

VOL. XL. No. 9

SEPTEMBER 1955

MECCANO

MAGAZINE

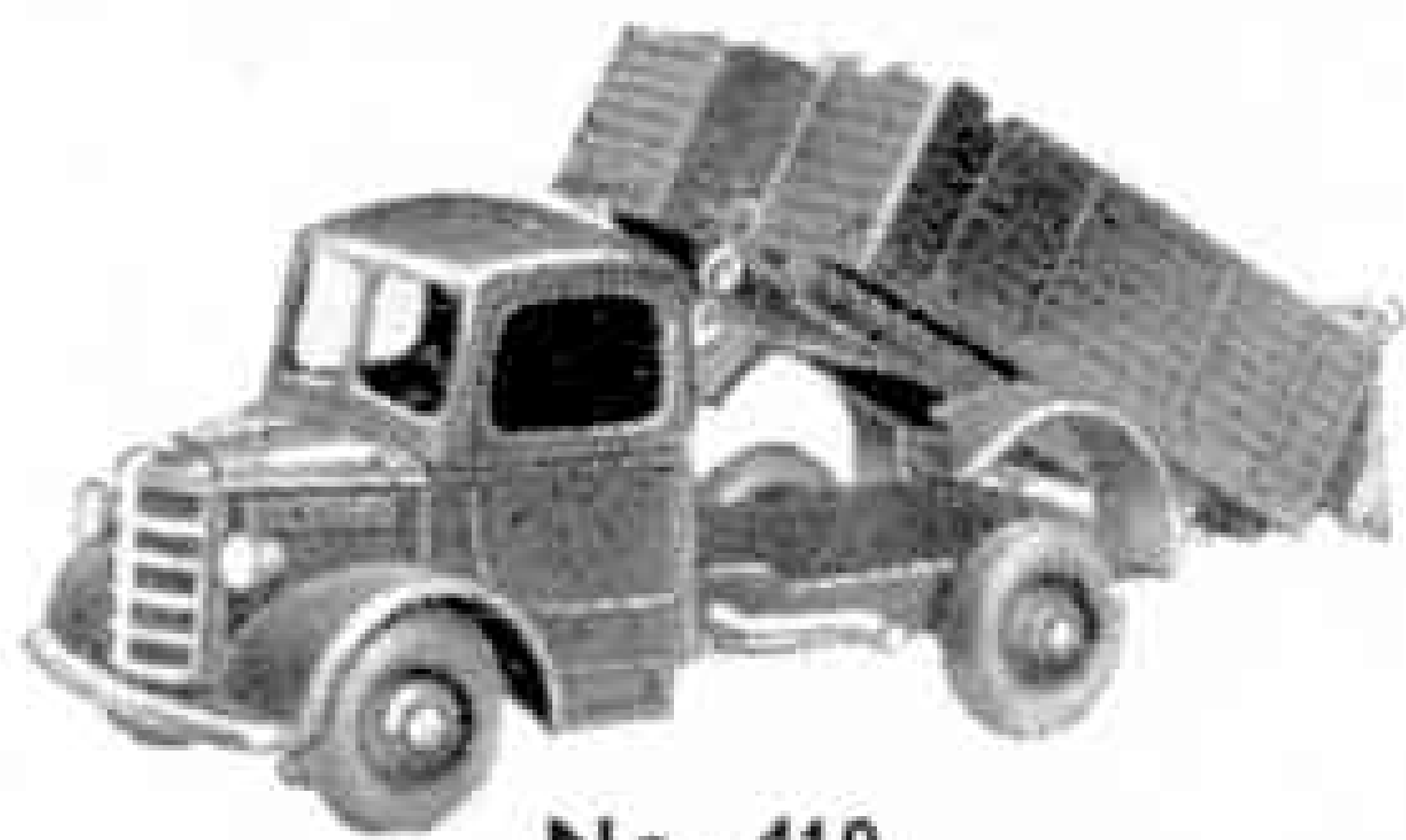


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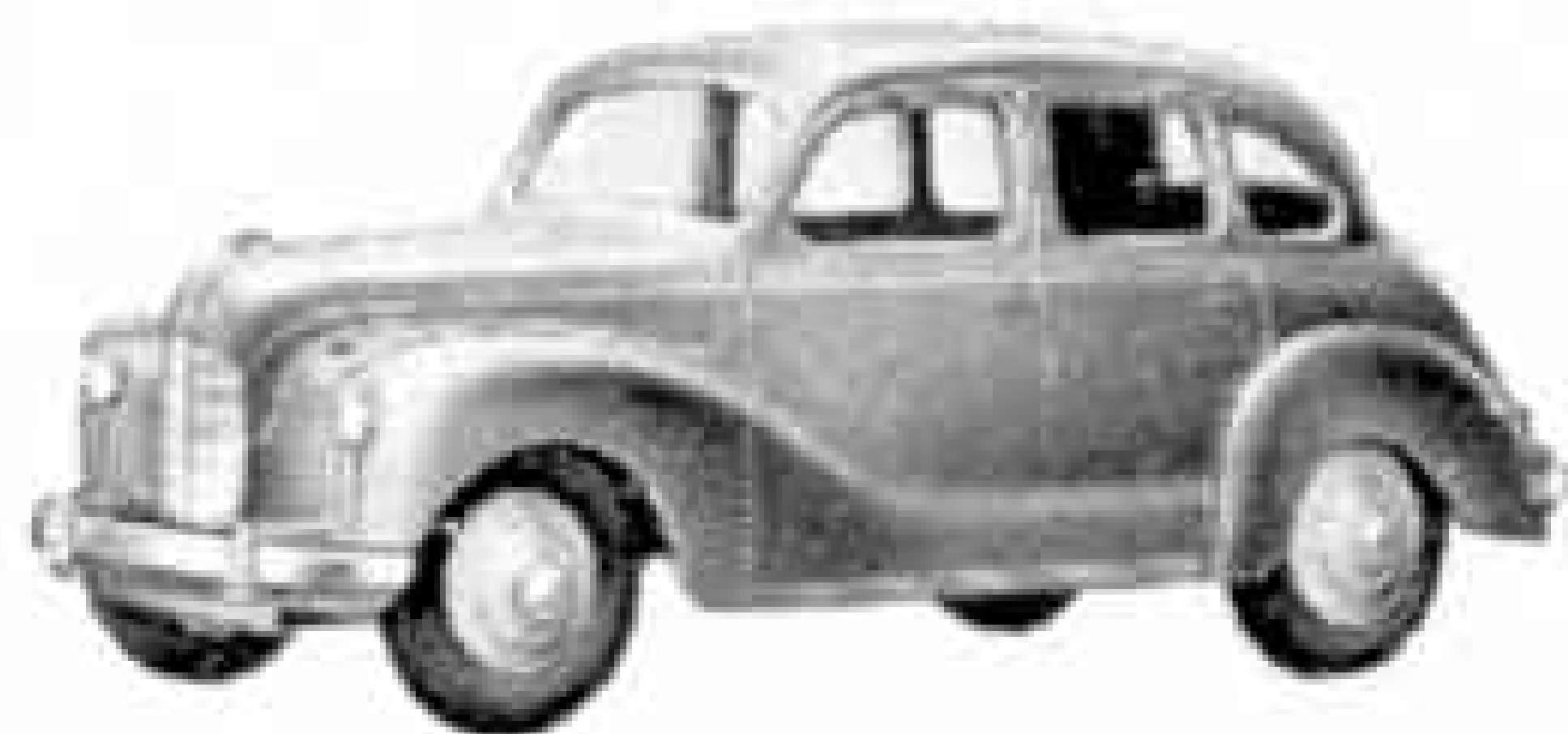
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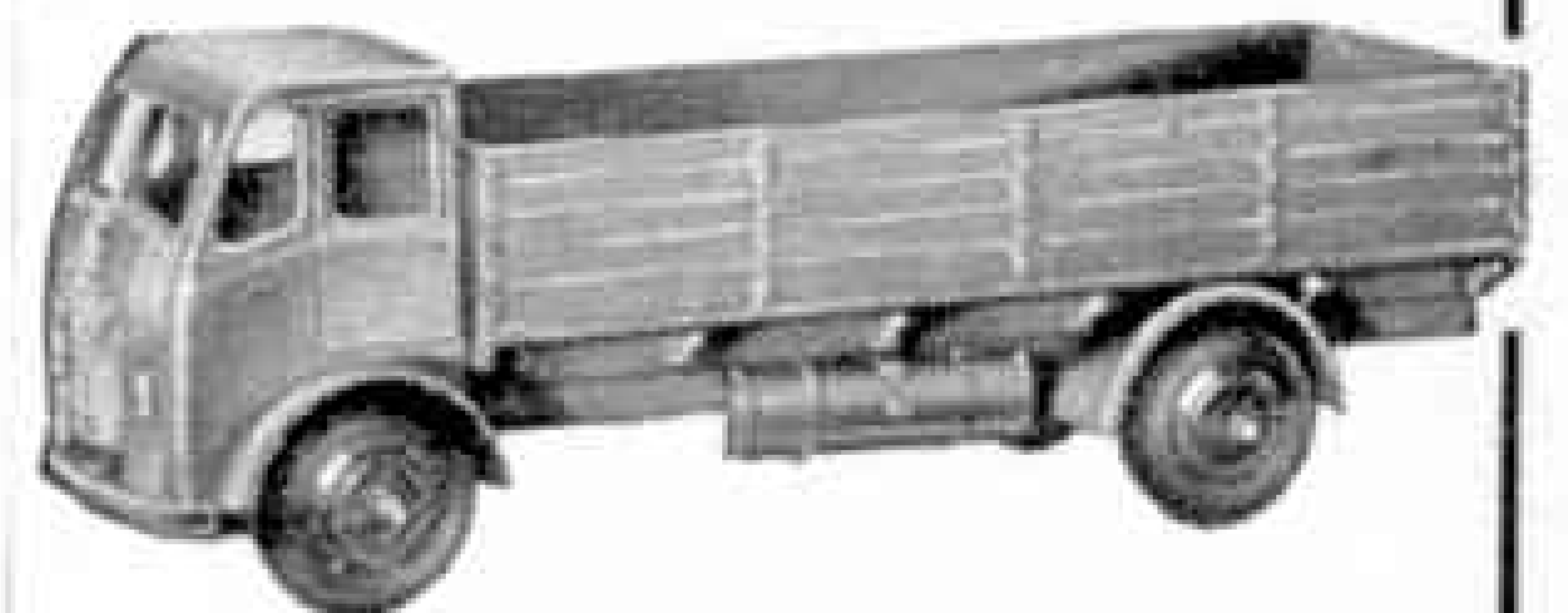
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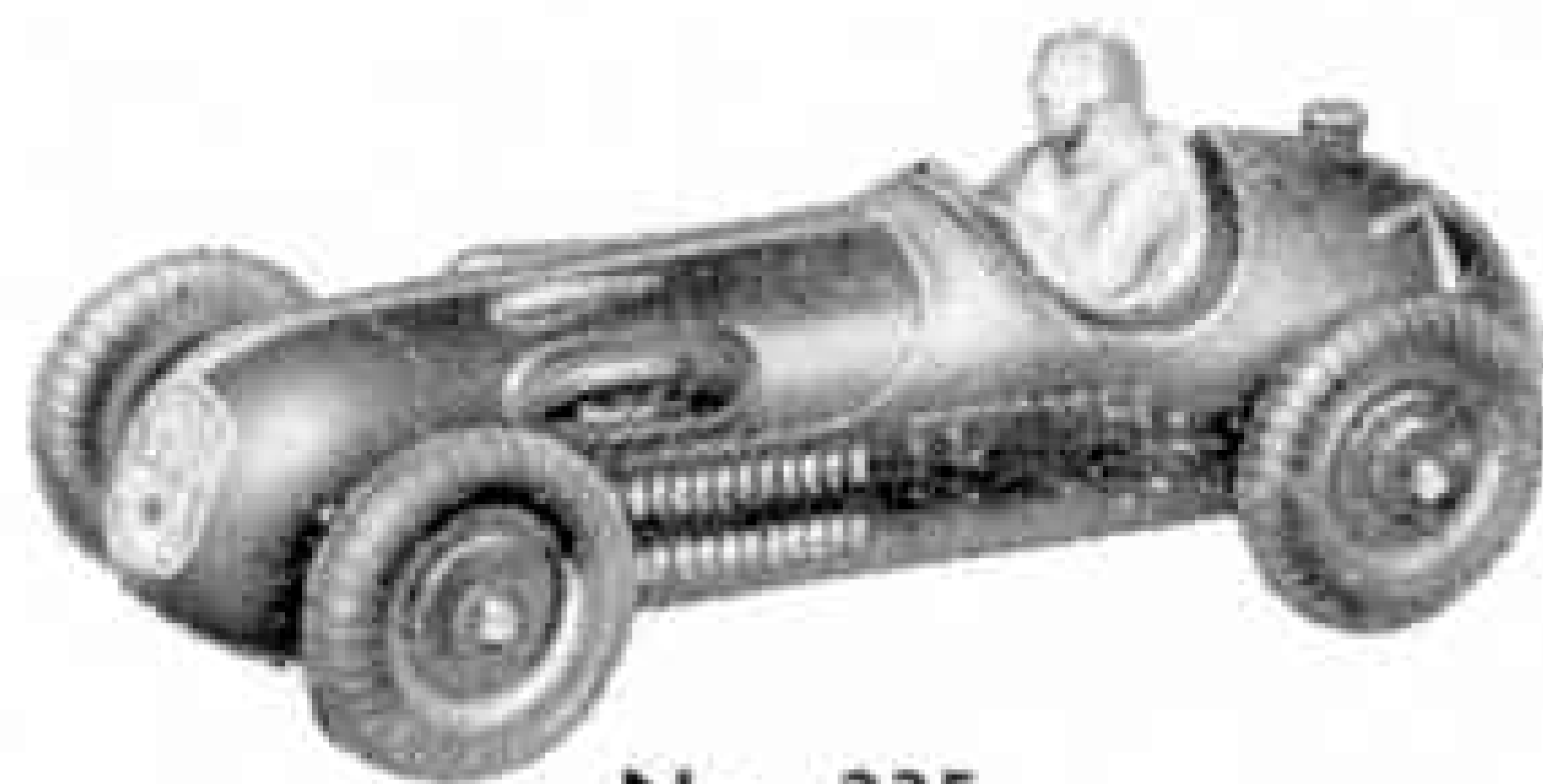
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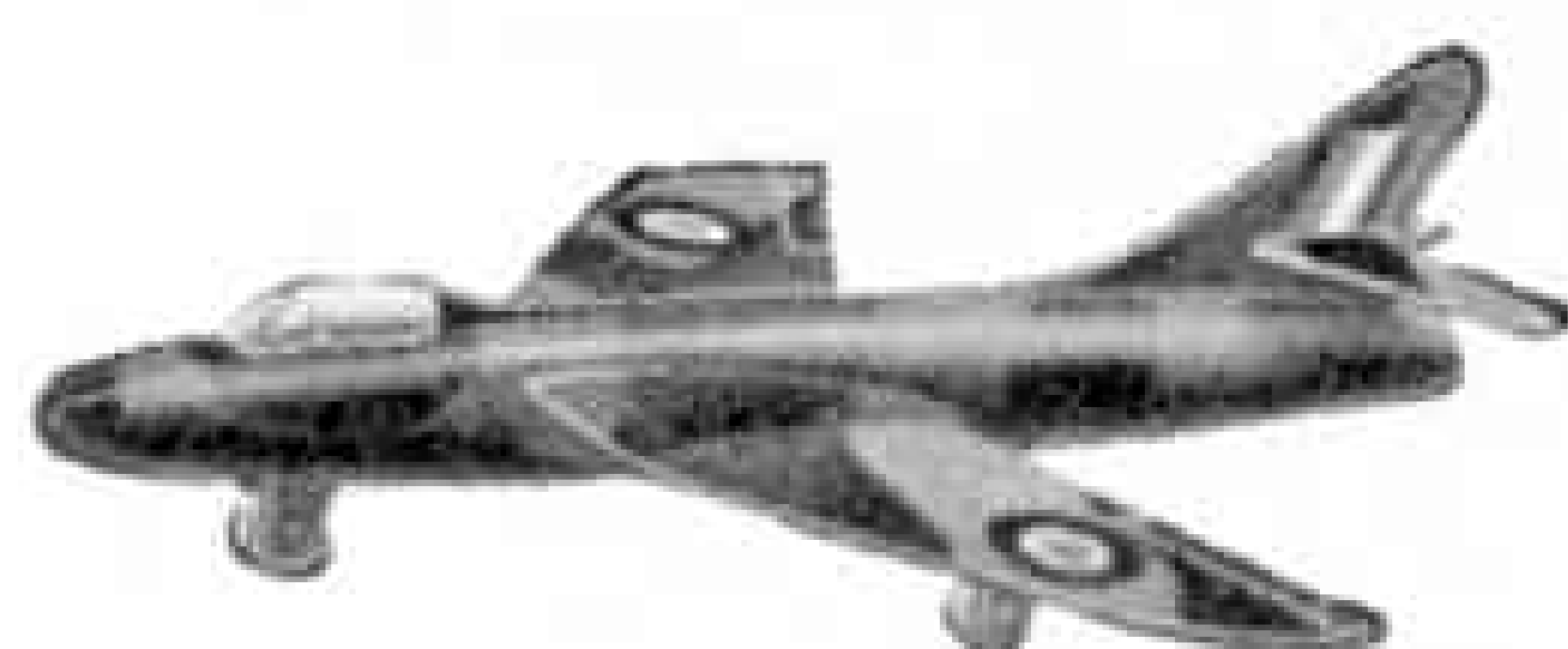
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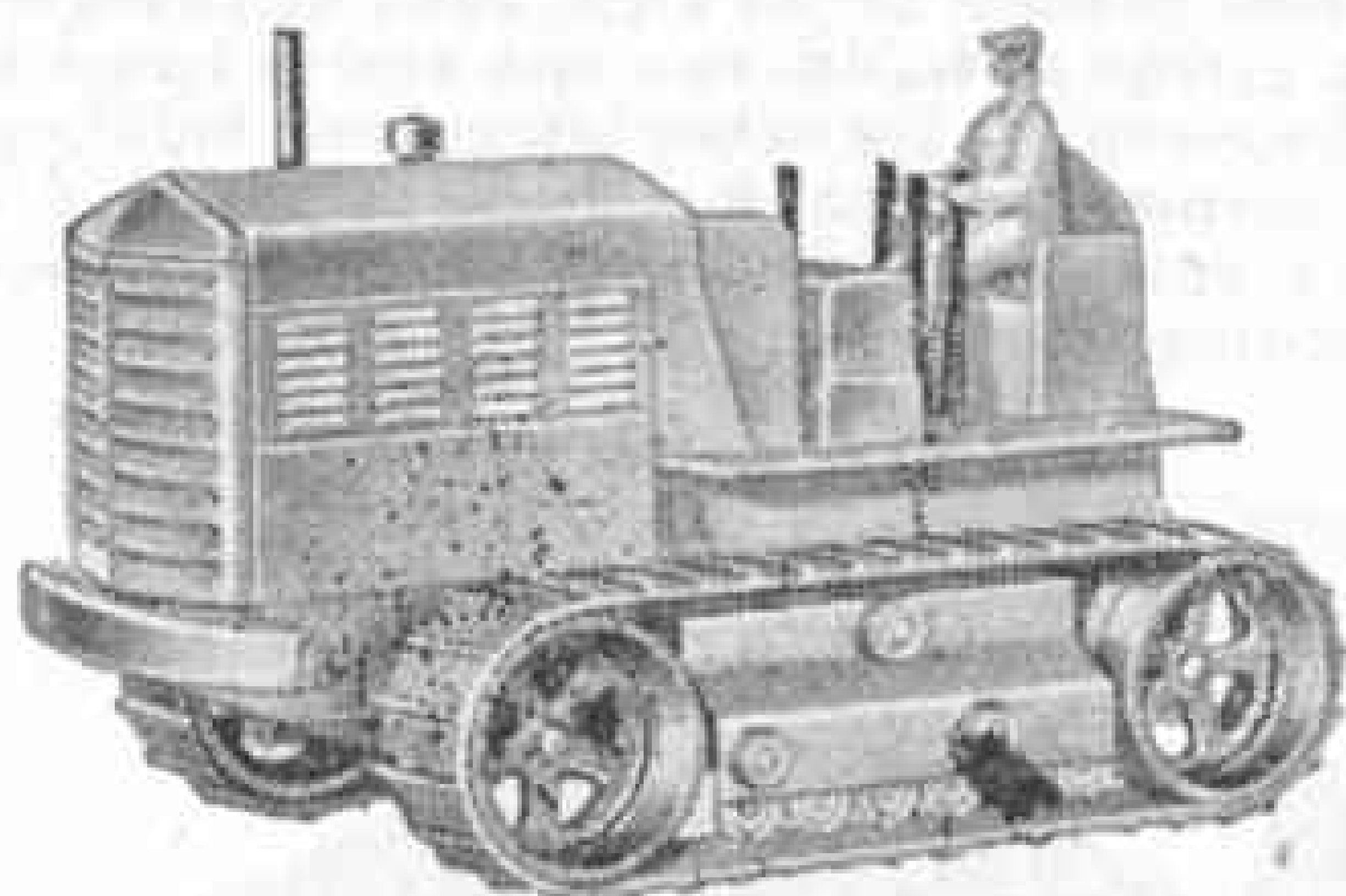


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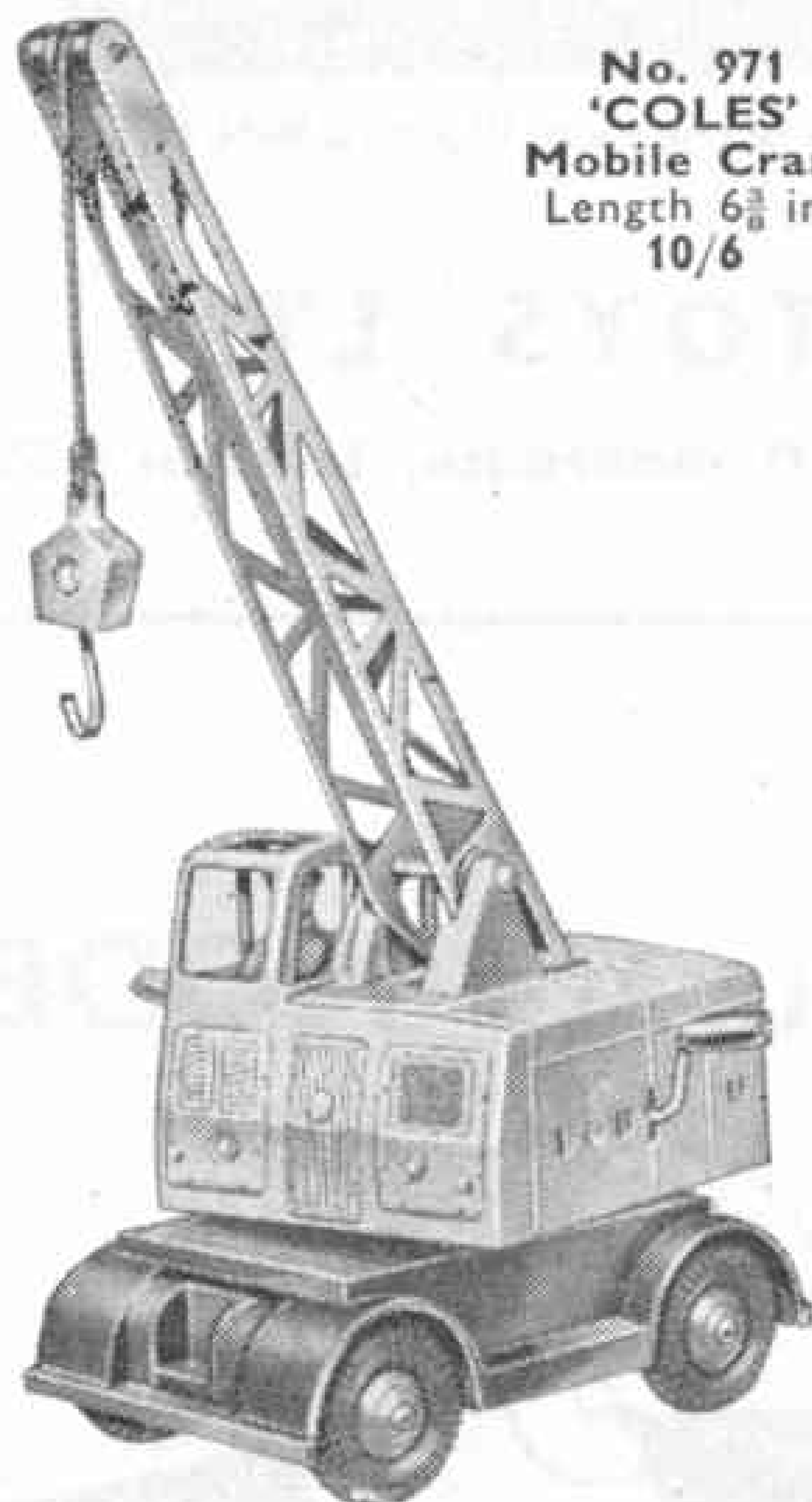
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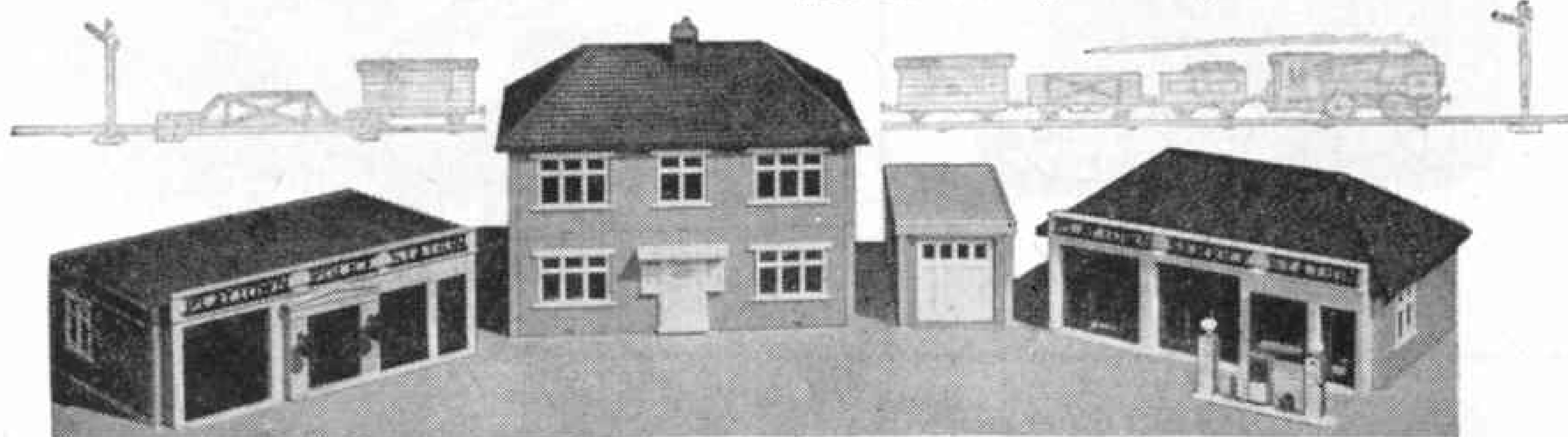
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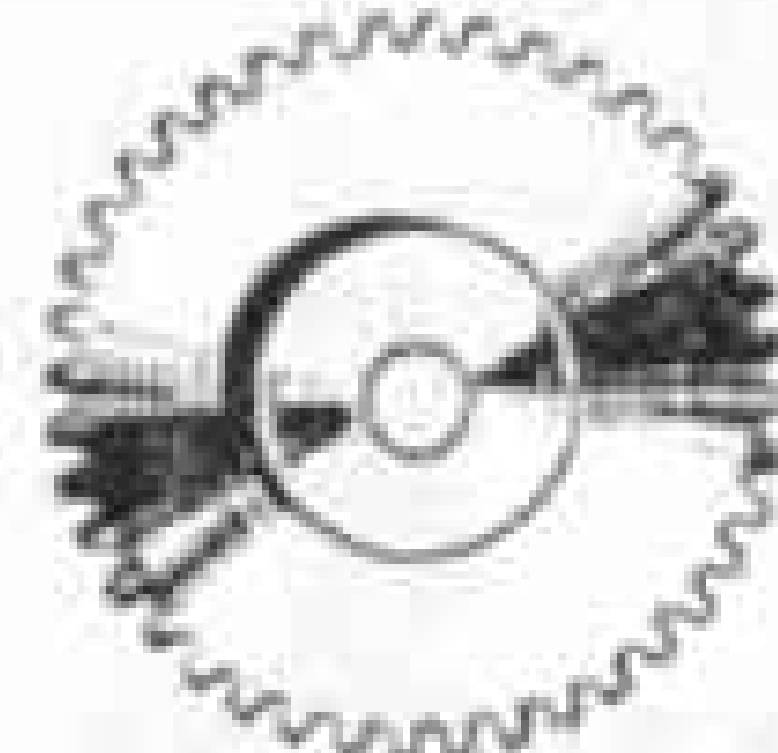
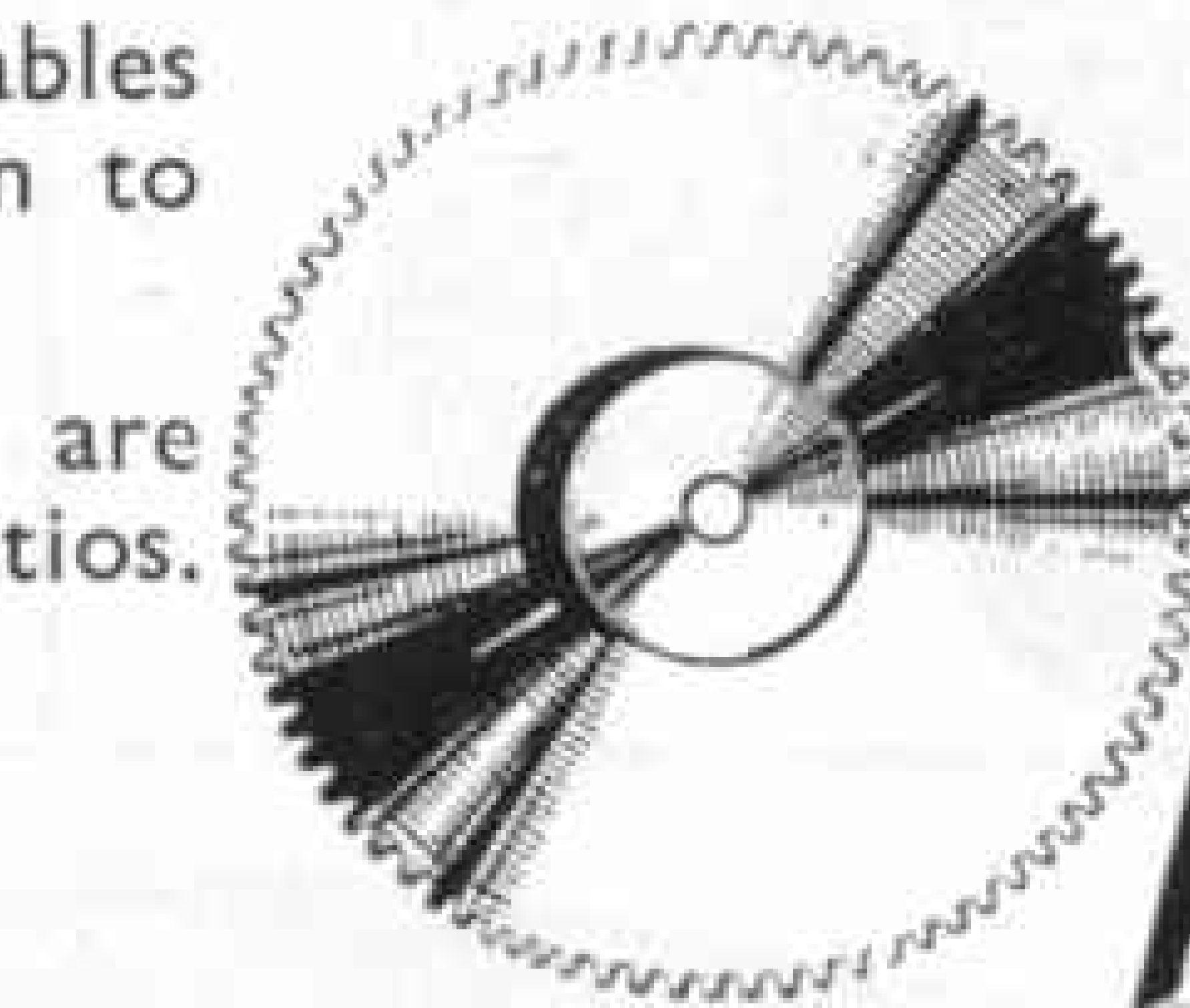
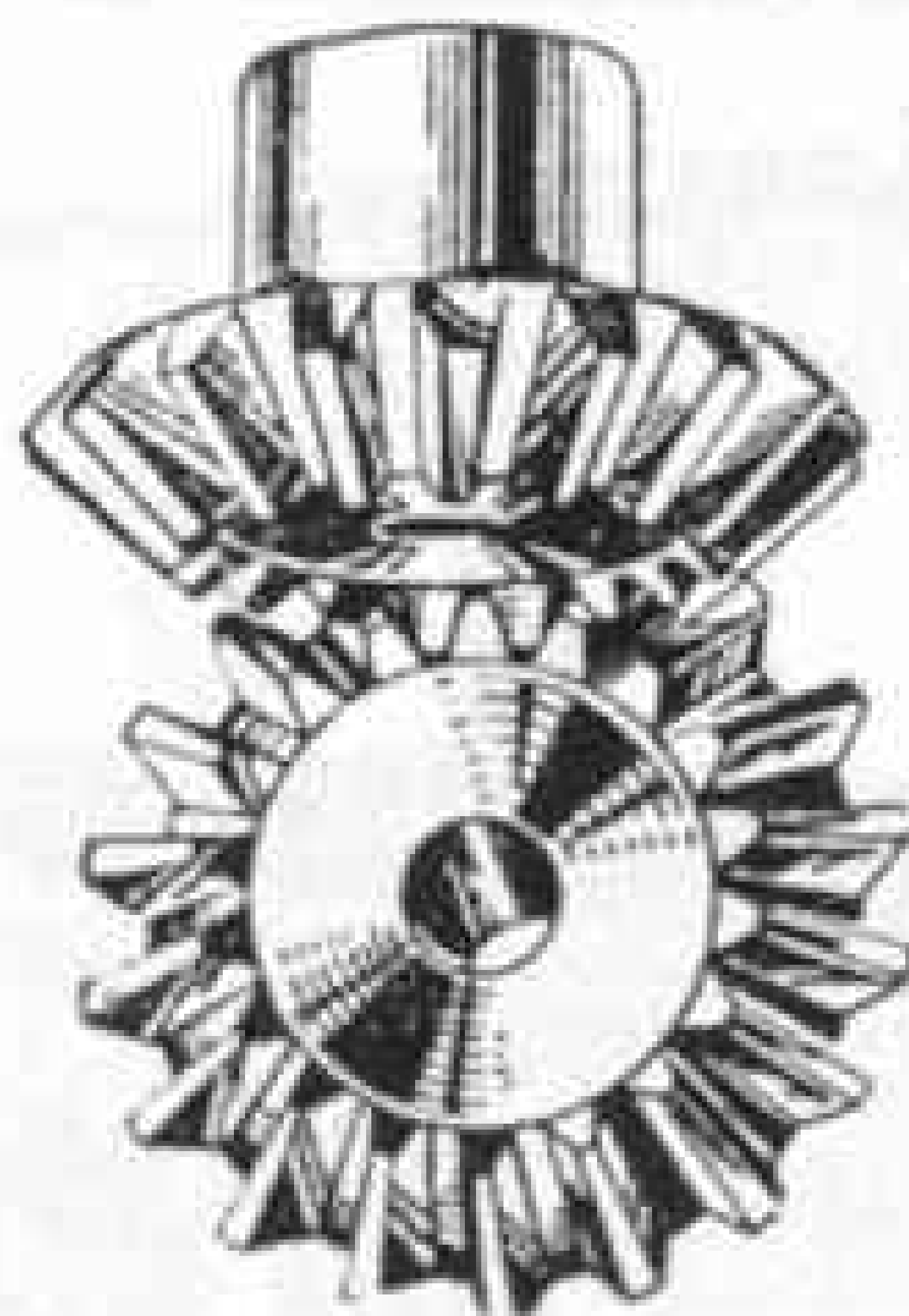
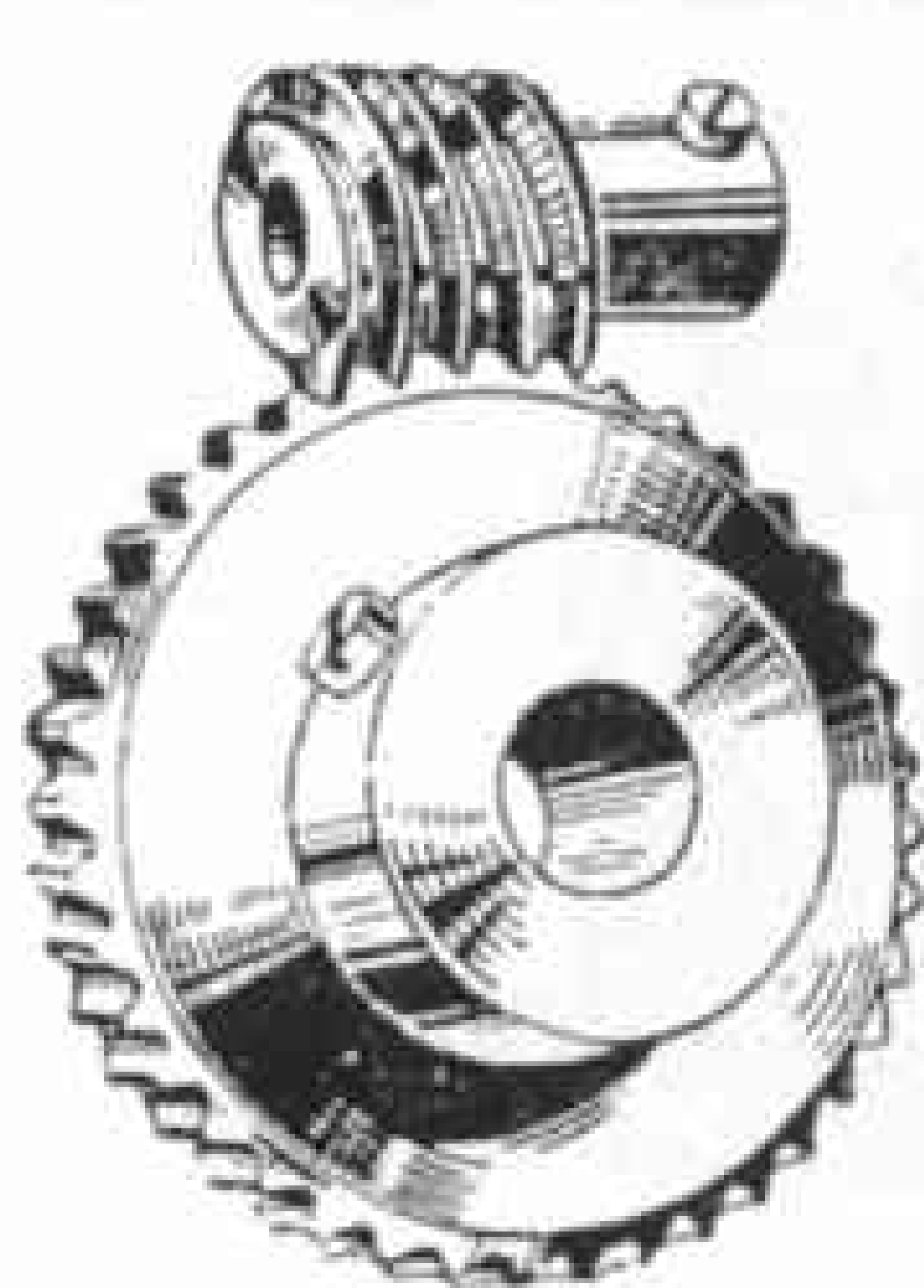
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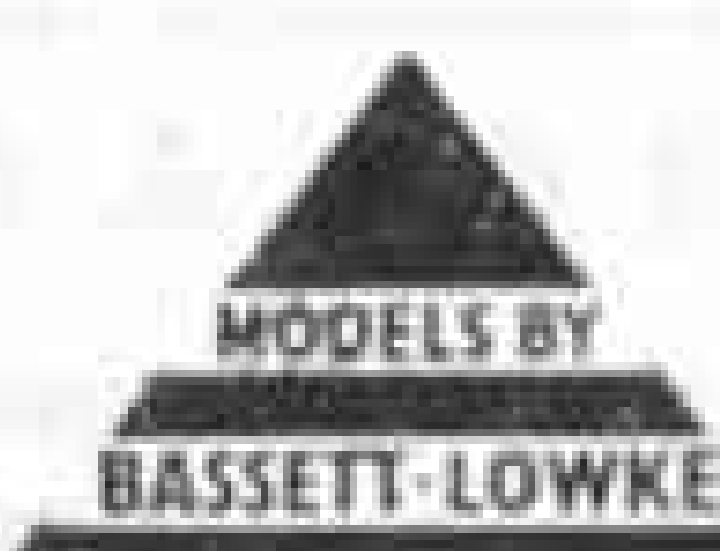
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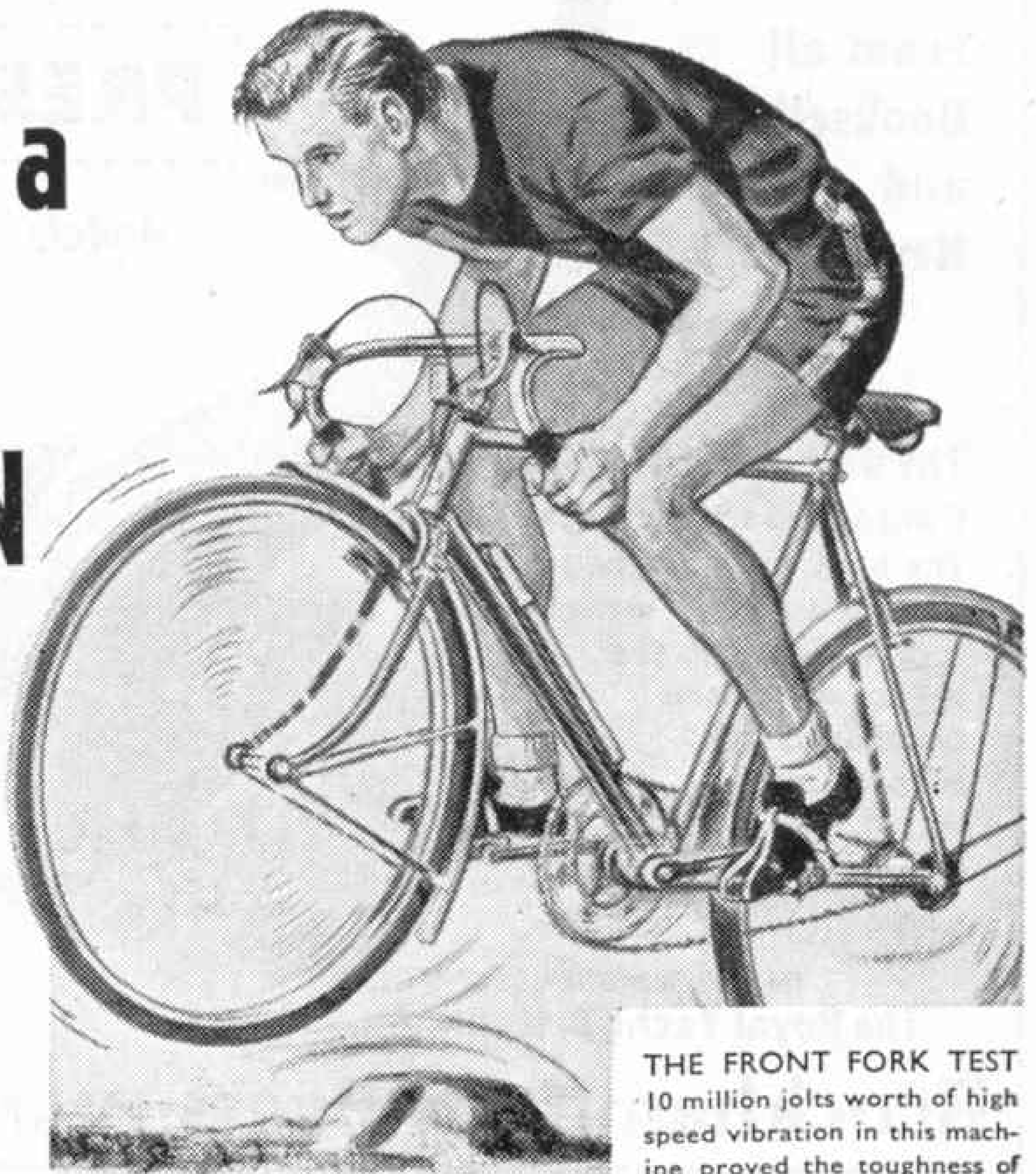
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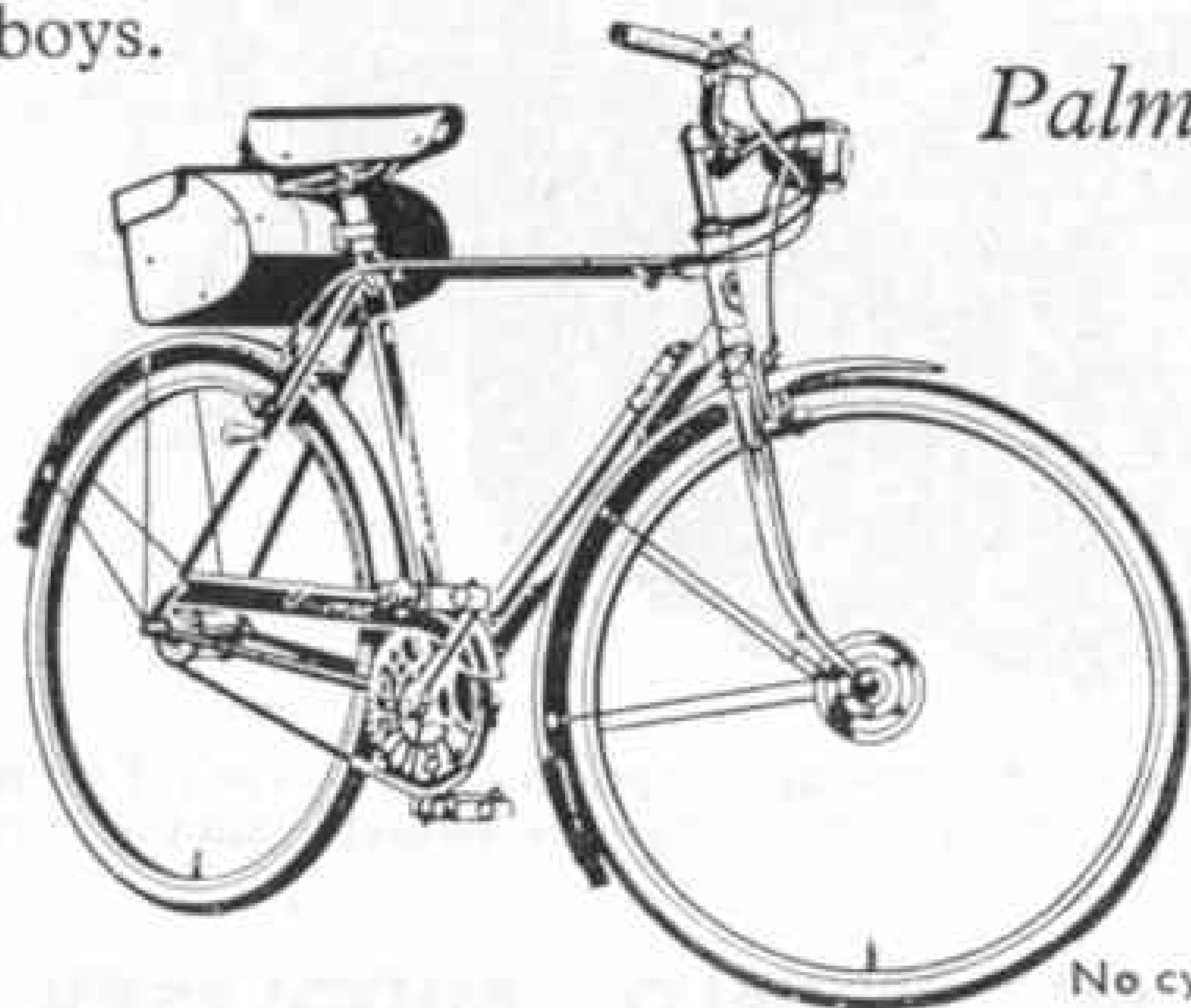
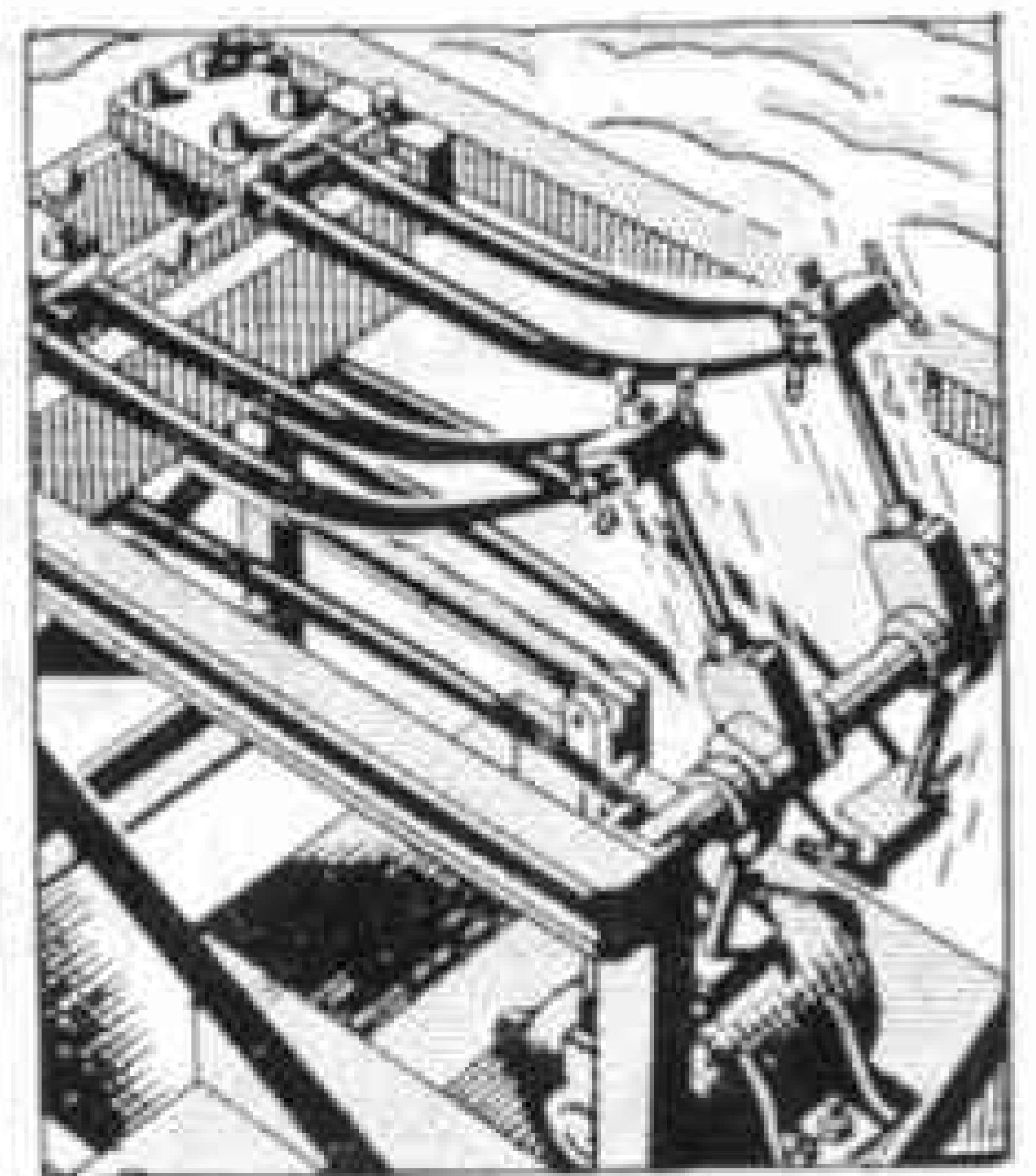
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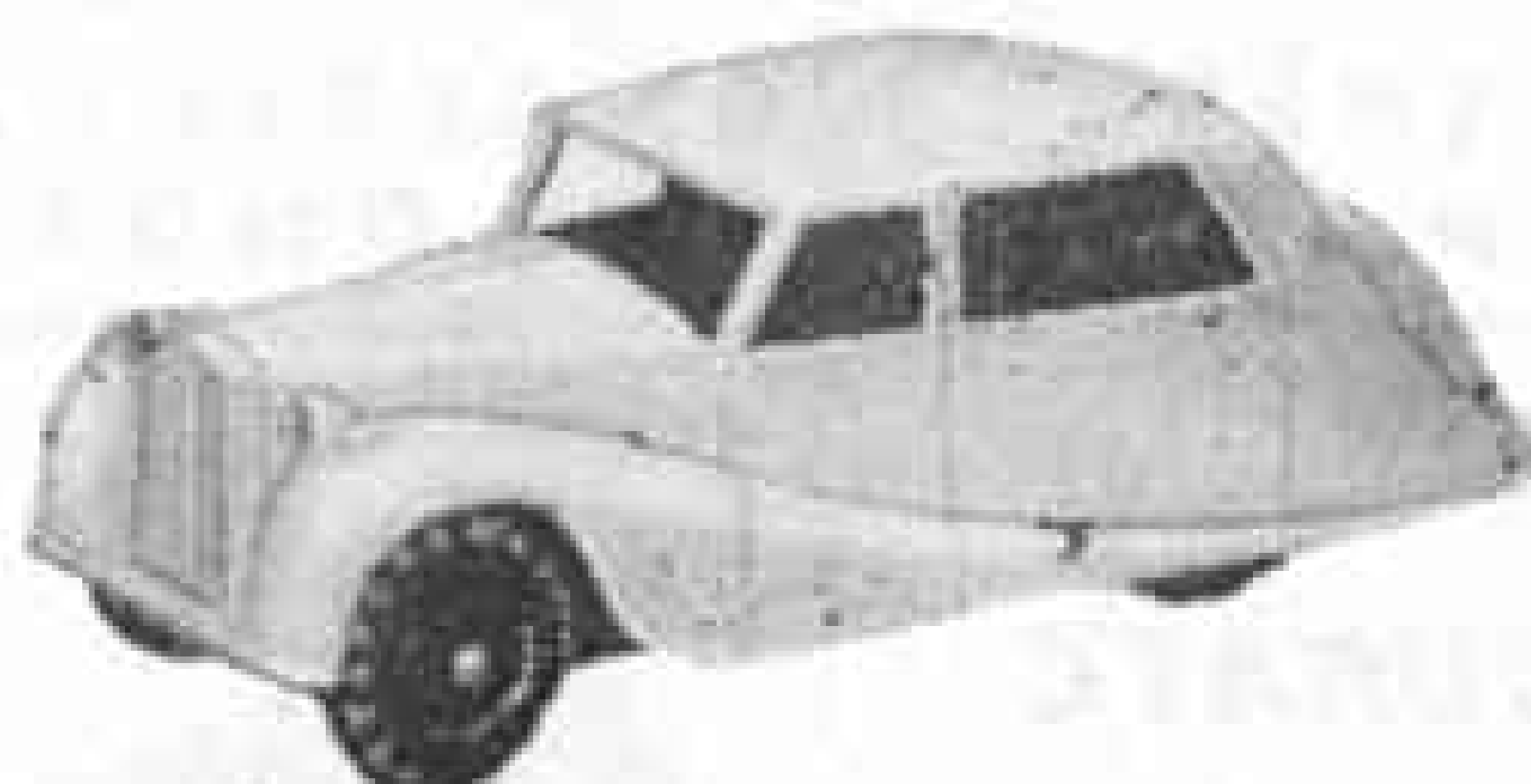
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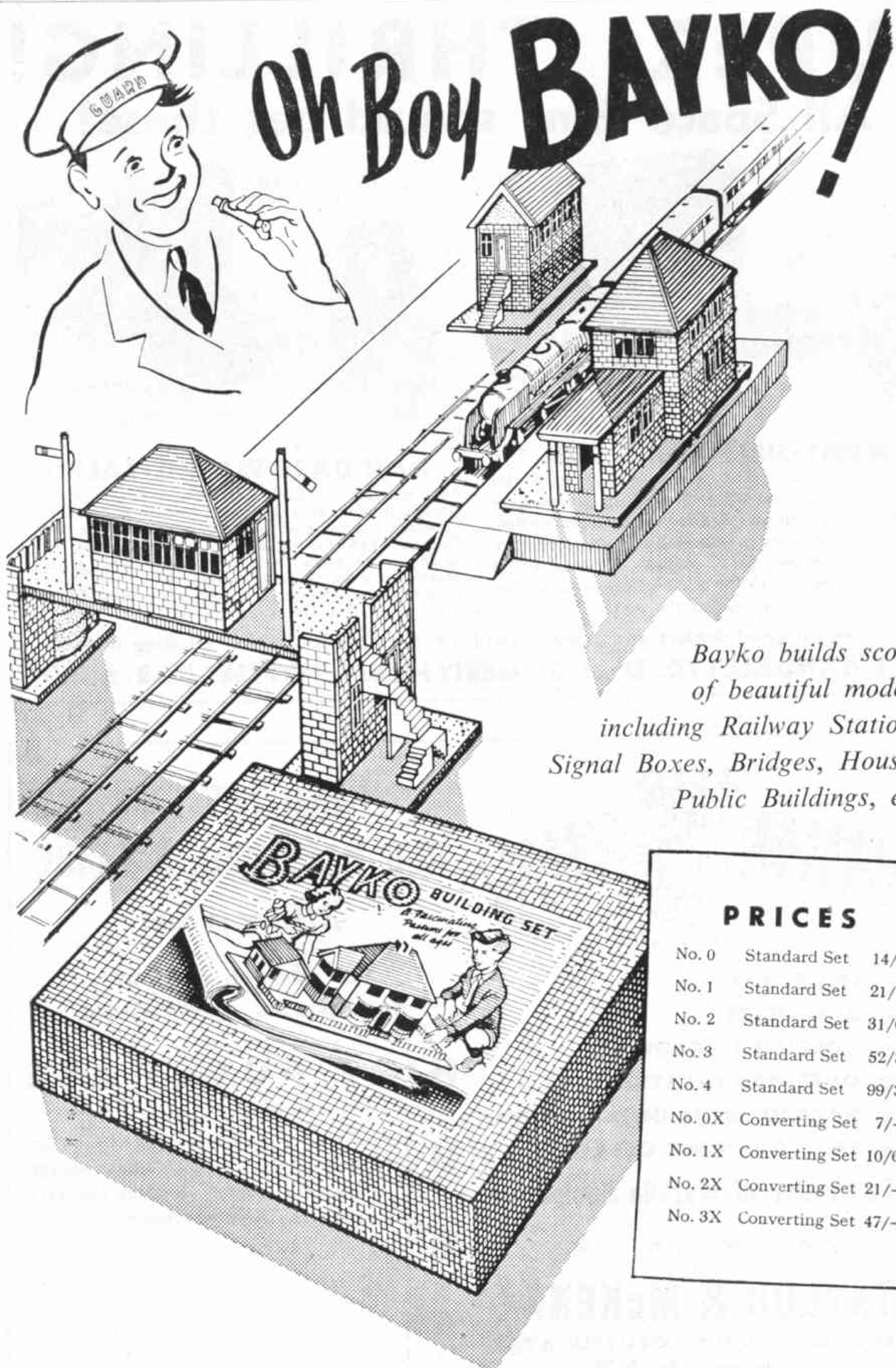
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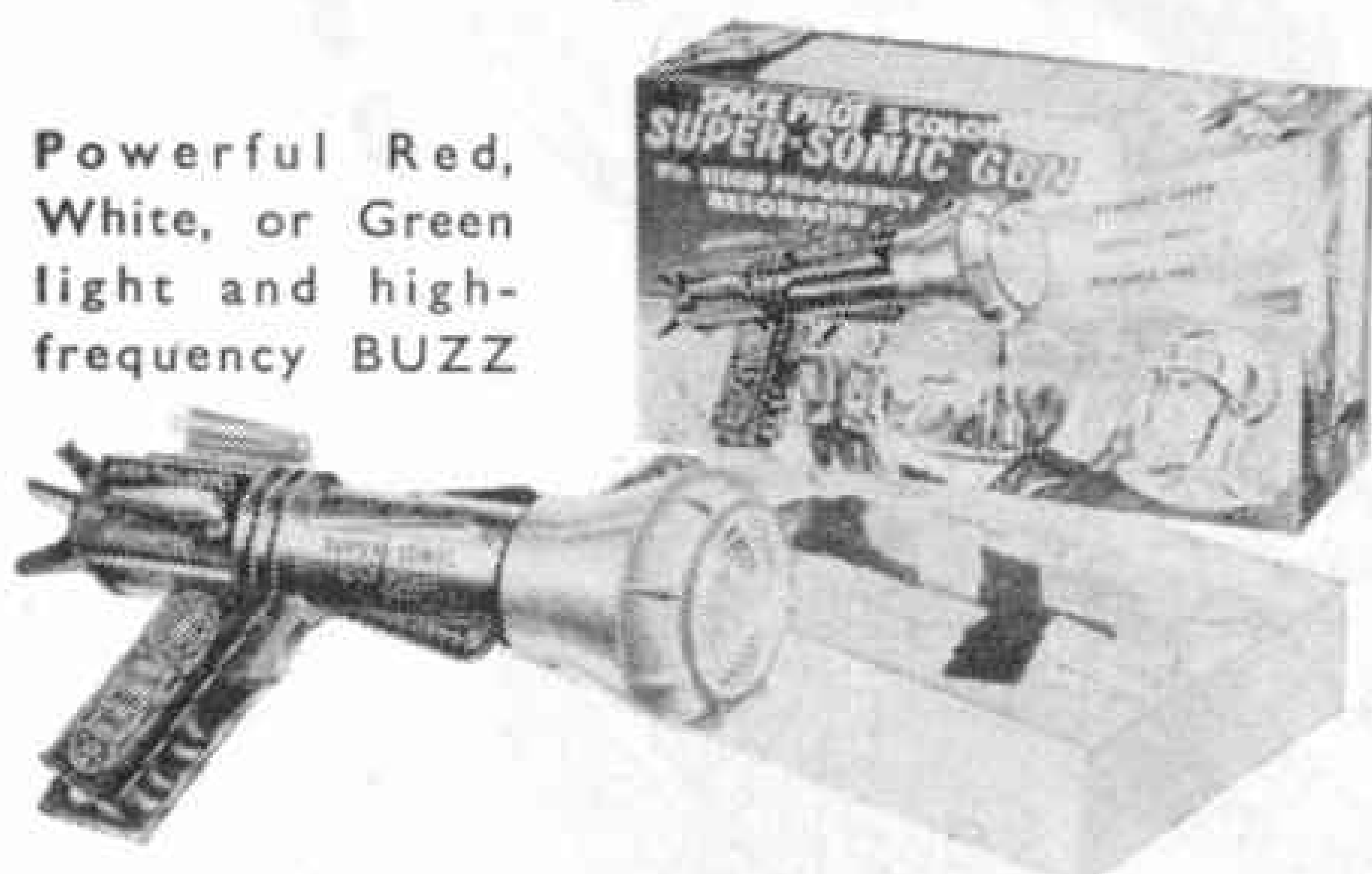
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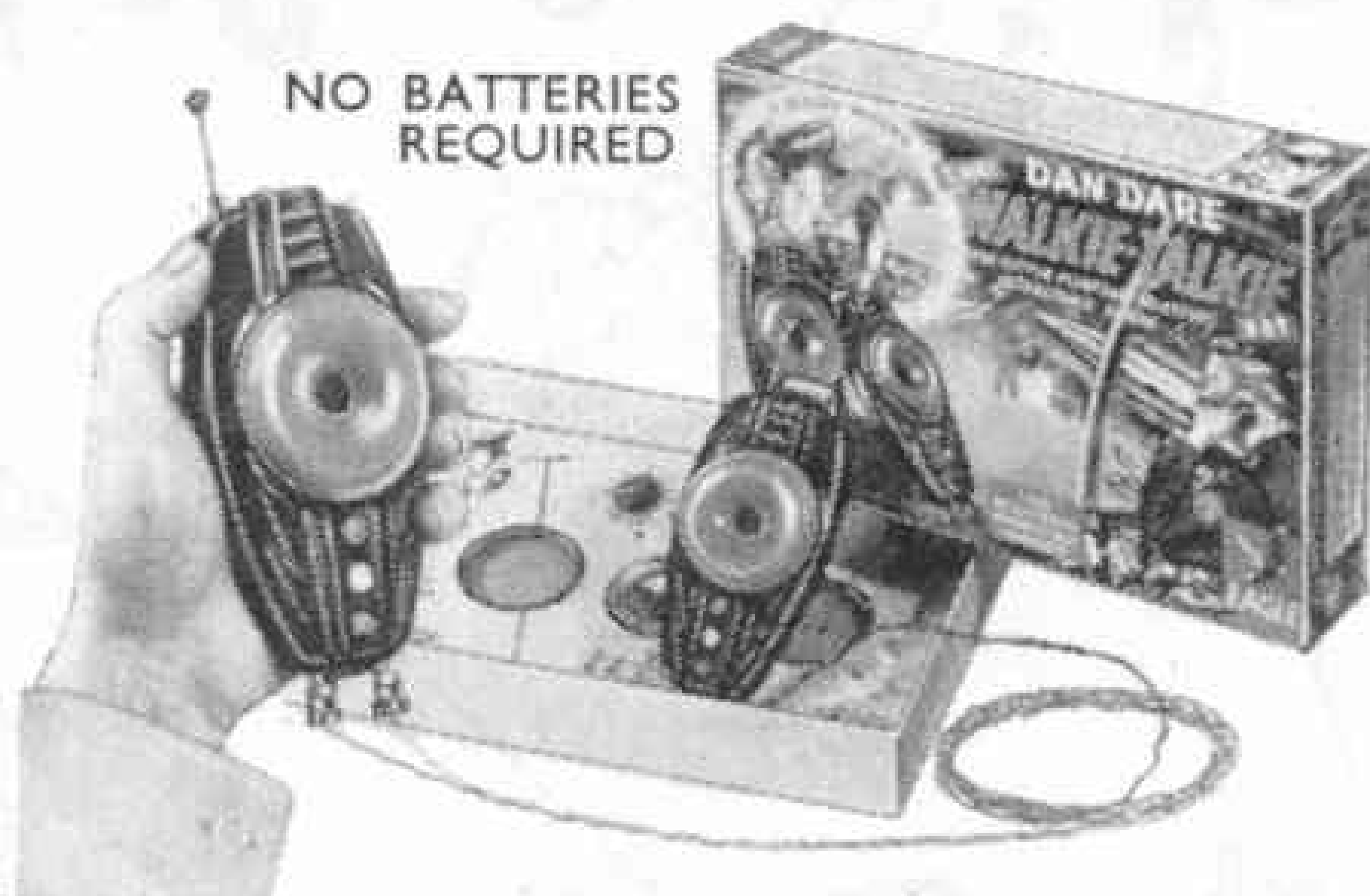


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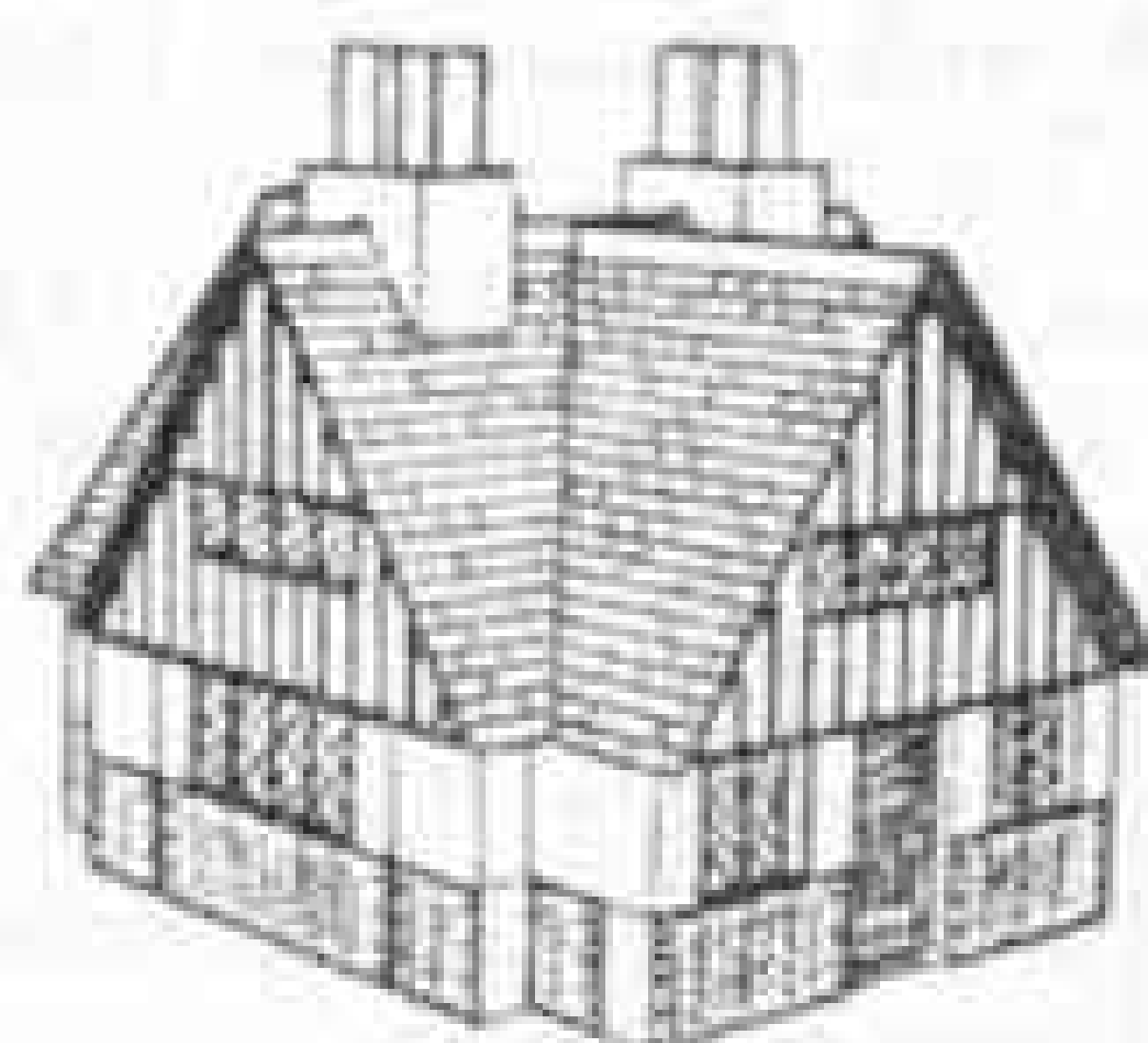
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Next Month: "VOLCANO IN ERUPTION"

MECCANO

MAGAZINE

Editorial Office:
Binns Road
Liverpool 13
England

EDITOR : FRANK RILEY, B.Sc.

Vol. XL
No. 9
September 1955

A Famous Voyage

My picture this month is an appropriate one, as the event with which it is connected occurred during September. As you will

begin her momentous voyage across the Atlantic. She was only a slow and tiny sailing ship, and it was not until the following December that her passengers landed on the spot in what is now the State of Massachusetts to which they gave the name of New Plymouth. Behind the stone at which the boy in the picture is looking so thoughtfully is a tablet, let into the wall in 1891, that gives a fuller account of the story of the *Mayflower*.

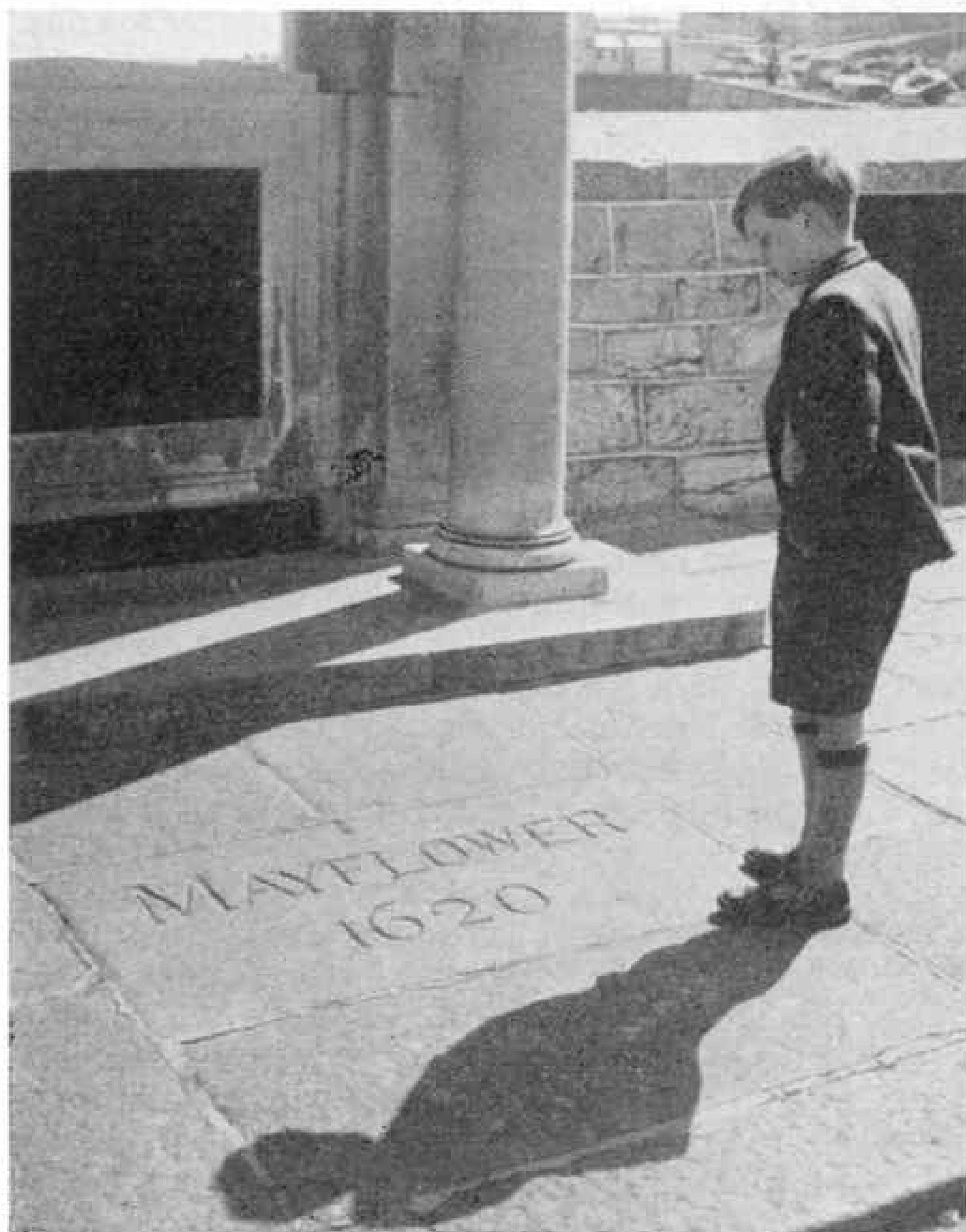
Thrills You Would Like!

In the Greatest Thrill Contest announced in the May *M.M.* competitors were asked to say which of 12 ambitions they would most like to have achieved. Readers of the *M.M.* are of course up to date, so it is not surprising to find that piloting the world's first space ship is the most popular of these ambitions. A footplate trip on the *Elizabethan*, driving a car in the Monte Carlo Rally and piloting a jet plane through the sound barrier also appeal strongly, and a good number would like to climb Mount Everest.

Some of you *may* achieve the ambitions you expressed in your entries, and it is not at all unlikely that the first space ship pilot will have been a reader of the *M.M.* in his youth, if he is not at the time of

his departure. But I was surprised to find how few wish to become members of Parliament, an achievement that came last but one, or to appear on television, which was last of all! Perhaps some of you can tell me.

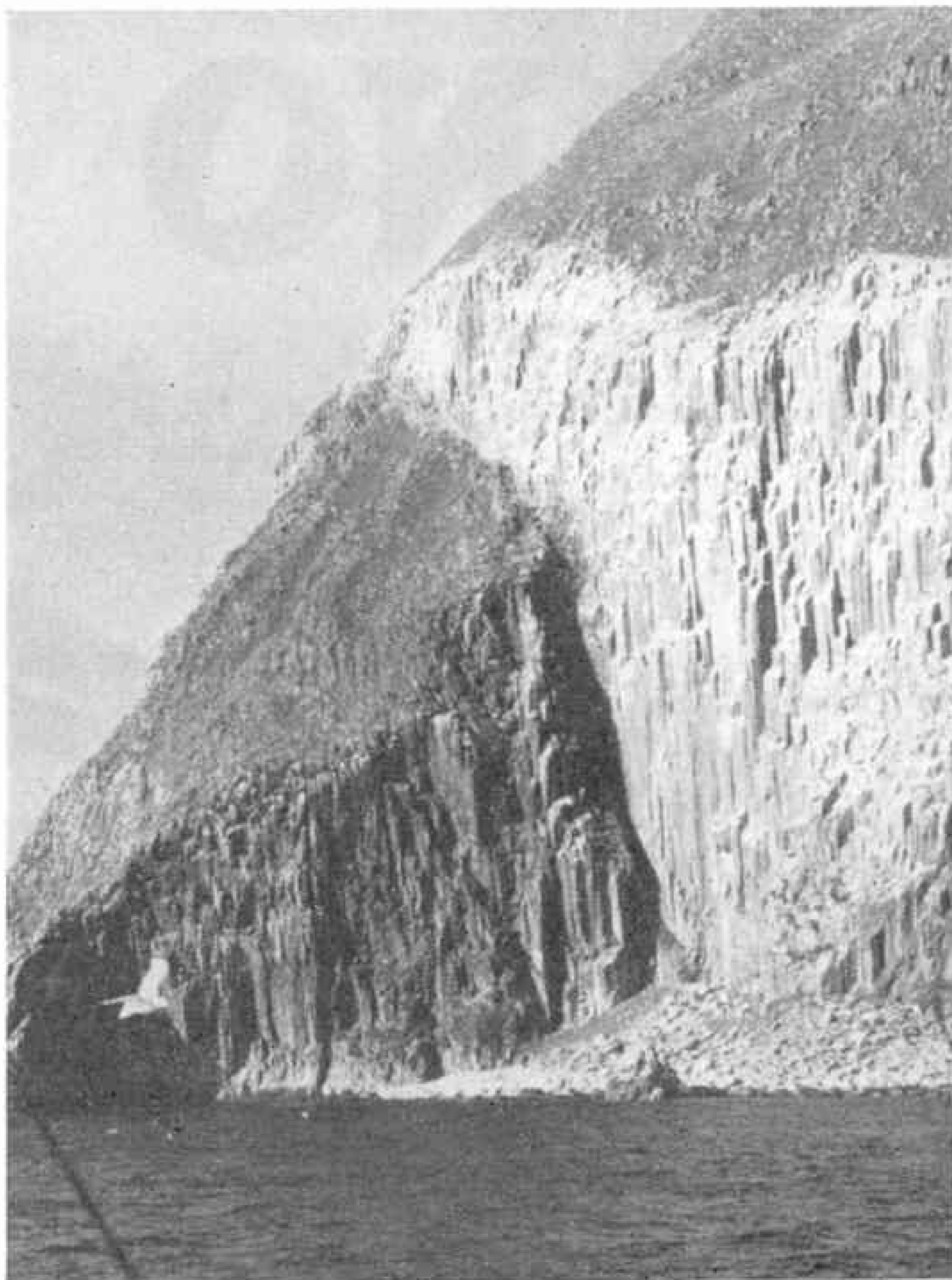
The Editor



Starting point of a great enterprise.

gather from the name and date on the stone, this was the sailing of the *Mayflower*, which carried the handful of Pilgrim Fathers to America to start a new life, and to found a tradition in the story of the United States.

The scene is in Plymouth, and the stone marks the spot where the *Mayflower* left English shores on 6th September, 1620, to



Guardian of The Clyde

By G. H. Pursell

Cocks". Brown rats infest the base of the cliffs, and feed on young or injured birds during the season, and on shellfish in winter. Higher up, on the slopes, is a small herd of wild Soay sheep and there are also some goats.

From the deck of a passing ship Ailsa Craig looks forbidding and unassailable, with great cliffs falling sheer to the water's edge hundreds of feet below, and yet, at one point on the northeast side, a kindly Providence has decreed that there should be a spit of land upon which to build a lighthouse. A fine modern lighthouse stands there now, and it is manned by three keepers, who tend the light and look after the powerful foghorns at the foot of the cliffs to the north and south of the island.

Near the lighthouse is a small cottage used by three men who work a small quarry, hewing ailsite. Ailsite, so called because it is found only on Ailsa Craig, is a particular form of granite from which curling stones are made, for the ancient Scottish game of curling. This game is played by Scotsmen in almost all parts of the world, and over 2,000 of these curling stones are exported annually in exchange for valuable dollars.

The lighthouse keepers and the quarrymen are nowadays the only inhabitants of Ailsa Craig, but there is evidence that in the past men have tried to gain a foothold on this grim island fortress. Four hundred feet up, above the lighthouse, and reached by a track, stands a three-storey tower known as Castle Comb. It is not known when it was built, but it has been a ruin for centuries. There is another track, running north, known as Highwayman's Road, while in the south west, at Little Ailsa, and about 40 feet up, is an opening in the cliff face known as MacNiall's Cave. This is a link with a famous smuggler of bygone days. On its

RIGHT in the middle of the approaches to the Firth of Clyde, and seemingly barring the entrance to all vessels wishing to enter, stands the famous rock called Ailsa Craig. It is about ten miles off the coast of Ayrshire, just opposite Girvan, and is really a mountain in its own right, for it is 1,114 feet high, three quarters of a mile long and half a mile wide. Often the summit is hidden in cloud and when seen from the mainland in winter, with snow covering its upper half and a white cloud swirling above like steam, it bears a strong resemblance to a Christmas pudding.

Ailsa Craig is a bird sanctuary nowadays and one of the world's greatest homes of the gannet, a huge sea-bird with a wing span of nearly six feet. Over 5,000 pairs of gannet breed there every year, together with innumerable puffins and guillemots. Gannets were once eaten by the people of Carrick on the mainland, as a principal food. Guillemots too were eaten, and to this day are still known locally as "Ailsa

The illustration at the head of the page shows the steep western face of Ailsa Craig, the mighty rock, well over a thousand feet high, that guards the approaches to the Firth of Clyde.

floor, 100 years ago, workmen found two stone coffins containing bones.

Further west is the Water Cave, about 50 yards long, with pillared walls characteristic of the columnar granite structure of the island itself. It may be entered by boat at low tide. And to the north is another cave called Swine Cove, possibly because it was a pen for the hogs that once were bred on the island. Rather surprisingly, about half way up, is a small lake, or loch, Loch Garry.

At the end of the 16th century, a certain local laird, Hew Barclay, was concerned in an attempt to overthrow the Church and conceived the idea of using Ailsa Craig as an invasion base, with the help of troops to be sent from Spain. Unfortunately for him, the Presbyterians heard about it and reached the island first. Barclay, in trying to avoid capture, either fell or threw himself into the water and was drowned.

On the western faces, the granite columns have been weathered by the storms of centuries and are criss-crossed with ledges. Here, the majority of the bird inhabitants have made their nests. Long crevasses in the grey precipitous faces have picturesque names like Dory's Yett, Rotten Nick, Sliddery and The Slunk. The great cliffs at the south are called Caigna'an and the Trammins.

During the last century, when there was a severe potato famine in Ireland, thousands of Irishmen set sail for Glasgow, with its shipyards and industries, in search of work. Ailsa Craig marked a kind of half way point on the journey and this gave rise to the nickname Paddy's Milestone, a name which is still used occasionally to refer to Ailsa Craig.

There is an old legend that the goddess Cailleach Bheur, hurrying across the sea with stones to build Caledonia, dropped one through a hole in her apron. This was Ailsa Craig!

Nowadays, Ailsa Craig can be visited on calm days, by motor launch, from Girvan. Pleasure steamers coming from Gourock and Dunoon, fifty miles away to the north in the Inner Firth, sail round it and Clyde yachtsmen sail

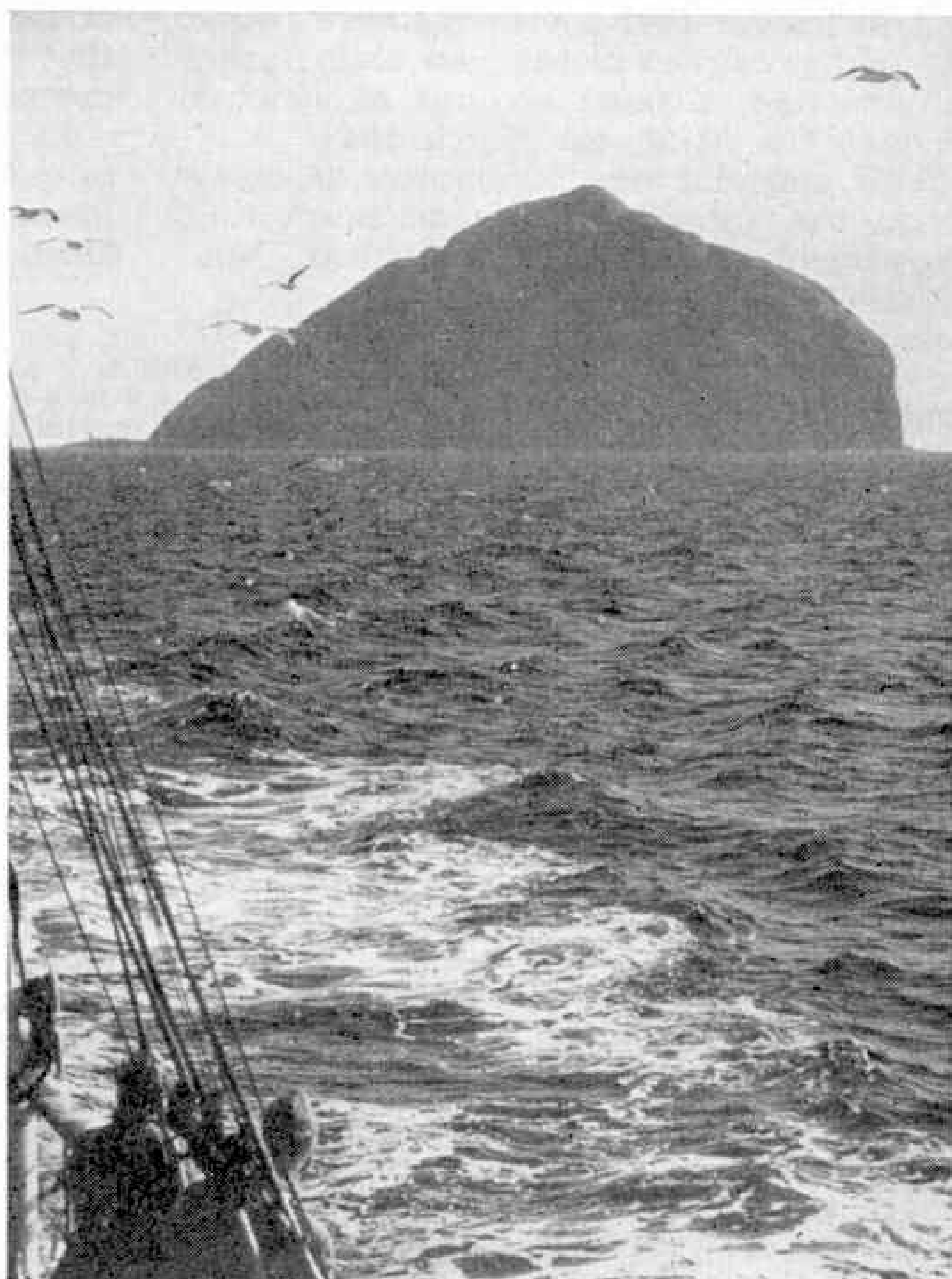
round it from Rothesay round Ailsa Craig and back.

The island is a remarkable land and sea-mark, and dwarfs all ships that sail by. I remember seeing a 20,000 ton ocean liner passing Ailsa Craig lighthouse one day, and, for all her huge size, against the rock she looked like a tiny clockwork boat.

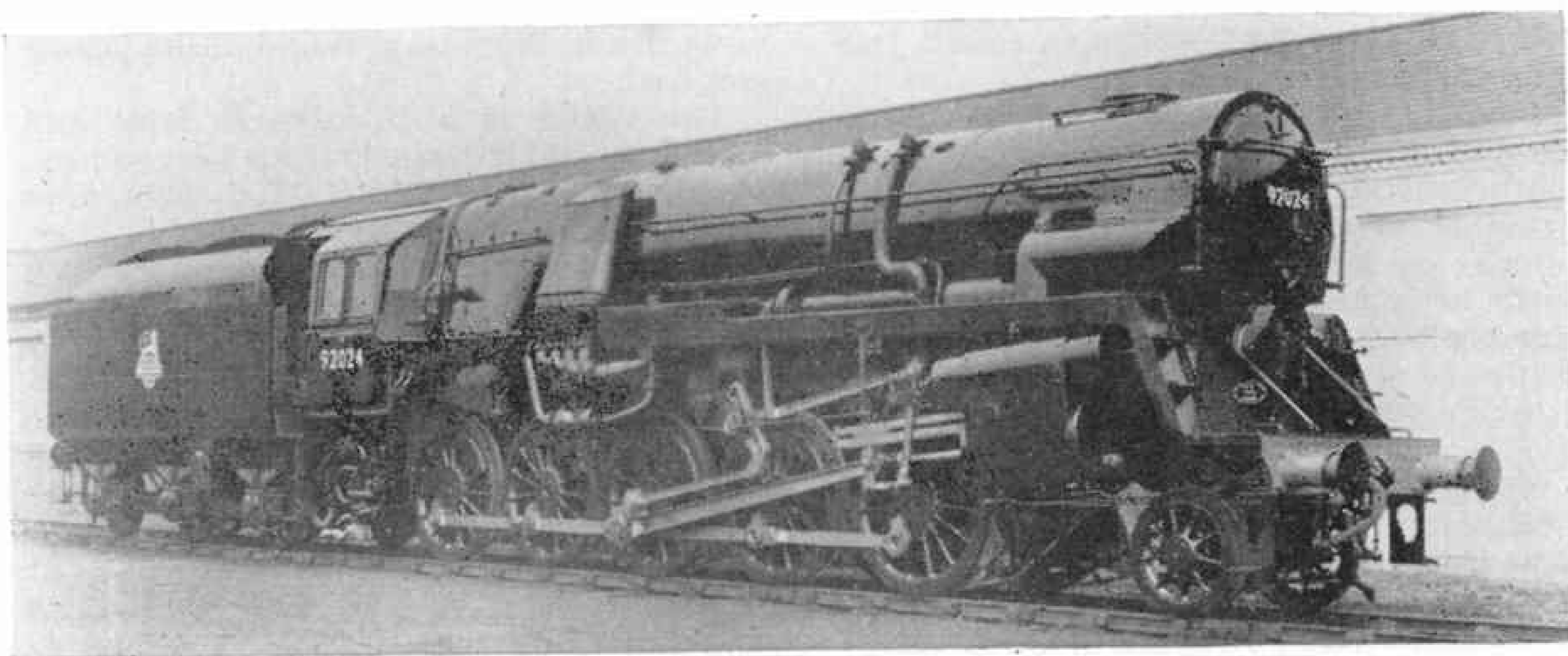
An interesting fact about Ailsa Craig is that pieces of the rock of which it is composed have been found in Pembrokeshire and Cork. Boulders of the rock were carried there by glaciers in the Ice Age.

During the war, men of the R.A.F. Air-Sea Rescue Service stationed at Corsewall point at the mouth of Loch Ryan, near Stranraer, used to swing, or check, their compasses by using Ailsa Craig as a leading mark. It lies due north of Corsewall point.

On a clear day, Ailsa Craig can be seen fifty miles away and one old seaman, gazing at it one fine clear summer evening from a long way off, shook his head gloomily, shrugged his shoulders, and said to me "When you can see Ailsa Craig, you know it's going to rain,—and when you can't see it . . . it is raining!"



Ailsa Craig seen from a passing ship. The spit on which the lighthouse stands is on the left of the picture.



A New Locomotive Boiler

Coal Saving on B.R. 2-10-0 Engines

By the Editor

LAST year British Railways introduced a new 2-10-0 goods locomotive that was given the power classification 9, the highest in use in British Railways. Readers will remember that I visited Crewe to see the earlier engines of this new class during construction, a short account of which I gave in the *M.M.* for March 1954.

This splendid new locomotive is being made the subject of a very interesting experiment, for ten of the class, Nos. 92020-92029, are being fitted with a new kind of boiler that is expected to produce a large saving in coal as compared with the standard type fitted to the previous members of the class.

This boiler is the invention of an Italian engineer, Piero Crosti, who has developed it from one designed by a Belgian engineer A. Franco, about 20 years ago.

The illustration on this page shows one of the new locomotives on completion. In general appearance it does not differ very greatly from the previous 2-10-0 locomotives made at Crewe, but one unusual feature on the side, just ahead of the fire-box, is easy to detect. This is a second chimney!

The upper illustration on the opposite page shows another difference—the existence of what seems to be a second and smaller boiler under the first, but is

actually a cylinder in which water for the boiler above it is heated before it is fed in. There are two smoke-box doors, and the lower of these is at the front end of this preheater, which extends back to the fire-box, as the lower illustration opposite shows.

In an ordinary locomotive a large proportion of the heat produced by burning coal in the fire-box is wasted. Most of this just disappears with the hot gases passing up the chimney. Before the gases do that they pass from the fire-box through the fire-tubes in the boiler itself, where they give up some of their heat to the water in the boiler.

If this part of the boiler, with its fire-tubes, could be made longer, the proportion of the heat used would be greater and the loss smaller. But for various reasons there are limits to the length of the boiler of a locomotive, and so some other way of saving at least part of the waste heat has to be devised if a steam engine is to be run more economically than usual. The simple solution to this problem worked out by Piero Crosti is in fact a neat way of providing, in effect, a longer *useful* path for the hot gases in the fire-box, without increasing the length of the entire locomotive.

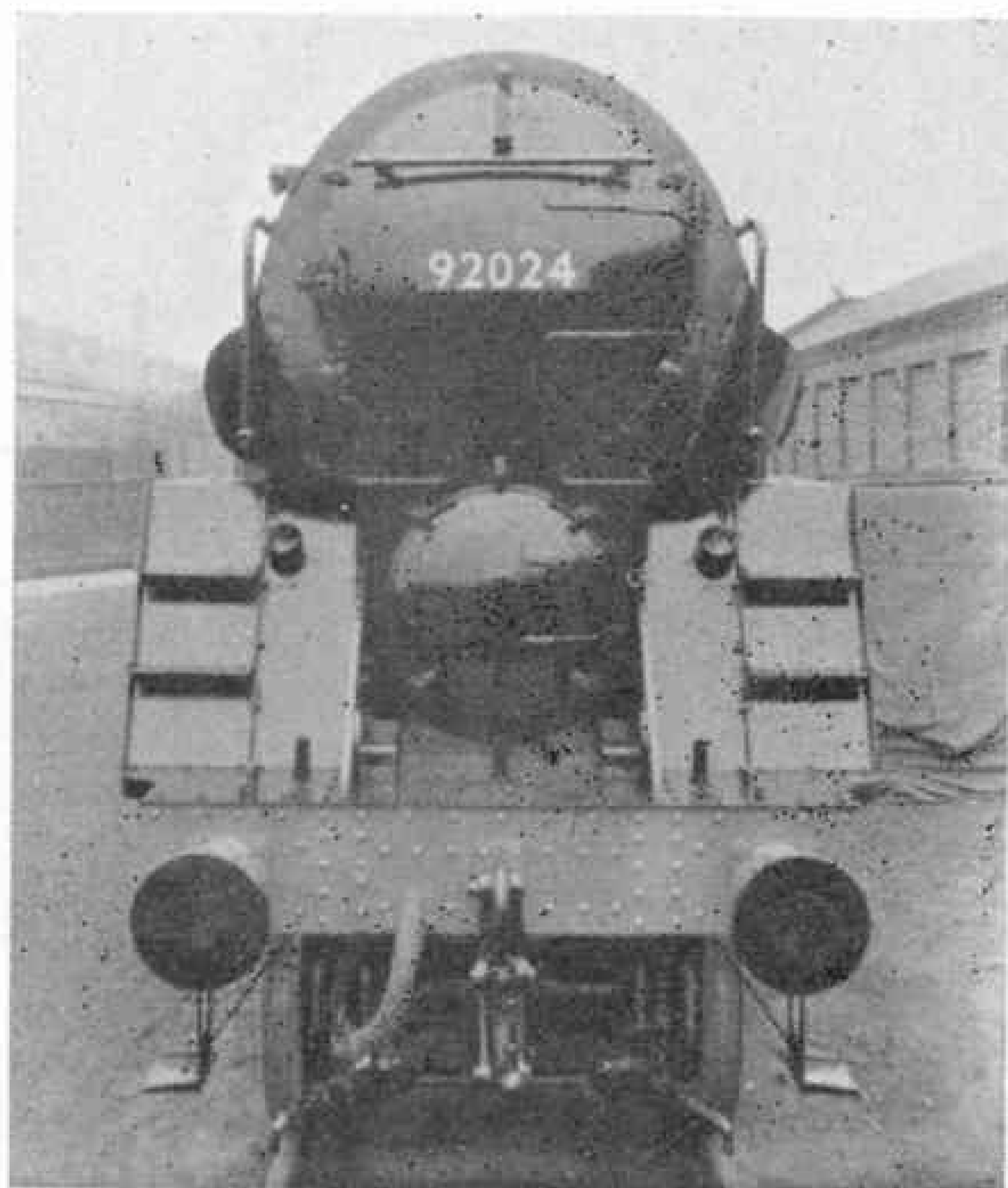
Now let us see how this has been done

At the head of the page is a picture of British Railways Standard Class 9 2-10-0 locomotive No. 92024. This is one of ten engines of the class fitted with the Crosti boiler, the final chimney of which in our illustration is seen on the side of the locomotive, just ahead of the fire-box. The illustrations on these pages are from British Railways photographs.

This view of No. 92024 shows the two smoke-box doors.

by following first the path of the hot gases and then that of the water, for the two are closely linked, as you will see. When the hot gases from the fire-box have passed through the fire-tubes of the main boiler they enter the smoke-box at the front, the position that this part of a locomotive occupies normally. But the smoke-box of the Crosti boiler is different from that of an ordinary locomotive in that the chimney can be closed and the gases guided into the preheater beneath. In the smoke-box they pass over an upper deflector, which helps to keep back char or ash, and then downward to the front of the preheater. There a lower curved deflector helps to turn them into tubes passing through the preheater, and there they give up more of their heat to the water with which the preheater is filled. When they reach the back end of the preheater they enter a second smoke-box and finally pass out of the strange looking second chimney I have already pointed out.

Now let us see how the flow of water is arranged. From the tender this is fed into the preheater by the injectors. The preheater is connected with the main boiler by means of pipes, and as water is forced into it by the injectors a corresponding amount of the water in the preheater is pumped through the pipes into the boiler. In both cases clack valves are used to prevent water returning. In these a metal valve is lifted from its seating by the rush of water, and falls



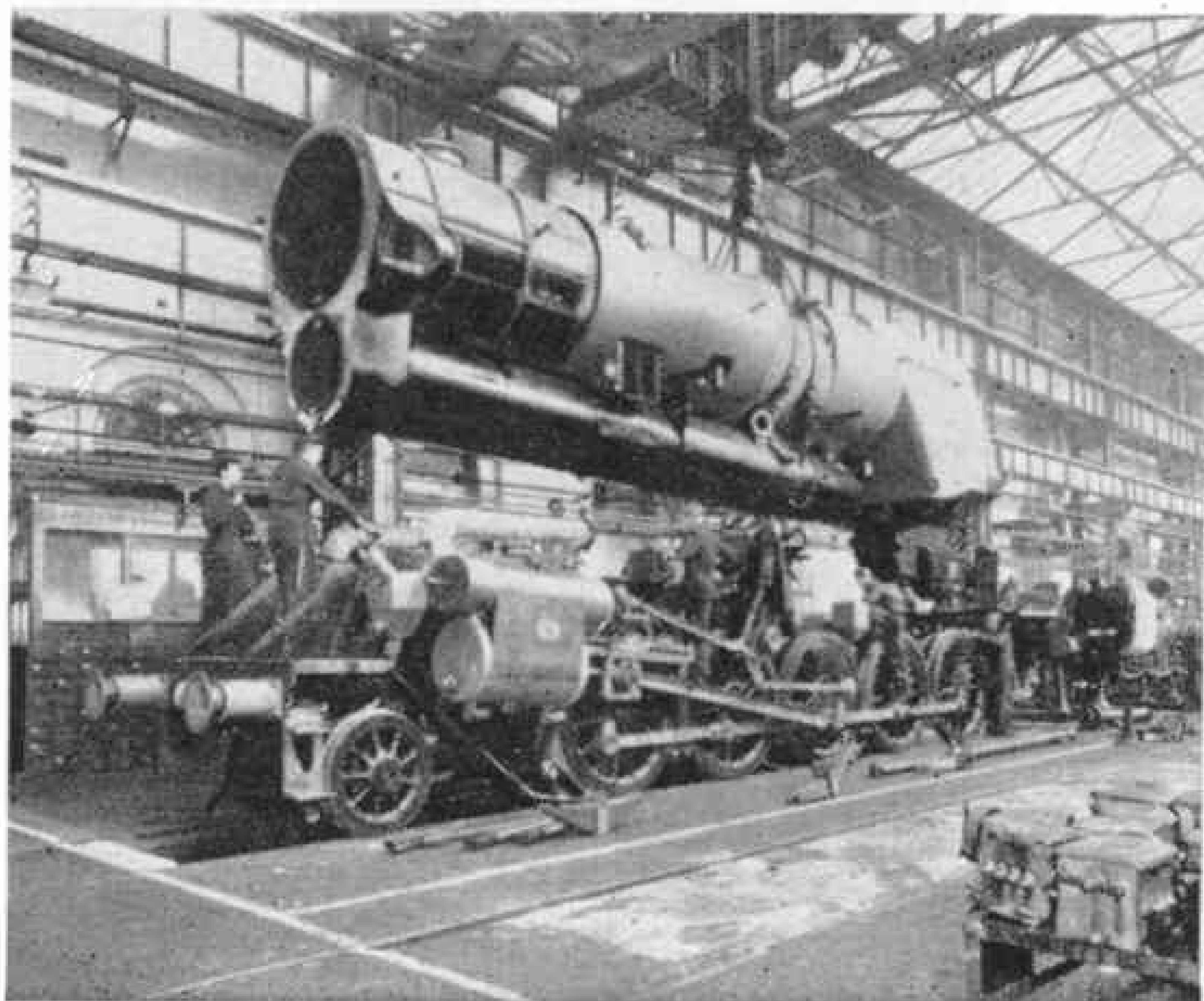
back on the seating, closing the entry pipe, when the injection pressure falls, so that the water can only pass one way. In the main boiler of course the water is further heated in order to raise steam for driving the locomotive.

It will be seen that the water and the hot gases flow in opposite directions to each other throughout the system, and with the preheater it is expected that a considerably greater proportion of the heat generated in the fire-box will go to heating the water and raising steam.

One cause of wasteful loss of heat in a normal locomotive is the emission of exhaust steam, which normally passes up through the blast pipe and out through the chimney. This of course does happen with the Crosti boiler, the final smoke-box being provided with blast pipes. But the exhaust steam passes through a jacket round the rear end of the preheater, where it gives up some of its heat.

Some of you may wonder why there is a chimney in the normal place at all. The reason is that it is wanted for lighting the fire of the locomotive, which could not be done readily with a "flue" that is partly downward and doubles back upon itself.

One of the new boilers being lowered on its frames at Crewe works.



San Marino

The Oldest Republic in the World

By E. Emrys Jones

Rome in 1849, pursued by Austrian soldiers, he was received with open arms by the people of San Marino. When Napoleon occupied Italy, he respected the independence of the Republic, and expressed his admiration for its principles—*Eternal Liberty coupled with independence*.

The government consists of a Grand Council of 60 members elected by a direct vote of all male citizens over 21 years of age. The Council elect a Supreme Court of twelve, and two Regent Captains, who are at the head of the Republic.

San Marino has practically no state debt and until 1922 had no taxation at all. Even now, income tax is low compared with that of Italy.

The first postage stamp was issued in 1877, and was the beginning of a wonderful series which is noted and collected by all philatelists. Even to-day, nearly all shops sell postage stamps; and this seems to be a national industry. Near the government

NEAR Rimini, on the east coast of Italy, is San Marino, the oldest and smallest republic in the world. It was mere chance that took me there, but what an exciting experience it was! I shall never forget the sight of Mount Titano rising above the plain of Rimini. On top of this 2,500 ft. mountain is the capital of the little country. The Republic itself is only 32 miles square and lies around the mountain. Its 16,000 inhabitants are mostly farmers, growing as much food as they can, and exporting any surplus.

It all began like this. A Christian stone-cutter from Dalmatia, named Marino, took refuge on Mount Titano from the persecution of the Emperor Diocletian about the year 300 A.D. He was later joined by a friend named Leo, and the two men lived a life of work and prayer. A lady from Rimini made a gift of Mount Titano to Marino and his followers. Marino became a saint and a protector of the place, leaving the domain as a haven for all free men of his time. Indeed, the people of San Marino are most hospitable and friendly to all visitors. When Garibaldi was fleeing from

The picture above shows the Fortress or Castle, San Marino. Below is a typical scene in the town itself.



buildings is the modern post office.

San Marino has her own army, and if necessary all male citizens between 16 and 65 years of age can be called up to defend their fatherland.

An interesting feature is that three different kinds of money have a free circulation. These are San Marino's own currency, that of Italy and papal money.

Blue and white are the colours of San Marino. The flag has two horizontal stripes, white and blue. Cars bear a white plate with the letters R.S.M., meaning *Repubblica San Marino*, in blue, followed by a number. A winding electric railway, with blue and white cars, runs from Rimini to San Marino, a journey of forty-five minutes.

There is a prison in San Marino too, housed in one of the towers that are features of the sky-line. I decided to go and explore this prison, and it was with some misgiving that I tugged at the bell-chain. The massive door opened, I was greeted with a smile, and asked to come inside. In my best Italian, I asked to see the Governor of the prison. "Certainly,"



The Government Palace and Statue of Liberty, San Marino, are seen in the upper picture on this page. Below is a communal water tap, one of the most important adjuncts of village life in Italy.

said the attendant, and took me to the Governor. He was having lunch with his family; the "attendant" also ate at the same table.

I was told that crime was practically unknown there. It transpired that the "attendant" was the prisoner, whose duty it was to act as a guide and messenger. He "lived" with the keeper of the prison! This man had quarrelled publicly with a neighbour and had been sentenced to three days imprisonment for his rudeness.

San Marino confers two Orders of Knighthood, upon foreign citizens only!

There are strong ties between the U.S.A. and San Marino. Abraham Lincoln wrote to the Regent Captains on 7th May, 1861, to say "Although your domain is small, your State is nevertheless one of the most honoured in history." All San Marino had been carefully watching the outcome of the Civil War in America in 1861, and in California is a town named San Marino, having the same City Seal and Coat of Arms as the Republic of San Marino.

The view from Mount Titano is superb, with the Adriatic to the east and the Apennines to the west, and visitors to San Marino derive real pleasure and interest from it.





One of the Royal Canadian Air Force North Star (Canadair Four) transport aircraft.

THE year 1948 was a difficult one for B.O.A.C. By then it should have had in service whole fleets of post-war air liners. Instead it could barely meet its commitments, for some of the new aircraft proved failures; others were obviously going to be many months late.

There was no longer any point in trying to make do with converted bombers or war-surplus transports. European and U.S. airlines had re-equipped with modern American air liners, and unless B.O.A.C. offered equally high standards of performance, comfort and reliability, it would lose its customers to the overseas lines.

The ideal was an aircraft like the American Douglas DC-6, which was a developed version of the DC-4 Skymaster with more powerful engines, a higher performance, more seats and a pressurised cabin to permit smooth, high-altitude "over the weather" cruising. But Britain was desperately short of dollars.

Fortunately there was an alternative.

In 1944, the Canadair company had been formed to take over operation of a factory at Cartierville Airport, Montreal, which the Canadian Government had built two years earlier for warplane production. Its first jobs were to complete the manufacture of 400 Canso amphibians for the R.C.A.F. and U.S. Navy, and to design and build a four-engined transport aircraft to the requirements of the R.C.A.F. and Trans-Canada Air Lines.

Very wisely, Canadair decided to adapt the already well-proven DC-4 Skymaster to these requirements rather than try to develop an entirely new design. Douglas

granted a licence for this, and offered to co-operate with the new Company on the necessary re-design.

Most important change requested by T.C.A. was replacement of the DC-4's normal 1,450 h.p. Twin-Wasp radials by 1,760 h.p. Rolls-Royce Merlin "in-line" engines, with which the airline already had considerable experience in the Lancastrians used on its transatlantic service. At the same time, Canadair decided to make provision for DC-6 type cabin pressurisation on the re-designed aircraft, although the R.C.A.F. did not need this refinement.

Little time was lost, and the prototype of the new transport flew on 20th July, 1946.

Known as the Canadair Four or DC-4M.1, it was

unpressurised and had accommodation for 40 passengers, with additional space for about 4,000 lb. of mail and freight.

After initial tests it was handed over to T.C.A. for service trials, and eventually 24 of this version were delivered to the R.C.A.F., who designated it the C-54GM North Star. T.C.A.'s 20 DC-4M.2s were almost identical, except that they were pressurised; and they put in fine service on the airline's transatlantic route until replaced by Super Constellations in 1954.

It was the pressurised DC-4M.2 that seemed like the answer to B.O.A.C.'s fleet problem in 1948, especially as no dollars would be needed for its Rolls-Royce engines. Knowing how long it takes to build a modern aeroplane, it did not seem likely to prove a very quick answer; but the Corporation underestimated Canadair's capabilities when it signed a contract for

The Canadair Story

By John W. R. Taylor

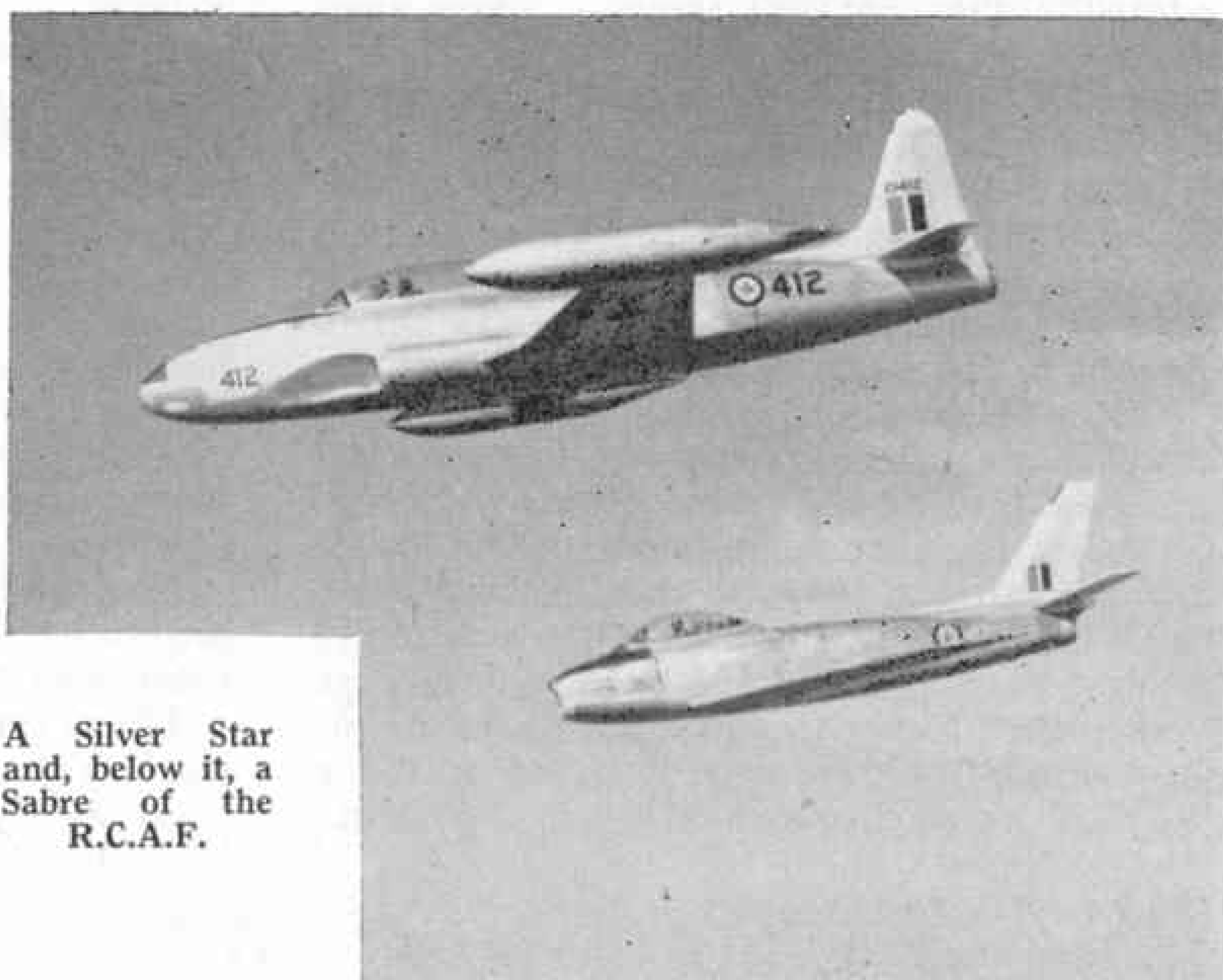
22 of these aircraft, for delivery within 20 months.

The first of B.O.A.C.'s Canadair Fours reached final assembly only 95 days after the order was received. Production was maintained on this basis, and the 22nd machine was delivered eight months ahead of schedule, a year less a day after the contract had been signed. This almost unprecedented achievement could not have been more welcome to B.O.A.C., for in July 1949, the Corporation was merged with British South American Airways, which meant that it had to find aircraft to fly not only its own vast network of routes but also the long B.S.A.A. services across the Atlantic to Bermuda, Chile, Brazil and the Argentine.

Known as the "Argonaut" class, B.O.A.C.'s Canadair Fours were originally intended more or less as stopgaps until the Hermes fleet was delivered. But they proved such first-class air liners that they were kept on side-by-side with the Hermes and, later, when still newer types came along, it was the Hermes, not the Argonauts, that were taken out of service.

Nor was the B.O.A.C. the only satisfied customer. Canadian Pacific Air Lines received its Canadair Fours well ahead of schedule, so that it was able to start trans-Pacific operations more than six months earlier than expected. And Canadair have kept up the good work ever since.

A very special aircraft, built in 1950, is the Canadair Five, which is a much heavier, more powerful version of the Four with 2,100 h.p. Double-Wasp engines. Only one was built, and it is used by the R.C.A.F. as a long range crew trainer and



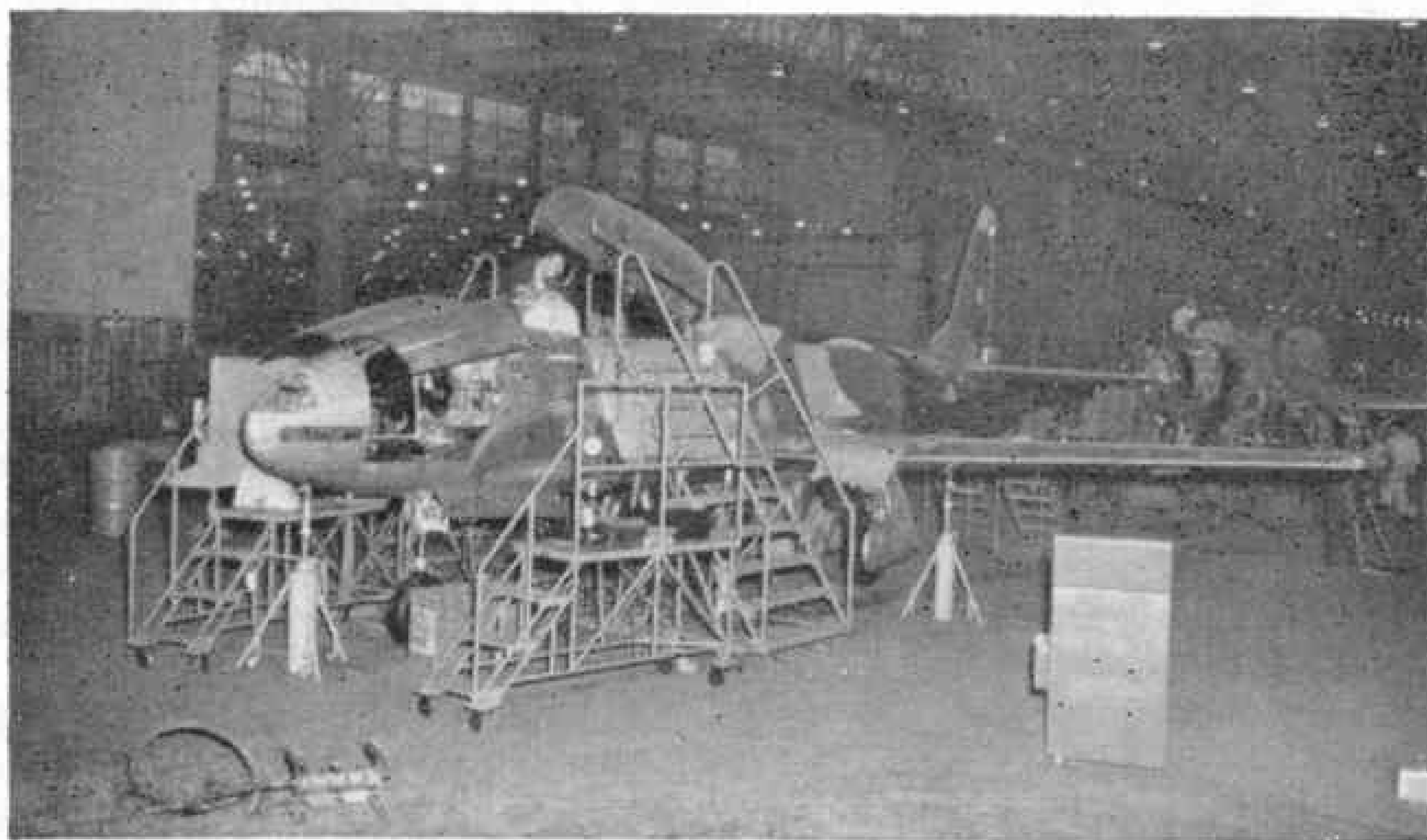
A Silver Star and, below it, a Sabre of the R.C.A.F.

as a private transport for the Canadian Prime Minister and other important people.

But by 1950 there had been some important changes at Canadair. The first was in January 1947, when the Company was purchased by the Electric Boat Company (now General Dynamics Corp.) of New York, builders of the world's first atomic-powered submarine and owners of the great U.S. Convair aircraft company.

Second change was in 1949, when Canadair began to turn over almost completely to military aircraft production.

The R.C.A.F. needed new fighters very quickly and there was little doubt that Canadair were the people for the job. The fighter chosen was the Sabre—certainly the best in the world at the time—and it was rushed into production, under licence from its



The Canadair-built version of the Lockheed T-33A Shooting Star jet trainer is known as the Silver Star. Here is a view of Canadair's production line of these machines.

designers, North American Aviation.

The prototype Sabre 1, which flew on 9th August, 1950, was based on the original F-86A. But production Sabre 2s were similar to the U.S.A.F.'s F-86E, with a more powerful J47 engine and a variable incidence tailplane to improve controllability at high speeds. They were supplied in very large numbers to the R.C.A.F., and proved so good that some were bought by the U.S.A.F., and used in Korea. It was a developed version of the same type, designated Sabre 4, which was supplied to the Royal Air Force and ferried across the Atlantic in Operation Becher's Brook, as described in the April 1954 *M.M.*

Good as it was, Canadair felt sure they could make the Sabre better still by fitting a Canadian-designed Avro Orenda 10 engine of 6,355 lb. thrust, instead of the usual 5,200 lb. thrust J47. So they installed one experimentally in the Sabre 3, which made its first flight early in 1953. In May of that year, the famous American airwoman, Jacqueline Cochran, used it to set up three world speed records—a 15 km.

on either side of the Iron Curtain. But something even better is on the way, for the Canadair Sabre 6, now in production at Montreal, has the more powerful Orenda 14 turbojet.

It is not possible to give up-to-date production figures for Canadair-built Sabres; but the total was over 1,200 in October 1954, of which some 375 had been supplied to the R.A.F. Needless to say, most of them were delivered ahead of schedule!

To train R.C.A.F. pilots to fly their new jet fighters, Canadair have also been building under licence the Lockheed T-33A Shooting Star two-seat jet trainer since 1952. Known as the Silver Star, their version has a 5,000 lb. thrust Rolls-Royce Nene turbojet, which is considerably more powerful than the T-33A's normal J33 engine, and it should have correspondingly improved performance. Well over 300 had been built by October 1954.

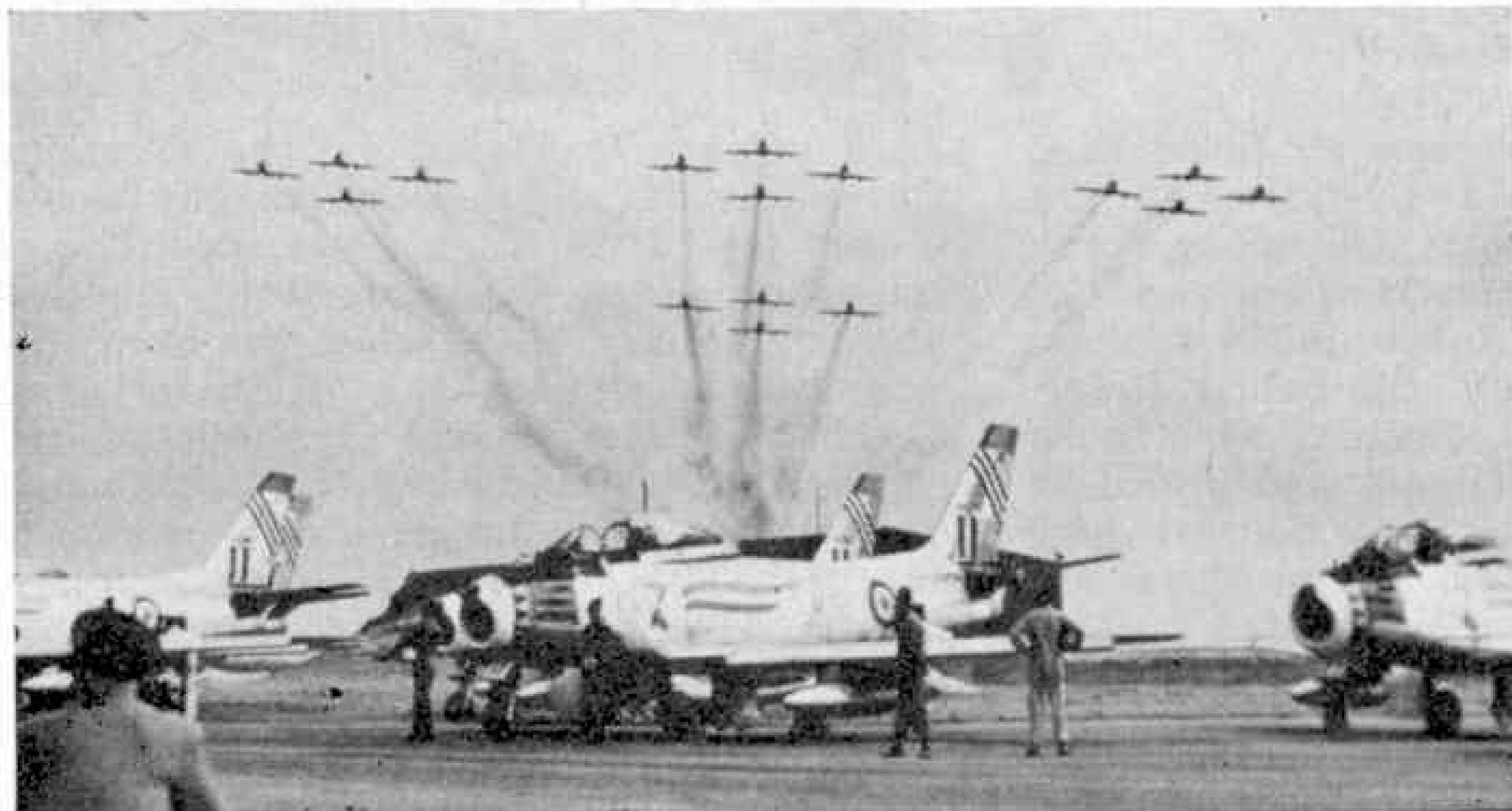
These repeated references to 1954 reflect the fact that a high proportion of Canadair's present-day work is secret. But we do

know that the 13,000 people who work in the Company's 2,500,000 sq. ft. of factories and offices at Cartierville Airport are busy on some very interesting projects.

For example, since March 1954 they have been remodelling the Bristol Britannia air liner into an over-water reconnaissance-bomber for the

R.C.A.F. Pictures of the mock-up show that it will hardly be recognisable as a Britannia by the time they have finished, because the CL-28, as it is called, will have a longer fuselage with fewer windows and large radar scanners bulging from its normally-smooth skin. Even its engines will be different, for 3,500 h.p. Wright Turbo-compound piston engines will replace the Proteus propeller-turbines of the air liner version. The prototype is due to fly in 1957.

Beyond this, there are reports that Canadair will soon start production of a Sabre replacement (Continued on page 481)



A dramatic flypast of 16 Canadair-built Sabre aircraft.

straight-away record at 675 m.p.h., a 100 km. closed circuit record at 652 m.p.h. and a 500 km. closed circuit record at 590 m.p.h.

Realising they had a world-beater in the Orenda-Sabre, the R.C.A.F. ordered it into immediate production as the Sabre 5, and it is this version which now equips the 12 Canadian fighter squadrons based on the Continent as part of the NATO air defence forces. Able to fly faster than sound in a dive, and complete with the finest possible operational equipment, including radar gunsights, they are the equal of any other fighters in squadron service in Europe



Kruger National Park

The World's Greatest Animal Sanctuary

By W. H. Owens

YOU do not have to be a big game hunter any more to enjoy the thrill of photographing lions at close quarters in their natural haunts. Every year this experience of a lifetime is shared by thousands of visitors to the Kruger National Park of South Africa, the world's biggest reserve for the protection of all animals and birds. In a wilderness of mountains, lakes, rivers, and open veldt, stretching for more than 200 miles through the Eastern Transvaal, live nearly a million wild creatures of every kind unmolested by gun or trap.

Driving through this huge reserve, the nature lover can easily and safely observe the natural habits of animals normally seen only in captivity. Lions prowl along the roads, quite indifferent to the passing traffic, sometimes in twos and threes, and often in prides of a dozen or more. A herd of elephants may charge across the road ahead, uprooting the trees and trampling everything in their path; man-eating crocodiles and enormous hippopotami lie drowsily in the many rivers and streams and wayside pools.

Then there is the whole multitude of gentler creatures such as zebra, giraffe and all the various members of the antelope

family, including the graceful little springbok, so called after the long distances it can leap. Bird life in the Kruger National Park is most abundant and of quite infinite variety, dazzling the eye with brilliant colours and confounding the ear with strange and startling sounds.

It is more than half a century since Paul Kruger, President of the old Transvaal Republic, first thought of preserving a typical region of the unspoilt African wilderness, and all the animal life contained within it.

Generations of hunters and traders had taken heavy toll of the wild creatures of the sub-continent, and killing had been on such a scale that it was feared many of the rarer animals would become extinct. Fortunately only two species, the surly rhinoceros and the graceful oribi, had been entirely eliminated. Of the other species at least a few remnants survived, and these needed only protection to restore them to their former numbers.

In 1898 what was originally called the Sabi Game Reserve, in the north east of the Transvaal between the Sabi and Crocodile Rivers, was established as a permanent wild life sanctuary. This was the beginning of the present Kruger National Park, the forerunner of many

Exciting traffic. The lions are wandering unconcernedly along a road in the Kruger National Park, South Africa. South African Railways Photograph.

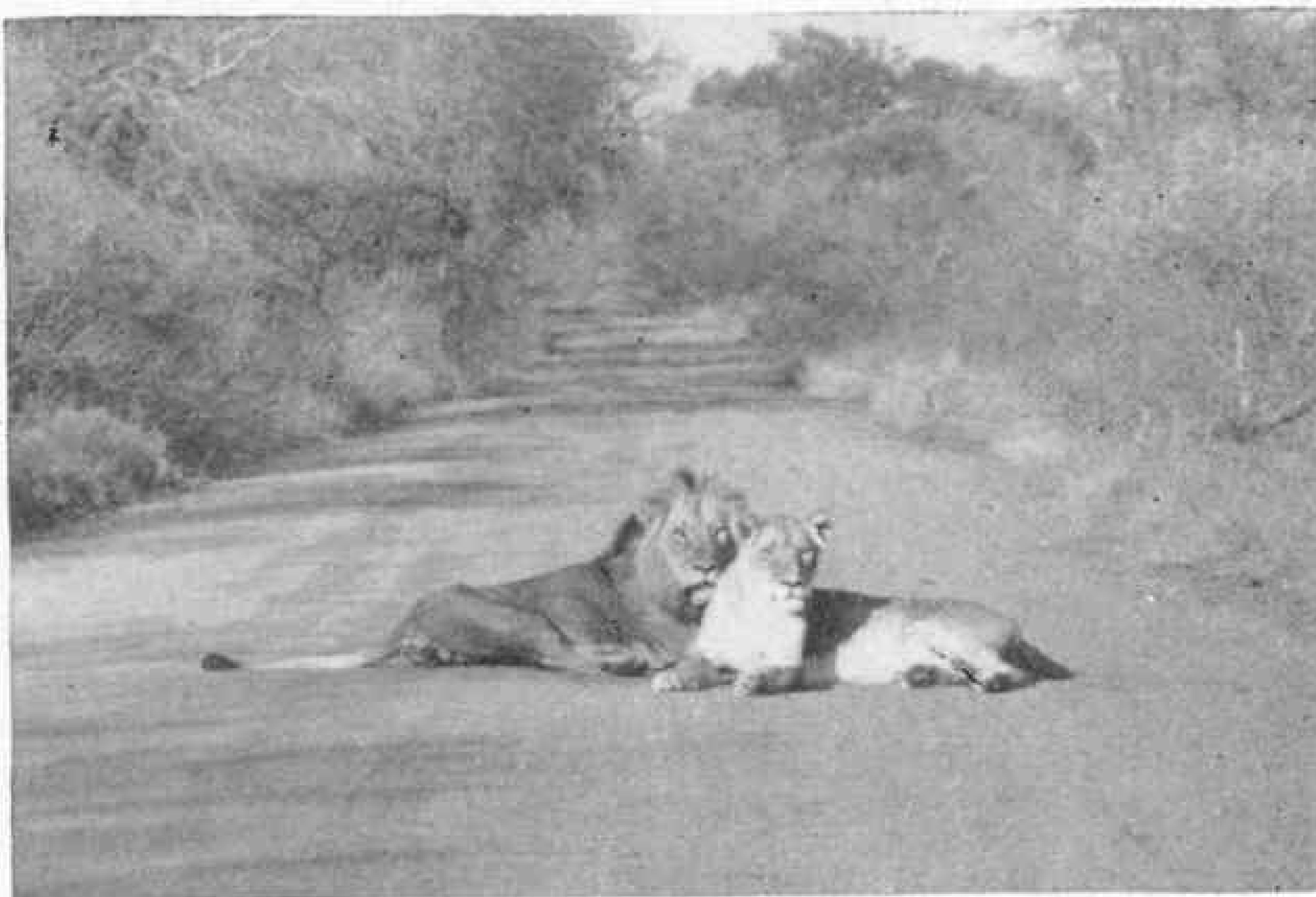
A rest on the way. South African Railways Photograph.

smaller game reserves not only in Africa, but also in other parts of the world as well. Its first and most distinguished Warden, Colonel J. Stevenson-Hamilton, appointed in 1902, was chiefly responsible for the great success in restoring wild life in all its rich abundance to the area.

During the past fifty years some of the most grievously reduced species multiplied in proportion to all the rest.

Outstanding examples are the Kruger's two thousand or so giraffe, which are said to be descended from just a single family of these animals that survived the wild life slaughter in the Transvaal. Tallest of all the game in the Reserve, and therefore the easiest to see, is the towering giraffe, known to the native Zulus as "indhlulamite", meaning "he that surpasses the trees".

Elephants, which died in countless thousands in Africa when ivory fetched a high price, had also become rare at the time the Kruger National Park was established. Because of the policy of conservation in the Transvaal, there are several hundred elephants once again living their allotted seventy or eighty years, or more. These leviathans of the bush and veldt are powerful enough to push over huge trees with thunderous crashes that

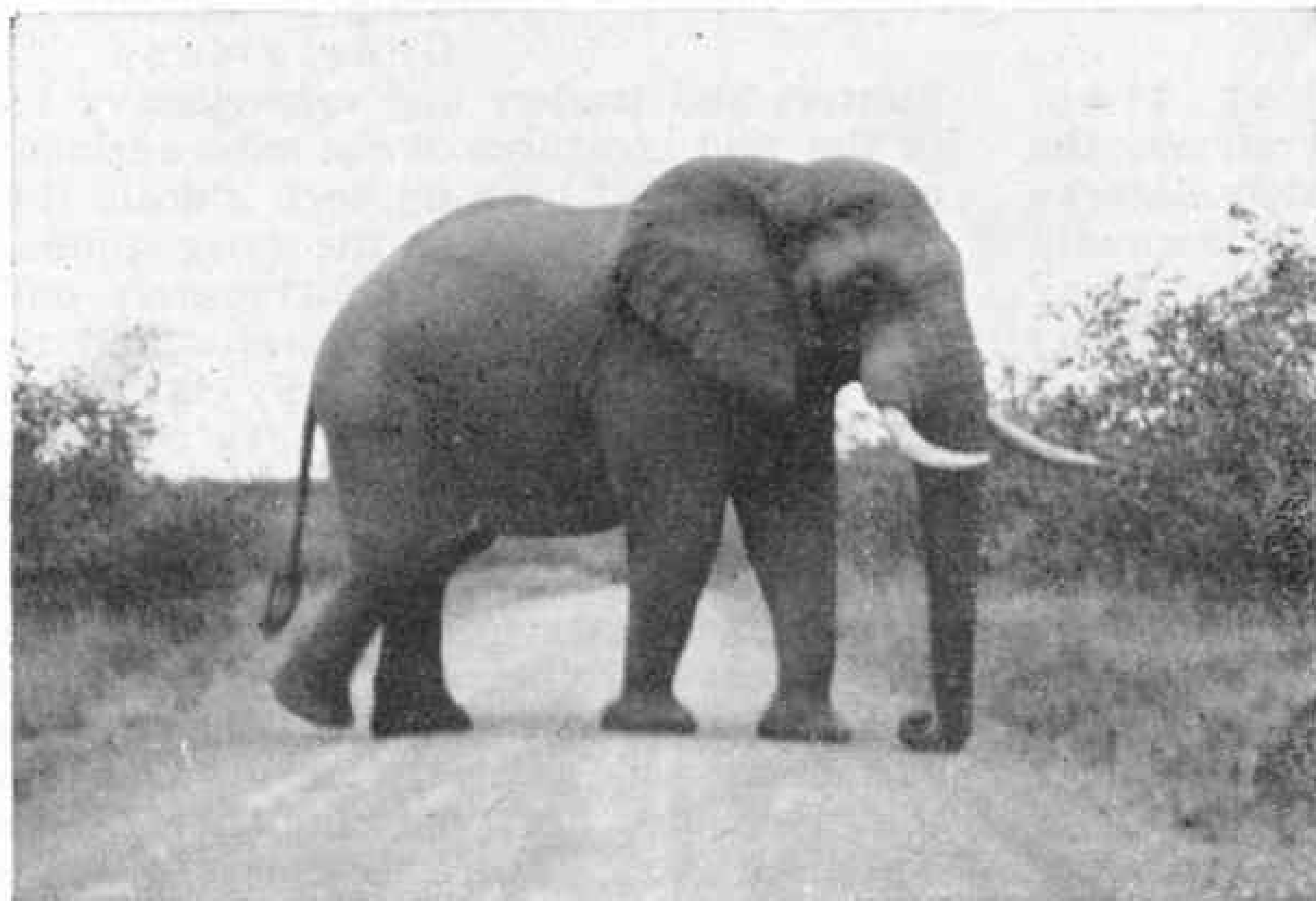


echo far over the countryside.

This is not, as some people think, just sheer vandalism. The elephants like to eat the soft shoots of trees, bushes and soft grass. So when there is little green undergrowth or grass available they fell the trees to get at the shoots. And by felling trees they create favourable conditions for the growth of grass, weeds and bushes that provide food for the smaller animals, which in any case are unable to reach the high branches and leaves.

One thing that impresses visitors to the Park is the sight of big herds of mixed game grazing peacefully together. There may be impala, blue wildebeest, antelopes, warthogs, monkeys and so on, together in one herd. Such herds are particularly noticeable when the animals are at the drinking holes or rivers. They are formed so that the methods of defence of one type of animal may supplement those of another—a natural alliance for their common defence.

Particularly watchful of danger are the impala, and they are the first to make a sneezing sound as a sign of danger. Monkeys will flee with deafening shrieks into the trees and in so doing warn the other animal communities for miles



Even elephants may be encountered on the roads of the Kruger National Park. South African Tourist Corporation Photograph.

around. But the cruel law of nature is often witnessed in the Kruger Park when lion or leopard emerges from the undergrowth with its victim—some gentle creature of the bush less fleet of foot than its companions.

When the Kruger National Park was first opened to motorists in 1927 only three cars ventured through the gates in a whole year. People would not believe it could be anything but highly dangerous to drive through country where such large numbers of wild animals roamed at liberty. In the second year, however, 180 cars were admitted, and the number has since increased to the present average of between 15,000 and 20,000 cars a year.

This Reserve has indeed become South Africa's greatest single tourist attraction. More than 1,000 miles of well-signposted roads have been laid down, and sixteen rest camps built, for tourists wishing to spend a few days there. These camps are modelled on the native African villages, with circular stone and straw-thatched rondavels, or guest-houses, which are comfortably equipped.

For safety reasons no one may sleep anywhere in the Park except at the official camps. Other rules are that you must not shoot animals, leave the roads, or get out of your car. Nor can you bathe because, as the visitors' guide puts it, "there are often crocodiles in the smallest pools!"

Visitors are astonished by the complete indifference of the wilder animals to motor cars. The lions ignore cars, however, because their noses tell them such things are not good to eat, and they do not associate the smell of petrol with human beings. Inveterate lion-watchers tell stories of the creatures sitting beside their cars because they are fascinated by the sound of the running engine. Rangers give the warning; "Don't imagine because the lions are passive they are therefore tame, and that you can go up and pat them. If you get out of your car in close proximity to lions you are courting trouble."

Most visitors respect such advice, but of course there have been the foolhardy ones who have amused themselves chasing lions in their cars and even throwing

bottles at them. One famous incident occurred some years ago when some picnickers left their car to have a group photograph taken on rocks by the roadside. When the film was developed a lion was clearly seen licking its whiskers only a few yards away. That led to the order for all visitors to stay in their cars. For over forty years now no gun or rifle has been



Mixed herds of game are seen regularly in South Africa's great reserve. With the zebra in this picture are wildebeest. South African Railways Photograph.

fired within the 8,000 square miles of the Kruger National Park, and visitors who go with firearms must surrender them temporarily at the entrances.

Following the success of the Kruger Park came the foundation of other similar reserves throughout South Africa. Some of the smaller parks are devoted mainly to the preservation of particular species. For example, the Hluhluwe Game Reserve in Zululand, 180 miles north of Durban, is famous for its herds of white rhinoceros, now one of the world's rarest animals. Both black and white rhinos are to be seen in the Hluhluwe area. Near Port Elizabeth is the Addo Elephant Park, the home of a herd of elephants living right on the doorstep of civilisation; in Cape Province, too, is the Mountain Zebra National Park, where rangers are experiencing much difficulty in the struggle to preserve this almost extinct creature.

Through the creation of such large game sanctuaries, the Africa of past ages has been preserved in miniature and man has in some measure repaid part of the debt he owes Nature for the senseless mass slaughter of wild and beautiful creatures a century ago.

Road and Track

By Peter Lewis

FROM my seat in the Tribune de la Presse at Le Mans I was privileged to watch the tremendous duel between the Hawthorn/Bueb Jaguar and the Fangio/Moss Mercedes that dominated the first two and a half hours of the 1955 race. A few minutes after five o'clock Hawthorn, with Fangio only a second or two behind him, wrested the lead from the Ferrari of Castellotti. The Jaguar and Mercedes set a terrific pace as they tried to "break" each other, and the lap record was shattered repeatedly as the two drivers duelled for the lead. One ten lap period was equally divided—five to Hawthorn, five to Fangio. The World Champion has admitted that he was able to beat the British car on acceleration out of the corners, but could not reach the Jaguar's maximum on the straight—and Fangio's Mercedes was timed at 181.57 over the measured kilometre on the Mulsanne Straight!

Seldom has such a fierce duel been seen and after only two hours of racing the average was higher than the 1954 lap record. Hawthorn had established a new circuit record of 122.393 m.p.h. and only five other cars out of the 58 that had started were on the same lap as the leaders. The Jaguar was more than a match for the Mercedes and the British victory was far from hollow, as suggested by some observers. It was a highly creditable performance, especially when it is realised that the Mercedes lead of two laps when they retired at 1.45 a.m. Sunday was—strictly speaking—little more than one lap. When Levegh's car crashed so disastrously at 6.30 p.m. Fangio somehow managed to weave his way through the pit area—where all was confusion—while Hawthorn was stationary at the Jaguar pit. By the time Hawthorn, badly shaken, had been persuaded to continue Fangio was at White House, having almost completed another lap.

What a convincing demonstration of British reliability! The Hawthorn/Bueb car covered 2,594.58 miles in twenty-four hours at 107.072 m.p.h., 54 miles more than the previous record distance, which was put up by the Rolt/Hamilton Jaguar

Ivor Bueb, co-driver with Mike Hawthorn of the winning Jaguar in the recent Le Mans 24 hour road race.



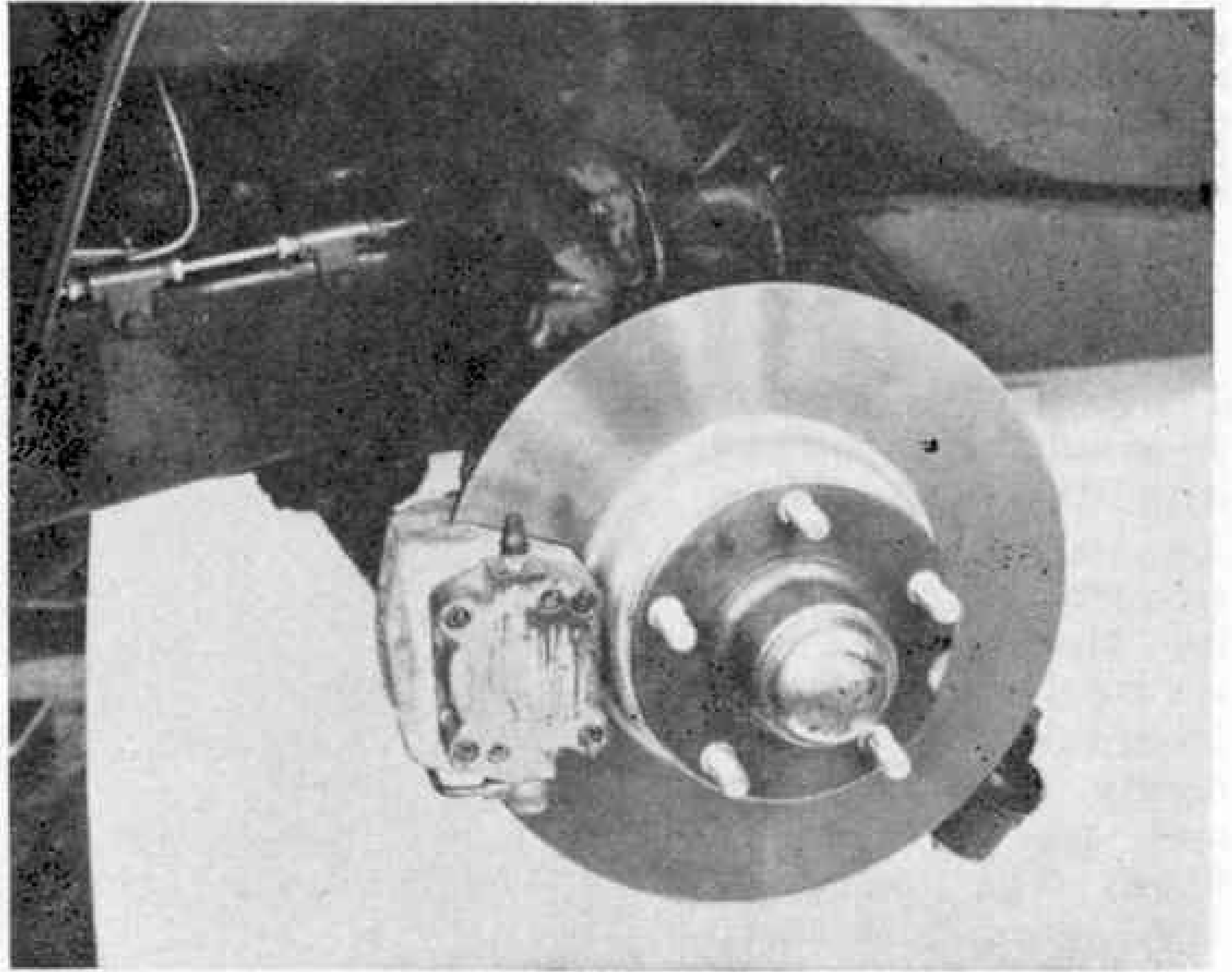
in 1953. This from a motor car which, under the bonnet, is very similar to the XK140 and the Mark VII saloon. The same crankshaft, bearing sizes, connecting rods and cylinder block are used—taken from stock and with only minor additional machining. A convincing proof of the soundness of the basic design, this year's Le Mans power unit developed 285 b.h.p.—an increase of 35 b.h.p.

over the 1954 car.

The Hawthorn/Bueb car was basically a standard production D type—and there are now a considerable number leaving the assembly lines at Coventry. It had certain prototype modifications, among them a new cylinder head and exhaust system and certain body changes to nose, windscreen and tail fin to improve penetration and stability. Certainly the Jaguars were better streamlined than any other car at Le Mans.

The D Type provided two of the main requirements for Le Mans—speed and reliability. Two men, Mike Hawthorn and

This picture of the Dunlop single cylinder disc brake for front wheels shows the general design. Photograph by courtesy of the Dunlop Rubber Co.



Ivor Bueb, provided the third requirement — driver ability. Hawthorn is an acknowledged master of the art, but 31-year old Ivor Bueb had never been to Le Mans as a spectator, let alone as a driver, and had only handled a D Type once when, eight days before the race, he was asked to join the team.

How did Ivor Bueb become a Jaguar 'Works' driver? This was the result of a conversation between John Cooper, designer and builder of the famous 500's, and Mr. W. Lyons, of Jaguar cars. Cooper assured the Jaguar chief that Bueb could lap Silverstone in a D Type in 1 minute 53 seconds, as fast as any Jaguar had ever gone round the circuit. On test Bueb did so, surprising the Jaguar people and, as he admits, also surprising himself.

At Le Mans Bueb was only able to practice at night, due partly to minor troubles with the car, and having watched Hawthorn and Fangio during their breath-

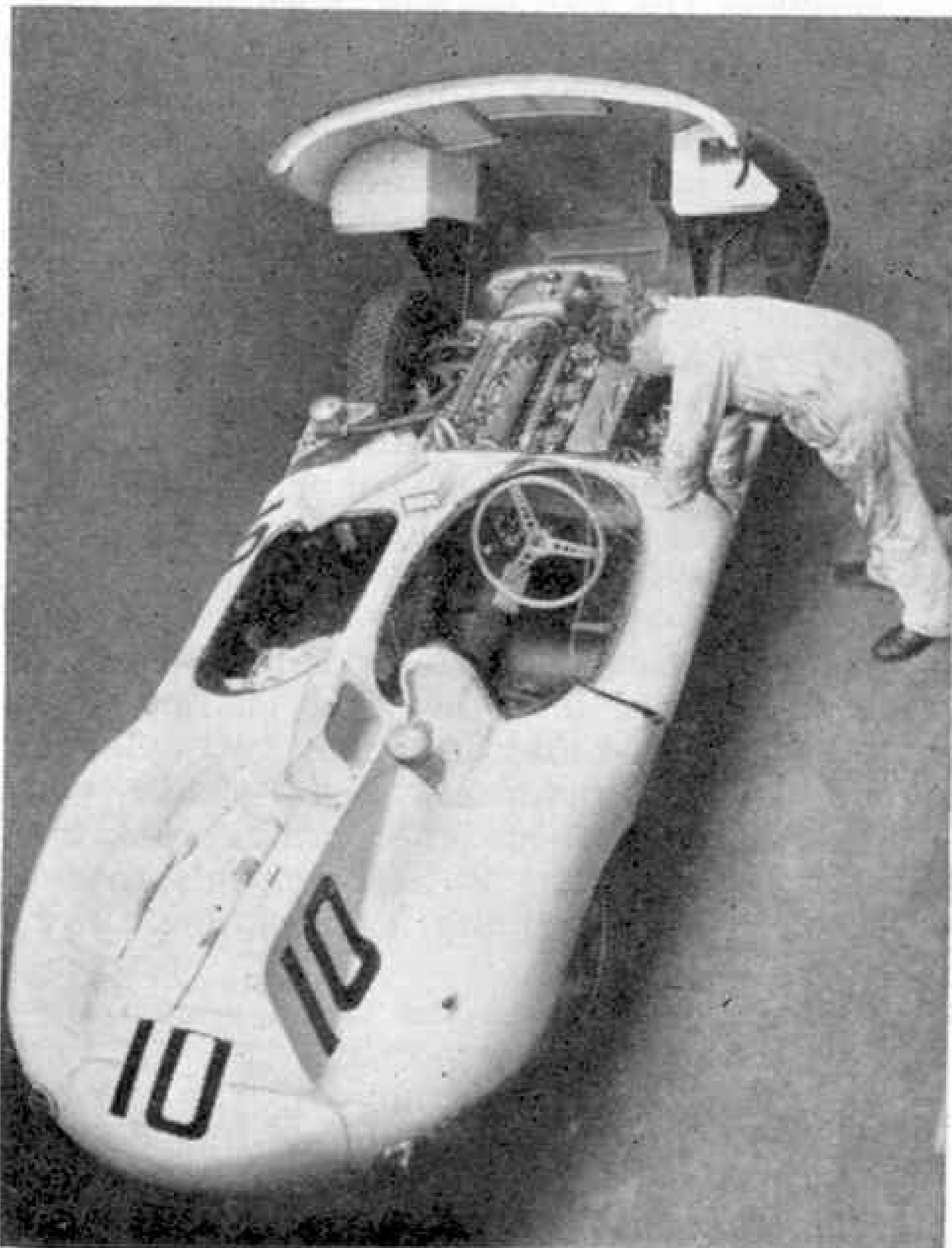
taking duel, was on the pit counter ready for his first spell at the wheel when he saw Levegh's Mercedes crash almost opposite. He freely acknowledges that during the first six laps after he had taken over from Hawthorn there were occasions when, shocked and bewildered by the tragedy, he felt like withdrawing and handing over to Bob Berry, the reserve driver. But somehow he forced himself to carry on and lapped Le Mans steadily for nearly three hours, his chief opponent Stirling Moss in the Mercedes, until Hawthorn took over again.

For a man who had never driven anything larger than a 1,100 cc. sports Cooper his effort was a fine example of grim determination and the will to win. In fact he drove for thirteen of the twenty-four hours, including almost the entire four hour period on Sunday between midday and the finish, when rain drenched the circuit.

For a month before the race Ivor Bueb saw to it that he had plenty of early nights. "That is one of the most important factors," he told me, "sufficient sleep." He hopes to drive for Jaguar in the Tourist Trophy Race in Ireland on 17th September and the next year we may see him at the wheel of the new Cooper Formula 1 car.

Ivor Bueb is most enthusiastic about the Dunlop disc brakes, fitted to the Jaguars at Le Mans. This type of brake, which is

(Continued on page 481)



The D-type Jaguar of Claes and Swaters, a private entry which came in third. Photograph by courtesy of the Autocar.

The beginning of the Rimutaka Incline. The locomotive is one of the special 0-4-2 Fell type engines that haul trains over its steep gradients. New Zealand Railways Photographs.



IN popular books on wonders of railway engineering, New Zealand is most frequently represented by that courageous expedient—the Rimutaka Incline. For eighty years, freight and passenger trains from the port of Wellington, and sheep and cattle trains from the rich farming country of the Wairarapa plains, have traversed the 1 in 15 gradients between Cross Creek station and the head of the pass in the Rimutaka mountains, hauled by special locomotives using the Fell centre-rail system—the only example in the world. During 1955, however, a new railway line crossing the mountain range at a lower altitude, made possible by a $5\frac{1}{2}$ mile tunnel, will allow the capital and the Wairarapa townships to be served more speedily and economically by diesel-hauled trains, and will mean the end of the Incline route. The demise of this unique railway is a melancholy prospect for the enthusiast and it is perhaps worth while recording something of the Incline's history and method of operation before it is quite forgotten.

In the sixties and seventies of last century ambitious plans were laid for the building of a system of railways in New Zealand, and immigration, which was to provide the labour to accomplish them, was at its height. The main line to the north east from Wellington was to cross the Rimutaka range and the Wairarapa plain to Masterton. Construction of the line went forward without incident along the Hutt River valley and into the foothills of the Rimutakas as far as the pass, 1,141 feet above sea level, where Summit station now stands. From there, the Public Works engineers were faced with a descent of 869 feet in three miles—a gradient impossible to negotiate by

The Rimutaka Incline

The End of a Spectacular Railway Feature

By J. R. Cook

ordinary methods of rail adhesion. They eventually chose as the solution to their problem the Fell system, with three miles of smooth centre-rail, as opposed to the more usual rack and pinion principle, raised a little less than a foot above the 3 ft. 6 in. New Zealand standard gauge road. The specially-built locomotives and brake-vans to use this unique single-line section of track were imported in the 1870's and '80's. In all, six Fell locomotives were obtained and these same engines are still giving faithful service at the moment of writing.

Each of the 39-ton Fells is in fact two locomotives within one frame. The orthodox engine, adhering by its own weight, is carried on six small wheels of 32 in. diameter, the two leading pairs being coupled and driven by two cylinders of 14 in. diameter and 16 in. stroke, with valve gear outside the frames. On four of the Fells this is Stephenson's motion while the remaining two employ Joy's valve gear.

What appears to the casual glance as a rather curiously-proportioned 0-4-2 tank engine conceals within it the second "locomotive," which runs on the double-faced central rail. This consists of a pair of cast steel wheels, with flat treads,

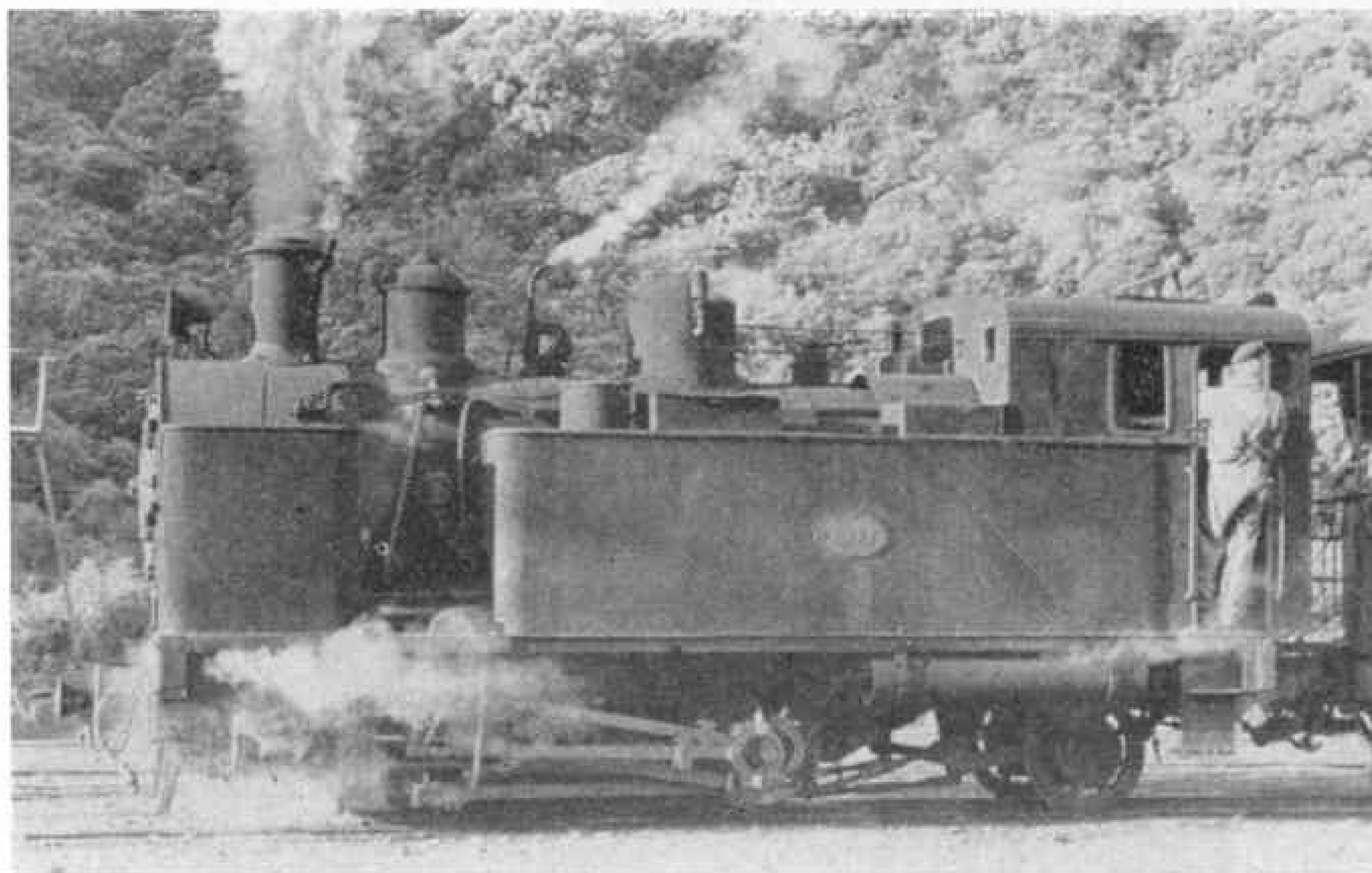
having vertical axles working in axle-boxes within the cross-frames. These are driven, through suitably massive gearing, by two cylinders of 12 in. diameter and 14 in. stroke, located near the base of the smoke-box. When in use, these horizontal driving-wheels are pressed hard against each side of the central rail, but they can be swung apart by means of controls in the cab when descending the Incline. During the descent, four cast-iron brake-shoes on each locomotive are applied, by means of screw hand-brakes, to the central rail in place of the horizontal driving-wheels. This is in addition to the usual Westinghouse brake system on the road wheels.

The generous-sized brake-shoes are also the main feature of the special brake-vans, which are so important a part of the Fell system of train operation, since control of the descent is dependent more upon the guards in the brake-vans than upon the engines' crews. The four brake-shoes per van are brought to bear on the central rail by levers reaching through the floor of the vehicle, and are applied by hand-wheel and screwed shaft in the usual

The train, brought up to Cross Creek from Masterton by steam locomotives—commonly double-headed by two "AB" class Pacifics—must be marshalled in the yard so that its weight is parcelled out among up to five Fell locomotives, each of which hauls its own section of train. Thus on the twelve-coach passenger train shown on the following page, a Fell is coupled behind each third coach along its length. A Fell engine heads the procession and an impressive array of three brake vans brings up the rear. In the original working instructions for the Incline, the individual engine load was fixed at 60 tons for passenger trains or 65 tons for goods.

With whistle signal blasts—shrill British railway whistles, unlike the American hooters on other N.Z.R. locomotives—the re-marshalled train moves out of the station. On the first curve, where the gradient begins gently, the horizontal driving-wheels of the first locomotive pass over the wedge-shaped leading end of the central rail and the speed now begins to drop until, by the time the last engine is on the gradient, the train has slowed to the required 6 m.p.h. for the climb. Now

follows forty minutes hard steaming up the three miles of curves round the mountain's flank, overlooking a



The Fell engines have small driving wheels, and the undergear consists of horizontally set wheels that grip the centre rail when ascending. Special brakes act on the rail during descents.

wild and desolate valley.

A heavy train ascending the Incline is a stirring sight indeed. Seldom is it possible to see—and

manner of hand brakes.

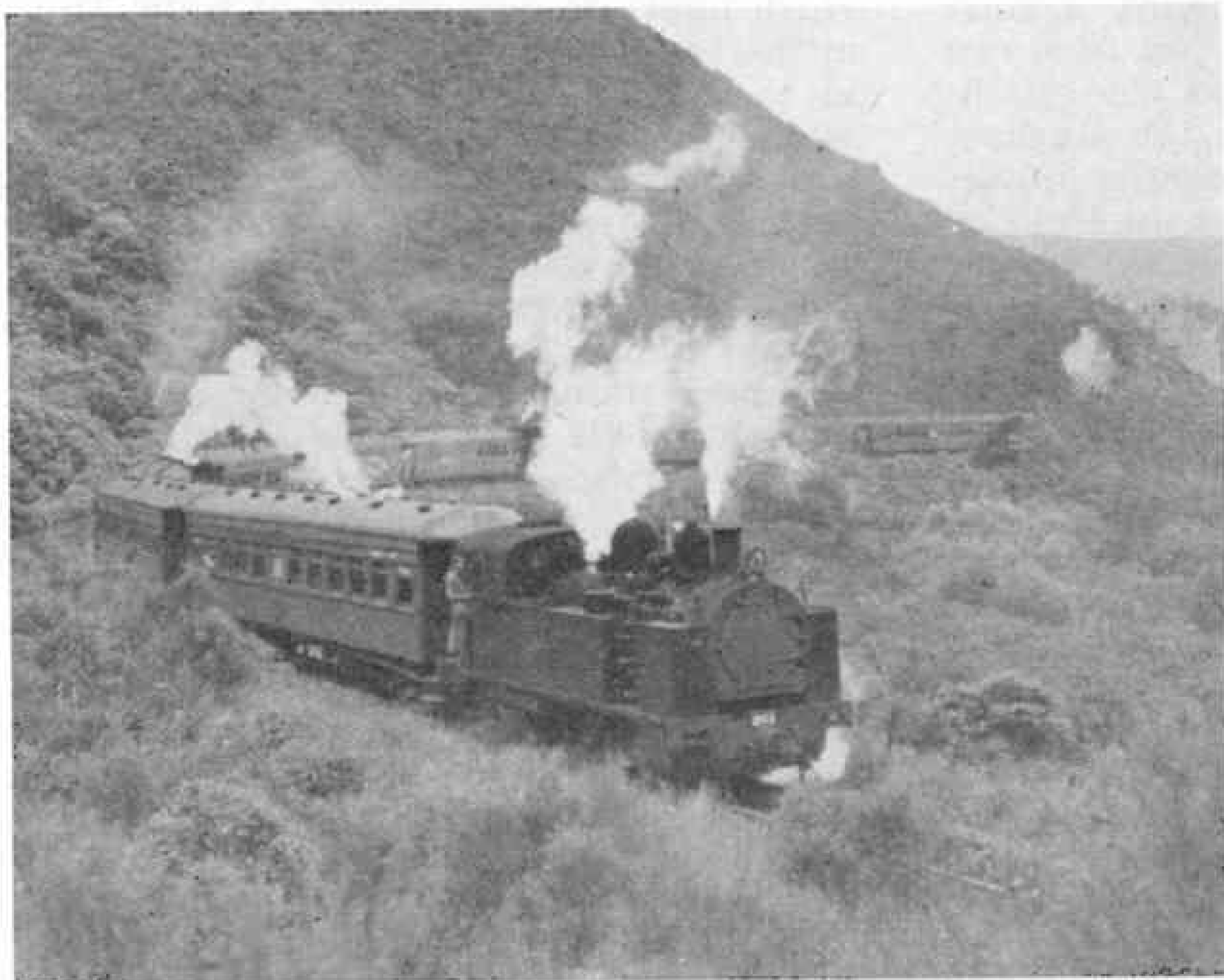
A set of brake-blocks seldom lasts more than one descent of the Incline with a heavy train. Working a train of 200 tons down from the summit requires two Fell locomotives and no less than five Fell brake-vans—three next to the locomotives, one at the rear and one in the middle of the train. The maximum permitted speed down the gradient is 10 m.p.h.

The really spectacular part, however, is the working of a train *up* the Incline.

hear—locomotives working so hard. The sharp beat of the exhaust from four Fells reverberates from the bush-clad slopes, and on a calm day the jets of smoke and steam are flung fifty feet in the air. Calm days in the Rimutakas are unfortunately rare and dangerously high winds are not unknown. Wind-breaks have had to be erected at one or two places along the line, and one curve near the summit, known by the appropriately ominous name of *Siberia*, was the scene

of the only serious accident in the line's history. There, in September, 1880, an early morning train from Cross Creek was caught by a terrific northerly gust, which snapped drawbars and chains and hurled

tedious length of the journey. New Zealand Railways therefore introduced in 1936 the first of their petrol-driven railcars of the Wairarapa class, specially for this line, and thereafter passenger trains using the Fell rail were run only on special excursions. Although the railcars can climb the steep Rimutaka gradient unaided, the Fell system has had its effect upon even their design, since



Climbing the Incline. The train of 12 coaches is being hauled by four Fell locomotives.

the raised central rail demanded an unusually high ground clearance for the chassis. This, besides marring their appearance a little, has also somewhat adversely affected their riding qualities.

The final approach to the problems set the Railways Department's engineers by the Rimutaka barrier was made in 1946, when work was begun on the new tunnel. Once the new line is in service the native bush will be allowed to grow back over the old lines and another brave experiment in railway operation will be only history.

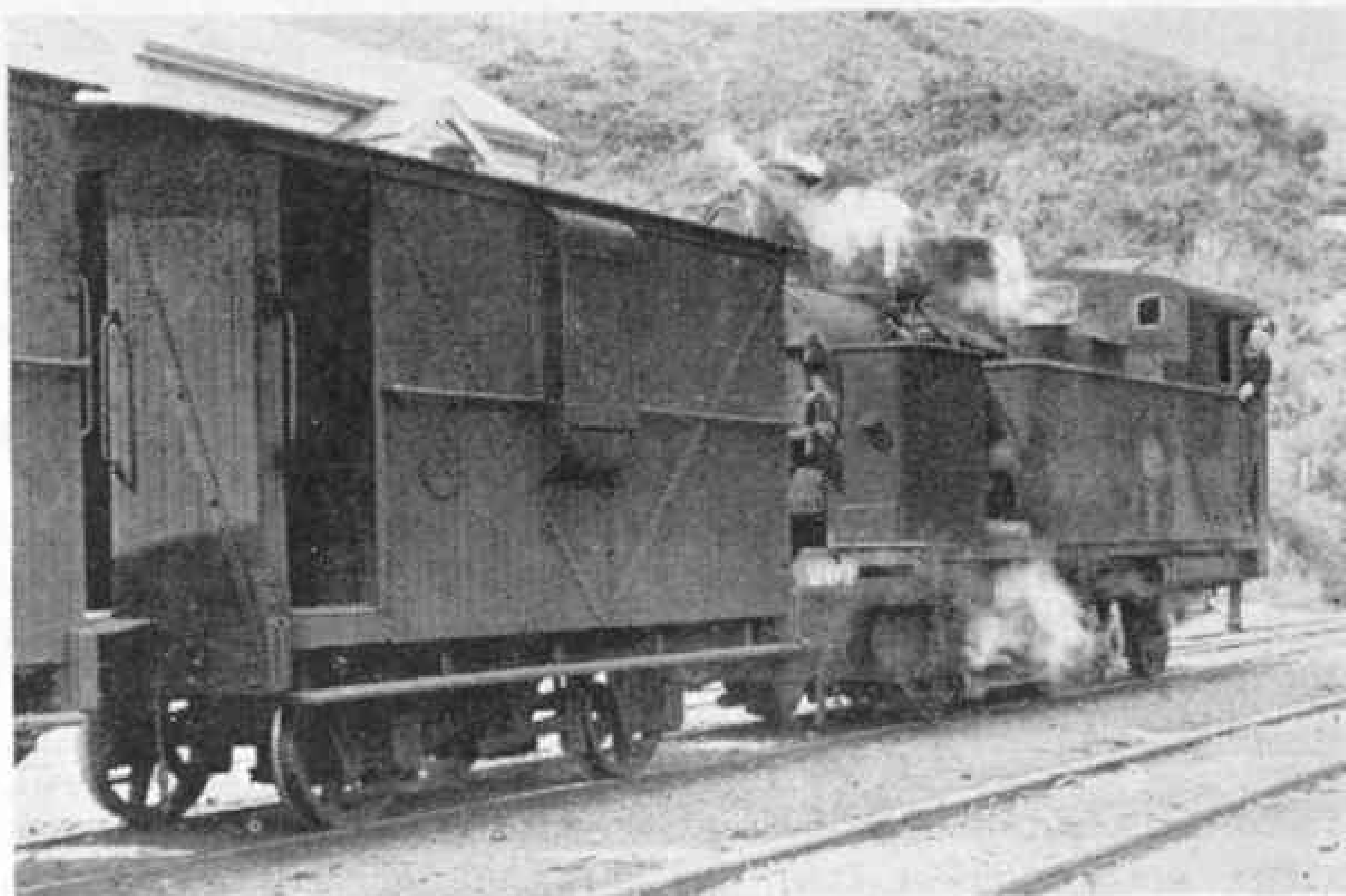
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Next month's M.M. will include an article on the new line and the Rimutaka Tunnel, the largest in the British Commonwealth.

goods vans and a carriage into the gully below, leaving only the locomotive and brake-vans on the track.

The central rail ends in a tunnel at the summit and train crews are given audible warning of its approach by a bell operated by the wheels of passing vehicles. Upon emerging from the tunnel the train enters Summit station yard, where the Fell engines are uncoupled and the train is again made up. Nowadays trains on the Hutt Valley section of this line are hauled to or from Wellington by 660 b.h.p. diesel electric locomotives.

With the time taken to climb the Incline plus at least fifteen minutes in either yard for marshalling, it will be realised that however much the regular traveller to the capital may have appreciated the engineering feat, or the spectacle of a train working the gradient, he soon came to deplore bitterly the



A Fell brake van, distinguished by its massive brake blocks.

You're a Walking Column of Water!

By Leslie E. Wells

YES, that means you, and me, and every living human being. The human body is fully three parts water. No wonder the scientists value the chemicals in the body of an ordinary person at less than ten shillings, for water is the commonest element of all, apart from air.

Fish are 80 per cent. water, and many fruits are 90 per cent. water. The orange in your hand is little more than a ball of water, and the hand holding it is much more water than it is anything else. Milk, which you are rightly told is very nutritious, is 80 per cent. water. Even a loaf of bread, which looks so solid, is half moisture. As butter is 75 per cent. water, spreading it on bread is very much like putting water on water.

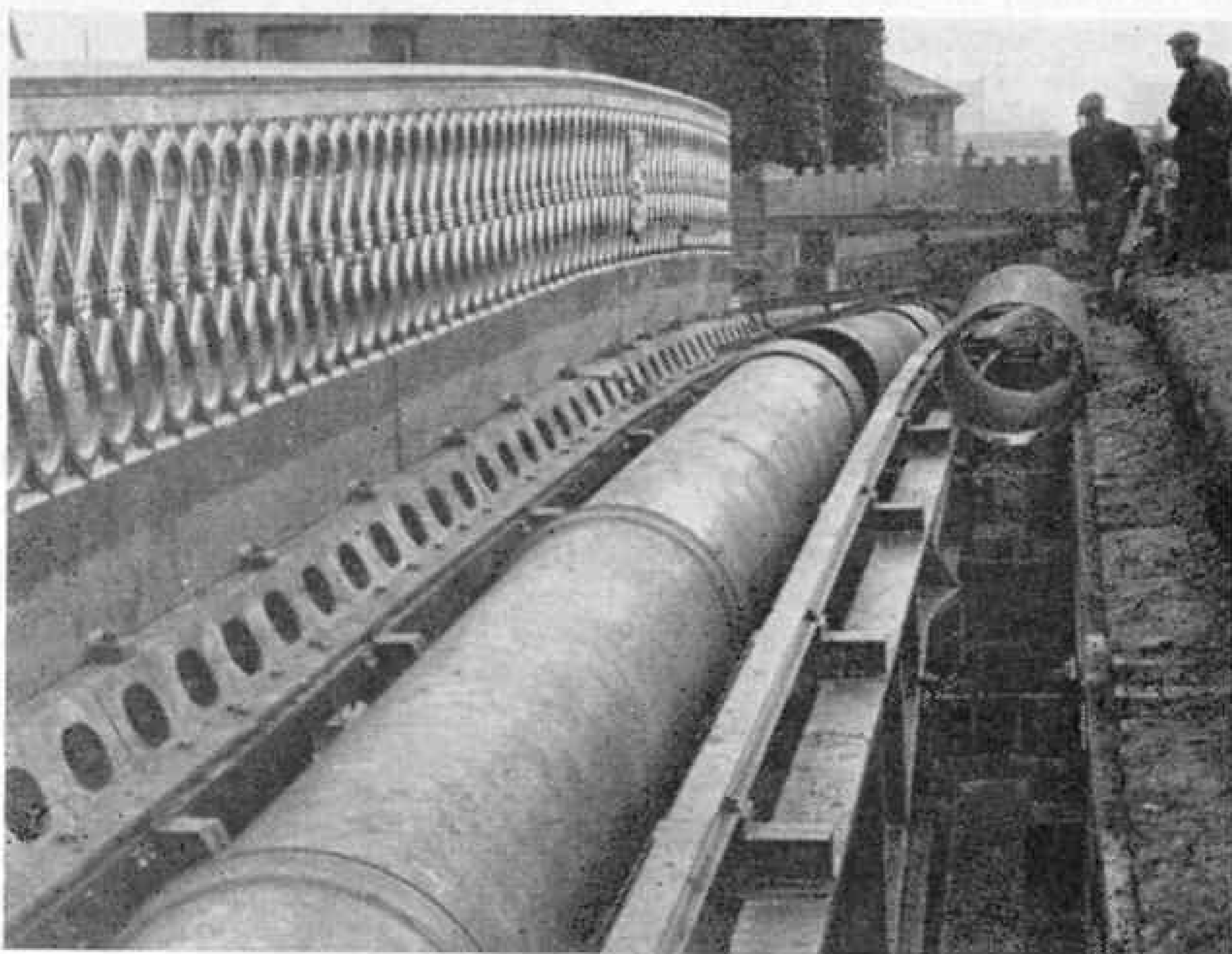
Yet, although your body contains so much water, it needs more, and plenty more. And not only on the back of the neck! The average human being drinks between three and four pints daily. He may disguise it as tea, cocoa, coffee or lemonade, but it is almost wholly water. For other purposes, however, he uses between 30 and 35 gallons a day.

The people of New York, Boston and Los Angeles apparently need far more than that, for on an average they use 100 gallons a day each. And the people of Chicago are even more lavish in their use of water; they get through 200 gallons per person per day.

The Londoner is a modest user of water, managing on some 35 gallons. But the population of the city is more than eight millions, and in addition to individuals using water, there are industries that need huge quantities of it. This is particularly true of soap and paper makers. Thus London needs more water than any other city in the world, and in 1954 Londoners got through no less than 480 million tons, or close on 110 thousand million gallons!

This means that a lot of people have done a lot of work and a lot of thinking about London's water supply. In fact, no less than 5,600 people are permanently doing something about the supply. They are employed by the Metropolitan Water Board, which is the largest supplier in the world.

We are very proud of that, but our



A 27 in. steel water main on a bridge across the Thames.

pride gets something of a knock when we learn that London's first reliable system of water supply was introduced by Peter Morrys, for he was a Dutchman. That was in 1582, when he fitted a pump by water wheels in the arches of the old London Bridge.

Morrays thought not only about his own generation, but also about those of his family who would come a long time after him, for he succeeded in getting the water lease from the city at 10 shillings a year. And the lease was for 500 years! That lease was sold to the Goldsmith's Company in 1701, and was bought by the New River Company in 1822. When that Company folded up, the Metropolitan Water Board took over, but it must still pay £3,750 each year to the London Bridge Waterworks, and it must go on paying until 2082, when the lease signed

by Peter Morrys at last expires.

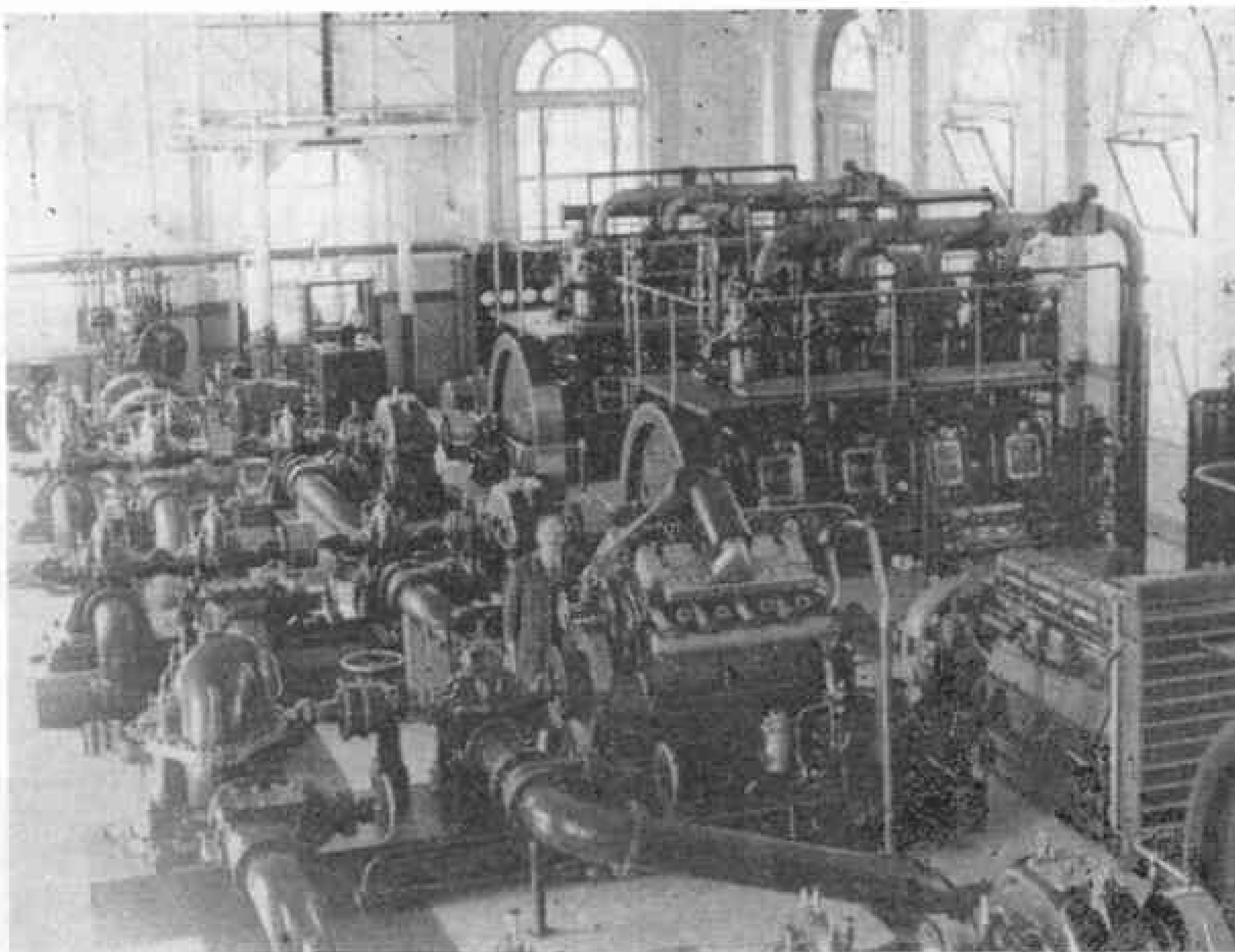
The pipes which feed London with water vary in diameter from three to forty-eight inches, and if they were placed end to end they would stretch in a curve over the Earth's surface from London to Shanghai!

The water pours into the mains from the huge reservoirs of the Thames and its tributary the Lee. Together they hold nearly 20 thousand million gallons of water, enough to flood the whole of London to a depth of 5 feet. The Queen Mary reservoir at Littleton alone holds sufficient water to supply London for 23 days, and on one filling it could supply the town of Winchester, in Hants, which has a population of nearly 25,000, for over twenty years. It is 723 acres in extent and its average depth is 28 feet, and the cost of building it was £2,000,000.

Drinking water has to be purified, and this is achieved by pumping it into huge storage tanks that contain layers of sand. The water sinks through the sand, leaving sediment behind it. Even then it may contain germs, and germs, which used to carry deadly plagues such as typhoid. So it is chlorinated to ensure that nothing harmful can get through to the taps.

The first filter beds to be erected in London were the work of James Simpson, who installed one in 1892 at

Water is freed from harmful germs by treating it with chlorine, and here is a Wallis and Tiernan chlorinator.

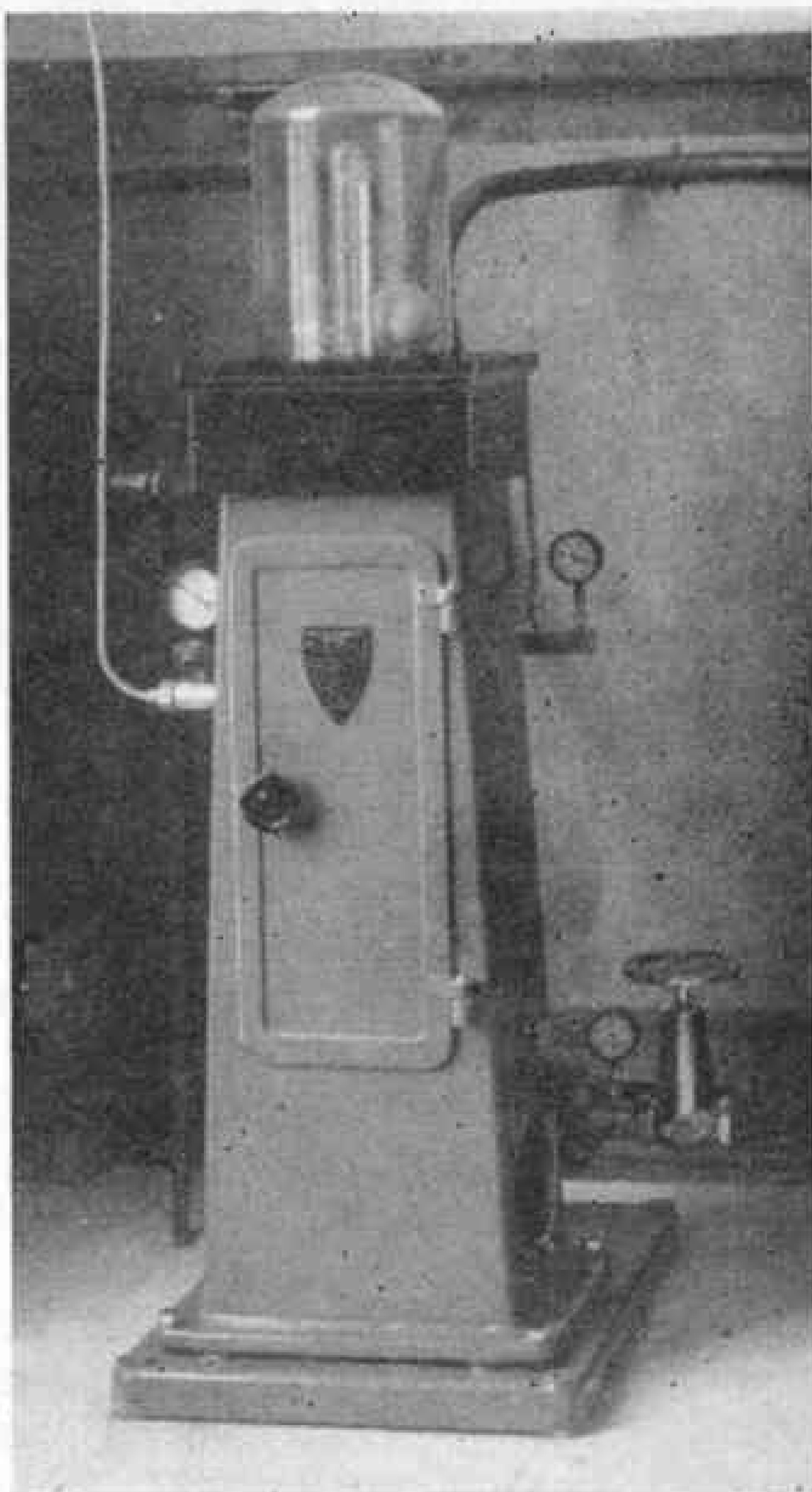


Water pumps driven by diesel power.

Chelsea. It speaks much for the excellence of his work that some of Simpson's filter beds are still in working order and continue to supply first-class wholesome water.

In spite of all the steps taken to ensure pure water, nothing is left to chance. Day by day throughout each year, a band of trained samplers collect water from the rivers, wells, reservoirs and mains. Thus the state of the water is known from its source to the tap of the housewife. Yet so cheap is the supply that the Londoner receives it at the rate of less than threepence per ton.

The samples are tested in laboratories, and any germs found are traced to their source and destroyed before they can cause the least harm. Of course, water is crammed with bacteria, those little creatures which can only be seen under the microscope. The bacteria brought to the laboratories of the London Metropolitan Water Board come in their millions and they are kept alive in incubators. Most of them are not harmful to the human being, but there are certainly plenty of them. In one year the bacteria kept in the incubators eat 1,200 pounds of meat, 180 pounds of peptone, 112 pounds of sugar, 48 pounds



of salt and 70 pounds of lactose or milk sugar.

There is so much gold in the sea that it has been said there is enough to make every person alive a millionaire. Indeed, it is estimated that there are 11 tons of gold to every cubic mile of sea water. The problem is to find a way to extract the precious metal from the water in such a way that it pays to do so. One American spent 3,000 dollars—over £1,000—extracting gold and silver from sea water. He got some all right, but only 25s. worth. Nevertheless, he stated that a cubic mile of sea water had in it gold worth 24 million pounds.

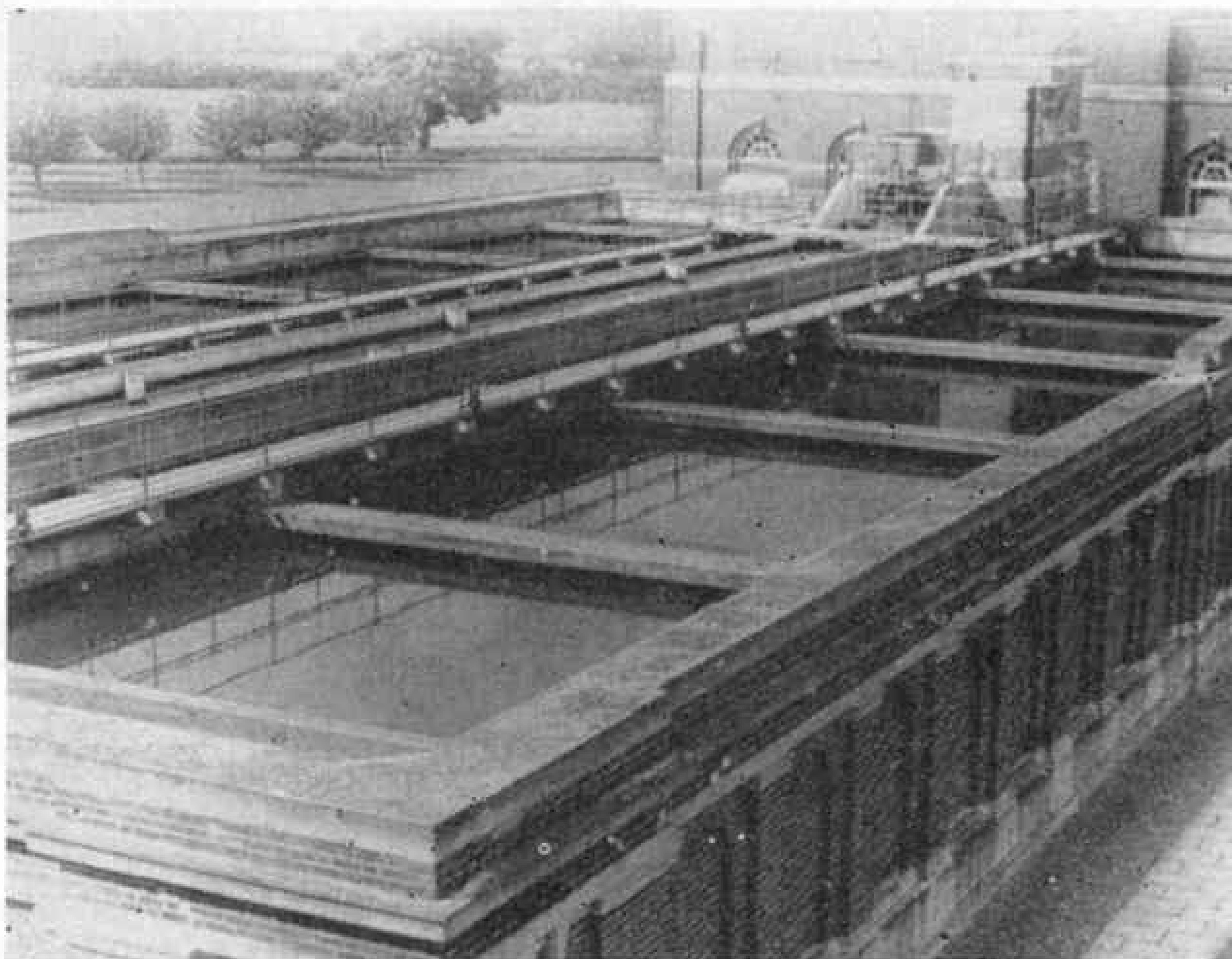
The sea also contains bromine, chlorine, potassium, sulphur, sodium, magnesium, calcium and oxygen, and every cubic mile of sea water contains about 160 million tons of chemicals.

The two most important things taken out of sea water are magnesium and bromine. Magnesium is the wonder metal used in the manufacture of aeroplanes, and is remarkable for its lightness.

Bromine is used in the manufacture of high-octane petrol. The Dow Chemical Company, in North Carolina, treats millions

of gallons of sea water daily to recover the bromine, and they handle ten thousand times more water than the chemical they seek.

Where did all this water come from in the first place? Well, according to the scientists, when the Earth was formed it was a flaming ball. As the surface cooled steam condensed in the cooler atmosphere, and then fell back to the Earth as water,



Primary water settling tanks.

forming seas, rivers and lakes.

That may be true. Whether or not, there is certainly a very large amount of water and every drop is a miracle.

Road and Track—(Continued from page 475)

able to operate at very high temperatures without fading, was a major factor in the 1953 victory of Jaguars and this year proved itself once again to be the best type of brake on the circuit, superior to both the Mercedes and Italian designs.

The basic principle of the disc brake is identical with that of the caliper type of brake used on sports bicycles. Hydraulic operation takes the place of cable, and friction pads working on a disc are used instead of brake blocks. Hydraulic pressure acting on pistons forces the friction pads against the exposed disc, revolving with the wheel.

The Le Mans Jaguars with servo motor assistance, are fitted with three pairs of pads per disc at the front and two per disc at the rear. The production brakes, such as are used on the Austin Healey 100 S, have one pair of pads per disc only. Without servo assistance a single pair of pads for each wheel can transmit all the pressure the average driver is capable of exerting on the brake pedal.

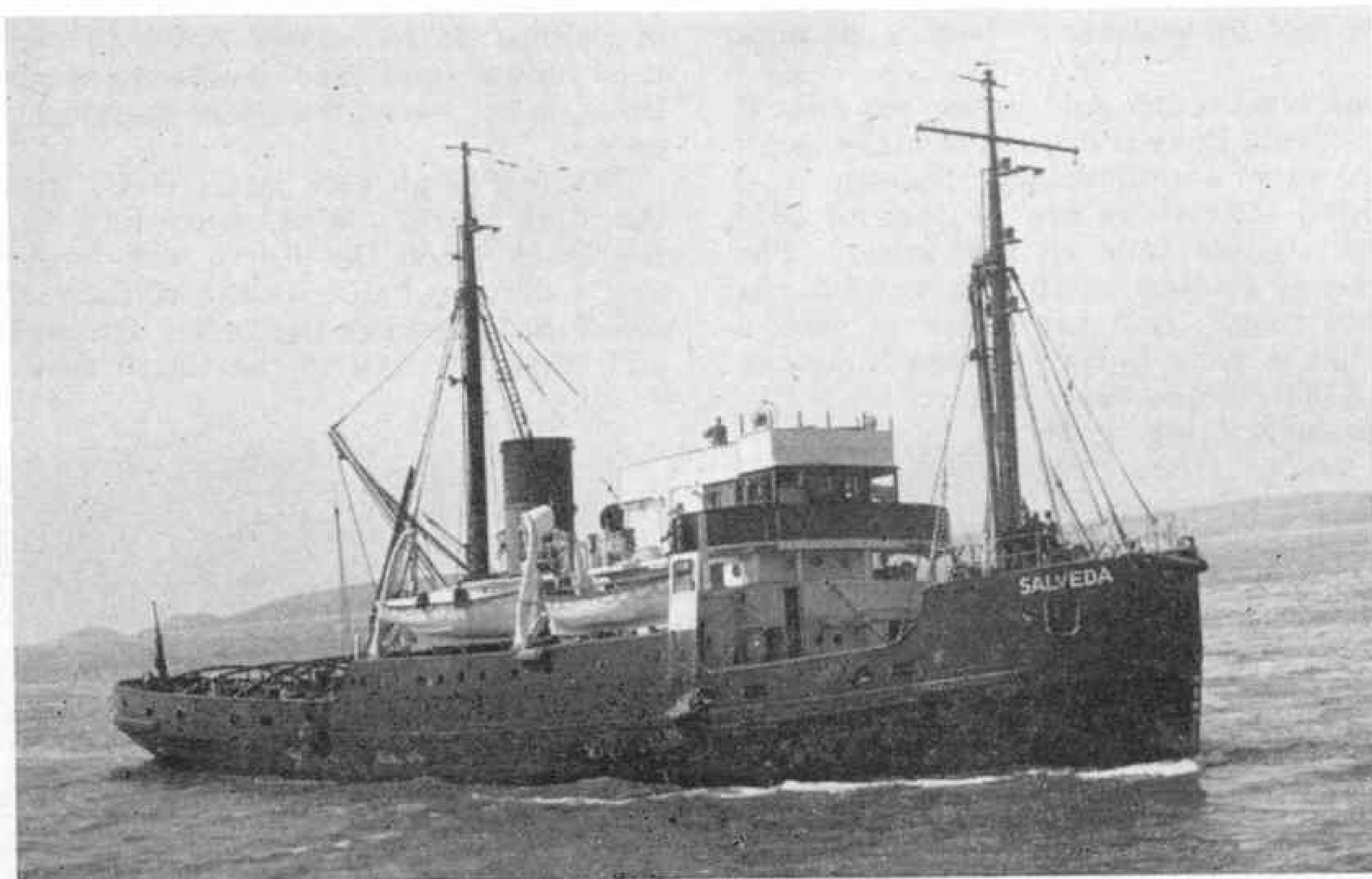
Freedom from fade is the secret of the disc brake success. Heat generated by use is not trapped inside a drum as with ordinary brakes, but is released from the two faces of the disc as it revolves in the airstream. Disc brakes are at present expensive to produce, but when one day they become standard on family cars

as well as high speeds sports machines, as they undoubtedly will, motor racing will have made yet another contribution to road safety.

The Canadair Story—(Continued from page 470)

for the R.C.A.F. Nobody yet knows what it will be, but the North American F-100 Super Sabre, Convair F-102 delta and Lockheed F-104 have all been mentioned. Any of them would be a logical choice. The F-100 would maintain the Company's present close liaison with North American. The F-102 was designed by a sister firm in the General Dynamics Group. The F-104 is not only a product of the original designers of the Silver Star, but is also reckoned to be the most advanced fighter in the world. Powered by a Wright-built Armstrong Siddeley Sapphire, it is a small "straightwing" aircraft, so secret that the U.S.A.F. have released no photographs, although it has been flying since February 1954.

Whichever is finally chosen, there is little doubt of the sort of armament it will carry, for Canadair have a very strong team of guided missile designers, whose first experimental rocket was launched in flight from a Sabre as long ago as August 1953. Two more certainties are that, coming from Canadair, it will be good and delivered ahead of schedule.



Salvage at Sea

The Ocean-Going Tug "Salveda"

By M. D. Hancock

THIS ocean-going tug was built by Cammell-Laird in 1943, and although owned by the Admiralty she is under charter to Metal Industries (Salvage) Ltd., Shandon, and has been for the past eight years. She has a gross tonnage of 782 tons and an overall length of 195 ft. During her eight years under the Company's management she has worked as far afield as Lisbon, Portugal's chief city and port, and in the north the wartime Naval Base of Scapa Flow is her periodic station. She is equipped as a foreign going vessel, and is capable of operations in any part of the world.

On one occasion *Salveda* took the s.s. *Lourenco Marques*, a vessel of 6,298 tons gross, in tow at Lisbon, and brought her safe and sound to Faslane Port, Dumbartonshire. Another long towage was that of the destroyer *Saumarez* from Gibraltar to Rosyth. Both these vessels were for breaking up, and as such were towing propositions and not salvage.

During August and September of 1954,

The picture at the head of the page shows the ocean-going tug "Salveda", which is fitted out for salvage work as well as for towing operations. This article tells the interesting story of a successful salvage effort in the Orkney Islands, in which she refloated a Grimsby trawler that had run aground after a fire had broken out on board. Photograph by courtesy of Metal Industries (Salvage) Ltd.

Salveda was stationed at her base in Scapa Flow, and it was on 1st September, a grey, misty morning, that she went to the aid of the stranded Grimsby trawler GY 1288 *Conway*, which had run aground after an outbreak of fire in her forecastle. The trawler was just leaving Kirkwall

quayside at about one o'clock that morning when, due to an accident, fire broke out in the hold and spread rapidly below the deck. *Conway* sounded her siren in successive blasts to raise the

alarm, and while out of control she made for the shallow water by the sea wall. Fortunately, the local fire brigade was soon on the scene, and water was pumped on board the vessel to extinguish the fire.

Salveda arrived from Scapa Flow to find the trawler high and dry in Kirkwall harbour, listing at an alarming angle. As the tide was on the ebb, there was no hope of an immediate refloating, and it was necessary to wait for high tide at 1.35 p.m. which would bring the first chance of pulling *Conway* clear. Meanwhile, the water

The "Salveda's" diver being prepared for his descent to examine the trawler for underwater damage.



that had been pumped on board to extinguish the blaze had now to be pumped out of the vessel before she could be refloated. For this purpose a portable pump carried as part of *Salveda's* working gear was placed on board.

The list diminished gradually as high tide drew near, until eventually the trawler's hull lifted gently from the sea bed and she floated clear. *Salveda* had run a tow line aboard during the morning's preparations and was in charge of operations from this point. With slow revolutions of her 1,200 h.p. oil burning engines she took the *Conway* in tow and within an hour both ships were securely tied alongside Kirkwall pier in readiness for a diver's inspection of the trawler's hull.

Although outwardly *Conway* seemed none the worse for her experience it was impossible to tell what damage, if any, she had sustained to her hull while running aground on Orkney's rock and shingle. It was for this reason a diver was sent below to confirm that the vessel was sound beneath the water line.

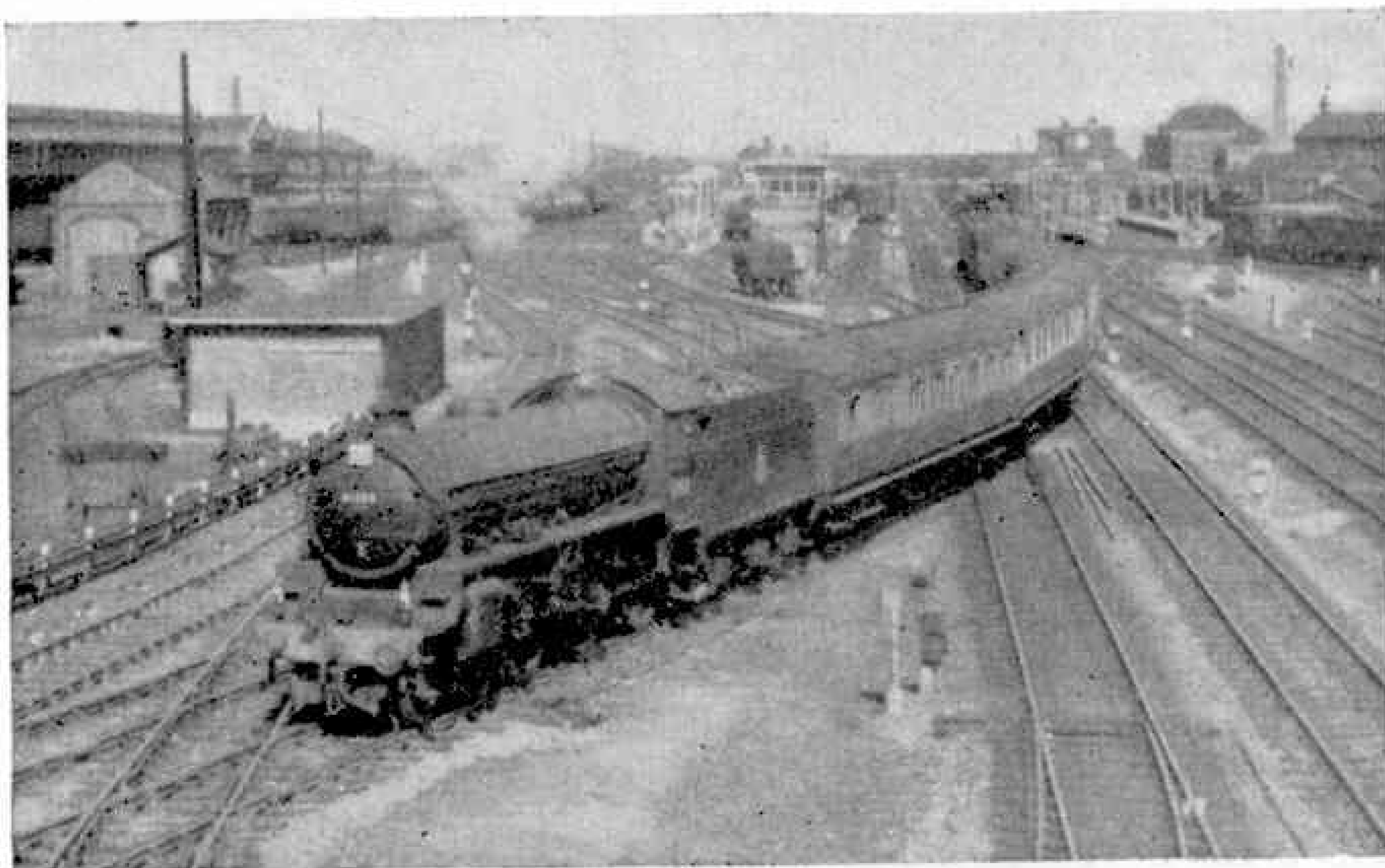
The diver, rigged for the job in his 17 lb. sea boots, leaden back and chest weights totalling 60 to 80 lbs., heavy

rubberised suit and diving helmet, prepared to make his descent. With his air supply regulated, the face plate was screwed home and he descended the ladder. He quickly disappeared into the water, with only a trail of bubbles to mark his path of inspection as *Salveda's* crew patiently awaited his re-appearance. Only a faint tapping noise could now be heard from the depths as his hammer sought out any leaking hull plates. Fortunately his search was in vain. The Grimsby trawler, apart from a burnt-out, smoke-blackened hold and gutted forecastle, was still a workable vessel and not a great deal of repair would be necessary to make her seaworthy and habitable once more.

Although interesting, this rescue operation was very mild compared to some that *Salveda* has undertaken in the past, and no doubt will have to undertake in the future. For those tasks to come let us wish her good fortune. Despite the rough work she carries out, there can be no denying she has a handsome look. She is designed to tow ships many times her own size, often through foaming tempestuous seas, in rain, gales and snow, risking not only her own loss but also that of the lives of all aboard her. It is to the work of such vessels as this and to the devotion of their crews that many seamen all over the world owe their lives.



The diver goes down.



A train for Sheffield gets smartly away from Doncaster behind B1 4-6-0 No. 61190.
Photographed by B. Mellis, Thorne.

Railway Notes

By R. A. H. Weight

Steam Locomotive Exhibition at Euston

I strongly advise readers who have the opportunity and whose interests lean towards the steam locomotive, past and present, to view the historical exhibition open until autumn daily in the fine Shareholders' Meeting Room at the top of the grand staircase leading up from the passenger hall at Euston. Admission charge is 1s., or 6d. for those under 14, and illustrated brochures are on sale.

There are splendid models, on some of which the wheels and motion move on pressing a button just as one sees when real locomotives are on a stationary testing plant, together with relics, paintings and drawings, illustrating in many cases the gay colours and beautiful lining-out that were the specialities of the old companies. As the steam era may soon be drawing to a close, it is fitting that this exhibition should in part be a retrospect of the work and lives of eight British outstanding and representative locomotive engineers, who played a leading part in shaping design and performance from earliest days to the present time. They are Robert Stephenson, John Ramsbottom, Edward Fletcher, Patrick Stirling, S. W. Johnson, Dugald Drummond, G. J. Churchward and Sir Nigel Gresley.

An absolutely up-to-date large exhibit is a full scale mock-up of the cab of B.R. class 8 4-6-2 No. 71000 *Duke of Gloucester*. Visitors can board the footplate, see all the polished controls and have them explained by a driver. There is a clever representation of a brightly burning fire, and through the driver's window is visible a film showing a stretch of main line as seen by the crew at night. There is also a moving panorama of historic and later locomotive pictures depicting many types and classes.

"Cornish Riviera" Speed Exploits

Before the introduction of the 4-hr. accelerated Paddington-Plymouth timing this summer for a distance of almost 226 miles, which usually includes a stop at Newton Abbot for another engine to assist over the severe gradients around Totnes and Brent, very fast trial runs were made in both directions. No. 6013 *King Henry VIII* was driven hard, passing Exeter, 173½ miles, in record time of 159½ min., gaining

8 min. on a very sharp booking. Maximum speed was 84 m.p.h. and there was some remarkable hill climbing.

Later with the same 14-coach load as far as Heywood Road, Westbury, where two were slipped, the visiting L.M.R. 4-6-2 No. 46237 *City of Bristol* also gained considerably to Exeter, although there were three permanent way repair slowings, and reached Newton Abbot before time, averaging over 60 m.p.h. from Paddington as on the previous run mentioned. *Treago Castle* was coupled in front of the big Pacific as pilot on to Plymouth.

East Anglian Express Travels

I enjoyed a round trip from Liverpool Street to Yarmouth, Lowestoft and back by the *Easterling*.

This very comfortable restaurant car summer express makes by far the longest regular runs without stop on the Great Eastern section, E.R. It runs each way over the 109½ miles between London and Beccles, the latter being a Suffolk junction, in rather charming surroundings, where the two-coach Lowestoft portion divides from, or is attached to, the main Yarmouth train.

The nine coaches, weighing about 320 tons in all, were taken without a stop in each direction and without a signal delay, though there were a few slacks on account of track repair or drainage work, by reboilered and clean green B17 3-cyl. 4-6-0 No. 61669 *Barnsley*, of Ipswich shed, which depot also provided the two keen footplate crews respectively taking charge of the down and up runs. Arrival at Beccles was 2 min. before time; the maximum speed was 70 m.p.h. and a good average was maintained over a rather hard route with many changes of gradient and climbs. The 10.30 semi-fast train from Liverpool Street to Norwich headed by 4-6-2 *Thomas Hardy* was passed at Ipswich just about punctually. At the smartly modernised South Town Station, Yarmouth, where we arrived as booked in 2 hrs. 35 min. from Liverpool Street, rebuilt ex-G.E.R. 4-4-0 No. 62546 *Claud Hamilton* waited with the connecting local to Lowestoft via the coast through Gorleston.

There were a good many once Great Eastern Railway locomotives still active in their native haunts, as well as Gresley L.N.E.R. big K3 2-6-0s and J39 0-6-0s along the route with, of course, later B1 4-6-0s and Britannias south of Ipswich, on Norwich services.

My friend and I started back from Lowestoft in the two-coach London portion hauled by an F5 2-4-2T bunker first, carrying express head code (two white discs over buffers!). *Barnsley* complete with *Easterling* headboard came into Beccles from Yarmouth, uncoupled to attach our two corridors in front and soon we were off, "London only," in the evening sunshine.

The schedule is slightly easier southbound, as there are other trains closely ahead in places. These were running to time, however, and we glided to a stand at Liverpool Street just before our booked arrival time of 10.0 p.m. in No. 12 platform, which we had left nearly 11 hrs. previously. From Mondays to Fridays cheap half-day excursion tickets are available by this fast service during the holiday season. A fine all-the-year express which we saw is the *East Anglian* composed of rather special coaching stock on the London-Norwich run.

The South Wales Pullman approaching Reading on its first down trip, behind 4-6-0 No. 5016 Montgomery Castle. Photograph by M. W. Earley, Reading.



More Diesel-Electric Trains

Further plans for diesel or diesel-electric running are in hand. The extension of the Liverpool Street-Shenfield electric passenger services employing overhead traction to Chelmsford and Southend-on-Sea is due to be completed by the end of 1956. It will form the basis

for further electrification along the Eastern Region main line to Ipswich, the Clacton-on-Sea branch and perhaps other routes in Essex.

Lightweight diesel-electric local trains have become a regular feature of the Watford-St. Albans branch line in Hertfordshire, L.M.R. providing more trains daily in an accelerated journey time of 15 minutes. During trials last year, passengers on that busy section were unanimous in their opinion that these diesel units provided smoother travel combined with the more comfortable seating of an entirely modern vehicle.

Stainless Steel on the "Ulster Express"

The *Ulster Express* conveying passengers to and from Belfast via Heysham Harbour, thence to Euston and back via Morecambe, Lancaster, Preston and Crewe, has provided something new in rail express travel this summer, as it has included in its formation a stainless steel first-class coach equipped with corridor compartments and also an open saloon in which the seats are pivoted, so that they can be turned if desired to form groups of four. They have footrests and are adjustable for reclining in a style familiar on the North American Continent. Decoration of this experimental and attractive vehicle includes mushroom-coloured walls, white metal mural pictures of country scenes, and fluorescent lighting.

New Standard Locomotives on the Southern

British Railways' standard tender engines are much in evidence by now in the London, Surrey and Kent areas, as 10 class 5 4-6-0 mixed traffic locomotives built at Derby, numbered 73080-9, have been allocated to the shed at Stewarts Lane,

Battersea. They are working on boat expresses between London, Victoria, and Dover or Folkestone as they come into regular service, as well as to Margate, Ramsgate and elsewhere.

Ten class 4 slightly smaller Mogul or 2-6-0 engines numbered 76053-62, from Doncaster Works, have been coming into S.R. service at Redhill and taking up duty on Reading trains, the one through daily steam business service from Reading, Guildford and Reigate to London Bridge and back. They are also running to Brighton, Tonbridge and occasionally Hastings, as they are just within gauge for the narrow tunnels of the Tunbridge Wells route.

"Piggy-Back" Flatcars in U.S.A.

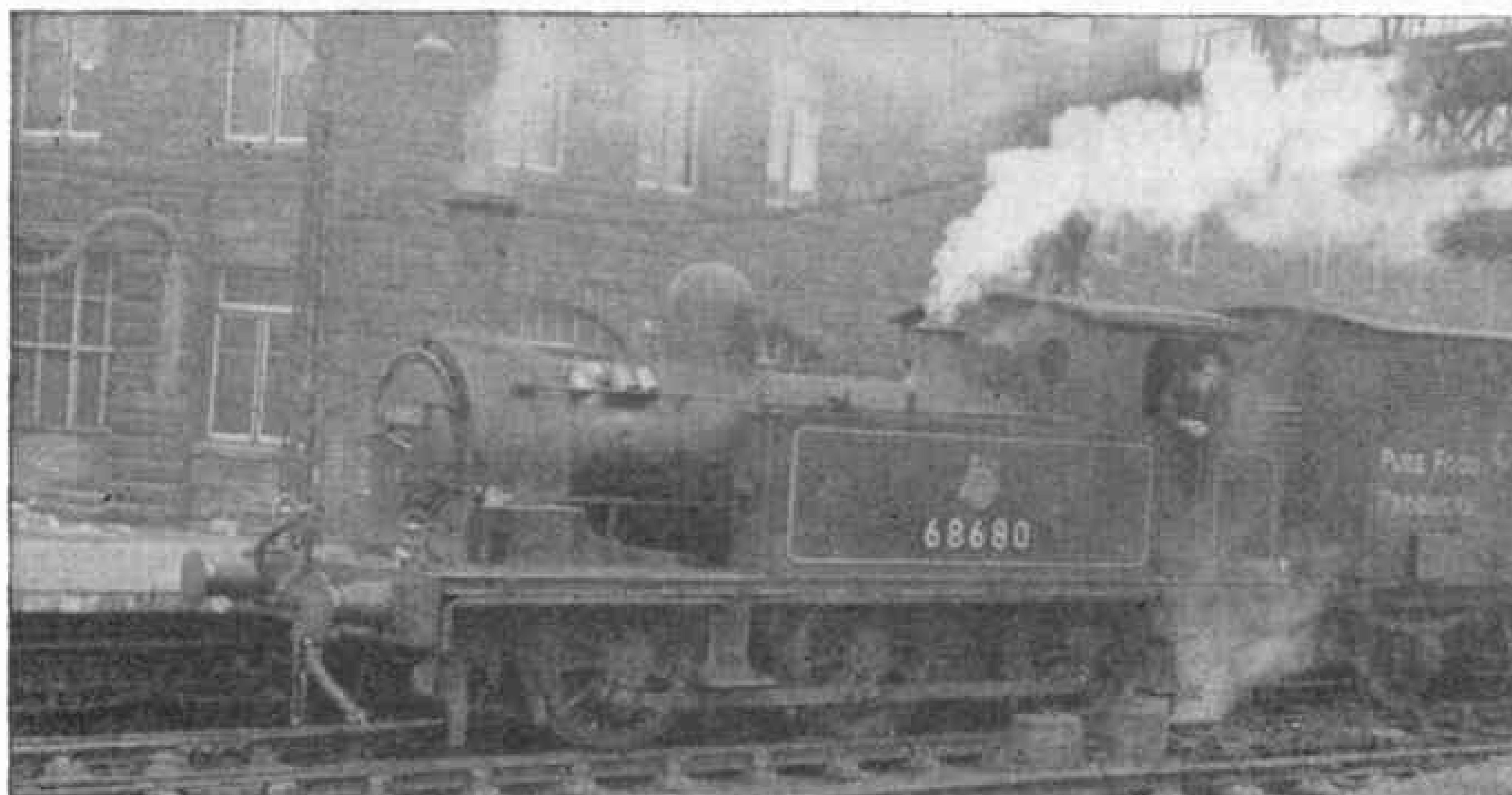
The Illinois Central Railroad announces the success of its loaded truck flatcar service. This is a development of the container idea much in use here, whereby packed loads of various kinds can be loaded or unloaded to and from road lorries and flat railway wagons.

This company applies the term "piggy-back" to three main types of trailer freight car operation. A complete freight consignment can be transferred straight to road and hauled to final destination mechanically. Tank wagons containing milk or other liquids are seen in Britain equipped for travel on flat wagons and also on roads.

More Modernisation Plans

Better passenger and freight accommodation, improved locomotive and carriage stabling or cleaning facilities, which also tend to facilitate increased speeds and safety, are the objects of further constructional schemes now in course of preparation or development.

There are rebuilding or modernisation plans for Plymouth, North Road; Peterborough, North; Manchester, Victoria; Barrow, Central; Cannon Street, London; Colchester; Chichester; Weymouth; Edinburgh, Waverley; and other important passenger stations, in some cases in conjunction with modern colour light signalling.



A neat North Eastern shunting tank on station pilot duties at Newcastle Central. Photographed by C. Lawson Kerr, Glasgow.

The Eighth Moth

By John W. R. Taylor

FEW aircraft still flying have had a longer or more exciting life than G-EBLV, the de Havilland Moth lightplane illustrated on this page. Its story began in 1924, when all kinds of freak aircraft were being produced in Britain because it was believed that the only way to make flying popular and cheap was by building simple glider-like monoplanes, powered by converted motor-cycle engines.

Captain (now Sir) Geoffrey de Havilland thought differently. He designed a sturdy two-seat biplane and asked his old friend Frank Halford, who died only a few months ago, to produce a small but powerful engine for it. The result was the 70 h.p. four-cylinder Cirrus, built mostly from parts of the larger Airdisco engine.

The new biplane was named the Moth, and, on 22nd February 1925, Capt. de Havilland took the prototype (G-EBKT) into the air for the first time from Stag Lane Aerodrome, Edgware. Nothing like it had ever been seen before. Costing only £595, its wings folded so that it could be towed behind a motor car and kept in a garage. Yet it was tremendously strong and so docile that almost anyone could fly it.

The Air Ministry chose Moths to equip the first State-subsidised flying clubs, and other orders began to flood in to the still small de Havilland company from embryo clubs and private fliers all over the world. The eighth machine off the line was G-EBLV, painted royal blue with silver wings for the Lancashire Aero Club.

It was delivered by Mr. (now Sir) Alan Cobham on 29th August, 1925; and he was only one of several famous airmen who flew it in the next ten years. For example, in 1928 the fine little Australian long-distance pilot Bert Hinkler gave an aerobatic display in "LV" at Blackpool.

But there were spills as well as thrills. Not long before Hinkler's display "LV" was crash-landed and overturned during a flight over the Pennines in bad weather. Eight years later, after a succession of private owners, it was collected from the top of a tree near Christchurch and repaired by Dick Shuttleworth, founder of the well-known historical aircraft collection.

It was bought from him for £185 by John Jefferson, who kept it in the same field as a herd of cows. They were reasonably co-operative, needing only a



A recent picture of G-EBLV, the eighth de Havilland Moth, built in 1925.

couple of circuits to drive them into a corner, except on one occasion when the only course was to land the Moth amongst them, over a five foot hedge. Afterwards, Mr. Jefferson discovered that it had come to rest only 50 yards from the hedge.

It was about that time that de Havillands began enquiring into the fate of the original Moth, G-EBKT, in the hope of being able to preserve it. Unfortunately, it had recently crashed, and parts of it had, in fact, been used to revive "LV" after its latest mishap. In its place, Mr. Jefferson offered G-EBLV to the company for the sum he had paid for it, provided they also sent £25 to the R.A.F. Benevolent Fund as a light-hearted fine for having failed to save the historic "KT".

The fine was paid, and after the war "LV" was restored to an airworthy condition by lads of the de Havilland Technical School. Today it appears regularly at important flying displays.

MECCANO MAGAZINE

Junior Section

HERE on the right is Banbury Cross, but not the one renowned in the nursery rhyme. That was pulled down more than 350 years ago, and the cross that those who pass through Banbury now see was not built until 1859, so that it is only 96 years old. An effort seems to have been made to give it an ancient appearance, for it was designed in the Gothic style of the famous Eleanor Crosses; but I have now learned that the people of Banbury do not very much like it, and that a scheme is on foot for replacing it by a new one, presumably more worthy of its historic associations.

A Proficiency Award

Every year Shell Tankers Ltd. award a prize of a sextant to their most efficient deck apprentice, the award being based on the results of Merchant Navy Training Board examinations and reports from the masters of the tankers in which the candidates gain practical experience. On the left the 1954 winner of the sextant is



Banbury Cross, with St. Mary's Parish Church behind it.
Photograph by Reece Winstone.

seen receiving his prize. He is George Bell, whose home is at Woolston, Southampton. He was selected for the award from 300 serving apprentices in the Shell tanker fleet.

After training at King Edward VII Nautical College, with a further month at the Outward Bound Sea School, Aberdovey, George Bell joined the 28,000 ton tanker *Capsa* in 1951 and in her and similar vessels he has already made voyages to the Middle East, Singapore, the United States and South America.

THE EDITOR



A Shell Tankers Ltd. deck apprentice receives the 1954 prize for proficiency.

Easy Model-Building

Spanner's Special Section for Juniors

AT the time I am writing this the weather is so hot and sunny it seems hard to realise that before so very long now the light evenings will be getting shorter and colder and the attractions of model-building and other indoor activities will have much greater appeal than they do at present for most of us. So I am planning ahead, and I have designed two small and simple models that will serve to occupy your last hour or so before bedtime during the shorter Autumn evenings.

The first of these is a simple See-Saw specially intended for my youngest readers, and which can be built from Outfit No. 00. The other is a little more advanced and is an amusing model of a Knife Grinder designed for Outfit No. 2. No doubt some of you will have seen one of these knife grinders at work, although there are not so many of them now as there used to be.

I will start with the See-Saw. You can begin assembly of this model by taking a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate and bolting to

it two Trunnions 1 to make the centre support. Now fix a Fishplate 2 tightly to each Trunnion as shown, taking care to pass the bolts through the slotted holes of the Fishplates. Move each Fishplate upward as far as possible before you tighten the bolt that holds it in place.

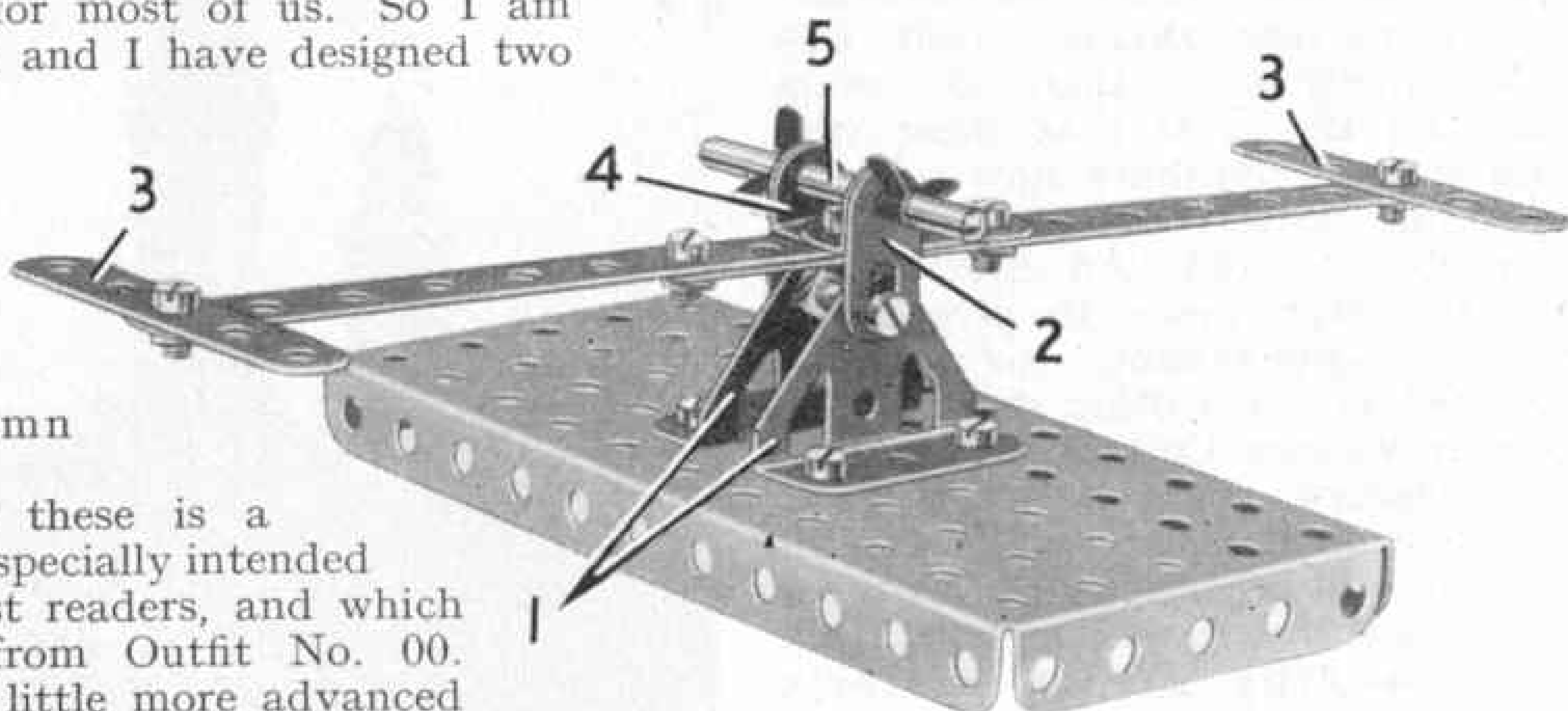


Fig. 1. A simple See-Saw built from Outfit No. 00.

Now take two $5\frac{1}{2}"$ Strips and place them together so that five of the holes in them overlap. Bolt the Strips together in this position, and at each end fix a $2\frac{1}{2}"$ Strip 3 to form a seat or saddle.

Now make the pivot for the See-Saw by fixing two Angle Brackets 4 to the middle of the overlapped $5\frac{1}{2}"$ Strips. Place the Angle Brackets together with their slotted holes overlapped, then pass a bolt through these holes and through the $5\frac{1}{2}"$ Strips. Now push a 2" Rod 5 through the Angle Brackets and the Fishplates 2 and use Spring Clips to hold the Rod in place.

To build the See-Saw you will need only the following parts: 2 of No. 2; 2 of No. 5; 2 of No. 10; 2 of No. 12; 1 of No. 17; 2 of No. 35; 11 of No. 37a; 11 of No. 37b; 2 of No. 38; 1 of No. 52; 2 of No. 126.

In building the Knife Grinder shown in Figs. 3 and 4 begin by making the base. The top of this is a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate. To each side of this bolt a $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate, and then strengthen the lower edges of the Flexible Plates with $5\frac{1}{2}"$ Strips.

The grinding stone is represented by a Road Wheel, and you should fix this on a $3\frac{1}{2}"$ Rod. Mount the Rod in two $2\frac{1}{2}" \times \frac{1}{2}"$

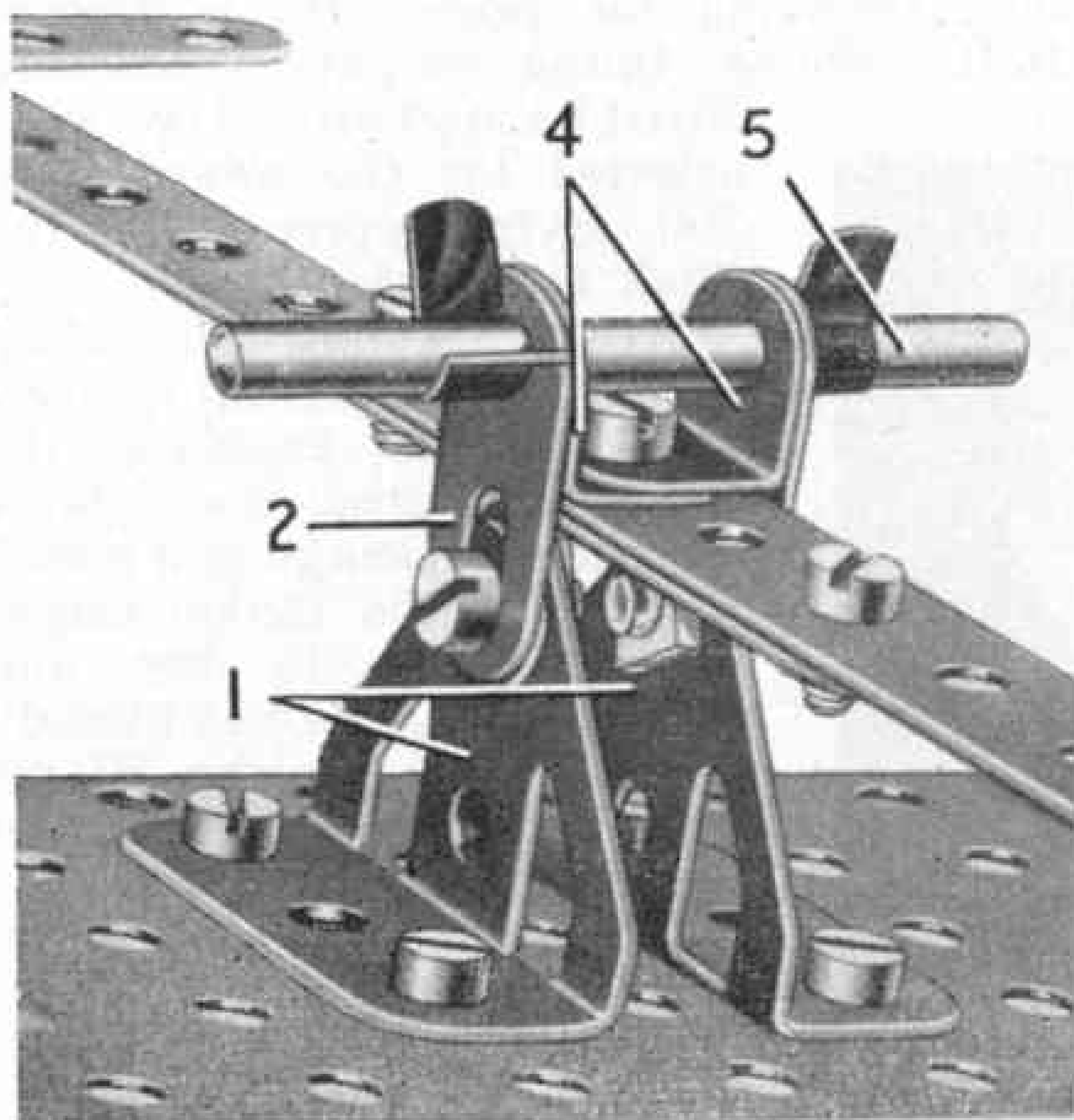


Fig. 2. How the See-Saw is mounted.

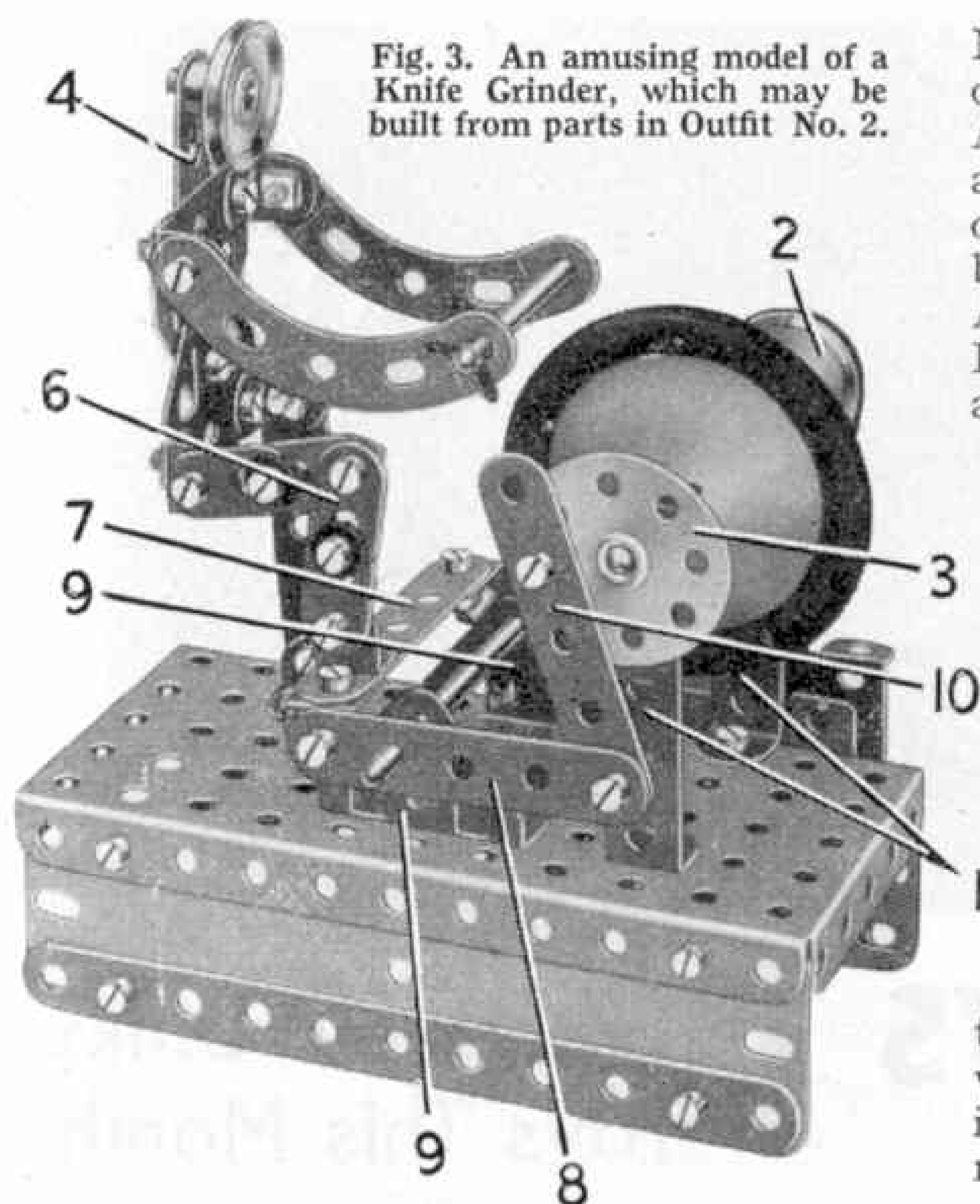


Fig. 3. An amusing model of a Knife Grinder, which may be built from parts in Outfit No. 2.

Double Angle Strips 1 bolted to the base, and fix on it a 1" Pulley 2. Now bolt a *Magic* Clockwork Motor to one side of the base (see Fig. No. 4), and loop a 6" Driving Band over the Motor pulley and the Pulley 2. Now fix a Bush Wheel 3 on the opposite end of the $3\frac{1}{2}$ " Rod to the Pulley 2.

You can make the body of the knife grinder by overlapping the pointed ends of two Flat Trunnions by two holes and bolting them together, using the same bolts to attach a $2\frac{1}{2}$ " Strip 4. Then fix two Angle Brackets to each Flat Trunnion as shown, and to the upper pair of Angle Brackets bolt two $2\frac{1}{2}$ " Stepped Curved Strips. Fix a 2" Rod in the Curved Strips with Spring Clips, to represent the knife. For the man's head use a 1" Pulley, and fix it on a $\frac{3}{8}$ " Bolt passed through the top hole in the Strip 4.

One of his legs is a $2\frac{1}{2}$ " Strip, and you should bolt this tightly to one of the lower Angle Brackets. Pivot the lower end of this Strip freely on a bolt 5, passed through the Strip and an Angle Bracket bolted to the base. The bolt is fitted with two nuts screwed tightly against each other. For the other leg 6 use four Fishplates. Bolt these tightly together as shown in picture

No. 3, and fix them to the second one of the lower pair of Angle Brackets. Attach the leg by a lock-nutted bolt to an Angle Bracket bolted to the foot bar of the treadle mechanism. For the foot-bar use a $2\frac{1}{2}$ " Strip 7, and attach it to two Angle Brackets fixed to further $2\frac{1}{2}$ " Strips 8. Pass a $3\frac{1}{2}$ " Rod through the Strips 8 and also through two Trunnions 9 bolted to the base. Now take another $2\frac{1}{2}$ " Strip 10 and pivot it at one end on a lock-nutted bolt passed through one of the Strips 8. To complete the model mount the other end of Strip 10 freely on a bolt fixed by two nuts in a hole in the Bush Wheel 3.

When the *Magic* Clockwork Motor is set working the knife-grinder rocks to and fro realistically, and at each forward movement brings the "knife" against the rim of the Road Wheel that represents the grindstone. At the same time his foot moves up and down with the treadle to give the impression that he is actually working the machine. For the best results it is essential to make sure that each moving part is pivoted freely.

The parts used in making the model Knife Grinder are: 2 of No. 2; 6 of No. 5; 4 of No. 10; 8 of No. 12; 2 of No. 16; 1 of No. 17; 2 of No. 22; 1 of No. 24; 4 of No. 35; 43 of No. 37a; 37 of No. 37b; 2 of No. 38; 2 of No. 48a; 1 of No. 52; 2 of No. 90a; 2 of No. 111c; 2 of No. 126; 2 of No. 126a; 1 of No. 187; 2 of No. 189; 1 *Magic* Clockwork Motor.

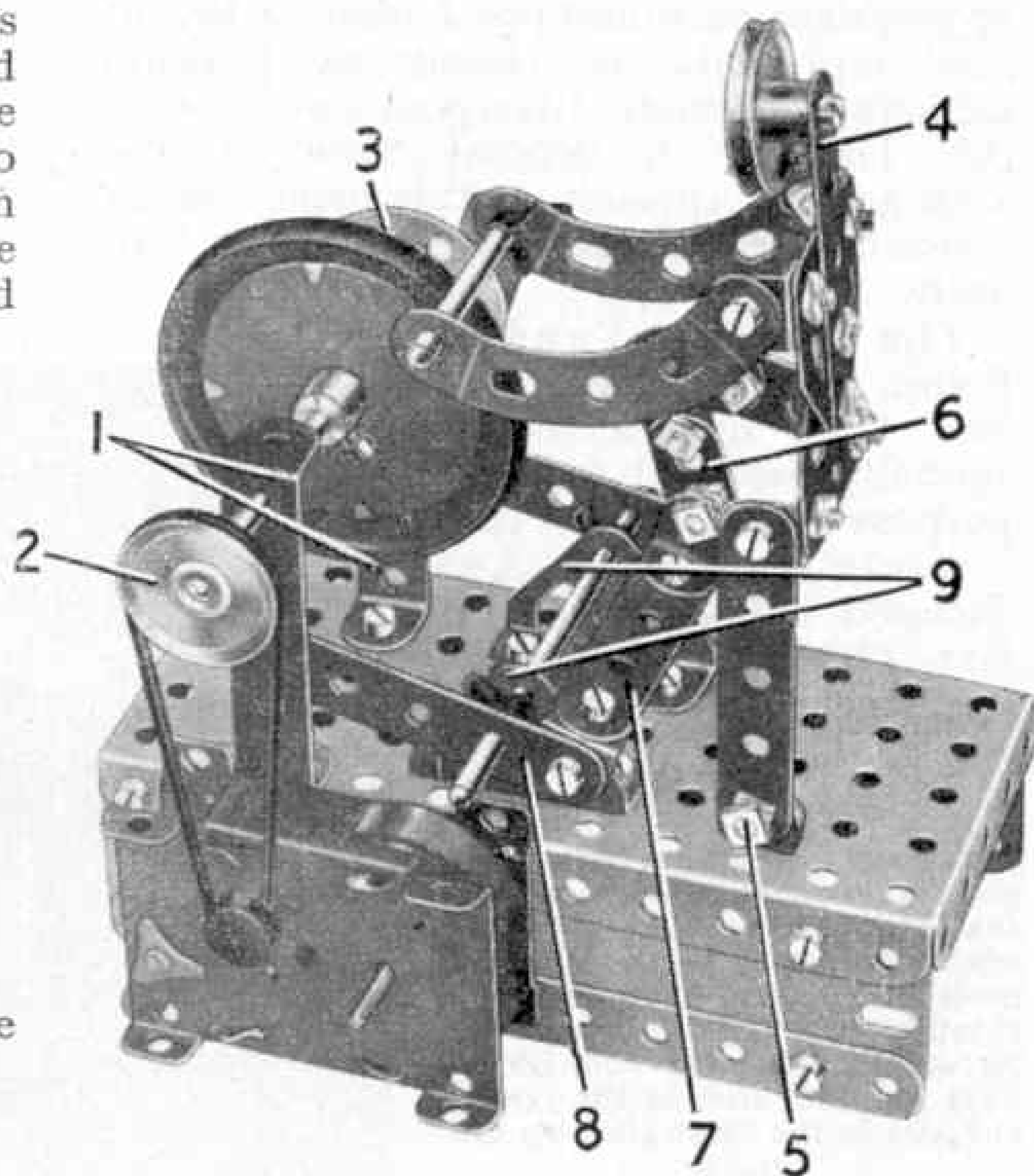
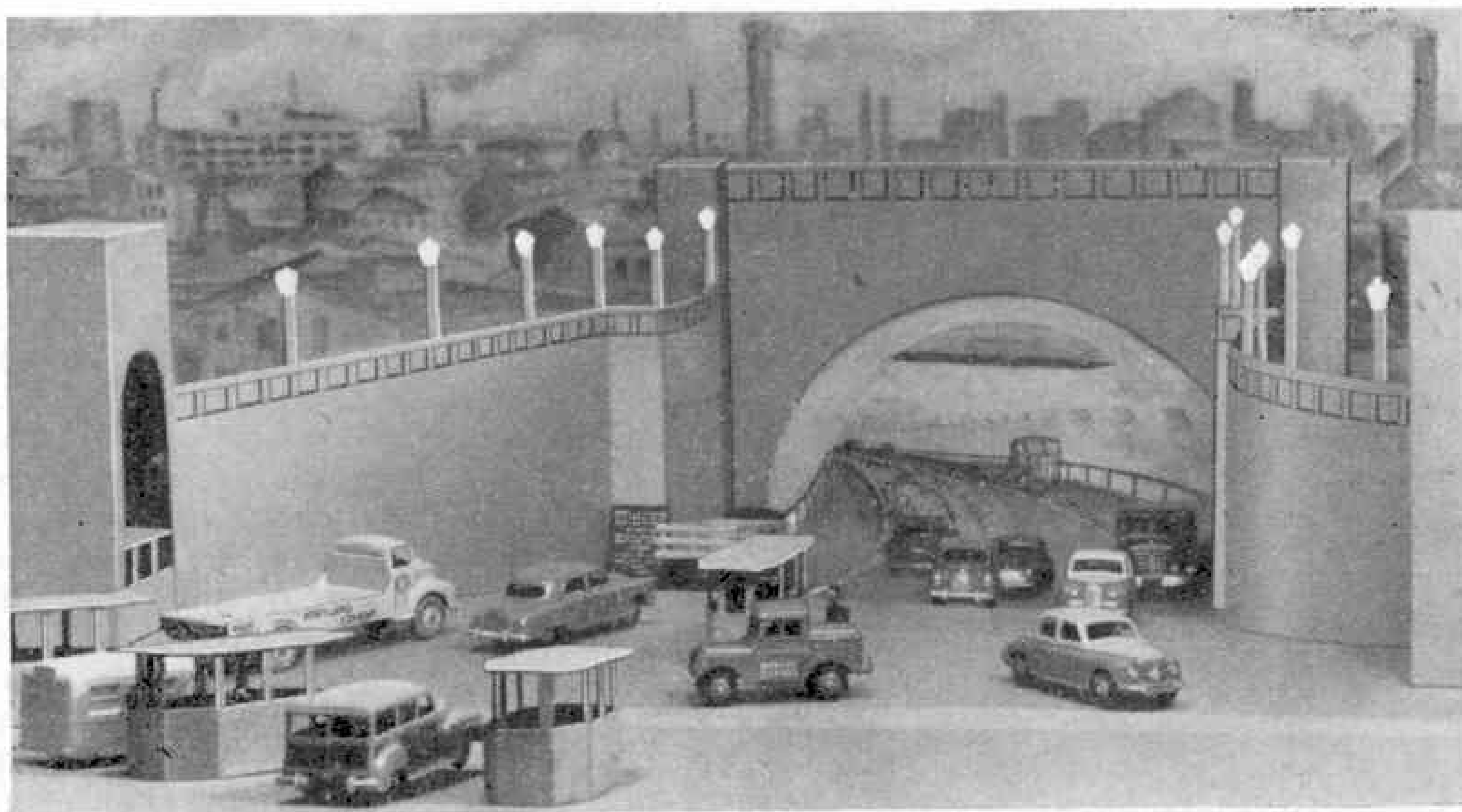


Fig. 4. The other side of the Knife Grinder showing how the *Magic* Motor is fitted.



DINKY NEWS

By **THE TOYMAN**

Three New Dinky Toys This Month

THOSE of you who have been fortunate enough to travel through Queensway, the famous road tunnel under the Mersey, will probably have seen the red vans used by the Tunnel Police for patrolling its 2.13 miles of roadway.

The first of the three new Dinky Toys I have to deal with this month is based on one of these Police Vans, and to show it in appropriate surroundings I made a layout that represents, as closely as I could manage, the main Liverpool entrance to the Tunnel. A general view of the arrangement appears on this page, and in a second picture is a close-up of the Van itself.

The Mersey Tunnel Police Van, Dinky Toys No. 255, has a body specially designed for the purpose for which the vehicle is used. An enclosed cab is provided for the driver and passenger, and behind this

is a low van body in which are carried tools and other special equipment. The words *Mersey Tunnel* appear in yellow on each door. The model is finished in red, with silver radiator grille, headlamps and bumper, and a towing hook is provided, for the real Van can be used to tow out of the Tunnel any vehicle that has broken down.

You may think that to make a realistic model of the Tunnel entrance such as that shown in my picture is beyond your possibilities, but I can assure you that its construction was really quite simple. It is of course not usually practicable to construct the tunnel itself, but the entrance

The upper picture on this page gives a good impression of the realistic appearance of the miniature Mersey Tunnel entrance made as a setting for one of this month's new Dinky Toys—the Mersey Tunnel Police Van, Dinky Toys No. 255, seen in the centre and also in the illustration on the right.



This view of the new 5.5 Medium Gun, Dinky Toys No. 692, gives a good idea of the realism and the amount of detail included in this splendid model.



can be modelled quite easily in a comparatively small space. It is in fact an ideal way of filling in an awkward corner in a larger layout, with the tunnel mouth placed in the corner and the approach leading into a road that sweeps round the corner.

The tunnel mouth and the approach walls are made from cardboard, as also are the small huts and the arches at the ends of the walls. The huts represent the actual ticket offices, at which the Tunnel tolls are collected. The uniformed figures in the Dinky Toys Station Staff Set can be put in them to collect tolls from tunnel users!

This construction of the tunnel mouth is quite easy, but calls for a little care if a really good effect is to be obtained. Actually my "tunnel" has no depth at all; it looks good in the picture, but is simply a drawing on paper, suitably coloured to represent the tunnel curving into the distance and then pasted behind the cut-out tunnel mouth. A remarkably realistic appearance can be obtained with very little trouble, and the effect can be heightened by drawing cars and lorries in the traffic lanes as though they are actually driving through the tunnel.

I am sure every Dinky Toys enthusiast will be eager to add the realistic Mersey

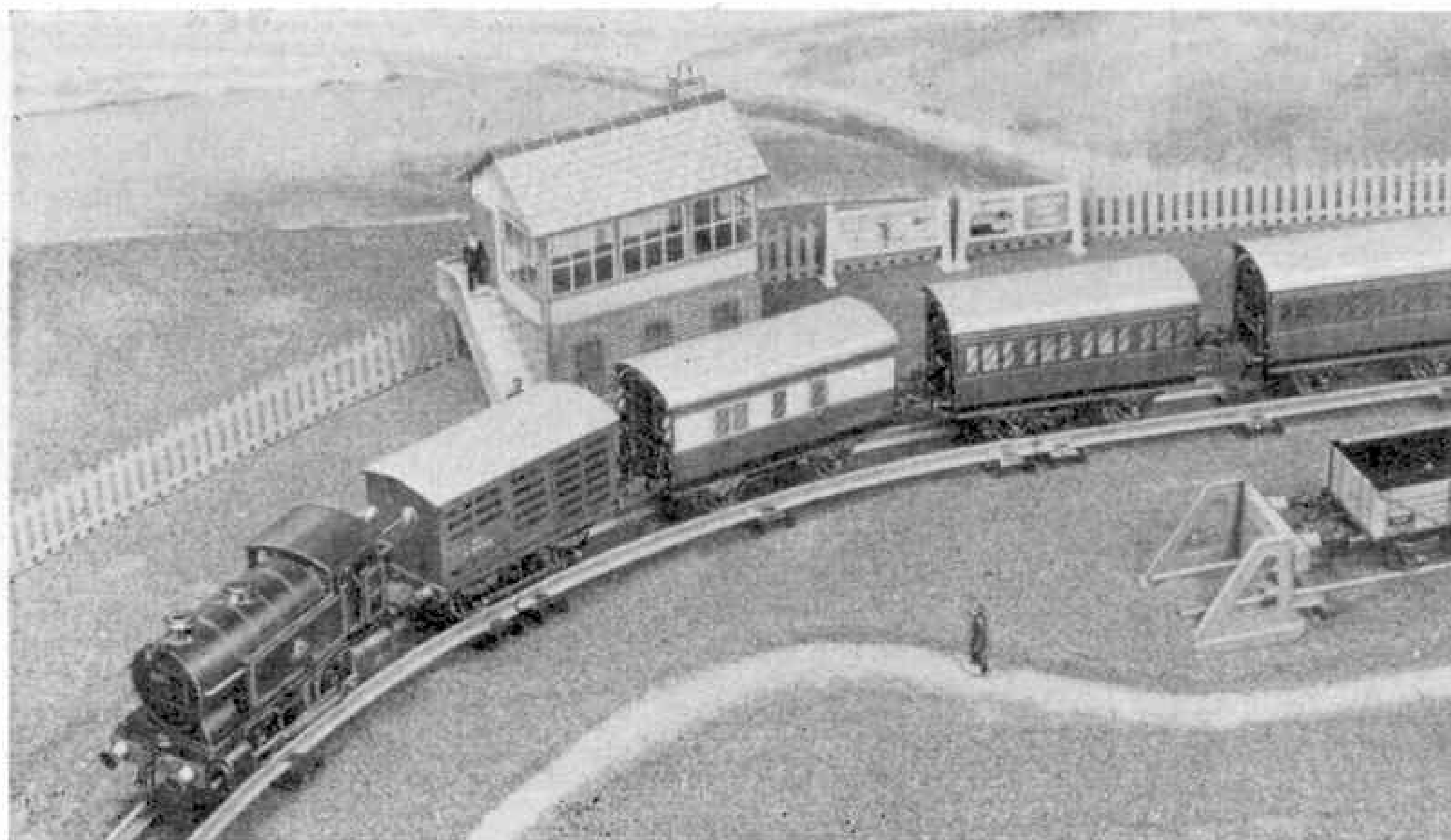
Tunnel Police Van to his collection, and I hope my efforts in making the layout illustrated will spur you on to try a similar scheme yourself. I can assure you it is great fun and I shall be interested to hear how you get on.

Now for news of another addition to the Army series. No miniature army is complete without artillery, and now a splendid model of a 5.5 Medium Gun, Dinky Toys No. 692, has been introduced. This is a really attractive miniature full of detail, and in my picture on this page it is shown being towed behind a 10-ton Army Truck. The gun barrel can be depressed or elevated just like the real thing. The pivoted towing and stabilizing bars are brought together for towing purposes and attached to the hook at the rear of the towing vehicle. When the firing point is reached the gun is detached and the bars opened out fanwise to form stabilisers.

Yet another new Dinky Toy for your collection is the fine van seen in the lower illustration on this page. This is Dinky Toys No. 481, a reproduction of a Bedford 10 cwt., lettered *Ovaltine* and *Ovaltine Biscuits*. It is in the correct colours too, in real Dinky Toys fashion.



An old favourite in a new guise. The Dinky Toys Bedford 10 cwt. Van is now available in a new colour scheme, with *Ovaltine* transfers.



Rail-Road Working

By Tommy Dodd

I HAVE a feeling that some of you younger Hornby railwaymen sometimes miss a lot of fun that you might otherwise have, simply because you do not always realise fully how the different pieces of your equipment can be used together. Not all of you have the opportunity of watching constantly the different activities that make up railway work. So I am going to talk about some of the things that you may be missing, and suggest how similar operations can be carried out in miniature to provide a great deal of fun and interest.

Most of you will be familiar with the miniature Containers that are included in the Hornby System, at least from the catalogue illustrations showing the useful Hornby Flat Truck carrying a separate van-like body. The special point about the containers is that they can be carried by rail and road vehicles. They can therefore be loaded with goods at a manufacturer's works, and reach the railway either by means of a private siding or on a lorry. At the other end of a long rail journey comes the transfer to a road lorry for final delivery right to the warehouse or shop where the goods are required. This is a lot easier, quicker and safer than transferring the goods themselves package by package from rail to road or vice-versa.

Milk and parcels are ahead of the passengers in the make up of the Hornby train seen in the picture at the top of this page. The signalman watches the train round the bend.

Now all this can easily be done on a Hornby Gauge 0 railway. The factory or shop may exist only in imagination, but the miniature Container is readily loaded on to a Hornby Flat Truck by means of the Goods Yard Crane, which has a good high lift. Lifting chains are fitted to the top of the Container and the Crane operator will find it quite a fascinating business to manage things so that the Container is planted fairly and squarely on the wagon.

Although the Container is normally boxed with rubber bands securing it to the wagon, there is no need to retain these in traffic. The Container cannot slide off the Flat Truck, the shallow sides of which prevent it from moving about to any great extent, but those of you who, quite rightly, like to carry out things in style can easily lash the Container down to the four rings that are fitted for such purposes to the sides of the Flat Truck. Meccano Cord or something similar is quite good for this purpose, but don't tie yourself in knots doing this. Nimble fingers and a little patience will work wonders. Don't forget that the Container has to be moved on to a road lorry at the other end of the run! When this point is reached the Crane is called upon again. The best road vehicle for our purpose is the Guy Flat Truck,

Dinky Toys No 432. The Container rests nicely on the deck up against the bulkhead and its end overhangs the tail of the wagon by a very small amount, just as some of the real containers do on their lorries. No securing is really necessary on this part of the journey, but the Dinky Toys "driver" must take the vehicle along at an easy speed and avoid any abrupt cornering.

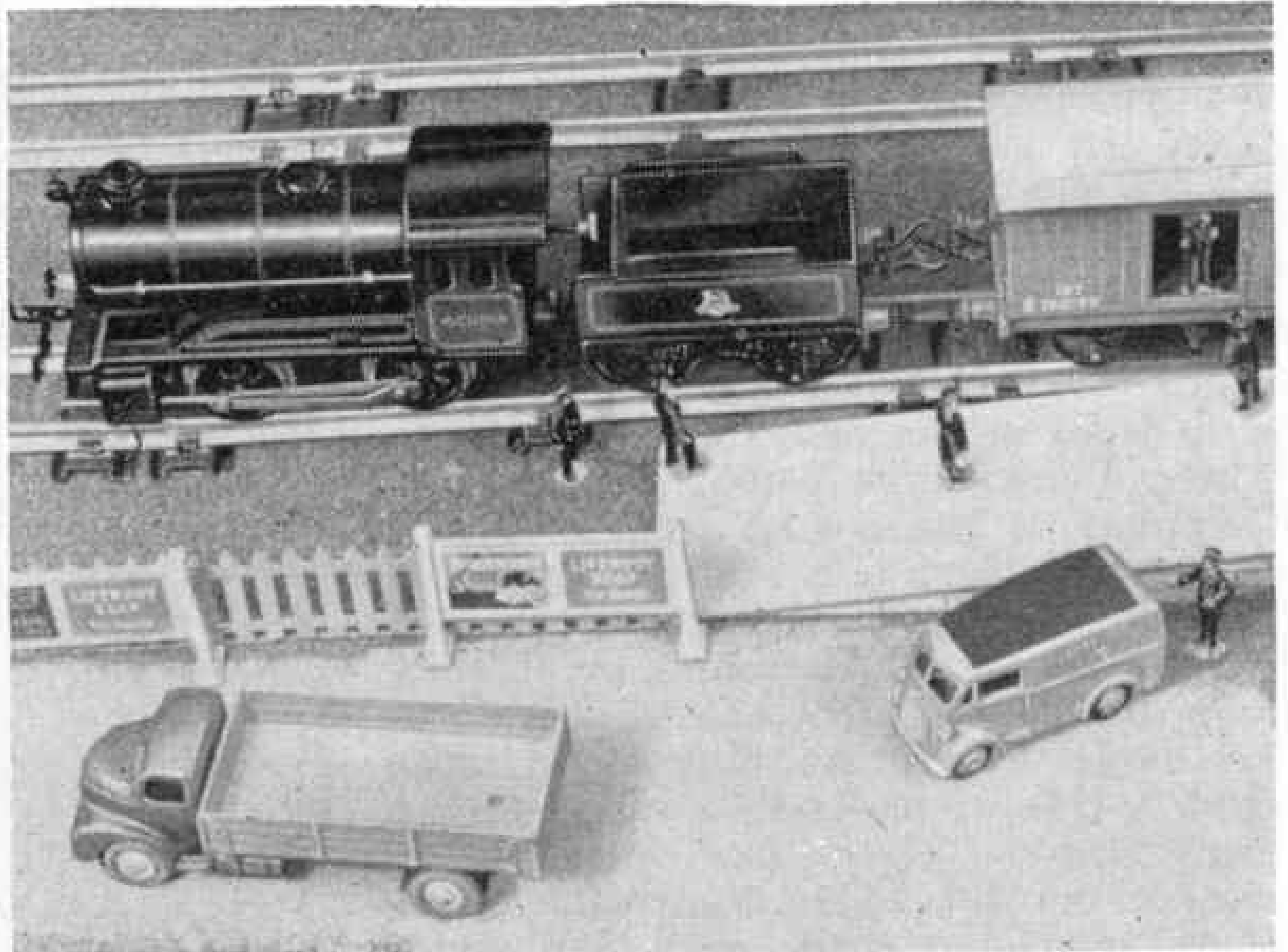
The Flat Truck for Container traffic is finished in the Bauxite red shade

Her Majesty's Mails are brought to the waiting train at the Hornby Station by the Dinky Toys G.P.O. Van.

that distinguishes B.R. wagons fitted with vacuum brakes. It can therefore be attached to a passenger train, as might be necessary if the contents of the Container are supposed to be urgently required. Alternatively, those who like to make a feature of Container traffic on their Hornby layouts can assemble a complete train of them to run as an important "fitted freight".

There is plenty more scope on a Hornby layout for rail-road working. The Hornby Milk Van is provided with several cans when you buy it, and additional cans can be obtained if you want them. Their transfer from road to rail adds to the fun of station or goods platform working. A

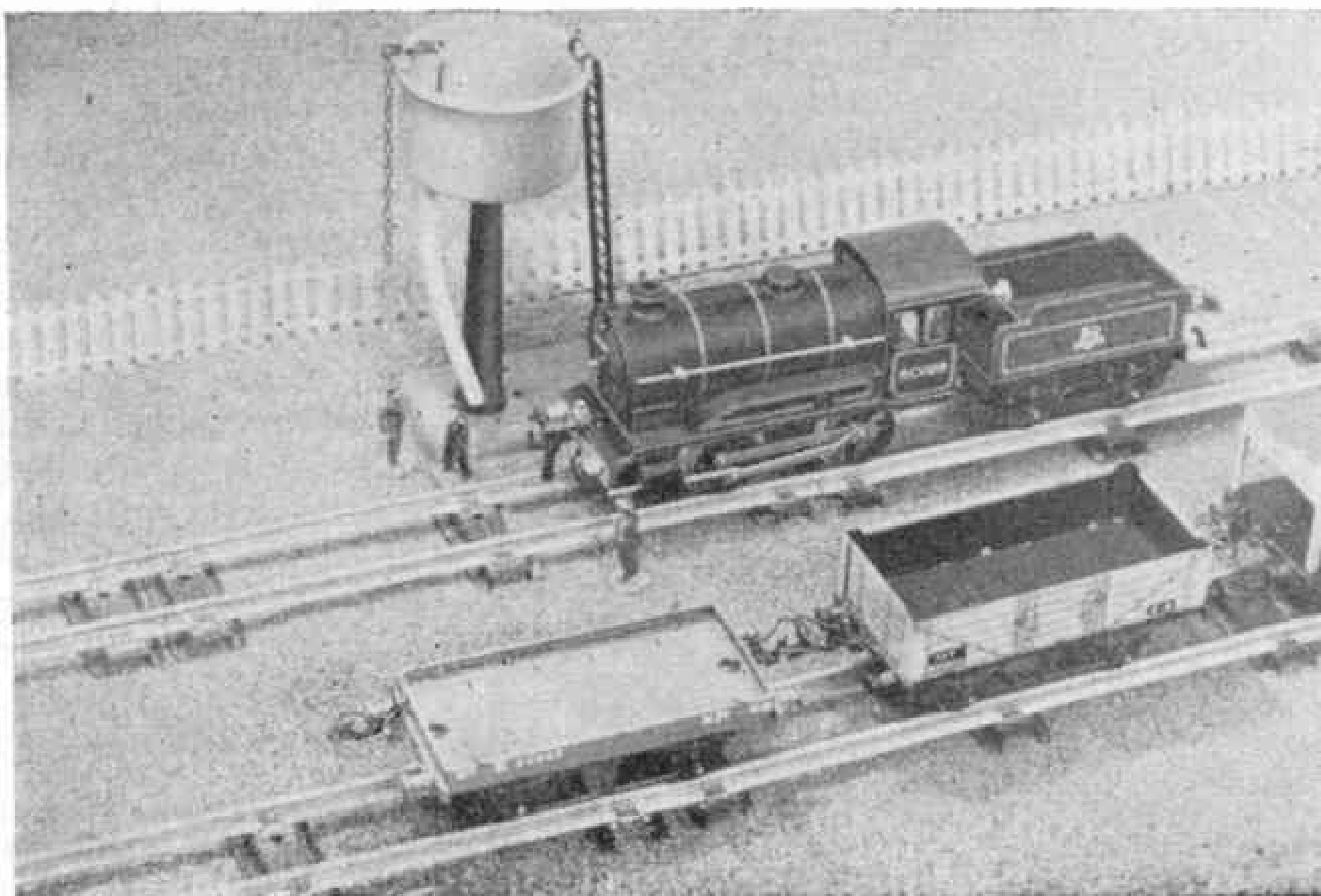
good vehicle for the road part of this job is Dinky Toys No. 418, the Comet Wagon with hinged tailboard, the latter making the loading and unloading of the cans quite an easy business. It is best not to use a lorry that has a plain flat deck. The



cans are rather slippery customers!

Those who like something easier than getting Milk cans in and out of a Gauge 0 Van can use Meccano Loaded Sacks, and load them in the Hornby Wagon No. 1, or in the similar Wagon with sheet rail. The Crane again can be employed for loading and unloading, but you can "manhandle" the Sacks if you like. There is a wider choice of road vehicles here. One with a hinged tailboard is not necessary. The Sacks can stand up in a

lorry that has sides and although a careful driver can manage a load of this kind on a flat-decked vehicle, it is perhaps safer to make the sacks lie down crosswise on such a lorry as the Guy Flat Truck. Place them alternately top to bottom and they will lie evenly on the deck.



The train is made up, and the No. 50 engine is standing near the Water Tank, ready to come and hook on to the Flat Truck, the first vehicle in the train.

Of General Interest

Giant Tongs

We all handle tongs of some kind, sugar tongs, coal tongs and so on, but few of us will ever get the chance of using tongs as large as those seen in the upper illustration on this page. These giants are lifting an enormous coil of strip steel in the annealing bay of the Abbey Works, Port Talbot, of the Steel Company of Wales Ltd.

The tongs are one example from the Heppenstall range, designed to lift objects of all kinds, round or square, long or short, light or heavy. They can be made for lifting almost anything from a bale of paper to a turret for an army tank. They are operated by remote control. The craneman lowers them over the load, with the tongs themselves automatically locked open after the previous lift. He then gives slack to release the automatic mechanism, which unlocks the tongs for gripping, and as he then starts the lift the tongs close in and take a tight grip on the burden.

The lower illustration shows a neat device for driving sawing and other machines from the engine of a car or van. It is a welded steel unit about 6 ft. long on which two pulleys are mounted, one of them the driving pulley, which is fixed,

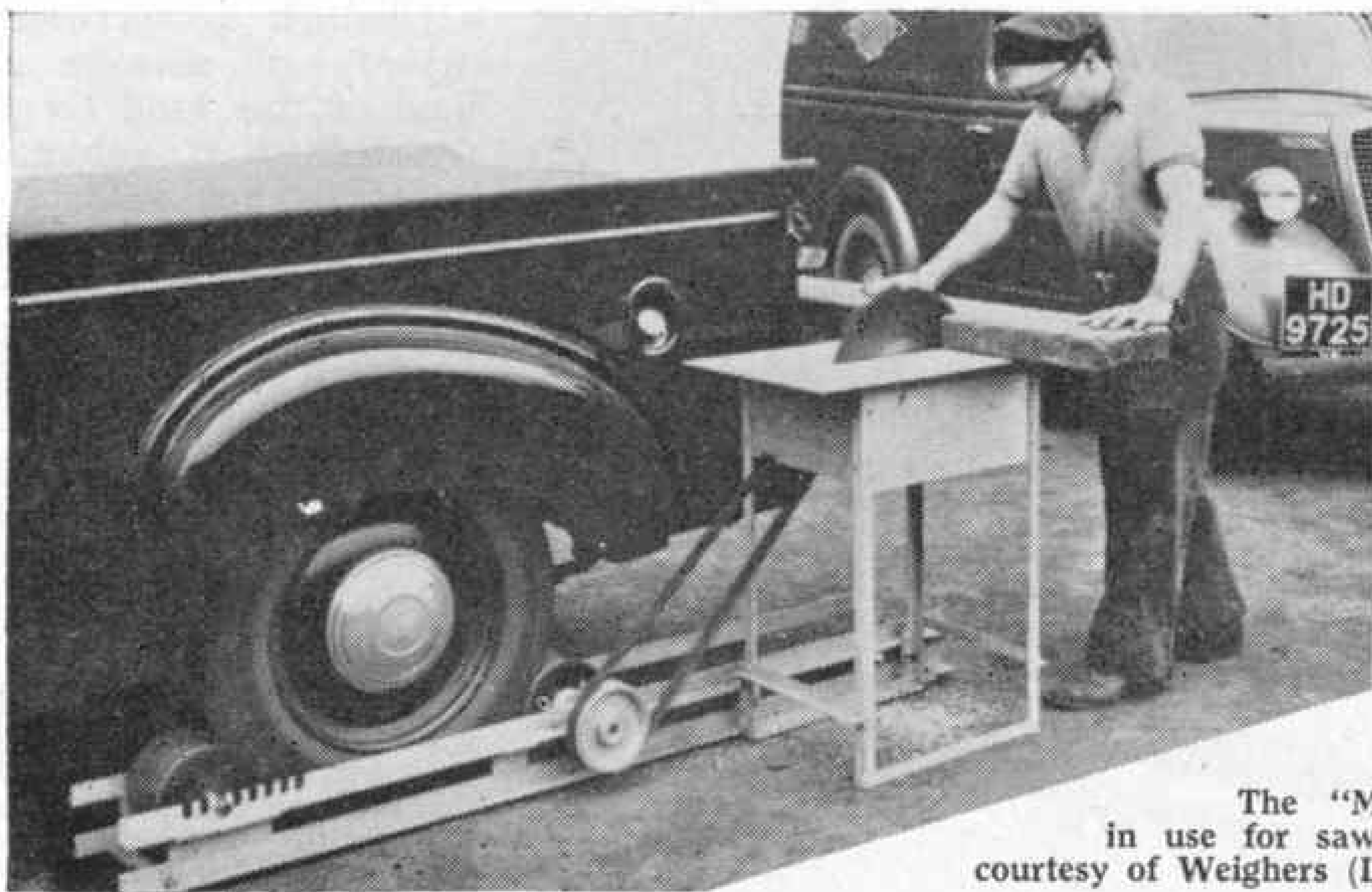


Giant tongs lift a heavy coil of strip steel. Photograph by courtesy of Brown, Lenox and Co. Ltd., Pontypridd.

and the other a removable one.

To use the device one rear wheel of the car or van is jacked up. The frame, after removing the second pulley, is slid underneath it and the latter is returned when the frame is in position, mounted in the slot, selected from those seen on the left of the frame, that is most suitable for the size of the wheel. Then the jack is lowered so that the weight on the fixed pulley is sufficient to give the drive when the car or van engine is running.

On any car or van the engine, running at a fast tick over, can easily drive a circular saw that will cut oak logs without effort. The unit can also be used for driving air compressors, flexible dynamos, pumps, mixers, etc.



The "Multi" power take off unit in use for sawing timber. Photograph by courtesy of Weighers (Livestock) Ltd., Batley.

BOOKS TO READ

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

"THE GREAT EASTERN RAILWAY"

By CECIL J. ALLEN, M.Inst.T., A.I.Loco.E.
(Ian Allan 25/-)

The former Great Eastern Railway, which was merged into the L.N.E.R. in 1923 and is now part of the Eastern Region of British Railways, has been neglected by railway writers, so it is good to find that Mr. Allen has turned his attention to it. His own railway career was in the service of the G.E.R. and its successors, and in his admirable book he shows the deep knowledge that the railway enthusiast gains of his own railway and those who run it.

The Great Eastern was a well-known line that served its urban, agricultural and coastal territory well. It was enterprising. With the Midland it led the way in admitting third class passengers to all trains, and it was the first railway to admit them to its dining cars, the provision of which, in later days, was on a very generous scale. It operated a Continental Boat train-and-steamer service via Harwich, and apart from its main line services to all parts of East Anglia, and even to York, it had a really extraordinary London suburban service. This ultimately was the most intensive steam-operated service in the world, the only one that ever involved up to twenty-four trains an hour over the same line of metals, at two-and-a-half-minute intervals.

In addition to its activities by rail and by sea the Great Eastern was one of the two earliest lines in this country to operate motorbus services on the road; and for these it actually built its own buses at Stratford Works.

Great Eastern punctuality was exemplary, and the hard-working and hard-wearing qualities of its locomotives remarkable. Then, too, it was the railway that served Royal Sandringham and, to go to the other extreme, it would, if you wanted sea water for your bath, bring small casks of it to your door!

Alone of British Railways, the Great Eastern could claim as its Chairman one who was destined to be the Prime Minister of this country—the Marquis of Salisbury. Again, no other British Railway ever installed an American as its General Manager, as happened when Henry Thornton accepted the post. It was a "happy family" sort of railway, with its Musical Society, its Athletic Association and the fatherly influence of Lord Claud Hamilton, a director for 50 years and chairman for 29 of them.

Unlike many railway histories, this one is by no means dull. The stories of the early companies that combined in 1862 to form the Great Eastern Railway are followed by an account of the company itself down to the time of grouping. Then Mr. Allen turns to locomotives, giving particular emphasis, and rightly so, to the very fine achievements of the Claud Hamilton 4-4-0s and the later 4-6-0s in the same tradition, of which Mr. Allen had extensive personal experience, on the footplate and otherwise. Coaching stock and train services provide further interesting chapters. The book ends with sections on the famous suburban services from Liverpool Street, the Continental Services and of course the days after the disappearance of the G.E. itself, the spirit of which still survives.

There are many good photographic illustrations in the book, by no means confined to engines and trains, with the usual diagrams and tables. The coloured frontispiece, and the attractive wrapper, show the company's special pride, the *Norfolk Coast Express*, in all its 1913 glory of blue paint, polished brass, burnished copper and varnished teak. This vision faded with the 1914 war and its aftermath, and so one should perhaps forbear to mention an unfortunate omission in the caption, especially in such a useful and readable addition to the railwayman's library.

"SMOKY: SLEDGE DOG OF ALASKA"

By JACK LANDRU (Max Parrish 8/6)

Dog lovers among our readers will delight in this fine Alaskan story of Smoky, an abandoned mongrel pup found by a 17 yr. old Alaskan boy, Lance Crawford, who decides to adopt him and build up his own dog team. We share Lance's early struggles and triumphs to care for and train his dogs, with a view to competing in the local dog races; and we are with them in many exciting adventures on the desolate Alaskan winter trails, including a fight to the death with a giant bear. Finally there is the exciting climax of the North American Championship, which ends in a gruelling 3-day, 70-mile race.

The story has an authentic background, as the author is a native of Alaska and has bred, owned, trained and raced sledge dogs all his life.

"THE THAMES CLYDE EXPRESS"

"THE BLUE TRAIN"

"ENGLAND TO AUSTRALIA"

By ALAN ANDERSON
(Brockhampton Press, Leicester 2/- each)

Here are three further additions to the "Famous Journey Series" by the same author, of which all previous titles have already received attention in the M.M. In the *Thames-Clyde Express* the reader is taken over the run from London to Glasgow by the Midland and former G. and S.W. routes. In the account of the *Blue Train* we travel from London by train, Channel steamer and then train again to the Mediterranean Coast. Special features of each journey are described and in each case there is the usual route map and gradient profile for the imaginary traveller.

In *England to Australia* we break new ground, if one can say such a thing about a journey by air, for the book describes a flight from London to Sydney in a B.O.A.C. Constellation aircraft. Planning and control are dealt with, and even the building of the aircraft itself is described, and again there is a route map, but not in such detail as in the rail journey books.

"A.B.C. BOOKLETS"

(Ian Allan 2/- each)

Once again the enthusiast will welcome the appearance of new editions of the familiar *A.B.C. Locomotive Books*. There are the usual four separate parts, covering respectively W.R. locomotive stock; the steam locomotives of the S.R., all diesel, diesel-electric and electric locomotives, and Southern multiple unit sets; L.M.R. engines, except for electric motor vehicles, which seem to have been missed; and the steam and electric stock of the E. and N.E. Regions. Scottish Region locomotives are included either in the London Midland or the E. and N.E. books, according to their origin.

The *A.B.C. of the British Army*, by Major C. J. Foley, M.B.E., is an addition to the series. Its various sections will help the non-military reader to follow the badges, colours, dress formation signs and other important markings that distinguish Army ranks and units. There is also a section on Army organisation, which includes a useful list of the official abbreviations or initials.

Another newcomer is the *A.B.C. of Trout Fishing*, by Arthur Sharp. This should be useful not only to the beginner, but also to many more experienced anglers. We are reviewing it almost at the beginning of the close season for trout fishing, but that will give its readers time to digest the information it contains and to make plans for their campaigns next Spring.

Air News

By John W. R. Taylor

U.S. Turboprop Liner

The first American turboprop air liner, an artist's impression of which appears on this page, is the Lockheed Electra. Designed to carry 64-90 passengers on 1,850 mile stage lengths at a cruising speed of over 400 m.p.h., it is larger and a good deal more powerful than even the developed Viscount 800. In fact, its four 3,750 h.p. Allison T56 propeller-turbines develop more than twice the power of the Viscount's Darts, ensuring high performance, though, one would think, at some cost in economy.

Wing span of the Electra is 95 ft., length 101 ft. 4 in., and loaded weight 98,500 lb. Yet it is designed to take off and land in less than 5,000 ft. Three prototypes are being built, and the first is planned to fly in October 1957.

American Airlines have already placed a £23½ million order for 35, delivery of which should begin in August 1958, and Lockheed hope to be building up to 132 Electras a year by late 1959.

Viscounts for K.L.M.

Meanwhile, Vickers continue to announce new orders for the Viscount at a most satisfactory rate. A major triumph was the sale of nine of the big Series 800 machines to K.L.M. Royal Dutch Airlines, who now use exclusively American equipment. B.O.A.C. have ordered 12 Model 700Ds, mainly for service in the Middle East; and several U.S. companies have chosen Viscounts as high-speed luxury transports for their executives, including the Howard Hughes Tool Company, Standard Oil Company, and the United

States Steel Corp., who have ordered three. They bring total Viscount orders to 234, of which well over 60 have been delivered.

Junior Flyers

More than 2,000 young Australians are members of the Junior Flyers' Club, started just over a year ago by Trans-Australia Airlines. Aims of the Club are to build up interest in commercial aviation, to encourage young people to make a career in the airline industry, to aid school studies of transport and social



An artist's impression of the Lockheed Electra air liner.

development in the Commonwealth, and to promote a spirit of service.

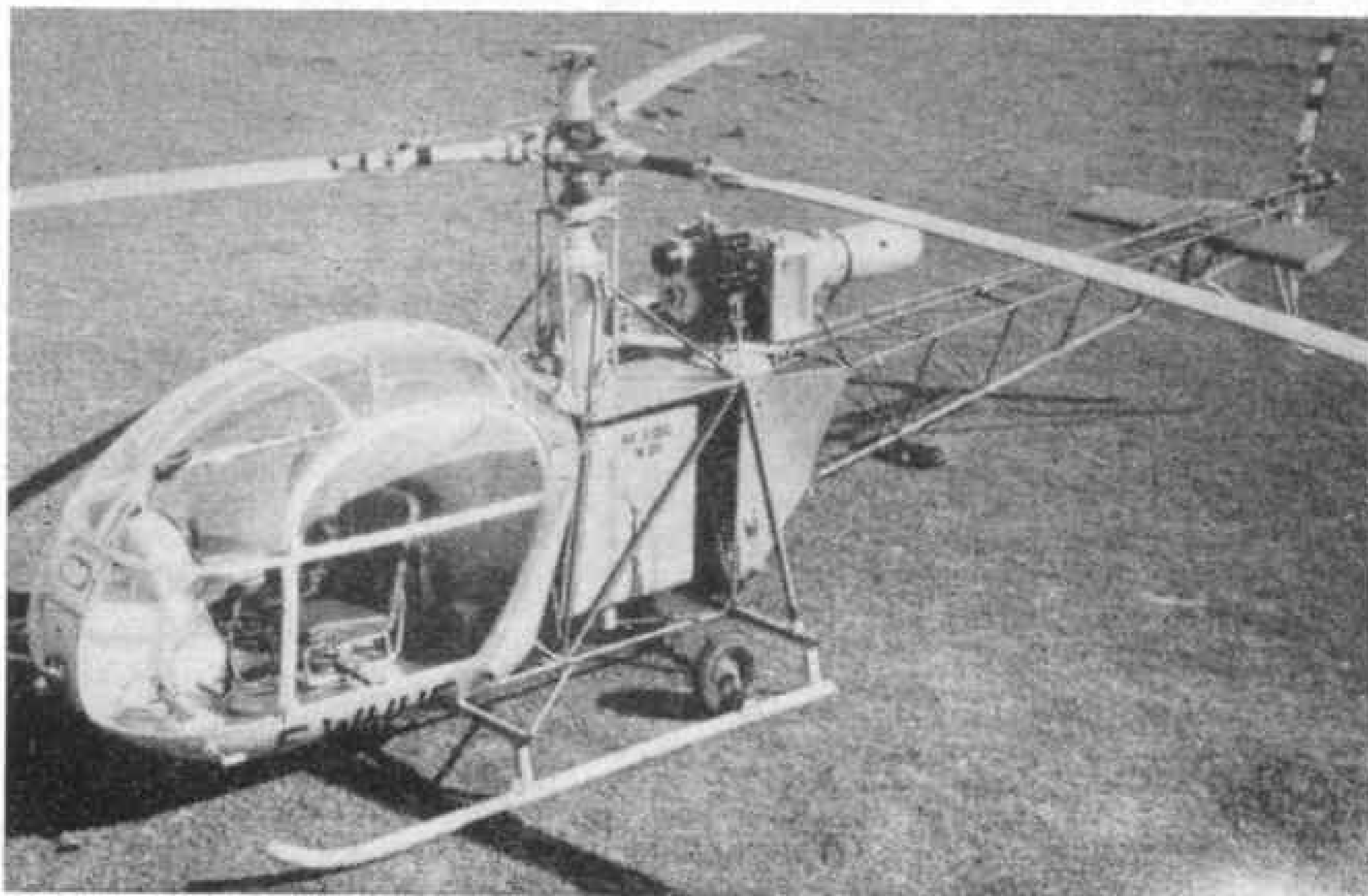
Membership is open to children below the age of 16 who fly by T.A.A. Boys are admitted to the Junior Pilot Club and girls to the Junior Hostess Club. All receive badges and a flying log, together with monthly copies of the airline's news sheet *Trans Air*, which contains a special column entitled "Calling Junior Flyers".

Helicopter Record

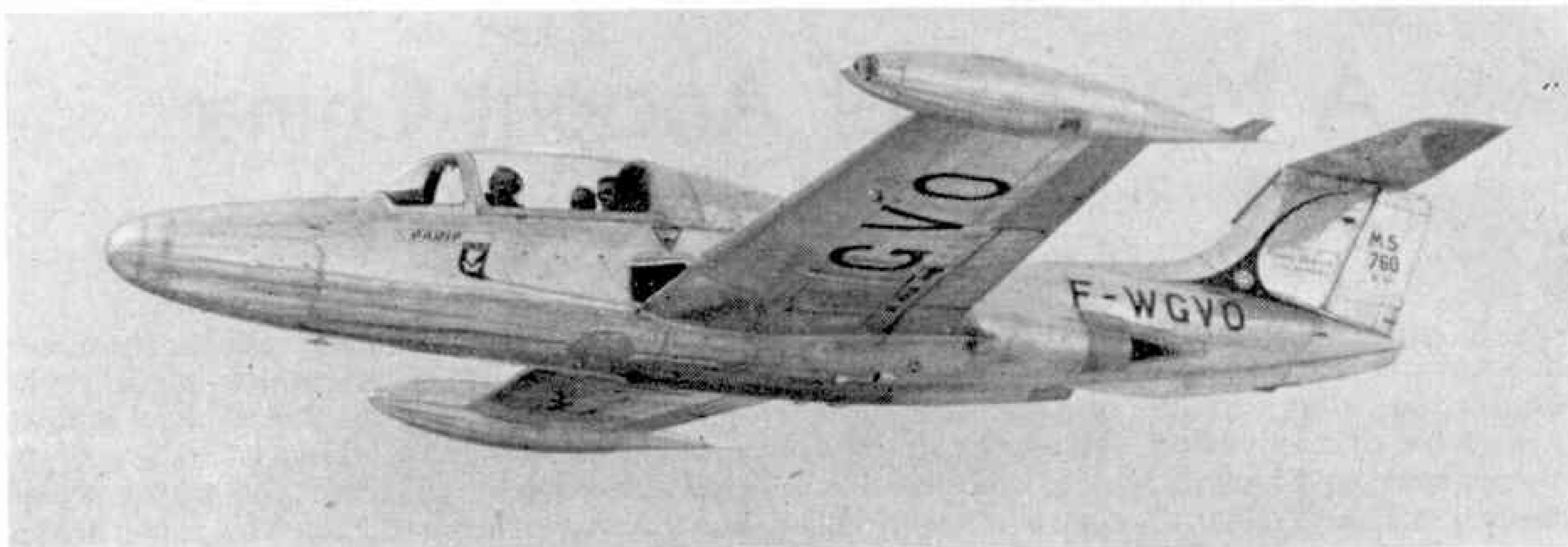
The French SE.3130 Alouette II helicopter, illustrated below, broke the international height record for rotating wing aircraft on 6th June, when it reached an altitude of 26,936 ft. Time taken for the climb, from Buc aerodrome, was 42 min., and the Alouette

was piloted by Jean Boulet, who already holds six records, including the closed-circuit distance record, which he set up in July 1953 in the earlier Alouette I.

Powered by a 360 h.p. Turboméca Artouste II turbine, the five-seat Alouette II has a rotor diameter of 38 ft., weighs 2,980 lb. and has a range of 323 miles at 106 m.p.h. It is in production, and the first five aircraft are due for delivery late this year. During the Paris Aero Show at Le Bourget in June, it demonstrated its weight-lifting ability by



French SE.3130 Alouette II helicopter that recently climbed to 26,936 ft., a record height for a rotating wing aircraft.



The little Morane-Saulnier MS.760 Paris, a French jet-powered lightplane that may be built in quantity in the United States.

carrying a small Renault van across the aerodrome on the end of a cable.

Big Blow

The Hawker-Siddeley Group's new supersonic wind tunnel has been opened by Lord Brabazon of Tara, at the Armstrong Whitworth guided missile factory at Whitley, Coventry. It is the first large-scale privately-owned British wind tunnel capable of giving a continuous airflow at three times the speed of sound (nearly 2,300 m.p.h.), and cost about £200,000 to build. It will be used for testing rockets, advanced jet engines, guided missiles and the next generation of 2,000 m.p.h. research and fighter 'planes.

Paris in America

The heading to this item is not so startling as it seems, because the "Paris" it refers to is the little Morane-Saulnier M.S.760 Paris jet-powered lightplane, which has arrived in America for demonstration. If all goes according to plan, it will be built in large numbers by the Beechcraft

This Boeing YC-97J Stratofreighter is one of two fitted experimentally with 5,700 h.p. Pratt and Whitney T34 propeller-turbines.



company at Wichita in Kansas.

Developed from the M.S.755 jet trainer, the Paris offers completely new standards of performance and comfort for a private touring aircraft. Its two 880 lb. thrust Turboméca Marboré turbojets give it a top speed of 355 m.p.h. and, with two wingtip tanks, it has a still air range of 870 miles carrying four people. Easy to fly, it should prove popular with U.S. companies as a high-speed "executive transport".

Duke to Fly Helicopters

Already a fully-qualified fixed-wing pilot, H.R.H. the Duke of Edinburgh is now learning to fly helicopters at White Waltham aerodrome near Maidenhead. His first lessons were made in a Westland S-51 Dragonfly, but the Duke will almost certainly continue his instruction on an S-55 Whirlwind, the type of helicopter

he uses most frequently for official visits.

Giant Carriers

The U.S. Navy has ordered a fifth aircraft carrier of the 75,000 ton *Forrestal* class, each of which will be able to carry a complement of 3,500 men and 100 aircraft, including long-range atom-bombers. It will be named U.S.S. *Kitty Hawk*, after the place where the Wright brothers made their powered flights, and will cost £71,500,000. The *Forrestal* itself is fitting out and will be in service within a year, followed by the U.S.S. *Saratoga*, which is due to be launched in October.

Rocket Models

To test the design of their new CF-105 supersonic fighter in high speed flight, Avro Aircraft of Canada are firing small models of the aircraft on the nose of ground-launched research rockets. Radio equipment inside the models sends back data on their performance during every stage of the flights, which usually last for only 15 seconds.

Stratofreighter with a Difference

The unfamiliar appearance of the Boeing Stratofreighter seen in the lower illustration on this page, results from the fact that it is one of two YC-97Js

fitted experimentally with 5,700 h.p. Pratt and Whitney T34 propeller-turbines. Modified at the request of the U.S.A.F., installation of the new engines gives the aircraft almost 63 per cent. more power, yet reduces its empty weight by nearly 5,000 lb.

Naval Gnats?

The Royal Canadian Navy is reported to be considering the use of a carrier-based version of the Folland Gnat lightweight jet fighter, for duty aboard its new carrier, H.M.C.S. *Bonaventure*. No immediate order is expected, as the ship is still many months from completion. Meanwhile the Orpheus-powered Gnat is expected to put in its first public appearance at the S.B.A.C. Flying Display at Farnborough this month.

A Mystery of Ancient China

The Riddle of the South-seeking Chariot

By F. W. Cousins, A.M.I.E.E., A.C.I.P.A., F.R.A.S.

AN interesting model is inconspicuously displayed in the Science Museum's exhibition that treats of the art and principles of navigation. It represents the South-seeking Chariot, which was possibly used by the Yellow Emperor Huang Ti in the 64th year of his reign. The Yellow Emperor was one of three great Chinese Emperors of an almost legendary period and his reign is dated in Chinese story at about 2634 B.C. He is said to have used this famous navigational device to guide his armies over the vast steppes leading to the south. To the Chinese the south was more important than the north, because to them where the Sun stood highest there was the centre of life and light.

The South-seeking chariot is seen in the illustration on this page. It commands our attention for a variety of reasons. Firstly, it contains a differential gear that is used ingeniously so to direct a pointer that the true south point of the compass is indicated, irrespective of the way in which the chariot is manœuvred.

Secondly, it discredits the story, presented in so many books and encyclopædia, that the Chinese invented the *magnetic compass* over 4,500 years ago.

Thirdly, it suggests that the Chinese artificers at Huang Ti's court were uncommonly well versed in the art of mechanisms, and that they had usefully employed the differential gear 4,500 years before it was *re-invented* in the West.

Meccano enthusiasts will be familiar with the differential gear, which has its most common use in the back axles of

motor vehicles, in which it allows the inner and outer wheels to make a different number of rotations as the vehicle follows a curve in the road. This is necessary to prevent wheel-slip, since the outer wheel has to travel farther than the inner wheel in the same time.

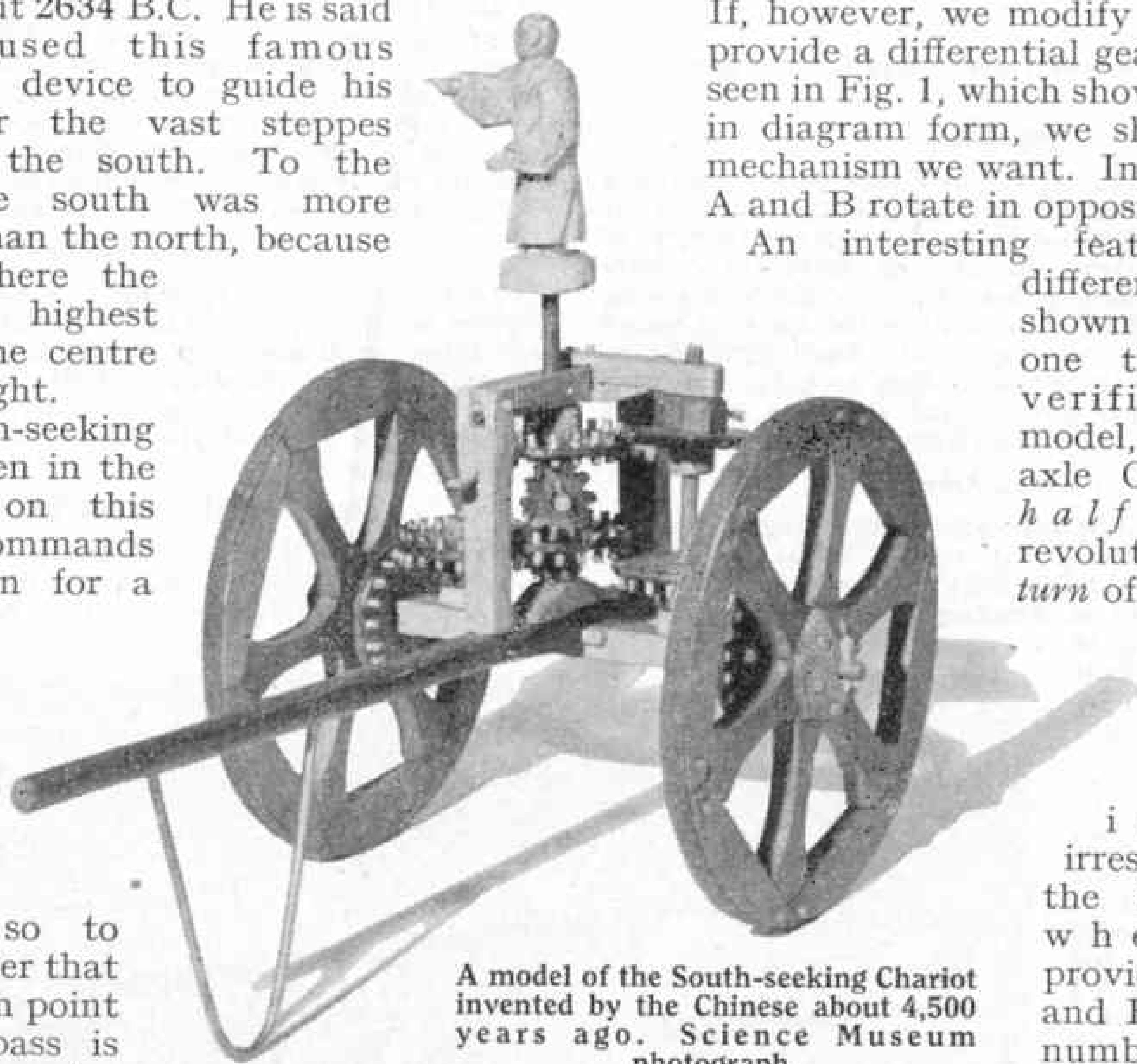
The differential gear used in the rear axle of a car would be of little use to direct a pointer in the South-seeking chariot. If, however, we modify the gear and provide a differential gear of the type seen in Fig. 1, which shows the chariot in diagram form, we shall have the mechanism we want. In it the wheels A and B rotate in opposite directions.

An interesting feature of the differential gear shown in Fig. 1, one that can be verified from a model, is that the axle C makes *one half turn* or revolution for a *full turn* of the wheel A

when wheel B is kept stationary. This is true irrespective of the size of the wheels D, provided wheels A and B have equal numbers of teeth. It is important to keep this in mind

to appreciate fully the working of the chariot.

The layout of the gears used in the South-seeking chariot is made clear in Figs. 1 and 2, the illustrations on the opposite page. Let us consider these in a little more detail. It will be seen that the pointer P is controlled by the axle C, to which it is rigidly connected by way of a vertical shaft. The differential gear consists of the wheels A and B, and the axle C, with its pair of small wheels, D and D1. The wheels A and B are free running on the axle F. The gear wheels lettered H in



A model of the South-seeking Chariot invented by the Chinese about 4,500 years ago. Science Museum photograph.

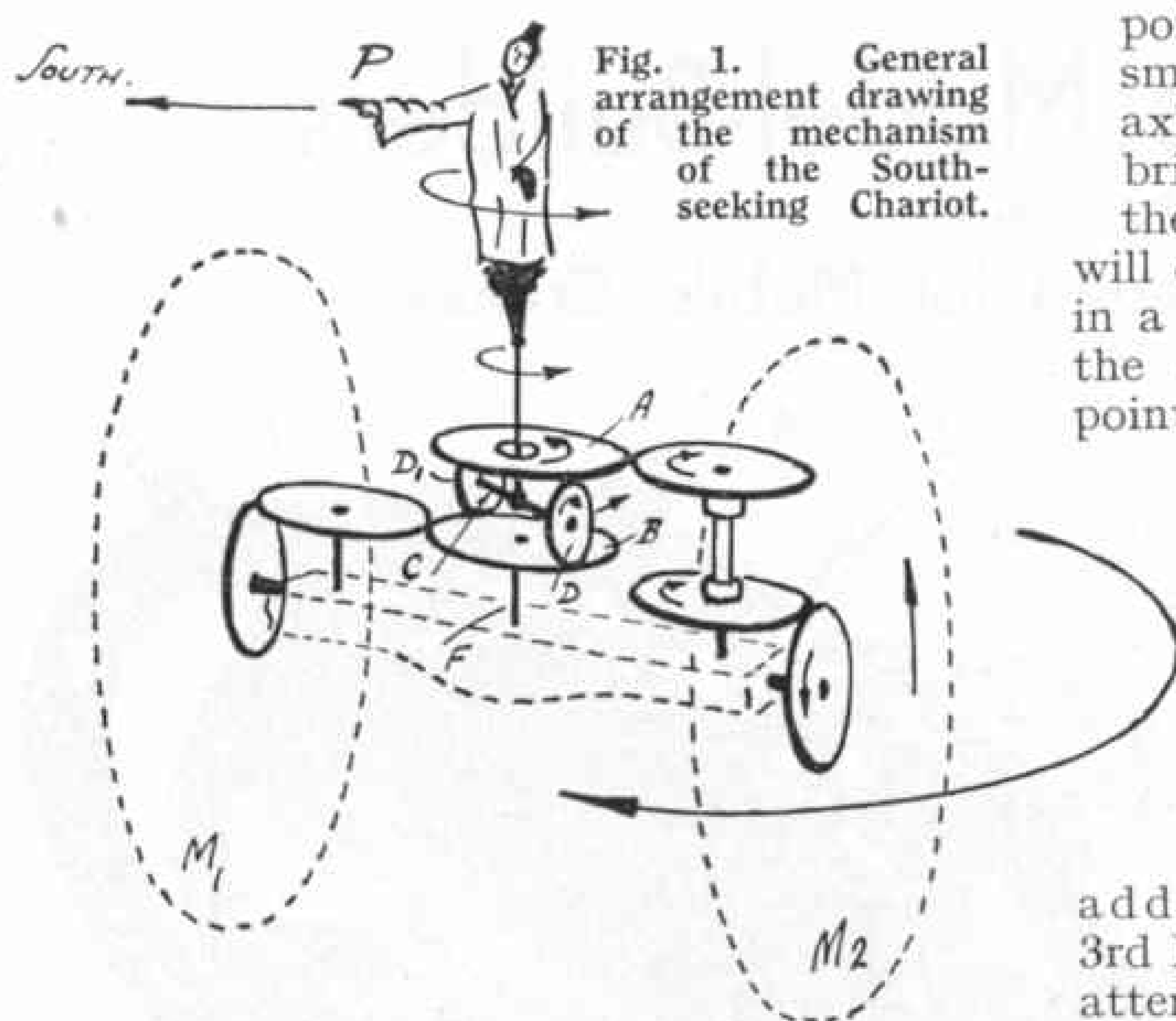


Fig. 1. General arrangement drawing of the mechanism of the South-seeking Chariot.

Fig. 2 have identical numbers of teeth, and this number is the same as the number of teeth of the wheels A and B.

The main road wheels of the chariot, M1 and M2, are spaced apart a distance x , which is made equal to the diameter of the road wheels, as is clearly seen in Fig. 2.

The reason for this equality of the lengths d and x will be obvious if we consider the main road wheel M1 to be fixed, that is stationary, as indicated in the lettering of Fig. 2, while the chariot is bodily revolved clockwise as seen from above. The chariot's outer wheel M2 then sweeps out a circular track, and will make *two complete rotations on its axle* for one revolution of the chariot in space.

Now the two rotations of main road wheel M2 will cause wheel A to make two rotations and the axle C one revolution, or turn, in a direction opposite to the chariot's direction of turn. In this example the axle C moves counter clockwise as seen from above. Now axle C and pointer P are rigidly connected and pointer P therefore remains fixed in space as the chariot is turned.

It will be appreciated that if the chariot moves forward or backward in a straight line, the main road wheels M1 and M2 will rotate at equal speeds and consequently the wheels A and B of the differential gear will also turn at equal speeds but in *opposite* directions. In these conditions the axle C and the

pointer P remain stationary, while the small wheels D and D1 rotate on the axle C. Any turning of the chariot will bring about a difference in the speeds of the two wheels A and B, and thereby will cause axle C to revolve the pointer P in a direction opposite to the direction of the chariot's turn. This will keep the pointer fixed in space on the point to which it was originally set—in this case the south point.

Now a word about the oft repeated legend of the invention of the magnetic compass by the Chinese.

Mr. George Lanchester, whose solution of the problem of the South-seeking chariot I have presented, delivered a learned address to the China Society on 3rd February 1947. In this he directed the attention of his listeners to a lecture by Dr. J. B. Kramer, an eminent electrical engineer, on the history of magnetism. Dr. Kramer makes this very forceful statement. "*Where are the manuscripts in which the Chinese lay claim to the honour of having discovered the magnet? There are none, and there never existed any writings by the Chinese claiming for themselves that discovery.*"

In the course of Dr. Kramer's researches he visited the British Museum and in the Oriental Library there he studied Dr. Herbert A. Giles' historic work *Adversaria Sinica* (Book 11853s) in which he found evidence that the South-seeking chariot was a *mechanical* device and *not magnetic*.

I think you will agree that the model by Mr. George Lanchester and the researches of Dr. Kramer provide a lesson of absorbing interest in the fields of mechanical engineering and the history of science.

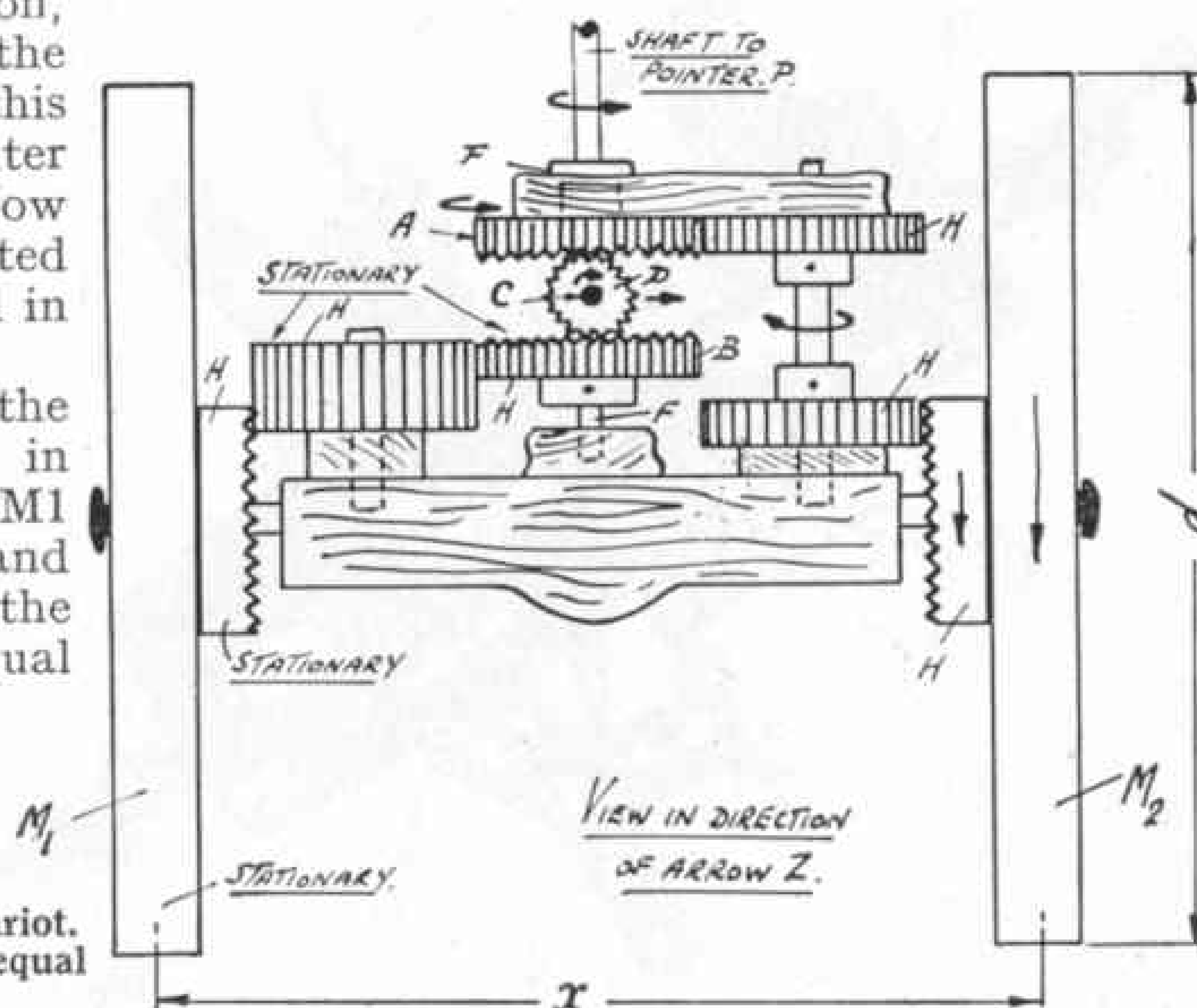


Fig. 2. The gearing of the South-seeking Chariot. The road wheels are spaced apart a distance equal to their diameter.

Among the Model-Builders

By "Spanner"

A Compact Bearing for Mobile Cranes

ONE of the most difficult problems to be overcome in the construction of advanced and fully detailed model mobile cranes and excavators is the provision of drives from the Motor in the superstructure through the roller bearing unit to the travelling and steering mechanisms in the undercarriage. In models fitted with wheel brakes the task is even more difficult as these also should be controlled from the operating cabin. This means that three separate movements, each individually controlled, have to pass through the centre of the roller bearing. Figs. 1 and 2 on this page show one of the ways in which three such independent movements can be arranged in a comparatively simple way. There is one disadvantage however, in this simple arrangement as it is not possible to slew the cab in a full circle, but this is not very serious as it is rarely necessary to turn the cab more than 180° , even in a real crane.

The roller bearing unit illustrated is very simple, the circular tracks for the rollers being provided by two Hub Discs, one of which is bolted underneath the cab and the other to the wheeled undercarriage of the model. The rollers are $\frac{1}{2}$ " Pulleys mounted on 2" Rods, each of which is held by Spring Clips in a Double Bracket bolted to a Circular Strip. A $3\frac{1}{2}$ " Gear 1 is fixed by nuts to $\frac{3}{4}$ " Bolts held by further nuts in the lower Hub Disc. A Wheel Disc is bolted centrally to this Hub Disc.

The driving shaft to the travelling movement is a Rod 2 passed through the centre of the roller bearing unit. A $\frac{1}{2}$ " Pinion 3 is free to turn on this Rod between the Gear 1 and the upper Hub Disc. The Rod is free to slide vertically in the roller bearing, but its movement is restrained by two Compression Springs placed on the Rod between the Hub Discs and Collars.

The drive from the Motor to Rod 2 and from there to the travelling wheels should be transmitted

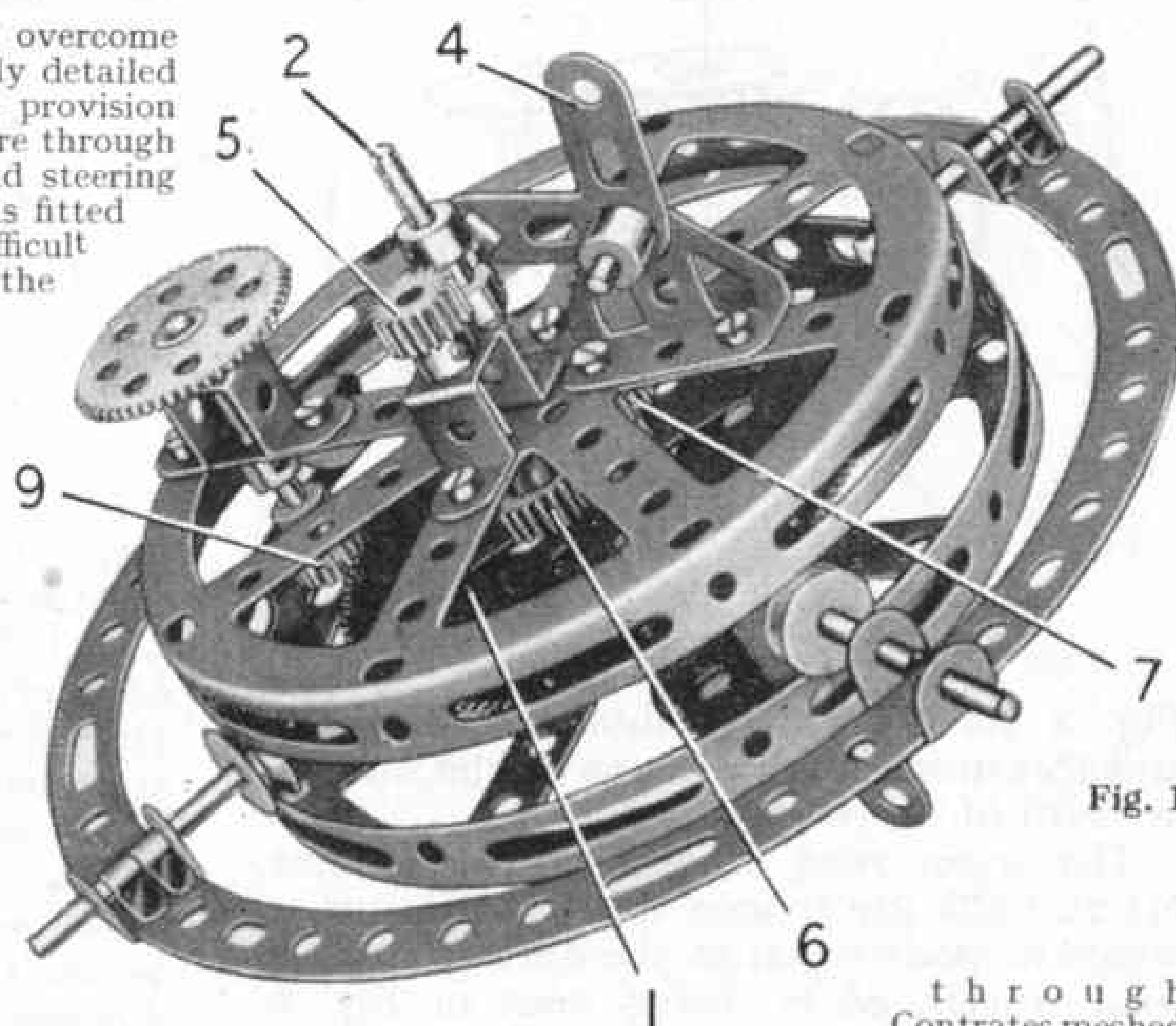


Fig. 1

through Contrates meshed with Pinions, as with this arrangement the drive is always engaged although the Rod is free to slide within limits set by the Compression Springs and the Collars. This sliding movement of the Rod is used to control the brakes. A Trunnion is bolted to each Hub Disc and a Bell Crank 4 is mounted on a Pivot Bolt passed through the Trunnion. One arm of each Bell Crank is connected to the brake rods, and a bolt fixed in the other arm by two nuts engages between Collars on Rod 2.

The steering movement is operated by a Pinion 5. This is fixed on a $1\frac{1}{2}$ " Rod mounted in the upper Hub Disc and in a Double Bent Strip. A $\frac{1}{2}$ " Pinion 6 fixed to the lower end of the Rod is in constant mesh with the Pinion 3 on Rod 2. Another $\frac{1}{2}$ " Pinion 7 meshes with Pinion 3 and is fixed on a $1\frac{1}{2}$ " Rod supported in the lower Hub Disc and in a Double Bent Strip. This Rod carries at its lower end a Crank 8 that is connected to the steering mechanism.

The slewing movement is operated by a $\frac{1}{2}$ " Pinion 9 that engages the Gear 1. This Pinion is fixed on a 2" Rod supported in the upper Hub Disc and in a Double Bent Strip.

A DISC BRAKE FOR FRONT WHEELS

Fig. 3 shows a new type of brake designed specially for the front wheels of Meccano vehicles. It is very simple to assemble and adjust, and is compact enough for the majority of models. Since the war advances made in the design of cars, and sports cars in particular, have made them capable of maintaining speeds

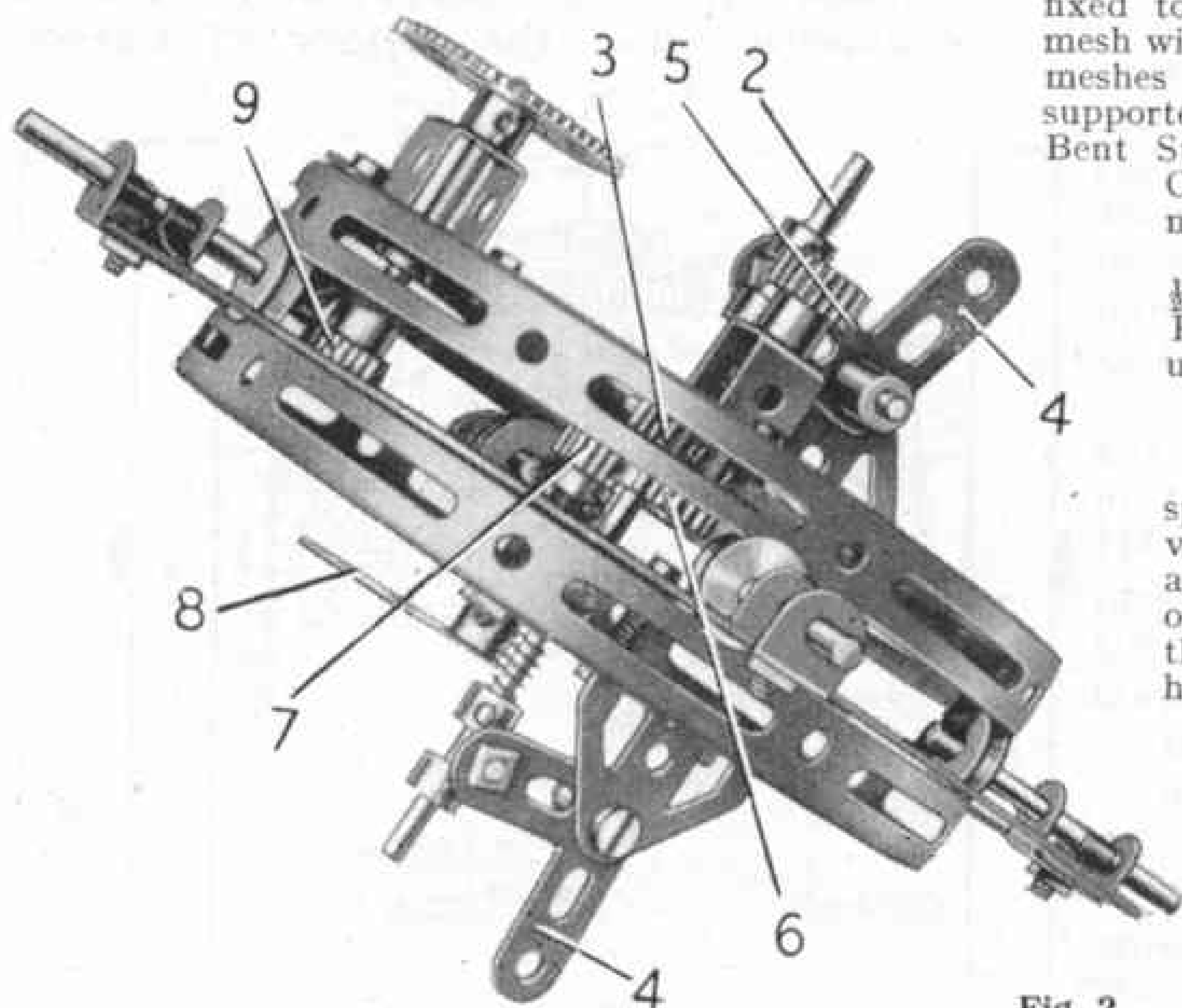


Fig. 2

Fig. 1 (above) shows a compact roller bearing for mobile cranes designed to allow steering and other drives to be transmitted through it to the undercarriage. Fig. 2 (left) is another view of this compact roller bearing.

that would have seemed unbelievable only a few years ago, and have created a demand for brakes of exceptional power. Unfortunately the streamlined shape of modern cars tends to reduce the efficiency of drum brakes after frequent use, as their aerodynamic design reduces the flow of air necessary to cool the brakes and overheating results. One of the more recent developments in vehicle braking systems is the application of disc type brakes to many high-performance cars, and the Meccano mechanism shown in Fig. 3 demonstrates admirably the principle of a brake of this kind.

The mechanism is mounted on a back plate provided by a Six Hole Bush Wheel 1. This is fitted with two Angle Brackets lock-nutted to the ends of twin transverse leaf springs that form the front suspension members. The Bush Wheel 1 forms a bearing for a $1\frac{1}{2}$ " Rod used as a stub axle. This Rod is free to turn in the boss of the Bush Wheel and carries a Collar at its inner end.

The brake shoes are formed by a 2" Strip 2 and a $2\frac{1}{2}$ " Strip 3. These are clamped together at their lower ends on a $\frac{1}{2}$ " Bolt, but they are spaced apart by a nut placed between the two Strips. The method adopted for mounting the shoes provides a novel use for the recently introduced Six Hole Bush Wheel, as the spacing of the holes in this part enables a 1" Triangular

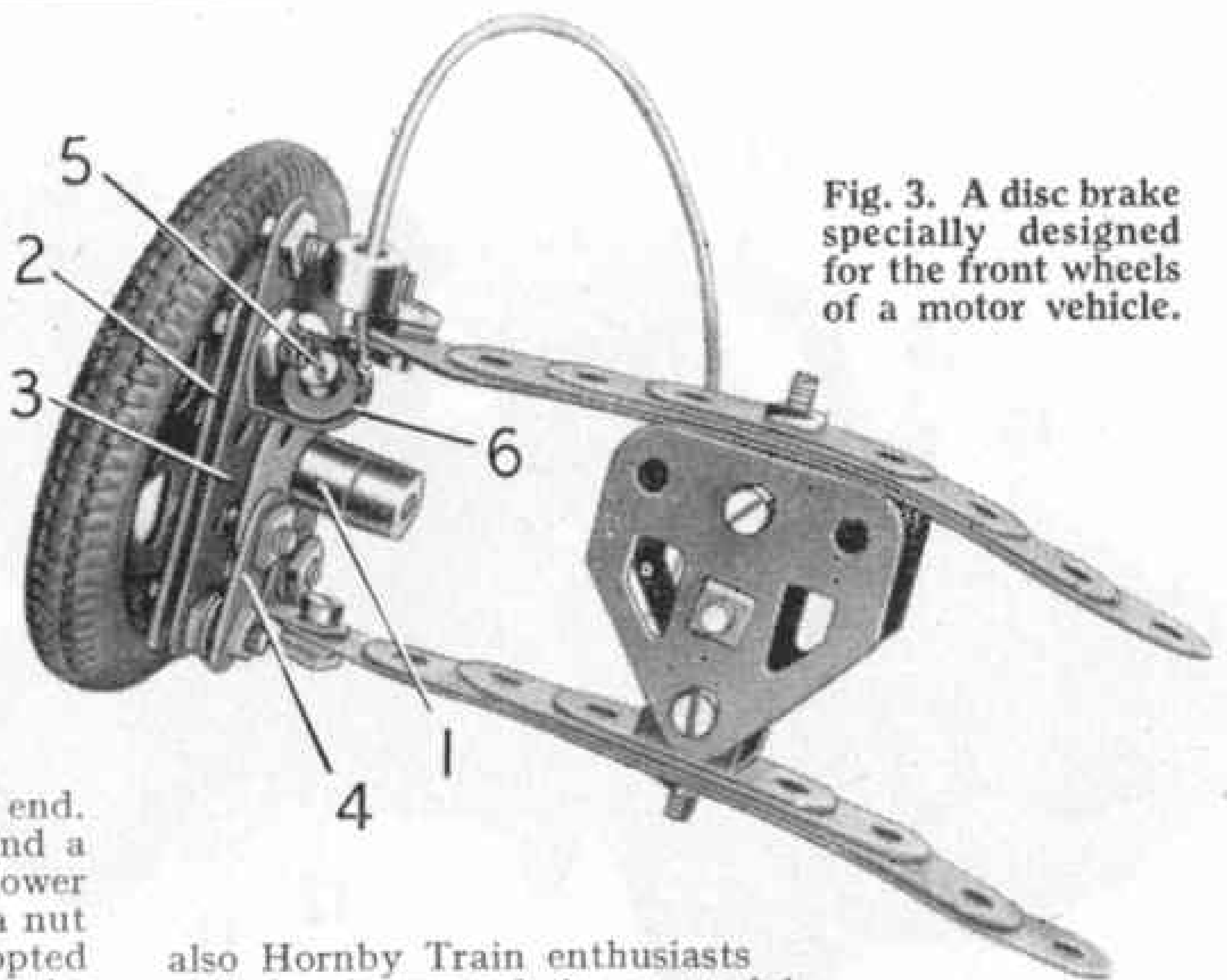


Fig. 3. A disc brake specially designed for the front wheels of a motor vehicle.

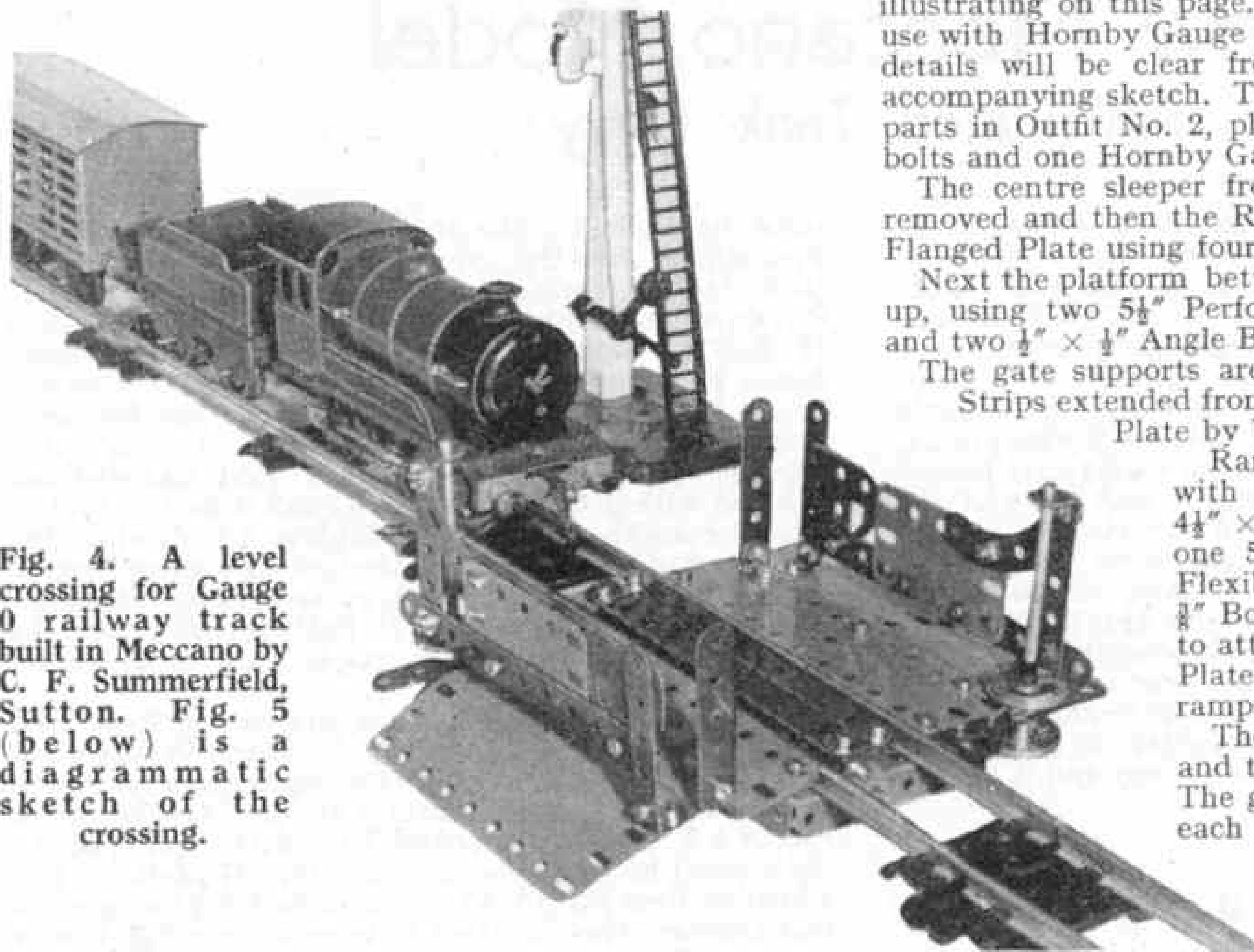


Fig. 4. A level crossing for Gauge 0 railway track built in Meccano by C. F. Summerfield, Sutton. Fig. 5 (below) is a diagrammatic sketch of the crossing.

Plate 4 to be bolted to it. The $\frac{1}{2}$ " Bolt carrying Strips 2 and 3 is fitted with a nut and three Washers, then passed through the Triangular Plate and fixed tightly in place by a nut. A $\frac{3}{8}$ " Bolt 5 is passed through Strips 2 and 3, and an Angle Bracket 6 is placed on it before a nut is screwed in position. The angle of Strips 2 and 3 is adjusted until the lower face of the Angle Bracket 6 bears against the edge of Bush Wheel 1.

The brake disc is an Eight Hole Bush Wheel fixed on the stub axle and arranged so that it is free to turn between the Strips 2 and 3. The brake is operated by a length of flexible wire passed through a sheath formed by Spring Cord. At each end the Spring Cord is gripped in Collars, one of which is screwed on to a $\frac{3}{8}$ " Bolt fixed by a nut in Strip 3. One end of the wire is bolted to Angle Bracket 6 and the other end is attached to a suitable brake lever. The brake is adjusted by tightening or slackening the nut on the Bolt 5.

A MECCANO LEVEL CROSSING FOR 0 GAUGE TRACK

Meccano model-builders who are

also Hornby Train enthusiasts will be interested in a useful level-crossing built in Meccano by C. F. Summerfield, Sutton, which I am illustrating on this page. The crossing is designed for use with Hornby Gauge 0 track and I think its main details will be clear from the illustration and the accompanying sketch. The crossing can be made from parts in Outfit No. 2, plus a few additional nuts and bolts and one Hornby Gauge 0 Straight Rail.

The centre sleeper from the Hornby Rail is first removed and then the Rail is attached to a $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flanged Plate using four Washers to ensure a firm fit.

Next the platform between the rails should be made up, using two $5\frac{1}{2}$ " Perforated Strips, four Fishplates and two $\frac{1}{2}$ " \times $\frac{1}{2}$ " Angle Brackets, and fixed in position.

The gate supports are mounted on $2\frac{1}{2}$ " Perforated Strips extended from and attached to the Flanged Plate by Trunnions.

Ramps are formed on one side with one $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " and one $4\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate, and with one $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " and two $2\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plates on the other. Two $\frac{3}{8}$ " Bolts with locked nuts are used to attach each ramp to the Flanged Plate and to raise the tops of the ramps to rail level.

The construction of the gates and the gate stops is clearly shown. The gates swing on $3\frac{1}{2}$ " Axle Rods, each held in position by two 1" Pulleys. Spring Clips keep the Double Angle Strips of the gates in position on the Rods.

When completed this level crossing gate forms a novel and attractive accessory that will function quite satisfactorily and will provide a useful alternative when a Hornby Level Crossing is not available.

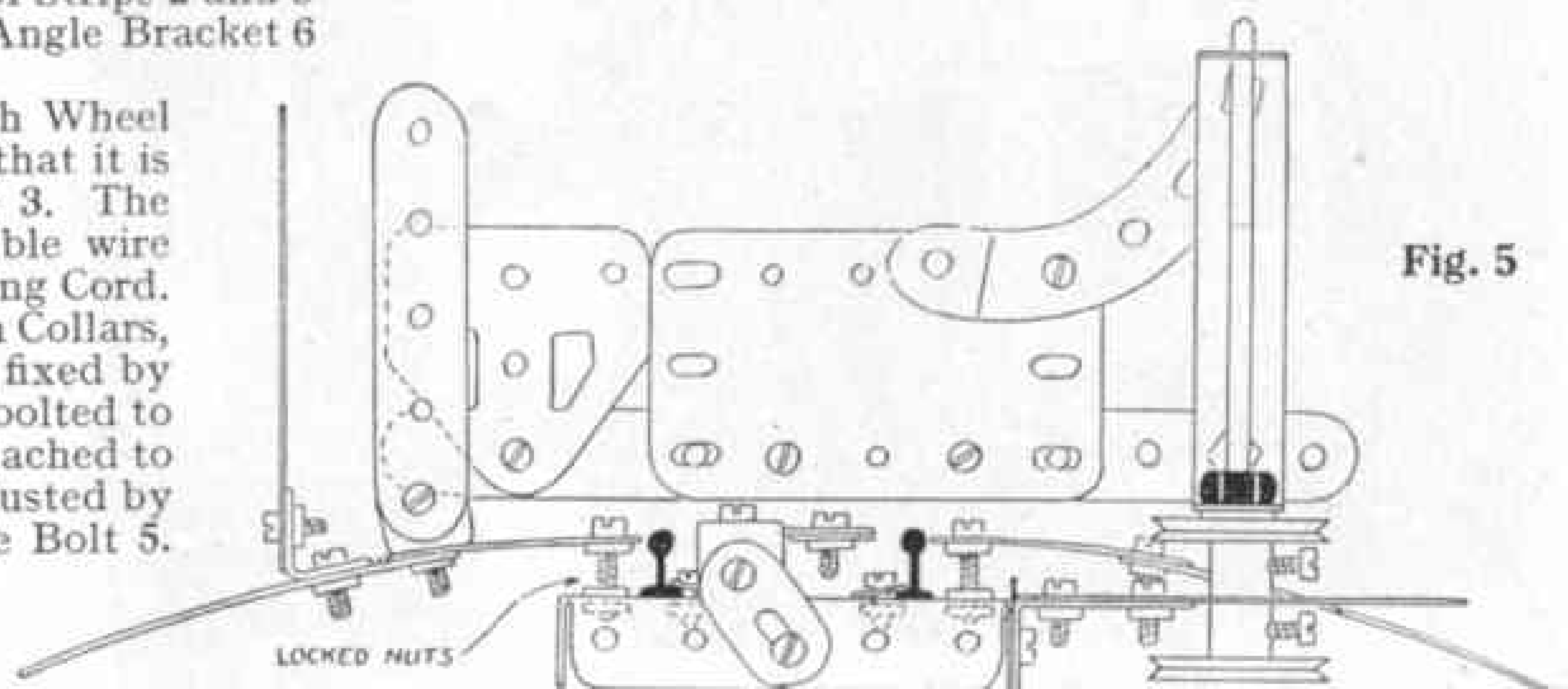


Fig. 5

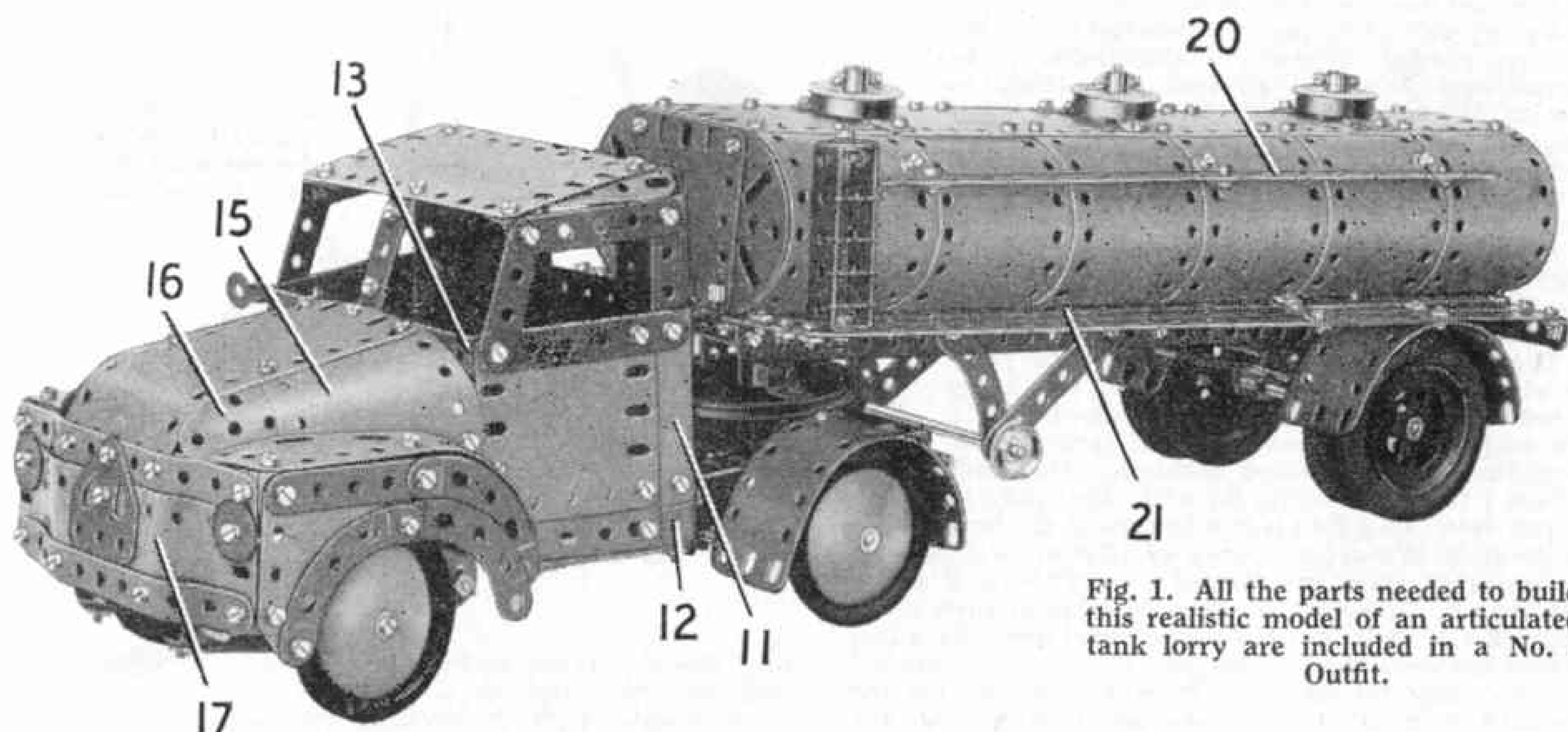


Fig. 1. All the parts needed to build this realistic model of an articulated tank lorry are included in a No. 8 Outfit.

New Meccano Model

Articulated Tank Lorry

OUTFIT No. 8 provides all the parts to build the attractive Articulated Tank Lorry shown in Fig. 1. The chassis of the lorry consists of two $12\frac{1}{2}$ " Angle Girders connected at their ends by $2\frac{1}{2}$ " \times 1" Double Angle Strips. Each of the leaf springs is formed by a $4\frac{1}{2}$ ", a $3\frac{1}{2}$ " and a $2\frac{1}{2}$ " Strip bolted together, with Angle Brackets fixed to the ends of the $4\frac{1}{2}$ " Strip. A Fishplate is lock-nutted to the rear Angle Bracket of each spring.

The Fishplates of the rear pair of springs are passed over a Rod mounted in the next-to-end holes of the chassis Girders, and are held on the Rod by Spring Clips. The Angle Brackets at the front ends of the rear springs are pivoted on a Rod supported in Trunnions fixed to the chassis, and this Rod also is fitted with Spring Clips. The arrangement of the front springs is similar to those at the rear except that 1" Triangular Plates are used in place of Trunnions.

The rear axle is a 5" Rod mounted in a $3\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strip bolted to the springs and is held in

place by Collars. The front axle beam is made by overlapping two $2\frac{1}{2}$ " Strips three holes and bolting them to the springs, the bolts securing also a $\frac{1}{2}$ " Reversed Angle Bracket 1 at each end. At one side a $1\frac{1}{2}$ " Rod 2 is mounted in the $2\frac{1}{2}$ " Strip and the Reversed Angle Bracket, and is fitted with a Collar 3 and a Crank 4. A second Collar placed above the Reversed Angle Bracket holds the Rod in place. On the other side the $1\frac{1}{2}$ " Rod is replaced by a 2" Rod, and this also is fitted with a Collar 3 and a Crank 4 and is held in place by another Collar. A Coupling 5 is fixed on the upper end of the 2" Rod, and the Cranks 4 are connected by a 3" Strip pivoted on lock-nutted Bolts. The front wheels are free to turn on $\frac{3}{4}$ " Bolts screwed into the Collars 3, but each wheel is spaced from its Collar by two Washers.

A 3" Strip 6 is pivoted at one end on a $\frac{1}{2}$ " Bolt fixed by two nuts in a $1\frac{1}{2}$ " Contrate 7. Three Washers are placed on the Bolt to space the Strip from the teeth of the Contrate. The Contrate is fixed on the upper end of a 2" Rod supported in a $1\frac{1}{2}$ " Strip bolted above the slotted holes of one of the chassis Girders, and in a Double Bent Strip held by the same bolts underneath this Girder. The Contrate is spaced from the Girder by four Washers. The other end of the Strip 6 pivots freely on a Threaded Pin held in the Coupling 5. The

lower bearing for the steering column is a 1" \times 1" Angle Bracket bolted to the chassis Girder in front of the Contrate 7 and held by bolts 8. The steering column itself should not be fitted until the cab is assembled.

The cab is made by fixing across the chassis a $4\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strip 9 and a $5\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strip held by bolts 10. The floor is a $4\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate. Each side of the cab consists of a $2\frac{1}{2}$ " \times $2\frac{1}{2}$ " and a $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plate bolted to the lugs of the Double Angle Strips, and extended towards the rear by an opened-out U-section Curved Plate 11

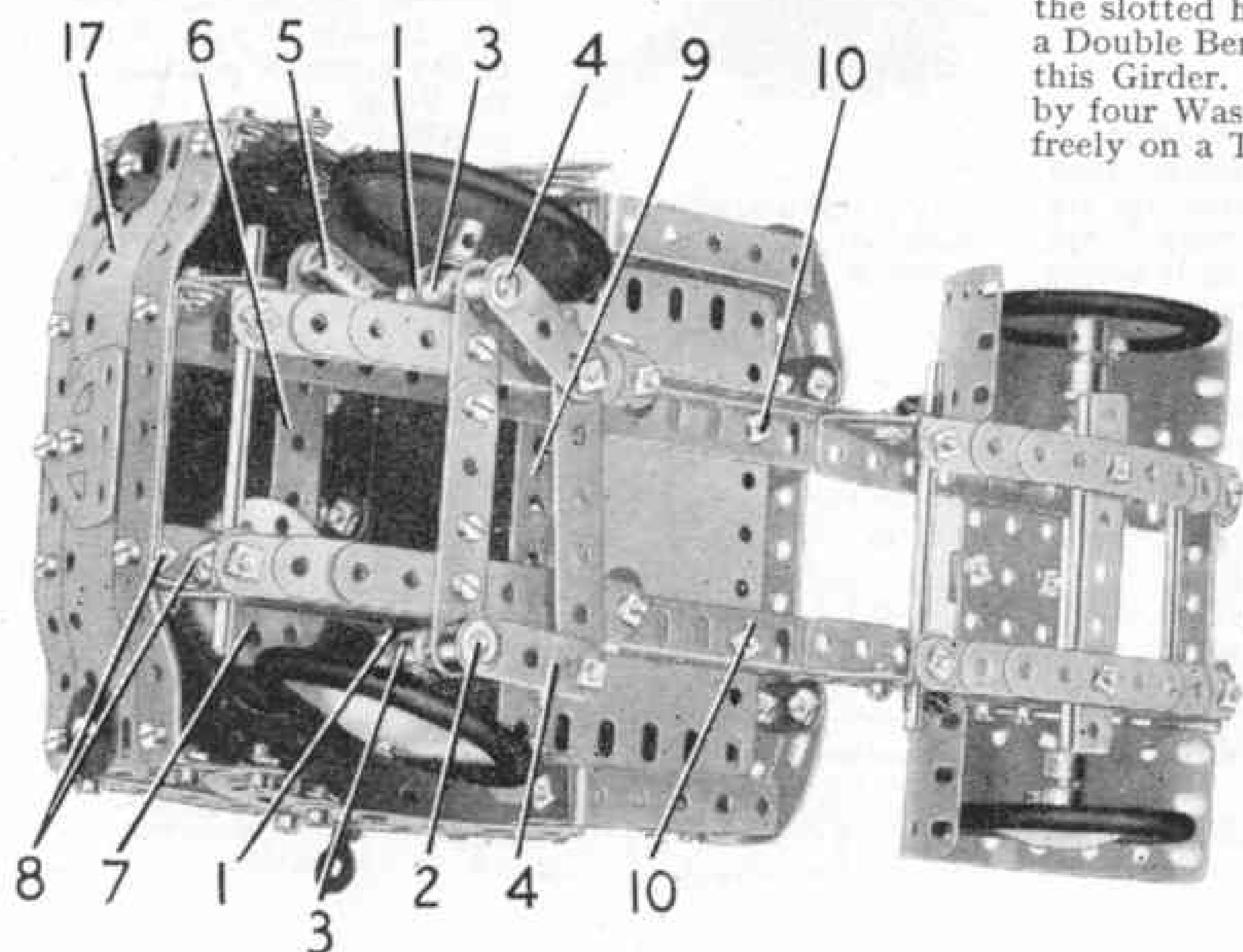


Fig. 2. This underneath view of the lorry shows details of the springs and the steering mechanism.

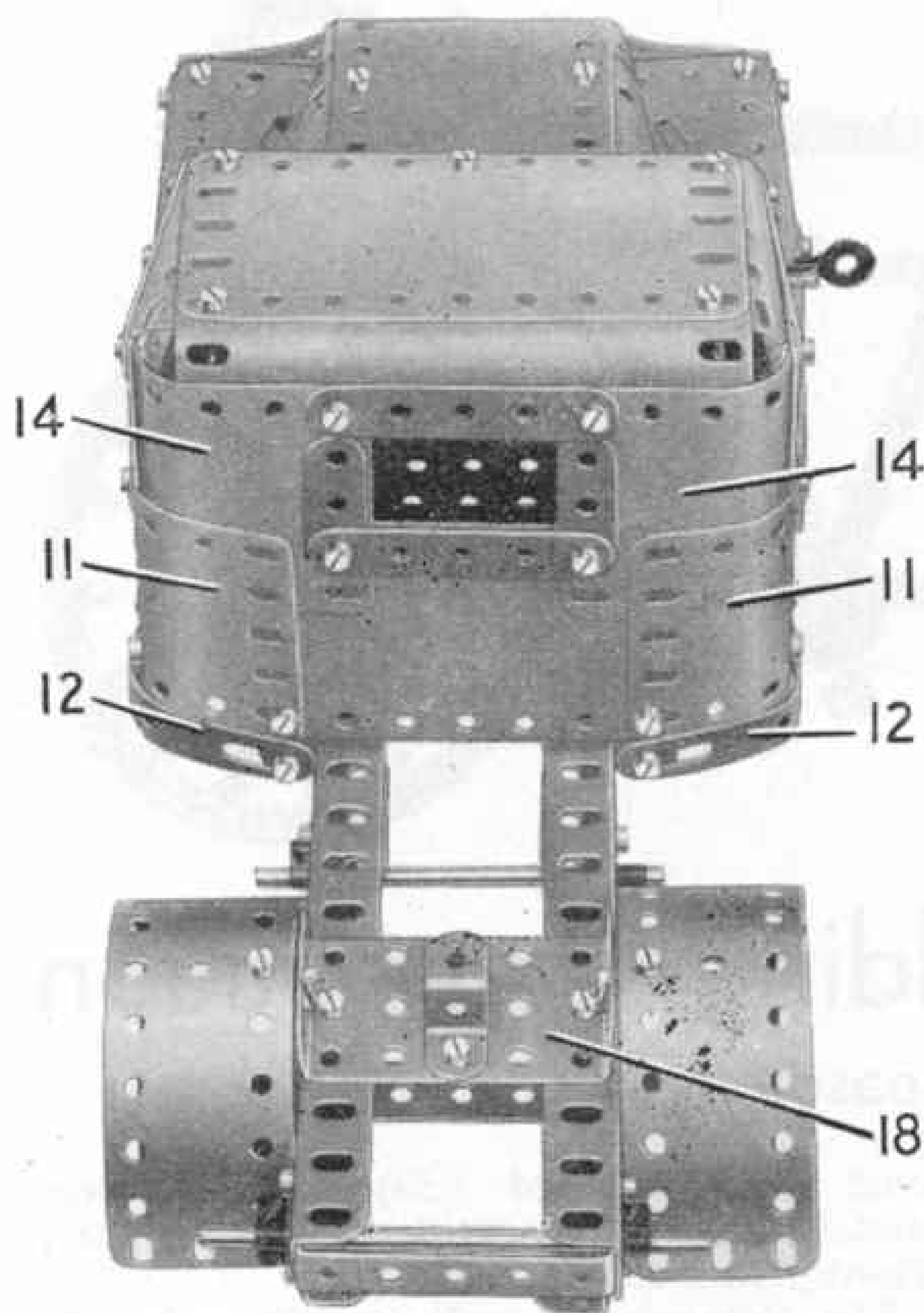


Fig. 3. A semi-plan view of the lorry revealing details of the cab plating.

and a Formed Slotted Strip 12. The upper edge of each side is strengthened by a $3\frac{1}{2}$ " Strip, and a $4\frac{1}{2}$ " \times $\frac{1}{2}$ " Double Angle Strip 13 is bolted between the front ends of these Strips on each side.

The back of the cab is made by bolting a $4\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate between the ends of the Plates 11, and curved $2\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plates 14 above each of these Plates. The rear window is edged by $2\frac{1}{2}$ " and $1\frac{1}{2}$ " Strips as shown in Fig. 3. Each side window consists of a 2" and two $2\frac{1}{2}$ " Strips arranged as shown. The roof consists of two $4\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plates, curved and overlapped three holes, with a curved $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plate on each side. It is bolted to the back of the cab and is connected to the front corners of the window frames by $1"$ \times $\frac{1}{2}"$ Angle Brackets. The centre division of the windscreen is a $1\frac{1}{2}"$ Strip bolted to Obtuse Angle Brackets.

The steering column can now be fitted. It is supported in a Flat Trunnion bolted to Double Angle Strip 13 and in the $1"$ \times $1"$ Angle Bracket mentioned previously. A $\frac{1}{2}"$ Pinion on the lower end of the steering column engages the Contrate 7, and a Collar is used to hold the column in position.

The top of the bonnet is a curved $4\frac{1}{2}"$ \times $2\frac{1}{2}"$ Flexible Plate with a $1\frac{1}{8}"$ radius Curved Plate 15 and a $2\frac{1}{2}"$ \times $1\frac{1}{2}"$ Triangular Flexible Plate 16 on each side. The Flexible Plate is attached to Double Angle Strip 13 by an Angle Bracket, and is

bolted to a plate 17 fixed to the front of the chassis. Plate 17 consists of two $5\frac{1}{2}"$ \times $1\frac{1}{2}"$ Flexible Plates curved and overlapped as shown and strengthened by a $5\frac{1}{2}"$ Strip. The side of each front mudguard is made from a $2\frac{1}{2}"$ \times $2"$ Triangular Flexible Plate, a $2\frac{1}{2}"$ Strip and three $2\frac{1}{2}"$ Stepped Curved Strips. These are joined together by Fishplates as shown in Fig. 1 and are connected by Angle Brackets to the plate 17. The top of each mudguard consists of a $3\frac{1}{2}"$ \times $1\frac{1}{2}"$ Triangular Flexible Plate and a Formed Slotted Strip. The $3\frac{1}{2}"$ \times $1\frac{1}{2}"$ Triangular Flexible Plate is attached to the side of the mudguard by Angle Brackets, and the Formed Slotted Strip and one of the Curved Strips are bolted to a Double Bracket fixed to the lower front corner of the cab side. The step is a $2\frac{1}{2}"$ \times $\frac{1}{2}"$ Double Angle Strip, and it also is bolted to the Double Bracket.

A $2\frac{1}{2}"$ \times $1\frac{1}{2}"$ Flanged Plate 18 is bolted to the chassis and a Double Bent Strip fixed to it forms the pivot for the trailer coupling. The $5\frac{1}{2}"$ \times $1\frac{1}{2}"$ Flexible Plates forming the rear mudguards are supported by $1"$ \times $1"$ Angle Brackets.

The tank is made by bolting six curved $5\frac{1}{2}"$ \times $2\frac{1}{2}"$ Flexible Plates to each side of a $12\frac{1}{2}"$ \times $2\frac{1}{2}"$ Strip Plate. Two T-section girders 19, each made from two $12\frac{1}{2}"$ and two $5\frac{1}{2}"$ Angle Girders, are bolted to the Flexible Plates on each side (Fig. 4) and these girders are connected at the centre and at the rear by $2\frac{1}{2}"$ \times $\frac{1}{2}"$ Double Angle Strips. The joins between the Plates are strengthened on the inside by $12\frac{1}{2}"$ and $5\frac{1}{2}"$ Strips. A catwalk 20 is formed by a $12\frac{1}{2}"$ Strip supported by Obtuse Angle Brackets. Two of the filler caps are $1\frac{1}{8}"$ Flanged Wheels fixed on Pivot Bolts passed through the centre holes of $2\frac{1}{2}"$ Strips bolted to the top of the tank. The third cap is fixed on a $\frac{3}{4}"$ Bolt passed through a $2\frac{1}{2}"$ Stepped Curved Strip.

The front end of the tank consists of a $2\frac{1}{2}"$ \times $2\frac{1}{2}"$ Flexible Plate and two Face Plates, and is attached to Angle Brackets. The two lower bolts used for this purpose are passed through the Angle Brackets first and are fixed in them by nuts. The Plates forming the end can then be swung over the bolts and held by further nuts. The rear end of the tank is similar except that Semi-Circular Plates are used instead of Face Plates.

A platform 21 on each side of the tank is made by bolting two $12\frac{1}{2}"$ and two $5\frac{1}{2}"$ Strips to a $1\frac{1}{2}"$ Strip and a Flat Trunnion fixed to the girder 19, and a ladder, formed by Cord laced between two $2\frac{1}{2}"$ \times $\frac{1}{2}"$ Double Angle Strips, is arranged between the platform and the catwalk on one side.

The trailer wheels are fixed on a 5" Rod mounted in Double Brackets bolted to two leaf springs. Each of these springs is made and is mounted in the same way as the rear springs of the lorry described previously.

The trailer coupling is a $1\frac{1}{2}"$ Rod 22 held in a 3" Pulley bolted to $\frac{1}{2}"$ Reversed (Continued on page 518)

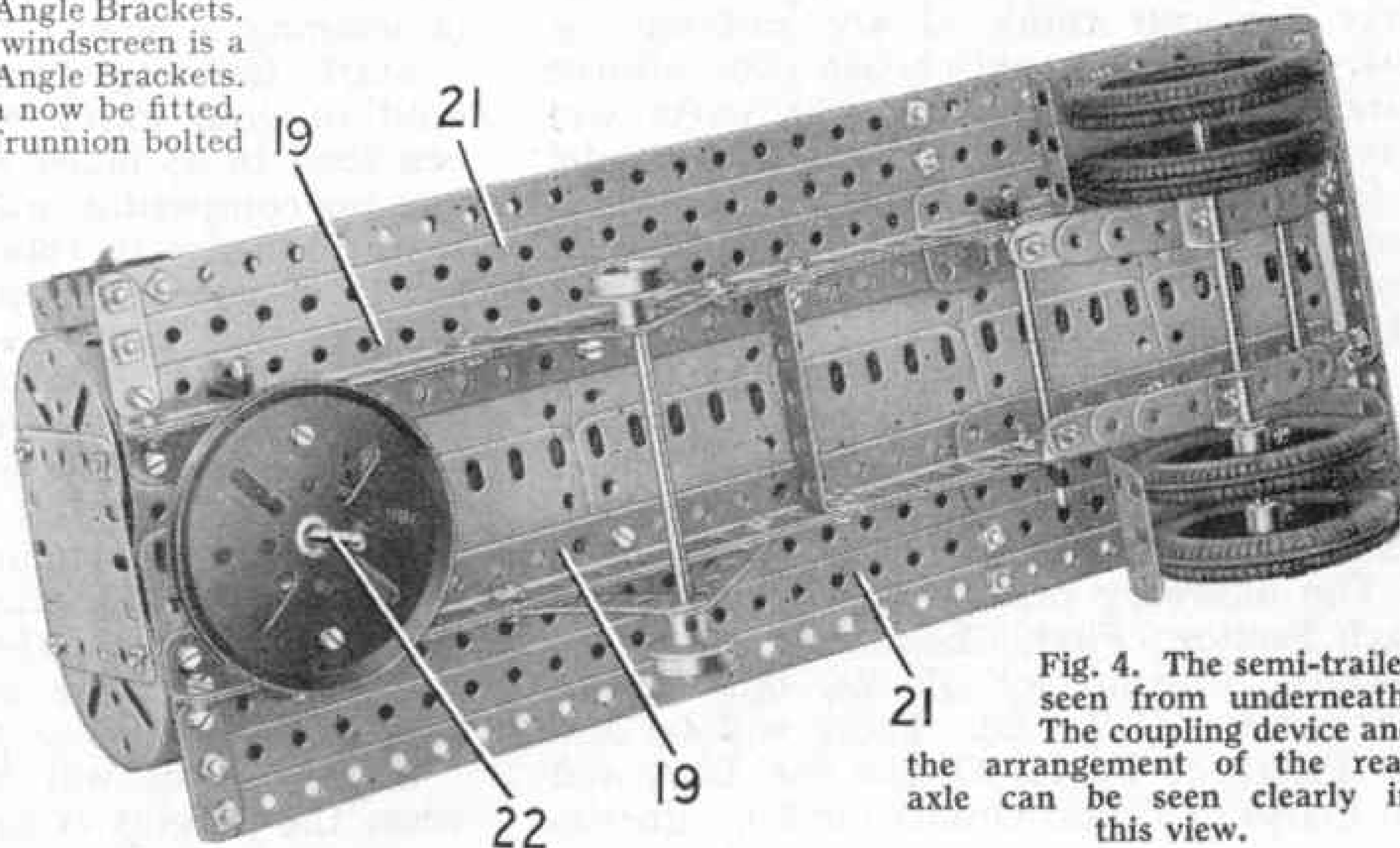
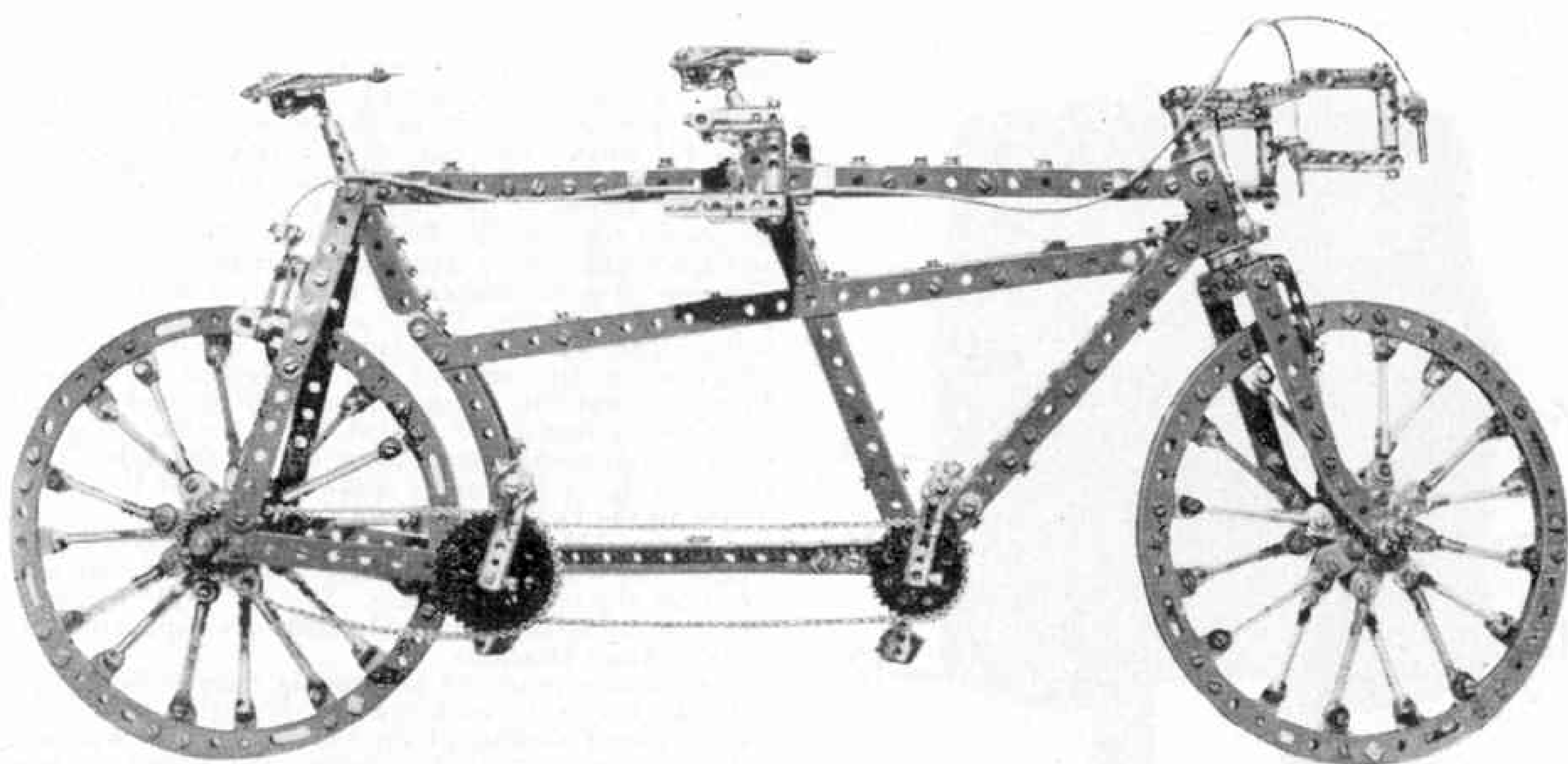


Fig. 4. The semi-trailer seen from underneath. The coupling device and the arrangement of the rear axle can be seen clearly in this view.



Meccano Model-Building Competition

Start the New Season Now!

TO start the new model-building season off with a real swing we are arranging another of the always popular general competitions that give every Meccano owner the chance of winning a useful cash prize no matter what his age or the size of his Outfit. The Contest is open to all readers, wherever they may live.

The rules in this type of contest are very simple, as there are no restrictions on the number of parts that can be used or on the subjects to be modelled. Cranes, vehicles, bridges, ships, aeroplanes or anything else likely that you can think of are suitable for entry, but you should choose your subject carefully bearing in mind the parts you have available. It is far better to model a small vehicle really well than to try to build a huge crane that is unsteady or flimsy in appearance owing to the lack of suitable parts.

The Competition will be divided into two Sections as follows: A, for competitors under 12 years of age on 30th November next, and B, for model-builders who are 12 years or over on that date.

The following prizes will be awarded in each Section: First, Cheque for £4 4s. 0d. Second: Cheque for £2 2s. 0d. Third: Cheque for £1 1s. 0d. There will be also 10 Prizes of Postal Orders for 10/- and 10 Prizes of Postal Orders for 5/-. Entries

must be addressed "*September General Model-Building Competition, Meccano Ltd., Binns Road, Liverpool 13.*"

The Competition will remain open for entries until 30th November, 1955, and entries received after that date will not be eligible.

The judges will take into account each competitor's age when judging his work, and small models will stand just as good a chance of success as large and complicated ones, provided they are realistic, neat and sturdily built. Each competitor, therefore, will have a fair chance

This realistic tandem racing bicycle won a prize in the March Competition for H. J. Halliday, London S.E.15.

of winning a prize.

Start building your model now and send in your entry without delay. You can send in as many entries as you wish, but no competitor will be awarded more than one prize in this Contest.

Don't send the actual model. A good drawing, or better still, a clear sharp photograph of your model, is all that is required, together with a few notes on any points of special interest. The drawings or photographs need not be your own work, but the model itself must be the result of your own unaided efforts. Now for a very important point—*make sure your age, name and full address are written clearly on the back of each sketch or photograph you send.*

Prize-winners will be notified by post when the judging is completed.

Meccano Competition Results

By "Spanner"

"March" General Model-Building Contest

THE full lists of Prizewinners in the two Sections of the March General Model-Building Competition are as follows. All the prizewinners have already been notified personally.

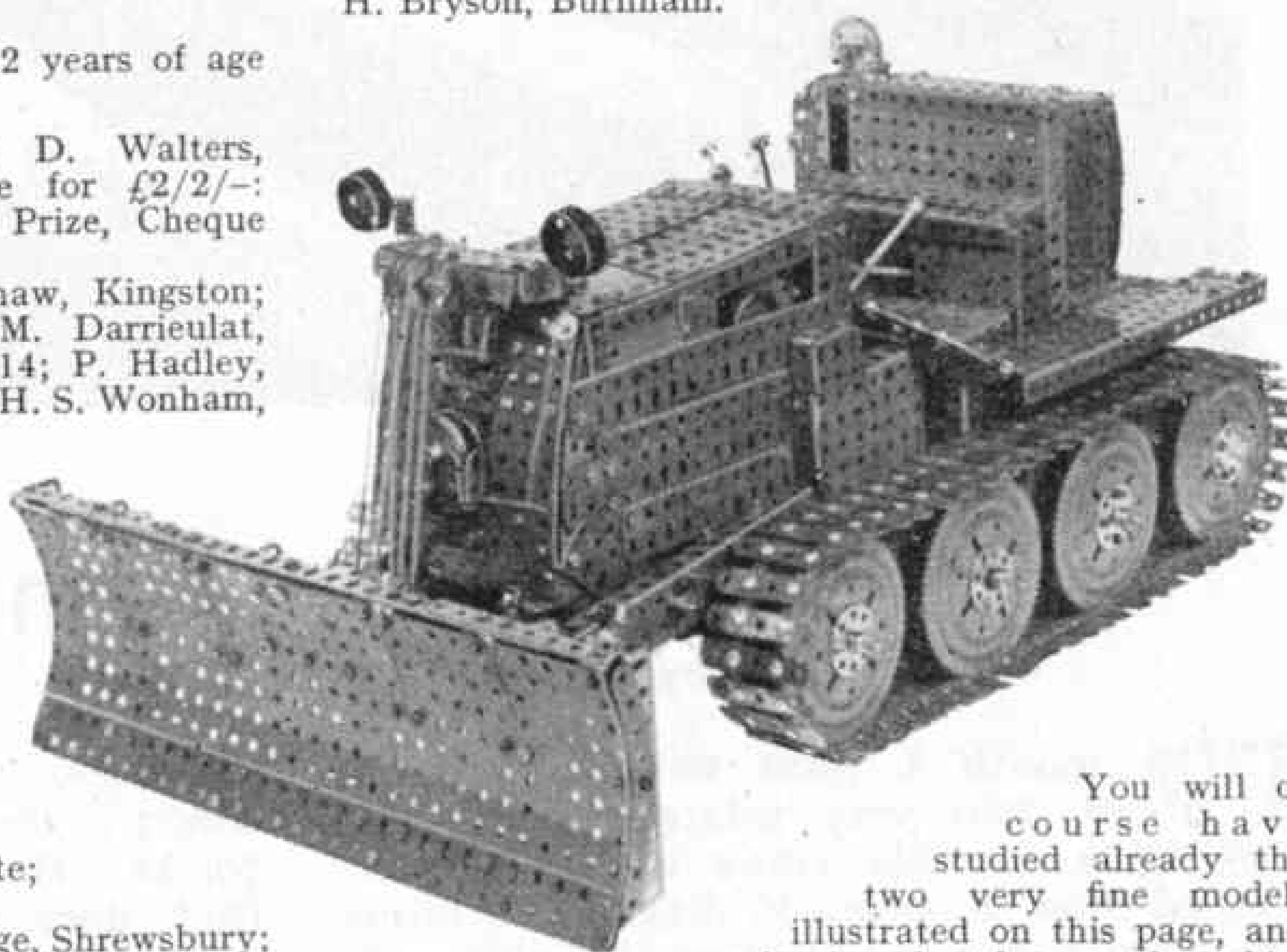
Section "A" (for competitors under 12 years of age on 31st May, 1955)

First Prize, Cheque for £4/4/-: D. Walters, Buckfastleigh. Second Prize, Cheque for £2/2/-: M. S. Welburn, Birmingham. Third Prize, Cheque for £1/1/-: M. Harris, London S.E.10.

Ten Prizes each of 10/6: M. Earnshaw, Kingston; R. G. Matthews, Sutton Coldfield; M. Darrieulat, Shepperton; D. G. Ainger, London N.14; P. Hadley, Lossiemouth; R. Farnsworth, Sheffield; H. S. Wonham,

D. Holland, Conisborough; L. Cooper, Oxford; B. Lester, Salisbury; G. W. A. Fogarty, Portadown; B. Sammons, Sanderstead; J. Spencer, Corsham; H. Bryson, Burnham.

A front cable dozer, based on a Vickers type machine. It won a First Prize (Section B) in the March General Model-Building Competition, for David Bretten, King's Lynn.



Eden Bridge; J. Penwill, Bournemouth; J. Laughton, Harrogate; H. Collins, Keynshaw.

Ten Prizes each of 5/-: D. G. Loveridge, Shrewsbury; R. P. Bainbridge, Belfast; T. Yates, Berkhamsted; C. H. Rose, Banstead; J. M. Loveridge, Shrewsbury; A. Hood, Woodford Green; F. W. Taylor, Manchester; S. Elliott, Yetholm; P. S. Gregory, Stockton-on-Tees; I. King, London N.4.

Section "B" (for competitors over 12 years of age on 31st May, 1955)

First Prize, Cheque for £4/4/-: D. Bretten, King's Lynn; Second Prize, Cheque for £2/2/-: E. H. Chandler, Stratford-on-Avon; Third Prize, Cheque for £1/1/-: P. Childerstone, Aldreth.

Ten Prizes each of 10/6: H. J. Halliday, London S.E.15; S. Bossi, Torino, Italy; F. G. Glass, Warlingham; R. Boundy, Linwood, S.E.1, New Zealand; P. J. Thomason, Winsford; D. C. Mead, Kidsgrove; J. Manduca, Balluta, Malta; K. P. Birch, Macclesfield; W. A. Clough, Newport; B. W. Rowe, Newton Abbot.

Ten Prizes each of 5/-: K. W. Newson, Sidcup; B. Evans, Blackheath; D. Moffat, Carrickmacross;

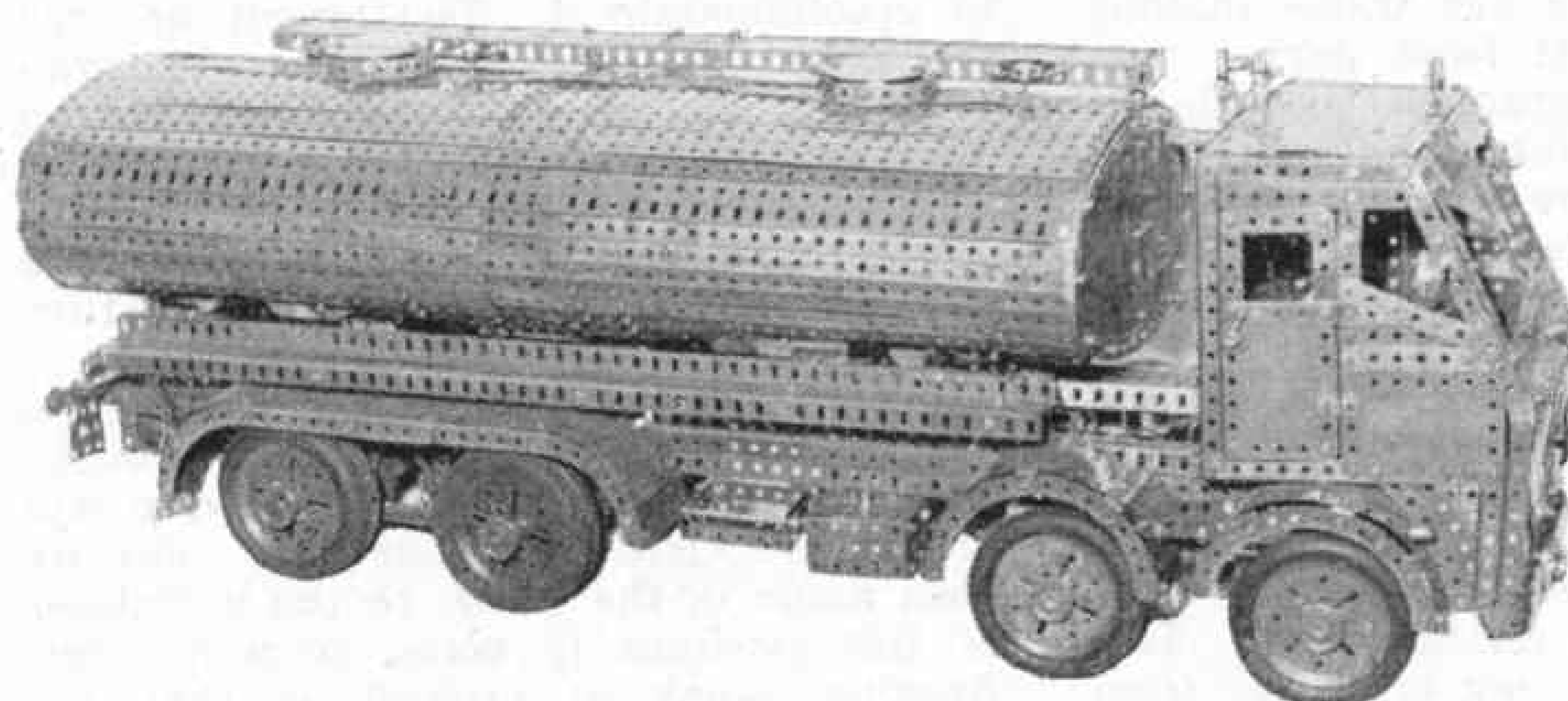
won for their builders the First and Second Prizes in Section B respectively. First I want to say a few words about the dozer built by David Bretten, which carried off the First Prize. It is based on a Vickers type machine, which it follows very closely in its main features and outlines. It is powered by an E20R type Electric Motor, which transmits its drive through a clutch and gear-box equipped with three forward and three speeds in reverse. The drive is then taken to the rear driving sprockets by steering clutches and brakes.

The model is fitted with a power take-off for driving auxiliary equipment, and the creeper tracks are made up with 2½" Strips, each being attached to Sprocket Chain by two paper clips. Adjustment is provided for setting the dozer blade at different angles.

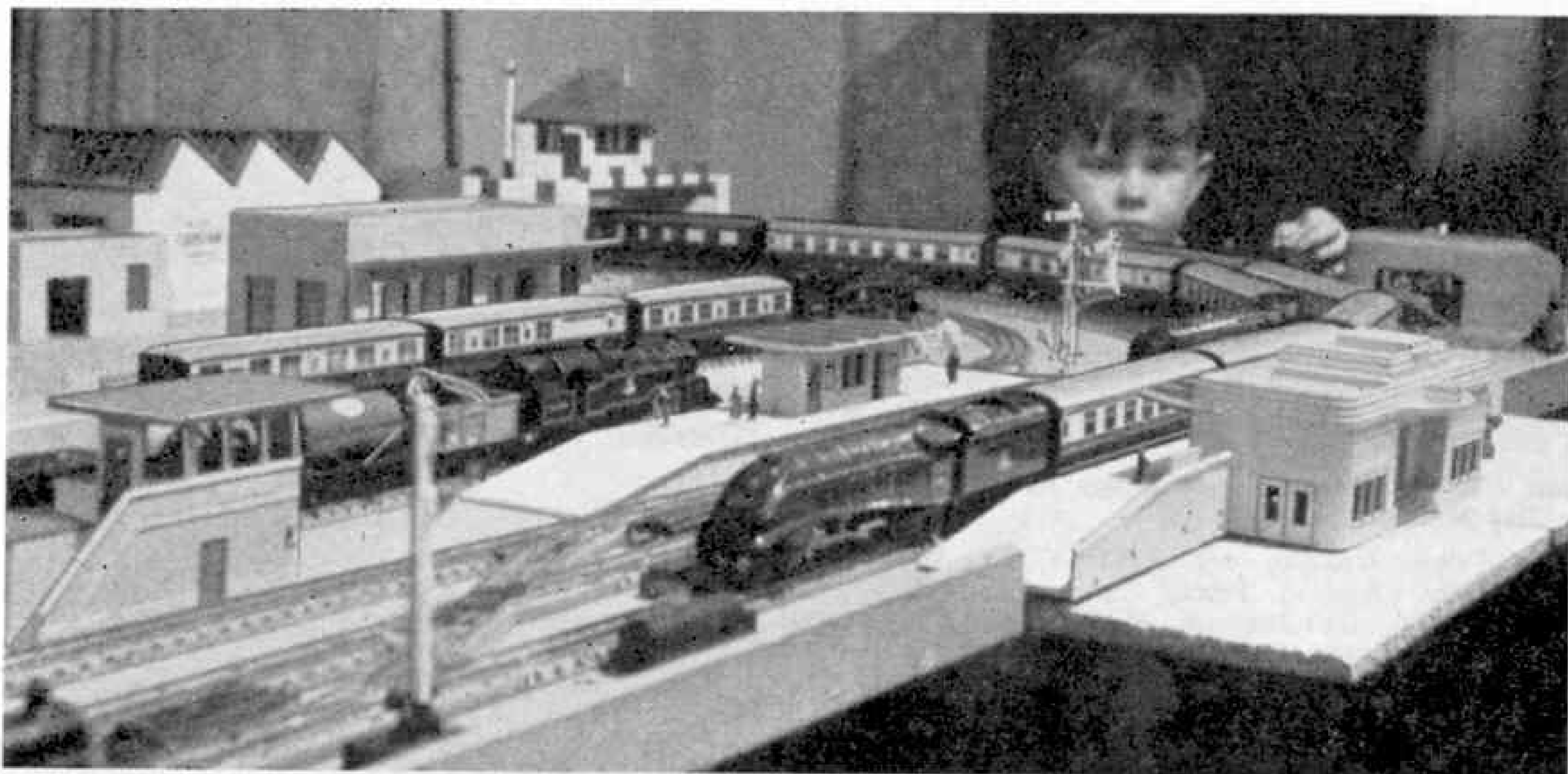
Mr. E. H. Chandler, Stratford-on-Avon, also based his model on an actual machine, the chassis of his Tank Lorry being a representation of a Leyland

"Octopus". It is equipped with a 3,200 gallon double compartment lubricating oil tank. The model is built to a scale of 1½ in. to 1 ft.

A fire engine and a traction engine built by D. Walters, won for him First Prize in Section A.



This fine model of a Tank Lorry won Second Prize (Section B) in the March Competition, for E. H. Chandler, Stratford-on-Avon.



HORNBY RAILWAY COMPANY

By the Secretary

Family Lines

THIS month I want to talk to you about two very interesting layouts that have recently come to my notice. One of them is shown in diagram form on the next page and you will see that although the system looks fairly complicated, it really is not so. This particular railway has been built up during the last year or so. It was begun originally by Mr. N. H. Murden, of Hull, for the benefit of his son, but, as frequently happens, Father became more and more interested! The result has been that the layout has made very good progress in a comparatively short space of time.

A great point about the system is the ease with which continuous running can be carried out. Most of us, I think, like to have our trains making long through runs, at least during part of the operating programme, and this is just the sort of layout on which it can be done. Between the usual up and down main lines that traverse the whole distance round the layout, there is a third track that is kept for fast traffic only.

This arrangement means that there must be fairly complete systems of Points and Crossings to enable trains to move freely from one track to the other as required and this condition is well met on the layout, except for one point. This is that there is no facing crossover from

the outer main line to the fast track, which is the middle one of the three main tracks. But there is a long outer loop, that goes almost half way round the system, that gives a useful alternative run, or on which a train can be held for the time being.

The system is assembled on a board 9 ft. long and 4 ft. 6 in. wide, and this is arranged on three sets of trestle supports. Special attention has been given to the building of a really adequate base for

the railway, with the result that the track is beautifully level and trains are able to take the fullest advantage of the running possibilities afforded. At the same time the board is portable

and can be set up wherever there is space to accommodate it. The layout has the necessary station and other railway buildings, such as an engine shed, but so far it has not been possible to incorporate lineside effects to any great extent. No doubt this will form the subject of further developments, because no miniature railway system is ever really finished.

It is interesting to note that the control position is at one end of the layout board rather than at one side of it and you will remember that reference has already been made in the *M.M.* to the usefulness of this position in some circumstances. Another point of interest is that the

Above David Warnes seems intently occupied in the task of running the trains on the Hornby-Dublo layout of Mr. N. H. Murden, Hull, but is evidently enjoying himself.

continuous nature of the line has proved of very great value when the railway has been on exhibition work. I have no doubt that it has proved a very great attraction on these occasions and that it has been the means of adding still further enthusiasts to the Hornby-Dublo ranks. It certainly seems to appeal strongly to David Warnes, the youthful enthusiast whom you see busily working the trains in one of the accompanying pictures.

For smooth working under exhibition conditions, the provision of sufficient siding space for rolling stock not in use is important and this layout is particularly well provided for in this respect. Another good point is the accessibility of the engine shed from the inner and middle tracks.

Another railway of the baseboard type and one which can be stowed away when not actually in use is that shown in the lower illustration here. This belongs to Mr. J. Lawton, of Manchester, who jokingly tells me that his sons Andrew and Robert are the real Directors of the concern and that he himself carries out the bulk of the work in order to put their schemes into operation.

This joint Lawton railway is arranged as a double oval track on a baseboard measuring 6 ft. by 4 ft. The tracks are connected by crossover points and each main track forms a separate circuit. Even so, it is quite simple to cross a train from one track to the other, because the

isolating arrangements have been carefully planned to make this possible. There is a definite routine laid down when such movements are to be made and this is always followed, so that there can be no

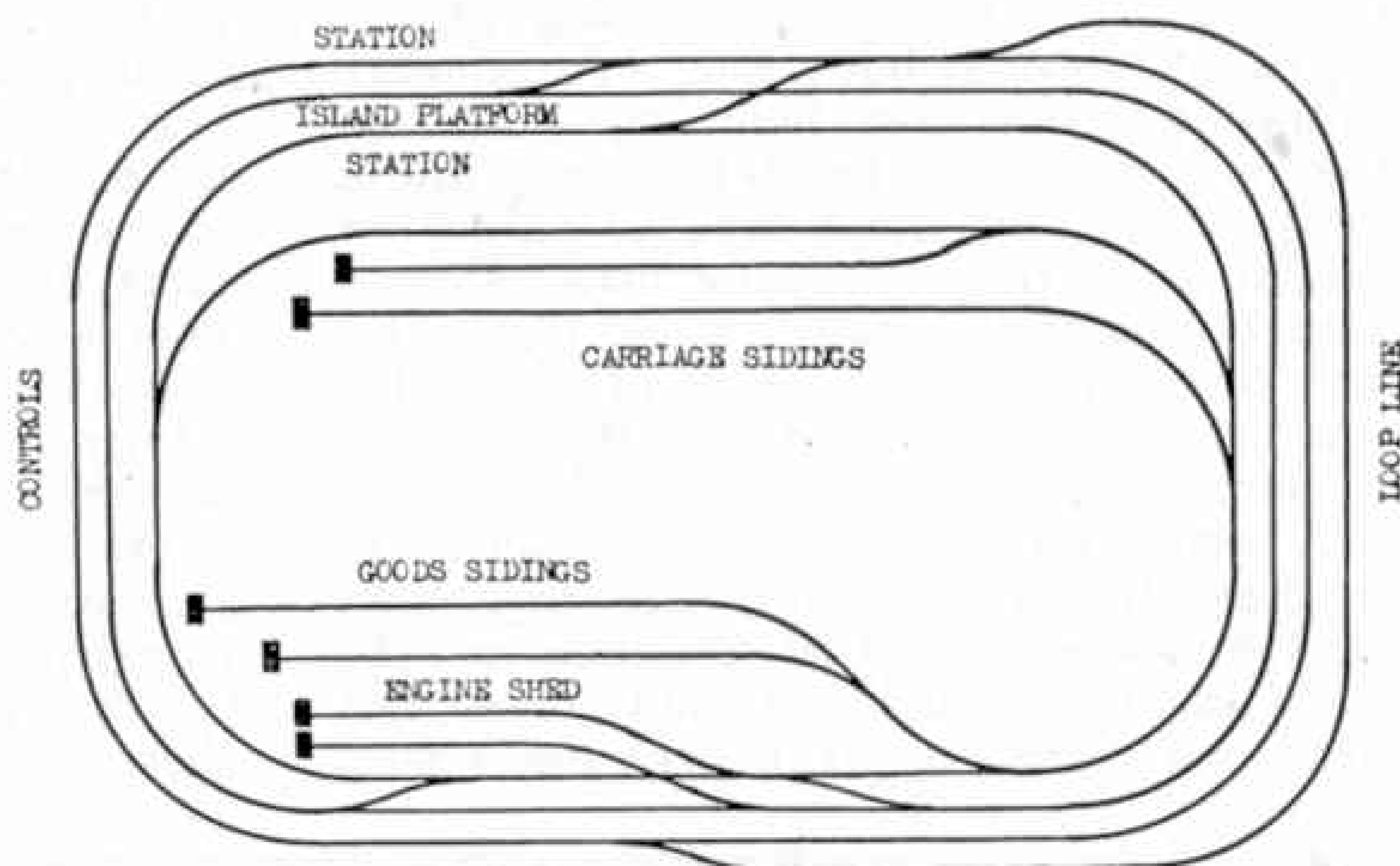
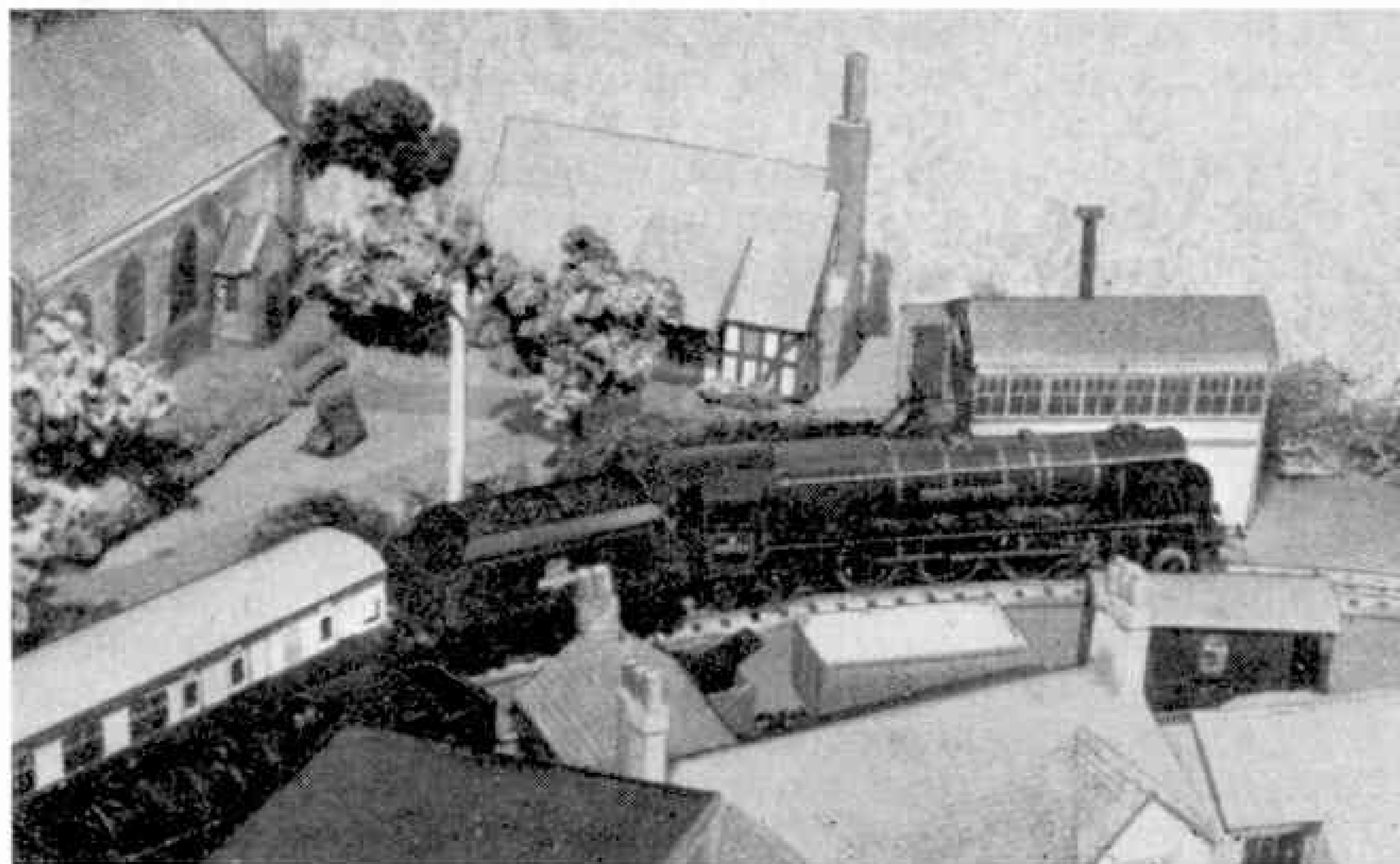


Diagram of the layout of Mr. N. H. Murden described in these pages.

slip-up in operations.

The railway serves the town of *Hornborough*. Like many real places, this has developed considerably since the coming of the railway. In addition to the railway buildings there are houses, shops, a fire station, garage and factory premises lining *Station Road* and *Railway Street*, these being laid out inside the main oval of the track. Access to the "outside" of the line is gained by means of a level crossing, while pedestrians have the additional advantage of a footbridge. An "old world" corner is provided by a miniature church and near to it, appropriately, are several Elizabethan buildings. Then these give way to modern

industrial requirements in the shape of a factory building, which is very useful here as cover for the electrical control equipment by which the railway is operated. So the lineside features are varied and effective.



An interesting corner on the Hornby-Dublo system of Mr. J. Lawton, of Audenshaw, Manchester. Particular attention is given to lineside effects.

Working Your Trains

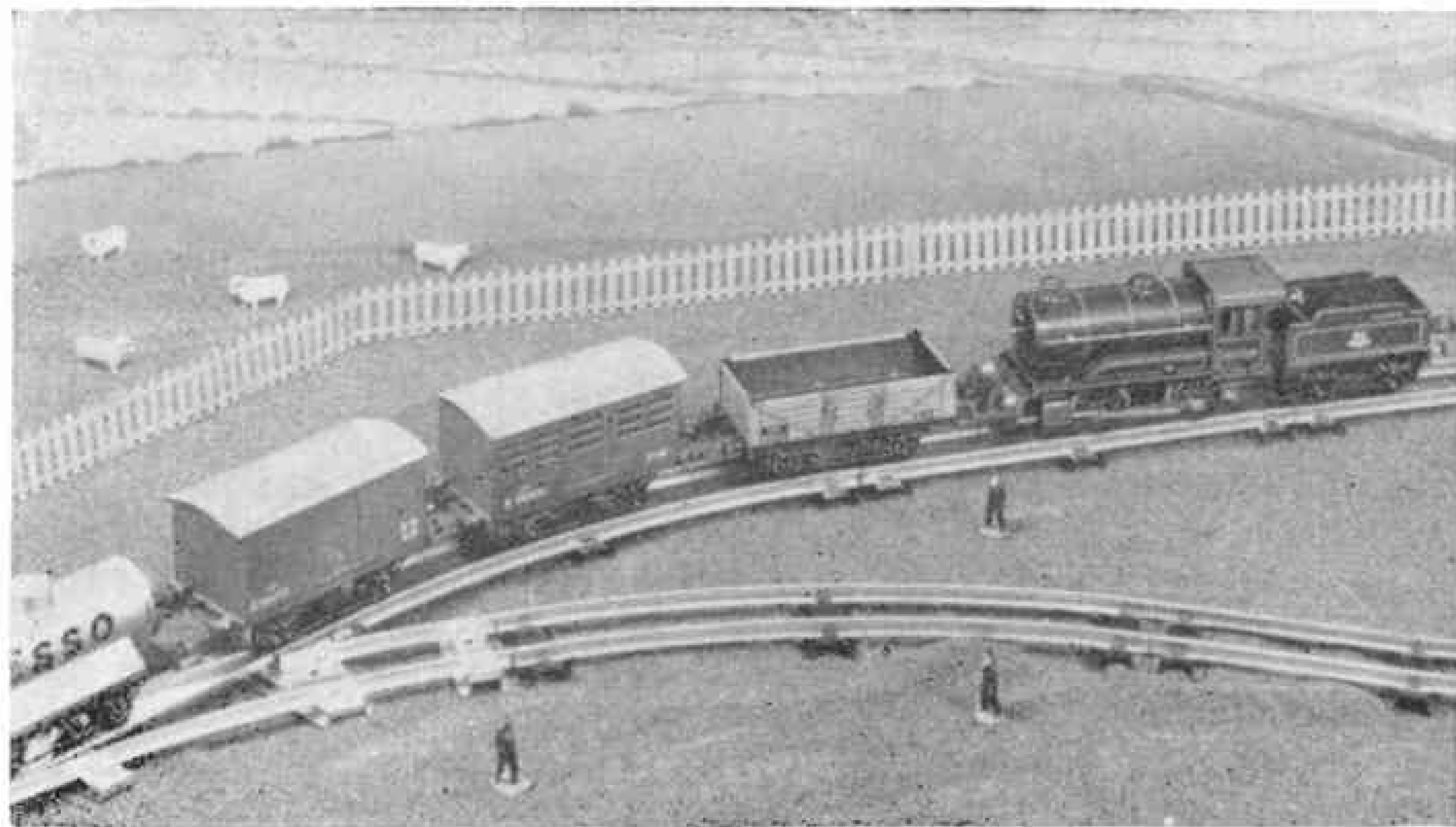
PROBABLY many of you who are Hornby owners have noted interesting features of real railway working in the course of recent holiday journeys, or when simply watching the busy rail traffic of the past month or two. It goes without saying that you would like to carry out similar operations on your own railway. Every miniature railwayman does this and there is no better way of increasing the fun and variety of Hornby railway working.

A point that always strikes the onlooker is that the best possible use is almost always made in actual practice of the track layout at any particular place, and the track indeed is planned to make sure

interesting and useful loops and sidings. Through running on the main line is easily possible, and the presence of the loops makes quite easy the crossing of trains that are heading in opposite directions. Loops also make it possible for one train to be held while another going in the same direction is allowed to overtake it. This is the kind of working that can often be seen on real railways. There are several sidings, so that goods trains can be worked correctly from station to station.

The effectiveness of the layout is greatly increased by the right use of the standard Hornby Accessories, such as Stations, Goods Platforms and so on. Then, too, there are some home-built scenic features,

such as hills and tunnels, while a miniature roadway makes its way along the centre of the



A Hornby No. 50 Locomotive runs tender first on a mixed freight train. Points and a siding are in the foreground.

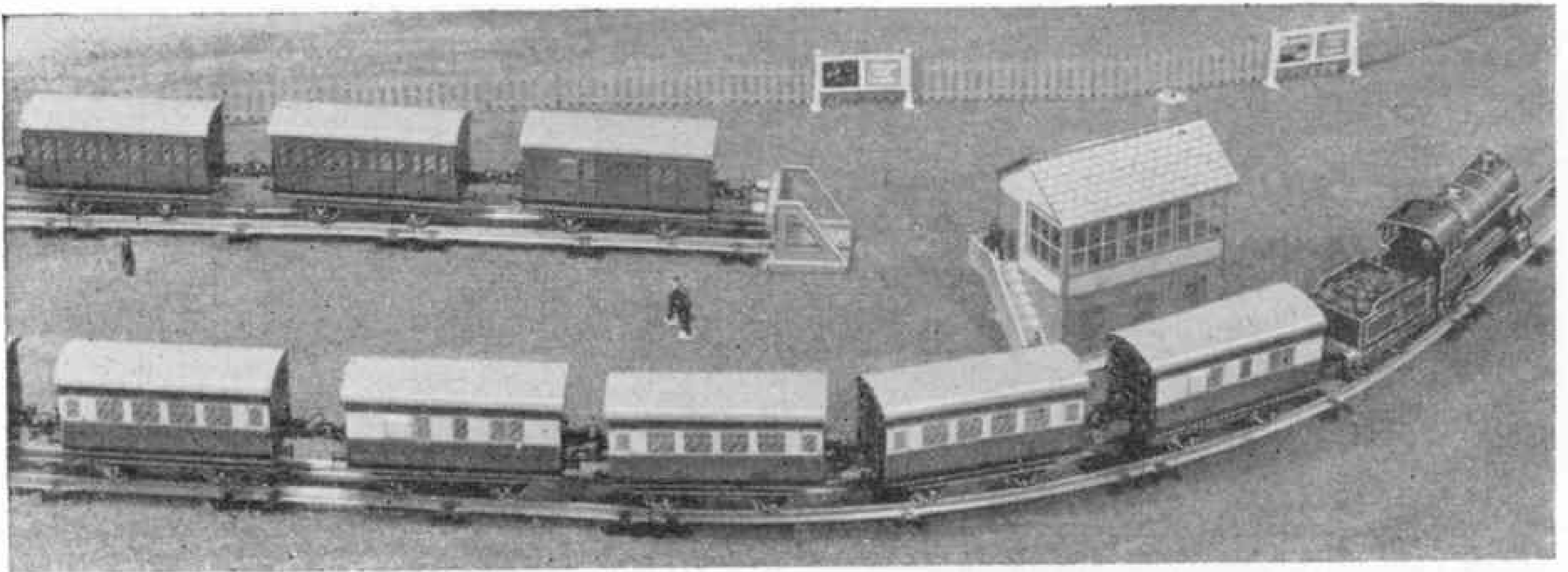
that it can be fully used. It is just as important to have good track arrangements on a Hornby layout as it is on real railways. That is why we must realise what Points and Crossings can do for us, and to understand how the other components fit in with them. When building up their layouts Hornby owners acquire plenty of experience with the various rail components and use this to arrange and try out different schemes.

Here is a typical instance of good track development overseas. The lower illustration on the next page shows a layout that has been built up by Mr. T. Raman, of Madras. Plenty of space was available for this enthusiastic and able Hornby Train owner, and that, as you all know, is a very big advantage. The main line itself is continuous, but it has several

these, paper and card have been employed and the variety and style of these structures gives a very appropriate local touch to the miniature railway scene.

Good use is made of the standard Dinky Toys miniature figures of railwaymen and passengers on the railway, but elsewhere the civilian population is well represented by realistic figures apparently of local workmanship. These add "local colour" and make a welcome change from the somewhat standardised and rather stolid types one is accustomed to meet on many miniature railway systems.

In the course of our train working, whether we are operating special holiday traffic or not, frequent coupling and uncoupling is necessary. This reminds us that we must keep our couplings in good condition; otherwise difficulties may arise.



Heavy traffic gives this Hornby No. 51 Locomotive a respectable load of corridor-type stock.

Traffic requirements may call for the working of an engine either bunker or tender first, according to its type, and this usually means that we have to bring two different types of couplings together. The front end couplings on Hornby Locomotives—except the No. 20 and M.O. types, which have none—are always of the hook and link type. The standard Hornby rolling stock has automatic couplings incorporating a special coupling loop. This loop should always be placed over the hook of the link type coupling.

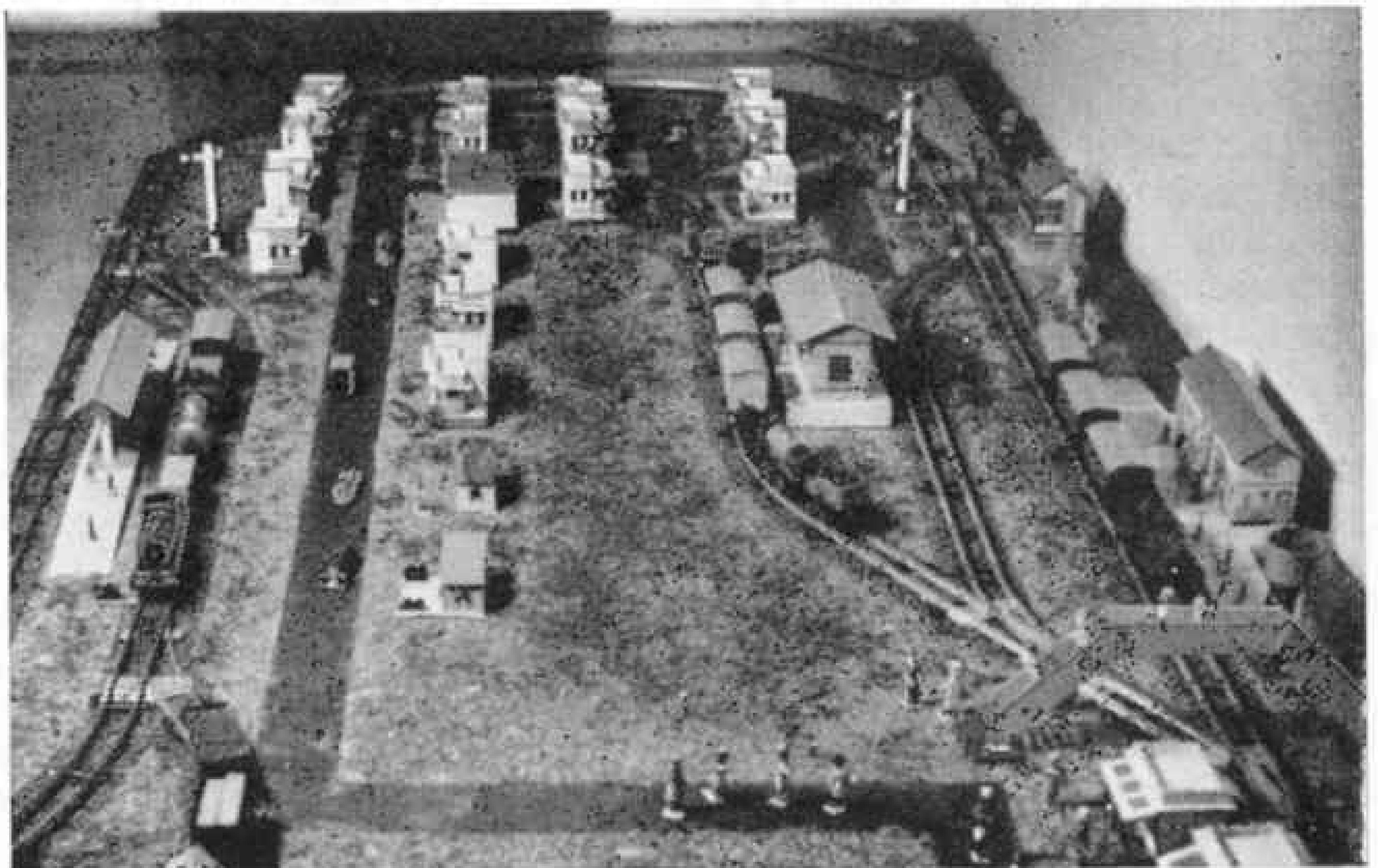
Our Tank Locomotives can spend practically half their time hauling trains in reverse, and similar working by tender types is not unknown in miniature. Our layout perhaps has no Turntable or any other means of turning an engine, so that we have necessarily to carry out a certain amount of tender first work; but that is good fun and has the advantage that we learn to manage our couplings properly and easily.

Efficiency in coupling and uncoupling is specially necessary when we have a long train of two or more parts bound for different destinations. It is fine and enjoyable to arrange working of this kind, and the complete train will look very smart behind one or even two No. 50 or 51 engines. If we follow this plan part of the train can be uncoupled at an intermediate stop, and

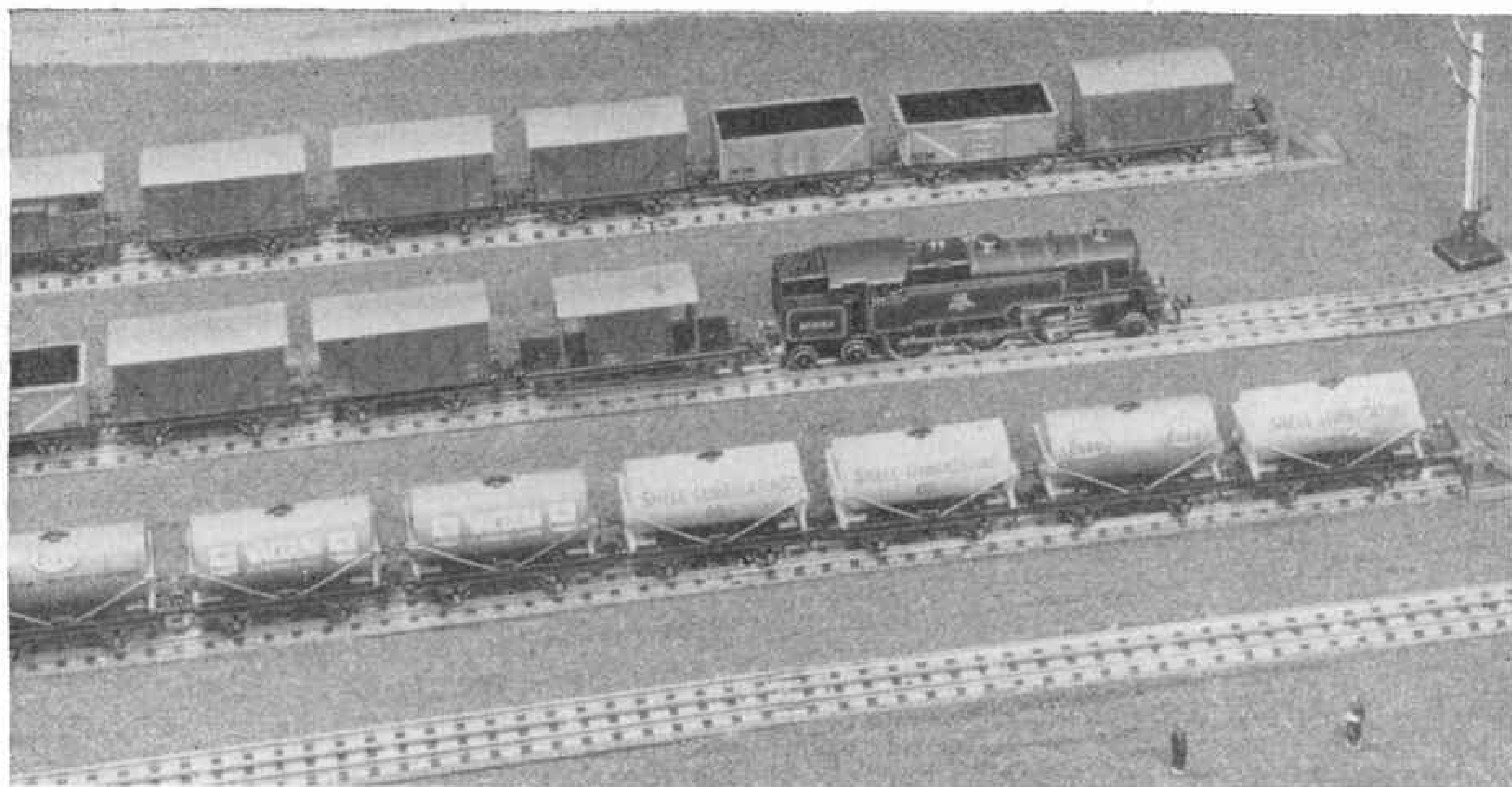
if there have been two engines in charge up to this point, one of them can perhaps be removed. The engine attached to the main part of the train can then move off, after which the detached one can back on to the second section.

If the layout permits it this second section naturally runs to a different destination from the first. If there is no branch line or alternative route, the imagination of the Hornby railway owner invariably overcomes such problems.

Don't forget that there should be a corresponding return service. In this the two parts of the train run independently at first and then they are combined at the junction point. The complete train then makes its way back to its original starting point. There is also the fun of shunting the train, so that engines and stock are right way about for the next run of this kind.



Part of the layout of Mr. Raman, an enthusiastic Hornby train owner, of Madras. Photograph by N. Vaman Bros., Madras.



IT has often been said that a miniature railway is only as good as its track. This does not mean the actual track layout, although the formation of the rails does have a considerable bearing on the success of the railway. Rather it is the general condition and alignment of the track that is referred to.

When we consider the matter for a moment we realise how true the opening statement is. It is not much good having an extensive main line with numerous and possibly complex junctions and so on, if the running of the trains over the layout is inclined to be uncertain or rough.

This point has been well taken into account in the design of Hornby-Dublo track, with its firm metal base, smooth running rails and positive connections. It is of course necessary to take care in laying the track in the first instance, and in keeping it in good order afterwards. Therefore we must pay careful attention to the surface on which our railway is to be laid. A good level area is required and therefore a table or prepared baseboard gives the best results.

Hornby-Dublo trains *can* be run on track laid on the floor, but all too frequently this scheme does not work out very well, either because the floor or its covering is uneven. Another point is that when

the railway runs over carpet the trains are always liable to pick up particles of fluff, and these inevitably find their way on to oily surfaces and into generally inaccessible spots.

In the illustration above a Hornby-Dublo 2-6-4 Tank Locomotive makes good progress with a train of vans. The siding in the foreground appears to be reserved for Tank Wagons.

A good firm base, then, is ideal and the usual arrangement nowadays is to prepare a well-constructed baseboard to carry the track. If this is made correctly with

sound bracing underneath it will overcome the level "bogey." We must of course make sure that the rails are properly connected, as is described in the instruction booklet packed with all Hornby-Dublo Locomotives and Train Sets, and we must

Talking of Track

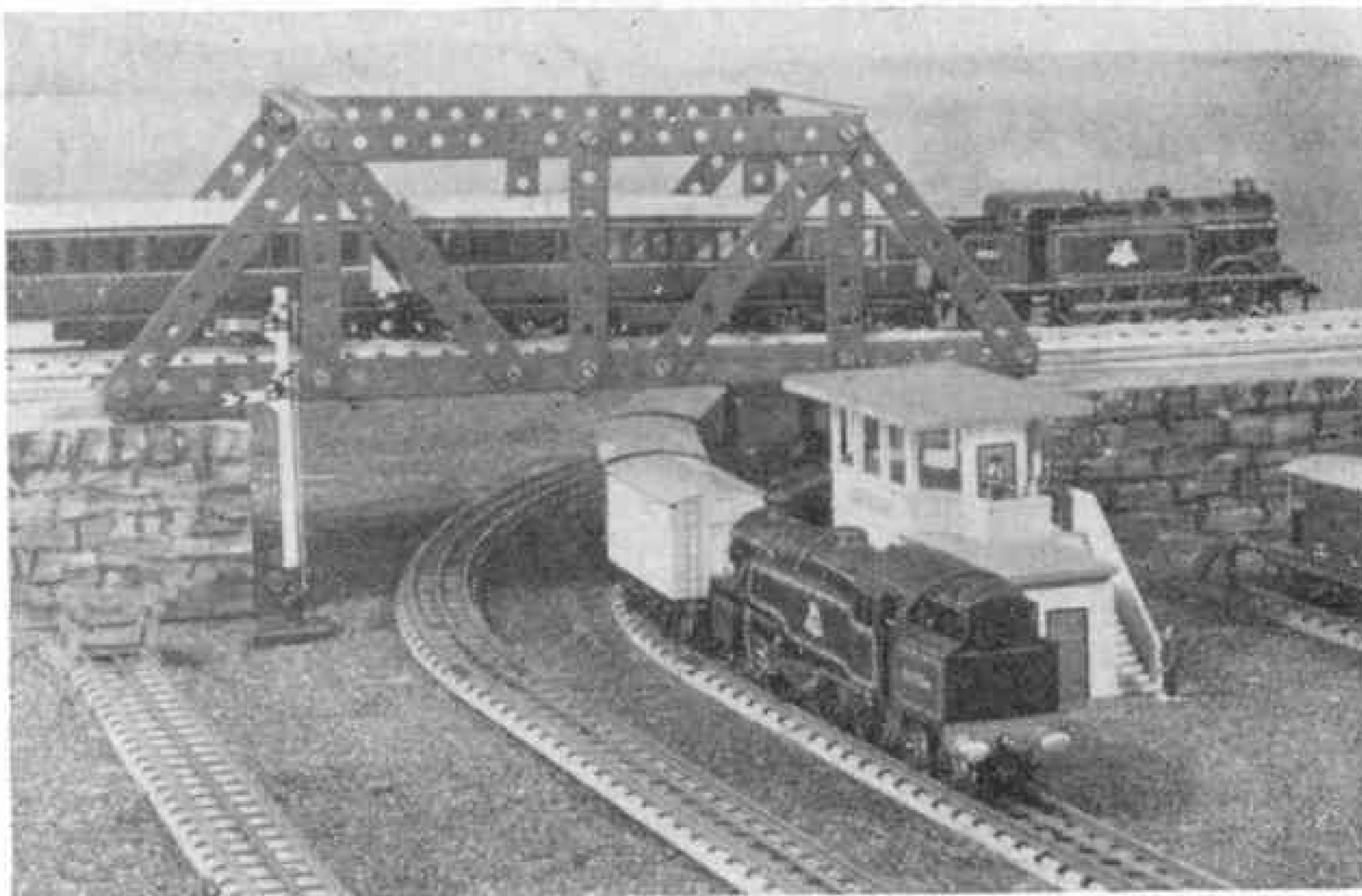
see that the alignment of the individual track pieces is satisfactory.

Straight track should be really straight and the curved sections should have a regular and symmetrical appearance. The practised Hornby-Dublo owner soon develops an eye for this kind of thing, but it does him no harm to be reminded of such items!

Having got the track correctly set and lined up, our next job is to secure it to the baseboard. The bases of Hornby-Dublo rails are pierced with holes so that the rails can be screwed to the baseboard, unless of course the whole thing has to be dismantled every time after use. It is useless to expect the screws to grip into the base, where this is wood or

composition board, unless pilot holes are made for them. A short pointed weapon that can be used like an ordinary bradawl is best for the purpose, and the "platelayer" soon gets to know just how far into the wood he should press the point. We must take care that the hole made in the base is right under the hole in the track, otherwise the screw will not go in straight.

Two-level working in Hornby-Dublo. An 0-6-2 Tank on a train of Suburban Coaches crosses a Meccano viaduct carrying its track over the lower line, on which a 2-6-4 Tank is approaching.

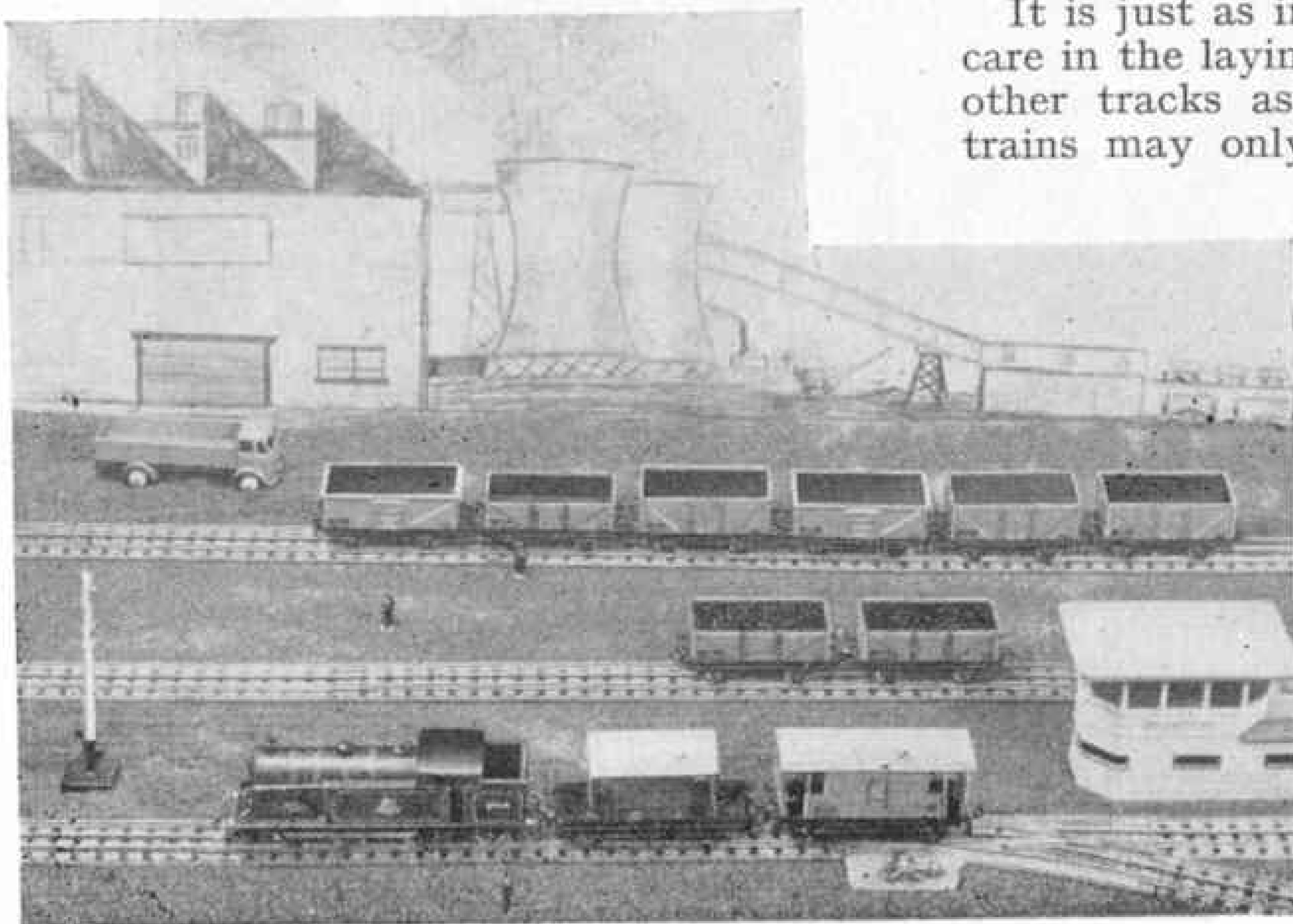


The right screws to use are those with round heads, No. 2 size, and $\frac{3}{8}$ in. or $\frac{1}{2}$ in. long, the latter for preference if a composition base is being used. The head of this type of screw has a flat surface underneath and when the screw is driven properly this flat surface will bear on the base of the track. If not, you will not get a proper contact between screw head and rail base and if the head of the screw is out of centre with the hole it may be liable to touch the live rail or to be brushed by a collector shoe as the engine goes by. In either case a short circuit, intermittent or partly so, will be the result, and it may take quite a bit of finding.

If this happens the screw has been driven too far and the rail base has been distorted. This can cause a slight tightening of the gauge of the rails, as you will realise that these tend to close in towards one another if the track base is unduly depressed in the centre. So you must make sure that the screwing down of the track is carried out carefully. Before giving the final turn to each screw, see that the rail concerned is nicely lined up with those adjacent. And when a series of three or four rails together has been finished, see that they form a nice straight stretch.

It is just as important to take as much care in the laying down of the sidings and other tracks as of the main lines. The trains may only travel slowly in sidings and loops, but it is nice to know that they will do so safely and surely as the result of careful work in putting down the rails. And you don't need to be told that Points and Crossings should receive specially careful attention.

A Hornby-Dublo 0-6-2 Tank with Brake Vans is on its way to begin a pick-up goods working. The background Power Station is well supplied with Hornby-Dublo Wagons.





Club and Branch News



WITH THE SECRETARY

LOOKING AHEAD

The exceptionally good summer this year has given members abundant opportunities to enjoy outdoor activities. There are still several weeks of summer ahead, but for the Club Leaders and Branch Chairmen it is already time to be considering the Autumn session that will begin a month hence. The drawing up of the programme for this term is one of the jobs of the Club or Branch Committee, but the schedule they plan should take account of the desires of the membership as a whole. A General Meeting should be held early this month, therefore, at which members should be invited to say what activities they would like to have included in the Autumn programme. This will give the Committee just the information they need in drawing up a schedule that is sure to be popular, always bearing in mind, of course, that Meccano model-building and Hornby Train operations should be the "backbone" of the respective programmes.

CLUB NOTES

LUMINA (LONDON) M.C.—The summer schedule has included arrangements for open air meetings in one of the local parks, to provide the Club's model aircraft enthusiasts with opportunities to try out their models. A photographic competition is being arranged. A comprehensive programme of Meccano model-building has been drawn up for the immediate future. It will begin with the construction of models of the simpler type and gradually work up to more complicated models. Club roll: 15. *Secretary*: J. A. Kirby, 9 Busby Place, Kentish Town, London N.W.5.

MILE END (PORTSMOUTH) M.C.—A successful Exhibition has been held, and in a competition judged by the visitors K. Mills won a prize with his fine model of a breakdown crane and trailer. At one meeting the Leader gave a talk about a wooden model of the Royal Yacht that he has built and in which he has incorporated an "engine room" constructed from Meccano parts. Club roll: 24. *Secretary*: Mr. A. J. Nicholson, 213 Sultan Road Buckland Portsmouth, Hants.

CONSETT & DISTRICT Y.M.C.A. M.C.—Naturally model-building activities have been on a reduced scale during this very good summer, but the construction of a model of the World's largest Walking Dragline is well advanced. A model of a V.2. 2-6-0 locomotive also is nearly completed. It has been decided to invite the St. George's (Gateshead) M.C. one Saturday next month. Club roll: 36. *Secretary*: B. Ward, 10 Cyril Street, Number One, Consett, Co. Durham.

AUSTRALIA

FREMANTLE & DISTRICT M.C.—Members are keen and the standard of Meccano model-building is steadily improving. The boys are grouped into two competitive teams, and the one winning the highest points total by the end of the year is awarded the group shield. An Exhibition was held on 24th June last, in which the Maylands M.C. also took part. Club roll: 10. *Leader*: J. HAMERSLEY, 6 Bolton Street, East Fremantle, Western Australia.

BRANCH NEWS

ROYAL WOLVERHAMPTON SCHOOL—The Branch have acquired a new room, and the members are co-operating enthusiastically in constructing a new layout so that train-running can be resumed as soon as possible. A visit to the B.R. Wolverhampton locomotive repairs shops was very interesting and instructive. *Secretary*: T. Grisdale, The Royal Wolverhampton School, Wolverhampton.

HALE END (LONDON)—At several meetings a member who is an expert model-builder has brought models of lineside accessories, such as buildings, for use on the Branch layout. Up to the present only Hornby-Dublo operations have been carried out, but an experiment is being made with Hornby Gauge 0 track, and will be continued if it proves popular. *Secretary*: A. Coe, 463 Hale End Road, Highams Park, London E.4.

EDLINGTON COUNTY SECONDARY SCHOOL—Summer meetings have been mainly confined to running practice on the Branch layout. It is hoped to extend this layout during next Session, and to increase the Branch membership. *Chairman*: Mr. K. J. Templeman, 86 Florence Avenue, Balby, Doncaster, Yorks.



Officials and some of the members of the Consett and District Y.M.C.A. M.C. Mr. C. J. B. Gardiner, President, is on the extreme left, with next to him Brian Ward, the Secretary. Mr. J. Goodrum, the Leader, is at the back of the group. The models are part of an Exhibition display that reproduced in miniature one of the Consett Iron Company's blast furnaces. Photograph by courtesy of Consett Guardian Limited.

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.

On a mountain path in the Tyrol.
Photograph by P. K. Woolley,
Birmingham.



A DAY IN THE TYROLEAN MOUNTAINS

When staying at Igls, in the Tyrol, last summer, I climbed a mountain called the Glungezer, starting from the cable railway station. Inside the cabin I was soon being whisked through the air 2,000 ft. up the steep mountain side. The mountain is 8,500 feet high, so I still had a long climb ahead.

The path which I followed was rough and twisting, but well marked by streaks of red paint on prominent rocks at intervals. At first it was level and at every turn a new and varied scene was disclosed, but soon the way became steeper, and when I reached a sign post I saw, for the first time, my objective, the Glungezer, towering out of the mist in the distance. On the sign post it said that I had a three hour walk to reach it. After a rest I continued with renewed vigour, determined to be the first hiker to reach the mountain hut at the summit of the Glungezer that morning.

In the valley below two streams glittered in the sunlight, and I could see a solitary shepherd with his flock on the bank of one of them. As I turned a bend in the track, I saw coming towards me a basket-laden donkey and a weather-beaten boy leading it. He was very pleased when I made signs that I wished to take his photograph, but was under the impression that he could have a print immediately!

At last I reached the Glungezerhutte. To my surprise, in front of the hut, which was in a sheltered hollow below the summit, there was a drift of snow

about four feet deep. In the hut I was made very welcome by the kindly family who during the summer months live there and serve the mountain walkers. On the large oak tables I had coffee with neither milk nor sugar, and the master of the house saw that I was comfortable and well fed.

As it was well past noon I spent only a short time on the now sun-baked rocks on the summit. The homeward journey was by no means monotonous. I decided not to take the cable railway, but to walk down the quiet mountain slopes. The sun was now casting the long shadows of the firs across the soft turf of the pastures, but I was pleased to reach my hotel and to relax after a wonderful day in the mountains.

P. K. WOOLLEY (Birmingham).

A STOCKS STORY

Behind the village stocks at Crantock in Cornwall there is a quaint memorial, seen in the accompanying photograph, carved in wood, of the last man put in them. They were last used in 1817 for William Tinney, a smuggler's son and a vagabond, who robbed with violence a widow of a neighbouring parish. He was placed in the stocks, but managed to escape.

The verse behind Tinney reads as follows;

I paid my price for finding out,
Nor ever grudged the price I paid,
But sat in clink without my boots
Admiring how the world was made.

R. D. BARRETT-LENNARD (London).

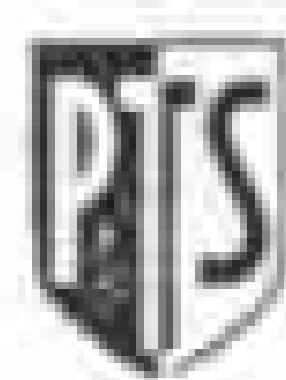


A quaint Cornish memorial.
Photograph by R. D. Barrett-
Lennard, London.

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Stamp Collectors' Corner

By F. E. Metcalfe

JAMAICA

THE set of stamps issued in Jamaica on 10th May to commemorate three centuries of connection with the British Crown draws our attention to this tropical isle, and this is perhaps an opportune moment to run through its philatelic history.

Jamaican stamps have always been popular with British collectors, and U.S. collectors are also partial to them. No country provides more fun for the advanced philatelist, but there is plenty of scope also for the beginner, and those who have not too much cash to spend on stamps. To these I would suggest that they decide on used, which are generally much cheaper than mint, for

Jamaica makes use of a lot of stamps.

Jamaica's first issue appeared in 1860. The stamps themselves are rather dull in appearance, as were many stamps of that period. All bore the head of Queen Victoria, and the same designs were in use until the turn of the century. But there was an important change in 1870, for the watermark was altered. Stamps of the first issue had the much sought after "pineapple" watermark. Then we got the Crown C.C. design. In 1883 the watermark became Crown C.A., and this remained on Jamaican stamps until the Crown Mult. C.A. came into use in 1905.

In the meantime there had been several design changes. But first a word about that "pineapple" watermark of the first set. All stamps that bear it are scarce, and it is always worth while to examine the watermark of those early "Queen's Heads," for "pineapples" turn up from time to time. But a word of warning—don't be tempted to buy poor copies of the early issues—or all issues for that matter—just because they are priced at very much below catalogue prices.

As a matter of fact, apart from exceptional copies, catalogue prices for old stamps bear little or no relation to real market value, and can mostly be disregarded as actual valuations. Perhaps there will come a time when some reality is introduced into them. In the meanwhile, those who go in for the early issues of Jamaica should first of all only take up well centred and lightly cancelled copies—full gum



for mint, and ignore stamps with lots of bits of mounts stuck on the back—and see that the prices are well below those given in the catalogue.

The "simple-lifer," as collectors call those who do not specialise, will have gathered a sprinkling of the "Queen's Head" and of course the two handsome "Llandoverly Falls" stamps of 1900-1, for they only cost a few

coppers. How well the writer of these notes remembers getting these two gorgeous stamps. For over fifty years this pair have delighted young collectors, who have rejoiced in their cheapness as well as their attractiveness.

Next we come to the "Arms" design of 1903. There is a very interesting variety to look for in the 1d., 1d., 2½d. and 5d. values. Underneath the shield is the word *Serviet*. On every sheet of the first issue we find a flaw and instead of the word as given we get *Ser et*. This variety is scarce, particularly in the case of the 5d. stamp. The catalogue values it at £35, in the case of the Wmk. Crown C.A., and £50 for the Mult Crown watermark variety. Finds of the variety are made from time to time, like the "pineapple" watermark, so keep your eyes open.

After the "Arms" designs we come to the single stamp bearing the head of King Edward VII—the 2d. grey.

It stands alone, for the King had died before a full set was prepared. We are rather slow bringing out new stamps. As a case in point,



Queen Elizabeth has been on the throne now for over three years, yet there are countries in the British Commonwealth still using stamps of the last reign.

After Jamaica's single K.E. VII stamp came the set with the head of King George V, and here we get shades galore. This question of shades is rather amusing. Collectors of K.G. VI stamps are supposed to have been those who started the cult. Actually collectors have always been interested in them, collectors of modern colonials no more so than those of previous days. Perhaps the only difference is that the Commonwealth Catalogue gave expression to the liking, and demand.

In 1916 these K.G. V stamps were overprinted *War Stamp*, and all kinds of varieties turned up. Collectors had a wonderful time while it lasted, and these varieties still lend themselves to plenty of fun. Some are rare and worth looking for. You get inverted and double overprints, missing stops, etc., all duly catalogued. So much for the assertion that only K.G. VI collectors are interested in the "trivial."

In 1919 Jamaica got its first pictorial set—if we ignore the "Llandoverly Falls" pair. There was no doubt propaganda behind such designs as the War contingent embarking, but they were handsome stamps and it should be noted that there are two watermarks to be taken

(Continued on page 518)



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Stamp Gossip

STAMP BOOKLETS

I HAVE had several letters within the last few months on the question of stamp booklets. You know the things I mean—those nice little books of stamps which they sell at the post office at various prices, according to the face value of the stamps they contain, and which are so handy for slipping in the pocket.

As there seems to be a growing demand for these, I may later ask the Editor to allow me to devote a page to them. I am afraid that I haven't space to go

into the subject thoroughly now, but some of our booklets that have been issued even since the beginning of 1952 are quite valuable. For instance, in March 1954 a 5/- booklet was issued containing panes of the following stamps: K.G.VI 1d., 2d.; Q.E.II 1d., 1½d. and 2½d. (two panes). Only 16,000 of these were manufactured, which of course is very few for such an item, and they are now worth several pounds each.

There are other valuable booklets issued since Queen Elizabeth came to the throne. Full details and prices of British and Commonwealth booklets of the present reign will be found in the new edition of the Commonwealth Catalogue of Queen Elizabeth stamps.

STAMPS ON STAMPS

This form of thematic collecting is growing in popularity as more stamps of the right kind are issued. A set of eight appeared in Cuba on 24th April to commemorate the centenary of her first postage stamps, which by their attractiveness will be in great demand. One of these stamps is being illustrated, and it will be noted that in the bottom right corner is shown a copy of the original Queen Isabella issue.

A lot has happened to Cuba since that appeared. Once a colony of Spain, the island is now a free progressive country, well thought of everywhere. It is rather a pity that the full set of eight is rather expensive, for the designs are full of interest, and a study of them provides a useful lesson in history in the easy and pleasant way. Anyhow, used copies can be picked up fairly cheaply, if one gets busy looking for them now.

CHARLES V EXHIBITION



The Belgian stamp illustrated is one of a set of three issued in March in connection with the Emperor Charles V Exhibition held at Ghent. This

4f. value features a reproduction of the painting by L. Gallait showing the abdication of this monarch. The other two values in the set are 20c., Homage to Charles V, by A. De Vrient, and the 2f., which reproduces a portrait of the King by Titian. Most dealers will be able to offer a set for very little.

ROTARY

A number of countries have issued stamps to

commemorate the 50th anniversary of the Rotary International, and collections of these stamps are being made by collectors all over the world, so there may be some fun later on. Countries like Australia, Brazil, France, etc., have issued plenty to go round. But some of the countries have not played fair with collectors. They have restricted their issues, which are thus expensive to get hold of.

There must be many readers of the M.M. who are interested in the Rotary Movement, and perhaps some of these would like a collection of the stamps issued in honour of their society. I would urge them not to buy those that are costly. They should be cheaper when the craze has died down.

OUR QUEEN'S STAMPS

As was to be expected, all the beautiful issues of the

Commonwealth that have appeared since Queen Elizabeth came to the throne are rapidly growing in popularity, more so now that most of the countries concerned have already brought out their new sets. The first edition of the Commonwealth Catalogue

dealing with the Queen's stamps came out early in 1954, and it has long been out of print. So a new edition, brought right up to date, had to be published, and a rush for it, even greater than that for the first edition, is evident. This is a great benefit to users of such works, for they get for a few shillings a catalogue that otherwise might cost many times the sum charged.

For instance, recently I wanted a copy of the new Holmes Catalogue of Canada, and found the retail price to be actually 55/-, which puts it beyond the pockets of most junior collectors. Anyhow, all will be able to afford the new "Q.E." catalogue, and many interesting varieties are illustrated in it.

SHIPS AND MORE SHIPS

With so many collectors interested in "Ships" stamps, how could I help asking the Editor to illustrate this Colombian beauty, which came off a letter I received recently? Printed in England, it is not particularly new, but isn't it a gem, with the skyline of New York showing in the background?



Stamp Collectors' Corner—

(Continued from page 515)

into consideration.

There was a "Child Welfare" set in 1923, but it sold badly, unfortunately, for no more sets of this character were issued, and the set which did appear now costs over a pound to buy!

Next we got a short set of K.G. V heads, and now we come to the K.G. VI set, still in use. I haven't room to go into details over this issue, but it is full of interest. There are a number of shades and perforation varieties, and one of the shades, the 1½d. light red-brown, is always causing discussion.

I actually discovered this variety. I received a sheet from the Kingston post office in 1944, and as the shade differed greatly from the rest, I showed a copy to the late Stanley Phillips, who decided to list it in Gibbons. There is no mistaking the right shade. Unfortunately it is generally the wrong one that collectors get hold of.

Perhaps the poorest set that Jamaica has issued was that which appeared in 1945 to commemorate the New Constitution. The 2/- value looks like the front page of a horror comic.

And there I am afraid I must leave Jamaican stamps. It is a grand country to collect, and you might do worse than take it up, if you are looking for something new to collect.

New Meccano Models—(Continued from page 503)

Angle Brackets fixed to a 2½" x ½" Double Angle Strip. The latter pivots on a Rod held in the girders 19 by Spring Clips.

Parts required to build the Articulated Tank Lorry: 9 of No. 1; 10 of No. 2; 2 of No. 2a; 6 of No. 3; 6 of No. 4; 18 of No. 5; 2 of No. 6; 6 of No. 6a; 6 of No. 8; 4 of No. 9; 14 of No. 10; 4 of No. 11; 32 of No. 12; 3 of No. 12a; 2 of No. 12b; 5 of No. 12c; 2 of No. 15; 2 of No. 15a; 2 of No. 15b; 5 of No. 16; 1 of No. 17; 3 of No. 18a; 3 of No. 20; 2 of No. 20b; 1 of No. 19b; 4 of No. 20a; 1 of No. 26; 1 of No. 28; 14 of No. 35; 236 of No. 37a; 218 of No. 37b; 12 of No. 38; 2 of No. 38d; 1 of No. 40; 2 of No. 45; 2 of No. 46; 7 of No. 48a; 1 of No. 48b; 2 of No. 48c; 1 of No. 48d; 1 of No. 51; 7 of No. 59; 2 of No. 62; 1 of No. 63; 2 of No. 77; 2 of No. 90; 7 of No. 90a; 2 of No. 109; 3 of No. 111; 1 of No. 111a; 6 of No. 111c; 2 of No. 115; 4 of No. 125; 4 of No. 126; 4 of No. 126a; 4 of No. 142a; 2 of No. 147b; 1 of No. 185; 4 of No. 187; 4 of No. 188; 6 of No. 189; 7 of No. 190; 5 of No. 191; 12 of No. 192; 1 of No. 197; 2 of No. 199; 2 of No. 200; 1 of No. 212; 2 of No. 214; 4 of No. 215; 4 of No. 221; 2 of No. 222; 2 of No. 224.

ROYAL ENGINEERS DISPLAY AT LONGMOOR CAMP

The Transportation Centre, Royal Engineers, at Longmoor Camp, in Hampshire, will be open to the Public on Saturday, 3rd September, from 1.30 p.m. to 7.30 p.m. There will be displays and demonstrations showing the full range of Military Transportation, also an exhibition of Engineer Plant. These will include prefabricated plate-laying, a mobile railway workshop, the railway signalling school, port operating, diving,



Peter Holmes, of Thorpe Bay, Essex, won first prize at a Fancy Dress Competition last year with this striking display. He wore a red jacket with green Meccano parts stitched on to form a pattern, and green trousers with red Meccano parts attached down the side.

the Movement Control model room, and other items. Visitors will be able to take a trip on the Longmoor Military Railway, and there will be rides on the footplates of main line locomotives. The Chichester and District Model Engineering Society will demonstrate a radio controlled tank. Drill displays will be given during the afternoon, and programmes of music will be provided by the Royal Engineers' Band. The Royal Engineers' Association will be holding a reunion dance in the evening.

Proceeds from the sale of programmes, and from certain events for which a small charge will be made, will go to the Royal Engineers' Benevolent Fund.

Cheap day return tickets will be available from stations within 60 miles radius of Longmoor, and frequent services on the Longmoor Military Railway (no charge) will connect at Liss and Bordon. There are also good bus services to Longmoor from the Aldershot and Petersfield areas.

1955
"PERCIVAL MARSHALL"
HANDBOOK CATALOGUE

The name Percival Marshall is well known to all who follow modelmaking and those interested in any practical hobby or craft will find plenty of titles to interest them in the 1955 complete catalogue of all the books published by Percival Marshall and Co. Ltd. These include practical handbooks, as well as more descriptive works of different kinds. The catalogue is well planned to make it easy to find what is wanted. Its publishers are Percival Marshall and Co. Ltd., 19-20 Noel Street London W.1, from whom copies can be obtained, price 6d. each including postage.

ACKNOWLEDGMENT

The interesting photograph of the *Mayflower* commemoration stone at Plymouth, reproduced on the Editorial page, is by Reece Winstone, Bristol.

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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.

A Locomotive Figureword

THE various competitions of special interest to railway enthusiasts which we have presented on this page have not so far included a Figureword Contest, so here is one. It is concerned with the names of B.R. locomotives—not class names like Pacific, but individual names such as *Firebrand*. There are nine such names in all, each of nine letters, and in the diagram on this page are nine horizontal rows, one for each of these words, which readers are asked to find with the aid of the clues given here.

In the last column of the diagram are numbers marked "Horizontal Totals." These are made up by giving numbers to the letters of the alphabet, A being 1, B 2, C 3, and so on to Z, the value of which is 26. The numbers representing the letters of each name must add up to the horizontal totals shown, and in addition the letters must be such that the vertical totals are those shown at the bottom.

As a help to make a start we reveal that the first letter of the first name is S, the

value of which is 19. Thus the first word required is one beginning with S, the horizontal total of the numbers represented by the letters being 99, and S contributes 19 to the first vertical total of 128.

The letters represented by X in the diagram will, reading from top left to bottom right, spell out a word denoting a railwayman.

There will be two sections in this contest, for Home and Overseas readers respectively, and in each prizes of 21/-,

15/- and 10/6, will be awarded for the three best entries in order of

merit with consolation prizes for entries just short of prize-winning standard. The diagram above must not be cut from the page; entries must be made on separate sheets, and in the event of a tie judges will take originality of presentation into account. State name, address and age.

Entries must be addressed *Locomotive Figureword Contest, Meccano Magazine, Binns Road, Liverpool 13*. Closing dates: Home Section, 31st October, 1955; Overseas Section, 31st January, 1956.

Summer Holiday Photographic Contest

There is still time to enter our Summer Holiday Photographic Contest, in which we invite readers who are photographic enthusiasts to submit the best of their 1955 holiday photographs. On this occasion more than one photograph may be submitted, but no competitor will be awarded more than one prize. The photographs must have been taken by him, and on the back of each print he must

state exactly what the picture represents—and remember to write his name, address and age.

The Competition will be in two sections, A for readers aged 16 and over, and B for those under 16. There will be separate Overseas sections, and in each section prizes of 21/-, 15/- and 10/6 will be awarded.

Entries must be addressed *Summer Holiday Photo. Contest, Meccano Magazine, Binns Road, Liverpool 13*. Closing dates: Home Section, 30th September; Overseas Section, 31st December.

x									99	HORIZONTAL TOTALS
	x								77	
		x							100	
			x						101	
				x					104	
					x				109	
						x			122	
							x		92	
								x	113	
128	82	140	92	57	121	97	104	96		
VERTICAL TOTALS									15/-	

Fireside Fun



"I'm sick and tired of having to do this every time some fathead forgets to pack the 'tail 'chute!"

Youngster looking around tidy, immaculate bedroom: "O.K.!! Who's been messing around my room?"

Golfer (totalling a high score): "I'm certainly not playing the game I usually play."

Caddy: "What game is that, sir?"

Johnny had been absent from school for some days and returned with a bandage round his throat. He presented a note:

"Please do not let Johnny learn any more French. His throat is so sore that he can hardly speak English."

"Haven't you any more recent books on anatomy?" complained the student. "These are at least ten years old."

"Look, sir," said the librarian, "there have been no bones added to the human body in the last ten years."

Henry: "You didn't laugh at Hector's joke. I thought it was quite a good one."

James: "It was a good one, but I can't stand Hector. I shall laugh when I get home."

Patient at Dentist's: "Ten shillings is an awful lot of money for pulling a tooth. It only takes about five seconds of your time."

Dentist: "Well, I could pull it out very slowly if you wish."

Sam: "When is a dog's tail not a dog's tail?"

Ham: "When it's a waggin'?"

Sam: "No, When it's a draggin'."

Tourist: "Good river for fish?"

Fisherman: "It must be. I can't persuade any of 'em to come out."

A boy leaning out of a window fell three stories to the street below. A policeman rushed to the spot where the boy landed and asked, "What's going on over here?"

"I don't know," the boy answered, "I just got here."

Two fisherman sitting on a bridge, their lines dangling in the water, made a bet as to which would catch the first fish. One got so excited he fell off the bridge.

"Well," snorted the other, "if you're going to dive for 'em, the bet's off."

"Oh, I do feel a fool," said one glow-worm to another. "I've just been talking to a cigarette-end for five minutes!"

BRAIN TEASERS CODED CASTLES

Each of the eight series of figures below represents the name of a famous castle in the British Isles. Each vowel in the name is represented by figure 1 and each consonant by a figure 2. Can you discover the names?

1. 2 1 2 2 1 2 1 2
2. 2 1 2 2 2 1 2
3. 2 1 2 2 1
4. 2 1 2 1 2 2 1 2 2 2
5. 2 1 2 2 1 2
6. 2 1 2 2 1 2
7. 2 1 2 1 2
8. 2 1 1 2 2 1 2 2 1 2

CATHEDRALS QUIZ

The initial letters of five cathedral cities placed in sequence spell the surname of a famous writer, which is also the name of another cathedral city. Can you name the author and five suitable cathedral cities?

NAME THESE

Can you discover which parts of the human body are indicated by each of the following eight phrases:

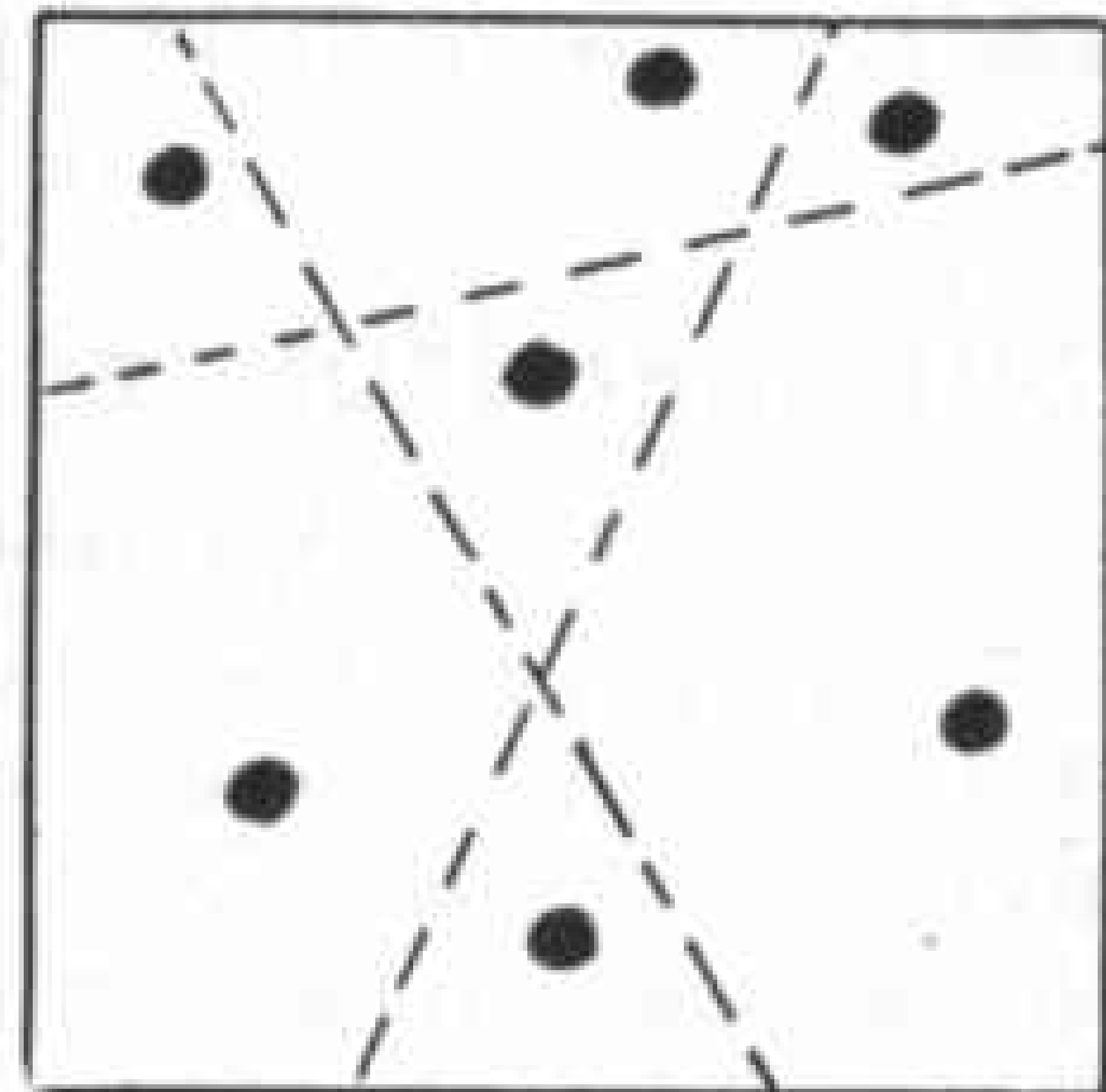
1. Tropical trees
2. Wild fruits found in country hedges
3. A strong storage box
4. A unit of measurement
5. Part of a book
6. Races are sometimes won by this
7. A main line
8. Part of a hill

ANSWERS TO LAST MONTH'S PUZZLES

Caging the Coins

One line starts at the top of the square and runs between coins 1 and 7 to the left of coin 4 and to the right of coin 5.

The second line starts at the bottom edge and passes between coins 6 and 5 to the right of coin 4 and to the left of coin 3. The third line starts at the left-hand side of the square and passes below coins 1, 7 and 3 and above coin 4.



A Beheading Puzzle

Habit — Abit — Bit — It — T

Two of a Kind

1. Sing-sing. 2. Ko-Ko. 3. Tom-Tom. 4. Bulbul.
5. Yo-Yo. 6. Lulu. 7. Dum-Dum. 8. Bebe.

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9/6

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By G. FREEMAN ALLEN

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3 A therm is:

- (a) a unit of measure,
- (b) a type of meter, (c) an electrical gadget?

4 When was the speed of 100 m.p.h. first achieved in a motor car? (a) 1913 (b) 1909 (c) 1904?

5 What famous painter designed a flying machine 500 years ago? (a) Rembrandt, (b) Michael Angelo, (c) Leonardo de Vinci?

1 What is a "filter" on a traffic light?

- (a) the shade over the signals, (b) the actuating strip in the road, (c) a green arrow permitting you to turn left against the red light?

2 Which travels fastest—

- (a) a cheetah, (b) a swallow, (c) a lion?



The **DUNLOP**

cadet knows all the answers

1 (c) But special care should be taken. **2** (b) A swallow can fly at 106 m.p.h. **3** (a) Measures heat value in gas-supply. **4** (a) By Percy Lambert. **5** (c) Leonardo de Vinci.

SCORING : 10 marks for every correct answer. 50—top of the class. 40-30—good. Below 30—Smarten up there!

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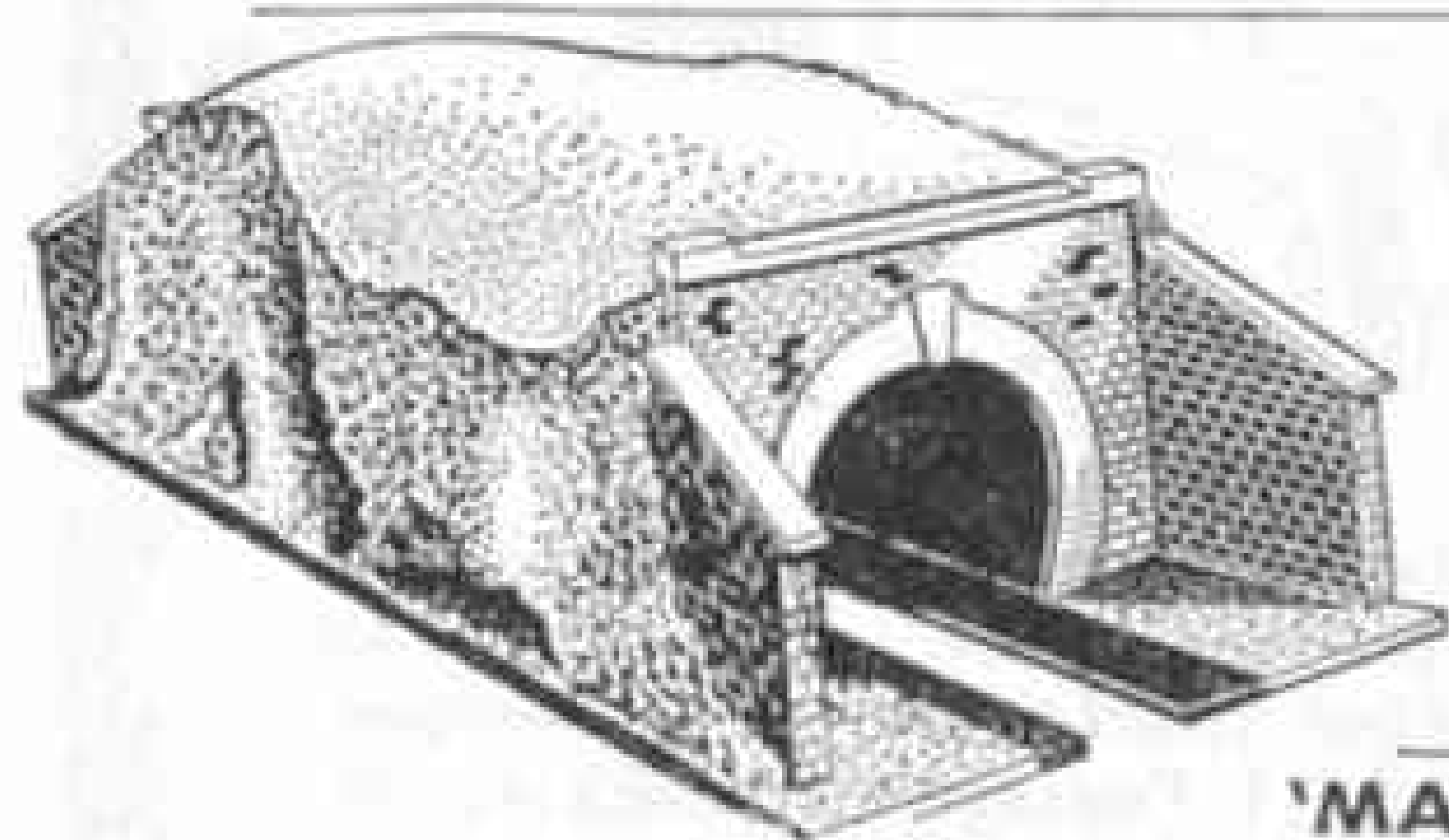
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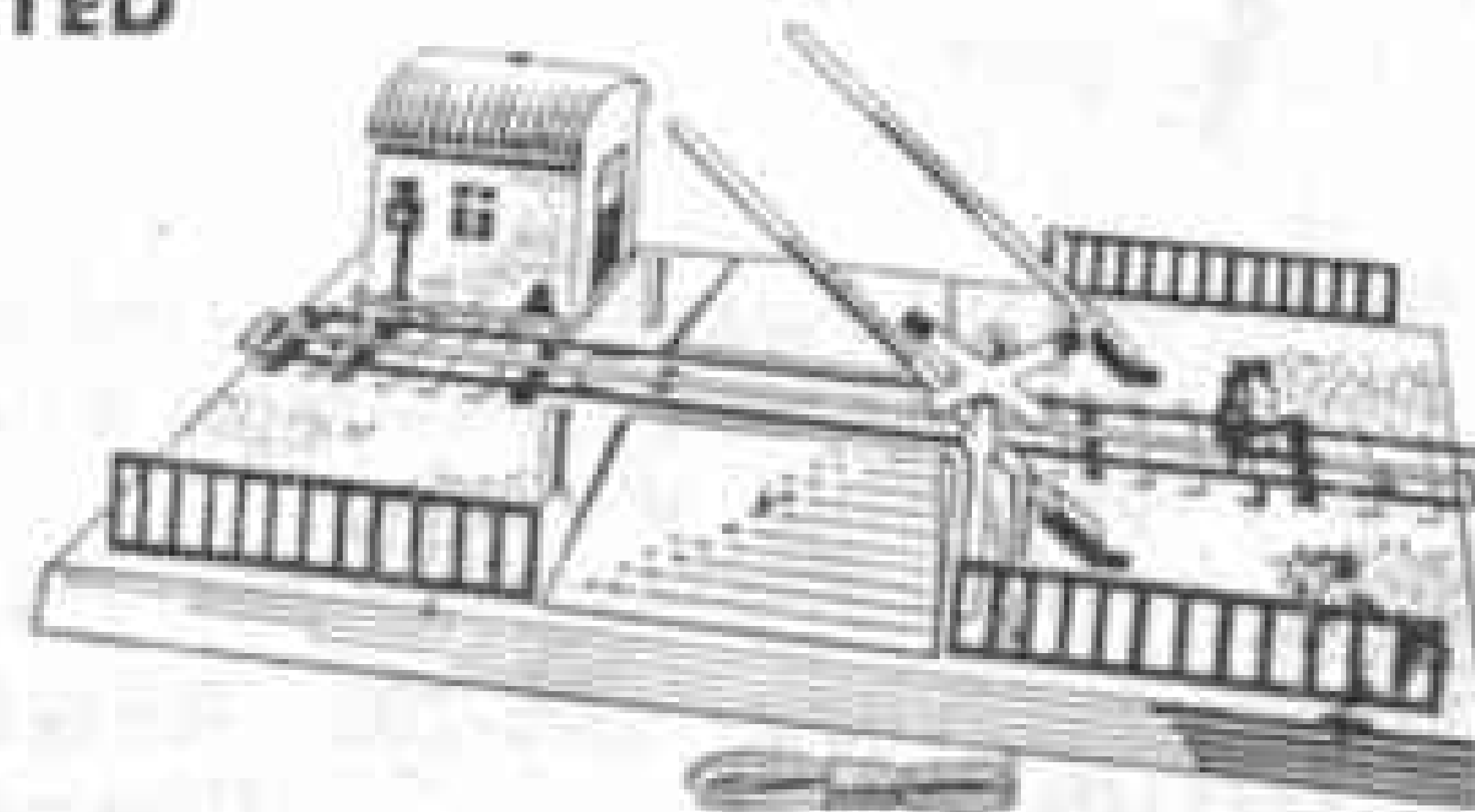
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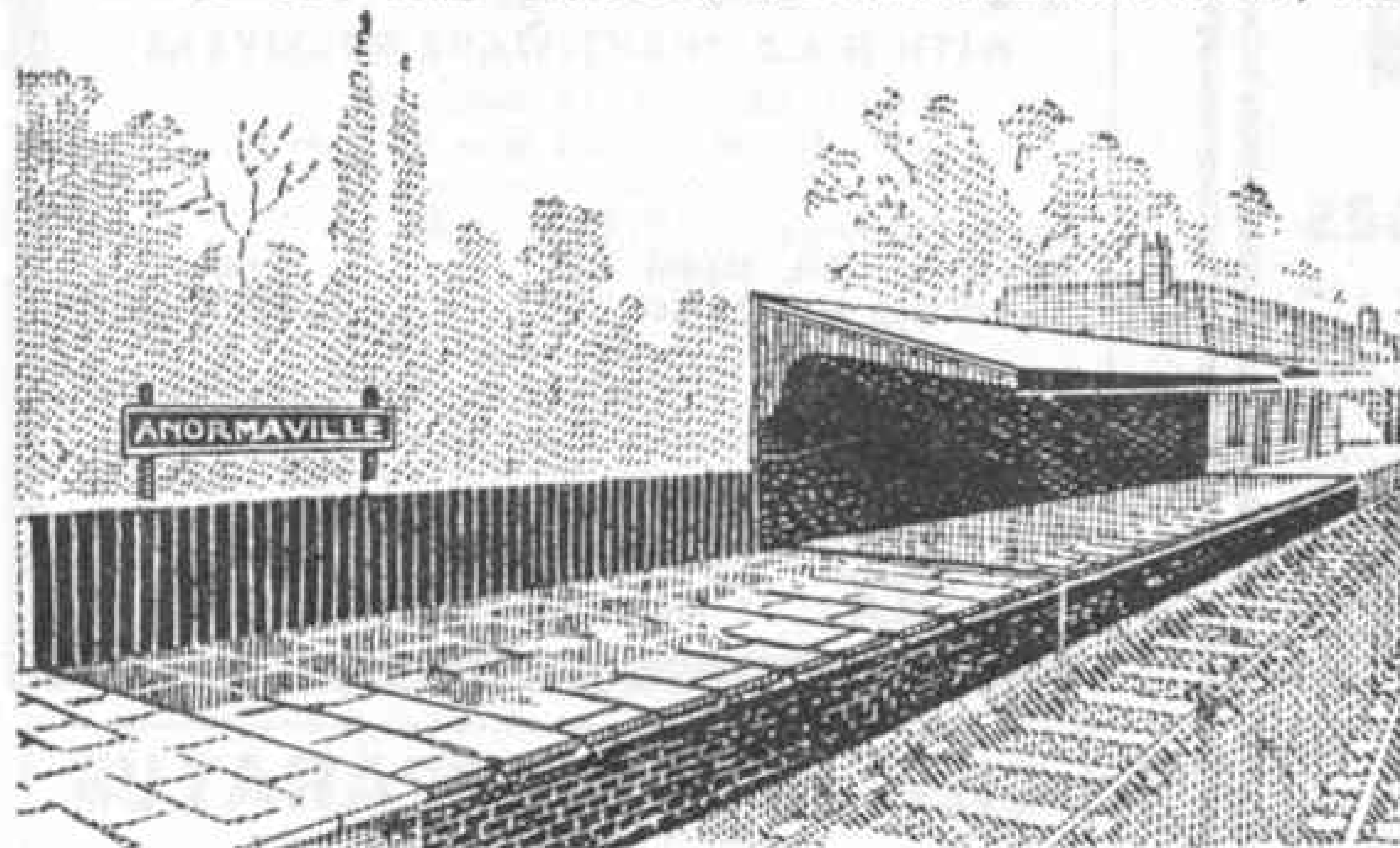


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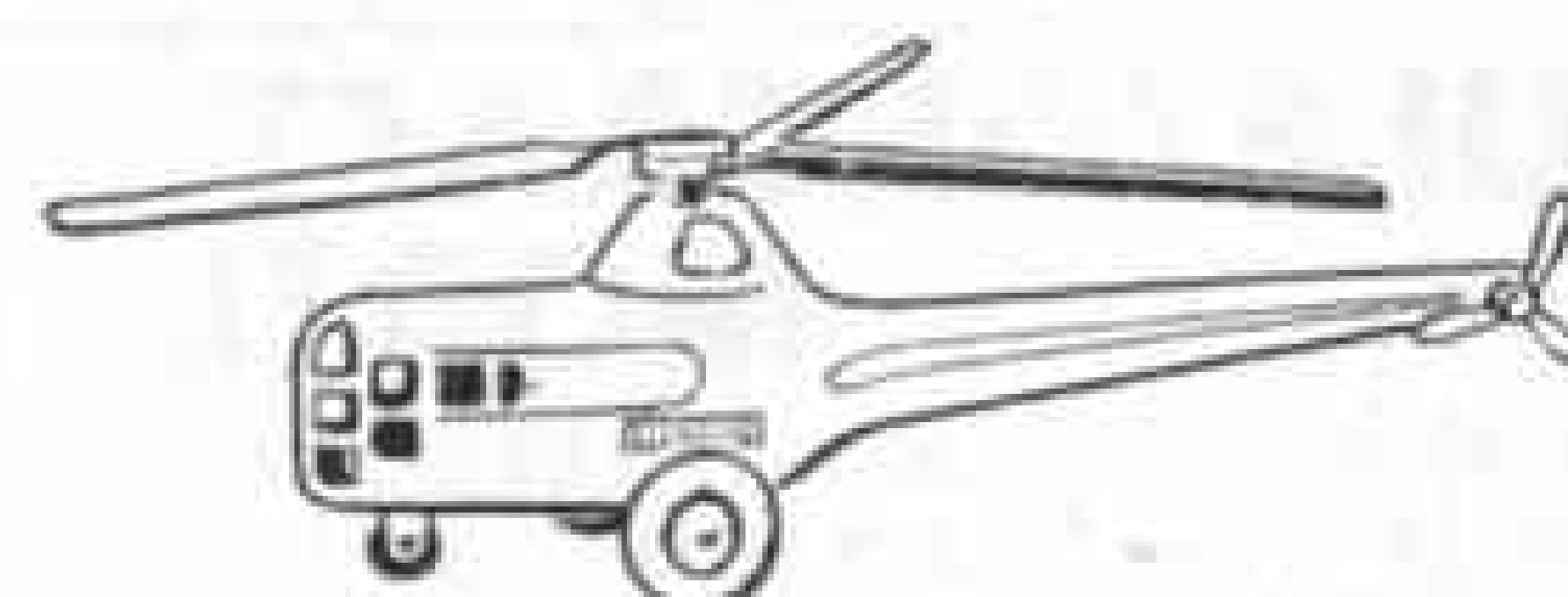


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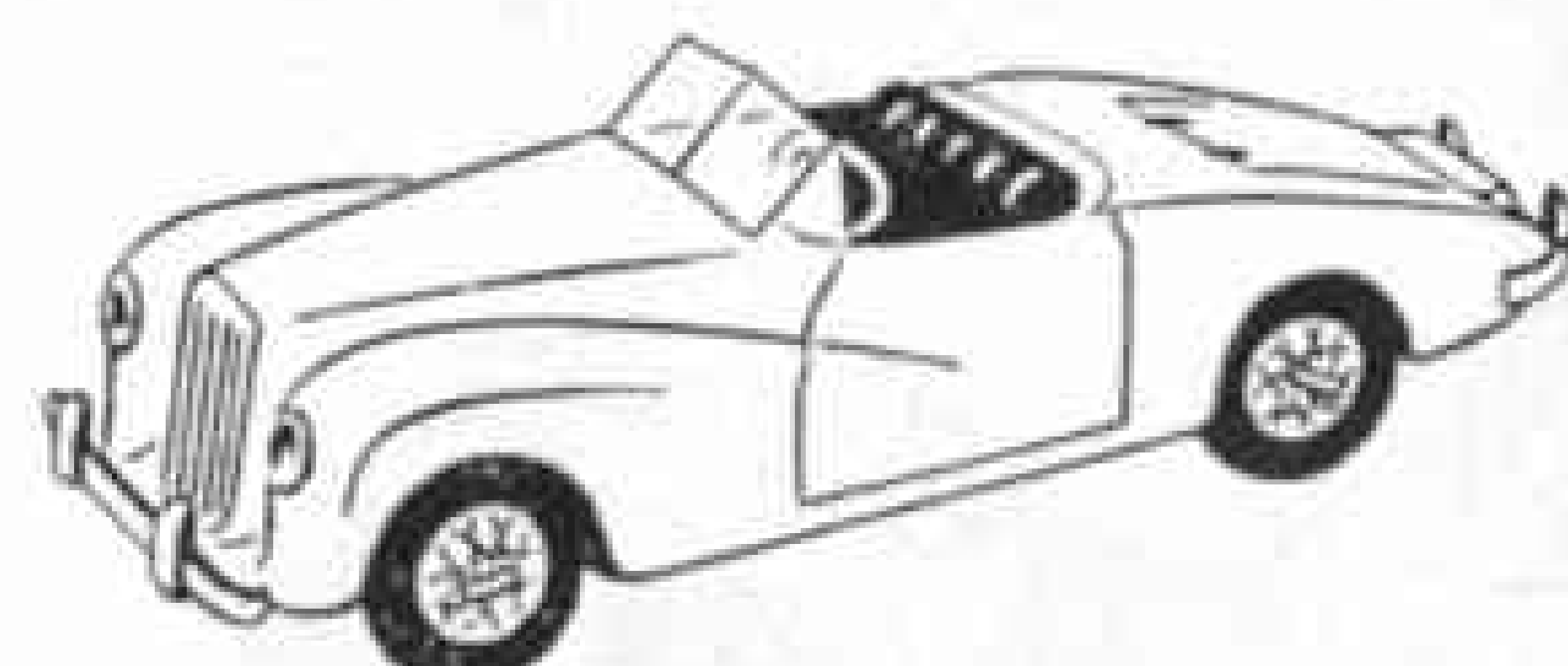
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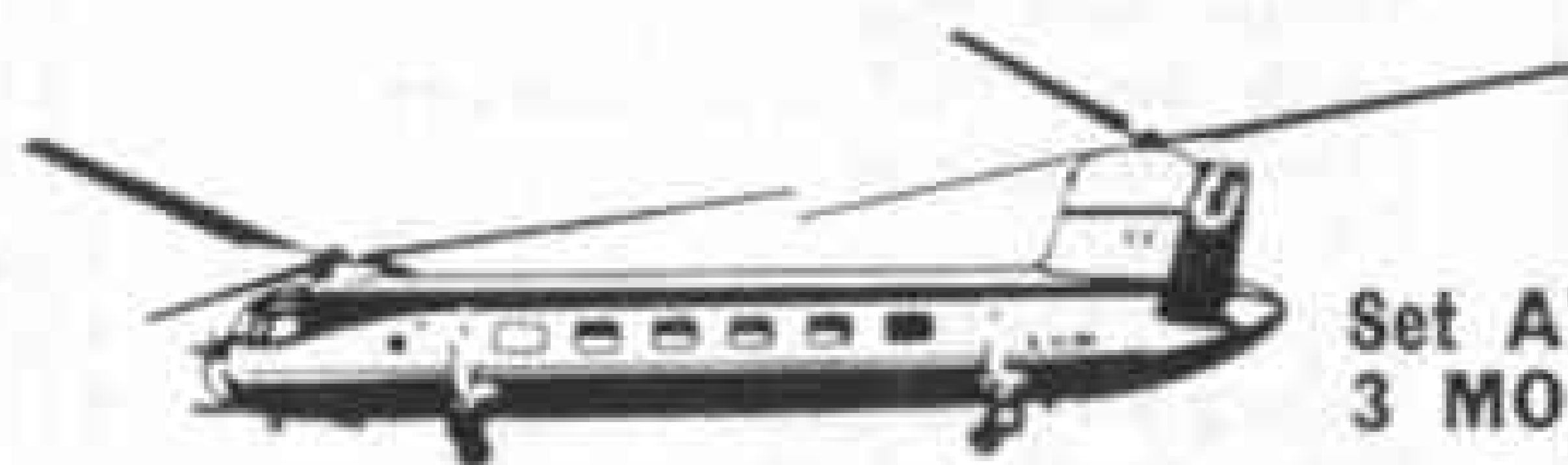
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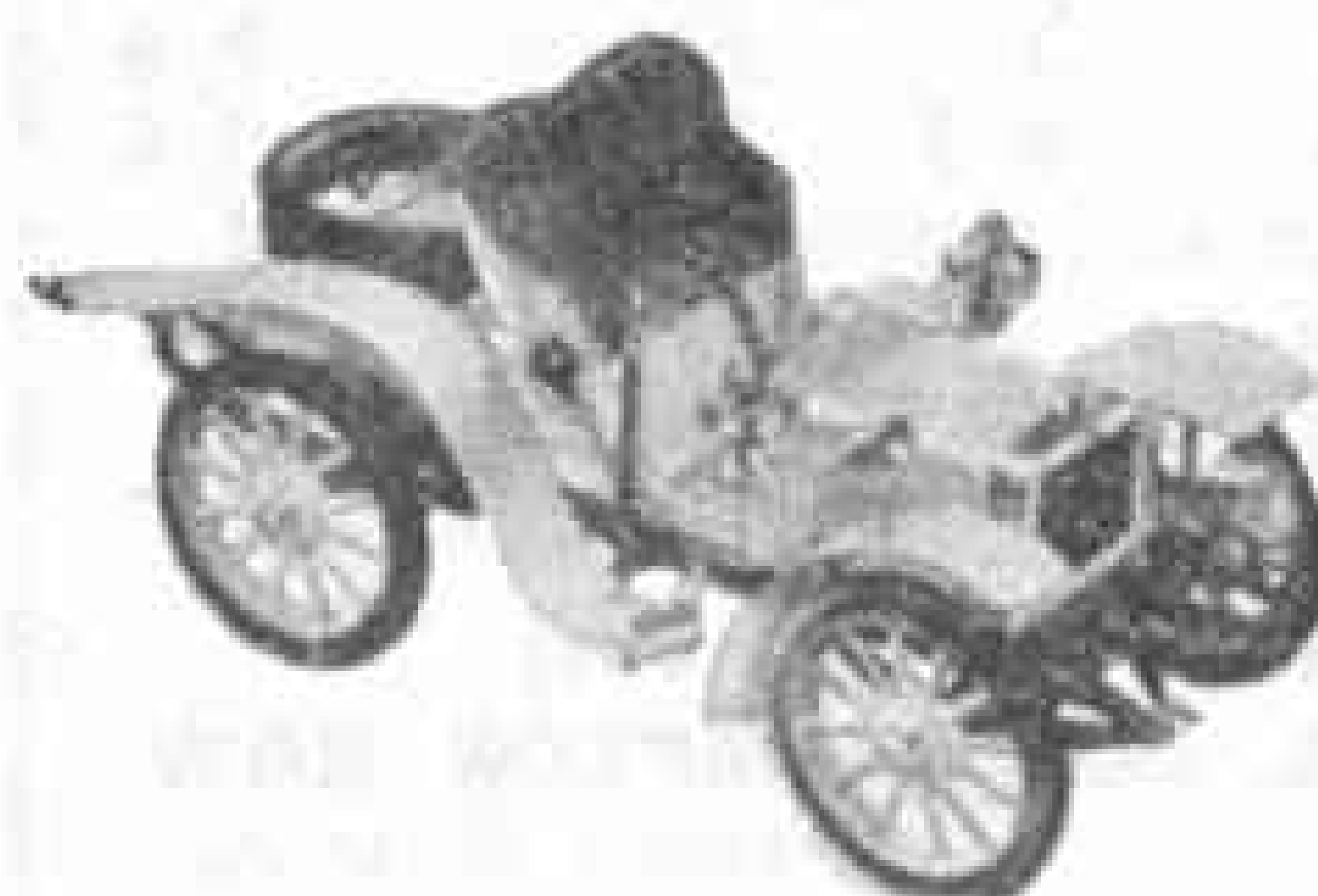
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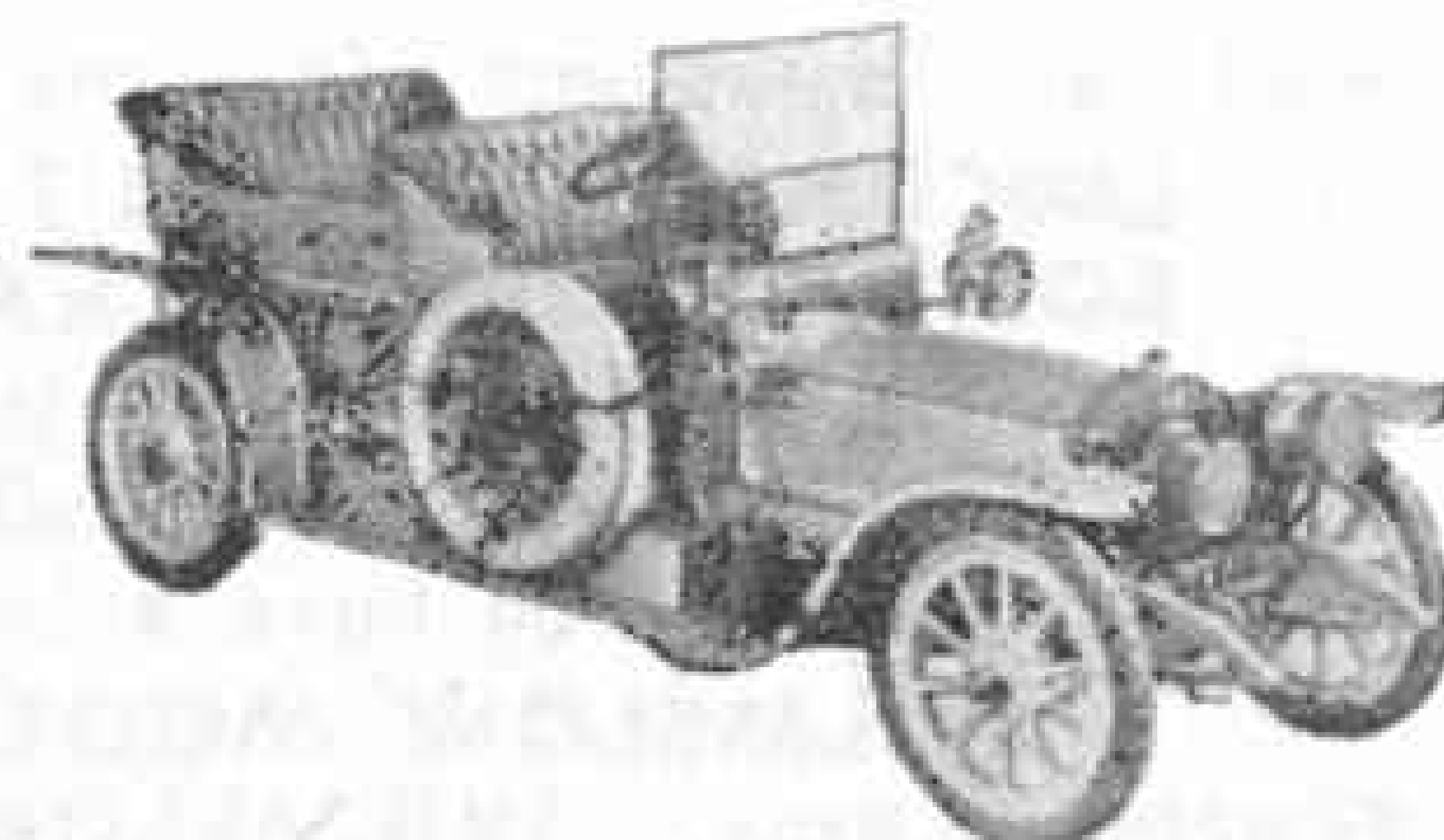
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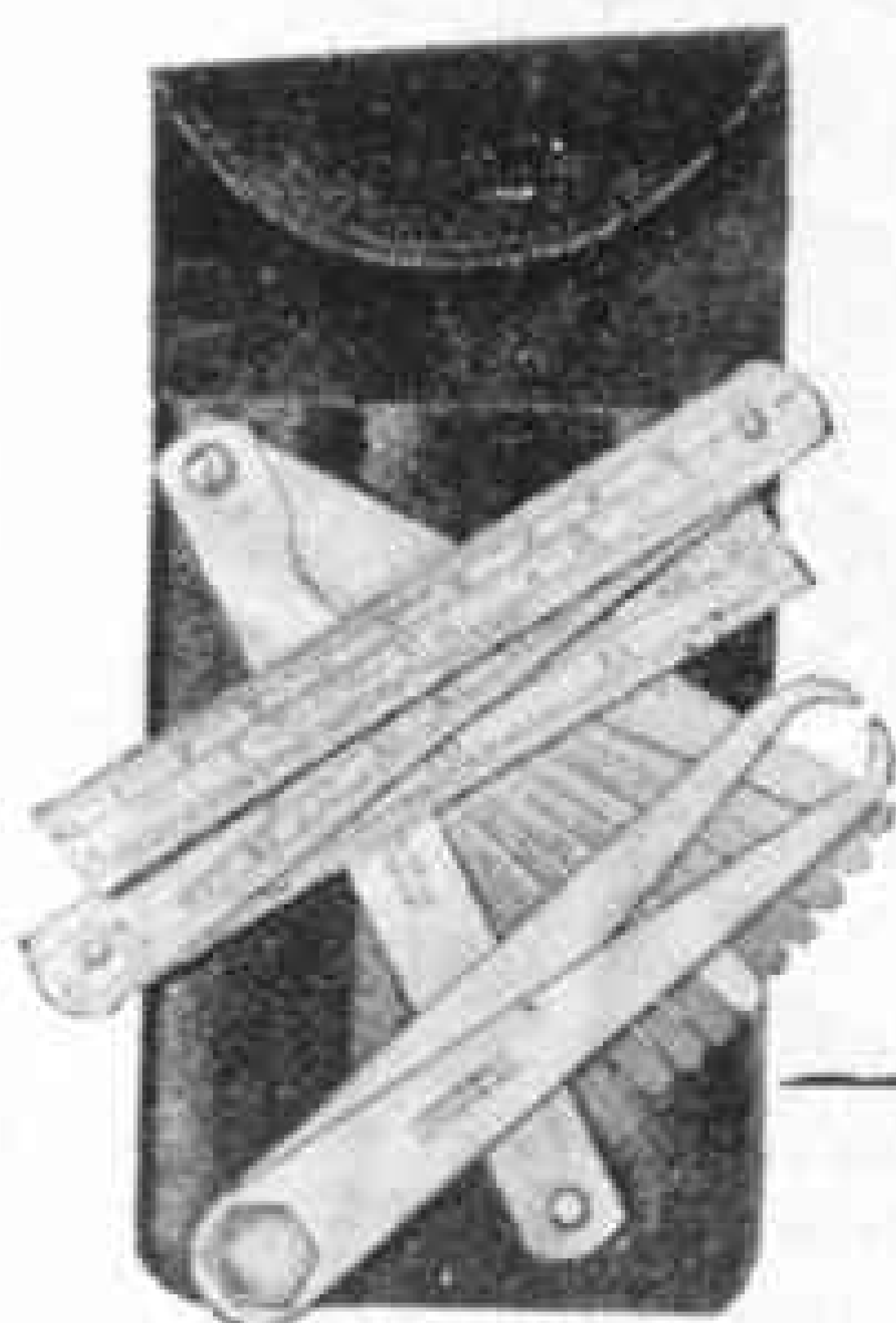


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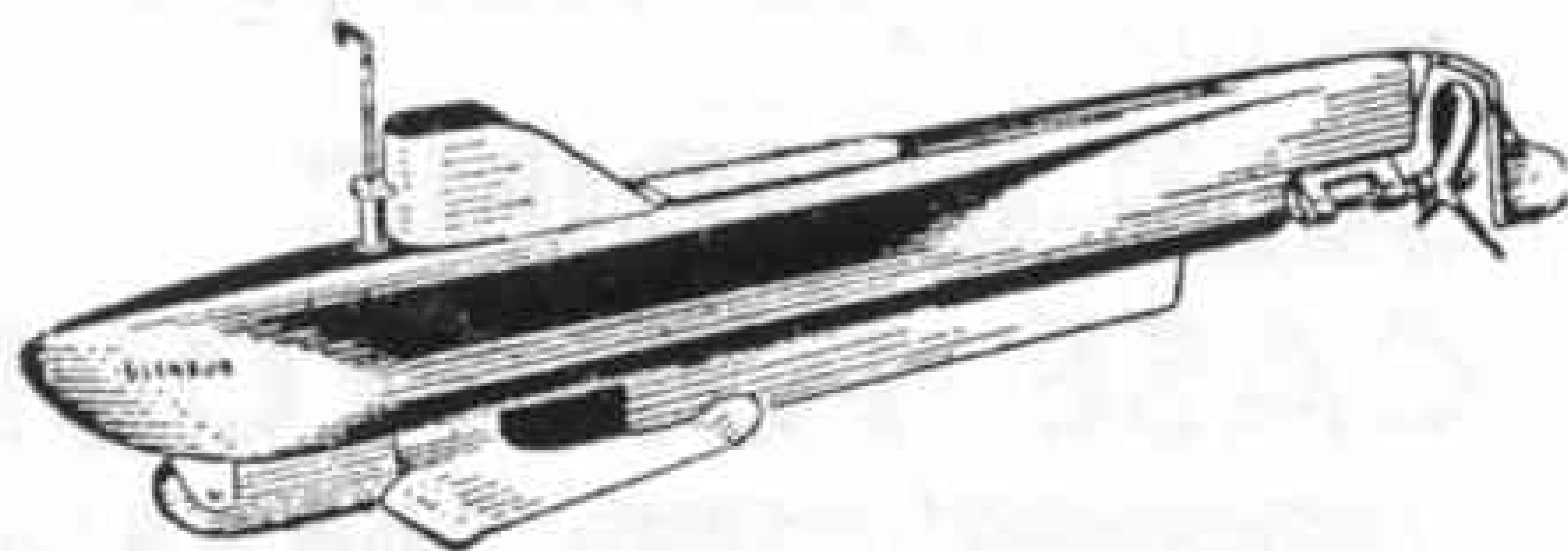


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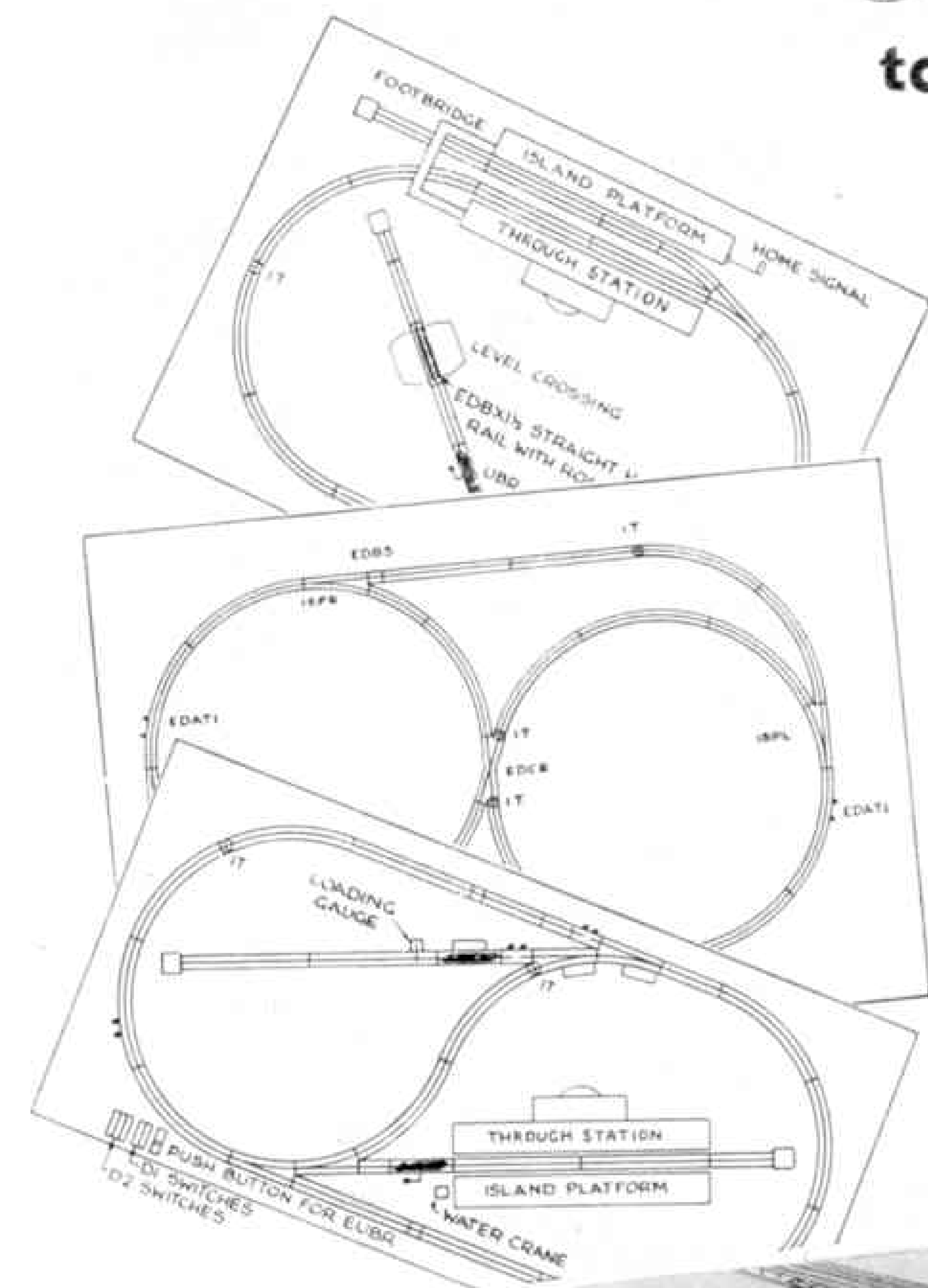
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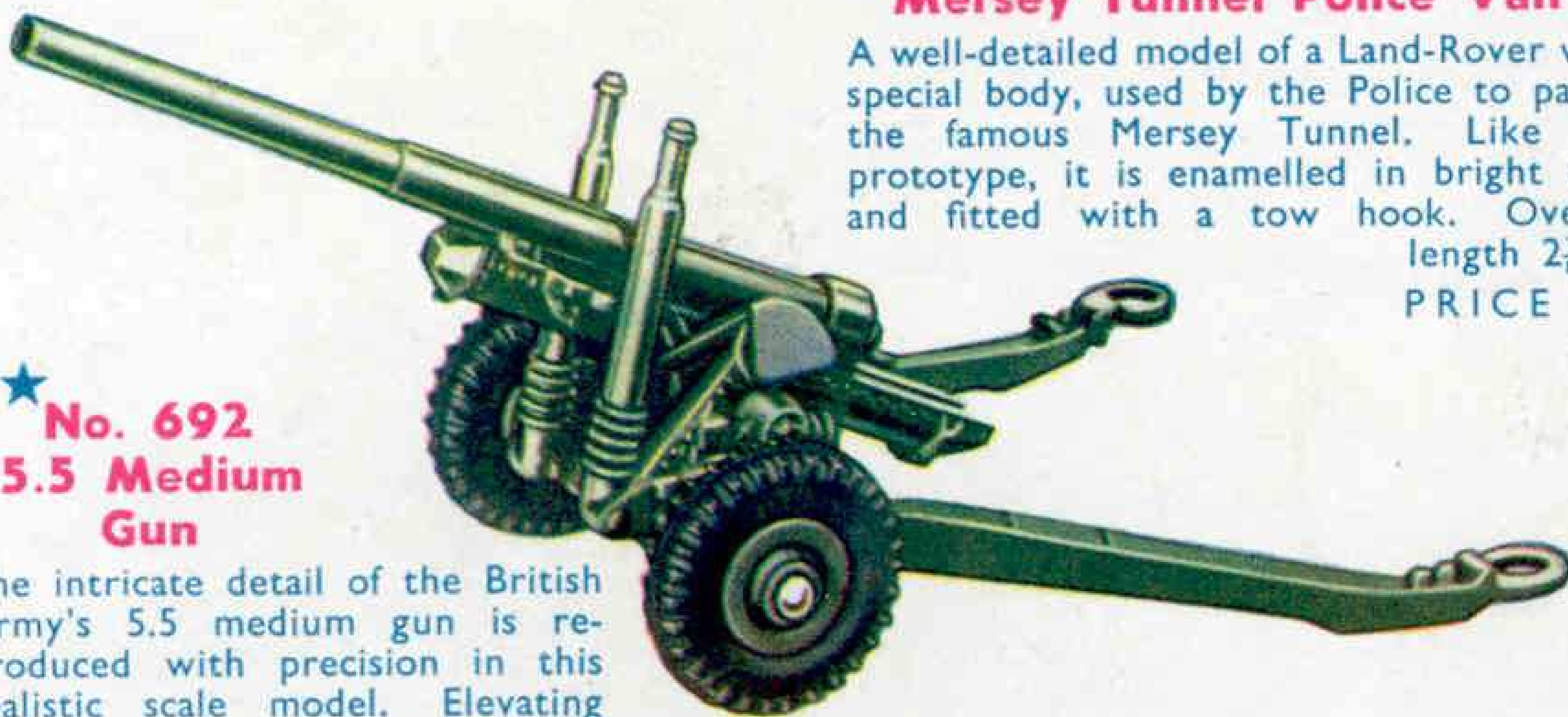
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