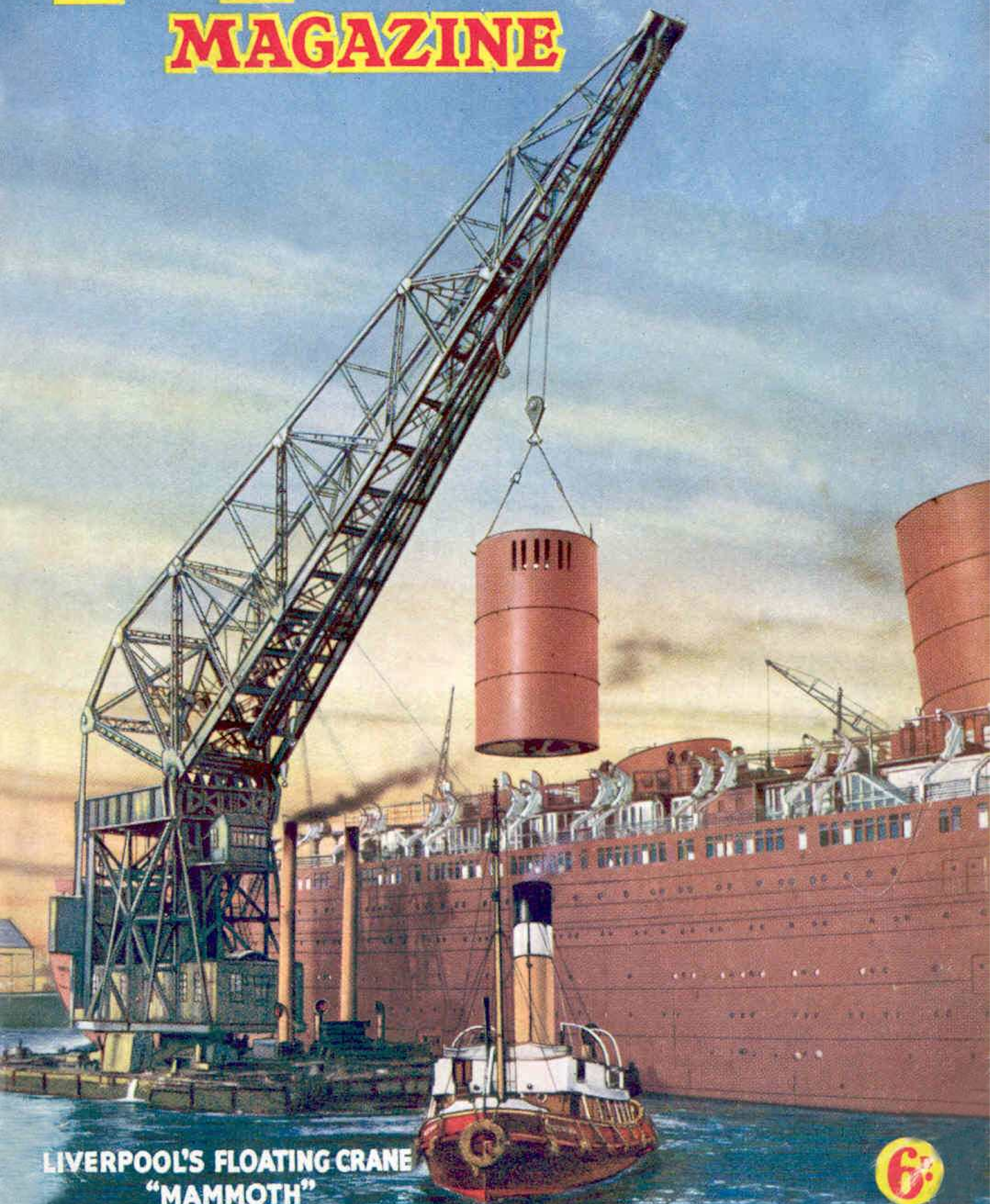


VOL. XXXIV. No.5.

MAY 1949

MECCANO

MAGAZINE



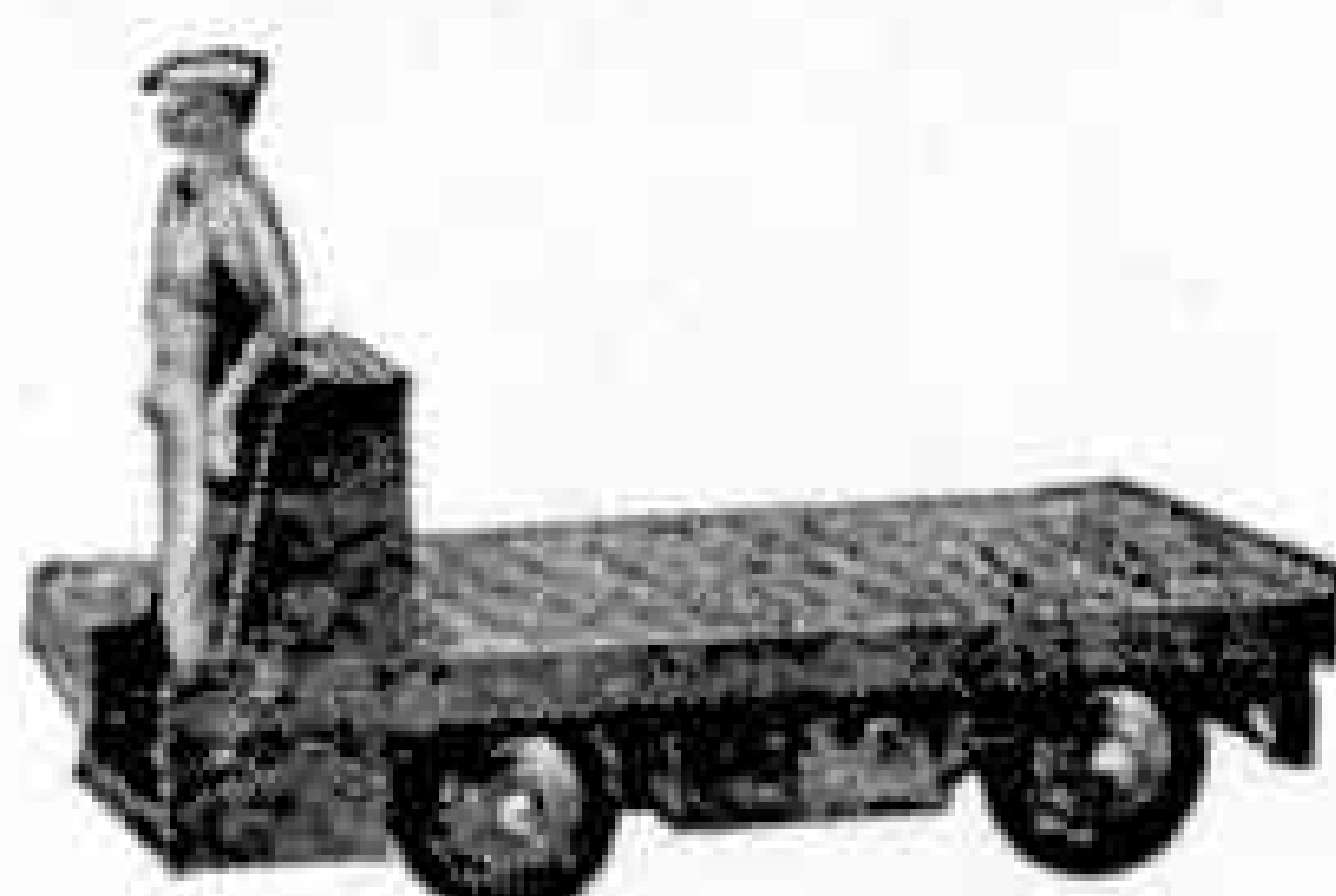
LIVERPOOL'S FLOATING CRANE
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DINKY TOYS



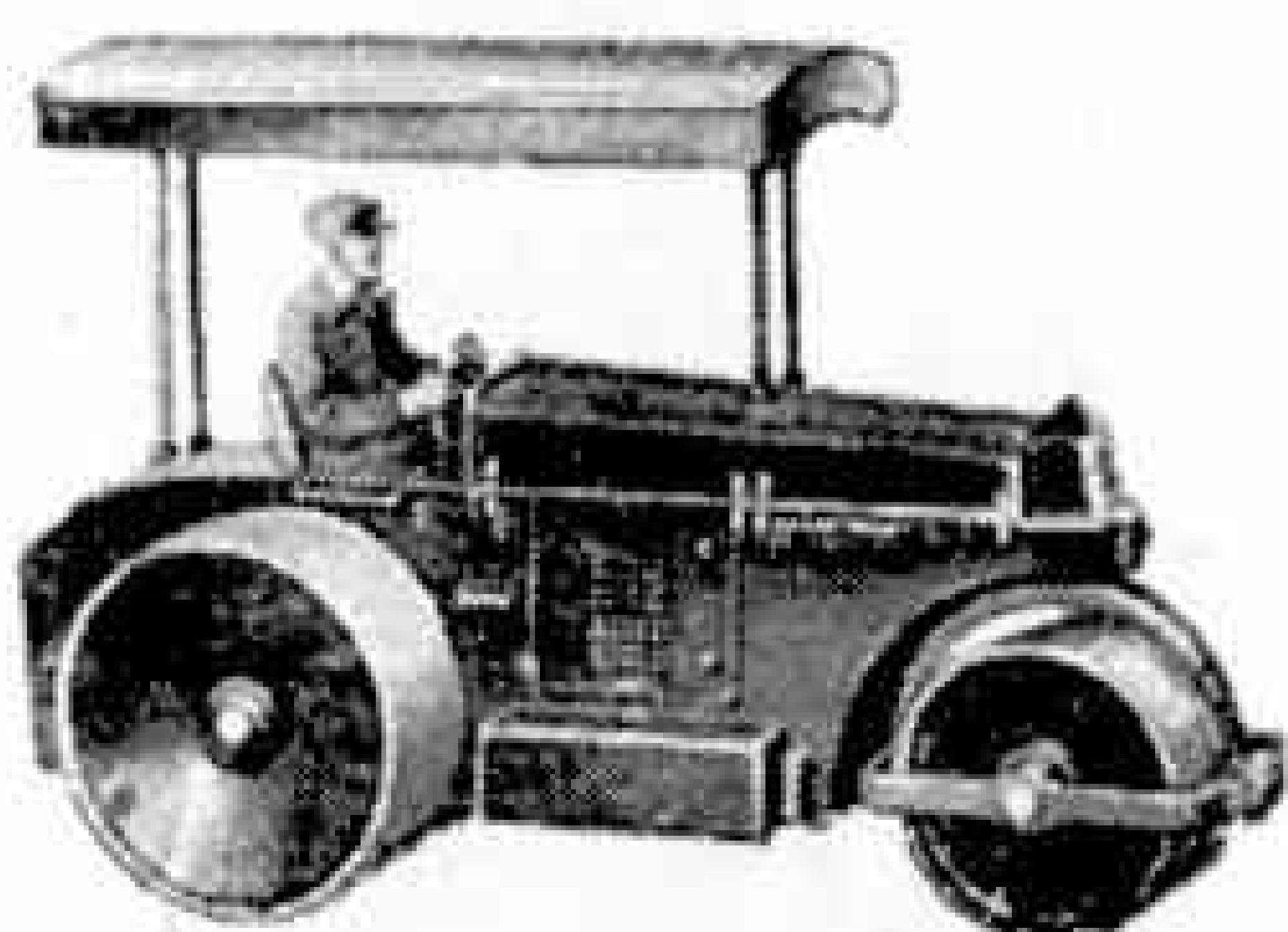
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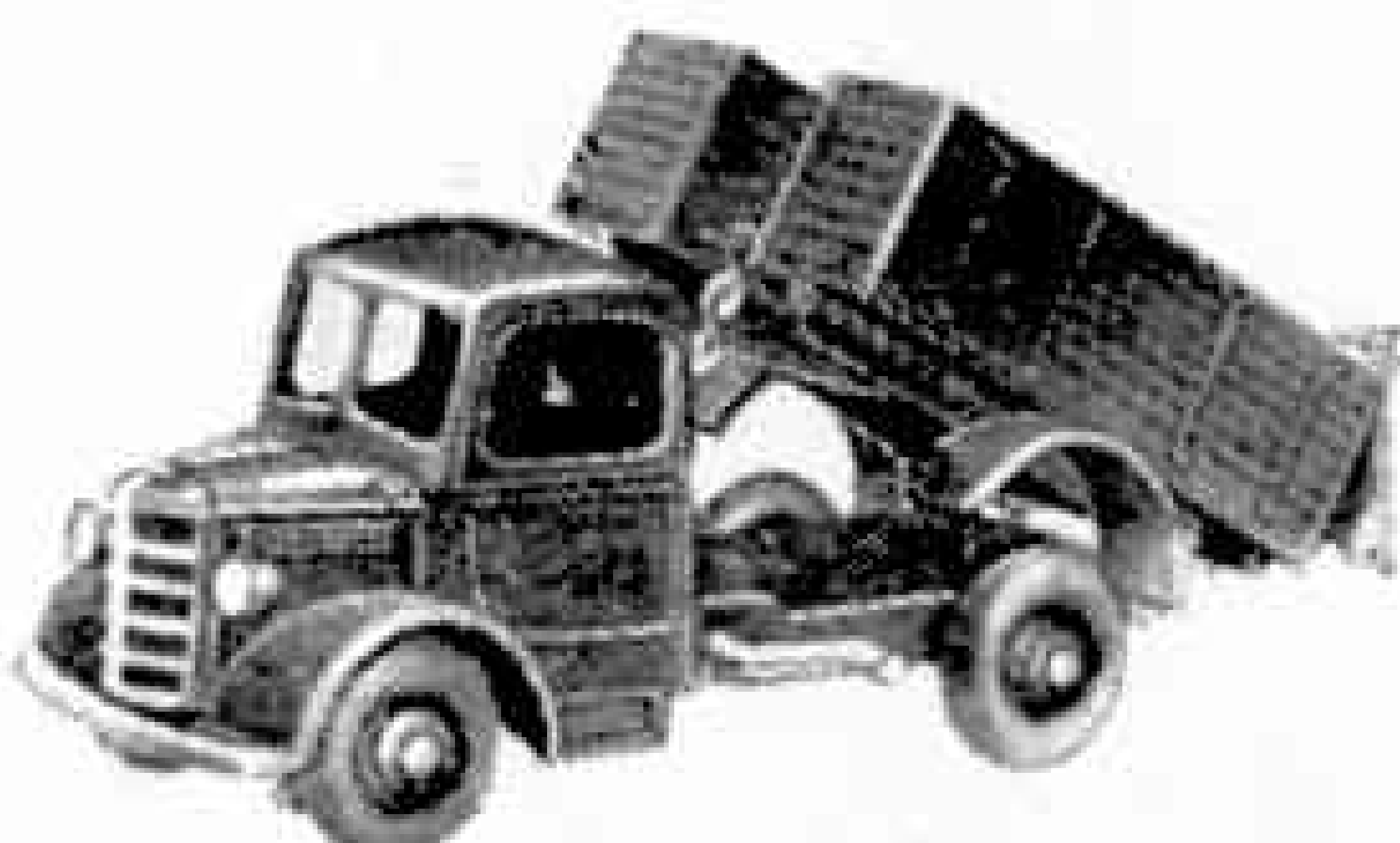
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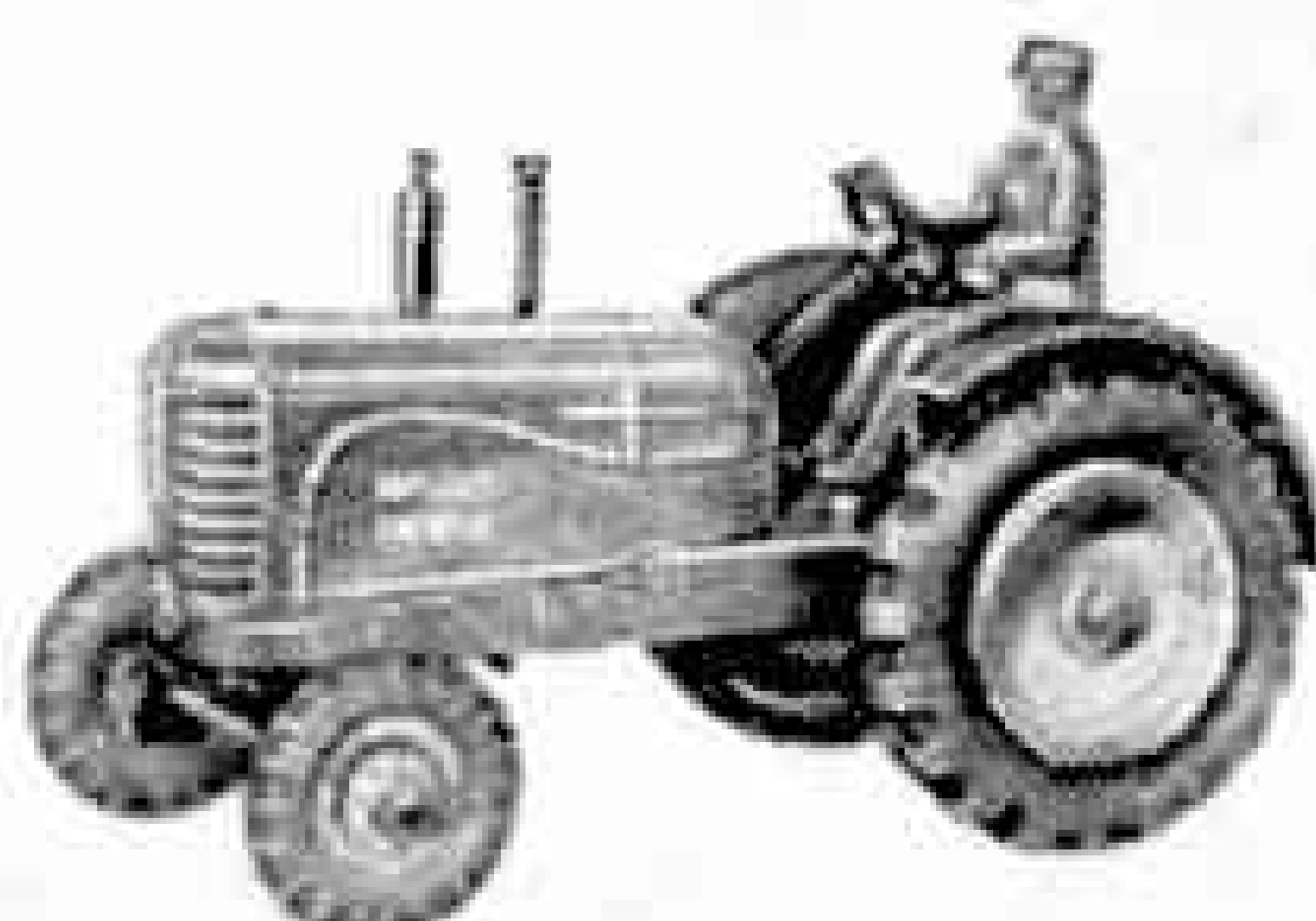
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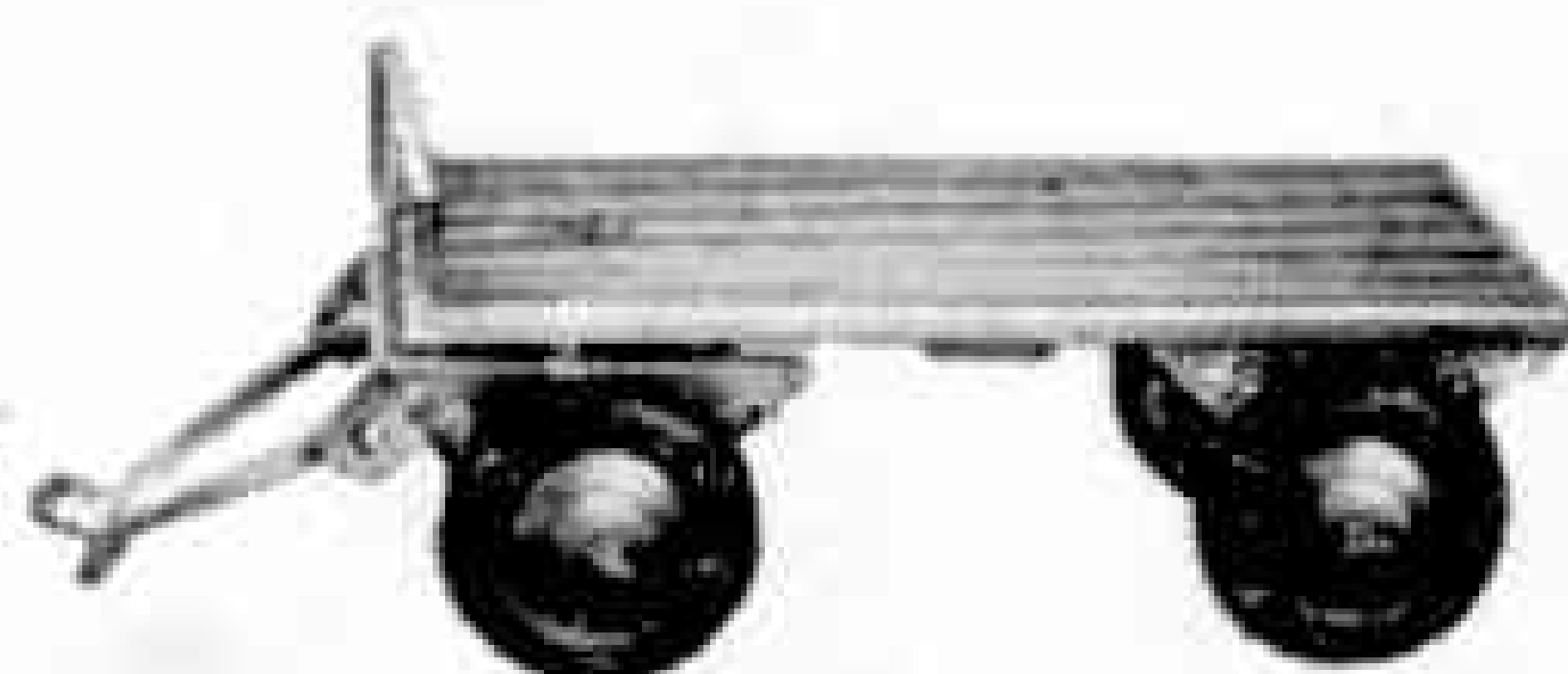
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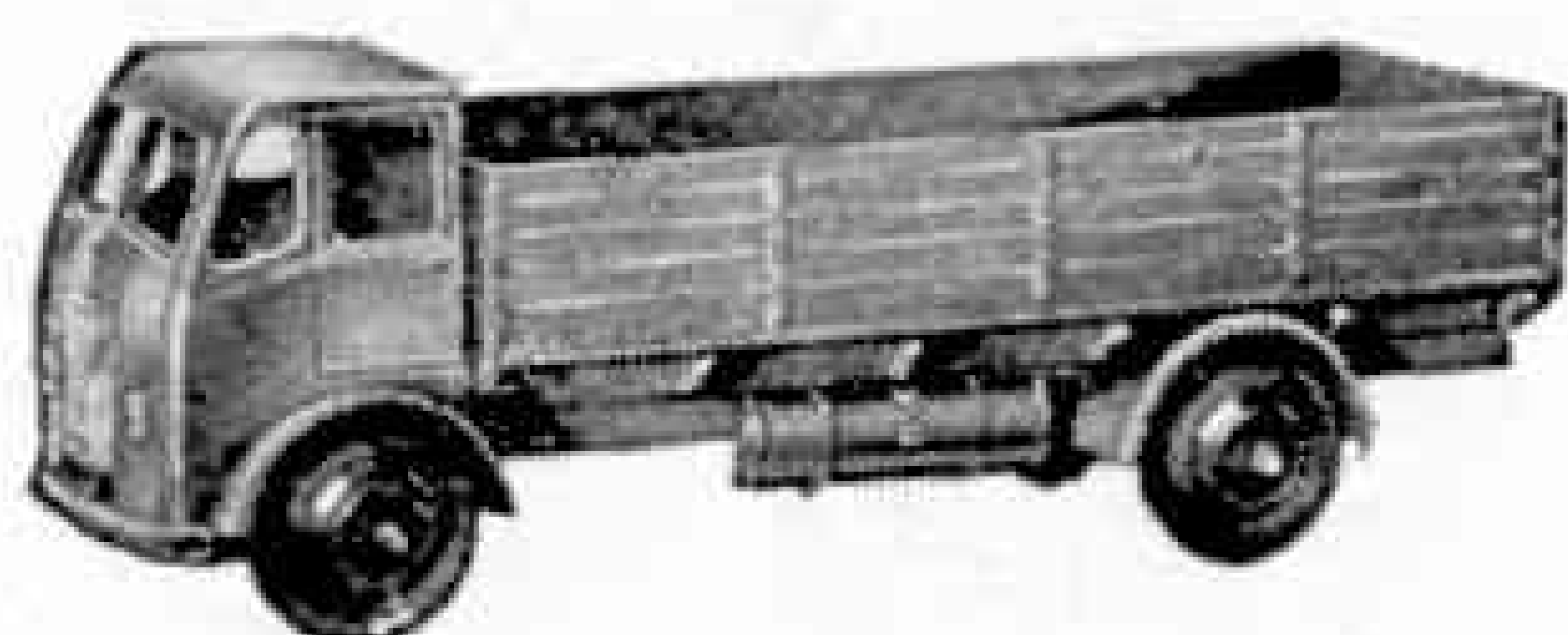
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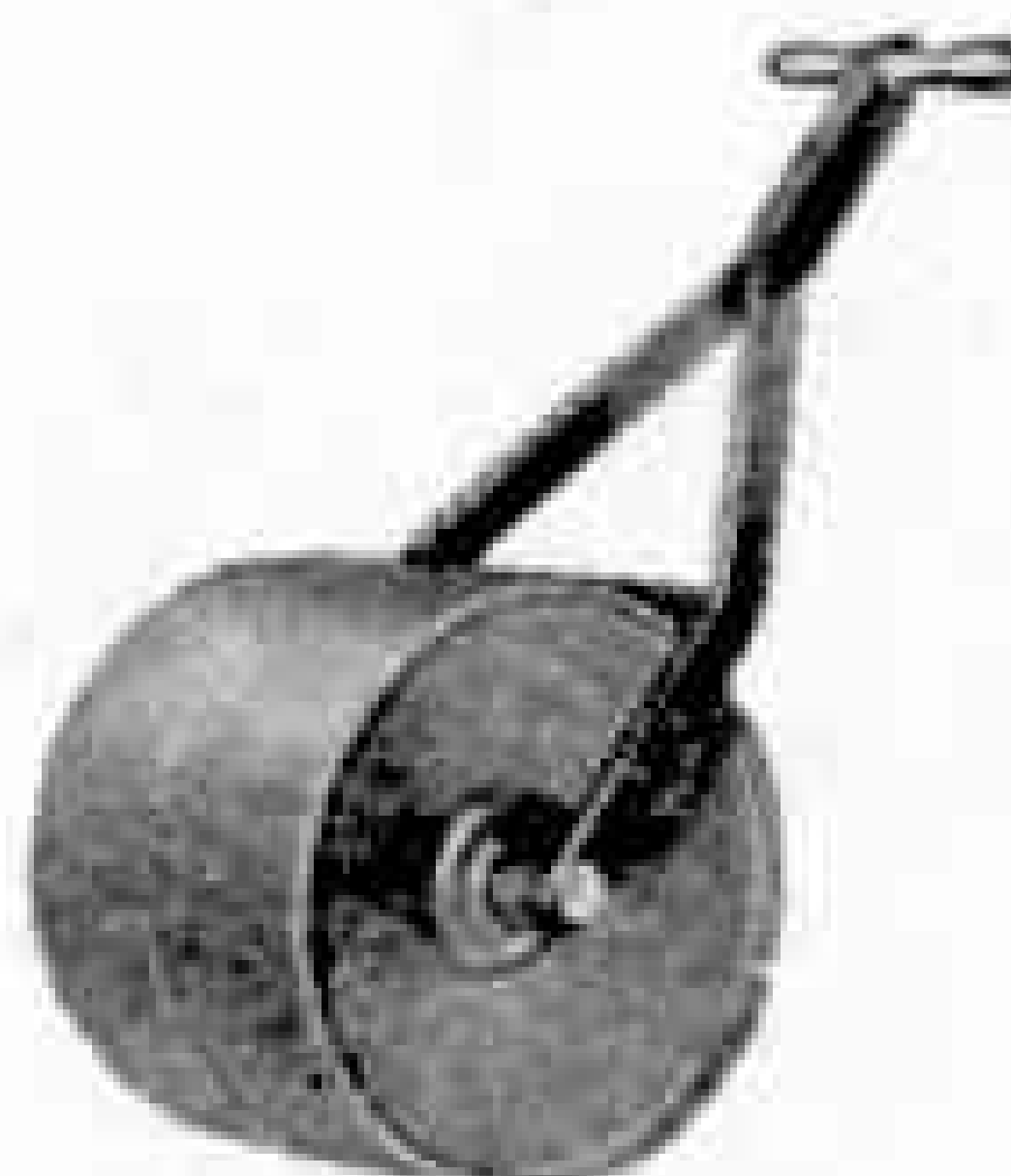
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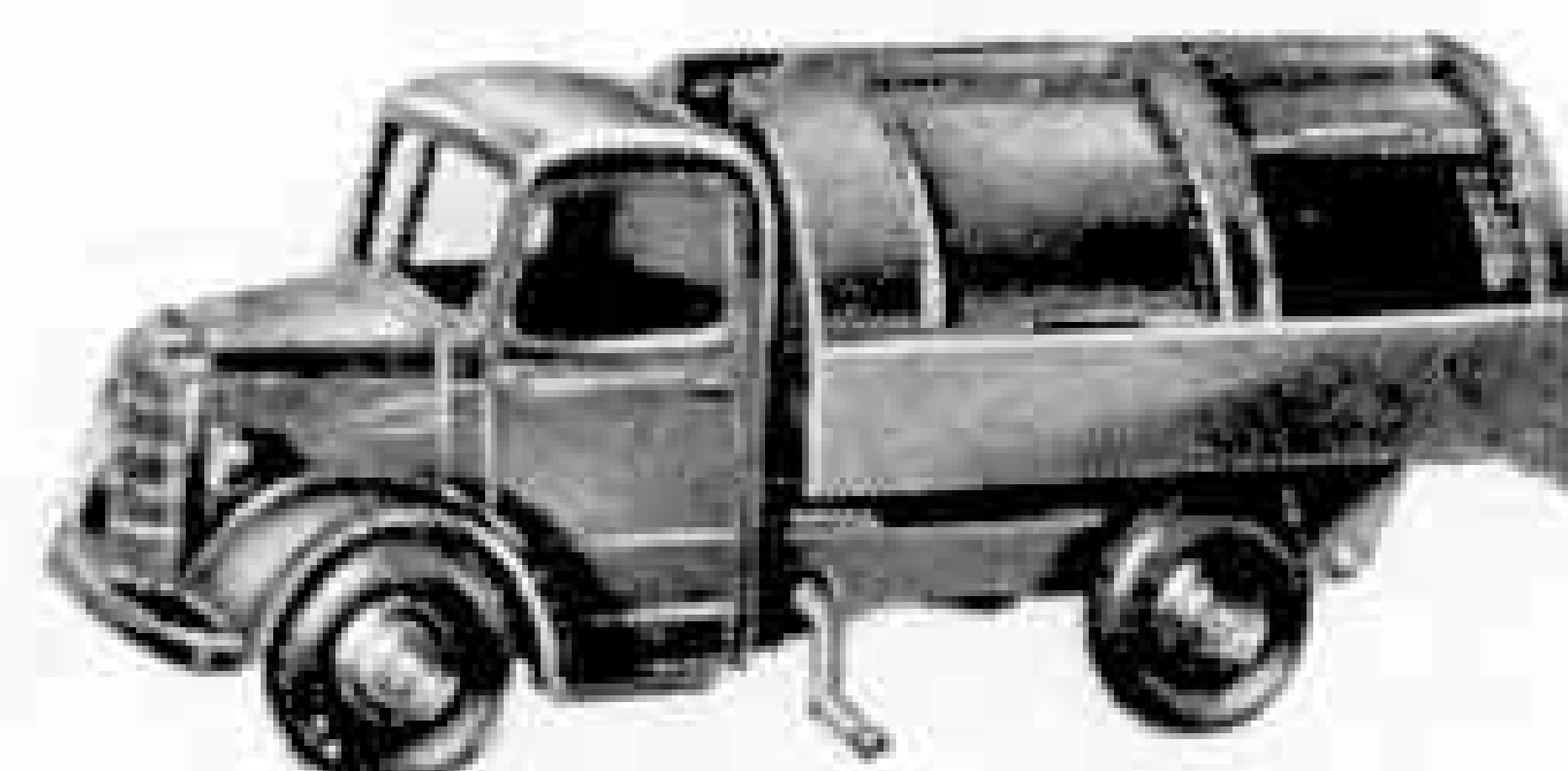
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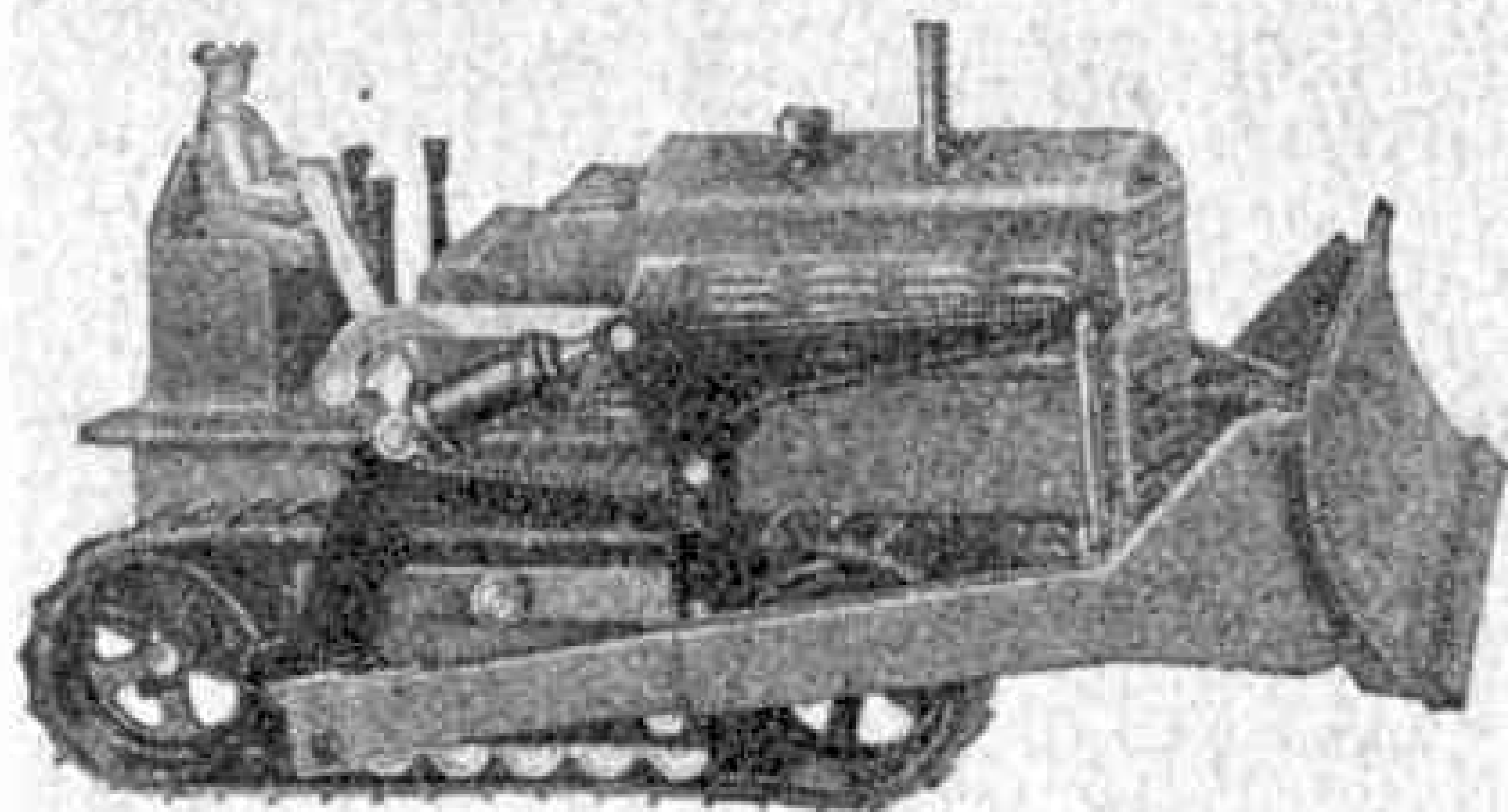
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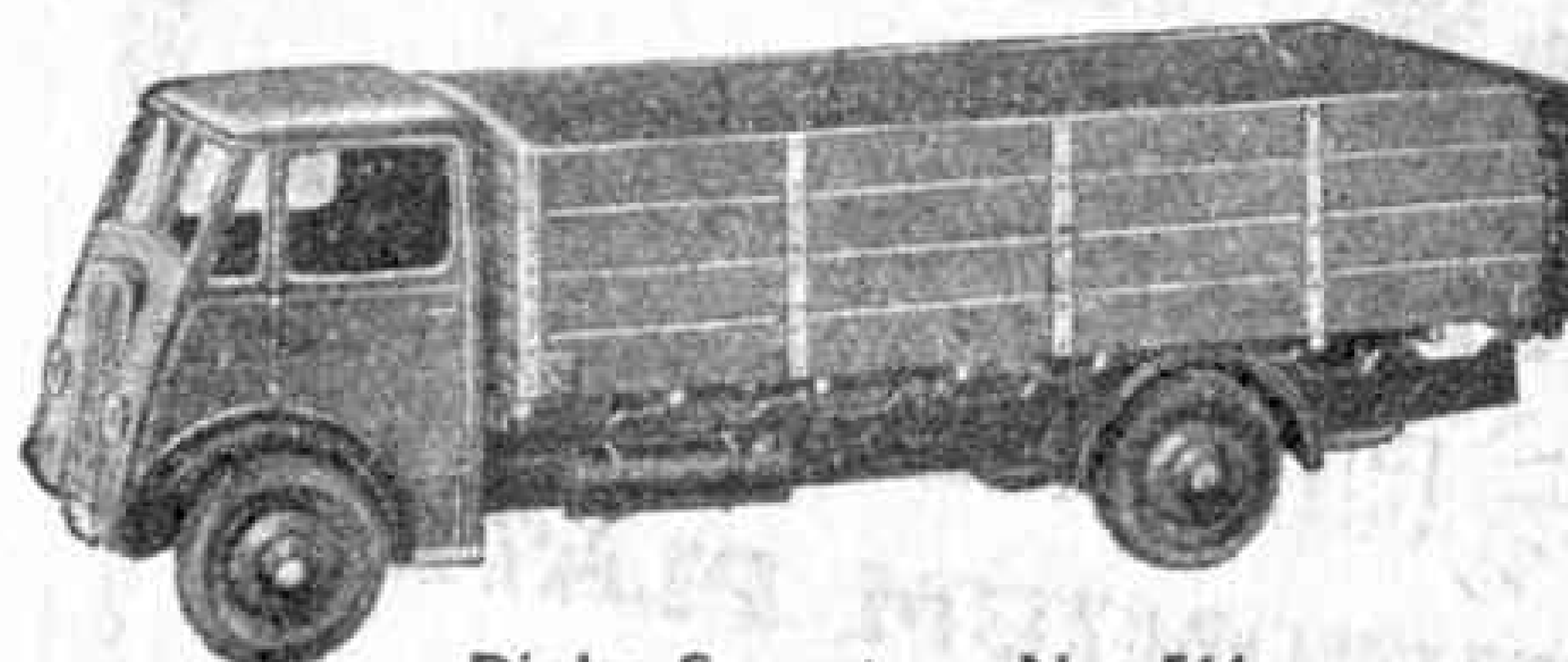
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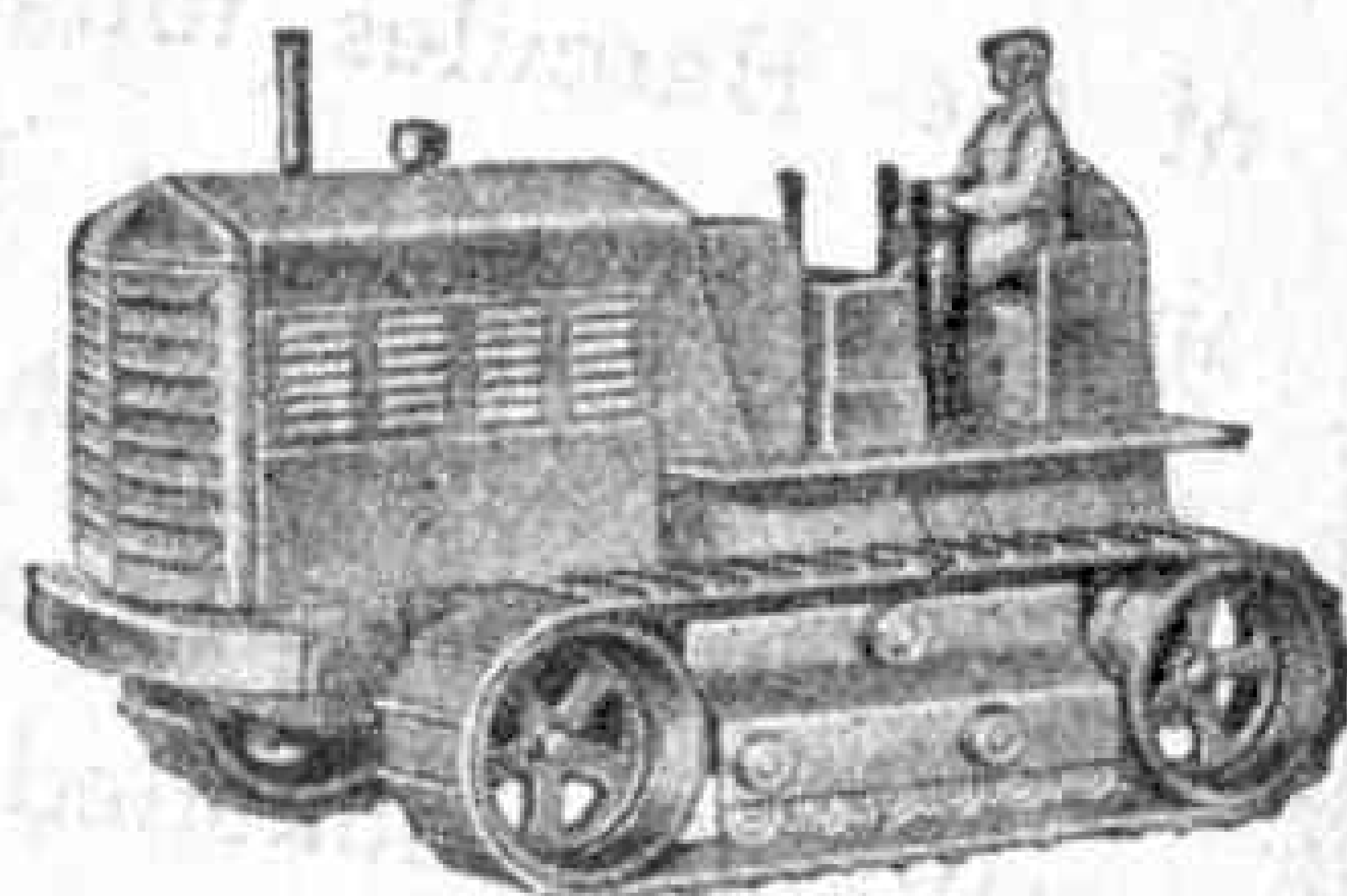
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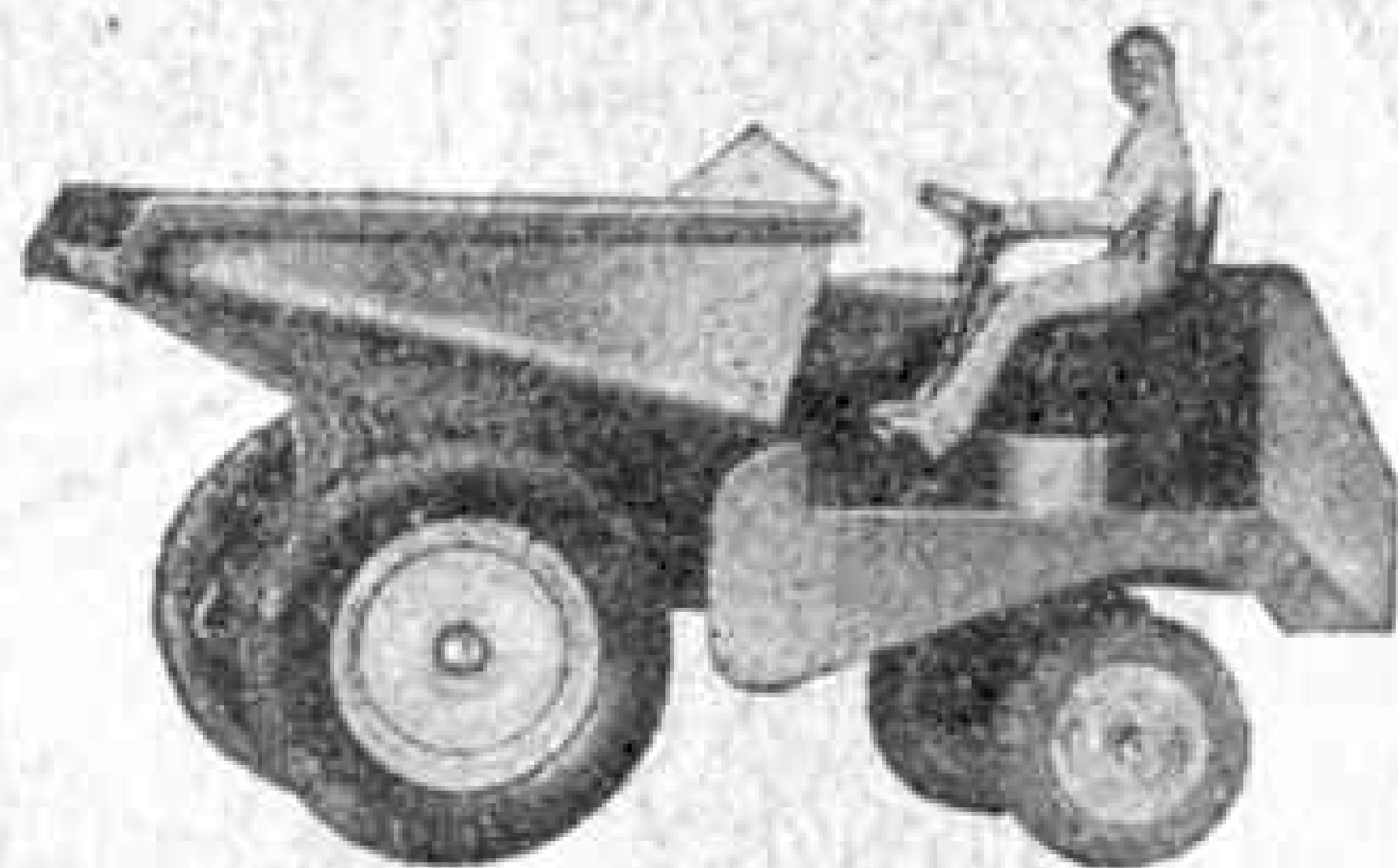
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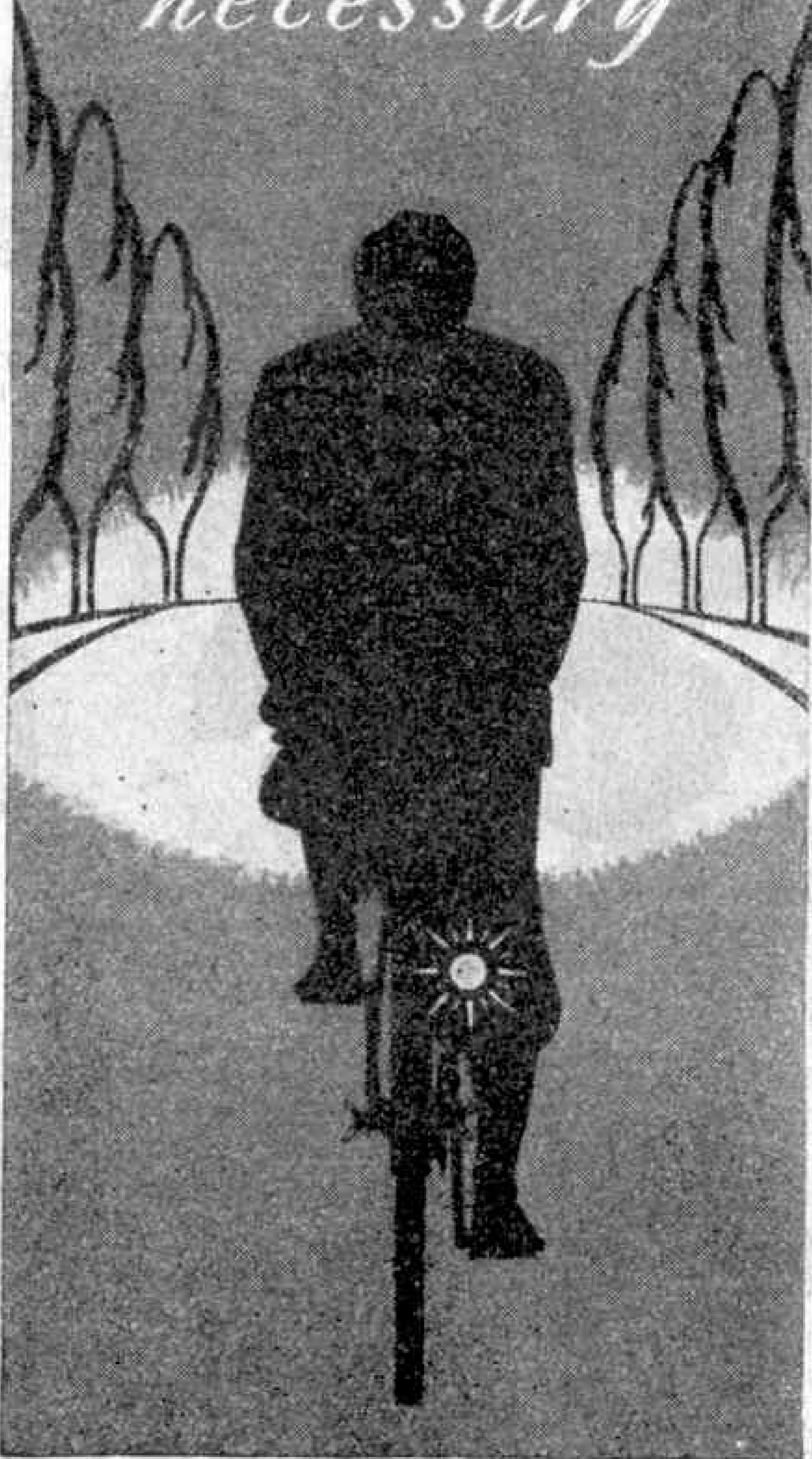
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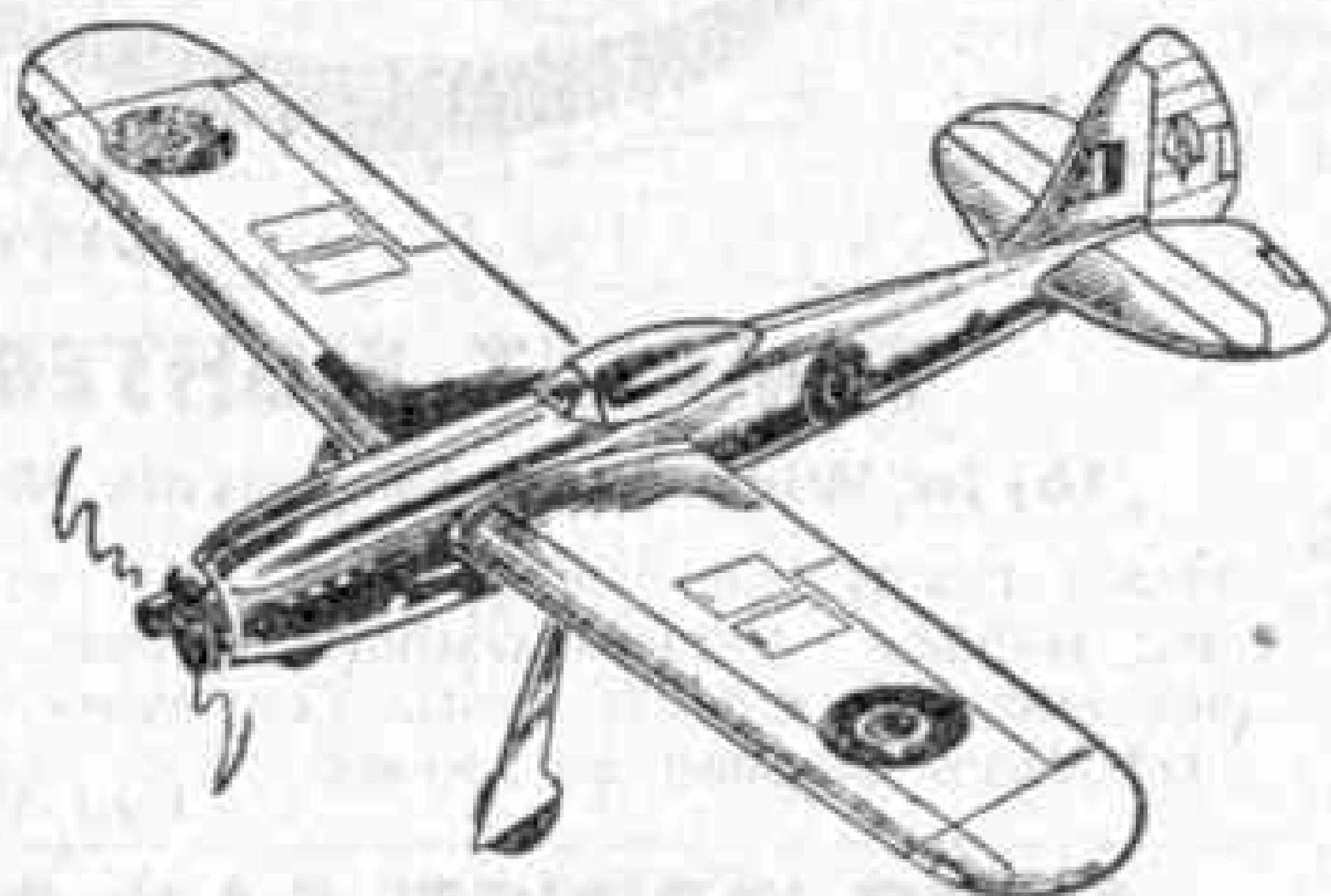
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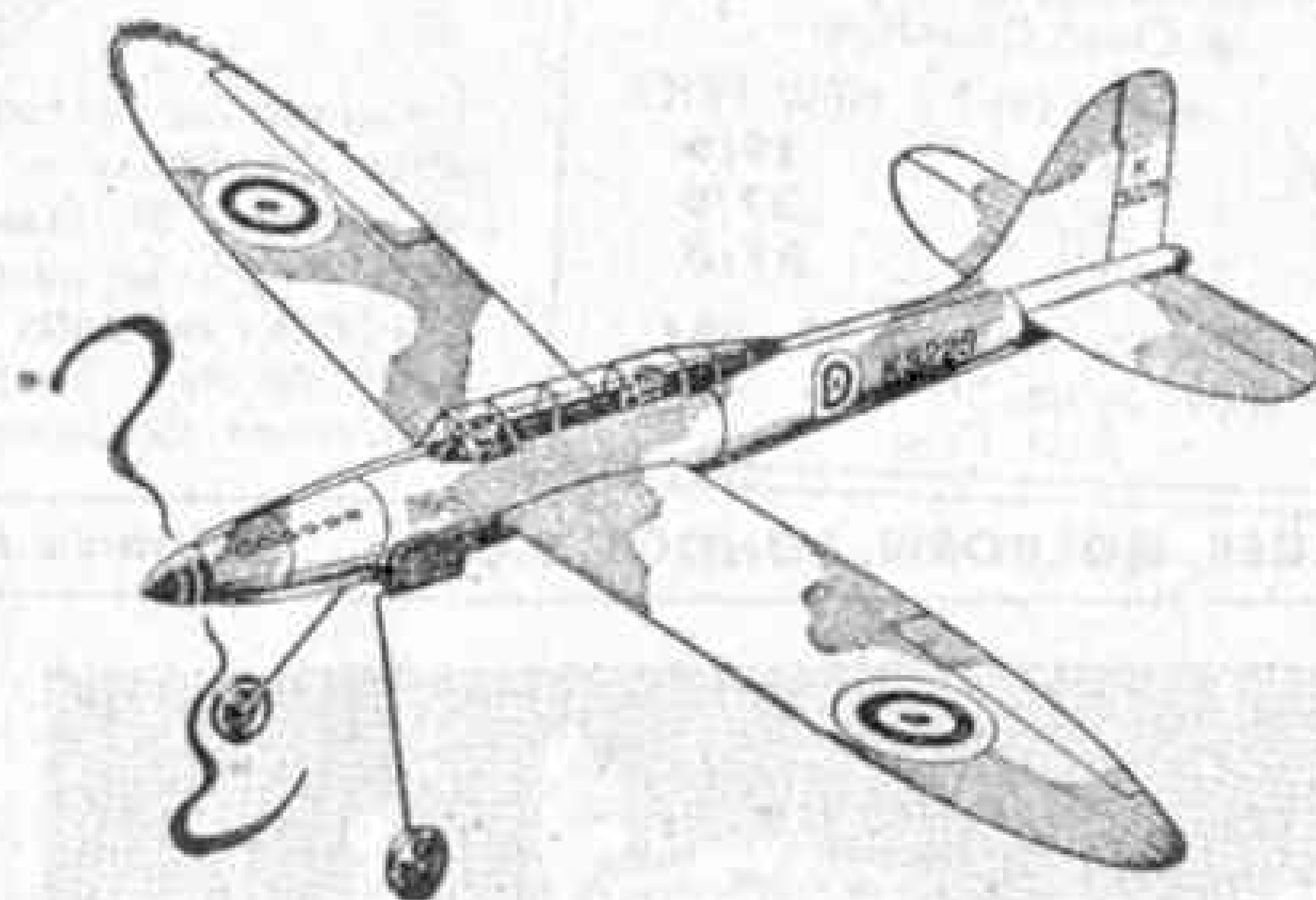
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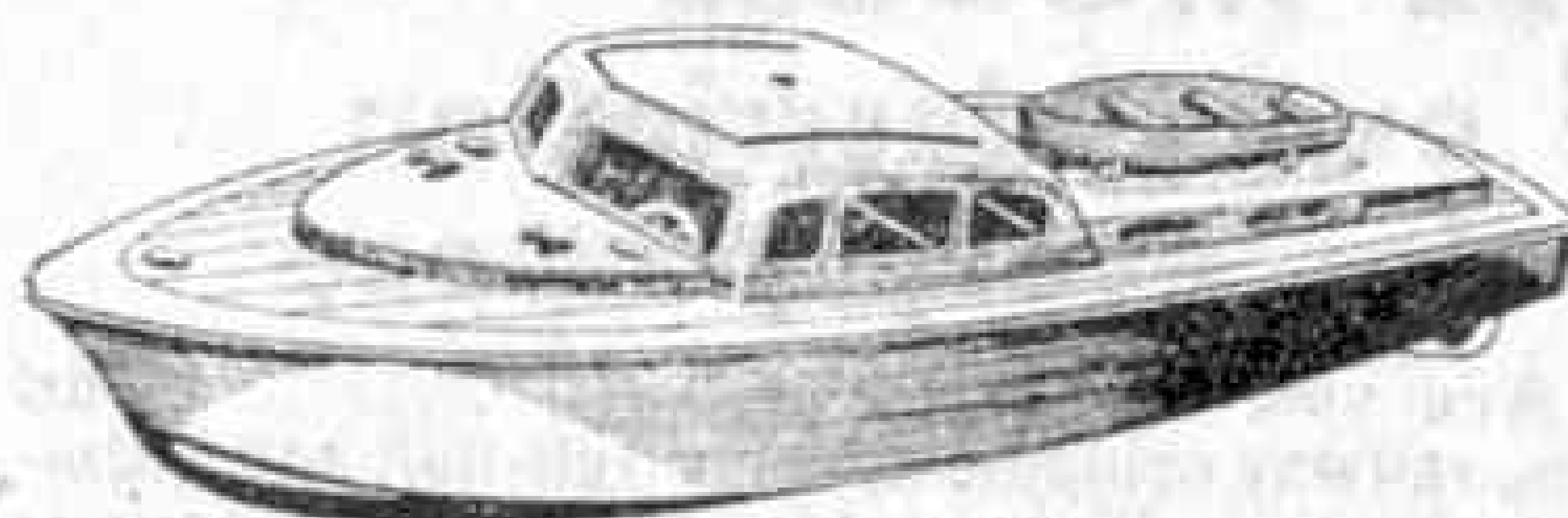
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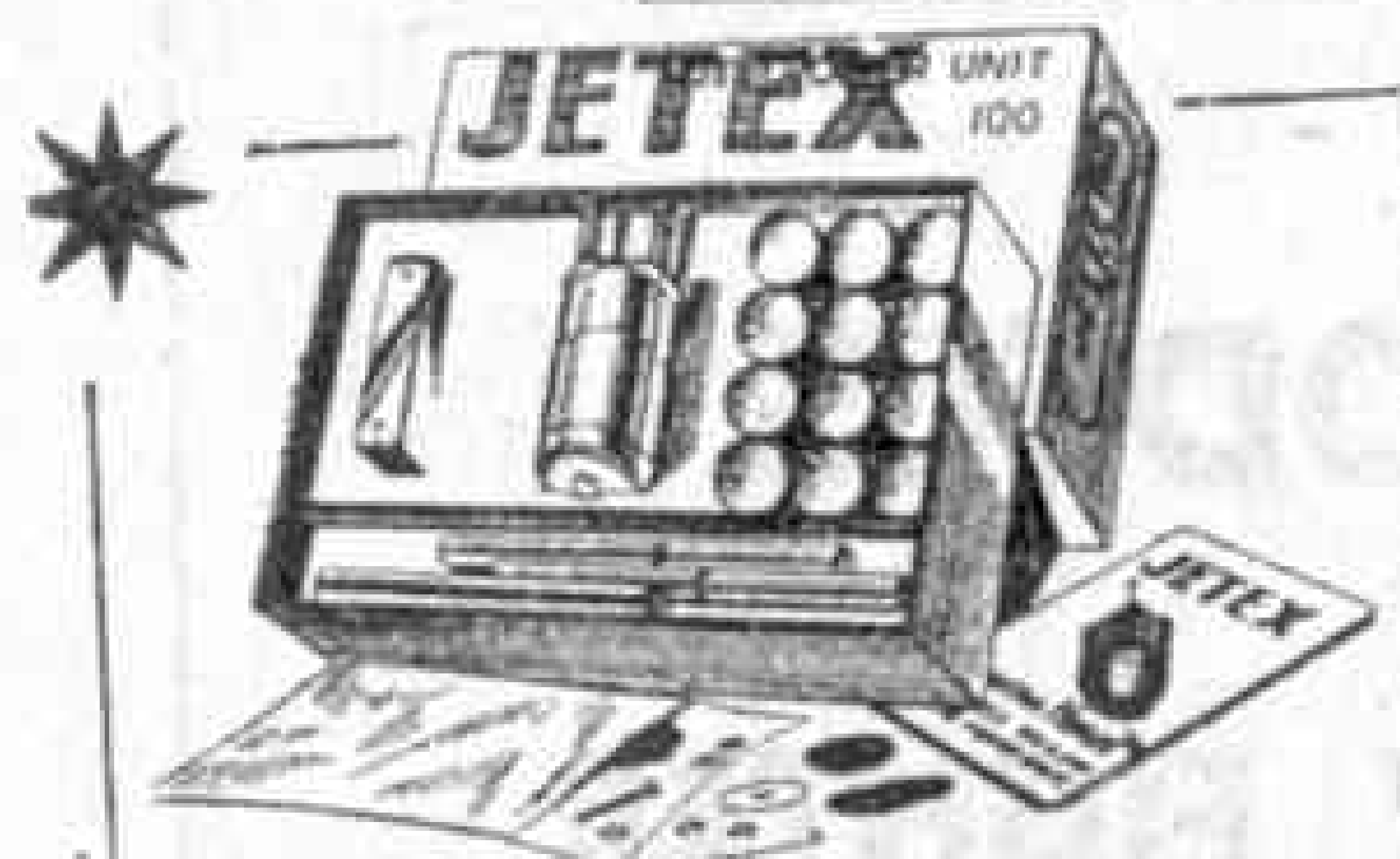
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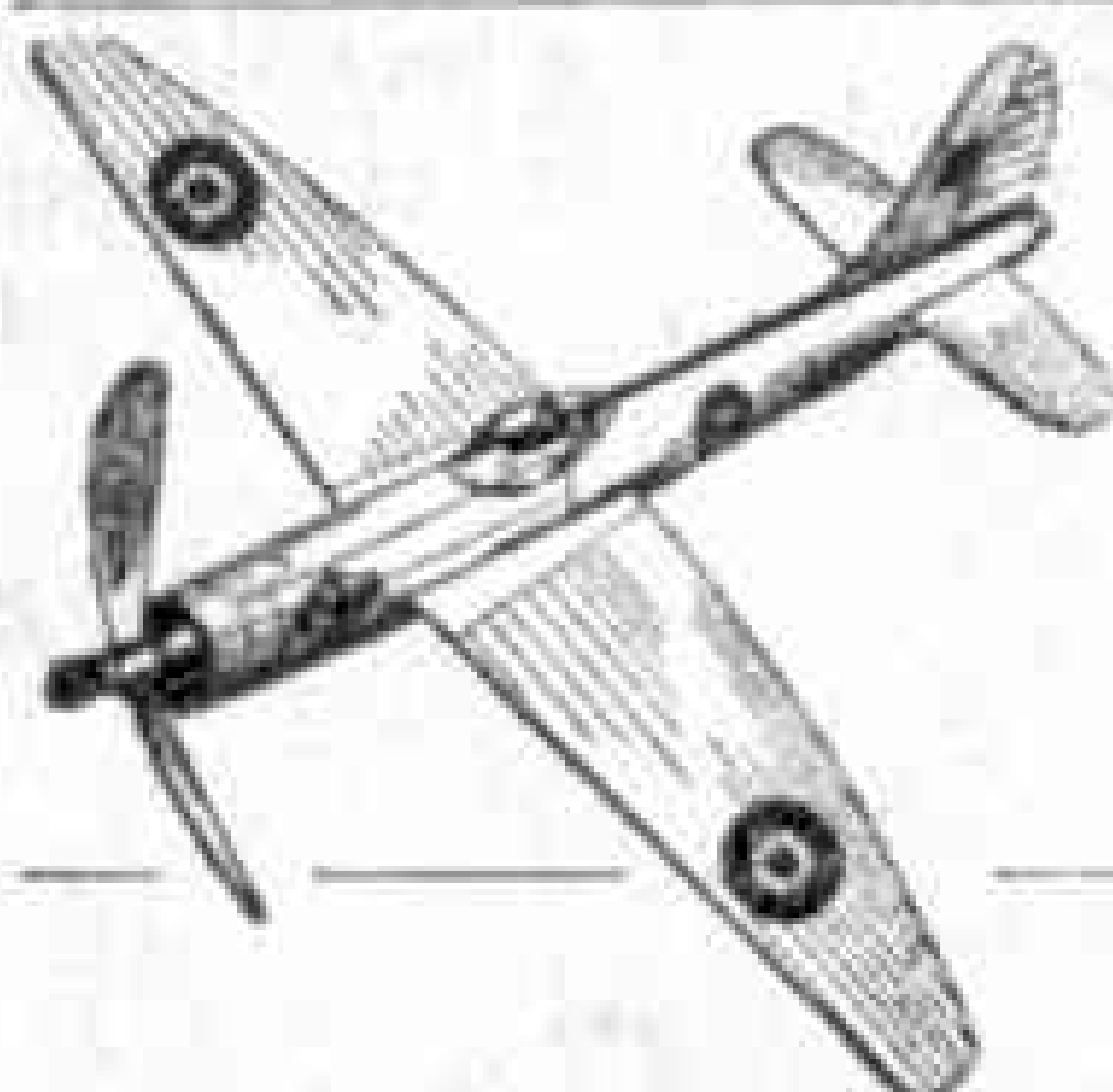
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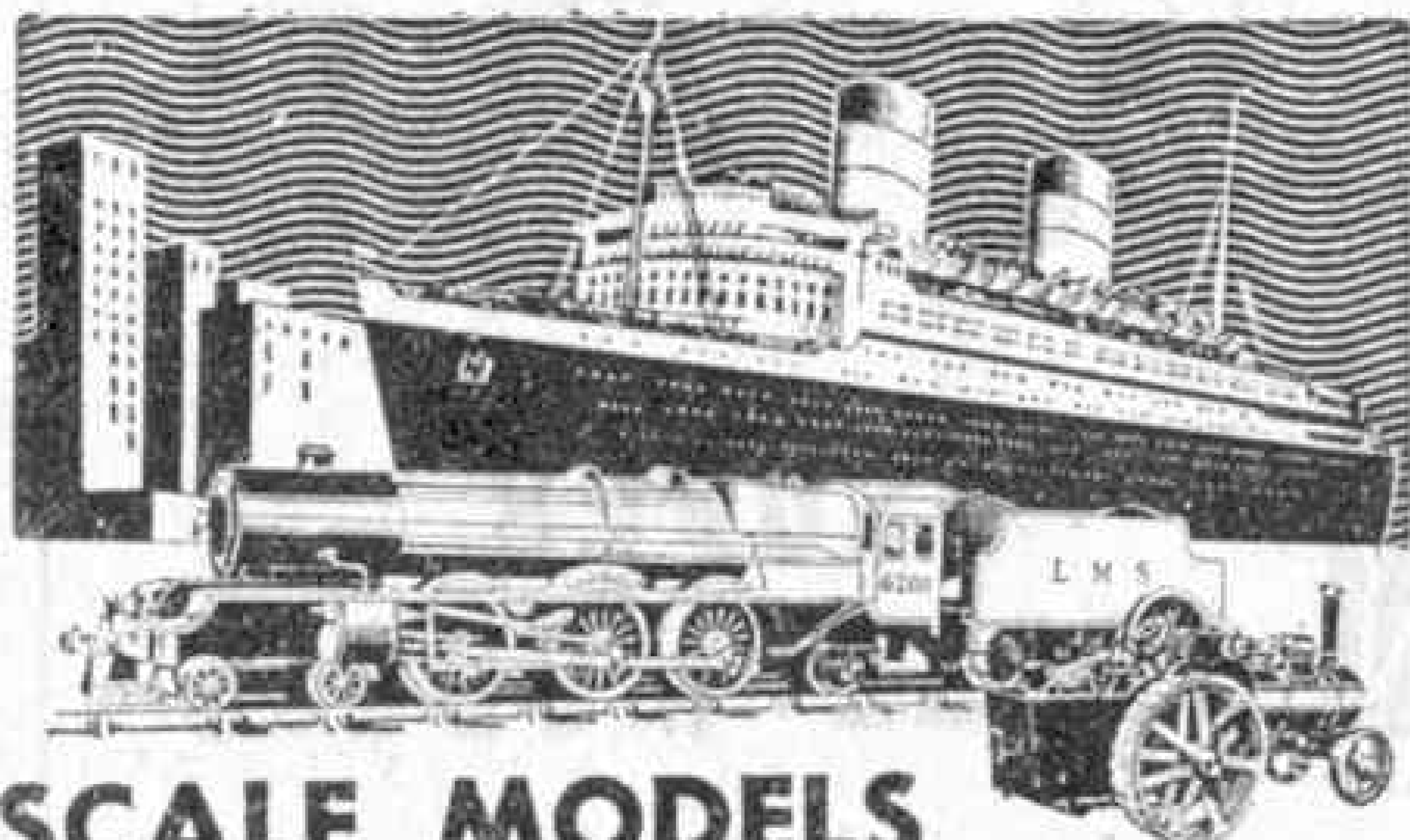
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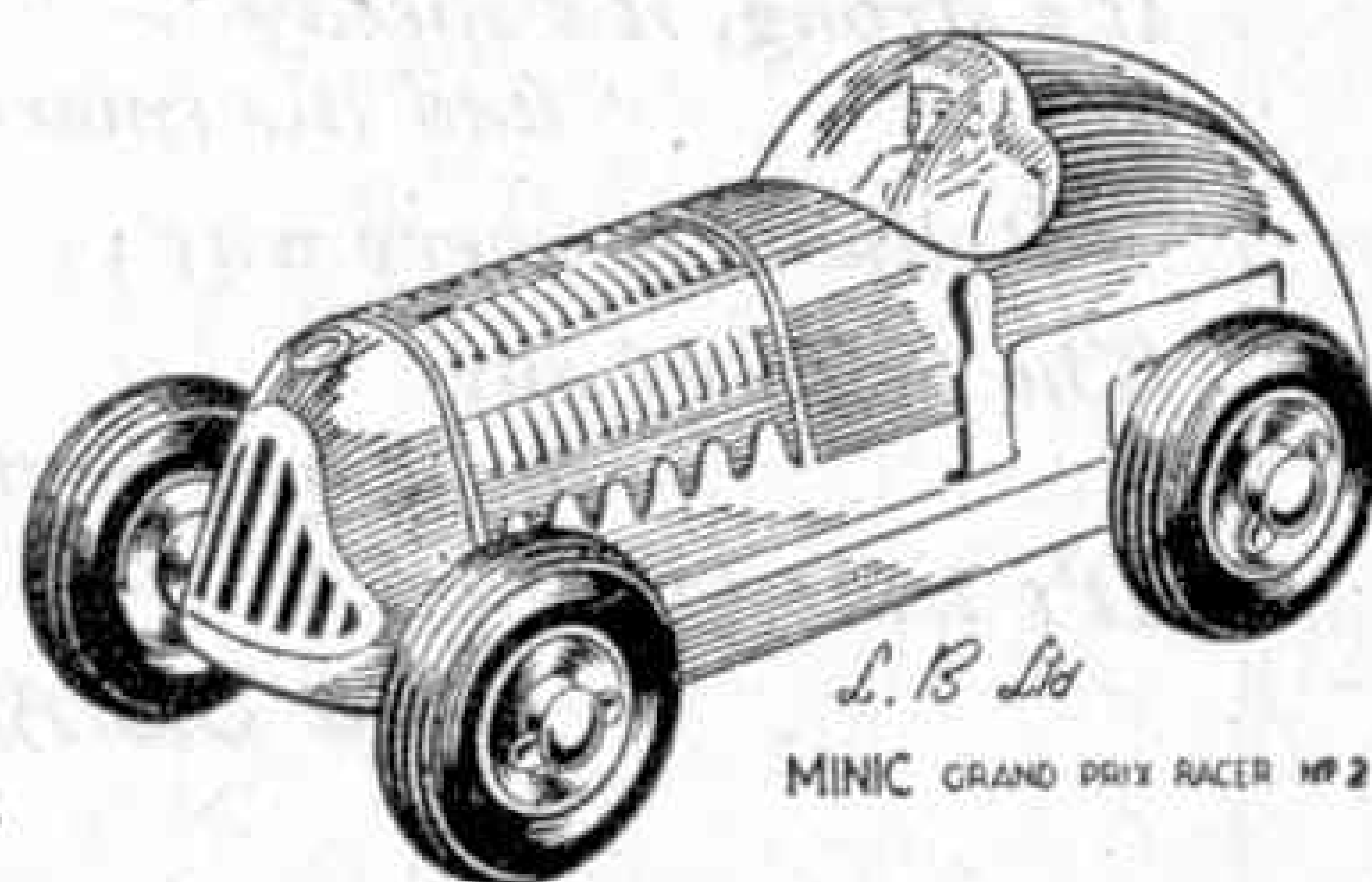
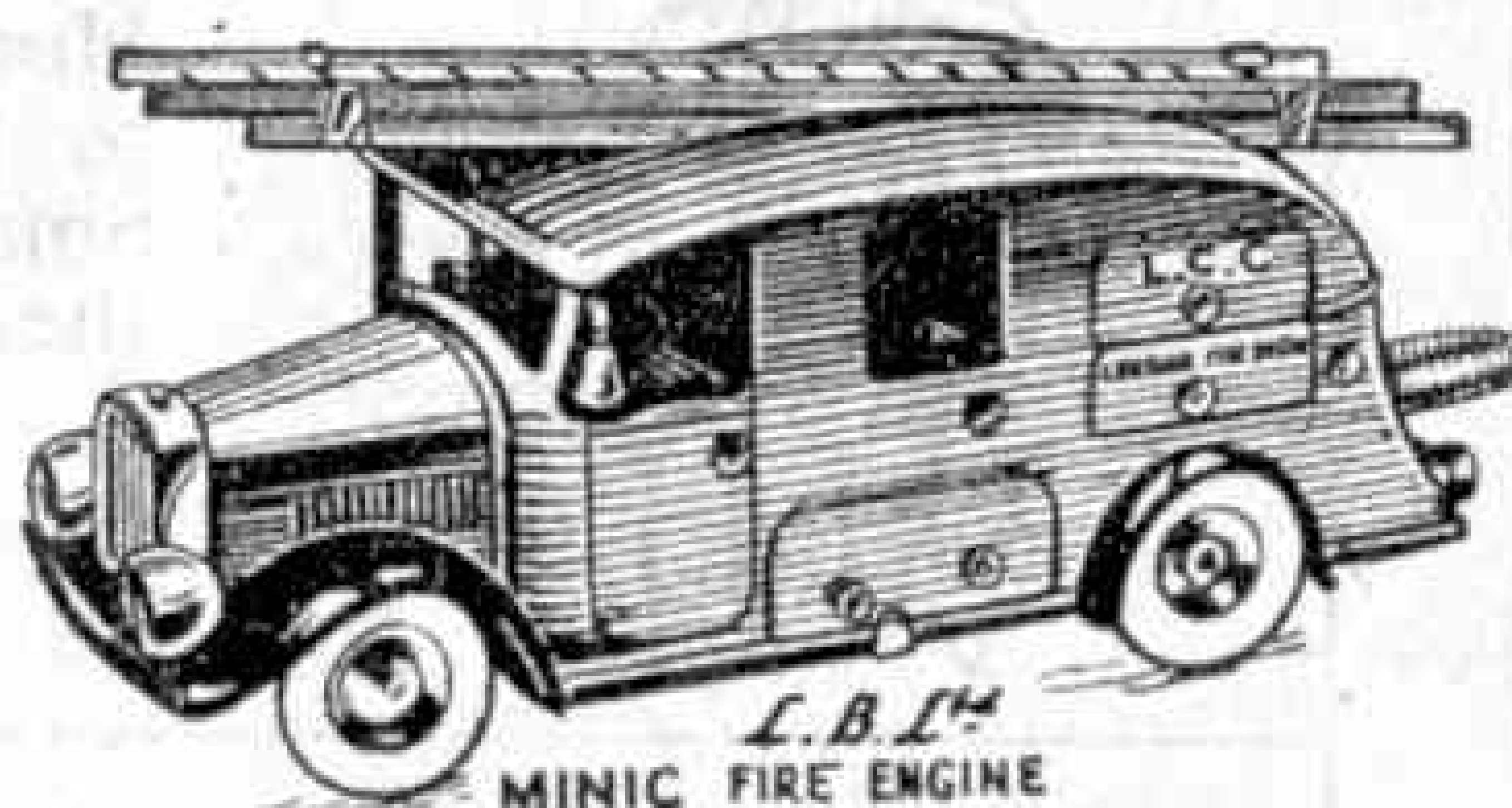
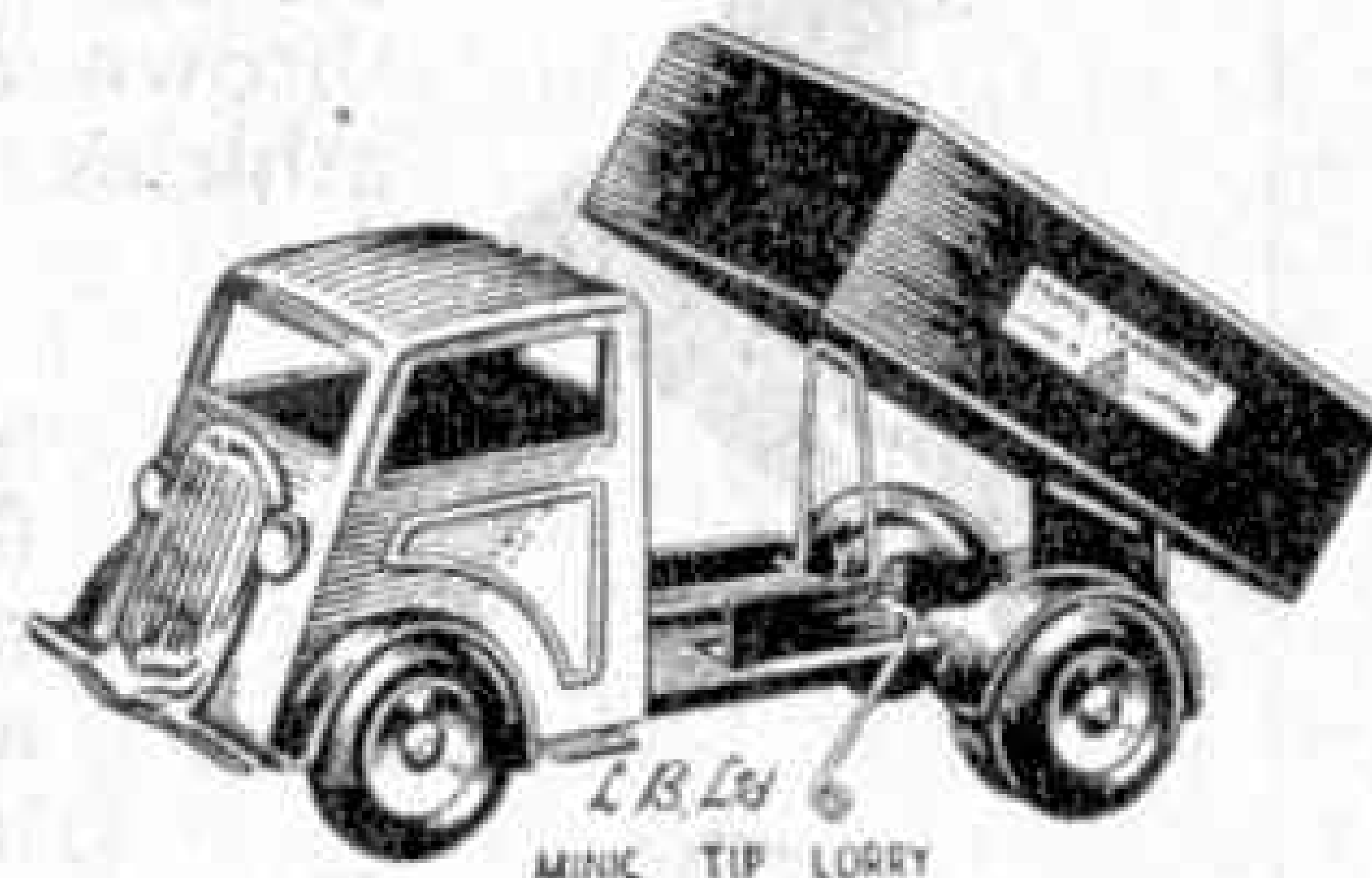
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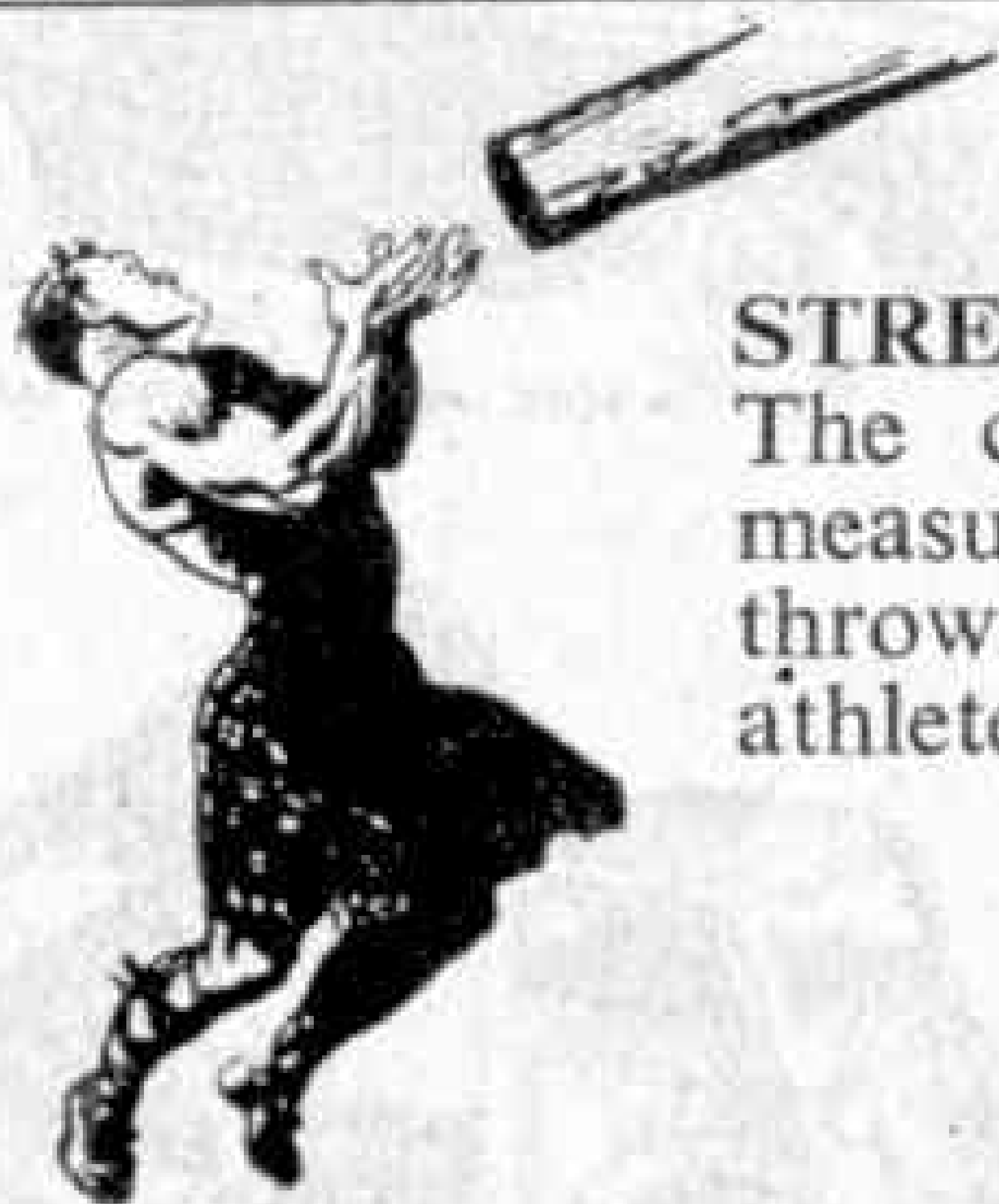
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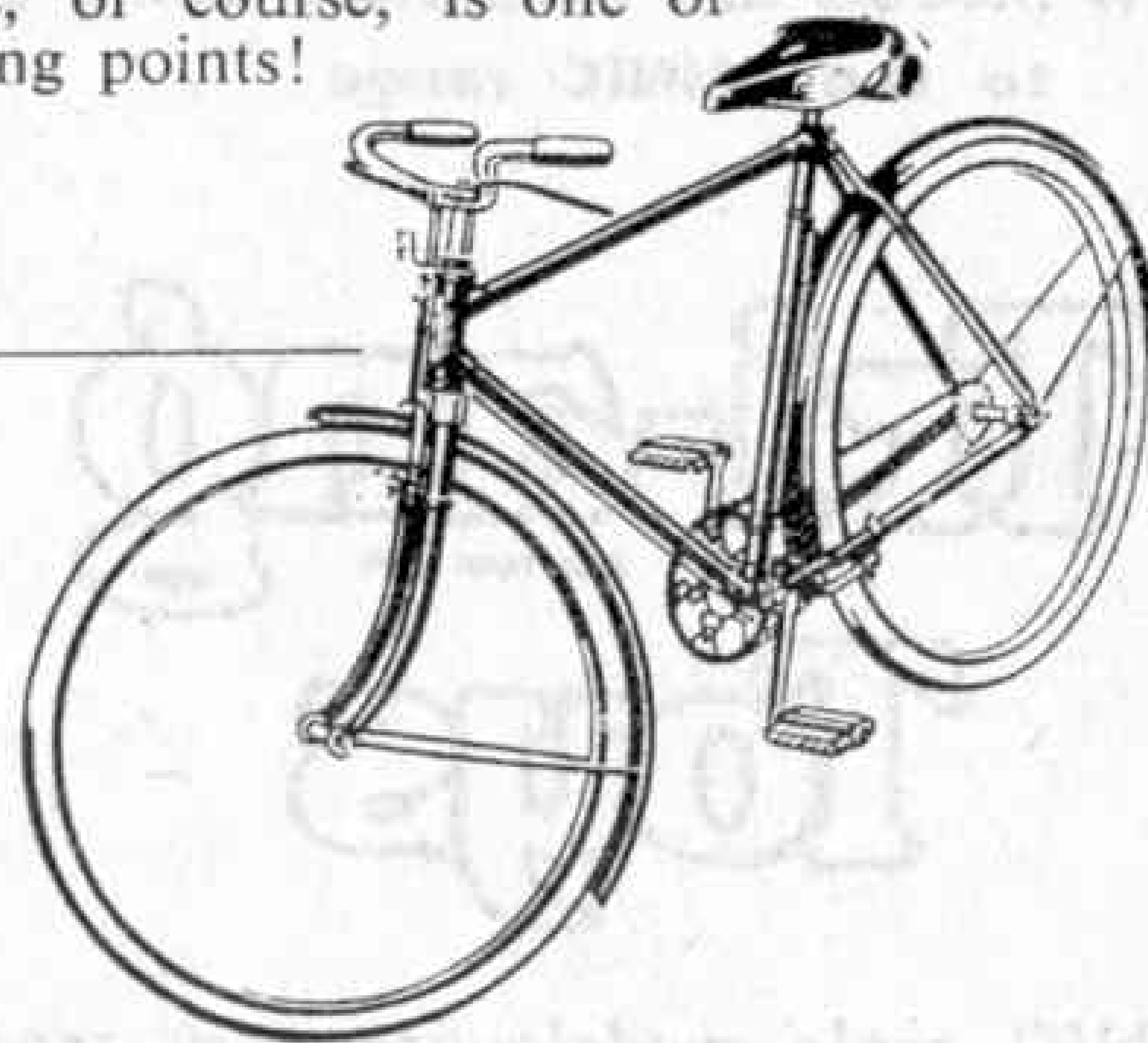
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MECCANO

MAGAZINE

Editorial Office:
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Vol. XXXIV
No. 5
May 1949

With the Editor

Canadian Water Power Scheme

Canada has an immense power potential in her great waterways. Many schemes have been under consideration in recent years but progress was halted by the outbreak of war and the urgent need for concentration on production for war purposes. Now, however, Canada is forging ahead with the development of her water power. One of the rivers that will soon be supplying power on an enormous scale is the Ottawa. Two great dams and power stations are now being built in the course of this river, and they will be described and illustrated in the "M.M." in the near future.

By way of contrast to the Ottawa scheme is the development of the Shipshaw power station in Quebec, the construction of which was actually brought about by wartime needs. This station was built at high speed and in the greatest secrecy during the war to provide power for the production of aluminium required to make the "Lancasters," "Hurricanes," "Spitfires" and other aircraft that did so much to bring about the downfall of Hitler. It houses the greatest concentration of power ever gathered together under one roof, for the 12 hydro-electric generating units that were installed in the powerhouse have a combined capacity of 1,200,000 h.p. The Shipshaw story will be told in next month's "M.M."

Instruments of George III's Day

If Meccano had been available in his day, King George III would probably have been an enthusiastic model builder. In his youth, as Prince of Wales, he showed great interest in mechanics, astronomy and scientific experiments of all kinds. Encouraged by this Royal interest, leading

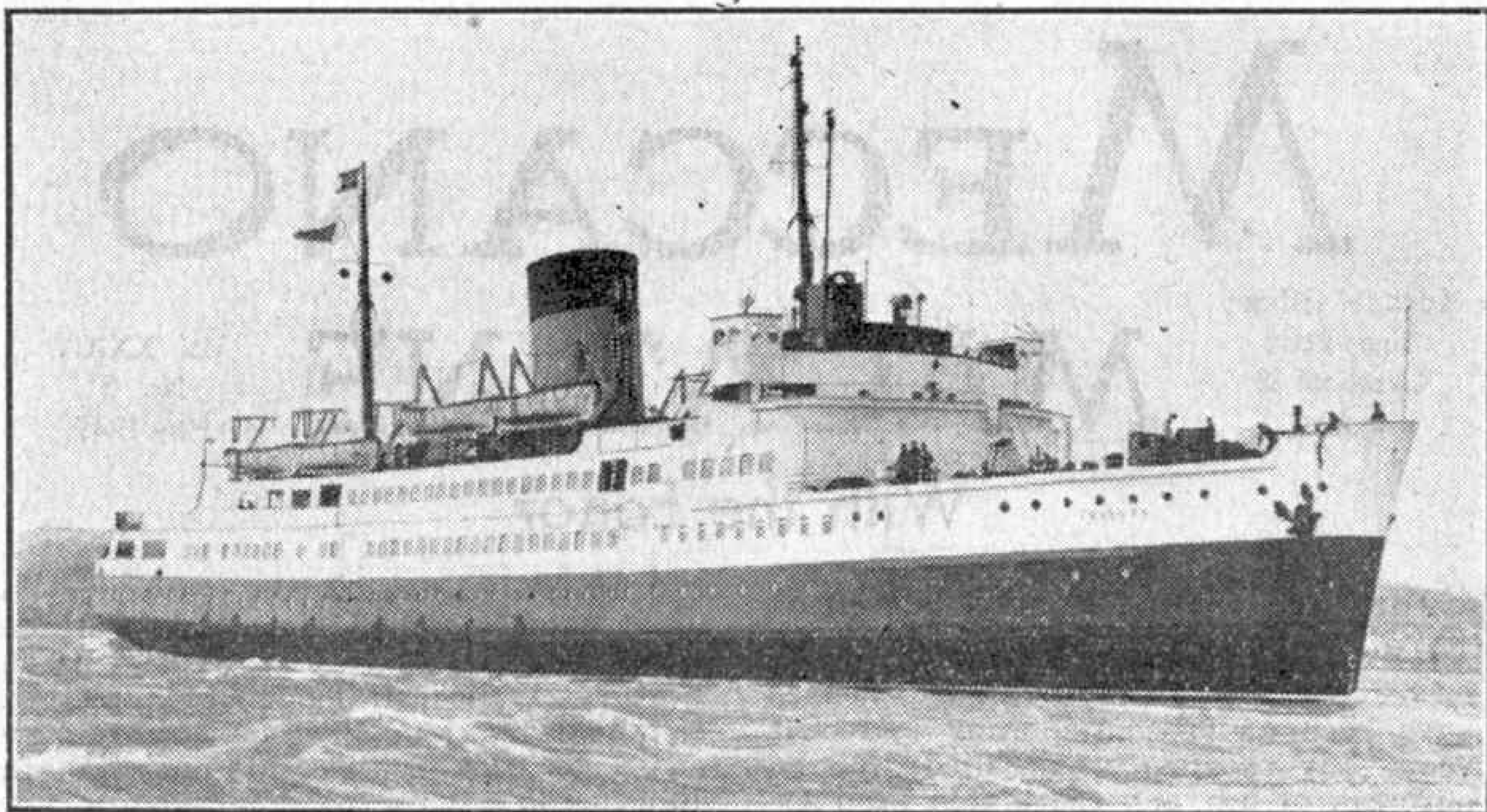
instrument makers of the period made many models for the instruction of the Royal children between 1750 and 1800. Fortunately the instruments were preserved as a collection, and they are now on view again at the Science Museum, South Kensington.

The long reign of George III, 60 years, saw many great industrial advances. Watt's improvements to the steam engine; the spinning machinery of Hargreaves, Arkwright and Crompton; Cort's invention of the puddling-furnace which gave such impetus to the manufactures of Birmingham and Sheffield; the invention of lithography in 1811; Wedgwood's artistic pottery; the Davy safety-lamp; the Bridgewater Canal between Manchester and Liverpool—all these were important features of this era, known to us as the period of the Industrial Revolution.

This Month's Contents

	Page
Cross-Channel Packet Boats ..	170
by Arthur Gaunt, F.R.G.S.	
Fun with Dinky Toys ..	173
Helicopter Progress ..	174
by John W. R. Taylor	
Prefabricated Food ..	180
by John W. R. Taylor	
The "Mammoth" ..	182
Welding ..	184
Kenya and Uganda Railway ..	186
by Capt. A. H. Woollen, B.Sc., R.E.	
Glass by Rail ..	191

Air News, 188. Books to Read, 176. Club and Branch News, 195. Competitions and Results, 204-5. Fireside Fun, 206. From Our Readers, 203. H.R.C. page, 196-7. Among the Model-Builders, 192. New Meccano Models, 194. Railway Notes, 178. Photography, 190. Stamp Pages, 199, 201.



The "Invicta," one of the present fleet plying between England and France.

Cross-Channel Packet Boats

By Arthur Gaunt, F.R.G.S.

ALTHOUGH you can fly from England to France in a matter of minutes nowadays, the packet boats which cross the English Channel are still performing an important service. Since the end of the war, indeed, new vessels have been added to the cross-Channel fleet, both to replace those lost by enemy action and to improve the speed and comfort with which passengers may travel to and from the Continent.

At the beginning of the present century, less than a million persons travelled by this route each year. The million mark was first attained in 1905, and by 1937 the number of passengers had risen to two million. No new records are likely to be set up this year, but an increasing number of passengers are expected to use this historic service during the summer.

Among the latest and most interesting ships on the cross-Channel route are the "*Maid of Orleans*" and the "*Falaise*." The latter was the first post-war vessel of the Southern Railway fleet; the "*Maid of Orleans*" was launched last September to replace the well-known pre-war ship of that name, which was lost in the Normandy invasion of 1944.

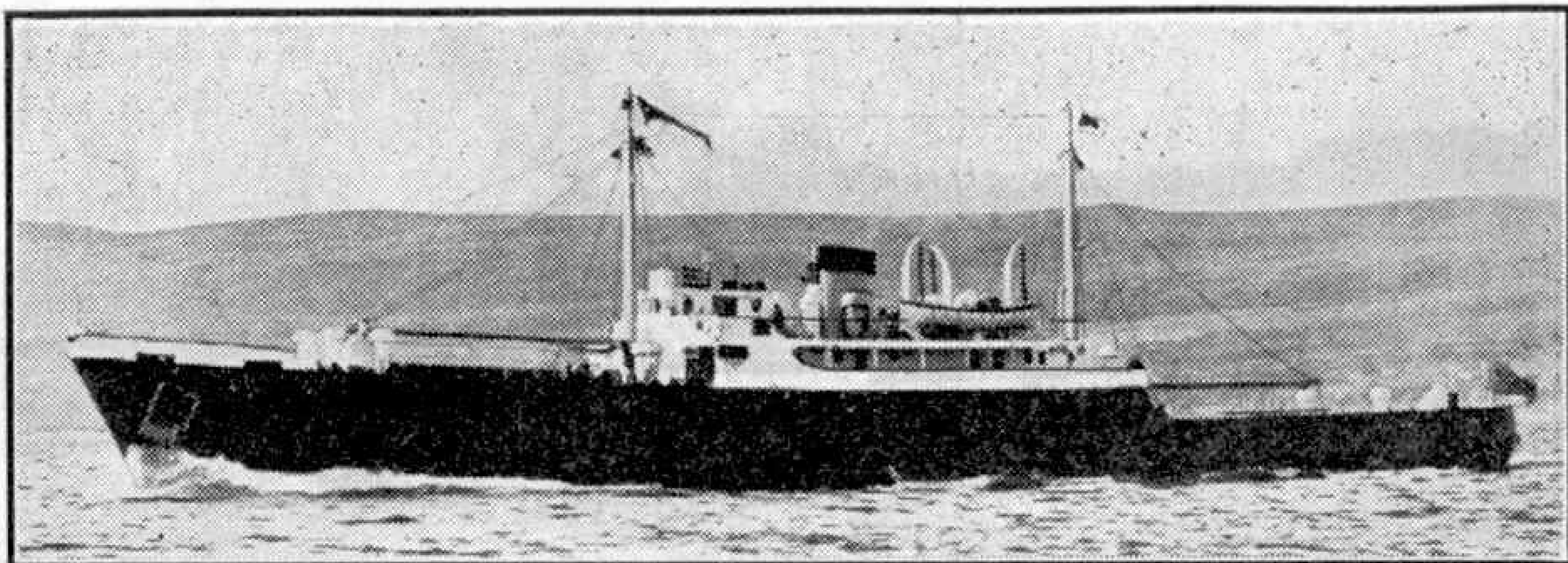
The "*Falaise*," named after the ancient Normandy town which figured in the liberation of Europe, was specially designed

to serve on any of the cross-Channel routes either by day or by night. Her overall length of 314 ft. and her gross tonnage of 3,710 make her the largest vessel to run on the Southampton routes. Her speed of 20½ knots also gives her the speed record for ships using these routes.

Again, she has greater sleeping accommodation than any other vessel built for the Southampton routes to the Continent. She can carry 1,400 passengers. Her two sets of turbines are of 10,000 b.h.p., and she is fitted with two bronze propellers. Turbine-driven generators give her ten times the amount of electricity of the older vessels on the cross-Channel services, and this current supplies power or lighting not only to the deck machinery, but also to the engine room auxiliaries and the galley.

She is equipped with the latest aids to navigation, including radar, so that she can continue running even in thick fog. The wheelhouse instruments include devices showing both the speed of the ship and the distance run.

So that the "*Falaise*" may be brought into harbour stern first if necessary, a rudder is fitted at the bow as well as at the stern, and this rudder can be controlled from either wing of the bridge. Still another aid is a Denny Brown stabilizer,



The "Winchester," a cruiser-like cargo ship plying between Southampton and the Channel Islands. She has diesel propulsion.

which considerably reduces the rolling of the ship. The "*Falaise*" was only the second cross-Channel boat to be fitted with such a stabilizer, and great improvements have been made since the first vessel was so fitted.

Air conditioning makes it unnecessary to open port holes and windows. The covered deck lounge has armour plate-glass windows, giving excellent visibility, and fluorescent fittings in the upper deck lounges and smoke rooms give shadowless lighting.

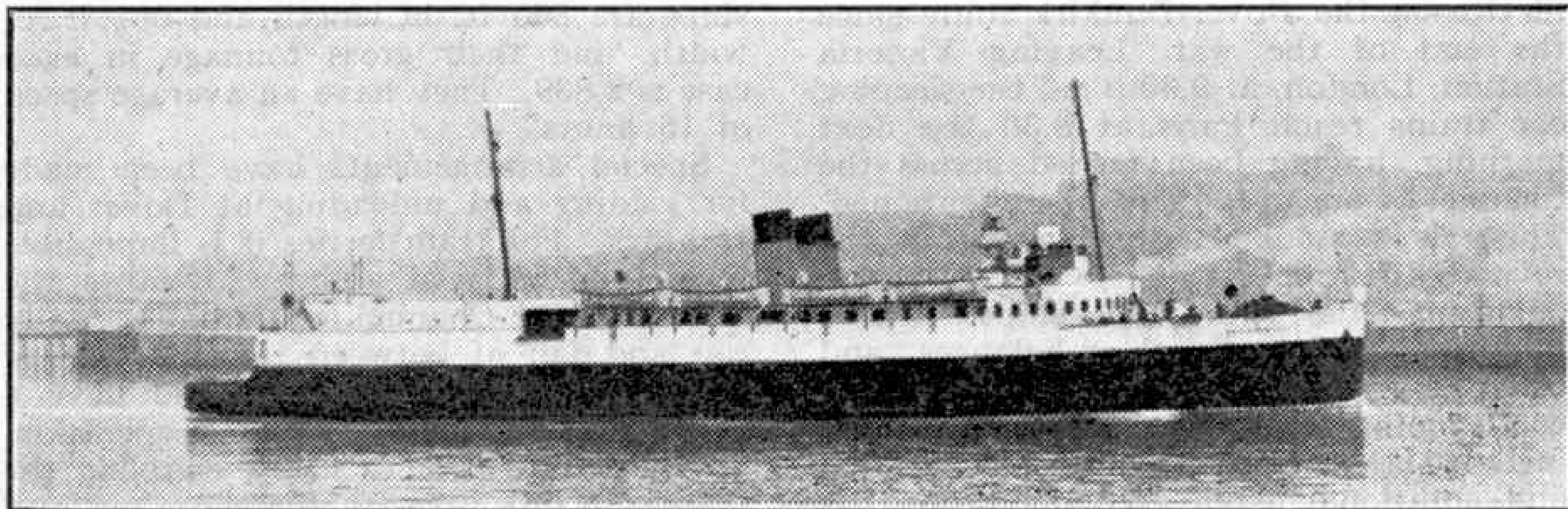
The new "*Maid of Orleans*," like the "*Falaise*," has a stabilizer. The success of this device in practically eliminating rolling when it was installed in the "*Falaise*" prompted the designers of the second vessel to adopt it too. Similarly she has been equipped with a radar installation, and has a bow rudder. Like the one at the stern, it is of the electro-hydraulic type.

The run of the "*Maid of Orleans*" is on the popular "short routes" to the Continent from Dover and Folkestone. She can carry more than 1,000 passengers. Her overall length is 341 ft., her breadth 50 ft. and

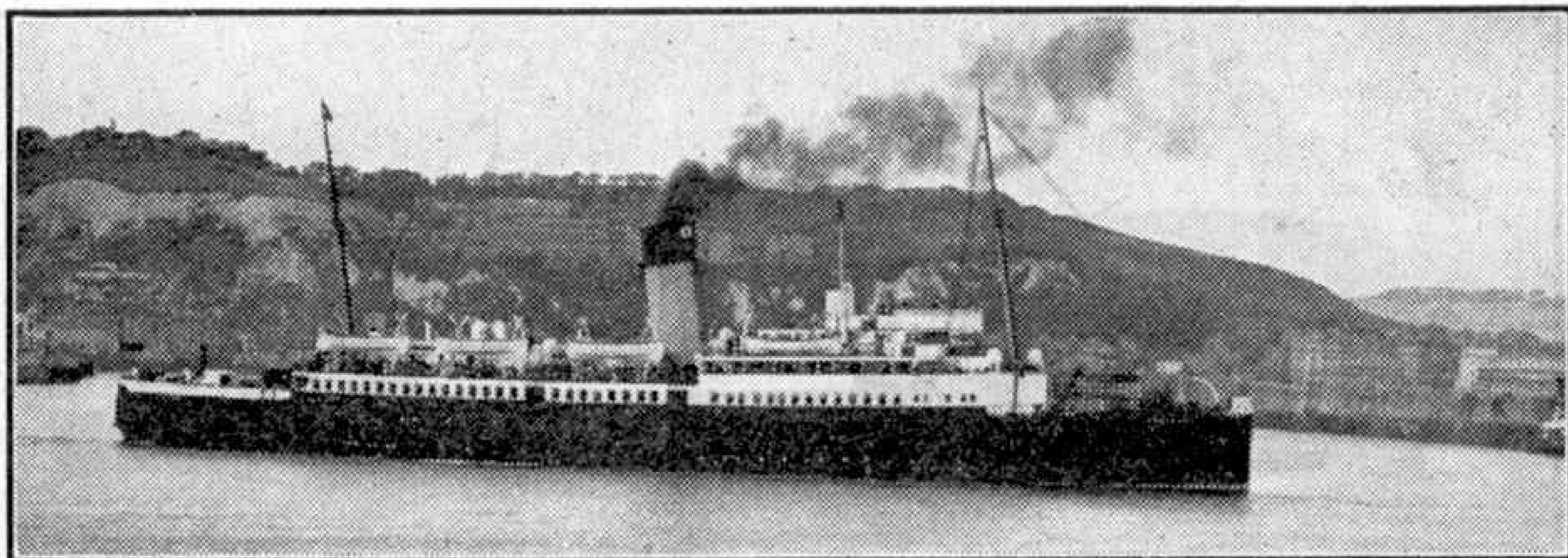
her depth 18 ft. She has a gross tonnage of 3,700, and is probably the smartest vessel of her class afloat at the present time, having a raked stem, a cruiser stern and one streamlined funnel. She is faster than the "*Falaise*"; her steam turbines develop 11,000 h.p. and give her a speed of 22 knots.

Even more interesting in some ways is the "*Dinard*," the largest motor car carrying ship on the Southern Railway cross-Channel services. She can carry 70-80 cars, and has accommodation for 300 passengers.

The "*Dinard*" is a ship with a history, too. She was put into service on the Southampton-St. Malo run in 1924, but during the war became a hospital ship. In that capacity she survived bombs, shells, and torpedoes at Dunkirk, and on D-Day she had an exciting journey to the Normandy beaches, for she struck a mine off the French coast; after all-night efforts she was towed back to Southampton. Hurried repairs enabled her to be put into service again in seven days, and she did valiant work with Cherbourg as her base.



The "Twickenham Ferry," built to carry trains across the Channel, thus giving London a direct railway link with Paris.



S.S. "Canterbury" leaving Dover for the Continent. The port has had a regular cross-channel service since 1782.

Between the Dunkirk evacuation and the landings in Normandy she visited 30 ports in the Mediterranean area, covering 30,000 miles in nine months and carrying nearly 8,000 patients.

The conversion of the "*Dinard*" into a ship for carrying cars to and from the Continent was undertaken during the winter of 1946-1947, and she took up her new job in July of the latter year, when she started an entirely new service between Folkestone and Boulogne. The work of reconstruction included the repair of fairly extensive mine damage, the removal of troop equipment, the fitting of a new bridge and upperworks, and the construction of two car decks. Improved passenger accommodation also was provided, such as a dining saloon for 90 persons, a chauffeurs' room, and A.A. and R.A.C. offices. There is also a special loading space for two motor coaches, and a turntable for cars. Facilities for loading and unloading at three points are another noteworthy feature.

The "*Twickenham Ferry*," the "*Shepperton Ferry*," and the "*Hampton Ferry*" are three pre-war train-ferrying ships which have been modernized and put back into service on the Dover-Dunkirk route since the end of the war. Leaving Victoria Station, London, at 9.30 p.m., the sleeping car trains reach Paris at 9.30 the next morning, having been ferried across the Channel by one of the ships just mentioned. There is a similar daily journey in the reverse direction.

During the war the ships carried munitions, locomotives, ambulances, and other weighty cargoes to France. Reconditioning and improving them has included their conversion to oil-burning, and additional cabin accommodation has been provided. Each ship can carry twelve sleeping cars, for which four sets of rails

have been provided on the train deck. At the stern the lines converge into two tracks, by which the trains pass from ship to shore across a drawbridge at the end of the dock. There is also accommodation for 25 cars, and several heavy lorries and motor coaches can be carried.

The locomotives of the night ferry trains carry a special headboard, with a background of deep blue with moon and star decorations. There is also a day ferry service, by which loaded wagons carrying such exports as steel, machinery, motor cycles and wool are transported direct to the Continent.

The rolling stock carried by the night ferry service consists of sleeping cars specially designed by the Compagnie Internationale des Wagons-Lits. The all-steel coaches measure 62 ft. 11 in. over all and are just over 9 ft. wide, with a height of 12 ft. 9½ in. from rail level. A special feature is that the sleeping coaches can be used either as first-class or second-class carriages. The first-class arrangement allows for one passenger in each compartment and the second-class arrangement for two.

The "*Twickenham Ferry*" and her sister ships are 360 ft. in length and 60½ ft. in width, and their gross tonnage in each case is 2,839. They have an average speed of 15 knots.

Special arrangements have been made for loading and unloading at Dover and Dunkirk. For train ferries it is impossible to use an inclined slipway, because the waters on the Channel coasts have a daily rise and fall of between ten and twenty feet. A slipway therefore would have a gradient too steep for railway operation. So the alternative of locks, enabling the vessels to link up with the shore on level terms, has been adopted.

New cargo ships (Continued on page 202)

Fun with Dinky Toys

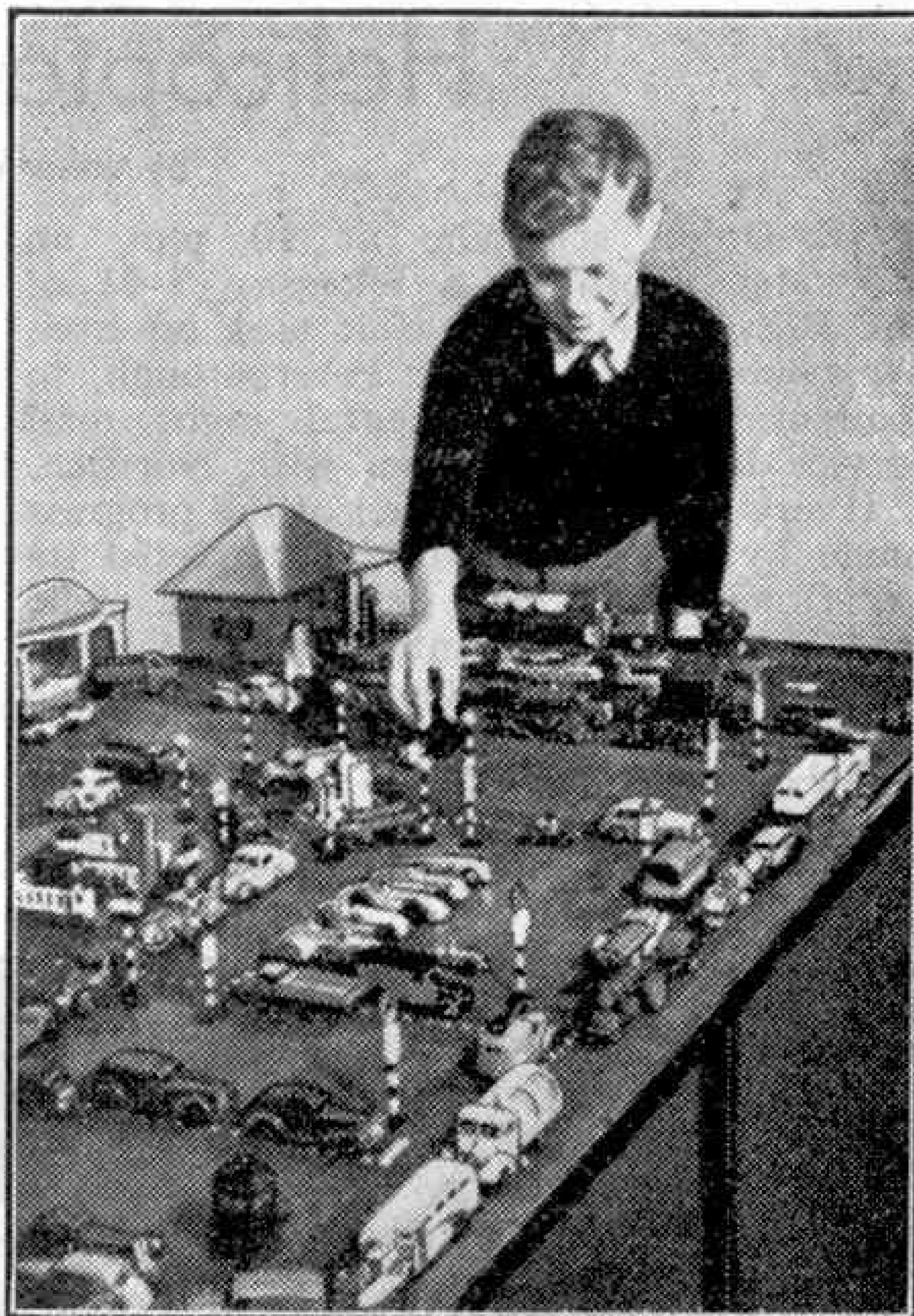
Thrills of a Model Town

ERIC KENYON, Blackburn, gets more thrills out of his Dinky Toys than out of any other toys he has ever had. One reason for this is that he has built a fine layout on which to run them.

Kenyon's interest in Dinky Toys began on a holiday, when he made friends with a boy who had about half a dozen Dinky Toys motor cars. He decided that he would take up the hobby himself, and now he has a complete set, not only of Dinky Toys, but also of Dinky Supertoys. He soon realized the need for a layout, and after trying various schemes he hit upon the idea of laying a green rubber ground sheet, 6 ft. long and 3 ft. wide, on a large table of exactly the same size to form the base. On this he marked out main and cross roads, with roundabouts at some of the intersections. These he painted black, the rest of the base being left green to represent fields, and down the middle of each road he painted little white spots to represent cat's eyes.

No road layout is really satisfactory without proper buildings, and Kenyon has provided his with bus stations, garages and taxi stands. Some of these were constructed by the owner in three-ply wood, and painted in bright colours; the others were made up from various building sets of suitable proportions. The general effect is splendid, as can be seen from the two photographs reproduced. An unusual feature seen in the lower picture is a bridge that at one point carries a cross-road over a busy main highway in order to simplify traffic problems. This was made very easily from a block of wood. A piece was cut out of the centre to form the span over the main road, and the ends were then planed down to ground level. Split pins and lengths of bicycle spoke made excellent railings for each side of the bridge.

On this road system Kenyon's Dinky Toys move about with complete realism, the final touch being provided by giving loads to lorries and open vehicles



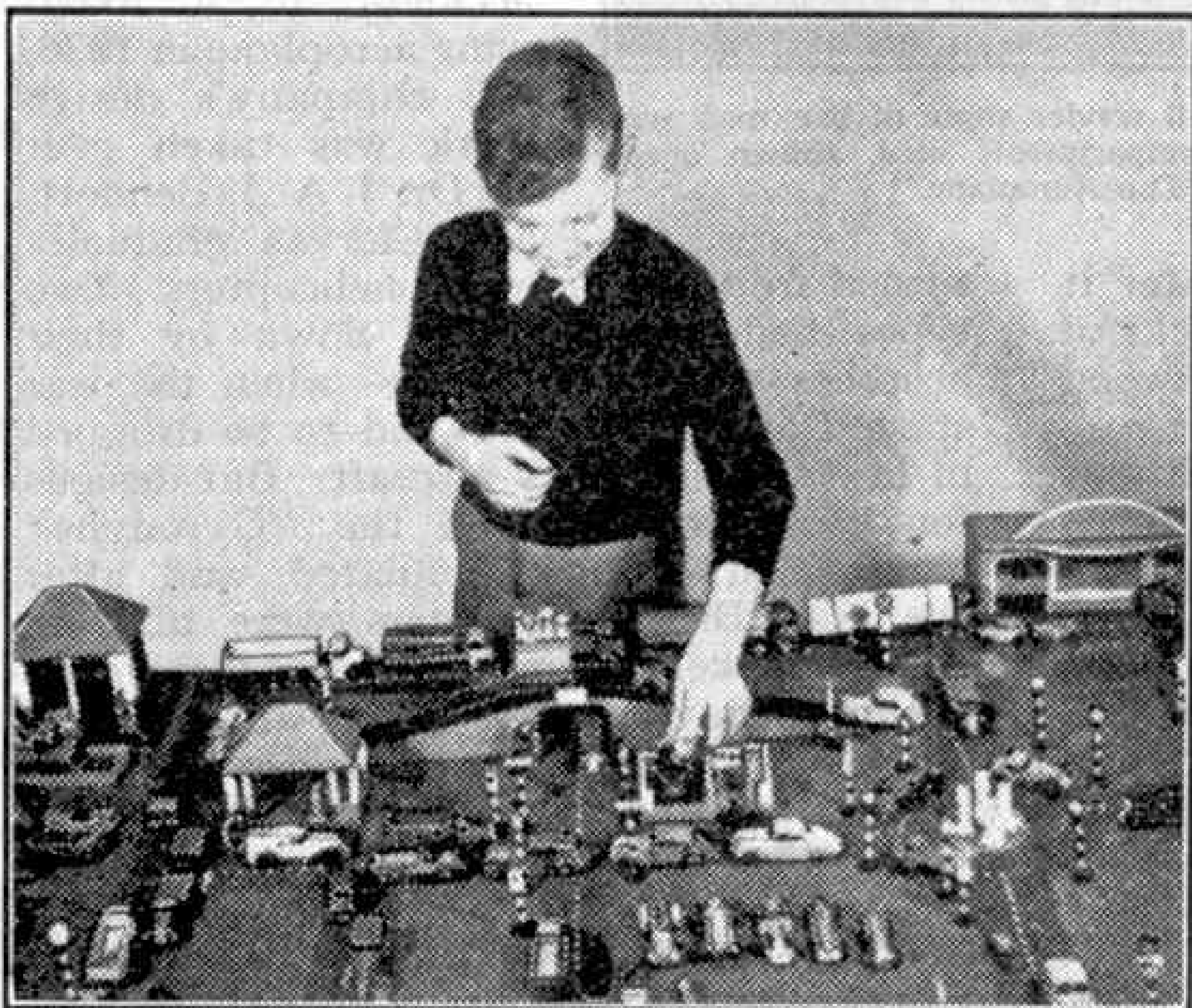
Eric Kenyon, Blackburn, carrying out operations in one corner of his Dinky Toys town. All roads have white spots painted on them to represent cat's eyes, and are provided with road signs.

generally. For instance, his Guy 4-ton flat truck carries a load of timber made by drying twigs and cutting them into 3 in. lengths; while an equally realistic load was provided for his Bedford Articulated Lorry by cutting a brush handle into lengths of 1 in. that could be stacked easily and safely on the vehicle.

There is always some part of the road system under repair and this gives opportunity for making realistic use of the Aveling-Barford Diesel Roller and the Bedford End Tipper, the latter bringing material and tipping it to be spread out ready to be consolidated by the former. Warning is given to traffic by means of danger signals consisting of $\frac{1}{4}$ -in. squares of red celluloid pinned at the ends of the section being dealt with. At one end of the layout is the flying field, on which various Dinky Toys aircraft are placed, and next to it is the army section, complete with tanks, jeeps and other suitable Dinky Toys.

It is easy to pack up the whole outfit and put it away after a spell of operations. The ground sheet folds up without cracking the paint, and indeed can be washed without harm, so that Kenyon's Dinky Toys town is always spick and span. The whole outfit is a model of neatness.

The complete realism of the layout has made it of the greatest value in developing the road sense of its maker's schoolfellows. Kenyon was asked to take it to school for demonstrations with this end in view, and it aroused the keenest interest.



Another view of Kenyon's model town, showing the bridge that carries traffic from side streets over a particularly busy main road.

Helicopter Progress

By John W. R. Taylor

DEAD on schedule, at 10 p.m. on 21st February, a Sikorsky S-51 of the B.E.A. Helicopter Unit took off from Westwood Airfield, near Peterborough, to inaugurate an experimental night mail service linking that town with Norwich.

If any proof were needed of the progress made by the Unit since it completed its experimental daylight mail service eight months ago (see September 1948 "M.M."), this take-off provided it, for conditions could not have been much worse. Despite half a gale and driving rain, the S-51 went up steadily, like a lift, turned slowly and then set off down-wind for Norwich, some

possible. New radio and radar aids will soon include the Decca Track Control Unit, which shows not only whether the aircraft is to left or right of its course, but also how many miles it is from its destination.

Development work in night-flying and blind-flying in this country was begun by pilots of The Fairey Aviation Company and the Ministry of Supply on Sikorsky R-4B helicopters shortly after the war. B.E.A. carried on the good work after completing their daylight mail service, with the result that this country is more advanced in blind-flying technique than the Americans.

In fact it is fairly safe to say that, although America is ahead in helicopter production, Britain now leads the world in most branches of helicopter development. This is not altogether surprising, as the British Cierva Company built the first successful rotating wing aircraft more than 20 years ago.

When Juan de la Cierva was killed in an accident to a fixed-wing aeroplane in 1936, the company's design work was taken over by Dr. J. A. J. Bennett, and Ciervas gradually

turned from Autogiros to helicopters. Two types had already been flown by their licensees—G. and J. Weir—when the war started and helicopters had to be dropped in favour of military aircraft. But designs for such machines as the "Gyrodyne" had already been formulated, and after the war British designers were able to start at once making up for six lost years, Sikorsky having proved in America that helicopters were both practical and useful.

Within three years our companies had built the world's fastest and largest helicopters—Dr. Bennett's Fairey "Gyrodyne" and the Cierva "Air Horse" respectively. Even more important, new safety features built into the "Gyrodyne" and Bristol 171 promise to make them



On the first experimental helicopter night mail service some of the mail was carried in the Sikorsky helicopter's rear compartment, here shown open. Photograph by courtesy of "The Aeroplane."

70 miles away. Fifty-six minutes later it landed at its destination, and the sacks of dummy mail put aboard at Westwood were unloaded.

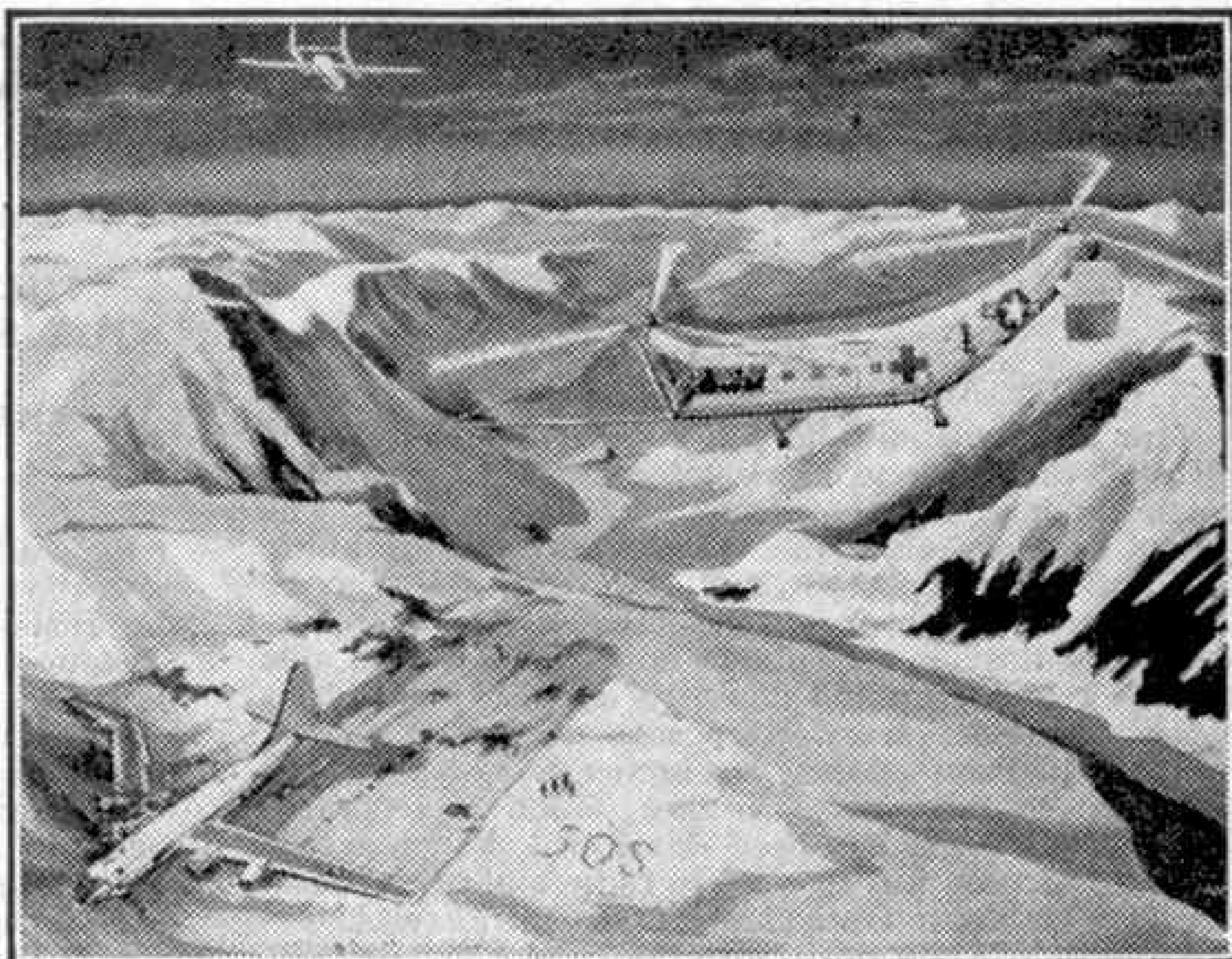
Although the flight was made without ceremony, watched by only a few dozen people, it nevertheless made history; for when the S-51 landed again at Peterborough at 2.56 a.m., after a 66-minute battle with the gale, it completed the first scheduled helicopter night mail round-trip in history.

The fact that B.E.A. are able to start scheduled night services, even experimentally, is a great tribute to the pilots and engineers who, for many months, have worked hard to perfect the special instruments and equipment that make it

the safest aircraft in the world. Having recently flown in the "Gyrodyne," I can also confirm that it is extremely comfortable, its cabin being more like the interior of a luxury motor car than an aeroplane. Thus British helicopters are being built around the three prime requirements of safety, high performance and comfort.

These British machines, together with the Cierva "Skeeter," the forthcoming Bristol 173, Firth "Atlantic" and a secret jet-helicopter of unknown make, should keep Britain in the forefront of helicopter progress, and it may not be many years before we see 24-seat, twin-engined helicopters flying all B.E.A.'s internal services.

A major headache is the fact that it has already cost the aircraft industry hundreds of thousands of pounds to develop British prototypes, for several are "private venture" designs, and unfortunately the aircraft companies have not unlimited financial resources. So it is now up to the Government to become really helicopter-minded. It is one thing to pay for a single test aircraft, and another to place production orders for 10, 20 or 50 and so put the industry on its feet. At the moment, the R.A.F., Army and Navy are only dabbling with helicopters, trying to find uses for them at a time when the Americans are already using



An artist's impression of the Piasecki helicopter coming down under its own power near a wrecked machine, after severing connection with the towing aircraft. The illustrations on this page are by courtesy of the Piasecki Helicopter Corporation, U.S.A.

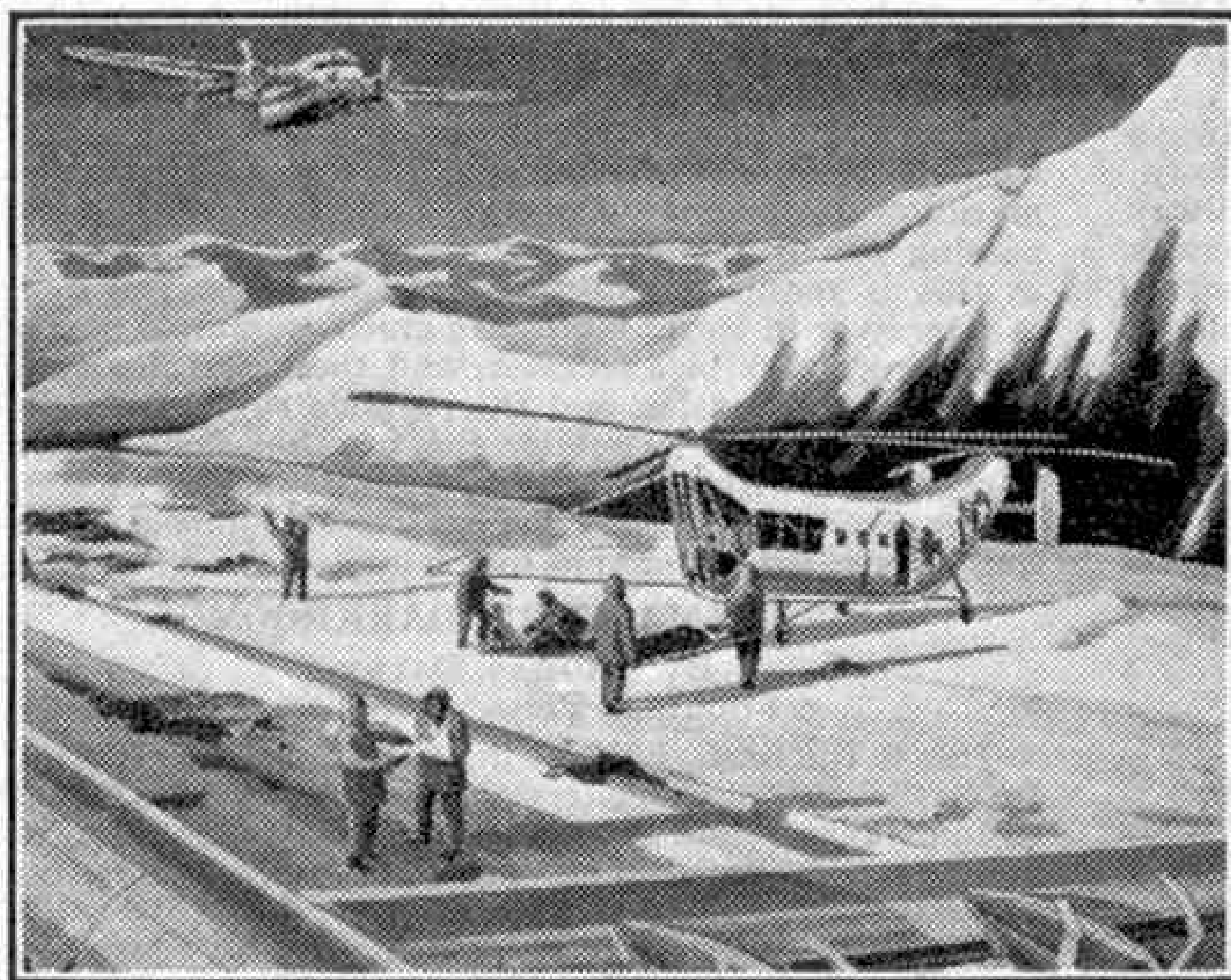
Sikorskys and Piaseckis for dozens of different jobs, which they do better than anything else in the world.

Most important of these jobs is, of course, rescue work. Time after time in the last few years, helicopters have saved the lives of air crash victims in all parts of the world from the Arctic to the tropical jungle of Nicaragua, usually in circumstances that have made rescue by other means impossible.

Unfortunately, the helicopter's short range has often necessitated its dismantling so that it could be flown in a large transport aircraft to within operating distance of its objective. This wastes a lot of time, and there is seldom much time to spare in a race to prevent death from injury or exposure.

News of a more practical solution to the problem of getting helicopters quickly to where they are needed has just come from America, where it is being investigated by the U.S.A.F. at Wright Field. It consists of towing an auto-rotating helicopter behind a transport aircraft, and so extending its range to that of the tow 'plane.

Preliminary flight tests, made with a conventional single-rotor helicopter, have already proved the practicability of the scheme. Tests with a Piasecki HRP-1 "Rescuer" helicopter, now beginning, should (Continued on page 202)



The crash victims being carried as stretcher cases into the helicopter, prior to it taking off to re-connect with the towing plane in the air.

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.

"ATOMS IN ACTION"

By G. R. HARRISON

(George Allen and Unwin Ltd. 12/6 net)

Here is a splendid book for older readers of the "M.M." who wish to know something of the way in which modern science affects our daily lives. The author remarks that the wheels of civilization are kept running by energy, and that this, whether we draw it from oil, coal or any other source, has come to us from the Sun. He shows how we have been able to tame this energy and how it is changed to make it suitable for our special purposes.

Prof. Harrison covers an immense range in the book. From him we learn how sound is recorded, how the telephone has been developed, and how the electron has been put to work in radio and in electrical control equipment. Optical instruments from telescopes to cameras also are dealt with, and there are sections dealing with the weather, with science in war and after, and with the entry of the atom into the practical world of energy production. Examples are given throughout, and we have many of these from the home, the farm and the factory. The final chapter gives us a glimpse of what is yet to come.

The book has 18 full page illustrations.

"MODEL AEROPLANE HANDBOOK"

By F. J. CAMM (Newnes. 12/6 net)

This latest book on the "how and why" of model aircraft construction is by one of the pioneers of the hobby in this country, and so has the stamp of authority. It begins with an interesting short history of model aeronautics, and subsequent chapters cover fully the design, construction and flight of all types of model aeroplanes, whether powered by engine or elastic. The model types described include gliders, autogiros and even ornithopters, or flapping wing models.

The book contains such a wealth of explanatory note and detail in its 300 or so pages that it is literally a pocket encyclopædia on this subject. It is illustrated with nearly 250 excellent line drawings and plans and over 60 half-tone photographs.

"LIGHT AND NARROW GAUGE LOCOMOTIVES"

By R. W. KIDNER

(The Oakwood Press. 3/-)

Light and narrow gauge engines, like the railways on which they run, have a fascination of their own, and this book, No. 8 in the series of Light Railway Handbooks issued by the Oakwood Press, provides a general review of the development of locomotive power for such systems. A comprehensive table of dimensions is given, and the interesting illustrations feature ancient warriors such as the Tal-y-Llyn locomotives of 1865, and such curiosities as the twin-boiler mono-rail engines on the Lartigue system.

With the eclipse of so many light or narrow gauge lines, and the disposal or breaking up of the engines, the book forms a useful record. Copies can be obtained from the Oakwood Press, Tanglewood, South Godstone, Surrey, price 3/2½ including postage.

"MICKY"

By AUBREY DE SELINCOURT (Routledge. 8/6)

We have previously met Robin and Anthony, Elizabeth and Ann, whose adventures afloat have been told by the author in various books, and here we meet them again in "Tern," their little half-decked sailing boat. In their cruise on White Whale Lake, Micky, a runaway orphan, is a complication who provides a mystery and opportunities for action in a story in the author's best manner. Line drawings form the illustrations.

"THE BISHOP'S CASTLE RAILWAY" (5/6)

"THE HUNDRED OF MANHOOD AND SELSEY TRAMWAY" (4/6)

"THE BASINGSTOKE AND ALTON LIGHT RAILWAY" (3/6)

By EDWARD C. GRIFFITH, B.A.

Each of these booklets deals with the history of a now abandoned railway of standard gauge. Of these the Bishop's Castle perhaps had the most colourful existence. It never completed its original course but remained tucked away in a remote corner of Shropshire, dogged by financial difficulties throughout its existence. Its locomotives and rolling stock included some veritable museum pieces, but some of these managed to run more or less regularly until 1935.

The Hundred of Manhood and Selsey Tramway, a rather ponderous title, was an eight-mile light railway from Chichester to Selsey. This had its period of prosperity until a decline in traffic, due to the general growth of road transport, finally caused it to cease operation in 1935.

The Basingstoke and Alton Light Railway was a branch of the former L.S.W.R., providing a connection across country between the West of England and the Portsmouth routes of that company. It was closed during the 1914 war and its track was removed and shipped abroad for Army purposes. It was restored in 1924, but not for long, passenger traffic ending in 1932 and goods traffic four years later.

Each of the lines had an interesting story, into which Mr. Griffith has delved thoroughly. He gives details of train services, with sketch maps, plans, gradient profiles and excellent illustrations, and enthusiasts with a leaning toward the unusual in railway history will enjoy his booklets. Copies can be obtained from the author, Mr. E. C. Griffith, B.A., 23, Downing Street, Farnham, Surrey. The prices shown above include postage.

"WIRELESS FOR BEGINNERS"

By C. L. BOLTZ (Harrap. 7/6)

Mr. Boltz is well-known to readers of the "M.M." as the author of elementary books on wireless. He is particularly fitted to deal with this subject from his experience in training soldiers during the war, and his present effort is a reply to many requests for a book that is really suitable for a beginner, telling him what are the parts of a receiving set and how they work, without going into technical details or using mathematics. He begins with the names of the parts, passing on to a simple account of electricity as far as this is required and then explaining each section of a receiver in turn. Notes are given on simple means of tracing faults in a receiver, and there are also brief accounts of television and the cathode ray tube.

A beginner in wireless construction, or indeed anyone who wishes to have some idea how a wireless set works, will find the book very useful indeed. It is well illustrated by simple diagrams.

"THE AMATEUR'S DARKROOM"

By THOMAS DALBY

(Fountain Press. Price 2/-)

This is the ninth booklet in the "Photofacts" series. In it the author considers the darkroom in different circumstances, and suggests methods to enable the photographer to produce the best results. Whether you have to "make do" with a large cupboard, utilise the back kitchen, bathroom or the "spare room," or are compelled to build a portable darkroom, you will find the suggestions and plans given in this handbook a valuable and practical guide. The book is illustrated with excellent line drawings and half-tone photographs of darkroom equipment.

"PATENT APPLIED FOR"

By F. COPPERSMITH and J. J. LYNX
(Co-ordination Ltd. 10/6)

We read with keen interest the stories of famous inventors, but seldom give a thought to those who have not become famous because their inventions, however ingenious, have not really been wanted, or were not sufficiently practical in character. The authors of *"Patent Applied For"* here give us what they call a light-hearted cavalcade of 100 years of inventions of this kind, with ample illustrations.

Those who worked out the ideas dealt with in this lively and amusing book certainly meant well. There are hundreds of quaint novelties, such as a rocking chair that worked a butter churn and a baby's cradle, and a sewing machine that could be taken about in luggage as easily as a pocket electric iron is carried to-day. Strange modes of progress along the road also are represented, such as the Danish hunting bicycle, consisting of a huge wheel with its owner seated inside; and a large array of queer ships meant to abolish sea-sickness, and generally to improve comfort and safety at sea, provide entertaining reading. Musical instruments, weird horseless carriages, and a device for escaping from the top floors of hotels on fire are included among the many gadgets and novelties described and illustrated here. We laugh at them now, but it is certain that there are many more to come, and no doubt things that seem clever and important to us will appear equally ridiculous to future generations.

"ELECTRICITY IN THE SMALL WORKSHOP"

By IAN BRADLEY and NORMAN HALLOWS
(Percival Marshall & Co. Ltd. 3/- net)

In the small workshop, whether maintained for a hobby or for more serious purposes, electricity is ideal for providing power as well as for lighting and heating. How this is most conveniently arranged is here explained in detail, with a special section on wiring and the provision of safety switches and other necessary devices.

The whole subject is covered with the use of a small generating plant in mind as well as mains supplies, and the treatment is of a practical character. Diagrams illustrate various points, and there are also reproductions of photographs of electrical plant and equipment. There is a good index.

"PEDLAR'S PROGRESS"

By B. M. H. GODDARD (Harrap. 7/6 net)

Ben Lovell was a pedlar who travelled far and wide throughout the countryside, and was welcomed by country people wherever he went, not merely for the good things he had for sale, but also for his delightful nature and his willingness to help others. Early in the story he is given a splendid opportunity, for chance brings into his path an evacuee London boy who has failed to settle down in the country and has determined to run away. Ben not only encourages the boy to return, but later takes him on his round of the countryside, and by the end of the journey the boy has lost his selfishness. An interesting and appealing story, with a coloured frontispiece and other illustrations in line by Bay Robinson.

"A.B.C. OF MOTORCAR SPOTTING"

By GRAEME L. GREENWOOD
(Ian Allan Ltd. 2/-)

This booklet deals with eight popular makes of car, showing how they have developed from 1935 down to 1948. They are the Austin, Ford, Hillman Minx, M.G., Morris, Standard, Vauxhall and Wolseley. In each case a series of photographs at different stages within this period is given, with brief but adequate descriptions drawing attention to important changes. This is followed by a list of registration letters, and a number section in which entries can be made of cars seen.

Copies of the booklet can be obtained from leading booksellers, price 2/-, or direct from the publishers, Ian Allan Ltd., 33, Knollys Road, Streatham, London S.W.16, price 2/2½ post free.

"THE SECRET OF THE CAVERNS"

By C. A. GEDGE (Harrap. 6/- net)

Mr. Gedge can be relied upon for a sound and really thrilling story, and in this book he has maintained his reputation. The scene is set in Derbyshire, where the hero spends a holiday during the grim summer of 1940. A fight with a local boy ends in an alliance between the two, who are then led by events into conflict with a gang of fifth columnists preparing to wreak destruction by blowing up a great dam. Caves and underground passages play a great part in the story, and there are exciting scenes below ground when the villains are finally trapped.

The story is well written and fascinatingly worked out. There is a coloured frontispiece and a map of the district.

"SIMPLE WORKING MODELS"

By C. E. PAGE
(Percival Marshall and Co. Ltd. 3/- net)

For those who are handy with tools there is a special fascination in constructing working models from various odds and ends, and perhaps one or two items specially obtained for the job. In this book there is a good variety of suitable subjects for the exercise of their skill in working wood or metal. Seven models are dealt with, including a simple reversing sand motor, a hot air engine, a large garden windmill and pump, and two types of water-wheel. Diagrams and dimensioned sketches are given, and the keen mechanic should have little difficulty in achieving the desired results if he follows out the methods detailed.

"DESIGNING AND BUILDING '00' TRACKWORK"

By ERNEST F. CARTER
(Percival Marshall and Co. Ltd. 3/- net)

The author's name will now be well known by "M.M." readers for a variety of handbooks dealing in a practical manner with a wide range of miniature railway construction subjects. The present book specialises in the treatment of "00" gauge track laying, and will be found useful by those who favour the rather exacting form of exercise that the construction of track from raw materials provides. The book contains many useful diagrams, with suggestions and explanations on layouts, points, etc., and is therefore not without value for miniature railway enthusiasts who have no occasion to put the schemes dealt with into practice.

"COAST WATERS"

By PHILIP BRIGGS
(Lutterworth Press. 5/- net)

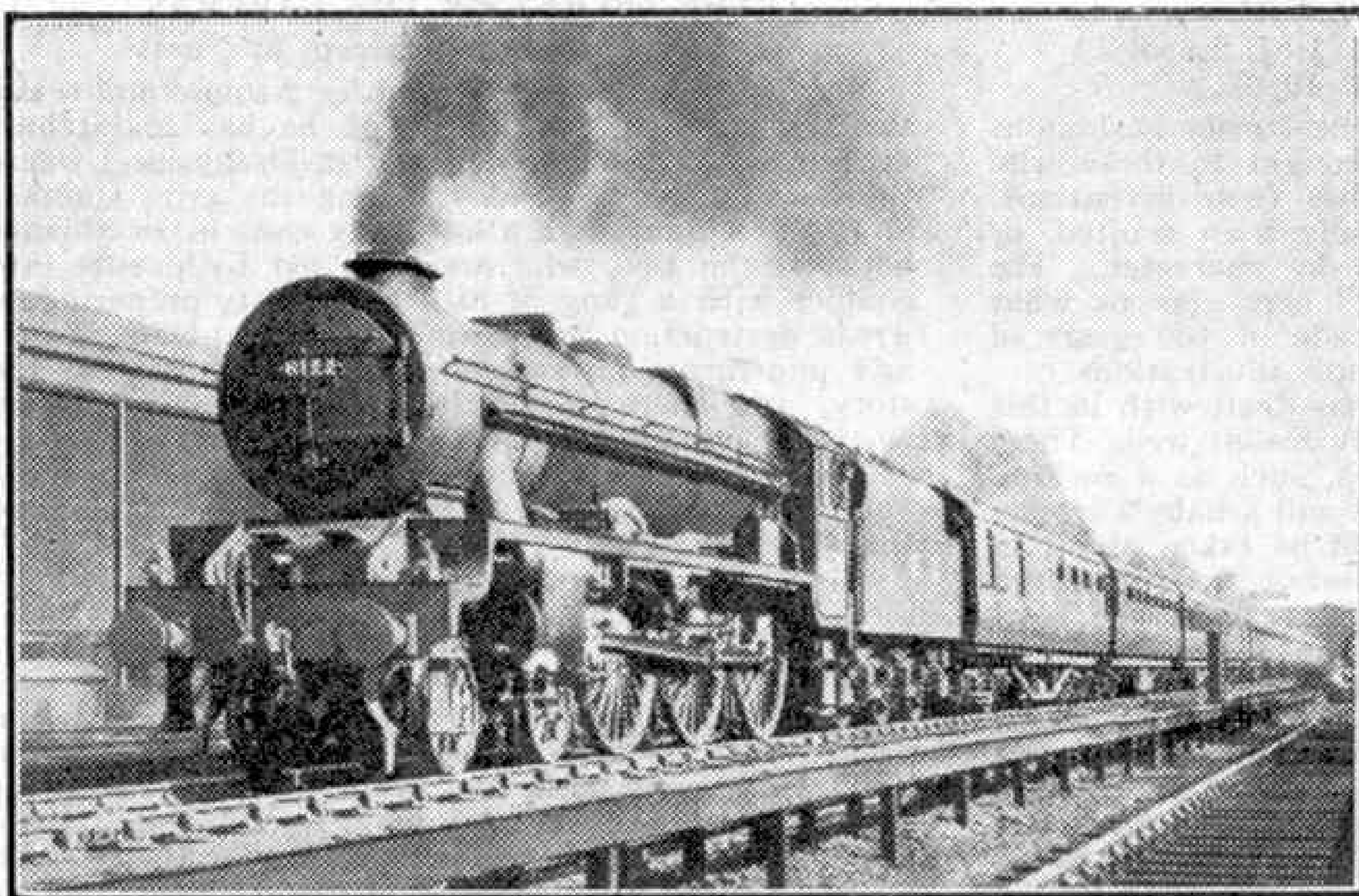
Four friends set out to spend their summer holiday on the East Coast, and on the way find a yacht for sale. They decide to buy it but first it is necessary to raise funds for the purpose and they set about this task in various ways. One is to give trips in a motor boat to holiday makers, and their first fare lands them into a series of complications, for they discover him secretly taking photographs of a yacht that is being altered in readiness for an important race.

The race plays a great part in the story, for a very unpleasant individual has resorted to these underhand tactics in order to score a win for himself. Needless to say, he is thwarted in this by the efforts of the four boys, who get their yacht as a result.

"SPACE SHIP TO VENUS"

By JOHN NICHOLSON (Venturebooks. 6/6 net)

Here is a story book, a thriller, in which readers accompany a formidable scientist who selects four companions for a trip to Venus in a rocket ship that he has created. The journey across space is decidedly interesting, and there are many surprises for the travellers when their rocket is slowed down and allowed to come to rest on Venus itself. In the trip the scientist and his accomplices make on that planet they meet many weird creatures, and pass through thrilling adventures in which they narrowly escape death. We leave them camped round a fire, wondering what new hazards will confront them.



A Manchester express climbing Camden bank behind former L.M.S. 4-6-0 No. 6122 "Royal Ulster Rifleman" of the converted "Royal Scot" Class. Photograph by F. R. Hebron.

A Fine "Bournemouth Belle" Run

Details have reached us of a splendid run by the London-bound "Bournemouth Belle" Pullman express hauled by No. 21C 14 "Nederland Line," when the 79½ miles from Southampton to Waterloo were covered unchecked in 83½ min., or 6½ min. less than quite a fast schedule. When an average of 55½ m.p.h. was sustained up the long gradual rise past Winchester and Micheldever, a mean speed of 71½ was maintained over 36 miles between Basingstoke and Surbiton, and the first 69 miles were covered in 69 min., it was hard to realize that the "Merchant Navy" had a 12-car load weighing fully 500 tons in all. To pass Basingstoke, 31½ miles, in 37½ min. with so heavy a train and be already well ahead of time was a fine achievement, followed immediately by very fast travel right into the London area.

Railway Notes

By R. A. H. Weight

New Locomotive Liveries

It is announced by the Railway Executive that the various types of locomotives to be painted in the new liveries, already announced, are as follows. To be blue, lined black and white: L.M.R. "7P" 4-6-2; E. and N.E.R. 4-6-2s classed "A1," "A3" and "A4" and 4-6-4 "W1"; W.R. 4-6-0 "King"; S.R. 4-6-2 "Merchant Navy." To be green, lined orange and black: L.M.R. "6P" and "5XP" 4-6-0s of "Royal Scot," "Jubilee" and "Patriot" classes, including rebuilds; E. and N.E.R. 4-6-2, all "A2" series, and "B2," "B17," "B3" 4-6-0s; W.R. 4-6-0, "Castles" and "Stars"; S.R. all light "Pacifics" and "Lord Nelson" and "King Arthur" 4-6-0s. This will also cover the Scottish Region where applicable.

All other passenger tender and tank engines as well as mixed traffic tender or tank engines will be in the new lined black style, while freight tender or tank types will continue to be plain black. Existing supplies of paint will be used in most cases before starting on changed liveries. The lined black is already in considerable evidence on various lines, and will become the commonest in many areas.

"Austerity" Locomotive Renumbering

The numerous Ministry of Supply freight 2-8-0s are being taken into British Railways' stock and renumbered from 90000-90732 (733 engines); 101 built by the North British Locomotive Company which had been E. and N.E.R. 63000-63100 become 90000-90100; 321 previously "on loan" constructed by the same firm become Nos. 90101-90421 in building date order. The 99 former L.N.E.R. locomotives built by Vulcan Foundry Ltd. change from 63101-63199 to 90422-90520; the remaining Vulcan 2-8-0s become 90521-90732.

There will certainly be some reallocation of these engines among the regions. Those sold out of Britain or not to be employed here are ignored in the latest numeration. British Railways have also taken over some 2-10-0s for service in Scotland, Nos. 90750-90774. They will all be known as class "8" W.D. engines.

Manchester-Sheffield Electrification Progress

In addition to the Liverpool Street-Sheffield electrification scheme, now well on towards completion, the Eastern Region is pushing ahead with its other large scale plan, also employing overhead current lines, with the intention of operating all traffic, including many coal and freight trains, over the difficult Manchester-Sheffield main line, as well as certain branches, exclusively with electric traction by the end of 1952. The new three-mile tunnel at Woodhead beneath the Pennines should soon be under construction. This will be one of the biggest engineering tasks of its kind undertaken in England for many years. There will be multiple unit trains for local working, together with a large stud of main line electric locomotives.

Western and Southern Tidings

New locomotives lately placed in service from Swindon Works were "Halls" Nos. 6999, "Capel Dewi Hall"; 7900, "St. Peter's Hall"; and 0-6-0T No. 9673, allocated to Laira, Plymouth. Among withdrawn engines were No. 9091, "Thames," formerly 3291, of the old "Duke" 4-4-0 type, and one of the larger inside-cylinder "Bulldog" 4-4-0s, No. 3441, "Blackbird" lately stationed at Worcester.

There will probably be several blue "Merchant Navy" engines in service this spring. There was still a good deal of work to be done on the new "Leader" class double-ended and all enclosed mixed traffic 0-6-6-0 locomotives when the writer saw them under construction at Brighton in March last. Several Marsh "13" 4-4-2Ts are being given intermediate repairs.

The once famous Stirling 7 ft. 4-4-0 class, lately known as "F1," will soon be extinct; a good deal of scrapping of various types is going on. It is understood that 20 more light "Pacifics" are to be built, also that two more "02" small 0-4-4Ts, S.R. Nos. 181 and 198, are to work in the Isle of Wight, carrying names and renumbered W35-6.

Additional names lately noted are: "West Country" No. 34029, "Lundy"; No. 34038, "Lynton"; No. 34041, "Wilton"; No. 34046, "Braunton"; No. 34047, "Callington"; and "Battle of Britain" No. 34062 "17 Squadron" and No. 34075, "264 Squadron."

High mileages since last in shops have been attained by "Lord Nelson" class 4-6-0s, including No. 863 "Lord Rodney" with a probable mileage of 120,000.

London Midland and Scottish Regional News

New class "5" 4-6-0 mixed traffic locomotives built at Crewe have been placed in service in the Lancashire area as follows: No. 44730-3, shedded at 24E, Blackpool; No. 44734 at 26A, Newton Heath. No. 42185, another 2-6-4T class "4" mixed traffic, is at 16A Nottingham.

At Derby was built 0-6-0 diesel electric shunter, No. 12050, sent to 5B, Crewe South, where are stationed the latest reported class "4" 2-6-0s numbered 43026-7, constructed at Horwich.

Withdrawn locomotives include the last of the original L. and Y. "Dreadnought" 4-6-0s, No. 10412, and two Highland "Ben" 4-4-0s, No. 14397 "Ben-y-Gloe" and No. 14403 "Ben Attow." "Patriot" 4-6-0 No. 45522 "Prestatyn" has been rebuilt to "6P" standard.

Rebuilt "Scot" No. 46120 "Royal Inniskilling Fusilier" was recently running on York-Derby-Bristol expresses.

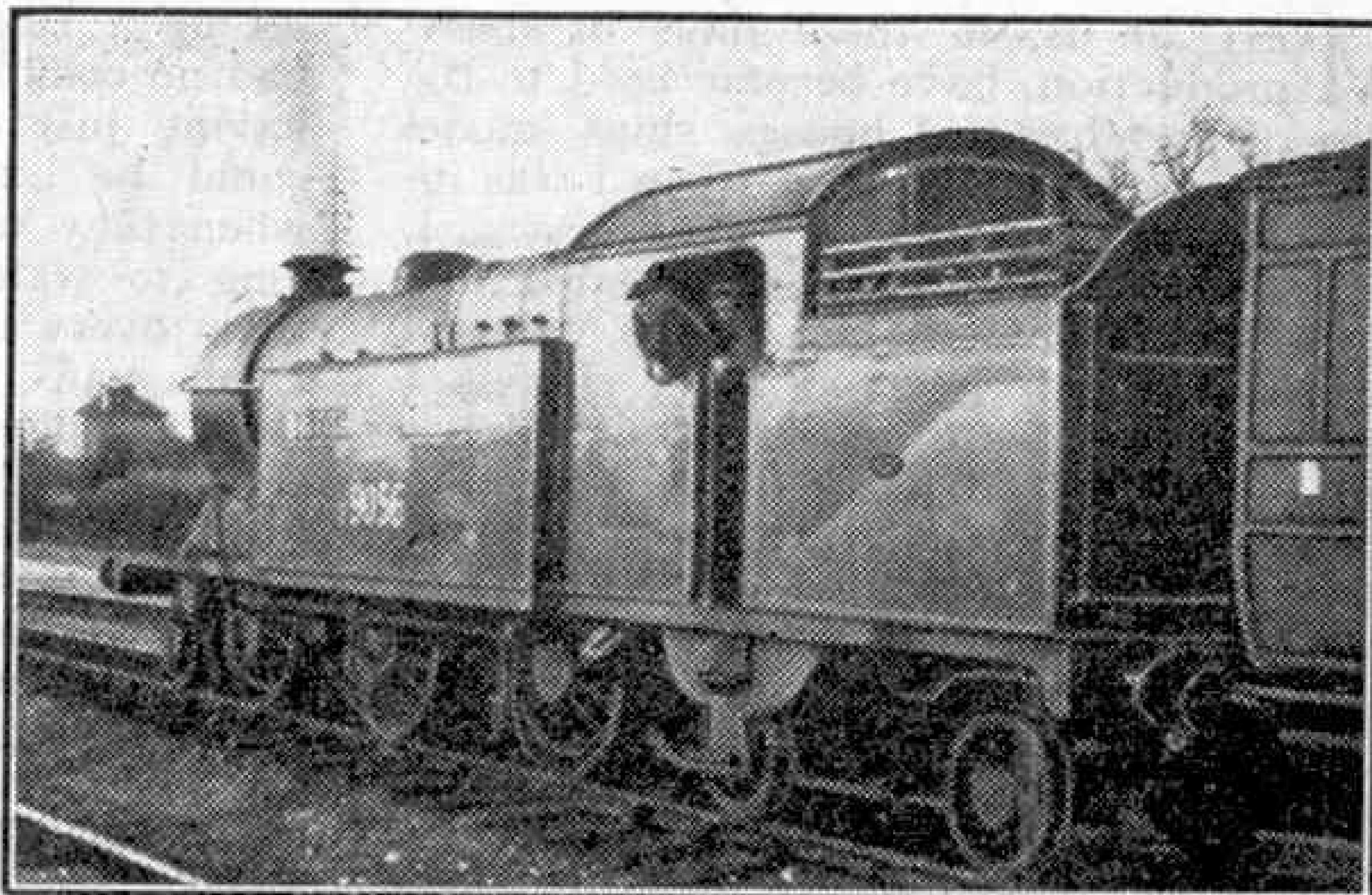
Caprotti-fitted class "5" 4-6-0s and rebuilt "Patriots" have added to the locomotive variety observable in Birmingham. L.M.R. 4-6-2s have lately been prominent at Shrewsbury, where much interchange between former L.M.S. and G.W.R. engines and rolling stock takes place.

Eastern and North Eastern Regions

We understand that the shed numbering code applying in the North Eastern Region will run from 50A to 54D, the principal districts being indicated by the letter A for the main depot, followed by B, C, etc. denoting sub-sheds, as the former L.M.S. practice is to become general. Eastern Region sheds will probably be numbered 40-46 similarly.

Some Tyneside electric train sets have been painted green in accordance with the new standard. New "A1" 4-6-2s built at Darlington are stationed as follows: Nos. 60142-3, Gateshead; and No. 60144, Doncaster, where also is allocated No. 60123, built there. "L1" tank engines stationed at Grantham work on main line slow services and on cross-country or branch trains. On the latter, "A5" G.C. 4-6-2Ts are also seen, together with 0-6-0 locomotives of

several classes as the G.N. 4-4-2 and 4-4-0 engines so long familiar, become more rare. We lately received a startling report that the monster L.N.E.R. "Garratt" 2-8-0: 0-8-2, No. 69999, had left its usual duties banking heavy coal trains in Yorkshire for similar main line work up the famous Lickey Incline on the



One of the massive and unusual Robinson 2-6-4 tanks originally intended for Great Central mineral traffic. Here the engine is on a passenger train. Photograph by D. W. Backhouse.

Midland Division of the L.M.R., possibly as a trial. All the 138 engines operating the London, Tilbury and Southend section of the L.M.R. are transferred to Eastern Region control, including 43 4-4-2Ts and 62 modern 2-6-4Ts, with a few 0-6-0 tender and other engines.

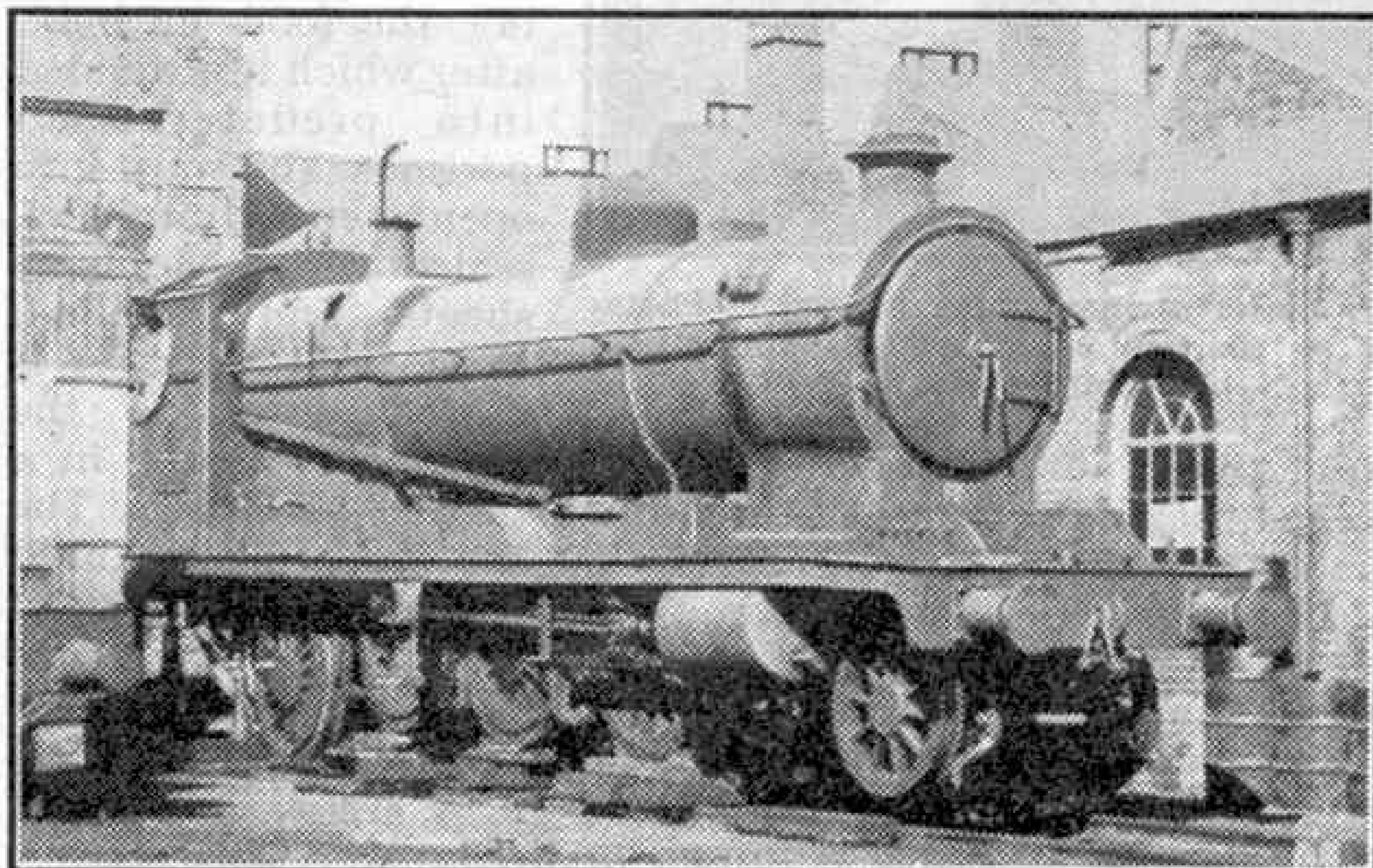
We illustrate one of the G.C. inside cylindered 2-6-4Ts built chiefly for heavy freight work in 1914-17, now known as class "L3" and sometimes seen on passenger trains along the Aylesbury joint line. When first appearing they were regarded as a decidedly unusual type and were indeed very big engines in their heyday, having boilers similar to those on the "Director" 4-4-0s.

During the recent war, express passenger haulage was shared successfully and somewhat indiscriminately between the three classes of "Gresley Pacific" then operating and the "V2" 2-6-2s. Now the latest "A1"

Peppercorn 4-6-2s work many principal trains; the smaller-wheeled varieties of "A2" are also considerably in evidence as well as the stout "A3" and "A4" engines. Many of the latter make long runs on successive days, reaching totals of several thousand miles a month and often recovering considerable time lost by rather frequent engineering or repair slacks unavoidable in recent months.

A programme of week-end Channel cruises by S.R. S.S. "Falaise" begins again this month. This post-war vessel of 3,710 tons was specially designed for Continental day and night service, and is one of the most comfortable cross-Channel ships.

On April 1st operation of the 705-mile Newfoundland Railway between St. John's and Port aux Basques was taken over by the Canadian National Railways. C.N.R. mileage now totals 24,109.



A "Great Westernised" Robinson R.O.D. 2-8-0 of the first world war. The engine is raised up on packing and the rear coupled wheels have been dropped from the frames. Photograph by John Hobbs.

Prefabricated Food

By John W. R. Taylor

MOST of us, in these days of mass-production, have become used to the idea of prefabricated houses, ships, model aeroplanes and so on. But when I was invited to Cadby Hall to see how Messrs. J. Lyons, the famous caterers, "prefabricate" food for eating in the clouds, aboard international air liners, I must confess I said that the idea of an embalmed kipper did not appeal to me. Now I am quite willing to eat not only my words but the "prefabricated" food; in fact, many of you have probably eaten it often without even knowing it.

The idea of marketing frozen cooked food was conceived by Lyons back in 1941, when skilled chefs and new kitchen equipment were in short supply. They aimed to cook food in the best restaurant manner and then freeze it, so that when it was heated up again the dish tasted as though it had come straight from the kitchen.

As a start they asked some of their best chefs to devise dishes that could be subjected to the new process. The high quality of the results was probably influenced by the fact that the chefs knew that they were to be the first to sample them!

For 18 months the frozen food never travelled beyond the doors of Cadby Hall. Many different meals were cooked, frozen, thawed, heated and eaten. They were sometimes left frozen for months and exposed to a great variety of conditions before being tested for quality in the laboratory and in the tummy. It was found that the food lost nothing in the process, and Lyons prepared to sell their new discovery under the name of "Frood."

A golden opportunity presented itself in 1943, when the United States Army

set up a Headquarters in London. They had no cooking facilities of their own, and having just come from a land of plenty could be expected to know good food when they tasted it. They did not have long to wait; "Frood" was supplied to them every day in the familiar dark blue Lyons vans, and they liked it.

As supplies increased, Lyons began to serve "Frood" in more and more of their own restaurants in the London area, and since the war it has been in such demand for hotels, canteens, schools and hospitals that thousands of pounds worth of additional equipment has had to be installed

at Cadby Hall to produce it. But the scene there is very different from that in some mass-production industries, for every item of food is carefully inspected before cooking and must be of the very highest quality.

Almost every dish imaginable can be supplied as "Frood," and I was able to watch everything from curried chicken to chocolate sponge puddings and shepherds pies being converted into neat frozen blocks.

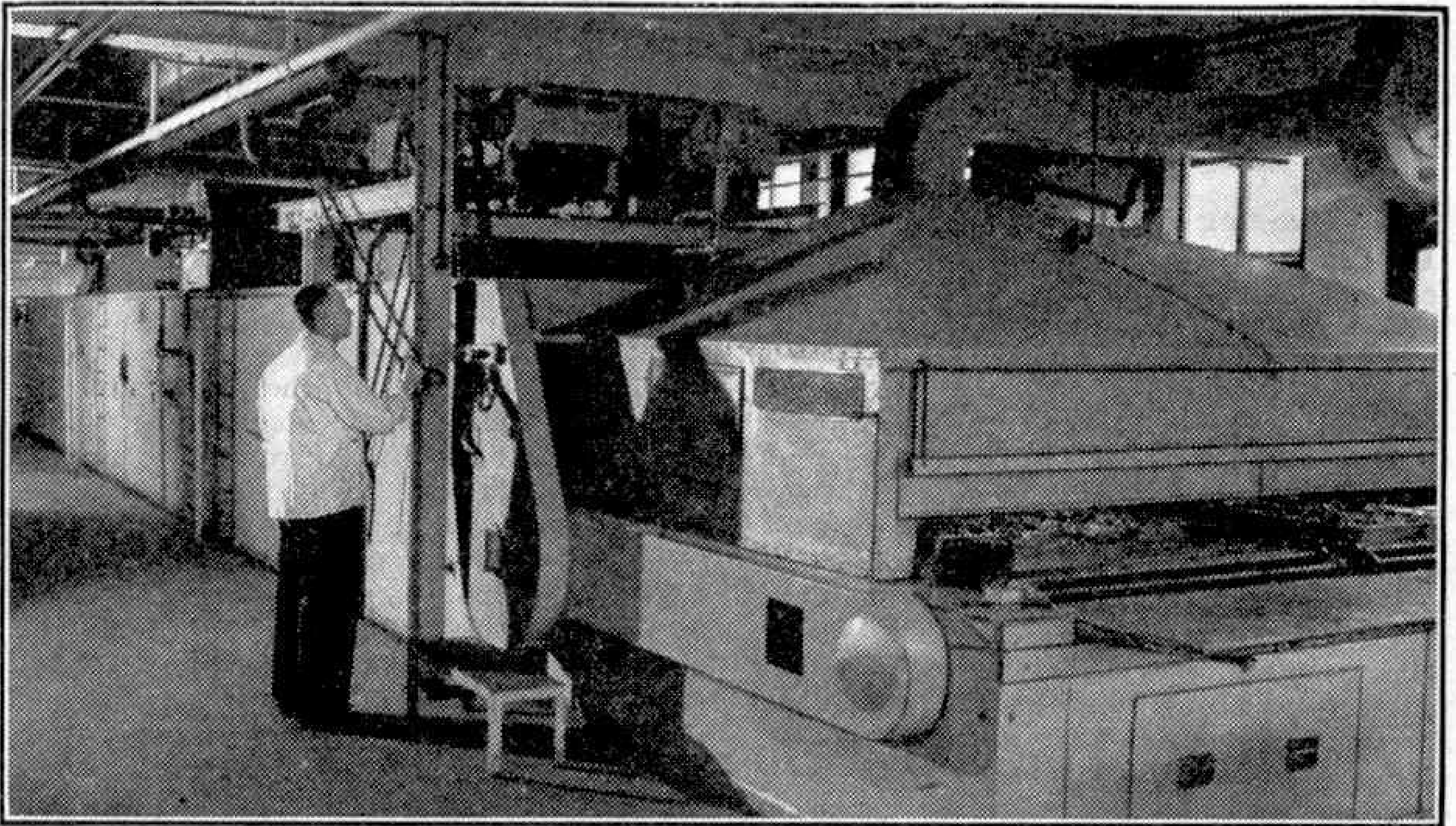
First stage is cooking the food in bulk, after which it is divided into predetermined portions and put into open metal containers, sealed with cellophane sheets and labelled. While still warm it is

passed down to the refrigerator room and quickly frozen in a temperature of 52 degrees of frost. The speed ensures that the food juices cannot dry or the flavour deteriorate. I joined the "Frood" in the refrigerator room for a few seconds, and immediately lost all ambition to be an Arctic explorer!

Once frozen it can be stored indefinitely until required, in the form of hard blocks, some of which look very different from the description on the label. A big advantage, of course, is that it makes possible the



An air hostess preparing the "Frood." Photograph by courtesy of J. Lyons and Co. Ltd., London.



A scene in the Cadby Hall "Frood" kitchens. Photograph by courtesy of J. Lyons and Co. Ltd.

serving of dishes out of season. For example, milk puddings can be cooked and frozen in summer when milk is plentiful, and served in the winter; similarly, dishes containing apples and plums can be prepared in the autumn and sold in the spring and summer.

It quickly became obvious that "Frood" was the answer to the problem of feeding airline passengers on long flights. There is little room for proper cookers, pots and pans in an aircraft galley, but the availability of food that needs only to be heated up in a small oven for a few minutes before serving is obviously a very different proposition.

Representatives of the airlines went along to Cadby Hall and told Lyons what they wanted, and how much space they could spare for ovens and food storage aboard 'plane. Then, in conjunction with the General Electric Company, Lyons designed a special lightweight oven for heating "Frood" meals in aircraft, together with little trays called "Skyplates" on which a complete meal for one person

could be arranged ready for serving.

The oven is only 2 ft. 6 in. high, 18 in. long and weighs 75 lb., yet it will heat 24 complete meals in 28 min. from the frozen state, or in 14 min. if first de-frosted.

It is a great tribute to Lyons' ingenuity that "Frood" is now served not only by British airline companies, including B.S.A.A. and Skyways, but by three of the world's greatest international carriers—Royal Dutch Airlines, Pan American Airways and Trans-Canada Airlines.

To demonstrate the qualities of airborne

"Frood" to new customers, Lyons and G.E.C. have converted a "Horsa" glider to resemble the interior of a modern luxury air liner, complete with seats, tables, galley, cloakroom and toilet. It serves a dual purpose, as it also provides a realistic setting for training air hostesses in "Frood" service.

I could not help thinking that if the R.A.F. equipped its "Horsas" in the same style, complete with kindly stewardess and "Frood," there would be no shortage of volunteer paratroops.



A special "Horsa" glider cabin with tables laid for a "Frood" meal. Photograph by courtesy of General Electric Co. Ltd.

The "Mammoth"

Merseyside's Giant Floating Crane

THE floating cranes that are used in estuaries and harbours have many features of outstanding interest. They are usually of immense power, ready to take over almost any lifting task involved in the construction of harbours and docks, the building of ships and the loading of vessels. They are notable too on account of their range and the variety of their applications. A floating crane can travel anywhere where there is depth for it, and to see one of these giants moving slowly and majestically along such waterways as the Mersey and Thames Estuaries is a very thrilling sight, especially if it is carrying one of the huge and spectacular loads for which these cranes have been designed.

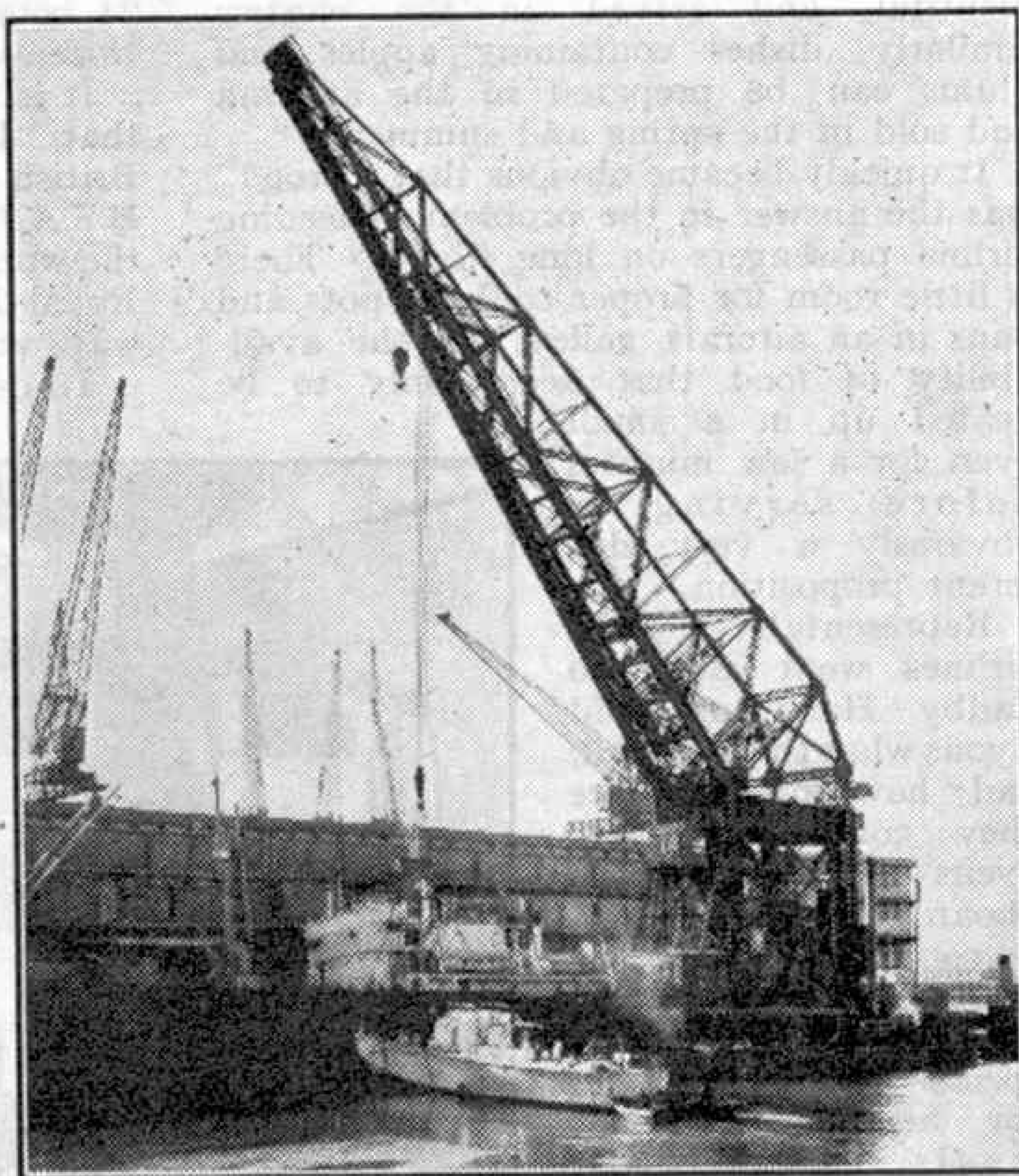
The floating crane shown on our cover is a splendid example of this type. It is the 200-ton crane "Mammoth" of the Mersey Docks and Harbour Board, to whom we are indebted for the photograph on which the cover is based and also for the illustrations reproduced on these pages. This is capable of slewing or turning round through a complete circle—the rotating weight is over 600 tons—and the jib can be moved up and down over a wide angle, so that it can be used in an extensive range of positions. The crane structure is mounted on a pontoon 154 ft. long and 88 ft. 6 in. in beam, and it is so placed that the greatest outward reach of the jib is either over the side of the pontoon or over its stem. An advantage of this is that the crane can deal with lifts in narrow entrances and in restricted places. Its ability to deal with heavy loads over the gates of the large graving docks of the Mersey Docks and Harbour Board system makes it of great value in ship repairing.

The scope of the crane indeed is exceptional in regard to height of lift and radius of action. It is capable of lying alongside the largest vessel afloat and delivering loads up to 60 tons from the hold of the vessel on to the quay, or in the reverse direction. The height of the lifting blocks used in lifts of this weight ranges from

115 ft. to 197 ft., according to the position of the jib.

Details of the lifting powers of the "Mammoth" are interesting. Loads of 60 to 200 tons are handled by two 100-ton lifting blocks fixed on the crane jib, and a load of 200 tons, the maximum, can be dealt with at a radius of from 95 to 110 ft., which gives a clear overside and overstem distance of from 50 ft. 9 in. to 65 ft. 9 in. The radius is greater for loads of 60 to 150 tons. The speed of lift for all these heavy loads is $3\frac{1}{2}$ ft. per min. and the height of the lifting blocks above water ranges from 98 to 170 ft.

With loads of 60 tons or less, which can be handled by two 30-ton blocks on a trolley that can be moved along the full length of the jib, the speed of lift is $16\frac{1}{2}$ ft. per min., and the radius of action is increased to 120 to 185 ft. The trolley speed is 12 ft. per min. With loads of all magnitudes the lifting blocks can be



The Mersey Docks and Harbour Board floating crane "Mammoth," preparing to lift a 75-ton ex-R.A.F. launch aboard the Houlder Line steamship "Elstree Grange" for shipment to Buenos Aires. The cradle in which the launch was lifted added 10 tons to the weight raised.

used singly when the weight to be lifted is half the maximum.

All these crane movements are electrically operated, and are under precise control at all speeds. For each there is a separate electric motor, and there are 10 of these, all interchangeable.

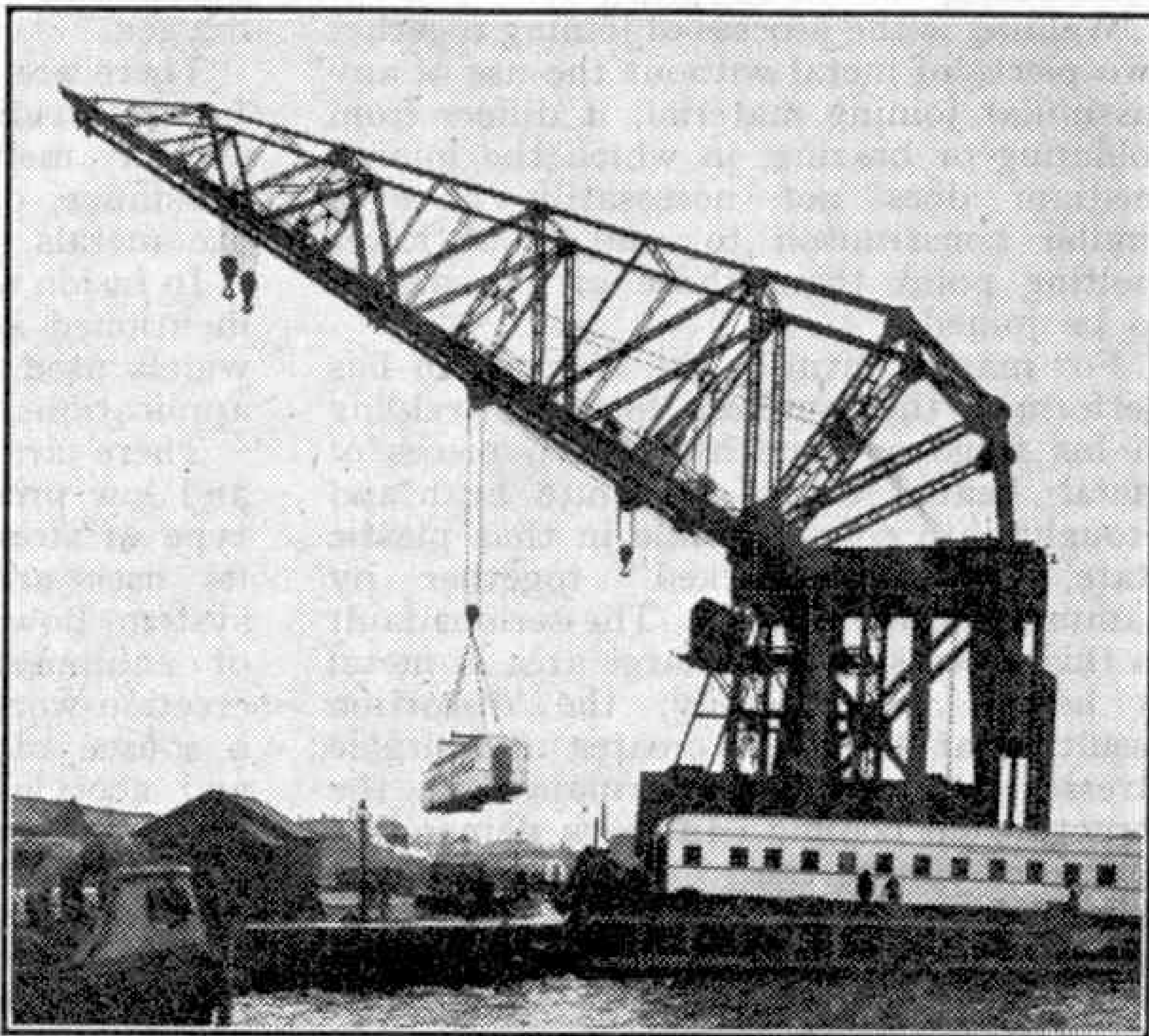
The hull of the vessel is divided into 18 compartments. On the after part of the deck is an area of about 300 sq. yds. that is specially strengthened, so that it can receive in safety heavy loads in transit. The illustration on this page demonstrates the use of this space. In it the crane is seen lifting railway coaches from the quayside on to the deck of the vessel, from which later they will be transferred to the steamer transporting them overseas.

The crane is driven by two sets of triple expansion marine type engines, working at a pressure of 150 lb. per sq. in., each of which can be uncoupled from the propeller shaft of the vessel and used for driving generating plant that provides the current for the crane movements. A separate steam-driven generator furnishes the energy for lighting the vessel, which can be done very effectively in order to make work at night possible.

The "*Mammoth*" is a striking feature when seen in the docks on Merseyside, with its giant jib towering over the great ships and warehouses; and it is even more impressive when it is seen making its stately way, at its speed of nearly 5 m.p.h., on the waters of the estuary, especially when it is carrying some giant load. On one occasion it carried part of a lock gate weighing 190 tons across the Mersey. This was the gate of the Alfred Dock, Birkenhead, which required strengthening and repairing and was removed to the Brunswick Dock, Liverpool, for this purpose. When the necessary work had been completed the two halves of the gate were taken across the river in turn without difficulty. On each occasion the half gate was swung from the dock wall to the deck of the floating crane, where it rested in an improvised cradle during its voyage.

The "*Mammoth*" also played an im-

portant part in the removal and replacement of bridges connecting the floating stages of the Wallasey Ferries at Egremont and New Brighton. Some years ago a bridge weighing 152 tons was placed in position at New Brighton with its aid. Later an existing bridge was removed for



Railway coaches for export being lifted from the quayside to the deck of the "*Mammoth*," ready to be transferred to the vessel in which they were to travel overseas.

reconstruction, and the rebuilt bridge, weighing 110 tons, was taken by the floating crane down the Mersey from the place where it was fabricated, and lifted into position. In work of this kind the state of the tide has to be taken into consideration, the connection being made at the moment when the tide has risen to its full height.

During one of the many air attacks on Merseyside during the war, a bomb hit the deck of the "*Mammoth*" while she was in the Birkenhead docks and she sank, with her giant jib still towering above water. Salvaging the vessel presented a very difficult problem. To make it easier to raise the pontoon it was decided to remove the jib. For this purpose two travelling steel towers 100 ft. in height were erected, and on these two powerful derrick cranes were mounted for use in dismantling the structure. Then the pontoon itself was raised and repaired, after which the cranes on their towers were employed in rebuilding the jib. This work was carried out by Sir William Arrol and Co. Ltd., Glasgow.

Welding

Modern Developments of a Centuries-Old Process

"TO weld" is the same verb as "to well," that is to boil or spring up.

Welding is the process of joining together two pieces of metal without the use of any dissimilar joining material; it differs from soldering or brazing, in which the joining medium does not necessarily have a similar constitution to, and is of lower melting point than, those of the metals to be joined.

For many centuries the blacksmith has performed the simplest form of welding in his forge or "smithy." Two pieces of metal, heated to red or white heat and brought into contact while in that plastic state, can be "worked" together by hammering on the anvil. The serious fault in this process is that a large area of metal is heated unnecessarily; the distortion resulting at the joint creates undesirable stresses which become permanent in the structure on cooling. In work demanding accurate proportions this cannot be tolerated.

Hence, before welding could become a

satisfactory. One was electric power, the other was the gas acetylene, burning in oxygen.

There are two main forms of welding—fusion welding, in which the metal is actually melted before joining occurs; and resistance, or pressure, welding, in which the metals are joined in a plastic state.

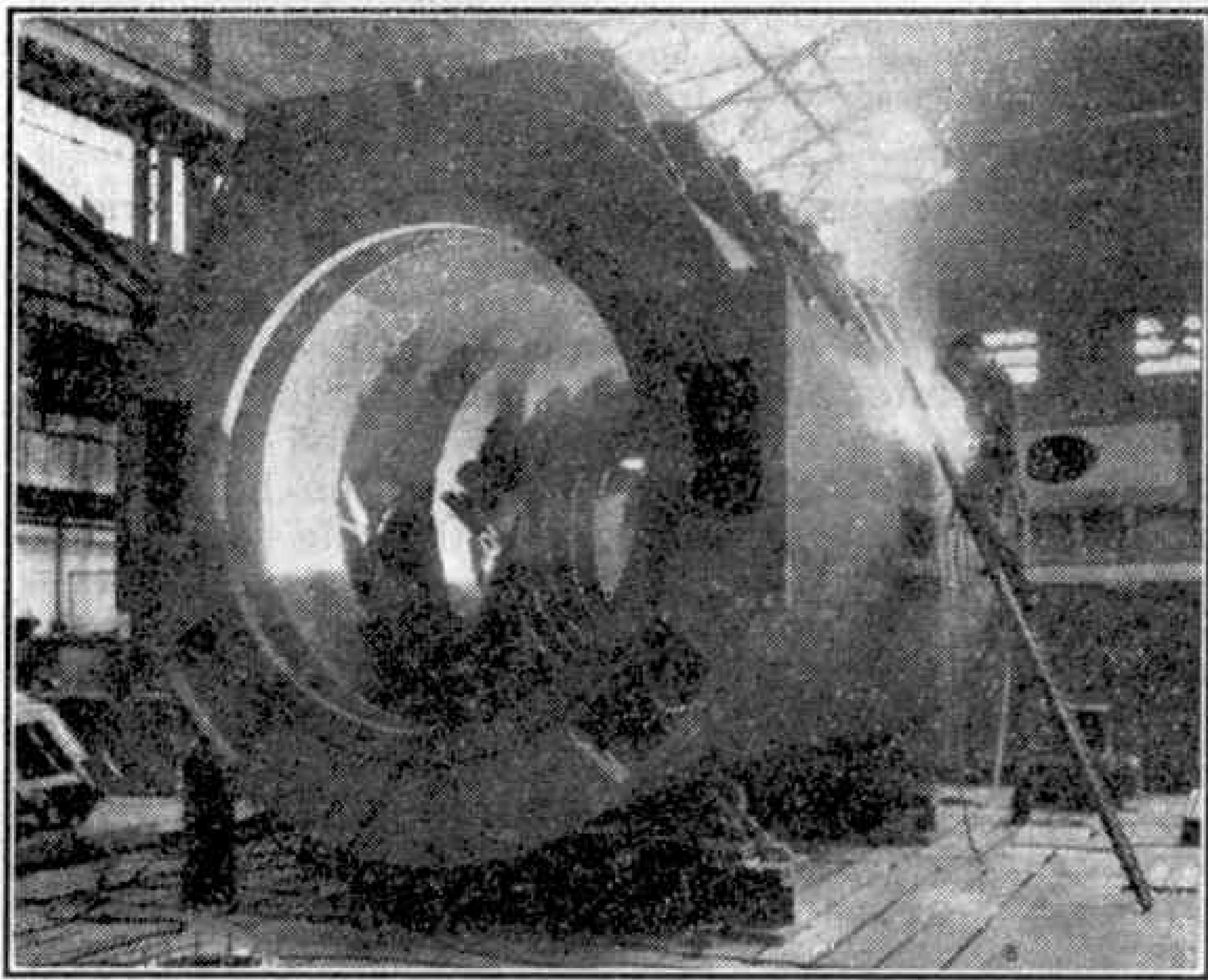
In fusion welding, of the two heat sources mentioned above oxy-acetylene is the less widely used, though it has its own peculiar applications.

There are two systems, high pressure and low pressure. In the former a larger type of storage container is required and its uses are limited. The low-pressure system, however, provides a portable form of equipment, and is very useful for erection-work on sites far removed from a source of electric power. The oxygen and acetylene are stored under pressure in metal bottles. To each bottle the welder attaches a pressure gauge and from each of these a rubber tube leads to a metal nozzle in which the acetylene mixes with the oxygen. The gas is released from each bottle by a key, and the flow through the nozzle controlled by taps on the nozzle handle; by this means the type of flame required on each occasion can be set precisely.

In welding by the oxy-acetylene process a filler wire is melted into the joint at the time of fusion, leaving that "wave-form" ridge along the line of joint that is a feature of a weld. It is suitable for thin, mild or stainless steel, bronze, copper and aluminium, and is used a great deal for repair work in cast iron. The welder wears goggles, tinted to requirements, as a protection from the glare of the nozzle flame.

The other heat source referred to, electric power, is the one used in all the processes now to be described.

The power, adaptability and convenience of electric arc welding have given it pre-eminence in most fields of welding construction. The procedure is much



Welding construction approaching completion on the stator frame of the generator shown on last month's "M.M." cover.

realizable engineering proposition, a means had to be devised of quickly heating as small an area of the metal concerned as possible. Two such high-temperature heat sources capable of being directed on to a restricted area of surface were found

faster than in gas welding, and thus produces less widespread heating and consequent distortion.

The electric circuit is composed of the welding machine, the conductors to and

together by mechanical force, they fuse.

Spot welding is chiefly used for thin metal sheets. The sheets to be tacked together are clamped under pressure between a pair of tips of small area, and as the current passes between the tips the "spot" between them becomes hot and fusion takes place.

In projection welding a projection is formed at the point to be welded, and when the two pieces are heated electrically to a plastic state and pressed together locally, they unite at that point. Projection welding is being widely used in the making of the tubular furniture to be seen in most furniture stores to-day, because the crossed tubes form ideal localized points. It is always a useful method when many welds are needed inside a small area or awkwardly shaped component.

In seam welding the

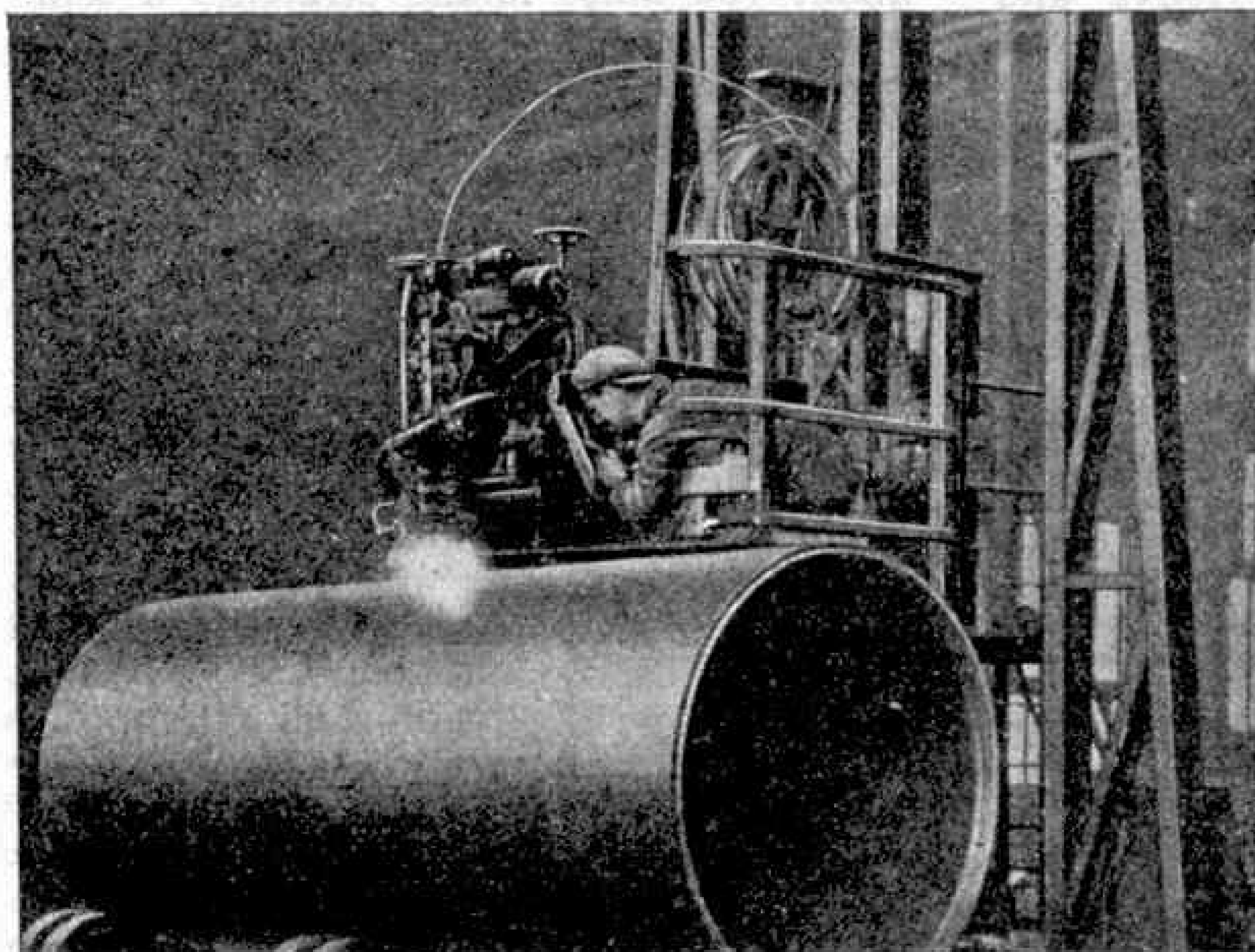
clamps are in the form of wheels and the sheets pass between, while an intermittent current traverses the revolving wheels. By varying the current impulse the spacing of the welds may be regulated. Butt and flash welding are similar processes, with the advantage that they cause very little distortion.

This article has not exhausted the various welding practices in vogue. In all cases the temperature is the important factor. It should be high enough to render the surfaces involved workable; yet, if excessive, it causes unwanted oxidization. A well-executed weld should normally have similar mechanical properties to the parent metal.

A word of caution to enthusiasts: When watching a welder at work, always wear suitable protection against the glare, or injury to the eyes may result.

* * * *

For the information on which this article is based, and for the accompanying photographs, we are indebted to the courtesy of Metropolitan Vickers Electrical Company Limited.

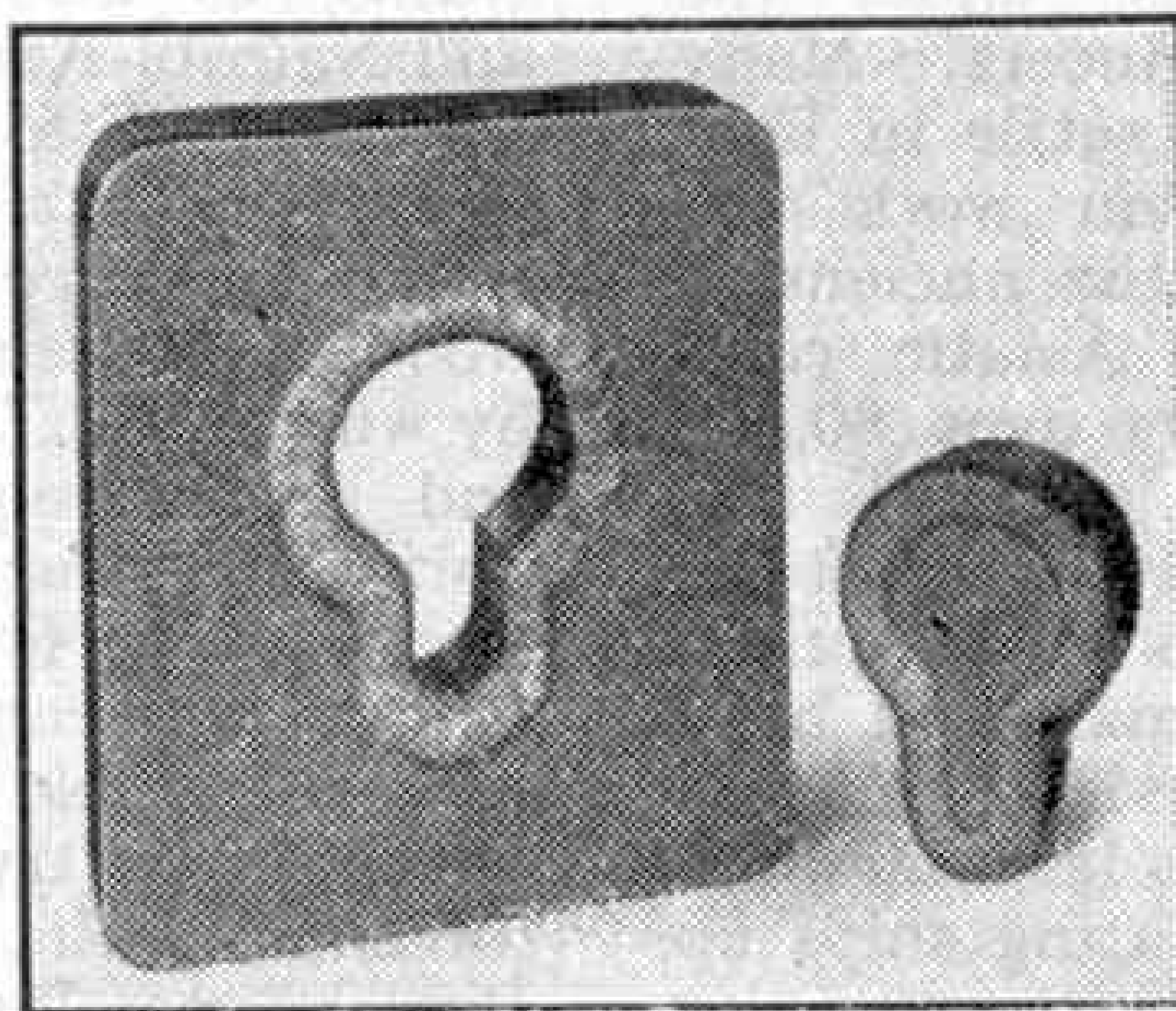


An automatic arc welding machine in operation in a Boiler Works.

from the job, the electrode, and the job itself. Simply, the process is this. The electrode is held so close to the seam between the two pieces of metal comprising the job that the current jumps across the gap. This arc is maintained, and the tiny gap then becomes, in effect, a furnace in which the metals concerned melt and intermix. Again the wave-form trail is laid along the line of weld.

There are two types of arc welding, metallic arc and carbon arc. In the former the electrode is metallic and melts into the weld, making provision against contamination; the latter employs a carbon electrode and any extra metal required in the weld is supplied by a filler wire. In both cases the welder uses a protective metal shield with a tinted glass window, either attached to his head, or held before him as shown in last month's cover picture.

Resistance welding is essentially forge welding brought up to date; the two pieces of metal are heated to a malleable state by electric power and, when pressed



In this illustration is shown a punch and die after the depositing of tool steel. Note the "wave-form" peculiar to all welds.

The Kenya and Uganda Railway

By Capt. A. H. Woollen, B.Sc., R.E.

THE construction of the Kenya and Uganda Railway was begun in 1895 for the purpose of opening up the interior of British East Africa, which was then unexploited country. The first section, Mombasa to Kisumu on the north-eastern shore of Lake Victoria, was opened in 1903. From Kisumu, connection was made to Uganda across the lake by shallow-draught lake steamers. Direct rail connection to Uganda was completed in 1931.

The construction of the railway was an interesting piece of Empire-building beset

about 100 miles inland stretches a semi-arid region of thorn-scrub and bush, the haunt of lion, elephant, and rhinoceros. Pushing the line through this was no mean feat, especially during the dry season when the problem of water-supply was acute. Often water had to be brought to the rail-head from a stream many miles farther down the line.

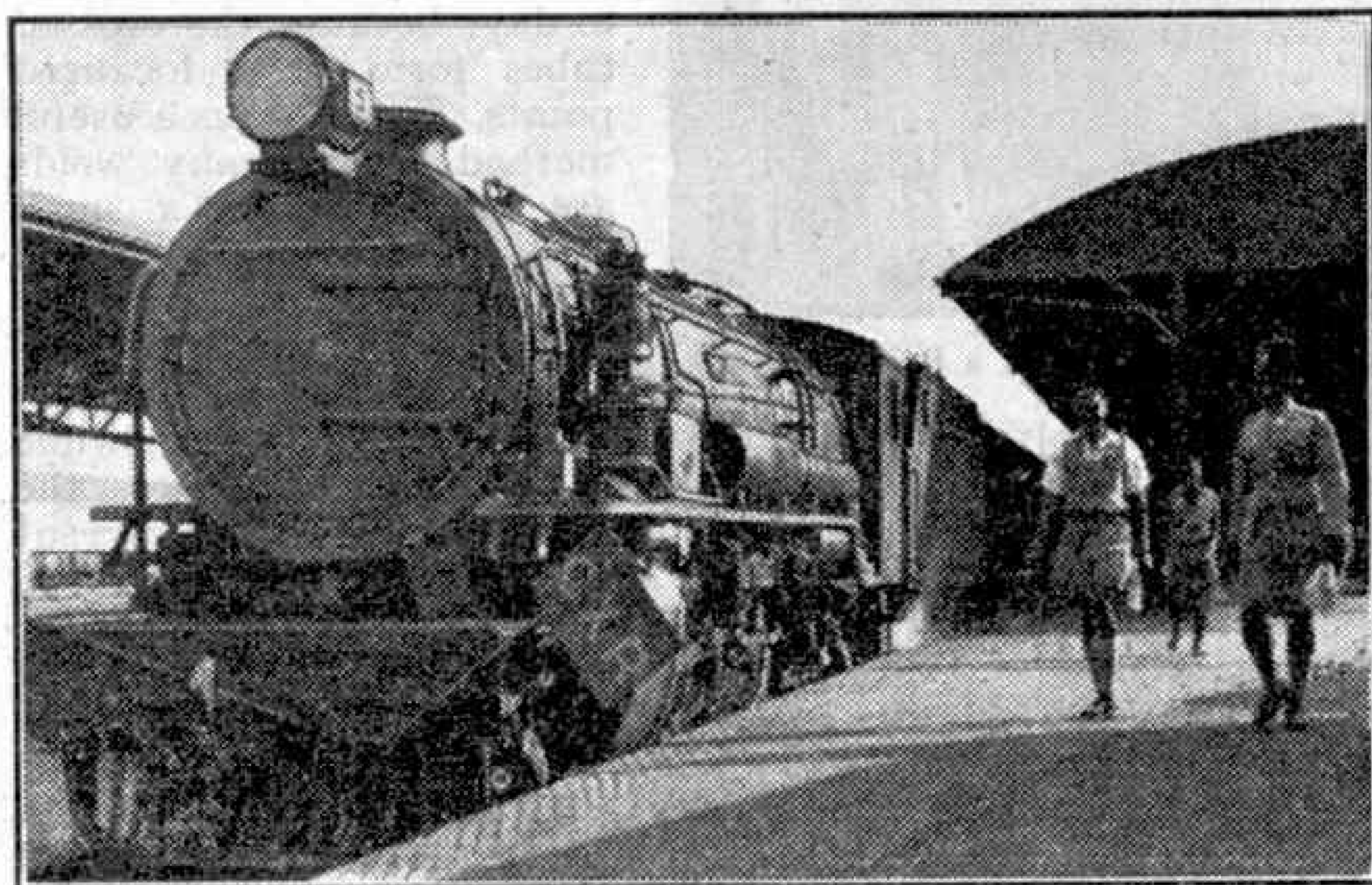
At Tsavo, about 120 miles from Mombasa, the construction camp was terrorized for several months by two man-eating lions. During that time they each devoured over a score of Indians and an unrecorded number of Africans, eluding all attempts to trap them. At one period the panic they caused was so great that construction ceased entirely for three weeks, until they were eventually shot by Colonel Patterson, one of the engineers in charge of construction.

The line is metre-gauge and single-track throughout. The track is doubled at stations and halts to permit the passing of trains, although by British standards traffic is extremely light. For example, the Mombasa-

Nairobi section is traversed once daily in each direction, apart from special boat trains, as also are the Nairobi-Kisumu and Nairobi-Kampala sections. The service from Nairobi to Nanyuki is operated thrice weekly in each direction.

Metal sleepers are universally used; wooden sleepers would quickly be eaten by white ants. To keep capital expenditure and labour requirements to a minimum during construction, cuttings and embankments are as few as possible, and the line follows the contours of the countryside, with the result that in the hillier sections of the country it takes an extremely tortuous path. Gradients are terrific by British standards, 1 in 50 being not uncommon.

Between Mombasa and Nairobi the country is flatter, permitting long straight

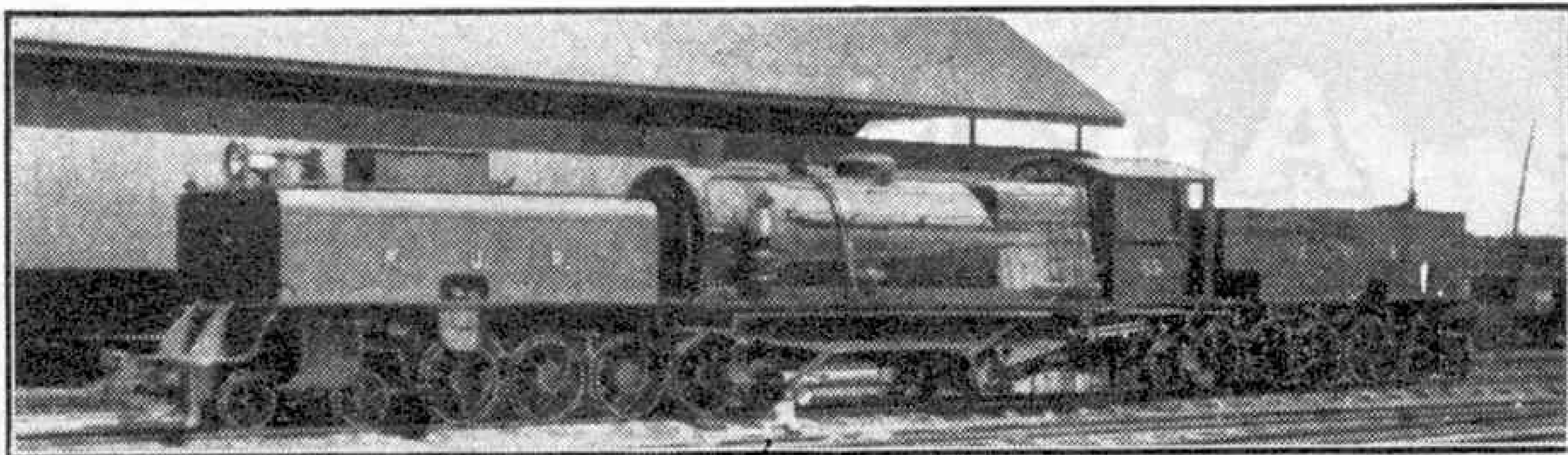


A Mombasa train waiting to leave Nairobi. Note the large proportions of the engine and its prominent headlight.

with many difficulties and hazards. Most of the track-laying was done by Indian labourers, mainly Punjabis, under the supervision of British engineers. Many of these Indians decided to settle in East Africa after the construction work was finished, and these formed the nucleus of the vigorous and growing Asiatic community which now numbers over 80,000 in Kenya alone.

Mombasa, the seaport of Kenya and the terminus of the railway, is built on an island connected with the mainland by a causeway over which passes the railway, and a floating bridge. It has large modern docks capable of accommodating ships up to 40,000 tons.

The railway was laid approximately on the line of the ancient caravan and slave route from Uganda to the coast. For



A 4-8-2 : 2-8-4 "Beyer-Garratt" locomotive of the Kenya and Uganda Railway, with its rods and motion removed while under repair at Nairobi.

stretches on which speeds of 40 m.p.h. and more are maintained. There is only one tunnel in the system, a very short one, said, no doubt slanderously, to have been built to meet the wishes of a prominent English lady who could not envisage a railway without a tunnel!

To the newcomer to East Africa a journey on the mail-train from Mombasa is of absorbing interest. Leaving the palm trees and plantations of Mombasa in the evening, the train soon enters the 100-mile stretch of thorn-scrub wilderness. At dawn next day the train is entering the Athi Plain, which extends south-eastward of Nairobi for about 50 miles. The Plain is a game-reserve, and at this time of day the vast herds of antelope, kongoni, wildebeeste, zebra, and giraffe which roam the Plain are feeding. They take no notice whatever of the train, and a magnificent view of African wild life can be obtained. An occasional lion can also be seen if the traveller is very lucky.

This region is also part of the reserve of the Masai tribe, an interesting race of

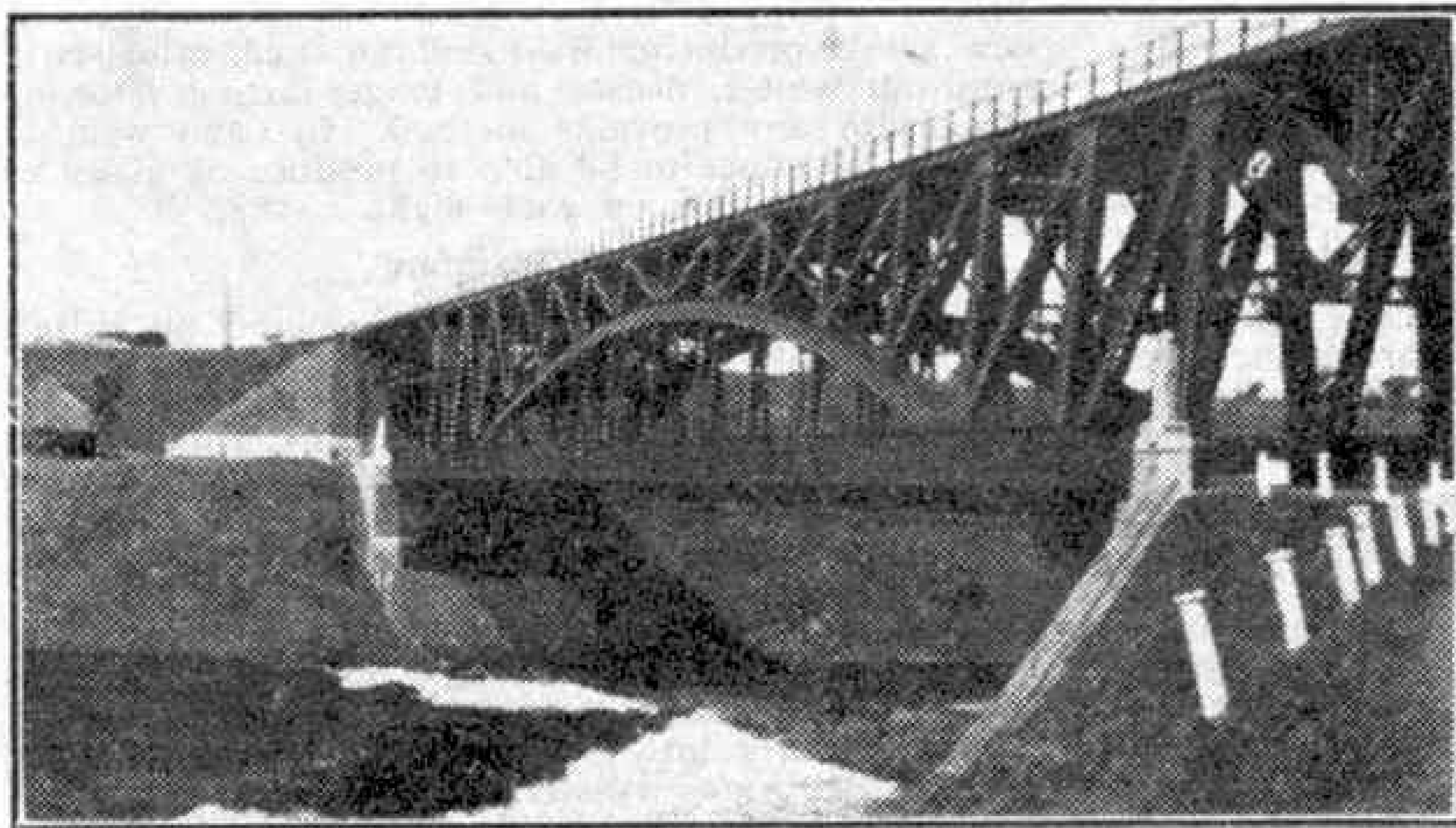
warriors who lead a semi-nomadic existence and whose chief diet is a mixture of bullocks' blood and milk. Nairobi, the capital of Kenya, is reached at about 9 a.m. Beyond Nairobi the line enters the hilly Rift Valley region, and so the "Pacific" which has hauled the train from Mombasa is replaced by a "Beyer-Garratt" articulated engine.

The region of the Great Rift Valley provides some of the grandest scenery in Kenya, and the descent, in zig-zag fashion, of the Kikuyu Escarpment of the eastern side of the Rift is a long business. On the floor of the Valley is Nakuru, a centre for the European farmer-settlers in the neighbourhood, and the junction of the two branches of the railway which go respectively to Kisumu and Uganda. The Kisumu line is the original line opened in 1903; the Uganda line crosses the gigantic Mau Escarpment, as the western wall of the Rift Valley is known, nine miles to the north of the Kisumu line. On the summit of the Mau Escarpment the railway reaches the highest altitude of all railways in Africa, 8,321 ft.

Kisumu, the terminus of the original line, is a pleasant place on the shore of Lake Victoria, the centre of the lake fishing trade, and a stop on the flying-boat route to South Africa. Steamers operated by the railway company ply between the three principal lake ports, Kisumu, Entebbe in Uganda, and Mwanza in Tanganyika.

On crossing the border into Uganda one cannot help noticing the marked change in vegetation.

(Continued on page 202)



The combined road and rail bridge over the river Nile at Jinja, Uganda completed in 1931.



Refuelling a British Overseas Airways "Constellation" transport.

"Vampires" to be Built in Switzerland and France

Following extensive service tests with four de Havilland "Vampires" over the last two years, the Swiss Government have decided not only to adopt the "Vampire" as Switzerland's standard defence fighter, but to build the type under licence.

The initial four aircraft were Mark Is, of which one had been modified to carry rockets and bombs for ground attack duties, in addition to high-altitude fighting. As the Swiss were particularly pleased with the dual-purpose type, de Havilland developed for them the special "Vampire" 6, which is similar to the R.A.F.'s "Vampire" 5 but has a "Goblin" 3 engine of 3,300 lb. thrust, instead of the 3,000 lb. thrust "Goblin" fitted to the Mark 5.

The first 75 "Vampires" for the Swiss Air Force are being built by de Havilland at Hatfield, and will be followed by an initial series of 100 Swiss-built machines for which the engines will be supplied from England.

France is also arranging to build "Vampires" along the same lines as Switzerland.

"Pluto" becomes "Plume"

Sections of the original "Pluto" (Pipe Line Under The Ocean) pipe-line system laid on the bed of the English Channel in 1944 from the South Coast to France, for supplying petrol to the Allied liberation forces, have just started a new lease of life in connection with the Berlin Air Lift. Locally known as "Plume" (Pipe Line Under Mother Earth), the pipes have been laid, by Control Commission engineers, from R.A.F. Station, Gatow, to the shore of Lake Havel, 1½ miles away.

Petrol is discharged from "Plainfare" tanker aircraft into underground tanks at Gatow, from which it can now be pumped at the rate of 100 gall. a minute into tanks at Lake Havel. It is then transferred to barges and taken by canal to points in the British sector of Berlin, a far more economical system than the former method of distributing petrol from Gatow by tanker lorries.

News of the B-36

On 29th January last a Convair B-36B six-engined bomber of the U.S.A.F. dropped two 20-ton bombs, the first from 35,000 ft. and the second from over

40,000 ft., at a distance of 1,200 miles from its take-off point. This is by far the greatest bomb load ever carried by a single aircraft.

General Hoyt S. Vandenberg, Chief of Staff of the U.S.A.F., stated recently that the B-36, flying at 40,000 ft., cannot be intercepted by American jet fighters of current design. What is more, experience has shown that if a jet fighter attacks the B-36 from astern its engine is liable to blow up in the turbulent slipstream from the bomber's six giant engines.

Bearing this in mind, the U.S.A.F. recently cancelled contracts for other types of bombers and fighters in favour of more B-36s. Some of them will probably be fitted with four additional under-wing jet engines to make them the fastest, as well as the longest ranging and highest-flying bombers in service anywhere.

Skywriting Again

The first post-war advertising by means of skywriting is scheduled to take place soon on behalf of Pye Radio, of Cambridge. It will be undertaken by Mr. Alistair Fraser, who owns the only aircraft in Britain equipped and licensed for skywriting. A new smoke-producing fluid will be used, which will turn out whiter, denser and longer-lasting lettering than with any previous method. In calm weather Mr. Fraser hopes to be able to produce as many as 12 or more letters on each flight.

Civil "Plainfare"

The fleet of civil aircraft administered by British European Airways which joined the Berlin Air Lift last Summer, carried an average of over 200 tons of fuel, food and other supplies into the German capital each day during its first 200 days of operation. Nearly 8,000 sorties were flown in that time, lifting a total of over 45,000 tons, which is more than the whole of the freight load carried by British scheduled air services for the 20 years before the war.

Greatest achievement of this mixed fleet of converted bombers and transport aircraft has been its ability to carry into Berlin every drop of liquid fuel used in the three Western Sectors in the last few weeks, for power stations, factories, homes, transport and the military and civilian services. In this respect the seven "Tudor" aircraft operated by B.S.A.A. and Air Vice-Marshal Bennett's Airflight Company have proved particularly successful.

Flying Saucer

A year or two back, when many people saw (or thought they did) "Flying Saucers" of various shapes and colours, there was in fact one genuine "Flying Saucer" on test in America. It was the little Chance Vought V-173 all-wing aircraft, illustrated on this page.

The V-173, which was designed as a full-sized, low-powered, light-weight flying "model" of the XF5U-1 naval fighter, was developed from a tiny twin-engined 7 ft. span "saucer" built by Charles Zimmerman, of Chance Vought, in 1934. Advantage of the novel layout is that it offers both extremely high speeds and low speeds in one machine. In fact, Chance Vought believe that a jet-powered "saucer" would be able to hover at zero m.p.h., helicopter fashion, or on the other hand achieve speeds of over 500 m.p.h.

Although neither the V-173 nor the XF5U-1 advanced beyond the prototype stage, they proved the soundness of Zimmerman's theories. It is significant that Chance Vought's latest production type, the revolutionary, swept-wing "Cutlass," which will be described in next month's "Air News," is a jet fighter of flying-wing layout.

Trout Eggs by Air

Fifteen thousand Brown Trout eggs have been flown by B.S.A.A. from Britain to Montevideo (Uruguay), destined for the Falkland Islands, where they are to be used to replenish the trout in the Islands' rivers and streams.

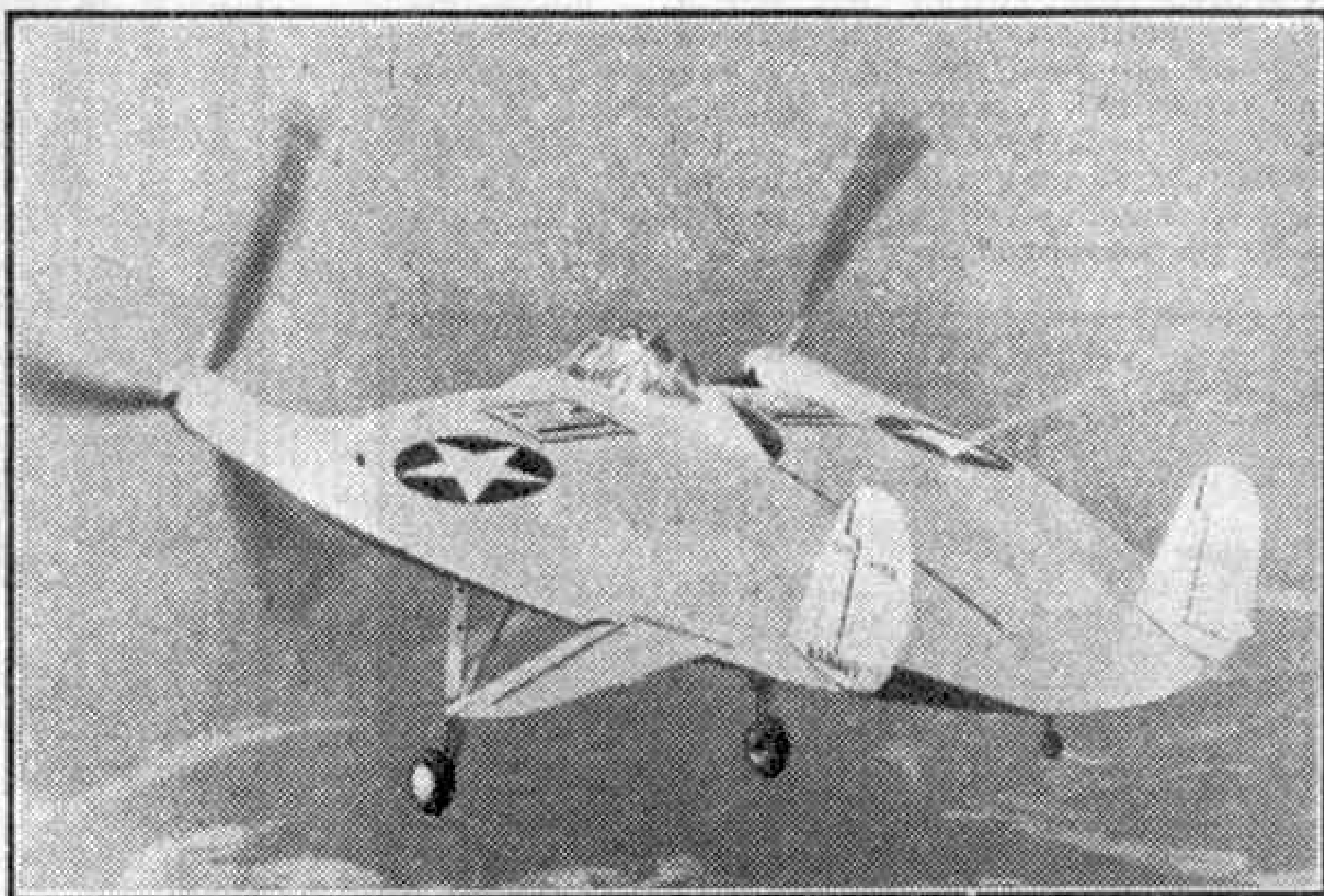
Weighing only a pound, the eggs were safeguarded on their 7,000-mile flight by 47 lb. of packing, including a metal container surrounded by cork chippings and 10 lb. of ice to keep them cool and so prevent their hatching *en route*. At Montevideo one of the ships operating the infrequent service to the Falklands awaited the cargo to carry it the remaining 1,000 miles by sea.

Ingenious Maintenance Trolley

Mr. D. J. Stapleton, Aer Lingus Station Engineer at Northolt Airport, has designed a mobile Maintenance

Unit that, since put into service, is estimated to have cut turn-round maintenance time by 25 to 50 per cent.

In effect, the Unit is a mobile workshop which carries all tools and spare parts necessary for routine maintenance. It has a small petrol motor which combines a charging unit for the batteries and current supply for portable hand-lamps fitted with wandering leads and flood lights. There is a work-bench and vice, a tool rack and drawers carrying sparking plugs, locking wire, etc. It is also fitted with fire extinguishers,



The Chance Vought V-173 all-wing aircraft. Photograph by courtesy of United Aircraft Corporation, U.S.A.

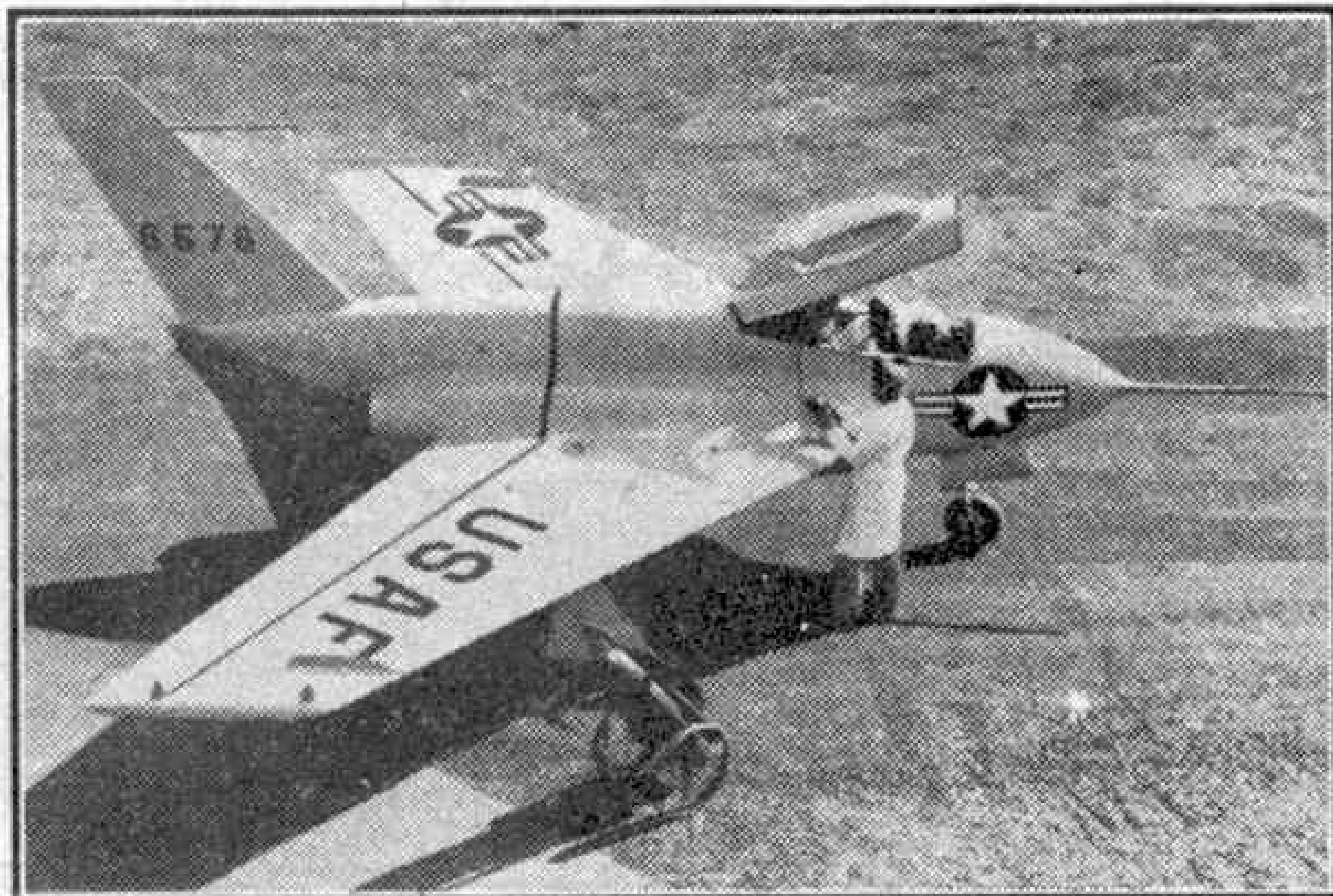
first aid kit, containers of hydraulic and de-icer fluids and a full range of measures and funnels. The top of the Unit can be used as a work platform, allowing engineers to work directly on the aircraft's engines while the machine is on the apron, thus saving hangar time.

The first Unit, which was built by Stapleton and some colleagues in their spare time from scrap material, is said to have cost less than £10.

Sonic Speedster

One of the smallest aircraft ever built for the U.S. Air Force, the Northrop X-4, shown at the foot of this page, has a wing span of only 25 ft. and weighs about 7,000 lb. It is very similar in general appearance to the de Havilland 108 and, like the British machine, has been designed for high-speed flight research; but its two Westinghouse jet engines give it rather more power than the 108's single "Goblin."

The American Bell X-1 and the D.H. 108 have already proved that flight at speeds greater than that of sound is possible, but the X-1 has always been flown through the critical band of speeds lying immediately on each side of sonic speed as quickly as possible, to minimize the effects of the compressibility shockwaves that can batter aircraft to pieces in a few seconds. What is more, the X-1's rocket motor gives it an endurance of only 2½ min. at full power, whereas the X-4 should be able to carry a pilot and elaborate instruments into this "trouble zone" of sonic flight, and keep them there long enough to find out a great deal more than is now known about its dangers.

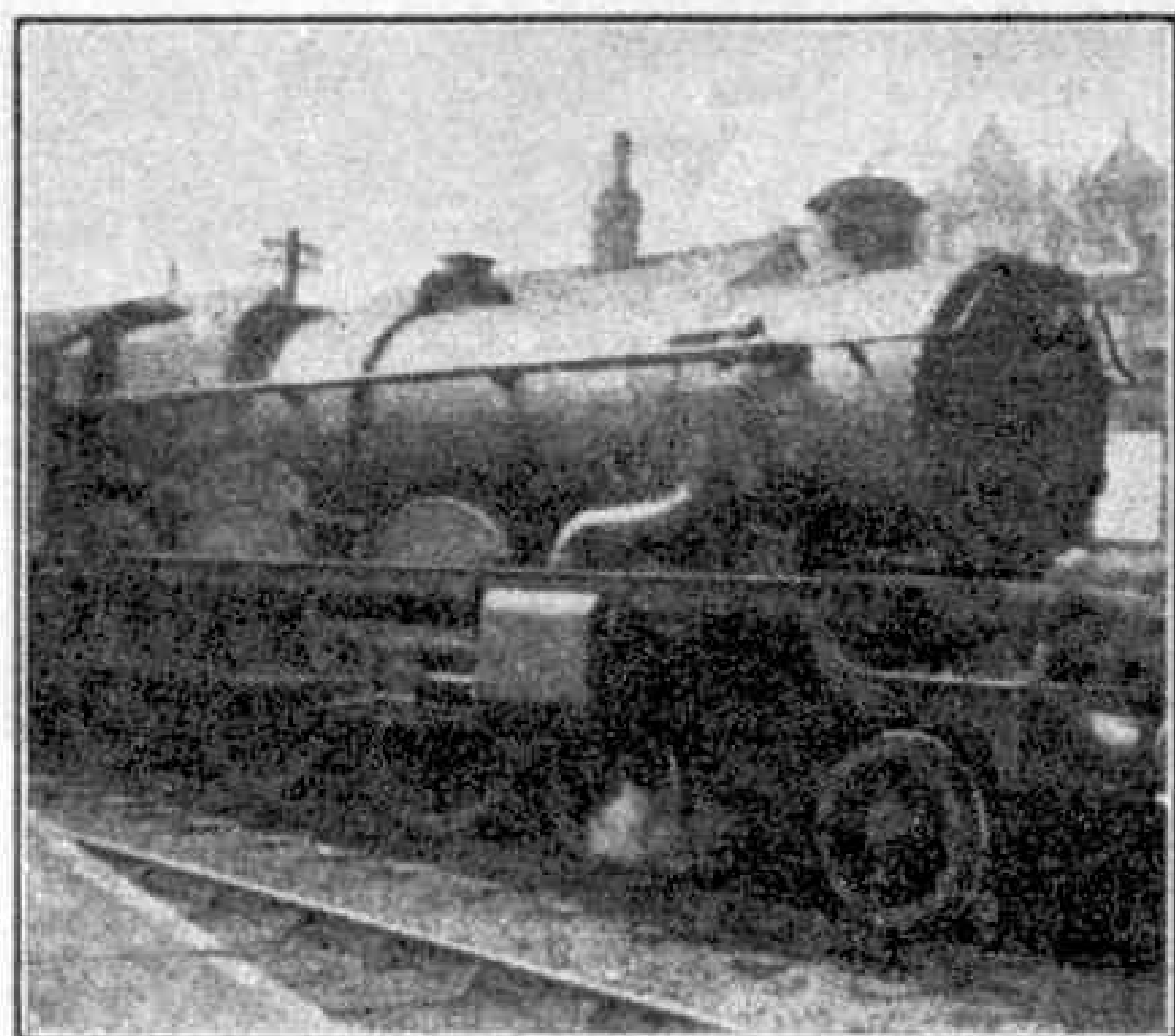


The dart-shaped Northrop X-4 research aircraft described on this page. Photograph by courtesy of Northrop Aircraft, Inc., U.S.A.

Photography

Background and Foreground Faults

AMONG the entries for "M.M." photographic competitions are almost always some which, although otherwise excellent, are spoiled by unsightly and unwanted background details. Quite often the unseemly background could have been avoided by moving or turning a little more to left or right, or slightly changing the angle of approach to the subject to be photographed.

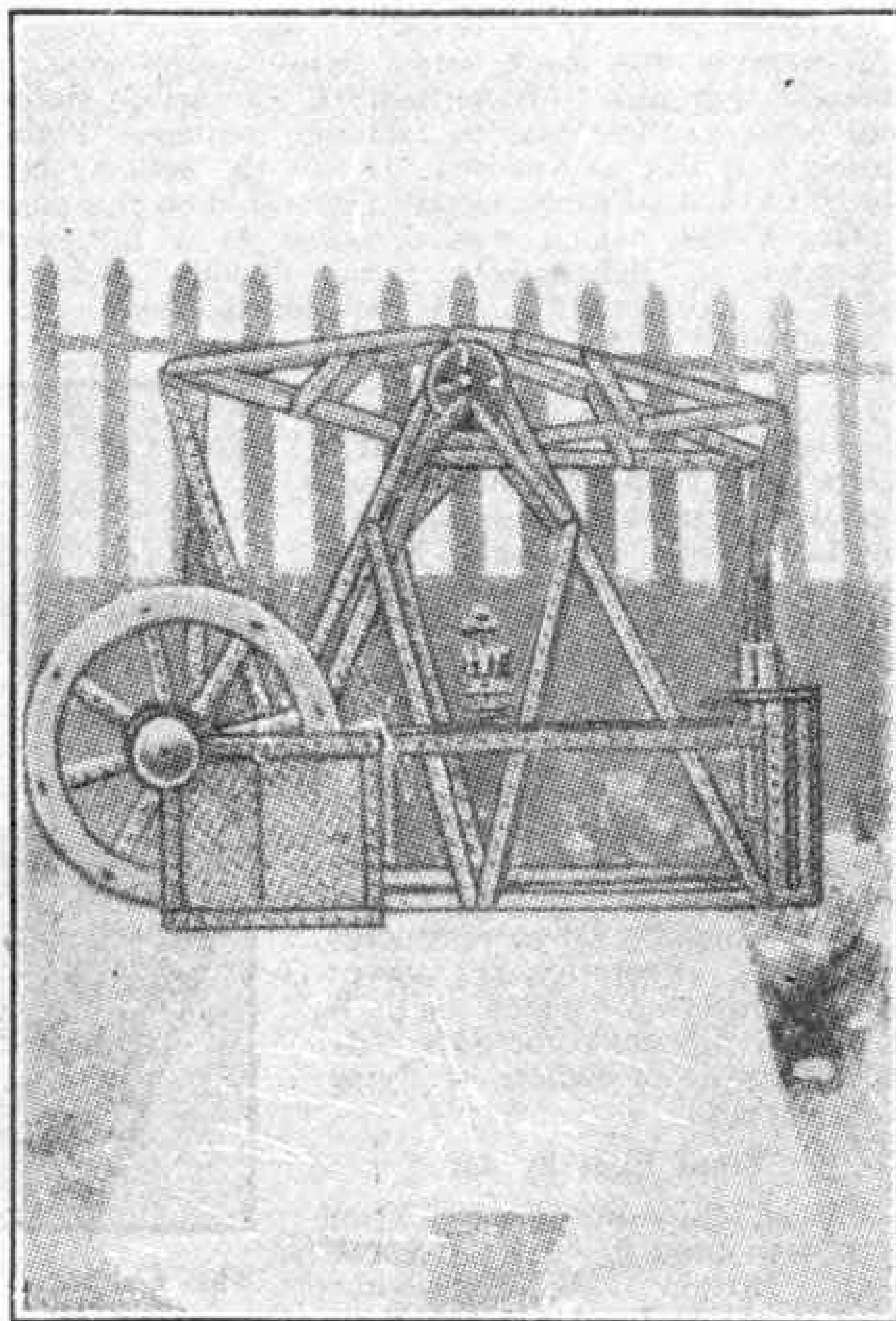


The telegraph pole and roof chimney are not really sprouting from the locomotive!

It is surprising how many otherwise first-rate photographs of stationary locomotives are taken in such a position that chimneys, telegraph poles or electric lamp standards appear to be sprouting from the boiler or cab! An example of this fault is shown on this page.

Meccano model photographs seem to be particularly liable to this background trouble, and often in model-building competitions we receive prints of really excellent models which, having been taken out-of-doors, appear to be entangled in a mass of foliage, or are almost invisible against a background of brickwork or railings. In the top picture the railings are so mixed up with the Strips and Girders of the model that it is difficult to make out its general outline, and the finer constructional features are lost. Similar confusion occurs when a model is posed on a chair with an ornamental back.

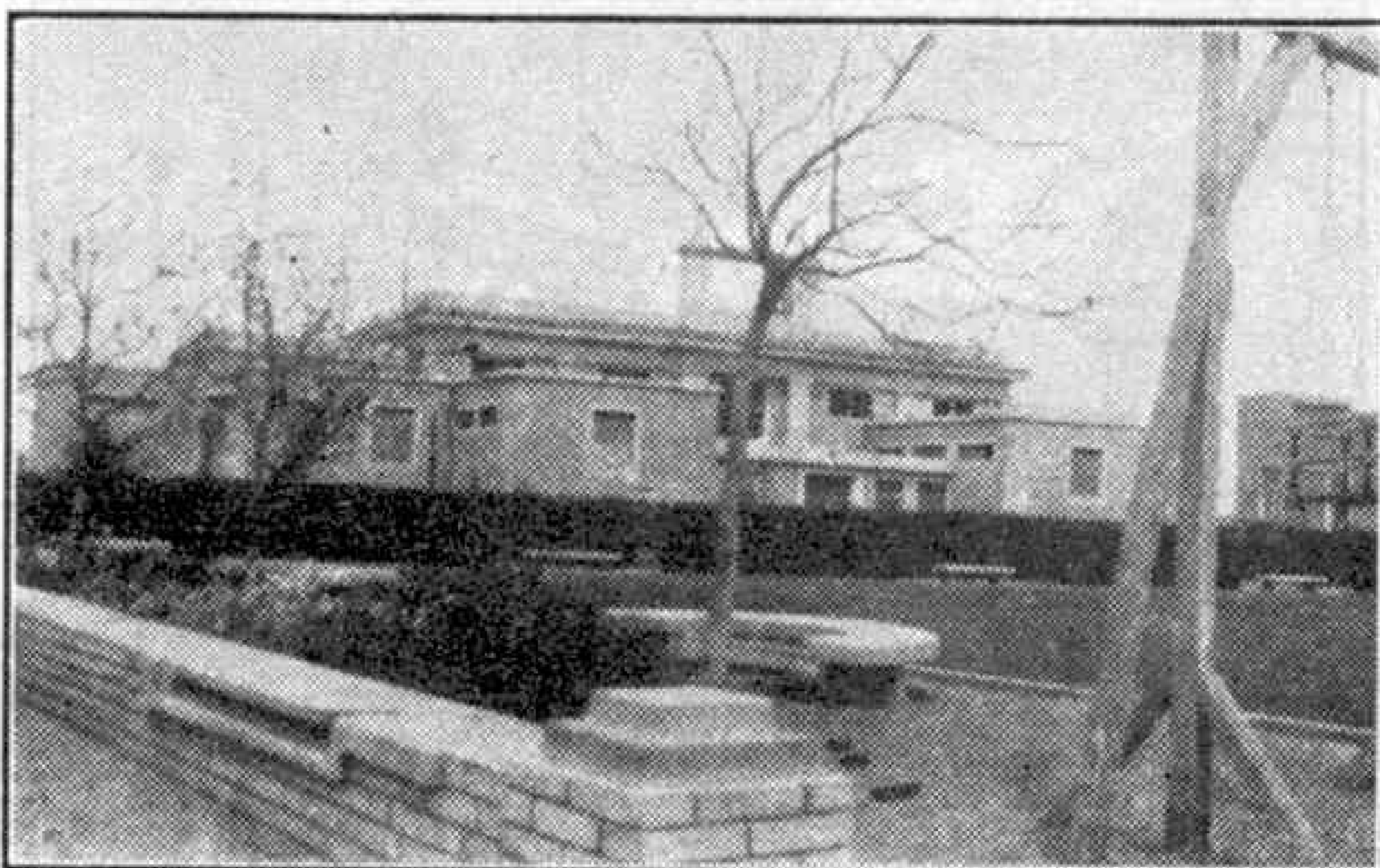
The best background for a small Meccano model that is to be photographed is a sheet of white cardboard or rough-surfaced paper, such as cartridge drawing paper. If the model is a large one, such as a crane or other vertical structure, a white sheet might be hung behind it. A light neutral background of this sort causes the structural details of the model to stand out



This picture shows the effect of photographing a Meccano model against an unsuitable background.

boldly, and greatly improves the photograph.

Sometimes it is the foreground that causes the trouble. In photographing buildings, for instance, a foreground requires careful consideration. It may be of such a nature as to add to the general attractiveness, and it may even be essential to include a fair amount of foreground to produce the right pictorial effect. More often, however, the foreground details are definitely not wanted. In the bottom photograph the foreground details, the trees and the swing in particular, distract attention from the building and are simply irritating.



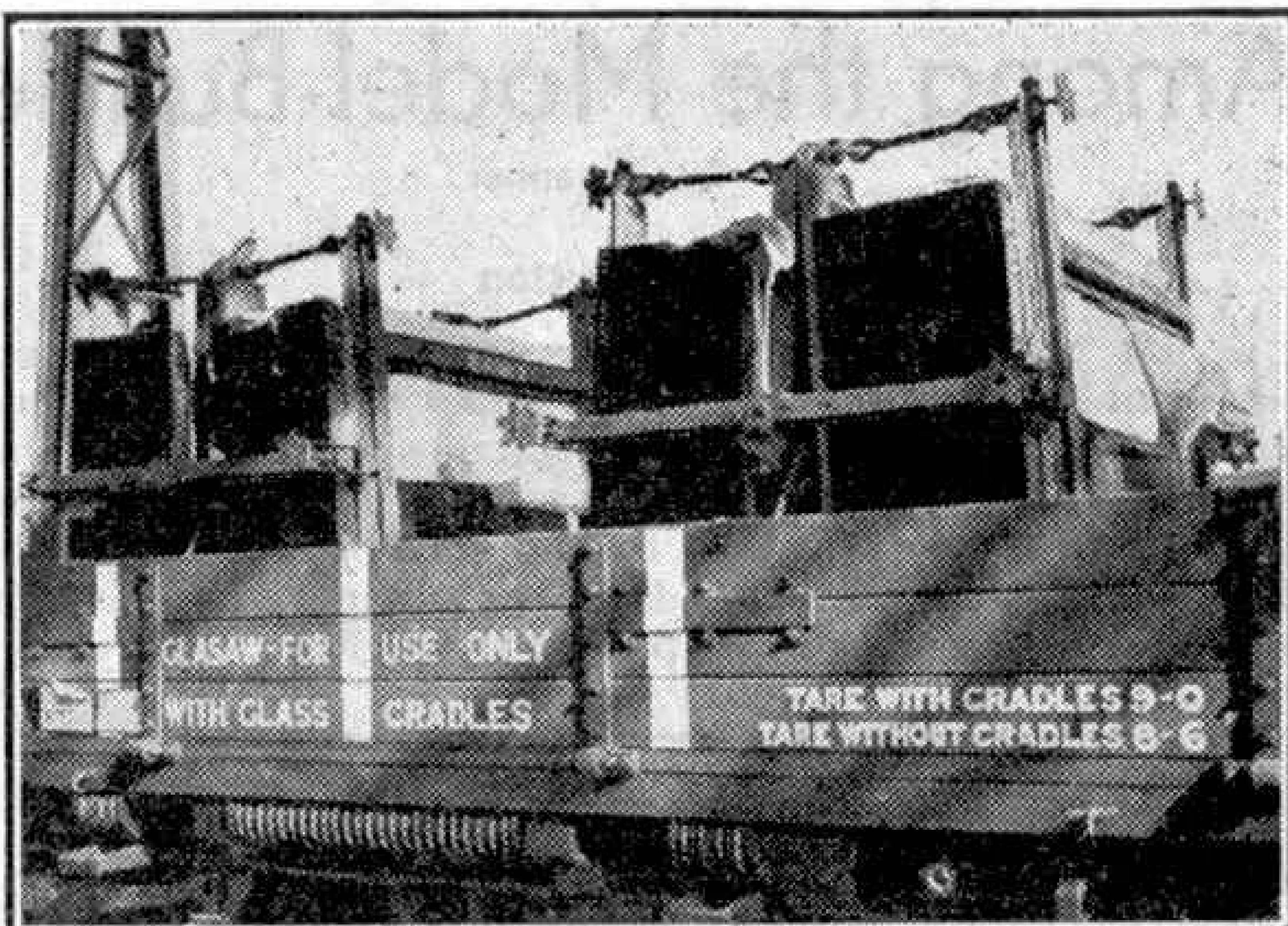
This view of the gymnasium of the English School, Cairo, is spoilt by the trees and swing in the foreground.

Glass by Rail

THE carriage of glass by rail has long required the provision of special equipment owing to the fragile character of such loads. In recent times the container system has improved the handling of small glassware. A container can be packed at the manufacturer's works and then travel with its contents undisturbed by road, rail, and perhaps road again before reaching its destination.

For large glass sheets special wagons fitted with trestles for supporting the load in a sloping position are well known. Often they are of the well type, thus allowing taller sheets to be dealt with. Other wagons for glass sheet traffic have special vertical stanchions, between which the sheets, crated or cased, can be clamped.

Recent developments on the London Midland Region, following up experiments



A pair of new glass-carrying cradles loaded on a special shock-absorbing wagon. The photographs and information on this page are by courtesy of British Railways, London Midland Region.

begun in 1946 by the former L.M.S. and Pilkington Brothers Ltd., the glass manufacturers of St. Helens, will enable window glass to travel from St. Helens, Lancs., more speedily, without packing, and better still, without damage. This has been made possible by new-type cradles carried in special shock-absorbing railway wagons. The new idea is to load sheet glass in two equal packs on either side of the felt-padded centre support on each cradle and to hold it in position with clamps.

The cradles are removable and can be carried in both road and rail vehicles. They are of light weight and easily accessible, both for loading and unloading. All clamping and securing of the glass is performed by mechanical means, without ropes or loose packing.

Each pack of glass is independently clamped by a felt-covered detachable steel frame, housed in sockets at the base and tightened at the top by screws which in turn are connected to the centre supports.

To prevent any longitudinal movement of the glass a swivelling adjustable steel beam is attached to the centre supports by a screw and is further secured at each end to the side frame by a screw clamp.

The shock-absorbing equipment of the new wagons, which allows the body in which the glass cradles are fitted to "float" on rubber springs, totally eliminates damage to sheet glass due to any violent movement during transit by rail. Each wagon can carry $8\frac{1}{2}$ tons of sheet glass in two cradles as compared with the load of three to five tons of glass packed in crates and carried by former methods.



A loaded glass cradle being lowered on to the deck of a road motor vehicle.

Among the Model-Builders

By "Spanner"

A Young Reader's Suggestion

C. G. South, London N.13, sent me details of a simple suspension device for the rear axle of a model vehicle. It consists of a $2\frac{1}{2}$ " Strip attached at one end to an Angle Bracket lock-nutted to the side of the chassis. The other end of the Strip is supported by a $\frac{3}{4}$ " Bolt, passed through

from 1" to $11\frac{1}{2}$ " in length. Their chief function is the conversion of rotary motion to longitudinal motion, but in models where a very long bolt is re-

quired, one of the shorter

Screwed Rods can be used for the purpose.

Several Meccano parts are specially designed for use with the Screwed Rods, and these include the Threaded Boss, Threaded Crank and Threaded Coupling. If one of these parts is attached to a model and a Screwed Rod threaded through it, then the latter can either be made to move longitudinally as it rotates, or its endways movement can be prevented and instead that portion of the model carrying the Threaded Boss or other threaded part can be caused to move up and down

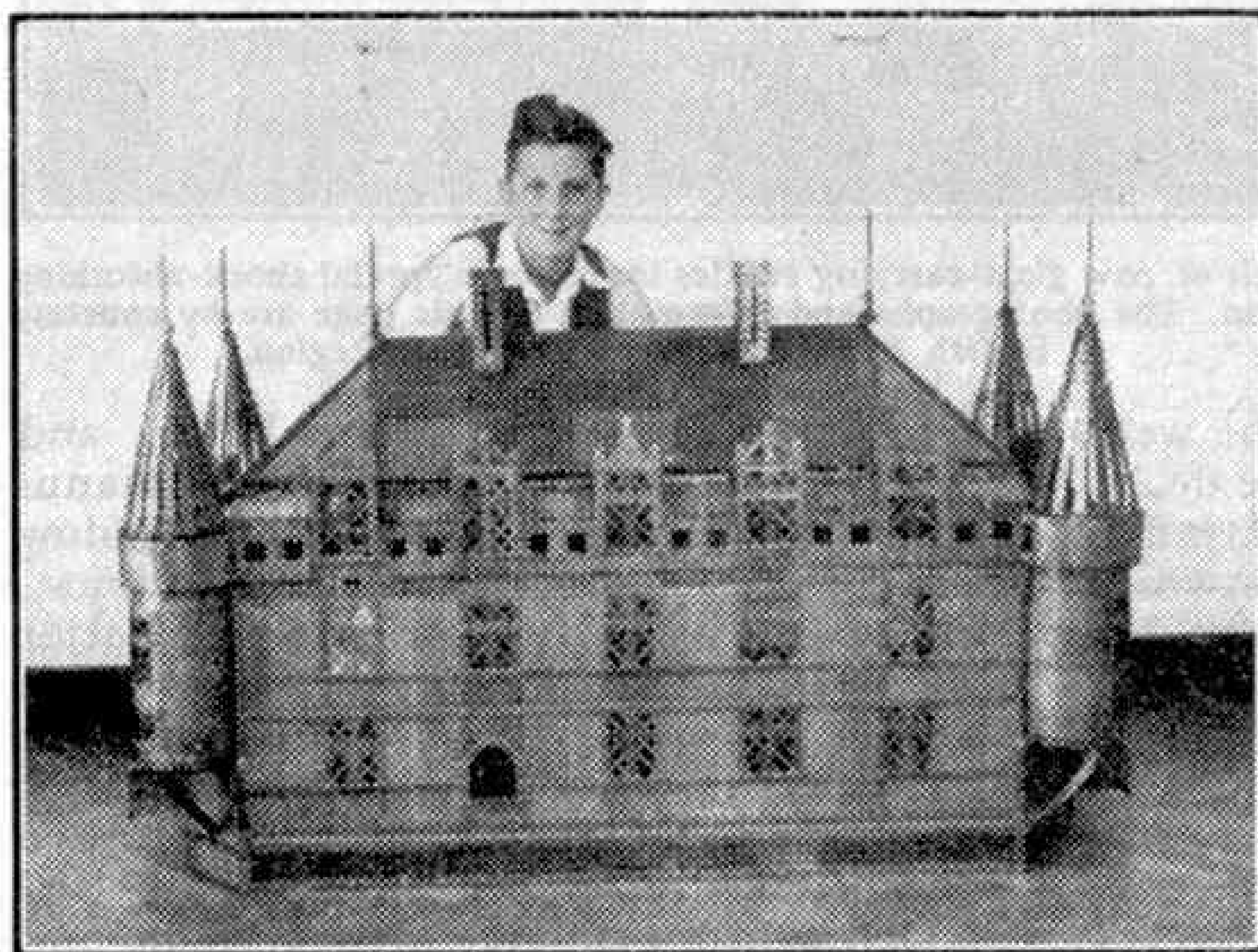
the Rod. This usage is very valuable sometimes and can be applied in many different kinds of models.

When it is required to fix a Threaded Boss or Threaded Coupling on a Screwed Rod, a nut should first be placed on the Rod and then screwed tightly against the part. Any other Meccano Wheel, Pinion, etc., can be attached rigidly to a Screwed Rod by gripping it tightly between two nuts threaded on the Rod.

When it is required to journal a Screwed Rod so that it can rotate like an Axle Rod, it should be connected by Threaded Couplings to Rods so that the latter can be journalled in the bearings instead of the Threaded Rod.



C. G. South, London N.13, one of the contributors to "Among the Model-Builders" this month.



A fine model of a famous French chateau, "Azay-le-Rideau," by Raymond Hassan, Alexandria, Egypt, who is seen putting the finishing touches to his work.

its end hole and then fitted with a Compression Spring. The Bolt is locked at its extreme end in the round hole of a second Angle Bracket pivotally attached to the side of the chassis three holes away from the Angle Bracket already mentioned. The Strip is then free to move up and down the shank of the Bolt against the tension of the Spring.

The rear axle is carried in a Double Bracket bolted to the underside of the $2\frac{1}{2}$ " Strip.

How to Use Meccano Parts Screwed Rods (Parts Nos. 78 to 82)

The Meccano Screwed Rods are available in nine different lengths ranging

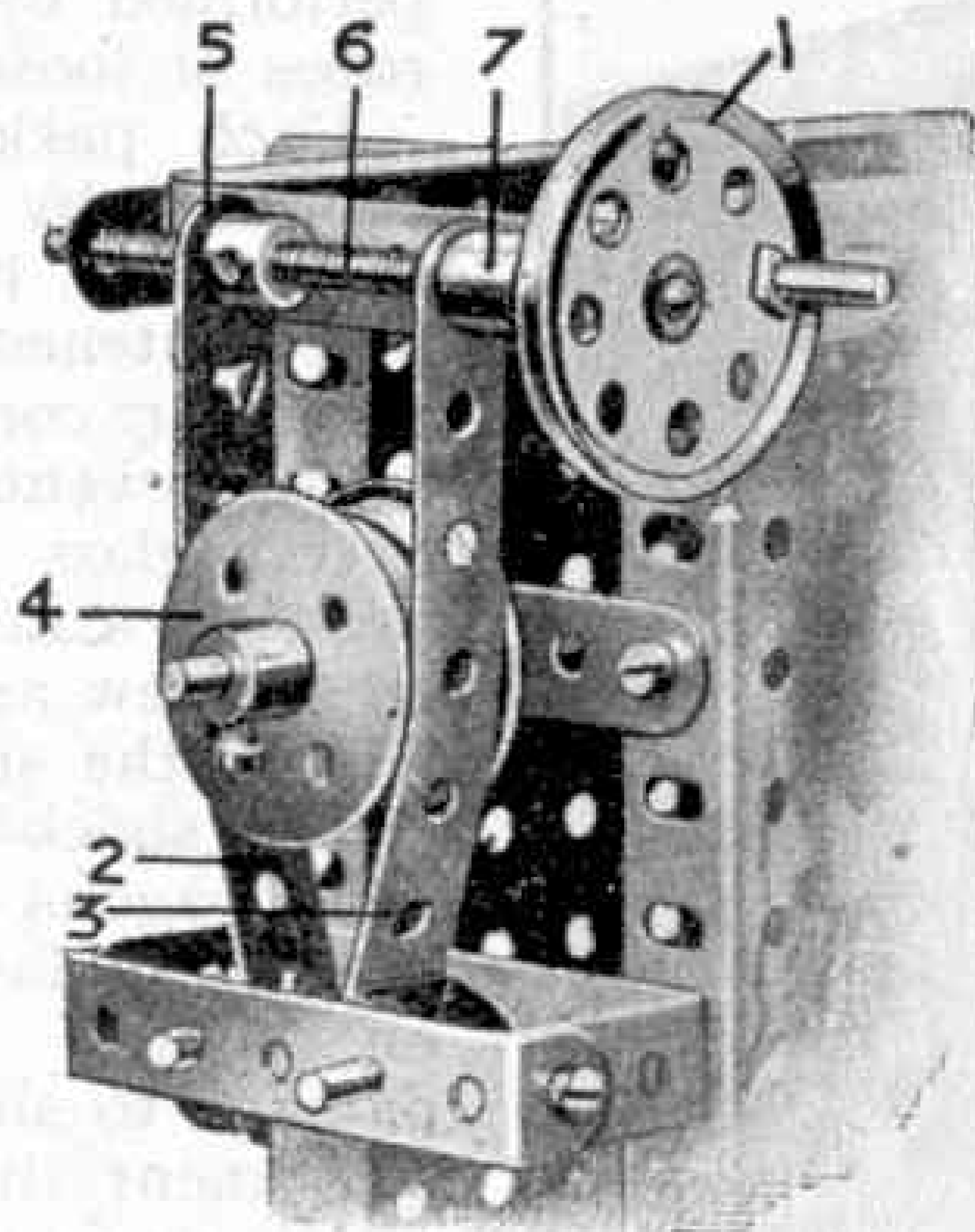


Fig. 1. This simple brake illustrates one of the many uses for a Meccano Screwed Rod.

Screwed Rods prove invaluable as a means of increasing the available power, although at a considerable loss of speed of operation. Fig. 1 shows a Screwed Rod used to expand or contract the bands of a brake.

Torsion Bar Suspension for Vehicles

One of the outstanding features of motor car design since the war is the almost universal adoption of independent front wheel suspension. This system allows one road wheel to be deflected by irregularities of the road surface without affecting the other wheel. The general use of independent suspension has resulted in almost complete disappearance from the fronts of modern cars of the once familiar axle beams and leaf springs, and their replacement by coil springs or torsion bars. Coil spring suspension units have been described in the "M.M." from time to time, and their construction is quite simple. The torsion bar system is rather more difficult, however, as this arrangement depends for its springing effect on the resistance to twisting set up in a steel bar. The illustrations on

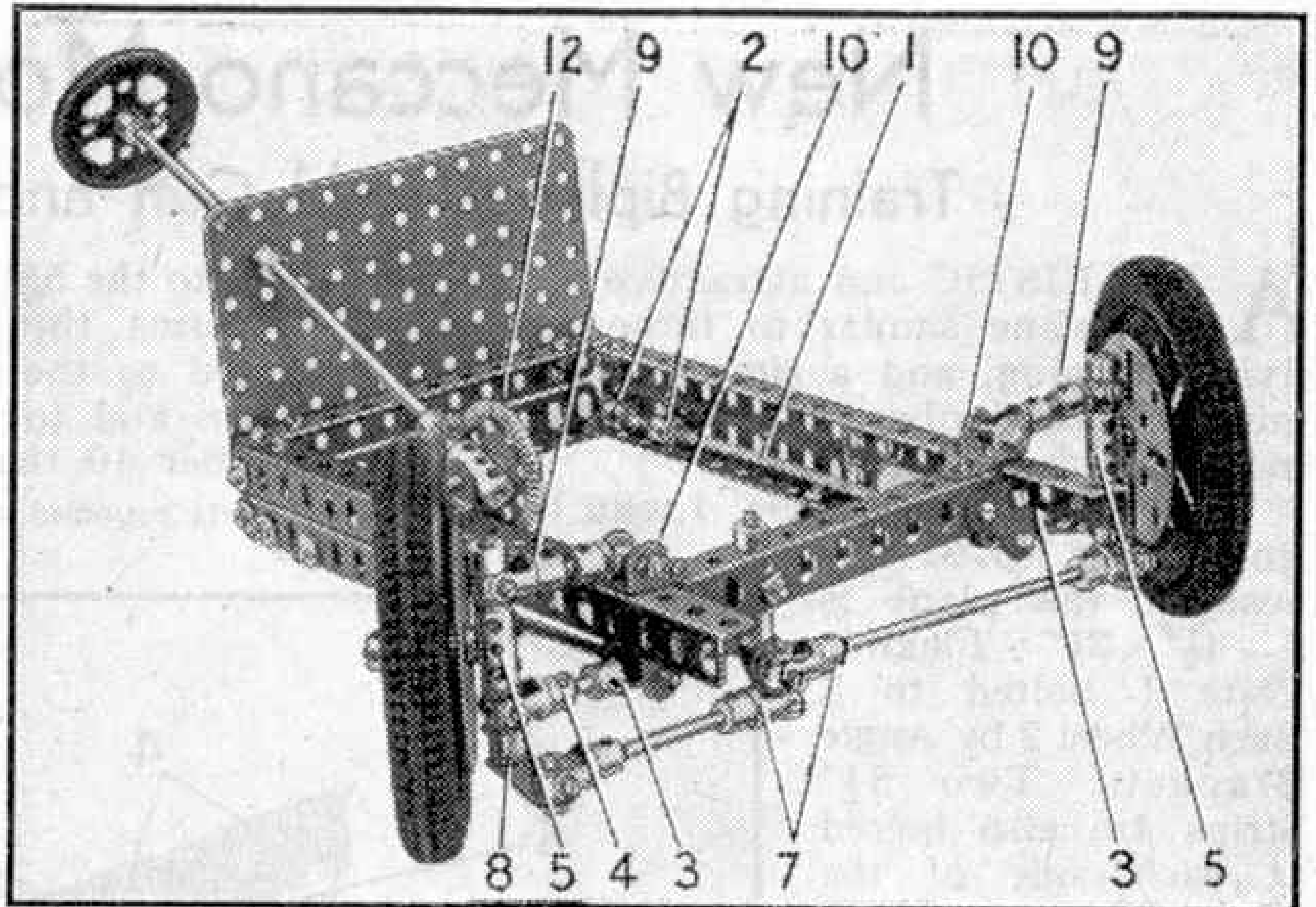


Fig. 2. The torsion bar suspension system described on this page. Its inclusion in a modern vehicle will greatly increase the realism and interest of the model.

this page show a method of constructing such a unit sent to me by W. Johnstone, Liverpool.

An 8" Screwed Rod 1 is fixed firmly to the chassis by two Threaded Bosses 2 which are attached to the chassis by Bolts spaced by Washers. The nuts must be tight enough to prevent the Screwed Rod from turning.

The opposite end of the Screwed Rod is mounted in two 1" Corner Brackets, and carries a Coupling 3. The Coupling is also fixed on the Screwed Rod by nuts, and it carries a 1" Rod fitted with a Swivel Bearing 4. A second 1" Rod fixed in a Coupling 5 is free to turn in the "spider" of the Swivel Bearing, and is fitted with a Crank 8. The Coupling 5 carries also a further 1" Rod that is free to turn in the "spider" of a Swivel Bearing 9. The Rod is held in position by a Collar, and the Swivel Bearing is connected by a 1" Rod and a small Fork Piece to a Double Bracket 10. The stub axles are 1½" Rods fixed in the Coupling 5. The links on each side are braced by radius rods 11.

Movement of the road wheels is controlled by a drop arm consisting of a Fishplate bolted to a 1½" Bevel Gear 12. The Fishplate is connected by a Rod and Collars to one arm of a Bell Crank with boss 13. The other arm is linked to the Cranks 8 by Rods and Swivel Bearings 6 and 7.

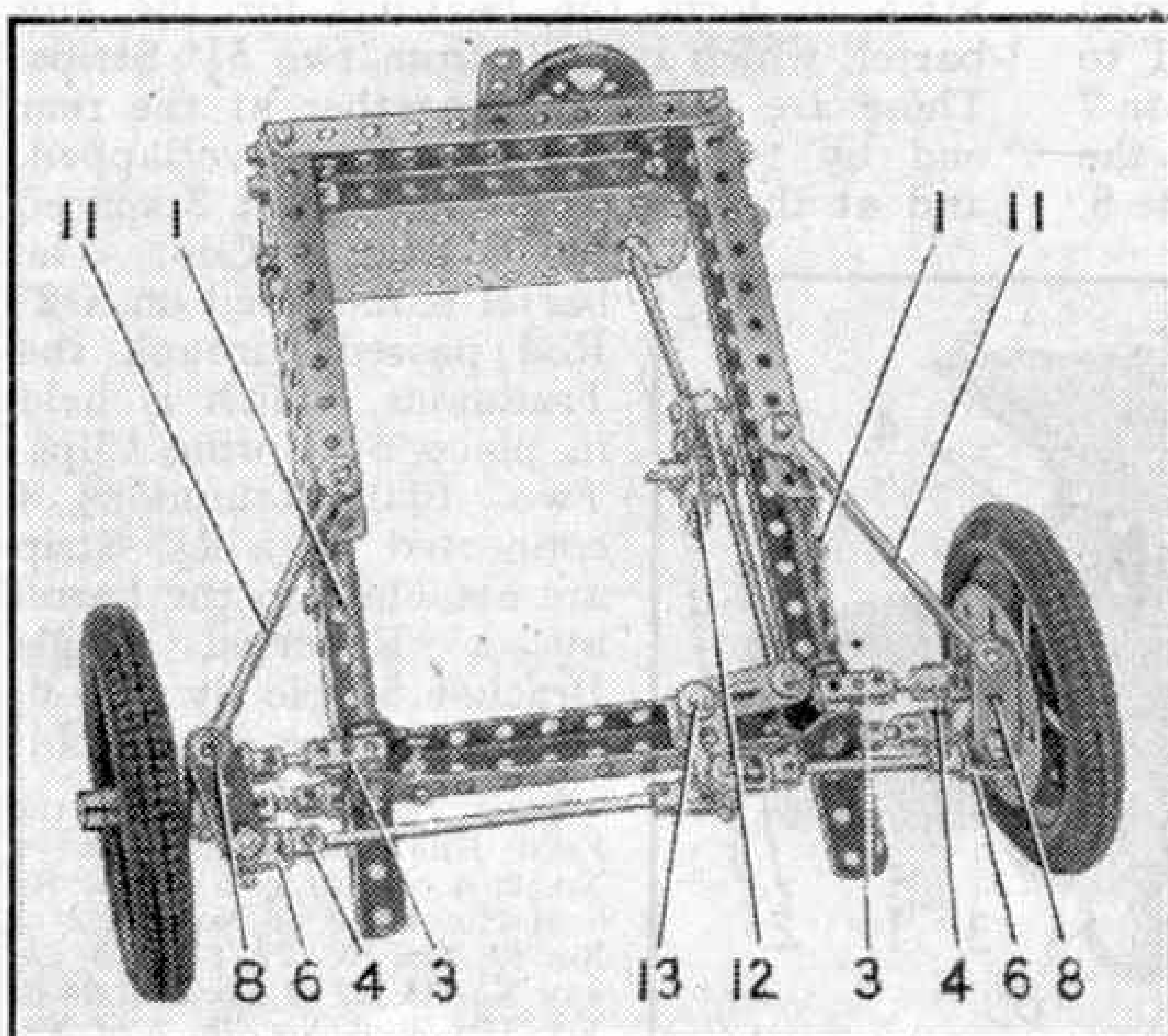


Fig. 3. An underneath view of the torsion bar suspension arrangement.

New Meccano Models

Training Biplane—Field Gun and Limber

A REALISTIC and attractive model of a biplane similar to those used for flying training, and a simple model field gun and its limber, form the two new models this month.

The biplane, seen in Fig. 1, can be built from Outfit No. 3. The nose of the plane is a $4\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate 1 bolted to a Bush Wheel 2 by Angle Brackets. Two $5\frac{1}{2}"$ Strips are also bolted at each side of the nose, one being seen at 3, and to these are fixed two $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips 4 and two $2\frac{1}{2}"$ Strips held by bolts 5 on each side. These form supports for the upper wing. Two $2\frac{1}{2}"$ Strips 6 are bolted to the $5\frac{1}{2}"$ Strips.

The upper wing is filled in by two $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plates and one $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate. One half of the lower wing is formed by a $4\frac{1}{2}" \times 2\frac{1}{2}"$ and a $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate, and the other by two $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plates and one $1\frac{1}{8}"$ radius Curved Plate.

The remainder of the fuselage is formed by four $5\frac{1}{2}"$ Strips joined at one end to the $2\frac{1}{2}"$ Strips 5. A Semi-Circular Plate 7 is bolted between the ends of two of the $5\frac{1}{2}"$ Strips, and a $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate 8,

held to the $5\frac{1}{2}"$ Strips by an Angle Bracket 9, forms the tail-plane. A Fishplate is bolted to the ends of the two lower $5\frac{1}{2}"$ Strips and to this is attached a $\frac{3}{4}"$ diam. Washer 10 that forms a tail wheel.

Parts required to build the model Biplane: 2 of

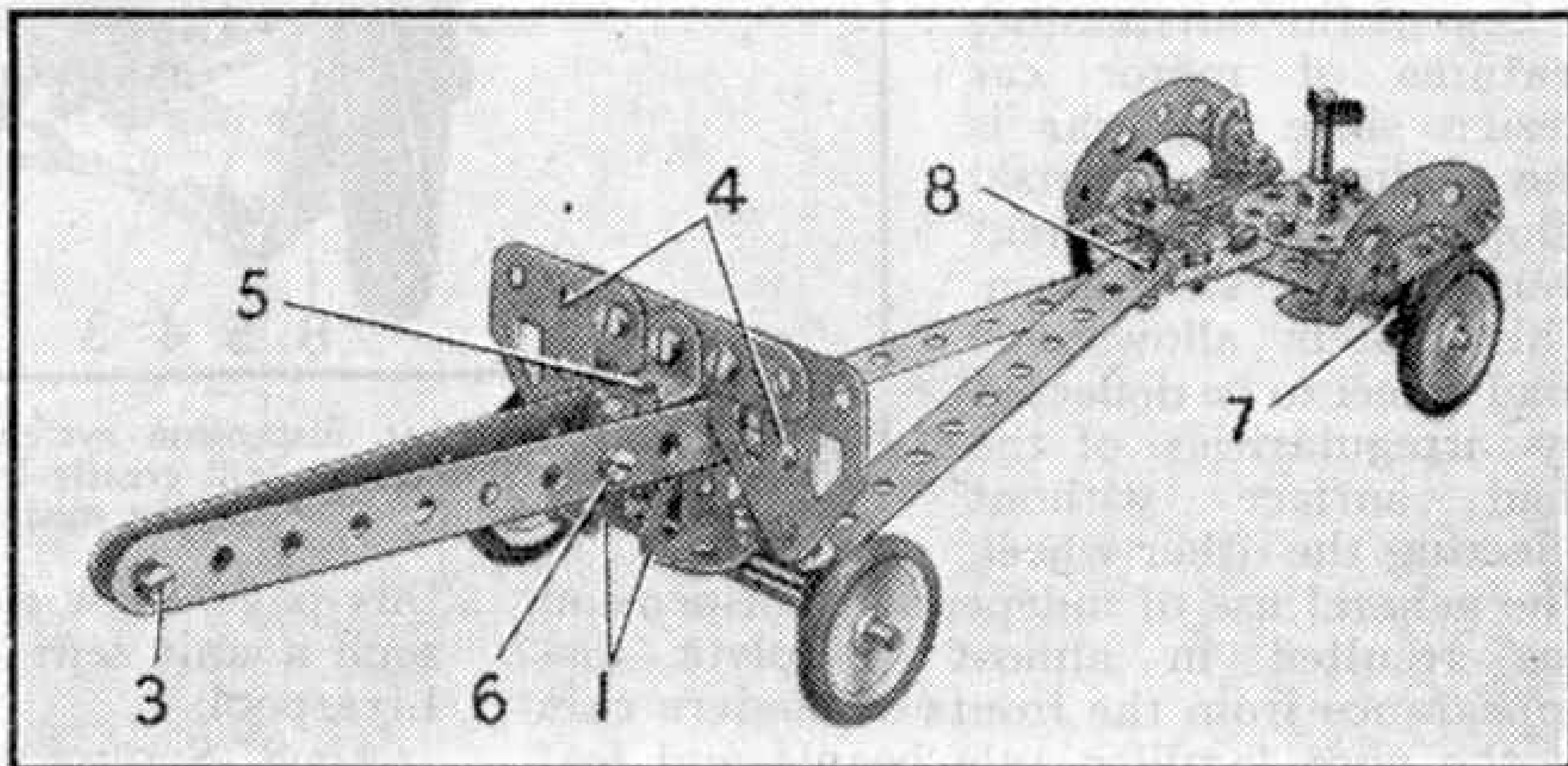


Fig. 2. A simple model of a field gun and its limber.

No. 1; 6 of No. 2; 9 of No. 5; 1 of No. 10; 1 of No. 11; 8 of No. 12; 1 of No. 16; 2 of No. 22; 1 of No. 24; 50 of No. 37a; 48 of No. 37b; 1 of No. 38d; 2 of No. 48a; 4 of No. 90a; 2 of No. 111c; 1 of No. 126a; 2 of No. 155; 2 of No. 188; 1 of No. 189; 2 of No. 190; 2 of No. 191; 2 of No. 192; 2 of No. 200; 1 of No. 214.

To build the Field Gun shown in Fig. 2 it is best to commence by bolting two Trunnions 1 to a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip to form the bearings for the gun barrel, which is built from two $5\frac{1}{2}"$ Strips. These are connected together at the rear end by two Angle Brackets overlapped, and at the muzzle by a $\frac{3}{8}"$ Bolt 3 spaced by a Spring Clip. The barrel is mounted on a 2" Rod passed through the Trunnions, which is held in place by Spring Clips. Two Flat Trunnions 4 connected by a $2\frac{1}{2}"$ Strip are attached to the barrel by a Reversed Angle Bracket 5 held by Bolt 6. They form the gun shield.

Parts required to build the Field Gun and Limber: 4 of No. 2; 4 of No. 5; 2 of No. 10; 6 of No. 12; 2 of No. 16; 2 of No. 17; 4 of No. 22; 1 of No. 24; 4 of No. 35; 27 of No. 37a; 24 of No. 37b; 4 of No. 38; 2 of No. 48a; 2 of No. 90a; 2 of No. 111c; 1 of No. 125; 2 of No. 126; 2 of No. 126a; 4 of No. 155.

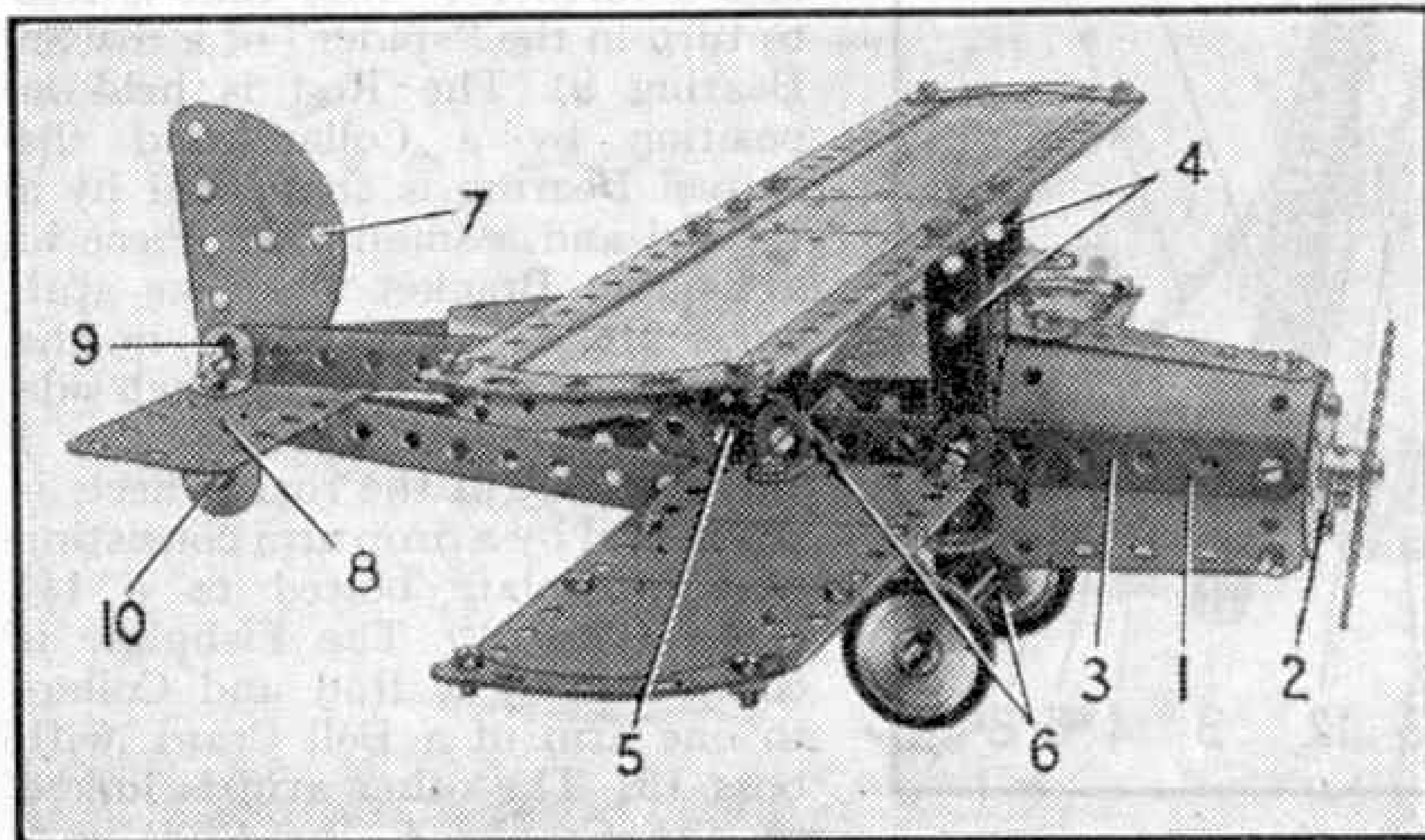


Fig. 1. An attractive model of a training biplane designed for Outfit No. 3.



Club and Branch News



WITH THE SECRETARY

AN EXHIBITION NOTE

A successful exhibition organized by the Thatcham M.C. has illustrated the advantages of an attractive and workmanlike display. All the models shown were of a very high standard, excellent Hornby and Hornby-Dublo layouts were operated with real efficiency, and there was a very effective Dinky Toys layout. A display of railway photographs provided an excellent background, and after seeing the exhibits visitors were given information about the Guild and the H.R.C., with leaflets to take away for further examination. One result of this good work was that the local newspaper published a splendid account of the exhibition. Another was that many visitors made special contributions to the Club's funds in token of their appreciation of the efforts of officials and members.

There is no reason why similar results should not be achieved in other quarters. An exhibition is a Club's shop window, and no pains should be spared to make it fully effective.

A SUMMER PROGRAMME SUGGESTION

The time has come to look closely into the summer programme. In many Clubs, cricket, cycling and other outdoor pursuits are followed, but there remain others, especially those newly formed and not yet strong in numbers, where these recreations cannot be arranged. This does not mean that a summer programme cannot be followed. One good way of keeping members together during the outdoor season is to arrange a series of local rambles for Saturday afternoons. Each of these should have some definite object in view, and Leaders and officials should make a survey of their neighbourhood immediately as a guide to possible excursions. There are historic and interesting places within reach of practically every Club.

Every excursion should end in some place where members can enjoy games and other amusements, with refreshments, before returning. Buns and ices are very useful for rounding off a successful trip.

Our picture of members of the Caer Urfa (South Shields) M.C. in their Club room in last month's "M.M." was reproduced by courtesy of the "Shields Gazette."

CLUB NOTES

THATCHAM M.C.—The Club's Exhibition was an outstanding success. An excellent report appeared in the local newspaper, and many visitors were so pleased with the Meccano models, a Hornby-Dublo Railway and a Dinky Toys Layout on view that they gave donations to Club funds. Previously a visit had been made to a model railway exhibition at Reading. Club roll: 25. *Secretary:* B. M. J. Ambrose, 51, Southend, Cold Ash, Nr. Newbury, Berks.

1ST MARTOCK SCOUTS M.C.—More Senior members have been enrolled. Models built at meetings have included a Mechanical Shovel and a Diesel Engine, and Model Aircraft also have been made. A Model Excavator is now under construction. One meeting was devoted to the flying of model aircraft. Club roll: 10. *Secretary:* J. Aplin, 13, Stapleton, Martock, Somerset.

BORDEN GRAMMAR SCHOOL M.C.—Mr. Weekes, Leader, gave a Talk on his experiences while training for the R.A.F. in America. The Secretary has given a Talk on the making of Crystal Receivers. Model-building continues, and Film Strip Displays are being arranged. Club roll: 14. *Secretary:* S. Wood, 20,



A group of members of the Plymouth M.C. in their Club room at Swarthmore Hall. This Club was affiliated in October 1926. The Leader is Mr. W. J. Ellis, and the Secretary D. M. Cundy. The Club has a long record of splendidly varied activities, including many successful Exhibitions, and its success is due to wise leadership, and the energetic support and co-operation of its members.

Harold Street, Queenborough, Kent.

SOUTH AFRICA

MALVERN (JOHANNESBURG) M.C.—Club meetings continue on the usual lines, Mr. E. W. Sykes again acting as Leader. The Christmas Party for children of the Epworth Homes was very successful. Ordinary meetings have been devoted to model work and to games. Club roll: 30. *Secretary:* Miss E. McMurray, P.O. Box 8, Cleveland, Johannesburg.

BRANCH NEWS

WEYMOUTH AND DISTRICT—Meetings are now held in a new and larger Branch room. Extensions have been made to the Branch layout, and further additions are hoped for. *Secretary:* A. J. Brown, 68, Wyke Road, Weymouth, Dorset.

SHIRLEY AND DISTRICT—Meetings are being held in a new Branch room, where better attendances are expected. Track Nights have been held. Both passenger and goods trains run at all meetings. *Secretary:* D. J. Hancock, 26, Wickham Avenue, Shirley, Croydon, Surrey.

MAGDALEN COLLEGE SCHOOL (OXFORD)—The number of members is increasing satisfactorily. Useful additions include three L.M.S. Tank Engines, and a Crossover. A tunnel also has been constructed. *Secretary:* R. A. Bowen, 33, Richmond Road, Oxford.

Background Scenes in Hornby-Dublo

FOLLOWING the lineside details considered last month, the accompanying pictures show how a Hornby-Dublo layout is improved by the addition of some form

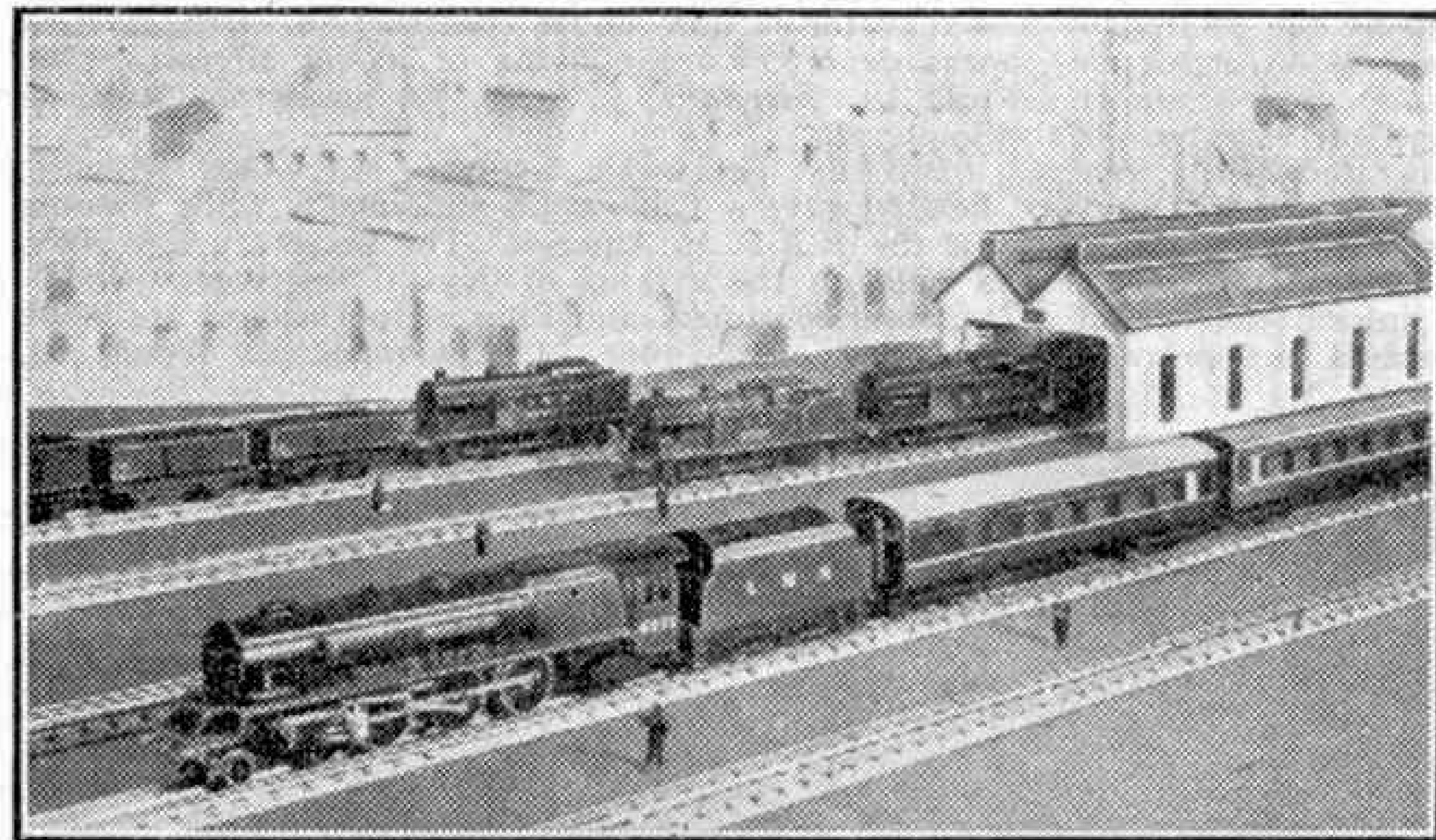
do very well. If not, a sheet or more of thick card will have to do instead. It is surprising what effective results can be obtained if a little care is taken with items of this kind. It

is usual to include some sky in the background; alternatively, the outlines of any buildings or other features on the horizon can be cut out with a fretsaw.

It is often possible to "build-up" a scene from coloured cuttings collected from various periodicals. A certain amount of repetition may be unavoidable, but such features as trees, houses and so on can safely be repeated. Some cutting and adjustment of the various pieces will

almost certainly be necessary to fit them together.

Permanent layouts naturally have the advantage where scenic work is being undertaken. The background can be more or less continuous and its features can be varied; and it can be made to tone in with the structural effects of the line, such as tunnels, bridges and so on. Lineside details, roads and so on as suggested last month can be introduced between the railway and background.

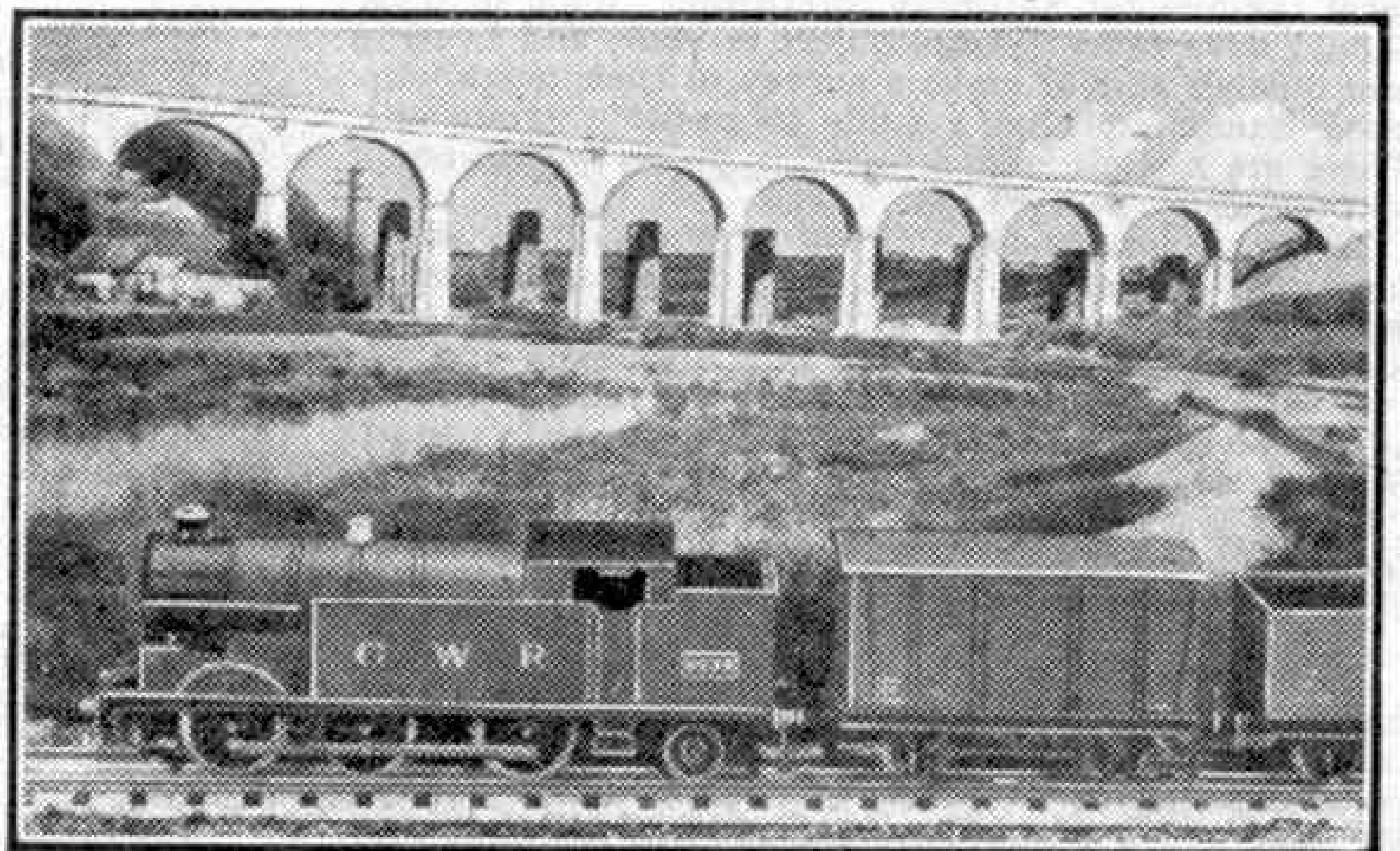


Part of a Hornby-Dublo layout with an industrial city background. The "Duchess of Atholl" 4-6-2 is prominent in this picture.

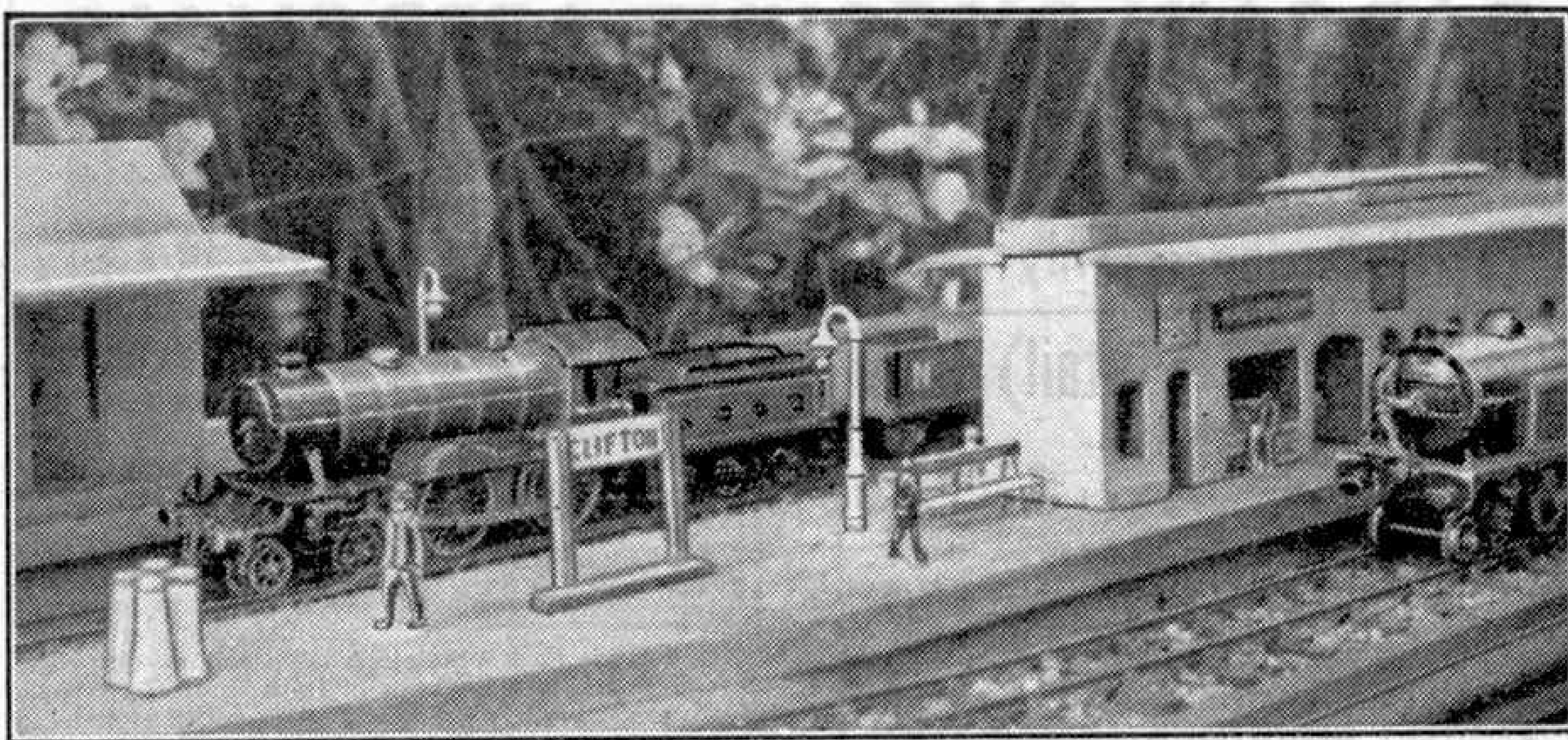
of background scenery. It is often thought that scenery can only be provided satisfactorily on permanent layouts. Certainly these give more scope for scenic effects, but even a small temporary layout is improved if a scene of some kind can be arranged behind the whole layout, preferably on the side opposite to the operating position.

The lower illustration shows an instance of this kind of setting. Here quite a small oval track is arranged in front of a large view, in this case actually a photograph of a Cornish viaduct. The background scene gives the suggestion of depth to the layout and provides an attractive general setting for the line.

Sometimes ready-made scenes such as this can be made use of, but frequently the Hornby-Dublo owner has his own particular ideas as to the type of country or district his railway is supposed to serve. Then he has to sketch out his ideas and colour them either with paints or even coloured chalks. If there is a sheet of plywood or something similar to work on this will



A Hornby-Dublo goods train posed in front of a realistic background. The latter is provided by a British Railways official photograph of Carnon Viaduct (Western Region).



"Clifton" Station on the layout described on this page, belonging to our reader "Rosco." The outdoor situation gives a realistic aspect to the line.

"Cragside" to "Clifton" by Hornby

An Outdoor Clockwork Railway

"CLIFTON" Station, part of which is shown in the photograph reproduced on this page, is on the outdoor miniature railway system operated by our reader "Rosco." The railway is a gauge 0 system and has passed through several stages since previous accounts appeared in the "M.M." a number of years ago. The present formation has been in existence about three years, and construction work of various kinds is still in progress.

The railway is raised on an average 2 ft. 3 in. from the ground, and rests on a series of tables supported by wooden posts driven into the soil. The whole affair is fixed and permanent, and there is no question of "putting away" at the end of a period of running, except for the locomotives. The rolling stock is shunted away by the engines into a small shed, which is subsequently closed up and forms a perfectly waterproof and sound shelter. Five parallel roads about seven feet long are provided for goods and passenger vehicles and these are approached by a single line from "Cragside" station. Thus the vehicles never leave the track—barring accidents!

"Cragside" station has two island platforms, one on each side of the main line, while a loop line passes round each platform. Thus four trains can be accommodated at one time, though it is

the practice to accept no more than three, thus leaving one road clear for an engine to "round" its train.

The goods depot for "Cragside" is separate and is to one side of the main line. Goods traffic does not enter "Cragside" station at all, but is diverted immediately at "Cadley" into the yard. Here five tracks take off and are available for marshalling goods trains.

Beyond "Cadley" the main line runs straight ahead to "Clifton." Here three or four trains can be accommodated at once and facilities for engines to run round their trains exist.

The locomotive power is clockwork and the backbone of the system is a stud of pre-war Hornby locomotives. These have done an enormous amount of running and comprise an L.N.E.R. "Hunt" class 4-4-0, two 4-4-2 No. 2 Special Tanks, and a "Flying Scotsman." All the locomotives are capable of hauling four or five bogie coaches between the two terminal stations, 33 yards apart, on one winding.

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Stamp Collecting

Canada's Fine Pictorials

By F. Riley, B.Sc.

LAST month I gave examples of early Canadian stamps, dealing chiefly with the discovery of the country and great events in its history. The more recent issues of Canada include many pictorial stamps of excellent design and printing that are fully worthy of the collector's attention. They illustrate the land



itself, with its mountains, lakes and rivers, and also tell us something of the country's industries.

The Canadian Rockies are a wonderful region of mountains, glaciers and rivers, and the development of great national parks in the area have helped to make their beauties better known all over the world. They first

appeared on stamps in 1928, a series of pictorials then including a stamp showing Mount Hurd, flanked by representations of the famous totem poles of the Indians of British Columbia. In 1930 another pictorial issue included a representation of Mount Edith Cavell.

Also in the 1930 issue was a striking picture of the old citadel of Quebec with the St. Lawrence flowing in front of it, and this brings us a reminder of the stamps illustrating the mighty rivers and great lakes of Canada. The St. Lawrence had already appeared on a stamp showing the Quebec Bridge in the 1928 issue. In 1933 the preliminary meeting of the Universal Postal Union Congress was marked by the appearance of a special commemorative stamp showing the Parliament Buildings from the Ottawa River. In the pictorial issue of 1927 we

find a view of the River Mackenzie, 2,300 miles long, which flows into the Arctic Ocean. A river steamer is seen in the picture, with a seaplane flying over it. In the far north of the country is the Great Bear Lake, which drains into the Mackenzie and is famous as the scene of the discovery in 1930 by Gilbert Labine of valuable deposits of uranium and radium. A picture of this lake appears on the 10c. value of a pictorial issue of 1946 marking the return of peace.

Canada has many great ports, and the entrances to the harbours of two of these, Halifax on the Atlantic Coast and Vancouver in the far west, are illustrated on stamps of the 1937 issue. This issue also includes a picture of the Gate of Fort Garry, Winnipeg, a historic monument and a reminder of



the work of the pioneers who opened out the Canadian prairies. In the same issue is a picture of an old chateau in Montreal, and another interesting historical stamp also reminding us of the association of the French with the early days of Canada is the 50c. value of the 1930 issue. This shows the Acadian Memorial Church and the statue of Evangeline

at Grand Pre, Nova Scotia. These names will be familiar to all who have read Longfellow's poem 'Evangeline,' which tells the story of the removal in 1755 of French settlers from

Acadia, as they called Nova Scotia, which had become British in 1713.

In the same issue, that for 1930, there was a prairie harvesting scene, which is a reminder of the immense importance of Canada's agriculture, especially the growing of wheat. Picturesque farm scenes appeared in the war effort issue of 1942 and in the 1946 series, the latter including also a representation of a prairie harvest scene in which the modern combine, which both reaps and threshes, is shown at work. One of the giant elevators in which grain is stored while awaiting shipment is shown on the 4c. value of the 1942 issue. Lumbering is another great Canadian industry, and the 50c. value of the 1946 issue illustrates logging operations in British Columbia.

Canada's interests at sea were suggested by the stamp illustrating the "Royal William" referred to and illustrated last month. Another side to these interests is shown by the 50c. stamp of the 1928 series, which features the fishing smack "Bluenose."

Naturally the 1942 issue, which commemorated Canada's war effort, deals with a wide range of industries. Canada made munitions and built corvettes and other ships, and the country was the home of a great air training scheme for Empire pilots. All of these activities are illustrated in this fine series of stamps. The peace issue that followed in 1946 included a stamp with a design showing a river power station. This is a reminder of the ever greater use that Canada is making of her magnificent waterways in the production of electric light and power. Although this issue, like that of 1942, was largely industrial in character, a pleasant note was introduced by the 7c. value, an air stamp that shows Canada geese in flight.

The royal portrait stamps of Canada also are notable. Since 1932 these have included portrait issues of other members of the Royal family in addition to well selected portraits of George V and George VI. Among these have been excellent portrait stamps of Queens Mary and Elizabeth, Princess Elizabeth and Princess Margaret Rose. Princess Elizabeth's portrait first appeared in the Silver Jubilee issue, one stamp of which portrayed our present King when he was still Duke of York. A double portrait stamp of the Princesses formed one of the stamps of the Royal Visit of 1939, and the marriage of Princess Elizabeth was celebrated by the very fine stamp illustrated here.

It is impossible in two short articles to explore thoroughly Canada's stamps, but sufficient has been said to show their range and interest. A representative collection would be a prized possession.



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For other Stamp Advertisements see also pages 198 and xi.

Stamp Gossip and Notes on New Issues

By F. E. Metcalfe

IT has been previously mentioned that our colonies, as well as Great Britain, would issue a set of stamps to commemorate the 75th anniversary of the Postal Union. This is now confirmed officially, and the values will be the same as those for the Olympic Games held in London last year, that is 2½d., 3d., 6d. and 1/- . Quite enough too, for we have had plenty of high value stamps already. As a matter of fact, not only will our colonies be issuing stamps, but most of the other countries all over the world also, and all will appear on 10th October.

All the rage just now is for the despised "Wedding" stamps. Most dealers left their purchase or otherwise to the judgment of their customers. This was a wise move, for customers of those who spoke against the stamps, unnecessary as they undoubtedly were,

are likely to get very cross now that the stamps are rising so rapidly in price. Perhaps they will cost £100 a set in a few months. If they do, not many of us will be able to muster the



cash, so why worry what happens? Altogether the set was far too expensive from the start for the average collector.

We mentioned the probability previously that all the Windward Islands at least are changing their stamps to fit in with the new dollar currency, and now we have proof. There seems to be a doubt whether the Leeward Islands will follow suit. The Crown Agents have announced a new set of St. Lucia. Consequently collectors should fill their KG. VI blanks of this colony as soon as possible, and they should not overlook the 1d. stamp which recently came out in a new perforation, 14½ x 14. This stamp is within the reach of all pockets, as is the 8d., which will not have a long life. The 3/- and £1 values are the two stamps to go for, if one can afford them.

Colonial stamps are all right, and a good deal of attention is given to them owing to their all-round popularity, but many collectors are also interested in what they call foreign. A widely collected country, both at home and abroad, is Belgian Congo, and a really attractive lot can be got together for a small sum. A stamp which merits popularity among "M.M." readers is one issued recently, part of a commemorative set, showing a real old time puffing-billy. Belgian Congo has issued a number of equally beautiful stamps, and as many of them are also instructive, one could do a good deal worse than form a small collection from this romantic part of Africa.

The Panama Canal Zone has a nice lot of stamps to its credit. Its used stamps are more popular perhaps in America than in Great Britain. Here it is not possible

to import the stamps mint owing to currency restrictions, but the used are grabbed up quickly by home collectors, or so dealers say. We are illustrating a real quaint item which appeared some months

ago. It was issued solo to commemorate the 25th anniversary of the establishment of the Canal Zone Biological Area. These Canal Zone stamps get into dealers' stockbooks, and as they can be picked up for a copper or two they are generally good bargains.

One of the most beautiful sets issued recently is the new definitive set of Burma, which actually appeared in



January. Some of the designs are really "superb," and had they been bi-coloured they would have been outstanding. We call them definitive stamps, but with Burma in the political melting pot maybe they will not have a very long life after all. Anyhow, used copies are trickling through and it would be a good idea to try to complete a set. There are 14 values, from 3p. to 10 rup., and 12 of these have been overprinted in Burmese characters for official use. De La Rue and Co. Ltd. are the printers, and they have employed the recess process for the printing.

When Jamaica brought out a set in 1945 to commemorate their new constitution, collectors started to criticize the designs and they have gone on

criticizing them ever since. Now just compare this new Burma set with that of Jamaica, and you will see how justified collectors were in complaining. Of course, some of the anna values of the Burma set are a bit too small for so much detail, but under a magnifying glass they look superb. As an anticlimax we illustrate one of the two stamps recently issued by Ceylon. They are half of a set of four, the other two of which have not yet appeared, that is being issued to commemorate the first anniversary of their independence. This 4c. stamp actually looks worse in colour, yellow, carmine and brown, than it does in the black and white illustration, and readers will agree that that is bad enough.



We are used to countries pouring out new stamps, but it has been left to Chile to put up a productivity record that probably will last for all time. At least one can hope so. To commemorate a book on Chilean plants and animals issued 100 years ago, three values, 60c., 2p. 60c., and 3 p., were issued in sheets of 100 stamps and 25 different designs used four times on a sheet. Phew! How many different stamps does that make? Frankly we couldn't count so high.

And now to a saner topic. Our own Falkland Island Dependencies has issued a single 2½d. stamp, but as postal rates have changed in that part of the world, if there is any postal matter to change, the life of this stamp may be brief. So if you cannot afford the hundreds of new Chilean stamps, go east a little, dear reader, and buy a copy of this humble value.



Cross-Channel Packet Boats—(Cont. from page 172)

are also operating on the cross-Channel routes. The twin-screw diesel-driven "*Winchester*" was launched in November 1947, and has been designed for carrying bulky cargoes on the Southampton-Channel Islands service. With a raked stem and full cruiser stern, she has a speed of 15 knots, and can carry cattle and horses as well as general cargo. Each hold also has 5-ton derricks and winches.

The history of the cross-Channel services has many entertaining aspects. The first regular service was started in 1782, with eight vessels, four English and four French, plying between Dover and Calais. They were, of course, sailing ships, and the real development of the service did not begin until the 19th century, when the first steamships were built. The first of these were paddle steamers, and three of the pioneers of this type were the "*Rob Roy*," the "*Majestic*," and the "*Marjory*."

The cross-Channel route has been the scene of several experiments in ship design, some of them bizarre efforts. An oddity was the "*Castalia*," launched in 1874. She had two half-hulls separated by a 26-ft. gap spanned by a superstructure. The two paddle-wheels worked in the space between the hull sections, each wheel being driven by a steam engine in the hull nearer to it. The scheme was far from successful, and the ship eventually became a hospital, moored in the Thames.

Another cross-Channel curiosity was the "*Bessemer*," which had a suspended saloon, intended to overcome the rolling and tossing. But the designers omitted to take into account the effect on the steering, and this ship too ended her short sea-going career ingloriously. She was partly dismantled, and the saloon went to be a lecture hall at a college. More successful was the "*Calais-Douvres*," designed rather like the "*Castalia*" except that her hulls were complete. She plied between England and France for nine years.

Designers do not believe that finality has yet been reached in the matter of experimental vessels for the cross-Channel services. They have in mind the possibility of building huge speedboats, capable of travelling at 50 knots and doing the voyage to and from France so swiftly that restaurants and saloons are unnecessary. If that day dawns, the cross-Channel service will indeed be a true ferry service.

Helicopter Progress—(Continued from page 175)

give even better results, as its tandem rotors make it much easier to control under tow.

Normal procedure will be for the "*Rescuer*" to take off first under its own power, and so remove slack from the 300 ft. towline connecting it with the towing aircraft—usually a Fairchild "*Packet*." Then, as the "*Packet*" begins its take-off run, the helicopter pilot will open his throttle and fly as fast as possible above and behind the transport, so reducing drag on the towline during the critical take-off period.

When both aircraft are flying steadily on course at an altitude of several hundred feet, the helicopter pilot will slowly decrease rotor pitch, close the throttle and ease into auto-rotative flight. Finally, the helicopter's engine will be cut and it will continue the flight as a rotating-wing "glider," until near the "target," when the engine will be re-started, pitch increased and the tow-line cast off so that the helicopter can be landed under full control.

Having unloaded survival equipment, food, doctors and medical supplies, the helicopter could begin a shuttle service to any town or landing strip within 100 miles of the accident, carrying 10 passengers or six stretcher cases at a time. If no hospital facilities were available, casualties could be loaded into the "*Packet*," after which both aircraft would return to base, following the procedure used at the start of the rescue mission.

Alternatively, if there were no suitable landing field for the "*Packet*," it would have to cruise overhead until casualties had been taken aboard the "*Rescuer*," which would then have to take off and

re-engage the towline in mid-air, probably with a rocket-line similar to that used in flight refuelling.

The complete scheme calls for a high degree of flying skill, particularly on the part of the helicopter pilot. But it is possible, and could be the means of saving many lives that otherwise would be lost.

So, in Britain and America, helicopter development continues to make great progress. The next few years should be extremely interesting, for it is certain that our lives will be more and more influenced by these strange aircraft that, so far, have never been used to destroy life, only to maintain and save it.

Kenya and Uganda Railway—(Cont. from page 187)

Uganda is a hotter and wetter country than the highlands of Kenya by virtue of its lower altitude and nearness to Lake Victoria, and the vegetation is in consequence more tropical in appearance. One notices too from the railway carriage the huge bulk of Mt. Elgon some ten miles to the north. Mt. Elgon is an extinct volcano 14,000 ft. high, and the Kenya-Uganda border passes through its crater. Just over the border lies the town of Tororo, from which a branch line runs northward for 80 miles to Soroti, whence there is a road connection to Juba in the Sudan.

The main line continues its way through Uganda, passing the numerous cotton smallholdings of the natives, until Jinja, on the northern shore of Lake Victoria, is reached. An interesting sight just outside Jinja is a vast sugar-cane plantation, which stretches as far as the eye can see. Jinja, which is noteworthy for being the location of the Ripon Falls where the Victoria-Nile flows out of Lake Victoria, was the terminus of the railway until the road and rail bridge over the Nile was opened in 1931. This single-span steel bridge has two levels, the lower one for the road and the upper one for the railway. Fifty miles beyond Jinja the line reaches Kampala, the administrative capital of Uganda, which is nine miles inland from Lake Victoria. The line terminates at Port Bell, the "port" for Kampala.

An interesting branch of the railway is the 130-mile section from Nairobi to Nanyuki, a farming settlement on the lower slopes of Mt. Kenya. This line passes through the reserve of the Kikuyu tribe, an industrious people principally devoted to the cultivation of maize and bananas.

The bulk of the work on the railway is performed by 4-8-2:2-8-4 articulated locomotives, aided by "Pacifics" for the coastal run, and a variety of wood-burning types. The fuel for the latter is provided by the large pine forests in the Kenya Highlands, planted for the purpose by the railway company.

WHAT BUBBLES OF AIR CAN DO

The designers of a water filtration plant for a city in the north west of the United States foresaw the possibility of trouble caused by freezing in their outdoor units. They knew that an engineer had already succeeded in keeping a pond in Wisconsin open in hard weather for migrating ducks and other wild fowl by bubbling air through it and decided to try the plan themselves. In their plant the water passing through the settling basins and the sand filters is agitated with compressed air whenever the danger threatens. Control is automatic, a thermostat starting the compressor when the thermometer drops below zero, so that bubbles of air stream through the water until the surroundings warm up again.

A NEW LORRY CONSTRUCTIONAL KIT

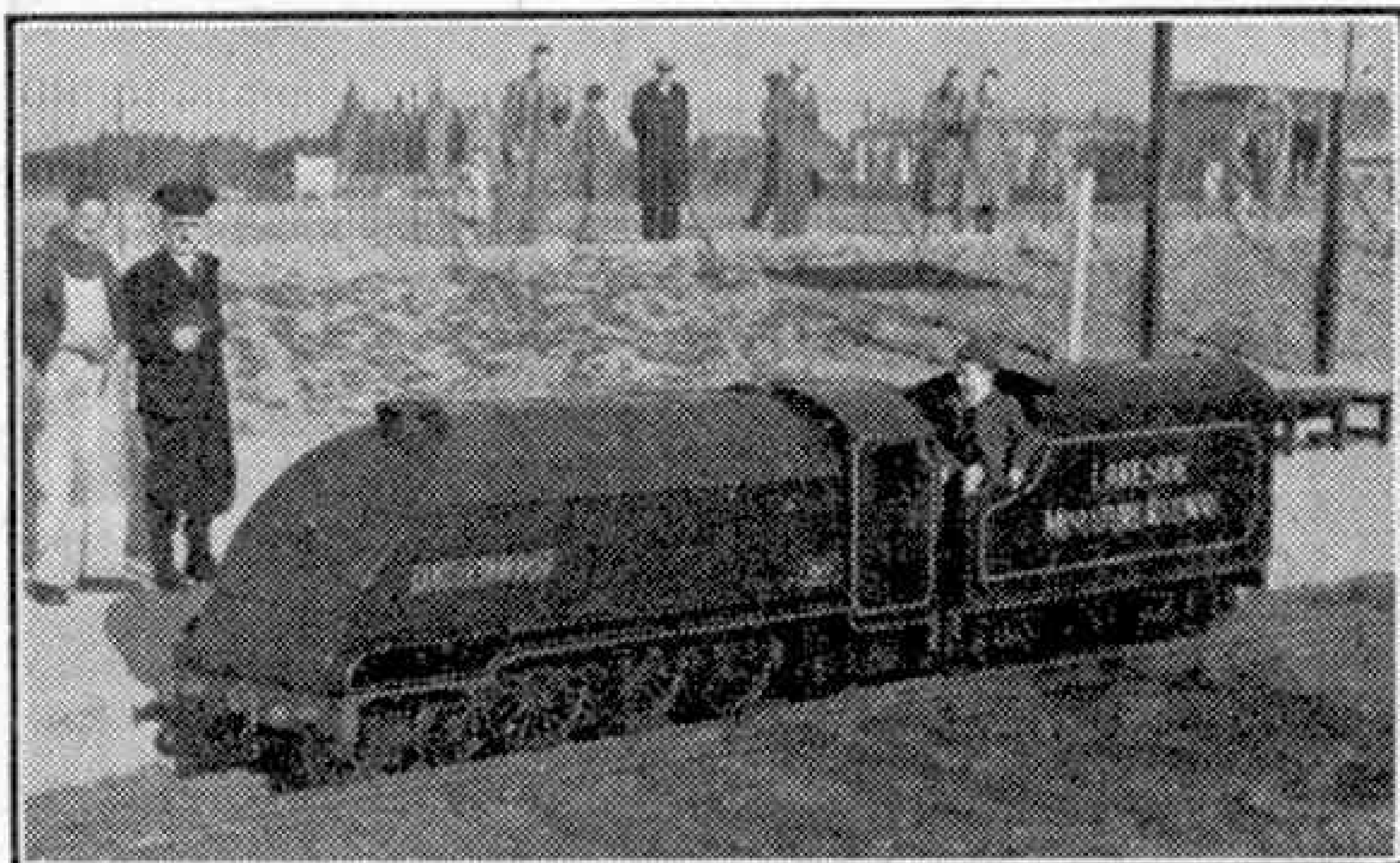
A fine new constructional kit for building a model of the Foden diesel 6-ton platform lorry is being introduced by our advertisers, Wilson's Lorries Ltd. This is reasonably priced and incorporates up-to-date features, including an all-plastic cabin. Full details can be obtained from Wilson's Lorries Ltd., 1, Great Winchester Street, London E.C.2.

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.

A PETROL-ELECTRIC LOCOMOTIVE

An interesting development on the 15 in. gauge Lakeside Miniature Railway at Southport, Lancs., was the introduction last year of a new locomotive, christened "*Duke of Edinburgh*" by a former Mayoress



The steam-outline petrol-electric narrow gauge locomotive "*Duke of Edinburgh*" on the Lakeside Miniature Railway, Southport. Photograph by Frank Mills, Kearsley.

of the town. Some interesting particulars of this have kindly been supplied by Mr. H. N. Barlow, the sole proprietor of the railway, and the engine is shown in the accompanying photograph.

"*Duke of Edinburgh*" is a 4-6-2, with six-wheeled tender, built in Mr. Barlow's own workshop from his own designs, and it is the culmination of an idea he has had for several years. The prime mover is a petrol engine, but instead of a clutch and gear-box transmission, a compound-wound 110-volt dynamo is coupled to it. The current thus generated is used to drive a series-wound electric motor. The final drive is through reduction gear, chains and sprockets to the middle driving wheels, the six wheels being coupled as in the normal practice.

In actual running this locomotive has been very popular with the public, and is ideal from the operator's point of view. The colour scheme is green with pale lining and lettering, the name being on an embossed plate.

It is understood that a similar locomotive, now under construction, is to be called "*Prince Charles*," and it is expected to be in service this season.

FRANK MILLS (Kearsley).

HOLIDAY IN CAPE TOWN

My home is in Benoni, a small town near Johannesburg that is the centre of the gold mining industry in the Transvaal, and to travel to Cape Town entails a journey of nearly 1,000 miles, a distance covered by train in about 36 hours. Even when the train was several miles from its destination, I was able to see the majestic outline of Table Mountain.

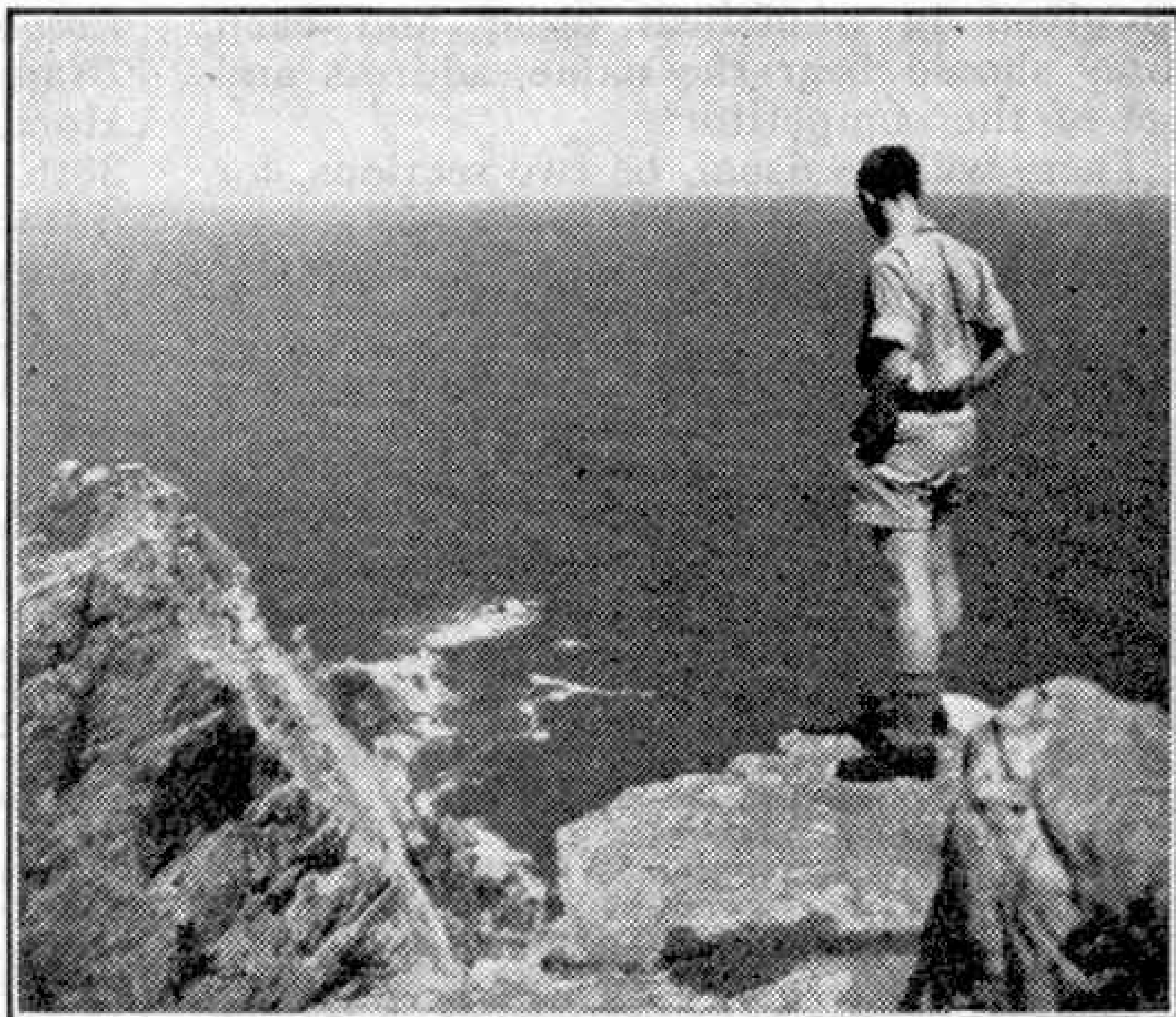
One of the most enjoyable trips to be made from Cape Town is a luxury motor bus tour which takes one right round the Cape Peninsula. Leaving Cape Town it proceeds south down the west coast of the Peninsula along Camps Bay, which has as its background a range of mountains called "the Twelve Apostles." Further south the road becomes what is known as Chapman's Peak Drive, and here it has been cut right into the side of the mountains. At frequent intervals there is a sheer drop from the side of the road into the sea below. After passing through the Cape of Good Hope Native Reserve, where wild flowers and animal life are preserved, the bus eventually arrives at Cape Point, where a lighthouse and wireless station are situated. At this southern tip of the Cape Peninsula one may look either east to the Indian Ocean or west to the Atlantic Ocean.

The bus returns to Cape Town via the east side of the Peninsula. It passes through Simonstown, the South African Naval Base, and through many small holiday resorts, nearly all of which have beautiful sandy beaches where there is ideal bathing in the warm water from the Indian Ocean. Further north much of the land the bus passes through is devoted to the growing of grapes, which are used chiefly for making the wines for which the

Cape is famous.

After spending nearly three weeks in and around Cape Town and the Cape Peninsula I became sure that this is "the fairest cape in the whole circumference of the globe," to use an old-time description of this peninsula.

H. P. BOYCE (Benoni, Transvaal).

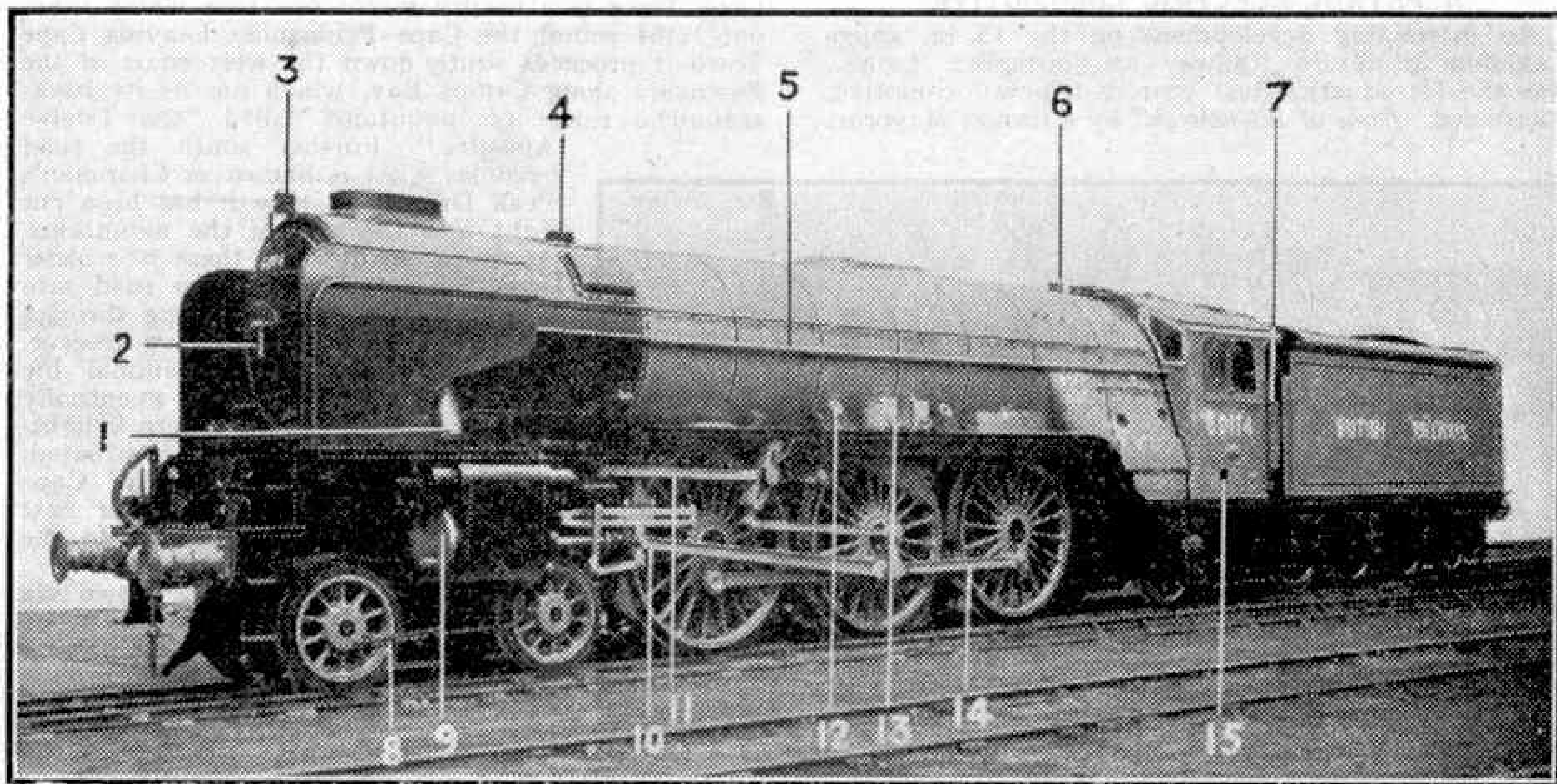


Looking seaward from the Cape of Good Hope, where the Atlantic and Indian Oceans meet. Photograph by H. P. Boyce, Benoni, Transvaal.

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.

Name These Locomotive Parts



Here is an interesting competition in which all readers can join. The illustration on this page shows a British Railways "Pacific" locomotive, various parts of which have been numbered. Competitors are asked to say what these parts are and to add in each case a brief note stating their purpose. The list of the parts should be given in numerical order and each entry should bear the name, address and age of the competitor.

There will, as usual, be two sections, for

Home and Overseas readers respectively, and in each there will be prizes to the value of 21/-, 15/- and 10/6, together with a number of consolation prizes. Neatness and novelty of the entries will be taken into consideration in the event of a tie for any prize.

Entries should be addressed "*May Locomotive Contest, Meccano Magazine, Binns Road, Liverpool 13.*" Closing dates: Home Section, 30th June; Overseas Section, 30th September.

Invent a Slogan

A slogan is a rallying cry. The word comes from a Gaelic expression used to call men of Highland clans to the defence of their standard when it was in danger of capture. To-day slogans figure largely in advertisements, and in fact they are the advertisers' battle cries.

It is good fun to try to think out suitable slogans for the many products that are advertised in the "*M.M.*," and this month we ask readers to try their skill in this fascinating pastime. They should keep in mind that a slogan must be easily remembered and therefore should consist of as few words as possible. Besides being short and snappy, a good advertising slogan must draw very pointed attention to the merits of the product concerned, while many of the finest slogans have been humorous in character.

Any product advertised in this issue of the "*M.M.*" may be chosen as the subject for an entry, and we look forward to some really smart efforts on the part of readers. Entries should be addressed: "*Slogans Contest, Meccano Magazine, Binns Road, Liverpool 13.*" There will be the usual two sections, for Home and

Overseas readers respectively, and in each prizes of 21/-, 15/- and 10/6 will be awarded for the efforts considered the best. Closing dates: Home Section, 30th June; Overseas Section, 30th September.

May Photographic Contest

The fifth of our 1949 series of photographic contests is a general one, in which we invite readers to send in prints of any subject. There are only two conditions—1, that the photograph must have been taken by the competitor, and 2, that on the back of each print must be stated exactly what the photograph represents. A fancy title may be added if desired.

The competition will be in two sections, A for readers aged 16 and over, and B for those under 16. Each competitor must state in which section his photograph is entered. There will be separate sections for overseas readers. In each section prizes of 21/-, 15/- and 10/6 will be awarded. Entries should be addressed "*May Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13.*" Closing dates: Home Section, 31st May; Overseas Section, 31st August.

Competition Results

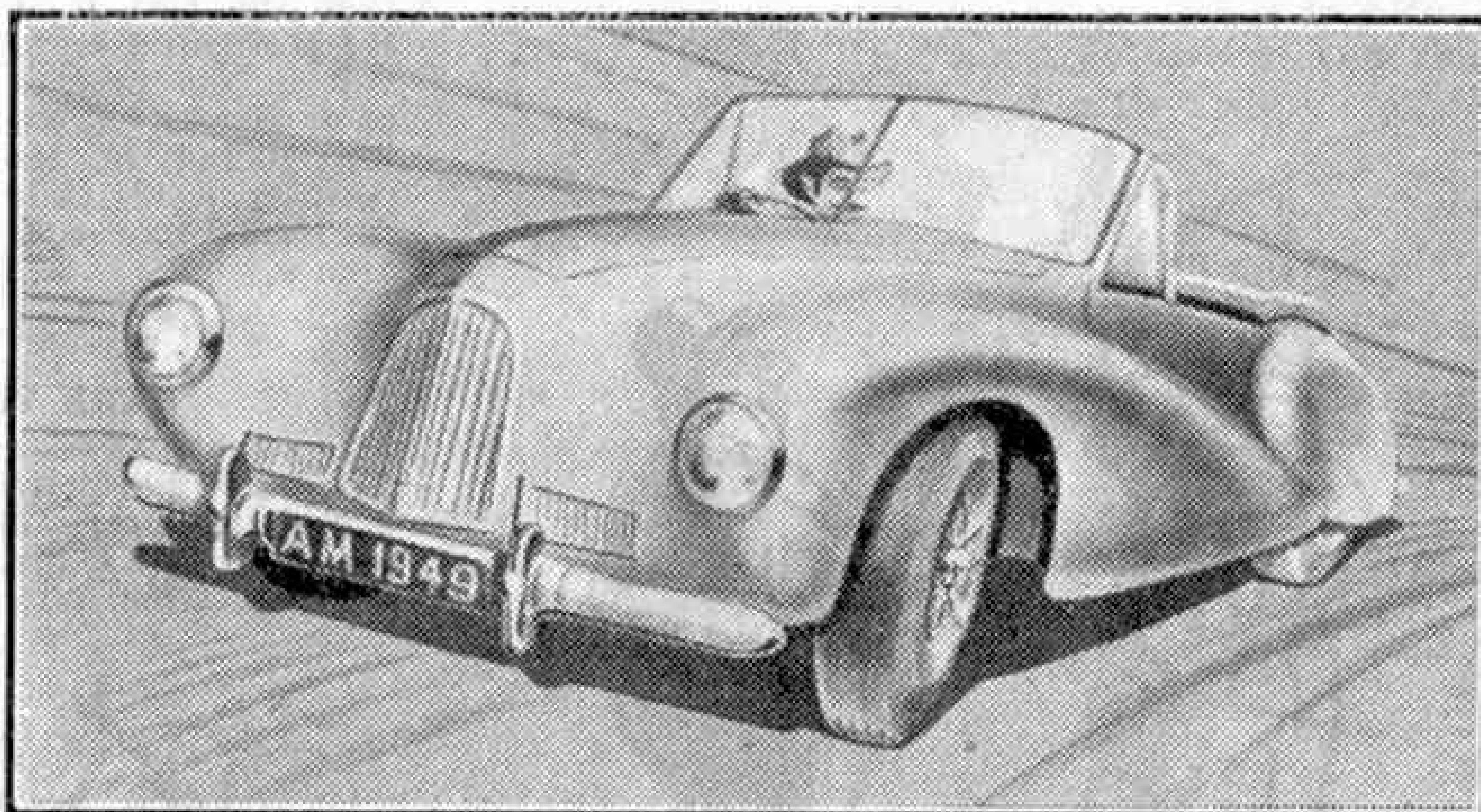
HOME

JANUARY 1949 COVER VOTING CONTEST (1948 Covers)

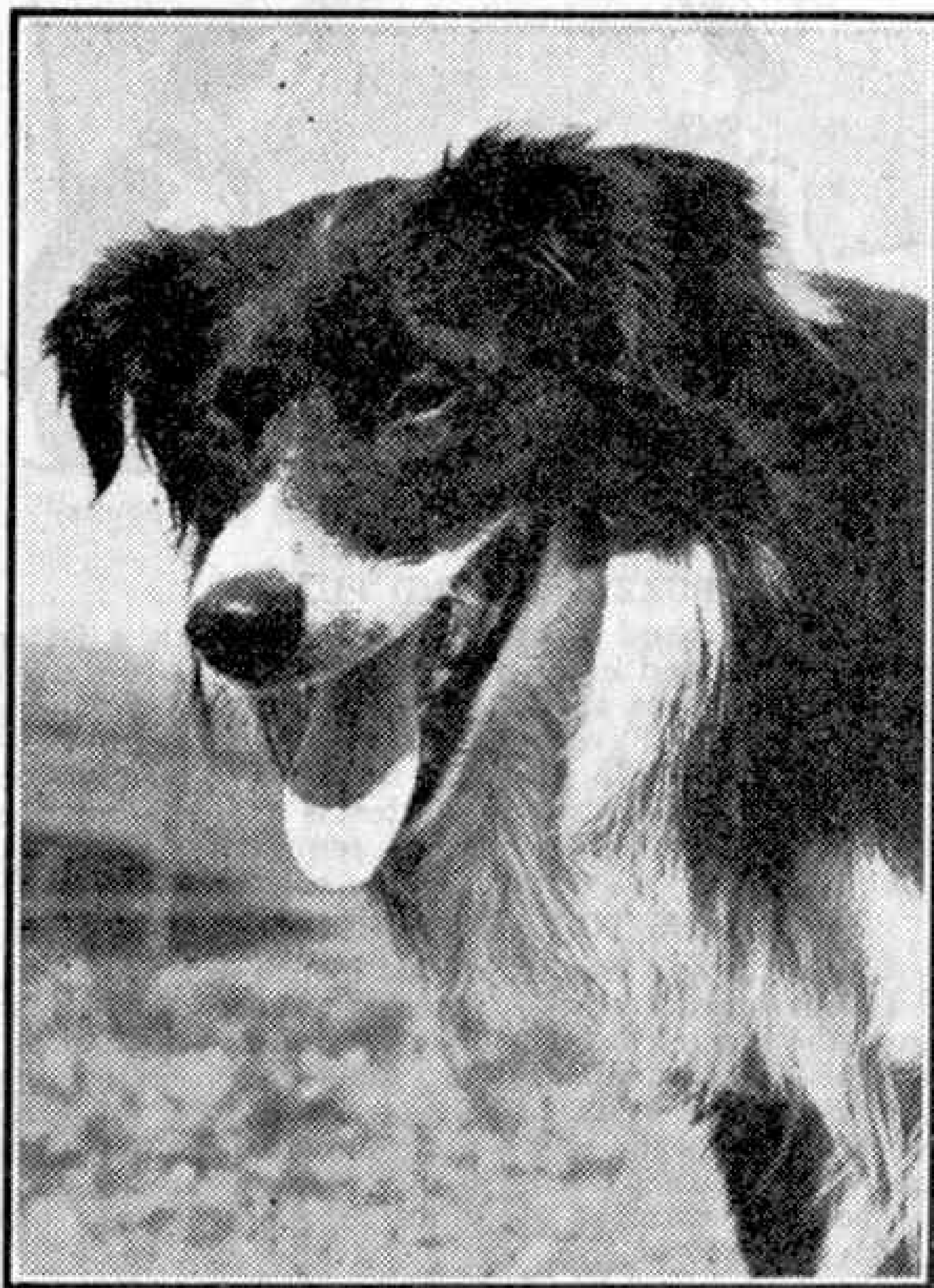
1st Prize: A. F. Sinnott, Liverpool 23. 2nd Prize: M. Hunt, Birmingham 13. 3rd Prize: E. Howey, South Shields. Consolation Prizes: N. N. Deacon, Leicester; M. S. Essam, Kettering; Mr. Spalding, Ipswich.

JANUARY 1949 DRAWING CONTEST

1st Prize, Section A: K. G. Rush, Luton; Section B: M. J. Darlington, Worthing. 2nd Prize, Section A: K. R. Pargeter, Stourbridge; Section B: J. D. Roche, Oswestry. 3rd Prize, Section A: D. Warner, Warwick; Section B: M. Wright, Edgware. Consolation Prizes: J. C. Smith, Selsdon; R. Francis, Nantwich; A. Grant, Aberdeen; B. R. Oliver, Taunton; J. E. Davies, Bristol 6; W. H. Robertshaw, Bradford; I. I. Macfarlane, Stafford; K. Petchell, Leicester; J. Greenwood, Accrington; A. G. Parkin, Peterborough; A. Hobbs, Exeter.



An excellent drawing by K. G. Rush, Luton, of an Aston Martin sports car. Awarded 1st prize in the January (Section "A") Drawing Contest.



This life-like photograph entitled "Hot Work" was awarded 1st prize in the January (Section "A") Photographic Contest. Submitted by J. McMath Neish, of Glasgow C.3.

JANUARY 1949 PHOTOGRAPHIC CONTEST

In view of the large number of really good entries submitted for this contest two special and several extra consolation prizes were awarded.

1st Prize, Section A: J. McMath Neish, Glasgow C3;

Section B: P. Clifford, Wembley. 2nd Prize, Section A: R. R. Bushell, Hoddesdon; Section B: D. C. Mills, Cannock. 3rd Prize, Section A: R. C. Smith, North Harrow; Section B: A. Hobbs, Exeter. Special Consolation Prizes: W. Forsch, Stoke-on-Trent; J. R. Norris, Nottingham. Consolation Prizes: C. H. Thomas, Aldershot; A. R. Brown, Isleworth; E. J. Elphick, Hastings; A. J. Wilshire, Littleover; H. J. Edwards, Tunbridge Wells; R. Atkins, Eccles; C. E. Lowe, Derby; D. A. Brockies, London S.E.9; I. Palmer, Blackpool; R. J. Hooker, Oxford; N. M. Wade, Birkenhead; C. Hasler, Reigate; P. J. Stone, Calstock; T. G. Hopkins, Gedling; D. I. Fry, Weymouth; L. A. Tripp, London S.E.26; P. Lowe, Derby; W. Turnill, Stamford.

FEBRUARY 1949 PHOTOGRAPHIC CONTEST

1st Prize, Section A: Mrs. I. Hardwick, Burnham-on-Sea; Section B: R. H. G. Simpson, Oxford. 2nd Prize, Section A: C. F. Stott, Brentwood; Section B: E. R. March, Upminster. 3rd Prize, Section A: Mrs. V. Neish, Pinwherry; Section B: C. E. Richardson, Mansfield. Consolation Prizes: A. M. Finnie, Leicester; R. E. L. Morgan, New Malden; J. McMath Neish, Glasgow C.3; S. L. Connors, New Malden.

OVERSEAS

JULY 1948 "BIRD-WORD" CONTEST

1st Prize: N. Burke, Paris, France. 2nd Prize: J. Bate, Galway, Eire. 3rd Prize: G. E. McKinnon, Sydney, Australia. Consolation Prizes: H. P. Chinoy, Bombay, India; I. Thake, Birkirkara, Malta, G.C.; C. A. Adams, Durban, South Africa.

JULY 1948 PHOTOGRAPHIC CONTEST

1st Prize, Section A: P. L. Stringer, Hastings, N.Z.; Section B: S. Ives, Oslo, Norway. 2nd Prize, Section A: R. A. Murtagh, Dublin, Eire; Section B: J. K. Williams, Hong Kong. 3rd Prize, Section A: R. H. Philpott, Mowbray, S. Africa; Section B: J. Vernon, Copenhagen, Denmark. Consolation Prizes: J. C. Carter, Stellenbosch, S. Africa; G. Lynch, Rathgar, Eire; N. P. Milne, Hawke's Bay, N.Z.

Fireside Fun

"What's that big building, dad?"

"I don't know."

"Well, what are all those people doing at that corner?"

"How on earth should I know?"

"Say, dad, you're not annoyed when I ask questions, are you?"

"No, of course not, sonny. Asking questions is the only way to learn anything."



"Why does that fellow pull his barrow instead of pushing it?"

"He tells me he hates the sight of it."

"What kinds of birds are kept caged up, Smith?"

"Jailbirds, sir."

"Do you know what men sentenced for smash and grab raids have to do in prison?"

"No. What do they do?"

"Grab sledge hammers and smash rocks."



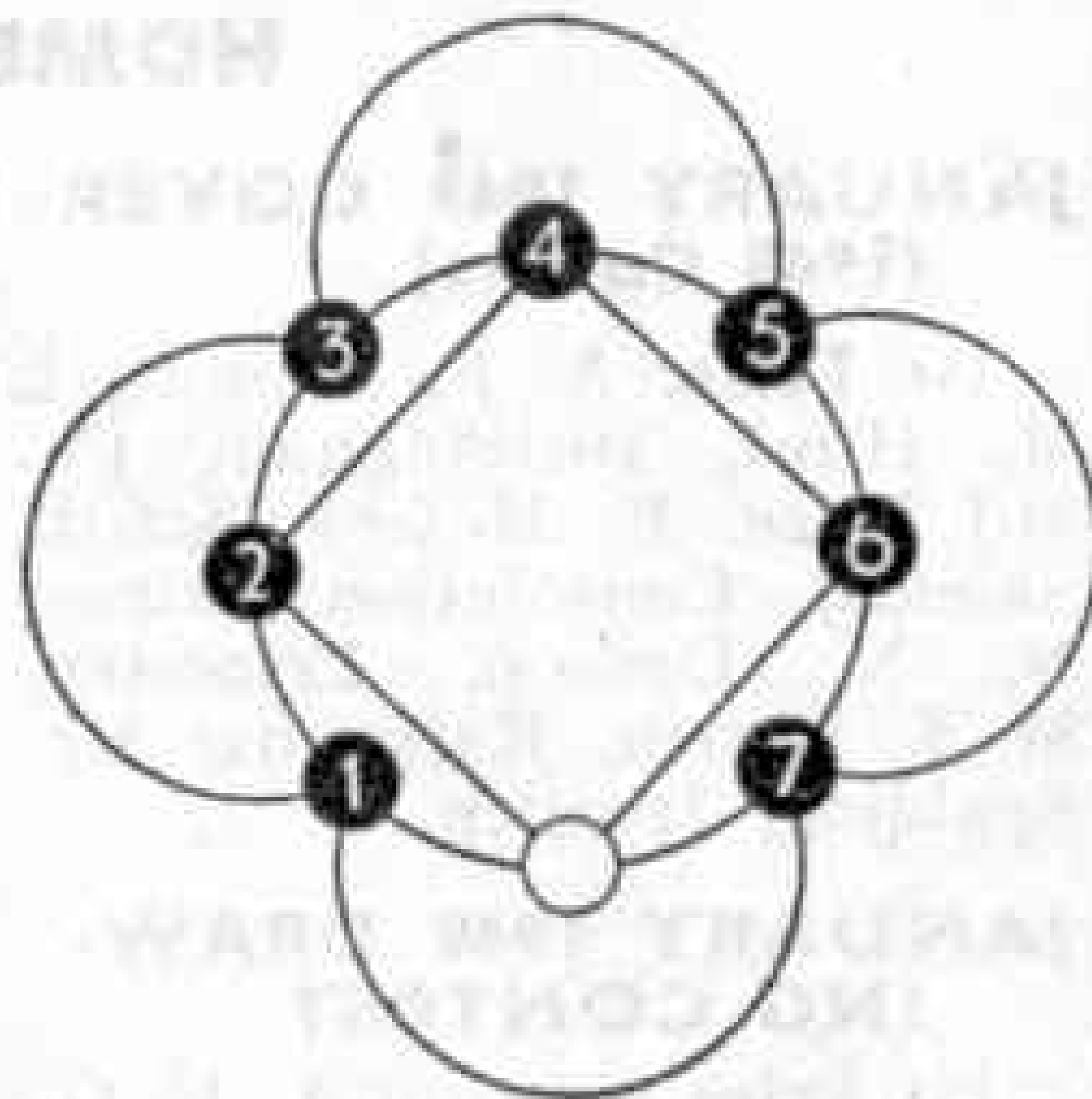
"What! Going on holiday again?"

"No. My wife's running the local jumble sale so I'm bringing my clothes to the office till it's over."

BRAIN TEASERS

PLAYING TRAINS

The accompanying diagram shows the tracks of a railway system around a large city. There are eight stations, represented by the small circles, and trains at seven of them, numbered 1 to 7. In how many moves can you reverse the order of the seven trains, so that the first is in the position of 7, the 2nd in the position of 6, and so on, the 7th ending in the position of 1? Only one train moves at a time.

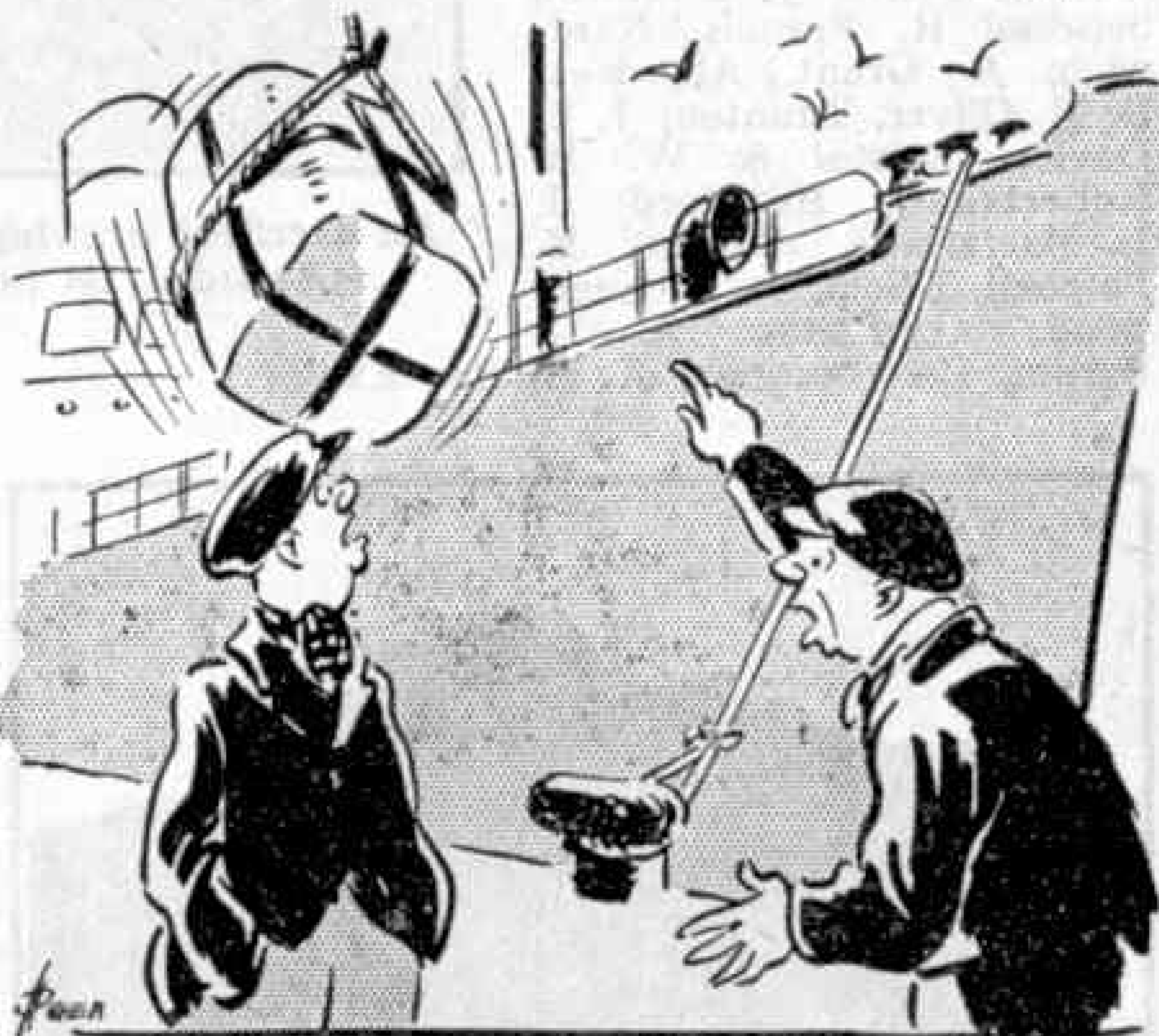


S.W.C.

ARE YOU CLEVER, TOO?

The other day I asked Jones how old he was. He didn't tell me directly, but said that if he had been 8 years younger, then 20 years ago he would have been only half as old as he actually was. This seemed very confusing, but I worked it out. Can you?

K.J.B.



"What d'yer mean, DUCK? They're seagulls!"

PUZZLE TO END PUZZLE

Here is a word pyramid, beginning with a letter of one word and ending with one of six. The clues for the six words are as follows: Vowel; Preposition; Posture; Film Favourite; Local Government Payments; Puzzle. In passing from one line of the pyramid to the next one letter is added, and the letters are then re-arranged as required. M.H.K.I.

SOLUTIONS TO LAST MONTH'S PUZZLES

The fish in our first puzzle last month weighed 16 lb.

In our second puzzle last month the two sons first cross the stream; one son then returned with the boat and his father crossed alone, the second son coming back with the boat. A similar procedure took the mother over. Finally the two sons crossed the stream and one returned to fetch the dog.

The total number of pupils in the school in our third puzzle was 156.

The four numbers making up 39 required in our fourth puzzle were 4, 8, 3 and 24.

THIS MONTH'S HOWLER

Words written in hysteresis are specially important.

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21/6 per set (packing and post, 1/3 extra)
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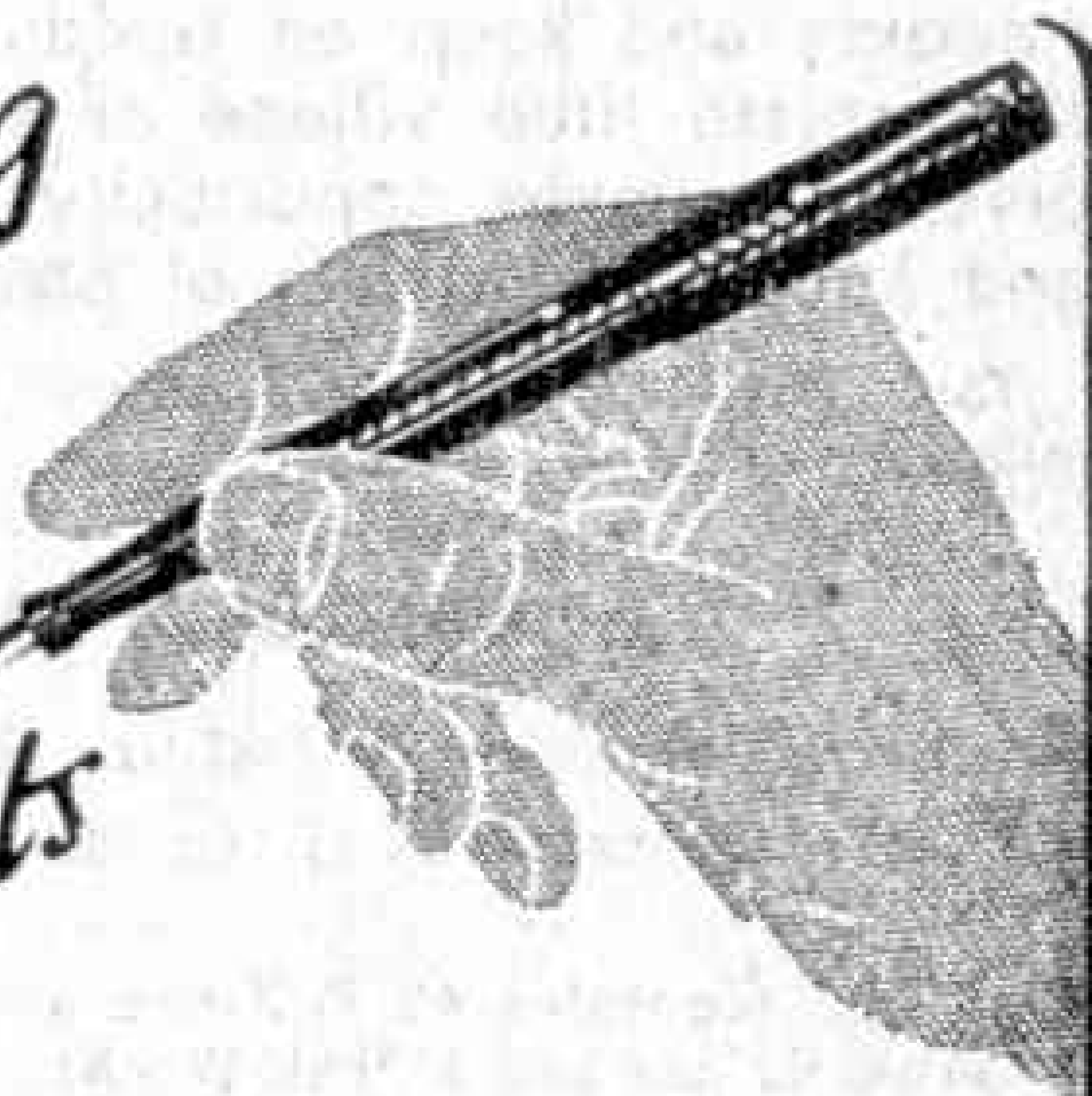
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Match size, 5½ oz. ..	13/6, 20/6 and 34/-
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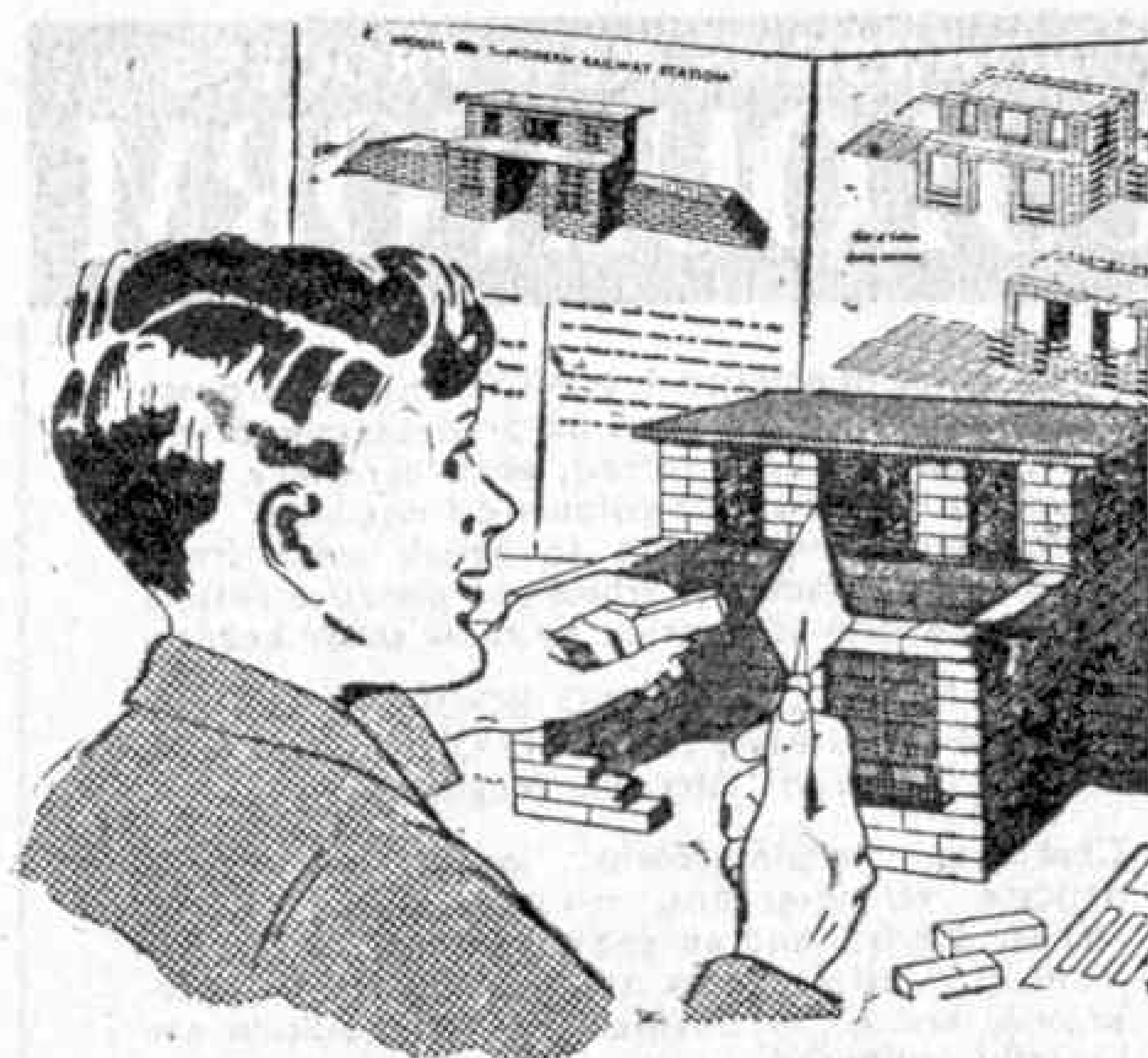


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IN BLACK, BLUE, GREEN OR GREY
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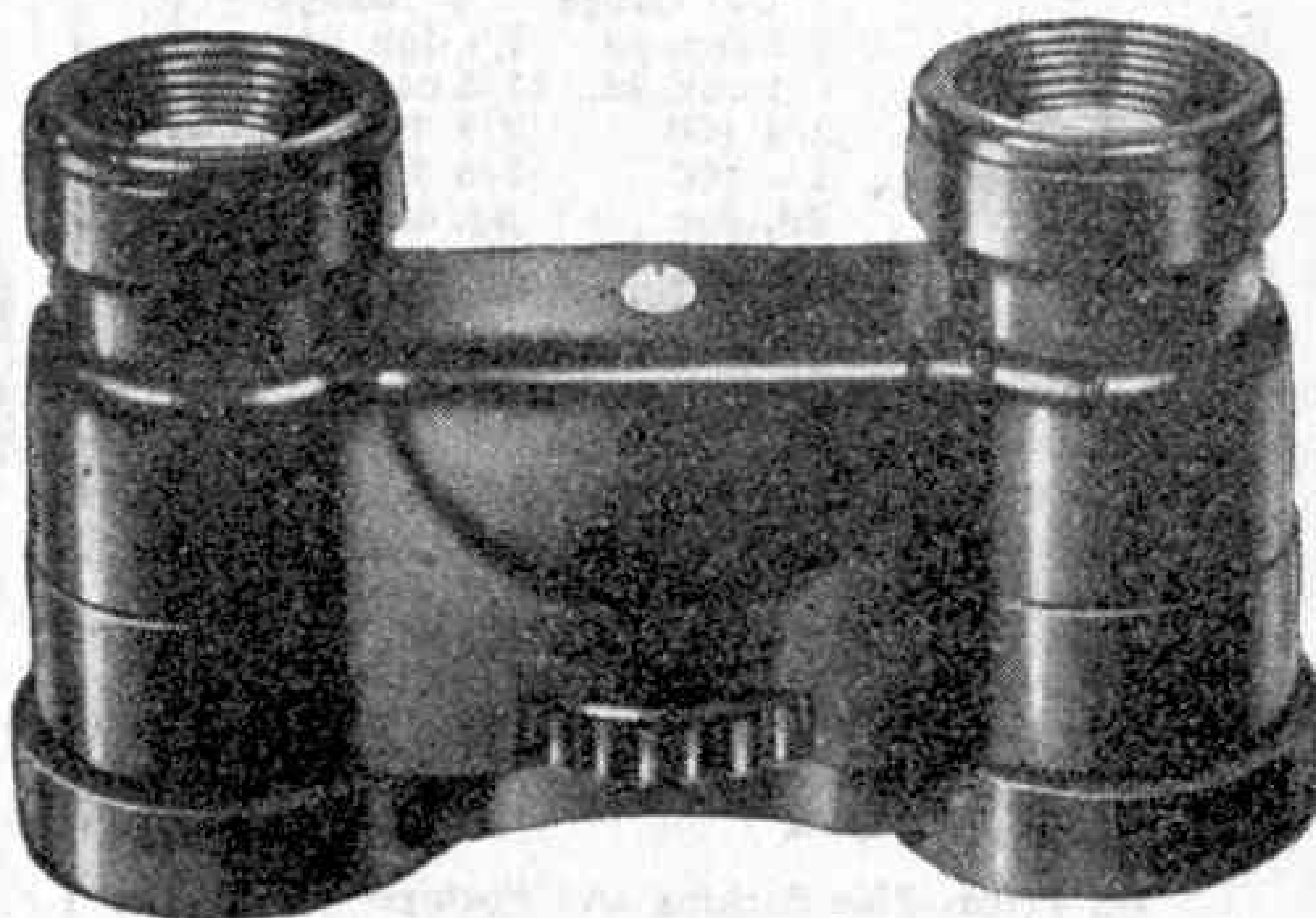
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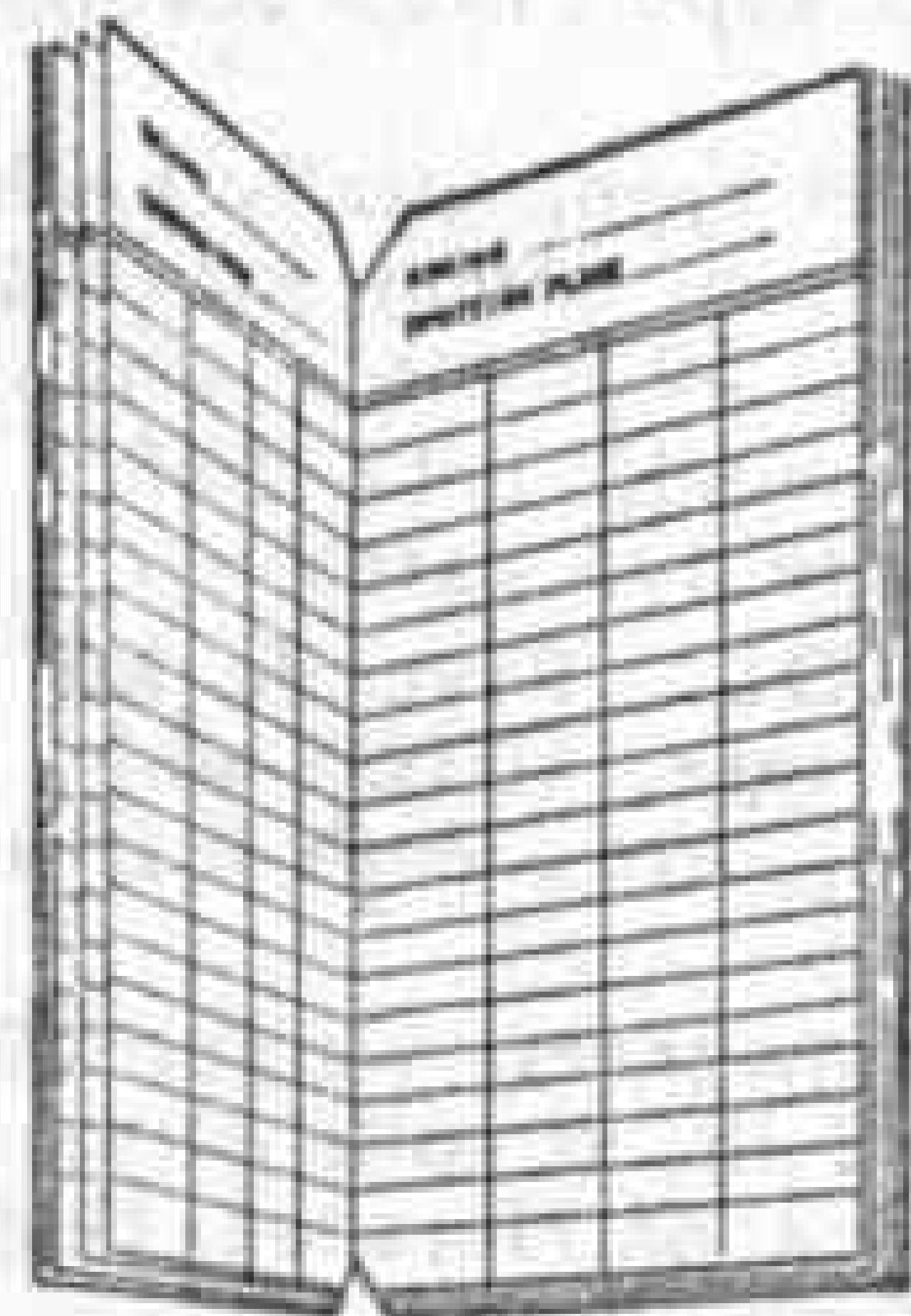
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(State which branch)	(State which branch)
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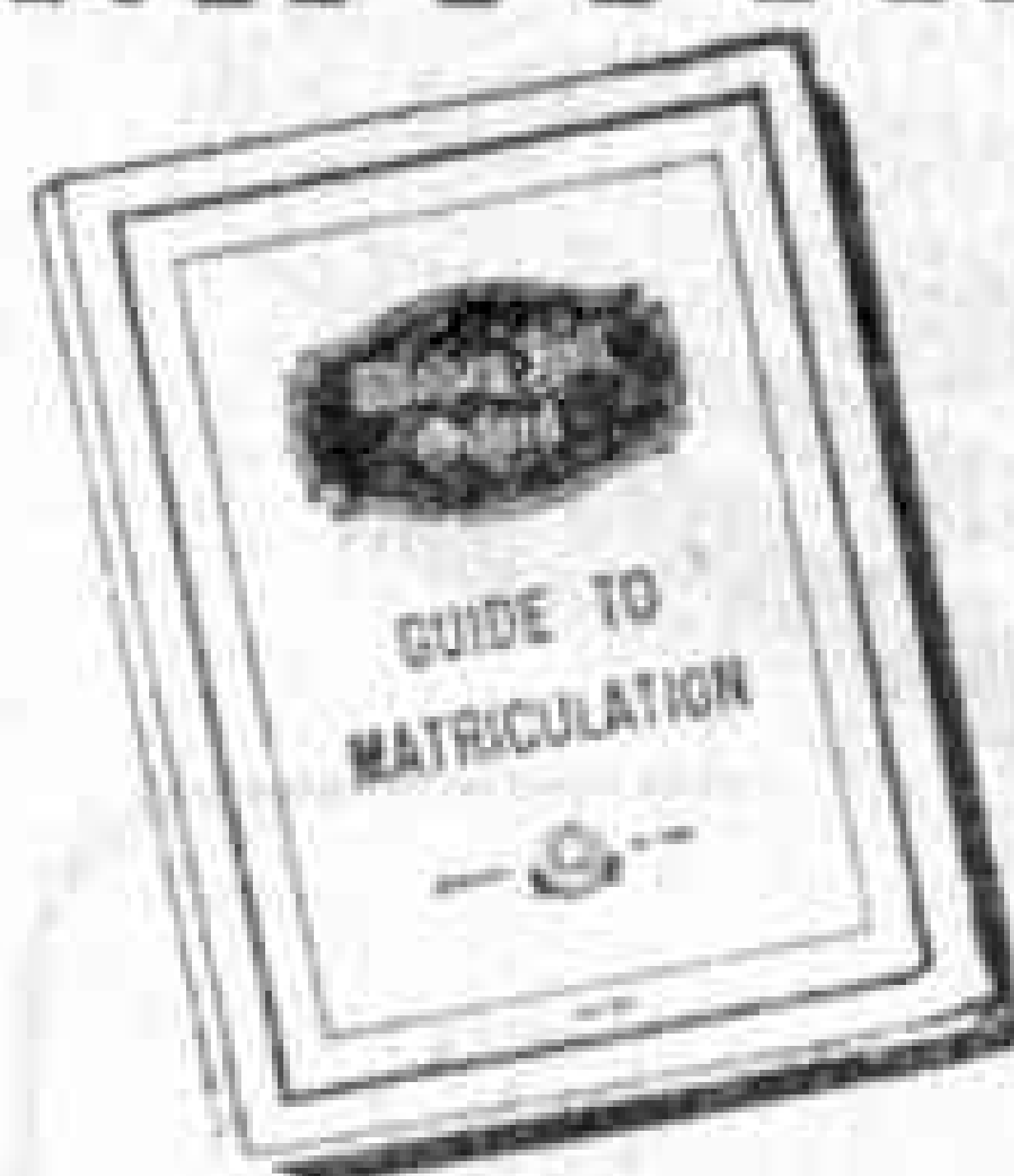
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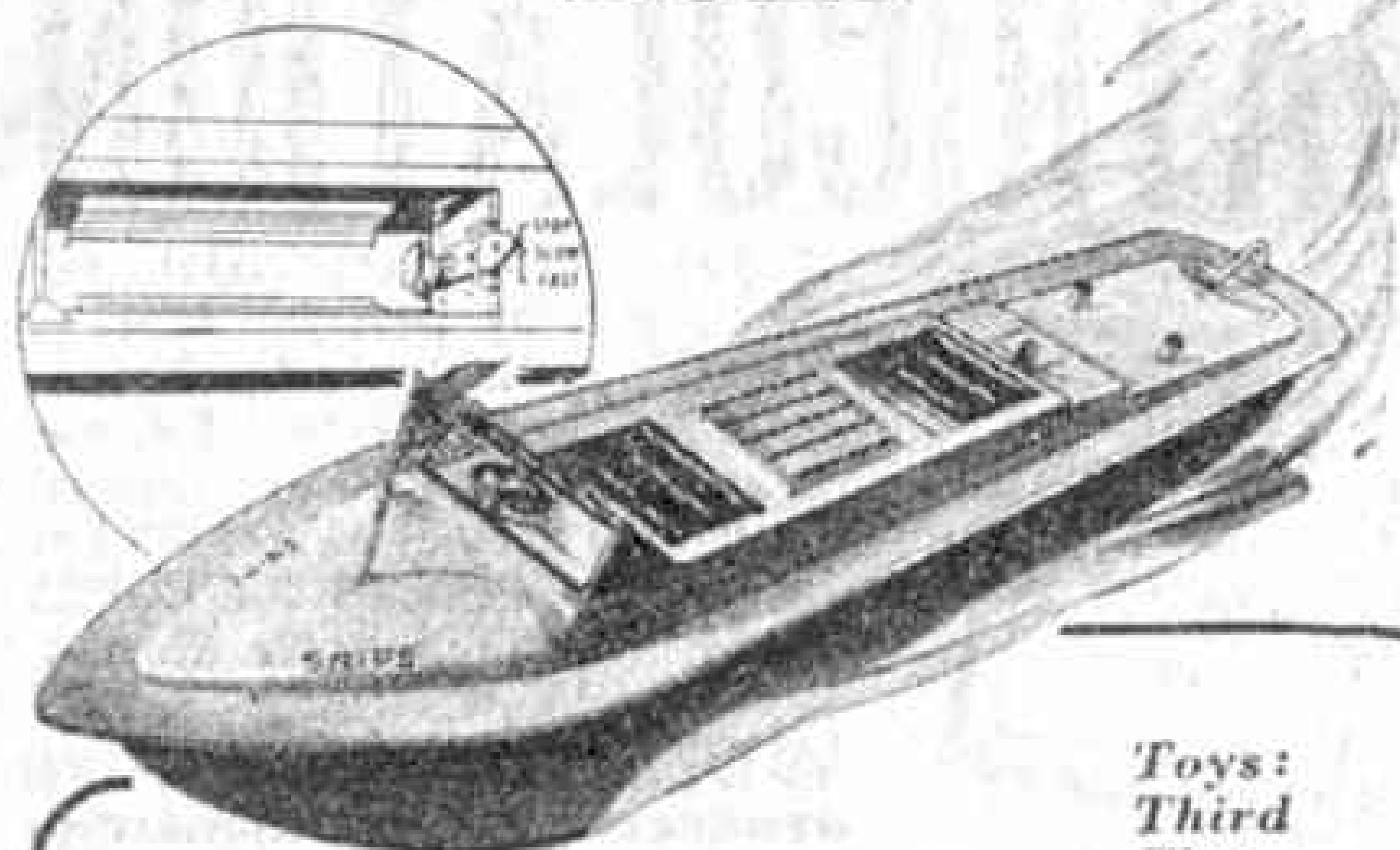
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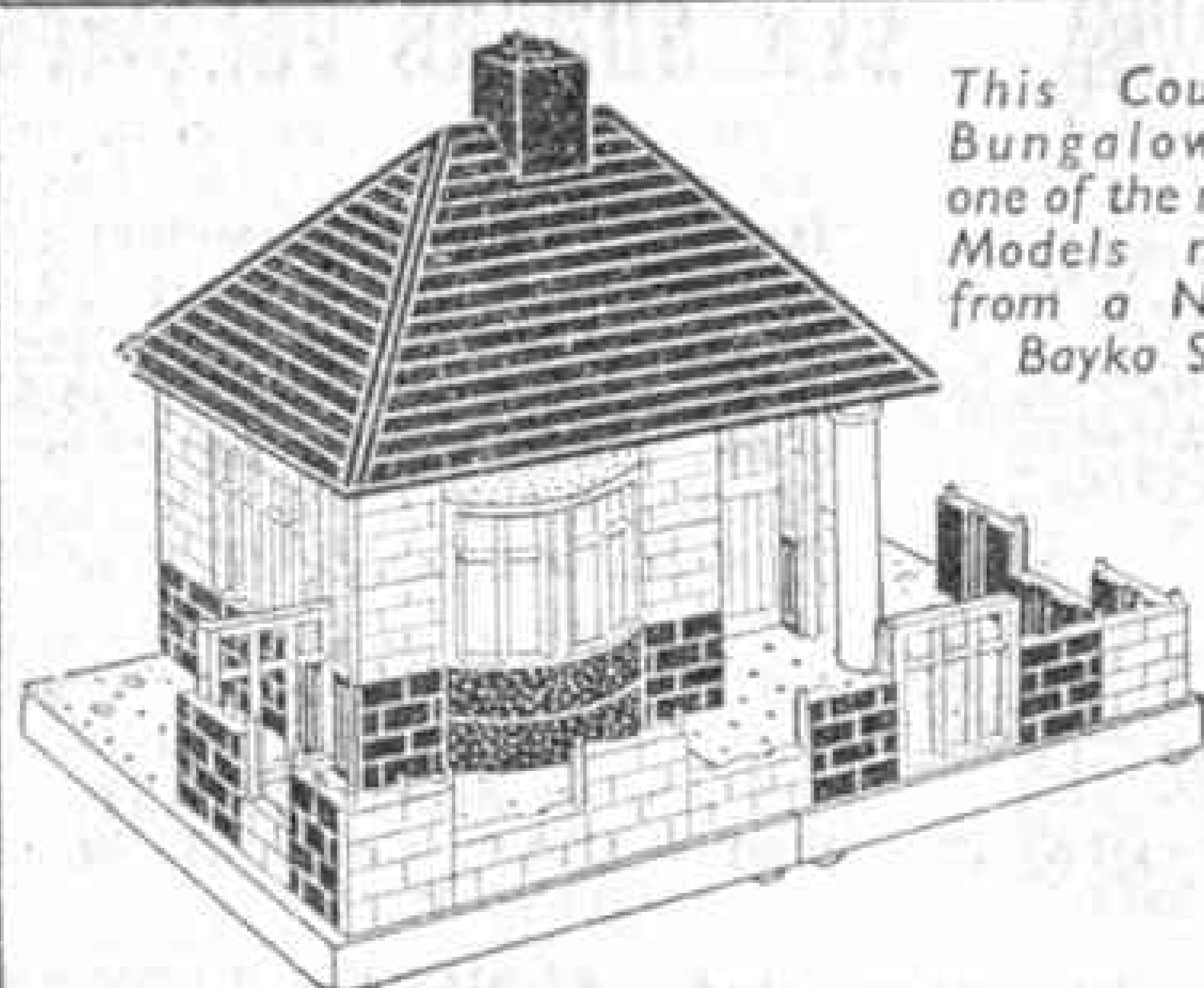
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