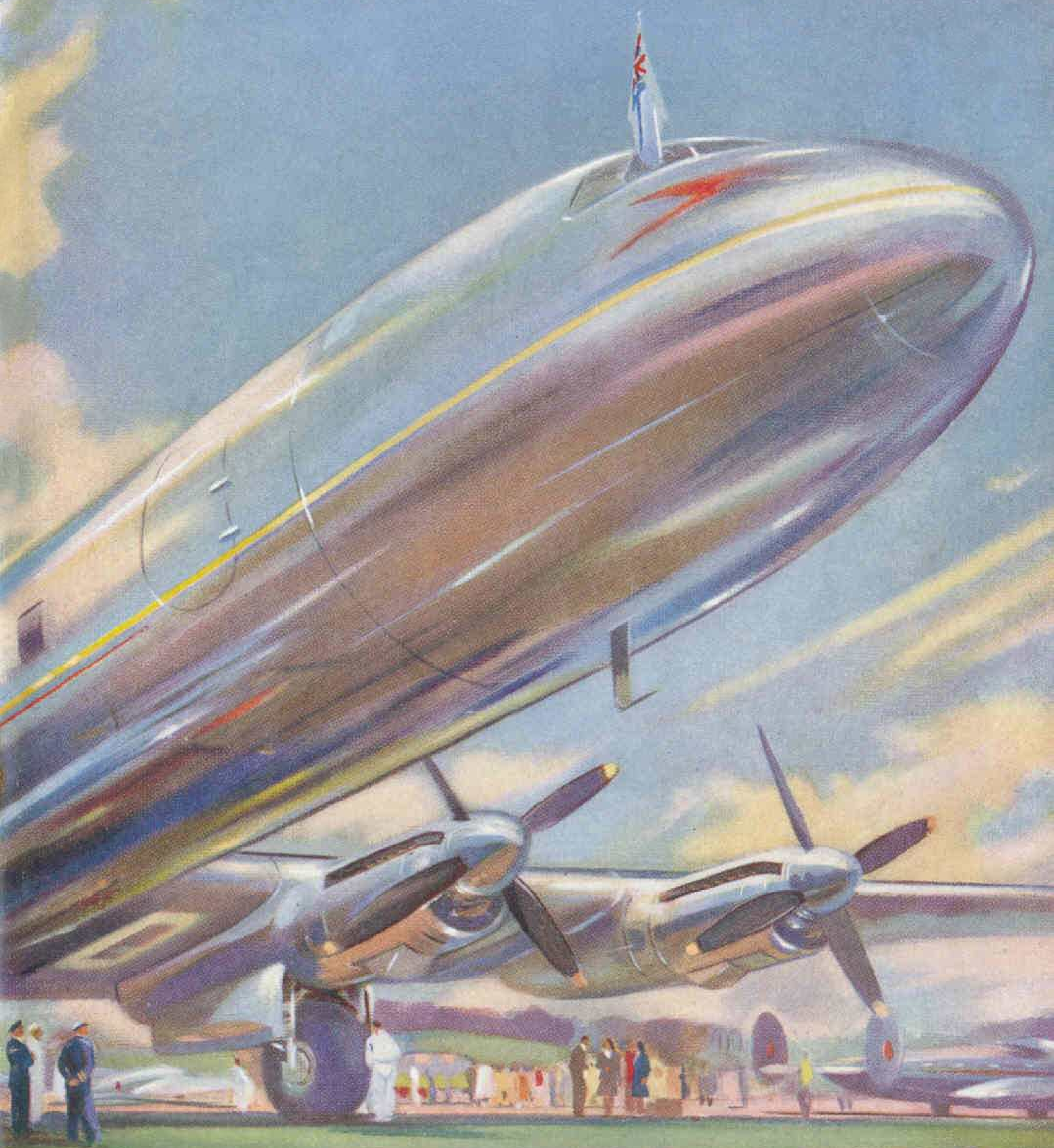


VOL. XXXII. No. 8.

AUGUST 1947

MECCANO

MAGAZINE



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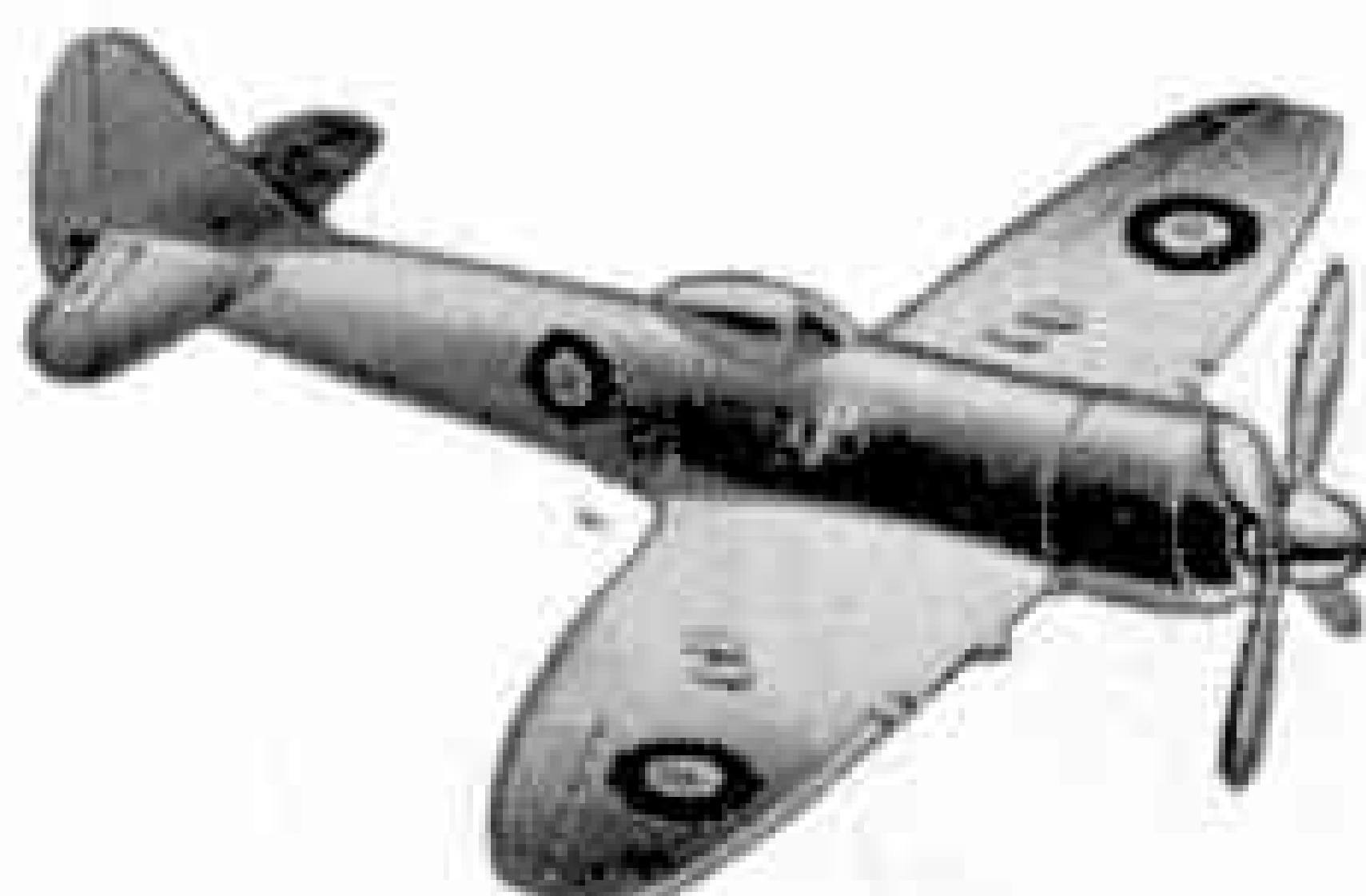


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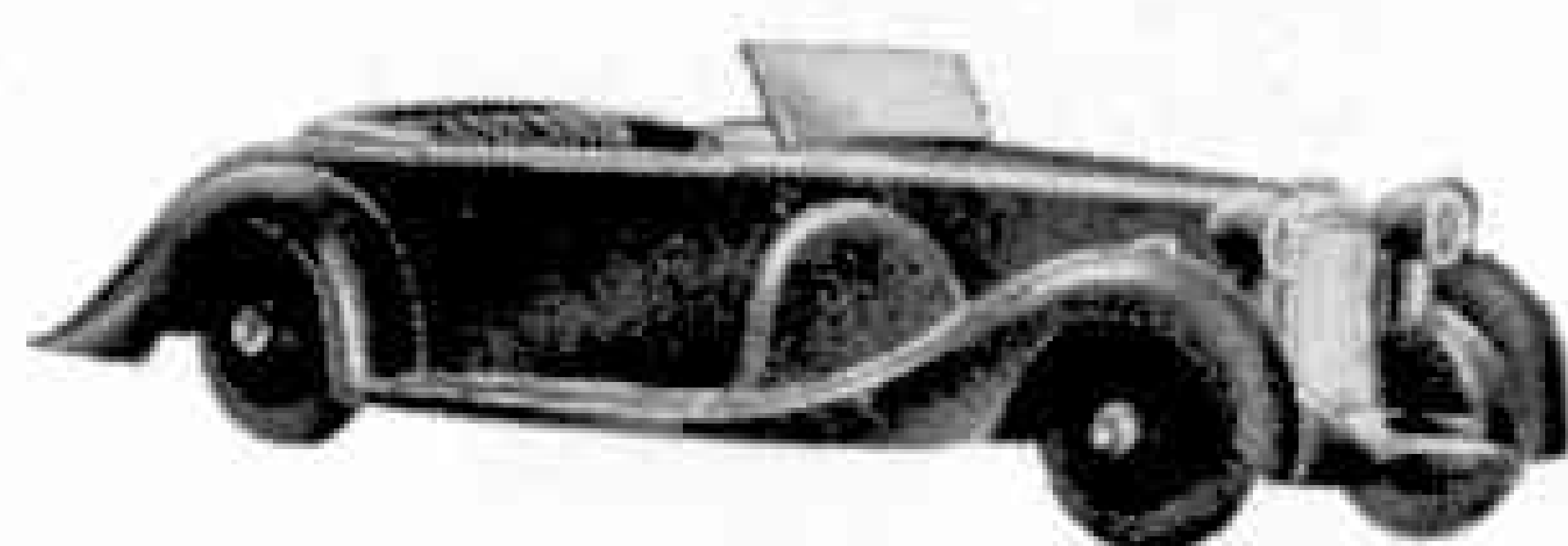
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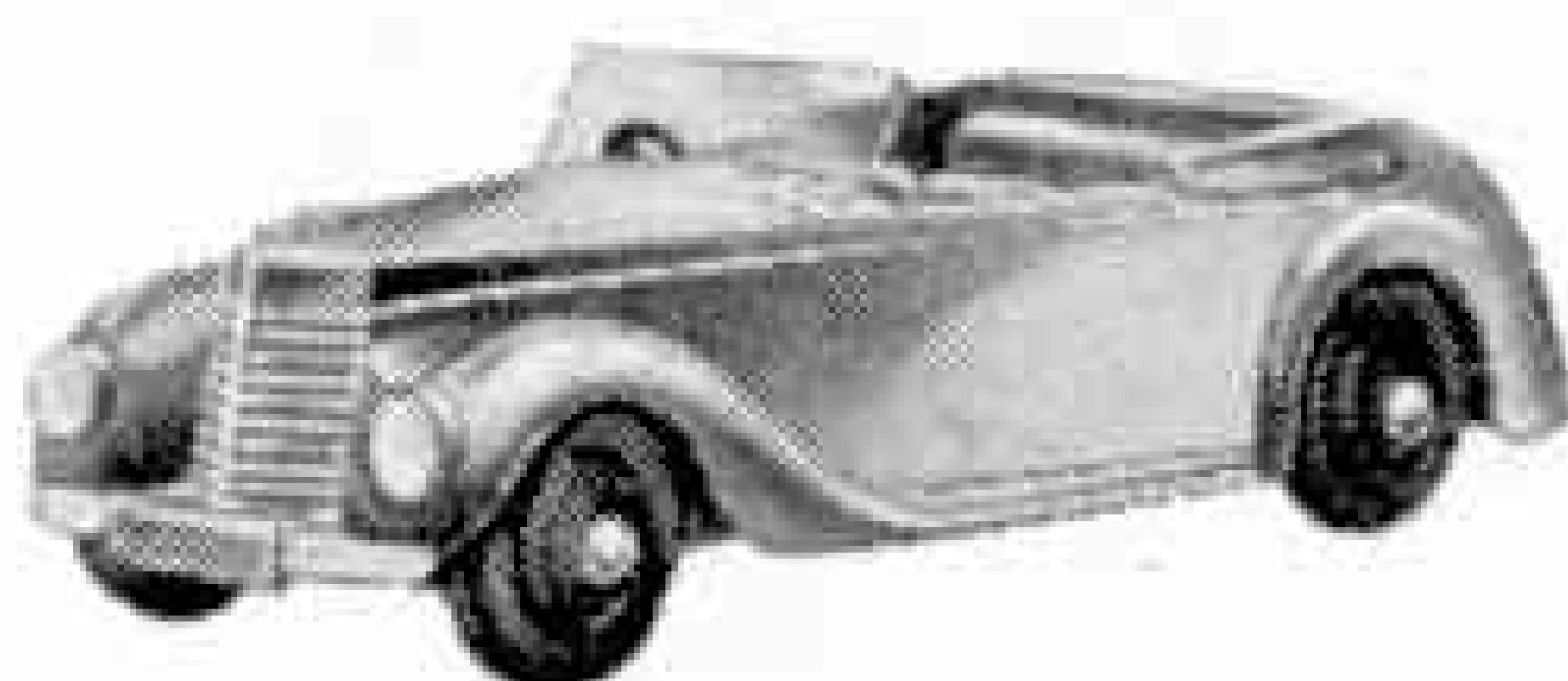
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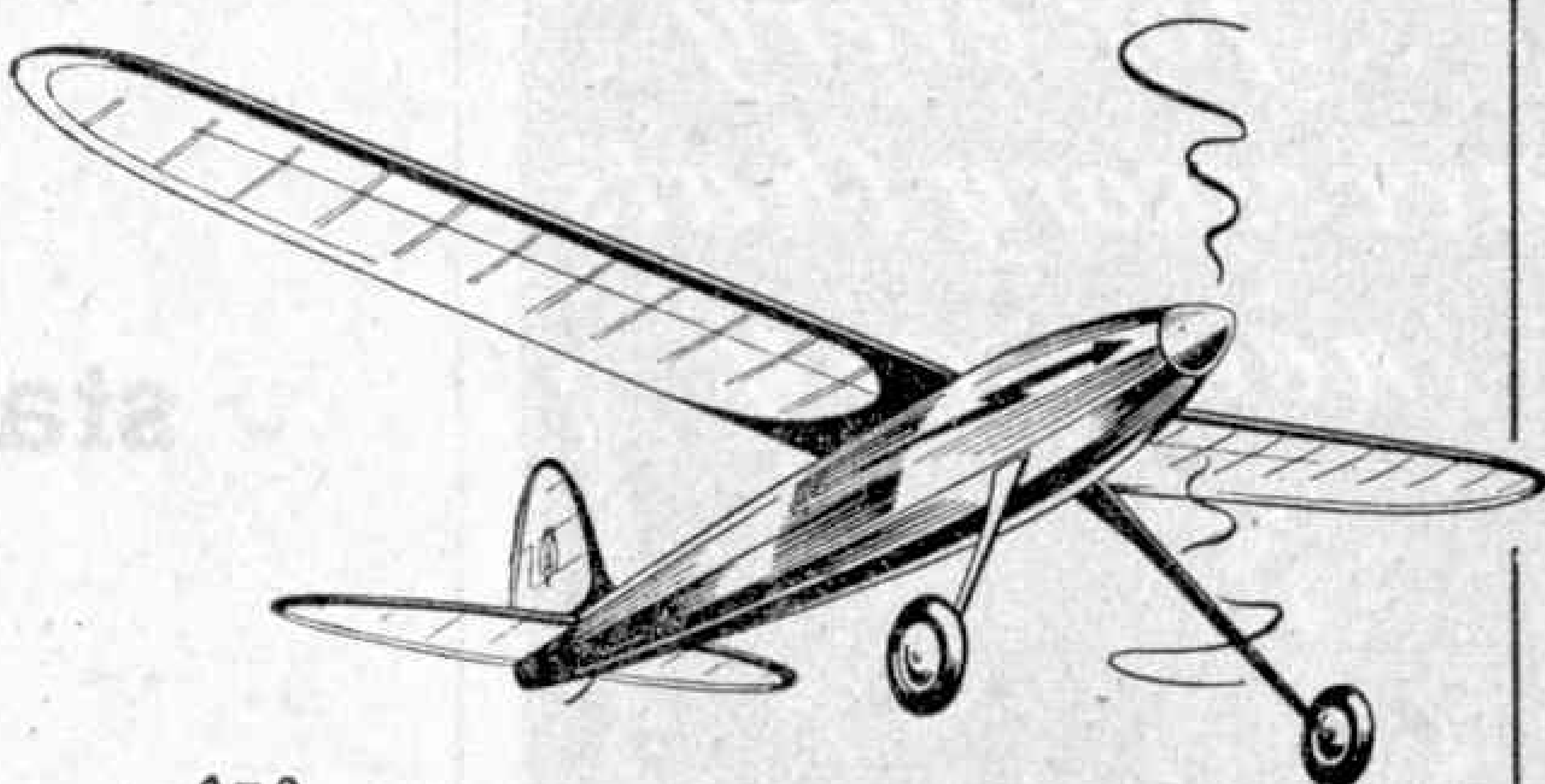
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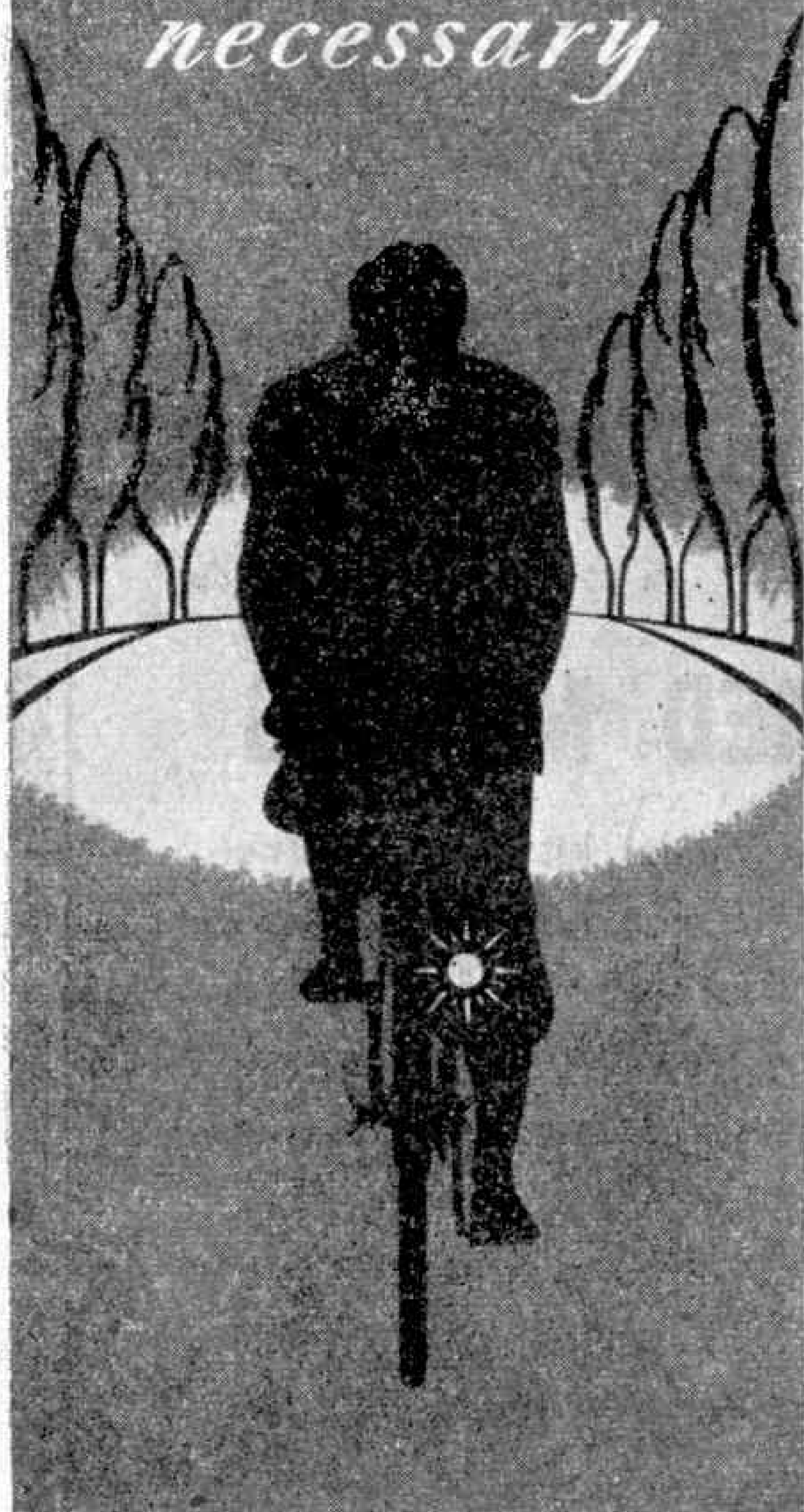
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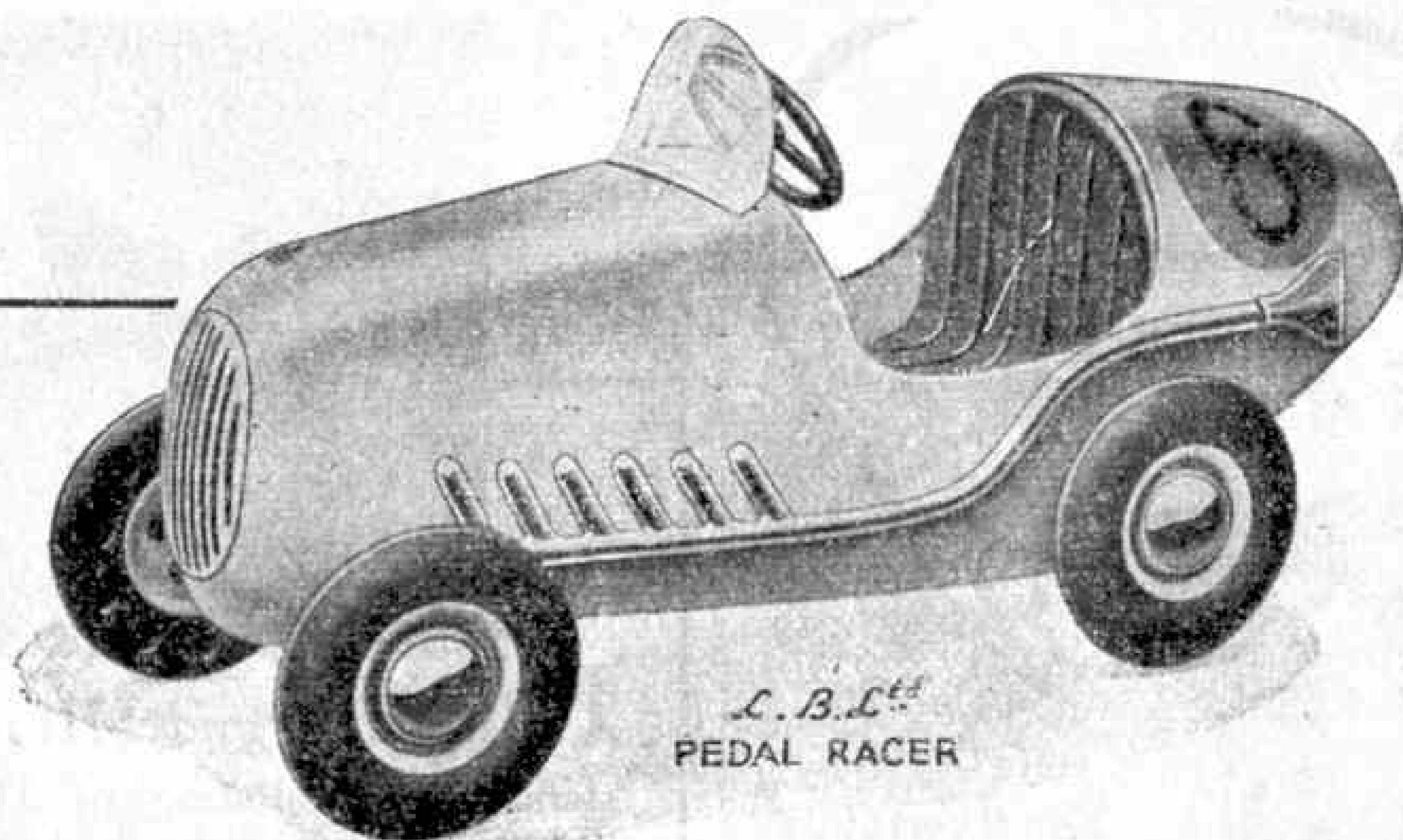
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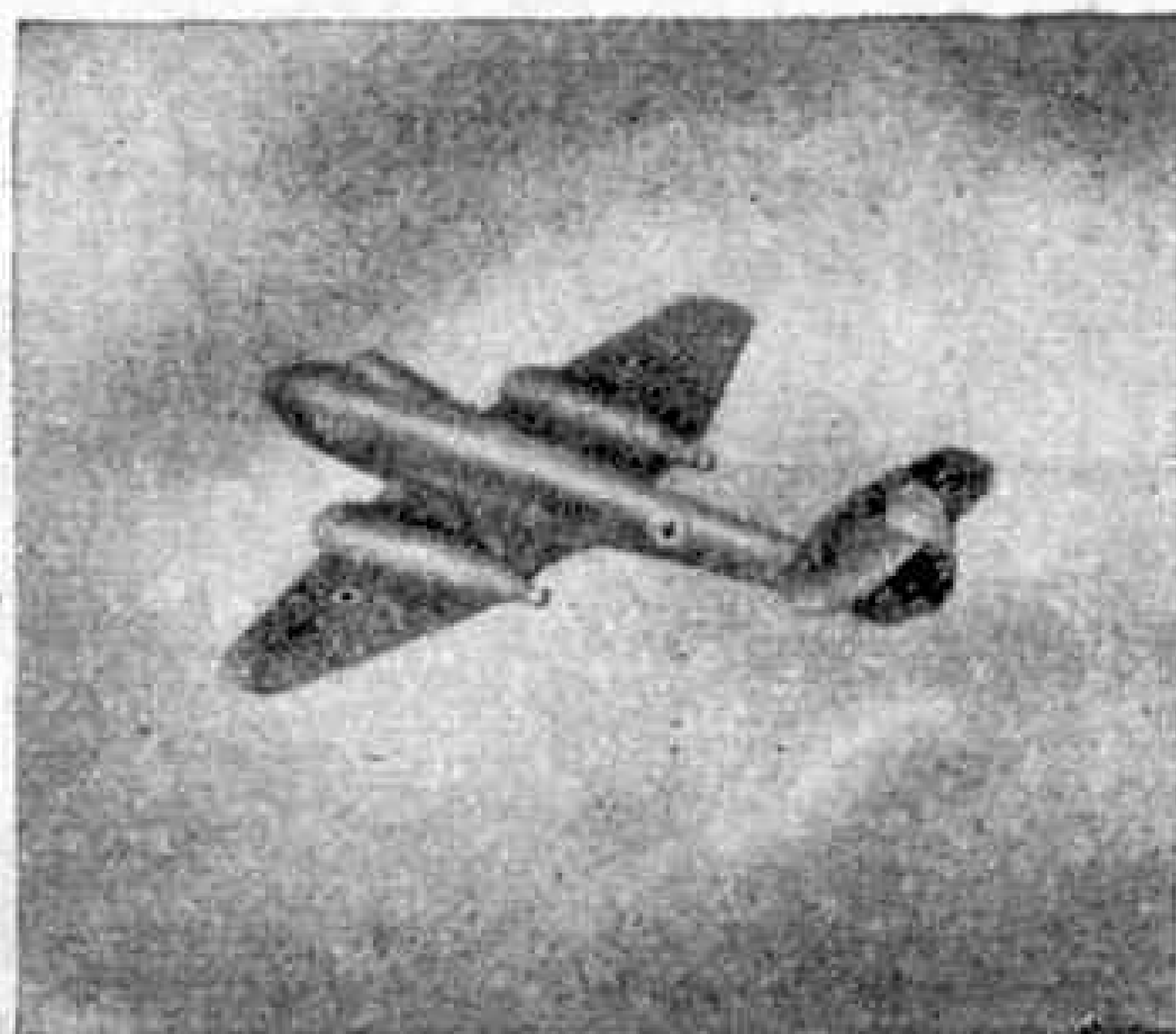
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MAGAZINE

Editorial Office
Binns Road
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Vol. XXXII

No. 8

August 1947

With the Editor

Motor Racing Here Again

Motor racing events are again in the limelight after the long interruption caused by the war. Already several interesting races have been decided, including the Jersey event, the Swiss Grand Prix, and the "Indianapolis 500"; while hill-climbs and rallies also have been held and there are more to come. Notable names also are coming back. The Mercedes of course is missing, but E.R.A.s and Maseratis are prominent, and from the Alfa-Romeo factory in Italy have come the 8-cylindered Alfettes that took the first three places in the recent Swiss Grand Prix. Of famous drivers of pre-war days B. Bira, Raymond Mays, Nuvolari and others have shown that they have not lost their nerve and skill, and no doubt new drivers will make their marks in races yet to come.

It will not be easy to overcome the handicap that the war years have imposed. Already it is clear that cars entered in the great races are suffering from lack of the prolonged trials necessary to ensure reliability under the tremendous strain of high speeds over long distances. We can look for better things next year, and 1948 will bring also a revival of such events as the Le Mans 24-hour race and the famous Monte Carlo Rally.

American Railway Equipment

I suppose that few people in this country have any idea of the tremendous extent of the American railway business. Taking rolling stock alone, figures recently issued by the Association of American Railroads show that on 1st May this year 99,896 new freight cars were on order. This total includes those for the railways themselves and for the private companies that operate fleets of freight vehicles over the railway systems.

Of the total number of cars on order, refrigerator car companies, and what are known as Class 1 Railroads, account for 93,622 vehicles, 20,353 to be built in railway shops and 73,269 by outside contractors. The term "Class 1 Railroad" refers to railways having operating revenues of 1,000,000 dollars or more a year. The variety of rolling stock on order can be gathered from the fact that 30,724 of the total are hoppers, that is cars with bottom discharging doors; 5,713 are gondolas, high-capacity vehicles for coal and similar traffic; 1,043 are flat cars; 9,584 refrigerators, 526 stock (livestock) cars, and 318 miscellaneous types.

Locomotive orders on 1st May totalled 662, of which 36 were steam, six electric and 620 diesel powered. These figures make an interesting comparison with those of the corresponding date in 1946 when there were on order 74 steam, six electric, and 410 diesels.

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Moving Mountains

Relocating an American Main Line

By William A. Savin

UP on the Pennsylvania Railroad's Conemaugh Division, about 40 miles east of Pittsburgh, a corps of engineers is rapidly changing in a big way the contours of hills and valleys which have stood since the beginning of time. They are engaged in the largest railroad construction or relocation job at present under way in the United States.

The work marks the start of construction

Lick Creek, a tributary of the Conemaugh River, for 12 miles.

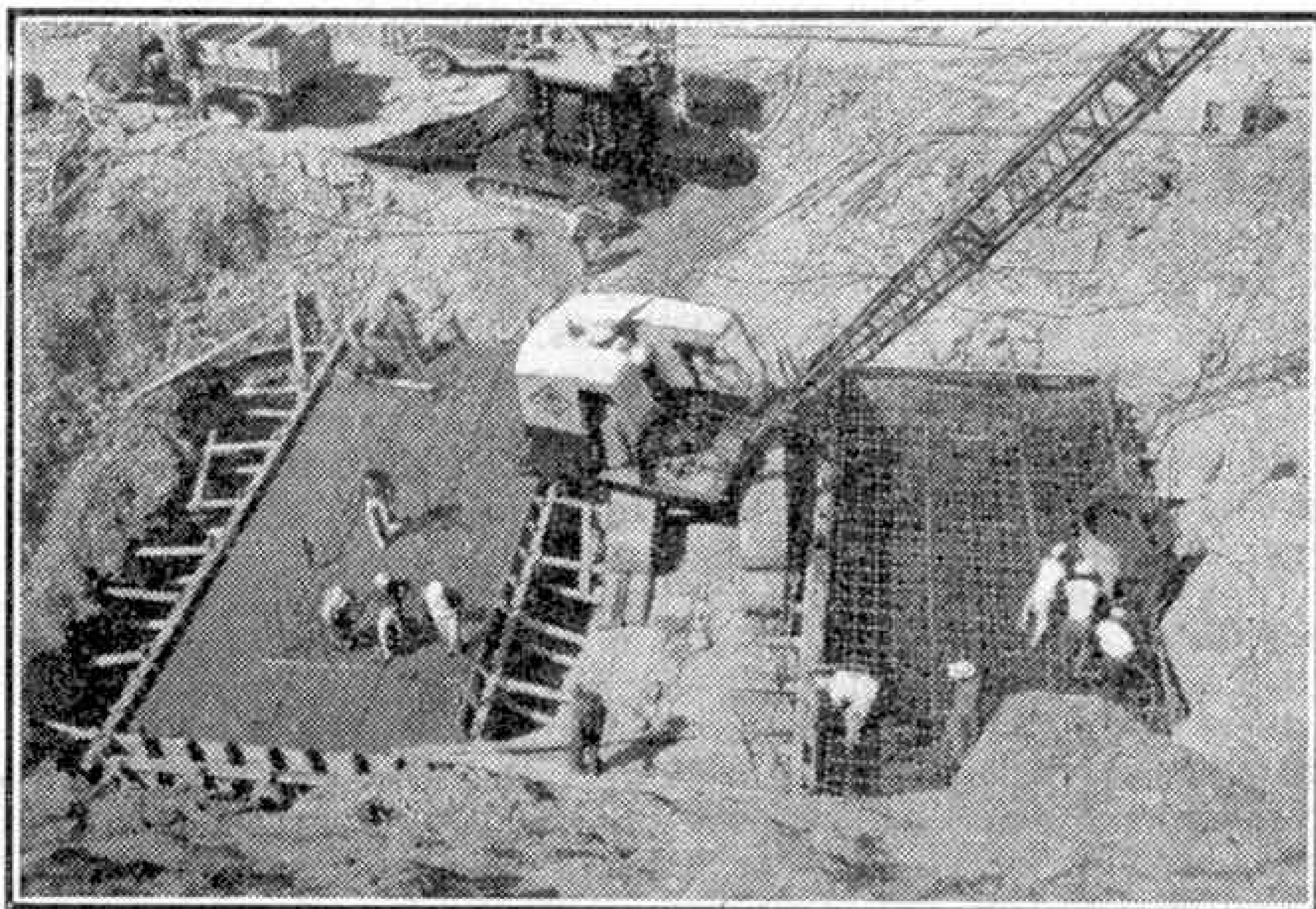
The full height of water in the reservoir will cover the present location of the Conemaugh Division main tracks, a double track line, between Bow Tunnel and the eastern vicinity of Blairsville, and the town of Livermore, along with the Pennsylvania Railroad Station at that point, will disappear from the map. It was

apparent, therefore, that the railroad tracks would have to be moved.

Let us see what this relocation of tracks will mean. First of all, it will cost in the neighbourhood of £4,000,000. Nine new bridge structures are being built, and a tunnel 2,660 ft. long is being cut through solid rock. Total length of the tracks to be relocated is almost 17 miles, and when the work is completed the main line tracks will be eight-tenths of a mile shorter than at present. They will

have been raised, and at the peak the new track will be $19\frac{1}{2}$ ft. higher than previously. For the new main line 140 lb. steel rail will be used, one of the new rail sections recently adopted by the railroad. Seven highway grade crossings and four river bridges will have been eliminated.

When the grading and masonry operations have been completed, probably towards the end of the present year, more than 3,000,000 cu. yds. of earth will have been moved and something more than 87,000 cu. yds. of concrete will have been poured into bridge piers and abutments. Nearly 2,000,000 lb. of steel reinforcing, along with 10,000 ft. of reinforced concrete and iron pipe, will have been put to use. In addition, the steel bridge girders and trusses that will be placed in position



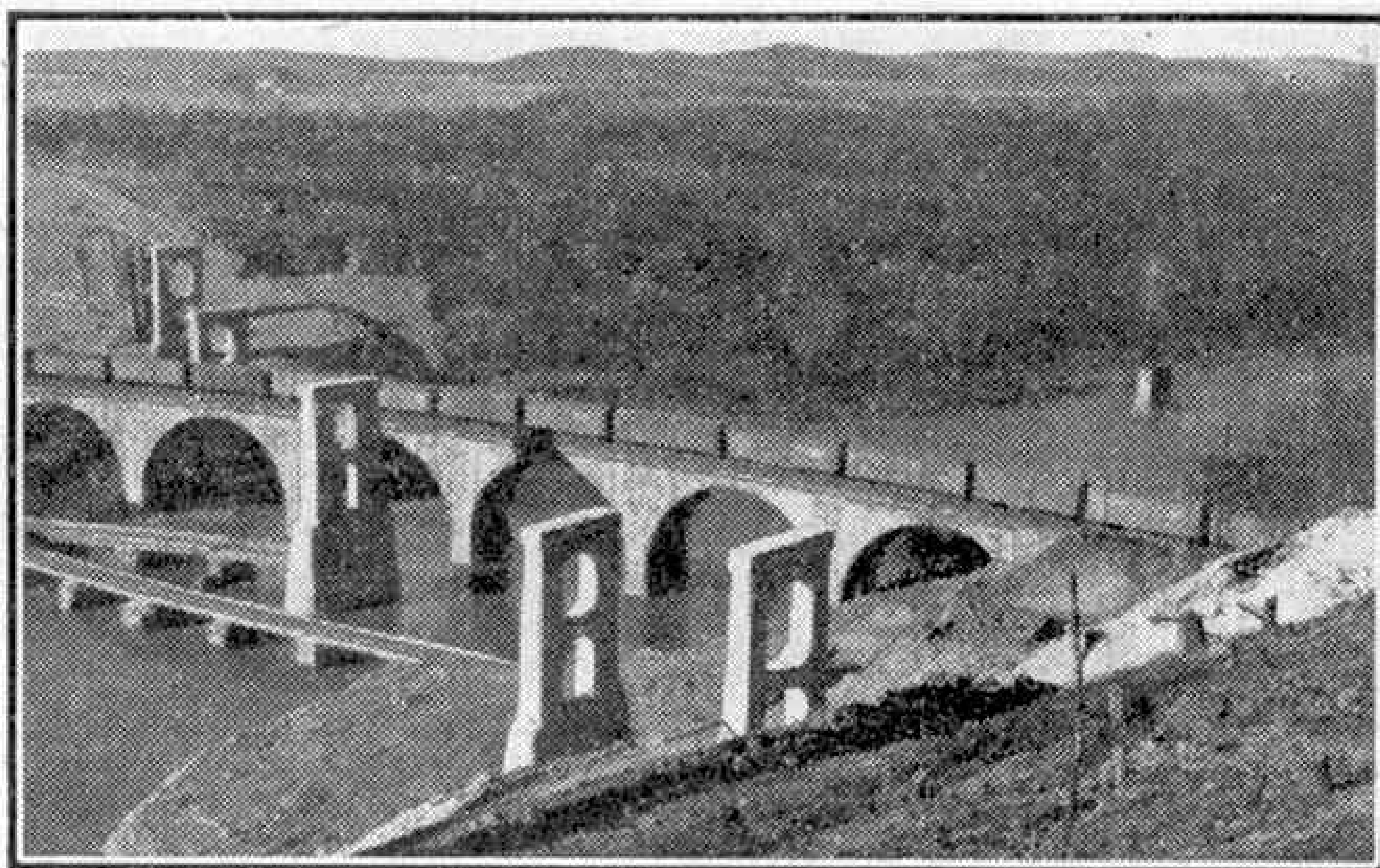
Completing the abutment for a 380-ft. bridge on the relocation of the Conemaugh Division line of the Pennsylvania Railroad described in this article.

of the Conemaugh Dam, which was authorised by Congress under the Flood Control Act of 28th June 1938, as part of a comprehensive plan for the reduction of flood heights in the Pittsburgh District and the Upper Ohio River Valley. The construction of the dam and the Conemaugh River Reservoir has necessitated the relocation of a portion of the railroad's Conemaugh Division. The present main line runs from Blairsville to Bow Tunnel in the bend of the Conemaugh River, and then on to Tunnelton, Saltsburg and Salina. The reservoir will extend from the dam in the Conemaugh River, approximately one-half mile upstream from the present river crossing at the west end of Bow Tunnel, to a total distance of 14 miles, and also will extend up Black

will weigh approximately 8,000 tons.

Six of the new bridges to be built will span water. Longest of the new structures is Bow Ridge Bridge, crossing the Conemaugh River west of Bow Ridge and boasting a length of 880 ft. Present main line trains use Bow Tunnel and upon completion of relocation, this 757 ft. tunnel will be abandoned and trains will run through an open cut 182 ft. in depth and then cross the Conemaugh via the Bow Ridge Bridge. Next longest bridge will be the 824 ft. eight-span crossing of the Conemaugh at Social Hall. This location, incidentally, derives its rather strange name from an old building still standing, and which was apparently used in years gone by as a hotel or social gathering place for patrons of an old canal.

The Kiskiminetas River will be bridged at Avonmore by a 462 ft. truss bridge with three spans, and east of Bow Ridge



The concrete piers of the new Bow Ridge Bridge, the largest of the new bridges necessary. It is to be half a mile in length.

will be erected over public highways.

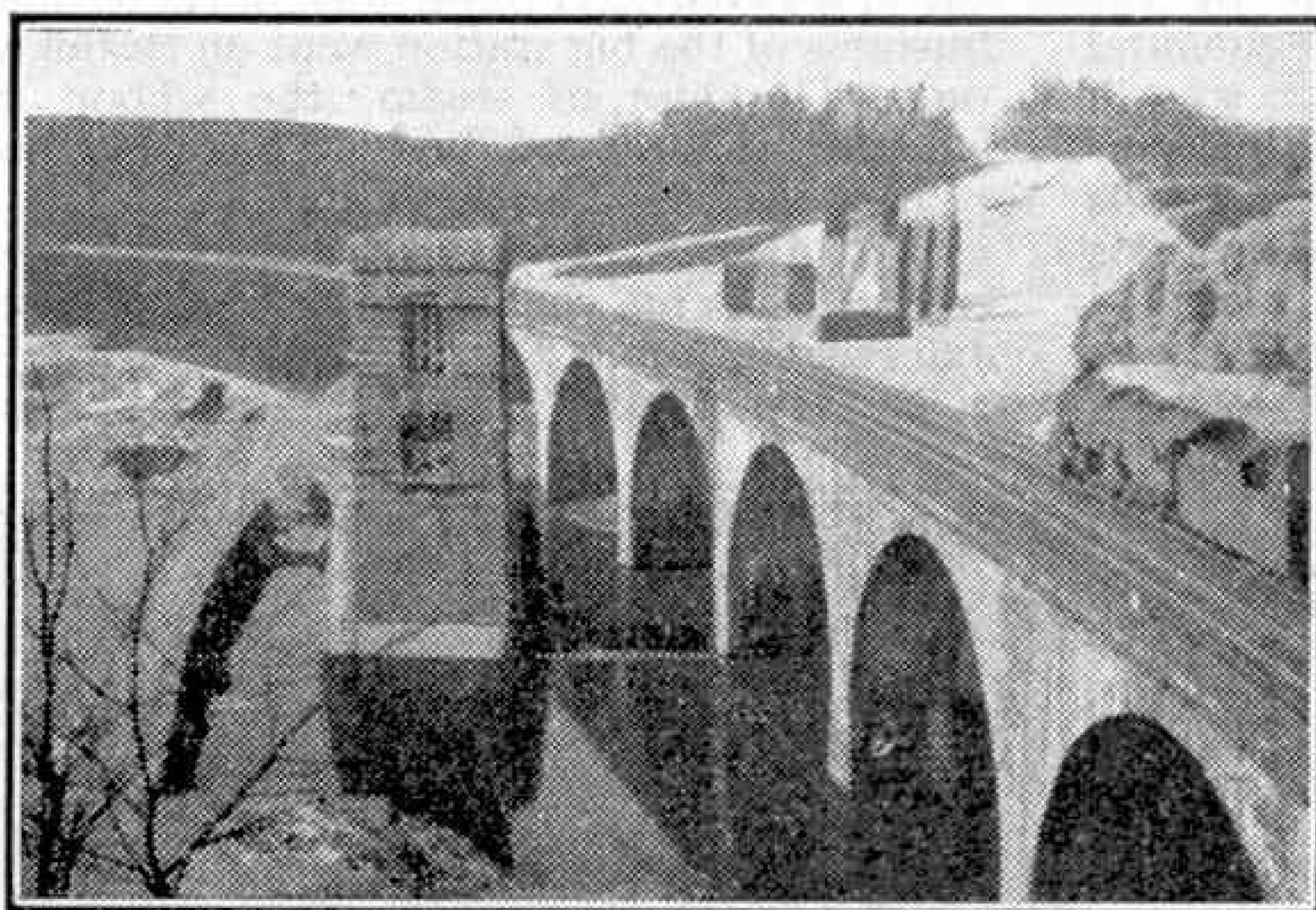
One of the most interesting phases of the track relocation work is the 2,660 ft. tunnel which is being built at Saltsburg. Drills started to bite into the solid rock to make an opening 15 ft. square in the summer of last year, and on 28th December 1946 daylight could be seen from one end of the tunnel to the other. Progress averaged about 30 ft. for a three shift day and it is noteworthy that no major accidents have been reported during the drilling and dynamiting operations. This opening will be enlarged in a subsequent operation, and the finished size of the tunnel, that is, inside of a 2 ft. concrete lining, will be 30 ft. wide by 28 ft. high. Incidentally, the concrete to be used in this tunnel will amount to 30,000 cu. yds. In order to clear the dynamited rock from the tunnel as quickly as possible, narrow gauge tracks were built into the opening and powerful electrically-driven miniature engines were used to haul out the blasted rock.

Upon its completion, the tunnel will be provided with forced air ventilating equipment at its west end. It will

also be electrically lighted.

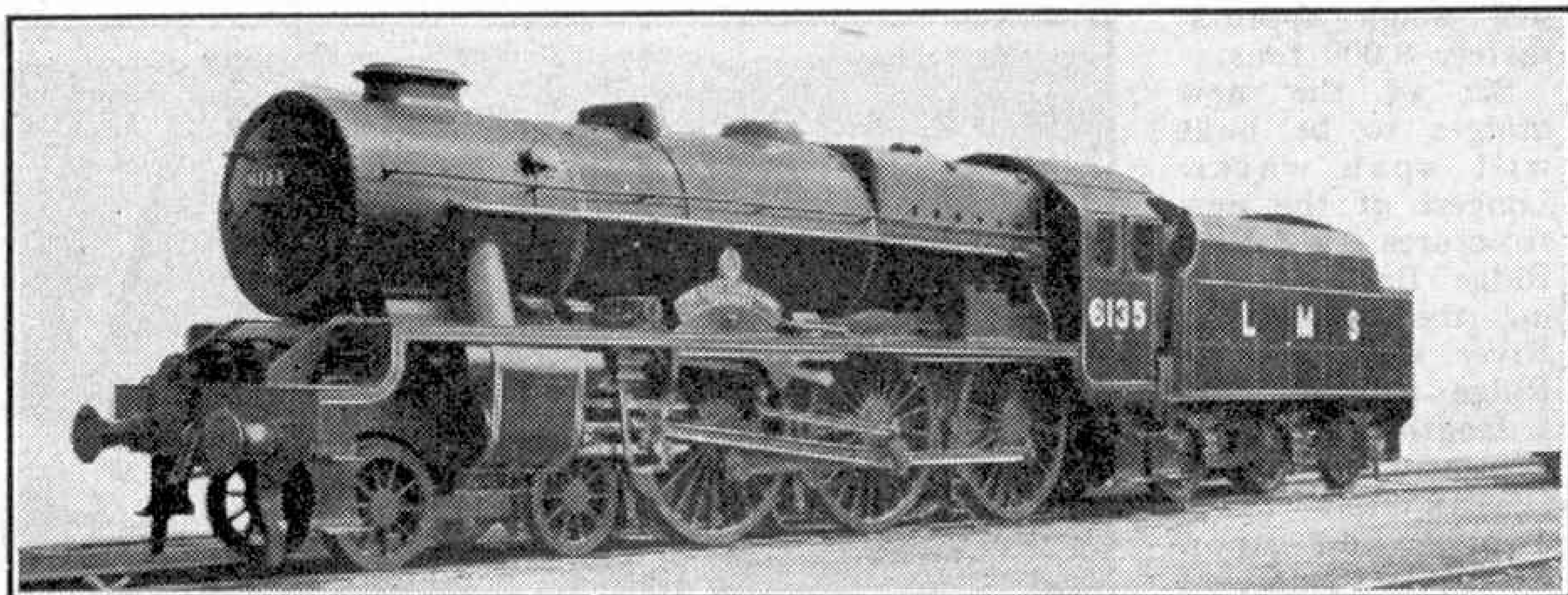
Trains may start running over the new line late in 1948 or early in 1949.

This article and our illustrations are reproduced by courtesy of the Editor, "Mutual Magazine" (U.S.A.).



The present main line of the Pennsylvania Railroad, which runs between the piers of the new Bow Ridge Bridge.

another bridge, 380 ft. in length, will cross Spruce Run. Blacklegs Creek, north of Saltsburg, will be spanned by a 259 ft. structure, and a bridge of 64 ft. long will cross Long Run at Avonmore. Three other bridges, varying in length from 26 to 48 ft.,



L.M.S. No. 6135 "The East Lancashire Regiment" of the converted "Royal Scot" class. The photographs to this article are by courtesy of the L.M.S.

"The East Lancashire Regiment"

By "North Western"

PRESTON station recently was the scene of an event of special railway and local interest, in which L.M.S. engine No. 6135, "*The East Lancashire Regiment*," played a principal part. The occasion was the unveiling of plaques of the crest of the East Lancashire Regiment that have been presented to the engine by the Regimental Association.

The engine, not to be outdone by the spic and span turnout of the Regimental Band and Guard of Honour that was in attendance, had been groomed to perfection. Brightly-burnished buffer heads and coupling, white-painted headlamps and a gleaming black coat were matched by the spotless cab and footplate fittings. Leading splashers were concealed by trim blue curtains hanging from a smart pelmet temporarily attached to the engine's handrail so that, when the time came, the nameplate with the Regimental crest already fitted above it could be formally unveiled.

After inspection of the Troops, the Chairman of the L.M.S., Sir Robert Burrows, and the Colonel of the Regiment, Brigadier J. W. Pendlebury, D.S.O., M.C., took up their positions in front of the veiled nameplate. Sir Robert Burrows in an easy and friendly speech referred to the interest of the L.M.S. in the counties and towns served by the railway, and in their regiments, and to the unique record of the East Lancashire Regiment.

In reply Brigadier Pendlebury spoke of the pride of the Regiment in having its name carried by an L.M.S. engine. At the invitation of the Chairman he then unveiled the nameplate and plaque, while the Guard of Honour presented arms and the Band played the Regimental March.

It was an impressive moment; and as if to remind those present of the all-round-the-clock character of railway work, normal business of the big station went on throughout. The hiss of steam, the whoop of whistles and the puffing of busy engines provided a background of sound.

Brigadier Pendlebury then inspected the engine, and on the footplate Driver Fox and Passed Fireman Cartmell, both formerly of the Regiment, were presented to him.



The nameplate with plaque above carrying the Crest.

Youngest Snake Charmer in the World

A Giant Python as a Pet

By M. Lorant

FEW professional snake charmers have ever been known to perform the extraordinary feats that Geza Szegedy, a Hungarian boy four years old, practised as a matter of course some time ago. Geza's only chum and playmate was Bubu, a giant python, one of the most dangerous inmates of the Indian jungle.

The idea that Bubu was a thing to be afraid of never entered the boy's head, and accordingly Bubu never conceived the idea that he might harm Geza, who looked after him with such fond care, although a single pressure of the snake's gigantic sinews could have squeezed the life out of the little boy. Geza and Bubu were firm friends and romped and played together all day.

Geza Szegedy, the son of an animal tamer, was brought up among animals, and nobody ever told him that a wild beast is something to be feared. The notion of fear never entered his mind at all. That is how his father explained the perfectly natural attitude of the child towards the huge snake that he had chosen as his pet.

"I confess quite frankly that I have never dared to tackle the snake as my four-year-old son did," the father said. "But I had no fear either concerning Geza's safety. He has known the snake ever since he was alive. Bubu took his food from him, allowed himself to be bathed by Geza, and romped and played with him, but he never got rough."

To see the snake coil playfully round the little boy's body and roll round in the grass with him, allowing his small head to be caressed, was a sight to make the

onlooker's blood curdle. But Geza and Bubu revelled in their games, and probably neither of them thought there was anything extraordinary about it.

"Pity that Bubu is so much older than I am," little Geza used to say. "He is 124 and I am only four. But he obeys me all the same. He is a very good snake."

Indeed the huge python looked remarkably docile when his baby master took hold of his head and held a milk flask to his mouth, making him drink like a little child. Bubu was a great consumer of milk. Geza gave him a warm milk bath every fortnight, and a great deal of the milk of human kindness into the bargain.

Bubu looked just as savage as his fellow snakes, however, when Geza fed him his fortnightly ration of 12 rabbits. He placed the rabbits in front of Bubu one by one. Bubu hypnotised them with his inflexible eyes according to the approved manner of snakes, and when the moment

came he pounced upon each helpless rabbit and swallowed it whole. Then Geza placed the next little victim in readiness, and the process was repeated until 12 bulges along Bubu's sinewy body denoted that his appetite was satisfied and the long process of contented digestion was about to begin.

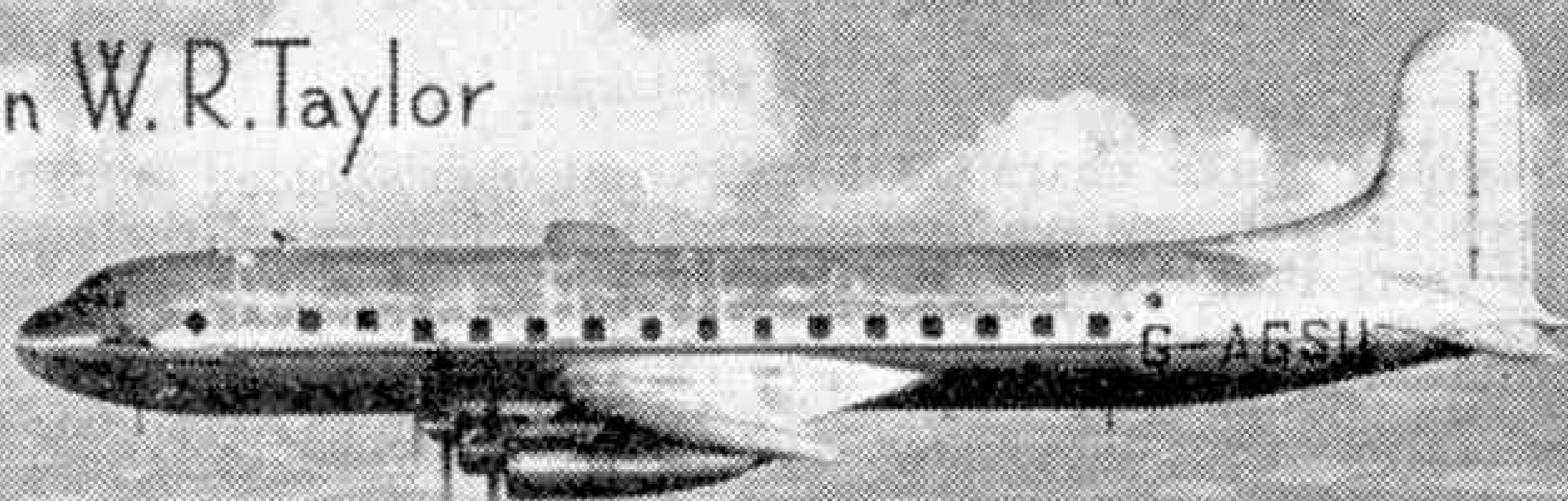
After the meal Bubu was ready to play again, to coil and curl around Geza playfully, and even exchange kisses, a sight to make one's hair stand on end, but one greatly enjoyed by the world's youngest snake charmer. Our illustration shows how fearless and delighted Geza is in the company of his novel playmate.



Geza Szegedy with Bubu, the giant 124 year old python that was his regular playmate.

THE AVRO "TUDOR"

by John W.R. Taylor



Avro "Tudor" II.

FEW aircraft have been the subject of so much controversy as the Avro "Tudor." When the first details of this new British air liner were released, it was heralded by the press as the last word in fast, luxurious post-war air transports. As a result, when B.O.A.C. announced after a series of proving trials that the "Tudor" I had several deficiencies, there was a great deal of disappointment, and many people who should have known better forecast that the "Tudor" was no good and that we should have to buy more American air liners to operate our long-distance airline services.

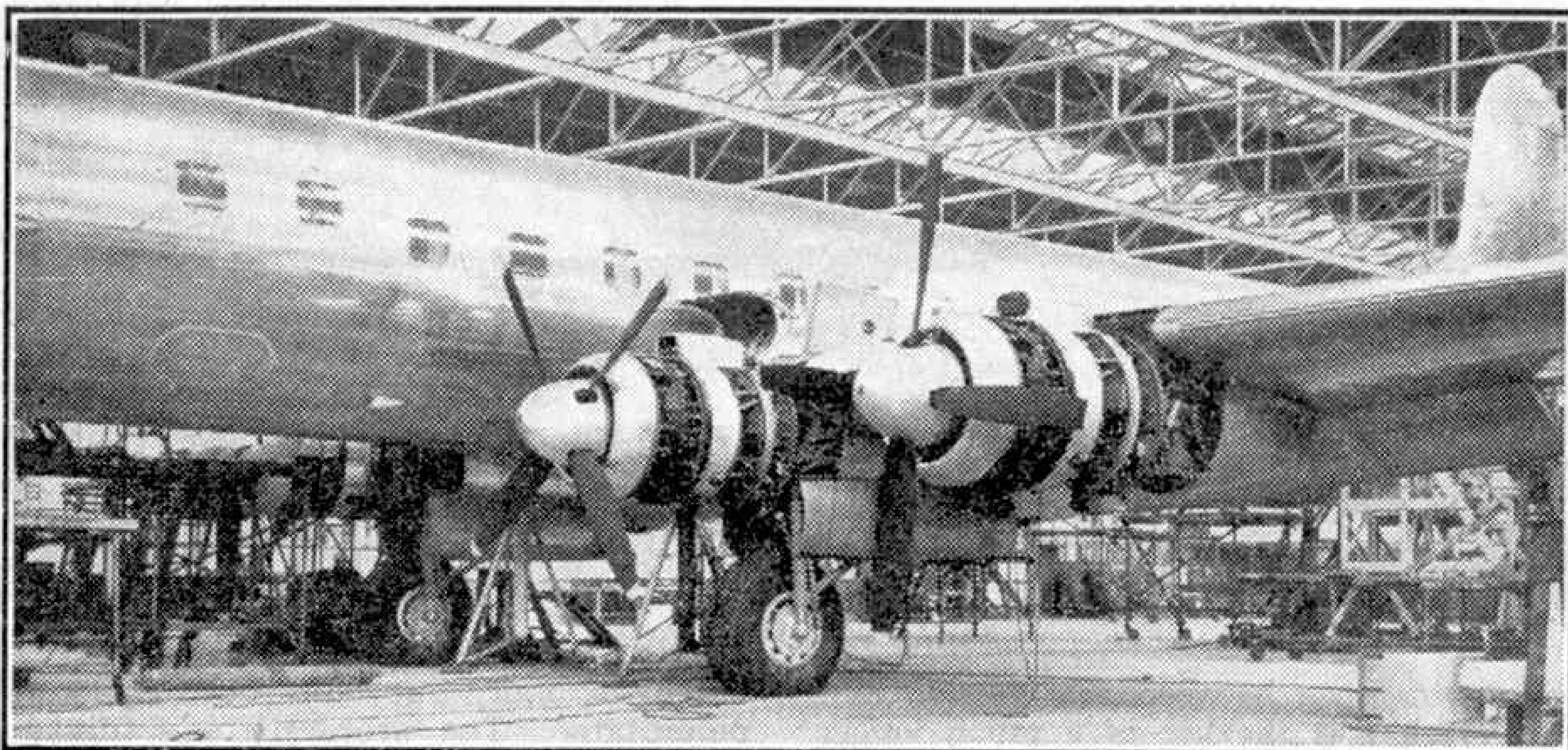
The truth is that all aircraft have "teething troubles" in the early months of their life. Sometimes these are serious, but more usually they can be cured by such methods as adding a dorsal fin, cleaning up the general design, strengthening some part of the structure or fitting different engines. In the case of the "Tudor" I, Avro have made a number of small modifications and now announce that the type is likely to exceed handsomely its original specification, which is quite a good answer to the pessimists. The "Tudor" is, in fact, what it was designed to be—a fast, comfortable and reliable air liner, planned during the final stages of the war to hold the fort on B.O.A.C. *Speedbird* routes until a new generation of post-war air liners becomes available.

During the war our aircraft industry had to devote all its tremendous energy and skill to producing at first sufficient of the world's finest fighters to prevent our losing the war, and then sufficient of the world's finest bombers to enable us to win it. Production of transport aircraft for the Allied air forces was left to the United States; as a result American

manufacturers were able to establish a lead in the design of new air liners. But an idea of the ability of our own designers can be gained from the fact that the Americans themselves predict that, by 1948, we shall not only have eliminated that lead but shall have outpaced them. This is largely due to the fact that Britain leads the world in the design and application of jet and "propjet" aero engines. It is significant that a modified Avro "Lancastrian" was the first air liner to fly with jet engines; that an Avro "Lincoln" has carried out a highly successful flight test programme fitted with two "Theseus" propjets in place of its outboard "Merlins," and that a "Tudor" VIII will soon be flying, powered with four Rolls-Royce "Nene" jets.

Eight different versions of the "Tudor" are now being built, but they are all variants of the basic Marks I and II designed for B.O.A.C. An important point to remember is that, although they incorporate many features combat-tested in the "Lancaster," and make use of a number of "Lincoln" components, the "Tudors" are in no way converted or developed from a bomber design. In this respect they differ from the "Yorks" and "Lancastrians" which have put in such fine service as interim transports on our airlines. The "Lancaster" was, without doubt, the finest bomber used by any air force in World War II, but the same space that will accommodate the concentrated weight of a 10-ton bomb will not accommodate 10 tons of assorted passengers and their luggage. So Avro started from scratch with the "Tudor" design, using orthodox all-metal construction, but including all the latest ideas to improve safety and comfort.

Throughout all the stages of design and



The second prototype Avro "Tudor" II, now re-designated "Tudor" VII, under construction. It is fitted with four Bristol "Hercules" 120 engines. For the photographs to this article and for the picture on our cover we are indebted to A. V. Roe and Co. Ltd.

production, there has been close co-operation between Avro and the Technical Branch of B.O.A.C. to ensure that the "Tudors" will be capable of holding their own with any comparable air liners in operation under all climatic conditions. The passenger cabins can be pressurised, a fact that ensures passenger comfort even when the "Tudors" cruise at 20,000 ft. or more to fly above bad weather. Complete dining facilities are available, full-course meals being served from a beautifully fitted out kitchen. There is a bar and lounge deck with carefully placed windows giving an unrestricted panoramic view.

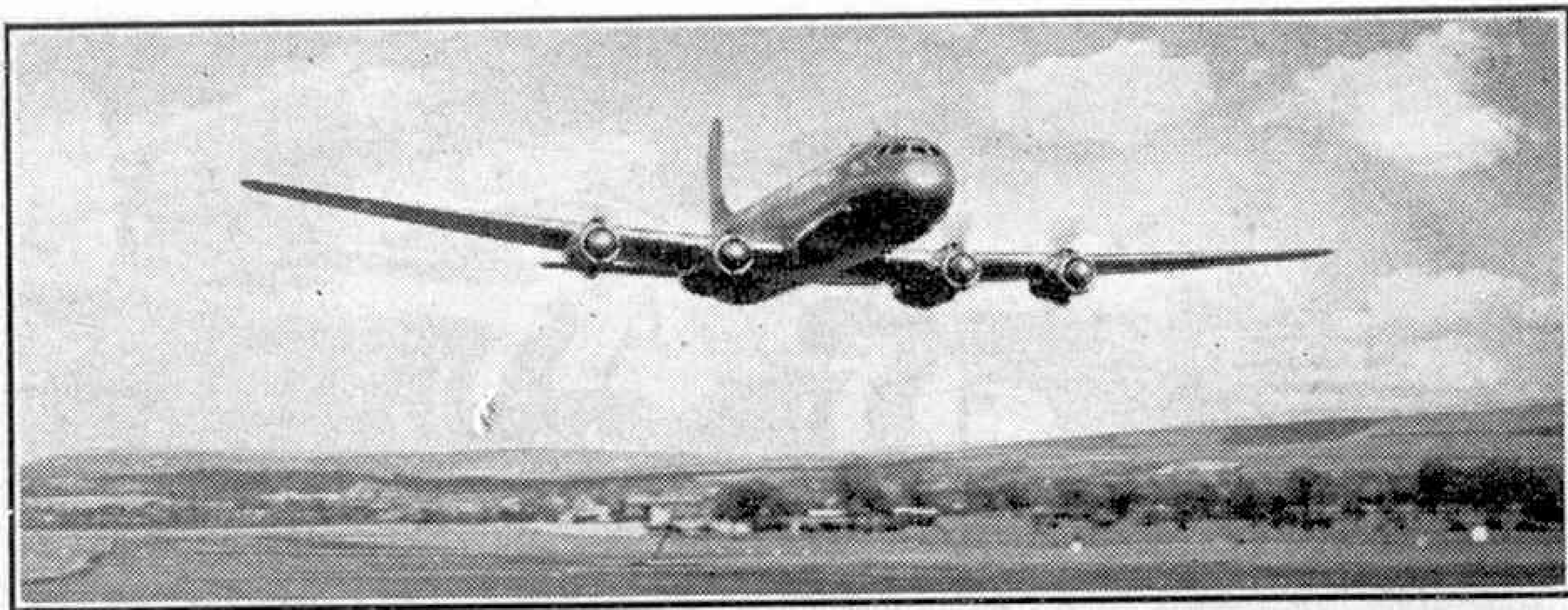
The various Marks differ chiefly in their internal arrangement and engine installations, the basic designs being sufficiently versatile to allow the aircraft to be "tailored" to suit the requirements of individual operators. The Mark I is a

12-passenger air liner, with a wing span of 120 ft., a length of 79 ft. 6 in., and a loaded weight of 78,000 lb. It is powered by four 1,770 h.p. Rolls-Royce "Merlin" 600 engines, which enable it to cruise for 3,220 miles at a speed of 300 m.p.h. This makes it suitable for B.O.A.C.'s trans-atlantic passenger service, especially as full sleeping accommodation is available for all passengers—a feature not provided on the American air liners at present in use. Fourteen "Tudor" Is are scheduled for service with B.O.A.C., all named after famous characters in British history. The first was christened "*Elizabeth of England*" by H.R.H. Princess Elizabeth at Heath Row on 21st January last.

Altogether orders for 50 "Tudor" IIs have been placed by the Ministry of Supply for B.O.A.C. and production of these is proceeding with full speed. The



A fine ground view of the "Tudor" II.



The "Tudor" VII in the air.

chief difference between this version and the Mark I is the use of a much longer fuselage with accommodation for up to 60 passengers. This puts the loaded weight up to 80,000 lb. and reduces the range to 1,850 miles at 230 m.p.h., but the latter is quite sufficient for service on our Empire routes. Unfortunately, the runways of some Empire aerodromes are neither long enough nor strong enough to take an aircraft of such weight—a fact that has caused much consternation. But, until adequate runway facilities are available at these places, the "Tudor" II can no doubt be put to good use on other services. It has an impressive appearance and a performance to match and will undoubtedly prove a valuable addition to Britain's merchant air fleet.

The Mark III is a special V.V.I.P. version of the "Tudor" I. Two have been fitted out by Armstrong Whitworth at Coventry for the use of British Cabinet Ministers and will have luxurious state-rooms and lounges. The "Tudor" IV has also been developed from the Mark I, for British South American Airways. The Managing Director of this airline is Air Vice-Marshal D. C. T. Bennett, who, during the war, formed and led in person the R.A.F.'s elite Pathfinder Force. In his fine book *"Bomber Command,"* Marshal of the Royal Air Force Sir Arthur Harris describes Air Vice-Marshal Bennett as "the most efficient airman I have ever met," an opinion that can only lend weight to the latter's description of the "Tudor" IV as "one of the finest commercial propositions ever known in the field of long-range transport." Its fuselage is 6 ft. longer than that of the Mark I, with accommodation for 32 passengers as well as a large payload of freight and mail. The Corporation have placed an initial

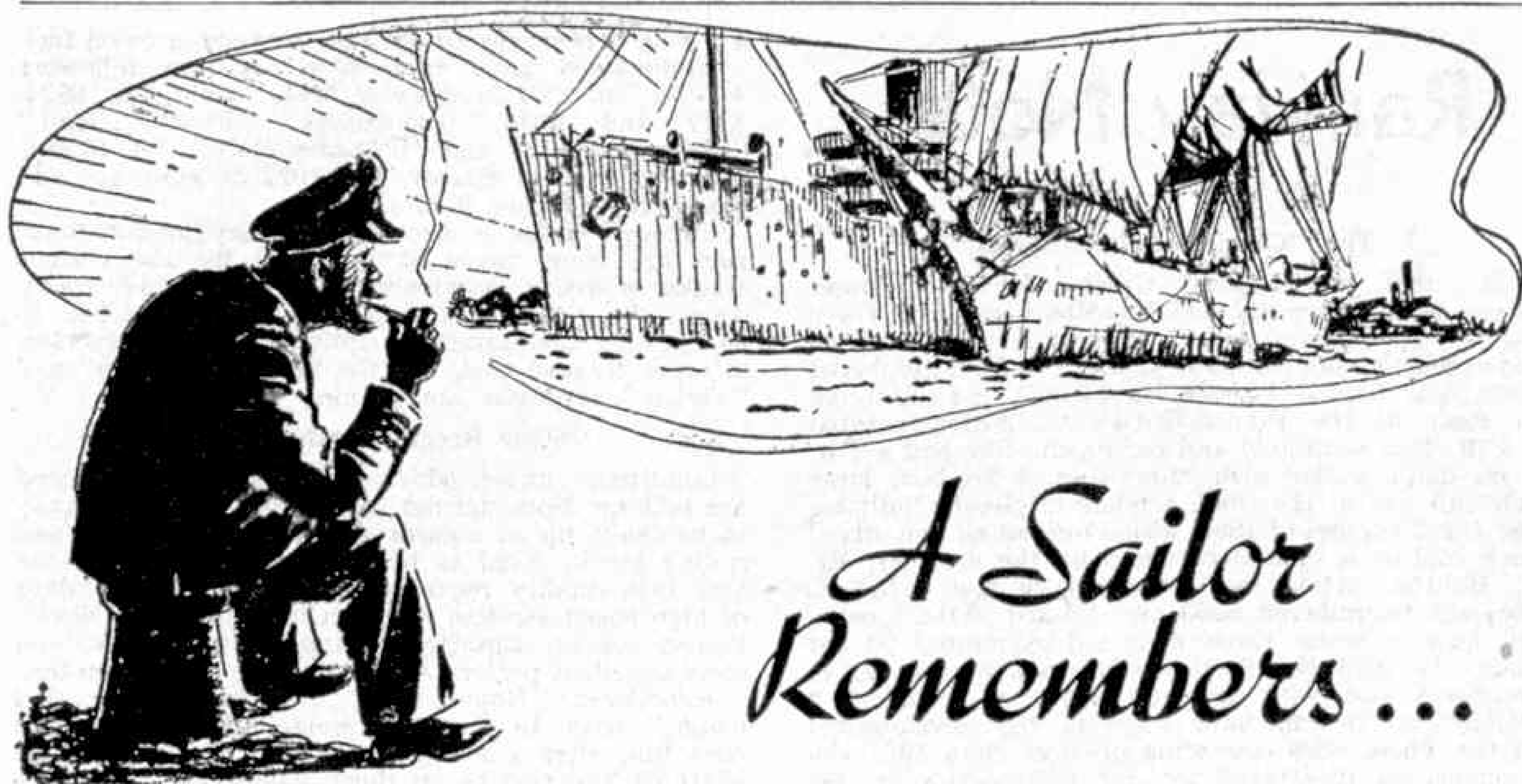
order for four, but will probably order more later. The prototype has already flown and the others are nearing completion.

Air Vice-Marshal Bennett added that "Statistics prove that, as compared with a much-vaunted American type in service to-day, the 'Tudor' IV can carry 12½ per cent. more load across the South Atlantic at the same cruising speed. These calculations are based on the official figures of the makers in both cases." He wished to make it clear that he inferred nothing against the American aircraft, but "many misleading statements have been made in connection with the 'Tudor' and it is desirable to do justice to the characteristics and performance of this fine British air liner." He hopes to be able to introduce the B.S.A.A. "Tudors" on the service to Rio de Janeiro and Buenos Aires and also on a new service to Mexico this Summer.

B.S.A.A. have also ordered a number of "Tudor" Vs, which are basically Mark IIs, with modified furnishing and accommodation. Another variant of the "Tudor" II is the Mark VI, six of which are being built for Flota Aerea Mercante Argentina (Argentine Airways). Deliveries of both these types will begin before the end of the year.

Finally come the Marks VII and VIII, both of which have experimental engine installations. The VII is a "Tudor" II powered by four 1,800 h.p. "Hercules" 120 engines, and already has made a number of highly successful test flights. The additional power of the "Hercules" is undoubtedly a tremendous asset, especially during take-off, and it is more than likely that we shall hear a lot more of the "Tudor" VII. Reference has already been made to the "Nene"-engined Mark VIII, which uses a

(Continued on page 342)



A Sailor Remembers ...

"Keep a Sharp Lookout for Ice!"

By Capt. Eric Minett

THIS curt order, given by the Mate, had a sinister yet thrilling sound to my young ears when rounding Cape Horn in a "windjammer" some 35 years ago. Try to imagine a big four-masted sailing ship, running before a whole westerly gale. The night is dark as pitch while huge Cape Horn seas, "Greybeards" as we called them, seem to hiss their Southern hate at mere man's handiwork.

"Keep a sharp lookout for ice!"

To my young brain ice brought back a mental picture of frozen ponds and skating at home, but ice at sea has a very different meaning. There are several different forms of ice, bergs, pack ice, sludge ice, pancake ice, etc.; but to sailormen the iceberg is the most dangerous.

Strange to say, there is a deal of difference between the bergs of the Southern Hemisphere and those of the Northern. Which reminds me—a candidate sitting for a Second Mate Board of Trade certificate was asked by the Examiner: "If you saw an iceberg how could you tell whether it was an Antarctic or Arctic berg?" The correct answer is this. The bergs in the Northern Hemisphere come from the glaciers in Greenland and the Arctic regions, and are most irregular in shape and size; I have seen them looking like great fairy castles, and huge white marble cathedrals. Their Southern sisters on the other hand are larger, flat-topped, and come from the Great Ice Barrier Reef. To come nearer home, the "Grand Banks" of

Newfoundland are noted for icebergs. Here is an experience on a vessel trading between Great Britain and Canada. We were bound for Quebec and Montreal, and the month was early May. For some 24 hours we had been feeling our way through fog and mist. We knew that ice was about. Now by the rules laid down to prevent collision at sea, a steam-vessel under weigh, which is making headway through the water, must sound on the whistle or siren one prolonged blast every two minutes. If she is stopped and not making headway, she must sound two long blasts.

We had been stopped and moving "Slow Ahead" and "Half Ahead" on our engines for some 24 hours. I was on the bridge, and we were steaming "Slow Ahead" giving the regulation one prolonged blast, when quite faintly I heard a similar long blast straight ahead. Putting the Telegraph at "Stop" I gave two long blasts and the Captain came up on the Bridge as I did so. "Give him another two," ordered the Captain, which we did. We got two answering blasts back, and this went on for some minutes, blast answering blast. Suddenly to our surprise we heard what sounded like a machine-gun firing "bang! bang! bang!" The next moment a huge ghostly shape was vaguely seen enveloped in fog, towering above our foremast. Yes! a berg! Putting our engines "Full Astern" we slipped clear. A near miss. It is said that about seven-

(Continued on page 342)

Railway Notes

By R. A. H. Weight

The "Claud Hamilton" Class

In 1900 the former Great Eastern Railway introduced a powerful and handsome class of 4-4-0 express locomotives with 7 ft. driving wheels, which did excellent work for many years. The first, numbered 1900, was named "*Claud Hamilton*," and exhibited in Paris at the Franco-British Exhibition painted G.E.R. blue with gold and red finish. She had a 4 ft. 9 in. diam. boiler with round-topped fire-box, large cab and one of the small tenders originally built for the 4-2-2 engines of 1898, which burned oil fuel mixed with coal on a system patented by the designer, Mr. J. Holden. After the formation of the L.N.E.R. she was renumbered 8900 and classed "D14," being the only ex-Great Eastern named locomotive at the time. In 1925 No. 8900 was given a new boiler of increased size with Belpaire fire-box, becoming a "D15," an intermediate stage in the development of the whole class consisting of more than 100 locomotives, as illustrated by our photograph on the opposite page of the engine now renumbered 2543.

In 1933 "*Claud Hamilton*" was rebuilt in the latest Gresley style as a "D16/3" with large boiler, round-topped fire-box, raised framing, L.N.E.R. chimney and nameplates. As a special case this rejuvenated pioneer locomotive of a celebrated class was painted green for a number of years after black had become standard for most other engines of the type. For a time she carried the number 7770 and then 2500. Now, after nearly 47 years' service she has been withdrawn for scrapping. Many similar locomotives are still running in rebuilt form, mostly as "D16/3s" numbered between 2501 and 2620, but their days are drawing to a close.

As a farewell tribute we reproduce a photograph of "*Claud Hamilton*" in L.N.E.R. rebuilt style. Fine models of this engine as originally appearing may be seen in the Bridewell Museum, Norwich, also at the Romney, Hythe and Dymchurch station at Littlestone.

Great Western Tidings

New "County" class 4-6-0 high-pressure express locomotives were recently placed in service and shedded as follows: No. 1027 "*County of Stafford*," Westbury; No. 1028 "*County of Warwick*," Bristol (Bath Road); and No. 1029 "*County of Worcester*," Stafford Road, Wolverhampton. Additional 94xx 0-6-0 tanks have been completed from No. 9405 to No. 9409; Nos. 9401-4 are allocated to PDN, Old Oak Common. Over 40 more W.D. "Austerity" 2-8-0 freight engines are on loan from the Government, a similar number of Great Western built L.M.S. type 2-8-0s having been handed over to the latter company.

The following "Hall" class 4-6-0s have been converted to oil burning; Nos. 4907, 4948, 4971-2, 5986, 6949, 6953 and 6957; they will be renumbered 39xx, though not necessarily in the same order. No. 3839,

a 2-8-0, is renumbered 4853 on conversion to oil fuel.

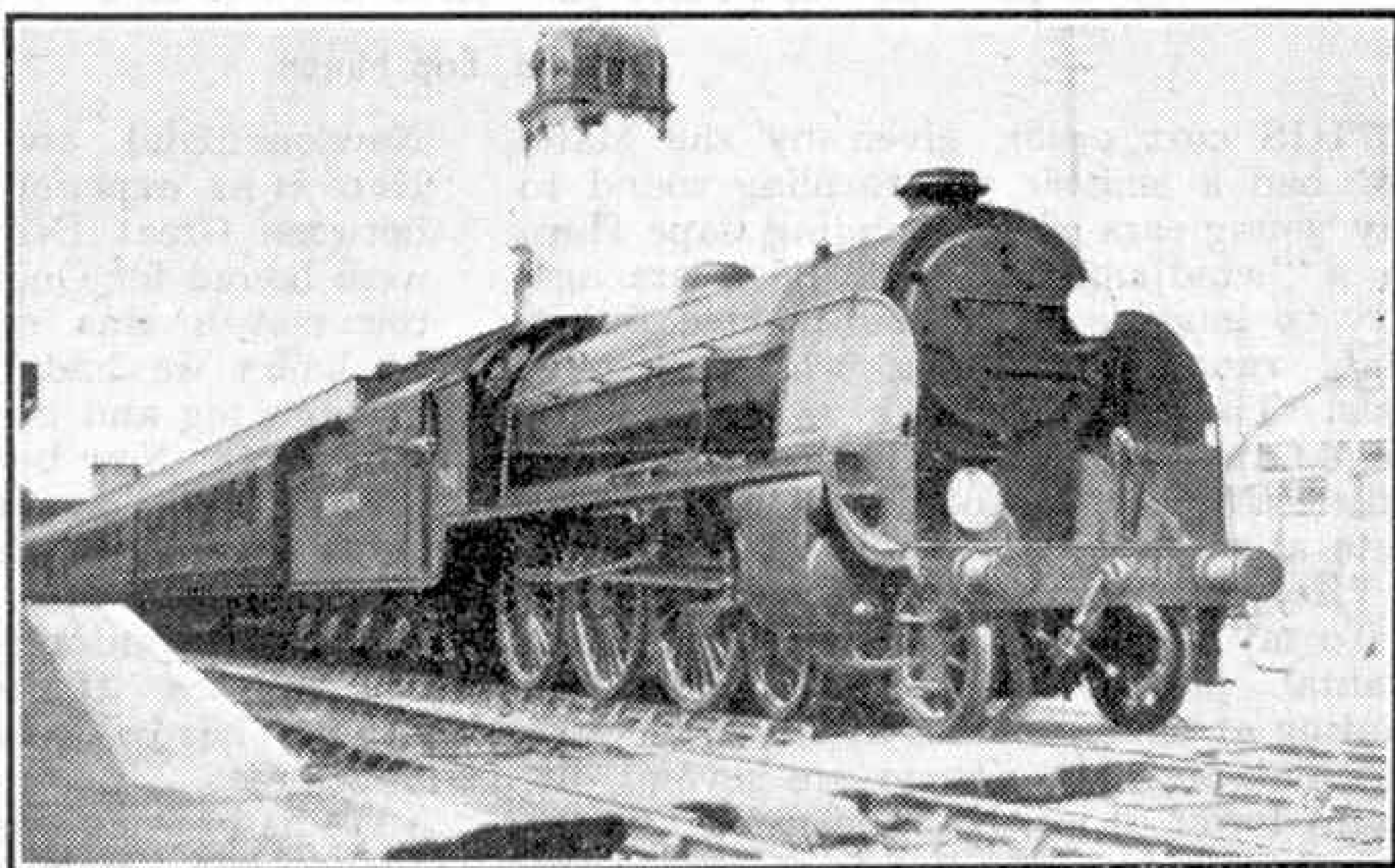
Nameplates have been fitted to the following 4-6-0s: No. 1002 "*County of Berks.*" and Nos. 6924, 6949 and 6970, respectively "*Grantley Hall*," "*Haberfield Hall*," and "*Whaddon Hall*." No. 1020 is now stationed at Exeter, No. 1022 at Penzance and No. 1023 at Truro in Cornwall.

Summer traffic is heavy and many long-distance runs are being made at weekends by the various classes of 4-6-0 locomotive with considerable loads. As on the other main lines, reductions have had to be made or maintained in ordinary weekday services in order to save coal, but the "*Cornish Riviera*" and "*Torbay*" expresses are running again.

Some Recent Notable Runs

Conditions under which fast trains are operated are still far from normal, and there is much leeway to be made up as regards maintenance of track and rolling stock. Coal is by no means always of the first rate quality regarded as essential in the days of high speed services and quicker schedules. Nevertheless average running has improved recently, and some excellent performances have come to our notice.

Reboilered "Royal Scot" No. 6168 "*The Girl Guide*," with 13 corridors weighing just over 400 tons full, after a sound run from Crewe stopped at Watford Junction to set down passengers. Then the 17½ miles into Euston were covered in 21 min. start to stop with the greatest of ease; a maximum of

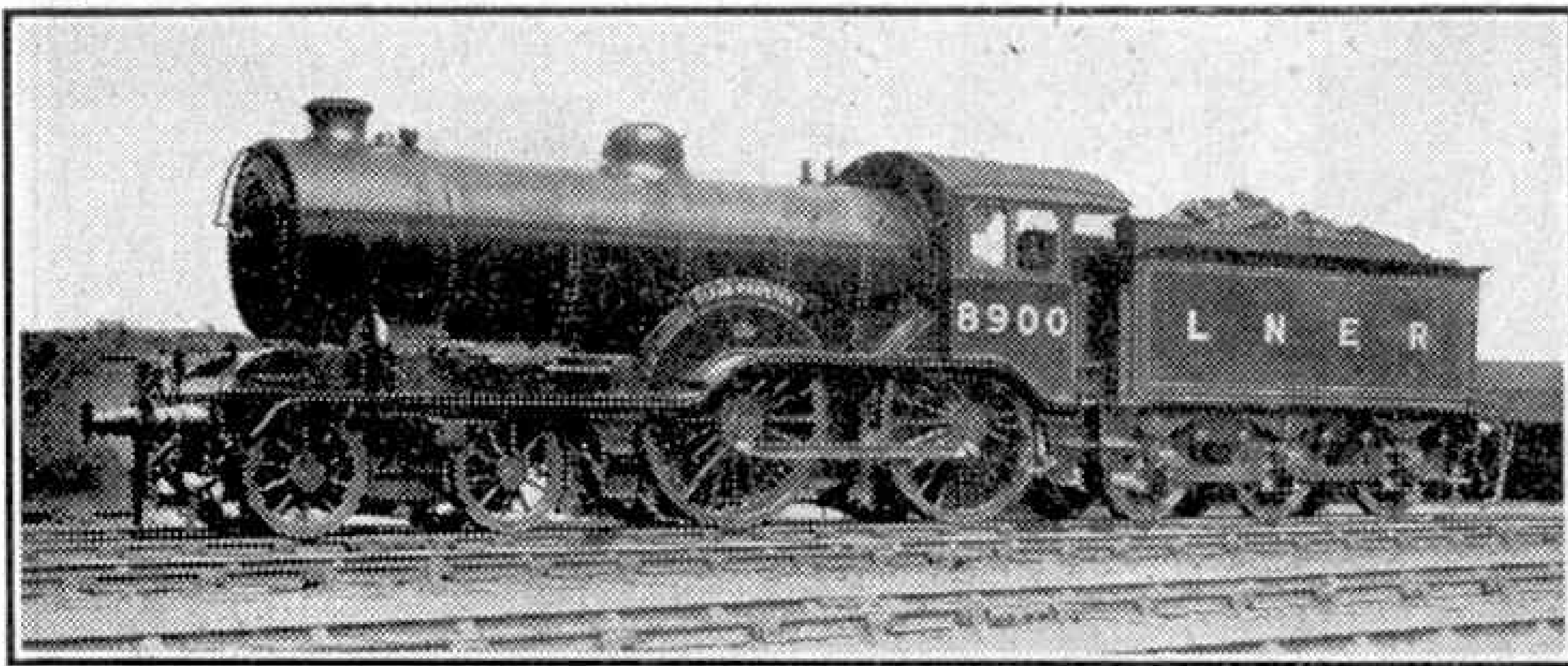


S.R. "N15" class 4-6-0 No. 740 "*Merlin*," in service as an oil-burner. Photograph by G. O. P. Pearce.

66 m.p.h. past Wembley was attained after a quick acceleration, and so a further two minutes were regained.

Further north on the L.M.S., on sections of Scottish line less than 40 miles long famous since Caledonian or Midland compound days for fast running over fairly favourable grades, standard Stanier 4-6-0s have achieved almost 60 m.p.h. start to stop times between Forfar and Perth, and also from Beattock station to Carlisle with loads of about 300 tons.

On the L.N.E.R. streamlined "Pacific" No. 34 "*Peregrine*," with double chimney, gave an outstanding performance for these days with a packed 15-coach train probably weighing 525 tons from Doncaster to Grantham, which had to call at both Retford and Newark. Including the surmounting of the Piper's Wood rise, Bawtry, 8½ miles, was passed in just over 11 min. Then a maximum of over 75 m.p.h. beyond Ranskill enabled 6 miles to be covered in 5 min., and a stop at Retford, nearly 17½ miles, to be secured in 20 min., 5 min. less than booked. On the 1 in 198 climb out of Retford 43 m.p.h. was attained, followed by very fast travelling down to



L.N.E.R. No. 8900 "Claud Hamilton" as rebuilt to class D16/3 and painted green in 1933. This engine has now been withdrawn.

the Trent valley, so that the next short stage of 18½ miles to Newark stop occupied only 20 min. 23 sec. On account of a relaying slack and a signal check before Grantham, the average over the 14½ miles, including a good deal of uphill from Newark to Grantham, was not quite so fast, yet no less than 12 min. had been regained on a difficult 50½ mile run.

S.R. No. 751, "Etarre," a Urie "King Arthur" 4-6-0 still black, though in good condition, and a sister locomotive to No. 740 illustrated this month as an oil burner, had a 12-coach load of some 420 tons weight on a relief Waterloo-Bournemouth express at Whitsuntide. This secured a clear road to Southampton, except for a signal check just outside at Northam, and an excellent non-stop run was given over the 79½ miles to the celebrated port. Without any particularly high speeds, and including permanent way slowing near Byfleet, Southampton was reached in 89 min., or 87½ net., equal to the best pre-war ordinary timings and 7 min. less than the allowance for the regular express which it preceded.

L.N.E.R. News

The "Flying Scotsman" is again running without a halt over the 162½ miles between Newcastle and Grantham on its southbound run, worked usually by a Gateshead engine and men. The daily advance portion of the northbound express passes York also, but stops at Darlington. Several East Coast fast trains are running without a halt between Peterborough and York, and between Newcastle and Edinburgh. Many more 4-6-2 express engines are now painted green unless of the "A4" streamlined variety when the finish is blue and chromium. No. 113 "Great Northern" is green and carries a turbo-generator for electric lighting.

"B1" 4-6-0s continue to come into service numbered 10xx from Darlington Works, 11xx from the Vulcan Foundry and 12xx from the North British Locomotive Co. One of the first G.N.R. 2-cyl. 2-8-0 mineral locomotives, now class "O3," is listed for withdrawal. The type was introduced in 1913 and has been developed on a large scale by the L.N.E.R. in the 3-cyl. "O2" form. Among engines scrapped is "C5" former Great Central 3-cyl. compound 4-4-2 No. 2896 "King Edward VII." The G.C.R. "Atlantics" have boilers similar to those on the unrebuilt O4s, the most numerous L.N.E.R. 2-8-0 class.

Southern Tidings

Locomotives seen in Ashford Works during June included Nos. 21C 132; "Q1" class 0-6-0s Nos. C15 and C23; "L" 4-4-0s dismantled Nos. 1773 and 1777; "L1" No. 1783, being painted light green; several "AY" W.D. 2-8-0s retaining five figure numbers though to be turned out in S.R. black style; "B1" South Eastern 4-4-0 No. 1101, withdrawn; and several of the

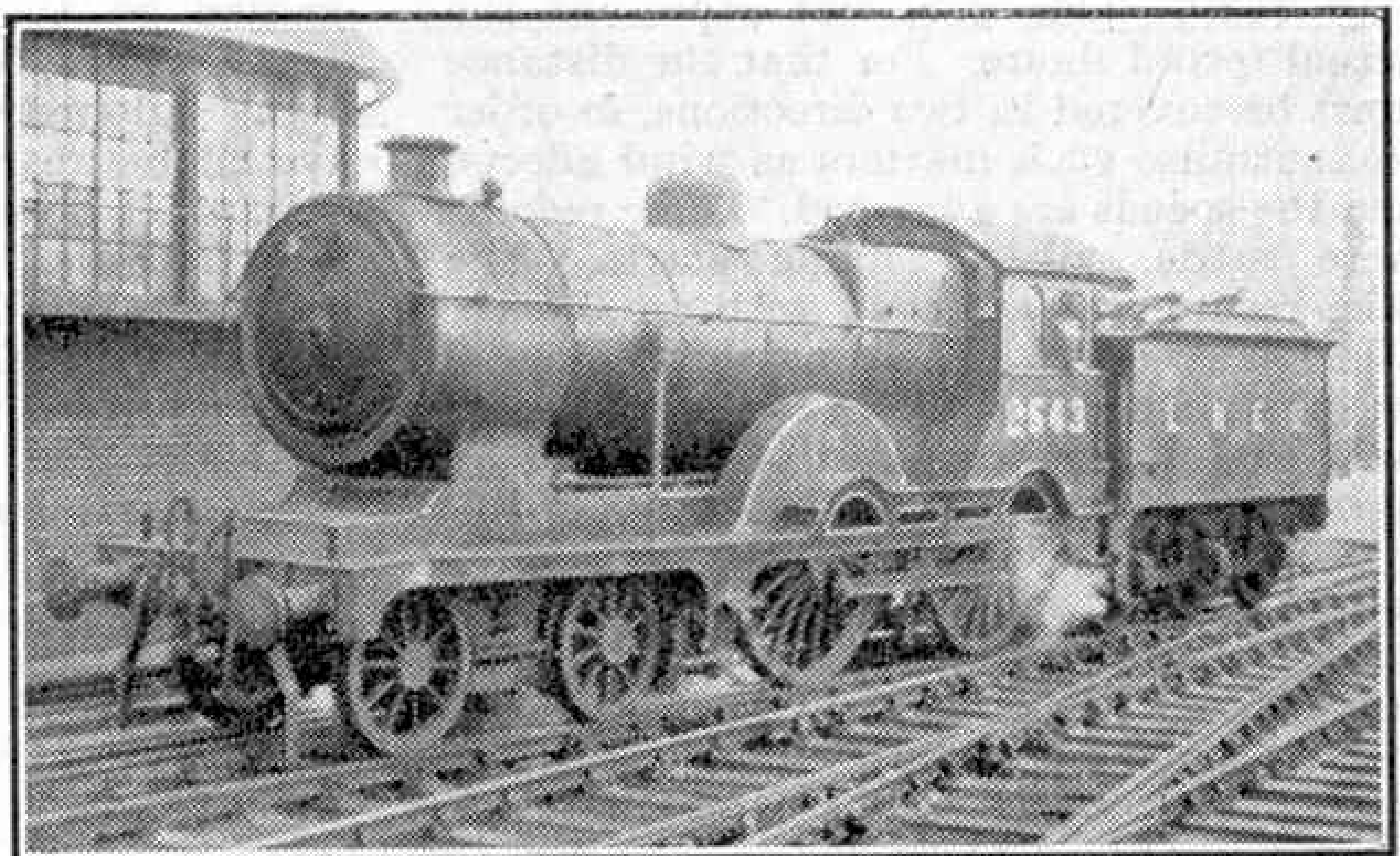
slightly older "F1" and "O1" engines, whose fate is uncertain. Some of the latter veteran 0-6-0s were being given new parts ready for further service. A large electric locomotive, No. CC3, is under construction.

A new express is running between Waterloo, Exeter, Ilfracombe and Plymouth named the "Devon Belle." It is formed of first and third class Pullmans, with observation car in rear. It is a heavy train of 12 cars, usually worked throughout by "Merchant Navy" or "West Country" locomotives and carrying special headboards and red wings on the sides of the air-smoothed boiler casing. The Plymouth and Ilfracombe portions run as separate trains west of Exeter.

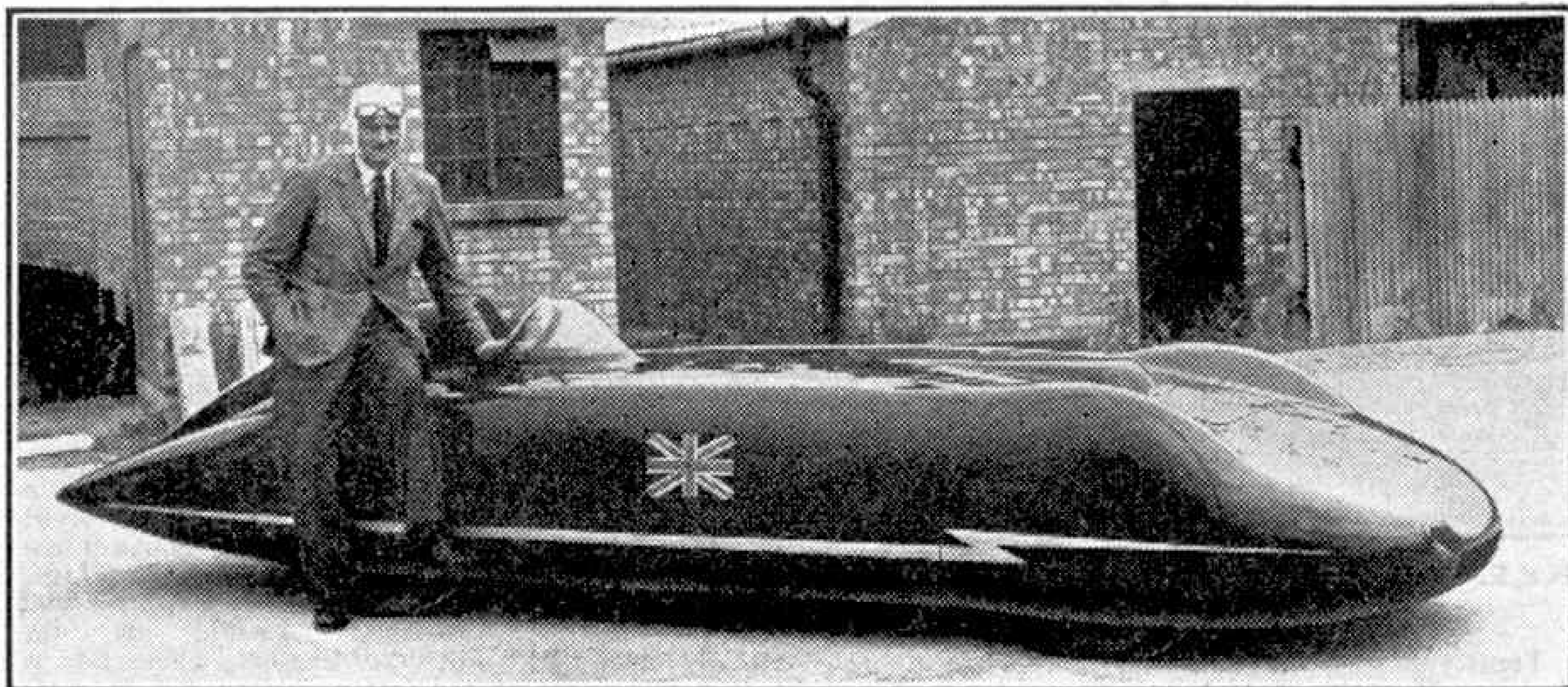
New "West Country" 4-6-2 No. 21C 164, the 1,000th locomotive to be built at Brighton, has been exhibited at the Works there finished in latest S.R. express passenger livery. In company, by way of contrast, were two veteran and diminutive L.B. and S.C. "Terrier" 0-6-0 tanks painted in the yellow style of Stroudley days. One is the former Works shunting engine with original type boiler, now named "Boxhill" as of old; the other No. 377S, her successor in that duty. We hope to publish a photograph next month, and also to illustrate one of the U.S.A. tank engines now in S.R. service.

* * *

The L.N.E.R. are building six third-class sleeping-cars of new design having single and double berth compartments. Hitherto third-class sleepers have provided four berths to each compartment.



L.N.E.R. Class D15 4-4-0 No. 2543, of the former Great Eastern "Claud Hamilton" class, at Peterborough North. Photograph by Eric Oldham.



Lt.-Col. Goldie Gardner and his M.G.

THE illustration at the head of this page shows Lt.-Col. Goldie Gardner's M.G., which is by far the fastest small car in the world. As it flashed along the great highways of Germany, Italy and Belgium in its record-breaking feats, the little green car with the Union Jack painted on the side of its sleek streamlined body gave convincing proof of the power and efficiency of the modern British small motor car engine.

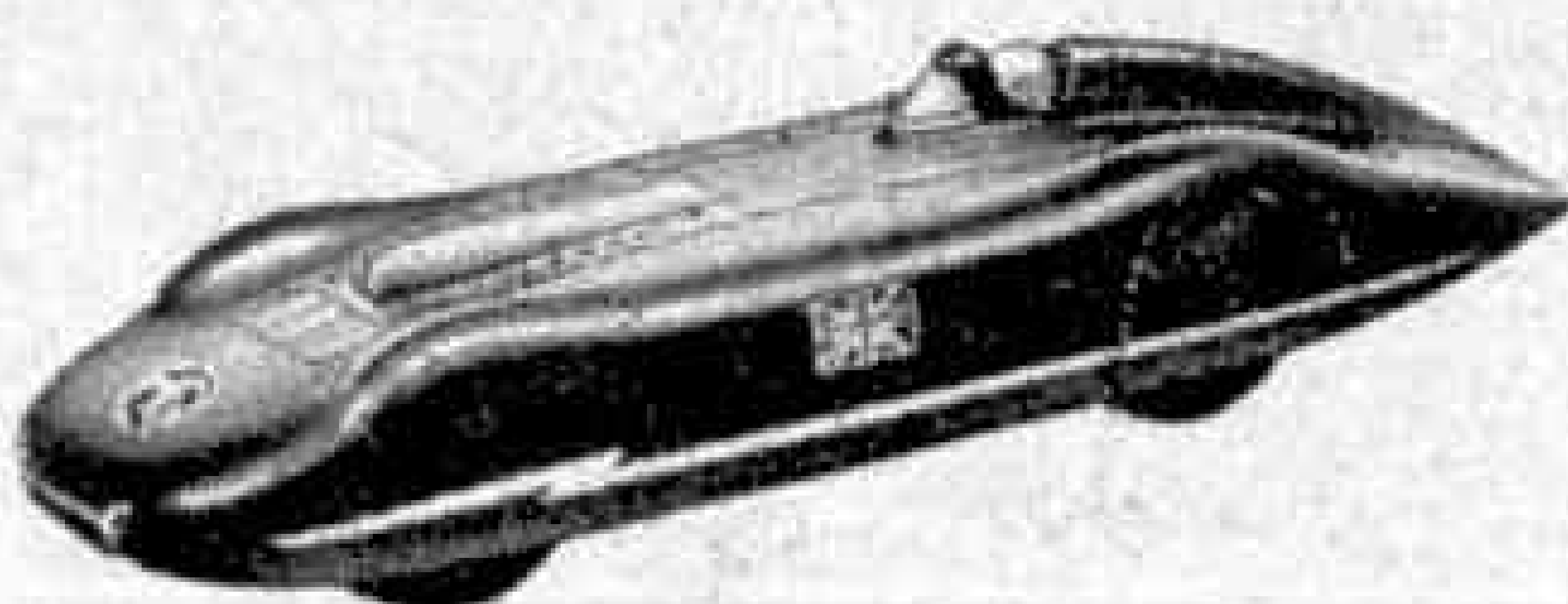
Gardner is in contrast to his remarkable car, for he is 6 ft. 3 in. in height! When he and his M.G. began their record breaking career the engine was in the 1,100 c.c. class, and along the Frankfurt-Darmstadt Autobahn, in Germany, the little car speeded in one run at 207.373 m.p.h. in May 1939. This does not represent the actual record figure. For that the distance must be covered in two directions, in order to neutralise such matters as wind effects, and the speeds are averaged. Three records were made, all for flying starts. The mile record was achieved with an average of 203.159 m.p.h.; that for the kilometre was established at 203.748 m.p.h.; and over five kilometres Gardner reached an average speed of 197.539 m.p.h.

Next day Gardner accomplished an even more striking feat by setting up records for cars of 1,500 c.c. capacity with practically the same engine. The conversion was made by boring out the cylinders slightly to

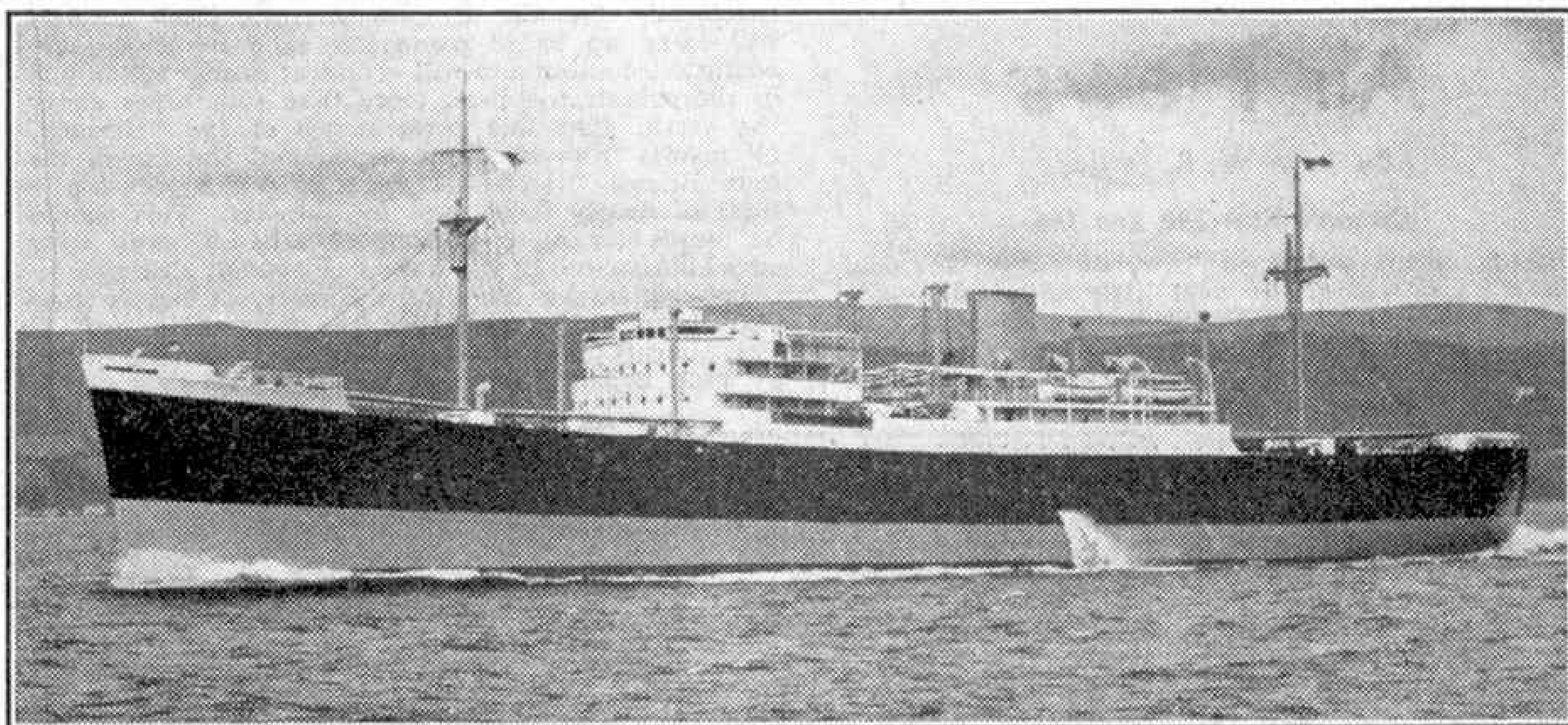
increase the capacity to 1,104 c.c., so that the car just came into the 1,500 c.c. class. The new figures set up for the mile, the kilometre and five kilometres were 203.8 m.p.h., 204.2 m.p.h. and 200.6 m.p.h. respectively.

When the war ended Gardner returned to his task with new ideas. This time his eyes were set on the speed record in the 750 c.c. class, which then stood at 140.7 m.p.h. The engine was modified by fitting a specially cast cylinder block to reduce its capacity, and along a motor road leading from Ostend the little M.G., with its tiny 750 c.c. engine, reached a top speed of 164 m.p.h. Only two runs were required to establish records in all three classes, and the actual figures created by Gardner were 159.151 m.p.h. for the flying mile, 159.098 m.p.h. for the flying kilometre and 150.467 m.p.h. for five kilometres.

Gardner now has his eye on the 500 c.c. class records. After the 750 c.c. records had been established the capacity of the engine was reduced to 494 c.c. by fitting hollow pistons without piston rings to two cylinders and disconnecting their valve mechanisms and the plugs. This left the engine with only four cylinders, and with it Gardner reached 102 m.p.h., only four m.p.h. less than the existing record. By the time these words appear in print a second effort may have been made at Ostend.



The Dinky Toys model of the M.G. record car.



Royal Mail Cargo Liners

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

ROYAL Mail Lines Ltd. have two very fine new cargo liners building at Belfast in the yards of Messrs. Harland and Wolff Ltd. These two vessels, the "*Loch Avon*" and "*Loch Garth*," are at present lying at the fitting out wharves and will be delivered to their owners during 1947; they are intended for the Company's North Pacific service via the West Indies and Panama Canal and will be notable additions to Britain's Merchant Navy.

In building these vessels, the aim of the owners is to satisfy not only the demands for speedy ocean transport, but also that perishable produce shall reach its destination in the best possible condition. The design of the insulated spaces will embody the very latest methods of refrigeration based on modern research and adapted to the special requirements of the trade on which the vessel will be employed. Special compartments of varying temperatures will ensure the prime conditioning of citrus fruit, bananas, etc., while others will be allocated to all kinds of dairy produce. A large amount of space will also be used for the carriage of general cargo.

These ships are based on the "*Loch Avon*," shown at the top of this page, a very fine vessel built for Royal Mail Lines Ltd. by Harland and Wolff Ltd. at their Govan Yard in 1938. This ship, which was powered by a double acting, two cycle, airless injection, diesel engine, sailed from Rotterdam on 6th August, and from London on 10th August 1938, on her

maiden voyage, under the command of Capt. F. Cooke, but she was not destined to have a long life. When she was sunk by a German U-boat during the early part of the second World War, Britain lost a very valuable cargo carrier.

The two new "*Loch*" ships will be driven by double reduction geared turbines developing 10,500 shaft horse power through a single screw, giving a speed of 16/17 knots. The vessels will be somewhat similar to the ship shown on this page, they will have a deadweight of 10,470 tons, a load draft of 28 ft. 6 in., and five cargo hatches which will be served by 17 electric winches. Twelve fortunate passengers will be carried in eight single and two 2-berth cabins each having its private bathroom and toilet. A special innovation for a ship of this type is the introduction of an ironing room for the benefit of lady passengers.

Royal Mail Lines Ltd. ordered their first motor cargo ship in 1920, from John Brown and Company at Clydebank. This vessel, the "*Lochkatrine*," was launched on 5th August 1921 and was a twin screw ship with insulated cargo space for the carriage of fresh fruit. Her diesel machinery was constructed by Harland and Wolff Ltd. This latter firm was then entrusted with the order for two sister ships, the "*Lochgoil*" and the "*Lochmonar*." The "*Lochmonar*," launched at Belfast on 8th December 1923 was to become famous in 1928 when she had a new bow built on to replace her damaged one.

Air News

By John W. R. Taylor

Cessna's New 190 and 195

In my recent article on *"America's New Personal Planes"* I described the neat little all-metal Cessna 120 and 140 two-seaters. The same company have now produced the prototypes of two larger personal planes, the five-seat Models 190 and 195, which have been especially designed to meet the requirements of air-minded business executives and are the largest, roomiest and most luxurious post-war aircraft of their type.

Like their little brothers the Models 120 and 140, the 190 and 195 are sleek, trim, all-metal monoplanes. Flight tests have proved them stable and easy to handle in the air, and they are powered by engines proved thoroughly dependable by millions of flying hours. The two machines are identical throughout except for their engines, the 195 having a 300 h.p. Jacobs and the 190 a 240 h.p. Continental. Top speeds are 180 m.p.h. and 170 m.p.h. respectively, with a cruising speed of 165 m.p.h. in each case. Both aircraft have an excellent rate of climb which enables them to take off from small fields, clearing any nearby obstacles. The Cessna 195 is illustrated on this page.

The cabins are roomy and luxurious, and completely air-conditioned. To the rear, in each aircraft, there is a compartment big enough to accommodate 200 lb. of luggage. Other features are the special Cessna safety undercarriage, a dynafocal engine mounting to reduce engine noise and vibration, two-way radio and a constant-speed propeller.

"Hermes" Air Liners for B.O.A.C.

The Ministry of Supply have ordered 25 Handley Page "Hermes" IV air liners, for use on B.O.A.C.'s Empire services. Delivery is expected to begin in the summer of 1948. The "Hermes" is the fastest of Britain's new passenger transports and is a post-war civil air liner in the true sense, having been designed

specifically for the Empire routes. Each aircraft will carry up to 63 passengers in a luxurious, air-conditioned cabin and will cruise at nearly 300 m.p.h. in the sub-stratosphere, more than four miles above the earth. The fine performance of the "Hermes" IV results from its clean design and the use of the four Bristol "Hercules" engines, which develop a total of nearly 9,000 h.p. for take-off. This should be ample for all conditions of take-off, even from airfields situated in the tropics or at high altitudes.

Looking further ahead, the Ministry of Supply have also placed orders for prototypes of the "Hermes" V. This aircraft differs from the Mark IV in being powered by four Bristol "Theseus" propjets, which together



The Cessna 195, a new American 5-seat civil machine. Photograph by courtesy of the Cessna Aircraft Company, U.S.A.

give a total of some 10,000 h.p. for take-off. It will have a cruising speed of 343 m.p.h. and a maximum range of over 3,000 miles. Like the "Hercules"-powered model, the "Hermes" V is pressurised and has a tricycle undercarriage.

* * * * *

A special version of the Lockheed "Shooting Star" jet fighter, powered by an Allison engine, set up a new world's air speed record of 623.8 m.p.h. in June last.

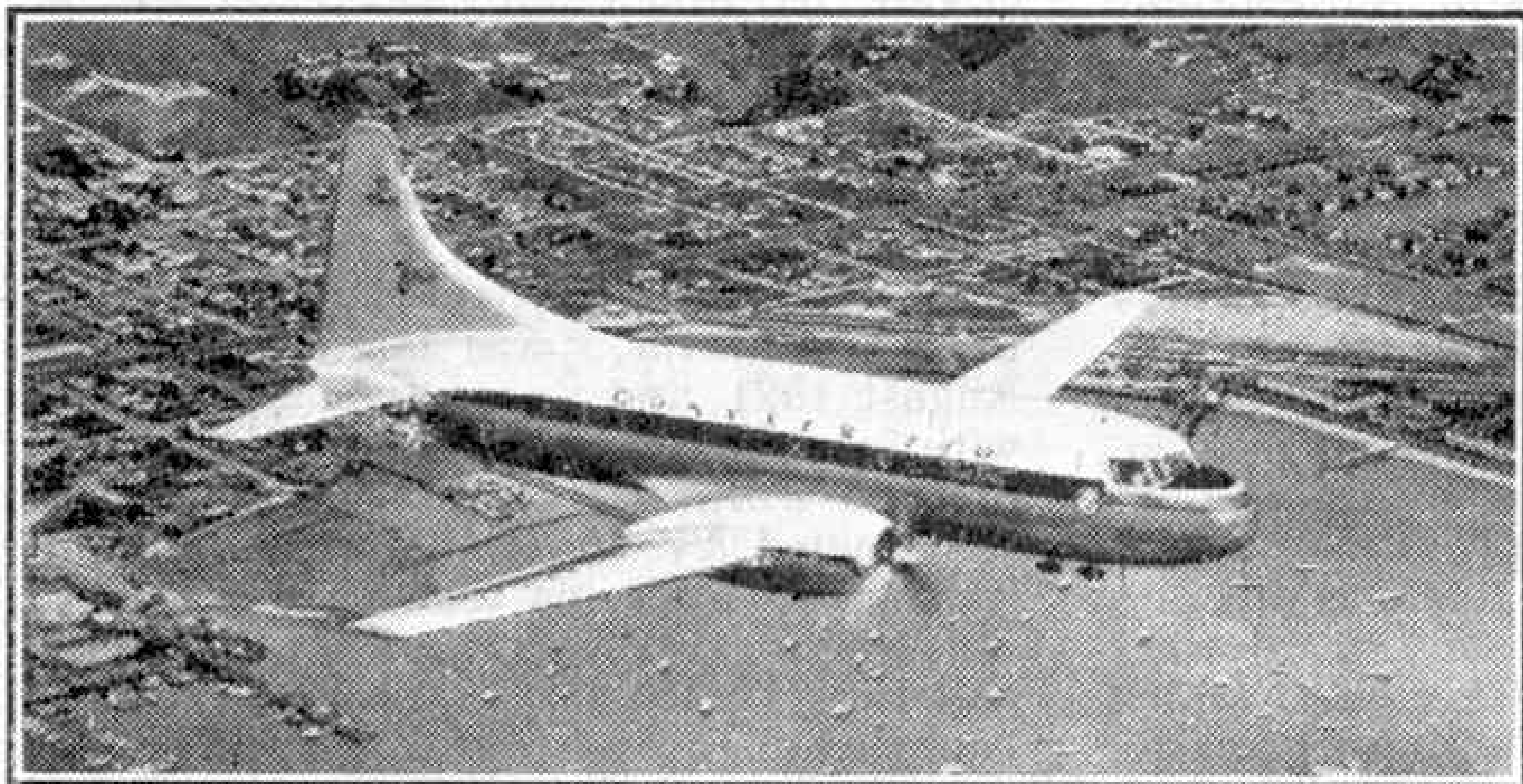
The Convair 240

The lower photograph on this page shows the first production type Consolidated Vultee Model 240 air liner, which successfully completed its initial test flight recently at San Diego. It is the first commercial aircraft to utilise engine exhaust gases to provide additional thrust during flight, a feature that adds some 10-12 m.p.h. to its cruising speed.

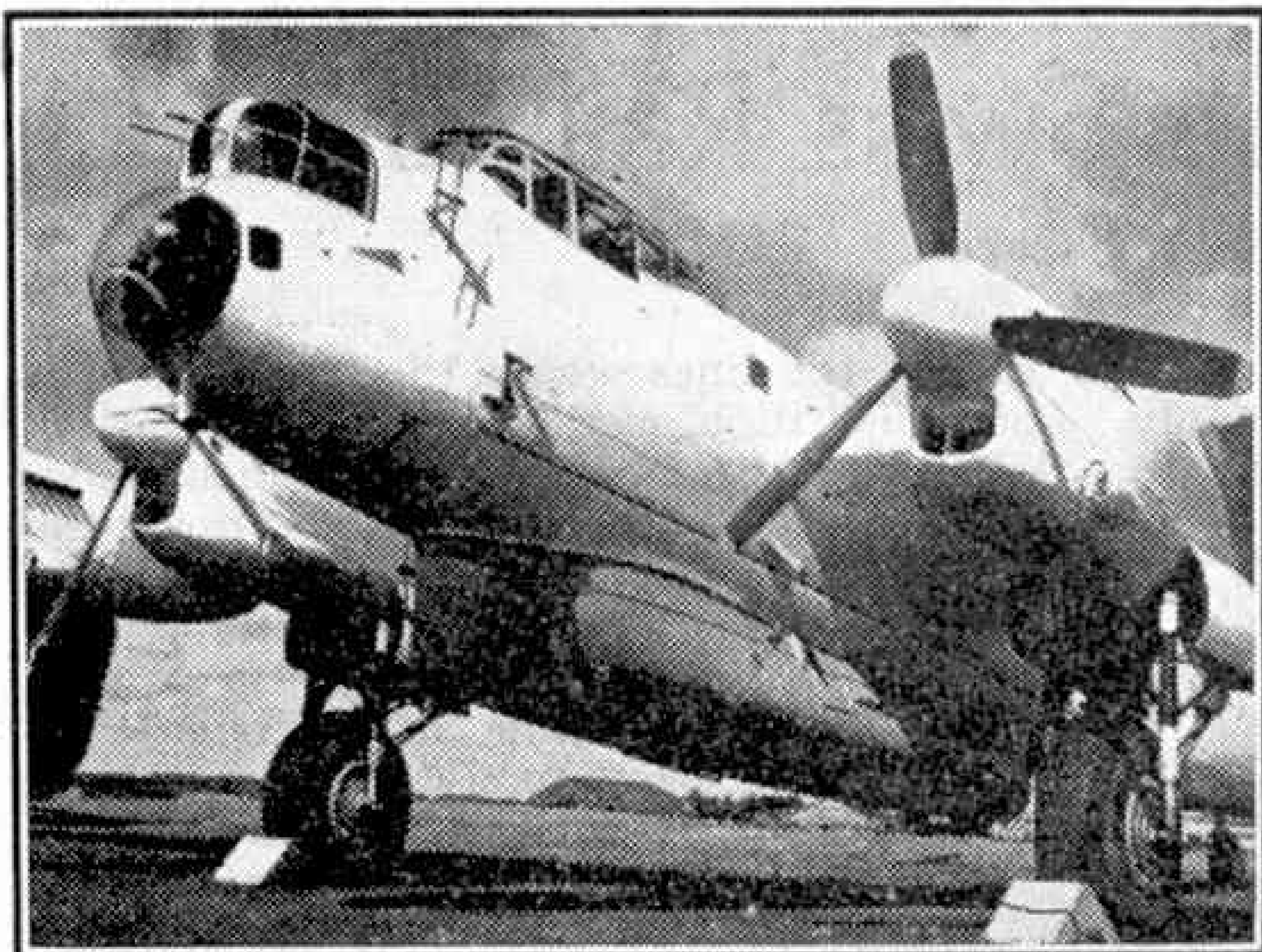
Powered by two 2,400 h.p. Pratt and Whitney engines, the 40-passenger Convair 240 will cruise at 300 m.p.h. It has a span of 91 ft. 9 in. and weighs 39,500 lb. fully loaded. More than 150 Model 240s have now been ordered by eight airline companies, the latest order being from Orient Airways Limited, who will use three of them on their routes in India, Afghanistan and Burma. The first aircraft have already been delivered to American domestic airlines.

* * * * *

The Government has authorised the export of six Gloster "Meteors" to the Argentine. The air force of that country will thus share with the R.A.F. the distinction of having a nucleus of the world's fastest and most highly-developed jet fighters.



The Convair 240 air liner, which seats 40 passengers. Photograph by courtesy of Consolidated-Vultee Aircraft Corporation, U.S.A.



Several Avro "Lancaster" bombers have been converted for Air-Sea Rescue duties. One of them is shown here with an airborne life-boat in position under its fuselage. Photograph by courtesy of A. V. Roe and Co. Ltd.

New B.E.A. Safety Standards

As foreshadowed in my "Safety in the Air" article in the May "M.M.," many of the leading European airline operators are now revising their safety standards to ensure that their air liners have plenty of power "in hand" during take-off. The British Air Safety Board, investigating "Dakota" accidents, recently stated that the all-up weight of an aircraft taken by itself was of less importance than the relation of that weight to the size of the airfields from which the aircraft are operated. The heavier the aircraft is loaded, the longer the runway it needs. As a result, the British European Airways Corporation have decided to regulate the all-up weight of their air liners in relation to the size of the airfields which they serve.

In general terms, the weight of each aircraft will have to be so regulated that it will take off and land within a stated percentage of the total length of the runway, will clear all obstacles in the neighbourhood by a stated margin and, in the event of engine failure over the highest obstacle on the route flown, will be able to carry on with a safe margin of height on the remaining engine or engines. Because of the new B.E.A. safety standards, on their internal routes only Northolt, Belfast (Nutts Corner), Glasgow (Renfrew) and Prestwick are suitable for "Viking" operations. "Dakotas," at a loaded weight of 28,000 lb., will meet the new standards at Aberdeen, Edinburgh, Isle of Man, Liverpool and Manchester and, at reduced weight, at Croydon, Jersey and Southampton. These airfields cannot be used by "Vikings" unless they are extended. The airfields at Guernsey and in the Orkneys (Hatston) are too small for either type at present.

More Versions of the "Vampire"

Three new versions of the famous de Havilland "Vampire" jet fighter have been announced. The first is the Mark II, which has been fitted experimentally with a Rolls-Royce "Nene." As the "Vampire" was not designed to take a turbine with a double-

sided impeller, it is impossible to take full advantage of the "Nene's" 5,000 lb. thrust. Even so, the Mark II shows an improvement in take-off, climb and ceiling in return for some loss in flying characteristics and engine accessibility. The "Vampire" II can be distinguished by two air intakes above its rear cowling, to improve air supply to the rear face of the impeller.

The "Vampire" III is a long-range version of the Mark I and is in production. It has a redesigned tail unit, with a low-set tailplane, and fins and rudders of the characteristic de Havilland curved form. The "Vampire" III is some 1,500 lb. heavier than the Mark I, but the increased power of its "Goblin" II engine ensures a top speed of 540 m.p.h. combined with a range of 1,390 miles.

Another "Vampire" is to be fitted with a "Ghost" engine, and this should prove the fastest version of all. But it is purely experimental, and the increased power of this new de Havilland engine will probably be used to the full only in a newer de Havilland fighter.

The Firestone GA-45D Helicopter

The Firestone Tyre and Rubber Company of America is well known in this country. Not so well known is its subsidiary, the Firestone Aircraft Company, which produced the neat little two-seat Model GA-45D helicopter illustrated on this page. Their engineers are no newcomers to the design and construction of rotary wing aircraft, as many of them worked for the old Pitcairn Autogyro Company, which pioneered the manufacture of these aircraft in America. Firestone bought up the Pitcairn firm in 1943, and the first product of the new combine was the XO-61 pusher-type autogyro. This was followed by the XR-9 lightweight military helicopter, from which the commercial GA-45D has been developed.

The XR-9 earned a great reputation with the U.S.A.A.F. by its stability and lack of fuselage and control vibration. It could be flown "hands off" and proved itself quite fast, manoeuvrable and easy to maintain. The GA-45D inherits all these assets, combining them with good looks. It is powered by a 175 h.p. Franklin air-cooled engine, which drives the 30 ft. main rotor and the small tail anti-torque rotor, and gives the machine a top speed of 115 m.p.h. Enough fuel is carried for well over two hours' cruising at 90 m.p.h. The GA-45D is small, with a length of 27 ft. 7 in., and its loaded weight of 1,950 lb. is less than half that of an average American motor car.



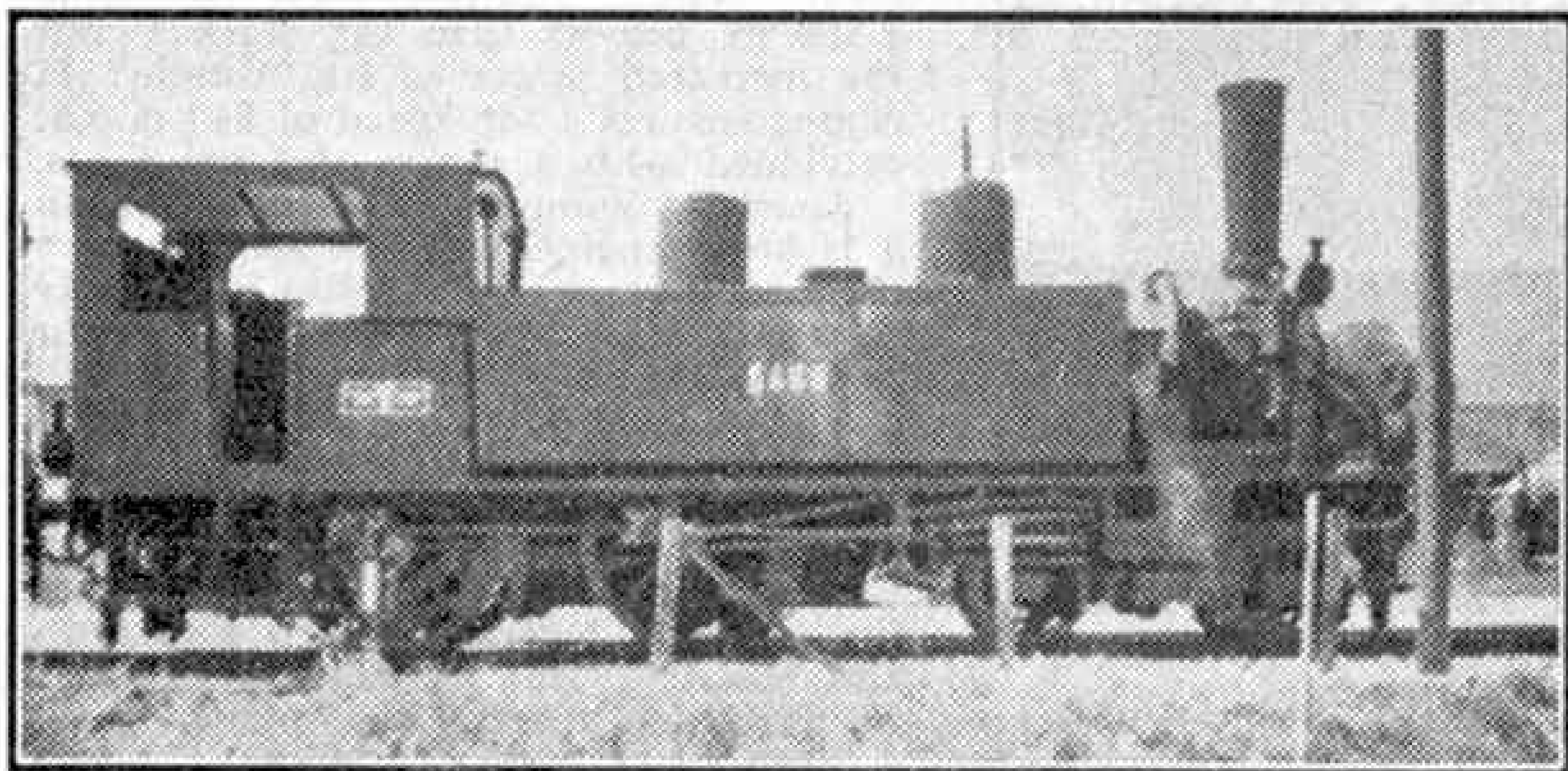
Firestone two-seat commercial type helicopter making a vertical take-off. Photograph by courtesy of the Firestone Aircraft Company, U.S.A.

Notes on the Swiss Railways

By R. E. Durnat

SOON after reading Mr. R. A. H. Weight's article on Swiss Railways in the July 1946 "M.M.," I was fortunate enough to

except the lines where there was no fear of competition, were nationalised to ensure economic running and administration.



A Swiss 4-4-0T built in 1895; it is probably the oldest steam locomotive in Switzerland.

be able to visit Switzerland myself. Moreover, I was in an excellent position to obtain details and information about the railways and their locomotives and rolling-stock.

The first train to run on Swiss soil did so on 15th June 1844 on the line from Strasbourg (Alsace) to Basle. Just over three years later, in August 1847, the first line constructed entirely on Swiss soil was opened with great ceremony; it was 16½ miles long and ran from Zurich to Baden. This was the railway referred to in the "M.M." in March last as the "*Spanisch Brotlibahn*" or "*Spanish Bun Railway*" in the article by Mr. W. J. Bassett-Lowke on "*Model Making in Switzerland*." So the present month sees the centenary of the Swiss railway system, and as part of the celebrations a full-size reproduction of the first train is touring the line, taking passengers on short return trips at attractive fares.

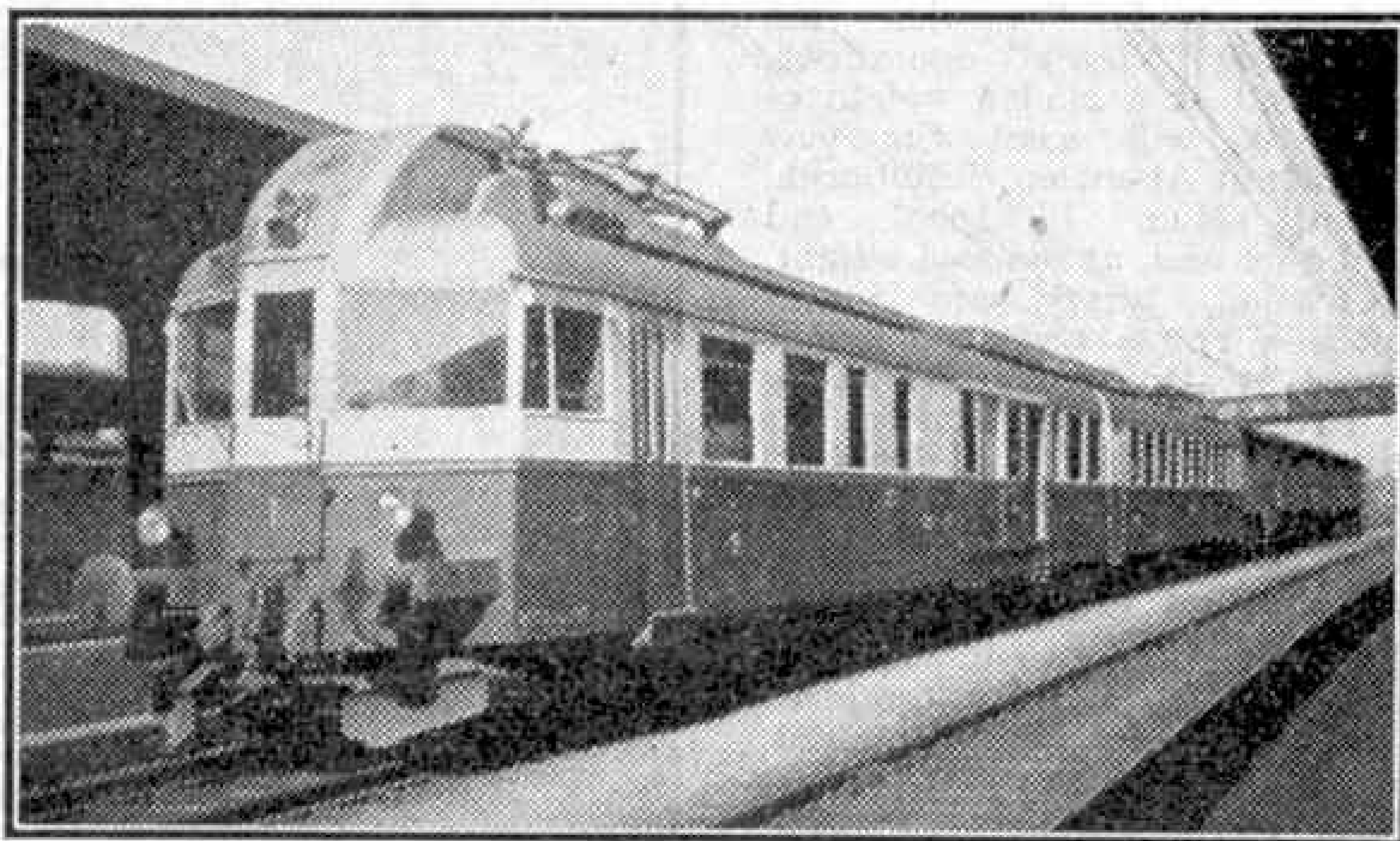
The early lines in Switzerland were pioneered by British engineers, and that is why, even to-day, the trains run on the left whereas road traffic, in common with that of most other European countries, keeps to the right.

In 1901 the Swiss railways,

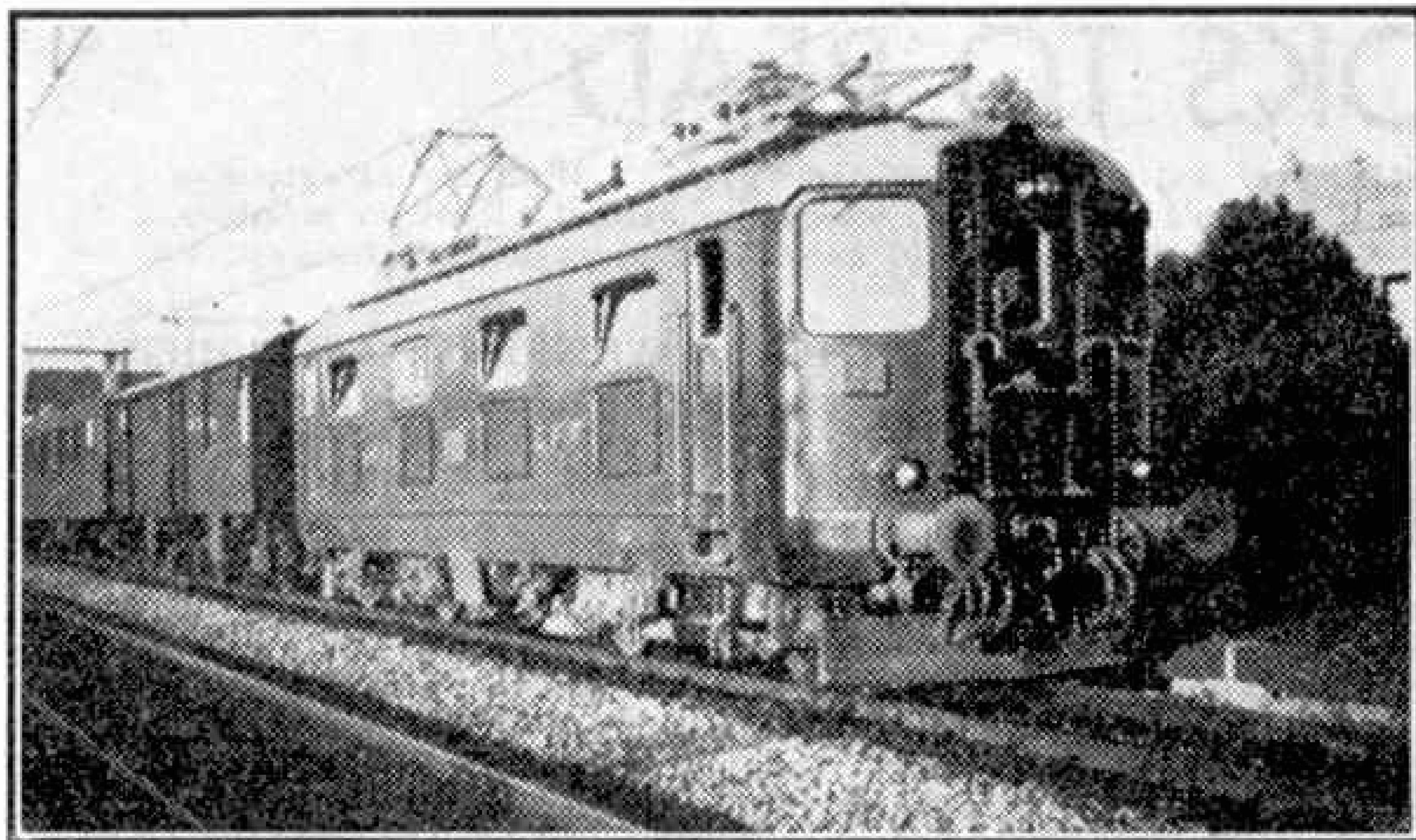
The 1914-18 war upset the Swiss railways considerably however. Switzerland had just embarked on a programme of electrification, but many trains were still hauled by steam locomotives. As all coal had to be imported, the railways had to use wood; eventually even this could not remedy the growing deficiency in coal. Services had to be severely curtailed, and in 1917 trains had to stop running altogether on Sundays.

The first Swiss electric train had run in 1899 and in 1906 trains began to run from Brigue to Iselle, using three-phase current, requiring three conductors. This system was unsuccessful, however, and the idea dropped. Now, over 88 per cent. of the Swiss Federal track is electrified, as well as nearly 100 per cent. of the mountain railways. Of the approximate total of 1,000 Swiss Federal locomotives 650 are electric, and there are two Diesel electrics.

In spite of the fact that over 60 per cent. of the line is single-track, the accident rate is extremely low, being one fatal casualty and four injured in every 10 million people carried. Passenger trains



A two-coach electric unit of the Loetschberg Railway. The pantograph for overhead current collection is folded down out of use.



A modern Swiss Federal electric locomotive.

arrangement is 2-8-4, the driving wheels being 5 ft. 4 in. in diameter. Weight is 125 tons and length 54 ft. 9 in., while the maximum speed is 62.5 m.p.h.

Of the two pantographs on the roof, only one is used at a time. Suspended from the roof is the main switch, which moves in an oil bath for cooling. The current passes to a transformer which steps down the voltage for the motors and for heating and lighting purposes. The wheels are driven by gearing, but a different system incorpor-

ating driving rods is used on some locomotives. These driving rods are attached to the outside of the hubs of the wheels on one side. The motors are cooled by blasts of cold air from the "ventilateurs," which are forward of the driving compartments at each end.

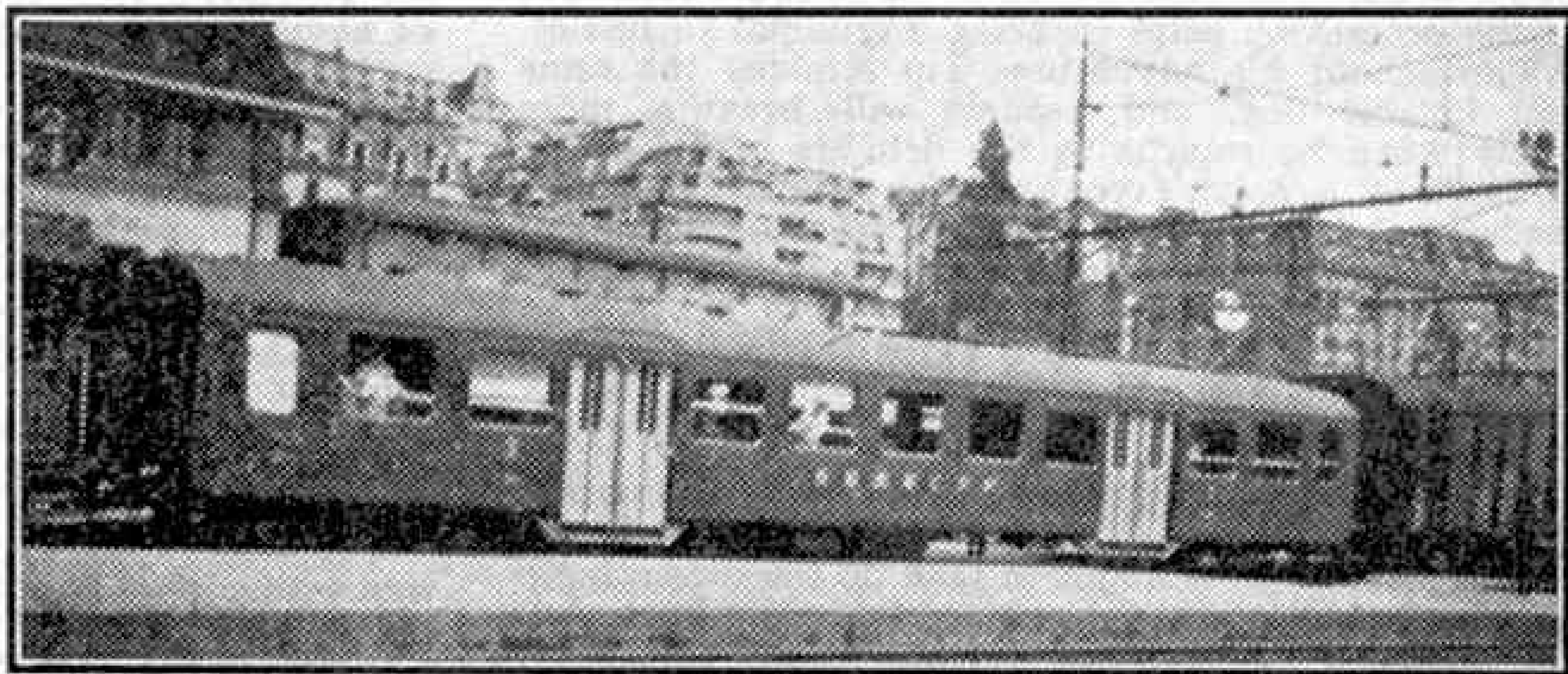
A new type of locomotive that was introduced in January 1946 is the Re 4/4. This weighs only 56 tons, with a maximum speed of 76 m.p.h. It has an all-bogie wheel arrangement and is 45 ft. 8 in. long. At present there are some 15 in service.

The heavy goods trains are pulled by the Ce 6/8s, which have a 2-6-6-2 wheel

are divided into seven classes. There are "De Luxe" International Expresses with 1st and 2nd class only; Direct, Fast and Light trains, the last so called because they are composed of steel "*wagons legers*" of very recent construction. There is the "train tramway," which stops at nearly every station but nowhere for long, and the "train omnibus" that stops everywhere from one to five minutes. There are also railcars, making very fast runs, with only limited accommodation for luggage. The fastest of these are the "Fleches rouges," which can reach 94 m.p.h. even on regular runs.

I found that many coaches are four- or six-wheeled, because it was found impossible to replace them during the war owing to the shortage of materials. The "*wagons legers*," however, are all bogie vehicles. The third-class seats are wooden, but so tailored to fit the back that, to some at least, they are as comfortable as upholstered seats. In the latest vehicles, including third class, there are small folding tables, and in some of them even speedometers for the edification of the passenger. The doors fold instead of opening. The third-class carriages seat 72 people and weigh 27 tons.

The most common engines on the Swiss Federal are the Ae 4/7 locomotives, "Ae" signifies "High-Speed Electric Locomotive" while the figure "4" denotes the number of driving axles and the "7" the total number of axles. The wheel



A Swiss Federal coach of the latest type with folding doors.

arrangement. They are very powerful, their maximum speed being only 40.5 m.p.h. Shunting is usually carried out by the Ee 3/3 0-6-0 locomotives. There are two types; one with the driver's compartment at one end, and the other with his compartment in the middle.

Steam engines are used for goods trains, shunting, and on non-electrified lines. Probably the oldest in Switzerland is the engine on the Nyon-Crassier line shown in the upper illustration on page 320.

BOOKS TO READ

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

"MINIATURE BUILDING CONSTRUCTION"

By JOHN H. AHERN (Percival Marshall. 8/6 net)

Modellers will welcome this excellent book on their hobby. Mr. Ahern's subjects range from suburban villas and industrial premises to farms, garages and country inns, and railway buildings and lineside features for miniature railway layouts are dealt with in specially attractive sections. Well chosen drawings and attractive half-tone views of interesting models provide ample illustrations.

The author deals first with things to model, and explains how to use a note book or sketch pad to take down details and make sketches of anything that catches the model maker's eye. The materials to be used and the tools required are next dealt with, after which we come to actual construction. Background scenery is given full treatment, and special attention is given to landscape and "townscape" effects.

The book is clearly and attractively written, and its wealth of material will make it suitable for miniature railway enthusiasts in search of atmosphere as well as for those who like modelling for its own sake.

"ADVENTURES OF TIP THE TERRIER"

By J. IVESTER LLOYD (Citadel Press. 6/-)

Mr. Lloyd has written an unusually good dog story. Horses also figure in it, and there is much play with ratting, rabbiting, hunting and other country sports; but throughout the chief role is given to Tip. He is a very ordinary terrier who makes himself unpopular in his first home by proudly bringing in a dead rat and by other exploits of the kind that one would expect from a dog of his type. But he endears himself to those who know what a dog should be, and finds a fresh home in a hunting stable. Then his adventures begin. He gets lost, and goes to sea and fights a horde of rats before he is found again, but in the process he helps to bring a criminal to justice.

Throughout his adventures Tip remains the same real lovable dog, and readers will breathe more freely when he returns to the delights of his home. He will be a great favourite with younger "M.M." readers, who will enjoy every minute of his story and also will like the many excellent drawings illustrating it.

"THE AMATEUR'S WORKSHOP"

By IAN BRADLEY

(Percival Marshall & Co. Ltd. 7/6 net)

Mr. Bradley has had 30 years' experience of amateur workshop practice, and here he freely places this at the disposal of those about to take up the increasingly popular hobby of model engineering. His book will be welcomed not only by those who are making a start, but also by every practical worker. It covers a good deal of ground. Amateur workshops were born to be expanded, and the author views their equipment as a long term policy, and indeed treats the subject generally from the point of view of gradual expansion.

The long term view is evident at the very start, in which the author deals with the workshop itself, and emphasises the need for planning with a view to additions at later stages, as well as for comfort and convenience. Later chapters deal with lathes and other machines, with the provision of power, storage facilities, tools of all kinds and materials. Practical advice is then given on milling, gear cutting, case hardening and so on, and there is an excellent chapter on drawings in which a simple but efficient draughting machine is described.

Clear drawings and half-tone illustrations of tools help to make the text clear.

"PATCHES," "WHISKERS" AND "HIPPO"

By JOEL STOLPER (Harrap. 5/- net each)

"Patches" is a giraffe, "Whiskers" is a leopard and "Hippo" is a hippopotamus, and in these delightful books we have their stories told from the time when they were tiny creatures to their old age. "Whiskers" learned to hunt when little more than a kitten, killing beetles and birds with the swift sureness that he needed when he grew up and had to depend on wild pigs, monkeys and other creatures to provide him with a living. He had many surprises and hairbreadth escapes, and once was lured into a trap, but fortunately escaped, to end his days in his jungle haunts.

"Hippo's" career was equally exciting. He squealed when his mother first pushed him in the water, but soon realised that a swamp was the place for a hippopotamus, in spite of crocodiles on the sandbanks and lions and leopards in the bush. He too survived many perils of the wilds, and ended by growing old and fat in his green swamps. "Patches" finished his career in a zoo, but he was happy there exchanging tales with his giraffe companions about the old country they had come from.

The books are copiously illustrated by fine animal drawings by the author. These will be enjoyed as much as the stories by our younger readers.

"THE BOOK OF CANOEING"

By A. R. ELLIS

(Brown Son and Ferguson Ltd. 6/- net)

This is described as the only book that gives up-to-date information on the canoeing possibilities of the British Isles. It is adapted both for the beginner and for the canoe expert. For the former it explains how to make the canoe and to use it, and for the latter it explains how to solve the problems of navigation that make the sport so attractive.

Special attention is paid to the faltboat, or folding canoe, the introduction of which has led to a revival of the sport; and there is a chapter on the kayak for those who find the larger folding boat beyond their reach. Hints on the use of a canoe and on camping and cooking follow, all the result of the practical experience of the author; and then we turn to descriptions of canoeing possibilities in various parts of the country. A number of lengthy trips all over the country are then described before we turn to canoeing in Scotland and Ireland, where there are great possibilities for the enthusiast.

The attractions of the book include useful drawings, interesting photographs and folding maps.

"TITLED TRAINS OF GREAT BRITAIN"

By CECIL J. ALLEN

(Ian Allan Ltd. 7/6)

This is a revised edition of Mr. Allen's book, the first version of which was reviewed in our May 1946 issue. It is more handy in size, and in make-up, type and quality of reproduction it is much to be preferred. The details of the working of trains have been brought up to date, and nine additional named services included, ranging from that Great Eastern institution the "Norfolk Coast Express" to the unique "Bluecoaster Limited" of the 15 in. gauge Romney, Hythe and Dymchurch line. A further welcome addition is the inclusion of tables showing the fastest scheduled runs in Great Britain in 1939 and long non-stop runs in 1939 and in 1946.

Copies can be obtained from A.B.C. Locomotive Books, Ian Allan Ltd., 33, Knollys Road, Streatham, London S.W.16, price 8/- post free.

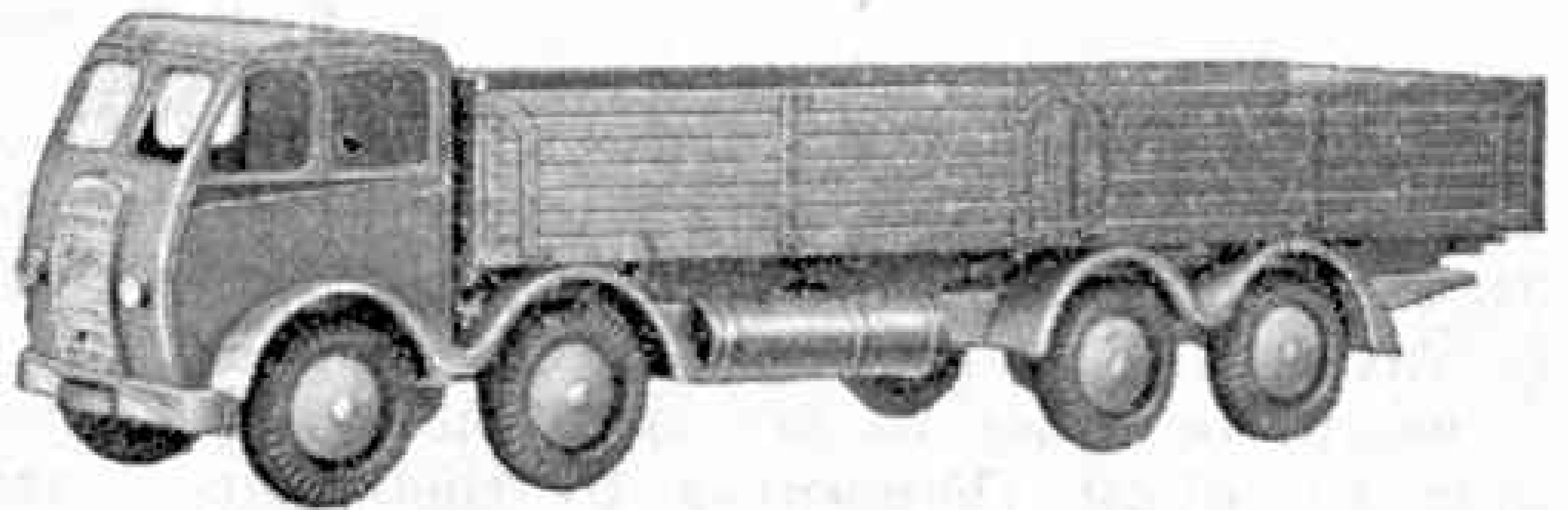
Dinky SUPERTOYS

A Fine New Series of Models

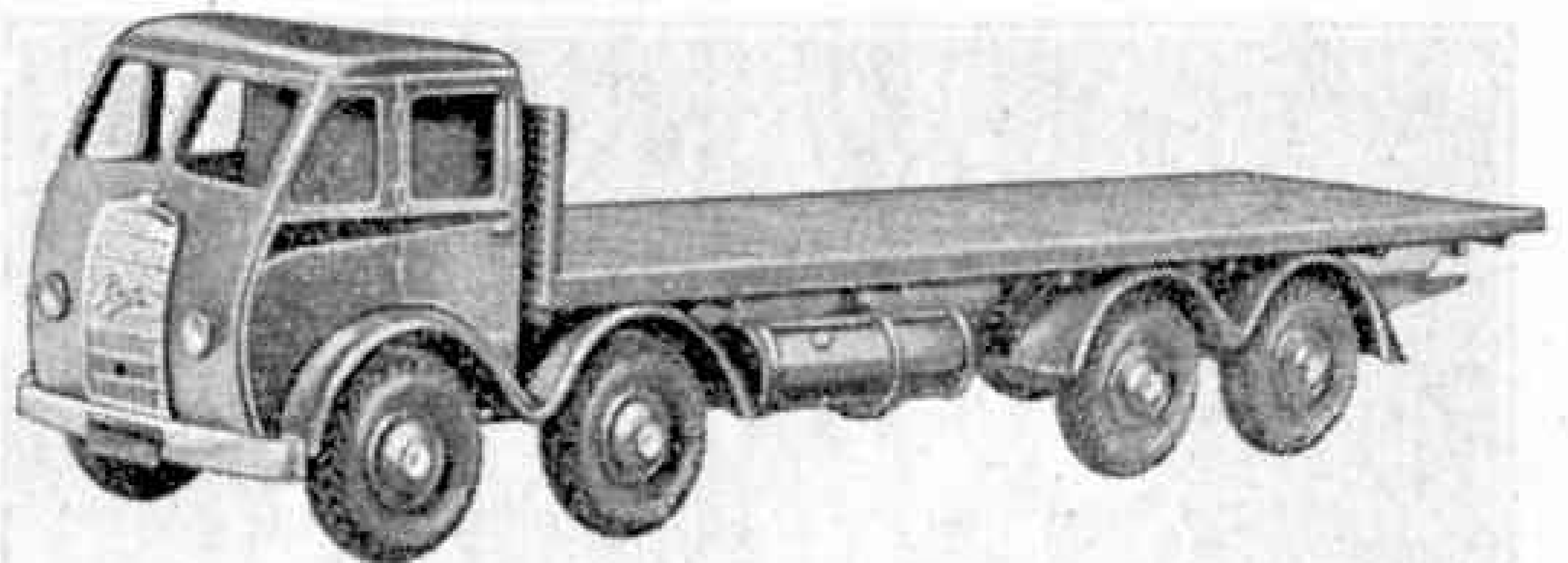
THIS month we announce the arrival of the first of our new products—the Dinky SUPERTOYS. These fine models have been given this name because they are die-cast miniatures similar in general style to our famous Dinky Toys, but much larger.

Take for instance the Foden Wagon shown on the right. The overall measurements of the actual wagon are 29 ft. 7½ in. long and 7 ft. 10 in. high; the corresponding measurements of the SUPERTOY model are 7½ in. and 1½ in. The same dimensions of the Guy Lorry are 20 ft. 1½ in. and 7 ft. ¾ in.; those of the SUPERTOY are 5½ in. and 1½ in.

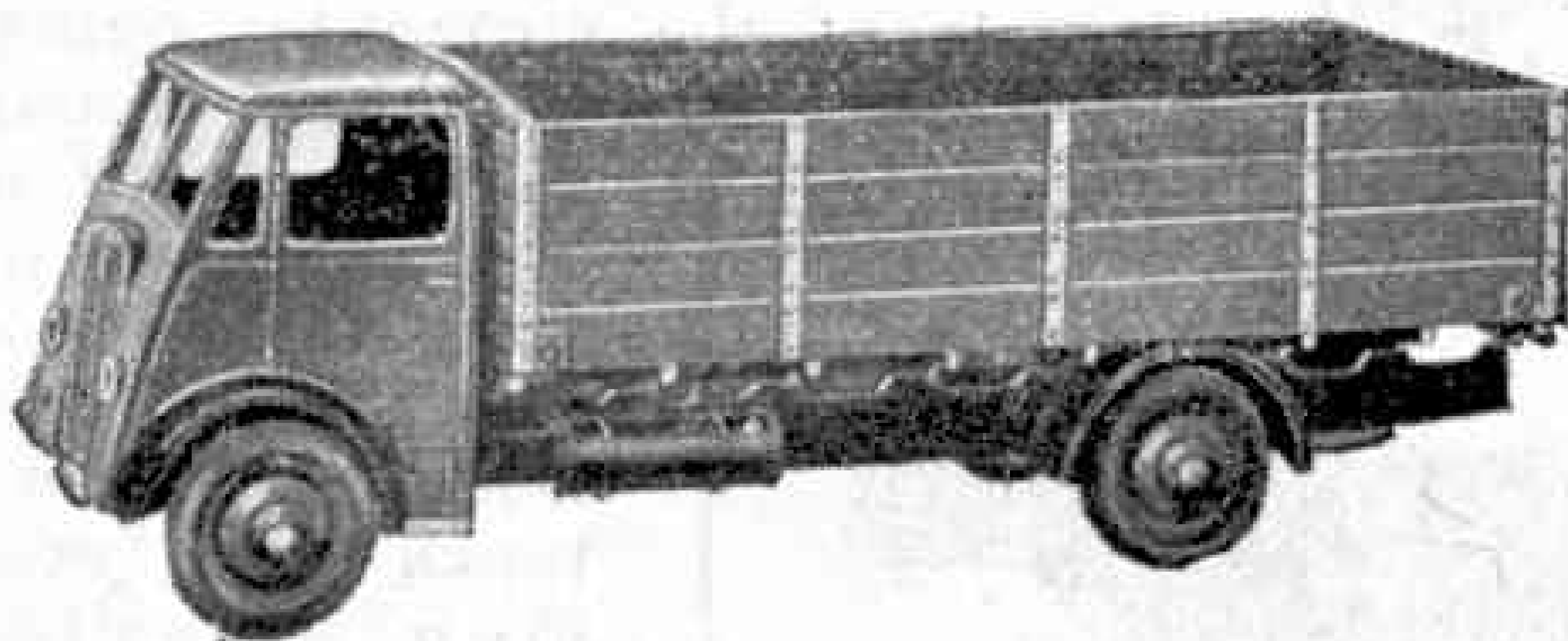
These big SUPERTOYS are very striking in appearance. Their size alone is impressive, and the great amount of accurate detail that has



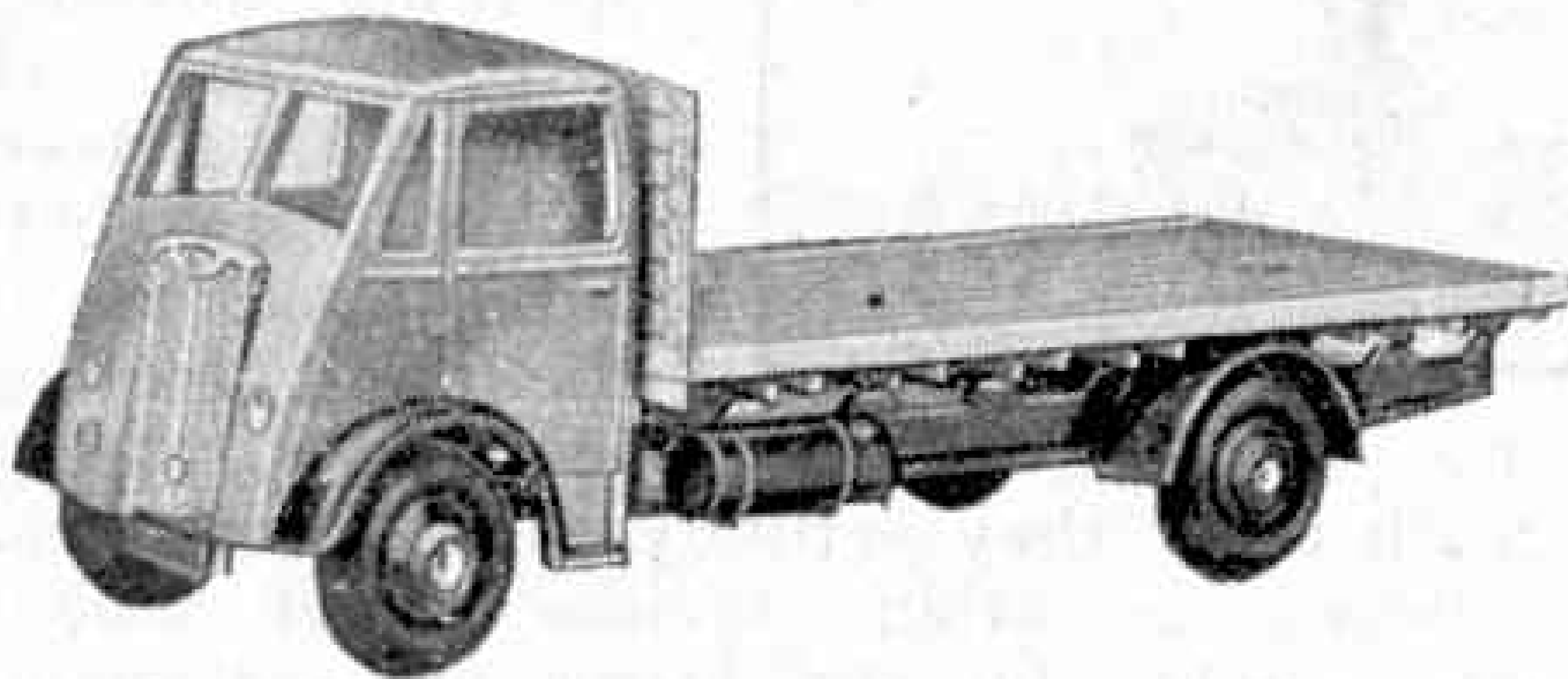
Dinky Supertoys No. 501 Foden Diesel 8-wheel Wagon.



Dinky Supertoys No. 502 Foden Flat Truck.



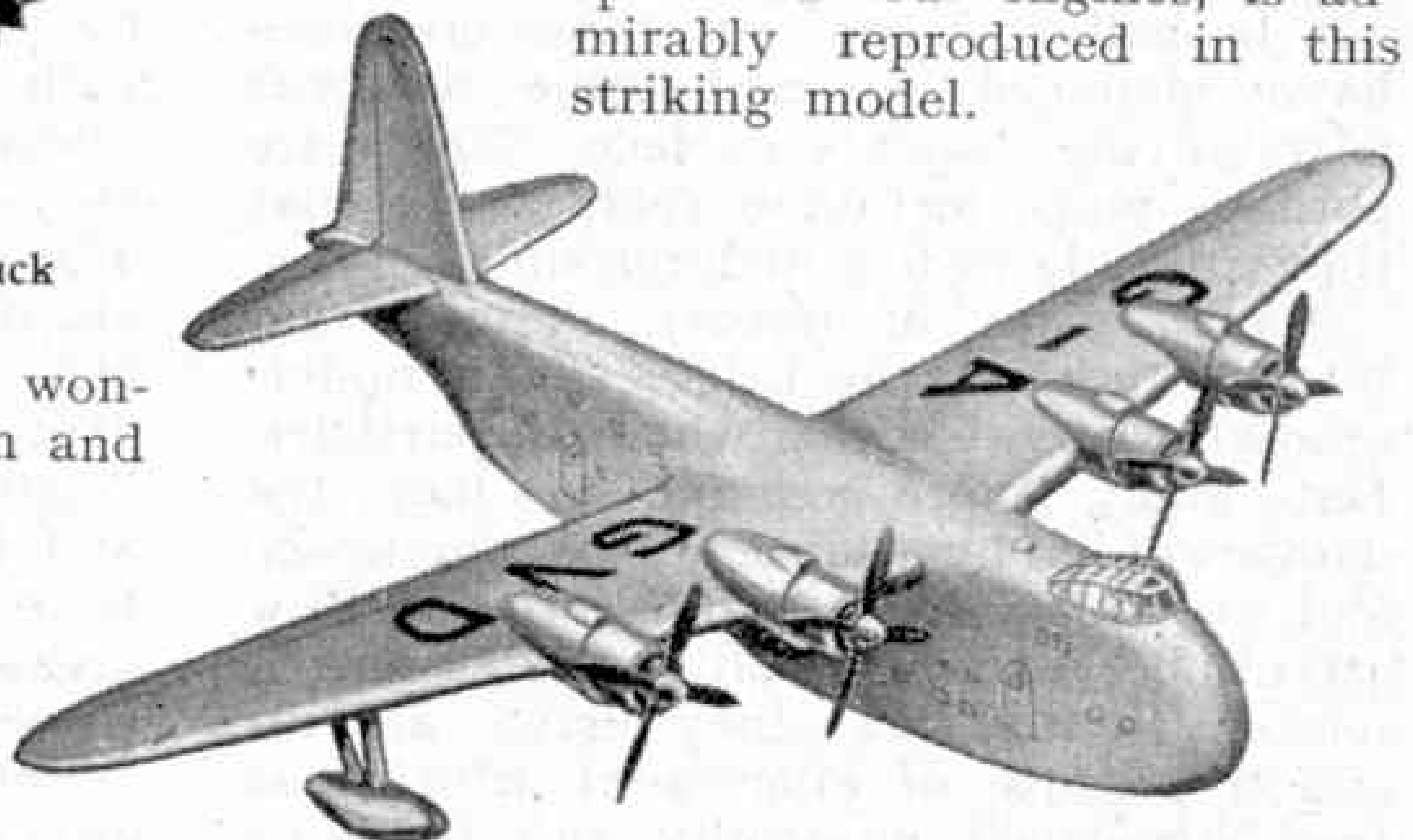
Dinky Supertoys No. 511 Guy 4-ton Lorry.



Dinky Supertoys No. 512 Guy Flat Truck

flanked by the two headlights. On the near side of the chassis, tucked under the body, is a miniature of the tank, and there is even the spare wheel, bolted in its correct place under the body at the rear. The bodywork is equally realistic. Two types are available, one with head, side and tail boards, the other a flat truck.

Equally attractive is the fine model of the famous Short "Shetland" Flying Boat illustrated at the foot of this page. This will be welcomed by all who are interested in aircraft. The "Shetland" is the largest British flying boat ever built, and its general appearance, with its stepped hull, large wing span and four engines, is admirably reproduced in this striking model.



Dinky Supertoys No. 701 "Shetland" Flying Boat.

been included in them makes them wonderfully realistic. The Foden Wagon and the Guy Lorry illustrate these features well. They have the same distinctive appearance as their prototypes, to which the roomy cab in a forward position contributes greatly. The front is faithfully reproduced, with the chromium-plated radiator grille

Nature's Lessons in Camouflage

Hiding Behind Spots and Stripes

By R. H. Ferry

NATURE points the way to effective camouflage, from which we may well draw deductions. It has been said that in Nature the strongest species only survive; it would be truer to say that those best able to adapt themselves to their surroundings have the best chance, for in

evolution and the ages. Let us look more closely at these experts in "Operation Camouflage."

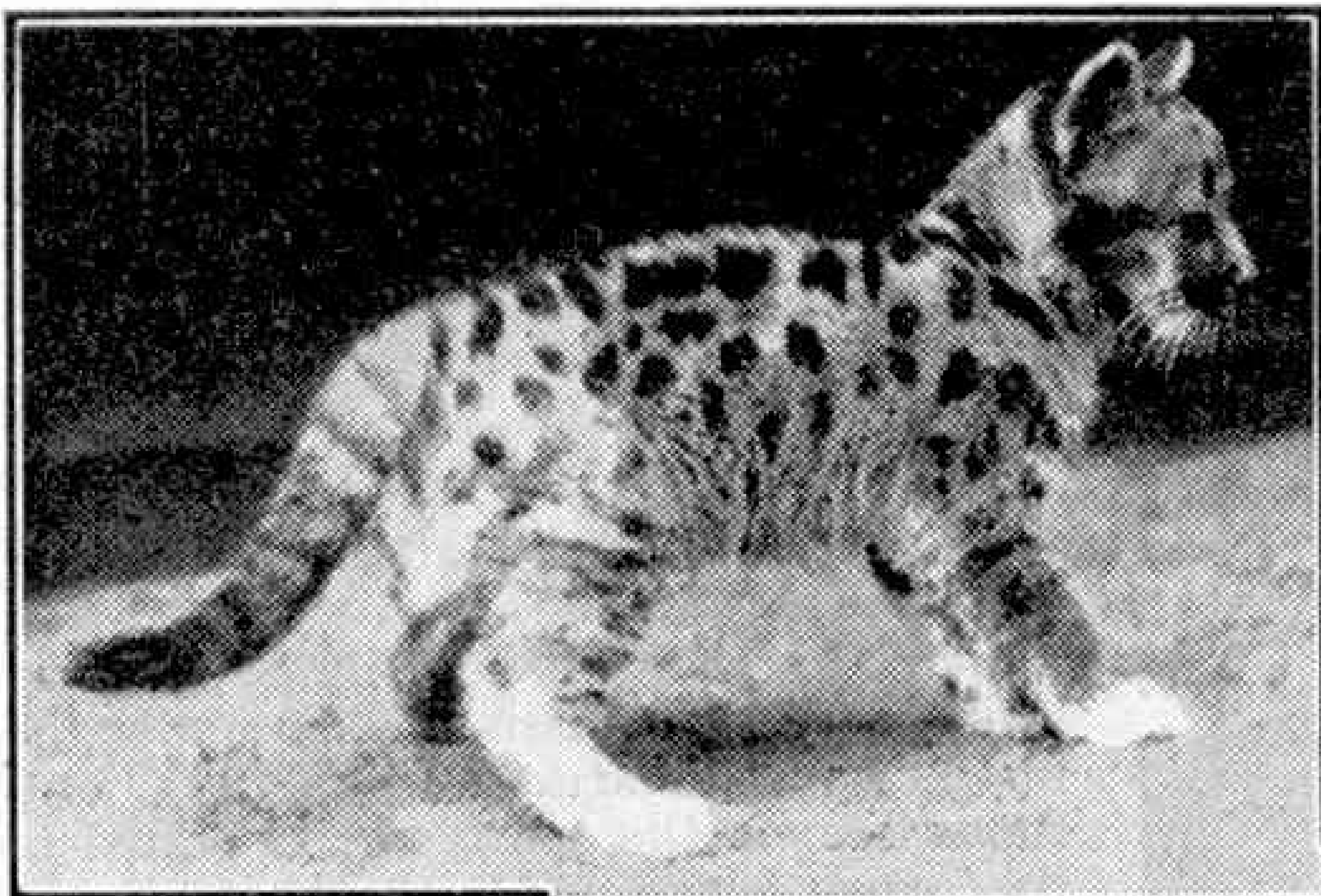
The first elementary lesson that nature teaches us is very applicable to present times. The less able a creature is to defend itself with offensive measures the greater its camouflage efforts. The defenceless young in a number of species are often strongly marked either in stripes, as in wild pigs, or spotted, like young deer; these markings, so unnoticeable on the dappled earth as the Sun filters through the trees, gradually fade to a self colour as the animals grow up and are able to run away or stand and fight.

Creatures which remain weak throughout life, for example the frilled lizards, adopt the aggressive attitude of the strong by puffing out their throats to look twice as big. Perhaps we may draw a lesson even from this. Dummy guns, tanks and even men provide imitation strength!

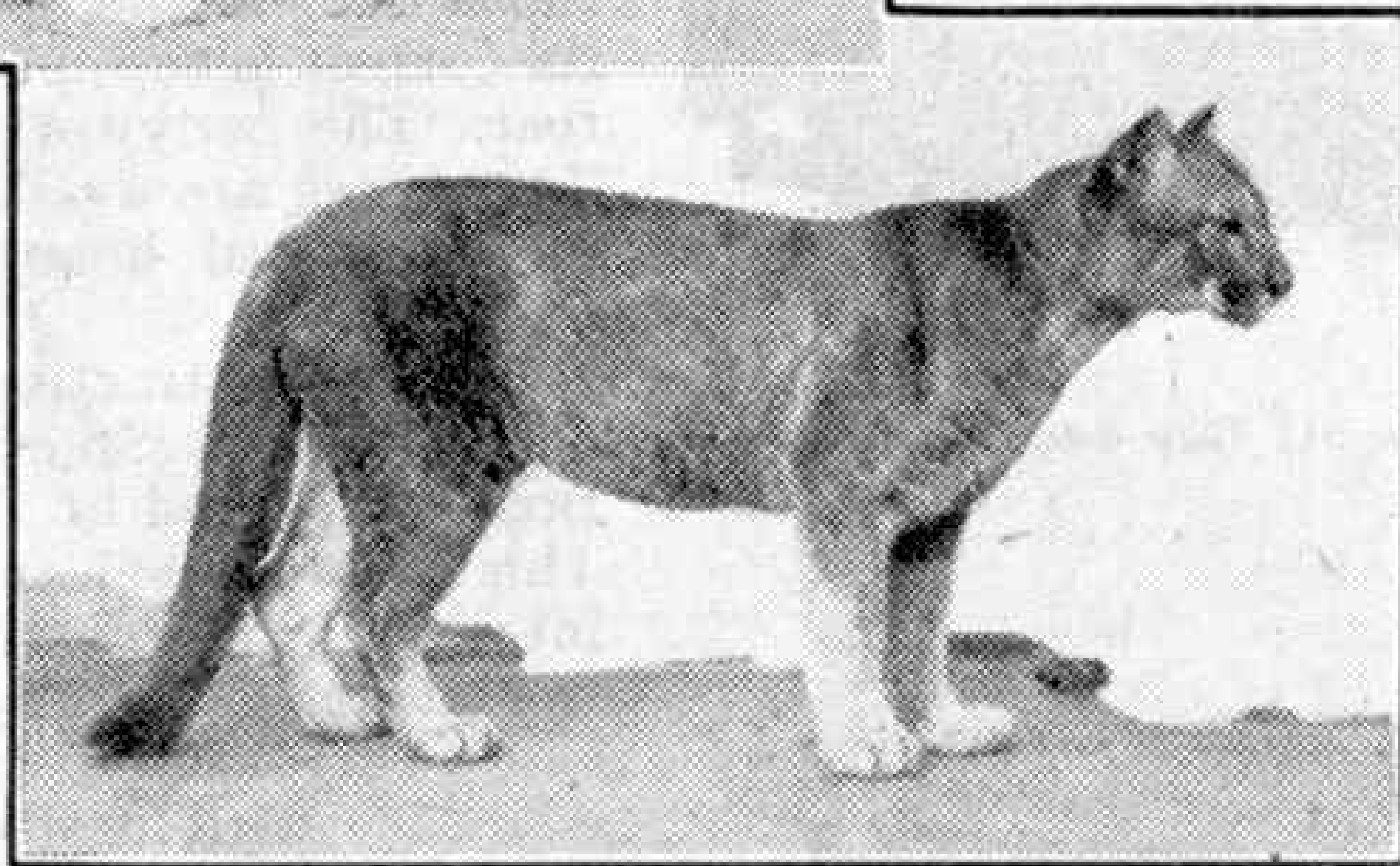
Generally speaking, animals adopt one of two camouflage techniques. They either make use of their background

by blending or sometimes contrasting with it, or they actually carry camouflage screens or other devices under which they hide. Of the latter we see little. The caddis-flies living under water, and always in fear of being swallowed by a fish, make a sheath of mud, twigs and stones. It is probable, now that "commandos" have blacked their faces and the backs of their hands, and scouts have carried branches of trees, that greater development may take place along these lines where infantry are concerned.

Colouration and blending with background, is, however, the widest form of camouflage. Animals as a rule do not

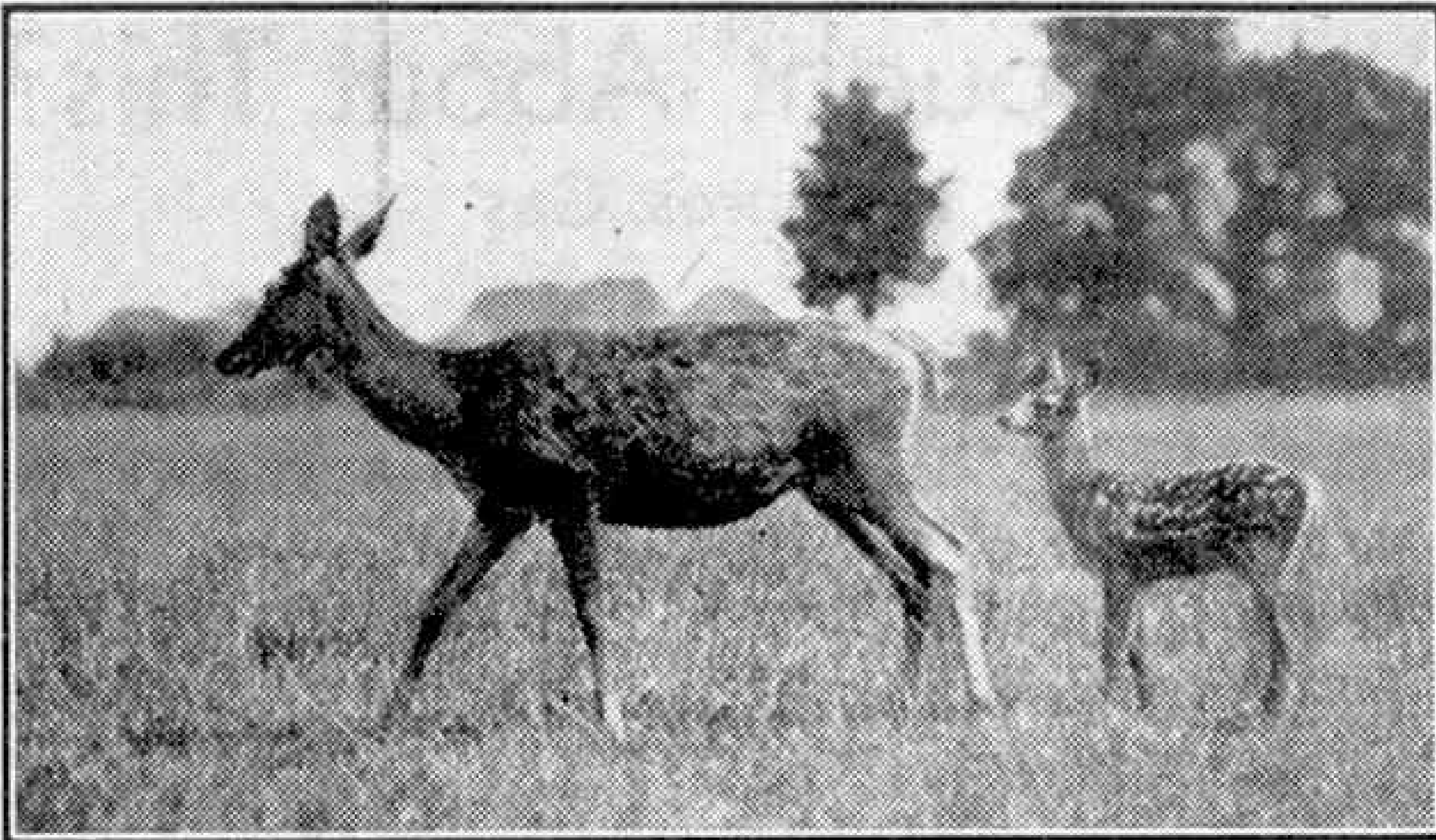


A puma cub and a puma. The defenceless cub is well marked with dark spots that provide camouflage effects. The illustrations to this article are from photographs by W. S. Berridge, F.Z.S.



the world of nature war never ends. Ants cannot be called strong, yet these creatures have managed to undermine a great part of the Earth's surface. They are perhaps more fortunate than we in that they are able to live underground.

Many scores of insects, animals and birds appreciate the safety of an underground existence, either wholly or partially. But many more remain to face the dangers of life by a subtle use of camouflage and it is to these that I would draw attention. Although wild creatures cannot reason things out, they have an instinctive sense of effacement which has been developed physically and to some extent psychologically throughout



The red deer yields another example of camouflage markings of defenceless young animals.

hide, but stand still on or before a suitable setting. The Indian tiger's stripes blend with the perpendicular cracks in the tall grasses, and the mottled hide of the giraffe blends with the patchy sunlight in the trees among which it lives and so on. The task is easier still for such creatures as lions, their drab self colour being exactly that of the veldt.

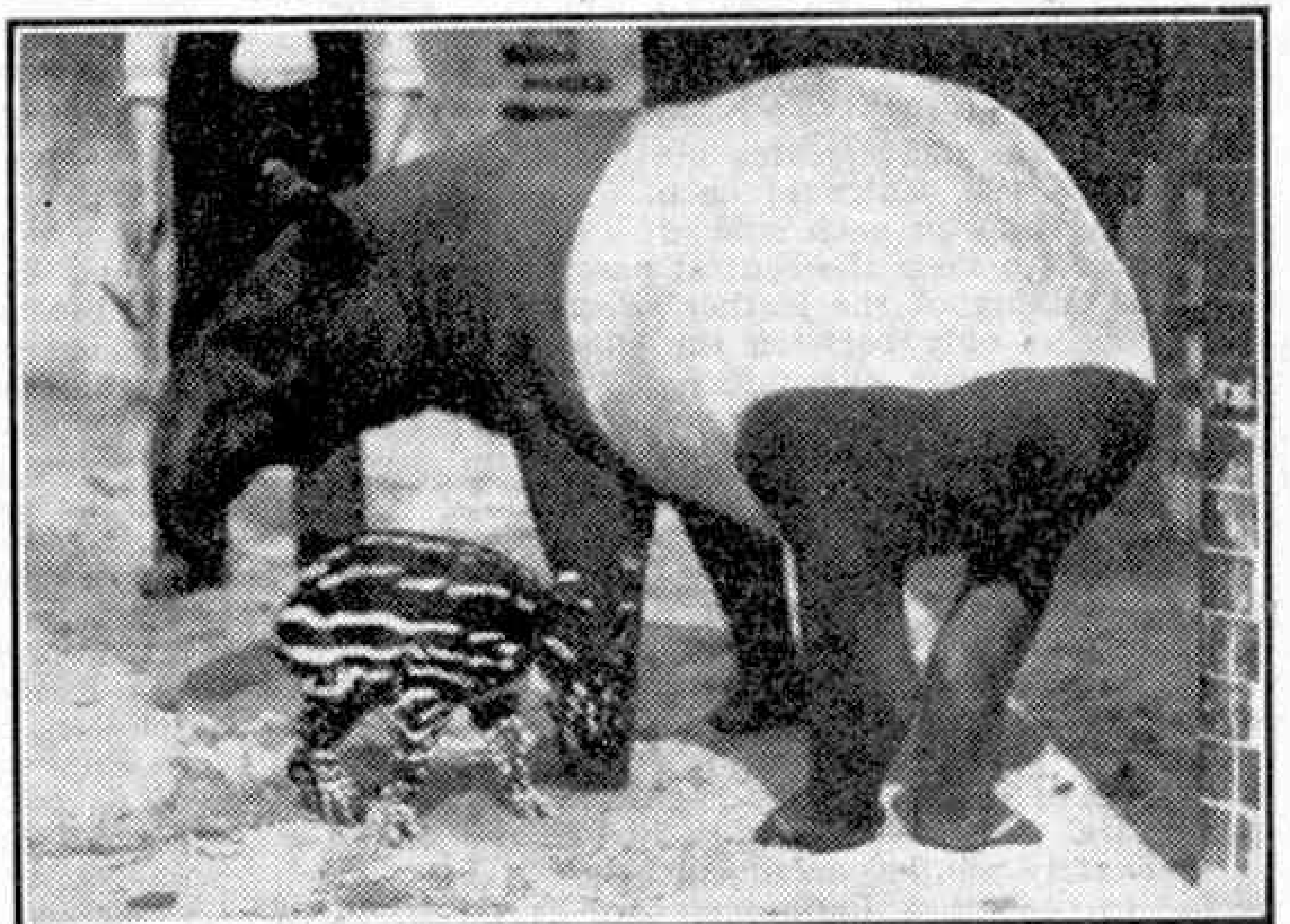
But colouration without due attention to outline, form, or silhouette is not enough. Many animals are given away by strong shadow, or actual hardness of outline. When painting on a flat canvas we employ shading to get rid of harshness of line. Nature employs many dodges with the same purpose in view. The white fronts of so many birds, animals and fish tend to make shadow less noticeable. It must be remembered that solid bodies not only absorb or obstruct light, but that they also reflect and radiate it.

Solid outlines in nature are softened in three ways. You will find that shading in is done by fading out. Thus if an animal darkly coloured on the back has sides of a softer hue and a white belly, the retina of the watching eye only takes in the white and the outline of the creature is lost to view. Still more cunning perhaps is the technique of one or two spots which take the eye in the full sense, as seen in butterflies and ladybirds.

Outline in the second method is often lost by the use of broad bands of different colours, or even of black and white. Much

of our present camouflage technique embodies this plan. The huge elephant, our biggest land animal, is extremely hard to see; one always hears or smells the beast before seeing it, because the beast becomes in fact a gap in the thick bush or a blot of drab colour on the landscape. The lion too, as mentioned before, has the advantage of self colour. The mane is not wholly a protective from thorns, but helps in its raggedness to obliterate the clear cut outlines of the beast, so that here is a third way of getting rid of outline.

When adapting the lessons of nature to our own needs, whether in war or peace, we come up against innumerable difficulties, but they can be overcome by careful planning and observation. The ostrich does not hide from its difficulties by putting its head in the sand. It makes itself as much like a thorn bush as it can; this may be termed direct mimicry. We too must get away from conventional ideas and allow ourselves full artistic scope, aided by our superior brain power and reasoning. It is a remarkable fact that colours in the great open spaces always blend, blue skies and seas, green fields, soil, yellow buttercups and purple thyme. Only when men start to juggle thoughtlessly with synthetic colours do clashes occur.



A Malay tapir and her offspring, which is strongly marked in stripes. These stripes fade away as the animal grows up.

Have You Ever Thought About This?

How a Gas Meter Measures Gas

By T. R. Robinson

A GAS METER, which measures and records the quantity of gas that passes from the mains to a consumer's burners, does not look at all like a steam engine, but its plain rectangular case contains a mechanism which operates in a way that is almost identical with the working of a double-acting, two-cylinder, slide valve engine.

The unit of measurement used for gas is the cubic foot, and the meter is constructed to count up and record the amount of gas used in such a way that these cubic feet are shown in "ones," "tens," "hundreds," "thousands" and so on, by the pointers of a group of indicating dials.

The gas is fed from the gasworks into the mains under pressure, and as it flows into the meter from the consumer's mains connection pipe, it passes first into a chamber, usually in the top part of the meter casing, which corresponds to the steam-chest of an engine. In this chamber are two slide valves, which move over openings, or "ports," under the control of a simple type of valve gear. Passages from the ports lead to the lower part of the meter casing, which is divided into two main sections by a central gas-tight partition. These two main divisions are equivalent to the two cylinders of an engine, and each is again subdivided into two by a diaphragm, which corresponds to the piston in an engine cylinder.

Each diaphragm is a circular disc, made of a special kind of soft, flexible leather, and it is attached at its circumference to a rim projecting from the central partition of the meter. It is the action of these diaphragms, which are moved backward and forward by allowing the pressure of the gas to act first on one side and then on the other, that operates the counting mechanism.

Two circular metal plates are attached to the centre of each diaphragm, one on each side of the leather, to keep the central part flat, and ensure that the flexing of the leather when the diaphragm moves occurs only between the edges of these discs and the diaphragm circumference. The outer metal disc is provided with guides, which ensure that the diaphragm keeps parallel to the central partition during its movement, and in the centre of the disc is a hinged coupling, linking it to a lever that is rocked as the diaphragm moves. The lever is mounted at its pivot point on a vertical spindle, which has its upper end in the chamber at the top of the meter. Fixed to this upper end of the spindle is another lever, and a third lever is pivoted to the opposite end of the second lever in such a manner that the movement of the diaphragm is transmitted to a small crankshaft, mounted vertically in the top chamber.

An exactly similar arrangement of levers is connected to the other diaphragm, and as the levers of both diaphragms are coupled to the same crank-pin, and are set to act at 45 deg. to one another, the movements of the diaphragms will work in the

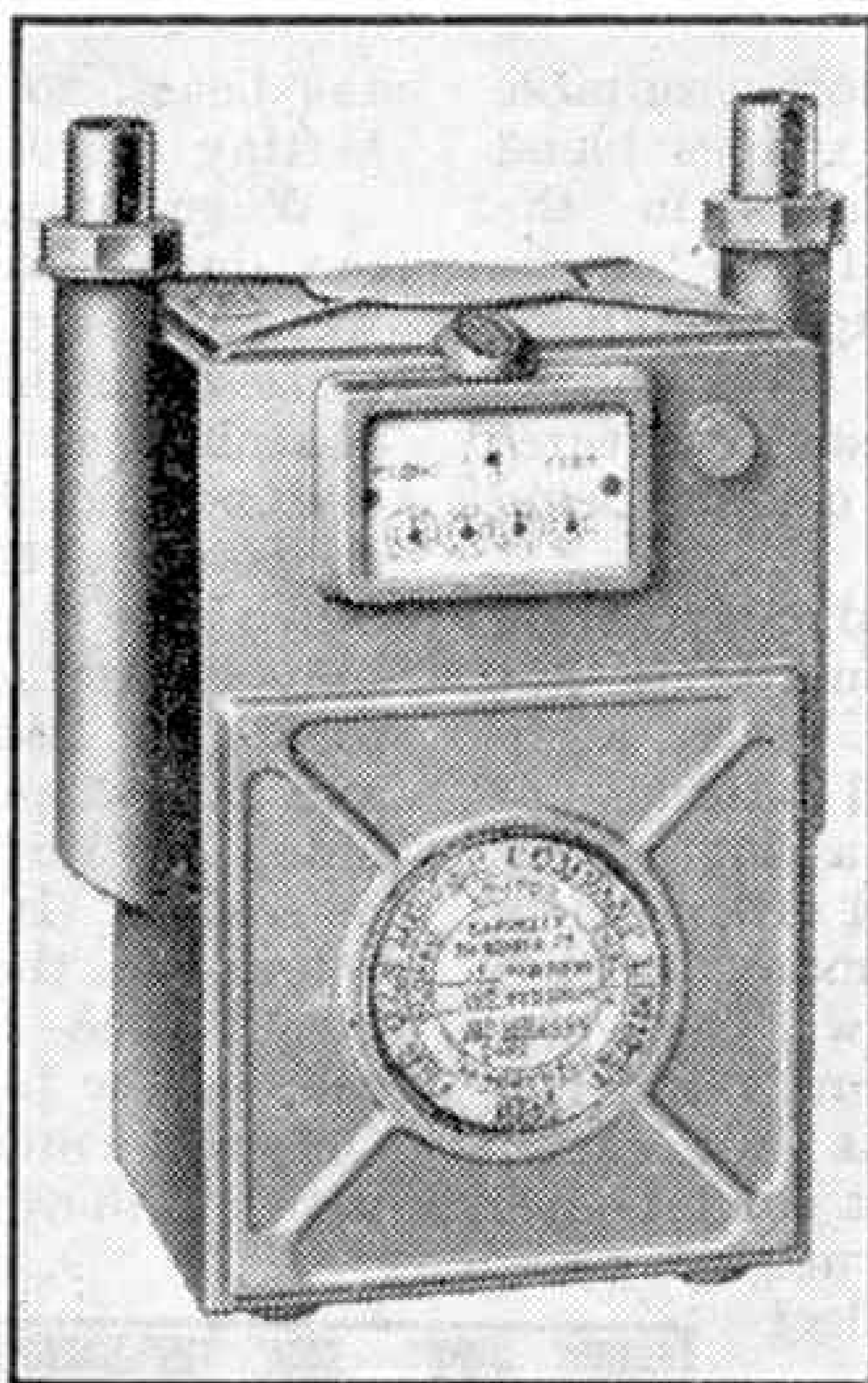
same way as the piston strokes of a two-cylinder steam engine, producing a continuous rotation of the crankshaft, with no "dead-centre" points.

On the opposite end of the crankshaft is a second small crank, the crank-pin of which is linked by two small levers to the two slide-valves. The relative positions of the main and valve cranks are set so that the movement of the valves occurs at the proper intervals to give correct admission of the gas from the mains, first on one side of each diaphragm and then on the other. At the same time, the gas that is displaced from the opposite sides of the diaphragms is permitted to go through a passage in each slide-valve, and thence through the exhaust port into the meter outlet pipe, and so to the consumer's burners.

The counting and indicating mechanism, which operates the dial pointers, is driven from the crankshaft through a worm reduction gearing. A worm mounted on the crankshaft engages with a worm wheel, fitted to one end of the spindle, which transmits the drive to a group of spur gears behind the dials. Each rotation of the worm advances the worm wheel one tooth, and a spur gear on the other end of the spindle meshes with a similar wheel in the spur gearing whose spindle carries the pointer of the first dial. This dial usually indicates two cubic feet for each rotation of the pointer, and is only used for testing purposes; but a pinion on its spindle meshes with a further wheel that carries the drive on to the rest of the dials. The second dial generally indicates 100 cu. ft. for each rotation of the pointer, and the others, each of which is geared to the preceding dial spindle by a 10-to-1 spur reduction gearing, show thousands, tens of thousands, hundreds of thousands, and even millions of cubic feet.

As the power to operate the meter comes from the pressure of gas in the mains, and this is never very high, the mechanism must be designed to act in the most efficient way, and to give the least possible obstruction to the flow of gas; unless this is done, there might not be a sufficient pressure at the outlet side of the meter to give a good supply to the burners. For this reason, all the parts, such as the diaphragms, valves, and so on, and most particularly the gas passages and ports, must be most carefully designed. The passages must be of ample size, and also properly streamlined, or there will be a great loss of pressure; and the leather for the diaphragms must be carefully selected, or they will take more energy than necessary in their operation. The leather comes from a special kind of sheepskin, and undergoes very careful preparation. It is only in this way that an efficient gas meter can be made.

Meters of the "prepayment" type, in which coins must be inserted in a slot before gas is available, are similar but have an additional mechanism that only permits the flow of gas when a coin is inserted.



A typical gas meter. Photograph by courtesy of Parkinson and Cowan (Meters) Ltd.

Photography

At the Seaside

FOR most people August is the seaside month, and many readers will be finding their way to some part of the coast, with good intentions and all the film they have been able to induce their dealers to part with!

It is in seaside photography that the cheap camera, with its largest stop about f11, comes into its own, for in fairly bright weather serious under-exposure for most subjects is nearly impossible. The danger lies in the opposite direction, and care must be taken to avoid over-exposure on open beaches in bright sunshine.

As to subjects, these depend very largely



Bathers on popular beach, Durban. D. Mills.

on the place chosen for the holiday. If it is a quiet fishing village, the day-to-day operations of the fisher folk provide plenty of opportunities for attractive pictures of the "men at work" type. In taking pictures of this kind be careful not to annoy the people concerned; it is easy to avoid all trouble by asking permission to photograph.

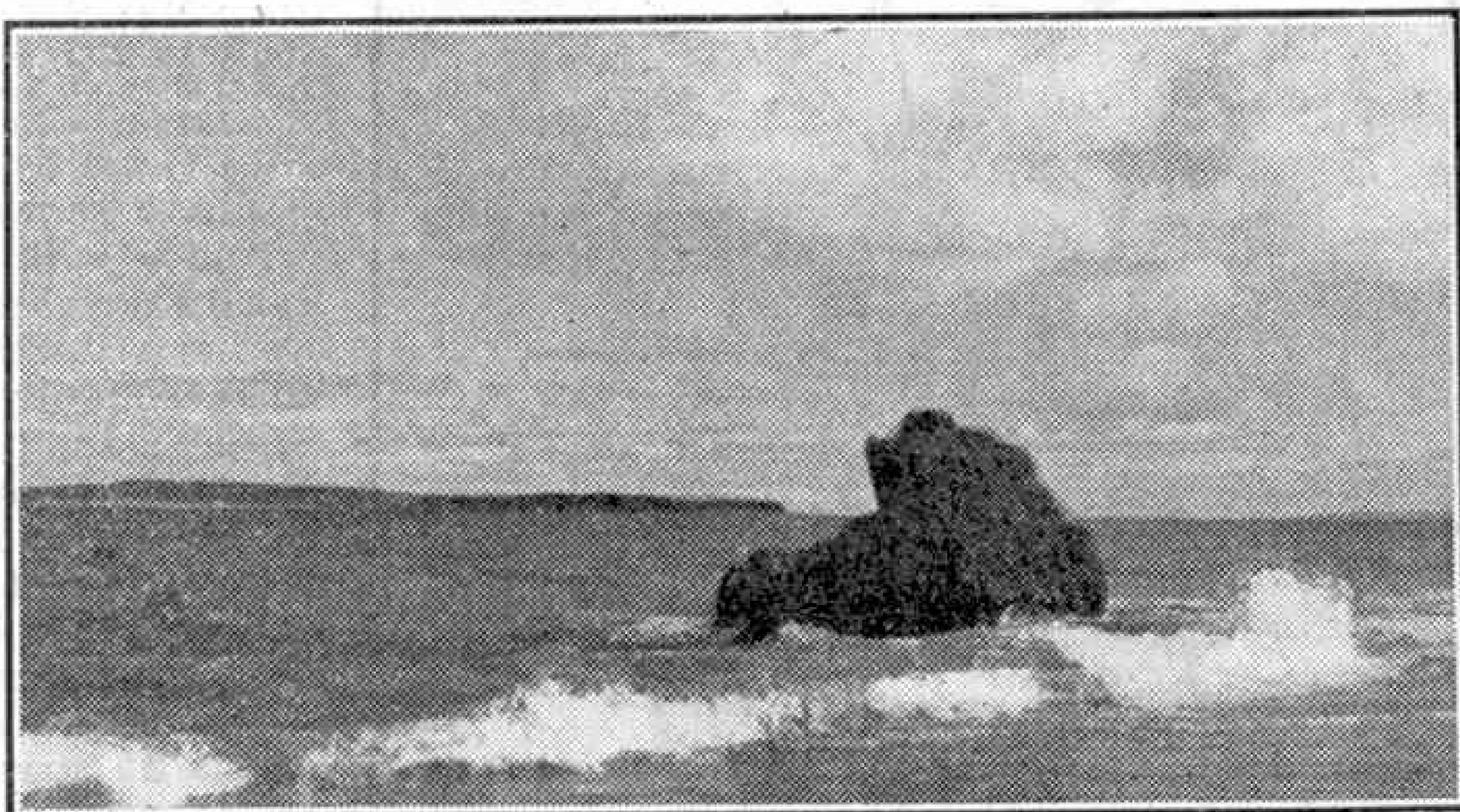
If you are lucky enough to spend your holiday among



The net mender. Peter F. Chapman.

wild cliff scenery your choice of pictures is very wide. It is a good idea to postpone taking your photographs until you have seen how the cliffs look from different points of view, and at different times of the day. The sky plays an important part in most cliff pictures, and a really suitable cloudscape is often worth waiting for.

Then there is the hilarious type of seaside holiday at places like Blackpool or Southend. Here the beach scenes are inexhaustible. If you get the opportunity try the effect of taking a few beach scenes from a rowing boat close inshore; but if you happen to stand up in the boat to get a wider view of the beach don't fall overboard in the excitement!



Seascape on the Antrim coast. E. M. Patterson.

New Meccano Models

Tramcar—Spring Balance—Wire Covering Machine

THE first of three new models to be described this month is the realistic Tramcar shown in Fig. 1. This can be built from the parts contained in Outfit No. 3, and if desired may be fitted with a *Magic Motor*.

Construction of the model should be commenced by bolting a $4\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate to each side of a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate, in the positions shown in Fig. 1. The driving compartment at each end is formed by bending a $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate and then bolting it to the Flanged Plate. Eight $2\frac{1}{2}"$ Strips are bolted to the sides as shown in the illustration, and are connected at their upper ends by a compound strip consisting of two $5\frac{1}{2}"$ Strips overlapped seven holes. The end pairs of $5\frac{1}{2}"$ Strips are joined by the $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips 1.

The roof consists of two Semi-Circular Plates, a $5\frac{1}{2}" \times 2\frac{1}{2}"$ and a $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate, which are bolted together and fixed to the Double Angle Strips 1. A 3" Formed Slotted Strip is attached to each Semi-Circular Plate by a $\frac{1}{2}" \times \frac{1}{2}"$ Angle Bracket. The trolley pole is represented by a 4" Rod held in a Stepped Bent Strip and a $\frac{1}{2}" \times \frac{1}{2}"$ Angle Bracket 2. The Rod is fixed in position by a Spring Clip and a Cord Anchoring Spring. The complete unit is

then fitted with a Double Bracket and bolted to the roof by means of a $2\frac{1}{2}"$ Strip 3.

The tram runs on four 1" Pulley Wheels fixed on $3\frac{1}{2}"$ Rods. Each Rod is journaled in a Flat Trunnion 4 and a Trunnion, and is held in place by Spring Clips. The control handles at each driving position are formed by $\frac{3}{8}"$ Bolts in Fishplates

fastened to the $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates by Angle Brackets. The headlamps consist of $\frac{3}{4}"$ Discs, and the bumpers are represented by 3" Formed Slotted Strips fixed in place by Fishplates.

Parts required to build the model Tramcar: 6 of No. 2; 9 of No. 5; 4 of No. 10; 1 of No. 11; 5 of No. 12; 1 of No. 15b; 2 of No. 16; 4 of No. 22; 1 of No. 23; 5 of No. 35; 50 of No. 37; 6 of No. 37a; 4 of No. 38; 1 of No. 44; 2 of No. 48a; 1 of No. 52; 6 of No. 111c; 2 of No. 126; 2 of No. 126a; 1 of No. 176; 1 of No. 188; 2 of No. 189; 2 of No. 191; 1 of No. 192; 1 of No. 212; 2 of No. 214; 4 of No. 215; 2 of No. 217b.

Fig. 2 shows a simple little contrivance with which small objects can be weighed. It consists of two Corner Gussets 1 connected at their ends by a rubber band or Spring 2 and pivoted on a 1" Rod 3. Two $2\frac{1}{2}"$ Strips 4 are connected by bolts and lock-nuts to the lower ends of the Corner Gussets and are pivotally connected to each other together with 2" Strip 5. A Loaded Hook fixed to the end of the 2" Strip supports the article to be weighed.

A semi-circular piece of cardboard

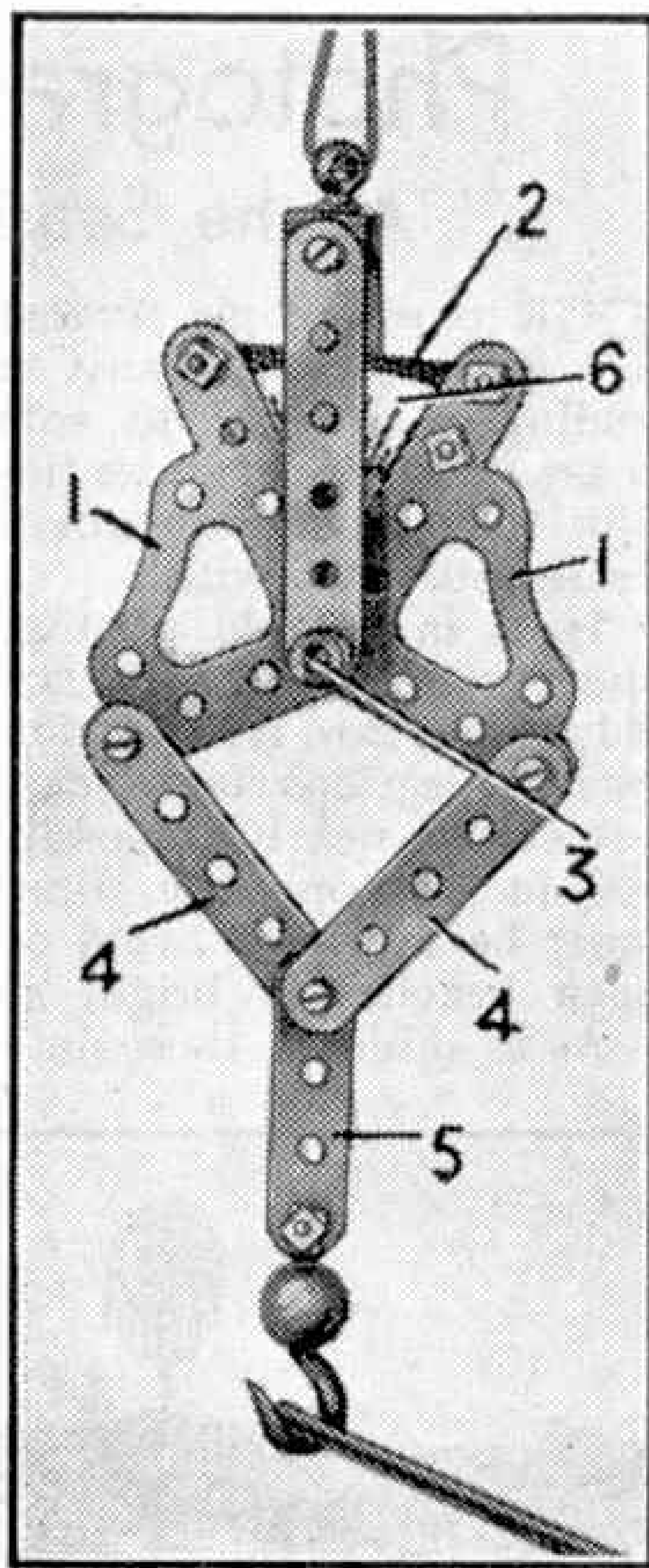


Fig. 2. A useful spring weighing device for light articles.

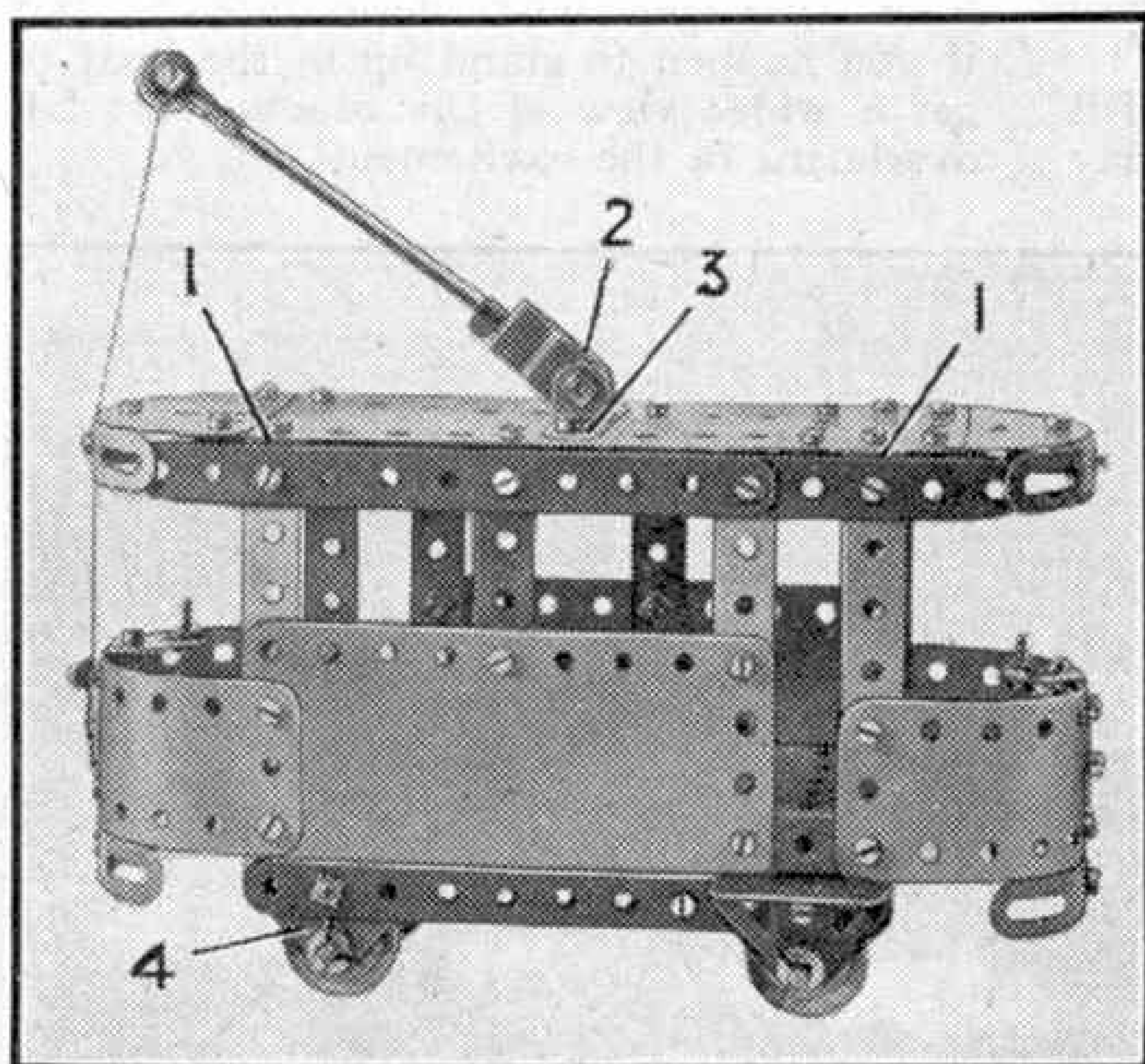


Fig. 1. A realistic tramcar that can be built from Outfit No. 3.

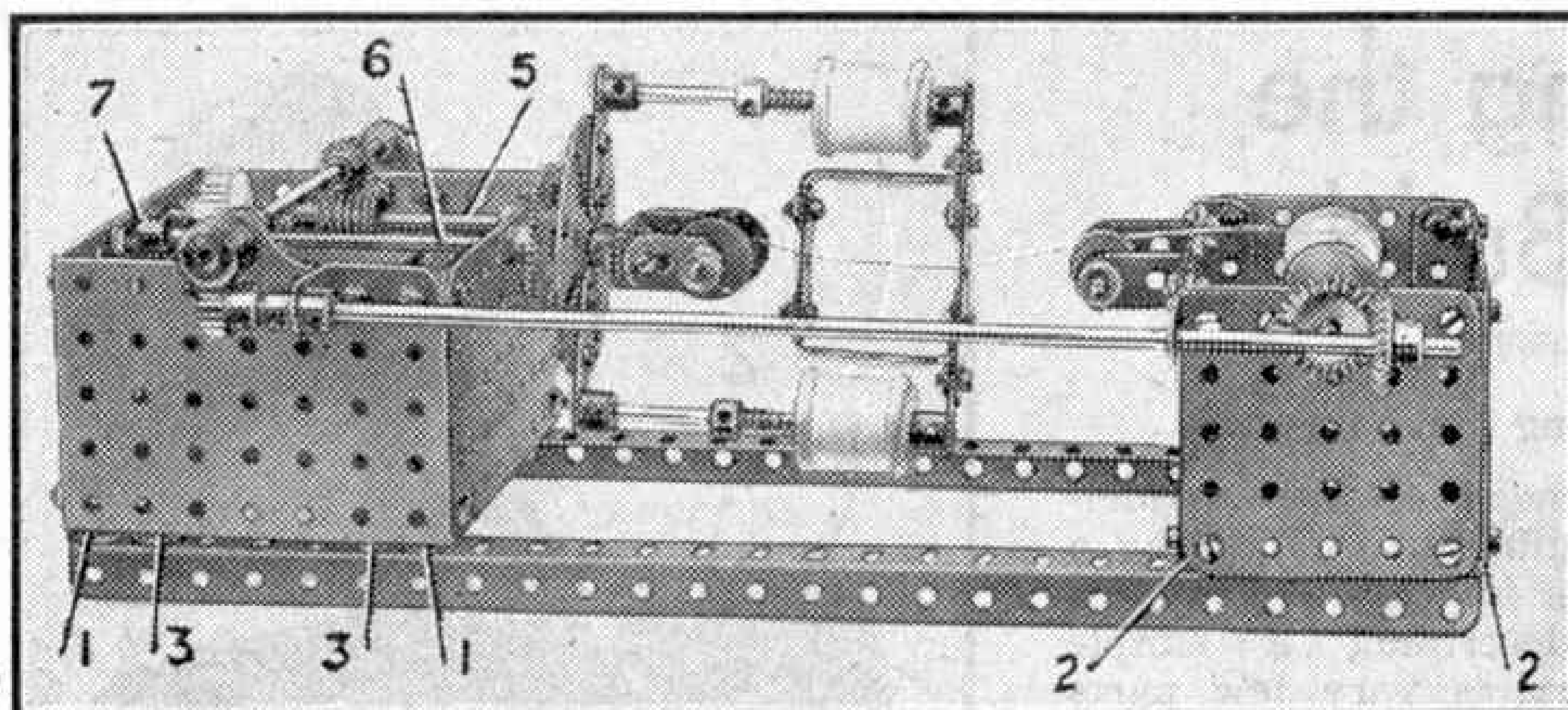


Fig. 3. A machine for wrapping bare wire with cotton or silk thread.

on which a scale can be calibrated, is attached to one of the Corner Gussets at 6. The movement of the other Corner Gusset over the scale is used to indicate the weight of the article.

The scale should first be calibrated by placing articles of known weight on the hook and then marking the position taken up by the Corner Gusset on the scale for each weight. Two 3" Strips, spaced by a Double Bracket at their upper ends, are pivoted through their lower end holes on the 1" Rod. Collars are used to space the Corner Gussets between the 3" Strips, and the 1" Rod is held in place by two further Collars.

A convenient handle for holding the balance while in use is formed from a Handrail Support and fixed to the Double Bracket.

Parts required to build the Spring Balance: 2 of No. 4; 2 of No. 5; 1 of No. 6; 1 of No. 11; 1 of No. 18b; 14 of No. 37a; 7 of No. 37b; 1 of No. 43; 1 of No. 57b; 4 of No. 59; 2 of No. 108; 2 of No. 111a.

The machine shown in Figs. 3 and 4 is designed for insulating bare wire by covering it with a double layer of closely wound cotton or silk thread. The machine is driven by an Electric Motor and when set in motion will continue operating for long periods without attention.

The base consists of two 12 1/2" Angle Girders connected by the 4 1/2" Angle Girders 1 and 2. The casing in which the

gearing is housed is built up from two 4 1/2" x 2 1/2" Flat Plates and two 3 1/2" x 2 1/2" Flanged Plates, and is bolted to the Angle Girders 1. The Electric Motor is held to the base by Strips 3.

The Pinion on the armature shaft of the Motor meshes with a 57-teeth

Gear Wheel locked on the Rod 4. This Rod is journaled in the side plates of the Motor, and the drive is transmitted from it to the Rod 5 by two 1" Gears. A 1/2" Pinion on the Rod 5 engages a 57-teeth Gear. This Gear is bolted to a Face Plate, and both are free to turn on the fixed Rod 6.

The Bobbins rotate on a yoke made by two 3 1/2" Rods held in Cranks bolted to the Face Plate. A light tension is maintained on the thread by Compression Springs pressing on the bobbins. The reel of uncovered wire is supported by two 1" x 1/2" Angle Brackets bolted to a Double Arm Crank 8, which is locked on Rod 6. The covered wire is wound on a roller driven from Rod 5 through two gears.

Parts required to build the Wire Covering machine: 2 of No. 2a; 1 of No. 5; 1 of No. 6a; 2 of No. 8; 4 of No. 9a; 4 of No. 9d; 2 of No. 10; 4 of No. 12a; 2 of No. 12b; 1 of No. 13; 2 of No. 14; 1 of No. 15; 1 of No. 15a; 2 of No. 16; 2 of No. 16a; 2 of No. 20b; 1 of No. 23; 3 of No. 26; 2 of No. 27a; 2 of No. 30; 2 of No. 31; 2 of No. 32; 65 of No. 37; 6 of No. 37a; 9 of No. 38; 2 of No. 48; 2 of No. 53; 2 of No. 53a; 12 of No. 59; 4 of No. 62; 2 of No. 62b; 2 of No. 72; 1 of No. 109; 2 of No. 111; 3 of No. 120b; 2 of No. 133a; 1 of No. 163; 2 of No. 191; 1 E1 or E120 Electric Motor.

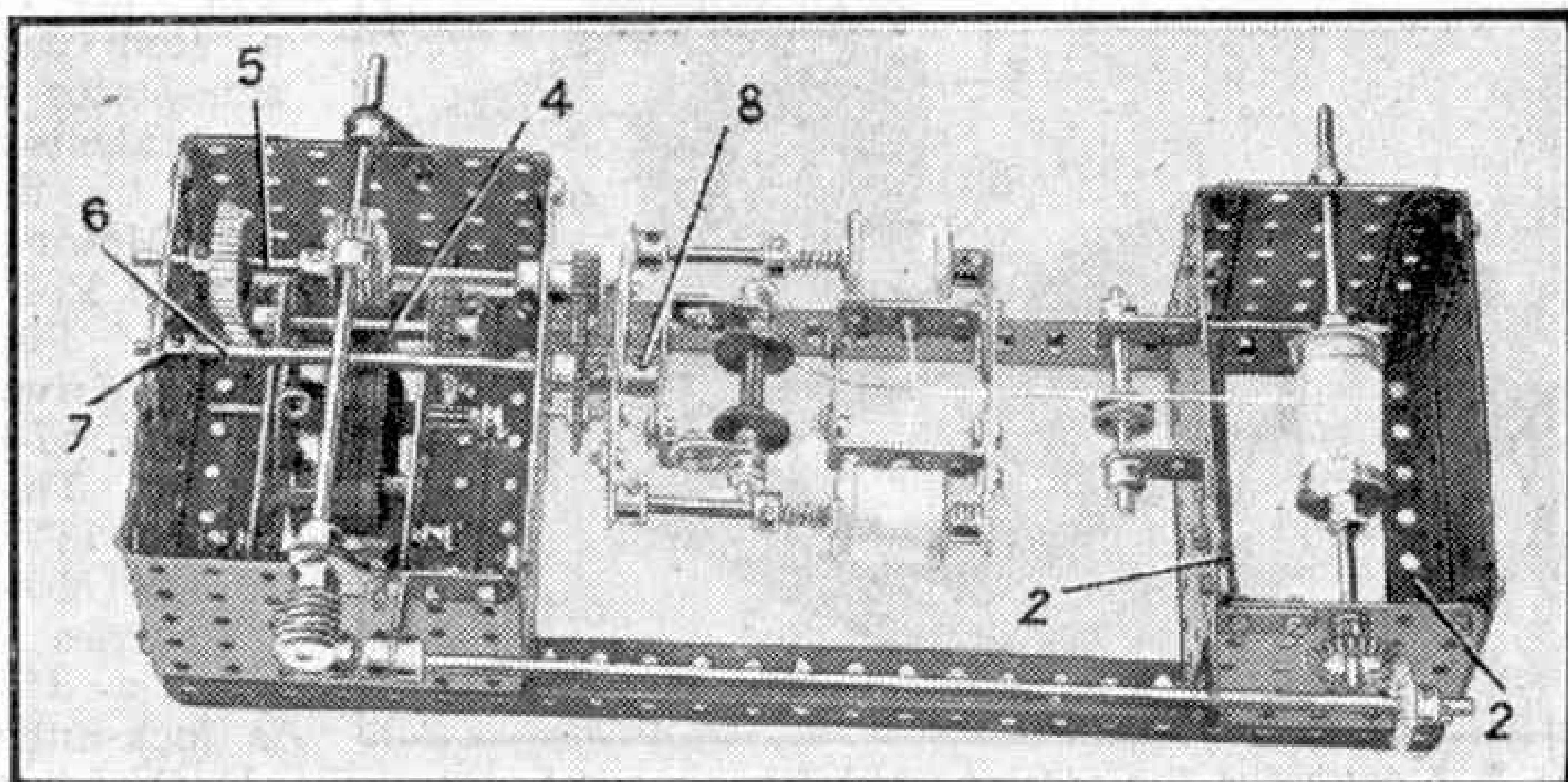


Fig. 4. Another view of the wire covering machine.

Among the Model-Builders

By "Spanner"

Simple Steering Mechanism

I receive many enquiries from model-builders who have difficulty in building a steering gear suitable for cars and lorries. I am therefore describing a simple mechanism that requires very few parts and can be adapted to fit most types of vehicles. It is shown in Fig. 1.

Each of the road wheels rotates on a stub axle consisting of a $\frac{1}{2}$ " Bolt fastened to an Angle Bracket 1. A $\frac{3}{8}$ " Bolt 2 passes through the end hole of a $2\frac{1}{2}$ " Strip that represents the axle beam, and the Angle Bracket 1 and a Fishplate are secured to the Bolt by two nuts. The track rod consists of a second $2\frac{1}{2}$ " Strip, which is lock-nutted to the Fishplates.

A Handrail Support is locked on the steering column in such a position that its shank engages one of the holes in the Strip forming the track rod.

A Useful Gadget for the Darkroom

Many model-builders are keen photographers, and those who develop and print their own negatives will be particularly interested in the apparatus illustrated in Fig. 2. This is a simple agitator designed to keep developing or fixing solutions

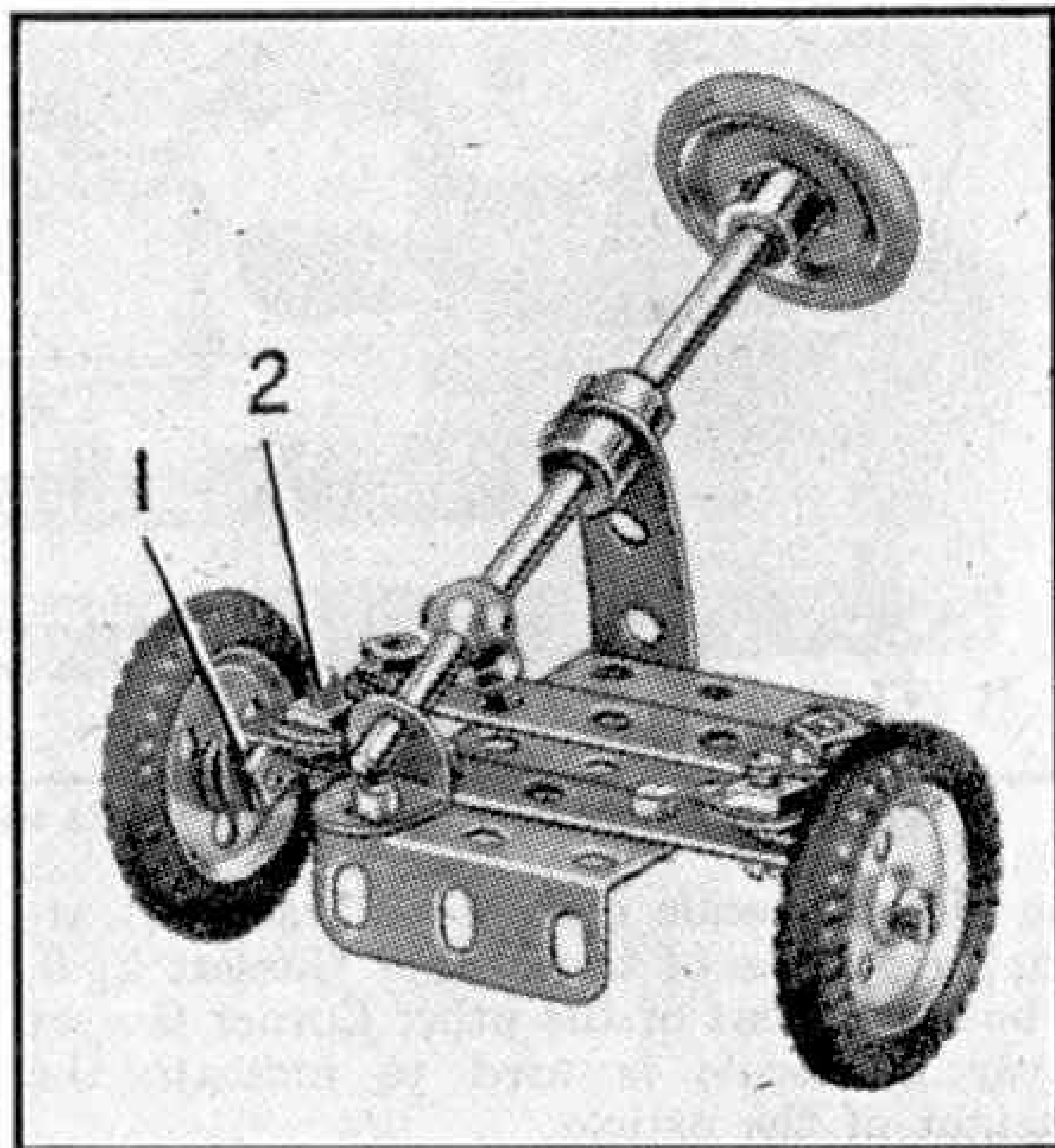


Fig. 1. A simple steering mechanism for small cars.

in constant movement, so as to prevent the formation of air bubbles on the negative.

The base of the model is formed from two $12\frac{1}{2}$ " and two $7\frac{1}{2}$ " Angle Girders bolted together. The corners are strengthened by 1" Corner Brackets. A support for the developing dish is built up from two $12\frac{1}{2}$ " and two $5\frac{1}{2}$ " Angle Girders. Short Rods held in Double Arm Cranks 1 are free to turn in Cranks attached to the base by Flat Trunnions. A $5\frac{1}{2} \times 2\frac{1}{2}$ " Flanged Plate 2 that supports the Motor is bolted to the base.

A Clockwork Motor is secured to the Plate 2 by two $4\frac{1}{2}$ " Angle Girders. It is fitted with a simple air brake consisting of $4\frac{1}{2} \times 2\frac{1}{2}$ " Flexible Plates bolted to Double Angle Strips and held between two Face Plates. The Face Plates are locked on a Rod 3 journaled in the side-plates of the Motor. The air brake is driven by a 57-teeth Gear on the driving shaft of the Motor and a $\frac{1}{2}$ " Pinion on the Rod 3.

A $\frac{1}{2}$ " Pinion locked on the Motor driving shaft is meshed with a 57-teeth Gear on the Rod 4. This Rod is journaled in two $1\frac{1}{2}$ " Flat Girders bolted to the Motor side-plates, and it carries a Coupling fitted with a 3" Strip. The Strip is lock-nutted to a $2\frac{1}{2}$ " Strip attached to the Crank 5, the two Strips being free to pivot.

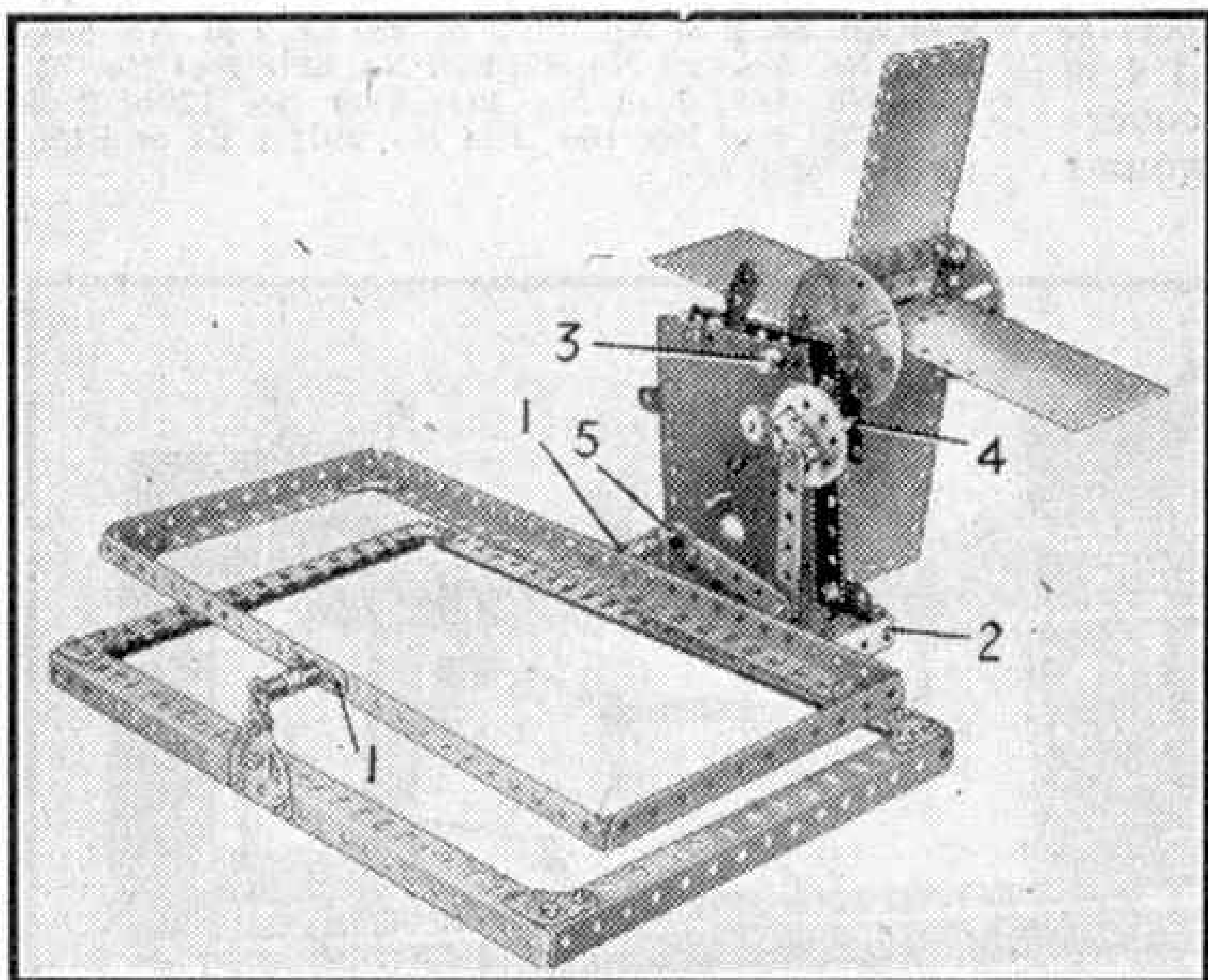


Fig. 2. A developing dish agitator, which forms a useful accessory in the darkroom.

A Gear-Box for Model Ships

One of my correspondents suggests the simple gearing arrangement shown in Fig. 4 as a suitable means of providing drives for twin propeller shafts from a single electric motor or other power unit. A Bevel Gear on the shaft 1 transmits the drive to two gears on the cross shaft 2 that engage the gears on the propeller shafts 3. By varying the length of the cross shaft the gears it carries may be adjusted to suit different propeller shaft centres.

The mechanism is mounted on a $3\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate and the bearing for the Rod 1, which takes the drive from the Motor, is provided by a Channel Bearing. The cross shaft is a $3\frac{1}{2}"$ Axle Rod, and it is supported by a second Channel Bearing.

A Collar on one side, and the Bevel Wheel that takes the drive to the shaft keep the cross shaft in position. Supports for the propeller shafts 3 are provided by two 1" Reversed Angle Brackets, and the ends of the shaft are journalled in Couplings attached to the cross shaft.

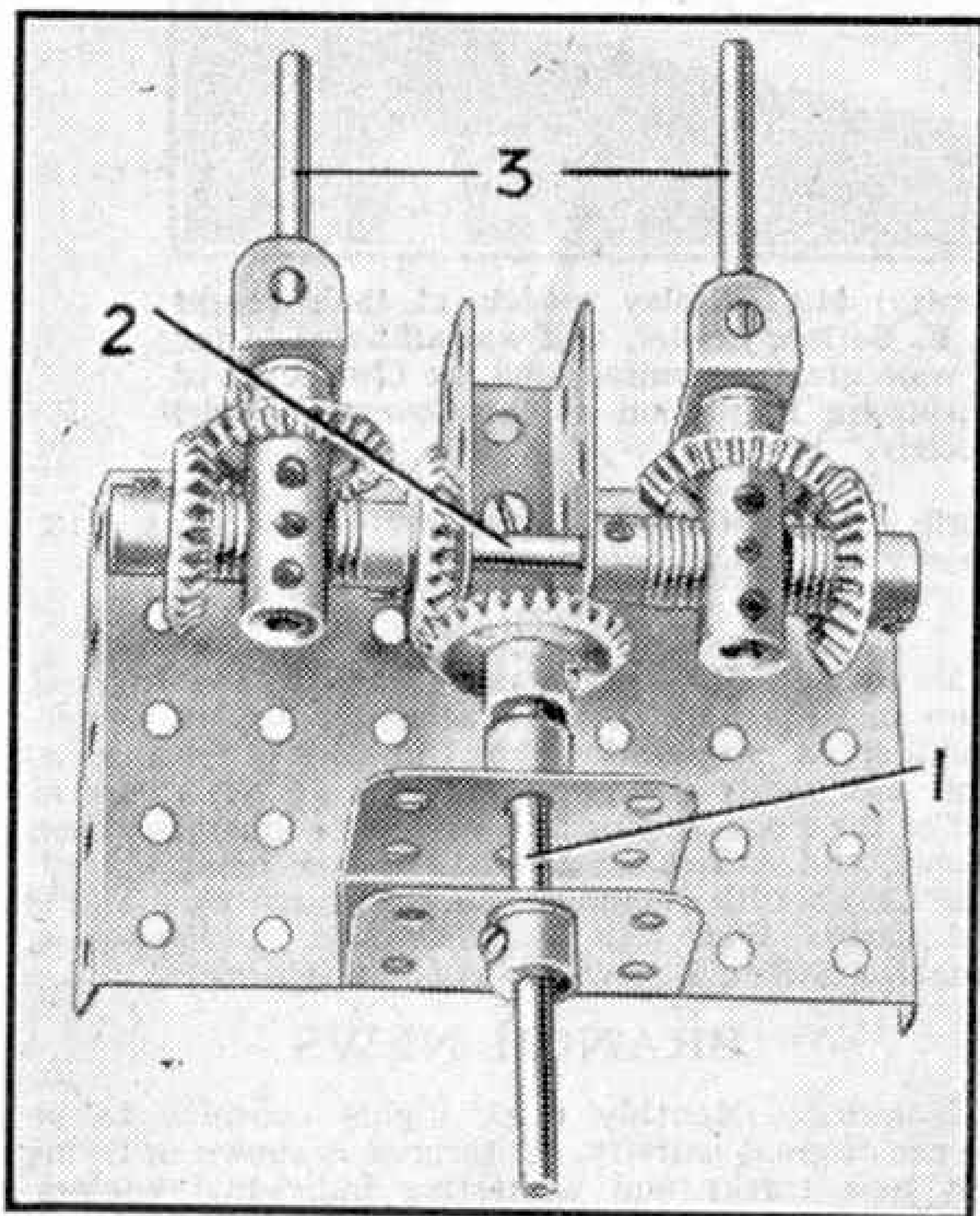


Fig. 4. Propeller shaft gearing for a model ship.

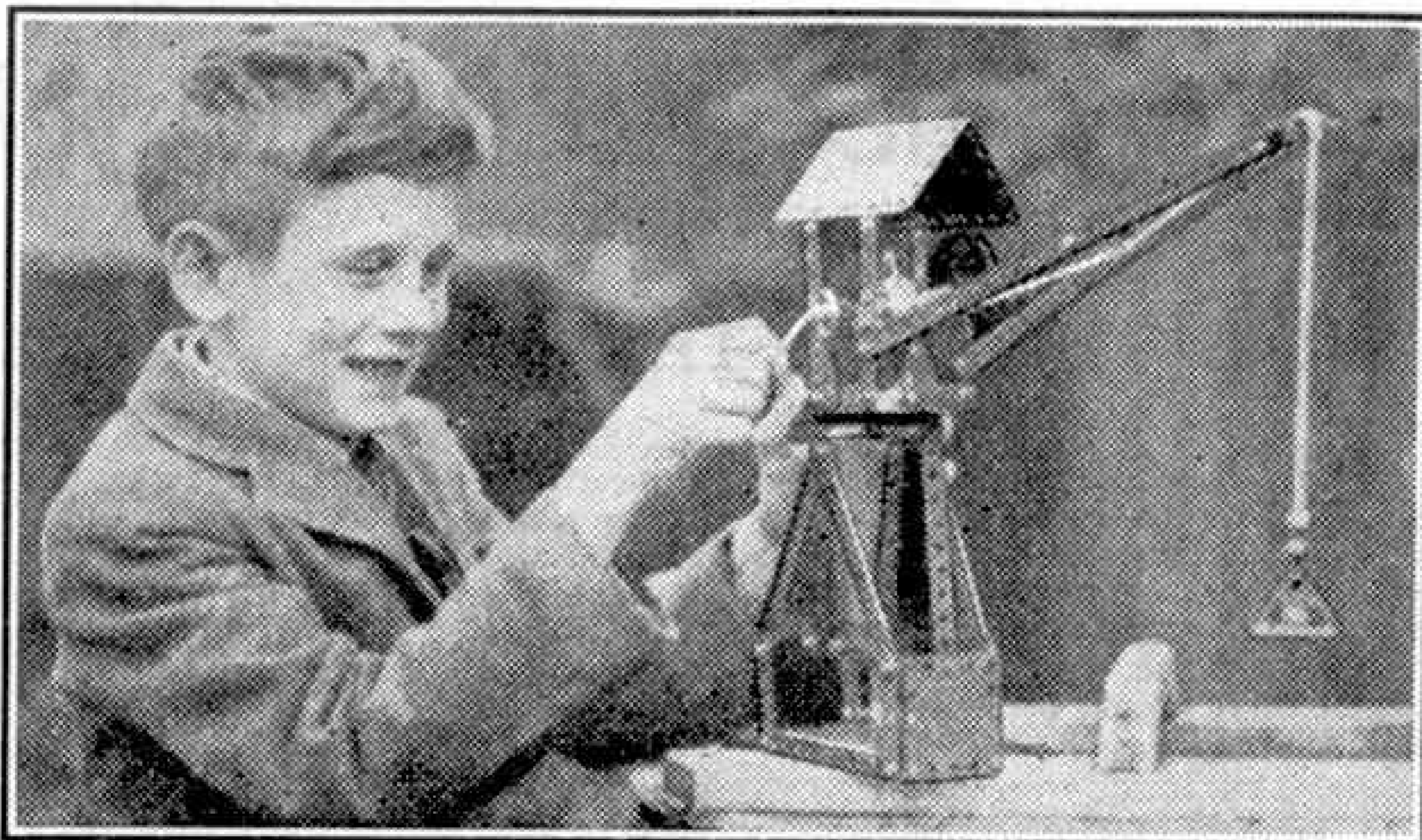


Fig. 3. Graham M. Day, London, an enthusiastic Meccano boy, with one of his latest model cranes.

Automatic Reverse for a Clockwork Motor

An ingenious idea for automatically reversing a reversible Clockwork Motor when it is used for driving a model vehicle has been submitted by J. Davies, Bristol. It is quite simple, and consists of tying one end of a piece of Cord to the driving axle of the model, and the other end to the reversing lever of the Motor. The result of this arrangement is that when the model runs along the ground the Cord wraps around the axle and so pulls the reversing lever over. A second Cord can be fastened between the front axle and the reversing lever, so that the latter is pulled alternately in each direction, and the model will then travel both forward and backward.

It is worth while mentioning that a device of this type can also be arranged to work effectively in a model crane or lift, so that the load or cage is alternately raised and lowered.

OUR SHORT STORY CONTEST STILL OPEN

The novel "Short Story" Competition announced in the July issue of the "M.M." is still open for entries in both the Home and Overseas Sections. It is not necessary to possess a Meccano Outfit to be eligible for the Contest, as there is no model-building in it. All that competitors are asked to do is to write a short humorous story incorporating as many Meccano Part names or terms used in connection with Meccano model-building as possible.

Stories must not be less than 50 or more than 150 words in length. Entrants may send in as many different stories as they wish, but no competitor will be awarded more than one prize.

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

Envelopes containing entries must be addressed to "Meccano Short Story Competition, Meccano Limited, Binns Road, Liverpool 13." Closing dates: Home Section, 30th August; Overseas Section, 29th November.



Club and Branch News



WITH THE SECRETARY

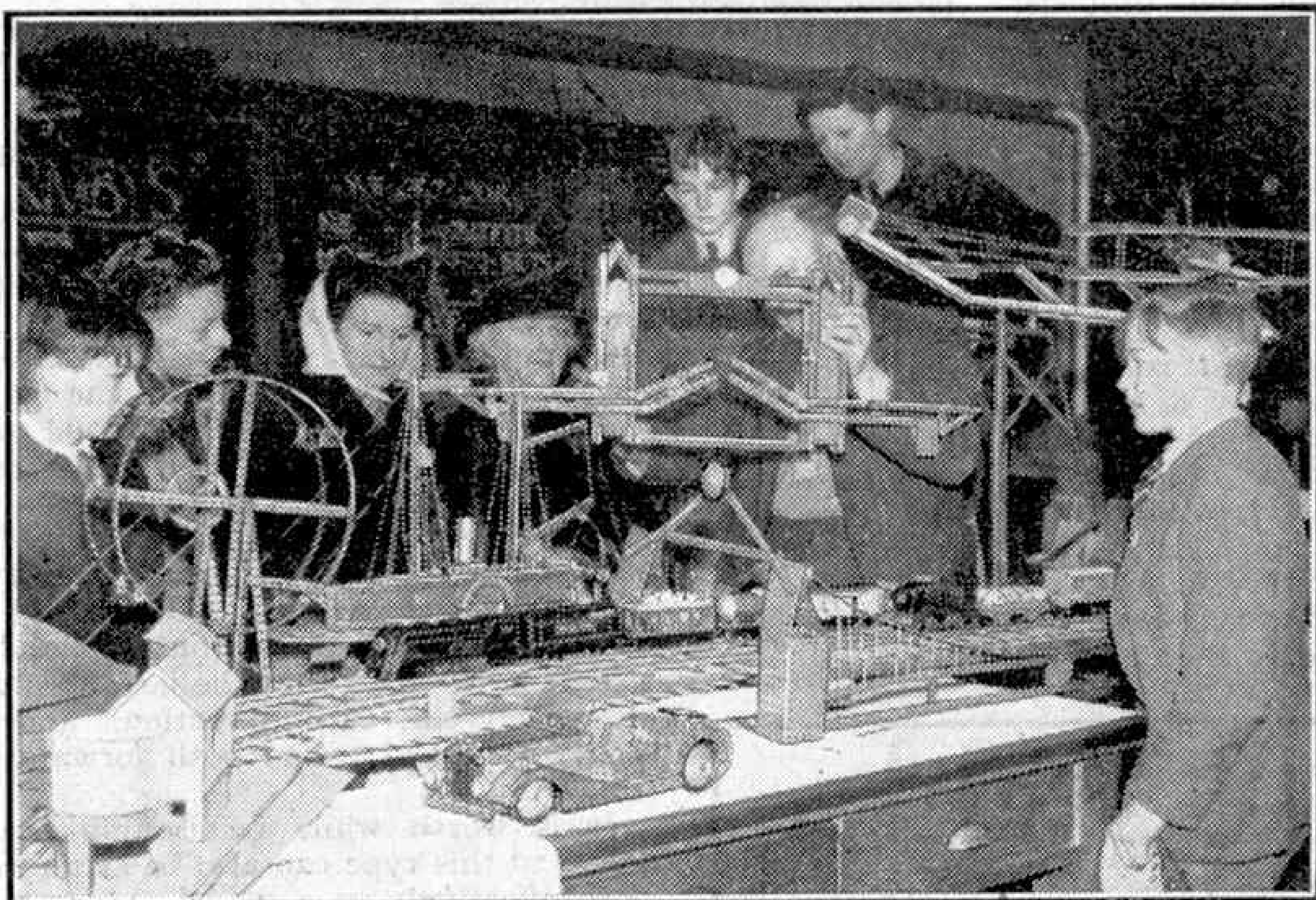
LOOKING AHEAD

The time is rapidly approaching when a return to Club and Branch room activities on a larger scale will be necessary, and plans for this should be made now. The actual details will of course be decided at the general meeting that usually is held in September, but both officials and members should have clear ideas on what should be recommended at this meeting and discussed there.

CLUB NOTES

GILLINGHAM M.C.—Great model-building activity continues. A Cricket Team has been formed with the kind assistance of Mr. J. Hill. Many new members are coming along. Club roll: 13. *Secretary*: B. Watts, 201, Balmoral Road, Gillingham, Kent.

CAER URFA (SOUTH SHIELDS) M.C.—Mr. A. Fyall has kindly accepted the post of Leader and has given interesting Talks on Engineering and Railway topics. A Gramophone Record Night has been held. Visits have been paid to a signal cabin and to a coach building



Members of the Barker's Butts Boys School (Coventry) M.C. display models at their recent Exhibition. This fine school Club was formed by Mr. F. Batten, Leader, and was affiliated to the Meccano Guild in June 1944. The Exhibition models were greatly admired, and the Club received an invitation to arrange a similar display at the Autumn Exhibition of the Coventry Model Engineering Society.

The first thing to settle is a good model-building scheme. It is not sufficient to allot a proportion of the meetings to model-building; there must be some idea behind this. A good scheme is to arrange one model-building competition a month, the subjects being carefully arranged to follow a definite plan, and to devote another monthly meeting to the construction of larger Meccano models, with specially interesting mechanisms, built by teams of members in competition. Interest is heightened by the award of small prizes for each contest, but a better plan is to award points in a competition continuing over an entire Session, as this helps to hold members together.

PROPOSED CLUBS

TONBRIDGE—Master C. Dalton, Yardley Court.

WEST MOLESEY—Master M. Wenban, 15, Molesham Way.

LIVERPOOL—Mr. D. Moody, 24, Merton Drive, Roby.

OLDBURY—Mr. H. W. Gilbert, 35, Apollo Road, Rood End.

works. Club roll: 15. *Secretary*: G. Burrows, 113, Quarry Lane, Cleadon, South Shields.

AUSTRALIA

MAYLANDS M.C.—Increased activity has marked Club meetings, which have been devoted to model-building in preparation for the Club's Exhibition. This was highly successful and over £4 was raised in aid of the Food For Britain Appeal. Films have been shown, and Australian Football is now being played. The Club's 12th Birthday was celebrated by a splendid party. Club roll: 30. *Secretary*: A. Pepper, 4, Aughton Street, Bayswater, Western Australia.

BRANCH NEWS

NORBURY—Monthly track nights continue to be scenes of great activity. Enterprise is shown in trying out new tracks and in testing individual engines. Games Nights also are held regularly. *Secretary*: D. R. C. Pavey, 37, Croft Road, Norbury, London S.W.16.

Hints from a Hornby-Dublo Owner

THE notes reproduced on this page have been received from our reader Mr. J. Allan Patmore, Wetherby, Yorks. We are sure that they will appeal to other readers and to Hornby-Dublo owners in particular. A comparison of one's ideas and methods with those of other model railwaymen is always of interest. Let us see what this Hornby-Dublo owner has to say:

"It is my practice to make up my trains into five

that Dad had given to him for his birthday! They can be dyed or painted a dull red then cut up and attached to wagons by thin black cotton. An unusual load for miniature wagons is three of the small capsules which contain the compressed gas for certain 'make your own' soda-water syphons, or several petrol lighter fuel containers. They can either be left their natural colour or painted matt black or red to resemble the 'bottles' used for oxygen, acetylene and other gases. By the way, don't use too glossy a paint for model railway work; it doesn't look very natural.

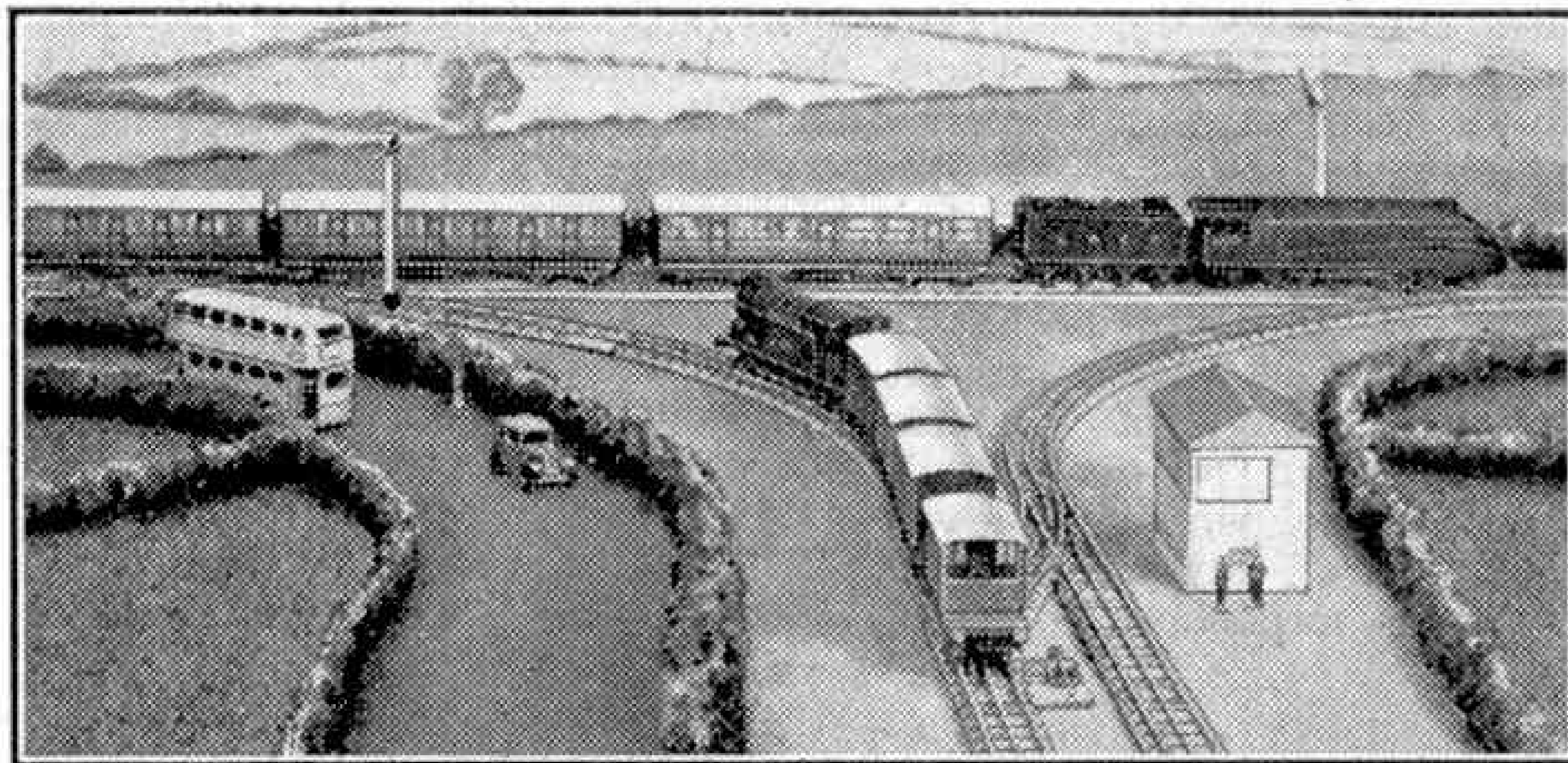
"Now for some track notes; if your track is double you may care to run your expresses only on the outside large radius track. This method has various advantages and is often made use of by model railway operators. If the track is single try and use the large radius Dublo curves for the main line. Running is easier on these large radius curves.

"Too little attention is generally paid to station design. Try to

base your station layouts on prototype practice, no matter how simple. It is more like the 'real thing' and often makes operating much easier. The diagram on this page is a good example and is one of the several that I can recommend, all based on actual practice.

"As a change from the all-too-usual main line running, try branch line running. A non-continuous track, with only a siding and a platform at each station, can provide a great deal of fun. A Dublo 0-6-2 tank, a coach or two, and half-a-dozen goods trucks are all that are necessary. 'Push-pull' trains can be usefully run and much time is then saved, which is valuable if the layout is of a temporary nature. With such trains loop lines as shown in the diagram are not necessary. If two engines are available, the layout can be divided into two, each half supposedly belonging to different companies. It is great fun preparing for 'through' non-stop working.

"A handy tip if an engine is to be kept stationary, and no isolating rails are used, is to isolate it by inserting a strip of paper between the collectors and the third rail, thus effectively cutting off the 'juice.' Again, even if you own a large stock of electric locomotives it is useful if you can have a clockwork engine to act as a 'shunter.' This saves much time and trouble in isolating sidings, loops and so on, especially where a layout is temporary and only put down for a short while. It is also very useful in acting as a pilot or banking engine."

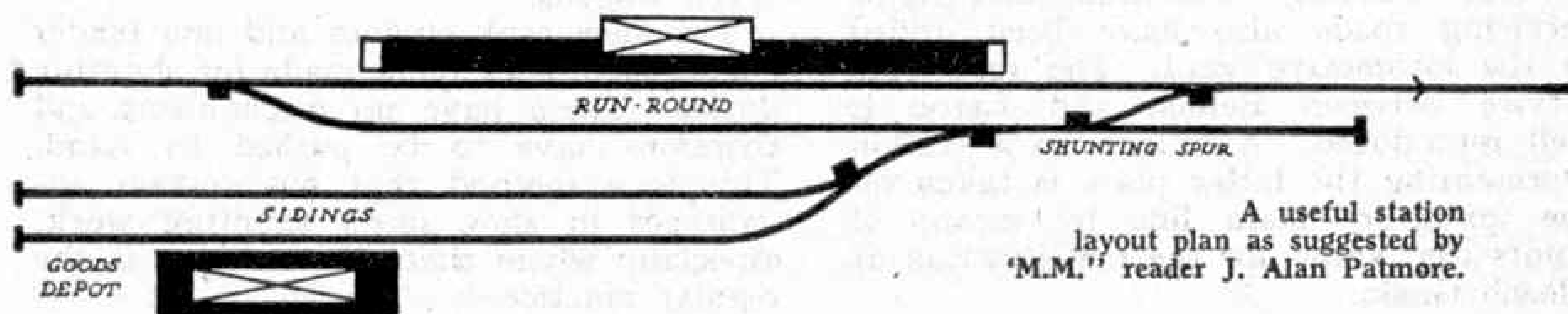


An unusual junction layout on a Hornby-Dublo railway. The triangular formation allows interesting variations in running.

coaches for expresses and three or four coaches for 'locals.' These are larger loads than those usually recommended for small layouts, but look much more realistic. On my system these loads are well within the capacity of the Dublo engines, provided that the maintenance, oiling and so on are carried out as recommended in the instructions. Even nine coaches is not unusual! These heavy loads are typical of the L.N.E.R. East Coast workings that I aim to reproduce. A point to remember, though, is never to let your trains overlap your platforms if it can be helped. It looks ugly and is bad railway practice although drawing up twice at some real stations is not unknown. Still, if you cannot extend your platforms, it is better to impose a limit on your train loads. This is often done in real practice. Trains look much better with name boards, and suitable schemes have been described once or twice in past issues of the 'M.M.'

"Engines should if possible be provided with crews on the footplate and coal in the bunker. Drivers and firemen can be 'manufactured' from standard Dublo figures by removing the bases if necessary and repainting, then fastening the men to the footplate with a tiny dab of heatless solder. As for coal, I have found that diced cork painted a matt black is as good as anything, especially if glued to a false bottom of card.

"Tarpaulins for goods trucks are best manufactured from old cotton handkerchiefs. Don't 'pinch' those



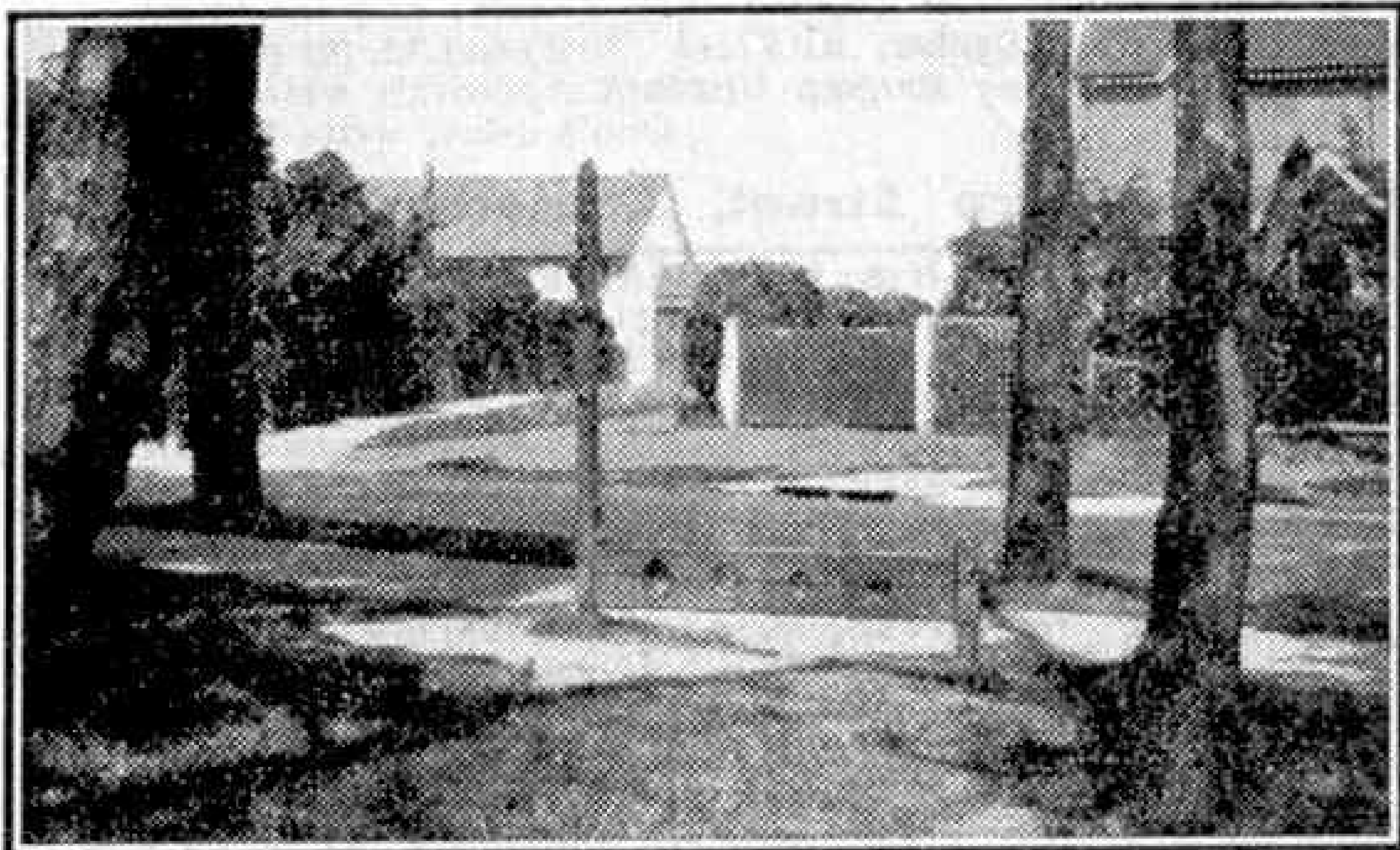
A useful station layout plan as suggested by 'M.M.' reader J. Alan Patmore.

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.

CAST IRON STOCKS

The accompanying photograph illustrates the iron stocks with whipping post at Ninfield, near Battle, in Sussex. These are I think very rare indeed. The



Iron stocks and whipping post at Ninfield, Sussex. Photograph by J. Dufty, London.

stocks shown probably date back to the time of Queen Anne or even earlier, when the Sussex iron furnaces were in full operation. Most stocks were made of wood and this explains why they have disappeared to a large extent.

It is not surprising to find stocks made of iron in Sussex, as this county was the centre of the iron industry of England in the days when stocks were largely used as a form of punishment. The necessary ironstone came from the Wealden districts, and the great forests of the county provided charcoal for smelting. The first iron cannon ever made in England was cast in Buxted in 1543.

J. DUFFY (London).

SIGNAL SOUVENIRS

Before railway grouping each company had its own characteristic pattern of signals, several of which remain to-day, especially on branch lines, although some are to be seen on main lines in the vicinity of large stations. On a journey to Lakeside I noticed three old type Furness Railway signals, and of these one at Greenodd is illustrated here. The lamp and spectacle are mounted lower down the post than the arm, and the chain used for raising and lowering the lamp can be seen inside the lattice-work post.

On some sections of the former North Eastern Railway are examples of the slotted post, where the arm is pivoted inside the post. This is a reminder of the early

days of signalling, when the arm actually disappeared into the slot.

On the L.M.S. main line, a little to the south of Preston, is a combination of old and new on one post, in the form of an upper quadrant arm with an old L.N.W.R. arm below. The latter, although of lower quadrant type, is fixed, a practice that was common at many L.N.W.R. large stations. By night the combination shows a distinctive appearance, the orange light of the distant arm being staggered to the right of the upper lamp, due to the lamps being on opposite sides of the post.

W. S. GARTH (Luton).

THE VILLAGE CAGE OF LINGFIELD

Cycling through Lingfield in Surrey I chanced upon a curious stone obelisk complete with steeple. At first sight it looked exactly like a miniature church, but closer inspection revealed that it was built on to the trunk of an old oak at the head of the village pond and was partly surrounded by a wooden fence. This strange building possessed a stout door, and on one of the walls the words "St. Peter's Cross" were deeply carved.

Upon investigation I learned some very interesting facts about this obelisk. It was known locally as "Ye Village Cage" or "St. Peter's Cross." Originally it was a wayside shrine, and on its small tower there was once a small font or basin, which was kept filled with Holy water taken from a special stream near by. I believe the basin is at present in Lingfield Church.

When in the eighteenth and nineteenth centuries the necessity arose for a local gaol, it was decided to convert St. Peter's Cross into a prison, thus saving unnecessary expense. Most village cages cost between £20 and £30.

There is an amusing legend about some poachers, the number of whom varies with the telling, who were caught and imprisoned in the cage until they could be removed to the county gaol. Late at night several other poachers crept up, removed the roof, helped their comrades to escape and then replaced the roof, leaving an empty dungeon. It is easy to imagine the astonishment of the authorities when they found the gaol empty and no indication that it had been broken open.

St. Peter's Cross was last used as a prison in the late nineteenth century and after lying idle for some time was converted into a museum. A body of trustees was formed and a curator appointed. As yet the collection is very small, the cage itself forming the main item of interest, but no doubt many interesting exhibits will be added in due course.

R. TAYLOR (Beckenham).



An old type Furness Railway signal at Greenodd, with the lamp and spectacle mounted lower than the arm. Photograph by W. S. Garth, Luton.

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For other Stamp Advertisements see also pages 338 and xi.

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Stamp Collecting

Stamps and Music

By F. Riley, B.Sc.

THE range of topics and subjects with which stamps are connected is really remarkable, but even the most enthusiastic collector could scarcely be blamed for surprise to find to what extent music is included



in this range. The music is real on a few outstanding, which actually reproduce a few bars as the essential portion of the design. Of these the most remarkable is the Brazilian stamp illustrated on this page. It was issued in 1936 to commemorate the centenary of the birth of Carlos Gomez. This Brazilian composer was born in Campinas, and studied in Paris and in Italy. His most famous work "*Il Guarany*," is an

opera in the Italian tradition, and the music on the stamp is from it.

For a long time this was the only stamp on which music was seen, but in 1940 it fell to the lot of the Soviet stamp authorities to issue a set of five stamps to commemorate the centenary of the birth of Tchaikovsky. Two of these show the famous composer's house. The other three bear portraits and the designer of the stamps made their import unmistakably clear by including a few bars of Tchaikovsky's music on each. In one case there is an extract from one of his symphonies, and on two stamps there is an excerpt from "*Eugene Onegin*."

More recently another interesting example has been added to the list of stamps including music in the design. It came from Bolivia in 1946, and was issued to mark the centenary of the adoption of the National Anthem of the country, the date of which was 18th November 1845.

It is only natural to commemorate anniversaries of the births or deaths of famous composers and artists by the issue of stamps, and in many countries excellent use has been made of such opportunities. The first example that comes to mind is the "Famous Composer" series issued in 1922 in Austria. These were charity stamps, sold at 10 times their face value in order to set up a fund for needy musicians. There were seven of them, ranging in value from 2½ kr. to 100 kr. and they were beautifully engraved. The famous composers portrayed on them are Haydn, Mozart, Beethoven, Schubert, Bruckner, Johann Strauss and Hugo Wolf. Although Beethoven was not an Austrian by birth, his career and music are inseparably associated with the city of Vienna, so that his inclusion in this series is fully justified.

A further stamp with musical associations has just appeared in Austria to mark the 150th anniversary of the birth of Schubert, and this is illustrated here. With Mozart, another musician of the golden age of Vienna, he was an

outstanding example of the tragedy that often overtakes genius. Both died young. Mozart was only 35 at his death, and Schubert was even younger, 31. The former was always in financial difficulties and Schubert's troubles of this kind were only less serious for the simple reason that he never had any money, the payment he received for those compositions published during his lifetime being pitifully small.

For other stamps celebrating great classical composers we can turn to Germany of the period between the two wars. An issue of 1926-27 gives us portraits of famous German writers, artists, philosophers, and so on, and among them were two stamps carrying portraits of Beethoven and a

third with a portrait of Bach, while in 1935 the anniversaries of Bach and Handel were commemorated by the issue of two further stamps on which were portraits of these musicians. At first glance it may seem a little strange to find that it was left to Germany to commemorate the great achievements of Handel by a stamp, in view of the fact that this composer accomplished the greater part of his work in England, and is buried in Westminster Abbey, but it must be remembered that he was born and educated in Germany.

Wagner had the compliment paid him in 1933 by the German state of having an entire series of nine charity stamps devoted to his memory. These had various designs based on his operas.

Looking further afield, we may next turn to Norway and Finland, where the national composers Grieg and Sibelius respectively have been honoured by the issue of stamps. The case of Sibelius is perhaps unique, for he seems to be

the only musician to whom a stamp has been devoted in his lifetime. Poland has commemorated its greatest musical figures, Chopin and Paderewski. We find a portrait of Chopin on a special stamp issued in 1927. Paderewski had previously figured in an issue of 1919 commemorating the first Polish National Assembly. This may seem a remarkable place in which to find a stamp carrying a portrait of a great musician. The reason for its inclusion there is the part Paderewski played in the revival of Poland after the war of 1914-18. He ranks as one of the makers of modern Poland as well as a great artist.

Italy has celebrated anniversaries of Spontini, Bellini and Rossini by stamp issues. Czechoslovakia has provided us with two good examples of musicians on stamps. The first of these is Dvorak, the composer of the New World Symphony and other famous works, the 30th anniversary of whose death was commemorated in November 1934. The second is Smetana, who will be known to many readers as the composer of "*The Bartered Bride*."

More recently the United States contributed to our collection a series of five stamps issued in 1940 to commemorate famous American composers.





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Stamp Gossip and Notes on New Issues

By F. E. Metcalfe

AS was to be expected, the U.S.A. Post Office, with its eye ever on the main chance, took full advantage of the centenary of the first American postage stamps and issued two more, as well as a miniature sheet. There is no room to illustrate the latter, which depicts the first two stamps issued by the U.S.A., but we are able to show one of the centenary efforts. While it is far short of what America was able to do 100 years ago, it is a nice enough stamp in its way, and as usual, the U.S.A. Post Office is reaping a useful harvest for its enterprise, for millions of these stamps have been sold that will never do any postal duty at all.



Recently a Member of Parliament stated that a set of commemorative stamps would yield £1,000,000 or more. Well, this is probably an exaggeration. A lot would depend on the face value of the set printed, but it is significant to note that the postal authorities of the Falkland Islands stated that over £100,000 worth of Falkland Island Dependencies stamps had been sold since they were first issued in 1944. This was nearly all profit, for there is very little postal need for stamps there at all. Penguins, the only inhabitants of those regions for most of the year, are not addicted to writing letters! With the stamps, however, we not only help to confirm our territorial claim in the Antarctic, but make a nice profit to boot.

As most collectors know, countries belonging to the Postal Union meet regularly to settle matters pertaining to postal affairs, and the country acting as host issues a special set of stamps. Even our own country did this in 1929, when the Congress was held in London. All the delegates to the Congress are presented with a set, mounted as a rule in a fine album. France, which had the honour this year, has issued not only a set of ordinary postage stamps, but a magnificent affair for air mail, with a face value of 500 f. This latter stamp is too large to illustrate, so we must content ourselves with one of the ordinary set. As usual the stamps are beautifully engraved and well worth collecting, from an artistic standpoint if nothing else.

Canada has again produced another commemorative stamp, this time to commemorate "Canadian Citizenship." It is a handsome affair, and we hope to illustrate it next month. Few stamps are more popular to-day than those of Canada, and few deserve more popularity, for not only are they very beautiful, but they are of low face value, and easily obtainable by all collectors. There may be one or two readers who would like to take up a new country. They could not do better than have a shot at Canada. If they are well to do they can go in for all issues, and if they buy wisely their money is as safe as the bank. If they only wish to

spend a shilling or two, or even a copper or so each week, they should collect modern Canada used. Let them take care to only mount superb



copies. They are to be obtained, if one takes the trouble to look for them, and the result will be a collection that will be a joy to behold. We repeat, see that only superb copies are selected, for as most of Canadian stamps are commercially used, many have heavy unsightly postmarks, one of which is enough to spoil a whole page.

Modern collectors are often accused by old timers of being far too concerned with the monetary value of stamps. There is really nothing in this gibe. True a collector to-day does study what he pays for his stamps; he has to, for on an average he will spend more in a week than did a collector of 30 years ago in a month. One thing to be said for a modern collector is that he takes pains to collect only decent specimens; many people would be better off to-day had the collector of yesterday done likewise, and fine specimens were probably obtainable in those days almost as cheaply as rubbish. The trend all the time is for fine specimens, so don't be tempted to mount inferior stamps; they are dear at any price.

The Australian papers have had a good deal to say about the proposed designs which have been selected for their new stamps. It sounds very well in theory, for a competition, open to everybody, to be held when new stamps are wanted; in practice it is generally a washout, for the poor engravers are all too often presented with designs, made and selected by amateurs, which are quite unsuitable for the medium of art in miniature. Let us hope that when Australia does finally issue its new stamps they will look better than the designs which have been picked, but we have our doubts; in the meanwhile, good designs or bad ones, Australia's stamps, like most of the others issued by the various members of the British Commonwealth of Nations, are enjoying the greatest popularity they have ever known. Taking them by and large they are worthy of that popularity. The writer's favourites are those of South Africa, but pick where you like; you cannot go far wrong.

Due for issue on 1st August is a set for New Zealand, which should be exceedingly popular with British collectors. It will consist of seven values, ½d. to 1/-, and each will depict a lighthouse. One value will show our own Eddystone Lighthouse. The stamps will be restricted to letters posted by the Government Life Insurance Department. Not all

collectors know these stamps, so we are illustrating one of the set now current.

Holland has produced a really delightful set of stamps in photogravure, and next month we will illustrate one. The head of Queen Wilhelmina in a more up-to-date portrait is shown, and the design is very similar to our own "Penny Black."



Competitions! Open To All Readers

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

The Right Words in the Right Places

In the panel in the centre of this page is a brief review of the way in which the air speed record has been raised from 45.75 m.p.h. to 623.8 m.p.h. during the last 34 years. From this story 12 words have been omitted and the place of each word is marked by dashes. The words taken out are the following: Aircraft; Content; Fighters; Installed; Jet; Landplane; Lockheed; Records; Seaplane; Surpassed; Wilson; and Winner. What we wish readers to do is to replace them. When the story has been completed by putting the words in what the competitor thinks are the right places for them, the entire paragraph should be written out carefully with the inserted words underlined. The competition is divided into the

It is difficult now to realise that the — of the first Schneider Trophy contest had to be — with a speed of 45.75 m.p.h. Later Schneider Trophy speeds rose rapidly, until in 1931 the contest was won by Great Britain at a speed of 340.08 m.p.h. This was a — record, and later the figure for — of this kind was raised to well over 400 m.p.h. by the Italians. Before the recent war the actual speed record was 469.22 m.p.h., made by a German —, but this was exceeded often by British — during the conflict.

All these — were made with machines in which ordinary petrol engines were —. The coming of the — engine promised even higher speeds, and this promise was fulfilled when Group Captain — achieved a speed of 606.25 m.p.h. with the Gloster Meteor IV, only to have this speed — by Group Captain Donaldson, who raised the record to 616 m.p.h. Now the — "Shooting Star" has achieved a speed of 623.8 m.p.h.

usual two sections, for Home and Overseas readers respectively, and in each prizes of 21/-, 15/- and 10/6 respectively will be awarded to the senders of the three best solutions in order of merit. A number of Consolation Prizes also will be awarded, and if there is a tie for any of the prizes the judges will then take neatness and novelty into consideration.

Entries must be written only on one side of each sheet of paper used, and no competitor may submit more than one effort. Entries must be addressed to "Missing Words Contest, Meccano Magazine, Binns Road, Liverpool 13." Closing dates: Home Section, 30th September; Overseas Section, 31st March 1948.

What Do You Know About These?

Readers of the "M.M." like competitions of the Quiz type, particularly when these are concerned with railway subjects, so for this holiday month we are giving them another contest of this kind.

Altogether there are 10 railway questions in this Quiz, and here they are:

1. Here are some familiar railway initials. Which railways do they indicate? C.L.C.; C.P.R.; P.R.R.; N.Y.C.; M. and G.N.; M.R.
2. What is a trap point?
3. Yellow ground signals are sometimes seen in sidings. Why are they yellow?
4. What is meant by an "Engine and Brake?"
5. A station called Waterloo is served by L.M.S. electric trains. Where is it?
6. What railway vehicle was called a dumb buffer wagon?
7. When an engine is described as dead, what does this mean?
8. Where did the locomotive "General" make its most famous run?
9. What is a "Pug" engine?
10. What is meant by a "stop block?"

When a competitor has decided on the answers to the questions all he has to do is to set these out in order, each with its number, and to post his effort to "August Quiz, Meccano Magazine, Binns Road, Liverpool 13." The name and address of the competitor

must be clearly marked on each sheet of his entry.

There will be the usual two sections, one for Home readers and the other for those living Overseas. In each of these sections prizes of 21/-, 15/- and 10/6 will be awarded for the best entries in order of merit, and other good efforts will be rewarded by consolation prizes. If there is a tie for any prize the judges will take into consideration the general neatness and originality with which the entry is set out. The closing dates are 30th September in the Home Section, and 31st March 1948 in the Overseas Section.

August Photographic Contest

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

Entries will be divided into two sections, A for readers aged 16 and over, and B for those under 16. They should be addressed "August Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13." There will be separate sections for Overseas readers, and in each section prizes of 21/-, 15/- and 10/6 will be awarded. Closing dates: Home Section, 30th August; Overseas Section, 28th February 1948.

Competition Results and Solutions

HOME

APRIL 1947 "HIDDEN NAMES" CONTEST

1st Prize: W. D. Simcock, Tamworth. 2nd Prize: J. L. Wilkinson, Sheffield 11. 3rd Prize: D. B. Appleyard, East Ardsley. Consolation Prizes: J. P. Warren, West Croydon; D. R. Hattersley, Ewell; C. E. Wrayford, Bovey Tracey; D. J. D. Gilbert, Bromley; F. Mills, Kearsley.

APRIL 1947 LOCOMOTIVE PUZZLE

1st Prize: G. L. Davies, Manchester 21. 2nd Prize: P. G. Garnett, Kendal. 3rd Prize: D. B. Ongley, Crewe. Consolation Prizes: H. Clarke, Greenford; F. D. Moles, Birmingham 14; P. E. K. Morgan, Lewes; F. Mills, Kearsley.

APRIL 1947 PHOTOGRAPHIC CONTEST

1st Prize, Section A: N. V. Salt, Newcastle; Section B: P. Garratt, Maidstone. 2nd Prize, Section A: A. S. Goldingham, Taunton; Section B: A. Lewis, Cardiff. Consolation Prizes, Section A: R. R. Bushell, Hoddesdon; P. A. Thompson, Wolverhampton; R. Wrigley, Clitheroe; D. J. D. Gilbert, Bromley; J. H. Taylor, Aberdeen; D. A. Prior, London S.W.19. Section B: D. C. Matheson, Basingstoke; D. Jones, Bridgend; M. Ennis, New Malden; A. Goodridge, Hounslow; J. K. Lloyd, Beckenham.

MAY 1947 PHOTOGRAPHIC CONTEST

1st Prize, Section A: N. V. Salt, Newcastle; Section B: I. D. McDougall, Malvern. 2nd Prize, Section A: H. J. Edwards, Tunbridge Wells; Section B: B. Nicholson, Long Eaton. Consolation Prizes: Section A: J. H. Vickers, Minehead; D. Sutherland, Glasgow N.W.; R. Wrigley, Clitheroe; E. G. Holley, Heathfield; Section B: M. Nesbitt, Westcliff-on-Sea; R. E. Morris, Swanage; B. Mallinson, Huddersfield; W. P. Gabriel, Leeds 6; G. S. Finlayson, Sheffield 8.

OVERSEAS

SEPTEMBER 1946 SIGNALLING CONTEST

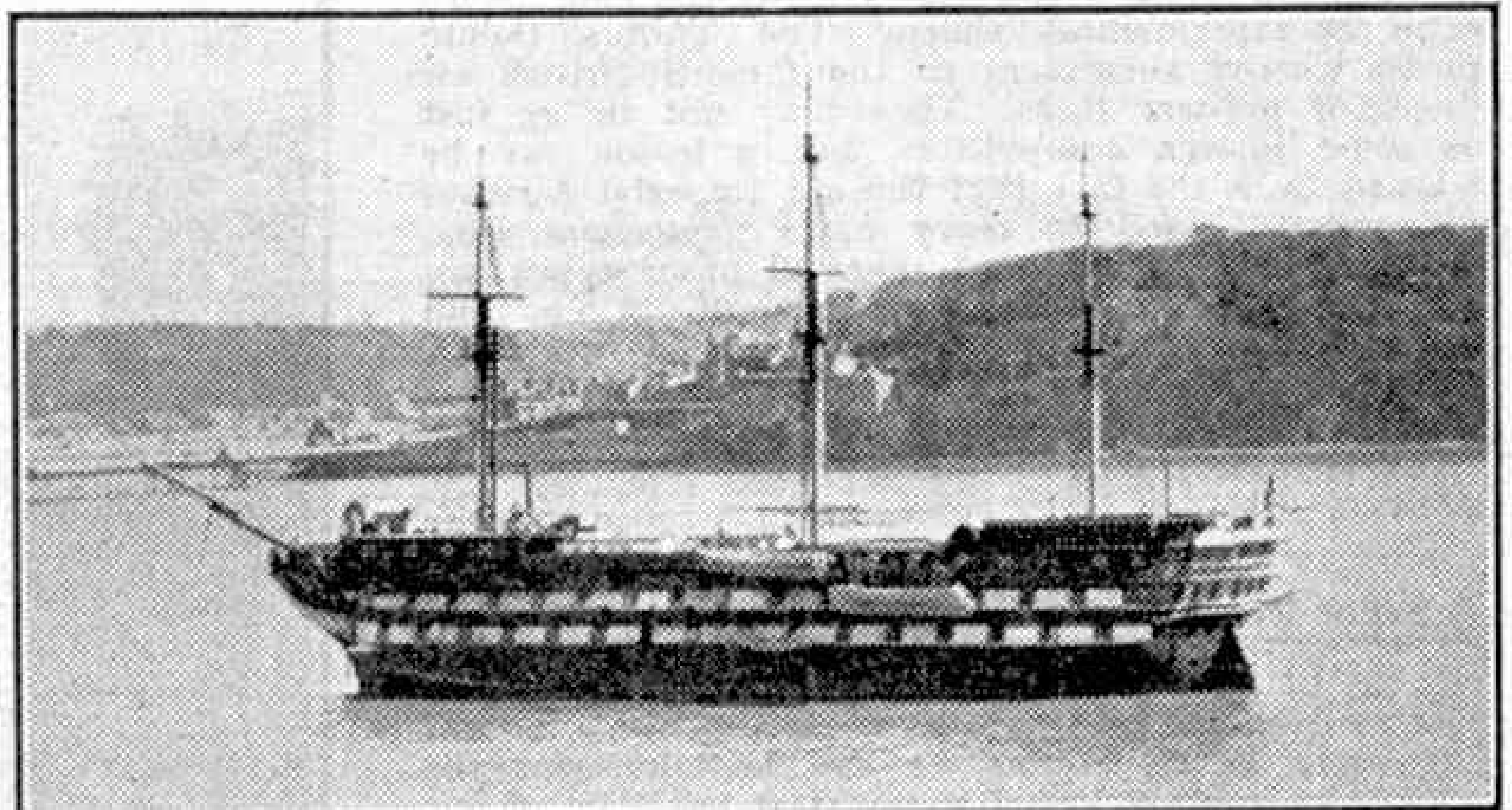
1st Prize: B. Rothsey, Marseilles, France. 2nd Prize: T. V. Cavanagh, Berne, Switzerland. 3rd Prize: B. Joyce, Amsterdam, Holland. Consolation Prize: J. T. G. Johnstone, Wellington C.1, N. Zealand.

SEPTEMBER 1946 PHOTOGRAPHIC CONTEST

1st Prize, Section A: N. A. Macdougall, Victoria, B.C., Canada; Section B: C. K. Mullin, Calcutta, India. 2nd Prize, Section A: L. B. Robbins, St. Johns, Newfoundland; Section B: G. Williams, Cairo, Egypt. Consolation Prize, Section B: J. F. Petrie, Invercargill, N.Z.

OCTOBER 1946 PHOTOGRAPHIC CONTEST

1st Prize, Section A: T. H. Bury, Haifa, Palestine; Section B: B. Stoggles, Naples, Italy. 2nd Prize, Section A: A. L. Riches, Rangoon, Burma; Section B: L. T. Gregory, Copenhagen, Denmark. Consolation Prizes, Section A: R. Underwood, Bloemfontein, S.A.; C. J. Ricketts, Potchefstroom, S.A. Section B: J. N.



The Cadet Training Ship "Conway" at her anchorage in the Menai Straits. Photograph by N. V. Salt, Newcastle. A prize-winning entry in the May 1947 Photographic Contest.

Clatworthy, Salisbury, S.A.; R. H. Clatworthy, Salisbury, S.A.

OCTOBER 1946 LOCOMOTIVE PARTS CONTEST

1st Prize: R. Hilditch, Naples, Italy. 2nd Prize: B. A. James, Oslo, Norway. 3rd Prize: W. Parry, Pietersburg, S.A. Consolation Prize: H. Hapgood, Winnipeg, Canada.

OCTOBER 1946 ENGINEERING DRAWING CONTEST

Section A, 1st Prize: K. B. Busby, Port Said, Egypt. 2nd Prize: J. Richards, Rangoon, Burma. 3rd Prize: A. D. Montgomery, Durban, S.A. Consolation Prize: R. W. Williams, Colombo, Ceylon. Section B, 1st Prize: L. P. Samson, Sydney, Australia. 2nd Prize: D. Welsh, Ruatoria, N.Z. 3rd Prize: C. H. Titherington, Montreal. Consolation Prize, Section B: L. R. Dickson, Pretoria.

SOLUTIONS

OCTOBER 1946 LOCOMOTIVE CONTEST

1. Smoke Deflectors. 2. Extra Head Lamp Signal Bracket (Peculiar to S.R.). 3. Head Lamp. 4. Snifting Valve. 5. Top Feed Clack Box. 6. Safety Valves. 7. Whistle. 8. Washout Plugs. 9. Spectacle Glass. 10. Fire Irons, Paddle, Pricker, etc. 11. Tender Spring. 12. Cab Side Door. 13. Housing for Screw Reverse. 14. Reverse Rod. 15. Balance Weight. 16. Expansion Link. 17. Crosshead. 18. Sandpipe. 19. Bob Weight of Screw Coupling. 20. Steam Heater Hose.

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November 1946 Crossword Puzzle Solution.

The Avro "Tudor"—(Continued from page 312)

Mark IV airframe. It is unlikely that this version will go into production, but it will provide a vast quantity of useful flight test data that will help to ensure the reliability and comfort of the jet air liners of the future.

The "Tudor" has been described as an "interim" air liner to operate B.O.A.C. schedules until the Bristol "Brabazons" are ready. But it will be some four years before these 125-ton giants are in service, and four years is a long life for an "interim" type. Aviation is advancing at tremendous speed to-day, and in reality all aircraft are "interim" types for, by the time one type goes into service there is inevitably an even better one on the drawing board or in the experimental "shops." The "Tudors" should prove worthy successors to the famous British air liners of pre-war days. They may not be as fast as some foreign competitors, but a lesson can be learned from the fact that the old Imperial Airways "Hannibals" used to carry more passengers from England to the Continent than all other types put together—in spite of a speed of 90 m.p.h. and "built-in head-winds." The aim of airline operators should be safety, comfort, regularity and good performance, *in that order*. With equipment like the "Tudors" B.O.A.C. should not find this hard to achieve.

A Sailor Remembers—(Continued from page 313)

eighths of their size is submerged and as they are just as irregular below water as on top our miss was extremely lucky. What we had mistaken for the whistle of another vessel was in fact the echo of our own whistle, being thrown back off the berg. I have heard of vessels being safely navigated past bergs by this echo off the ice. The bangs were caused, so the Captain told me, by the vibration of the whistle's sound cracking and splitting the ice on the berg. "Look out for the 'Pups'," said the Captain. Never having heard this term before I was puzzled as to what he meant until he explained that the "pups" are the large pieces of ice which fall away or break off from the parent berg.

Since the "Titanic" disaster, an Ice Patrol is maintained by the United States to keep track of bergs, the position of which is sent out by wireless to all vessels. They are then plotted on the chart, but in the old days of sailing ships one can imagine the nightmare they must have been to navigators.

THE WORLD'S LARGEST FOUNTAIN

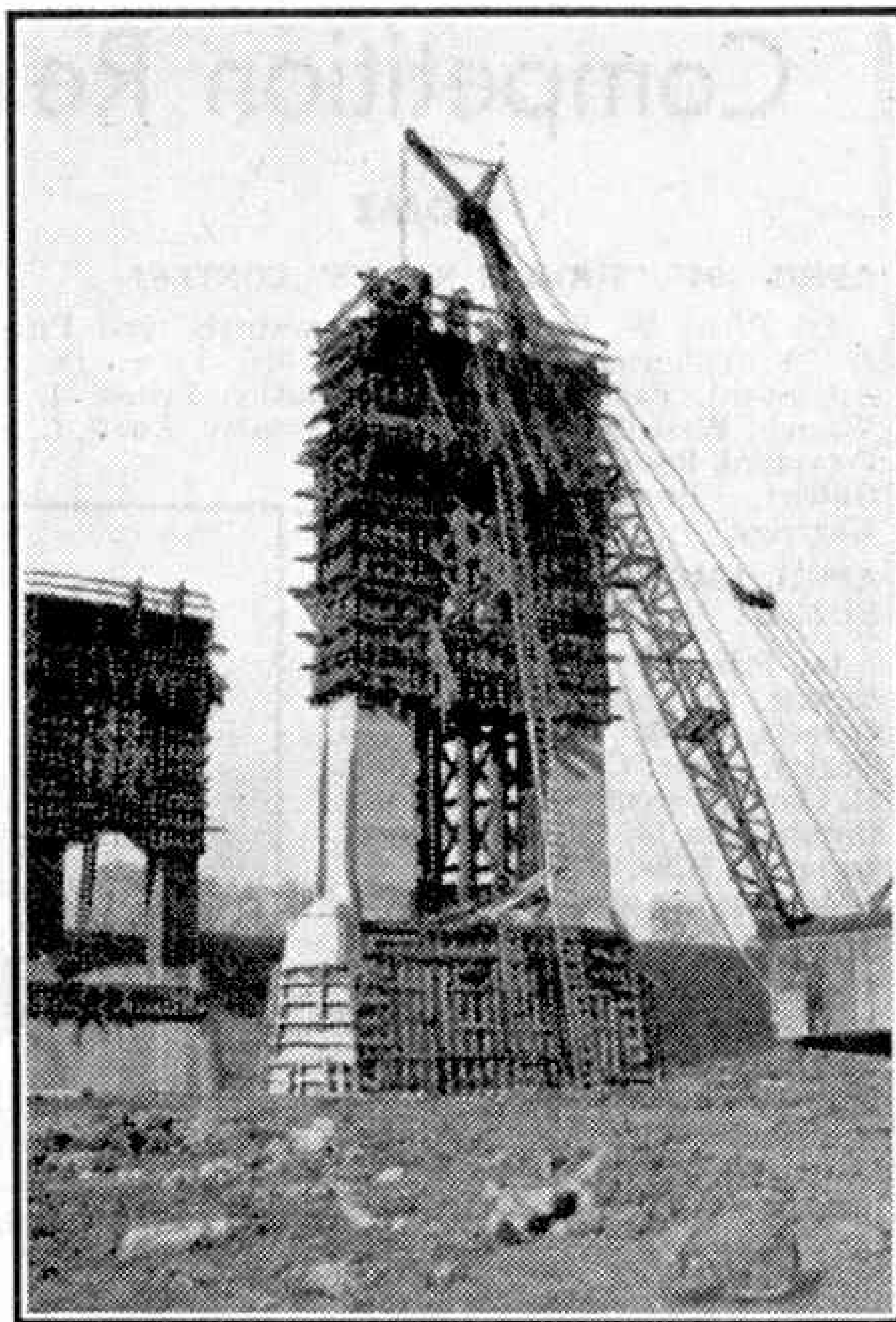
What is believed to be the largest fountain in the world is one of the grandest spectacles of Chicago when it is in operation and floodlighted. It is the Buckingham Fountain in Grant Park. The largest of its four basins, which are mounted one above the other, is 280 ft. across, and between them the four hold 1½ million gallons of water. A central jet shoots skyward to a height of 200 ft., or more than half the height of the cross of St. Paul's Cathedral, and altogether there are 133 jets, through which about 15,000 gallons of water are forced every minute.

The fountain was built in 1927 and cost £15,000. Pink marble from Georgia was used in its construction. Its displays are continuous throughout the summer and are most gorgeous in the late evenings, when drops of water become jewels and the spray creates rainbows in the variously coloured rays of floodlamps of 45,000,000 candle power.

BREEDING THE GIPSY MOTH

By D. Pledge

The Gipsy moth was common in the Fenlands of Norfolk and Cambridgeshire until about 1850, when it became extinct as a British species. There have since then been numerous efforts to introduce continental species into this country, but all have so far failed, unlike the accidental introduction of this



Pouring concrete for one of the piers of Social Hall Bridge, one of the new structures erected during the diversion of the Pennsylvania Railroad line described and illustrated on page 306.

moth into North America. There it is now a notorious pest, for its larvæ or caterpillars feed on the foliage of fruit trees. These caterpillars are very pretty, as I have just had the pleasure of finding out. The front five segments on the full-grown larvæ are grey with long hairs and two raised blue spots on them; the last six segments are similar to the first in all respects, except that instead of blue dots they have red ones.

This year I have been able to follow their life histories quite closely as I was given some ova or eggs by a friend last August. These I carefully kept until 16th April, when the young larvæ started emerging. They grew rapidly and the first spun up its cocoon on 10th June, a number of others following during the next two or three days. Finally, on 28th June I had the pleasure of seeing a male Gipsy moth, fully developed and perfect in every respect, in my breeding cage. Others emerged later in the month.

The male and female moths differ greatly in both size and colour. The male moth measures 38 mm. or a little more than 1½ in. from wingtip to wingtip and the female 58 mm. In colour the female is whitish with black or brown markings, and the male varies from a pale grey with prominent darker markings to a very dark brown with the markings hardly distinct. The extinct British form was almost black.

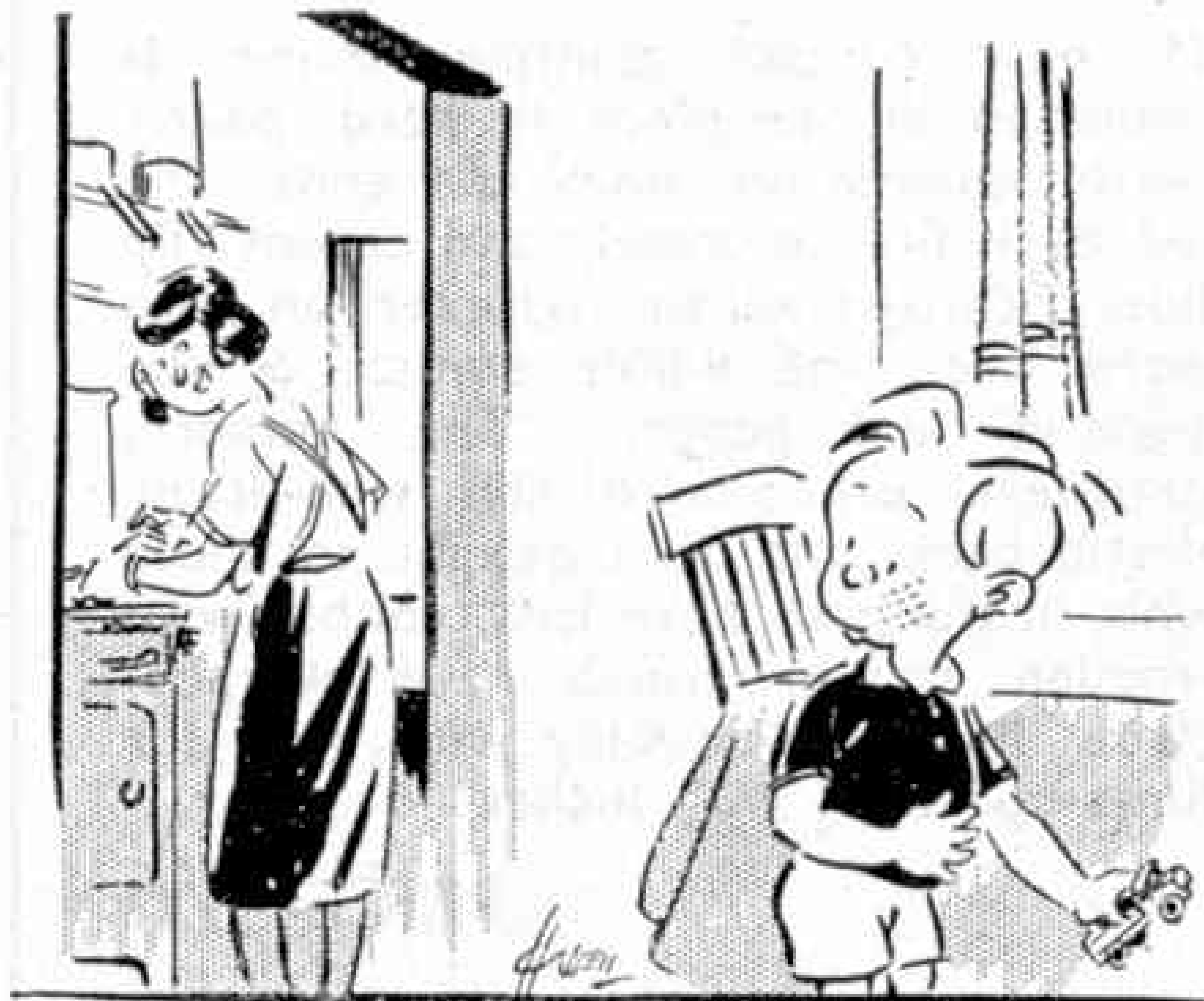
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 "I did. I shook my head, didn't I?"
 "Well, you can't expect me to hear it rattle from here."



"Isn't it one o'clock, Mummy?"
 "Not yet, dear."
 "H'm. Then my tummy's fast."
 "Have you seen the man again who sold you that land under 2 ft. of water?"
 "Yes, I have."
 "I suppose he sold you a suspension bridge or something this time."
 "Well, not a bridge exactly, but he did sell me a boat."

"I've taken on a new man to-day, sir."
 "What can he do?"
 "Nothing special at all, sir."
 "Good. We shan't have to break him out before we break him in."

"Another of these motor cyclist pests, eh?" said the local magistrate. "These fellows ought to be kept off the road. What's the charge?"
 "Er . . . riding on the footpath, your Worship."



"What does he mean by 'taters,' Sergeant?"
 "It's only his ignorance, sir, he means spuds."

THIS MONTH'S HOWLER

Skyscrapers are men who sweep the heavens with their telescopes.

BRAIN TEASERS SCISSORS WORK MAGIC

Below is a number square that is not of the magic type. By cutting it into four pieces and re-arranging these, however, it can be made into a true magic square, that is one in which the sums of the numbers in the columns, rows and diagonals are the same.

1	15	5	12
8	10	4	9
11	6	16	2
14	3	13	7

Can you find how this square should be cut in order to give the desired result? The sum of the numbers in each column, row and diagonal must be 34.

F.U.



"Have you anything more comfortable—for corridor use?"

SOLUTIONS TO LAST MONTH'S PUZZLES

In dealing with our first puzzle last month the first impulse is to divide the 2/6 by four, but this means using halfpennies. Then it is realised that no more than three people need be involved, a grandfather, a father and a son, each receiving 10d.

The solution to our second puzzle is as follows:

$$\begin{array}{r} 5291 \\ 126 \\ \hline 31746 \\ 10582 \\ 5291 \\ \hline 66666 \end{array}$$

The order of the boys in our third puzzle, starting with Tom, the shuffler, and going round in the clock-work direction, is Dick, George, Harry, Jim and Peter.

Here are the answers to the questions in our fourth puzzle last month. The Cinque Ports were originally Dover, Hastings, Hythe, Romney and Sandwich. Winchelsea and Rye were afterwards added, making a total of seven instead of the original five. The winner of the last Schneider Trophy contest was Fl. Lt. Boothman, in 1931. A Butt and a Barrel are measures of water for ships; the former is 110 gals. and the latter 36 gals. A Candy is an Indian liquid measure of 500 lb., and a Catty is a Singapore measure of 1½ lb.

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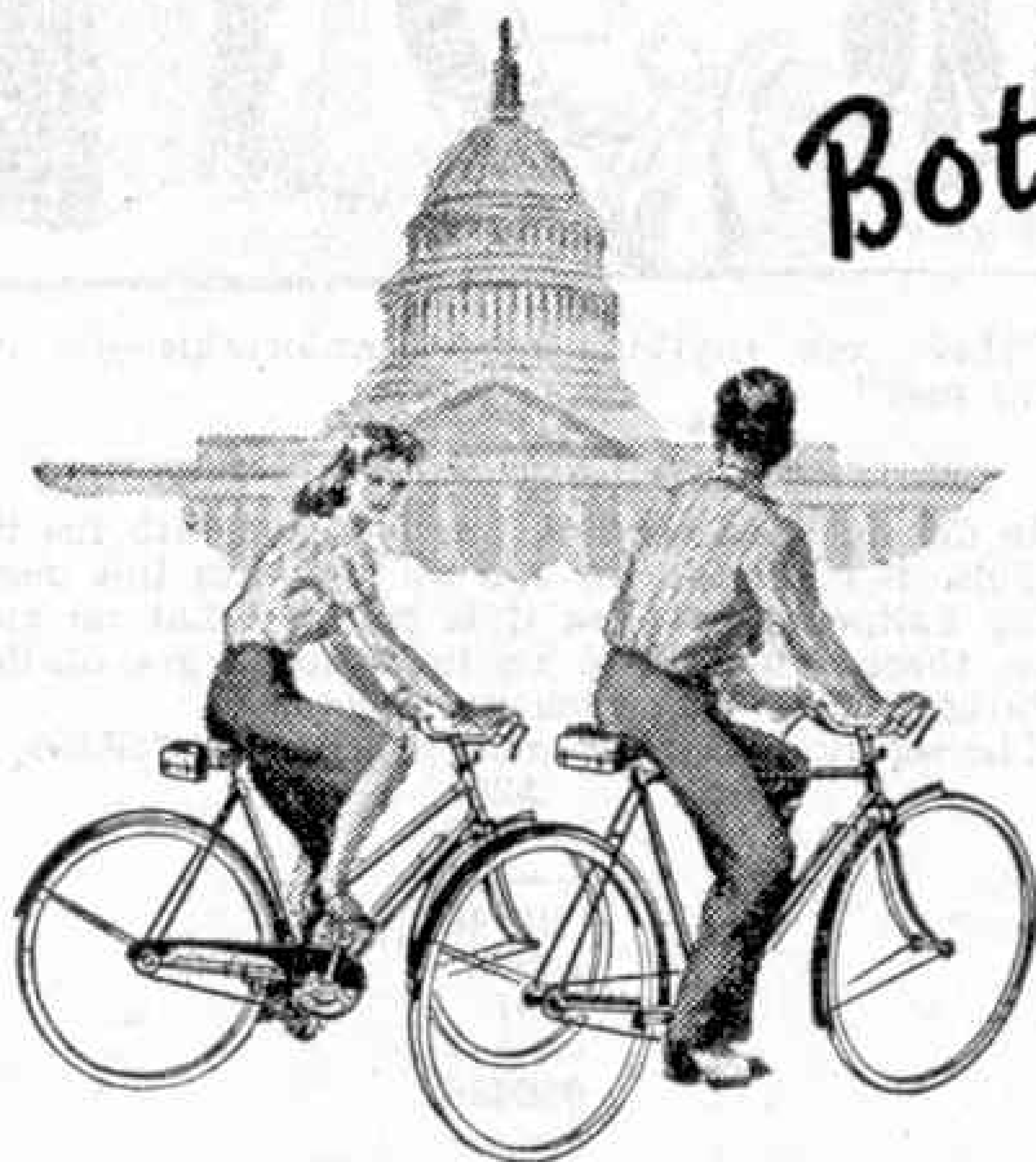
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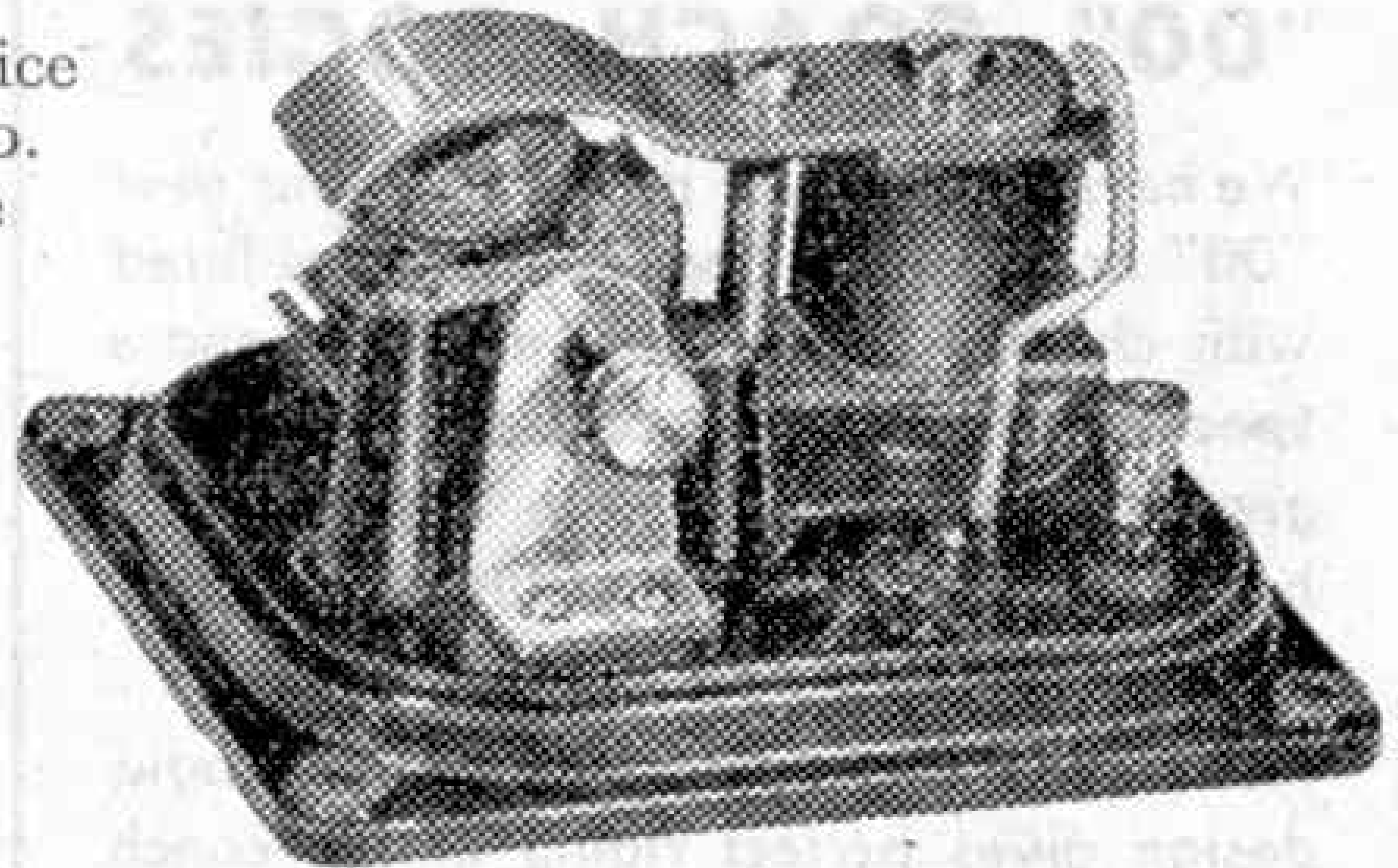
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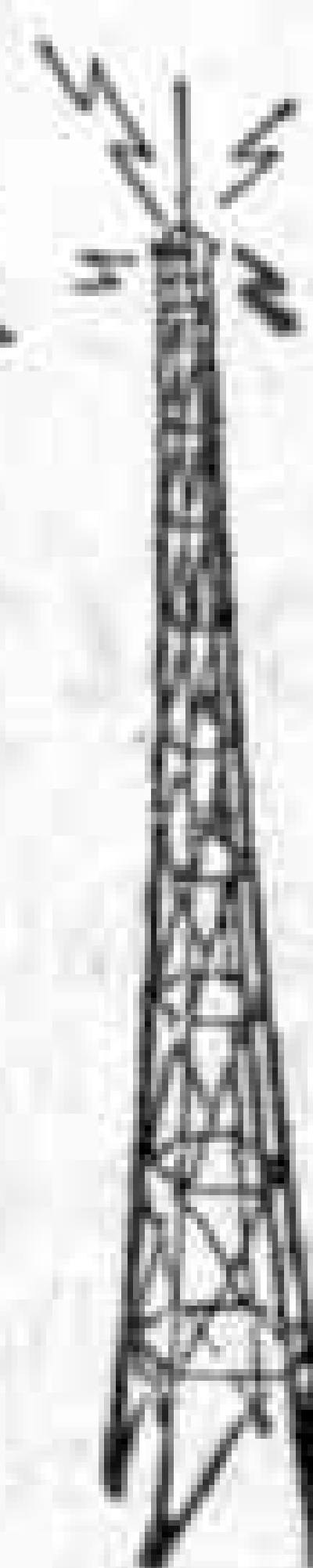
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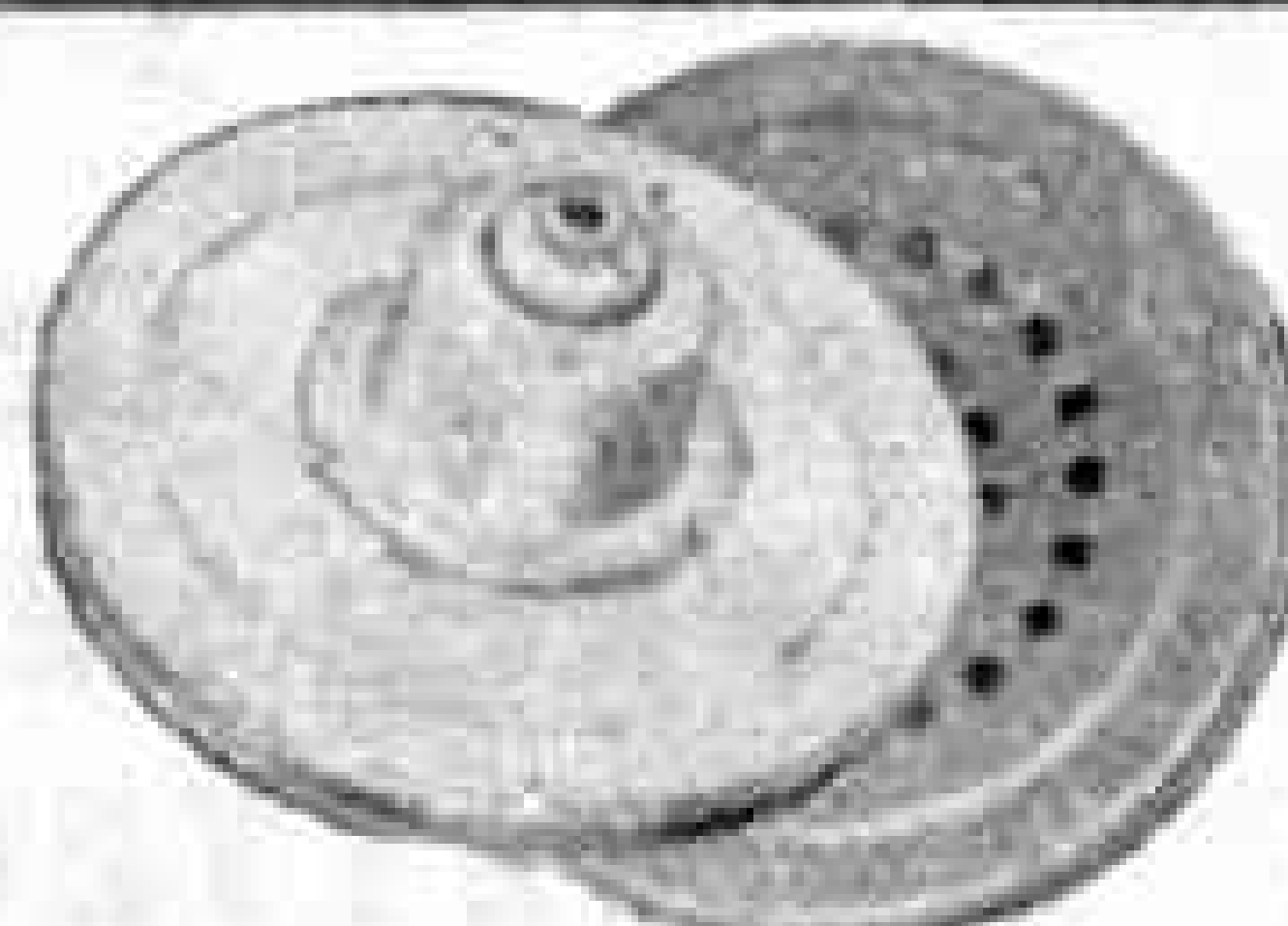
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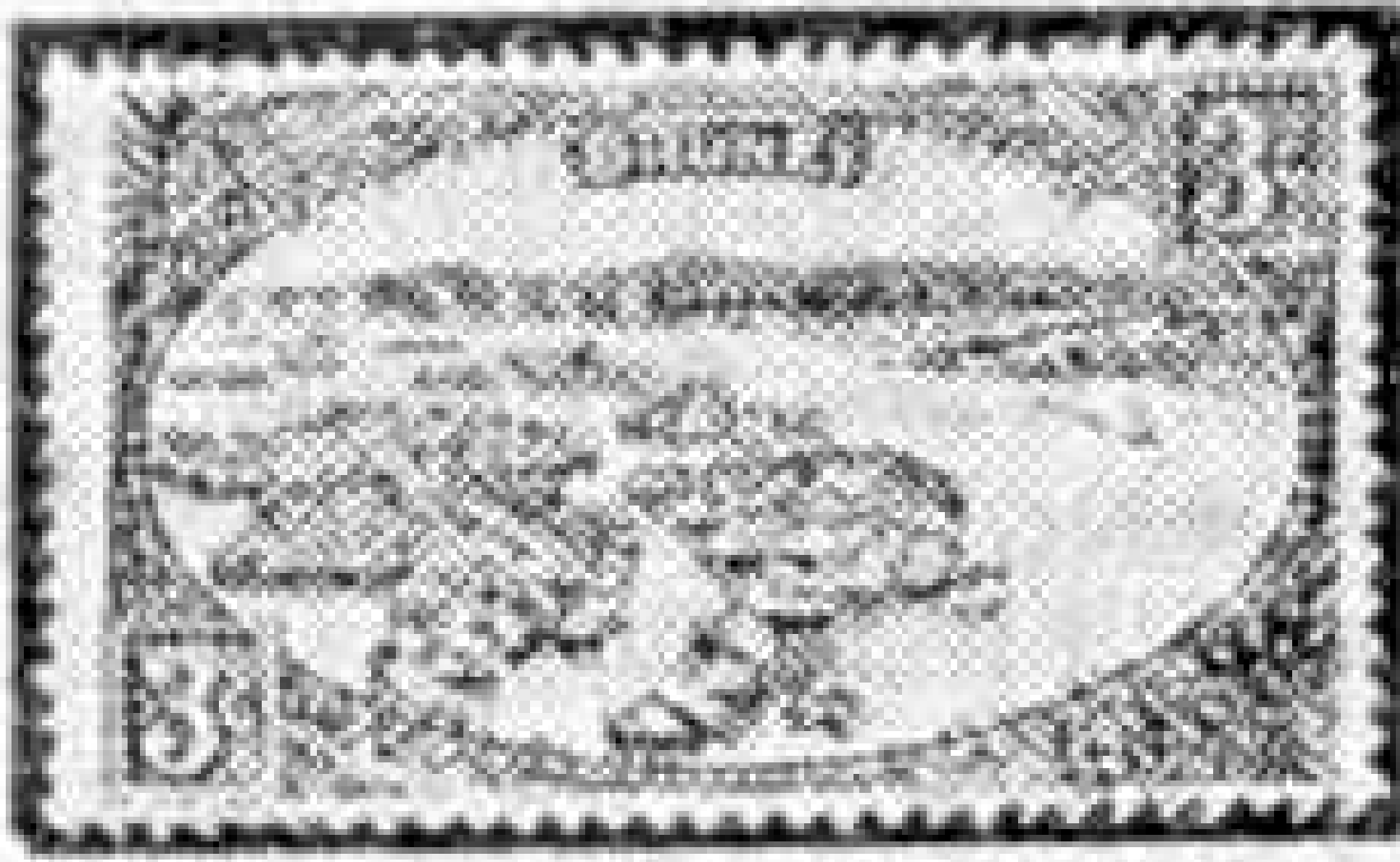
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(See also pages 336 and 338)

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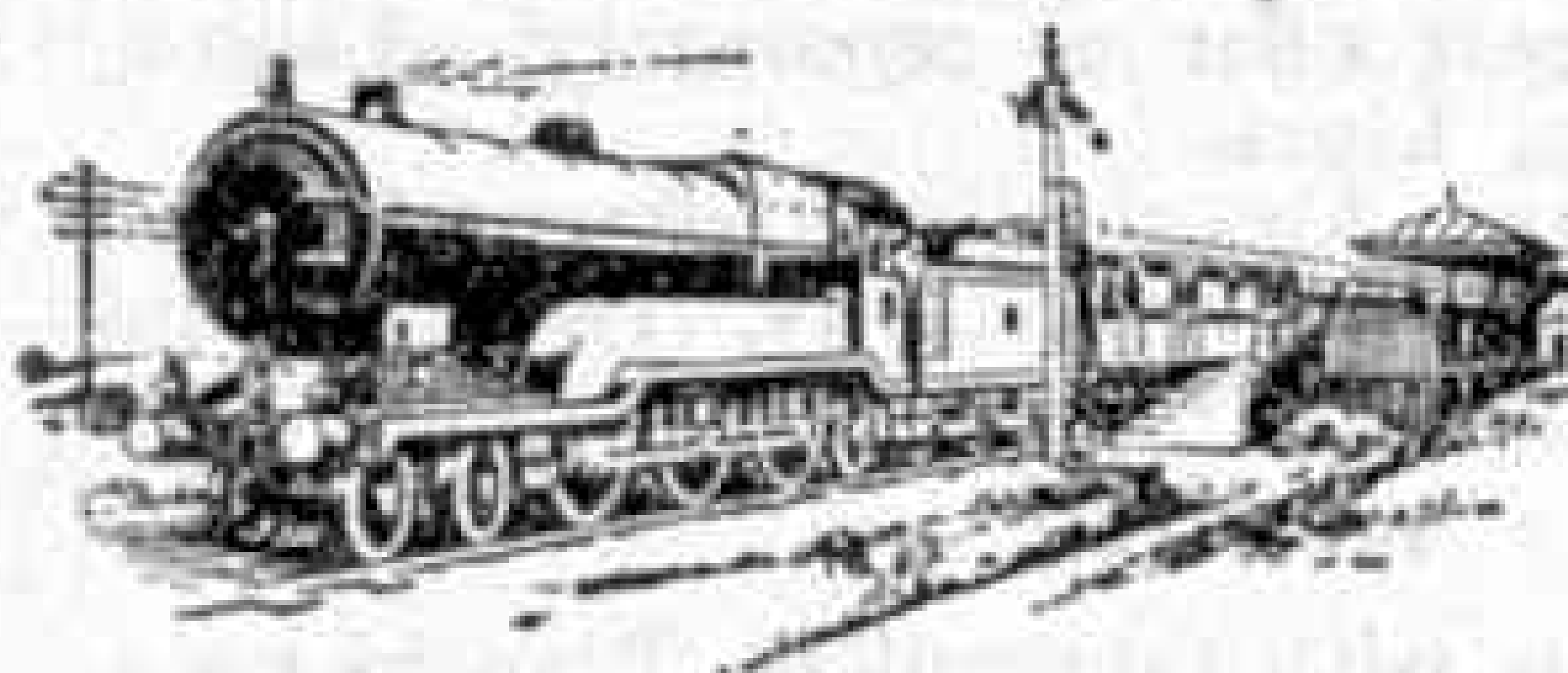
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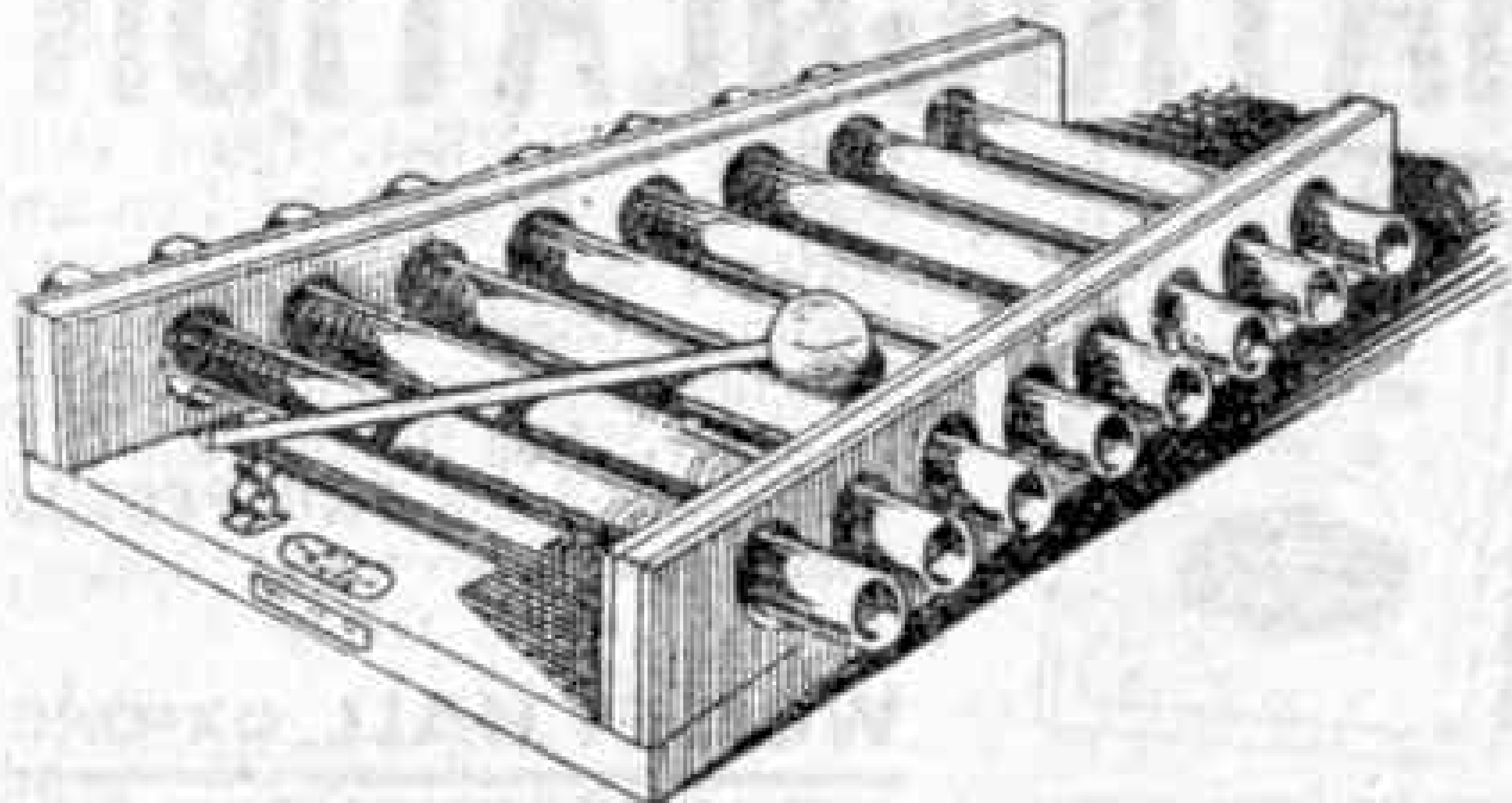
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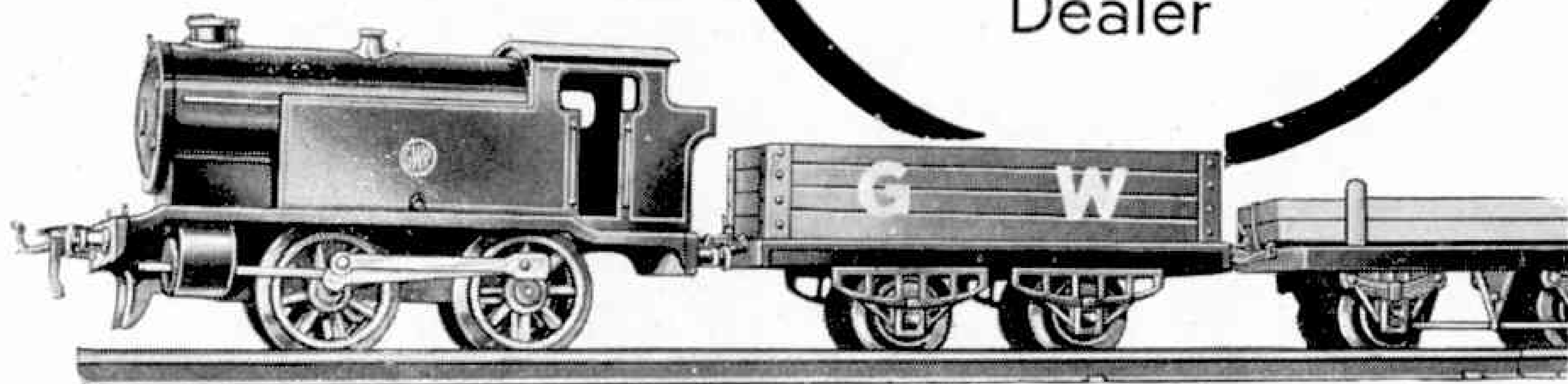
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