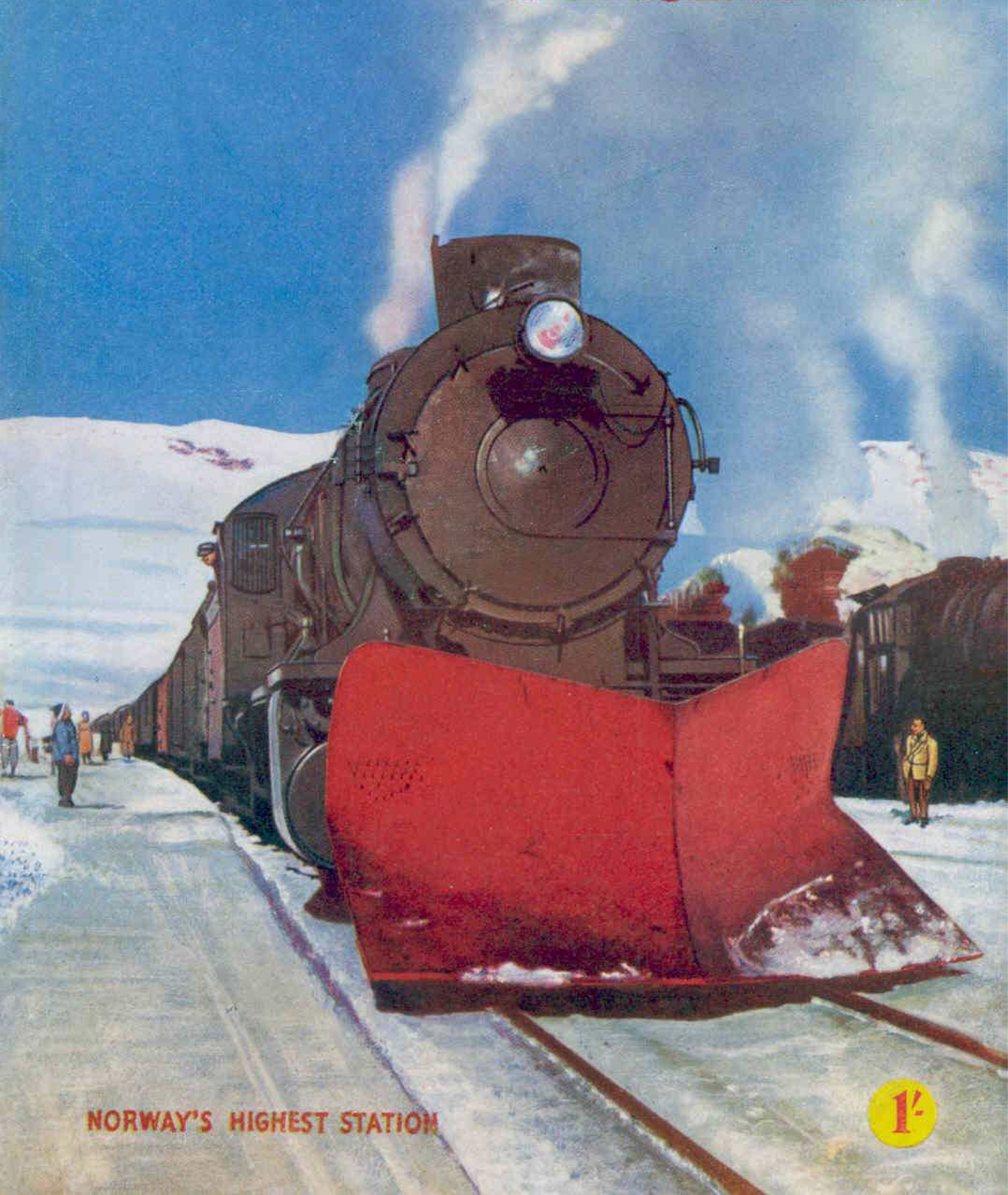


VOL. XL. No. 10

OCTOBER 1955

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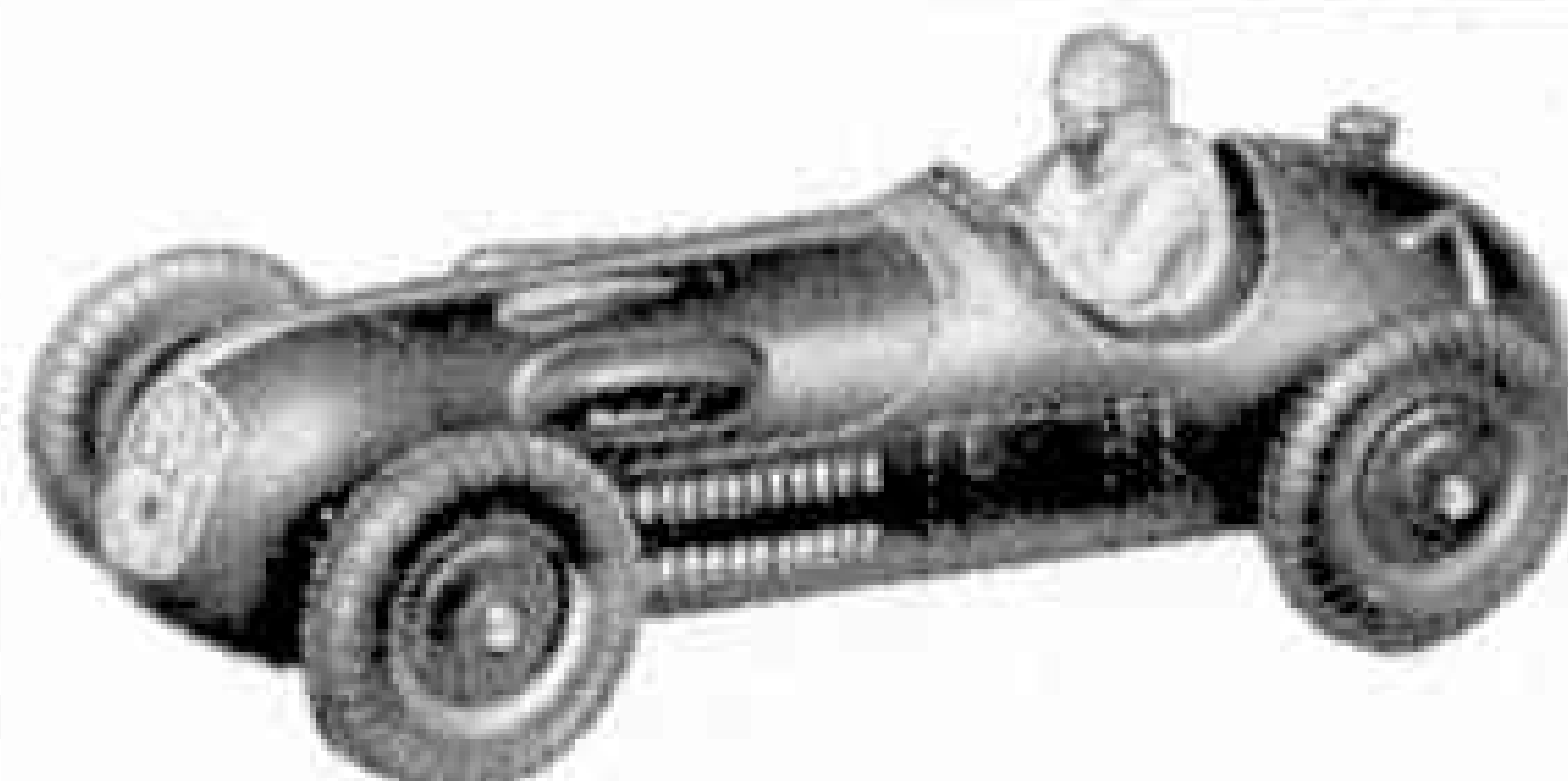
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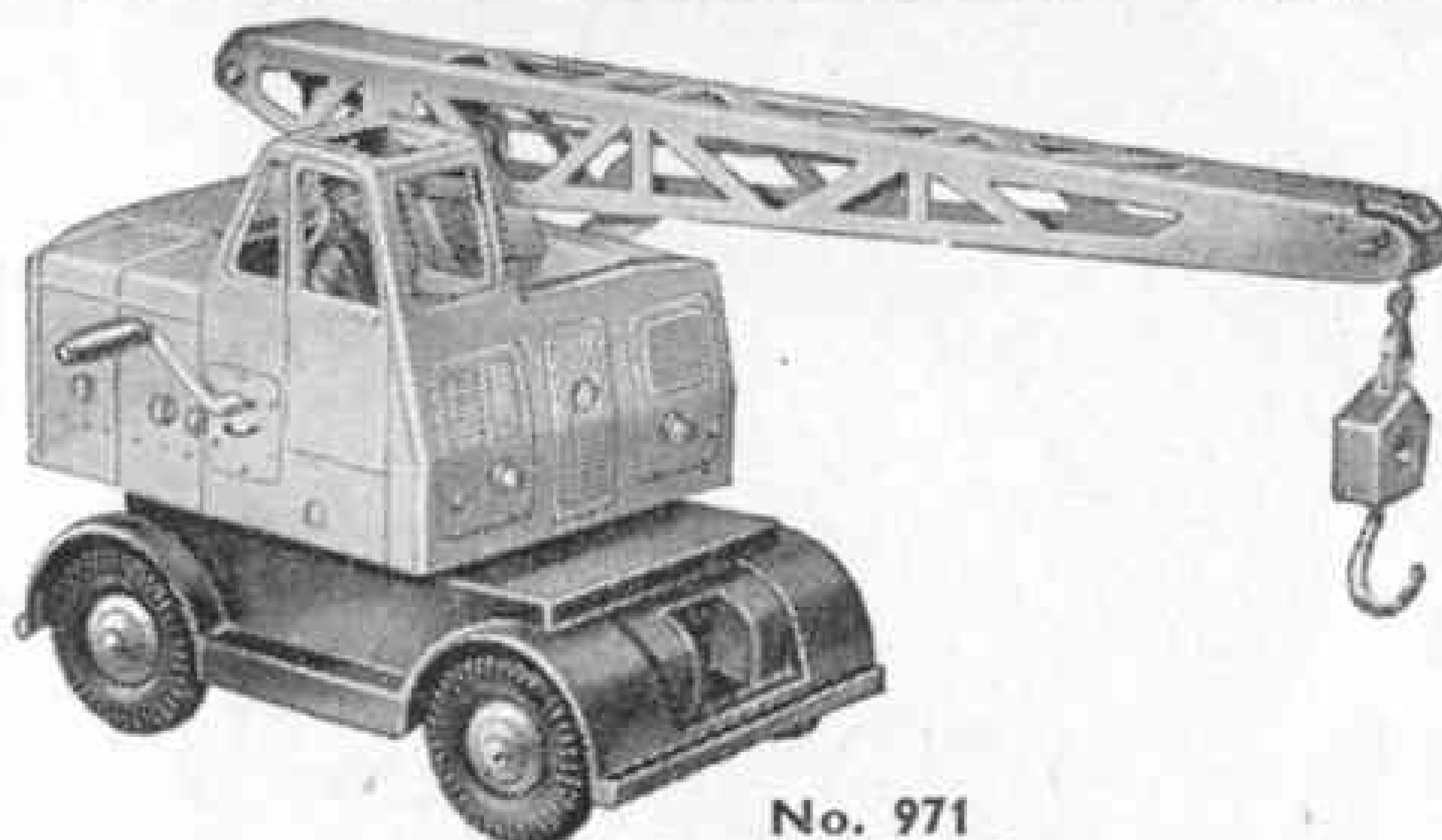
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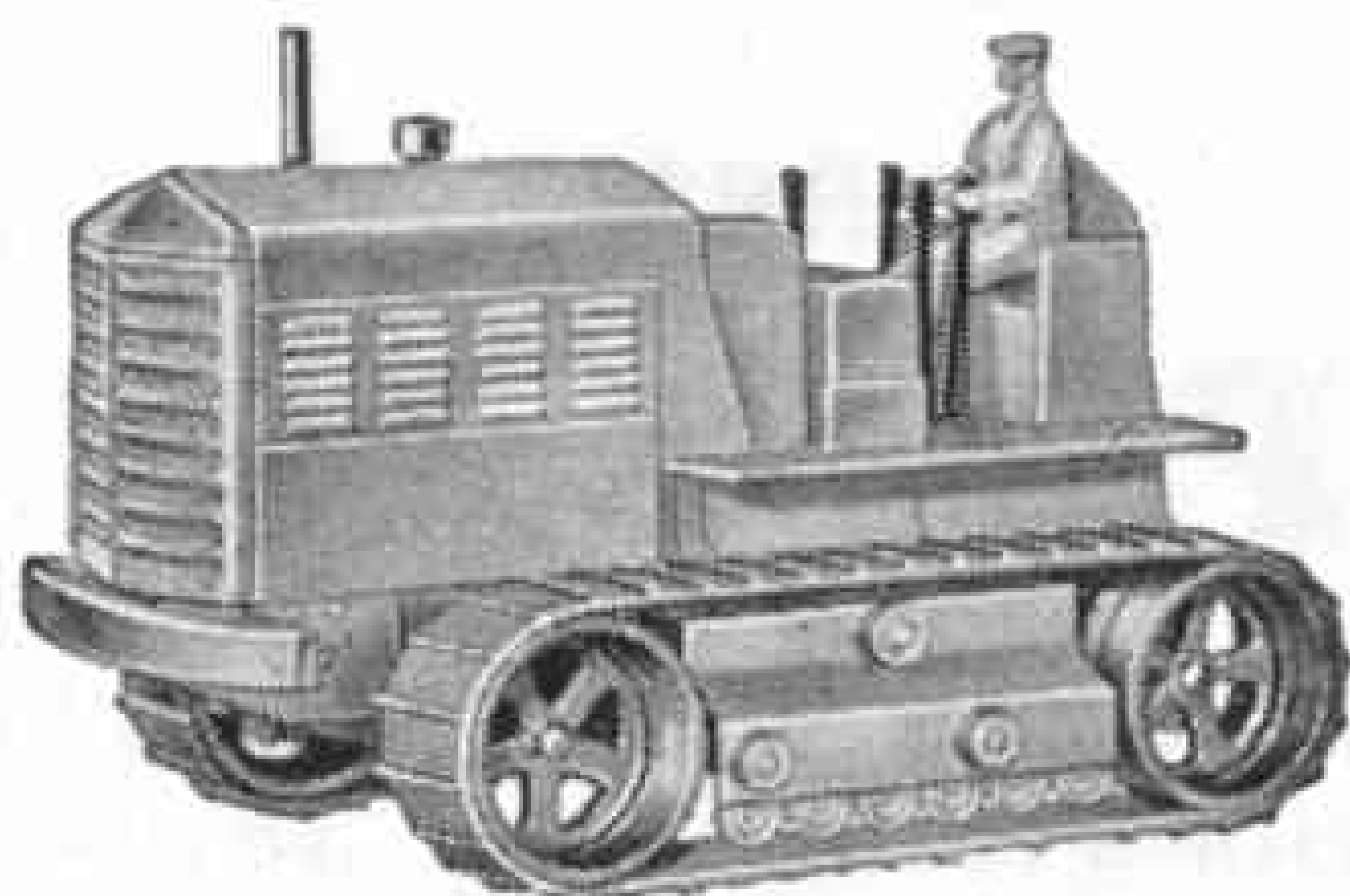
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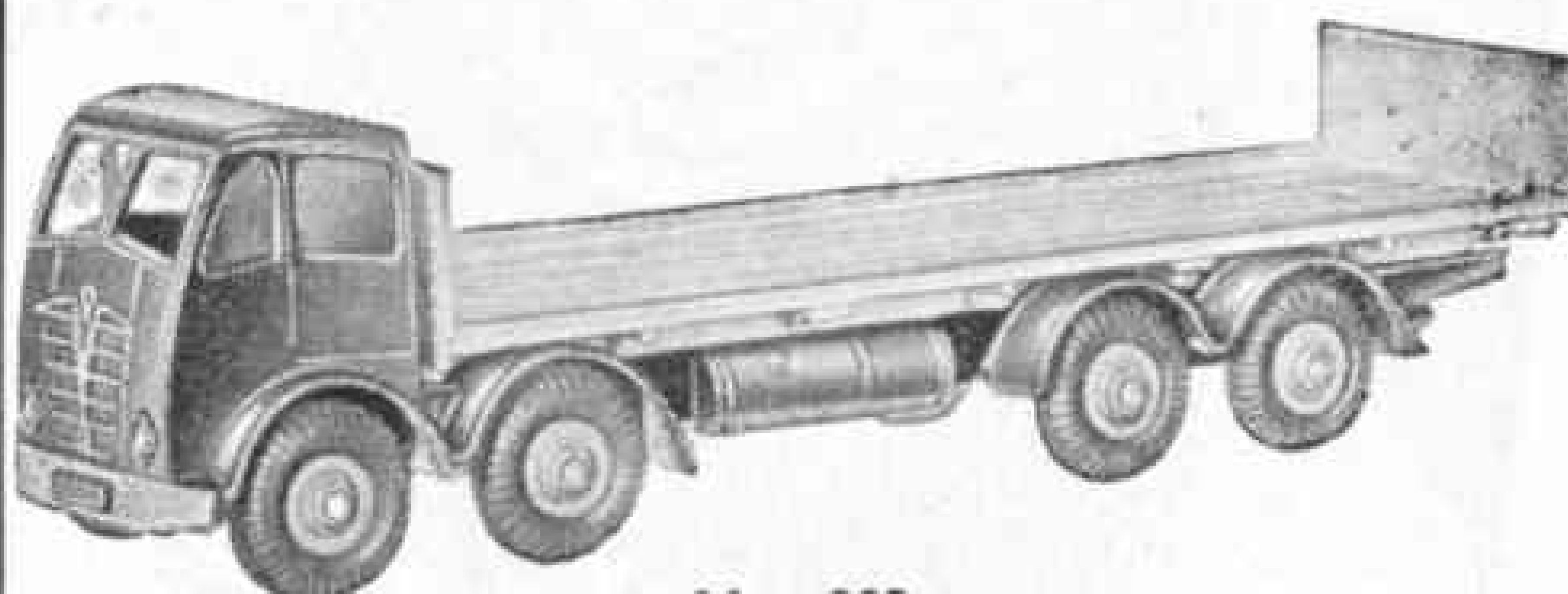
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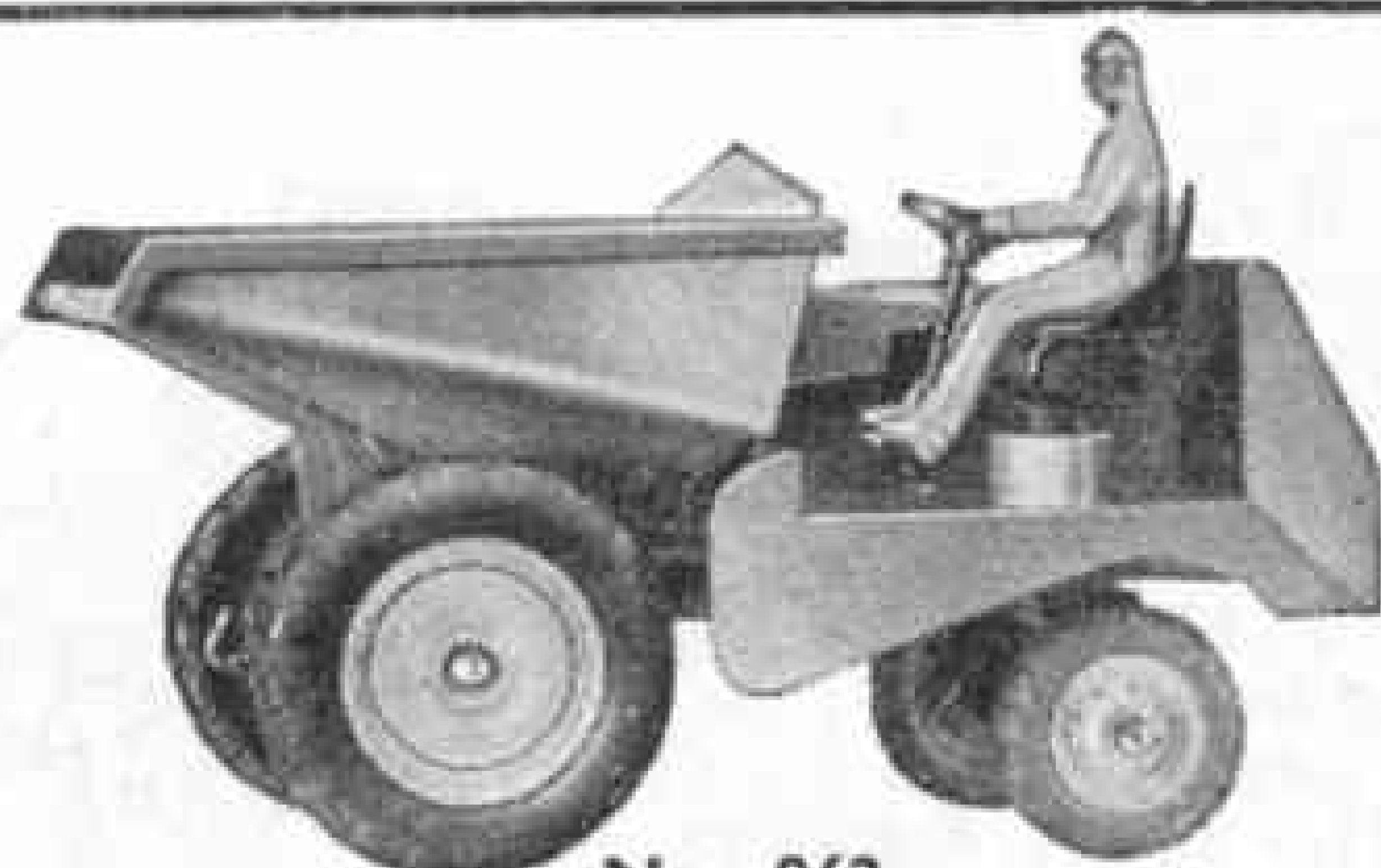
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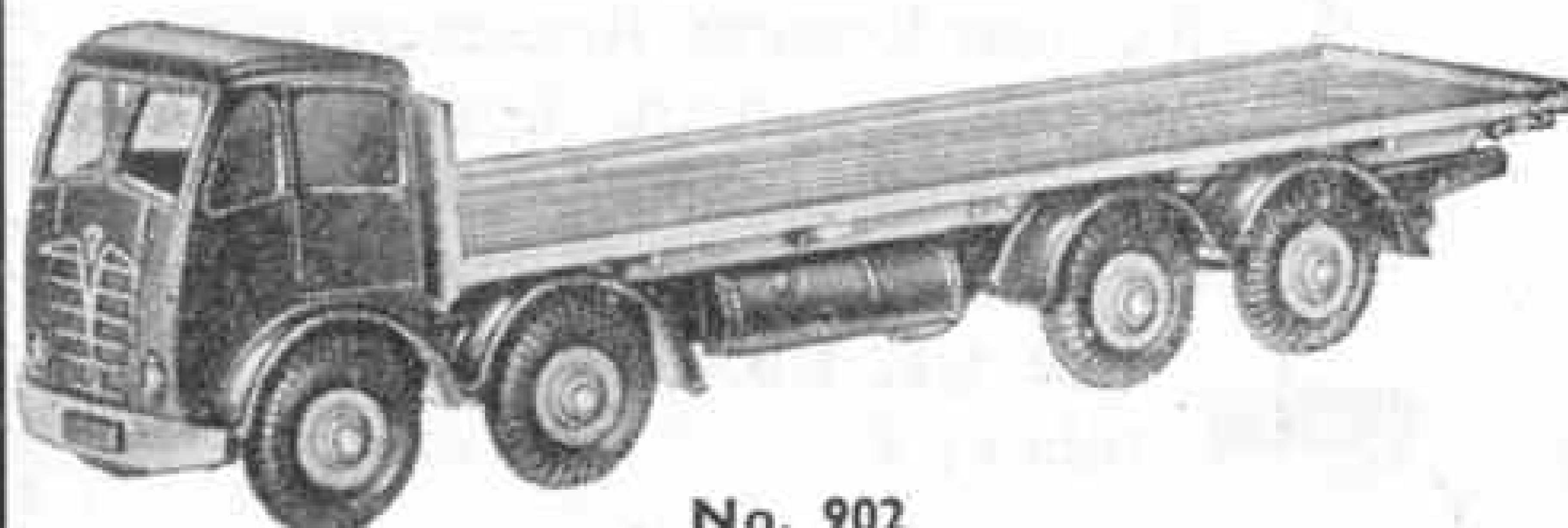
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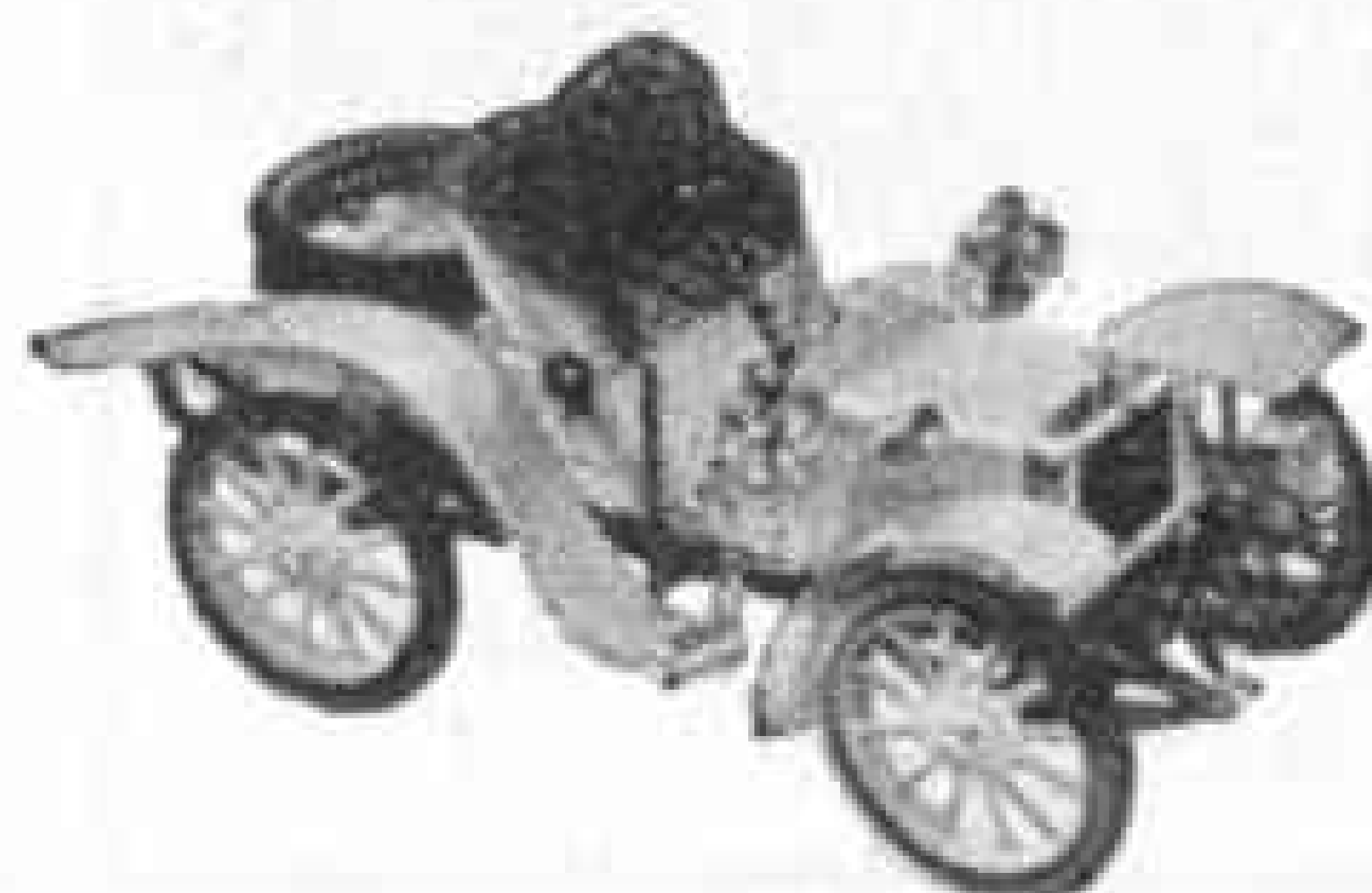


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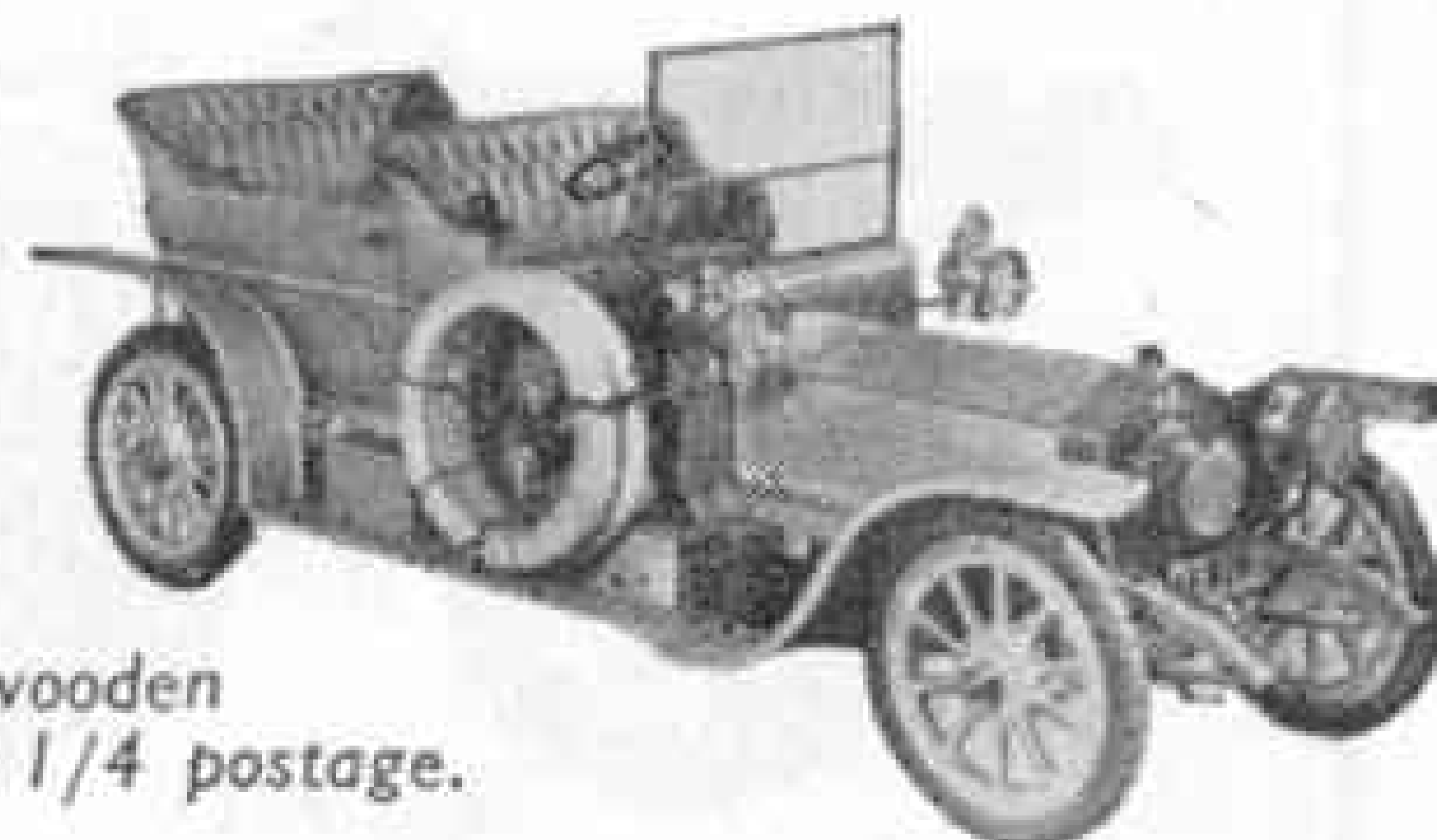
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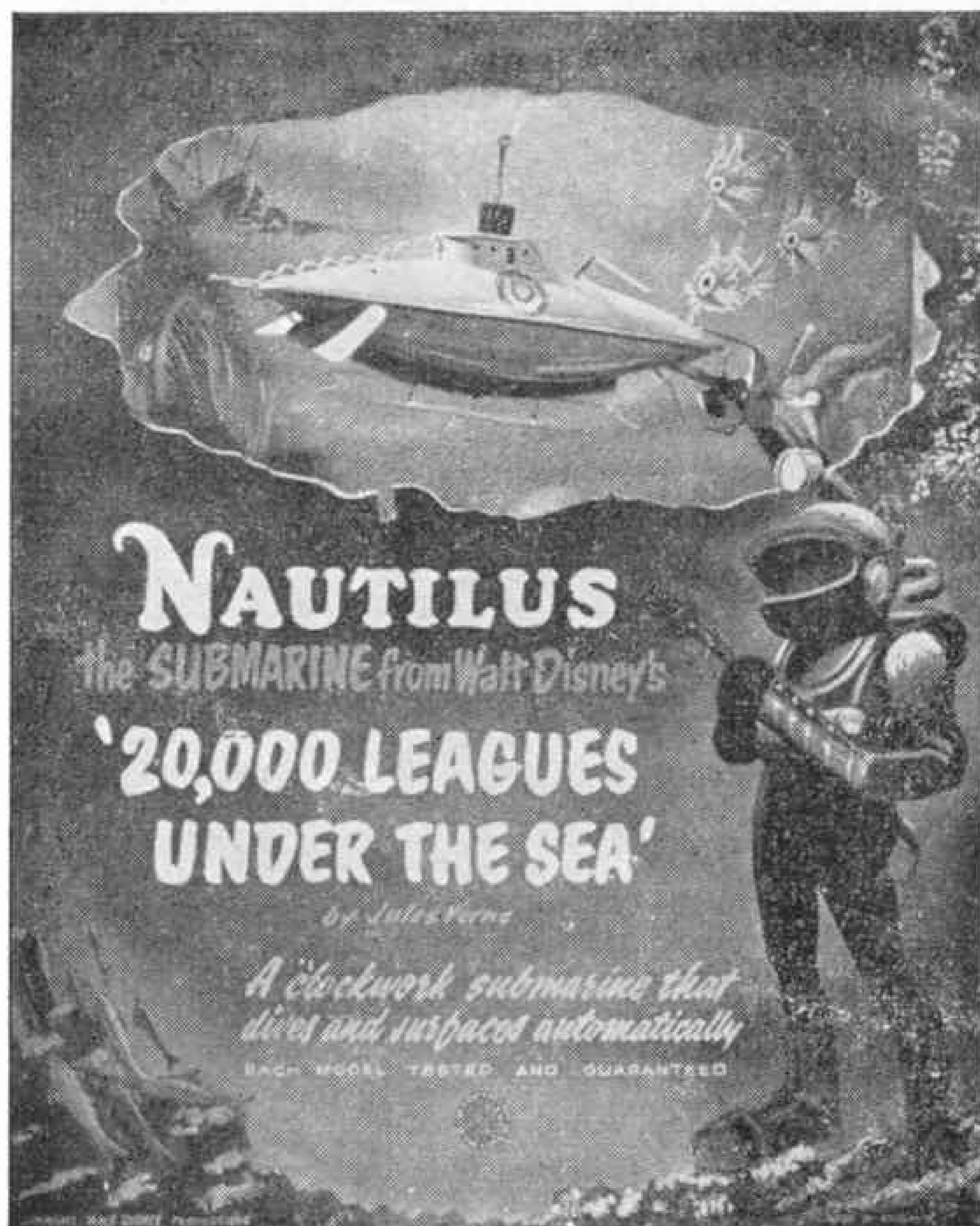
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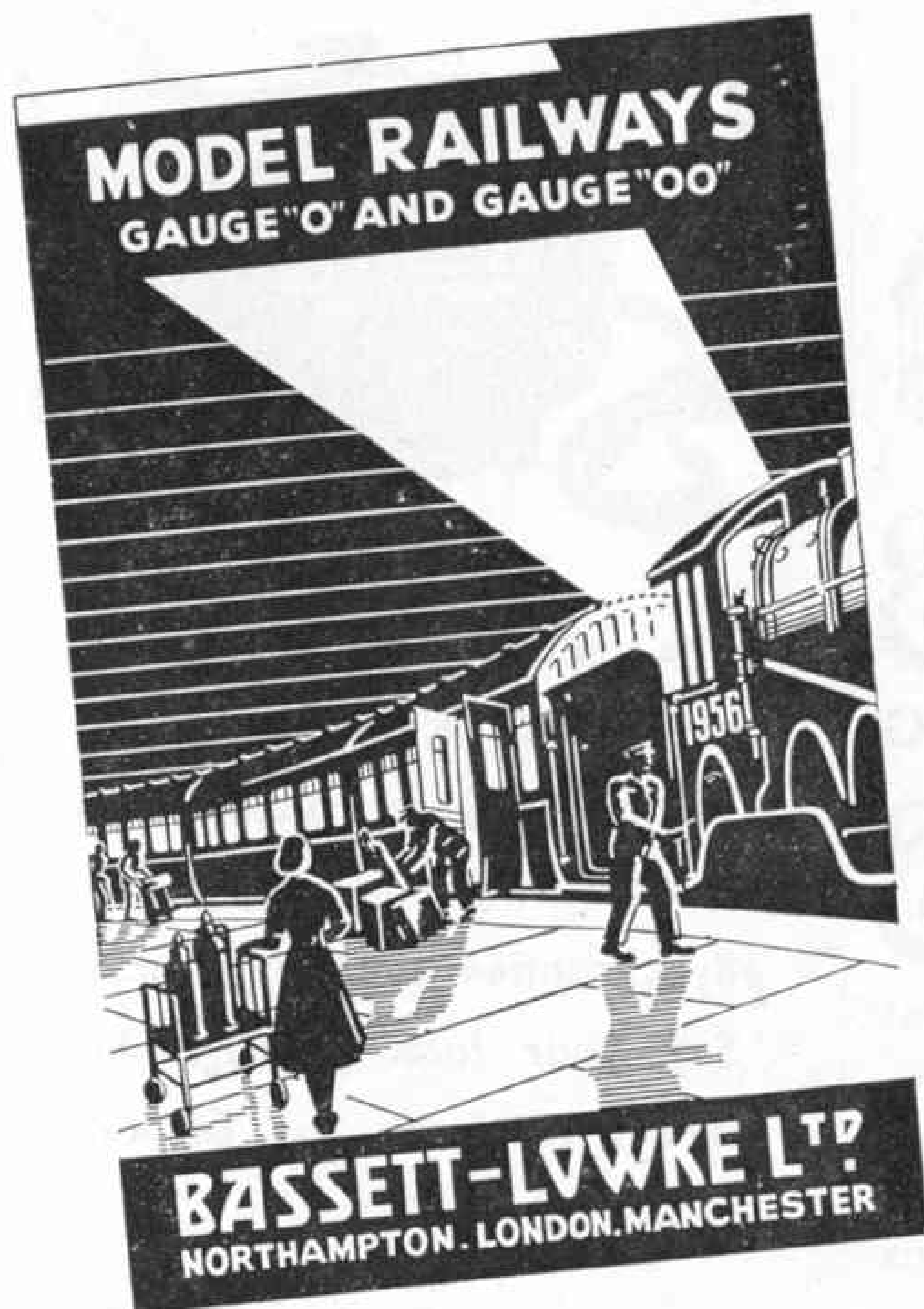
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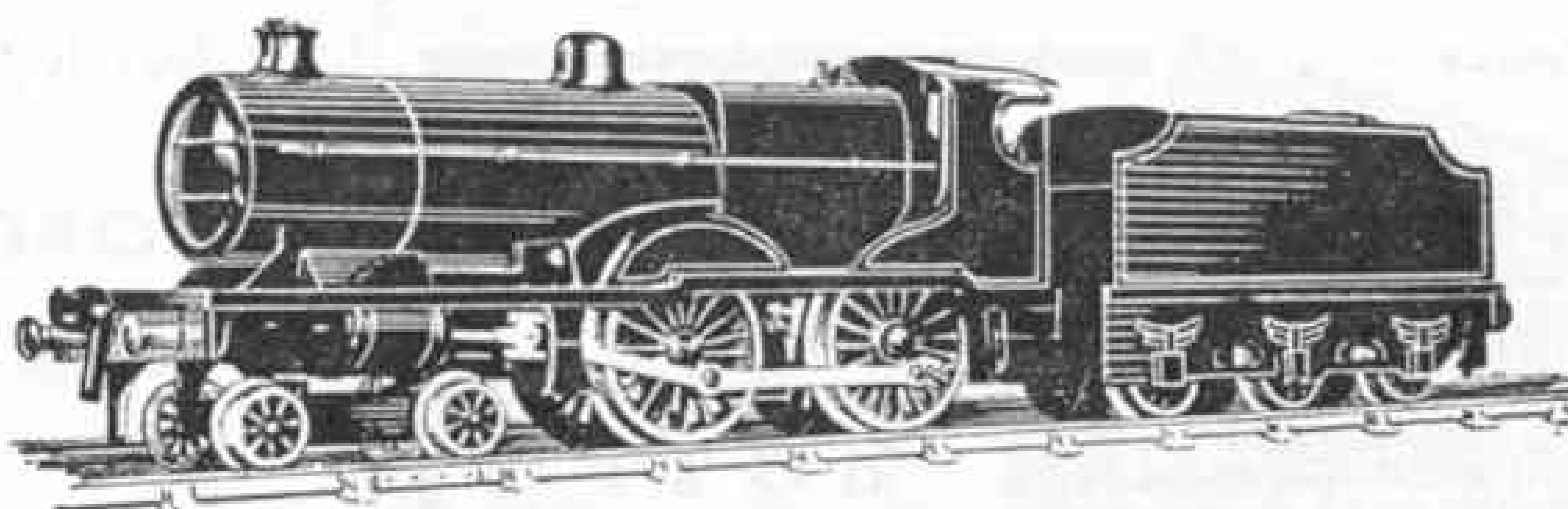


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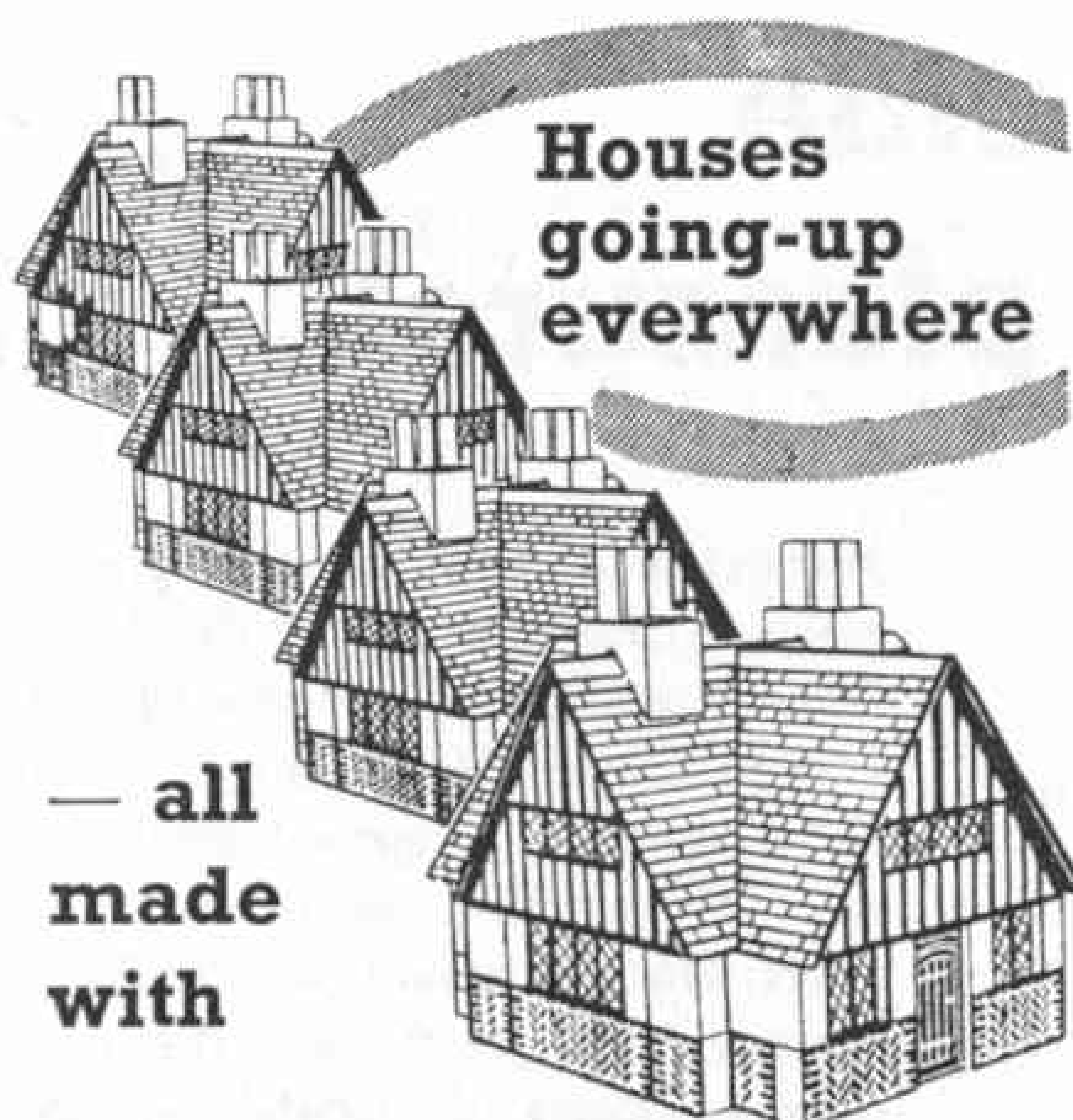


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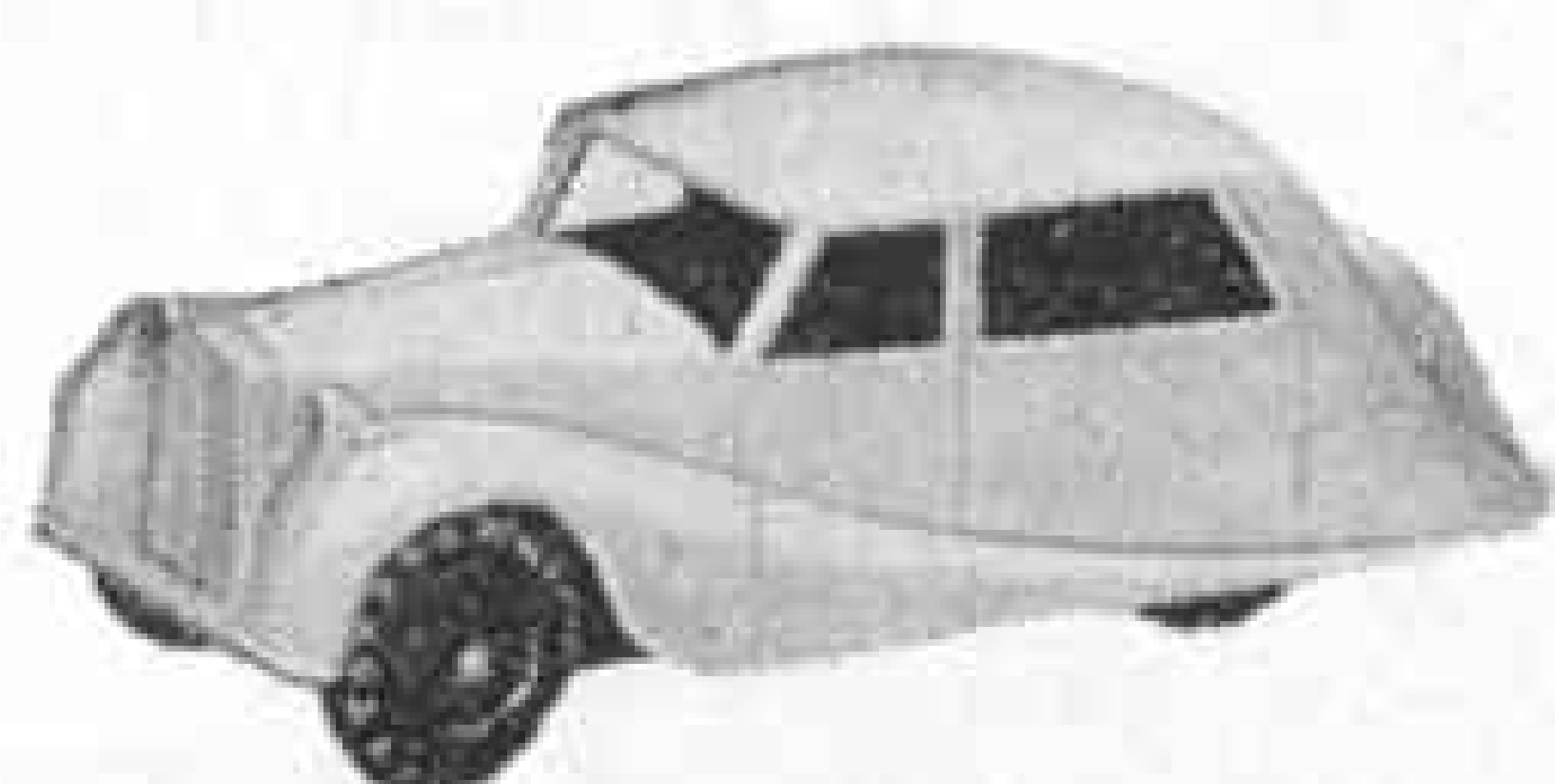
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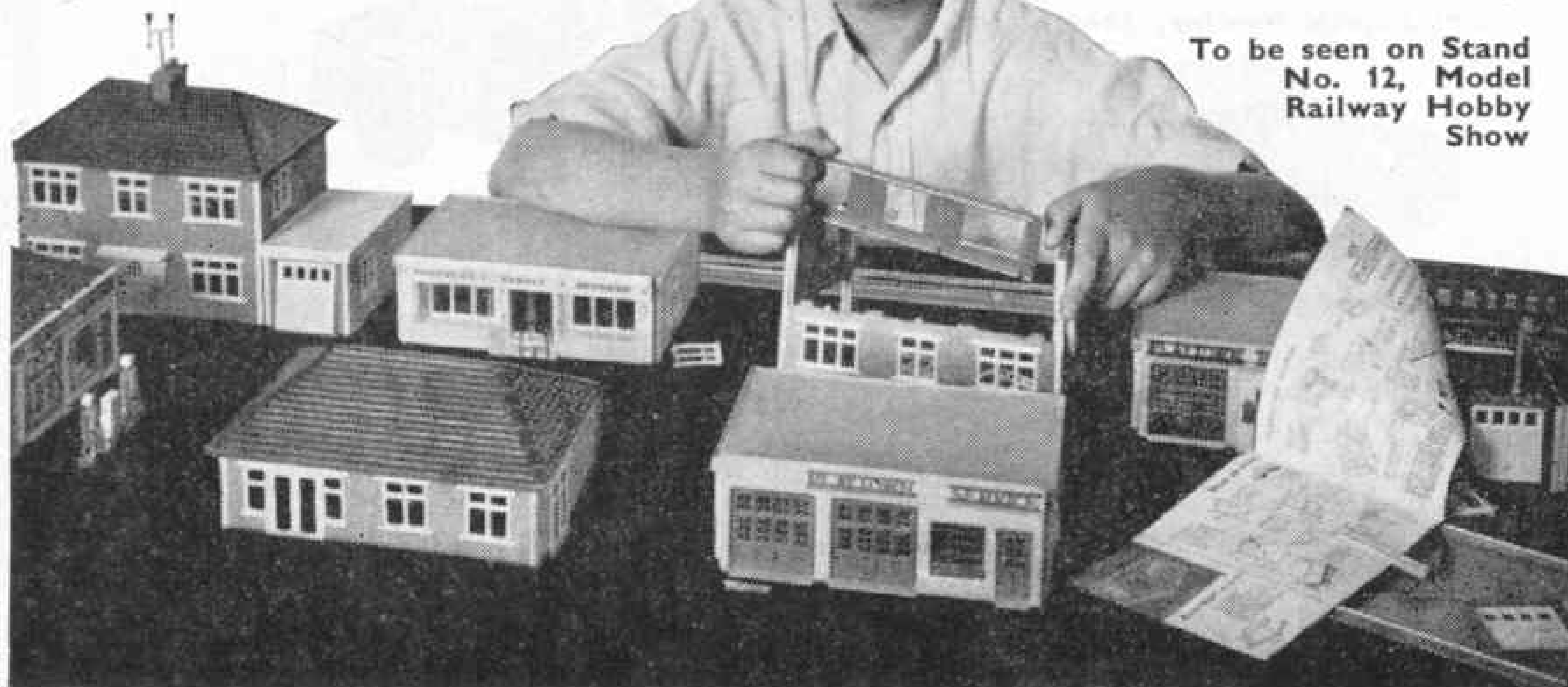
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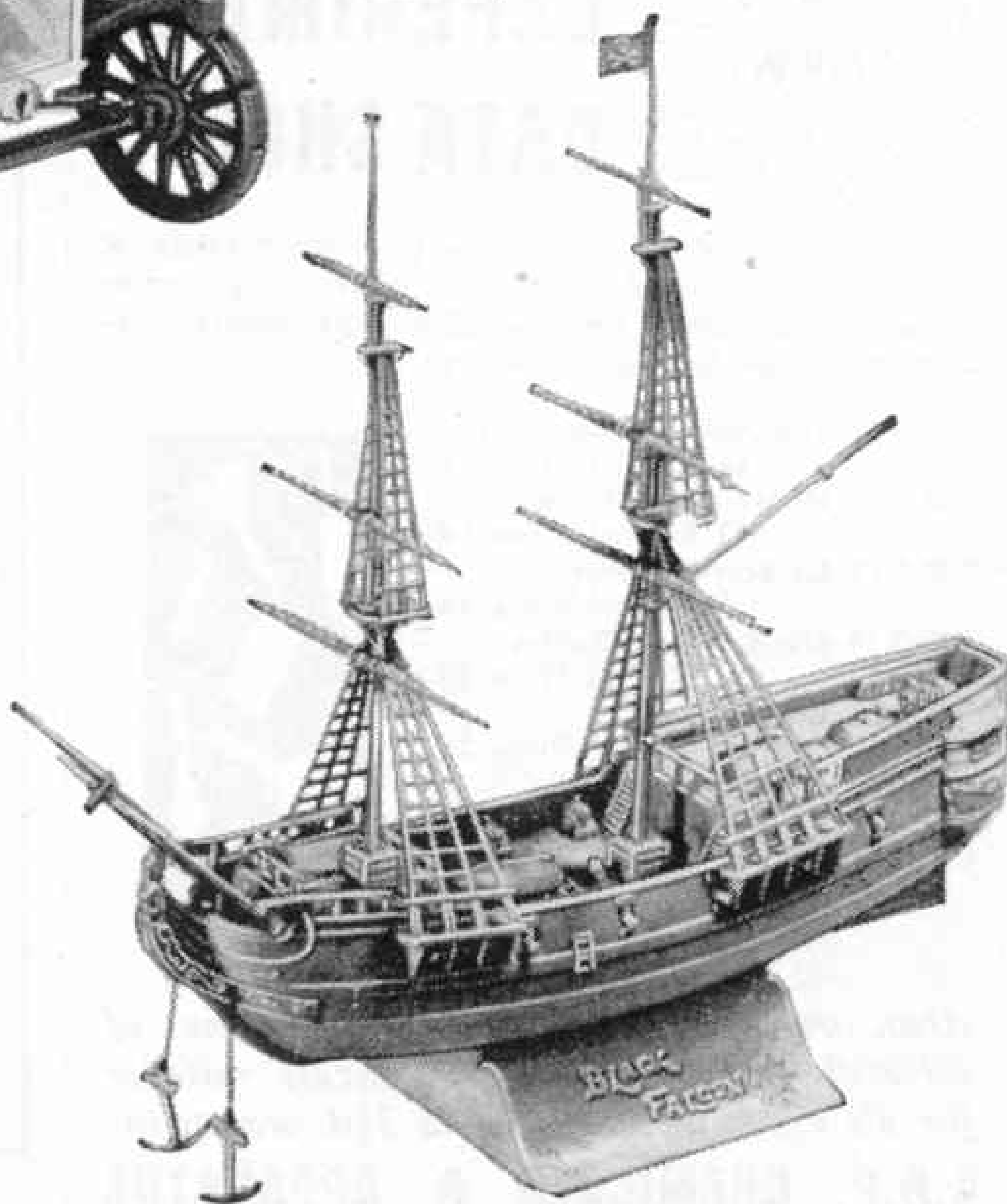
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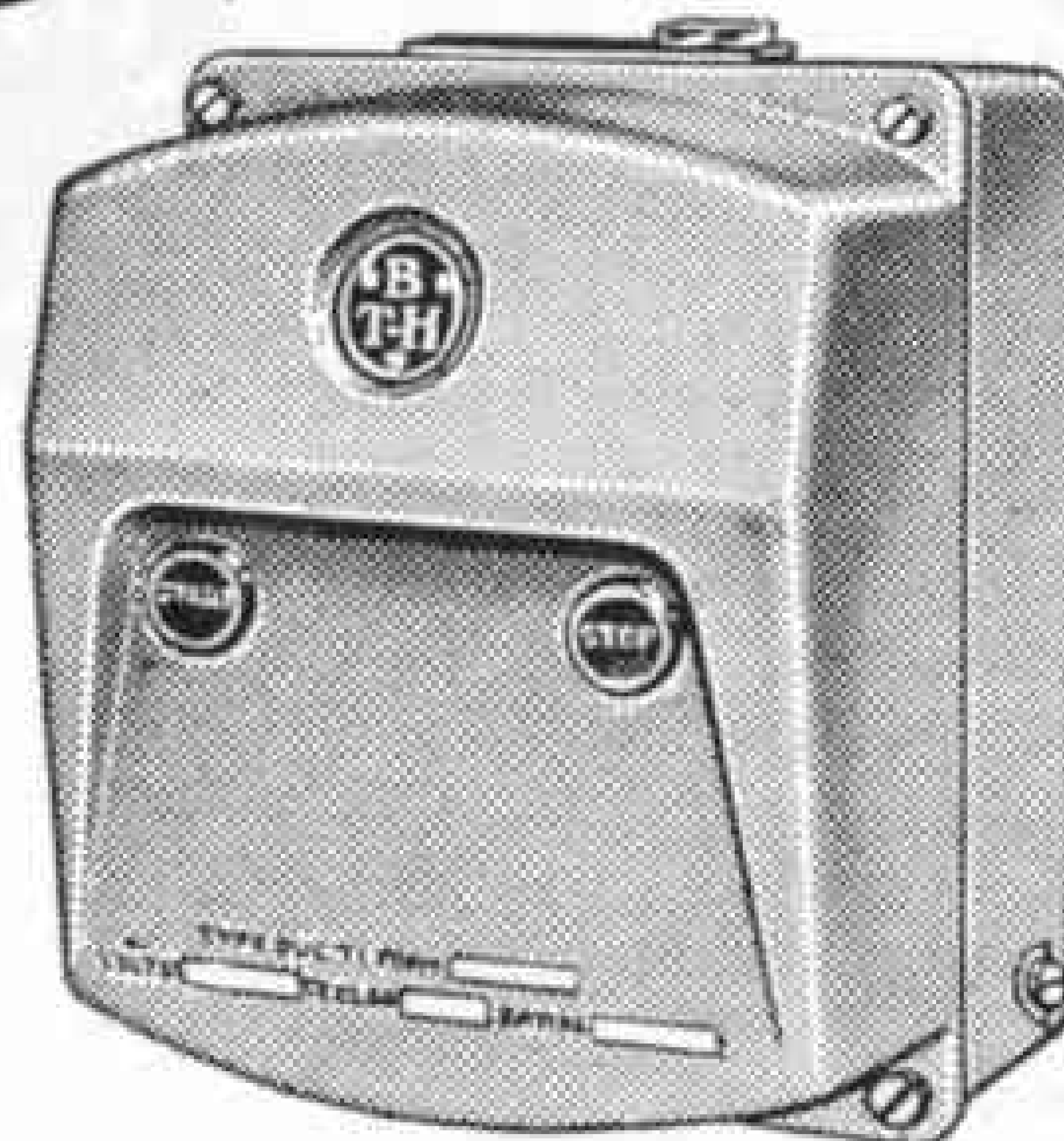
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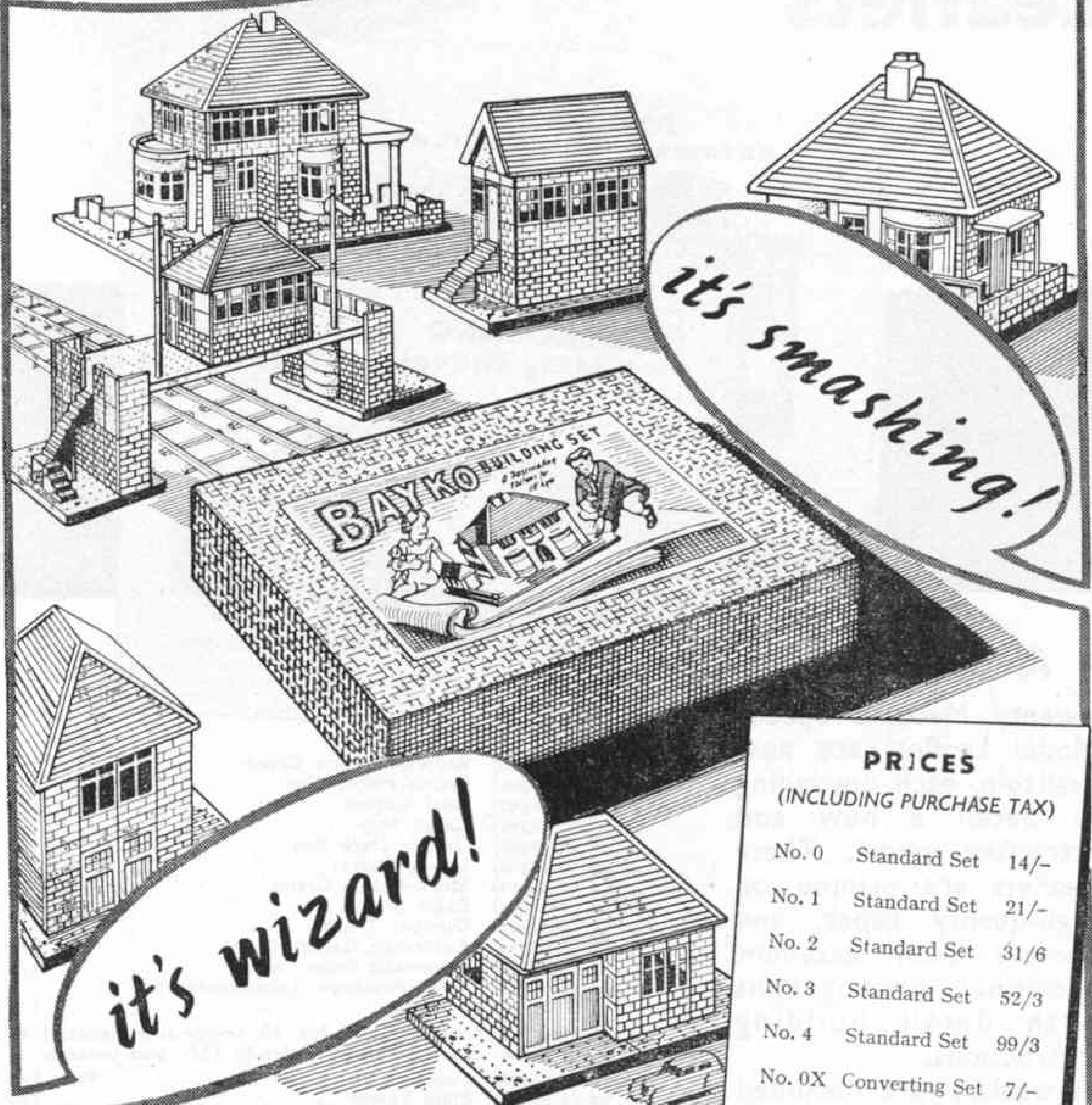
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MECCANO

MAGAZINE

Editorial Office:
Binns Road
Liverpool 13
England

EDITOR : FRANK RILEY, B.Sc.

Vol. XL
No. 10
October 1955

A Unique Station

Can you read the name on the board above the building shown in my picture this month? If you make a shot at pronouncing it you might gather from the sound what it means. It is the name of a station on the Swedish Railways line that runs northward to the iron mines of Kiruna, and is continued to the Norwegian coast by the Narvik railway. The station is actually on the Arctic Circle, and so far as I know it is the only one in the world that has this distinction. I suppose that the name means *Polar Circle*, and the board carrying it gives also the distance of the station from Stockholm and its height above sea level.

I have included this picture because one of the articles in this issue describes the railway that runs from Kiruna to Narvik. The whole of this section of railway is within the Arctic Circle, and is almost, but not quite, the most northerly railway in the world. That distinction apparently belongs to the railway that runs northward to the port of Murmansk, on the Arctic coast of the U.S.S.R.

Scandinavia figures largely in this month's issue, chiefly because of railways in the peninsula. Besides the article describing the one between Kiruna and Narvik, there is another dealing with one

of the most spectacular railways in the world, the line between Bergen and Oslo, the capital of Norway. A scene on this railway is shown on the cover of this month's issue and from it you will have

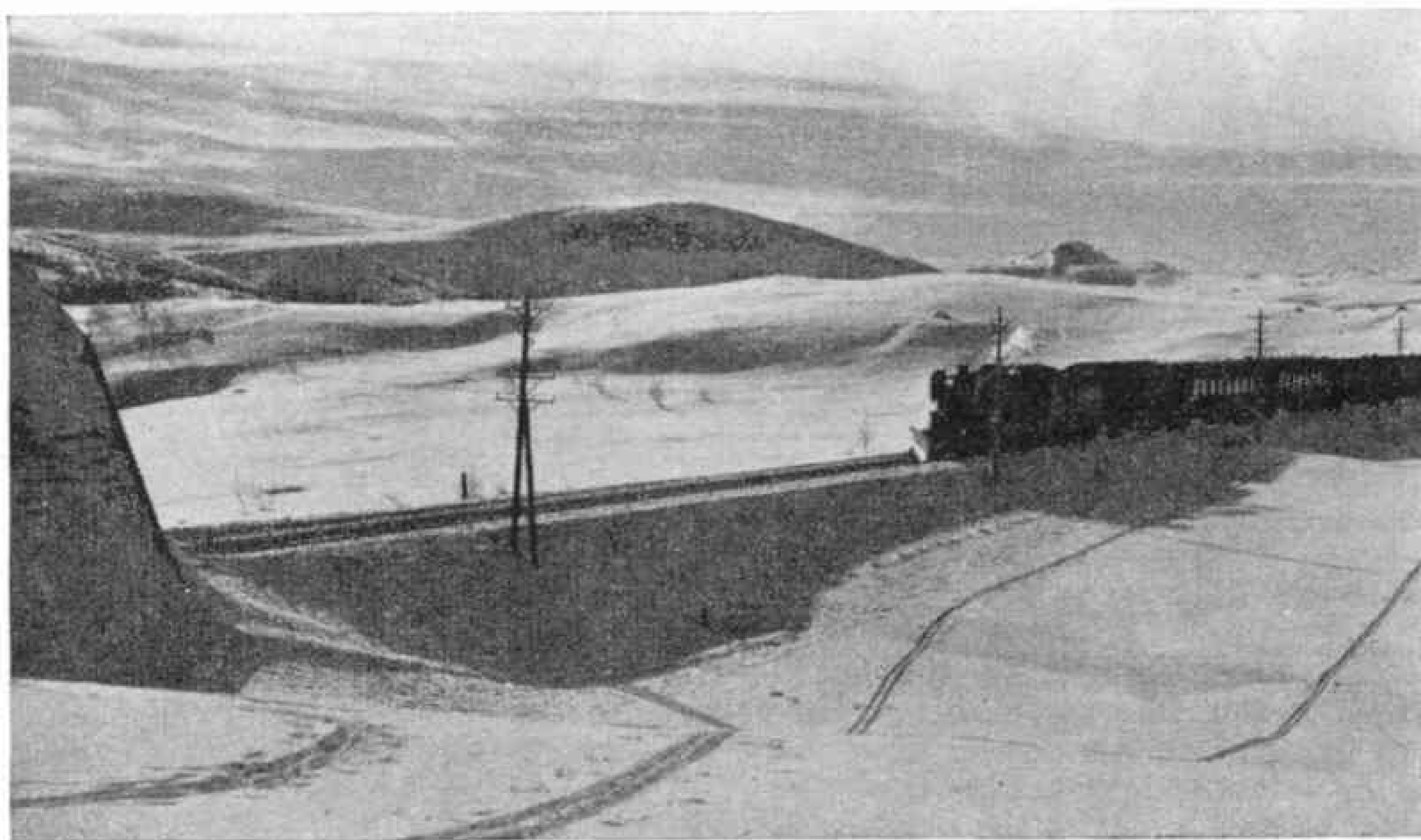


This picture shows the building at a station that stands on the Arctic Circle, in Sweden. Photograph by C. E. N. Watts.

realised that the struggle with snow plays a great part in its operations. This is not surprising, for in crossing the mountain barrier the railway climbs to a height of well over 4,330 feet above sea level.

No wonder the engine seen on the cover is equipped with a formidable snow plough. Giant rotary ploughs are used to clear away heavy falls of snow, but the engines of trains passing over the line also must do their share of the work of keeping the track clear.

The Editor



A Mountain Railway in Norway

Fighting Snow on the Oslo-Bergen Line

OUR cover this month shows a train halted at Finse, the highest railway station in Norway. Finse is on the remarkable line of the Norwegian State Railways connecting Bergen, on the west coast, with Oslo, the country's capital. The outstanding feature of this railway is the crossing of the mountains that separate Oslo from the West Coast. To climb these the railway has to ascend to a height of 4,330 ft. This it reaches at Taugevatn, a few miles west of Finse, which is itself 4,070 ft. above sea level. On the west side practically the whole of this tremendous climb is concentrated between Voss, which is 66 miles inland from Bergen and is at a height of 187 ft., and the summit at Taugevatn, a distance of roughly 45 miles, so that the gradients are very severe. For many miles indeed the ascent is at the rate of 1 in 50.

Norway of course is a land of steep mountains, and in many of its wild valleys, with their precipitous sides, there is a risk of landslides as well as of avalanches in winter. Because of this danger on the line between Voss and Finse, the track could

not be laid along the floor of the valley up which the climb is made. Instead it runs along the mountain side, passing through tunnel after tunnel on its way. On the eastern side of the mountains the track is not so steep, and there the railway has been laid in a more normal and easier fashion, along the floors of the valleys through which it runs.

Since Finse is at such a great height, among the giants of an extensive mountain

mass, it is not surprising to realise that snow and ice play a great part in the lives of the railwaymen who live there. It is in fact the headquarters of the various teams of railway linesmen who clear the tracks

when they are blocked with snow. They are certainly needed, for snow remains in these mountainous regions until July, when there is still ice on the waters of the nearby Lake Finsevatn, and in severe seasons has even persisted into August.

The surrounding countryside is a paradise for those who enjoy winter sports, and it was at Finse that Captain Scott and many of his companions trained and tried out their equipment before his second Antarctic

Our cover this month shows a train at Finse, the highest station in Norway, headed by a locomotive equipped with a snow plough. It is reproduced from a colour photograph by J. Allan Cash, and the article on these pages gives some idea of the formidable gradients on the line and of the battle with snow and ice waged every winter on it. The picture above shows a train on the snowy heights of the line.

expedition, in which Scott himself with four companions reached the Pole, in December 1912, only to perish on the return journey.

The Oslo-Bergen railway is by no means the highest in the world, or even in Europe, in spite of its 4,330 ft. at Taugevatn. There are railways in the Alps that climb higher, but they never ascend above the tree line, which there is about 7,000 ft. The tree line in Norway is only 3,000 ft., and consequently conditions at the summit of the Bergen-Oslo railway are much more severe than at the highest points of the railways in Switzerland. This was realised when the line was built. Its longest tunnel is the Gravahals, which is well over three miles long and had to be driven through solid granite. Drills of the type that had been used in boring the Simplon Tunnel were used, and at one time Italians accustomed to handling these tools were brought in to do the work. But the severity of the climate proved too much for them, and they had to return home. The hardness of the rock through which the tunnel passes added greatly to the difficulty of completing the work.

In the 306 miles of the full length of the Oslo-Bergen line there are nearly 200 tunnels, three of which, including Gravahals, are over a mile in length. Besides the tunnels there are extensive snow sheds in the mountain regions, built over the tracks in places where avalanches are to be expected. Clearing the line in winter is the work of

giant rotary ploughs that whirl the snow in great arcs well to the sides of the track as they are pushed along by locomotives, and the engines of trains passing over the line also play their part in keeping the tracks clear, as they are fitted with snow-ploughs like the one shown on our cover. Life on the railway for the greater part of the year is indeed a battle with snow.

This amazing railway has branches, and one of them is even more astonishing than the Bergen-Oslo line itself. On leaving Finse, a traveller from Oslo to Bergen passes over the summit at Taugevatn to Hallingskeid, a station that is built right into the mountainside, tucked out of the way of landslides. From the following stretch of line to Myrdal he gets magnificent views, interrupted all too frequently for his liking by cuttings, tunnels and snow screens, but just before reaching Myrdal he can look through light shafts pierced in the rock on the north side to a vertical precipice descending into a valley a thousand feet below.

This huge cleft between mountain peaks is perhaps one of the most impressive sights to be seen during the entire journey between Oslo and Bergen. But the valley is also the site of one of the most fantastic railways in the world, by which Flam is reached from Myrdal. Flam is at the head of a branch of a long fiord running in from the west coast and is only 6 ft. above sea level. Myrdal is 2,900 ft. high, so that on



Three levels of the Flam Railway. This climbs nearly 3,000 feet in its course of 12 miles, in which it tunnels in vast loops in the mountain side. On the right are the zig-zags of the road.

this railway, which is only 12 miles long, there is a drop of nearly 3,000 ft. from Myrdal. The gradient is 1 in 18, and there are 20 tunnels.

It is indeed the boring of tunnels that has made the line possible, for soon after leaving Myrdal the line plunges into a maze of loops and spirals bored in great part through the mountains (Continued on page 574)

Cradle of Air Power

By John W. R. Taylor

WHEN Princess Margaret visited the Royal Aircraft Establishment at Farnborough on its 50th birthday, in July, she was able to watch a superb display of flying by some of Britain's newest, fastest and finest aircraft. As they filled the sky with the beauty of their streamlined forms and the thunder of their engines, she probably remembered the vast wind tunnels, the laboratories and structure test rigs that she had seen during her tour of the Establishment, and realised that there was not an aeroplane in the show that had not benefited in some way from research done at Farnborough.

Britain's privately-owned aviation industry

"Colonel" Samuel F. Cody in his huge aeroplane at the Army Aeroplane Tests on Salisbury Plain, 2nd August, 1912. Photograph, "Picture Post" Library.

builds aircraft second to none in the world; but it is the R.A.E. that helps to turn aeroplanes into air power—not just military air power, but commercial air power to speed trade in the air ocean that unites all peoples of the world.

There was no such thing as air power when the first corrugated iron shed was erected at Farnborough in 1905. The Army had a few balloons, which it used for observing the movements of enemy units in battle; and the shed was the Army Balloon Factory. It was commanded by a gentleman named Col. Templer, whose favourite relaxation was to take his wife shopping in a caravan towed behind a ten-ton traction engine. So there was little peace and quiet in Farnborough even then.

Col. Templer and his deputy, Col. Capper, had little doubt that flying would one day change the whole pattern of war. When they heard that the Wright brothers were already flying aeroplanes successfully in America, they showed far more initiative than the U.S. Army and tried to persuade

the Treasury to pay the Wrights to continue their experiments at Farnborough. Meeting with no success, they decided to do the next best thing and build their own aeroplanes.

At that opportune moment, one of the most incredible characters in the whole history of British aviation put in an appearance. Samuel Franklin Cody was an American who, like his friend and namesake, Col. W. F. "Buffalo Bill" Cody, had spent his early life hunting buffalo and



fighting Indians. Afterwards, he ran a wild west show and, even after he became an employee of the Balloon Factory, he insisted on riding around Farnborough on a richly-saddled white horse, wearing a ten-gallon stetson hat and cowboy boots. With his goatee beard and flowing hair, he was often mistaken for "Buffalo Bill" and even King George V called him "Col." Cody—after which he proudly adopted the title for the rest of his life.

Cody was taken on as an instructor in kiting, as it was believed that the use of big man-lifting kites would overcome the drawbacks of balloons, which had to be accompanied by heavy gas-producing equipment and were vulnerable to gunfire. But he had other ideas and, after fitting a small petrol-engine to one of his kites and flying it as a pilotless aeroplane, he asked permission to build a full-size aeroplane.

He was a big, tremendously strong man and his aeroplane proved equally massive. As a result, it was usually known as the "Cathedral", although its official name was the British Army Aeroplane No. 1. It looked far too cumbersome to lift itself



successful aeroplane, but lacked the cash to develop it, they offered him £400 for the aeroplane and a job as draughtsman and test pilot. He accepted and, in 1912, produced the B.E.2, which was chosen as the standard reconnaissance aircraft of the newly-formed Royal Flying Corps.

The Balloon Factory had, meanwhile, been renamed the Royal Aircraft Factory and had set to work with great enthusiasm to design

J. W. Dunne in one of his tailless sweptwing biplanes. This photograph, from the "Picture Post" Library, was taken at Eastchurch in 1910.

off the ground; but it did, and in 1908 flew 496 yards at Farnborough, so gaining Cody the honour of making the first official aeroplane flight in Great Britain.

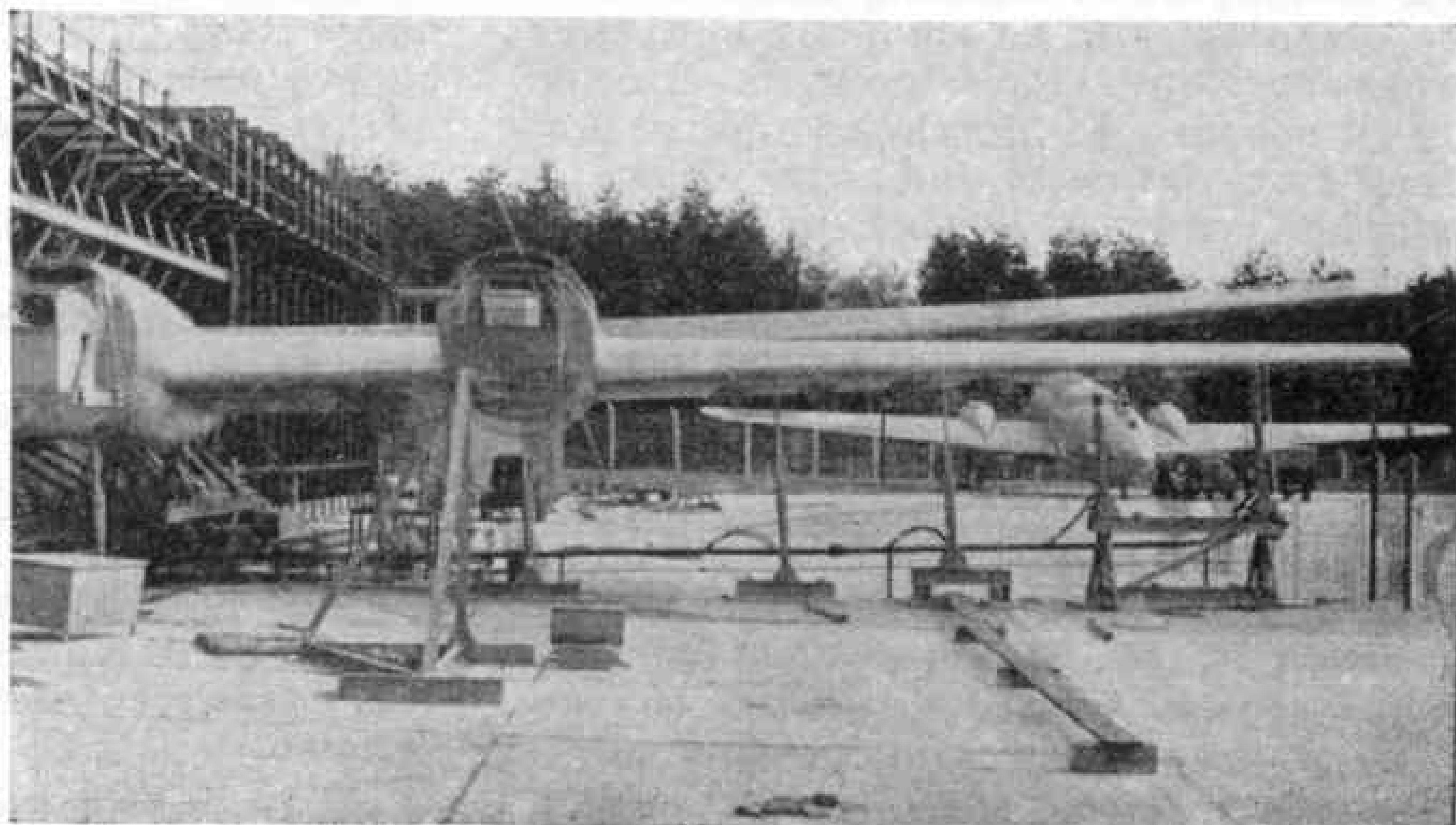
At the same time, J. W. Dunne built at Farnborough a series of weird-looking tailless aeroplanes with sweptback wings, which promised to overcome the problem of instability in the air that had killed so many pioneers.

Just as Cody and Dunne were beginning to fly with confidence, the War Office decided that experiments with aeroplanes were too costly and unlikely to produce any worthwhile results, and they both lost their jobs in 1909. In fact, the experiments had cost a total of £2,500, whereas Germany spent £400,000 on military aeronautics in that year.

It was not long before the Balloon Factory was back in the aviation business. Hearing that a young man named Geoffrey de Havilland had designed and built a

all the aeroplanes likely to be needed by the R.F.C. This began to worry the struggling British aircraft industry, which believed with some justification that the Government intended to buy only Farnborough-designed aeroplanes for the new Service, leaving them to scrape an existence as sub-contractors.

The Press joined the attack on the alleged Government monopoly of warplane design; with little result until 1915, when Anthony Fokker invented an interrupter gear which enabled machine-gun bullets to be fired between the propeller blades of the monoplane fighters he was building for the German air force. In the "Fokker scourge" that followed, Factory-designed aeroplanes were shot out of the sky over France in droves. Claiming that this proved they were no good as warplanes, the Press and Members of Parliament demanded that



Bristol Britannia aircraft undergoing fatigue test at the Royal Aircraft Establishment, Farnborough. British Official Photograph.

aircraft design should, in future, be left to private companies.

An official Commission in 1916 supported this demand. It was bitterly resented at Farnborough at the time, but proved eventually to be one of the wisest steps ever taken for the advancement of British aviation. Since then, the Factory—which

as early as 1920. The first British diesel aero engine and superchargers were built. So were pilotless, radio-controlled targets and flying bombs, the first of which was produced at Farnborough in 1916.

Even today, few people realise the importance of the R.A.E.'s contribution to victory in World War 2. The radio with which our fighters were guided to their targets in the Battle of Britain was designed and installed by technicians from Farnborough. The compasses with which

The fuselage of a Britannia inside the water tank at Farnborough. British Official Photograph.

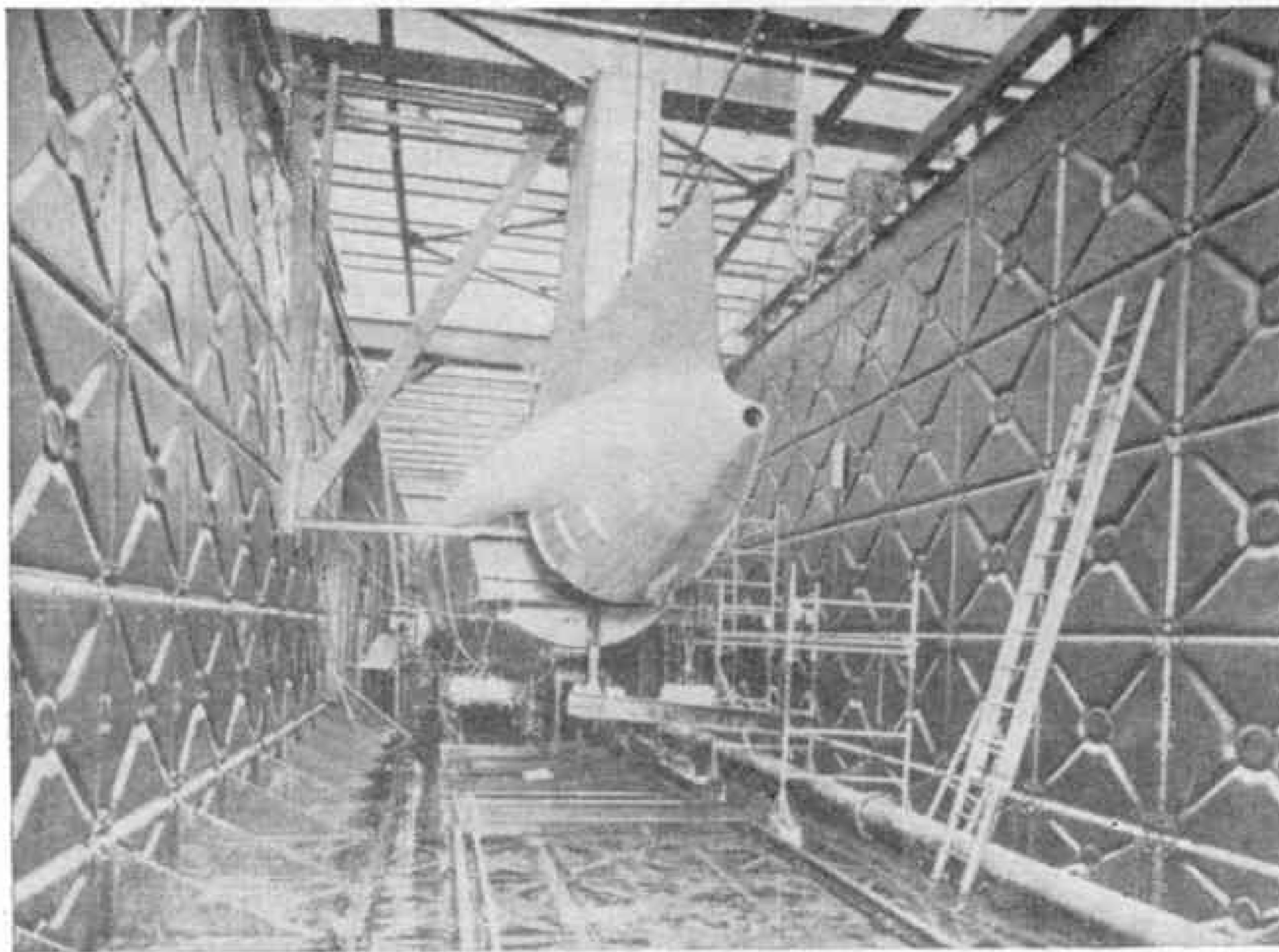
our bombers navigated and the bombsights which ensured their accuracy were perfected there; so were the cameras that photographed the results of each raid.

Rocket projectiles, gyro gunsights, the catapults that launched Hurricane fighters in protection of convoys of merchant ships, self-sealing fuel tanks, all were developed in the huge, superbly-equipped research centre that had grown from the single shed of 1905.

Needless to say, this work was all very secret, and even in peacetime much of the work of the R.A.E. has to be hidden under a veil of official secrecy. If we could glimpse inside its newest high-speed wind tunnels, we should see models of fantastic shape under test, telling scientists what will happen to the next generation of research 'planes and fighters when they try to fly at 2,000 m.p.h. In the "ditching" tanks, we could watch air liner models being catapulted into the water, so that methods of emergency escape can be worked out for their passengers.

In another section we could see experimental wings made of plastic. And in a block of buildings bigger than a super-cinema we could watch TRIDAC, the R.A.E.'s "mechanical brain", working out complex mathematical problems that would take a team of scientists months to solve.

(Continued on page 574)



was renamed Royal Aircraft Establishment when the R.A.F. was formed in 1918, to avoid confusion of initials—has been a research centre not only for aircraft, but for all the thousand and one items of complex equipment that are essential if an aeroplane is to do its job efficiently.

There had been a wind tunnel at the Factory since 1907; but in 1918 a start was made on a bigger and better one. Aircraft testing had been getting more scientific and thorough since 1912, when the technique was introduced of stacking sacks of shot on to the wings of an aeroplane until they broke, to prove their strength. In the 1920's this idea was developed and the first giant test rigs were built, in which an aeroplane can be twisted and bent at intervals of a few seconds for hours or days or weeks on end, to reproduce the stresses of flight.

New ideas in streamlining were perfected in the wind tunnels at Farnborough. Scientists deliberately put aeroplanes into dangerous spins to find out what caused spinning and how it could be cured. Research by the engine division laid the groundwork for the whole future development of powerful piston-engines. Variable pitch propellers were test flown

The Conveyancer Overlander

Fork Lift Truck for Highways and Rough Ground

FORK lift trucks nowadays are to be found in practically all factories and other places where material has to be moved quickly and easily, or stacked for storage or on lorries for carriage. They are used in conjunction with pallets, which are simply platforms, on which goods are loaded, that have battens underneath to leave a space between them and the floor on which they stand.

As every Dinky Toys enthusiast knows, the forks of a fork lift truck can easily be inserted under a pallet, after which this with its load can be raised for carriage elsewhere, and can be lifted higher to be stacked. All this can be done swiftly and

of the hydraulic type and an epicyclic gear-box that is controlled pneumatically. There is also an auxiliary gear-box giving the truck four forward speeds and one reverse when working as a road vehicle. The road forward speeds are higher than the "stacking direction" speeds.

The controls include two steering hand wheels, and the driver's seat can be swivelled round to allow him to face in either direction of travel, so that he looks forward in both of the two directions in

A fork lift truck designed for use on all types of surface. Illustration by courtesy of Conveyancer Fork Trucks Ltd., Warrington.

easily, and there seems no end to the list of materials that can be handled in this way—anything indeed that can be laid on the surface of a pallet can be moved swiftly and easily.

Although the fork lift truck today is practically universal in industry, it is only in the ten years or so since the end of the second World War that the system has become widely accepted in Great Britain. Generally speaking, fork trucks have been designed to work on reasonably good floors and level ground, but now a new one has been introduced, the Conveyancer Overlander, that can run at 30 miles an hour on roads, and can be used on almost any kind of surface, including sandy roads, soft mud and very rough loose tracks.

A glance at the picture of the Overlander on this page shows at once why it can do all these things. It is a 4-wheeled vehicle provided with a six-cylinder diesel engine, which drives it through a torque converter



which the truck moves. The steering is power assisted, and the driver can steer either with two road wheels or four, the most convenient being readily selected.

Another interesting feature of the Overlander is the equipment provided for increasing or lowering air pressure in the large pneumatic tyres. This has to be altered to suit the particular type of surface over which the truck operates. Provision is made for a simple plug in to the tyre valve, and beyond that all that is necessary is to operate a selector that decides whether the pressure shall be increased, or decreased. There is a pressure gauge to ensure that the tyres are properly inflated for the task in hand.



Mails for the Isles

By Arthur Turner

"THE mails must get through" has long been the slogan of Britain's postal service, and that motto is applied as far as possible even to the most inaccessible parts of the United Kingdom, including scores of inhabited islands off the mainland or in lakes and lochs.

Delivering mails to the Orkneys and Shetlands, for instance, is no mean feat at certain times of the year, and many difficulties have to be overcome in serving the Western Isles, the Scilly Islands, and many islets in bays and estuaries round Britain's shores.

No one scheme, in fact, is suitable for getting mails to these isolated spots. Various means are used, according to the individual circumstances, and the services make an absorbing study for anyone interested in transport. Air transport has somewhat simplified the problems in recent years. Some of Scotland's larger islands have been receiving mails by plane for more than twelve years, and the Scilly Islands have had an air mail service since 1947.

Yet the bulk of the islands round our coasts get their letters and parcels by sea. Such mails are often carried under contract

by the steamship companies plying to and from the mainland. Thus the vessels of the historic MacBrayne fleet operate between Glasgow and the Hebrides, and the ships of the Scotland, Orkney, and Shetland Shipping Co. Ltd. run from Leith and Aberdeen to the most northerly detached outposts of the United Kingdom.

In other instances, fast motor launches are used to get mails to their destination. This method is often adopted for small islands only a short distance offshore, or situated in lakes. For instance, three times a week in summer and twice a week in winter the islands of Loch Lomond are visited by their waterborne postman from Balmaha, on the Dumbartonshire bank. The postman in this instance is indeed the owner of Balmaha Bay, who is under contract to the Postmaster General to deliver letters and parcels with his launch *Waterwitch*. A clause in the contract absolves him from making deliveries if weather conditions are dangerous, but it is very rare for the round to be abandoned, despite ice, gales, and fog.

This service does not provide for the delivery of mail right to the door, but the inhabitants of the islands keep watch for the approach of the postman's launch and collect their letters and parcels at the landing-place. On Inchmurrin an old ship's bell is rung to

announce the arrival of the *Waterwitch*. The value of this service to the inhabitants of the islands is shown by the fact that between 3,000 and 4,000 items are delivered by motor launch every year.

Among many other small islands with a similar postal service is Furzey Island, a tiny outpost near Poole, Dorset. It lies near the larger and better-known Brownsea Island, birthplace of the Boy Scout movement, and is served by a postman who braves the hazards of winds and high seas to deliver the mails.

The Scilly Islands are served by steamer and aircraft in providing a daily mail service with the mainland, and the history of the surface mails here covers an

Transferring mails for the Scilly Isles from R.M.S. "Scillonian" to the launch "Nor-Nor." Photograph by courtesy of H.M. Postmaster General.

exceptionally long period. Scillonians have had a regular mail service by sea for more than a century—and a telegraph service for at least 64 years. The air mail service was started only in 1947. This service has its centre at Hugh Town, on the largest island, St. Mary's, but the four inhabited "off" islands of Treco, St. Agnes,

to Gourock, where the mails are taken by train to Glasgow.

The vessels carrying mails to the Western Isles are the modern representatives of a fleet established in 1851, and the history of this steamship line has many interesting facets. The s.s. *Dirk*, an 181-ton ship built in 1909 for the MacBrayne services, was the first vessel of any kind to be fitted with a gyroscope, and another point worth mentioning



R.M.V. "Lochiel" at West Loch Tarbert loading mails for the Western Isles.

St. Martin's and Bryher receive their mails by motor launch.

Even these small Atlantic outposts have a proud place in postal history. Though Bryher did not have a post office until 1891, one was established on Treco as far back as 1869—at least, that is the date given in official records, though whether this applies only to the first official mail delivery is sometimes questioned.

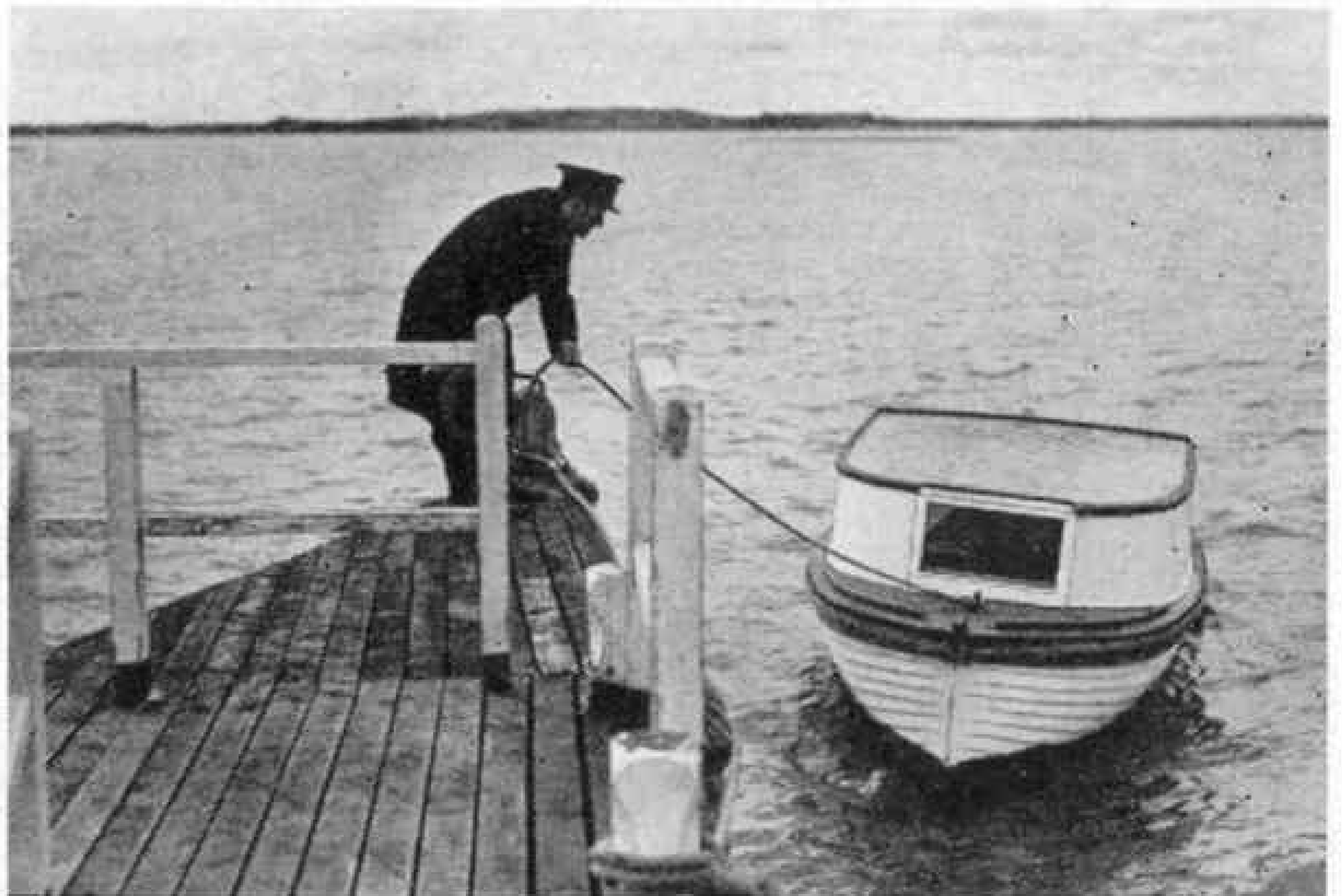
Considering their isolation, many of Britain's islands are able to get mail to London in an astonishingly short time. Letters posted by 7 a.m. on Colonsay, one of the three islands in the Hebrides southern postal area, are delivered in London next morning. Letters posted in the afternoon in some parts of Scotland for Port Ellen, on the island of Islay, often reach their destination before 11 a.m. the next day.

All types of mail are carried by the r.m.v. *Lochiel*, which plies between Islay and West Loch Tarbert, on Kintyre. There it connects with another steamer going

services. Such an office was provided aboard the paddle steamer *Columba*, a 600-ton vessel built in 1878.

The largest ship at present under contract for the carrying of mails to and from the Western Isles is the t.s.m.v. *Loch Seaforth*, 1,090 tons, built in 1947 for the Stornoway, Kyle and Mallaig mail route. Much larger vessels take mails to and from the Orkneys and Shetlands, these including the m.v. *St. Ninian*, 2,242 gross tonnage, and the oil-burning s.s. *St. Clair*, 1,641 tons. Another noteworthy Royal Mail steamer is the m.v. *St. Ola*, which plies between Thurso and Stromness, (Continued on page 574)

Postman at Poole Harbour tying up his boat before setting out to deliver mail on Furzey Island. Photograph by courtesy of H.M. Postmaster General.





An up train from Leeds (Central) at Beeston Junction in charge of Pacific No. 60044 Melton. Photograph by Archdeacon E. Treacy.

More Good Runs Summarised

During the summer season, which has been extremely busy on many lines, I have been travelling considerably by long distance and other trains and maintaining close touch with locomotive and traffic working by observation as well as by contact with officials and friends. Messrs. D. S. Barrie, M.B.E., and Norman Harvey have kindly contributed to the selection of logs quoted.

Another fine performance by *Royal Scot*, No. 46100, rebuilt 3-cyl. 4-6-0, was on the midday 2-hr. Euston-Birmingham express. This is booked to stop at Coventry, 94 miles, in 94 minutes, with an 11-coach load, totalling 375 tons behind the tender. After a fast climb to Tring, with subsequent high speed beyond Bletchley, there was almost a dead stand for signals on the slightly rising grade before Roade and then a permanent-way repair slack, but even so Rugby, 82½ miles, was passed in 82½ min. and Coventry was reached only ½ min. late. A smart run on to Birmingham exactly regained that small deficit, so giving a punctual arrival.

Continuing on the Western Division, L.M.R., though in the opposite direction, there is for report an extremely fine effort on a shorter run by class 6, smaller 3-cyl. 4-6-0 of the Jubilee class No. 45734 *Meteor*, with a heavy 14-coach train of new stock weighing with passengers about 490 tons. Camden Driver J. Thomas and Fireman Yates were on the footplate. The start was from Northampton 3 min. late, joining the West Coast main line at Roade, 6 miles away. Having touched 74 m.p.h. near Wolverton, the 15 rising miles from Bletchley to Tring were run in 13½ min. Speed fell only gradually from 71 to 60 m.p.h., so at the top this Wolverhampton line express was punctual, although the locomotive might be regarded as overloaded. Track relaying

with necessary slow speed put an end to a fast descent approaching Kings Langley, but net time for 48½ miles to stop at Watford Junction was little over 51 min. compared with 55 allowed.

Turning now to the Southern, with contrasted types of motive power, the newest and most powerful diesel-electric, No. 10203, last spring gained a minute from Waterloo to Woking, and from there 2 min. to the second stop at Andover Junction, with a 13-coach 440-ton train forming the 1.0 p.m. express to the West of England. Over undulating grades across the Hampshire downs and uplands through Basingstoke, the 28 miles between Farnborough and Hurstbourne were covered in 25½ min.

In fast London-Eastbourne-Hastings multiple unit electric trains I have logged speeds up to 78 m.p.h. on the Brighton main line, and 76 between Haywards Heath and Lewes, with a frequent maximum round about 75, and start to stop averages of nearly 60 m.p.h. when recovering lost time, or on the quickest schedule, between East Croydon and Haywards Heath, 27½ miles.

West Country 4-6-2 No. 34099 *Lynmouth*, Ramsgate engine and men, gave me my fastest-ever run of its kind after leaving Ashford (Kent) 6 min. late, with a full 10-coach, 355-ton, non-stop coast express for London. Twice 78 m.p.h. was reached before Tonbridge, which was passed with the usual slight slowing for the curve, and 26½ miles was covered in the remarkable time of 25 min. 50 sec. from the start. *Lynmouth* seemed all set to make up most of the delay encountered east of Ashford and would certainly have reached London Bridge within an hour, including stiff climbs, but for a signal slowing on the 1 in 122 rise to Sevenoaks Tunnel and a stop outside London Bridge. Even so we arrived within the 64-min. allowance for 54½ miles.

Peterborough as a Railway Centre

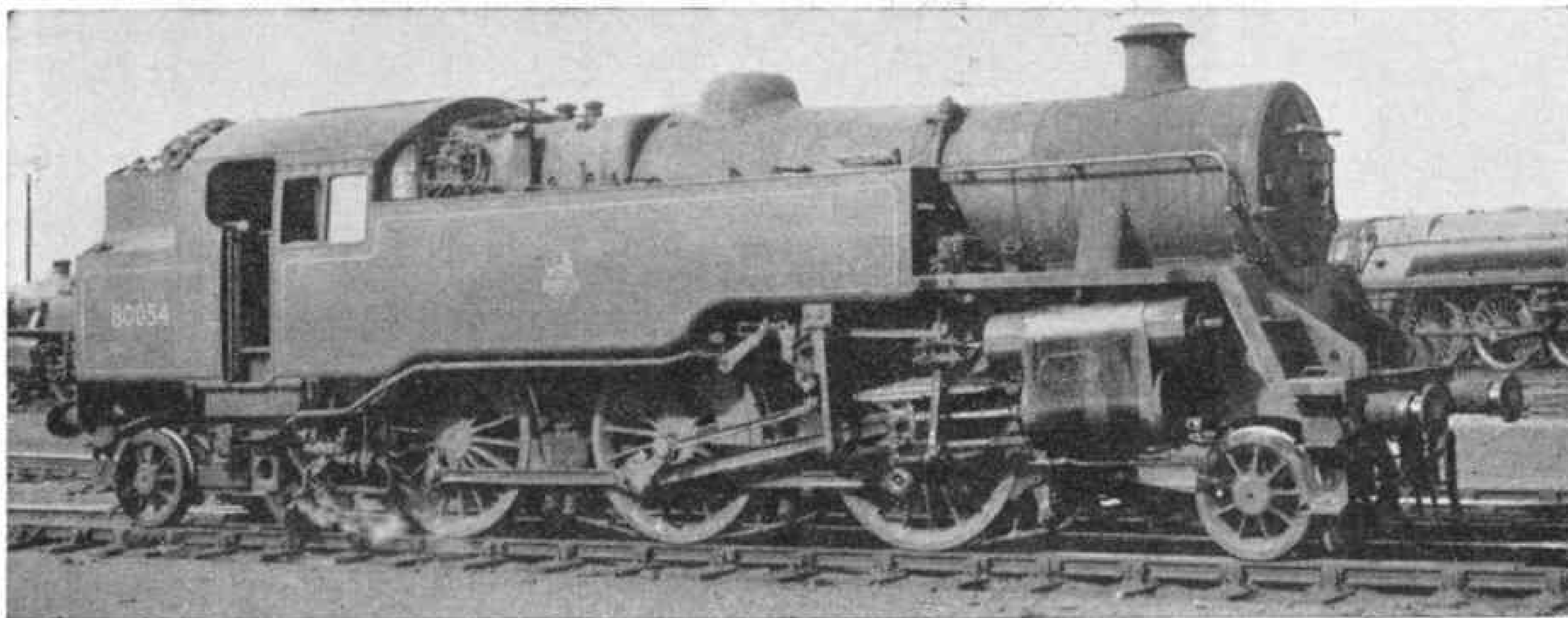
The cathedral city and market town of Peterborough in the east Midlands is of considerable interest and importance as a railway centre. Its North station is on the East Coast main line from London, King's Cross, to Scotland with extensive marshalling yards and a large Motive Power depot. Important branch lines thence serve the Boston, Lincoln, Skegness and Grimsby areas, and Wisbech and the Norfolk coast by means of what used to be called the Midland and Great Northern Joint system.

The East station south of the River Nene is also under the control of the Eastern Region, with trains to and from March and Ely, connecting with various parts of East Anglia. It also handles London Midland services from the Rugby direction, and from the Leicester direction, Midland Division, with various long distance through carriages or trains, some of which serve both stations. The lines of the former Midland Railway are alongside the main Eastern Region tracks for over 6 miles north of Peterborough before branching away to Stamford.

I spent some time on a busy and hot afternoon watching the main line traffic working at Peterborough, North, and at the quiet "Midland" station at Helpston, near mile-post 82 from King's Cross. On the E.R. line there is just a signal box of the same name, which also controls a level crossing over the four busy tracks, being also a block section fully signalled. The southbound *Elizabethan*, non-stop from Edinburgh, headed by A4 4-6-2 *Lord Faringdon*, the up *Flying Scotsman* worked by A1 *Silurian*, and its Newcastle

Railway Notes

By R. A. H. Weight



A B.R. Standard 2-6-4 tank that carries a number well known to Hornby-Dublo enthusiasts. Photograph by J. L. Stevenson.

relief portion with A2 rebuilt engine, *Cock o' the North*, all passed about to time.

There were also A3 Pacifics and V2 2-6-2s on express passenger trains, with two of the latter also on goods, as was a B16 ex-North Eastern Railway 4-6-0 mixed traffic locomotive. B1 4-6-0s, including those on the through Grimsby-Boston-King's Cross runs, also were seen, with a good many L.M.R. type class 4 2-6-0s in the 43 numbering variously employed on trains of both Regions. One took us up from Helpston, passing behind the main North station and down over the connecting line to the East one, where there were Claud Hamilton D16 4-4-0 and Sandringham class, 4-6-0 engines among others. From Peterborough North to Helpston a rebuilt Midland class 2 4-4-0 had been on. I have seen compound 4-4-0s along there sometimes. One of the new class 9 2-10-0s was drawing out of New England yard with a coal train, and there were several W.D. 2-8-0s about as usual, together with big K3 2-6-0s.

Southern Tidings

Locomotives hauling Kent coast or Hastings trains through Tonbridge during a summer Saturday afternoon's observation comprised 6 different West

Country and 1 Britannia 4-6-2. The last of these was the familiar and polished *William Shakespeare* on the *Golden Arrow*. There was also 7 King Arthur N15 4-6-0s; 8 Schools 4-4-0s; 3 new class 5 4-6-0s; 3 N and 2 U1 2-6-0s; with L, D1 rebuild and old-style D 4-4-0s on stopping services.

U1, 3-cyl. engines work London-Hastings fast trains sometimes. I had a trip behind No. 31909 on the 2.25 from Charing Cross, though the running on that occasion was only good in parts. There are many logs indicating quite fine performance by those Moguls in the past over the difficult Chatham-Margate main line.

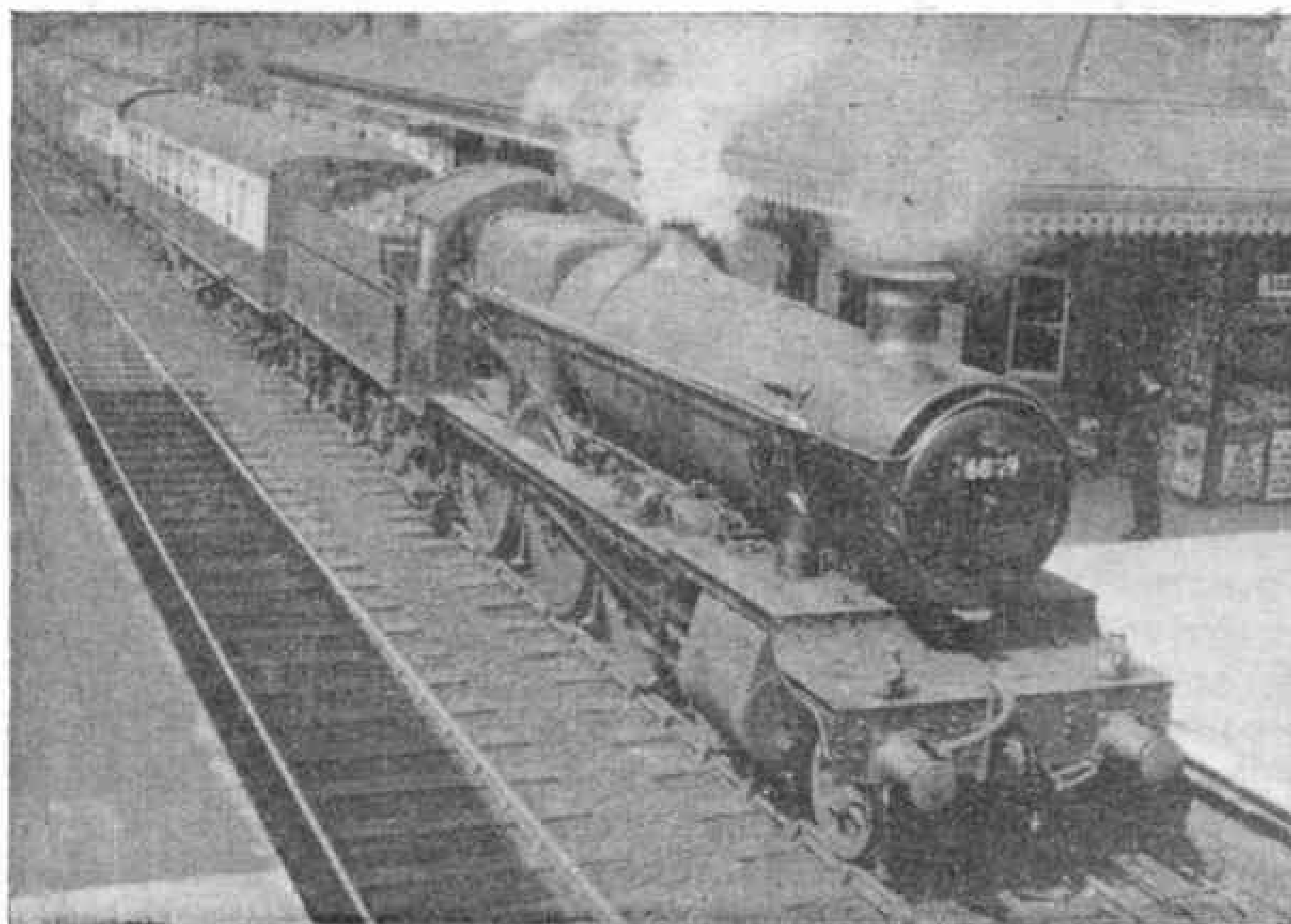
Most, if not all, of the five remaining H2 Atlantics of the former L.B.S.C.R. have been busy during the summer helping to cope with the heavy through Midlands holiday traffic to and from the Sussex coast—these trains run through between Brighton and Willesden or Kensington (Olympia) via the West London Junction line—and visiting Eastbourne and Hastings, working from Brighton to Bournemouth, etc. An L.M.R. class 5 4-6-0 has been seen again on the through Friday night Manchester-Brighton duty, returning on Saturday afternoon. New class 4 2-6-0s of the 76053 B.R. series have also been on through Midlands trains; to Hastings, Newhaven, Reading, Ramsgate and elsewhere.

Light Pacific No. 34066 *Spitfire* blazed the trail on a country single line quite unaccustomed to such large locomotives when it hauled a Ramblers' excursion of 8 corridor coaches from Victoria to Heathfield, Sussex. This is on what is known as the "cuckoo line," which is steeply graded amid beautiful country connecting Tunbridge Wells and Eridge with Polegate and Eastbourne.

Swindon to build Diesels

The British Transport Commission announce that twenty-five 200 h.p. diesel shunting engines will be built at Swindon. The work, which will be commenced next year, will embrace the construction of all mechanical parts; and the complete erection, including the diesel engines and transmissions supplied by contractors, will be carried out in the locomotive works.

W.R. 4-6-0 No. 6809 "*Burghclere Grange*" comes alongside the platform at Camborne, Cornwall, with a train from Penzance to Paddington. Photograph by G. Clarke.



The lake of asphalt in the island of Trinidad, in the West Indies. The illustrations to this article are reproduced by courtesy of the Trinidad Lake Asphalt Co. Ltd.



WITH new road-building and industrial projects in progress in so many lands to-day, there is a huge and unprecedented demand for the black bituminous material we know as asphalt. This is used practically everywhere in modern road surfacings, and in industry, for such purposes as electrical insulation and anti-corrosion products.

The world's richest source of asphalt is a very remarkable lake on the West Indian island of Trinidad, remarkable in that it constantly replenishes itself by natural means. For in spite of the fact that millions of tons of asphalt have been taken from it over the best part of a century, the supply remains exceedingly rich and always of the same excellent and unvarying quality. The present rate of output exceeds 100,000 tons a year.

Columbus, like other early explorers, must have noticed the Asphalt Lake when he discovered the island in 1498 and annexed it to Spain. But the earliest mention of the strange "Lake of Pitch", as it was once called, is found in the diary of Sir Walter Raleigh, written nearly 100 years later. Raleigh and his men arrived at Trinidad in the spring of 1595, and they actually landed at a point on the south-west coast where an overflow of asphalt from the Lake reached down across the shore into the sea. Obviously he was impressed both by the quantity and the quality

of the pitch, for he wrote of it:

"At this point called Tierra de Brea or Piche there is that abundance of stone pitch that all the ships of the world may be therewith loden from thence, and wee made triall of it in trimming our ships to be most excellent good, and melteth not with the Sunne as pitch of Norway, and therefore for ships trading South partes very profitable."

Very little was heard of the Lake again over the next two hundred years or so until, about the beginning of the nineteenth

century, some Spanish settlers in the West Indies were reported to be trying to

Trinidad's Asphalt Lake

By W. H. Owens

extract the asphalt for export to Europe. Their efforts, however, seem to have been entirely unsuccessful.

Then, in 1850, the Lake came into much prominence through Admiral Thomas Cochrane, tenth Earl of Dundonald, who made a series of experiments with Trinidad asphalt to confirm his belief that it could be used profitably for a number of different purposes in industry and commerce. One of his experiments concerned its use, in conjunction with coal, as a cheap fuel for ships.

It was, no doubt, through the Earl's pioneer work and the promising results of his experiments that, in 1888, the Crown granted a working concession to a British company for the whole of the Asphalt Lake.

That was the beginning of a great and progressive industry in Trinidad, which nowadays gives steady employment to some 1,500 of the island natives and sends its products all over the world.

Just how and when this remarkable Lake originated is not exactly known, but it was certainly many thousands of years ago. Over a period of general earth movements

Cutting raw asphalt from the lake and loading it into a truck for transport to the refinery.

in the area the beds of rock were broken or faulted, as a result of which a huge subterranean reservoir of oil and natural gas forced its way through to the surface.

In the course of time a large circular basin was formed where the oil collected in great quantities, the excess overflowing the rim and escaping to the sea close by. The asphalt in its raw state is really a mixture of bitumen, silt, clay and water. It is plastic, but is of such a consistency on the surface that it will bear the weight of the men who excavate it and the railway trucks that carry it away to the adjacent refinery.

The Lake is in constant movement. Material taken from it is replaced with fresh supplies that are rising all the time to the centre of the deposit. This overall movement is not perceptible to the eye,

but is shown by the fact that pieces of wood which emerge on the surface of the asphalt at the centre gradually drift towards the edge of the Lake, where they appear to be slowly sucked back into the



morass again.

The process of excavating the raw asphalt is a very simple one and, with the exception of transport, still depends on hand labour. Workers hack away great lumps of material, weighing on the average between 40 and 70 lb. each, with special long-handled pickaxes.

Excavated pits never go deeper than about two feet, since at that level the rate of digging is counter-balanced by the upward pressure of the mass. Moreover, the shallow pits made by digging will disappear entirely when left for two or three days, so that the same areas of the Lake can be worked over and over again.

To each digger there are usually five "headers", so called because they carry the asphalt lumps on their heads to the waiting railway wagons. Two railways of 24-in. gauge, operated by cable haulage, take the asphalt directly to the refinery tanks. Conveyors carried on aerial ropeways link the refinery with the shipping

(Continued on page 574)



Refined asphalt flowing into barrels in a continuous stream from the refinery.

Odd Lines on Trams

By Dennis Gill

CONTRARY to current belief, the tramcar is not just a carriage for conveying passengers. It has many other novel and distinct uses.

Now do not run away with the idea that I am going to describe how ramshackle "old trams" have been made into homes. Man's ingenuity deserves a greater compliment than that. This is an account which should interest you, not only because it is about tramcars—everybody must have a soft spot for trams—but because it is a pot-pourri, an olla-podrida, or whatever else you may like to call it, of curious facts.

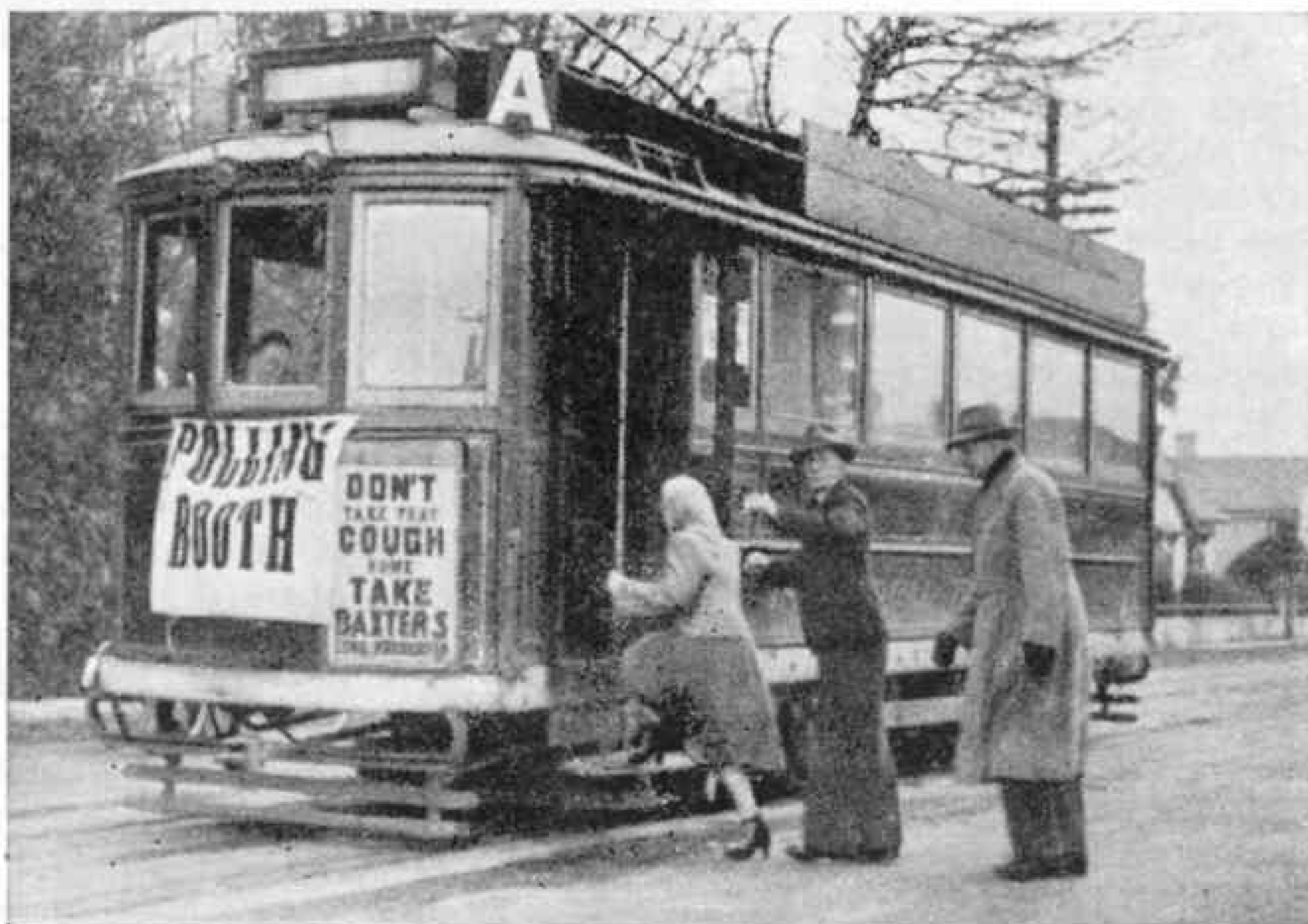
To start the wheels turning let us ring the bell in the Brazilian city of Salvador, or perhaps I should write "toll the bell," for that is where they had tramway funeral services. The dead were conveyed to the cemetery in a specially designed tramcar, surely the most unusual hearse in the world, with the priest and the bereaved

fighting are still running to-day—but what soul-destroying, battered, old juggernauts some of them are! Years of service have reduced them to a crawling pace, and they are known as "tortugas", which means tortoises.

It was also in Mexico City that Dictator Porfirio Diaz provided his wife with her own private tram, complete with silk curtains, armchair seats, magazine racks and spittoons. That, however, was nothing unusual. In those days men were gentlemen and would do anything to please a woman.

Unique is a tram in Australia avoided by fare dodgers, namely Sidney's prison car, No. 948, which has six barred cells with a corridor along one side. It runs between the Court House and Long Bay

A tramcar used as a polling booth in Invercargill, New Zealand.



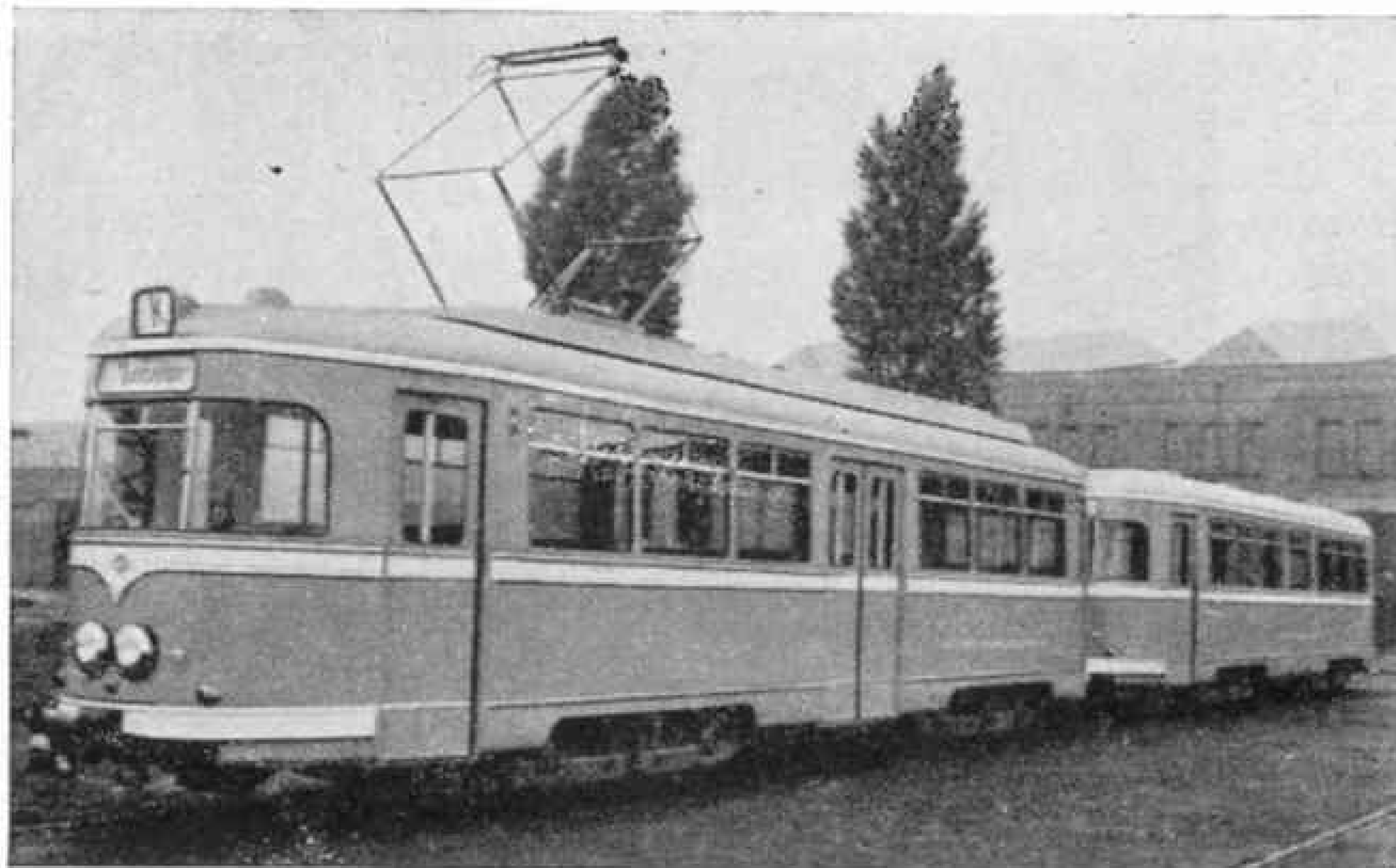
riding alongside the coffin, and other mourners following behind in a trailer. As a matter of fact, tramway funeral services were quite fashionable once upon a time. They were started in Milan about 1896, and they also used to have them in Paris and Mexico City.

"From corteges to battlefields"—such was the life of the trams in Mexico City. During the revolutions of 1914-18 they were commandeered by rival generals and used as troop carriers, armoured units or mobile gun platforms. They must have been a thrilling sight. One can well imagine them, with their trolley poles swishing, as they swayed down main streets firing broadsides, like some formidable battleships, into shop windows!

Trams that survived the fury of the

Gaol, and must be the most unpopular tram in the world. Passers-by in the street cannot see into the cells, for they are windowless, and notices at both ends of the car warn them—should they be foolhardy enough to try—that they cannot climb aboard.

There are many people who read books—and if the books come to them they are delighted. In Edmonton, Canada, and the German city of Munich, tramcars have been converted into travelling libraries. Seats have been removed and replaced by book shelves carrying approximately 1,500 volumes of literature, and desks and



chairs have been installed to suit the librarian's requirements. Different outlying suburbs are visited on a pre-announced schedule; and each day that a car is in use over eight hundred books are handled, which is sure enough proof that the service is popular.

Seeing that many families are now being hypnotised by television, the reader might like to know that B.B.C. cameramen find tramcars useful when televising Blackpool's illuminations. The first occasion was in 1951, when the cameras and all the other equipment were mounted on a standard tram chassis, thus enabling pictures to be transmitted from a moving road vehicle for the first time. The transport department allows the television service an uninterrupted run, and viewers are able to see all the illuminations in a short space of time. In 1953 George Formby, the comedian, in an illuminated gondola—decorated open single-deck tramcar—drew alongside the television cameras and sang a song—so adding to the success of the broadcast.

At Invercargill, New Zealand, on 1st September, 1951, a tramcar was used as a polling booth—this, supposedly, being the correct way to conduct a vote. It was certainly a novelty, and consequently was used by a considerable number of

The new tramcar seen in the upper picture of this page has a dining car attached to it, and the interior of the latter is seen below. This remarkable development is to be seen in Dusseldorf, where there are tramcars fitted with telephones.

electors, who normally would have voted elsewhere, or perhaps not at all.

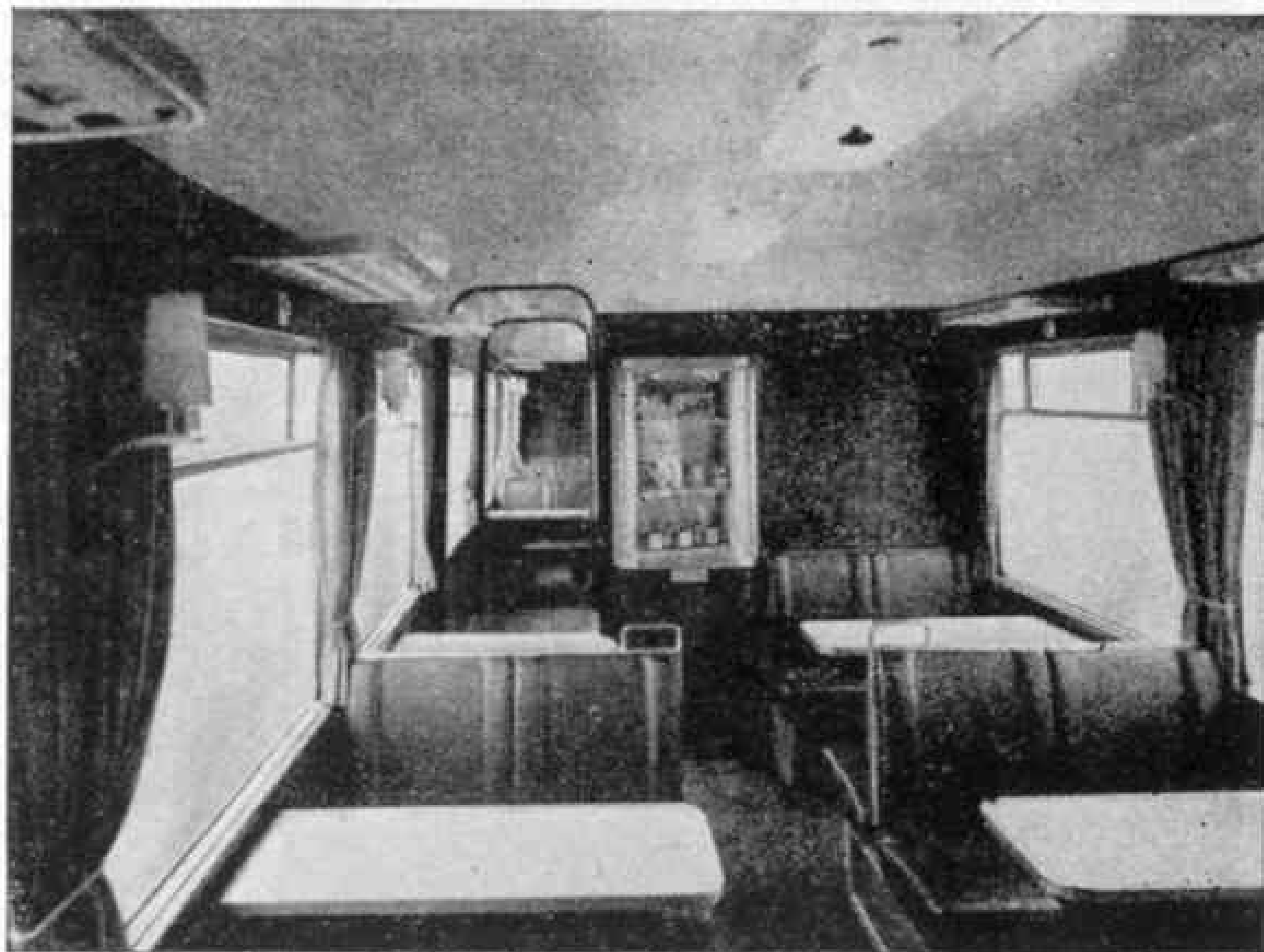
Old tramcars seem to last forever. On a blitzed site in the centre of Belfast three have been joined together and turned into offices for the Northern Ireland War Memorial Building Fund. Their lower decks have been equipped with electric lighting, heating, carpets, furniture, etc., so that they make very snug offices indeed. Surprisingly enough,

few people in Belfast realise that these offices once ran through their city, so cleverly have they been converted.

It would appear that tramcars also make excellent boarding houses, for 73 years old Mrs. Anna Fox of Chicago has slept in that city's all-night trams each night for the past seven or eight years. She says that the fare for 126 miles is cheaper than an all-night lodging and that the cars are more comfortable. That there

is much truth in her statement cannot be denied. Chicago's new luxurious trams have soft upholstered seats, good ventilation and plenty of heat, particularly in the coldest weather.

How would you like to be given a box of

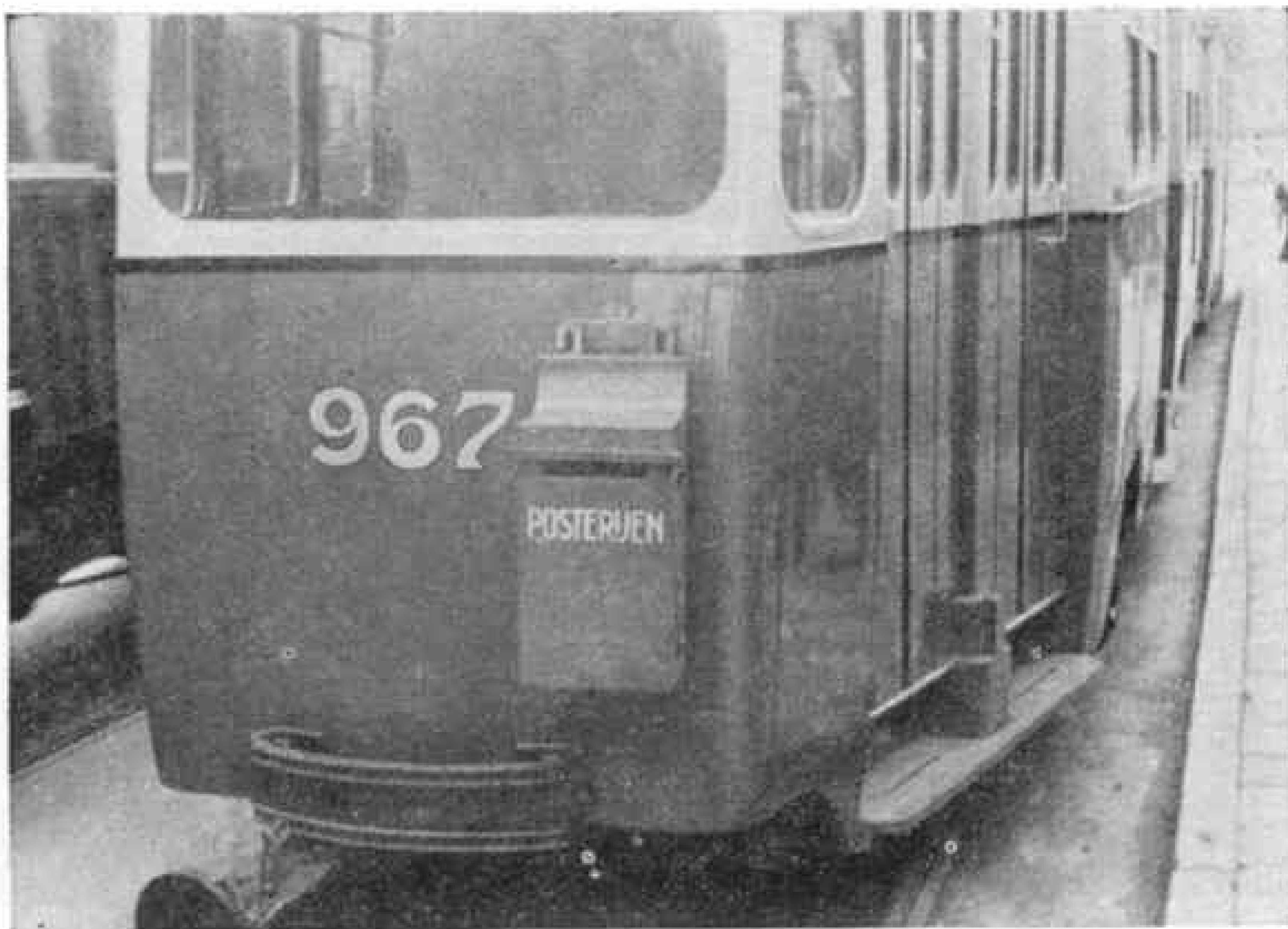


An Amsterdam tramcar that carries a post box.

chocolates with your tram ticket? Not so long ago the Zurich tramways department organised a "Fairy Tale" trip during which passengers were carried in a new tramcar, the men receiving free cigarettes and the ladies free confectionery. The conductor's desk was decorated with flowers; and the reason for all this was to further good relations between the undertaking and its passengers.

Zurich might be proud of its trams, but not so Calcutta, which has had a troubled political history during the last twenty years. The trams there, by their very nature, are vulnerable targets for unruly elements; and often during demonstrations and riots they are overturned and set on fire. It has been necessary to fit all of them with heavy wire screens to protect the drivers from missiles.

In Dusseldorf the need of the passenger has been well catered for. Some of the trams running to Duisberg and Krefeld have been fitted with restaurant cars, and there are others with two-way telephone installations,



so that passengers can talk to subscribers in that area.

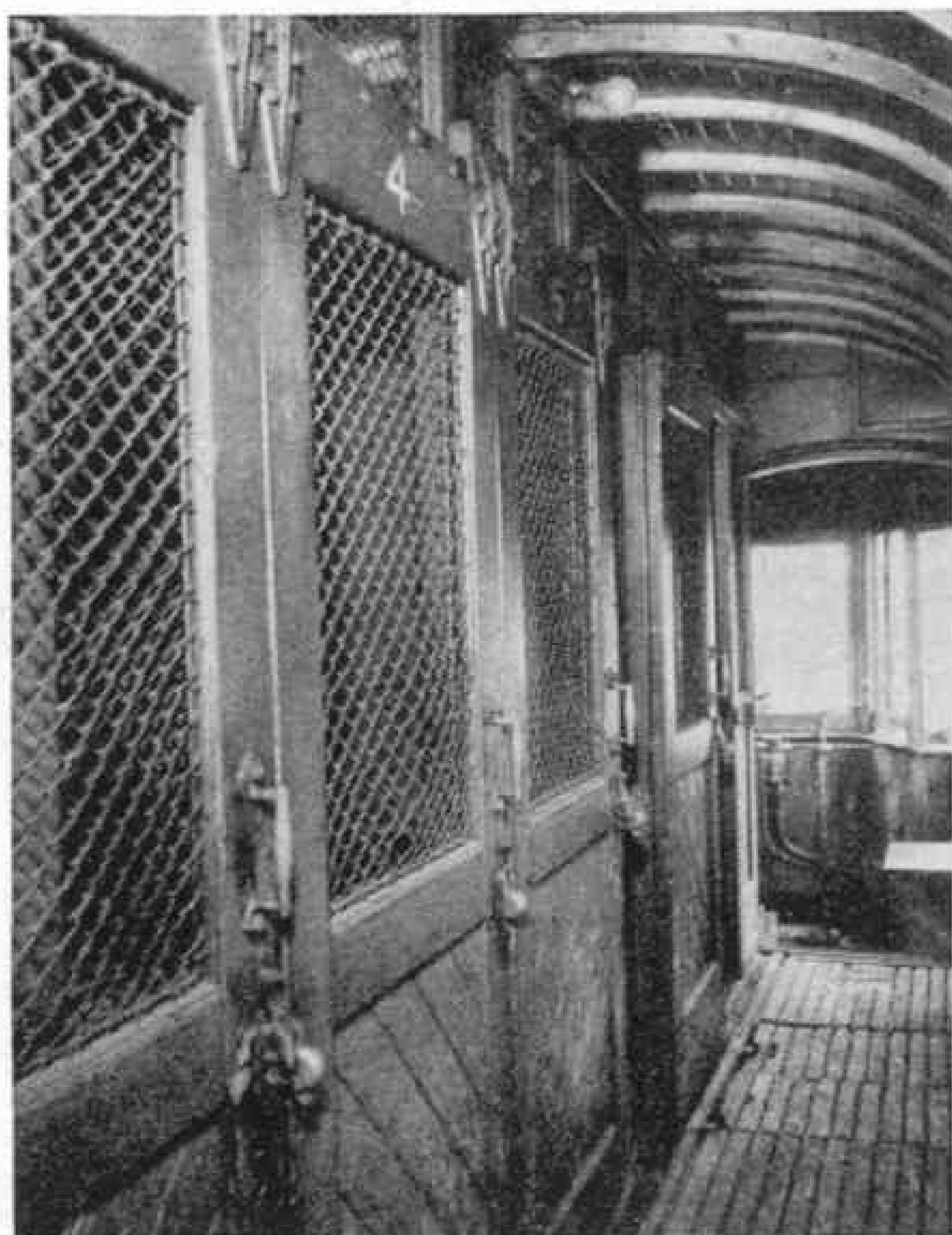
These dining cars are as luxurious as any in the world, the kitchen being all-electric and very compact. Riding qualities are perfect, and speeds of up to sixty miles per hour are attained. If you are an Englishman, this will probably astonish you—but, you see, in Germany the trams are not old-fashioned. They are streamlined, luxurious and very fast; and are the principal means of transport in all large cities and towns.

One often sees people rush "posthaste" up to an Amsterdam tram—not to board it—but to pop a letter into the little red box fitted to the side. At least 10 per cent. of the city's outgoing mail is posted in this way, the boxes being frequently emptied at a sorting office along the route. Once upon a time they did the same at Huddersfield, Wallasey and no doubt other places where there are now no trams.

Children who send letters to Santa Claus might like to know that he no longer travels on a sleigh hauled by reindeer, in Detroit at any rate. In 1953 he arrived at a department store of that city by tram, in previous years having used helicopters and aeroplanes.

If I mentioned the words coffee-pot, toast-rack, knife-board, tray and garden-seat, you might think I was having a picnic in the garden; or if I said solebars, sand-hopper, dash, and tumble-home, you would perhaps imagine that I was referring to beachcombing. Some people, however, would know that I was talking about tramcars.

Now I do not propose (Continued on page 574)



Not open to paying passengers! This is the scene in Sydney's prison tramcar.

BOOKS TO READ

Here we review books of interest and of use to readers of the M.M. With certain exceptions, which will be indicated, these should be ordered through a bookseller.

"GREAT AIRMEN"

By Wing Commander NORMAN MACMILLAN,
M.C., A.F.C. (Bell 12/6)

Books on famous or noted people, past or present, can be dull or interesting according to whether they are merely records of achievements or also reveal the character of the people concerned. In this collection of brief biographies of great airmen the author ably accomplishes this dual task.

The earliest days of powered flight are recalled in the author's accounts of the pioneer work of the Wright Brothers, Louis Bleriot, Sir A. Verdon-Roe and Sir Geoffrey de Havilland. The emergence of the aeroplane as a formidable military weapon, during the First World War, is seen in the life stories of Anthony Fokker, Capt. Albert Ball, V.C., and Baron von Richthofen. Other great airmen featured here are Senor Don Juan de la Civera, of Autogiro fame, Air Commodore Sir Frank Whittle, the jet engine pioneer, and Sir Alan Cobham and Sir Charles Kingsford-Smith, M.C., who blazed the trails for some of the trans-continental air routes of today.

In any book of this kind it is the omissions that surprise us, but obviously there has to be a limit to the number of biographies that can be included. The line drawings at the head of each chapter are interesting, but a few portraits would have added to the attractiveness of the volume.

"MODEL RAILWAY ILLUMINATION"

By E. F. CARTER
(Percival Marshall and Co. Ltd. 3/6)

The well-known series of model railway books published by Percival Marshall and Co. now includes one on model railway illumination by E. F. Carter, who has many other books on miniature railways to his credit. Its five chapters cover the field fairly thoroughly, and it will be found useful by those who want to operate their railways by night. The lighting of signals, signs and buildings is dealt with as well as train illumination, and the methods that can be employed for lighting are discussed at length. A good selection of diagrams helps the reader to follow the text accurately.

Copies of the book are obtainable from Percival Marshall and Co. Ltd., 19 and 20 Noel Street, London W.C.1, price 3/6, postage extra.

"BRITISH CIVIL AVIATION"

By D. G. T. HARVEY
(Adlard Coles 15/-)

During the past year more passengers crossed the Atlantic by air than by sea, a significant indication of the great growth of air travel in recent times. This expansion applies also to air freight, and in both these capacities British Civil Aviation is served by a fleet second only in size to that of America, and of a standard unsurpassed throughout the world. For every giant air liner in service, however, there are many smaller machines, and for every trunk route a network of feeder services to complete the pattern of this system.

The first part of this book contains a detailed description of every aircraft flown by British airlines, the data given including photographs, general arrangement drawings, interior diagrams, dimensions, weights, performance figures and development history. There are additional sections covering future design, helicopters and flying boats. Part II gives details of all the British operating companies, their history, names of executives, routes flown, fleet, traffic statistics and commercial associations.

"THE OBSERVER'S BOOK OF WEATHER"

By R. M. LESTER, F.R.Met.Soc. (Warne 5/-)

To all who are interested in B.B.C. radio and television weather reports, and indeed to every reader of the Magazine who likes to know something of what is going on around him, I can recommend Mr. Lester's book. This is full of information, given concisely and simply, on our skies, our atmosphere, and the constant changes that take place in these.

Those who read the book will find themselves able to follow television weather charts with more understanding, for the author explains well the meaning of isobars, fronts, depressions, troughs, ridges and other terms used in describing them. They can also learn how pressures, wind speeds and so on are recorded at many different points so as to build up the charts themselves.

Amateur weather observers also have the sky to watch, an absorbingly interesting and indeed attractive subject, for cloud formations are wonderful things to study. The book is an excellent guide to their relation to our weather, and a good series of pictures, many of them in colour, will help to make readers weatherwise.

Mr. Lester also goes fully into such matters as the make up of our atmosphere, with its several layers that are now being explored more thoroughly than ever in the past, and where our weather originates, which provides him with an interesting story of endless battles between polar and tropical air masses. Rain, hail, snow and thunderstorms, and the effects of mountains are among the many other subjects dealt with, and weather lore and traditions also come within the range of Mr. Lester's story. Many of the old weather rhymes and beliefs are without foundation, as he shows, but some have reality, and it is really interesting to learn that one of the truest of all is the one that describes a red sky in the morning as a shepherd's warning and a red sky at night as a shepherd's delight. There is also a more remarkable one, that the ant runs faster as the mercury rises, that also seems to have some foundation.

There are 16 pages of colour illustrations, 48 pages of half-tones and many drawings in the text.

"ABC OF OCEAN TANKERS"

"ABC OF COASTAL SHIPS"

"ABC OF BRITISH WARSHIPS"

By H. M. LE FLEMING
(Ian Allan 2/6 each)

The ships listed in *ABC of Ocean Tankers* are mainly those of British companies controlling tankers of 3,000 tons gross and upward. *ABC of Coastal Ships* records vessels engaged on coastal, cross-Channel, and short sea routes around and between Great Britain and Ireland and to Northern Europe from Norway to Brest. Passenger and dry cargo vessels, tankers, and the larger ferries are included. In each booklet the companies are dealt with in alphabetical order, and each fleet list is prefaced with a note on the owner's colours and, if any, funnel markings. The lists give the names of the vessels, their date, gross tonnage, dimensions, speed, and type of propelling machinery. There are 50 or so excellent half-tone illustrations in each booklet.

This new edition of *ABC of British Warships* covers battleships, aircraft carriers, cruisers, destroyers, submarines, and the varied types of smaller vessels that make up a Naval force. It again includes the ships of the Commonwealth Navies in addition to those of the British Navy. The ships are arranged in classes, and the technical details given include dimensions, displacement, engines and armament.

Rimutaka Tunnel

The Longest in the British Commonwealth

UNTIL last year the longest railway tunnel in the Southern Hemisphere, and indeed in any country in the British Commonwealth, was the $5\frac{1}{4}$ mile Otira Tunnel, in the South Island of New Zealand. The record still belongs to that Dominion, however, for there an even longer railway tunnel was completed last year. The track is now being laid, and the tunnel is expected to be open for traffic towards the end of this year.

This new record tunnel is $5\frac{1}{2}$ miles long, and it will carry a single line railway through the Rimutaka range of mountains north east of Wellington, in New Zealand's North Island. This line is a new one, just over 14 miles long, which cuts out the present line over the notorious Rimutaka Incline. This was described in last month's *M.M.* It has an average gradient of 1 in 15, and special means of working trains up and down it have to be used. Over the new line there will be no gradient of more than 1 in 70, so that train running will be easier as well as quicker.

Most of the present railway across the hills is winding, with many sharp curves that keep train speeds down to little more than 20 miles an hour. On the Incline itself, which has to be climbed by trains from the country to Wellington, the speed indeed is limited to 6 miles an hour for trains going up, and 10 miles an hour for those descending. The track winds about so much that at one point trains going north from Wellington travel almost due south for miles. The time required between Upper Hutt and Featherston is two hours or more, but over the new direct line passenger trains will be able to run between these two places in about 25 minutes, and goods trains will take 35.

The need for an improved new line had been recognised for more than 50 years,

and many better routes had been explored or surveyed. The final decision to begin work on the present scheme did not come until November, 1946. A start was not made with the necessary tunnel until three years later, and then only on a small scale, by a small party of Ministry of Works tunnellers. The full length of the tunnel was to be 28,864 ft., and 27,600 ft. remained to be driven when finally a contract was let for the main task. An American firm, Morrison-Knudsen Ltd. of San Francisco, were awarded the contract, with a price of £2,295,335. The firm undertook the work as a joint venture with Downer and Co. Ltd., a New Zealand firm of contractors.



The first "passenger train" to pass through the Rimutaka Tunnel. It ran on a ceremonial occasion to mark the completion of the bore.

Four years were allowed for completing the tunnel, but so efficient are the methods now used for work of this kind that the two headings, one driven from each end, met in a little less than three years, and the concrete lining of the tunnel was finished a month or so later. The two sections of the bore met almost perfectly. The levels of the eastern section were little more than an inch above those of the western portion, and the two were only half an inch out of line.

Whenever it could be done, what is

called the "full-face" method of excavating was used. This meant drilling a round of holes in the face and firing charges of explosive in them, removing the broken out material and putting in timbers to

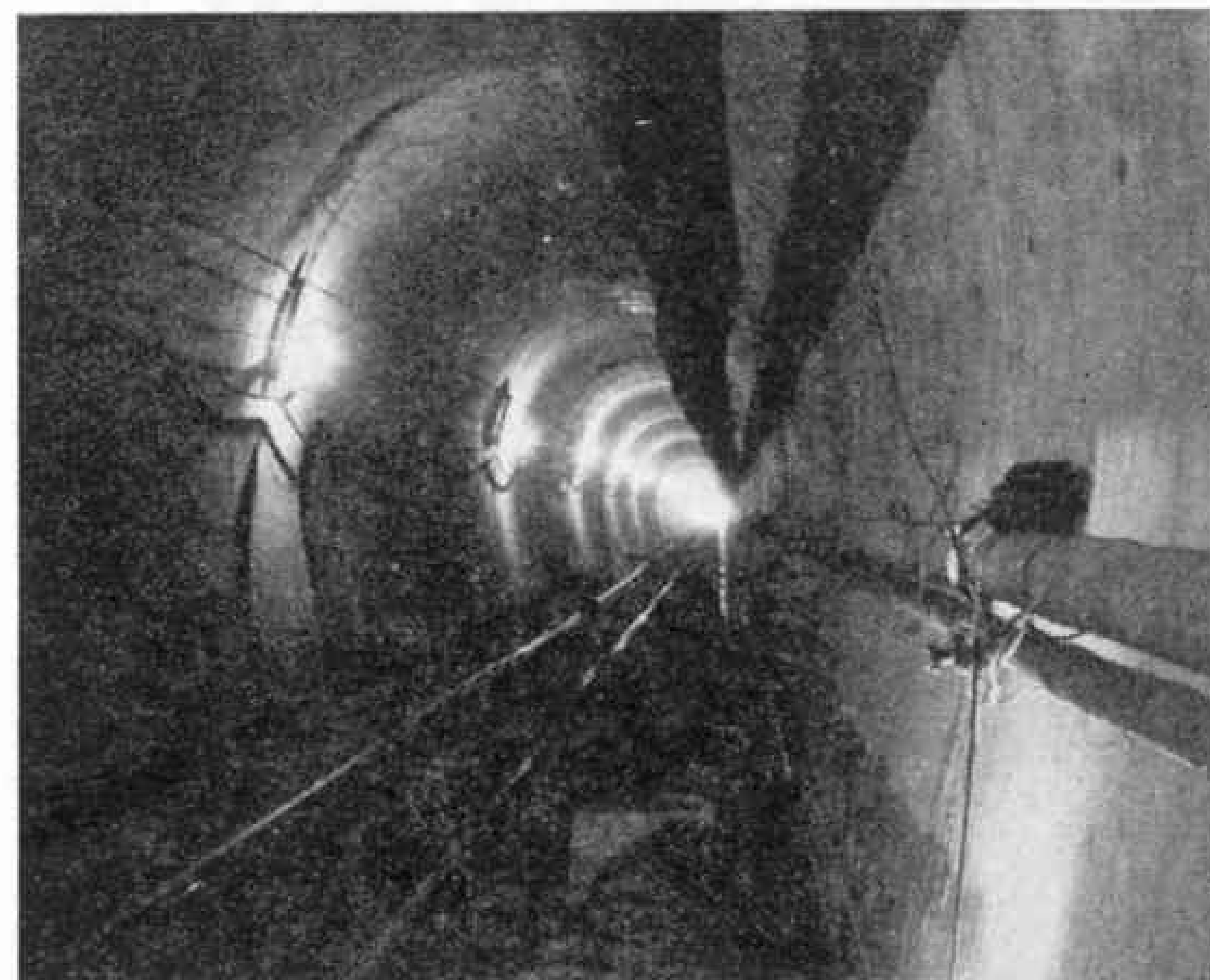
and six cars, the trains running on a construction track of 3 ft. gauge. The spoil was scooped up by special mechanical shovels, which threw it overhead on to a conveyer belt that delivered it into the muck cars of the train.

One device that was found very useful as the work progressed was the cherry picker. This stood on rails set about 9 ft. apart and straddled the train of muck cars. These it lifted, one at a time, over the tops of the others forward to the face to receive its load. The cherry picker speeded up the process of loading the soil very considerably.

The tunnel is lined with concrete, and altogether, including the wall footings and side drains, a total of 25,756 tons of cement were used in making it. The greatest height of the finished tunnel is 17 ft., at the crown of the arch, and its greatest width is 15 ft. 4 in. at a height about 7 ft. above the firm level. From the western portal the line in the tunnel

rises at a gradient of 1 in 400 for more than $2\frac{1}{2}$ miles, and from the summit it falls at 1 in 180 to the eastern portal. The highest point in the tunnel is 460 feet above sea level; that of the present line is at a height of 1,144 feet.

When the track is laid and signalling work is done, the tunnel will be used by three or four diesel railcars and an average of three goods trains daily.

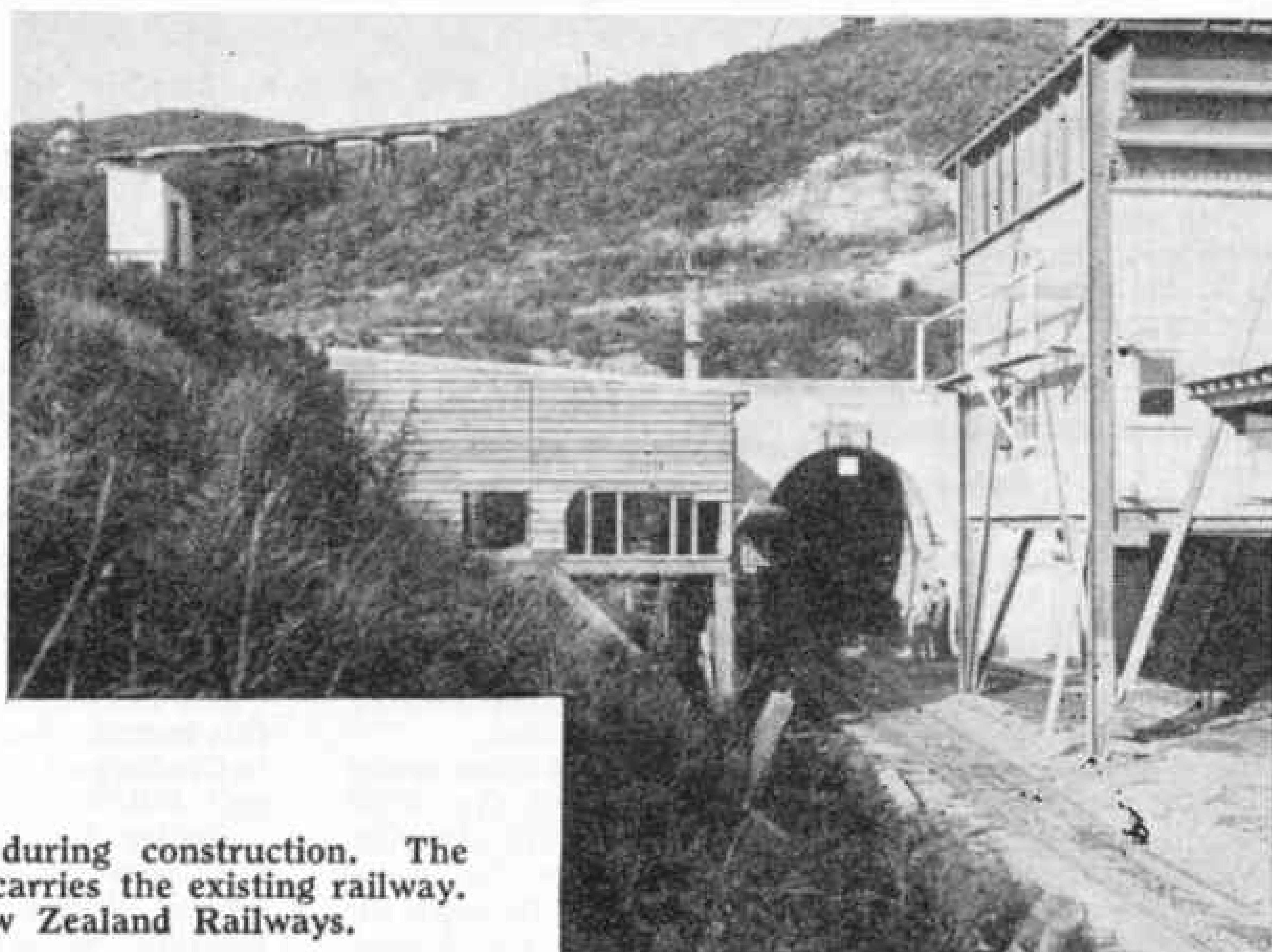


The Rimutaka Tunnel during construction, looking towards the western portal. The track is a temporary construction one, and the pipes were used to take air to the working face.

support the roof. The number of holes drilled varied according to the character of the ground through which the tunnel was being driven, but a typical round consisted of 70 holes, each 6 ft. deep. High speed drills of Swedish design were used, and more than 3,500 were used up before the tunnel was finished.

The quantity of gelignite exploded in the holes also varied, but an average figure was 140 lb. for each round. The actual amount used throughout the tunnelling operation was about 294 tons. The charges were fired electrically, from a point about 400 ft. back from the face, and from ten to twenty minutes had to be allowed for the smoke to clear away before the spoil brought down by blasting could be removed.

This spoil was carried away by "muck trains," each usually consisting of a battery electric locomotive



The western portal of the tunnel during construction. The wooden viaduct on the hillside above carries the existing railway. Illustrations by courtesy of New Zealand Railways.

Air News

By John W. R. Taylor

London's Helicopter Service

When B.E.A.'s helicopter passenger service between London Airport and the South Bank heliport, near Waterloo Air Terminal, was opened on the 25th July last, passengers on the first flight included the Minister of Transport and Civil Aviation. The first public service followed shortly afterwards, and B.E.A.'s float-equipped Westland S-55's are already becoming a familiar sight to Londoners.

Normal week-day services begin at 8.40 a.m. from the Airport and 9 a.m. from the South Bank, continuing hourly until 5 p.m. The fare for a single flight in either direction is 35/-, and it is a worthwhile investment, because the helicopter follows the course of the river Thames into London, passing near dozens of interesting places, including the Houses of Parliament. The floats

British European Airways' helicopter Sir Kay taking off from South Bank heliport, London, on the passenger service to London Airport. B.E.A. photograph.

are a safety measure, to permit an emergency landing on the river in the event of engine failure. Other special equipment includes an engine silencer and an anchor and cable, which were demanded by the Thames Conservancy Board to stop the helicopter drifting among river craft if it had to alight on the water.

Rudderless Landing

The pilot of a U.S.A.F. Convair B-36 bomber had an unpleasant experience recently when the whole of its 32 ft. high rudder fell off during flight over Colorado, leaving only the fin. With a crew of 29 aboard, he managed to make a successful emergency landing at an Air Force base in South Dakota, using the ailerons for directional control.

Austers for the Antarctic

Four Royal Air Force pilots, with two Auster floatplanes and a ground servicing party, will accompany the Commonwealth Trans-Antarctic Expedition, whose advance party leaves for Antarctica next month. During their stay in the South Polar regions, the R.A.F. party will help the Expedition by carrying out reconnaissance and other duties.

The Austers will be taken out in the Canadian sealer *Theron*, with one assembled on deck and the other crated. On arrival in the Falkland Island Dependencies, the uncrated aircraft will be lowered into the water and will then take off to guide the *Theron* through the ice into Vahsel Bay. Air reconnaissance will follow, to help the advance party to choose a site for the

Expedition's base, after which the R.A.F. men will come back to Britain in about May of next year. They will return to spend a year with the Expedition in November 1956.

British Engines for Electra?

It is more than likely that British engines will be chosen to power the new Lockheed Electra air liner, which was described in last month's *M.M.* Lack of suitable U.S. propeller-turbines compelled Lockheed's President, Robert E. Gross, to come to Britain this summer to see the latest Rolls-Royce, Bristol and Napier engines. He was accompanied by C. R. Smith, President of American Airlines, who has ordered 35 Electras for delivery in 1958. Reports state they were particularly impressed by the Napier Eland, which develops over 4,000 h.p. in its latest form, with revolutionary air-cooled turbine blades.

New U.S. Navy Camouflage

The new FJ-4 Fury fighter, which is in production for the U.S. Navy at North American's Columbus, Ohio, factory, has shed the traditional sea-going Navy blue for a two-toned grey and white coat. The new colours were chosen to make the aircraft more difficult



to identify in flight, and consist of gull grey top surfaces above the level of the wing roots and a glossy white undersurface.

The FJ-4 Fury is a navalised version of the famous Sabre jet, with folding wings, deck hook, a heavier armament of four 20 mm. cannons and a 7,800 lb. thrust Wright-built J65 Sapphire turbojet. Its top speed is over 690 m.p.h. and it can carry tactical atomic bombs under its wings. Recognition features include the "spine" along the top of its fuselage, between the cockpit and tail, and the unusually tall, narrow fin and rudder.

Viscounts on Rural Services

The people of the small town of Bourke, more than 400 miles from Sydney, in the far north-west of New South Wales, will become the first country folk to be served directly by propeller-turbine air liners when Butler Air Transport begin Viscount operations this month. Services on the coastal route from Sydney to Coolangatta, and to Dubbo, Parkes and Evans Head, will follow immediately afterwards.

Butler Air Transport have ordered two Viscounts, and have an option on four more. Their founder, Arthur Butler, made a record-breaking flight from England to Australia in a 75 h.p. Comper Swift lightplane in 1931 and still flies on the company's



services at least once a week in the role of first officer. The airline's other equipment includes Dakotas, Ansons and two Herons. They operate a 3,300 mile network of routes between towns that sometimes have a population of less than 250 people.

Flying Boat's 80-Mile Sea Trip

During a recent patrol, Flight Crew 3 of the U.S. Navy's patrol squadron 48 experienced engine trouble on their twin-engined Martin Marlin flying boat, and had to alight on the Inland Sea near the Shimonosaki Straits, Japan. Very appropriately, the aircraft's commander had just completed a correspondence course on "Basic Seamanship." So he quickly changed from an airman to a seaman. He organised a proper naval watch system and decided to taxi all the way to his home base on one engine. The 80-mile sea trip took 9 hrs. 24 min. and proved once more the advantage of having a flying boat hull to sit on when things go wrong over the sea.

Another Britannia Order

The Israeli national airline El Al has ordered three Bristol Britannia 300LR air liners, with an option on two more. They will be delivered early in 1957, and will be capable of flying non-stop London-New York services, from both east and west, all the year round.

El Al's Britannias will carry a total of 93 passengers in two compartments—one First Class with sleepers, the other Tourist Class. Powered by four 4,120 h.p. Proteus 755 propeller-turbines, they will carry a full load for 4,600 miles at a cruising speed of 385 m.p.h.

The third production Britannia 100 for B.O.A.C. has now flown, and the type is expected to enter service on the Corporation's South African route next spring.

The illustration above shows the P5M Martin Marlin flying boat of U.S. Navy patrol squadron 48 that landed on the sea owing to engine trouble and taxied 80 miles to its home base, as described on this page.

Below is seen a Boeing B-52 Stratofortress fitted with cross-wind landing gear making a taxi run on Boeing Field.

Cross-Wind Undercarriage for B-52

Boeing have announced that all B-52 Stratofortress bombers are fitted with cross-wind landing gear, which will enable them to use many more airfields throughout the world than would be possible with a normal type of undercarriage.

Briefly, a cross-wind undercarriage has wheels that "castor" or turn like the little wheels on the bottom of many armchairs and settees, to cancel out the effect of wind blowing across the runway. They can be pre-set by the pilot before take-off or landing; so that they run straight down the runway, while the rest of the aeroplane "crabs" along with its nose pointing

into the wind. The result is reduced drag, increased lift and greatly improved safety. The lower illustration on this page shows a B-52 thus equipped moving down a runway at the Boeing airfield in a cross-wind.

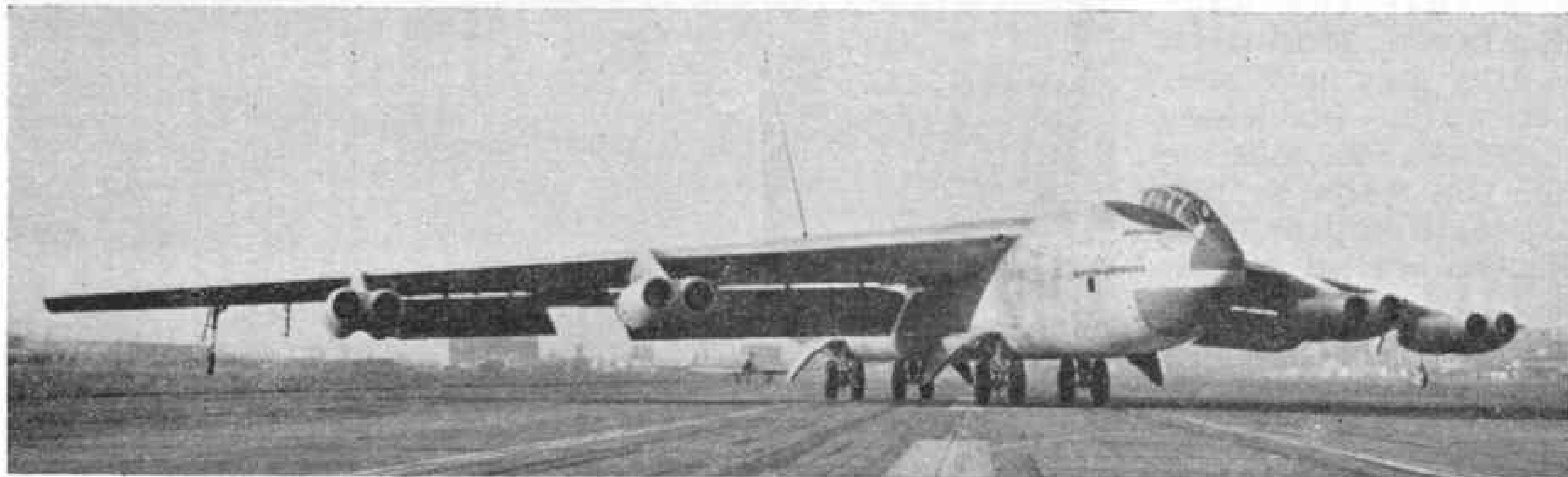
The B-52 is the first military aeroplane fitted with this type of undercarriage as standard equipment.

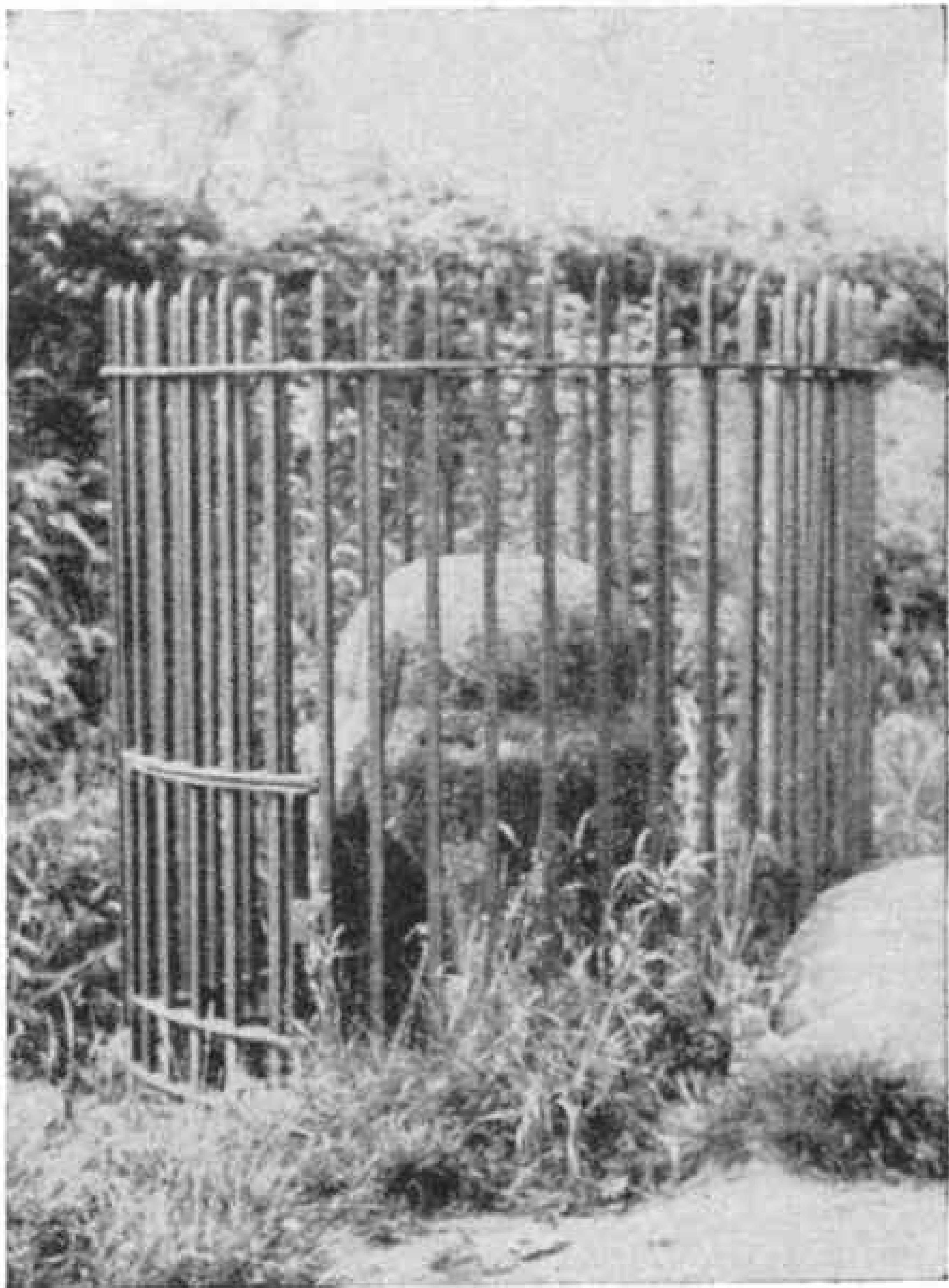
T.V. at 7,500 Feet

Mr. Arthur Parker, a radio engineer, and his pilot watched a Test Match for an hour on the 9 in. screen of a television set, whilst cruising at 7,500 ft. in a Miles Messenger lightplane, within a 25-mile radius of Wolverhampton. They reported that reception was clearer than on the ground.

Heavy Drop from a Packet

A C-119 Packet belonging to the U.S. Air Force was specially flown from Western Germany to Blackbushe on 2nd August last, to give a demonstration of a heavy cargo drop to O.T.C. and C.C.F. Cadets.





An old well at Harpham, near Driffeld, said to have been made by St. John of Beverley.

Kettering. It has supplied the village for at least 665 years, and is still in use. It is beneath the fine Eleanor Cross, erected about the year 1791, that marks a halting place on the route of the funeral procession of King Edward I's beloved Queen.

Then there is St. Chad's Well, at Stower, near Lichfield, which is believed to have been used for baptisms by the Saint after whom it is named. He died in 672, and for a long time after that there was a chapel nearby where visitors to the well were invited to pray.

One of our most remarkable wells is at Stanton Harcourt, near Oxford. Its singularity lies in the fact that it was given by a Maharaja of Benares. He lived in the neighbourhood for some years, and was disturbed to find how inadequate the village water supplies were.

To remedy matters he engaged a water diviner, and an underground stream was discovered and tapped. The well was subsequently given an oriental canopy, and today this carries an inscription recording the Eastern potentate's unusual gift.

Other old wells owe their fame to the curative qualities of the water, or to some phenomenon about the stream. At the foot of Buckhaw Brow, between Settle and Ingleton, is Britain's most famous ebbing and flowing well.

Its singularity is that the rectangular basin fills and empties regularly and automatically.

Well, Well!

By Arthur Gaunt

WATER supplies are so essential to life that wells and springs in many parts of Britain have long been venerated, and tours through the countryside can be given exceptional interest by seeking out such ancient sources of the life-giving stream. To this day, certain villages in Derbyshire decorate their springs once a year, as a reminder of the importance of these supplies.

One of the oldest springs in Britain is to be seen in the churchyard at Rudston, four miles from Bridlington. It has never been known to fail, and antiquarians say that the huge Rudston Monolith nearby may have been set up in prehistoric times as a thankoffering for this water supply.

Northamptonshire has an ancient well at Geddington, near



Revolution Well, near Carr Manor, Leeds, commemorated the centenary of the landing of William of Orange.

Hands' Well, one of five at Tissington, Derbyshire, is dressed with flowers each Ascension Day.

You cannot be sure of seeing this extraordinary action, for the supply source varies, and sometimes the basin is almost dry, but when the well is fully operating the ebb and flow presents a curious spectacle.

A story is told of a horseman arriving at the well and allowing his mount to drink. The water ebbed as the steed drank, and the rider was so alarmed by the apparently prodigious thirst of the horse that he led the animal back to Settle for veterinary attention!

The exact cause of the rise and fall is unknown, but it is thought that some natural syphoning action in the supply channels is responsible. In bygone days there was a firm belief that the well was connected with the waters of Morecambe Bay, and that the ebb and flow coincided with the breaking of the waves on the beach there.

A railed-in stone canopy nowadays covers an historic East Riding well. This, by the roadside at Harpham, is reputed to have been opened up by St. John of Beverley, who was in the neighbourhood—his birthplace—at a time of drought. By simply thrusting his staff into the ground he caused water to gush forth. A somewhat different account declares that he did this for the benefit of Athelstane's army, who were passing through Harpham, and that in return the first King of all England gave



Beverley Minster the right of sanctuary.

Various other springs and wells have equally strange legends. Cornwall has a well in which St. Neot is said to have kept a number of fish, one of which was caught each day for his frugal table. But one day the Saint's servant removed two and grilled them both. When St. Neot learned about this, he promptly returned one fish to the well, and according to the legend it was quite unharmed, swimming and snapping at flies as though it had never been grilled.

Memorial wells are numerous, too, and an example is the so-called Revolution Well, near Carr Manor, on the outskirts of Leeds. This is not of particularly ancient origin, for an inscription on the canopy states that the spring that feeds it was opened on 15th November, 1788. That date was exactly a century after William of Orange landed in England, and this circumstance gave the well its name.

Derbyshire villagers who decorate their wells do so on different dates, and there are thus many opportunities to see this old, enchanting custom. The wells are surrounded by light wooden frames,



The first mineral spring in Harrogate to be commercialised was Tewit Well, on the Stray.

bearing a clay bed on which different coloured flowers, leaves, and tinted rice are arranged to form Biblical scenes. The pictures are astonishing in their detail, and each is surmounted with a text, similarly formed with flowers. The same families usually decorate each well year after year, and there is keen competition between them.

Places that observe this custom include Tissington, Tideswell, and Bonsall. Wirksworth has a number of street taps that are dressed in the same way, though here the rite is in thanksgiving for the provision of piped water, and not for never-failing springs.

Well-dressing indeed is a craft as well as a custom, and it has its unwritten rules. The use of materials other than "natural" ones is considered bad practice, but different villages have different ideas about the choice. Again, in some areas complete flower blossoms are used in building up the pictures; in other parts of Derbyshire the villagers use only the petals. Other materials are rhubarb seeds and lichens.

Well-dressing is said to have originated at Tissington soon after a great drought in 1615, when only this hamlet among many hereabouts remained well supplied with water. Other villages in Derbyshire suffered severely as their wells dried up, but the springs at Tissington continued to flow. The wells there are five in all, and each is decked with flowers every Ascension Day.

The background for the floral pictures is usually made of moss pressed on the bed of clay, the clay itself being held on the board by nails driven through from the back. In making a large picture more than 2,000 bluebell heads are often used.

The phenomenon of the ebbing and flowing well near Settle has already been mentioned, but there are other singular sources of water. In the ruined church at

Llanidan, near Caernarvon, is a water stoup that always refills itself after being emptied, though there is no obvious explanation. It used to be thought that the vessel was replenished by rainwater that remained in the ivy covering the roof and then trickled down. But the stoup continued to be refilled even after the ivy was removed. The mystery remains unsolved.

Britain's spas, of course, owe their development to the exploitation of mineral springs in the vicinity, and in Valley Gardens, Harrogate, can be seen the covers of no fewer than 36 such springs. They are unique, for no two have exactly the same mineral content, despite their nearness to one another.

Harrogate also retains the domed building that once covered the Tewit Well, discovered in 1571. This structure, though no longer in use, still has the bar from which chalybeate water was sold, and the circular bench on which customers sat to drink it still remains.

Many of our old roadside wells have been turned into drinking fountains and have been given a canopy. One of these

fountains, at Radcliffe-on-Trent, Notts., has an extraordinary story. The structure is only just over fifty years old, having been erected to commemorate the coronation of King Edward VII. The villagers aimed to have one of the first such memorials, and the drinking fountain was built a short time before the date fixed for the Westminster Abbey ceremony, an inscription stating that the King was crowned on 26th June, 1902.

Unfortunately the crowning had to be postponed until 19th August, owing to His Majesty being taken ill. Yet the memorial fountain at Radcliffe has never been altered, and the inscribed panel on it continues to quote the wrong date for his coronation.



This memorial fountain at Radcliffe-on-Trent was intended to commemorate the coronation of Edward VII, but it is inscribed with the wrong date.

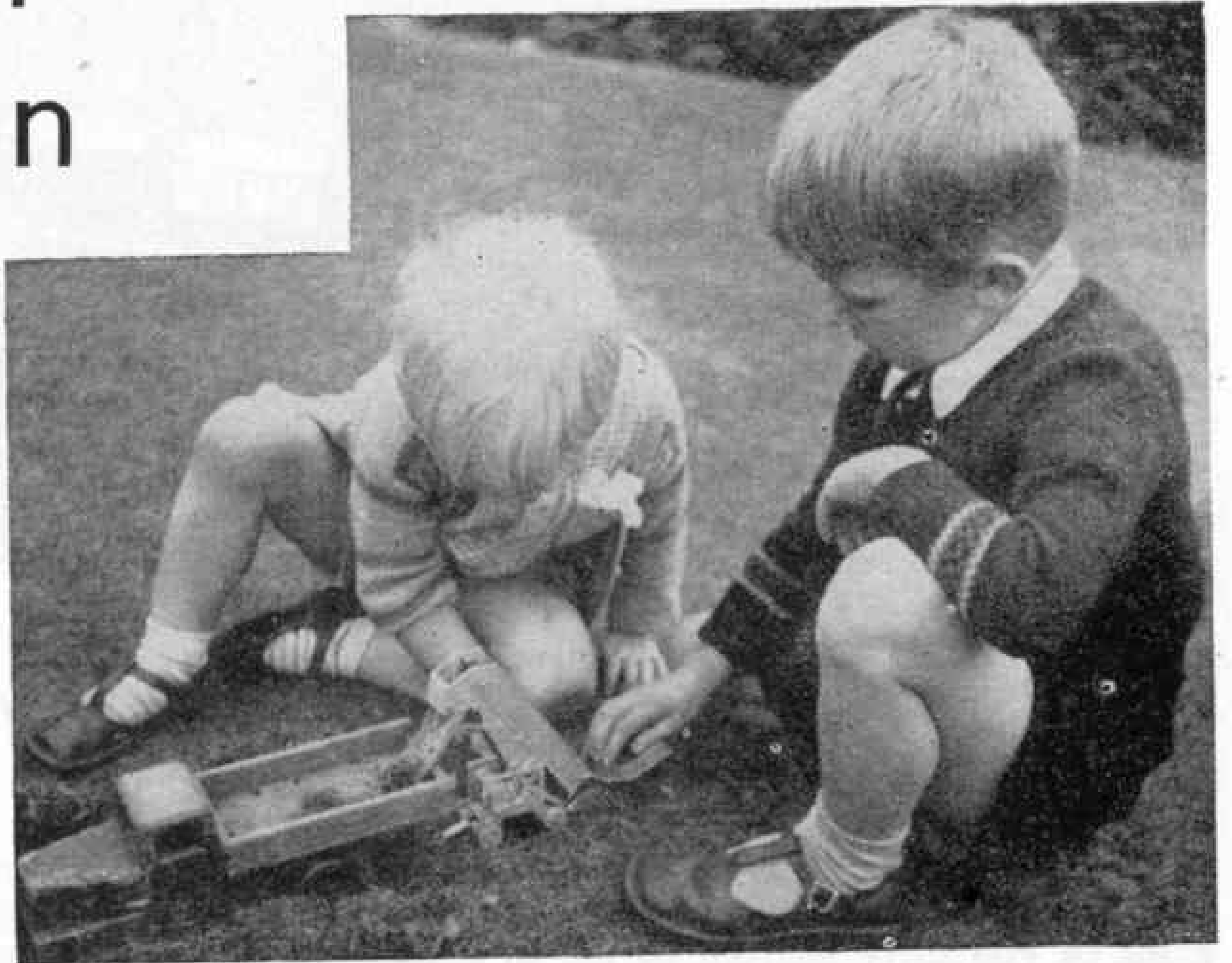
MECCANO MAGAZINE

Junior Section

Counting Hornby Train Runs

There is nothing like a good plaything for attracting attention, or for showing how things work. Meccano models of course are ideal for both, and Hornby-Dublo trains too can be very useful. The picture below shows one that played an interesting part in a display at the Instruments Exhibition held this year at Earls Court.

The display was arranged by Victoria Instruments Ltd. The purpose of the devices seen on the Hornby-Dublo board is to count things accurately and quickly. These register their own passage by interrupting a ray of invisible light, and thus actuating an electric



"You see, it works like this." Paul and Keith Beard, West Kilbride, enjoying fun with the Dinky Supertoys Elevator Loader.

counter. The counter on the right indicates the number of objects that pass a given point while it is in operation. The larger one next to it also does this, but it adds one for each of those passing in one direction and subtracts one for an object passing in the reverse direction.

Both counters were used to check the number of wagons or coaches passing a certain point. The one on the right registered more than a quarter of a million passages as trains ran round and round the oval track. The second checked the wagons in the sidings, showing their number correctly at any moment. Hornby-Dublo enthusiasts will not be surprised to learn that the trains kept the counters busy throughout the Exhibition.

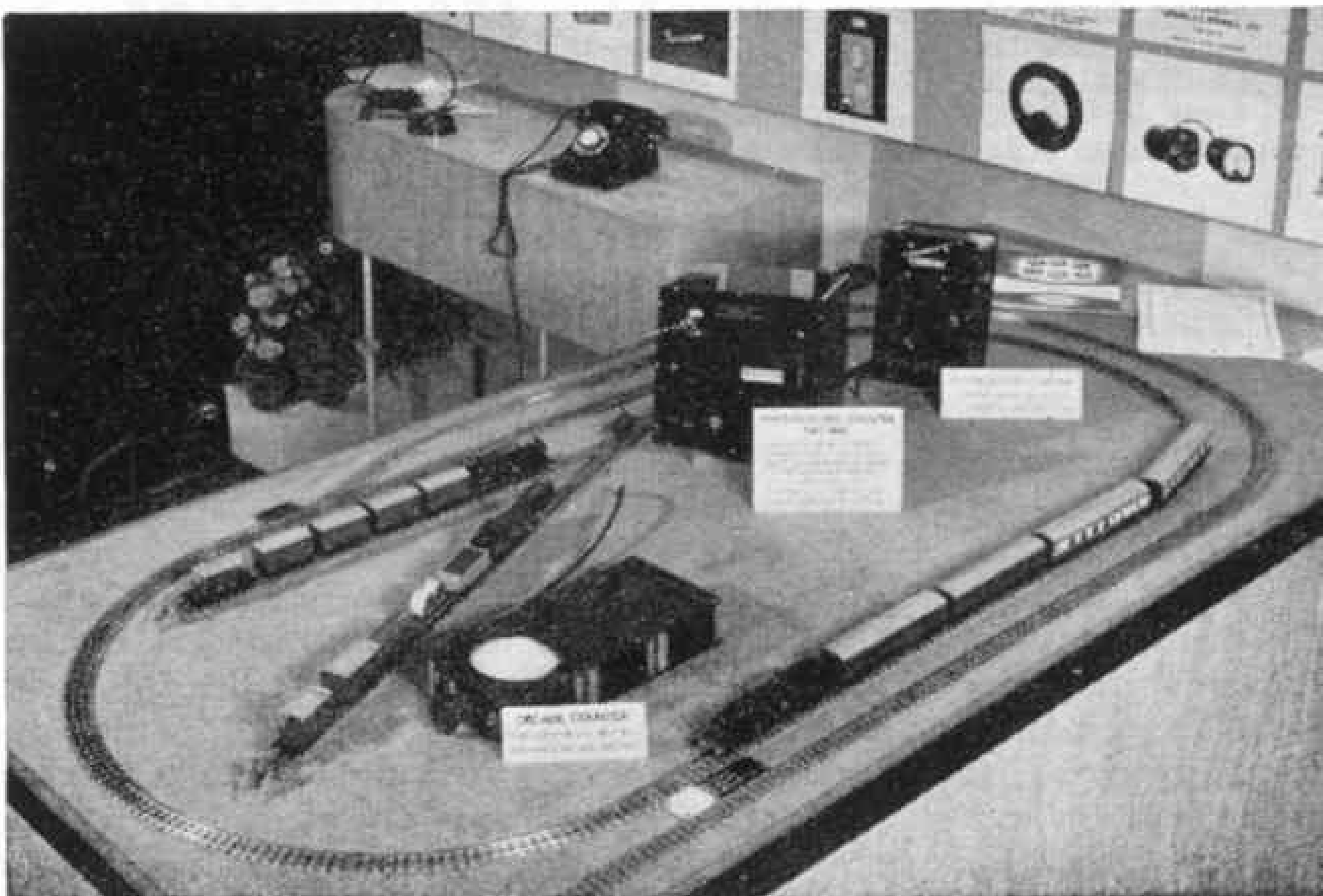
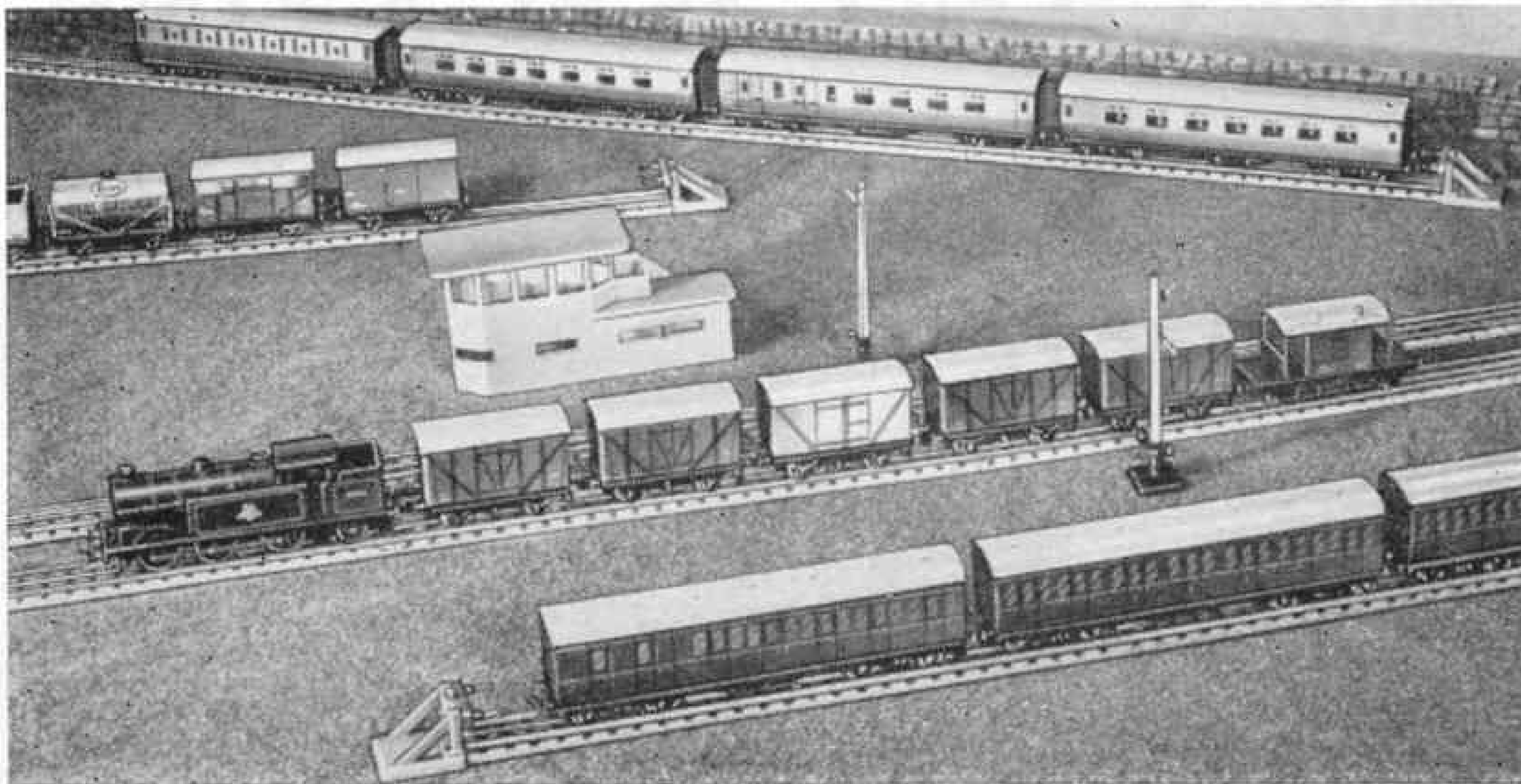


Photo-electric counters at work on a Hornby-Dublo railway. One of those seen on the layout also detected the direction of travel of wagons passing a given point.



A Hornby-Dublo Railway is Fun

By Tommy Dodd

THIS month I am turning again to Hornby-Dublo matters, because quite a lot of you have written to me in recent weeks asking various questions. The answers to many of the questions are to be found in the very popular Hornby-Dublo coloured folder that is available either from your dealer or from Headquarters, but there are bound to be several things that the beginner especially likes to consider and to talk about.

When you have got the Hornby-Dublo train that you have so long wanted, you are only at the beginning of things. It is quite true that the beginner finds plenty of amusement in the first few simple operations, putting down the track, connecting up the power supply and control gear and then running the train. And practice with a simple outfit, like the standard Train Set, is good, as with it he gets the "feel" of the engine and becomes familiar with trackwork.

Of course the beginner is puzzled now and again. For instance, among his rails he finds a straight half rail that has a plastic moulding between the running rails. This section is not movable, but I find that it is sometimes confused with the movable plastic ramp of the Uncoupling Rail and those who are new to the hobby sometimes ask what it is for.

In the picture above a van train headed by a Hornby-Dublo 0-6-2 Tank passes the Signal Cabin. The positions of the arms of the Double-Arm Signal show that a stop is likely to take place at the next "home" Signal.

Now the proper name of this rail is EDBX $\frac{1}{2}$ Straight Half Rail with Roadway, and in the word "roadway" lies the clue to the purpose of the moulding. The Rail is intended for use with the Hornby-Dublo Level Crossing, which the beginner is sure to want soon, and the moulding represents the timbered or paved roadway that is a feature of real level crossings. You will find later that the Level Crossing itself does not have a length of track built in.

Instead the track is intended to pass through the Crossing. So something is needed between the running rails to provide a built-up roadway so that your Dinky Toys motor vehicles can have a

smooth passage over the track. The EDBX $\frac{1}{2}$ is the answer to this need.

It is better to have this special rail already in your Train Set than to find later on that you need it, after you have brought your new Level Crossing home, and when, of course, the shops are shut!

When the beginner knows his engine and track he begins to have ideas about extending his layout. Then of course he isn't a beginner any longer. He will soon find that it is easy to stretch out, for the standard curves are so arranged that an oval layout can be made longer or wider simply by putting in more straight rails. He will easily see where to do this.

And he can then go further by adding Points and perhaps a Crossing or two. In a way there is no limit except that of the space available—but remember that your railway cannot hope to rival even the smallest of real ones in total rail length and still be a model one easily controlled. The

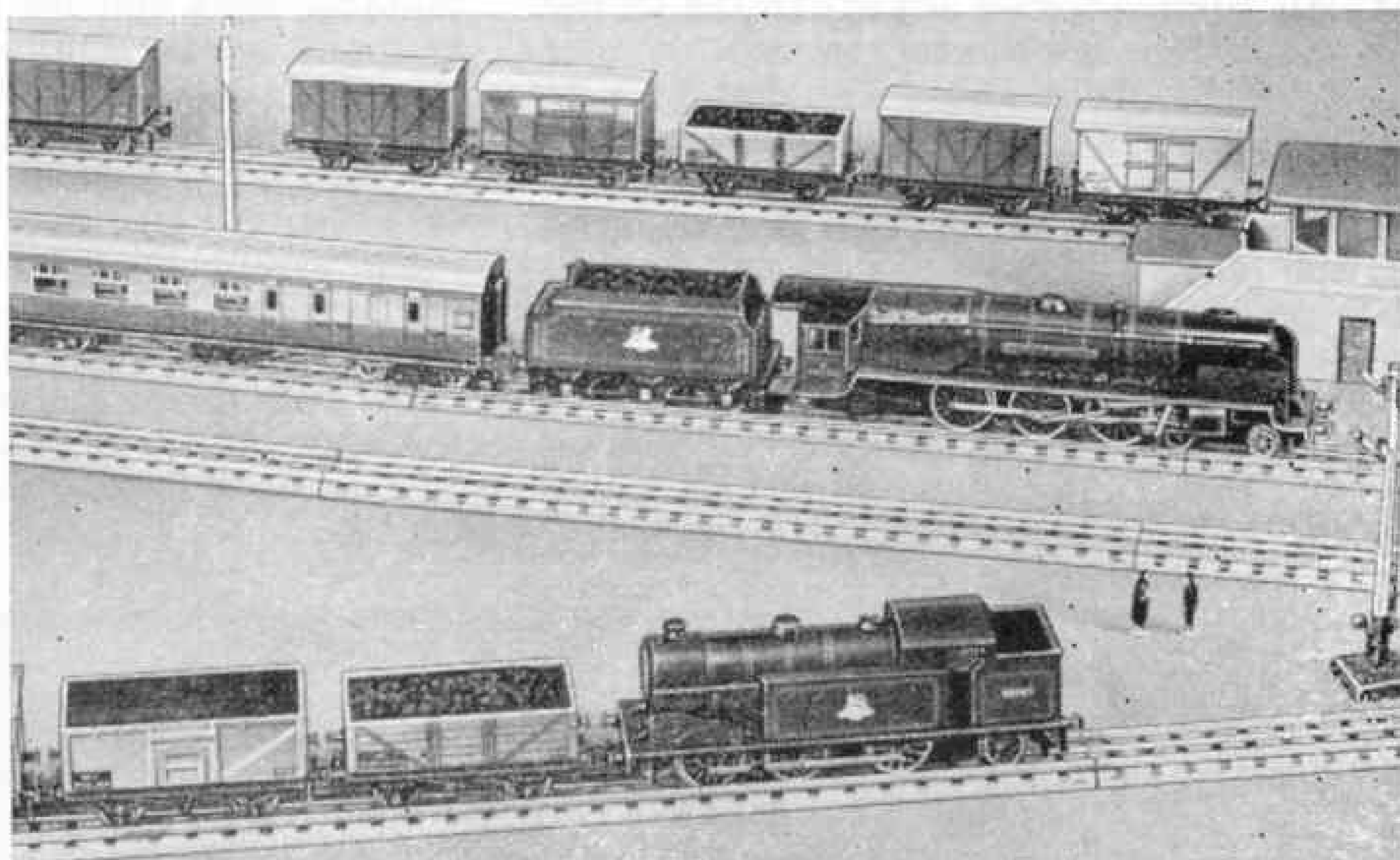
"Duchess of Montrose" on an express train has a clear road past the Signal Cabin. In the foreground an 0-6-2 Tank working bunker first is waiting at the Signal.

Hornby - Dublo Rail Layouts booklet will help. Copies cost 3d. from any Meccano dealer or from Headquarters.

When you plan to make your layout bigger think about using double track. After all, most of our real railways have double track, and even the Hornby-Dublo beginner can easily fix it up by the use of the Large Radius EDA2 Curved Rails in the system. These are laid outside the standard radius curves, and joining up the "corner sections," made up of large radius curves, is a perfectly straightforward business.

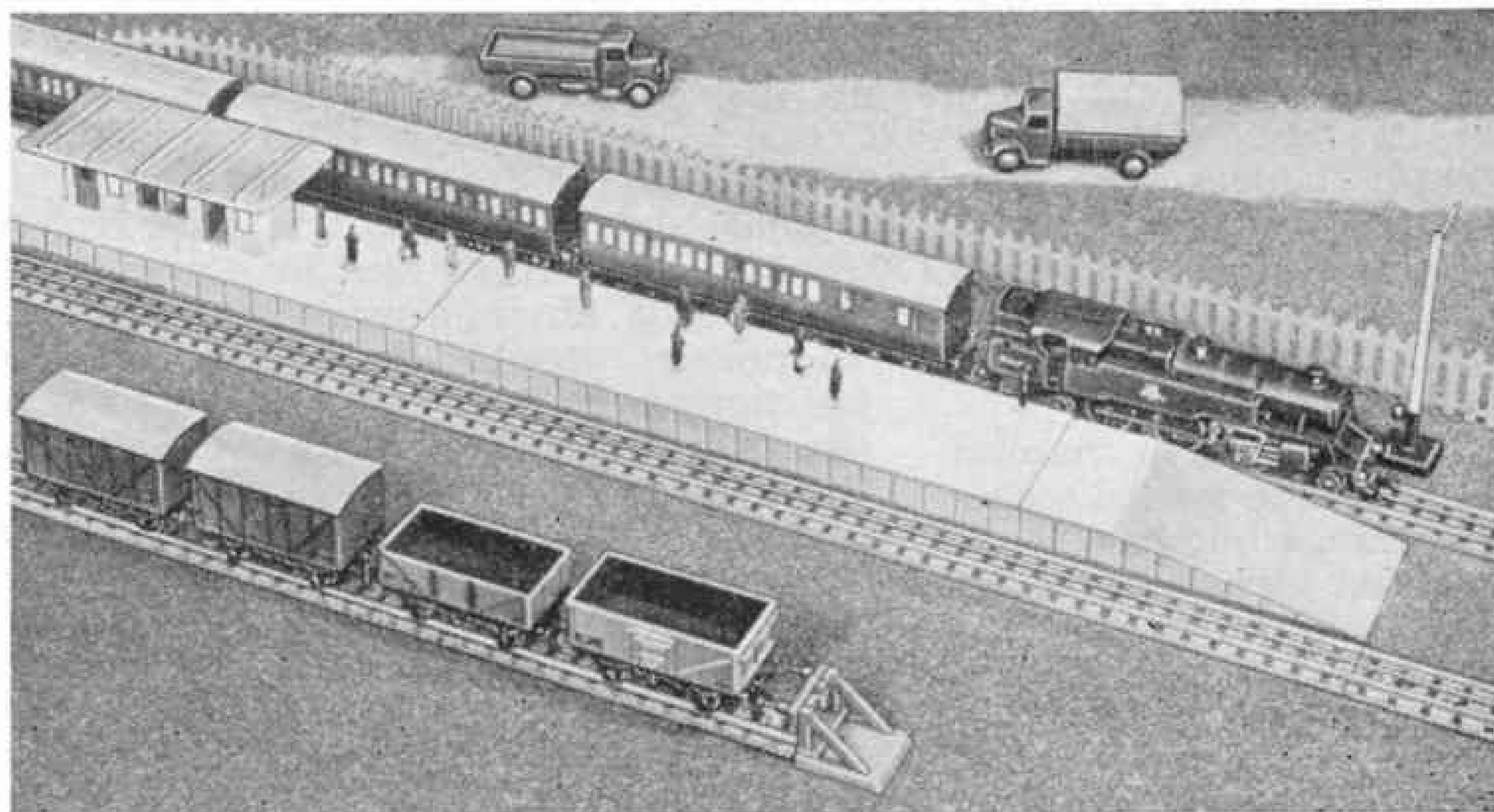
With this great improvement you can run two trains, one in each direction, just as on the up and down main lines of the

real railways. But remember that each main track should form a separate electrical system if independent running of the two trains is required. Two tracks should be connected by means of Points so that



your trains can run through from one line to the other, and you can keep the two circuits separate by putting an Insulating Tab between the centre rail clips at a convenient joint between the Points.

I have mentioned these things specially because they are matters that crop up in the development of practically every Hornby-Dublo system. They are easy, but make a wonderful difference to train running. On a well-planned railway indeed there is no end to the operations that can be carried out, and the working of trains becomes a really fascinating business.



"All Stations to Dublo Town." A Hornby-Dublo 2-6-4 Tank with a train of Suburban Coaches comes alongside the platform.

DINKY NEWS

By **THE TOYMAN**

New Models You Will Like

THE tipping lorries already in the Dinky Toys series are among the most popular of all the models, and I am now able to tell you that a new vehicle fitted with a tipping body has been introduced. This is the Euclid Rear Dump Truck, an addition to the range of Dinky Supertoys. As you will see from my pictures it represents a rather special kind of tipping vehicle, and of course it actually works.

A dumper truck of the kind represented by the new Dinky Supertoys model must

building sites and for constructional work of many kinds. Dumper trucks are often used for transporting these materials, and my pictures are intended to represent a Dumper fetching material from the quarry for a road construction job in hilly country.

To arrange the quarry scene I piled coarse sand on a base cloth, against a background of hills made by laying the cloth over boxes of various sizes. Loading the Euclid Truck was also quite easy, as I made a simple bucket from tinfoil to



The new Euclid Rear Dump Truck (Dinky Supertoys No. 965) at work on a road-making project. It is shown tipping a load of gravel to fill a hollow in the line of the new road.

be capable of carrying heavy loads over rough country. As this kind of vehicle is often loaded by grab cranes and excavators the body must be exceptionally strong to stand up to the strains involved when the grab releases its load. The Euclid dumpers are rightly famous for their strength, and their ability to stand up to rough use and hard wear, and these qualities of the actual vehicle are equally prominent in the fascinating Dinky Toys miniature.

To show the new model in natural surroundings I made up two special scenes that were easy to arrange but have a lot of play value. The first picture shows the Euclid Rear Dump Truck, Dinky Supertoys No. 965, being loaded at a typical sand and gravel quarry. Quarries of this kind are familiar sights in many parts of the country, and they supply materials to

fit the Dinky Supertoys Coles Mobile Crane. The bucket is filled with sand, swung over the Truck and emptied.

When doing this you will soon realise why a dumper truck used for this type of work needs an immensely strong body. To prevent possible damage to the cab the tipping body is extended to form a strong protecting cowl plate over the cab. Other parts of the vehicle likely to be damaged, such as the headlamps, are also fitted with protective covers. The tipping body itself is strongly braced by heavy metal ribs to withstand loading shocks. All these features of the real vehicle, and many others, are reproduced accurately in the model.



The Euclid Rear Dump Truck receiving a load of gravel at a quarry. This picture gives a good impression of the sturdy construction and detailed moulding of this new addition to the Dinky Supertoys range.

When the model is loaded it is "driven" to the construction site, and during this operation the reason for another special feature of the new model will become apparent. The quarry and the rough surface of the road itself impose a great strain on the tyres and wheels of the vehicle, so heavy duty tyres and strong wheels are essential features.

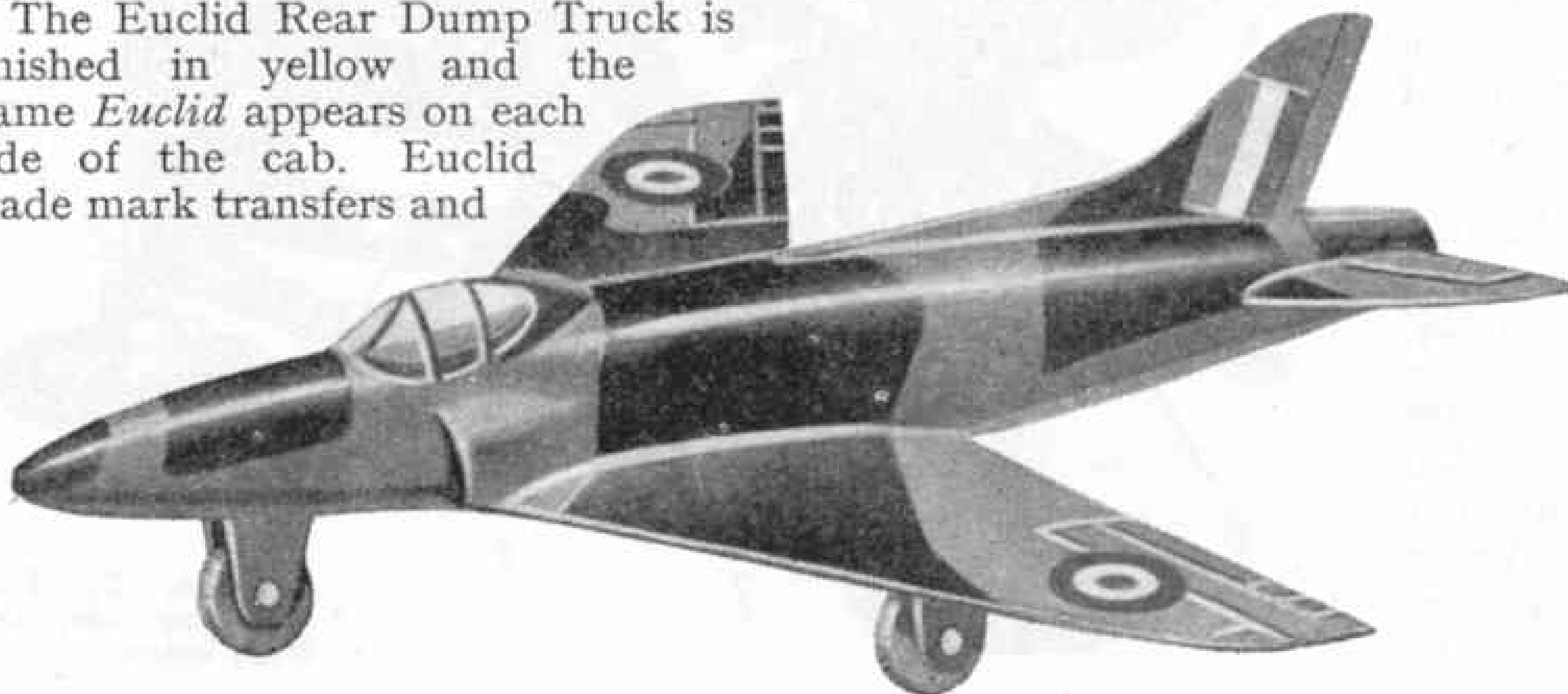
On arrival at the scene of operations the dumper truck load is tipped quickly and easily wherever the material is needed simply by turning a handle mounted in the chassis. This tipping mechanism is perhaps the most interesting feature of the new Supertoy, as it differs from those fitted to the other tipping models in the range. When the handle is turned a small pinion drives a rack strip along guides in the chassis, and the action of the rack strip sliding against the specially shaped underside of the body, operates the tipping movement smoothly and positively.

The Euclid Rear Dump Truck is finished in yellow and the name *Euclid* appears on each side of the cab. Euclid trade mark transfers and

appropriate lettering are applied to the sides of the tipping body.

This month there are again three new models. The second of these is another addition to the growing range of Dinky Toys aeroplanes. The Vickers-Supermarine Swift, Dinky Toys No. 734, is modelled on the well-known single-seat interceptor fighter. One of these aircraft attracted widespread attention in 1953, when it flew at 735.7 m.p.h. in level flight, which was then a world record. The model is accurately made in true Dinky Toys fashion, and is finished in camouflage colours with R.A.F. markings on the wings and tail fin. The tricycle undercarriage is in position for landing or take-off on your model aerodrome.

Then there is an old friend in a new guise. This is Dinky Toys No. 471, Austin Van "Nestles," which is pictured in colour on the back cover of this issue. It is finished in a very brilliant shade of red, with yellow wheels, and the name *Nestles* in gold. Altogether it is a delightful production, which every Dinky Toys enthusiast will want to add to his collection.



The Vickers-Supermarine Swift (Dinky Toys No. 734). The latest addition to the aircraft series.

Easy Model-Building

A Racing Car and a Bulldozer for Small Outfits

THE two models I have for you this month are a Racing Car made from parts in Outfit No. 1 and a Bulldozer, all the parts for which are contained in Outfit No. 2.

Let us start with the Racing Car. To make each side of the main frame bolt

support also $2\frac{1}{2}$ " Strips 8. Now bolt another $2\frac{1}{2}$ " Strip 9 to an Angle Bracket fixed to the upper end of Trunnion 7, and attach a $2\frac{1}{2}$ " Strip 10 in a similar way to the Flat Trunnion 3.

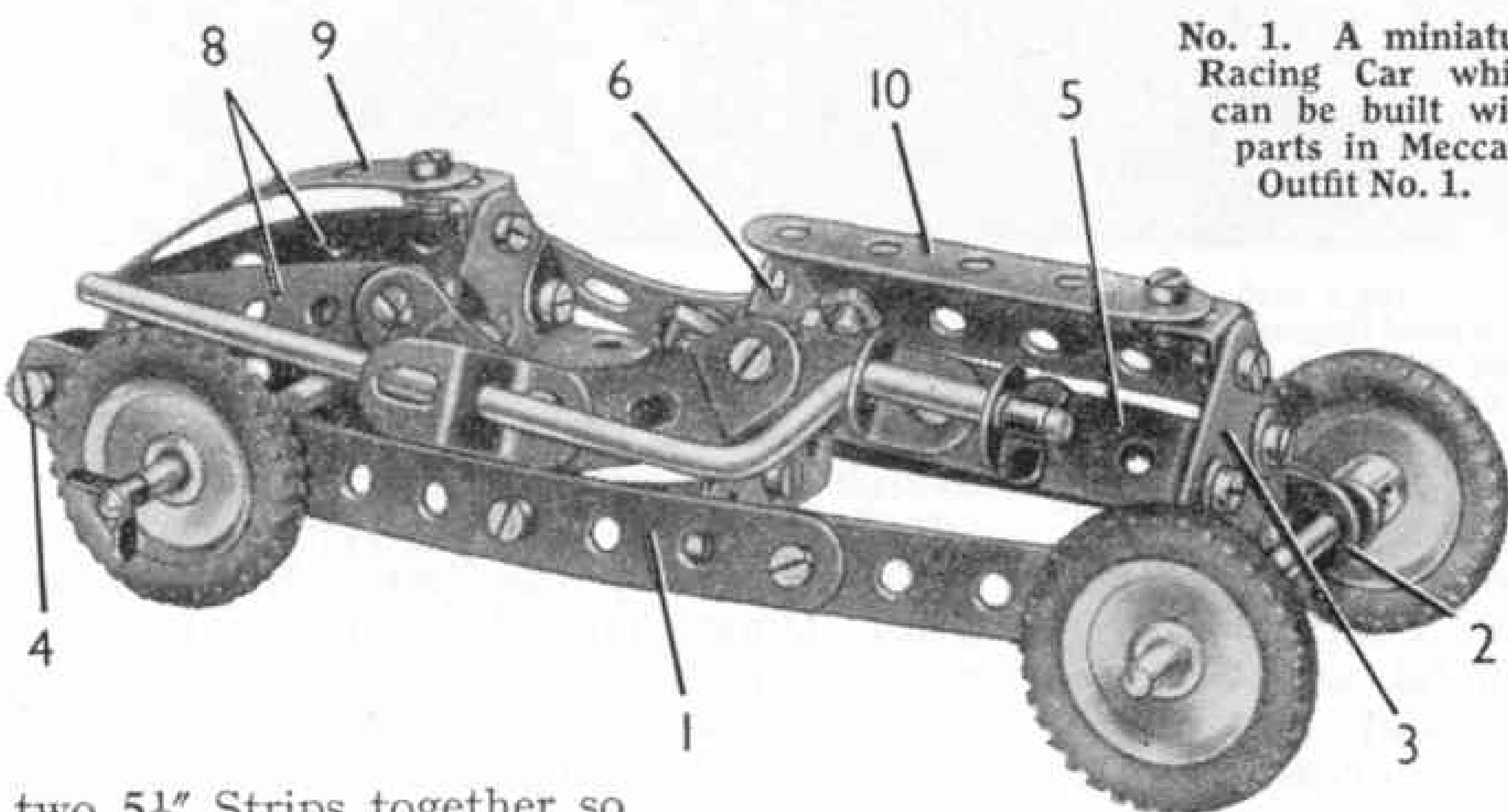
Pass a $3\frac{1}{2}$ " Rod through the strips 1 and on it mount the rear wheels, holding them

in place with Spring Clips. Push a $3\frac{1}{2}$ " Rod through the Fishplates 2 to form the axle for the front wheels, and fix the wheels on it by their set-screws.

The exhaust pipe is represented by a Crank Handle. Pass the Handle through a $\frac{1}{2}$ " Reversed Angle Bracket bolted to one of the Curved Strips and through two Angle Brackets

fixed to one of the Double Angle Strips 5. Use a Spring Clip to hold the Crank Handle in the Angle Brackets. Complete the model by bolting a Fishplate between the Curved Strip and the strip 1 of each side.

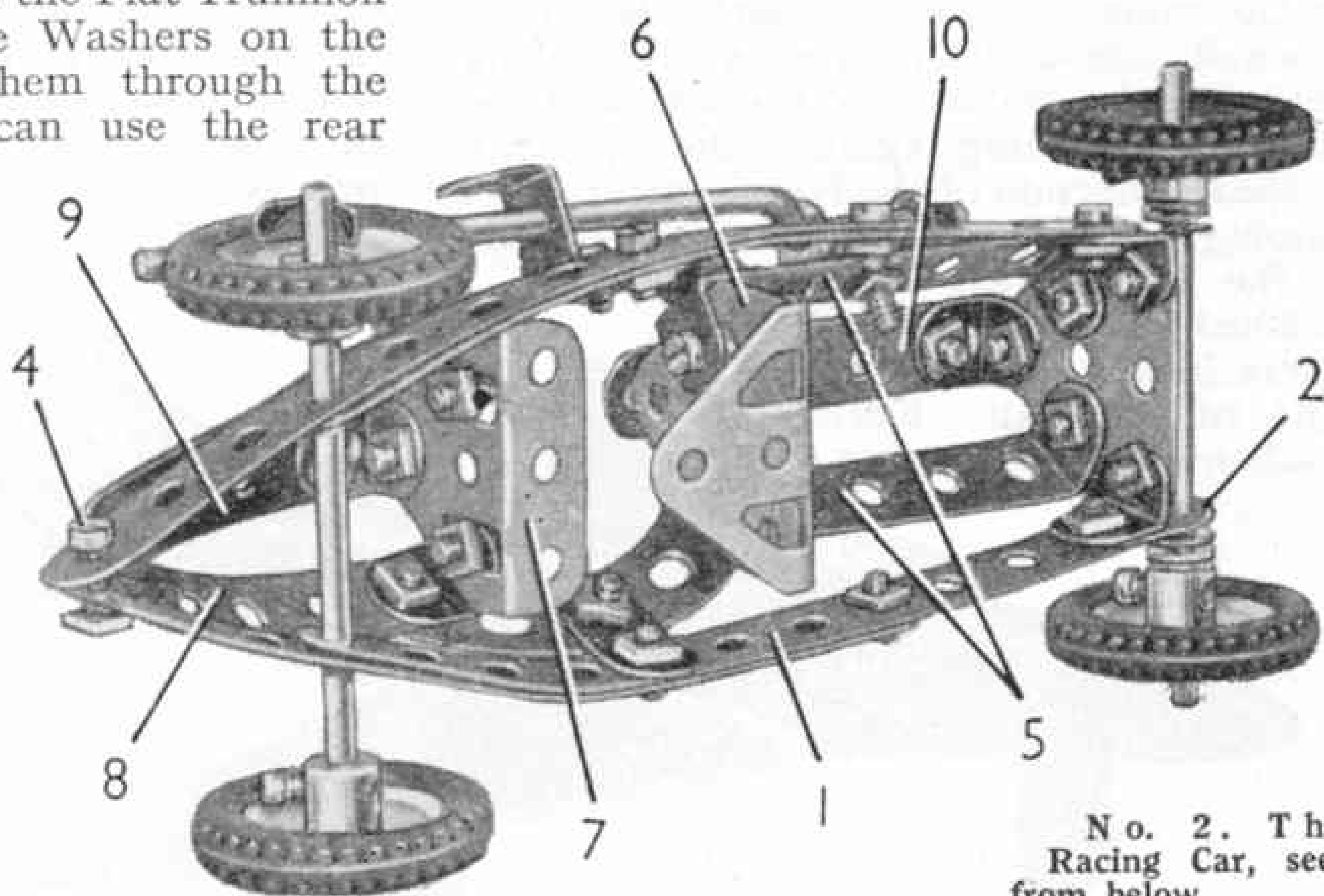
The parts you will require to build the Racing Car are as follows: 4 of No. 2; 4 of No. 5; 4 of No. 10; 8 of No. 12; 2 of No. 16; 1 of No. 19s; 4 of No. 22; 3 of No. 35; 29 of No. 37a; 24 of No. 37b; 6 of No. 38; 2 of No. 48a; 2 of No. 90a; 3 of No. 111c; 1 of No. 125; 2 of No. 126; 2 of No. 126a; 4 of No. 142c.



No. 1. A miniature Racing Car which can be built with parts in Meccano Outfit No. 1.

two $5\frac{1}{2}$ " Strips together so that they overlap each other by eight holes to give you a made-up strip 1. Now bolt an Angle Bracket to the front end of each strip 1, using the same bolt in each case to hold a Fishplate 2. Bolt a Flat Trunnion 3 to the Angle Brackets to form the radiator. Connect the rear ends of the strips 1 by a $\frac{3}{8}$ " Bolt 4.

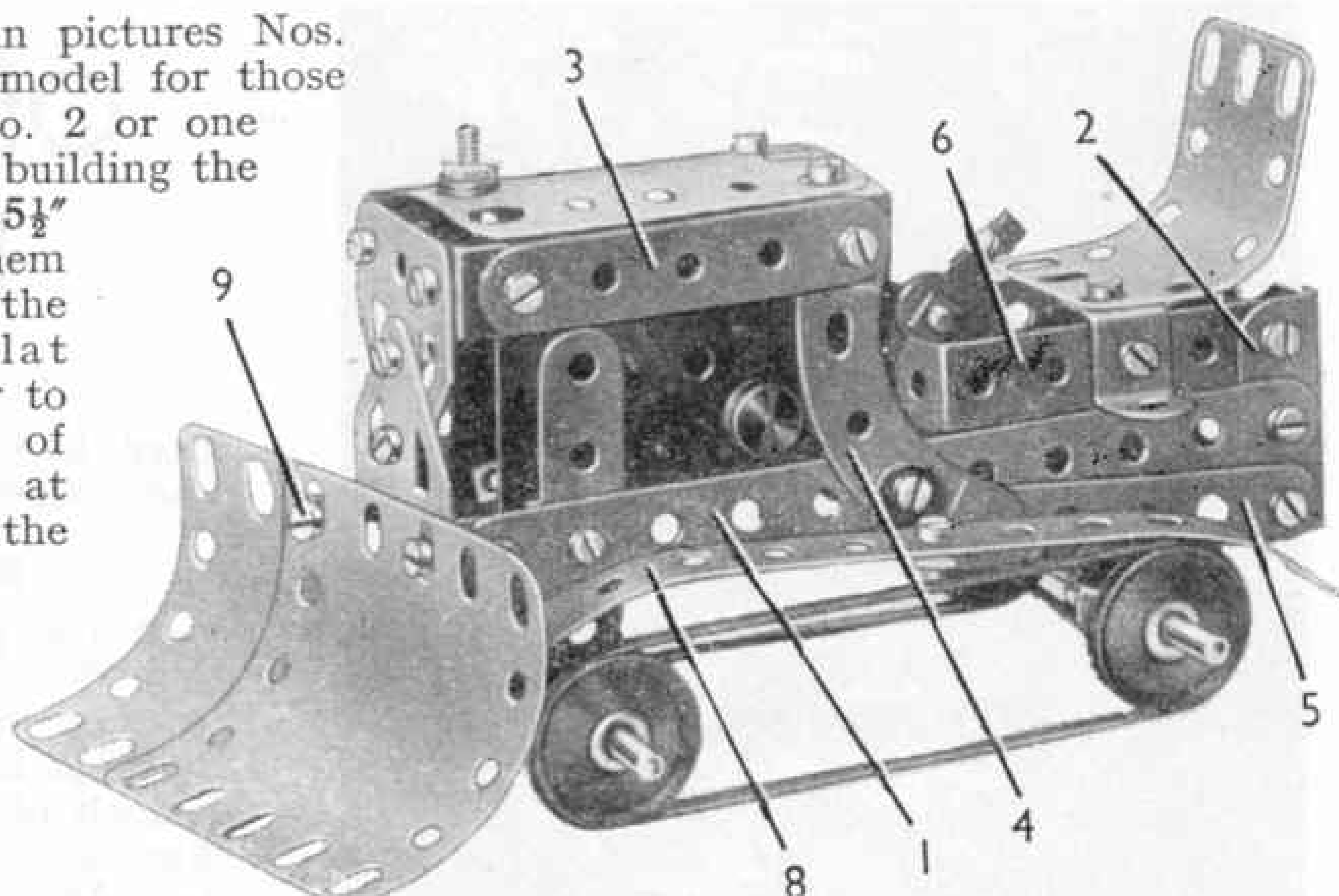
The next step is to fix two $2\frac{1}{2}$ " $\times$ $\frac{1}{2}$ " Double Angle Strips 5 to the Flat Trunnion 3, taking care to place Washers on the bolts before passing them through the Flat Trunnion. You can use the rear lugs of the Double Angle Strips to support a Flat Trunnion 6, which forms the front of the driver's cockpit. For the rear of the cockpit use a Trunnion 7, and attach it by Angle Brackets to $2\frac{1}{2}$ " Stepped Curved Strips bolted to the Double Angle Strips 5. You can use the bolts that connect the Angle Brackets and the Curved Strips to



No. 2. The Racing Car, seen from below.

The Bulldozer shown in pictures Nos. 3 and 4 is an excellent model for those who possess an Outfit No. 2 or one larger. You should begin building the model by taking two $5\frac{1}{2}$ " Strips, and connecting them by Angle Brackets to the lower one of two Flat Trunnions bolted together to form the radiator. One of these Strips can be seen at 1 in picture No. 3. To the rear end of each $5\frac{1}{2}$ " Strip bolt a Trunnion 2. Now connect the Trunnions together by a bolt to complete the chassis or main frame of the Bulldozer.

Bolt two Angle Brackets to the upper Flat Trunnion of the radiator and fix a $2\frac{1}{2}$ " Strip 3 to each Angle Bracket. Now attach a $2\frac{1}{2}$ " Stepped Curved Strip 4 between the Strip 1 and the rear end of the Strip 3 on each side. Fix a $2\frac{1}{2}$ " Strip 5 to the Trunnion 2 and the lower end of Curved Strip 4, and then bolt a $2\frac{1}{2} \times \frac{1}{2}$ " Double Angle Strip 6 to the Trunnion. For the top of the bonnet use a $2\frac{1}{2} \times 1\frac{1}{2}$ " Flexible Plate. Curve this slightly as shown and attach it to Angle Brackets held by the same bolts that connect the Strips 3



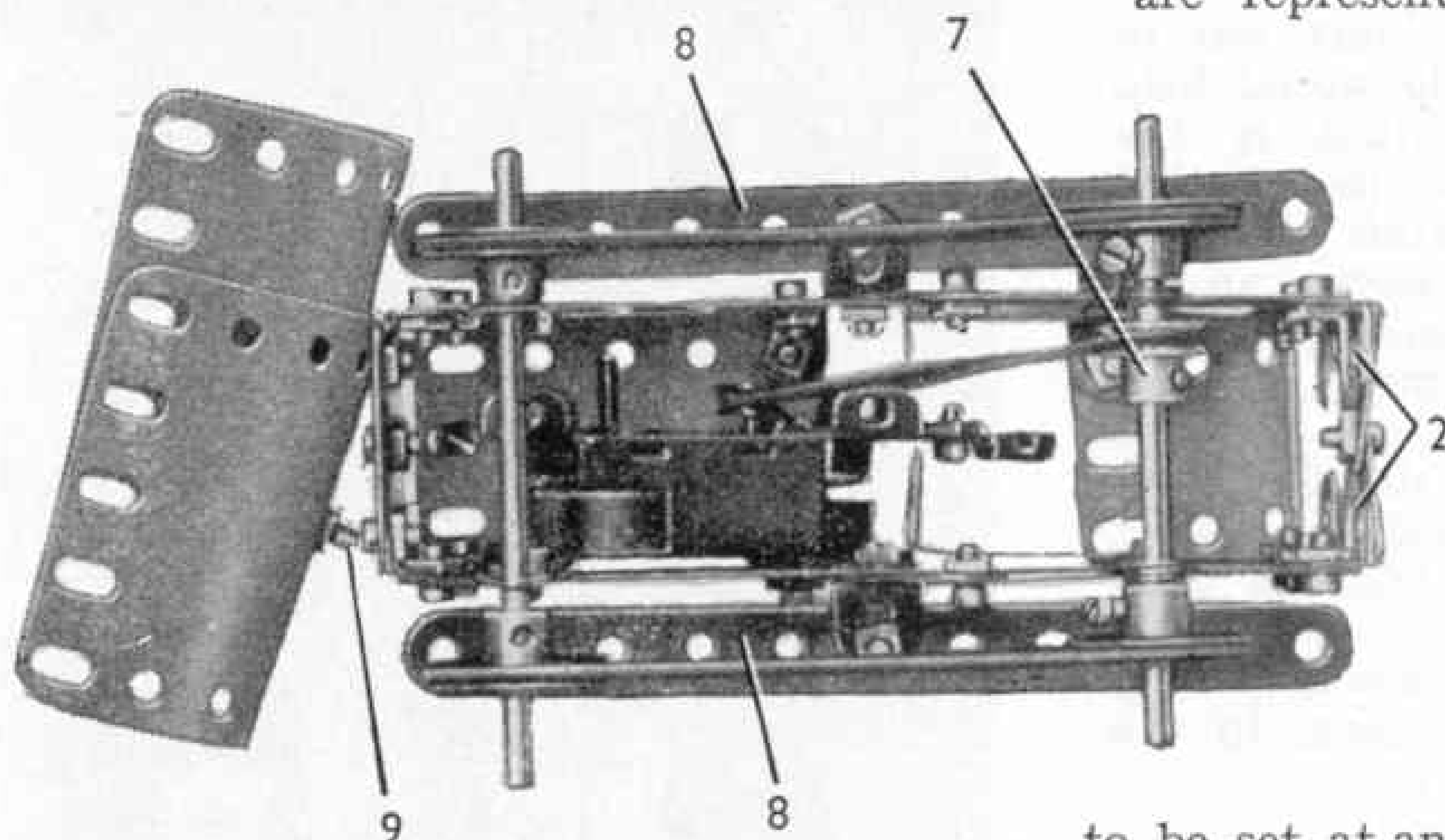
No. 3. A business-like but easy-to-build Bulldozer, which can be made from Outfit No. 2.

$3\frac{1}{2}$ " Rod carried in Fishplates attached to the Strips 5. Fix a $\frac{1}{2}$ " Pulley 7 on the last-mentioned Rod between the Fishplates.

Now bolt a *Magic* Clockwork Motor to one of the Strips 1 and pass a 6" light Driving Band around its pulley and the Pulley 7 on the rear wheel axle. Lengthen the Motor brake lever by bolting to it a Rod and Strip Connector.

The creeper tracks of the Bulldozer are represented by 10" light Driving Bands. These are placed round the 1" Pulleys that form the wheels. You can make a cover 8 for each track from a $5\frac{1}{2}$ " Strip attached to an Angle Bracket.

For the Bulldozer blade bolt together two $1\frac{1}{8}$ " radius Curved Plates, then use one of the bolts to attach the blade to the front of the model. The projecting end of the second bolt 9 causes the blade



No. 4. A view of the Bulldozer from underneath showing how the Magic Motor is fitted.

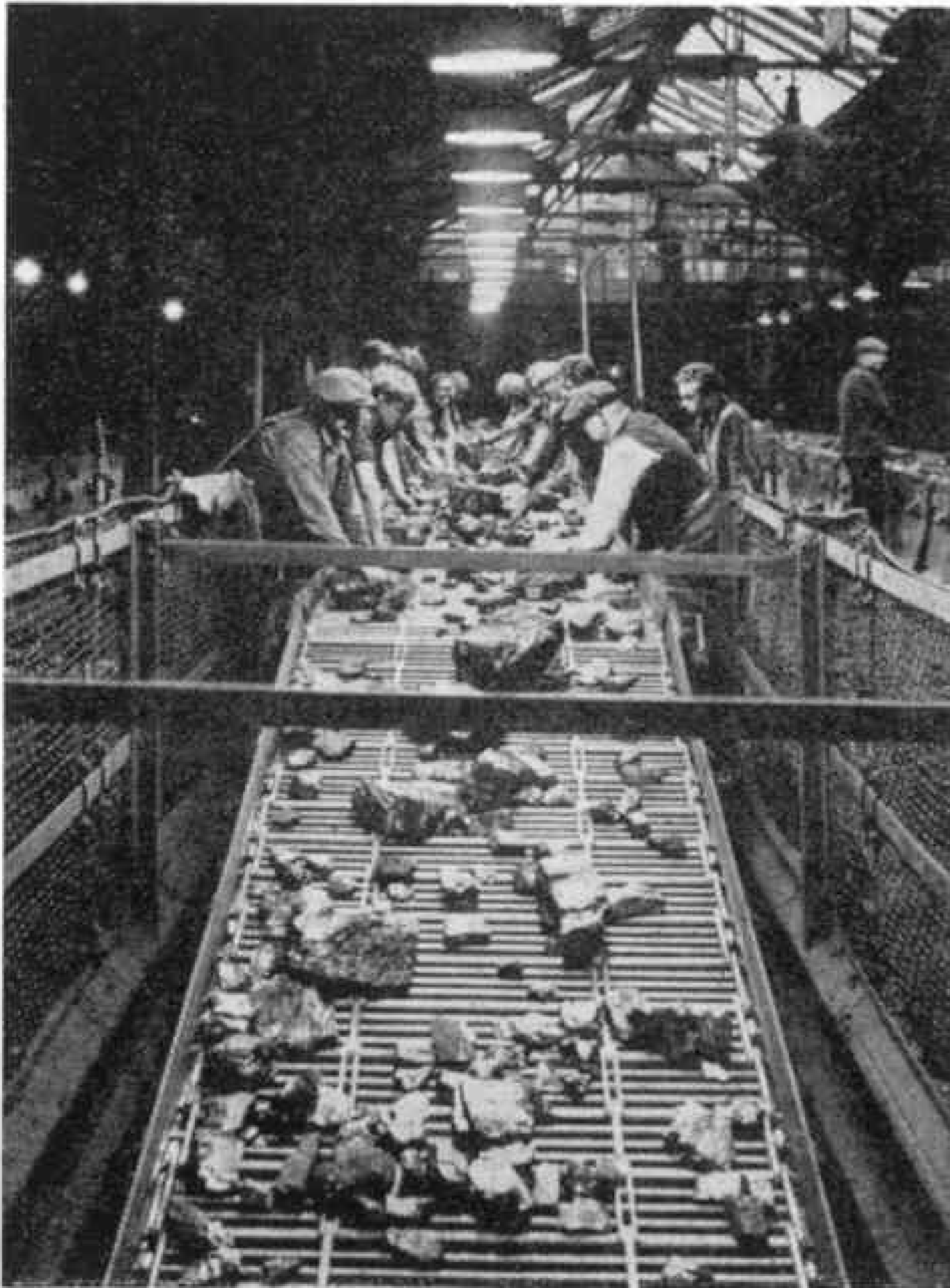
and the Curved Strips 4. You should note that one of these bolts, the one on the opposite side to that seen in Picture No. 3, should be fitted with two Washers before you pass it through the Strips.

Fix the front wheels on a $3\frac{1}{2}$ " Rod pushed through $2\frac{1}{2}$ " Strips bolted to the Strips 1. Mount the rear wheels on a

to be set at an angle (see picture No. 4). A slightly curved $2\frac{1}{2} \times 1\frac{1}{2}$ " Flexible Plate supported by a $\frac{1}{2}$ " Reversed Angle Bracket bolted to one of the Double Angle Strips 6, forms the driver's seat.

The $\frac{1}{2}$ " Pulley and Driving Bands in the model are supplied with the *Magic* Motor.

Parts required to build the Bulldozer: 4 of No. 2; 6 of No. 5; 2 of No. 10; 8 of No. 12; 2 of No. 16; 4 of No. 22; 36 of No. 37a; 35 of No. 37b; 8 of No. 38; 2 of No. 48a; 2 of No. 90a; 1 of No. 111c; 1 of No. 125; 2 of No. 126; 2 of No. 126a; 2 of No. 188; 2 of No. 200; 1 of No. 212; 1 *Magic* Clockwork Motor.



Picking coal under sodium lamps. Photograph by courtesy of the General Electric Co. Ltd.

Light on Dirt

If you wanted to pick dirt out of coal, what kind of lighting would help you most? Sodium lighting is the answer. Its yellow glow makes dirt stand out so effectively from coal that inexperienced men and boys can be employed on the pit-head belts on which the separation is made. Under it the coal glistens, in sharp contrast with the dull surface of the dirt, and the latter is so easily picked out that it is said to be nearly impossible for it to be left with the coal.

The picture above shows a coal picking belt at Lady Victoria Colliery, in the Lothians Area of the Scottish Division of the National Coal Board, with pickers at work under sodium lighting. The lamps and other equipment necessary were supplied by the General Electric Co. Ltd. The first belt on which the new idea was used proved so successful that two belts in another colliery were similarly equipped, and four

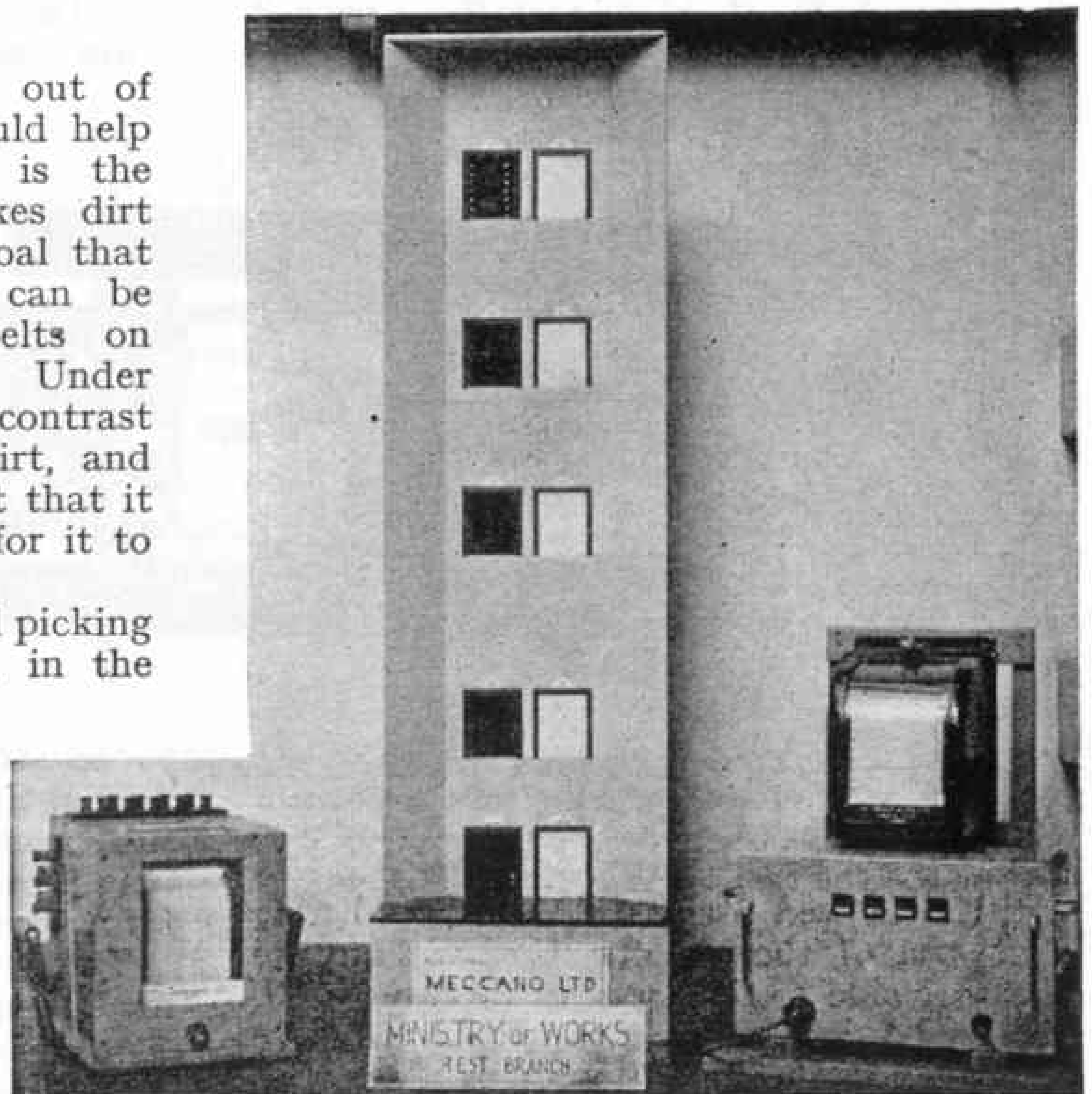
Of General Interest

more belts are being converted at Lady Victoria Colliery.

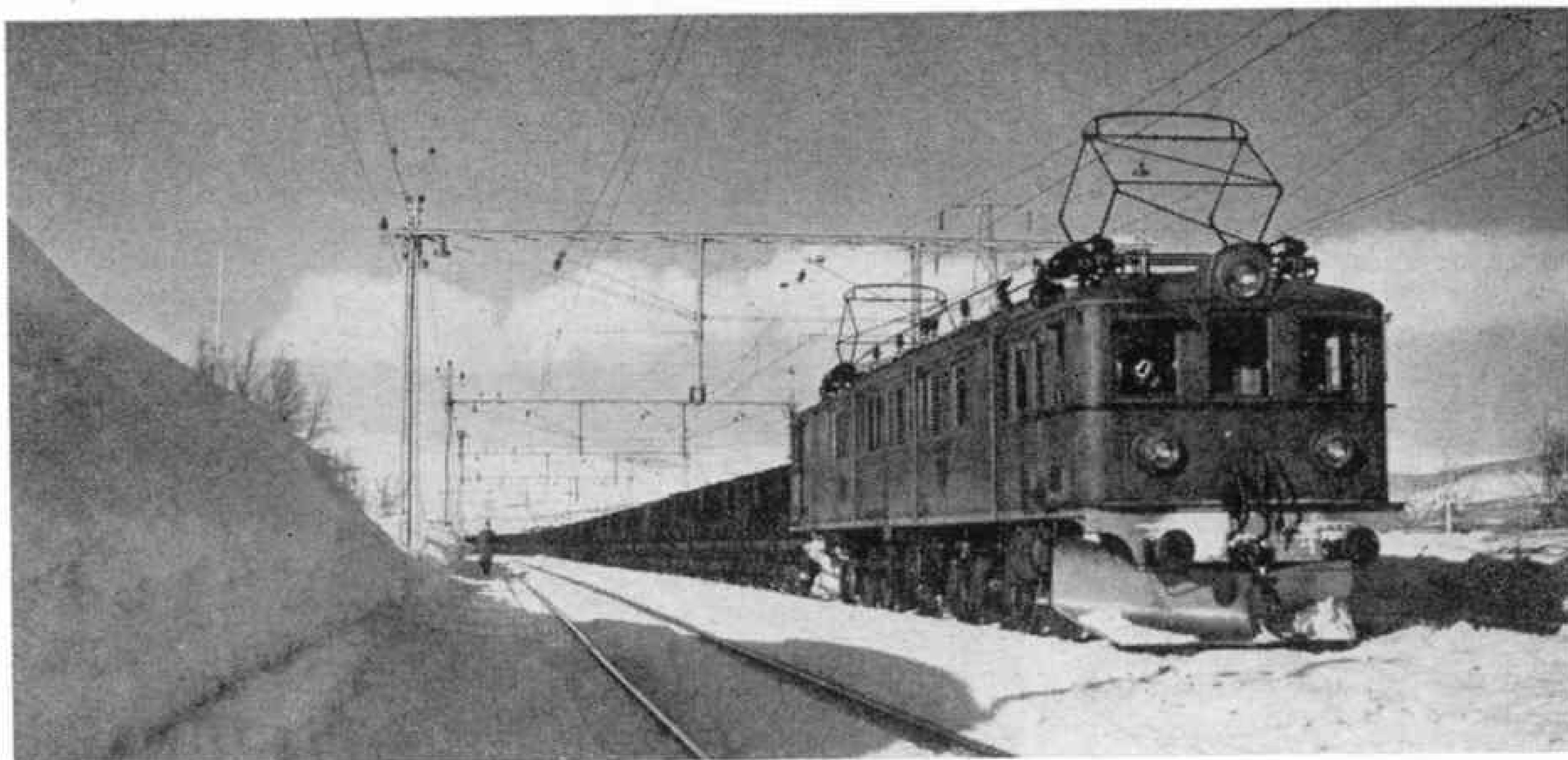
Behind the Screen

In the picture below, the "front" that seems to show the floors of a large building hides a Meccano model of a lift that has been used in the Test Branch of the Ministry of Works to illustrate how to measure the power demands of a lift mechanism at different rates of acceleration. The speed of the lift and the actual hours of lift running were measured with it, the latter electrically by means of contacts on each floor.

The model was shown at the June Conversazione of the Institute of Civil Engineers, and many of those who saw it were eager to look behind the screen to see the "works" and find how they were constructed.



A Meccano model that illustrates tests on lifts devised by the Test Branch of the Ministry of Works.



Sweden's Ore Line

A Scandinavian Arctic Railway

By Noel Watts

BETWEEN 1890 and 1900, plans were being considered for developing ore mines at the great "mountain of iron" at Kiruna, in Arctic Sweden. Many critical problems had to be solved. The three greatest were to establish a mine that could be worked all the year round in almost inconceivably severe weather conditions; the second to build a town with modern amenities to house some 15,000 people; and last, but by no means least, to provide efficient transport for the export of the millions of tons of ore it was proposed to extract.

Kiruna is about 100 miles inside the Arctic Circle, nearly 900 miles north of Stockholm. It was not proposed to process the ore at Kiruna. As soon as it was mined it was to be transported to a suitable port, where it could be loaded on ships and sent to buyers in all the countries of Europe. In 1900 the nearest seaport was Lulea on the Gulf of Bothnia, 200 miles away to the east. A railway, built by an English company, already existed as far as the smaller ore field at Gällivare some distance to the east of Kiruna, and there would be little difficulty in extending this line to the new mines. But Lulea had the

fatal disadvantage of being ice-bound for many months each year, and it could therefore never provide the required facilities for dealing with the ore produced by the new mines.

An ice-free port had to be found, and this could only be done by proceeding westward over the mountains and down to the coast of Norway. There the influence of the Gulf Stream keeps the sea above freezing point throughout the Arctic winter.

Many surveys were undertaken before a practicable route was found, ending where the port of Narvik now stands. It is interesting to learn that in 1900 there was nothing at all where Kiruna now is and at Narvik only one farmhouse existed, at the head of the fiord.

Both towns were founded in that year and in 1950 great celebrations were held to mark their jubilee.

It took four years of extremely hard work to extend the line to Narvik, a distance of 100 miles from Kiruna. The first 80 of these are of easy gradient, climbing gradually to the mountain divide between Sweden and Norway at Riksgränsen, where the line is nearly 2,000 feet above sea level. The descent

This article tells the story of a railway in the Arctic Circle that brings ore from the great mountain of iron at Kiruna, in Sweden, to the Norwegian port of Narvik, which became so well known during the second World War as the scene of intense fighting. The picture at the head of the page shows a train on the line, headed by one of the electric locomotives used on it.

from this point to Narvik makes the line one of the most picturesque in the world. From Riksgransen the track drops steeply, and the train continually plunges into tunnels in the rocks or passes along the mountain sides protected nearly all the way by snow-sheds or snow-breaks. Suddenly it emerges from a tunnel right on the edge of Rombaks Fiord where, many hundreds of feet below, one can still see the wrecks of the German destroyers which retreated

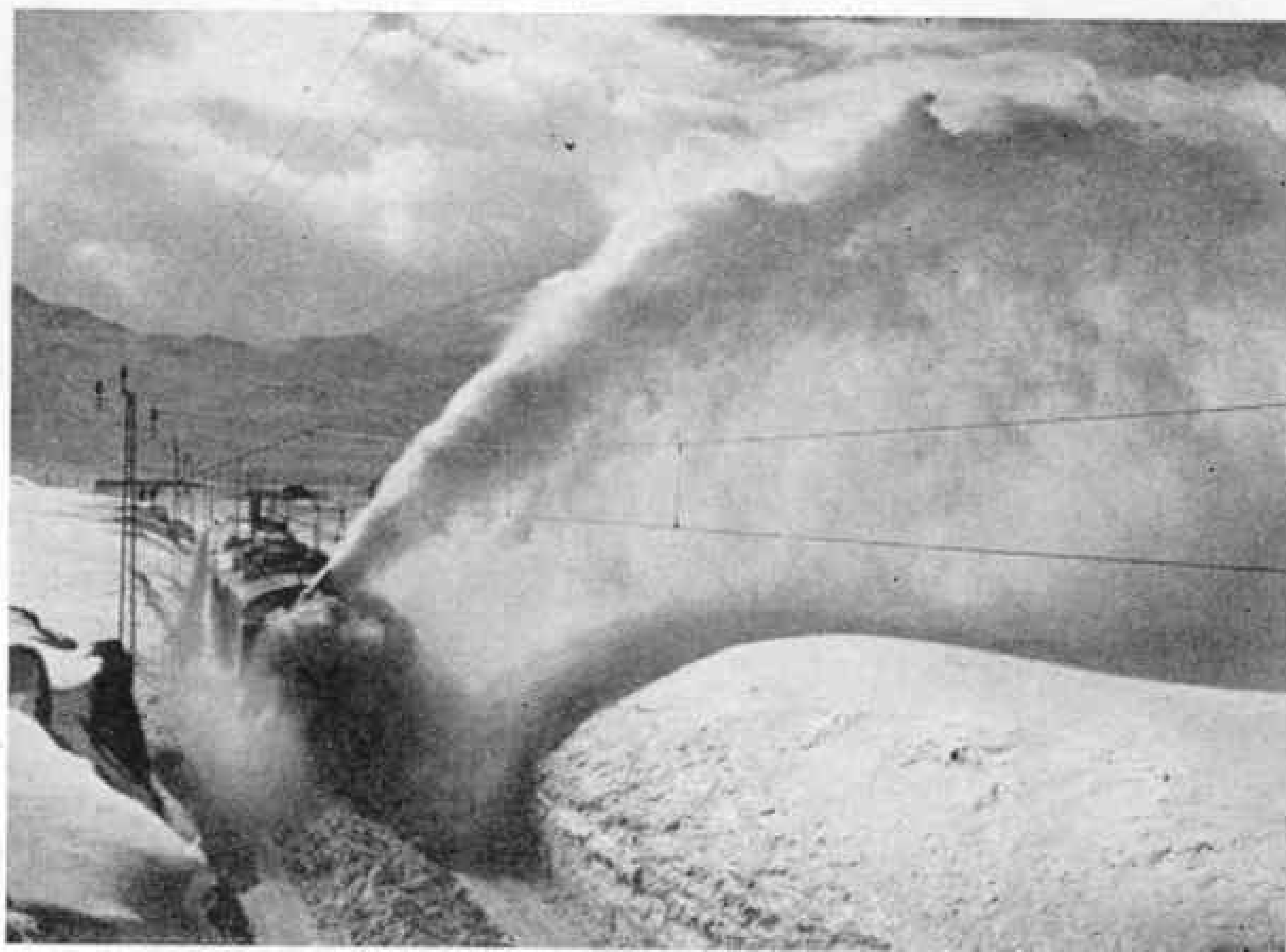
A rotary plough hurls a vast plume of snow to one side as it clears the line of the Kiruna-Narvik railway.

here in the Battle of Narvik, and which were sunk by the British ships which followed them in.

The line is cut in the solid rock of the mountain and comes gradually down to Narvik passenger station. The ore trains then run on to the quay, where their loads are tipped on to endless belts which take them straight to the waiting ships.

It is not easy properly to appreciate the great difficulties encountered in maintaining and working a line such as this the whole year round. For while the physical difficulties are great, the greatest hazard of all is the weather. It is hard for us in this country to imagine what a winter in those latitudes can be like. Snow falls in September and the ground is covered until the following June. Temperatures of

minus 30 deg. Centigrade are usual—nearly 60 Fahrenheit degrees of frost—and the country is swept by blizzards. To add to this, since the line is north of the Arctic Circle, the sun does not rise at all for six or seven weeks and several months are spent



in dim twilight with only the light of the moon or the Aurora to help.

It is a tribute to the many Swedish railwaymen who live along the line that it is never closed for more than twelve hours under even the most severe conditions. The author has only seen the country in summer, when for a few short weeks it is a blaze of wild flowers, but one had only to see the hundreds of appliances for dealing with snow and ice in the marshalling yards at Kiruna to realise that summer is indeed fleeting and that by mid-September some of them might be in use.

Originally the line was steam hauled, but steam was not satisfactory because of the severe weather and also because of the lack of coal in Sweden. It only became efficient when it was electrified in 1915 and since that time nearly all Swedish main lines have been electrified. There is plenty of water power available in all parts of the country, and generating stations at suitable points supply power to the railway company. Technically minded readers will be



The stationmaster gives the "right away" by waving a green and white disc from side to side.

interested in some details of the methods used particularly in view of forthcoming schemes for the electrification of lines in Britain.

The State Power Stations generate normal three-phase power, but at railway stations about 100 km. (60 miles) apart converters have been installed which transform the current to single-phase alternating, with a frequency of $16\frac{2}{3}$ cycles per second at the very high voltage of 15,000. This current is fed into overhead wires and, because of the high voltage, these wires can be made very thin. In view of the trouble experienced with conductor rails in this country due to icing, the overhead system favoured by the Swedes is interesting. Apparently their network of wires stands up to the rigorous conditions very well and they assured the author that this system was much to be preferred to conductor rails.

The amount of ore produced by the mines is colossal. A year's output is between six and seven million tons, and of this 90 per cent. is taken to Narvik. Every hour day and night long trains of up to 50 or 60 trucks rumble from Kiruna on their way to the coast. The trains have continuous vacuum brakes and they move

An iron ore train at Riksgransen, the highest point on the line, nearly 2,000 ft. above sea level.

at a fast pace. One curious difference from British freight trains is that they have no guard's van; instead the last truck carries a vertical pole painted with red and white stripes rather like a barber's pole.

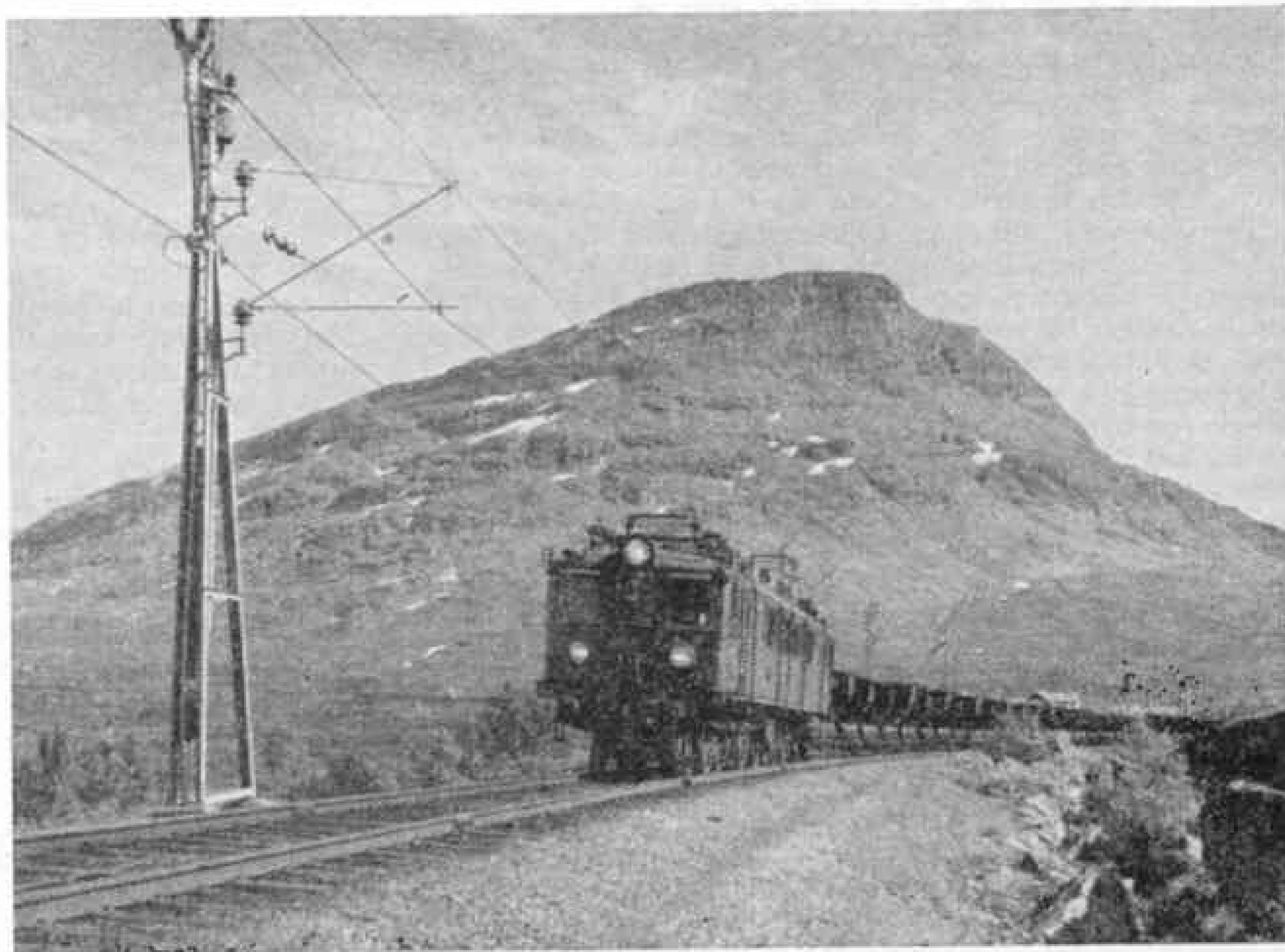
All, or practically all, Swedish lines have only single tracks so it is quite a feat of organisation to keep the flow of full trains to Narvik and the return of the empty ones constant. There are numbers of stations along the line where trains can pass, and at several places where there is a suitable piece of flat land considerable sidings have been laid out.

The "ore line" is indeed a model of efficiency and would be a credit to its staff in

temperate zones. In the Arctic it is little short of wonderful to see it in operation, with trains moving swiftly and smoothly through the barren countryside. Some idea of its importance commercially may be gathered from the fact that the mining company paid £5,000,000 in freight charges in one year, and it is one of the most profitable lines in the whole of Sweden. And it has an extensive passenger service, both local and long distance.

The distance from Stockholm to Narvik is 950 miles and daily in summer four trains each way make the whole journey. On these trains one travels in perfect comfort, sleeping cars are provided and food is available at every hour of the day and night. They run smoothly and on the single line maintain a steady average of 40 miles per hour, stopping every hour or so at junctions. Each train does its nearly 1,000 miles in just twenty-four hours. In that time on the way north from Stockholm one can watch the trees get smaller until at last there are only small birch trees left.

Twenty hours after starting the Arctic



Circle is crossed, saluted by blasts on the engine hooter and marked on the ground by a line of white stones. Soon one sees the huts of the Lapps who still live in the north with their reindeer, and Lapps themselves often join the train, dressed in their bright colours. And so on through the "Land of the Midnight Sun" until exactly one day after leaving Stockholm the train comes down the side of Rombaks Fiord and quietly into the new station at Narvik.

Among the Model-Builders

By "Spanner"

A NOVEL FREE-WHEEL MECHANISM

Most model-builders will be familiar with the *Magic Clockwork Motor*, which is designed specially for driving suitable models built with the smaller Outfits in the Meccano range. In a power unit of this kind it is important to keep the overall size as small as possible, and one way in which this is achieved in the *Magic Motor* is in the arrangement for winding the spring without turning the driving shaft.

In most large clockwork mechanisms a pawl and ratchet arrangement is used, but in the *Magic Motor* a "floating" gear gives the same result efficiently and much more compactly. One of the gears between the spring shaft and the driving shaft is fixed on a rod mounted in slotted bearings. When the rod is in one position in the slots its gear comes into mesh with the other gears and pinions of the gear train, but if the rod is moved to the opposite ends of the slots the gears are disengaged and the drive is disconnected.

The movement of the rod in the slots is entirely automatic. When the Motor is running the drive tends to bring the gears into mesh, but when the spring is being wound the drive on the floating gear is in the opposite direction and it moves out of mesh.

A similar arrangement can be used in Meccano models to provide a free-wheel that is smoother in operation and more free-running than the usual pawl and ratchet device, and Fig. 1 shows one way in which the mechanism can be made.

The housing for the mechanism consists of two $2\frac{1}{2}$ " Flat Girders connected at their ends by Double Brackets. The driving shaft 1 and the output shaft 2 are mounted in round holes in the Flat Girders and each is fitted with a $\frac{3}{4}$ " Pinion. The floating shaft 3 is mounted in slotted holes and carries a $\frac{7}{8}$ " Pinion 4. When the mechanism is driving, the Pinion 4 is carried to the lower limit of the slotted holes and engages the Pinions on the driving and output shafts. If the output shaft tends to over-run the drive, or if the

drive is stopped while the output shaft is still turning, the Pinion 4 is carried upward on its Rod and the drive is disconnected.

A FINE MODEL AIRCRAFT CARRIER

The illustration at the foot of the page shows young

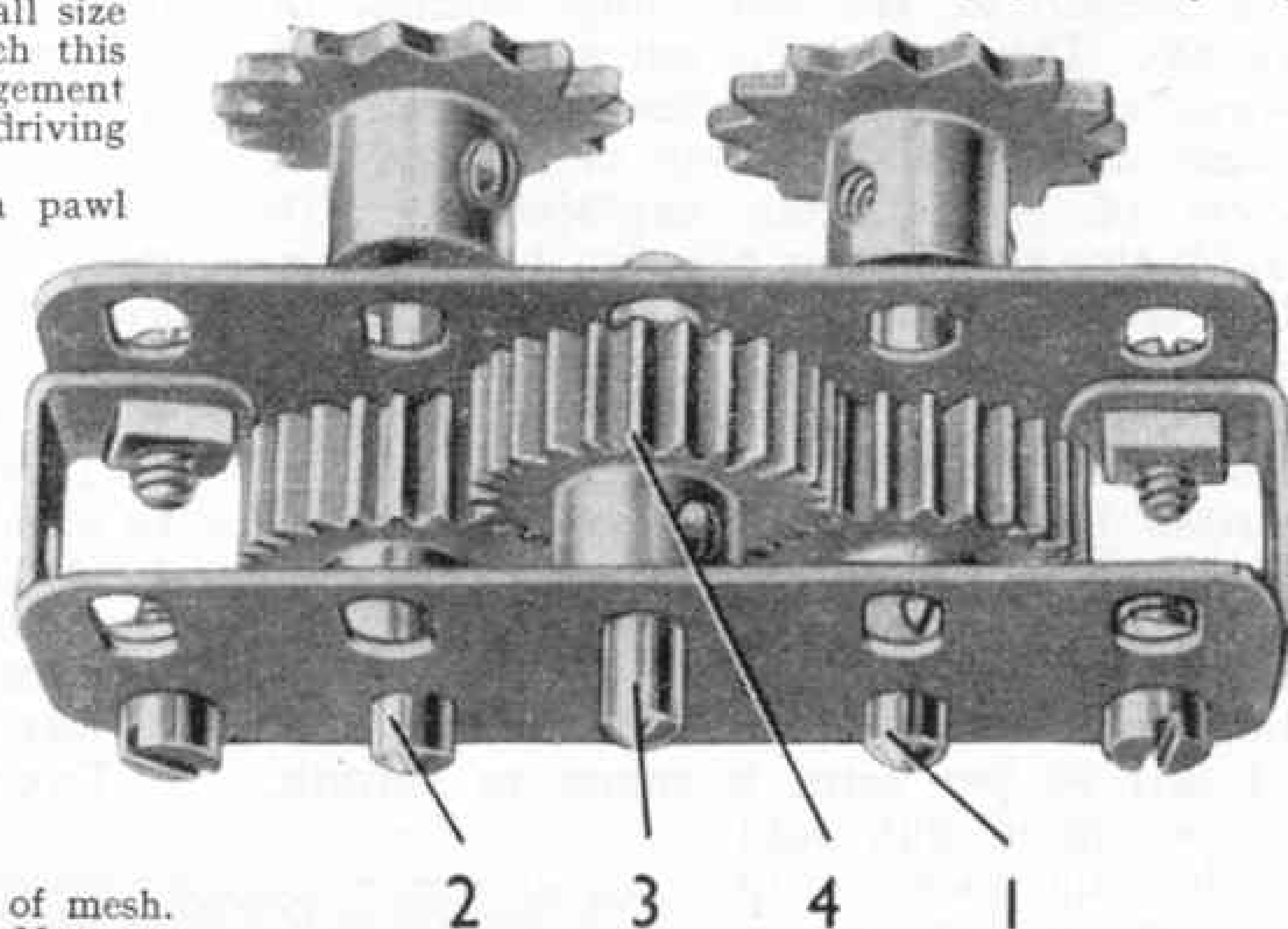


Fig. 1. A novel free-wheel mechanism specially designed for use with small and simple models.

Francy Mahnen of Esch on the Alzette, Luxembourg, with a splendid model of the U.S. aircraft carrier *Forrestal* that he has built. Francy is a very enthusiastic Meccano boy and the aircraft carrier is one of his latest and largest models. It has a total length of 80 in. and a beam of 22 in., and its height from waterline to the top of the mainmast is 45 in. It is provided with a main take-off and landing deck, with a hangar deck below, and lifts are provided to transport Dinky Toys planes from one to the other. The ship's armament includes eight 5 in. guns, and among other details are radar screens made of very fine mesh wire.

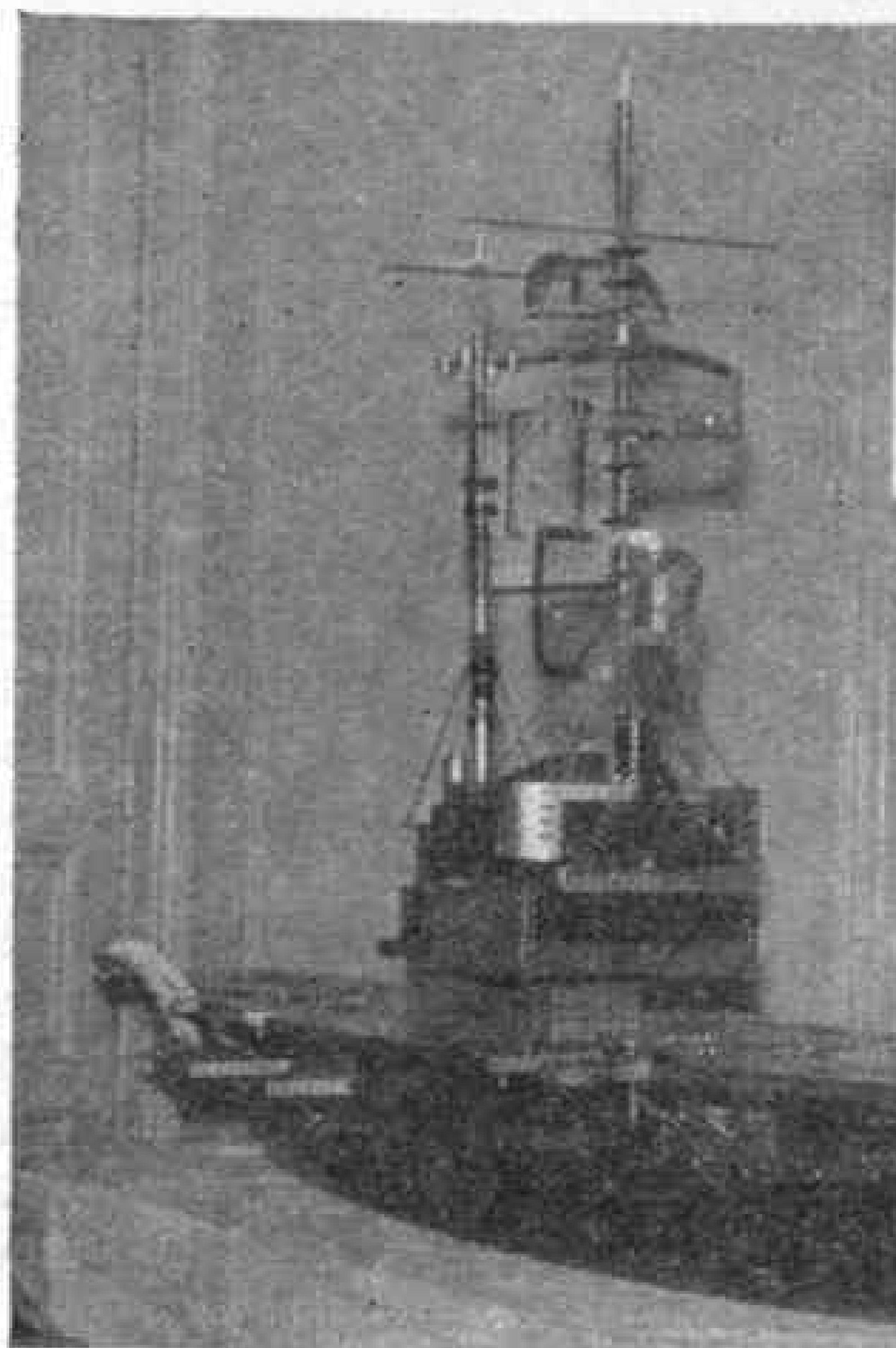
Francy spent three months in building the model, and I think you will all agree that it is an excellent piece of work for one so young.

MODEL CRANE BUILDERS SEE THE REAL THING

Most readers will recall the special model-building competition in which prizes were offered for Meccano

models of the well-known Jones KL 66 Mobile Crane, manufactured by K and L Steelfounders and Engineers Ltd., Letchworth. The list of winners of the chief prizes, with illustrations of some of the best entries, appeared in the *M.M.* for June last. Successful competitors in the contest received an invitation to visit the Works at Letchworth and see the actual cranes being constructed.

Among those who were able to avail themselves of this special opportunity was M. Rosenbloom, London, and the upper illustration on



Francy Mahnen, Esch on the Alzette, Luxembourg, and his model aircraft carrier U.S.S. "Forrestal."





M. Rosenbloom (extreme left) and some of his friends, on the occasion of their visit to the Works of Messrs. K and L Steelfounders and Engineers Ltd., Letchworth, to whom we are indebted for the photograph.

this page is reproduced from a photograph taken on the occasion of his visit. He is seen with some of his friends with a KL 66 Crane as a background.

VARIABLE PITCH PROPELLER MECHANISM

This mechanism is based on an arrangement suggested by M. Oliver, Morpeth, and is shown in Fig. 2. The propeller shaft is a Rod 1 mounted in a suitable framework, and it is driven through a $1\frac{1}{2}$ " Contrate and a $\frac{1}{2}$ " Pinion. The Rod passes through the centre transverse hole in a Coupling 2, which is fixed in place and carries in each of its end holes a 1" Rod fitted with an End Bearing 3. The 1" Rods are not fixed in the Coupling, but are held in place by Collars. The End Bearings support the propeller blades, each of which consists of two $3\frac{1}{4}$ " Strips connected at their inner ends by a Fishplate. A $\frac{3}{8}$ " Bevel Gear fixed to the upper end of Rod 1 caps the assembly.

A Threaded Pin is screwed into a threaded hole in the boss of each End Bearing and a Swivel Bearing 4 is fixed on the shank of the Threaded Pin. Each Swivel Bearing is linked by a $1\frac{1}{2}$ " Rod to a Handrail Support 5 that is screwed into a Coupling 6, which is free to slide on Rod 1. The shanks of the Handrail Supports must not grip the Rod. A Socket Coupling is fitted over the lower end of Coupling 6 and is fixed to it by tightening the Grub Screws.

The control lever is formed by a $2\frac{1}{2}$ " Strip bolted to one arm of a Bell Crank 7 with the join strengthened by a 1" Corner Bracket. The Bell Crank is mounted freely on a Pivot Bolt fixed by its nuts in a Trunnion bolted to the framework. A $\frac{3}{8}$ " Bolt in the second arm of the Bell Crank is arranged so that its shank engages the groove in the Socket Coupling.

When the control lever is operated, its movement is transmitted by the links so that the End Bearings 3 are turned in opposite directions. Thus the angle, or pitch, of the propeller blades is altered according to the position of the control lever.

The mechanism serves as a useful demonstration of the principle of a variable pitch propeller, but it is rather too large for actual use in a model aeroplane. It may be found useful however, in connection with the rotors of model helicopters, and Oliver tells me that he has experimented with the arrangement in models of this kind.

HOW TO USE THE MECCANO DRIFT

The number of letters I receive from Meccano enthusiasts seems to be growing daily, and reading this correspondence and dealing with the queries in it takes a considerable amount of time. I enjoy reading these letters however, and whenever possible I am glad to help model-builders in any way I can. Some of the problems apply to particular models and call for personal replies. These I reply to by letter, but in other cases similar queries crop up so frequently that if possible I like to answer them in the *M.M.*, as I feel that other readers may have been troubled by similar difficulties.

One of the questions I am asked very often concerns the Meccano Drift, part No. 36c. Usually the letters about this part come from young model-builders, who are not sure of the exact uses of the "pointed rod," as most of them call the Drift! First of all I would like to make it clear that it is not really a constructional part; it is really a tool in the same class as the Spanner and Screwdriver with which every Meccano boy is familiar. Sometimes it is found that when several parts are arranged with holes overlapped it is difficult to line up the holes accurately so that a Bolt or a Rod can be passed through them. In cases like this the pointed end of a Drift can

be pushed through the holes until they are brought exactly into line. Although the Drift is intended as a tool it can be used in certain cases as a constructional part. An example of this is in the assembly of free-running bearings. If the pointed end of the Drift is placed in a Rod Socket this arrangement will be found to provide an exceptionally free running bearing that can be used in models of many kinds.

Another example of the usefulness of a Drift as a constructional part is in the assembly of indicating mechanisms of various kinds. A Drift mounted in a Coupling makes a useful pointer in this type of mechanism.

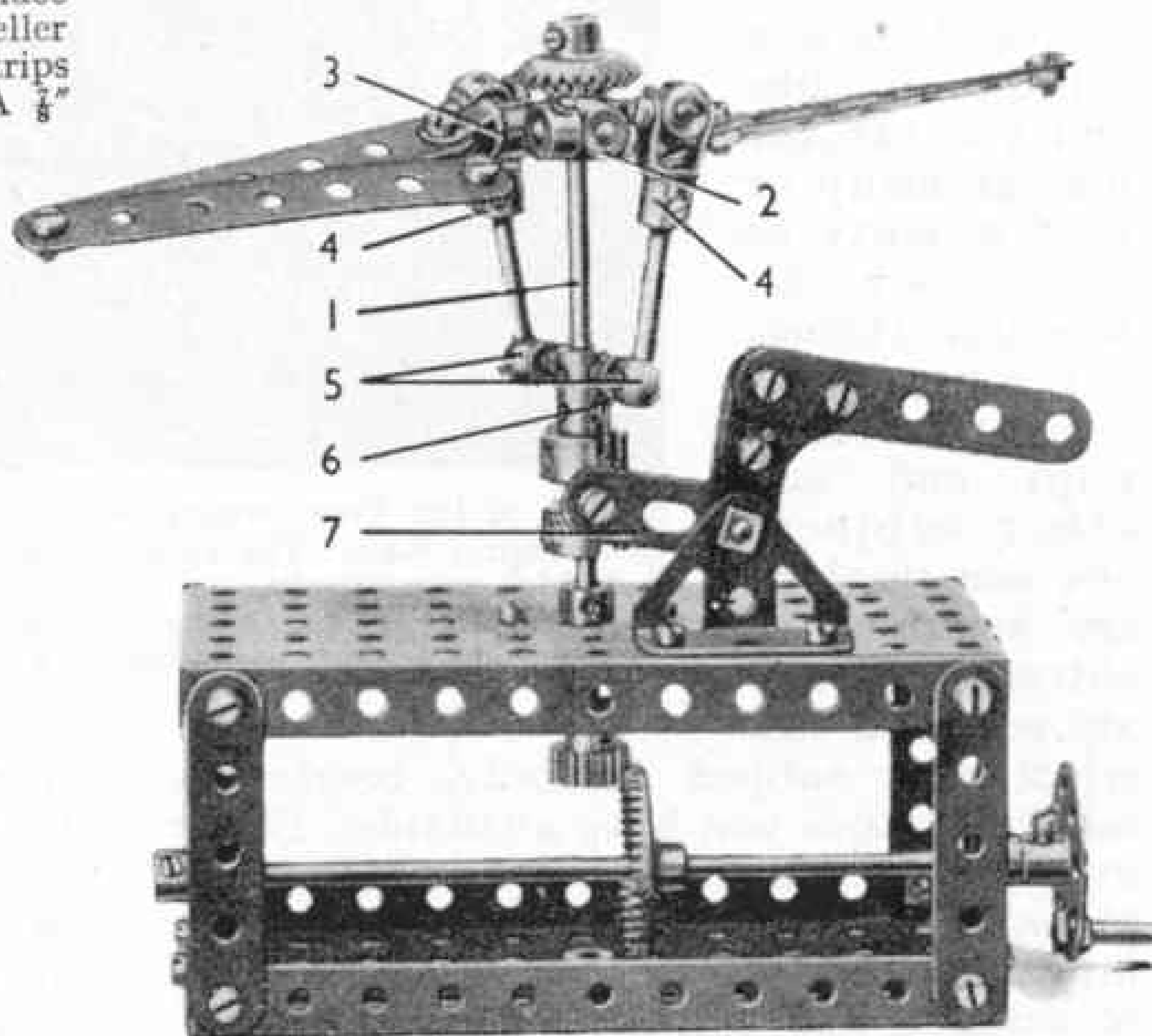


Fig. 2. A demonstration model of a variable pitch propeller mechanism.

Prizes for Model-Builders

The First of the Winter Competitions

AT this time of the year indoor hobbies and pastimes assume greater importance than during the summer, and once again Meccano model-building becomes the chief indoor activity of millions of boys in this and other countries. They know from experience that there is no better way of occupying themselves during the long dark evenings.

As we announced in the September issue of the *M.M.*, we are starting the model-building season off with a real swing by arranging another of the always popular general competitions that give every Meccano owner the chance of winning a useful cash prize, no matter what his age or the size of his Outfit. The contest is open to readers living in any part of the world.

The rules in this type of contest are very simple. There are *no* restrictions on the number of parts that can be used or on the subjects that may be modelled. Your model can be based on any subject you like and you can use just as many or as few parts as you wish. Vehicles, cranes, bridges, aeroplanes, ships and any other subjects you can think of are suitable for entry, but if you are wise you will

select your subject carefully, bearing in mind the parts you have available. Better model a small vehicle really well than try to build a huge crane that is unsteady or flimsy in appearance, owing to the lack of suitable and sufficient parts.

The Competition will be divided into two Sections as follows: A, for competitors under

12 years of age on 30th November next and B, for model-builders who are 12 or over on that date.

The following prizes will be awarded in each Section: First, Cheque for £4/4/-. Second: Cheque for £2/2/-. Third: Cheque for £1/1/-. There will be also 10 Prizes of

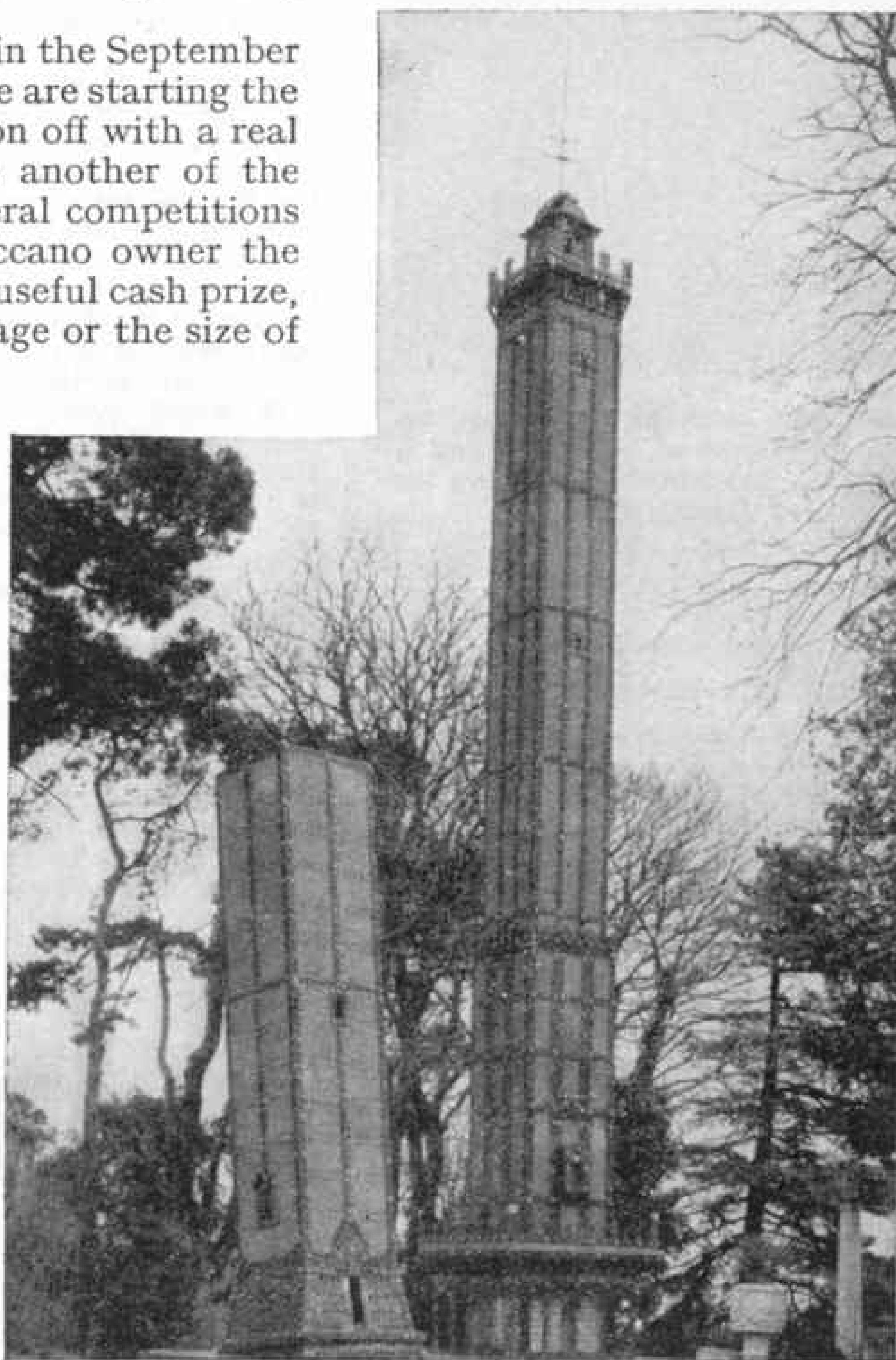
Postal Orders for 10/- and 10 Prizes of Postal Orders for 5/-. Entries must be addressed *September General Model-Building Competition, Meccano Ltd., Binns Road, Liverpool 13.*

The Competition will remain open for entries until 30th November, 1955.

The judges will take into account each competitor's age when judging his work, and small models will stand just as good a chance of success as large and complicated ones, providing they are realistic, neat and sturdily built. Each competitor therefore will have a fair chance of winning a prize.

It is not necessary to send the actual model. A good drawing or better still, a

clear sharp photograph of your model is all that is required, together with a few notes on any points of special interest. The drawings or photographs need not be your own work, but the model itself must be the result of your own efforts. Make sure your age, name and address are written on the back of each sketch or photograph.



Models of the Two Towers, which are a prominent feature in Bologna, Italy. The models are approximately 3 ft. and 6 ft. high respectively, and were built by Alessandro Pajello, Bologna, as an entry for a Meccano Competition. The illustration shows the models in a realistic outdoor setting.

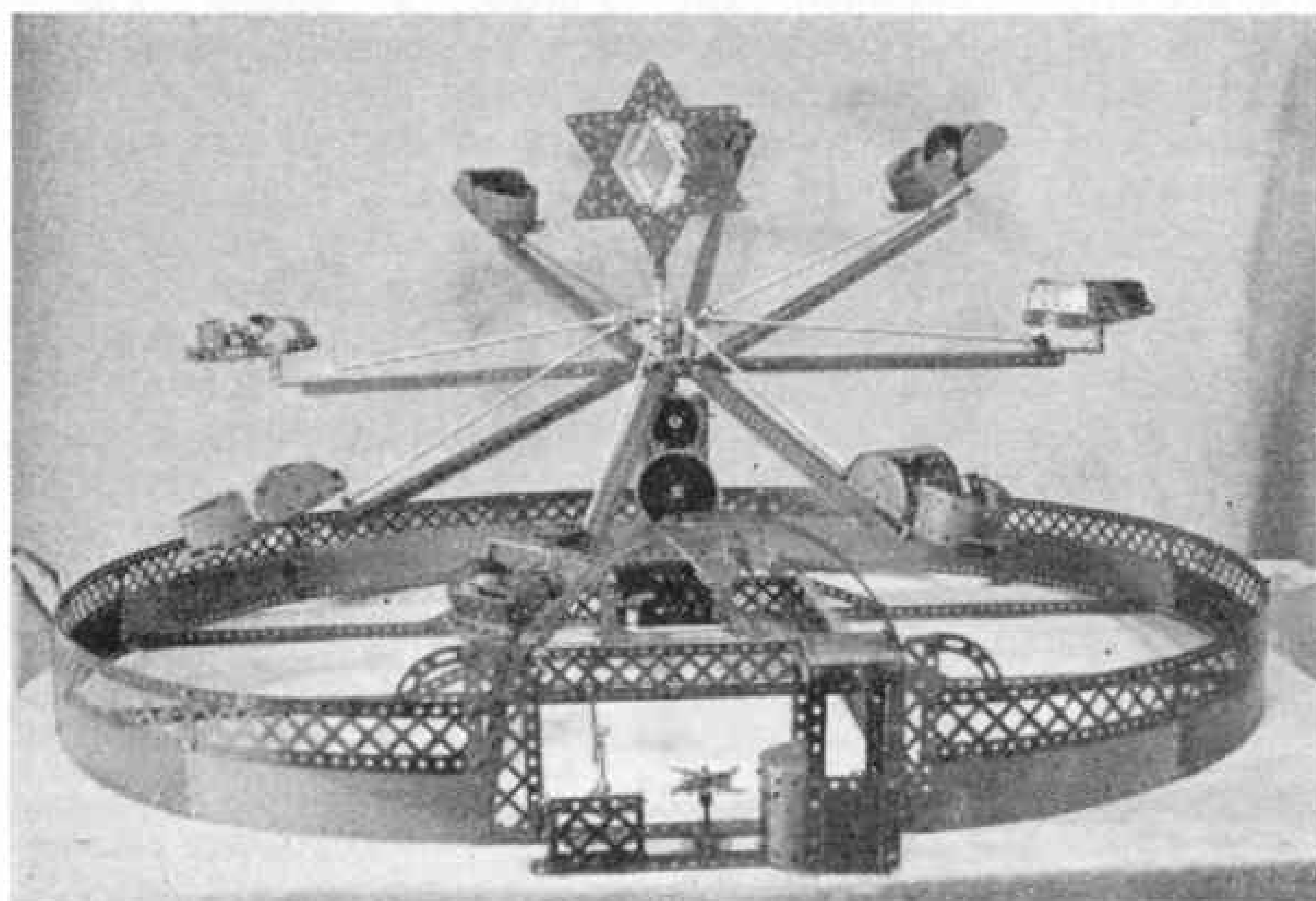
What Shall I Build Next?

Fun Fairs Provide Good Subjects

MODEL-BUILDERS in search of a subject for their next model will find many fascinating and suitable objects for their attention in any seaside fun fair or pleasure park, and a very important

The game can be played by throwing Meccano Metal Balls, Part No. 168d, at the targets, but even more fun is obtained if a simple spring pistol is made to fire Collars or Washers at the figures.

Although the old fashioned roundabout still holds sway in almost every fair, it now faces severe competition for popularity from a wide variety of other ingenious "liver-shaking" machines, among which are such hilarity-provoking devices as "Dodgem Cars" and "Trip to the Moon" machines, Speedways and a curious machine called the "Octopus," which has become a firm favourite in recent years. A fine Meccano model of one of these machines is shown in the upper illustration. This type of machine is most



A fine model of the Octopus fairground amusement machine. It was built by Mr. H. Henry, Strood, Kent.

aspect of this field of model-building is that it provides subjects suitable for those with either small or large Outfits.

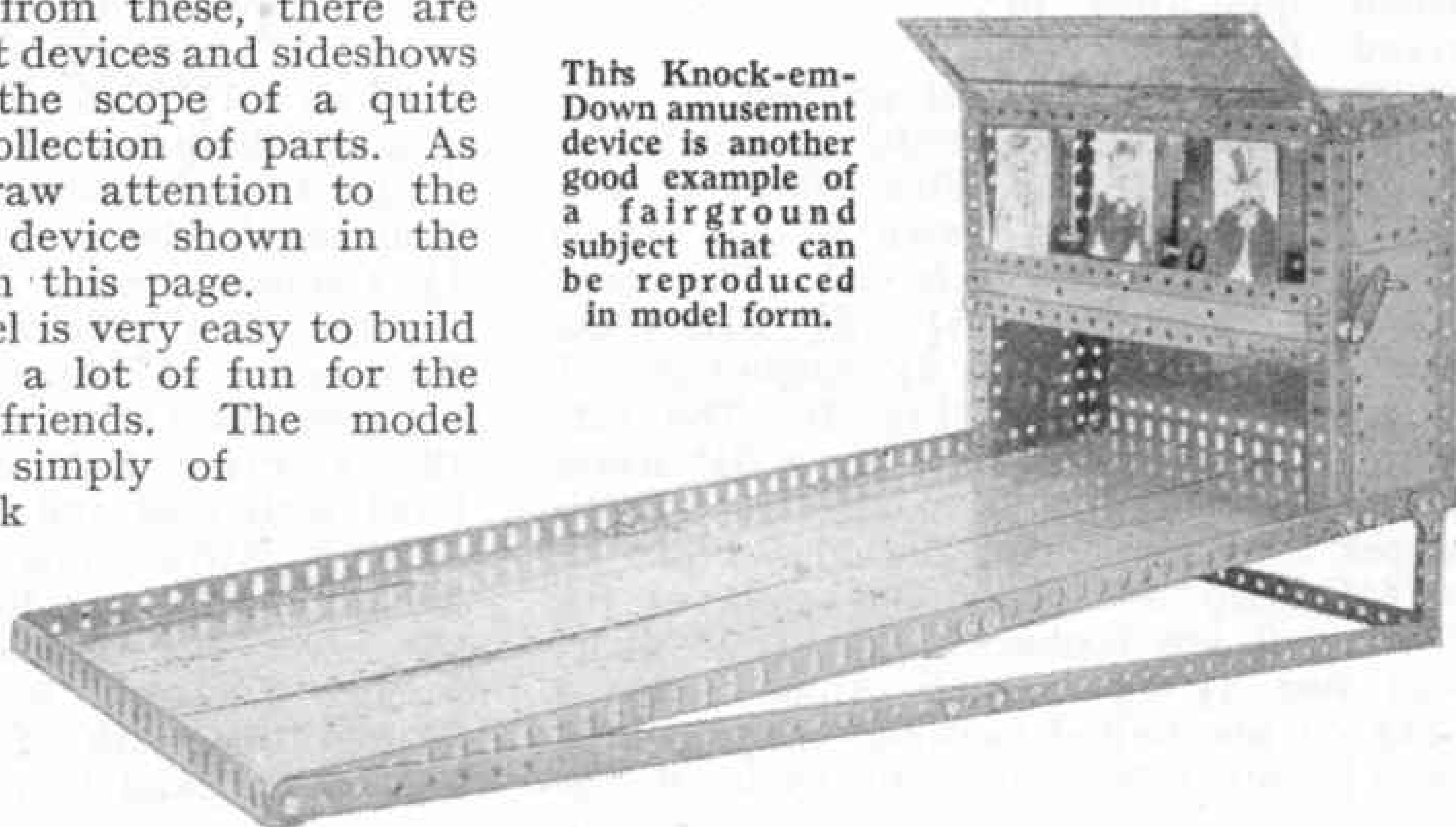
Everyone is familiar with the huge roundabouts, scenic railways and giant swing boats that form prominent features of most fun fairs, and which make ideal subjects for the lucky possessor of a big Outfit. But apart from these, there are dozens of amusement devices and sideshows that come within the scope of a quite modest Outfit or collection of parts. As an example we draw attention to the "Knock-em-Down" device shown in the lower illustration on this page.

This type of model is very easy to build and it will provide a lot of fun for the builder and his friends. The model illustrated consists simply of a suitable framework with three targets made by drawing amusing figures on cards, and then attaching these to pivoted Strips.

interesting to construct and operate, for in addition to the usual rotating movement of the passenger cars at the ends of the arms, each arm rises and falls as it rotates. This motion is obtained by a crank off-set slightly from the main shaft of the machine. A series of connecting links is arranged between the crank and the arms.

We hope readers who experiment with fun fair subjects will send us details, and photographs of their models if possible.

This Knock-em-Down amusement device is another good example of a fairground subject that can be reproduced in model form.



New Meccano Model

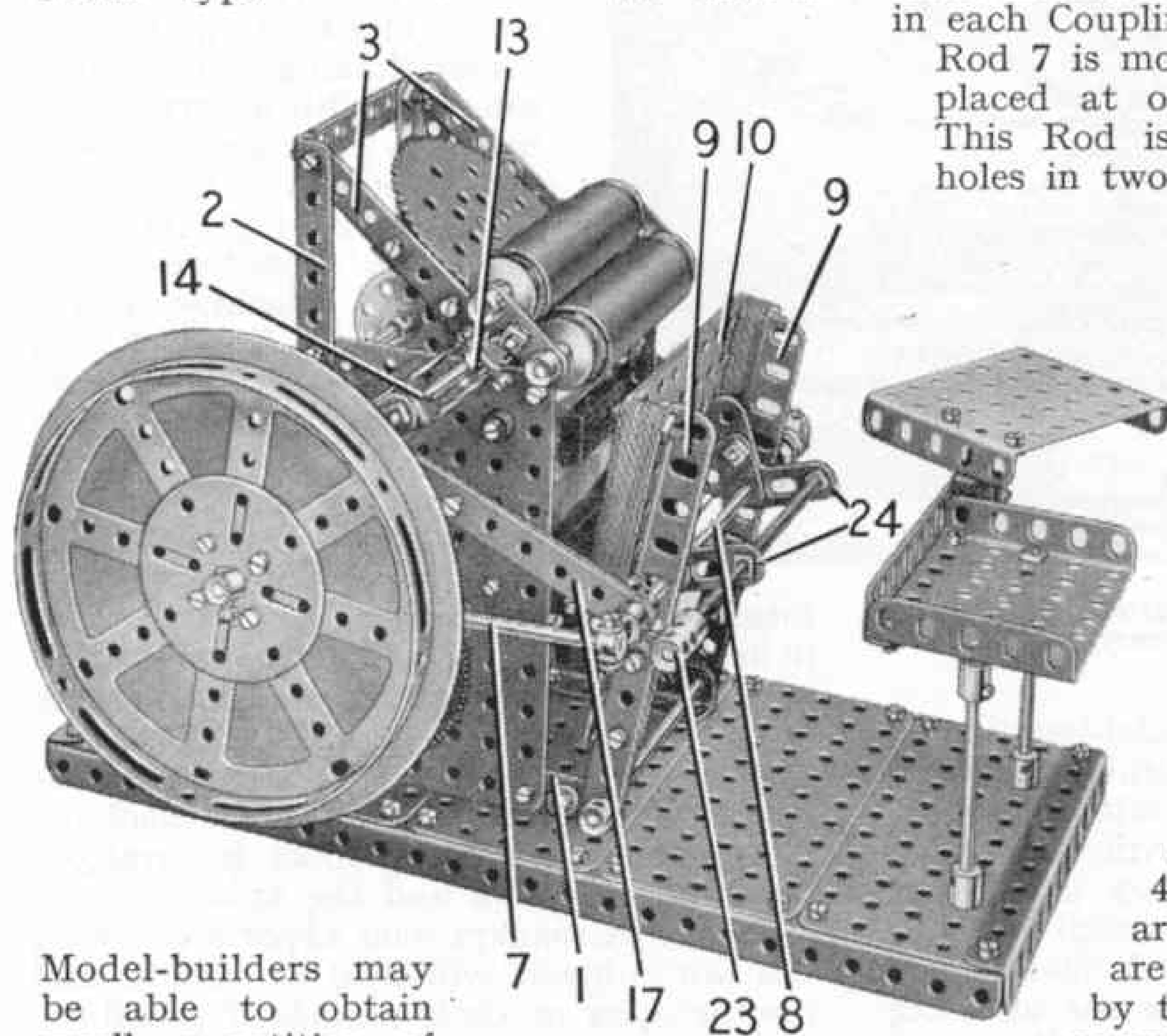
Printing Machine

THE attractive new model we are describing this month is a machine that will actually print. It is based on a model designed by Mr. F. Davy, Auckland, New Zealand, which won a Prize in the International Model-Building Competition held in 1952/53.

The model will operate satisfactorily using the rubber type supplied in toy printing outfits, but better results can be obtained if standard metal type is used.

projecting ends of the Girders 1 so that the round holes in the Strip cover the slotted holes in the Girder.

The main driving shaft is a $6\frac{1}{2}$ " Rod 5 mounted in Double Arm Cranks bolted to the $5\frac{1}{2}$ " $\times$ $3\frac{1}{2}$ " Flat Plates. The Rod is held in place by Collars, and it carries, between the Plates, a Single Throw Eccentric 6, and a $2\frac{1}{2}$ " Gear at each end. A Coupling is mounted freely on a Pivot Bolt fixed centrally in one of the slotted holes in each Gear, and a Rod 7 is held in each Coupling. The other end of each Rod 7 is mounted in a Swivel Bearing placed at one end of a $6\frac{1}{2}$ " Rod 8. This Rod is supported in the slotted holes in two $4\frac{1}{2}$ " Angle Girders 9, each of which is extended downward by two face-



Model-builders may be able to obtain small quantities of used metal type quite cheaply from local printers.

The base of the model is made by bolting five $5\frac{1}{2}$ " $\times$ $2\frac{1}{2}$ " Flat Plates to two $12\frac{1}{2}$ " Angle Girders, with a $5\frac{1}{2}$ " Angle Girder fixed across each end. The main frame is formed by a $5\frac{1}{2}$ " $\times$ $3\frac{1}{2}$ " Flat Plate on each side bolted to a $4\frac{1}{2}$ " Angle Girder 1 attached to the base (Fig. 1). The Flat Plate is extended upward by a $3\frac{1}{2}$ " Angle Girder 2 and this is connected to the upper front corner of the Flat Plate by a $4\frac{1}{2}$ " Strip 3. The upper ends of the Girders 2 are connected by a $3\frac{1}{2}$ " Strip, and two $3\frac{1}{2}$ " $\times$ $\frac{1}{2}$ " Double Angle Strips 4 (Fig. 2) are bolted between the Strips 3. A $1\frac{1}{2}$ " Strip is bolted to each of the

Fig. 1. A fine platen printing machine that really works. It can be used for printing visiting cards and produces a remarkably clear impression when it is properly adjusted.

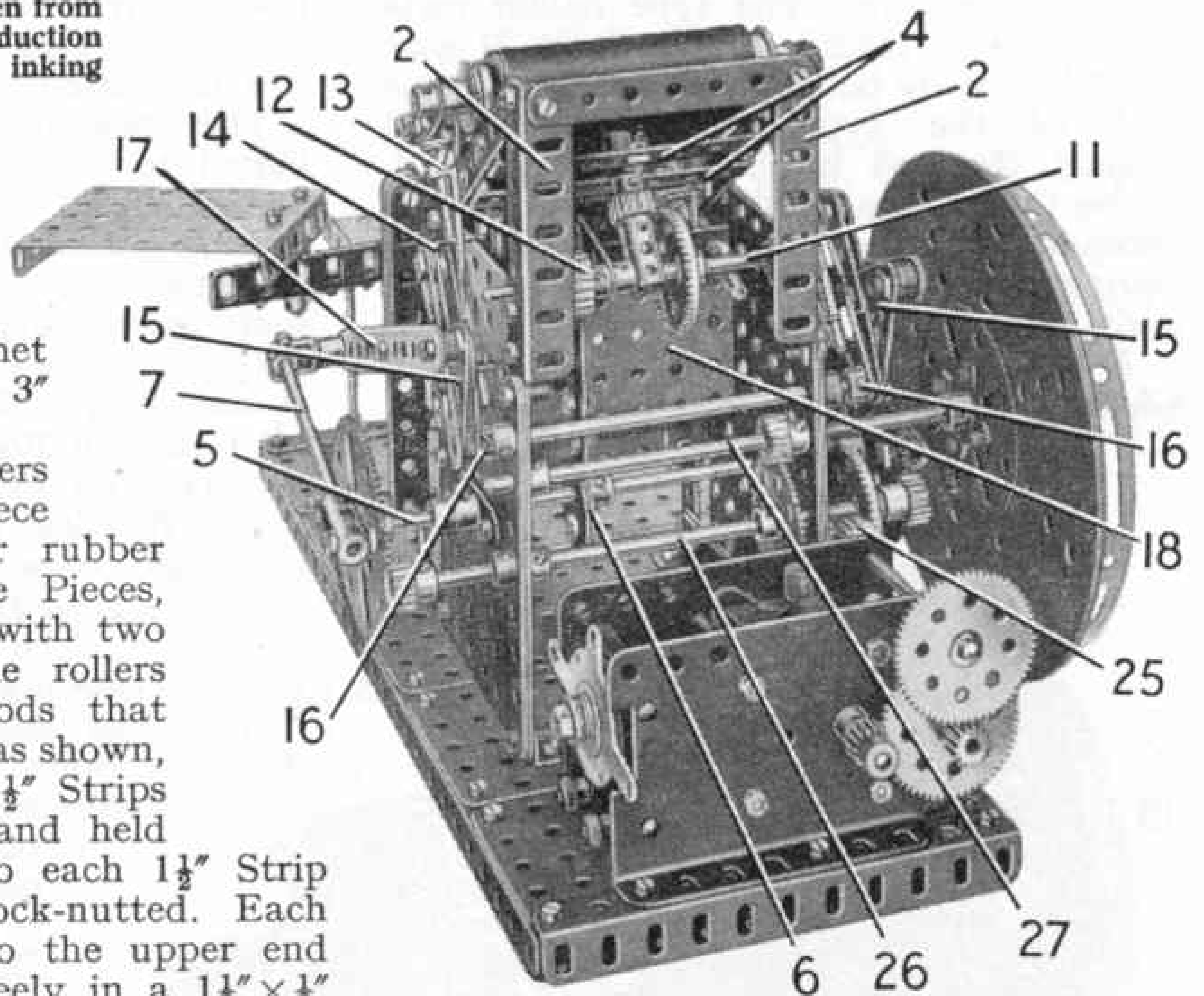
to-face $2\frac{1}{2}$ " Strips that pivot on a Rod held in the Girders 1 by Collars. The pressure plate 10 is bolted to the upper ends of Girders 9 and consists of three $4\frac{1}{2}$ " $\times$ $2\frac{1}{2}$ " Flat Plates. These are placed face-to-face and are spaced from the Girders by ten $2\frac{1}{2}$ " Strips on each side passed over $\frac{3}{4}$ " Bolts.

The inking plate is a 3" Sprocket fixed on a $1\frac{1}{2}$ " Rod. This Rod is supported in a $1\frac{1}{2}$ " Strip bolted to the Double Angle Strips 4, and also in a Coupling that is mounted freely on a Rod 11 between a $1\frac{1}{2}$ " Contrate and a Collar. The Contrate engages a $\frac{1}{2}$ " Pinion fixed on the $1\frac{1}{2}$ " Rod, and a $1\frac{1}{2}$ " Strip is placed on Rod 11 between the Collar and a Ratchet Wheel 12. A Pivot Bolt is passed through a Pawl with boss and through an end hole of a 3" Strip. The Pivot Bolt is then fixed by two nuts to the $1\frac{1}{2}$ " Strip, and the lower end of the 3" Strip is bolted to the Eccentric 6. The Pawl is held against the teeth of the Ratchet 12 by a Driving Band looped through the hole

Fig. 2. The printing machine seen from the rear, with the Motor reduction gearing and the drive to the inking plate clearly shown.

in the Pawl and bolted to the 3" Strip. When the shaft 5 is turned the Eccentric and the ratchet mechanism rotate the 3" Sprocket intermittently.

Each of the inking rollers is made by pressing a piece of $\frac{5}{8}$ " internal diameter rubber tubing over two Sleeve Pieces, each of which is fitted with two Chimney Adaptors. The rollers are mounted on 5" Rods that carry $\frac{3}{4}$ " Flanged Wheels as shown, and are connected by $1\frac{1}{2}$ " Strips passed over the Rods and held in place by Collars. To each $1\frac{1}{2}$ " Strip an End Bearing 13 is lock-nutted. Each End Bearing is fixed to the upper end of a Rod that slides freely in a $1\frac{1}{2} \times \frac{1}{2}$ " Double Angle Strip 14. The Double Angle Strip is bolted to a $2\frac{1}{2}$ " Strip, and this in turn is fastened, together with a $1\frac{1}{2}$ " Corner Bracket 15, to a Crank 16. The Cranks 16 on each side are fixed on a Rod mounted in the $5\frac{1}{2} \times 3\frac{1}{2}$ " Flat Plates and held in place by Collars. The



bearings for the Rod are strengthened by three $4\frac{1}{2}$ " Strips bolted to each Flat Plate. Two face-to-face $5\frac{1}{2}$ " Strips 17 on each side are pivoted on lock-nutted $\frac{1}{2}$ " Bolts fixed in the Corner Brackets 15 by two nuts each, with Washers on the Bolts for spacing purposes. The other ends of the Strips 17 are mounted on Rod 8 between the Swivel Bearings and Collars. It should be noted that the Swivel Bearings are not fixed on Rod 8.

The $\frac{3}{4}$ " Flanged Wheels of the roller shafts run on the edges of Strips 3 and the $5\frac{1}{2} \times 3\frac{1}{2}$ " Flat Plates. The Wheels are held in contact with the edges of the parts by 6" Driving Bands looped between the Cranks 16 and bolts in the End Bearings 13.

The bed for the type is a $3\frac{1}{2} \times 2\frac{1}{2}$ " Flanged Plate 18 bolted between the $5\frac{1}{2} \times 3\frac{1}{2}$ " Flat Plates. A type holder 19 is made by fixing a $3\frac{1}{2}$ " Angle Girder, strengthened by a $3\frac{1}{2}$ " Strip, along each side of a $3\frac{1}{2} \times 2\frac{1}{2}$ " Flanged Plate. The upper flange of this Plate is strengthened by two $2\frac{1}{2}$ " Strips and is connected to the $3\frac{1}{2}$ " Angle Girders by Angle Brackets. Two $2\frac{1}{2}$ " Angle Girders 20 placed together, also are connected to the $3\frac{1}{2}$ " Angle Girders by Angle Brackets, to make an open box $2\frac{1}{2}$ " square

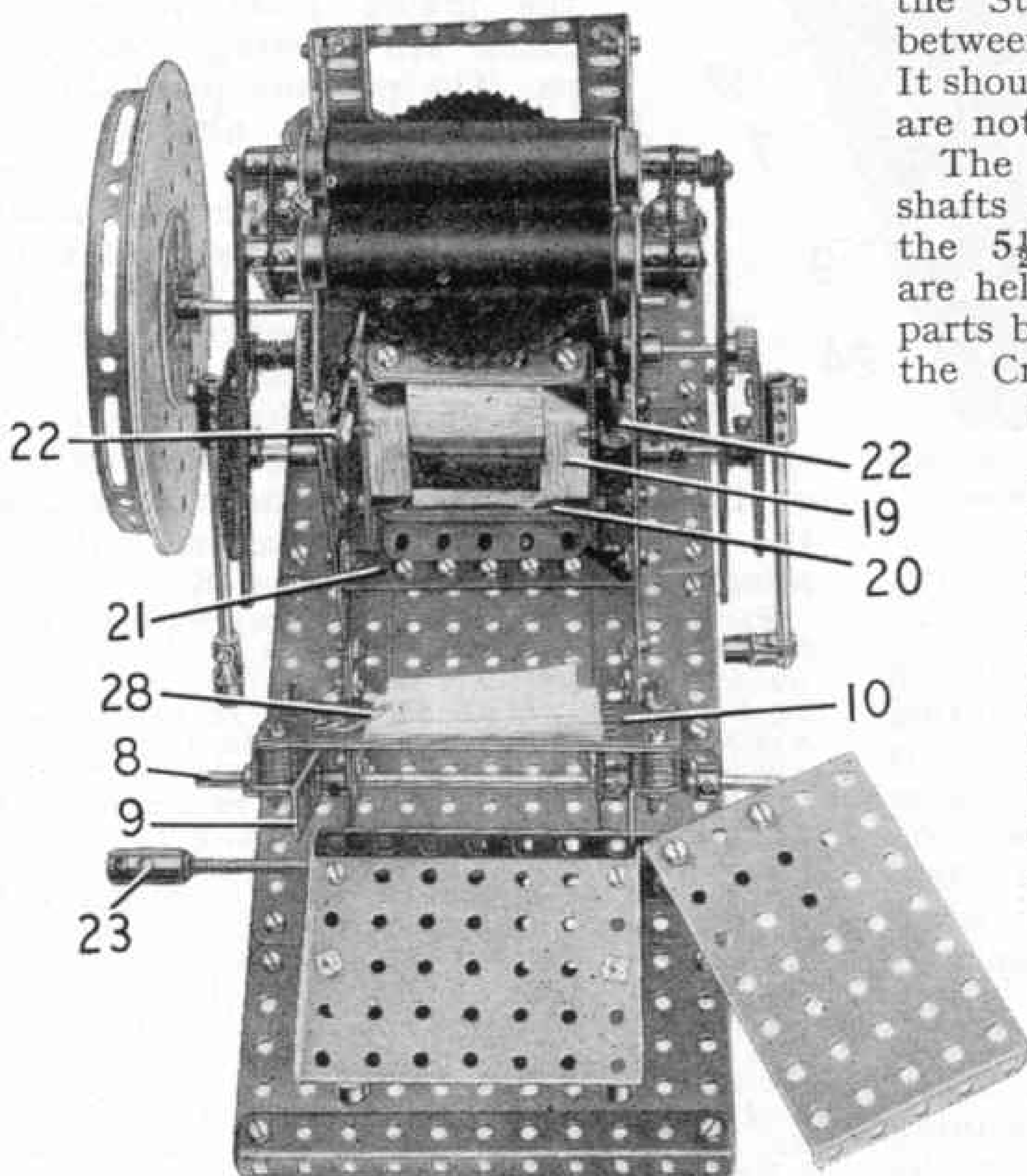


Fig. 3. A semi-plan view of the model, showing the type holder and the way in which it is mounted in the machine.

to hold the type. The type holder rests on a $3\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 21 and is held on it by bolts as shown. The upper end of the type holder is pressed against the bed by bolts in Collars 22. These Collars are fixed on 2" Rods passed through the Plate 18. A Compression Spring and a Collar are then placed on each Rod.

A 6" Driving Band is passed over the Girders 9 and at each end is looped over

plate moves backward again and will not print even though the machine is still in motion.

The operating E20R Electric Motor is bolted to the rear of the base (Fig. 2), and is fitted with 16:1 ratio reduction gearing provided by two $\frac{7}{16}''$ diam. Pinions and two 60-tooth Gears. The driving shaft carries a $\frac{1}{2}''$ Pinion 25 that engages a $1\frac{1}{2}''$ Contrate on a Rod 26. A $\frac{1}{2}''$ Pinion at each end of Rod 26 drives one of the $2\frac{1}{2}''$ Gears on Rod 5, and a 57-tooth Gear also fixed on Rod 26 engages a $\frac{1}{2}''$ Pinion on the flywheel shaft 27. The flywheel is assembled from two Face Plates, a Hub Disc and two 6" Circular Plates.

The model is completed by adding feed and delivery trays as shown, and by placing $\frac{3}{8}''$ Bolts along the lower edge of the pressure plate to support the paper. After printing, the paper is peeled from the type by an Obtuse Angle Bracket 28.

The type can be set up in its holder and fixed tightly in place by inserting wood packing pieces along the sides, top and bottom. The Eccentric 6 must be adjusted on its shaft so that the ratchet mechanism rotates the inking plate while the rollers are passing over the type. The pressure plate should be adjusted by altering the position of the Rods 7 in their Couplings. The pressure plate must be parallel to the type when it is in the printing position, and if necessary, Washers should be placed on the Bolts that fix it to the Girders 9.

The model is prepared for printing by spreading a small amount of printing ink on the 3" Sprocket. Minor adjustments of the type-holder can be carried out by altering the position of Plate 18.

Parts required to build the Printing Machine: 4 of No. 2; 8 of No. 2a; 3 of No. 3; 1 of No. 4; 28 of No. 5; 6 of No. 6a; 2 of No. 8; 3 of No. 9; 4 of No. 9a; 4 of No. 9b; 2 of No. 9d; 4 of No. 12; 1 of No. 12c; 4 of No. 14; 3 of No. 15; 1 of No. 15a; 1 of No. 15b; 2 of No. 16; 3 of No. 16a; 3 of No. 16b; 2 of No. 17; 2 of No. 18a; 4 of No. 20b; 5 of No. 26; 2 of No. 26c; 1 of No. 27a; 2 of No. 27c; 2 of No. 27d; 2 of No. 28; 136 of No. 37a; 107 of No. 37b; 45 of No. 38; 1 of No. 45; 2 of No. 48; 3 of No. 48b; 2 of No. 52a; 4 of No. 53; 3 of No. 53a; 26 of No. 59; 2 of No. 62; 3 of No. 62b; 3 of No. 63; 1 of No. 63c; 5 of No. 70; 2 of No. 77; 1 of No. 80; 1 of No. 95b; 2 of No. 109; 4 of No. 111; 2 of No. 111a; 13 of No. 111c; 1 of No. 118; 2 of No. 120b; 2 of No. 128; 1 of No. 130a; 2 of No. 133; 2 of No. 146; 1 of No. 147a; 3 of No. 147b; 1 of No. 148; 4 of No. 163; 8 of No. 164; 2 of No. 165; 2 of No. 166; 4 of No. 179; 3 of No. 186a; 1 E20R Electric Motor.

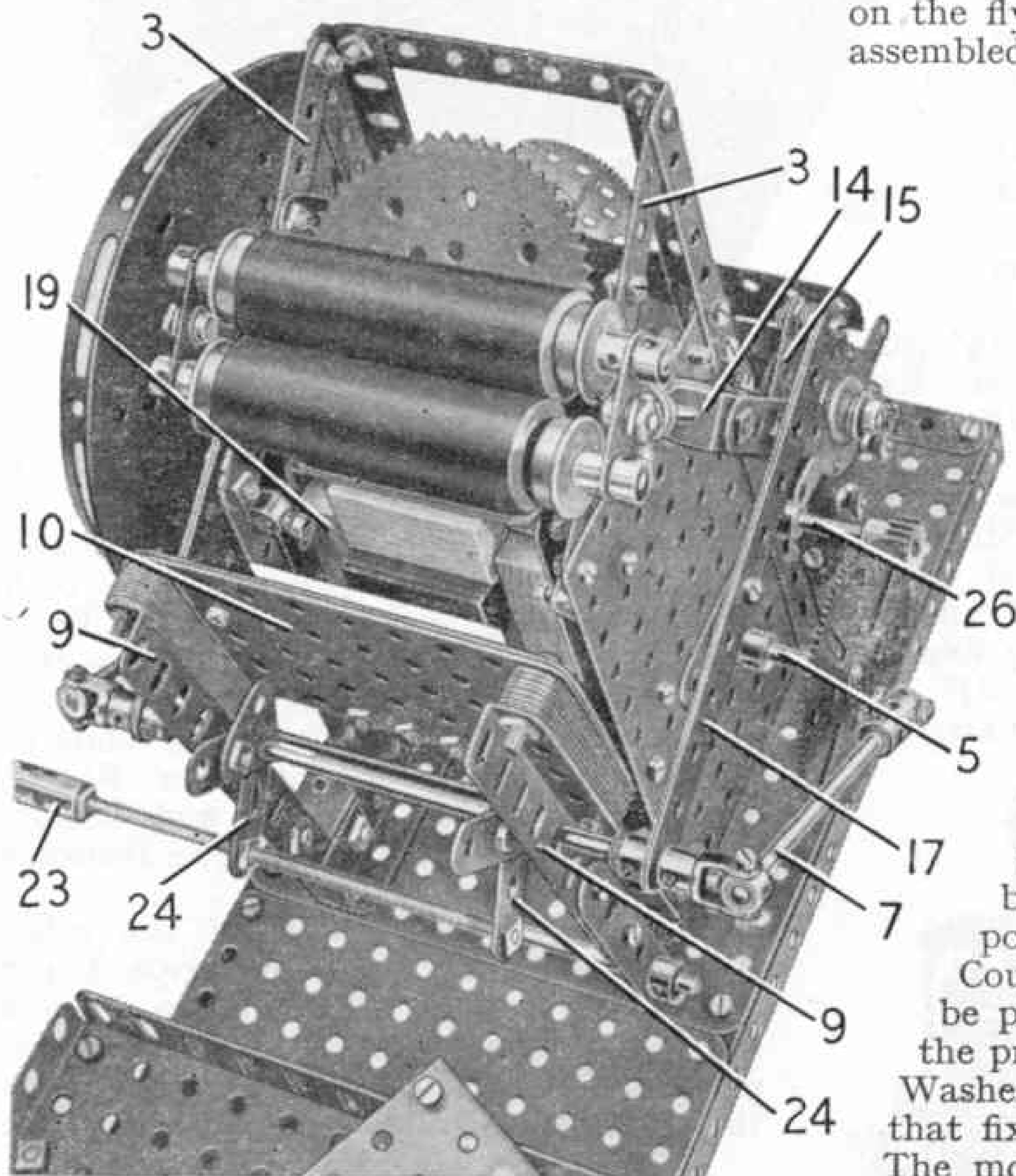


Fig. 4. A close-up of the inking rollers and the crank mechanism that operates the machine.

Rod 8. The Driving Band pulls the pressure plate back to the limit of the slots in the Girders 9, but when printing it is moved forward into the printing position by operating a lever 23. This lever is a Screwed Rod held by nuts in two Bell Cranks 24, which are fixed on Rod 8 as shown. A 1" Triangular Plate is bolted to each Bell Crank, and when lever 23 is operated these Triangular Plates and the ends of the Bell Crank arms press against the rear face of the pressure plate and force it forward. When the plate is forward it is in the printing position, but by releasing the lever the



Club and Branch News



WITH THE SECRETARY

FOSTERING A COMMON INTEREST

With the return of the dark evenings Meccano model-building regains its place as a major activity in the Club programme. This activity needs directing into definite channels, however, and while an occasional "Build what you like" meeting will suit the more inventive members, model-building as a general rule should have some specific subject, or subjects, as its goal. Some Clubs favour a "mass concentration" upon the construction of a particular large model, each member being given a certain job to do, or a group of members made responsible for one part of the model. Such team work is an excellent means of welding the membership together.

A little friendly rivalry can be stimulating, however, and certain Clubs with a fairly large membership achieve this by dividing the members into groups or "factions", each group being given an appropriate nickname such as *Nuts*, *Bolts* or *Screws*. Each group is allocated a particular model to build, and when all the models have been completed and grouped together they are collectively inspected and judged, and points awarded according to merit.

Whichever course is adopted the members learn how to work together amicably and of the joy derived from taking a pride in the job in hand.

FORTHCOMING CLUB EXHIBITION

The Norbury Transport and Model Railway Club, which includes the Norbury M.C., will hold their Annual Exhibition on Saturday, 19th November next at St. Stephen's Church Hall, Winterbourne Road, Thornton Heath, Surrey, from 3 p.m. until 8 p.m. Prices of admission: Adults, 6d.; Children, 3d.

CLUB NOTES

BURY GRAMMAR SCHOOL M.C.—The School Exhibition staged after the annual Prize Giving included the usual Hornby-Dublo display by this Club, and the layout again proved to be an outstanding attraction. Several excellent Meccano models built by members were shown. Club roll: 12. *Secretary*: I. A. Stockley, 22 Benson Street, Bury, Lancs.

CONSETT AND DISTRICT Y.M.C.A. M.C.—Members have been busy preparing for the Club display at the Consett and District Annual Show. It will include a model of the historic locomotive *Rocket*, one of a 56-ton

iron ore truck that runs between Tyne Dock and Consett Iron Works, and the model of the world's largest dragline referred to last month. Club roll: 36. *Secretary*: B. Ward, 10 Cyril Street, Number One, Consett.

AUSTRALIA

MELBOURNE M.C.—Meccano model-building continues to be very popular, and some outstanding models have been constructed. So many members have become interested in "00" gauge that Hornby-Dublo working was demonstrated at a recent meeting by Peter Fisher, a member. He arranged his layout on a new table that can be extended to accommodate a much larger Hornby-Dublo layout if subsequent events justify it. The showing of coloured film slides on the Club screen is also very popular. *Secretary*: Mr. L. Ison, 8 Hayes Street, Northcote N.16, Victoria, Australia.

INDIA

MYSORE M.C.—New President, Vice-President and Leader have been elected, and with this fresh inspiration the Club is now well launched on a series of regular Meccano Model-building meetings at which members have already given proof of their enthusiasm and skill by completing some excellent models. Plans have been made for the Club to stage an impressive display at the forthcoming Mysore Dasara Exhibition, which will be the largest so far held in Mysore. The Exhibition will be opened by Mr. J. Nehru, Prime Minister of India. *Secretary*: M. N. Radhakrishna, No. 1096 Chamaraja Puram, Mysore, India.

NEW ZEALAND

CHRISTCHURCH M.C.—The Club's 25th Anniversary was a great success. The 60 people who attended included several past members, prominent among whom was Mr. J. Ancall, a past Leader and the oldest "veteran"—he joined the Club on its second night. A nicely varied programme of model-building and

Hornby train operations maintains members' interest and enthusiasm. *President*: Mr. C. E. Saunders, 6 Walsall Street, Riccarton S.W.1, Christchurch, N.Z.

BRANCH NEWS

HALE END (LONDON)—An outing to two more British Railways S.R. sheds was very interesting. Indoor model railway operations have been continued. *Secretary*: A. L. Coe, 463, Hale End Road, Highams Park, London E.4.



Mr. C. E. Saunders, President of the Christchurch (New Zealand) M.C. which, as reported on this page, recently celebrated its 25th anniversary. Throughout its existence this Club has been fortunate in its Presidents and senior officials. Mr. Saunders is himself a keen and expert Meccano model-builder, and the marked success of the Club's displays at Exhibitions shows how effectively he imparts his enthusiasm to the members.

HORNBY RAILWAY COMPANY

By the Secretary

Remote Control in Hornby-Dublo

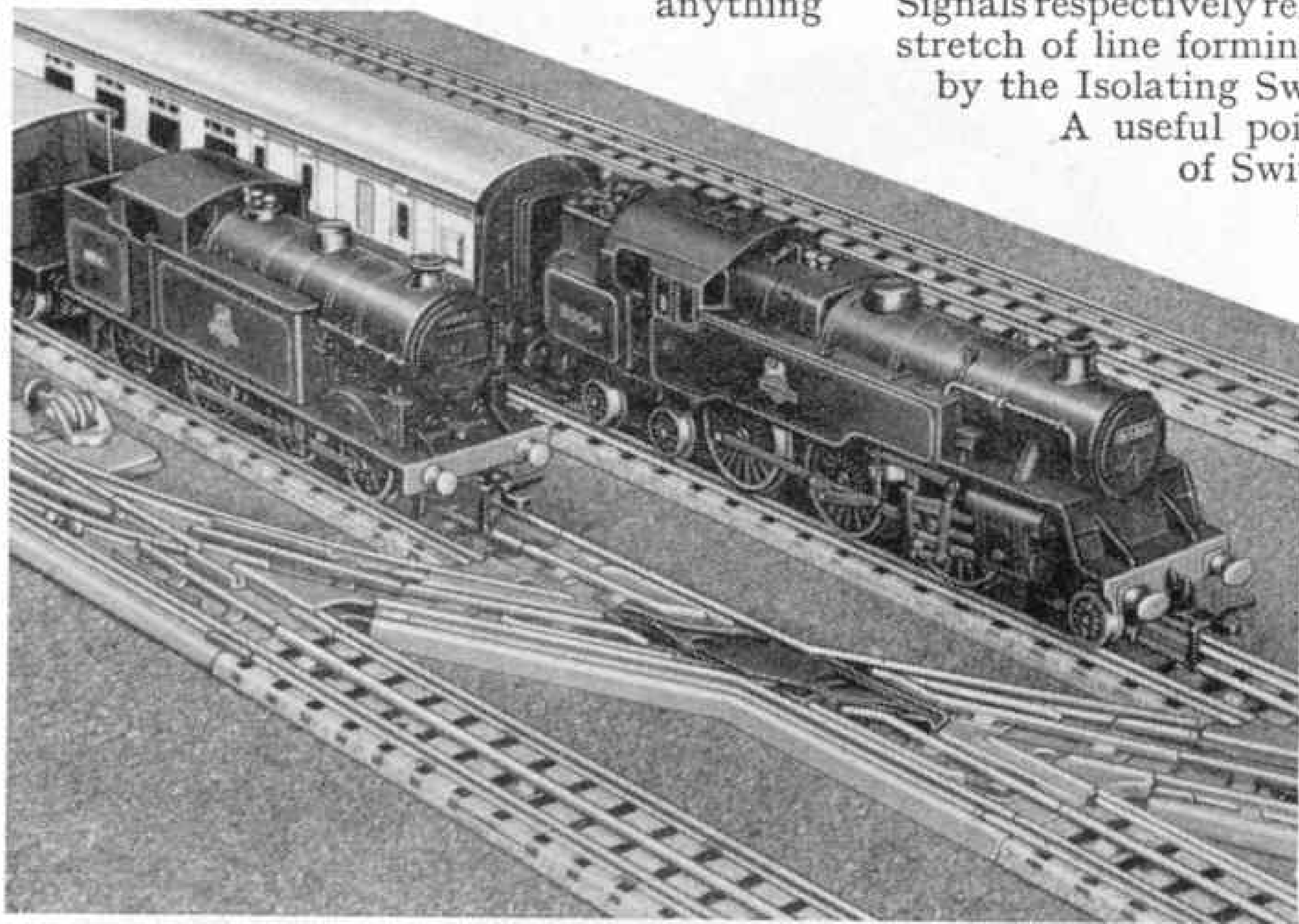
EVERY Hornby-Dublo owner soon becomes skilful in using the control handle of his power unit. But he can do much more from the lineside than run his trains, and the care with which a road can be set, and the correct signals given, for instance, has to be tried in practice before it can be fully appreciated. In fact, with Electrically-Operated Points and Signals, and the Electrically-Operated Uncoupling Rail, the owner of a Hornby-Dublo railway can carry out practically the whole of his railway working without touching anything

D1 Switches, which have three terminals and have red casings. They are distinguished from the D2 Isolating Switches, which are similar in general appearance, but have black casings and two terminals.

On a layout where there are several Switches of each type it is the usual practice to group the red ones and the black ones separately, but it is not absolutely necessary to follow this arrangement. They can be arranged in any way the operator finds convenient. Thus an Isolating Switch D2 can be placed with the two red-cased D1 Switches that work the Points and Signals respectively relating to the particular stretch of line forming a section controlled by the Isolating Switch.

A useful point about both kinds of Switches is that they are so constructed that they can be grouped together to form, in

Part of a busy layout on which the use of Electrically-Operated Points and Signals would be of advantage, particularly where crossover points are involved, as in this picture.



except his control handles and Switches.

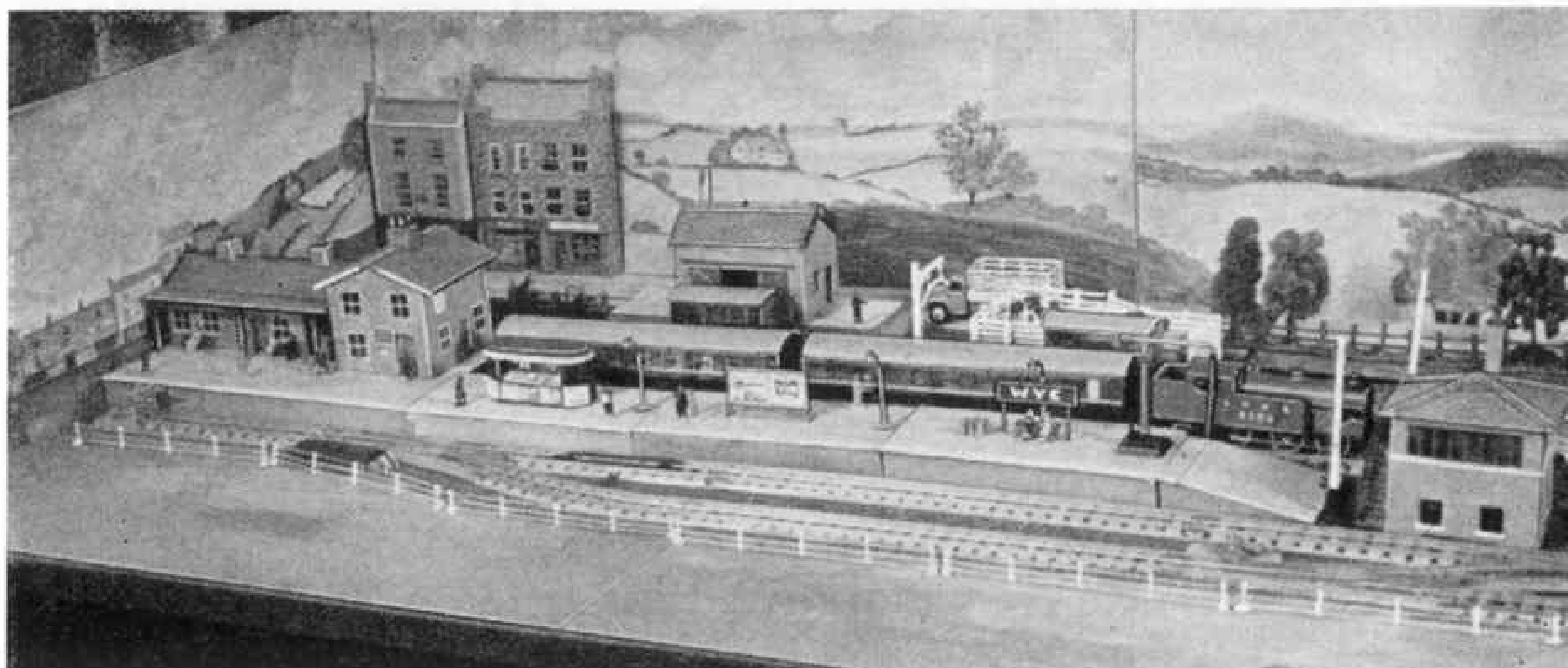
Some of you may think that the wiring up of such accessories is rather a complicated affair, but I can tell you that it is not. The connections between an Accessory such as a Signal, its operating Switch and the power supply are simple in themselves and they are fully detailed in the instructions that go out with all Electrically-Operated Points, Signals, or Uncoupling Rails. As more Accessories are added the wiring scheme is just repeated, so that even on a large layout it is the amount of wiring rather than complexity that has to be considered.

Electrically-Operated Points and Signals are worked by means of the familiar

this purpose. They are made in two lengths so that either four Switches, or six, if required, can be grouped together. This is done by just placing the Switches side by side, passing the Rods through the holes provided near their bases and screwing the nuts tight on their ends.

On a Hornby-Dublo railway provided with Electrically-Operated Points, Signals and Uncoupling Rails, the operator becomes traffic controller, signalman, driver and shunter all in one. In making any particular movements the Points should be set first. Then the appropriate Signal, or Signals, can be pulled off and the engine or train can be set in motion. If the train has been standing on a section isolated electrically

effect, a complete lever frame. There are special Grouping Rods for



"Wye," a country branch terminus on the layout of Mr. G. A. Scott, London. Good use is made of Hornby-Dublo Electrically-Operated Accessories, including Uncoupling Rails and Points. Photograph by Kelvin Photos, London.

from the main circuit, the D2 Switch controlling this section should be operated to make the section "live" before the movement of the Signal. If this order of operations is followed as a matter of routine, the Hornby-Dublo owner will find that he can carry out a series of quite involved manœuvres without getting "tied up" or flustered in the course of them.

Many Hornby-Dublo owners make a practice of inter-connecting some of their Points and Signals. Some of the arrangements may not be entirely correct according to actual practice, but the miniature railway manager has a certain amount of licence in this respect and this inter-connection can be really useful at times.

An example of this is shown in the wiring diagram on this page. In it a set of Left Hand Electrically-Operated Points and the appropriate Junction Signal are wired to operate together. If the connections are made as shown, and the operator pulls the Switch lever over to the left, as seen in the diagram, the Points are set

for the curve, and at the same time the semaphore of the left-hand "doll" on the Junction Signal rises to the "clear" position. When the lever is pushed back the Points return to normal. At the same time the right hand semaphore goes to "clear," and the left hand one to the "stop" position.

Control of the Electrically-Operated Uncoupling Rail is arranged somewhat differently. Instead of pulling or pushing a switch lever, which only feeds current to the Points or Signal "motors" during the middle portion of its travel, the operator has to use a special push-button Switch. The uncoupling ramp is raised electrically when the push button is pressed down, and current remains on only so long as the operator's finger is on the Switch. This helps a lot, because the operator does not have to remember what position the ramp is in. It only operates so long as he is pressing the button. The idea is that it is easy when several movements to and fro over the Uncoupling Rail are required in the course of shunting operations. Each time press the button down to uncouple, and then release it. Simple, isn't it?

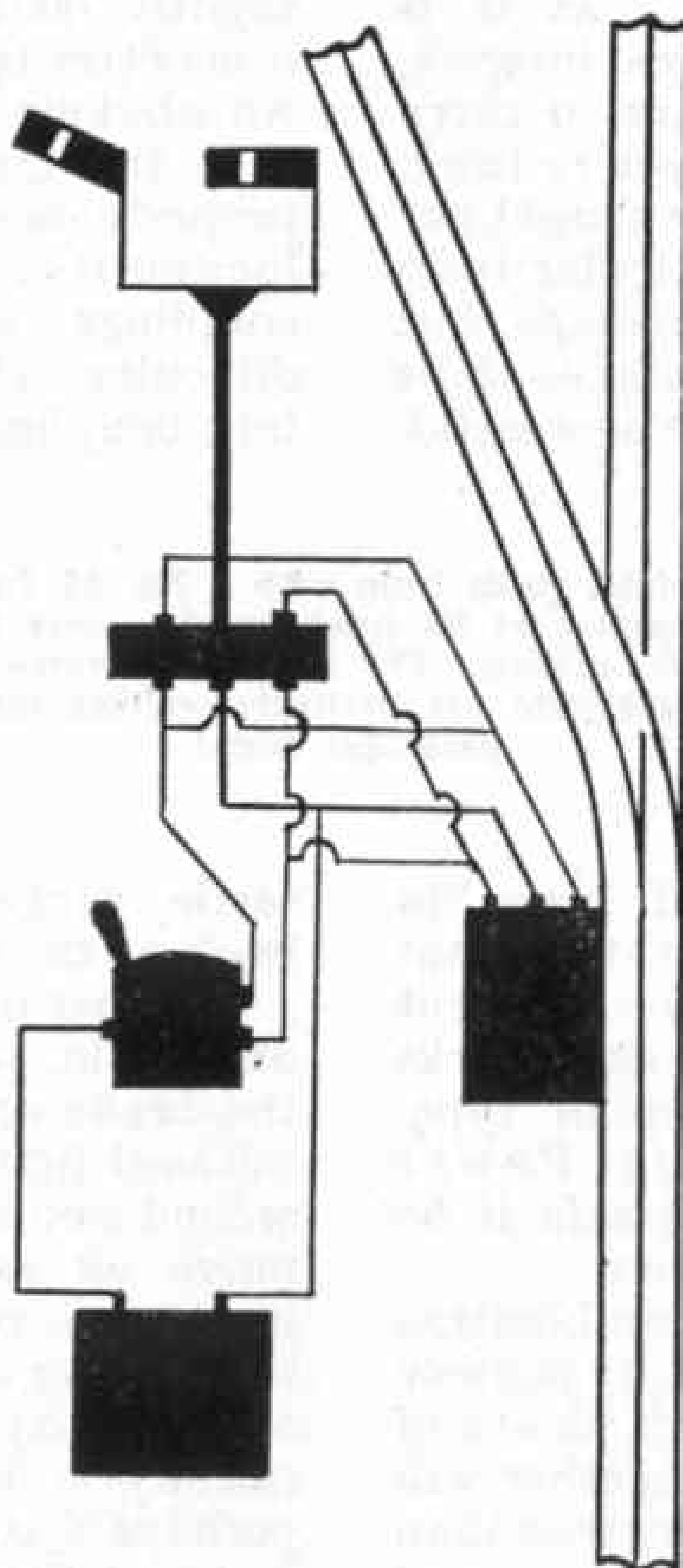


Diagram of Electrically-Operated Junction Signal and Points inter-connected so that the Signal Arms show which way the switch rails are set.



Double-Headers and Brakes

IN our Hornby Train talk last month we finished up with a brief note on the use of two engines on one train. A real train that is piloted or "double-headed", as it is sometimes called, always excites interest, and a Hornby Train owner likes to carry out similar workings on his own railway. There is no reason at all why he should not do so, if the weight of any particular train is too much for one engine to manage, but there are one or two things that have to be watched if such working is to be successful.

We have often pointed out in these pages that the ideal arrangement for double-heading on clockwork layouts is to use two engines of similar type, or at least with similar mechanisms. Such a pair will keep "in step," as it were, better than two that have clockworks of slightly different characteristics. Of course all clockworks vary a little, even those of similar type, but the miniature Motive Power Superintendent will be playing safe if he puts two similar engines together.

The running results of such a combination will sometimes surprise the Hornby railway owner. Given a good track, with plenty of straight run, the two engines together will often take a bigger load or run further than might be expected from the performance of

one engine pulling just half the train on its own.

If one engine of a pair does tend to be slightly faster on the run than the other, it is better to put the faster engine in front. An obvious precaution of course is to see that the tender of the leading engine is properly coupled to the front of the second locomotive. Where similar types of couplings come together there is no difficulty. But if an automatic and a plain link coupling are involved, then we must

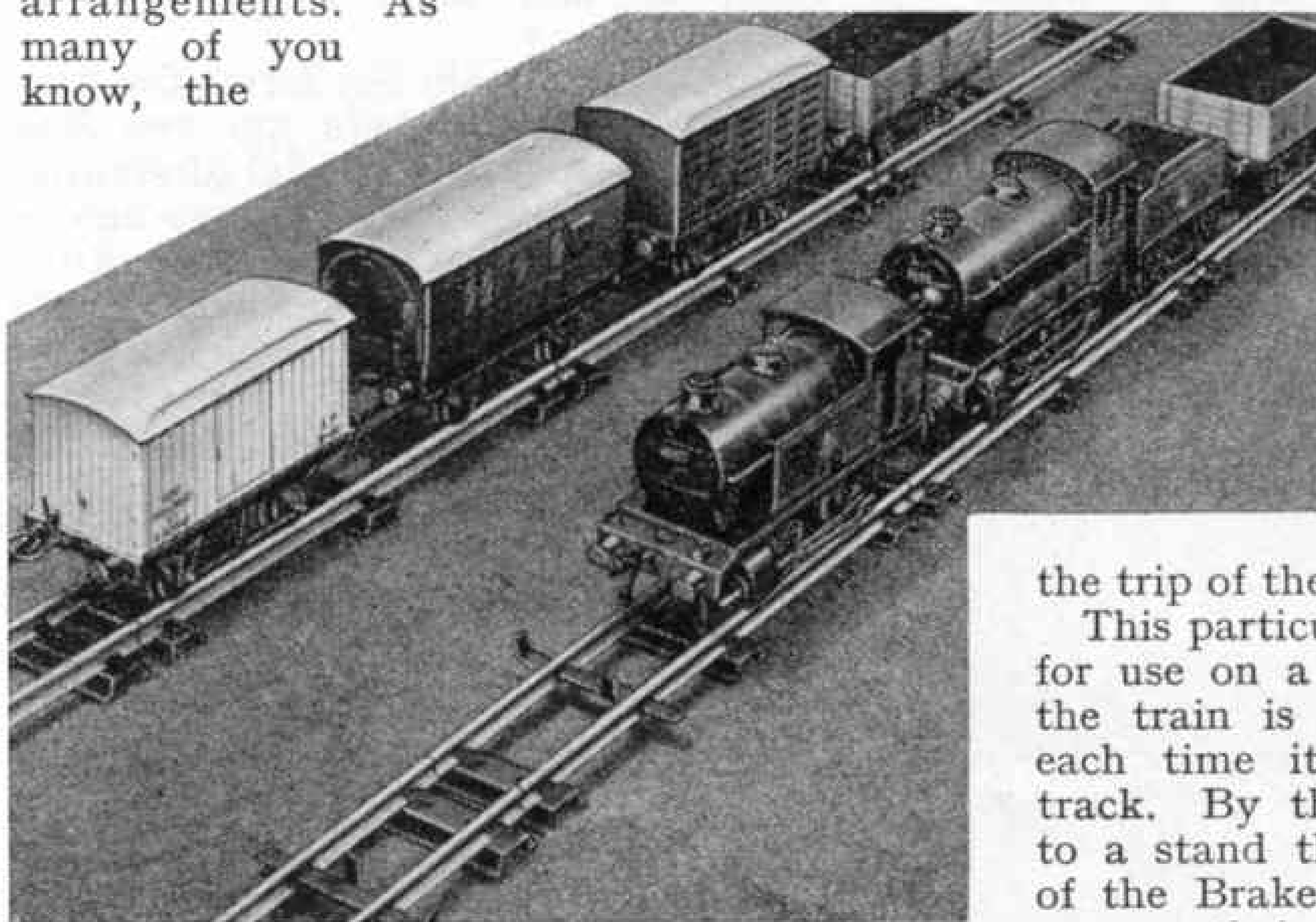
follow our usual rule of placing the loop of the automatic over the hook of the other coupling. It is no good trying to work the opposite way round. The link of the plain coupling will not

settle properly on the specially-shaped hook of the automatic type.

Another little point is that when starting off a train, both engines being fully wound, the brake on the leading engine should be released first. Then when the brake of the second one is released the whole train will move off smartly. Some operators may manage to release both brakes at the same time, using one hand for each; but it is not always easy to do this, especially if the railway is down on the floor and there is perhaps a station, signal or something else between the engines and operator.

A mixed goods train with a No. 40 Tank locomotive at its head trundles over the Level Crossing. The miniature figures on the platform are patiently waiting for a passenger train!

Now we have started our train the next thing we must consider is stopping it. One or two problems may be involved if we are using the standard Brake Rail for this purpose. With two similar locomotives together on a train there is no particular difficulty, but in a situation like that shown in the upper picture on this page, where a No. 40 Tank is leading a No. 51 Locomotive, we have to make special arrangements. As many of you know, the



A No. 40 Tank and a No. 51 Locomotive approach a combination of two BBR Rails arranged to operate the brakes on both engines almost simultaneously.

the brake gear of the second engine engages

the trip of the other rail.

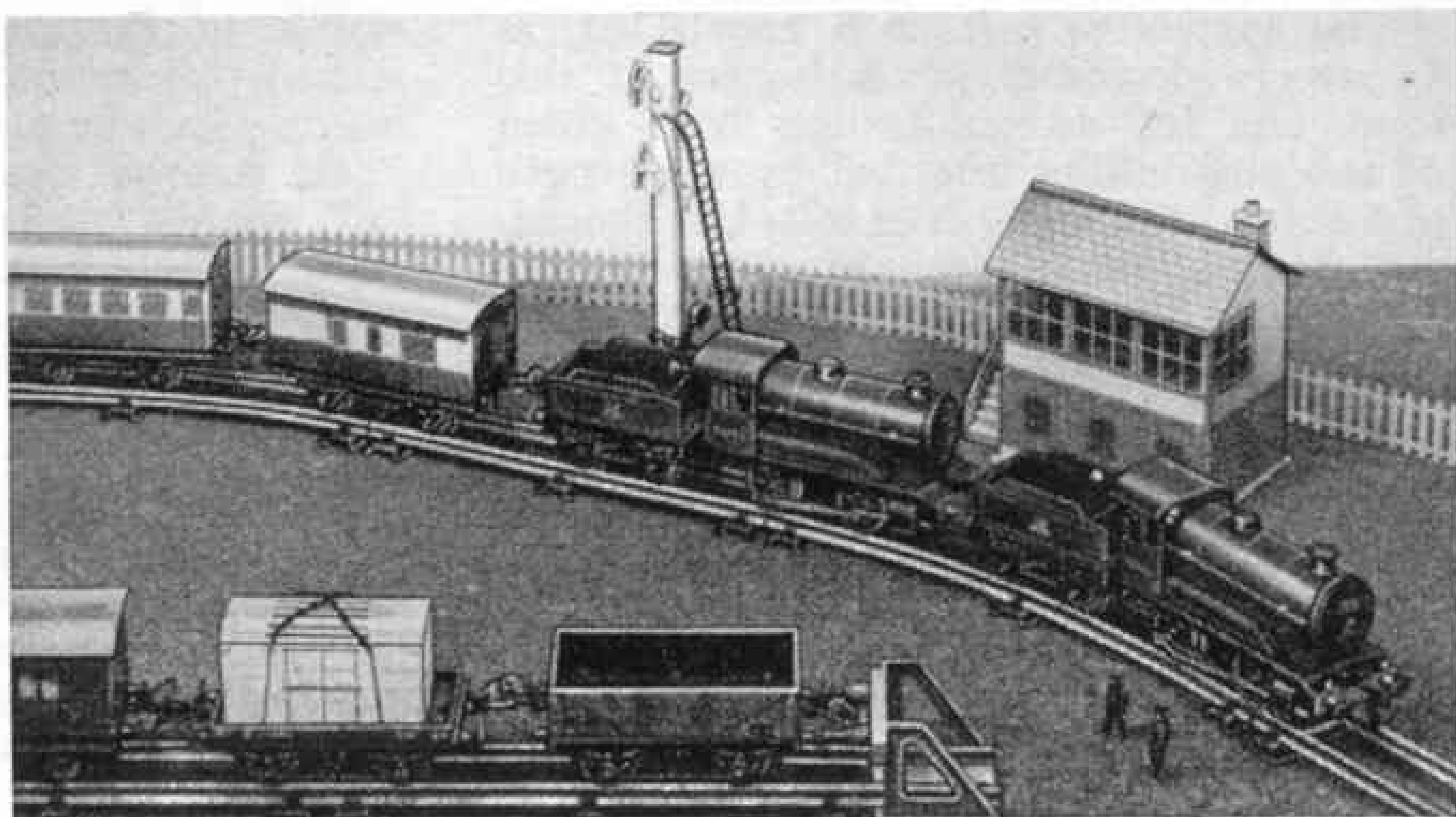
This particular scheme is only suitable for use on a continuous railway where the train is required to make a stop each time it makes a circuit of the track. By the time the engines come to a stand they have passed the trips of the Brake Rails and they can then resume their journey as soon as their brakes have been released. Ordinarily a No. 40 and a No. 51 Locomotive together could not pass a BBR Brake Rail without the brake gear of one or other of them being affected.

To ensure trouble-free working it is essential to see that the brake gear on the engines and also the track trips are free in operation. Both brake gear and track trips should be lubricated from time to time, using thin oil of sewing machine quality.

setting of the Brake Rail for a No. 40 Tank differs from that required for a No. 51 Locomotive; the brake trigger on the former is central, but on the latter it is set to one side, the left hand side actually when looking ahead.

This was the situation that faced one of our readers who wished to brake both the engines together. In solving our reader's problem, a little experimenting showed that with two BBR Rails adjacent to one another, as shown in the illustration, braking could be managed quite satisfactorily. As the track trip on the Brake Rail is nearer to one end of the Rail than the other it was found necessary to lay the Rails together in such a manner that the track trips were

An ideal double-heading arrangement; Hornby No. 50 and No. 51 Locomotives together on a heavy passenger train.



The Railway Scene

Hornby-Dublo Round the Town

THERE is little doubt that today the Hornby-Dublo railway owner is likely to regard his layout not as a railway only, but as an important part in a more or less complete model representing a whole district, a town or perhaps simply a village. This is all to the good, because the variety of activities and interests that are involved all form part of the general hobby of model railwaying.

An attractive layout that is a fine example of this trend is seen in the picture on this page and the upper one opposite. It belongs to Peter and Christopher Watson, of Malvern, both keen H.R.C. members and M.M. readers, full of enthusiasm for Hornby-Dublo railways and also for Dinky Toys. In

An aerial view of the main station on the Hornby-Dublo layout of Peter and Christopher Watson, Malvern. The railway system forms part of a miniature township.

the development of the layout they have had the interested and active support of their father, Major F. E. Watson, R.E.

The system is laid on a baseboard, as is always desirable for a layout of this kind, and full advantage has been taken of the possibilities afforded by the length of 8 ft. and the breadth of 6 ft. Hardboard, well braced, forms the base and the whole is mounted on trestles, bringing the system up to a convenient height for handling.

No further expansion is possible at present because the railway has to be accommodated in a bedroom, but we feel that Peter, the occupant of the room, would willingly camp out, if he thought that this would benefit the railway! Although the track itself is all at the same level, the township that it serves is not, and this makes possible some of

the fine effects seen in the pictures. In fact, the way in which the levels are arranged gives the impression that the layout is very much more spacious than it really is, and there is no sense of overcrowding.

A double track main line forms the basis of the railway, but there are two long outer loops that provide useful alternative and avoiding routes. One of these can be seen on the extreme left in the first of our two pictures, where it runs outside the main walls of the station, which by the way is named *New Street*. The other is



visible in the right hand corner of the second picture and a mixed goods train is making its way along the track concerned.

An unusual feature is provided by an "S" shaped return loop, practically the whole of which is in a tunnel under the main roadway and the centre of the township. Both continuous and there-and-back running is possible for passenger or goods trains, and the latter are able to make some quite interesting shunts.

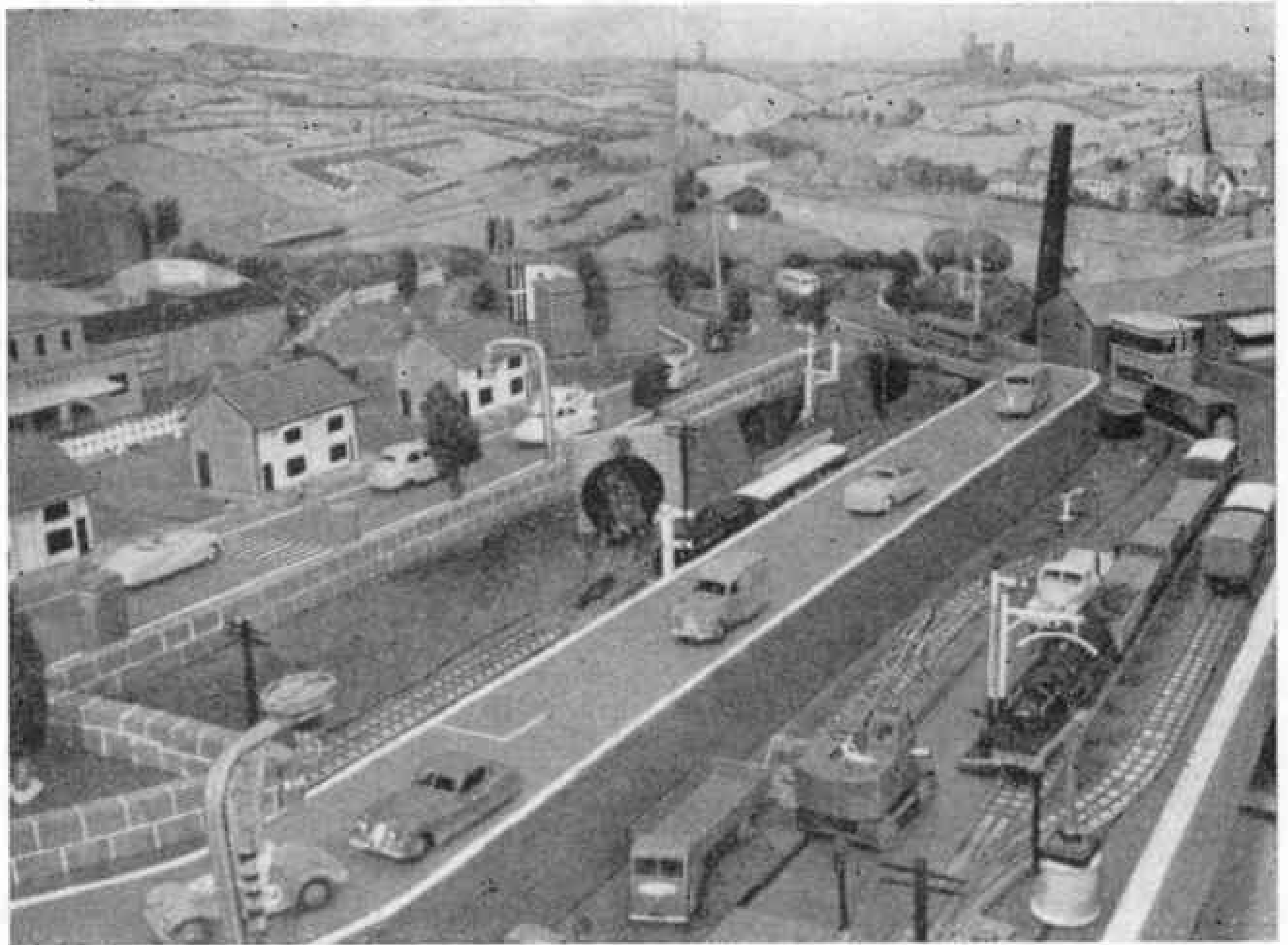
Railway traffic is heavy and to handle it there are four Hornby-Dublo Locomotives, the most recent of which is the popular and powerful 2-6-4 Tank. We learn that in order to get this engine the "Locomotive Committee" did a great deal of hard

Another view across the same layout. The raised roadway and the railway tracks at lower level are effectively arranged.

saving of pocket money! Now they have the satisfaction of seeing the engine in service on the layout.

Much work has been put into the construction of the roadways, buildings and so on. *New Street* station is specially interesting. It has three platforms, two of them for through traffic on the main line, and one terminal bay. The treatment of the roof is ingenious. The main walls are connected by five cross members arched at the top as are many railway station roofs. There is, however, no roof proper. Instead, imagination supplies the glazing. After all, a real roof is sometimes a nuisance to the model railway owner, who often wants to reach inside his station. The Watson's can do this comfortably!

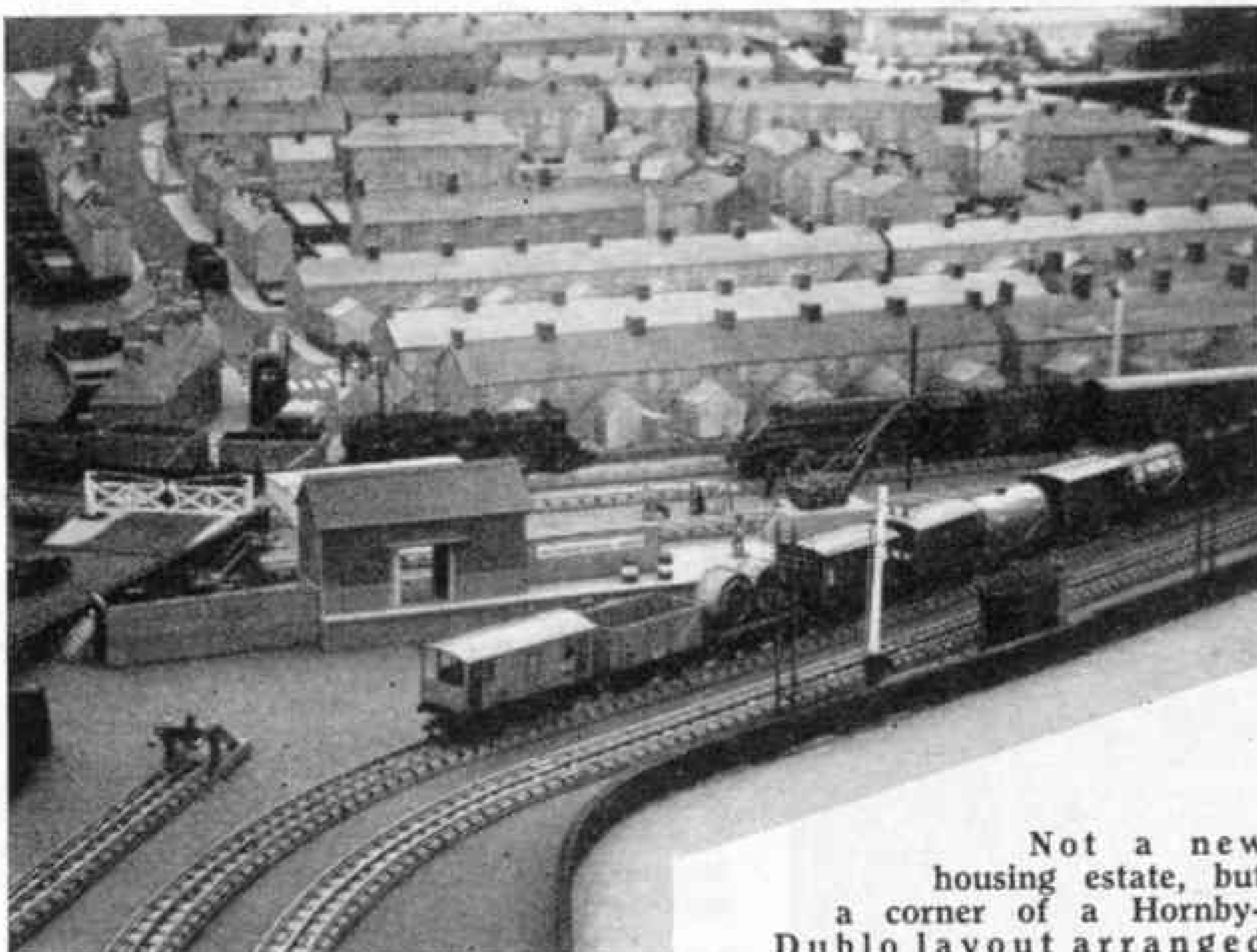
Pavements, roadways, parking spaces and so on are all neatly marked out in white paint, so with road signs and good lighting drivers of Dinky Toys vehicles have no difficulty in finding their way around. The lighting of the buildings and



the roadways is in fact a special feature of the electrical installation, a separate Transformer being devoted to this purpose alone.

The third illustration shows something of the possibilities of street by street modelling with the aid of simple, but effective buildings. The layout forms part of a display sponsored by the Lowestoft Town Council and the exhibit, complete with railway, appeared at the Suffolk Agricultural Show. Hammant's Limited, the Meccano dealers who undertook to fit up the Hornby-Dublo Railway, report that the model attracted a great deal of

attention and that considerable interest was shown in it and the railway by H.M. The Queen Mother when visiting the Show. It is estimated that the two locomotives in use covered about 45 actual miles in the course of the two days during which the show was open. Previously, one of these had already covered about 250 miles in a window display, without any attention other than routine oiling and so on. Similar performances by other Hornby-Dublo Locomotives also have been made recently in the course of exhibitions and displays.



Not a new housing estate, but a corner of a Hornby-Dublo layout arranged

specially to show the building development possibilities of an actual area.

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For other Stamp Advertisements see also pages 572 and xx

Stamp Collectors' Corner

By F. E. Metcalfe

LIMES LAND

MONTSERRAT was recently in the philatelic news with a change of portrait from King George VI to Queen Elizabeth II. On this colony, like Dominica some of whose stamps are illustrated here, limes are grown freely; with oranges, tomatoes and sea cotton. It is one of the four components of the Leeward Islands Presidency, and its capital is Plymouth. This Presidency is being broken up. Antigua is the head of the group, as it were, and that is the reason why 1d. and 6d. stamps of the latter colony were overprinted in 1876, when it was decided to let Montserrat have its own postage stamps. Two

of the then current stamps had the name Antigua crossed out and Montserrat printed underneath.

There are two shades of the 6d., green and blue-green, and in 1883, as a ½d. stamp was needed, some of the 1d. stamps were bisected for the purpose.

Copies of these half stamps, with ½ printed on them in black, turn up from time to time. But these are said to be fakes, so if you come across one, don't imagine that you have found something really special.

There is just one point about the blue-green shade of the 6d. stamp. A mint copy is catalogued at £18, but apparently used copies are not known, and this makes one wonder if the shade is genuine at all. Oh yes, I know that the shade has been catalogued, but I also know that lots of doubtful items were given recognition in the days when collectors blindly followed and believed in anything which might be catalogued. Fortunately for themselves, collectors to-day have minds of their own, and in the main much more knowledge of their stamps than was once the case. I affirm this, in spite of all that has been written about those "giants of the past."

In 1880 Montserrat got its first stamps, that is its first stamps printed specially for it. They were the plain and full

key type, with the head of Queen Victoria. The first of these were the 2½d. and 4d., and in 1884 several more values were added. It was between the release of the two stamps in 1880 and the ½d. stamp in 1884 that the



original 1d. stamp of 1876, to which I have already referred, was bisected and issued, pending the release of the proper stamp in Montserrat. Both 1d. stamps were bisected while they were current, for they seem to have been always running out of ½d. stamps.

There are two perforation varieties of the second 1d. stamp. The first was perforated 14 and the second 12. The latter is worth looking out for, as even a used copy is catalogued at 40/- and is actually worth about a third of that sum.

Montserrat got its first pictorial set in 1903. There were nine values from ½d. to 2/6, with the device of the

Colony for the design, watermarked Crown C.A. There was also a large stamp with the head of King Edward VII, watermarked Crown C.C. Next the watermark was changed to Mult. Crown C.A. There was yet a third change in 1908,



but this time in the colours of the stamps.

None of these stamps is particularly cheap, but they are undoubtedly scarce, and if they belonged to the much more popular KGV group, instead of the KEVII, they would sell for at least double what they do actually bring. King Edward VII stamps never have quite caught on as they should have done, but if there ever were a change in taste, and they became even half as popular as King George VI stamps, then we should see some fun.

Next we come to the first KGV issue. This consisted of a large 5/- stamp, released in 1914, and then a set of 11 values of ordinary sized stamps, showing not only the Device of the Colony (which had to be reduced) but the head of the King as well. The watermark was the old Mult. Crown C.A. Stamps of this set are mostly scarce, but watch out, for they came out again (with extra values) with the watermark Mult. Script C.A., which is still in use, and some of these stamps are not anything like as scarce as the stamps they replaced.

And now we come to the King-pin set, one which we would all like to own, but alas few of us can afford. In 1932 a set of ten values were issued to commemorate the



tercentenary of Montserrat's connection with the British Commonwealth. Alas, this attractive and very worthy issue was a flop, hence its high price today. As will be remembered, we were all very hard up in the early thirties, and even ten shillings was looked upon as too much to spend on stamps, even if we had it to spend. Consequently very few sets were sold. I don't know how many were disposed of, but the set brings more pounds today than it cost shillings while current.

After this we had the Silver Jubilee and KGV Coronation issues, in 1935 and 1937, and then in 1938 we got the KGV definitive issue. This was an attractive set of three designs, from ½d. to 5/-. There are not only two perforations—the first Perf. 13 is the scarcest—but also some very good shades, which accounts for its popularity, for most collectors like such varieties. During the currency of this set we had of course the Victory, Royal Silver Wedding, 75th Anni. U.P.U. and the University College commemoratives. Then in 1951 came the second KGV definitive set of seven attractive designs, and it is this set that has now appeared with the Queen's Portrait in place of that of her late father.

(Continued on page 574)



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For other Stamp Advertisements see also pages 570 and xx

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Stamp Gossip

THE QUEEN'S STAMPS

YEARS ago, when stamps were relatively few, it was all right to collect something of everything. But with over a hundred thousand stamps having been released already, and that number being increased by the thousand every year, to make a show at all one must concentrate. To those who contemplate a change therefore, or think of taking up the hobby for the first time and wonder which stamps to go in for, I would suggest that they should give consideration to the "QEII" issues of the British Commonwealth.

I have my own personal collection of these, and I am liking it more and more all the time, for many reasons. First of all the stamps are mostly very attractive. They form a group within the capacity of all collectors—you can take sets from a top face value of 3d. right up to the top, according to your wishes, and means—and if you take care to mount the stamps neatly, and keep them in perfect condition, their resale value will probably be higher than those of any other group.

You should have a catalogue of the stamps. The Commonwealth Catalogue of QEII Stamps for 1956

has just been issued. It contains lists not only of postage stamps and postage dues, but of booklets etc., as well. Though fully bound



and illustrated, it only costs 4/-, and any stamp dealer, or such booksellers as W. H. Smith and Sons, can supply it.

ELECTRIC TRACTION

I knew as soon as I got a copy of the French commemorative stamp issued on 11th May that here was one that I simply must ask the Editor to have illustrated. It shows the forepart of the train, including that fine looking engine, and was issued to commemorate the electrification of the Valenciennes-Thionville line.

The stamp is line engraved, and is beautifully produced, as are most French stamps. Formerly it was the custom to use damped paper when printing by the recess method. But France has developed a dry paper process, and now turns out work that is in a class by itself. There is nothing to touch an engraved stamp. Maybe, from a technical standpoint, those colourful issues turned out in Switzerland by heliogravure are very fine, but there is something lacking that recess printed stamps have.



THE ANDES

One of the stamps illustrated this month is of great interest just now, with so much talk going on about climbing high mountains, etc. It was issued by Chili to commemorate the visit to that country of President Peron, and shows peaks in the high range Argentina and Chile is called out



there, but also the statue that was erected on one of the peaks as a visible sign, after a frontier agreement had been made, of an expressed desire for perpetual peace between the two countries. I had the thrill of visiting the Andes once and, well, they are incredible.

SOME STAMP

I can just imagine how eyes will pop when the diamond shaped stamp is examined, with the stirring title *Millenary Issue. Defeat of Eric Bloodaxe 954*. I am afraid that I am so ignorant that I had never previously heard of the gentleman with the sanguinary title, and knew nothing of his background.

But I do know something of the background of such stamps as those issued by Lundy Island in the Bristol Channel, and Herm Island in the Channel Islands. While I do not deny their interest, they will never appear in some catalogues because of their status. They cover postage from the island on which they are issued to the nearest British Post Office, and while the G.P.O. will allow them to be stuck on the backs of envelopes, they must not appear on their fronts. I think collectors will be well advised to stick to the stamps that are catalogued.



EMBOSSSED STAMPS

More than once I have been asked what embossed stamps are. Well, here is one that was issued in honour of the great German poet Schiller, who died 150 years ago. These embossed stamps were always very popular, and those that British collectors go after most are the stamps issued by Gambia in 1869, the first issue of this country in fact. These bear a raised portrait of Queen Victoria, with a coloured background to set off the embossing.

Incidentally, the German stamp illustrated costs a little over a shilling mint, but mine came off an envelope and cost precisely nothing. You too may find one. They are not scarce, and they are interesting.

A Mountain Railway in Norway—*(Continued from page 523)*

that flank the valley. At one point three levels of the line can be seen, one above the other, and the Bergen line above makes what may be described as a fourth floor in this remarkable achievement of the railway engineer.

The time of descent from the mountain to the fiord is 53 minutes, but the uphill journey is shorter. There is also a road, made to allow constructional material to be brought up to the Oslo-Bergen line when this was built. This climbs to the level of the railway in a series of astonishing zig-zags.

Cradle of Air Power—*(Continued from page 526)*

Even the R.A.E. site at Farnborough, with its 800-acre aerodrome, is no longer big enough to house all the equipment needed for present-day aviation research. Much of the aerodynamic research is now done at the National Aeronautical Establishment at Bedford. Rockets are tested on ranges at Larkhill on Salisbury Plain and Aberporth in Wales. Rocket motors are developed at Westcott, and there are other laboratories at Martlesham, Orford and Cardington.

Quietly, efficiently, day after day, the R.A.E. continues to maintain Britain's leadership in the air. When the Comet disasters occurred, it was Farnborough that built a huge water tank in record time, put a complete Comet inside, and pumped up its fuselage with air and bent its wings at regular intervals to simulate hours of flying with the cabin pressurised in gusty conditions. When the fuselage burst, it confirmed the R.A.E.'s belief that the disasters were caused by metal fatigue, and today whole sections of the Establishment are devoted to combating this menace to aircraft safety.

The Comet investigation threw a spotlight briefly on the work of the Royal Aircraft Establishment. Now, once more, all is secret. But we can be certain that, whenever its help is needed, the R.A.E. will not fail our aircraft industry. There is no finer centre of aeronautical knowledge and research in the world than the cluster of buildings just to the north of the gnarled grey skeleton of the tree to which Samuel Franklin Cody tied his "Cathedral" biplane 47 years ago, before flying became a science.

Mails for the Isles—*(Continued from page 529)*

in the Orkneys, via Scapa Flow.

Mails for some of the small islets, such as Fair Isle, go on the last stage by small motor boats, such as *Good Shepherd*, which ties up at North Haven.

Perhaps the strangest mail service to an isolated spot is the one arranged some years ago for a lonely sheep farm on the banks of Loch Shin, in Sutherland. The arrangement resulted in the farmer receiving 10s. a week for collecting his own letters!

The Post Office is required to ensure that mails addressed to this farm across the Loch reach their destination, but it was found impracticable to recruit any local person to act as postman. So the tenant came to an agreement whereby he rowed across the Loch twice a week to collect his mail, and was granted an allowance for the time spent.

Trinidad's Asphalt Lake—*(Continued from page 533)*

pier on the coast.

The maintenance of railway tracks on an unstable mass such as the Asphalt Lake naturally involves some special problems. For example, the rails have to be re-laid at very frequent intervals to prevent them from sinking out of sight.

Operations at the Lakeside refinery continue day and night all through the year, refining the crude material in preparation for shipment to markets overseas. Asphalt is fed from the rail wagons into huge tanks, heated by steam coils, which remove all the surplus moisture and the vegetable impurities attached to it. It is then screened off and run into barrels. The screening plant is also steam-heated to prevent the

asphalt from sticking and cooling during this final stage of purification.

Refined asphalt from Trinidad Lake finds wide application in many important branches of civil and industrial engineering throughout the world to-day. But it is seldom used in its natural state because it is too hard.

Odd Lines on Trams—*(Continued from page 536)*

to explain what all those words mean, for to give away such secrets would indeed be an unforgivable sin. But, if you care to go to Chessington Zoo in Surrey you might find a tram enthusiast in a tram, and it is quite likely that he will be able to tell you all the answers. Yes, I am being serious! At Chessington Zoo you really will come across an old tramcar—parked near a country road. It is No. 1858, previously owned by London Transport, but now the property of some ardent tram lovers who have appropriately called themselves the "1858 Group." It is to be preserved for the sake of posterity, although at the moment it is used as a meeting place, members of the group gathering in the lower saloon for discussions on tramcars.

Stamp Collectors' Corner—*(Continued from page 571)*

In addition to all these stamps, since 1903 the stamps of Leeward Islands have been on issue and in use in Montserrat. While these may not have very attractive designs, they are sought after for their watermarks and shades, particularly the KGVI issue. Shortly these stamps will be withdrawn, and astute collectors are picking up what copies they can get while they are available. Later on they may be very nice stamps to have.

Summing up the stamps of Montserrat, the early issues may be beyond the pocket of the average collector, but from KGVI onward some nice items are to be found, and at reasonable prices. And here is a little tip. There are many good shades in the first KGVI set, apart from the perforation varieties. Gibbons only list one, but the Commonwealth gives several. The 3d. of the Perf. 14 is listed in a shade by both catalogues (CW 16a, SG 106ab) and it looks like proving a good little stamp. If you can buy at something under the Gibbons price of 4/- do so.

MODEL RAILWAY HOBBY SHOW

This Show will be held in the Central Hall, Westminster, London S.W.1, and will be open from 19th October to the 22nd. It is sponsored by the Model Engineering Trade Association, and visitors will find there a comprehensive display of model railways and model railway material.

The exhibits will include a fine Hornby-Dublo railway, with Meccano models and Dinky Toys. The Exhibition will be open from 11 a.m. to 9 p.m. daily, and the charges for admission are 2/- for adults, and 1/- for children under 14.

HOBBIES 1956 HANDBOOK*(Price 2/-)*

Fretwork enthusiasts will welcome this new edition of the Hobbies Handbook. In addition to cataloguing the current range of this firm's fretwork outfits and designs, it lists also innumerable tools and other equipment they produce for woodworkers generally, and as usual the text includes several helpful and interesting articles. For readers who are new to the fretwork hobby there are easy-to-follow instructions on how to construct miniature wooden toys cheaply. The more experienced craftsmen will want to try their hand at making the modern pieces of furniture and other articles for the home described in this book.

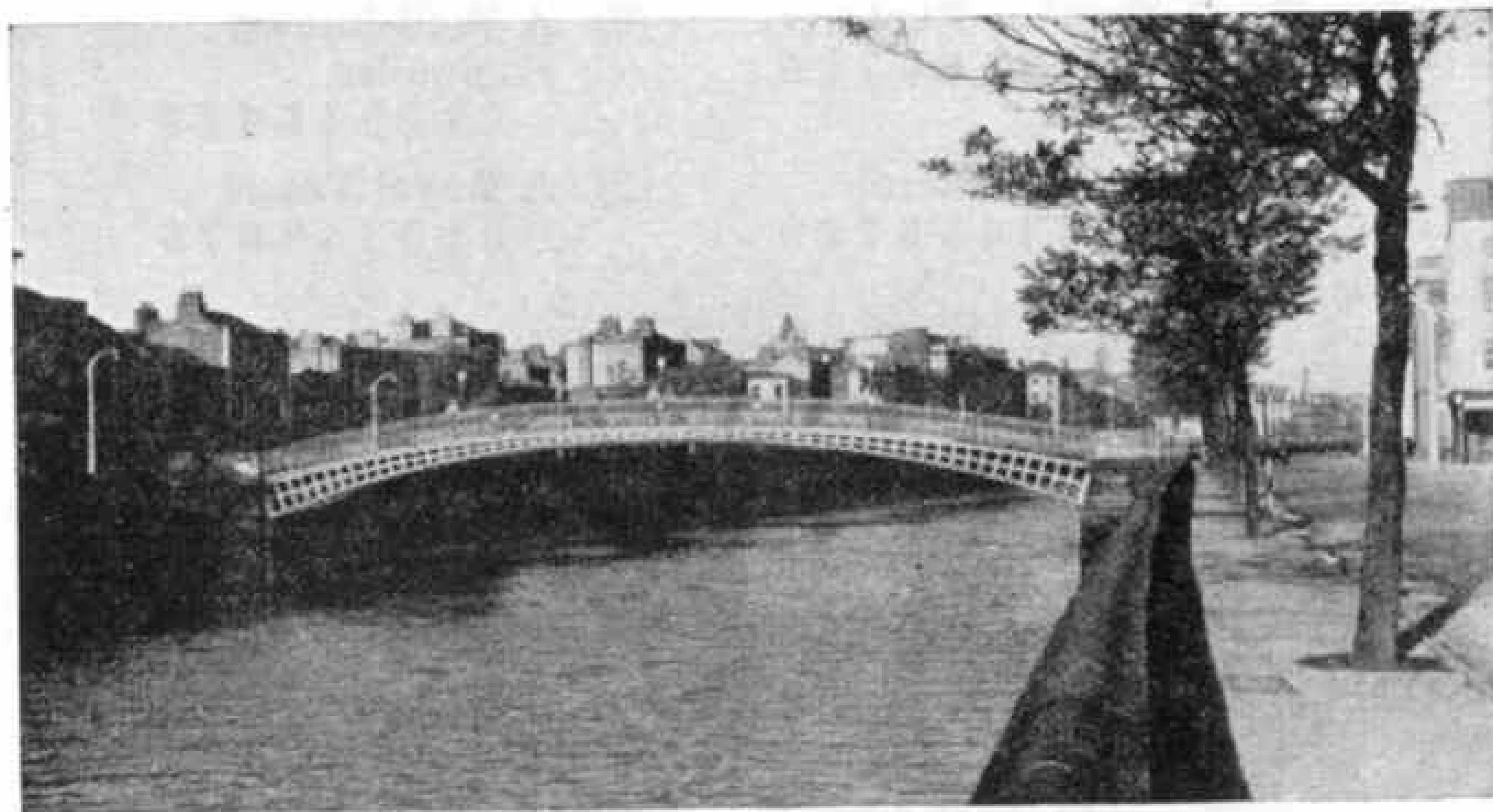
A traditional feature of this annual handbook is the free fretwork design given with it, and in this 1956 issue the subject is the 17th century galleon *Royal Charles*. A kit obtainable for building this attractive and colourful model includes a hull already partly shaped so as to eliminate much of the intricate work normally associated with such subjects.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, 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.

DUBLIN'S HALFPENNY BRIDGE

By far the most elegant of the eleven bridges across the River Liffey, in Dublin City, is the single span cast-iron footbridge called the Halfpenny Bridge. This was designed by some unknown person in 1816 and was built by a private toll company, which gave rise to the name by which it is known. Officially it was named the Wellington Bridge, and was renamed the Liffey Bridge in 1921.



The Halfpenny Bridge, Dublin. Photograph by R. G. Brooks.

The bridge is an arch with a span of over 100 ft. that was achieved by adapting methods of stone construction to work in iron. The three ribs forming the arch are each composed of a series of one hundred and twenty panels of cast-iron, which act as voussoirs, the truncated, wedge-shaped blocks which make up a stone arch. The effect is pleasing, as the bridge seems to spring out from either bank like a live thing.

R. G. Brooks (Dublin).

THE WANTAGE TRAMWAY

The Wantage Tramway Company's line, of standard gauge, was opened in 1857 and was laid on the grass verge on the left of the road from Wantage Road Station to Wantage itself, 2½ miles away. The passenger service was withdrawn in July 1925, but a freight service continued another 20 years.

The line's first steam engine was a veritable box on wheels, with a

stove-pipe chimney protruding through the roof. She was No. 4, but was known locally as the *Coffee Pot*. She came in 1877 and gave Wantage the honour of having the first regular steam tramway service in the country.

Then there was *Jane*, No. 5. Her official name was *Shannon* and she was technically a four-wheeled well tank engine. She was built in 1857 and arrived at Wantage 21 years later, after work on a private railway in Bedfordshire, the works at Crewe, and on a railway in Derbyshire. She missed a scrapyard in 1946 and was renovated and painted at Swindon, and then returned to Wantage Road Station for exhibition.

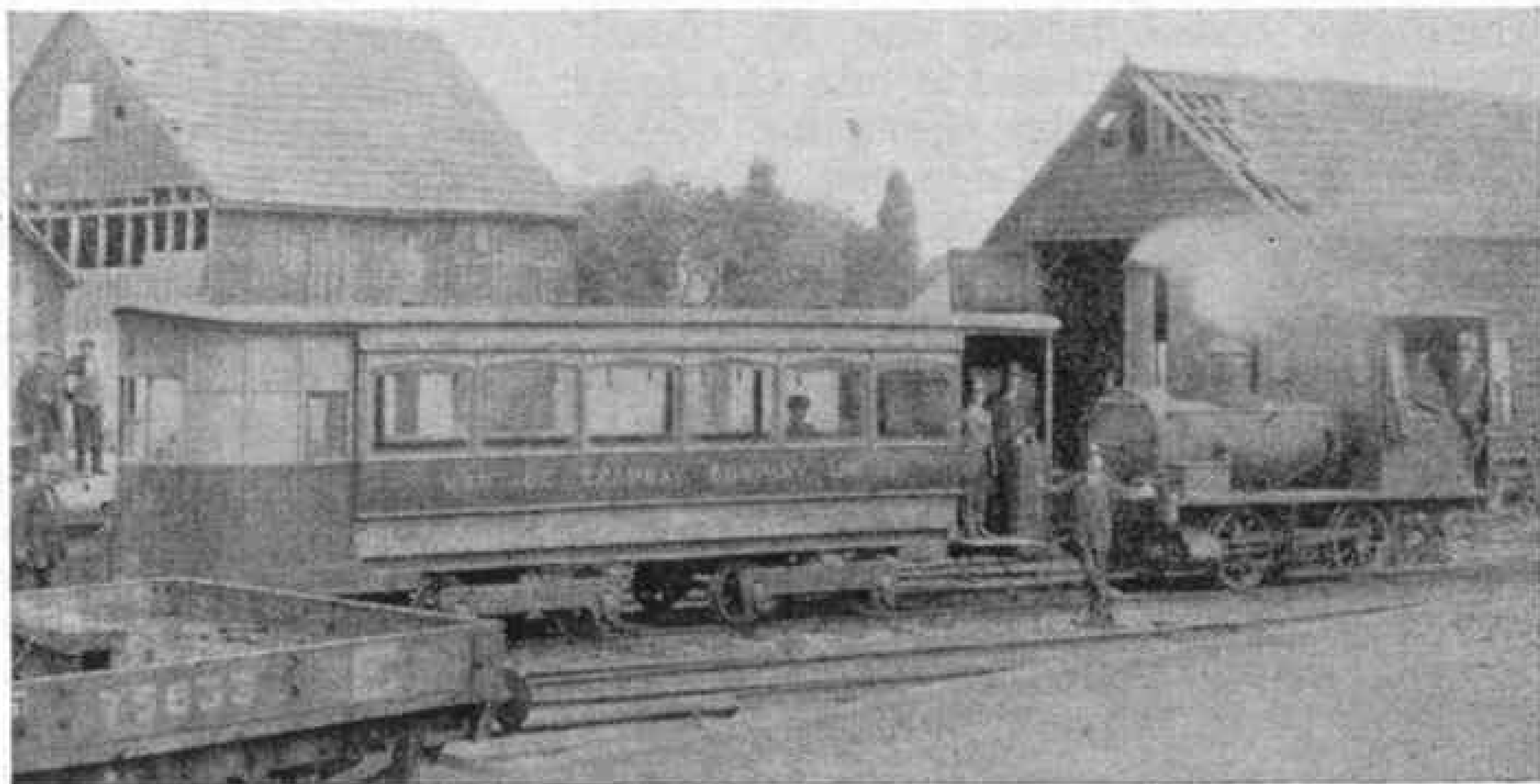
There was another engine, which was nameless but was No. 7. She had four wheels and carried water in a saddle tank over the boiler. She was built in 1888 by the Manchester Ship Canal Company, and was the last engine to use the line, as she hauled the dismantled track away.

Many curious stories are told of this historic tramway. One concerns the driver who always speeded up his train on approaching a particularly rough or awkwardly curved bit, explaining that he would get over it more quickly. Another tells of a race between the tram and the donkey cart of a local chimney sweep, when "The Wantage Tram, all steam and smoke, was beat by Arthur Hitchcock's moke." The fare was high and it was a standard joke to tell the conductor when he asked the unsuspecting traveller for it that it was a ticket that was being bought, and not the tram itself.

Alas, there is now nothing left of this interesting line except a few rusty rails near the town terminus—and of course *Jane*!

D. F. PERKINS (Wantage)

Jane, the Wantage Tramway's most famous locomotive, with the double bogie tramcar. Photograph by T. Revely, Wantage.



Competitions! Open To All Readers

*Prize-winning entries in M.M. competitions become the property of Meccano Ltd.
Unsuccessful entries in photographic, drawing and similar contests will be returned if
suitable stamped addressed envelopes or wrappers are enclosed with them.*

CODE-WORDS

- | | | |
|---|--|--|
| (1) A Famous Airman
0 1 2 3 4 5 6 | (2) A Record-Breaking
Aircraft
0 1 2 3 4 5 6 7 | (3) A Famous Racing
Motorist
0 1 2 3 4 5 6 7 8 |
| (4) A Royal Palace
0 1 2 3 4 5 6 7 8 9 | (5) A Noted Cricketer
0 1 2 3 4 5 6 7 | (6) A Breed of Dog
0 1 2 3 4 5 6 7 8 |
| (7) A Noted Locomotive
Engineer
0 1 2 3 4 5 6 7 | (8) A Famous Explorer
0 1 2 3 4 5 6 7 8 9 | (9) A Well-known
Footballer
0 1 2 3 4 5 6 7 8 |
| (10) Polar Exploration
Ship
0 1 2 3 4 5 6 7 8 | (11) A Great General
0 1 2 3 4 5 6 7 8 9 | (12) A Royal Vessel
0 1 2 3 4 5 6 7 8 |

CLUES

- | | | |
|--|--|--|
| (1) 3462 kind of ceremony
150 tennis term | (2) 3475 sustain
0612 weight measure | (3) 5831 a prima-donna
0647 rise easily
2 half a century |
| (4) 7856 suspend
210 young animal
349 Kipling character | (5) 6170 to loll
4523 magician's accessory | (6) 45723 sweetmeat
8160 stupify |
| (7) 7235 a British river
4610 to bang | (8) 18765 an inn
09234 refreshment | (9) 648 Chinese coin
075312 wise counsellor |
| (10) 8642 thoroughfare
350 girl's name
71 United Nations | (11) 4527 departed
3819 remember Helen?
06 well-known magazine | (12) 5738 girl's name
01426 part of human body |

OUR Competition this month is an adaptation of crossword puzzles and numerical coding, to which we have given the name "Code-Words".

In the centre of the panel above will be found strings of numbers ranging from 0 to 9. These represent the names of famous men or well-known objects, and accompanying each is a key giving a clue to the hidden subject. At the foot of the panel there are given sets of clues from which the coded letters can be traced. When the letters are sorted into the order indicated in the code, the name of the hidden object will stand revealed. It should be noted that the numbering gives the correct order of the appearance of the letters in the puzzle, and that when a letter is repeated in any word it is given a distinct number for each appearance.

For example, puzzle No. 1, "A Famous Airman", is lettered 0 to 6. Therefore, the name of the airman contains seven letters. The solution of the first clue—3, 4, 6, 2; "kind of ceremony"—is "rite", and this gives us four of the letters, which must be placed in the order of their numbers. The

letters represented by 1, 5, and 0, for which the clue is "tennis term", make the word "lob". With each of the clue letters in position, the name of the famous airman stands revealed as *Bleriot*.

This example makes the requirements of the contest quite clear, and readers are invited to go ahead with the solving of the remaining 11 puzzles.

There will be the usual two sections in this contest, for Home and Overseas readers respectively, and in each prizes of 21/-, 15/- and 10/6 will be awarded for the three best entries in order of merit, with consolation prizes for entries just short of prize-winning standard. The diagram above must not be cut from the page, but entries made on separate sheets. In the event of a tie the judges will take originality of presentation into account. State name, address and age.

Entries must be addressed *Code-Words, Meccano Magazine, Binns Road, Liverpool 13*. Closing dates: Home Section, 30th November, 1955; Overseas Section, 29th February, 1956. Post your entry in good time, especially if from overseas.

Competition Results and Solutions

HOME

APRIL/MAY 1955 SPRING PHOTOGRAPHIC CONTEST

1st Prize, Section A: J. E. Price, Malvern; Section B: R. Westacott, Elstree. 2nd Prize, Section A: J. W. Whitelaw, Harpenden; Section B: P. R. Francomb, Bristol 2. 3rd Prize, Section A: J. Balmond, Birmingham 6; Section B: I. Mitchell, Selkirk. Consolation Prizes: G. D. Bonner, Edinburgh 4; B. Walters, Maidenhead; A. V. Macintosh, Dundee; L. Bathgate, Wroughton; C. H. Lovelock, Woolhampton; M. Warriner, Wallasey.

APRIL 1955 FIGUREWORD CONTEST

1st Prize: A. Kippax, Southport. 2nd Prize: J. E. Nowers, London E.11. 3rd Prize: T. G. Walker, Lydbrook. Consolation Prizes: G. P. H. Styan, Purley; M. Jones, Panteg; R. C. Hearn, Horley; W. A. Glover, Crieff; P. C. Houchin, Bideford; A. I. Wyllie, Belfast.

MAY 1955 GREATEST THRILL CONTEST

1st Prize: J. M. Griffiths, Bramhall. 2nd Prize: G. Chilcott, Bransgore. 3rd Prize: L. T. Arthur, Birmingham 20. Consolation Prizes: B. D. Johnstone, Ardrossan; J. S. Knowland, Oxford; P. Ward, Norton; J. E. Floyd, Porlock.

JUNE 1955 MOTOR CAR CONTEST

1st Prize: C. Gadsden, Bexhill-on-Sea. 2nd Prize: D. B. Bonny, London N.1. 3rd Prize: R. Stevens, London S.E.22. Consolation Prizes: J. Radford, Nottingham; A. D. Jenkins, Bromham; R. M. Athey, Wallsend.

JUNE 1955 RAILWAY DRAWING CONTEST

1st Prize: V. J. Corasi, Harrogate. 2nd Prize: D. Parkinson, Stockport. 3rd Prize: T. Sutton, Cleckheaton. Consolation Prizes: J. Howard, Langley; I. Burnett, Portsmouth; M. Alabaster, Birmingham 5; V. Carter, Armagh.

OVERSEAS

JANUARY 1955 COVER VOTING CONTEST

1st Prize: D. Kitto, Otago, New Zealand. 2nd Prize: H. Waliszewer, Buenos Aires, Argentina. 3rd Prize: D. Algeo, Athlone, Eire. Consolation Prizes: T. R. Cudby, Wellington S.W.1, New Zealand; C. S. Wickramasinghe, Colombo 5, Ceylon; E. Addison, P.O. Umkomaas, South Africa.

JANUARY 1955 LOCOMOTIVE NAMES CONTEST

1st Prize: T. Linton, New York, U.S.A. 2nd Prize: P. A. Black, Durban, South Africa. 3rd Prize: M. Hindley, Petone, New Zealand. Consolation Prizes: B. C. Rice, Christchurch, New Zealand; A. V. Brown, Cape Town, South Africa; S. O'Hara, Waterford, Eire.

FEBRUARY 1955 WAGON CONTEST

1st Prize: I. N. Koochi, Bombay, India. 2nd Prize:

B. Hodgson, Sydney, Australia. 3rd Prize: S. Nanavati, Allahabad, India. Consolation Prizes: N. Peters, Singapore; A. Andrews, Melbourne, Australia; K. P. Nixon, Montreal, Canada.

FEBRUARY 1955 SOCCER CONTEST

1st Prize: O. Kelly, Cork, Eire. 2nd Prize: A. D. Blake, Invercargill, New Zealand. 3rd Prize: W. Coleman, Toronto, Canada. Consolation Prizes: G. Lee, Calgary, Canada; T. H. Lewis, Brisbane, Australia; J. Markham, Perth, Australia.

MARCH 1955 CROSSWORD CONTEST

1st Prize: F. Poldy, Hong Kong. 2nd Prize: M. B. Jameson, Christchurch N.1, New Zealand. 3rd Prize: K. Bernie, Canberra, Australia. Consolation Prizes: J. B. Sweeney, Dublin, Eire; S. R. Davidson, Toronto, Canada; P. O'Connor, Dublin, Eire.

MARCH 1955 AEROPLANE DRAWING CONTEST

1st Prize: P. Turner, Durban, South Africa. 2nd Prize: D. J. Faux, Wintethur, Switzerland. 3rd Prize: E. G. Burrows, Kalkara, Malta, G.C. Consolation Prizes: M. Comrie, Durban, South Africa; T. R. Cudby, Wellington S.W.1, New Zealand; B. Davies, Stanger, South Africa; A. R. Keith, Melbourne, Australia.

SOLUTIONS

FEBRUARY 1955 WAGON CONTEST

1. Side discharging door. 2. Vacuum brake pipe. 3. Buffer. 4. Door operating lever. 5. Wheel tyre. 6. Axle box. 7. Hand brake lever. 8. Wagon number plate. 9. Truss rods. 10. Date of last oiling and district number.

FEBRUARY 1955 SOCCER CONTEST

1. Goalkeeper. 2. Penalty area. 3. Netting. 4. Referee. 5. Reserve team. 6. Free kick. 7. Minutes. 8. Linesman. 9. Wembley Stadium. 10. Goal post.



"The Old Cottages." A picturesque scene in Shanklin, I.O.W., submitted by K. G. Lambert, Bridlington. Awarded 1st prize in the November 1954 Beauty Spots Photographic Contest, Section A.

Fireside Fun

Policeman: "Hi! Where do you think you're going? Can't you see this is a 'One Way' street?"

Motorist: "Well, I'm going one way, aren't I?"

House Owner: "I'm glad you've stopped complaining about the plaster falling."

Tenant: "Yes, it's all down now!"

Bean: "My sister plays the piano by ear."

Pod: "Pooh! that's nothing. My uncle fiddles with his whiskers!"

"You say your mother-in-law threw a chair at you?" said the magistrate.

"Yes, sir."

"And then your wife threw a table at you?"

"Yes, sir."

"Why did you run away?"

"I saw my daughter looking thoughtfully at the sideboard."

BRAIN TEASERS

PYRAMID OF MECCANO PARTS

The inverted pyramid of letters below contains the letters of the names of eight Meccano parts, all jumbled together. Using each letter once only, can you find the eight names?

```

B T L O N T S U T P I R Y
L E L U P A N G E L B
C A R T K E G C I
L P N I S R P
O L C R D
L R A
O

```

MISSING LETTERS

Below are shown several groups of three letters, which when rearranged, form the centre portions of five-letter words. By adding one letter at each end of these groups you can form words that answer the clues given for each group. Can you make up the complete words?

Centre	Clue
A A T	Causing death
H F A	A handle
A T S	You might get stuck with this
E R A	Fear
A R E	A colour
E D R	A salesman likes to get this

SYLLABLE CLUES

Can you discover the six words indicated by the clues given below? A separate clue is given for each syllable of each word.

Example: Horseshoe:

CLUES 1, An animal.
2, Foot covering.

Now see if you can solve these:

- Lounge - pronoun - short sharp sound
- Combat - to send by water
- A culinary plant - indefinite article - to harken
- Domestic animal - of the same kind
- Deceive - search for
- A drinking vessel - piece of wood

ANSWERS TO LAST MONTH'S PUZZLES

Coded Castles

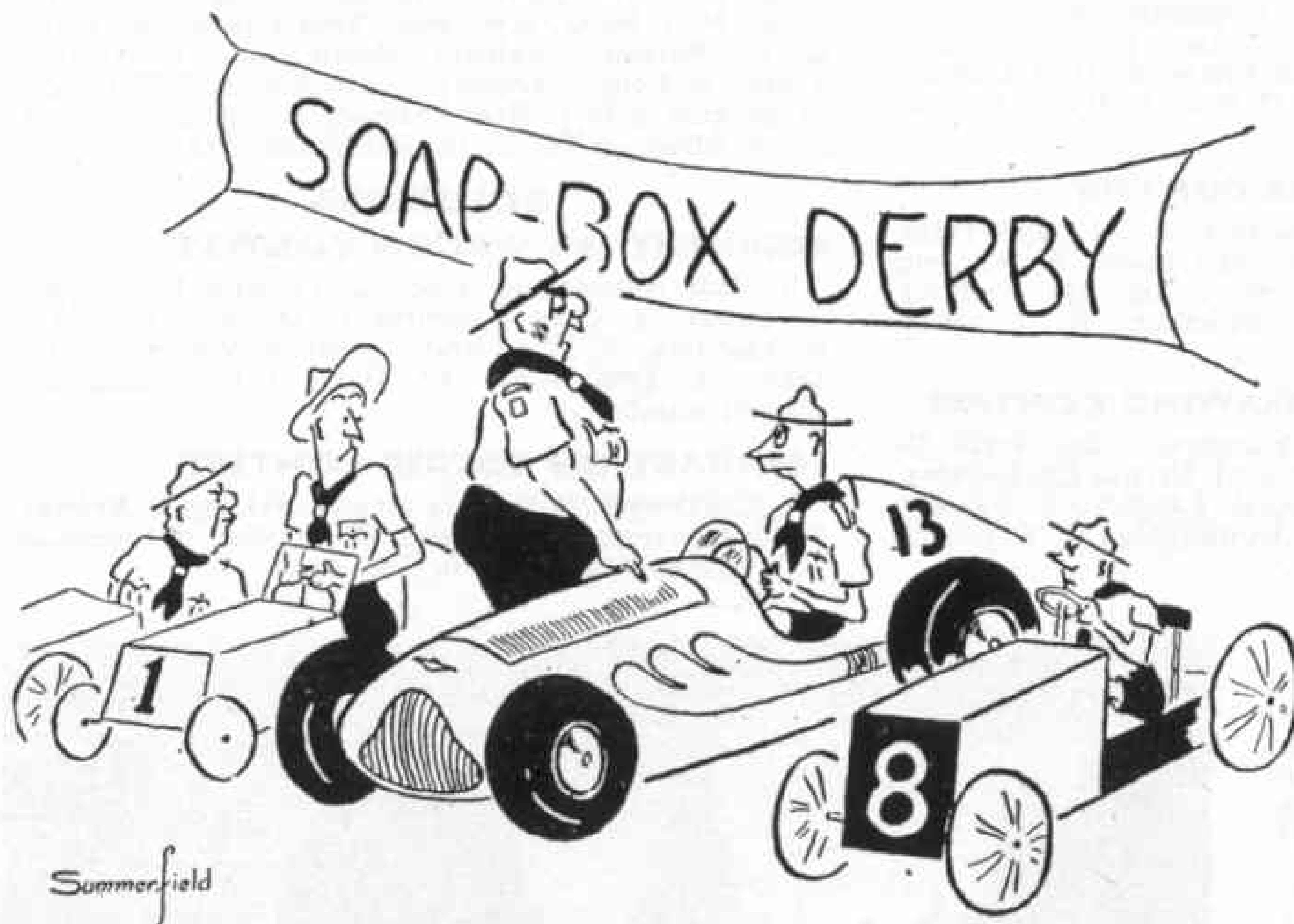
- Balmoral; 2. Windsor; 3. Corfe; 4. Kenilworth; 5. Ludlow; 6. Conway; 7. Dover; 8. Caernarvon.

Cathedral Cities

Five cathedral cities that meet the requirements of this puzzle are Worcester, Ely, Lincoln, Liverpool and Salisbury, the initial letters of which spell "Wells." There are other cathedral cities that could be substituted for some of those given in our solution, and no doubt you discovered some of these.

Name These

- Palm; 2. Hips; 3. Chest; 4. Foot; 5. Spine; 6. Neck; 7. Trunk; 8. Brow.



"Obviously you haven't read the rules Prendergast!"

Paddy was in court. "Guilty or Not Guilty?" he was asked.

"How can I tell?" he answered, "I've not heard the evidence yet."

Ethel: "His singing is heavenly."

Robert: "Well, its certainly unearthly."

Two absent-minded hunters were strolling in a jungle without their guns. Suddenly there sprang up before them an animal long thought to have disappeared from the Earth. It was a giant Sabre-Toothed Tiger.

"What'll we do?" quavered one hunter.

"I don't know about you," said the other, "but I'm getting ready to spread the news."

He: "Why does a woman say she's been shopping when she hasn't bought a thing?"

She: "Why does a man say he's been fishing when he hasn't caught a thing?"

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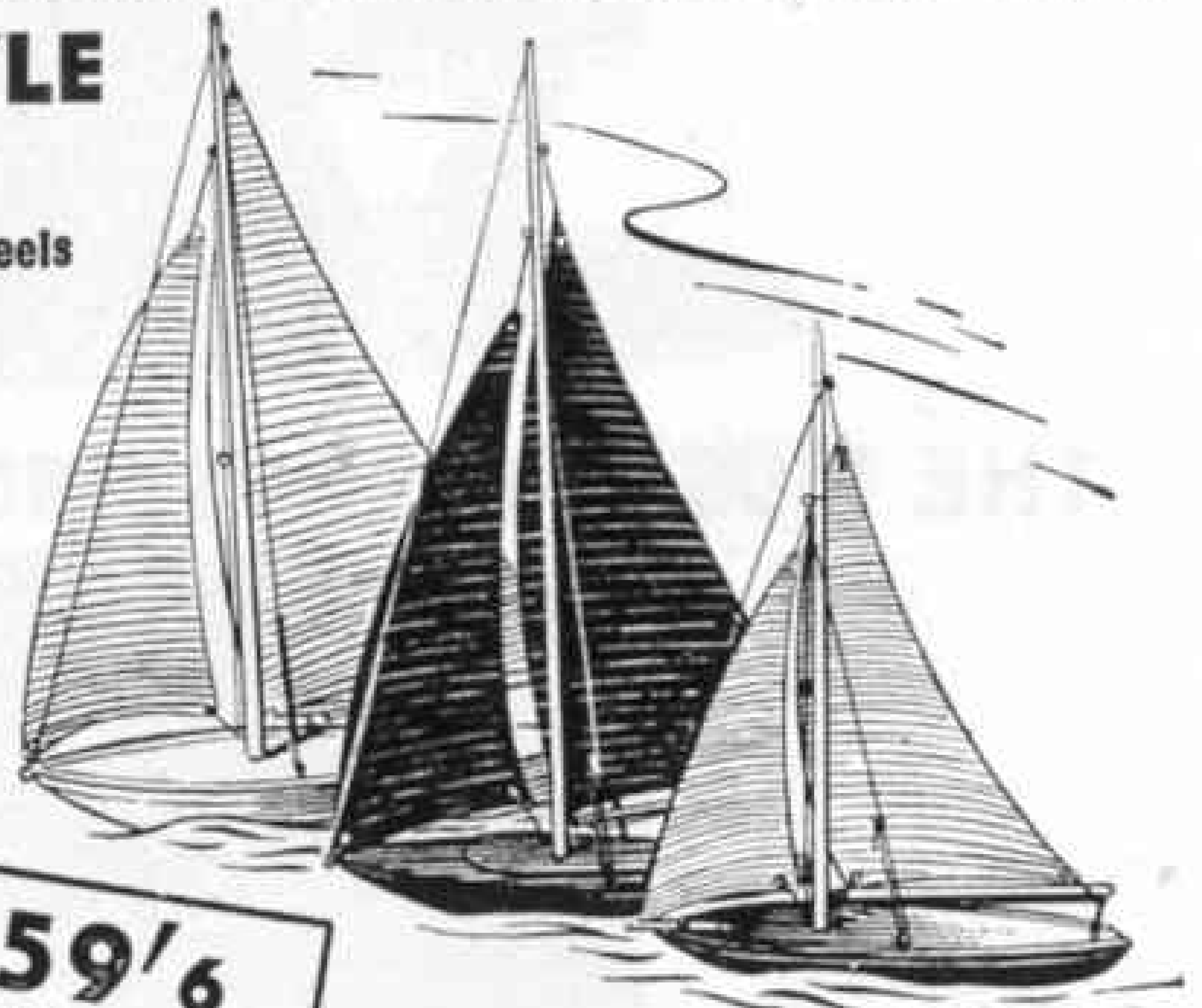
(Illustrated on left)
Fully adjustable,
simple fitting
Bermuda rigging,
17 in. Coloured
Hull — with
contrast
lining. 20
in. mast. **12/9**

CORMORANT YACHT

(Centre of illustration)
Bermuda rigging
with similar fittings
to the "Petrel"
**17 in. Coloured
Hollow Hull** with
contrast
lining. 20
in. mast. **18/6**

PUFFIN YACHT

(Illustrated on right)
Bermuda rigging
with coloured sails
and solid 13 in.
Coloured Hull
with contrast
lining. 13
in. mast. **9/11**

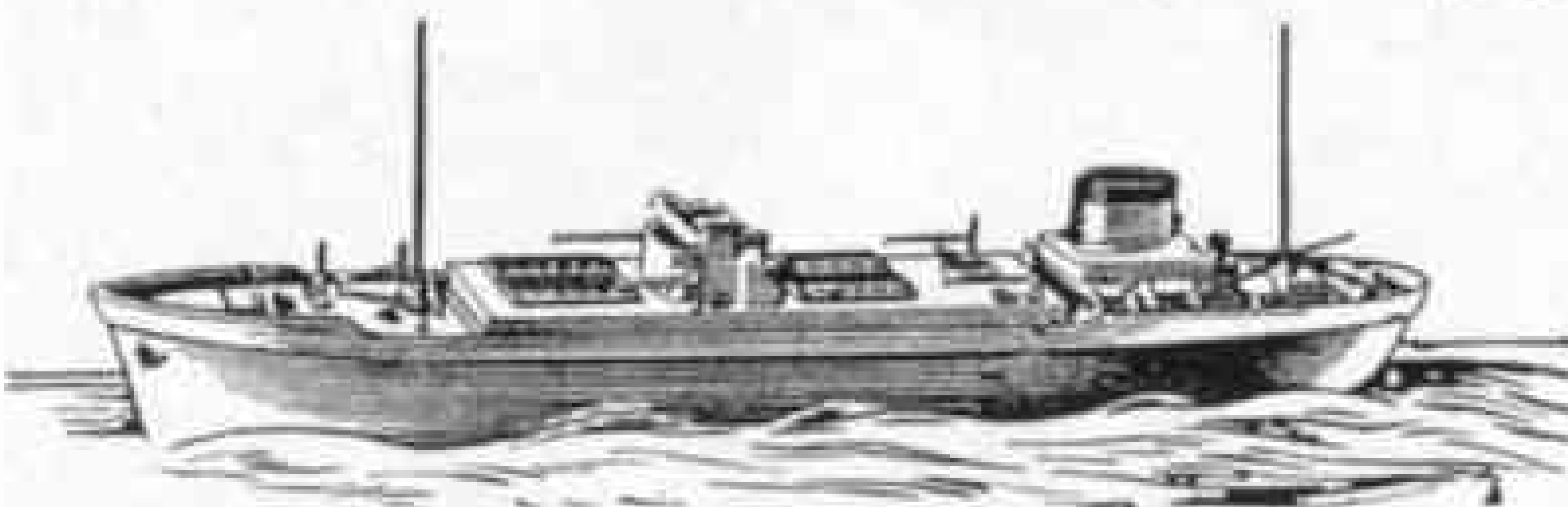


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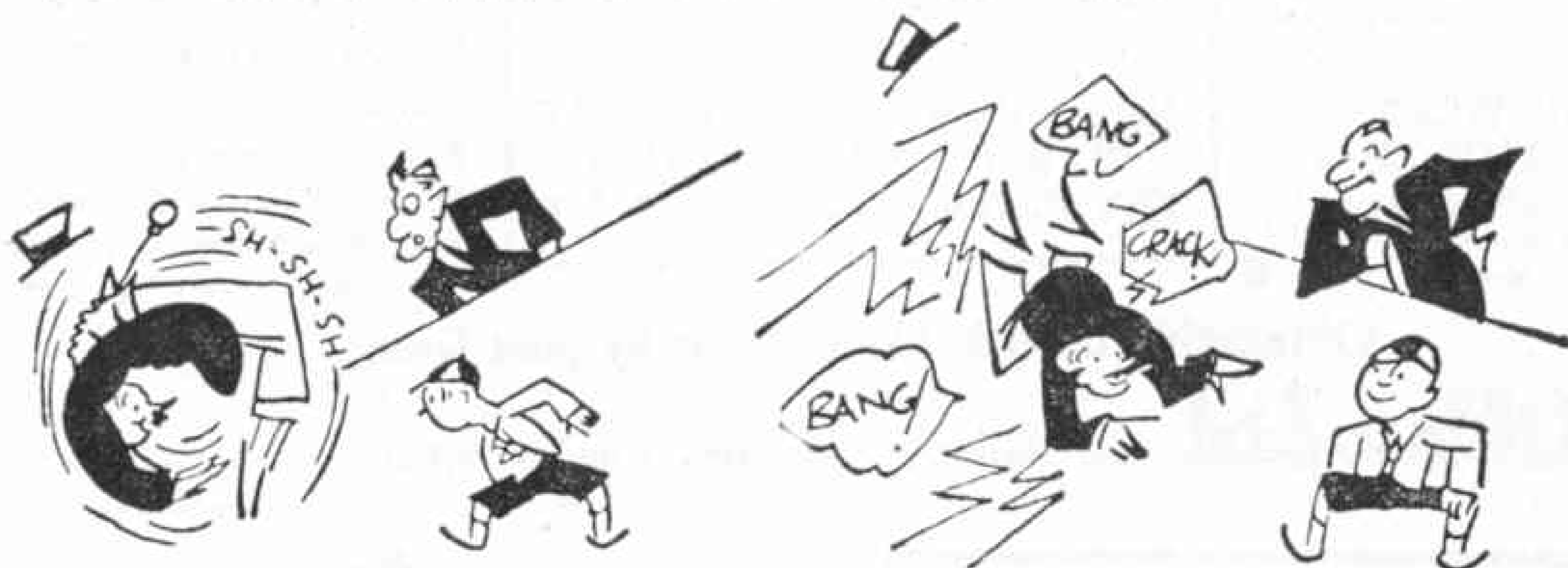
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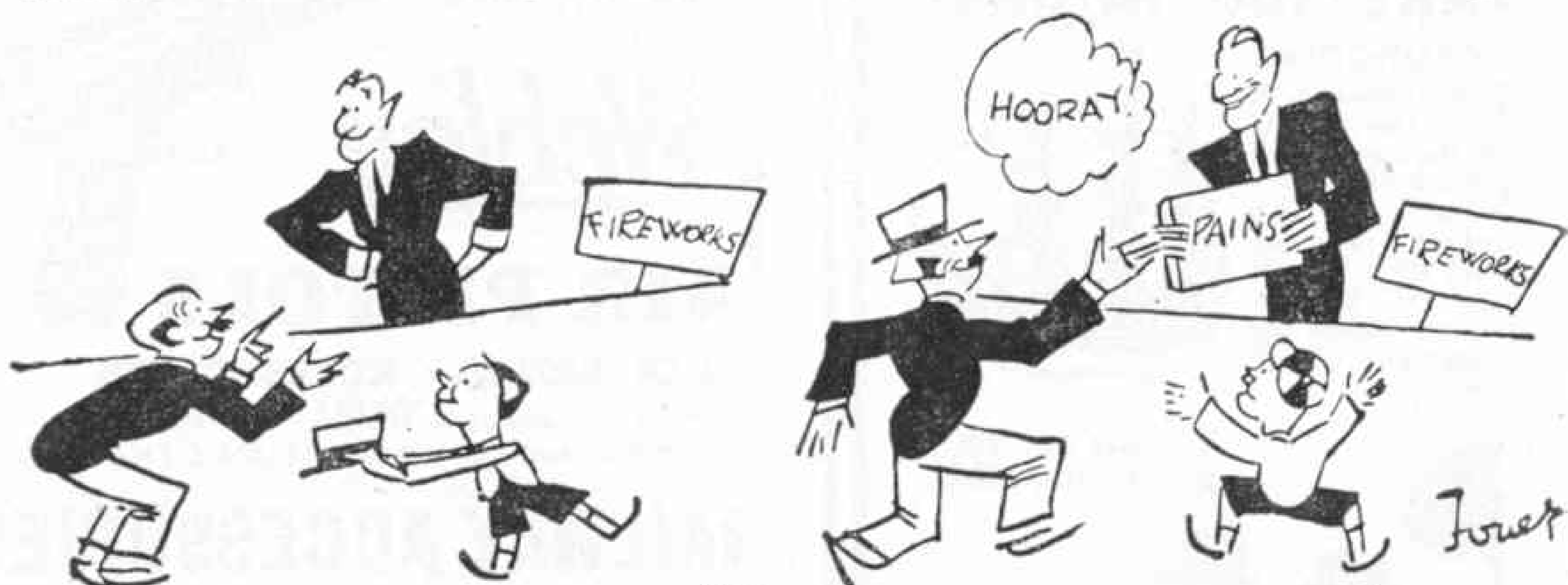


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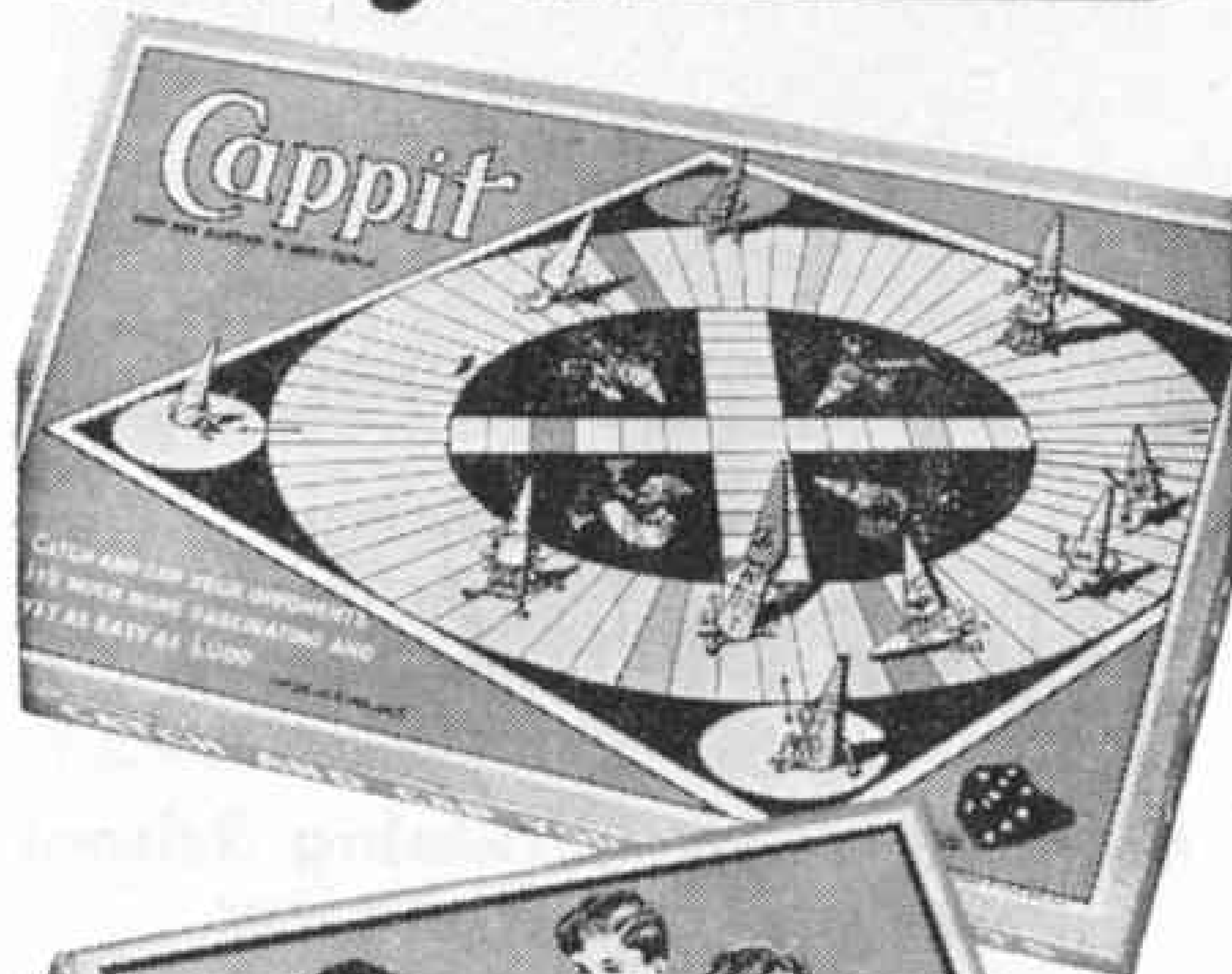
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(see also pages 570 and 572)

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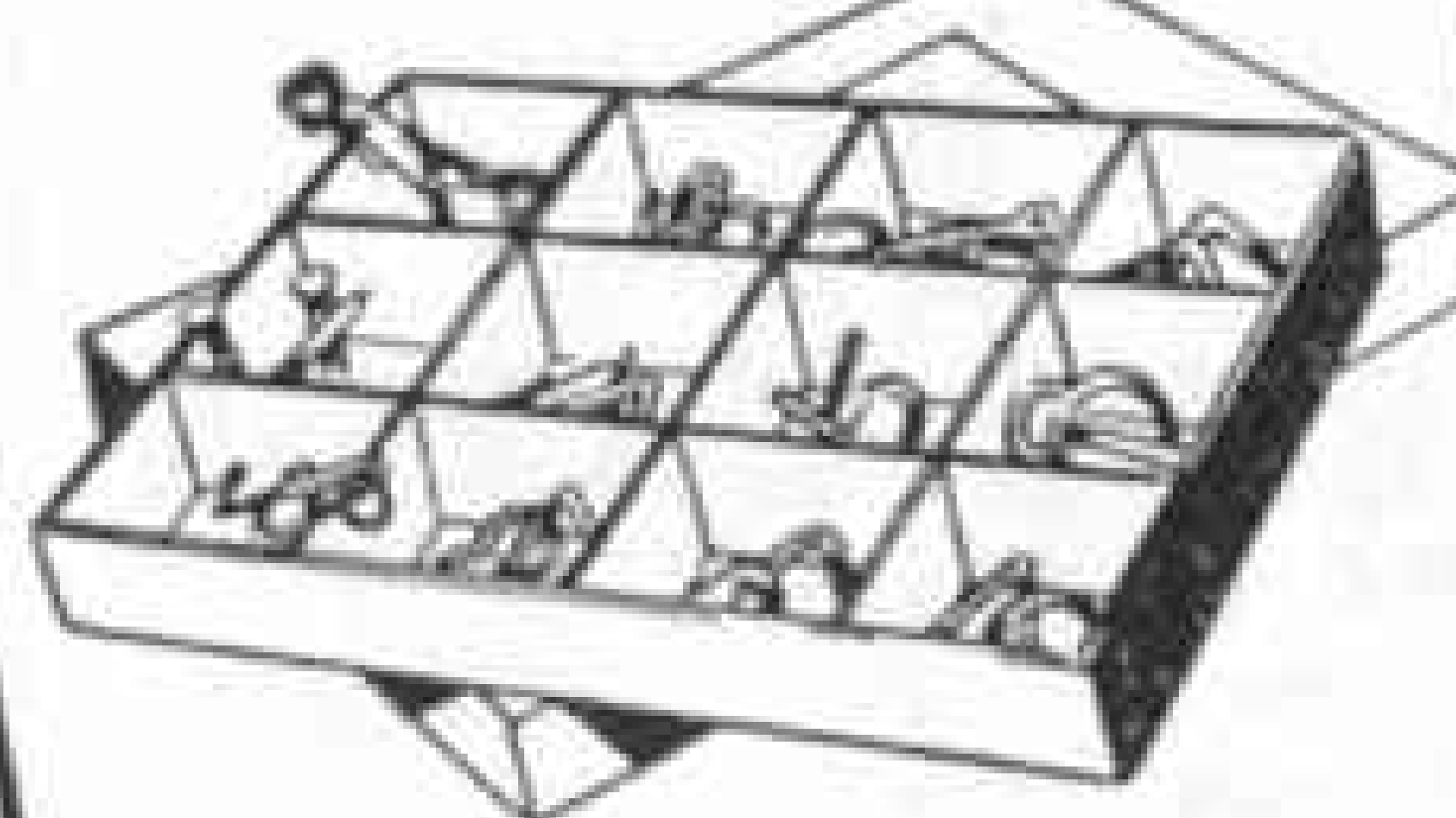
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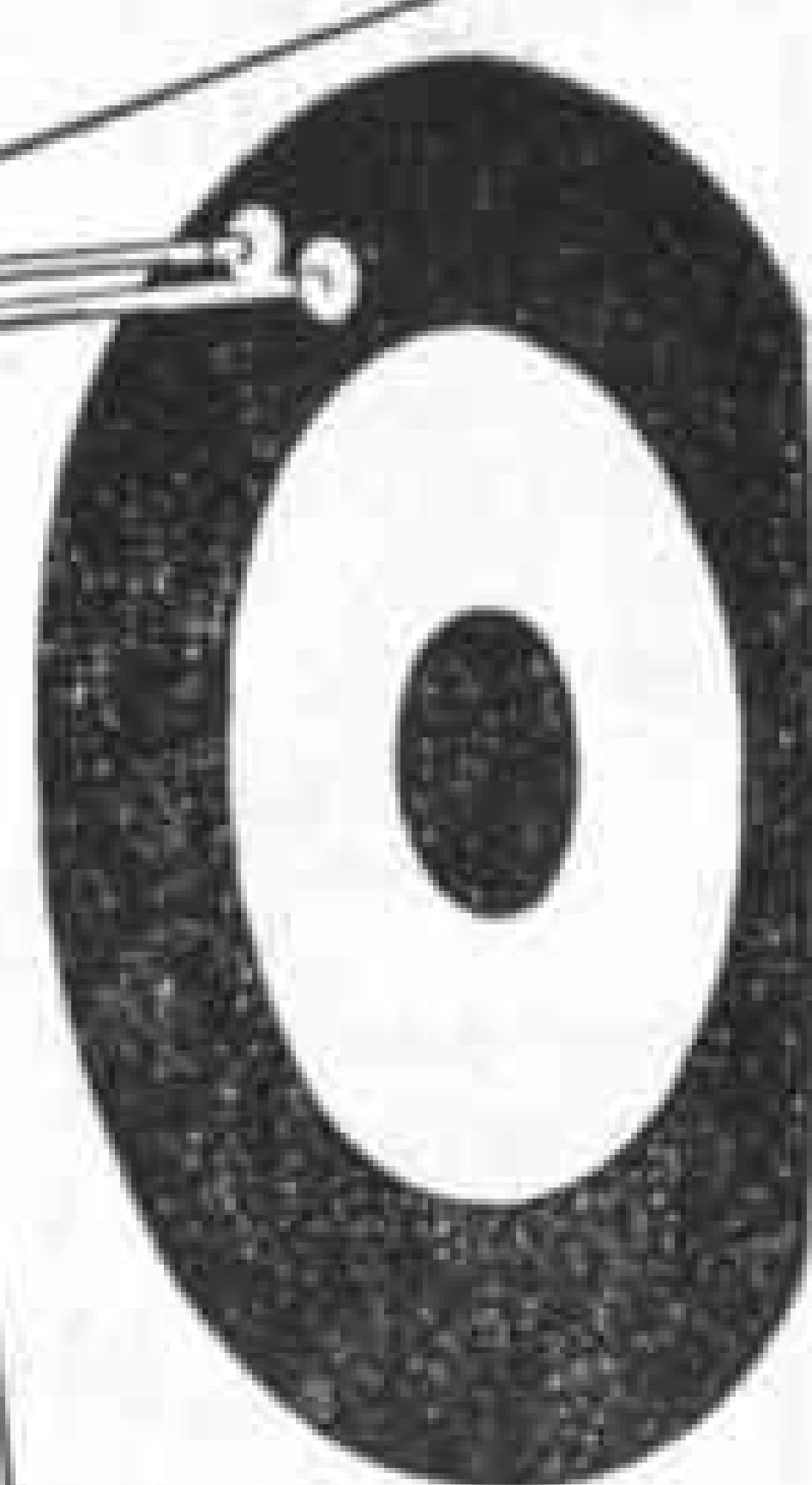
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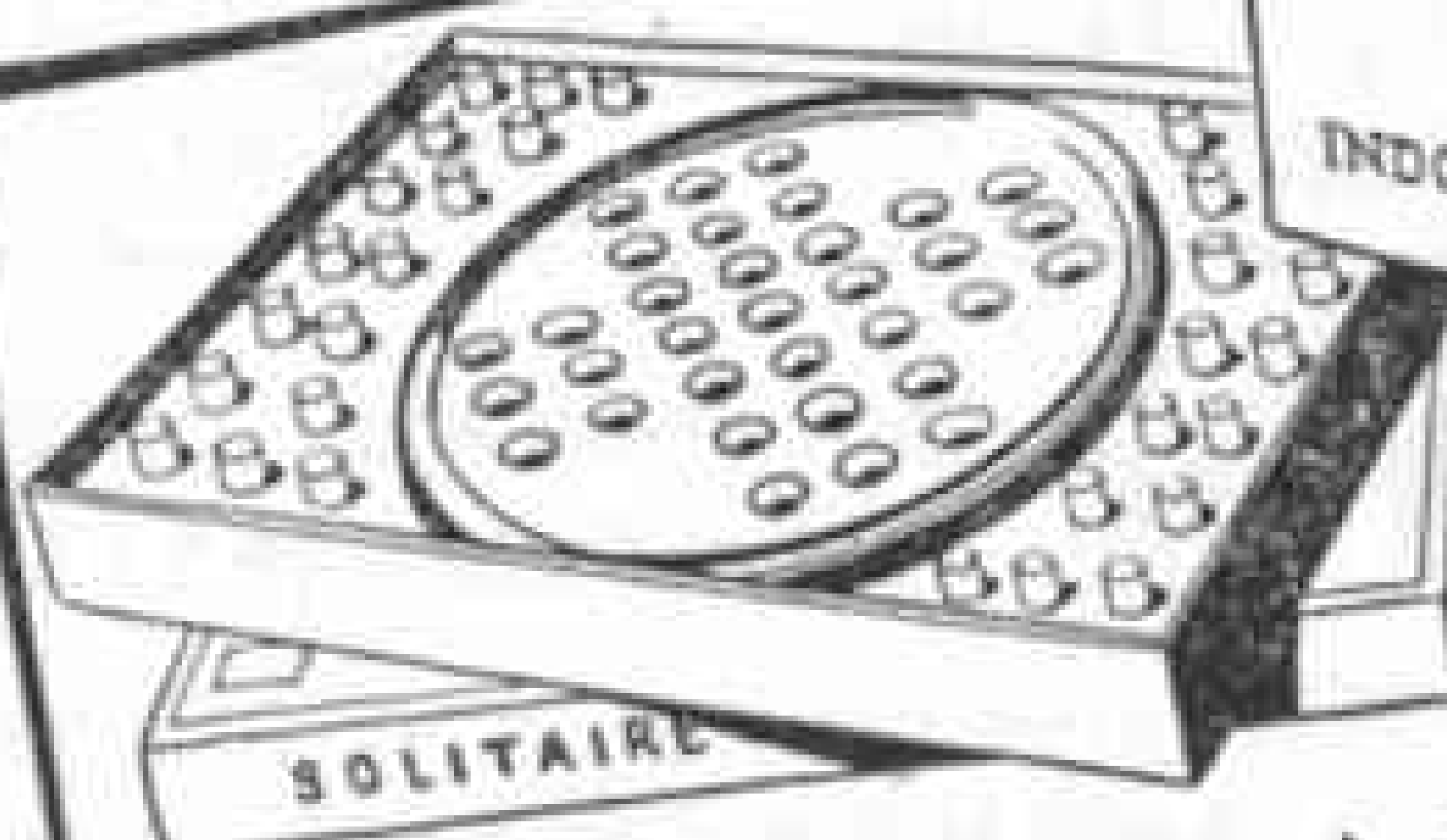
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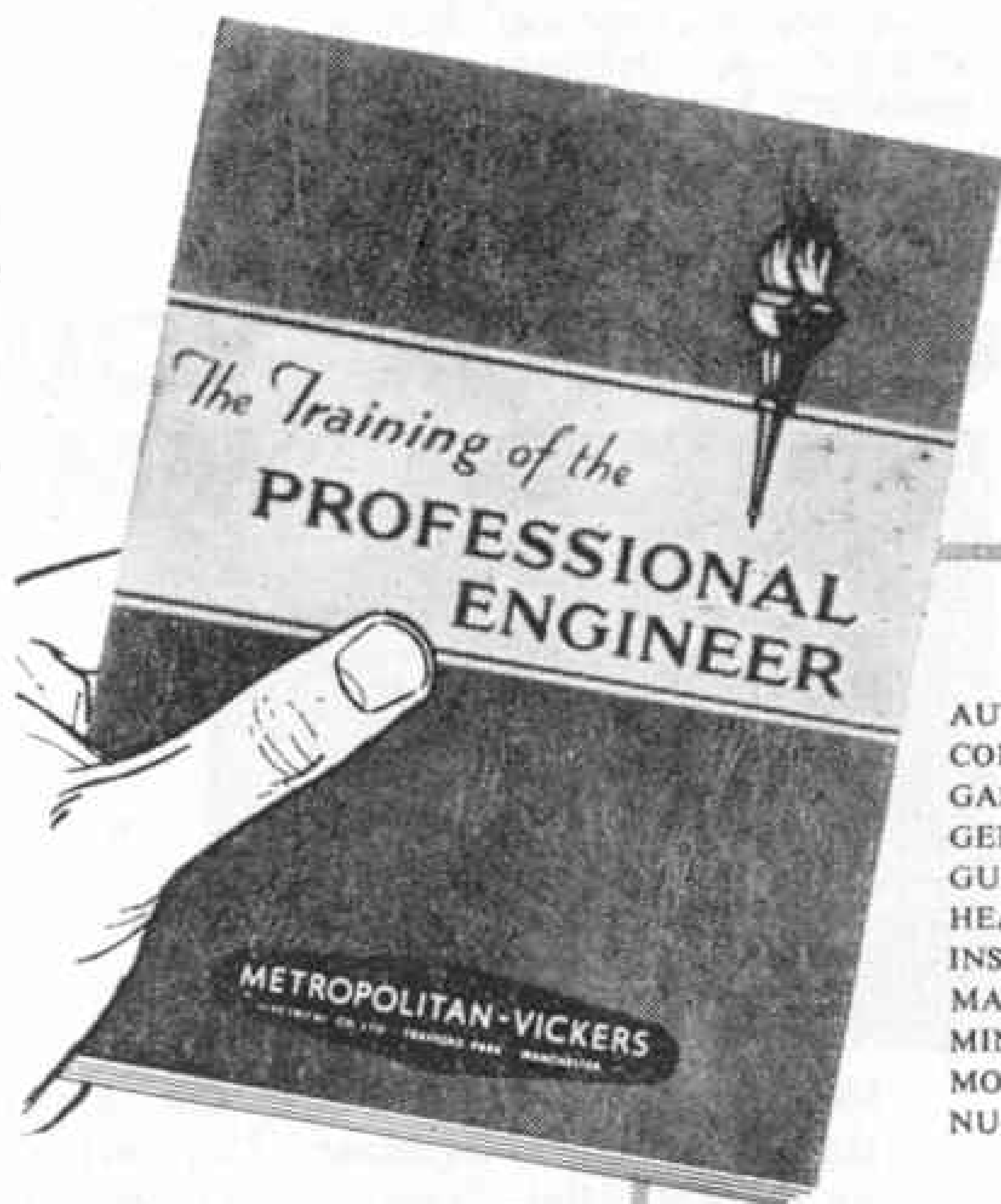
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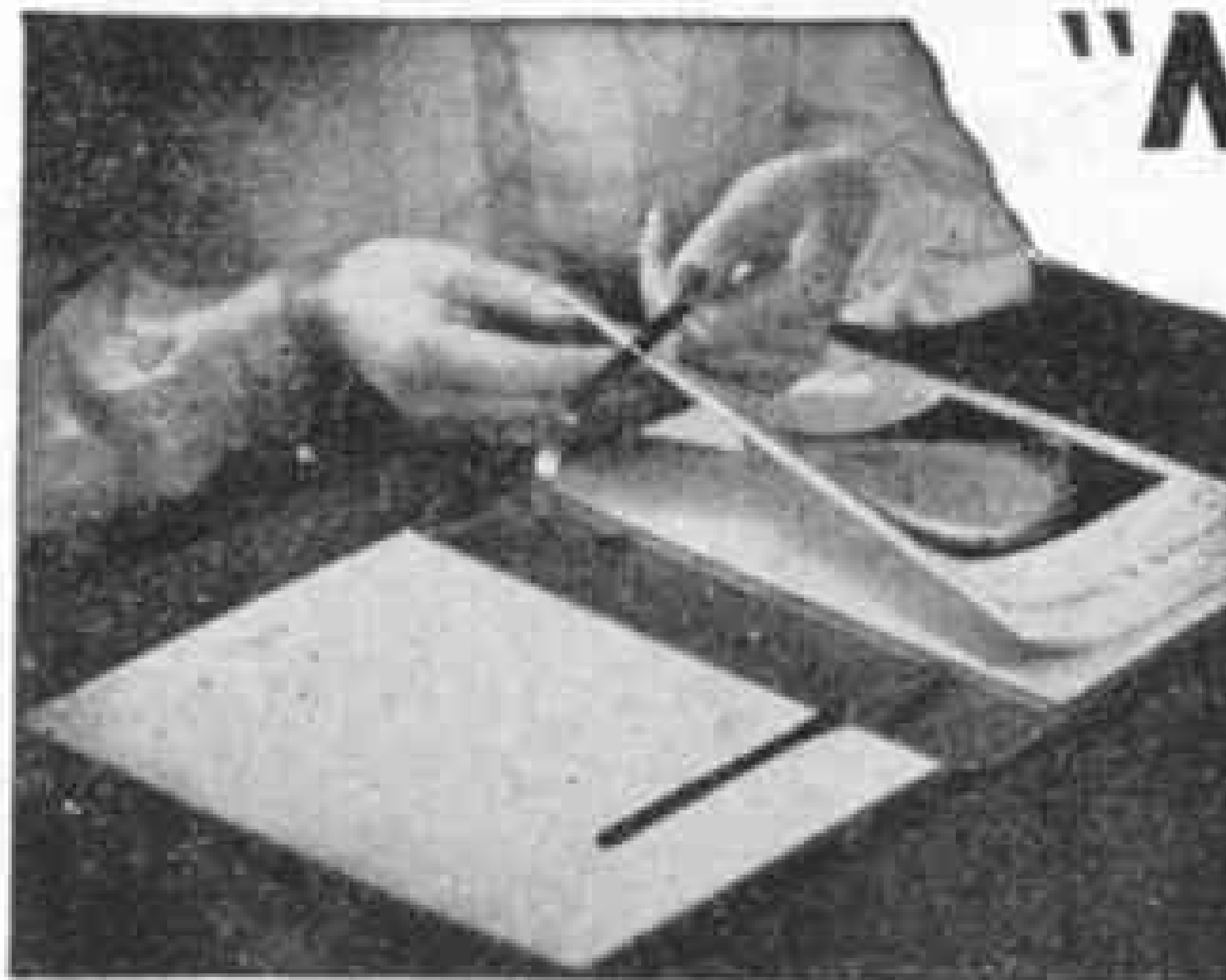
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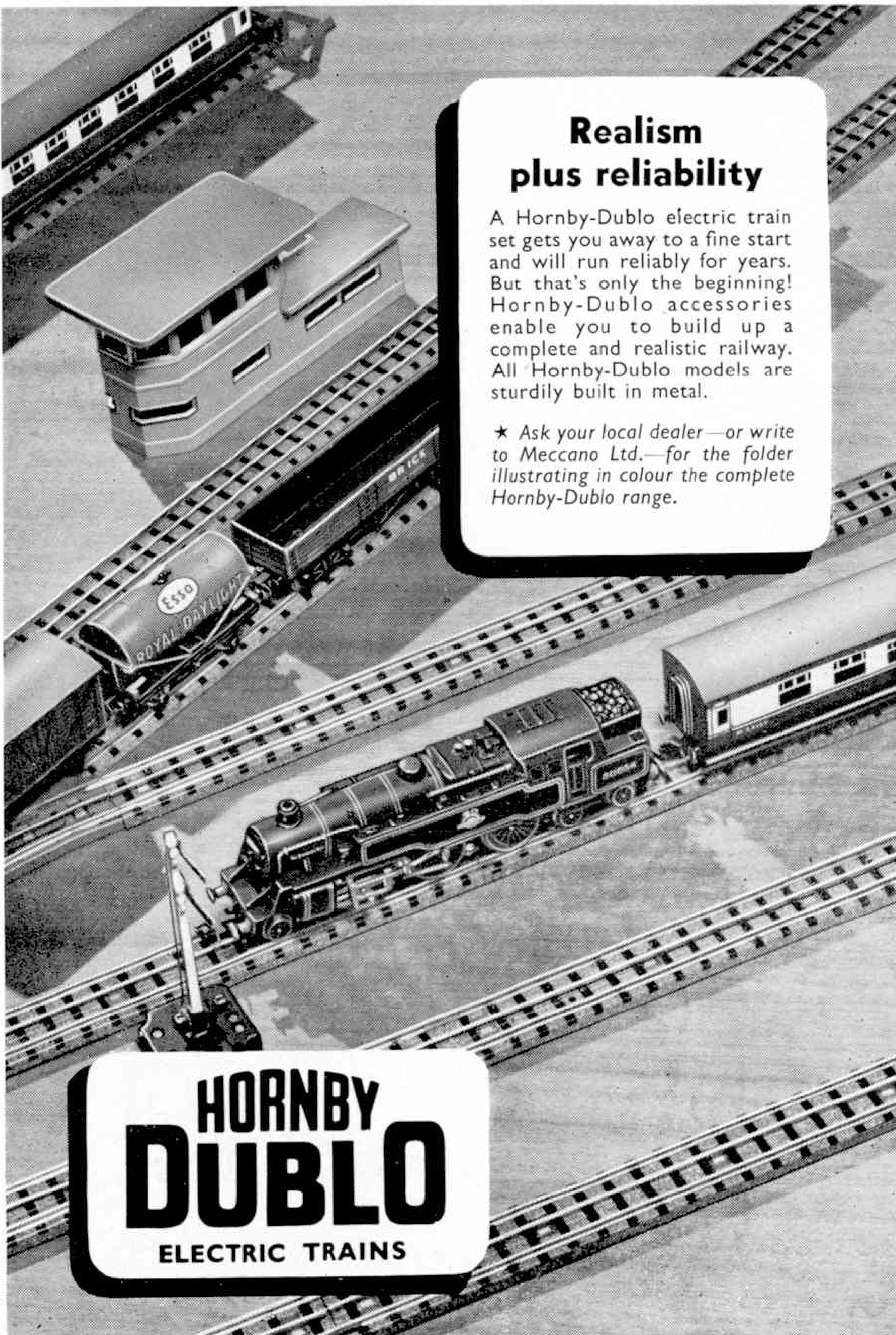
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