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JULY 1947

MECCANO

MAGAZINE

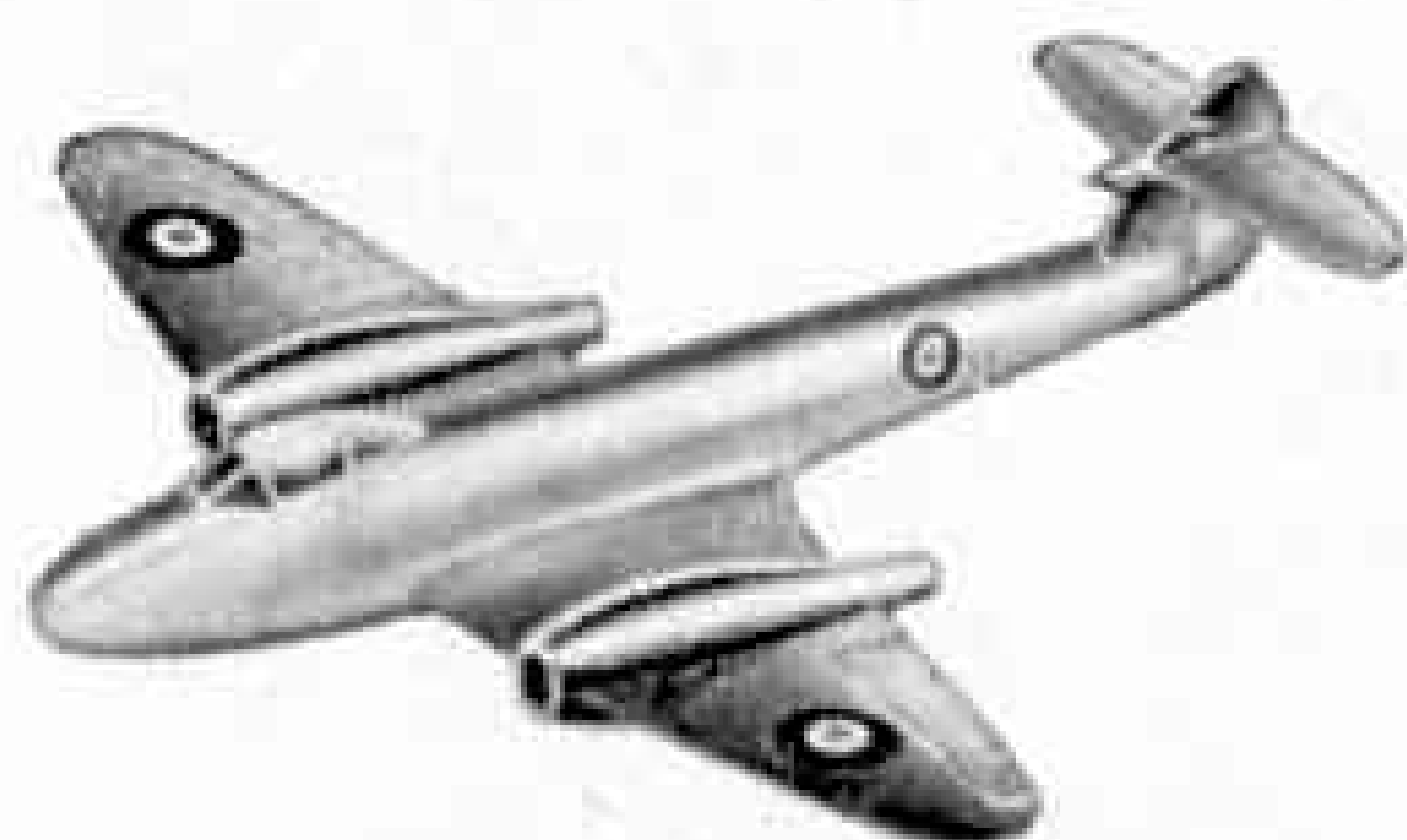


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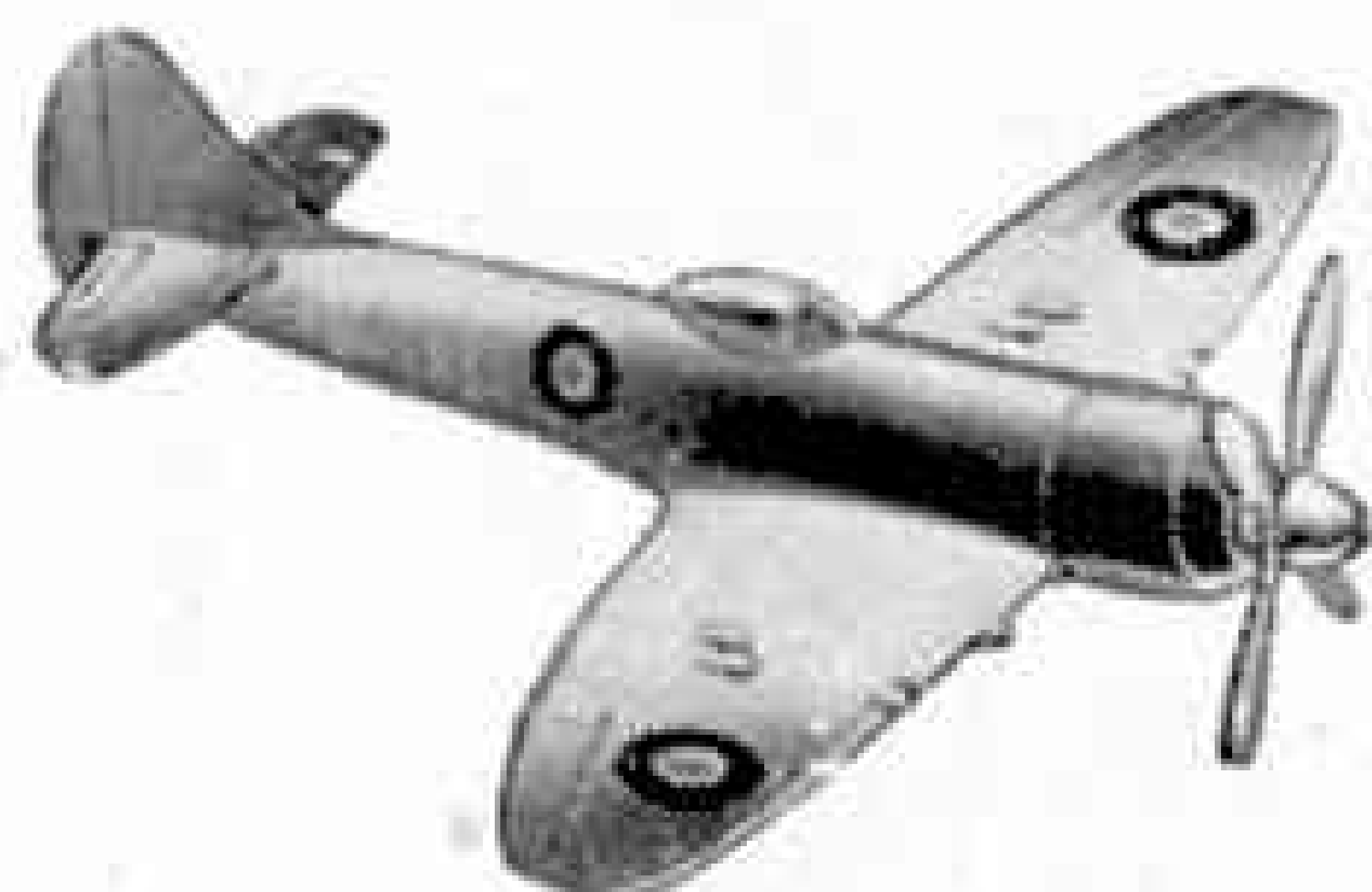
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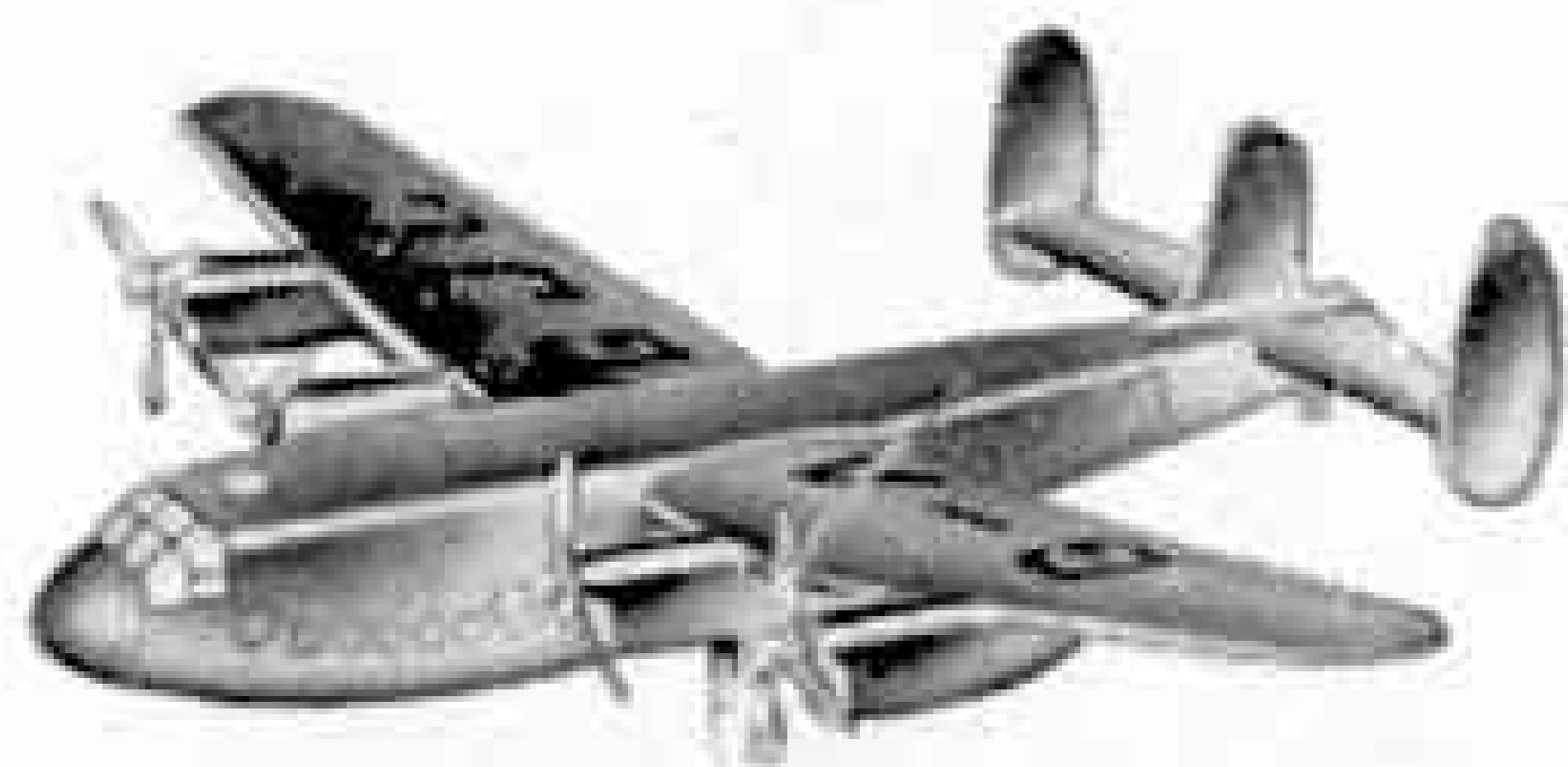
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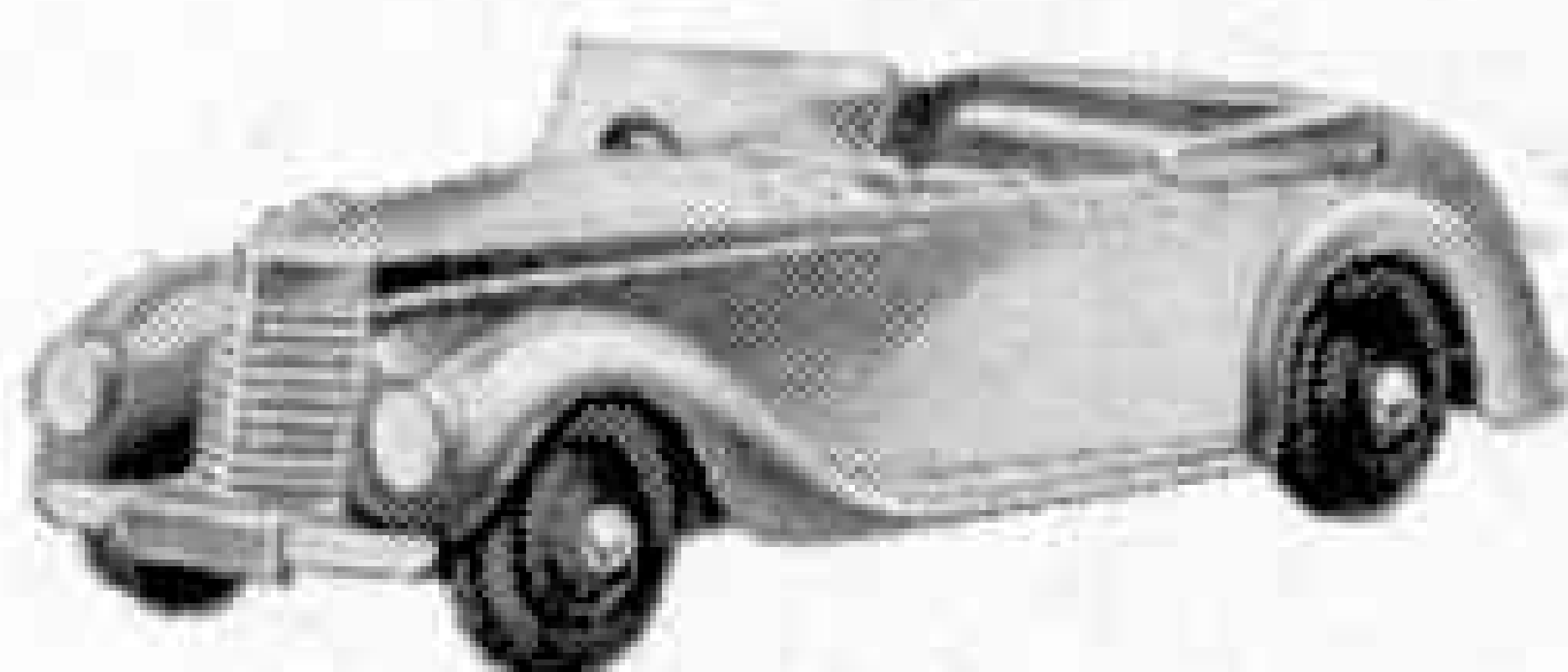
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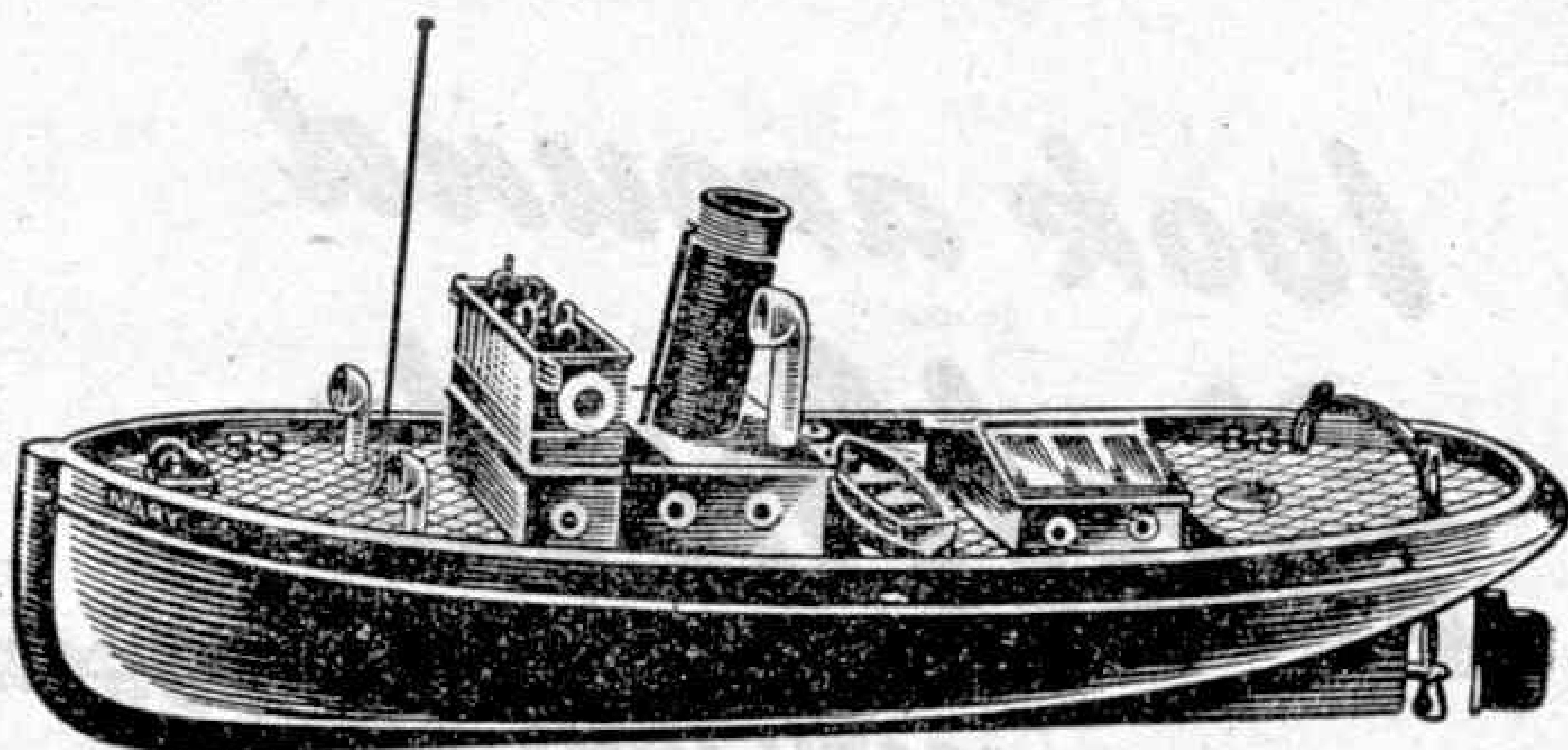
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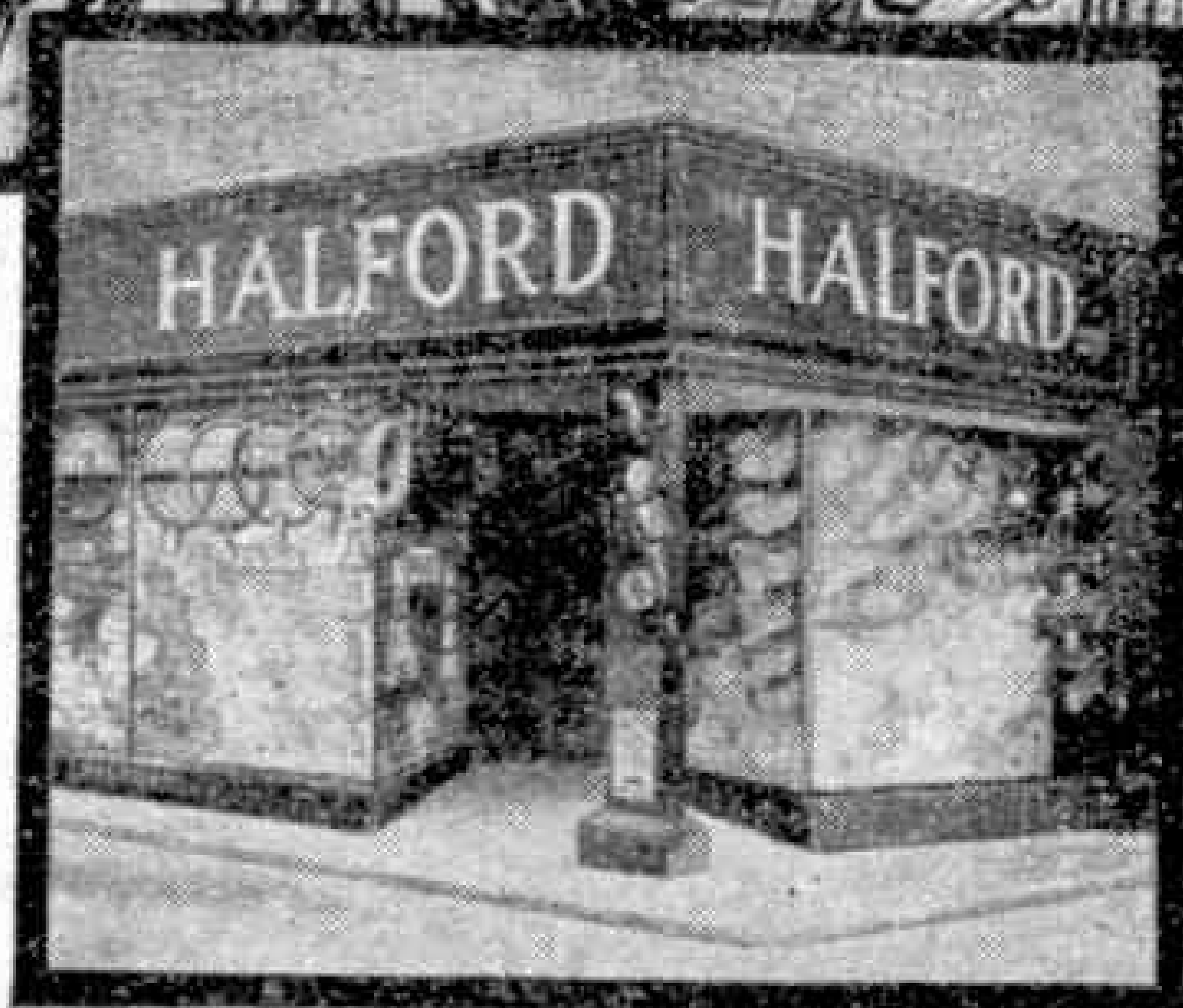
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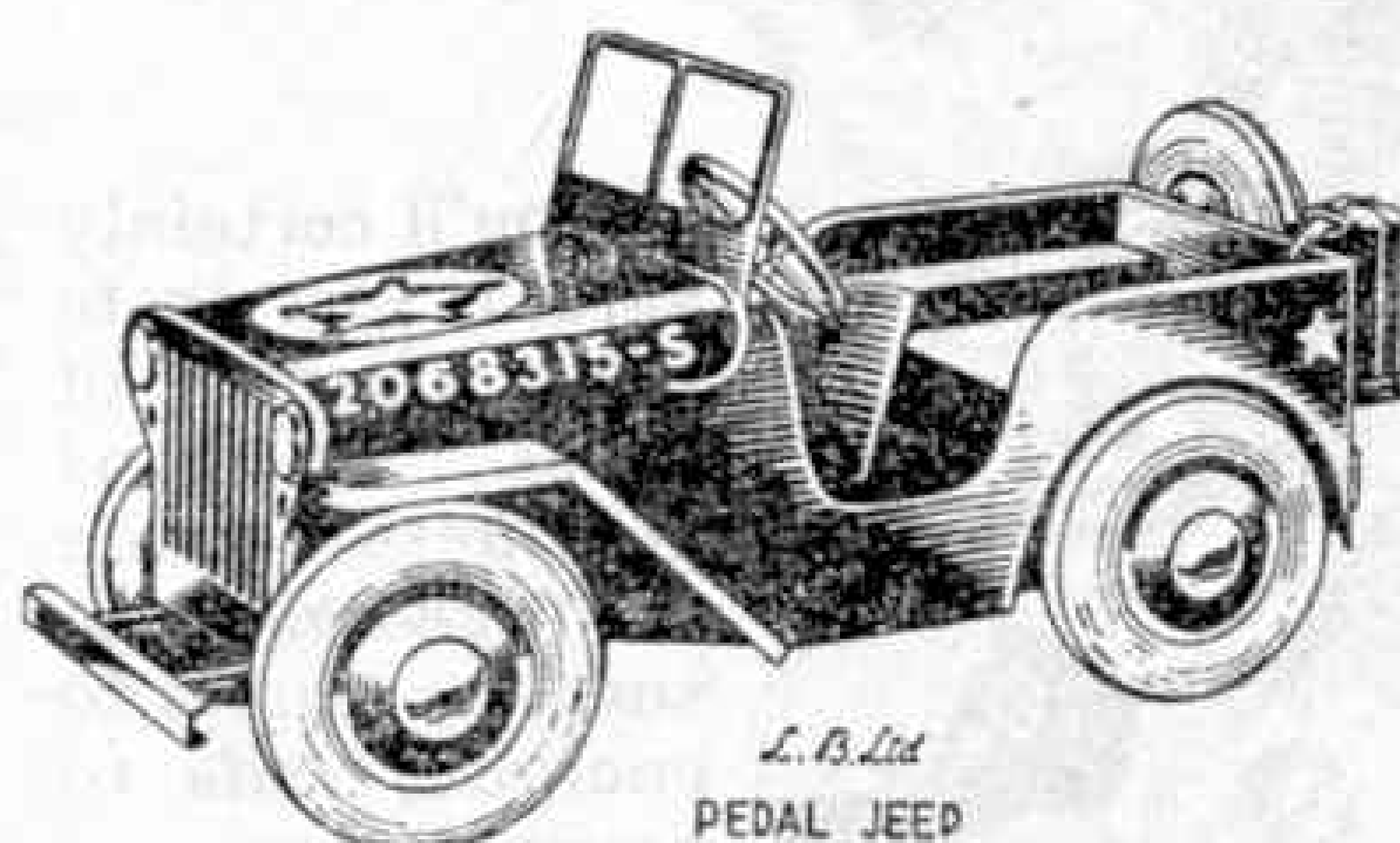


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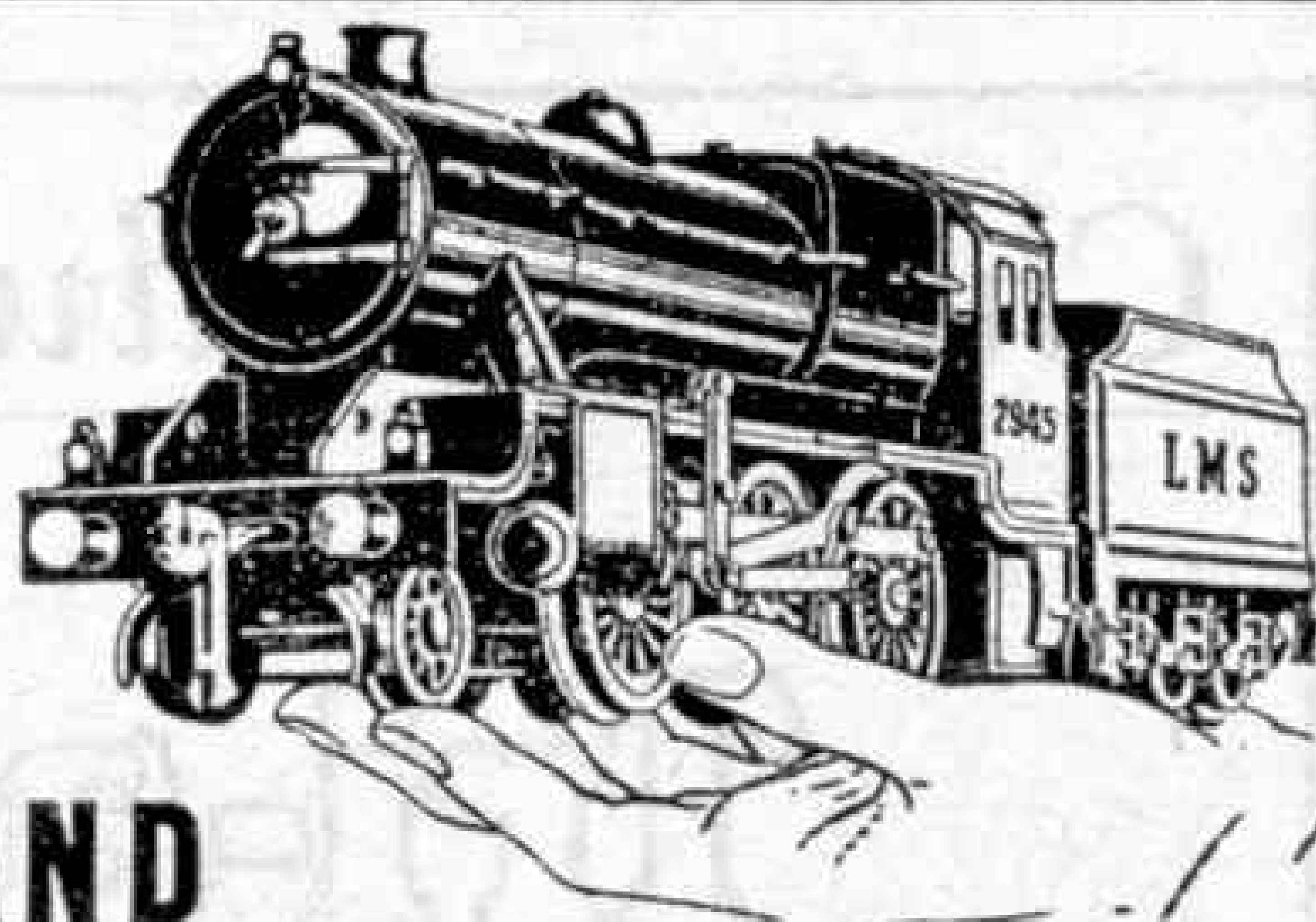
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MAGAZINE

Vol. XXXII
No. 7
July 1947

With the Editor

Flying Faster than Sound

In recent issues of the "*M.M.*" there have been several references to the dangerous compressibility shock waves that batter aircraft to pieces at speeds approaching that of sound (sonic speed). In effect they form a "wall" through which aircraft must penetrate before speeds of 1,000 m.p.h. and more can become practicable. Designers all over the world are trying to devise aircraft capable of breaking through this barrier of shock waves to reach supersonic speeds, clean design being more important than sheer brute force.

Over in America experimental research aircraft are now being prepared for an all-out attempt to fly at speeds approaching, and in excess of, the speed of sound. The U.S.A.A.F. started preliminary tests with a Bell XS-1 rocket-plane early this year. Now the U.S. Navy are engaged on a similar programme of flight tests with the new Douglas "Skystreak" jet-propelled aircraft, a special article on which will appear in the September "*M.M.*"

If American pilots succeed in flying these small super-streamlined machines faster than sound they will, without doubt, greatly benefit aviation as a whole. But, while wishing them every success and applauding their achievements, we must not forget the less publicised but highly successful work being done by our own scientists and designers. The fact that work on British supersonic aircraft such as the 1,000 m.p.h. Miles M-52 was cancelled last year is one proof that our experts believe that there are more satisfactory ways of obtaining data on supersonic flight than by using piloted aircraft. In fact it is quite probable that our experiments are well in advance of those being made anywhere else in the world.

L.A.M.S. Developments

Since the appearance last month of our article on an air charter company, interesting developments have occurred. Customs facilities have been made available at Stansted, and in future freight-carrying aircraft will use this airport instead of Heath Row.

The "Halifax" aircraft "*Port of Sydney*," mentioned in the article, left Sydney, Australia, on the last lap of its round-the-world flight on 27th May, carrying seven tons of dripping—a gift to the people of Britain from their friends in Sydney. The flight was completely successful, and Dr. Humby, L.A.M.S.' Managing Director, who flew as second pilot, is now considering the possibilities of a Pacific freight service. All of which proves that enterprise and initiative still pay in these days of controls and mass form-filling.

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The "Butterfly Boat"

Story of the Paddle Steamer

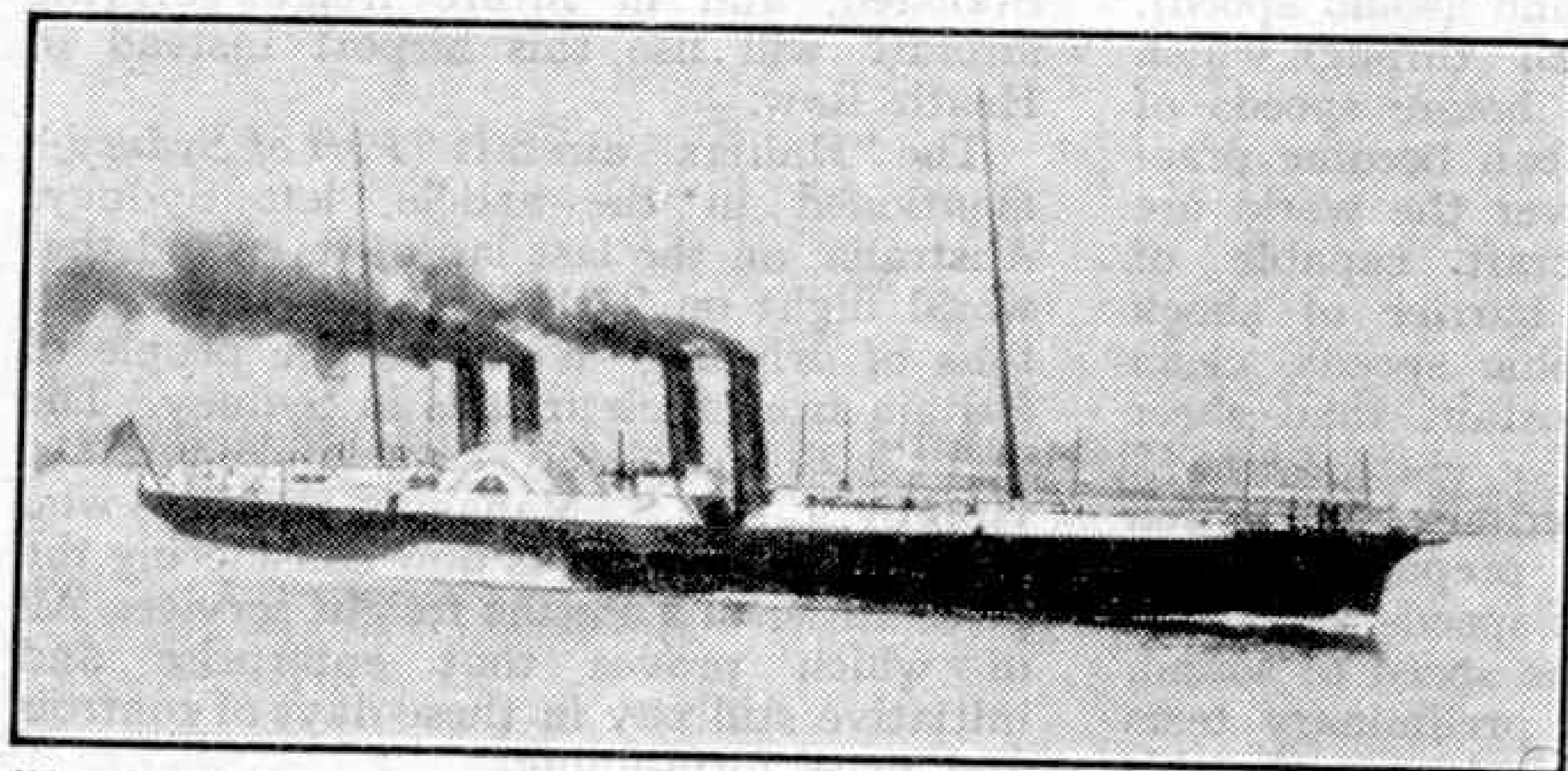
By Frank C. Bowen

THERE is no doubt that the paddler—the "Butterfly Boat" as the deep sea man calls her—has great fascination for most people, and recently the interest would seem to have been increased by her rapid decline, although her long prophesied disappearance has not yet occurred and in the last strongholds which suit her characteristics better than any others it may be deferred for a long time yet.

For many years the paddle ruled supreme. Man had many centuries of experience with manual rowing and paddling, and when he finally overcame some

to study about the paddle wheel before it could claim real efficiency.

It is not proposed to give any detailed history of the development of the paddler on rivers, the coast and across the channels, but to give some picture of the highlights of her progress from Henry Bell's pioneer steamer "*Comet*"—which he put on the Clyde service in 1812 without any idea of revolutionising sea transport but only to get more visitors to his hotel at Helensburgh—to the magnificent vessels on the Clyde, Bristol Channel and London River to-day.



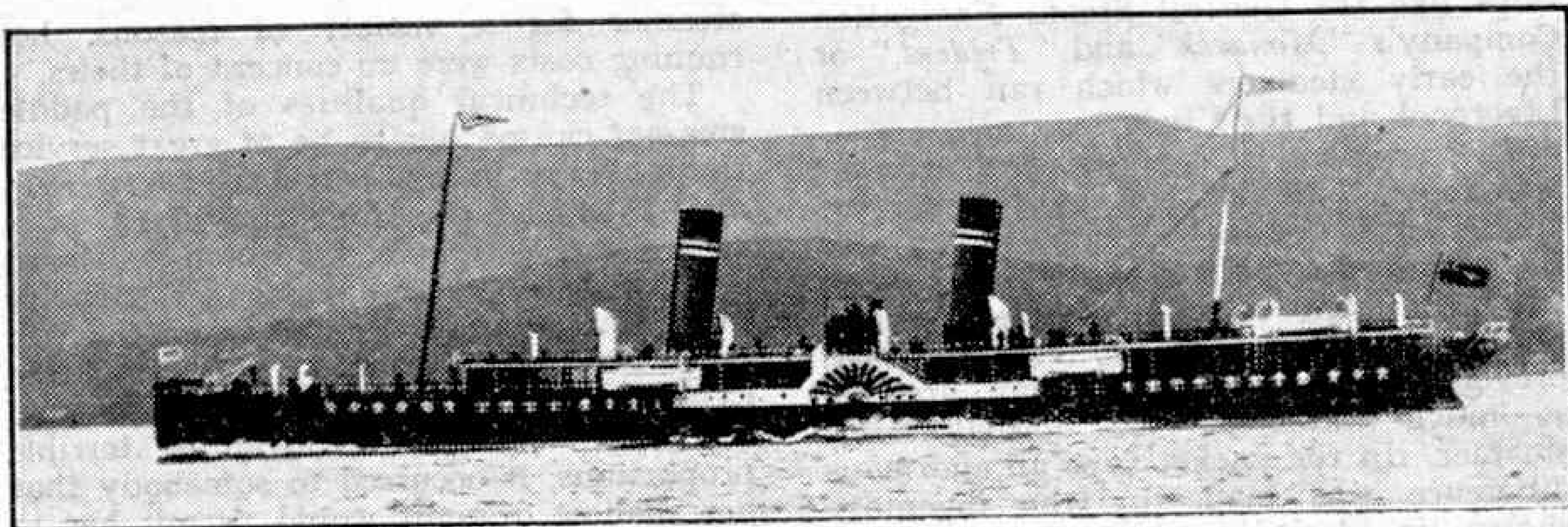
"Connaught," built 1860 for the City of Dublin Company's cross-Channel service, with a speed of 18 knots, a record for a ship of her type. The illustrations to this article are by the Nautical Photo Agency.

of the difficulties of utilising steam power the idea of adapting the oar was first tried by most inventors and then discarded for the obviously superior continuous operation of a wheel fitted with a number of boards round its perimeter. The principles were obvious, but the pioneers had all sorts of ideas as to where the wheel should be placed. Some thought that a pair should be employed, one on either side of the ship; others broke away from accepted hull lines to provide a waterway right down the centre in which the wheel was placed; others put it right aft, inaugurating the sternwheel steamer which still has a place on any number of shallow rivers overseas. But the first system was finally recognised as being the most efficient for ordinary service. It was not until many years later that people discovered what a lot of things there were

All the early steamers were extremely inefficient as judged by modern standards; that was inevitable, and those who were willing to accept progress could appreciate that their performance, poor as it was, made an immense improvement on that of the sailing vessels which they were designed to rival. The sailing ship's hull, with

its bluff bow and long run, was naturally first adopted without change. It afforded less shelter to passengers than it had under sail, for the machinery took up a lot of space which had formerly been cabins, and for some years nobody had the idea of fitting cabins on deck. The design and construction of engines and boilers were primitive. In most cases the former could not be turned fast enough to give the steamer a reasonable speed, so that many were given wooden spur gearing to increase the revolutions of their paddles, a feature which constantly gave trouble through the teeth breaking off and which made the terrible noise that earned so many early steamers the nickname of "coffee mills."

Happily the new system attracted some unusual men from the very first, and they soon appreciated the faults of the pioneers



The famous "La Marguerite" of 1894. With her gross tonnage of 2,205 and speed of $22\frac{1}{2}$ knots she was the very last word in the paddle excursion steamer.

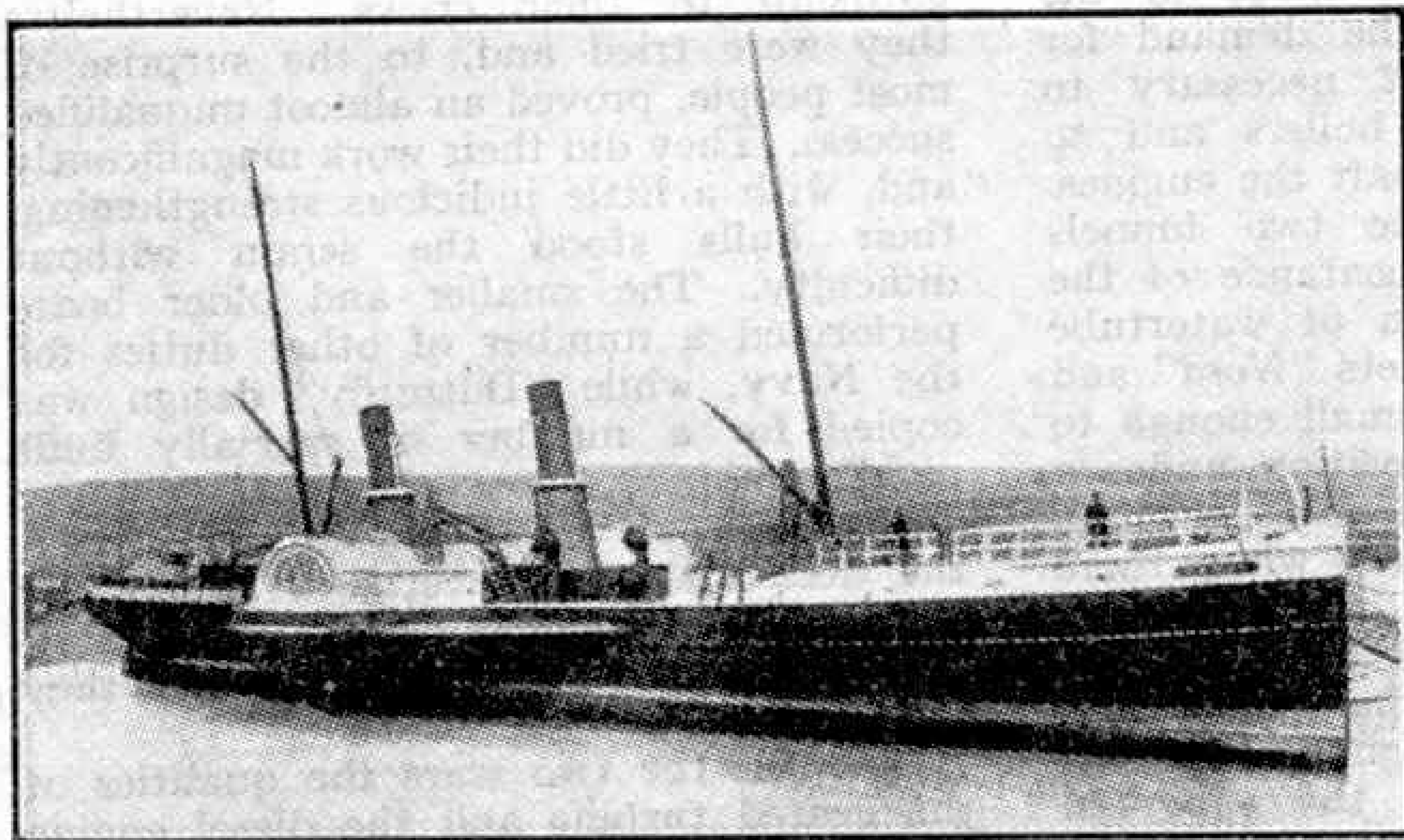
and started to rectify them. In 1816 James Watt quite accidentally discovered that engines could be reversed; until then steamers could only come alongside by stopping the engines well away from their berth and letting the ship drift in, a matter for very pretty judgment which caused many accidents. Napier studied the bow lines and the effect of driving the ships through the water.

Speed was a very important factor and great ingenuity was devoted to securing it by making the hull as light as possible. Before there were any scantling regulations this was, naturally enough, often taken too far but it gave the iron hull its first real chance and made a great difference to ships of every kind. So it was with the machinery. Tubular boilers were tried in the steamer "Luna" on the Clyde as early as 1837, but the experiment was not repeated for years afterwards. The side-lever engine, later adopted for all the big paddle liners which crossed the Atlantic or went to the East, was first

introduced for river excursion work in the twenties. Speed was nearly always the great incentive to progress and really remarkable results were obtained; it seems incredible that the "Rothesay Castle" managed 12 knots on the Clyde as early as 1816.

As far as the purely excursion steamer was concerned the revolution occurred in the eighties of last century, although there were a few outstanding steamers in the seventies, like the "Lord of the Isles" and "Columba" on the Clyde which were really out of their period but which started the improvement. The General Steam Navigation Company started a new programme in 1887 with the "Halcyon" type of 17-knotters, designed for the East Coast and Thanet services but also capable of running across the Channel. Steel hulls permitted the weight to be kept down without danger, machinery was greatly improved by the successive introduction of the compound and in some cases the triple expansion engine, boilers had higher pressure and reduced size, hulls were made more seaworthy by plating the sides up to promenade deck level right forward to the bows, and accommodation was greatly improved.

By that time the paddler on the long coastal services such as the London-Edinburgh route had long disappeared in favour of the screw steamer, but while it did last the type produced some extraordinarily interesting



"Paris," built 1876 for the London, Brighton and South Coast Railway's Newhaven-Dieppe service.

ships like the General Steam Navigation Company's "*Monarch*" and "*Trident*," or the early steamers which ran between Liverpool and the Clyde.

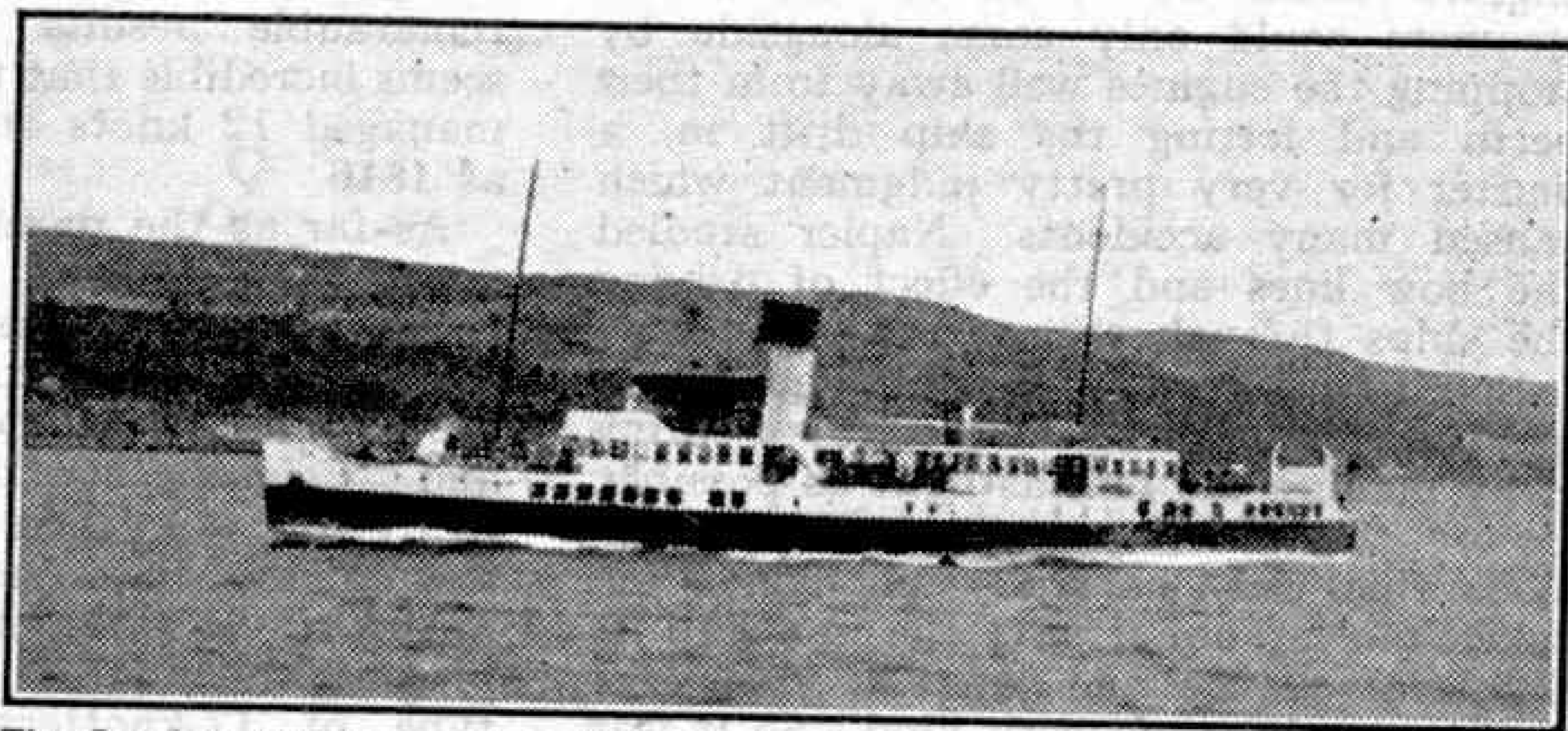
The progress of the pleasure steamer was more than equalled by that of the paddle cross-Channel packet, which was the standard type for many years when the poor state of most of the terminal ports, particularly on the French coast, prevented the use of anything drawing as much water as the normal screw steamer. In the packet type an enormous difference was made by the ingenuity shown in designing and building the blockade runners during the American Civil War, little steamers which would never have satisfied modern safety regulations but which did remarkable things. Any number of their features, suitably modified, proved invaluable to the designers of the packet steamers which finally reached 2,000 tons, with high standards of seaworthiness and sea-kindliness, excellent accommodation and a speed of 22 knots or even more.

Against their qualities was the fact that they were terribly extravagant and liable to accidents. Their running economy was not to be compared with that of screw steamers, and their machinery occupied a totally disproportionate space in the hull, particularly when the demand for increased speed made it necessary to increase the number of boilers and to divide them before and abaft the engines. The wide spacing of the two funnels greatly improved the appearance of the ship, but the introduction of watertube boilers in the French packets "*Nord*" and "*Pas-de-Calais*" in 1896, small enough to be concentrated in one position under a single smoke stack, obviously saved a great deal of room. On routes where there was sufficient water to permit screw steamers the paddler had already been replaced when the introduction of the turbine engine at the beginning of the present century hastened the progress. But there were still many regular passengers who greatly preferred the paddle

steamer for a variety of reasons; her running costs were no concern of theirs.

The technical qualities of the paddle steamer caused her to be of great service to the Navy in two wars. Between 1914 and 1918 she was first considered as a cross-Channel trooper, for which her broad decks and very large passenger capacity made her admirably suited when the trip only took a few hours. Then, when the casualties among trawlers commissioned for minesweeping were attaining terrible proportions, it occurred to somebody that her shallow draught would permit her to pass right over the average minefield and would make her an admirable substitute.

At first the idea excited derision; the excursion steamers were nothing but



The London, Midland and Scottish Railway's paddler "*Caledonia*," built 1934; a good example of the modern paddler.

"paper boats," originally designed to last for a few years only and nearly always withdrawn in the winter months. To put such ships on to one of the most arduous duties undertaken by the Navy would be to court disaster and would be a terrible hardship to their crews. Nevertheless they were tried and, to the surprise of most people, proved an almost unqualified success. They did their work magnificently and, with a little judicious strengthening, their hulls stood the strain without difficulty. The smaller and older boats performed a number of other duties for the Navy, while "*Butterfly*" design was copied for a number of specially built paddle minesweepers. In the war just completed they were again fully employed, the deck space of several of the bigger ships being as great an advantage for anti-aircraft vessels as it had been when they were used as troopers.

Between the two wars the qualities of the geared turbine and the diesel engine for excursion work led to very few paddlers being built, but

(Continued on page 302)

B.O.A.C.'s New Aircraft Markings

By John W. R. Taylor

RIGHT from the earliest times man has had a weakness for decoration. At first there was not much to decorate, so he painted himself, hence the woad used by the Ancient Britons. That was only a start and, before long, the Rembrandts of the day were painting the inside of their caves, their war-shields and their chariots. The recent war showed that the warriors of to-day are every bit as enthusiastic about painting their "chariots."

The practice of naming and decorating aircraft is by no means restricted to war-planes, and airline operators are as proud of their particular colour schemes as shipping lines are of their painted funnels. Most modern aircraft are left in their natural metallic finish, but a good example of the way they are afterwards decorated by individual airlines is shown in the illustration of one of Pan American Airways' "Constellations" that appeared in the February "M.M."

The new standardised markings recently introduced by the British Overseas Airways Corporation are, by comparison, very modest. "Streamlining stripes" have been dispensed with altogether, but this is quite logical, for they often tend to detract from the fine structural lines of the air liners on which they are painted. The basis of the markings is the famous B.O.A.C. Speedbird emblem, and the designers had

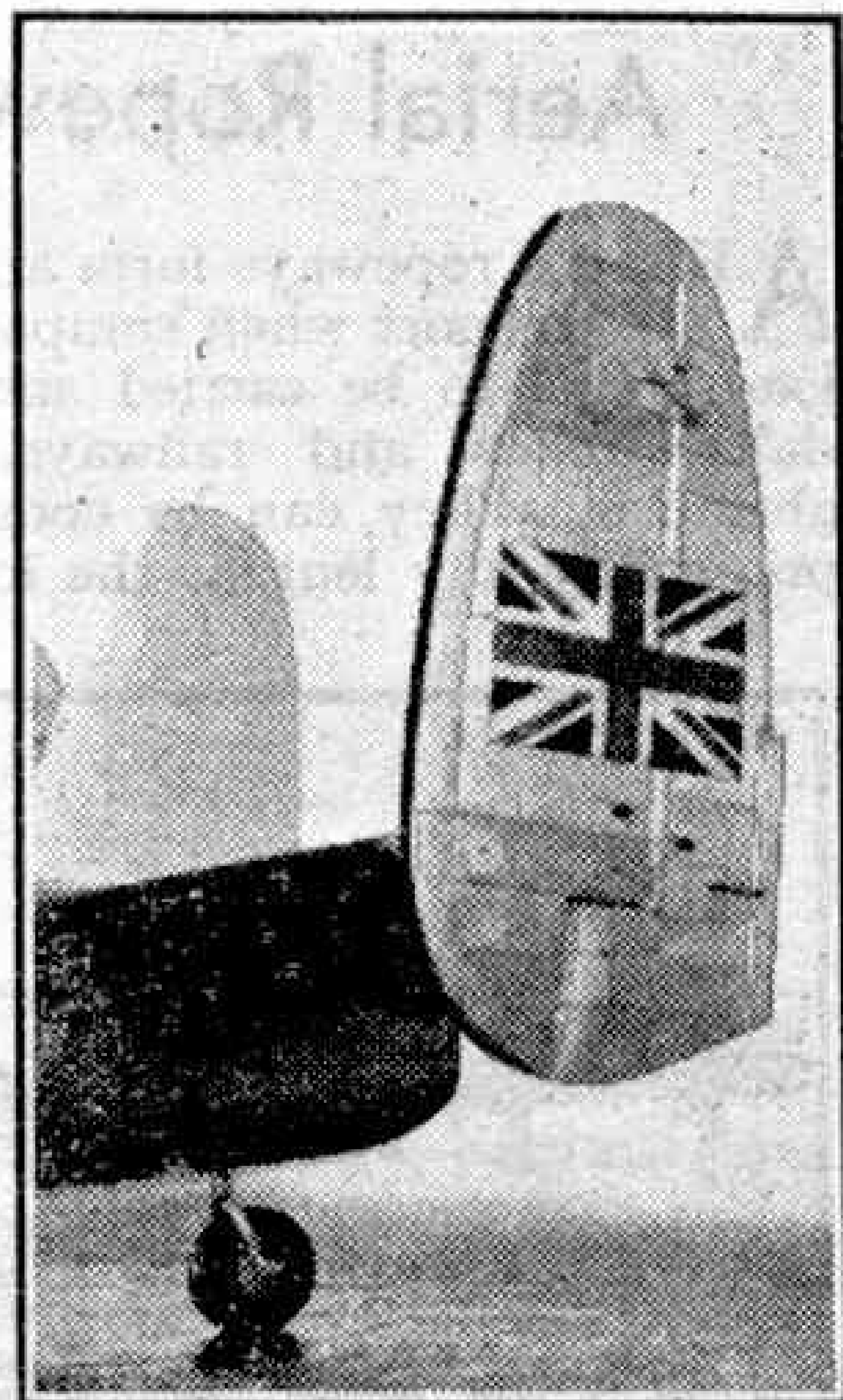
to find a way of combining this neatly with the Corporation's initials, the word "Speedbird" and the name of the aircraft. The task was complicated by the

fact that so many different types of aircraft are now in service with the B.O.A.C. fleet, all with their portholes, windows, radio aerials and other excrescences in different places.

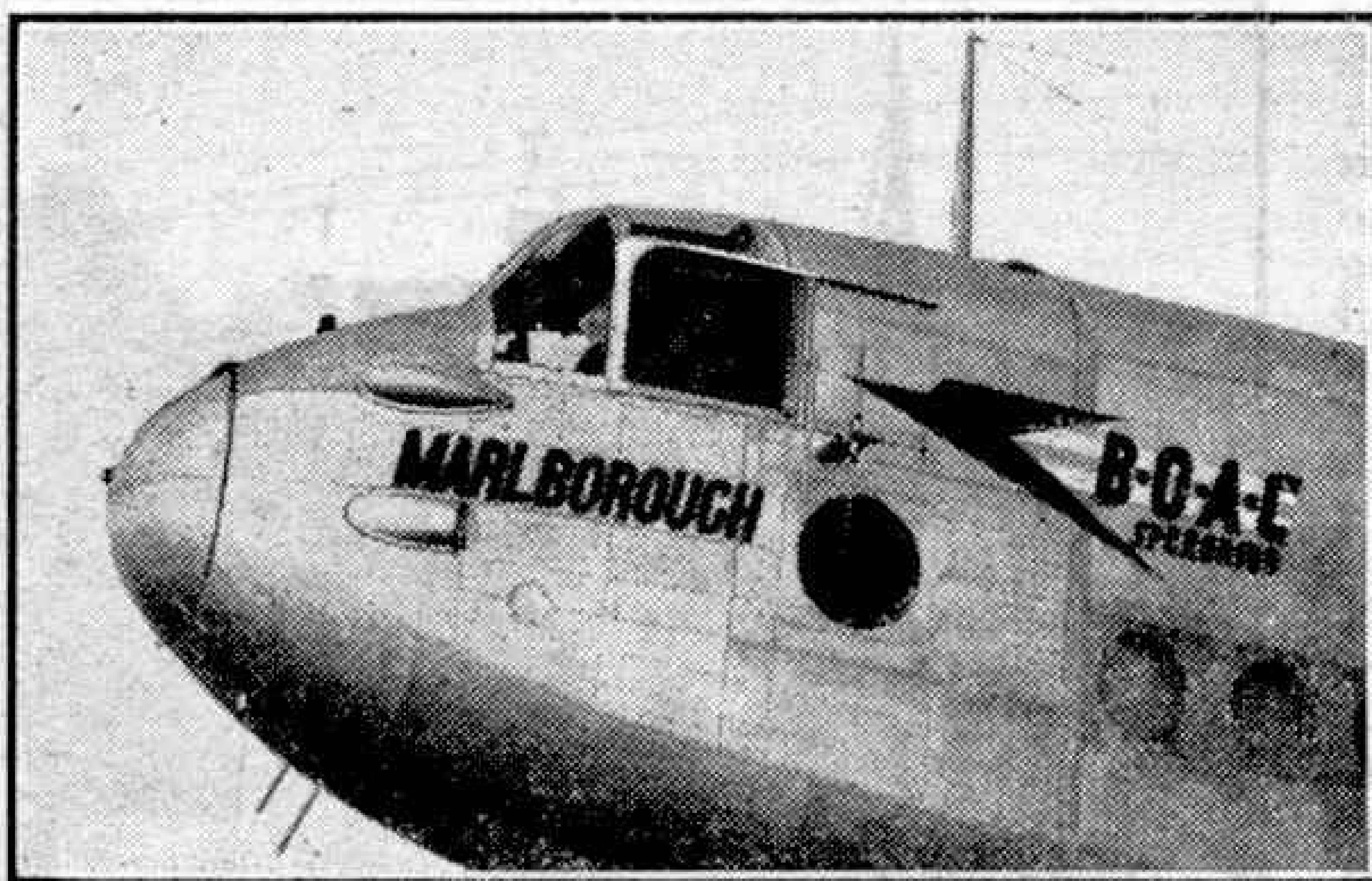
The scheme finally adopted is shown in the illustrations on this page. The Speedbird emblem is painted in the standard Corporation blue, with a half-inch wide gold border. Aft of this appear the words "B.O.A.C." and "Speedbird" in B.O.A.C. Cyclone italics, also edged with gold, the former being superimposed on two white bands to tie together the design. The name of the aircraft can be placed

forward, above or aft of the emblem as convenient, and naturally the size of the markings can be varied to suit the particular aircraft.

To complete the standard design, the initials "B.O.A.C.," again painted in blue with a gold border, appear over the main passenger entrance door; while a Union Jack is painted on the aircraft's fin or fins. The new markings tell their story every bit as well as the larger, gaudier type, combining practicability with a simple dignity in keeping with the traditions of one of the world's oldest and safest airlines.



The B.O.A.C. standard tail markings on the "York."



The new standard markings on the nose of a B.O.A.C. Speedbird "York" aircraft. Photographs by courtesy of British Overseas Airways Corporation.

Aerial Ropeway for Indian Cement Works

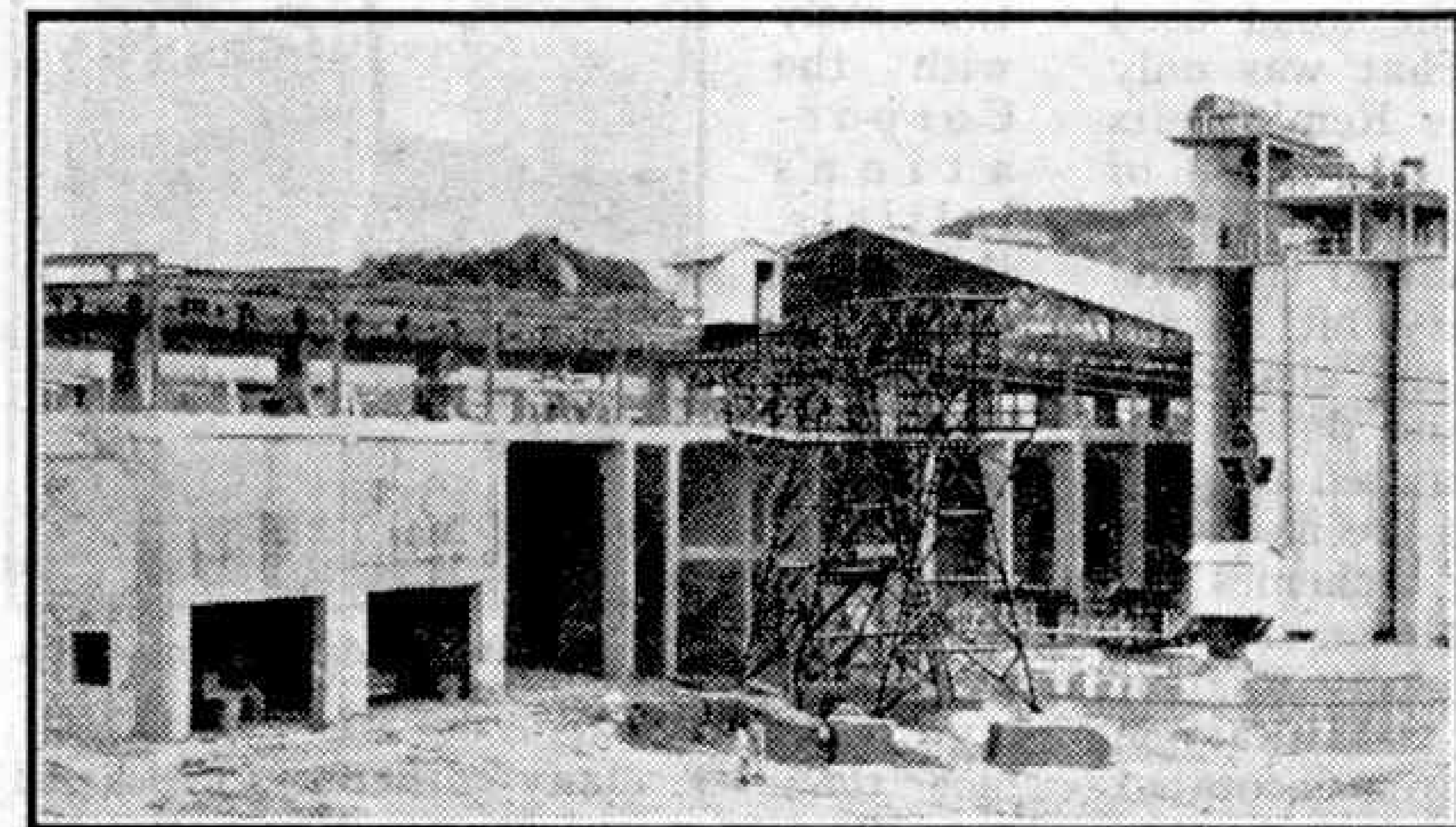
AERIAL ropeways form an ideal means of transport when comparatively light loads have to be carried across hills and dales, roads and railways, and other obstacles. They can be constructed over practically any length, the longest one in

The individual loads in each bucket on the ropeway are 14 cwt.; they move at a speed of 140 yds. per minute and are spaced about 59 yds. apart. The ropes that support the loads are of steel and are of locked coil construction, that on the loaded side of the ropeway having a circumference of $4\frac{3}{4}$ in. and that on the return side a circumference of $3\frac{3}{8}$ in. The rope that hauls the loads along on the track rope is $2\frac{3}{8}$ in. in circumference. The route of the ropeway has a fall in favour of the loads and under normal conditions only about 6 h.p. is required to drive.

Our cover picture shows a double tension station, which is provided to ensure that the correct tension is applied to the track ropes. The cages are filled with

concrete blocks of the correct amount to produce this tension. It is essential that these weights should be hung freely as they have to take up any variation in the length of the rope due to temperature changes or rope stretch.

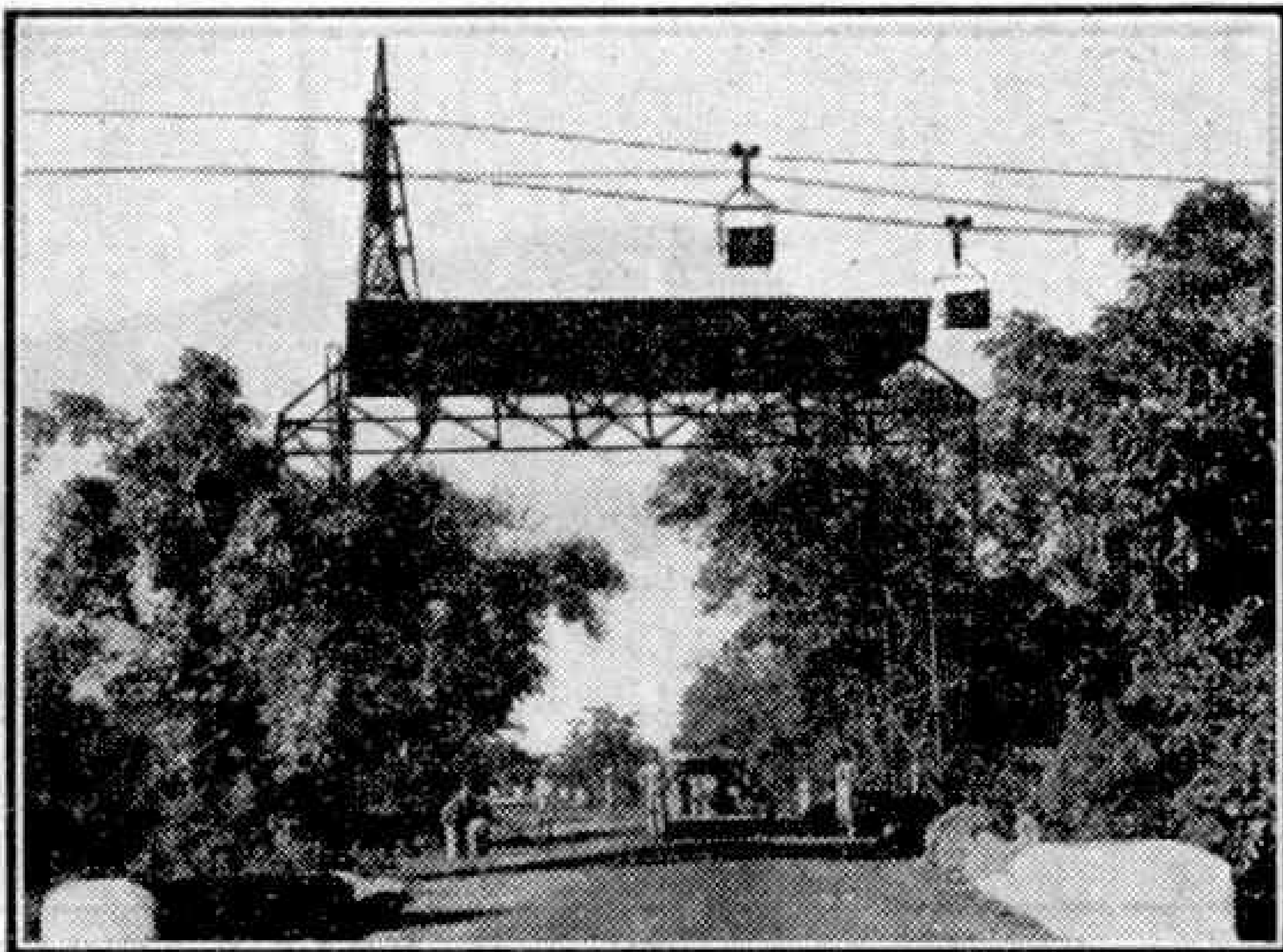
Wherever an aerial ropeway crosses a road it is usual, in order to safeguard traffic passing below, to provide some form of protective bridge or net.



Entrance to the unloading station at the Bhupendra Cement Works, India. Photographs and cover illustration by courtesy of British Ropeway Engineering Co. Ltd.

the world at present having a length of 70 miles; and they have been built to handle capacities up to 300 tons per hour. The ropeway shown in the accompanying illustrations was built, designed, and supplied by the British Ropeway Engineering Co. Ltd., London, to the Associated Cement Co. of India for use at their Bhupendra Cement Works, which are situated a few miles from Kalka, near to the foothills to the Himalayas.

The ropeway carries limestone from the quarries to the works and handles 100 tons per hour over a length of $6\frac{1}{4}$ miles. It is in one straight line from end to end, no angle stations being involved; it crosses the paths of several wide rivers, a main road and a broad gauge railway. A large part of the route is through the forest of Malla, which is a hunting preserve of the Maharajah of Patiala. In designing the ropeway it was necessary to allow, over the forest portion of the route, for the buckets containing the material to be at such a height that they would easily clear an elephant and howdah.



Protection bridge where the ropeway crosses a road.

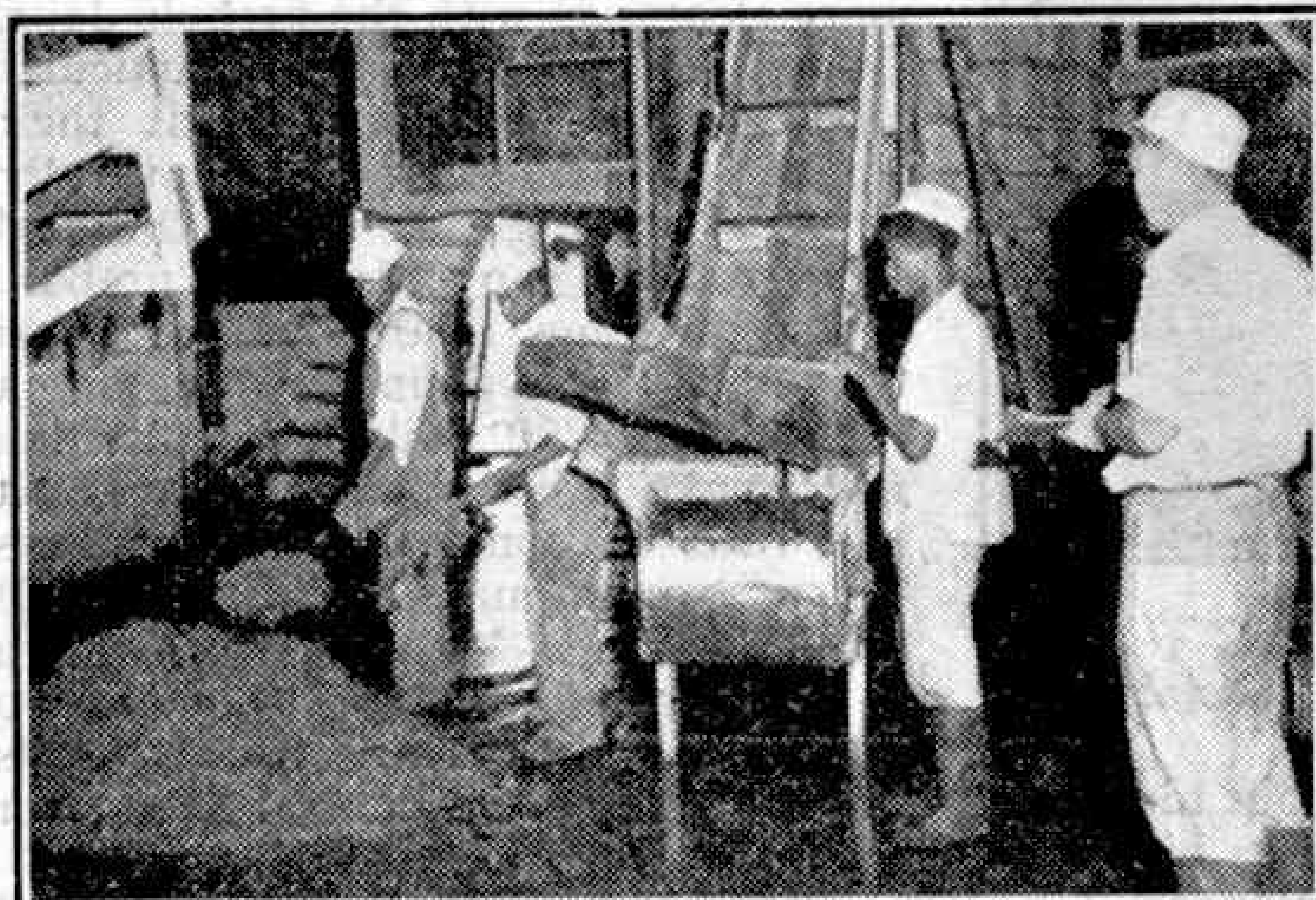
A Seaweed Industry

By Michael Lorant

ONE of the most useful products obtained from seaweed, is "agar." This substance is used for the treatment of wounds, in medicine, and as a sizing in paper and cloth. It is used also for such varied purposes as thickening soup, in the manufacture of tungsten wire and in photographic plate emulsions. In addition, Oriental peoples have for years used it



A fisherman harvesting seaweed on the North Carolina coast.



Washed seaweed goes to the "cooker" where jelly extraction begins.

extensively in cookery; it is rich in certain minerals and vitamins.

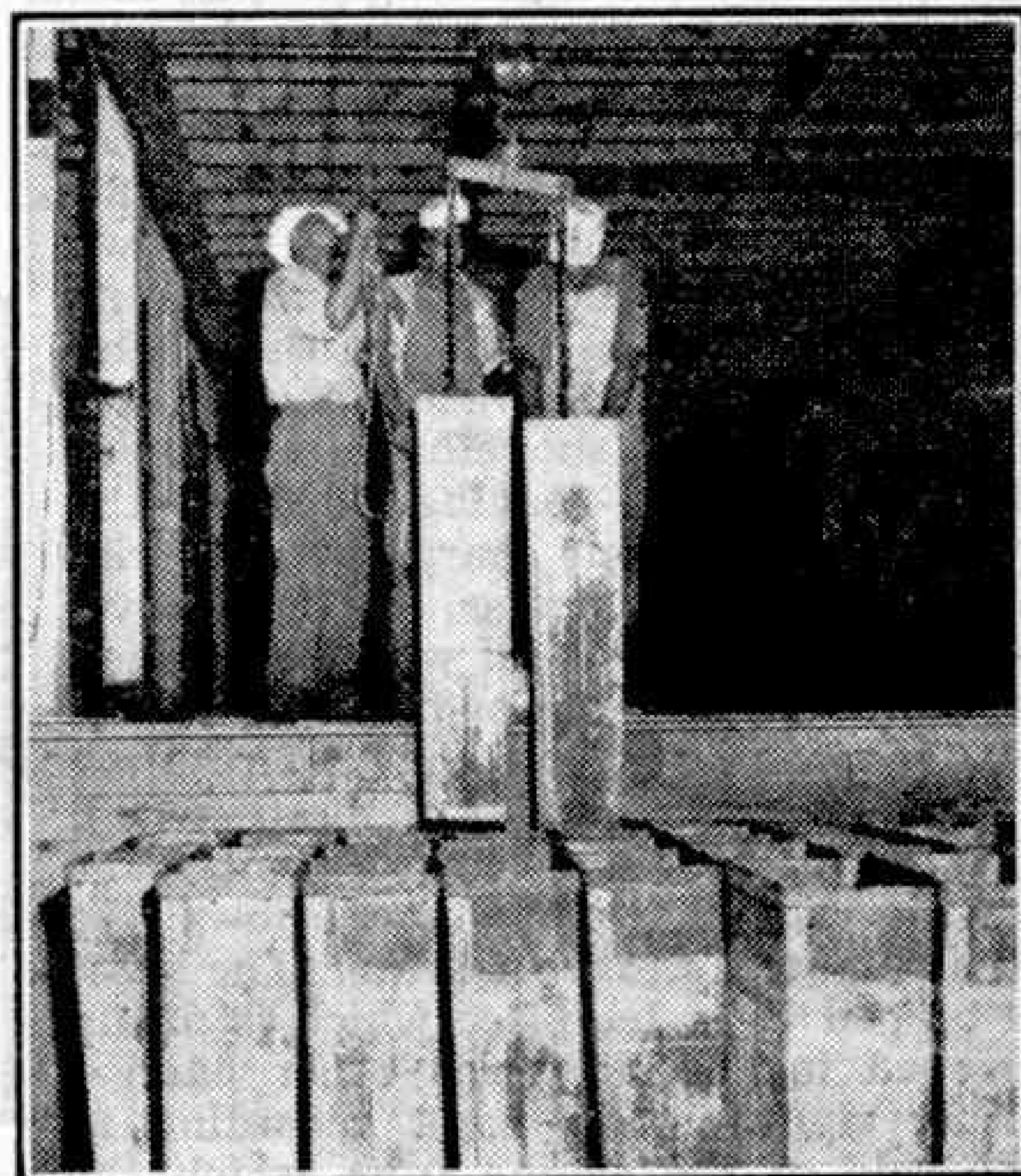
Before the war with Japan, the American supply of agar came mainly from Japan, but of course this supply ended after Pearl Harbour. An official survey was therefore begun of America's Atlantic coast to find seaweeds from which agar might be produced. The search was successful, and at least one species forms the basis of a new and thriving industry on the Carolina coast. Native swimmers rake the stuff up into piles and the trawlers who used to curse the weed are now bringing it in along with their shrimps and selling it to the local processing plant, where it is washed, dried, cooked, frozen and reduced to commercial agar for one or other of the many uses mentioned above.

The filtered solution of seaweed gelatine is placed in huge ice cans to cool, where it sets to form jelly.

A weed gatherer can collect as much as a ton in a day, and the commercial fishing boats sometimes come in with actually more seaweed than fish. The weed grows rankly, sometimes four feet tall.

Experience indicates that there are also possibilities for cultivation of the weed. Sprays of it, tied to bricks and sunk to the bottom of the Sound, have been found to multiply ten times in volume within a short period.

So a new industry has arisen from America's war needs.

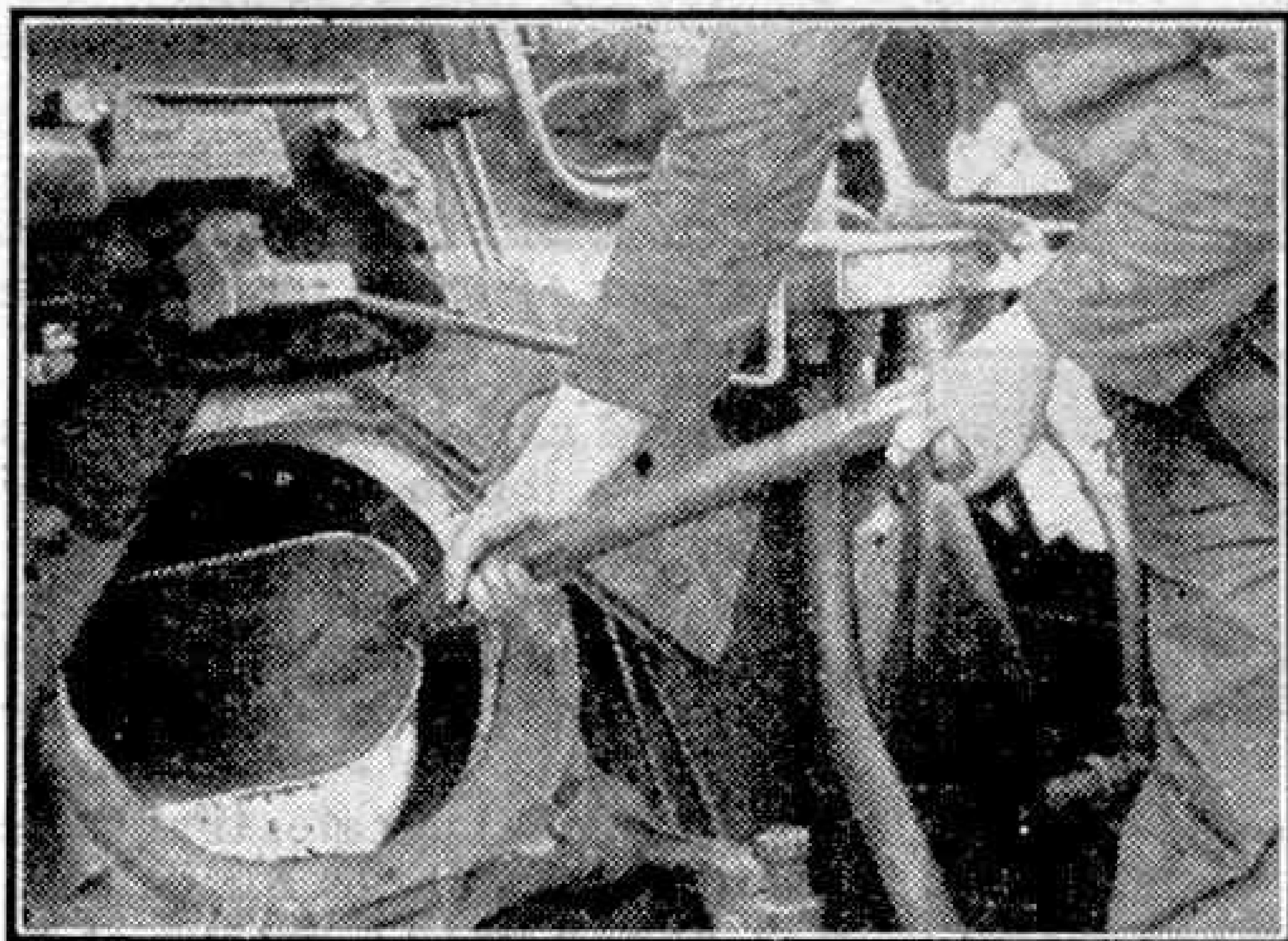


Have You Ever Thought About This?

What Kind of Shovel Does a Fireman Use?

By "Shed Superintendent"

COULD you draw a fireman's shovel from memory? I should not be surprised if some readers sketched something like a garden spade at their first attempt! As a matter of fact, firing a



The right grip of the shovel.

locomotive requires a shovel of special shape.

A good fireman is as particular about his shovel as a tennis player is about his racquet. The shovel must be well balanced and of exactly the right length. The metal part—known as the blade—is almost as long as the shaft, as can be seen from the photographs. The blade is 1 ft. 6 in. long when new, and the shaft is 1 ft. 8 in. long. These shovels are made by two or three well-known manufacturers, and special steel is used for the blades to withstand the wear incurred in scooping up each shovelful of coal. For this purpose the leading edge of the blade must be kept sharp. A deep rim round the outer edge of the shovel prevents coal falling off with the motion of the engine, the lumps being about the size of a man's fist for the best results.

The shaft is made of hard wood, without any tendency to splinter, as the fireman slides one hand down the shaft at each stroke of firing. The shaft is topped by a tee-piece which is firmly gripped in the fireman's other hand—either right or left hand according to the side of the engine from which the

fireman works. The tee-piece forms a safeguard against the shovel slipping out of the fireman's hands into the firebox! This has happened more than once and has compelled him to use his bare hands until the next stopping place. In fact, a train on one occasion stopped specially at a wayside station while the fireman went to the porters' room to borrow a scuttle-shovel!

Some firemen cut their shovel-blades to a narrow shape, to give more clearance with the firehole door. Others set the blade to a particular angle with the shaft, to suit their length of arm, as this naturally governs the angle at which the coal shoots off the shovel into the firebox.

An average shovelful of coal weighs twelve pounds, and on a journey of 200 miles the fireman will make about 800 strokes, at the rate of some seven shovelfuls every two minutes. In course of time the blade becomes worn down

at the leading edge and becomes too short for further use. These worn shovels are then collected at a central depot for re-blading, as illustrated.

If a hot meal is required, a well-polished shovel also makes an excellent frying-pan. When placed inside the firehole door for a few moments, eggs and bacon can be cooked to a turn! This is seldom done nowadays, for obvious reasons!



Locomotive shovels awaiting repair.

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With the exception of those issued by the Scientific and Children's Book Clubs, which are available only to members, and certain others that will be indicated, these should be ordered through a bookseller.

"00 GAUGE LAYOUT AND DESIGN"

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

The purpose of this interesting handbook is to consider the various types of layout that are used by real railways for carrying out different operations, and then to show how these practices can be followed in a Gauge 00 layout. In other words, the author confines himself to layout design with the object of showing how a model railway may be made really railway-like.

Starting with the all-important question of space, the author emphasises the special advantages of 00 Gauge and then proceeds to show how a layout plan should be drawn up. Various types of layout, continuous, spiral, or point-to-point, are considered, along with the requirements of single line, double track and quadruple working. From here we pass on to station design and an interesting section on the track requirements for goods traffic. A final chapter deals with tunnels, culverts, lift bridges and other structural works.

The book is intensely practical, and contains a surprising number of valuable suggestions. It is fully illustrated by useful drawings.

"PETROL-ENGINED MODEL AIRCRAFT"

By C. E. BOWDEN
(Percival Marshall and Co. Ltd. 7/6 net)

Few hobbies are so well catered for by way of written instruction as that of the model aircraft enthusiast, but there is always room for another textbook if it has the merit of being practical and based on experience. Lt.-Col. C. E. Bowden, A.I.Mech.E., is well known in the model aviation world as a master of his subject, and his latest book will be welcomed by all who value his opinions and know of his wide experience in the hobby.

The book begins with a brief history of petrol-engined model aircraft, and traces the developments in design and construction that have led to the high-performance models of to-day. Discussion on the choice of a type of model to build and on the power unit and its mounting is followed by advice on the preparation of the scale drawings upon which construction of a model is based, and by actual building details. Here the author gives useful hints on the materials and tools for the job. The ignition system, control of flight duration, automatic stability and design, and the action and pitch of propellers are among the many subjects dealt with, and there are special chapters on radio control and the actual flying of a petrol model.

Line drawings supplement the text, and there are many excellent half-tone illustrations.

"THE GIRLS OF FORT TREGANTLE"

By ELIZABETH ROGERS (Warne. 6/- net)

The girls of Fort Tregantle are members of the A.T.S. who spent some summer weeks at a Cornish station. This gave them opportunities of interesting service, and also provided them with rare comradeship and much fun. Eventually they became entangled with a group of Nazi spies. This provides a thrilling climax to the story, in which the pursuit and capture of the intruders is due to the intelligence, initiative and sheer pluck of our heroines.

There is a coloured frontispiece to the book, which is unusually vigorous and exciting for one intended for girls, a natural development perhaps in view of the part that girls played in the national effort during the war.

"YOUNG ROBIN BRAND, DETECTIVE"

By F. W. CROFTS
(University of London Press. 7/6 net)

Mr. Freeman Wills Crofts, whose detective stories, introducing Inspector French, are world-famous, has now written this junior detective story, which has an engineering interest that will increase its attractions for "M.M." readers.

The scene of the book is a railway deviation scheme involving the construction of a large viaduct across a river. Into the midst of the intensive work involved young Robin Brand comes on holiday with his school friend Jack, the son of the engineer in charge, and the two boys enjoy themselves thoroughly exploring the extensive works in progress and taking runs along the line on the footplates of the engines engaged in the constructional work. Then trouble breaks out in the form of thefts of tools and materials. The abduction of Jack's sister, followed by the receipt of threatening letters, steps up the tension, and in the furious activity that follows Robin is given full opportunity for making use of the knowledge of detection that the pursuit of his hobby has brought him. His efforts receive generous praise from Inspector French himself, who gives him advice that helps to bring about a satisfactory ending to the case.

The book is splendidly illustrated by four colour plates and many black and white pictures.

"RAILWAY MODELLING IN MINIATURE"

By EDWARD BEAL
(Percival Marshall and Co. Ltd. 10/6 net)

This is the third edition of a well-known work. Mr. Beal is an authority on miniature railways and their operation, specially experienced in 00 gauge work, with which the volume deals. What he has to say on the subject is the outcome of practical work, largely in connection with his own "West Midland" lines, scenes on which provide many of the excellent illustrations in the book.

Mr. Beal begins with a section on the advantages of the chosen gauge, after which he passes on to track work and layout design. Next we come to model railway buildings, with general hints and specific examples in two chapters that are full of useful information and advice. Rolling stock and motive power are fully dealt with, and the picture is then completed by a section on scenery in which Mr. Beal is at his best.

A chronicle of the development of the author's own layout and a survey of American products and practice complete a very fine book.

"MODEL PETROL ENGINES"

By EDGAR T. WESTBURY
(Percival Marshall and Co. Ltd. 7/6 net)

This handbook, by a writer with 25 years' practical experience with almost every known type of model petrol engine, will appeal to all model engineers interested in these power units. To-day petrol engines are extensively used in model aircraft, power boats and racing cars.

After a very brief survey of the development of miniature petrol engines, the author explains the general principles on which these work, with separate accounts of the four-stroke and two-stroke engine designs. Other chapters go fully into such important matters as carburation, ignition, lubrication and cooling, operation and maintenance. The many excellent illustrations include sectional line drawings and half-tone reproductions and photographs of a variety of model petrol engines.



The S.R. Royal Train, Portsmouth to Waterloo, passing Esher on 12th May, 1947, when the Royal Party travelled to London at the conclusion of their South African tour. The engine is No. 850 "Lord Nelson." Photograph by C. R. L. Coles.

Railway Notes

By R. A. H. Weight

L.M.S. Locomotive Developments

New class "5" 4-6-0 mixed traffic locomotives continue to come into traffic. Nos. 4783-8, built at Horwich in April, are allocated to shed 5A, Crewe North; Nos. 4768-70, constructed at Crewe, have gone to 29A, Perth shed; and Nos. 4771-2 are at 32A, Inverness. Further rebuilds with the latest tapered boiler are No. 5514 "Holyhead," of the "Patriot" class, now "6P," and No. 6139 "The Welch Regiment," a "Royal Scot."

The class "4F" former Glasgow and South Western inside cylinder 2-6-0 type is extinct on account of the withdrawal of No. 17829. Other once familiar Scottish types to be completely withdrawn from service are the Highland Railway "3P" early "Castle" class 4-6-0s; the "Dunalastair III" Caledonian 4-4-0s, also dating from about 1900; and the same company's small 0-4-2 saddle tank with 3 ft. 8 in. driving wheels constructed in 1885 for the Killin branch, where weight limits were severe. This interesting little engine had lately borne the number 15001.

On those L.M.S. lines in South Wales west of Abergavenny, which seem rather far remote from the West Coast Route, standard "2P" 2-6-2Ts have taken over the working of services operated for many years exclusively by former London and North Western engines that were elderly but tough.

"Royal Scot" 4-6-0 No. 6134 "The Cheshire Regiment," repainted in new style but retaining a parallel boiler, was the centre of an impressive ceremony in April last at Chester General station. This was attended by Field Marshal Viscount Montgomery, who travelled on the footplate for a short distance. The occasion was the presentation of plaques bearing the regimental crest to be carried by No. 6134 above her nameplates. No. 6202, the "Turbomotive" 4-6-2, following a complete general repair and painting in the latest standard style, has returned to service on the Western Division. The new lightweight 2-6-0 and 2-6-2T types continue to appear for trial or general duty at various sheds.

Sliding Concrete Stop Blocks

To overcome risks of damage such as that sometimes sustained in the blackout period or by rough shunting, when wagons or other vehicles strike rigid buffer stops at the end of sidings, the Southern Railway have developed in the Western Divisional workshops a concrete stop block weighing 19 tons.

This consists of five sections easily portable to the site and there fitted together with tie rods. The complete unit is mounted on a steel skid frame that will move on impact, so minimising the effect of a collision.

During a test a rake of wagons weighing 104 tons struck the new stop block at 6 m.p.h. without damage, pushing it back only 10 ft. into a heap of granite chippings. The stop block is fitted with a wagon type draw-bar and coupling hook in front, so that a locomotive can draw it into normal position again if it is pushed too far.

We understand that such stop blocks are being introduced on the G.W.R. They are often seen in France.

L.N.E.R. News

New "B1" green 4-6-0 locomotives continue to appear on many parts of the system from Darlington Works, also from the plants of the North British Locomotive Co. Ltd. and the Vulcan Foundry Ltd. Those from the latter so far bear numbers 1140-59. The hundredth "B1" built at Glasgow, No. 1139, appeared on 1st April last, the series continuing as ready from 1190 to 1339. The named ones constructed at Darlington now include No. 1021 "Reitbok"; No. 1022 "Sassaby"; No. 1023 "Hirola"; and No. 1024 "Addax." The last-named is stationed at Tweedmouth near the Scottish border, the others at Heaton, Newcastle. No. 1020 "Gemsbok" is the 2,000th engine built at Darlington since the present series of Works numbers was instituted some 60 years ago, though much of the work in the early days was actually done at Gateshead. Five rebuilt 4-6-0 "Sandringhams," class "B2," are shedded at Colchester. Another "C1" former G.N. large "Atlantic" has been through shops and returned for a further spell of service; this is No. 2885, formerly No. 4455.

The new high-pressure "Pacifies" with 6 ft. 2 in. driving wheels now under construction at Doncaster are officially classed "A2/3" and are numbered up to 524. No. 521 "Walling Street" was out on main line trial in May, painted green, on the same day as No. 16 "Silver King," streamlined "A4" in spotless blue and chromium which had just completed works overhaul; No. 113 "Great Northern," a modified "A1," is not being streamlined at present, but has lost her experimental blue shade of paint for the standard green. It is reported that some of the "03" 2-cyl. 2-8-0s, the first Great Northern mineral engines of that type, are to be withdrawn, as so many of the Ministry of Supply "Austerity" type modern 2-8-0s are working on the L.N.E.R.

On account of severe flooding round about Selby, in Yorkshire, and at Tottenham, in the Lea Valley, trains had to be diverted in March last from the Doncaster-York, Leeds-Hull, and Great Eastern

Cambridge main routes, so that many unusual locomotive workings were observed on branch or alternative lines. As during the exceedingly severe periods of snow and ice, just before, prompt measures were taken to keep the traffic moving by whatever means were available.

Southern Tidings

"West Country" 4-6-2 locomotives are in hand up to No. 21C 170. We are informed that Nos. 21C 158-64 are all being stationed at Nine Elms, several being there at the time of writing and running to Bournemouth and elsewhere from Waterloo, Western Section. Nos. 154-7 are on the Eastern Division, working from Stewart's Lane, London, or Ramsgate sheds, all being intended to be shedded at the former. Engines of this type are working to or from Folkestone, Dover and Victoria on Continental boat trains weighing over 400 tons, as the "Lord Nelsons" and "King Arthurs" did before the recent war. Many of these light "Pacifics" are to carry a new series of "Battle of Britain" names, commemorating war leaders, famous fighting aircraft of those 1940 days in S.E. England, squadrons and notable aerodromes. Great names already chosen include "Winston Churchill," "Lord Dowding," "Fighter Pilot," "Hurricane," "Spitfire," "Biggin Hill," "Manston" and "Croydon."

No. 850 "Lord Nelson," the pioneer 4-cyl. Maunsell 4-6-0 of the well-known class, was chosen to head the Royal Pullman Car train on the occasion of the departure as well as the return of the Royal Family in connection with the Royal visit to South Africa. The day of departure was cold and snowbound, that of the return sunny and fine with Hampshire and Surrey country looking grand; in each case, however, the engine and the train looked superb, with No. 850 in latest style paint and equipment. Mr. C. R. L. Coles has favoured us with the good photograph of the return special passing Esher, Surrey, reproduced this month.

Several "B4x" 4-4-0s lately stored are now back at work, but none of the original "B4" tender engines appears to be running at the time of writing. No. 2042 of that class has been scrapped. Other



L.M.S. fast goods train from London to the North passing King's Langley, Herts., hauled by new class "5" 4-6-0 No. 4905. Photograph by C. R. L. Coles.

withdrawals include the veteran Stirling "F1" 4-4-0 No. 1205, built 1883, and the sister engine No. 1062; "B1" 4-4-0 No. 1101; "Jubilee" 0-4-2s Nos. 598, 609, 634 and 638; "K10" Drummond 4-4-0s Nos. 138, 342 and 387-8. No. 201, "02" 0-4-4T, has been renumbered W34 and named "Newport" for service in the Isle of Wight.

Many W.D. 2-8-0s are being renovated at Brighton and Eastleigh.

The first of the main line electric locomotives, C.C.1, was recently overhauled at Durnsford Road shops, Wimbledon, after attaining an enormous mileage since first entering service. She was lately noted, painted light green with yellow lines, like the steam "Pacifics," passing Three Bridges almost noiselessly with a Horsham freight train.

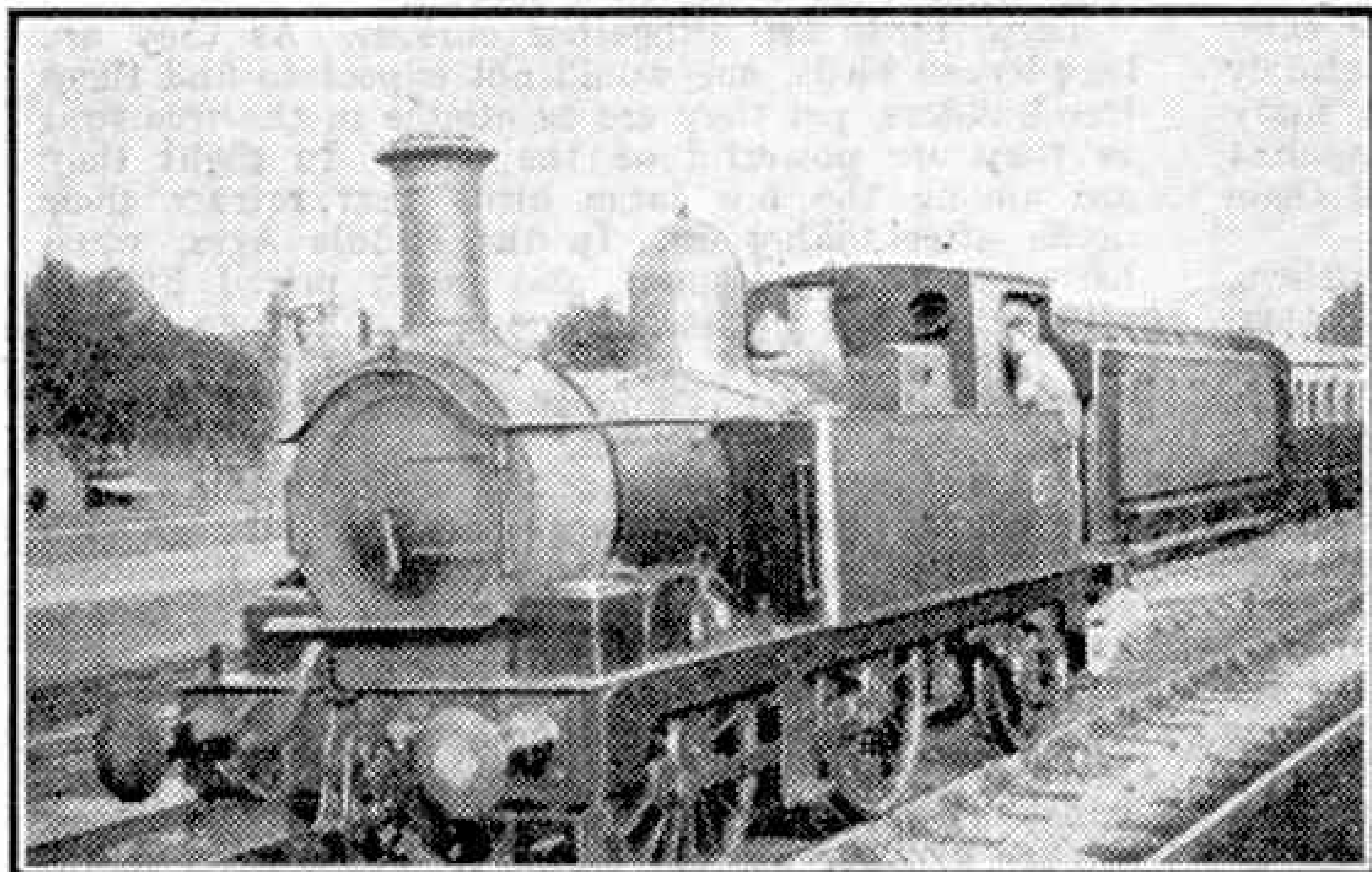
No. 83, "B4" dock 0-4-0 tank, was lately shunting at Brighton, afterwards travelling on light via Hastings and Ashford to go on loan to a Kent Colliery; No. 89 of the same class is now at Brighton. Their usual haunt hitherto has been Southampton, Eastleigh or Winchester.

Experimental Dining Cars on the L.M.S.R.

Increased floor and table space, separate chairs for seating, double glazed windows and improved lighting, heating and ventilation are special features of two experimental restaurant-cars equipped by the L.M.S. These are the forerunners of five first-class and five third-class cars to be completed as soon as possible. New type table lighting, less cramped movement for passengers and attendants, rubber insulation to prevent vibration, Dunlopillo-filled cushions, metal luggage racks and flush fitting carpets are also notable features of the equipment. There are as usual tables for two passengers on one side of the gangway, and for four on the other. The first two cars for first-class passengers are running in the Euston-Manchester service (car with kitchen), and on Euston-Birmingham-Wolverhampton expresses respectively.

New Streamlined U.S.A. Diesel Expresses

The Union Pacific Railroad has developed during the past 10 years a fleet of fast, streamlined expresses hauled by diesel-electric locomotives of great power. These are known as the "Cities" trains and are now in daily operation between Chicago and Portland, Chicago and Denver, and Chicago and San Francisco and Los Angeles. The "City of Los Angeles" streamliner was inaugurated in 1936, with five round trips a month. Now five new trains provide a daily service in each direction in 39½ hrs.



One of the old-style G.W.R. 0-4-2Ts, then numbered 213, at Weymouth in 1932. Photograph by W. Hardin Osborne.

Birds in Flight

Secrets of Wing Action

By R. H. Ferry

THE generally accepted explanation of the mechanics of bird flight is that the up and down wing action resolves itself into forces that give both forward speed and lift. There is another school of thought, however, which I bring to the notice of Meccano readers in this article. According to this, flight depends on a kind of valve action, and the idea shows how wide the field still remains for original thought and observation by amateur or expert.

To the casual glance the flight of a bird depends simply on the flapping up and down of wings. In actual fact there is a great deal more to it than this. Bird flight is accomplished by a complicated wing mechanism and flying technique that is nothing short of miraculous.

On consideration it will at once be appreciated that if flight depends only on an up and down action, the down stroke would send the bird up, but the up stroke would have the opposite effect and send the bird down. Even if flight were possible in these circumstances, it would be an alternating jerky progress far from the smooth passage through the air that we see. In reality flight depends on a co-ordination of the bones, muscles, and feathers that go to the make-up of a wing. Feathers are well suited for the task; they are light, but at the same time durable and strong enough to fan the air. The muscles are elastic, and the bones, which I refer to again later, have strength coupled with the lightness that of course is all-important.

The feathers, all of which grow out of the skin, are of two kinds or qualities. There are strong closely webbed feathers, and equally important soft fluffy feathers. These two types lie in layers one against the other, and on the action of the air against them rests mainly the secret of bird flight.

During the down stroke the two layers of feathers, the soft lying beneath the hard, are forced together, and thus form a compact air-resisting fan. On the up stroke the soft feathers open up from the closely webbed ones and allow the air to filter through. This natural valve action of the feathers resembles the washer valve action in the foot of a water pump. In the water pump the action is reversed, however, for here the valve closes on the up stroke, bearing the water with it.

In bird flight the valve action is helped by the co-ordination of an elastic-like band that runs along the whole length of the wing and is attached to the quills of the main flight feathers near their base. The elastic band contracts during the down stroke, and then helps to hold the wing compact. As the wing rises on the up stroke it stretches, and the

effect of this is to allow the feathers to open out.

The actual movement of the wings also co-operates with the quill band and feather valve action. The wing tip describes a double curve when viewed from the front in a horizontal plane, and to some extent the air is spilled out behind and the bird is propelled forward as the wings move. The extent of this movement varies with different birds.

Another point to bear in mind is that on each down stroke of the wings the bird rises slightly at the head. This is easily observed in a gull flying slowly. If another stroke of the wings is not at once made the bird goes into a forward glide on a slightly downward plane.

Each bird has a particular technique in flight and a wing design to suit its own needs. Some birds, such as the small tropical humming birds, flap their wings so fast that they can "tread the air" and suck at a flower head. Their wings are geared for both fast and slow action, while other birds, such as our own herons, have a slow wing beat that is easy to watch. The speed or performance of a bird's flight depends on the cut or design of the wings rather than on the number of wing beats to the minute.

The herons are grand birds to watch in flight. One cannot mistake their slow, arched, wind-filling beat for that of any other bird. Though the beat is slow, alarmed herons can take off and make away out of gun-shot distance at high speed; I have timed them to fly



A hen Montague's Harrier in flight. Photograph by Eric J. Hosking, F.R.P.S.

with three wing beats to a second.

These birds are altogether curious. As they are long-legged birds, one would not expect to find them tree builders, yet they are as nimble in the tree tops as they are powerful on the wing. In flight they are among the few large birds that retract their necks after taking off. In the Middle Ages, when herons were royal game and much prized by the King's hawking parties, they towered high to out-fly the falcons "set on" them. Now that they are no longer hunted, herons appear to fly straight and the spiral ascent is rarely seen.

It is curious to note that the wings of our fastest flying birds, the swifts, work independently of each other. The long flight feathers are used as directional guides and in banking at speed. These birds eat and drink on the wing.

The silent night-flying owls, which get their food hunting cautious mice and small rodents, have a soft feathery pad on the front margin of their wings, which renders their flight quite silent. Here then we see another use for feathers. The kestrel hawk, known as the wind-hover, brakes with its tail while it beats hard with its wings. This enables the bird

to remain steady in the air while it scans the ground below for food with its unbelievably efficient long-distance sight. Both owls and hawks will also fan the long grass at close range when in search of mice.

Buzzards belong to the hawk family of predatory birds, but unlike these fast flyers they are experts at slow gliding flights. They have broad wings with a rather rounded tip. The wing stroke is slow, almost tired in appearance. Often on the stillest day one may watch these big brown birds slipping from one air current to another, ascending in flat or steep spiral circles, or gliding to lower levels. Though no wind can be felt on the ground the upper air is clearly defined to the watcher by their movements.

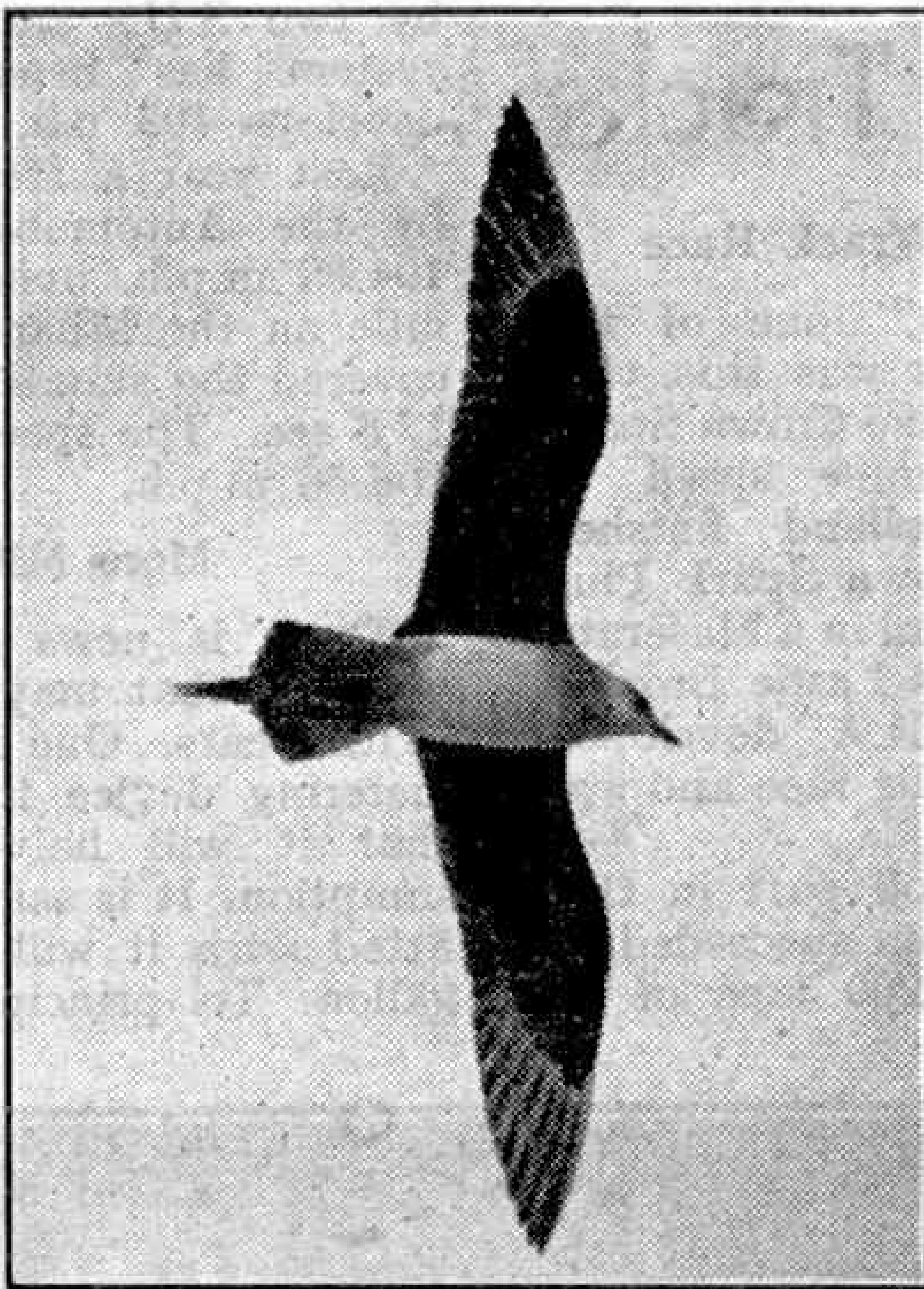
All the gull tribe are grand flyers. Probably the greatest masters of sustained flight are the albatrosses, which have a wing span from tip to tip of 14 ft. These birds have been seen 1,000 miles from land. The neat clear-cut wings of deep-sea birds enable them to skim low to the valleys in the waves and to rise steeply over their crests. Special mention should be made of the storm petrels called by seamen Mother Carey's chickens. These birds are no longer than sparrows, and so expert are they that they appear to run over the water itself. The strong flying fulmars and the shearwaters, with their long narrow wings, also come in this class.

In 1946 we heard a good deal of a golden eagle which was released in its Highland fastness after a period of captivity in the Zoo. These birds, now extinct in England, have such a strong "lift" that they carry off lambs, and it is said that on one occasion a shepherd's child was kidnapped, but fortunately dropped unharmed.

According to an interesting legend the eagle is not the King of Birds. The story goes that a wren hid on the eagle's back when there was a competition for the altitude record. When the eagle could fly no higher this little wren had flown higher than all the other birds and so rightly wears the crown!

Of the carrion vulture-like birds, the huge S. American condor is able to glide above the snow line of its home in the Andes, at an altitude of 20,000 ft.

The bones of flying birds are air-pocketed for the sake of lightness. The quaint, non-flying penguin on the other hand, is very heavy for its size and has more or less solid bones. Here is an interesting contrast in size. Mr. Brian Vesey FitzGerald, the well-known naturalist, states that the golden-crested wren, our smallest bird, weighs no more than a single sheet of paper in an envelope, and has a body no bigger than that of a humble bee. In spite of this it can do



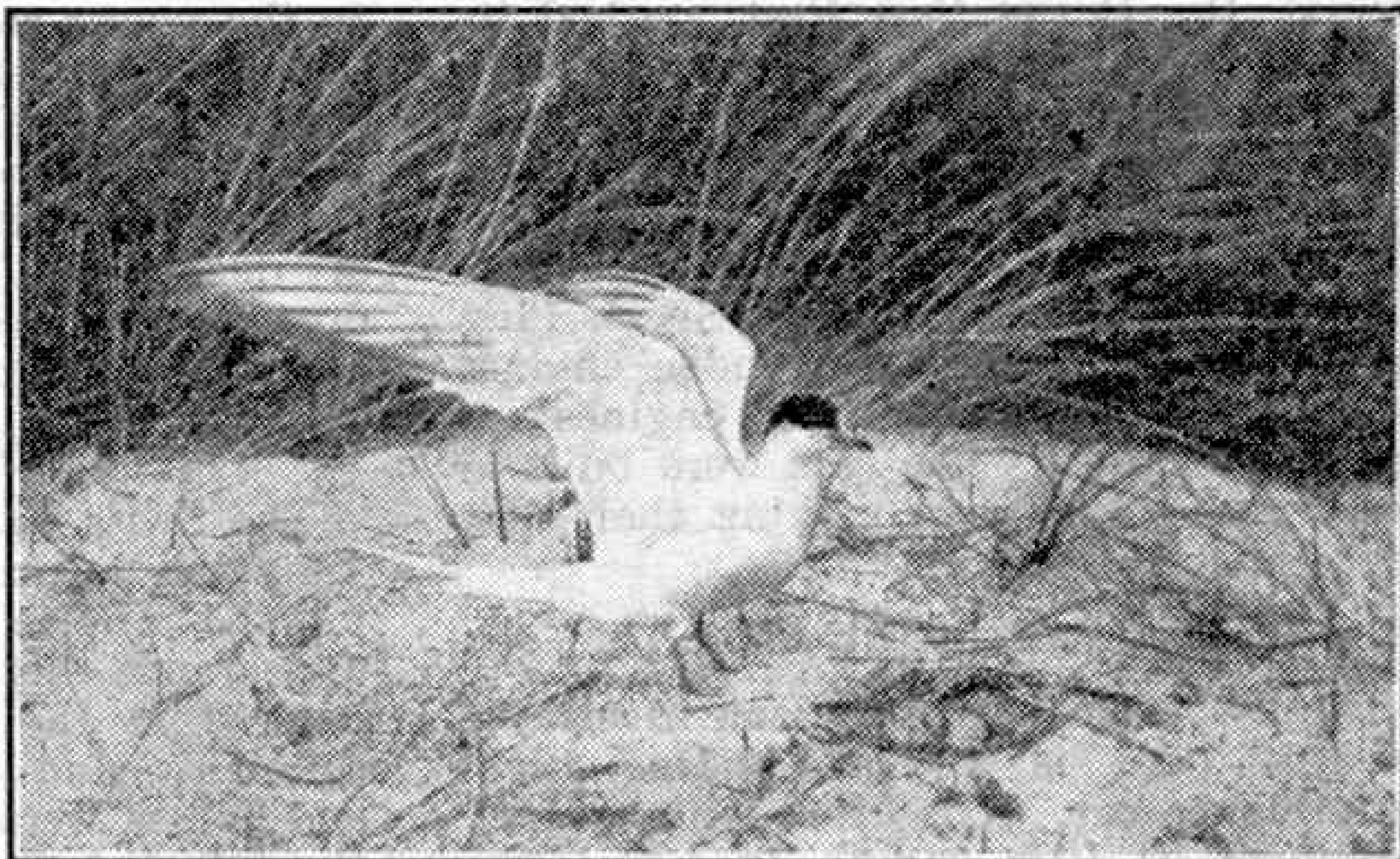
The Arctic skua. Photograph by Eric J. Hosking, F.R.P.S.

evolved. This made it easier, no doubt, for the creatures to run faster, and take mighty leaps and bounds.

Birds have descended from the tree-climbing reptiles or from lizard-like creatures which walked on two legs. In either case with the advent of feathers these early creatures soon saw the possibility of flight, and wings, as we know them to-day, developed. The archæopteryx were not unlike the modern bird, but they retained clawed fingers on their wings. These fingers can still be seen on the fore margin of the wings of the modern species, but they are now joined together in one bone. The young of the South American bird, hoatzin, scrambles up trees using these "pre-historic claws."

Another similarity between birds and reptiles is, of course, that they both lay eggs.

Birds fly to find food and suitable climates in which to live, and to escape from their enemies. It is not surprising that they are masters of the art.



A tern on the point of landing. Photograph by H. Vickers, F.R.P.S.

non-stop journeys of 400 miles.

There is no doubt that birds make use of thermal currents and cloud formations to gain height and speed.

Whatever the bird's size, a good deal of strength is required for the downward thrust of the wings. The power needed is generated by the biggest muscle in the bird's body. This is attached at one end to the forearm bone in the wing and at the other to the breast bone. To ensure that there is no waste of effort, the feathers are made concave on the under side and convex on the upper.

It is difficult to imagine that the graceful, free-flying birds of to-day are zoologically related to reptiles, but there is too much evidence as to leave any doubt in our minds.

As the world became cooler, the scales of the earliest reptiles gradually developed to give warmth to their otherwise naked bodies. The scales probably split or became frayed along the edge of the arms, feathers

Road and Track

The 500 Indianapolis Track Race

The "500 Indianapolis," one of the greatest racing car events was this year won by Mauri Rose in a Blue Crown Spark Plug Special at an average speed of 116.338 m.p.h. Bill Holland finished second, also in a Blue Crown Spark Plug Special, with Ted Horn third in a Maserati. The only British entry was Leslie Brooke, but unfortunately his E.R.A. developed gear-box trouble prior to the race and was unable to qualify.

Over 30 competitors took part in this year's event, but only seven succeeded in completing the gruelling 200 laps of $2\frac{1}{2}$ miles each. The start in this race is a rolling one, the competitors making a circuit of the track behind the starter, who then turns off the track and gives the signal to start racing. The first lap speed of 122.5 m.p.h. was a record, and a new record of 124.2 m.p.h. also had been made at the end of four laps. The two Blue Crown Spark Plug Specials were in the lead at 100 miles, the first car's average then being 120.14 m.p.h. Another special, the Bowes Seal Fast, pushed its way into second place at 200 miles, and later actually led for a short time, but Rose and Holland regained their positions and the two then led the way to the end of the race.

The successful Blue Crown Spark Plug Specials have $4\frac{1}{2}$ -litre 4-cylinder engines with front wheel drive. The engines are not supercharged. The cars were built in Los Angeles and were making their first appearance in a race.

A Fast British Car

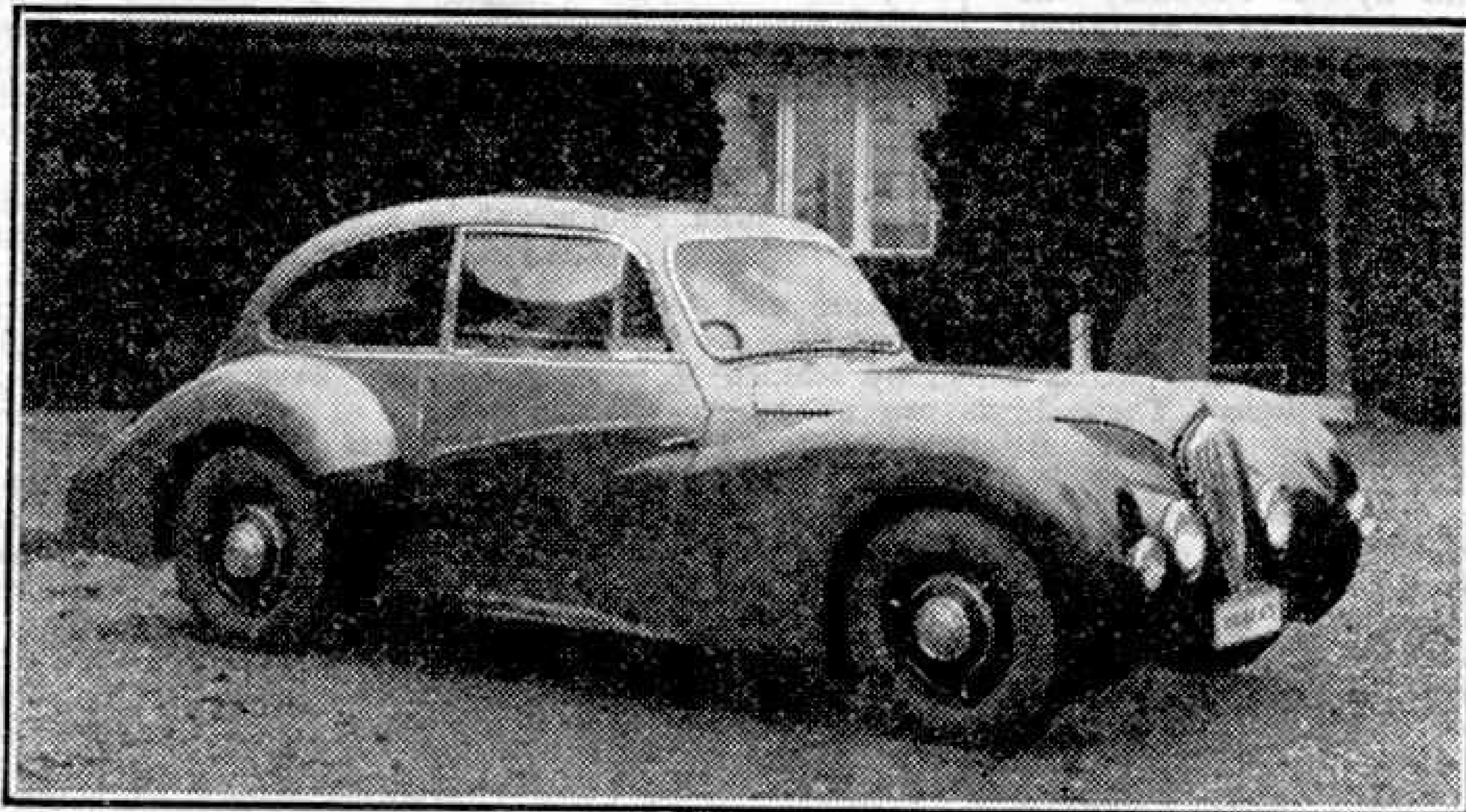
The 2.4 Litre Healey Saloon illustrated on this page is an outstanding high-performance car. It is fitted with a Riley 4-cylinder $2\frac{1}{2}$ litre engine, in which the down-draught carburettor has been replaced

by two S.U.s and an easy-flow exhaust system has been fitted. The engine develops 103 b.h.p. at 4,500 r.p.m.

Last year a Healey Saloon was timed by the Automobile Club of Milano at 104.65 m.p.h. over a flying quarter of a mile on the Milan-Como Autostrada, and covered the standing start quarter mile in 17.8 sec. The speed over a kilometre was 106.56 m.p.h.

More Miles per Gallon

There is news of two interesting inventions that may eventually be seen on British cars. One is a new carburettor or metering device for which it is claimed that it will halve normal petrol consumption. It is said that a 12-16 h.p. car fitted with it will cover 50 miles to the gallon. Its principle is the injection into



The 2.4 Litre Healey Saloon. Photograph by courtesy of Donald Healey Motor Co. Ltd.

the engine of an accurately measured quantity of petrol directly proportionate to the power required.

The second invention is a new gearbox. With it gear selection is just a matter of pressing a button on the gear lever, which can be placed either on the steering column or dashboard. The clutch is electrically operated at the same time, so that a clutch pedal becomes unnecessary.

Italian Victory in the Swiss Grand Prix

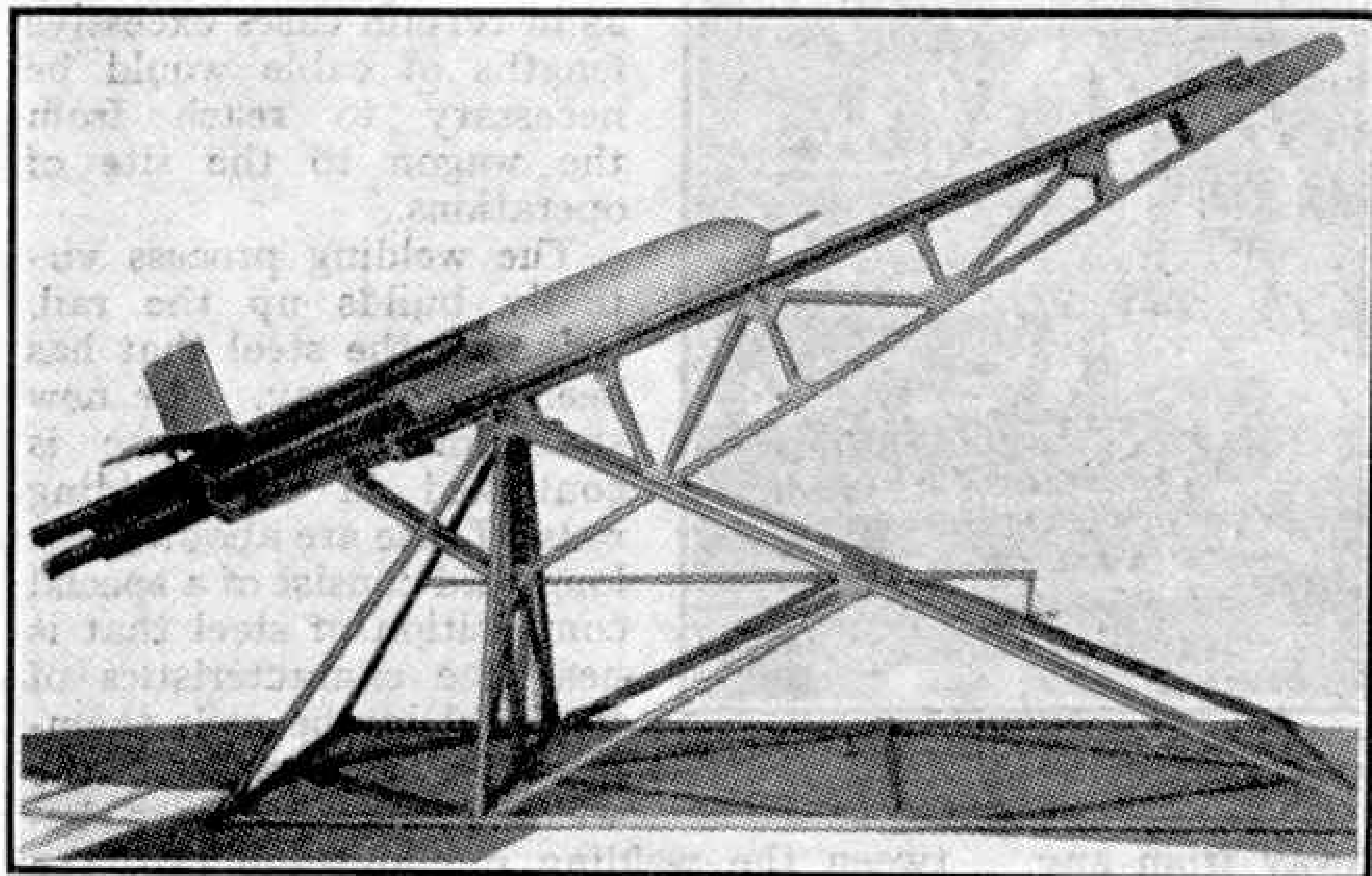
The Swiss Grand Prix at Berne on 8th June was the occasion of a distinct triumph for the Alfette team, making their first appearance this year. Three of these cars, entered in the race by the Alfa-Romeo company, and driven by Wimille, Varzi and Trossi, were the only ones to complete the full distance in the final. The winner, Wimille, also achieved the fastest lap time.

The Fairey Guided Missile

By John W. R. Taylor

ONE of the most potent weapons used by the Japanese in the Pacific War was the suicide aircraft. Hundreds of these 'planes were shot down, but a proportion inevitably got through and crashed at full speed into Allied ships,

work vigorously with the result that, in spite of the great many problems that had to be overcome, the prototype was designed, built and test flown only seven months after its specification had been finalised.



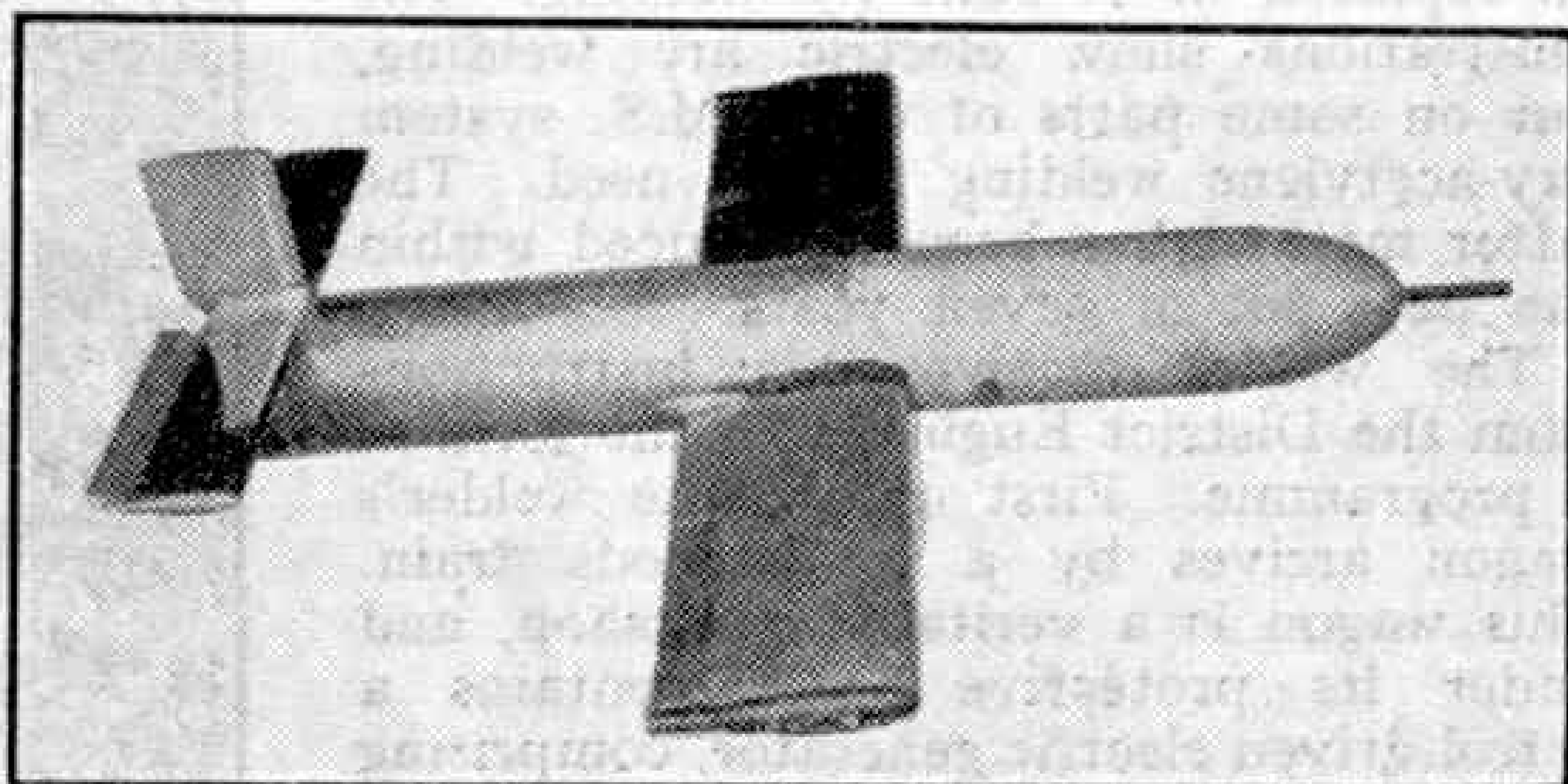
blowing themselves up with their target. To combat this menace, British and American scientists and technicians were given the task of developing as quickly as possible a series of short-range guided anti-aircraft missiles. The Americans actually used their "Little Joe" rockets with some success before the war ended, but details of the more advanced British counterpart—the "Stooge"—have only recently been released.

The development story of the "Stooge"—or, to give it its official name, the Fairey Guided Missile—began in the summer of 1945, when the Research Division of the Fairey Aviation Company was selected by the Ministry of Aircraft Production to design and construct Britain's first guided missile. While the preliminary discussions were in progress, Japan capitulated. Naturally, that meant that there was no longer any urgent need for quantity production, but the Ministry requested that work on the Fairey missile should continue on a research basis. The Fairey engineers set to

The specification laid down strict size limits for transportation and storage, and required a weapon that was easy to manufacture and assemble for action. Consequently the "Stooge" was designed as a series of components that, by the use of spigots and quick-release pins, could be assembled by a team of four men in less than 1½ minutes. It is, in effect, a small all-metal monoplane of 6 ft. 10 in. wing span,

with a loaded weight of 738 lb. Its 250 lb. warhead is contained in the fuselage nose, aft of which are the control motors and, at the rear, four 75 lb. thrust rocket motors.

For take-off it is mounted on the rails of a light, tubular ramp, some 10 ft. high, take-off being assisted by four standard 3 in. anti-aircraft booster rockets. The latter are automatically jettisoned after two seconds, from which time the "Stooge" comes under the control of the operator on the ground. He "pilots" it by means of a "joystick" mounted in a small control box, the radio signals (Continued on page 302)



The Fairey Guided Missile. The upper photograph shows it mounted on the ramp from which it takes off assisted by rockets. Photographs by courtesy of The Fairey Aviation Co., Ltd.

Welding in Permanent Way Maintenance

By "S.M."

HAVE you ever thought, when travelling in an express train, of the terrific strain and wear imposed on the metals? It is heavy enough to warrant regular

wheels and so on. It is so positioned in a siding as to allow the flexible cables to reach the first sets of points and crossings to demand the welder's attention. If

necessary, the generating plant can be manhandled to sites adjacent to the work, as in certain cases excessive lengths of cable would be necessary to reach from the wagon to the site of operations.

The welding process virtually builds up the rail, replacing the steel that has been worn away. The new steel for this purpose is contained in the welding rods. These are about 18 in. long, and consist of a special composition of steel that is near the characteristics of the steel in the rails themselves. In practice, the welder strikes an arc be-

tween the welding rod and the rail, the rail acting as a negative to his electric arc plant.

In oxy-acetylene welding, on the other hand, the blowpipe melts the metal in the welding rod and heats the rail steel



A permanent way welder at work, showing the specially fitted wagon with all the gear.

renewal of the rails miles away from any points and crossovers, but is heaviest over crossings, those seemingly involved-looking "Vees" with wing and check rails.

In the quite recent past it was necessary frequently to replace the wing rail, due to the excessive wear. Just about 1939, we on this branch of the L.M.S. Railway were to see something new to us in the matter of permanent way maintenance. This was the application of welding, which had already been brought into use on the main lines of the L.M.S. about 1930-31. In practice, the idea was that any wing rail and crossing-nose metal which has been worn by the action of traffic would be replaced or re-built by welding. The illustrations show electric arc welding, but on some parts of the L.M.S. system oxy-acetylene welding is also used. The latter method has been introduced within the past six or seven years.

The welder receives his instructions from the District Engineer, in the form of a programme. First of all, the welder's wagon arrives by a local goods train. This wagon is a veritable workshop, and under its protective sheet contains a petrol-driven electric generator, comprising internal combustion engine, electric generator and all the additional accessories that will be needed, such as cables, grinding



The welder building up a wing rail. Note the spare welding rods in the box.

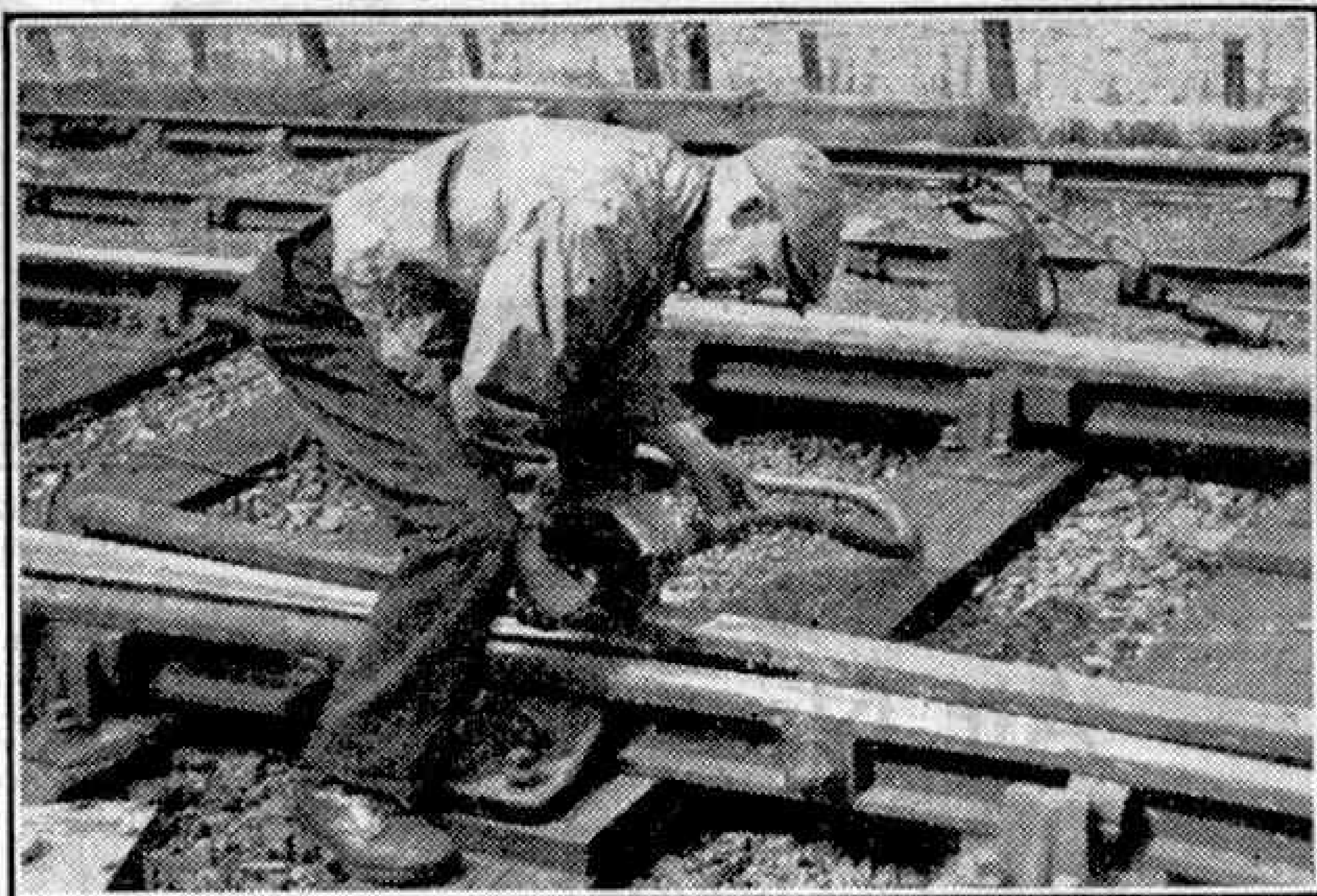
sufficiently so that the two metals become a homogeneous whole.

When the welder has finished each spot, the grinder faces his main job. It is to "iron out," as it were, all the little uneven places to ensure a smooth and finished surface. In this he succeeds so well that one has difficulty in observing where the original steel ends and the weld begins. Finally the welder puts his "trade-mark," actually the month and year welded, on to a portion of the check rail, thus—"7.46." The Engineer's Inspector can then see at a glance when to include that particular spot in the welder's future programme.

The Company lay it down in the regulations that a lookout man must be provided for this work, or indeed any similar work. This is as it should be, for the hissing of the arc, coupled with the exhaust of the engine and the hum of the generator, make it extremely unlikely that the welder would hear any approaching train.

When the two men have dealt efficiently

with all worn wing rails and crossing noses in my area, the apparatus is loaded on to the wagon, carefully sheeted, and the vehicle re-labelled to the next station or depot appearing on the welder's list.

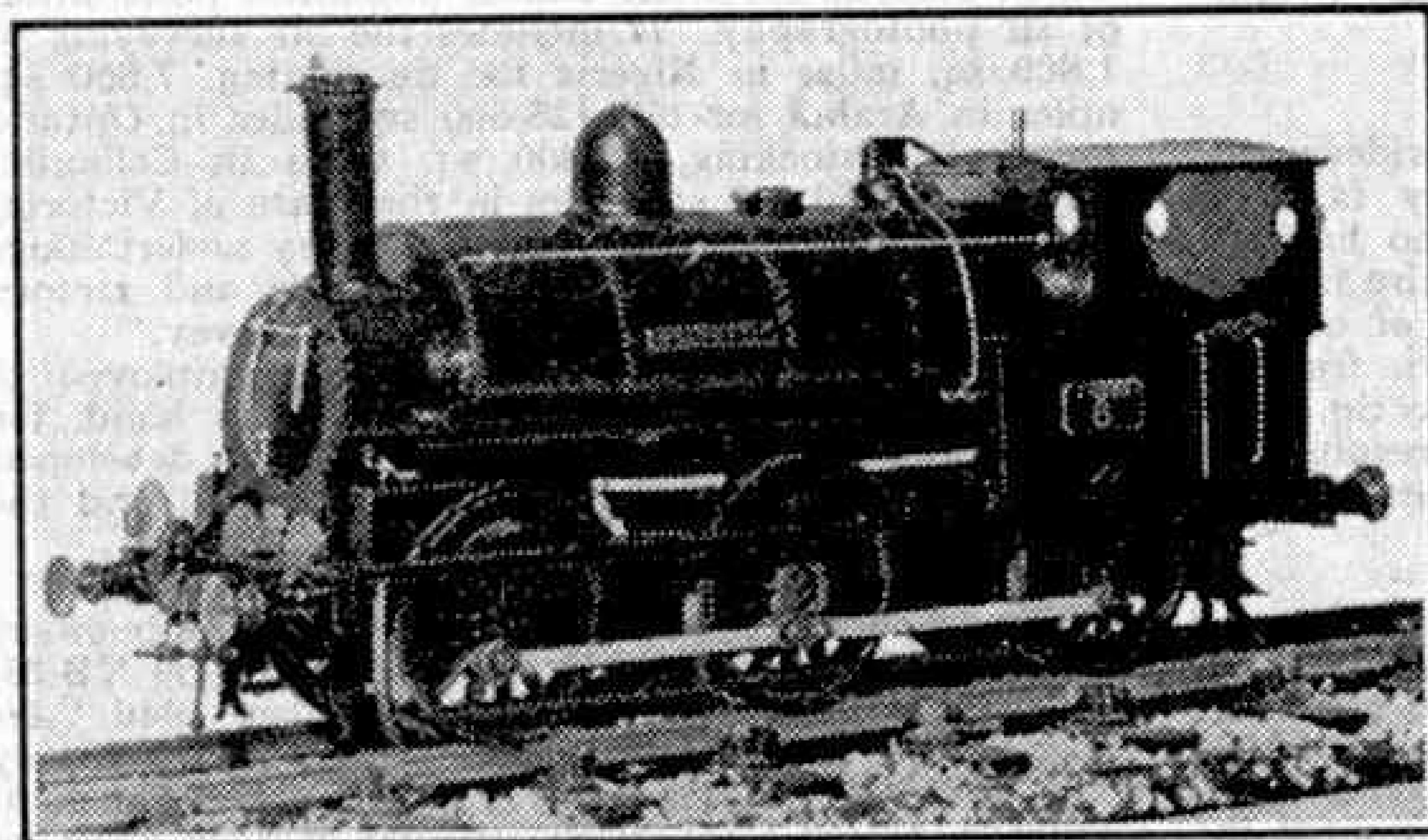


Truing up the renewed crossing by means of a portable grinder.

It is obvious that a good deal of time and money is saved, as compared with the old methods. Considerable advances are continually being made in the sphere of welding, so that these observations are not intended to be an up-to-the-minute technical discourse on the subject, but to relate simply what happens on the job.

A Notable Model Saddle Tank Engine

The illustration shows a recent addition to the railway stock of Mr. C. L. Fry of Dundrum, Co. Dublin, whose miniature railway system was described in the "M.M." last January. The engine represents veteran saddle tank "Holyhead," No. 6 of the Dundalk, Newry and Greenore railway. This is a small

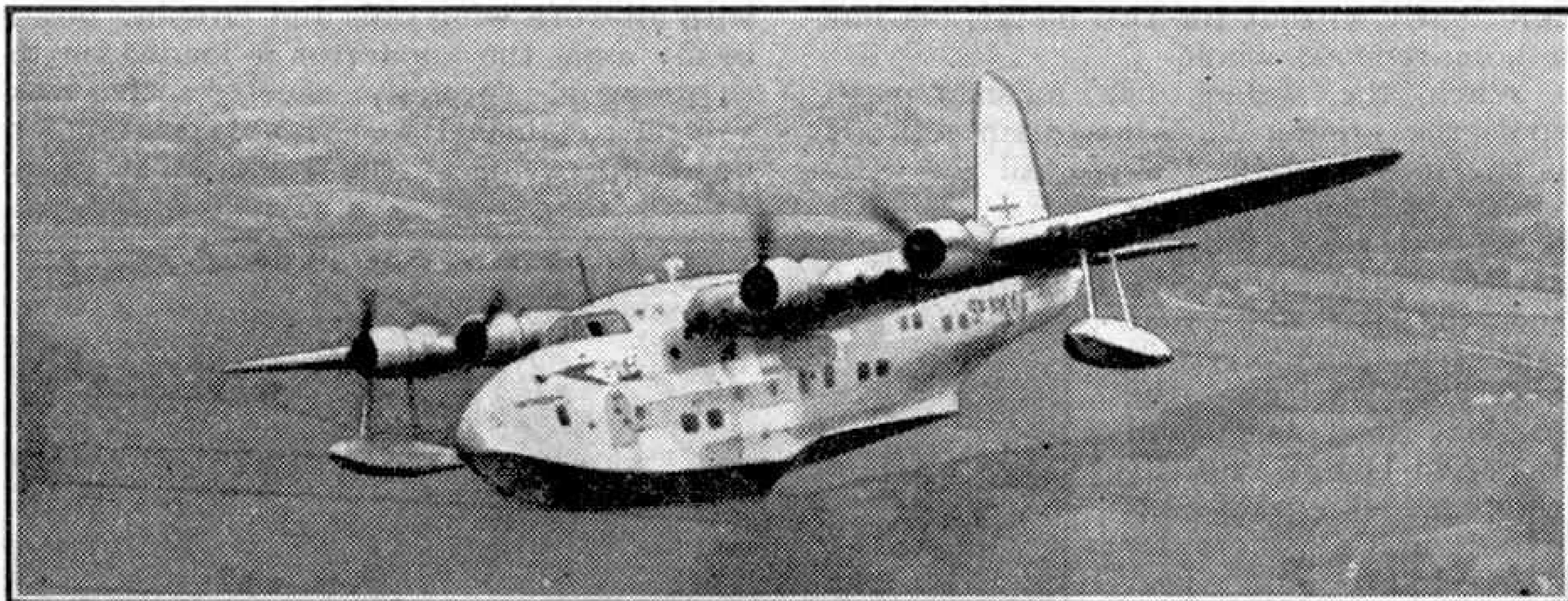


A Gauge 0 model of a Crewe-built saddle tank. Photograph by the builder and owner, Mr. C. L. Fry, Dundrum, Co. Dublin.

line once forming an outpost in Ireland of the former L.N.W.R., on which engines and coaches of North Western origin adapted to the Irish standard gauge are still to be seen. The engines were built at Crewe many years ago for this service. In general appearance they resembled the once familiar "special tanks" of the L.N.W.R. used for shunting.

The model, which is electrically driven, is remarkably complete in detail, even to rivet heads and engraved number plates. The sloping smoke-box front with its upward-opening door is prominent; while the open space inside the main frames ahead of it allows the dummy cylinder and valve chest covers to be clearly seen just as on the real engines. The brake gear reproduces the wooden brake-blocks so long a feature of the older L.N.W.R. engines, and the boiler mountings are characteristic of former Crewe practice. The situation of the coal bunker inside of the cab will be noted also the outward flare of the bunker sides and the curious side "wings," reminiscent of an old-fashioned arm-chair, curving round to the back weatherboard.

A train of typical coaching stock, nearly all 6-wheeled, has been made to run with the engine and thus complete the realistic old-time effect. These 6-wheelers have radial axles to ease the running round curves. There is also one bogie coach, unusual now in having first, second and third class compartments.



B.O.A.C. Speedbird "Plymouth" type flying boat in flight. It can seat 22 day passengers or 16 "sleepers."
Photograph by courtesy of British Overseas Airways Corporation.

Air News

By John W. R. Taylor

More Flying Boats for B.O.A.C.

Short and Harlands of Belfast are building a fleet of nine "Plymouth" and three "Bermuda" class flying boats for B.O.A.C., to operate their U.K.-Karachi service and to replace the three American Boeing boats that have put in such good service on the Corporation's Baltimore-Bermuda route. These aircraft are basically Short "Sandringham" VIIIs, but are being specially equipped for the two services. They differ from the 21 "Hythe" class boats described in the March "M.M." in that they will have a streamlined nose and tail instead of faired-over gun positions.

The new aircraft are each powered by four Pratt and Whitney "Twin Wasp" engines, and have a cruising speed of 180 m.p.h. at an all-up weight of nearly 27 tons. The "Bermuda" class will seat 30 passengers, and the "Plymouths" have accommodation for 22 day passengers or 16 "sleepers." The Boeing boats at present operate a thrice-weekly service in each direction on the 820 miles Bermuda route, but when the new machines go into operation in the Autumn it is hoped to increase the frequency to a daily round trip. The popularity of this service with holiday-making Americans is apparent from the fact that between them the Boeings carried some 14,500 passengers on this route in the last eight months of 1946.

Farming by Aircraft

Because of the late season and the widespread floods of February and March last, many farmers were faced with the prospect of little or no harvest this year. One enterprising Northamptonshire farmer decided to experiment with aerial sowing of one of his 50-acre fields, and corn seed was sown from a Miles "Aerovan" in eight "bombing runs" by Sq. Ldr. Nelson, one of the Miles test pilots. The results are not yet known, but doubtless will be considerably better than no harvest at all.

World's Fastest Trainer

The Gloster Aircraft Company have produced a two-seat trainer version of their record-breaking "Meteor" fighter. Not only is the new machine the world's fastest training aircraft, it is also faster than the officially published top speed of any fighter in service with any foreign air force. The "Meteor" trainer is basically similar to the latest Mark IV fighter and, as this airframe has been tested at speeds

of over 1,000 km. per hr. and has been stressed to withstand loads of up to 9G (nine times the pull of gravity), it will stand up to the roughest treatment any pupil is likely to give it. Its two 3,500 lb. thrust Rolls-Royce "Derwent" V engines give it a top speed of 585 m.p.h.

The slightly lengthened fuselage houses the instructor and pupil in tandem, beneath a single continuous Perspex canopy. All controls and necessary instruments are duplicated, and a standard 180 gall. "Meteor" drop fuel tank can be carried to increase the aircraft's endurance to nearly 1½ hrs. at 540 m.p.h. No armament or other items of military equipment are carried, but air brakes are fitted to permit instruction in all the latest high-speed combat tactics. The position of the cockpits ensures an excellent all-round view, and of course complete training can be given in twin-engine and tricycle undercarriage technique and the handling of jet engines. Even the best piston-engined trainers cannot meet such requirements, and the "Meteor" trainer thus provides the necessary final link in the complete training of the modern fighter pilot.

Surveying by Air

The old and tedious method of surveying land at ground level is now largely superseded by air photography. This form of mapping made great strides during the war, and it is now possible to produce plans up to a scale of 1/1,250 and to show accurate 5 ft. contours.

The British Hunting Aerosurveys Company, specialists in aerial mapping, have work in hand which demonstrates the almost boundless possibilities of air photography. It includes the air surveying of 1,800 sq. miles in Nigeria for tin mining, 7,800 sq. miles in Arabia for oil, 125,000 sq. miles in Ontario for timber stocking, 12,800 sq. miles in Colombia for oil, and 50,000 sq. miles in the State of Victoria, Australia, for mapping. Other air survey undertakings in hand include town planning, estate and factory layout, land utilisation and geological survey.

Oblique and vertical photography is employed at various heights, according to the work in hand, for which the Williamson company have developed specialised cameras—the Eagle IX Vertical and the new O.S.C.-1.

The second of the 15 Northrop flying-wing bombers is now ready for flight. Unlike the prototype XB-35, which was illustrated in the September 1946 "Air News" and is fitted with four Pratt and Whitney "Wasp Major" engines, this YB-49 bomber has eight 4,000 lb. thrust General Electric jet engines. The jet version is faster than the XB-35, but only two of the 15 bombers will be jet powered as the piston-engine version has a more useful range.

Propeller Test Houses

Two new test houses, each capable of accommodating propellers up to 30 ft. in diameter, have been added to the experimental facilities of the Hamilton Standard Propellers division of the United Aircraft Corporation, U.S.A. They embody the latest principles of aerodynamic construction and, added to an existing battery of two 18-ft. and two 24-ft. cells, give Hamilton the most extensive privately-owned propeller testing equipment in the world.

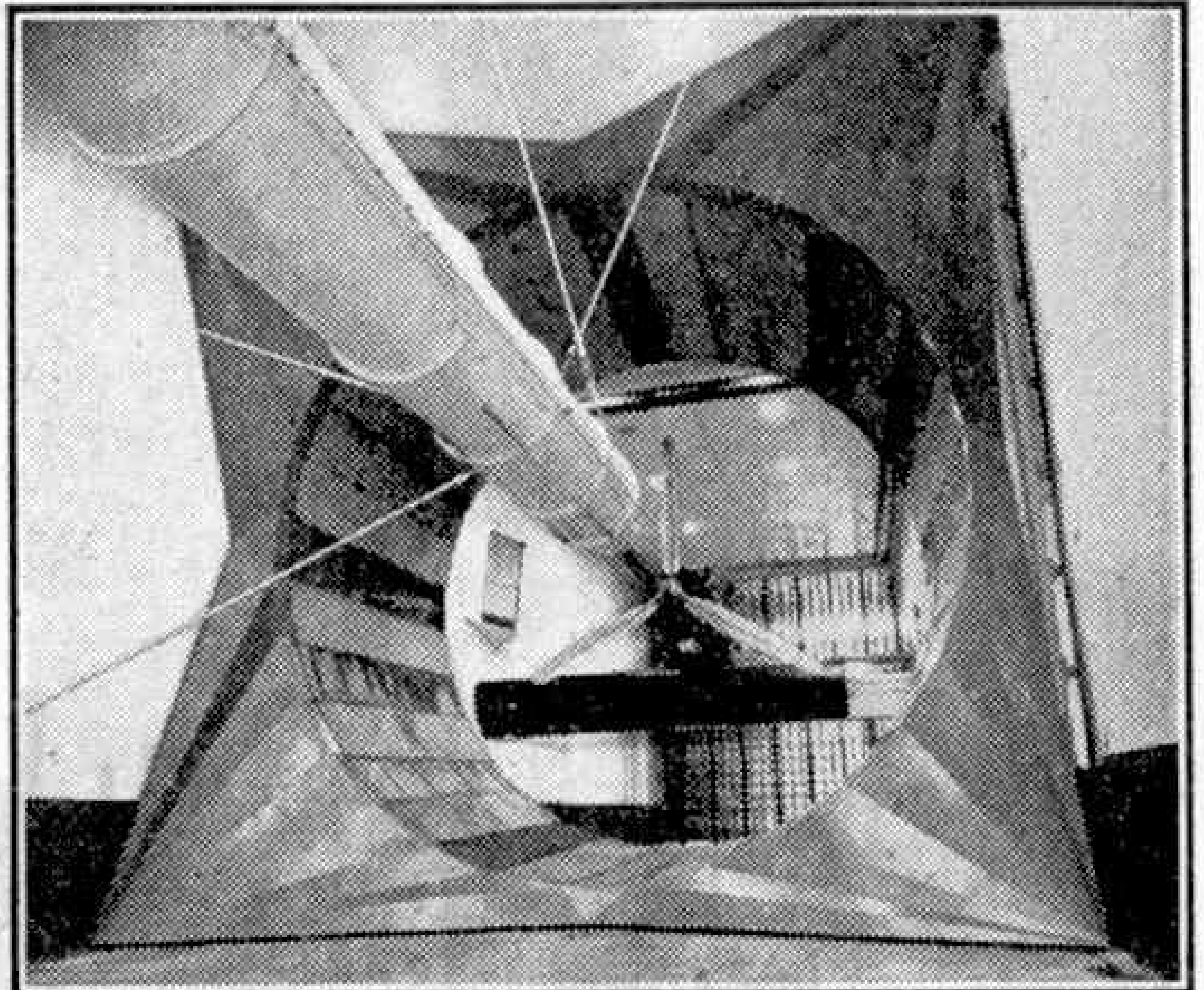
The new houses are the first to use adjustable air funnels, which smooth out the air flow through the test cells and are largely instrumental in making them the first in experimental history to be free from air disturbances. Contained in one building 212 ft. long, 110 ft. across and 63 ft. high, they are already in use testing experimental propellers for the United States Army and Navy. In them propellers are subjected to gruelling endurance tests, and checked for operational, performance and vibration standards far in excess of actual flight requirements.

The air funnels, known technically as cone-type orifices, are mounted on 40-ton structures that can be moved back and forth within each test house. They are 15 ft. long, and can be contracted to 15 ft. dia. or expanded to 30 ft. at one end. With this double adjustability the air flow within each test chamber can be restricted to conform to the size of the propeller under test. Air speeds up to 125 m.p.h. are created in the test cells when operating at full capacity. In the photograph on this page Hamilton Standard's largest hydromatic propeller, 20 ft. in dia. and one of the largest in the world, is dwarfed by the immensity of the new test cell. The adjustable air funnel is shown expanded to its full extent.

To protect employees inside the building and nearby residents from the noise of propellers and engines in test, the air is drawn into, and expelled from, each cell through streamlined sound-proofing panels. Rolling steel curtains 33 ft. square, among the largest to be built in America, cover the openings of the cells when these are not in use.

Canadian de Havilland Aircraft

Following the success of their "Chipmunk" primary trainer, de Havilland Aircraft of Canada Ltd., have announced their second design. This is the "Beaver," an all-metal, four-seat high wing monoplane designed



Testing a 20 ft. dia. propeller, one of the largest ever built, in one of the huge new test houses of the Hamilton Standard Propellers Company, U.S.A., by whose courtesy this photograph is reproduced.

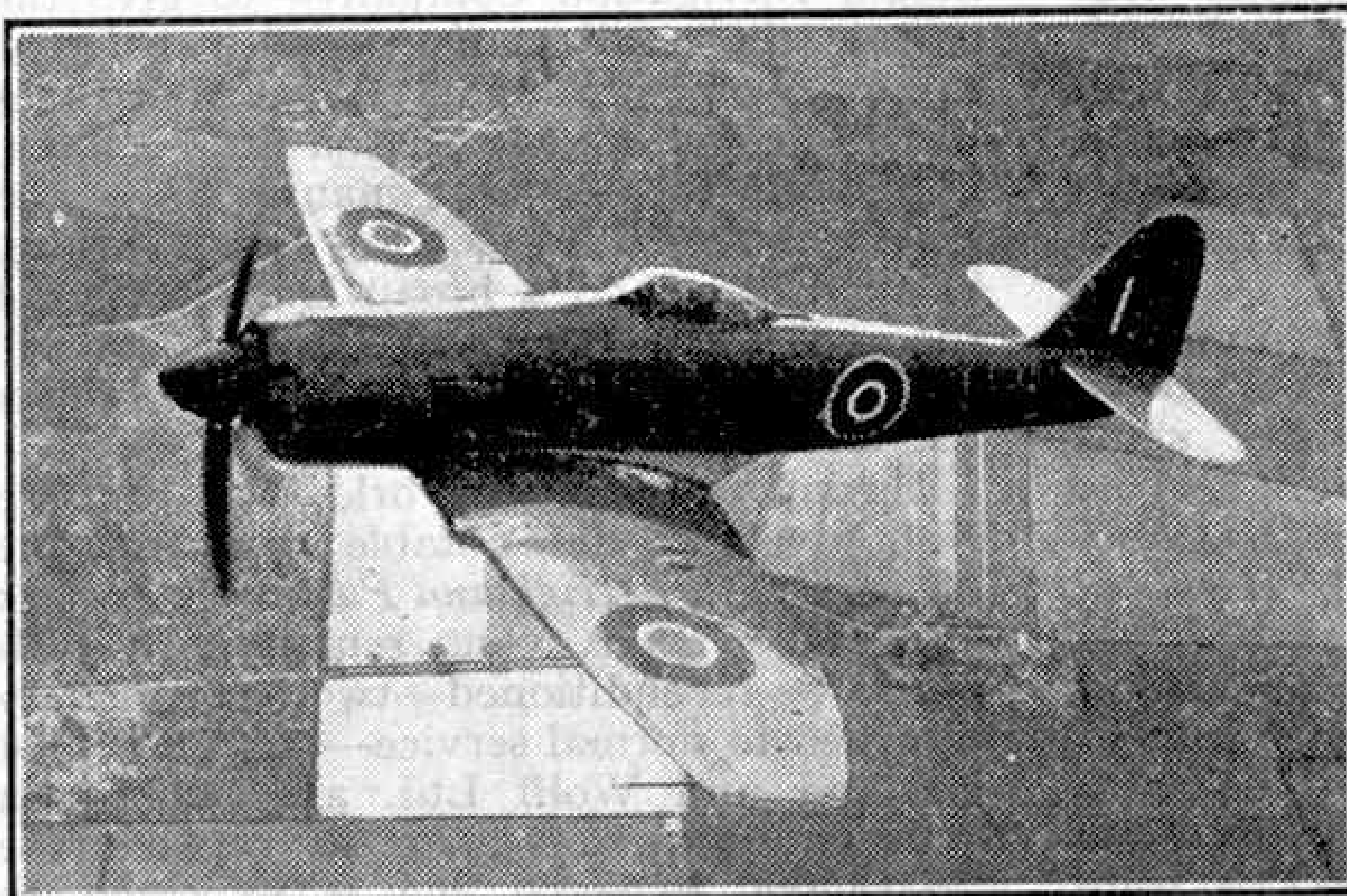
primarily for operation in the Canadian North country. It is in fact intended as a replacement for the veteran D.H. "Fox Moth" biplanes that have put in so much good service in the Dominion. Although particularly suited to the rigours of "bush-flying," there is little doubt that the "Beaver" will be in demand also from countries far away from Canada.

Some Facts about the Bristol "Brabazon"

Most people who have seen pictures of the Bristol "Brabazon" air liner now under construction must have been impressed by its great size, but probably few have realised how vast and intricate a project it is. For instance, the 200 v. alternating current electrical system of this aircraft uses no less than 31 miles of wiring. The prototype will contain more than 1,500,000 rivets, and despite the extensive use of full-scale lofting, still requires more than 12,000 drawings for its construction. Its wing span of 230 ft. is 30 ft. more than the distance separating the main structures of London's Tower Bridge, and some 30,000 sq. ft. of sheet metal will be used in covering the aircraft's wing and fuselage.

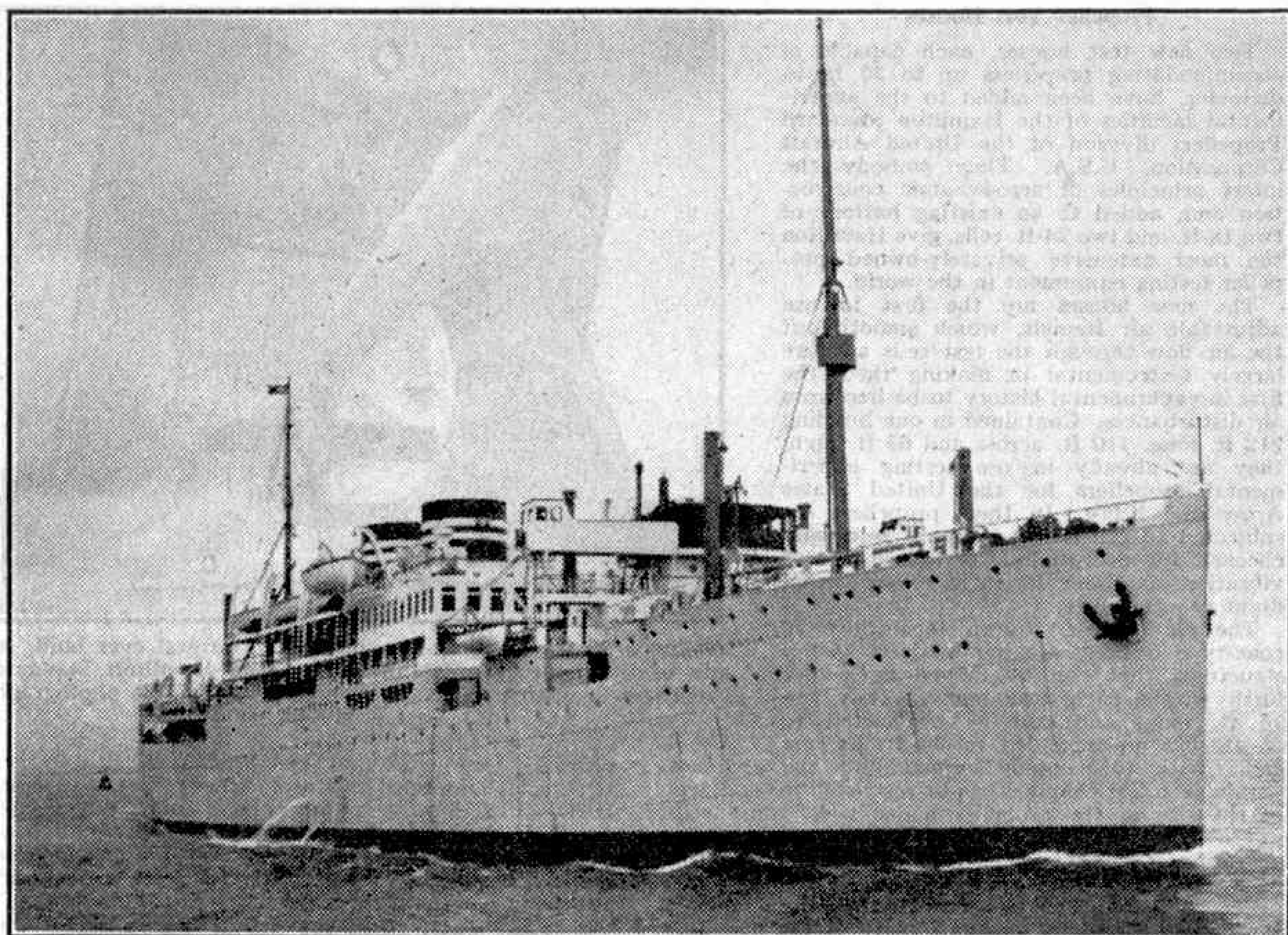
"Sea Furies" for Canada and Holland

Production "Sea Fury" aircraft are now coming off the assembly lines at Hawker's Langley factory in very satisfactory numbers. They are being built for the Royal Canadian Navy and Royal Netherlands Navy as well as for our own Royal Navy, while a slightly modified version known as the "Fury Baghdad" is in production for the Iraqi Government. The fine photograph at the foot of this page showing a "Sea Fury" in flight was taken by Hawker's chief photographer, Mr. Cyril Peckham, who recently won an international competition, organised in New York by the Intava Company, for the world's best black-and-white aerial photograph.



A fine photograph of a Hawker "Sea Fury" fighter in flight.

The new Vickers E 10/44 jet fighter has been named "Attacker."



M.V. "Highland Monarch."

The Famous Nelson Sisters

By Denis Rebbeck, M.A., M.Sc., B.Litt., M.I.N.A., A.M.I.Mech.E.

SHIPS are always in the news; a striking example of this was provided last Christmas by the M.V. "*Highland Monarch*" when she raced across the Atlantic with 250,000 Argentine turkeys. She had been held up by strikes and had to go at full speed to reach the Christmas Market in London. In spite of bad weather she reached London in time to get a large part of her cargo on to the market.

The "*Highland Monarch*" was built by Harland and Wolff Ltd., at Belfast in 1928 and was one of five sister ships constructed by Harland and Wolff for the Nelson Line. The others were "*Highland Chieftain*," "*Highland Brigade*," "*Highland Hope*" and "*Highland Princess*," all of 14,100 gross registered tons. The "*Highland Hope*" was wrecked on the Farilhoes Rocks, near Peniche, Portugal, on 19th November 1930, but passengers and crew were saved. Harland and Wolff Ltd. were entrusted with the construction of a

replace vessel and in 1932 there appeared the "*Highland Patriot*."

In August 1932 the vessels of the Nelson Steam Navigation Company—to give the owners their full name—were transferred to new ownership, under Royal Mail Lines Ltd. The well-known Nelson Line colours, grey hulls with a faint mauve tinge, the red funnels with three thin bands, white, black, white, and a broad black top, and the red house flag, with the black "N" on a white diamond, disappeared from the high seas.

During the second World War the five Nelson sisters did notable work for the Allies, but the "*Highland Patriot*" was sunk in October 1940. The remaining vessels are to be reconditioned—two have already returned to normal service—and at Belfast Harland and Wolff Ltd. are building a new and superior liner to replace the "*Highland Patriot*"; she is expected to enter the service in 1948.

Engineering Notes

A Special Lathe for Plastics

The wide and varied use of plastics as a raw material in industry has brought about the introduction of machines specially designed for working in these materials. One of the latest of these is the "Anglon" Hand Turning Lathe illustrated here. This machine is ideal for the production of plastic buttons and similar articles, and is exceptionally neat and modern in appearance. It is a convenient height to allow the operator to work in comfort and is provided with a tray in which a supply of plastic blanks is stored. There is also a chute down which completed work is ejected into boxes.

The mandrel is mounted in strong ball-bearings and is belt driven by a 1 h.p. electric motor. The motor has a three-step pulley, by means of which three different mandrel speeds can be obtained, the required speed being selected by a simple speed-change device. The motor is mounted on a pivoted platform, which can be locked in any position by means of a single nut, and this also forms a tensioning device for the driving belt.

Another feature of the machine is a patented tool feed mechanism, which prevents a careless operator from slamming the cutting tool into the work. This mechanism gives an extremely fine feed, which rapidly decelerates as it approaches the end of the stroke, and equally rapidly accelerates when the tool is withdrawn.

The machine is designed and built by E. H. Jones (Machine Tools) Ltd., London N.W.9.

A Machine for Renovating Concrete Floors

Among the many ingenious devices contrived during the war for plant maintenance is a portable rotary pneumatic scraper, which is designed for reconditioning concrete floors. The machine removes encrusted and embedded dirt, oil and metal chips, and levels down surface irregularities due to wear. It has a cutter head with four tools or blades each tipped with cemented carbide. These tools extend slightly beyond four carbide steel blanks set in a steel ring, which forms part of the head and controls the depth of the cut required to get down to clean concrete.

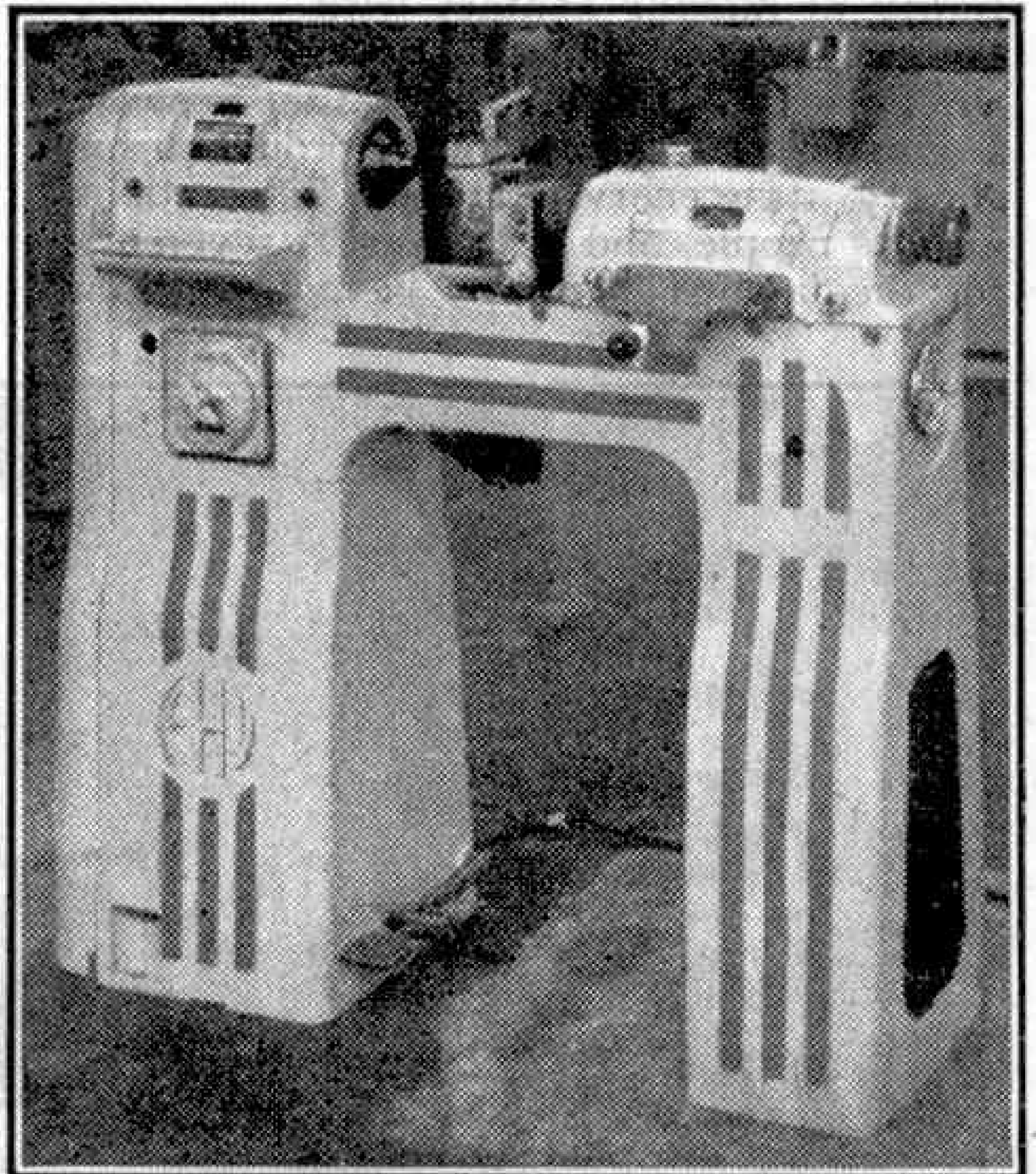
The tool is driven by an air motor, and the machine is mounted on a truck that can be pushed by one man but is sufficiently heavy to keep the cutting tools in contact with the floor when in action.

New Ships for the G.W.R.

Two new 3,000-ton cross-channel ships built at Birkenhead for the Great Western Railway will replace the former "*St. David*" and "*St. Patrick*," both of which were sunk during the war. Each of the new ships will accommodate 1,300 passengers, 50 motor cars and 350 tons of freight, and sleeping quarters will be provided for 400 persons.

A Great X-ray Plant

In the United States the Babcock and Wilcox Company are building a new 2,000,000 volt X-ray plant that will take radiographs of steel walls six to seven inches thick. The new equipment is designed to X-ray heavy welds up to 10 in. thickness, and the building in which it will be installed will have walls of sand 42 in. thick, which will be packed between steel plates to protect persons in the vicinity from the X-ray radiation.



The "Anglon" Hand Turning Lathe described on this page. It is a product of E. H. Jones (Machine Tools) Ltd., London N.W.9, and is specially designed for producing articles in plastics.

The Cornish Pumping Engines

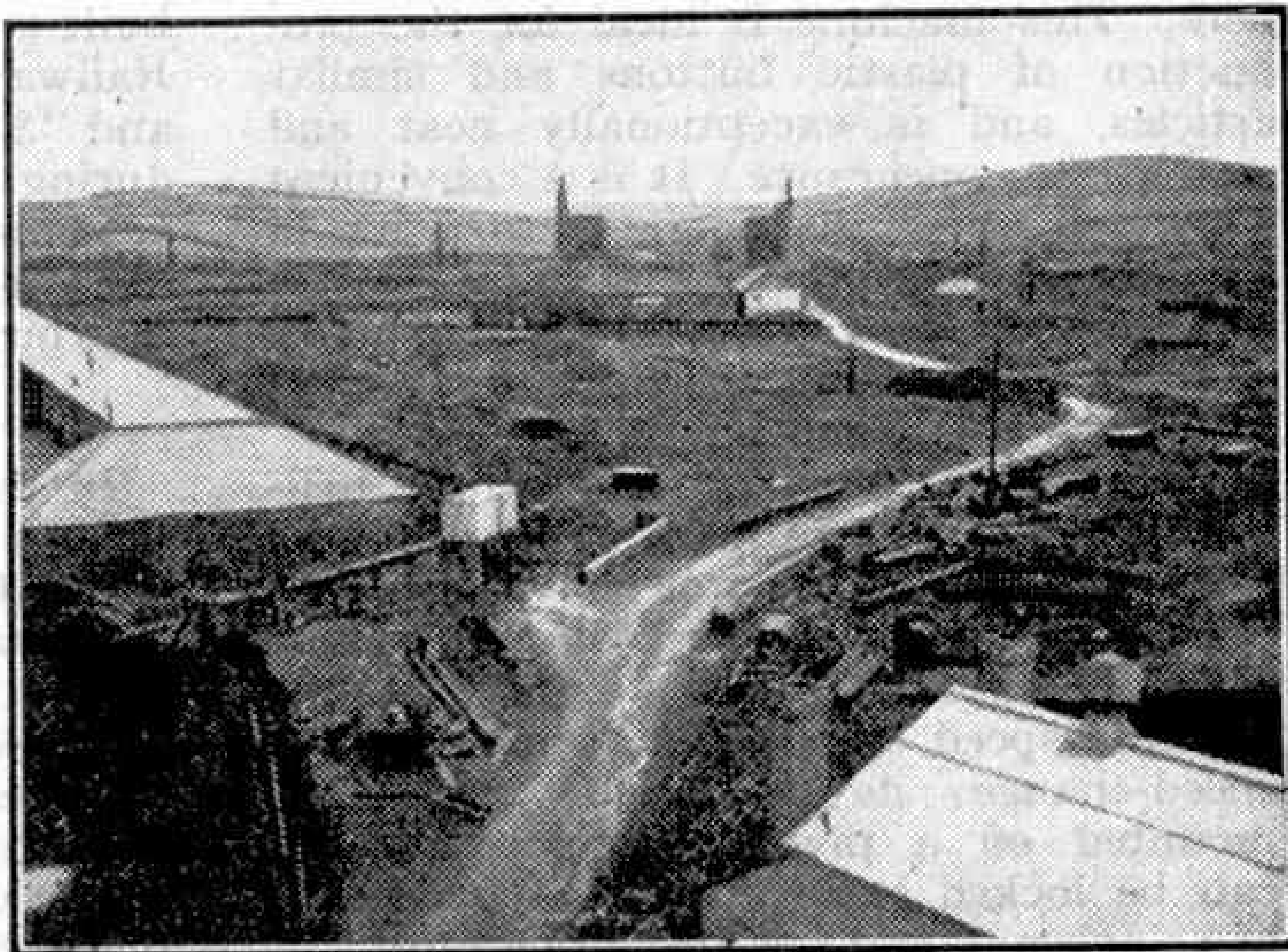
Relics of Past Engineering Achievements

By W. J. Bassett-Lowke, M.I.Loco.E., F.R.S.A.

EVERY year a great many people take the G.W.R. "*Cornish Riviera Express*" to spend their vacation in the picturesque bays and hamlets of Cornwall and enjoy the lovely sands and rocky scenery of that rugged coast. I wonder how many who stay at, say, St. Ives, take a short journey inland to Redruth and Camborne and other centres of the mining areas in this county, which 60 or 70 years ago were prospering with the tin and copper mining industry? The present-day scene is a depressing one. The old pumping stations at the tin mines are nearly all in ruins, the machinery having been removed, sold for scrap, or allowed to rust away, and the buildings are mostly in an advanced state of decay.

During my recent visit to that district I took the opportunity of making contact with Mr. J. H. Trounson, the Hon. Curator of the Cornish Engines Preservation Society. I found him a Cornishman proud of his county, its scenery, historical associations and its people, and with a great reverence for the famous men who have been born

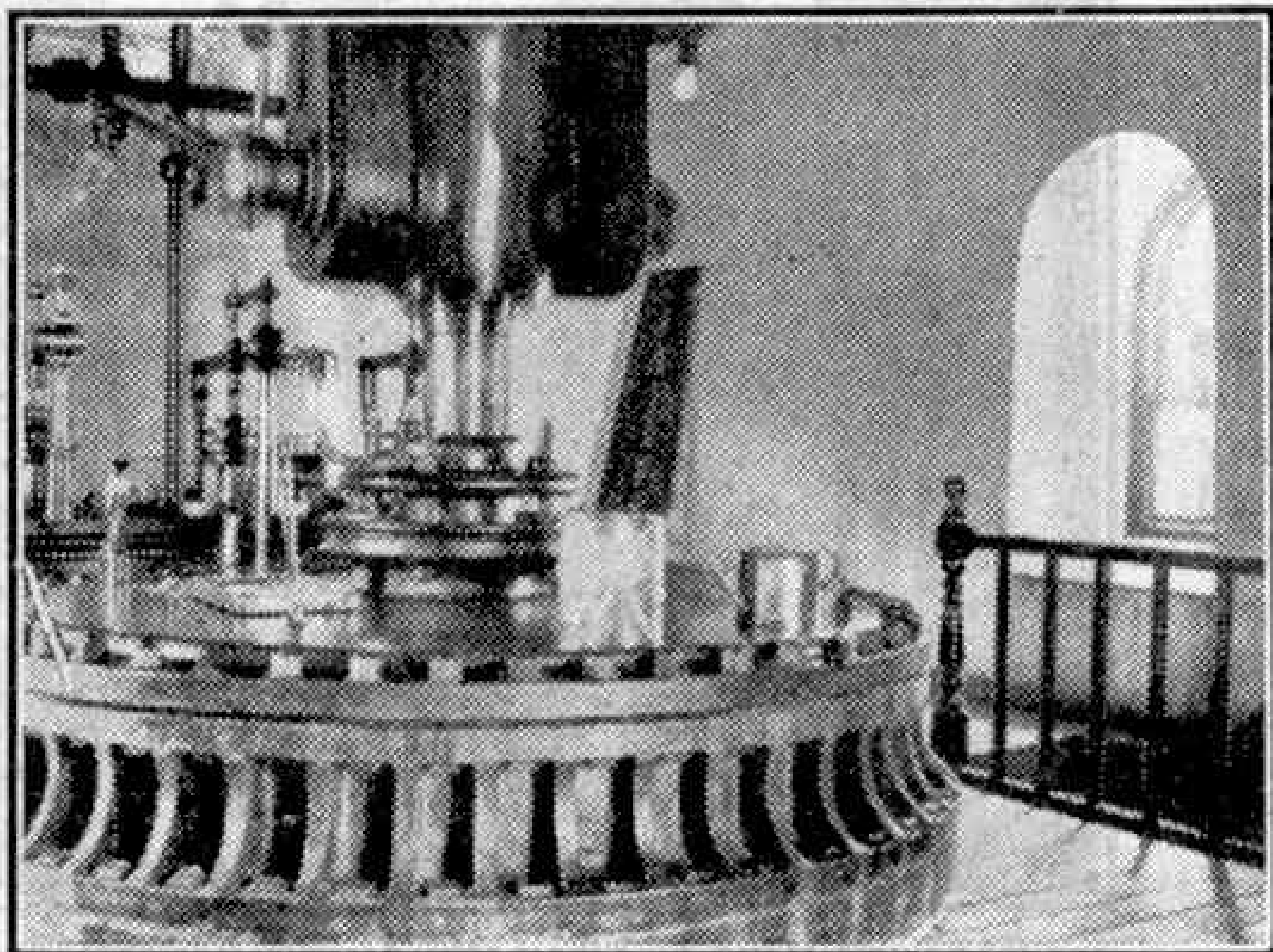
in Cornwall. We always remember Richard Trevithick as one of these famous Cornishmen; that inventor and engineer who built



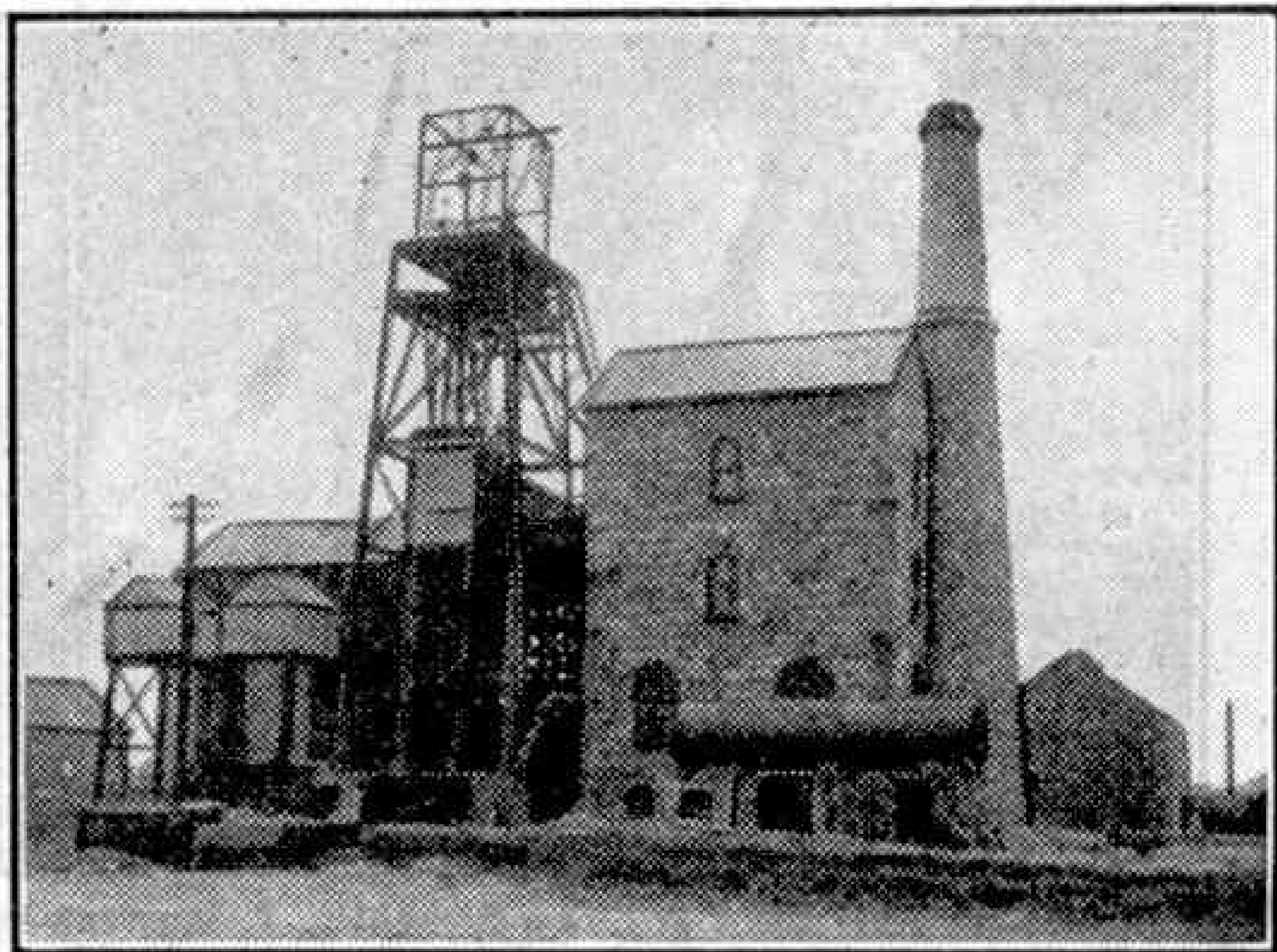
A general view of the country around Camborne, taken from the top of Cook's Kitchen Shaft at the South Crofty Mine.

the first steam locomotive to travel on rails. That was in March 1804, when the locomotive hauled a crowd of 70 people at the rate of five miles an hour! The unveiling of the statue of Richard Trevithick in Camborne on 17th March 1932, in the presence of the late Duke of Kent, gave an impetus to the Preservation Society. Richard Trevithick's cottage, where he lived, has been preserved, and it is hoped to collect many of the relics in connection with this period and keep them in this house.

When in Redruth, the house where William Murdoch lived from 1782 to 1792, which contains a small but interesting museum, is well worth a visit. He was not a Cornishman, but a Scot, and originally worked for Messrs. Boulton, Watt and Co., of Birmingham. The house has a tablet, presented by Richard Tangye, which records that Murdoch made the first locomotive (a model one) while living in



The cylinder head of the 90 in. Cornish pumping engine in Cook's Kitchen Shaft, South Crofty Mine.



Robinson's Shaft at the South Crofty Mine containing an 80 in. Cornish pumping engine.

that house, and tested it at Redruth in 1784. Also that he invented gas lighting and started to use it in the house in 1792.

From an engineering point of view, Cornwall gave the lead from the 17th to the 19th century in deep mining and engineering machinery and particularly in pumping engines. The Cornish pumping engine is perhaps the greatest single achievement of Cornish engineers. Unfortunately these engines have been rapidly disappearing, due to the closing down of the tin mines, the salvage drive and replacement by electric power. In the year 1935 a number of men of the district determined to preserve some of these historical relics, and a meeting was held, very appropriately, in the house of William Murdoch. A committee was formed, which later developed into the Cornish Engines Preservation Society, now under the Presidency of The Rt. Hon. The Viscount Falmouth. The first step taken by the committee was to save from the scrapheap the beam winding engine and engine-house of the Levant Mine, near St. Just. They raised sufficient funds, purchased the engine, and placed it and the engine-house in a state of preservation. This engine, designed by Francis Michell and built by Messrs. Harvey and Co., of Hayle, in 1840, is the oldest remaining in Cornwall. It is double-acting and has a stroke of 48 inches, and only ceased working in September 1930—over ninety

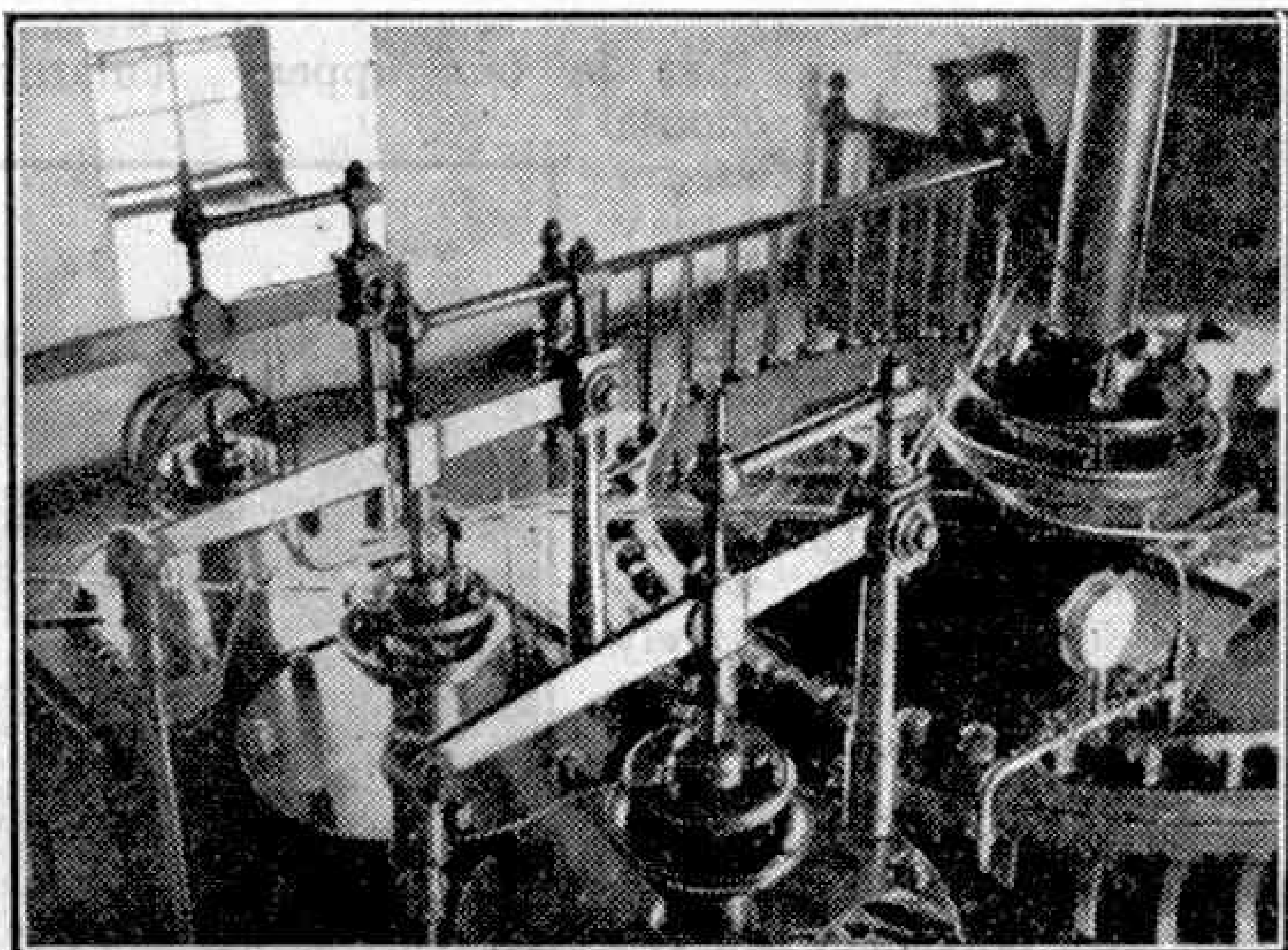
years of constant work!

Further steps were taken later with a view to establishing an Industrial Museum, and through the help of East Pool and Agar Ltd., of Redruth, and with the agreement of the Ministry of Supply, another winding engine with its house has been given to the Society. The engine, which was built in 1887 by Messrs. Holman Bros., of Camborne, is in a state of great dilapidation and was the last Cornish rotative beam engine to be built in that county. It is hoped to proceed with the reconditioning of the engine-house as soon as conditions permit.

For those who are not conversant with the Cornish pumping engine, it was the final development by Richard Trevithick and his collaborators of a single-acting beam engine, which was first introduced by Thomas Newcomen for pumping water from the Cornish mines, and was greatly improved by James Watt. This type of engine remains in use to-day, practically as James Watt modified it 167 years ago, from Newcomen's design.

I had an opportunity of visiting two of the engines that were still working at South Crofty Mine, in the Camborne-Redruth area. One of these, an 80 in. Cornish pumping engine, is one of the most interesting in Cornwall. It was built to the design of Captain Samuel Grose, a Cornish engineer, by the firm of Sandys, Vivian and Co., of Hayle, in 1854. It was first erected at the

(Continued on page 302)



The valve gear of the 90 in. Cornish pumping engine built by Harvey and Co. of Hayle in 1873.

Photography

Pictures by the Waterside

MANY of the most successful summer pictures taken inland are connected in some way with water—a lake, a pond, a river or a stream. Failures in this kind of photography are mostly due to trying to make pictures of lakes with a very wide stretch of water in the foreground. With any lake or large pond it is almost always best to have something definite in the immediate foreground, such as trees or boats. Our centre picture shows the value of foreground detail of this kind.



A picturesque river scene at Lower Slaughter. Photograph by M. W. Taylor, Southall.

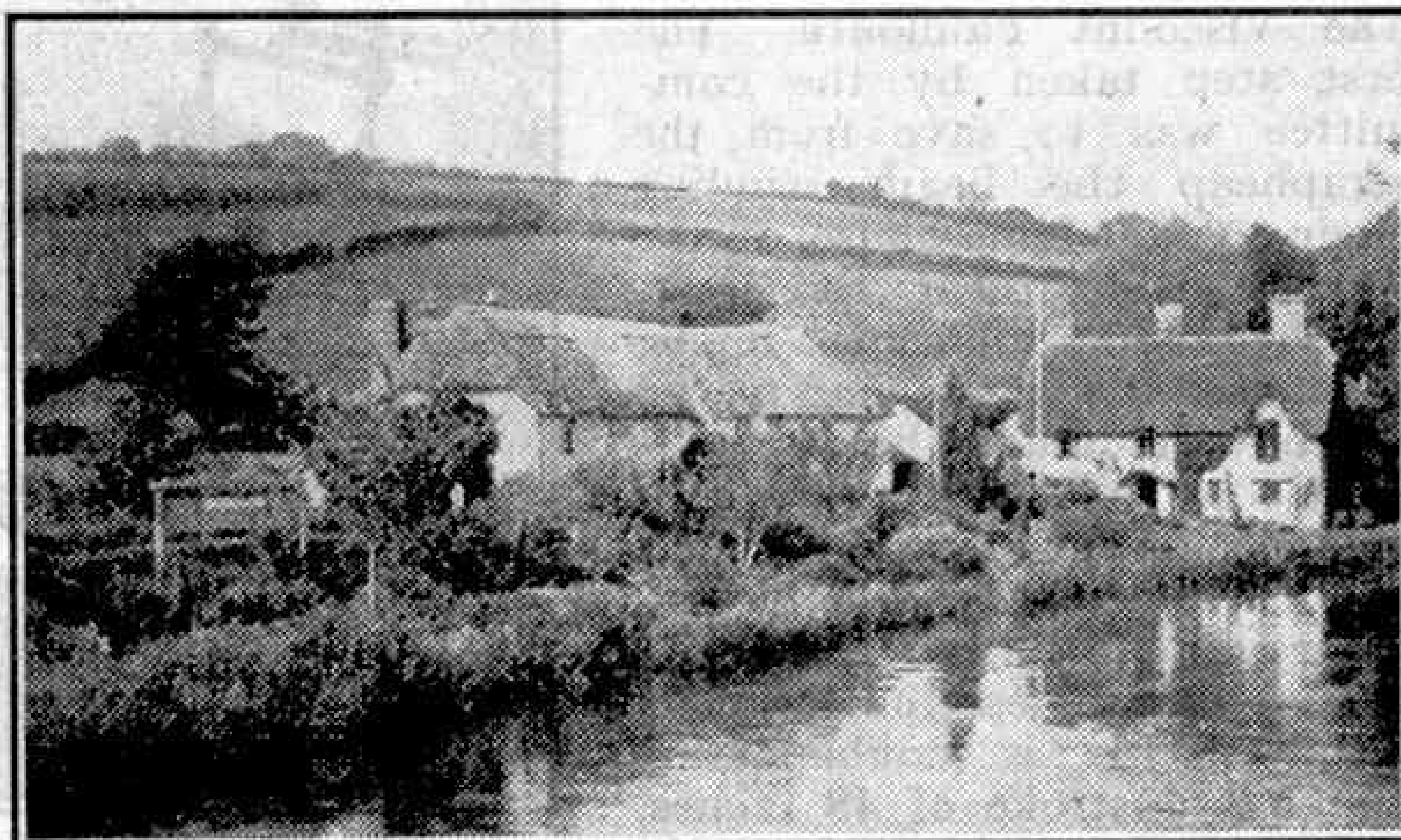


"Fishing on Lake Grasmere." Photograph by N. Holden, Abergele.

Pictures such as that in our upper illustration almost choose themselves. Here the reflections in the water play a very important part in producing the generally restful, almost drowsy, effect. In the bottom picture, too, reflections add a great deal to the effect. Without them the waterside would be comparatively uninteresting, and a great deal of the country atmosphere would be lost. Sometimes even a most ordinary-looking cottage close to the edge of a pond will throw a reflection that makes the scene really attractive.

Sunshine is helpful in water scenes as in all other types of picture making. On the other hand blazing sunshine is not good because of the dazzling effects produced in the water. Very often a day when the light is softly diffused with light clouds gives better effects. On the other hand a dull day usually means a dull picture.

The waterside scenes shown in our three illustrations may serve as a reminder that full exposure is needed for such subjects. Where part of the scene involves trees, the light is cut down appreciably, and even in a scene like that in the bottom picture, which is quite open, the strong foreground requires ample exposure. A light meter or calculator will save much waste of films.



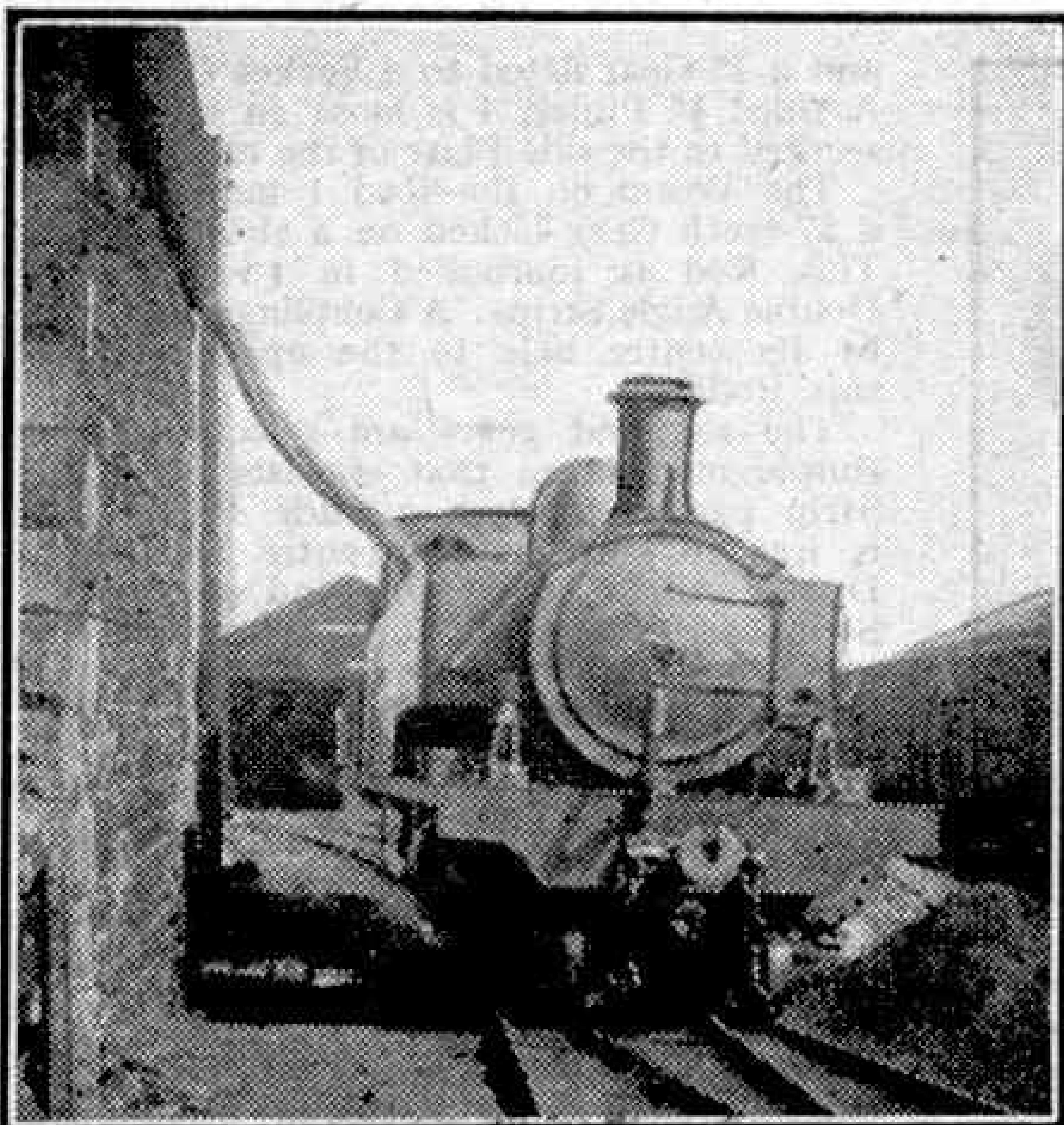
"On the River Exe, Devon." Photograph by H. Jones, Cardiff.

The County Donegal Joint Railway

By J. L. Campbell

THE County Donegal Joint Railway had its beginning in the Finn Valley Railway that was opened in 1863. This formed a branch connecting with the Londonderry and Enniskillen line, now part of the Great Northern Railway of Ireland, at Strabane and running to Stranorlar, a distance of 14 miles. It was laid to the Irish standard gauge of 5 ft. 3 in.

Later on another line, the West Donegal Railway, in which the Finn Valley concern was interested, pushed its 3 ft. gauge metals through wild and sparsely populated Southern Donegal from Stranorlar, eventually reaching Donegal Town. In 1892 the Finn Valley and the West Donegal Railways amalgamated to form the Donegal Railway, and the Finn Valley line from Strabane to Stranorlar was altered to the 3 ft. gauge. By degrees the line stretched out to



Taking water at Strabane; County Donegal 4-6-4 tank No. 11, "Erne," is the engine.

Killybegs, to Glenties and a branch went to Ballyshannon.

This enterprise was not very successful financially, and ultimately it passed into the joint hands of the G.N.R. (I) and the former Midland Railway of England. On 1st May 1906 the County Donegal Railways Joint Committee came into being to run the system, its members being, in equal numbers, representatives of the G.N.R.(I) and the Midland. The latter company's interest has since passed to the present-day L.M.S. The Midland had already acquired the Belfast and Northern Counties line to Londonderry via Coleraine. The latter was now worked by the Joint Committee and in 1909 a line was laid from Strabane to Letterkenny.

The County Donegal is now the longest narrow-gauge railway in the British Isles, having 125 miles of track, including the Londonderry-Strabane section and the Strabane and Letterkenny Railway that are both worked by C.D.R. rolling stock. At the time of writing, unlike many narrow gauge lines in Ireland it shows no signs of closing down; in fact, there is an extensive programme for the reconstruction of rolling stock.

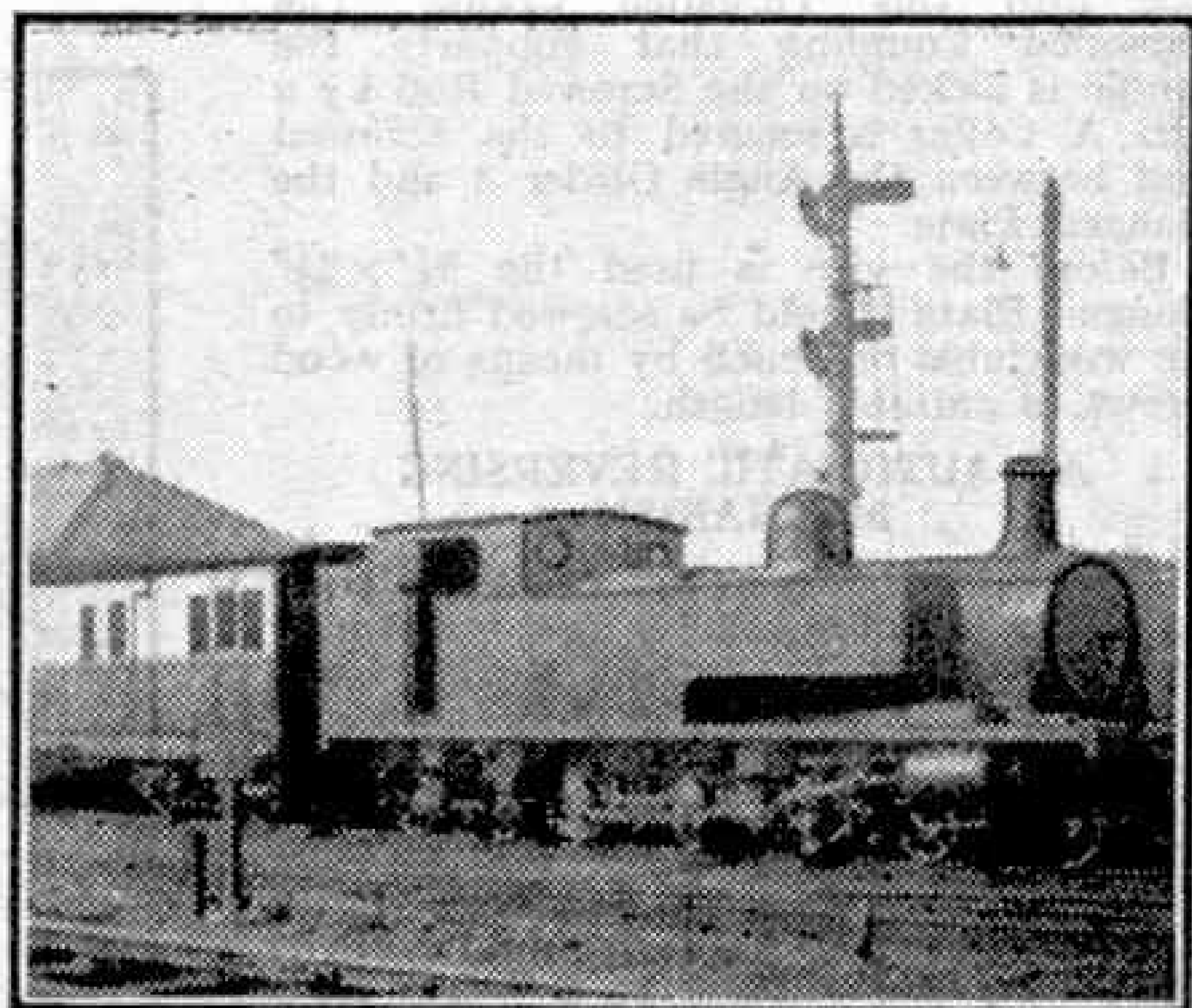


Six-cylinder diesel railcar No. 18 of the County Donegal Railway "on the shed" at Strabane.

Before 1930 this railway maintained almost two dozen steam locomotives to operate its services, but with the opening up of roads in the area in this motor age it has lost much of its passenger traffic. The result is that now only 11 locomotives are in service, the others being used mainly for spare parts which were unobtainable during the war. Those in service at present are 2-6-4 and 4-6-4 tanks. These locomotives, all of which are named, work goods trains only as a rule; but when passenger traffic is exceptionally heavy they take over from the railcars normally employed for that task.

The railcars are in fact a feature of County Donegal operations. In the later 1920s the G.N.R.(I) gave serious thought to the diminishing passenger traffic on some of its branch lines and began experimenting on County Donegal metals with small petrol-driven railcars. Two narrow gauge cars were designed and built at Dundalk Works in 1931 and as a result of their performance the G.N.R. then constructed standard gauge cars for their own lines.

The County Donegal did not lag behind however; they ordered further petrol-driven cars. Later, realising that if they had a bigger type of car all their passenger services could be worked by it, they brought into service a car somewhat larger than the petrol-driven type, but powered by a diesel engine.



A mixed train from Killybegs in charge of 4-6-4 tank No. 11.

Among the Model-Builders

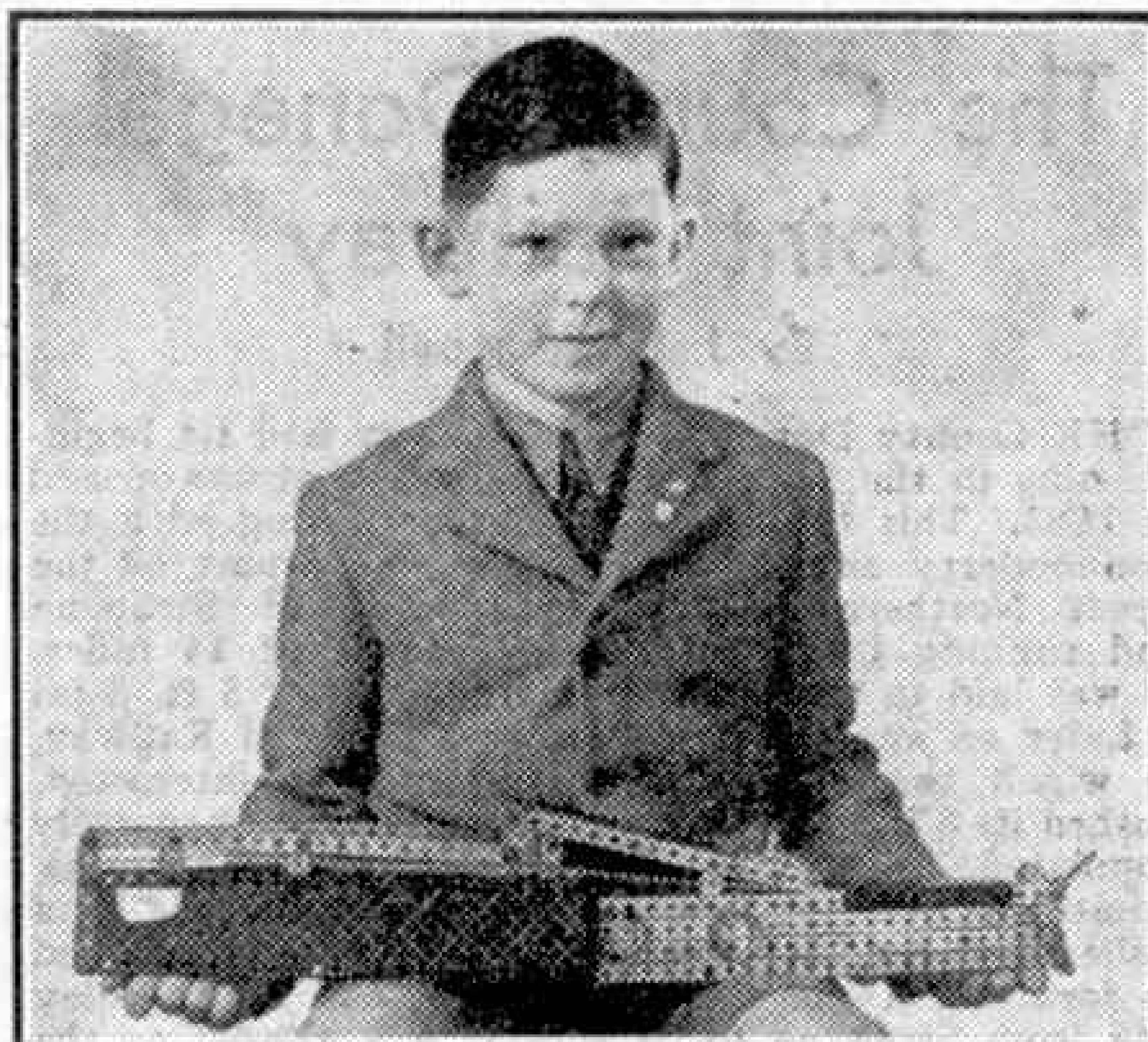
By "Spanner"

A USEFUL VICE

Model-builders who are also keen handymen will be interested in the model shown in Fig. 2. This is a simple screw vice that can be used for many purposes in the home. It will be found particularly useful for holding small metal parts in position for soldering or drilling.

The jaws of the vice consist of $3\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plates strengthened by $3\frac{1}{2}"$ Angle Girders. The fixed Plate is secured to a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate by a $3\frac{1}{2}"$ Angle Girder 1 and two Angle Brackets. The guide Rods 2 for the sliding jaw are locked in Double Arm Cranks attached to the flanges of the moving Plate by Angle Brackets, and they pass through further Double Arm Cranks on the fixed Plate.

A Threaded Crank is bolted to the Angle Girder 1,



John S. Davies, an enthusiastic Meccano model-builder, who lives at Lyndhurst, Hants.

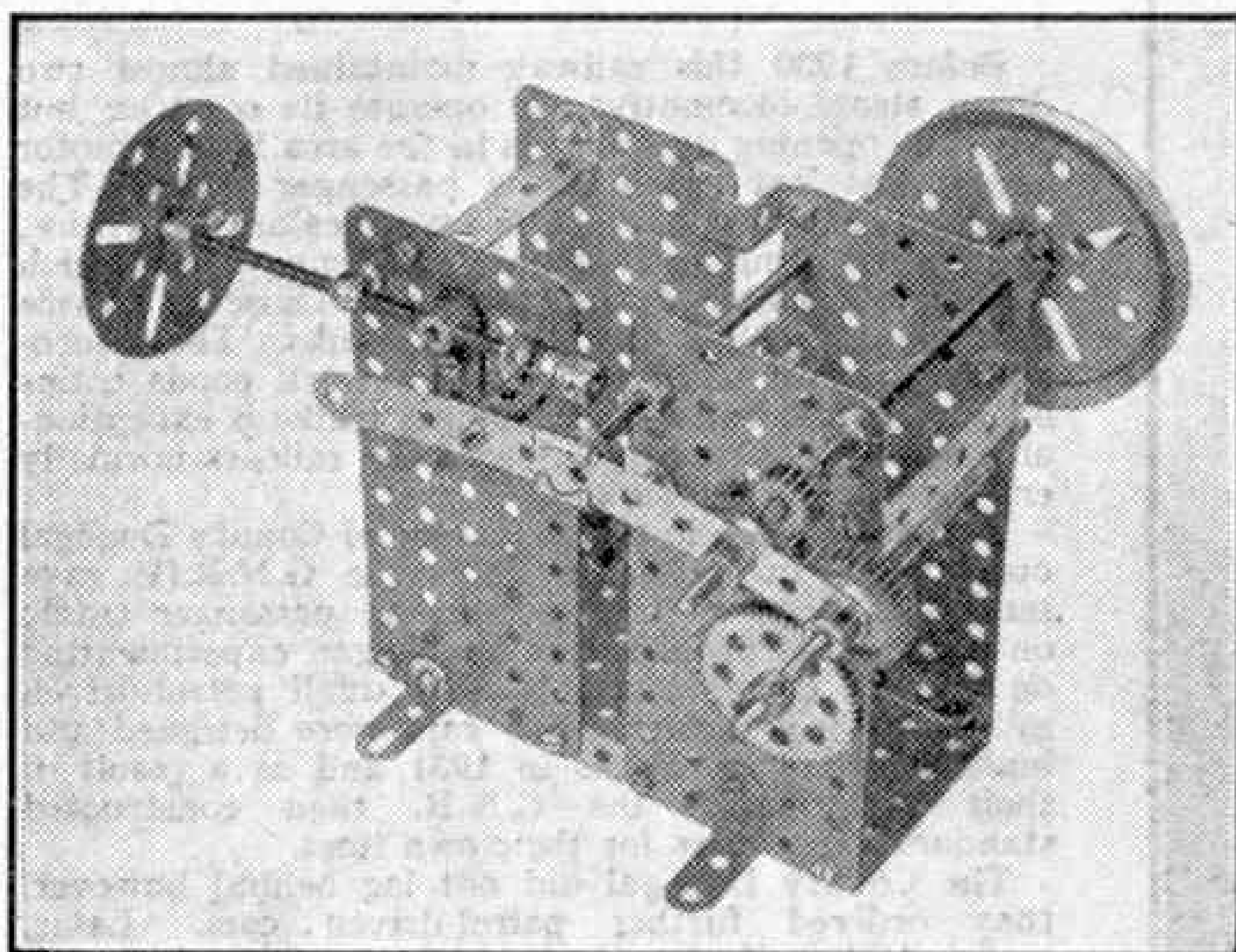


Fig. 1. The marine type gear-box designed by Mr. W. R. H. Temple, Upminster.

and a Screwed Rod passes through the jaws of the vice into this Threaded Crank. The Threaded Coupling that supports the handle is locked on the Screwed Rod by a nut. A Collar is secured to the Screwed Rod between the Angle Girder 3 and the Flanged Plate.

Before the vice is used the $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate should be screwed firmly to the worktable or bench by means of wood screws of suitable length.

AN AUTOMATIC REVERSING MECHANISM

The device shown in Fig. 3 will be found extremely useful in models used for display and exhibition. It enables models such as Pit Head Gears and Elevators to operate for considerable periods without any attention, as the reversing of the winding drum controlling the hoisting and lowering of the cage is carried out automatically.

The Rod 1 is driven by the Motor, and is fitted with a $\frac{1}{2}"$ Pinion 2, a Worm Gear and a $1"$ Gear. The Rod 3 is free to slide in its bearings, and it carries a $\frac{1}{2}"$ Pinion

and a $1"$ Gear fitted to a Socket Coupling. A third $\frac{1}{2}"$ Pinion 4 is loose on a $\frac{1}{2}"$ Bolt secured to the side Plate of the mechanism.

The Worm on the Rod 1 meshes with a 57-teeth Gear locked on a short Rod 5. This Rod is journaled in two $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips. A Coupling is secured by its centre hole to the upper end of this Rod.

The required gears are selected by a simple mechanism that consists of a $2\frac{1}{2}"$ Strip passed through a Slide Piece that is free to turn in the centre hole of a Double Angle Strip. One end of the $2\frac{1}{2}"$ Strip carries a small Fork Piece, and the other end is pivotally attached to the Coupling on the Rod 5. A Coupling is secured in the jaws of the Fork Piece by a $\frac{1}{2}"$ Bolt, and two $1"$ Rods held in this Coupling engage the groove on the Socket Coupling on the Rod 3.

The drive to the winding drum is taken from a $\frac{1}{2}" \times \frac{1}{2}"$ Pinion on the Rod 3 to a $2\frac{1}{2}"$ Gear on the winding shaft.

Before a model is set in motion care should be taken to ensure that there is no excessive play in the selector mechanism and that the positions of the gears allow a brief period in neutral.

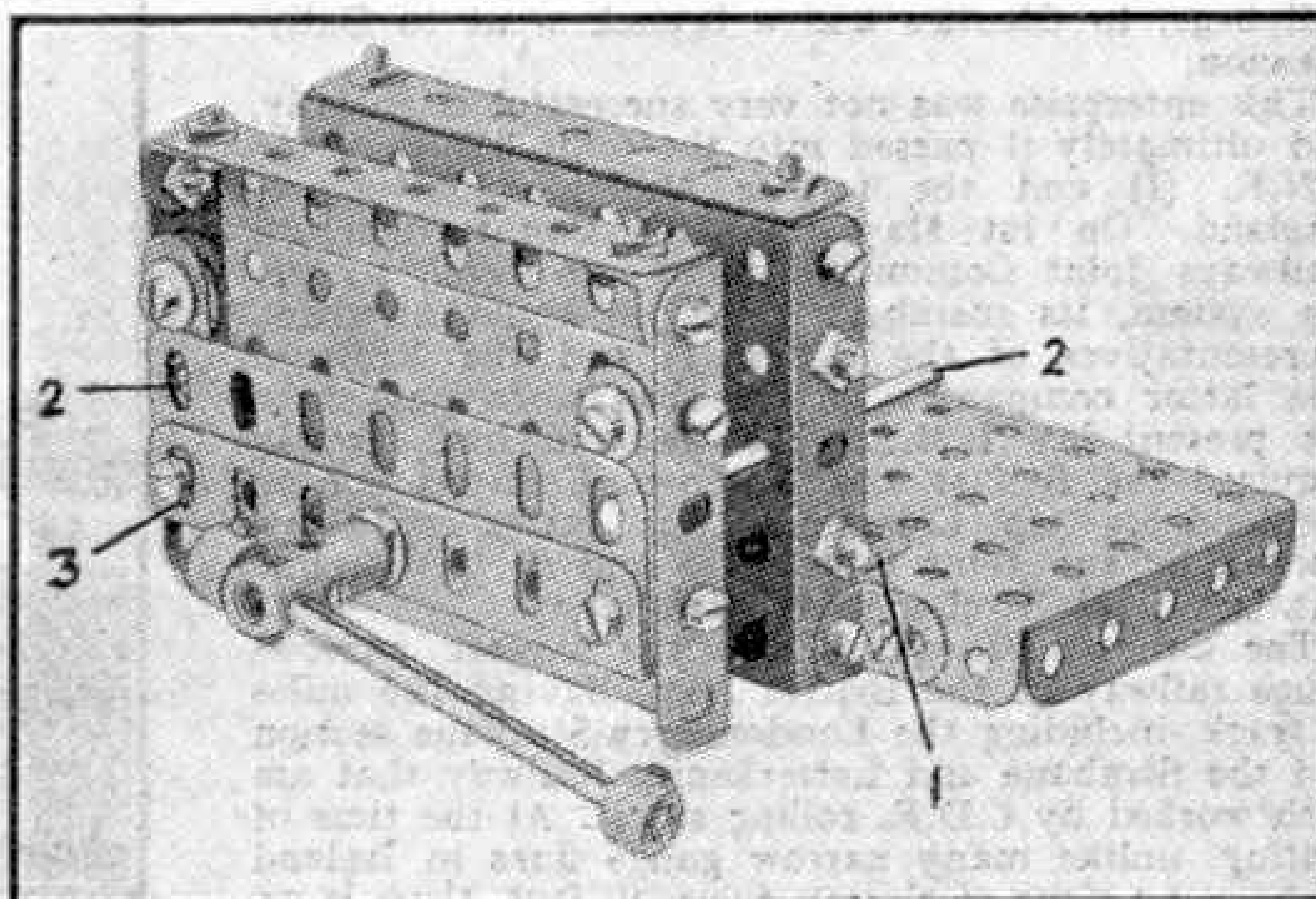


Fig. 2. A useful vice for holding light work.

A MARINE TYPE GEAR-BOX

Mr. W. R. H. Temple, Upminster, has been a keen model-builder for some years, and recently he sent me the interesting suggestion that is illustrated in Fig. 1. This is a gear-box of the type often used in small power boats, and is designed to provide ahead, neutral and astern motions. Although it is intended primarily for marine purposes, no doubt model-builders will be able to find other useful applications for a gear-box of this kind.

A Crank Handle fitted with a 3" Pulley representing the fly-wheel is driven by the power unit, and a $\frac{1}{2}$ " Pinion locked on the Crank Handle transmits the drive to either one of two 1" Gears. These Gears are fixed on short Rods journaled in a $5\frac{1}{2}$ " Curved Strip. The final drive is taken from the forward or reverse gears to a 57-teeth Gear Wheel on the output shaft.

The $5\frac{1}{2}$ " Curved Strip is mounted in a Slide Piece that is locked on a Rod held by the framework of the model. Movement of the Curved Strip is controlled by a screw mechanism, but if desired this may be replaced by a lever mechanism so that a more rapid change from forward to reverse directions is possible.

A stouter bearing for the two 1" Gears can be provided by using two $5\frac{1}{2}$ " Curved Strips connected to each other by Double Brackets.

One of the advantages possessed by this type of gear-box is that all movement is confined to the intermediate gears, thus simplifying the connections to both the power unit and the model.

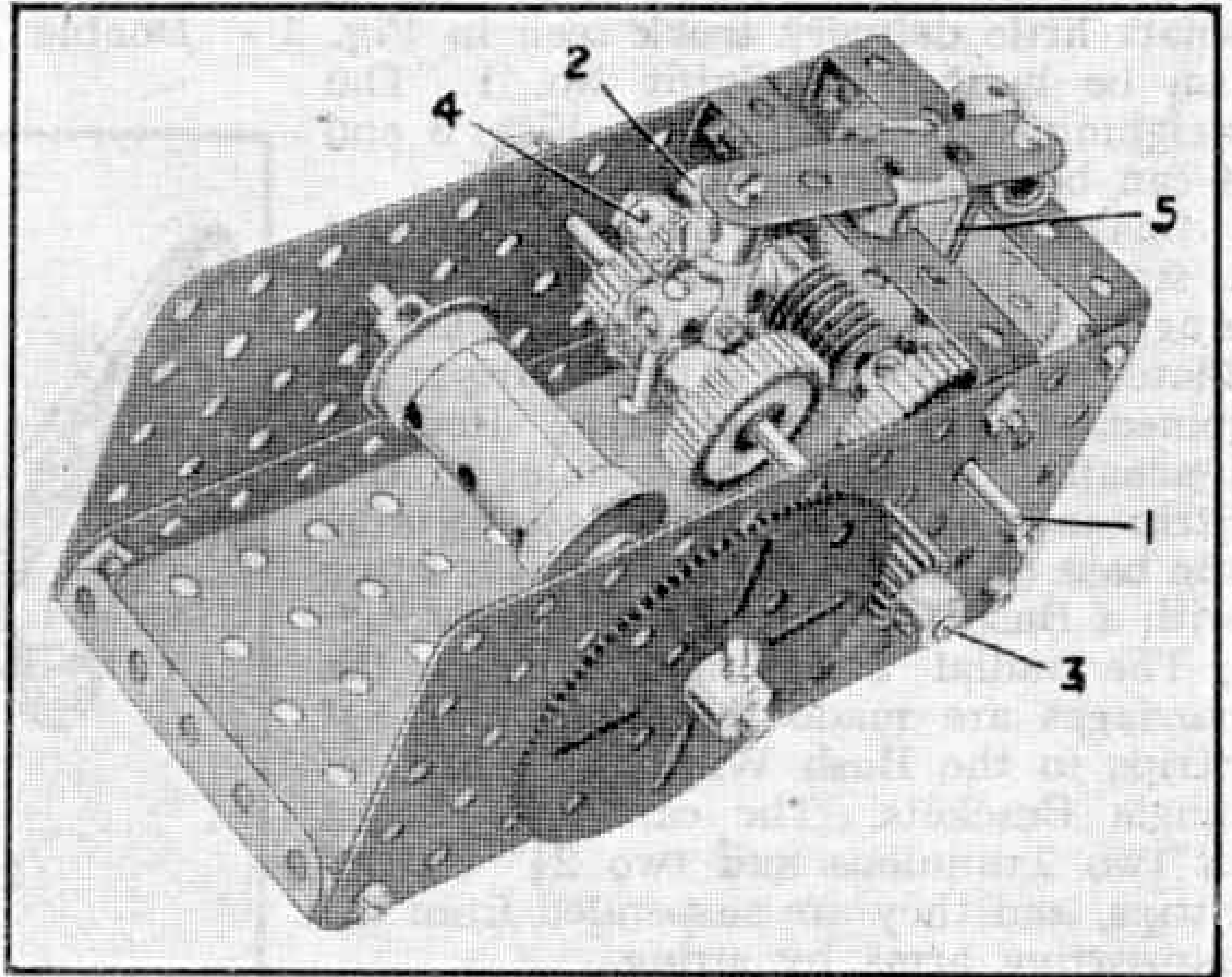


Fig. 3. This mechanism automatically reverses the direction of a drive.

This Month's Meccano Competition

NOVEL SHORT STORY CONTEST

Here is a fascinating competition in which every reader of the "M.M." can participate, as it is not necessary to possess a Meccano Outfit to be eligible for the Contest and there is no model-building to do. A range of fine prizes is offered and boys and girls of any age and living in any part of the world are invited to take part.

All that competitors are asked to do is to take a pencil and a sheet of paper and write a short story incorporating the names of as many Meccano parts as possible, or terms used in connection with Meccano model-building. The following short story is given as an example: "Pawl was playing with a Ball near a Motor Tyre store, when the Boss, who was a Crank by nature, Loomed up in front of him. 'Hook it, or I'll Collar you,' growled the old Buffer. Just then a Dog Clutched the Ball and tried to Bolt with it. Pawl wheeled round to Grab the dog, but only pinioned the Boss, who tore himself out of Pawl's Clutch and stepped on a Curved Strip of banana

entry as humorous as possible. The more amusing a story is the better will be its chance of winning a prize.

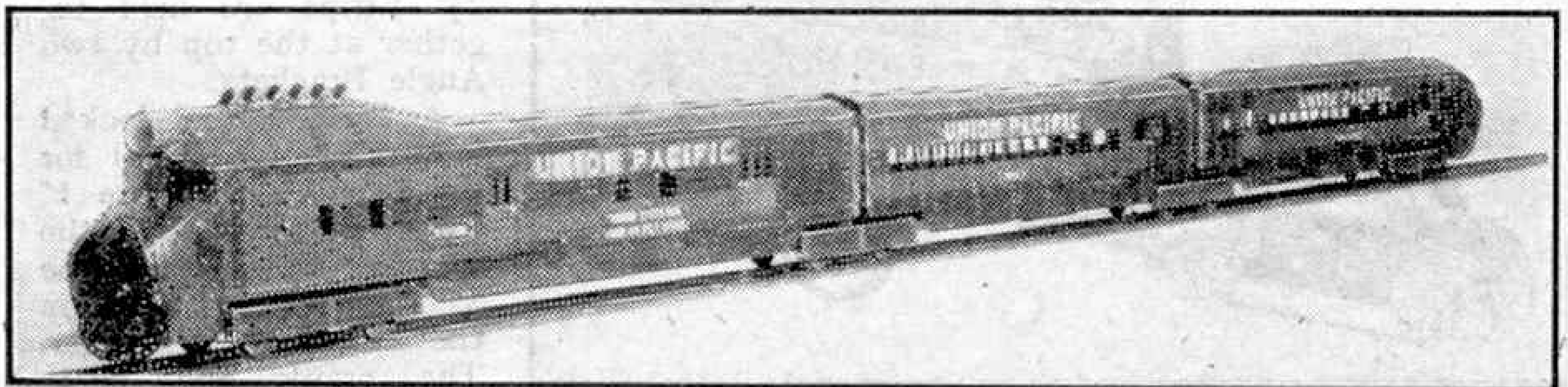
The prizes will be awarded for the story that the judges think the most humorous and which contains the greatest number of part names and model-building terms.

Competitors may send in as many different stories as they wish, provided that each story does not contain more than 150 words. No competitor will be awarded more than one prize.

There will be two Sections only, Home and Overseas, and prizes will be awarded in each Section as follows: 1st, Cheque for £2/2/-; 2nd, Cheque for £1/1/-; 3rd, P.O. for 10/6. There will be also five prizes each consisting of a P.O. for 5/-.

Entries should be written on one side of the paper only, and on the reverse side must appear the competitor's name, age and address.

Envelopes containing entries must be addressed to "Meccano Short Story Competition, Meccano Limited, Binns Road, Liverpool 13." Entries for the Home Section must be posted in time to reach Liverpool before 30th August next, but entries from Overseas readers will be accepted until 29th November.



A fine Meccano model of a Union Pacific Train, designed by H. G. Shorten, Winnipeg, Canada.

New Meccano Models

Subjects for Outfits Nos. 0, 1 and 4

THE aerial roundabout amusement device shown in Fig. 1 is designed for construction from Outfit No. 0, while the smart little delivery truck seen in Fig. 2 can be built from Outfit No. 1. The weighing machine shown in Figs. 3 and 4 can be built from Outfit No. 4.

Construction of the aerial roundabout is started by bolting two $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips to a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate. The Double Angle Strips are joined by a $2\frac{1}{2}"$ Strip, and a $3\frac{1}{2}"$ Rod 1 is journalled in the centre hole of this Strip and in the Flanged Plate forming the base of the model. The Rod is fitted with a Bush Wheel and a 1" Pulley.

The radial arms that support the carriages are made by fixing four $5\frac{1}{2}"$ Strips to the Bush Wheel by means of Angle Brackets. The carriages consist of two Trunnions and two $2\frac{1}{2}"$ Curved Strips, and they are suspended from the supporting arms by string.

The model is set in motion by turning a Crank Handle fitted with a 1" Pulley, which is journalled in two Flat Trunnions bolted to the base. A length of string is passed around this Pulley and the Pulley on the Rod 1.

Parts required to build Aerial Roundabout: 4 of No. 2; 1 of No. 5; 4 of No. 12; 1 of No. 16; 1 of No. 19s; 2 of No. 22; 1 of No. 24; 1 of No. 35; 16 of No. 37; 2 of No. 38; 2 of No. 48a; 1 of No. 52; 2 of No. 90a; 2 of No. 126; 2 of No. 126a.

All the parts used in the tricycle delivery truck shown in Fig. 2 are contained in Outfit No. 1.

A $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate is used for the base of the load carrier, and $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates are bolted to each side of

this, and $5\frac{1}{2}"$ Strips are attached to the Flexible Plates by Fishplates. The $5\frac{1}{2}"$ Strips are joined at each end by $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips. The front axle is

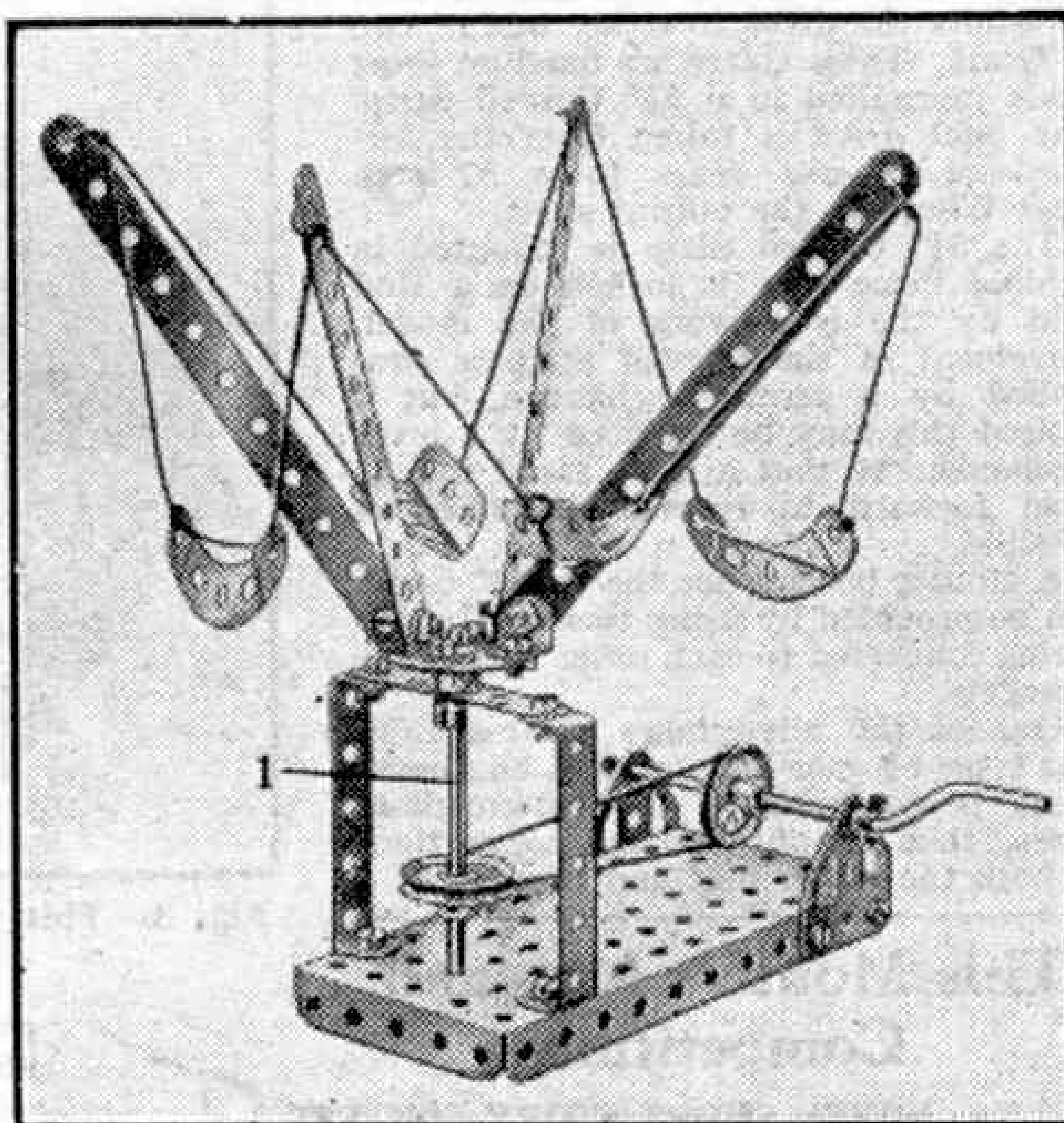


Fig. 1. This attractive aerial roundabout can be built from Outfit No. 0.

journalled in Trunnions bolted to the Flanged Plate, and a Flat Trunnion is used to fill in the front of the carrier.

The cycle frame consists of two $5\frac{1}{2}"$ Strips joined together at the front by two Angle Brackets. A $\frac{3}{8}"$ Bolt is used to fix the Angle Brackets together, and this Bolt is passed through the base of the truck and lock-nutted. The rear forks consist of four $2\frac{1}{2}"$ Strips attached to the $5\frac{1}{2}"$ Strips as shown in the illustration. The $2\frac{1}{2}"$ Strips are held together at the top by two Angle Brackets.

A Bush Wheel locked in a 2" Rod is used for the rear wheel. The 1" Pulley representing the sprocket is locked on the 2" Rod and spaced from the frame by a Washer. The crank and chain wheel consist of two Angle

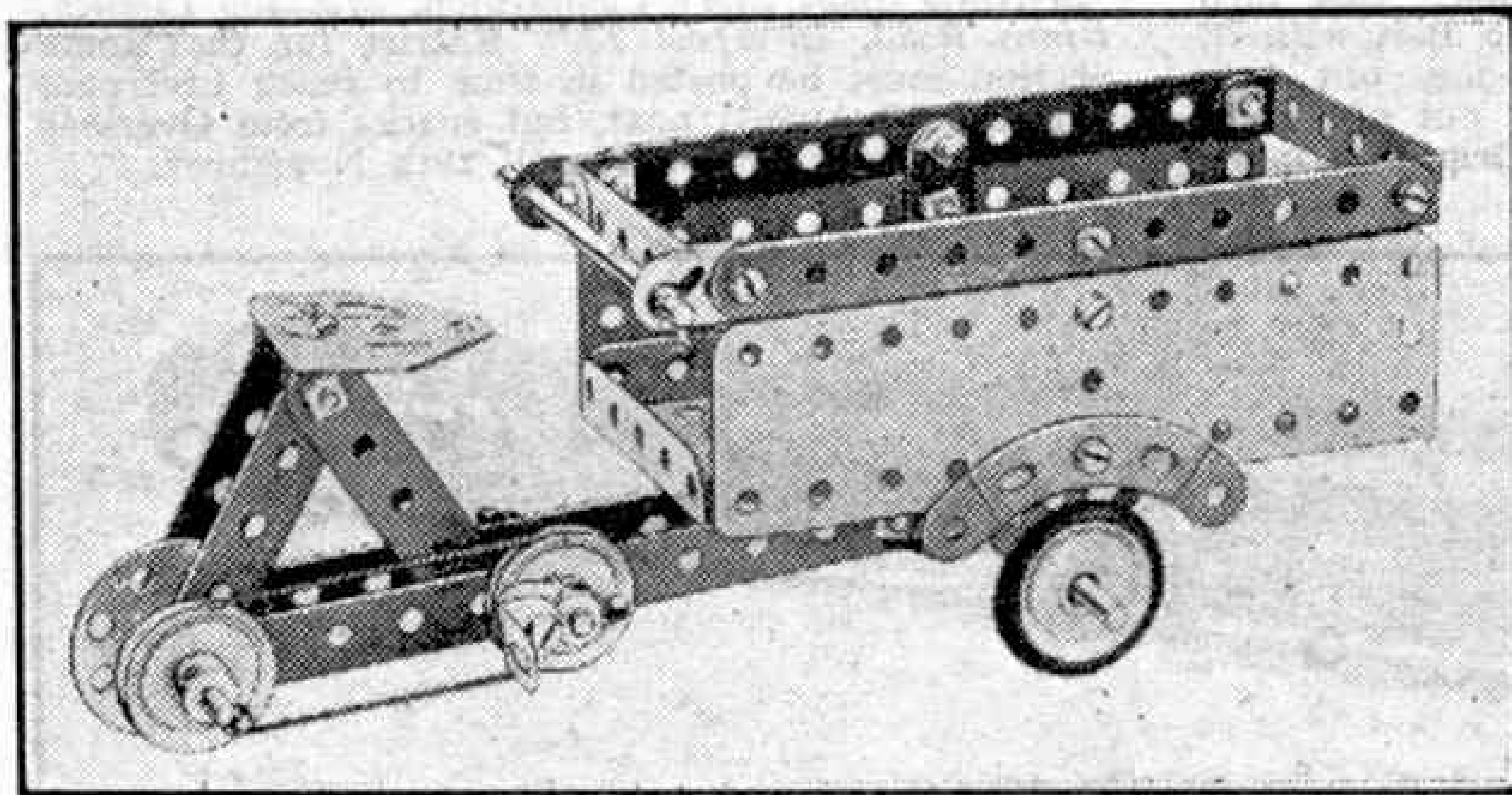


Fig. 2. A tricycle delivery truck built from Outfit No. 1.

Brackets lock-nutted together and bolted to the boss of a 1" Pulley. This Pulley is locked on a 2" Rod journalled in the main frame.

The left-side crank is formed by an Angle Bracket lock-nutted to a Fishplate. A Bolt is fastened in the elongated hole of the Fishplate, and this is then pushed on the 2" Rod. A Spring Clip on this Rod is placed so that its lugs engage the bolt in the Fishplate and secure the crank to the Rod.

Parts required to build model Delivery Truck: 4 of No. 2; 4 of No. 5; 4 of No. 10; 8 of No. 12; 2 of No. 16; 2 of No. 17; 4 of No. 22; 1 of No. 24; 4 of No. 35; 24 of No. 37; 6 of No. 37a; 3 of No. 38; 2 of No. 48a; 1 of No. 52; 2 of No. 90a; 3 of No. 111c; 2 of No. 126; 2 of No. 126a; 2 of No. 155; 2 of No. 189.

In building the weighing machine shown in Figs. 3 and 4 it is best to begin by bolting $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates to the sides of a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate. A $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate is used for the front of the base. The operating lever is made by bolting two $5\frac{1}{2}"$ Strips to a Double Bracket, which is then attached to the Double Angle Strip 1.

The platform consists of a $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate, strengthened by $2\frac{1}{2}"$ Strips and attached to the lever by Angle Brackets. Each side of the upright column is formed by two compound strips, the rear pair consisting of $5\frac{1}{2}"$ and $3\frac{1}{2}"$ Strips. The Strips at the front are $5\frac{1}{2}"$ and $2\frac{1}{2}"$ respectively and are joined by a $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flanged Plate 2. The rear pair are connected by two $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips.

One side is filled in by two $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plates, the upper plate being bent over and

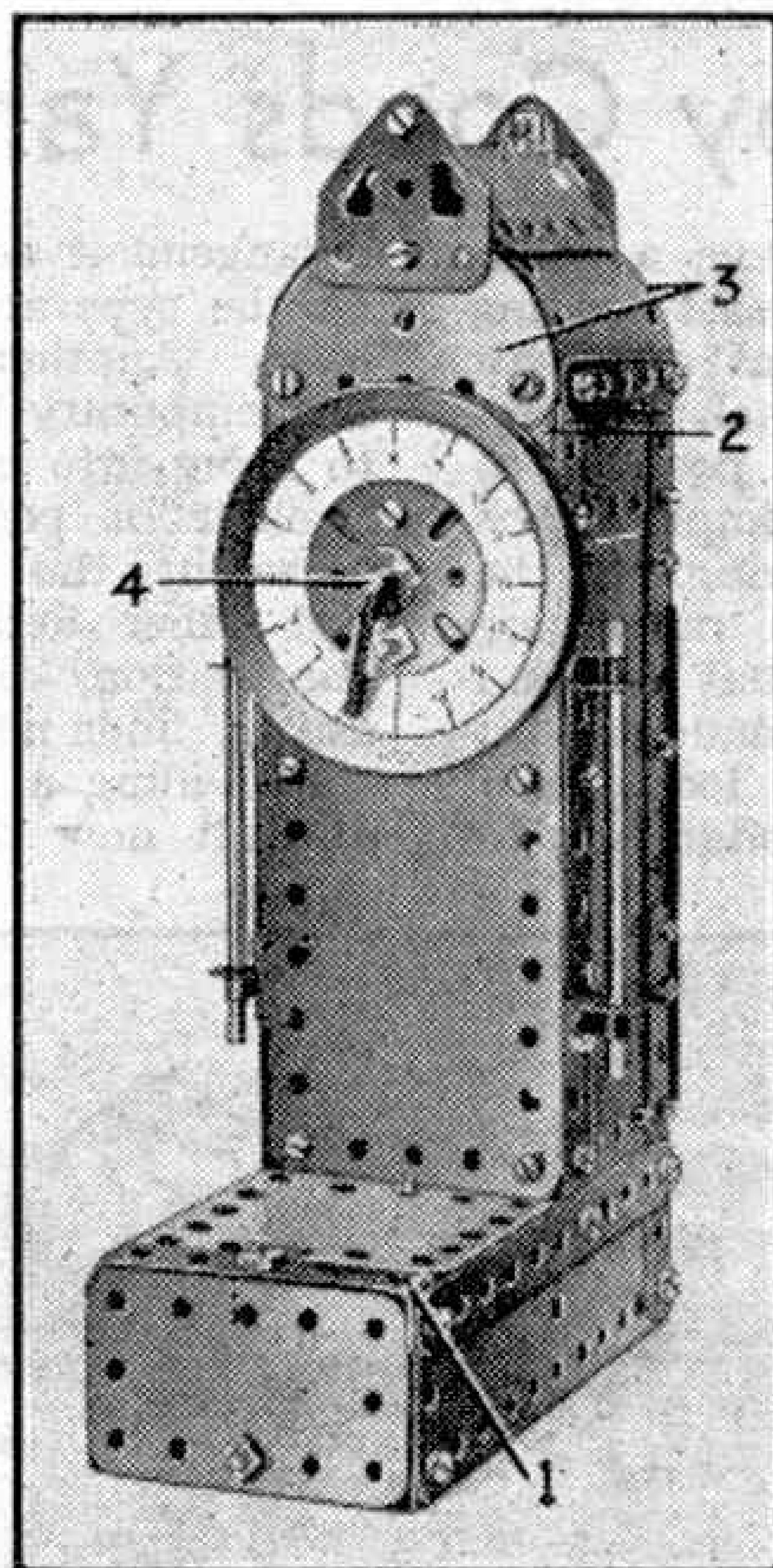


Fig. 3. A realistic "Try your Weight" machine, built from Outfit No. 4.

pushed in the Rod and Strip Connector so that its end engages the lugs of the Spring Clip.

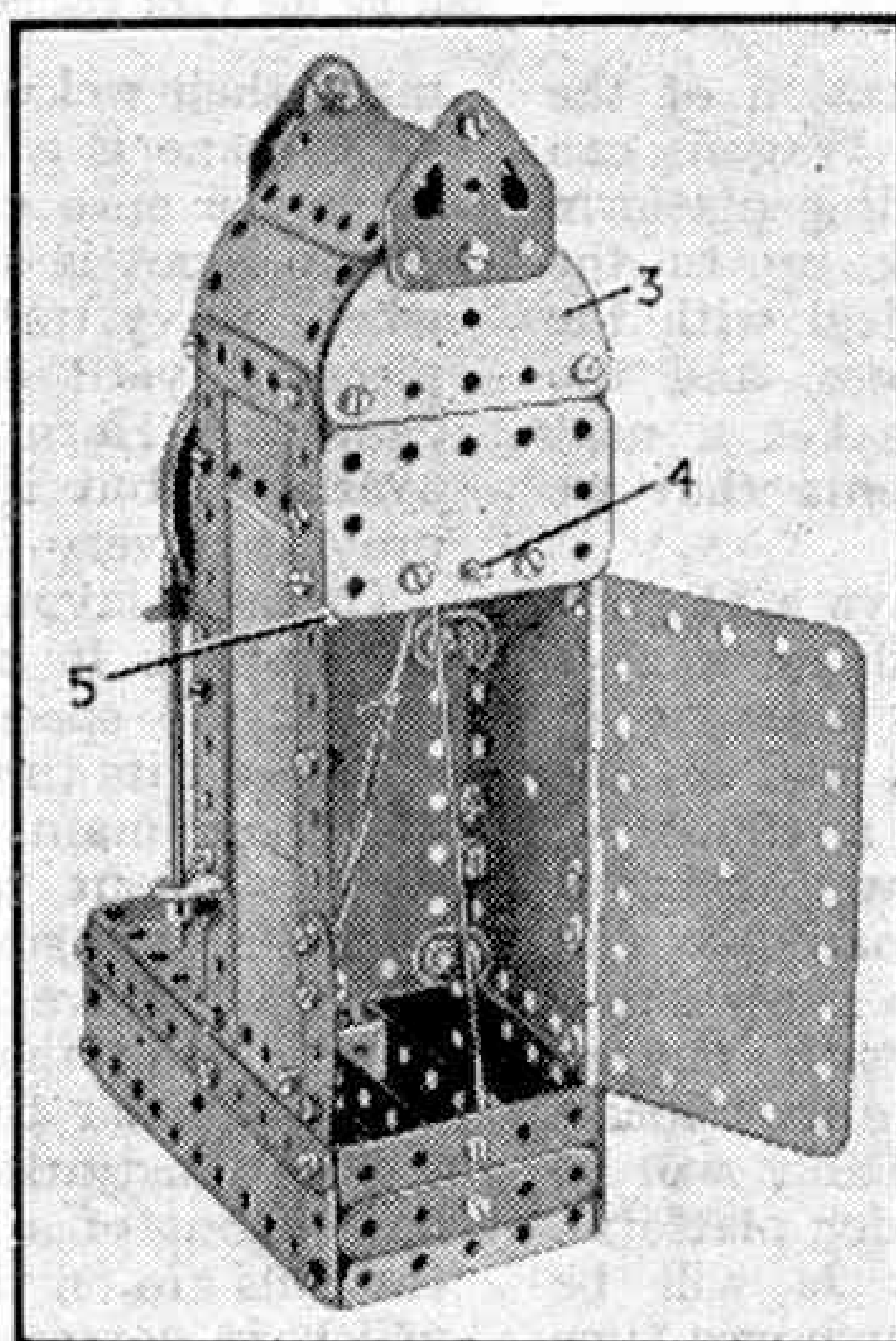


Fig. 4. The weighing machine seen from the rear with door open to show the mechanism.

bolted to the opposite side, which is filled in by one half of a Hinged Plate and a $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate. The other half of the Hinged Plate forms the inspection door at the rear.

A $4\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate is used for the front, and is attached to the sides by Angle Brackets. Flat Trunnions are bolted to the Semi-Circular Plates 3, and a $9/32"$ radius Curved Plate is secured to the Trunnions by two Angle Brackets. The 3" Pulley representing the dial is bolted to the Flanged Plate 2 and the Flexible Plate forming the front of the column.

The Rod 4 is journalled in the boss of the 3" Pulley and in the Double Angle Strip 5. A Rod and Strip Connector on this Rod is separated from the dial by three Washers, and is held in place by a Spring Clip. A 1" Rod is

A length of Cord fastened to a $1\frac{1}{2}"$ Rod journalled in the end holes of the operating lever is wound a few turns around the Rod 4, and is then tied to a Driving Band. The Driving Band is stretched slightly and bolted to the column.

If a weight is placed on the platform the lever is depressed against the tension of the Driving Band.

Parts required to build model Weighing Machine: 8 of No. 2; 2 of No. 3; 7 of No. 5; 1 of No. 10; 2 of No. 11; 8 of No. 12; 3 of No. 16; 1 of No. 18a; 1 of No. 18b; 1 of No. 19b; 8 of No. 35; 66 of No. 37; 2 of No. 37a; 3 of No. 38; 1 of No. 40; 6 of No. 48a; 1 of No. 51; 1 of No. 52; 1 of No. 111c; 2 of No. 126a; 1 of No. 186; 2 of No. 188; 2 of No. 189; 2 of No. 190; 1 of No. 191; 1 of No. 212; 2 of No. 214.

Some Hornby Goods Yard Schemes

MOST Hornby railways have a goods yard of some kind or at least a siding or two where the goods trains are dealt with. Even on the simplest tracks without any sidings at all it is still possible to make use of a few ideas to improve the interest and fun of train running. In the earliest stages of our model railwaying it is usually the goods train that is found specially attractive. It is made up of varied vehicles and we can load them with all manner of different oddments to represent the miscellaneous cargo of a real freight train.

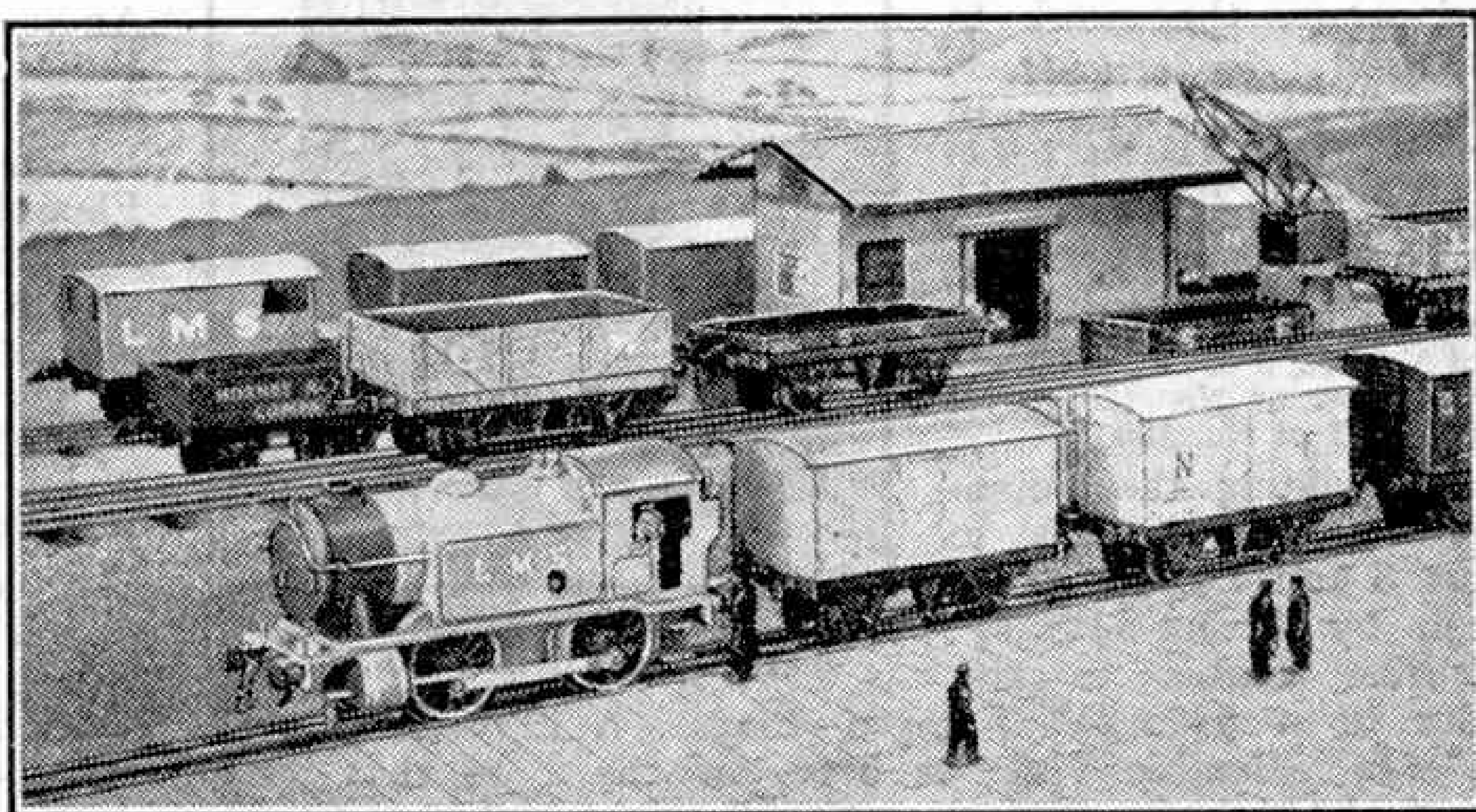
A system that has passed beyond the early development stage will be almost sure to include a goods station of some kind. Some readers, no doubt, will be fortunate enough to possess a Hornby Goods Platform like the one shown in the accompanying illustration. If so, this forms a splendid centre for the operation of the goods traffic on the layout. Wagons can stand at one side of the loading platform and road vehicles can back up to the other side. The crane can deal with the heavier lifts required at times, and the building on the platform makes a neat store for the various oddments that we use for loading our wagons.

If we do not happen to have a Hornby Goods Platform we can easily arrange a substitute. A plain loading platform or bank is better than nothing, and on the simplest temporary layouts a couple of good thick books or a shallow cardboard box can be used. The cardboard box can be painted and lined out to represent a brick or stone structure with flagged paving if we wish to improve its appearance. An easier scheme probably will be to finish it to represent a wooden platform.

With a fairly large box it will be possible to make a simple warehouse type of building where the wagons go inside for loading or unloading. The exact

arrangement adopted will depend largely on the type and size of the box that we have. Another scheme frequently used for temporary layouts laid on the floor is to bring into use some item of furniture, a chair or perhaps a suitable stool, to represent the goods depot. Side walls and other details must be left to the imagination, but the young enthusiast usually finds no difficulty about this.

Providing a suitable crane is not very difficult now that Meccano Outfits have



A busy yard scene on a Hornby layout. A perishable train of vans is being moved out by the yard engine.

made their welcome reappearance. A plain yard crane is a simple subject, but more elaborate ones can be constructed if the goods depot is supposed to be a big one where heavy traffic is dealt with. Another piece of yard equipment is the loading gauge. A Hornby loading gauge may be available, but if not Meccano parts will provide a very good substitute.

On large layouts where there are several locomotives it may be possible to keep one engine specially for yard duties. It will spend its time making up trains ready for their main line run or in moving wagons about for loading or unloading purposes. On smaller layouts these movements will have to be made by the engine of any train that is being dealt with at any particular time.

The illustration shows a train being hauled out of a factory yard. Note that the rails are on the same level as the road, which is common practice in yards and dock areas, to permit road vehicles to cross the track.



Club and Branch News



WITH THE SECRETARY

CLUB AND BRANCH HOLIDAYS

We have now reached the holiday season of the year, and I hope that every member of the Guild and of the H.R.C. will enjoy a thoroughly happy and healthy time during this outdoor season. Many of them will travel away from home, and wherever they go they are sure to find good subjects for new models, or interesting railway features that will give them ideas to be put to profitable use in Club and Branch operations.

At this time of the year Clubs and Branches also can enjoy holidays, when members leave their quarters to take part in rambles, excursions, cycle runs and outdoor games. For events of this kind there must always be some object in view. For instance, a Club ramble is not a mere walk to be started aimlessly and ended anywhere. Some special place should be the aim, whether one of interest of some kind or one at which members can thoroughly enjoy themselves for an hour or two. I know that too much organisation may spoil the fun of a happy gathering of this kind, but there should be definite arrangements in regard to meeting place and objects if a ramble is not to degenerate into a scramble. This applies even more particularly to a cycle run, in which a greater distance is covered.

SWIMMING AND LIFE-SAVING

One activity that I hope all Club Leaders and Branch Chairmen will keep in mind is swimming, one of the healthiest and most valuable pastimes. There must be few Clubs out of reach of a good swimming pool, or unable to visit indoor baths, and it is a good idea to organise a swimming section. Two things should be kept in mind. One is the training of younger members, for which the Seniors who are good swimmers should make themselves responsible. The other is the arrangement of a programme of races and other events. A special feature also could be made of life-saving. If no member of the Club is competent to take charge of this it is usually not difficult to find some enthusiast who is willing to give his services in training members in this very important branch of swimming.

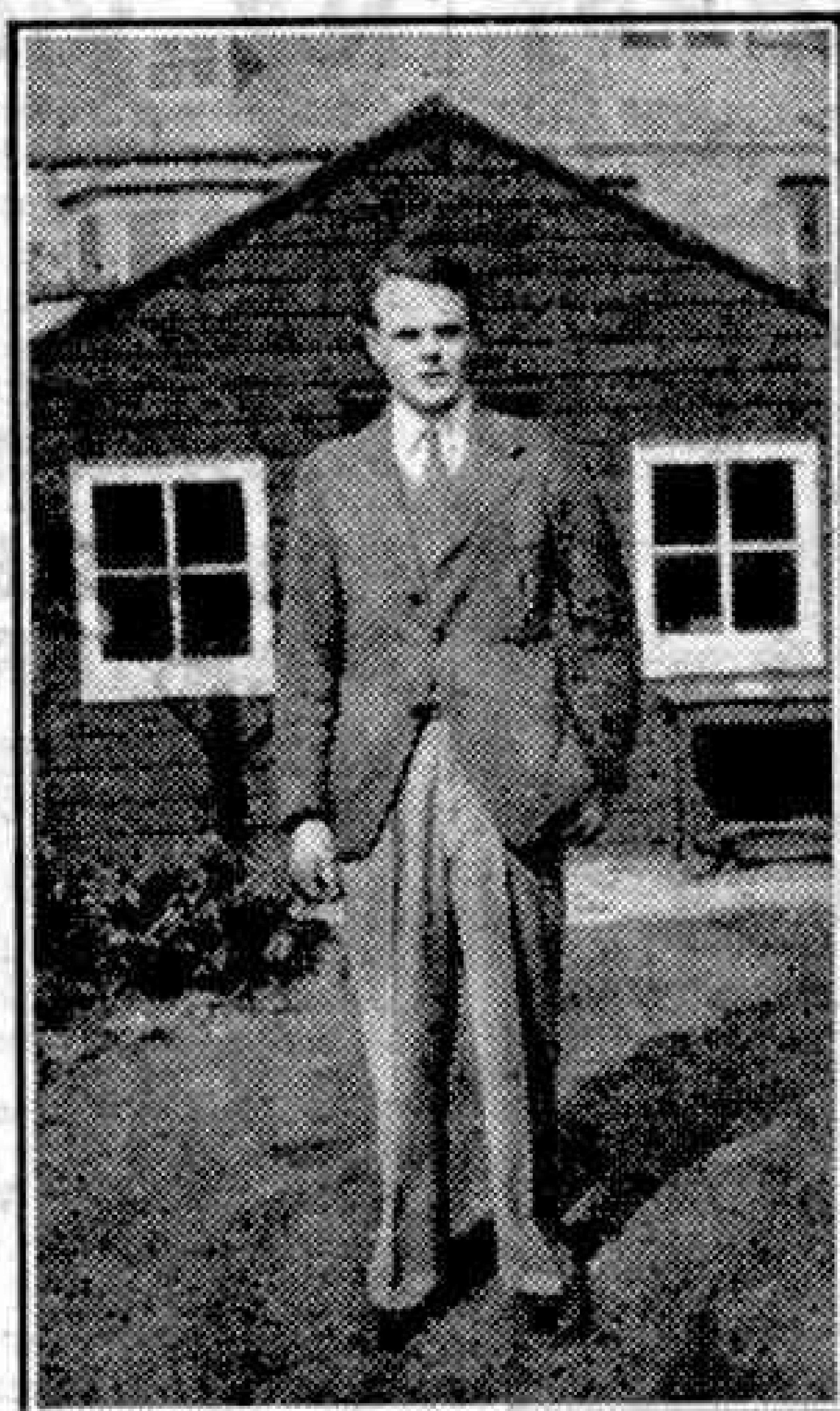
PROPOSED CLUBS

HARPENDEN—Mr. T. Hastings, 11, Salisbury Avenue.
NEWCASTLE-ON-TYNE—Master D. Dean, 43, Buckingham Street.

CEYLON—Mr. N. C. D. G. S. Gunasekera, "Swasthigiri," Bentota.

LONDON N.13—Mr. N. F. Tozer, 40, Rayleigh Road, Palmers Green.

BIRKENHEAD—Mr. D. Naybour, 53, Milton Road, Tranmere.



P. Hobson has been General Secretary of the Hornsea M.C. since 1945. This very fine Club was affiliated in April 1930. Careful organisation under the inspiring guidance of Mr. R. W. Shooter, Leader, has contributed largely to the success of the Club, which has always enjoyed the services of enthusiastic and capable officials.

CLUB NOTES

PLYMOUTH M.C.—The Club this year will celebrate its 21st Birthday. The committee has been re-organised. An official visit has been paid to the Exhibition of the Plymouth and District Society of Model and Experimental Engineers. Plans have been made for visiting Clearbrook this summer, where a tract of land has been placed at the disposal of the Club. Club roll: 40. *Secretary:* D. M. Cundy, 10, Whitefield Terrace, Lipson, Plymouth.

NORBURY M.C.—Members have had a very busy time, with monthly Model-building Competitions, Hornby Train Nights, Debates, Lantern Lectures and Talks. At one meeting Mathematical Games and Problems were enjoyed. There is keen competition between the "Bushwheels," "Fishplates," "Trunnions" and "Grubscrews," the sections into which members are grouped. Club roll: 45. *Secretary:* D. R. C. Pavey, 37, Croft Road, Green Lane, Norbury, London S.W.16.

HORNSEA M.C. — The programme continues to be varied and attractive, with Model-building a prominent feature. Mah-Jongg has become very popular with members, who also devote time to a wide variety of outdoor games when the weather is favourable. Outings on the Mere and Cricket also have been enjoyed. Talks on "Railways," "Gulliver's Travels" and other interesting subjects have been given. Club roll: 47. *Secretary:* P. Hobson, 1, Marlborough Avenue, Hornsea.

SOUTH AFRICA

MALVERN (JOHANNESBURG) M.C.—Mr. N. L. Cowling has resumed Leadership of the Club. Construction Nights are proving attractive. On these occasions all members display models, which make a splendid show when all are working. Outings have included a Hike, Swim and Camp Fire, and a visit to a Children's Home, when members entertained the children to a Film Show, with Refreshments and Sweets. Club roll: 23. *Secretary:* D. Eblen, P.O. Box 8,

Cleveland, Johannesburg, South Africa.

BRANCH NEWS

HORLEY—A large oval track with various sidings and stations has been laid down, and seven locomotives are in use during operations. This gives members excellent practice in timetable working and control, and the meetings are very enjoyable. *Secretary:* M. R. Berry, Police House, Balcombe Road, Horley, Surrey.

SOUTH AFRICA

WATERKLOOF HOUSE PREPARATORY SCHOOL (PRETORIA)—Excellent co-operation is achieved at track meetings. Special attention has been given recently to providing scenic effects. *Secretary:* R. Horn, Waterkloof House School, Brooklyn, Pretoria.

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For other Stamp Advertisements see also pages 298 and xi.

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Stamp Collecting

Ascension and St. Helena

By F. Riley, B.Sc.

FAR out in the Atlantic Ocean there are two solitary islands that are of unusual interest for such small places. They are Ascension and St. Helena, and in reality they are peaks of a submerged ridge that divides the Atlantic Ocean into two basins, Northern and Southern. They are both volcanic in origin. The peak of Ascension rises to a height of 2,820 ft., while the highest point of the rugged hills of St. Helena is 2,700 ft. above sea level. They are within the tropics, but the south-east trade winds that blow across them keep the temperature mild and pleasant.

Here are the next two points of call in our Empire stamp tour. St. Helena is 1,700 miles from Capetown. It is only 10½ miles long, with a width of 6½ miles, but its population in 1940 was estimated at 4,710. It was discovered in 1501 by the Portuguese navigator Juan De Nova, probably on St. Helena's Day. The Dutch claimed it in 1633, but never occupied it. It was seized by the British, re-taken by the Dutch and then again captured by the British, and held by the East India Company until 1834, when it became a Crown possession. The British Government had previously taken charge of it for the six years from 1815 to 1821, when it was the prison of Napoleon, the event in the history of the island that is best known. The exiled Emperor lived at Longwood, in the centre of the island 3½ miles from Jamestown, the capital, and there he died in 1821.

The island is really an ancient volcano changed by the wearing away of its rocks. Steep and picturesque ravines stretch in all directions, and there are many outstanding peaks and pinnacles to which such names as the Ass's Ears, the Chimney, Lot and Lot's Wife have been given.

The first stamps of St. Helena appeared as long ago as 1856 and were portrait stamps. These continued to be the rule for many years, the tablet type coming in 1890 and continuing to the reign of Edward VII. Then came an issue of two interesting stamps, each of which had a picture in a second colour underneath the portrait. The pictures showed Government House and the wharf at Jamestown, and for many years these and more tablet portrait stamps provided for the postal needs of the island. They were followed by one in which the badge of St. Helena, an East Indiaman on the rocky coast, provided the picture.

The first full pictorials came in 1934, to celebrate the centenary of the transfer of the island from the control of the East India Company to the Crown, and they form a

very striking series. One of them, the 1d. value, is of outstanding interest in that it bears portraits of all four British sovereigns of the 100 years celebrated, beginning with William IV and ending with George VI. The four portraits are in ovals in the corners and between them is a picture showing the Governor's

House at Plantation, built in 1791, and once occupied by Sir Hudson Lowe, Napoleon's custodian. The twin peaks Lot and Lot's Wife appear on the 1d. value;



the quay at Jamestown, where Napoleon landed as an exile in 1815, and Jamestown itself are seen on other stamps, and the 2/6 value carries a figure of St. Helena, the patroness of the island.

This series was followed by the Silver Jubilee and Coronation issues, both of the usual Colonial type, and then in 1938 came another badge issue, this time with a portrait of King George VI.

Ascension Island is 760 miles from St. Helena, and is only 7½ miles long and six miles wide. For many years it had the distinction of being H.M.S. "Ascension," the only island in the world to be an official ship, for it was controlled by the Admiralty and garrisoned by marines until 1922. Then it became a dependency of St. Helena and was transferred to the Colonial Office.

This event saw the beginning of Ascension's stamp story, but at first the stamps of St. Helena overprinted with the name of the island were used. The first direct Ascension stamps appeared two years later, and carried the badge we have already noted on the stamps of St. Helena. One design was used for all values from ½d. to 3/-, but each stamp was in two colours and these were widely varied.

The growing taste for pictorial issues found expression in the next issue of 10 years later, a very fine one in which each stamp was in black with a second colour, all showing interesting scenes on the island itself. The lowest value pictured Georgetown, the capital, and the pier of this port appeared on the 1½d. value. Famous beach and mountain scenes distinguished other stamps in the issue, and the 1/- value depicted the sooty tern and Wideawake

Fair. Wideawake is the name given by sailors to the sooty tern, from its cry. At certain seasons this sea bird crowds in countless numbers to certain islands in

the Atlantic, and the gathering on Ascension is known as Wideawake Fair.

Ascension is noted also for the abundance of turtles and turtle eggs found on its shores, the season for these lasting from December to May or June. The 2d. value gives a reminder of this; it shows a small map, with a drawing of a turtle on it. The Green Mountains, six miles from Georgetown, are shown on the 4d. value. Springs in these mountains provide water for the people of Ascension, who number about 170, practically all belonging to naval and telegraph staffs stationed on the island.





RHODESIAN ROYAL VISIT FREE

WE will send you **ABSOLUTELY FREE** this lovely green and black two-colour stamp, which shows both of our Royal Princesses (Princess Elizabeth and Princess Margaret Rose). This very beautiful stamp was only issued in April 1947, to commemorate the Royal Visit to SOUTHERN RHODESIA during the African Royal Tour.

This attractive stamp and historical souvenir was on issue for a very short time only and is now scarce. We managed to obtain a small supply, and now have pleasure in offering one to you **ABSOLUTELY FREE** for you to add to and improve your own collection. Just send us 3d. in stamps to cover our posts, and ask for **free Rhodesian Royal Visit stamp**. It will be immediately sent to you with our interesting approvals. **WINDSOR STAMP CO. (Dept. M), UCKFIELD, Sussex**

K.G. VI ISSUES

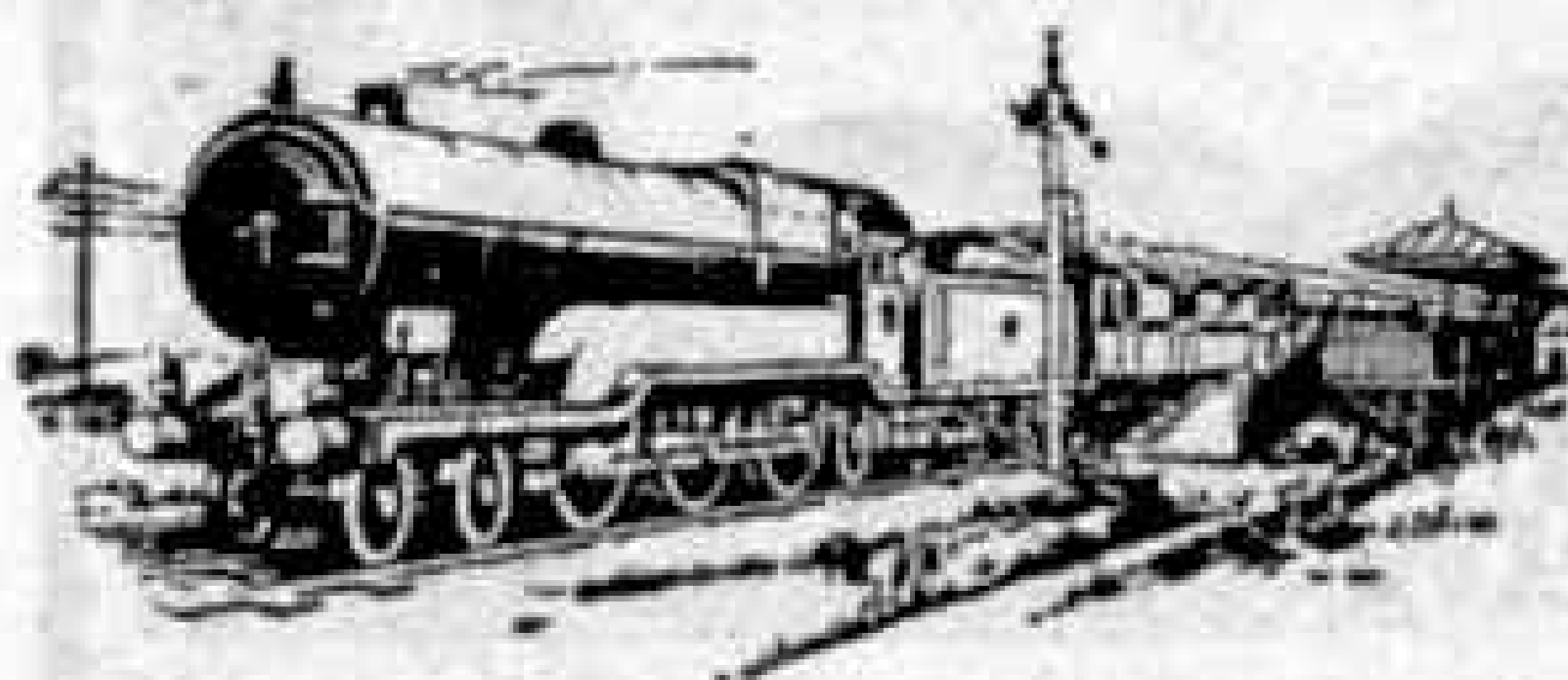
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Stamp Gossip and Notes on New Issues

By F. E. Metcalfe

COLLECTORS and dealers were more than just pleased when at long last the "Victory" set of Southern Rhodesia appeared, months after the other sets. While the four stamps were neat enough in



their way, there was nothing about their designs or appearance to compensate dealers for all the upset they had experienced in having to wait so long before they could complete their hundreds (in some cases thousands) of orders. Well it's all over now and many collectors will already have mounted their sets. The chief drawback to the Crown Colony series is the fact that all are of the same design, and though this is nice enough in

itself, 90 stamps all the same, except for the colour, does get a bit boring.

We make such a fuss in this country about producing a stamp design that it was, of course, out of the question to expect that each colony would have its own distinct stamps, but had this been possible these "Victory" stamps would have enjoyed a popularity all over the world, which would have more than compensated the various colonial governments for their extra outlay. As it is, the stamps which have been issued are already creeping up in price, for belief is gaining ground that the actual numbers sold were less than those disposed of for the Coronation in 1937.

Many collectors will have copies in their collections of the so-called French "Marianne" stamps. These were produced in London, and are certainly quite attractive. The colours are good, but it is the design which causes most of the fuss, and this is amusing, for the writer of these notes, at any rate, cannot see the slightest difference between these stamps and the good old "Penny Black" as far as the general structure of the design is concerned.

Collectors seem to be quite excited about the forthcoming set of stamps which is being emitted for Norfolk Island. By the time these words appear in print the stamps themselves should be on sale, and while they have not yet actually arrived in this country (though they should soon be here as the issue date was 10th June) we are able to illustrate



what the stamps will look like, owing to the courtesy of the Australian Government. With a population of less than a thousand maybe there will

not be much demand for these stamps, except from collectors, but they can be expected to provide enough revenue to keep Norfolk Island in clover, for the news was recently given out that over one hundred thousand pound's worth of stamps had been sold of the Falkland Island Dependencies, and the only population of that remote territory is penguins, which shows the possibilities of profit.

Egypt is still at it. This time she has produced a stamp to commemorate the evacuation of British troops from another portion of her territory. The stamp is attractive enough, and as the question of distribution seems to have been solved in a satisfactory manner, the stamp can be bought for less than 6d. which brings it within the reach of most collectors. Incidentally Egyptian stamps seem again to be gaining in popularity. They slumped slightly when it was noticed that Gibbons were listing them under "Foreign Countries" in their new issue chronicle; however, the latest edition of their Part I catalogue, shows Egyptian stamps still among British Colonial stamps. Of course it is pointed out that Egypt is no longer part of the British Empire. Thus can collectors of these stamps make the best of both worlds.



Probably some readers would see in the newspapers an account of the protests in the Bahamas parliament, over the veto exercised by Mr. Creech Jones on the project for the emission of a set of stamps to commemorate the tercentenary of the founding of the colony. The Colonial Secretary is said to have stated that Bahamas had already had a special set of

stamps within recent years, and that he was against the exploitation of stamp collectors.

As all the rest of the world—outside the British Empire—is bringing out new sets every few weeks or so, one can only be amused at the sentiments expressed. Of course there is nothing to such an opinion, and one might have thought that, with stamps being issued by Egypt to celebrate the demise of one part of the Empire, a more loyal portion of our commonwealth might have been allowed to express its loyalty in a similar fashion.

All this talk about exploitation of collectors only seems to come from the part of the world—British Empire—which does the least of it, and anyhow if there was the slightest pressure put on any collector, by any government, for them to buy their stamps, there might be some excuse for such statements. As it is there is none; collectors buy or do not buy stamps, just as they themselves please.

Probably no country has provided more attractive stamps for young—and not so young—collectors, as Liberia. One doesn't hear talk about exploiting collectors coming from this African republic; they just go on producing attractive pictorial stamps, which have given so much pleasure for so many years. This month we are illustrating one of a set issued to mark the commencement of the project to build a harbour at Monrovia. (Cont. on page 302)



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.

TRACK DOWN THESE SLOGANS

Last month's "M.M." Advertisement Contest proved so popular, and attracted so many entries, that we are following it this month with another advertisement contest, concerned this time with well-known slogans that are used to emphasise the features of well-known national products. Each of the slogans used has appeared recently in the Press or on the hoardings.

The slogans are shown in the panel on this page, and readers are asked to identify the products to which they refer. Some of the slogans will be recognised very quickly, but there should be no real difficulty in identifying any of them, for "M.M." readers keep their eyes open as they move about.

When as many slogans as possible have

been tracked down to their source a list of the products represented should be prepared in the order given in the panel. The complete list should be addressed to "Advertising Slogans, Meccano Magazine, Binns Road, Liverpool 13."

As usual the competition is in two sections, for Home and Overseas readers respectively, and in each section prizes to the value of 21/-, 15/- and 10/6 will be awarded for the best entries in order of merit. If there is a tie for any prize the judges will take into account the neatness of

the entry or the novelty in which the solution is presented.

Closing dates are 30th August in the Home Section and 28th February 1948 in the Overseas Section.

1. That's How I Like My Milk.
2. The Daily Tonic Everybody Needs.
3. Does More Than Bleach.
4. Preparing To Be A Beautiful Lady.
5. Safety Fast.
6. Second To None.
7. More Than A Breakfast Food.
8. You Can Depend On It.
9. The Scientific Cleanser.
10. It's A Man's Tobacco.
11. For Daily Increasing Health.
12. The Family Friend.

What Air Lines Are These?

For our second contest this month we turn to the air lines of the world. This will give a splendid opportunity to those "M.M." readers who are specially interested in aviation, but this special interest is not absolutely necessary; every reader of the "M.M." will have gathered sufficient information about commercial aviation to solve the simple puzzle that we are setting him.

Below we give the jumbled names of a selection of air lines, and readers are asked to say what these names really are. As an example to make matters clear, the first jumble is "HBTIIRS SEVOREAS SAIAYWR." This obviously is a company that has three words in its name and examination and re-arrangement show these words to be "British Overseas Airways." It will be seen that each word in the names of the airway lines is shown separately, which in itself will provide a clue in certain instances.

- | | | | |
|--------------|----------|----------|---------|
| 1. HBTIIRS | SEVOREAS | SAIAYWR | |
| 2. IHSIRBT | PONAEURE | WASYARI | |
| 3. NTSQAQ | REEMIP | IWSYARA | |
| 4. UTOHS | CARNAFI | WSYIAAR | |
| 5. ERA | SLNIUG | ATTEANRO | |
| 6. IDEUTN | RIA | ELSN | |
| 7. ANP | RNAAMCIE | RSYWAIA | |
| 8. TAENRSE | RAI | NISEL | |
| 9. PNA | INAMACRE | ODWRL | RIASYWA |
| 10. ALRYO | CDTHU | IRA | NSLIE |
| 11. RNAEACIM | LSAIEIRN | | |
| 12. NTASR | AAANCD | ARI | ELSN |

Entries must be addressed "Air Lines Contest, Meccano Magazine, Binns Road, Liverpool 13." There are two sections in the competition, for Home and

Overseas readers respectively and in each prizes of 21/-, 15/- and 10/6 will be awarded for the best solutions in order of merit. The judges will take neatness and novelty into account if necessary. The closing dates are 30th August in the Home Section and 28th February 1948 in the Overseas Section.

August Photographic Contest

This month's contest is the 8th of our 1947 series, and in it, as usual, prizes are offered for the best photographs of any kind submitted. There are two conditions—1, that the photograph must have been taken by the competitor, and 2, that on the back of the print must be stated exactly what the photograph represents. A fancy title may be added if desired.

Entries will be divided into two sections, A for readers aged 16 and over, and B for those under 16. They should be addressed "August Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13." There will be separate sections for Overseas readers, and in each section prizes of 21/-, 15/- and 10/6 will be awarded. Closing dates: Home Section, 31st July; Overseas Section, 31st January 1948.

COMPETITION RESULTS OVERSEAS

AUGUST 1946 RAILWAY QUIZ

1st Prize: J. A. Markham, Windsor, Canada. 2nd Prize: Pablo Giese, Buenos Aires, Argentina. 3rd Prize: B. Costigan, Brisbane, Australia. Consolation Prize: K. Lindwall, San Francisco, U.S.A.

SEPTEMBER 1946 POINTWORDS CONTEST

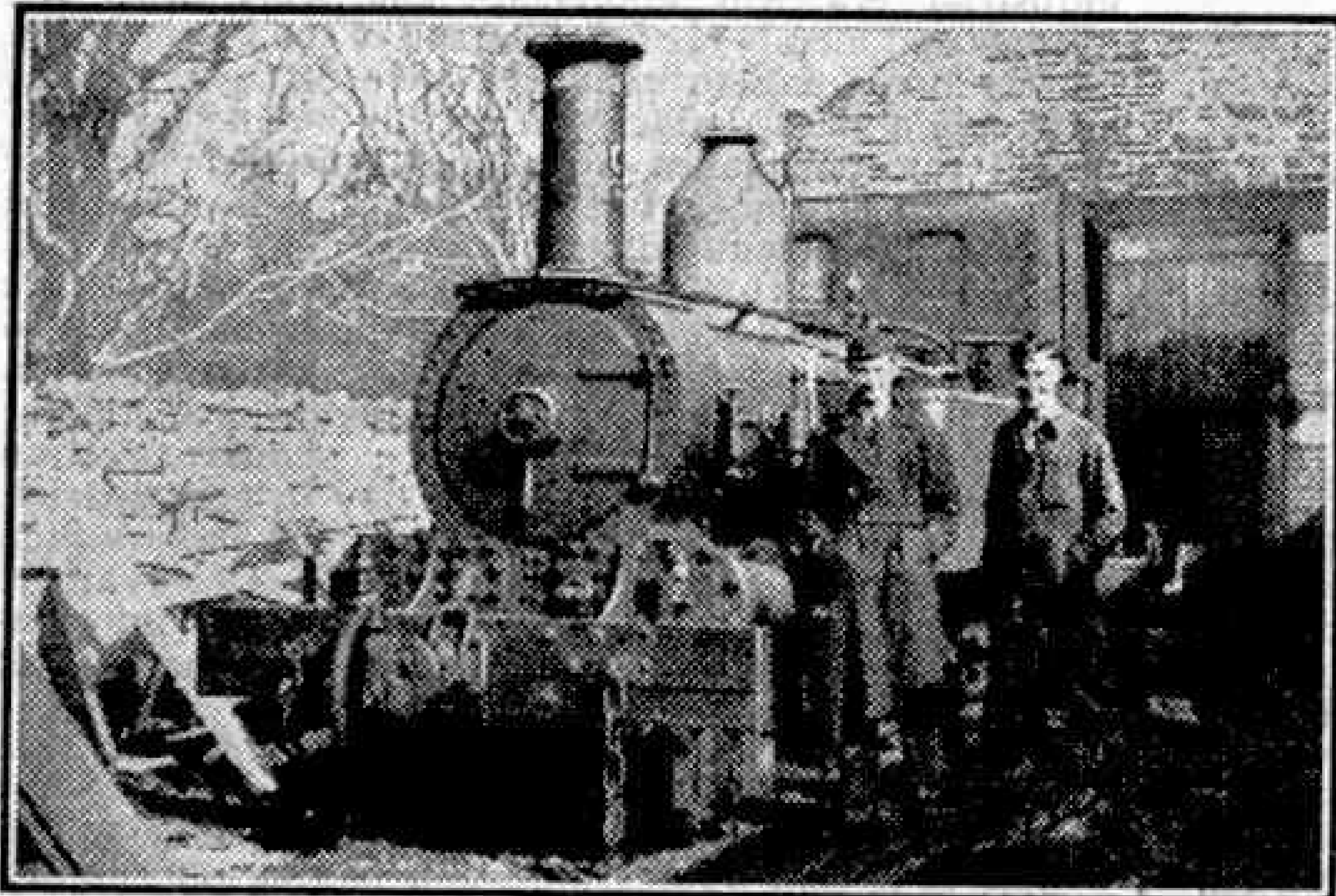
1st Prize: G. Stokes, Port Elizabeth, S.A. 2nd Prize: J. S. Manduca, Sliema, Malta, G.C. 3rd Prize: M. Most, Pietermaritzburg, S.A. Consolation Prize: M. Boocock, Oxford, N. Zealand.

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.

THE ISLE OF MAN RAILWAY

The 16 engines owned by the company are all 2-4-0 tanks except No. 15, "Caledonia," built by



Isle of Man Railway 2-4-0T No. 9 "Douglas" at the running shed.

Dubs and Co., and were built by Beyer-Peacock to the 3-foot gauge, with 3 ft. 9 in. driving wheels. They were named after important people connected with the line at different times. Numbers 1 to 9, and No. 14, the least powerful, were delivered between 1873 and 1896; Nos. 10 to 13, which are slightly larger, came along from 1905 to 1910; and No. 16 "Mannin," the most powerful, was delivered in 1926.

The line is single track with passing loops at each station and there are about 45 miles of main line. After travelling over the whole of the system and seeing all the locomotives, I visited Douglas works and running shed. These are situated at the northern end of the station, opposite the large carriage shed. The works and the shed are connected by a door at the back. First we inspected the works, a single track with an inspection pit running the whole length of the long stone building. All repairs are undertaken here, and even the most extensive overhauls can be carried out, the machinery being operated by steam from an old locomotive boiler outside the shed.

On the occasion of my visit, No. 6 "Peveril" was being completely overhauled. The boiler was at one end of the shop and the frames, without the wheels, were at the other.

In the shed, a two-track

building with inspection pits, No. 15 "Caledonia," the ex-Manx Northern Railway 0-6-0T, was lying dead, fitted with a snowplough. This engine is rather slow, though powerful, and is not often used. Other engines of the standard 2-4-0T type were there, and in a small yard was No. 9 "Douglas," from which many parts had been taken to repair other locomotives.

P. J. LUCAS (Southport).

GIANT DRAGLINES IN NEW ZEALAND

In New Zealand's pioneering days, when the settlers felled the huge forests, they expected grass to grow in their stead. But frost pulverized the soil and the hills were soon being eaten away by the seasonal heavy rains, which started landslides and slips, and in time the rivers carried the earth out to sea, to pile it up in bars at their mouths. These obstructions then gave rise to serious floods, and in time some 11,000,000 acres of flat ploughable land were lost.

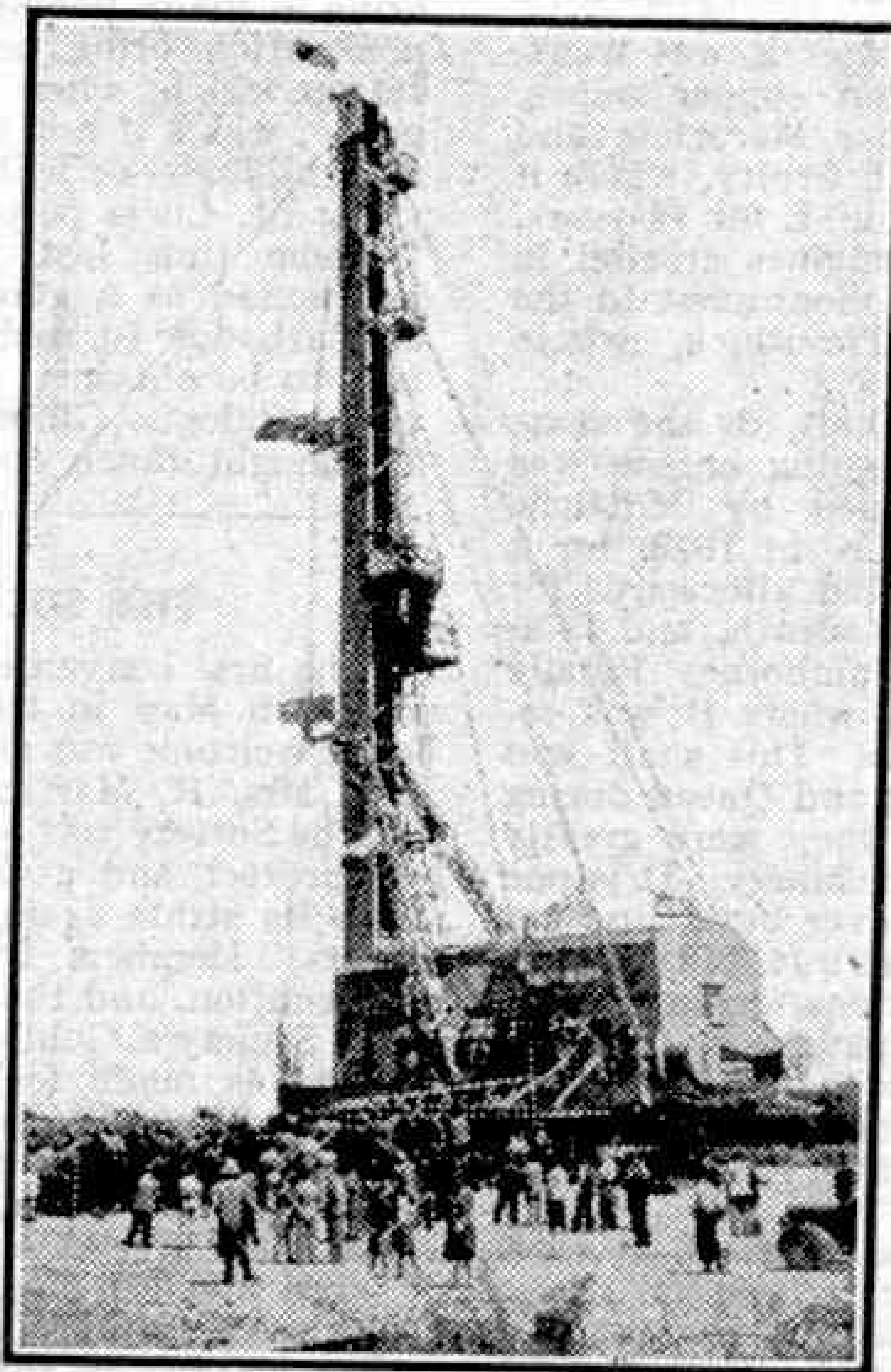
One of the most logical solutions of this problem is to clear the shingle bars that obstruct the flow of the rivers, which then increase in speed and scour out their beds instead of silting up. Three giant Diesel-engined draglines were imported from the United States of America for this purpose, and began operations at the mouth of the Otaki River last November.

The draglines have two towers, the maximum distance between them being 1,000 yards. The large or head tower is 134 ft. high and contains so much machinery at the base that it does not require anchoring; but the small or tail tower, which is 30 ft. high, has an 80-ton weight to hold it firmly in place.

The operator's position in the head tower is 60 ft. above the ground, and the big winding drums in the base turn at his finger touch on the electric controls. The bucket scoops up from 10 to 12 cu. yds. or 18 tons at a time. It is pulled through the river bed between the towers, one on each side of the river, by a 1½ in. cable, which on its way from drum to bucket passes over a sheave in the frame of the head tower to a pulley on the top of the tail tower, and is attached by a short chain to the rear of the bucket below. On a long span the bucket is returned to the digging point after tipping by means of a light back haul cable.

In America these draglines have dug out earth at the rate of 350 cu. yds. an hour, but under the Otaki River conditions 250 cu. yds. an hour are expected.

K. BOOCOCK
(East Oxford, N.Z.).



A gigantic dragline at work in New Zealand. Photograph by courtesy of "The Evening Post," Wellington.

The "Butterfly Boat"—(Continued from page 268)

those that were ordered were of outstanding quality. It was not easy to introduce revolutionary changes of design after the scientific work which had been put in before 1914, but in matters of detail, comfort and economy great improvements were made. They had not only to face the competition of the ships of rival types but also that of the road and rail interests. Such ships as the General Steam Navigation Company's "Royal Eagle" on the Thames, various Clyde steamers including the diesel-electric "Talisman" and the railway steamers whose buried paddle boxes struck a new note, and others in the Solent and Bristol Channel showed how many attractive features could be worked into the type which, technically, was quite obsolete.

Like so many other instruments which have been surpassed by clever inventions, the paddler still does some jobs better than ships of any other type; she has stability, manoeuvrability and high speed with a light draught, does not draw the water from under her when passing through shallows and, what some technicians are apt to forget, retains the affectionate interest of the passenger to an extraordinary extent.

The Fairey Guided Missile—(Continued from page 279)

being picked up by an aerial carried inside the missile's tail fin. The "Stooge" has a top speed in level flight well in excess of 500 m.p.h., and can be made to perform most manoeuvres of a normal aircraft. In fact it has been developed to the stage where a skilled operator could guide it on to any target within its four miles range.

The military possibilities of such a missile are obvious and further developments can be expected. It also has its uses in peace. For instance, it could carry a life-line or a self-inflating lifeboat right over a ship in distress, or carry special mail over water or difficult country. But chiefly it is a powerful weapon for defence or offence.

The Cornish Pumping Engines—(Cont. from page 287)

Wheal Alfred Mine, near Hayle. Later it was transferred to the Crenver and Abragan copper mines, then to Tregurtha Downs Mine near Marazion, and in 1903 was finally erected at South Crofty, where it has worked continuously, day and night, for 44 years. It is one of the most successful engines erected in Cornwall, and stands as a working monument to the designer, and also to Richard Trevithick, whose pupil Grose was.

I next visited Cook's Kitchen Shaft, in the same mine, where a 90 in. Cornish pumping engine was working. This engine was designed by Matthew Loam, and built by Harvey and Co. in 1873, for a South Wales colliery. It was adapted afterwards for the Tresavean Copper Mine near Redruth, and later moved to Wheal Grenville, near Camborne. Finally it came to South Crofty in 1922, where it was re-erected in a concrete engine-house. This shaft was honoured by a visit from the King and Queen during a tour of Cornwall in 1942, and they were greatly impressed by this huge piece of machinery. It is one of the largest engines of its type ever built, and has a stroke of 10 ft. in the cylinder and 9 ft. in the shaft. The plunger poles from the surface down to the 1,153 ft. level are the largest employed in Cornwall and are 20 in. in diameter. Below the 1,153 ft. level are smaller plungers, down to the bottom level, which is 2,022 ft. from the surface. Delivery of the water is about 575 gallons per minute.

In addition to these two engines that are at work in the Camborne-Redruth district, there is also a 90 in. pumping engine at work at the nearby East Pool and Agar Mine, and there are also three Cornish pumping engines and one Cornish rotative beam engine still working in the St. Austell area.

It is interesting to note that there are six Cornish

engines installed at a London pumping station, at Kew Bridge. The largest of these is a majestic 100 in. Cornish beam engine, completed by Harvey and Co., of Hayle, in 1869. Two of the engines one known as the "West Cornish" and the other as the "East Cornish" engine, are over a hundred years old. All six were run for what was probably the last time in May 1946, when members of the Cornish Engines Preservation Society were privileged to be present. There is another 100 in. pumping engine of Messrs. Harvey's make in London, at the Lea Bridge pumping station. This engine, which is more interesting in design than the one at Kew, dates from 1854, and is known as the "Victoria" engine.

I am sure all readers interested in the preservation of the great engineering works of the early English industrial era will appreciate the work that the officials and members of the Council of the Preservation Society are doing to maintain some of these famous engineering giants, which will rapidly be sold for scrap unless someone takes a practical interest in their salvage. Who knows but that one day we may find it necessary to take advantage once more of the rich mineral wealth that Cornwall possesses. Any readers visiting Cornwall this Summer who would like to increase their knowledge of the early engines in this part of England, where this industry once brought prosperity to the Cornish people, should take an opportunity of spending at least a day in this district. I have no doubt that the Secretary of the Preservation Society, Mr. W. Tregoning Hooper, of The Observatory, Falmouth, would be pleased to supply any information regarding the Cornish tin mines and the present position of the work of the Society.

Note: The author wishes to express his thanks to the Cornish Engines Preservation Society and to the South Crofty Mining Co., by whose courtesy he was able to obtain photographs and factual information regarding these engines.

Stamp Gossip—(Continued from page 299)

Collectors of King George VI stamps seem to be more than ordinarily keen on perforation varieties. Some stamps, like the 3d. Gibraltar perforation 14, bring as many pounds as similar stamps in a common perforation bring pence. Now here is a nice little stamp which, when found, can be bought for a few pence, which if not worth pounds is certainly worth a few shillings—or will be one day. We refer to the 1d. violet St. Lucia perforated $14\frac{1}{2} \times 14$.

Some time last year the writer of these notes mentioned as a good stamp the perforation variety of Barbados 1d. red (No. 249a), mint of course. It was to be obtained then for about a shilling. In the new catalogue Gibbons list it at 27/6 and it cannot be bought much cheaper anywhere.

THE SOCIETY OF INVENTORS

The first convention of the above Society was held on 10th May in the Pavilion Gardens, Buxton. A civic welcome was given to the members by Councillor and Mrs. R. Martin, the Mayor and Mayoress.

The Society was formed 11 years ago on Merseyside, to protect and assist inventors, and is now getting into its stride again after the interruption of the war years. Members from various towns attended the convention, and the opportunity was taken to present the Society's Gold Medals for 1945 and 1946. This award is made for the best invention of the year. Mr. J. Atkinson, London, won the 1945 Medal with an ingenious universal metal clip, and Mr. F. W. Rutter, Manchester, gained that for 1946 with what was described as a very "ingenious child's toy."

The inventor has always been a neglected member of the community. The Society's aim is to alter all that, and to give advice and assistance to any inventor. Further information can be obtained from the Secretary, The Society of Inventors, Chamber of Commerce Building, 1, Old Hall Street, Liverpool 3.

Fireside Fun

"Did you sound dad and mum about buying us some cricket things?"

"Yes, I did, and dad sounded the worst."

"I can tell the age of a chicken by the teeth."

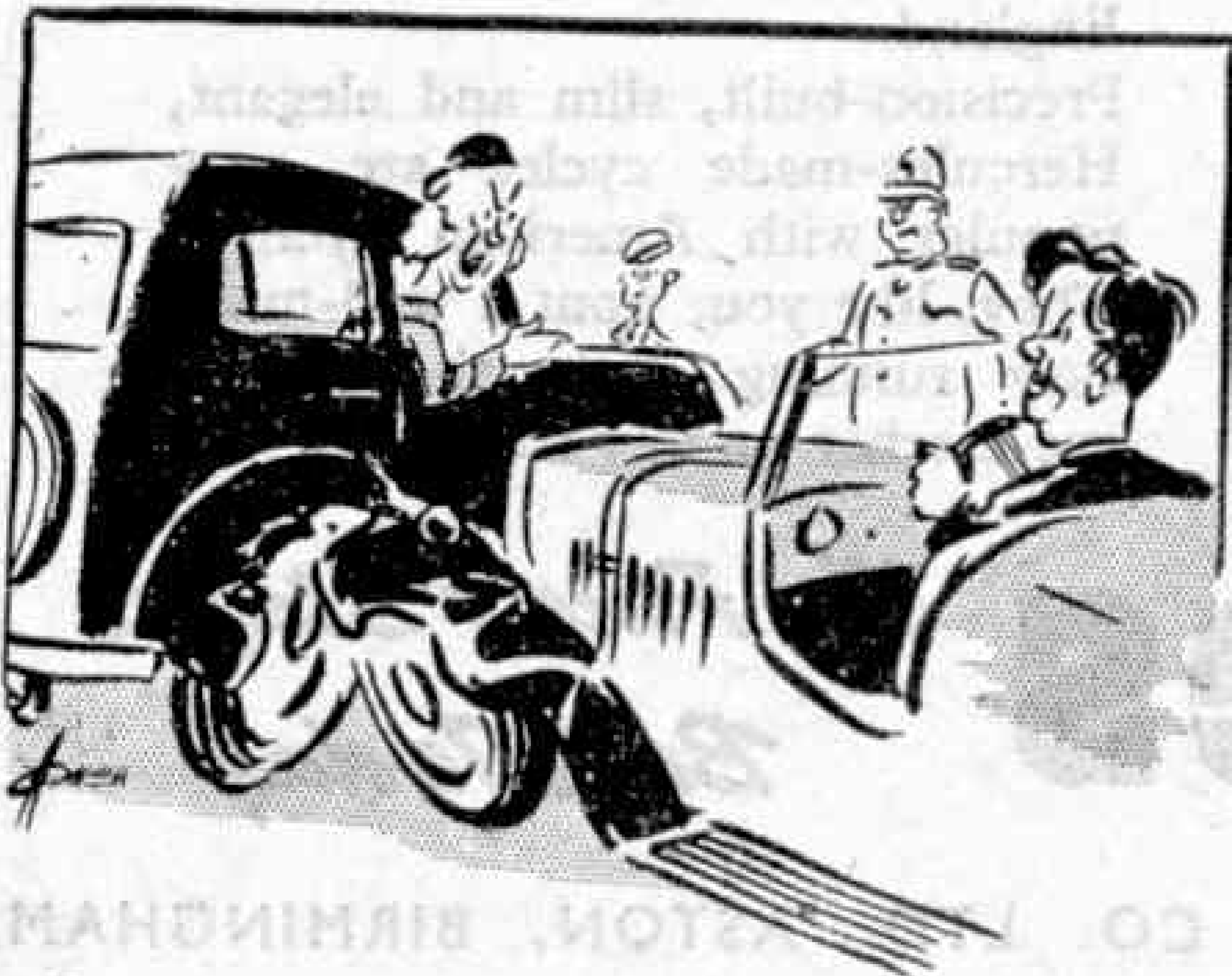
"But a chicken hasn't any teeth."

"No, but I have, haven't I?"

"Why are you late for school?"

"Please, teacher, I swallowed a piece of wool."

"H'm. That's a fine yarn. Stay in half an hour."



"I turned the way I signalled."

"I know. That's what fooled me!"

"You know that new bicycle I bought from you."

"Yes, sir. Is anything wrong with it?"

"Not exactly, but you didn't deliver that free wheel you said it had."

Visitor: "I understand you make all your electric light yourself."

Host: "Yes, I do, but of course I have a sort of engine thing to do the work, you know."

"Have you anything in stock to cure toothache?"

"Yes, sir, here's a sovereign remedy."

"Heavens, I don't want that. Haven't you something about sixpence?"

"Where's my lunch gone?" roared the foreman.

"Why, you told me to eat it up and I did," replied the boy messenger in amazement.

"I didn't tell you to h'eat it up. I said you were to 'eat it up."

"I didn't heat it up. I just had it cold."

"I hear your husband is a great darts enthusiast."

"Rather. When he comes home from work he darts in for his tea, darts upstairs for a wash and a change, and then darts out again. Darts all night, in fact."

"I'll kill dat low-down good-for-nothing husband o' mine."

"Why, Aunty, what has poor old Uncle Tom done now?"

"He's gone an' lef' de chicken house door open, an' all de chickens gone."

"Oh, that's nothing. They'll all come home to roost."

"Come home to roost? Dat's what de chickens has gone home for!"

THIS MONTH'S HOWLER

Silence is what you don't hear when you listen.

BRAIN TEASERS

NOT JUST ARITHMETIC!

Two fathers and two sons are to have half-a-crown divided equally between them, and the smallest coin each is to receive is 1d. Can you see how this was done? There is more catch than arithmetic in this.

S.W.C.

NUMBERS FOR LETTERS

Here is an interesting multiplication sum, in which each letter represents one of the numbers from 0 to 9 inclusive. Can you find what the numbers are?

H A G E
E A D

C E J I D
E B H F A
H A G E

D D D D D D

M.H.K.T.

A ROUND GAME

Six boys sat round a circular table playing dominoes. Jim sat next to Harry and opposite Dick, while George was opposite the boy who sat next to the shuffler. It was Tom's turn to shuffle and Peter dug his left elbow into his ribs as a hint to get on with it. Can you say in what order round the table the six boys were seated?

A QUEER MIXTURE

Can you answer the following teasing questions? What are the Cinque Ports? Who was the winner of the last Schneider Trophy Race? What is the difference between a Butt and a Barrel of water? How heavy is a Candy, and how does it compare with a Catty?



"Thank heaven, it's gone at last."

"That's not the ball, sir. It's your wrist watch!"

AN EASY ONE TO END WITH

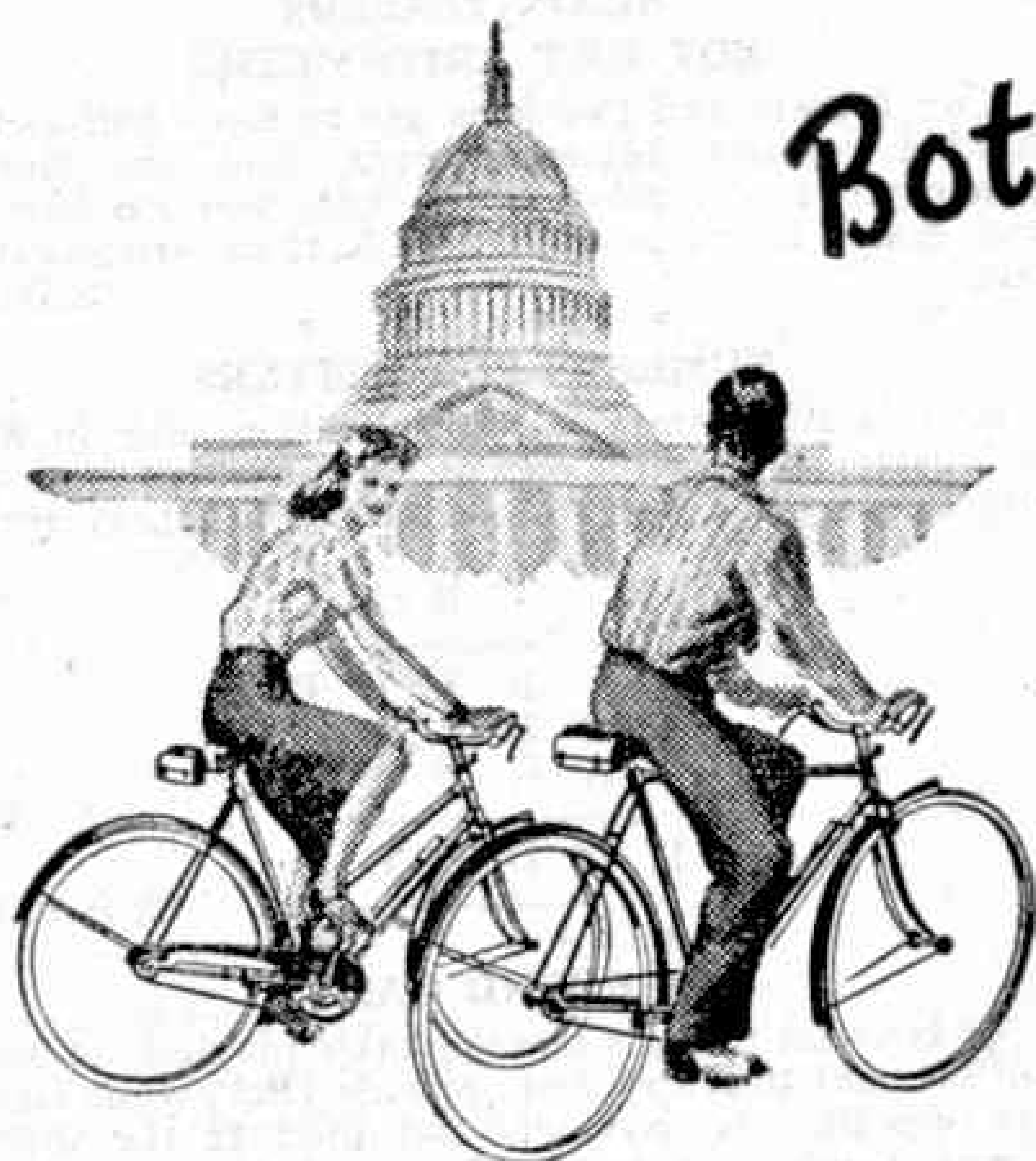
Certain letters have been left out from the following six words. When the blanks have been filled the words can be re-arranged to form a well-known quotation.

. P R . . . S ; . O . E ; . N ; . T . . N . L ; . R . . S ;
T . . ; . U . A .

SOLUTIONS TO LAST MONTH'S PUZZLES

The bright idea that came to Jones when he was about to discard his very slow watch, which lost 55 min. every hour, was that he could use the minute hand to mark the hours, since it would travel from one figure to the next in one hour.

The 10 words of seven letters each in our second puzzle last month were: ELEMENT, DEPOSIT, MORNING, SETTLED, RINGLET, PAPOOSE, PLUMBER, STRETCH, HERRING and PLAYBOY. The middle letters of these 10 words make up the name MONTGOMERY.



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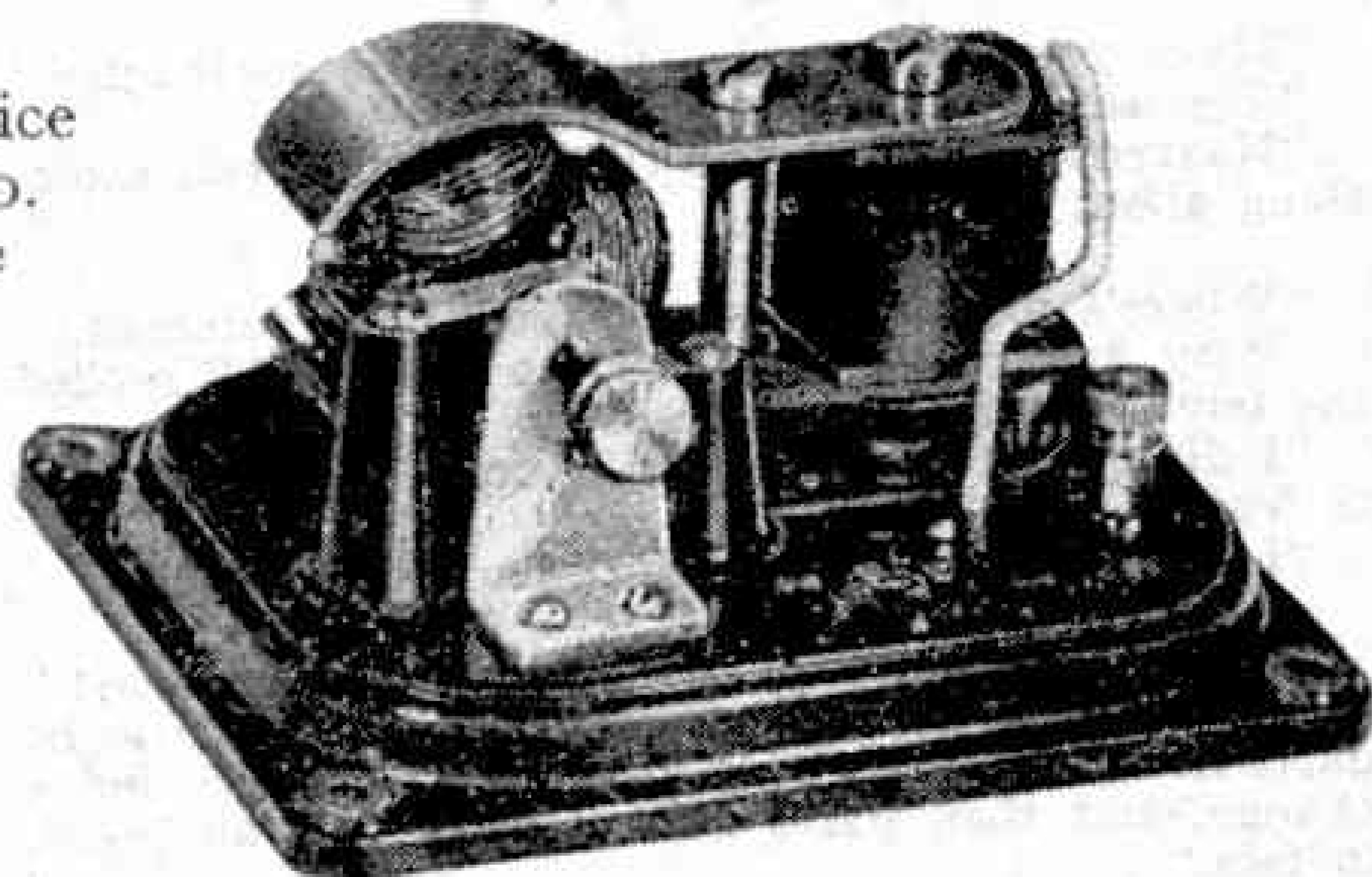
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6 volt Accumulators	11,000

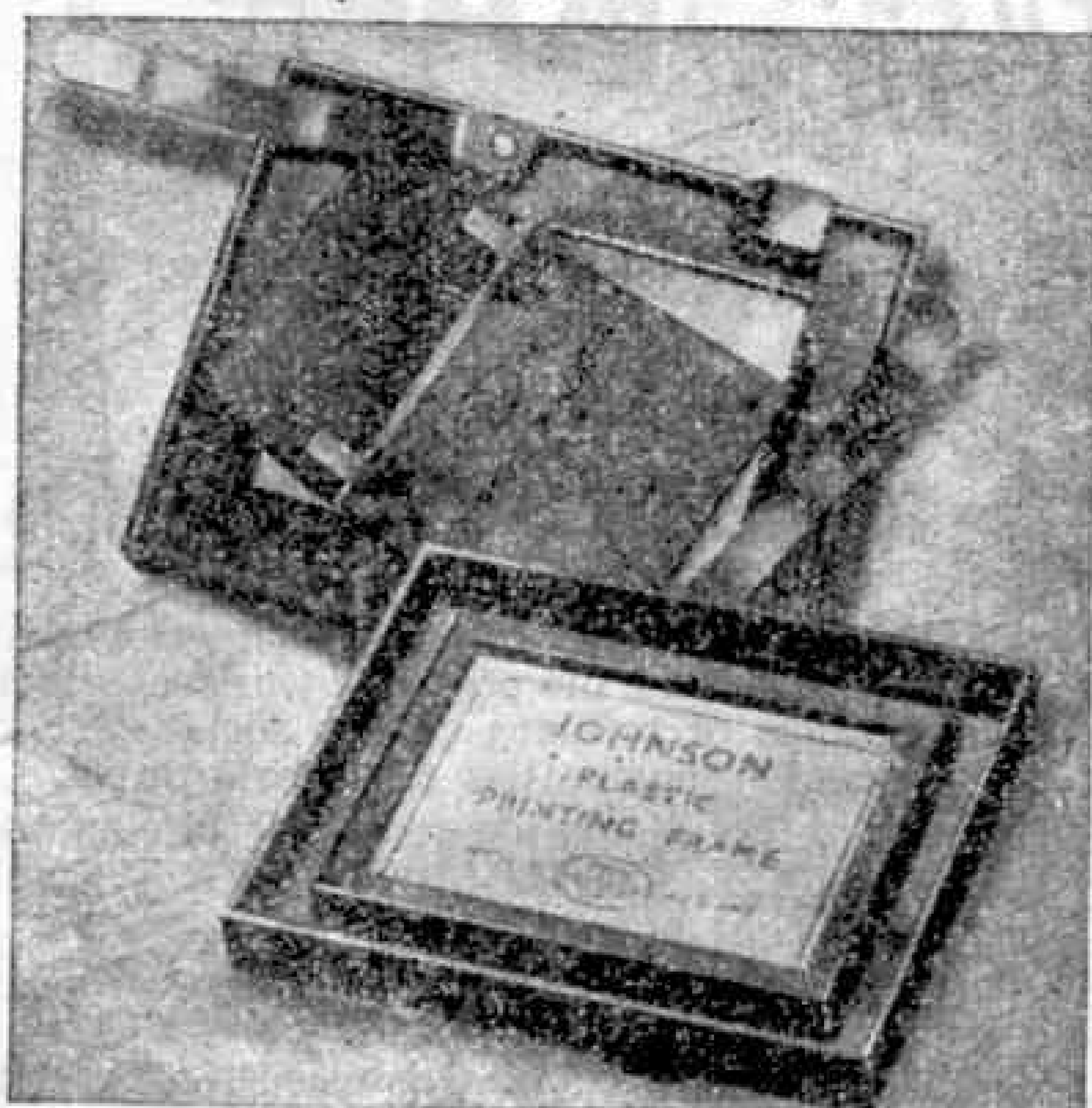
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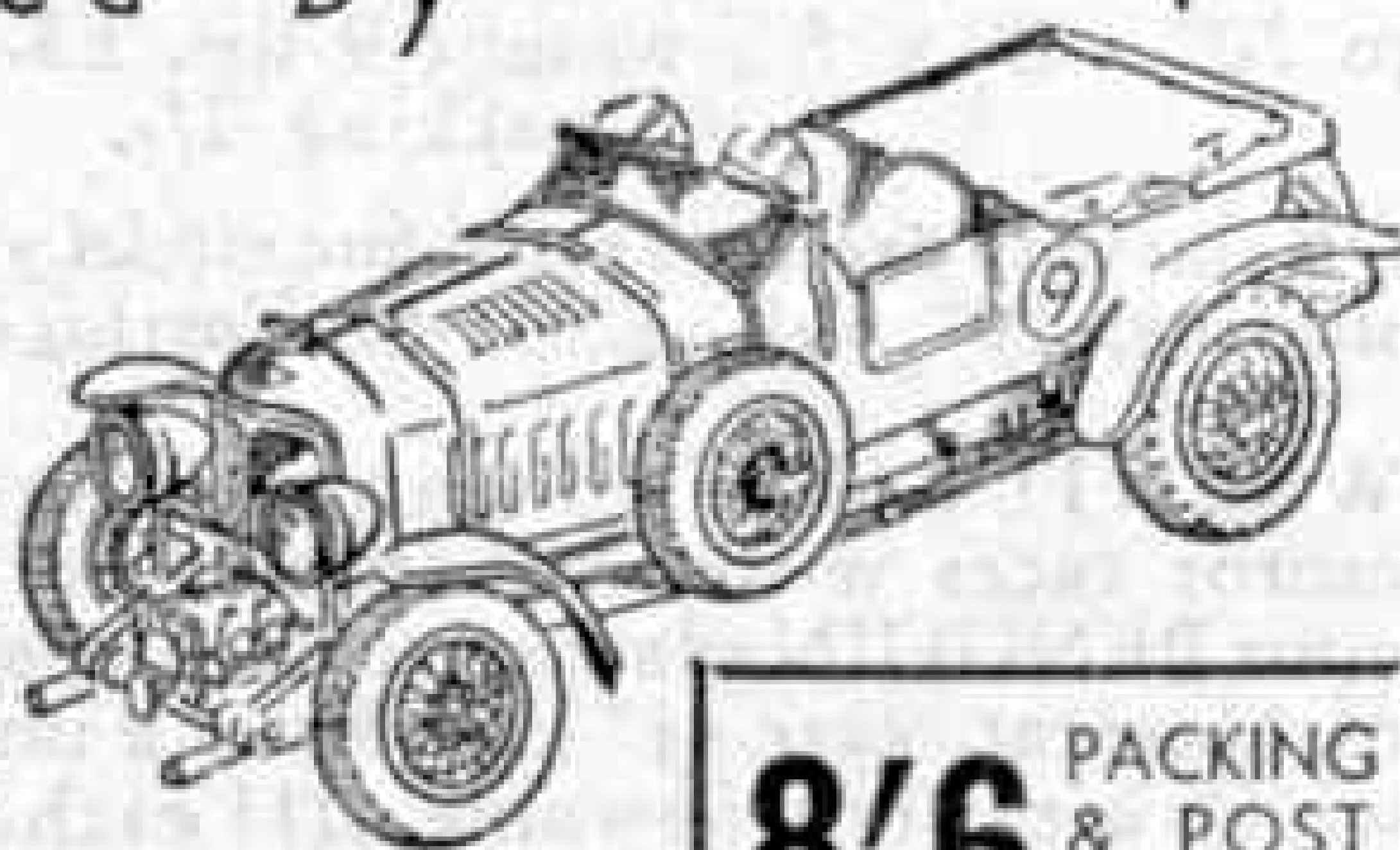
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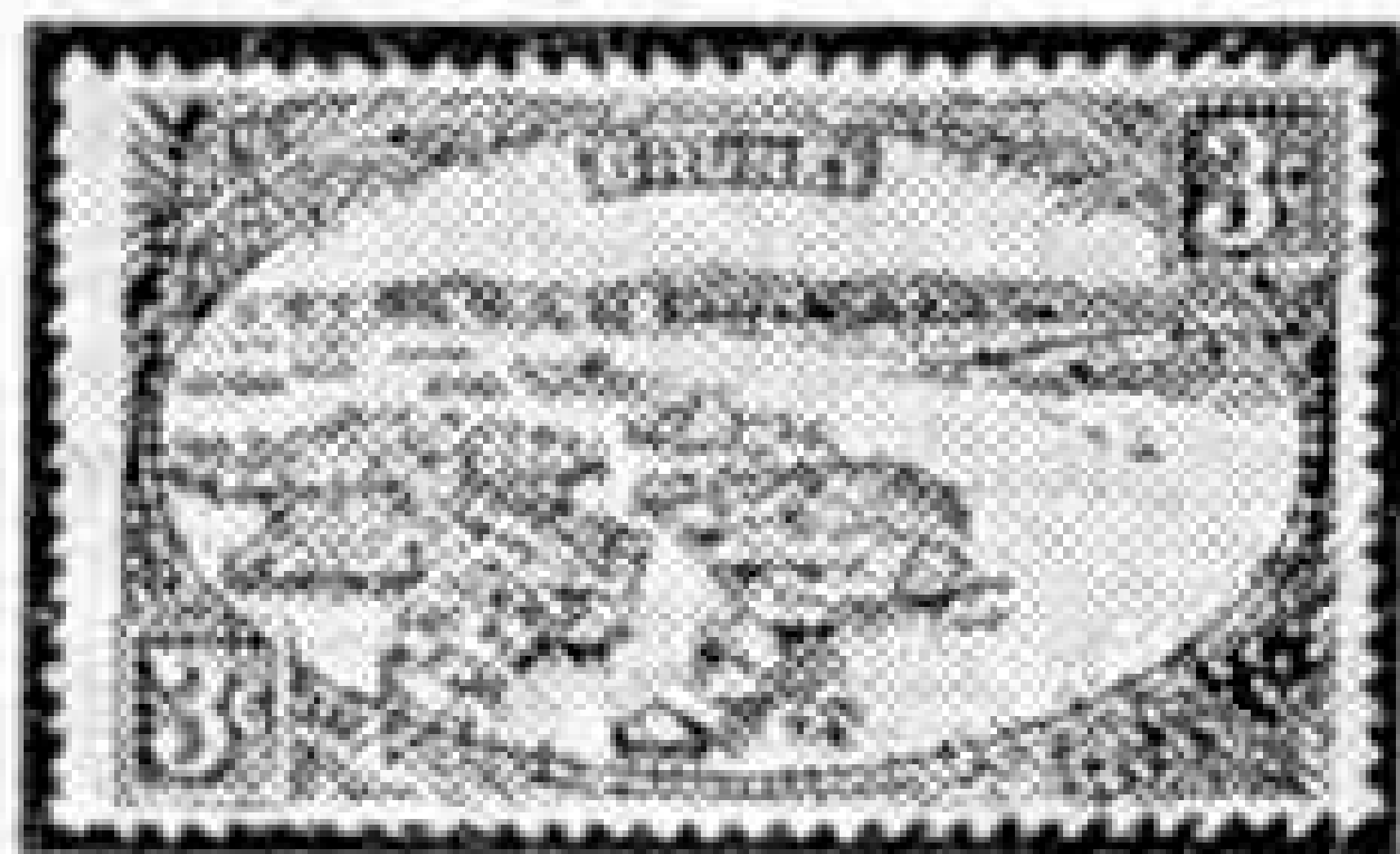
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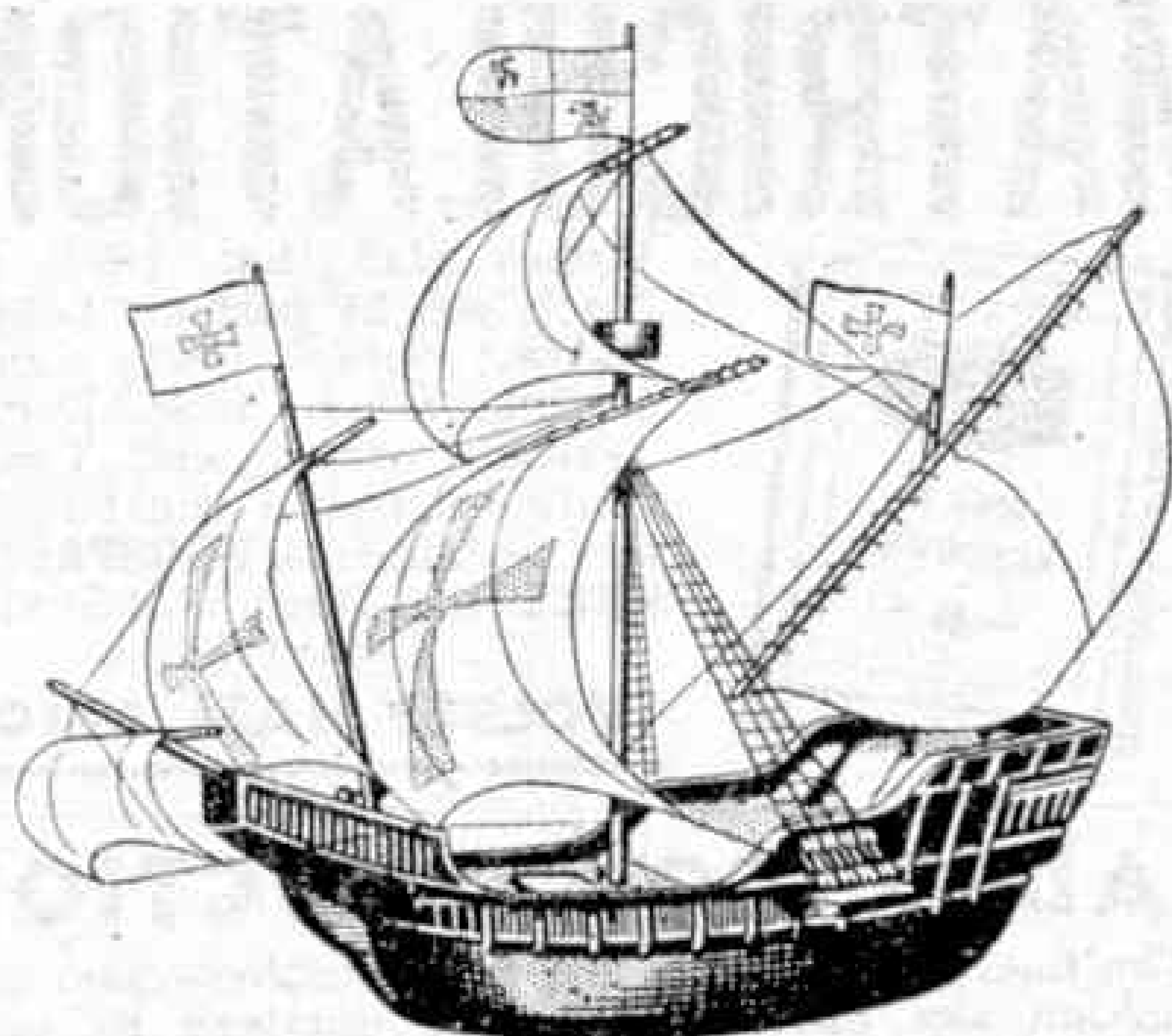
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No. 2 and No. 4 Meccano; Triang Gyro Cycle; Pony Saddle with Bridle; Six Golf Clubs; Hornby Clockwork 2 ft. Radius and Parallel Points. Offers to—W. Woolhouse, "The Woodlands," Fotherby, Louth, Lincolnshire.

35 mm. Films, 2/6 and 7/—Stamp for particulars.—Green, 321, Kingsway, Dundee.

"Aeroplane Spotters," January 1945-March 1947; "Scouts," September 1944-March 1947 (four missing); "Boys' Own Papers," November 1944-January 1947 (two missing). Excellent condition. What offers?—Box "M.M." 18.

"Meccano Magazines," April 1926 to December 1928, clean without covers. January 1929 to December 1947 as new. Offers.—Walden, 51, Busheyhall Road, Watford.

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"Meccano Magazines," Bound, January 1934 to December 1937; Loose, January 1938 to September 1940; February 1940 missing. Perfect condition. Best offer secures.—Morris, Littleholme, Ellis Road, Crowthorne, Berks.

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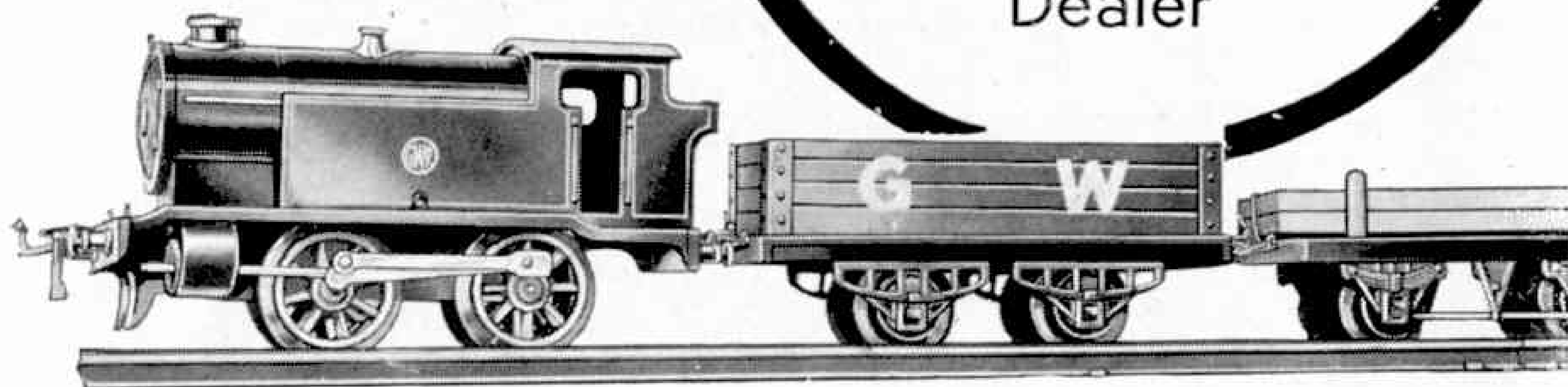
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