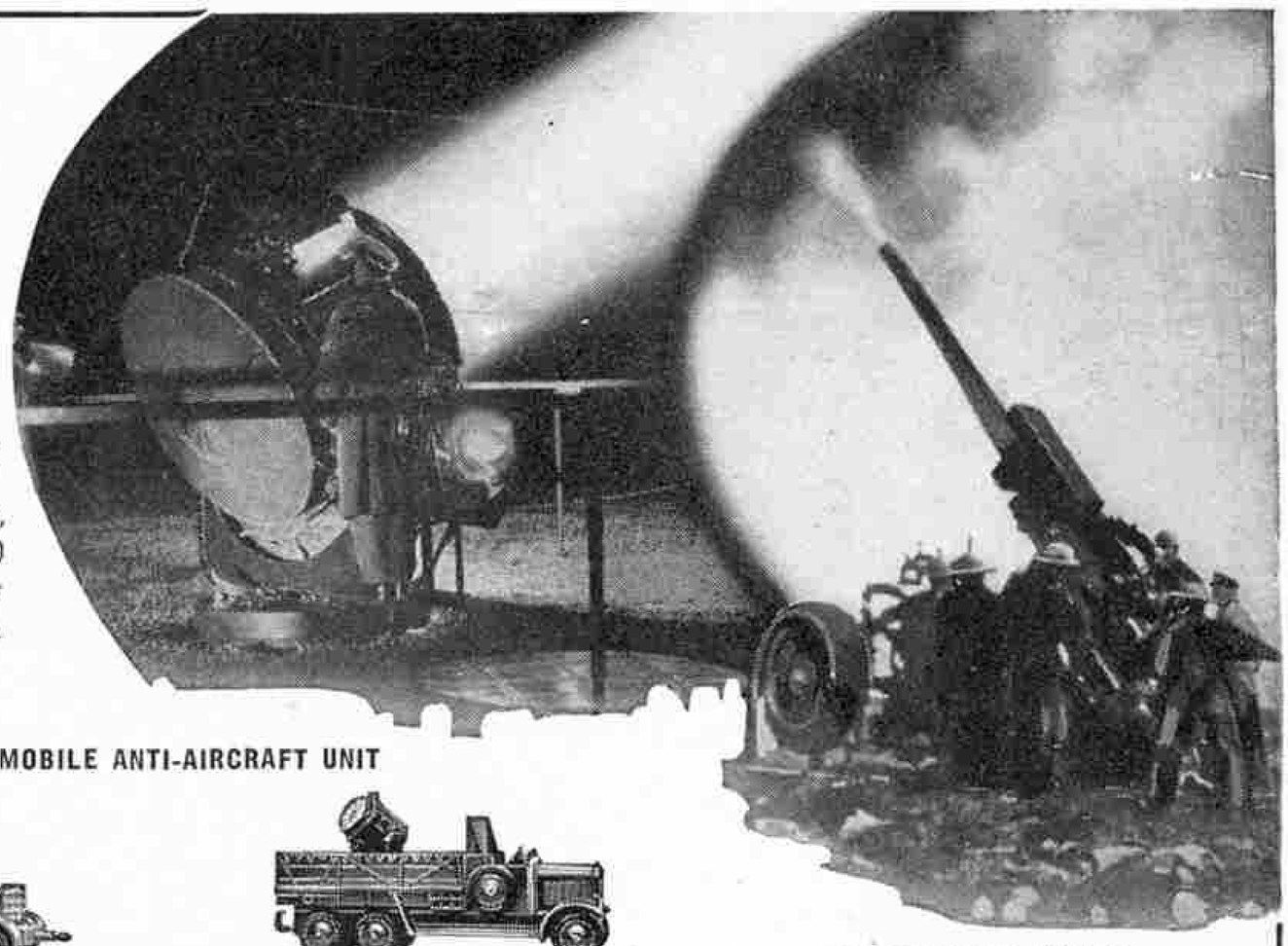
VOL. XXV. No. 12. DECEMBER 1940

MECCANO MAGAZINE

THE NIGHT BOMBER

6D.

DINKY TOYS



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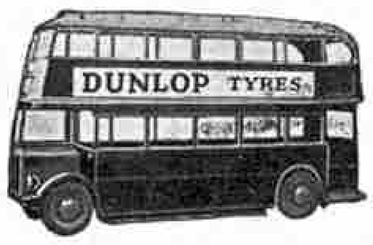

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Comprises scale models of a Quick-Firing Anti-Aircraft Gun mounted on a mobile platform and a Searchlight mounted on a lorry. Both Gun and Searchlight have elevating and traversing movements. Price **4/-** per set
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Comprises scale models of an 18-pounder Quick-Firing Field Gun, Trailer and "Light Dragon" Motor Tractor. Price **3/-** per set
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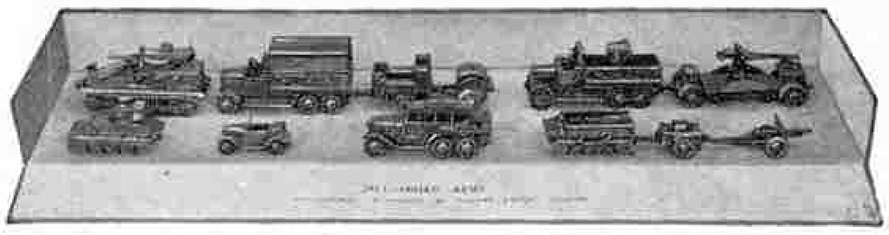

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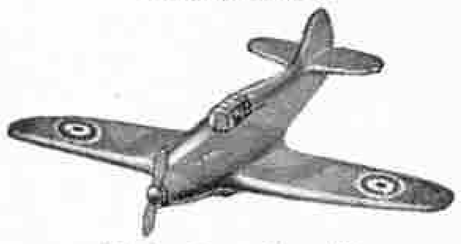

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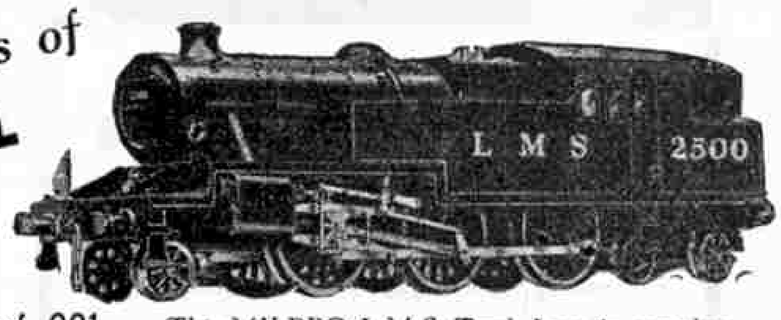

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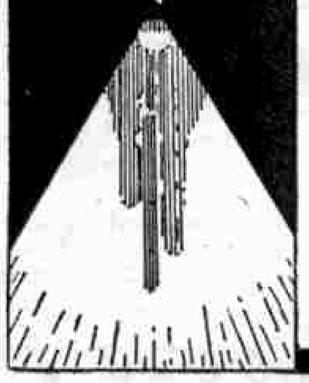

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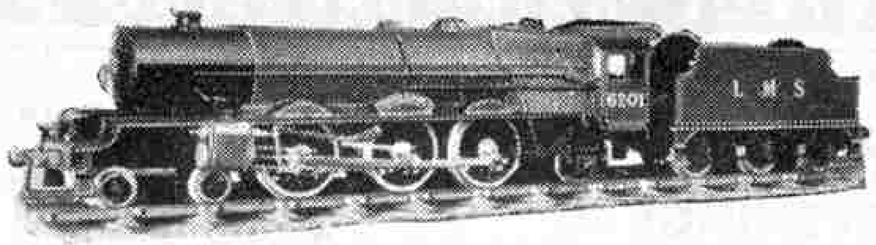

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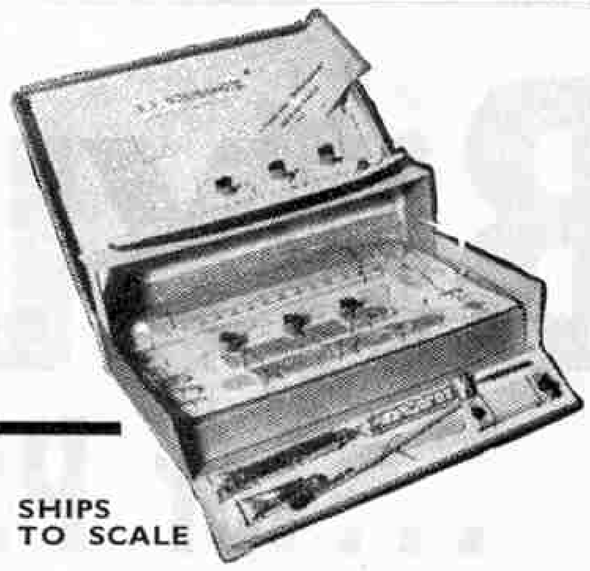

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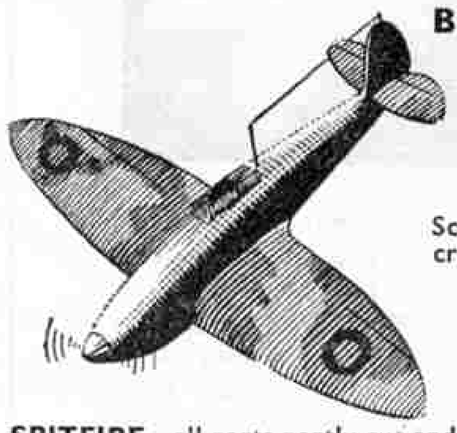
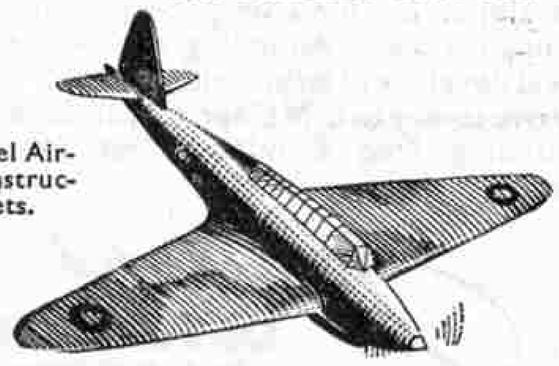


Scale Model Aircraft Construction Sets.



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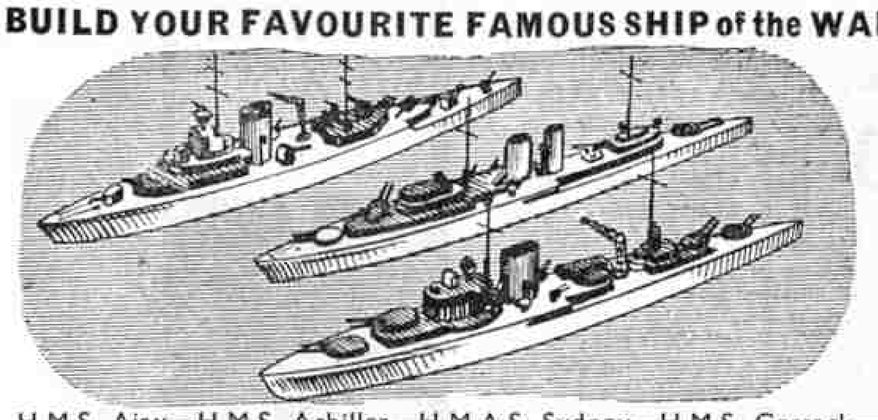

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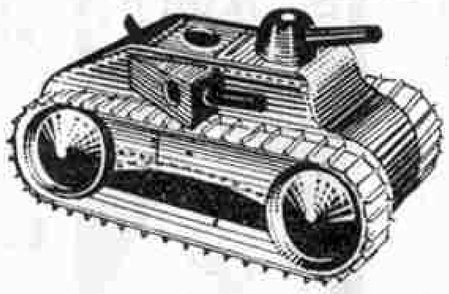

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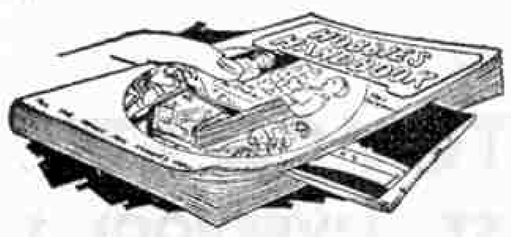

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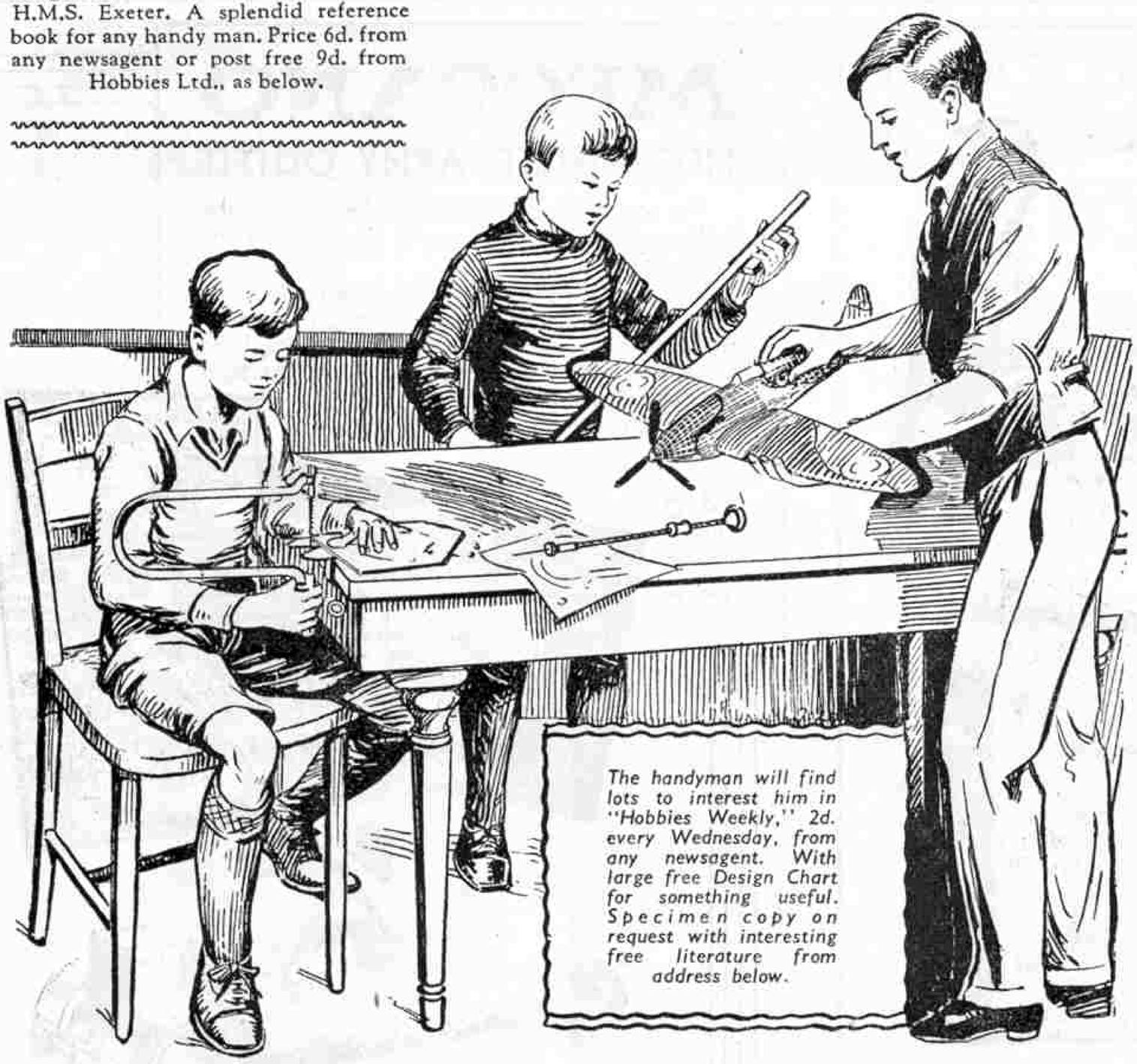

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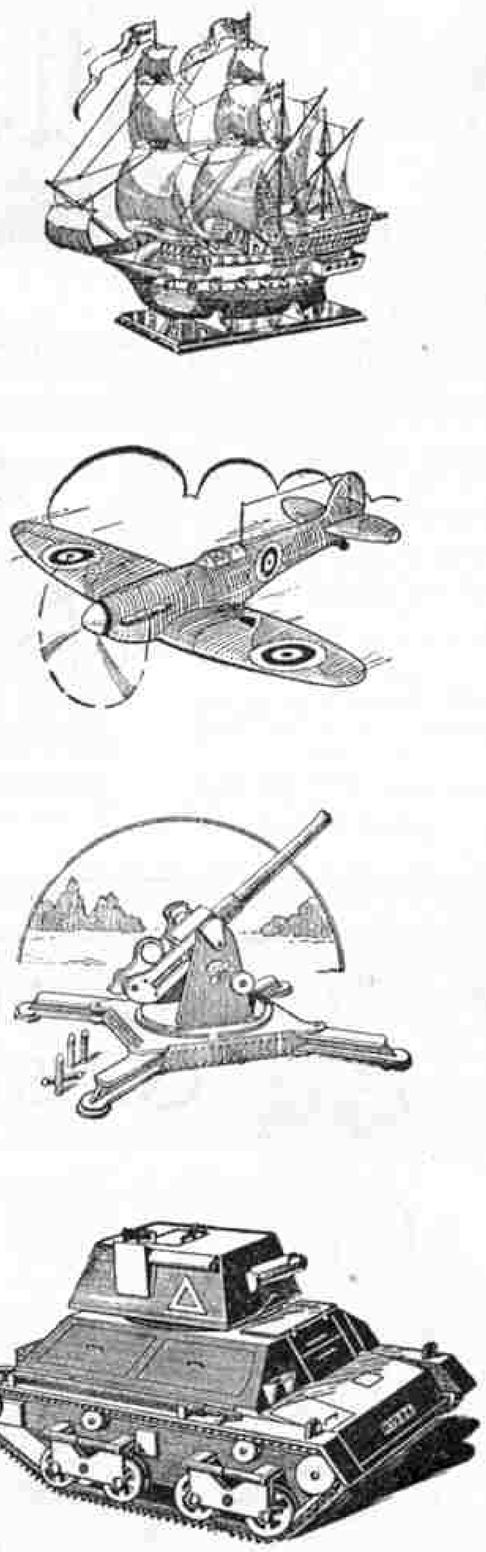

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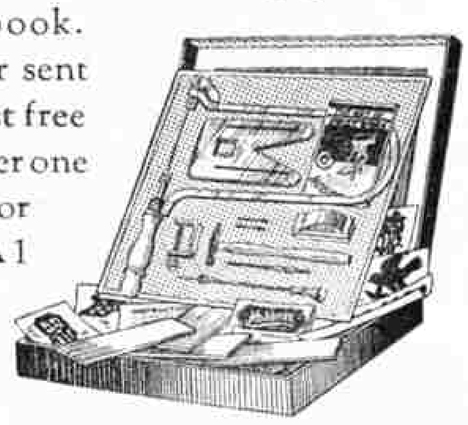

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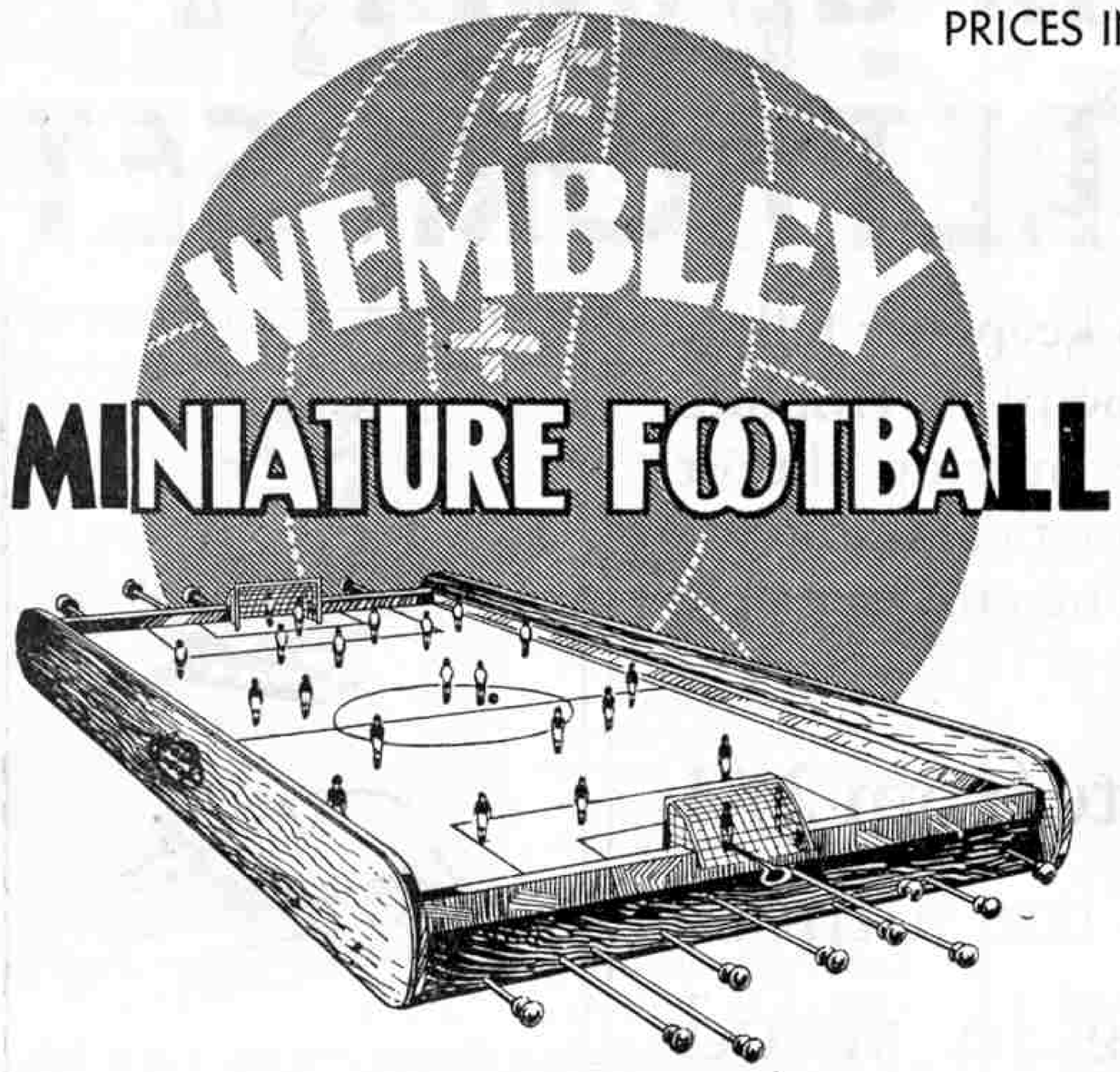

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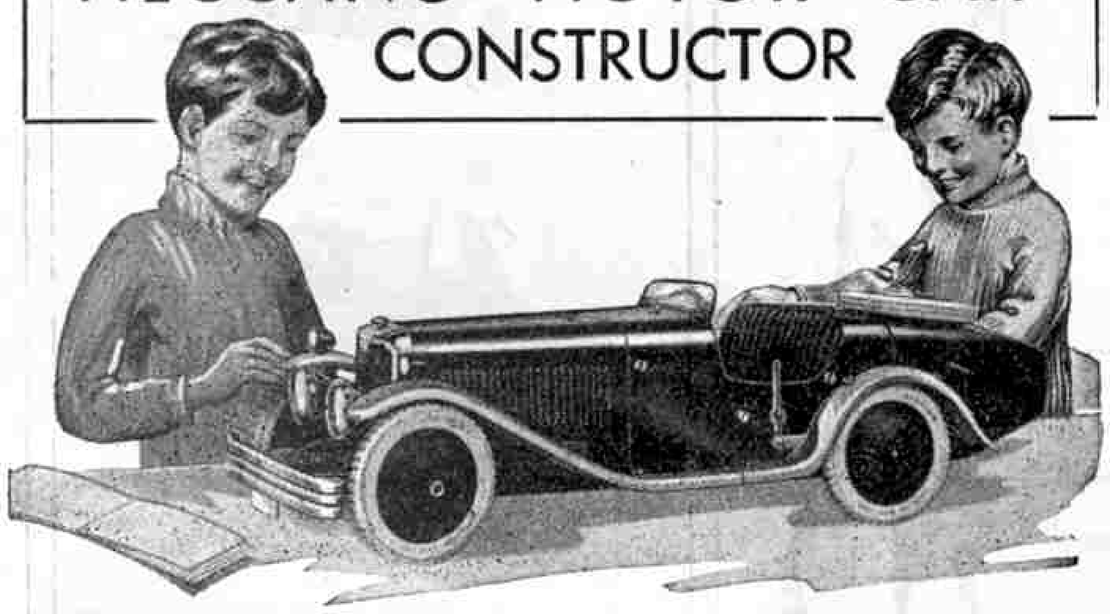

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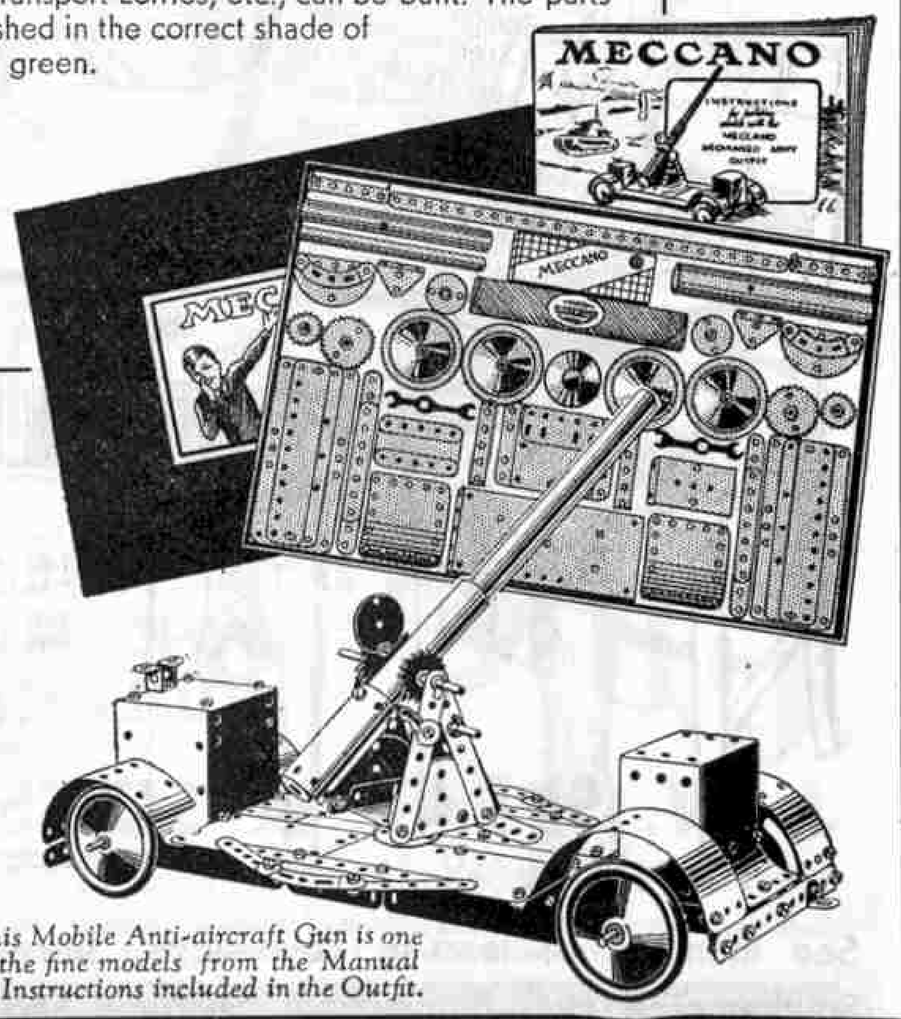

This Mobile Anti-aircraft Gun is one of the fine models from the Manual of Instructions included in the Outfit.

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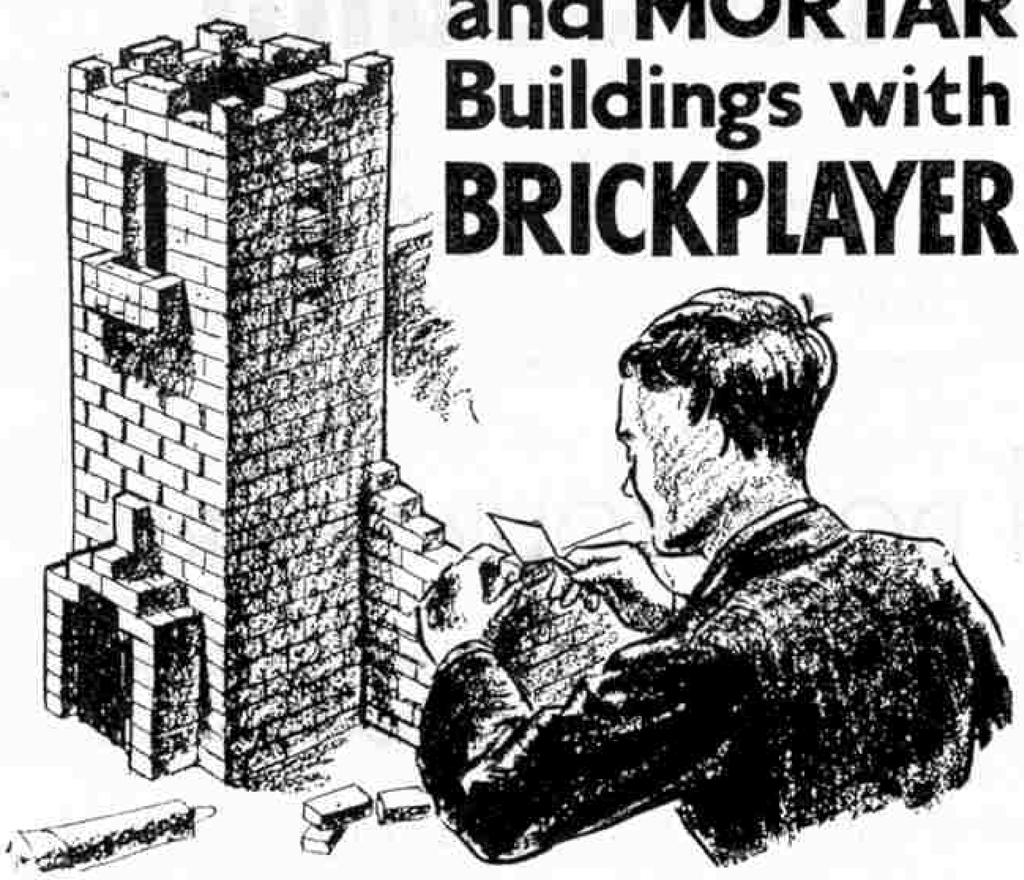

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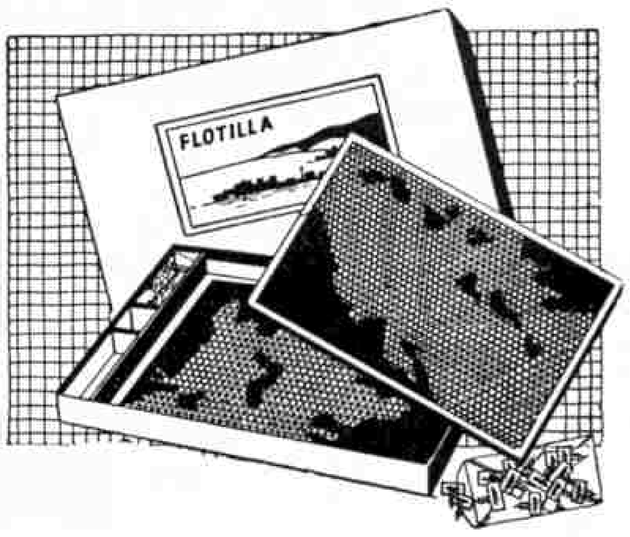

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Lord Beaverbrook Thanks Meccano Boys!

On the Editorial page we print in full the message received from Lord Beaverbrook, Minister of Aircraft Production, in acknowledgment of the cheque for £2,000 sent to him as a first instalment towards the purchase of a "Meccano Spitfire."

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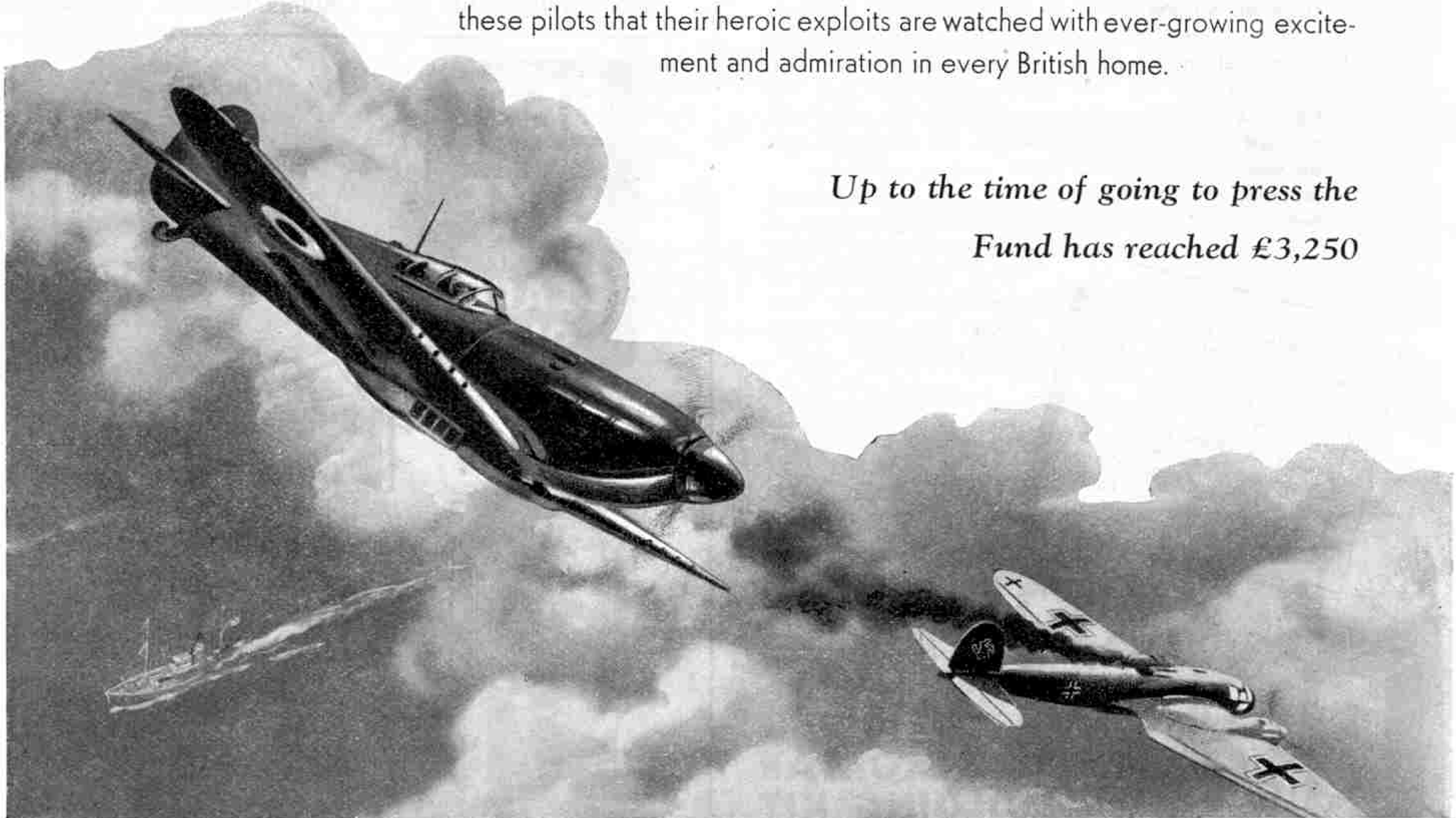

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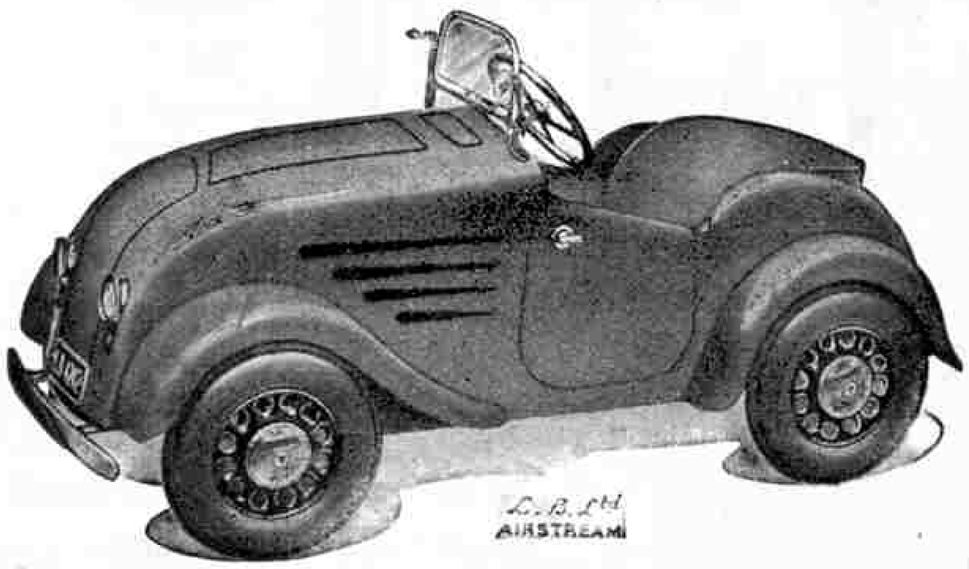

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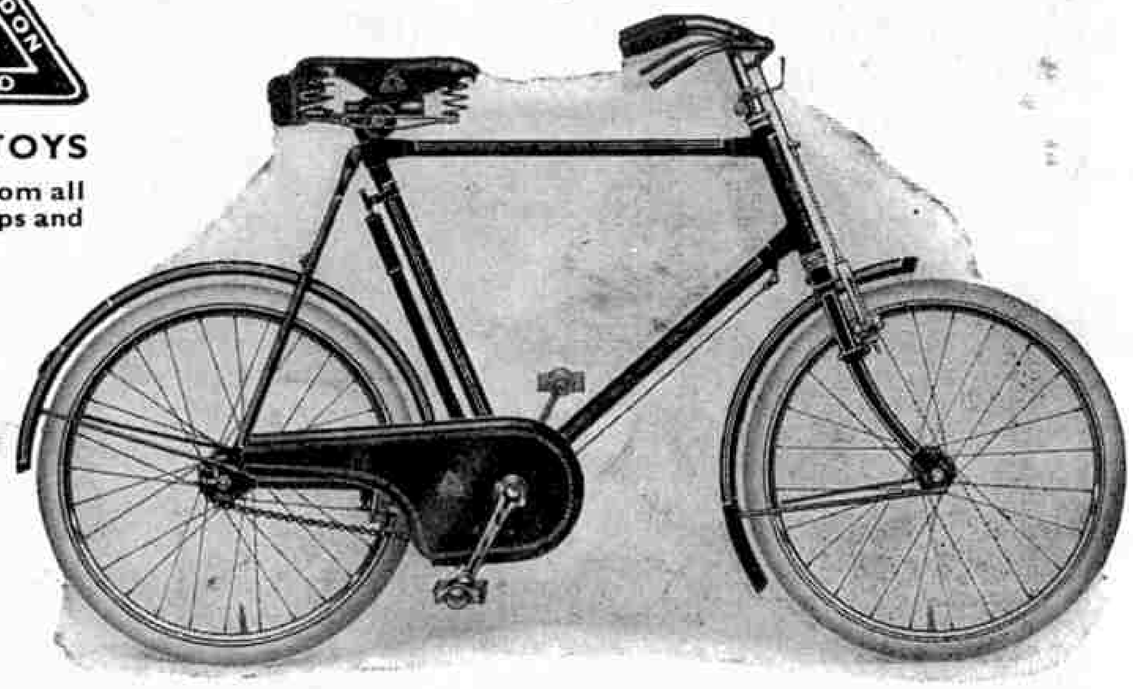

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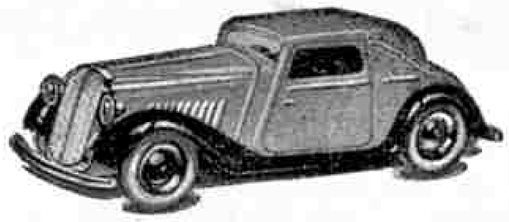

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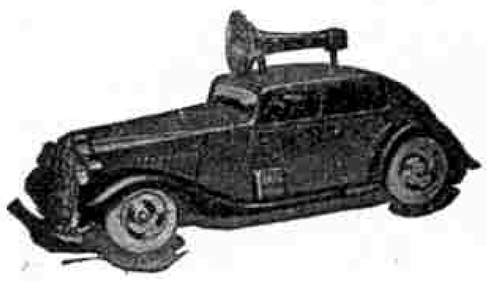

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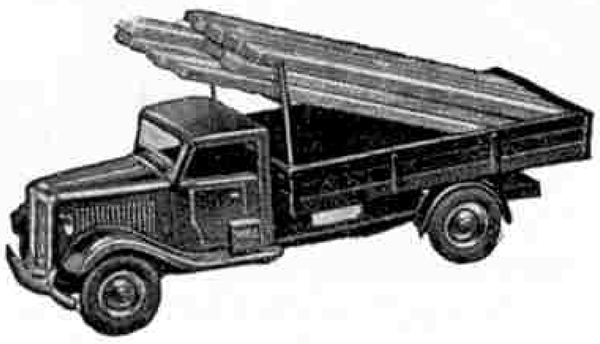

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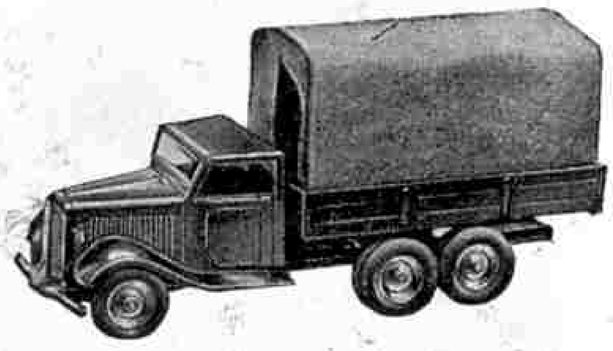

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Christmas Greetings to All my Readers! From the Editor.

MECCANO MAGAZINE

Editorial Office:
Binns Road, Liverpool 13
England

Vol. XXV. No. 12
December 1940

With the Editor

"Meccano Spitfire" Fund

The fund for the purchase of a "Meccano Spitfire" has made splendid progress, and at the time of writing has reached a total of more than £3,250. Contributions ranging from 2/6 to several pounds have been received from all over the British Isles and from many parts of the Empire overseas, and the flow continues steadily.

In spite of this good response I am afraid that large numbers of Meccano boys have not yet done their bit. I am sure that many of them have not yet seen to it that their mothers, sisters and friends all have pendants. I wonder if these boys realise that they are letting down those who have helped towards this splendid opportunity of showing appreciation of the heroes of the great air victories of the past few months? I appeal for a big combined effort among Meccano boys everywhere.

Every pendant sold is a step nearer the "Meccano Spitfire."

Lord Beaverbrook Thanks Meccano Boys

The following message was received from Lord Beaverbrook, Minister of Aircraft Production, in acknowledgment of the cheque for £2,000 sent to him as a first instalment towards the purchase of a "Meccano Spitfire."

Ministry of Aircraft Production,
Millbank, S.W.1.

"To all who subscribed to the Meccano Spitfire Fund I send my warmest thanks.

"They have rendered splendid assistance to the Air Force and to our country in her hour of need.

"And in so doing they have given proof to our friends in every land of their devotion to the cause of justice and freedom, and determination to do all in their power to uphold it."

Yours sincerely,

Beaverbrook

Air Marshal Sir Charles Portal, K.C.B., C.B., D.S.O., M.C.

Leaders in the War

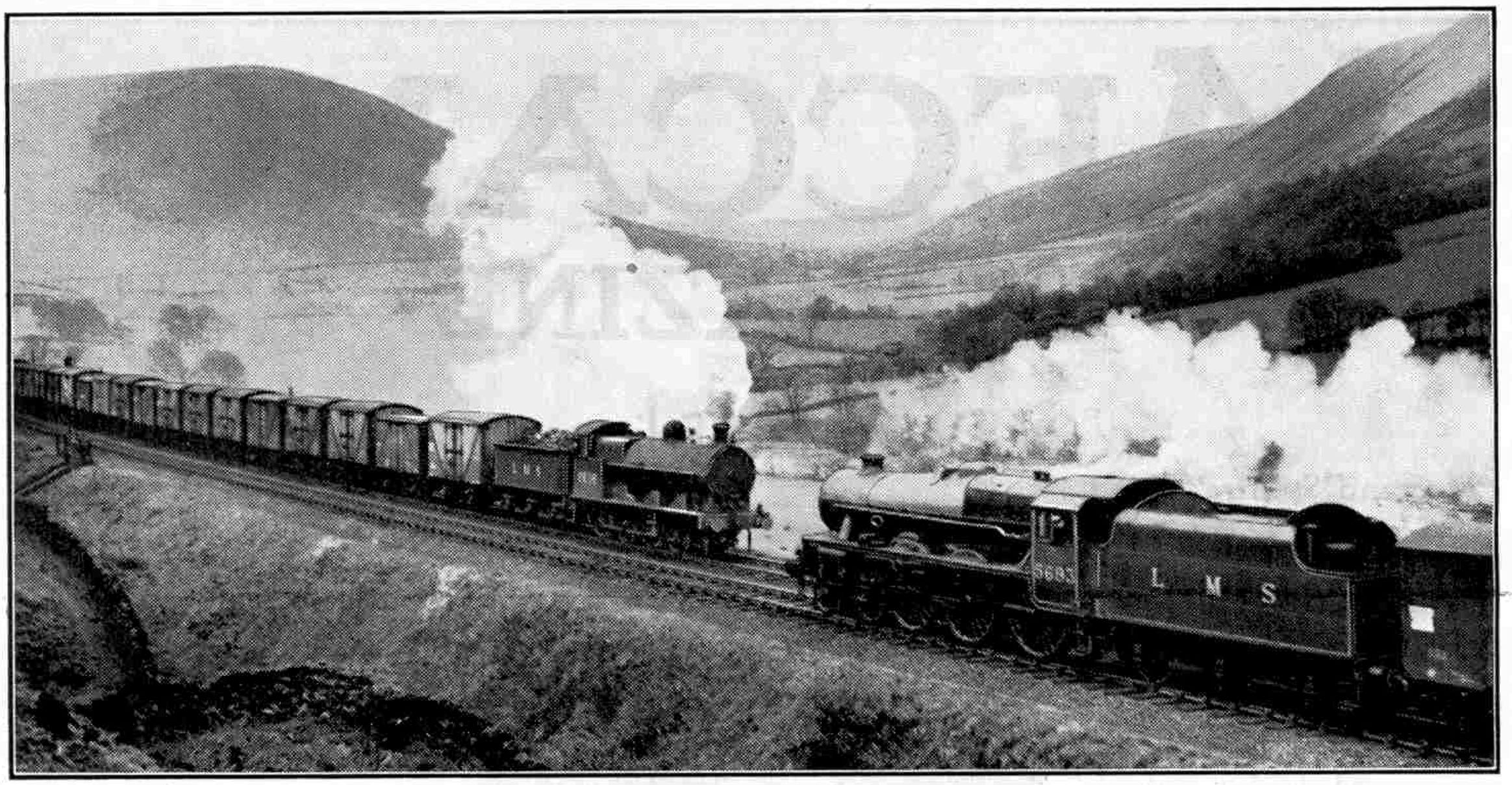
XIII.—Sir Charles Portal

Air Marshal Sir Charles F. A. Portal was born at Hungerford in May 1893, and was educated at Winchester and at Christ Church, Oxford. When the war of 1914-18 began he enlisted in the Royal Engineers as a motor cycle despatch rider, and later was promoted to Second Lieutenant.

In 1915 he was transferred to the Royal Flying Corps as an observer, with the rank of Flying Officer, and soon showed himself to be both a fine pilot and leader of men. He was only 23 when he was given his first Command, No. 16 Squadron, and in 1917 he was awarded the Military Cross. Later that year he won the D.S.O. "for conspicuous gallantry and devotion to duty," and the official record adds that over many months he had done "magnificent work in co-operation with the artillery." He was mentioned in despatches three times, and in 1918 was awarded a Bar to the D.S.O.

In 1919 Sir Charles was granted a permanent commission in the R.A.F., with the rank of Squadron Leader. He was one of the first officers to pass through the Royal Air Force Staff College, which he did in 1922-3, and afterward he was appointed to the Air Ministry for Staff duties. In 1925 he was promoted to Wing Commander, and two years later he was given command of No. 7 Bomber Squadron. In 1931 he became a Group Captain, and in 1934 he was in command of British Forces, Aden. He returned to England the next year to become Instructor at the Imperial Defence College.

In April this year Sir Charles was made Commander-in-Chief, Bomber Command, and in this capacity he was responsible for organising the highly successful bombing raids upon Germany and enemy occupied territory. He proved himself to be a fine organiser and, as always, was very popular with his men. In October last he succeeded Air Marshal Sir Cyril Newall as Chief of the Air Staff.



Freight trains to and from Scotland passing at speed among the Westmorland hills. Photograph by courtesy of the L.M.S.

A Fast L.M.S. Freight Train

Manchester to Glasgow in the Brake Van

By a Railway Engineer

IN the "*M.M.*" for September 1940 I described the working of an important fast freight service as seen from the footplate of the locomotive. In the present article things are viewed from a strikingly contrasting viewpoint, the guard's brake van, in which I was privileged to travel on a particularly interesting pre-war service, the 8.40 p.m. from Manchester to Glasgow.

South of the Border the train is worked by the Midland Division, though running for the first stage of the English journey over Central Division tracks. This arrangement is a survival of pre-grouping days, when the Midland Railway had running powers over the Lancashire and Yorkshire system from Hellifield to Manchester. This initial stage involves some very severe climbing, and with the ascent to Aisgill following—an altitude of 1,166 ft. above sea level—and the use in Scotland of the Caledonian Railway line with the Beattock Bank to be mounted, it would scarcely be possible to find a harder route from Manchester to Glasgow. Yet with the maximum permitted load of 32 four-wheelers and a brake van, the Class 5 mixed traffic 4–6–0s need assistance only up the Beattock Bank, and then mainly because a traffic stop is scheduled at Beattock itself, and the bank has to be climbed from a dead start.

The train leaves from the one-time Midland goods station in Manchester—Ancoats. Here, as late as 8.15 p.m., I found loading up still in progress. Our train was to be 31 vans, and judging by the way those I saw open were filled our total load, including the 20-ton brake van, was at least 390 tons behind the tender.

The track layout is such that a certain amount of manœuvring is necessary before the train can get away on its direct line, from Ancoats Junction, and it is only at this point that the main line engine takes on.

Although the intervening distance is only approximately one mile, 25 minutes are allowed for this initial operation; but in spite of a start from the terminus two minutes late we got away from Ancoats Junction, behind No. 5266, a Class 5 4–6–0 at 9.2 p.m.—three minutes early. Some further slow travelling is entailed before the Manchester area is cleared. Passenger trains were on all sides. Several times we were stopped by signal, and the schedule time of 17 minutes for the 1½ miles from Ancoats Junction to Victoria was exceeded by 2¾ minutes and we were now running only just on time. But we were really getting into our true stride, and riding on the open rear platform of the van the increased speed was most exhilarating. It was a warm fine night, and even at 9.30 p.m. dusk was only just coming. Our three tail lamps were lit, and the side ones shone forward too, like great yellow eyes, on each side of the platform. On the gradual rise towards Bolton speed rose to 29 m.p.h., the van riding very smoothly, as it did also when we were slowing down to take the sharp curve at Bolton West Junction. The couplings were all screwed tight, every vehicle was fitted with the vacuum brake.

We were now on a bank as steep as Beattock. For 6½ miles from Bolton the gradient is 1 in 72, and up this we went at a steady 20 m.p.h.—good going with a 390-ton load. Heavy grades such as this are characteristic of the railways of north-east Lancashire, and after breasting the summit at Walton Siding we entered upon an equally abrupt descent towards Blackburn. The guard and I went inside the van for Walton Tunnel, "a dirty hole," as Bailey put it, full of swirling smoke clouds, and the dim light from one oil lamp showed the vacuum gauge needle dropping back; signals were against us at Spring Vale, and the driver was braking. Nevertheless, we were through Blackburn, 24½ miles from Manchester Victoria, in 55½ minutes.

But a more severe check came just as we were going down the bank past Langho at 53 m.p.h.; permanent way work was in progress at Whalley, and we had to slow up to 15 m.p.h. This put us two minutes behind time, but No. 5266 and her crew were equal to the occasion and brought us into Hellifield exactly on time.

It was now 11.5 p.m. Five minutes were spent taking water and then we got away on the non-stop run to Carlisle. After a welcome downhill start there comes the gruelling ascent to Blea Moor—a solid 14 miles at 1 in 100. The driver made the most of the favourable start, working No. 5266 up to 52 m.p.h. in 3¼ miles, but after passing Settle Junction speed quickly fell off while for half an hour we forged our way up among the giants of the Pennines.

It was a fascinating ride—fascinating in its quiet novelty. The moon shining fitfully through banks of cloud revealed a surprisingly great expanse of wild country. Out on the back platform, out of the beam of the lamps, it was almost light enough to read my watches; on ahead, a splash of bright yellow fire-glow showed the whereabouts of the engine, but at the rear end there was none of the noisy glamour that characterises travel on the footplate. We were getting up in great style, and came past the lonely signal box at Blea Moor exactly four minutes early; the 17.2 miles from Hellifield had taken 38 minutes, and throughout the 14 mile climb we had averaged 26 m.p.h.

At Blea Moor the hardest climbing ends. Getting along on a track on a steep mountainside, where the line is protected by snow fences, we quickly gathered speed; Garsdale was passed at 53 m.p.h. and we took the final short rise up to Aisgill summit fairly flying, without speed falling below 44¾ m.p.h. Some fast downhill running now followed, with several miles at 57 to 58 m.p.h. nearing Kirkby Stephen, but then unfortunately there came delays; a slower freight train was ahead, and we were stopped before she was shunted out of our way. So instead of averaging well over 50 m.p.h. we took 30 minutes for the 13.6 miles from Kirkby Stephen through Appleby to Long Marton. Once past the latter station we got a clear road and No. 5266 put on a fine spurt down the lower Eden Valley; 22 miles were reeled off at an average of 52½ m.p.h. and we went through Armathwaite at a full 60 m.p.h.

No time was wasted in engine-changing at Carlisle. Up at the front two more vans were added; No. 5266 was exchanged for No. 5117 of the same type, and we left again only ten minutes late, to suffer, however, further delays before a preceding freight for the G. and S.W. line got clear of us at Gretna Junction. Now in the ordinary way our train ran non-stop to Beattock where it was side-tracked for half an hour. But tonight, owing to our lateness, the group of important night expresses that overtake us there was already hard upon our heels; we should not have been able to get out to Beattock ahead of the first one, and so we were put into the loop at Quintinshill only 1.6 miles beyond Gretna.

The night was very still and fine and soon we heard the rumble of an oncoming train; it was the first of the batch, the "Parcels," and she came racing past headed by a "Jubilee." Next came "The Royal Highlander." There was some compensation for our long wait, for in pre-war days, before the black-out, there were few more thrilling spectacles than that of a big express "all-out" in the dead of the night. Judging by her length, however, she was divided, and it was only the Aberdeen portion that had passed. Still we were kept in the loop, and sure enough after another ten minutes there came the Inverness section. Then at long last we ourselves got the road, after a wait of 38½ minutes.

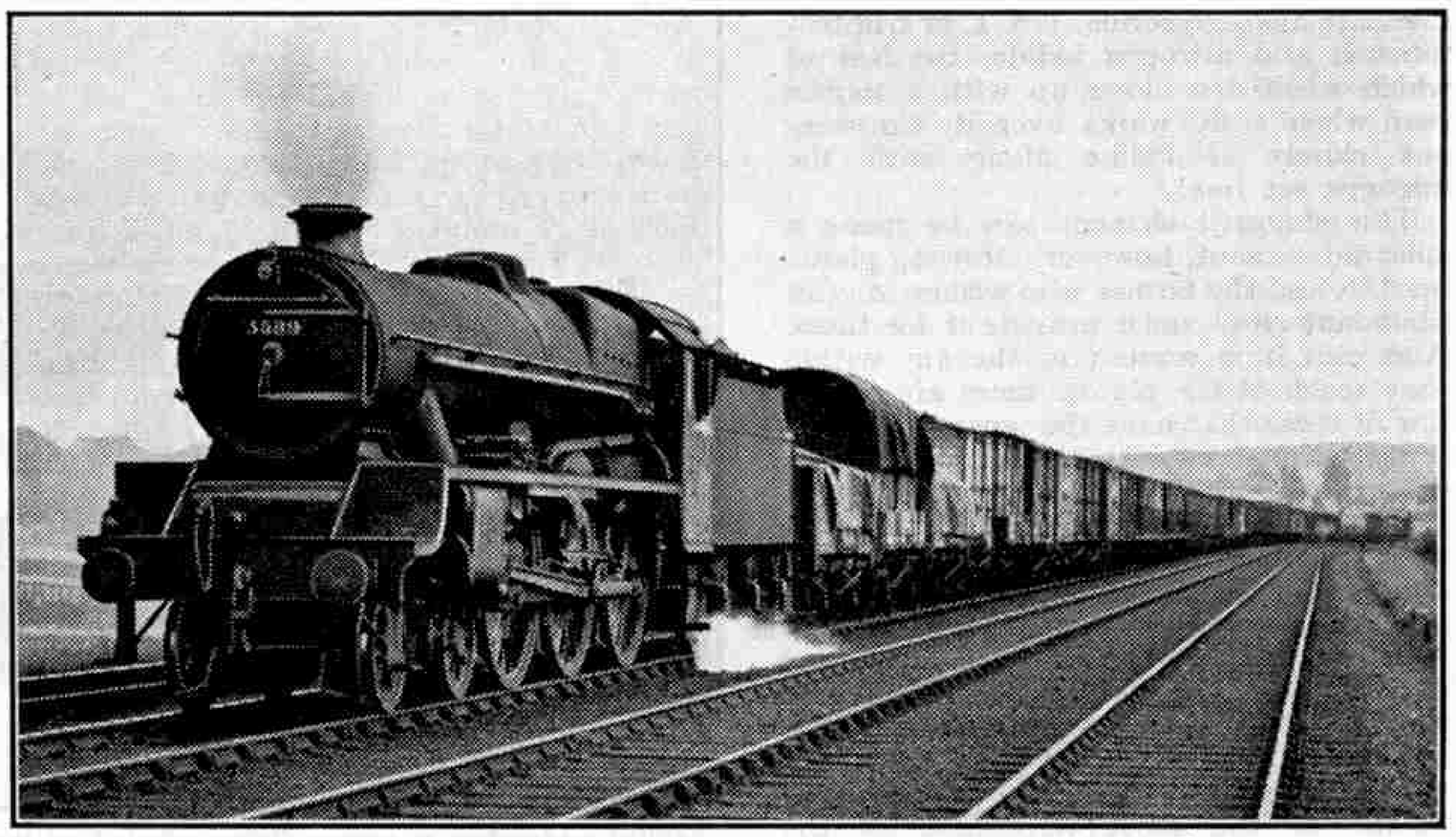
No. 5117 was not long in showing her paces. With the increased load, now 415 tons behind the tender, we accelerated slowly up the 1 in 200 bank, but the stop at Quintinshill had taken heavy toll and we passed Kirtlebridge 57 minutes behind time. We were now doing 45 m.p.h., and after mounting the further 1 in 200 rise to Castlemilk the engine developed a good turn of speed. Lockerbie was passed at 51 m.p.h., there was very little falling off on the gentle grade past Dinwoodie, and at the viaduct beyond Wamphray we touched 57 m.p.h. So, in the early dawn, we neared Beattock. The 23 miles from Kirtlebridge had taken just 32 minutes, and in this short distance two minutes had been regained; even so we reached Beattock 55 minutes late.

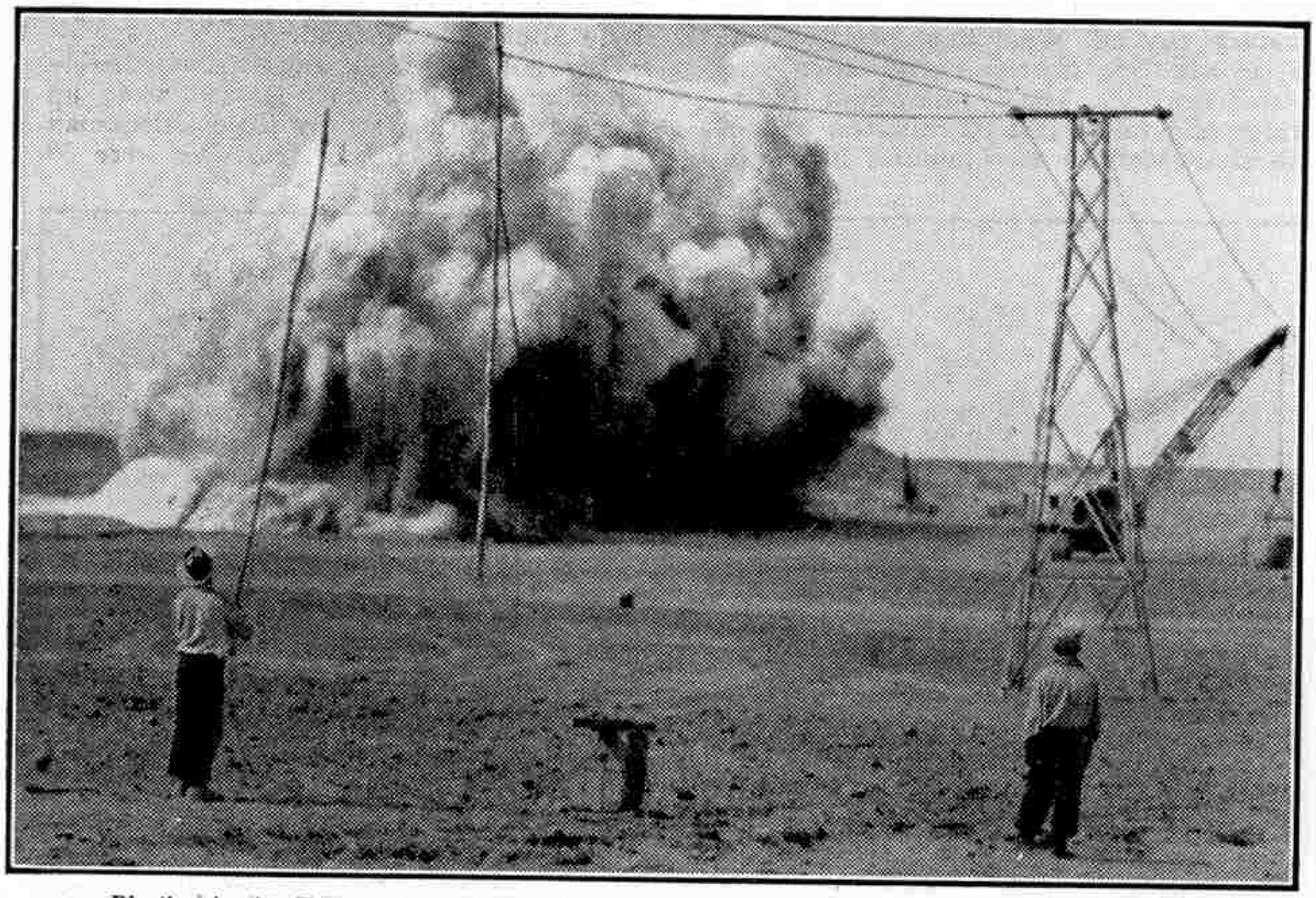
Tail-end view of an L.M.S. fitted freight train. This is the type of van in which the author rode from Manchester to Glasgow. The illustrations on this page are from photographs by E. R. Wethersett

By the time we had got our bank engine on in rear and were ready to start, another famous West Coast "flyer" was bearing down upon us—the 8.30 p.m. Euston—Aberdeen Postal train. Ordinarily the freight used to run ahead of her all the way to Gartsherrie, where it was turned off the main line, but this morning into the loop we went at Beattock. It was nearly day, and a fine fresh morning. I climbed down from the van for a leg-stretcher while we waited, and soon she was signalled. It was worth waiting to see her pass: her headlamps twinkled vigorously in the twilight, the sky was still sufficiently dark for her fire to throw a fierce glare upon the exhaust steam, and the powerful sidelights on the mail vans blazed ready for the exchange of bags. The sight was made doubly impressive by the engine—a gigantic non-streamlined 4-6-2, *"Duchess of Montrose."* After this, still we were not allowed to go; a second portion of the "Postal" was following; another ten minutes, and she raced through headed by a Midland compound.

We got the road almost immediately after, and at 3.50 a.m. started away up the bank, with a sturdy little Caledonian 0-4-4 tank pushing in rear. We were 50 minutes late. The two engines quickly got hold of the train and we were soon doing 30 m.p.h. For me it was a novel experience to have the bank engine so very close; one is accustomed to hearing it behind from the last coach of a passenger train, but now, here she was chugging away under our very noses, as it were—a veritable little spitfire. On the upper part of the bank, forging our way up among the hills on a grade of 1 in 70, speed was kept steadily at 24½ m.p.h., and we passed Beattock summit in exactly the 25 minutes allowed for the ascent of the 10-mile long bank.

As we came over the crest, 1,014 ft. above sea level, the bank engine shut off steam; she had not been coupled up in any way during the ascent, and now she just dropped behind. And so we rolled quietly down the Clyde valley to journey's end. Mist was about, and compelled easy running at times; but we ran up to 55 m.p.h. elsewhere, and with signals everywhere clear reached Buchanan St. goods station at 5.57 p.m.—only 37 minutes late.


L.M.S. express goods train hauled by a Stanier 4-6-0, No. 5589 "Gwalior"



Blasting in the Chilean nitrate fields. The necessary current is supplied through overhead wires.

Fertiliser Found in a Desert

The Romance of Chilean Nitrate

ONE of the laziest substances that we know is nitrogen, the invisible gas that constitutes about four-fifths of our atmosphere. It has a decided preference for living alone and free, and it unites directly with other elements only when driven to it by really extreme measures. For instance, it only forms a union with the oxygen of the air when it is stirred up by a violent electrical discharge, such as a flash of lightning. This reluctance to keep company with other elements gives nitrogen a really sensational place in chemistry. There are various ways of making substances containing the gas, but it is so determined to follow a lone course that many of its compounds explode violently and liberate it on the slightest provocation. Among them are nitro-glycerine, T.N.T. or trinitrotoluene, and nitrogen iodide, the last of which when dry blows up with a terrific roar when a fly walks over it, throwing out clouds of iodine along with the nitrogen set free.

This sluggard element can be made a splendid servant, however. Growing plants need it, and the farmer who wishes to grow abundant crops must provide it for them. Although it is present in the air, within easy reach of the plants, there are only a few of these that have the power of seizing it for themselves with the aid of bacteria in the soil, often attached to their roots, which transform the gas into salts that they can take up. These plants belong to the pea and bean family, and farmers include some of them in their crop rotations in order to increase the quantity of nitrogen in the soil. Other plants have to be fed with nitrogen compounds that dissolve in water so that their roots can absorb them.

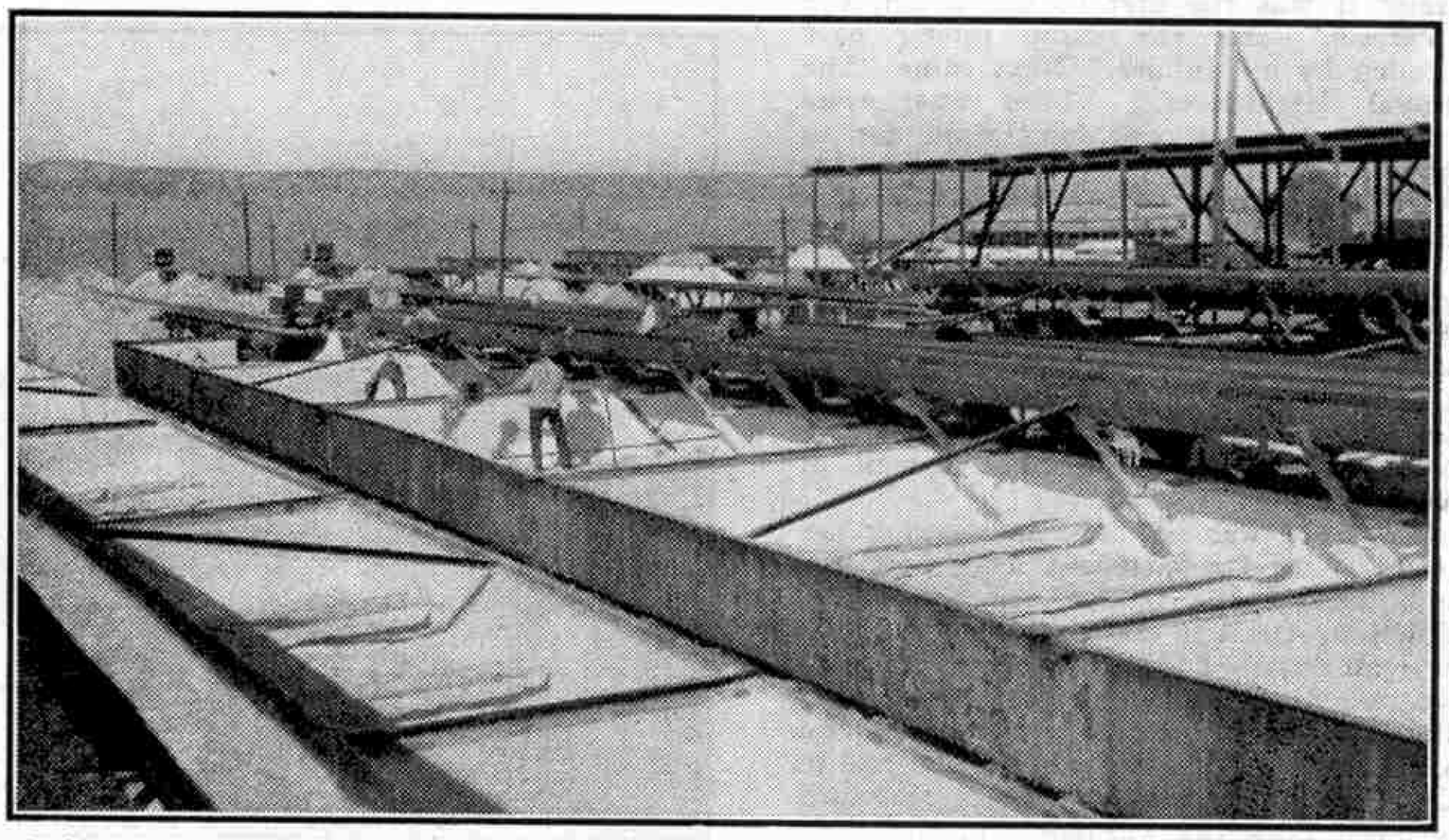
One of the most important of the fertilisers containing nitrogen is Chilean nitrate of soda. This reaches food growers in the form of white crystals or granules, and at first glance there is nothing very mysterious or romantic about it. There is a very interesting story behind its production, however. Chile is a long narrow country on the Western Coast of South America. It stretches from the southern tip of the continent, which approaches the Antarctic, to a point well within the tropics; and a short journey across it by rail carries one from hot coast lands into the icy regions of the heights of the Andes. Its climate therefore offers astonishing contrasts. There are places where the rainfall is heavy, in some places amounting to 200 in. a year; but in the north there is a desert region where years can pass without the fall of a single drop of rain.

This desert region is found on a plateau that forms a kind of step in the sharp rise from the coast to the snow-capped peaks of the Andes. It is a grim and forbidding area where day by day the Sun's rays pour down from a cloudless sky and mirages delude the traveller into the belief that in the distance there are lakes, rivers and marshes. No plants grow there, and wild animal life cannot exist.

There is a tradition that about 200 years ago two Indians travelling across this desert dug a hollow in the ground and in it lit a fire to warm themselves. Suddenly they were startled by blue sparks and flames, and were horrified to discover that the earth around their fire was crackling and sending forth strange lights. In their terror the men ran away to a neighbouring township, from which they returned with a priest, armed with a vessel of holy water to exorcise the devils they had angered.

Later the priest took some of the ground back with him and examined it, to find that it contained what he thought was saltpetre. This he knew to be used in the making of gunpowder, and he was able to reassure the Indians who had summoned him. Then he threw the remainder of the material into a corner of his garden. Some time later he was astonished to find that plants grew with astonishing vigour in the part of the garden where he had dumped the mysterious earth, which clearly was responsible for the improvement. Further trials proved the wonderful fertilising power of the desert ground, and this was the beginning of what eventually became a world-wide trade in Chile saltpetre.

The nitrate in the desert region is concentrated in a strip of land more than 300 miles in length and 12 to 18 miles in width, where it is hidden beneath two layers, one a few inches in thickness, and a thicker one in the form of a hard rocky mass that can only be broken up by means of explosives. The nitrate or "caliche" bed below these layers is normally white or grey in colour, but various impurities may make it violet, yellow, green or red. It varies in thickness from about 18 in. to 12 ft. or 16 ft., and the proportion of nitrate in it is from about 7 to 80 per cent.



Making preparations to remove Chilean nitrate from the tanks in which it is crystallised. The illustrations to this article are reproduced by courtesy of the Nitrate Corporation of Chile Ltd., London.

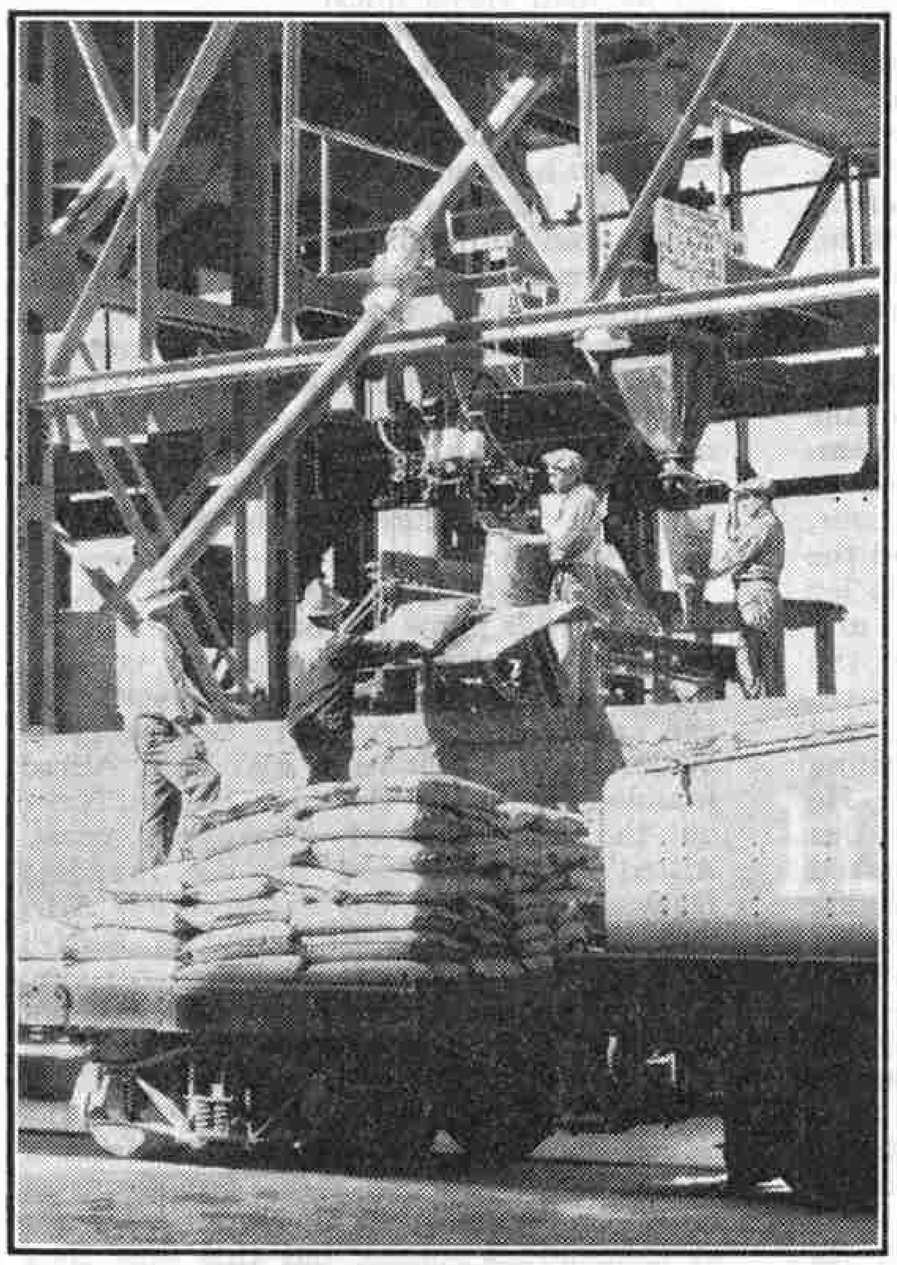
It seems strange that such a desolate region as the nitrate fields of Chile can be so full of a material that farmers all over the world use to produce abundant crops. The absence of rain has been a great factor in the preservation of the nitrate, for this is readily soluble in water and would have been washed out of the soil long ago if the rain-bringing clouds sweeping across South America were not deprived of their moisture in their passage across Brazil and the Argentine, and the last upward rush over the towering Andes.

The land was not always arid. At one time it was probably covered by a sea, and it has been suggested that the nitrate was formed by the decomposition of great masses of seaweed left behind when the water evaporated. Seaweed is rich in iodine, and the fact that Chilean nitrate contains a proportion of this valuable element lends support to the belief that the beds were formed in this manner.

One of the most valuable features of Chilean nitrate is that it contains small proportions of rare elements that we now know to be essential to plant growth, although in many instances the proportion required is too small to be detected except by the most delicate of all known tests. For instance, in addition to iodine it contains minute proportions of zinc, which prevent malformation of leaves; of manganese, which banishes what is known as "grey speck" in oats; and boron, the presence of which is necessary to cure certain diseases of the sugar beet.

Extracting the caliche is a form of mining. Bore holes are sunk through the protecting layers to a level beneath the caliche itself, and the ground is blasted by means of powder fired by time fuses.

Loading cars with crystalline nitrate in bulk.



Bagging, sewing and loading granulated nitrate ready for shipment.

The material is then carefully sorted by workmen, who break up large boulders by means of iron bars and by driving steel wedges into them. The pieces of caliche are carefully cleaned, and samples are tested by sprinkling the material in powdered form on the wick of a lamp. The inspectors who do this are so skilful that they can estimate the proportion of nitrate to within two or three per cent. by the extent of the fire from the powdered caliche.

When the caliche is at a depth of 15 ft. or more the open work method of extracting it is not used. Instead it is mined by underground methods, starting from a shaft up which the ore is raised to the surface in buckets hauled up by mule power, using a kind of block and tackle arrangement. Then it is carried on mule carts or motor lorries to the refineries. Formerly the refineries were within easy reach of the nitrate fields themselves, but as the industry has grown, and narrow seams have been worked out, the distance over which the raw material has to be carried has been increased and to-day it may be over 12 to 13 miles.

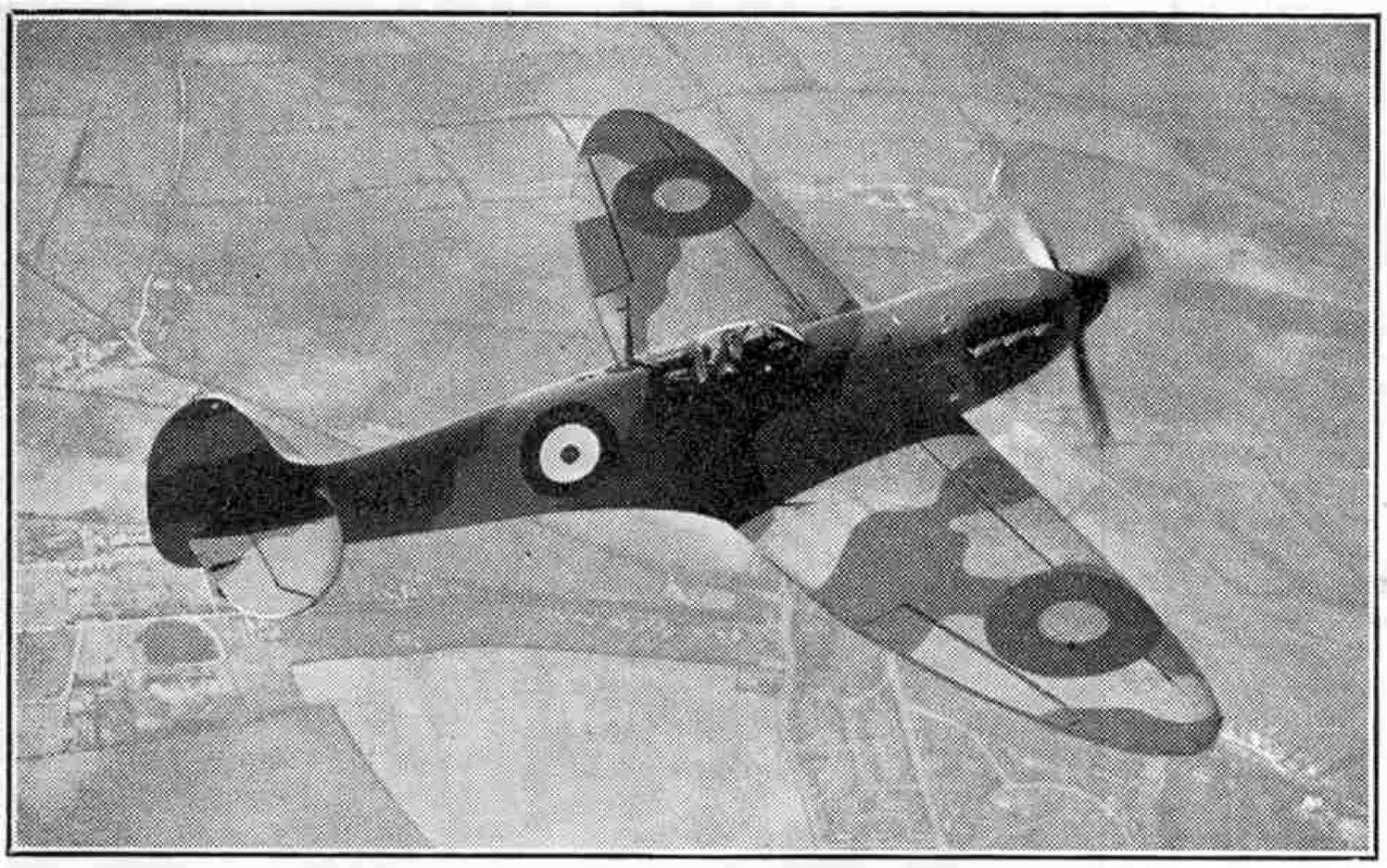
Water is used to extract the nitrate from the caliche. In the refineries producing crystalline nitrate it is first crushed and then dissolved in water in batteries of tanks that hold from 80 to 100 tons each, and steam pipes raise the temperature until the mass boils. After 24 hours the solution is drawn off into tanks where the clay, sand and slime settle, leaving a clear liquid that is pumped or run into cooling tanks. This liquid contains a small proportion of salt and other chemicals, but as cooling proceeds the nitrate crystallises out in comparatively pure form, forming glistening crystals that have been described as "white gold of the desert." These are shovelled on to one side of a sloping tank to drain, after which they are further dried on sloping benches and transferred to the storage yards, which are flat terraces with concrete floors. There they are exposed to the weather, but in perfect safety, for rain never comes.

These methods sufficed when the richer caliche was being worked, but to-day material containing smaller proportions of nitrate is mined and is used in the modern process of making granulated nitrate. Highly mechanised methods are employed. The useless material forming the overburden is drilled and blasted, and then removed by electric drag scrapers. Bore holes for blasting are driven down by means of drills, and as many as 500 to 600 blasts are exploded at the same time. When the overburden has been removed the caliche itself is broken up by further blasting, and electrically-operated shovels, each capable of lifting five tons at a time, load the chunks into 30-ton trucks that are hauled to the refinery by electric locomotives.

Some of these chunks may weigh as much as 3 tons each. They are fed into giant crushers built underground to a depth of 18 ft. The bowl of one of these crushers is about 12 ft. in depth and diameter, and the revolving pestle in the centre itself weighs about 20 tons. Other crushers reduce the small fragments produced, and the final product is carried on a travelling belt to the extraction tanks, passing under a powerful magnet on the way in order to make sure that no fragments of metal remain in it that might damage the machinery. The material dealt with is so dry that over the primary crushers there is always a heavy column of dust visible at a distance of 50 to 60 miles.

In producing granulated nitrate water warmed to a temperature of about 104 deg. F. is used, and the solution is cooled by refrigerating plant. Thus much less fuel is needed than when making crystals, and all the heat required is obtained from the exhausts of the huge Diesel engines that supply power for the plant. This process is carried on in enormous concrete tanks, each holding 10,000 tons of caliche; and the solution from the tanks is circulated through tubes of small diameter surrounded by refrigerating material. The crystals that fall from the tubes are dried and fed into furnaces in which the nitrate is melted and made to flow along a metal channel into heated pots. There pumps throw it in the form of a spray into high chambers built of steel plate and cooled by air circulation, and it solidifies as small round pellets when it meets the cold air.

More than 91 million tons of nitrate have been produced in Chile since 1830. Naturally there have been fears that the deposits would become exhausted, and as long as 30 years ago the prediction was made that they would be worked out early in the present century. Nature has been bountiful, however, and recent surveys have shown that in the nitrate desert there is enough material to supply the farmers of the world for many generations to come.



Vickers-Supermarine "Spitfire" Fighter "somewhere over England." Photograph by courtesy of "The Aeroplane."

How the "Spitfire" was Developed

By Arthur Lamsley

THE "Spitfire" fighter was born about fifteen years ago, commencing its amazingly adventurous career in 1925 as Supermarine S4 monoplane, designed and built to take part in the Schneider Trophy race off Baltimore, U.S.A., and piloted by H. C. Baird. But after setting up a record of 226 m.p.h. the aeroplane crashed in a test flight before the contest. Two years later the Air Ministry took up the Schneider Trophy challenge through the Royal Air Force. In the contest off Venice, Flight-Lieut. Webster won the Trophy for Britain in Supermarine S5 with a speed of 281.65 m.p.h.

Flying-Officer Waghorn, R.A.F., won the Trophy again in 1929 in an improved Supermarine S6 at a speed of 328.63 m.p.h. During the same year Squadron-Leader Orlebar, now Director-General of Training at the Air Ministry, created a world record of 357.7 m.p.h. with the same machine.

Then came 1931 and with it the last of the Schneider contests, when Britain got the Trophy outright after three successive wins. The day of the great race arrived on 12th September, and what a day! Visibility was reduced to about a mile, there was blinding rain and mist, and the wind howled half a gale. A more unfriendly day for high-speed racing could not be imagined —and it was still summer in England! The rules provided for unfavourable weather, and the international racing officials abandoned the race till next day.

A magnificent morning, sun-flooded and with a visibility of over fifteen miles, dawned on 13th September—unlucky number for the superstitious, but the luckiest yet for British aviation. Tens of thousands of people lined the shores of South Hampshire and the northern coast of the Isle of Wight, in tense excitement.

In the testing area off Calshot Castle in Southampton Water a small silver seaplane waited near the starting-line, rising and falling uneasily on the short choppy waves. One o'clock struck. A gun boomed, followed immediately by a dull roar, and a great splash of spray told that Flight-Lieut. Boothman, R.A.F., and England's first choice of pilot, had taken the air in Supermarine S-6B. All his pent-up nervous excitement, strained almost to breaking-point since the race had been postponed, was let loose, and his mighty engine, sensitive to the light touch of his fingers, roared like an uncaged lion as the seaplane took off, circling at about 150 ft., then landing gracefully, skimming the shimmering blue water like a great gull. It was a magic moment. The crowds within sight gasped as they watched the seaplane rise suddenly again with a terrific noise when Lieut. Boothman opened his engine full throttle and rushed over the starting line into the triangular course of seven rounds, making 217 miles.

What appeared to be a silver bird fluttering in the sunlight was the seaplane banking round the first pylon off Bembridge. Across the open sea it dashed to West Wittering, off Chichester Harbour, rose higher, swooped down and around the next pylon, and on along the 14-mile leg of the course fringing Southsea and Portsmouth towards the pylon in the Solent.

Lieut. Boothman flew superbly, his machine as steady as a rock hurtling through the air at 343 miles an hour. He shattered the world's lap record in this first round. Round after round he flashed by the tense crowds of spectators, flying so low that his figure could be seen crouching in the cockpit as if urging his machine faster and faster. The cheering crowds could never have realised a fraction of the terrific strain on this lone pilot in his mad dash through the air, faster than any man had flown in a distance flight. He was strapped to a 2,000 h.p. engine in a monoplane, his will and his hand compelling its speed and controlling its caprice, one of the most concentrated jobs ever undertaken by a human being.

In exactly 38 min. 22 sec., at an average speed of 340 m.p.h., Flight-Lieut. Boothman won the Schneider Trophy for his country and prepared the way for the future "Spitfire."

The race was over. Boothman, realising his task was done, slackened speed, and leaping high into the air with his wonder machine, much like a schoolboy jumping in ecstacy after shooting a goal, flew over the fleet of ships that were thundering an ovation on syrens and hooters, dropped on to the harbouring waters of the Solent, and taxied towards Calshot Castle. A fleet of swift motor boats surrounded his machine, taking it in tow. The gallant airman was carried ashore on the shoulders of burly Air Force mechanics. On the Calshot beach he stood unsteadily, smiling though his face was deadly white and testified to the gruelling nervous strain he had had to endure. He had won the Blue Riband of the air for his country.

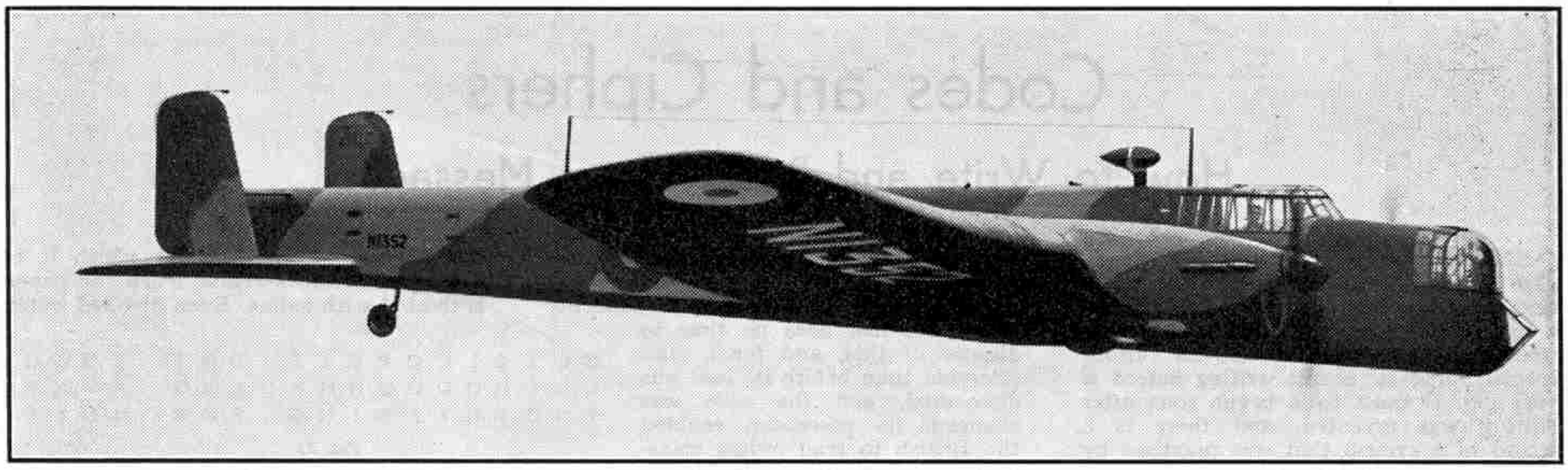
A few days later Flight-Lieut. George Stainforth, in the same winning monoplane, created the world's record of 407.5 m.p.h. in a series of dive tests from a height of 15,000 ft. into a measured mile off Spithead. The "Spitfire" had arrived! All the experience gained in the four Schneider Trophy contests was embodied in the production of the single-seater fighter that has become the wartime terror of the air.

It was powered with a Rolls-Royce engine. On the day of the race Sir Henry Royce, designer and builder of the powerful 2,000 h.p. engine, was at his home in West Wittering on the Sussex Coast, a few hundred yards from one of the pylons around which the competitors had to turn an acute angle. Owing to a breakdown in health Sir Henry could not go out to witness the race, but he was propped up in a bed drawn near a window from which he could see and hear the materialised ambition of his life flash past the pylon on its mad speed quest.

The "Spitfire" was further developed by the late Mr. R. G. Mitchell, chief engineer and designer of the Supermarine Aviation Works, Southampton. He was 30 years old when he designed the first Supermarine S4; he laboured unceasingly, courage undaunted through failing health, for a dozen years, and successfully re-designed his first creation, making it possible for a British machine to attain a world record with a speed of 407 m.p.h. It was a great blow to British aviation when he passed on suddenly at the early age of 42, a year before the delivery of the first fighter squadron of "Spitfires" to the Air Ministry in July 1938.

Designer Mitchell was born at Stoke, but made his home in Hampshire, and the "Spitfire" is a Hampshire machine, created, perfected and produced in the works on the northern shores of Southampton Water. Over 1,000 years ago King Alfred founded and built the first British Navy on the same bit of Hampshire coast. Alfred's ships cleaned up the invading Danes in a west Solent battle in 897 A.D. and established the beginning of British sea power. "Spitfire" fighters, arriving 1,043 years after, are today shooting down invading German bombers in the skies over these same historic British waters.

Not long ago over Spithead and the Solent there might have been a repetition of the Schneider Trophy races. Squadrons of "Spitfires" were hurtling through the air at tremendous speeds, but this time they were attacking German bombers, sinking one a minute with the murderous fire from eight machine guns secreted in the wings of each aeroplane, and spitting bullets at the fantastic rate of 9,000 a minute, truly a warm reception for the invader!



An Armstrong Whitworth "Whitley" Heavy Bomber.

The Armstrong Whitworth "Whitley"

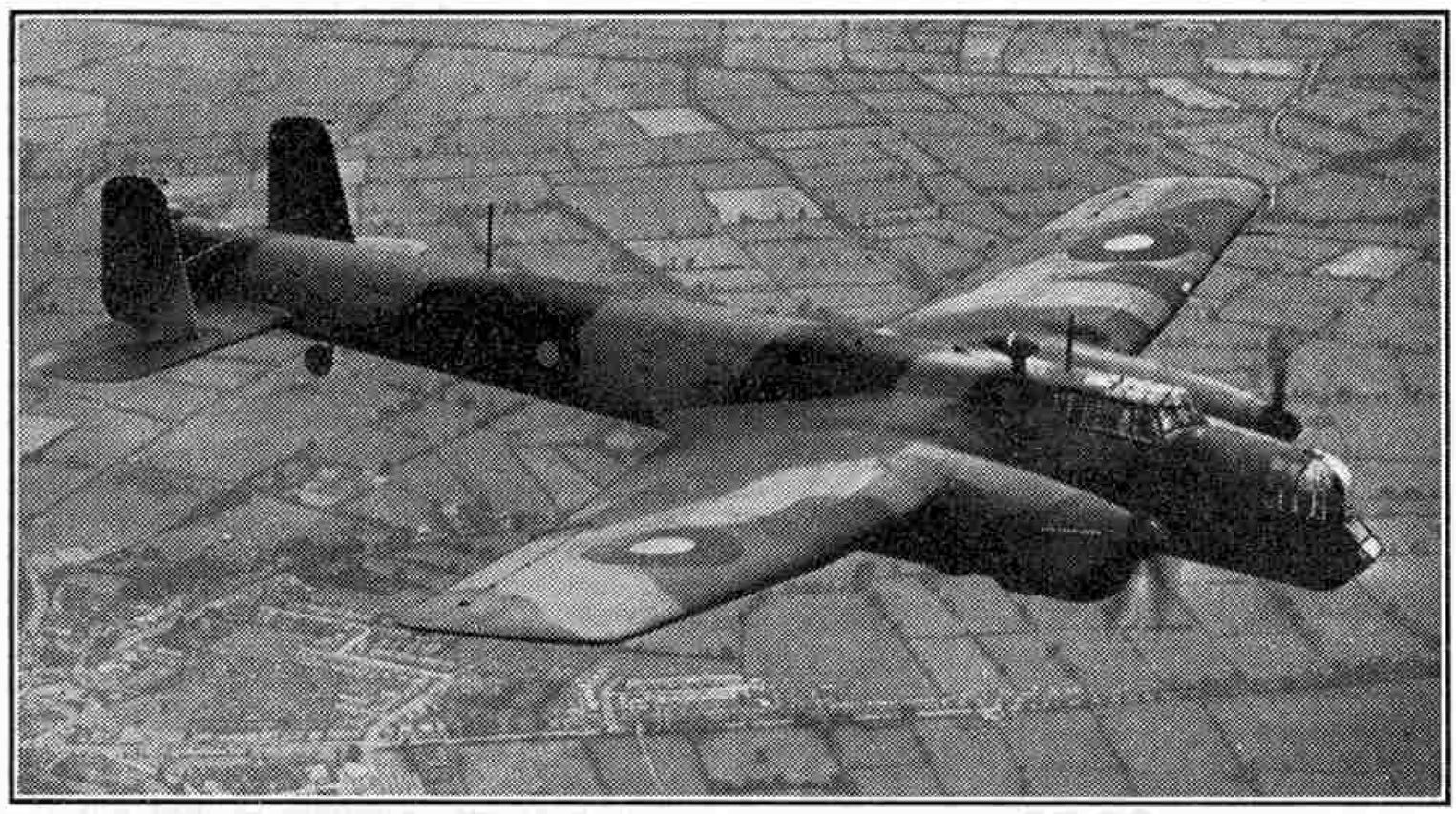
A Fine Type of R.A.F. Heavy Bomber

THE nightly raids upon military objectives in Germany and enemy occupied countries have given the Royal Air Force long-range bombers and their crews ample opportunity to prove their mettle, and both men and machines have achieved remarkable success. One of the interesting type of heavy bombers employed on these long night raids is the Armstrong Whitworth "Whitley," shown on this page. Our cover illustration is a remarkably realistic impression of one of these machines flying over a sleeping city, and is based upon an illustration kindly lent by Sir W. G. Armstrong Whitworth Aircraft Ltd.

Aircraft employed on bombing raids upon military objectives have to contend with tremendous A.A. barrages thrown up by the defenders, and with enemy pursuit fighters, and therefore must be able to withstand a great deal of punishment and damage. A recent R.A.F. night raid over Germany in which "Whitleys" took part provided an instance of how well these machines are standing up to their hazardous duties in this respect. When over Bremen, one of the "Whitleys" was hit by anti-aircraft fire, and one of its engines was put out of action and the other also affected. By carefully "nursing" the slightly damaged engine the whole way home the pilot brought the heavy bomber back safely to a British aerodrome. The greater part of the long return journey was made at a height of only 400 ft. above the sea.

The latest "Whitley" produced in quantity is called the Mark V. It normally carries a crew of five, consisting of the pilot, navigator, wireless operator, and two gunners. One of the gunners occupies a four-gun turret in the extreme stern of the fuselage. The navigator also acts as second pilot and bomb aimer. The front gun is mounted in a rotatable turret in the fuselage nose. The bombs are carried internally below the floor of the fuselage and in the wings, in compartments with spring-loaded doors.

Sir W. G. Armstrong Whitworth Aircraft Ltd. have long specialised in the construction of metal aircraft, and they accomplished valuable pioneer work in the use of high tensile steel in aircraft production. In their "Whitley" bomber the familiar tubular construction has almost entirely given place to light alloy rolled sections, pressings, and corrugated sheeting. The number of different parts, or components, has been reduced to the minimum and all are standard sections, an ideal arrangement for large-scale production of aircraft.



Another view of the "Whitley." Aircraft of this type are being used with great success by the Royal Air Force in bombing raids upon enemy military objectives. The illustrations on this page are by courtesy of Sir W. G. Armstrong Whitworth Aircraft Ltd.

The illustrations on this page show the "Whitley" to be a twin-engined middle wing monoplane. It has a span of 84 ft., and the wing is built up round a single box-spar internally stiffened by a series of bracing ribs, and the whole forms a structure of great strength. The leading and trailing edge sections are bolted to the spar at each rib point. The outer sections of the trailing edge are equipped with ailerons, and from the inner point where these end to the junctions of the wing with the fuselage hydraulically operated trailing edge flaps are fitted.

The two main petrol tanks are mounted in the wing, one outboard of each engine. They are shaped to the contour of the wing and form part of its leading edge. The two oil tanks are similarly shaped and placed, but in those portions of the wing between the engine nacelles and the fuselage. A third petrol tank is fitted in the fuselage centre section.

The fuselage is 69 ft. 3 in. long and is built in three sections, the nose, centre, and stern. The sections are assembled on jigs and when completed are bolted together, forming a metal monocoque structure which is covered with Alclad sheeting flush-riveted to give a perfectly smooth surface. The pilot's cockpit is high up in the fuselage and just ahead of the wing, a position that gives an excellent forward and downward view. The pilot sits at the port side, and to his right is a seat used by the navigator or second pilot. The wireless operator sits behind the pilot.

The tail unit is almost a miniature of the wing. It has a spar that extends right through the fuselage and is secured to this in the same manner as the wing. The twin fins and rudders are about half-way along the tailplane, a departure from the general practice of putting them at the ends of the tailplane. They have metal framework with fabric covering.

The powerful engines of the "Whitley" are two Rolls-Royce "Merlin" IVs, a radial water-cooled type with single-speed supercharger and rated at 990 h.p. at 12,250 ft.

Codes and Ciphers

How to Write and Read Secret Messages

SENDING messages by secret methods, so that they can be read only by those intended to receive them, has always been a fascinating pursuit, apart altogether from its value in wartime and for various special purposes. Secret writing indeed is very old. It must have begun soon after writing was invented, and there is a record of a system that was practised by the Spartans 2,400 years ago. They disguised messages by writing them on a long and narrow strip of paper wrapped round

L	C	Z	Y	V	H	H	E	T	A	V	V	F	L	D
M	D	A	Z	W	I	I	F	U	B	W	W	G	M	**E**
N	**E**	B	A	X	J	J	G	V	C	X	X	H	**N**	F
O	F	**C**	B	Y	K	K	H	W	D	Y	Y	**I**	O	G
P	G	D	**C**	Z	L	L	I	X	E	Z	**Z**	J	P	H
Q	H	E	D	**A**	M	M	J	Y	F	**A**	A	K	Q	I
R	I	F	E	B	**N**	N	K	Z	**G**	B	B	L	R	J
S	J	G	F	C	O	**O**	L	**A**	H	C	C	M	S	K
T	K	H	G	D	P	P	**M**	B	I	D	D	N	T	L

Fig. 1.

a staff in spiral fashion, as shown in the lower illustrations on the opposite page. On unrolling the strip it seemed to be covered only with a meaningless jumble of letters, but the receiver solved the mystery of its contents by simply wrapping it round another staff of the same diameter as the one used in writing the message.

An even older plan for hiding a message was employed by a Greek in Persia, who shaved the head of a slave and wrote on the man's bald head information that he wished to pass on to a friend in Miletus, on the shores of the Mediterranean. The slave was kept imprisoned until his hair grew again, when he was sent to Miletus, there to be again shaved so that the message he carried could be read!

Such simple schemes are far too slow to be of any use to-day, when speed in the transmission of information is absolutely essential, especially in wartime. In current warfare codes and ciphers are used in countless ways. For instance, codes are used in the armed forces for transmitting orders. For these a code book is necessary. This is a carefully prepared document in which all possible orders are condensed into a single word or a group of words that can be transmitted quickly by wireless, by ordinary telegraphy or over the telephone. The receiver translates the message into ordinary language by using his own copy of the code book.

Naturally code books are carefully treasured documents, which must be kept safely locked up from prying eyes and destroyed in emergency lest they fall into enemy hands. Thus the commander of a warship that is threatened with capture or destruction weights his code books and throws them into the sea to sink to the bottom.

Both in war and peace every effort is made to secure the code books of an enemy, and many spy stories have been written around attempts to steal them. During the Great War of 1914-18, a diver groping in the dark interior of a sunken German submarine discovered a package wrapped in lead. This proved to be the German Naval code book. Apparently the submarine had met its fate so suddenly that there had been no time to dispose of this, and for a considerable time before its loss was discovered, and the code was changed, its possession enabled the British to read orders transmitted to German vessels. Similar treasures were discovered in other submarines, which were searched whenever possible, and the knowledge thus gained led to the loss of many U-boats.

Codes take many forms, and at first glance messages in which they are used appear incomprehensible. Some of them can almost be described as pictorial writing, and in this sense the Indian sign writing is a good example. Several of the signs that the Indians used are illustrated on this page, and it will be seen that there would be no great difficulty in making up with such signs a story that could convey very much information, and could only be read easily by those who know the key or code.

One way of disguising a message is to use a secret ink. It is very easy to make up an ink that will do for this purpose, and all readers will revel in the experiments involved. One plan is to use the juice of an onion. Writing in this is invisible, but becomes evident when the paper is warmed. A very good secret ink is made by dissolving the chemical called cobalt chloride in water. This solution is pink, and it is diluted with water until writing with it is invisible. On holding the paper in front of a fire the writing appears in blue and is easily visible. Secret writing in this "ink"

Fig. 2. Examples of Indian sign writing.

has the advantage that it can be made to disappear again by breathing upon it, or leaving it in a cool moist place.

Rice water is another secret ink that has been used. Writing for which it is employed becomes visible when the paper is treated with iodine. Even distilled water

C	L	E	G	L	C	C	P	G	L	E	D	M	P	Z M W Q
D	M	F	H	M	D	D	Q	H	M	F	E	N	Q	A N X R
E	N	G	I	N	E	E	R	I	N	G	F	O	R	B O Y S

Fig. 3.

has been used as a secret ink, which is developed by the use of iodine vapour.

The use of secret ink alone is not sufficient to conceal a message, for inquisitive experts have discovered how to deal with practically any secret writing that can be produced, and they do not hesitate to put their ideas into practice. Some additional kind of disguise therefore is adopted and this of course takes the form of a code or

T	F	V	B	Z	G	I	K	Y	X	U	B	N	Z	C	O	L	S	N	Y	Y	T	C	O	
G	U	E	Y	A	T	R	P	B	C	F	Y	M	A	X	L	O	H	M	B	B	G	X	L	
H	V	F	Z	B	U	S	Q	C	D	G	Z	N	B	Y	M	P	I	N	C	C	H	Y	M	
I	W	G	A	C	V	T	R	D	E	H	A	O	C	Z	N	Q	J	O	D	D	I	Z	N	
J	X	H	B	D	W	U	S	E	F	I	B	P	D	A	O	R	K	P	E	E	J	A	O	
K	Y	I	C	E	X	V	T	F	G	J	C	Q	E	B	P	S	L	Q	F	F	K	B	P	
L	Z	J	D	F	Y	W	U	G	H	K	D	R	F	C	Q	T	M	R	G	G	L	C	Q	
M	A	K	E	G	Z	X	V	H	I	L	E	S	G	D	R	U	N	S	H	H	M	D	R	
N	B	L	F	H	A	Y	W	I	J	M	F	T	H	E	S	V	O	T	I	I	N	E	S	

Fig. 4.

cipher. With a cipher there is no need for a book that must be guarded. The letters are rearranged, or have others substituted for them according to some prearranged plan, and all that is necessary is that those concerned should know the method used.

There are many ingenious ways of disguising information to be conveyed secretly. One of the most remarkable of these was exploited by a German spy of the name of Müller during the war of 1914-18. Müller's headquarters were at a baker's shop in Deptford, the baker being a naturalised Englishman who was in the habit of sending papers to Amsterdam. This practice aroused the suspicion of a Postal Censor, who tested one of the newspapers for writing in a secret ink, with surprising results that lead eventually to the arrest both of the baker and of Müller.

It was then discovered that Müller was actually using the advertisement columns of British newspapers for passing on information that he had acquired. Working with a special cipher, he composed an advertisement conveying whatever news he had, and inserted this as a seemingly harmless notice in the columns of a suitable newspaper. A copy of the newspaper was then sent abroad, and it was only by the chance of secret ink having been used on this one copy that the trick was discovered. When it was known, British experts carefully worked out the code and themselves took Müller's place, with the difference that the information they sent on was more likely to be of use to ourselves than to the enemy! They actually received a sum of about £400 from Müller's employers to pay for the advertisements before the ruse was discovered.

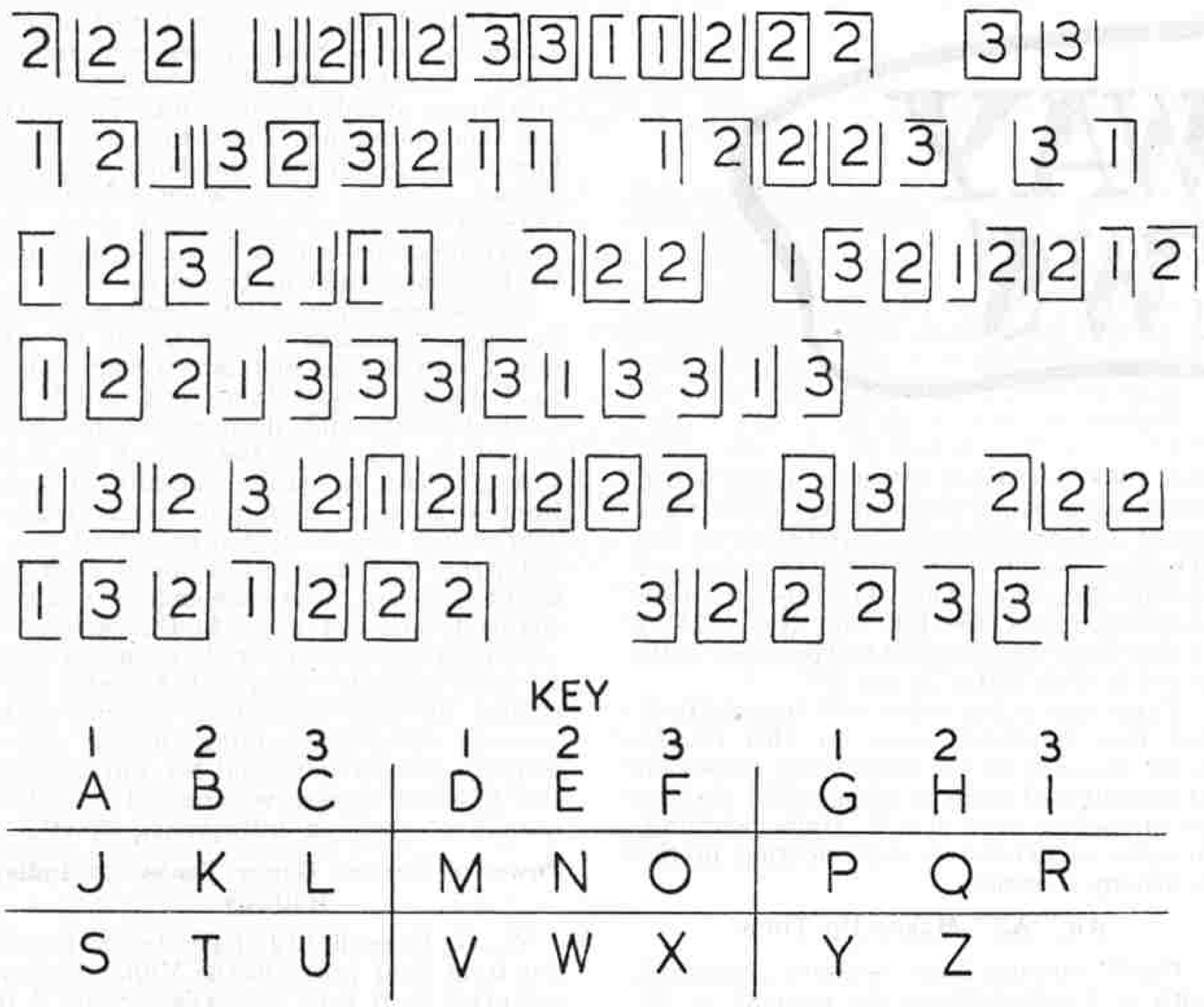


Fig. 5. A simple form of code, with an easily remembered key.

In many ways ciphers are far more interesting than codes. With these there is no necessity to have a book that must be jealously guarded. All that is necessary is that those concerned should know the method that is adopted in disguising the letters of the message or information that is being sent. A message in cipher looks bewildering. For instance, what can one make of such a sentence as "Cleglccpgle dmp Zmwq?" Actually this would be easy to the cipher expert, who has worked out ways and means of reading hidden messages, and has been so successful that there seems to be no cipher that cannot be solved or "broken." In dealing with this example he would simply write down under each letter the next one in the alphabet, and would continue until he recognised real words instead of hopeless jumbles of letters. His working in this instance need not go further than two rows below the hidden message, and would appear as in Fig. 3, where the top line repeats the cipher.

This is a very simple substitution cipher, in which the letters have been changed to other letters or symbols. Julius Caesar used this method, representing the letters by others a certain number of spaces backward or forward in the alphabet. The cipher used in the above example is of this kind.

A substitution cipher can be made more difficult by breaking the message up so that its words, or even its separate letters, appear in different lines when the solution is found. Then it is not easy, especially for those who are unpractised in reading ciphers, to pick out the words from the great mass of letters collected. An example is given in Fig. 1, the top line being the secret message in cipher and those below it representing the working of the solver, following the plan already explained. The letters that make sense are printed in bold type so that the unpractised reader can pick them out easily.

The cipher expert has to be prepared for tricks that make the solution of a cipher difficult to pick out, but his trained eye invariably finds the solution, however it is hidden. Fig. 4 is another example. The first line gives the cipher message, which represents a well-known proverb, and readers will be interested to discover this for themselves in the eight lines of working that follow.

In order to make things harder a message is sometimes made to read backward instead of forward, and there is a further interesting trick in which a reversed alphabet is used. In this a key is made by setting out the letters of the alphabet in a long horizontal row, beginning again when Z is reached, and writing the alphabet somewhere underneath, but in reverse order. For instance, the first letter of the reversed alphabet, which of course is Z, may come under the letter L, in which case A in the reversed alphabet will appear under the letter K. In putting the message into cipher L is then substituted for Z. K for A and so on throughout.

K Y C K D W R M V Z T F K C V A V M B M D C O

Fig. 6.

This form of substitution cipher is easily read. Since the solver does not know where the reversed alphabet was placed in the key he begins by placing it under the ordinary alphabet with Z under A, Y under B and so on. Then he uses the key to de-code the message, whatever it is. This gives him a second set of letters that still appear meaningless, but all that he has to do now is to move each letter along a certain number of spaces in the alphabet. This he does by the method already explained, that is by continuing the alphabet under each of the letters.

These are some of the many tricks that can be played with substitution ciphers of this kind, and Fig. 6 is another example for readers to solve. The solution and that for the cipher in Fig. 4 will be given next month.

Then there are ciphers in which numbers, lines varying in length or position and various other symbols are substituted for letters. These are more complicated in appearance than in reality. One such cipher is illustrated in Fig. 5, along with its key. In it each letter in the alphabet is given a special position within a framework, and its position is indicated by the number one, two or three. Readers should have no difficulty in deciphering the message written above the key.

Can you read this mysterious note?

"Dt kuelg e buevv pej tw e outla ty mlg ewq ktzj mw xtudgw vdggu vggxv dsg jmbsd ner dt ojgea md. Ozd dsmv sev oggw qtwg ewq dsg pej mdvguy ltzuq og xeqg jgq std ewq qjtkkgq mw ltuq nedgj nmdstzd ojgeamwb dsg buevv. Dsg buevv ty ltzjvg nev or wt xgewv ew tjqmwejr amwq."

This is written in a comparatively easy substitution cipher, and in the absence of a key a start could be made with its solution by counting up the number of times each symbol occurs. The letter that is most often used is E, and this is followed by T, A, O and N. The five least used are J, K, Q, X and Z. The remaining letters, which occur much less frequently than those of the ETAON group, and much more often than K, X, Q, J and Z, are used in the following order of frequency: I S H R D L C U F M P W G Y B V. Knowing this is not usually sufficient to solve a cipher message, especially a short one, in which the order given may not be followed exactly. The decipherer then has to take into account double or treble letters. For instance, the letters E. O. L. S and F are those most commonly doubled, so that after counting up the frequency of the individual symbols the next thing is to look for doubles. Combinations such as THE and AND also can often be picked out by the number of times that the symbols representing them are repeated, and here it is useful to remember that THE is the most commonly occurring of all words of three letters.

By the time these points have been looked into clues will begin to make themselves evident, and then it is a matter of following them up and using common sense. The task is made easier if the letters are separated into words, for any word of one letter must be I, A or O, while more words begin with T than with any other letter and R, S and T are the letters that occur most often at the ends of words. With ideas such as these in mind readers should be able to make sense of the apparently meaningless jumble of letters reproduced above, and to work out a key for it. Next month we will give the solution of this mystery note.

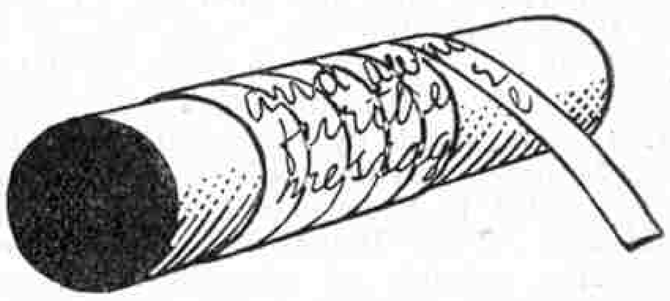


Fig. 7. A form of cipher used 2,400 years ago. How it worked is explained in this article.

RAILWAY NEWS

S.R. Tank Locomotive Classification

Last month we explained the S.R. locomotive classification system as far as tender engines were concerned. Turning next to tank engines, there is rather a diversity of types not regularly numbered. Powerful banking and local goods tanks mostly found in the London area are: G16 4–8–0s Nos. 492-5 and H16 4–6–2s Nos. 516-20, both E types; W 3-cyl. 2–6–4s Nos. 1911-25; and Z 3-cyl. 0–8–0s No. 950-7. The small 0–8–0T No. 949, formerly Kent and East Sussex Railway, "*Hecate*" is not classed.

Of passenger tank engines with B lettering 4–6–2Ts Nos. 2325 and 2326 are J1 and J2 respectively. The 4–4–2s Nos. 2001-10 and 2595-604 are 11x rebuilds. Nos. 2021-30 and 2075-91 are the 13 express class, with 6 ft. 7½ in. driving wheels. The 0–4–4s numbered 2363-98 are D3, except No. 2397, rebuilt with Marsh boiler, which is D3x. Class A locomotives include the Wainwright standard S.E.C.R. 0–4–4Ts numbered variously between 1005 and 1554, and forming Class H. The older version, Kirtley engines of the L.C.D.R. numbered 16xx, are R and R1.

The larger Drummond E engines of Class M7 carry numbers between 21 and 676. The engines of Class T1 are a slightly lighter and smaller version. Those of Class 02 are small 4 ft. 10 in. locomotives dating from Nine Elms Works days of the nineties, and the 20 in service in the Isle of Wight are separately numbered W14-33. All these are of the 0–4–4 type.

Of the B general service classes there are 0–6–2s Nos. 2165-70 and 2453-62, with 4 ft. 6 in. wheels, of Class E3, and Nos. 2407-18, newer engines, are Class E6. Various engines with numbers between 2463 and 2583 are E4, with 5 ft. wheels; the E5s have wheels of 5 ft. 6 in. diameter; and the 10 E1Rs are rebuilds with small wheels. Several of these were rebuilt by Marsh with extended smoke-boxes and new boilers, then having "x" added to their classification. Classes E1 and E2 are B 0–6–0Ts. The few remaining rebuilds of Stroudley's famous "Terriers" are A1x.

Other 0–6–0T shunting engines are in the Eastern Section, with letter A, such as the Stirling R and R1 rebuilds; Class T comprises Nos. 1602-4 of Kirtley design. The small Wainwrights of Class P, are Nos. 1323 etc., and 0–6–0 saddle tank No. 1685 is Class S. Most of these 0–6–0 tanks have many years of service to their credit and are variously numbered. In the Western Section, E, the 0–6–0Ts numbered chiefly 2xx are G6. The 0–4–0 dock shunting tanks are B4, and Nos. 3741-4 of the same type are C14. The stout little 0–4–2Ts with letter B are D1.

There are a few other odd locomotives, but this summary gives an idea of the main features of an interesting collection of ancient and modern engines still playing an important part in S.R. traffic working, in spite of extensive electrification in the Southern counties.

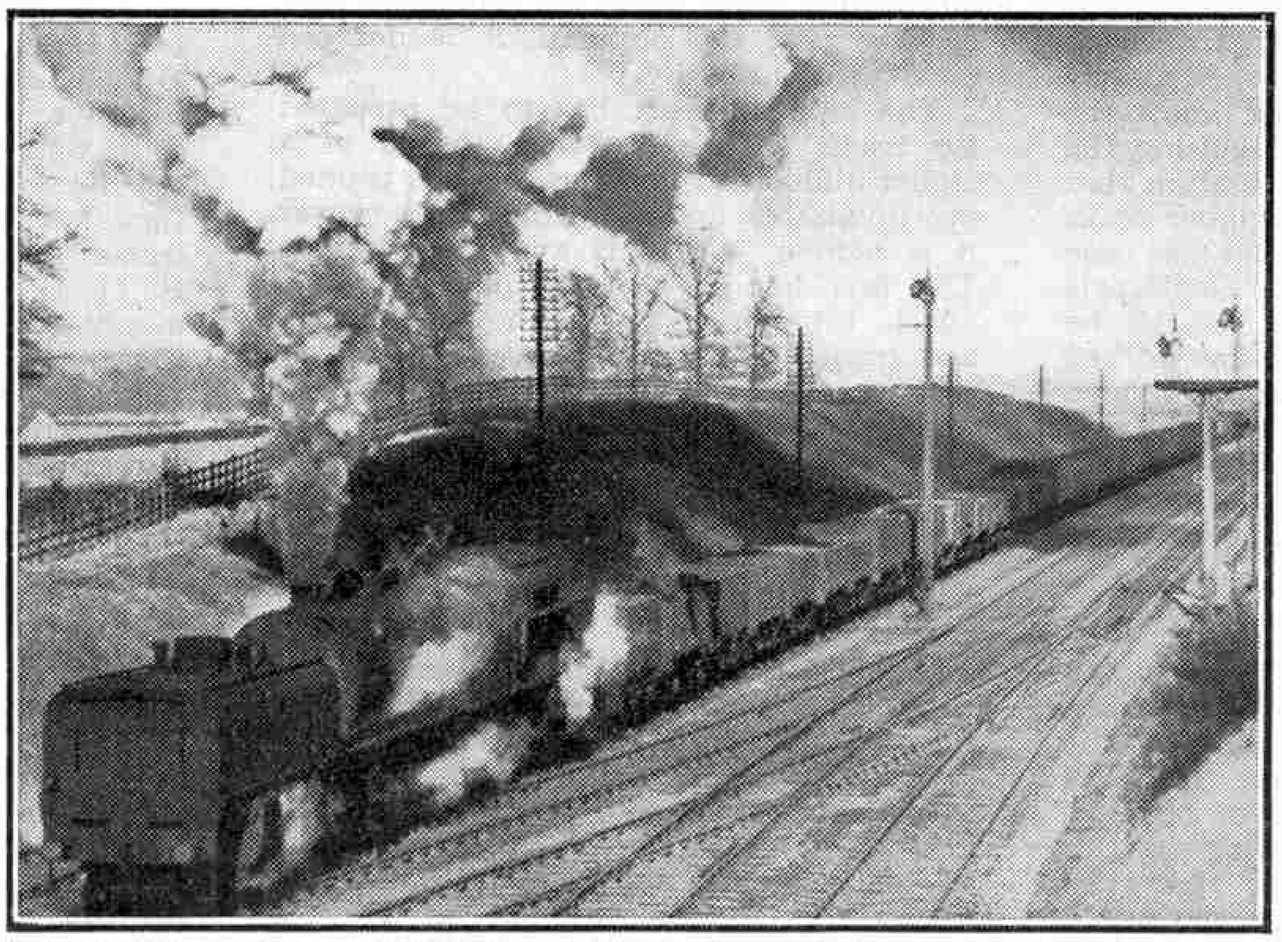
An "A3" Makes Up Time

Good running was recently displayed with a London-Newcastle express of 18 coaches, weighing over 620 tons full, by L.N.E.R. A3 Class "Pacific" No. 2578 "*Bayardo*," stationed at Gateshead and working the train throughout. This engine is one of the five converted in 1927 from A1 class when the 220 lb. per sq. in. boiler was introduced. It has lately been fitted with a steam collector dome, as usual on later-built Doncaster express locomotives. This feature is apparently to become standard on all L.N.E.R. "Pacifics."

Owing to an air raid warning being in progress, the first 16 miles from King's Cross were taken very slowly. After being halted at a signal box in order that the driver might be informed that "Raiders passed" had been sounded, the next 89 miles were covered start to stop at an average of 57 m.p.h. Over a stretch of 65 miles over varying gradients, including the dead slowing through Peterborough, an average of 60.8 m.p.h. was maintained, lively wartime travelling indeed! The maximum speed touched was 70 m.p.h. and the minimum over the St. Neots hump of 61 m.p.h. was fine work with such a load in these times, when the normal impetus of very high speed over the preceding 20 miles or so is not forthcoming to the same extent as before the war.

On accelerating after passing Peterborough "*Bayardo*" worked up to 64½ m.p.h. on the level or faintly rising ground to Essendine, was doing 58½ m.p.h. at Little Bytham and, despite a slight check at Corby, went over the top of the 1 in 178 gradient to Stoke summit at only fractionally below 40 m.p.h., so that a good deal of lost time had been recovered.

Further minutes were regained after the Grantham stop, where the engine crew was changed. The 50½ miles to Doncaster, for which 64 min. is allowed, occupied only 59 min. actually, or about 57 min. net., taking an out of course slowing into account. Notwithstanding heavy intermediate station work and the initial delay this 620-ton express was only 4 min. late into Newcastle—an enterprising effort!



A L.M.S. "Garratt" in full blast at the head of a heavy coal train approaching Harlington, Bedfordshire, on the up fast line, Midland Division. Photograph by W. S. Garth, Luton.

Powerful Narrow Gauge Tanks for Indian Railway

W. G. Bagnall Ltd. have lately turned out from their works in the Midlands some powerful local type 2–6–4Ts for the 2 ft. 6 in. gauge section of the Mysore State Railway in India. This is a system with a mileage of over 400 on narrow gauges, possessing about 54 locomotives and 750 rolling stock vehicles.

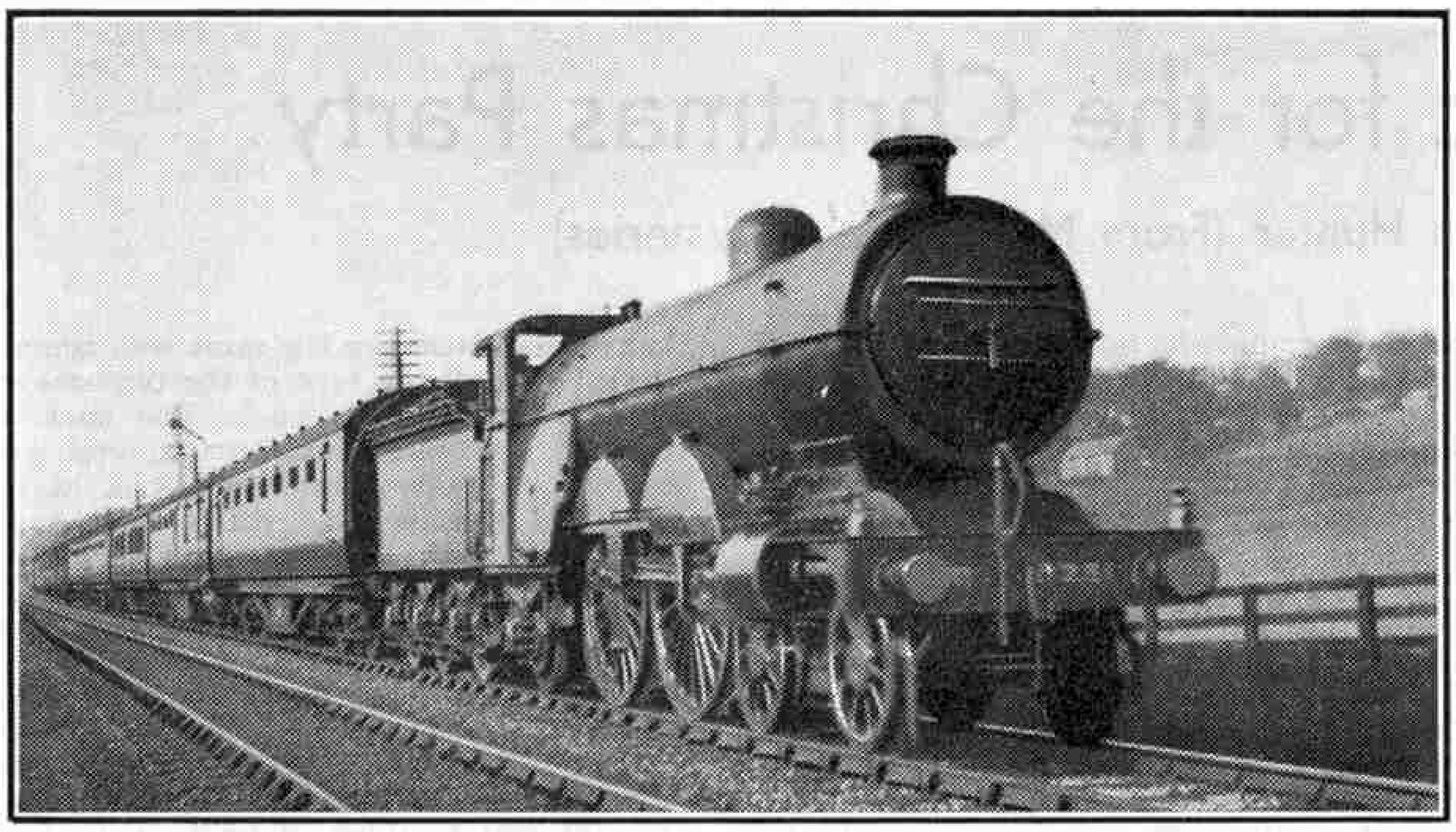
The new engines have long side tanks carrying 1,200 galls. water, and the driving wheels as well as the trailing ones are mostly enclosed by bar framing. The driving wheels are 3 ft. in diameter. The two outside cylinders are 11½ in. in diameter with a stroke of 18 in. and the heating surface, including that of the superheater, is 621 sq. ft. The boiler pressure is 160 lb. per sq. in., and though the total weight in working order is only 36½ tons the theoretical tractive effort at 9,000 lb. is high for an engine of this size.

Another "Blue Train"

"Blue trains" have become famous in recent years as examples of special speed and luxury. The well-known French "Riviera Blue" train, a sleeping car express run by the International Sleeping Car Company, and the L.N.E.R. and L.M.S. streamlined expresses have been followed by the introduction of similarly coloured special rolling stock in various parts of the world for "crack" trains. A new one has now been instituted in South Africa, providing air-conditioned luxurious coaches with observation car. It connects Johannesburg with Lourenço Marques, running once each way weekly. Unlike the first mentioned services, this express is able to operate now.

* * * *

A passenger train starts on its run somewhere in the United States every 4.8 seconds on the average.



A G.N. "Atlantic" working a N.E. express composed of L.M.S. stock. The engine is No. 3281, stationed at Grantham, but working temporarily over the N.E. area, and the train is the 5.00 p.m. Newcastle-Liverpool express. Photograph by W. B. Greenfield, Gateshead.

A Taff Vale 4-4-2T on a Royal Train

Mr. D. S. Barrie's article on page 474 of the October "*M.M.*" on the Taff Vale Railway centenary prompts me to write about a Taff Vale locomotive that in a way was historic.

The "C" Class of this railway consisted of six 4–4–2Ts numbered 170 to 175. These were designed by Mr. Tom Hurry-Riches and were used primarily for "main-line" passenger traffic. They had two inside cylinders of 17½ in. diameter and 26 in. stroke, coupled wheels 5 ft. 3 in. in diameter and a boiler pressure of 160 lb. per sq. in. As was the Taff Vale practice for a long period, the dome and safety valve casing were of polished brass. No. 173, the locomotive illustrated on this page, was responsible for hauling the Royal Train when His late Majesty King George V, accompanied by Queen Mary, visited the Iron and Steel Works at Dowlais on 11th June 1912. Piloted by No. 171 it hauled the train from Cardiff to Dowlais, via Pontypridd and Llanciach, returning to Penrhiwceiber to meet the Royal Party, who travelled by road via Merthyr and Aberdare to this point. The engine carried the Royal Coat of Arms on the smoke box front.

In 1893 this engine was responsible for an event of a less happy nature. One of the springs came loose, derailing the train and causing the loss of 13 lives. Accidents were extremely rare on this line, however, for on it there were only three major calamities causing loss of life. This is no mean record for a line which, as Mr. Barrie pointed out, operated the densest mineral traffic in the British Isles, if not in the whole world.

In later years these engines, together with a class of 4–4–0Ts, were equipped for running "Auto-trains." From these duties they were gradually withdrawn, and in the years 1925–1927 they were scrapped by the G.W.R., which by then was in control of the Taff Vale and other South Wales railways. In their hey-day they were fine locomotives, both in appearance and performance. Like so many other things, however, railway engines must move with the times in design as well as along the track, so despite their virtues they had to give way to the larger and more powerful 0–6–2Ts.

It has long been the writer's desire to model No. 173, but this must remain unsatisfied until the disposal of a certain Continental nuisance. Although the engine is now obsolete, its handsome, simple lines are ideal for the model maker, and the flexibility of the wheel arrangement is no mean consideration to model railway owners who, through lack of space, must restrict the diameter of their track to the minimum of four feet. T. L. JONES.

L.N.E.R. 2-6-0 Development

When Mr. H. N. Gresley, now Sir H. Nigel Gresley, introduced his first new design as Locomotive Superintendent of the former Great Northern Railway in 1912, it was a 2–6–0 or "Mogul," then a little known wheel type in Great Britain. Yet No. 1630, the engine of this type he then produced, was destined to lead the way to a new era in Doncaster practice, in the course of which entirely new standards of locomotive performance were to be set up and beaten again and again. A powerful general service engine was much in demand on the G.N. at the time, and the new engines Nos. 1630-9, K1 Class, soon proved their worth. They had two outside cylinders and piston valves actuated by Walschaerts gear.

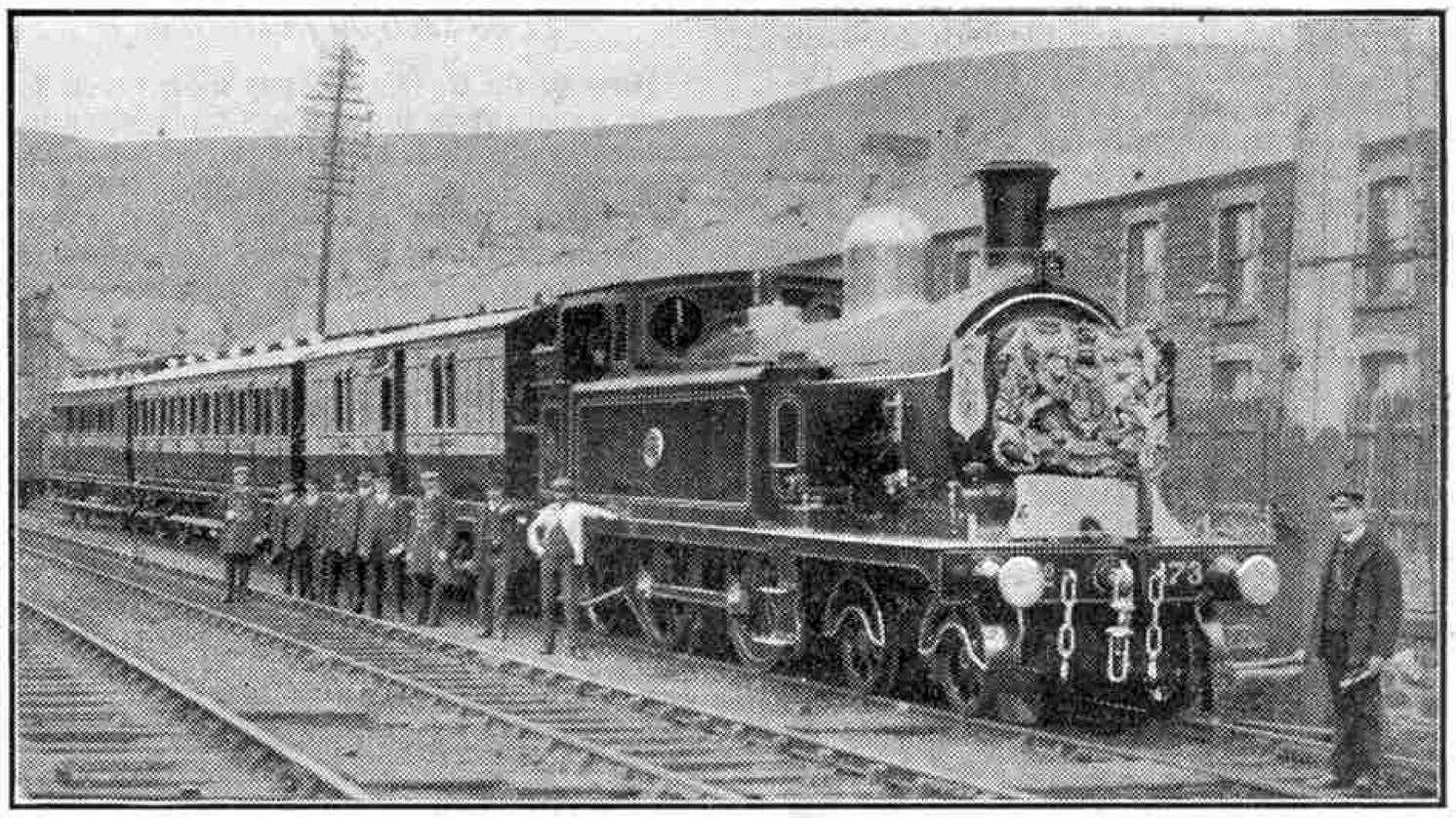
Two years later the next step was taken with the much larger boilered No. 1640, K2 Class, and to its dimensions and class all the first ten are now rebuilt. There are now 75 K2 engines, numbered L.N.E.R. 4630-4704. They are familiar on the Great Eastern section, over parts of the North Eastern area and in the Western Highlands of Scotland now as well as on their native metals.

In 1920 there appeared a most notable further development, the K3 Class, with a boiler diameter of 6 ft., then the largest in the country. Also, for the first time on a standard class of engine, they had three-cylinder propulsion with the valves for the inside cylinder driven off the outside Walschaerts gear by means of the now familiar Gresley patent. The first 10 engines were painted green and had the narrower G.N. type of cab. They proved capable of handling fast passenger and freight loads far greater than anything hitherto tackled single-handed, and to-day there are 194 K3's performing heavy general service on all parts of the system suitable for an axle load of 20 tons. News is just to hand of their continued employment to a greater extent than hitherto on the Great Eastern, Great Central and North Eastern (coastal) sections. The three cylinders are 18½ in. by 26 in., the boiler pressure is 180 lb. per sq. in. and the total weight 123 tons.

The "Loch Long" K4 class is a new and slightly smaller type of 3-cyl. 2–6–0, specially built to provide maximum possible power within the weight and length limits of the steeply graded and severely curved Glasgow-Fort William route, on which the largest engine allowable had been the K2 type. The new locomotives, numbered 3441-6 and bearing Highland names, have driving wheels of 5 ft. 2 in. instead of 5 ft. 8 in., as on the other classes described. As details of their performance recently published in the "*M.M.*" clearly proved, they are vastly more powerful than their predecessors on the scenic West Highland route.

G.W.R. Locomotive News

New 0–6–0 goods engines of the "2251" class are Nos. 2221-4; a further 2–8–0 is No. 3824. Two ex-L.B.S.C. 0–6–0 Stroudley type tank engines of the class known as "Terriers" which had been working on the recently closed Weston, Clevedon and Portishead Railway, have been taken over by the G.W.R. and given the numbers 5 and 6.



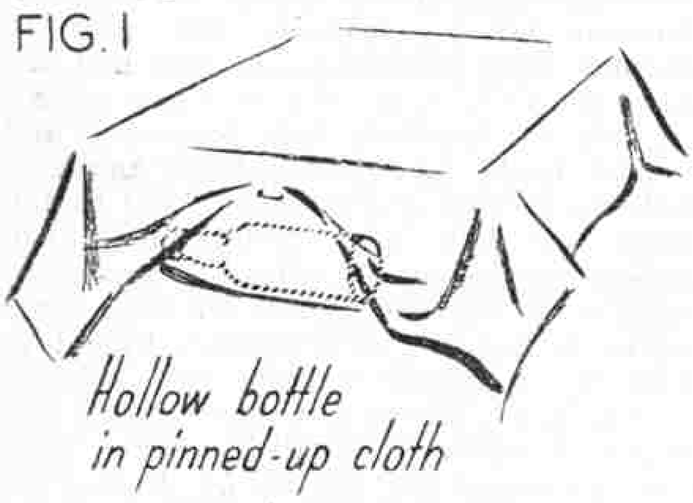
Taff Vale Railway 4-4-2T No. 173, with the Royal Coat of Arms mounted on the smoke-box. This engine hauled the Royal Train when King George V and Queen Mary visited South Wales in June 1912.

Easy Magic for the Christmas Party

By Norman Hunter (From Maskelyne's Mysteries)

SIMPLE tricks that give scope for plenty of fun seem to me to be called for this year. So here are some feats of merry magic, arranged so that they can be done without either special skill or special apparatus.

FIG. 1



Hollow bottle in pinned-up cloth

FOR THE TROOPS

You begin by showing three handkerchiefs, a white, a red and a blue. You then roll a sheet of paper into a tube and tuck the handkerchiefs inside. In a rather dramatic voice you say: "From these three famous colours I am now going to produce something that is dear to the heart of every fighting man."

Most of your audience will expect a Union Jack to make its appearance. But you lift the tube and there standing on your outstretched hand is—a bottle of beer!

How to do it. The most unjust part of this trick is the fact that the bottle of beer isn't real! It is one of those cardboard imitation bottles that can be bought at sweet shops. They usually contain crackers or sweets. All you will need for the performance is the empty cardboard bottle. This must be hidden behind your table, either by using a table with a drawer, pulling out the drawer at the back a little way and resting the bottle in the drawer, or by pinning up the tablecloth to form a sort of shallow trough into which the bottle can be placed. See Fig. 1. Have the table at your left and the bottom of the bottle pointing towards you.

Having shown a sheet of stiff paper, lay it on the table while you display the handkerchiefs. Now pick up the paper

FIG. 2

Picking up the bottle behind the paper

with your right hand, fingers on top and thumb underneath. Take the paper by the edge that overhangs the back of the table and slide your thumb into the cardboard bottle. You will then find you can lift the paper with the bottle behind it. Roll the paper round the bottle to form a tube, Figs. 2 and 3 will explain the movements.

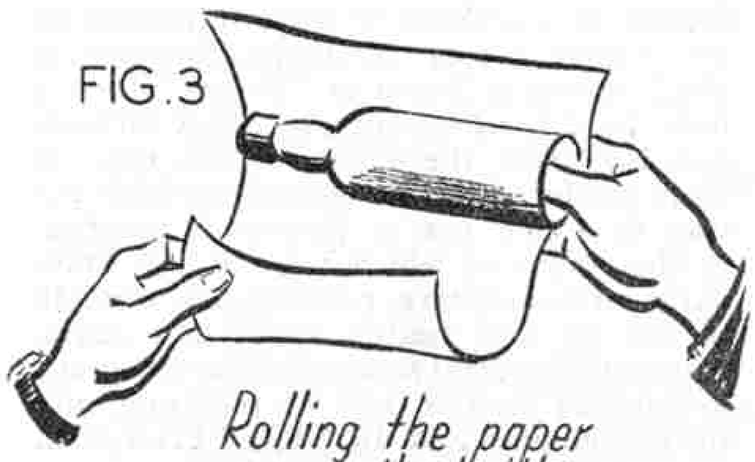
All you now have to do is to tuck the handkerchiefs into the tube and up into the hollow bottle. Stand the tube on your hand and lift the paper, revealing the bottle.

LOOPING THE LOOP

For this trick you have two long loops of paper ribbon. The paper should be about 2 in. wide and the loops about 2 ft. long. One loop you give to a member of the audience and ask him to sit on the platform facing the audience, or in that part of the room you are using as a platform. Next you give him a pair of scissors, take a pair yourself, and ask him to cut his band of paper in two, along the centre. He does so and you cut your band. When he has finished he has two separate bands of paper. But to everyone's astonishment your loop has done something strange. Instead of two loops, you have one loop twice as long as the one you started with.

Now you ask your assistant to cut one of his loops through the middle again. Again he gets two separate loops. You cut your long loop in two, and the result is two loops linked together.

FIG. 3



Rolling the paper round the bottle (as seen by performer)

How to do it. The paper loop given to your assistant is made by simply sticking the two ends of a strip of paper together. The one you use yourself, however, although it looks the same, has a slight difference. Before you stick the ends of this loop together simply turn one end round so that the loop has a twist in it. The rest of the trick simply works itself. Only be careful to give your assistant the right loop.

THE TELL-TALE CARD

A very large number of the best card tricks consist of getting someone to choose a card and shuffle it back into the pack, after which you tell him the card he chooses and produce it in some startling way. The whole secret in each case, whatever the details of presentation may be, consists in being able to discover which card was chosen.

A simple way to do this is to arrange the pack so that if any card is turned round, that card will in some way appear different from the rest to the performer, who knows what to look for. For instance, you can use a pack of cards with a picture design on the back. Arrange the pack so that all the backs are the same way round, that is with all the tops of the pictures at the same end of the pack. The pack is shuffled, you spread it fanwise, and ask someone to take a card and look at it. While he is doing this you quietly turn the pack round. You can then have the chosen card returned and the pack shuffled. As the chosen card has the design on the back pointing the opposite way to all the rest of the cards, you can easily find it.

A good way to present the trick by this method is to say to the chooser of the card, after he has shuffled it into the pack: "I want you to think of your card while I deal the pack on to the table. Your thoughts will make your card fly out of my hand. Only you must think very hard."

You then deal out the cards. When you arrive at the one with the reversed back you give it a sharp flick by pressing your thumb and finger hard together where they grip the card and then sliding them sharply apart, thumb to the right and finger to the left. This action, which is something like snapping your fingers, will make the card shoot out of your hand.

Another way of using the "card turned round" idea is to take any pack and, with a sharp knife or razor blade, carefully cut a tiny piece off the corner of the pack. Slice it right down the pack so that every card has one corner missing. See Fig. 4. Any card turned round in this pack can be found in a second even with the pack behind your back, because the corner will stick out where all the other corners have been cut off, as shown in Fig. 5.

When you use this method you can produce the chosen card while holding the pack behind your back, saying: "All conjurers can see with their fingers. I can do more than that. Not only can I see the card you chose, but I can see where it is in the pack."

More than one card can of course be dealt with by either of these methods, but be careful that the chooser does not absent-mindedly turn his card round while looking at it. If he should do so you must reverse the pack again before he returns it.

RED WEIGHS HEAVY

"Very few people know," you begin, "that red cards weigh much heavier than the black suits. A conjurer can tell the difference at once. Let me show you."

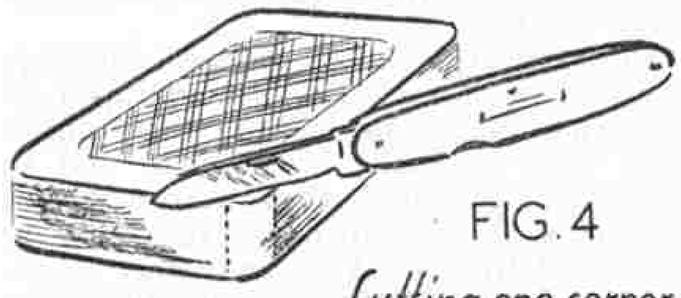


FIG. 4

Cutting one corner off all the cards in the pack

You deal out the cards, faces upward, one at a time. As you take each card from the pack you weigh it in your hand without looking at it, and say: "Ah, very heavy, undoubtedly a red card"; or "No weight to this, it must be black." And

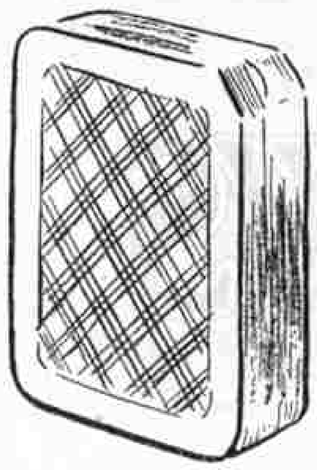


FIG. 5

Corner of turned card projecting where all the other corners are cut off.

as you turn over the audience see that you have foretold the colour correctly each time. The pack can be thoroughly shuffled at any moment and still you can go on telling the colour of each card. Yet the pack is an ordinary one.

How to do it. This is simply another trick with a pack of cards with "one-way" pattern on the backs. Before the performance arrange the red cards with the backs all one way and the black cards with the backs the other way. Telling one from another is then perfectly simple, however much the pack is shuffled; and even if anyone notices that the backs have one-way patterns, the cards seem to be so well mixed that this does not seem to help the secret.

THE TRICKY TIN OF TOFFEE

This trick can start in a very popular way by the tin of toffee being handed round for the audience to sample some of the contents. The tin, which is a round one, is then laid on its side on a board that slopes from a chair to the ground.

"If I let go of this tin of toffee," you say, "I suppose you can guess what will happen." You let go of it for a moment and catch it again as it begins to roll down the board. "Yes, it rolls down the board. But if anyone who is eating one of the toffees says "stop," it will obey. Will someone try?"

You let the tin roll down again, and as someone says "stop," the tin obediently stops.

"Now will another toffee eater tell it to roll up the board," you say. Again the tin obeys, rolling slowly up the sloping board.

The tin can now be made to roll up or down the board, quickly or slowly, stopping whenever it is told. Sometimes a member of the audience who is not eating toffee can be asked to command the tin. But the tin takes no notice of the order. "Only toffee eaters are obeyed," you explain. Finally you ask everyone who had a toffee to shout "Go." The tin then rolls rapidly up the board and right off at the top, after which tin and board can be thoroughly examined.

How to do it. This quite sensational piece of magic needs three things—a drawing pin, a length of fine black cotton, and a friend at the end of the cotton. Arrange the board, which should be painted dead black and be about 4 ft. or 5 ft. long, with one end resting on a chair seat. The board runs down straight towards the audience. Just under the top edge of the board press in the drawing pin and to it tie one end of the cotton. Lead the cotton over the back of the chair and, by means of a needle, thread it through a screen or a curtain some little way behind the chair. Behind this screen or curtain is your assistant and he holds the other end of the cotton.

When you put the tin of toffee on the board, you do so by first passing it under the thread. If you let go of the tin and your friend gently slackens the thread, the tin will roll down the board. By checking the thread or pulling on it your hidden assistant can make the tin stop or roll up the board. Fig. 6 shows the whole working of the trick. The finish, when the tin rolls off the top of the board, is accomplished by your assistant pulling on the thread until the tin goes over the end of the board. He then gives a tug to the thread and pulls out the drawing pin so that everything may be examined. It is worth the trouble of tacking a couple of narrow pieces of plywood down the sides of the board to prevent the possibility of the tin rolling off during the performance.

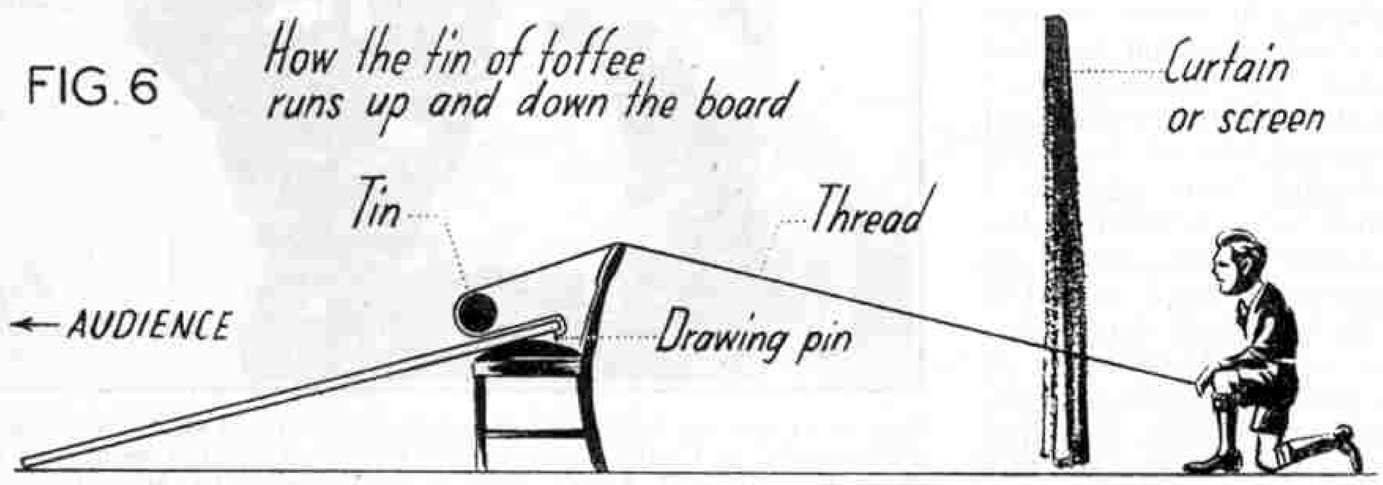


FIG. 6 *How the tin of toffee runs up and down the board*

A SWEET FAREWELL

For this last trick you make use of some small squares of paper similar to those in which the toffees used in the previous trick were wrapped. You bring them forward on a small tray, together with an empty matchbox. Various people are asked to take the papers, screw them up and put them into the matchbox, which you then stand in full view on the table. Everyone is then asked to make toffee-eating noises, and when the result has become sufficiently revolting, you open the matchbox and show that each paper now contains a toffee, which you distribute. The box can be examined.

How to do it. You want two matchboxes exactly alike. In one place some toffees wrapped in papers similar to those you are going to use. Have this box in your right hand, and hold the tray in the same hand so that it covers the box. The papers and empty box are on the tray.

Come forward and distribute the papers and ask someone to take the box. When the papers have been screwed up and put into the box, take back the box in your left hand. Now you apparently put the box into your right hand and take the tray in your left, in order to stand the box on the table, which is on your right side. What you really do is to place the tray over the box in your left hand and bring away the previously hidden box in your right hand. The movement is so natural and easy that nobody will suspect that a change has been made, especially as they do not know what is to happen. See Figs. 7 and 8.

While the toffee-eating noises are being made you casually lay the tray aside on a hat or small waste paper basket, or behind a screen, thus getting rid of the extra box. The remainder of the trick is now easy.

One final word of warning before you open fire with these tricks on your friends. There are two important points to be borne in mind by those who set out to learn

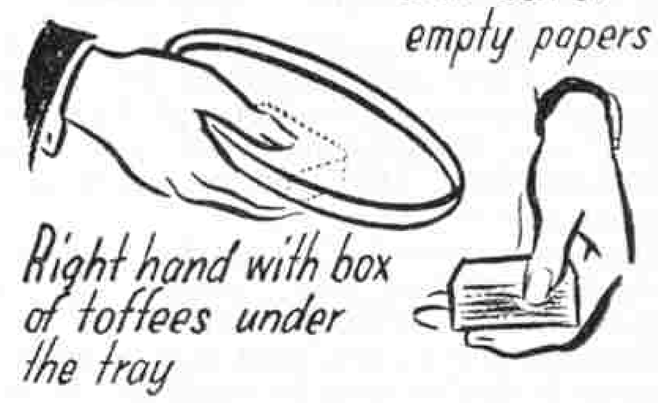


FIG. 7

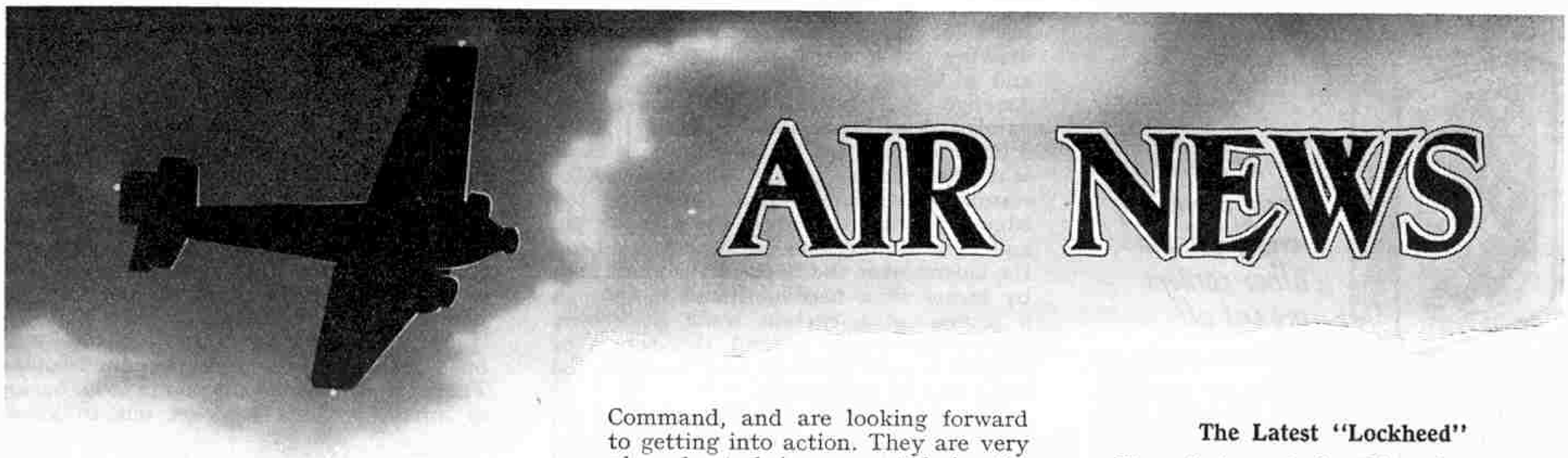
conjuring. The first point is to practise every trick repeatedly in private before performing it before an audience; the second is that, unless it is absolutely necessary, the same trick should not be repeated before the same audience because, knowing what is coming, they will have a much better chance of discovering the secret than if the effect were a surprise.

In order to distract the attention of the audience at critical moments in the performance of a trick, a few jokes and witty sayings should be selected and memorised. If the conjurer is able to do so, it is better to keep on talking almost all the time, as this prevents the audience from concentrating their attention too much on the conjurer's movements. It requires a great deal of technical skill to carry through tricks successfully in dead silence while all eyes are fixed on one's hands!

Another point is that even when the greatest care is taken it is always possible for some little thing to go wrong during the trick, and if the conjurer can keep on talking he has a good chance of remedying the mistake without the audience noting that anything has occurred.

FIG. 8

I hope very many of my readers will try their hand at puzzling their sharp-eyed friends with these tricks; and to those who are taking up conjuring for the first time I wish every success.



An R.A.F. Anson's "Finest Hour"

An "Anson" aircraft of the R.A.F. Coastal Command patrolling off Calais fought in succession two German "Henschel 126s," one "Messerschmitt 109" and three "Messerschmitt 110s," all of which were driven off.

The two "Henschel" Army Co-operation aircraft attacked the "Anson" as it approached the French coast. In the first exchanges the British pilot was wounded, but accurate fire from his machine quickly silenced one of the German rear gunners. Both "Henschels" then withdrew. A "Messerschmitt 109" had dived to their assistance, and the navigator of the "Anson" was shot through the knee before the enemy aircraft also broke away after a fusillade.

A minute or two later the British machine encountered a formation of at least 70 Nazi fighters flying above, and three of them, "Messerschmitt 110s," detached themselves to deal with the comparatively slow but sturdy "Anson." As usual this machine fought back much harder than the enemy expected, and one of the "Messerschmitts" after receiving a burst from it made off, smoking, and was quickly followed by its two companions.

The wounded R.A.F. pilot and navigator brought their "Anson" safely back to its base.

Czechs with the R.A.F. in the Middle East

After months of adventurous travelling, during which they covered thousands of miles in enemy and neutral countries and overcame difficulties and setbacks which would have broken the spirit of most men, a party of officers and other ranks of the Czecho-Slovakian Air Force have joined with the Royal Air Force. These men are in a desert camp in the Middle East Command, and are looking forward to getting into action. They are very pleased at being accepted in the R.A.F., after having been denied the chance of fighting the Nazis in direct defence of their own country. Most of the officers and men are trained pilots and observers.

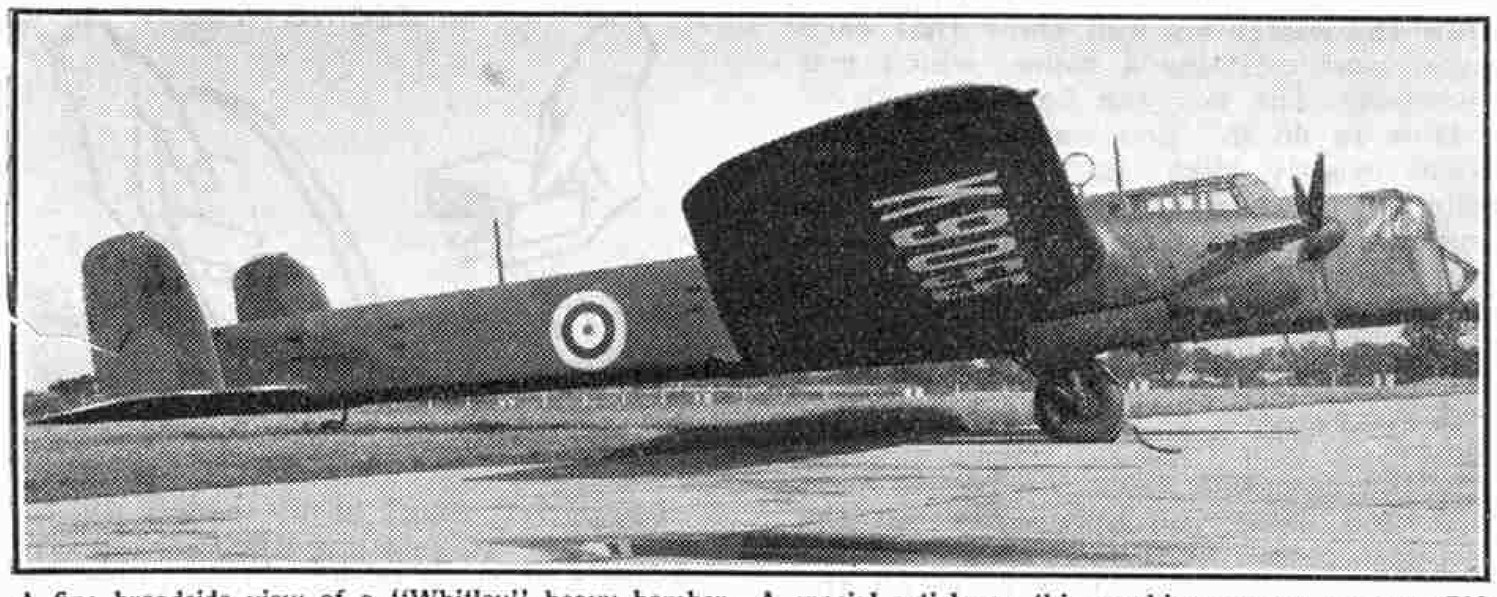
A Fortunate Near Miss

After fighting in more than 30 actions and shooting down six enemy aircraft, a young Royal Air Force fighter pilot has collected only one souvenir. He carries it about with him everywhere. It is a splinter ¾ in. long and ¼ in. wide from a "Messerschmitt" cannon shell that struck his "Hurricane."

"I force-landed my 'Hurricane' on a south of England golf course, on the only fairway which was not covered by obstructions," he said the other day. "I was about 400 yd. from the nineteenth hole, and as I started to walk towards the clubhouse I felt something in my shoe. So I pulled it off, and inside I found this piece of shell splinter. It had come into the cockpit, struck my instep, and had cut right through the leather; then it had stopped, as although it was right inside the shoe it had not even scratched my foot or torn my sock."

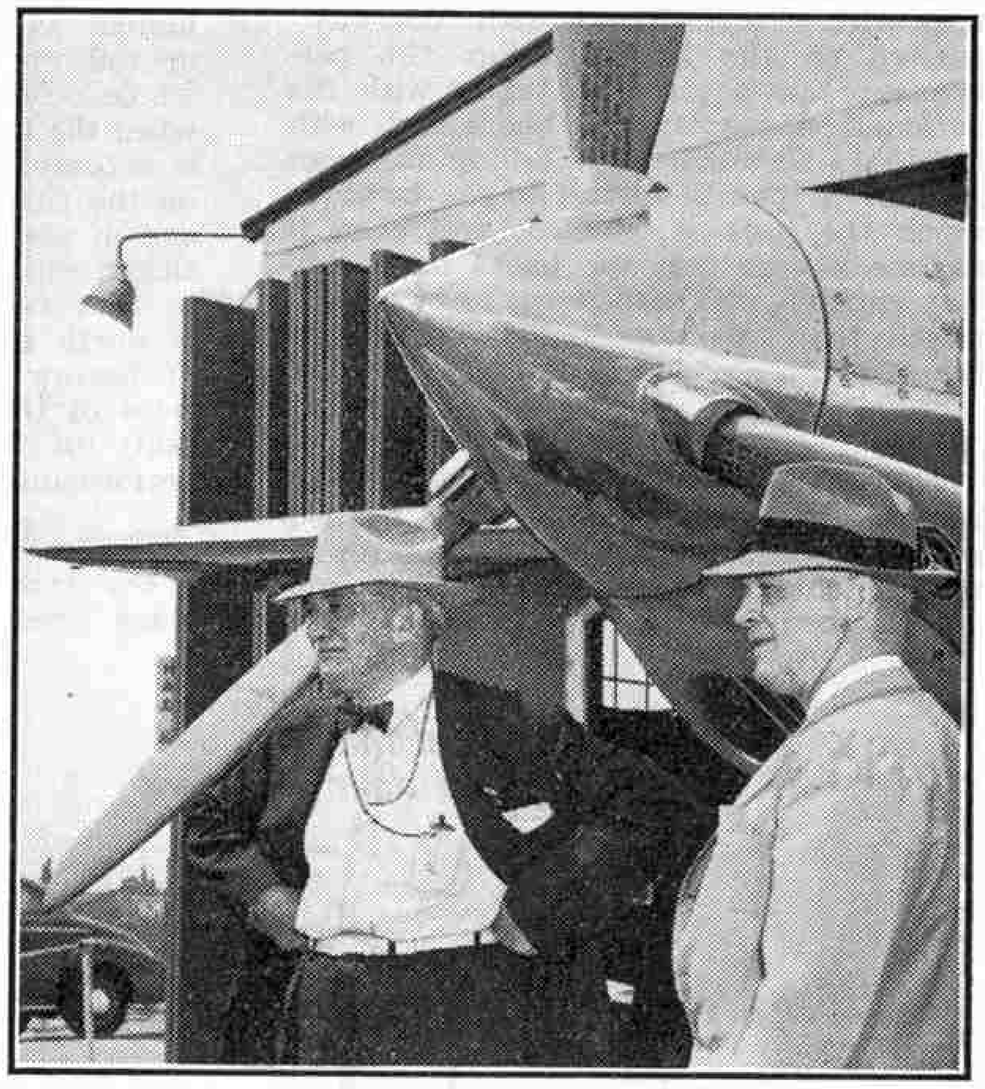
* * * *

The British Government are reported to have purchased 10 Douglas DC-2 air liners from Eastern Air Lines, U.S.A. The company is replacing them with 10 new Douglas DC-3 transports.


A fine broadside view of a "Whitley" heavy bomber. A special article on this machine appears on page 519. Photograph by courtesy of Sir W. G. Armstrong Whitworth Aircraft Ltd.

The Latest "Lockheed"

The photograph in this column shows the nose and airscrew of a "Lockheed P-38" interceptor fighter in front of which are Mr. W. S. Knudsen, Chairman of the United States National Defence Advisory Commission, and Major-General H. H. Arnold, Chief of the United States Army Air Corps. This latest Lockheed type is said to be the world's fastest military aircraft, and in a recent flight claimed a top speed of more than 460 m.p.h.


Nose of a Lockheed P-38 interceptor fighter seen behind Mr. W. S. Knudsen, Chairman of the United States National Defence Advisory Commission, and Major-General H. H. Arnold, Chief of the United States Army Air Corps. Photograph by courtesy of Lockheed Aircraft Corporation, U.S.A.

The P-38 is in production for the United States Army Air Corps and has been ordered by the British Air Ministry. It is a twin-fuselage all-metal monoplane, with a three-wheel retractable undercarriage.

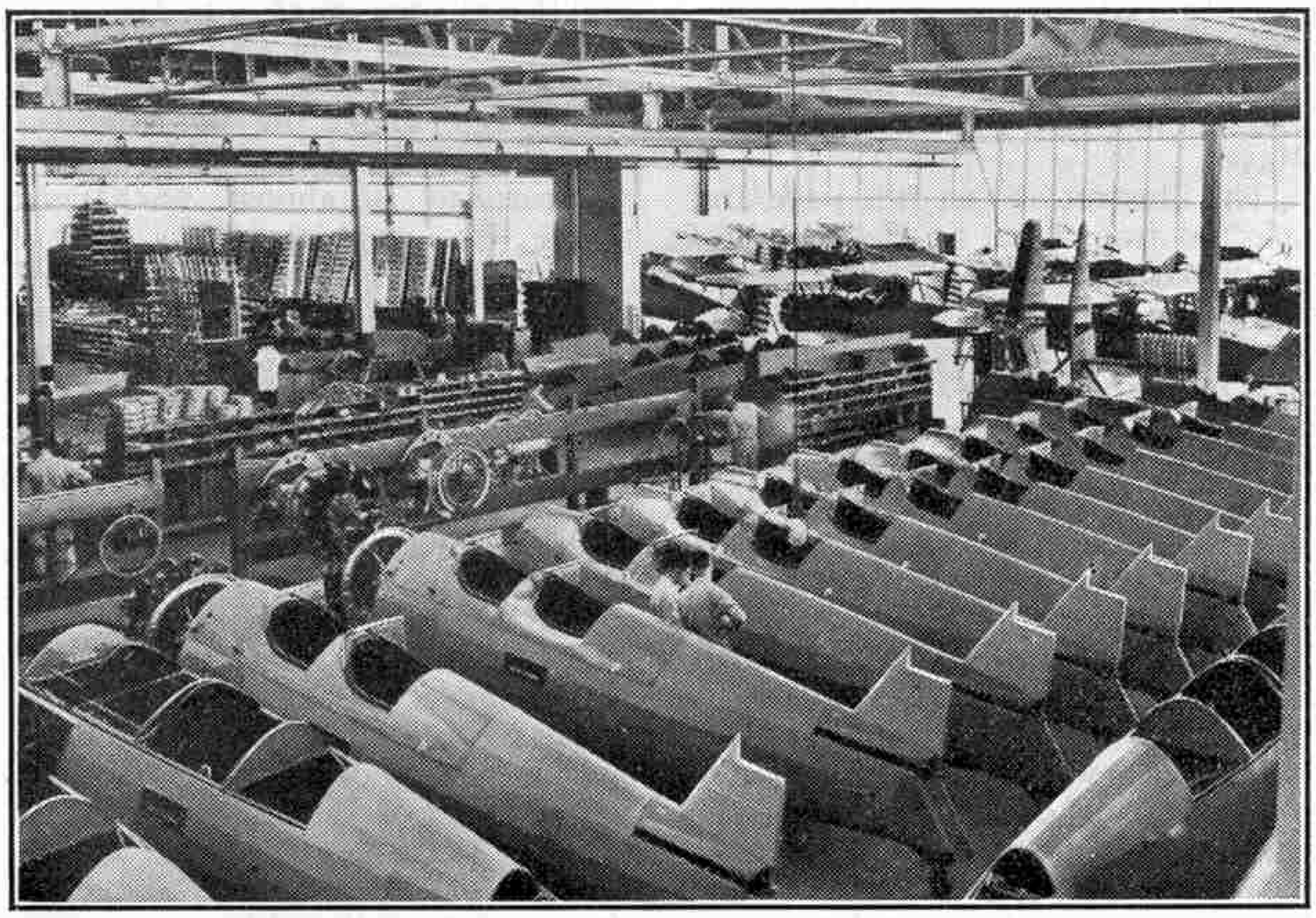
Definitely Unserviceable!

A squadron of R.A.F. Coastal Command "Blenheims" recently bombed a German aerodrome on the Norwegian coast. The place was so badly damaged that the Germans painted a huge notice on the landing ground, saying in effect: "Unserviceable—Don't Land Here."

Next day one of the same "Blenheims" went over to see what damage had been done in the raid. The pilot read the notice, dived, and shattered the warning with his bombs.

Trainer Aircraft for U.S. Defence

Stearman primary training aircraft for the United States National Defence Programme are now being completed at the rate of one machine every 3 hrs. throughout the two main shifts of each day. The production rate is being steadily increased, and present plans indicate that within a few months a rate of one machine every 90 min. can be reached. These trainers are being constructed at the Stearman Aircraft Division of the Boeing Aircraft Company, and the upper photograph on this page shows the work in progress.



Primary training aircraft for the United States Army and Navy under construction at the Stearman Aircraft Division of the Boeing Aircraft Company, U.S.A. by whose courtesy this photograph is reproduced. These aircraft are being completed at the rate of one every three hours.

Within a year the Stearman company have received orders from the United States Army Air Corps and the United States Navy for 1,500 trainers, and together the contracts comprise the largest number of primary training aircraft ever ordered in peacetime from one manufacturer by the United States Government. The types of trainers included in the orders are the Stearman PT-13B, PT-17, and PT-18 for the Army Air Corps and the N2S-1 and N2S-2 for the Navy. All are biplanes, and the types are of the same basic design but with some variations, including different engine installations.

Trans-Canada Air Lines Progress

Trans-Canada Air Lines have added to their extensive air routes by introducing an air mail service between Toronto and Windsor, by way of London, Ontario. Later, passengers also will be carried on this service.

Delivery of six Lockheed "Lodestar" transports to the company has begun, and it is expected that all will be received by the end of this year. These aircraft will be employed on the new service just mentioned, and also on the company's transcontinental air route. The "Lodestar" carries a crew of three and 14 passengers.

The flight staff of Trans-Canada Air Lines now includes 35 Captains and 33 First Officers, and a further 13 First Officers are undergoing training at the company's school.

"Heinkel" Crew Prisoners a Second Time

Members of the crew of a German "Heinkel III" which made a forced landing in Kent recently are now prisoners of war for the second time. They were shot down in France and taken prisoner, but were released by the French five days after the Armistice. After some time in hospital and on leave, they returned to their unit.

Their "Heinkel" was leading a flight which operated from a French base to attack the London docks. The starboard engine of the machine was hit by A.A. fire, and as oil escaped the engine seized, the machine lost speed, and fell behind the formation. It was chased by "Spitfires," and the steering was put out of action. The pilot said that they would have baled out but one of the crew had been wounded. So he force-landed and immediately threw an incendiary bomb into the cabin. Soldiers arrived in time to pull out the bomb, and the aircraft was saved.

* * * *

The United States War Department recently placed two huge orders for aero engines, one with the Pratt and Whitney company for 17,000 engines, and the other with the Wright Corporation for 20,000.

Keen Polish Eyes

Polish fighter pilots have unusually good eyesight. "They can see a 'Hun' miles away," one British pilot said. "I have good eyesight, but these Poles are surprising. They've called my attention to German aircraft long before I could see them."

A Polish airman explained it in this way. "We in Poland had very poor radiotelephony—poor, compared with the British radio, I mean. Where your pilots are trained to have keen ears as well as keen eyes, our men had to get used to relying almost entirely upon their eyes."

An R.A.F. Flight-Lieutenant who helped the Poles in their training, and was posted to their squadron, said: "I can give you a good example of what they are like. One murky day, in training, we were sent up to 'intercept' some 'Blenheims' flying on a given course. There were clouds and goodness knows what in the sky.

"Suddenly one Pole called over the radio telephone that he had seen the 'Blenheims.' I couldn't see a thing but clouds, so I told him to lead on. He led the formation, and believe me, it was some time before I spotted the 'Blenheims.' In fact we were in a perfect position for an attack by the time I had seen them."

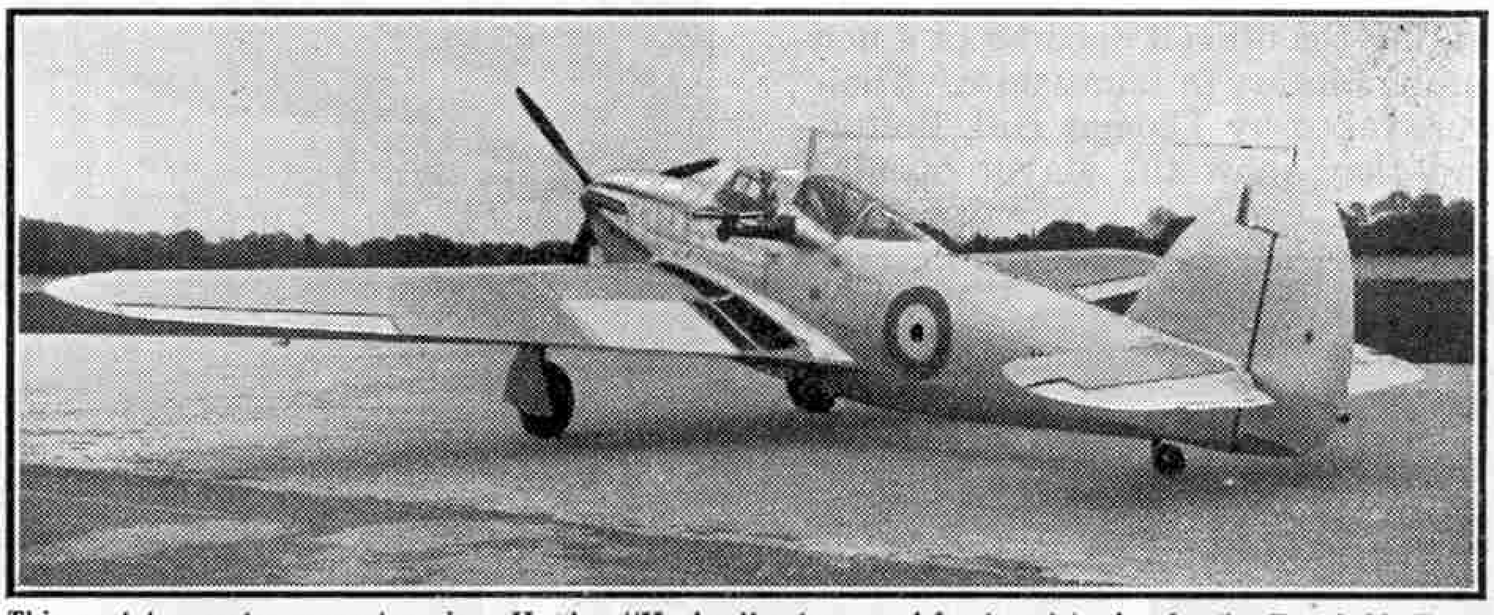
Stricken Bomber Hits Back

A Royal Air Force bomber flying across the North Sea to take part in a raid on Germany encountered an enemy twin-engined fighter that approached out of the darkening sky and attacked the bomber on the port beam, with machine guns and cannons. One shell hit the main petrol tank and made a large hole in it, and other severe damage was done. The enemy then attacked again, in the hope of finishing off the bomber, but the British rear gunner got in an accurate burst at close range, hit the enemy's starboard engine and set it on fire. A few seconds later the German went into a steep dive, and was seen to explode about 250 ft. above the sea.

By this time the difficulties of the bomber had increased, and it became obvious that the rubber dinghy would have to be launched and the aircraft abandoned. The crew were safe in their dinghy several minutes before the bomber sank.

* * * *

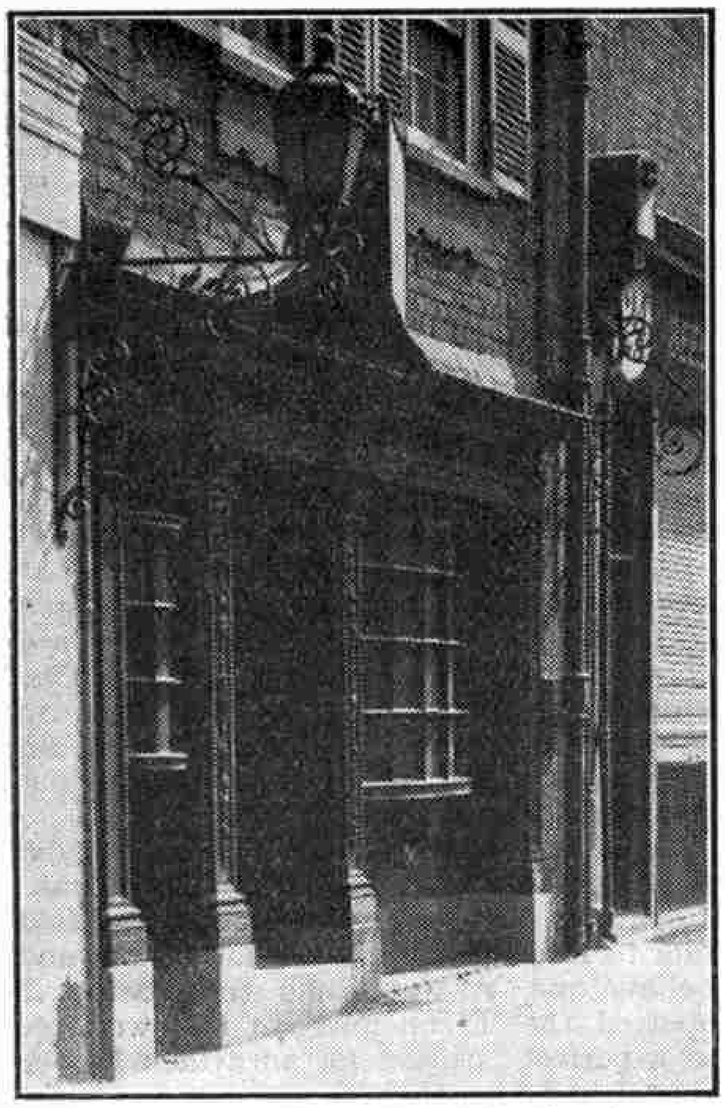
A Lockheed aircraft of the South African Air Force has set up a new record for a flight between South Africa and Kenya by flying from Pretoria to Nairobi, more than 2,000 miles, in 10½ hrs. This was the first time that this long trip has been accomplished in one day.



This neat two-seater monoplane is a Hawker "Henley," a type used for target-towing by the Royal Air Force. Photograph by courtesy of Hawker Aircraft Ltd.

London's Old Shops

Pictures From Our "Series" Contest



No. 4, Green Dragon Court, Southwark.

IN the July *"M.M."* we announced details of a novel photographic competition in which prizes were offered for the best sets of not less than five photographs that would link up to form a more or less continuous story. The idea appealed to *"M.M."* readers interested in photography and some very fine pictures were submitted. These have now been judged, and the prizes have been awarded as follows:

1st Prize, Cheque for £2/2/-: T. Hill, Bolton; 2nd, Cheque for £1/10/-: A. Dell, London S.E.27; 3rd, Cheque for £1/1/-: A. Elvey, London S.E.9; 4th, Cheque for 15/-: J. Needham, Enfield; 5th, Cheque for 10/6: S. Pethybridge, Newton Abbot.

Two Special Editor's Prizes of Cheques for £1/1/-: P. Lawrie, London S.W.19, and W. Barr, Birkenhead.

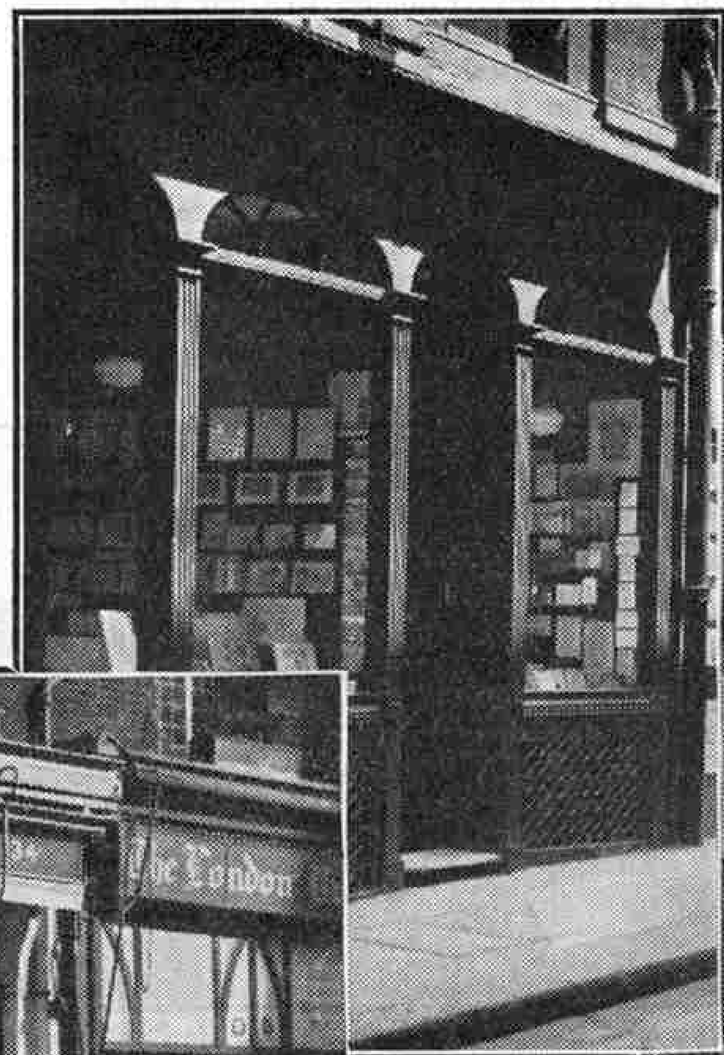
The First Prize was awarded for a set of seven photographs illustrating the official opening of a new public Library in Lancashire. These were taken by Thomas Hill, Bolton, and they show the Mayor opening the Library entrance door, incidents during the speeches, the architect and builder of the Library and finally the departure of the Mayor.

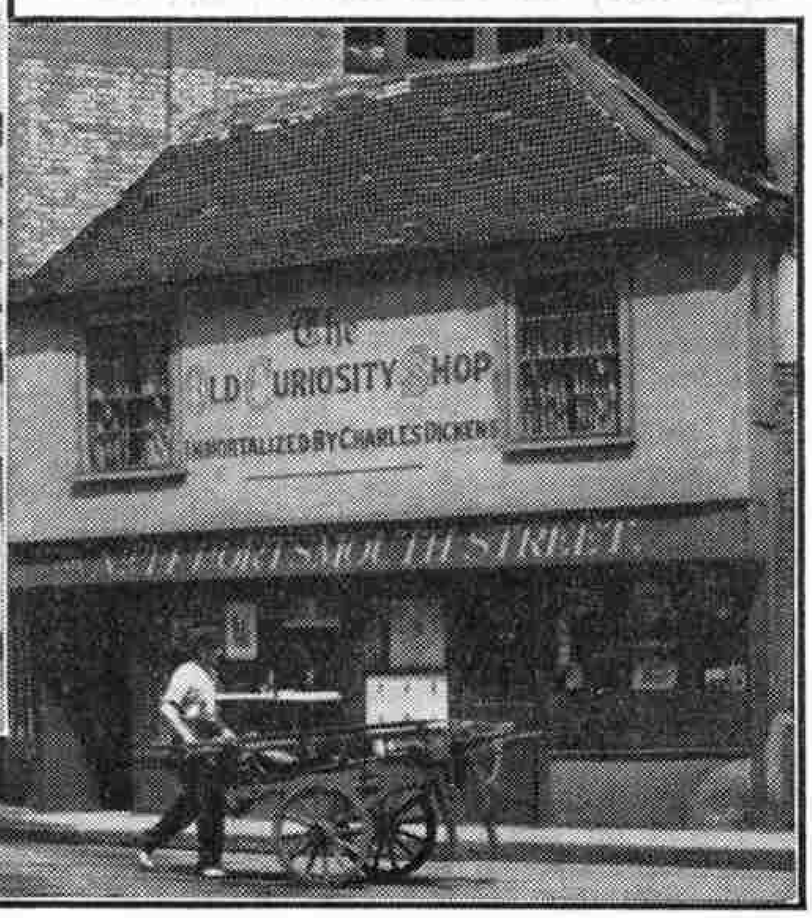
The illustrations on this page are selected from a set of eight photographs entitled "Old Shops," submitted by A. G. Dell, West Norwood, London. These pictures tell a story of London shops of bygone days. Shopping today is very different from what it was a century or two ago. In our great modern stores it is possible to purchase almost anything from a pin to a grand piano under one roof, but in days gone by shops were more individual in character and usually specialised in only one kind of merchandise. Happily a few genuine and unspoilt old-time shops are still to be found, successfully competing with the modern emporiums in some of our historic towns. A particularly fine example of a London shop of this type is the delightful bow-windowed snuff and tobacco shop in the Haymarket. This was founded by P. Fribourg, a Swiss, well over 200 years ago, under the sign of *"The Rasp and Crown."* Its outward appearance is almost unchanged from its original state. Many distinguished patrons have passed through its narrow door, among them being George III and George IV, the Kings of Hanover and Belgium, the famous statesman Pitt, and the notorious Beau Brummel.

Another famous old London shop still carrying on its original business is Lock's, in St. James's Street. Hats from this firm are famous all over the world, and preserved in the firm's books are the accounts of all their customers since 1700, among whom were Lord Nelson and the great Duke of Wellington.

The *"Old Curiosity Shop"* at the corner of Portsmouth Street is famous for a rather different reason. It is popularly believed to be the shop immortalised in Dickens' *"The Old Curiosity Shop,"* but evidence strongly points to its having originally been the dairy of a house owned by the Duchess of Portsmouth.

No. 4 Green Dragon Court, Southwark, is a pretty little shop bearing the date 1663. As this date is previous to the Great Fire, it seems likely that the structure does not actually go back to that period, but is an example of period re-building.





Three of London's famous old shops.

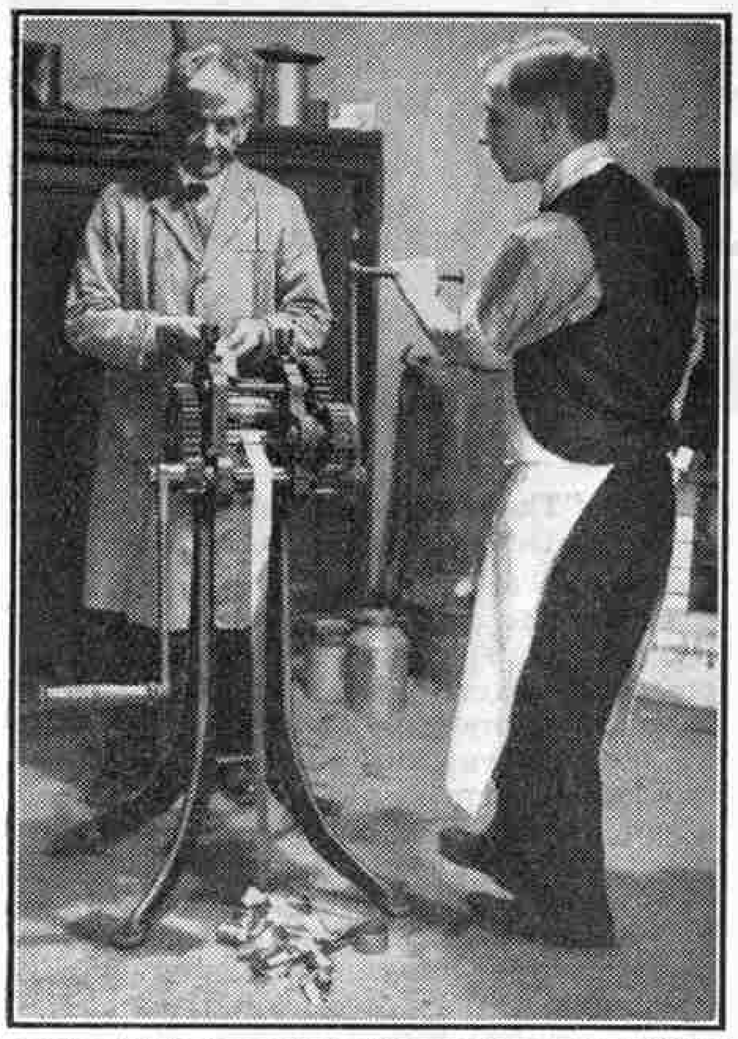
Left: a charming snuff and tobacco shop in the Haymarket.

Above: an old print shop in Paternoster Row.

Right: "The Old Curiosity Shop," Portsmouth Street.

The Craft of Gold-Beating

By G. Bernard Wood



Leeds gold-beaters rolling pure gold into a long ribbon for gold-leaf preparation.

APART from an extra thinness achieved to-day, there is practically no difference between modern gold-leaf and that which was made thousands of years ago, in the East, where the craft of gold-beating probably originated. Many Egyptian mummy cases that have been brought to light recently have made this comparison possible, for they still retain their original coverings of gold leaf. Further, Pliny states that in his day gold-beaters could produce 750 leaves, each about three inches square ("four fingers," to use his own terms of measurement), from one ounce of gold. To-day, from an equivalent amount of the precious metal, craftsmen obtain about three times as many leaves.

Because of its splendid preservative properties, gold-leaf was applied to both wood and metal by the Ancient Egyptians. After the fall of Carthage the Romans also began to use gold-leaf, gilding their temples and palaces with it in such a lavish way that the sight must have been really magnificent. Architectural gilding has now fallen from general favour, but many examples of the external use of gold-leaf are still to be seen. The Albert Memorial in Kensington Gardens was gilded with leaves of pure gold.

In other spheres, however, the decorative value of this material is utilised with great advantage. Sign-writers, cabinet makers, book decorators, picture framers, motor-body decorators and many other types of workers use gold-leaf freely.

For purposes of colour and cheapness the modern gold-beater usually adds a small proportion of alloy to the gold, which is then placed in clay crucibles and smelted in a furnace. Later, the molten metal is poured into an ingot that gives a bar of gold measuring 2 in. long, 1 in. wide, and $\frac{1}{4}$ in. thick, and weighing approximately $2\frac{1}{2}$ oz.

The only machine in the gold-beater's equipment is now brought into operation. This is a hand-worked rolling mill. Between its two steel rollers the bar is propelled backward and forward for half an hour, at the end of which time the gold will emerge as a ribbon six yards long! Curiously enough, and for some unknown reason, the width of the rolled gold barely increases during the process, though in thickness it has been reduced to approximately 1/1000th in.

The ribbon is now cut into 1 in. pieces preparatory to the first stage of beating. This is done in a "cutch"—a batch of 200 sheets of tough paper, each $3\frac{1}{2}$ in. square. Each gold square is laid in a central position between every two "cutch" papers, which are now bound together by vellum bands so as to form a firm packet.

The first beating is done with an 18 lb. hammer on a block of hard stone or marble. Starting in the centre of the cutch, the craftsman gradually works towards the edges, and at the end of half an hour the gold will have spread evenly to the limits of the cutch papers. Each gold square is now lifted out with wooden tweezers and cut in four by means of a "waggon"—a curious square-shaped instrument fitted with adjustable knives of Malacca cane.

The quarters now go into the "shoder" for a second beating. The shoder consists of 800 gold-beaters' skins, bound together when all the quarters are in their central positions by parchment bands. This is beaten for two hours. The labour of beating is minimised somewhat by the skin's elasticity, which causes the hammer to rebound.

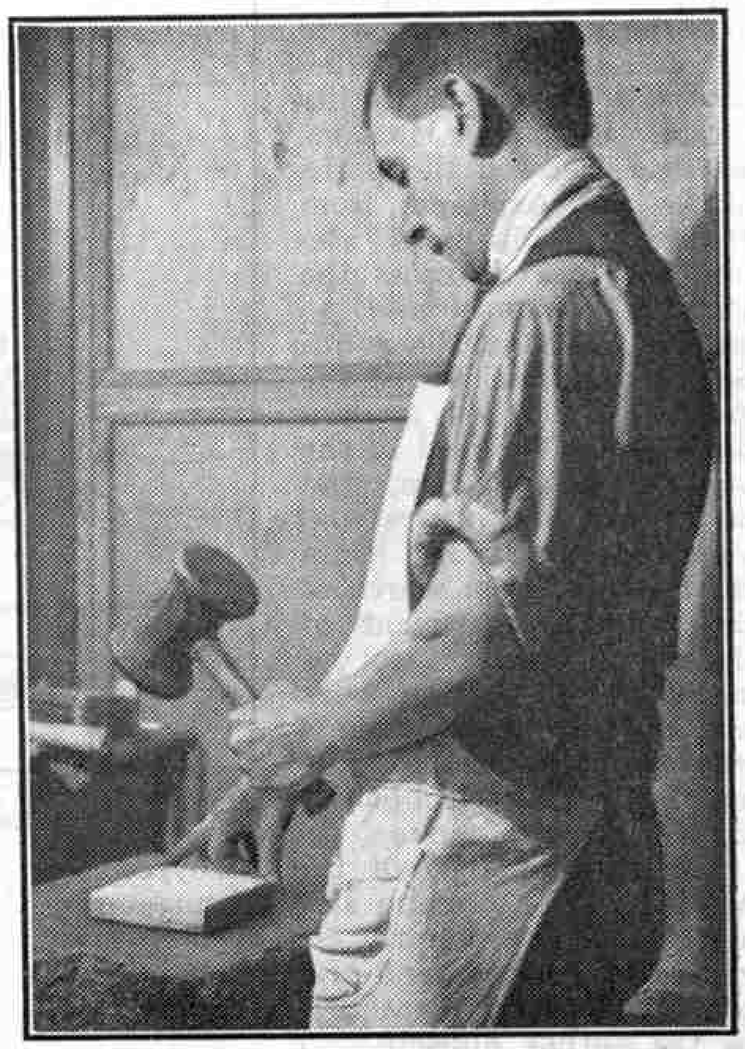
Finally, each sheet of gold—now at least four times thinner than at the last stage of beating—is placed between every two skins of the "mould"—a packet consisting of 1,000 pieces of the finest gold-beaters' skins.

Incidentally, it is worth noting that to make sufficient skins for one mould the gut from about 380 oxen is needed. The skins are prepared with great care and they will endure about 200 beatings in the mould, after which term of service they are fit for use in the shoder alone.

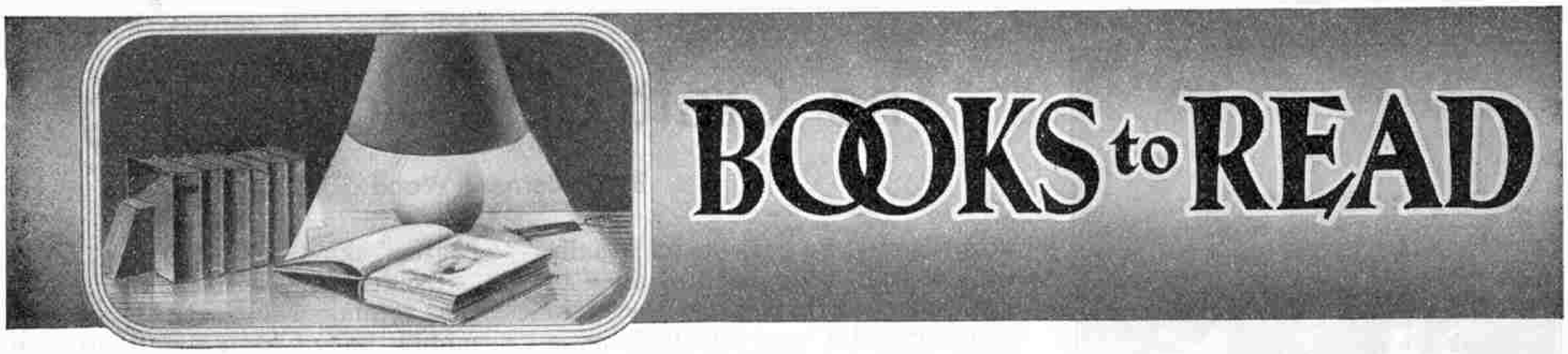
The mould is beaten for five hours with a 7 lb. hammer. By this time the gold-leaf is approximately 1/200,000th in. in thickness and is capable of transmitting light. If pure gold, or gold but slightly alloyed, has been used, the light will be transmitted in soft green rays; if it has been alloyed with a large proportion of silver, the rays will be of a beautiful pale violet shade.

The leaves are now removed from the mould and placed one by one on a leather cushion where they are cut with the waggon into $3\frac{1}{4}$ in. squares. Finally, these flimsy pieces of shimmering, precious lustre are inserted between the tissue pages of small books containing 25 pages. Red ochre is rubbed over each page to prevent the gold-leaf from adhering.

Such a book—the form in which gold-leaf is dispatched—contains from four to five grains of gold. As the English sovereign weighs 120 grains, about 25 books of gold-leaf could be made from this coin.



A gold-beater at work, hammering gold leaf in a "mould."



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, we can supply copies of these books to readers who cannot obtain them through the usual channels. Order from Book Dept., Meccano Limited, Binns Road, Liverpool 13, adding 1/- for postage to the price. Postage on different books varies, but any balance remaining will be refunded.

"The Story of the Pacific"

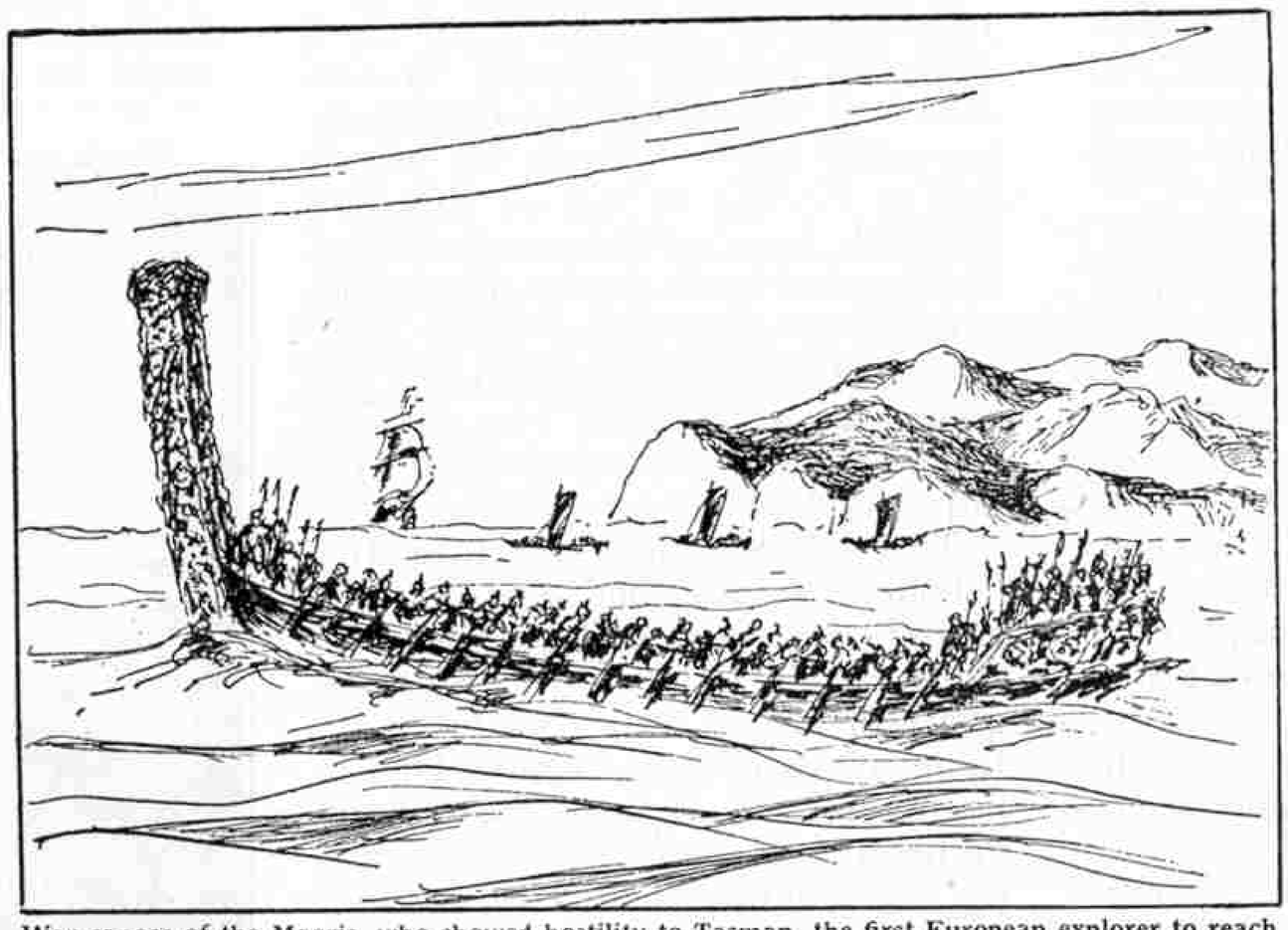
By Hendrik van Loon (Harrap. 8/6 net)

Mr. van Loon's book gives us both the history and the geography of the Pacific Ocean. But what a difference there is between it and the kind of book that we were familiar with in our schooldays! The author indeed asks us to forget what we were taught in the school about the Pacific, and when we do this and follow him in his fascinating survey we realise how wonderful the great ocean and its story are.

We go first through the Panama Canal, that magnificent modern gateway of the Pacific, in order to learn of the first exploration of the South Seas centuries ago by the primitive Polynesians. As navigators and explorers the Polynesians were magnificent. For hundreds of years after their great voyages of discovery they kept in communication with each other, travelling backward and forward in their tiny boats over the immense distances between their settlements. Mr. van Loon outlines briefly all that can be known of these people in their prime, and leaves us full of admiration for their great achievements.

This world of the Polynesians remained utterly unknown to westerners until comparatively recent times, and the author goes on to tell us how the second discovery of the ocean and its islands was made. He himself has followed the paths of the great explorers, from Balboa, the Spaniard who was the first to cross the Panama Isthmus and to see the waters of the South Sea, to Captain Cook, the greatest of all these modern discoverers. We read of the voyages of Magellan, and of Tasman and others who ventured southward from the East Indies in search of the mythical continent of the South, the subject of many legends and of tales told by the crews of ships who had seen snatches of unknown coasts when blown far out of their courses.

The full romance of the discovery of Australia, New Zealand and the surrounding islands is brilliantly conveyed in Mr. van Loon's graphic and original style. The book is illustrated by original drawings by the author himself.



War canoes of the Maoris, who showed hostility to Tasman, the first European explorer to reach New Zealand. From "The Story of the Pacific," reviewed on this page.

"The Model Railway Handbook"

By W. J. Bassett-Lowke, M.I.Loco.E. (Bassett-Lowke Ltd. 3/6 net)

This practical guide to the installation of a model railway is now in its 9th edition, and is completely revised and rewritten. The whole of the matter has been rearranged, so that each gauge now has a section devoted to it; and very many new and interesting illustrations have been incorporated. Everything that the model railway enthusiast can want is to be found in it, from a general consideration of real and miniature railways to the construction of layouts and the running of steam, clockwork and electric model locomotives.

The author begins with a survey of the beginning of model railways and the introduction of scale models. Then he takes up each gauge in turn, explaining its special features and telling us something interesting about famous model railways using it. Succeeding chapters deal with practical planning and construction, and with the signalling of miniature railways. This last section is particularly interesting for its explanation of the general principles and of the refinements of interlocking and other safety measures on a model scale.

Next comes a valuable chapter on ways and means of representing real railway features, including cuttings, embankments, backgrounds and lineside equipment. The introduction of life by the use of miniature figures, such as Meccano Dinky Toys, is well treated, and there are excellent suggestions for model railway photography. Finally come practical hints on the manipulation of models of all kinds.

The book is one that can be thoroughly recommended both to the beginner and to those experienced in the hobby.

"The Boys' Own Annual"

(Lutterworth Press. 10/6 net)

This old favourite has now reached its 62nd volume and is as good as ever. Its contents are splendidly varied, and cover practically every interest that a boy can have. There are serial and short stories, all by well-known authors, together with articles on stamps, aeroplanes, ships and locomotives, nature notes, and useful contributions on sports and camping. Gardening and allotment hints are included, as they should be in wartime, and those who enjoy making things for themselves will find ample variety of contributions of the "how-to-make" type.

As usual all these articles and stories are well illustrated, and excellent coloured plates include one of Kenneth Farnes, the famous England fast bowler, whose cricket yarns form one of the attractions of the volume, which provides a feast of entertaining and useful reading.

"Ascaris: The Biologists Story of Life"

By Dr. Richard Goldschmidt (Scientific Book Club. Members only, 2/6)

Ascaris is a parasitic worm that to most people would be uninteresting, and indeed unpleasant. Yet it is a living thing, and here it is made the peg on which to hang the amazing story of living creatures generally. With it as the starting point we learn something of the manner in which animals adapt themselves to their surroundings, and how they feed themselves, grow and prosper. The fascinating story is finely told, so that it can be followed by those who are not already familiar with biology; and the book is one that can be recommended to thoughtful older readers who are interested in the mysteries of life. There are 78 line drawings.

"Pearl Island"

By Margery McNab (Routledge. 6/- net)

Three children on their way to school in New Zealand are shipwrecked, but succeed in reaching a South Sea island. There they live quite happily for a time with the natives, who are greatly impressed by them and make almost a goddess of the youngest of the three, whose talking doll is looked upon as magical. They have many interesting adventures finding their own food, fishing and hunting, and they share the adventures of the natives in fighting pirate gangs that ravage the seas. The story is a delightful one that will be of the greatest interest to our younger readers, who will enjoy the many fine illustrations.

"The Sirhowy Valley and its Railways"

By D. S. Barrie and Charles E. Lee (The Railway Publishing Co. Ltd. 3/6 net)

Most "*M.M.*" readers know something of the early development of railways in the North Eastern colliery districts, but probably are not familiar with the corresponding movement in South Wales. It is to remedy this position that the present book has been prepared. It is bound to appeal to the serious student of railway history and its authors are well qualified for their task, Mr. Barrie by reason of his close knowledge of South Wales and its railways, and Mr. Lee because of his important investigations of early railways.

It is interesting to discover that the line of development in the Sirhowy Valley was almost exactly the opposite of that followed in the North East. The North Eastern coalowners and other industrialists constructed railways for their own use with their own rolling stock, and they used the edge rail and the flanged wheel that are still employed on our railways. In the Sirhowy Valley the plate rail was employed, with the idea of accommodating wagons capable of running on the roads. Probably for this reason passenger traffic began earlier on railways in South Wales than elsewhere.

There are four chapters in the book, of which the first two deal with the early tramroads in the Valley, the others taking up the story of the railways into which these roads developed. The Sirhowy Tramroad itself linked Newport with the Tredegar ironworks, and it is fascinating to read of the manner in which this and other tramroads were planned and developed. It was not until 1829 that the steam engine certainly was introduced on the Sirhowy road, 23 years after it was constructed, when a locomotive built by Robert Stephenson and Co. was put to work. The trial run of the engine was somewhat adventurous. The whole day was occupied in travelling from Tredegar to Newport, because so much time was taken in repairing the road after the rails had been broken by the weight of the engine and in replacing the engine itself on the track. Finally the chimney of the locomotive was knocked off by the overhanging branches of a tree!

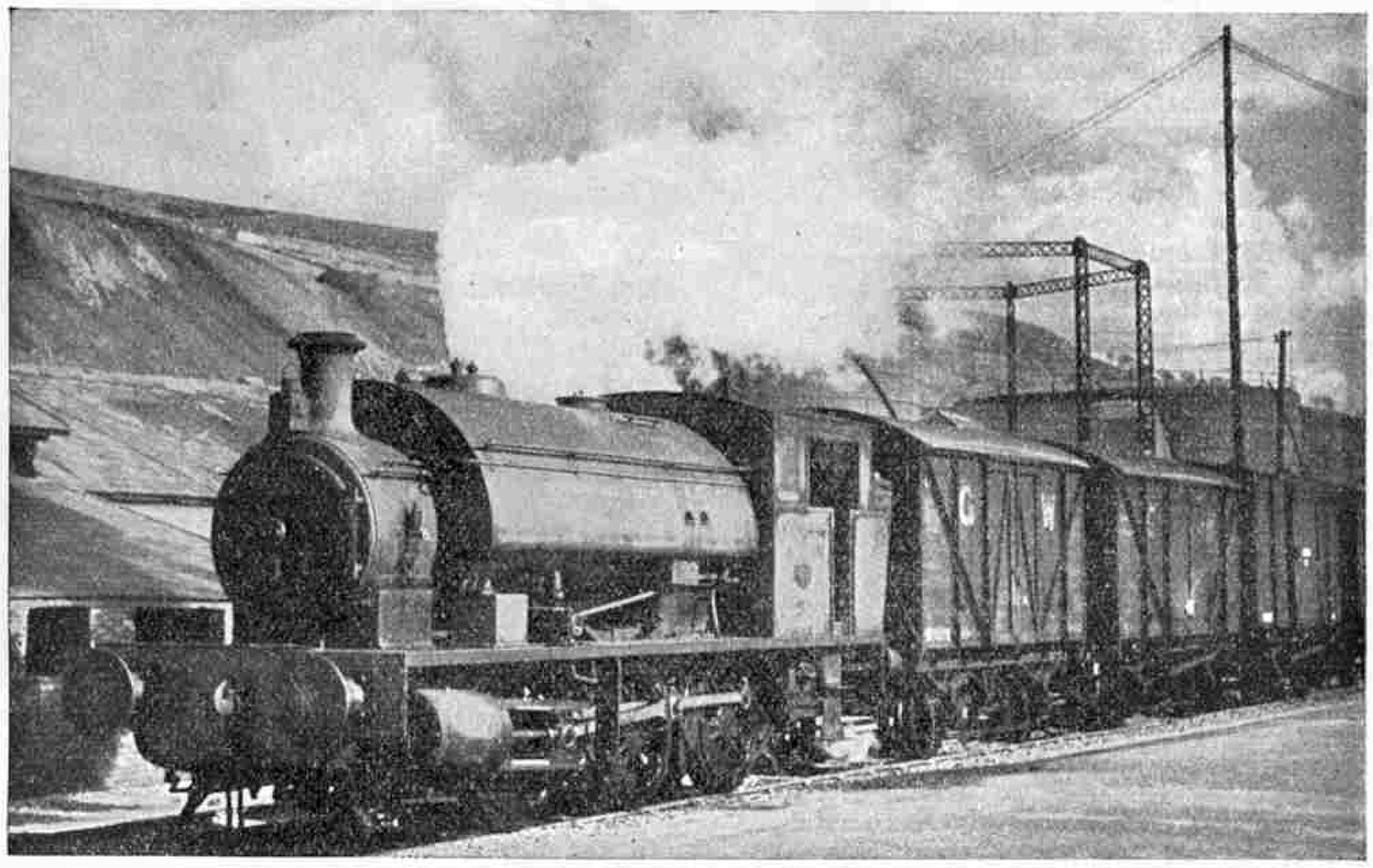
By degrees the various tramroads of South Wales were converted into railways as we know them to-day. This happened to the Sirhowy tramroad, which was extended and improved, and finally became the property of the L.N.W.R. The interesting story of the negotiations that brought this about is well told, and finally we come to an excellent survey of the entire railway and its surroundings, as seen during a journey by rail to-day through the Sirhowy Valley.

The book is well illustrated by photographs of stations and other scenes on the railway and of locomotives, and in addition there are four excellent maps and many useful diagrams.

"Atlantic Spy"

By Frank Elias (Lutterworth Press. 2/9 net)

When Geoffrey Bantock went to stay in a remote Welsh seaport he had already had a good share of excitement in encounters with spies on the East Coast, and little thought that there was more to come. A local shipowner who is curiously nervous, and a sinister stranger who is of stunted growth but is enormously strong, arouse his suspicions, and later he is surprised to see the stranger on the deck of a German submarine that is chasing a ship in which he has become an involuntary passenger. The ship is blown up by a magnetic mine, and Geoffrey, one of the only two survivors, is rescued by a flying boat. Other adventures follow his return home, when he is kidnapped by the dwarf and threatened with an unpleasant death. How he escapes, and how his adventures give him the clues to a spy mystery, must be left for the reader himself to discover.



One of the 32 tank locomotives shunting in the Ebbw Vale works. From "The Sirhowy Valley and its Railways," reviewed on this page.

"Mutiny in the Caribbean"

By G. W. Keeton (Bell. 6/- net)

A gallant rescue in the Thames on a foggy night, a dastardly murder in a country mansion and a long and desperate sea fight in the West Indies, provide thrills and excitement throughout this fine sea story. The man who is rescued from drowning in the Thames is no less a person than Admiral Benbow, the famous sea-dog, who promises to befriend his rescuer Ralph Hemstock, the hero of the story. Shortly afterwards Ralph travels to his home near Winchester, and there is tricked by a murderer, who makes it appear that Ralph himself has killed one of his old friends.

As if this were not excitement enough the accused lad is rescued from captivity by a mysterious highwayman, who stuns him and then takes great care that he is pressed into the Navy in a ship bound for the West Indies. There he again meets Admiral Benbow, the Commander of the British Fleet in those waters, and has adventures innumerable, ending by taking part in the great battle against the French in which Benbow is deserted by traitorous Captains, but fights on in spite of being dangerously wounded. Ralph's enemy and accuser also turns up in the West Indies, but his plans are foiled and the youth's name is cleared.

This is a fine story, which is especially exciting, and at the same time realistic, when dealing with Benbow's brave fight against heavy odds.

"The Mine Detector"

By Frank Elias (Lutterworth Press. 3/- net)

Tom Barstone is fortunate enough to become assistant to Bayard, an inventor who has produced a car that in emergency can leap over a wall or a fence. When war breaks out Bayard is completing experiments with an instrument designed to detect magnetic mines. German spies try to discover his secret, and Tom and others have exciting times baffling their efforts. Then comes the great test of the invention on a mine-sweeper. The trawler in which Bayard and Tom embark for this purpose is itself blown up by a mine in an unexpected position, and determined efforts to account for its appearance there bring to light a story of treachery. The story is full of surprising turns.

"Apple and Charlotte"

By Edith L. Elias (Lutterworth Press. 6/- net)

This is described as a fairy tale, and will be just the thing for our younger readers, both boys and girls. Apple and Charlotte never dreamed that they were going to be King and Queen, but this is what happened to them. The sudden change in their fortunes, for previously they had been very poor indeed, did not upset them, and they behaved very well, except perhaps when the Queen ran away to sit on a stool in a shop in Hatpin Lane and eat jam tarts. There were many strange happenings before they lost their thrones and found real happiness once more.

There are four illustrations in colour, and nine others, all of full page size.

"Caravan Days"

By Dora Fowler Martin (Harrap. 5/- net)

"Caravan Days" is another book for younger "*M.M.*" enthusiasts. It is the story of a caravan holiday in which Oxford, Banbury, Cheltenham and Bath are visited, and it strikes an unusual note. An entire family is concerned, father, mother and three children, and the children are all "characters" who find plenty of opportunity both for getting into mischief and for finding enjoyable adventures. The book has eight full page illustrations and other drawings in the text.

ENGINEERING NEWS

The "*America's*" Swimming Pool

A striking feature of the new United States Lines flagship "*America*," the largest merchant ship yet built in the United States, is the swimming pool, which is situated on "C" deck. The pool is 33 ft. long, 19 ft. wide and 8 ft. deep at the after end, and is lined with aquamarine tiles. On each side is a wide "beach," represented by sand coloured non-slip tiles, and on these stand aluminium chairs and tables. Fluted columns linked by silver rails border the pool. The whole is surrounded by dark blue walls, with entrance doors of polished metal ornamented with embossed starfish. A huge circular mirror, indirect and under water lighting are other features of the pool, and it is served by elevators so arranged that they may be opened exclusively to cabin, tourist or third class passengers at different times.

Save Your Old Torch Batteries

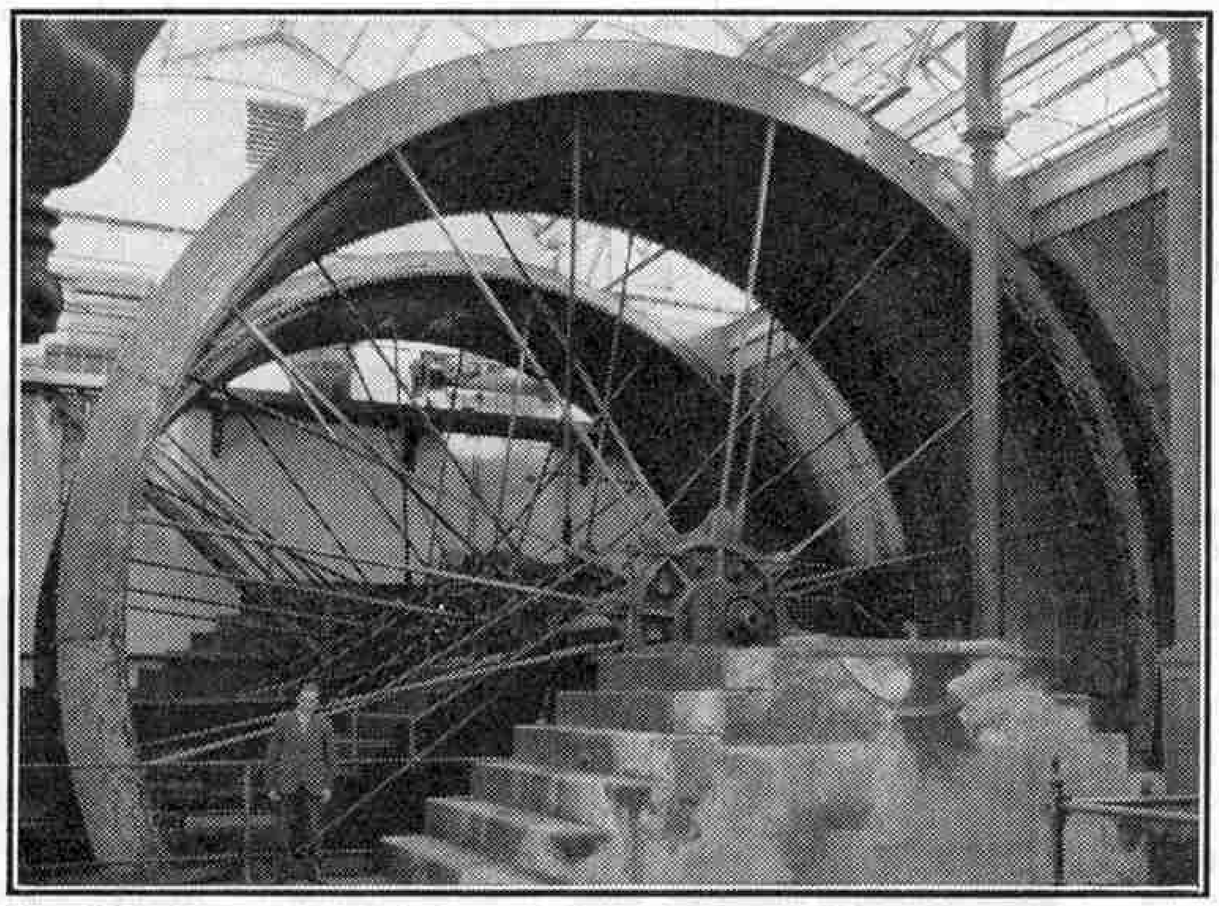
Many thousands of used torch and high tension batteries are collected from houses and business premises, and hitherto there has been no useful purpose to which they could be put. As a result of experiments carried out by the Salvage Department of the Ministry of Supply, however, several firms are now recovering from the batteries carbon, zinc, manganese ore, brass, copper and other materials useful in our war effort. From 100 tons of discarded high-tension batteries it is possible to recover approximately 10 tons of zinc, 3 tons of carbon rods, 10 tons of pitch, 3 tons of pulverised carbon, 1 ton of brass and copper, 10 tons of cardboard and 50 tons of a mixture of graphite, manganese ore and beconite. The brass and copper can be used for making buttons for uniforms and bands for shells, and the zinc for camp utensils. Graphite is needed for machine grease and soldiers' boots blacking.

China's Largest Marine Oil Engine

A shipyard in Hong Kong recently completed a new motorship that is propelled by the largest marine oil engine yet built in China. The vessel is the "*Hermelin*" and the engine, which was manufactured under license from Harland and Wolf Ltd., has an output of 1,700 h.p. and is capable of driving the ship at a maximum speed of 12 knots. The "*Hermelin*" is to operate along the China coast and will make voyages also to Singapore and Bangkok.

New Soviet Shipping Activities

Two new Soviet turbo-electric ships, the "*Joseph Stalin*" and "*Vyacheslav Molotov*," each carrying 508 passengers, are now plying on two new Baltic shipping routes. The ships were built this year and are fitted with the most modern equipment. They operate between Leningrad and Stettin, with calls at Tallinn and Libau, and between Helsinki and Stockholm.



Two of four large water-wheels in use at the cotton factory of James Finlay and Co. Ltd., Doune, Perthshire. They have given excellent service for over 100 years.

Waterwheels in Continuous Use Since 1832

In the upper illustration on this page can be seen two of four huge water wheels that have been in continuous use for over 100 years in a cotton factory at Deanston, Doune, Perthshire, owned by James Finlay and Co. Ltd., of Glasgow, manufacturer of Finlay sheets, pillow cases, and towels. They drive the mill machinery, and were constructed in 1832. Each wheel is 36 ft. 6 in. in diameter and 11 ft. wide, is equipped with 80 buckets, and develops 75 h.p. when revolving at two revolutions a minute. The source of power is water taken from the River Teith. The wheels are arranged in pairs and drive the main mill shaft through massive gears.

The power plant at the mill has been extended from time to time by the addition of electric generators driven by water turbines, which are used to supply electric current to the mill and to the village of Deanston. The most recent addition is a Bruce Peebles 165-kw generator, driven by a Mirrlees, Bickerton and Day Diesel engine, which has been installed to provide a standby source of power for use when there is a shortage of water. A striking feature of this generator is that although its power is more than the combined power of two of the large water wheels, it occupies only a small fraction of the floor space taken up by a single wheel. The vast difference in size is a remarkable illustration of the great advance that has been made in engineering and power development since the ancient wheels were constructed.

* * * *

About 50 old French and English guns that for many years have acted as bollards on Tower Hill, London, are being removed for use in munition making. They are about 100 years old, and were originally installed in wooden warships.

A Road Line Marker

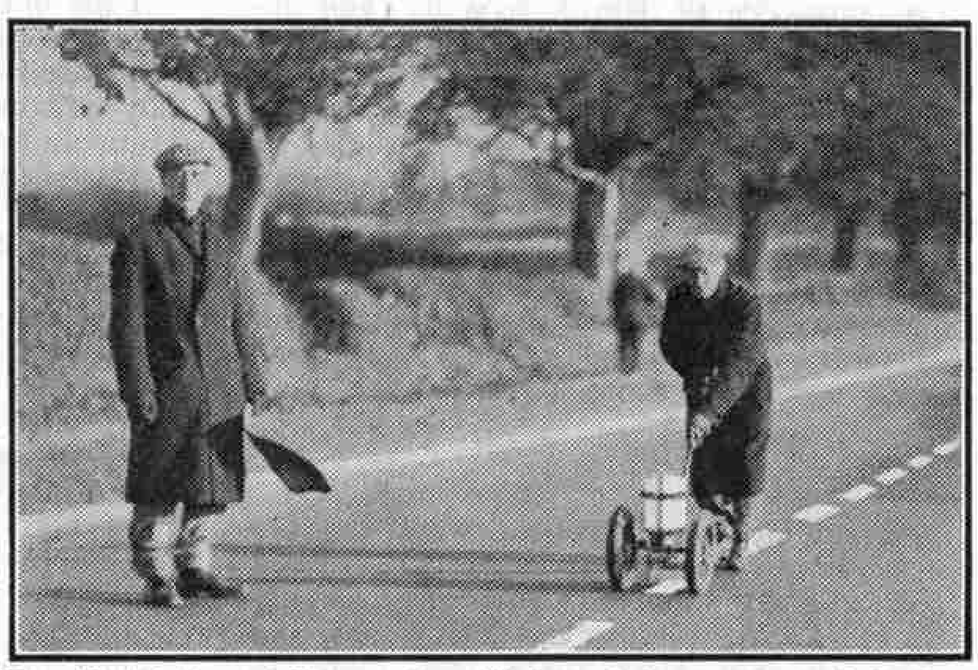
One of the latest and most efficient machines for marking white traffic lines on roads is the "Invicta," an example of which is shown at work in the lower illustration on this page. This machine is manufactured by Aveling-Barford Ltd., Grantham. The paint is carried in a container, and is gravity fed through rubber tubes to a sponge rubber marking roller in contact with the road surface. The flow of paint is stopped by raising the roller clear of the road, when control bars fitted across the feed tubes come into operation. This arrangement is particularly advantageous when painting "broken" lines.

The control bars can be fixed in suitable positions to regulate the flow of paint in accordance with the nature of the road surface, the necessary adjustment being made by turning a knob fixed at the top of the handle. This operates through a cam, and a pointer shows how the bars are set. A second rubber roller in contact with the paint applying roller ensures even distribution of the paint. Provision is made for raising one of the road wheels in relation to the other so that the device can be used for painting kerbs. It is claimed that this road line marker will do work equivalent to that of six men applying paint by hand.

Removing Water from a Mexican Mine

An Ingersoll-Rand centrifugal pump, driven at 3,525 r.p.m. by a 350 h.p. electric motor, is now doing work in a Mexican silver mine that once required the combined services of 300 men and 1,500 mules. The pump is situated on the bottom level at the foot of the mine shaft, and is used to raise water 1,425 ft. to a storage tank on the surface.

In 1832, when the shaft was only 240 ft. deep, the water was raised by means of horse whims, a vertical cylinder or drum upon which a rope was wound when it was rotated by a horse. A giant leather bucket was attached to the rope.



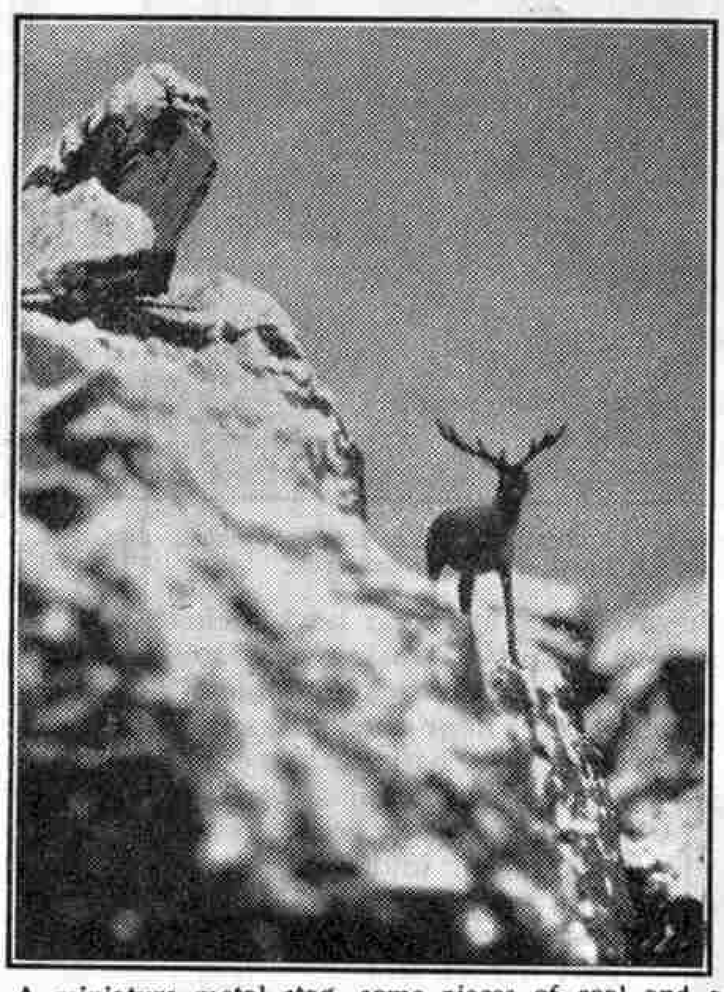
The "Invicta" road line marker. Photograph by courtesy of Aveling-Barford Ltd., Grantham.

Photography

"Table-Top" Work for Winter Evenings

FOR the benefit of readers who are not acquainted with table-top photography it must be explained that this interesting pastime consists of arranging miniature models on a table in such a manner that the assembly represents a complete scene, and then photographing it so that the resulting picture conveys the idea of a full-sized scene. An idea of the remarkably realistic effects that can be obtained in this way may be had from the illustrations on this page, all of which are examples of simple table-top photography.

Weeds and tufts of grass intermingled with small stones comprise the setting for this jungle scene. The elephant is a small celluloid model.



A miniature metal stag, some pieces of coal and a sprinkling of salt, compose this realistic picture.

If we place on a table a small figure about two inches high and behind it arrange a heap of stones to a height of about 12 inches and take a photograph of the group, the resulting picture will give an illusion of someone climbing up a rocky hillside that towers 20 or 30 feet above him. The realism of the picture is further increased if a background that suggests a cloudy sky is included.

Readers will readily see that the possibilities of table-top photography are practically limitless. By taking care to see that the parts of the scene diminish in scale the farther they are from the foreground, it is easy to suggest miles of open country or sea, high and dangerous cliffs, castles and the interiors of buildings.

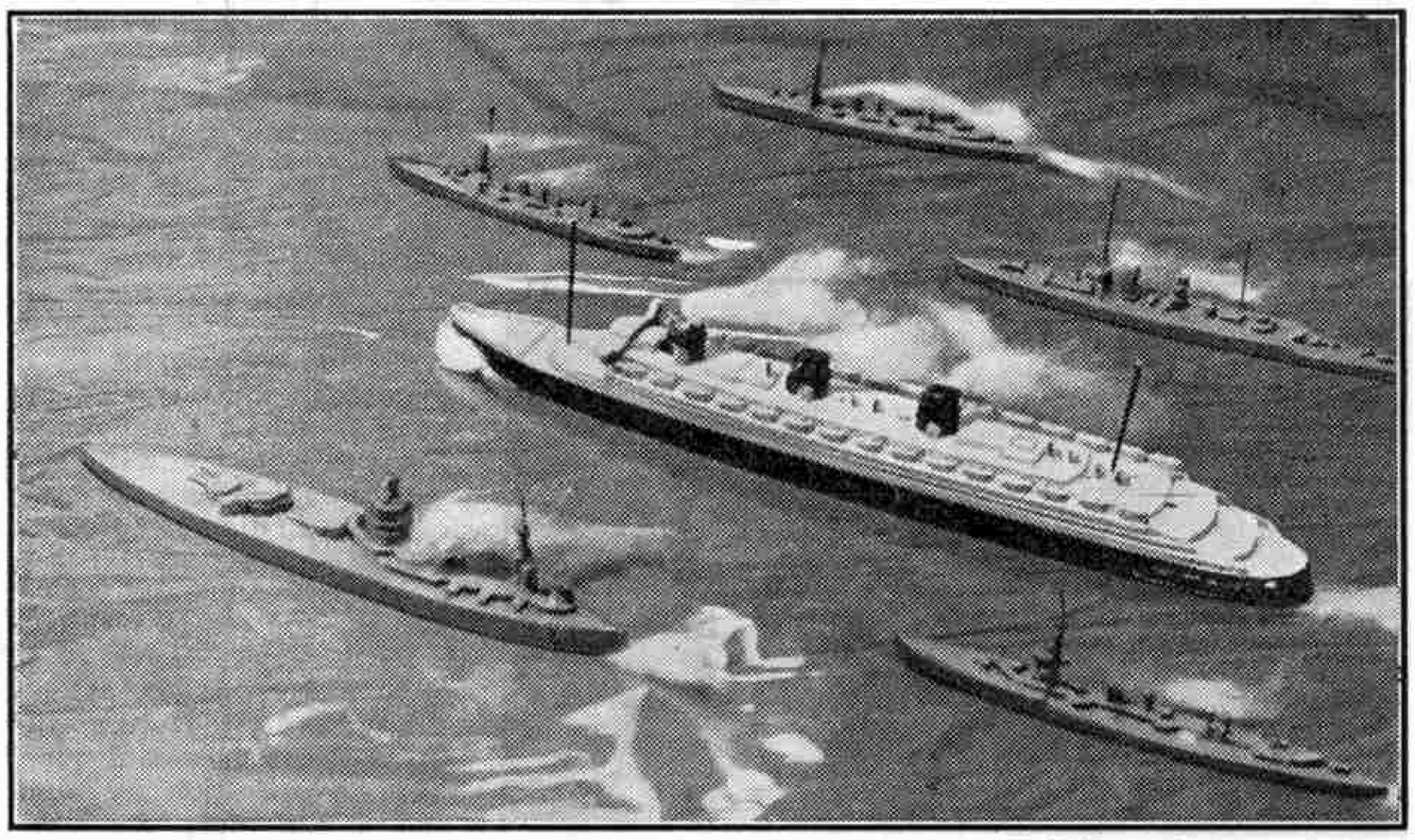
One of the greatest difficulties of table-top photography in the past has been that of obtaining miniature figures of people, animals, motor cars and ships, etc., small enough to be in keeping with the general scale of a scene. Since the introduction of Meccano Dinky Toys, however, this difficulty no longer exists. These splendid little miniatures are available in such a wide variety of subjects, and are so realistic in detail, that it is possible to use them in hundreds of different table-top photographs.

It is equally easy to arrange suitable settings, for these can be built up from odds and ends to be found in any home. For example, fine ash from the kitchen grate makes splendid sand, while snow can be reproduced with common salt. Bits of coal or small pieces of rock can be used to represent crags and boulders, and a good representation of grass is obtained with a piece of velvet. A remarkably fine water effect can be obtained with the aid of a sheet of cellophane, and by skilfully creasing this small or large ripples and waves result. This material provided the sea in the convoy picture at the foot of this page. Twigs cut from bushes can be used to represent almost any kind of tree, from a slender sapling to a hoary oak; while small metal lids from powder boxes and bottles serve well as bowls and basins. Such things as these are easily obtainable and the keen photographer will have no difficulty in building up a collection of bits and pieces from which he will be able to produce almost any kind of setting. In addition many realistic objects can be modelled in plasticine.

The photographic part of the work is not difficult, and requires only a little care. The most suitable type of camera is one fitted with a focussing screen. Sharp focussing is very important, and a camera of this type enables the photographer to ensure that his picture is sharp, and also allows him to study the general arrangement of the scene with greater ease than in the view finder of a folding film or box camera. In order to obtain a good-sized picture the camera must be placed near the subject. There is no difficulty about this with a camera fitted with double extension bellows, but with a box camera or other type of non-focussing camera a portrait attachment must be fitted to the ordinary camera lens. This will allow the camera to be placed at a distance of 3 ft. from the picture. This distance should be measured accurately from the camera lens to the main feature of the picture.

Many table-top photographs can be taken by arranging the articles forming the picture directly on a table. If much of this work is to be done, however, a small stage of baseboard will be found more convenient. This should be about 3 ft. long and 2 ft. wide. A cardboard background of the same size will be necessary, and for pictures of interiors this may consist of a piece of buff-coloured cardboard on which is drawn or painted a simple sketch representing the wall of a room, with or without doors as desired. For outdoor scenes a picture with trees and a faint outline of distant hills in it is the most suitable. The foreground should be left bare.

An important point in obtaining realistic effects is proper lighting. Electric light is the best and most conveniently arranged, but quite good results are given by candles, although when these are used longer exposure times are necessary. I shall go into this matter more fully next month, when I shall also give hints on arranging and photographing various kinds of scenes similar to those shown on this page.



"The Convoy." A picture made up with Dinky Toys Ships by R. H. Drinnan, Sheffield.

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.

Great Hampden Church

I recently took a photograph of Great Hampden Church, in which John Hampden is buried. It will be remembered that during the Civil War Hampden raised a regiment of infantry for the Parliamentary Army, and was severely wounded in the fight at Chalgrove Field against Prince Rupert. He died at Thame in June 1643.

The church contains many interesting memorials of Hampden. Thus in the chancel there is a carving of the scene of the battle at which he was wounded, showing him being attended to by his men. The church itself is situated high up in the Chilterns, between Wendover and Princes Risborough, and is not far from Chequers, the country residence of the Prime Minister.

PATRICK C. ROWLEY (Thame).

A Motor Tour in Western Ireland

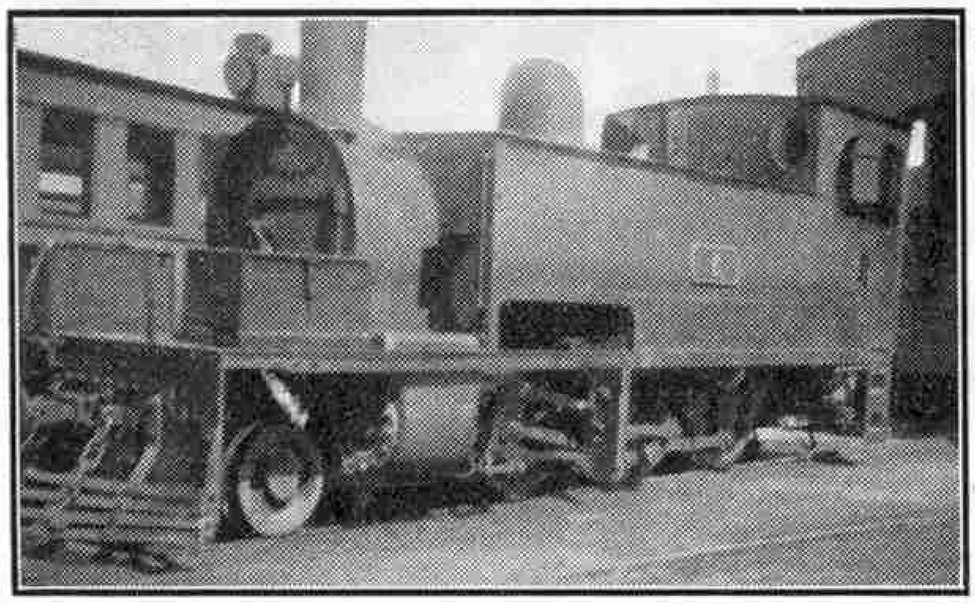
During a motor tour that I made just before the war I visited Tralee and became interested in the narrow gauge railway from there to Dingle. This runs along the Dingle peninsula and is about 30 miles in length. The station at Tralee is a quarter of a mile from the main station on the Irish standard gauge line of the Great Southern Railways, into which the Tralee and Dingle Railway was merged in 1925.

A station hand invited us to look round. He was very unhappy because the passenger services had been closed recently owing to the growth of motor transport. We went through to the engine shed, where there was a separate portion for repairs, and there I photographed one of the 2-6-0 engines, which were built at Inchicore Works, Dublin. The coaches I saw had an entrance at each end, with a corridor along the middle, and the third-class seats had no cushions.

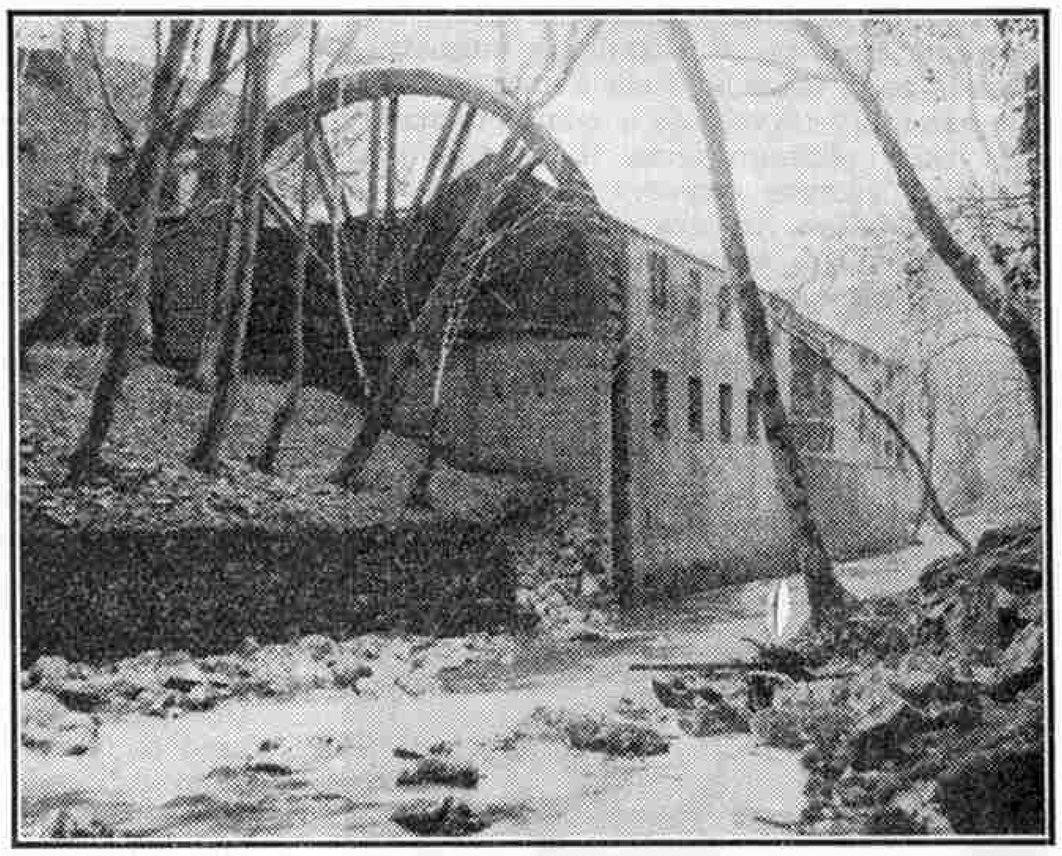
The gauge of the line is 3 ft., and at the time of my visit there were only two goods trains daily in each direction. There is a signal box just outside the station, from which a few signals and a level crossing gate are operated, but the points are worked by outside levers. The line continues through a street to the main Great Southern station, so that the transfer of goods from one line to the other can be carried out conveniently.

During the trip I stayed at Cahirciveen, and when there visited the cable station on the island of Valentia. The cable-laying ship *"Lord Kelvin"* was in port at the time. This vessel is fitted with a plough that makes a furrow in the ocean bed in which to bury cables to protect them from injury by trawlers. It was described and illustrated in the *"M.M."* for September of last year.

T. CHALLIS (Ramsbury).



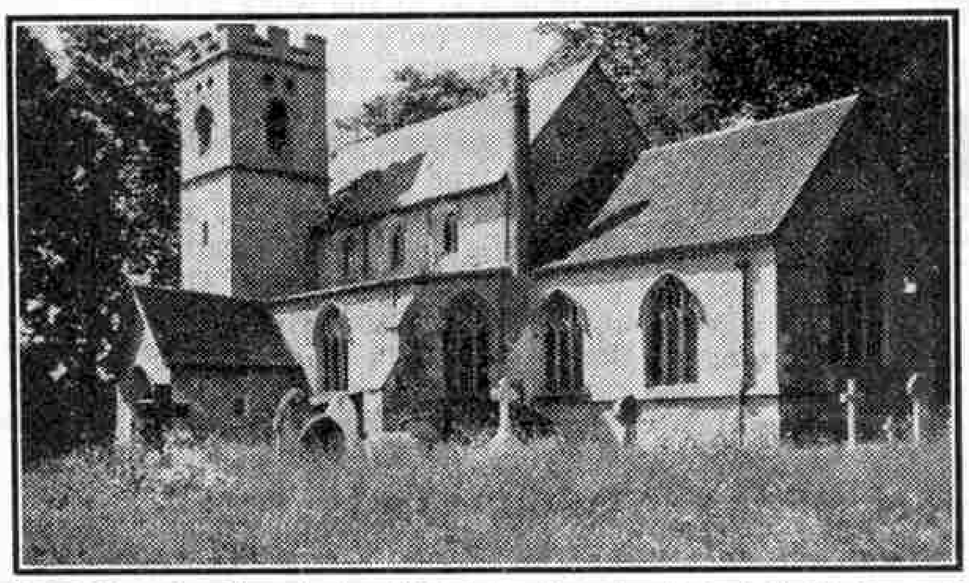
A 2-6-0 locomotive of the Tralee and Dingle Railway, now part of the Great Southern Railways of Ireland. Photograph by T. Challis, Ramsbury.



The mill wheel at Caldbeck, Cumberland. This has now been dismantled. Photograph by G. H. Cole, Caldbeck.

A Famous Mill Wheel

Until recently the largest mill wheel in England was the one in the mill at Caldbeck, Cumberland, which is illustrated on this page. The wheel has now gone for scrap, its owner having decided that the metal shall be used to help the nation's war effort. Visitors from all over the world formerly came to see it.



Great Hampden Church, in which John Hampden is buried. Photograph by Patrick C. Rowley, Thame.

The wheel was 42 ft. in diameter, and carried 64 buckets to hold the water that drove it. The water was fed into the buckets by a pipe 2 ft. in diameter that led it from a dam a quarter-of-a-mile upstream, and power was transmitted by means of a toothed ring wheel, 22 ft. in diameter, on one side of the mill wheel. During very frosty weather steam pipes were in operation by night and day to keep the wheel clear of ice.

G. H. COLE (Caldbeck).

Castles in Touraine

Touraine, in France is a wonderful country full of mediæval castles, and last year we spent a fortnight there visiting from three to six castles a day. The district is situated to the south-west of Orleans, and the river Loire passes right through it.

It is most interesting to know how all these castles came to be bunched up just in one county. During the middle ages many rich and powerful nobles built their homes there, near the banks of the Loire. There they had all they could possibly want, a castle for a home, a river on which to travel, horses, stables, hunting lodges, and grounds. The river looks very inviting, so much so that Chenonceau castle actually is built right across it.

Two of the castles I went to were in ruins. They were Chinon and Loches. To Chinon came Joan of Arc to fetch the dauphin Charles in order to take him to Rheims to be crowned King of France. All that is left of the room where she met him are three walls and a huge chimneypiece that is decorated in the usual way with coats of arms. At Loches we saw wooden cages where prisoners were kept, and all kinds of instruments of torture. The dungeons go down to some three floors below ground level, and there they are very cold and dark. Chambord is the biggest castle in Touraine. It was built as a hunting lodge for the King.

One of the most interesting of all these castles is that at Blois. Here about 10 different kinds of architecture are represented. Building a castle in those days was a slow task. It was usually carried on from father to son, and that is one reason why many castles are in mixed styles of architecture. Another reason is that some very early castles were partly pulled down and rebuilt by new owners.

A queer and interesting feature of Touraine is the way farmers and vintners live in their little homes cut deep in the sides of the rocky slopes of the hills. Other places of interest are the wine caves, where we saw the wine being bottled and packed. At one place we were given a sample of the wine, not unlike champagne, which was delicious. These caves also are hewn deep down into the rocky hills.

R. E. TAIT (Shoreham-by-Sea).

New Meccano Models

Dragline—Rifle—Aircraft Carrier

THE first of the three models described this month is a fine dragline excavator. This is shown in Fig. 1 and is designed for construction from the parts in Outfit No. 3.

The control cabin is the first section to build. The front of this consists of a 5½″×1½″ Flexible Plate that is connected to a 5½″ Strip and a Flat Trunnion, by a ½″×½″ Angle Bracket. The narrow ends of the 5½″×1½″ Flexible Plate are joined to 4½″×2½″ Flexible Plates that form the sides of the cab.

A 3½″ Crank Handle with Erinoid Grip is journalled in the cab and carries a Cord Anchoring Spring and two Cords which pass through the windows at the front of the cab. A lever 1 consisting of two 2½″ Strips is pivoted on a ⅜″ Bolt and a length of Cord is attached to it, the other end of the Cord passing through one of the cab windows. Two Flat Brackets are bolted to the 5½″ Strip so that the Curved Slotted Strips 2 make contact with them.

The Strips 2 are attached to a 5½″×2½″ Perforated Flanged Plate. Two Trunnions 3 are bolted to the Flanged Plate, and two 5½″ Strips are made firm to them by two 2½″ Curved Strips held by Bolts. These 2½″ Curved Strips are secured by their centre holes to the Trunnions, their end holes being joined to the 5½″ Strip to make it rigid. Two 2″ Rods carrying four 1″ Pulleys shod with Rubber Rings, are journalled in the 5½″ Strips.

The jib is pivoted on a 3½″ Axle journalled in a 2½″×½″ Double Angle Strip. A ½″ Pulley without boss is secured between two ¾″ Discs at the end of the jib, and the length of Cord that is attached to the lever is joined at its other end to a Flat Bracket that is free to pivot on a ⅜″ Bolt on the jib.

The dragline bucket consists of a 5½″×1½″ Flexible Plate, and two 2½″×1½″ Flexible Plates are joined to one of its longer sides. One of the Flexible Plates is bent up to form the back and is joined to the 5½″×1½″ Plate by a Double Bracket. The longer of the two lengths of Cord passes over the Pulley and is fastened to the Bracket. The other Cord is attached to the bucket. The jib is raised or lowered by operating the lever in the cab.

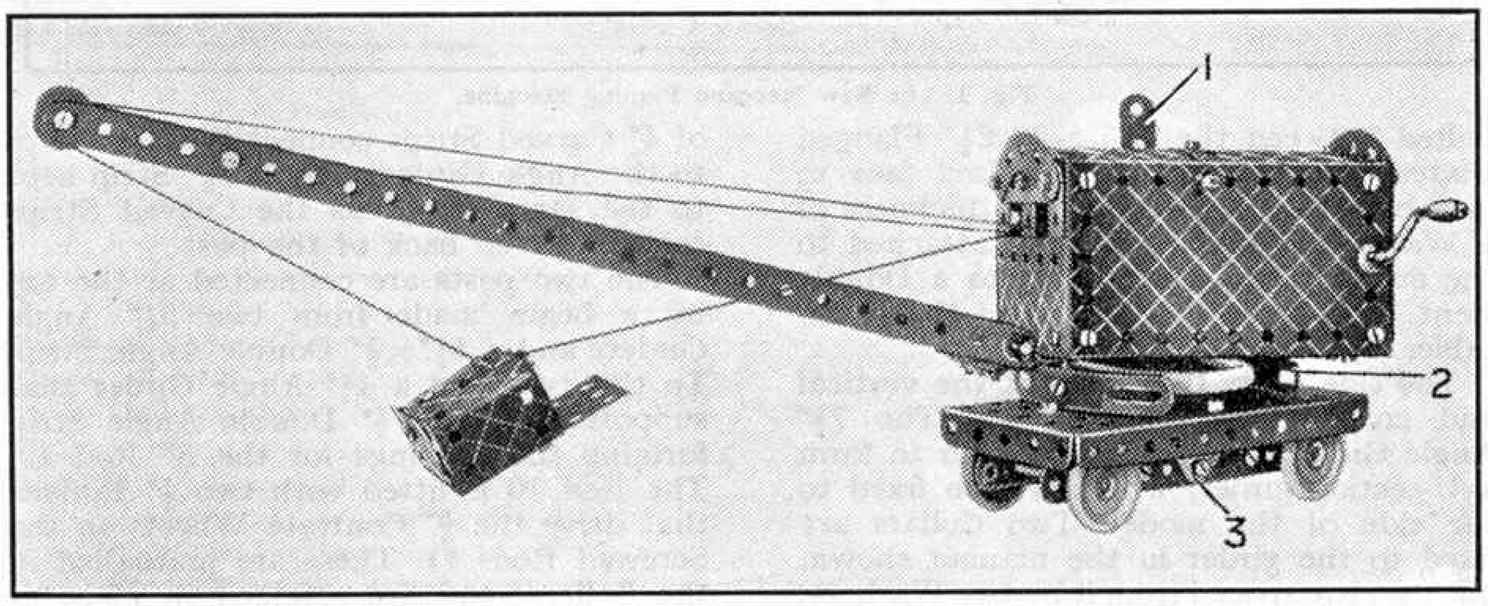


Fig. 1. Outfit No. 3 contains all the Meccano parts required for building this model dragline excavator.

Parts required to build model dragline: 2 of No. 1; 3 of No. 2; 6 of No. 5; 3 of No. 10; 2 of No. 11; 8 of No. 12; 1 of No. 15b; 1 of No. 16; 2 of No. 17; 1 of No. 18a; 1 of No. 19g; 4 of No. 22; 1 of No. 23; 1 of No. 24; 6 of No. 35; 56 of No. 37af; 50 of No. 37bf; 5 of No. 38; 1 of No. 40; 2 of No. 48a; 1 of No. 52; 4 of No. 90a; 3 of No. 111c; 2 of No. 126; 2 of No. 126a; 4 of No. 155a; 2 of No. 187; 1 of No. 176; 2 of No. 188; 2 of No. 189; 2 of No. 190; 2 of No. 191; 1 of No. 192; 2 of No. 215; 2 of No. 217b.

A simple model rifle, which can be used to fire projectiles consisting of rubber Driving Bands, is shown in Fig. 2. The barrel of the rifle is built from two 12½″ Strips held together by two further 12½″ Strips bolted over them. This structure is strengthened by a 3″ Strip bolted along each of its sides at a point 2½″ from the front end. The rear 12½″ Strip is then bolted to two 12½″ Strips overlapped 2½″. Two more 12½″ Strips and a 4″ Curved Strip form the stock of the rifle. The front sight is made up of two 1″ Corner Brackets bolted one on each side of the front 12½″ Strip.

The trigger and release consist of two 2½″ Curved Strips and a 2½″ Curved Crank Strip. The 2½″ Curved Strips are bolted one on each side of the barrel by means of lock-nutted ¾″ Bolts, and they are spaced apart at the top by a Collar and at the bottom by three Washers. The 2½″ Curved Cranked Strip also is lock-nutted to the barrel, and it is joined to the Curved Strips by a 4½″ Strip. An Angle Bracket forms the trigger.

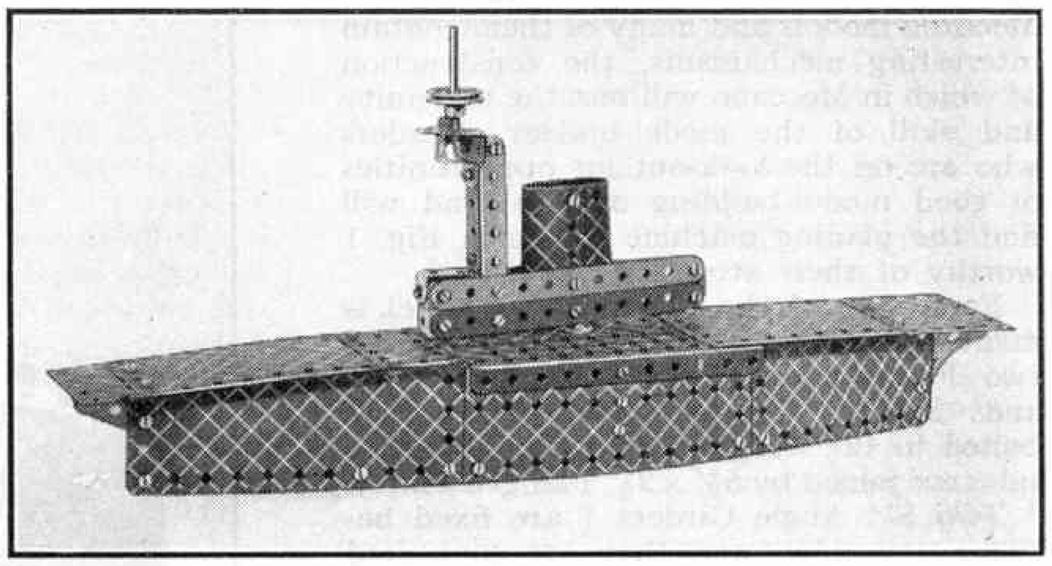


Fig. 3. A simple model aircraft carrier built from parts in Outfit No. 4.

A 10″ Driving Band is used as the bullet. It is stretched over the front sight and the Curved Strips, and is released by pulling the trigger, which is then returned to its normal position by the action of a 3″ Driving Band.

Parts required to build the model rifle: 8 of No. 1; 2 of No. 2; 1 of No. 2a; 2 of No. 3; 1 of No. 10; 27 of No. 37a; 15 of No. 37b; 4 of No. 38; 1 of No. 59; 1 of No. 89b; 2 of No. 90; 1 of No. 90a; 6 of No. 111c; 3 of No. 111a; 2 of No. 133a; 1 of No. 186.

The model aircraft carrier shown in Fig. 3 is specially designed for construction from the parts in Outfit No. 4. Its details are very simple. The lower sides of the Flexible Plates forming the sides of the hull are edged with 12½″ and 5½″ Strips overlapped, and the Plates are spaced apart by two Flanged Sector Plates bolted between them. The prow is a 2½″ Strip bolted through its centre hole in the position shown, a 2½″ Curved Strip being used in a similar manner to form the stern.

The superstructure consists of four 5½″ Strips joined at the after end by a Flat Bracket. At the forward end the upper and lower pair of Strips are joined by Double Brackets. The control bridge is formed from 3½″ and 2½″ Strips.

Parts required to build model aircraft carrier: 2 of No. 1; 6 of No. 2; 2 of No. 3; 2 of No. 5; 2 of No. 10; 2 of No. 11; 4 of No. 12; 1 of No. 17; 1 of No. 22; 2 of No. 35; 52 of No. 37a; 52 of No. 37b; 1 of No. 48; 1 of No. 52; 2 of No. 54a; 1 of No. 90a; 1 of No. 125; 1 of No. 126; 2 of No. 126a; 2 of No. 188; 2 of No. 189; 3 of No. 190; 2 of No. 191; 2 of No. 192; 1 of No. 198; 2 of No. 199.

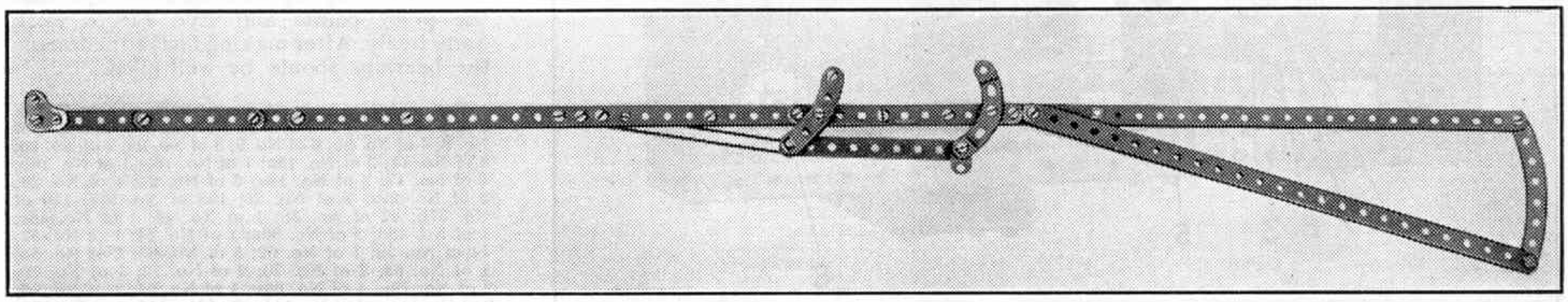


Fig. 2. A rifle that really shoots. Rubber driving bands are used as bullets.

A Meccano Planing Machine

THE machines used in engineering workshops are excellent subjects for Meccano models and many of them contain interesting mechanisms, the construction of which in Meccano will test the ingenuity and skill of the model-builder. Readers who are on the look-out for opportunities of good model-building of this kind will find the planing machine shown in Fig. 1 worthy of their attention.

Each side of the base of the model is made from a 5½″ × 2½″ Flexible Plate and two Flat Plates, of dimensions 2½″ × 2½″ and 5½″ × 2½″ respectively. These are bolted to 12½″ Angle Girders, and the two sides are joined by 5½″ × 2½″ Flanged Plates.

Two 5½″ Angle Girders 1 are fixed between the sides, and they are connected by a 2½″ × 1½″ Flanged Plate 2. The lower Angle Girders are connected by 5½″ Strips in the manner shown in Fig. 2. A 3″ Rod 3 held in place by Collars forms a pivot for the 5½″ Strip 4. An Eye Piece 5 slides on this Strip and its boss engages with the shank of a ½″ Bolt fixed to the arm of a Crank on the upper end of Rod 6. The Rod also carries a 57-teeth Gear meshed with a ½″ Pinion on Rod 7. A further 57-teeth Gear on this Rod meshes with a ½″ Pinion on an adjacent Rod to which is fixed a 1″ Sprocket Wheel.

The E1 or E120 Electric Motor is bolted to one of the Flanged Plates, and the small Pinion of the Motor meshes with a 57-teeth Gear fixed on the end of Rod 8. This Rod carries also a 1″ Sprocket Wheel, which is connected by Chain to the similar part mentioned previously. The worktable is made from a Hinged Flat Plate edged round with 5½″ and 4½″ Angle Girders in the manner shown in Fig. 1. It is fitted on the underside with four Eye Pieces, each of which is held by its screw on the shank of a ½″ Bolt, but is spaced from the table by four Washers.

The Eye Pieces slide on two 12½″ Strips bolted between the two 5½″ × 2½″ Flanged Plates. Two 5½″ Strips 9, bolted face to face but spaced apart by the thickness of a Washer, are then pivotally attached to the end of Strip 4, and also to a Double Bent Strip fixed to one end of the worktable.

The side posts that support the vertical and cross slides are identical. The 7½″ Angle Girders are bolted together to form a U-section girder, which is then fixed to the side of the model. Two Collars are fixed to the girder in the manner shown, but they are spaced from it by two Washers. A 4½″ Strip is then bolted to the side of the model, the same bolts holding also Double Brackets. Further 4½″ Strips are bolted to these Brackets as shown. A pair of 4″ Curved Strips connect the 4½″ Strips to the Angle Girders, and a 4½″ Strip bent to the same radius as the Curved Strips completes the back of the post.

The two posts are connected at the top by a beam made from two 5½″ Angle Girders and a 5½″ × ½″ Double Angle Strip. To this is bolted a 4½″ Angle Girder that supports the 4½″ × ½″ Double Angle Strip forming the bearings for the 8″ Rod 10. The Rod 10 is fitted with two ½″ Pinions that drive the ¾″ Contrate Wheels on the Screwed Rods 11. These are journalled in the Collars, and are retained in place at their lower ends by Aeroplane Collars. A Threaded Boss is screwed on each Rod 11 and to it is fixed a Coupling 12 by a ½″ Bolt. These Couplings carry two 8″ Rods, and further Couplings are fixed to the ends of the Rods.

The Collar 13 and a similar one at the other side of the model are now fixed to the outermost Coupling by a ½″ Bolt, a Washer being used for spacing purposes. The two Collars form bearings for the 9″ Screwed Rod 14, which is prevented from moving endways by Collars and is fitted with a Bush Wheel that forms a hand wheel. This Rod 14 is fitted with a Coupling that carries the cutting tool, the Coupling being bolted to two Double Brackets that slide on the 8″ Rods as shown in Fig. 1.

After completing the assembly it is essential to ensure that all gears and Pinions are secured tightly to their Rods and that the pivot points and Eye Pieces work quite freely. After making final adjustments the bearings should be well oiled.

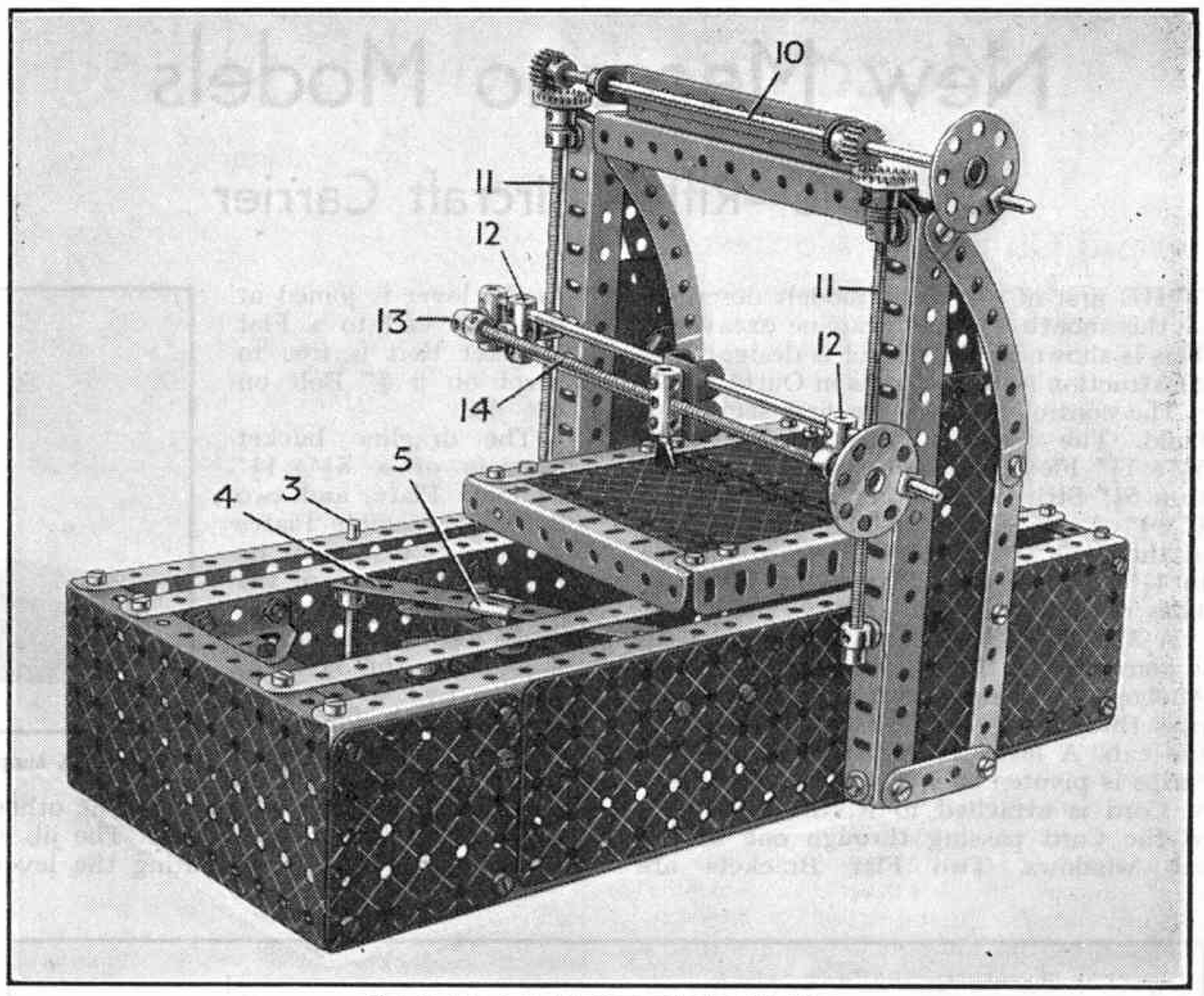


Fig. 1. The New Meccano Planing Machine.

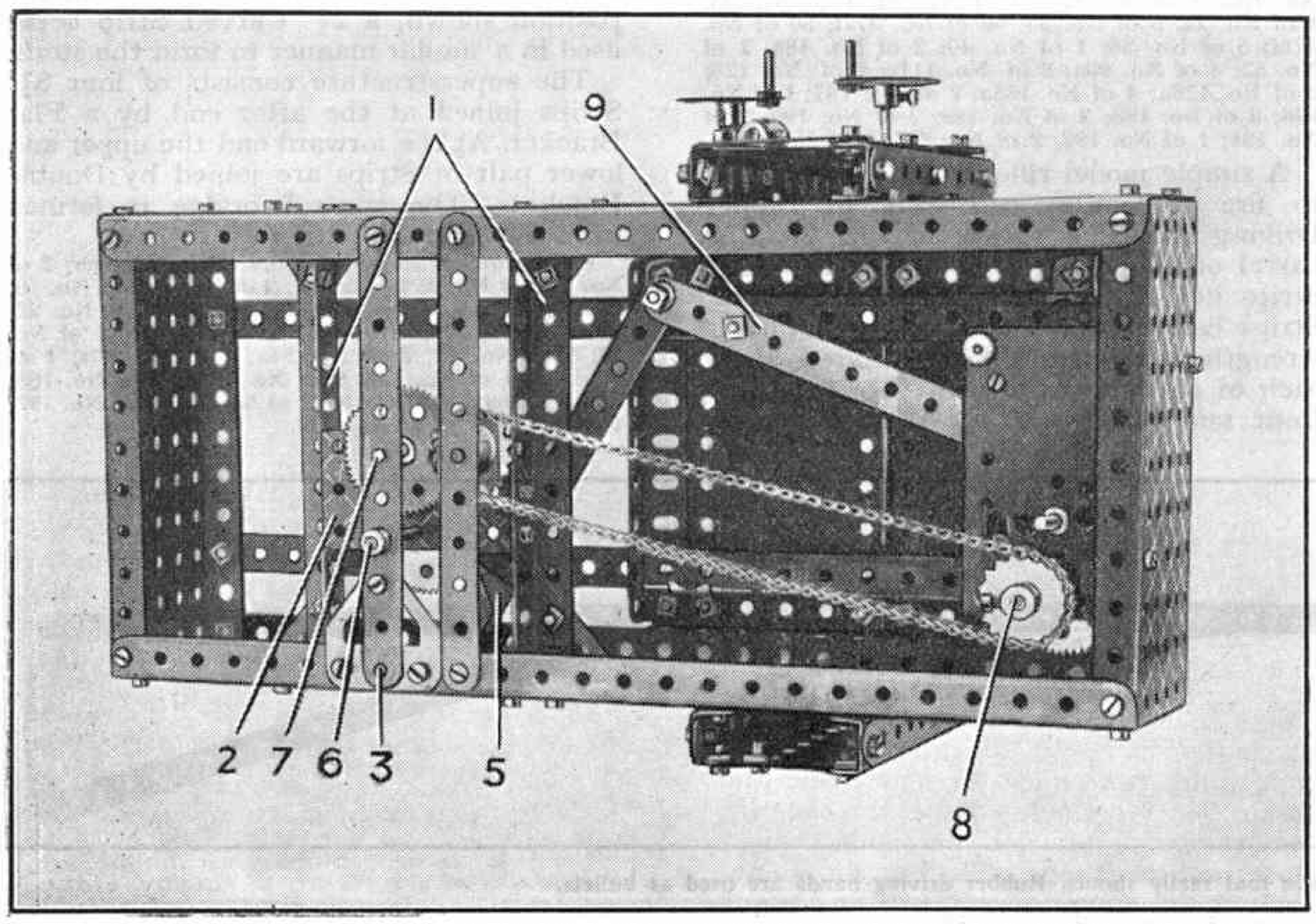


Fig. 2. This underneath view of the Planing Machine shows details of the table operating mechanism.

Parts required to build the model planing machine: 2 of No. 1; 5 of No. 2; 8 of No. 2a; 2 of No. 6; 4 of No. 8; 4 of No. 8b; 6 of No. 9; 3 of No. 9a; 2 of No. 10; 8 of No. 11; 3 of No. 13a; 1 of No. 16a; 1 of No. 16b; 1 of No. 17; 2 of No. 18a; 2 of No. 24; 4 of No. 26; 3 of No. 27a; 2 of No. 29; 108 of No. 37a; 109 of No. 37b; 42 of No. 38; 1 of No. 45; 1 of No. 48c; 1 of No. 48d; 5 of No. 50a; 1 of No. 51; 1 of No. 52; 14 of No. 59; 1 of No. 62; 5 of No. 63; 2 of No. 64; 1 of No. 65; 2 of No. 70; 2 of No. 72; 1 of No. 79; 2 of No. 79a; 4 of No. 89b; 1 of No. 94; 2 of No. 96; 8 of No. 111a; 2 of No. 111c; 2 of No. 115; 4 of No. 126; 1 of No. 126a; 1 of No. 74b; 2 of No. 189; 2 of No. 192; 1 of No. 198; 2 of No. P52; 1 E1 or E120 Electric Motor.

Meccano Model-Building Competitions

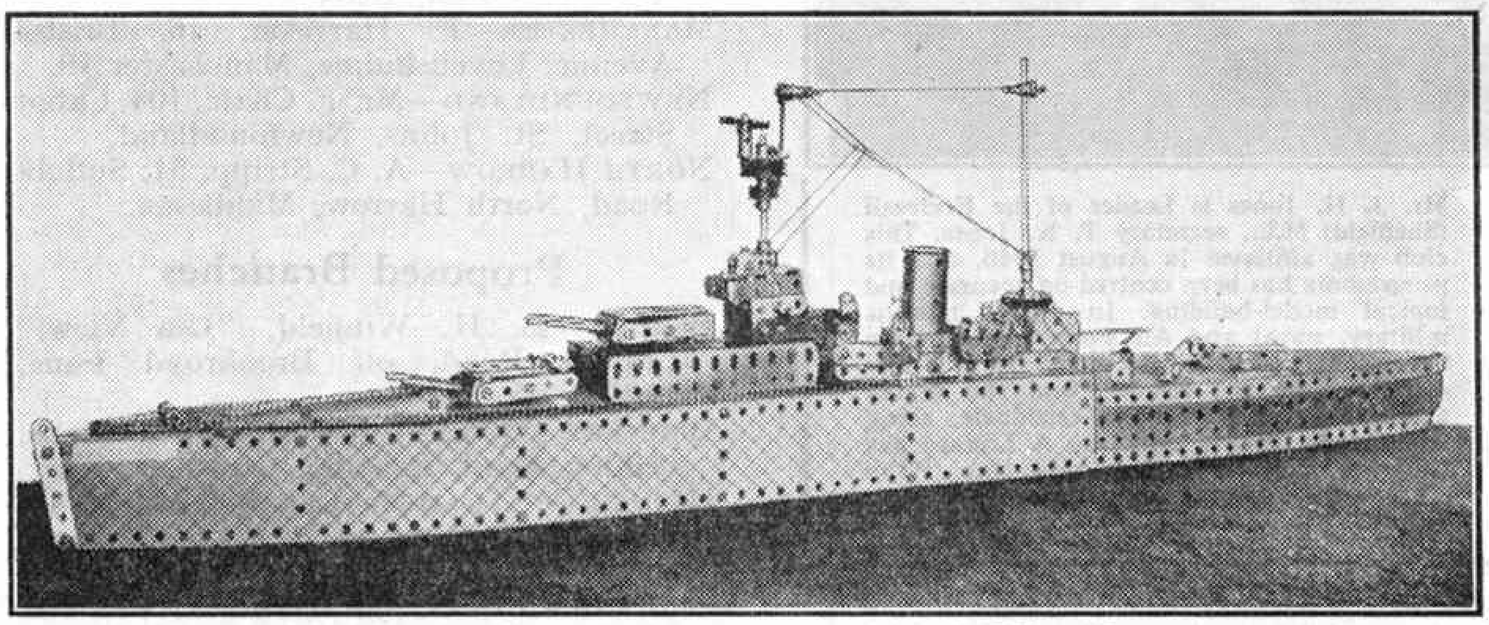
By "Spanner"

Grand Christmas Contest

At this time of the year Meccano model-building activities reach their greatest intensity, for those who are already Meccano enthusiasts are adding parts to their Outfits, and thousands of recruits to the hobby are being enrolled. In order to ensure that every model-builder shall have an opportunity to exercise his skill I am organising a grand Christmas model-building competition, in which models of all kinds may be entered, and splendid prizes will be awarded for the best and most interesting submitted. These prizes will include both cheques and Meccano and Hornby products.

The rules of the contest are few and simple. There are no entrance fees to pay or forms to fill in, and readers of any age can take part. Models may represent any desired subject and may be constructed from any size of Outfit or number of parts, but it is wise to remember that simple well-built models will be more favourably considered by the competition judges than complicated structures that are scrappilly built.

I advise intending competitors to try and incorporate in their models some ingenious use for a Meccano part or a new Meccano movement. Models displaying originality of this kind, no matter how simple they may be, will stand the best chances of winning the prizes. When the model is completed a photograph of it should be prepared, but if this is not possible a good sketch will do. The competitor's age, name and address should then be written on the back of the illustration, and it should be sent, together with a brief description of the model, to *"Christmas Model-Building Competition,"* Meccano Ltd., Binns Road, Liverpool 13." That is all there is to do and if a competitor has taken pains with his model and put his best workmanship into it there is no reason why he should not wake up one morning to find a letter containing some good news awaiting him!



A sturdy and businesslike warship built by A. J. Wilson, Luton.

All models submitted must be the competitor's own work, and actual models must not be submitted for consideration.

The competition will be divided into two Sections, A for readers living in the British Isles, B for readers living Overseas. Section A will close for entries on 31st January 1941, but Section B will remain open until 31st March 1941.

The following prizes will be awarded in each Section of the Contest. The First Prize is a cheque for £3/3/-. The Second and Third Prizes will consist respectively of Meccano or Hornby products to the value of £2/2/- and £1/1/-, and there will be 20 further prizes, 10 consisting of Meccano or Hornby products to the value of 10/6 and 10 of similar products to the value of 5/-. Every winner of a prize consisting of Meccano or Hornby products will be allowed to make his own choice from current price lists.

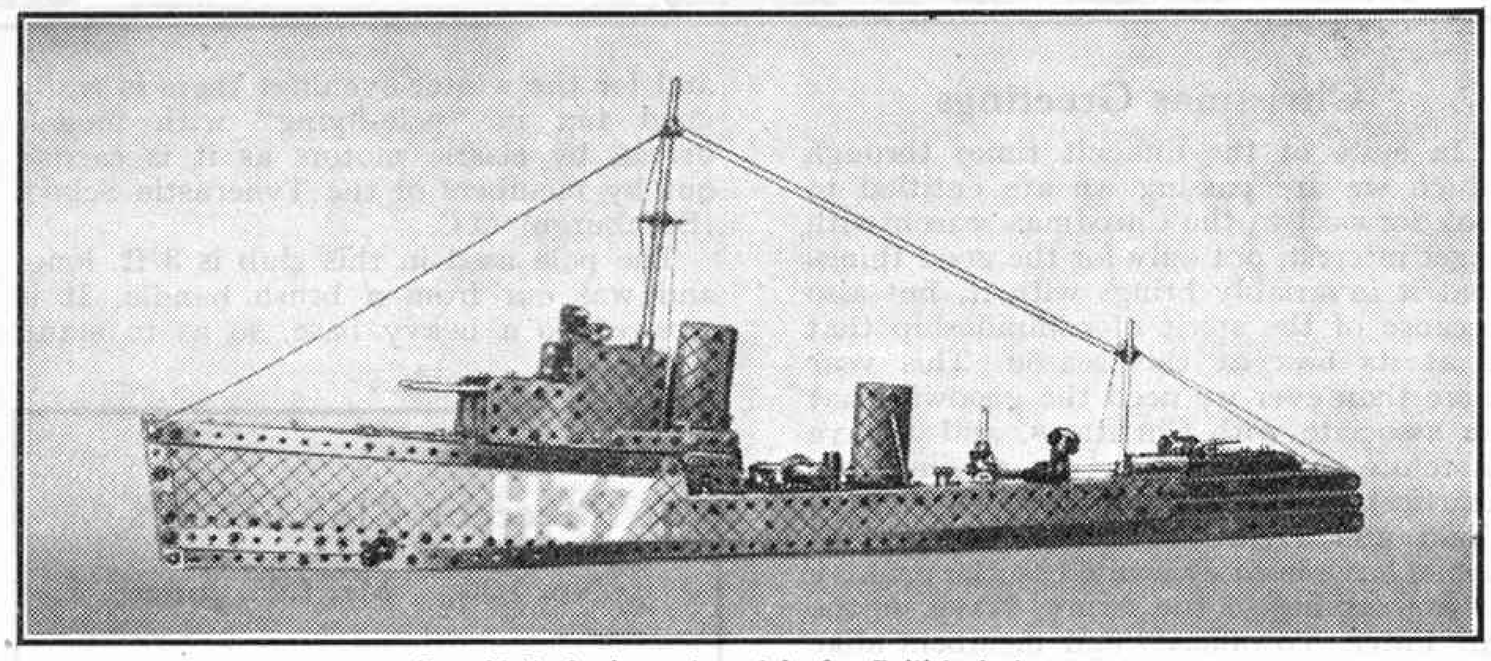
Competitors who would like to have their photographs or drawings returned to them after the entries have been judged should enclose a stamped addressed envelope for that purpose. Photographs or drawings of prize-winning entries will not be returned.

Correspondence relating to any subject not connected with the competition must not be enclosed in the same envelope as a competition entry. Entries will not be acknowledged, but all prize-winners will be advised by post.

More than one model may be entered in the competition, but all entries from any single competitor must be sent under the same cover. No single competitor can win more than one prize; if he sends two or three models they will be considered jointly.

Readers' Prize-winning Models

The upper illustration on this page shows a fine model of a British destroyer that won a prize for Ronald Parker, St. Leonards-on-Sea, a competitor in the *"Allied Fighting Forces"* Competition. It is noteworthy on account of the neat manner in which the hull and superstructure are shaped from Flexible Plates, and another good feature is its well-balanced proportions.



Ronald Parker's neat model of a British destroyer.

Naval vessels of various kinds were prominent among the entries in this Contest and another good example of these models is the battleship shown in the lower illustration. It was built by A. J. Wilson, Luton, and also makes good use of Flexible Plates, which are laid on a rib structure built up from Strips and Angle Girders. The gun turrets are made from 2½" Strips, Double Angle Strips and Flat Girders, with 2" Rods for the guns. Flat Girders are very useful and sturdy parts and I should like to see more competitors using them in their models. Aft of the funnel is an aeroplane hanger and a catapult.

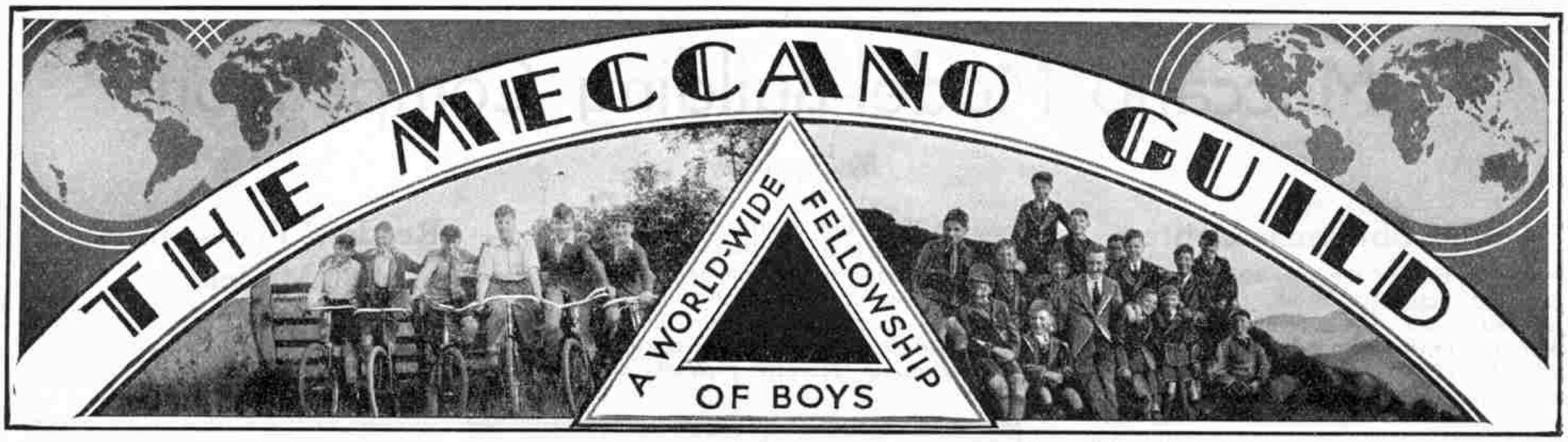
The varied equipment of Britain's mechanised army provided many model-builders with excellent subjects for their entries. Among these was D. S. Scruby, Bideford, who built a very sturdy and realistic model of a 15 cwt. army truck. This is fully equipped mechanically and has a three-speed gear-box operated by a reversing Electric Motor. In bottom gear the vehicle will readily climb slopes of up to 30 degrees.

Prize-winners in August "Sharp Eyes" Contest

The competitors named in the following list were the most successful in identifying the fragments that made up the illustration of a Meccano Nut and Bolt on page 391 of the August *"M.M."*

First Prize, Meccano or Hornby goods value £3/3/-: H. Gordon Johnston, Southall; 2nd, products value £2/2/-: C. Bradshaw, Sheffield 9; 3rd, products value £1/1/-: C. Wrayford, Bovey Tracey.

Products value 5/-: P. Hodd, Hove 4; L. Roberts, Cardiff; R. Nichols, Birmingham; P. Stephens, Glasgow; A. Walsh, Leeds; N. Gregory, London, S.E.11.



Christmas Greetings

In spite of the difficult times through which we are passing we are entitled to look forward to the Christmas season with eager interest, not only for the good things that it invariably brings with it, but also because of the spirit of comradeship that is at its best at this season. This year more than ever we need the goodwill that we associate with Christmas, and I have therefore no hesitation in sending my heartiest greetings to all members of the Guild and H.R.C. whether they are at home, have been evacuated to the country or are serving in the Army, Navy or the Air Force. To officials and members alike I send my best wishes for a good time that will strengthen the bonds of friendship between us, and lead eventually to finer and happier days.

Programmes for the Blackout

In these days of blackouts and air raid warnings Leaders may find it a little difficult to follow a programme of the usual type, for meetings may have to be curtailed in the interests of safety. Snappy features therefore have become desirable. In many Clubs it is still possible to embark on the construction of large models, but in most cases it is probably preferable to encourage members to build models at home and to bring them to the Club room for discussion, or as entries in special contests.

In the Club room contests that may be described as sharp and interesting should be arranged. These will include such well-tried favourites as building a model with a limited number of parts and blindfold model-building. The reproduction of some special model after it has been examined by members for a short period also can be tried and will be found very good fun. The model chosen for reproduction should be fairly simple, but as members gain practice they should be set to build models including some mechanism or form of construction that is not obvious at a glance.

Games of course must play a part in the programme, and fortunately there is an amazing variety to choose from, including table games as well as more strenuous pursuits such as Darts, Table Tennis or even Basket-ball and Badminton, where space for these is available. A spell of intense activity is the best way to dispel boredom or weariness.

Indoor Model Aeroplane Flying

A very fine pursuit that will combine exercise with a constructional hobby, and will keep members on the move, is the making and flying of model aeroplanes. In summer constructors can go out into the open to test their models in actual flight, and for the winter evenings there is really good fun in "pole-flying" with models driven by elastic motors as it is carried out by members of the Tynecastle School (Edinburgh) M.C.

The pole used in this club is 3 ft. long, and was cut from a brush handle. It is screwed to a heavy base, so as to stand firmly upright, and a nail is partly driven into its rounded top so that a small ring of copper wire can be slipped over it. To the ring is attached a thread from 3 ft. to 4 ft. long, the other end of which is attached to the aeroplane model to be tried. It has been found that the thread is best attached to the wing tip by passing it through the tissue with the aid of a needle.

The pole is placed in the centre of a room, and the elastic motor is then wound up and the aeroplane put on the floor, with the thread just taut and the nose pointed along a tangent to the circle of flying. The propeller is released a fraction of a second before the aeroplane itself. The latter then runs a few inches along the ground before taking the air and rising in a turn or so to the height of the top of the pole. Landing is equally realistic, and trials will soon enable the trimming and balance to be adjusted for level flight.

It has been found advisable to use a more powerful motor than for outdoor work, one with say four strands of rubber instead of two, and not to wind the motor up to the same extent as in flying practice in the open. The models also can be released from the hand in the air instead of being left to rise from the floor, but care must then be taken to have them on an even keel and the thread taut in order to avoid a tendency to violent dives.

Models of wing-span as little as 12 in., which are really too small for outside flying, can be used with success indoors. The models used by members of the Tynecastle M.C. are made of balsa wood covered with tissue, the materials for which are supplied in kit form by many manufacturers at prices from 9d. upward.

Meccano Club Leaders

No. 106. Mr. J. H. Jones

Mr. J. H. Jones is Leader of the Ecclesall (Sheffield) M.C., secretary T. K. Jones. This club was affiliated in August 1940, and its programme has been centred on accurate and topical model-building. In recent months military, naval and Air Force models have been constructed. Each model is carefully examined by the Leader, and the marks awarded are entered on a certificate, along with a constructive criticism. A Library has been formed and a club magazine, "The Meccanitian," is issued.

Proposed Clubs

ASHTON-IN-MAKERFIELD—D. H. Griffiths, 47, Old Road, Ashton-in-Makerfield.

BIRMINGHAM—G. F. Hood, 63, Norton Crescent, Bordesley Green East, Birmingham 9.

LUTON—C. J. Ratcliff, 57, Montrose Avenue, Luton, Beds.

MANCHESTER—F. Harrison, 16, Bristol Avenue, Levenshulme, Manchester 19.

NEWFOUNDLAND—Mr. F. Chafe, 104, Cabot Street, St. Johns, Newfoundland.

NORTH HARROW—A. C. Stripp, 51, Suffolk Road, North Harrow, Middlesex.

Proposed Branches

BATLEY—B. H. Winfield, "Lea View," Church Road, off Brookroyd Lane, Batley, Yorks.

BROMLEY COMMON—R. Disher, The Glebe, Oakley Road, Bromley Common, Kent.

HENLEY-ON-THAMES—E. B. May, 42, Harpsden Road, Henley-on-Thames, Oxon.

OLD COLWYN—N. J. Davidson, Lleweni, Llysfaen Road, Old Colwyn, N. Wales.

RUGBY—A. J. Goulding, The "Campbell" Hotel, Rugby.

STRANRAER—J. McGuffie, 56, Hanover Street, Stranraer, Wigtownshire.

TOWNSVILLE—Masters D. Rhodes and M. Wildgoose, Emroyd, Townsville, Yorks.

WEST BROMWICH—G. O. Parker, 68, Gads Lane, West Bromwich, Staffs.

Club and Branch News

Club Notes

York M.C.—Attendances at meetings have been satisfactory, and there have been many interesting visitors. The Club's Hornby Railway has now been completed. It is electrically operated and is divided into three separate sections, each with its own controlled circuits. A lighting system and signals are now being installed. Special meetings for Meccano model-building are now being held. Club roll: 16. *Secretary:* G. Hodgson, 1, "Sunnyside," Heslington Lane, Fulford, York.

Islington M.C.—Air raids make operations difficult, but members are being kept together by meeting in the home of Mr. V. Miller, Leader, who also visits them in their own homes. As soon as the situation becomes easier meetings will be resumed. In the meantime good model-building is being done at home by members, and social activities continue as far as possible. Club roll: 10. *Leader:* Mr. V. Miller, 541, Liverpool Road, London N.7.

Hornsea Evacuee M.C.—The first meeting of the Winter Session was devoted to a Cinematograph Display, the chief film being "*The Wrecker.*" At the next meeting scenes in the film were enacted with the Hornby Railway in the Leader's garden. Two sections, known as the "Apprentices" and the "Engineers" respectively, have been formed, to meet on alternate Club nights. Cycling, Games and Lectures are the chief activities. Club roll: 15. *Leader:* Mr. R. W. Shooter, The Gowans, Cliff Rd., Hornsea, E. Yorks.

Hillside (Whitefield) M.C.—This Club has now secured affiliation. Special interest is taken in Model-building Competitions, in which small prizes are offered. Models constructed have included a dragline excavator, a steam lorry and a high speed rescue launch. Contests in which waterline scale model ships were built also have been held. Social Nights are enjoyed at intervals. First Aid and A.R.P. classes are being organised. Club roll: 8. *Secretary:* D. Johnson, Hillside Avenue, Whitefield, Nr. Manchester.

Middlesbrough M.C.—Evacuation and blackout conditions are hampering the work of the Club, but members are being kept in touch with each other in various ways. The Club's Headquarters are now occupied as a Canteen for the Forces, but a Discussion Section is to be formed for members still in Middlesbrough as soon as a suitable meeting place can be obtained. Club roll: 34. *Leader:* Mr. J. Byers, 36, Palm Street, Middlesbrough.

Helmsley Methodist Sunday School M.C.—This Club was founded by Mr. R. W. Shooter, Leader of the Hornsea M.C., and is now under the leadership of Mr. W. E. Handley. Meetings are held in the School Room, and at each one hour is allowed for constructional work and half-an-hour for games. The games played include Table Tennis, Bagatelle and Darts. Model-building activities have included the construction of miniature tank traps and excavators. Club roll: 12. *Secretary:* H. Mountain, c/o Mr. W. E. Handley, Bridge Street, Helmsley, York.

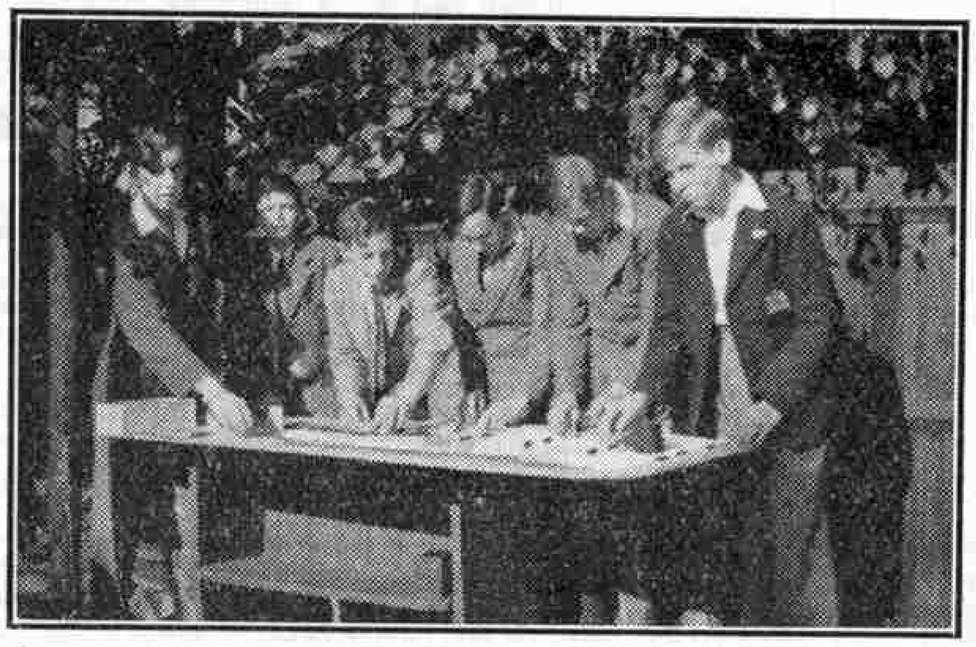
Tynecastle School M.C. — Meetings have been devoted generally to "pole-flying" demonstrations of models of aeroplanes. The flying and the dives and other manœuvres of the machines created intense excitement. A description of this interesting pursuit appears on the opposite page. Club roll: 20. *Secretary:* Ian Anderson, 28, Moat Street, Edinburgh 11.

Torquay M.C.—The attention of members has been concentrated chiefly on model-building. A Bridge Building Contest was held after all members had built a cantilever bridge, and a fine working crane was built at another meeting. Hornby-Dublo train operations also have been carried out, with shunting and signalling practice. Table Tennis and a card game invented by Mr. N. A. Bird, formerly Leader of the Club have been played. Mr. Bird unfortunately has left Torquay, and on his departure he was entertained to a farewell supper by members. Club roll: 12. *Secretary:* G. Fawcett, "Rosea," Marldon Road, Shiphay, Torquay.

Ecclesall (Sheffield) M.C. — Excellent transport models have been built by members, including a Diesel-engined lorry, a mechanical horse and a tractor with tipping trailer. A special model that scored full marks was a high speed ship coaler. For a Radio Feature Programme a member fitted up a room as a studio, using a microphone and a gramophone pick-up, and the "broadcast" was heard perfectly. The electric equipment of the Club's Hornby Train layout has been completely overhauled. Club roll: 6. *Secretary:* T. R. Jones, 327, Millhouses Lane, Ecclesall, Sheffield 11.

Muirfield (Dundee) M.C. — Model-building and Games have been the chief features. In a special contest models of ships were called for and the results were excellent. A Talk on the construction of model aeroplanes from balsa has been given by a senior member. More Meccano parts have been added to the Club's stock, and a Library has been formed. More members are wanted and the secretary asks those interested to get into touch with him. Club roll: 11. *Secretary:* B. Bowie, 39, Provost Road, Dundee.

Totnes M.C.—A stock of Meccano parts has been purchased for use in Club model-building. Preparations are now in progress for an Exhibition, the proceeds of which will be devoted partly to the local "Spitfire" fund and partly to Club funds. Club roll: 16. *Secretary:* T. S. Macnamara, "Gables," Totnes.



A group of members of the Acton Branch No. 308, Chairman, Mr. J. M. Statham, secretary, Mr. S. W. Simmons. This Branch was incorporated in June 1936. In our photograph members are seen at work on the first section of a garden layout that has been in regular use. The secretary is seen on the left, and next but one to him is D. F. B. Kevan, Editor of the Branch's successful Magazine "The Signal." Track meetings are varied by Lectures and a monthly Film Show.

AUSTRALIA

Melbourne M.C.—Most of the Club's activities have been concerned with Hornby Railway operations. These are very realistic, and the positions of members are changed regularly so that all become expert in every phase, including shunting operations, signalling and station work. A special Variety Night was held. Members brought puzzles to solve, a locomotive was tested and an interesting telegraph machine was explained and demonstrated. Members proved expert in assembling jig-saw puzzles in an interesting contest in which they were timed. Club roll: 10. *Secretary:* Leonard Ison, 8, Hayes Street, Northcote, N.16, Victoria, Australia.

NEW ZEALAND

Christchurch M.C.—The Club recently celebrated its 11th Birthday by a Social. One of the attractions was a competition for estimating the number of nuts and bolts in a bottle, by means of which £1 1s. was raised for Red Cross funds. At another meeting a Lantern Lecture was given on a tramping holiday trip. A joint Debate was held with the Ashburton Club on the motion "*Coal is a greater asset to New Zealand than Oil,*" proposed by members of the Ashburton M.C. The contest was won by the Christchurch M.C., the members of which spoke in favour of oil. "Monopoly Evenings" are held at the homes of members, a small charge being made in order to increase Club funds. Club roll: 26. *Secretary:* D. Pratt, 102, Kerrs Road, Christchurch N.E.1.

Branch News

Whitecraigs (Glasgow).—Members recently have been especially busy on war work. One is a member of the A.F.S. and the younger members are collecting books and magazines for despatch to members of the Services. Track working is carried on as far as possible, and the Chief Engineer continues to "repair" locomotives and rolling stock as necessary. A Recruiting Campaign is in progress. *Secretary:* A. T. Henderson, "Studley," Treemain Road, Whitecraigs, Glasgow.

Northampton.—Meetings are being held on Saturday afternoons monthly, but a few members are meeting every week with the object of rebuilding the track on a more convenient plan. Games have been played, but conditions have made Visits to places of railway interest impossible. Mr. G. L. D. Hodges, Chairman, has joined the R.A.F. and Mr. P. W. Samwell, Secretary, is acting as his deputy. *Secretary:* P. W. Samwell, 47, Clarke Road, Northampton.

Martinwhite (Guildford).—Incorporation has now been secured. Interesting meetings have been held, at one of which a Meccano bridge 2 ft. 6 in. in length was constructed and wired for lighting. The track has been lengthened and excellent timetable running has been carried out. Plans for adding to the Branch's resources and improving conditions generally have been discussed, and additions are made regularly to the rolling stock and track already in the possession of the Branch. Meetings are held twice weekly. *Secretary:* T. M. White, Bingham, Stoke Road, Guildford.

Monkstown (Co. Dublin).—After the summer activities, in which Cycle Runs played a prominent part, members settled down to track operations, for which several complex timetables were prepared. Good running resulted, largely owing to the care with which track and rolling stock were overhauled. Additional trucks have been obtained. The Branch Library has been extended, and a Magazine is to be published at two-monthly intervals. *Secretary:* R. D. Pierce, 20, Monkstown Road, Monkstown, Co. Dublin.

Greenlands (Buxton).—The excellent work of this Branch continues, and plans have been made to celebrate its first birthday. Members are busy raising money for a local "Spitfire" Fund. *Secretary:* J. R. Swain, "Greenwood," College Road, Buxton.

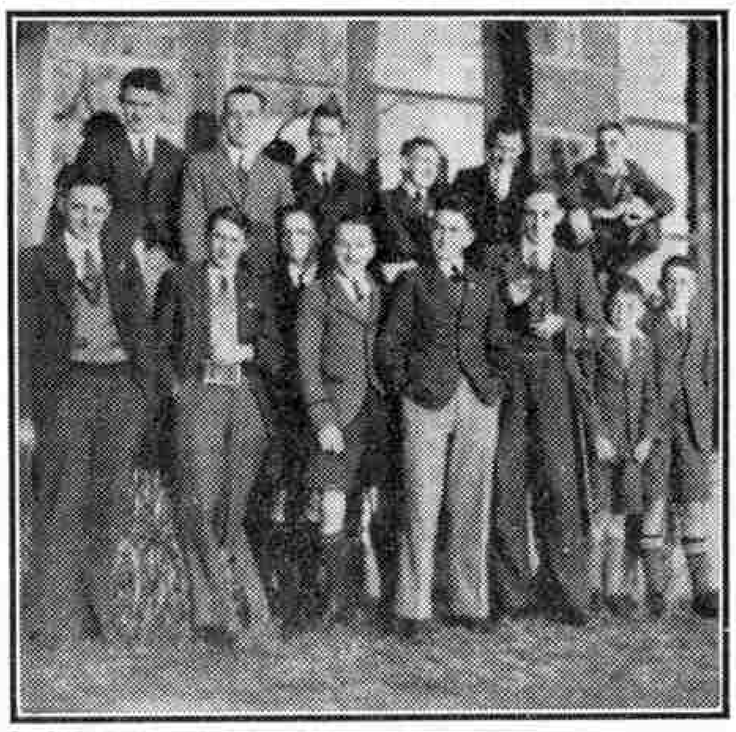
Folkstone. — A new tunnel has been constructed for the Branch layout. This has double track and telegraph lines have been carried through it. Special attention is being given to single line traffic, as the Branch layout has not yet been completed in accordance with the plans that have been worked out, and a limited stock of locomotives, coaches and wagons is at present available. *Secretary:* F. E. Saunders, 79, Dover Road, Folkestone, Kent.

Carmarthen.—Excellent track meetings have been enjoyed. A new locomotive has been introduced, and the Branch Traffic Controller has compiled a new timetable in order to make the best use of it. The rotas for drivers and firemen also have been revised. Other activities have included Film Shows, Monopoly and other Games. At one meeting each member spoke for two minutes on Branch topics, making many useful and practical suggestions. *Secretary:* J. D. Lewis, 7, Spilman Street, Carmarthen.

Acton.—Work on the construction of the new Branch layout has been somewhat hindered by air raid warnings, but satisfactory progress is being made. Regular discussions on further constructional work are held. Meetings are now arranged for Saturdays, and in addition to track operations there will be a film show monthly, while constructional work also will be continued. *Secretary:* S. W. Simmons, 37, Derwentwater Road, Acton, London W.3.

NEW ZEALAND

Mt. Albert.—This newly incorporated Branch is making good progress. Mr. W. S. Patten, Chairman, has given the Branch a permanent layout board, and the track is continually being improved. Excellent operations are carried out. A library has been formed, and now has a total of 65 books. At one meeting a special general knowledge test was arranged and proved very enjoyable. Strawberry plants dug up by members from the place where the permanent layout board has been installed were sold in aid of Branch funds and realised 7/-. *Secretary:* T. Patten, 40, Margaret Avenue, Mt. Albert, Auckland, S.W.2, New Zealand.



Members of the Christchurch M.C. who took part in billeting and entertaining members of the Ashburton M.C. during a recent visit. This flourishing New Zealand Club, led by Mr. J. Ancall, was affiliated in May 1930, and has a splendid record. Visits are made regularly to a School for the Deaf and a Boys' Home, and this good work is highly appreciated.

BOUNTY MUTINY PKT. FREE!

Pitcairn Island, the haven of the famous Mutineers commemorated by Charles Laughton in the film, "Mutiny on the Bounty," is included in this magnificent offer of 27 different stamps. Only a few of these beautiful stamps have been issued, and no more can be obtained. Other stamps included: Germany (President Hindenburg), Italy (King Emmanuel), Philippine Isles, Switzerland, Map issue, Australia (Queen Elizabeth), and finally a rare 100-year-old stamp. Send immediately 3d. postage and request approvals.

LISBURN & TOWNSEND LTD.
(MM), LIVERPOOL 3.

Shopkeepers! Send immediately for details of "Liver" (no purchase tax) Stamp Packets. READY SALE.

FREE WONDERFUL 1940 OFFER 20 New Issues and Novelties

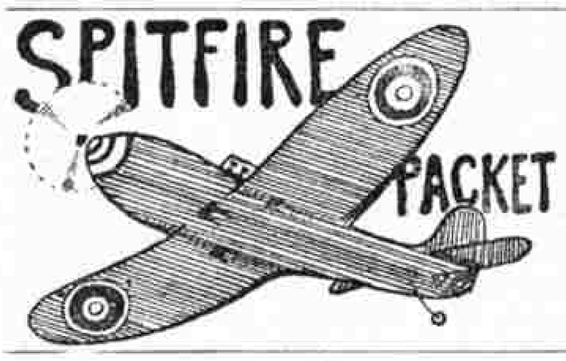
Including Czecho-Slovakia (President), **Finland** (40 years old), France (unused **new type**), **Gilbert & Ellice Isles** (**Frigate Bird**), Greece (**Charity, Queen Olga and Sophia**), Japan, Jugo-Slavia (Boy King), **Poland** (obsolete pictorials), Turkey (**surcharged**), Venezuela (high value), etc. I will send this collection absolutely free to all stamp collectors sending 2d. postage (abroad 1/-).

G. P. KEEF, WILLINGDON, EASTBOURNE, ENGLAND

UNUSED AFRICAN PACKET

Fine packet of unused African stamps from Belgian Congo (river scene), Morocco Agencies King George VI, already obsolete, Italian East Africa (Abyssinia, etc.), Sudan, Somali Coast, Algeria, Cameroons, a fine set of 5 Ivory Coast, new issue, inscribed in error 'Baloue Woman' for 'Baoule Woman'—one is already obsolete—and another set, only just issued, of French Guinea, Mozambique, etc., etc., 30 stamps in all, sent free to all genuine applicants for approvals enclosing 2½d. postage. Only one gift to each applicant.

R. D. HARRISON — ROYDON — WARE



PACKET contains 36 air, triangular, and stamps with aeroplanes on, etc.—2 LIBERIA triangular (with aeroplane), usually sold at 7d.; NIGERIA (Geo. VI); COSTA-RICA triangular (fish); URUGUAY INDIA (mail train); ROUMANIA (Carol); 8 CANADA (a fine set including large Royal Visit pictorial); 2 TANGANYIKA; 3 PALESTINE (pictorials); 6 BRAZIL (including airpost and aeroplane design); 5 U.S.A. (obsolete); 2 JAVA; COSTA-RICA (Exhibition triangle) and MOROCCO, LARGE PICTORIAL; Peru New Issue; GERMANY (airpost); COCHIN (large) and IRAQ.—Price 5½d., postage 2½d. extra, abroad 3½d. extra. Money back if you are not satisfied. Applicants for approvals receive 8 Peru FREE (catalogued at 9d.) and in addition, those sending addresses of stamp collecting friends get an additional set of 4 GEORGIA. FOR EVERY PACKET SOLD I AM GIVING THE PROFIT TO THE "SPITFIRE FUND," SO YOU WILL BE HELPING TO WIN THE WAR.
BARGAINS—100 B. Colonials 1/-; 6 Triangular 7d.; 18 Georgia 10d.; 20 Rhodesia 1/2; 14 new Geo. VI 1/2.

H. C. WATKINS, Stamp Importer (M.M. Dept.), Granville Road, BARNET

OIL?

Stamps of the Oil Countries

To all applicants for our Famous Approval Sheets, enclosing 3d. to cover cost of postage we will send FREE 10 stamps from 10 different oil countries. Offer is for 30 days (abroad 60 days).

Dept. 342, ERRINGTON & MARTIN
South Hackney, London E.9. Estab. 1880

ALERT

Be alert for here is a marvellous **FREE** Bargain Pkt. that you just cannot afford to miss. Our wonderful **DECEMBER Free Gift** is the best packet you can get as it contains valuable and interesting stamps, many **BRITISH COLONIAL PICTORIALS; COMMEMORATIVES; ZOO** stamps and other High Quality issues including a famous **CAPE OF GOOD HOPE;** scarce **SAAR** Plebiscite issue; nice set of mourning Stamps in black issued by **GERMANY** for death, **BELGIUM** for fatal accident and **YUGO-SLAVIA** for murder, of their rulers; **LIECHTENSTEIN** (Numeral Due); fine **JAPAN** (Chrysanthemum Emblem); **TRAVANCORE** (Shell); **ITALY** (Labour Celebration); **GREECE** (Athens); **PERU** (Soldier); **JAMAICA;** a Near East selection from **PALESTINE** (Biblical Scene); **EGYPT** (The Desert); **CYPRUS** and **IRAQ** (Emir); set of different Sultans of **PAHANG. PERAK** and **SELANGOR; SIAM** (King Prajadhipok) now **THAILAND;** current **NIGERIA;** Dominions selection of **AUSTRALIA, INDIA** and **NEW ZEALAND;** lovely **NEGRI SEMBILAN (Sungei Ujong); I.F.S.** (Weapon); famous Tiger pictorial of **FEDERATED MALAY STATES** and in addition fine uncommon early **QUEEN VICTORIA** stamp. Get this whole collection of these exciting stamps **ABSOLUTELY FREE** by sending 3d. stamps for Approvals to:

WINDSOR STAMP CO. (DEPT. M), UCKFIELD, SUSSEX

THE FIRST STAMP EVER ISSUED

(British 1840 Penny Black) for P.O. **4/6!** It is guaranteed genuine in every respect. Its companion stamp (1840 2d. blue) for a further **6/9** (cat. 17/6)! Other "Classics" which every collector should have are the **Cape of Good Hope Triangulars;** we offer 1d. rose (cat. 40/-) for **12/6;** 4d. blue (cat. 15/-) for **5/-;** and 6d. pale lilac (cat. 40/-) at **15/-.** Superb approvals of any country against approved English References or a deposit. **Full Lists Free.**
NORRIS & CO. (Dept. M), Somercotes, Derbyshire

WARTIME CHRISTMAS GIFTS MUST BE USEFUL AND PRACTICAL

You will have chosen wisely if you give a copy of the

Standard Catalogue of Postage Stamps of the World

1941 EDITION NOW ON SALE

The "Black-out's" best antidote and the most practical Reference Catalogue for stamp collectors of all ages.

THE WORLD'S POSTAGE STAMPS FROM 1840 RIGHT UP TO DATE

1,000 Pages. 7,800 Illustrations.

Comprehensive Price Lists of Stamps, Albums, etc., sent on receipt of **3d.** *postage.*

6/6
POSTAGE 7D. EXTRA
ABROAD 1/-
U.S.A. & CANADA
$1.50 POST FREE

WHITFIELD KING & CO. (M.M.), IPSWICH, SUFFOLK. Est. 1869

FREE STAMPS

50, all different, 2 Indian Silver Jubilees and 1 Canadian Royal Visit, 1939, to introduce my low-priced approval books containing stamps from ½d. Liberal discount given, and a list of 133 further bonus gifts of Coronations, Jubilees, Commemoratives. Please send 3d. for postage.

C. A. RUSH
8, Birley Road, Whetstone, N.20

SEASON 1940-41

We shall be pleased to hear from old and new friends. Approvals for all collectors. Please state interests.

E. & N. GREY, 9, ROSEMARY AVENUE HOUNSLOW

PLEMONT SHILLING PACKETS

25 Animal stamps. 25 Bird stamps. 25 Architectural 25 Zoological. 25 Aeroplane, Ship, etc. 25 Scenery. All diff. Cash with order. Postage extra. Any one packet free to approval applicants sending 3d. post. List free.
A. M. Bowman (M Dept.), 34, Meriden Ave., Stourbridge.

100 DIFFERENT STAMPS FREE

to applicants for ½d. approvals.
COX, 17, STONELEIGH PARK ROAD, EWELL.

I STILL CONTINUE MY OFFER of 50 different stamps free, which includes 20 British Colonials, French Colonials and other attractive Stamps, to applicants for my famous ½d. Stamps and cheap sets. Send a postcard. Without approvals 9d.
FLEMING, 52, WHITCHURCH ROAD, CHESTER

Free "WORTH WHILE" Free Stamps in the News: GREECE

10 different USED stamps from this brave and ancient country FREE to all applicants for a selection of my "WORTH WHILE" approvals of stamps worth while.
Jos. H. Gaze, 21, Atwood Road, Didsbury, Manchester

FREE PACKET of 35 different Canada to applicants for approvals (½d. to 6d.). P. Lewis (member J.P.S.), 185, West Heath Road, London N.W.3.

PACKETS OF STAMPS

France 25 for **4d.**; 50 for **9d.**; 100 for **2/3.** China 25 for **9d.** Denmark 25 for **6d.**; 50 for **9d.** Greece 48 for **1/6.** Guatemala 10 for **6d.** Iran 25 for **1/3;** 50 for **2/3.** Japan 15 for **3d.**; 50 for **1/3.** Rumania 48 for **1/3.** Spain 25 for **1/-.** Sweden 25 for **6d.**; 50 for **1/-.** Thailand 25 for **2/3.** Turkey 24 for **9d.**; 48 for **1/3.** U.S.A. 25 for **9d.** Postage extra.
HARROWVENS (MM), 224, KING STREET, NORWICH

For SERIOUS COLLECTORS

Our Bargain "Discount" Approvals contain a fine range of picked Modern and New Issues, Pictorials and Commemoratives, etc., from 1d.–6d. each, less a generous discount. Send to-day with confidence. Approvals or details are post free, and we do NOT send again unless requested. State whether you want British Colonials, Foreign or both. You'll be delighted with our PERSONAL service.

THE BIRKDALE STAMP CO. (P.T.S.),
Dept. M, 104, Liverpool Road, Southport, Lancs.

HOSPITAL STAMPS

75 Different Foreign and Colonial Stamps selected from Collections presented to Hospital, Send 6d. and stamped addressed envelope to:
SECRETARY, Memorial Hospital Hall, Woolwich, LONDON S.E.18
An approval sheet from our limited number will be sent on request.

FREE AND POST FREE. 30 Colonial stamps, inc. MINT NEW ISSUES, to all applicants for my bargain approvals (½d. to 6d.). Send P.C. to: C. W. Griggs, 16, Station Road, Woburn Sands, Bucks.

For other stamp advertisements see pages 542 and xiii.

STAMP COLLECTING

The Story of the Postmark

A modern pictorial postmark.

FREQUENTLY we have given the advice in these pages that it is most important that used stamps should be retained on their original envelopes as far as possible. That advice has been given because a used stamp on entire, as such specimens are called, is worth much more than a used stamp off cover.

Why should there be this difference in value? The reason is that the postmark tells the story of the letter in an unmistakeable manner, and establishes facts that can rarely be settled by a simple stamp itself.

It is appropriate to consider the story of postmarks this month, for it was in December 1839 that the first steps toward the introduction of the adhesive stamp were taken. Incidentally, the change of colour of our first stamp, the famous Penny Black, from black to red, was due solely to the importance of securing a legible postmark. Sir Rowland Hill, who was Secretary to the General Post Office, found by experiment that the red and other coloured postmarks used to cancel the Penny Black stamps could be removed from the stamp without leaving a trace. Only a black cancelling ink gave a really satisfactory and permanent obliteration. He therefore ordered that only black ink was to be used. The arrangement of black on black proved unsatisfactory, however, the markings being almost imperceptible, and so in 1841 it was decided to reverse the original idea and to substitute a black cancellation on a red stamp. Thus came the Penny Reds of 1841, a family that was destined to enjoy a long life. During the 40 odd years they were in use 20,700 million Penny Reds were issued.

Postmark centred on a stamp.

Postmarks were in use in Britain long before the coming of adhesive stamps, but their earliest use was to serve as a frank showing that the appropriate postal charges had been paid. The famous Bishop and Dockwra marks, mentioned in our article in the *"M.M."* for May last on the centenary of stamps, were examples of this type. Later a dual form of marking was adopted, one mark being used to show that postal charges had been paid and the other showing the date and time of posting. A specimen of the dual marking employed immediately before the introduction of the "Penny Black," used at Frome on 8th March, 1826, is shown here. We show also a "Free" mark, applied as a frank to letters posted by Members of Parliament and members of the nobility, all of whom had the right of free postage. Many Peers and Members of Parliament earned fat fees by joining the management of various companies solely for the purpose of signing their names upon all letters sent out by the companies, who were thus relieved of substantial postage bills.

A field post office postmark from the Great War accompanied by the stamp of the Regimental Censor.

With the introduction of the Penny Black, there came the Cross Patee postmark, a Maltese Cross form applied in red, the sole purpose of which was to prevent frauds on the revenue. It was used at all offices, and it had the disadvantage that it gave no indication of where the letter had been posted. Following the colour change to which we have already referred the next reform was to introduce numbered obliterators, to be used in addition to the Cross at all principal offices. These were first employed on 1st May 1844, and the numbers were distributed in alphabetical order, gaps being left in the sequence to provide for sub-offices that were likely to become sufficiently important to require the use of such a stamp at a later date.

A dual postmark of pre-stamp days, used at Frome in March 1826.

Key lists of offices using obliterators were issued annually. The list of 1844 gave 936 as the number of offices using obliterators, but the numbers did not run in sequence through to that figure, each number in use being preceded by a Class Letter, A, B, C and so on. Additional numbers were added up to 1873, at which time G35 was reached, the office distinguished by this mark being Lesbury, in Northumberland. At this stage, it was decided to fill in the vacant numbers and a complete revision was decided on. In the result, it was April 1882 before G35 came into use again, this time at Bloxwich, in Staffordshire.

A Naval postmark, with the stamp of a ship's Censor.

As our readers know, certain British Colonies did not show figures of value on their early stamps, the individual values being different only in their colours. Mauritius is a case in point. Here, to save expense, only one plate was engraved for the 1854 issue and the later issue of 1858. The stamp was printed in three different colours, green, vermilion and magenta, and their allotment was left to the discretion of the Colonial Postmaster. The magenta colour was adopted for the 9d. denomination when this value was introduced in 1859, but when supplies of the penny value ran short in 1862 this same magenta stamp was employed as a makeshift!

A free postmark of 1839. Note the franking signature at the bottom of the envelope. The postmark alone was not sufficient to carry the letter free.

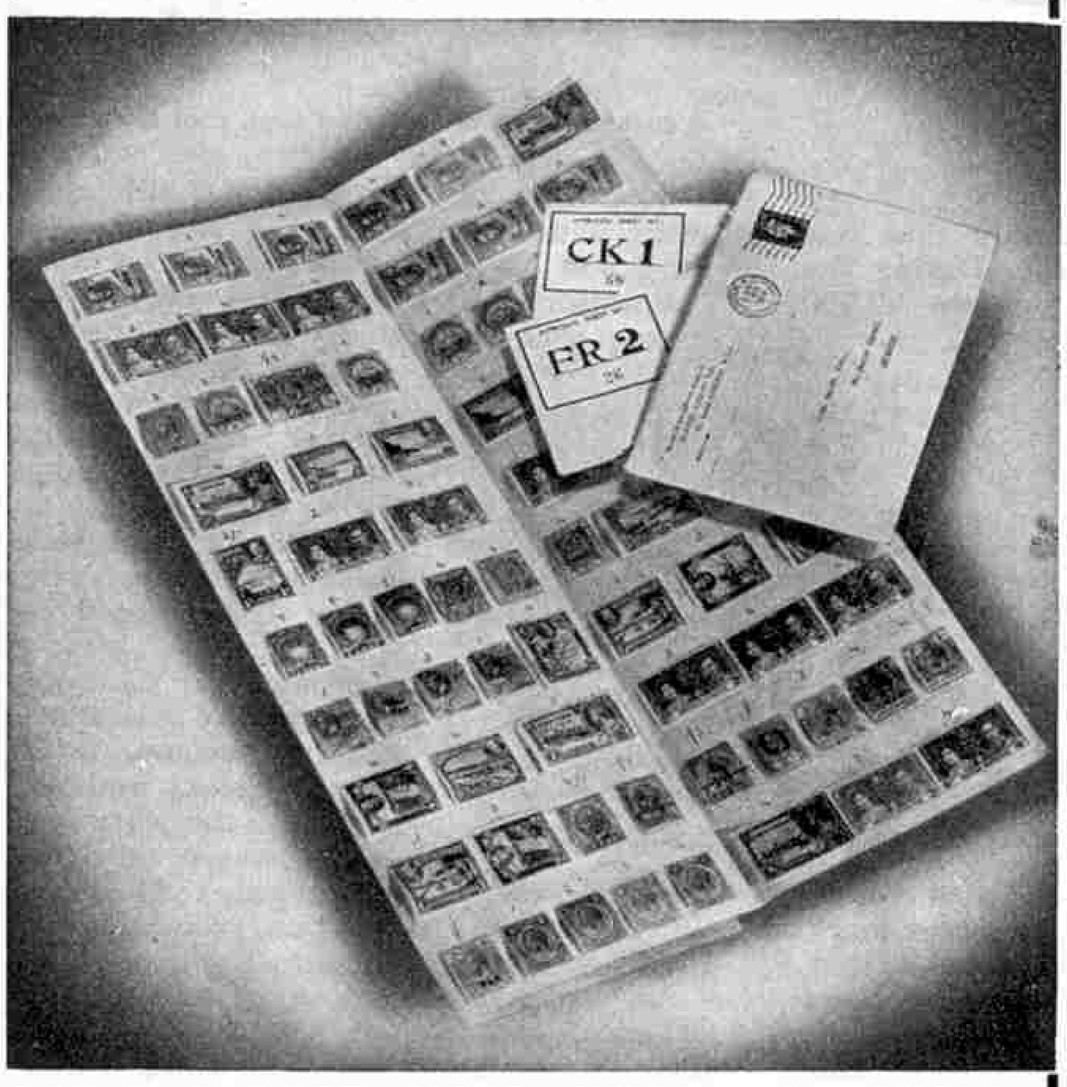
As it happens there is usually no difficulty in determining for which value individual specimens were employed. (Cont. on page 543)

STANLEY GIBBONS XMAS OFFERS

EVERYTHING THAT IS BEST IN STAMP COLLECTING

Stamp Collecting—the World's Most Popular Hobby, even more popular in war-time because it is ideal for "black-out" nights.

This Christmas, Stanley Gibbons, from their war-time address at St. Albans, hope to give you their usual pre-war service, but please help and order what you want AS EARLY AS POSSIBLE—earlier than usual.



DON'T FORGET YOUR XMAS APPROVALS

Christmas is the time when every enthusiast improves his collection with stamps from the well-known S.G. Approval Selections. There are none better.

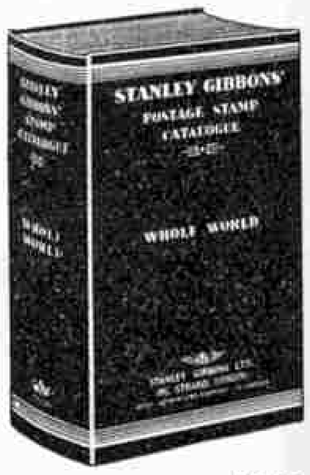
S.G. Approval Sheets, arranged in catalogue order by countries or in special groups such as Air Stamps, King George VI stamps, etc., are the best you ever saw. Here are new stamps and old stamps, pictorials, commemoratives, provisionals and air stamps, all in fine condition and with many on every sheet priced at only a penny or a few pence each. Write TO-DAY, mentioning the countries or groups you would like to see.

For more advanced collectors there are the famous Blue Approval Books.

GIBBONS' CATALOGUES 1941

No keen collector should be without a "Gibbons' 1941," with its latest prices, up-to-date information and many new issues illustrated, described and priced for the first time.

GIBBONS' CATALOGUE 1941



WHOLE WORLD 18/6
Part I. British Empire, with Egypt and Iraq . . 7/6
Part II. Foreign Countries 11/6
POSTAGE EXTRA: Whole World, U.K. 8d., abd. 1/6; Pt. I, U.K. 7d., abd. 11d.; Pt. II, U.K. 7d., abd. 1/2.

GIBBONS' "SIMPLIFIED" 1941, 6/6. Post. U.K. 7d., abd. 1/3.

NOW'S THE TIME for a NEW STAMP ALBUM

Christmas is the time to get a new stamp album and this year there is a special reason.

Long, "black-out" winter nights pass quickly when you spend them to remount your stamps in a brand-new Stanley Gibbons' album, but what you must remember this year is that paper and all other stamp album materials are difficult to obtain and are rising in price. If you buy NOW, you make sure of your album and you will get a better and cheaper one than if you wait.

Below is a list of albums we specially recommend for "M.M." readers.

The "STRAND" Without Maps
No. 2176. 352 pages. 14,500 spaces. Attractive pictorial binding. Guarded 6/–
With 8 Fine Maps in Colour
No. 2177. 352 pages. 14,500 spaces. Neat cloth binding, bevelled edges 7/6
No. 2178. 368 pages. 15,000 spaces. Handsome grained cloth binding, gilt lettered 8/6
POSTAGE: Strand, U.K. 7d., abd. 1/1.

The "VICEROY" 384 pages. 16,000 spaces
Special Features: (1) "The World and its Story," 88 illustrated paragraphs about stamps. (2) Stamp Identification Table. (3) 8 Maps in Colour.
No. 2179. Library style binding, back and corners grained, bevelled edges and gilt lettered 9/6
No. 2180. Specially handsome binding with leather back and bevelled edges, gilt lettered 10/6
POSTAGE: Viceroy, U.K. 7d., abd. 1/3.

The "CENTURION"
Interleaved to Prevent Stamps Rubbing. 388 pages. Over 16,000 spaces
Special Features: (1) Exceptionally full guarding to prevent album bulging. (2) A concise Glossary of Philatelic Terms. (3) A Stamp Identification Dictionary. (4) Helpful hints for the collector. (5) Eight fine maps in colour. (6) A page of illustrations showing specimens of the various classes of stamps.
No. 2506. Very durable grained cloth, handsomely inscribed with title and gold ornament showing the classic "Queen's Head." Packed in box 15/–
No. 2507. De Luxe edition. As above, but bound in half-leather . 17/6
POSTAGE: Centurion, U.K. 9d., abd. 1/9.

Remember these names, and ask your supplier to show them.
ACE (5/–). SIMPLEX (4/6, 6/6, 9/6 and 14/6).
SENATOR (8/6). EXETER (9/–).
NUBIAN BLACK-LEAF (10/–).
UTILE (10/– to 22/6).

BLANK LOOSE LEAF ALBUMS

PITCAIRN ISLAND

The Brand-New "MUTINY ON THE BOUNTY" Stamps.

Pitcairn Island, far away in the Pacific where Fletcher Christian, John Adams and the other *Bounty* mutineers settled in 1789, has just issued its first stamps—fine Pictorials showing Christian, Adams, Lieut. Bligh (do you remember Charles Laughton in the film?), pictures of the *Bounty* and a map showing where Pitcairn lies. We offer ½d., 1d., 1½d., 2d., 3d., 6d., and 1s. stamps—all unused, for 3/–, plus postage.

ASK FOR SET 5073

To complete the set we can supply the 2/6 stamp, unused, showing Christian and a Pitcairn view for 3/3, plus postage.

STANLEY GIBBONS LIMITED
36-38, LONDON ROAD, ST. ALBANS, Herts.

THIS IS OUR NEW ADDRESS for all orders SENT BY POST.
For callers OUR SHOP AT 391, STRAND, LONDON W.C.2, REMAINS OPEN.

For other stamp advertisements see pages 540 and xiii

"The Story of the Postmark"—

(*Continued from page 541*)

A new cancellation stamp, differing completely from those in use previously, was introduced almost simultaneously, and

magenta stamps of that time cancelled with the new form of postmark can be classed as penny values almost automatically.

Postmarks also tell the story of stamps used outside their home countries. In the early days of stamps, issues from Great Britain were almost invariably employed by the Colonial offices and at certain places abroad. The numbered obliterators employed in those offices give clear evidence of use abroad. Thus M and A25 were used in Malta, and G and A26 in Gibraltar, while Port Said used B02. Sometimes, but not always, these marks were accompanied by another showing the name of the town and colony in a marking similar to those of modern days. Gibbons' catalogue gives a complete list of these "used abroads" at the end of the Great Britain section.

Even to-day the stamps of Great Britain are used in certain offices abroad, in the Morocco Agencies, for example, but these can be clearly identified by the cancellation stamp, which usually bears the wording "British Post Office" with the name of the town around the perimeter of the cancelling stamp.

Modern cancellations take many interesting forms, one of their common uses being to combine propaganda for some national movement with their normal function. Every one of our readers will have seen a wide variety of such marks, that most commonly seen in Britain to-day being an exhortation to *"Save Waste Paper, Metals, Bones, Rags,"* as part of the national economy campaign. The well-known *"Post early for Christmas"* that appears annually about this time was first used in 1907 as an experiment at Rochdale, Lancashire.

Many countries have used attractive pictorial markings for this purpose, but it will come as a surprise to know that this is no modern innovation. Canada used a pictorial mark as far back as the closing years of the last century.

We think readers will have learned sufficient from these brief comments to realise that the postmark is worthy of a prominent place in every collection. One collector we know makes a point of saving every stamp that he finds with a cancellation perfectly centred on the stamp, as in the specimen illustrated on page 541.

Stamp Gossip

and Notes on New Issues

The Pitcairn Islands Issue

The long awaited Pitcairn Islands first issue is now available for illustration, and a selection from the designs is given on this page. Apart from its historic association with Captain Bligh and the mutineers of the *"Bounty,"* the series has many atrractive features that will ensure its popularity.

Full details of the various designs were given in the *"M.M."* in March last. One point of interest in connection with the set is that genuinely used specimens are likely to be rare, and readers who are fortunate enough to obtain them should hold them tightly. The normal mail bag from the Pitcairns is less than 10,000 letters a year.

Stamps and the Black-Out

It was recently estimated by a very keen business man in the stamp world that the number of collectors had increased by nearly 15 per cent. since the outbreak of war. This increase he attributed largely to the "black-out."

Undoubtedly very many people have found in stamps the ideal relaxation for the long winter hours, when air raid alarms and general living conditions imposed by the war have made it essential for all of us to find a healthy indoor occupation. Stamps have a peculiar quality of attracting the whole of our attention, to the exclusion of other things that may be happening around one, and for that reason provide the ideal relaxation from nervous strain.

There is another interesting effect of the war on stamps. Values are rising because there is a difficulty in meeting the demand for even the commoner varieties. Normally dealers import large quantities of stamps from abroad with which to make up packets. Such importations are now impossible, not because the importation of stamps is banned but because it is not permitted to send funds abroad to pay for them. Stocks are running down quickly and when they approach exhaustion prices must rise. Some part of the rise of course will be lost when the war is over, and normal imports are resumed, but it will not all disappear.

United States Artists Commemoratives

The latest stamps in the series illustrating famous Americans form the artists set, which appeared in September. Of the five values included two are shown here. One is the 2c. value, showing a portrait of James McNeill Whistler, and the other is the 3c., which depicts the famous sculptor Augustus Saint-Gaudens.

The next set to appear in this series will illustrate famous American inventors. These are as follows, the associated invention being given in each case: 1c. Eli Whitney, the cotton gin; 2c., Samuel F. B. Morse, the electric telegraph; 3c., Cyrus H. McCormick, the mechanical reaping machine; 5c., Elias Howe, the sewing machine; and 10c., Alexander Graham Bell, the telephone.

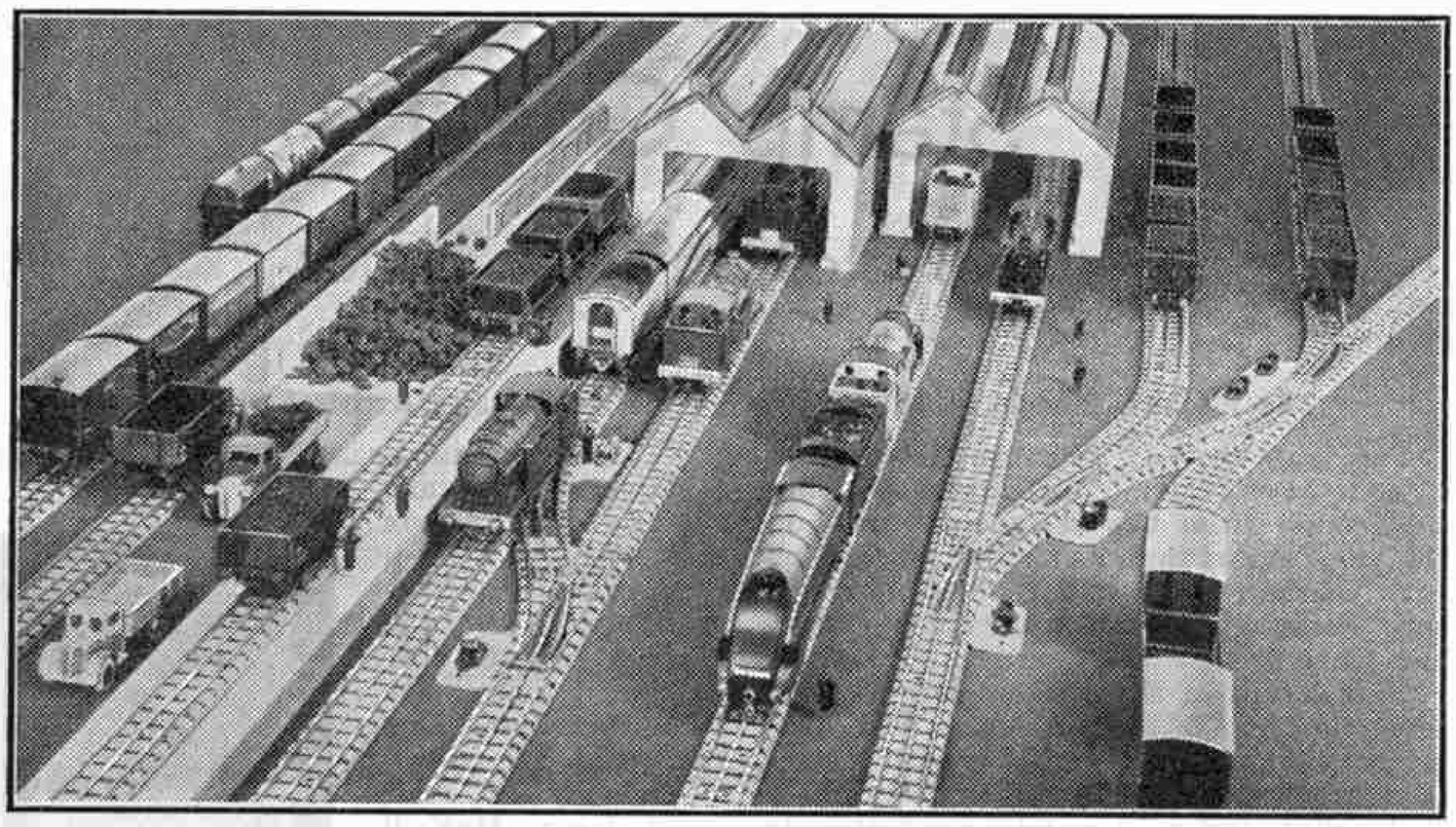
Another U.S. series for which readers should watch is the forthcoming Defence series. This will consist of three stamps featuring respectively allegorical designs for Industry and Agriculture (1c.), the Army and Navy (2c.), and Security, Education, Conservation and Health (3c.). The best design is that of the 2c., which shows a really remarkably fine picture of an anti-aircraft gun. This stamp is illustrated here. The 1c. value will show the Statue of Liberty and the 3c. the Torch of Progress.

Chile's Pan-American Union Jubilee Stamp

Chile, one of the last of the South American States to issue a stamp to commemorate the jubilee of the Pan-American Union, has now issued a single stamp. This is a 40 centavos value, bearing a design showing the Western Hemisphere with that portion of the Americas included in the Union.

The departure from the bunch of flags that has been so commonly adopted throughout South America for this commemoration is refreshing, but for all that the issue has not escaped criticism. Chile has limited the printing to 100,000 copies, a quantity far from sufficient to meet the demands of philatelists. Other Pan-American Union Jubilee stamps were referred to in our July issue.

We thank David Field Ltd., 7, Vigo St., London W.1, for their courtesy in loaning the stamps from which the illustrations for this page have been made.



Engine Sheds and a coal bank on a Hornby-Dublo layout. The elevated road serving the bank can also be used for "coaling" locomotives.

The Possibilities of Hornby-Dublo Railways

THIS month's article is devoted to a general description of the possibilities of the Hornby-Dublo System, with the special object of helping those who are hoping within the next few weeks to obtain their first Hornby-Dublo Train Set.

Hornby-Dublo Trains are made to run on rails having a gauge, or width apart, of ⅝ in. This is known as Gauge 00, and the scale employed for the various models is 4 mm. to the foot. The smallness of the scale allows the greatest possible realism to be obtained within a given space. This is a great advantage where space is limited, and even where there is plenty of room available a much more comprehensive system can be laid down with Gauge 00 components than is possible with the material of larger scales. Some idea of what can be done is given by a glance through the folder *"A Selection of Layouts for Hornby-Dublo Electrical Track,"* which can be obtained from any Meccano dealer. Here the largest layout requires a space of only 8 ft. by 4 ft.

Although both electric and clockwork locomotives are available in the Hornby-Dublo range, the former are the more popular, owing to the positive remote control that is possible with them. The speed of the locomotives can be delicately adjusted by the simple movement of the Controller handle. Reversing is not a matter of luck or even of judgment which way the engine will go; it is certain. Move the Controller handle to "Forward" and the engine goes forward; move it "Backward" and the engine goes backward—every time. This is a great advantage in train working, especially if there is any shunting to be done. The engine will always do as it is wanted, just as if there were a miniature driver on the footplate. There is in fact all the thrill of driving your own locomotive.

The realism of working is greatly increased by the fact that Hornby-Dublo Locomotives are such perfect miniatures of the real thing. Express work is dealt with by the splendid L.N.E.R. "Pacific" or 4–6–2 type engine, No. 4498 *"Sir Nigel Gresley,"* a beautiful reproduction of the real streamliners turned out of Doncaster works. Almost every external detail of the actual engine is incorporated in the model, and the tender is of the latest corridor type adopted for long runs. Engine and tender are finished in the attractive shade of blue adopted by the L.N.E.R. for their streamlined engines, and have a very smart appearance.

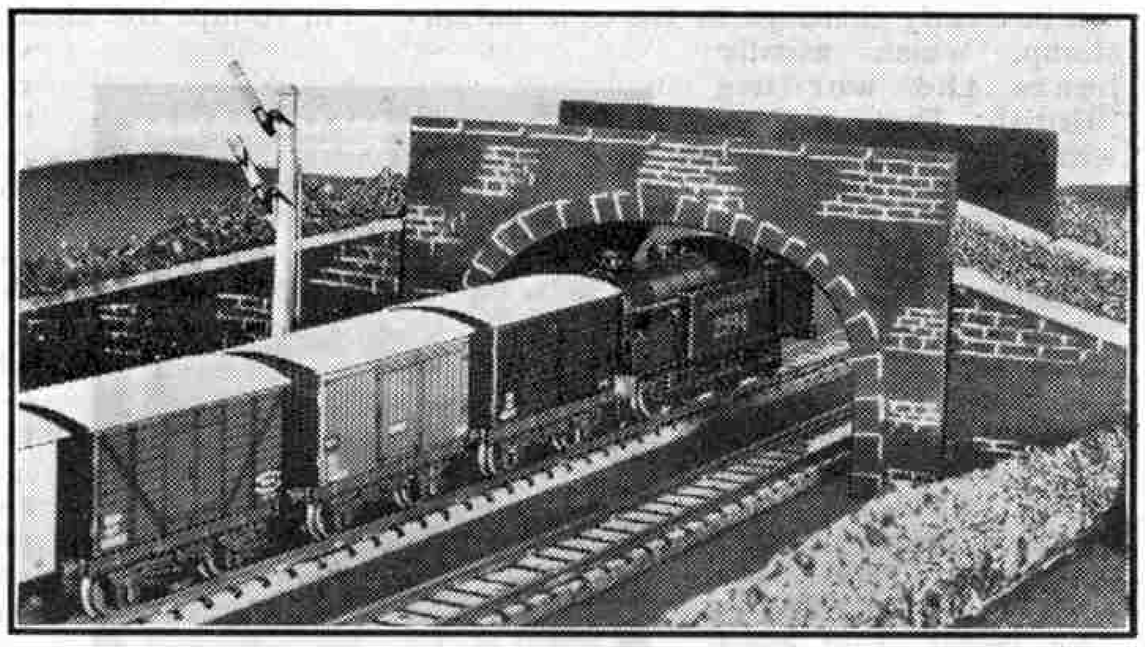
For the local traffic and miscellaneous working, both passenger and goods, there is a standard 0–6–2 Tank Locomotive of powerful and imposing appearance. This is available in the colours and style of each of the four main line railway companies. Special attention was devoted to the uses of the Dublo Tank Locomotive in the *"M.M."* last month, so that there is no need to say much more about it here.

With these two types of engines at his disposal the Hornby-Dublo railway owner has no difficulty in arranging realistic working schemes, and various instances of varied operations have been given in these pages from time to time. The motors fitted to the electrically-driven models are designed to give effective trouble-free service, and they will do so continuously provided that the simple instructions packed with each locomotive and train set are followed.

The Hornby-Dublo Clockwork Locomotives are just as effective in their own particular sphere. There is no remote control feature, but both brake and reversing gear for hand operation are provided on the engines. The levers controlling these movements project through the cab roof of the streamlined express engine, and are placed in the bunker of the Tank Locomotive.

Rolling stock in great variety is available and it is grand fun to make up different kinds of trains according to the traffic to be handled. The standard passenger train packed in the sets containing the streamlined express locomotive consists of a corridor Two-Coach Articulated Unit of the type widely used on the L.N.E.R. main line. In addition there is a separate Corridor Coach to run with the Articulated Unit. Each of these items follows the characteristic "East Coast" outline and finish, the familiar teak brown finish being well reproduced by means of the tinprinting process. Splendid express trains can be assembled with them and either separate Coaches or Articulated Units alone, or combinations of both types of vehicle can be used. Whatever arrangement is followed, the complete train, with the graceful streamlined Locomotive at its head, has a very handsome appearance.

The simplest combination of the two types of vehicle would be one Articulated Unit and a single Corridor Coach. The single Coach need not run all the way, but could be detached at an "intermediate stop" and run separately over the remainder of its journey in charge of a Tank Locomotive. It would then represent one of the numerous "through coaches" for various destinations that are such a



A van train hauled by a Hornby Dublo 0-6-2 Tank passing under a bridge. Hornby-Dublo clockwork engines run well and have brake and reversing gear.

feature of modern railway working. The Articulated Unit alone also can be pressed into service for local passenger work when required, for articulated trains are widely used on the L.N.E.R. for suburban traffic. Alternate journeys could be made with Express and Tank Locomotives respectively, and even such a simple variation as this is of great help in obtaining an air of realism in operation with the smallest amount of equipment.

Goods stock in the Hornby-Dublo System is most realistic and there is a good choice of vehicles of different kinds. Commencing at the rear end of the train, there is a true-to-type Brake Van in the style and colour of the latest vans on each of the four main line railways. These are splendid little vehicles, and incorporate, either in their die-cast bases or in the tinprint design of the bodywork, almost all the features that are characteristic of

the real stock that they represent.

The various Wagons and Vans, while similar in general outline, are made to represent many different types of stock by a variation in the tinprint design of each vehicle. The result is that freight trains of many kinds can be run, from general goods, coal trains and so on, to the most important express trains conveying perishable foodstuffs.

It is really great fun to make up any Hornby-Dublo train, either passenger or goods, because all Dublo stock is fitted with automatic couplings that engage on impact when the vehicles are pushed together by the engine. The Tank Locomotive and the tender of the express Locomotive, also are provided with these couplings, so that coupling-up "by hand" is quite unnecessary.

Added to the remote control that is afforded with electric railways, this automatic coupling makes for splendid realism in working. An express Locomotive can come backing down from the shed to the station where its train is already waiting, having been assembled previously perhaps by another engine. Gentle handling of the Controller is necessary as the rear of the tender draws nearer and nearer to the train; then with a "chink," as the couplings engage, the engine is coupled up to the train and ready to start away on a long journey.

Goods train marshalling, as the assembly of wagons into the required order in a train is known, is even more fascinating. A train can be made up without any of the items requiring to be touched by hand. The engine moves from road to road, picking up a wagon here and drawing it out, then pushing it up to others standing on another track. Coupling up is automatic and so the work goes on until the whole train is complete, the Brake Van is attached and the "engineman" waits for the signal to leave the yard for the main line. "Line clear" can be given automatically if the Signal governing the way out of the sidings is one of the latest electrically-operated type.

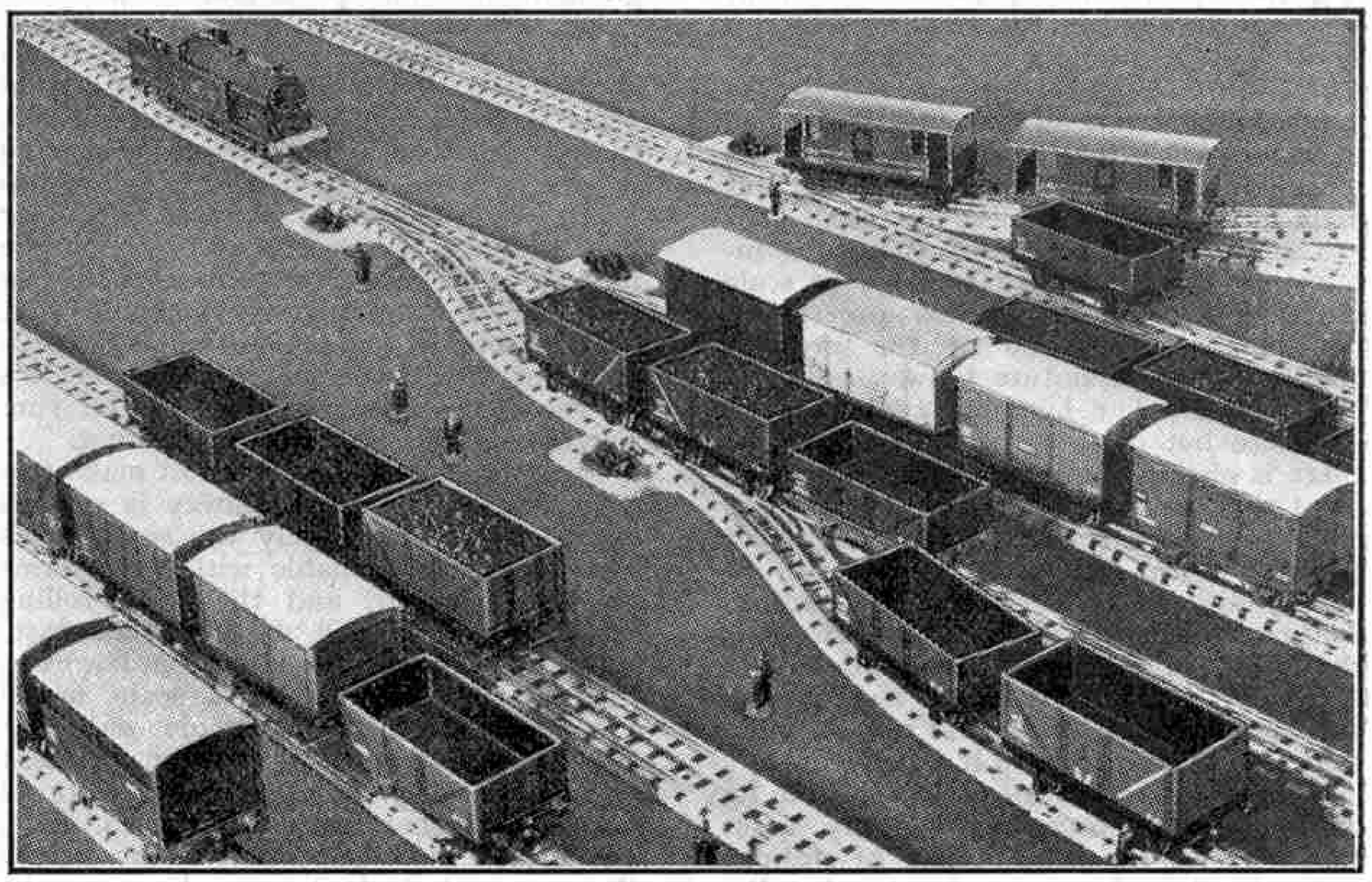
The Electrically-operated Signals are controlled by means of a special Switch D1, current for this purpose being obtained from the Dublo Transformers supplying the track. These Switches are so made that they can be assembled into groups very similar in general appearance to the lever frame in a modern signal cabin. This applies also to another type of Switch known as "D2." This Switch is intended to be used in conjunction with the special Isolating Rail that makes it possible to switch on or cut off the current from any section of the track as required. In this way we can have several engines on the track at the same time; one being at work on the main line, while others are held in sidings or in the engine shed according to the placing of the Isolating Rails.

This isolating feature, in conjunction with the electrical operation of Signals, added to the perfect control of the locomotives, makes a Hornby-Dublo layout ideal for realistic operations. The trains move exactly according to the wishes of the operator, the correct signals being made to work just as in real practice. There is scarcely a movement that cannot be carried out correctly when these features are in operation together. A great advantage, too, which adds to the realistic effect, is that the control apparatus, controller, and the "lever frames" consisting of groups of Switches D1 and D2, can all be placed "off the track."

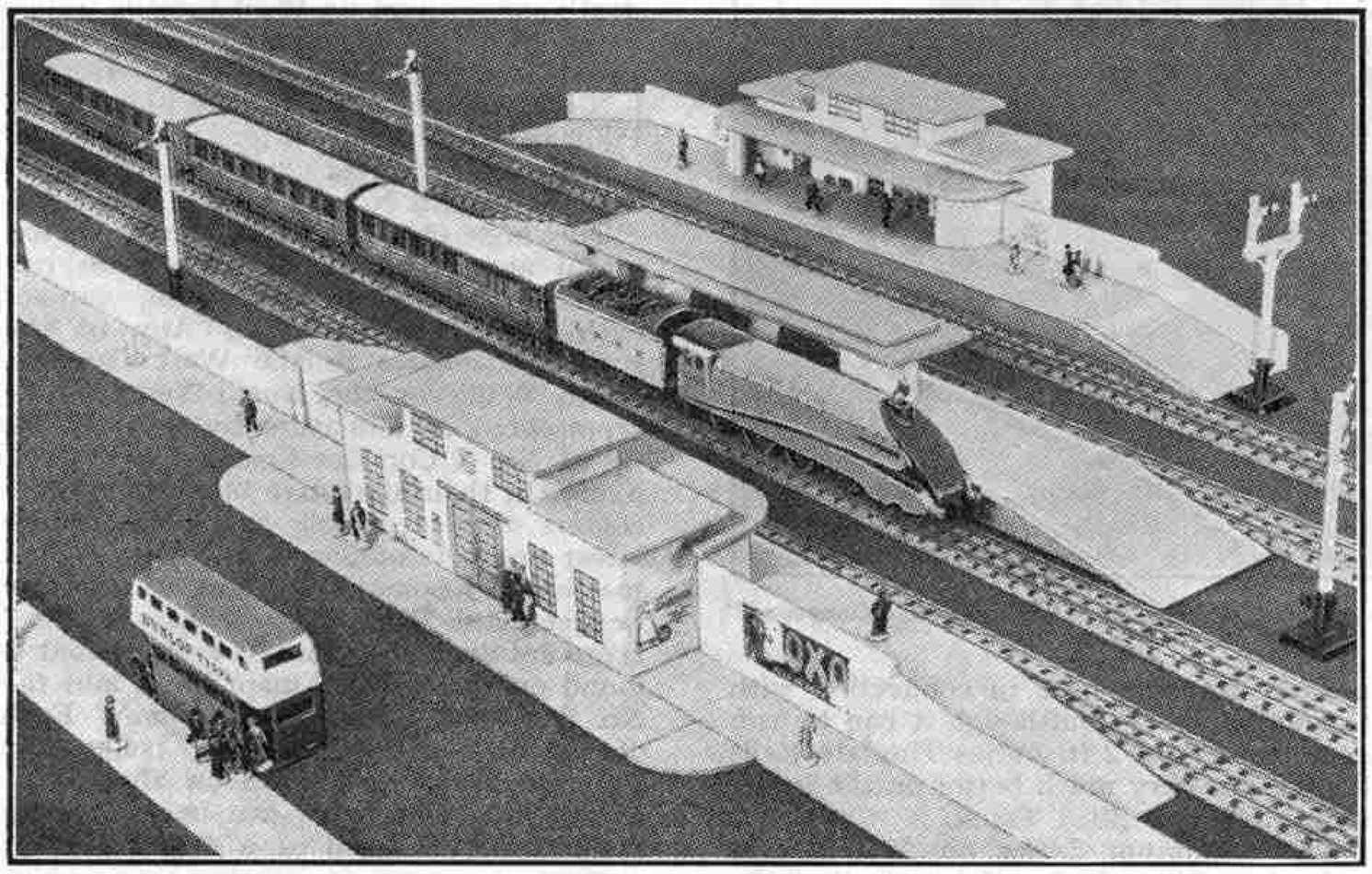
As a result the lineside effects on a Hornby-Dublo layout are not interfered with in the least by the presence of control apparatus, which can all be neatly accommodated on a control panel or switchboard away from the line. This greatly assists the effect of the various buildings and accessories, such as stations, signal cabins and engine sheds, all of which are represented in the Hornby-Dublo range. The buildings are all carried out in up-to-date styles to represent the reinforced concrete work largely used nowadays. The Main Line Station represents the normal type of passing station with its building centrally situated on the platform. It can be used alone on a single line system, or each side of the complete station on a double track layout can consist of the standard Main Line Station. Where more tracks are in use, Main Line Stations can be employed together with the Island Platform, which is made to match the other Stations in platform length and general style. The effect of the two types together is very striking.

A new note is struck in what is known as the City Station Outfit. This does not consist of a complete station in one piece, but of a number of separate components, platforms, main building, side walls and all-over roof that can be arranged in several different ways. Thus the parts can be assembled as a terminal station, for correct buffer stop sections are included; or on the other hand by a rearrangement of the parts a main line station of the junction type can be made up. In addition minor variations are possible, as the articles and photographs that have appeared in the "*M.M.*" have shown. Goods traffic is catered for by the Goods Station, which has the usual warehouse and office building situated on the raised loading "bank." The Signal Cabin, too, is a splendid little model of the medium signal cabin of real practice.

Hornby-Dublo Locomotives are housed in the realistic Engine Shed, which is arranged to fit over a double line of rails.



Shunting in progress in a miniature marshalling yard. The high and low-sided Wagons and the various Vans are representative of the selection of stock in the Hornby-Dublo range.



An important passing station made up of two standard Main Line Stations with an Island Platform serving the two centre tracks.

Hornby Trains and Gauge 0 Railways

MANY years of constant development have resulted in the Hornby Gauge 0 Train System reaching its present stage of perfection. The System now offers the model railwayman an amazing variety of material, with which miniature layouts representing the practice of any of the four main line companies can be operated.

The growth of a layout is always interesting, no matter what gauge or scale is employed. It is in this process of development that one of the greatest charms of the miniature railway hobby is to be found. The layout may be always complete but is never really finished, for there is always some addition or improvement that can be carried out. So the plain circle or oval track with which most layouts begin can be extended almost indefinitely. Points, crossings and sidings can be added, and with these additions the train services can be developed accordingly. Further rolling stock will be necessary and the increased traffic will require more locomotives to deal with it.

With the extension of the track from its original simple form there usually arises the need for the introduction of stations and other lineside equipment, so that the layout passes from the stage of being a mere track and begins to have something of the appearance of a real railway. Station layout in fact forms quite an interesting part of miniature railway work, and a great deal of enjoyment can be had from the development of a station in a realistic manner. Not only passenger but goods traffic also has to be allowed for. This means siding accommodation and perhaps a goods platform: and possibly an engine shed and carriage sidings will have to be provided in addition. Then there are such items as loading gauge, signals and a signal cabin that are also connected with the running of the trains; and finally the accessories that help to provide a setting for the line, such as tunnels, footbridges, fencing, telegraph poles, lineside posters, gradient and mile posts and so on.

By the time these items are provided the mere haphazard running of the trains as first practised is usually a thing of the past. If not actual working to timetable, there is usually a definite operating scheme in use with the idea of providing appropriate train services for the particular line involved. It is in this respect that the user of Hornby Train material is so fortunate, for the variety of engines and rolling stock at his disposal allows practically any of the principal standard services of the main line companies to be run. Let us consider passenger trains first.

Generally speaking it does not make any difference whether the railway is electric or clockwork; practically the same types of engines are available with both forms of motive power, and the same rolling stock of course will do in either case. There is one important exception, however; the splendid L.M.S. 4-6-2 scale model *"Princess Elizabeth"* is made only for electric operation. With this magnificent locomotive and the attractive No. 2 Corridor Coaches finished in L.M.S. style, any of the more important trains on the Western and Scottish main lines can be represented. Originally these engines worked between Euston and Scotland, but with the extension of their operation to Liverpool, and more recently to Manchester and now to Holyhead, there is greater scope in miniature for the reproduction of the actual services on which they are used. On such heavy trains as these now commonly run on the routes just mentioned the hauling power of the Hornby *"Princess"* is invaluable. An important point to note in connection with this engine is that although it can be run on the standard 2 ft. radius Tinplate Rails it performs very much better on the larger radius Hornby Steel Track.

For maximum duties on 2 ft. radius railways, either clockwork or electric, the No. 3 type of Locomotive gives good service. This is made to represent a famous type of engine of each group, so that the bulk of the heavier duties on tinplate lines can be handled by No. 3 Locomotives, supplemented perhaps by the well-known No. 2 Specials.

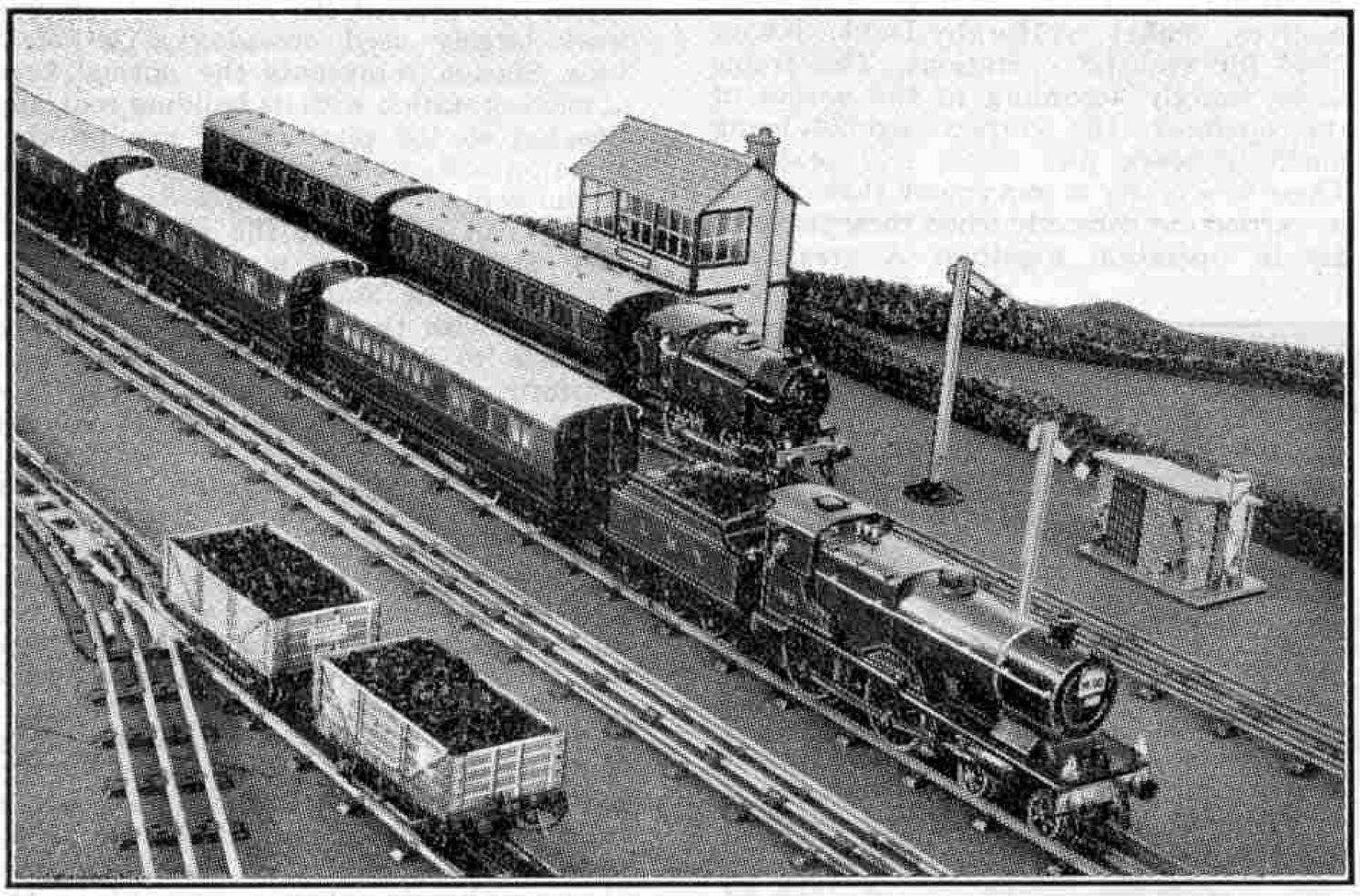
The L.M.S. No. 3 Locomotive bears the name *"Royal Scot"* and can be employed very well for any of the duties performed by these engines in actual practice. For an L.M.S. electrically-operated railway the *"Royal Scot"* makes a very good "second string" to the larger and more powerful *"Princess Elizabeth."* More attractive perhaps as a model, in view of its true-to-type character, is the No. 2 Special type of Locomotive, the L.M.S. prototype represented being the familiar "Standard Compound." The engines are specially identified with the Midland Division and so are specially favoured by those who base their operating schemes based on the services of that section of the L.M.S. The "Compounds" are used extensively on practically all sections of the L.M.S., however, so that the model can be employed quite correctly whether Midland, Western, Central or Scottish activities are followed in miniature.

L.N.E.R. standard services, with trains composed of teak-finished, tinprinted No. 2 Corridor stock, can be run by the No. 3 *"Flying Scotsman"* Locomotive, or the popular No. 2 Special "Hunt" class engine that bears the name *"The Bramham Moor."* Engines of the latter class are found chiefly in the North Eastern and Scottish Areas of the L.N.E.R., but in miniature their field of activity can be extended if necessary as the model "Hunt" is such a good representation of standard L.N.E.R. practice. The *"Flying Scotsman,"* on the other hand, like the L.M.S. Standard Compound, can be widely employed, for the real engines of this class have penetrated far from their original "native heath."

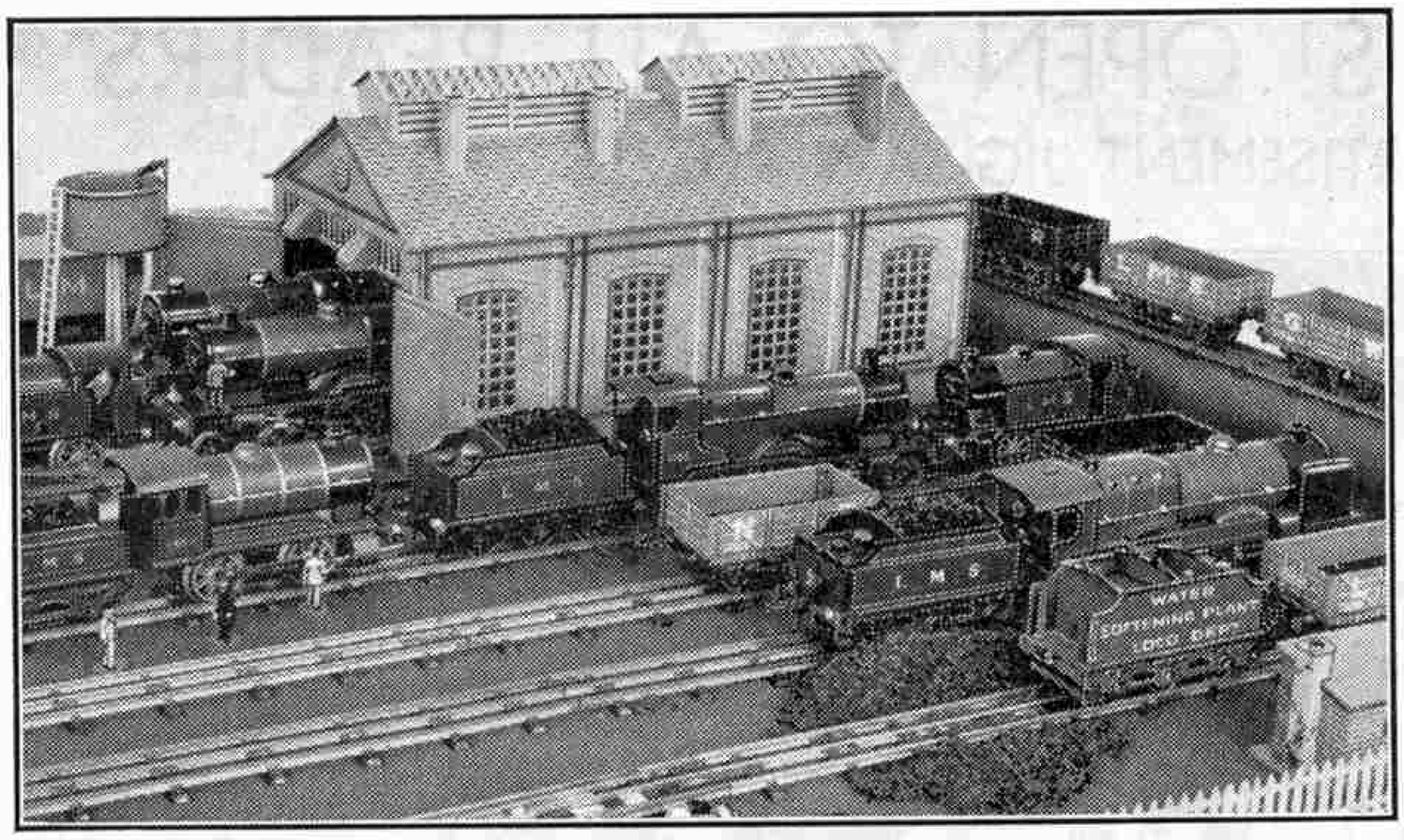
In dealing with L.N.E.R. operated trains the "Pullman" services such as the *"West Riding Pullman"* and the *"Queen of Scots"* remind us that the Hornby No. 2 Special Pullmans are splendid replicas of the all-steel vehicles used on these famous trains. Pleasing variety therefore can be introduced into the workings on a Hornby L.N.E.R. system, the brown and cream Pullmans making an interesting contrast to the more sober yet very attractive teak-brown standard No. 2 Corridor Coaches.

The high character and attractive external appearance of G.W.R. trains can be reproduced in a fascinating manner with Hornby components. Any of the standard services to the West Country, South Wales or the North-West can be represented in miniature by trains made up of No. 2 Corridor Coaches in G.W.R. livery. In their attractive "tea and cream" colours they resemble very closely the latest products of Swindon Works. In the matter of locomotives there is a choice between the No. 3 *"Caerphilly Castle,"* representative of a class of engines that is found on the G.W.R. main lines, and the No. 2 Special *"County of Bedford."* Each of these has the domeless boiler and Belpaire fire-box standard on all G.W.R. big engines, and either can be used quite fittingly at the head of a model G.W.R. express.

Southern enthusiasts have quite a good



A special "through train" of S.R. No. 2 Corridor Coaches in charge of an L.M.S. E220 Special "Standard Compound." It is overtaking a tank-hauled "local" running on an adjacent track.



A realistic locomotive depot on a Hornby layout showing various engines "at home." The Hornby Engine Sheds, such as the one shown here, are excellent and useful Accessories.

choice of locomotives for their principal trains. There is the No. 4 type engine *"Eton,"* modelled after the first of the "Schools" class, which are specially associated with Kent Coast duties and more recently with extraordinary performances on the Bournemouth line.

Then there is the No. 3 type engine *"Lord Nelson,"* representing the biggest passenger engines in use on the S.R. They are now kept almost exclusively on the Western Section from Waterloo, but in pre-war times they were to be found on such famous trains as the *"Golden Arrow"* and the *"Ferry Boat Train"* in and out of Victoria. The remaining "first link" S.R. engine in the Hornby range is the No. 2 Special No. 1759, modelled on the familiar "L1" class 4–4–0s long famous on the run to Folkestone.

Hornby No. 2 Corridor Coaches in S.R. style make up into splendid trains suitable for either of the three types of engines just dealt with. In addition the Hornby No. 2 Special Pullman can again be used when an all-Pullman *"Golden Arrow"* or *"Bournemouth Belle"* is to be run. Alternatively a single Pullman can be included in a train consisting otherwise of S.R. stock, this being a favourite practice on the S.R. and one that will add to the interest and attraction of Southern services in miniature.

Suburban train practice is well represented by the No. 2 Special Tank type of Locomotive and the No. 2 compartment type Coaches introduced to run with it. These components can be used to represent almost any of the more important business and residential suburban services. They can be supplemented too, for general traffic, by the smaller and simpler items in the Series. Being of standard designs and coloured to represent the finish adopted by each big company, the descriptions given in the Hornby catalogues is sufficient for them. They are of course all very useful and quite effective in sharing the working of a Hornby layout.

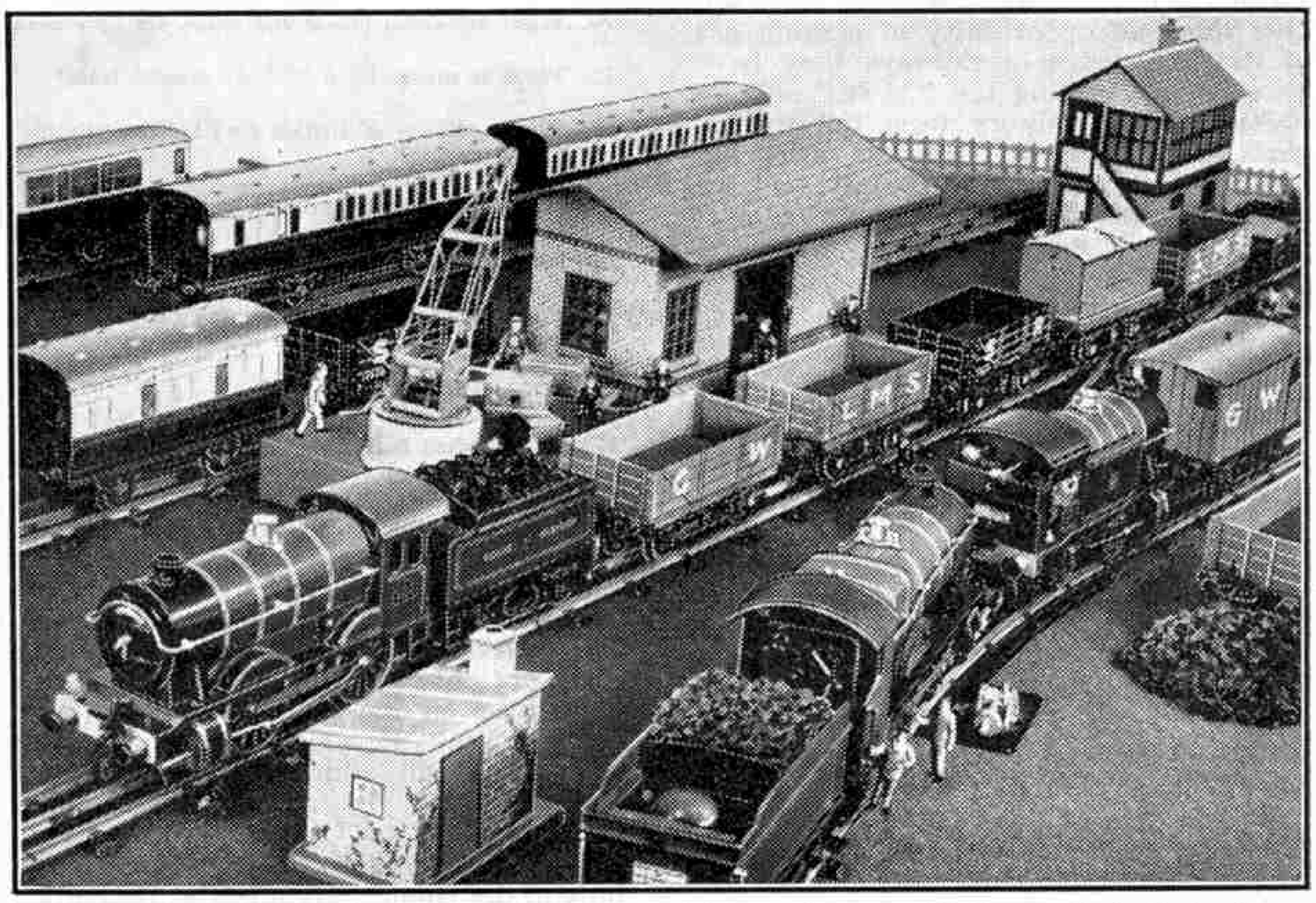
One great point about the miniature railway hobby is that running a railway is not necessarily a "one-man" affair. Frequently several owners of Hornby material combine their stocks and carry out operations together on the one track; this form of working of course reaches its greatest development in the running activities of H.R.C. Branches. When a joint line of this kind is worked it often happens that the engines and stock of more than one company are represented. In that case "through services" and the use of "running powers," or the modelling of the operation of an actual joint system become the rule. Some very interesting developments are possible in this way and either real or imaginary through services can be run.

As indicated previously there is a very good choice of Hornby Locomotives both for electric and for clockwork railways. Each form of motive power has its particular advantages and of course its keen supporters. Where mains alternating current is available this can be employed to provide power for an electric Hornby railway through the medium of a Meccano Transformer. This forms an efficient and perfectly safe method of reducing the mains current to the value required for operating the locomotives. There are two voltage systems in use for Hornby Electric Locomotives, the 20-volt and the 6-volt respectively. Where alternating current is available and a Transformer can be used, the 20-volt system should always be adopted. It is more efficient electrically, and there is the great advantage that the larger 20-volt Locomotives are provided with automatic reversing mechanism. This affords complete remote control, reversing being effected by switching off the current and switching it on again by means of the speed regulator handle of the Transformer. Where the Transformer in use is of a kind that has no speed regulator incorporated, reversing is effected by means of the Resistance Controller.

Where the mains supply is Direct Current, or there is no supply at all, accumulators must be used, and then the 6-volt system should be adopted. Hornby 6-volt Locomotives, like the smaller 20-volt engines, are reversed by the hand operation of a lever in the cab.

Hornby Clockwork Locomotives have a reputation all their own for pulling power, length of run and reliability. Provided that the simple instructions packed with every Hornby Locomotive and Train Set are carried out, they will last for years with reasonable usage. Excessive oiling should be avoided, for the surplus oil finds its way all over the engine and encourages dust to settle, with consequent loss of appearance and, what is more important, loss of efficiency through clogging of the mechanisms and working parts. In addition oil finds its way over the wheels to the track and causes trouble through slipping.

All Hornby Clockwork Locomotives are fitted with brake gear that can be operated by hand from the cab lever, or if preferred by means of a suitable Brake Rail. A Brake Rail is a piece of track peculiar to clockwork systems. It consists of an ordinary length of rail to which is fitted a movable catch. When set for braking, the catch engages with a "trip" forming part of the engine mechanism, and when this happens the brake is applied and the train is pulled up. Some rails of this kind are also fitted with similar means for reversing Hornby Clockwork Locomotives and it is important that the correct Brake or Brake and Reverse Rail should be used for the particular locomotive (*Continued on page 550*)



A busy Goods Platform staffed effectively by Dinky Toys miniature railwaymen. The Locomotive in the foreground is an excellent example of Hornby motive power representing G.W.R. practice.

COMPETITIONS! OPEN TO ALL READERS

ADVERTISEMENT JIG-SAW PUZZLE

This month's contest is of a kind that readers enjoy thoroughly. The illustration on this page is a Jig-Saw built up of fragments of advertisements appearing in this issue, and we want competitors to track down the origin of these. Some of the fragments will be easy to trace, but others will require keen eyes. Certain advertisements are represented more than once, and some of the fragments may be placed sideways or even inverted. Yet everything is fair, and readers no doubt will be equal to the interesting problem set them.

In order to identify each fragment readers are asked to give the name of the advertiser and the page number of the advertisement from which it is taken. There will be prizes of Meccano products to the value of 21/–, 15/–, 10/6 and 5/– respectively for the senders of the four most correct lists in order of merit, and consolation prizes also will be awarded, so that everybody will have a good chance of winning a prize. If necessary the neatness and novelty of entries will be taken into consideration. There will be prizes of equal value in the Overseas section.

All entries must be addressed to *"Jig-Saw Advertisement Contest,"* Meccano Magazine, Binns Road, Liverpool 13. The closing date in the Home section is Wednesday, 18th December. This early date has been chosen so that winners can be informed in time to allow them to choose their prizes for despatch to reach them on Christmas Day. The Overseas section closing date is 31st March, 1941.

HORNBY RAILWAY CONTESTS

A Railway Questions Competition

Here is a competition that will be very attractive to all H.R.C. members, as it will give them an opportunity of making use of the knowledge of railways they have obtained by reading the *"M.M."* and by observation or enquiry from railway experts. Other *"M.M."* readers also will enjoy taking part in the contest, and we add the reminder that every *"M.M."* competition is now open to all who wish to take part.

1. **What is indicated by a diamond-shaped sign on a signal post?**
2. **What is meant by the letters "NP" on railway wagons?**
3. **Which railway had the first dining-car, and at what date?**
4. **What does a broad red stripe painted on a tank wagon mean?**
5. **Which railway had the first corridor train?**
6. **What is the largest locomotive class in Britain, from the numerical point of view?**
7. **Which pre-group railways had no 4-6-0 type locomotives?**
8. **Which railway has a series of engines named after well-known British aircraft?**
9. **What is a "Tommy Dodd"?**
10. **What are catch points and when are they used?**
11. **What is meant by a "fitted" freight train?**
12. **Which railway in Britain first built a "Pacific" tender engine?**
13. **What is meant by an "insulated" van?**
14. **What company owns the Forth Bridge?**
15. **What wheel arrangement is the "Atlantic" and on what British railways is it used now?**
16. **What is a slip coach?**
17. **Who devised the screw coupling?**

There are the usual two sections in the contest, Home and Overseas, and in each there will be three prizes consisting of Meccano or Hornby Train products to the value of 21/–, 15/– and 10/6 respectively, in addition to consolation prizes. The complete answers to the questions should be written on one side of the paper only, on the back of which the competitor's name and full address must be given. Entries should be addressed *"December Questions Contest,"* Meccano Magazine, Binns Road, Liverpool 13." The closing date in the Home section is 31st December, and that in the Overseas section is 31st March, 1941.

Christmas Drawing Contest

We are sure that readers, whatever their interests, will enjoy a drawing contest this month. Every reader is invited to take part in this, and any subject whatever can be chosen, so that representations of Christmas scenes, favourite locomotives or motor cars, views on road or railway, and even humorous sketches can be submitted. Paintings as well as drawings in pencil or ink are eligible, but the prizes will be awarded on drawing merits and originality. Those who cannot make use of colour therefore should not hesitate to send in their entries, and each competitor may send in as many drawings as he wishes.

There will be two sections in the contest, "A" for readers aged 16 and over and "B" for readers under 16. In each section there will be prizes of Meccano products to the value of 21/– and 10/6 respectively. There will be similar prizes in a special section for Overseas readers.

Each competitor must write his name, address and age on the back of his entry, and this should be addressed *"Christmas Drawing Contest*, Meccano Magazine, Binns Road, Liverpool 13." The closing date for home entries is 31st December, and for overseas entries 31st March, 1941.

Successful entries become the property of Meccano Limited. Unsuccessful entries will be returned if stamped addressed envelopes are forwarded with them.

FIRESIDE FUN

HE WON

Murphy, who was the local athletic champion, had been holding forth at great length. Presently, one of the bored listeners said: "I'll bet I can wheel something in a wheelbarrow from one street lamp to the next, and you can't wheel it back!"

Murphy looked him over—not a very hefty sort of fellow. He thought of bags of cement, bricks and old iron, and concluded that whatever the man could do he could better.

"Taken," he said.

The challenger smiled, and with a couple of witnesses they set out. A wheelbarrow was borrowed and taken to the nearest street lamp.

The challenger rubbed his hands, picked up the handles. "Get in, Murphy, old man," he said.

* * * *

WHY IT DID NOT FIT

Captain (to recruit struggling into his new uniform): "Pull yourself together. Don't you know you're wearing the King's uniform?"

Recruit: "Oh, that's it, I knew it wasn't meant for me."

* * * *

The Bore: "Yes, I am a thought-reader, too! I can tell exactly what a person is thinking."

Fed-up: "In that case, I beg your pardon."

* * * *

A water-cover blew off its seating in a city street, and an upward shower of water gave passers-by a spectacular sight.

"Oh! is it an air raid?" a startled old lady enquired.

"No, mum!" replied a tough old fellow in overalls. "It must be a submarine attack!"

* * * *

"A man wants to see you, mother," shouted little Johnny from the front door.

"Ask who he is" said his mother.

Johnny returned to the kitchen with an awe-stricken look.

"He's just like a man, mother," he whispered, "but he says he's an insanitary spectre."

* * * *

"Have you ever appeared as a witness before?"

"Yes, your honour."

"In what suit?"

"My blue serge."

* * * *

Whenever the Vicar was doing a little job of carpentry, the small evacuee kept close at his heels, trotting after him.

"Well, my little man," said the Vicar at last, "are you trying to learn a few tricks of the trade?"

"No" was the reply, "I'm waiting to hear what a parson says when he hits his thumb with a hammer."

* * * *

Father (reprovingly): "Do you know what happens to liars when they die?"

Johnny: "Yes, sir. They lie still."

A GOOD TIME HAD BY ALL

Willie: "Did you have a good time at the picnic?"

Jimmie: "Fine! Tommie got into a wasps' nest, father fell out of a tree when he was putting up a hammock, and Mary got chased by a bull."

* * * *

An officer asked for volunteers to go over the top, and promised a pound for every prisoner brought in. Three Tommies took on the job, but after creeping about and seeing no signs of the enemy, settled down in a shell-hole to wait. Suddenly one of them popped his head over the top. Then he said in an excited whisper: "Don't look now, but there's about £30,000 coming this way!"

* * * *

First Old Lady: "I hear that the Germans are going to bomb the Empire."

Second Old Lady: "That doesn't worry me. I always go to the Plaza."

* * * *

Sergeant: "Jones! Where is that new recruit?"

Private Jones: "He tried to sew a button on with gun-cotton."

* * * *

"That's a nice umbrella you've got."

"Yes, shall I tell you how I got it? I was walking home in the rain and saw a young man going my way with an umbrella. I thought I would ask him if he would let me share it with him, so I went up in a friendly way, and said, 'Where did you get that umbrella?' And he threw it down and ran off as fast as he could."

* * * *

"What should I take if I am run down, doctor?"

"The number of the car, of course!"

* * * *

"I haven't seen the professor recently. Have you heard anything of him, he was such a clever man?"

"Well, the last time I saw him he was swimming, and suddenly called out, 'I'm thinking, I'm thinking'."

"You ass! Don't you know the professor had a lisp!"

* * * *

An officer on board a battleship was drilling his men.

"I want every man to lie on his back, put his legs in the air, and move them as if he were riding a bicycle," he explained. "Now begin!"

After a short effort, one of the men stopped.

"Why have you stopped, Cassidy?" asked the officer.

"If you plaze, sor," was the reply, "Oi'm coastin'."

* * * *

An American travelling through Scotland was impressed by an imposing statue. "Who is that," he asked an old Scot.

"That," said the loyal Caledonian, drawing himself up proudly, "is a monument to the memory of Wallace."

"Ah," said the Yank. "Good old Edgar!"

* * * *

The young boxer staggered into his corner after a terrific hammering. "Am I doing him any damage?" he asked.

Disgusted Second: "No, but keep on swinging your fists about, the draught might give him a cold."

* * * *

QUITE SO!

Mistress: "What are you doing there?"
Burglar: "I'm at your service, Madam!"

SIMILARLY AFFECTED

Mother: "Willie, was it a bad accident when you and the other boy ran into each other on your bicycles?"

Willie: "Well, he was knocked speechless and my bike was knocked spokeless."

* * * *

A builder, when returning thanks to those who drank his health, modestly observed that he was "more fitted for the scaffold than for public speaking."

* * * *

THE SQUEEZE

Reporter: "Can you find me a seat?—the Press."
Verger: "I'm afraid not, sir—the squash."

* * * *

"Mother," said little Tommy, "am I made of dust?"

"Yes, dear."

"Then why don't I turn into mud when I take a drink?"

* * * *

Mrs. Jones: "There! Broke my looking-glass. Now I suppose I shall have seven years' bad luck?"

Mrs. Brown: "Don't you believe it, Mrs. Jones! A friend of mine broke hers, and she didn't have seven years' bad luck. She was killed in an explosion next day!"

* * * *

Lieutenant (roaring with rage): "Who told you to put those flowers on the table?"

Steward: "The Commander, sir."

Lieutenant: "Pretty, aren't they?"

* * * *

Bank Clerk: "Sorry, madam, but your account is already quite a bit overdrawn."

Lady: "Well, suppose it is? Haven't I a right to do what I please with my own account?"

* * * *

"I hear they've taken the early morning bus off your line. Do you miss it much?"

"Not since they took it off."

* * * *

Actor: "Yes, usually my audiences are glued to their seats."

Friend: "What a quaint way of keeping them there."

* * * *

"Julius Caesar," wrote the small boy, "was renowned for his great strength. He is said to have thrown a bridge across the Tiber."

* * * *

Junior: "The mouth organ you gave me was the best present I ever got."

Uncle: "I'm glad to hear that."

Junior: "Yes, mother gives me sixpence a week not to play it."

* * * *

Owner of yacht: "Well you can have the position as deckhand, my man, but you would not have got it if I had any choice. Fancy coming after a situation with a dirty collar, a torn coat and a black eye!"

Deckhand: "That's nuffink; you should ha' seen the other three blokes what was arter the job!"

* * * *

Teacher: "Philip, why were you late to school this morning?"

Philip: "I think I must have over-washed myself."

* * * *

"I wish you would pay a little attention to what I am saying," roared the exasperated barrister to a stubborn witness.

"Well," was the calm reply, "I'm already paying as little as I can."

* * * *

The grocer and his wife were discussing the costumes they were to wear at a fancy-dress ball. Joan, aged seven, was an interested listener.

"Mother," she said, "can I go as a milkmaid?"

"No, dear, you're too small."

"Well, can I go as a condensed milkmaid?"

* * * *

THIS MONTH'S HOWLER

A coroner is the man that plays the coronet at bankwets.

Hornby Trains and Gauge O Railways

(*Continued from page 547*)

employed. The MB9 Brake Rail, for instance, can only be used in conjunction with the M0, No. 0 Streamlined and No. 0 "*Silver Link*" Locomotives. The M1, M3 and No. 0 Locomotives are braked by the BB1 Straight Brake Rail, but their reversing gear can only be operated by hand from the cab. No. 1 Locomotives, both tender and tank types, are braked or reversed by the AB2 Curved Brake Rail, while the larger engines still, No. 1 and No. 2 Specials, No. 3C and No. 4C types, require the BBR1 Brake and Reverse Rail.

The regularity of the running of Hornby spring-driven locomotives gives special point to the phrase "like clockwork," and this feature makes the clockwork engine of special value for timetable working. This is taken advantage of by many miniature railway owners who specialise in this form of operation. It is great fun to run a fairly large layout to a prearranged timetable, carefully worked out to suit the engines available.

There is a very big selection of Hornby Wagons and Vans for all kinds of freight traffic. To deal with them thoroughly would require a series of several articles in order that the design and purpose of the different kinds should be appreciated. We hope to do something in this direction in future issues of the "*M.M.*", so that those commencing the hobby now and intending to add to their rolling stock shall have a guide to assist them in their purchases. Similarly the subject of Accessories is a wide one, and we hope to deal with this likewise during the coming year.

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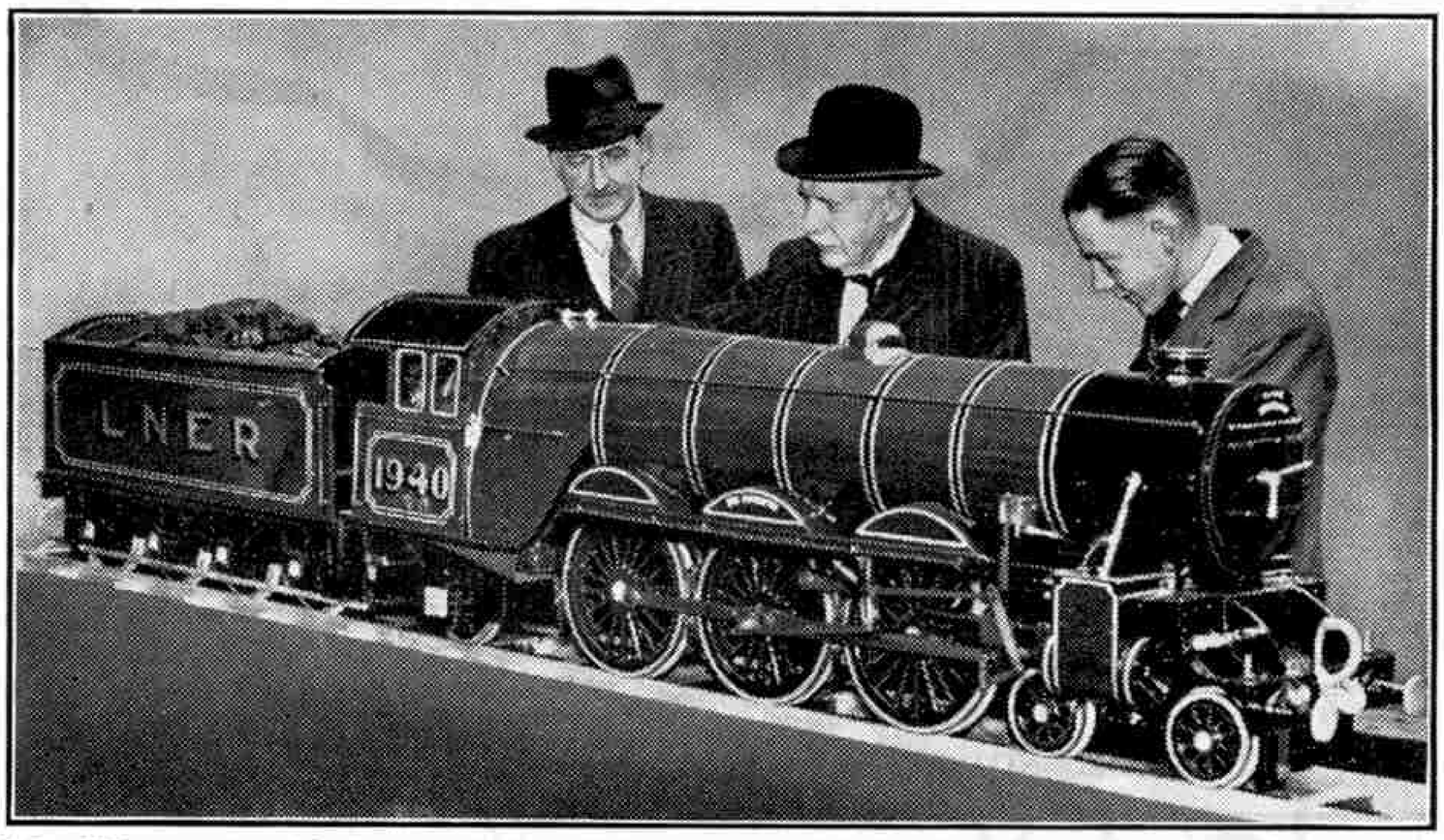
A Fine Locomotive Model

The splendid working model of an L.N.E.R. "Pacific" locomotive illustrated on this page was constructed by Mr. E. Dove, Sherwood, Nottingham. The model is designed to work on track of 7¼ in. gauge and is 10 ft. long, weighing 14 cwt. in full working order. Its boiler holds two gallons of water, and the tender provides storage for a further four and a half gallons. Coal is burned in the fire-box and the working pressure is 100 lb. per sq. in.



A fine 7¼ in. gauge working model of an L.N.E.R. "Pacific" built by Mr. E. Dove, Nottingham. Mr. Dove, on the left of our illustration, is seen demonstrating the model to Councillor Wallis Burch, Lord Mayor of Nottingham. Photograph by courtesy of the "Nottingham Journal."

Mr. Dove spent nine years in the construction of the model. Since its completion in April of this year it has been displayed in Nottingham and Glasgow, where it has attracted large crowds and has been instrumental in raising substantial sums for various Comforts for the Troops funds. In our illustration Mr. Dove is seen with the Lord Mayor of Nottingham, who was greatly interested in the model when it was on show in that city.

The builder of this splendid model is also a Hornby Train enthusiast. With his son, who also is seen in our photograph, he operates an electric railway that took seven years to construct and build up to its present proportions.

Identifying British and German Aeroplanes

Air warfare has brought out the need for ability to recognise military aircraft of all kinds as soon as they can be seen, and a splendid way of learning the characteristics of British and German fighters and bombers is to play the interesting and exciting card game "*War Planes.*" For this a special set of 67 playing cards is provided. Each card carries an illustration of one of these aeroplanes, with a description of its recognisable features, and the game itself is designed to encourage owners to become familiar with these features, and so help them to recognise the aircraft themselves.

The cards are obtainable from Temple Press Ltd., Bowling Green Lane, London, E.C.1. In each set 52 cards bear the ordinary playing card symbols, so that all ordinary cards game can be played with them.

Another product of Temple Press Ltd. that is almost indispensable to the modern boy is "*Aircraft Identification,*" issued in two Parts, 2/- each. Part One deals with British and German fighters and bombers, and Part Two with troop carriers and seaplanes, and British training machines. Altogether 61 machines are described, and for each there are five detailed and accurate silhouette drawings and four comparative photographs. These enable the possessor of the book to learn not only the details of each aircraft, but also its general appearance in a variety of attitudes, so that each can eventually be recognised almost at a glance. The types chosen for illustration are those most likely to be seen over the British Isles and the surrounding seas, and the booklets meet practically every requirement of the spotter.

"*Aeroplane Recognition Tests,*" Parts 1 and 2, two further booklets issued by Temple Press Ltd. provide excellent practice in spotting by giving photographs of machines in actual flight for recognition by the reader. These have been taken from distances and angles that are representative of conditions on active service. The price of each of these booklets is 6d.

Chemistry as a Hobby

Chemical experiments make a splendid hobby for the winter evenings, as many of great interest can be performed with very simple apparatus. Whether they wish merely to dabble in this fascinating science, or to carry out serious analysis and research, all who are interested will find full details of a splendid range of apparatus and chemicals in the catalogue published by our advertisers A. N. Beck and Sons, 60 Stoke Newington High Street, London N.16. This gives particulars of complete outfits at prices to suit all requirements, from those of the beginner to those of the advanced experimenter, and in it are lists of many articles that can be purchased singly as required. A copy of the catalogue will be sent to any reader who writes to A. N. Beck and Sons, mentioning the "*M.M.*"

"Frog" Model Aeroplanes

Every reader of the "*M.M.*" is intensely interested in aeroplanes, and in scale models of fighters, bombers and other types of machines. The "Frog" model aircraft marketed by our advertisers Lines Bros. Ltd. cover every requirements of the model enthusiast, from models already made-up to kits of parts for their construction. The factory in which these models are produced is claimed to be the only one in the world where flying scale model aeroplanes are made on a mass production basis.

The original "Frog" flying scale models have long been popular and continue to delight their owners by their accuracy and flying powers. The "Frog" Senior Series includes kits to build a range of British, French and German military aircraft models. The parts are carefully printed on balsa and tycoon tissue is provided for covering, with a supply of quick-drying cement. Every detail is clearly worked out and full scale drawings make the kits complete. This applies also to the "Penguin" non-flying scale models, which can be supplied as made-up models or in kit form, and are so much like the real thing that it is difficult to distinguish a photograph of one from a picture of the actual aeroplane.

Full details of this range of aeroplane models is given in the "Frog" model aircraft catalogue. A copy of this will be sent to any reader who applies to Lines Bros. Ltd., Tri-ang Works, Morden Road, Merton, London S.W.19, mentioning the "*M.M.*"

Skybirds Eighth Annual Model Rally

Now is the time for aircraft modellers to prepare their entries for the 1941 "Skybirds" Rally, which will take place next March. The following "Skybird" models are eligible: Messerschmitt Me. 109, Hampden, Dornier Do. 17, Henley, Defiant and any model subsequently introduced in the series.

Further details of the Rally will be available by 1st January 1941, and readers interested should make application to "Skybirds," 3, Aldermanbury Avenue, London E.C.2.

THE MECCANO MAGAZINE

R·A·F

RADIO FUND

★

A Message from the Editor

The object of this Fund is to provide portable radio sets for the isolated units of the R.A.F., who are in urgent need of this means of keeping in touch with current events and hearing the programmes of the B.B.C. These units, which include the Observer Corps and outlying detachments of all kinds, are on watch unceasingly, day and night, for enemy activities. The conditions in which they work cut them off almost entirely from any form of amusement, and their off-duty hours are apt to become very monotonous. For these units a radio set will come as the most welcome of all gifts.

The Fund is in direct association with the R.A.F. Comforts Committee, and all money received will be forwarded to this Committee *without any deduction whatever for working expenses*. The Committee will buy suitable radio sets, and distribute them where they are most needed.

I appeal to every one of you to look on this Fund as your own special way of making things more cheerful for the men of the R.A.F. Tell your parents, uncles and all other relations about the Fund, and gather in their subscriptions.

THE EDITOR.

Up to 1st November the sum of £110 had been sent to the R.A.F. Comforts Committee, and with this money the Committee had purchased and issued to R.A.F. units 21 portable wireless sets.

Last month we sent the Committee a further cheque, for £10, bringing the total amount sent to £120.

Have YOU sent a donation?

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	£124	4	1

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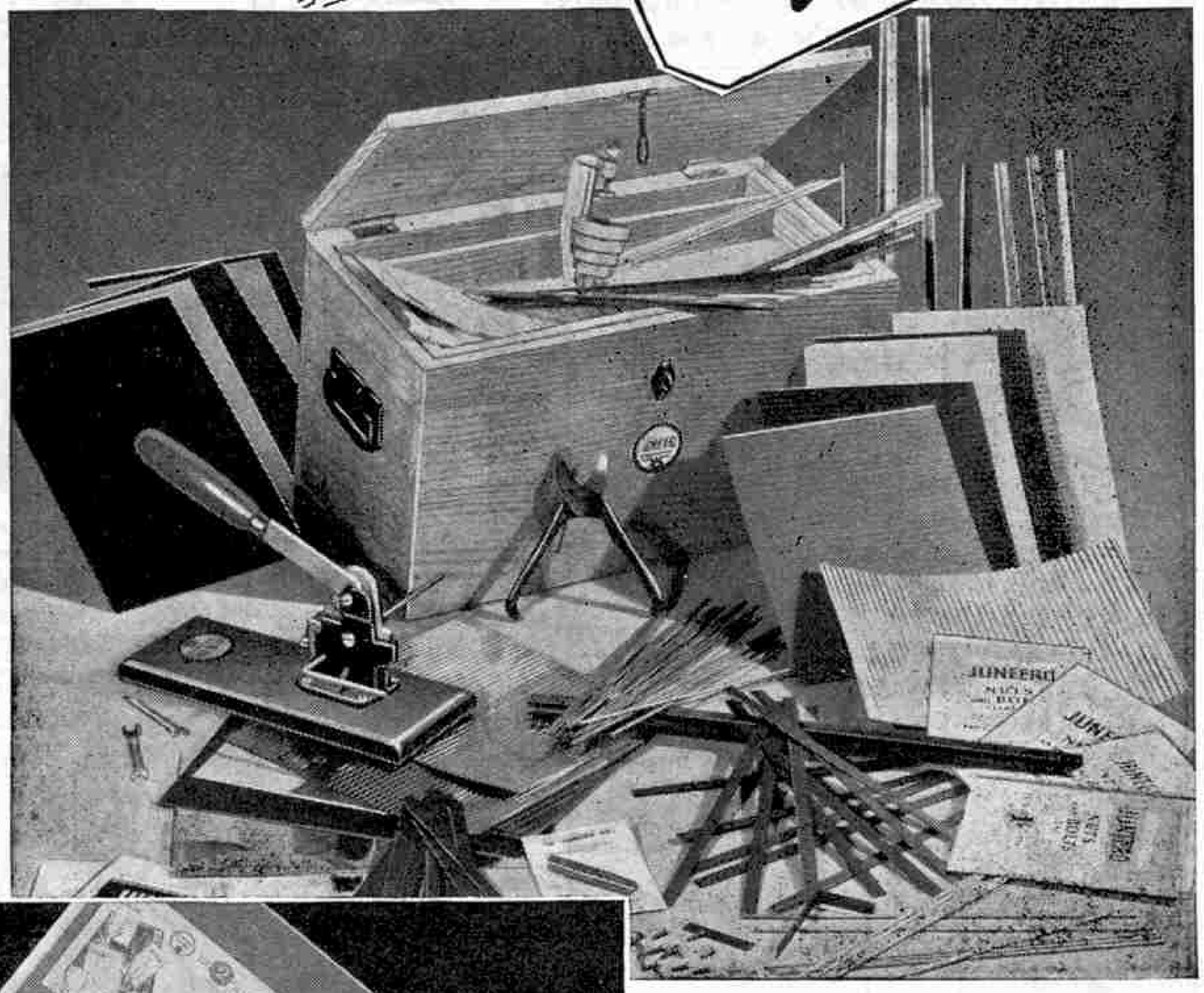

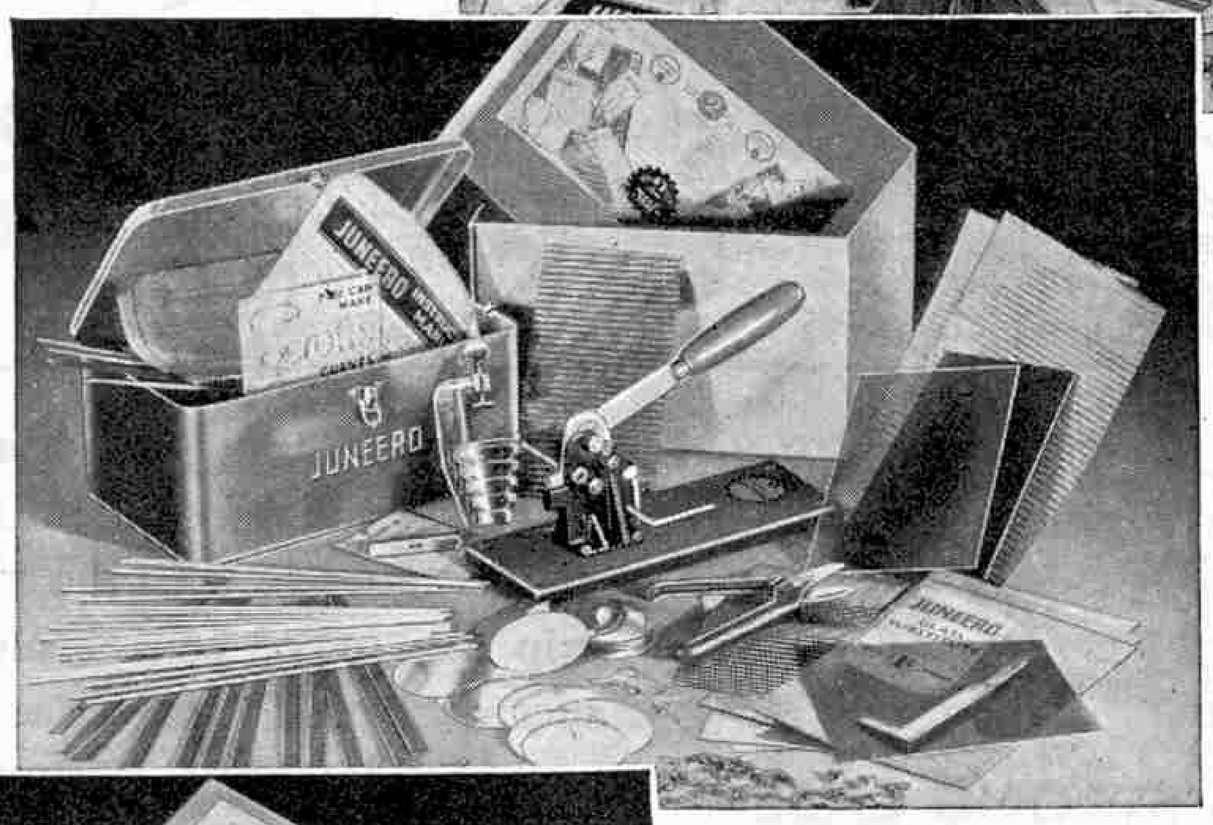

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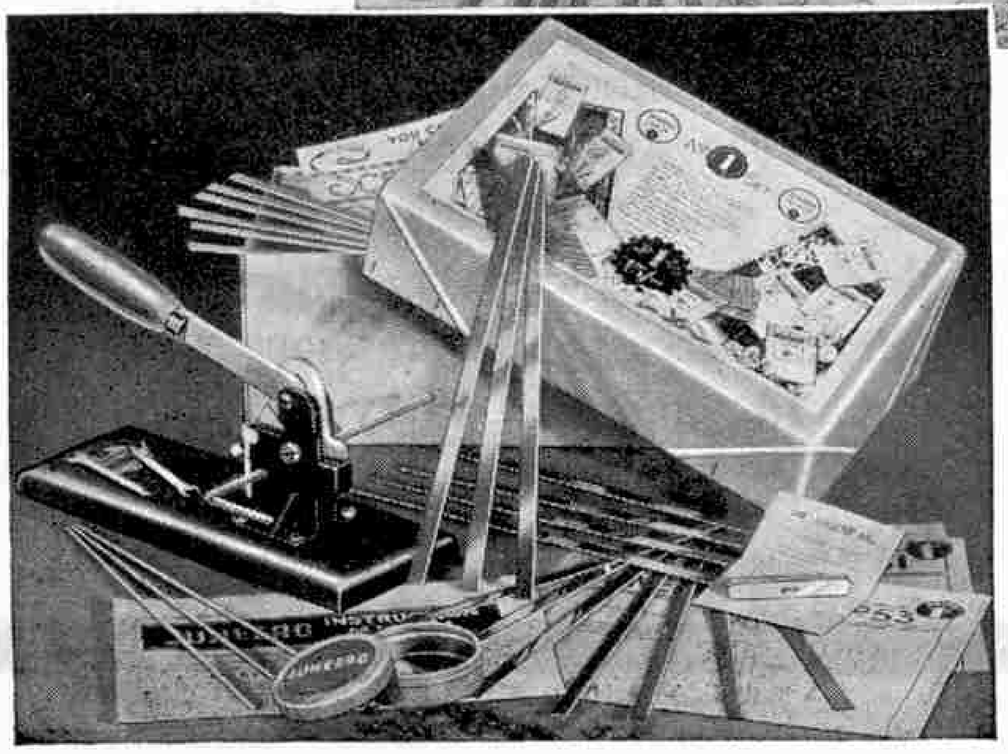

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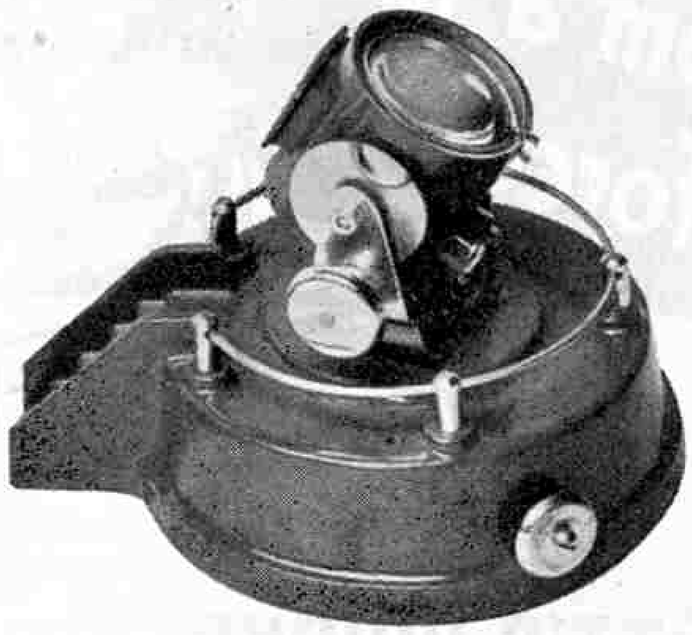

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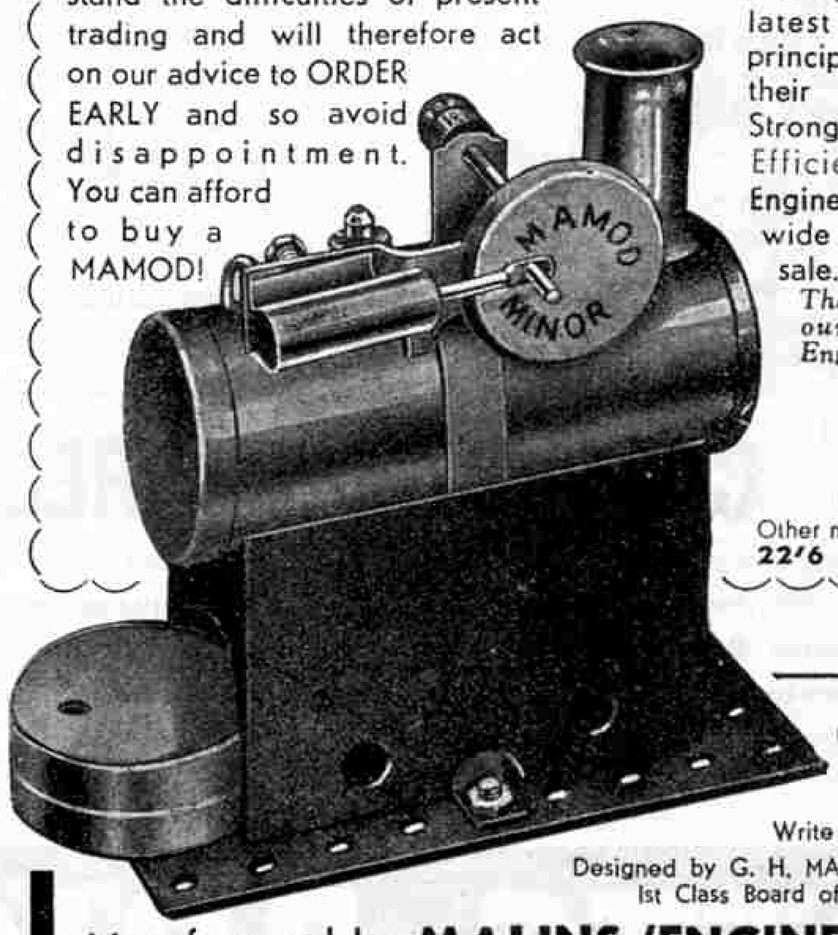

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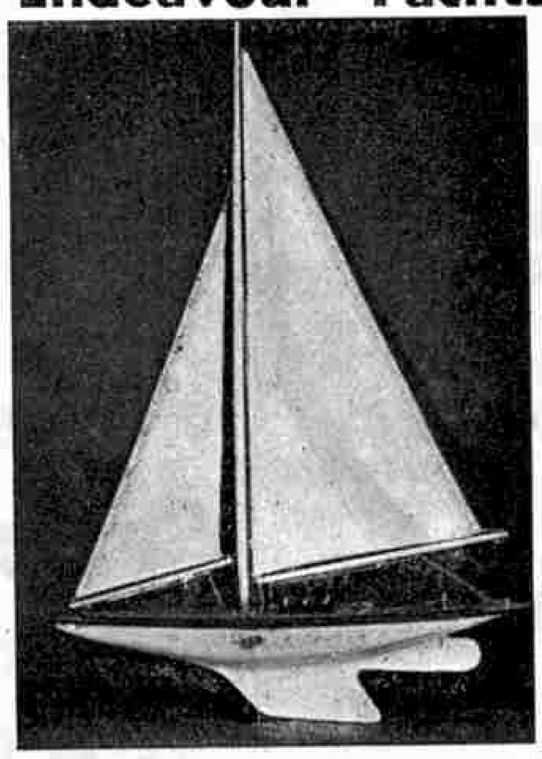

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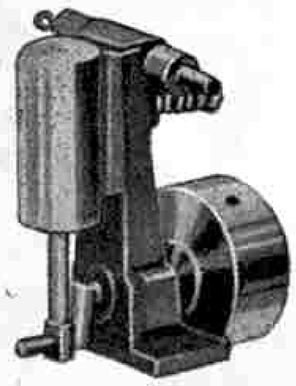

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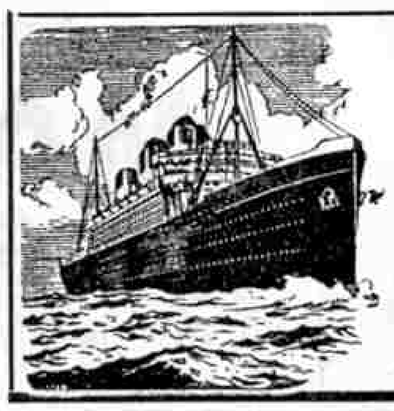

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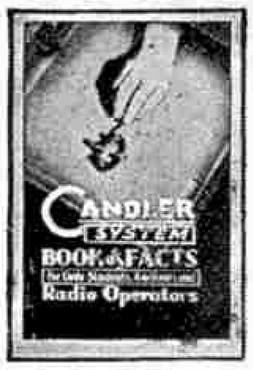

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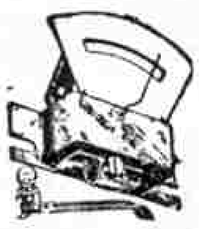

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I.C.S.

READERS' SALES AND WANTS

Readers should note that all advertisements of Hornby Trains and other Meccano products included in this column relate to items no longer featured in the catalogue. Advertisements of current products cannot be accepted for this column.

Collection 3,402 Stamps in 450 page album; approximate catalogue £50; accept 65/–. Smaller collection 1,434 in loose-leaf album; approx. £11; accept 15/–.—V. R. Ward, 3, Dawson Road, Handsworth, Birmingham 21.

Sale. Foreign Stamps with catalogue; value £3/5/–; sell £1; or will exchange for "Meccano Magazines."—Cyril S. West, 197, Ancona Road, Plumstead, S.E.18.

Going! 30 sets Cigarette Cards in albums and odds. Send for list.—Ward, Church Street, Dufftown, Banffshire.

Giant Model Railway, 1 Loco., 79 Rails, £2.—Berry, Hendliegh, Halland, Sussex.

For Sale. T.T.R. 0-4-0T, 0-4-0, 4-4-0 L.M.S. Locomotives, 4 Controllers, 2 double Transformers, 120 pairs unused Wheels. All in good condition. Cost nearly £11. Sell for £6 or separately.—Owen, Lenzie, Caemelyn, Aberystwyth.

Sale. "Chums" 1940, 5/–; "Modern Boy's Annual" 1938, 2/–; "True Adventure," 3/–; "The Air Force of To-day," 3/6. "Biggles Goes to War," 2/–; "Wonders of World Aviation" (parts), 12/6; "Aircraft of the British Empire," 3/–. All perfect condition.—Henderson, 94, Bellevue Road, Edinburgh.

Sale. Album containing 1,200 different Stamps; cat. (£6/10/–), accept 25/–.—Mason, New Hall Farm, Tyldesley, Manchester.

Sale. L.M.C., Bassett-Lowke Locomotives, Coaches and Wagons, etc. Stamp for list.—Boulter, 101, Beechwood Road, Sheffield 6.

Sale. Brown Ice Skating Boots, size 7½ with skates, in excellent condition; slightly used; cost 45/–; accept 30/–.—Ross, 70, Beechwood Drive, Glasgow W.1.

Sale. "M.M.'s" February 1935 to date.—G. R. Speak, "The Rookery," Sheepfoot Lane, Heaton Park, Manchester.

Sale. Quantity Bond's Steel Track. Also 12 volt 10 amp. Dynamo. Wanted. Wind Dynamo. Write—J. Mathews, Rose Cottage, Aylesbeare, Exeter.

Sale. Assorted Meccano, Red-Green, worth 122/–; plus Electric and Clockwork Motors. Perfect condition. Take 69/– or offers.—J. L. Nield, 14, Chapel St., Ripley, Derbys.

Sale. Trix Railway, Monopoly, Totopoly, Britain's Soldiers, Developing Gear, and some "Railway Wonders of the World."—Cook, 219, Coombe Lane, Wimbledon, S.W.20.

Sale. Bassett-Lowke 20-volt Electric Train, gauge "O," 60 ft. Track, Accessories. Also Lott's Chemistry No. 7. Particulars from—Gray, St. Michael's Shaftesbury.

Wanted. Instruction Leaflets Nos. 16a, 19, 27, 32, 34, 1 (old model), and new model books for back years. State price.—Sunnyside, Heslington Lane, York.

Sale or Exchange. £18 worth of Trix Twin Railway gauge "OO," little used, would accept same value in Meccano or £14 cash. Apply—F. Cowling, 139, Rowland Road, Scunthorpe, Lincs.

Wanted. Model Petrol Aero Engine; reasonable—Sweetenham, Park Road, Keynsham, Nr. Bristol.

Mains Lighting Cinema, brand new, with 400 ft. Films, £1.—Smith, 65, Gold St., Kettering, Northants.

Sale. B.L. Stanier Steam Mogul; black; new condition; perfect running order; £4/10/–.—Payne, 39, Revell Road, Kingston, Surrey.

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Sale. Gauge "O" Electric Railway. All complete. £2, or nearest.—Stevens, 70, Chittys Lane, Dagenham, Essex.

Sale. £6 Meccano, Red-Green. Very good condition. Accept £3 or near offer. Write for list. Also Single Cylinder, Double Acting, Vertical, Slide Valve, Centre Flue Steam Engine with Pressure Gauge, Water Gauge, Governor, Whistle, Adjustable Safety Valve, Water Cock, Filler Funnels, etc. 35/–.—Brown, Halfacre, Lowick, Kettering.

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AIRCRAFT IDENTIFICATION

Our photographs are being used extensively by all ranks of the R.A.F. and "roof-spotters" for the identification of aircraft. Each month we add new titles to our standard list (No. 10) of over 1,000 titles of civil and military aircraft of all types including

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British, German and Italian

Supplementary List No. 10/2M was issued in October; Supplementary No. 10/3M, in November. Now we are able to announce that Supplementary No. 10/4M will be available early this month (December). Any, or all, lists will be sent with specimen photograph post free 4d.

OUR NEW LIST

Our new consolidated list No. 11/M (incorporating all titles in the four supplementary lists) will be available early in January. Order your copy now for delivery as soon as ready—price 2d. post free (or 4d. with specimen photograph).

We also list photographs of Railways (engines, trains, etc.) and of Ships (liners, sailing ships, warships, etc.). List and specimen photograph 4d. post free.

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Registered at G.P.O., London, for transmission by Canadian Magazine Post.

EDITORIAL AND ADVERTISING OFFICE:
LIVERPOOL 13, ENGLAND.
Telegrams: "Meccano, Liverpool."

Publication Date. The "*M.M.*" is published on the 1st of each month and may be ordered from any Meccano dealer, or from any bookstall or newsagent, price 6d. per copy. It will be mailed direct from this office, 4/– for six issues and 8/– for twelve issues.

To Contributors. The Editor will consider articles and photographs of general interest and payment will be made for those published. Whilst every care will be taken of articles, etc., submitted, the Editor cannot accept responsibility for any loss or damage. A stamped addressed envelope of the requisite size should be sent where the contribution is to be returned if unacceptable.

Readers' Sales and Wants. Private advertisements (i.e., not trade) are charged 1d. per word, minimum 1/–. Cash with order. Editorial and Advertising matters should not be dealt with on the same sheet of paper.

Small Advertisements. 1/6 per line (average seven words to the line), or 16/– per inch (average 12 lines to the inch). Cash with order.

Display. Quotations for space bookings, and latest net sale figures, will be sent on request.

Press Day, etc. Copy should be sent as early in the month as possible for insertion in following issue. We usually close for press on or before 6th of each month for following issue. Half-tone blocks up to 100 screen.

Proofs of advertisements will be sent when possible for space bookings of not less than half-an-inch.

Voucher copies. Sent free to advertisers booking one inch or over. Other advertisers desiring vouchers should add 8d. to their remittance and should order voucher copy at same time.

Remittances. Postal Orders and Cheques should be made payable to Meccano Ltd.

Ordering the "M.M." Overseas

Readers Overseas may order the "*Meccano Magazine*" from regular Meccano dealers or direct from this office. The price and subscription rates are as above, except in Australia, where the price is 1/– per copy (postage extra), and the subscription rates 7/– for six months and 14/– for 12 months (post free), and Canada, where the price is 10c. per copy, and the subscription rates 65c. for six months, and $1.25 for 12 months (post paid).

The U.S.A. price is 15c. per copy, and the subscription rates $1 and $2 for 6 and 12 months respectively (post free).

Overseas readers are reminded that the prices shown throughout the "*M.M.*" are those relating to the United Kingdom and Northern Ireland. Current Overseas Price Lists of Meccano products will be mailed free on request to any of the undermentioned agencies. Prices of other goods advertised may be obtained direct from the firms concerned.

CANADA: Meccano Ltd., 187-189, Church St., Toronto.
UNITED STATES: Meccano Co. of America Inc., New Haven, Conn., Meccano Co. of America Inc., 200, Fifth Av., New York.
AUSTRALIA: Messrs. E. G. Page & Co., 52, Clarence Street, Sydney, N.S.W.
NEW ZEALAND: Models Limited, Third Floor, Paykel's Buildings, 9, Anzac Avenue (P.O. Box 129), Auckland, C.1.
SOUTH AFRICA: Mr. A. E. Harris (P.O. Box 1199), 142, Market Street, Johannesburg.
INDIA: Karachi: Daryanamal & Bros., Elphinstone Street. Bombay: Bombay Sports Depot, Dhobi Talao. Calcutta: Bombay Sports Depot, 2, Lindsay Street. Madras: Bombay Sports Depot, 162, Mount Road.

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HORNBY DUBLO

GAUGE 'OO'

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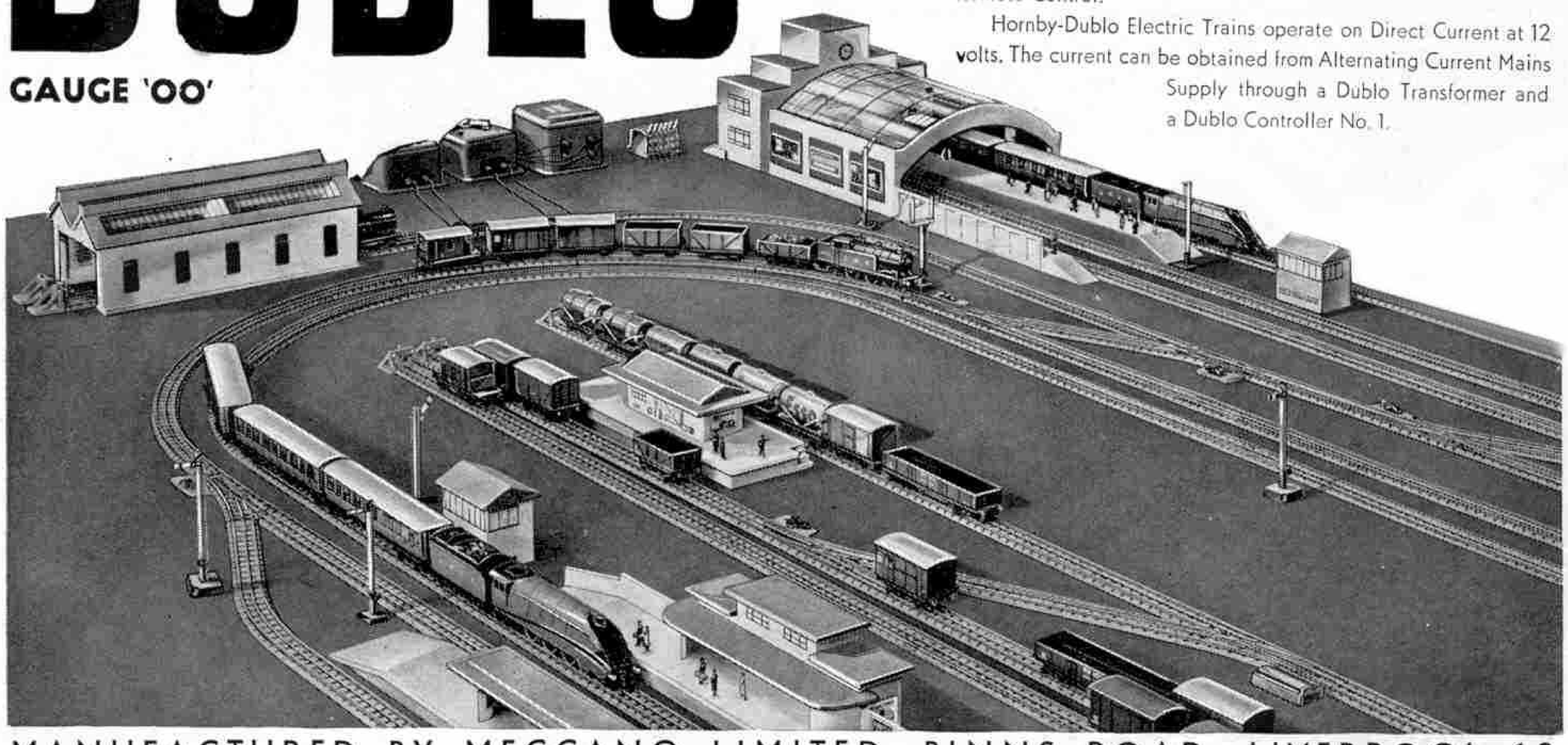

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