

VOL. XXVIII. No. 1

JANUARY 1953

MECCANO

MAGAZINE



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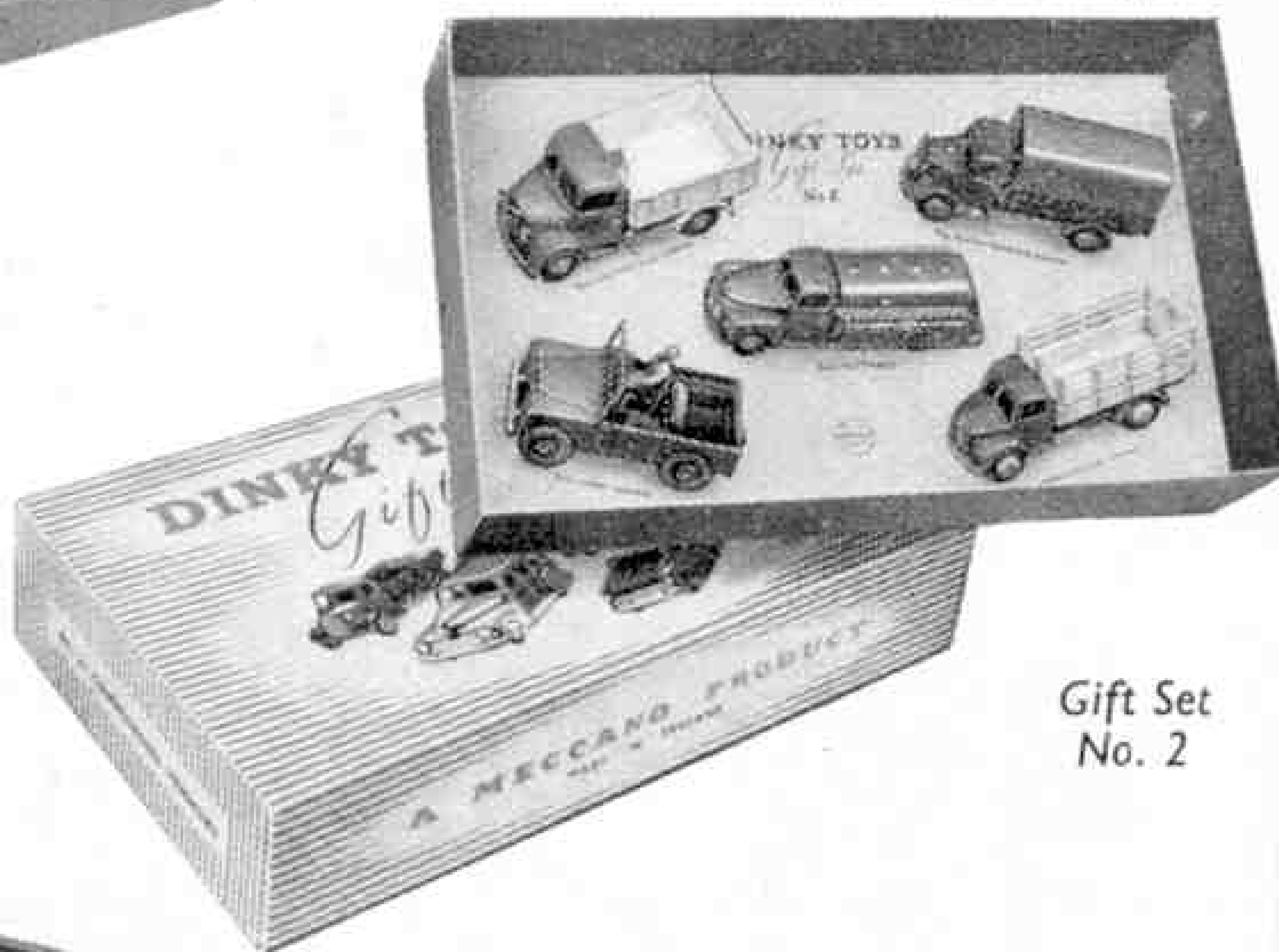
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THE MECCANO MAGAZINE

DINKY TOYS

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No. 27f
Estate Car
3/5



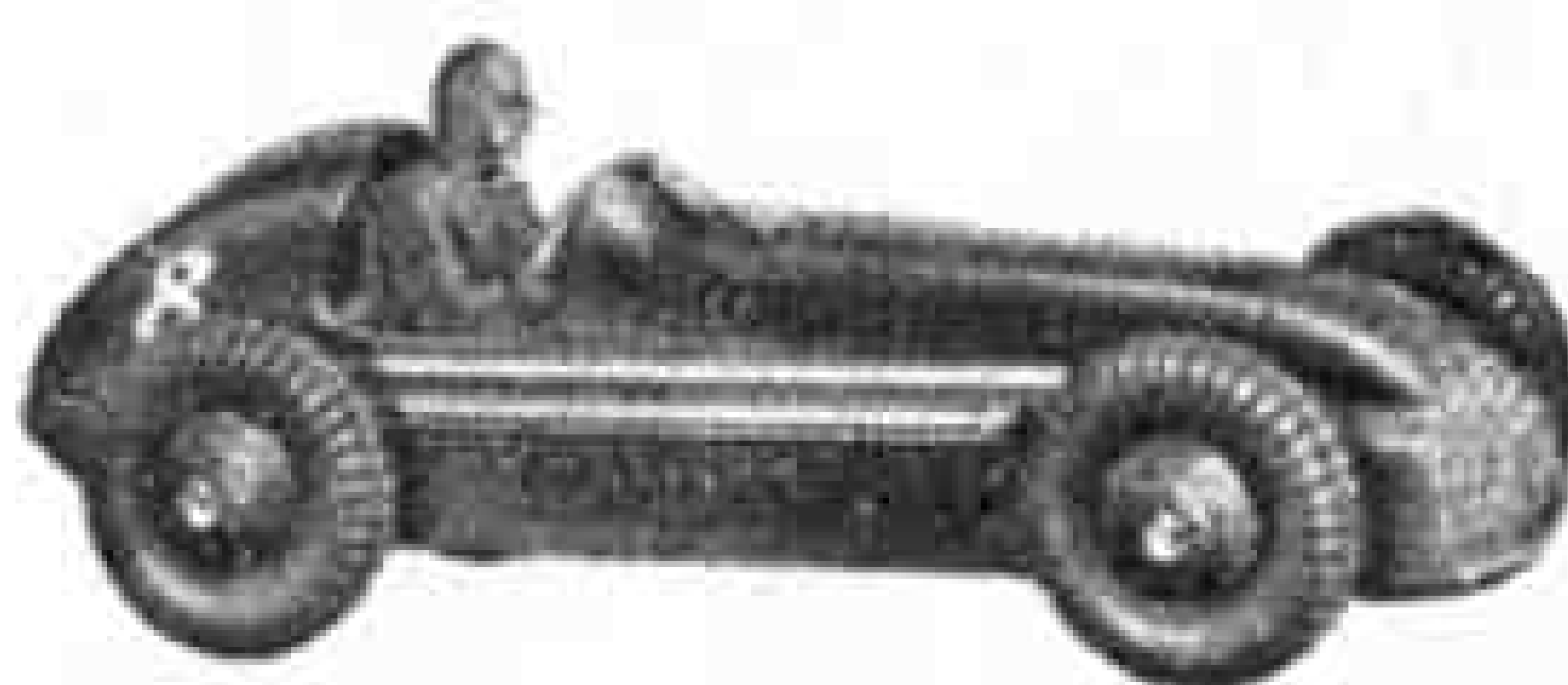
No. 29f
Observation Coach
3/11



No. 27j
Triple Gang Mower
6/6



No. 40h
Austin Taxi
3/10



No. 23f
Alfa Romeo Racing Car
3/1



No. 25w
Bedford Truck
4/4



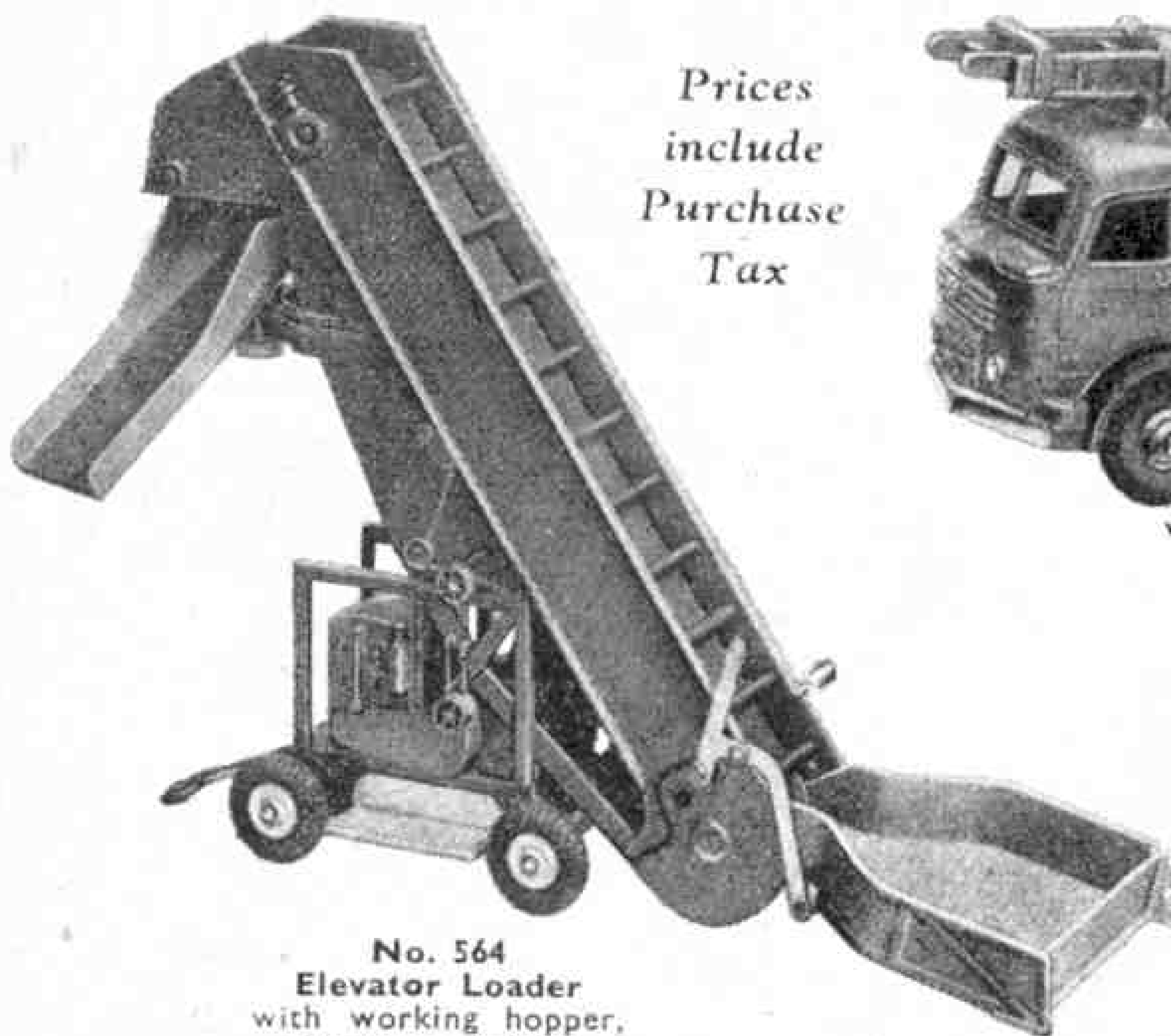
No. 34c
Loud Speaker Van
2/6



No. 30h
Daimler Ambulance
3/5



No. 40e
Standard Vanguard Saloon
2/11



No. 564
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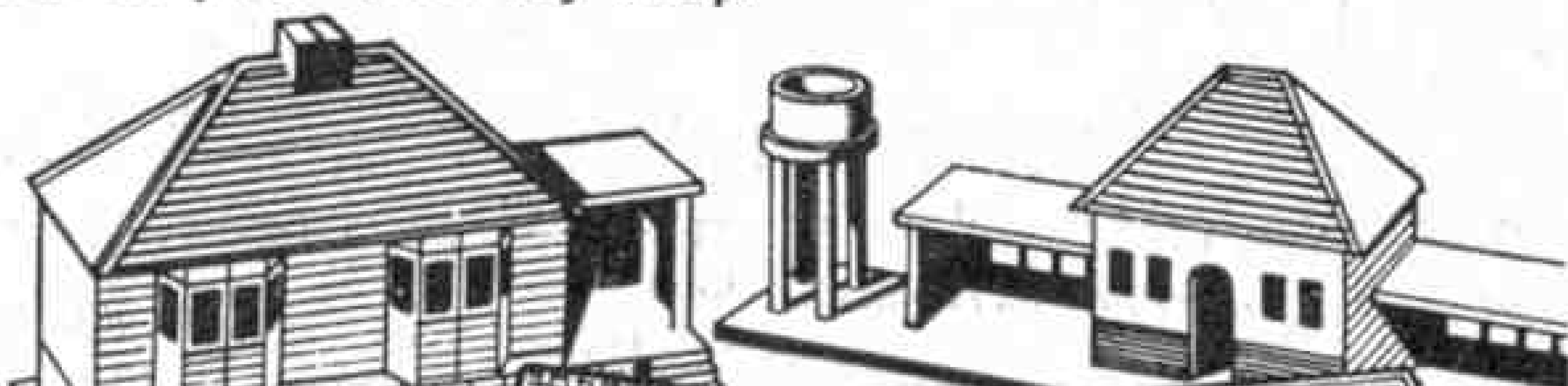
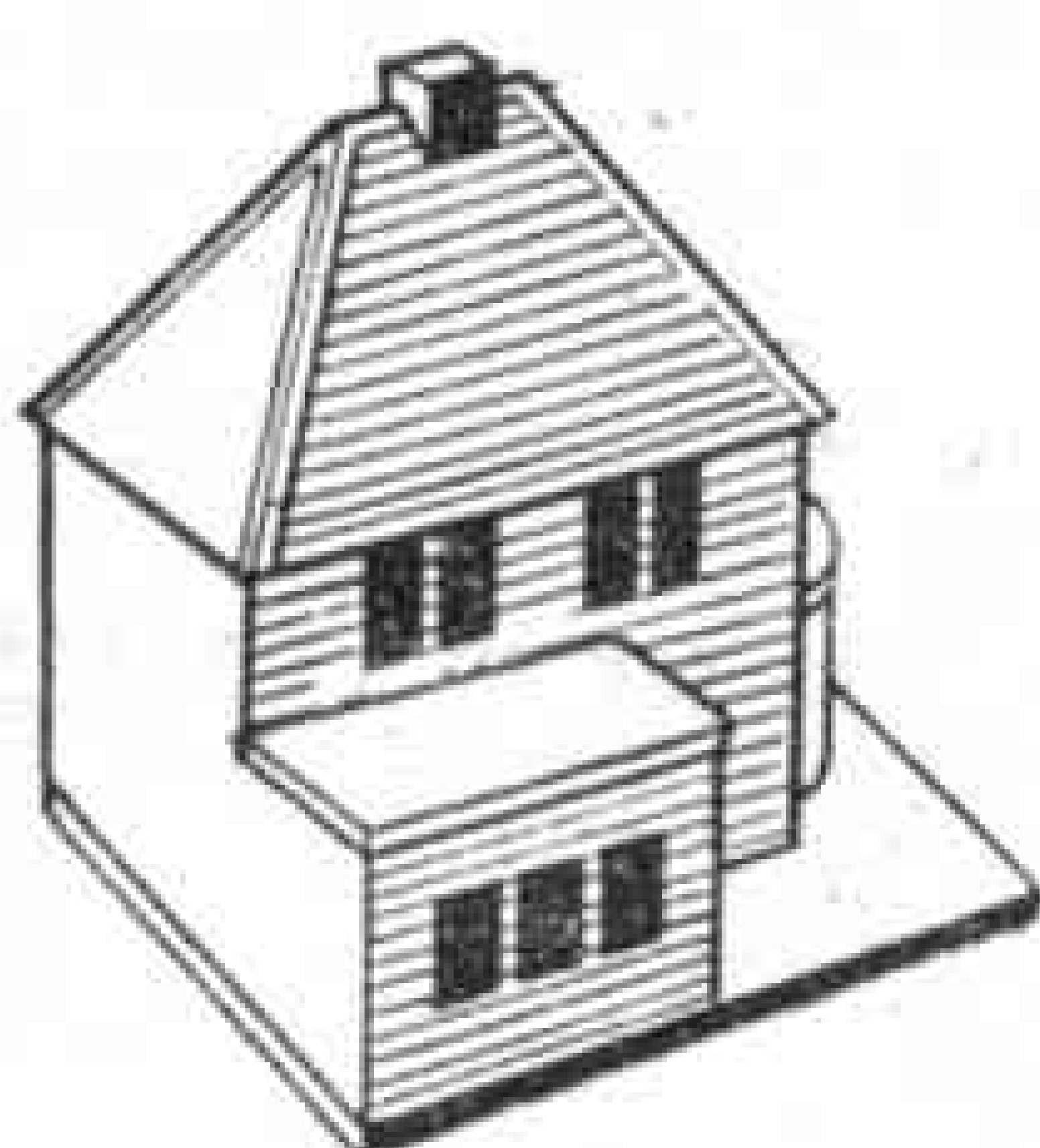
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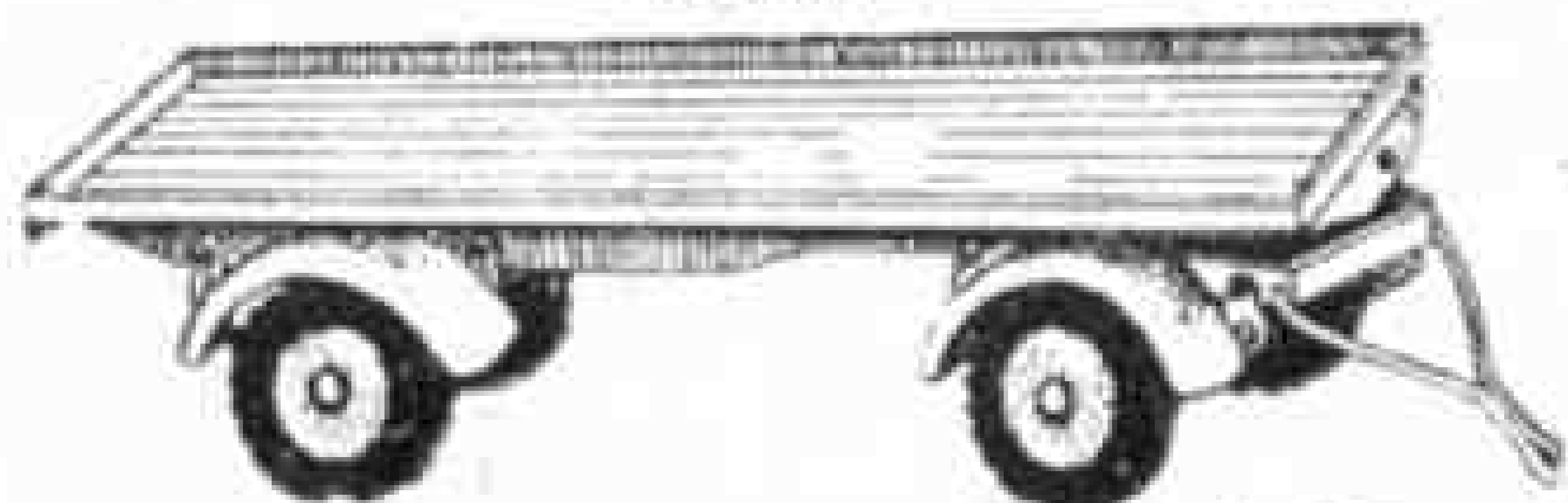
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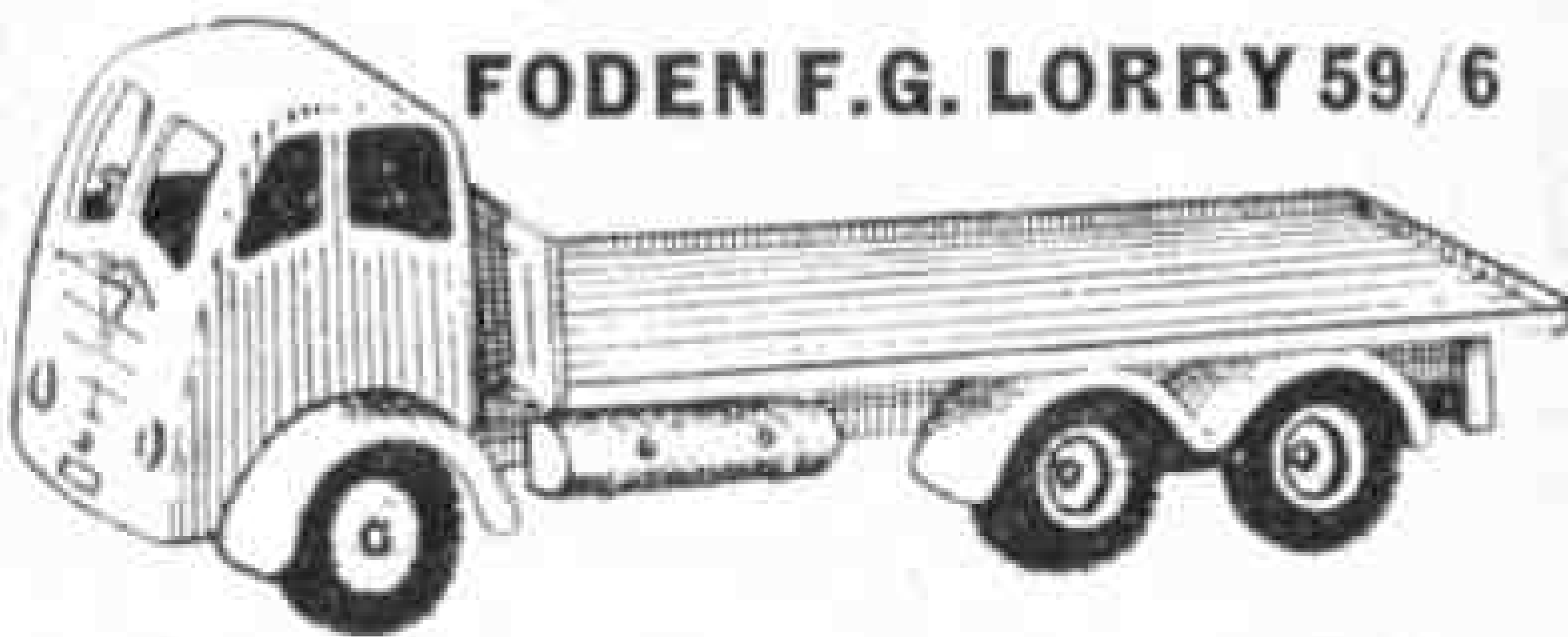
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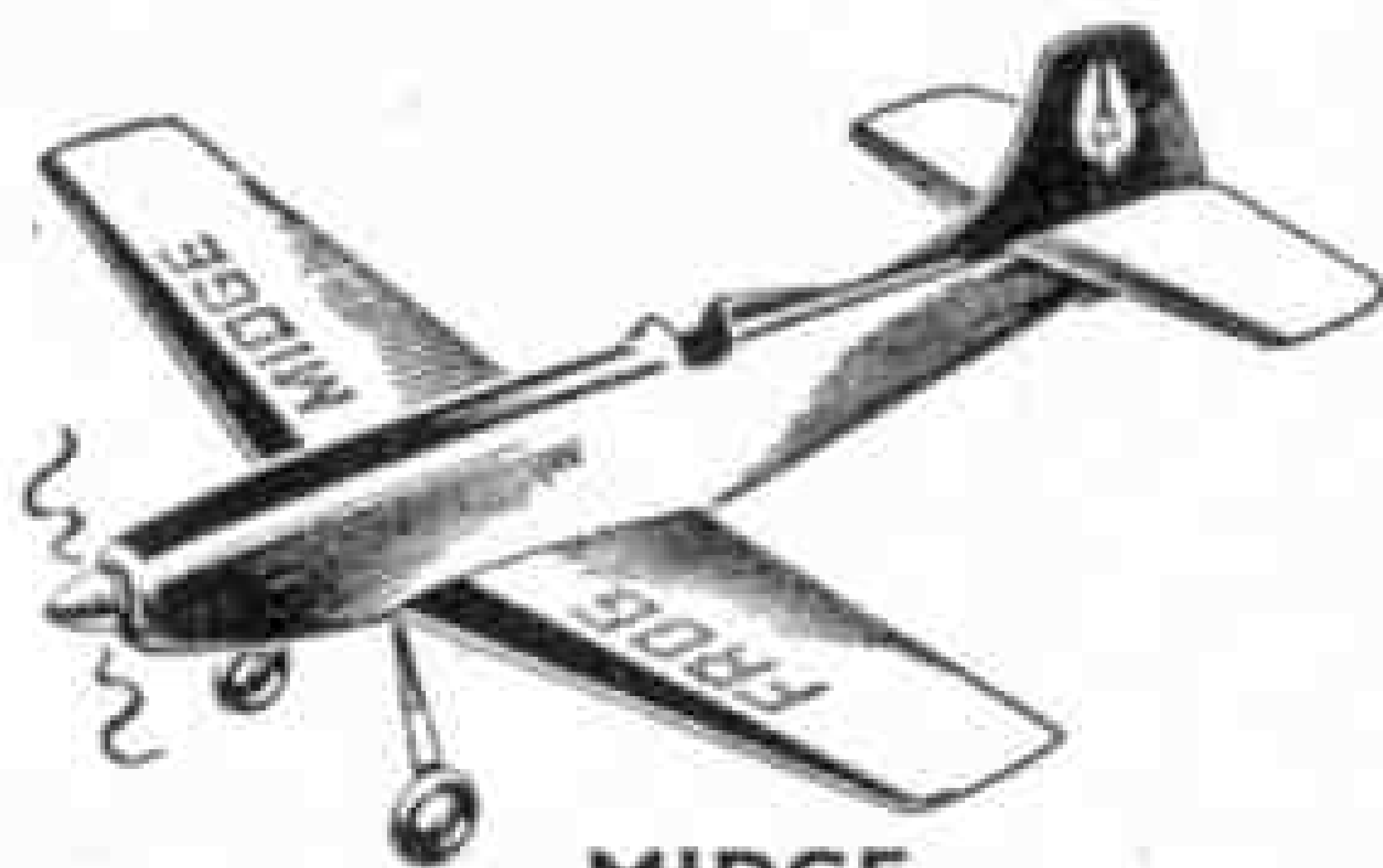
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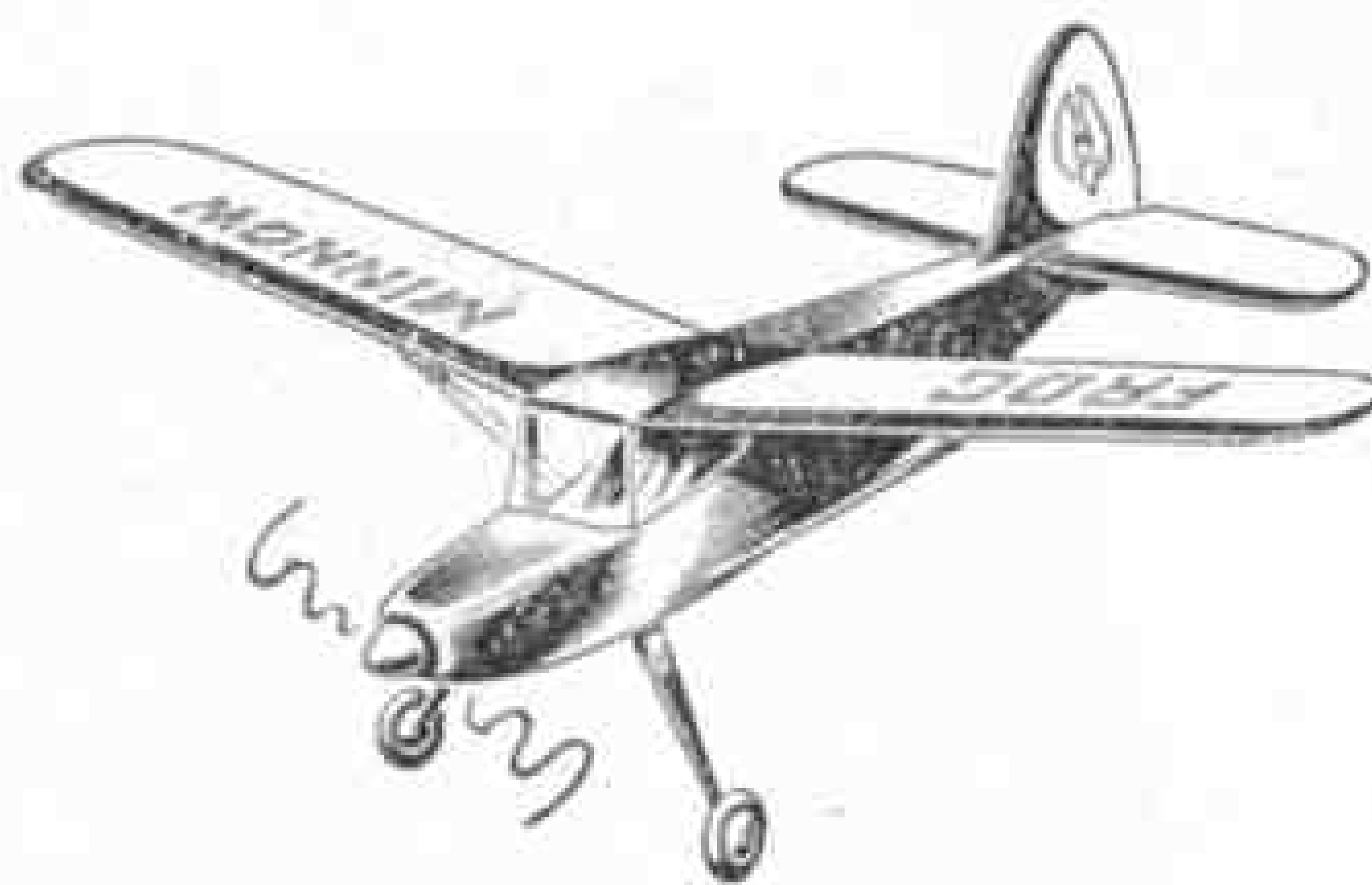
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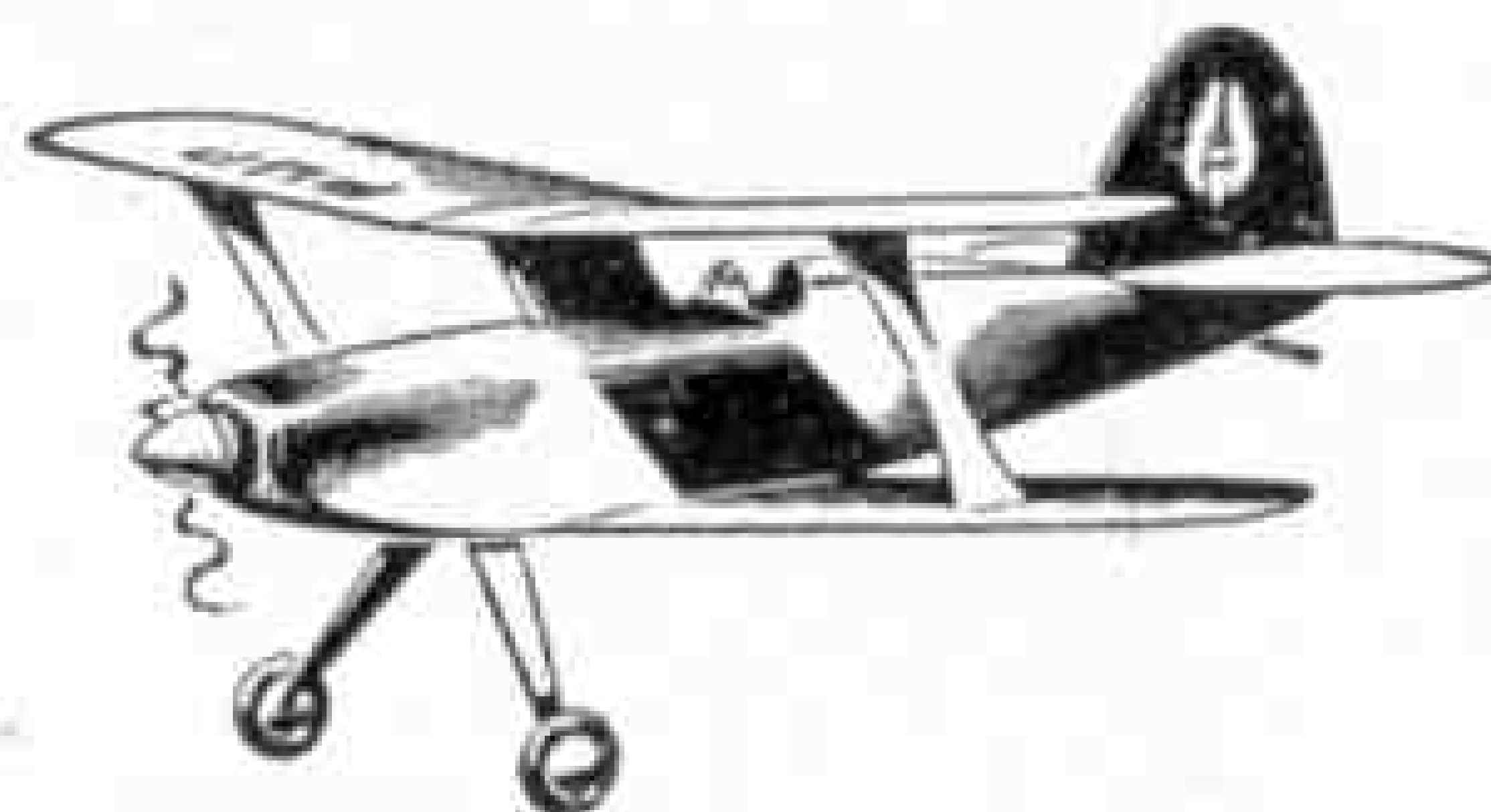
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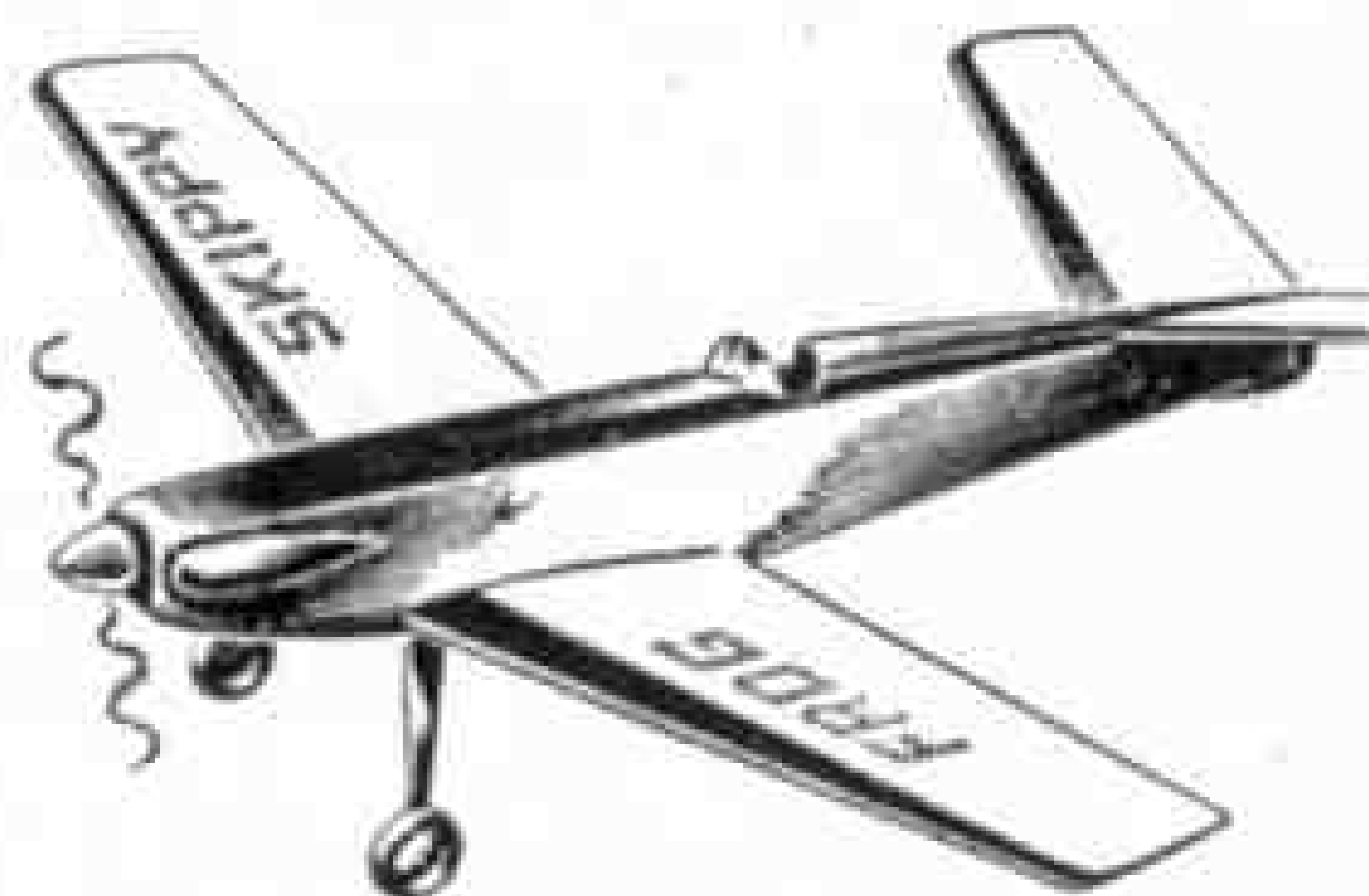
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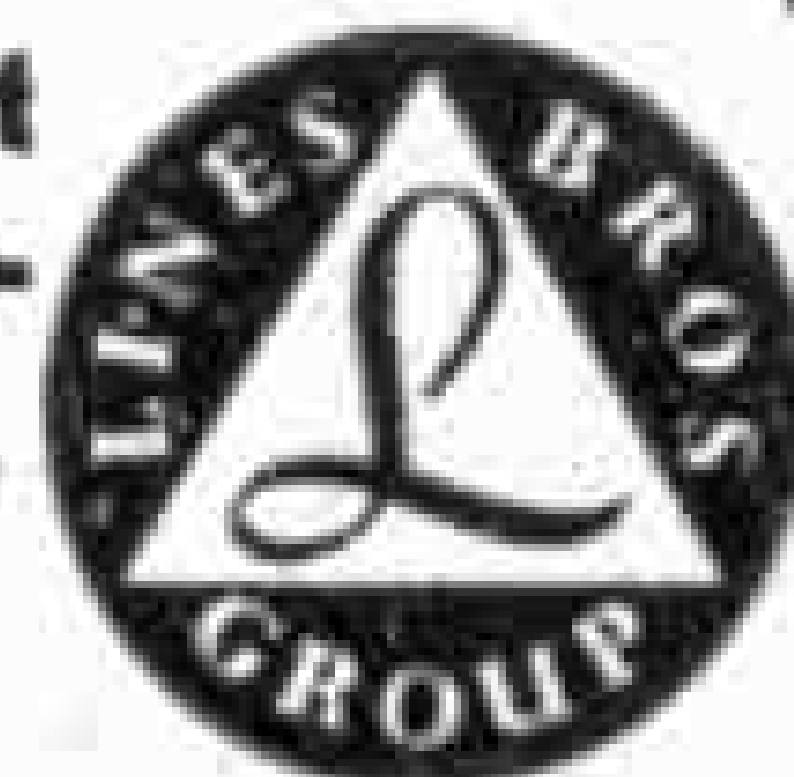
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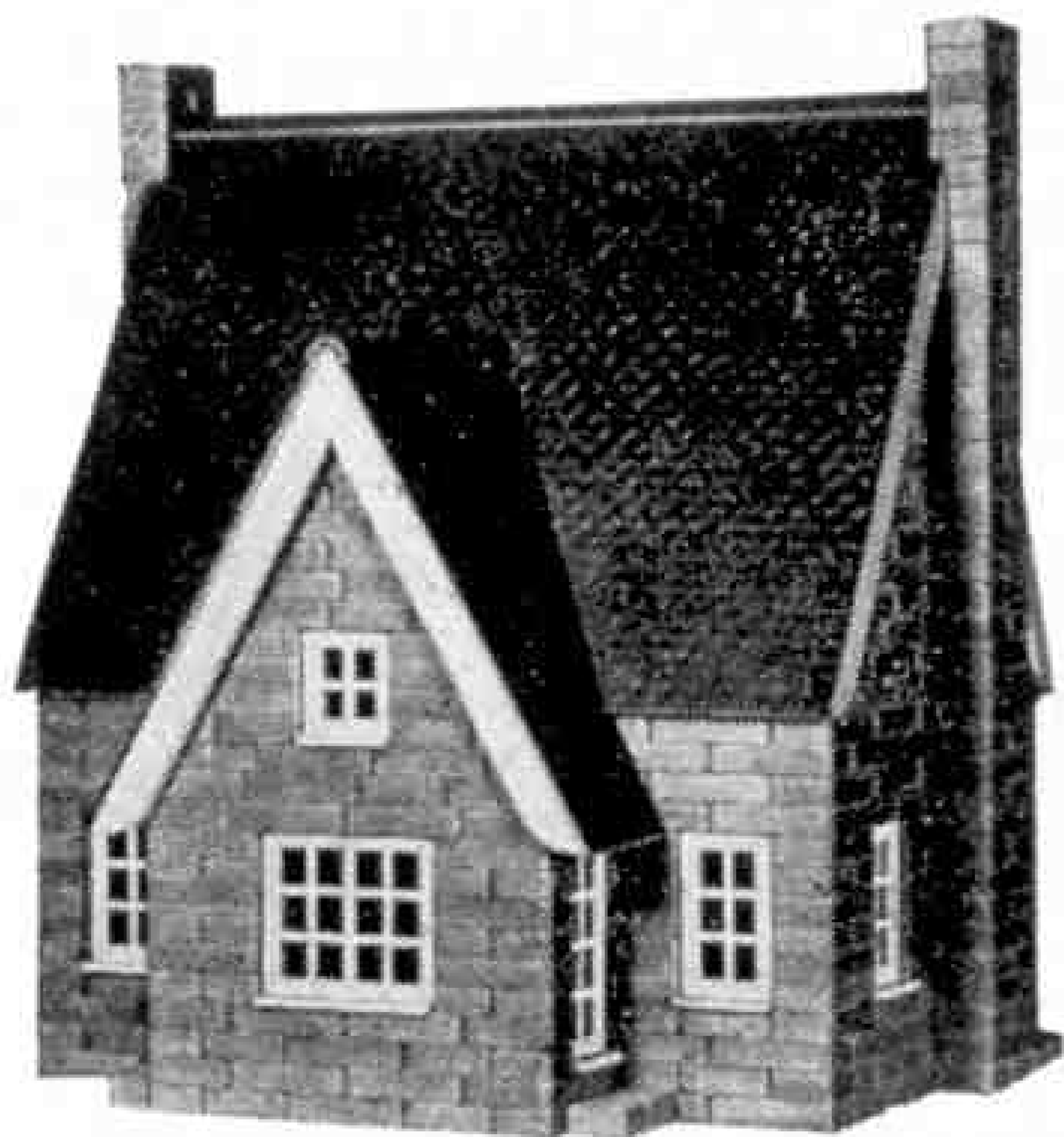
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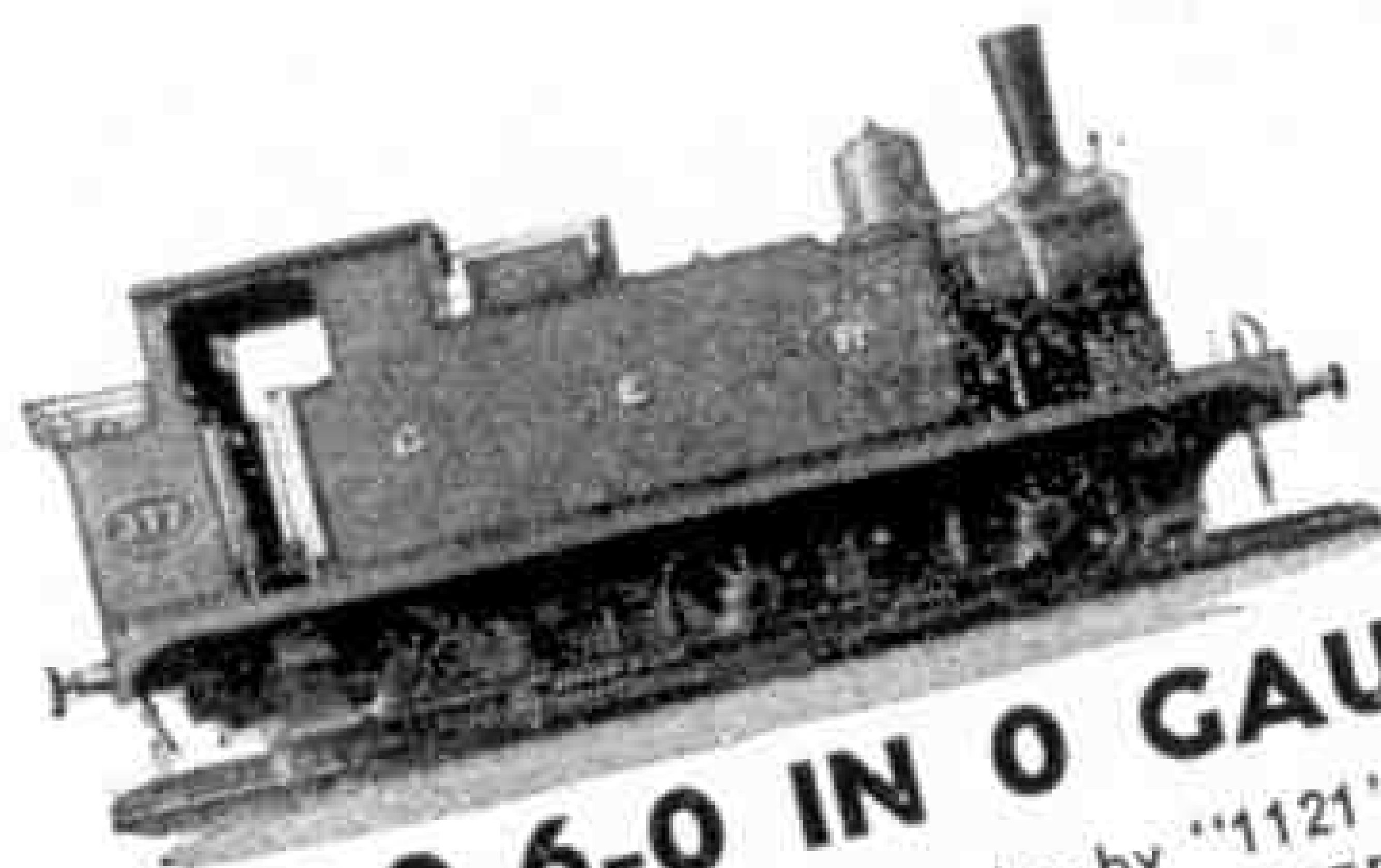
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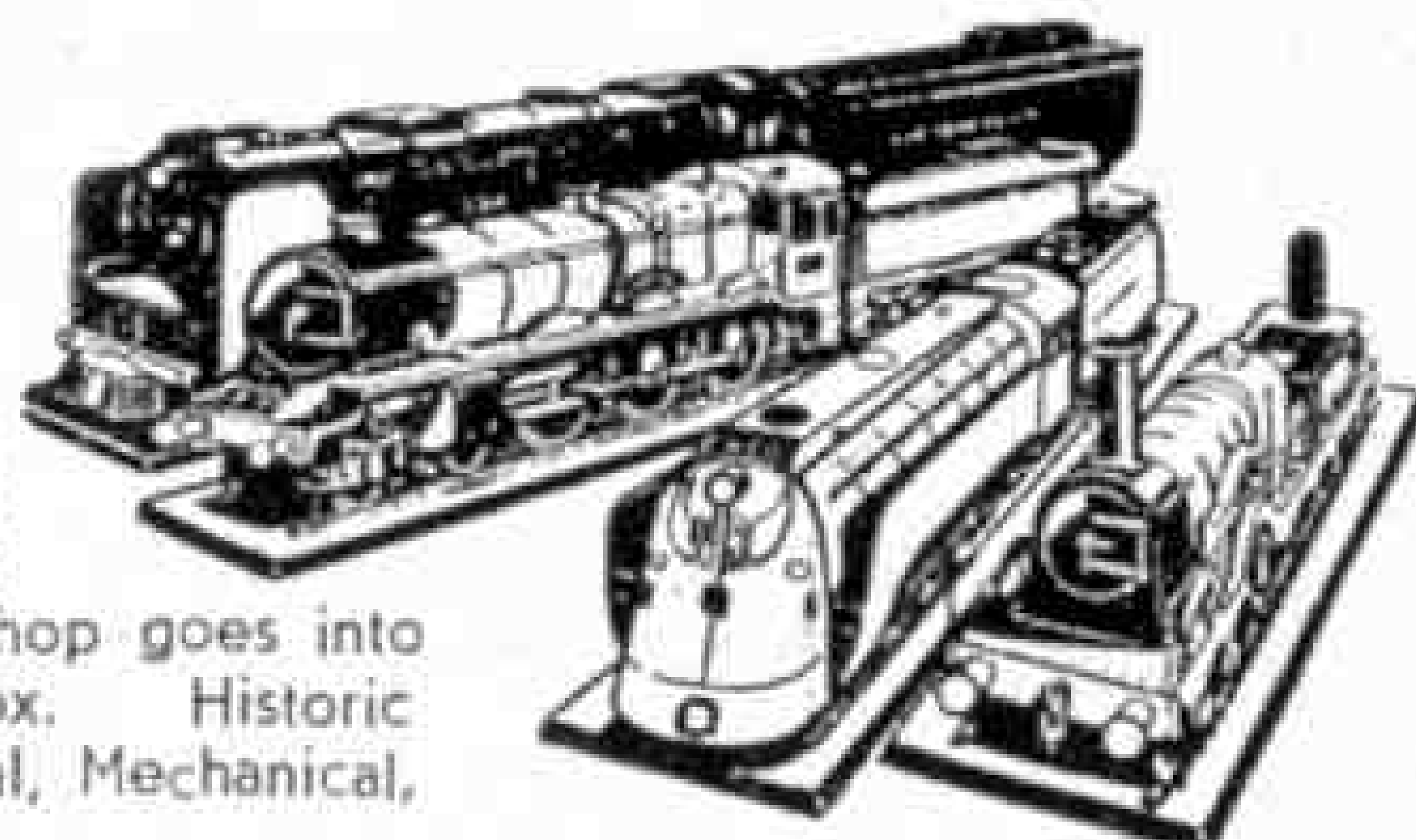
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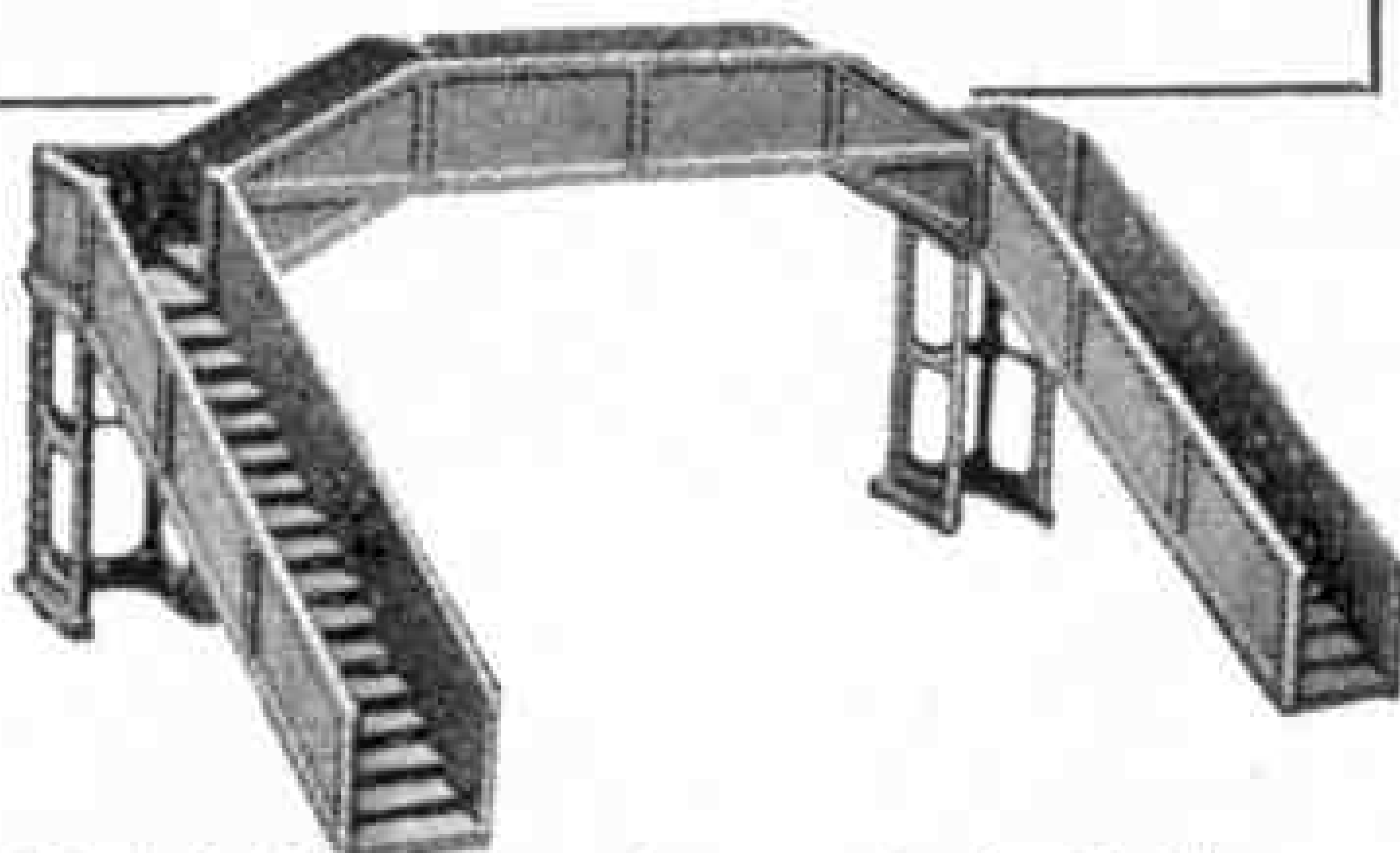


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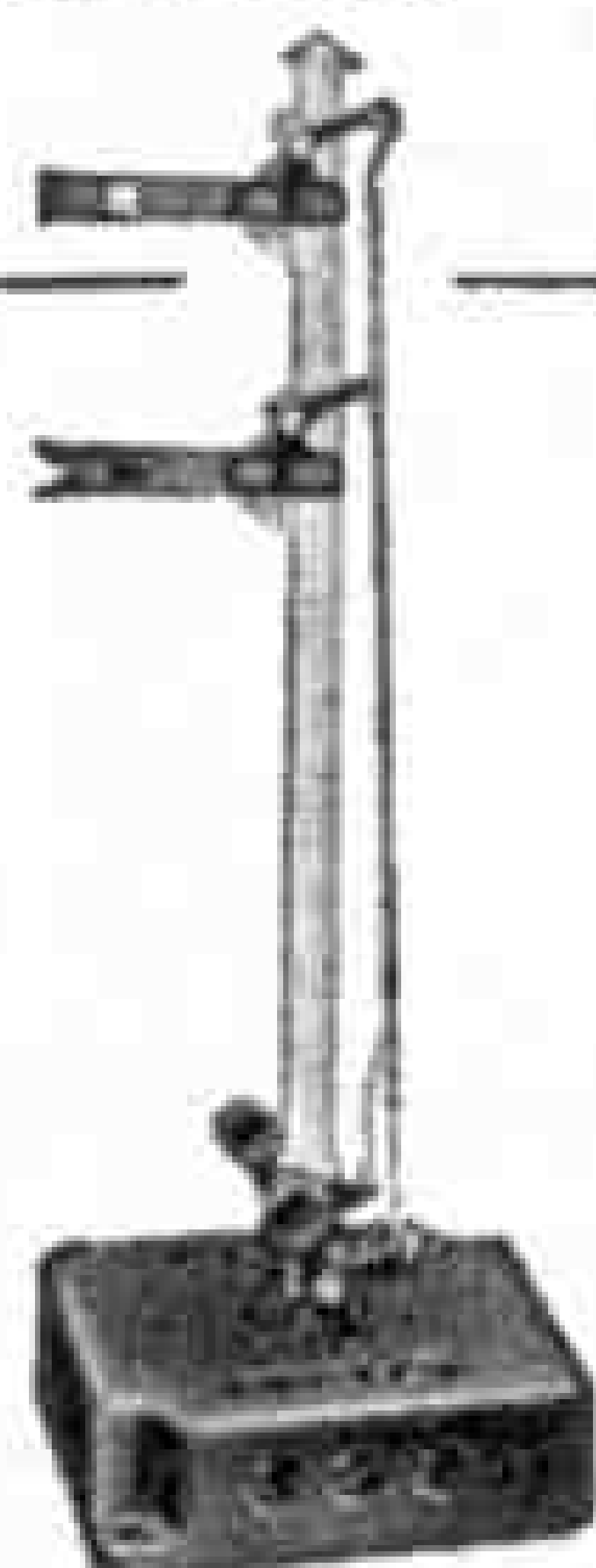
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D1 FOOTBRIDGE



Model of re-inforced concrete footbridge. It spans a double track.
10/6

ED2 ELECTRICALLY OPERATED DOUBLE ARM SIGNAL



"Home" and "Distant" as illustrated
13/11

D1 SIGNAL CABIN



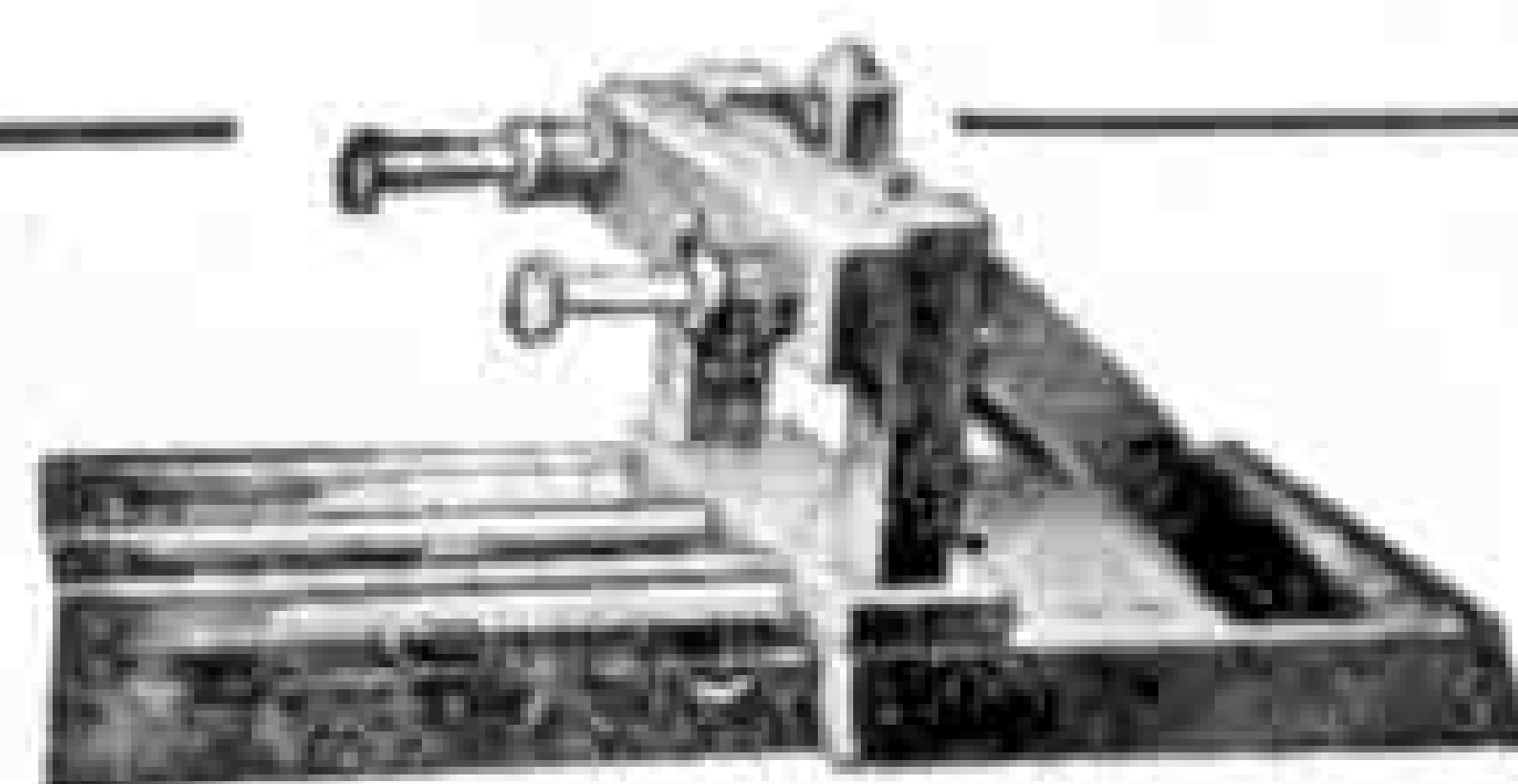
Finished to represent concrete, with orange roofs and green doors. Height 3 in. Length 5 3/4 in.
12/5

MINIATURE FIGURES



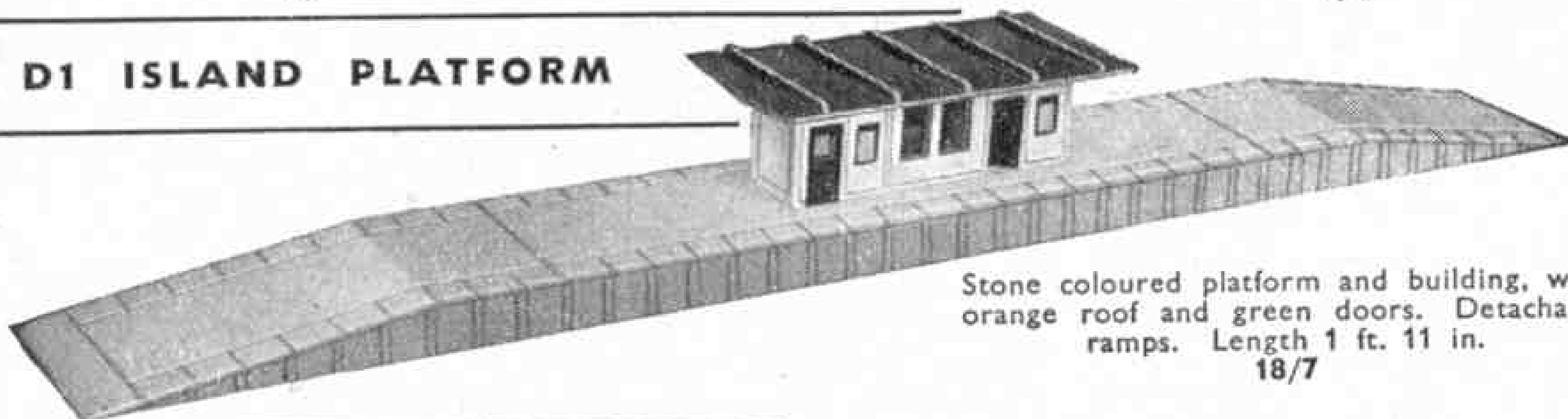
Dinky Toys No. 1003—Passengers
3/3

D1 BUFFER STOP



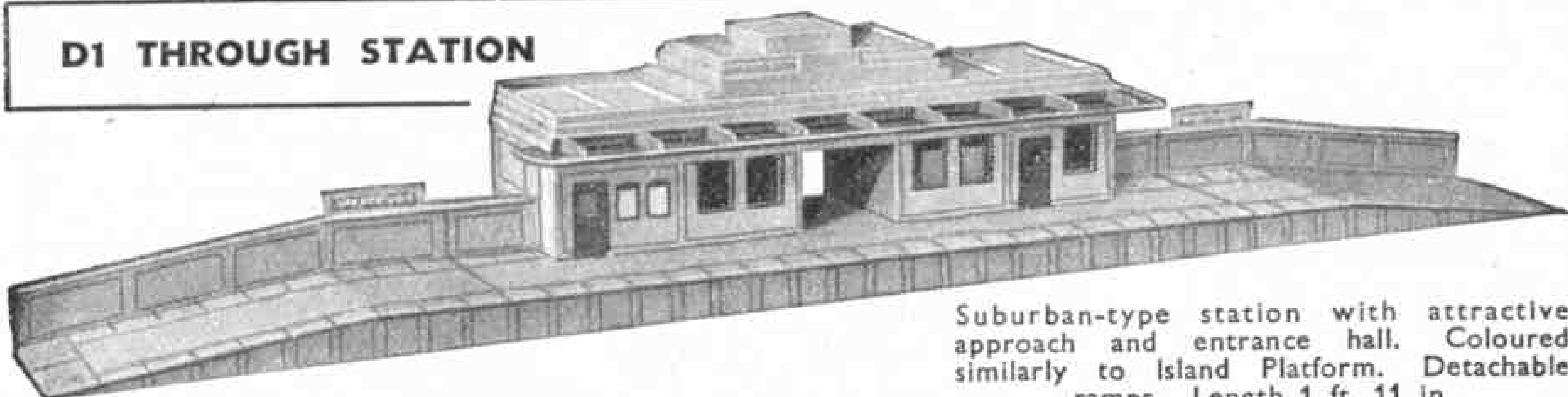
Working spring heads
2/2

D1 ISLAND PLATFORM



Stone coloured platform and building, with orange roof and green doors. Detachable ramps. Length 1 ft. 11 in.
18/7

D1 THROUGH STATION



Suburban-type station with attractive approach and entrance hall. Coloured similarly to Island Platform. Detachable ramps. Length 1 ft. 11 in.
41/10

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Editorial Office:
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Vol. XXXVIII
No. 1
January 1953

Good Wishes for the New Year

Today we begin the New Year, and I hope that 1953 will bring to every reader opportunities for progress and advancement, and indeed prosperity for everything in which he is interested. This of course includes the *M.M.* I hope that the measures I have taken during the last few months to improve the Magazine will make it more valuable than ever and that it will find many new readers, for the more there are the better it can be made.

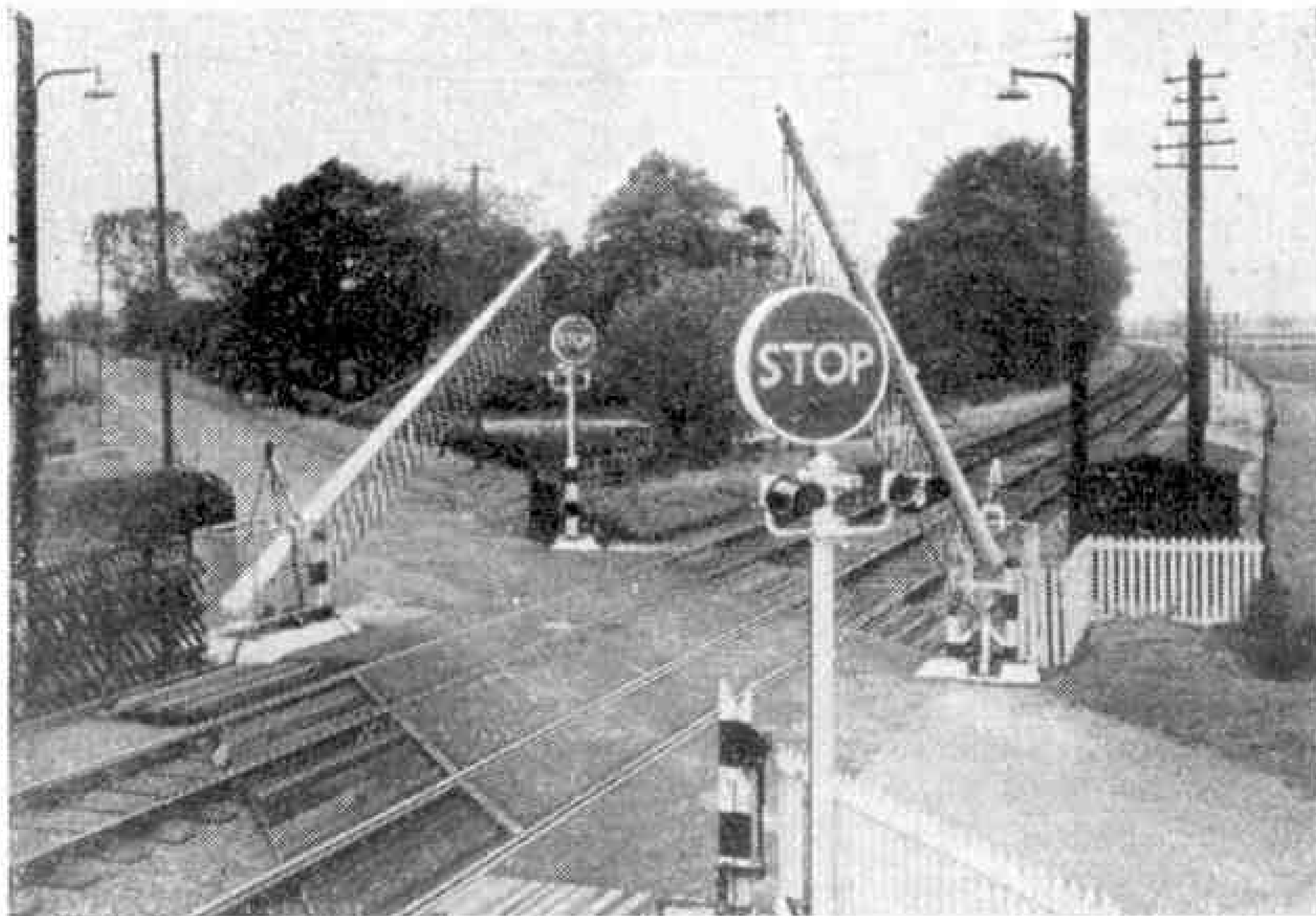
Road to Success

I promised you a star for the opening issue of the year, and on page 10 you will find the outcome of my promise—the story of my talk with Stirling Moss.

There is no need for me to tell you who Stirling Moss is, for all of you will know him as an outstanding racing driver, as much at home in rallies and reliability trials as he is on the race track. Although he is only 23 years of age his triumphs in motor races and rallies are already innumerable. Last year he again won the British Racing Drivers Club Gold Star—for the third year in succession!

At times we are apt to be so dazzled by the brilliance of the achievements of such a great sporting personality as Stirling Moss that we overlook the root causes of his success. The more I see of him the more I appreciate that hard work and close attention to detail have been the foundation of his great successes. In races on road

and track and in reliability trials alike, he has never spared any effort to learn the course thoroughly and to form a just estimate of its condition in various weathers, so that he could plan his race.



A level crossing barrier that reminds us of those to be seen in the United States and Canada. It is an experimental lifting barrier, with "Stop" lights and boards and floodlighting, that has been installed at Warthill, Yorkshire, on the N.E.R. line between York and Hull.

Add to this care for detail his profound knowledge of the mechanism and control of a car, and his wonderful capacity for getting the utmost out of a racing or sports car, or indeed out of any motor car, and you have the explanation of the brilliance of this great British driver.

On road and track we all wish him well during 1953.

The Editor

I Look at the Forth Bridge

By the Editor

IT now seems a long time since I first crossed the Forth Bridge, but my memory of the occasion is still vivid. I had looked forward to seeing the bridge for many days before I actually reached it and, needless to say, I was at the window of my compartment all the time that the train occupied in travelling over the mile or more of steelwork of which it consists.

I think I should rather say travelling *through* the steelwork, for as I went northward giant tubes, made up of plates riveted together, seemed to shoot up from below to rise above my head at all angles, while lattice girders shot across my view in other directions in seeming chaos. Yet I soon realised that there was complete order, and later, when I saw the bridge as a whole from points on the shores of the Firth of Forth, and from the ferry that crosses the Firth almost beneath it, I could realise to the full just what the mass of steelwork was really like and gather some idea of the construction of the bridge.

Whether one sees the Forth Bridge first from the inside, that is from a train crossing it, or from the outside, when the entire structure can be seen at a glance, there is no doubt about it that the bridge is impressive. Its size alone is sufficient to strike awe into those who see it for the first time. There is a mile or more of steelwork, built up in three giant sections, more or less diamond shaped, resting on masonry piers, and all constructed on a massive scale. Even then it is difficult perhaps to realise fully exactly how big the bridge is, but if a train

happens to be passing over it this will help, for what in a station seems to be a monster engine and a long stretch of large coaches seems here but a toy.

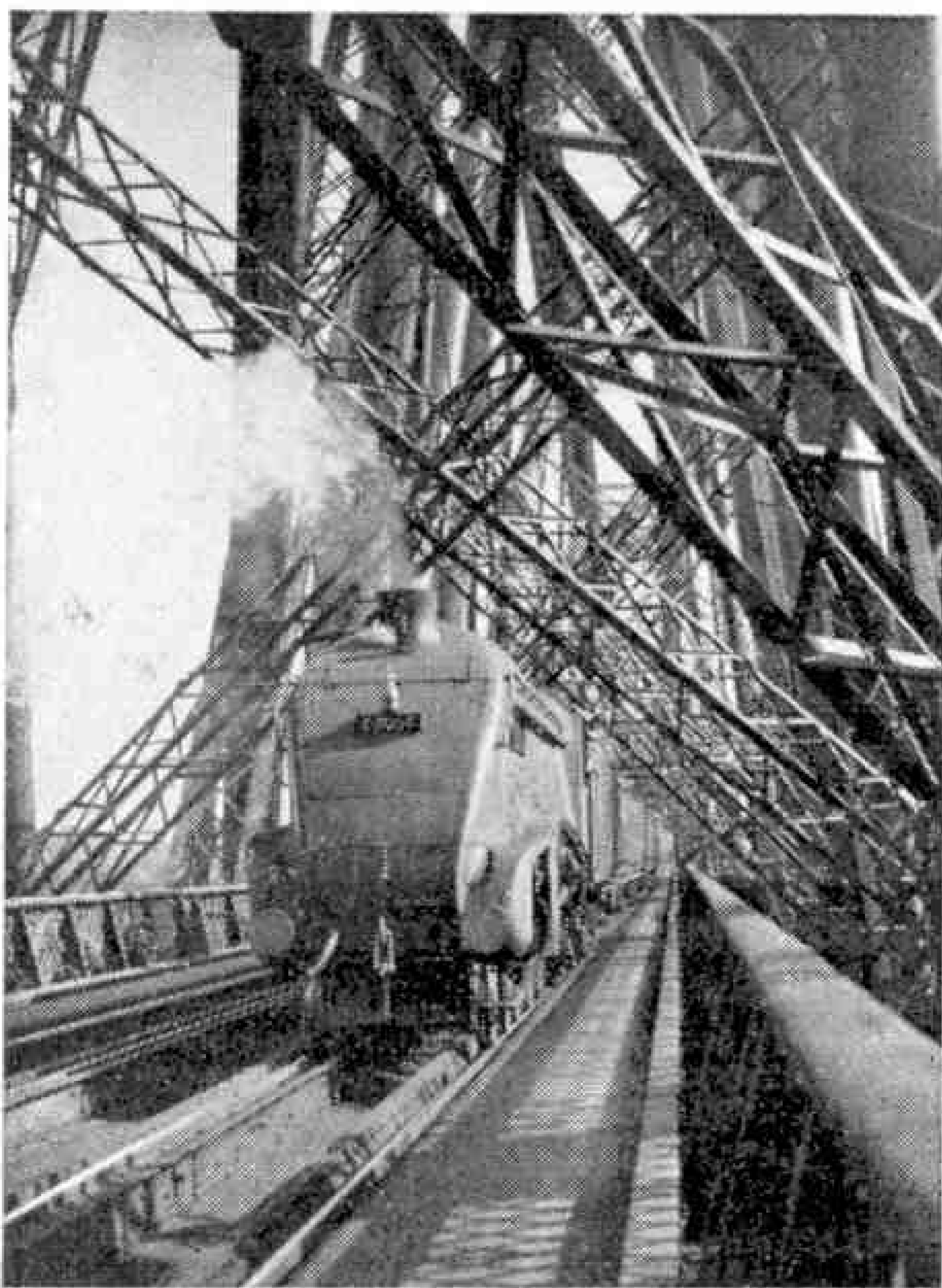
Look too at the little connecting girder spans that join the three great diamonds or cantilevers. Little? Compared with the bridge as a whole they look small, but each is 350 ft. long and could barely be fitted into an Association football field of full size, or at least of international size,

although it would be no easy task to get it there, for it weighs 872 tons. And the steelwork of the bridge itself is more than 15 times as long as each of these connecting spans. I imagine an enormous structure of this length in relation to that of the playing area of your favourite League team and you have some idea what this wonderful bridge is like. Then add the lengths of the approach spans, which bring the total to more than a mile and a half!

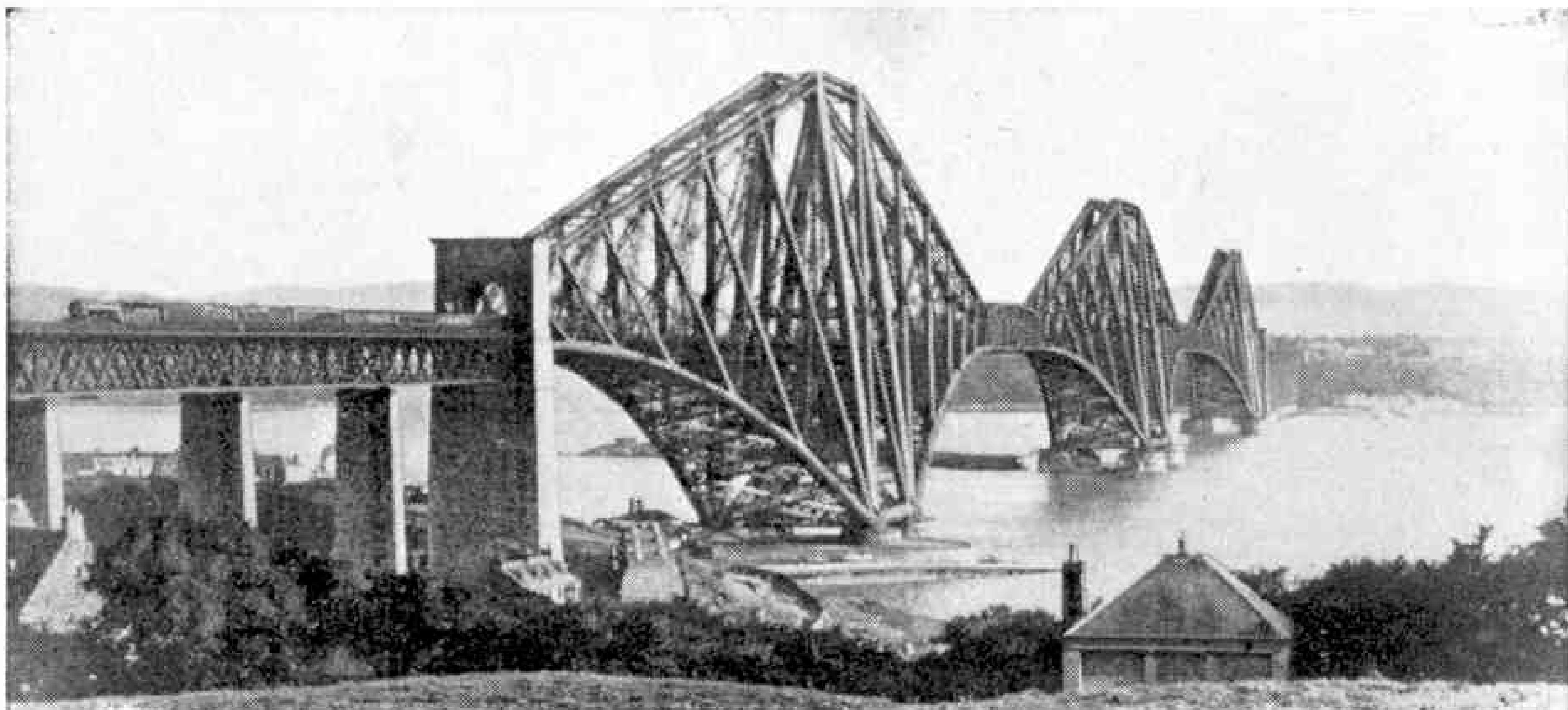
Now the Forth Bridge was built more than 60 years ago, and was then rightly regarded as one of the wonders of the world. It was the first of the great

cantilever bridges and it had no real rival in this field until the Quebec Bridge was built nearly 30 years later. The Quebec Bridge has a span a little longer than the 1,710 ft. of the two spans of the Forth Bridge, but it is much shorter in overall length, as it has only two cantilevers, and not three.

For longer spans suspension bridges are now favoured, but the cantilever bridge is not exactly disappearing, and a good example of this type, the Howrah Bridge



The 4.15 slow train from Edinburgh to Aberdeen crossing the Forth Bridge, with 4-6-2 No. 60004 William Whitelaw at its head. This photograph, and the one on which our cover is based, were taken by E. R. Wethersett.



A fine picture of the giant cantilevers of the Forth Bridge stretching across the water from North Queensferry to the Dalmeny Shore. British Railways Photograph.

over the Hoogly at Calcutta, was completed only six years ago. One advantage that the suspension bridge has over the cantilever is that for equal loads the quantity of steel required is much less, and this of course is very important. Suspension bridges too seem graceful, but for my part I like the massive purpose that the Forth Bridge shows in every inch of its length, and there is a comfortable feeling of soundness and solidity as one crosses it by train.

What exactly is the idea of a cantilever bridge? The answer is simple. It is a bridge in which the parts are balanced. Look at the picture of the whole of the bridge that appears at the head of this page. It will be seen that each of the diamonds, or cantilevers, rests on masonry piers. From these steel towers built of giant tubes, some of them 12 ft. in diameter, rise upward, those on one side leaning towards those on the other, and the rest of the steelwork extends outward on each side of these central portions. The weights of the two extensions therefore balance each other

and they did this throughout construction, as the two tapering arms of each cantilever were built outward simultaneously from the central tower. The towers rise to a height of 342 ft. above the piers on which they rest, and 361 ft. above high water mark, a height about equal to that of St. Paul's Cathedral.

The arms of the middle cantilever do not clutch those of the outer cantilevers directly. The actual junction is made by the 350 ft. girder spans about which

I have already written. The steelwork is carefully planned to withstand all the stresses that can be put upon it. Generally speaking the tubular beams take up compression, or squeezing stresses, while the lattice girder work takes care of the pulls or tensions.

There are over 54,000 tons of steel in the bridge, and 6½ million rivets were used in building it.

Undoubtedly the bridge is still one of the wonders of the world, a tribute to the skill and courage of John Fowler and Benjamin Baker, the engineers who designed it.



The central cantilever of the Forth Bridge rests on the island of Inchgarvie, on which the lighthouse seen in this picture has been erected as a guide to shipping. British Railways Photograph.

The Bristol Britannia



John W. R. Taylor

WHEN the Bristol Aeroplane Company released the first brief details of their projected Type 175 air liner in 1948 a lot of people were disappointed—including me! Designed to meet B.O.A.C.'s specification for a "Medium Range Empire" type, it was an attractive enough aircraft, powered by four 2,500 h.p. Centaurus piston engines and able to carry 32 passengers for 2,000 miles. But it was hailed in the Press as a "super Constellation," which was silly because by that time the "Connie," also with four 2,500 h.p. engines, was carrying 44-64 passengers for 3,000 miles at 309 m.p.h., and its makers, Lockheed Aircraft Corp., had an eight-year start over Bristols.

At the same time, two or three British companies were working on designs for a bigger "Long Range Empire" air liner, suitable for B.O.A.C.'s North Atlantic and Far East services. But the Government decided to cut expenditure on civil aviation. So the "Long Range Empire" was abandoned, and Bristols were asked to make their Type 175 big enough to do both jobs. Nobody would have blamed them if they had fought shy of this, because the two specifications were so different that a compromise aircraft, intended to satisfy both, might well have ended up by doing neither job efficiently.

To their credit, they tackled the problem so enthusiastically that, before long, the original Bristol 175 was a thing of the past, superseded by a bigger and more useful

air liner, designed to be powered initially by Centaurus piston engines, and later by four of the tremendously powerful new Proteus propeller-turbines that Bristol's Engine Division hoped to have ready for service by 1952.

It looked so promising that the Ministry of Supply at once ordered two prototypes, and B.O.A.C. began to show a lot more interest. They already had on order a fleet of de Havilland Comet jet liners; but the Comet was still an unknown quantity. Nobody had ever flown a pure-jet air liner, and plenty of critics predicted that

it would be too noisy and too uneconomical for passenger-carrying. It was, therefore, common-sense to insure against delay or failure of the Comet by ordering also a fleet of more orthodox air liners. And, as the new Bristol 175 looked as good as anything else in the world,

it seemed logical to buy this aircraft rather than comparable American types at a time when dollars were scarce. So, in November 1948, B.O.A.C. announced that they planned to order a fleet of 25 Bristol 175s. The production contract was signed in July, 1949, and it was decided to start full production right away rather than wait until a prototype had flown.

Full credit should be given to B.O.A.C. for their courage in ordering nearly £25,000,000 worth of Comets and Britannias "off the drawing board" in this way, at a time when all other world airlines were planning to re-equip with

The photograph at the head of this page shows the Bristol Britannia air liner, with its four Proteus turbo-props being run up prior to taxiing tests. The illustrations to this article are reproduced by courtesy of The Bristol Aeroplane Company Ltd.



The Britannia on the Filton runway before the start of taxiing trials.

piston-engined DC-6Bs and Super Constellations. We know now that their faith in Britain's aircraft industry was more than justified, but in 1949 they were faced with the unenviable prospect of pioneering jet transport on world trunk routes.

Original plans were for the first few production Type 175s to be Centaurus-powered. But, early in 1950, as part of an economy drive and because the Comet and Viscount had flown and removed any doubt of the practicability of jet transports, B.O.A.C. decided to drop the Centaurus version entirely and asked Bristols to press on as quickly as possible with the Proteus-engined Type 175, which was given the name "Britannia."

Their decision was influenced by interesting events on the other side of the Atlantic. It had been obvious for some years that if airlines were to continue to progress they would have to cater for an

entirely new class of air traveller. Since the war they had devoted their efforts to attracting people with lots of money. At the cost of a few extra pounds or dollars, travellers on the North Atlantic run could walk out to their aircraft on red carpets, eat magnificent five-course meals, with free wines and liqueurs, free orchids and beauty kits for the ladies, cigars for the gentlemen and zip-fastened overnight bags in which every passenger could put odds and ends needed during the journey.

It was all very nice until some bright airline executive realised one day that all the people who could afford such service and who wanted to travel by air anyway were probably already doing so. Consequently, the only way to attract more passengers was to cut out the frills, pack a few more people into each air liner and reduce fares to a minimum, for people of average means.

A thing like that cannot be done overnight. All international air fares are fixed by the International Air Transport Association, of which most big airlines are members, to avoid ruinous price wars on competitive routes. But in September 1948 Pan American were given the go ahead on a regular tourist class service between New York and Puerto Rico, and two months later other U.S. lines began domestic air coach services linking big cities across the length and breadth of America.



The first and second prototypes under construction in the Aircraft Assembly Hall at Filton.

At first, old aircraft, too slow for first-class services, were used for coach travel, and nobody minded because fares were down by as much as 30 per cent. Within a year, three times as many people as before were travelling by air in America, without any adverse effect on first-class services; proving that nearly all tourist class passengers were people who would otherwise have used surface travel.

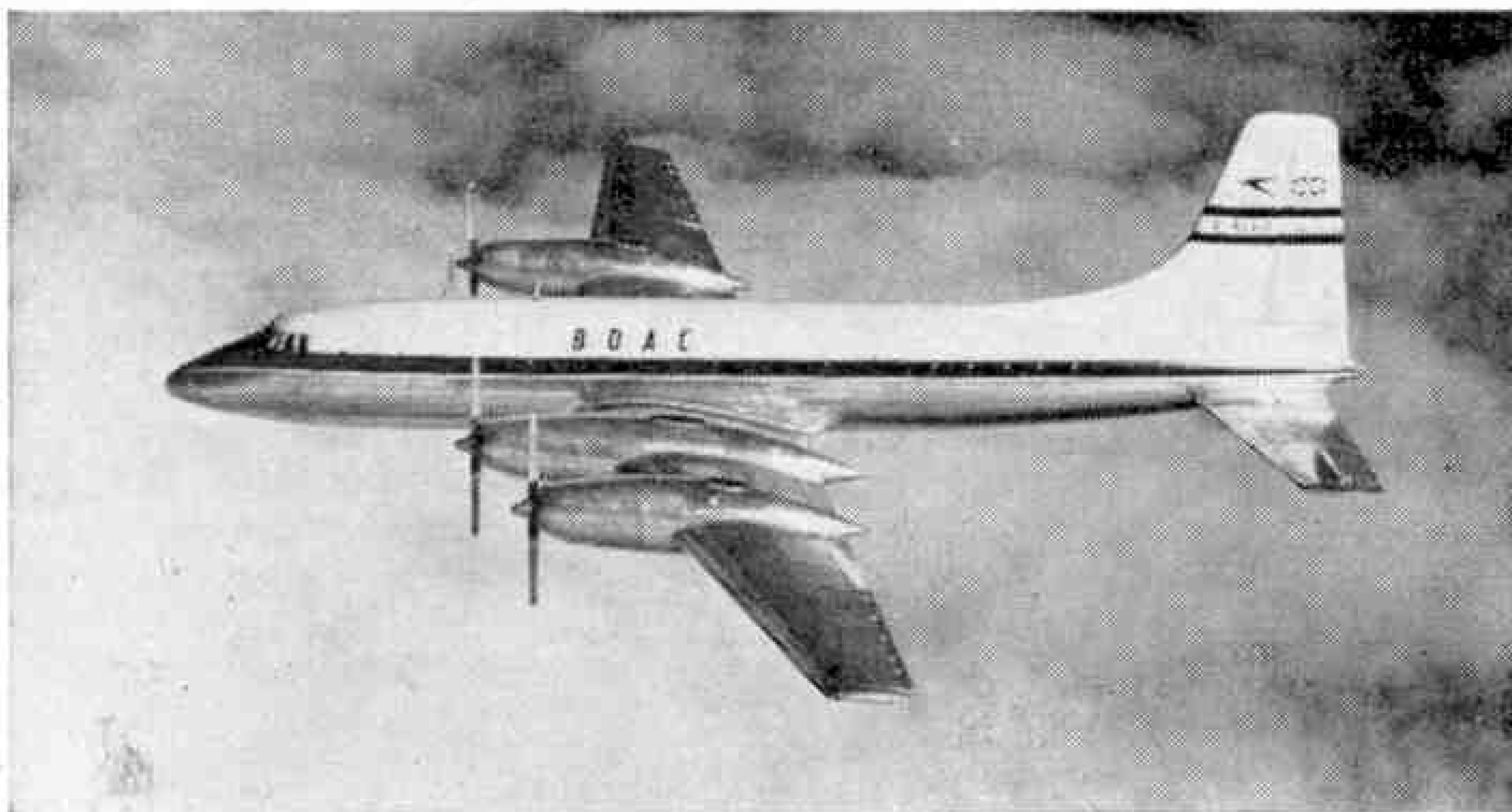
It was big business—so big that it was soon necessary to use modern, high-speed air liners on air coach services. Finally, on 1st May, 1952, the nine major transatlantic operators all introduced North Atlantic tourist services, with a London–New York return fare of about £173 instead of the usual £254, and a Winter off-season fare of less than £150.

B.O.A.C. converted Constellations into 68-seaters for their *Mayflower* tourist service. But they had foreseen the possibility of transatlantic tourist travel two years earlier, and that is why they were so anxious to buy those 25 Britannias. They knew that the Series I Comet would have insufficient range for service over the North Atlantic. But the later Series 2 and Series 3 Comets were a very different proposition, offering the possibility of 500 m.p.h. luxury jet travel between London and New York by 1954. To back up the Comets, B.O.A.C. needed big, fast, comfortable air coach planes, and the Britannia looked like the answer.

Today, we know it is the answer. The first Britannia made its maiden flight on 16th August, 1952, flown by Bristol's chief test pilot, Mr. A. J. "Bill" Pegg and crew of five. A fortnight later it showed its paces at the S.B.A.C. Display at Farnborough, and was acclaimed by the world Press as one more example of Britain's leadership in the air. There was no disputing its qualities. In its coat of white, blue and silver B.O.A.C. colours it swept overhead gracefully and incredibly quietly, looking every inch a safe, sturdy, practical air liner.

A glimpse inside the Britannia's cabin showed little beside test equipment, but its great size left little doubt of the standard of comfort it will offer passengers one day. The method of seat attachment makes possible a large variety of cabin arrangements, so that the same basic aircraft can carry 50 first-class passengers, their baggage and six tons of freight in great luxury for 4,000 miles, or up to 104 tourist-class passengers, six abreast, in an air coach version. Its performance is equally good. The 15,120 total h.p. of its four Proteus 705 propeller-turbines and low wing-loading enable it to take off in 3,700 ft., and cruise at 360 m.p.h. at 30,000 ft., with a full load, giving it a clear lead over its best foreign competitors right from the start.

Every possible care has been taken to ensure the comfort and safety of the Britannia's passengers and crew. The cabin is pressurised and air conditioned, and equipment includes thermal anti-icing system and full radio-navigational aids including search radar. Four-wheel bogie



The Bristol Britannia in the air.

undercarriage legs enable the 62-ton aircraft to use any normal big runway, and reversing propellers are fitted to reduce landing run to a minimum.

Specimens of every major component have been subjected to endless tests in wind tunnels and structure test houses. The 140 ft. span wings were clamped into a big test rig and bent up 7 ft., at the tips, then twisted and bent until they broke at a far higher load than the Britannia will ever experience in service. Undercarriages were raised and lowered 1,000 times. Fuselage sections were pressurised far beyond normal working pressure, and (Continued on page 52)

The Television Microscope

IN one of the most remarkable of the triumphs television has won since it became a reality, it is used along with a microscope to show the wonders of the world of tiny things on a screen. No more peering through a tube with one eye glued to the lens at its top! Instead it is possible for many people at once to see what there is on a slide placed under the microscope.

After all, the idea is quite simple. Instead of a human eye at the top of the microscope tube we place an electric eye, in the form of a television camera. What this sees is signalled through a connecting wire to a television receiver, and there it appears enlarged on the screen.

Carrying out the idea in practice meant a long series of experiments, however. Final success came with the introduction of a remarkable small and sensitive pick-up vacuum tube for use in the television camera. This is known as the Vidicon, and it was developed in the research laboratories of the Radio Corporation of America. It is only an inch in diameter and about six inches in length, and is just right in size for use with a standard microscope.

The television camera that has been designed for use with the Vidicon is about the size and shape of a movie camera taking standard 16 mm. films. It is mounted over the microscope in such a position that the projected image falls on its light sensitive surface. In other words, this light sensitive surface takes the place of the eye of the observer, who normally has to look through his microscope in order to study whatever he has on the slide placed on its stage.

The camera is connected by a cable to a control unit that is of about the size and complexity of a table model of a home television receiver. In fact, it resembles a receiver in many of its details. It supplies all the voltages and scanning signals necessary to operate the camera, and in addition it displays the television image on a viewing screen. The operator can control brightness and contrast at will.



A microscope with the television apparatus that shows an enlarged picture of the object on a screen that can be seen easily by many onlookers at once. We are indebted to the Radio Corporation of America for this illustration and for the information in the accompanying article.

The combination of microscope and television units has many remarkable advantages in addition to that of allowing many people at once to see what is revealed by the microscope. One is that a narrow contrast range in the specimen on the microscope slide can be expanded to fill the entire contrast range of the television system, so that practical use can be made of magnifications in excess of those normally considered useful with the light microscope.

The light in which specimens are seen also can be varied, in order to achieve different contrasts, and it is even possible to view specimens in the invisible light known to all as the ultraviolet. The use of this light indeed often gives high contrast, because certain biological materials have high powers of absorption for it.

Yet another great advantage that the television microscope brings with it is that in many instances it allows specimens to be examined without staining. When the biologist is studying living tissues, using a plain microscope, he finds it necessary to stain parts of them with dyes of various colours in order to

(Continued on page 52)

A Trip to Brighton Works

By "North Western"

SOMEHOW I have always associated Victoria Station with holiday travels. Possibly this is because the first time I ever went there, about 1912, was the occasion of one of those grand family pilgrimages to the sea. We had crossed London and I remember we had to wait quite a long time before our train was due to leave.

My most recent occasion for a journey from Victoria was somewhat different, for I was due to join my good friend Mr. R. A. H. Weight and other railwayists to take part in a Centenary visit to Brighton Works, where they began to build engines in 1852. I should explain here that two separate trips were run in this way, each on a different Sunday in October last; the trips and the programme generally were organised by the Railway Correspondence and Travel Society, in conjunction with British Railways Southern Region and the Pullman Car Company Ltd.

In order to revive to some extent the atmosphere of earlier times it was arranged that the train should be representative as far as possible of the "Brighton in an hour" service in steam days, the former *Southern Belle*. So a number of more or less vintage Pullmans made up our train; there were 8 of them in all, making a train weight of about 335 tons full. To complete the illusion of L.B.S.C. travel one of the five remaining Brighton Atlantics, No. 32425 *Trevose Head*, provided our motive power. On the first trip in early October the engine had been No. 32424 *Beachey Head* with a Newhaven crew. There were Brighton men on the footplate of our engine, Driver Bourne and Fireman Plaine on the down run and Driver Woods and Fireman Hubbard on the up. Locomotive Inspector McCarthy was in charge on both journeys.

It was a wet morning, but we got away

well, crossing the Thames and soon swinging alongside the old L.S.W.R. (now Southern Region, Western Section) main line through Clapham Junction to the typical 12-wheeled rhythm of our Pullman. The recorders in our party got down to the serious, but exciting business of logging the run. Stop watches came into play, and timings were called off and speeds recorded as each strategic point of the journey was reached.

I was able to share the excitement of the brisk running without the necessity for doing any timing myself. This was fine, because it enabled me to follow the



The R.C.T.S. Brighton Special of 19th October. No. 32425 is pressing on through London suburbs in this photograph by H. Gordon Tidey.

gradient profile of the route that was incorporated in the well-prepared programme specially produced for these trips. In addition, in spite of the weather and poor visibility, I was able to see something of the lineside. The Brighton route is well wooded and although this makes it picturesque from the passenger's point of view it can create trouble for locomotives, especially in Autumn. Wet leaves on the track cause slipping, and it was due to this as much as anything else that on both our journeys higher speeds were not reached. Actually the maximum on the run down was 71 m.p.h. and a time of 61 min. net instead of the even hour was recorded.

On arrival at Brighton, groups were formed for touring the Works and subsequently the running sheds. As it was

Sunday the Works were deserted. There were engines about of course, plenty of them, some under repair, some complete but just "dead," and others being built. In spite of this evidence of activity interrupted for the weekend, it was not

designs, but capable of giving a good account of themselves.

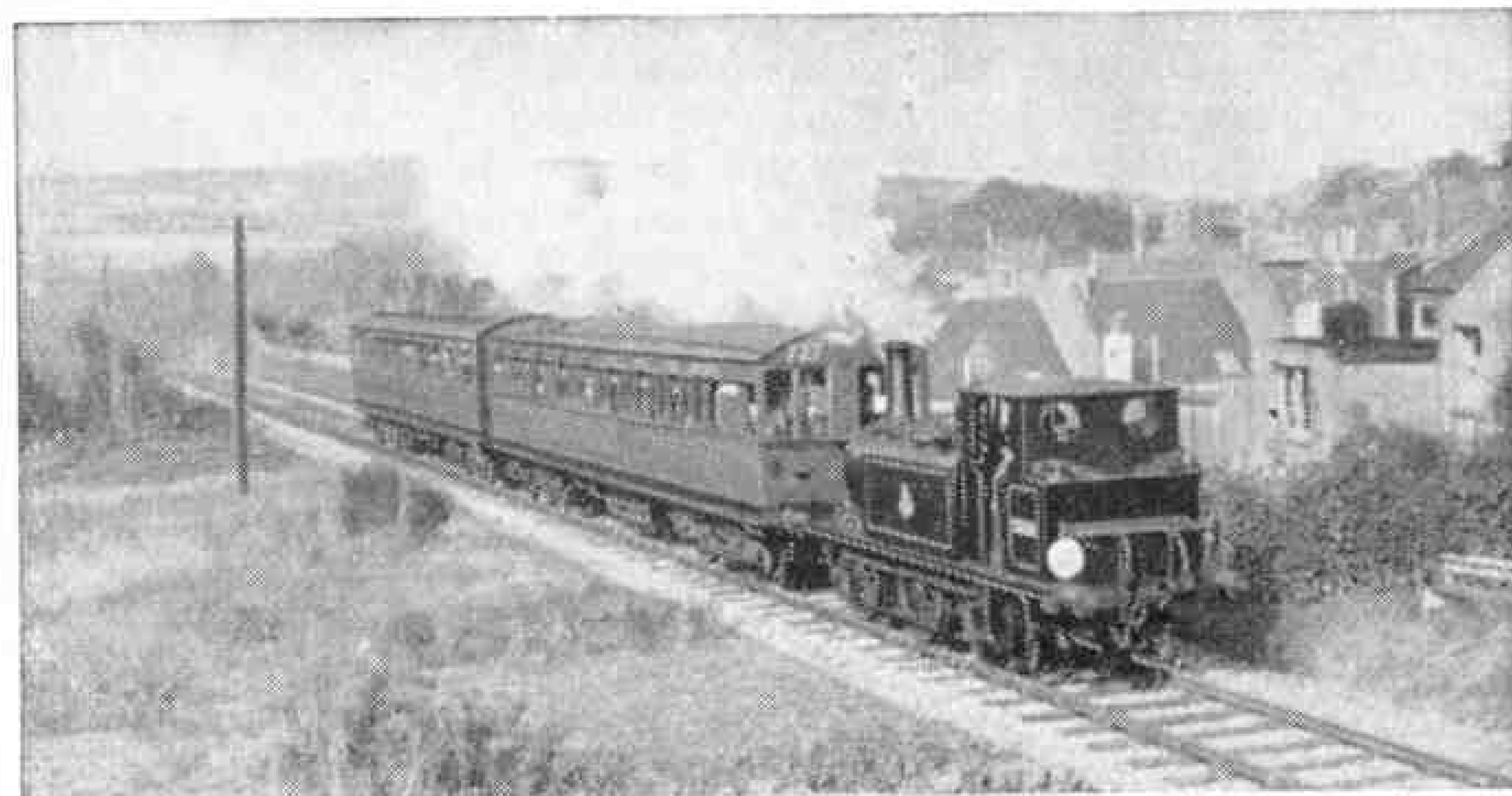
At Brighton Motive Power Depot an interesting collection of engines was on view. A special feature was the display in line of various engines that have at one

time or another carried the name *Brighton*. These were respectively a Terrier No. 32640 built in 1878, one of the large Billinton 0-6-2 tanks No. 32587 of 1903, and the present owner of the title, an Eastleigh product of 30 years later, No. 30915 of the Schools Class.

An additional special exhibit was the last remaining 4-4-2 tank of class I3, No. 32091, now withdrawn from

service. It seemed hard to realise now that these by no means big engines shared in the working even of the *Southern Belle* years ago.

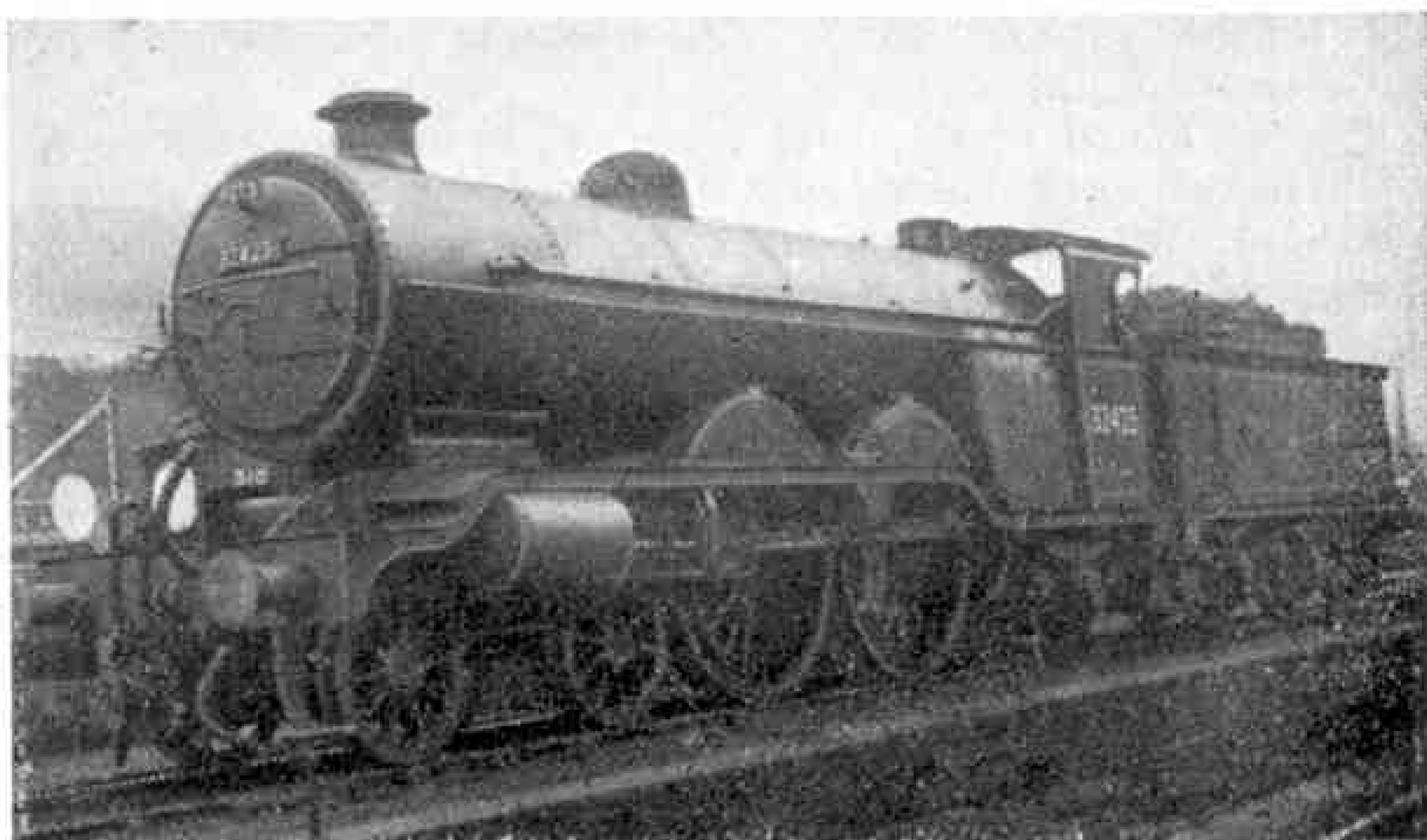
A trip behind another Terrier to Kemp Town and back, over a line which has had no passenger service for 20 years, was to prove that even at 80 years of age a Stroudley engine can do useful work. The normal duties of this engine, which used to be numbered 72 and named *Fenchurch*, are shunting at Newhaven. Our return run to Victoria was made in just under the hour. A signal delay at Haywards Heath encouraged a grand recovery, with a maximum of 75 at Horley.



A cheerful view of one of the Kemp Town special trips. The diminutive 80-year-old Terrier is dwarfed even by the low-roofed coaches that were used. Photograph by S. C. Nash.

difficult to imagine that the ghosts of past Locomotive Engineers who had ruled at Brighton were lurking about somewhere. There was John Craven, for instance, who built scarcely any two locomotives alike, followed by the immortal Stroudley, who brought to Brighton locomotive building an order and precision unknown before, that has been maintained ever since. In the matter of externals, many of his engines wore his yellow livery, officially termed "improved engine green." We were able to see a specimen of this striking turn-out, for the Works shunting locomotive is a Stroudley Terrier 0-6-0 tank finished in this style and it still sports a copper-capped chimney.

Locomotive construction ceased at Brighton when the Southern Railway was formed, and the Works were practically closed. Under wartime pressure it became necessary to re-establish Brighton for locomotive building, and since this took place in 1942 some 284 new locomotives have been built. At the time of our visit a series of B.R. standard 2-6-4 tanks was in hand; tough looking engines these, quite unlike the traditional Brighton



Trevose Head waiting at Brighton for the return journey of the R.C.T.S. Special. The characteristic features of later Brighton locomotive practice are well portrayed in this photograph by W. J. Reynolds.

A Talk with Stirling Moss

By the Editor

SITTING comfortably in a pleasant lounge talking to Stirling Moss was one of the most enjoyable experiences of my life. Stirling knows what he is talking about when his subject is motor car racing and motor car rallies, and it is thrilling to listen to his stories of the cars he has driven and the successes he has gained. There is nothing dramatic in his conversation, as one usually understands the term, but all the time there is the feeling that here is a master of his trade giving his listeners well judged and mature comments.

I had not talked long to Stirling before I discovered that in his boyhood days he had been a Meccano enthusiast and a reader of the Magazine. I had already felt assured on this point, so I was scarcely surprised when he told me. It seemed only natural somehow that a master of mechanism should have had an introduction to it through Meccano, and it was equally natural that such an enthusiast should be a regular *M.M.* reader. He seems to have been a car enthusiast before he took up Meccano, for I gather that he became interested when he was only six, while he actually drove a small Austin when he was 11. He had been familiar with cars from his very earliest days, for his father had raced himself, and his mother had taken part in car trials. It is not surprising therefore to find that he badly wanted a car when he was only 15, a car that he could not only drive himself but could use in races of some kind.

Unfortunately this was forbidden, but he did become the owner of a three-wheeled Morgan when he was 15. This was followed first by an M.G. and then by a B.M.W.

sports car when he could drive on the road. Next year came his start in the racing world, when he sold his B.M.W. and with the proceeds bought a Cooper 500. This was the car in which Stirling rose to fame as a racing driver. It was his own car, entered in races by himself and even at his first race meeting he secured a third place in the event for which he entered. This in

itself was a wonderful start, but more was to follow, for after that "firsts" became the rule.

At this time Stirling was only 18, and his remarkable successes were very impressive, even to those who knew how he had grown up with cars and had become a skilful driver, and also one who knew every corner of the racing game, both on and off the track. When he was telling me about his early races, however, there was no special elation in his voice. He spoke simply as one who had studied every detail of the career to which he had set himself.

Looking back on his

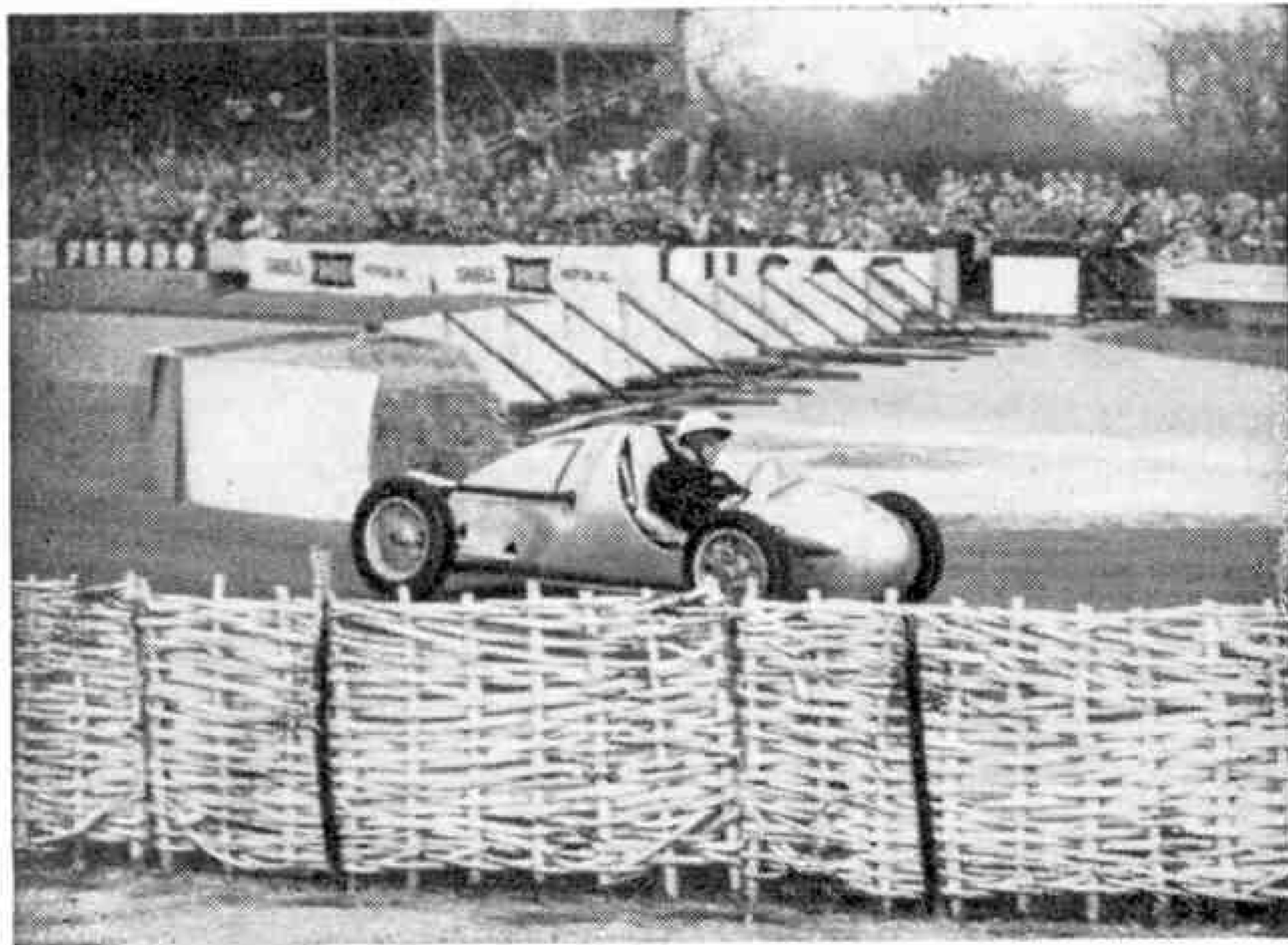
career on road and track it is clear that he has earned his successes by the close attention he has given to every detail and the care he takes to keep himself perfectly fit. In all his races he just set out to run as fast as his car would allow and to finish as high as he could, whatever the opposition. He showed this very early when he drove H.W.Ms. in Continental races against experienced drivers in faster cars at a time when Ferraris were sweeping the field.

"You were young to take part in races in which no doubt veterans of the track were competing" I remarked. "Did you ever feel nervous?"

Stirling seemed slightly interested in this himself.



Stirling Moss is congratulated at the end of one of the many races in which he scored a victory.



Moss taking his Kieft through the paddock bend at Goodwood to win the Earl of March Trophy race.

Looking back over the reports of that last day of last year's Monte Carlo Rally I recalled that of the crew of the winning Sunbeam-Talbot it was Stirling Moss who was chosen to drive the car on the treacherous surface, and his control and timing throughout were masterly. He may have been right in saying that the result was pure luck. That was typical of him—but the luck was the kind that falls to the expert.

This brought me to an important question that I had determined to ask Stirling, a short one that is likely to arouse a lot of discussion. It was this.

“What qualities

should a racing driver possess?”

The answer to this question might have been a very long one, but a very brief one came immediately.

“He must have the feel of his car” replied Stirling. “It goes without saying that he must be familiar with every detail of it and that he must possess good judgment of speed and distance. But above all he must be absolutely at one with the car, so that he controls its every movement with the same speed (Continued on page 52)

“I only remember being nervous on one or two occasions,” he said after a moment's thought. “One of these was at one of the earliest meetings in which I took part. It had been raining heavily and the course was wet and slippery, and it was very easy to get into a skid.”

“It doesn't seem to have disturbed you very much” I said.

“Actually it taught me a great deal, and never since have I felt nervous even in the most difficult conditions when I have been driving a car that I knew and that was completely reliable.”

“A Sunbeam-Talbot in the 1952 Monte Carlo Rally, for instance,” I suggested. “On that last circuit particularly driving must have been very difficult with a road covered with ice and snow.”

“Perhaps you are right” he said. “The surface was bad and it was necessary to keep very closely to the average speed laid down for the circuit, but I was lucky. Anything might have happened on that road, and fortunately I was able to keep the car going on schedule, and we got round without mishap.”



Stirling Moss and his co-driver John Cutts in one of the cars of the official Sunbeam-Talbot team on the Stelvio Pass during the 1952 Alpine Trial, in which the team won 11 major awards. The pass climbs to a height of 9,042 ft. Photograph by courtesy of Sunbeam-Talbot Ltd.

BOOKS TO READ

"PIONEERS OF BRITISH INDUSTRY"

By F. GEORGE KAY
(Rockliff, 25/-)

One of the most remarkable periods in British history is that of what is usually called the Industrial Revolution, in the 18th and 19th centuries. This changed Great Britain from an agricultural to a manufacturing country, and the story of the pioneers who invented the machines and showed us how to produce the power to drive them is a really stirring one. Mr. Kay traces this story from its beginning, and gives us brief pictures of the many great men who contributed to the change.

To tell this wonderful story in full would require many volumes, but Mr. Kay has succeeded in giving a fine outline of it, with a remarkable amount of detail about inventions, engineering works and new methods of manufacture as well as the host of great men, ranging from James Brindley, George Stephenson, James Watt and Murdoch to Faraday, Clerk Maxwell, Lord Kelvin, Marconi, Lord Rutherford and Sir Frank Whittle, who created them. It is curious that the great pioneers and inventors, who showed how wealth could be created on a scale never previously imagined, should have been blamed for the heavy labours and other evils of the earlier days of the revolution. It is now realised that these were not their fault, and there is no doubt that, in the words of Mr. Kay, "Mankind in general gained inestimable rewards from the hopes, the sweat and the misery which went into the creation of the modern world."

The book is profusely illustrated throughout, chiefly from contemporary sources. The pictures include prints of the 18th and early 19th century industrial scene, the climax of achievement in the industrial revolution, working drawings, portraits of the pioneers and illustrations of models of machines and ships. The book generally is one that gives a wealth of reading of a kind that will help all to understand how our modern world has come into being, and will suggest also that there are still worlds to conquer before our industrial revolution will have reached its goal.

"THE GREAT NORTHERN RAILWAY"

By R. A. H. WEIGHT
(Ian Allan Ltd., 3/-)

Mr. Weight's latest production forms No. 2 of the *Railways Before the Grouping* series now in course of publication. The author had the advantage of living by the main line of the Great Northern for many years. From this vantage point he maintained a unique day-to-day record of locomotive and train working from personal observation, supplemented by notes from officials and friends. Similar friendly co-operation in the matter of photographs, together with specimens from his own private collection, have helped him to produce a splendid pictorial record of engines and trains in Great Northern days. These range from Stirling single-wheelers, and less familiar types such as an American built 2-6-0 or an Ivatt 0-8-2 tank, some on typical G.N.R. trains of different periods, to the Gresley Pacific of 1922 with its 20-coach 610-ton test train. Intermediate and freight trains have their share of attention too.

There is also a most informative account of the G.N.R. and its affairs, so that the booklet makes a fascinating publication for anyone who remembers the old Great Northern; besides providing much of unusual interest for those who like to delve into the railway doings of the past.

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

NEW ADVENTURE STORIES

Any adventure story by JOHN PUDNEY is certain to be good, and *Monday Adventure* (Evans, 8/6) is as exciting as anything he has written. This new "Fred and I" yarn tells how they go as crew to Uncle George aboard his cabin cruiser "Bounty," on a fishing trip up the River Thames. While the craft is moored near old Blackmead Abbey, now being used by a film producing company, they discover that the film-making cloaks far more sinister activities, and their investigations soon land them in conflict with the crooks, with exciting results.

Incidentally, there is an interesting competition in connection with this book, and an entry form is included in each copy.

The Missing Cricketer (Evans, 8/6) is a fine sporting yarn by PATRICK PRINGLE that begins with two cricket-mad boys loitering outside a cricket pavilion, hoping to get the autograph of Dave Marshall, the star batsman of the Australian touring team. Two days later, Dave disappears—and he is still missing on the eve of the last Test, on which the Ashes depend.

But there is a clue to the mystery in the boys' autograph albums, and in following it up they are led into a series of thrilling adventures that end in a dramatic climax.

The Ghost Mare, by DAVID GREW (Warne, 7/-), is set in the "badlands" and prairies of Southern Alberta, Canada, and concerns a mysterious white mare that lured horses from the surrounding farms

to join her wild herd. Billy Thornton determines to capture and tame the mare, but the bad luck imputed to her seems to dog his efforts, threatening to ruin not only his own happiness, but the security of his home. How he succeeds makes a fine yarn.

Stories of adventure involving aircraft are in great demand, and in *The Airmen of Sheba's Temple* (Lutterworth Press, 5/-) GUY DEMPSTER tells an exciting story set in South Africa, in which the heroes get mixed up with a gang of crooks and an eccentric archaeologist with whom they had planned to start an airline. How the airline is eventually started in the face of every difficulty, how the crooks are run to earth and how Sheba's Temple is discovered at last all help to make this a most thrilling story.

Another good aviation yarn is *Crash Landing* by ERIC LEYLAND (Brockhampton Press, 5/-) in which Uncle Mick, a Hatton Garden diamond merchant and famous war-time pilot, takes young Tony, his nephew, for a flight in his two-seat glider. What Tony saw happening on the ground as he looked down from the glider was later found to provide a clue to the identity of thieves who stole diamonds worth £30,000 from Uncle Mick's safe. Tony becomes involved in exciting events that follow the theft and include a glider flight that ends in Belgium. Eventually the diamond thieves are caught and their booty recovered.

The Dongoi Killer by C. T. STONEHAM (Museum Press, 6/-) is a dramatic tale of life in wild Africa. Its author was a professional hunter for many years, and has an intimate knowledge of the life he describes. The story concerns two young men who take over a coffee farm in the Kenya mountains. They learn that a band of Wakamba criminals have taken refuge in the adjacent mountains and that Ogot, a rogue elephant, has also entered the district. The two men set off into the hills in search of this wild giant, for whose slaughter a reward is offered, but find themselves in turn hunted by the savage natives. They have a hectic time before finally outwitting the enemy and killing the elephant.

**"ROCKETS, JETS, GUIDED MISSILES
AND SPACE SHIPS"**By J. COGGINS and PRATT
(Sidgwick and Jackson, 10/6)

One day, perhaps sooner than we expect, a young man looking like a cross between a deep-sea diver and a mediæval knight will clamber aboard a giant rocket, at the start of the greatest adventure still awaiting mankind—a space-flight to the Moon. This book is intended for the other young men who will help make that dream come true. Most of them are still at school, but they will be the first true rocket engineers, because so far our big rockets have been built by men who were originally aircraft engineers, chemists, physicists and mathematicians.

So far, too, rockets have been used chiefly for war. The best known method of stopping enemy tanks is by rockets; so is the best method of stopping enemy aeroplanes and submarines. But V.2-type war rockets are already paving the way for space-flight, testing new fuels and methods of control, and probing the secrets of deadly cosmic rays more than 150 miles above the earth with monkeys, mice and delicate test instruments for "passengers."

This new American book tells the story of the rocket from early times to the present day, and gives fascinating glimpses of the future. There are a few minor errors in the text, but the magnificent illustrations by Jack Coggins, many in full colour, more than make up for these slips. The authors explain in simple terms how all the various types of rocket and jet work, and how they have been used, from the primitive "firework" rocket with which the Chinese routed a Mongolian army in the year 1232 to their complex World War II counterparts. Mr. Coggins also gives exciting pictures of the sort of worlds scientists will find when they land first on man-made space-stations and then on the Moon and planets.

JOHN W. R. TAYLOR.

"EGGS AND NESTS OF BRITISH BIRDS"

By R. L. E. FORD (A. & C. Black, 6/6)

Watching birds at their nests calls for a sound technique as well as plenty of patience, and in the first part of his book Mr. Ford tells the beginner how to construct a simple but effective "hide" from which to observe birds, how to dress so as to be as inconspicuous as possible, the use of artificial bird calls, and how to acquire the art of finding nests by ear. He goes on to describe types of nests and nesting-sites; variations in the shape, colour, texture and markings of birds' eggs, and explains for the beginner some of the terms usually used in describing the eggs.

The second part of the book is devoted to descriptions of the nests and eggs of British birds. The eight colour plates of birds' eggs will be of great help to the young nature student seeking to identify his "finds," and in addition there are 19 fine half-tone photographs of birds and their nests.



Green woodpecker, showing the strong tail features splayed out and gripping the bark to support the bird. Photograph by Lionel E. Day. (From "Eggs and Nests of British Birds" reviewed on this page).

**"TEACH YOURSELF MECHANICAL
DRAUGHTSMANSHIP"**

By S. M. HOOD (English Universities Press, 6/-)

Readers who have decided to take up Mechanical Draughtsmanship as a career will find this book a great help in mastering the basic principles of the subject. Experience has proved that the best progress is made by the student who has received a training in the principles of plain and solid geometry, and the author therefore deals fully with certain geometrical principles which find application in drawing office practice.

The book is arranged in the form of 11 lessons dealing respectively with equipment; geometrical application and construction; types of projection; pictorial drawing; sections; screw threads; nuts; bolts, washers, etc.; locking devices; limits and tolerances; freehand and working drawings. Finally there is a valuable set of data tables. Many line drawings help to explain the text.

**"LOCOMOTIVE
CAVALCADE, 1920-1951"**

(H. C. Casserley, 20/-)

Our locomotive enthusiast readers will revel in this book, which tells broadly the locomotive story in Britain over the period included in the title. It is packed with pictures, all of them from the author's own camera, and these form a remarkable record of many of the engines that have seen service during the time. Some are with us still, but many unfortunately have been withdrawn in the name of progress.

The book includes many representatives of classes that have been familiar in their time, with individual locomotives from many of the smaller lines here, there and everywhere in Great Britain and Ireland, and some of the illustrations, including the "multiple" frontispiece and jacket, are

in colour. The text backs up the illustrations with many good stories, personal experiences and so on.

There is a good index to the illustrations, and details of the classes of engines that have become extinct and all new designs introduced during the same period are included in appendix form. The author indeed provides a wealth of pleasant reading. Copies of the book can be obtained directly from him, price 20/-, at "Ravensbourne," Berkhamsted, Herts.

"SHIP RECOGNITION—MERCHANT SHIPS"

By LAURENCE DUNN (Harrap, 12/6)

There are over 31,000 steam and motor vessels of all nations on the high seas. Obviously no one can hope to remember all their names, but it is possible to know their types and characters, and so be able to answer the question "How can you recognise her?"

The author of this excellent handbook is a well-known marine artist in shipping circles, who served during the war years in the Admiralty, and is an expert on his subject. He explains his particular technique of ship recognition and illustrates it with over 200 photographs and drawings. There is a good glossary, and an index that lists over 340 characteristic ships and types.

How I Found a Sea Eagle's Nest

Bird Watching in Iceland

By Henry A. S. Key

OUR party consisted of three, my wife, my friend Henry Stansfield and myself. We had travelled more than a thousand miles from our port of embarkation in Scotland, using various modes of transport and had at length reached this remote valley in the north of Iceland, where we hoped to find the eyrie of the sea eagle, a species that ceased to nest in Britain nearly half a century ago.

We sited our camp by the shore of a fjord, facing a scene of austere beauty. From the opposite shore a valley stretched away into the distance, hemmed in by ranges of ice-capped mountains with craggy slopes and snow-filled gullies. Torrents of water from the melting snows cascaded down the ravines, here and there precipitating themselves over rocky ledges to boom and thunder with clouds of spray on to the boulders below.

Vegetation was sparse, the lower slopes being clothed with coarse mountain grasses, dwarf heather, juniper and mosses enlivened by the pink cushions of Saxifrage, a flower that in Britain is found only on the highest hills. Few other species of prominent colour were to be seen, apart from the yellow cups of the Iceland poppy and the starry white blossoms of the mountain avens. The nakedness of the broken scree was irregularly clothed with birch scrub, now vividly green in small leaf, and from its shallow depth, nowhere greater than three feet, the song of redwings re-echoed across the valley.

As it was midsummer, there was no darkness in this northern latitude and the strong air induced adventure. On most days the Arctic skies were deep blue, contrasting sharply with the billowy masses of pure white cloud, but occasionally, as a reminder that we were adjacent to the Arctic Circle, the wind would veer north-westward, cooling itself still further as it tore over the ice-caps, and from a leaden sky would roar down the glen to test our little tents and their anchorage.

At all hours, almost the only sounds were those of the birds for whom this area held special attraction. Arctic terns fished for herring fry at the water's edge. Eiders and several other species of duck

regularly swam past, while marauding skuas, chased by gulls, poached their food by attacking other species until they dropped any fish that they had caught. Whimbrel and golden plover called plaintively from the hummocky grasslands with parental care, while by the shore the "kleeping" calls of anxious oystercatchers startled ringed plovers, purple sandpipers and other waders.

In the late evening, when the rosy glow of the lowering sun lit the hills with an ethereal light, the eerie calls of great northern and red-throated divers as they courted far out on the "lake" engendered an unearthly atmosphere.

During the second evening in camp we spotted an adult eagle, molested by a party of noisy gulls, flying towards the valley along the far shore, disappearing soon behind a fold in the hills. Encouraged by the occurrence, we set out early on the



The author examines closely the two eggs of a sea eagle's nest on a narrow ledge, high on a cliff in Northern Iceland.

next morning, crossing the fjord by boat, full of hope and braced up by perfection of weather. We stumbled along the rocky shore, where broken masses of crag tumbled into the deep waters, and along a strand of black volcanic shingle until we reached

avail. An occasional snipe from its cover in the birch, one or two wheatears and redwings, and several meadow pipits scolded this intrusion into their breeding grounds, while a pair of ravens croaked their annoyance from a higher precipice.

From this eminence I could see small parties of goosander feeding in the streams far below.

For a mile or more I continued ranging the crags, becoming more disconsolate with each step, till I came suddenly to the end of this first range, where the hills were deeply cleft by a ravine. Far up the valley I was overjoyed to see one other likely site sufficiently precipitous to provide the eagles with a home, and hurriedly I retraced my steps with the good news.

More rough travelling for an hour and we were at the foot of the towering mass of rock buttresses. Barely had we started to make a detailed inspection with our glasses when I saw twin

specks silhouetted against a distant snowfield. The telescope revealed a pair of the eagles for which I was looking! Such good fortune was almost unbelievable and gave every promise that we should attain our goal.

Almost immediately one of the birds flew from its airy perch to another farther along the crags, showing as it did so its enormous spread of wing. Excitedly, as my companions kept vigil, I climbed rapidly up the slippery scree and broken rock slopes, quite out of breath, until I came to the main face of rock, which was cleft by a series of steep gullies, some of which were dry, while others, more sheltered, were treacherous with insecure snow-slopes cut by icy torrents. I made my choice and climbed steeply, slipping and slithering, clutching whatever tuft of sparse vegetation or rock hand-hold I could find, slowly ascending and dislodging pieces of insecure rock, which fell with a great deal of clatter to the foot of the gorge. At last I reached a narrow ledge and negotiating this came to the head of the pinnacle. I heaved myself over the last rock wall digging my toes into each shallow crevice.

Imagine my delight on attaining a narrow grassy ledge not more than five



A ringed plover standing over her eggs. The photographs illustrating this article were taken by the author during his Iceland adventure.

a sandy margin where the mountain stream fed into the fjord through a delta of rushing burns.

The course of the river along the floor of the valley was divided by a network of channels carved by winter floods, and several of these we crossed where the waters were shallow over the spate beds. We toiled with our packs over large areas of grass tussocks until presently we came to the first promising mass of crags where a ghyll cleft the fell slopes. The noise of our clambering startled a grey hawk from some ledge high up on the massif, and we got our first fleeting glimpse of an Iceland falcon.

But we were in search of larger "game" and scanned the heavens eagerly for a sign of the majestic birds. Our gaze wandered downwards to the snows and then to the rocks, but we were not rewarded. Could it be that they were perched out of sight beyond some buttress, for we felt convinced that they must be in the vicinity?

Leaving Henry Stansfield and my wife to watch from some vantage point, I scaled the crags for a height of several hundred feet, peering into all likely ledges and crevices and clapping at intervals to disturb any unwary birds, but all to no

paces along, at the far end of which in a shallow depression in the turf lay two white eggs. The eagles, which had flown away at my approach, now reappeared from their look-out on the opposite side of the valley and circled round at no great elevation with outstretched pinions, legs lowered and talons extended as if to attack, calling with their shrill cries. They were massive birds, dark grey in colour with white tails, their length being in the region of three feet and the span of their wings nearer eight. The threatened attack was fortunately not pressed home.



The nest of a redwing in birch scrub.

I shouted to my companions, who of course could not hear me at this range, but understood my gesticulations and climbed as quickly as possible to share the pleasures of our find. We feasted our eyes on the soaring flight of the birds and sensed the feelings of space and solitude aroused by this elevated site. Then, in order not to disturb their breeding, we photographed the nest and made a rapid departure—our steps lightened by this wonderful experience.

By the way, the photograph in which I am seen examining the sea eagle's eggs was taken by delayed action.

The Barisal Guns

By Charles Manning

THE Barisal Guns are not a new form of armament; indeed, they are not guns at all, but are merely gunfire sounds originating at Barisal, a village near the mouth of the Ganges in India. These mysterious detonations are not confined, however, to Barisal. They have been heard all over the world, including the British Isles.

Mr. G. B. Scott, a traveller, recorded his impressions of the now famous "guns" in the last century.

"I first heard the Barisal Guns in December 1871," he writes. "I was on my way to Assam from Calcutta through the Sunderbunds. The weather was calm and clear, no sign of any storms. All day the noises aboard ship prevented other sounds being heard; but when all was silent at night, and we were moored in one or other of the narrow channels in the neighbourhood of Barisal, Morelgunge, and upwards, far from any villages or other habitations, at intervals, irregularly, could be heard the dull muffled boom as of distant cannons."

Barisal Guns have also been reported from many parts of Australia. When on the journey in which he discovered the Darling and Murray Rivers, in 1828, Sturt observed in his journal:

"About 3 p.m., on the 7th, Mr. Hume and I were occupied tracing a chart upon the ground. The day has been remarkably fine, suddenly we heard what seemed to be the report of a gun fired at a distance of between five and six miles. I sent one of the men immediately up a tree but he observed nothing unusual."

The British Navy are not unaware of these Barisal Guns. In an entry from the log of the *Resolute* on the high seas in the year 1883, appears the following:

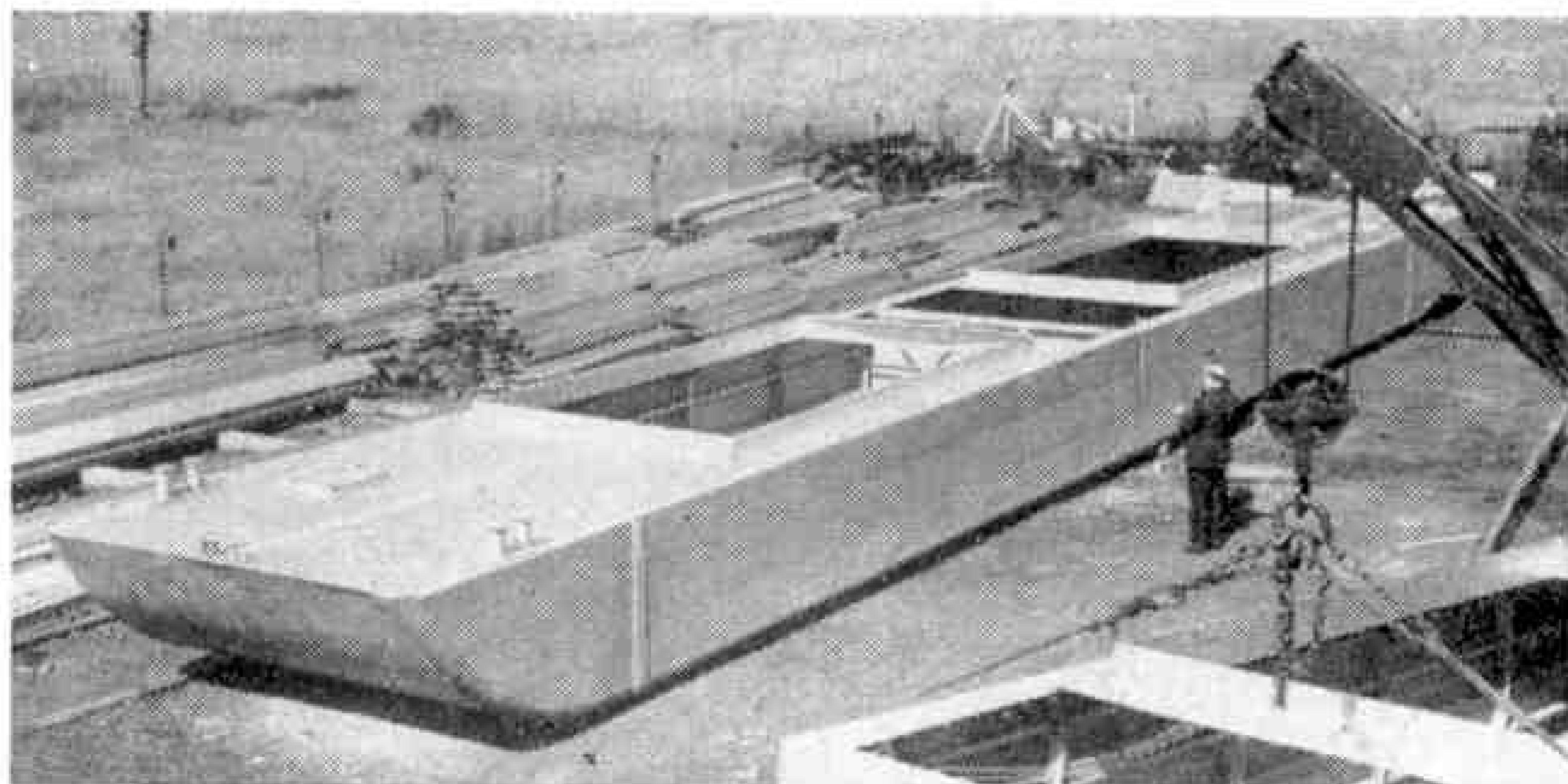
"Six reports like those of guns to the westward, supposed to be caused by electricity, as no ships are in the vicinity. The position given is 71° 09 N. 12° 28 W. about sixty miles west of Jan Mayen Island."

Many explanations have been given for these sounds: fireworks, actual guns, bamboos bursting in heat, thunder, lightning, landslides, underwater eruptions. But so far none of these has satisfied those who have actually heard them.

Engineering Notes

Special Barges for Service in Belgian Congo

During the last 20 years increasing use has been made of aluminium alloys in the construction of small marine craft, and an excellent example of the



An aluminium-alloy barge designed for service in the Belgian Congo under construction. Photograph by courtesy of Thorpe Brothers (Bessborough Works) Ltd., West Molesey.

use of these alloys is seen in the upper illustration on this page, which shows one of 60 special barges that are being built by Thorpe Brothers (Bessborough Works) Ltd., Molesey, for service in the Belgian Congo. The barges will be used for transporting general cargo from the upper reaches of rivers down to ports on the coast. Aluminium alloy is of course admirably suitable for this trade, as it is immune from attack by various marine worms and borers, which limit the service life of wooden craft to about three years.

The use of aluminium alloys, besides ensuring freedom from corrosion, immunity from parasitic attack and minimum maintenance requirements, has made possible a draught of only 5 in. unladen and 3 ft. 1 in. laden, which are considerably less than those of an equivalent steel barge. This shallow draught will allow the barges to be used for eight months of the year, which is well into the dry season when the rivers are denuded of water.

The barges are designed for pushing rather than towing, and for this purpose are fitted with large wooden bumpers, or fenders, at each end. In order to ensure absolute watertightness a special sealing agent is inserted between the plating and the frames. This sealing material will retain its plasticity for many years.

The total weight of each barge, with all fittings, is no more than six tons. Each has a length of 77 ft. and a beam of 11 ft. 6 in. and a depth of 4 ft. 6 in. The hold capacity is 60 tons, 40 cubic feet being allowed per ton.

The hull is subdivided by means of three watertight

bulkheads, which provide two cargo holds and two peak tanks.

For convenience the barges are shipped to the Congo in two halves, which are assembled together at their destination.

Heavy Load leaves Rugby for Canada

One of the heaviest single-piece loads ever to leave the Rugby Works of the British Thomson-Houston Co. Ltd., by road, was despatched recently on the first stage of its journey to Canada. It was the completely-wound stator of a British Thomson-Houston 25,000-kW hydrogen-cooled turbo-alternator set, built for the Ford Motor Company of Canada, and it will be installed at the Company's Works at Windsor, Ontario.

The stator itself weighs 97-tons, and with its specially-constructed steel transit skid, made a total dead-weight load of 109 tons.

Because of the size and weight of the load it could not be transported by the most direct route from Rugby to Liverpool and detours of over 50 miles had to be made. When it reached Liverpool Docks the stator was lifted on board the S.S. *Arabia* by the 250-ton floating crane *Mammoth*, which is a familiar sight on the Mersey.

After crossing the Atlantic to the port of Sorel in the St. Lawrence river, the load was taken to its destination by a special train travelling at a maximum speed of 10 m.p.h. The train was accompanied by special railway workers whose job was to clear the route of any obstructions such as signals and so on.

The steam turbine that will drive this huge alternator will run at 3,600 r.p.m. under a steam pressure of 800 lb. per sq. in. at 800°F.



Stator of the BTH 25,000 kW hydrogen-cooled turbo-alternator for Canada, en route from the BTH Works at Rugby to Liverpool Docks. The weight of the load was 109 tons. Photograph by courtesy of British Thomson-Houston Co. Ltd., Rugby.

Milestones of History

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

WITHOUT the help of the signposts and milestones that stand beside our highways, modern road transport would operate under a severe handicap. Although many such roadside objects were removed in 1940 as an anti-invasion measure, most of them have now been replaced.

Many of these milestones merit preservation as historic relics. Their story goes back roughly 2,000 years. The earliest in Britain are believed to have been set up alongside the military highways built by the Romans, and the oldest example standing today in this country is to be seen between Corbridge and Carlisle. It was erected 1,600 years ago to help the Roman legions travelling to and from the forts along the Roman Wall.

The Roman mile differed from our present-day statutory mile. It is thought that the Romans standardised the distance between each pair of milestones at 1,000 double paces. This made their mile 1,620 yards instead of 1,760 yards, so that 725 Roman miles are needed to make up 665 of our English miles.

London has a souvenir in the same category as the Corbridge Roman milestone. This is the famous London Stone in Cannon Street, the central point from which the distances along the Roman roads in Britain were measured.

This London relic does not now occupy the exact site on which it stood originally, when it was the equivalent in Britain of the gilded pillar set up in Rome to mark the centre of the Roman Empire. Until 1742 it was on the opposite side of Cannon Street to that now occupied. In 1796 its removal was only averted by the generosity of a public-spirited citizen, who had it

built into the wall of St. Swithin's Church, where it remains today.

The heyday of the milestone in Britain did not arrive until stage-coaching became general, and many of the most entertaining specimens date from the 18th and early 19th centuries. In those days such stones were often given by local philanthropists, and there was little uniformity about their design or strict accuracy about the distances

quoted. The value of old milestones to the modern traveller is consequently restricted, but "collecting" them can be an absorbing hobby. A close examination will often reveal singularities of great interest.

Some examples take their measurements from churches. Two stones of this type stand near Bramhope, between Leeds and Otley, for they indicate the distances to the churches at Burley, Ilkley, Addingham, and other places.

In one instance here the mason who carved the words apparently outran his patience, and eventually used the map-maker's abbreviation, a cross, instead of the word

"church"! In Wiltshire there are several venerable milestones using the shorter and older name "Sarum" for "Salisbury," but the height of brevity seems to have been achieved in the New Forest by a mason who merely inscribed 2B on one side of a stone and 4B on the other, leaving wayfarers to figure out for themselves that the point is two miles from Beaulieu and four miles from Brockenhurst.

Incorrect milestones have sometimes been set up deliberately to hoodwink the public! When it was claimed that Atherstone, Warwickshire, was exactly 100 miles from London, Liverpool and



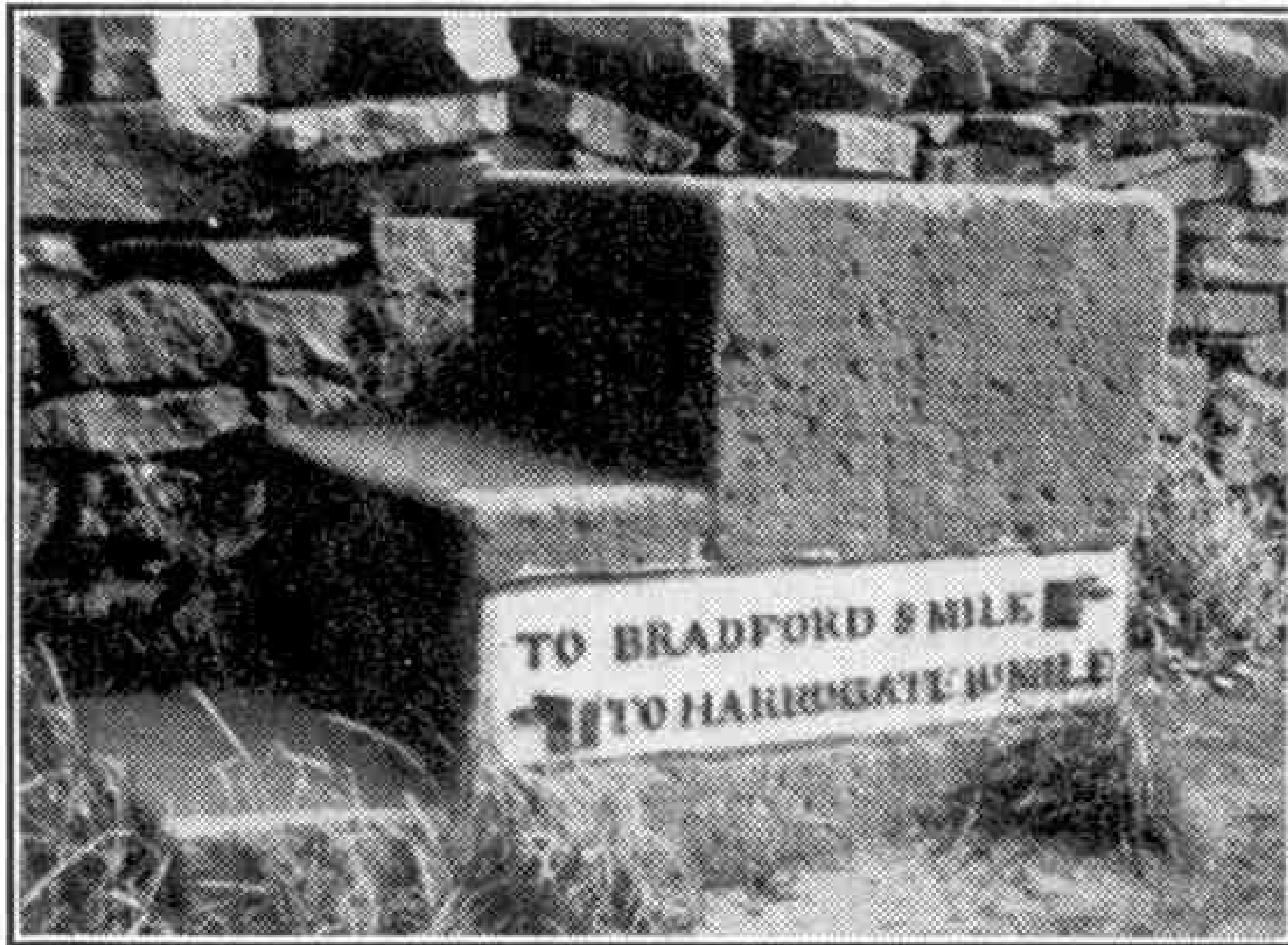
On this unusual milestone, to be seen at Thirsk, are carved a shepherd, a lamb and a calf.

Lincoln, the statement was challenged. To "prove" the point a milestone was erected outside the Red Lion Inn, and the distances carved on it were calculated to uphold the claim. In reality, though London and Liverpool are roughly 100 miles from Atherstone, Lincoln lies less than 70 miles away from that centre!

Even more astonishing were the distances quoted on the stones beside the London-Brighton road in Georgian times. Although the resort is nearly 52 miles from London, the stones were so spaced that only 50 were needed to cover the distance.

The explanation was that in those days the Sovereign was not allowed to travel more than 50 miles from London unless a Minister of the Crown went with him. On one occasion, when George IV wanted to visit his beloved Brighton Pavilion at a moment's notice, no Minister was available to accompany him. The milestones along the route therefore were re-distributed to bring Brighton within 50 miles of London, thus permitting the King to go to the seaside without a Minister on future occasions!

A peculiarity about certain milestones standing in the Settle district of Yorkshire today is that they indicate the distances to Halifax, in the industrial West Riding. They are relics of the era when wool was spun and



An old mounting block has been put to good use as a milestone on the road between Bradford and Harrogate.

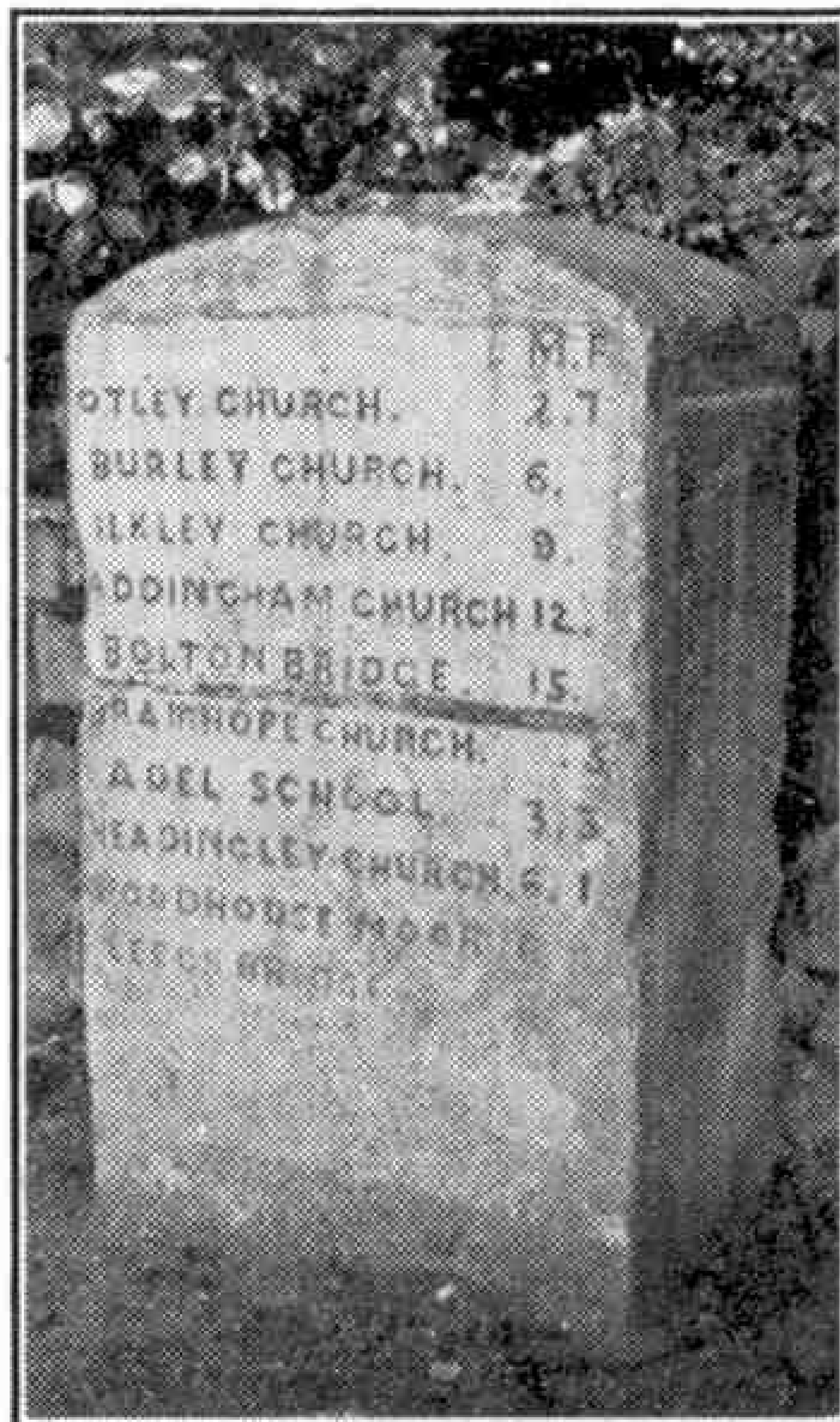
distance marks, but old examples take an amazing variety of shapes.

Coats of arms appear on some of them—as, for instance, on a specimen three miles from Royston, on the London-Cambridge road. The emblem in this instance is a reminder that the stone was set up in

accordance with a bequest administered by the dons of Trinity College, Cambridge. The crest, in fact, is that of the College.

Derbyshire long ago widely adopted an unusual style of milepost, resembling a bobbin on a stick, while a curious example on the outskirts of Thirsk proclaims that the district is a big farming area. One side of the stone, which is triangular, depicts a shepherd carrying a sheep, while on another side is a picture of a calf.

In some localities old mounting blocks have been adapted as milestones by having a plate attached to them or the distances inscribed on the side. In the early 18th century a whole series of stones with three steps, and carved with mileages, were erected between Grantham and Stilton.



It seems that milestones do not always give distances between towns and villages. Here is one, which stands on Pool Bank, near Otley, that shows the distances to many churches.



A trio of Hiller Hornet Helicopters, including the prototype with enclosed cockpit, etc. Photograph by courtesy of Hiller Helicopters, Inc., U.S.A.

Air News

By John W. R. Taylor

Helicopter Jeeps Ordered

The U.S. Army, Navy and the Marine Corps have each ordered a small number of Hiller Hornet two-seat ramjet-powered helicopters, so as to determine their value for casualty evacuation, liaison, reconnaissance, wire-laying, artillery observation and other duties.

Designated HJ-1, the Hornet has only two hand controls, no foot controls, and lacks completely the usual complicated helicopter engine and transmission mechanisms. Its twin 35 h.p. ramjet engines weigh only 12 lb. each and have no moving parts. They burn almost any type of low cost fuel, including lower grades of petrol, paraffin and diesel oil, and can be removed from the tips of the 23 ft. rotor in a few minutes with no other tool than a screwdriver.

Development of the Hornet as a cheap family and sports aircraft began four years ago, but production was stopped by the Korean War, for which Hiller have been mass-producing military versions of their famous three-seat Type 360. The HJ-1 Hornets will weigh about 360 lb. empty, and carry a useful load of 600 lb. at up to 80 m.p.h. They will have a skid undercarriage instead of the usual wheels, to give greater stability in field operations.

Trooping by Air

The movement of British servicemen and their families overseas and on leave is now done largely by air transport. Regular flights, carrying troops at a rate of over 120,000 a year, are being made between Great Britain, the Middle and Far East, Jamaica, Malta, Gibraltar, West and Central Africa.

Comets for P.A.A.

The importance of Pan American World Airways' recent order for three de Havilland Comets is out of all proportion to the number of aircraft involved. It marks the first practical admission by a major U.S. airline that American designers cannot hope to compete seriously with Britain's splendid series of jet-powered air liners for many more years.

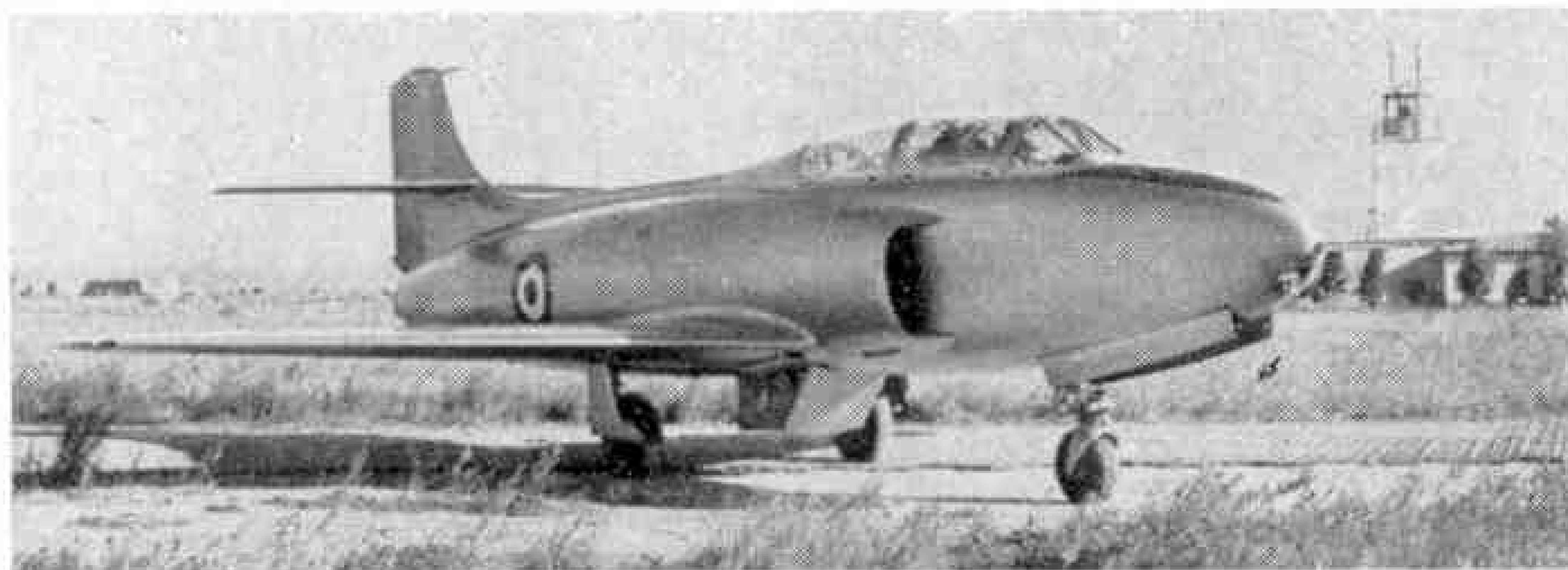
Pan American's Comets will be of the Series III type, scheduled for delivery in 1956, and the company hold an option for seven more in 1957. They will be half as big again as the Series I Comets now being operated by B.O.A.C. to South Africa and the Far East, with a wing span of 115 ft., length of 111 ft., and loaded weight of 145,000 lb. Powered by four 9,000 lb.

thrust Rolls-Royce Avon R.A.16 turbojets, they will be able to carry 58 first-class or 78 tourist-class passengers, plus mail and cargo, for 2,700-mile stage lengths on the airline's long international routes, at a cruising speed of 500 m.p.h., with full allowance for head winds and fuel reserves. An unusual feature of the Comet III will be large external fuel tanks attached under the leading edge of each wing near the tip.

Vickers Design Changes

Production versions of the super-priority Vickers-Supermarine Swift fighter and Vickers-Armstrongs Valiant bomber, shown at the last S.B.A.C. Display, vary in many respects from early prototypes.

The cockpit of the Swift has been moved forward, as have the air intakes for its Avon turbojet. Ports for two large-calibre guns are visible under its fuselage; but this armament will almost certainly be doubled in due course. Similarly, the rear end of its fuselage will probably be fattened to house an after-burner, which will be standard equipment on all Swifts,



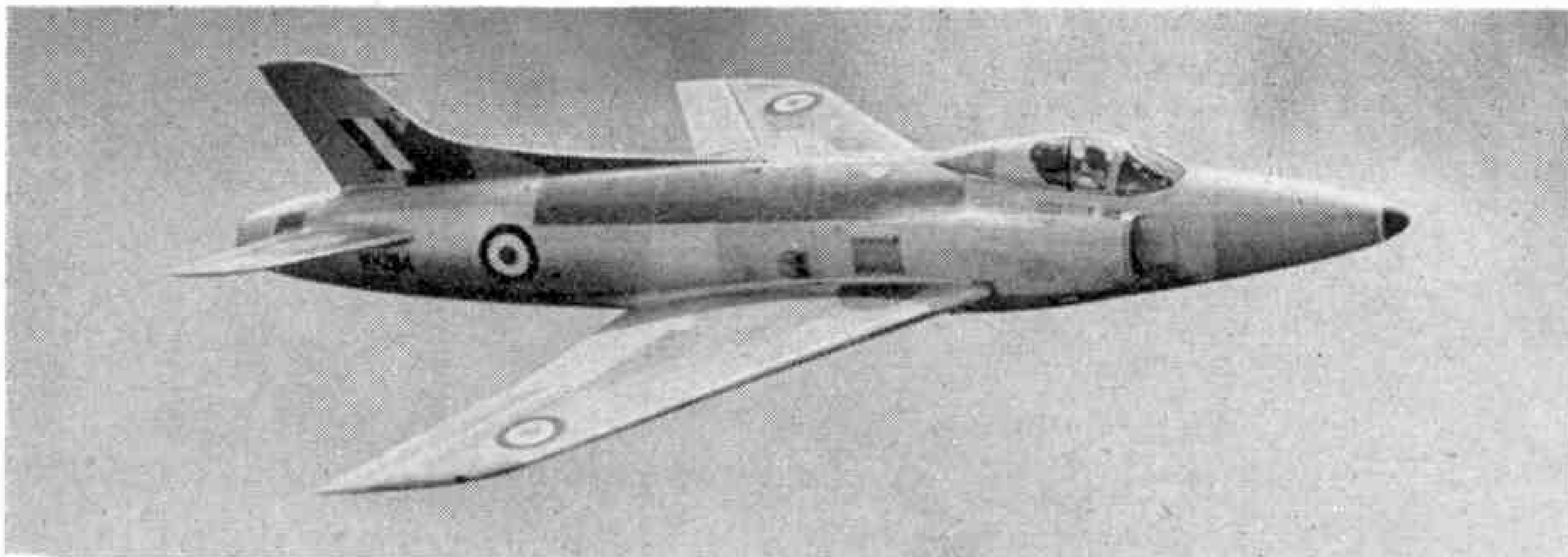
Fiat G.80 jet trainers are in large-scale production for the Italian Air Force. Here is the G.80-1B version. Photograph by courtesy of Fiat Aircraft Company, Turin.

Hunters and Canberras.

The second Valiant has bigger "half-spectacle" shape air intakes for its engines, indicating probable use of a new higher-powered mark of Avon.

Green Flare Path

The flare path on Rose Bay, Sydney, which guides flying boats in to safe landings at night, is now green instead of amber. The change was made following complaints of difficulty in distinguishing the old



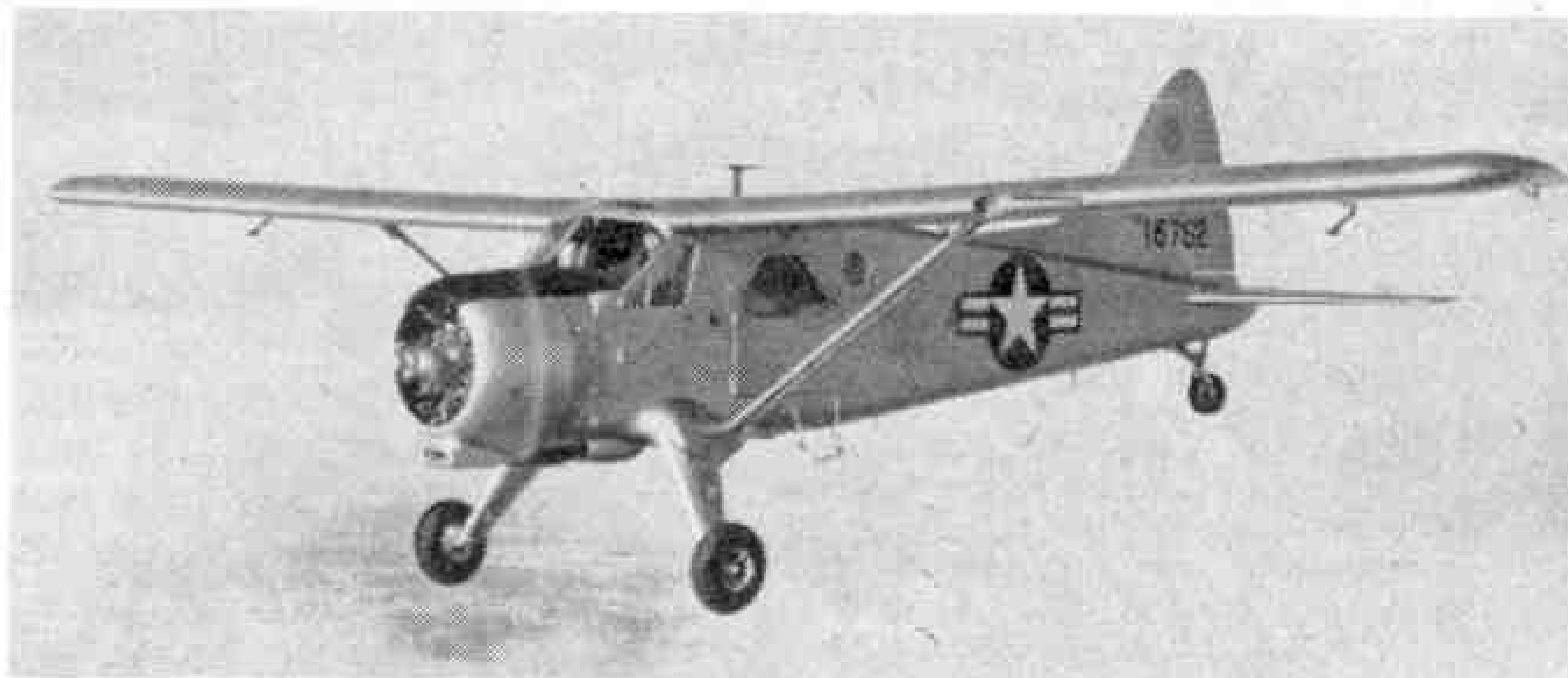
Vickers Supermarine Swift, the first British swept-wing jet fighter to go into production for the R.A.F. Photograph by courtesy of Vickers-Armstrongs Ltd.

flare path from hundreds of harbour-side lights surrounding it.

Australian Department of Civil Aviation experts decided that green flares would show up best, especially in bad weather when visibility is poor. They then installed the lights, went up one night in a flying boat and proved to themselves that they were right.

Hit an' Git

U.S. Marines, who pioneered the use of helicopters for troop transport, have developed a new technique for hitting an enemy hard when and where he least expects it. It entails delivering a 24-barrel rocket launcher, slung under a Sikorsky HRS-1 (S-55) helicopter, to an advanced position from which it can fire off a few quick salvos. Before enemy artillery can start to fire back, the still-hot rocket launcher is hooked back on the helicopter and flown away to safety, or another site, complete with its crew.



D.H. L-20 Beaver liaison aircraft in service with the United States Air Force. Photograph by courtesy of de Havilland Aircraft of Canada Ltd.

The Beaver

Following the phenomenal success of their little Chipmunk trainer, de Havilland Aircraft of Canada are now doing a roaring trade with their second design, the rugged seven-seat Beaver transport, illustrated above. Intended originally to meet the exacting requirements of Canadian bush flyers, for operation in all climates on wheels, floats or skis, it turned out so well that D.H. Canada entered a Beaver for a U.S. Air Force and Army design competition for a new liaison aircraft. Despite tough competition from U.S. manufacturers, it was an easy winner, and scores have already been delivered to the U.S. Army under the designation L-20. Hundreds of other Beavers are in world-wide service for passenger and freight-flying, air ambulance, soil top-dressing,

fishery and wildlife protection, forest fire patrol and many other jobs.

The Beaver is an easy-to-build all-metal aircraft, with a 450 h.p. Pratt and Whitney Wasp Junior engine that gives it a cruising speed of 137 m.p.h. for 480 miles with full load. It has a span of 48 ft., weighs 4,820 lb. and needs so short a take-off run that one based in England often takes off across the runway at Hatfield.

Italian Jet Trainer

The Fiat G.80-3B two-seat jet trainer is already in large-scale production at Turin for the Italian Air Force, and is hotly tipped as a standardised trainer for all N.A.T.O. countries. Such a choice would be wise, because its top speed of 535 m.p.h., excellent manoeuvrability and armament of two .50 in. machine guns, eight rockets or two bombs, would enable it to double as a fighter in an emergency.

Full flying and operational equipment, including twin ejector seats, are fitted to the G.80, which is powered by a 3,500 lb. thrust D.H. Goblin 35 turbojet. Versions with 5,000 lb. thrust Ghost (G-81) and Nene (G-82) engines are projected, and an all-weather fighter version is also under development.

Famous Aeroplane Moved

Australia's most famous aeroplane, Sir Charles Kingsford Smith's trimotor Fokker *Southern Cross*, is to be given a final home as a showpiece in the public lounge of the new overseas air terminal at

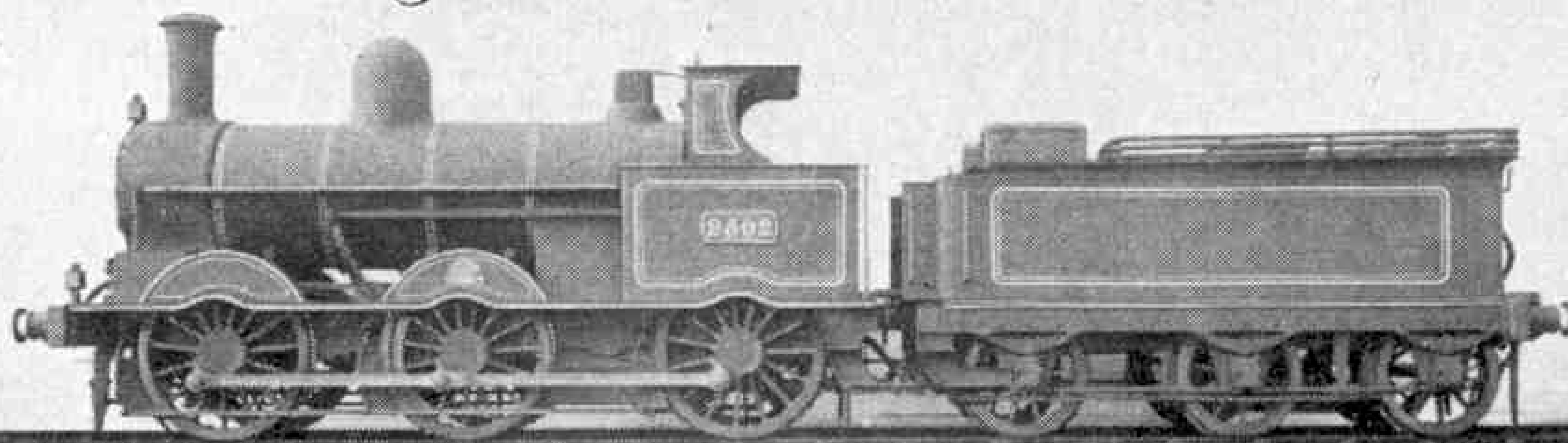
Mascot Airport, Sydney.

The adventures of *Southern Cross* did not end when "Smithy" retired it, after his pioneer flights across the Pacific. It has since been assembled, taken apart, re-assembled and filmed many times. Now it has been taken to pieces for the last time, for safe-keeping in store until the air terminal is completed.

Malaya Mercy Missions

Westland-Sikorsky Dragonfly helicopters of the R.A.F.'s Far East Air Force Casualty Evacuation Flight have lifted more than 200 sick and wounded from jungle clearings in Malaya and carried them to within easy reach of hospital since the Flight was formed two years ago. On occasion, the helicopters have landed their passengers literally at the hospital door.

Engine Nicknames



by R. S. McNaught

LIKE all other persons and things we hold in affectionate regard, railway engines have always been liable to get nicknames. From all I can gather, it is a habit very much confined to the British, who however do not hesitate to apply it to engines belonging to other people. This was noticeable when the original British Expeditionary Force—the Old Contemptibles—found itself on the Continent at the outset of the 1914–18 War. Somebody then spotted, with incredulous glee, the old-fashioned Belgian engines, which had huge square smokestacks like nothing else on rails; they were instantly dubbed *Souvenirs*, and the name stuck for ever.

To have some idea at least of the nicknames attached by time-honoured usage to various classes of locomotives is a very useful asset to any railway enthusiast, and should by no means be looked upon as a frivolous touch to our hobby. When one comes to look into the matter, it is obvious that in almost the majority of cases the “unofficial” name gives a clue to the usefulness or the popularity of the class concerned.

There are many instances in this sphere where a single word speaks volumes. For example, could there be a better name than *Mourners* for the little Webb 0-6-2 tank engines of the former London and North Western line? It does not require the eye of an expert to decide that these engines have never been liable to set up speed records, whatever their other qualities; and these must be many, for the class

has kept going years beyond what might have been expected.

It must be thoroughly understood that in writing of “nicknames” we are dealing only with what may be best described as “informal but generally-accepted titles which have never appeared either on name plates or in official records.” Thus, *Royal Scot* is not a nickname for that class; on the other hand *Baby Scot* definitely is a nickname for the smaller type, originally derived from Crewe Claughtons, which are known officially as *Patriots*.

Very occasionally an exception to the rule turns up, however. A good recent example is to be observed in the standard General Purpose class of the Eastern Region. These are officially B 1's or *Antelopes*. But one of them, its original number 8306, came into service with the splendid name *Bongo*, and this was too good a thing to miss. So to-day few of the men refer to the class as anything but *Bongos*, whether you like it or not. Apparently the unofficial

name was not liked in official circles, for after a works visit for overhaul No. 61005, as she now is, returned to service minus name plates. But they have since been restored!

After all, the B1's are excellent engines within their limits, and who could really dislike a *Bongo*?

The origin of nicknames is often one of the most intriguing mysteries. Obviously they must start with one particular person, most probably some foreman, fitter, or driver closely associated with a new engine right at its advent. I cannot trace

Our heading illustration shows a *Cauliflower*, one of the L.N.W.R. 0-6-0s that were given this name because of the fancied resemblance to this useful vegetable of the coat-of-arms on the driving wheel splashers. British Railways Photograph.

many instances of nicknames contrived after a machine has been in service any length of time. If the name is apt it sticks and soon spreads, and thus achieves a kind of unofficial sanction wherever the newcomer works. In due course it appears in print, probably first of all in one of the journals of the various railway enthusiasts' clubs or societies. Then it finds its way into the old-established monthlies, and finally into the spotters' notebooks, and then it would be difficult indeed to forget or change it.

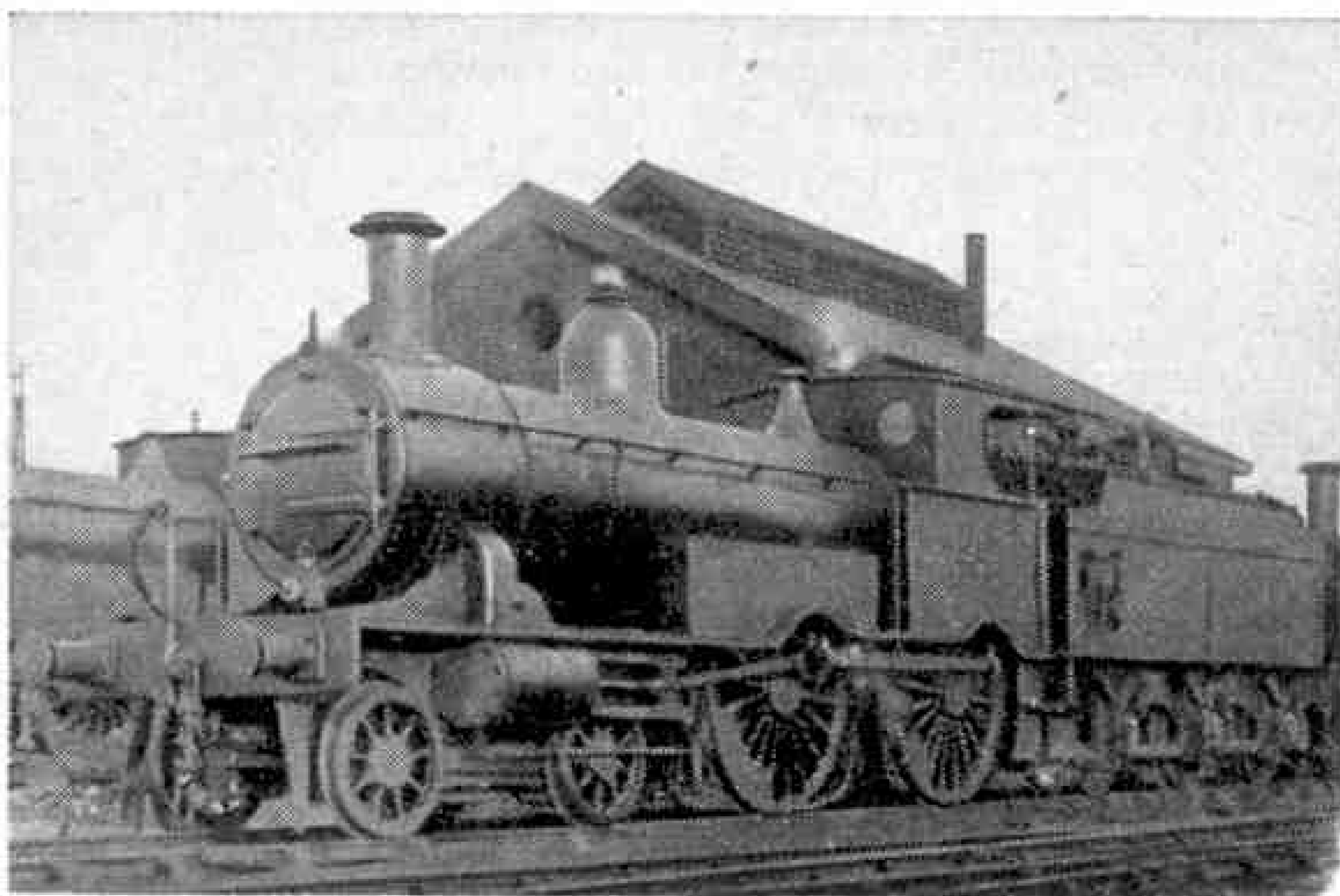
This process was easy in the case of a compact railway of the pre-grouping era, but even then I have often wondered, for instance, how soon after they issued from Crewe Works the stalwart 18 inch goods class—the official description—were talked of at Camden and Carlisle as Cauliflowers! This celebrated nickname of course arose from the innovation of adorning the engine's middle splasher with the coat of arms of the owners, which from a distance of a few yards looked singularly like that pleasant vegetable! Did the crew of the first 18 inch goods to surmount Shap say to the interested motive power workers at Carlisle Shed: "Well, here's the new model, and the chaps at Crewe call them Cauliflowers, so you call them the same?"

Do nicknames have any practical value in railway working? The answer is, "Yes, quite a lot," because they are invariably time-savers and very handy as such in the boisterous and noisy conditions of the job. It is a lot easier for a running shed foreman, with safety-valves roaring

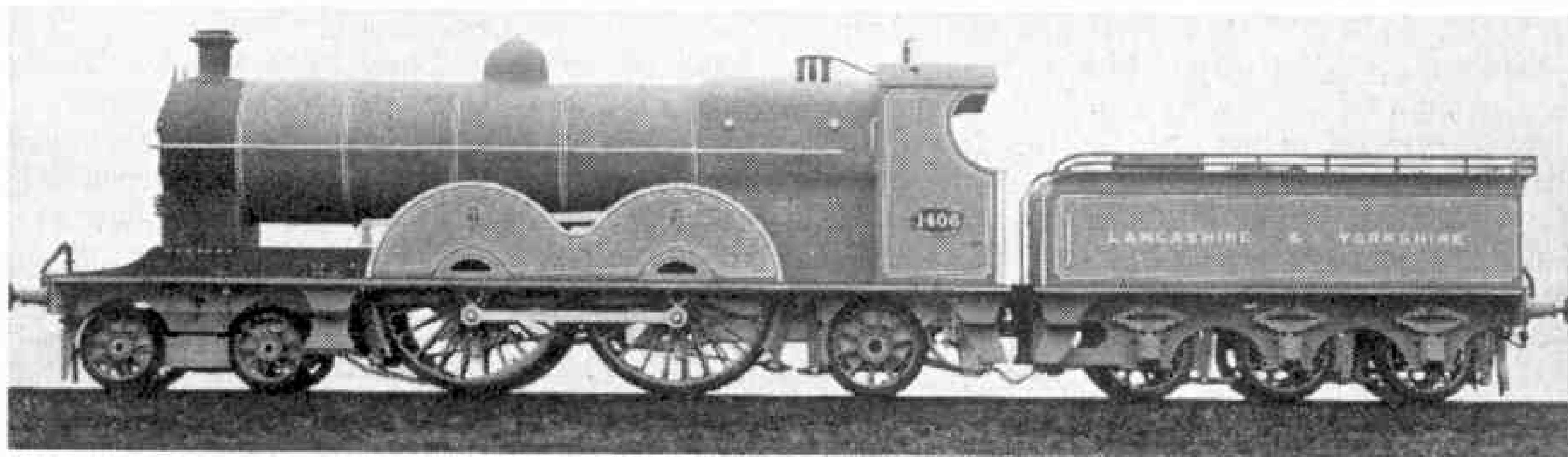
away in his immediate vicinity, to shout across several sets of metals to a spare crew "Get that Jenner off the coal stage quick" than "get that ex-Great Northern goods engine . . ." or even "get No. 10 . . . 6 off the stage." I would go further, and

say that the majority of the men know the engines only by their class nicknames, and whether the latter are frivolous, affectionate, or even the reverse of complimentary, they play a vital part in the everyday activities of shed, goods yard, or station.

I can recall watching some shunting operations at a station in which a Great Western 2-cylinder passenger engine was taking part—a grand old type now nearing extinction. To mere spectators at the platform end like myself, she was a Saint, and if we called her a Lady or even a Court we were also right, for the several groups form but one general class. But to the shunters, signalman, and inspector supervising the shunting, she was the



A Peacock 4-4-0 of the former Midland and Great Northern Joint Railway. These engines were built by the well-known firm Beyer, Peacock and Co. Ltd., of Manchester.



A Highflyer, or in other words a Lancashire and Yorkshire 4-4-2 as turned out from Horwich Works just over 50 years ago. The tall slender boiler and the big long-striding coupled wheels account for the nickname. The class became obsolete in 1934. British Railways Photograph.

Bristol engine, for their working timetables ordained that the engine from an incoming Bristol express should perform this regular shunting operation before proceeding to shed to turn and be serviced. But to the enginemen their steed was definitely a 29, and by no other name, even their official ones, were these famous engines known, whether Saints, Ladies, or Courts. Perhaps 29 can hardly be classed as a nickname as it was derived from the running numbers of the series from 2901 onwards, but on

I refer of course to the one and only Stroudley Terriers. It is true that to their drivers and firemen these great little machines were always the Rooters, but in their native Sussex the two terms are synonymous, and if you ever owned a terrier worth the name, you would know whether they are rooters or not! For such small engines to have found for themselves an honoured place in the Hall of Fame is a very remarkable thing, and of course some of them are still very much on the go. If



An L.N.W.R. Webb Compound 0-8-0 coal engine with the piano-front casing prominent ahead of the smoke-box. Many of the class were converted to superheated simple engines. British Railways Photograph.

the whole the G.W.R. standardised types led to fewer unofficial titles than on most other lines.

In the earliest days, the genesis of nicknames can be seen in the first lumbering Wylam Dillies, and Puffing Billy itself was scarcely likely to appear in its owners' records as such. As time went on and various firms set up in the new and very lucrative business of engine-building, their products, which of course were of their own design, were dubbed accordingly. Thus we find mention of Bury's, Sharpies, Vulcans or Peacocks, which are not difficult to identify. The same idea has been extended in more modern times; at the turn of the century some Brighton engines built in Glasgow were always called Scotchmen—a horrible name to the purist—and even in Southern days a batch of the well-known King Arthurs were similarly referred to as Scotch Arthurs. In many quarters, incidentally, they are regarded as the pick of all the Arthurs.

It would be impossible within the scope of a single article to give anything like a comprehensive list of nicknames of the past and the present, but I will group a small selection of perhaps the best known into the sections in which they naturally fall.

I will begin with the most celebrated of all engine classes to carry a nickname, and that in itself probably the most apt ever bestowed upon a class of engines.

you turn to page 52 you will see a fine picture of one of these famous engines.

A long list could be compiled of names with a whimsical turn derived from celebrities of the period. In its early days the Premier Line, the old L.N.W.R., had its Bloomers, both Large and Small, which must have caused the raising of many a prim Victorian eyebrow. The same company's men were once promised marvellous new compounds that were to conquer Shap and dispense with double-heading for ever. Actually they got the dullest and most sluggish of all Mr. Webb's creations, the 4-6-0 1400 Class four-cylinder compounds, and promptly called them Bill Baileys after the hero of a music hall song of the day.

Some feature or look, good, bad or unusual, is perhaps the most common source of a locomotive nickname. The L.N.W.R. Piano-fronts were a good example of this. They were given a curved box at their front ends to enclose part of the low pressure cylinder—they were compound engines—and this irresistibly suggested the curved lid over the case of a piano. Actually they were ungainly mineral engines. The L. and Y. Highflyers provided another instance. They were 4-4-2s that had unusually large coupled wheels, which gave them a long striking appearance, and tall slender boilers.

More examples of these nicknames will be given in a further article next month.

Photography

Developing the Film

By E. E. Steele

MANY people condemn photography because, they say, it is so expensive, but this need not be so if one is prepared to do one's own developing and printing. This reduces the cost considerably, and there is an immense satisfaction in completing the job from start



Loading a film in an apron type tank.

to finish. Admittedly it will be necessary to buy a few dishes and other essentials, but some of these may be borrowed from the household stock, and costs will soon be met by the saving in doing the work yourself, instead of paying the chemist to do it.

The cheapest way to develop a film is to see-saw it through a dish of developer, but it will be necessary to do this in a room that you have first made completely light-proof. With ortho films a red safelight may be used, but with panchromatic films it is wise to develop in complete darkness.

A far better method is to acquire a daylight developing tank. There are two types of tank; one containing a central spiral core into which the film is pushed, and the other having a celluloid apron inside which the film is coiled. In practice the film must be loaded into the tank in the dark. With experience this is done in a few seconds in a cupboard under the stairs, or some similar place that can be easily blacked out. The tank can be then brought out and all subsequent operations done in daylight, a very convenient method.

Purchase packets of developer and fixer, each to make one pint. Kodak D.76 developer is cheap and excellent, and each packet contains a list of films, with developing times for each type. Make up the chemicals according to instructions in the packets, and allow to cool to 65°F., the

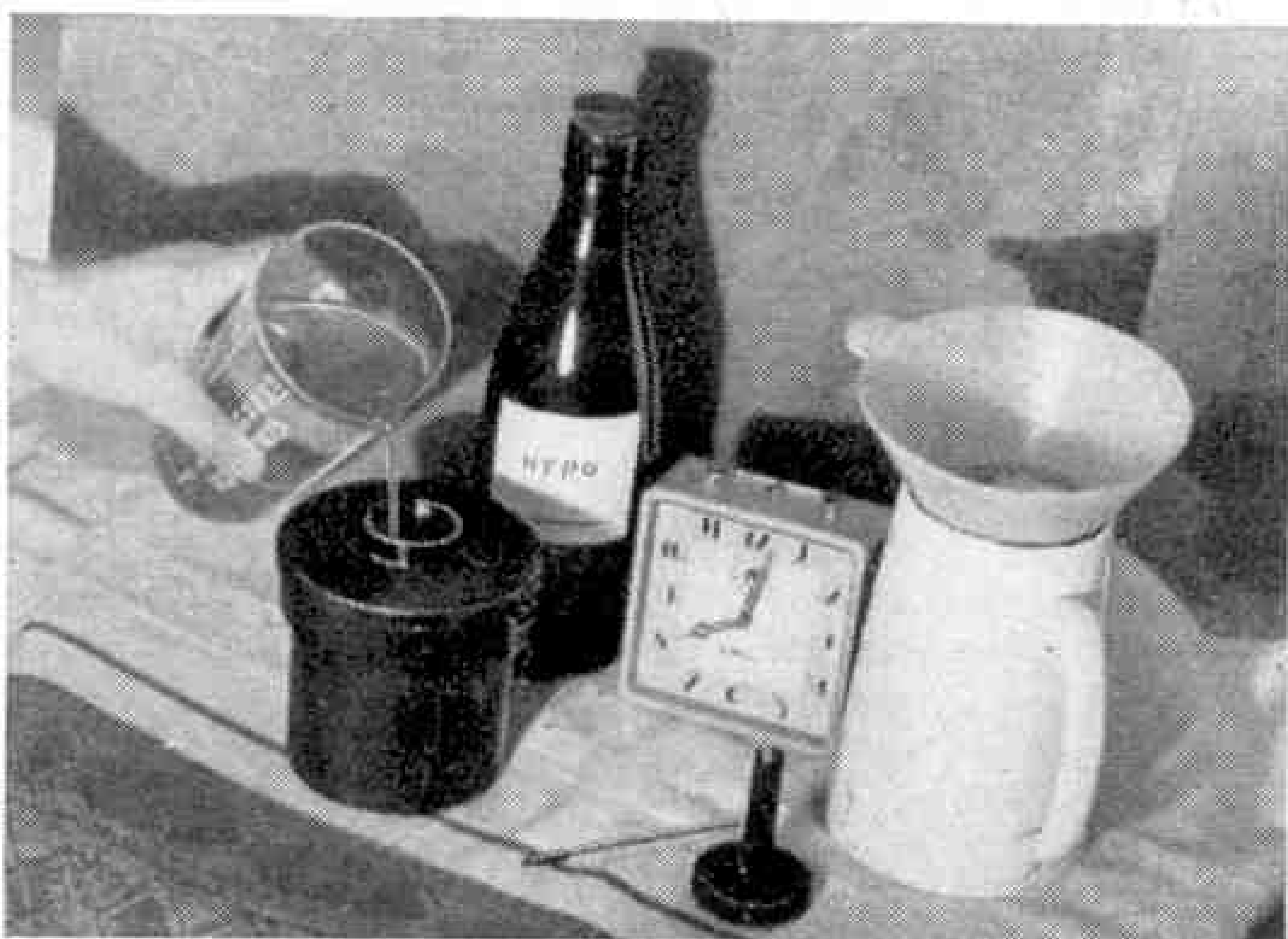


Developing a film in a dish by see-saw methods. The illustrations to this article are from photographs by the author.

recommended temperature. Pour in the developer and agitate the knob on the tank about every two minutes to keep the developer well circulated.

When the time is up pour the developer into a bottle for future use, rinse out the tank with clean water for one minute, and then pour in the fixer, allowing it to act for ten minutes, with occasional agitation. Pour fixer back into the bottle, and wash the film by allowing water from a tap to run into the tank for half an hour. Afterwards drain the film and hang it up to dry in a really dust-free atmosphere.

Points to remember: carefully check the temperature of the developer, and agitate the film at frequent intervals. Handle the film by the edges only. Developer and fixer can be saved and will process from four to six films, if the developing time is increased by 10 per cent. each time.



Pouring in the developer.

Shipping Notes from the Wear

Sunderland's New Dry Dock

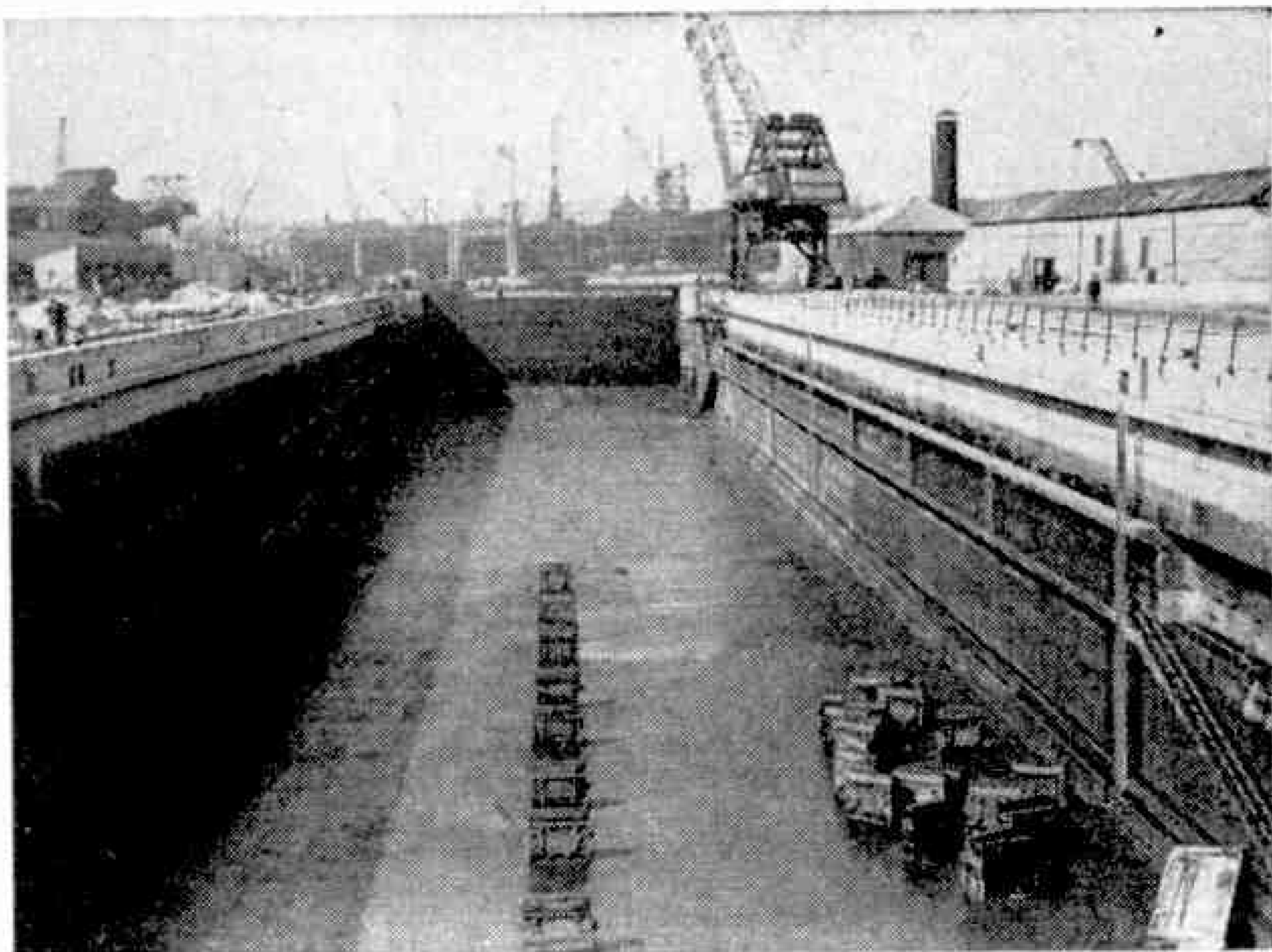
By Sidney Teasdale

SHIPS have been built on the River Wear at Sunderland for over 600 years, and a great seafaring tradition has been built up by the men of the north-east coast. Sunderland indeed proudly claims the distinction of being the biggest shipbuilding town in the world. When it is pointed out that the eight shipyards on the river are all situated within the Borough boundaries, and that during the second World War more than a quarter of the total tonnage of ships built in the United Kingdom were launched from Wear shipyards, it can be appreciated how well this claim is founded.

The shipbuilding and repairing yards at Sunderland extend up the River Wear approximately $3\frac{1}{2}$ miles to Pallion. There, on the south side of the river, are the yards of Messrs. Short Bros. Ltd., and W. Doxford and Sons Ltd. The latter firm distinguished itself in the early years of the present century by winning the blue riband of the shipbuilding world with the highest output of any yard. On the north side, near the Queen Alexandra Bridge, is the Southwick yard of W. Pickersgill and Sons Ltd., from whence the last Wear-built sailing ship was launched. Passing the engine works of George Clark Ltd. and sweeping round the Deptford yard of Sir James Laing and Sons Ltd., famous as the birthplace of many large oil tankers, the river then becomes lined on both sides with coal staithes. From these staithes millions of tons of coal are shipped annually to London and the south, and for export abroad.

At Monkwearmouth, the main Newcastle-Sunderland railway line spans the river on a bridge with limited headroom that is one of the limiting factors governing the navigation of large ships on the Wear. Side by side with the railway bridge is the modern Wearmouth road bridge,

from which is afforded an excellent view of the floating pontoon and shipyard of S. P. Austin and Sons Ltd., where many of the coastal colliers have been built. One of the latest of these is the *Lady Charrington*, named by Lady Charrington herself, who performed the launching ceremony. The vessel is being built for Messrs. Charrington, Gardner and Locket (London) Limited, and will be of 2,900 tons dead weight capacity. She has a



T. W. Greenwell's new dry dock nearing completion.

length of 270 feet on the load line and a breadth of 41 feet, and is fitted with a triple expansion reciprocating engine using saturated steam supplied by two boilers. In service the vessel will have a speed of 10 knots. The *Lady Charrington* affords an interesting comparison with the 16,000 ton tanker which, in the upper illustration on the opposite page, can be seen in the background fitting out at Doxford's Palmers Hill Quay.

Passing the yards of John Crown and Sons Ltd. and Joseph L. Thompson and Sons Ltd. on the north bank of the river, and the Corporation Quay on the south bank, the ship-repairing yard of T. W. Greenwell and Co. Ltd. at the South Docks is reached half a mile from Roker Pier Head. It is here that a further achievement has

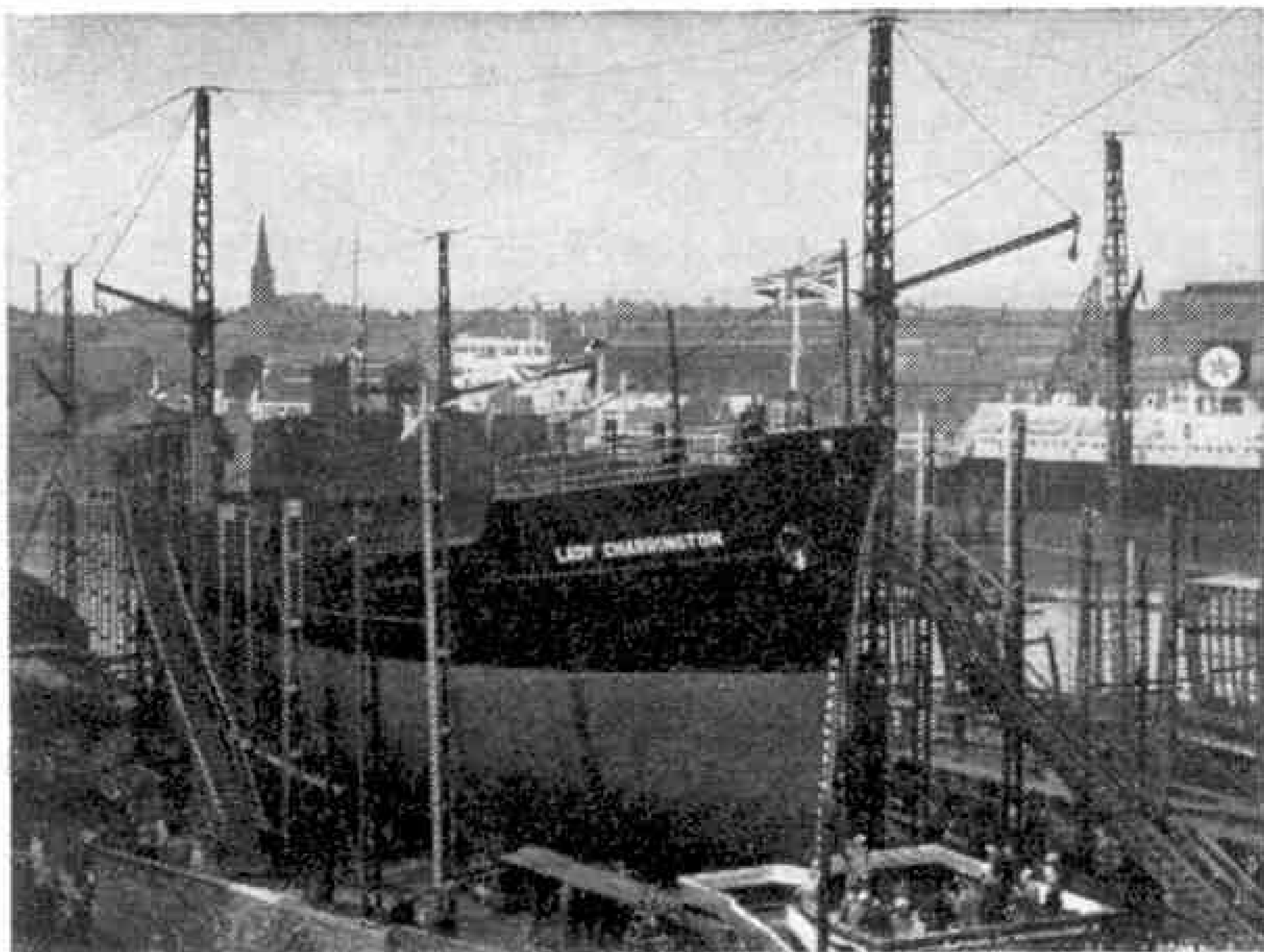
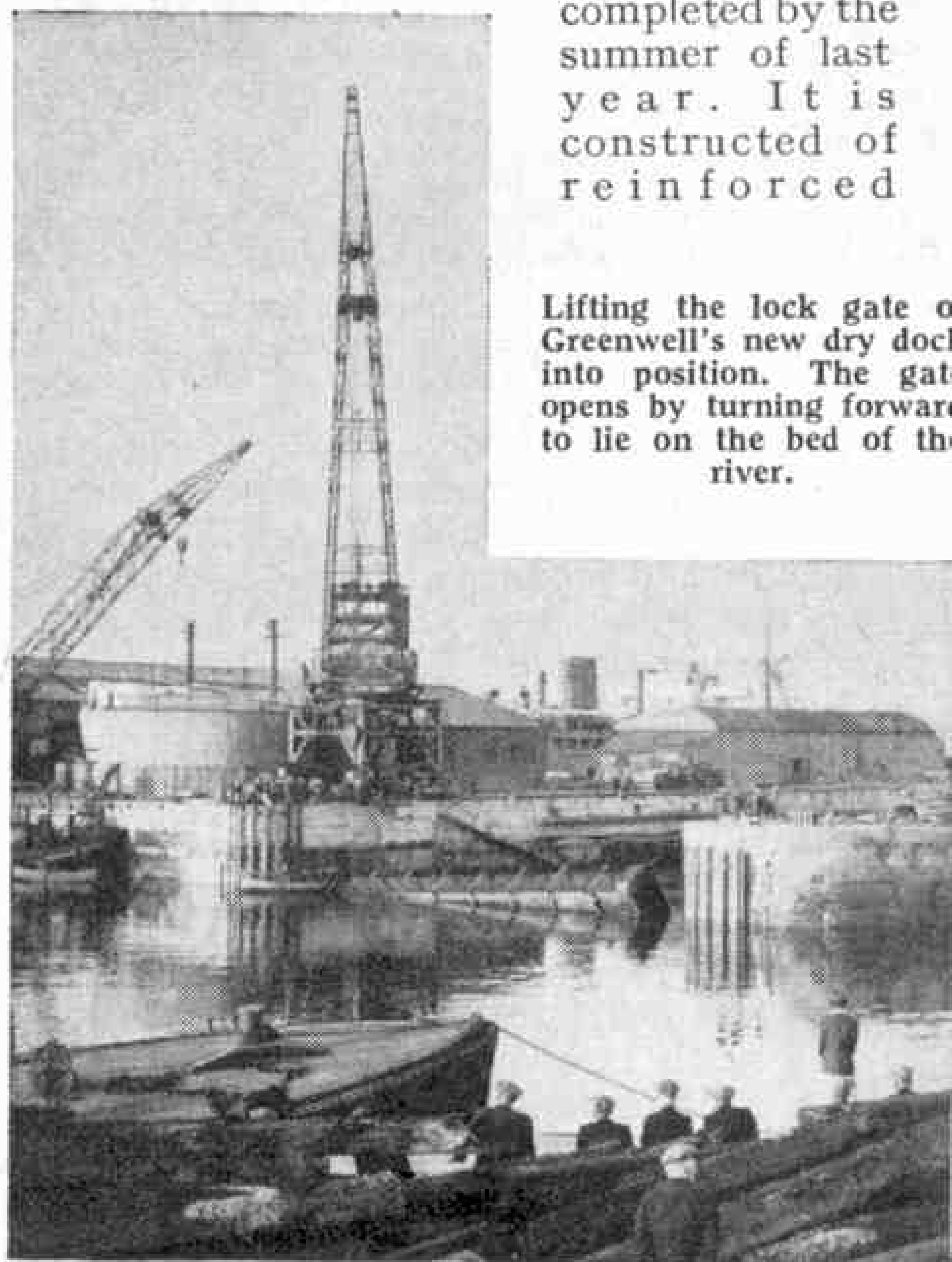
recently been added to the Wear's long history of progress by the opening of a splendid new dry dock. This took place on 3rd October last year, when Lady Fraser, wife of the Chairman of the Anglo-Iranian Oil Company and British Tanker Company, performed the opening ceremony, after which, the 28,000 ton tanker *British Realm*, was floated in. This vessel, the largest ever to enter the Wear, was illustrated in last month's *M.M.*

The new dock, built on the site of Greenwell's old No. 1 dock, will provide docking and repair facilities for giant oil tankers that have been launched from British yards since the close of the second World War. Hitherto, there has only been one large dock between the Firth of Forth and the Thames capable of accommodating such vessels, and the need for providing additional facilities became a matter of importance.

Work on the dock began in May 1950

and was completed by the summer of last year. It is constructed of reinforced

Lifting the lock gate of Greenwell's new dry dock into position. The gate opens by turning forward to lie on the bed of the river.



A new collier about to be launched from Austin's Yard, on the Wear, by Lady Charrington, who christened the vessel with her own name.

concrete, and is 675 feet long and 87 feet 6 inches wide at the entrance. It will accommodate vessels of up to 32,000 tons.

Probably its most interesting feature is the dock gate. This was built on the Tyne by Vickers-Armstrongs Ltd., and towed round to Sunderland by sea. It is 32 feet high and 91 feet wide, and in the lower illustration on this page it is shown being manoeuvred into position by a 40-ton travelling crane. Unlike the ordinary type of dock-gate, which opens sideways, this operates by swinging on under-water hinges and it has ballast tanks which automatically flood to assist it when opening. In the open position, it lies flat on the river bed and a ship entering the dock passes over the lock-gate, which rises to the vertical position to seal off the dock.

In addition to building the new dock, Greenwells have enlarged their No. 2 dock by 50 feet to enable it to take vessels of up to 18,000 tons. These projects in turn set a problem in quay space and it has been necessary to extend the old quay by 210 feet to give it an overall length of 810 feet. These improvements are of great importance to productivity on the Wear.

Prior to the visit of the oil tanker *British Realm*, the largest vessel to be dry-docked at Sunderland was the 16,750 tons *Charlton Venus*. Larger vessels had to go to the Tyne, and among these was the *Rondeffjell*, a tanker of 23,000 tons which was built in two halves, which were towed round to the Tyne for joining together in dry dock.

Diaries by the Million

By Arthur Nettleton

CHRISTMAS and the New Year may be regarded as Diary Time, for this is the season when most of us buy or are given one of these useful books. Indeed, the number of diaries sold in the United Kingdom each year nowadays exceeds 10,000,000, and most of them are bought at this time of the year. Little wonder that catering for this widespread trade is an all-the-year-round job, or that manufacturers are already starting to produce some of the 1954 editions.

Today there are scores of different types, for the modern diary is much more than a book-form calendar with spaces for notes and day-by-day records of activities. Not only does it range in size from the monster example for office use to the bijou one for ladies' handbags, but special editions also are produced in great variety. It is often a compendium of useful data, and there are diaries for sportsmen, dog-lovers, Boy Scouts, electricians, engineers, schoolboys, and a host of other people interested in particular subjects.

You might imagine that making diaries is now entirely a mechanised job. Machines *do* perform many of the operations—and marvels of ingenuity some of them are!—but you would be wrong to imagine the paper and leather going in at one end and completed diaries coming out at the other. In reality, the materials go through many processes, and several of these are performed largely by hand. The work is in many ways a skilled craft, entailing years of practice before perfection is attained.

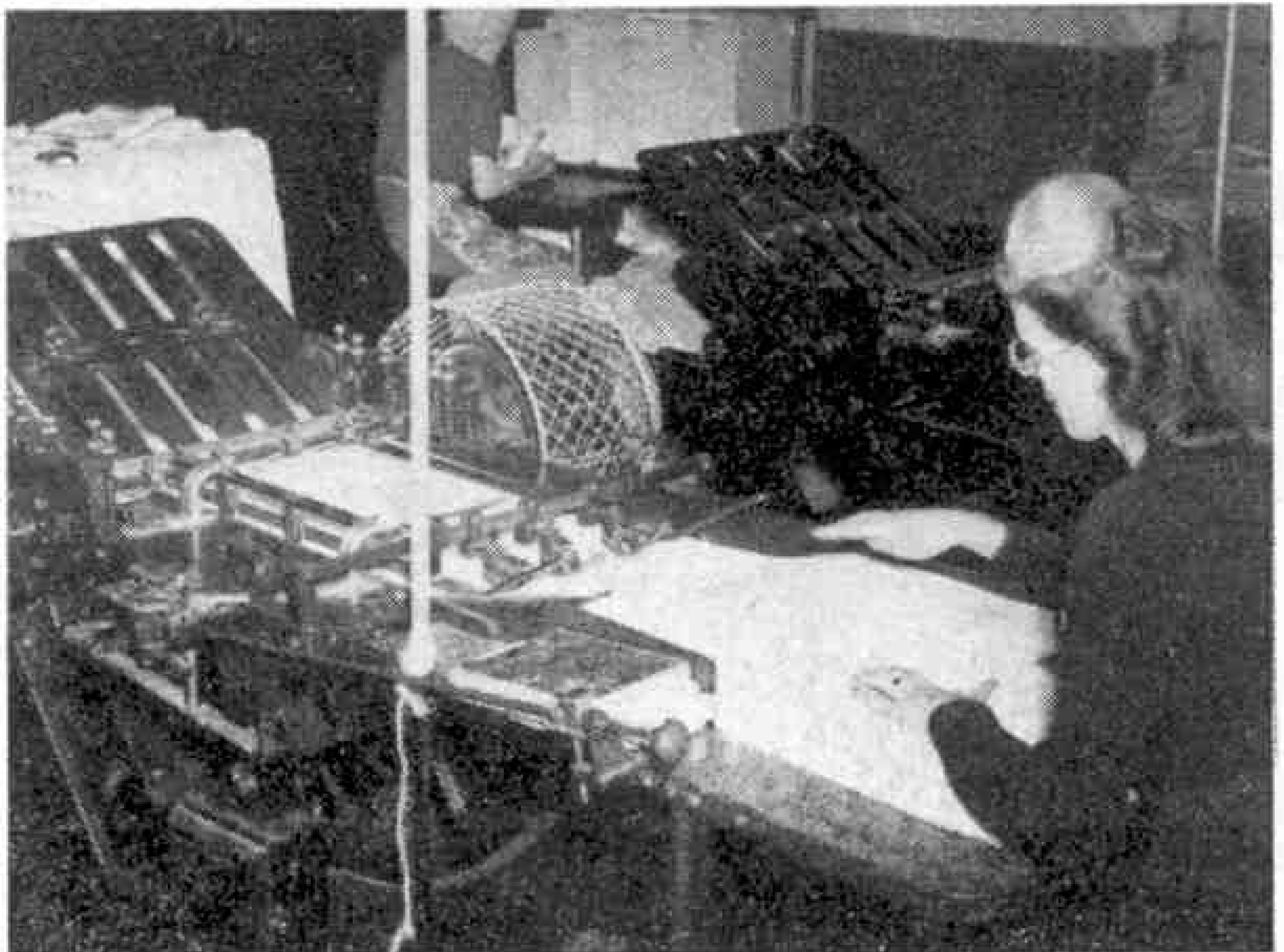
But before taking a peep at the operations it is interesting to dip into the history of diaries. How old is the custom of diary-keeping, and who were the greatest diarists?

Perhaps in the Stone Age details of memorable events were carved on stone slabs, but history tells us that the first chronicles of events to be preserved in the form of a written record were the Books

of the Bible. The Ancient Greeks had a form of diary, but it was merely a memoranda of military happenings.

The literary diary as we know it today dates back about 400 years, and since then it has often been invaluable to historians. In addition to supplying facts unrecorded in historical chronicles, the personal diary has given a graphic picture of daily life in the times when it was written.

Many people have kept diaries since the 17th century, among them John Evelyn,



When the pages of a diary have been printed the sheets are folded ready for binding, in the machine shown in this picture. For this and the other illustrations to this article we are indebted to Charles Letts and Co. Ltd.

Dr. Johnson, Boswell—and of course Samuel Pepys. A famous diarist of today is the Rt. Hon. Winston Churchill.

The first to produce a printed and bound diary on a commercial scale was John Letts, who was born in 1760. In 1809 he published a diary, or "bills due book and almanac" as he called it, and his descendants have been issuing diaries ever since.

The first step in the production operations today is to gather the information which the book is to contain. This means collecting a considerable amount of specialised detail in many cases, as well as noting such matters as the phases of the Moon, public holidays, and so on. For instance a motorists' diary must quote the existing speed records, and a sportsmen's diary must list various sports

figures. The editorial pages are then set up in type by the printing department, and meanwhile the particular leather for the cover is chosen from the wide variety of real and imitation leathers available.



The craftsman at work here is skiving leather, that is paring it to half thickness at the edges to allow for turning these over when making up into binding cases for diaries.

The skins are then carefully cut by hand to the required size. Any parts of the skin that show blemishes are discarded—which in the case of some leathers means considerable wastage.

These covers are next "skivered," or thinned out at the edges by passing them through a machine which shaves off about half the thickness, enabling the edges to be turned over without bulking. This turning over process is done by women and girls, because finger dexterity is needed and the rounded corners have to be neatly pleated.

Next comes the tooling of the front and back covers, and this also is a hand process, a tooling iron being heated to just the right temperature and passed round the edges. The operation gives a fine smooth line which adds much to the appearance and finish of the cover.

Finally the cover is lettered in gold or silver with the particular title, the process being performed on a blocking press. The cover is fitted on a platen, the brass die or wording being heated and stamped over gold foil.

The printed sheets now having been delivered by the printing department, these are folded to form sections of the diary, and endpapers are pasted on the first and last sections before these

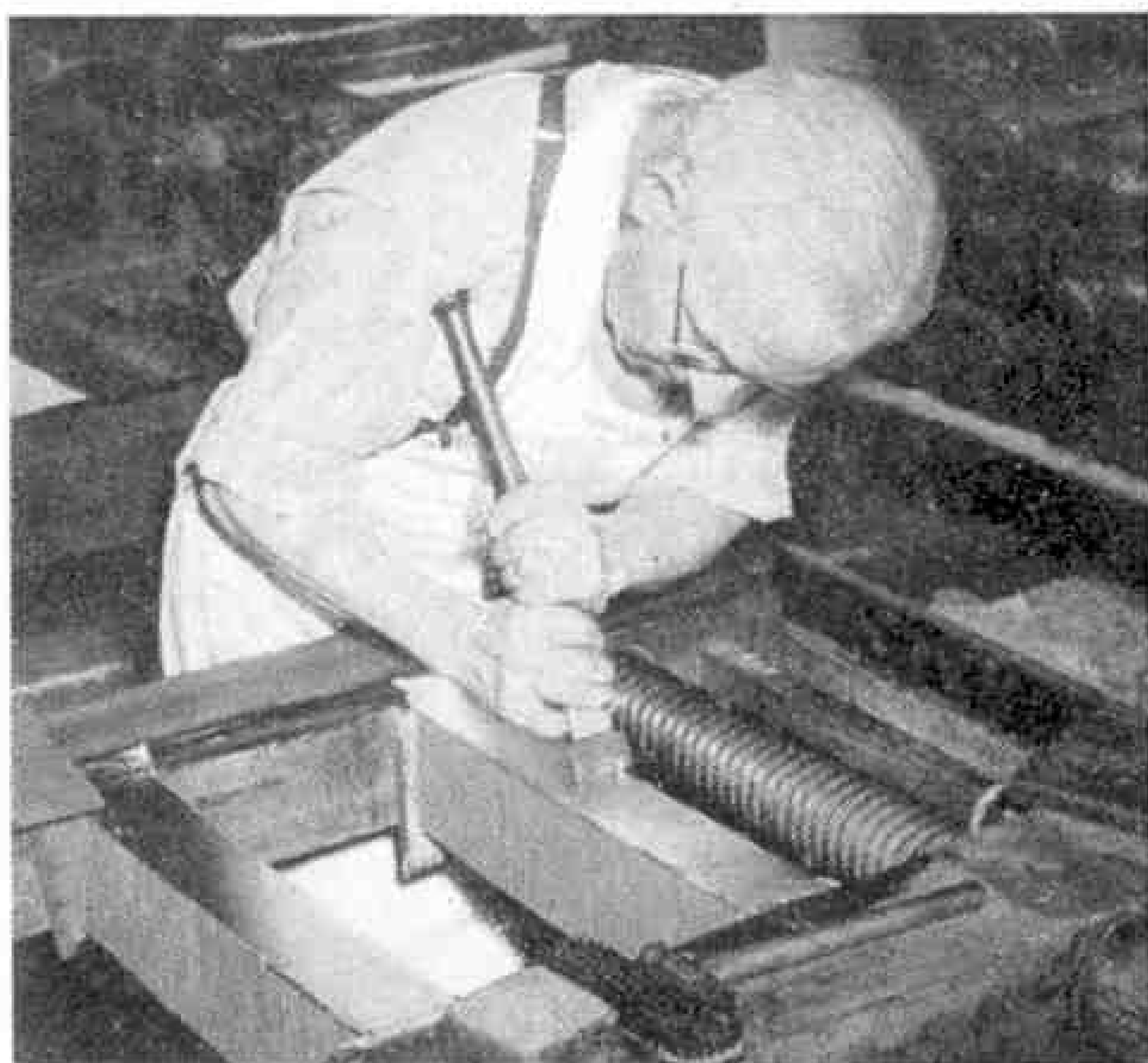
are gathered into the right order for sewing. The sewing is done on a special book sewing machine, into which the sections are fed in the correct sequence.

The sewn books are then nipped to flatten them before they are actually bound together on a machine specially designed for dealing with the flexible kind of binding. The machine glues the backs of the diaries and affixes a linen tape down the spine. When the glue is dry the books are once again nipped before being cut to the proper size.

Now follows the fascinating process of gilding the edges. The first step in this job is to clamp a stack of diaries in a press and scrape the edges. Starch is then applied, and a layer of gold or silver leaf thinner than the thinnest tissue paper is added.

Finally the edges are burnished with a tool fitted with a specially selected semi-precious stone. After being pasted into the covers the books are now complete in diary form.

The modern diary is not only an almanac and a miniature encyclopædia combined, but a work of art as well. The millions of examples that change hands at this season are produced by a combination of research and skilled craftsmanship, together with the help of machines.



When the edges of a diary have been gilded they are burnished with a special tool.

Britain's Largest Dam

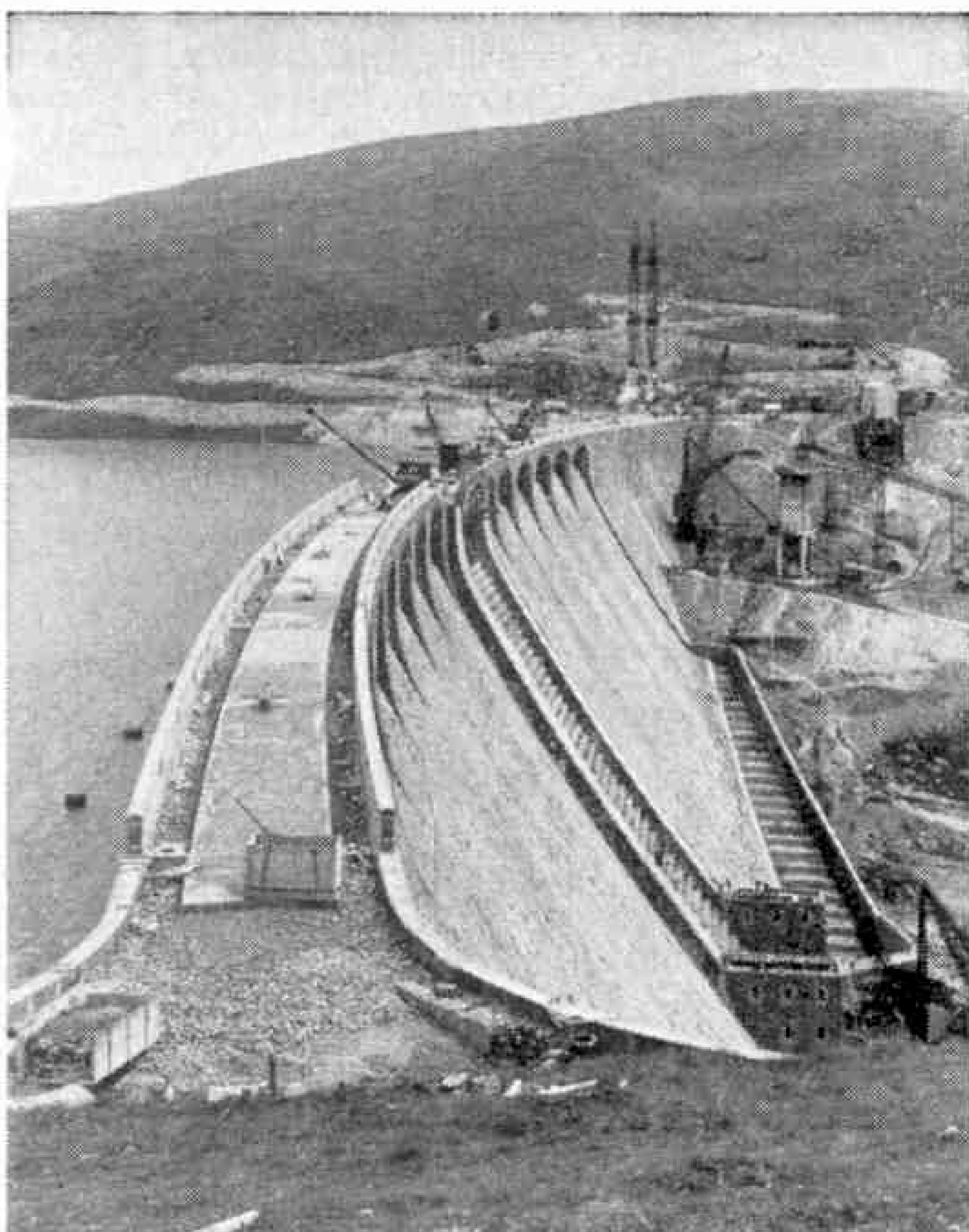
Birmingham's Water Reserves Doubled

PROVIDING an ample supply of water for a great city is a tremendous task, especially when the city is an industrial one that is growing rapidly. A good example of this is provided by Birmingham, the population of which has doubled since the beginning of the present century. In the same period its need for water has more than doubled, for the demand has risen from 18 to 48 million gallons a day!

Local sources of water had become insufficient many years ago, and to provide for the growing demand three great dams were built on the course of the River Elan, in mid-Wales. These were opened by King Edward VII in 1904, although Welsh water had been flowing into Birmingham three years earlier through the great pipe line that formed part of the scheme.

The three dams and reservoirs built on the River Elan were sufficient for many years, although the consumption had increased to over 34 million gallons a day by 1937. This was a year of drought and for the first time the two upper reservoirs on the Elan were called upon to supply water, which until then had been taken only from the lowest and largest of the three. By this time it was clear that additional storage was required. The original plans had included the building of three additional reservoirs on the River Claerwen, a tributary of the Elan, but later these were changed, as it was found possible to build a single dam instead of the number originally proposed. This could be made half as high again as those on the River Elan, and the reservoir behind it would store considerably more water than the three originally planned.

Owing to the war, work on the Claerwen Dam could not start until 1946. Then it proceeded steadily and to-day across the valley through which the Claerwen flows there is a great concrete gravity dam, the largest in Great Britain, with a height of 251 ft. The reservoir behind it is over



The Claerwen Dam nearing completion. It has been built in order to extend the water supply of Birmingham. The illustrations to this article are reproduced by courtesy of the General Manager and Secretary, City of Birmingham Water Department.

four miles long and contains 10,625 million gallons of water, which is more than twice the supply available from the reservoirs previously constructed on the River Elan.

The Dam was opened by Her Majesty The Queen in October last. Her Majesty inspected the Dam and descended the stairway within it to the valve house, where she operated the mechanism that opened the outlet valves, thus causing water to be discharged from the reservoir for the first time.

The Claerwen Dam is built of concrete, whereas the three built earlier on the River Elan are of masonry. It is curved to a radius of 2,000 ft. and has an overall length of 1,166 ft. The height from the stream bed to the crest is 184 ft. At its foundation, which is carried down into the bed rock to a depth varying from 10 ft. to 15 ft., it has a maximum breadth of 180 ft.

A roadway is carried over the Dam on 13 arches. The central arch has a span of 60 ft., and on each side of it there are six others each with a span of 40 ft. The crest level under the central arch is 6 inches lower than that under the other arches,

so that the normal overflow will take place there. The face of the Dam below the central arch is built in a series of steps, and the crest itself has been rounded to give a smooth flow of water. In times of flood, water will flow under the flanking arches down the face of the Dam, and will be guided by training walls at the foot into the stilling pool and gauge basin.

When water is required from the reservoir it will be drawn off through discharge pipes at the foot of the Dam. It will then flow down the original course of the River Claerwen into a small reservoir, from which it will be diverted through a tunnel in a hillside into the largest of the three River Elan reservoirs. From this it can be drawn off to pass through the aqueduct to the city.

When work on the Dam began the river was diverted into a by-pass channel, and excavation started. The structure was built in 23 giant blocks, and the joints between these were made watertight by continuous vertical copper strips. The concrete in alternate blocks was placed in position four weeks in advance of that in the blocks between them, in order to allow the heat generated in the masses during the setting of the concrete to leak away. Provision always has to be made for this, even when, as in this instance, special "low heat" Portland cement is used.

There are two inspection galleries throughout the length of the Dam. One of these, near the crest, is level; the other is stepped to follow the outline of the valley in which the Dam was built. On the upstream side the Dam is faced below water with Staffordshire engineering bricks. The upper part of this side, and the whole of the downstream side and the channel retaining walls, are faced with masonry in order to make the work harmonise as closely as possible with the surroundings.

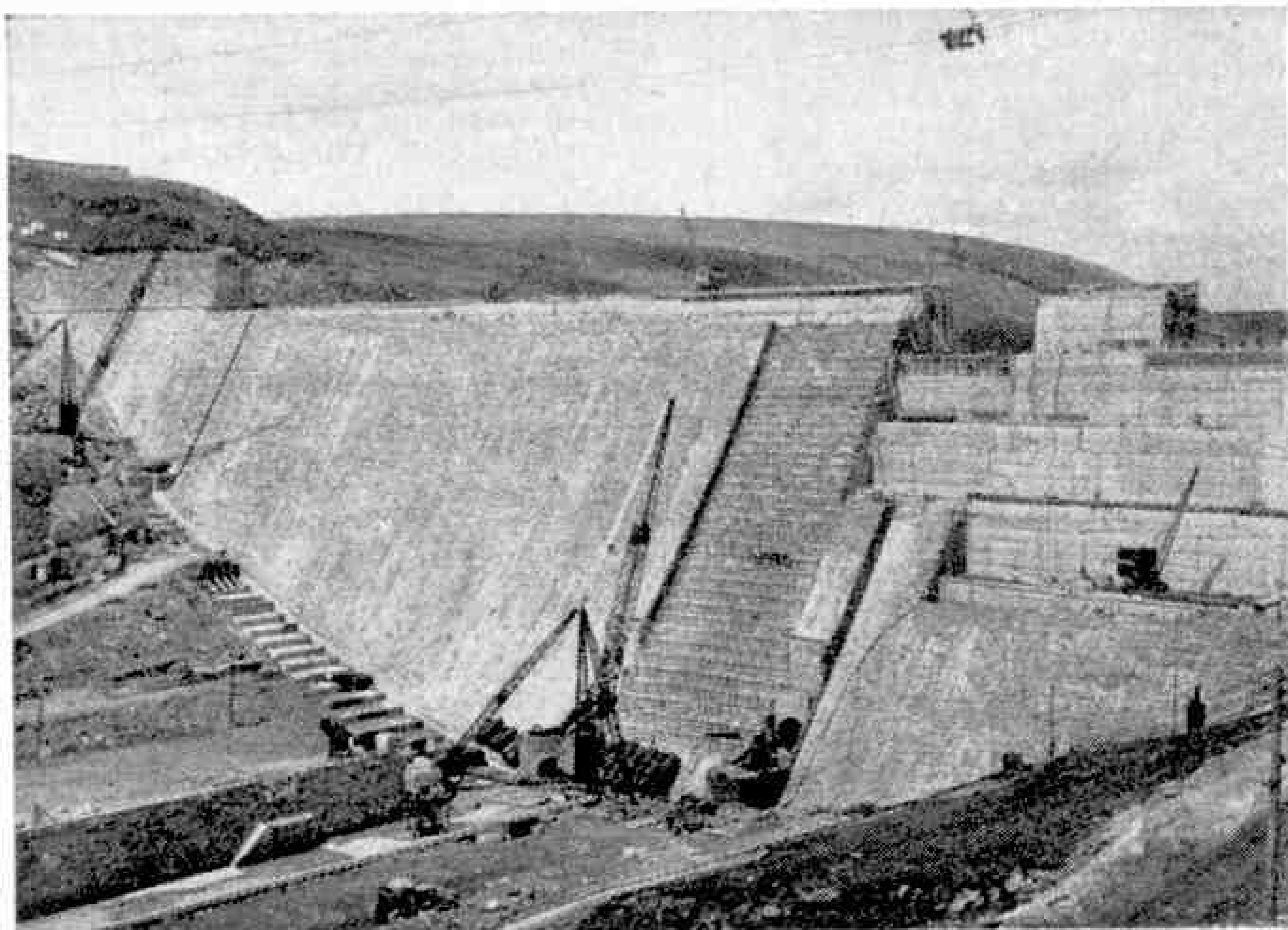
All the concrete for the main structure was handled by means of two electric cableways, each with capacity of 10 tons.

Besides carrying material the cableway transported the mobile cranes, weighing about 9 tons each, that were used during constructional work.

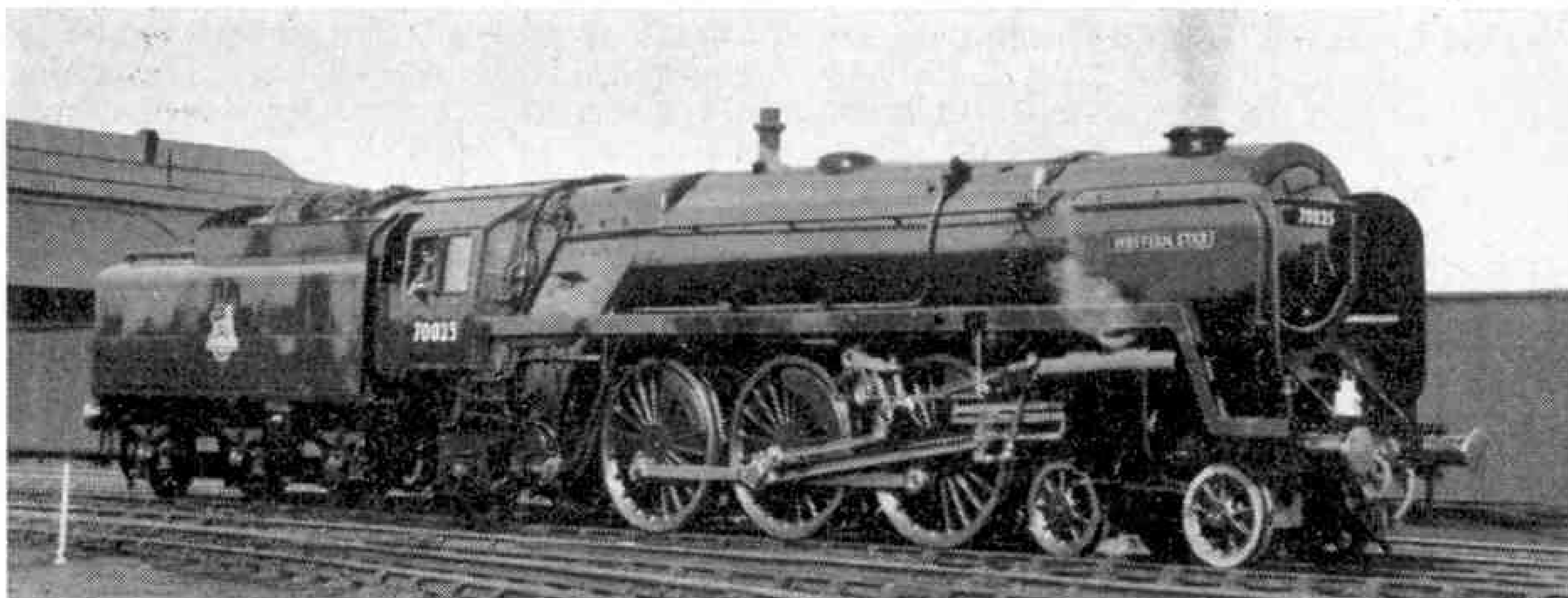
Some idea of what was involved in the building of the Dam is given by the quantities of materials used. Approximately $1\frac{1}{4}$ million bricks, half a million tons of crushed stone, 200,000 tons of sand, 70,000 tons of cement and 18,500 tons of masonry had to be transported to the site, and an electricity generating station with a capacity of 1,500 h.p. was installed to provide power to operate the plant.

Stone for concrete was obtained from a quarry about three miles away. Most of the sand was obtained from the Severn Valley, a distance of over 70 miles by road, and the low heat Portland cement used was made at Aberthaw in South Wales, taken to Rhayader Station by train in specially made containers, and carried to the site by a fleet of lorries.

About 370 men were employed in building the Dam. The contractors, Edmund Nuttall, Sons and Co. (London) Ltd., provided a temporary camp for 200 of them, with bungalows for members of the staff. This was about seven miles away and outside the catchment area. Others were accommodated in Rhayader. Local men were among those who took part in the work, and they were transported to the site daily in coaches, in some cases from a distance of 40 miles.



The Claerwen Dam seen from the front. In this picture the overhead cable system by which material was placed in position can be seen.



Railway Notes

By R. A. H. Weight

The Isle of Wight Revisited

It is always a pleasure to travel on the smart little Island lines which I described in the *M.M.* for February, 1952. So I looked forward to my visit last summer, when I travelled by the Southampton-Cowes route to and from the mainland, securing splendid views en route of the liners *Queen Elizabeth*, *United States*, *Capetown Castle*, *America*, *Samarra* and *Oranje*.

On the Island journeys were made behind 02 0-4-4Ts Nos. 17 *Seaview* and 31 *Chale* between Cowes and Newport, thence from Newport to Freshwater and back along the single line that begins at the back of Newport station, so is reached by a backward shunt out of the platform until clear of the junction points. We passed Carisbrooke Castle and obtained fine views across the Solent to the New Forest, with the new giant oil refinery at Fawley, Hants., visible in the distance at times when we were near Yarmouth. The push-and-pull 02 No. 36 *Carisbrooke* was noted painted unlined black, three others were still green, though lined black is the accepted standard for the passenger engines.

One of the E1 0-6-0 goods tanks was undergoing general repair at Ryde, and two others were having lesser attention, but nearly all the 02s are required every Saturday in the summer, when five trains per hour run to and from Ryde Pier and very heavy traffic is handled. It is indeed busy every day during the holiday season.

The Ventnor West branch, with its wonderful sea and undercliff views, has been closed owing to lack of patronage during the quiet months. The future of the Freshwater branch is also under review, I was told, as it suffers similarly. The main Ryde-Shanklin-Ventnor route of course is the busiest. The five-day season tickets allowing unlimited travel anywhere in the Island again proved extremely popular in summer. An interesting vehicle I noticed was a flat-roofed London, Chatham and Dover Railway bogie van built for service in Kent over 50 years ago.

British Built "Garratts" for Australia

In course of construction and shipment recently to the order of the New South Wales Government Railways have been 50 very large articulated, Beyer-Garratt, 4-8-4:4-8-4, 4-cylinder general purpose locomotives, having a total length of 108 ft. and weighing in all 255 tons. The tractive effort calculated on the usual basis is 59,560 lb. though owing to the number of wheels the maximum axle weight is 16 tons. A mechanical stoker is fitted, while other equipment of these AD-60 class monsters, numbered from 6001 upwards, includes roller bearings, electric lighting,

mechanical and grease lubrication. The steam pressure in the big boiler is 200 lb. per sq. in. The builders in this country are Beyer-Peacock & Co. Ltd.

Impressive Traffic Figures

Though I have no intention of giving a lot of dull figures, it is impressive to realise that on the 12 busiest Saturdays last summer, 6,519 long distance passenger trains from London carried 2½ million passengers; and that 4,092 main line and local services for holiday traffic ran during the four days of the last August Bank Holiday week-end, with 85,000 passengers going to Blackpool and 194,000 proceeding to Kent and South Coast towns, for example.

In the year about 170 million tons of coal were conveyed by British Railways. Their ships operating to Ireland, the Continent, etc., carry in a year some 1½ million tons of cargo, half a million motor vehicles and 200,000 head of livestock.

Total passenger journeys per annum exceed a billion. There are over 19,000 steam locomotives and 42,000 passenger carriages.

Eastern and North Eastern Regions

A large number of the newer and more powerful J50 Gresley type side tanks are replacing the long familiar 0-6-0 saddle tank engines at Hornsey shed, for shunting and local goods work around the London area of the Great Northern section. More K3 Moguls and the one K5 have been allocated to Stratford, whence a number of the 2-cyl. 2-6-0s of class K2 have removed to Nottingham and Lincoln districts.

New diesel-electric shunters numbered 12123-6 are working from Hornsey or King's Cross, and Nos. 12127-30 at March.

More N8 former N.E.R. Worsdell 0-6-2Ts have been withdrawn, as well as a few more of other old types destined for complete scrapping gradually. It will probably be a long time before all the Sandringham 4-6-0s are condemned, as many are still doing good work, but because of bad condition on arrival at Doncaster Works, No. 61628 *Harewood House* was listed for withdrawal instead of general repair.

The A1 4-6-2 No. 60130 *Kestrel* has been engaged in tests along the main line between New Barnet and Huntingdon, with a new form of automatic train control producing electric indications in the cab as to the position of distant signals passed. In connection with these trials, one of the streamlined, beaver-tail cars used on the pre-war Coronation high speed expresses, fitted with electrical indicating apparatus, has been pushed along by *Kestrel*, which is normally a Grantham engine, but was temporarily working from King's Cross. Other locomotives are being equipped.

Some of the last journeys on the Elsenham and Thaxted light railway before closure were operated amid much public interest by J15 0-6-0 No. 65467,

A new Britannia takes the road.
No. 70025 Western Star photo-
graphed when first out of Crewe
shops by J. E. Wilkinson.

built in 1912 as G.E.R. No. 569. A J68 0-6-0T often worked the branch.

New Light Diesel Trains Coming

British Railways have decided to introduce a number of light, multiple-unit diesel trains in various areas considered most suitable for development or replacement of passenger services. Each unit will consist of two vehicles, driven from either end, to be run as such or in combination with other sets up to four units if required. Omnibus type engines will be located under the floor. Mechanical transmission will be used and seating will be on 'bus principles with a good look-out for passengers. Each unit will have toilet accommodation, heating, and space for luggage and parcels.

The object is to provide a greater frequency of service, higher rate of acceleration, quicker turn-round at terminals and cleaner internal conditions, because of absence of smoke, than is possible with certain local steam services, and to employ them first in the West Riding of Yorkshire round about Bradford and Leeds.

The first contracts were to be placed with Leyland Motors Ltd. for diesel engines, and with Walker Bros. (Wigan) Ltd., for transmission actuating the wheels and axles.

Western Tidings

Included in recent arrivals of new locomotives were class 7 4-6-2s, Britannia type, numbered 70026-8 and named respectively: *Polar Star*, *Rising Star* and *Royal Star*. Others were diesel-electric 350 h.p. 0-6-0 shunting engines numbered 13000-3, built by the London Midland Region. Pannier tanks numbered 8495-6, 9483-5, were received from contractors.

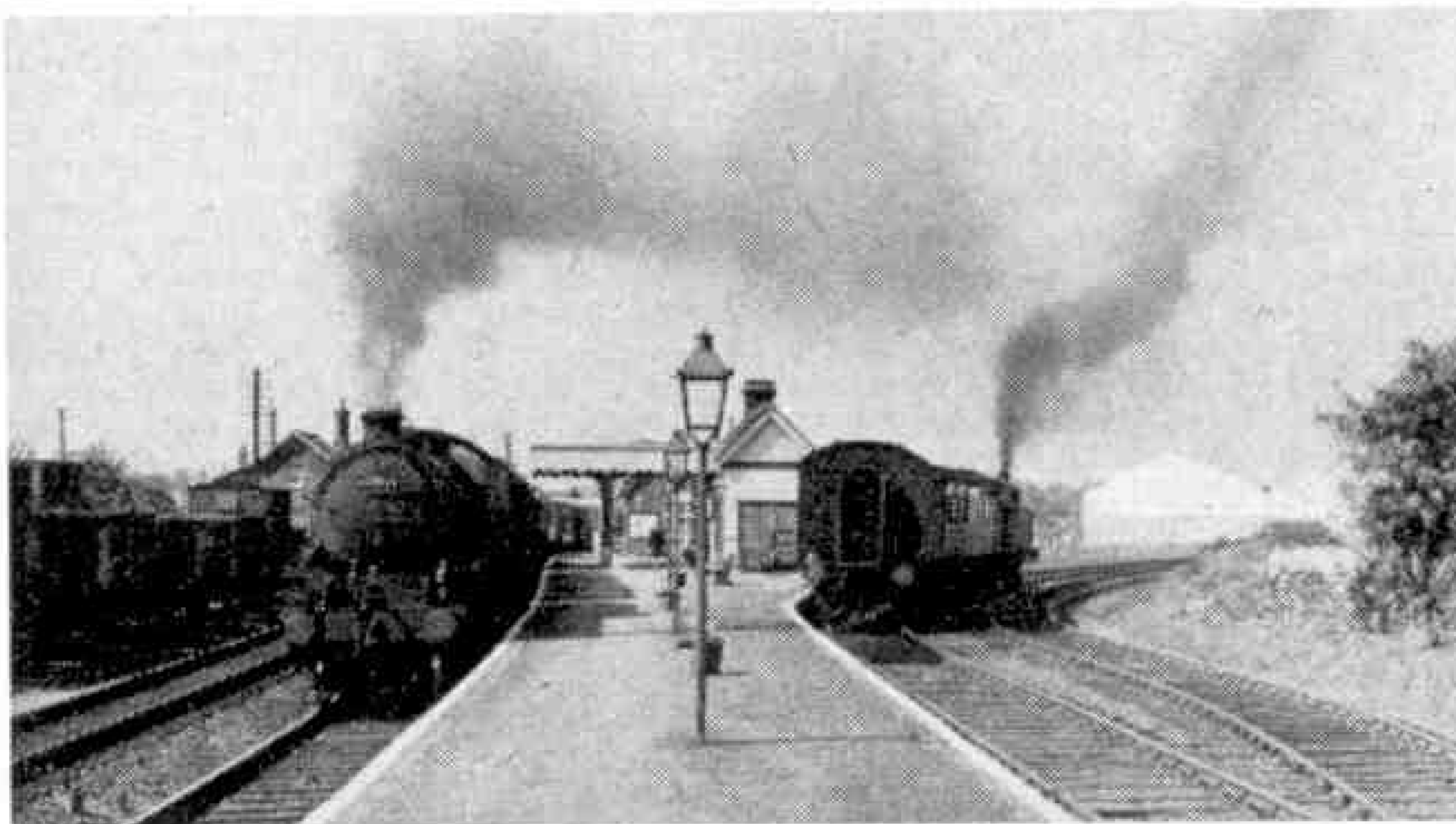
Among the engines condemned were Star 4-6-0s No. 4021 *British Monarch*; No. 4060 *Princess Eugenie*; and 0-6-0T No. 2197, which had been Burry Port and Gwendraeth Valleys Railway No. 8 *Pioneer*. The Bristol King No. 6000 *King George V* was transferred to 81A, Old Oak Common.

Extensive mechanisation has been carried out at Temple Meads Goods Station, Bristol, providing more rapid handling of heavy traffic and including

electric conveyors and platform trucks. A remarkable 631-ft. conveyor can serve any one of the 84 road vehicle loading berths along the cartage front.

New Signalling Completed at Euston

Upon completion of complicated engineering and electrical work outside Euston terminus last autumn, which necessitated temporary diversion or cancellation of some trains, much-needed modernisation and improvement in signalling and platform accommodation was brought into use. Three old style signal boxes



Country junction scene. A freight train from Whitemoor lollops past the up platform at Elsenham, while the passenger train waits to depart along the Thaxted branch, now closed. Photograph by R. E. Vincent.

have been replaced by a new all-electric one containing 227 miniature levers, having illuminated diagrams of the whole station area, which is completely track circuited and equipped with colour light signals. Several platforms have been lengthened and opportunity has been taken to improve and simplify the track layout. There is a sharply-rising gradient outside Euston up to Camden, where the locomotive and freight yards are situated.

An Enormous Out-of-Gauge Load

A huge storage drum with a length of 60 ft., weighing 38 tons, loaded on a flatrol wagon, was observed towering above the Wainwright 0-6-0 that hauled it when travelling along slowly as a special train. For its passage other traffic was stopped through South London suburbs from Charlton, S.R., up towards London Bridge and Bricklayers' Arms, and thence down a goods line to Angerstein Wharf, where the Port of London Authority took charge.

The drum is one of several intended for use at the big oil refinery nearing completion in the Isle of Grain, North Kent. These vast cargo pieces were lifted by that body's Leviathan floating crane, and then floated down the river to destination. Charlton, where the drums were constructed, is on the way from London to Grain and not far from the Thames, though no suitable facilities for waterside handling exist there.

Novel re-railing equipment, including a giant 150 ton jack, is to be tried out by British Railways.



Empty milk tanks "inside the engine" form part of the load of a down evening train from Bristol to Weston-super-Mare. No. 7014 *Caerhays Castle* is the engine. Photograph by Frank Mills.



Club and Branch News



WITH THE SECRETARY

TOUCHING UP THE PROGRAMME

I am glad to have this opportunity of wishing all connected with the Guild and H.R.C. a very happy and progressive year in 1953.

The reactions of members to the programme of the first Winter Session, just ended, will enable Leaders and Branch Chairmen to assess the degree of success attained. Possibly some items proved unexpected "flops," and others, to which less importance was attached, proved exceedingly popular. Here, at the beginning of the second Winter Session, Leaders and Chairmen have the opportunity of taking these results into account and of amending their pre-arranged programmes so that they will accord more with what the members want. Do not be afraid to make such changes if they seem desirable.

I hope that all Clubs who have not already done so will get busy on a club model for the great Meccano International Competition.

INCREASING THE CLUB ROLL

Hundreds of new Meccano and Hornby Train enthusiasts have been brought into being during the past fortnight by receiving a Meccano Outfit or a Hornby Train Set as a Christmas present. All these happy youngsters are not only potential members of the Guild and H.R.C. but are ideal material for recruiting into Club or Branch membership. "The more the merrier" should be the slogan of every progressive Club or Branch, and I hope that Leaders and Chairmen will be alert to capture as many as possible of these new enthusiasts.

Before this can be done the potential member needs to be made aware of the existence of a Club or Branch in his locality, or reasonably near enough for him to attend. This calls for a little publicity work on the part of Secretaries, which can take the form of a neatly written or typed advertisement of the Club or Branch in the windows of local Meccano dealers or, in the case of school organisations, on the notice board. Then, too, each member should be encouraged to play his part by bringing into membership any of his friends or neighbours who have just become owners of Meccano Outfits or Hornby Train Sets.

If these measures are energetically followed they should bring quite good results, benefiting the Club or Branch concerned and introducing the new members to the wider enjoyment to be gained by joining with others in their favourite hobby.

CLUB NOTES

CRYPT GRAMMAR SCHOOL (GLOUCESTER) M.C.—A Model-building Competition at one meeting produced a large number of entries and included some very ingenious models. A Quiz at which all the questions asked were on railway and engineering subjects was very well attended and proved a great success. Club roll: 38. *Secretary:* P. T. G. Hobbs, 31, Estcourt Road, Gloucester.

ST. LEONARDS (ST. ANDREWS) M.C.—A Puppet Show brought by one member provided a very

enjoyable evening's entertainment. Plans have been made for a Visit to a local beet factory. Club roll: 10. *Secretary:* R. Laing, 2, Bowling Green Terrace, St. Andrews, Fife.

ST. GEORGES (GATESHEAD) M.C.—A visit was paid to the Tyneside Model Engineering Exhibition at Newcastle, where the two railway layouts and many working models were of great interest. At one meeting Meccano roundabout models were judged, after which the Leader showed some excellent coloured slides prepared from photographs taken during Club cycle runs. A Hornby-Dublo layout has been laid down, utilising all available track. At one Model-building meeting members were called upon to build models each containing 70 parts, and some excellent results were obtained. Other activities have included a Table Tennis tournament and a Beetle Drive. Club roll: 14. *Secretary:* A. H. England, 18, Joicey Road, Low Fell, Gateshead, 9.

AUSTRALIA

FREMANTLE AND DISTRICTS M.C.—Members have been busy organising a Models Exhibition, which will be open to the public. An entry fee will be charged on each model, and it is hoped that Club funds will benefit considerably. A Tennis afternoon proved so enjoyable that it has been decided to make it a regular feature of the Summer programme. Club roll: 22. *Secretary:* B. A. Howe, 9, Phipps Street, Bicton, West Australia.

BRANCH NEWS

MILE END (PORTSMOUTH)—An interesting discussion on the recent Exhibition was held at one meeting, and afterwards a table tennis tournament took place. Two new Hornby-Dublo points have been bought out of the profits of the Exhibition. A conducted tour of the Fratton Goods Yard and Locomotive Sheds proved most interesting. *Secretary:* M. Powell, 92, Renny Road, Fratton, Portsmouth.

HINDHEAD AND DISTRICT—One meeting was devoted to designing and planning a new Hornby-Dublo Branch layout, and subsequent meetings have been devoted mainly to work on the baseboards for this layout. *Secretary:* B. J. Hinde, "Hindhead Brae," Hindhead, Surrey.



Kenneth H. Strudwick,
the energetic Secretary
of the Exeter M.C.



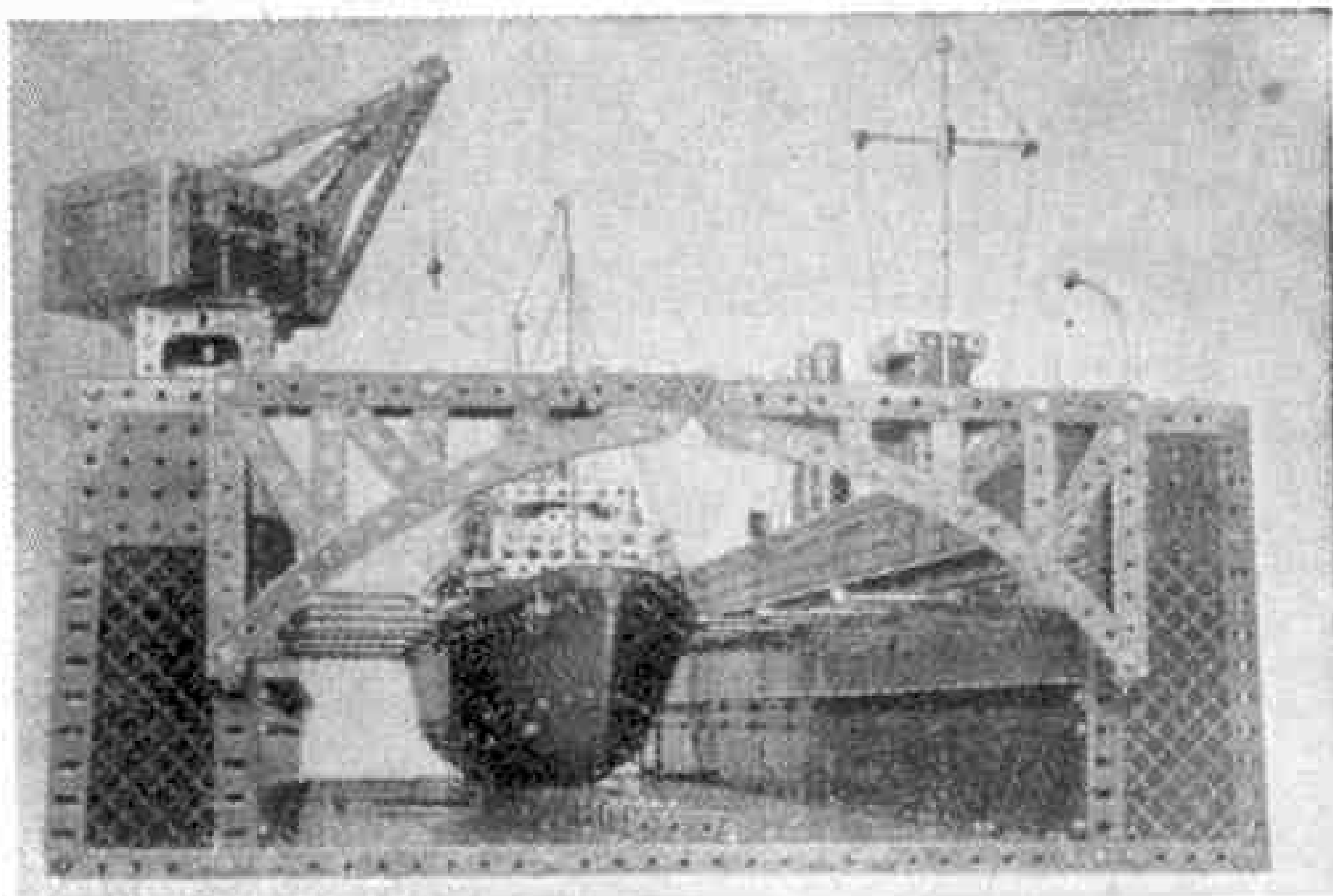
Officials and members of the Forest School (London) M.C. This excellent Club was affiliated in January 1951, and carries out an interesting programme in which model-building and visits to places of interest are important features.

The Great Meccano Competition

By "Spanner"

Special Welcome for Overseas Model-Builders

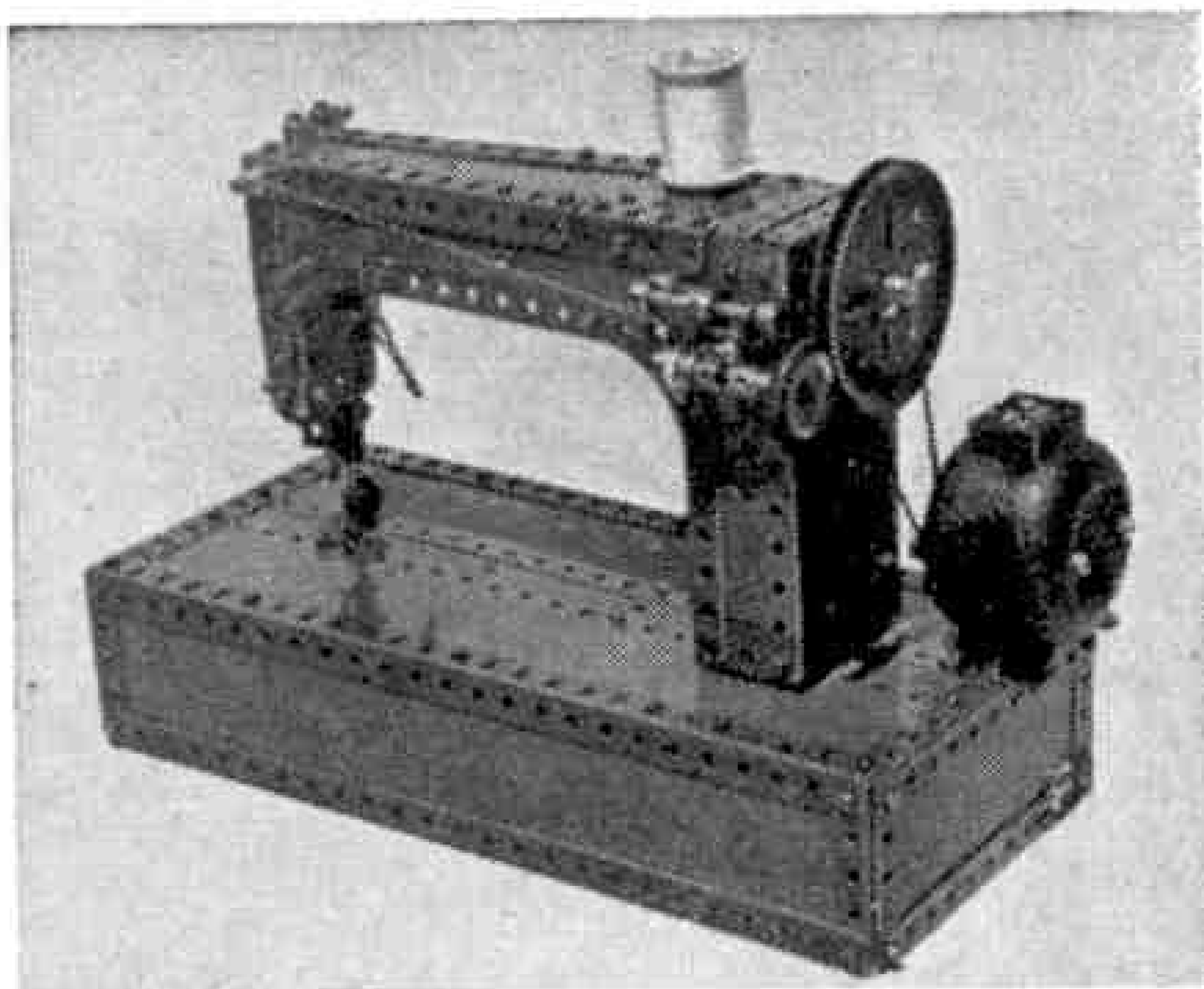
JANUARY is the month when we all make New Year resolutions of one kind or another, and no doubt most of us have already made several. There is one resolution, however, that must be made by every owner of a Meccano Outfit who has not yet set about building a model for our International Competition. This is that he should plan his entry now. He has plenty of time for this, as the closing date



This model of a ship in dry dock won a prize for Pablo Giese, Buenos Aires. It owed its success to its originality and the realism of the setting.

is still three months ahead.

This suggestion applies particularly to readers living overseas. All Meccano owners, wherever they live and whatever their nationality, can take part in the Contest, and we are indeed looking forward to a record number of entries from enthusiasts in Australia, New Zealand and South Africa, in Canada and indeed in practically every country in the world. Their entries will receive exactly the same careful consideration as

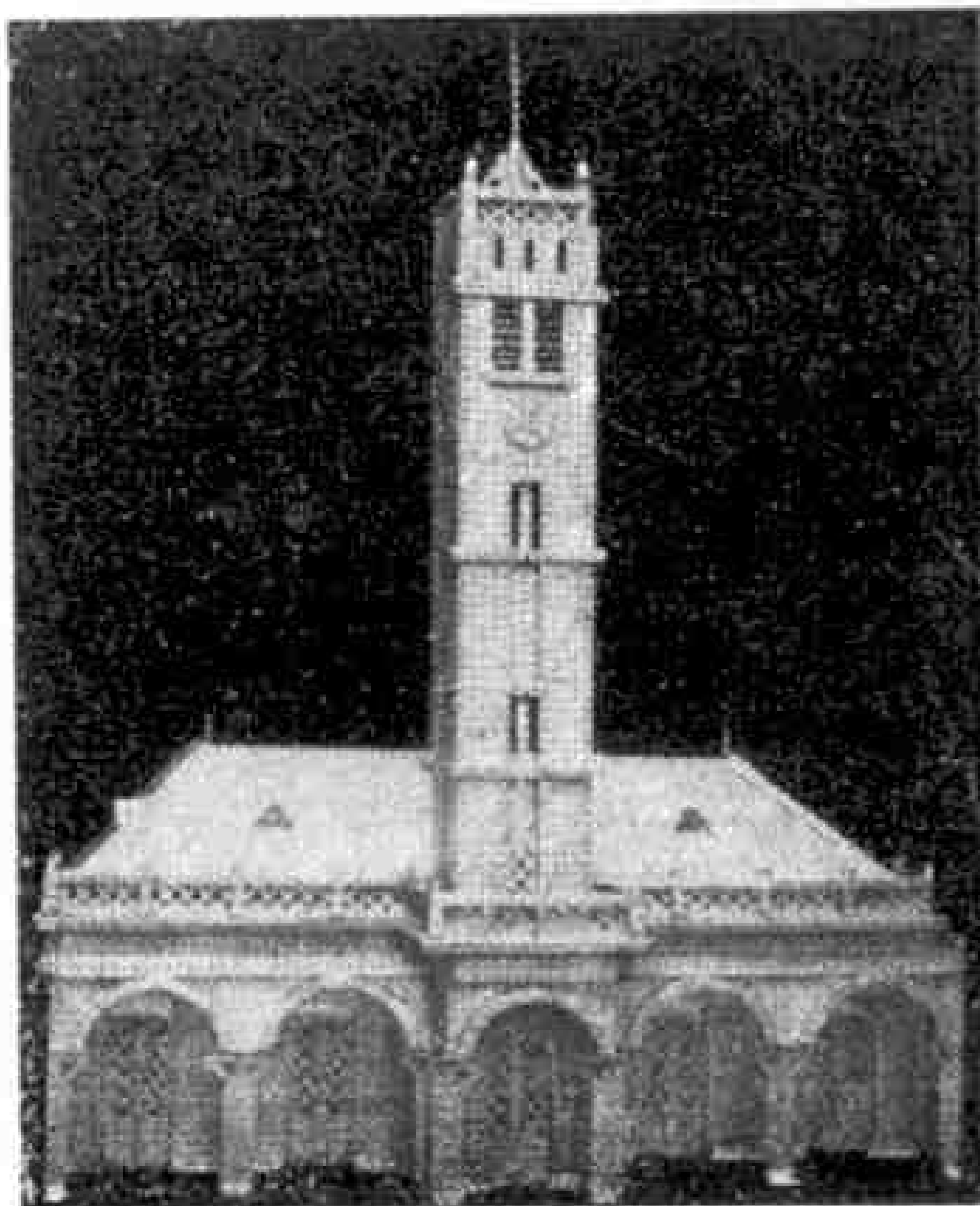


Models of an unusual or original type are the best for competition purposes. This simple sewing machine is an example. It won Third Prize for Jorge C. Cavalle, Buenos Aires, in a recent contest.

those sent in by competitors living in the British Isles, and the conditions and rules of the Competition are the same for all.

Anyone who wins a prize in the International Competition will have every reason to be proud of his success, for it will have been earned in face of competition from the best Meccano model-builders in the world! This fact alone, quite apart from the possibility of winning one of the many prizes waiting for model-builders, should provide sufficient incentive to every enthusiast to do his utmost to achieve the honour of bringing at least one of the First Prizes to his own country.

One last reminder. *Entries must be posted in time to reach Liverpool not later than 31st March 1953.* A special Competition Leaflet containing full details of the Competition, list of Prizes and full instructions for preparing and sending in entries, can be obtained, free of charge, on application to Meccano dealers and distributing agents, or direct from Information Service, Meccano Limited, Binns Road, Liverpool 13.



Models of architectural subjects are attractive and offer scope for model-builders to display their artistic abilities. This example is by J. de Proft, Willebroeck, Belgium.

Among the Model-Builders

By "Spanner"

A CAM-OPERATED INTERMITTENT MOTION

Intermittent motion has many applications in model-building and several methods of obtaining it have been described in the *M.M.* in the past. Yet another method is shown in Fig. 1. In this case the base of the mechanism is a $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate, which is fitted along each of its flanges with a $4\frac{1}{2}''$ Strip 1. The bolts fixing the Strips in position hold also two Flat Trunnions 2 and two $1''$ Corner Brackets 3, and a $3\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 4 is bolted between the free ends of Strips 1. The Double Angle Strip is held by $\frac{1}{8}''$ Bolts, and Washers are placed on each Bolt to space the Double Angle Strip evenly between the $4\frac{1}{2}''$ Strips.

The driving shaft is a Rod 5 mounted in the Corner Brackets 3. The Rod carries a Collar, a Crank 6, a $\frac{1}{2}''$ Pinion 7, a second Crank extended by a $2\frac{1}{2}''$ Strip 8, and a Worm 9. The Cranks are loose on the Rod, but the other parts are fixed in place by their grub screws. The two Cranks are connected together by a $1\frac{1}{2}''$ Bolt, and a $\frac{1}{2}''$ Pinion 10 is free to turn on the shank of the Bolt between the Cranks. The driven shaft is a Rod passed through the Flat Trunnions 2, and it carries a 57-tooth Gear 11 and two Collars that hold the Rod in position.

The Worm 9 is in constant mesh with a $\frac{1}{2}''$ Pinion 12. This Pinion is fixed on a $1\frac{1}{2}''$ Rod fitted also with a $1''$ Sprocket, which is connected by Chain to a similar Sprocket on Rod 13. The $1\frac{1}{2}''$ Rod is mounted in the Flanged Plate and in a Double Bent Strip bolted to it, and the bearings for Rod 13 are provided by a Double Bent Strip and the Double Angle Strip 4. Collars are used to hold the Rods in position.

The cam that operates the mechanism is fixed to the upper end of Rod 13, and it consists of three $2\frac{1}{2}''$ Stepped Curved Strips attached by Fishplates to the rim of a Face Plate. The free ends of two of the Stepped Curved Strips are connected to two $1\frac{1}{2}''$ Strips bolted together. A Tension Spring fitted between Crank 6 and a $1\frac{1}{2}''$ Corner Bracket, ensures that an Angle



J. Quinn, Armagh, with an ice cream tricycle he has built.

Bracket 14 bolted to Strip 8 bears constantly against the edge of the cam.

When the Angle Bracket 14 bears against the Stepped Curved Strips of the cam, the Pinion 10 is brought into mesh with the 57-tooth Gear 11, and the drive from the input to the output shaft is transmitted through the Pinions 7 and 10 and the Gear 11. As the cam rotates slowly under the action of the Worm, Angle Bracket 14 slides off the Curved Strips on to the straight section of the cam, and the Tension Spring comes into operation and brings Pinion 10 out of mesh with the 57-tooth Gear.

SIMPLE MECHANISM FOR AN "OCTOPUS" ROUNDABOUT

Fairgrounds provide good subjects for model-builders, and one that is enjoying a run of popularity at present is the Octopus roundabout. As most readers will know, this is now an established favourite alongside the helter-skelters, scenic railways and other attractions of a modern amusement park. The Octopus consists of a set of chairs pivotally mounted at the ends of pivoted arms. When the machine is in motion the arms revolve and simultaneously rise and fall in a rather complicated movement that is imparted to them by a special crank mechanism. Several methods of reproducing this crank action in Meccano are possible, and as an example I am illustrating in Fig. 2 a suggestion sent to me by Mr. R. D. Tilney, Cambridge. Although Mr. Tilney's device reproduces the movements of the actual machine realistically, it is extremely simple, and can in fact be built from the parts in Outfit No. 4.

The base of the mechanism is a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate 1, to which are bolted two Trunnions 2 that support a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip. A $3\frac{1}{2}''$ Rod is mounted in the Double Angle Strip and the Flanged Plate, and

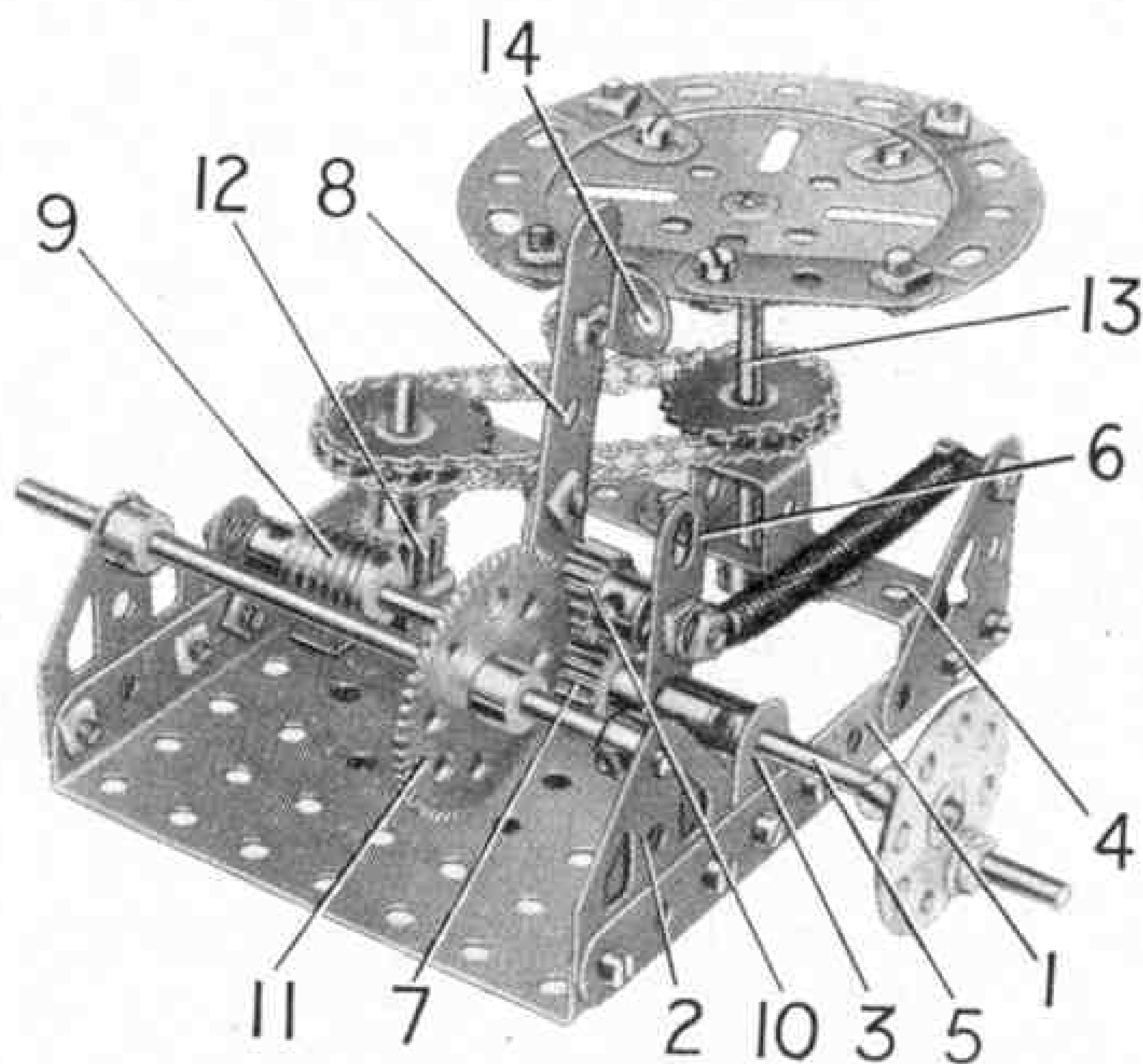


Fig. 1. An intermittent motion mechanism controlled by a cam.

it carries two 3" Pulleys 3 and 4 and a Bush Wheel 5. Pulley 3 and the Bush Wheel are fixed on the Rod, but Pulley 4 spins freely and is held in place by a Spring Clip.

A $\frac{1}{4}$ " Reversed Angle Bracket is bolted tightly to the Bush Wheel, and a $\frac{3}{8}$ " Bolt is fixed in the free lug of this Bracket. A Wheel Disc 6 is passed over the Bolt and lock-nuts are used to keep it in position.

The arms carrying the passenger chairs are $5\frac{1}{4}$ " Strips, and each of them is attached by a lock-nutted Bolt 7 to an Angle Bracket bolted to Pulley 4. Up to eight arms can be fitted, but in the sketch only two are shown in order to reveal the construction clearly. Each arm is connected to the Wheel Disc 6 by a short length of Cord, and it is important to make sure that all the Cords are exactly the same length. The off-set position of the Wheel Disc then ensures that the arms on one side are raised while those on the opposite side are lowered.

The Pulley 4 may be driven by a *Magic Motor*, and Pulley 3 can be rotated slowly by a Cord belt from a Crank Handle. If sufficient parts are available it is a simple matter to arrange a drive from the Motor to Pulley 3 also, but it must be driven much slower than Pulley 4.

SELECTIVE DRIVE MECHANISM FOR CRANE WINDING SHAFTS

From one of my Overseas correspondents, Surendra H. Shah, Bombay, India, I have received details of a simple mechanism designed for use in models where two winding drums are used. With this mechanism either of the drums can be driven as desired from a common input shaft. The mechanism is useful therefore for operating the hoisting and

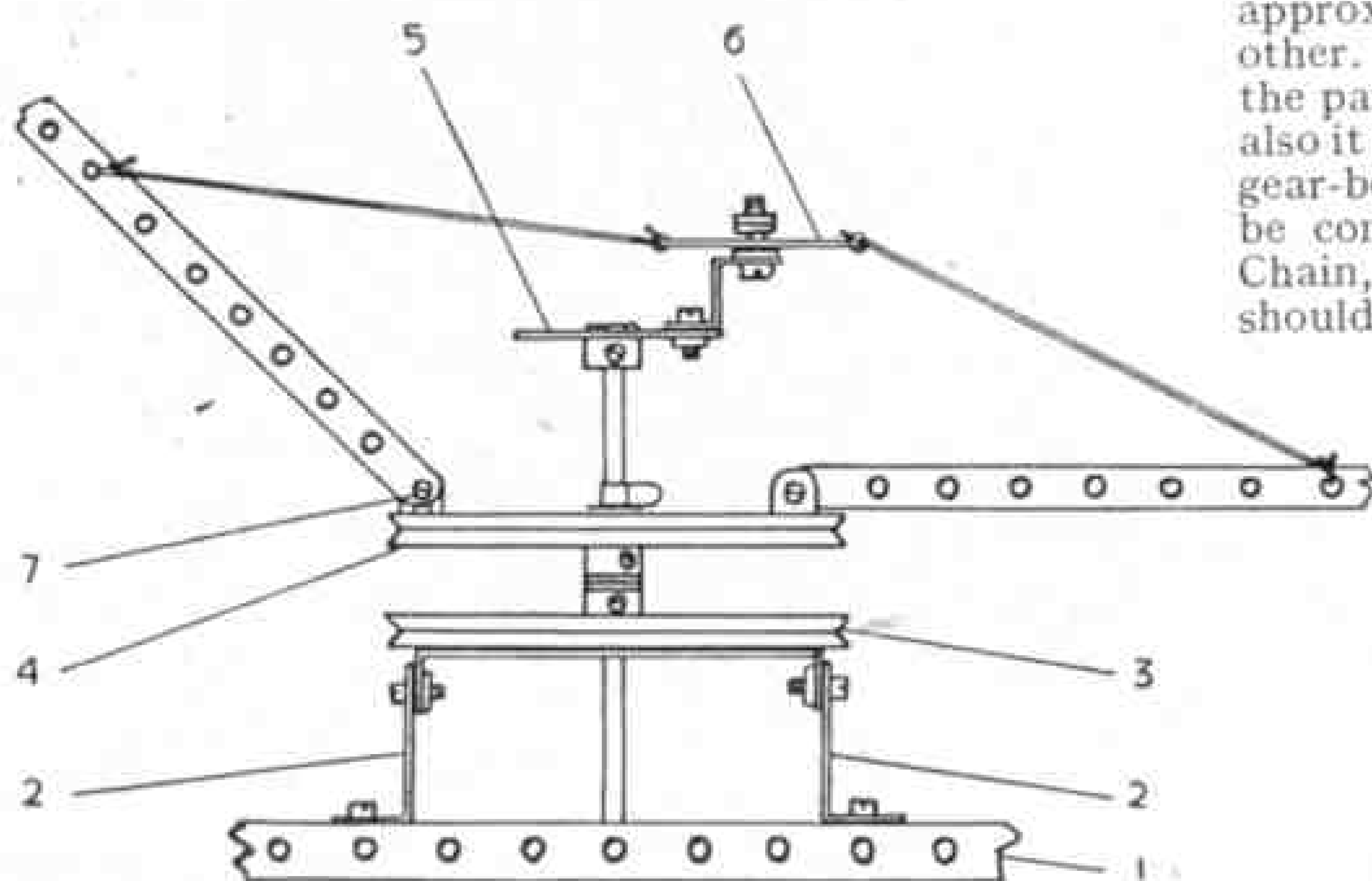


Fig. 2. This simple "Octopus" mechanism can be assembled from the parts in a No. 4 Outfit. It was designed by R. D. Tilney, Cambridge.

luffing movements of cranes and similar models. One of its special features is that the gear that is moved into mesh is mounted on the operating lever, so that it is not necessary to slide either the output or input shafts in order to engage the drive.

The input shaft is a Rod 1 fitted with a Bush Wheel 2, which is free to turn on the Rod but is held in place by a $\frac{1}{2}$ " Pinion 3. A $2\frac{1}{2}$ " Strip is clamped tightly to the Bush Wheel between two nuts on a $\frac{1}{4}$ " Bolt, and a $\frac{1}{2}$ " Pinion 4 turns freely on the shank of this Bolt. The output shafts carry a 50-tooth Gear 5 and a 57-tooth Gear 6 respectively,

Fig. 4. A realistic tommy gun built by K. Mills, Portsmouth.

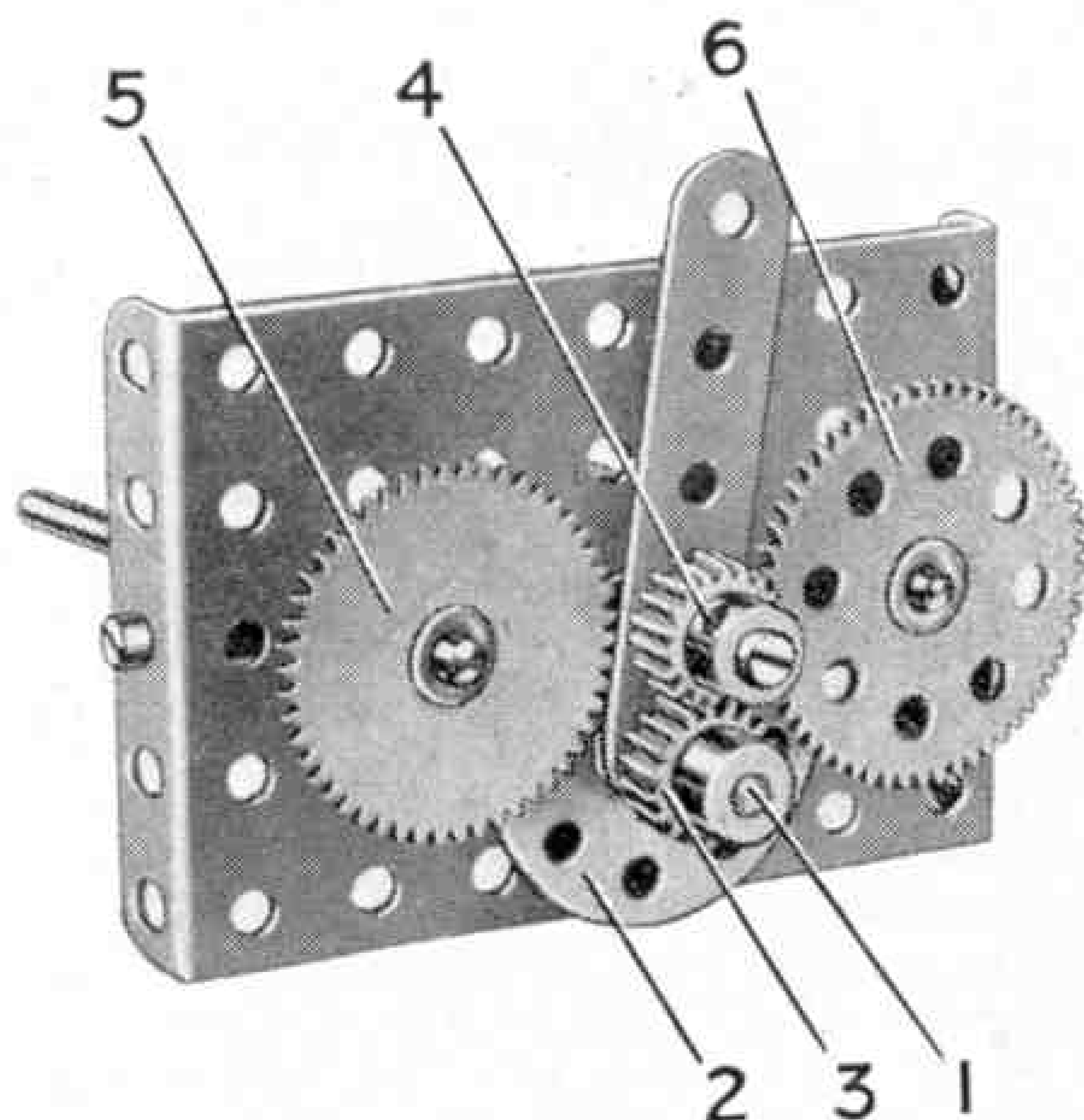


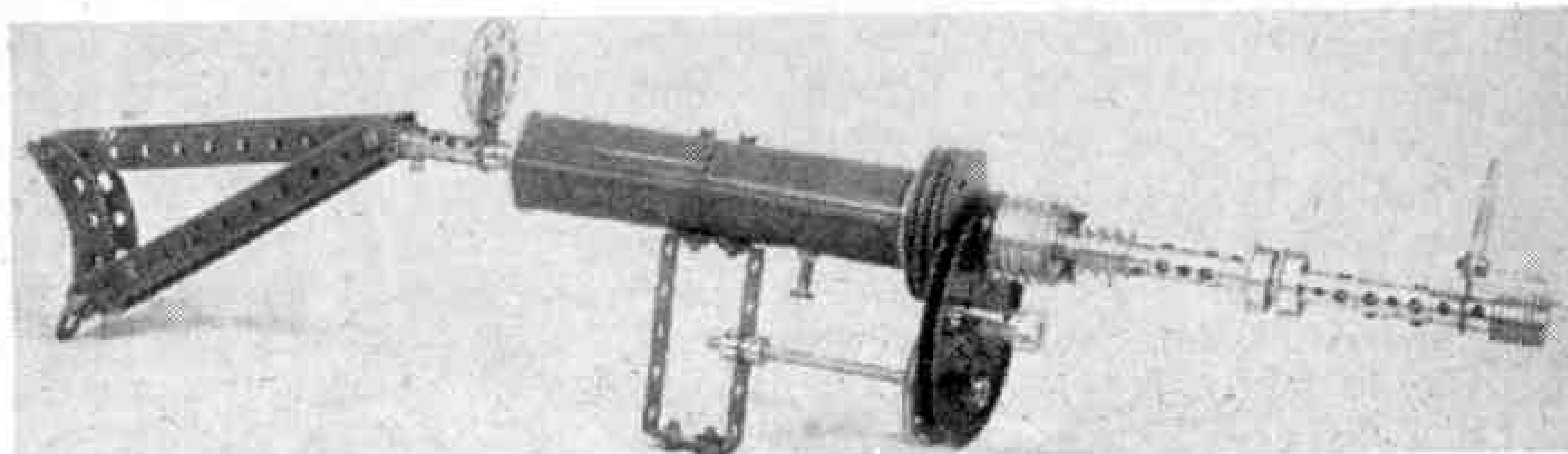
Fig. 3. This novel mechanism can be applied to many types of cranes for controlling the luffing and hoisting barrels. It is the work of Surendra H. Shah, Bombay.

and the Pinion 4 can be engaged with either of these by moving the $2\frac{1}{2}$ " Strip appropriately.

The mechanism provides a driving ratio of approximately $2\frac{1}{2}$: 1 to one shaft, and of 3 : 1 to the other. This brings the mechanism within the scope of the parts included in a Meccano Gears Outfit "A," and also it allows the arrangement to be used as a two-speed gear-box. For this purpose the output shafts should be connected by two 1" Sprockets and a length of Chain, and a further Sprocket on one of the shafts should be connected by Chain to the model driving shaft. The difference in the ratios may be a disadvantage in some models, and in such cases the 57-tooth Gear can be replaced by a 50-tooth Gear, to give the same ratio to both shafts. The different ratios will be useful in many model cranes however, as they allow a slow speed drive to the luffing movement. The 3 : 1 ratio shaft can be used to operate the luffing cords, and the $2\frac{1}{2}$: 1 shaft is available to provide a faster drive for hoisting the load. The output shafts can be used to form the winding drums, as they are not required to slide.

A MECCANO TOMMY GUN

The realistic tommy gun illustrated in Fig. 4 was built by a young Meccano enthusiast, K. Mills, Portsmouth, who is 11 $\frac{1}{2}$ years old and a member of the Mile End Meccano Club. It is not a working model, but I think readers will agree that Mills has made very good use of his parts in reproducing the rather complicated features and outlines of this type of gun. The clever use of Pulleys and Conical Discs to form the barrel cooling fins is interesting, and altogether the model is a noteworthy effort on the part of its young builder.



New Meccano Models

Breakdown Crane—Helicopter

THE simple breakdown crane shown in Fig. 1 can be built with a Meccano Outfit No. 2. The hoisting and luffing movements are operated by a Crank Handle and a handwheel respectively, and the cab and jib can be slewed so that a load can be raised or lowered at any point around the model.

The crane truck on which the cab is mounted is a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate fitted with two Fishplates bolted to each of its side flanges. Two of the wheels are fixed on a $3\frac{1}{2}"$ Rod passed through one pair of Fishplates and the other two wheels are each held by set-screws on $\frac{3}{8}"$ Bolts passed through the remaining Fishplates.

The base of the cab is made by bolting two $5\frac{1}{2}"$ Strips to two $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips. One of these indicated at 1 is bolted to a Bush Wheel, and the bolts also hold in position two Trunnions 2 that serve as supporting brackets for the jib. The second Double Angle Strip is placed at the rear of the cab and is held by a bolt 3 on each side.

Each side of the cab consists of a $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate 4 and a $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate 5. Plate 4 is edged by a horizontal $2\frac{1}{2}"$ Strip, and Plate 5 is strengthened by two vertical $2\frac{1}{2}"$ Strips. The roof is a $1\frac{11}{16}"$ radius Curved Plate, and it is attached to the side by Angle Brackets, which are opened out slightly to allow a small curve in the Plate. The back of the cab consists of a straightened $1\frac{11}{16}"$ radius Curved Plate, and it is connected to the sides by Angle Brackets. The cab floor is made of a $4\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate bolted between the Double Angle Strips.

A 2" Rod is fixed in the Bush Wheel, and is passed through the centre hole of the Flanged Plate and through a $\frac{1}{2}"$ Reversed Angle Bracket bolted underneath the Plate. A Spring Clip serves to keep the Rod in position.

The jib is made from two $5\frac{1}{2}"$ Strips, each of which is lengthened by a Stepped Curved Strip and it is pivoted on a 2" Rod passed through the Trunnions 2. The upper ends of the jib members are connected by a $\frac{3}{8}"$ Bolt attached to one of the Curved Strips by two nuts.

The load Hook is fastened to a length of Cord tied to a Crank Handle mounted at the rear of the cab. The Cord for raising and lowering the jib is tied to a $3\frac{1}{2}"$ Rod fitted with a Road Wheel 6.

Parts required to build Breakdown Crane: 4 of No. 2; 6 of No. 5; 4 of No. 10; 7 of No. 12; 2 of No. 16; 2 of No. 17; 1 of No. 19g; 4 of No. 22; 1 of No. 24; 4 of No. 35; 36 of No. 37; 2 of No. 37a; 3 of No. 38;

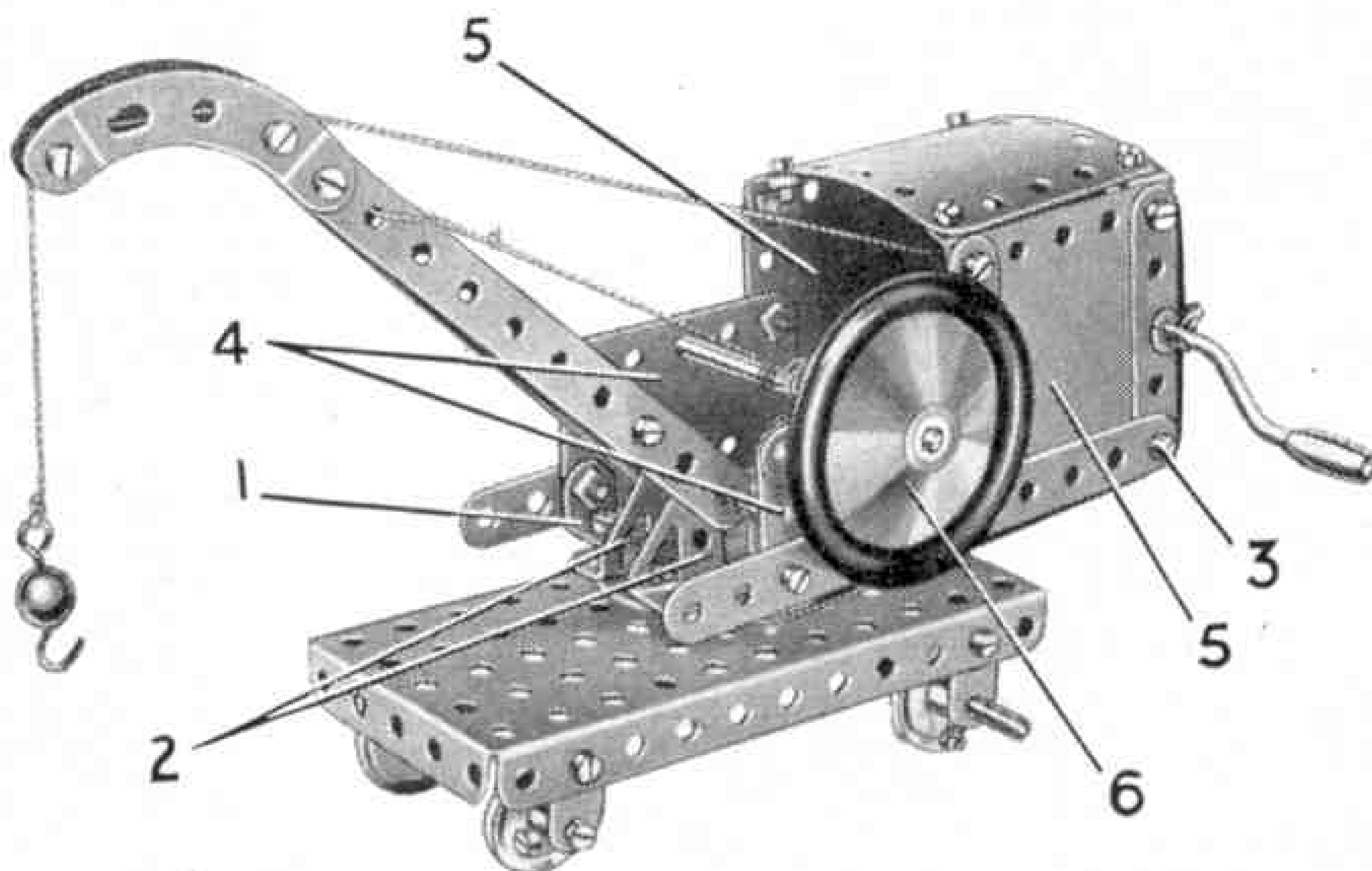


Fig. 1. This simple railway breakdown crane is one of the attractive models that can be built from Outfit No. 2.

1 of No. 40; 2 of No. 48a; 1 of No. 52; 1 of No. 57c; 2 of No. 90a; 3 of No. 111c; 1 of No. 125; 2 of No. 126; 1 of No. 187; 2 of No. 188; 2 of No. 190; 1 of No. 191; 2 of No. 200.

The simple helicopter seen in Figs. 2 and 3 can be built with a No. 5 Outfit. It is fitted with a *Magic* Motor that drives the main and tail rotors realistically.

The fuselage is assembled on a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate 1. A $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate, edged by a $5\frac{1}{2}"$ Strip 2, is bolted to each of the longer sides of the Flanged Plate, and Strip 2 is extended five holes towards the nose by a $3\frac{1}{2}"$ Strip 3. A $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip is bolted between Strips 3 in their next-to-end holes, and the lower section of the nose is completed by two Formed Slotted Strips. The floor is filled in by two $2\frac{1}{2}"$ Stepped

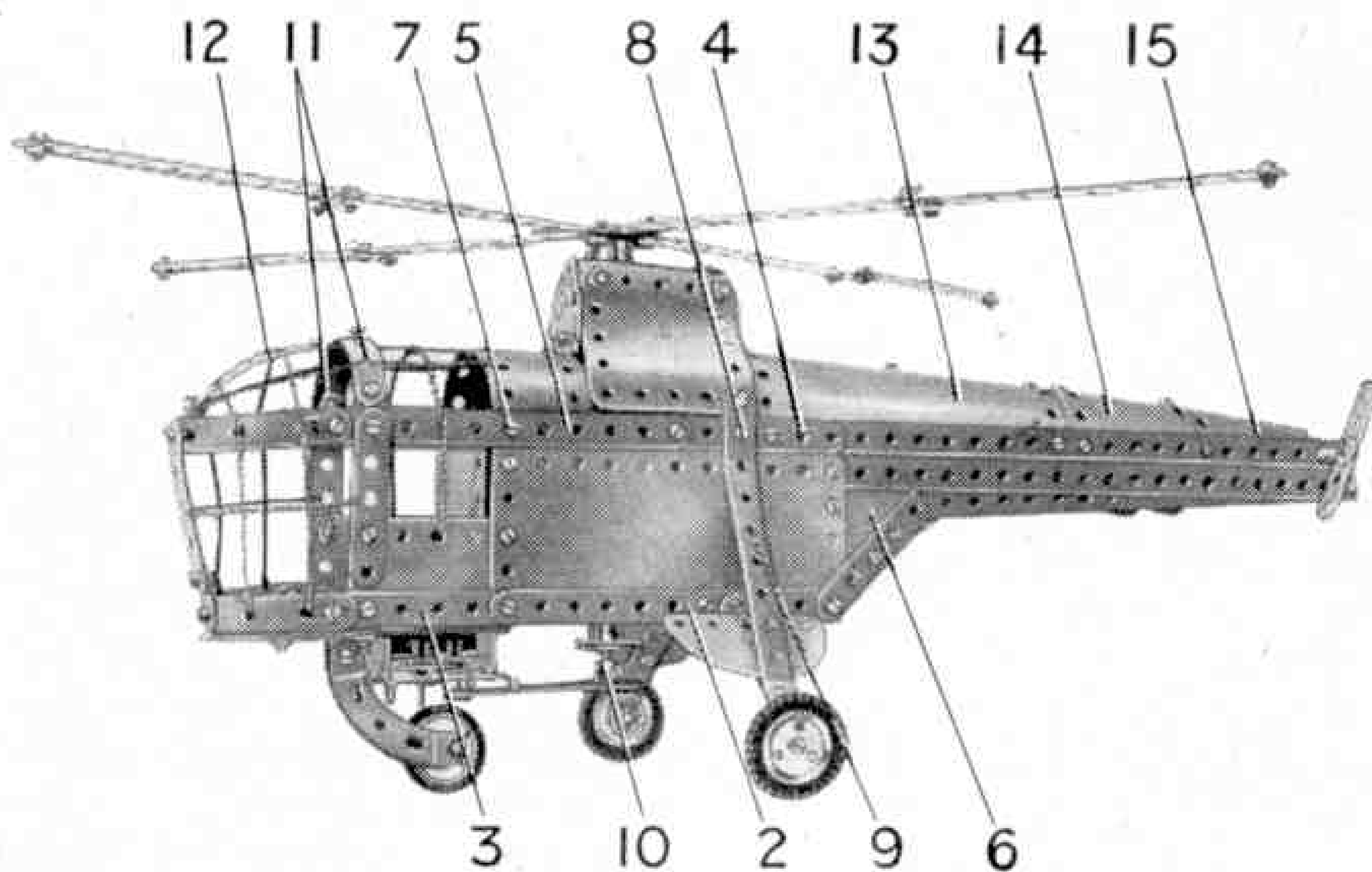


Fig. 2. A model for aeroplane enthusiasts. This realistic helicopter is driven by a Magic Motor, and can be built from parts in Outfit No. 5.

Curved Strips and two Wheel Discs bolted to the Double Angle Strip.

The $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate on each side is extended upward one hole by a $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate, and this is edged by a $5\frac{1}{2}"$ Strip 4. A further $5\frac{1}{2}"$ Strip 5 overlaps Strip 4 by six holes, and it is connected by a $2\frac{1}{2}"$ Strip to a $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate bolted to Strip 3. Strips 5 are extended forward by two Formed Slotted Strips, and these are joined to those around the floor of the nose, by two $2\frac{1}{2}"$ Strips overlapped four holes. A $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flanged Plate bolted between the Flexible Plates attached to Strips 3 separates the nose from the rest of the fuselage, and a Trunnion fixed to the Flanged Plate represents the pilot's seat.

The tail boom is made by bolting three $12\frac{1}{2}"$ Strips to each side of the main fuselage. The rear ends of the Strips on each side are connected by a Fishplate, and they are joined to the Strips on the opposite side by a Double Bracket. The fuselage sides are completed by adding $2\frac{1}{2}"$ Strips and $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates 6. The sides are braced by $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips held by the bolts 7 and 8.

Each leg of the main undercarriage is made by bolting a Semi-Circular Plate and a $2\frac{1}{2}"$ Strip to an Angle Bracket fixed to the fuselage. The Angle Bracket is opened out slightly, and a further Angle Bracket, which is also opened out, is fastened to

the end of the $2\frac{1}{2}"$ Strip. A 1" loose Pulley fitted with a Motor Tyre is free to turn on a $\frac{3}{8}"$ Bolt that is fixed by two nuts to the Angle Bracket. A $5\frac{1}{2}"$ Strip 9 is bolted between the fuselage and the $2\frac{1}{2}"$ Strip.

The castor-mounted wheel of the undercarriage is fixed on a 1" Rod mounted in $2\frac{1}{2}"$ Stepped Curved Strips. The Curved Strips are bolted to a Double Bracket that is lock-nutted to the Double Angle Strip between Strips 3.

A Magic Clockwork Motor is bolted to the underside of the $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate, and its pulley is connected by a Driving Band to a 1" Pulley 10. Pulley 10 is fixed on the lower end of a long axle made by joining a $4\frac{1}{2}"$ Rod and a 2" Rod by a Rod Connector, and the axle carries also a further 1" Pulley inside the fuselage. The axle is mounted at its lower end in the Flanged Plate 1, and at its upper end it is passed through a $2\frac{1}{2}"$ Strip. This Strip is fixed to Double Brackets bolted to $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plates, and the Flexible Plates are attached to the upper ends of Strips 9. The 1" Pulley on the axle inside the fuselage is connected by a Cord belt to a $\frac{1}{2}"$ Pulley (the Pulley (Continued on page 52)

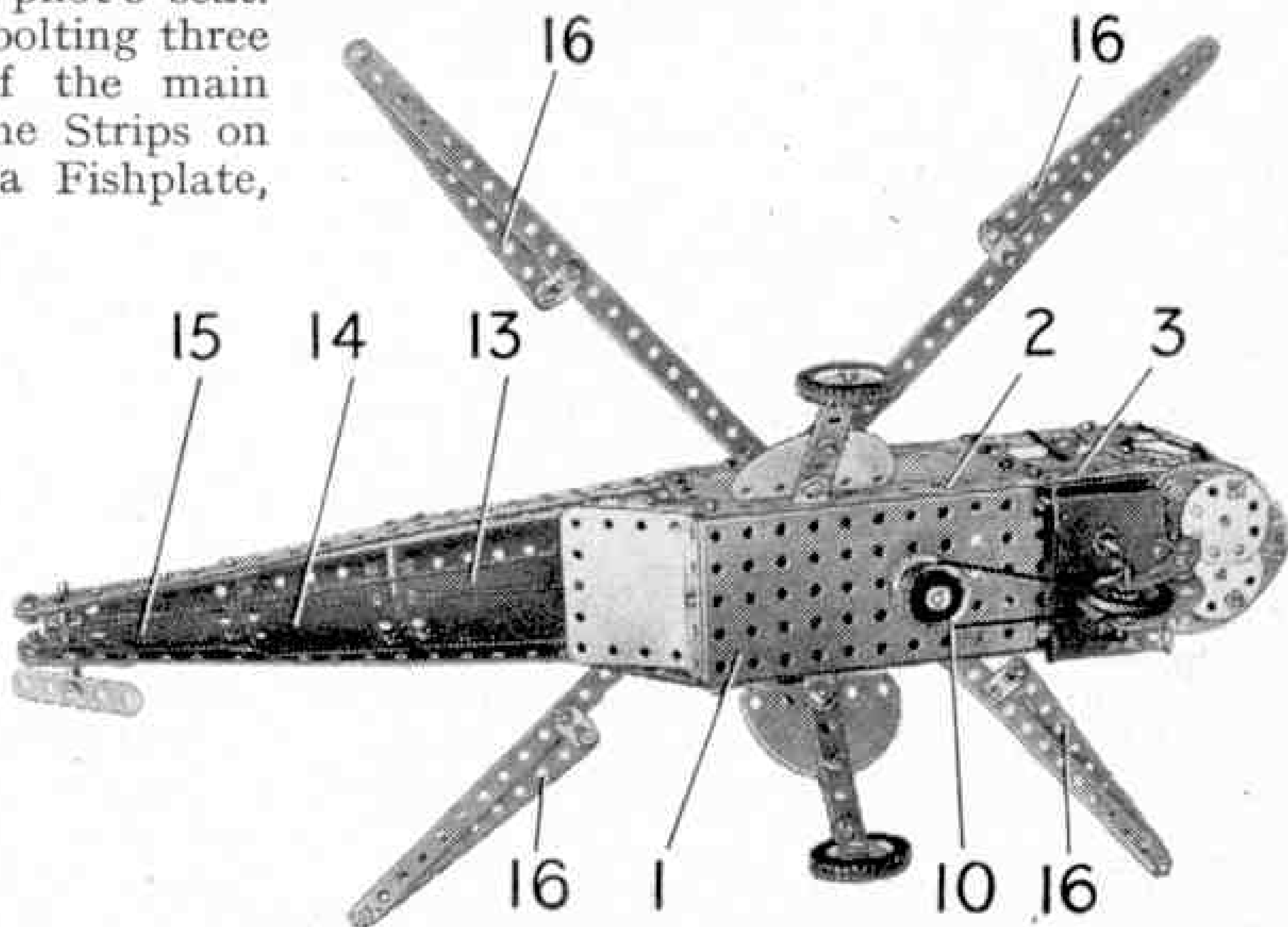


Fig. 3. The underside of the helicopter fuselage showing the drive to the main rotor, and the undercarriage

More Prizes for "M.M." Readers

"Coronation" Model-Building Competition

ON June 2nd this year, Her Majesty Queen Elizabeth II, will be crowned at Westminster Abbey, and this great occasion will be attended with all the traditional pomp and ceremony that has marked these great events throughout the long history of the British people. The celebrations will give rise to many interesting and attractive schemes of street decoration, and special events of all kinds will be organised throughout the British Commonwealth so that British people everywhere will be able to take part in the rejoicings. We are therefore making the Coronation the subject for a special Competition in which readers are invited to send in Meccano models of suitable subjects connected in any way with the Coronation Ceremony or the public celebrations.

As an example of what is possible, we illustrate on this page a beautiful model of St. Edward's Crown, which is used in the actual crowning ceremony.

This fine replica was built in our Model Department, and at first glance it would scarcely be thought that a satisfactory crown could be made of Meccano. However, the ingenuity of our model-builders triumphed over all difficulties! Indeed, they were not satisfied even when they had built this splendid model, but went on to produce a complete set of Coronation regalia in Meccano! With the exception of the orb at the top, one or two pearl ornaments, and the ermine and lining, the crown illustrated consists entirely of Meccano parts.

Other good examples of suitable models for entry in this "Coronation Competition" are the State Throne, The Coronation Chair, and the State Coach in which the

Queen will travel from the Palace to Westminster Abbey on the great day. There are other special coaches and carriages that will also make good subjects, and some of the decorative emblems, coats of arms and other devices used for decorating streets and public buildings may be found suitable and attractive to model. Model-builders with plenty of parts at their disposal can also tackle architectural subjects such as Buckingham Palace and Westminster Abbey.

Any model based on a subject even remotely connected with the Coronation, or the public celebrations, will be eligible for entry in this Contest.

The Competition is open to model-builders living in any part of the world, and there are no age limits.

The prizes to be awarded for the best models received are as follows:

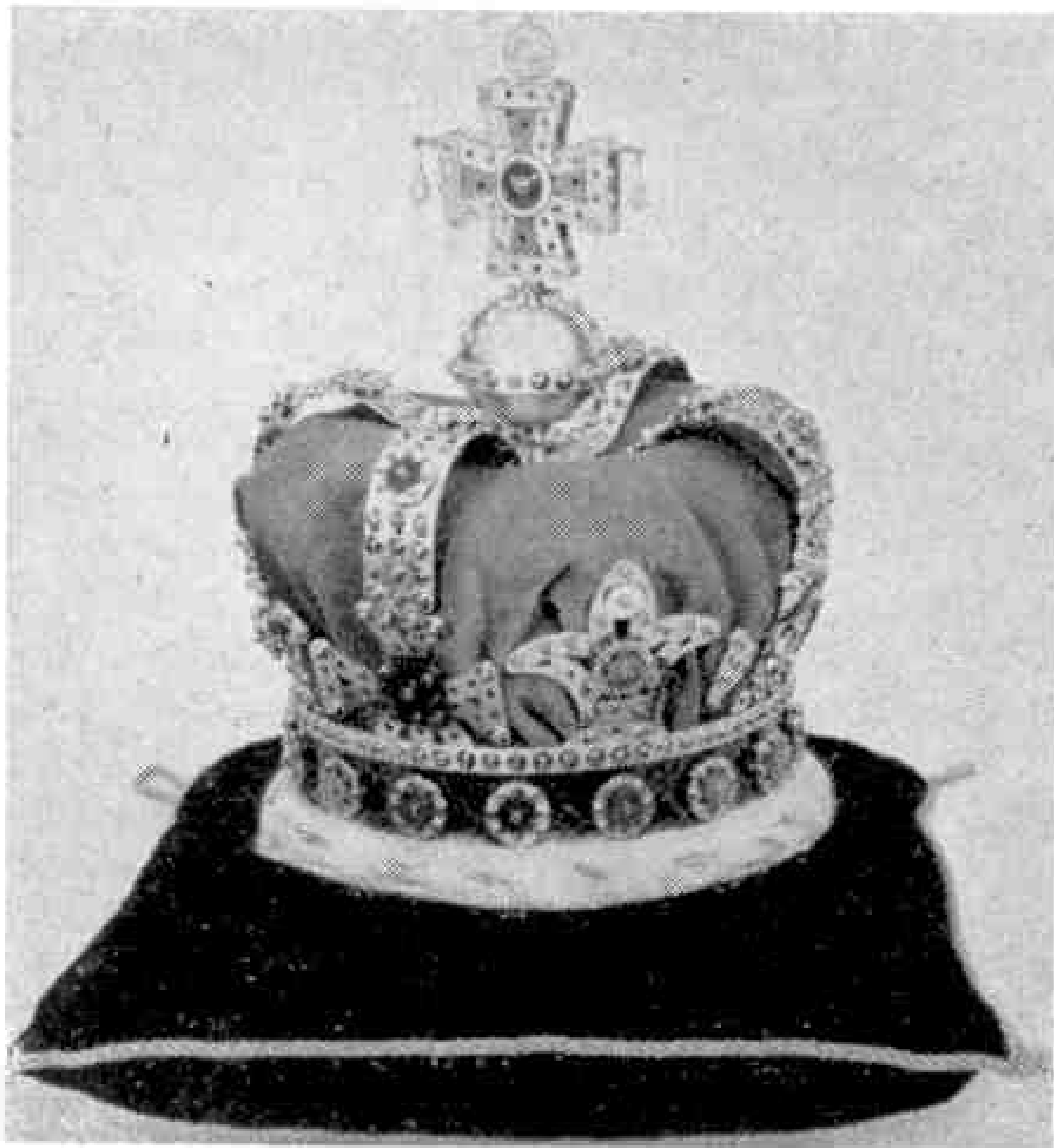
First, Cheque for £5/5/-. Second, Cheque for £3/3/-. Third, Cheque for £2/2/-. There will be also Twenty

Prizes, each of £1/1/-, and Twenty Prizes, each of 10/6. Certificates of Merit also will be awarded.

Photographs or drawings of models only are required. *Actual models must not be sent.* Entries should be addressed to "Coronation Model-Building Competition, Meccano Ltd., Binns Road, Liverpool 13."

The Competition will remain open for entries until 31st May next.

All entries, no matter whether they are sent by readers living in Great Britain or residing Overseas, will be grouped together. There will not be a separate Overseas Section, as the specially extended closing date will give every model-builder in whatever part of the world he lives, ample time to prepare and forward his entry.



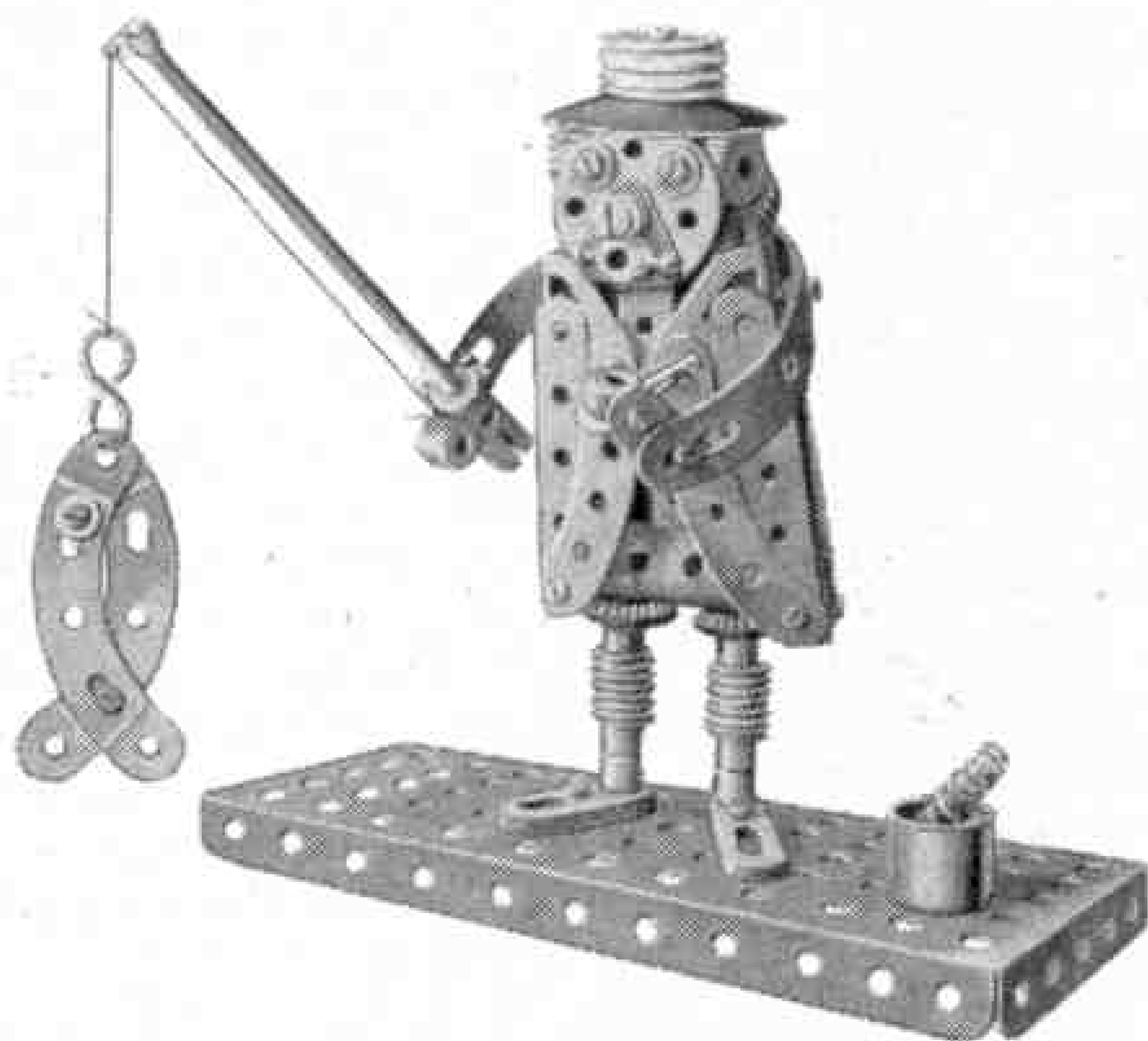
A fine reproduction in Meccano of St. Edward's Crown, with which many British Sovereigns have been crowned.

Model-Building Competition Results

By "Spanner"

"Sporting Meccanitions" Contest

IN this novel competition, which was announced in the June 1952 issue of the *M.M.*, competitors were asked to assemble a few Meccano parts to represent people engaged in some kind of sport or outdoor game. I am pleased to say that the Contest proved a great success, both in the number of entries it attracted and in the originality and ingenuity shown in



"The Angler," landing the one that didn't get away! This amusing Meccanition was one of two models that won First Prize for N. Blunsdon, London N.W.6.

many of the models submitted.

The full list of prize winners is as follows:

First Prize, Cheque for £3/3/-: N. Blunsdon, London N.W.6. Second Prize, Cheque for £2/2/-: J. A. Heywood, Macclesfield. Third Prize, Postal Order for £1/1/-: A. Beaumont, Johannesburg.

Ten Prizes, each of 10/-: R. Matthews, Sutton Coldfield; J. Birch, London E.1; I. G. Trainer, Liverpool 10; G. Hyslop, Prestwick; K. Hamilton, Taranaki, New Zealand; P. Seymour, Kimberley, South Africa; A. Coppola, Birkirkara, Malta; R. Martin, East Grinstead; D. P. Tromans, Wolverhampton; H. Bosworth, Melton Mowbray.

Ten Prizes, each of 5/-: D. W. Budden, Newbolt-on-Stour; D. Gardiner, Lincoln; S. Dennison, Giffnock; B. Parker, Attenborough; C. Carlson, Alberta, Canada; D. Mead, Stoke-on-Trent; I. Groombridge, Lower Hutt, New Zealand; B. Williams, Christchurch, New Zealand; N. Harvey, Umtata, S.A.; A. S. Muchall, Lancaster.

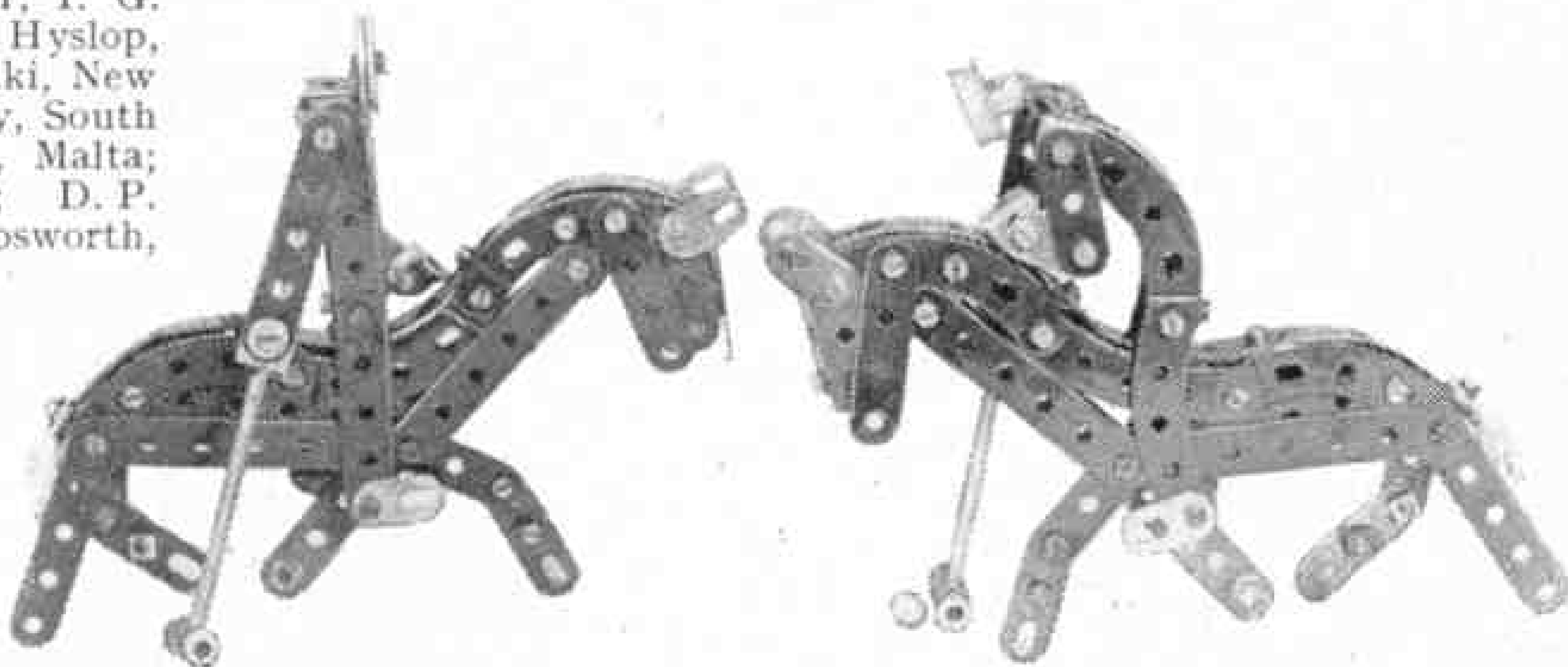
It is not always possible to illustrate models that win the prizes in competitions, owing to the fact that the photographs or drawings submitted are unsuitable for reproduction. In the present Contest, however, N. Blunsdon, who won First Prize, sent two excellent colour-wash drawings, both of which are reproduced on this page. His models represent an ice skater and an angler, and I am sure that readers will join with me in congratulating him on the very skilful and ingenious use he has made of Meccano parts in reproducing these subjects so realistically.

The skater is particularly attractive, and the use of a Fan to represent her ballet skirt, coupled with curls represented by Bolts, with Spring Clips for ribbon bows, makes the model a worthy winner. Almost equally ingenious is the use of a Spring to represent the bait in "The Angler." Note also the angler's pipe, formed from a Rod and Strip Connector and a Collar.

An amusing entry from J. A. Heywood, entitled "The Bullfight" and consisting of a Matador getting to grips with a fierce-looking bull, won Second Prize, and the Third Prize went to Anthony Beaumont, for his "Polo Players," shown in the illustration below.



"Graceful Gertie" on the ice. Another fine entry by N. Blunsdon.



Polo players in action won 3rd Prize for Anthony Beaumont, Johannesburg.

HORNBY RAILWAY COMPANY

By the Secretary

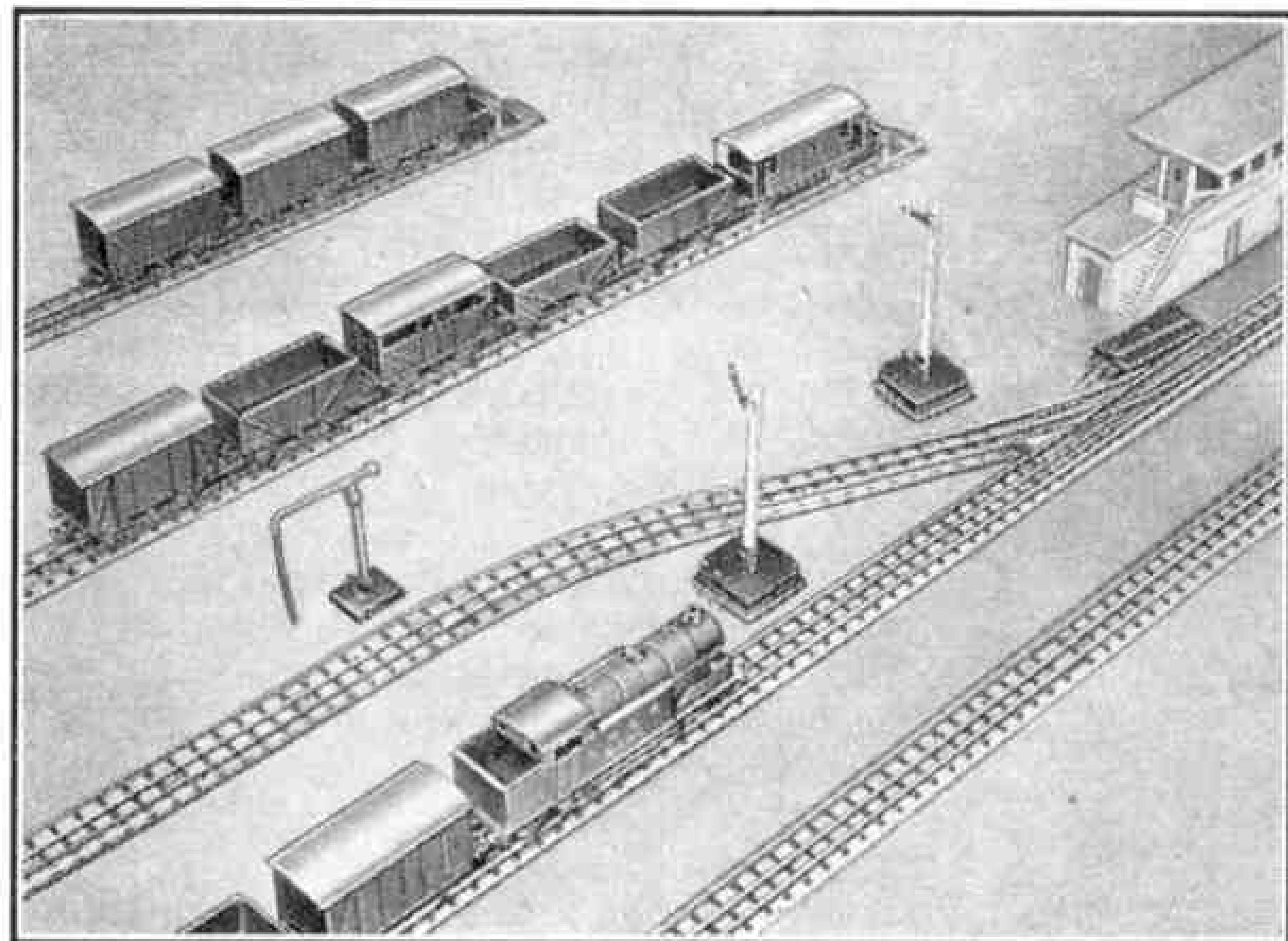
Combined Operations

WITH Hornby-Dublo Electrically-Operated Points and the corresponding Electrically-Operated Signals now available we are well equipped to use both together on a layout. Normally,

The scheme provides for the inter-working of the Points with the two Signals in such a way that when the Points are set for the straight run the Signal nearest to the main line is in the "off" position;

that alongside the siding is then in the "stop" position. When the Points are moved over to give the road to a train in the siding, it is the siding Signal that goes to the "off" position and the other one indicates "Stop." This is a useful arrangement for miniature train working, for the semaphores of the Signals show the operator which way the Points are set.

In order to attain this result the centre terminals of the two Signals and of the Points are connected together and to one of the Transformer terminals. The left hand terminal of the siding Signal is wired to the corresponding terminal of the Points, to the right hand terminal of the other Signal and to the lower terminal of the Switch. The upper terminal of the Switch is wired to the right hand terminal of the Points and of the siding Signal and to the left hand terminal of the other Signal. The second Transformer terminal is connected to the single Switch terminal.

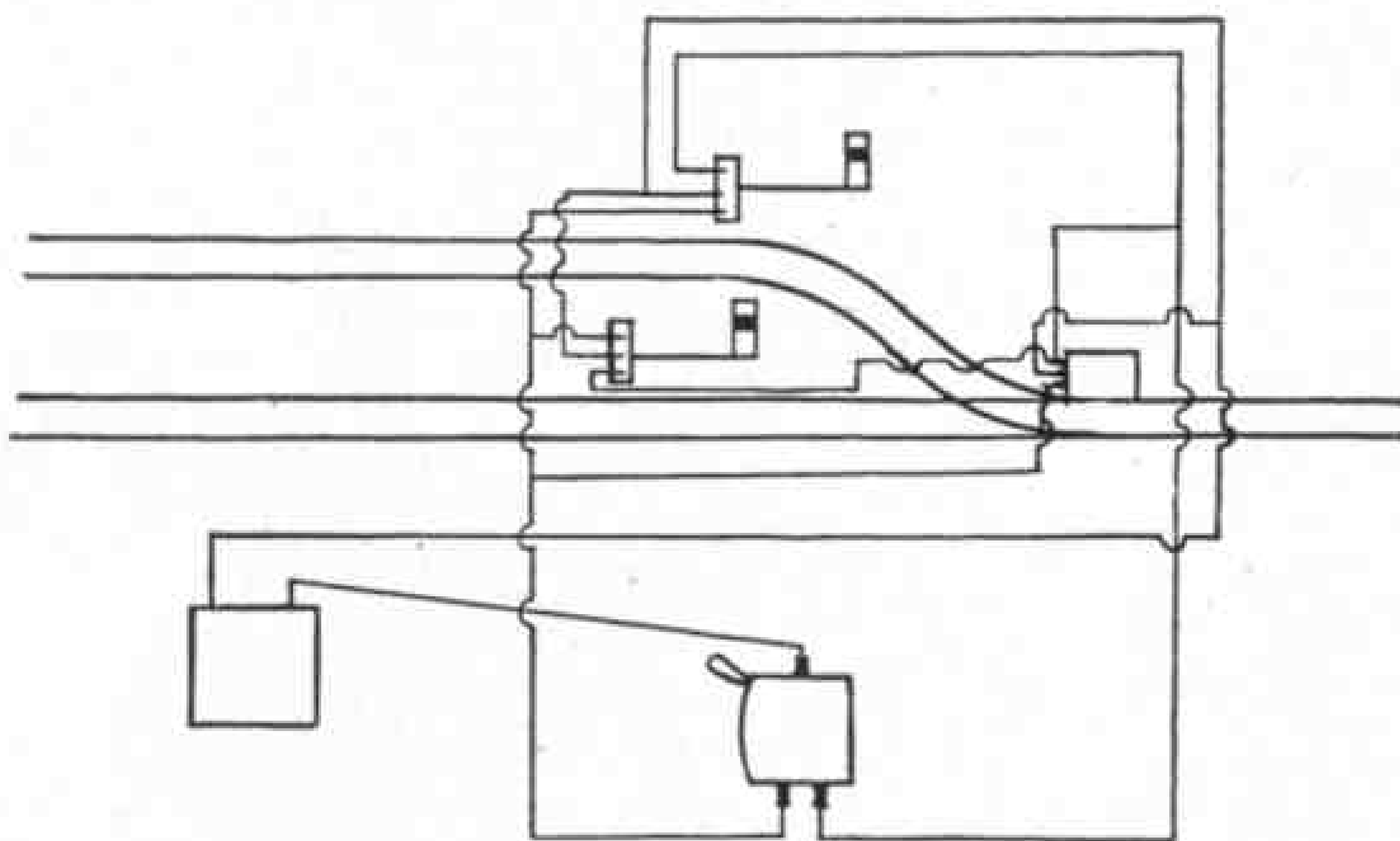


Hornby-Dublo Electrically Operated Points and Signals in this picture are arranged for working together. The train has a clear road past the Points, while the siding Signal operated from the same switch gives a stop indication. All wiring is carried below the baseboard.

Points and Signals are controlled separately in miniature, as they are in actual practice, but on a Hornby-Dublo layout we can sometimes combine their operation quite reasonably.

The exact manner in which such combined operation is applied to a layout will vary with the track conditions, but I am sure that Hornby-Dublo owners will have no difficulty in deciding which particular Points and Signals on their railways can be operated together with advantage. The maximum number of accessories that can be wired up to operate together is four.

In the illustrations on this page there is a simple application of combined control involving one set of Points and two Signals. It is assumed that traffic moves from left to right and in each case the situation is made quite clear by the picture.



Wiring diagram for the combined operation of Hornby-Dublo Electrically Operated Points and Signals referred to in this article.

The Barrodale Railway and Town

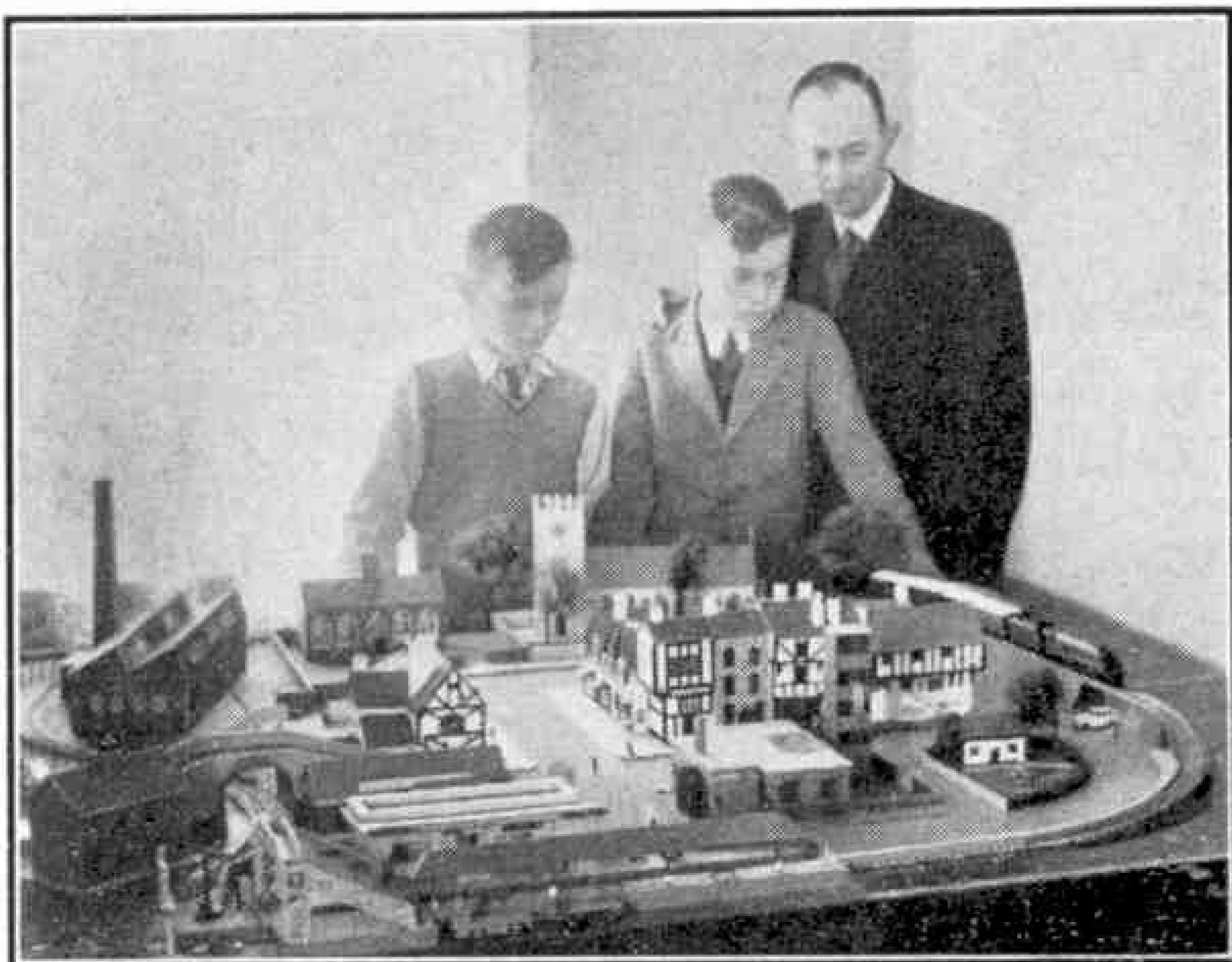
ON many miniature layouts the various lineside features give the impression that they are very much subsidiary to the railway. On other systems one is liable to gain exactly the opposite view. Actually the railway and the lineside should as far as possible be complementary to one another. In this respect a nice balance between the two is struck on the layout featured in the illustration here. The partners in developing this attractive miniature system are Mr. G. D. Barrodale of Rhyl and his boys Ian and Michael, both of whom are H.R.C. members.

The Hornby-Dublo railway seen in the picture here, which has developed at the same time as the miniature township it serves, is not obtrusive. It fits nicely into the general scene, although it does in fact encircle the town with its main line and includes an S-bend or return loop that winds its way through the various properties.

There are no odd corners with an untidy or forgotten look about them, because the arrangement of the system as a whole has been carefully worked out.

The track diagram is interesting in that it departs somewhat from the ordinary

oval. It is a continuous system that manages to look different, while the sidings and the centre return loop have a natural appearance that somehow is missing on some railways. Yet it is not obviously a continuous main line, because



Mr. G. D. Barrodale, of Rhyl, with Ian (H.R.C. No. 200211) and Michael (H.R.C. No. 200644), watch their Hornby-Dublo train approaching the station of the miniature town.

on one corner of the baseboard on which the whole layout is erected the track enters a tunnel that bores through a cleverly-arranged hill. It emerges again somewhat unexpectedly at an angle, to curve away towards the edge of the board, where it is joined by the return loop.

The railway centre in the miniature town is of course the two-platform station and in one direction sidings lead to a goods yard and a carriage shed. These sidings are provided with Uncoupling Rails so that shunting movements are easy to carry out. A *Sir Nigel Gresley* locomotive and L.N.E.R. Coaches provide for the transport of the inhabitants of the township, while their freight is handled by a small selection of goods wagons.

Some of the town buildings, including a church and shops, have electric light.

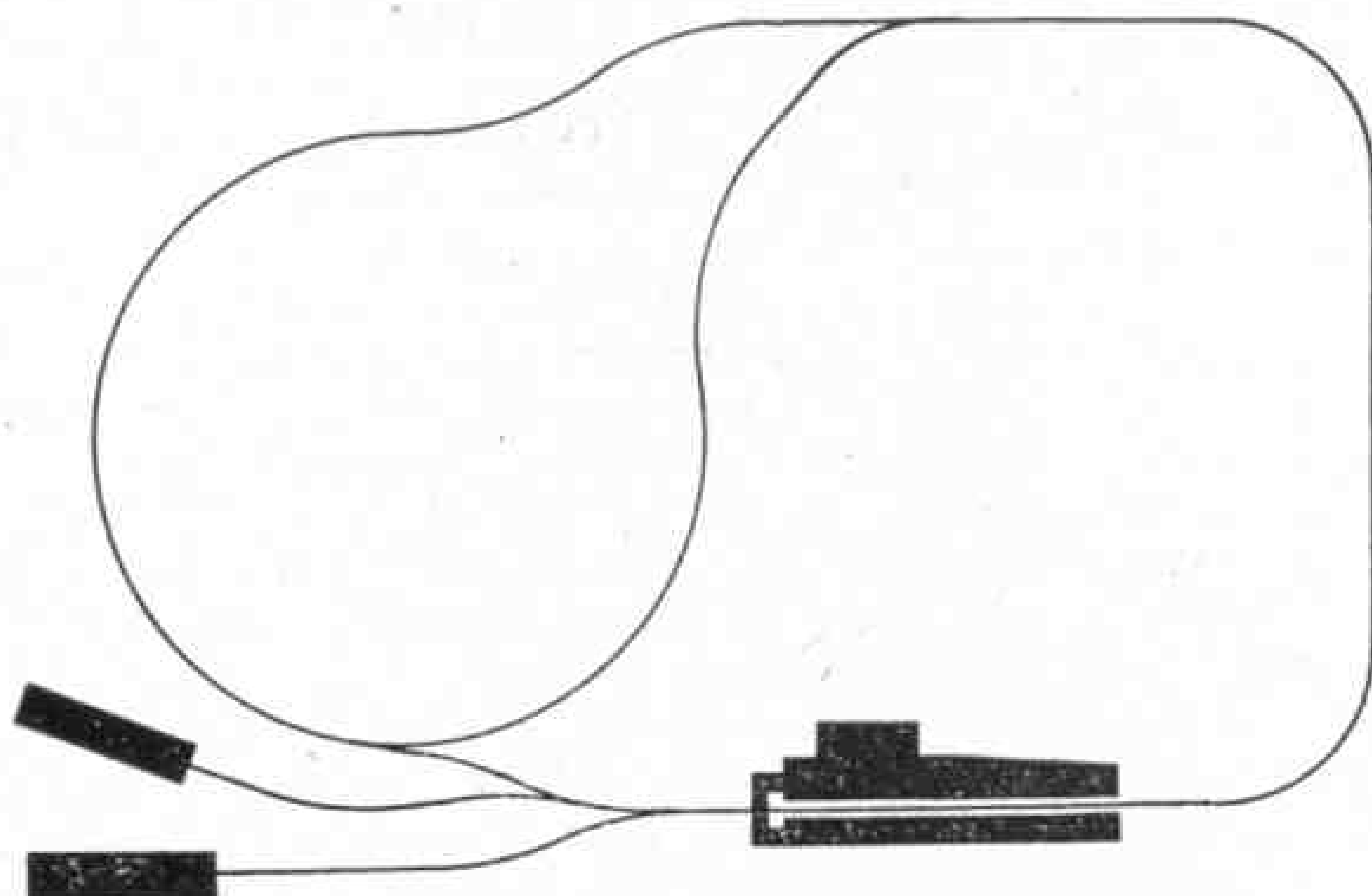
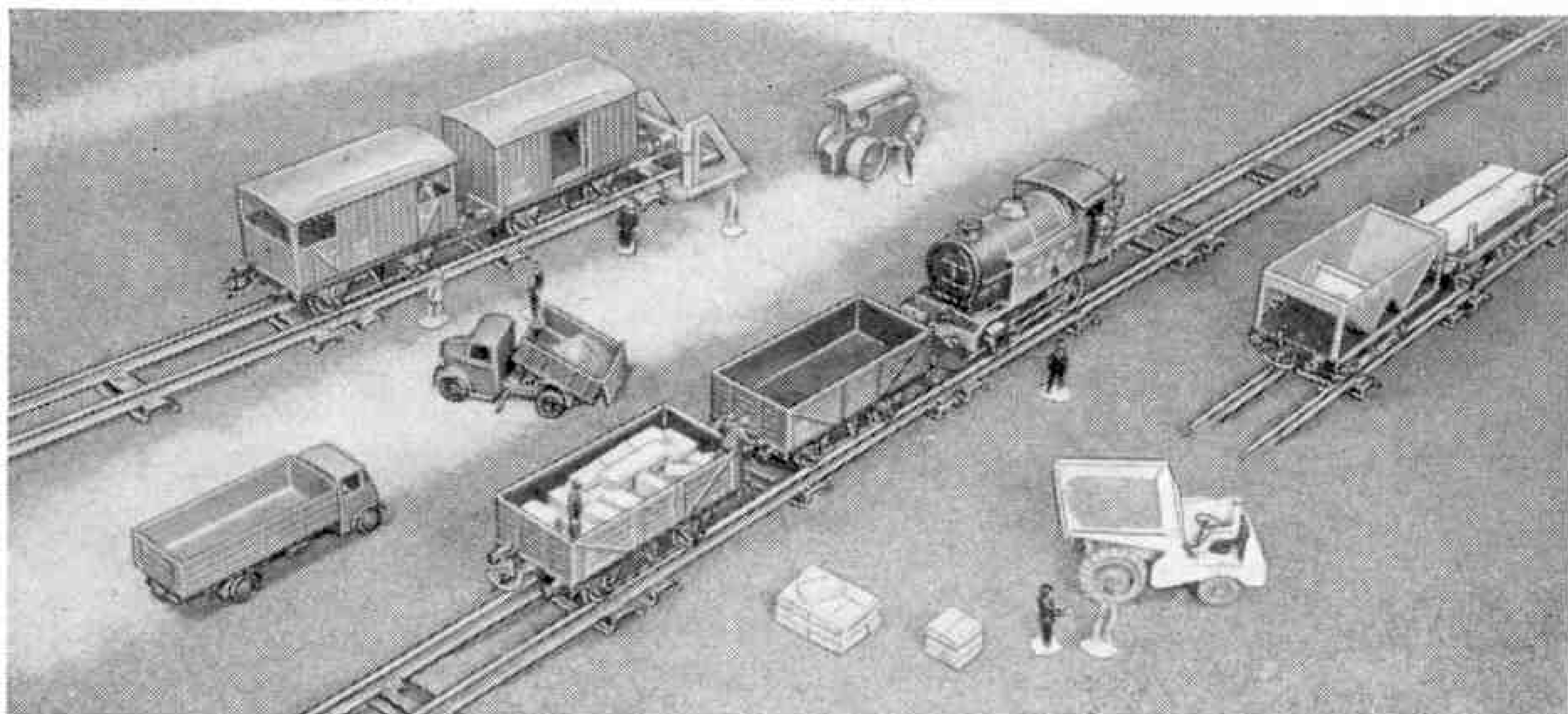


Diagram of the Barrodale railway showing the unusual course of the main line.



Building Up Your Hornby Train Set

THE Hornby railway owner is rarely content for long with his Train Set as first bought. He wishes to build up the Set and to develop the railway so that it grows steadily from a plain Train Set into something more exciting. The extent to which additions can be made depends on the type of equipment with which operations are begun. The M0 type Train Sets and equipment are in a class of their own, with special M0 type Rails and 9 in. radius curves that are suited only to the running of M0 stock. The latter have their own system of couplings specially suited to the simple requirements of these little railways.

The BM Straight Rails allow the standard oval track included in an M0 Train Set to be extended to almost any length. It is thus possible to make a good long main line, and this is what many boys like because they wish their trains to run long distances. Curved M9 Rails can be obtained, too, and it is useful to know this in case any of the original set of rails becomes damaged.

Once we have extended the track there is now room for more vehicles, and the addition of one or two of the attractive little M0 Wagons allows a nicely varied train to be assembled.

The owner of an M1 Train Set has a little more scope for development. Not only does his Train Set include standard Hornby Rails, but Points and Crossings suitable

for use with the 1 ft. radius curves found in M1 Train Sets also are available. Thus a more ambitious layout can be developed with 1 ft. radius track. It must be pointed out, however, that no larger Hornby locomotive than an M1 can operate satisfactorily on such a system.

Separate rolling stock of the M1 type is not listed, but this does not mean that the M1 Owner is prevented from building up his rolling stock. With the exception of the Hornby No. 1 Passenger Coaches, and the corresponding Guard's Vans, which have a fairly long wheelbase, the standard Hornby four-wheeled rolling stock can run on a 1 ft. radius layout.

The couplings of these Hornby vehicles are of the automatic type and so are different from those fitted to M1 trains, but many railway operators do use the two types together with fair success by placing the loops of the

automatic couplings over the hooks of the ordinary link couplings used on M1 trains. This usually works all right as long as the engine is pulling the load, but a little difficulty *may* be encountered if the engine is pushing its train over 1 ft. radius Curves and Points. Of course, it must be remembered that the M1 locomotive cannot be expected to haul many more vehicles than the two that are provided in the standard Train Set, especially if the layout in use is one that has many curved sections.

Extensions are more easily made by the

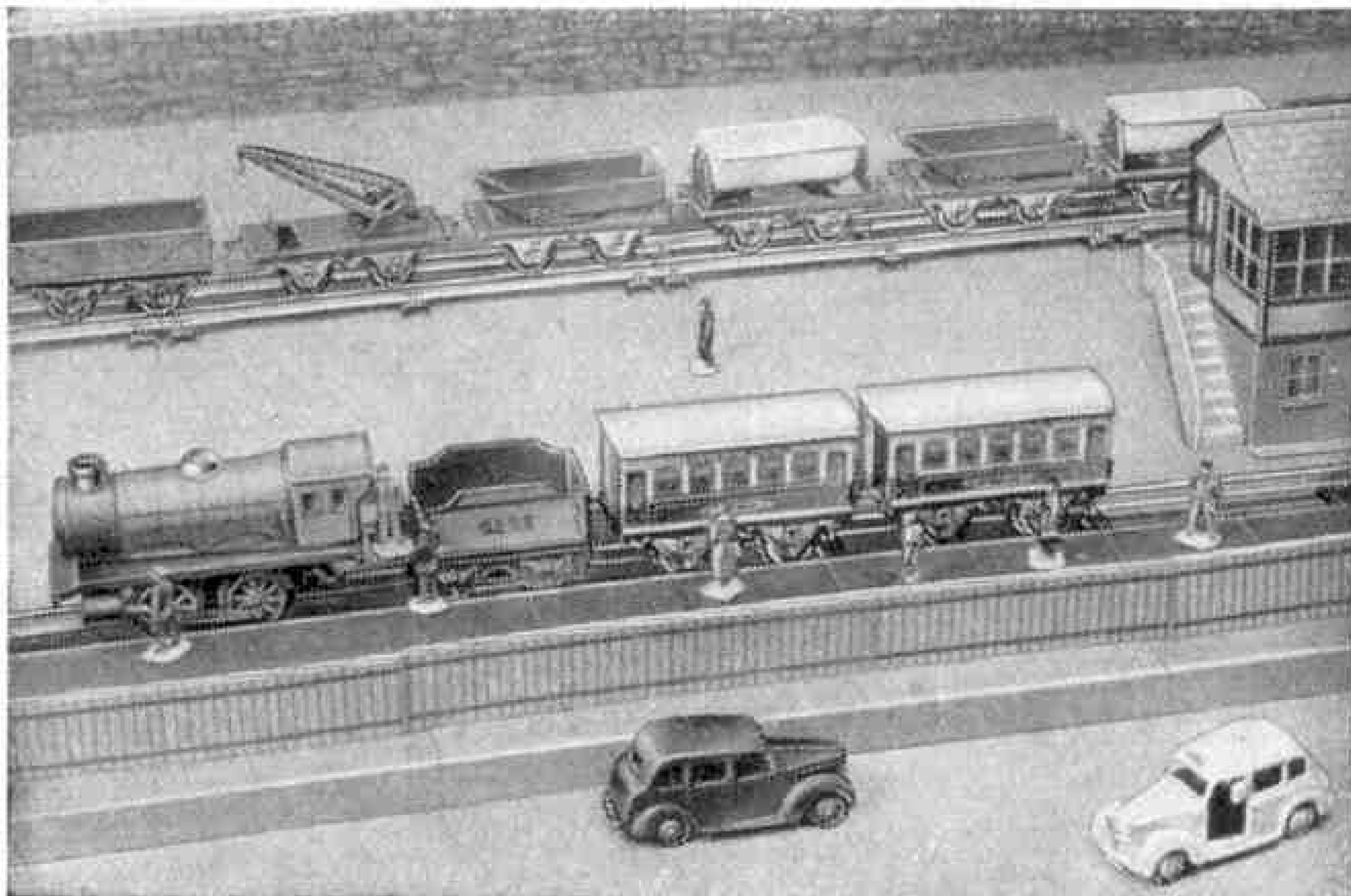
Above is depicted part of a Hornby railway yard showing various Dinky Toys vehicles and figures used in conjunction with the trains. The engine is placing the open wagons for loading purposes, and repairs to the yard surface are evidently in progress.

owner of the larger Hornby Train Sets. These have 2 ft. radius Curves, and on these any Locomotive or item of rolling stock in the Hornby range can be run. Thus an M0 or M1 train, surviving perhaps from one's first adventure in miniature railwaying, could be run on track developed with 2 ft. radius equipment obtained later on.

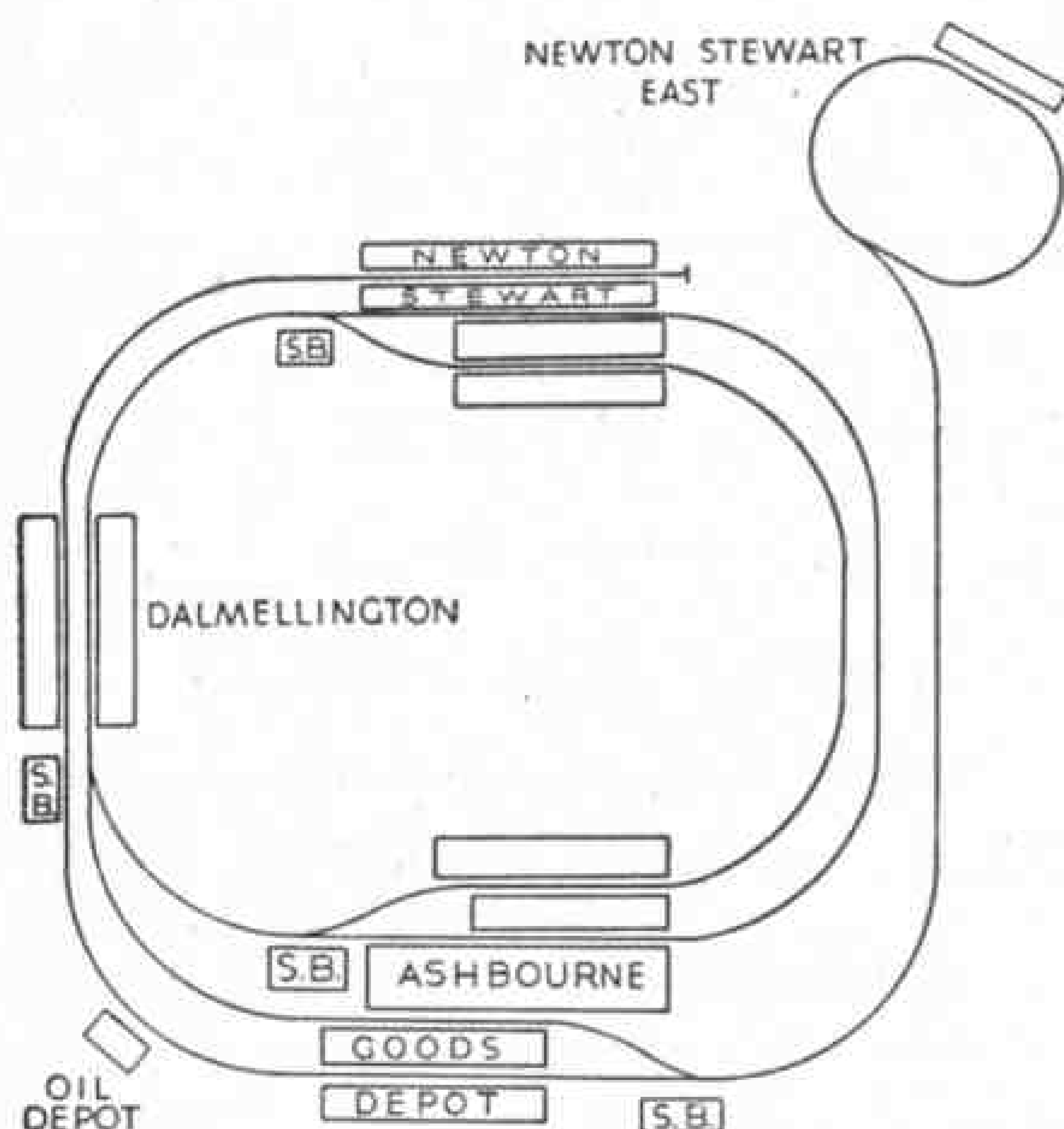
A good idea is to make 1 ft. radius Curves and Points form a separate section of a large layout, such as a branch line. Train working on such a layout can be real fun. The diagram on this page shows an M.M. reader's system on which this sort of scheme has been successful. The layout has been developed by G. M. Slater, Keighley, who has managed to confine his 1 ft. radius equipment to the short continuous loop in the top right hand corner of the diagram. It will be noted that this oval, serving a station known as *Newton Stewart East*, is situated at the end of a fairly long branch line. The branch can be considered to extend, in effect, from *Newton Stewart*

on the main line right round past *Ashbourne* to reach the continuous section already mentioned.

As the diagram shows, the main line serves several stations, and trains run between them on a timetable system. The



Dinky Toys figures give life to the scene when this M0 passenger train is alongside the platform. Several different types of M0 Wagons stand on the track in the background.



The Hornby layout of M.M. reader G. M. Slater, Keighley, Yorks., which has a continuous main line and a branch line.

branch line train which is in fact operated by an M1 locomotive runs at frequent intervals in order to connect with main line trains. The surroundings of the railway, which is laid on a permanent baseboard, are of interest, for roads, fields, buildings and other items contribute to the general realism. There is in fact a farm and out buildings within the branch line oval. Again, a bus station is found appropriately outside the main line station at *Newton Stewart* and a loading platform for an imaginary miniature gasworks is situated on the branch beyond *Ashbourne*.

The arrangement on this layout of what we may call connecting loops is of interest. Between *Ashbourne* and *Newton Stewart* there is a loop inside the main oval that makes it possible to regard this section as a double track length. Even if it is not used in this way the provision of an alternative route via the loop is of benefit in train running.

Another connection is that running from *Dalmellington* round to *Ashbourne*, where it passes between a passenger platform and the Goods Depot and then joins the branch to *Newton Stewart East*. Its length is such that a train can be held on it quite conveniently while other traffic is passing on the main line and on the branch.

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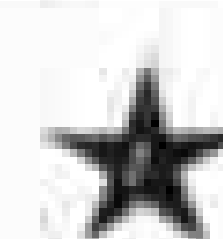
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For other Stamp Advertisements see also pages 48 and xvi.

Stamp Collectors' Corner

By F. E. Metcalfe

MIGHTY INDIA

AS most collectors will know, India recently released a new set of postage stamps, officially known as the "saint-poets" issue, which mark a completely new departure in stamp printing for what has been called the sub-continent. This seems to be an opportune moment to refer to this very interesting set, and at the same time to give Indian stamps a general look-over.

For over a century India has been producing postage



stamps, and these have always been printed by either the lithograph or typograph process. Few would credit them with any artistic merit. To be quite frank they have been a dull lot. Yet stamp collectors have in the past gone for them in a big way. This is proved by the fact that a full collection would be worth a small fortune. Indeed, these Indian stamps—at least the early ones—have gone up so much in value, that one would need to have very well lined pockets before one could think of forming a representative collection.

Still, that need not worry us. If the first few issues of India are beyond our reach, a good show of stamps released during the present century—and that is going back quite a bit, for those who like the older stamps—can be gathered for a relatively small sum, provided that only used stamps are collected. On the score of cost I am going to suggest that only such stamps be considered, for generally they are so much cheaper than mint.

If one starts the collection at 1900, stamps bearing portraits of Queen Victoria and onward can be included. Here is ample scope for one to form a collection worth looking at, if great care is taken over the quality of the stamps included. Good copies exist if one takes the trouble to look for them, and as a rule they can be picked up as cheaply as the off-centred and heavily postmarked copies. And what a difference it makes to the appearance of a collection, for in the main the stamps are not much to look at, and if they are poor copies as well the result is pretty moderate.

I said at the beginning that the new set breaks new printing ground. Some time ago machinery for the production of stamps by the photogravure process was installed, and the "saint-poets" issue is its first fruits. There is another point about this new set—it is the first for India in the Queen Elizabeth II group, and likely to be collected in Great Britain on that score alone.

Now it is a fact that when a country installs a lot of printing machinery, it takes jolly good care to make good use of it—France and Austria are notable examples of this—and from what I have heard India will certainly be no exception. In fact, already several other special stamps are projected, and my suggestion is that collectors should take up the collecting of Indian stamps from this



found to show four of them. A brief summary of the lot will perhaps prove useful to those who wish to write up their collections.

The first value is of 9 p. and depicts Kabir, the mystic saint. He lived in the 15th century and his couplets, written in Hindi, are said to have an irresistible appeal to Indians. The colour of the stamp is yellow-green and the design is adapted from a painting in the State Museum, Lucknow. The

second value, 1 anna, shows Tulsidas, a poet of the 16th-17th century and author of *Ramcharitmanas*, popular version of the Indian epic *Ramayana*. The colour of the stamp is crimson, and the design adapted from a painting in the Bharat Kala Bhawan, Benares.

The third value is of 2 annas, and here we get a portrait of a lady, a Rajput princess of the 15th century, who wrote a number of favourite devotional songs. The design is an adaptation of a painting in the House of Kishangarh. The colour is scarlet. The fourth stamp, 4 annas, gives us a picture of Surdas, the blind poet of the 15th-16th century. He is the author of a great Indian work *Sursagar*. The colour of the stamp is blue, and again we have an adaptation of a painting, which in this case hangs in the Department of Archaeology, New Delhi.

The fifth stamp shows us Ghalib, the Urdu 19th century poet, whose letters are said to be masterpieces.

The stamp is of 4½a. value and is magenta in colour, and a painting in the library of the Nawab Sadar Yar Jung, Habibganj (Aligarh) has been used for the design. Finally, on the 12a. value we get a portrait of Tagore, the winner of the Nobel prize, and to be quite candid this is the only one of these six personalities of whom the writer of these notes had ever heard. The colour of the stamp is brown, and the design is an adaptation of a photograph to be found in the Visva Bharati, Santiniketan.

Now that is the lot, and it must be pretty obvious to all that the above is a crib. It is. The Director of Indian Posts has kindly supplied the data, and it is a very good start to future relations that the Indian Post Office is so alive to the wants of stamp collectors.

I can thoroughly recommend young collectors to take up Indian stamps.





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R. D. HARRISON

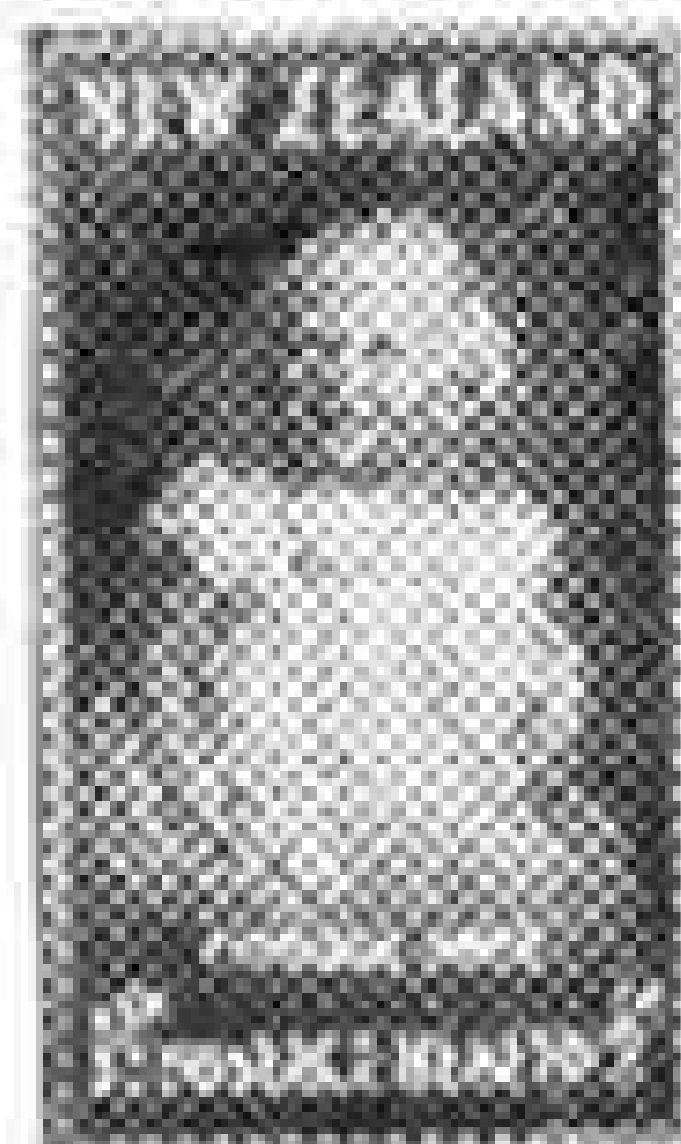
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Stamp Gossip

EVA PERON

EVEN our own newspapers have reflected the sorrow that was felt in Argentina over the death of the wife of its President, and repercussions have been felt all over the world. During his holiday in Spain the writer of these notes visited the wonderful church of Montserrat, way up in those fantastic mountains, and even there they were holding, to a packed congregation, High Mass for Evita. Philately comes into most things nowadays, and it has been decreed

that for one year Argentina will use only stamps bearing a portrait of the lady. One of these stamps is illustrated here. It is one of a beautiful set, printed in photogravure, a method that lends itself so well for such stamps.



QUAINTNESS

I saw a most interesting collection the other day. It was quite large, and it contained only stamps with quaint designs. A new one, which the collector had just obtained, was in his

opinion about the best he had come across for a long time. It is a stamp issued by Sweden to commemorate the 400th anniversary of the death of Olavus Petri, the Swedish reformer. Born of poor parents, Petri became a pupil of Luther, and later not only preached a lot, but composed hymns and published many books. Today he has a place in Swedish history. I must say that I also think the stamp a beauty.

PELOTA

Now here is a grand stamp for those who are forming a "sports" collection. It is one of a commemorative set from Bolivia, and shows clearly a pelota match.

Pelota is Spanish for ball, but in this connection it refers to a game popular in France and all the Spanish speaking world. Unless one understands the finer points, the game is not particularly interesting to watch, but even the uninitiated cannot help but admire the strength of the players when they bash (yes, that is the right word to use) a hard rubber ball, covered with goat skin, against a wall at the end of a long court. Standing back on a large court, the players will, with the help of a curved basket strapped on one wrist, drive the ball as much as fifty yards, and it is said to fly off the wall at the rate of about a hundred miles an hour.

Recently the writer watched a pelota match being played for the world championship, in San Sebastian. Talk about enthusiasm! The spectators were besides themselves, and to be candid your scribe, who understands the game, also felt excited. Anyhow, this is a nice stamp and that is what matters.



AIR LETTERS

M.M. readers generally are interested in anything

to do with aviation, so those who do not know already may be intrigued to hear what a craze there is for those very ordinary looking sheets of paper bearing a 6d. stamp that can be sent to any part of the world where there is an air service. I think our own country originated the idea, and now most others have adopted it.



Some time ago I received one from Abyssinia, and my word, didn't a collector of such items snap it up!

He told me a lot about this

phase of philately, if it can be considered as such. Apparently even special catalogues exist on the subject. When the Olympic Games were held in London in 1948, besides a set of postage stamps, the design of the 6d. value was used on an air letter form and now these are worth many times face value, if they have not been used.

The way these air letters are housed in albums, according to my informant, is for them to be folded carefully as they should be folded for posting. I think that a collection of used ones at any rate should be quite interesting, even if not very beautiful.

THOMAS MOORE

There is no postal administration in the world that plays more fairly with collectors than that of Ireland, which is one of the reasons why new Irish stamps are welcomed so warmly. The pair released on November 10th last year were thus sure of popularity right from the word go. Men like Thomas Moore really deserve all the honour their country can shower upon them. Not their part to strut about in fancy uniforms, and at the same time often bring misery to their fellow human beings, but to bring pleasure, which this Irish musician and poet did in abundant measure.

Moore was born in Dublin in 1779 and died a hundred years ago. His songs are sung all over the world. One, *The last rose of Summer*, the writer of these notes has heard sung in cities like Rome, Budapest, Buenos Aires and even as far away as Ankara, for it was included in the opera *Martha* and is the most beautiful aria in that tuneful work.

There is another interesting point about the two stamps under review. They were produced in Ireland itself by the British firm of Thos. De La Rue, in recess, and this is the first time postage stamps have been printed in Dublin by that process.

STAMPS TO WATCH

In 1943 a printing of the 1½d., 2½d., 3d., and 1/- stamps of Gilbert and Ellice Islands was released, and instead of the centres of these being jet black, they were slate, with a faint purple tinge. Now that they are included in the Commonwealth Catalogue they are bringing good prices, so look out for them. You may be able to buy them at just over face value.



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.

Which 1952 Cover Did You Like Best?



The illustration above reproduces, on a very small scale, the 12 covers of last year's issues of the *M.M.* Being in black and white, it does not give any idea of the colour and brilliance of the originals, and is intended only as a reminder of what the subjects were. We invite readers to give us their opinion of these 1952 covers.

It is only necessary for each entrant to state on a postcard: A, which of the covers he likes best; and B, in what order he thinks they will be placed by the combined votes of competitors. In each list the covers must be referred to by the names of the months when they appeared, and

it is not necessary for a competitor to place his own favourite at the top of his list under the second heading.

The names, addresses and ages of entrants must be written on their postcards, which should be addressed to *1952 Cover Voting Contest, Meccano Magazine, Binns Road, Liverpool 13*. As usual there will be two sections in this competition, for Home and Overseas readers respectively, with prizes in each of 21/-, 15/- and 10/6 for the three entries judged the best, and consolation prizes for other good efforts.

Closing dates: Home Section, 28th February; Overseas Section, 30th May.

Word-Making Contest

In the course of an interesting letter to the Editor received recently, R. K. Eustace, of Bristol, a new reader, mentioned the surprisingly large number of words that he had succeeded in obtaining from the title *Meccano Magazine*. He suggested that the idea be "tried out" on other readers, and we are losing no time in doing so! In this contest, therefore, we invite entrants to see how many words they can produce from the title of this Magazine, using any or all of the letters. The results of their efforts should be written out neatly in a list, and on the back of it they should write their name, address and age.

There will be the usual two sections for Home and Overseas readers respectively, and in each prizes of 21/-, 15/- and 10/6 will be awarded for the best entries in order of merit. In addition consolation prizes will be given for other deserving efforts.

Entries should be addressed to *Word-Making Contest, Meccano Magazine, Binns Road, Liverpool 13*.

The closing dates are Home Section, 28th February; Overseas Section, 30th May.

January Photographic Contest

This is the first of our 1953 series of photographic contests. It is a general one, in which we invite readers to submit prints of any subject. Each competitor may submit only one photograph, which must have been taken by him, and on the back of his print must be stated exactly what the photograph represents.

The competition will be in two sections, A for readers aged 16 and over, and B, for those under 16. Each competitor must state in which section his photograph is entered. There will be separate Overseas Sections, and in each section prizes of 21/-, 15/- and 10/6 will be awarded. Entries should be addressed: *January Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13*. Closing dates: Home Section 31st January, Overseas Section 30th April.

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.

UNUSUAL BUSES

M.M. readers who are Road Transport enthusiasts will be interested in the accompanying picture of a motor coach operated by the Ulster Transport Authority, one of the very few operators who build the bodies of their own vehicles. The bus illustrated is one of two coaches with almost identical coachwork, the main difference being that the other has only 24 seats, whereas the bus in the picture has 30. The second coach does not have a large route number indicator in the front roof and has not got destination indicators in the front of the cab. Instead it carries a single indicator in the roof and has an attractive radiator grille. Both vehicles have toilet compartments and the more recent of the two has facilities for serving refreshments.

Under the upper deck is a large luggage locker with a capacity of about two tons and capable of accommodating the largest type of pram or bicycle, a feature of great advantage to holiday-going families. This locker is accessible from the near-side as well as the rear, and it also houses the air conditioning plant.

The central entrance door is power operated. One of the two vehicles has folding tables of the railway carriage type between the upper deck seats, which are fitted to face each other.

The chassis is of Leyland make and is 30 feet long. The Leyland Diesel engine develops 125 b.h.p. and drives through a four-speed gear-box at a governed

maximum speed of 45 m.p.h. Twin steering mechanism is controlled by a single steering gear and one steering wheel. The second pair of front wheels are much smaller than the first pair, thus allowing the body floor to be really level. This adds to the comfort of the passengers, who are not inconvenienced by protruding wheel arches.



A coach, built and operated by the Ulster Transport Authority, that has many interesting features. Photograph by J. C. Mulvagh, Warrington.

The coach illustrated is used on ordinary stage services, but its companion is used on private-hire and tour work. The former is finished in dark green and white while the latter is painted in two shades of green and cream. They are both unusual and impressive vehicles, as the accompanying picture of one of them suggests.

J. C. MULVAGH (Warrington).

A CLIMBING TORTOISE

A tortoise is not usually thought of as a climbing animal, but one of my two tortoises proved to be an expert at this. Along with its companion it was kept in a compound that I built. This was surrounded by wire netting which extended to a height of about 12 in. but he escaped from it several times and by watching him I discovered that he could work his way up the netting, in the sure and deliberate manner that is characteristic of the tortoise.

After I had seen him do this once or twice I set about making his climbing feat impossible. I lined the inside of the wire netting with stout cardboard, thinking that he could not get a grip with his claws on its smooth surface. But he escaped yet again!

His success in getting over the fence puzzled me until one day I saw him on the back of the other tortoise, which appeared to be sleeping near the fence. Then it became clear that he was using his companion as a stepping stone. In this way he got high enough to secure a grip at the top of the wire netting and the rest was easy. The photograph I am sending with this note shows him climbing up from his companion, who provided the way for him to escape.

R. COTTON (Bearsden, Glasgow).



How a tortoise escaped from its compound. Photograph by R. Cotton, Bearsden, Glasgow.

The Bristol Britannia—(Continued from page 6)

small-scale Britannia control surfaces were flight tested on a Bristol Freighter.

As a result of all this care and skill, the Britannia can be regarded as a thoroughly practical aircraft only five months after its first flight. Already B.O.A.C. have ordered five more, equipped to carry 20 tons of cargo instead of passengers at rates which will compare favourably with surface transport. And they have taken over one of the Ministry prototypes to bring their passenger-carrying fleet of Britannias to 26. Overseas airlines, including Qantas, Aerovias Guest of Mexico and Tasman Empire Airways may soon decide to re-equip with Britannias, and there are persistent rumours that R.A.F. Coastal Command and the Royal Canadian Air Force are interested in a militarised version for long-range over-water patrol.

This is only a start, for Britannias will not be in full service for another couple of years, and will then have many years of development ahead of them. Almost certainly, loaded weight and payload will soon be increased, making them even more attractive economically; and more powerful, economical engines like the Rolls-Royce Conway or Napier Nomad may make them even more attractive militarily. So the Britannia, like the Comet and Viscount, is a British air liner of which we can be very, very proud.

The Television Microscope—

(Continued from page 7)

make these stand out, and to give the contrast that is necessary if they are to be examined and studied thoroughly. The use of stains, which in most respects have proved very efficient, has disadvantages of its own. With televised microscopy specimens can be made to stand out clearly without staining, so that these undesirable results are avoided, and the slow or rapid movements of material under a microscope can easily be watched on the television screen.

The use of this new method in the study of microscopic living things is only just beginning, and there is no doubt that the new tool will provide wonderful aid in probing more deeply into the structure of materials.

A Talk with Stirling Moss—(Continued from page 11)

and certainty that he can control his own actions."

This interested me very greatly. Every racing car has its own individuality. In racing it is not enough to be skilful with clutch, gear-box and brake. The racing driver must know instinctively what to do and when to do it, just as he knows how and when to move his own limbs in running a race himself.

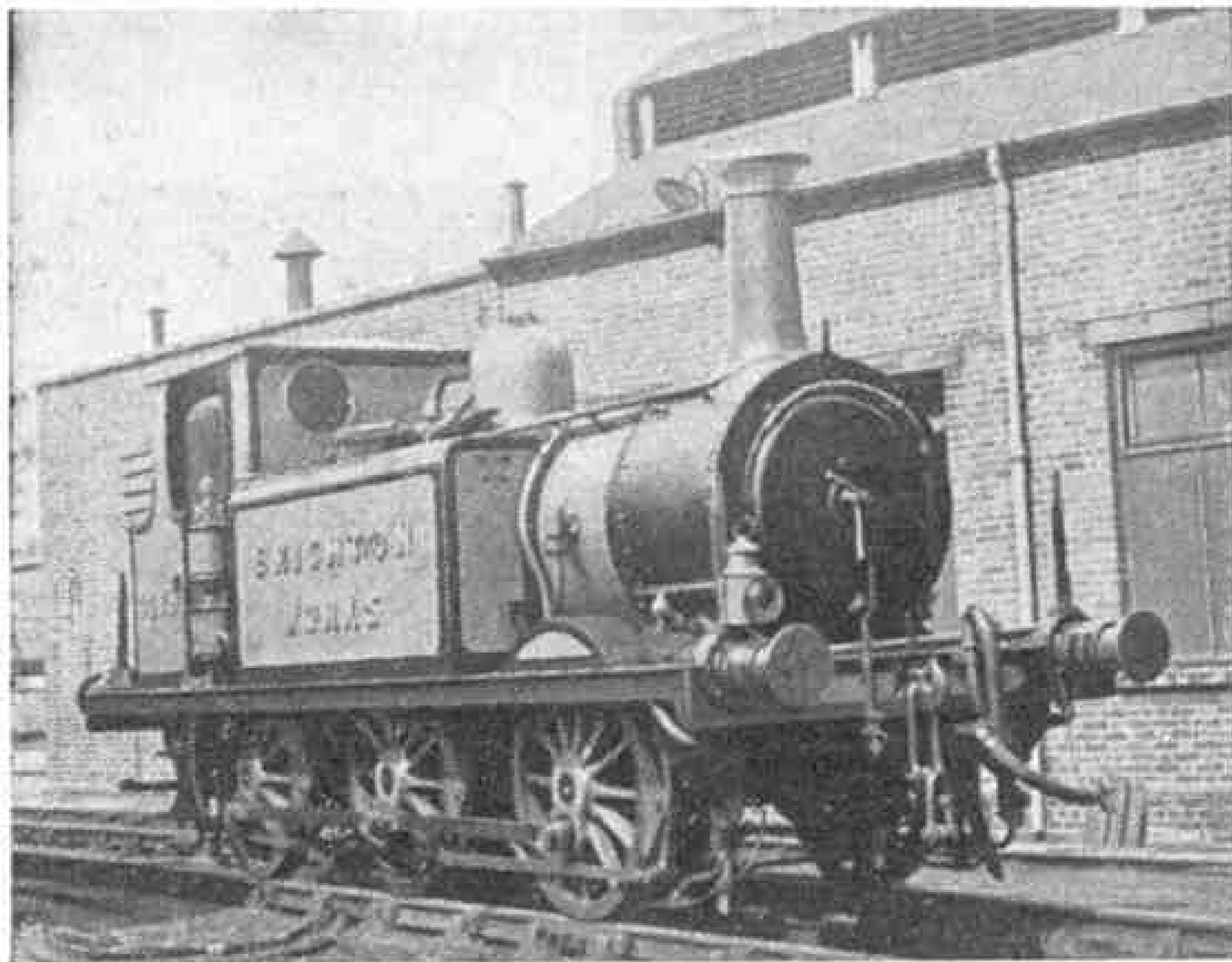
In his youngest days Stirling was a horseman, skilled in jumping, and apparently the same skill that he developed there has played a great part in the control of the very highly strung cars that he has driven at speed and around curves in the motor car world. Today he flies for relaxation and pleasure, so he is accustomed to speed in more spheres than one, and no doubt he will be as successful in the air if occasion arises as he has been on land.

Stirling's triumphs on the racing track, and in endurance tests and rallies have been legendary and I need not present readers with a list of them. They would take up more space than I could spare anyway! But I would like to remind readers of his outstanding achievement in the International Alpine Rally in July of last year, when he was a member of the Sunbeam-Talbot team that won the Manufacturers' Team Prize for the best team irrespective of size, class or nationality, and secured other awards in what

has been described as the toughest rally in the world, for car and man. I have already spoken of his part in the 1952 Monte Carlo Rally. This month he is taking part in the 1953 Rally, again in a Sunbeam-Talbot, and in this he will carry the best wishes of every reader of the *M.M.*, all of whom have followed his career with the most intense interest.

New Meccano Models—(Continued from page 39)

is supplied with the *Magic Motor* fixed on a $1\frac{1}{2}$ " Rod, mounted in the tail boom, and a $2\frac{1}{2}$ " Strip bolted to a Rod and Strip Connector on the Rod represents the tail rotor.



The Brighton Works Terrier, originally L.B.S.C. No. 35 Morden built in 1878. The engine is resplendent in the yellow Stroudley livery, with the copper chimney cap that formerly distinguished Brighton passenger locomotives. Photograph by H. C. Casserley.

The top of the fuselage is completed by two $2\frac{1}{2}$ " Strips 11, curved to shape and attached to the sides by Obtuse Angle Brackets. A $5\frac{1}{2}$ " Strip 12 is also curved and is fixed at the nose to an Obtuse Angle Bracket. Strip 12 is supported at its rear end by a $5\frac{1}{2} \times 1\frac{1}{2}$ " Flexible Plate bolted between the sides.

The curved top of the tail boom is formed by two $5\frac{1}{2} \times 2\frac{1}{2}$ " Flexible Plates 13, two $1\frac{1}{2}$ " radius Curved Plates 14 and a U-section Curved Plate 15. These parts are curved to the required shape and are fixed to the sides of the boom.

The main rotor blades are made by bolting four $12\frac{1}{2}$ " Strips to a Bush Wheel fixed on the upper end of the axle driven by the Motor. The $12\frac{1}{2}$ " Strips are arranged in pairs, each pair being made from two Strips overlapped seven holes. The blades are completed by $5\frac{1}{2}$ " Strips 16 arranged as shown in Fig. 3.

EXHIBITION OF RAILWAY PHOTOGRAPHY

Readers in Lancashire and Cheshire who are interested in railway photography will be glad to know that the splendid Railway Photographic Exhibition held in London last October, and referred to on page 480 of the *M.M.* for that month, will be showing at the Liverpool College of Art, Hope Street, Liverpool 1, from Monday 5th January to Saturday 10th January inclusive. The hours of admission will be: Monday to Friday inclusive, 5.30 p.m.—8 p.m., and on Saturday, 1.30 p.m.—8 p.m. Admission will be free, and a Catalogue, price 1/—, will be on sale.

This Exhibition has been organised by the Railway Correspondence and Travel Society in association with the Railway Photographic Society.

Fireside Fun

Client: "My neighbour has put up a fence opposite my study window, out of spite, I'm sure, and I can't see to write. What should I do?"

Lawyer: "Switch on the light. Six and eightpence, please."

"Heavens. I've left the safe door open!" exclaimed the small merchant to his partner. "I must go back."

"Why worry about that," answered his partner. "We're both here, aren't we?"

"How long was that assistant of yours with you?"
"Never. He was against me all the time."

"Yes, it was one of those spectacles one can never forget" said the club bore.

"My word," interrupted one of his victims. "Where do you get them? I'm always forgetting mine."

"What is a hypocrite?" asked the teacher.

"A boy who comes to school with a smiling face" answered the class.

"Why were you kept in at school today?"

"I didn't know where the Bahamas were."

"In future remember where you put things."

"My husband was a heavy smoker, but he has given it up."

"Good. To break off a habit of a lifetime takes a strong will."

"Yes. That's what I've got."



"H'm. They're turning them on two at a time now. Getting late, of course."

BRAIN TEASERS

A TYPEWRITER SHIFT

Jones claimed that he was an expert on the typewriter and could type blindfold. He was promptly challenged and a sentence was dictated to him. Here is what he typed!

RGW HYSFW FYUSWS VT RGW WCUSWBXW
EWBSWEWS RGW CWESUXR DEWWUBF RGW
NUBWE.

What was really dictated and how did the confident youth go wrong?
V.B.



"Yes, he's one of the early settlers out here."

"I thought you all showed him great respect, but he looks young to be a pioneer."

"Oh, it isn't that! He just pays his bills quickly."

NOT AT ALL IMPOSSIBLE

The owner of a house thought his hall was dark, so he made the window twice its original size. In doing this he did not increase either its height or its width. How did he manage this?

A WEIGHTY PUZZLE

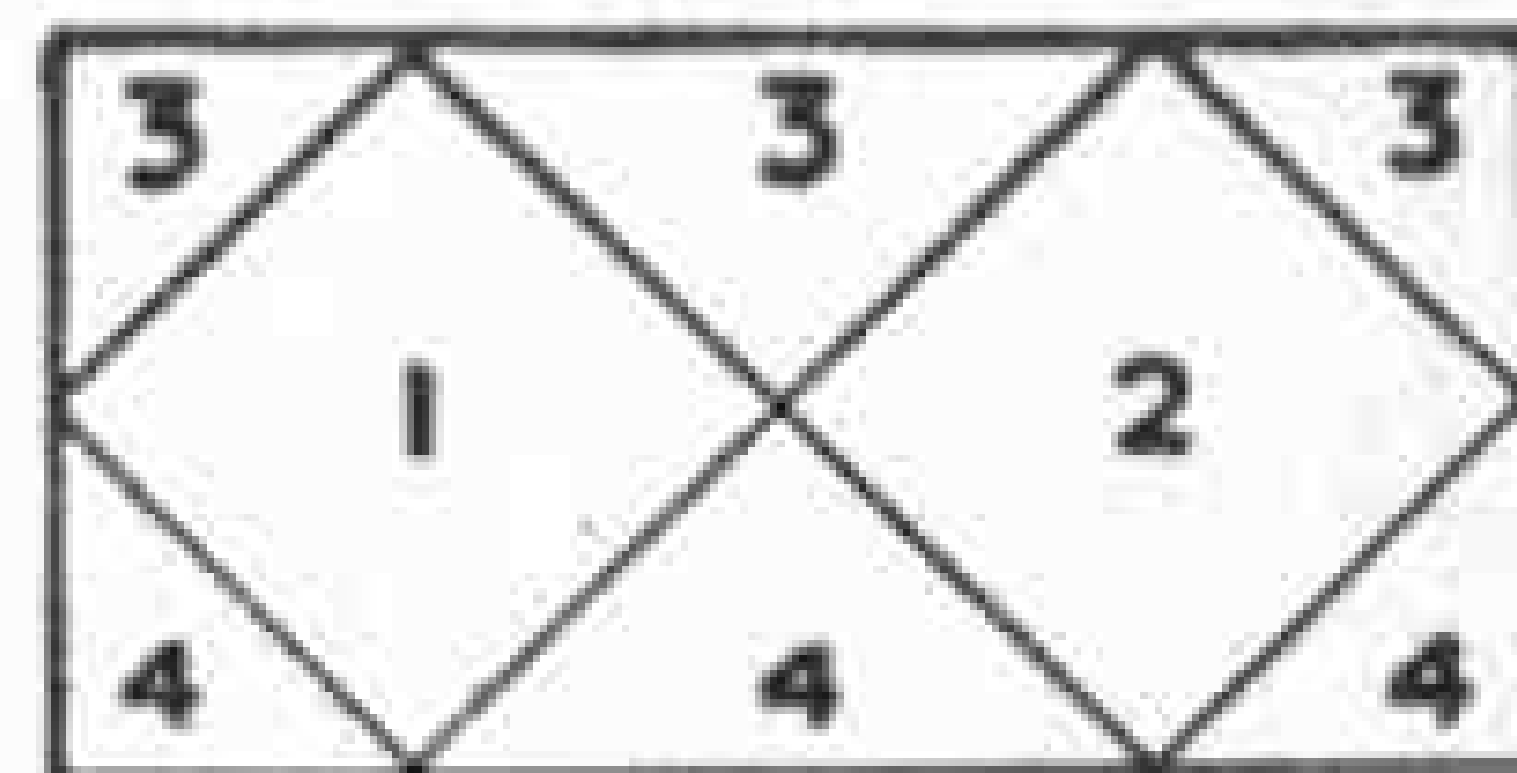
What is the least number of weights that would be required to weigh any number of pounds from 1 to 69 inclusive? What would the weights be?

SOLUTIONS TO LAST MONTH'S PUZZLES

The four words to which the clues in our first puzzle last month led were Lanky, Satin, London and Defend, and the names of the lorries were Atkinson, Foden and Leyland.

The solution to the problem of squaring the rectangle is shown in the accompanying diagram, in which each piece is given the number of the square into which it fits.

Solving our third puzzle seems impossible, but in reality it is quite easy. The cost of the buns is $13/6\frac{1}{2}$, a total of 649 farthings. This number can only be made up by multiplying 11 by 59, so there were 59 boys, and each bun cost 11 farthings, or $2\frac{1}{2}$ d.



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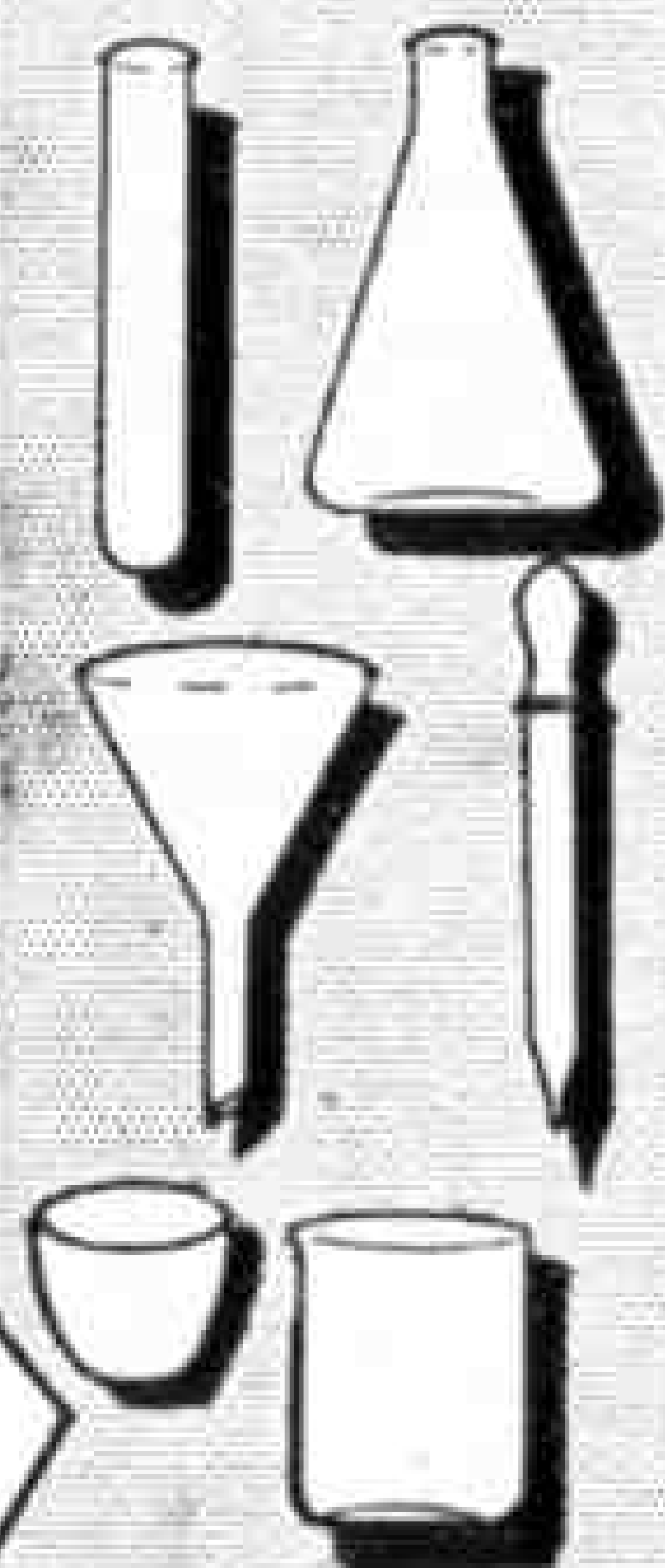
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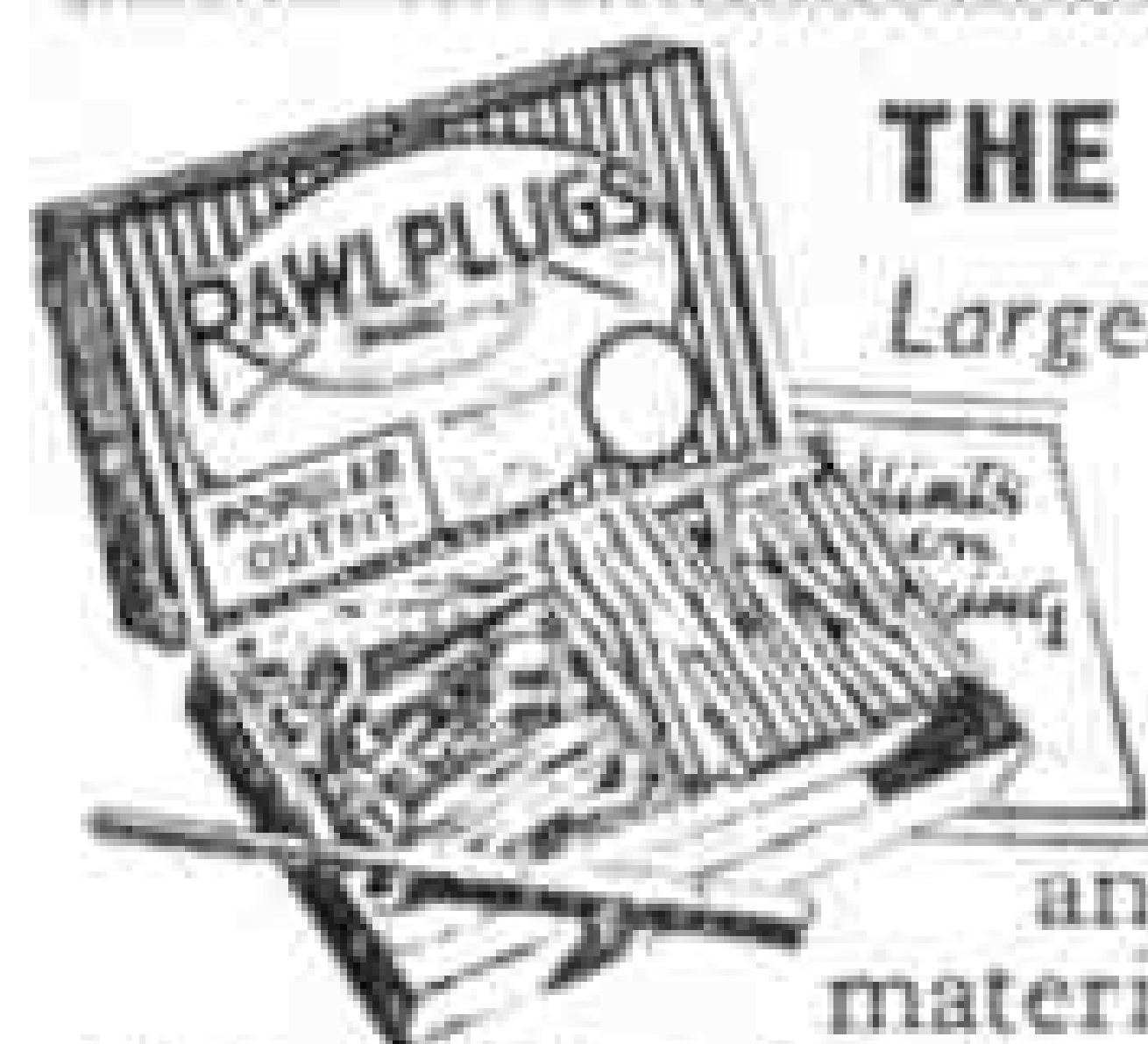
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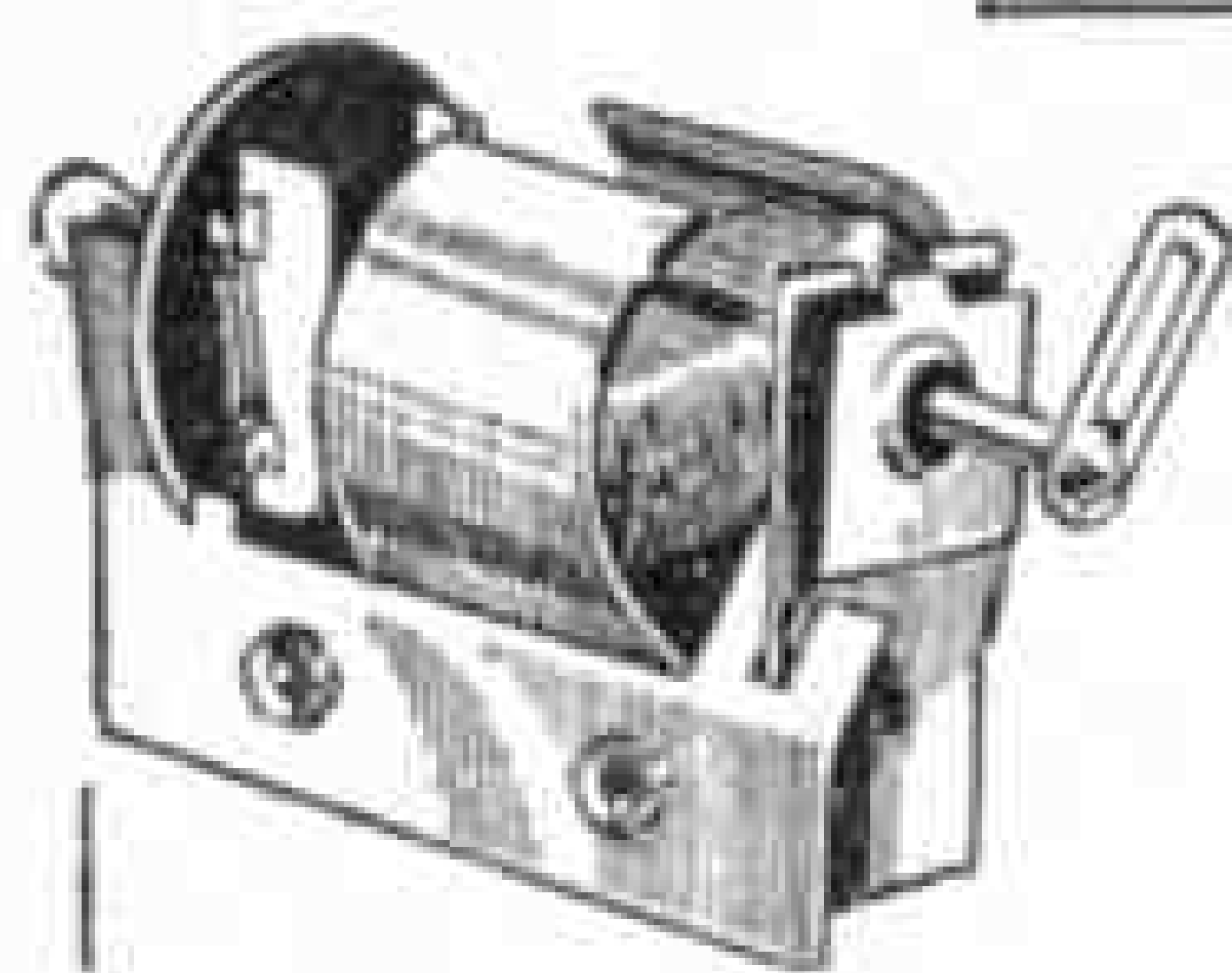
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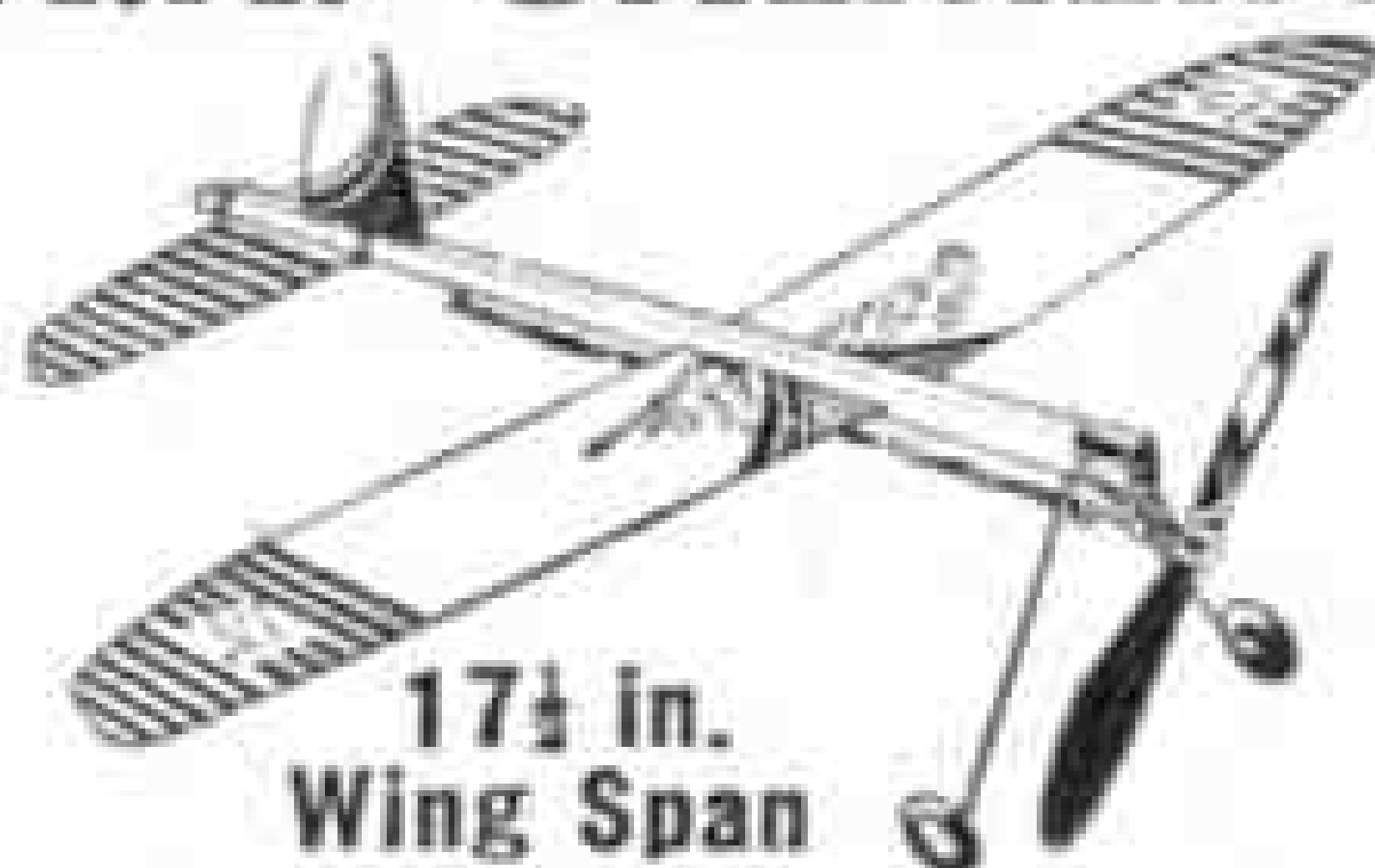
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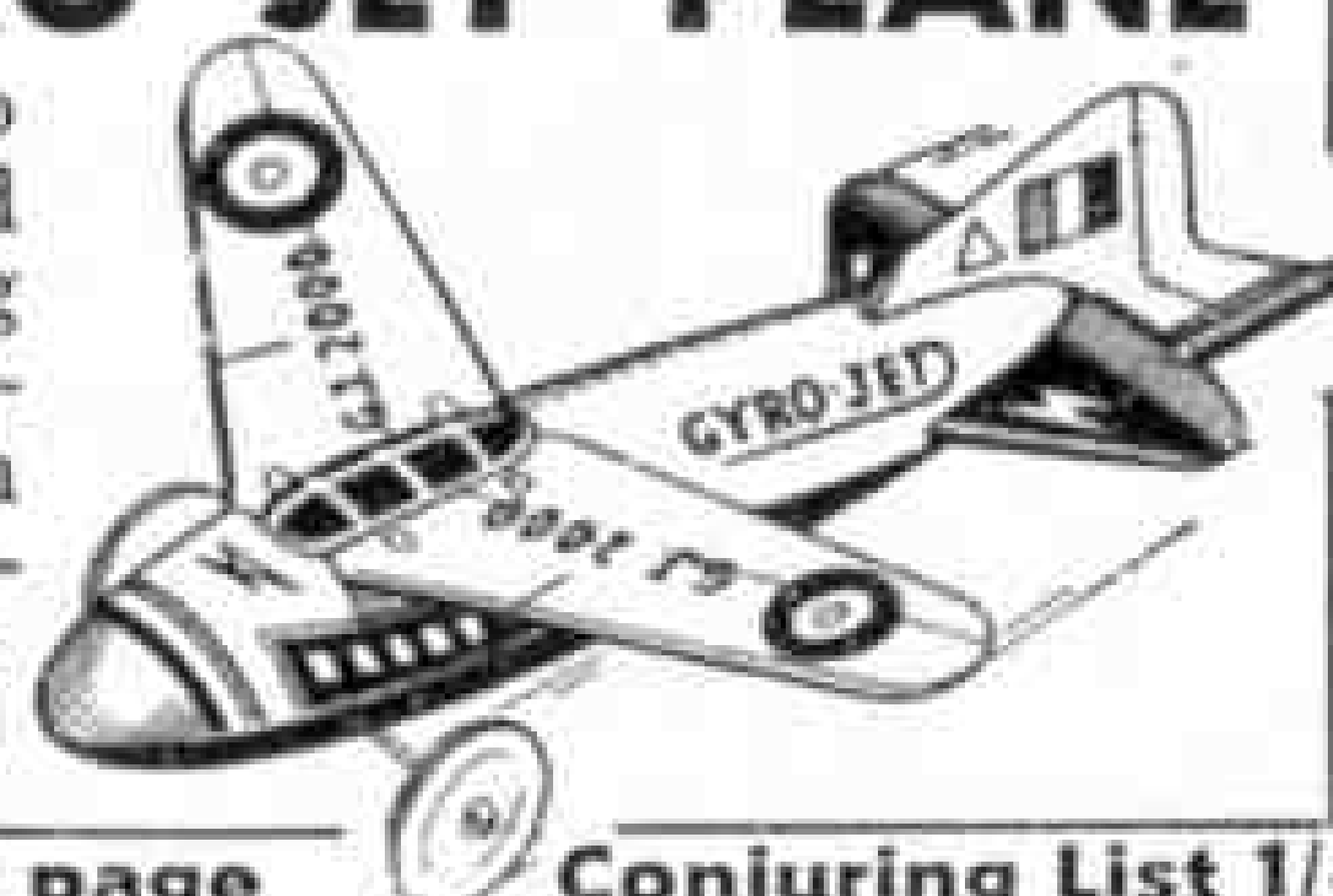


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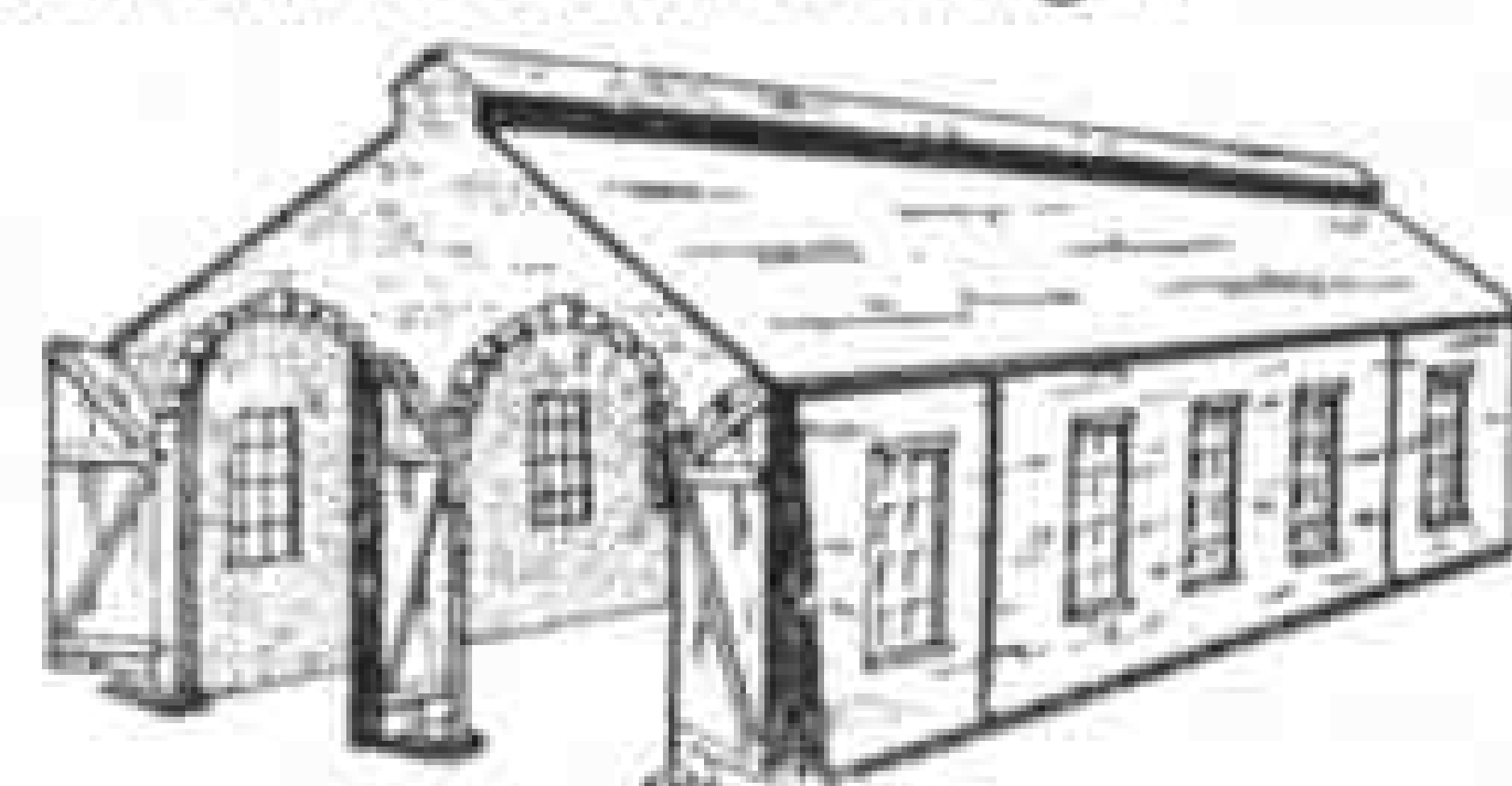
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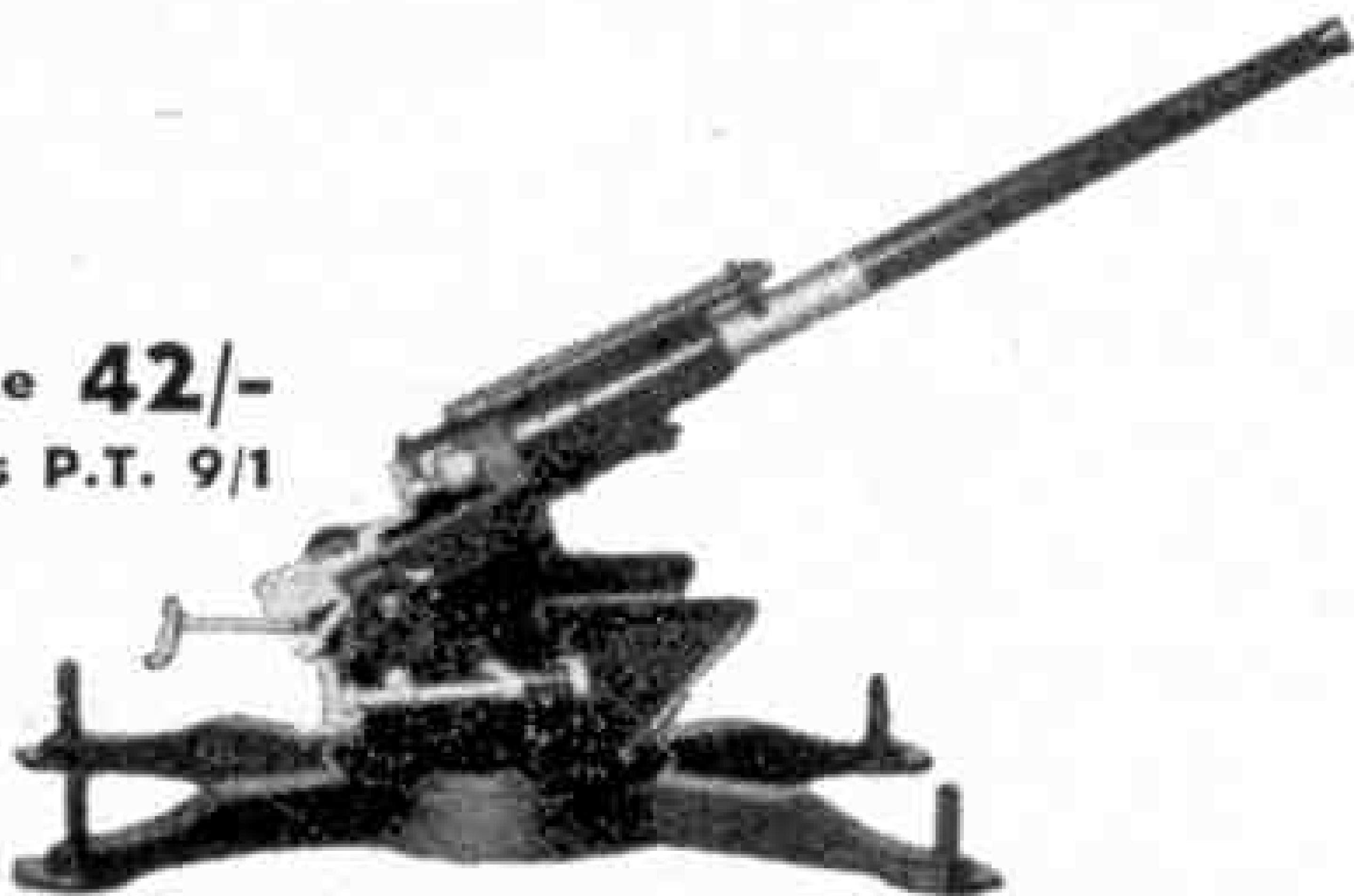
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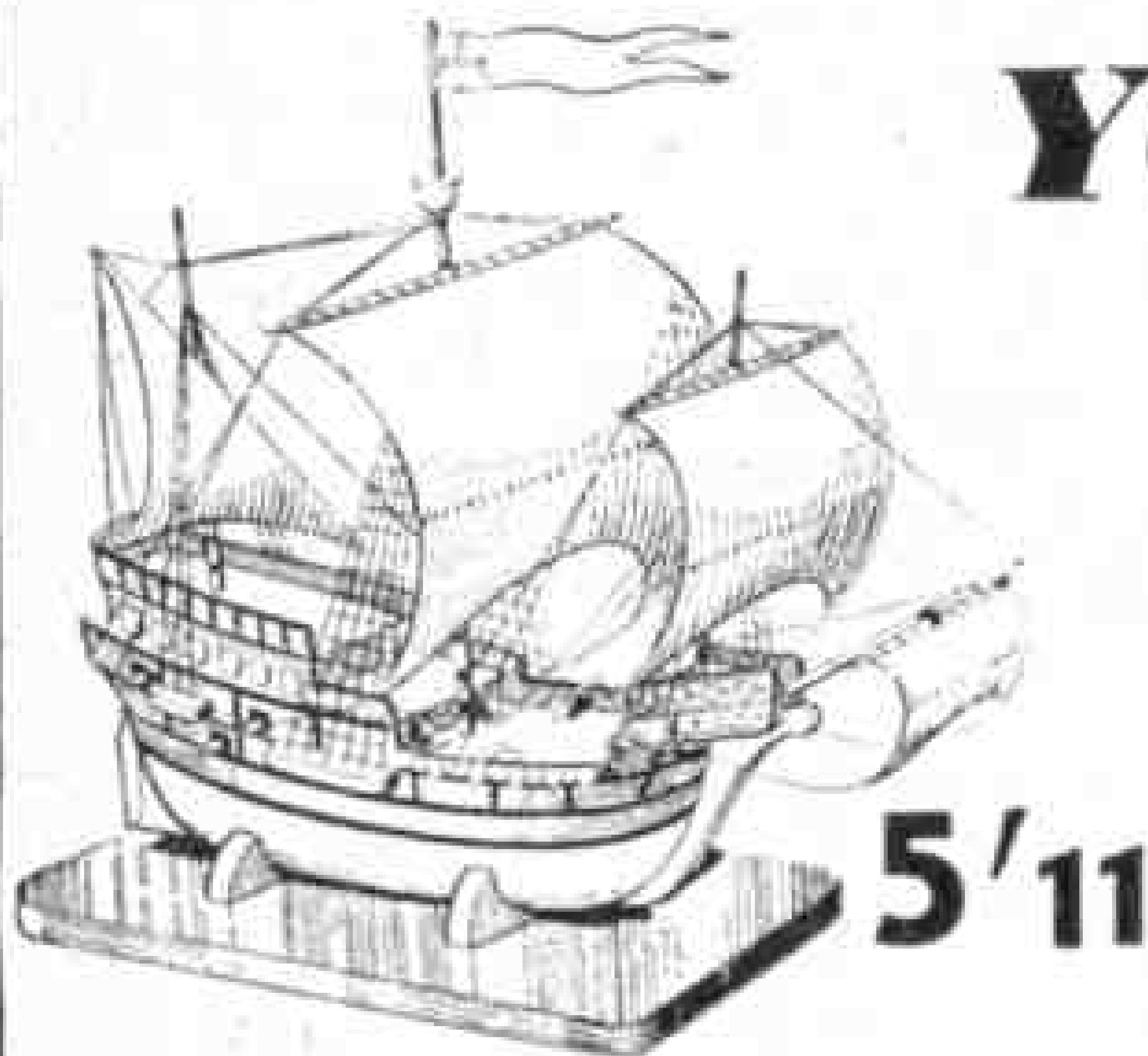
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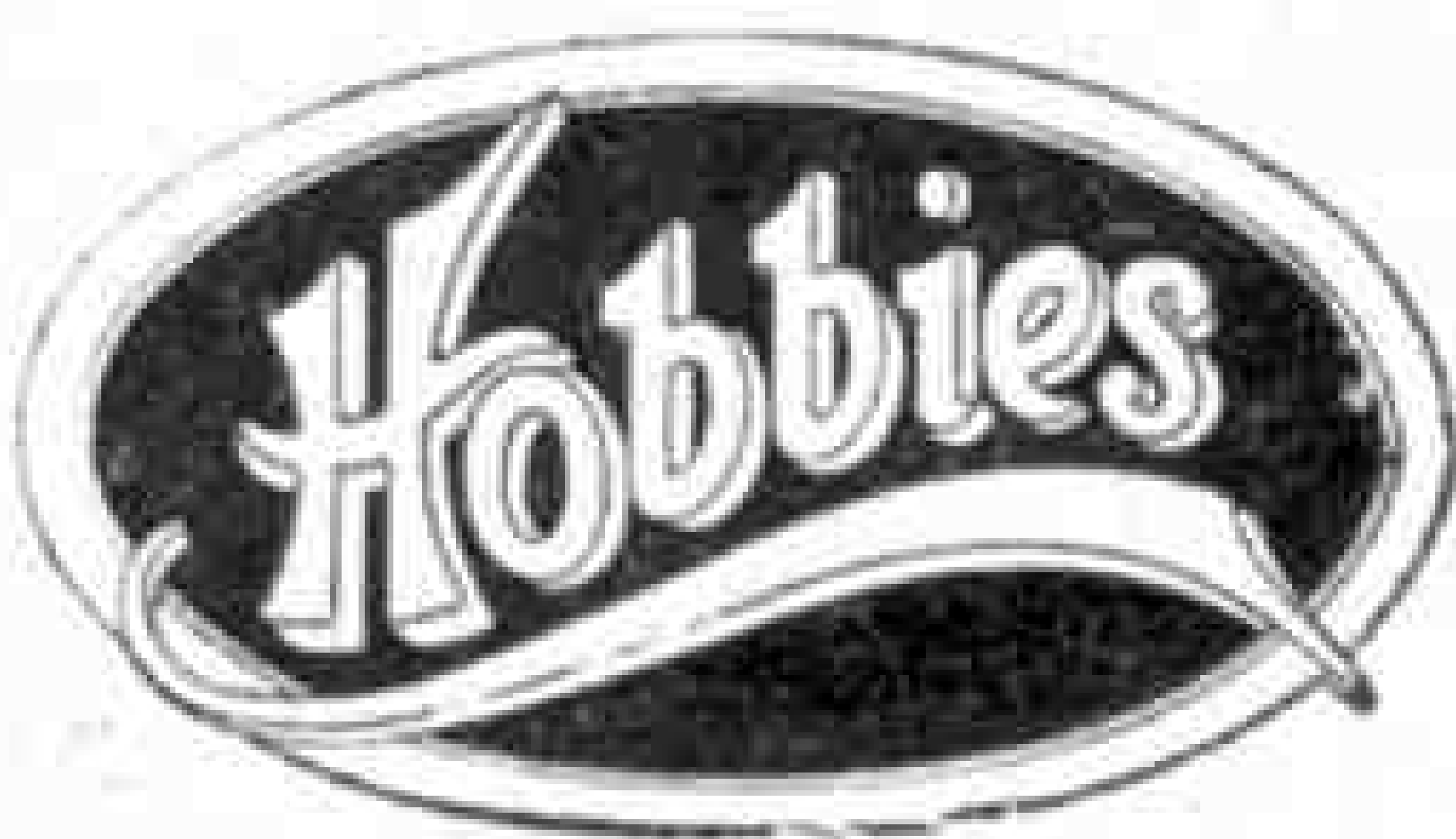
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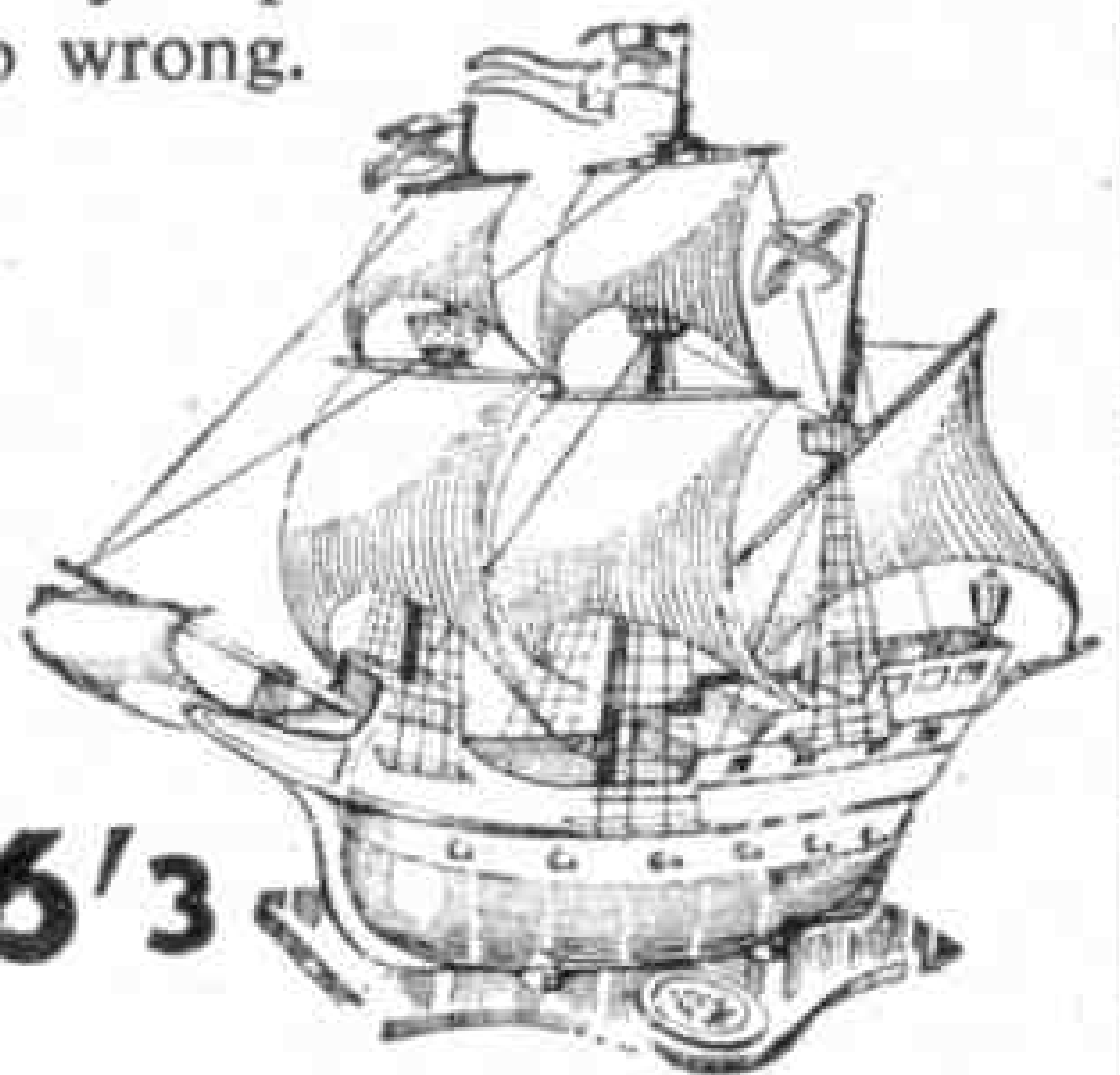
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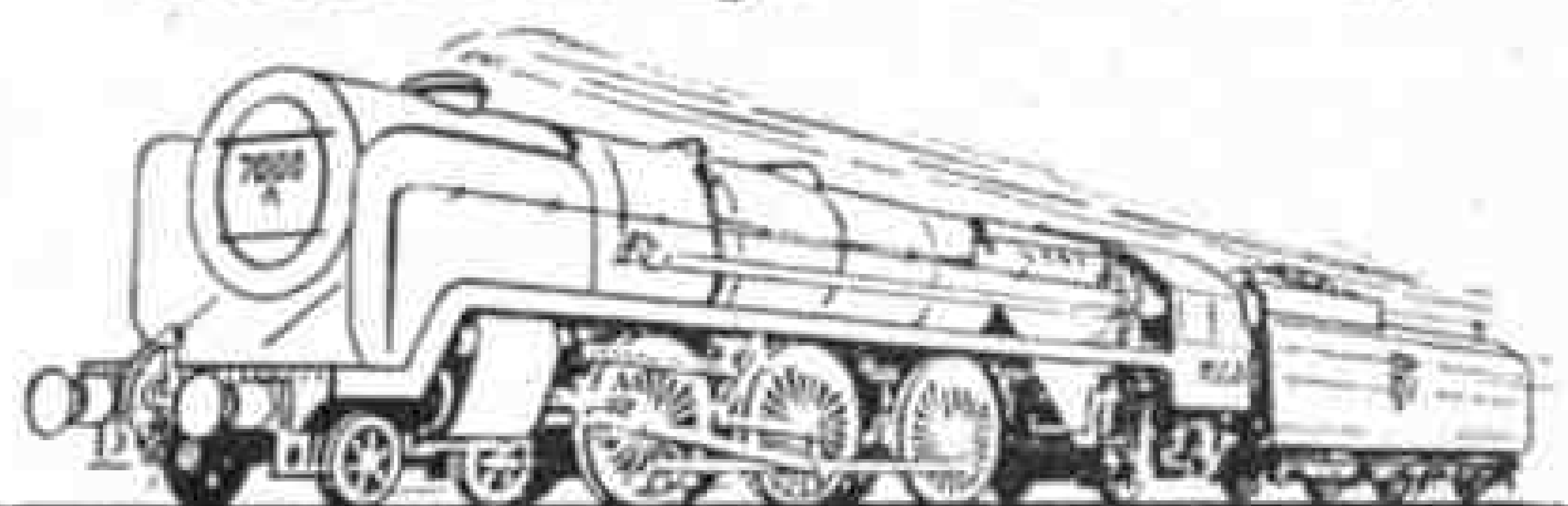
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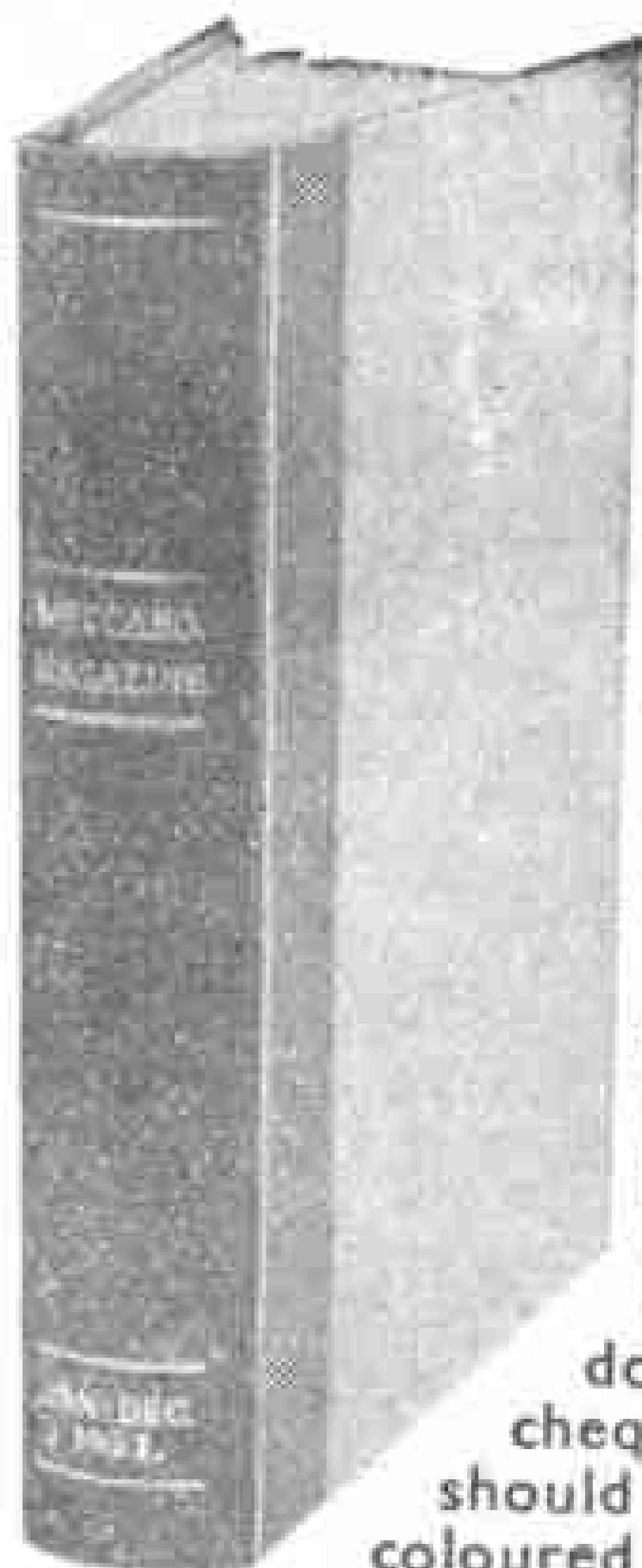
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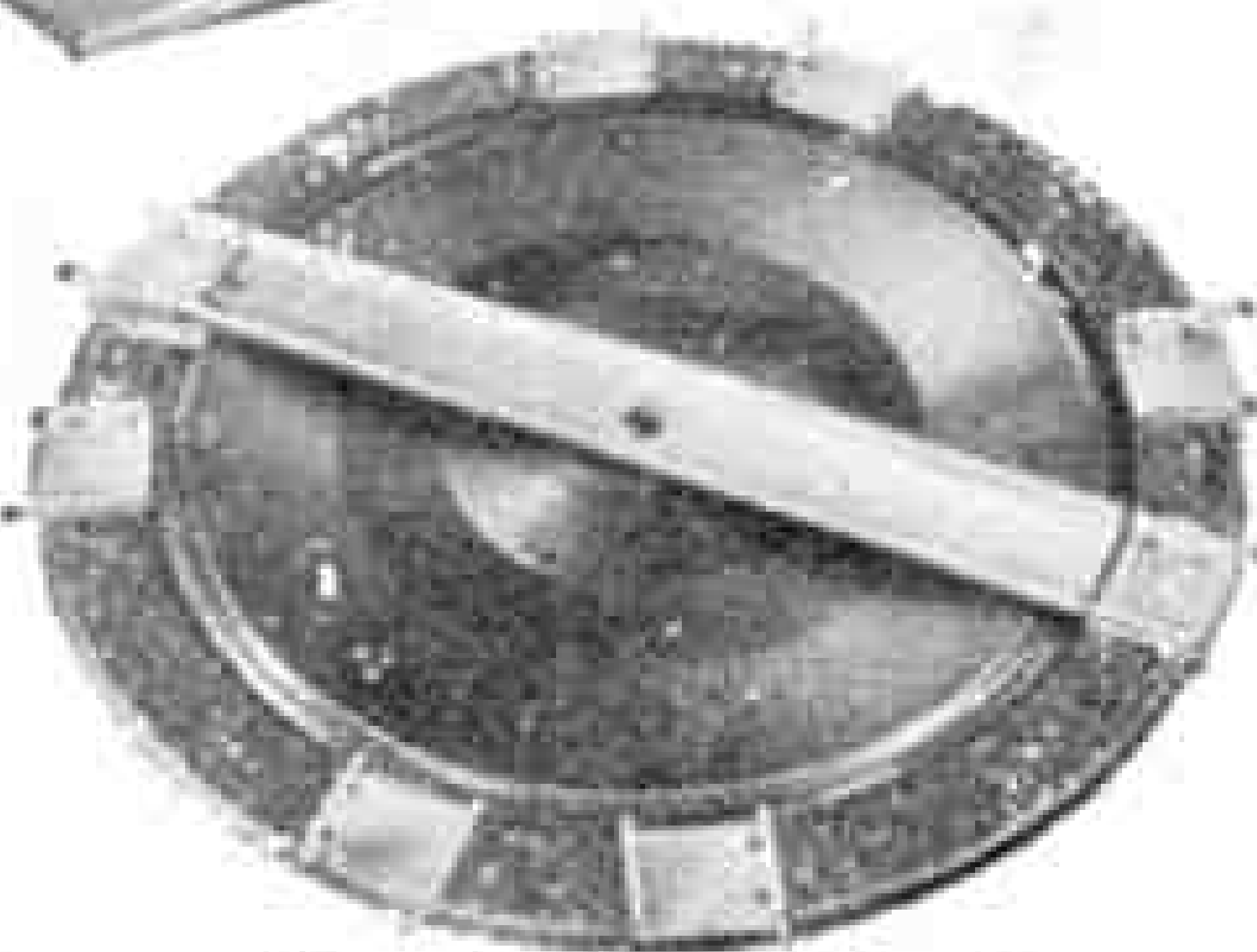
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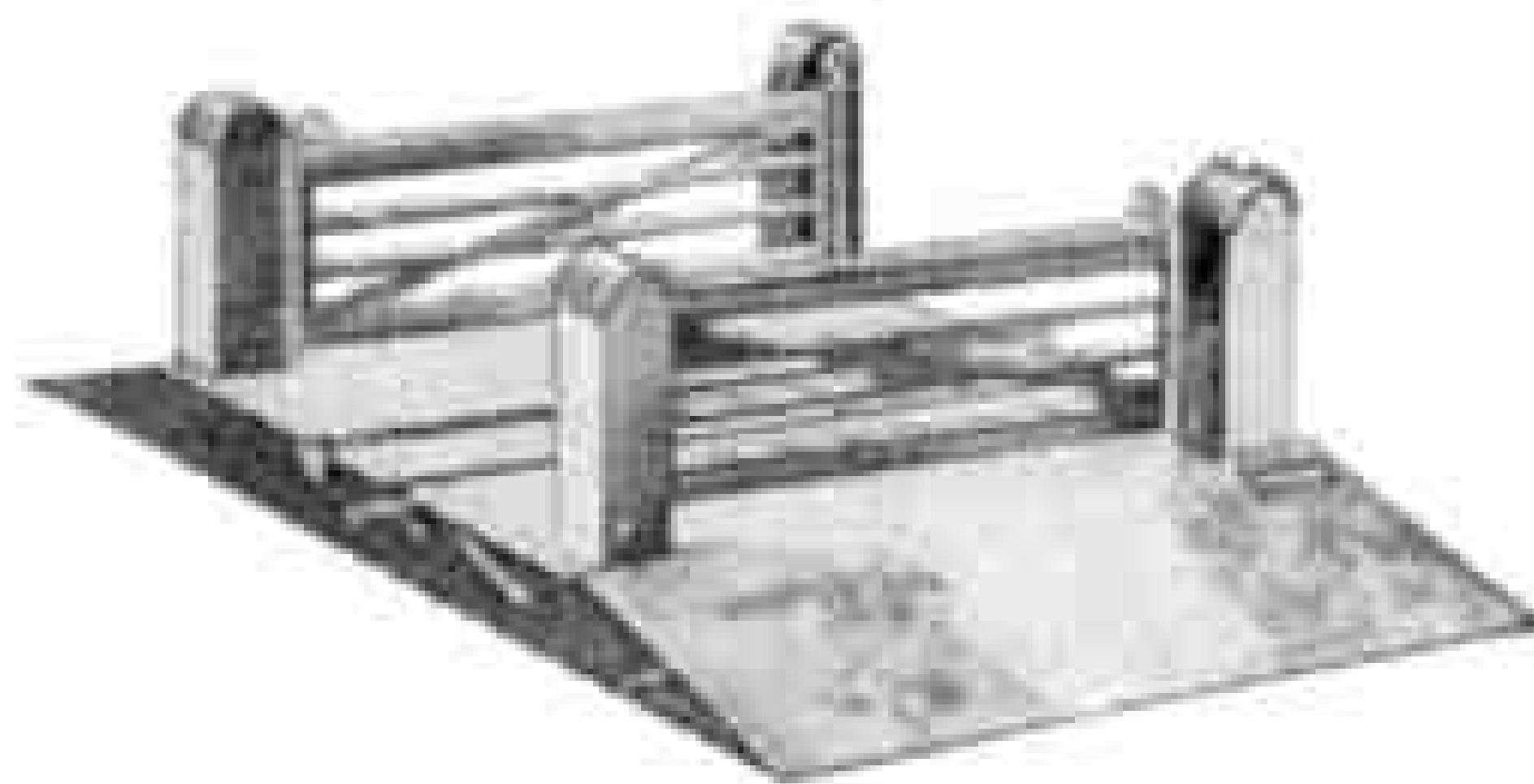
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7/5



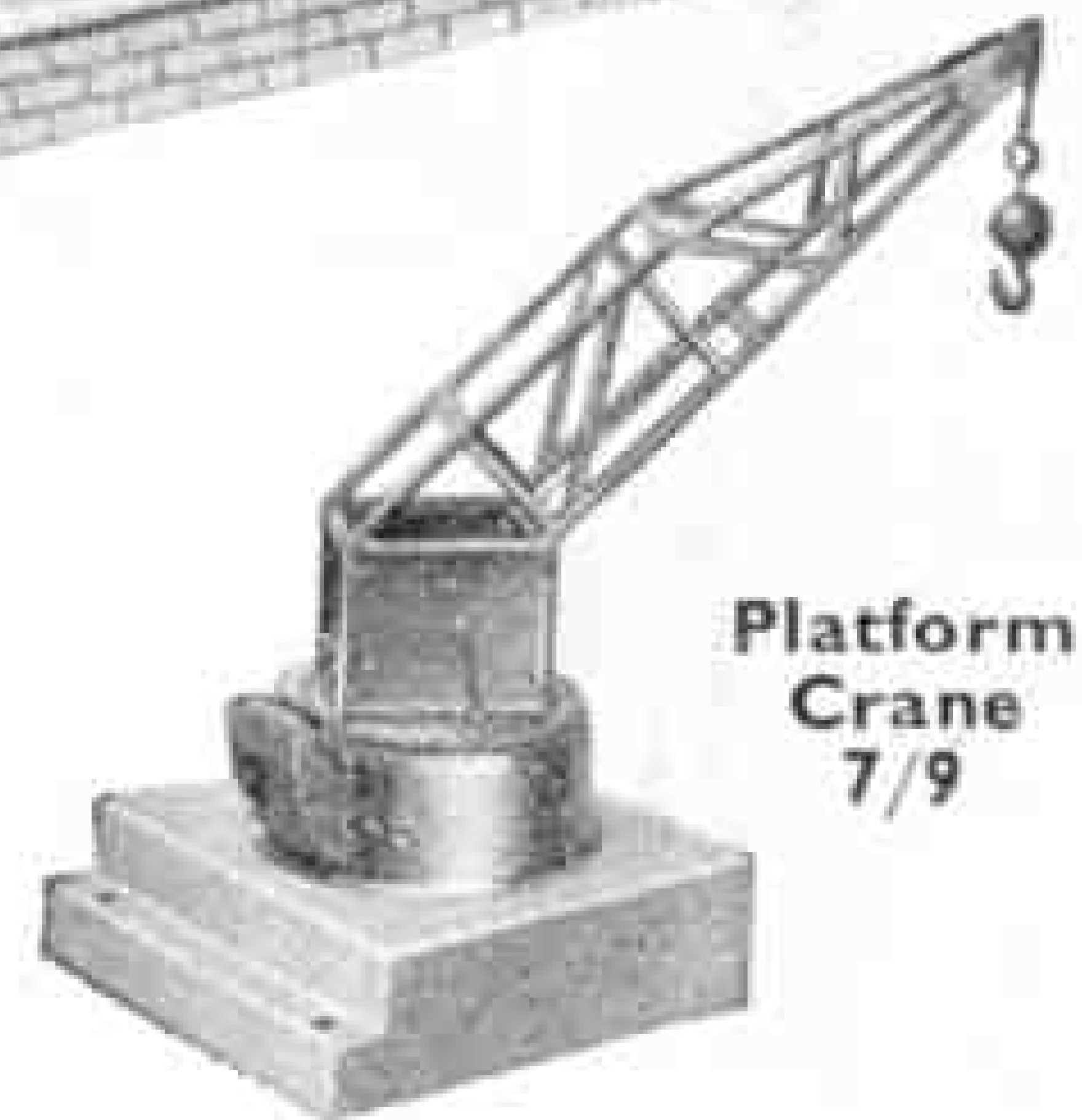
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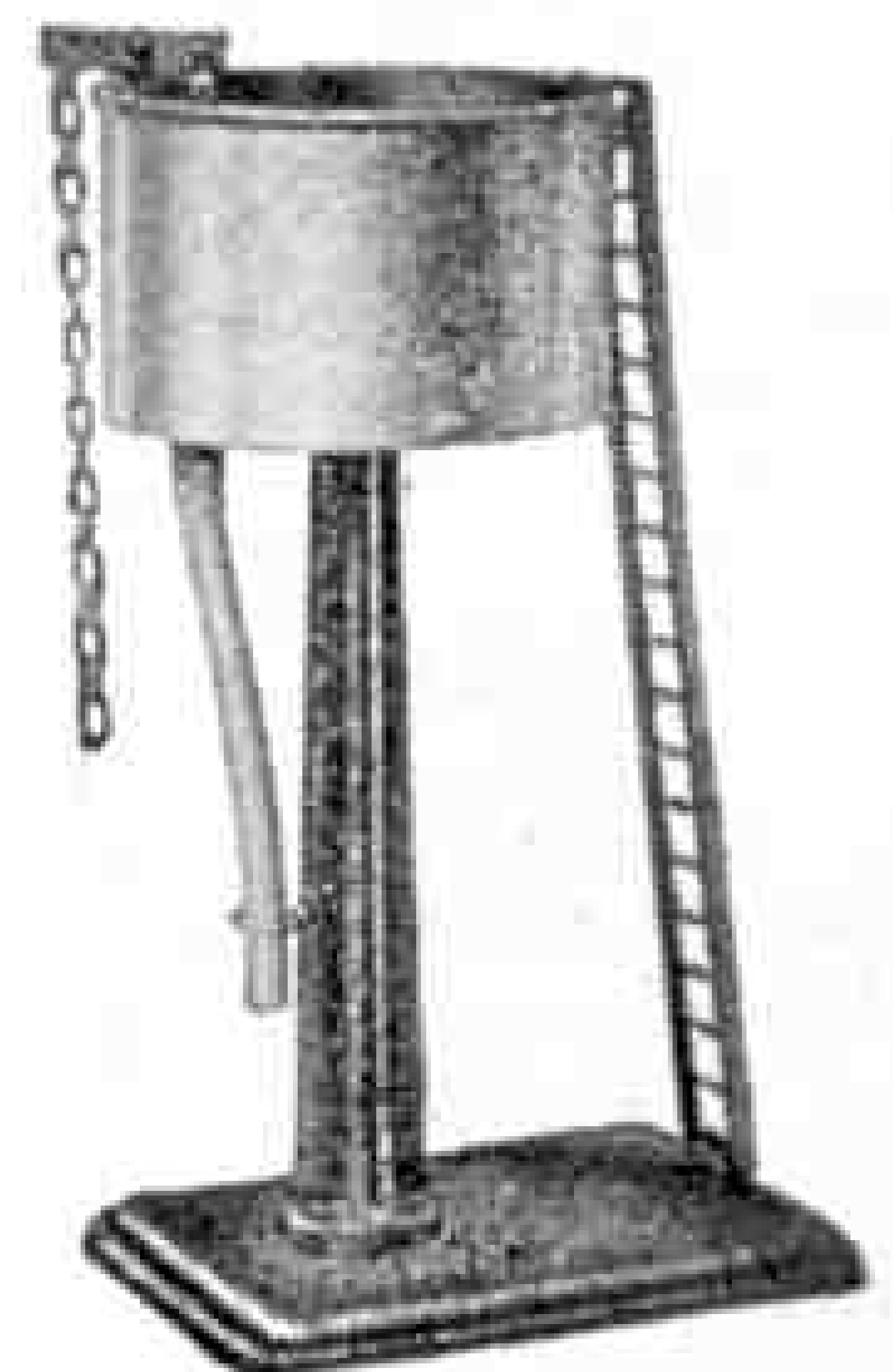
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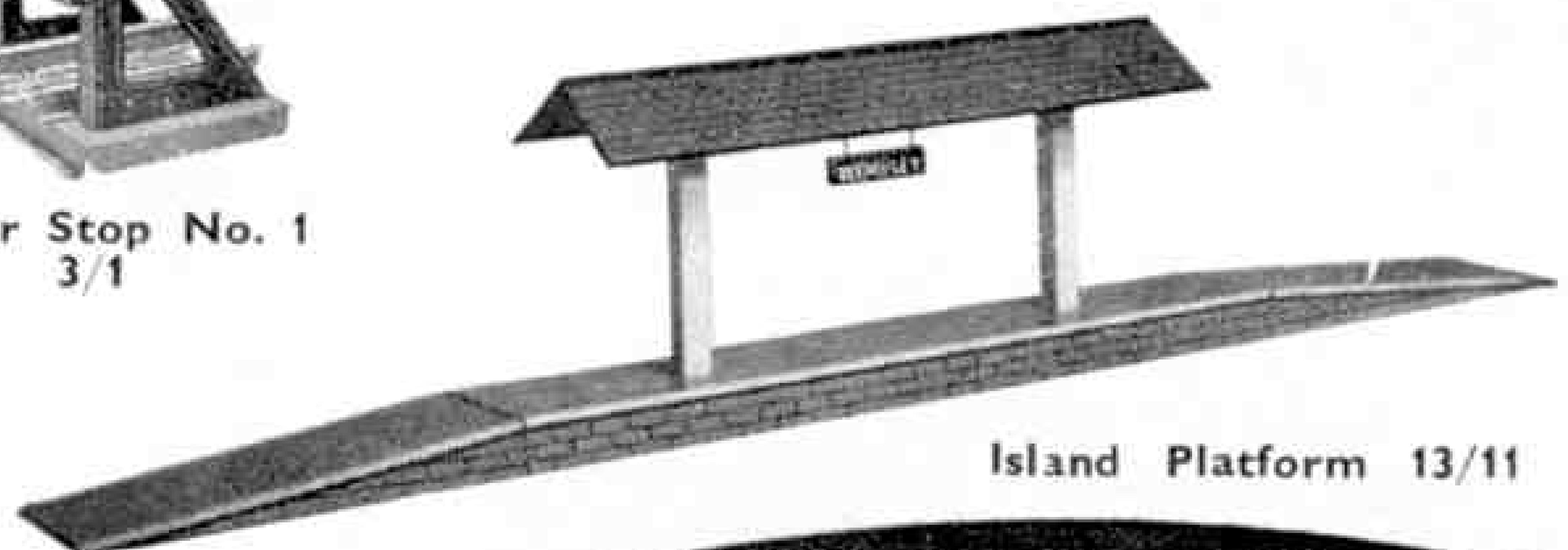
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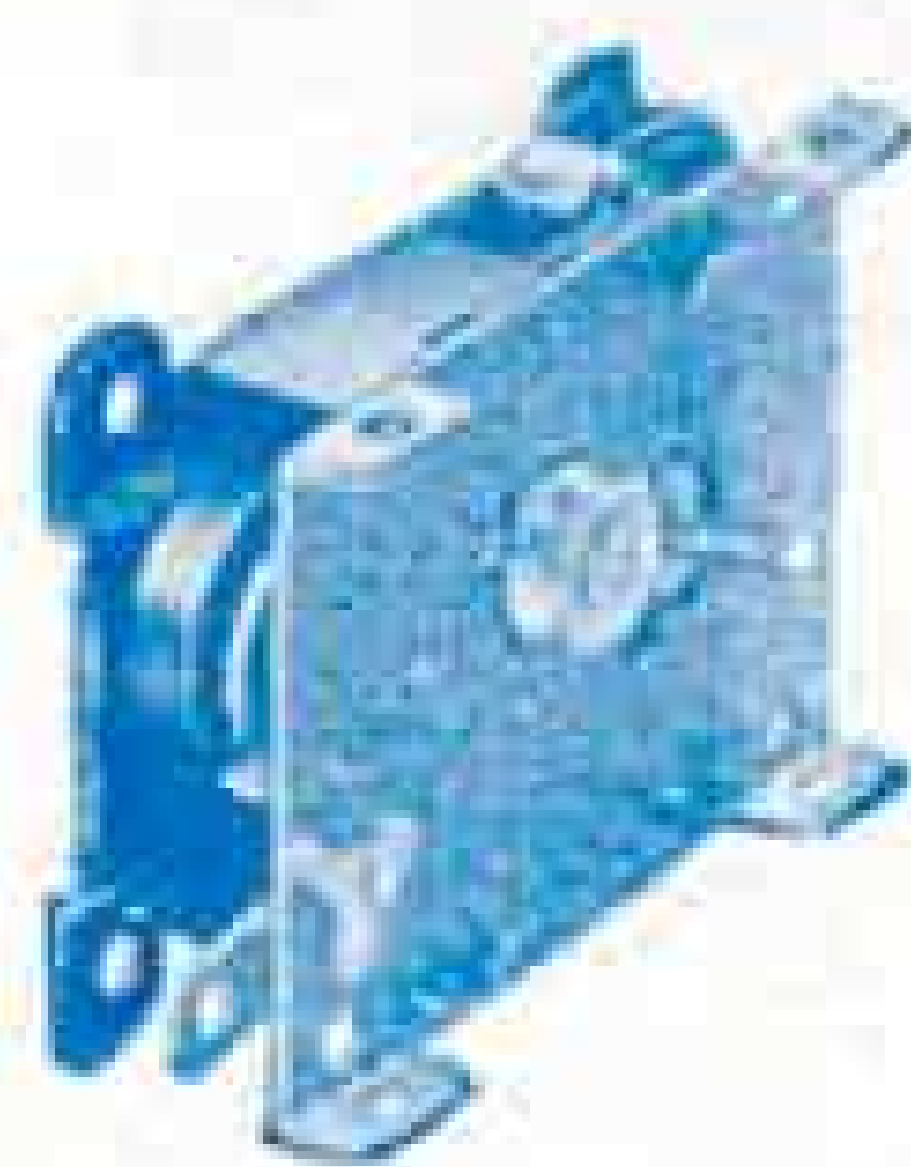
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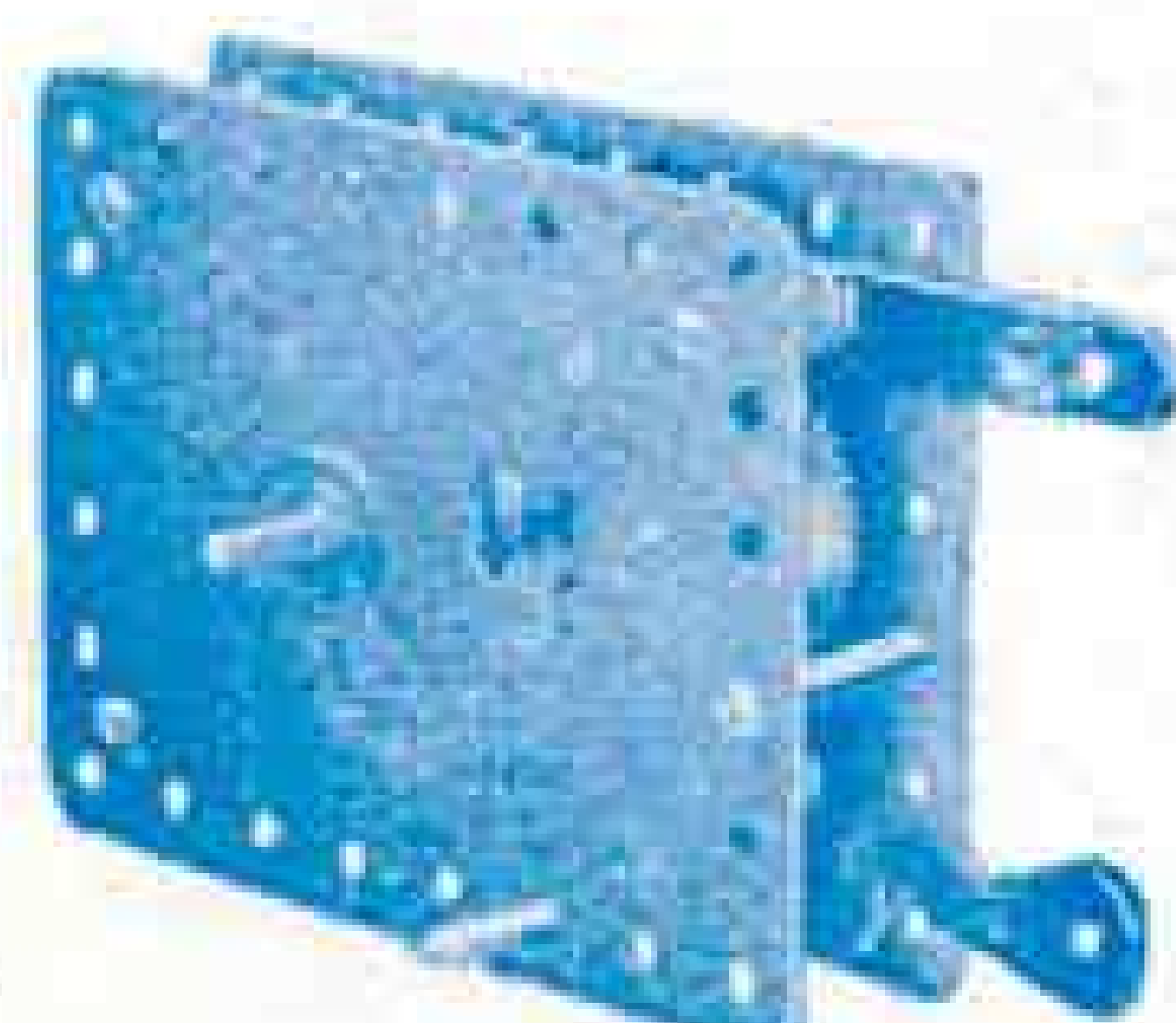


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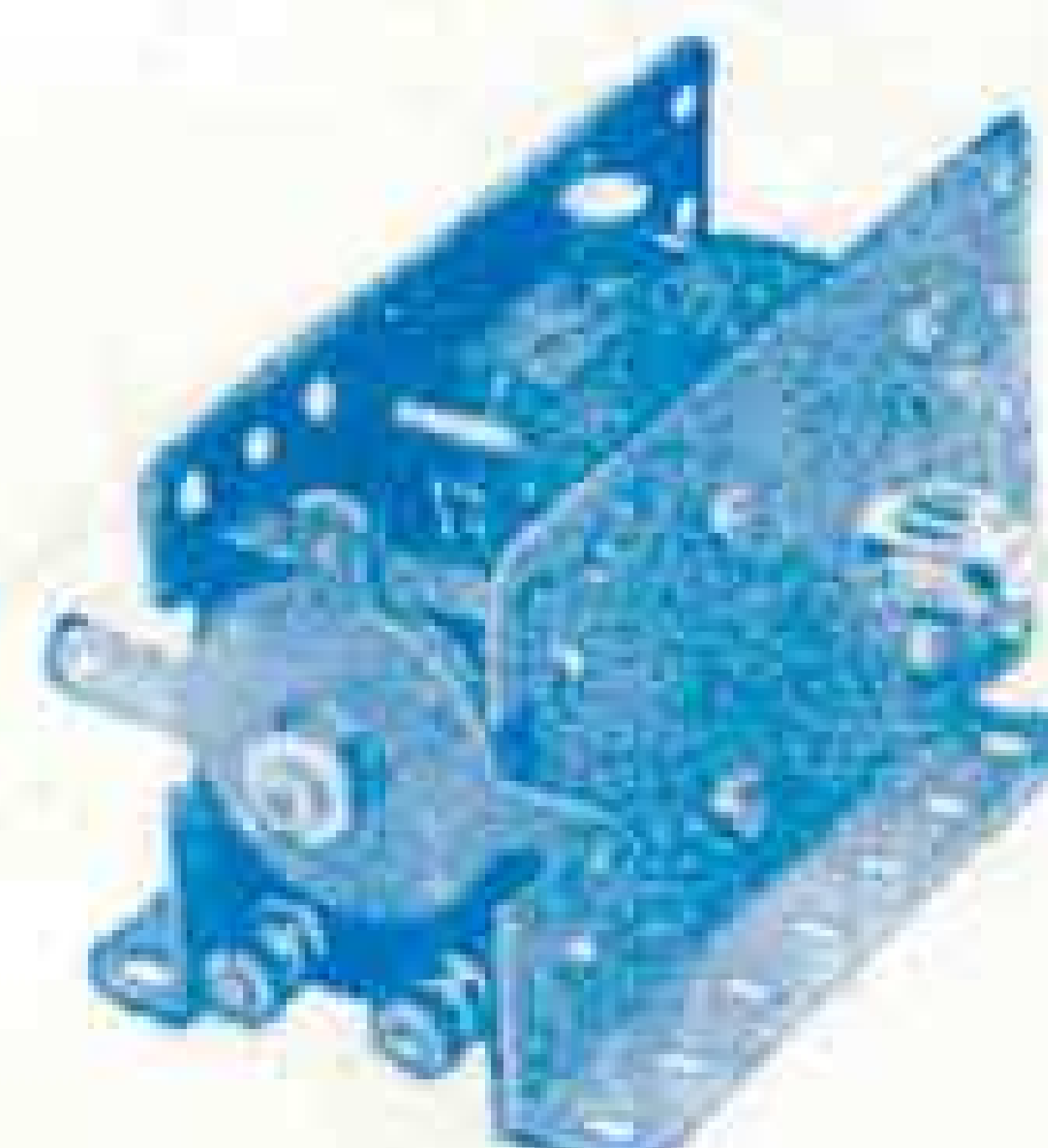
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