paris Air Display in 1957, against competition by the finest aerobatic teams of the U.S. and NATO Air Forces. In Britain they are known usually as "Treble One". Officially, they are No. 111 Squadron of the Royal Air Force Fighter Command, stationed at Wattisham, Suffolk.

Fully-operational unit

For four years they have been Fighter Command's No. 1 aerobatic unit; yet they are not professional demonstration pilots. On the contrary, Treble One is a fully-operational part of Britain's air defences. Its Hunters are identical with those used by other squadrons, except for their glossy black paint scheme and devices which inject diesel oil into the jet exhaust to produce white smoke-trails. Its pilots are fully-trained combat airmen, hand-picked only to the extent that not all pilots have the "big match temperament" needed to perform 50 or 60 non-stop displays before large crowds in several different countries during a summer season.



A picture from the album . . . taken in the days when the squadron flew Gloster Gauntlets.

Inevitably, there have been changes in the team during the past four years, and the winter months have had to be spent each year in putting newcomers through their paces in normal squadron duties and in teaching them the finer points of formation flying. To start with, each new pilot flies as wingman to one of the veterans, and manœuvres are performed well above the 300 to 5,000 feet at which they are done during a display. By February, the new men are usually good enough to take their place in Treble One's intricate formations, flying in the rear positions, where any small mistake cannot endanger aircraft behind them.

Mistakes need not be big to be dangerous when aeroplanes fly sometimes four feet apart at 450 m.p.h.!

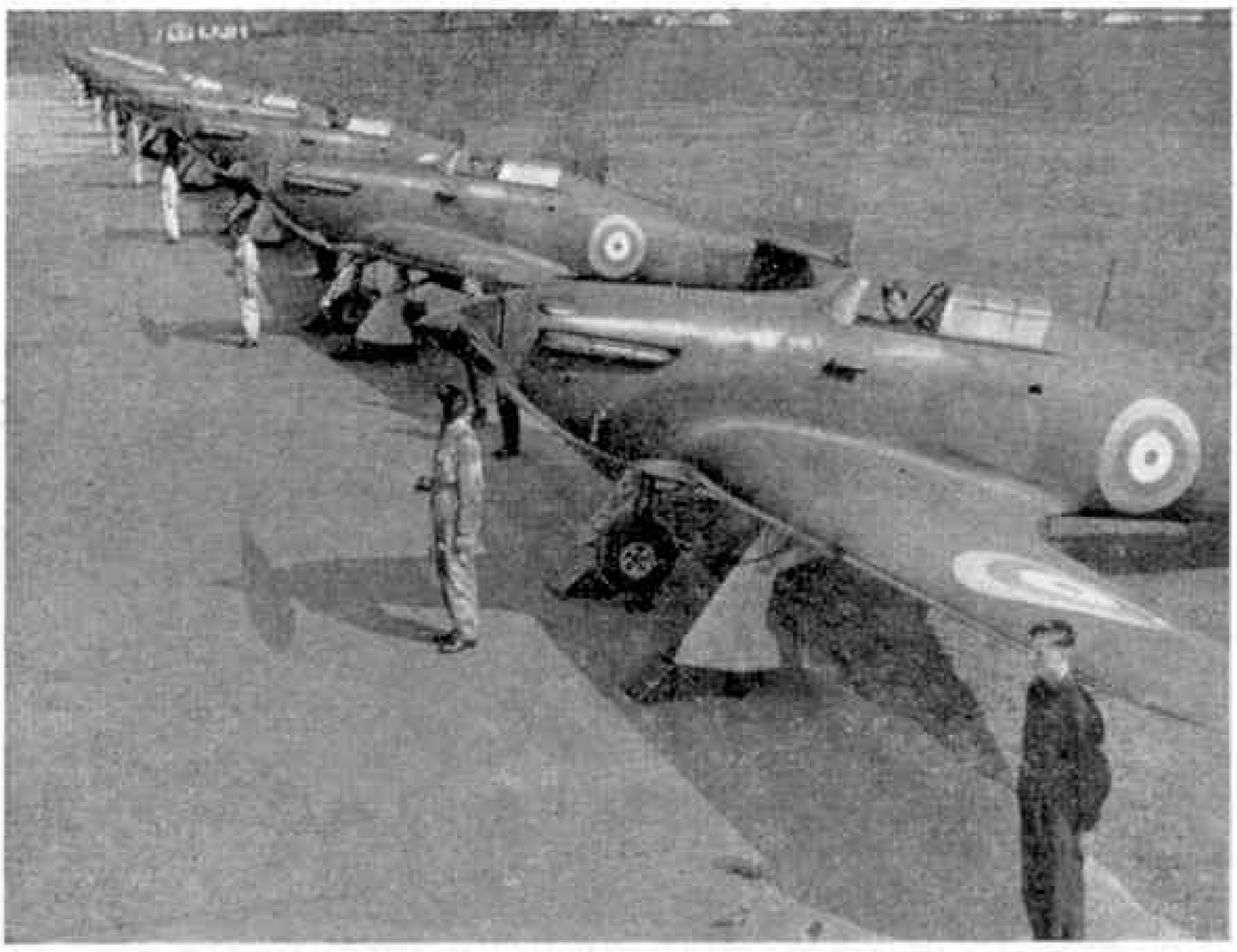
What, then, is the key to the squadron's tremendous success, which has enabled it to outfly even specialised aerobatic teams like the U.S.A.F.'s Skyblazers? One reason is its leadership, first under Squadron-Leader Roger Topp, who built up Treble One's unrivalled reputation in 1957–58, and then under Squadron-Leader Peter Latham, who has since achieved even greater perfection.

The Hunter aircraft also must take some of the credit, for this superb fighter, with its Rolls-Royce Avon engine and Fairey powered controls, is as graceful to watch and as gentle to fly as any of its great predecessors from the Hawker design team led by Sir Sydney Camm.

Thirdly, there is the fact that the Royal Air Force has always led the world in formation aerobatics, which play an important part in improving flying discipline and squadron morale. Few of those lucky enough to have seen one of the pre-war R.A.F. Pageants at Hendon are likely to forget the thrill of watching loops and other manœuvres performed by biplane fighters tied together with lengths of bunting.

Competition to take part in the Hendon Pageants was so keen that squadrons practised for weeks to perfect their routine. This had an effect on the general standard of flying in the R.A.F. and it was often found that the best aerobatic team also achieved the best results in exercises and weapon-firing practice. So, performances like those by Treble One today have a far greater value than simply entertaining visitors at air displays.

No. 111 Squadron's first major success at a public display seems to have been in 1928 when it won the Battle



Twelve young men in flying kit, pilots of Treble One, stand proudly in front of their brand-new Hurricanes. The squadron flew these aircraft during the last war.

Flight Competition at Hendon, flying Siskin IIIA biplane fighters; but it had proved its worth in action ten years before this.

A variety of duties

It was formed as a unit of the Royal Flying Corps in Palestine on 1st August, 1917, with an assortment of aircraft and a variety of duties that included reconnaissance, photography, escort work and offensive patrols. By the time General Allenby opened his final attack on the Turkish armies in Palestine, in September 1918, it had been re-equipped with fifteen S.E.5A fighters, armed with machine-guns and 20 lb. bombs. Wingtip to wingtip with six other British and Australian squadrons, it inflicted terrible casualties among the retreating Turks in the narrow passes and ravines of the Wadi el Far'a. Within five weeks the campaign was won and the war was over.

For a few years after the 1914–18 War No. 111 Squadron was disbanded. It reformed at Duxford, in 1923, and one of its Flights was the first R.A.F. unit to be equipped with a fighter of post-war design, the aggressive little Gloster Grebe. The others flew Sopwith Snipes of wartime vintage, but by mid-1924 the entire squadron had Siskins. These were followed by Bristol Bulldogs in 1931 and Gloster Gauntlets in 1936.

Then came one of the greatest advances ever made in air defence, when Treble One became the first R.A.F. Squadron to be equipped with an eight-gun monoplane fighter, in the shape of the Hawker Hurricane. People living around the squadron's base at Northolt soon saw these beautiful little aircraft being flown in immaculate formations and on 10th February, 1938, the commanding officer, Squadron-Leader John Gillan, hit the headlines of the world's Press by flying a Hurricane from Edinburgh to Northolt at an average speed of 408 m.p.h. Everyone knew he had been helped by a strong tail wind, but there was no longer any doubt of the Hurricane's capabilities.

No. 111 Squadron had plenty of opportunity to prove the qualities of its Hurricanes and, later, Spitfires during World War II. It claimed nearly 100 enemy aircraft in the Battle of Britain and fought many air battles over enemy-occupied Europe before leaving for North Africa, where it became the top-scoring fighter squadron of the Tunisian campaign. When the war in Europe ended the squadron was providing close support for the Eighth Army in Italy, with well over 200 victories in air combat to its credit.

Once again it lost its separate identity for a time after the war, but since 1953 it has been a permanent part of Britain's fighter defences, flying first Meteors and then, since June 1955, Hunters.

The power of the Black Arrows. An arresting study of vertical ascent. Copyright, Air Ministry photograph.

Set a new fashion

On 8th August, 1955, Squadron-Leader Roger Topp repeated, in a Hunter, John Gillan's 1938 Edinburgh–Northolt flight, completing the trip in 27 min. 46 sec. at an average of 717 m.p.h. In the following year Treble One became Fighter Command's reserve aerobatic team. Since 1957 it has been the No. 1 team in Fighter Command and the world.

Until it appeared on the scene, all jet aerobatic teams had consisted of four aircraft. It set a new fashion with a five-'plane formation. Then it began to experiment with still larger formations, until eventually the entire squadron of sixteen Hunters was able to perform co-ordinated displays in two teams of nine and seven aircraft respectively. *(Continued on page 539)*

Where Have The Wheel Beats Gone?

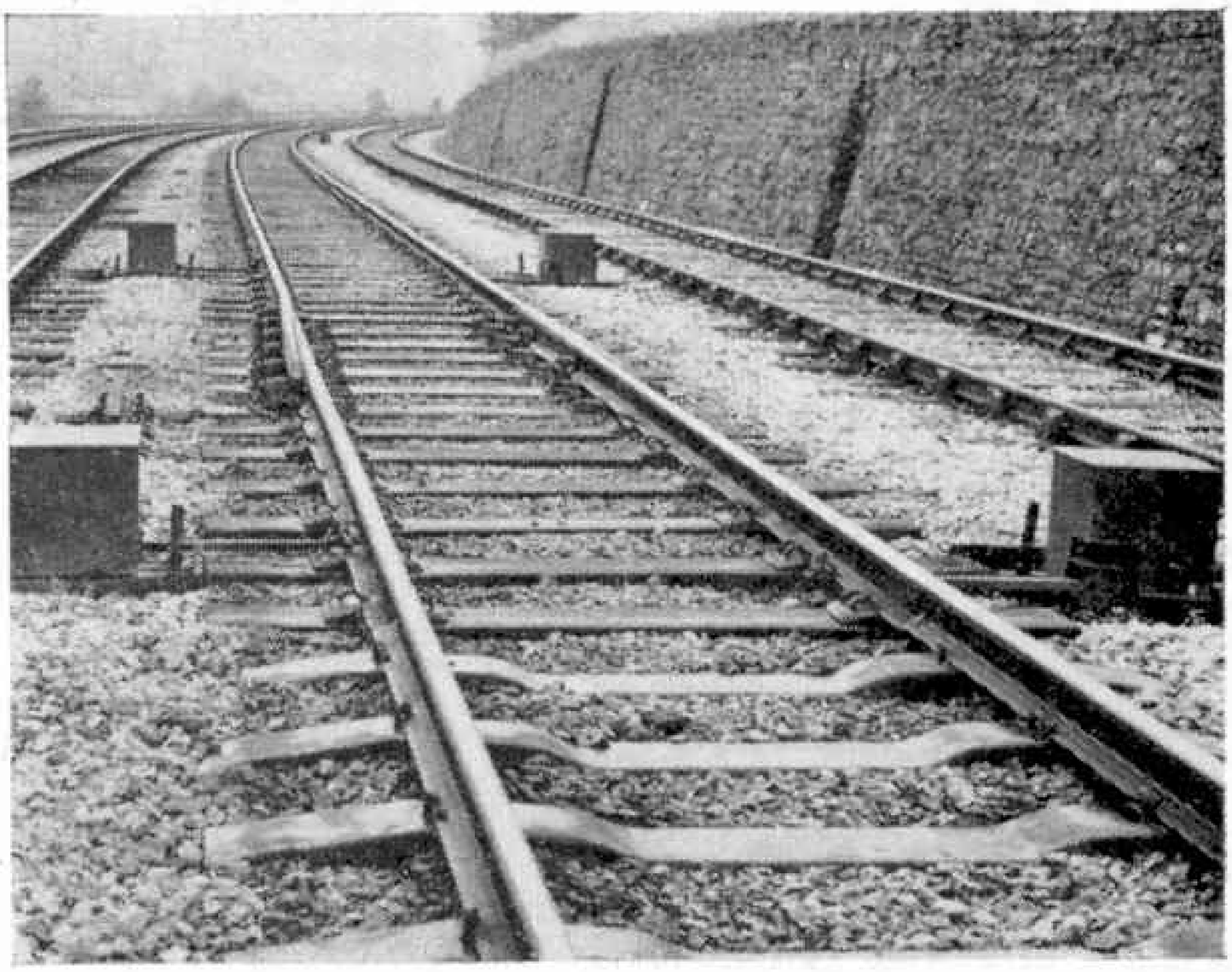
W.R. Experiments with long-welded rails

THE sound of carriage wheels passing over the joints in railway lines has long been one of the accepted background noises of our lives. It has an accomodating quality in that it acts either as a soporific or as a stimulant; or it can be ignored altogether. Despite the fact that different people react to this sound differently it is, because of its regularity, more soothing than disturbing.

It will upset those who calculate the speed of trains from this sound to know that it will gradually disappear. It has disappeared already, in places, through the introduction of welded rail joints. And the running of the train over those stretches of line which have been welded together is smoother and more silent than before. People who have been lulled half asleep by the familiar, regular wheel beats find themselves wondering what is missing. The beats have gone all right. The question is where? It is common knowledge that the gaps between rails allow for expansion, that in summer they close up. If all the rails are now welded together, how can they expand. Where do they expand to?

The simple answer is that, as part of the research carried out throughout British Railways, it was found by experiments in the laboratory and on an experimental length of line in South Wales that if a series of ordinary 60-foot rails were welded together to make up a mile, the only part of the entire length which expanded measurably was the last fifty or so yards at each end; and it was also found out that regardless of the overall length, one mile or ten, it was still only the last fifty yards which counted. What about the part in between?

Imagine that a length of welded rail, a mile long, is heated by the summer sun. The heat, being even over the whole length, will force the rail to expand and the first parts of it to show this visibly will be the two ends. Simultaneously, the middle portion will attempt to follow suit. But since it cannot do that, any more than a man can get out of the middle of a crowded Tube train until the people nearest the exit have moved first, the rail builds up a pressure within itself. Prevented from moving lengthways, it tries to buckle either inward or outward. But the fastenings holding the rail to the sleeper, and the sleeper being firmly embedded in and surrounded by ballast, prevent this too; while any attempt to lift upwards is made impossible because the effort within the rail can neither overcome the weight of the track nor its own internal resistance to vertical movement resulting from the design of the rail itself.

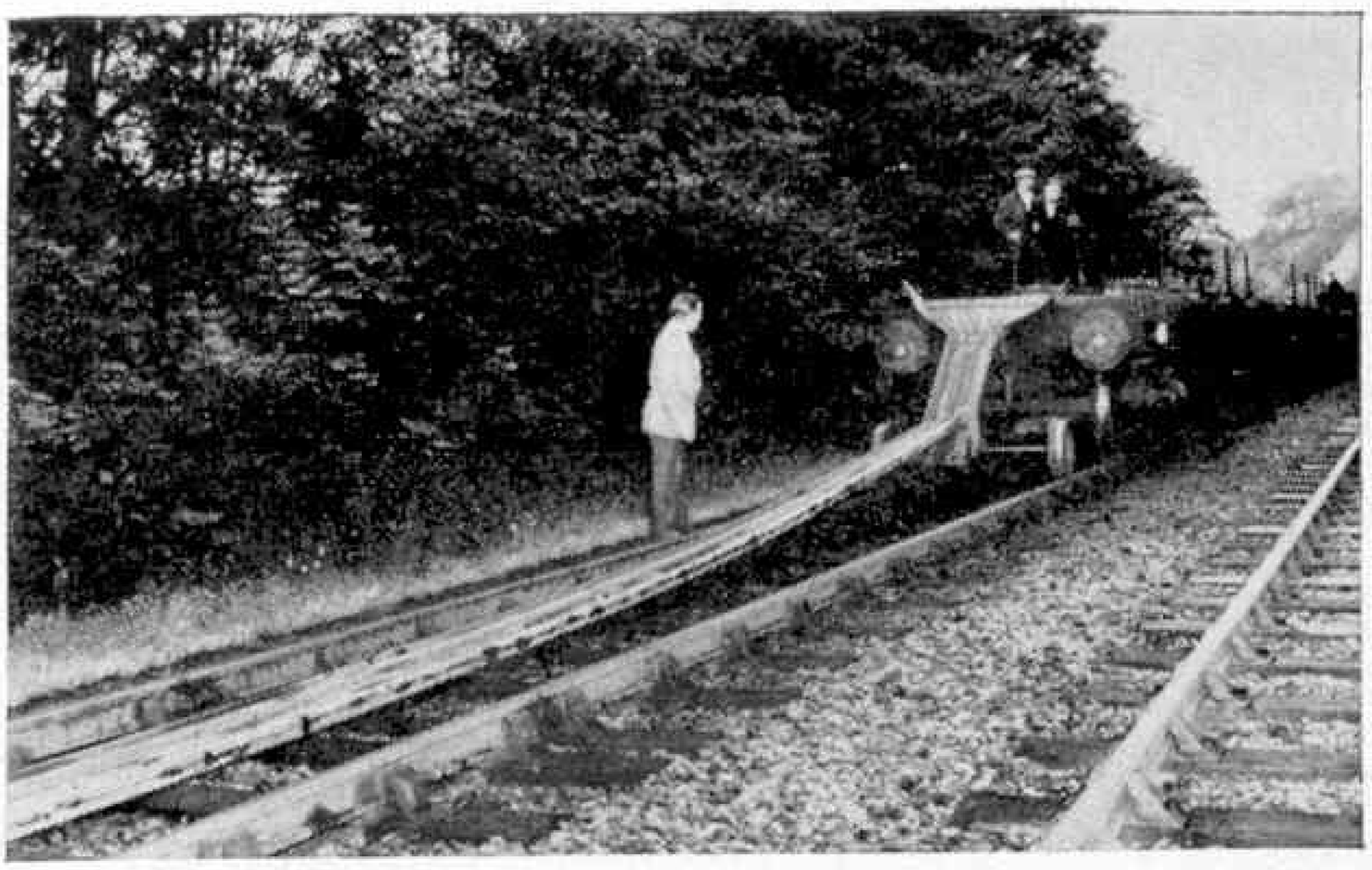


Adjustment switches at the ends of adjacent lengths of long-welded rails allow for expansion and contraction caused by temperature changes. These illustrations and the information in this article are by B.R. Western Region.

In other words, any attempt by the rail to move out of alignment is always prevented by the strength of the rest of the track. These various components, made up of ballast, sleepers and fastenings, now become the key, and the way in which their individual powers are combined is vitally important. Once the combination has been settled, the extreme ends of the rail are

taken care of by adjustment switches which allow the expansion to occur.

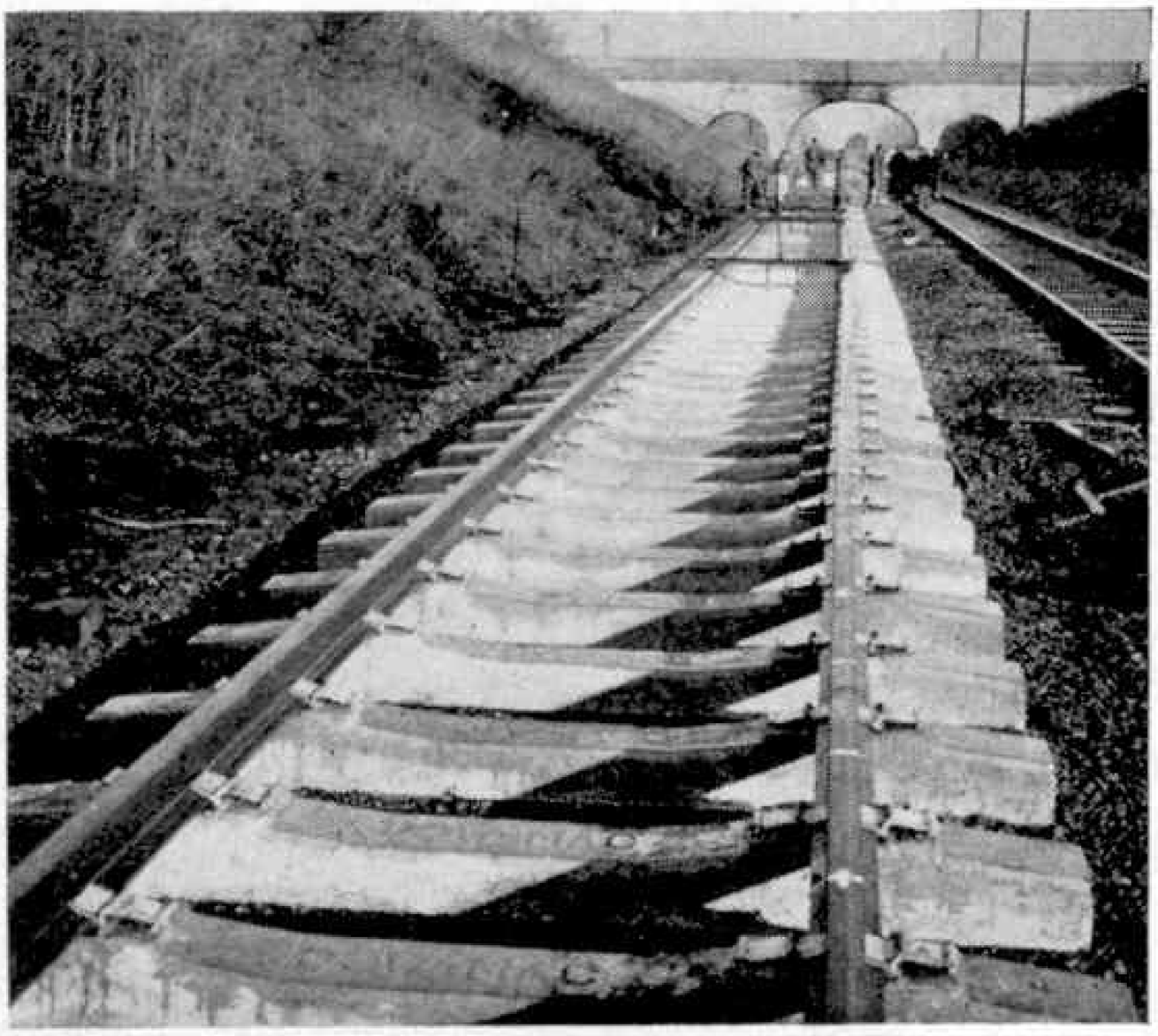
The advantages of long-welded rail are substantial. A mile of ordinary railway line has nearly 200 joints needing maintenance; the joints suffer wear and tear from the passage of the wheels and this shortens the life of the track itself; and they produce noise. But a mile of welded track does away with the joints and the need for maintaining them, and the cost of this work. Wear and tear is reduced and the life of the whole track increased; the running of trains is smoother and the noise greatly lessened.



Unloading a 300 ft. section of long-welded rail from a specially adapted bogie bolster wagon. The lengths are sufficiently flexible to allow for unloading from the wagon to the ground.

This is the modern track technique, part of the Modernisation Plan. That long-welded rail is as yet only in its early stages (the Western Region has about 60 miles of welded lines) is due to several reasons. One is that the research to discover the best combination of track components has been necessarily thorough, in the interests not only of safety, but of economy, for while the practical application of the method may be successful it also has had to be proved economically sound. Another is that intensity of traffic in many parts of the Region makes rapid track relaying something of a problem, so that the work can only be done on Sundays.

A great deal of the research into the practical application of welded rails was carried out in the Civil Engineering Laboratory of the Western Region. In a disused tunnel near Westbourne Park station, London, hundreds of experiments were made, based on data collected, over a period of years, on the running line in Wales. From this data the "field" conditions were simulated in the tunnel and related to a track bed 120 feet long.

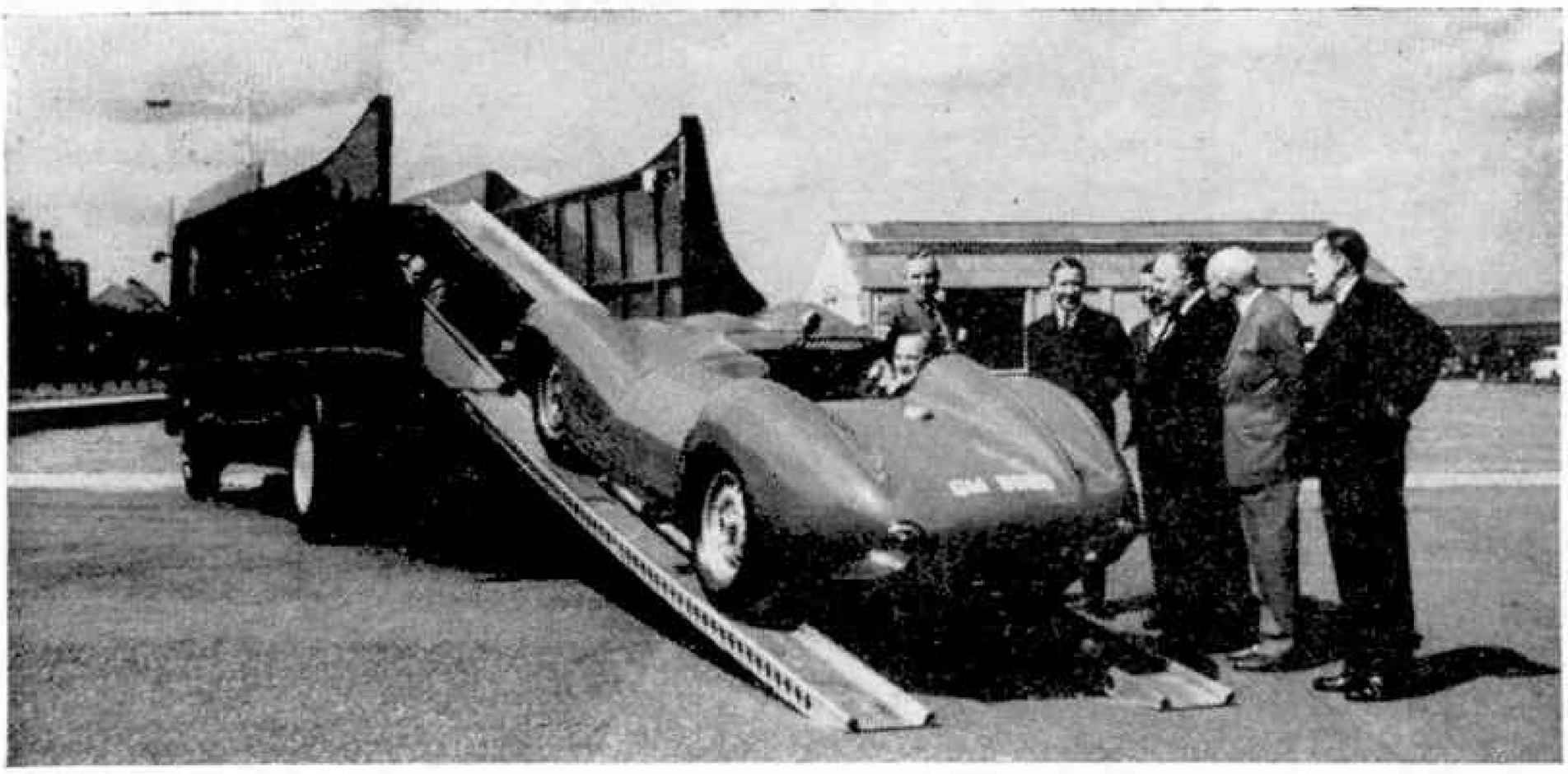


Re-laying with long-welded rails and concrete sleepers in progress at Chippenham. Concrete sleepers have a long working life and great stability.

Rails are of two main types, flat-bottomed and bullhead, and differ in weight; sleepers can be of timber or concrete, and the spacing, as well as the dimensions, of both can be altered; fastening types number something like 40; ballast is of several grades. Even individually, these components are variable, but when they are combined on the single project of creating the best kind of track, the permutations with which to experiment are numerous.

Proof of Success

Today this type of track is already in use, giving the smoothest running possible. It may only be 60-odd miles on the Western Region, but the very fact of those miles of long-welded rails being in existence is proof of success. From now on the mileage can only increase.



Transport for the racing car . . . The Ecurie Ecosse Jaguar.

Road and Track

By Peter Lewis

OCCASIONALLY, I am fortunate enough to have a Jaguar for road test, and the amazing value for money of these Coventry-built cars with their magnificent Le Mans winning power unit never fails to impress me. For with a Jaguar, one has a great deal of power allied with comfort and interior trim in the best traditions of British workmanship. There is nothing shoddy about Jaguars, and to sit in the driving seat of a 2.4, 3.4 or 3.8 facing the impressive array of instruments so sensibly laid out, is an introduction to the world of real motor cars—for well under £2,000.

Early one morning, when most people were asleep, I took my Road Test Jaguar—a 2.4 litre Mark 2 model—on to M1.

Down the feeder strip she purred and away in second gear. The needle of the revolution counter climbed rapidly to 4,000 revolutions per minute—just on 40 m.p.h.—and a quick change with the stubby, remote control gear lever engaged third gear, with the rev. counter needle climbing towards 5,000 revs. and 70 m.p.h. A rush of air through the open window made far more noise than the subdued hum of the powerful engine and there was power to spare, with little more fuss than the soft swish of an express lift. The revs. mounted —5,100, 5,200, 5,300—and into top gear. The speed continued to build up once more to over 5,000, the needle of the speedometer steady at 90 m.p.h. Then a little more pressure and 100 m.p.h., the "ton" as they call it in motor-racing, was registered on the speedometer.

A lorry ahead and a shallow curve. Deceleration, and a light touch on the brake pedal brought the powerful disc brakes into action. 90 m.p.h., 80, 70–60 (almost crawling now!) and a quick change down to third gear. A flash of the lights with the special steering column switch which operates day and night, a short warning on the twin horns and we were level with the lorry and away—the lorry well into the left-hand side. What a safe wide road is M1 when it is used properly. Away again and into top. Better keep her steady at 85 to 90 otherwise it will be too early for breakfast in Birmingham!

On the return journey M1 was a little more crowded but it was, if anything, even

The gleaming finish of the bodywork reflects the sunshine in this picture of the Jaguar Mark 2.

This interior view of the Mark 2 Jaguar shows the dashboard instruments and comfortable seating arrangement for the driver and front seat passenger.

more entertaining. For under these conditions the Jaguar excelled as I used the disc brakes to hold back until the way ahead was absolutely clear, and then the power of the 2.4 litre engine to take me through quickly and safely. The driver of a powerful car does not have to take chances. He can afford to wait, secure in the knowledge that the acceleration and high maximum speed of his car will enable him to maintain a fast schedule, on a road like M1, in absolute safety.

Who can blame me for patting the radiator of the 2.4 when she was once more parked in the run-up. Cars, especially Jaguars, are like humans. They appreciate a quiet, sincere word of thanks.

High speed transporter

There was a time when foreign racing cars—and transporters—were the centre of attraction at race meetings in this country. This season it has been British cars and drivers—and the Ecurie Ecosse transporter, the most modern racing car transporter in the world. The chassis is the well-proved 7 ton Commer chassis, lengthened to 17 ft. 3 in. wheelbase, while the power unit is a *(Continued on page 539)*

Racing Personalities: Jimmy Clark

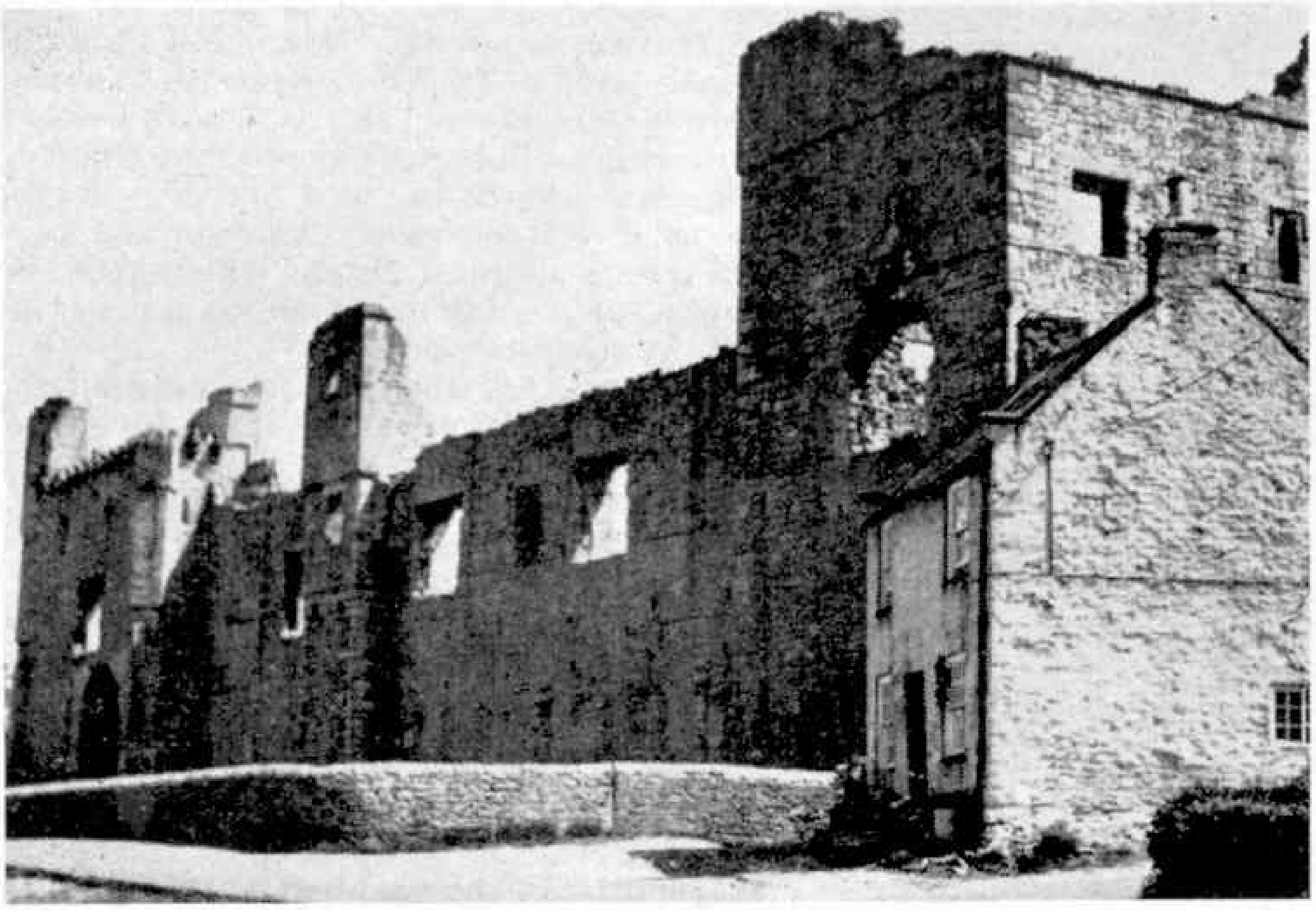
Jimmy Clark.

FEW drivers have made such an impact in such a short time on the motor-racing scene as 24-year old Jimmy Clark. One can say that he has climbed the ladder of success two at a time since June and the Dutch G.P.—his first F.I. race and his debut in the World Championship. In four months the boyish-looking, quiet and unassuming farmer from Chirnside, Berwick—to whom motor-racing is more of a hobby than a profession—has raced against the cream of the world's drivers in the Dutch, Belgian, French, British and Portuguese G.P.'s; and his forceful yet sensible driving has been rewarded with two fifth places, a fine third in the Portuguese G.P., and eight championship points.

This is only part of Jimmy Clark's 1960 success story, as since Colin Chapman snapped him up in April for Formula 2 and Formula Junior, Clark has taken the chequered flag in F.J. races at Goodwood, Oulton Park, Aintree, Silverstone, Brands Hatch and Solitude, Germany. In Formula 2 he has not been quite so successful, but nevertheless there have been some fine drives.

This likeable Scotsman, who is just as proud of his kilt as Ron Flockhart, is no stranger to the British circuits, for he started motor-racing seriously in 1958 when he drove a D Type Jaguar and a Porsche for Border Reivers, whose "home" garage is only two miles from Clark's farm. Last year it was Border Reivers again and his success story with the Scottish team's Lotus Elite was such that Colin Chapman—at the annual Lotus Dinner—awarded a trophy to Clark for the best performance in a driver's first season with a Lotus.

Ask him what are his highlights of the 1960 season and he will tell you: "Following Jack at Brands on August Bank Holiday" (Brabham won and Clark retired with gear selector trouble), and "scrapping with Graham Hill's B.R.M. for 20 laps in the Dutch G.P." The 1961 season could be his vintage year.



Castles You Own

By Arthur Nettleton

Middleham Castle, guarding Wensleydale, was once the "Windsor of the North." Photographs by the author.

WILL you be visiting any of *your* castles this autumn? Walking, cycling or motoring, you are almost certain to come across a number of them, for examples are to be found in most parts of Britain.

They are the strongholds marked on maps as Ancient Monuments and they are cared for by the Government. The Ministry of Works (originally the Office of Works) has been looking after such historic ruins for nearly 100 years, and until recently this has been done in a quiet sort of way.

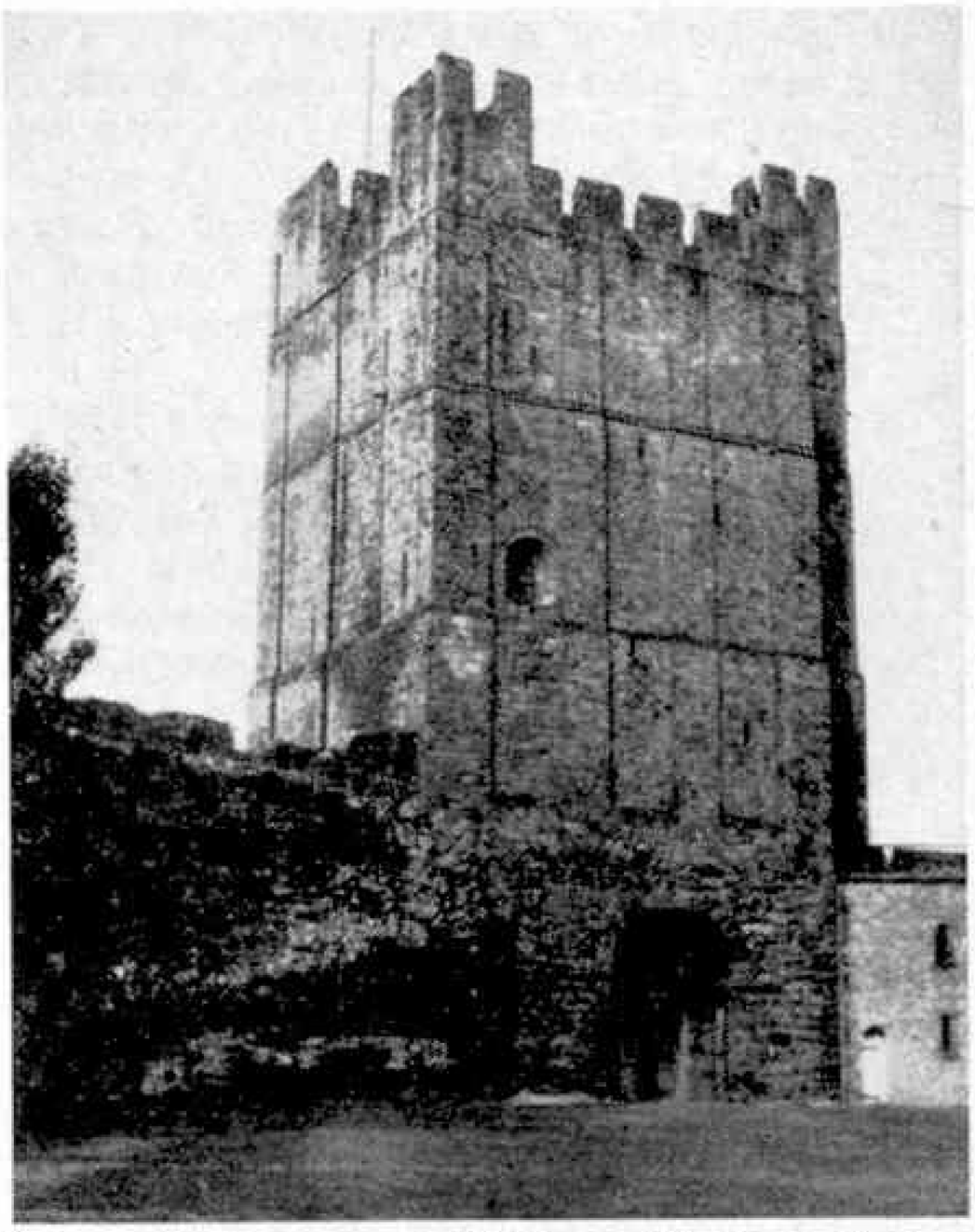
Now, however, a greater interest in ancient monuments is being encouraged and tourists and holidaymakers are being invited to inspect them more often. Already more than 6,000,000 visitors a year are being attracted by our ancient monuments in general, for the list runs to about 600 and includes abbeys, gateways, prehistoric camps, and ancient stone circles, as well as castles.

But castles alone provide plenty of scope for entertainment, for many of them have interesting histories, unusual features, or associations with famous men and women of the past.

Massive Keep

In Wensleydale, Yorkshire, is a fortress which was once the "Windsor of the North" —Middleham Castle. Although it fell into disuse 500 years ago and was allowed to decay, great sections still remain, and during recent years the Government has taken steps to prevent the structure from crumbling further.

Like all old castles, that at Middleham was built round a massive tower or Keep, which could be defended to the last. Most other Keeps, however, contained only apartments for the owner of the castle and his family, whereas the Middleham Keep had rooms for officers and servants.



This massive tower, part of Richmond Castle, Yorkshire, took 50 years to complete.

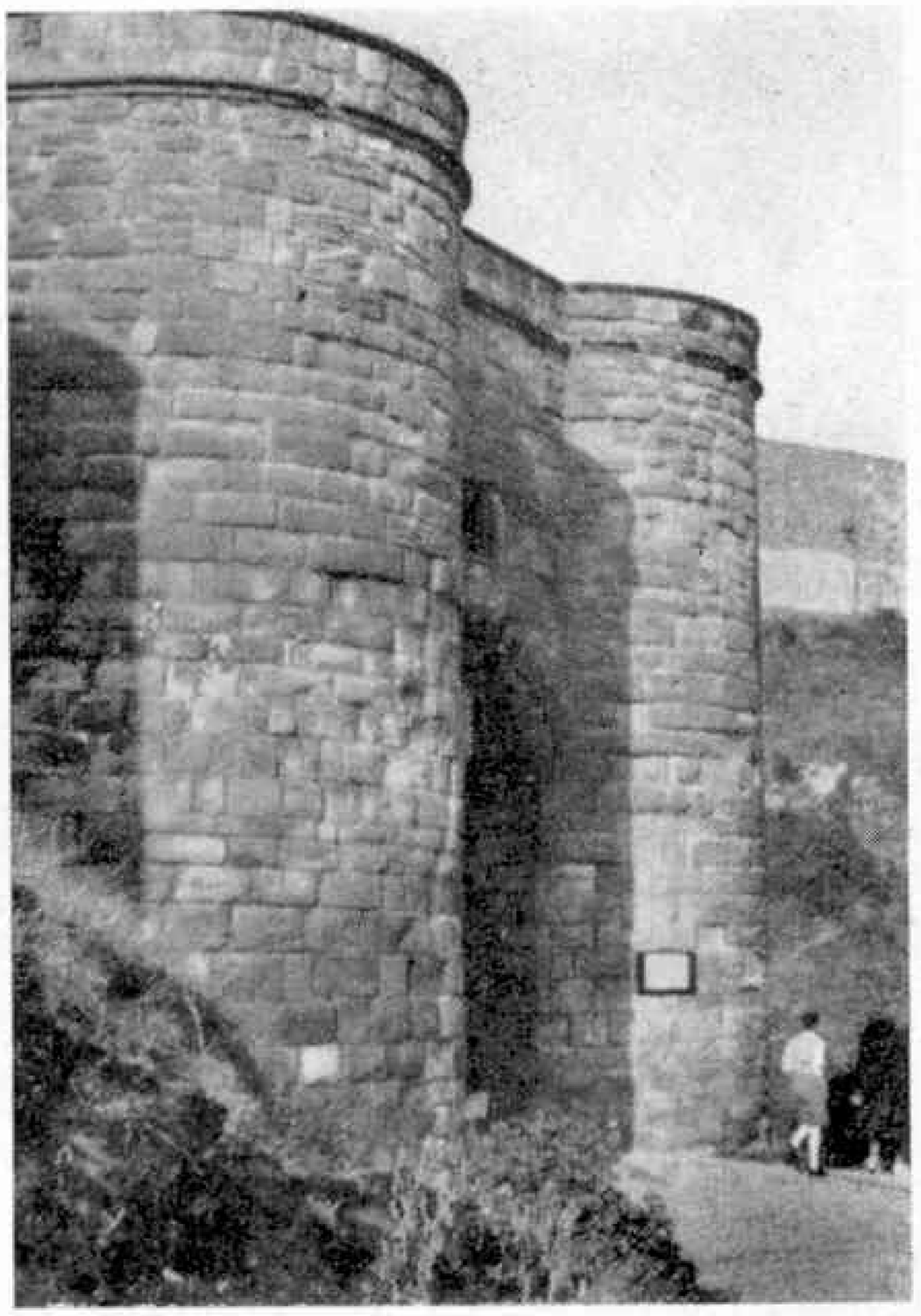
When this Yorkshire stronghold was owned by the Earl of Warwick ("Warwick the Kingmaker") it was the scene of splendid gatherings. Big feasts and medieval sporting events took place here, and with a little imagination you can picture the colourful affairs attended by knights and others of high rank.

Not many miles away, at Richmond in Swaledale, stands another impressive castle built 900 years ago. The main tower itself took 50 years to complete, so strongly was it fashioned. The most romantic part of the history of Richmond Castle tells of King Arthur and his knights. Legend relates that the famous monarch and his retinue lie sleeping in a cave beneath the fortress, and the story continues that a good many years ago an idle cobbler called Thompson found the entrance. Saying nothing to anybody he crept along a tunnel and reached a vast chamber where, to his utter amazement, he saw a company of knights slumbering. *Nearby he noticed King Arthur's sword, Excalibur, and he immediately got the hare-brained idea of carrying off the weapon as a souvenir. But no sooner did his fingers touch it than the knights stirred in their sleep, and the cobbler fled in terror. Although he got out of the tunnel safely, he was never able to find the entrance again.*

The same castle has a Golden Tower where a valuable hoard is reputed to await discovery, and still another belief here is that a secret passage connects the fortress with a ruined abbey some distance away.

In the North of England, too, you might

Among the buildings now protected as Ancient Monuments is Ashby-de-la-Zouch Castle.



Once the scene of a ruse which led to a victory for the Roundheads in the Civil War—Scarborough Castle gateway.

care to visit Scarborough Castle, especially if you are interested in an account of a strange incident there during the Civil War. The castle is cared for now by the Ministry of Works and anyone may visit it, but during the country-wide conflict 300 years ago it was held for the King. The Roundheads finally hit upon a ruse to capture it. They noticed that every market day a number of tradesmen were admitted to the castle to sell goods to the garrison. The defenders, therefore, did not think it extraordinary when rather more than the usual group of traders turned up one day, and although the hour was rather early for doing business, the tradesmen were allowed through the gateway.

Then they suddenly threw off their rustic garments and revealed themselves as Roundheads. In their baskets they did not carry articles for sale but weapons, and as a result of their trickery Scarborough Castle was quickly captured.

One of the most picturesque medieval castles in the Midlands is at Kirby Muxloe, near Leicester. Although the interior is in ruins, the walls and towers are still massive, and a deep, water-filled moat surrounds them. Yet the stronghold was never finished

The ruins of Spofforth Castle, near Wetherby, once the home of the Percy family.

by the builder, Lord Hastings, for he was beheaded as an alleged traitor before he could complete it.

He intended Kirby Muxloe Castle to replace the stronghold he had already built at Ashby-de-la-Zouch, a few miles away. That earlier castle also still stands and the ruins are similarly cared for by the Government. Ashby-de-la-Zouch Castle, in fact, comes into Sir Walter Scott's famous novel *Ivanhoe*, being the place where King John, in the story, went to watch a great tournament. Here, too, Mary, Queen of Scots, stayed for a time as a prisoner.

Other sovereigns who were entertained there in happier circumstances included James I and Charles I. The castle was particularly well equipped for catering on a lavish scale, and the kitchen, which is still to be seen, was one of the biggest ever built.

Tintagel Castle, Cornwall, like Richmond Castle, is associated with King Arthur. Tradition says he was born there and that a declivity in the ground there was formed by Merlin, the magician of Arthurian legend. This south-western castle is on the list of Ancient Monuments, and a number of others along the South Coast are also still preserved.

Nearly 900 years ago William the Conqueror landed on the South Coast—not, however, at Hastings, as some people believe. He and his Norman invaders came ashore near Pevensey Castle, which stands four miles from Eastbourne. The ruins as you find them today include part of a Roman fort, as well as the remains of a stronghold built by the Normans. In 1066 the sea came right up to the site; to-day the beach is some distance away.

In a corner of the ruins is a deep well where a piece of Roman well-rope was found in 1908. It was made of twisted bark, and was the only piece of Roman cordage discovered in Britain up to that time.

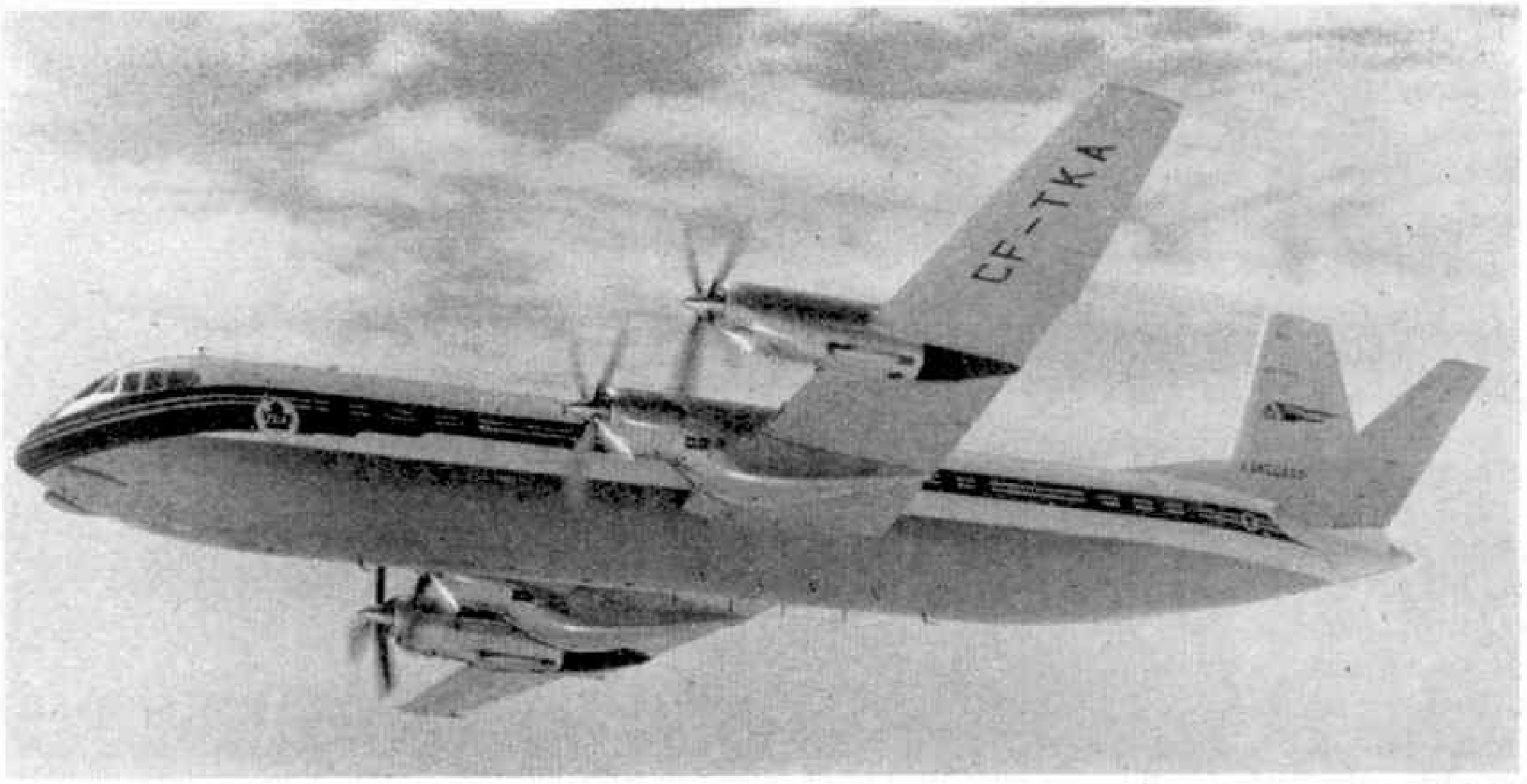
Pevensey Castle was one of the chief points of defence when the Spanish Armada was approaching England in 1588, and was equipped with a battery of cannons to repulse the invaders if they landed in the vicinity.

A Striking Outline

Spofforth Castle, between Harrogate and Wetherby, and Richborough Castle, in Kent, are other buildings now under the Government's care. The fortress at Spofforth, a striking outline against the sky, has a turret at one corner which gives it a Continental appearance. This castle was the home of the powerful Percy family, and they turned it into a great fortified mansion. One wall of the ground floor is formed by the natural rock.

The Romans founded Richborough Castle to protect the neighbourhood from pirates, and if you visit it you will be impressed by the thickness of its walls—more than 12 feet at some points.

Modern schemes to (Continued on page 539)



CF-TKA, the first of 23 Vickers Vanguard 952s for Trans-Canada Air Lines.

Tropical Trials for Airliner

By
John W. R. Taylor

ALTHOUGH the handsome Vickers Vanguard 952 airliner illustrated above will enter service early next year in Canada, it will first spend several weeks in Africa. The reason is that modern transport aircraft must prove themselves able to fly in all climates before getting their Certificate of Airworthiness, and this particular Vanguard has been chosen for tropical trials.

It will be flown during the hottest part of each day, so that Vickers' technicians can measure its performance. They will be specially interested in the take-off and landing runs recorded under such conditions, because the output of every type of aero engine falls off in high air temperatures and many airliners do not have sufficient reserve power to lift a full load out of small airfields in hot countries.

With four 5,545-h.p. Rolls-Royce Tyne turboprops, the Vanguard 952 should have no difficulty in carrying its normal load of 96 passengers anywhere in the world. Trans-Canada Air Lines expect it to be so efficient and profitable to operate that they have increased their order from 20 to 23 aircraft. Another 20 Vanguard 951s and 953s, with 4,985 h.p. Tynes, will be flown by B.E.A.

AIR NEWS

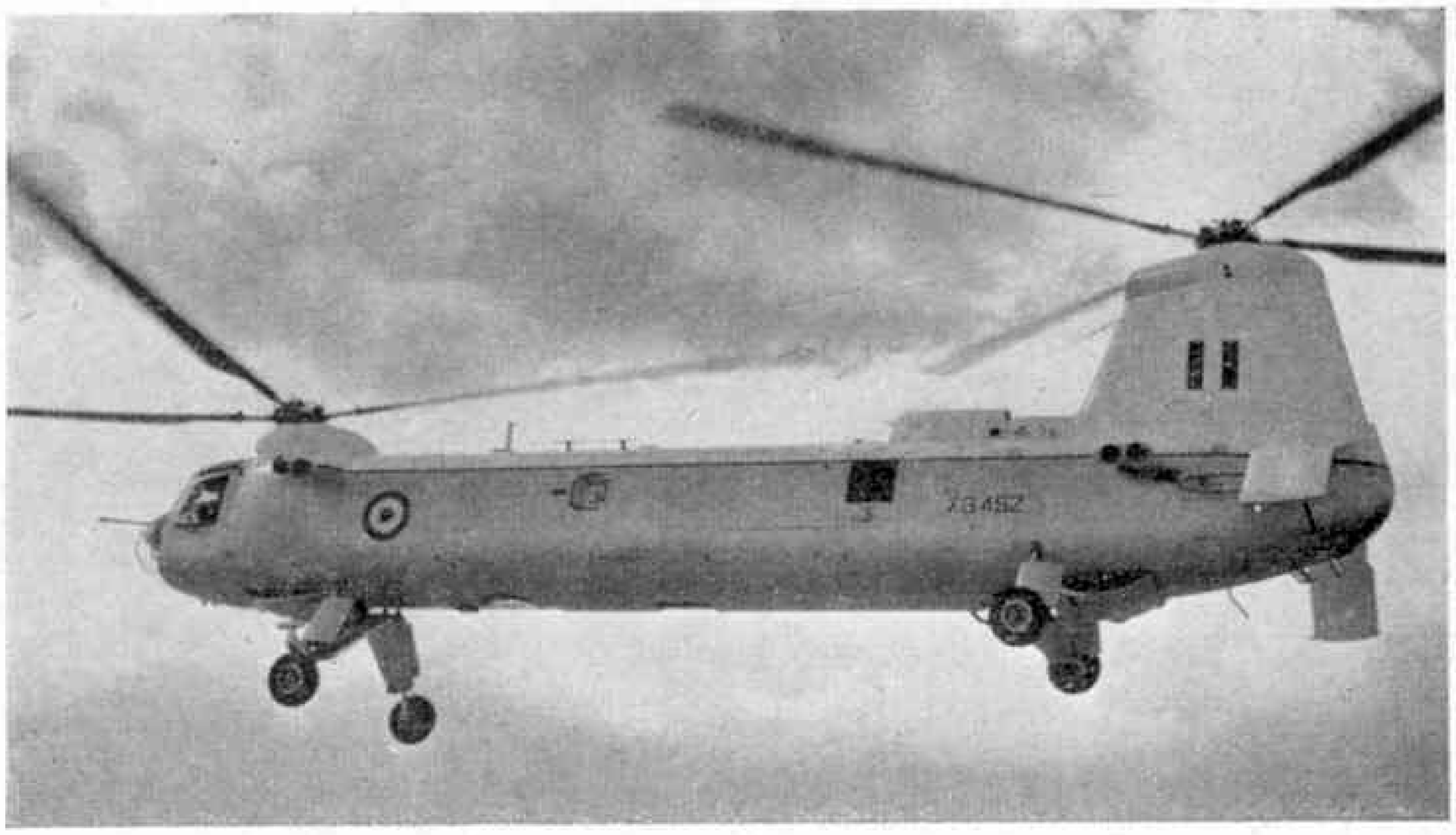
U.S. Supersonic Bomber

One of the big surprises of the U.S. defence budget early this year was a proposal to abandon development of the supersonic North American B-70 Valkyrie as a bomber. All contracts for advanced radar bombing, navigation and other operational systems were cancelled and North American were left with an order for only two prototypes. These might have been scrapped also, but for the fact that they could solve some of the problems of designing and building a supersonic airliner.

Now the U.S. Government has changed its mind and has decided to spend over £100 million on developing the B-70 as a front-line bomber, although there is no intention of placing a production contract yet. This move shows that the piloted bomber is by no means dead in an age of long-range missiles. In fact, it would be difficult to think of a more formidable weapon than the tail-first delta-wing B-70, which will cruise at 2,000 m.p.h. and will be armed with 1,000-mile-range Sky Bolt air-launched ballistic missiles.

Rotary-Wing Records

While on its way to Idris in North Africa



A close-up of the Belvedere helicopter in flight. The tail surfaces are of new design.

for tropical trials, a Belvedere helicopter of the kind illustrated here, has set up two point-to-point speed records. It flew the 980 miles from London to Rome in 8 hours 13 minutes, including stops, and the 1,405 miles from London to Malta in 12 hours 6 minutes. Average speeds were 118 m.p.h. and 115 m.p.h. respectively. Excluding stops, the average speed over the entire route was 130 m.p.h., which is unusually high for a helicopter.

Until Westland took over Saunders-Roe, Fairey Aviation and the helicopter division of Bristol, the Belvedere was known as the Bristol Type 192. As can be seen in the illustration it is a tandem-rotor aircraft, powered by two 1,650 h.p. Napier Gazelle shaft-turbines. Special cross-shafts in the transmission system ensure that if one engine fails the other will drive both rotors. The changeover to single-engine operation is completely automatic and takes only two seconds, after which the helicopter can return to base and land safely even with a full load.

As a transport the Belvedere carries up to nineteen fully-equipped troops, 6,000 lb. of freight or twelve stretchers, a medical attendant and two sitting casualties. Its rotors have a diameter of 48 ft. 11 in. and its loaded weight is 18,500 lb.

Sabena's Air Taxis

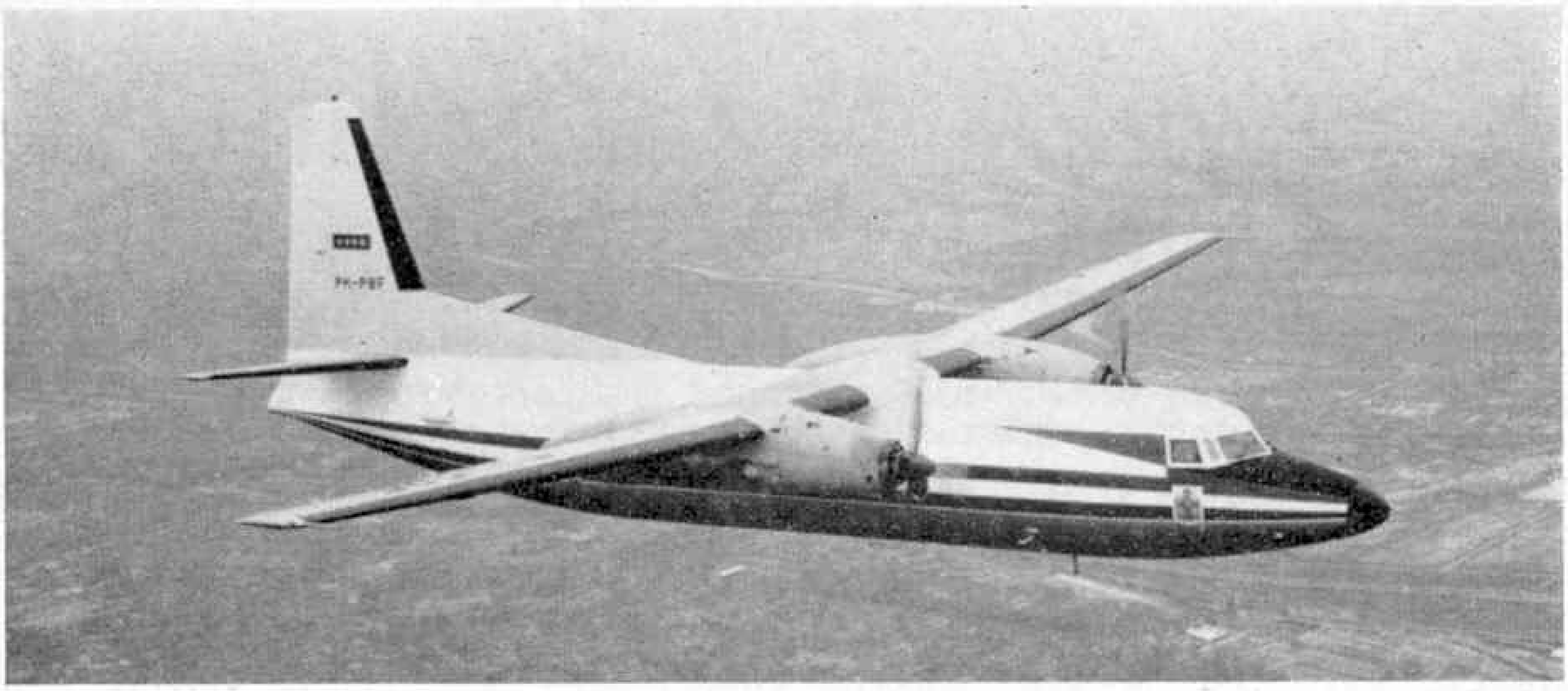
Having already pioneered international helicopter services, Sabena Belgian World Airlines have now started an air taxi service which should prove extremely useful to businessmen and tourists. Passengers wishing to visit places not on the Sabena network can arrange to have a twin-engined Cessna 310 taxiplane waiting for them at the airport at which they land. They can then travel where they like and when they like, in luxury, at 194 m.p.h. "chauffeured" by a fully-trained airline pilot and radio officer. There is a fixed price per mile, which is the same for one, two or three passengers.

The hovercraft baggage container floats up the loading ramp of an aircraft. The air hose connected to the unit can clearly be seen. Trans-World Airlines picture.

Baggage Travels on Air

The latest idea adopted by Trans-Worid Airlines to speed the turn-round of their jet airliners is to pack passengers' baggage in miniature hovercraft which can be "flown" up a loading ramp into the aircraft.

Known as the Douglas Glide-Aire, the hovercraft consists of a container shaped to fit snugly into the airliner's freight-hold and capable of carrying over half a ton of luggage, equivalent



There is a graceful, as well as a regal, look about the Fokker Friendship illustrated here. The picture is by courtesy of the Royal Netherlands Aircraft Factories.

to about 30 large cases. It is loaded in the air terminal and towed out to the aircraft on a trolley. There, an air-hose is connected to it, and it travels up the ramp and into the freight-hold on a cushion of air, guided easily by one man. Once it is in place, the air-hose can be disconnected and used to fly eight more Glide-Aires into position to fill the hold.

"Man-in-Space" Moves

McDonnell Aircraft have begun delivery of the Mercury manned satellite capsules, details of which were given in the November 1959 issue of the *M.M.* By the time you read this, one of the capsules will probably have been fired down the Atlantic missile range, using as a booster the U.S. Army's "Old Reliable" Redstone missile. If all goes well, a monkey will travel in the second or third capsule launched in this way, and one of the seven American "space-men" will ride in the fourth. The journey will take him 120–130 miles down-range, and he will experience some five minutes of "weightlessness."

Meanwhile, it is hoped that another full-scale capsule will be launched into orbit by an Atlas booster, and recovered successfully within a few weeks. Next step after that will be to send a chimpanzee on an orbital flight early next year. If he gets back safely after a three-orbit, four and a half-hour journey, a man will take his place and the era of space-travel will have opened. Unless, of course, a Russian astronaut opens it earlier!

Royal Friendship

The Fokker Friendship, illustrated at the head of this page, may not look much different from all the other airliners of this type in service throughout the world; but it is a very special one, being equipped as the personal air transport of Holland's Royal Family. Prince Bernhard himself, a skilled and experienced pilot, will probably fly it on many occasions. Designed to replace the veteran DC–3 Dakota, the Friendship has been ordered so far by 56 airline operators, governments and companies in nineteen countries. A total of 105 of these 'planes had been built by Fokker in the Netherlands, and by Fairchild in America, by August this year, when Friendships had already logged about 200,000 hours of airline flying. Orders at that time totalled 164 and were increasing almost every week.

R.A.A.F. Rainmakers

When a Dakota of the Royal Australian Air Force landed at its base at Richmond, N.S.W., recently, the rain was coming down so hard that its crew had to make a dash for shelter. It served them right, for they were responsible for the rain!

Australia sometimes suffers so severely from drought that the R.A.A.F. has been studying the possibilities of rain-making for more than thirteen years. The first aircraft used for the job, back in 1947, was a Liberator bomber. Whenever suitable clouds appeared it took off and "seeded" them with 200 lb. of "dry ice", while a Beaufighter cruised below to report the results.

Rain fell on several occasions, so it was decided to try another technique to see if even heavier showers could be produced. This involved "electrocuting" clouds with the aid of a Lincoln bomber, which flew into layers of cloud at *(Continued on page 539)*

"*TWINS*" OF THE SOUTH AYRSHIRE COALFIELD

THE South Ayrshire coalfield occupies a semi-circular basin running inland from Ayr Bay, Scotland. The main centres of production are round Dalmellington in the south-west, and Drongan in the centre.

Two main railway lines run through the area, roughly from north to south. One is the Glasgow-Carlisle line, of the former Glasgow and South Western Railway, known locally as the Nith Valley line. This runs to the east of the coalfield, through Mauchline and the Cumnocks.

By Derek Cross

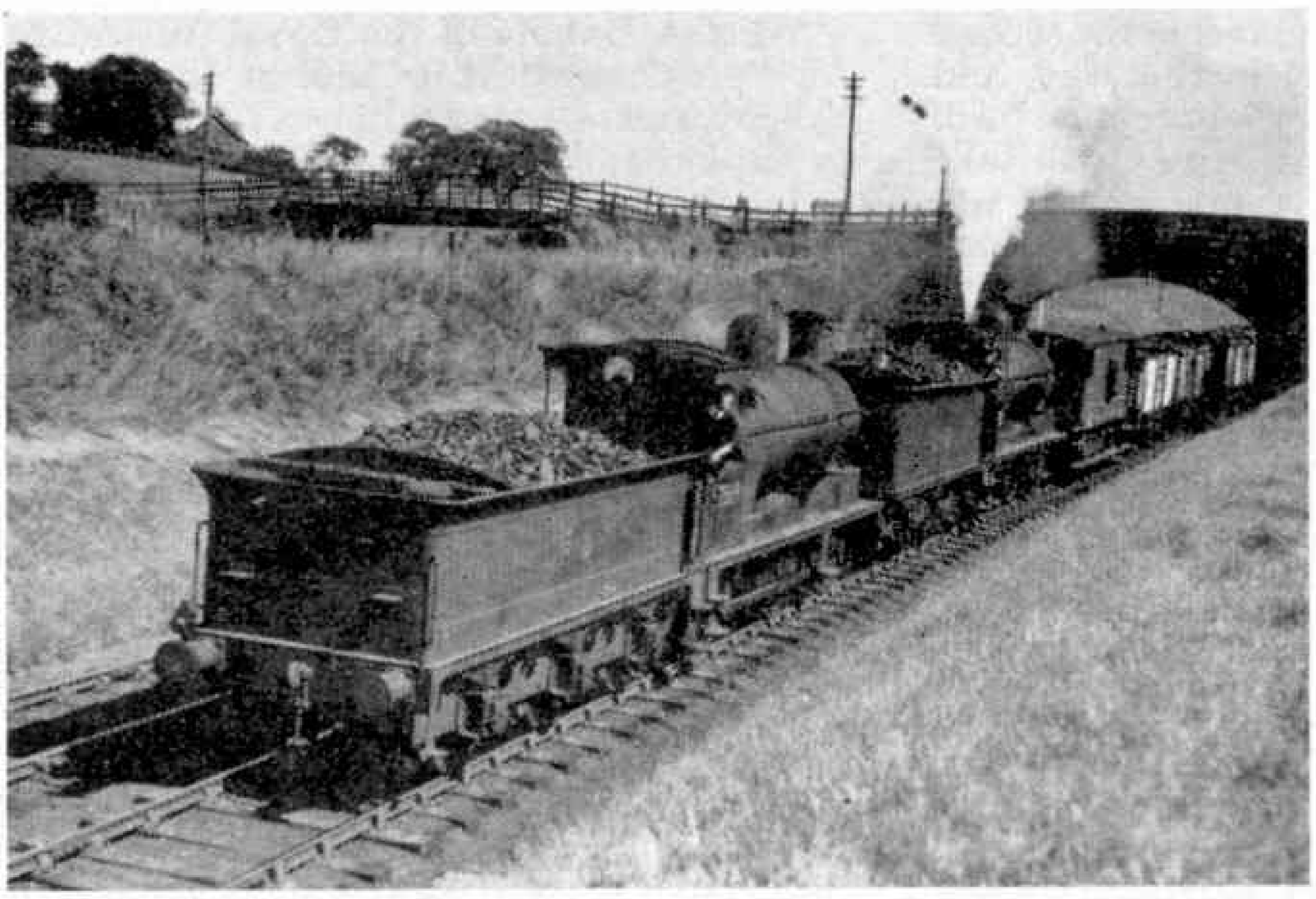
The other is the Glasgow-Stranraer main line, which runs along the coast to the west of the coalfield before turning inland at Ayr to follow the Doon and Girvan valleys, and then rejoins the coast again at Girvan. This line, although originating as the Ayr, Girvan and Stranraer, a private company, was soon taken over by the G. & S.W.R.

Between these two main lines the "Sou' West" built several smaller branch lines running in a general east-west direction. Most of these were designed to exploit the coal measures and their attendant small mining towns and villages. The Ayr and Mauchline line was built to give Ayr direct connection with the south; but, apart from the special trains which run on Saturdays during summer to the holiday camp at Heads of Ayr, it is now used only for goods traffic. This includes fairly heavy coal traffic from the Cumnock area to Ayr Harbour.

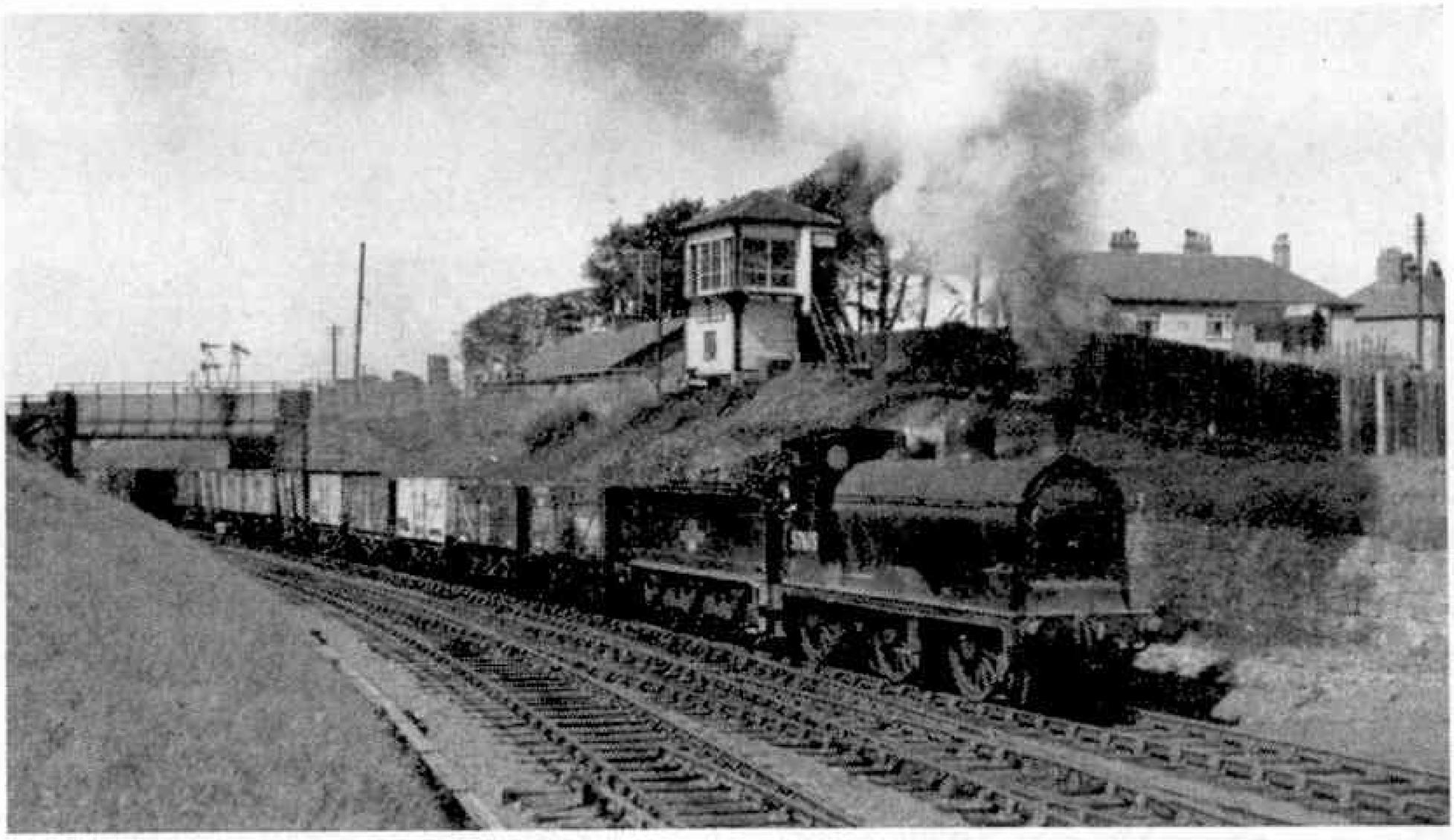
Most important line

Among other branches that have survived, at any rate until fairly recently, is the Ayr and Muirkirk branch which leaves the Ayr-Mauchline line at Annbank Junction. This is undoubtedly the most important of all the lines serving the South Ayrshire coalfields. Although built as a single line it was intended as a passenger carrying line, and from the beginning and up to the end of the war carried two through trains to and from Edinburgh (Princes Street) via Muirkirk, Carstairs and Midcalder every day. This working entailed reversal at Lanark and involved at least a three hours' journey. In addition there were some local trains between Ayr and Muirkirk.

Now, all passenger trains have been withdrawn and the line is open only to goods traffic. One rather unexpected result of this has been that although the track is still complete there are no through workings over it at all. The eastern end, serving two small pits near Dumfries House, about two miles west of the disused station at Old Cumnock, is worked by a daily goods from Muirkirk. The western end, to and from the Drongan



"The Twins" **coal train, so called because it is double-headed, on the way from Drongan collieries to Ayr in charge of two ex-Caledonian McIntosh 0-6-0 locomotives.**



A train of empty wagons takes the Mauchline route at Annbank Junction, with McIntosh 0-6-0 No. 57615 at its head.

area, serves several big pits, including one opened about a year ago, and boasts three or four coal trains a day to Ayr Harbour.

This line has two branches, one of which goes off immediately west of Drongan and once doubled back to join the Ayr-Dalmellington line about two miles from Dalmellington. For some years the line has been abandoned except for about a mile of track at each end used for storing surplus coal wagons.

The other branch leaves the Ayr-Mauchline line at Mossblown Junction, about a mile west of Annbank, and heads north, serving Mossblown Colliery, one of the biggest in the district. The line continues north-north-west and skirts Prestwick Airport before rejoining the Glasgow-Ayr main line half a mile north of Prestwick Station, but the junction faces in the Ayr direction so that coal trains from Mossblown can run direct to Ayr Harbour. At one time this was a triangular junction, but the arm facing towards Glasgow has been removed.

Engineering works on many of these branch lines are comparatively heavy and include some very handsome brick and stone viaducts, the most notable of which are respectively the Dalrymple Viaduct on the Dalmellington line, the short but very pretty viaduct over the Doon near Alloway on the Heads of Ayr line, and the Stair Viaduct over the Ayr between Annbank and Drongan. This last-named viaduct, although not as high as the well-known one over the Ayr at Ballochymle on the Nith Valley Line, is considerably longer. In addition there are several short but high viaducts on the Ayr-Mauchline line.

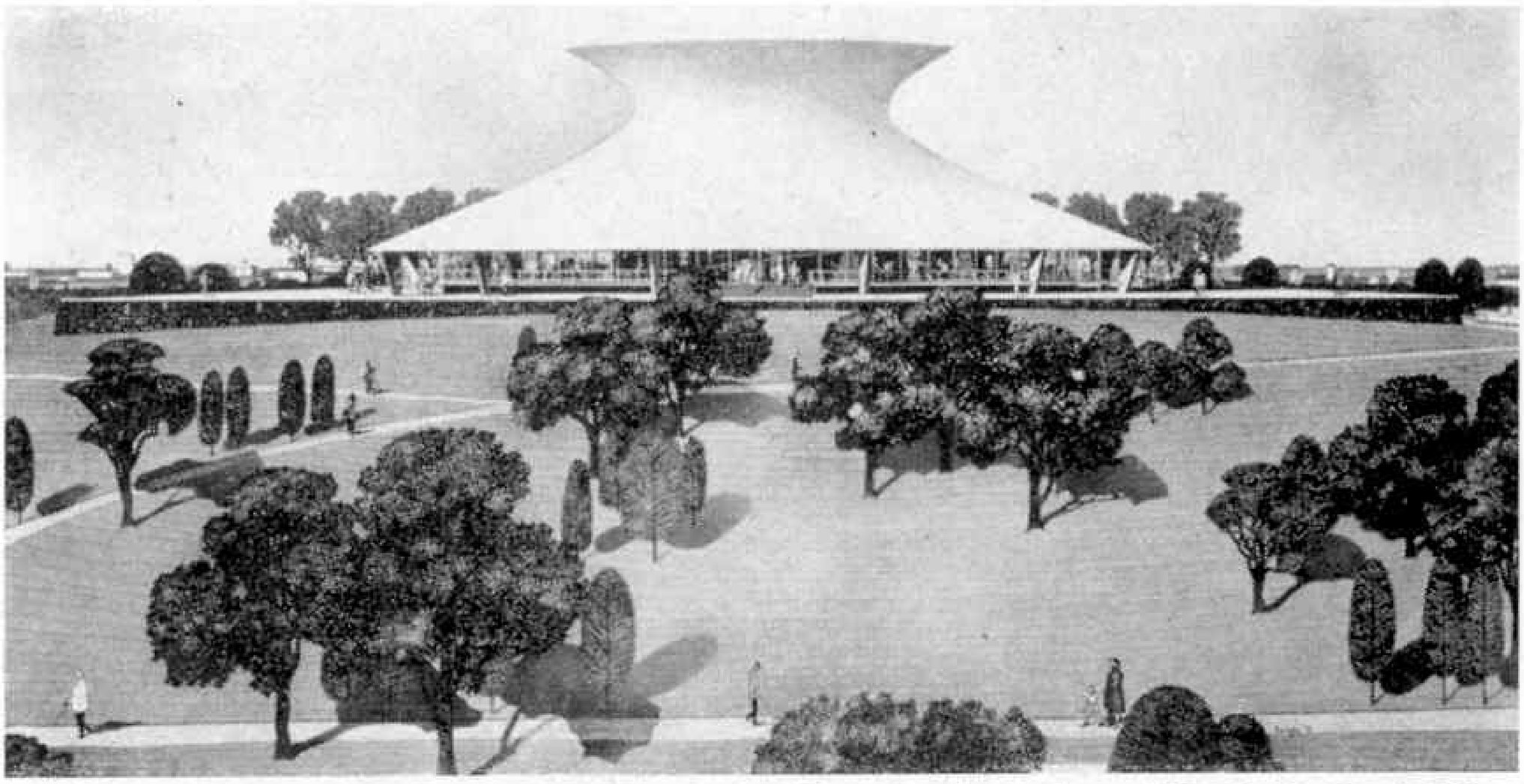
Traffic working on all these lines, most of which are very steeply graded, is done by engines and crews from Ayr shed on an out-and-back basis. The one exception to this is the Muirkirk-Dumfries House turn.

Apart from recent incursions by B.R. Standard 2-6-0's, this line is worked entirely by ex-Caledonian 0-6-0s of both 2F and 3F power classifications as the Stair Viaduct does not permit anything heavier to be used. During my acquaintance with the line, a little while ago, the general pattern of working was that three trains of empties left Ayr in the early morning. One ran only as far as Mossblown Junction and then reversed to shunt the Mossblown pit, afterwards returning to Falkland Junction via Prestwick. This turn was repeated once or twice more during the day as traffic required. The two other empty wagon trains ran to Drongan and their engines shunted pits there. One of these engines remained up there all day, usually returning with a loaded coal train about 4 p.m.

Name everyone uses

Meanwhile, at about 10 a.m., another empty train ran from Ayr to Drongan, the engine returning to Ayr about mid-day on a very heavy coal train coupled with the engine of the second train that had made the earlier trip.

One of our photographs shows this train, known locally as (*Continued on page 539*)



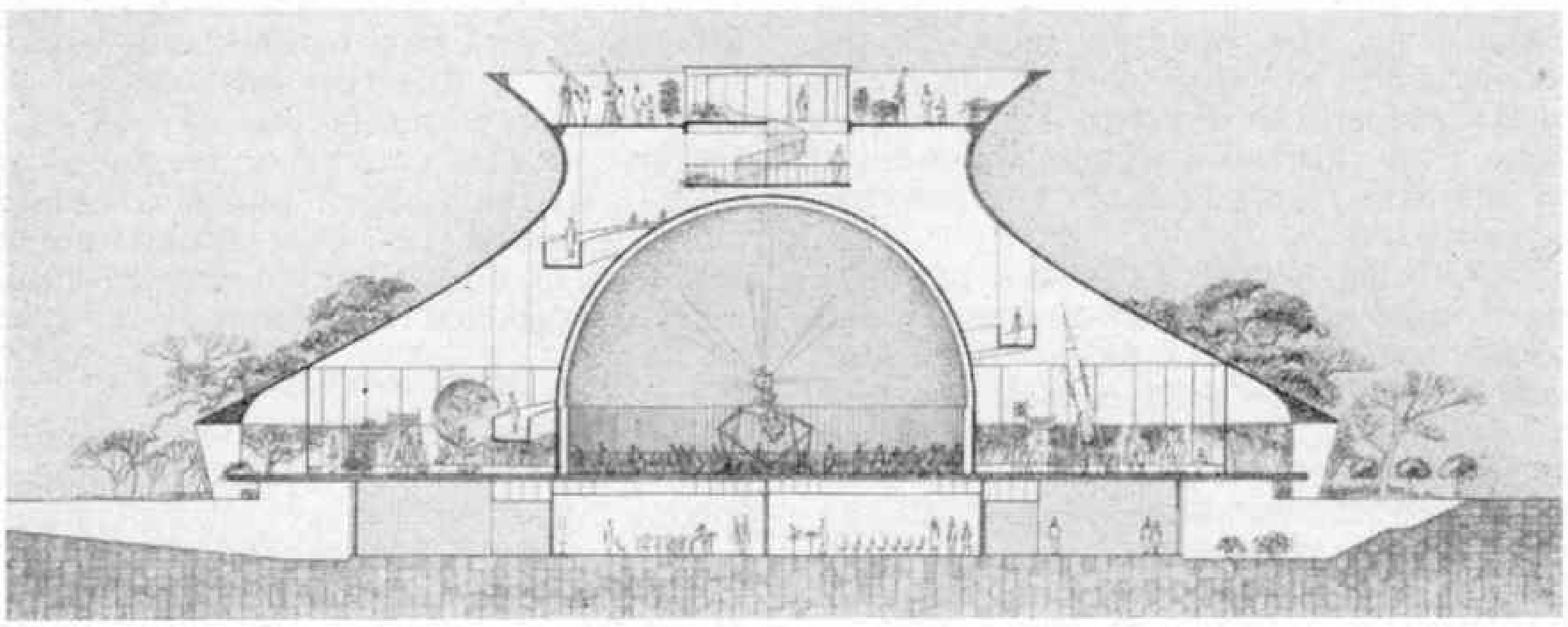
The new planetarium will be a circular building raised above the ground on columns.

Planetarium That Won Design Award

A CIRCULAR glass wall more than 500 feet long, which extends completely round the building, will be one of the features of the new million dollar planetarium to be built at St. Louis, Missouri. This striking building, which won the Progressive Architecture Design Award citation for 1960, will stand on a bluff overlooking a lake in the south-eastern part of the city's forest park and will be visible to motorists who daily pass along a nearby highway.

The planetarium will bring to grown-ups and children alike the fascinating story of the stars and the Universe, and the principles of astronomy will be explained at a level which all can understand. Within the planetarium itself will be a circular auditorium, to seat 400 people, enclosed in an aluminium dome on which images of the constellations, as they appear at any given time, will be projected. Sun, moon and planets will be visible on the star-studded dome. Some of the phenomena that can be shown and explained will include the annual travel of the sun, the direct and retrograde motions of the planets, and the phases of the moon.

A broad and flexible exhibit area of 9,000 square feet will provide ample space for a changing array of items dealing with space travel, astronomy and the heavenly bodies. A winding ramp encircling the dome will offer a bird's eye view of the exhibits and provide access to an observation platform 45 feet above ground level. Hellmuth, Obata & Kassabaum, Inc., of St. Louis, are the architects for this project.

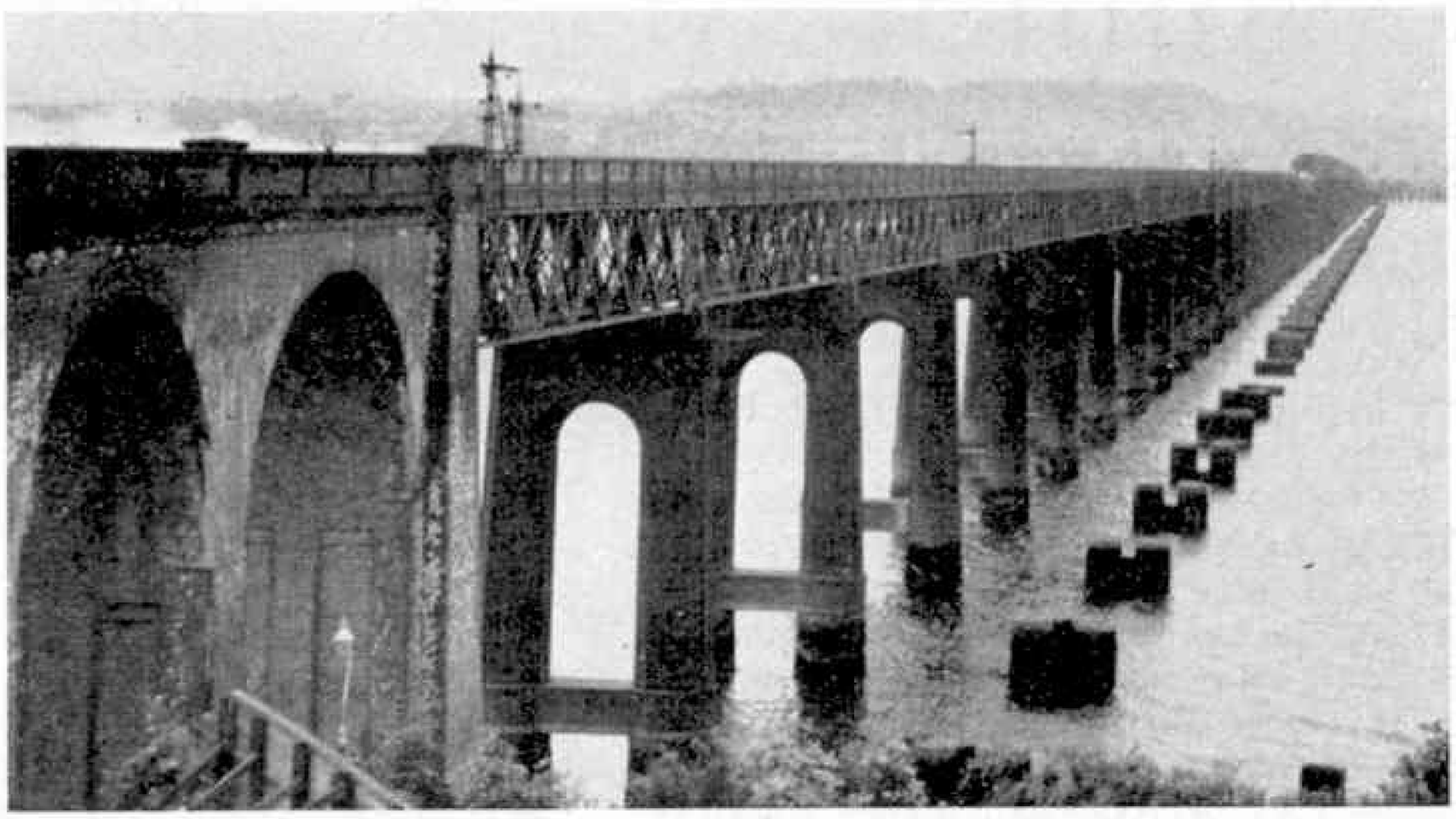


A sectional view of the proposed planetarium showing, among other features, the circular auditorium in which images of the stars will be projected. Both the pictures on this page are by courtesy of the McDonnell Aircraft Corporation.

From Our Readers

This page is reserved for articles from our readers. Contributions are invited on any subject which the writer feels is of special interest. These should be written neatly, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

A DISASTER RECALLED

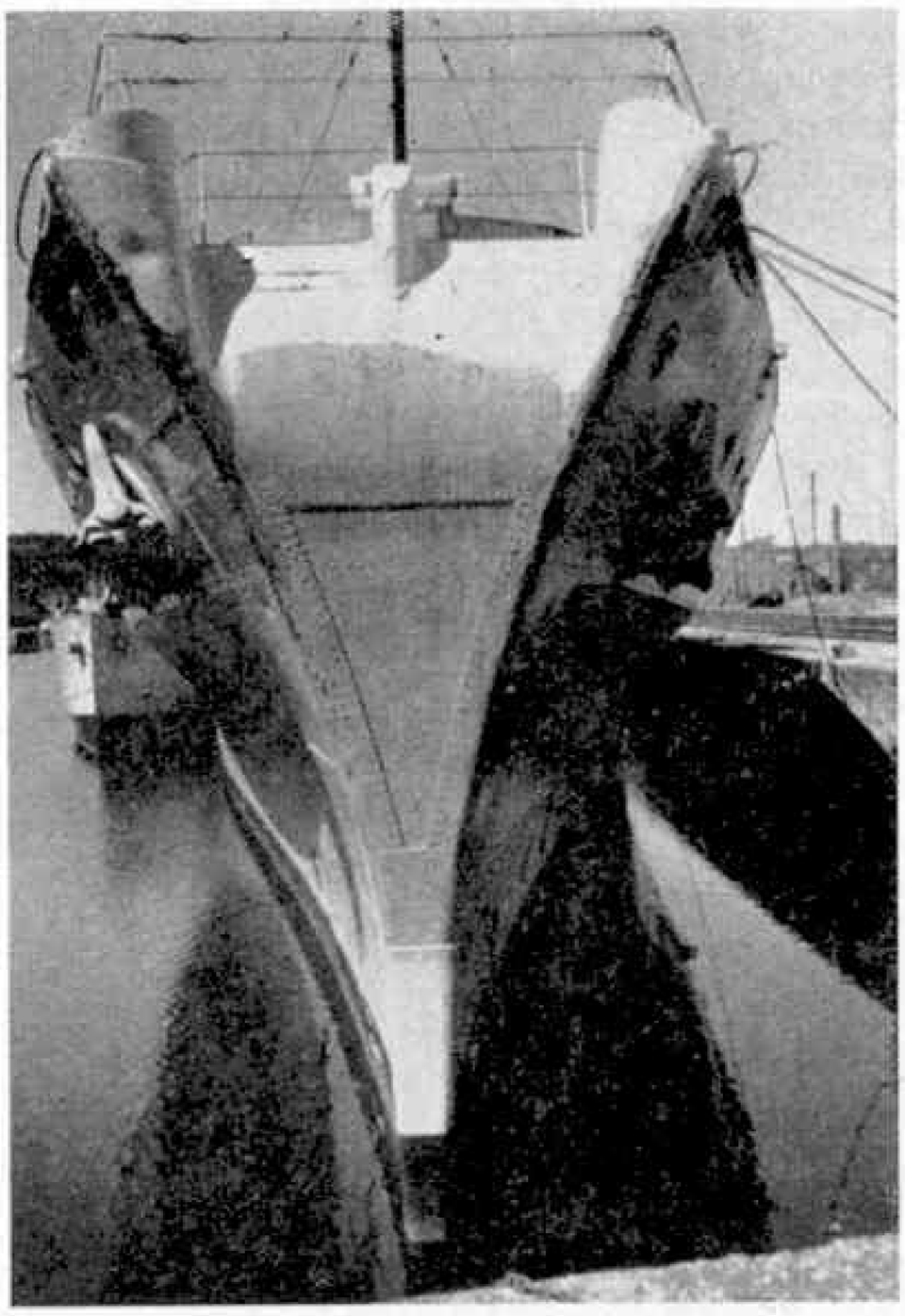


SINCE railways began, I think you will agree, one train mishap stands out above all others—the Tay Bridge disaster of Sunday December 28, 1879, when the 5.20 p.m. Burntisland to Dundee (Tay Bridge Station), consisting of North British engine No. 224, five passenger coaches and a guard's van, was flung into the swift-flowing Tay, owing to the collapse of the high girders in the centre of Sir Thomas Bouch's two-mile bridge. As a result, some 75 passengers and railway staff lost their lives. Alongside the present Tay Bridge, built at a cost of £650,000 in 1888, with an ample margin of safety, are the remains of the piers of the former structure. A few weeks ago I visited lower Tayside and my photograph, taken from Wormit Station, shows the present bridge, with the stumps of the single-line old Tay Bridge alongside.

Engine No. 224 was actually recovered from the river and ran until 1924. She was known by train crews as "The Diver", but never crossed the Tay again Metal recovered from the old bridge was sold as scrap to a firm of English locomotive engineers, who built from it a number of small engines for use in Southern Spain.

CYRIL R. ROWSON (Liverpool 12).

The Silent Fleet



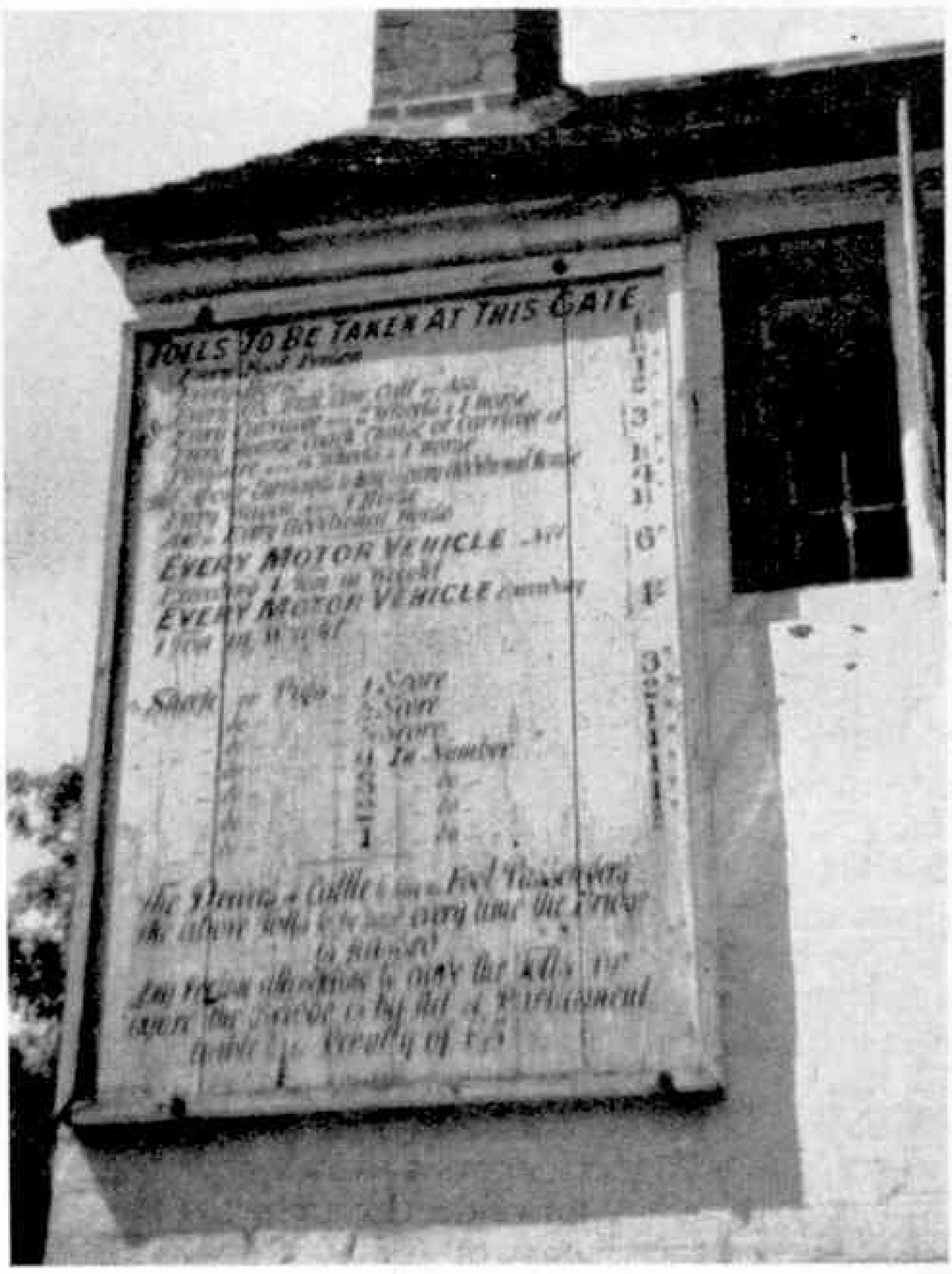
This photograph shows the bows of H.M.S. *Guardian*, biggest ship of the "mothball" fleet laid up at Penarth Dock in South Wales. She is a submarine net layer built in 1932.

Other ships laid up here have included destroyers, frigates, corvettes and minesweepers. Nearly all have served in the war, many in the battle of the Atlantic, and some have been sold to the Commonwealth and foreign countries. All these ships have their guns, torpedo tubes, and deck machinery "cocooned", that is, covered with an airtight plastic skin sealed and weather-proofed to prevent moisture corroding the metal surfaces. All other entrances, funnel outlets and doors are similarly sealed. These ships, however, are now being towed away.

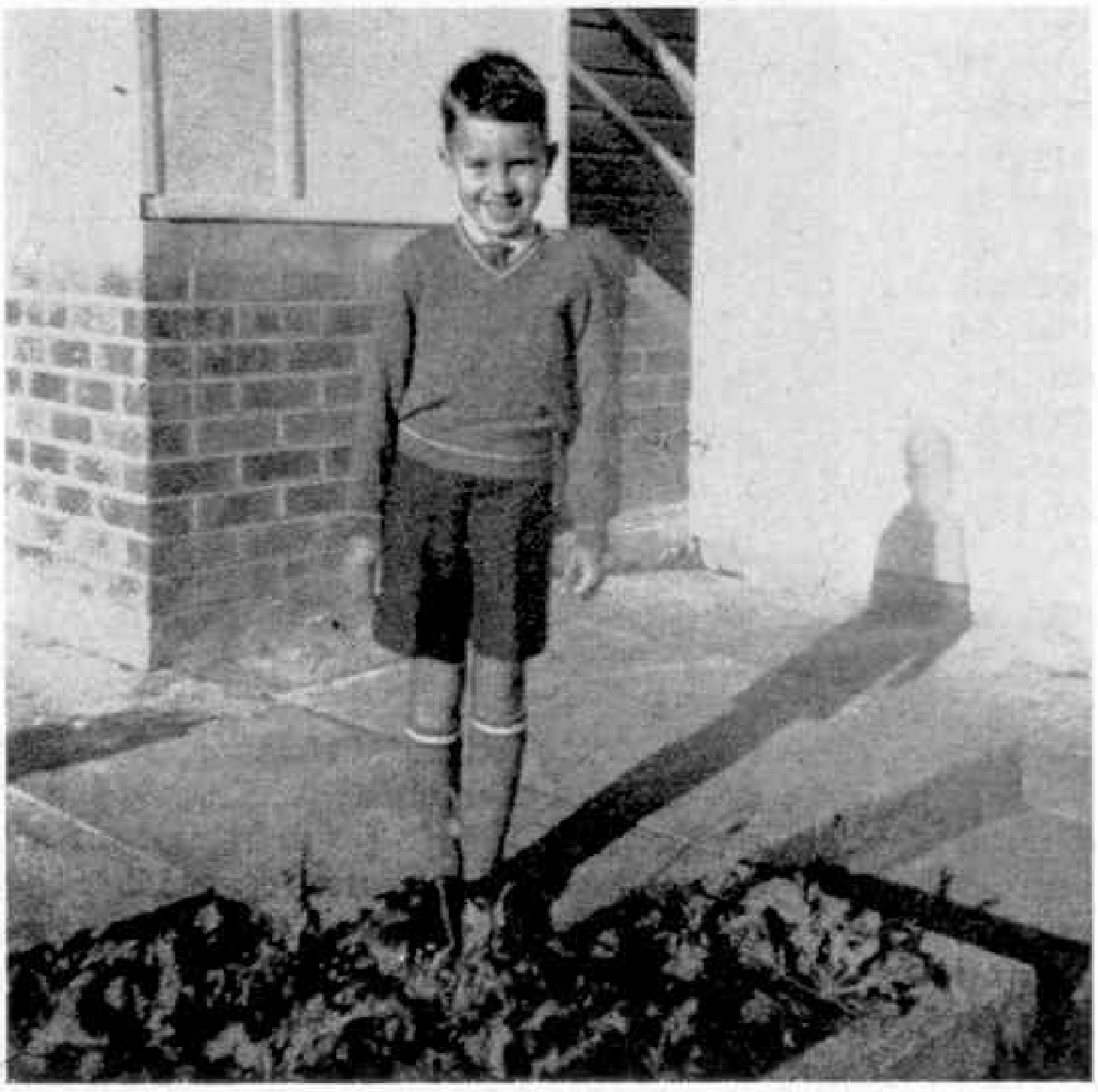
E. H. MORONEY (Penarth).

MECCANO MAGAZINE

Junior Section



THE photograph on the right, taken by 10-year-old Brian Harvey of Basingstoke, Hampshire, shows the list of tolls exhibited at the approach to the bridge over the River Thames at Pangbourne, Berkshire. It reveals a curious mixture of ancient and modern and reads: Every Foot Person, ½d.; Every Horse, 1½d.; Every Ox, Bull, Cow, Calf or Ass, 1d.; Every Carriage with 2 wheels and 1 horse, 2d.; Every Hearse, Coach, Chaise or Carriage of Pleasure with 4 wheels and 1 horse, 3d.; The Above Carriages to pay for every additional horse, 1½d.; Every Wagon with 1 horse, 4d., and for every additional horse, 1½d.; Every Motor Vehicle not exceeding 1 ton in weight, 6d.; Every Motor Vehicle exceeding 1 ton in weight, 1/–; Sheep or Pigs, 1 Score, 3d.; ½ score, 2d.; ¼ score, 4, 3 or 2 in number, 1d.; Sheep or Pig, 1 in number, ½d. The drivers of Cattle to pay as foot passengers. The above Tolls to be paid every time the bridge is passed. Any person attempting to evade the Tolls or injure the Bridge is by Act of Parliament liable to a penalty of £5.



Australian enthusiast

The lower picture shows a young Meccano enthusiast who lives in New South Wales, Australia.

He is Phillip Jay of West Kempsey, who began to use Meccano before he learned to write properly, for he is still only in the second class in the infants' school.

His father, Mr. Alwin Jay writes, "While I do not suppose it is any record, Phillip made his first Meccano model some two years ago, using my original Set which is still in good working order after 25 years." Which is a very great tribute to Meccano.

DINKY TOYS NEWS

By THE TOYMAN

Taxi And Police Car In The U.S. Style

ONCE again summer is over—all too soon for many folk, I know—and the long dark evenings are back with us for many months so that most Dinky Toys activities will have to be carried on indoors.

Many of you will be adept by now at creating your own layouts; pictures in these notes from time to time show how expert at this some of our collectors are. For those who are just entering into the fascinating realms which Dinky Toys can offer as a hobby, I will have more to say later on. But first, I want to mention two grand new models which all enthusiasts will want to add to their collection—models which will enable them to vary their road schemes from purely British or continental scenes to those found in America.

Sleek and colourful

The two latest Dinky Toys to come from the Meccano Works have an American origin—a sleek, colourful, U.S.A. Taxi (or cab, as the Americans call them), and a dashing U.S. Police Car. Both these fine new miniatures are illustrated here and you can see how very realistic they look equipped as they are with windows, seats, steering wheel (fitted on the left of the front panel) and the popular four-wheel suspension.

The taxi is a splendid model of one of the types of roomy, fast-moving vehicles to be found on the streets of New York. It has a bright two-tone finish—chrome yellow body and bright red roof—and is given a fine air of realism by a neatly-moulded sign which carries the word "Taxi", and which is mounted in the centre of the roof towards the windscreen. The seats are cream.

The authentic touch

If you go for a ride in a New York taxi, you are always sure of the fare to be charged even before you enter the cab, for the tariff is displayed on the side of the vehicle. This final authentic touch has been applied to the Dinky Toys taxi at both sides of which, in the panels formed by the doors, are the words, neatly printed in red, "25c First, 5c additional 1/5 mile" which, of course, tells you that it will cost you 25 cents for the first fifth of a mile and five cents for each additional fifth of a mile after that.

The police car is another true-to-life American model wearing a splendid and dignified black gloss finish with white panels, on either side, carrying the word

The new U.S.A. Taxi is No. 265 in the Dinky Toys series.

Another thrilling new model No. 258, U.S.A. Police Car, has an imitation warning light and a radio aerial.

"Police". Police signs are also carried on the bonnet and the boot, and perhaps the most important feature is the imitation red warning light on the roof which makes the car look so important that it must surely demand priority wherever it is used on your layout. Finally, this new car, based on a De Soto chassis, has a neat radio aerial fixed just in front of the boot.

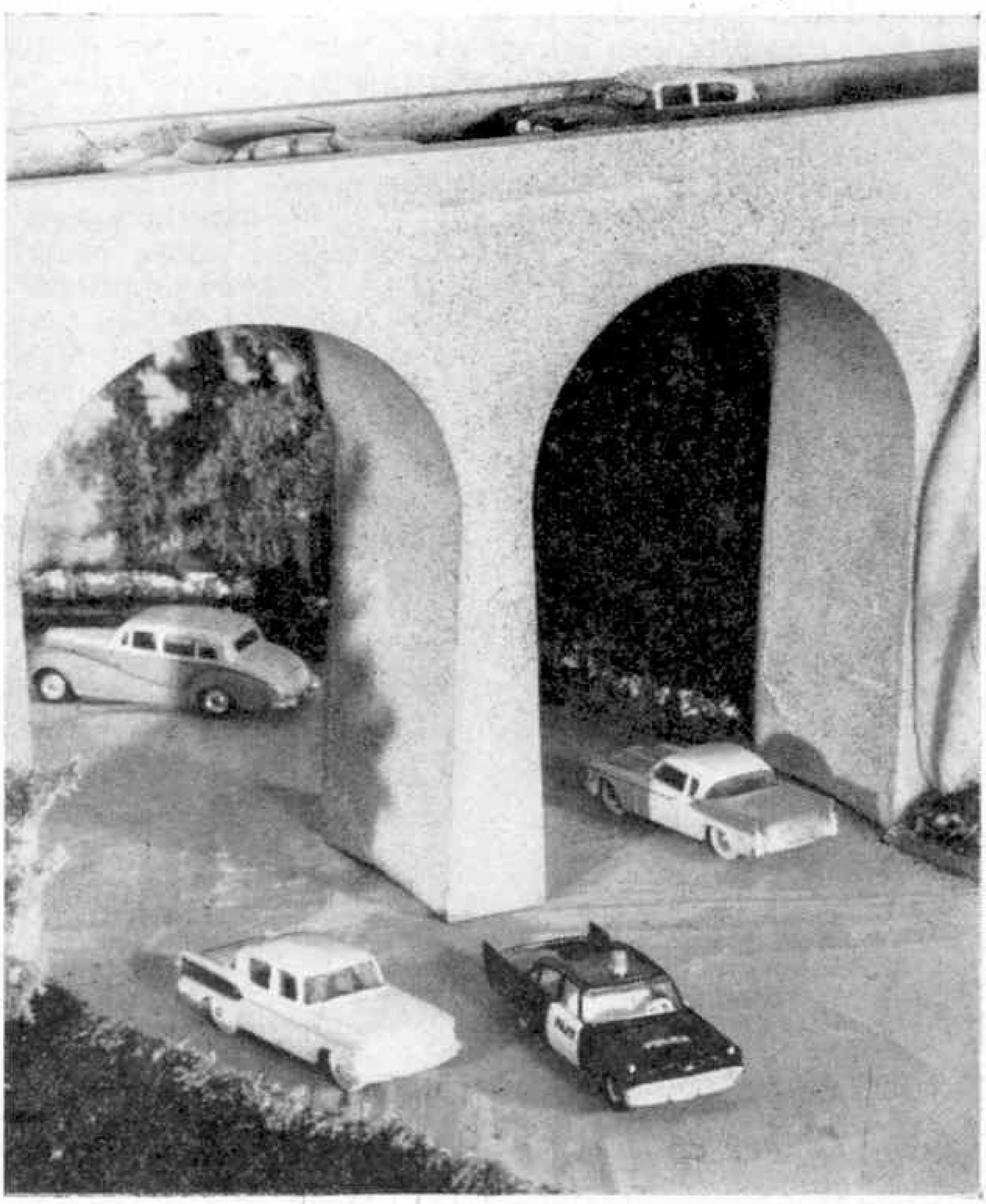
A common driving offence in any country today is speeding, and the photograph on this page depicts a scene often to be seen at almost any time of day in the United States. A police car has just overtaken a road hog and is forcing him to stop by cutting across his "bows" and, as you will realise, somebody is in for trouble! You may have noticed that even under these circumstances the police car obeyed the rules of the road by waiting until he had turned the corner and passed under the fly-over bridge before cutting in on the offender.

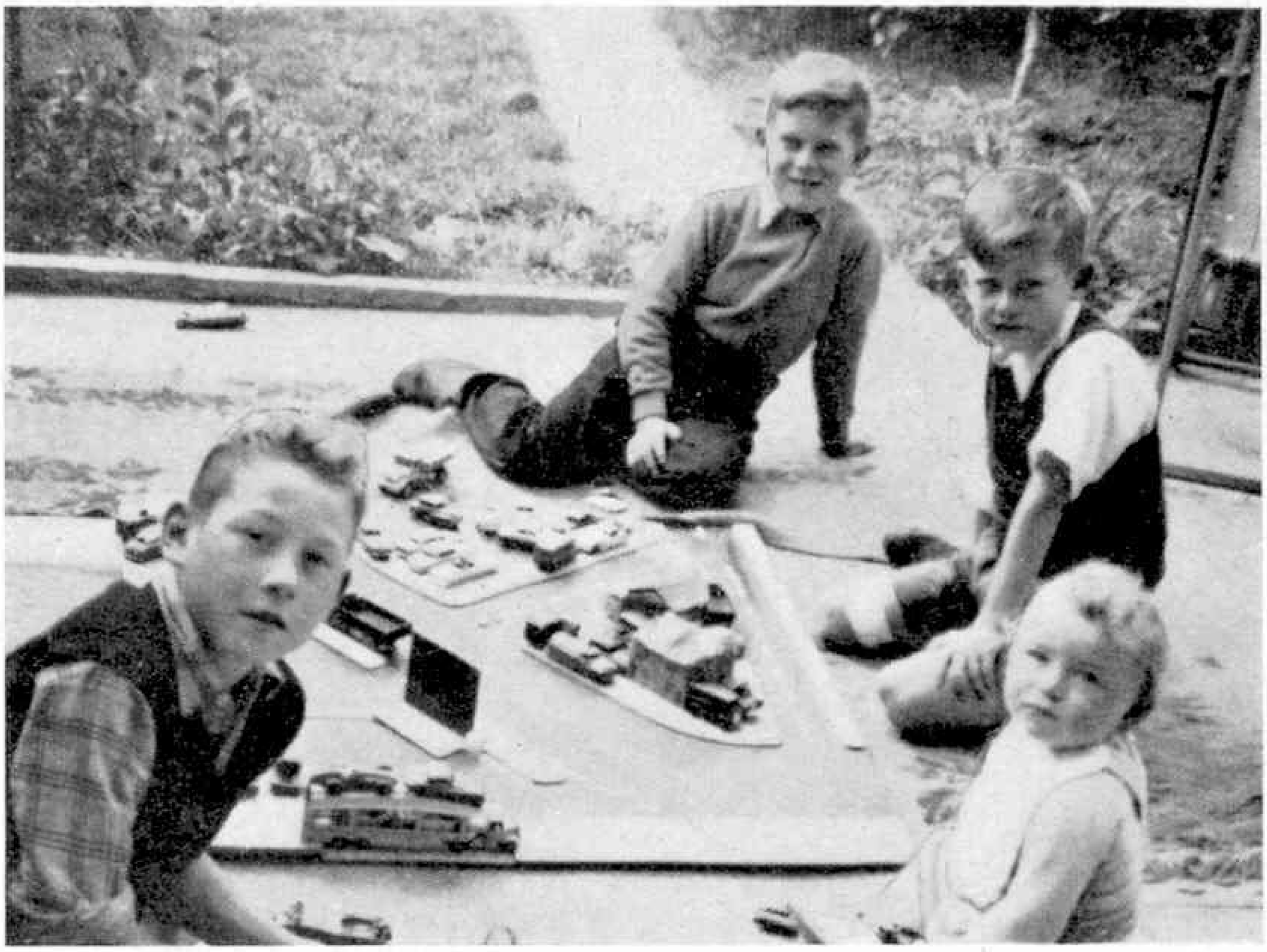
While on the subject of our latest models, I am sure you will be interested to know that the Healey Sports Boat, illustrated in these notes last month, is now available separate from its trailer. It is No. 797 on the Dinky Toys list and is available with either a red deck and cream hull or a yellow deck and cream hull.

Whenever the opportunity arises I like to publish photographs of Dinky Toys collectors and their layouts. This month I have selected the picture on page 513 which shows Philip and Steve Tucker, with their friends Alan Roberts and Philip Greaney, all of London, playing with their layout in the garden and, judging by their expressions, having a jolly good time. Which brings me back to the topic at the start of these notes.

The return of winter has its good points and bad points, whichever way you look at it, but it does mean that there is ample opportunity for you to make up interesting schemes indoors. These may be either of the temporary kind, simply laid out on the table or floor, or the permanent type in which roads and buildings are fixed to a hardboard base or a base of some other suitable material.

The law has been broken on the American highway. Cutting across the culprit to bring him to a halt is the new Dinky Toys U.S.A. Police Car.





Happy with their layout are these four young Londoners referred to on page 512. All are Dinky Toys enthusiasts.

Among recent winners of £2 monthly awards was William Phillips of Motherwell, pictured here.

Based on the real thing

It is a good idea to design your road system on the layout of real roads near your own home, with which you are quite familiar, and you can easily make simple buildings from pieces of cardboard glued together and coloured with water colours or poster paint. And, of course, if you or your brother or sister have a Bayko Outfit, you have a ready-made toy for giving you neat roadside buildings which can enormously enhance the particular reproduction of town or countryside that you may have in mind, for Bayko, attractive in the range of buildings it offers, and simple to use, is made to approximately the same scale as Dinky Toys.

DINKY RHYMES

No. 175 Hillman Minx

In chariot gold, the Pharaohs bold
Careered around the Sphinx;
They raised the dust, yet missed the thrust
that stamps the Hillman Minx.

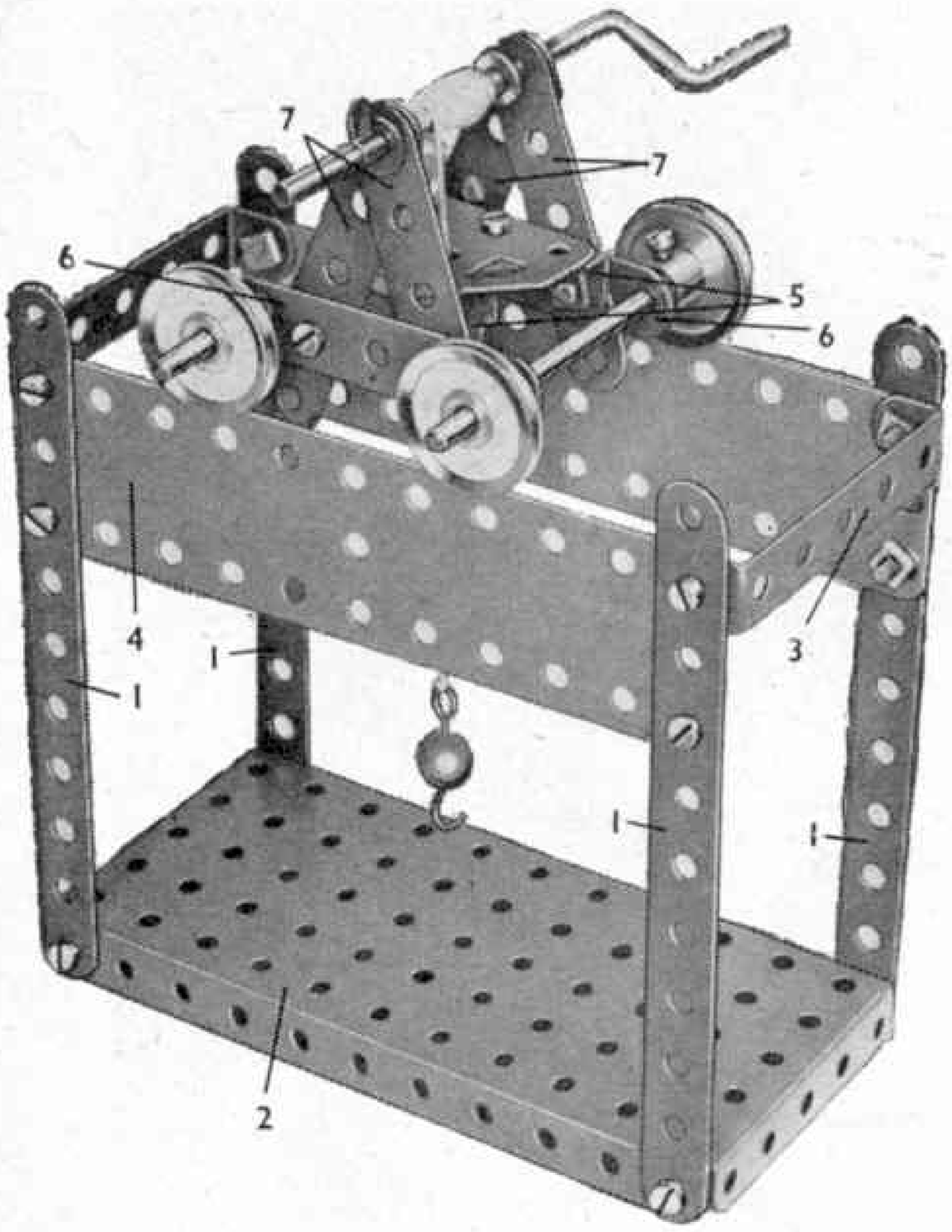


Fig. 1. A workable Gantry Crane that can be built from parts in Outfit No. 2.

Gantry Crane

Our first model this month is a workable Crane known as a Gantry Crane, which can be built from parts in Outfit No. 2. It is shown in Fig. 1.

The Gantry is supported by four $5\frac{1}{2}$" Perforated Strips 1 bolted to the corners of a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate 2. These are connected together by two $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips 3 and two $5\frac{1}{2}" \times \frac{1}{2}"$ Flexible Plates 4, the edges of which provide the running rails for the trolley. The hoist trolley is constructed from two Trunnions 5 and a Flat Trunnion bolted together, two $2\frac{1}{2}$" Strips 6 being secured to their lugs. The same bolts also hold $2\frac{1}{2}$" Strips 7, through the upper ends of which a Crank Handle is passed and is held in place by Spring Clips. The Crank Handle is fitted with a Cord Anchoring Spring to which is attached cord that passes through the centre holes of the Trunnions and is tied to a small loaded Hook. The trolley runs on four 1" Pulleys fixed on $3\frac{1}{2}$" Rods passed through the ends of the Strips 6.

Parts required to build the Gantry Crane: 4 of No. 2; 6 of No. 5; 2 of No. 16; 1 of No. 19g; 4 of No. 22; 4 of No. 35; 18 of No. 37a; 18 of No. 37b; 8 of No. 38; 2 of No. 48a; 1 of No. 52; 1 of No. 57c; 2 of No. 126; 1 of No. 126a; 2 of No. 189.

Spanner's Special Section for Juniors

Easy Model-Building

Three-Wheel Sports Car

The neat three-wheel sports car shown in Figs. 2 and 3 is quite simple in construction. The chassis consists of two $5\frac{1}{2}$" Strips 1, connected by a $1\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 2 and attached by Angle Brackets to a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 3. A *Magic* Clockwork Motor is bolted to the chassis as shown in Fig. 3, and the Motor pulley is connected by a Driving Band to a 1" Pulley on the rear axle. The axle is a 2" Rod held in place by a Spring Clip. The Motor brake lever is extended by a 1" Rod held in a Rod and Strip Connector fixed to the lever.

Each side of the body is assembled on a $5\frac{1}{2}$" Strip 4 bolted to the lugs of Double Angle Strip 3 and joined to the chassis by $\frac{1}{2}$" Reversed Angle Brackets 5. The side is plated by a $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate and by a $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate. Two Obtuse Angle Brackets are fixed to the rear end of each $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate, and the Brackets on each side are bolted together.

A $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flanged Plate is bolted between the front ends of Strips 4, and it projects one hole in front of the Strips. Two $2\frac{1}{2}$" Strips 6 placed face to face, are fixed to the Flanged Plate, and these support a $3\frac{1}{2}$" Strip 7 that forms the front axle beam.

The front Wheels are each fixed on a $1\frac{1}{2}$" Rod mounted in a Double Bracket and held in place by a Spring Clip. A $\frac{3}{8}$" Bolt is passed through a Fishplate and the Double Bracket, and these parts are clamped tightly together by a nut. The Bolt is then passed through one of the end holes of the Strip 7 and is fitted with lock-nuts, so that the Bolt, Double Bracket and Fishplate pivot freely in the Strip. The Fishplates

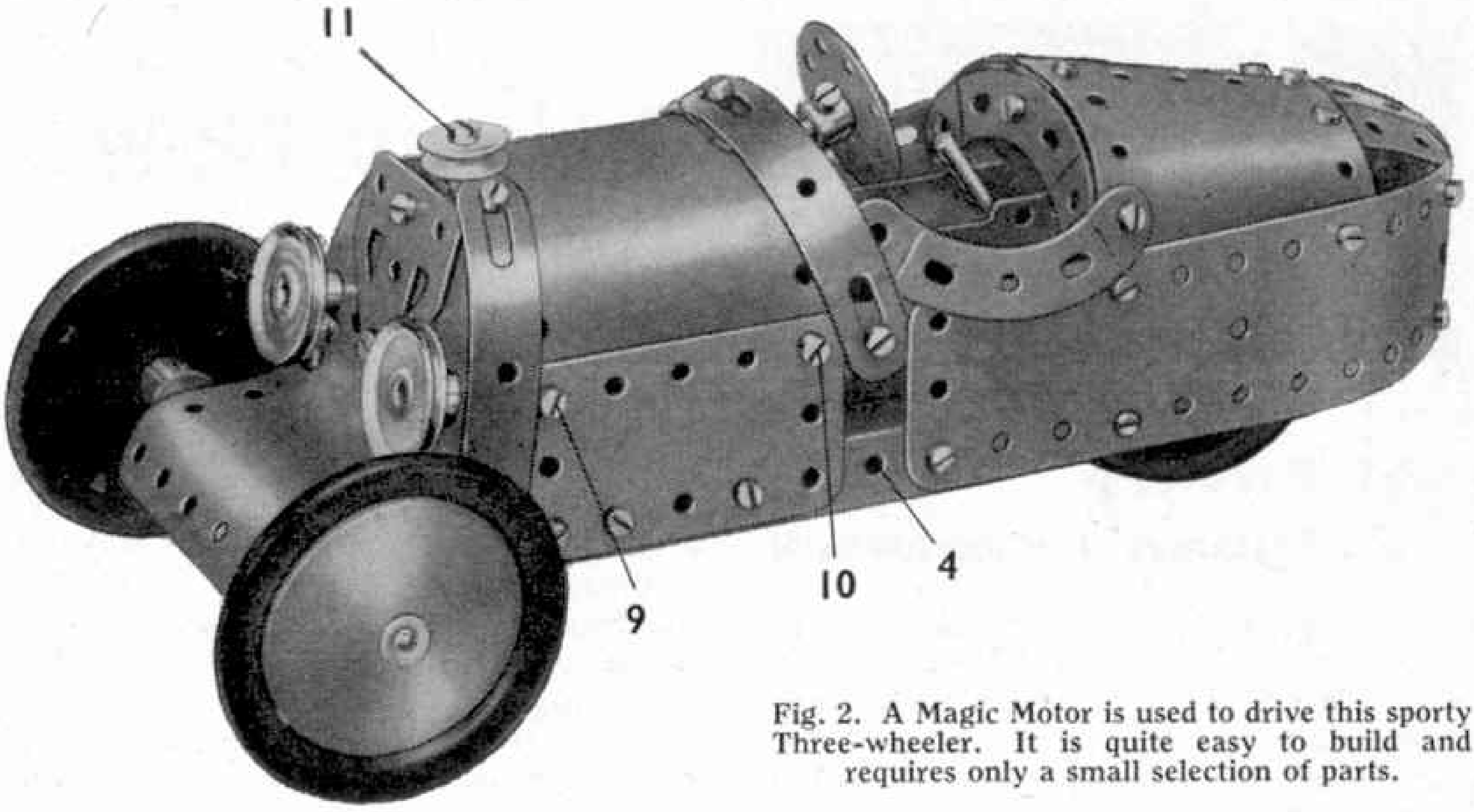


Fig. 2. A Magic Motor is used to drive this sporty Three-wheeler. It is quite easy to build and requires only a small selection of parts.

are linked by a second $3\frac{1}{2}$" Strip attached by lock-nutted bolts, and two Angle Brackets are fixed to this Strip by a Bolt 8 to form a U-shaped piece.

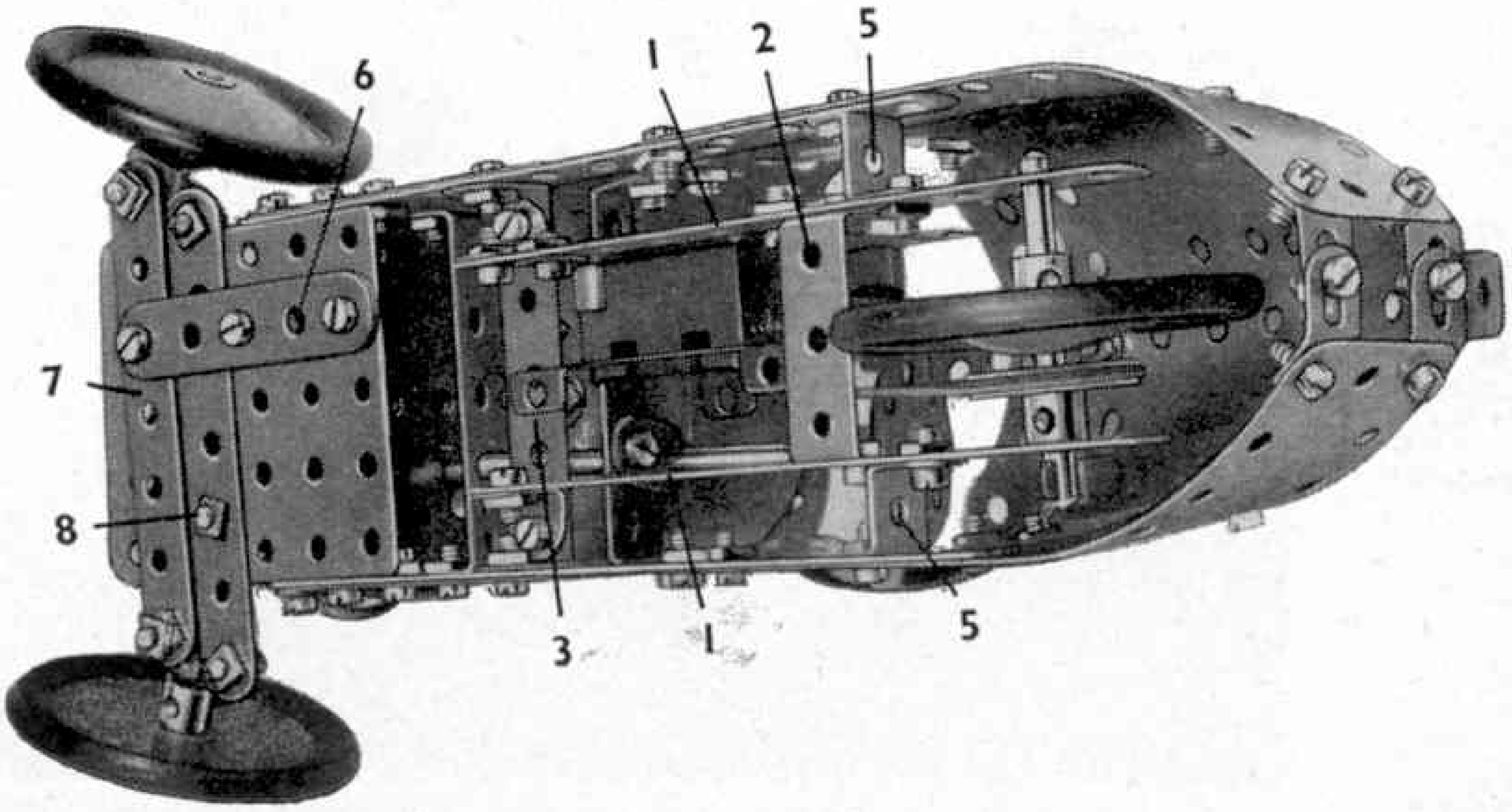
The upper edges of the Flexible Plates that form the sides of the body are braced by $5\frac{1}{2}$" Strips. The top of the bonnet is a $4\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate curved as shown in Fig. 2, and the Bolts 9 and 10 that fix the Flexible Plate in position attach also two $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips placed between the sides of the body. The bonnet is completed by four Formed Slotted Strips.

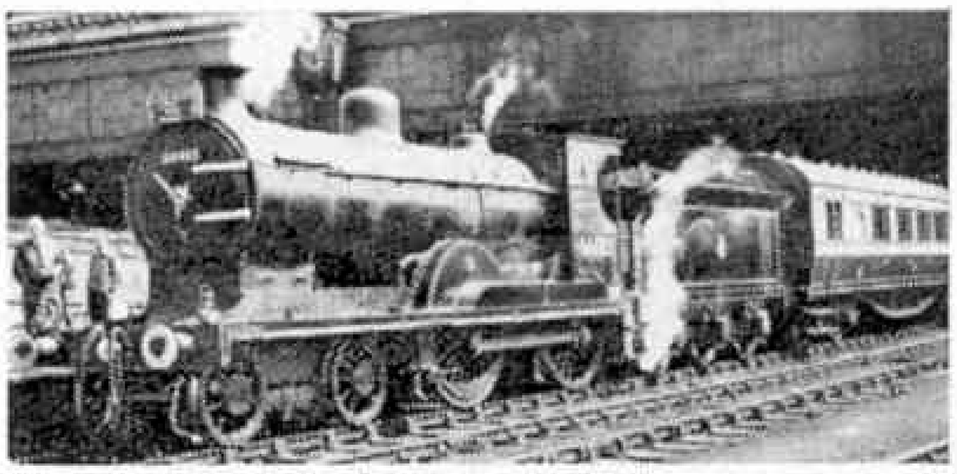
The radiator cap is a $\frac{1}{2}$" loose Pulley held by a $\frac{3}{8}$" Bolt 11 that fixes also an Angle Bracket placed inside the bonnet. This Angle Bracket is used later to fix the radiator in position.

The steering column is a Crank Handle, which is passed through the Double Angle Strip held by Bolts 9 and through a Fishplate bolted to the Double Angle Strip held by Bolts 10. The grip of the Crank Handle engages between the Angle Brackets fixed by Bolt 8 to the $3\frac{1}{2}$" Strip of the steering mechanism.

The radiator and front cowl are formed from a Semi-Circular Plate bolted to a $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate shaped as shown in Fig. 2. Two 1" Pulleys on $\frac{3}{8}$" Bolts represent headlamps, and the assembly is fixed to the Angle Bracket attached to the bonnet by $\frac{3}{8}$" Bolt 11. The rear cowl of the car consists of two $1\frac{11}{16}$" radius Curved Plates bolted at an angle tc the $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates and joined together at the centre. The tail is completed by three $2\frac{1}{2}$" Strips bolted to the $1\frac{11}{16}$" radius (*Cont. on page 527*)

Fig. 3. An underneath view of the Sports Car showing how the driving Motor is fitted.





Railway Notes

By R. A. H. Weight

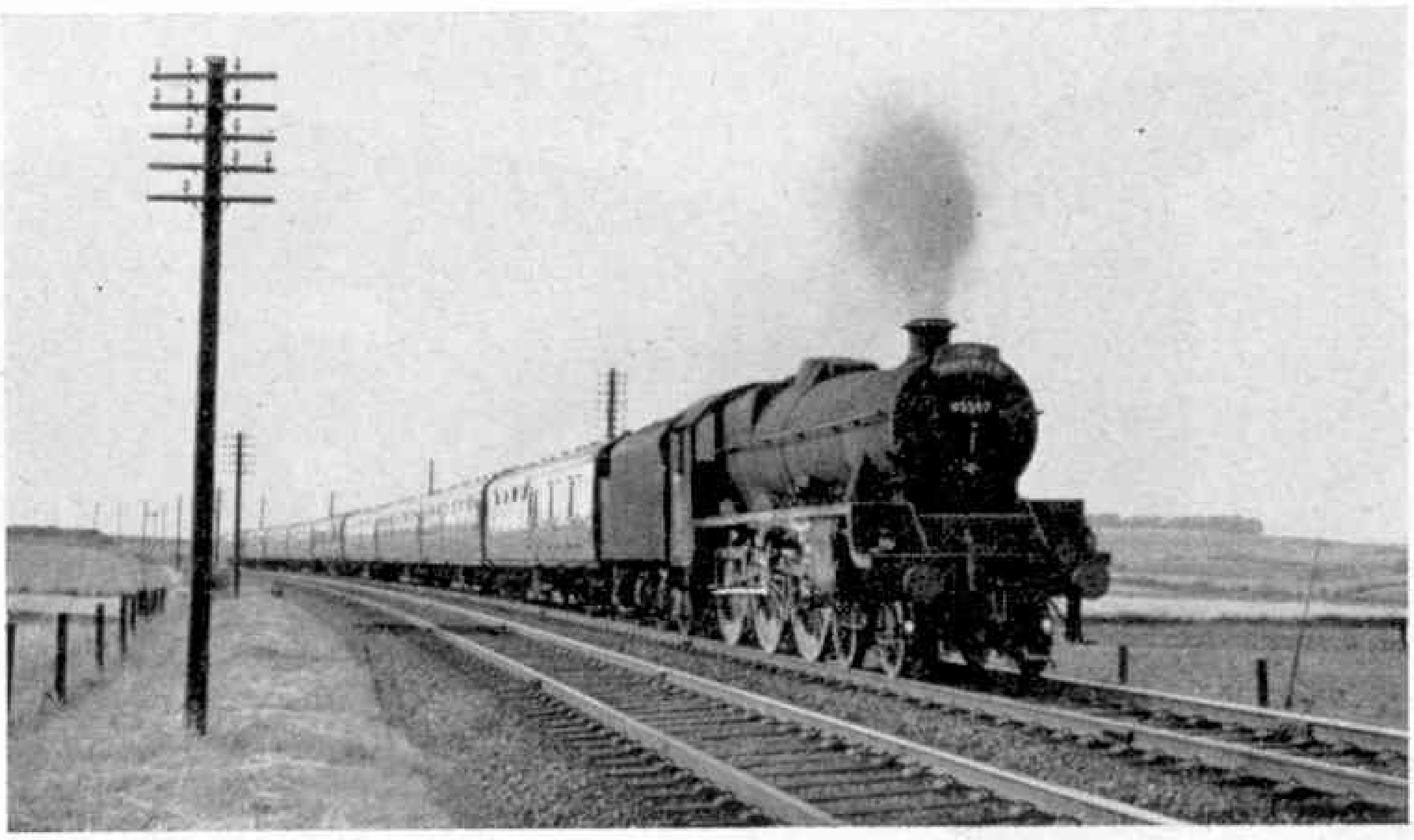
Diesel Luxury Pullman Expresses

AS a notable part of the B.R. Modernisation Plan, de-luxe Pullman diesel-electric multiple-unit train sets of entirely new type have been introduced on the London Midland, and Western Regions. One of the W.R. trains appears on our cover this month, from a photograph by A. F. Wright. They are finished externally in striking Nanking blue and white, and are beautifully equipped internally to a standard equalling, if not surpassing, anything of their type in the world. They feature a complete air-conditioning system, adjustable reclining seats in first class cars and an advanced standard of seating throughout in centre-corridor saloons with tables. Double-glazed windows have venetian blinds between, and there is a remarkable absence of noise. Novel, wide gangways between the cars afford freedom from oscillation, and there is exceptionally complete kitchen and pantry accommodation, lighting, etc.

The 6-car *Midland Pullman* carries first class passengers only from Manchester, Central, to London, St. Pancras, in the morning, returning in the evening on overall timings less than 3¼ hrs. In early afternoon, at the time of writing, an intermediate "flying trip" is made from St. Pancras to Leicester and back. The northbound 85-minute schedule for 99 miles, averaging 70 m.p.h., is the fastest in Britain. In the opposite direction 2 minutes more are allowed, over a fairly difficult route.

One day in August I watched this most impressive train arrive at St. Pancras just after 12 noon, 2 minutes before time. Two hours and nine minutes later, nearly 100 miles away, I was on the platform at Leicester, Midland, when it glided almost noiselessly and punctually to a stop at the conclusion of its next run! Only 23 minutes later, having crossed over to the up side, it was away again, on its return very fast run to London, due at 4.0 p.m.!

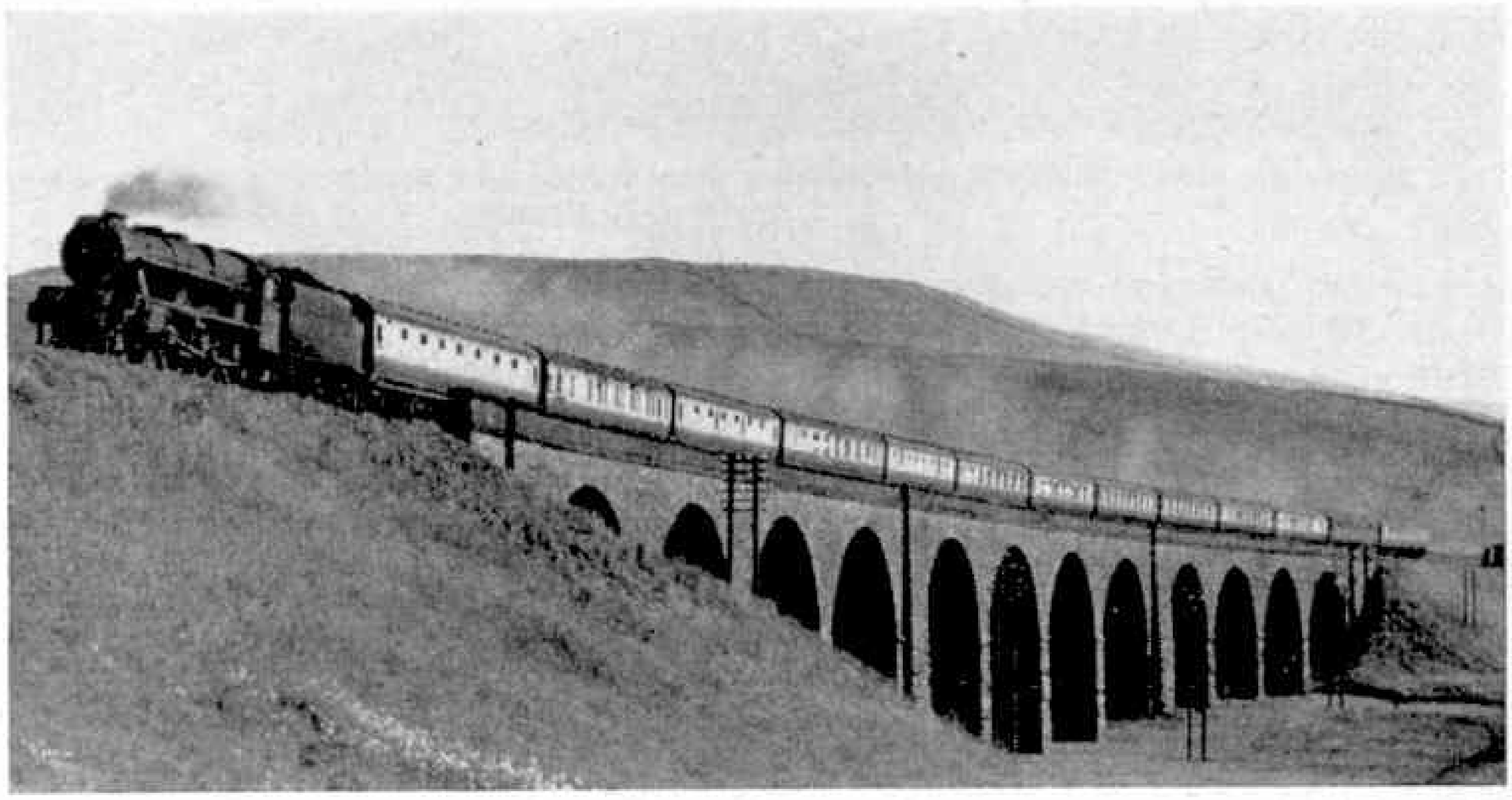
Two W.R. sets each of 8 cars, providing first and second class accommodation, and named the *Birmingham Pullman* and *Bristol Pullman* respectively operate twice each way. The one runs between Birmingham – Leamington – Paddington (also serving Wolverhampton and Solihull morning and evening); and the other between Bristol and London, with a call



"The Waverley", photographed by T. G. Hepburn on the occasion referred to in these notes. The engine is No. 45597 "Barbados".

at Bath Spa on mid-day runs. Some of the timings are the quickest ever of their kind.

The power cars at each end contain a 1,000 h.p. 12-cyl. diesel engine coupled to a main electric generator designed to supply traction current at between 1,250 and 1,700 amperes, as well as auxiliary generators feeding the lighting, heating and air-conditioning, refrigeration and other comprehensive equipment. They also have some seating accommodation, guard's and luggage compartments.



A Royal Scot with the down "Thames–Clyde Express" near Garsdale, on the Leeds–Carlisle line. Photograph by W. S. Garth.

Supplementary fares are charged according to distance and class, in view of the fast and exceptionally choice Pullman travel provided.

Good 4–6–0 Midland Runs

After seeing the *Midland Pullman* into St. Pancras as mentioned in a preceding paragraph, I boarded the 12.15 express to Leeds and Bradford headed by Royal Scot No. 46162, *Queen's Westminster Rifleman*, with "9-on" or about 325 tons gross. The 7P power thus provided compared with average 6P Jubilee capacity showed to marked advantage. We kept the rather tight passing times out to Hendon, St. Albans, Luton, with a good deal of climbing, and went over Sharnbrook summit at the top of a 1 in 119 bank at 58 m.p.h. in 57¾ min. for the 59¾ miles from the start, meanwhile having descended between Luton and Bedford with maxima of 84/82 m.p.h.

After Sharnbrook, where downhill speed could have been high, came a severe track repair slowing from which there was acceleration over undulating grades to 66 m.p.h. prior to stopping at Kettering, 72 miles, in 71½ minutes, a few seconds down on the fastest booking of its kind although about 2½ minutes had been lost. Nothing was gained on the sharply-timed 27 miles forward to Leicester, which included two ascents and two moderate speed restrictions carefully observed, but we were there just after 2.0 p.m.

Little did I think, say, in early summer, 1959, that I should hear announced, and travel by, a non-stop express from Stoke-on-Trent to St. Pancras! Since November last, however, as mentioned in these notes at the time, in order to reduce traffic on the busy Rugby-Euston route while considerable works are in hand preparing for electrification, a few Manchester expresses via the Potteries route in the north have been diverted by way of Leicester to and from St. Pancras. At Stoke I boarded the quickest of these on its arrival from Manchester, Victoria (another temporary diversion while London Road terminus was being rebuilt) via Stockport and Macclesfield. The 7P locomotive was rebuilt Patriot No. 45521, *Rhyl*, with "10-on", about 360 tons gross, and as we had to await tender filling from the water crane, the next available troughs being a long way off, start was 4 minutes late.

The "strange" course, for such an express as ours, was over one-time North Staffordshire Railway metals through Uttoxeter to Egginton Junction, thence on to a section of the Birmingham–Derby main line. Branching off again along a connecting link past Castle Donington, little used by regular passenger trains for a considerable period, it avoided Derby and Trent, and involved a good deal of cautious running.

When we joined the normal Derby–St. Pancras main tracks at Sheet Stores Junction at 2.28 p.m. we had nearly 120 miles to go with 122 minutes left, if arrival

Jubilee No. 45615 "Malay States" entering Trent station on a Bradford–St. Pancras express. Photograph by J. A. Fleming.

in London was to be on time at 4.30. After some 70 m.p.h. travel we gently passed through the platform line at Leicester at 2.50, still a little late.

Speeds over the sharp ups-and-downs varied between 53 and 86 m.p.h. as we passed through showers. There was a long speed restriction at Harpenden, Herts, but we were to time on entering the inner suburban area at Hendon, 7 miles from St. Pancras, having covered 113 miles from Sheet Stores in 113 minutes. It was now 4.21; every signal had been clear so far but some congestion between Kentish Town and St. Pancras involved slowings, then a short stop caused a slightly late arrival. But engine and crew had done well. The distance from Stoke to London this way is 163 miles compared with 146 direct to Euston, though there is not much difference between present best schedules.

Jubilee gaining time

The Waverley, principal-stations express from Edinburgh, Waverley, by way of Galashiels, Carlisle, Sheffield and Nottingham, has the quickest non-stop timing of the day from the latter city to St. Pancras, 123½ miles in 125 min. starting at 6.0 p.m. On a recent trip a Royal Scot brought the train over the mountainous section to Skipton and so on to Leeds where 6P No. 45597, *Barbados*, stationed like its keen Driver J. E. Ellis and Fireman B. Mann, at Holbeck depot Leeds, took over a full train, "9-on" say 340 tons gross.

As we were accelerating uphill in sunshine at over 50 m.p.h. about 6 miles out from Nottingham, an old friend secured the excellent photograph accompanying this story. After easing through Melton Mowbray there was excellent performance uphill and down, such as minima of 60, 55, 54 m.p.h. at the top of the principal rises to Corby, Sharnbrook, Leagrave respectively; maxima 87, 82, 84, etc., with cautious passage of junction and crossovers near Kettering. There was a track repair slack 15 miles from London followed by rapid acceleration towards Hendon; with no other delay of any kind we made a triumphant arrival in St. Pancras at 8.2½, 2½ minutes early, having averaged over 60 m.p.h. overall from Nottingham.

Mr. J. A. Fleming sends slight detail of another grand effort by No. 45615, *Malay States*, that left Derby 11 min. late on *The Palatine*. Combined smart work reduced the arrears to 8 min. when restarting from Leicester; high speeds were maintained whenever there was a chance but—"hopes were damped by a standstill signal check at Luton . . . nothing daunted we arrived St. Pancras at correct time . . .", he writes.

Trent is a unique station

The locomotive just mentioned was photographed on another occasion by Mr. Fleming as it was entering Trent station, a single, wide island platform almost in the country but surrounded by a network of tracks. Trent is a key junction 'twixt Nottingham and Derby, respectively 6 miles to the east, and 10 to the west. It is near the River Trent, and is in Derbyshire.

The 12.15 and 12.25 expresses from St. Pancras, as it happens, both call at Trent but are at the time going in opposite directions! The 12.25 arriving via Nottingham, uses the up line then curves away to Sheet Stores Junction and so to Derby and Manchester. Another spur, however, enables trains for Derby to start from the down platform and, roughly speaking, they wind round in a semicircle before joining the same tracks.

The Unusual Story of . . .

THE DECCAN FLYING SAUCER

FEW objects look more dejected than the hulk of a once-fine aeroplane, sitting on the edge of a field minus engines, wings, tail and undercarriage. When such a hulk has been used for several years to give soldiers in heavy boots practice in getting quickly in and out of an aircraft cabin, the result is even more depressing.

This was the fate of the Dakota illustrated at the top of this page. A relic of World War Two, it remained for more than a decade, propped up on trestles, at an army centre at Trimulgherry, in Hyderabad.

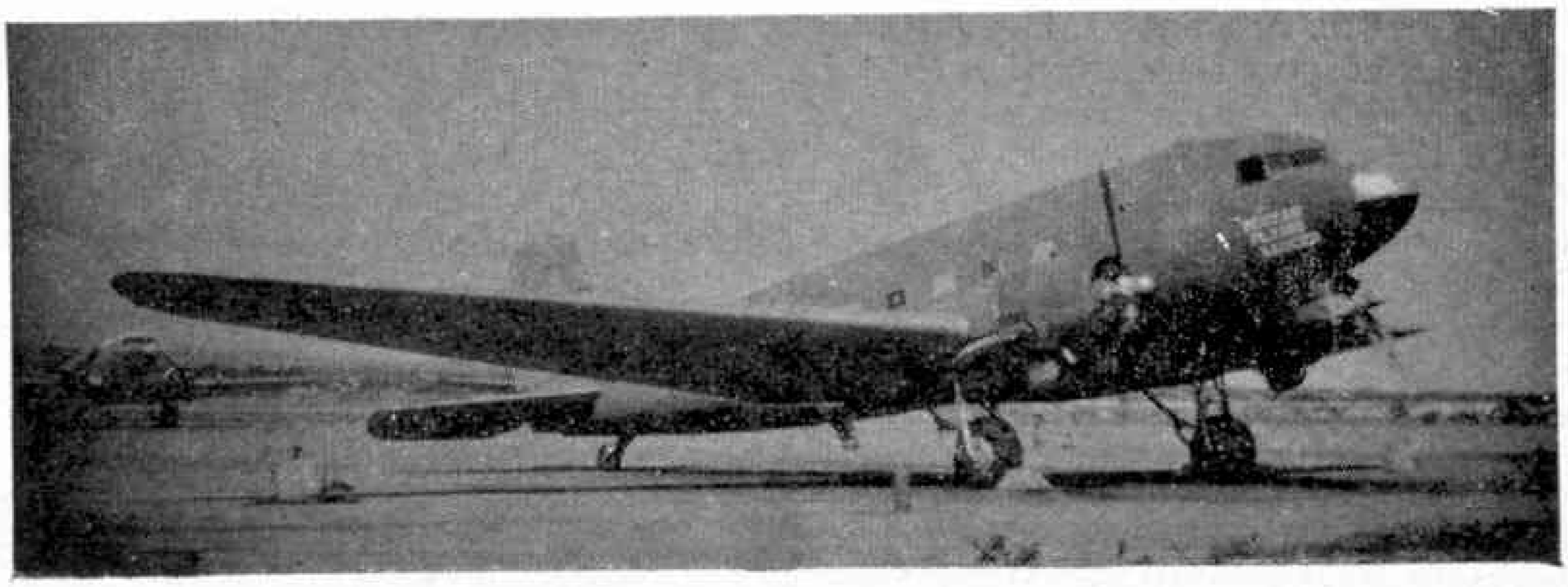
The colonel in charge of the centre had every reason to be surprised when Mr. S. S. Nadig, an inspector of the Hindustan Aircraft Company, arrived one day and offered to pay good money for the Dak's shell. He lost no time in agreeing to a price and soon a Dakota servicing party from the Hindustan works arrived to collect their purchase.

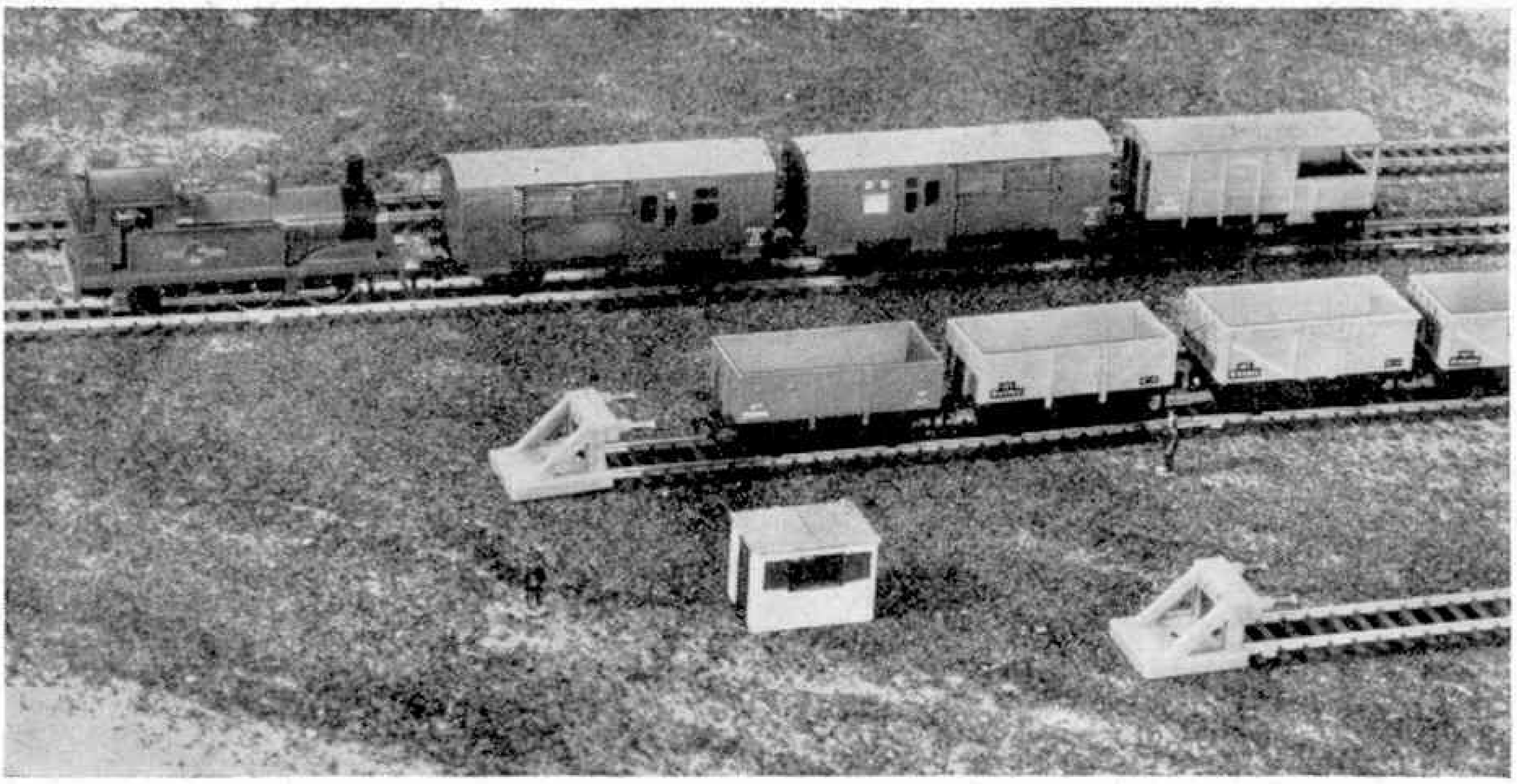
With its patchy, worn camouflage the Dak looked even worse when it arrived at the company's base at Begumpet and was dumped near some shiny, airworthy Dakotas. Its interior was covered with sand and mud; the skin was torn and cut. Even worse, the basic structure, and main wing and tail attachment fittings, were in very bad shape.

Undeterred, the Hindustan engineers got to work. Every inch of the fuselage was carefully cleaned, inspected and repaired where necessary. New parts were bought, including complete outer wings, engines, undercarriage and tail unit. In two and a half months, the wreck was turned into what appeared to be a perfectly good Dakota, as the picture below shows. All that remained was to prove that it flew like one.

This was the job of Hindustan's chief test pilot, Mr. Kunjiraman, who arrived one day, from the main works at Bangalore, with Radio Officer Shanbog and Flight Engineer Prasad. Everyone turned out to see what would happen. To their surprise, the old Dak seemed so eager to get airborne that it took off after an amazingly short run. Now it has begun its second flying life with the Indian Air Force, as the *Deccan Flying Saucer*.

J. W. R. TAYLOR.





Two of the realistic Hornby-Dublo Horse Boxes are being taken along this Two-Rail main line by the 0-6-0 Tank Locomotive. This engine and the Brake Van shown are on pick-up duties.

Train Names and Horse Traffic

THIS month there are several things to talk about. In the first place Hornby-Dublo Two-Rail owners have welcomed the appearance of the Handbook of Two-Rail track formations with wiring diagrams that became available a little while ago. I know this useful booklet has done a great deal towards sorting out layout and wiring

HORNBY RAILWAY COMPANY

By the Secretary

problems and no Two-Rail enthusiast can afford to be without a copy. The price is 6d. and copies are available from dealers or direct from H.R.C. Headquarters. The price quoted includes postage.

With the advance of the Hornby-Dublo Two-Rail System readers have been writing to tell us about the layouts they are building up. An instance of this occurs in the article by *Layout Man* in this issue. I hope many more will follow the example of H.R.C. member D. Matthews, parts of whose railway are shown on page 524 and forward notes on the progress of their railways, together with some good, clear pictures.

At the top of the next page is shown part of a Hornby-Dublo railway, this time a Three-Rail one, that you have read about before. This is the layout developed by G. A. Rogers, of Bilbrook, near Wolverhampton. I have decided to show you this particular view this month, not only because of the general realism of the scene on the effective layout in question, but because it illustrates very well the use of the popular Train Name and Destination Labels provided with Hornby-Dublo Named Train Sets. In addition, the items concerned can be obtained separately, which is nice to know, as it is always useful to have a few spares of this sort of thing handy.

The Labels themselves are of the self-adhesive kind and they are divided into two categories, those for the engine and those for the Coaches. Those for display on the Locomotive are intended for fixing to the metal Headboards produced for the various Hornby-Dublo express Locomotives of current type. In our picture the *Duchess of Montrose* is shown displaying the *Royal Scott* Headboard and Label. It looks well, doesn't it?

In addition to the Labels for the Locomotive Headboards, there are Train

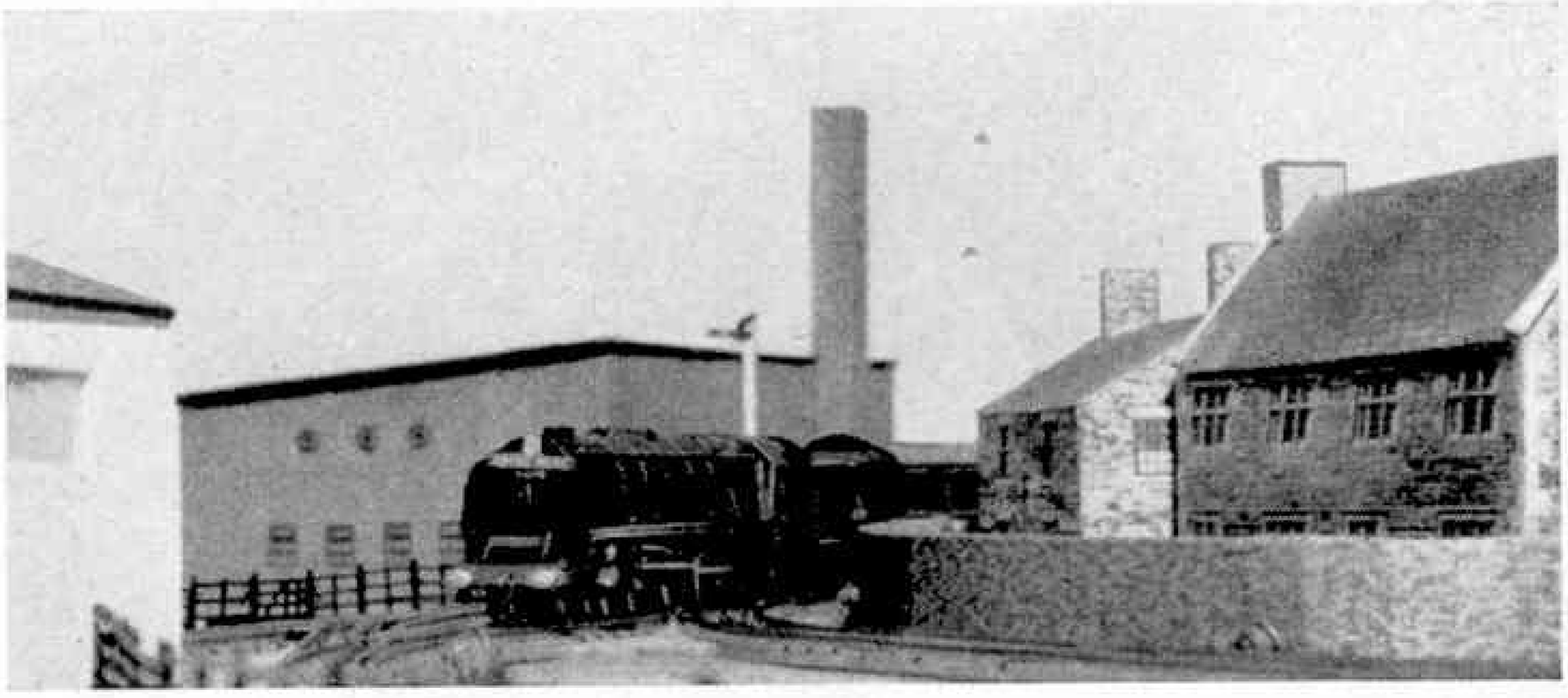
Name and Destination Labels for attaching to Hornby-Dublo Corridor Coaches. These are fixed directly above the windows of the Coaches themselves. The self-adhesive character of the Labels makes it possible for the train titles, etc., to be changed as required by the services to be run.

The introduction into the Two-Rail System of *The Caledonian* and *The Talisman* Train Sets has added to the variety of the titles available and I have already shown you specimens of them in these pages. A point to note is that although the destination Labels for the Coaches of *The Talisman* are also used for the older *Flying Scotsman*, the same thing does not apply to the respective labels for *The Caledonian* and the *Royal Scot*. Although in each case these read *London–Glasgow*, there is a difference in colours for the two services. The labels for *The Caledonian* have a cream background, whereas those for the *Royal Scot* have a tartan background.

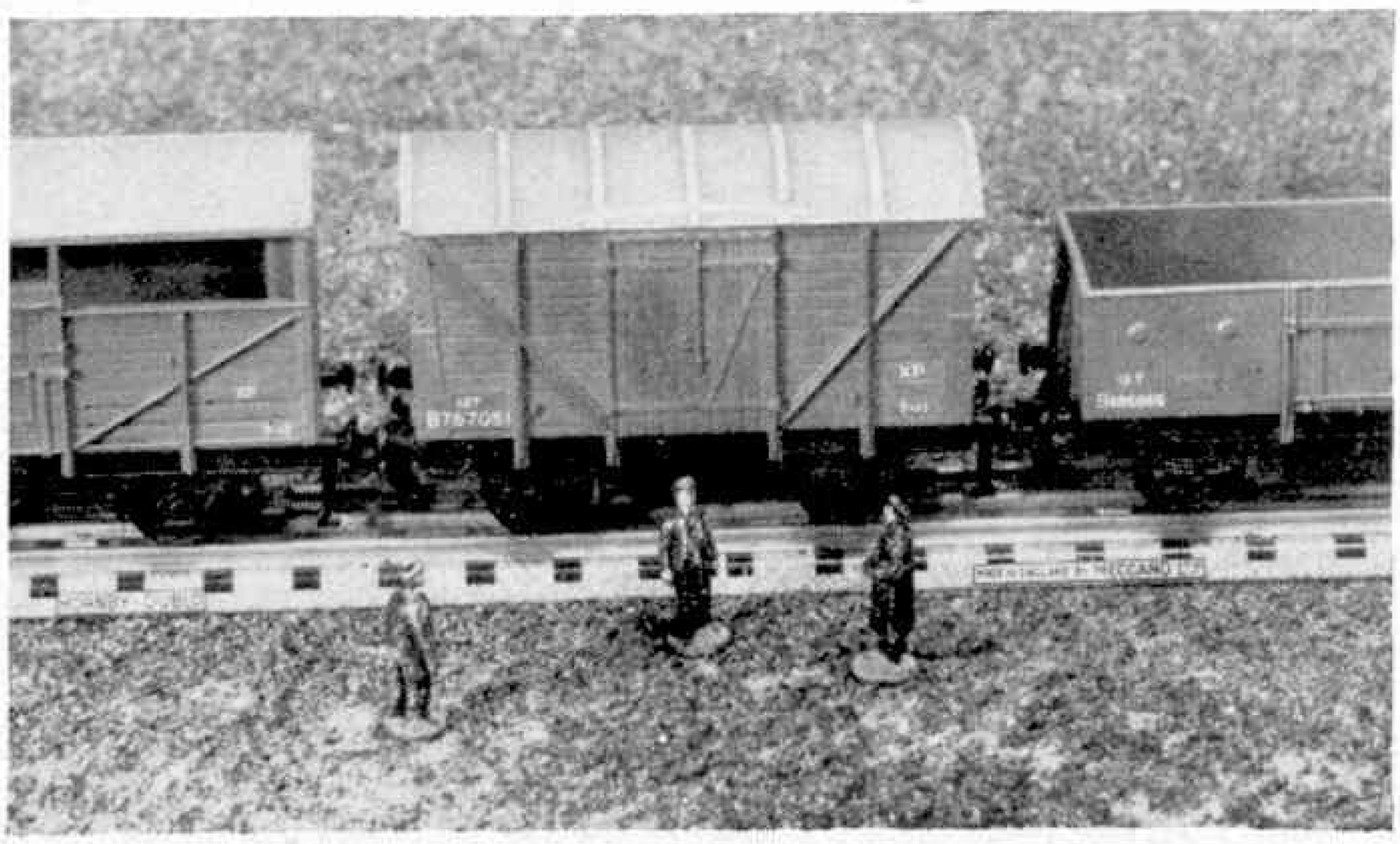
So far as Locomotive Headboards are concerned there is no distinction between Two-Rail and Three-Rail Locomotives of corresponding type. Thus the Headboard originally produced for *Duchess of Montrose* will suit the Two-Rail *City of London* equally well. It can also be fitted to the older *Duchess of Atholl* Locomotive. There must be many examples of this engine still in service, to judge by the letters that reach me.

All Hornby-Dublo Castles require the same type of W.R. engine Headboard, but the A4 Pacifics that have appeared in the Hornby-Dublo System require special consideration. The current Two-Rail model is *Golden Fleece*. Like its Three-Rail counterpart, representing the record-breaking *Mallard*, this is made to carry a representation of the standard E.R. type of headboard. But the older, single-chimney *Silver King* and *Sir Nigel Gresley* Locomotives do not incorporate the slot in the sloping smoke-box necessary for fixing the miniature Headboard in position. A plain slot is not sufficient, as several of you have found when you have been tempted to drill a hole in the casing of your Locomotive and file this out to accept the tail of the Headboard. There are ways and means of getting over this particular problem and some of them have been mentioned before in these pages.

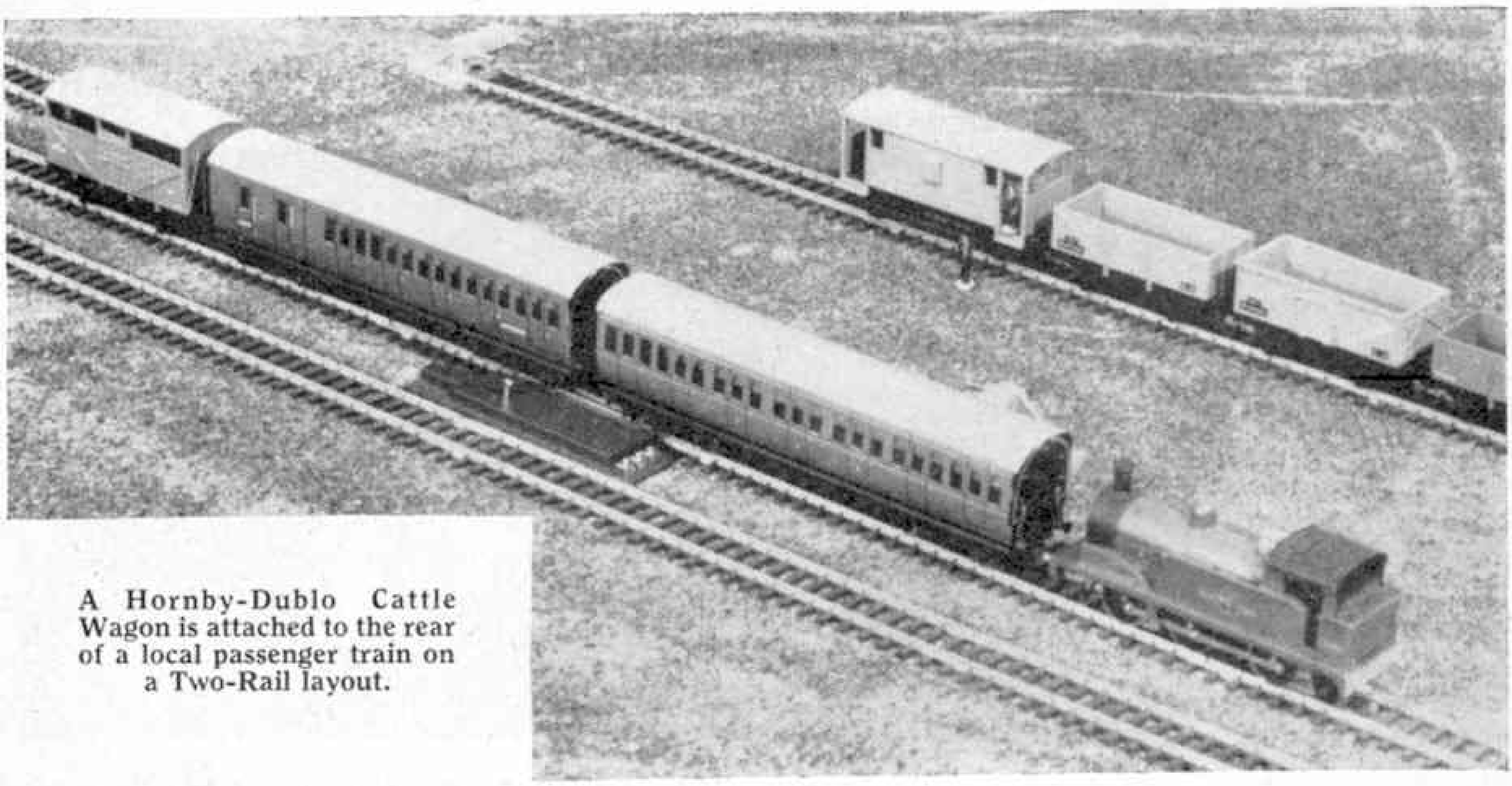
Probably the easiest way is not to use the type of Headboard intended for our current E.R. Pacifics, but to use that designed for



"The Royal Scot" headed by "Duchess of Montrose" traverses an industrial area on the layout of Mr. G. A. Rogers, of Bilbrook.



Train examination is a routine matter at many stops. This Hornby-Dublo picture reproduces a familiar scene.



A Hornby-Dublo Cattle Wagon is attached to the rear of a local passenger train on a Two-Rail layout.

L.M.R. 4–6–2s. The fixing lugs at the side of this can be bent so that they are at right angles to the face of the Headboard, which can be then fitted to the *Silver King* engine or *Sir Nigel Gresley* by easing these lugs between the handrail and the smoke-box casing at each side of the Locomotive. This type of board will easily take the E.R.-type Headboard Labels.

Reference to E.R. and L.M.R. 4–6–2s and the train titles appropriate to them in Hornby-Dublo always reminds us of the long through runs commonly made by these classes of engine in real practice. I know many of you like to reproduce these workings in miniature, as far as possible, but not all trains, even on a busy Hornby-Dublo railway, are running all the time. In actual practice, stops are made to change engines, or to change enginemen, and as a rule at such halts the opportunity is taken of having the train examined.

Similarly, when stops are made for locomotive purposes by through freight trains the vehicles composing such trains are examined as well. Wheel tyres are sounded, brake gear, couplings, wagon doors, sheets and so on all come under the scrutiny of the examiner. In the lower picture on the previous page the simple scene suggests this sort of thing. It should be easy to arrange something similar on your own layouts and little touches of this kind make all the difference.

I suppose most Hornby-Dublo railways now include at least one Horse Box among their equipment. This very attractive vehicle, with its effective doors and miniature horse, provides some splendid opportunities for realistic traffic working. The illustration at the head of this talk shows two Horse Boxes forming a train on their own, having been collected by an engine and Brake Van on pick-up duties.

At times, special trains of Horse Boxes are necessary in connection with race meetings, horse shows and the like and this type of activity can now be followed up in a very attractive manner. The rail Horse Box can be used in conjunction with the Dublo Dinky Toys No. 073 Land Rover and Horse Trailer. In last month's issue *The Toyman* referred specially to this and included a realistic picture that might well form the basis of similar operations on your own layouts.

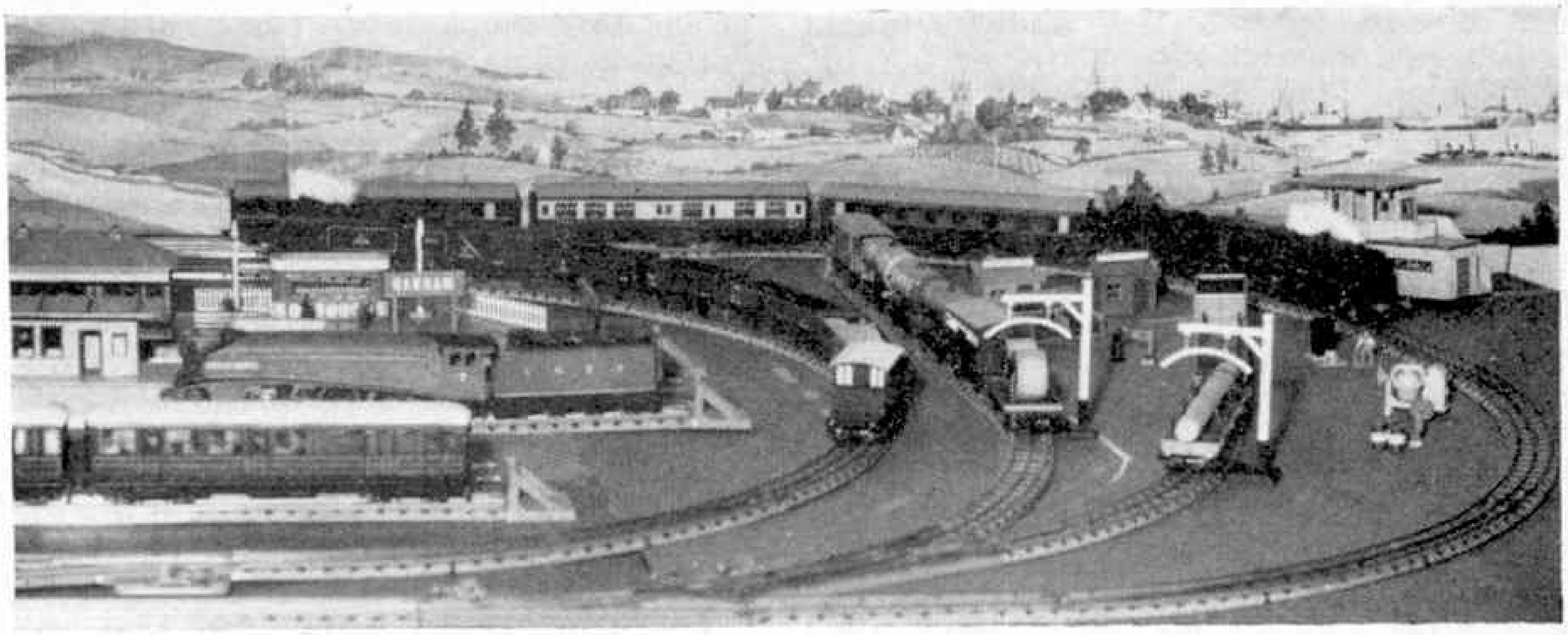
Reference to the horse itself suggests other possible livestock traffic operations in miniature and on many layouts plenty of use is found for the attractive Hornby-Dublo Cattle Wagon. This is remarkable for the amount of detail included in the bodywork and the vehicle can be run either in freight or passenger train services. Cattle specials are not unknown at times, and on some miniature layouts a feature is made of this type of traffic. Why not on yours?

M. & G. N. RAIL TOUR

The Midland and Great Northern Joint Railway Preservation Society will operate a rail tour by special buffet car train on Saturday, 8th October, 1960. It will leave Norwich City Station at 12.20 p.m., hauled by an ex-G.E.R. J15 0–6–0 locomotive. The train will travel by way of Lenwade, Themelthorpe Spur, Reepham, Aylsham South, Wroxham, Trowse, Tivetshall, Homersfield, Beccles and Lowestoft, to arrive at Norwich Thorpe at 6.30 p.m.

Fare for the tour will be £1 inclusive of printed illustrated itinerary. Accommodation is limited, and interested readers are advised to book immediately. Remittances (cheques, postal orders, etc., payable to the Midland and Great Northern Joint Railway Preservation Society) should be sent to Mr. B. Clark, 578 Eastern Avenue, Ilford, Essex.

"LAYOUT MAN" WRITES FOR THE HORNBY-DUBLO ENTHUSIAST



Appeal Of The Hour-Glass Track

HORNBY-DUBLO owner Peter Wensley, of Birkdale, Lancashire, is fortunate in having a generous amount of space—10 ft. by 9 ft.—for his railway. He has not been slow to take advantage of this and the line actually incorporates three separate baseboard sections, two 6 feet in length and the other 8 feet long. These are arranged so that the general plan of the layout is roughly U-shaped. As only a part of the railway is shown on this page something of the extent of the whole system will be realised.

Two of the baseboard sections adjoin one another at right angles, while the third, which lies parallel to the first, is connected to the intermediate one by means of a Meccano structure that supports a tunnel through which the railway runs. Over this section, and for some distance along the intermediate baseboard, there are three main running tracks running alongside one another. Close to the point where the outer baseboards adjoin the centre section the outer tracks diverge from one another, but following the edges of the baseboard ultimately meet to form a return loop. Similarly, the centre track of the three is divided by means of Points, the diverging tracks re-joining to form another loop at each end of the line. Broadly speaking, therefore, the track layout is based on the so-called "hour glass" shape we have met before.

Continuous running is possible round the outer and the centre circuits, but matters are ingeniously arranged so that a terminal station is included on one of the outer baseboards, and various connections involving Points and Diamond Crossings between the different tracks provide a great deal of variety in operation.

Exciting possibilities

A train can start from the terminus and follow the various routes available for as long as the operator wishes. Finally, by suitable movement of the Points it can return to its starting place. This is familiar miniature railway practice, but when the possible variations in route are examined the possibilities even for a single train become quite exciting. A goods yard and other sidings for shunting and for the marshalling of trains are included on the section of baseboard accommodating the terminal station but, in the main, the chief operating interest lies in the running of long-distance train services, ample scope being provided by the nature of the layout.

In addition to the tunnel, located between two of the baseboards as already described, there is another tunnel covering

Part of the Hornby-Dublo layout of "M.M." reader Peter Wensley. The system is fairly extensive and is well laid out for train running.

a corner of one board. This is quite an effective arrangement, as also is the inclusion of Level Crossings almost directly opposite to it.

There are two separate electrical circuits, independently controlled, so that two trains can be run at the same time while the other is held in an electrically-isolated section of the siding. Three Hornby-Dublo Locomotives are employed on the layout and they find plenty of work to do. They are respectively the 4–6–2 Locomotives, formerly standard, *Duchess of Atholl* and *Sir Nigel Gresley* and the familiar Hornby-Dublo 0–6–2 Tank.

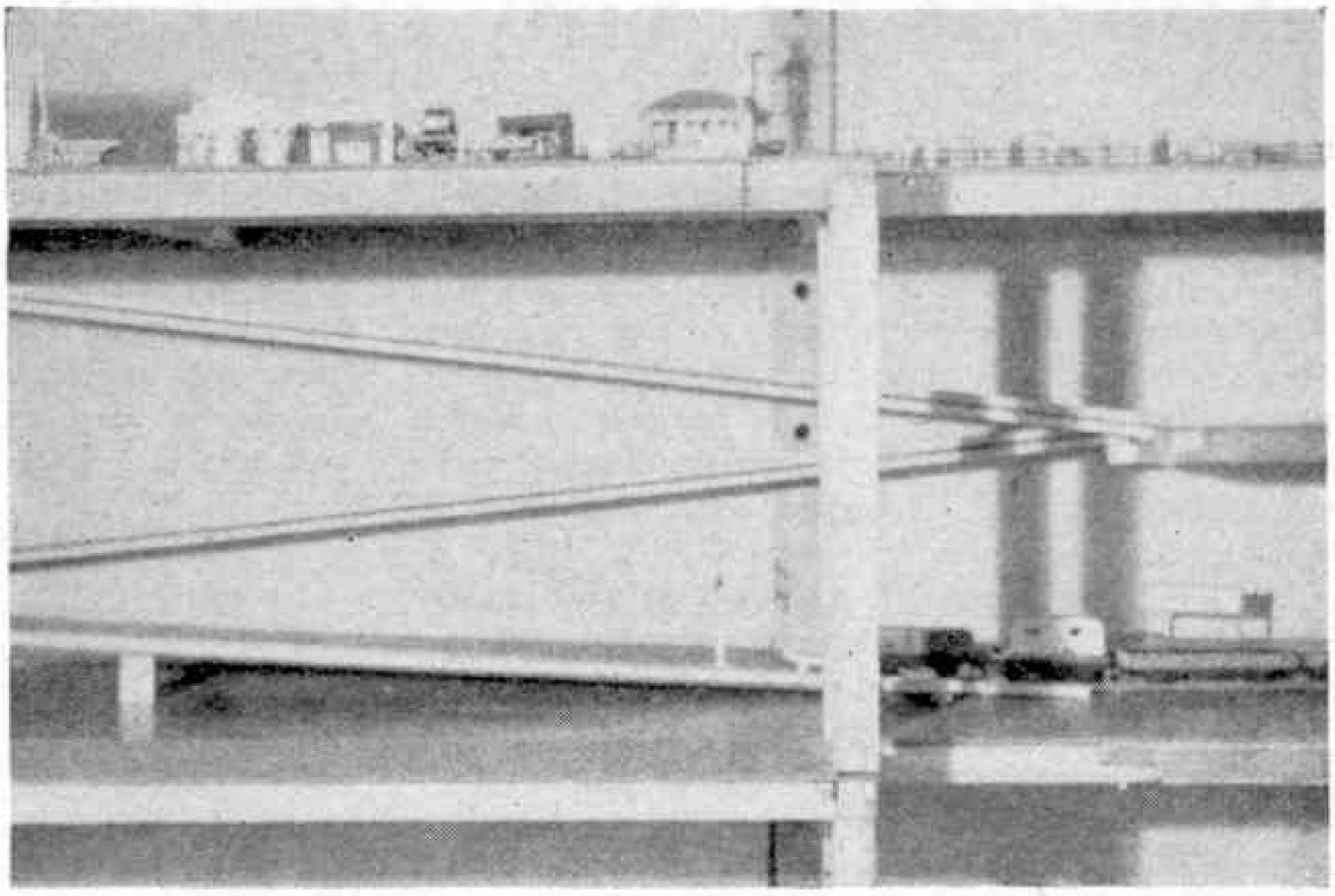
Unlike Peter Wensley's layout, which is level throughout, the railway shown in the two pictures on this page is arranged to incorporate two levels. For notes on this line and, of course, for the photographs from which our pictures have been prepared, I am grateful to *M.M.* reader D. Matthews, of Fawley, Hants., who, with his father and brother, has been busy building up this system for some time.

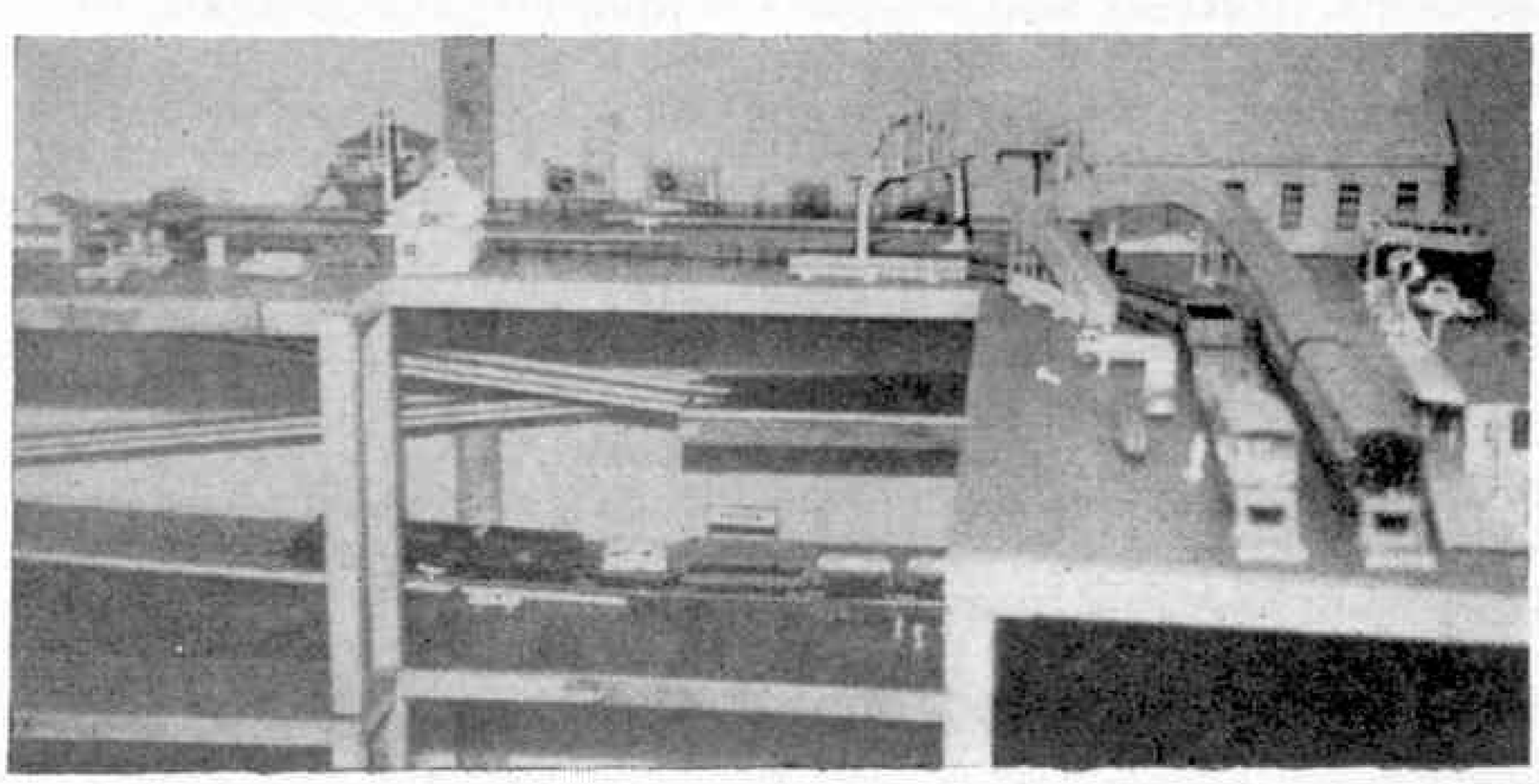
Low-level goods yard

The railway originated as a Hornby-Dublo Three-Rail affair, but there was no permanent baseboard and the layout had to be dismantled after each session of train running. Our friends came to the conclusion that it would be much better to have a permanent system. Work on the baseboard was put in hand and at this stage it was decided to adopt the Hornby-Dublo Two-Rail system.

At normal baseboard level is the main running section of the railway; the low-level section incorporates a goods yard and dock section. Owing to space and other restrictions this section is reached by a two-stage incline with an intermediate "reversing station". This means that stock being passed from the normal level to the lower runs down the first stage of the incline to the reversing station, which is actually known as *Midway*. At this point the direction of travel is reversed and the second stage of the design brings the vehicles down to quayside level. This zig-zag arrangement means that the incline is not spread out over long distances beneath the baseboard. In consequence the slope of the inclines is very severe, much more, indeed, than is ever encountered in normal Hornby-Dublo working. So trains passing up or down are restricted to a locomotive and a single bogie coach, or its equivalent in goods stock.

The arrangement is not one that will appeal to everybody, but it is an interesting variation that may be useful on occasions.



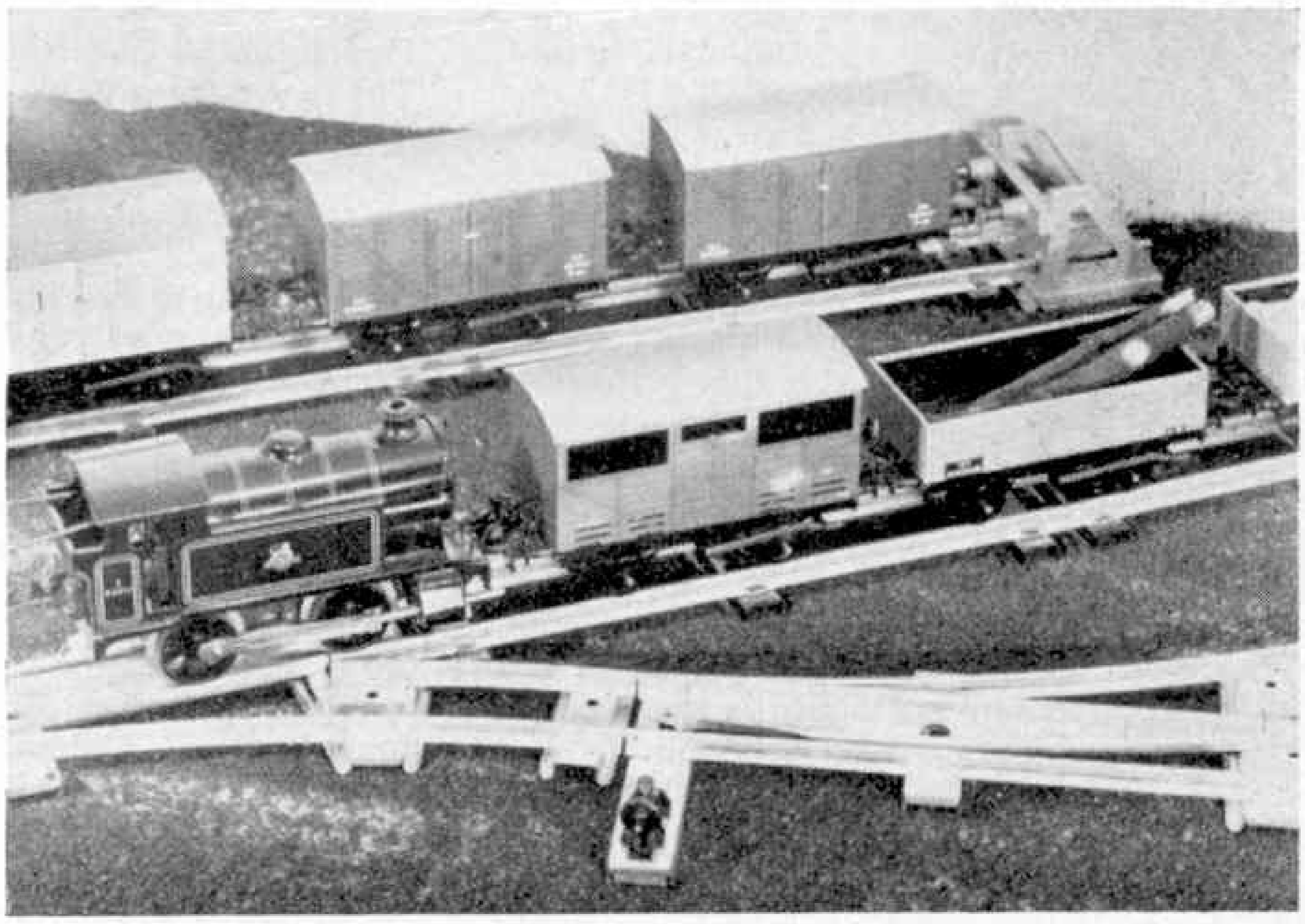


Two views of the Hornby-Dublo railway of D. Matthews (H.R.C. No. 322806), showing the special inclines below the baseboard.

This month, "Tommy Dodd" discusses

POINTS TO WATCH

WATCH your Points is an ancient railway maxim, the earliest pointsmen being in much the same position as the operators of Hornby-Dublo railways today, for even main line points at one time were operated by the pointsman on the spot, and not from a distant lever frame. It is a good piece of advice for the miniature railway owner to look after the Points included in his track. If they are not kept in good order, or are worked carelessly, then derailments and other troubles can result and there is no need for me to tell you that derailments are things to be avoided.



Points are important parts of the railway. How to use them and care for them is described on this page.

I think, therefore, we might as well follow up the few notes on Hornby Rails in our last month's talk with a chat about Points. In the first place they must be included in the layout in a correct manner, that is to say, they must fit in with the general scheme in such a way that there is no distortion of the track. The joining of the adjacent Rails to Points must be carefully done. On a railway that has to be taken up again when running is over, make sure that you use the Rail Connecting Plates and the Point Connecting Clips provided to ensure that the joints do not open while train running is in progress. On a layout that is more permanent, with the Rails attached to a baseboard as in the picture above, the Plates and Clips may be omitted.

In working Points it is important to make sure that the operating lever is pressed fully down, to one side or the other, so that the moving part of the Points, known as the switch rails, is set in the correct position. There is a locking arrangement underneath the Points to hold the switch rails firmly, but this will not be fully effective unless the lever is worked properly.

Points, like all other parts of the track, are subject to wear and tear, not only as the result of train running and general railway working, but also, on a temporary system, because they have to withstand the constant joining up and taking apart of the track. This means that the rail ends and connecting pins are likely to need attention, as described last month. In addition, the switch rails of the Points may require adjustment from time to time. It is important that the tapered end of each switch rail should fit closely up to the fixed rail either straight or curved, in either position of the Points.

At the same time, it is just as important to see that the other end of each switch rail should line up properly with the straight or the curved section of rail that follows it. If the switch rails are out of alignment then the wheel flanges can stray from their correct path and a derailment may result. Even if a derailment is not caused your train may get a disagreeable bump.

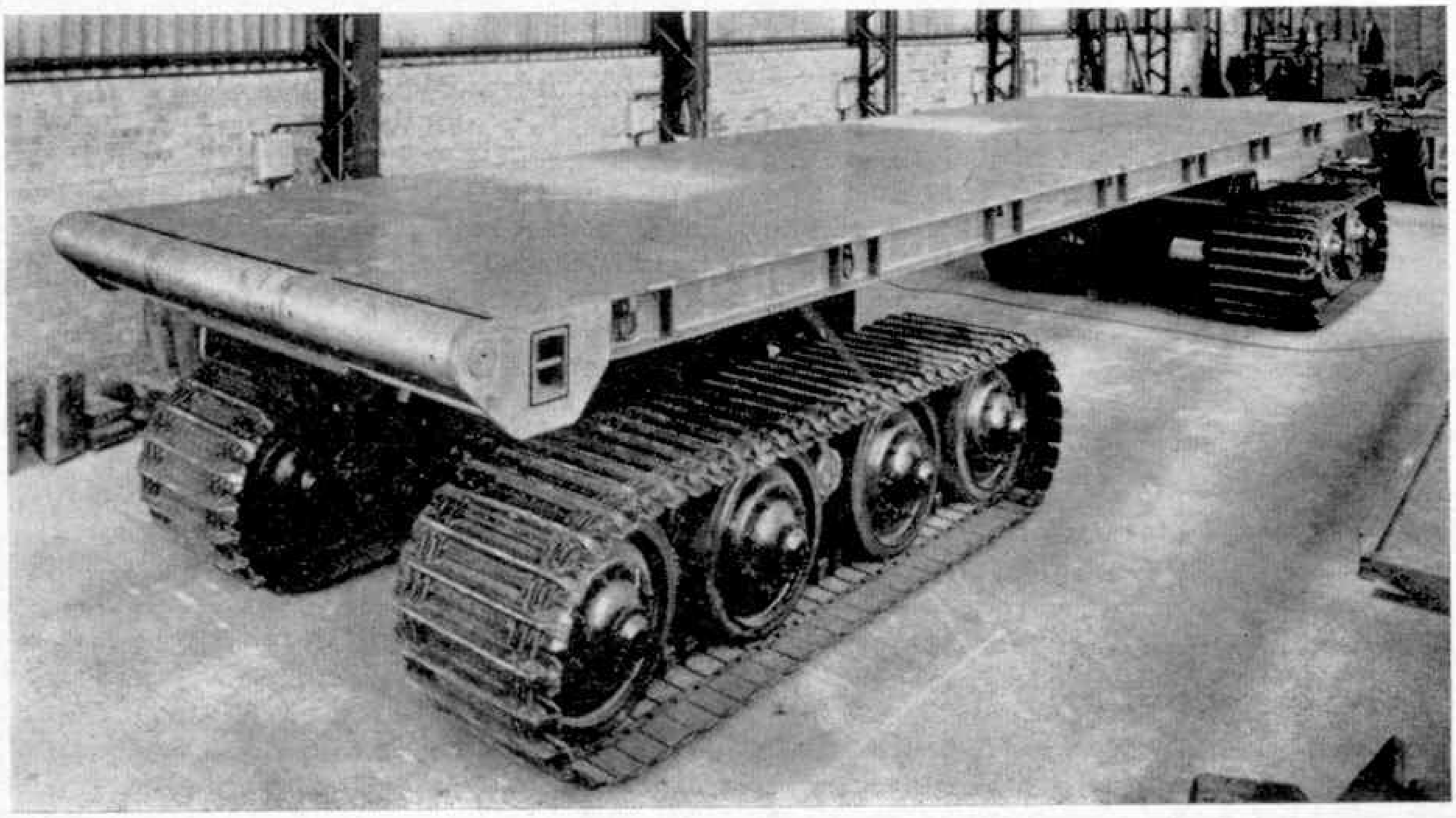
Of General Interest

TWO novel introductions to the world of transport form the subject of our General Interest page this month. The picture on the right shows the new Canterbury "Belle" which allows the sidecar user to enjoy road travel and, at the same time, combine it with the ever-growing sport of boating. The Canterbury "Belle" is, in fact, a motor boat-sidecar, measuring 7 ft. 7½ in. in length and 38 in. in width at the stern. It is powered by an 80 c.c. Jap Villiers, inboard, two-stroke engine fitted with a draw cord starter. The fuel is Petroil, and the engine develops 1·5 b.p.h. at 3,000 r.p.m. Estimated fuel consumption is about 60 miles per gallon and the speed approximately 11 knots. The rudder is controlled by a single lever and there is a hand lever throttle. The sidecar can be released in a matter of seconds from the sidecar chassis.

The photograph below is of a high flotation, fully-tracked trailer with removable bogies which can be converted on the spot to conventional road transport. Two of these have recently been made in the United Kingdom for the first time. They are for use by the Shell-BP Petroleum Development Company of Nigeria Limited. The use of removable tracked bogies means that the trailers can either be used fully tracked in the swamps of the Niger Delta or, fitted with normal rubber-tyred bogies, for road work.

The trailers are standard 28-ton oilfield trailers adapted to the design of Shell engineers by Dyson Ltd., of Liverpool, using specially-designed tracked bogies by J. A. Cuthbertson Ltd. of Biggar, Scotland. The rear bogie arrangement is readily interchangeable. At the front end, when the tracked bogie is removed, the trailer can be attached to a fifth wheel tractor and operated as a semi-trailer.

When operating on their tracked equipment in the swamps, the trailers will be towed by either Cuthbertson Water Buffalo or Caterpillar D8 Tractors.



Autumn Meccano Competition

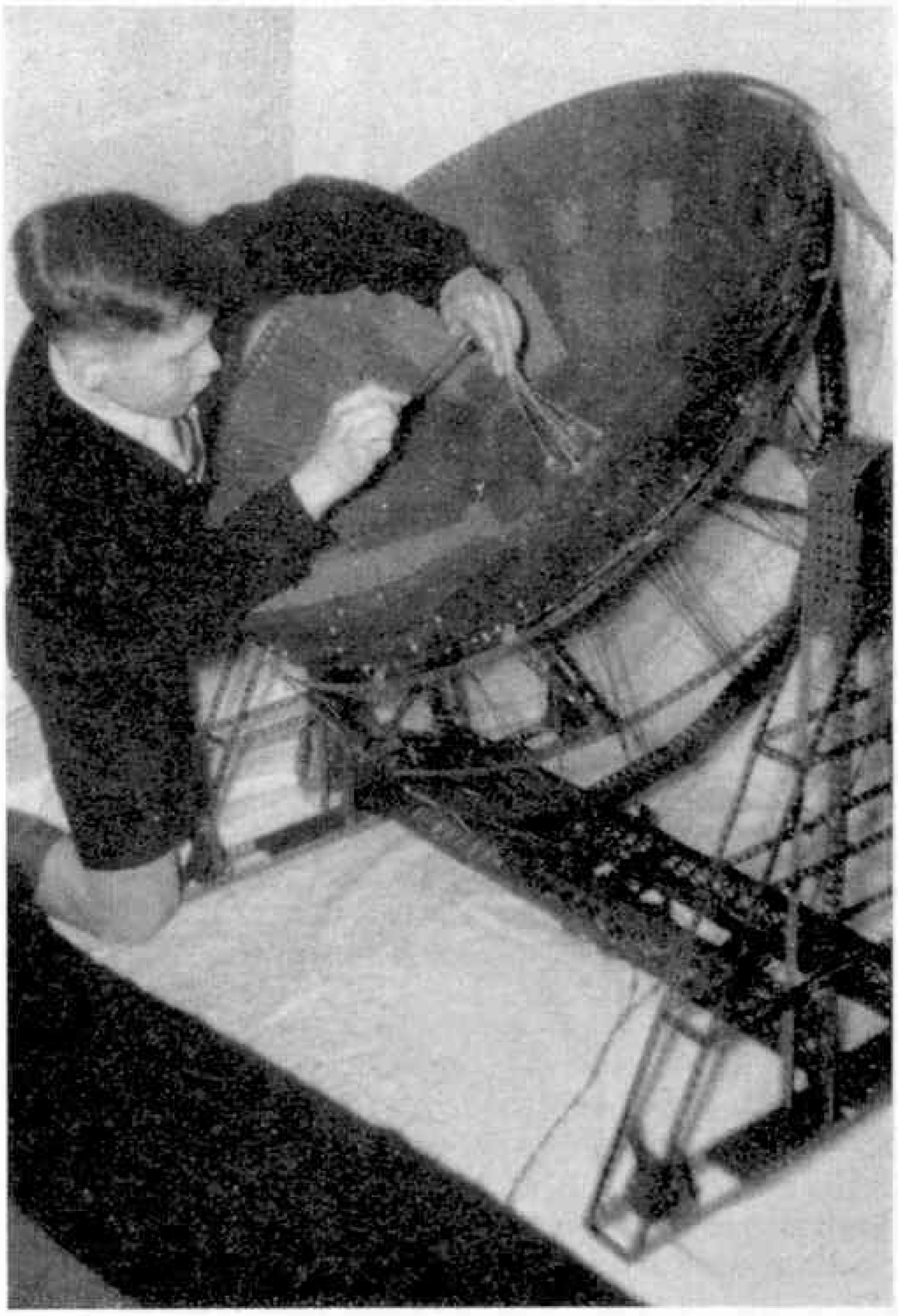
Prizes for Models of all Kinds

THE first of the season's general model-building Competitions is now in full swing and it presents all Meccano model-builders with a fine opportunity to indulge in a pleasant and worthwhile pastime, while at the same time providing them with the chance to win a cash prize for their efforts. Full details of these prizes appear in the panel at the foot of this page.

The Competition is open to model-builders of all ages living in any part of of the world, and every competitor has an equal chance no matter what his or her age may be or the size of the Outfit possessed. This is assured by the fact that in awarding the prizes the judges will take into consideration, when assessing the merits of a model, the age of the competitor and the size of the Outfit or quantity of parts from which his or her model is built.

In entering the Competition all the model-builder has to do is first to think of a new model of any kind whatever and then set to work to build it as neatly and realistically as possible from standard Meccano parts. When the model is completed the next thing is to obtain either a photograph of it or, if this is not possible, make a good sketch showing the details as clearly as can be managed. The photograph or sketch need not be the competitor's own work, but the model itself must be the result of his own unaided efforts. This model must not be sent under any circumstances.

The competitor should write his age, name and full address in *block* letters on the back of each photograph or drawing, and then send them in an envelope addressed to "Autumn Meccano Model-Building Competition, Meccano Ltd., Binns Rd., Liverpool 13."



A fine model of the Jodrell Bank Radio Telescope, which won a First Prize for Clive Wright, West Bridgford, Notts, in a recent Meccano Competition.

Entries will be divided into two Sections as follows:—A, for competitors under 14 years of age; B for those age 14 or over.

The contest will close on 31st December, 1960, and all entries must be received on or before that date.

THE PRIZES

The following prizes will be awarded in each of the Sections A and B.

First Prize — Cheque for £4 4s. 0d.
Second Prize — Cheque for £2 2s. 0d.
Third Prize — Cheque for £1 1s. 0d.
Five Prizes each of 5/–d.

Certificates of Merit also will be awarded.

Easy Model-Building—(*Continued from page 515*)

Curved Plates.

Three 2½" stepped Curved Strips form the sides and rear of the driver's cockpit as shown in Fig. 2.

The *Magic* Clockwork Motor will drive the model for a considerable distance at a good speed. The Motor can be wound by inserting the key in the gap left between the 5½" × 1½" and 2½" × 1½" Flexible Plates that form the sides of the body.

Parts required to build the Three-Wheel Sports Car: 6 of No. 2; 2 of No. 3; 5 of No. 5; 3 of No. 10; 2 of No. 11; 6 of No. 12; 4 of No. 12c; 1 of No. 17; 2 of No. 18a; 1 of No. 18b; 1 of No. 19g; 3 of No. 22; 1 of No. 23; 1 of No. 24; 5 of No. 35; 57 of No. 37; 10 of No. 37a; 7 of No. 38; 1 of No. 48; 3 of No. 48a; 1 of No. 51; 3 of No. 90a; 6 of No. 111c; 2 of No. 125; 2 of No. 126a; 3 of No. 187; 2 of No. 188; 2 of No. 189; 1 of No. 190; 1 of No. 191; 2 of No. 200; 1 of No. 212; 1 of No. 214; 4 of No. 215; 1 *Magic* Clockwork Motor.

Among the Model-Builders

By "Spanner"

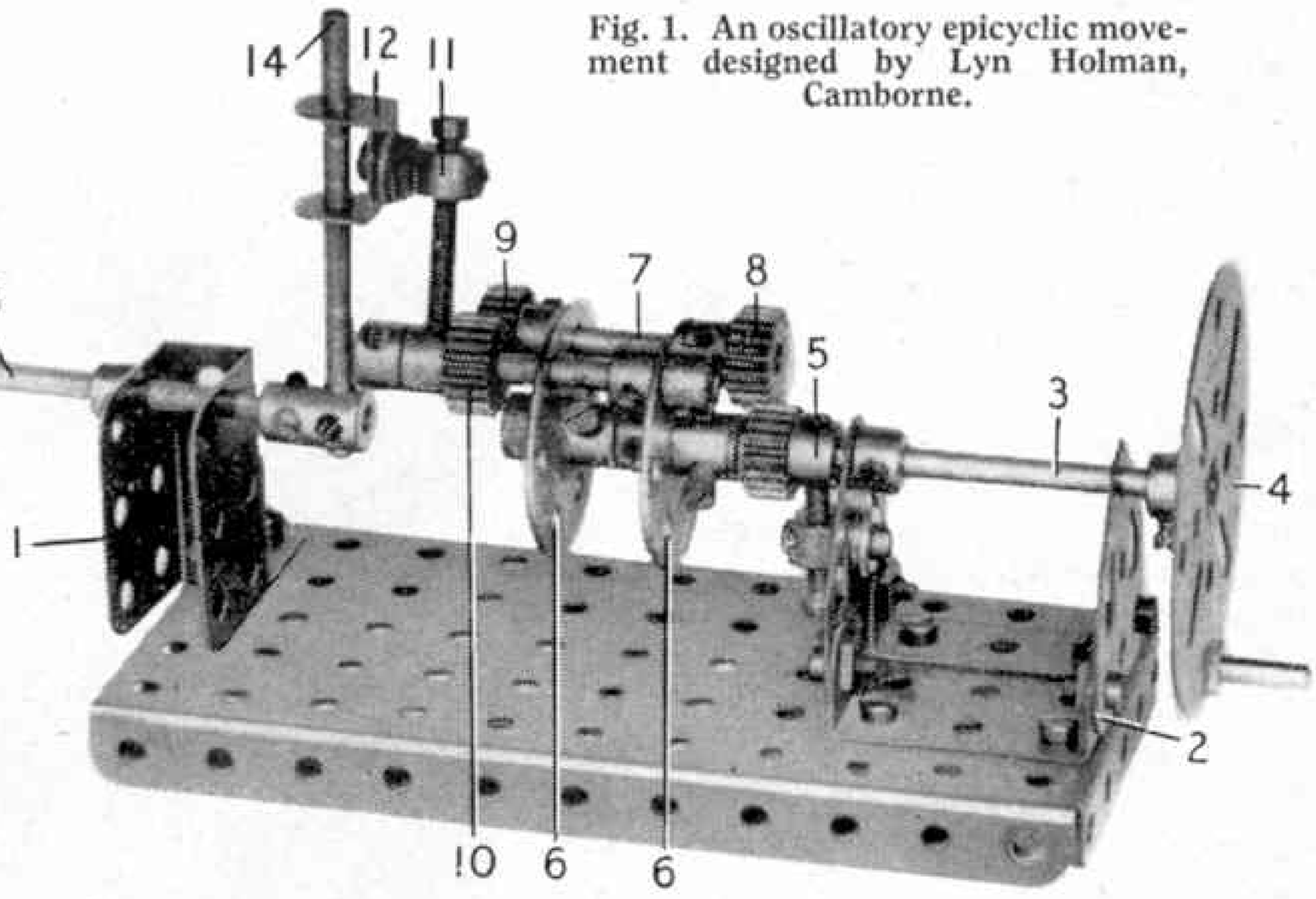


Fig. 1. An oscillatory epicyclic movement designed by Lyn Holman, Camborne.

An Oscillatory Epicyclic Movement

A CHANNEL Bearing 1 is attached to a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate with a $1'' \times 1''$ Angle Bracket. Two Flat Trunnions 2 are bolted to two $1\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips secured to the Flanged Plate. Through the Flat Trunnions a $4\frac{1}{2}''$ Rod 3 with Hand Wheel 4 is journalled. A $\frac{1}{2}''$ Pinion 5 is loosely placed on the Rod with a $\frac{3}{4}''$ Bolt in its boss. The Bolt is anchored in a Collar bolted to the inner Flat Trunnion. Two six-hole Bush Wheels 6 fastened to the Rod 3 are spaced apart with a Collar and Washer as shown. Secured to the $1\frac{1}{2}''$ Rod 7 are two $\frac{1}{2}''$ Pinions 8 and 9. Pinion 9 engages with a $\frac{1}{2}''$ Pinion 10 on a $2''$ Rod that is held in position in the Bush Wheels by three Collars, and is free to rotate. A $1\frac{1}{8}''$ Bolt is inserted in the boss of the Pinion 10 and it carries a Collar 11, which is lock-nutted to a Double Bracket 12. A $2''$ Rod 13 mounted in a Channel Bearing, supports a Short Coupling holding a $2\frac{1}{2}''$ Rod 14, upon which the Double Bracket slides. Before finally securing the $\frac{1}{2}''$ Pinions on the Rod 7, they should be rotated so that the $1\frac{1}{8}''$ Bolt is located in an upright position, so imparting an oscillatory movement to the Rod 14.

The mechanism, which was designed by Lyn Holman, Camborne, is intended for converting continuous rotary motion into oscillating motion about the same centre line, but without using any fixed point other than that on the centre line. It makes use of a condition in epicyclic gearing in which two gears move bodily around a third gear, which is fixed from rotation, all the gears meshing. If the outer gear has the same number of teeth as the fixed gear it will not rotate about its axis. Any point on this outer gear therefore remains in the same relative position regardless of its rotation around the "sun" wheel. This "point" is represented in the model seen in Fig. 1 by the $1\frac{1}{8}''$ Bolt is the boss of the $\frac{1}{2}''$ Pinion.

Inconstant Speed Gear Box

This gear-box, designed by H. C. Geesink, The Hague, Holland, transforms a constant speed into an inconstant speed, which can be interrupted or given a back and forward movement by fixing or loosening the set-screws of the $2\frac{1}{2}''$ Face Plate 44. This gear-box might be used for many interesting models such as a meccanograph designing machine and mechanical tools.

Details of the mechanism are as follows. Two $7\frac{1}{2}''$ Angle Girders 1 are joined together by five $5\frac{1}{2}''$ Angle Girders and braced at each corner with $1''$ Corner Brackets. Now bolt the $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plates 2 and 3, with $2\frac{1}{2}''$ Angle Girders, to the $5\frac{1}{2}''$ Angle Girders 4. A $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plate is then bolted to the $2\frac{1}{2}''$ Angle Girders to support the $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plates. The $1\frac{1}{2}''$ Angle Girder 5 holds a Flat Trunnion. To the remaining $5\frac{1}{2}''$ Angle Girders secure $1\frac{1}{2}''$ Angle Girders at each end, and connect each pair with a $5\frac{1}{2}''$ Slotted Strip and a $5\frac{1}{2}''$ Flat Girder, the middle two having a $2\frac{1}{2}''$ Flat Girder bolted to them. The $2\frac{1}{2}''$ Angle Girder and the $1\frac{1}{2}''$ Angle Girders are joined together by a $7\frac{1}{2}''$ Strip 6 and a $3\frac{1}{2}''$ Strip 7. Two $1\frac{1}{2}''$ Strips 8 and 9 are attached to the $1\frac{1}{2}''$ Angle Girders with a Double Bent Strip to support the $1\frac{1}{2}''$ driving Rod 10.

To the Rod 10 a Face Plate 12 is secured and also a $\frac{3}{4}''$ Contrate Wheel 11 that engages with a $\frac{1}{2}''$ Pinion 14 fixed to the $2\frac{1}{2}''$ Rod 13. On each end of the Rod 13 is fixed a Rod Socket 15, each of which is tightly

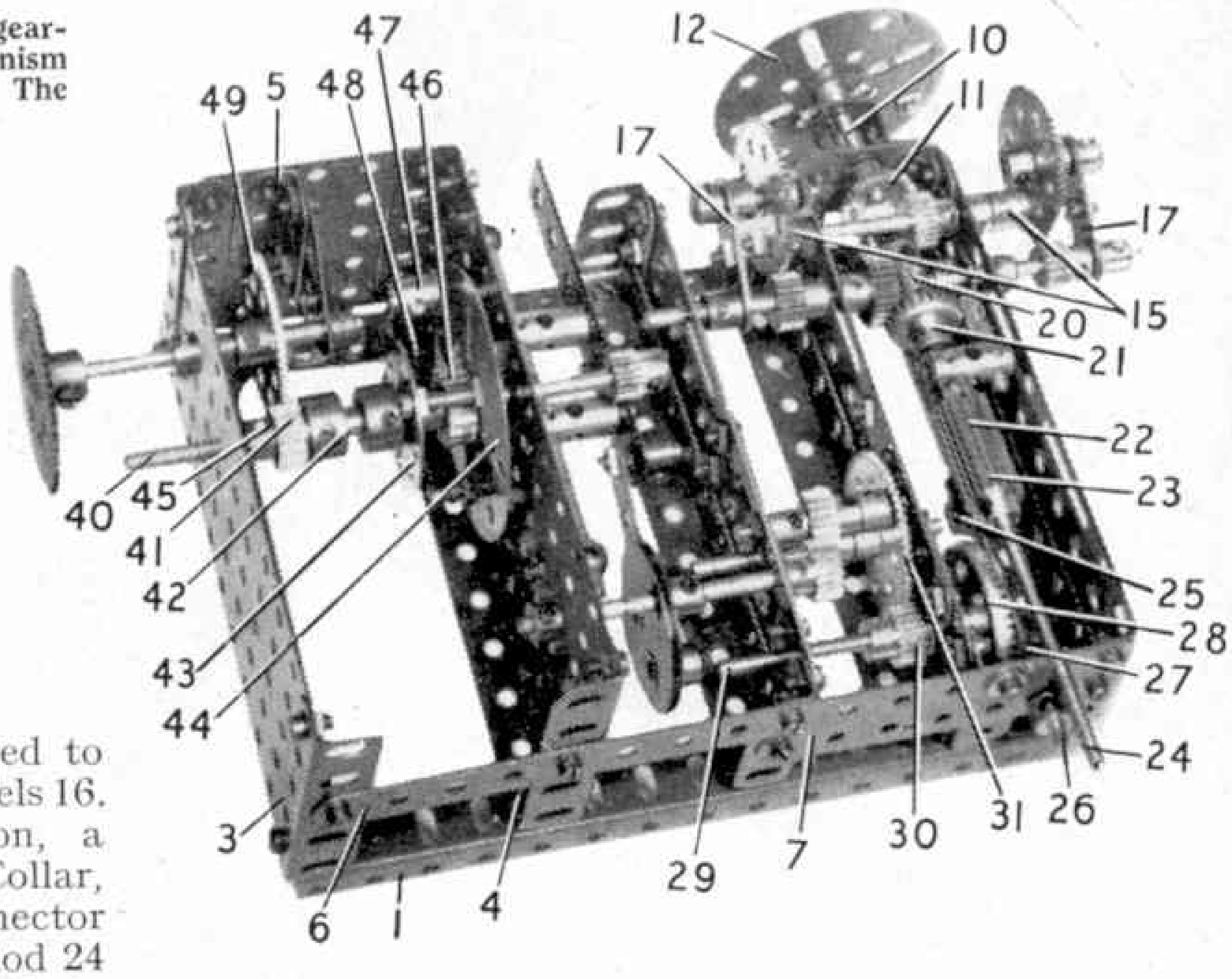


Fig. 2. An inconstant speed gear-box that is based on a mechanism designed by H. C. Geesink, The Hague.

bolted in a hole in a 57-tooth Gear Wheel 16. Into the bosses of the Gear Wheels are secured 1″ Rods that carry a Crank 17 with a 1½″ Strip bolted to it and held between two Collars. Through the bosses of the Cranks 17 a 5″ Rod 18 is passed and it can slide in the slots of the Slotted Strips. Two ½″ Pinions 19 are arranged to engage with the Gear Wheels 16. Now secure a ¾″ Pinion, a Washer, a Coupling 20, a Collar, and a Rod and Strip Connector to the Rod 18. To a 5″ Rod 24 fix a ¾″ Contrate Wheel 21 to engage with the ¾″ Pinion, the Rod being free to rotate in the Coupling 20. A ½″ × ¾″ Pinion 22, and a ½″ Pinion 23, with their teeth in line, are fixed to Rod 24. The Rod 24 is held in the Coupling 20 by a 1″ Rod placed in a Rod and Strip Connector that is secured in the Coupling between the Contrate Wheel 21 and the Pinion 22. To the 6½″ Rod 26 fix a ¾″ Pinion 27 and a ½″ Pinion 25. Pinion 25 is arranged so that it engages the Pinions 22 and 23. Pinion 27 drives a 1½″ Contrate Wheel 28 on a 2½″ Rod 29. The ½″ Pinion 30 drives a 57-tooth Gear Wheel 31 on a 2½″ Rod that carries a ½″ Pinion 32 which engages with another loose ½″ Pinion 33 mounted on an Adaptor for Screwed Rod and held by a Collar 34. The Eccentric 35 is mounted on a 3″ Rod that is driven by a ½″ Pinion 36 engaging the ½″ Pinion 33. On the arm of the Eccentric is fastened a Threaded Pin to which a 3½″ Rack Strip 37 is secured by a Collar. A 1½″ Strip is bolted to the Rack Strip and also two Threaded Couplings 38, which slide on a 4½″ Rod 39 attached to the Flat Plate by two Handrail Supports. The Rack Strip engages with a 7/16″ Pinion on a 5″ Rod 40.

A ½″ Pinion 41 is fastened in a Socket Coupling 42 fixed to the Bush Wheel 43. The Bush Wheel is attached to the Face Plate 44 by two ¾″ Bolts and six Nuts. This unit is free on the Rod 40 and is held in position by a Collar 45. The Ratchet Wheel 46 is fixed to the Rod. A Pawl 47 is bolted to the Face Plate 44 by a Pivot Bolt, and a Spring 48 keeps the Pawl in engagement with the Ratchet Wheel. A Gear Wheel 49 mounted on a 3″ Rod is driven by the ½″ Pinion 41. If a to-and-fro motion is required the set-screw in the Face Plate 44 should be tightened.

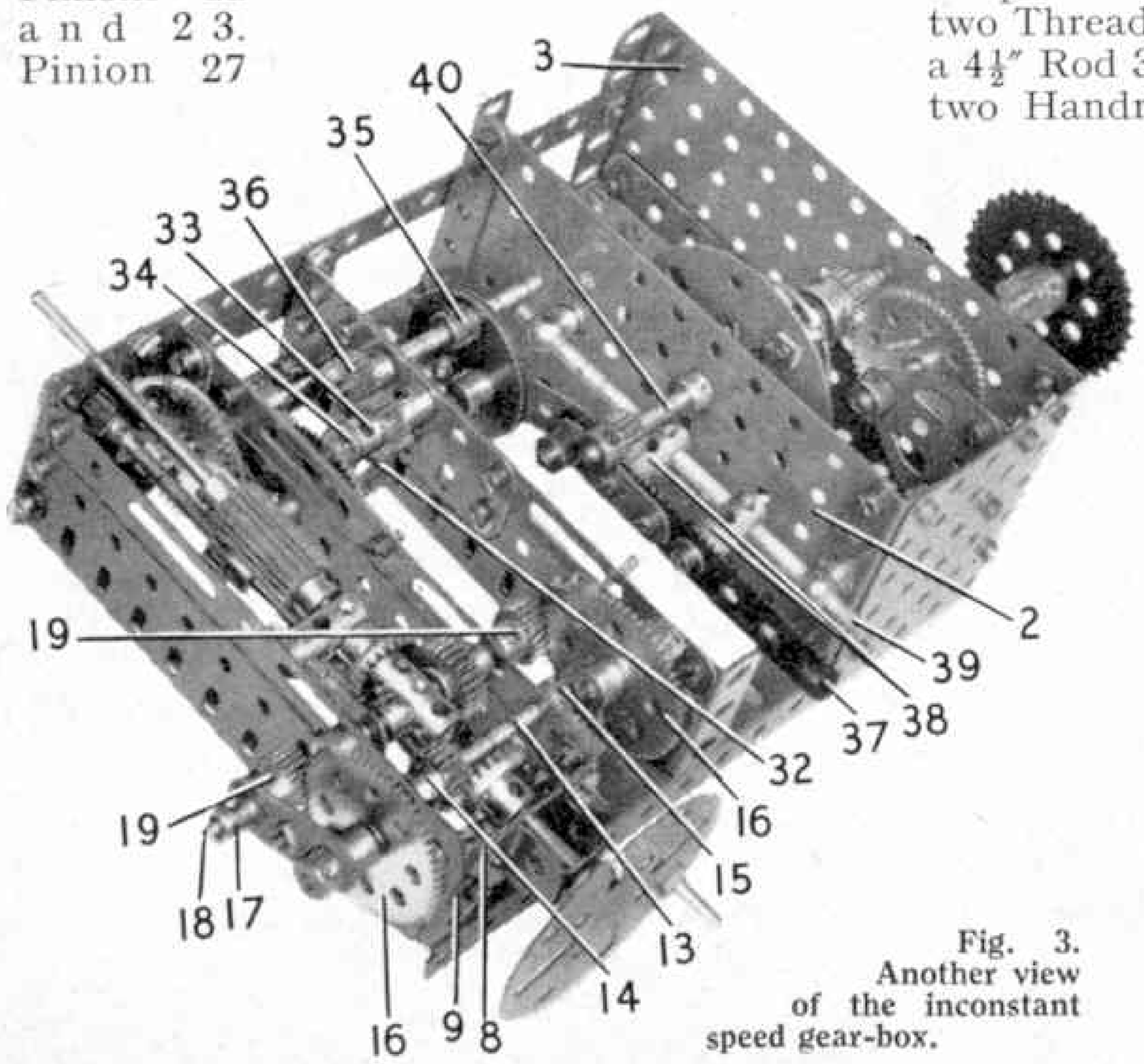


Fig. 3. Another view of the inconstant speed gear-box.

MODEL OF THE MONTH

A Fine Mechanical Excavator

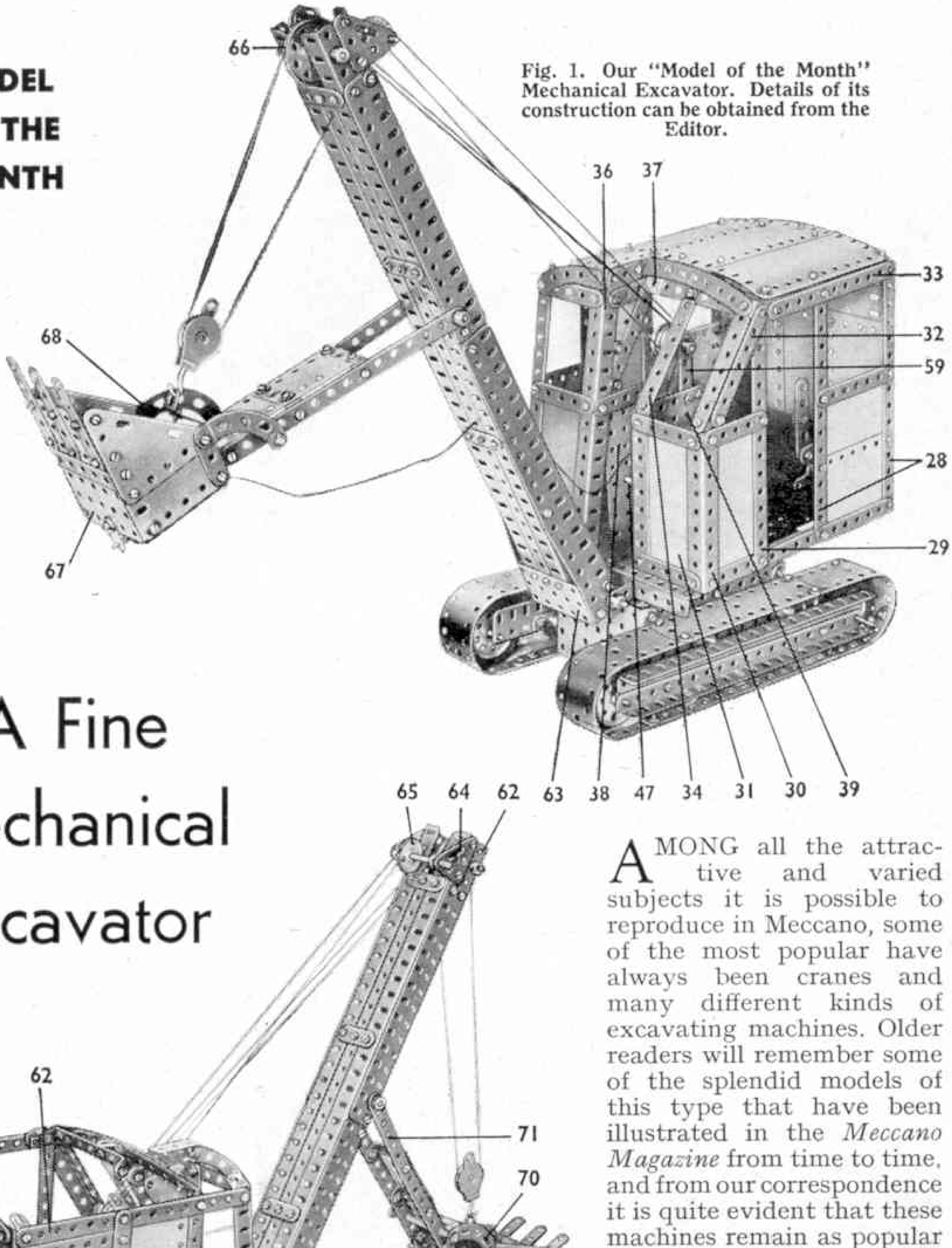


Fig. 1. Our "Model of the Month" Mechanical Excavator. Details of its construction can be obtained from the Editor.

AMONG all the attractive and varied subjects it is possible to reproduce in Meccano, some of the most popular have always been cranes and many different kinds of excavating machines. Older readers will remember some of the splendid models of this type that have been illustrated in the *Meccano Magazine* from time to time, and from our correspondence it is quite evident that these machines remain as popular as ever with the model-builders of today. It is for this reason, and in response to numerous requests, that we have chosen an excavating machine as the subject

Fig. 2. The Mechanical Excavator seen from a different viewpoint.

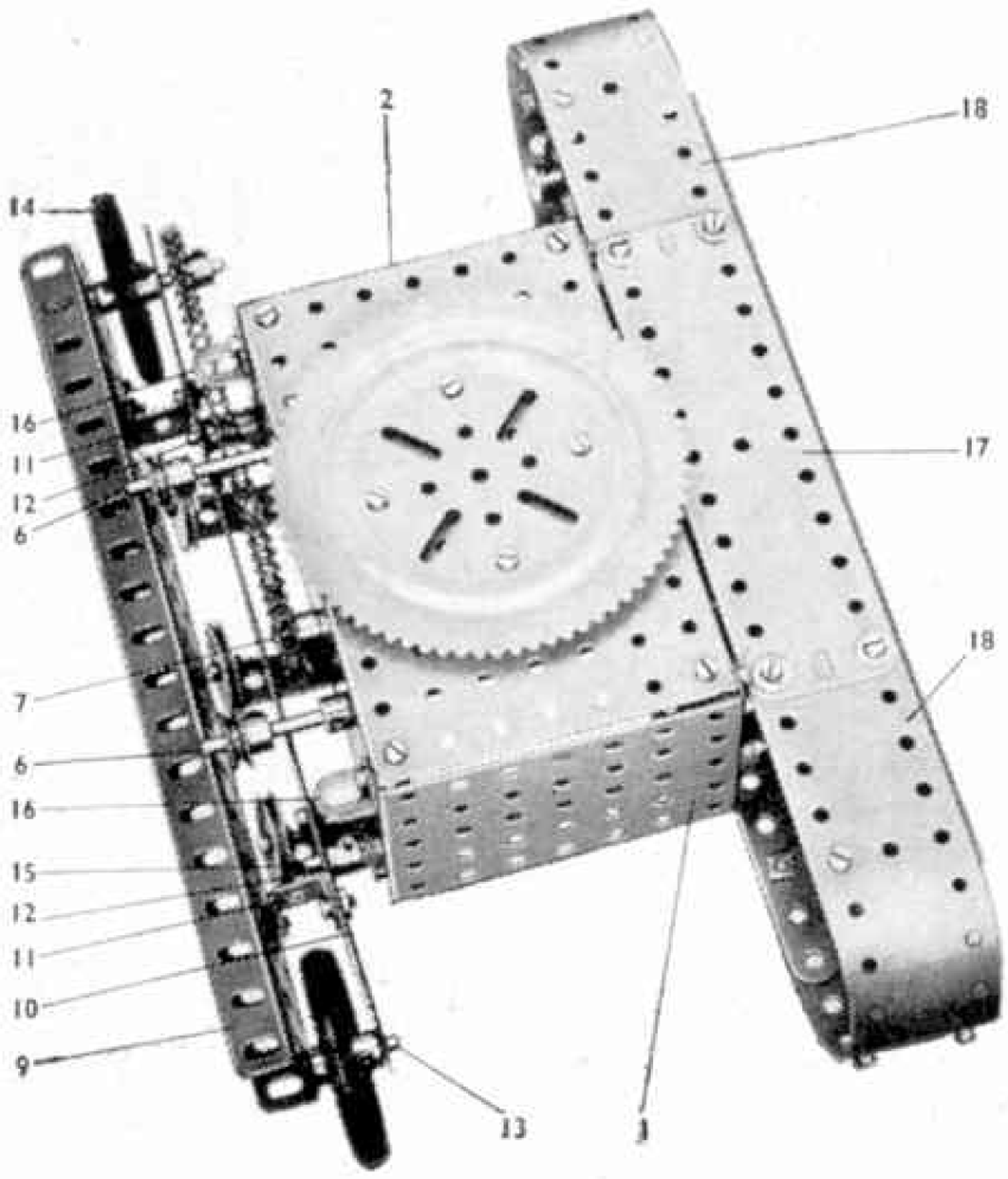


Fig. 3. The base on which the superstructure swivels, with one of the tracks removed to show the drive to the wheel axles.

for the "Model of the Month" illustrated complete in the pictures on this and the facing page.

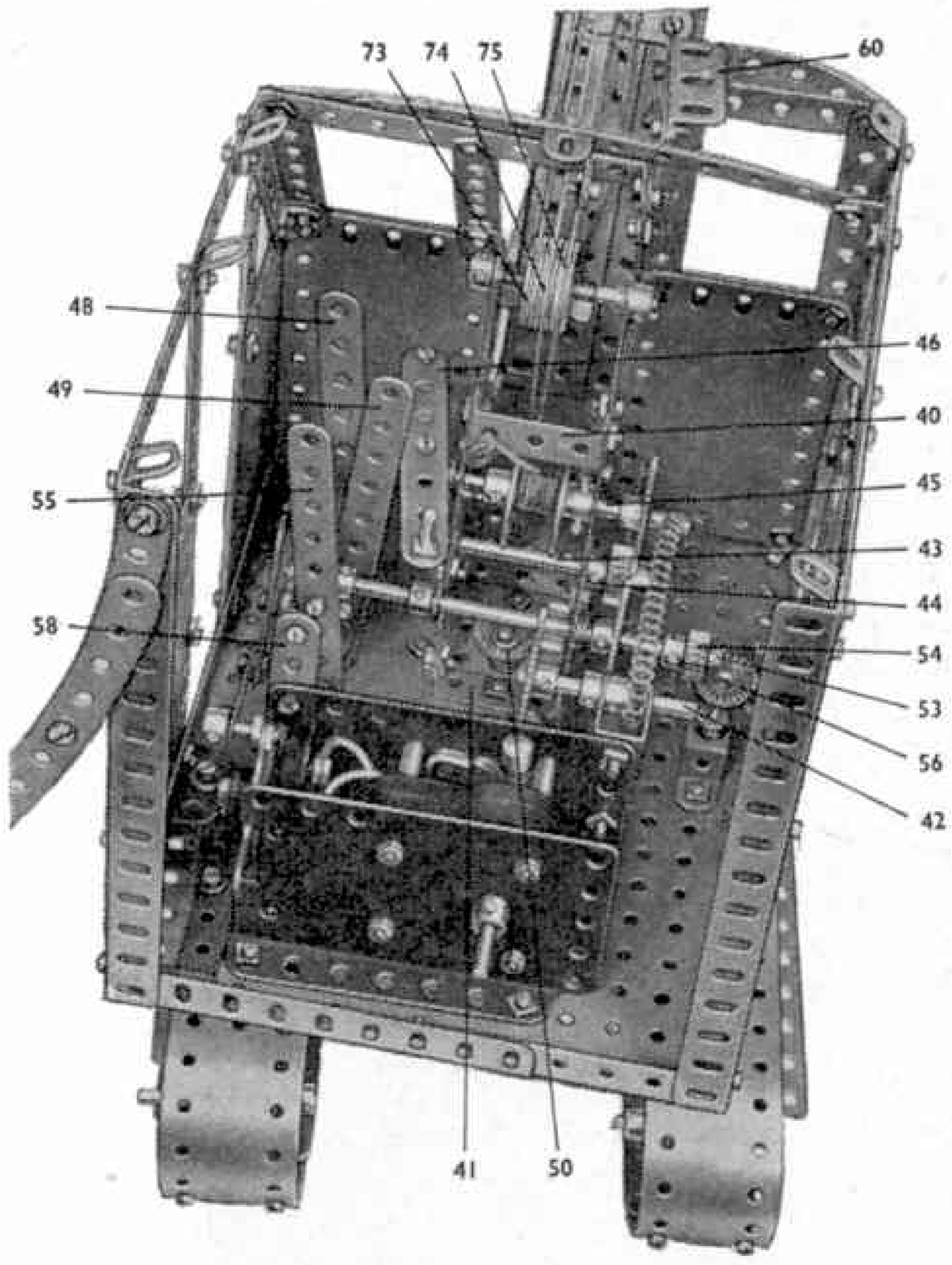
This Excavator, or Mechanical Shovel, as these machines are sometimes called, carries out all the essential movements of a real machine and it derives its motive power from either an E15R or an E20R type Electric Motor, whichever happens to be available.

As usual with these "Model of the Month" subjects, any reader who wishes to build the model can obtain the complete instructions simply by writing to the Editor, *Meccano Magazine*, Meccano Ltd., Binns Road, Liverpool 13, enclosing a 3d. stamp for postage.

Readers living in Canada, Australia, New Zealand, South African, Ceylon, Italy, Rhodesia and the United States of America, should write to our main agents for those countries for their copies of the instructions, also, of course, enclosing suitable stamps for postage.

We advise all who wish to build this model to apply for the instructions immediately they receive this issue, as supplies are not unlimited.

Fig. 4. The interior of the cab showing arrangement of the Motor and gear mechanism.



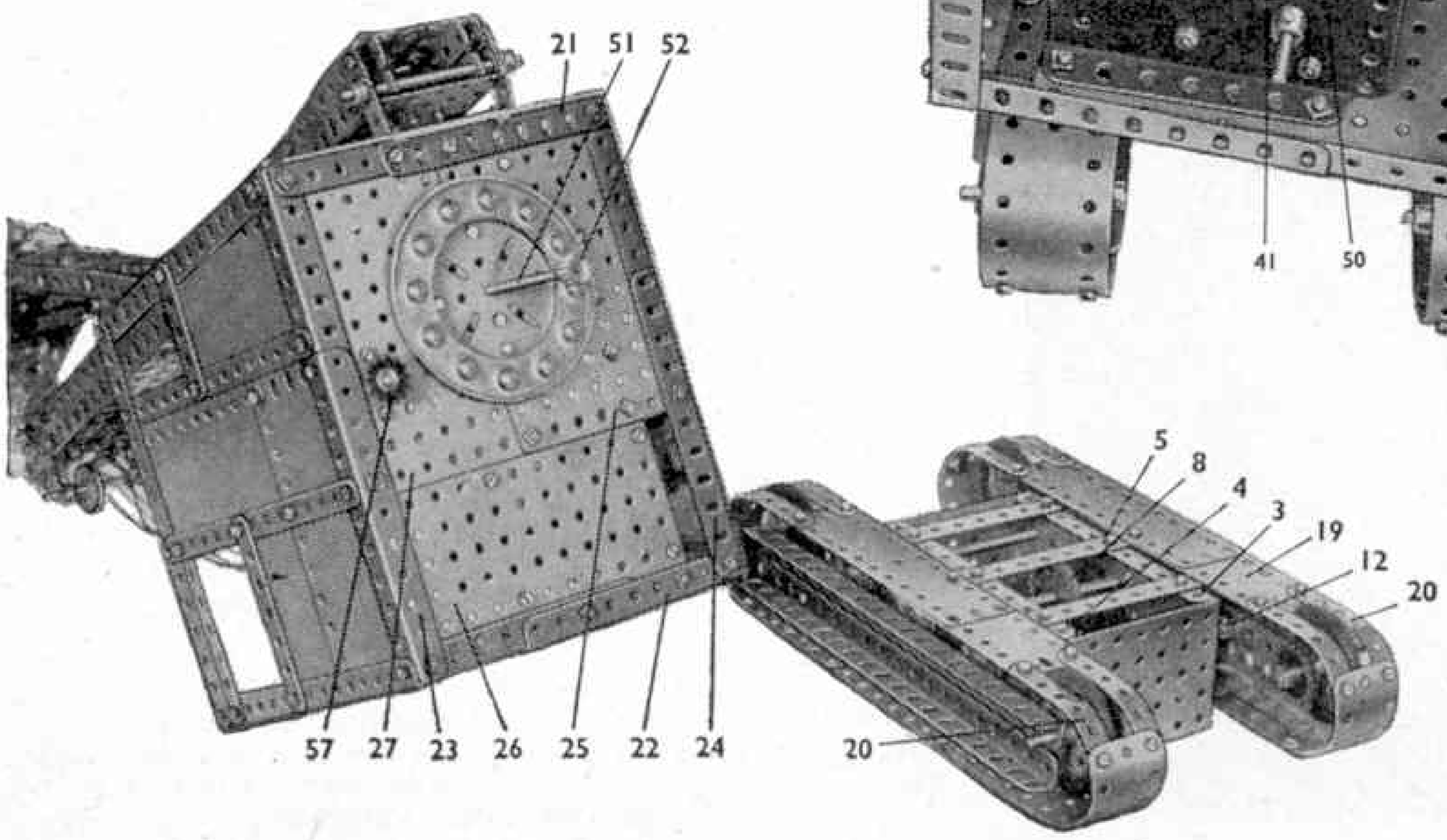


Fig. 5. On the left is the underside of the cab and on the right is shown the wheeled base with part of the casing removed.

WITH THE SECRETARY

Club and Branch News

A VISIT TO PORTSMOUTH

I RECENTLY made the journey down to Portsmouth to see how the activities of the North End Club were progressing. The Club, who now run an annual exhibition, were very ambitious this year and held a "Pastimes Exhibition" at the Co-operative Hall in Portsmouth.

There was a display of Meccano products including Meccano itself, Dinky Toys and Two-and Three-Rail Hornby-Dublo Electric Train Sets. Visitors found much to interest them in working models constructed by members of the Club. There was a dockyard scene, as befits a town such as "Pompey", which has a naval dockyard within its wide boundaries and which has a long and splendid association with the sea and, in particular, the Royal Navy.

One of the members, 15-year old Roger A. Scutt, constructed for this scene a 1/66 scale model in Meccano of a battle-class destroyer powered by a Meccano Electric Motor which operated the gun turrets. Another member, Peter Williams, had added to the appeal of this scene by supplying a Meccano-built escort destroyer. A quay, which included a Hornby Platform Crane as part of its equipment, had also been constructed by Roger and had been finished appropriately in naval grey.

North End (Portsmouth) Club has a quite enthusiastic membership, with Mr. A. Nicholson as President and Secretary and Mr. R. G. Enfield as Leader of the Hornby Railway Company Branch. Both worked hard for the Exhibition and Mr. Enfield constructed, in short leisure periods over a matter of weeks, a model railway layout which contained some excellent scenic effects. It was a pity that all the background could not be completed in time for the exhibition but, even so, the layout made quite a brave show.

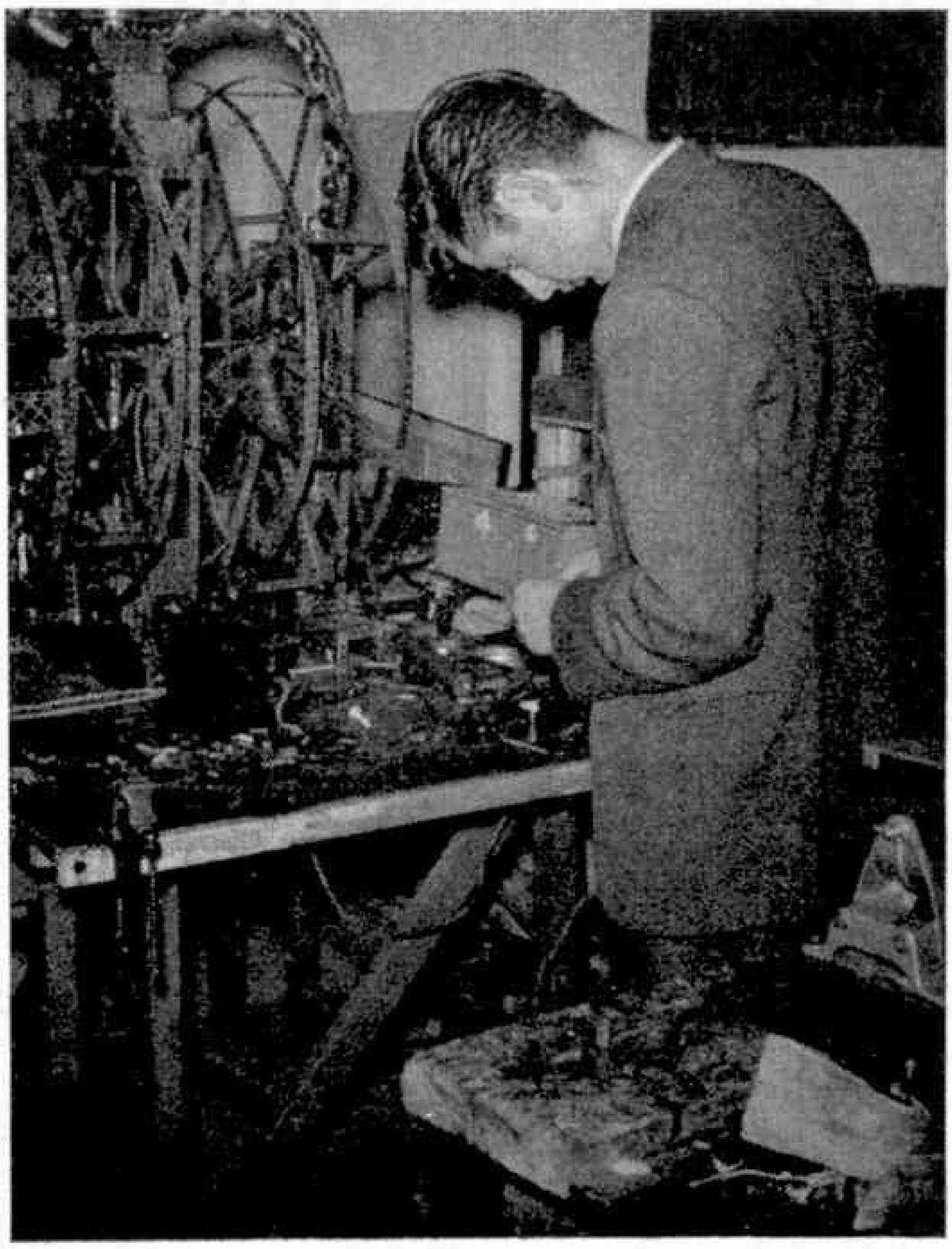
A second rail layout of Hornby-Dublo Three-Rail, which members of the Club had built up between them, was being operated by 13-year old Peter Williams. Peter, as I have already stated, also built an escort destroyer out of Meccano. Around the layout which he was operating were road sections and a skew bridge (built by Mr. Nicholson) which ran over the railway line.

I was impressed by the fact that officials of the Club and some of the members were proudly wearing the Meccano Merit Medallion.

Mr. B. Madhava Shenoi, Vice-President of the Mysore (India) M.C. In the three years Mr. Shenoi has been associated with the Club it has benefited greatly from his keen interest in its activities and his able guidance.

CLUB NOTES

ASHTEAD FREE CHURCH M.C.—Summer activities have included an outing to London Docks, where the party was shown over the Union Castle liner *Kenya Castle*. The members were allowed up on the bridge, and one of the ship's officers explained the various navigating instruments to them. They were also shown the chart room, where the ship's course is plotted during a voyage. Films shown during a meeting at the Club room included one on the history of helicopters, one on supersonic flight, and a road-safety cartoon. Future plans include a visit to the B.R. Southern Region South



Peter Winter, a senior member of the Consett and District Y.M.C.A. M.C., at work on a Meccano model of a Double Wheel. Peter is an apprentice electrician with the National Coal Board.

Lancing Railway Works. *Secretary:* Robert Nagel, 41 Newton Wood Road, Ashtead, Surrey.

CONSETT AND DISTRICT Y.M.C.A. M.C.—A new model of a Joy mine loader was the centre of attraction when displayed at the Further Education Exhibition at Durham Technical College in June last. The actual machine, working at the coal face, can deal with some 200 tons of coal during a 5½-hour shift. This and all the other Club models have been dismantled, and at the time of writing stocktaking is in progress. Ambitious models being planned for the first of the winter Sessions include a set-up illustrating space flight with flying saucers, a model of a plate and strip rolling mill, and one of a dance floor and orchestra. The winter programme will also include model-building competitions, film shows and visits to places of interest. *Secretary:* John R. Goodrum, 7 Tees Grove, Leadgate, Consett, Co. Durham.

INDIA

MYSORE (INDIA) M.C.—A publicity campaign to make better known the aims of this enthusiastic club is in progress. A neat card bearing details of the Club is on display in Mysore in two cinemas, two popular hotels, two studios and two book-shops and efforts are being made to get more such cards displayed. It is hoped that this campaign will result in more members being enrolled. Mr. P. R. Seetaram, B.Sc., L.A.M.S., has succeeded Mr. Simonelli as Co-Leader. *Secretary:* Mr. M. N. Radhakrishna, 16 Mothikhana Buildings, Santhepet, Mysore 1.

NEW ZEALAND

CHRISTCHURCH M.C.—Attendance at meetings has been good, and a very high standard of model-building has been maintained. At one meeting there was an interesting display of home-built models. A Parents' evening was well attended. There was an excellent display of working models, which included an 8 ft.-long cargo ship and other vessels, a coaling plant and a transporter bridge, for the visitors to see, and there were games and competitions. The visitors all enjoyed themselves, especially in the competition for parents, who had to build a table from parts placed before them. A tape recording was made during this contest and played back afterwards to the great amusement of all present.

Model Mechanisms was the subject of one model-building meeting, during which some excellent and varied gear-boxes were constructed. *Secretary:* Robert Boundy, 25 McBratneys Road, Dallington, Christchurch.

ST. JOHN'S (DUNEDIN) M.C.—At one meeting the group leaders combined in giving an excellent model-building talk. Interesting models examined and demonstrated at the following meeting included a blacksmith (powered by a *Magic* Motor). The energetic Washers group had built a "railway scene". *Secretary:* William J. Earl, 60 Ann Street, Roslyn, Dunedin, New Zealand.

BRANCH NEWS

AVIARY MODEL RAILWAY CLUB (LEEDS)—At one indoor meeting a full scale Quiz was held, instead of the usual track operations. Outdoor activities during the summer included cricket and rounders. *Secretary:* John Baker, 10 Salisbury Terrace, Leeds.

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For other Stamp Advertisements see also page 536

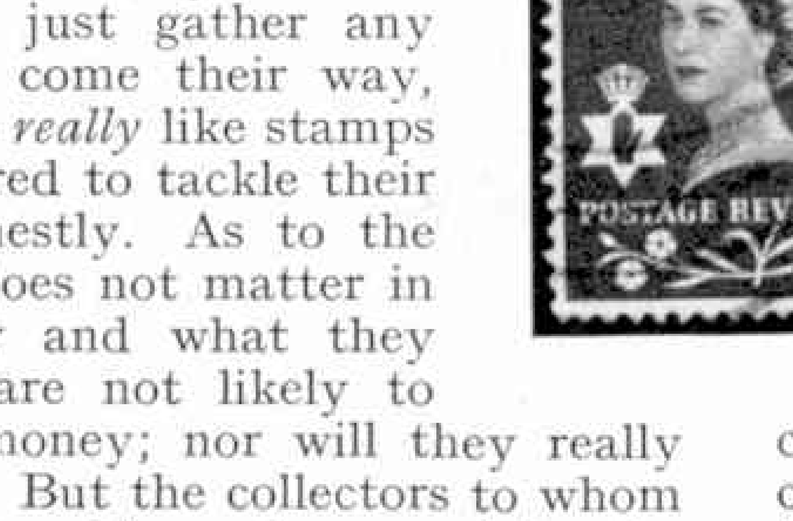
For Stamp Enthusiasts

Our Own Stamps

By F. E. Metcalfe

I SUPPOSE there is no indoor hobby which is so popular throughout the world as stamp collecting, although the only time it receives general publicity is when a collection sells for a million pounds, as one did recently, or forty-three "Penny Blacks" sell for as many hundreds of pounds.

There seems to be as many ways of collecting these fascinating "bits of paper" as there are collectors. But the latter can be more or less divided into two sections—those who do not take the hobby at all seriously, but just gather any stamps which come their way, and those who *really* like stamps and are prepared to tackle their collecting earnestly. As to the first kind, it does not matter in the least how and what they collect, they are not likely to spend much money; nor will they really get anywhere. But the collectors to whom these lines are addressed come into the second category, the enthusiasts who really want to form a stamp collection, not one of much value perhaps—funds probably won't run to that—but one which will educate as well as amuse; a collection in fact which, if regular supplies of pocket money are spent on it, will not represent an entire loss if it has to be sold for one reason or another.



In my own early days of stamp collecting most enthusiasts collected everything. because there was not a great deal to collect. But for years now the world's printing presses have literally erupted stamps—over seventy sets have been issued this year to mark "World Refugee" year—and a result of this increasing flood is that general collections (that is, collections embracing the stamps of all countries) have been swept almost out of existence. By general collections I mean those formed on serious lines, as distinct from those which just consist of a relatively few stamps picked up anywhere.

But there are more collectors today than ever before, you will say. That is true. The hobby is certainly booming, but collectors who take the hobby at all seriously have had to limit their scope, and thematic collecting has become quite popular. British Commonwealth stamps of the present reign, as well as those issued during the period when King George VI was on the throne, have a tremendous following. The stamps of the French colonies are another popular choice, and so on. Then, too, you have many serious collectors just limiting their field to a couple of countries, or even an odd one. Limitation indeed, but this month I am going to suggest a little collection which can provide a lot of fun without costing much precious spare cash. The stamps involved are no less than those of our own country issued during this present reign.

British stamps were never, in the old days, particularly popular here at home, except with the advanced philatelists. One of the reasons was, as catalogue illustrations testify, that they were the dullest lot issued by any country. Those terrible designs released before the first world war were enough to deter anyone. But while we have not yet got those pictorials which so many ask for—how tired the P.M.G. must be of saying "No" to their pleas—our stamps have brightened up a lot. The current definitive stamps are practical and well-designed, and what with the double change in watermarks, and the graphite and phosphor-graphite issues, we get a most (*Continued on page 538*)

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For other Stamp Advertisements see also page 534

Stamp Gossip

KALIDASA, POET AND DRAMATIST

MORE than once it has been mentioned that India is producing such interesting and attractive stamps that these are rapidly becoming best philatelic sellers. Now, India has even gone one better by issuing, on 22nd June last, two really beautiful stamps to honour her great Sanskrit poet and dramatist. Again our good friend Mr. E. R. Kooka, of Bombay, has sent copies and a first-day cover. It's a pity that there is not room to illustrate both values (15np and 1.03np) but the one shown will prove what a nice set we are considering.

And who was the great Kalidasa? Little is known of his life, but the Indians class him along with Homer, Plato and Shakespeare, and we will take their word for it, as there are very few of us who know a word of Sanskrit. But, thanks to Mr. Kooka, I can mention that the design of the 15np illustrates a scene from the Meghadūta, where the figure (Yaksha, the hero I suppose) is pleading with a cloud to carry his message of love to his beloved. The 1.03 stamp shows a scene from the other great work of Kālidāsa, the Sakuntālā, where the heroine is writing a love letter to her beloved Dushyanta, in the midst of sylvan beauty. I suggest you buy a set for yourself. The price will only be around half a crown, or three shillings, if you don't delay; and apart from enjoying the beautiful designs, take a crack at learning about them. The exercise will be well worth while.

GOLDEN JUBILEE OF GUIDING

Australia issues such interesting stamps that I do wish I could find room to illustrate more of them, but with hundreds of attractive stamps coming out all the time, rationing has to be very strict indeed. Australians themselves are very critical of the designs of their stamps, unduly so, many people think. Anyhow, here is a stamp which simply must be illustrated, for it has to do with an event which will interest young people. The object of the issue to commemorate the Golden Jubilee of Guiding in Australia. There is no need to describe the design, for it speaks for itself.

If all the Australian Guides are as attractive as the one depicted I can see an increase in emigration, once the fact is known! The great point about these Australian special issues is that plenty are released and the face value is low, which means that any collector can get copies for a few pence. No wonder the stamps of Australia today, along with those of the sister countries of New Zealand and Canada, are "tops" in popularity with young British collectors who, however scarce pocket money may be, can afford to make quite a show. This is a lot more than can be said about the stamps of some countries, which cost the moon.

THIS CHANGING WORLD

When the rest of Africa was presenting an uneasy face to countries like Britain and France, the Congo, on the surface at any rate, seemed quite contented. We were told that Belgium had a secret the rest of us had not got, of being able to keep its colonials quiet. Well, there is nothing very quiet about that Central African country today, yet that does not stop the issue of attractive stamps. Especially appealing is the issue released on 30th June last. The "Independence" set consists of eight values all showing various facets of life in the Congo. Such issues are of intense interest, even if the object behind their emission is a tap at collectors' pockets. Of the

(Continued on next page)

Stamp Gossip—*(Continued from previous page)*

designs I have picked one for illustration, which apart from being self-explanatory gives an insight of what is going on, or shall we say, the authorities hope will go on, as advancement comes. We can only hope that it will come, but it won't be as easy as some people apparently believe.

TIGER CAT

A Birmingham reader wrote recently to say he had adopted an old tip of mine, and when he came across a stamp with an interesting design which he did not understand he went round to the local reference library. Being in Birmingham, with a first-rate reference library right on hand, he is in luck. But there are such libraries up and down the country, so many of our readers can follow his example and visit their local establishment for a like purpose. In a surprising number of cases he was able to get most of the information he was seeking. For instance, Australia has recently issued several stamps bearing flowers and animals indigenous to that great country. As a collector of such subjects, my correspondent went to the library and there learned all about tiger cats, etc. But according to what he has told me the animal shown on the stamp is not a very exact copy of what the animal looks like. Anyhow—and this is the important point—the collector referred to is enjoying his hobby, and picking up interesting knowledge at the same time. Who says you cannot gild the lily?

THE TIP OF THE MONTH

Last April British Somaliland issued a couple of overprinted stamps to mark a change in the constitution. The stamps were to remain on sale for six months. However, when June came that part of the Horn of Africa was given its so-called freedom, and with only 24 hours' notice the stamps were withdrawn. The Crown Agents have not yet published the sales figures, but they are bound to be small, and this looks like being a good set. At the moment the price is round about half-a-crown. It should be a nice little philatelic investment at that figure. The stamps I am referring to have the overprint "Legislative Council Unofficial Majority 1960" and the numbers in the Commonwealth "QE" Catalogue are S16 and S17.

For Stamp Enthusiasts—*(Continued from page 535)*

interesting lot of varieties, which provide substance for beginner and advanced collector alike.

Now let's get right down to cases. The first "QE" British stamp to appear was the 1½d. in December 1952, and by 1954 the whole set to 1/6d. had appeared with the "Tudor Crown" watermark. Later, in 1955, we got the high values from 2/6d. to £1, and if these latter are examples of the pictorial stamps which so many seem to want, then give me the small "Queen's Heads", a sentiment I am sure the Post Office will echo, as the large stamps must cost more than twice as much as the lower values to produce.

Next, in line with a suggestion about a change in watermark—when convenient—from the Queen, the watermark was changed and it became what is known as the "St. Edward's Crown" watermark. The values were changed during 1955 and 1956. Then to the surprise of collectors, there was yet a second change, and while the crown of the watermark was still of the "St. Edward" shade, the EIIR was dropped, as can be seen by the illustrations. This alteration was effected in 1958 and 1959.

Fun indeed for collectors, especially as certain values taken from stamp booklets had the watermark inverted, and others from certain rolls—which are used in stamp machines—had the watermark sideways. There is not room here to give details of all these variations, but full listings will be found in the Commonwealth "QE" Catalogue, a new edition of which will appear early this month. As if all this were not enough to keep collectors on their toes, along came the "lined" stamps, and since then our own relatively ignored stamps have really come into their own. The resulting publicity, coupled with the fact that collectors, in the main like varieties, did the trick.

I don't think I need say much here about the "graphite" and phosphor-graphite stamps, as I have referred to them before. Do not forget, however, that "graphite" stamps (those with black lines down the back, but with no lines on the front, as have the phosphor-graphite) exist with the two latter watermarks, and also with inverted watermarks from booklets. It is important to remember the latter, because these "booklet" stamps are the result of special printings and, as philatelic varieties, are becoming very popular. Of course, when you buy a booklet it is only a fifty-fifty chance that you will get stamps with inverted watermarks, for half the stamps are normal, but you can always use for postage any you don't want, or perhaps your dealer will be able to supply a set of "inverts," at a little over face value.

There was another change in our stamps, or rather the high values from 2/6d. to £1. At the beginning of 1958 De La Rue took over from Waterlows the job of printing our stamps, and collectors are having a whale of a time trying to spot the differences. I will not attempt to explain them here, as they are quite complicated, but the catalogue I mentioned gives full details.

And now to sum up. "QE" stamps up to 1/6d. can be found with any of three watermarks, and higher values with either of the last two; "graphite" stamps up to 3d. and 4½d. in the two last watermarks respectively, and the "graphite-phosphor" to 4½d. in the current watermark. And don't overlook the "inverts" and the "sideways" watermarks—surely plenty to keep one "knitting". And if you go in for "used," a quite nice little display need cost very little.

I have not referred to the special issues, as they do not need any explanation, being quite straightforward. They are not without interest, of course, and in spite of criticism of some of the designs their inclusion adds a nice touch of colour to a collection. But do not mix them up with the ordinary definitive stamps. Mount them *after* the latter, in the order they appeared. They look much better that way.

As I finish these notes, there is news of yet another set of G.B. stamps, to 4d. plus the 6d. and 1/3d. values, with front phosphor lines only, so that is another interesting "QE" set to go for.

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The First British Motor Show—(*Continued from page 489*)

and ball bearings. Powered by a 1½-horse-power Benz benzoline motor, it weighed just under 6 cwt. and sold at £130.

A much more spacious model by the same manufacturers, known as a Motor Victoria, and fitted with a large leather hood and a 3 h.p. motor, cost £230.

The majority of cars depended on tube ignition, which meant that the tubes had to be kept hot by means of a live flame placed near the carburettor. Theoretically, this method proved reasonably satisfactory but, when the vehicle was on the road, the flame invariably went out at the first sign of wind.

In most of the early cars the function of the clutch was performed by a tapering leather cone inserted in the flywheel. When, as often happened, the cone slipped out, the clutch was depressed and sand was thrown into the flywheel to restore the necessary grip. Oil supply, too, presented its problems. Dial gauges were unknown and, in order to keep abreast of such matters, the driver had to keep a careful watch on a series of drippers on the dashboard.

Although some super-models exhibited in 1896 had engine brakes fitted behind the gearbox, most drivers were compelled to entrust their safety, and that of other road users, to wooden or leather blocks acting on the tyres of the rear wheels. When pneumatic tyres were fitted, application of the brakes frequently resulted in a puncture.

At the first Motor Show, not so much as a spanner or screwdriver was provided with the car, practically everything except the engine, chassis and body being counted as extras. So, when a purchaser had decided on his choice of car, an additional £100 or so was spent on wings, tyres, running boards, lamps, horn, windscreen, speedometer—an instrument capable of fantastic readings—hood and "dust protector". The last-named item was a tightly-stretched piece of canvas projecting from the back of the car to catch the dust thrown up by the rear wheels.

In conclusion, it was not until the summer of 1902 that the Society of Motor Manufacturers and Traders, present organisers of the show, was formed. The first Motor Show under the control of the Society was held at the old Crystal Palace from January 3 to February 7, 1903. Year by year it has grown in importance and prestige until to-day it is regarded as one of the world's outstanding annual events.

The Black Arrows—(*Continued from page 495*)

Some of the formations invented by Roger Topp and Peter Latham have been copied by other aerobatic teams, but none has attempted displays by large formations on the scale of Treble One. Each formation pattern has a name, such as Wine Glass, which is shaped like a champagne glass, Card Eight, which is reminiscent of the symbols on the "eights" in a set of playing cards, and Farmer, which takes the shape of the Russian MiG-19 fighter (NATO code name "Farmer").

Only once has any air force held a temporary lead in the number of aircraft used in an aerobatic manœuvre. This was when the Pakistanis looped a formation of sixteen F-86 Sabres early in 1958. Everyone wondered how Treble One would react, and the answer was given at Farnborough late that year.

The airfield was hushed as the time came for No. 111 Squadron to put in an appearance. Suddenly, the sky to the west seemed filled with aeroplanes. "One, two, three . . . everyone seemed to be counting. Before they had finished, the whole vast formation of 22 Hunters swept up into a graceful and perfect loop . . . followed by a second loop . . . after which six peeled away, leaving sixteen Hunters to perform an incredible roll in formation.

There was more to come; but those first three manœuvres alone were sufficient to confirm Treble One as the greatest aerobatic team of all time.

Road and Track—(*Continued from page 499*)

Rootes diesel engine—a direct injection two-stroke with opposed pistons. There are three cylinders with a Rootes type "blower" unit to give 105 b.h.p. at 2,400 r.p.m., a heavy-duty dry-plate clutch and a four-speed gearbox with synchromesh on all speeds.

The transporter can carry three racing cars and a full complement of mechanics and spare parts. David Murray, the genial patron of Ecurie Ecosse, and "Wilkie" Wilkinson, his chief mechanic, designed the body, which was built by Alexanders of Falkirk. It is of "Open deck" construction on two levels, the top deck accommodating two cars and the lower deck one car, a compartment for drivers and mechanics and a large cabin for spares and equipment. Loading is no problem. The first car is hauled up a ramp by an electric winch and then up another ramp on to the top deck. The second car, once it has been winched up the ramp, is elevated to the top deck by a Lockheed hydraulic system; the third stays on the lower deck.

The driving cab has been planned for day and night comfort and includes deep cushions, a reverse inclined windscreen for good visibility, map-reading lights, radio, and special driving lights.

What's that you say? Mechanics have never had it so good. Well, maybe, but it's not getting to the circuits—it's working round the clock once you get there that makes the life of a motor racing mechanic tough and often thankless, but never boring.

Castles You Own—(*Continued from page 502*)

encourage more people to visit these and many other castles include the erection of additional signposts Attractive guide-books telling the stories of these ancient fortresses, and pointing out their special features, are to be published. Artists are to prepare drawings showing how the castles looked when they were occupied. These pictures will be displayed on the site and will be on sale as postcards.

Some of the castles can be visited without payment; in other instances a small charge. The money helps to cover the £600,000 a year needed to maintain the historic strongholds and pay the wages of the men who look after them.

Air News—(*Continued from page 505*)

10,000 ft. trailing two 300-ft. long electric cables from its bomb-bay. As it did so, a powerful electric generator was started up, to send current through the cables in an attempt to reproduce the ionization that clouds experience from a bombardment of cosmic rays. This seemed less successful than seeding, and since 1951 good results have been achieved using silver iodide crystals instead of "dry ice". It is not easy work for the aircrews, who are subjected to extreme turbulence and high winds inside the clouds, as well as the dangers of airframe and engine icing.

"Twins" of the South Ayrshire Coalfields

(*Continued from page 507*)

"*The Twins*" as it was always double-headed, usually with both engines tender first, to provide extra brake power on the rather steep descent from Mossblown Junction to Ayr. As far as I know the name of "*The Twins*" stems entirely from local usage; it is by this title that the train is always known in the district, even to the operating authorities.

In the afternoon things would return to normal, with two more trains out and back to Drongan. There are two daily coal trains from the Nith Valley line that run to Ayr Harbour via Mauchline, as there is no connection between the Nith Valley and the Muirkirk line at Old Cumnock. These trains serve collieries at New Cumnock, Sanquhar and Kirkconnel and are worked on an out-and-back basis from Ayr, usually by a 2-6-0.

Most of the shunting at the mines is done either by converted farm tractors or by British Railways locomotives as only three (one at Dalmellington, Mossblown and the new one between Drongan and Coylton) have locomotives of their own. This fact may also have something to do with the use of small 0-6-0s on these trains, and the consequent double-heading of "*The Twins*", as I doubt if anything bigger than a 0-6-0 could get into many of the colliery sidings.

Fireside Fun

"Just a temporary arrangement until they get the lift working again, Miss Jones!"

Father: "Have you seen my shaving-brush, Willie?"
Willie: "No, father; but Jimmy's wooden horse has got a new tail this morning."

* * * *

Artist: "With one stroke I can make a smiling face sad!"
Sam: "So can our form-master!"

* * * *

Policeman (to motorist): "Why didn't you slow down? Didn't you see the notice—'Slow down here'?"
Motorist: "Yes, but I thought it was describing your village."

* * * *

Johnny: "Grandpa, can you help me with this sum?"
Grandpa: "I could, my boy, but it wouldn't be right, would it?"
Johnny: "I don't suppose it would, but have a shot at it, grandpa."

* * * *

FIVE MINUTE CROSSWORD.

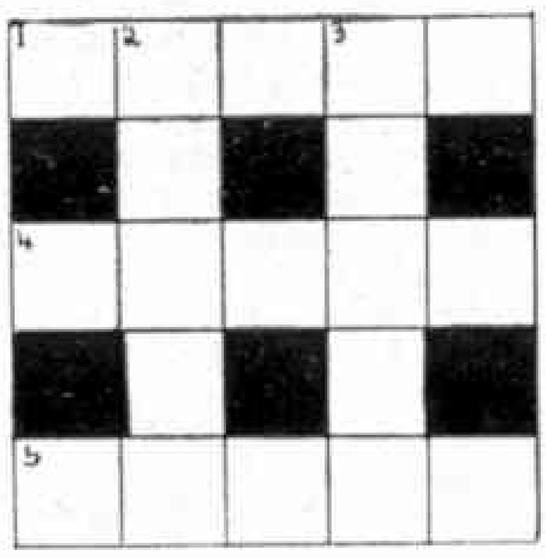
Clues

Across

(1) Black or White.
(4) Stretched Circles?
(5) Share out.

Down

(2) Without this the Blacksmith would be lost.
(3) Dwelling in the arctic.



Answer to Last Month's Puzzle.

The Road to St. Ives.

There was only one *going* to St. Ives. All the others must have been coming *from* St. Ives since the man *met* them on the road.

A famous boxer, fearing his coat might be stolen, attached a ticket "Owned by a champion boxer."
When he returned he found no coat and on his ticket the added note: "Taken by a champion sprinter."

* * * *

Teacher: "Can anyone tell me what happened after Caesar mustered his army?"
Boy: "Yes sir, he peppered the enemy and took the citadel by assault."
Teacher: "Sit down my lad, I'll have no sauce from you."

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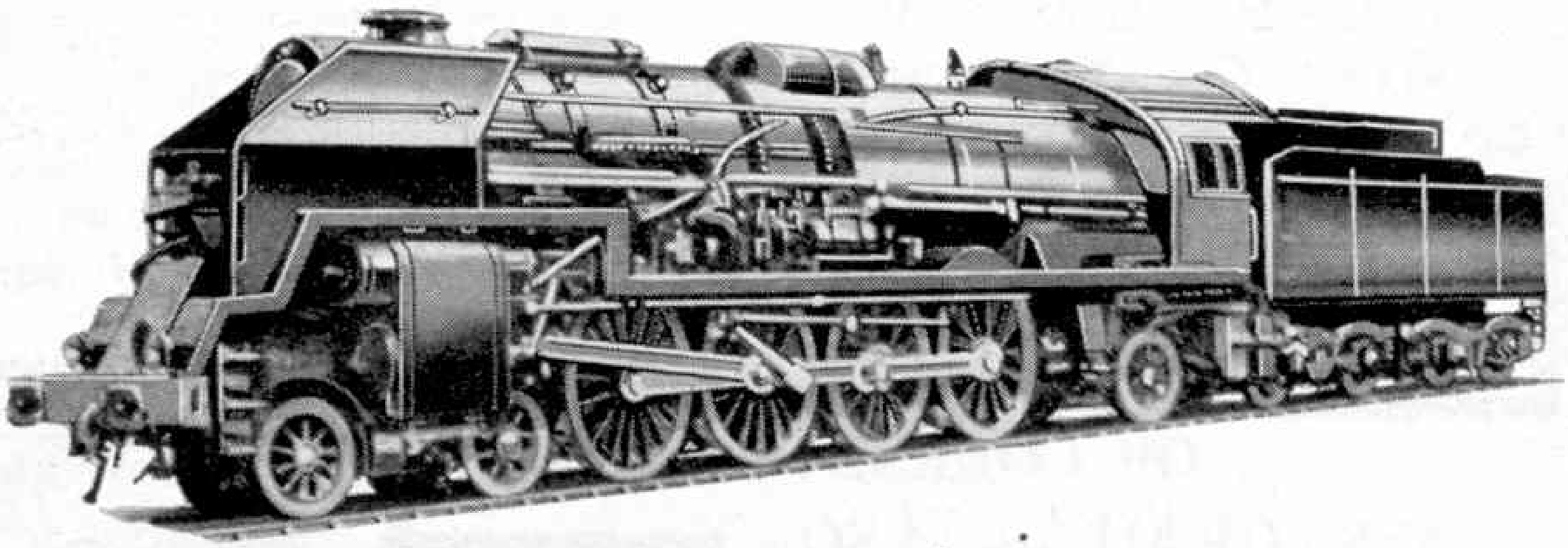

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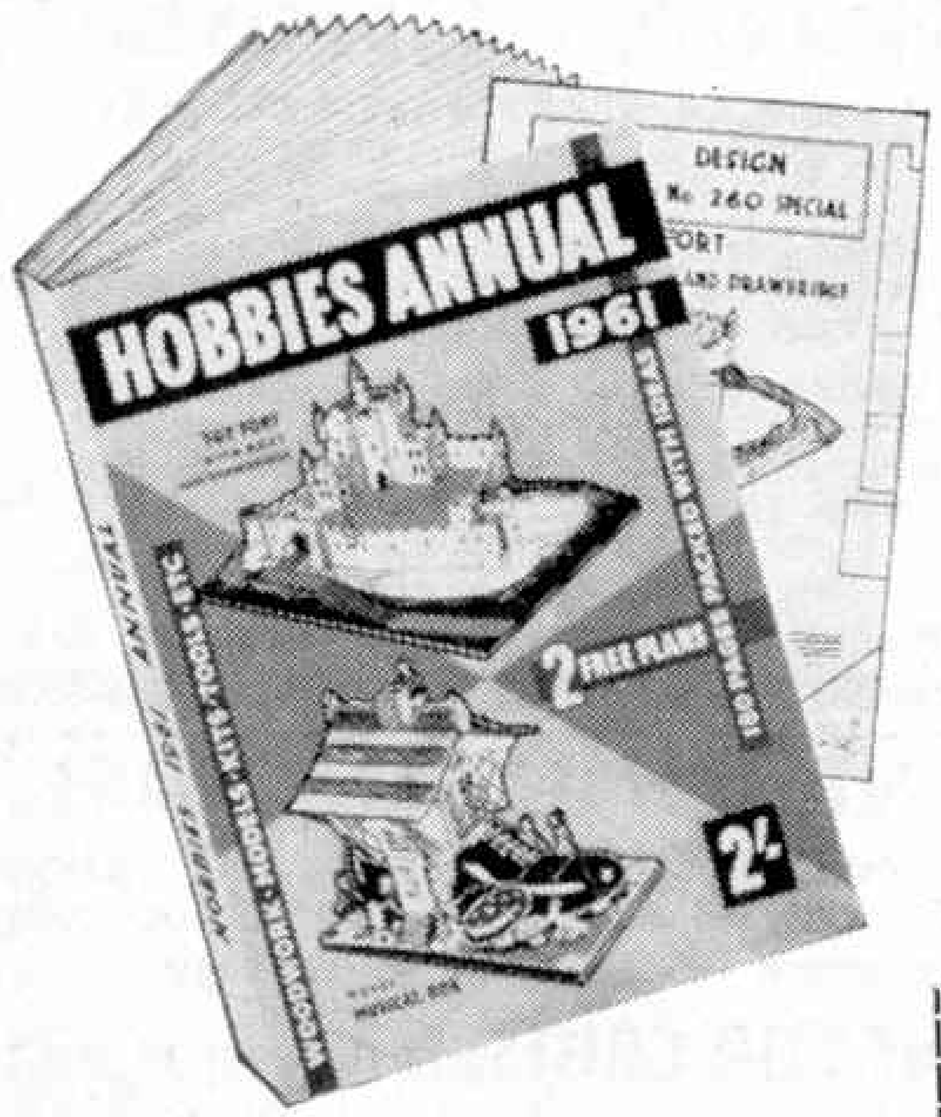

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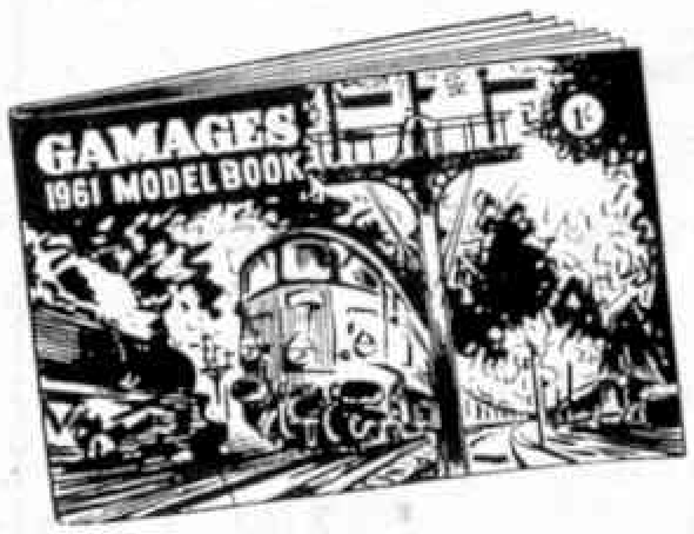

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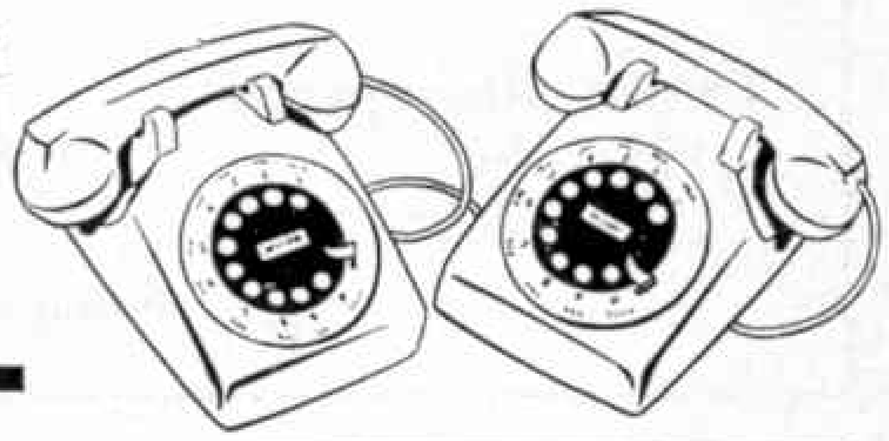

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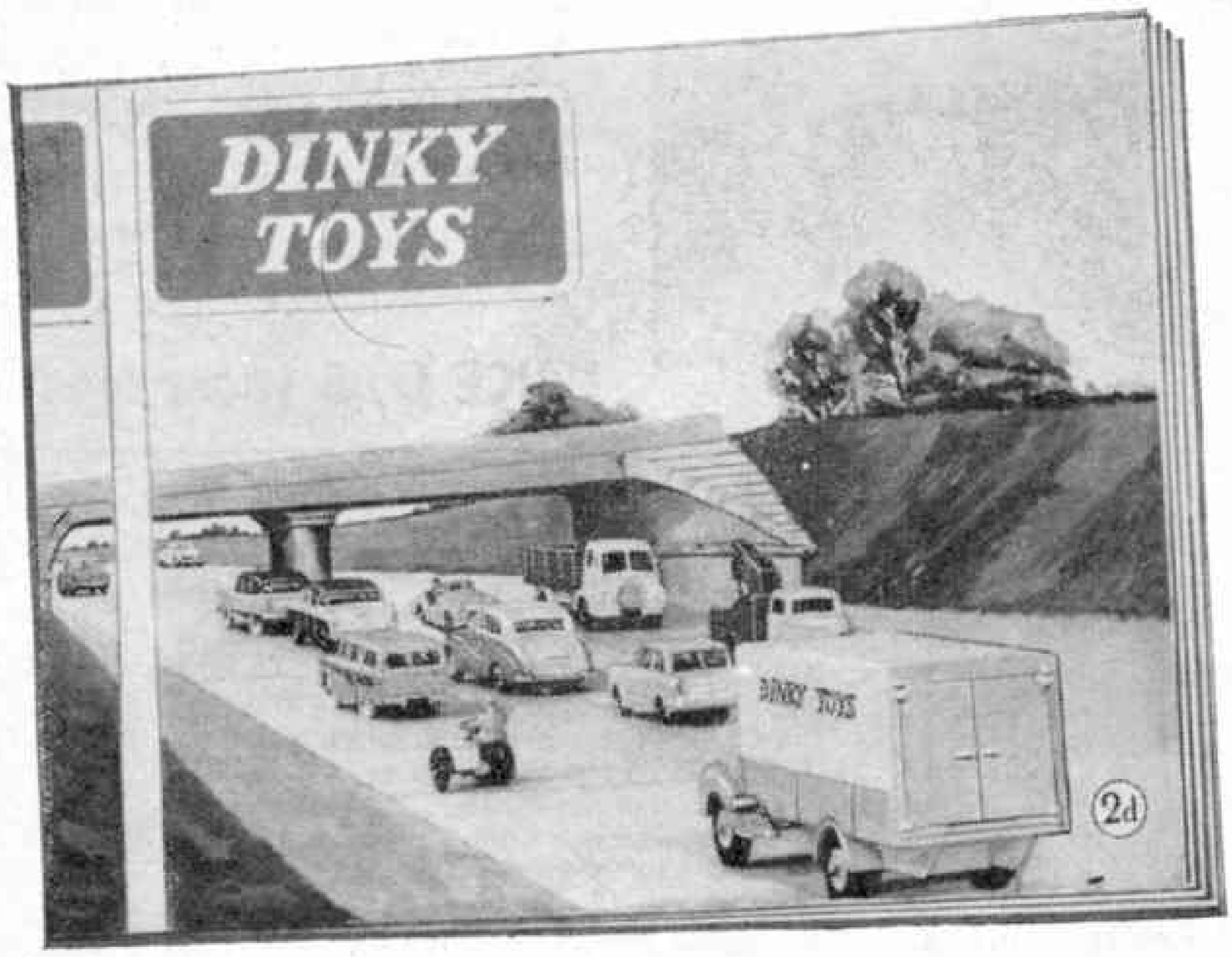

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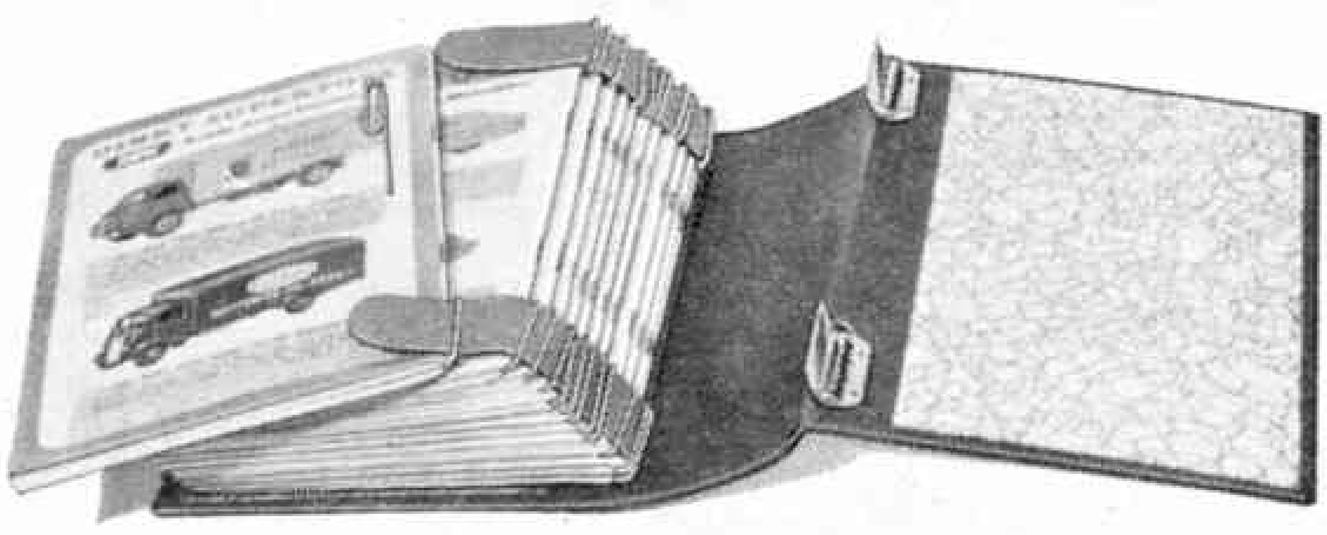

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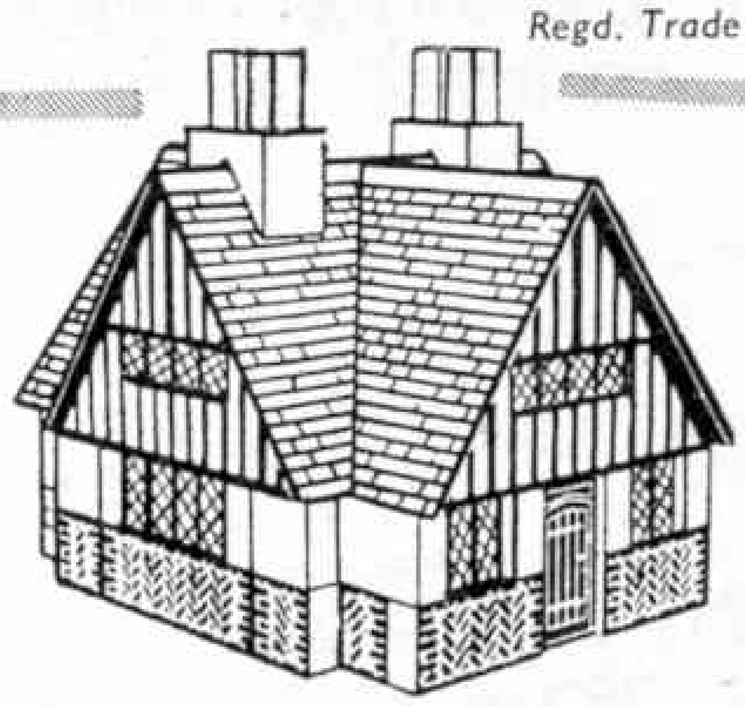

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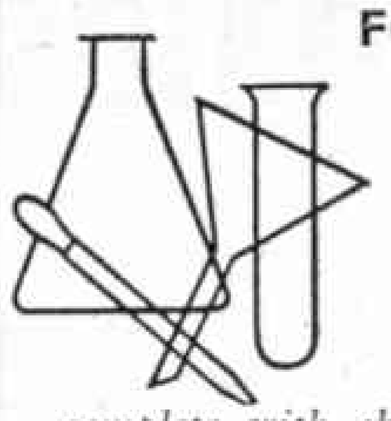

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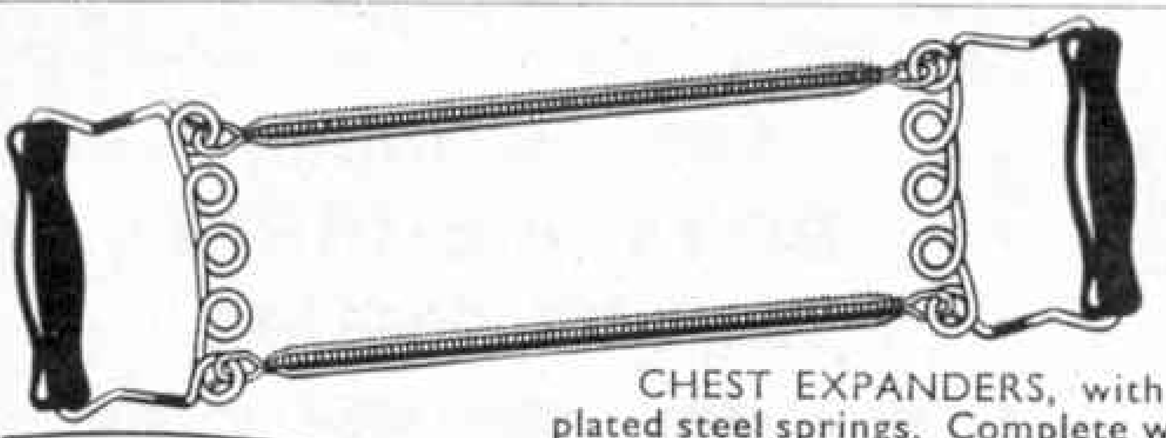

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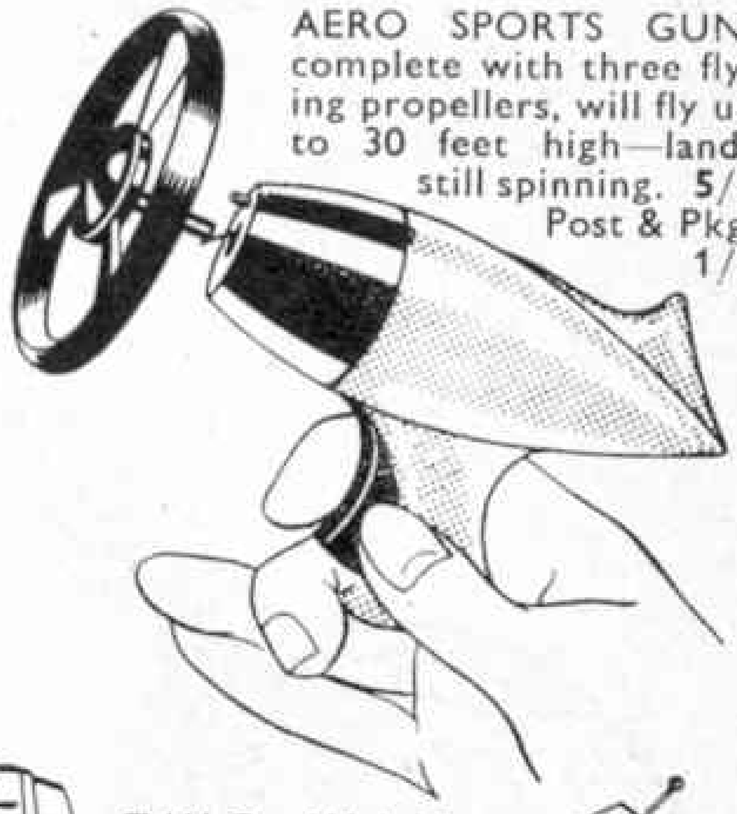

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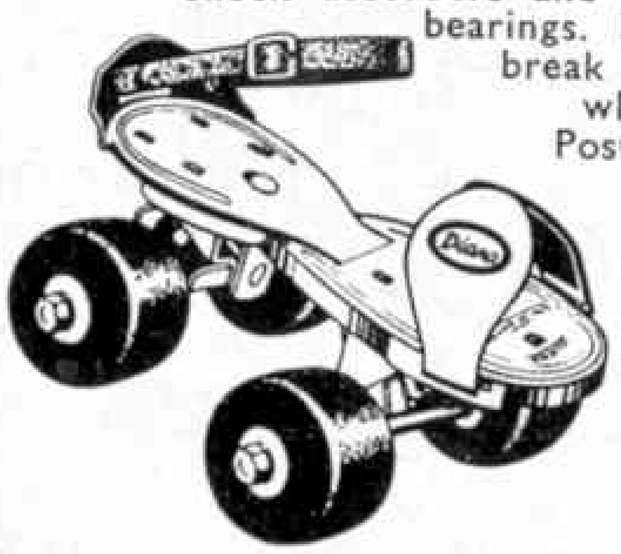

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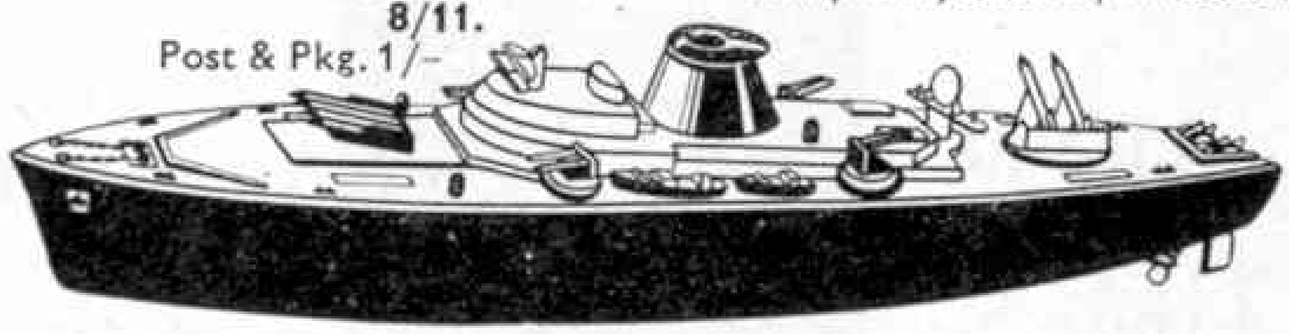

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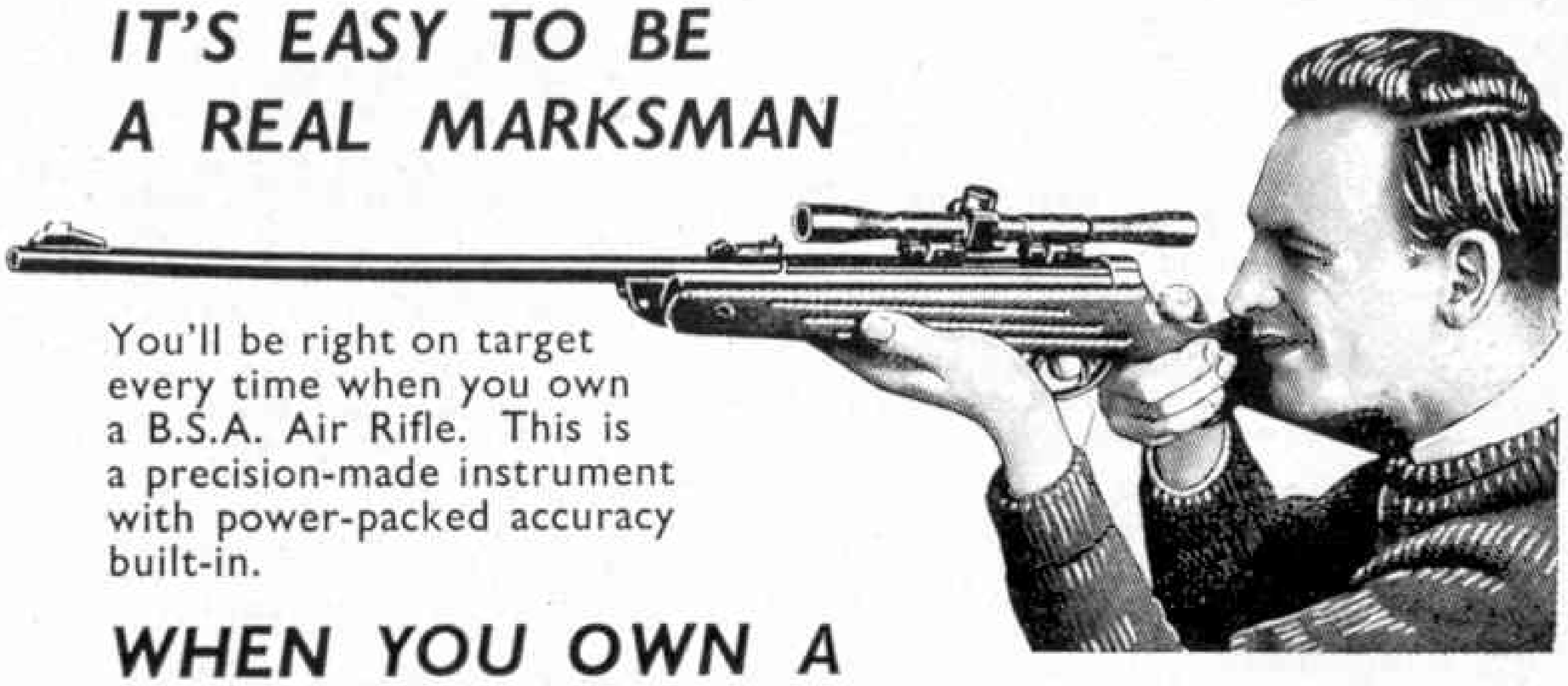

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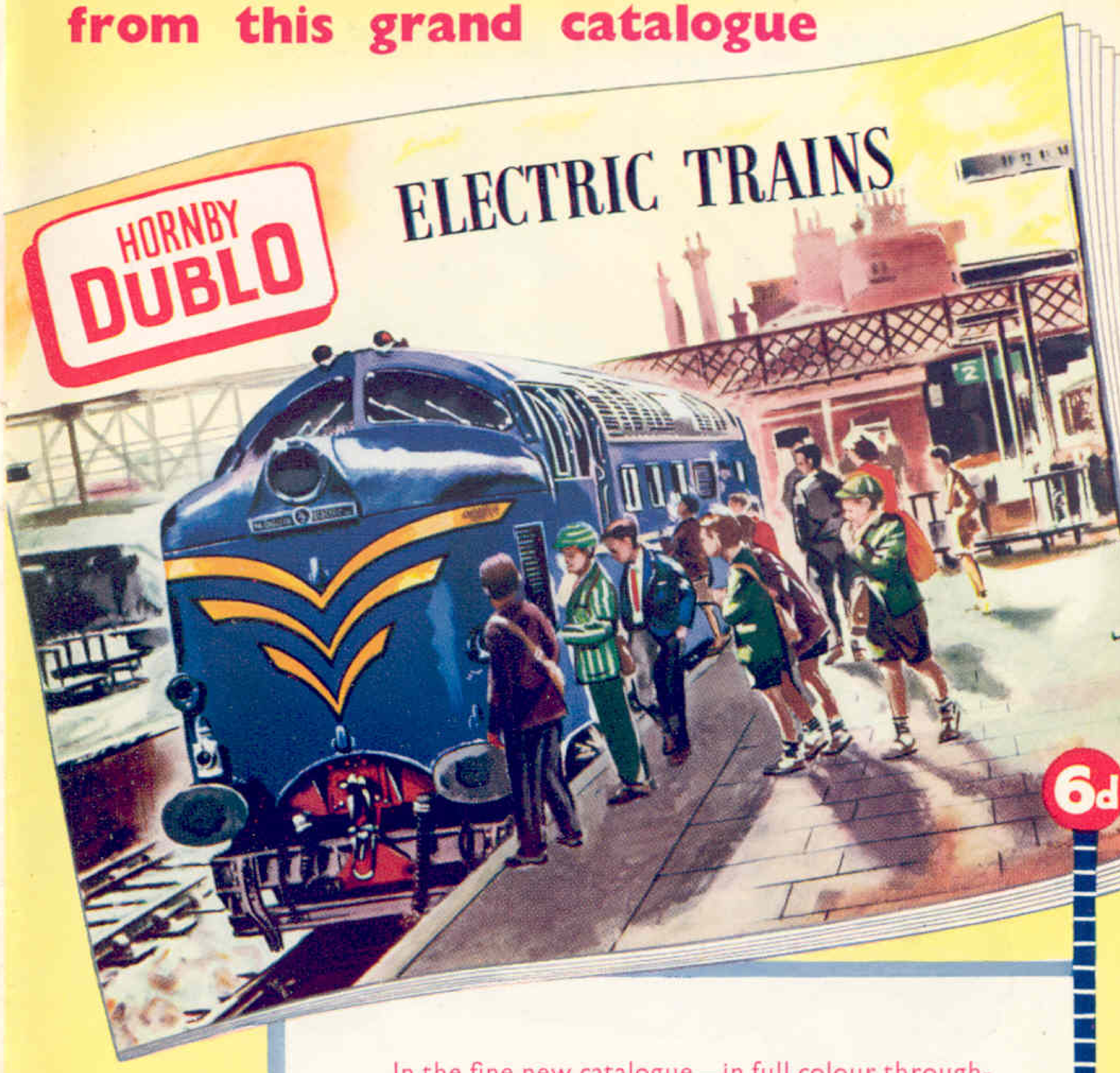

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MODEL OF THE MONTH.

Mechanical Excavator.

Illustrated in October, 1960, issue of the Meccano Magazine.

Base and Creeper Track.

Bolt two 3½" x 2½" Flanged Plates 1 and 2 to the ends of two 5½" x 2½" Flanged Plates 3 and 4. Three 5½" x ½" Double Angle Strips 5, with 1" loose Pulley Wheels attached to the lugs by ⅜" Bolts, are secured to the bottom flanges of the Plates 3 and 4. Two 6½" Rods 6 are passed through the plates, each carrying two ½" Pulleys and two Collars to support the imitation track. A 4½" Rod 7 has a 1" Sprocket Wheel at each end and a 1½" Bevel Wheel 8, a Coupling and a Collar near the centre. On the top flanges of the Plates 3 and 4, bolt a 5½" x 3½" Flat Plate to which has been bolted a 4" Ball Thrust Race Toothed Disc, spaced with a Collar on each of the ⅜" Bolts. Four Angle Brackets 16 are bolted to the sides of the Plates 3 and 4. Two 9½" Angle Girders 9 are secured to a 9½" Flat Girder to form a U-section girder. Another 9½" Flat Girder 10, is attached to the U-girder by two Double Brackets 11. At the same time fix the Double Arm Cranks 12 in position. Before placing the Cranks on the Rod, four spacing Washers are required on each side. A 1½" Pulley with Tyre is secured on a 1" Rod 13 with a Collar. The driven wheels 14 are mounted on a 2" Rod, together with a 1" Sprocket Wheel that is driven by Chain from the 1" Sprocket Wheel on Rod 7. The units are fastened to the base by passing a 5" Rod 15 through the centre of the end holes of the Plates 3 and 4. To the Angle Brackets 16, bolt a 9½" Strip covered over by three 5½" x 1½" Flexible Plates 17 and 18. Another 9½" Strip is bolted to the centre Double Angle Strip 5, with two 5½" x 1½" Flexible Plates overlapped seven holes. The ends of the Flexible Plates 18 and 19 are connected together by 3" Strips 20, bent round, and allowing the Tyres to protrude as shown.

Cab Base.

This is a 8½" x 6½" rectangle, built with compound Angle Girders, 21, 22, 23 and 24, and filled in with three 5½" x 3½" Flat Plates 25, 26 and 27. Bolt a Flanged Disc underneath the Flat Plates in the position shown. Three upright 7½" Strips 28 and 29 are bolted to the Angle Girder 24, filling in the

space between Strips 28 with two 3½" x 2½" Flexible Plates. A 4½" Angle Girder 30 is attached to the front of the Angle Girder 24 with a 4½" x 2½" Flexible Plate to join it to the Strip 29. Another 4½" x 2½" Flexible Plate 31, with two 2½" Strips and a 4½" Angle Girder is bolted to the Angle Girder 30. The 4½" Angle Girders are extended by Obtuse Angle Brackets and 3½" Strips, which are secured to a 3½" x ½" Double Angle Strip, extended with a Double Bracket. The 3½" Strip 32 has a Fishplate at each end, one to secure it to the Angle Girder 30, and the other to extend the 5½" Strip 33. It will be seen that the inner 3½" Strip 34 is attached to the Double Angle Strip by gripping the end of the Strip by a Washer. A 7½" Angle Girder 35 is bolted to the Angle Girder 23, and is connected by three 2½" Strips, a 2½" Curved Strip, and a 4½" x 2½" Flexible Plate, to the 7½" Angle Girder 36, which is attached to the base by an Angle Bracket. A 2" Strip supports the Angle Girder 36 to the Double Bracket 37, and a 3½" Strip is gripped by a Washer to the Angle Girder. Two 4½" x 2½" Flat Plates 38 and 39 are bolted to the inside Angle Girders, and held rigid by two 1½" x ½" Double Angle Strips 40 and 41, the latter being bolted to the base.

Motor Drive and Gear Box.

Fasten an E20R(S) or E15R Electric Motor to the Flat Plate 26. To the Motor side plate, bolt a Channel Bearing, spaced away with Washers. A Worm Wheel on the Motor shaft, drives a 57-toothed Gear Wheel on a 2½" Rod 42, carrying a ¾" Sprocket Wheel and a Collar, and which is mounted in the Channel Bearing. On a 3" Rod 43 mounted in the fifth hole up from the base and the second hole from the end of the Plates 38 and 39 place a ¾" Pinion 44, a 1½" Sprocket Wheel and a Collar. Connect the Sprocket Wheels with Chain. A 3½" Rod 45 mounted above the Rod 43, has two Bush Wheels and a 50-toothed Gear Wheel secured to it, in such positions as to allow sufficient side movement of the Rod for the Gear Wheel to disengage with the Pinion 44. For the Bush Wheel nearest the Plate 38 a nut and bolt is fixed in the Plate 38 to act as a brake by engaging Bolts in the Bush Wheel boss when the Rod is slid in that direction. A loose Collar, between two fixed Collars is pivotally attached by a nut and bolt to the 3½" Strip 46, which is lock-nutted to a 1" x 1" Angle Bracket attached to the Plate 39. A Threaded Pin is placed in the end hole

of the Strip.

Another similar Rod 47, fitted with two Bush Wheels and a 50-toothed Gear Wheel, is placed in the fifth hole up, and the second hole from the front end of the Plates 38 and 39, and engages with the Pinion 44. A lever 48, lock-nutted to an Angle Bracket bolted to the base, operates the Rod 47. Below the Rod 43 is another Rod fitted with a 50-toothed Gear Wheel and a $\frac{1}{2}$" Pinion. This Rod can be moved endways by means of the lever 49. The Gear Wheel is in constant mesh with the Pinion 44, and is adjusted to allow the $\frac{1}{2}$" Pinion to engage and disengage with the $\frac{3}{4}$" Contrate Wheel 50, secured to the Rod 51. Rod 51 also carries a $\frac{1}{2}$" Bevel Wheel 52, which is adjusted to engage with the Bevel Wheel 8 in the base of the model. The Rod 51 is mounted at its lower end in the Coupling on Rod 7 which is held in position by a Collar. Washers are required to make the Contrate Wheel 50 engage with the $\frac{1}{2}$" Pinion. Two $1\frac{1}{2}$" Strips are bolted to the Plates 38 and 39 to form a bearing for the 5" Rod 53. A $\frac{1}{2}$" Pinion 54 and a 50-toothed Gear Wheel, are secured on the Rod which can be moved endways by a lever 55, which is pivotally connected by a Nut and Bolt to a loose Collar placed between two fixed Collars on the Rod. The $\frac{1}{2}$" Pinion 54 engages with a $\frac{3}{4}$" Contrate Wheel 56 secured to a Rod carrying a $\frac{3}{4}$" Sprocket Wheel 57 that is connected by Chain to the Ball Thrust Race Toothed Disc. A Threaded Pin secured to the Motor starting lever, is linked by a $1\frac{1}{2}$" Strip lock-nutted to a $2\frac{1}{2}$" Strip, which in turn is lock-nutted to an Angle Bracket attached to the Motor side plate by a $1\frac{1}{2}$" Strip 58. Two $2\frac{1}{2}$" Strips 59 are secured to the Plates 38 and 39 and they support a 2" Rod fitted with three 1" loose Pulleys.

<u>Completion of the Cab</u>.

The Angle Girder 36 is extended by a Fishplate which supports a $1\frac{1}{2}$" Angle Girder 60. Two $7\frac{1}{2}$" Angle Girders 61, attached to the base, are connected at the top by two $5\frac{1}{2}$" Curved Strips overlapped nine holes. Four $5\frac{1}{2}$" x $2\frac{1}{2}$" Flexible Plates fill in the back of the cab. A $7\frac{1}{2}$" Strip 62 connects the Angle Girders 61 and 35. The side is filled in with two $5\frac{1}{2}$" x $2\frac{1}{2}$" one $4\frac{1}{2}$" x $2\frac{1}{2}$" and a $3\frac{1}{2}$" x $2\frac{1}{2}$" Flexible Plate, supported by two $7\frac{1}{2}$", one $2\frac{1}{2}$", and two $3\frac{1}{2}$" Strips.

The roof of the cab is made by bolting three $5\frac{1}{2}$" x $2\frac{1}{2}$" and two $2\frac{1}{2}$" x $1\frac{1}{2}$" Flexible Plates to the Obtuse Angle Brackets on the sides of the cab.

The Jib.

Two 18½" Angle Girders are bolted to a 2½" x 1½" Flanged Plate 63, with Strips placed between them, and held by 1½" Strips. Another similar unit is built, and they are connected together by four 9½" Flat Girders, two on either side. 1½" Corner Brackets 64, bolted to the 18½" Angle Girders support a 2" Rod carrying a 1" loose Pulley Wheel 65. The other pair of 18½" Angle Girders form the bearing for the 1½" Pulley Wheel 66 on a 2" Rod held in position by Collars. The jib is attached to the cab by a 3½" Rod placed through a 2½" x 1" Double Angle Strip, bolted to the Angle Girders 21.

The Digger Bucket.

The bottom of the bucket is built with two 2½" x 1½" Flanged Plates 67 and a 2½" x ½" Double Angle Strip. Each side is built by bolting a 2½" x 2½" Triangular Flexible Plate and a 2½" x 1½" Flexible Plate to the Flanged Plates 67. Two 2½" x ½" Double Angle Strips 68 and 69 are secured to the top of the Flexible Plates, supported by a 1½" Strip and a 2½" Stepped Curved Strip 70. A 1½" x ½" Double Angle Strip is attached to the Double Angle Strip 69, and supports two 7½" Strips 71, which swivel on a 2½" Rod placed in the 18½" Angle Girders forming the jib. Two 2½" x 1½" Flexible Plates are bolted between the Strip 71. The Curved Strips 70 are attached to the 7½" Strip 71, by a 3" Screwed Rod and four Nuts. Three 2½" Strips are bolted to the front 2½" x 1½" Flanged Plates, to represent the teeth. An Angle Bracket is bolted to the centre of the Double Angle Strip 68 to anchor the Single Pulley Block. The back of the bucket is a 2½" x 2½" Flat Plate, hinged to the Double Angle Strip 69.

A 1½" Double Angle Strip 72, bolted to the Flat Plate, carries a 2" Rod which is spring loaded by a Compression Spring and Collar. An End Bearing is placed on the end of this Rod. The lower end of the Rod projects into a Fishplate bolted to the Flanged Plate 67. A short length of cord running from the cab and attached to the End Bearing is used to operate the bucket unloading mechanism.

A length of Cord is attached to the centre strip of the jib by a Washer (on the inside) passed around the single Pulley Block, over Pulley 66 at the jib head, over the centre loose Pulley 74 in the cab, and finally is tied

to the winding drum 47.

Another length of Cord is attached to the Corner Bracket 64 passed around the Pulley 73, around the Pulley 65 and around the other Pulley 75, and finally is tied to the winding drum on Rod 45.

Parts required to build The Mechanical Excavator:- 2 of No. 1; 4 of No. 1a; 7 of No. 1b; 3 of No. 2; 3 of No. 2a; 9 of No. 3; 12 of No. 4; 13 of No. 5; 1 of No. 6; 9 of No. 6a; 4 of No. 7a; 4 of No. 8a; 4 of No. 8b; 4 of No. 9; 6 of No. 9a; 2 of No. 9c; 3 of No. 10; 5 of No. 11; 15 of No. 12; 1 of No. 12b; 10 of No. 12c; 2 of No. 14; 3 of No. 15; 2 of No. 15a; 1 of No. 15b; 1 of No. 16; 4 of No. 16a; 1 of No. 16b; 5 of No. 17; 2 of No. 18b; 5 of No. 21; 10 of No. 22a; 4 of No. 23a; 2 of No. 24; 1 of No. 25b; 2 of No. 26a; 4 of No. 27; 1 of No. 27a; 2 of No. 29; 1 of No. 30a; 1 of No. 30c; 1 of No. 32; 2 of No. 35; 320 of No. 37a; 310 of No. 37b; 80 of No. 38d; 1 of No. 40; 1 of No. 45; 7 of No. 48; 3 of No. 48a; 2 of No. 48b; 3 of No. 48d; 4 of No. 51; 2 of No. 52; 4 of No. 52a; 2 of No. 53; 2 of No. 53a; 40 of No. 59; 4 of No. 62b; 1 of No. 72; 1 of No. 80c; 4 of No. 89; 2 of No. 90a; 1 of No. 94; 1 of No. 95a; 4 of No. 96; 2 of No. 96a; 6 of No. 103a; 1 of No. 103h; 2 of No. 103k; 10 of No. 111a; 2 of No. 114; 1 of No. 115; 1 of No. 120b; 2 of No. 133; 4 of No. 142d; 1 of No. 151; 1 of No. 160; 1 of No. 166; 1 of No. 168; 6 of No. 188; 1 of No. 189; 3 of No. 190a; 4 of No. 191; 9 of No. 192; 1 of No. 221; 2 of No. 223; 1 E15R Electric Motor.