

VOL. XLV. No. 5

MAY 1960

MECCANO

MAGAZINE



15c

MECCANO

Miniature Engineering for Boys



* This is Outfit No. 5
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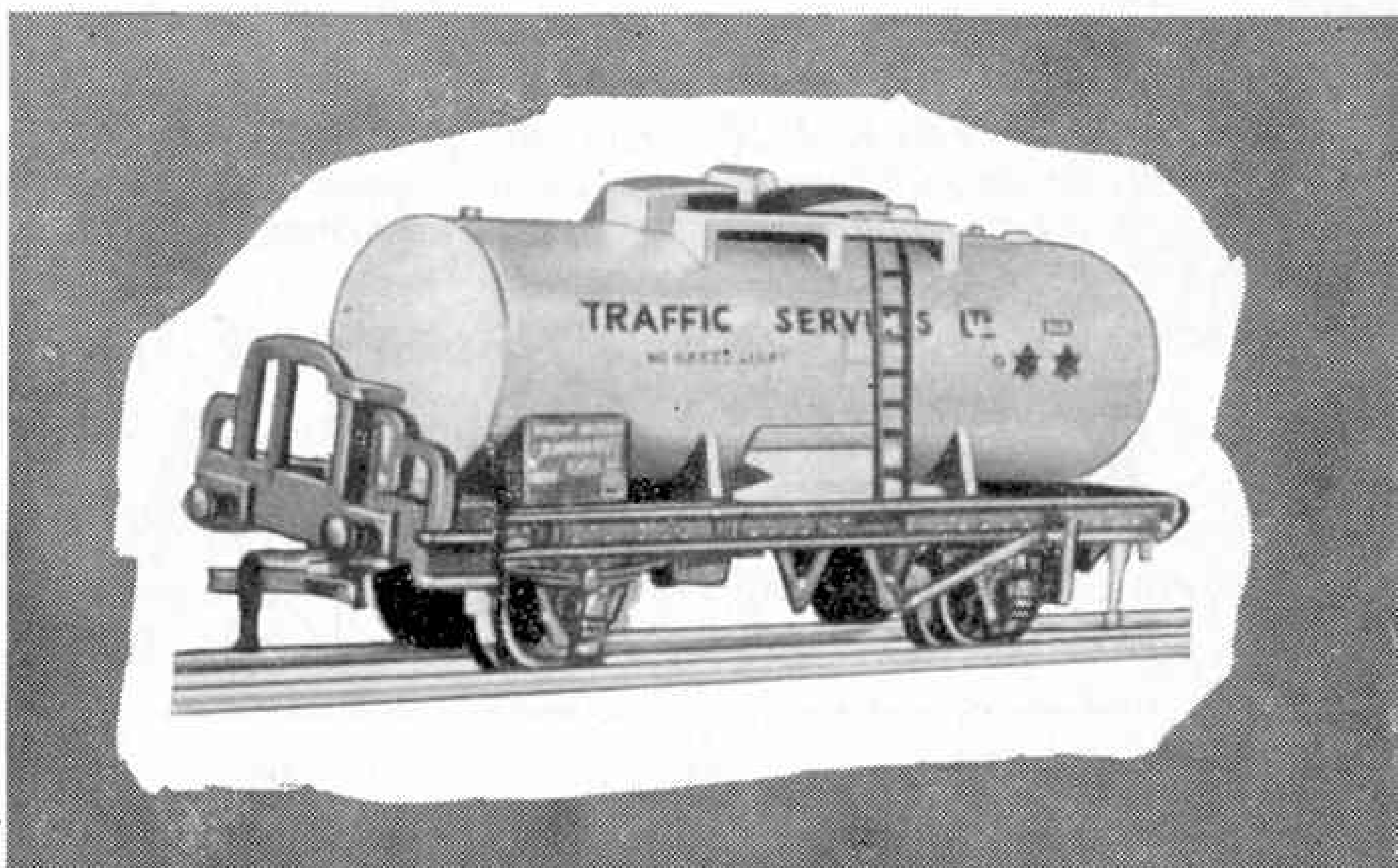
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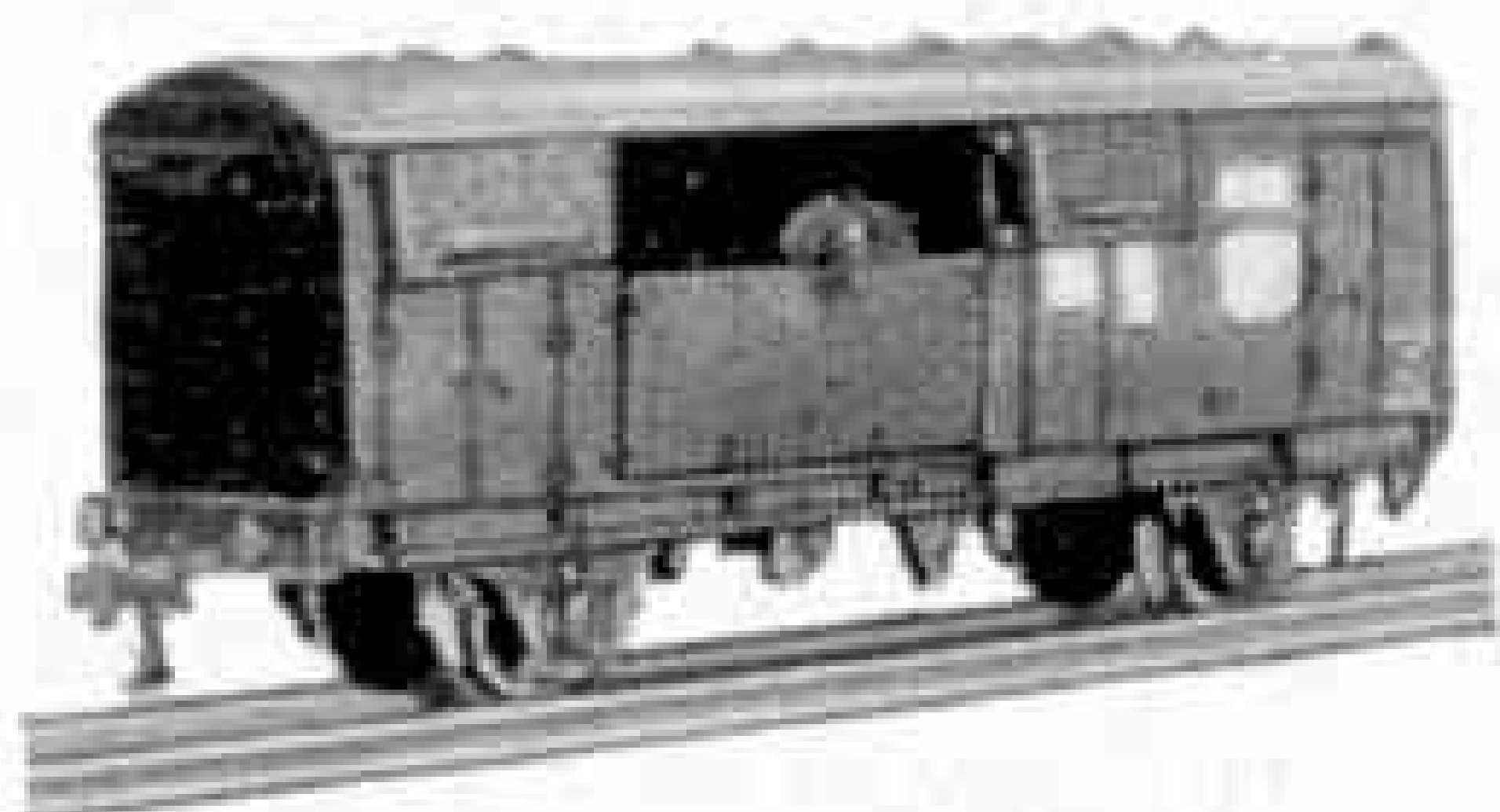
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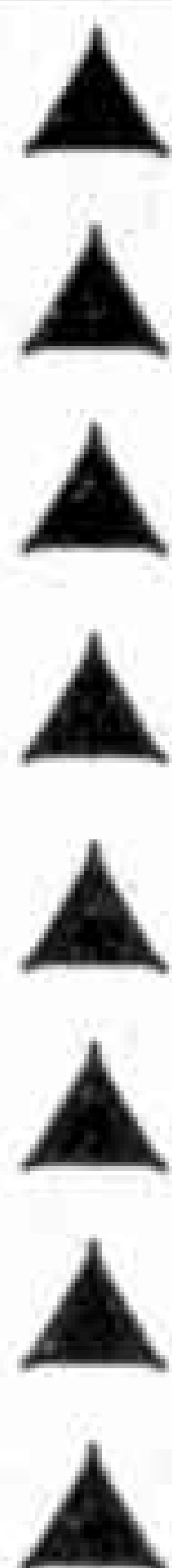
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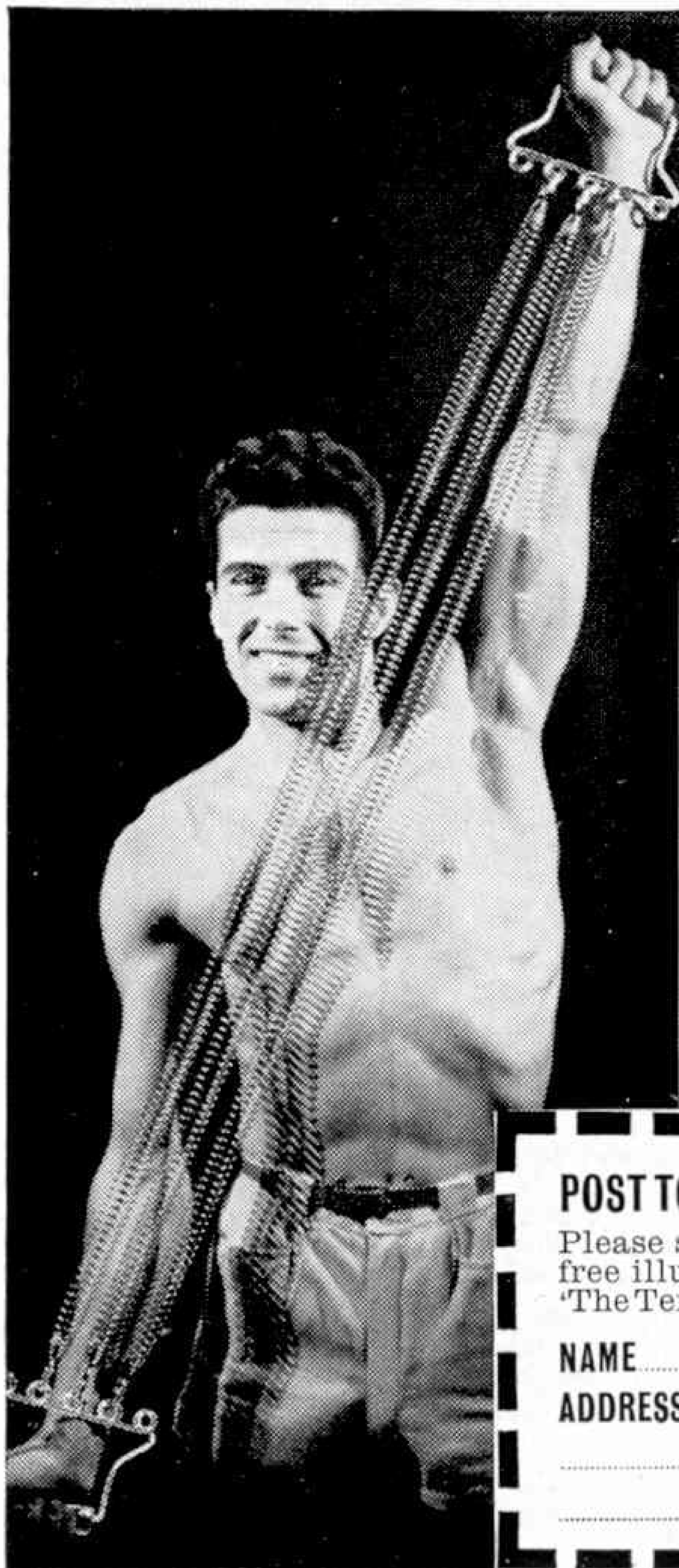
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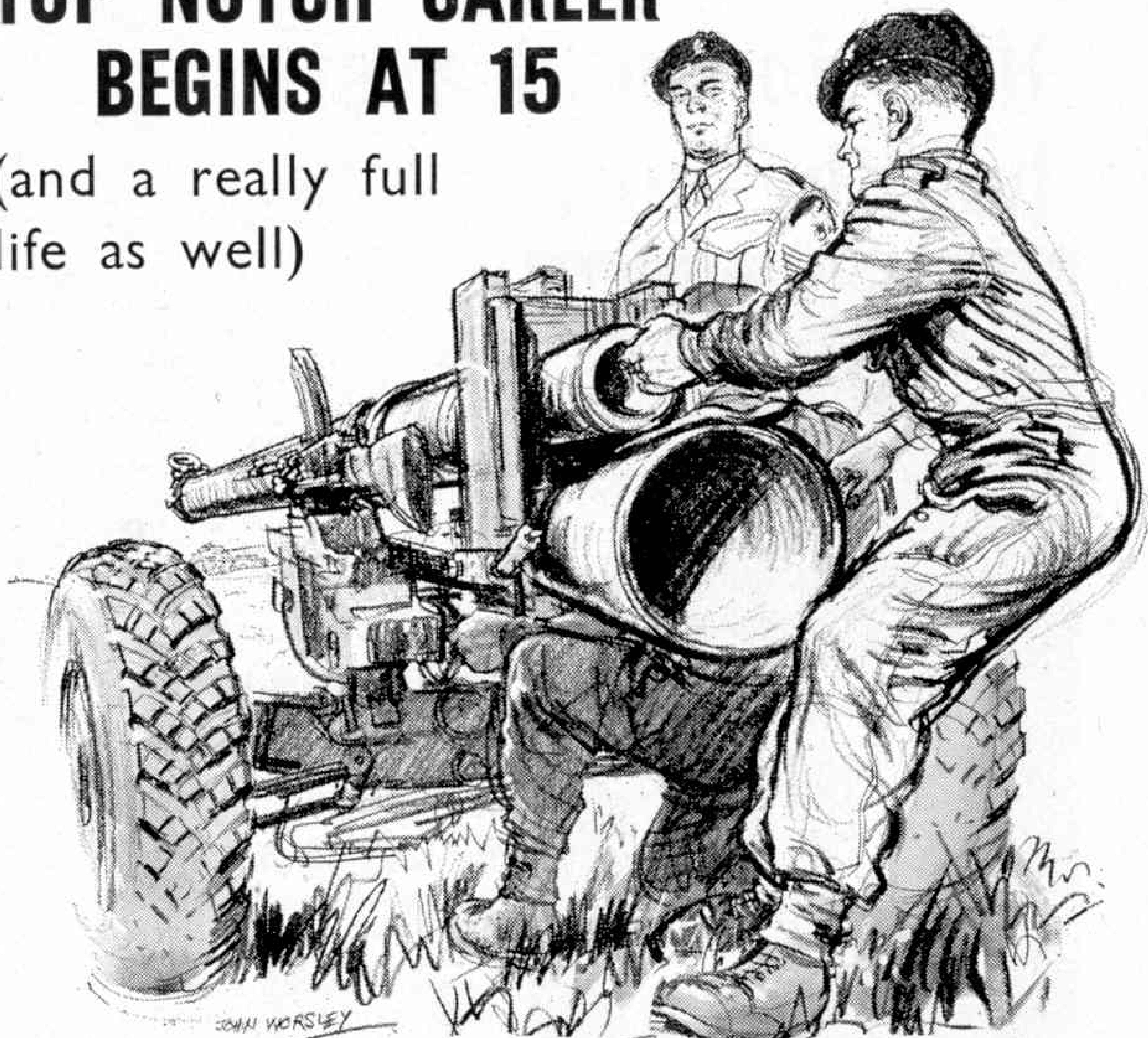
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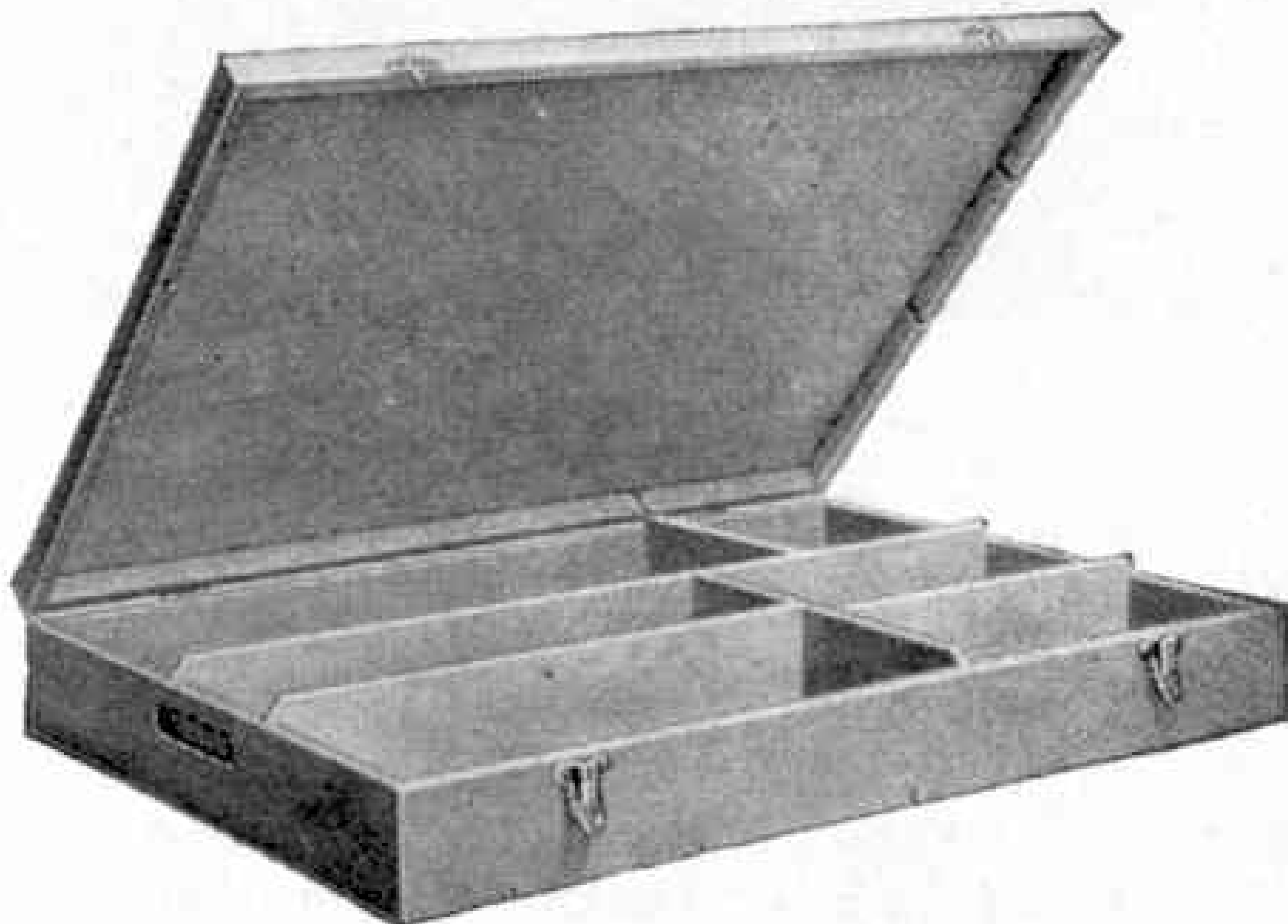
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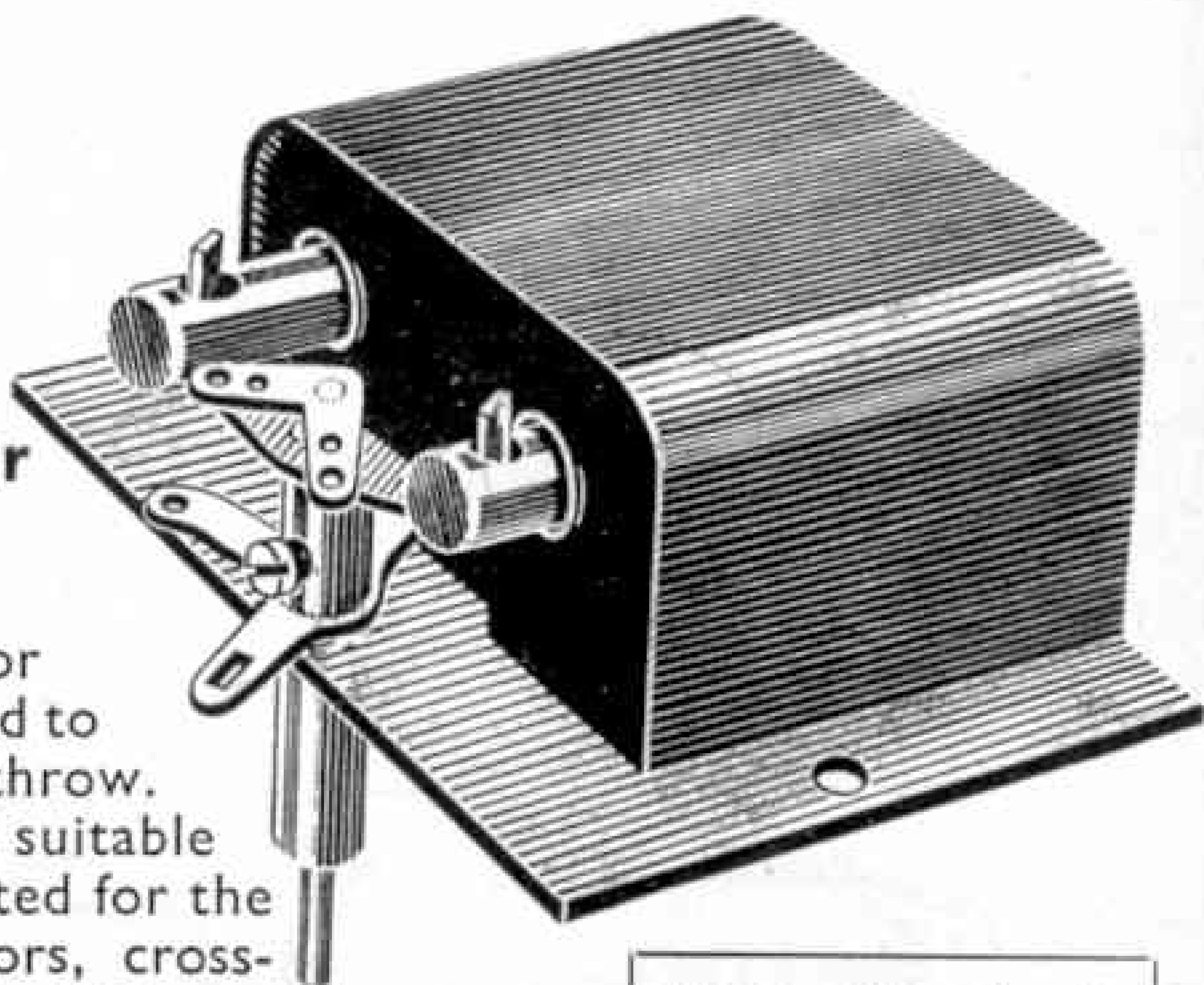


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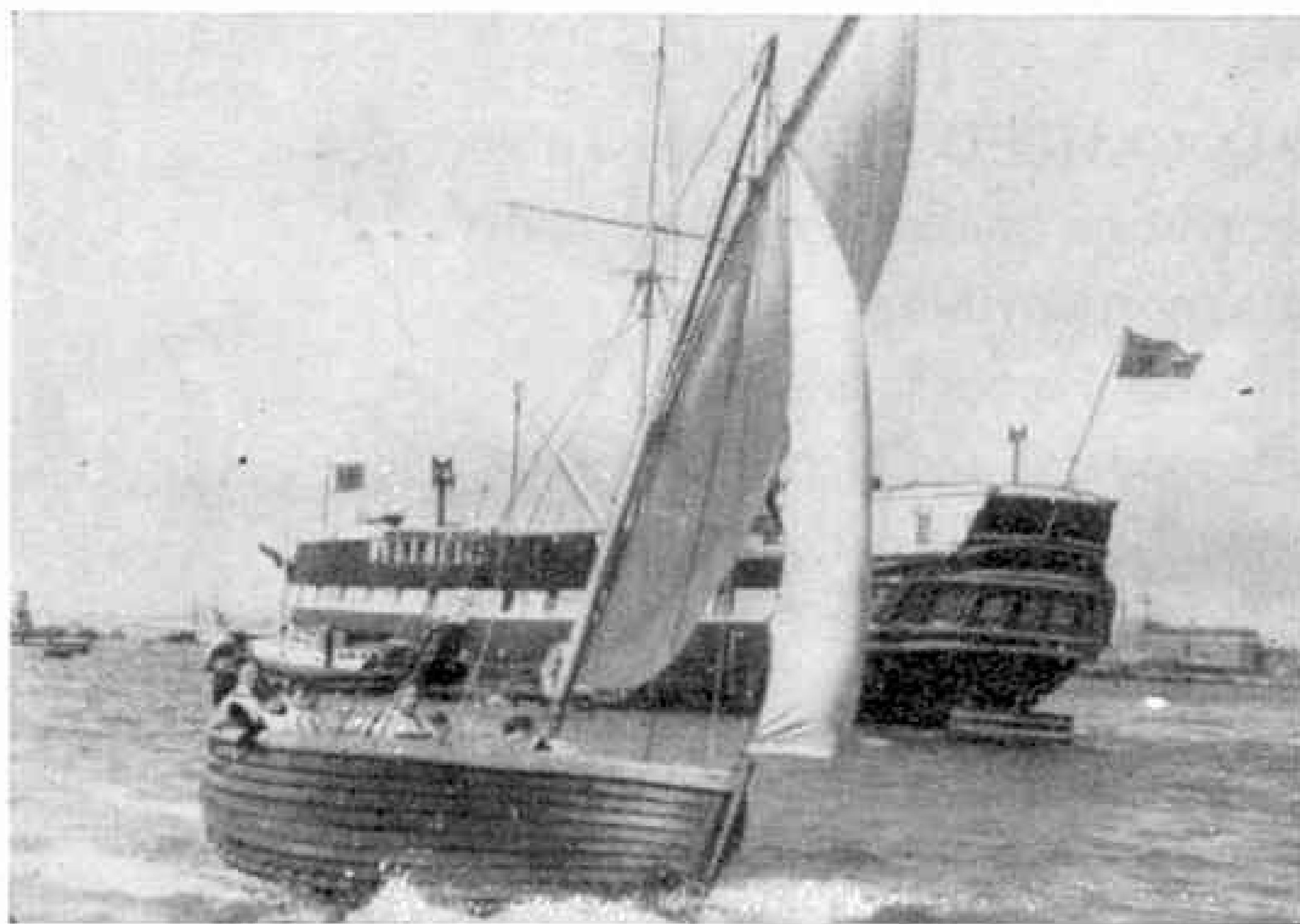
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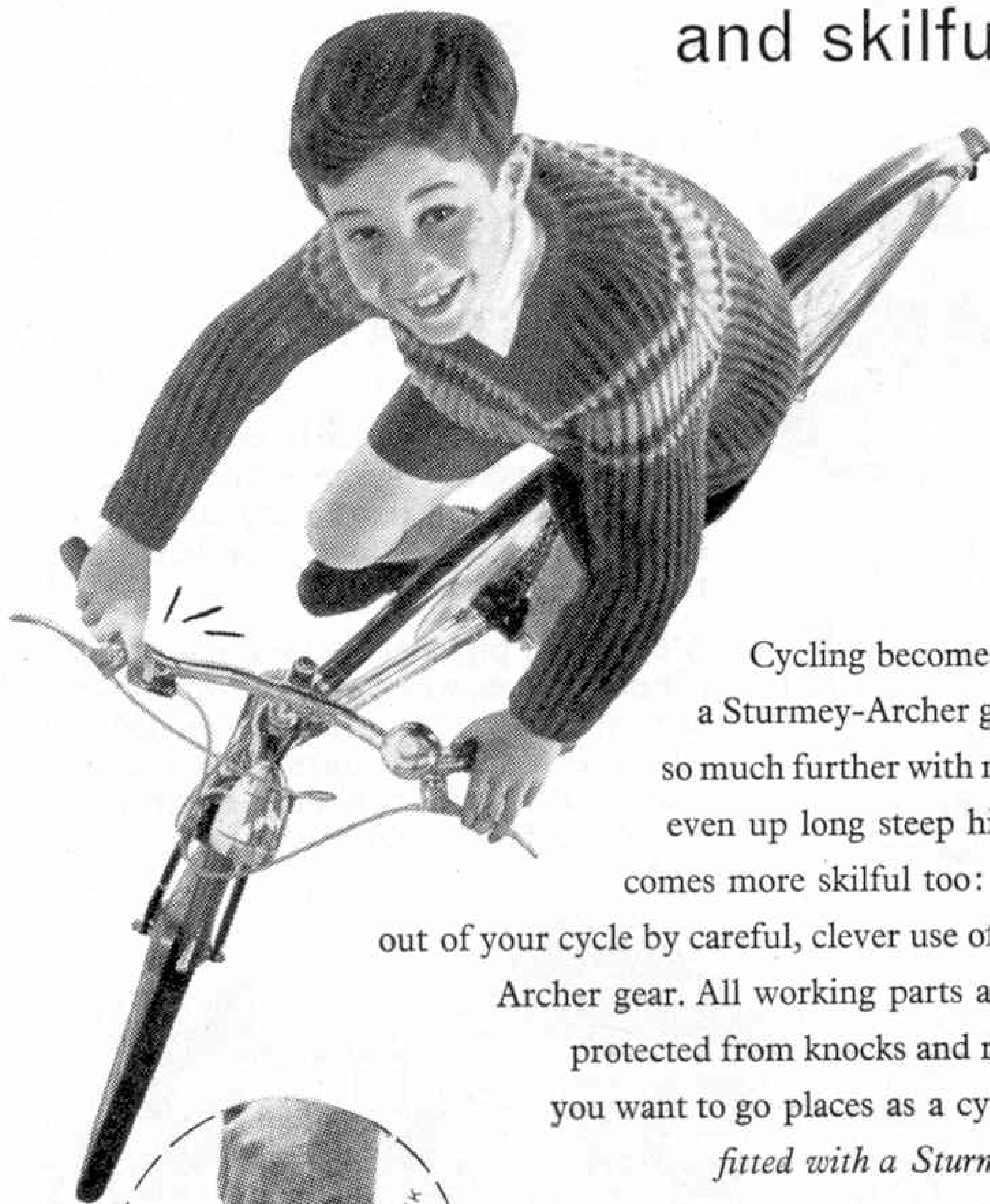
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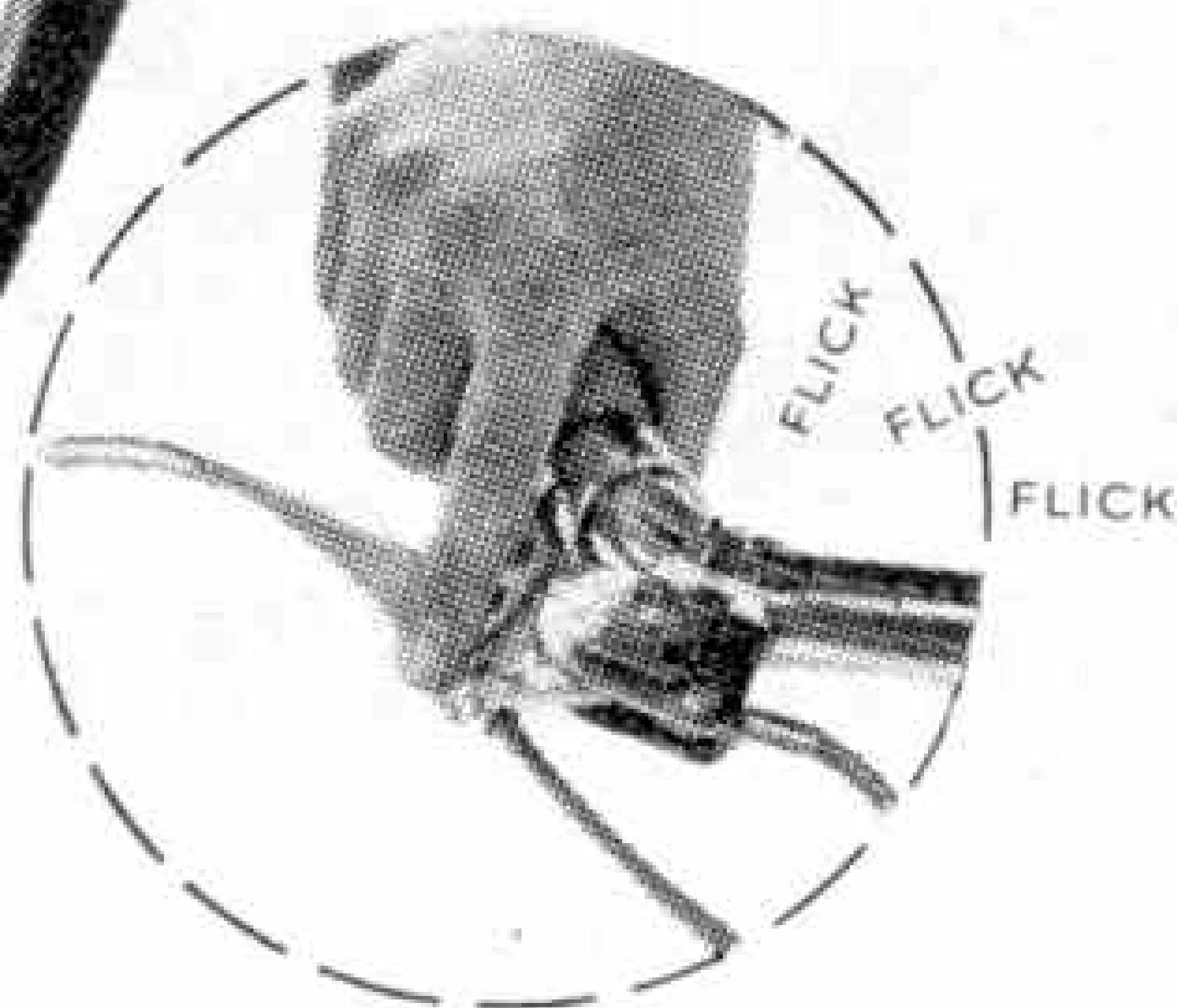
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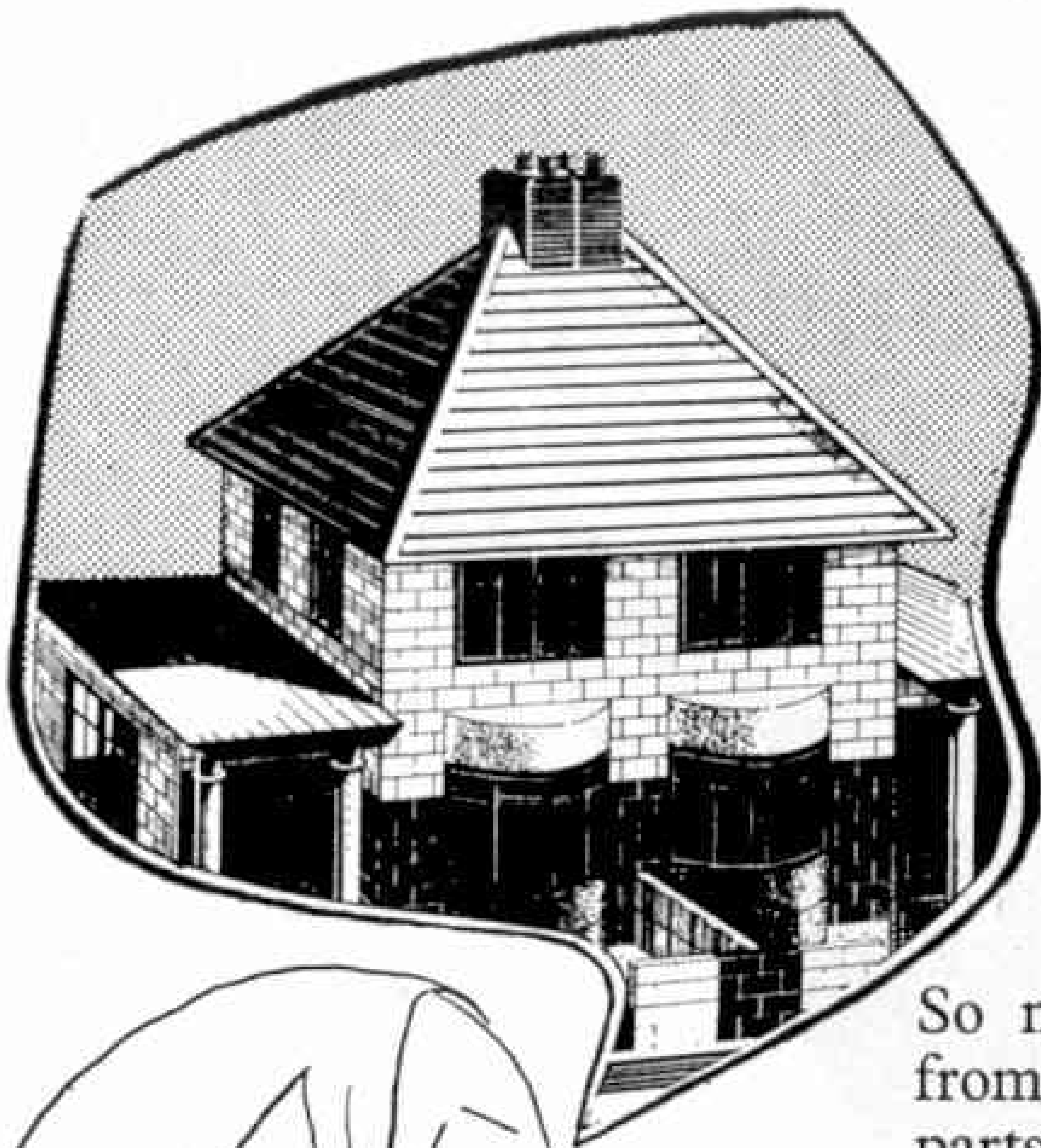
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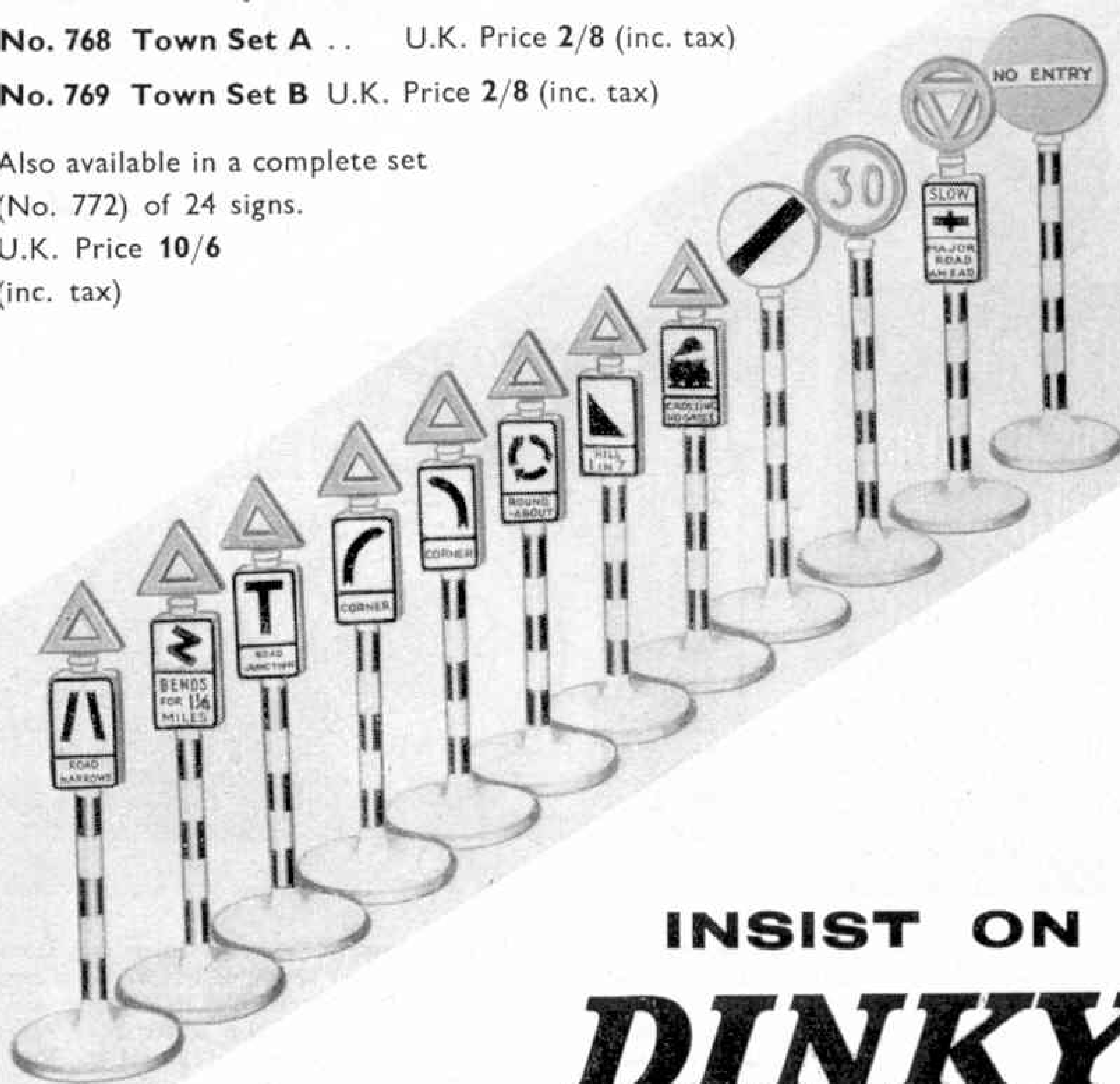
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MECCANO

MAGAZINE

Editorial Office:
Binns Road
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Vol. XLV
No. 5
May 1960

Seeking Your Views

ONE of the great advantages of this Editorial page is that it gives me the chance, each month, to have a sort of personal chat with each of the *M.M.s* many thousands of readers—something it would be quite impossible for me to achieve in other ways. It is, in fact, the *raison d'être* for this page; it enables the Editor to become less of a shadowy figure behind the scenes, which necessarily he must be for the greater part of each month, and emerge as someone who is directly interested in your reactions to all you can see and read in the pages of this Magazine.

From letters I receive I know your views, your likes and dislikes, and your comments do offer useful guidance on the type of subjects you expect the Magazine to deal with. Many complimentary remarks are made and I am grateful for these, for the *Meccano Magazine* has a proud record to sustain, and it is our constant endeavour never to allow it to fall from the pinnacle it has achieved as a periodical which can entertain and instruct boys of all ages.

Even so, since change is a necessary part of life, so a Magazine of this nature must be ready to adapt itself to new situations and circumstances. For that reason I shall,

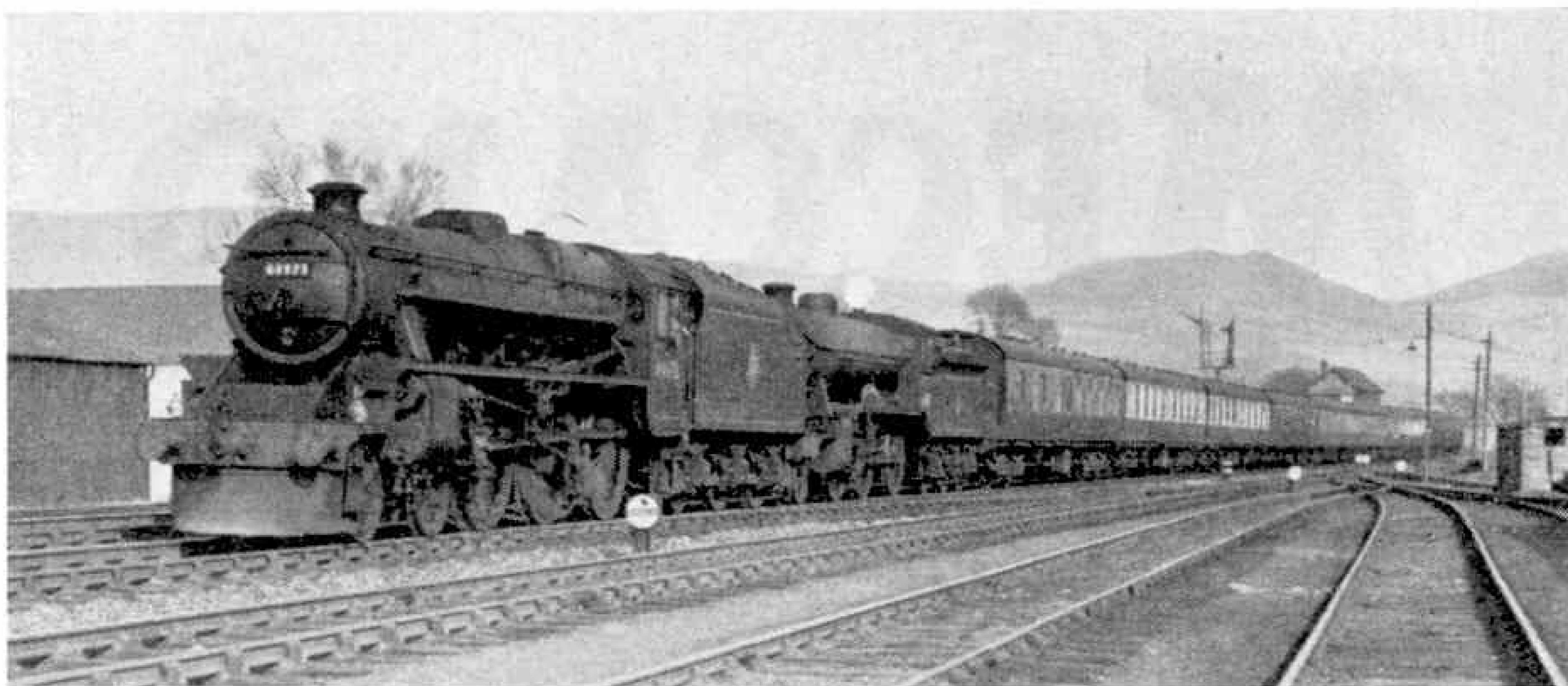
before long, be asking all our readers to complete a questionnaire. Just who reads this Magazine, how long they have been readers, and what they most like to read in these pages or, indeed, what they would most like to read if they had their choice, will be the sort of questions you will be asked. The answers, I can assure you, will be patiently sifted.

In Dinky Toys News this month we tell the story of a brave little boy, Hans Terreehorst, of Rotterdam, and how he has been aided in his fight against polio by his interest in Dinky Toys.

The Editor

A modernised car on the cliff tramway at Babbacombe, Devon. The story of "Britain's Cliff Lifts" is described on pages 233-5.





A down West Highland train approaching Dumbarton hauled by 4-6-0 No. 44973 and 2-6-0 No. 61797 "Loch Quoich". The leading engine has a small snow plough below the buffer beam. This and the lower illustration on the next page are from photographs by G. H. Robin.

Scenic Grandeur on Scottish Railways

ON a summer evening the *Aberdonian*, bound from London (King's Cross) at 7.30 for destinations well over 500 miles away was a heavy, well-filled express with "14 on".

The front portion for Aberdeen via Forth and Tay Bridges (part continuing to Elgin, near the Moray Firth) consisted of three sleeping cars, five corridor coaches and two vans; then came the West Highland section in which I travelled, two "sleepers", one composite coach destined for Fort

In this article
R. A. H. Weight
describes a circular
tour of the Highlands
by rail and sea.

William and detached at Edinburgh, and a restaurant car in rear, as far as York, that was kept busy until after 11 p.m. serving four-course dinners and refreshments.

The locomotive through to Newcastle was A1 4-6-2 No. 60125, *Scottish Union*, normally shedded at Doncaster. I knew by the chime whistle in the early morning hours that an A4 Pacific was hauling us from Newcastle to Edinburgh.

My small cabin in a modern B.R. 1st class sleeping car was a model of ingeniously-contrived comfort, with controllable warmth and air-conditioning, hot and cold water, bright, dim and bedside lights,

drawers, folding shelves, and handy aids for shaving, hanging up one's watch, and so on. After 7.0 next morning I drew back the shutter on the window side and, while still comfortable in bed enjoying early tea brought in by the through Conductor, excitedly began my sightseeing.

We were climbing from Clydeside on single track, had been passing the Gareloch and Loch Long and approaching Arrochar—downhill—42 miles from Glasgow.

So Much to be Seen

We were now launched into the grandeur of Britain's most continuously spectacular secondary main line—the West Highland—extending to Mallaig in the north-west corner of Inverness-shire. This is 164 miles from Glasgow (Queen Street) where the three London vehicles had been attached, before 6 a.m., to a through train for Mallaig.

There was so much to be seen all around that as soon as ready I changed to a compartment or, for a time, the dining car with more spacious windows on each side, and armed myself with a pictorial ex-L.N.E.R. route guide. Although it was still rather misty, the views for several miles down to Loch Lomond, with its towering, wooded slopes on the far side, were beautiful.

We had eight heavy coaches, plus two vans, necessitating the use of two engines owing to the severity of the route. The

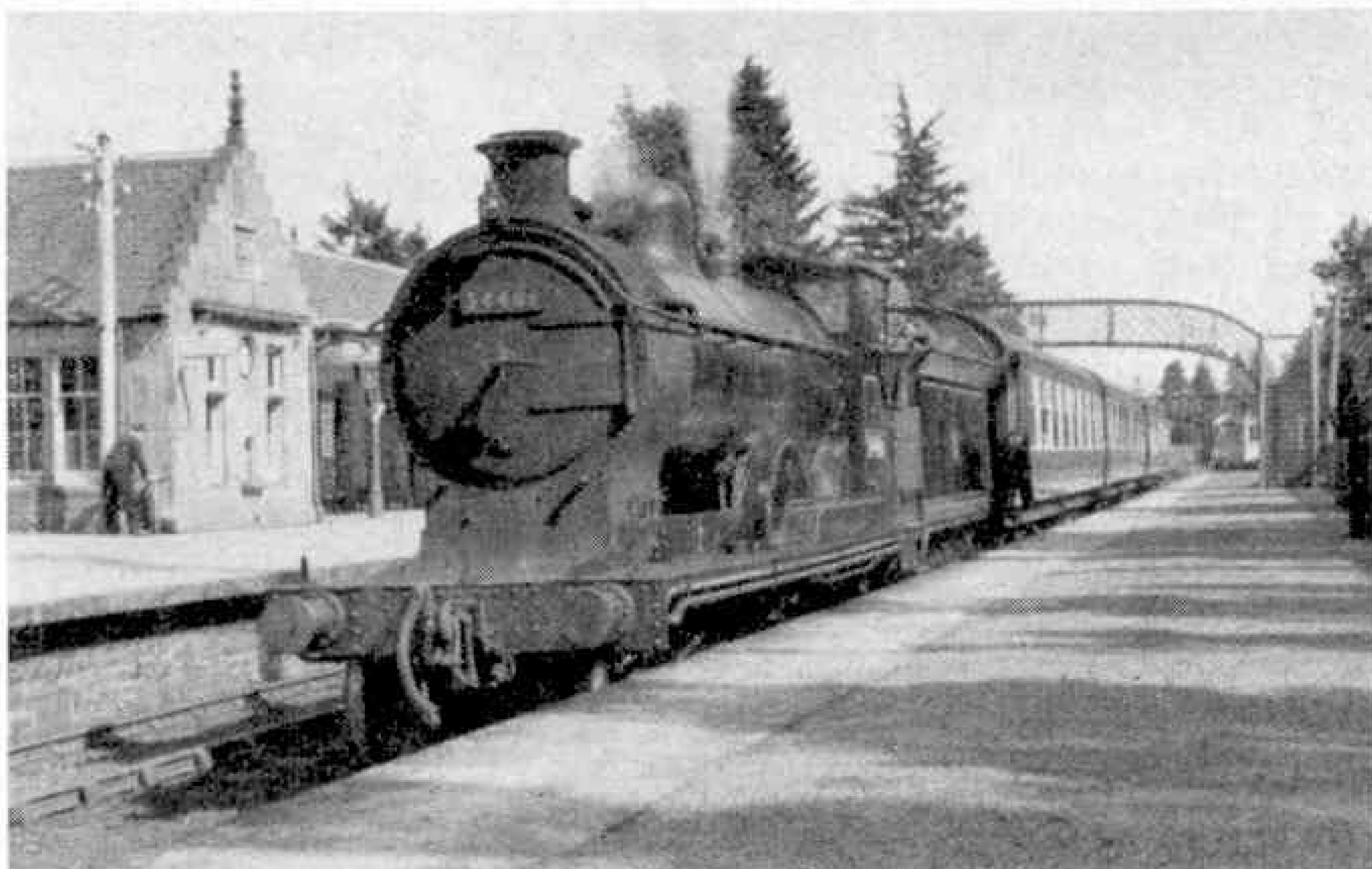
locomotives were No. 61787, *Loch Quoich*, a K2 2-6-0, originally built for the G.N.R. of England and belonging to the class long a mainstay of this West Highland line, and L.M.R.-type class 5 4-6-0 No. 44787.

I viewed them while they were taking water at Crianlarich, where the remarkable Oban line is crossed — with a connecting junction — the two single tracks running parallel for some distance on the opposite sides of a broad, wild valley.

Bacon and eggs, with other accompaniments of a good breakfast, were enjoyed as the train wound its fascinating way, as the weather cleared, through Argyllshire, Perthshire and Inverness-shire along "The Road to the Isles".

There were tremendous curves, sharply-changing gradients, glens, waterfalls and lochs, peaks over 3,000 feet high. We passed wild Rannoch and other extensive moorlands. Calls were made at lonely stations—usually simply passing places with an island platform and Swiss Chalet-style buildings—there were snow sheds or fences to protect the track in severe winter

weather when, even so, there are sometimes complete blockages. On we went past Corroon summit, 1,350 feet above sea level, then came lovely views of Loch Treig, where a great dam supplies water to an



A former Caledonian 4-4-0 No. 54466 waits at Moy, with a train from Aviemore to Inverness. Photograph by R. F. Roberts.

aluminium works. Followed the descent to more wooded country until we reached the terminal station, Fort William, delightfully situated by the salt-water shores of Loch Linnhe.

After reversal and leaving behind the King's Cross portion, we restarted behind K1 2-6-0 No. 62012, with "6 on" and diverged on to the 41-mile Mallaig line, regarded by many travellers as one of the finest scenic journeys of its kind in Europe.

I revelled in the views of Ben Nevis (4,400 ft. and Britain's highest mountain mass), the locks at the start of the Caledonian Canal, leading to Loch Ness, superb close-up vistas of other lochs, the open sea, the impressive Glenfinnan Viaduct, wooded heights in the historic Prince Charlie country; Arisaig, Loch Morar and, soon after noon, Mallaig itself



Class 5 4-6-0 No. 44707 in typical West Highland scenery above Loch Long with a Mallaig-Glasgow train.

within sight of some of the Inner Hebridean islands. I had travelled more than 600 miles in sixteen and three-quarter hours.

Saloon observation cars run in summer on certain West Highland trains, although I was unable to fit in a journey in one.

Then, aboard the m.v. *Loch Seaforth*, 1,090 tons, biggest of the David MacBrayne fleet which maintains regular passenger, mail and cargo services between the Scottish mainland and the Western Isles, etc., I took advantage of the comfortable dining and observation saloons in this smart, miniature liner bound for Stornoway,

is the case with other lines in the Highlands, there are only a few trains each day. At Kyle, during a busy afternoon period, I watched the transfer of passengers, luggage, newspapers, mails and goods between ships and trains or road vehicles, then went to the excellent British Railways Hotel, with its fine views over harbour, sea, and Skye, for tea and rest.

The only afternoon train from Kyle across, inland, to Inverness, the 5.40 p.m., was formed of three corridor coaches and four vans, hauled by No. 45365, another of the L.M. "black fives" ubiquitous in those parts.

Steep Gradients

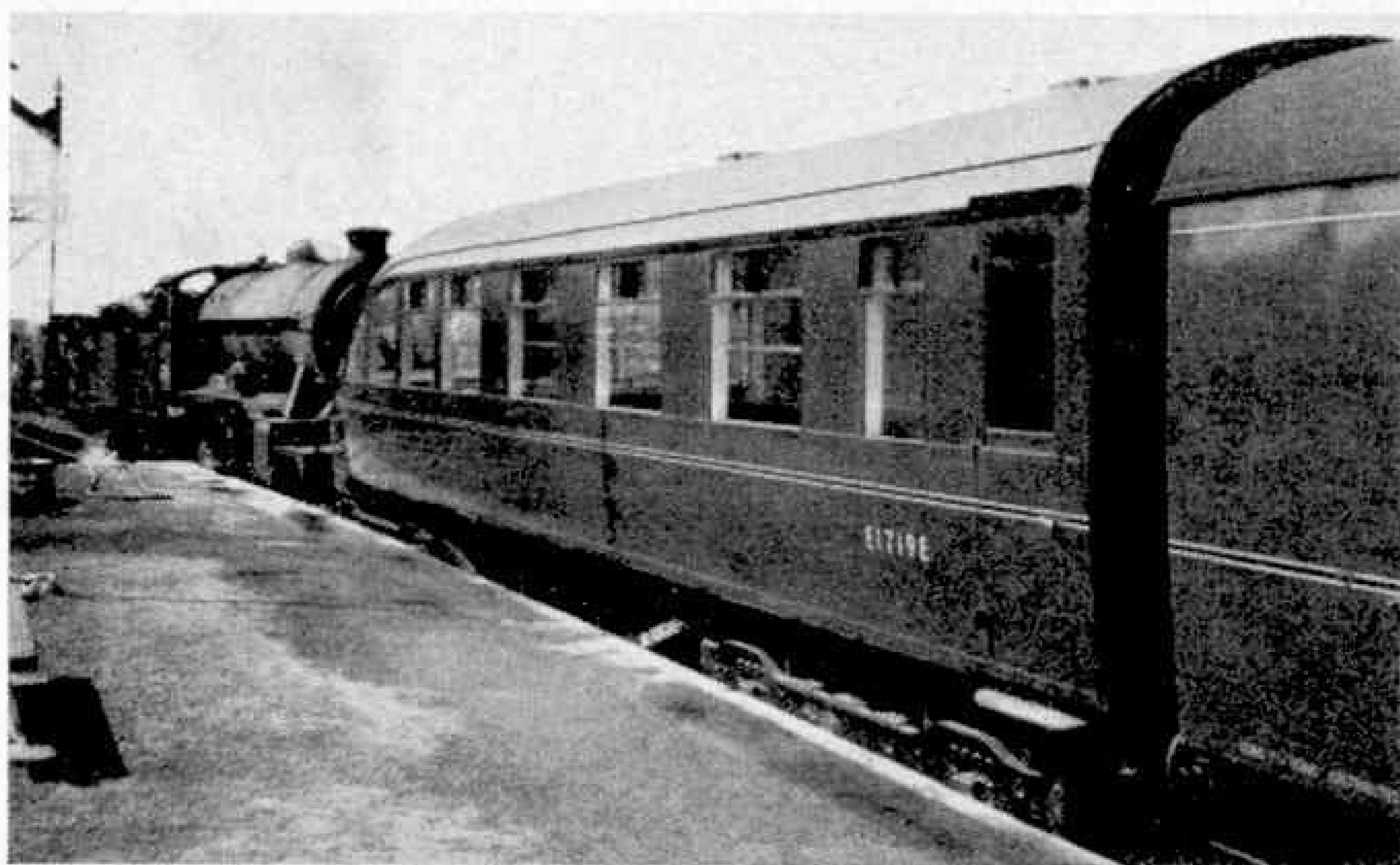
In evening sunshine it was another glorious trip starting off with the lochs, mountains, cliffs and gorges of Wester Ross; gradients as steep as 1 in 50 and continuing amid most attractive scenery (late daffodils blooming in June!) with ex-Highland Railway stations and passing loops.

At tiny Achanalt, under the care of a signalwoman—who was attended by a black retriever dog

—we crossed the one evening train in the opposite direction, worked by No. 44991. Engine and train crews changed over here. I alighted at the bright junction station, Dingwall, having almost reached the eastern Scottish shore, sighted Cromarty Firth, and completed the journey into Inverness behind Nos. 44798 and 44723 in Britain's furthest north train, from Wick and Thurso, with buffet car from Helmsdale and a most friendly staff.

Inverness is an important town and railway centre. The ex-Highland, then L.M.S., station is curiously laid out with platforms roughly like the sides of a triangle across the base of which go through north-south lines connecting to the sidings and depots, also the platform tracks. It is customary for arriving trains to "run past", as it were, on a through line, then back into a platform. As far as possible this facilitates access to connecting services waiting on the adjacent one and releases engines more quickly.

(Continued on page 266)



No. 61789 "Loch Laidon", acting as station pilot at Mallaig, is coupled to the observation coach at the rear of a recently-arrived train. Photograph by J. C. W. Halliday.

so well equipped for day and night travel. A call was made at Armadale (Skye) and then, after sailing about 25 miles through the Sound of Sleat, with mainland and Isle of Skye peaks and rugged country visible on either side, I disembarked at the Kyle of Lochalsh and from that point travelled by the ferry which conveys buses, cars and passengers to Kyleakin, Skye, for a short look round.

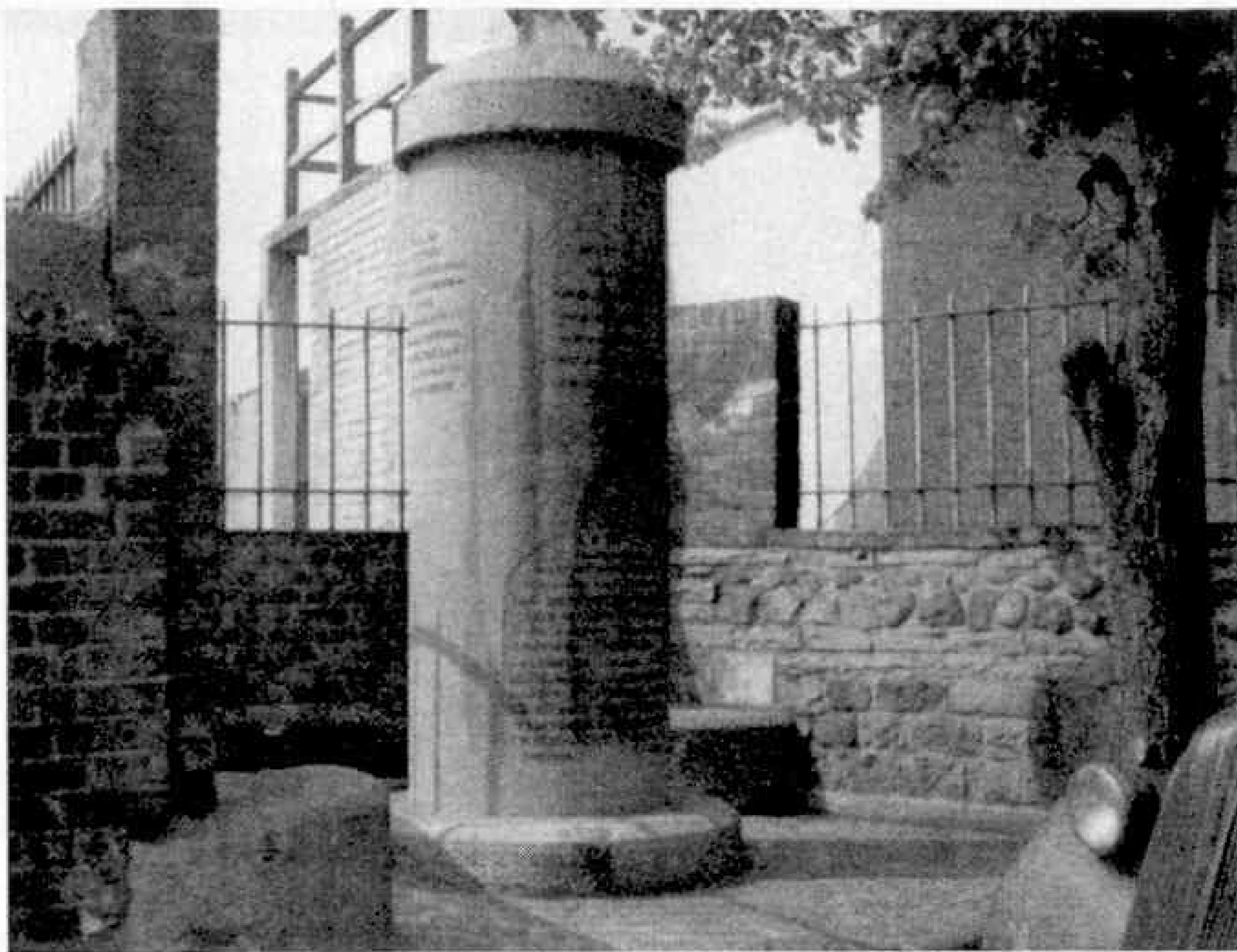
Railway Outposts

Kyle, in the County of Ross and Cromarty is, like Mallaig, a village, railway outpost, fishing port and staging point between the mainland and the numerous isles off the far North-West of Scotland. One would have to travel in roundabout fashion for hundreds of miles by train to bridge the gap between these two small, remote termini as they are at the ends of long, separate branches which come from different directions.

Population is sparse, so on each line, as

Nigel B. Maslin
Asks—

Where Did Cæsar Cross the Thames?



A QUESTION which has occupied the minds of historians over the years has still not been answered—where did Julius Cæsar cross the Thames in 54 B.C., during his invasion of Britain?

Mr. C. Colbeck, M.A., in his notes on Cæsar's *Gallic War, Book V*, says the crossing was almost certainly made above Teddington where the tideway ended, for it would have been folly to have crossed below that point.

The older antiquaries, however, suggest Coway Stakes as a probable crossing place, and tradition has it that the Venerable Bede found these Stakes, supposed to have been driven in by Cassivellaunus, the British chieftain, against Cæsar, and gave the place—which is close to Shepperton—its name.

Among other suggestions is that put forward by the late Sir Montagu Sharpe, but to understand this we must know something of the battle between Cæsar and the British. In his *Gallic War, Book V*, Cæsar writes, "The territory of Cassivellaunus was divided from the maritime states by the Thames, distant about eighty miles."

Cæsar's objective was to defeat Cassivellaunus whose camp was at Verulamium (St. Albans) about nineteen miles north of Brentford.

In his book, Sir Montagu Sharpe says, "It is obvious that 'about eighty miles' could not refer to the general stretch of the Lower Thames, but to some place across it where the territory of the British chieftain could be entered."

The monument in Ferry Lane, Brentford. The plaque concerning Cæsar's crossing is set in the top left of the monument. Photograph by permission of Gunnersbury Park Museum, London.

According to Sharpe, Brentford seems to have been this place, as it is just eighty miles from the Roman landing place at Dover.

Cæsar's account continues, "Cæsar, being aware of their plans, led his army to the Thames to the kingdom of Cassivellaunus. The river was passable on foot at one place, and that with difficulty. When he arrived there, he noticed a large force of the enemy drawn up on the opposite bank. The bank was also defended with sharpened stakes fixed outwards, and similar stakes were placed under water and concealed by the river.

"In such a rush"

"Having learnt these particulars from captives and deserters, Cæsar sent forth the cavalry, and immediately ordered the legions to follow. But the soldiers went at such a pace and in such a rush, though only their heads were above water, that the enemy could not withstand the charge of the legions and cavalry and they left the bank and took to flight." That, briefly, is the story of Cæsar's Thames' crossing, although we cannot pin-point its whereabouts.

Sir Montagu Sharpe, who did a great deal of work on the subject, presented one of the stakes from the river, which he believed to have been used as a defensive measure, to the Gunnersbury Park Museum,



Arthur Gaunt Tells You About:

The World's Most Famous Play

ALL roads in Bavaria this summer will lead to the attractive village of Oberammergau, set amid enchanting mountain scenery about 44 miles from Munich. Tourists from many countries are expected to flock to this centre, for here is performed a religious drama aptly described as the most famous play in the world—and it is presented only once every ten years.

The play portrays the events immediately before the Crucifixion, and is a form of Passion Play widely performed during the Middle Ages. But the Oberammergau version had a strange beginning....

In 1632 a plague struck Bavaria and was brought to the village by a man who rashly violated the isolation imposed by the inhabitants at that dreadful time. His folly resulted in more than eighty deaths at Oberammergau and prompted the villagers to make a solemn pledge. They vowed that if they were spared further deaths from the pestilence they would present a Passion Play at ten-year intervals. As local records reveal, the plague did subside immediately afterwards and nobody else at Oberammergau succumbed to its ravages.

Two years later the pledge was honoured for the first time. Thus began the series of performances that have made the Bavarian village known throughout the world.

The original Passion Play has been re-written more than once, but it still follows the mediæval form, and although the ten-year sequence has not been strictly adhered to for various reasons, the Play has never been permanently abandoned.

At one period it was banned by the State,

but there is reason to believe that it took place all the same. The Napoleonic Wars interfered with the performances and they were suspended

in World War I. War conditions caused another suspension in 1940, but when the Play was again revived in 1950 more than half a million people attended, about 130,000 of them foreigners. Every seat for the 87 performances was sold, and no fewer than 60,000 applications for tickets had to be refused.

Preparations for the 1960 performances, which begin in mid-May and continue until the end of September, started in earnest as long ago as the Spring of last year. One reason for such an early

Above is shown the building where the Passion Play, with its cast of 1,000 people, is performed. It has accommodation for more than 5,000 onlookers.

beginning is that all the men taking part are required to grow long hair and a beard.

Out of a population of about 5,000, about 1,400 inhabitants are concerned in the production in one way or another. Of the 600 actors, 130 have speaking parts, and it is a rule that all the cast must have been born at Oberammagau, or have lived there for twenty years.

Eagerly Sought

Last summer, in accordance with custom, minor religious plays were presented in the village theatre so that the selection committee might choose the actors for the main Passion Play rôles. These short plays also gave acting experience to those too young to have taken an active part in the 1950 Passion Play.

The chief rôles, of course, are those of Christ, Mary, His mother, and the Apostles, but even the minor rôles are eagerly sought after, and for those unable to take speaking parts there are places in the crowd scenes.

Anton Preisinger, who had the rôle of Christ in 1950, again has the part this year. A young girl, Irmgard Dengg, is to be Mary.

Recent months have also seen the costumes and other stage properties being brought out, to be carefully examined and repaired if necessary. The inhabitants of Oberammagau have a valuable wardrobe of Passion Play garments, including costumes 200 years old. Among these clothes fashioned in the style of 2,000 years ago, are Christ's purple robe, Pilate's rich raiment, Roman soldiers' uniforms, and merchants' attire. No effort has been spared to make them as realistic and authentic as possible.

Each performance lasts a whole day, except for a two-hour interval at midday, and there are about forty changes of scenery during the sixteen acts of the drama.

Long ago the Play was transferred from its original setting in the churchyard, to a specially-built stage. The present auditorium seats more than 5,000 people and was

carefully designed for its unique purpose.

The stage itself has special features, too. Since horses, sheep, donkeys, and other live animals are used in many scenes, special entries have been provided for them from the street behind the stage. Thus they can be introduced or removed quickly as required, without holding up the Play.

The original actors used a script older



Above, the scene as Christ is taken before the High Priest. Below, the road to Calvary.



than the Oberammagau performance itself, the text having been written for a Passion Play at Augsburg about 400 years ago. However, it has been completely revised on three occasions by monk-scholars. The version used this year will be based on one prepared about 150 years ago and improved by an Oberammagau pastor between 1850 and 1860.

Not until 1810 did music begin to have an important place in the Play. Previously, the musical accompaniment consisted of only a few songs. Special music was, however, composed for the performances soon after the 1810 presentation, a schoolmaster born at Oberammagau carrying out this job. When, in 1817, a fire destroyed the score, he set to work again.

For the 1950 performances a complete revision of the music was again carried out, and the new choral settings will be used again this year. Wagnerisms which tended to complicate the earlier versions have been removed.

Even so, the music composed in 1817 is still preserved, although it was damaged during the last war. A strange occurrence was the discovery of a complete manuscript copy of this music in England some years back.

Mountains as Backcloth

Past performances of the Passion Play have brought renown not only to Oberammagau itself, but also to some of the actors. The best-known player, Anton Lang, acted the part of Christ for three seasons—1900, 1910 and 1922, the last-named series having been delayed from 1920 by post-war difficulties.

Another member of the now world-famous Lang family, Johann Georg Lang, designed and painted the present stage. Although the auditorium is open to the sky, and the distant mountains form a striking backcloth, the audience is under cover. No artificial lighting effects are used, but electrical mechanism enables the scenery to be changed quickly.

The Cross, which the man playing the part of Christ has to drag behind him, weighs just over 80 lb. It is also an unbroken tradition that none of the players may wear wigs, grease paint, or similar stage accessories.

Because the Play is performed only every ten years, the stage and auditorium are removed after the last performance,



Election day—the cast of the Passion Play is chosen by secret ballot about a year before the play begins. Here a group of Oberammagau residents discusses the events of the day. No man or woman can take part in the play unless they have lived in the town for 20 years.

and the site cleared so that it can be put to other uses. The preparations and rebuilding for this summer's Play are expected to cost more than £200,000.

In addition, an exhibition of woodcarving has been arranged. Indeed, when the inhabitants of Oberammagau are not preparing for their recurring religious drama they are mostly engaged in producing delicately-carved objects.

Ready for Influx

The village has been a famous centre of the craft for centuries, and in the eighteenth century Oberammagau sent its products all over the world. At one period the local craftsmen had business houses in most capital cities.

But when Passion Play Year comes round the carvers put aside their knives and prepare for the great influx of people. World interest this year is so great that the 1950 record of 500,000 visitors is almost certain to be broken.

First of the Big Jets

By John W. R. Taylor

THE Boeing 707 of Braniff Airways, illustrated on the cover of this month's *M.M.*, is just one of 83 of these big jetliners which were in service at the beginning of February this year. Between them, they had by then flown a total of 121,300 hours, or 52,000,000 miles, and had carried 2,365,000 passengers without a single accident on a scheduled service.

This is a fine record, especially when we remember what the experts were saying about the "big jets" two or three years ago. Their views were summed up by the airline operator who wailed "We are buying aeroplanes that haven't yet been fully designed, with millions of dollars we don't have, and are going to operate them off airports that are too small, in an air traffic control system that is too slow, and we must fill them with more passengers than we have ever carried before."

Highest Ever

So far, the signs are that his pessimism was misplaced. Many airports have been enlarged to cater for the Boeing 707 and its Douglas counterpart, the DC-8: others are being extended. The air traffic controllers have coped with the greatly-increased speeds and there has been no shortage of passengers. The proportion of seats filled on jet flights across the Atlantic is, in fact, the highest ever.

Some design changes have been made as a result of experience in service. For example, most 707s will soon be fitted with a taller fin, and a small additional fin under the rear fuselage, to make them easier to handle if an engine should fail at take-off—an improvement first demanded by the British Air Registration Board for B.O.A.C.'s 707s. This sort of thing happens



Boeing 707 airliner of Pan American Airways

with most aeroplanes; but some problems, such as the noise made by the big jets, remain to be solved.

In terms of engine reliability, the 707s have an almost unbelievable record. One airline flew a total of 48,380 hours with no failures and only two shut-downs to avoid possible damage after something appeared to have gone wrong. On this basis, the 707 has proved about twenty times as reliable as a piston-engined airliner.

Engine Still Ran

This is not, of course, mere luck. Pratt & Whitney took no chances with the JT3C turbojets of the early-model 707s. It was suggested that these engines might be damaged by sucking in objects lying on the parking apron of an airport. So Pratt & Whitney opened up a JT3C to full power on a test-bench and then hurled into the intake such items as a pair of pliers, three mechanics' hats, pieces of glass, a length of iron chain, pilot's headphones, nuts and bolts, a fur-lined jacket and several dead birds. The engine continued to run!

At the moment, passengers have benefited from the introduction of the 707 mainly in terms of shorter travelling time. T.W.A. operate a non-stop transatlantic service from New York to London in six-and-a-half hours, at no greater cost than a similar trip in a piston-engined aircraft. In time the greater efficiency and capacity of the jets may also make possible lower fares.

SPACE NOTES

U.S. HAS LUNAR TIMETABLE

THE most important space-flight organisation in the U.S.A. is the National Aeronautics and Space Administration (NASA). Although the armed forces also have an interest in space, NASA is charged with carrying out basic space research and producing all the space vehicles needed for non-military purposes.

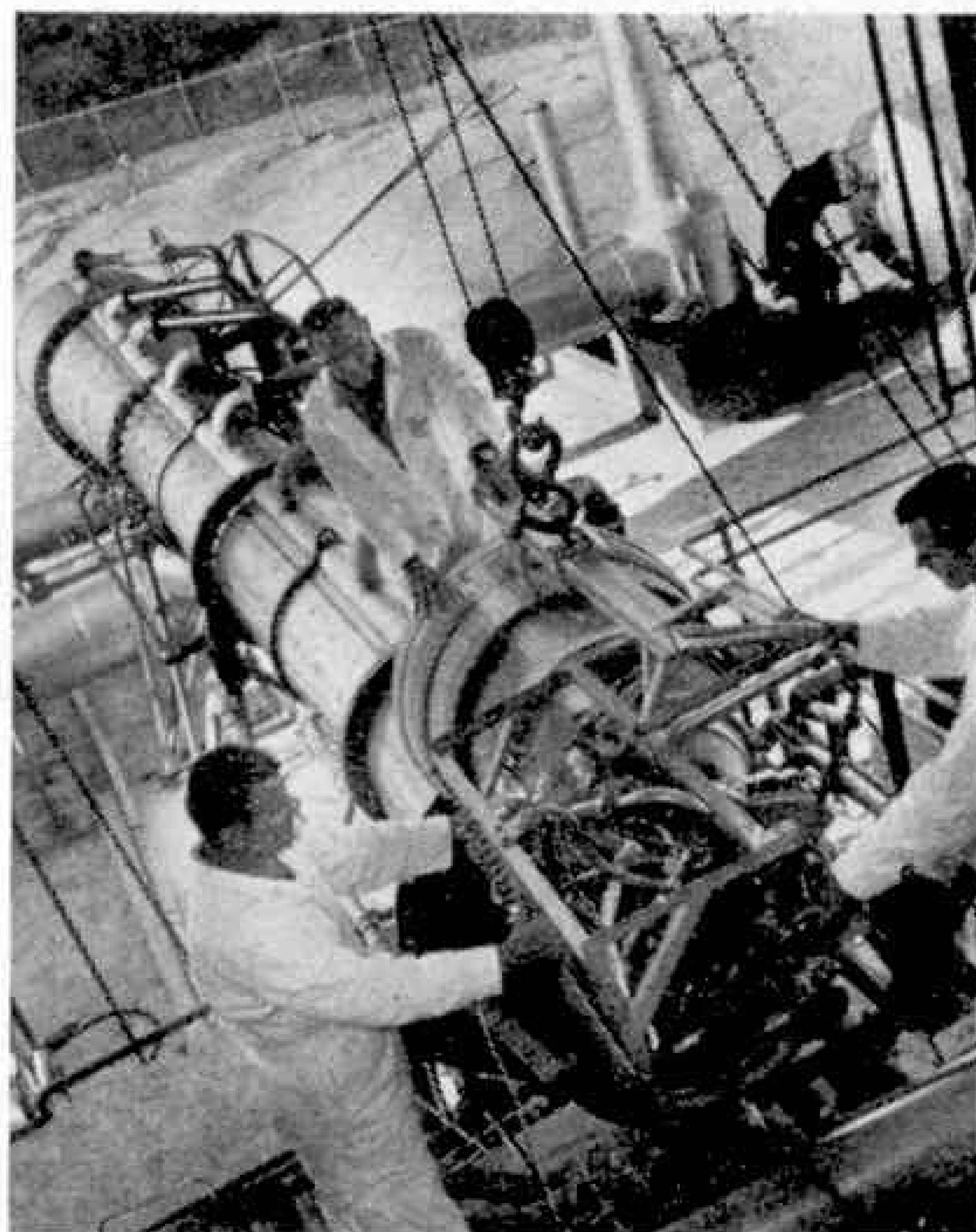
NASA is planning its operations a good ten years ahead and has recently issued a tentative timetable, given below, saying what it hopes to achieve in the next ten to fifteen years. At first sight this looks as though it has been compiled by an imaginative science fiction writer . . . a manned landing on the Moon by the late 'sixties,

By J. Humphries, B.Sc. (Eng.),
A.M.I.Mech.E., A.F.R.Ae.S.

followed in a very few years by manned landings on Mars and Venus. But the truth is that this is a serious document drawn up by scientists, and we can be sure that if the Americans do not manage to keep to this timetable, the Russians will.

Although there are still too many failures it can be fairly said that all the requirements for putting satellites into orbit can now be met, and that it is time to press on with the next stage, the conquest of the Moon.

NASA has a detailed ten-year programme for this achievement, starting with the near-



miss firing of 1959 and finishing with a manned return flight in 1969.

The table on this page shows this programme. More information on Centaur, which is to be used for soft-landing instruments, is given below and it is hoped to give information on some of the other vehicles in future issues of *Space Notes*.

Incidentally a "hard" landing is where the vehicle is allowed to crash; a "soft" landing is where the vehicle is slowed down and the instruments are landed intact and continue to transmit data about the surface of the Moon.

Above is shown an XLR-115 engine being lowered into position on a test-stand behind a vacuum installation for testing under space conditions. (Photograph by courtesy of Pratt and Whitney Aircraft, U.S.A.)

N.A.S.A. TEN-YEAR PROGRAMME

Year	Mission	Vehicle	Payload (lb.)
1959	Near-miss	Juno II	15
1960	Vicinity	Thor-Delta	80
1961	Orbit	Atlas-Agena	980
	Hard instrument landing	Atlas-Agena	650
	Soft instrument landing	Atlas-Agena	430
1962	Soft instrument landing	Atlas-Centaur	730
	Unmanned orbit, instrument return	Atlas-Centaur	275
1963	Soft instrument landing	Juno V	1700
1964	Unmanned orbit, instrument return	Juno V	700
1965	Soft instrument landing, return with sample	Juno V	200
1966	Soft instrument landing	Nova	19,900
1969	Manned landing and return	Nova	2100

WHO OWNS THE MOON?

Now that the technical means for flight to the Moon are to hand, it is high time to determine the legal position of lunar exploration.

The conquest of the New World in the sixteenth and seventeenth centuries was on a "first come, first served" basis and has since led to a great deal of trouble. The Russians have already landed their emblem on the Moon, in Lunik II, but have expressly stated that they lay no claim to ownership. The way thus seems open to international trusteeship under the United Nations' Trusteeship Council.

If this were done, there would be no national ownership on the Moon and sections would be leased to any government wishing to explore or exploit the natural amenities.

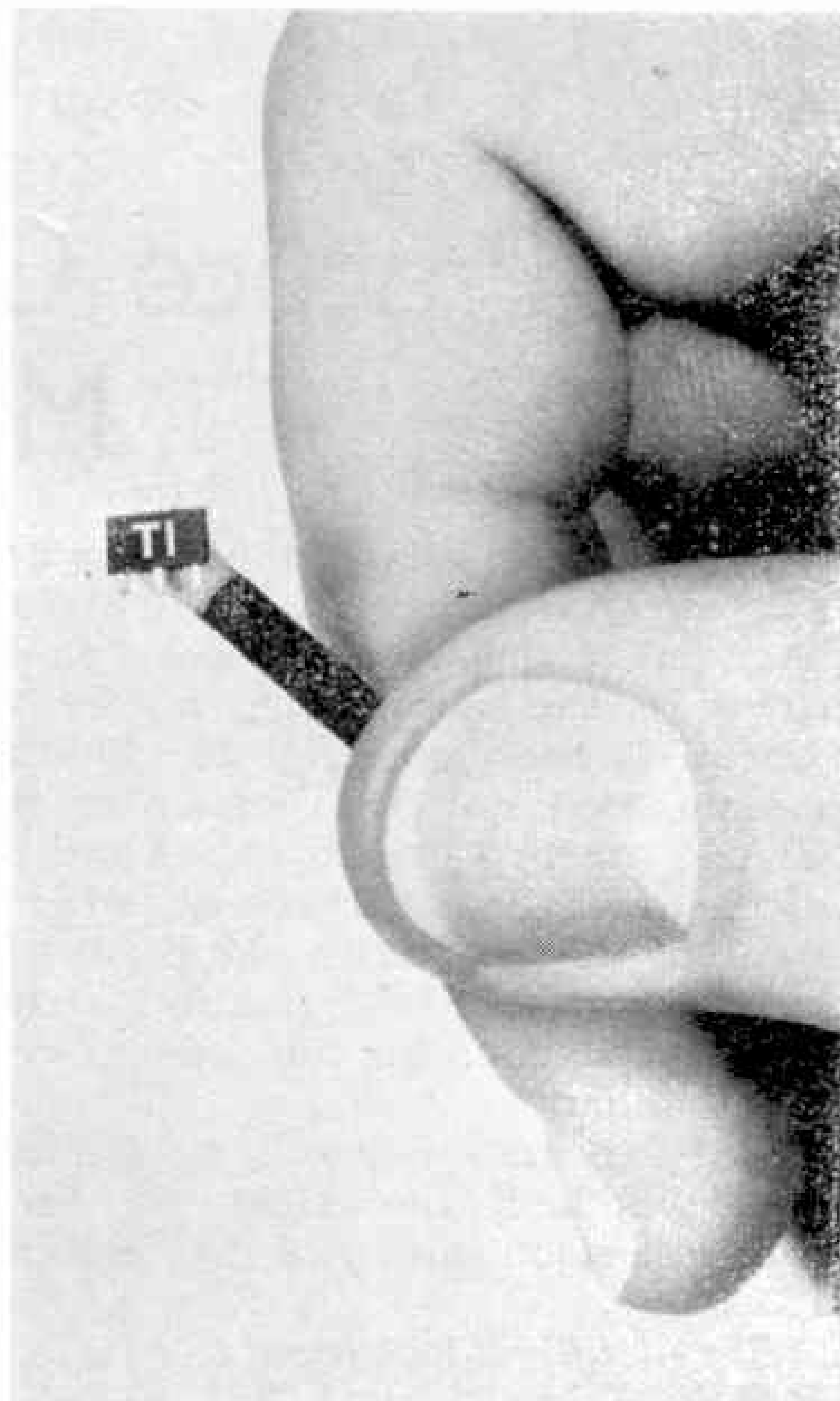
LIQUID HYDROGEN ROCKETS

To date, most of the large rocket motors have burnt liquid oxygen together with a fuel which is rather similar to household paraffin. This fuel has the advantages of cheapness, ease of handling and ready availability. There are, however, some fuels that will give better performances and of these the best is liquid hydrogen. Until recent years liquid hydrogen was very much a laboratory chemical, expensive and only available a few gallons at a time. Now several commercial plants are producing it and in certain parts of the United States it is available in tank-car loads. Needless to say, the price has also dropped.

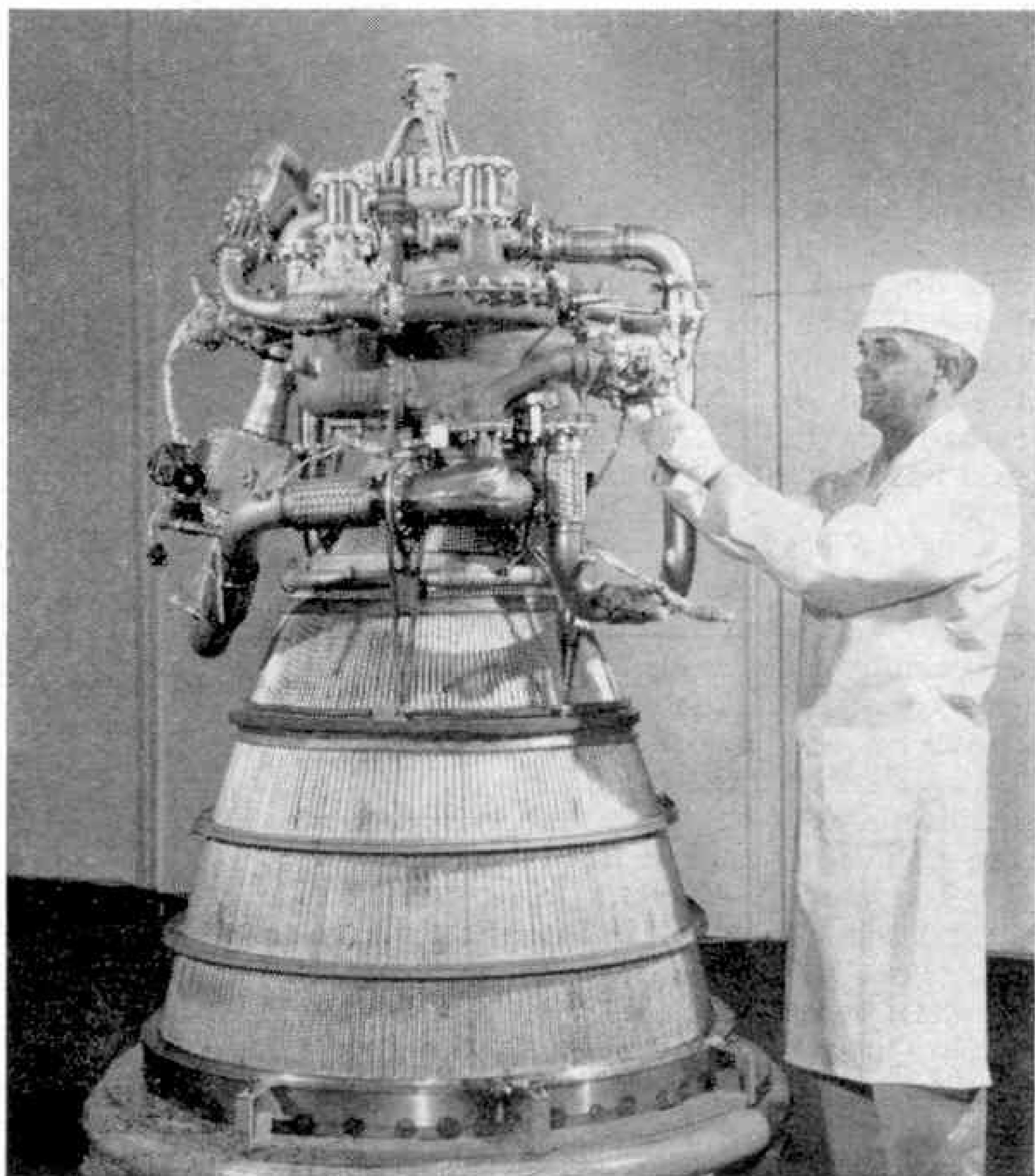
Several firms have run small rocket motors on liquid hydrogen during the past ten years, but Pratt and Whitney are the only people to make a large production engine. This new engine, the XLR-115-P-1, delivers 15,000 to 20,000-lb. of thrust and will power the Centaur space vehicle. This vehicle, used as a second stage on top of a modified Atlas, will be able to put a 7,500-lb. satellite into a 300-mile orbit, or to send a 2,000-lb. payload into deep space, or to "soft" land 730 lb. of

(Continued on page 266)

The Pratt and Whitney liquid hydrogen rocket engine. Note the large nozzle for use in space. (Photograph by courtesy of Pratt and Whitney Aircraft, U.S.A.).



This is a complete electronic circuit, measuring only $\frac{1}{4}$ in. x $\frac{1}{8}$ in. x $\frac{3}{32}$ in. (Photograph by courtesy of Texas Instruments.)



John W. R. Taylor describes a

Practice Count-Down on a Missile Site

A VISIT to a Royal Air Force unit is usually exciting and interesting, and as I motored across the flat Fen country towards the aerodrome of Feltwell in Norfolk, one morning in February, I remembered my first encounter with the R.A.F. nearly 30 years ago. That, too, was in East Anglia, at Duxford, where I saw some of the wonderful old Bristol Bulldog fighters of No. 19 Squadron stripped of their fabric covering and being overhauled in a hangar.

Not far from Feltwell, at Mildenhall, I had watched the start of the great MacRobertson air race to Melbourne in 1934.

My first flight was from R.A.F. Upwood; and I became the first journalist to fly at night in a jet night fighter when I went to West Mallory in 1953 to write a story for the M.M.

No two memories of the past are similar. There has always been something new to see and do, and my visit to Feltwell was no exception, for this station is the home of No. 77 Squadron, the R.A.F.'s first ballistic missile unit.

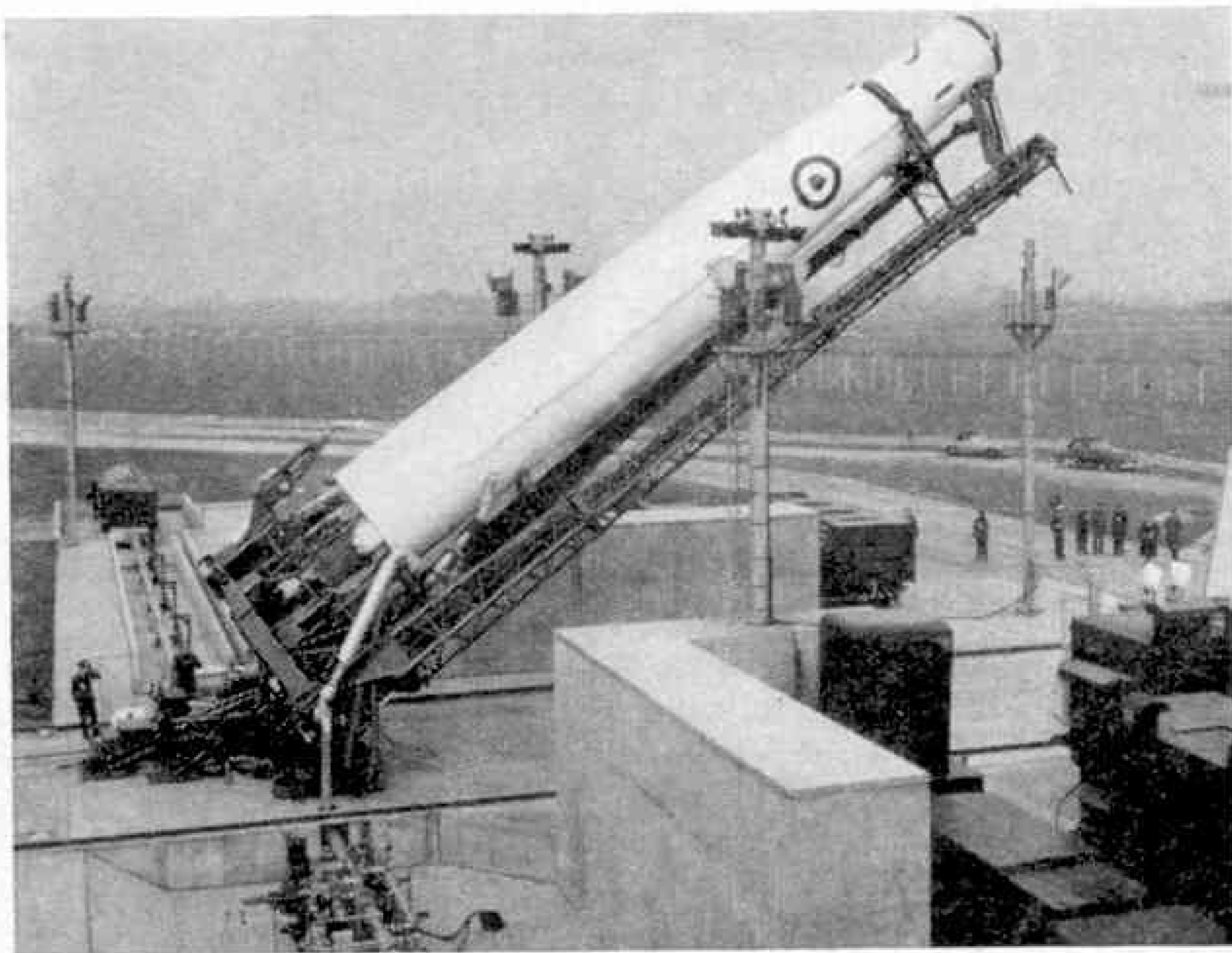
All was quiet

Instead of the usual roar of engines and smell of paraffin or petrol, all was quiet and still as I drove on to the airfield. When I entered the huge maintenance hangar it was so clean, and the air inside it so free from dust as a result of the highly-efficient air-conditioning, that I felt almost as if I ought to remove my shoes as people do when entering Far Eastern temples.

No Queen's Regulations, or the strictest station commander, could achieve such spotlessness simply by ordering it. At Feltwell, every man realises that the

tiniest speck of dirt on the delicate gyros of a missile guidance system could send it off course, and that a few drops of moisture in the combustion chamber of a rocket engine could make it explode when started.

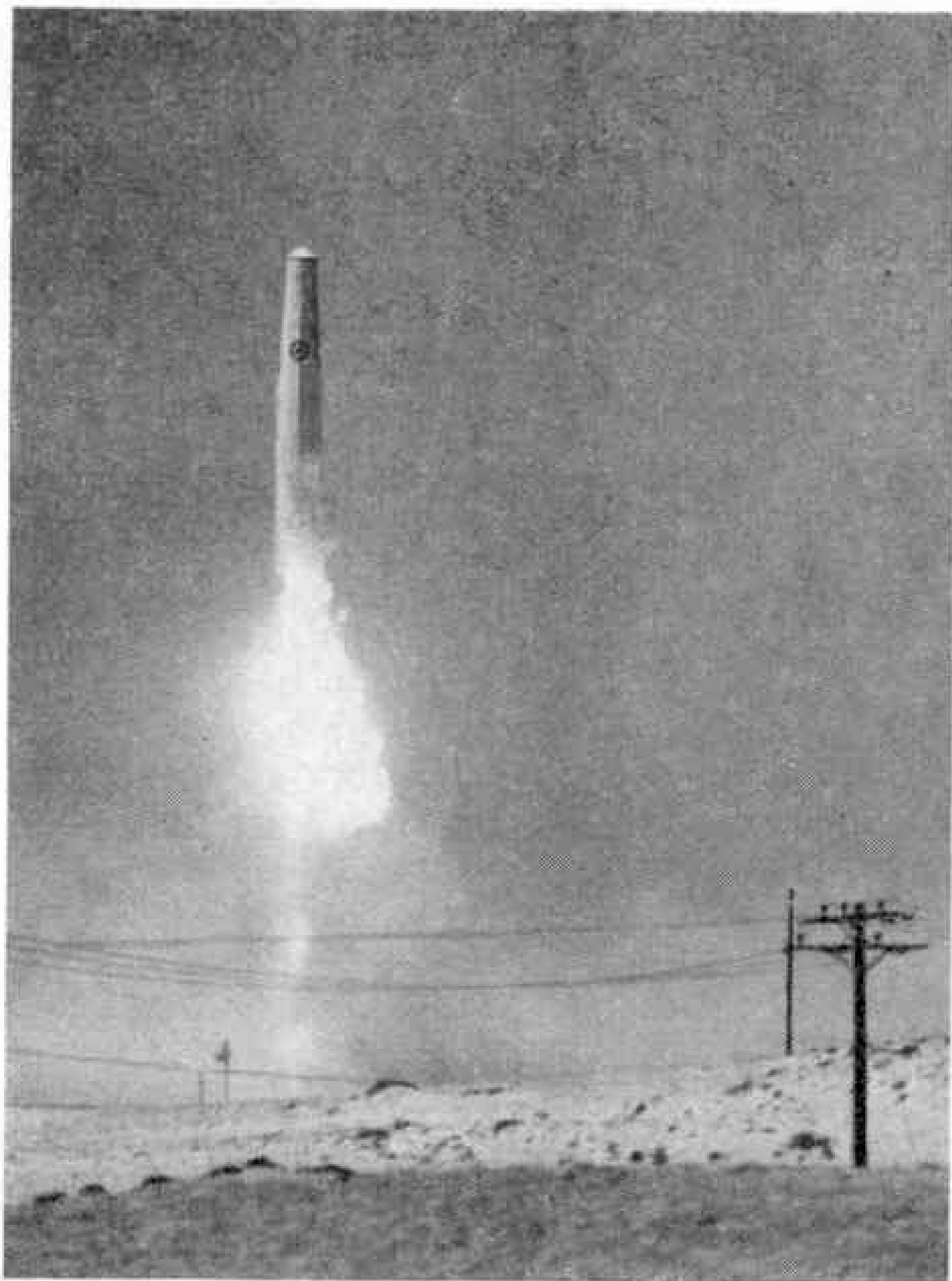
Inside this hangar, in one of the walled-in servicing enclosures, I watched the A.C. Spark Plug inertial guidance system of one of No. 77 Squadron's Douglas Thor missiles being checked with the aid of electronic computers. It was a sphere, little bigger than a football, yet it can steer the weapon through space with fantastic precision, to hit and destroy a pinpoint target more than 1,500 miles away.



One of No. 77 Squadron's launching pads, at Feltwell. Air Ministry photograph.

The Launching Pads

A little further on I saw one of the Rocketdyne MB-3 rocket engines which give Thor a speed of up to 10,000 m.p.h. (fifteen times the speed of sound). It looked simple and quite small for a motor capable of producing 150,000 lb. of thrust; but almost the entire 65-ft. body of the missile, except for the warhead, guidance and



The first Thor Intermediate Range Ballistic Missile launched from Vandenberg Air Force Base by an R.A.F. crew rises from its pad. Official U.S. Air Force photograph.

engine bays, has to be filled with tanks for the vast quantities of liquid oxygen and kerosene propellents that this engine burns in a mere 156 seconds after take-off.

From the hangar, I went out to one of No. 77 Squadron's launching pads. There are only three of them, for each ballistic missile unit has just three rockets, without even a reserve. They are stored horizontally in long dark-painted shelters, and as I watched the shelters began to move away on rails, revealing the huge white missiles, decorated only with red, white and blue roundels.

It was rather eerie, because the whole 15-minute count-down is more or less automatic. All three missiles at each site are controlled and fired by a single small team of men, under a Launch Control Officer, from a trailer not far from the firing pads. Once he has started the firing sequence, he need do little more than check that all is going as it should, by watching the flashing lights on the switch panels in front of him.

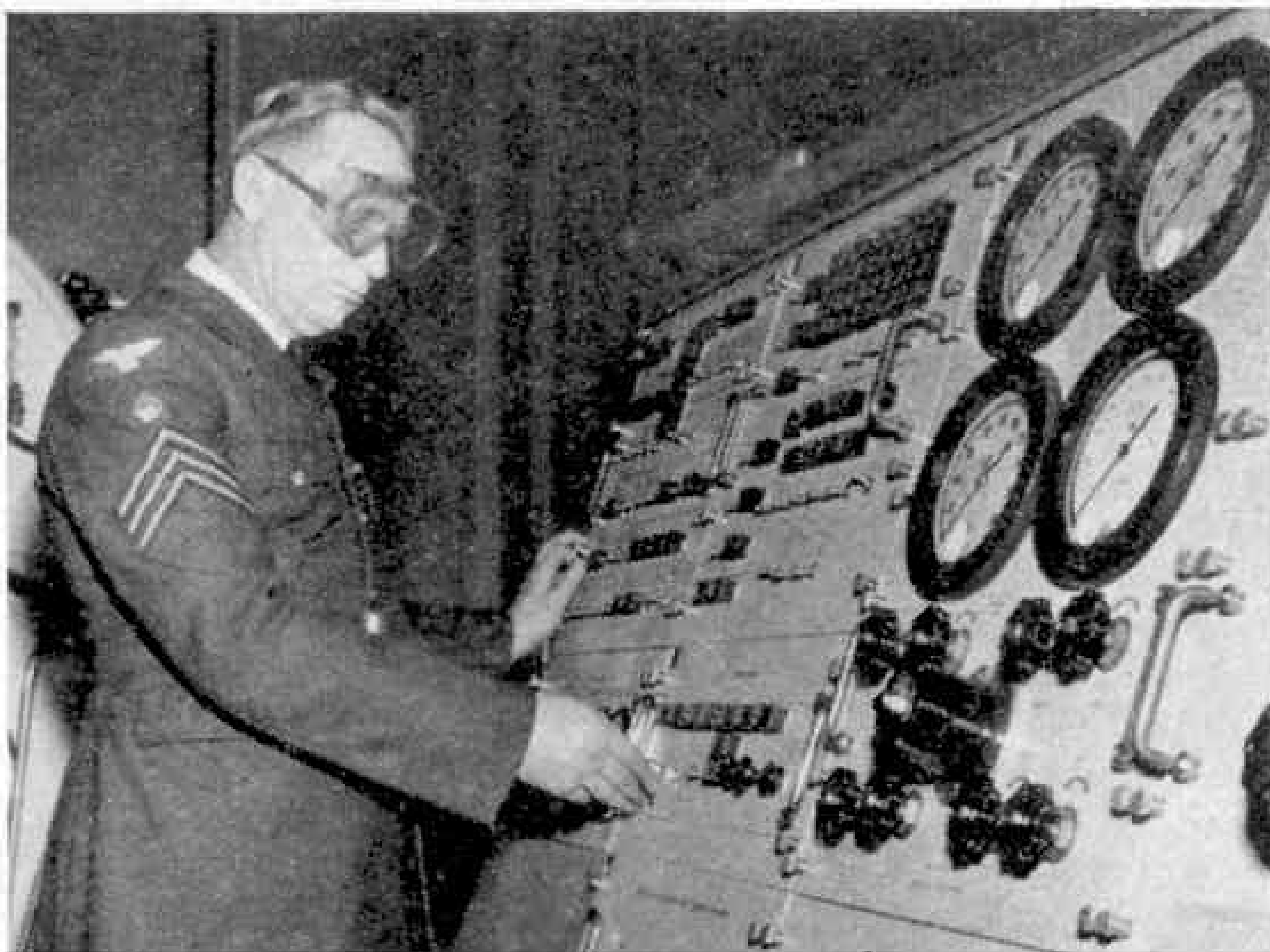
Almost Ready

When its shelter has been moved away, the missile is raised to a vertical position by its erector. The propellents then begin to flow into it from storage tanks on each side of the pad and the erector arm is lowered, leaving the missile pointing upward and almost ready to go.

As I watched a practice count-down on that grey February morning, hardly a sound could be heard; yet a hundred and one items of equipment, electric circuits and valves inside that great white rocket were being checked methodically and automatically as the minutes were counted over loudspeakers. Remembering that the stubby nose-cone is designed to house an H-bomb warhead, I found it difficult to prevent a shiver running up and down my spine.

This is no place to argue the rights and wrongs of politics and military planning which make such terrifying weapons necessary. Suffice it to say that Thor is one of the best weapons in the world for what it has to do, which is to keep the peace simply by being ready for firing 24 hours a day, seven days a week, every week. There is equally little doubt that No. 77 Squadron is as smart, efficient and proud of itself as any unit in the Royal Air Force.

Altogether there are twenty such squadrons in Bomber Command, each occupying a former operational aerodrome. Four of the stations, including Feltwell, are main bases, with servicing hangars, and each has four satellite bases which are little more than launching sites. The whole force consists (Continued on page 266)



At the rocket test panel. Air Ministry photograph.



Railway Notes

Contributed by R. A. H. Weight

No. 92220, "Evening Star"

IN response to a "Name the Loco." competition announced by the Western Region, hundreds of staff members sent in suggestions for a suitable name for the last B.R. steam locomotive recently completed at Swindon and the last of a notable line of class 9 2-10-0s. The chosen name *Evening Star*, since ceremonially affixed, was proposed by three competitors who shared the Chairman's prize of ten guineas.

Southern Tidings

The first series of Type 3, 1,550 h.p. diesel-electric mixed traffic locomotives, numbered from D6500 upwards, is entering service. They are equipped for carriage heating by electrical means and so need no steam boiler nor water tanks. The saving of space and weight permits the provision of an 8-cyl., more powerful, Sulzer diesel engine, compared with the 6-cyl. one on the Type 2, otherwise mainly similar D5000 class. Some of these have been on loan to the Southern from L.M.R. Crompton Parkinson electrical equipment and transmission figure in each type. The new Type 3 units are geared for a maximum speed of 80 m.p.h. Southern requirements will call for 98 locomotives.

Steam locomotives to be seen on the Oxted-Uckfield route from London to Brighton I described last month include West Country Pacifics; U1 and other 2-6-0s; Schools, L1 or L 4-4-0s; 2-6-4Ts; C2x former L.B.S.C.R. 0-6-0s, etc.

The Charing Cross-Dover-Ramsgate train headed by *Exeter* illustrated on this

page was checked by signals close to Petts Wood Junction, near Orpington. Later, on that same journey with a heavy 11-coach train weighing about 390 tons full, lost time was more than made up by dint of a fast start to stop run from Tonbridge to Ashford, 26½ miles in 26½ minutes with sustained maximum speeds around 74-76 m.p.h.

For their return trip to London in the afternoon on the second up *Man of Kent*, with "10-on," Driver Todd and Fireman Davis of Bricklayers' Arms Depot, had a sister 4-6-2, No. 34012, *Launceston*. The express had been delayed by a temporary track-circuit failure at Margate; the coal in



Southern rebuilt West Country class locomotive No. 34001 "Exeter", passing Petts Wood on the 9.10 a.m. from Charing Cross. Photograph by B. C. Bending.

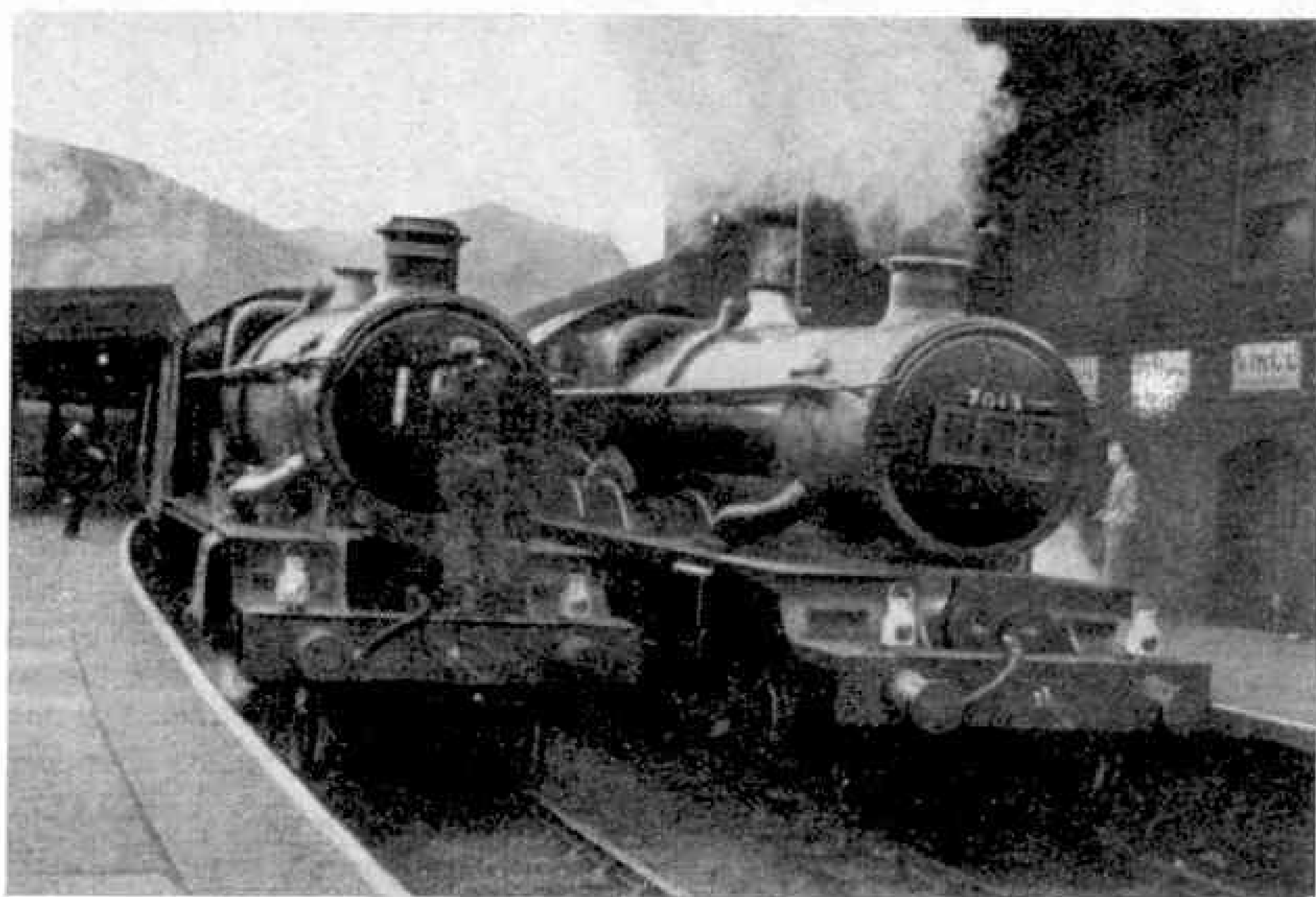
the tender was awfully dusty, and the enginemen's task the more arduous. Boiler pressure varied considerably, and was never up to blowing-off point, but with the powerful engine a great effort after leaving Ashford for a non-stop run to Waterloo (Eastern) produced speeds up to 86/82 on the favourable stretch through the Weald of Kent before Tonbridge. The latter station was passed in 25½ min. and some climbing was faster than usual on each side of Sevenoaks. There were three extra slowings but Waterloo, 55¼ miles, was reached in five minutes less than the 66½

allowed, and so into Charing Cross where another engine, crew and passengers were waiting to take possession for the fast 4.10 p.m. down, due to be quickly away.

Mr. Norman Harvey logged these runs from the footplate. From the comfort of one of the nine Pullman cars he also recorded a good steady journey by the *Bournemouth Belle* hauled by rebuilt Merchant Navy 4-6-2 No. 35024, *East Asiatic Company*.

Expresses away every five minutes

Certainly without parallel as a daily occurrence from a British terminus, perhaps in the world, is the Monday-Friday sequence of express departures from Paddington,



Part of the busy Paddington scene caught by the camera of P. J. Lynch. No. 7013 "Bristol Castle" is leaving with a train for Worcester and Hereford, while No. 5020 "Trematon Castle" prepares for departure for South Wales.

W.R. between 8.45 and 9.15 a.m. All the trains concerned are bound for destinations more than 100 miles away and the first two run more than 100 miles without stopping. The first three use the same tracks for over 80 miles to Wootton Bassett, beyond Swindon, though long before that they are considerably further apart than when starting.

The series begins notably with the *Bristolian* for Bristol only, reached in 1½ hrs. Next is the 8.50, *South Wales Pullman*, first call at Newport, Mon., 133½ miles away. An ordinary S. Wales express follows at 8.55 calling at Reading to take up passengers, then at Newport. The 9.0 *Inter-City* is for Birmingham and Wolverhampton; so is the 9.10 that also goes on to Shrewsbury - Chester - Birkenhead, with other stops. Both branch off a few miles out from Paddington at Old Oak Common

and call at High Wycombe, Bucks. In between there is the 9.5 serving principal stations to Bristol, via Bath, following the same route as the *Bristolian*; the seventh departure, at 9.15, is a similar type of train for Oxford-Worcester-Hereford, the third in this group calling at Reading and leaving the main lines to Bristol and S. Wales just on the London side of Didcot. Normally the *Bristolian* is hauled by a diesel locomotive, the 8.50-9.15 all by King or Castle 4-6-0s.

There are other important departures from Paddington at 5-min. intervals, though not for so long. Later in the morning that busy terminal receives close successions of inward main line and express services, also handling an evening peak etc. Ten minute or longer scheduled intervals are more in vogue, for example, at Euston, King's Cross, St. Pancras.

The Talisman was in to time!

Tranquil by name and built over 35 years ago, the rejuvenated N.E.R. A3 Pacific No. 60071 proved extremely lively in performance when, almost at a moment's notice, it was called upon to take over the up morning *Talisman* at Darlington. A breakage had occurred on the express's diesel locomotive just as it was leaving for the 232-mile non-stop run to King's

Cross timed at over 60 m.p.h.

The restart with *Tranquil* was 19 min. late at 11.54 with "9-on" or about 330 tons in all. There were two slacks for track repair work, and a dead stop for signals at Offord, Hunts., 56 miles from King's Cross, though all clear otherwise. With some very high speeds and grand running up hill and down that I wish I could have experienced and logged, the flyer arrived punctually at its terminus 3½ hrs. later at barely 3.25 p.m. in no more than 211 min. overall, averaging 66 m.p.h.

Driver Davis and Fireman Pethers of King's Cross Shed were the keen and able performers on the footplate. Driver Davis was also responsible for the splendid run I enjoyed in the same express with the famous A4, *Mallard*, when about 19 min. were regained as reported in the January, 1959, *M.M.* *Tranquil*, with another King's

Cross driver, I am informed, has since achieved another similar time recovery up from Darlington on *The Flying Scotsman*, a heavier train though not timed quite so fast.

Many fine runs are made when circumstances warrant and conditions permit a special effort, the fullest use being made of the recovery margins comprised within many schedules.

Recent New Locomotives

Additions to main line diesel stock have lately included the following:

With hydraulic transmission: B-B Type, 2,200 h.p. W.R. Nos. D815-8, named respectively *Druid*, *Eclipse*, *Foxhound*, *Glory*.

Diesel-electric: Type 4, 1 Co-Co 1. No. D10, *Tryfan*, also No. D255, to L.M.R.; and Nos. D237-54, nearly all N.E.R. Several of these 2,000 h.p. locomotives are sharing in the through East Coast express running to and from Newcastle, King's Cross, etc. Trials also have been taking place in Scotland where tandem operation by two Type 2 1,160 h.p. units on accelerated Edinburgh-Aberdeen passenger services was expected soon to commence at the time of writing, with appropriate local ceremonies.

Following a series from Derby and Crewe

Works, Bo-Bo 1,160 h.p. locomotives built at Darlington Nos. D5094-5113 are being allocated to the E. and N.E. Regions. Brush A1A-A1A, 1,365 h.p. mixed traffic type 2, Nos. D5565-80 and upward have been entering service on the G.N. and G.E. Lines, E.R., one or two being painted in experimental liveries. This design appears very successful.

Continuing completion of the blue-liveried L.M.R. main line electric loco-



The restored Midland Compound No. 1000 takes water at Sheffield when working an enthusiasts' special. The onlookers evidently admire the spotless condition of the engine. Photograph by J. F. Henton.

motives recently announced was evidenced by the arrival of No. E3003 at Longsight, Manchester, with others soon to follow.

Steam: class 9 2-10-0s numbered 92218-20, to 86C, Cardiff (Canton) Depot. Diesel-electric, and diesel-mechanical shunting units are becoming more numerous in many areas.

"RAILWAYS AS A CAREER"

By MAXWELL TAYLOR

(B. T. Batsford Ltd., price 12/6)

Probably few *M.M.* readers fully realise the wide scope of railway activities and therefore the tremendous number of occupations involved in keeping the wheels turning twenty-four hours a day. In this Batsford publication, one of the first three of a series described as "Career Books", the author writes in an entertaining manner of the opportunities afforded of making a career in the railway industry. The British Railways modernisation plan now in progress means that there is wider scope than ever before for those leaning towards railway work.

There are nine chapters dealing with railways in general, their organisation and the men that keep them going, not only those with whom we are familiar because we see them perhaps every day, but also those whose work is done outside the public gaze. The methods of recruitment and the different training schemes now operated by British Railways, and the opportunities offered by a railway career, are considered and there is, in conclusion, an index which is useful for ready

reference.

This is a readable book, suitably illustrated and, for the information it contains, the price is distinctly moderate.

TRACTION ENGINE RALLY AT ANDOVER

The Andover and District Model Engineering Society are again holding their annual Traction Engine Rally at Finkley Manor Farm, Andover, Hants. This year the event will take place on Saturday, 14th May, and as on previous occasions there will be an excellent gathering of steam traction engines and veteran cars. One novel feature this year will be a relay race, run with four types of traction engines, and there will also be a steam fire engines' demonstration. The 7½ in. gauge, passenger-carrying miniature railway will be in operation again, and there will be the usual large marquee housing, this time, a model engineering exhibition of general engineering models.

The Rally Secretary, Mr. G. Howell, of 5 The Crescent, Andover, will be pleased to give further particulars to readers who hope to be able to visit the Rally, and who will write to him for them.

The Ups and Downs of Seaside Life

Britain's Cliff Lifts

By
Arthur Turner



St. Nicholas' Cliff lift, Scarborough, one of four such inclined tramways at this Yorkshire resort. Photographs reproduced by courtesy of J. & E. Hall, Ltd., Dartford.

Although there are barely a dozen cliff lifts in Britain, together they carry several million passengers each summer, and from an engineering viewpoint these short inclined railways are well worth studying.

Such lifts, operated by various means, provide easy and swift access to the beach at a number of resorts on the East and South Coasts of England, and enable a steep and often lengthy climb back from the shore to be avoided.

In this respect, Scarborough is the best equipped resort in Britain, for it has no fewer than four cliff lifts of different types. Holidaymakers have, in fact, been provided with this mode of transport between the esplanade and the Spa ever since 1876, though the tramway was rebuilt and modernised in 1932.

It is also the longest of the four inclined tramways at Scarborough, the length of track being 284 feet. The gauge is 4 ft. 8½ in. and the gradient 1 in 1¾. Each of the two cars can carry 24 passengers and is able to make four runs in five minutes.

Originally this cliff tramway was run by hydraulic power, but the reconstruction in

1932 included the installation of electric power.

The service operates only from Easter to the end of September, but another Scarborough cliff lift nearly as old is kept open throughout the year. Known as the Central Tramway, it links St. Nicholas' Cliff with the foreshore road and was constructed in 1880.

Thirty passengers can be carried at a time, up and down a gradient of 1 in 2. For nearly 50 years the motive power came from a steam engine but just over thirty years ago electricity took over.

The two other cliff lifts at this Yorkshire resort are of more recent construction. One, built in 1930, provides transport between St. Nicholas' Cliff and the Aquarium, while the other was constructed in 1931 between Alexandra Gardens and Peasholm Gap. Both these tramways are owned by the corporation, whereas the two others are under private ownership.

Power for the St. Nicholas' Cliff Tramway is supplied by a 45 b.h.p. electric motor, this driving through worm gear to the main

shaft and rope drums each taking $4\frac{3}{4}$ inch steel cable. Similar driving arrangements operate the other tramway.

An interesting inclined tramway is to be seen at Saltburn, on the same coast. Originally a vertical hoist, it was rebuilt in 1883 in its present form. A complete reconstruction was carried out in 1921-22, and there have been major repairs to the track and cars since.

The lift is operated by means of water ballast, the weight of the ascending car being counterpoised by the weight of the passengers and water ballast in the descending car. A brakeman at the top of the incline controls the speed of the cars, and at the end of its run the down-going car discharges its ballast.

The two cliff lifts at Hastings, in Sussex, carried a total of well over half a million passengers last summer. The older, the West Hill lift, was opened in 1891 and transports passengers between the promenade and Hastings Castle and St. Clement's Caves.

Unlike most other cliff tramways, it is completely enclosed, for it runs through a brick-lined tunnel.

A horizontal diesel type engine of fairly modern design supplies the power today, though for a number of years the tramway was run by a 40 h.p. gas engine.

Each car can seat sixteen people, and the carriages move up and down a track of 6 ft. gauge on a 1 in 3 gradient which is 500 feet long. As with all such lifts, each car is fitted with automatic braking gear which comes into operation if the haulage cable breaks.

The East Cliff lift at Hastings was constructed for the corporation in 1903 and designed by the Borough Engineer of that time. It is in an open cutting throughout, and connects the promenade with the cliff walks.

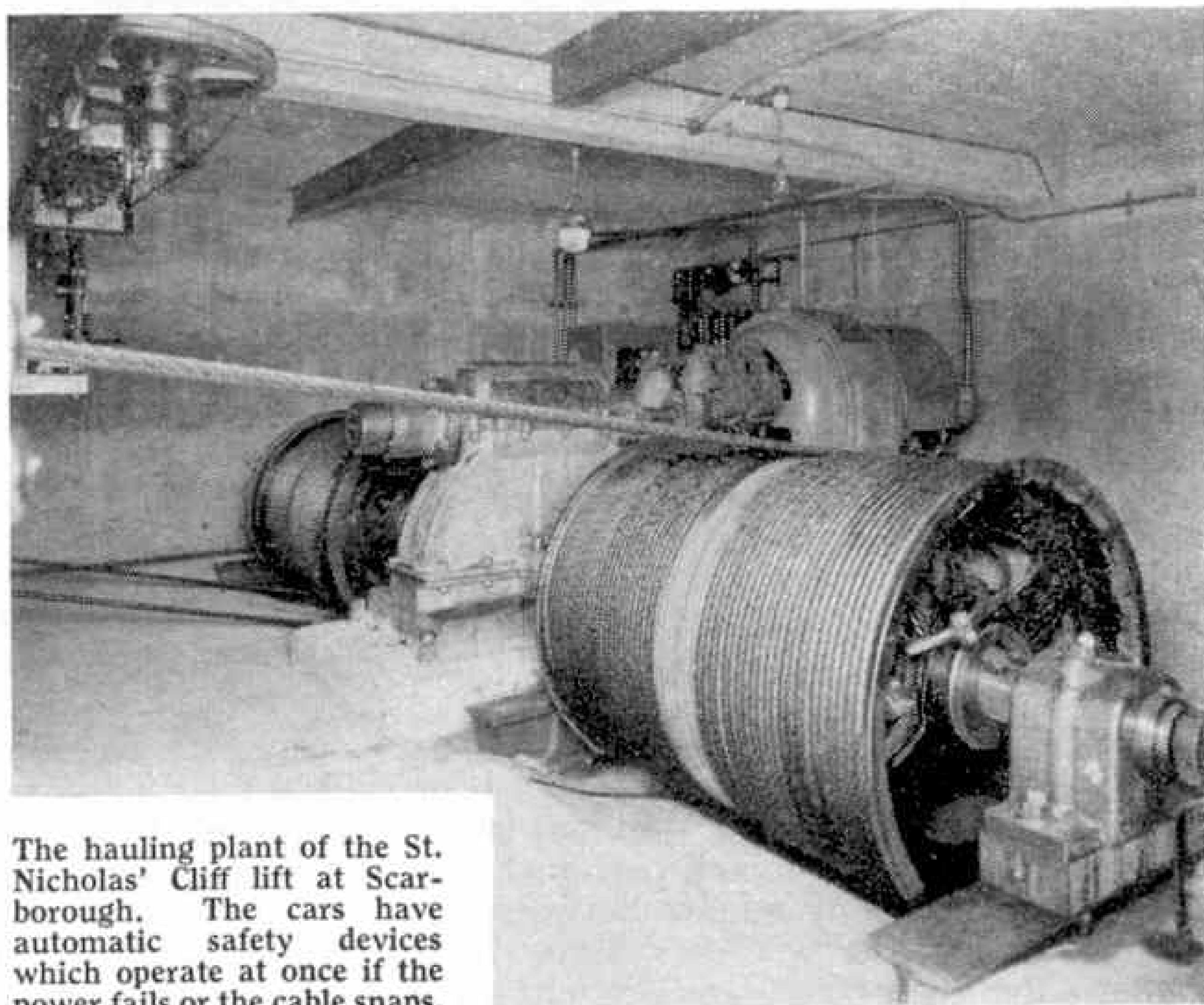
The track, of 5 ft. gauge, is 276 feet long and has a gradient of 1 in $1\frac{1}{4}$. The tramway operates on the same principle as that at Saltburn, each car being fitted with a tank. The tank underneath the car at the top is

filled with water so that its weight is increased and it is able to haul up the other car.

An interesting feature is that the water is not allowed to run to waste when the descending car reaches the bottom. The ballast, discharged into a sump under the lower station, is returned to the upper station by means of a centrifugal pump driven by an electric motor. This system has been adopted not merely to save water but also to save power. Since the pump can be in operation continuously, it can be of less power than the motor which would be needed if the cars were winched directly.

Longest and biggest of all Britain's cliff railways is that at Babbacombe, near Torquay. The distance from the top to the bottom station is 716 feet, and the cars are designed to accommodate forty passengers. The vertical rise is 240 feet and the gradient 1 in 3.

This tramway saves visitors a stiff climb from Babbacombe Beach to the Downs, 256 feet above sea level. Apart from fulfilling this practical purpose, its novelty makes it something of a holiday attraction.



The hauling plant of the St. Nicholas' Cliff lift at Scarborough. The cars have automatic safety devices which operate at once if the power fails or the cable snaps.

Since it re-opened in 1951 after its wartime closure, this 34-years-old inclined railway has carried more and more holidaymakers each season. The yearly total now amounts to between 80,000 and 1,000,000, the exact number depending largely on the weather.

Until 1955, each car had room for only twenty passengers, but the accommodation

was then doubled.

Yet, it is not an easy tramway to maintain, and it has been an expensive proposition in recent years. The moving face of the cliff has entailed relaying the whole of the track since the end of the war. However, by spending about £14,000 on this and other mechanical improvements the tramway



The Babbacombe Cliff tramway, near Torquay, the longest passenger lift of its kind in Britain.

has been put into such a condition that it now promises to be a revenue earner for a good many years to come.

The 1954-1955 improvements included the installation of complete new cable gear at the top station. The large-capacity cars each weigh nearly five tons empty and almost seven and a half tons fully loaded.

A system of four wire ropes $2\frac{1}{2}$ inches in circumference connects the cars in such a way that the weight of one balances that of the other, but electrically-driven haulage machinery deals with unbalanced loads.

The machinery consists of an 85 b.h.p. direct current motor which takes its current from the alternating current supply, this

current being rectified by a motor generator to provide the 300 volts D.C. required by the haulage motor. That motor operates the main driving wheel through worm and pinion gearing, and the four haulage ropes make a double pass round the drum.

Speed control is effected by a governor which automatically cuts out the current and stops the machinery when it slightly exceeds 600 feet a minute. Safety devices include a mechanical brake on the main driving shaft, which operates automatically should the current fail, and a device which secures the cars to the track

if the ropes break.

This outsized cliff tramway can transport passengers from the lower to the upper station in one and a half minutes, and the cars can make 30 trips in an hour, including the time needed for loading and unloading.

Such beach lifts merit study, as well as being a boon to holidaymakers.

"NARROW GAUGE RAILWAYS OF EUROPE"

By PETER ALLEN and P. B. WHITEHOUSE

(Ian Allan Ltd., price 35/- net)

The British Isles, with the exception of Ireland, never had many narrow gauge railways, and indeed light railway transport, apart from electric tramways in the cities and towns, was unfamiliar to the majority of the British public. This was not the case on the mainland of Europe, however, as narrow gauge steam operated tramways and light railways were a major form of transport for many years, both in towns and in country districts. Vast systems once existed, but various circumstances have caused their decline over the years. The present age sees the still further decline of these, gradually, year by year, and the book under review sets out to describe a number of survivors in both word and illustration.

Narrow Gauge Railways of Europe is intended by the authors to be mainly an illustrated scrap-book, but

apart from the large number of superb illustrations, it gives a considerable amount of information also. The systems chosen are mainly those which still employ steam locomotives, which of course are the most interesting, but there are few nowadays who work their traffic exclusively by steam.

Although the ranks of narrow gauge railways have been considerably reduced, there is still a surprising number left, and this book will prove valuable to all who have seen some of the systems described, and may whet the appetite of those who have not yet done so while the opportunity exists.

The book is well produced, on art paper throughout, with large, easy-to-read print and with two-colour plates as well as a large number of photographic reproductions. The coloured jacket illustration perhaps conveys the spirit of the narrow gauge more than any of the half tones, however.

Copies can be obtained from bookstores or direct from the publishers, Ian Allan Ltd., Craven House, Hampton Court, Surrey.

Air News

TAIL WITH A HISTORY

AS the de Havilland Comet 4C jetliners of Mexicana have a cruising speed of 500 m.p.h., the last thing you would expect them to carry is a calendar. Yet each Comet has no fewer than four calendars, decorating each side of its

By

John W. R. Taylor

fin and the two wing leading-edge fuel tanks.

If you could see them you would soon realise that they are very different from the kind of calendar you have on your wall at home. In fact, they are reproductions in gold of the famous Aztec Sun-stone dug up in Mexico City in 1760. Nearly 12 ft. in diameter and weighing 25 tons, this great stone calendar was carved in the reign of King Axayacatl and is surprisingly accurate, showing that the Aztecs knew a great deal about astronomy.

Caribou Carries Caribou

When Canada's herds of caribou decide it is time to move home each year, they roam anywhere from the snow-covered Arctic lands to the dense forests of Newfoundland and the Western Provinces. A 2,000-mile journey from one country to another is, however, a bit too much for even baby caribou to attempt on foot. So when two of them were presented by the people of Newfoundland to the American city of St. Louis, they went by air.

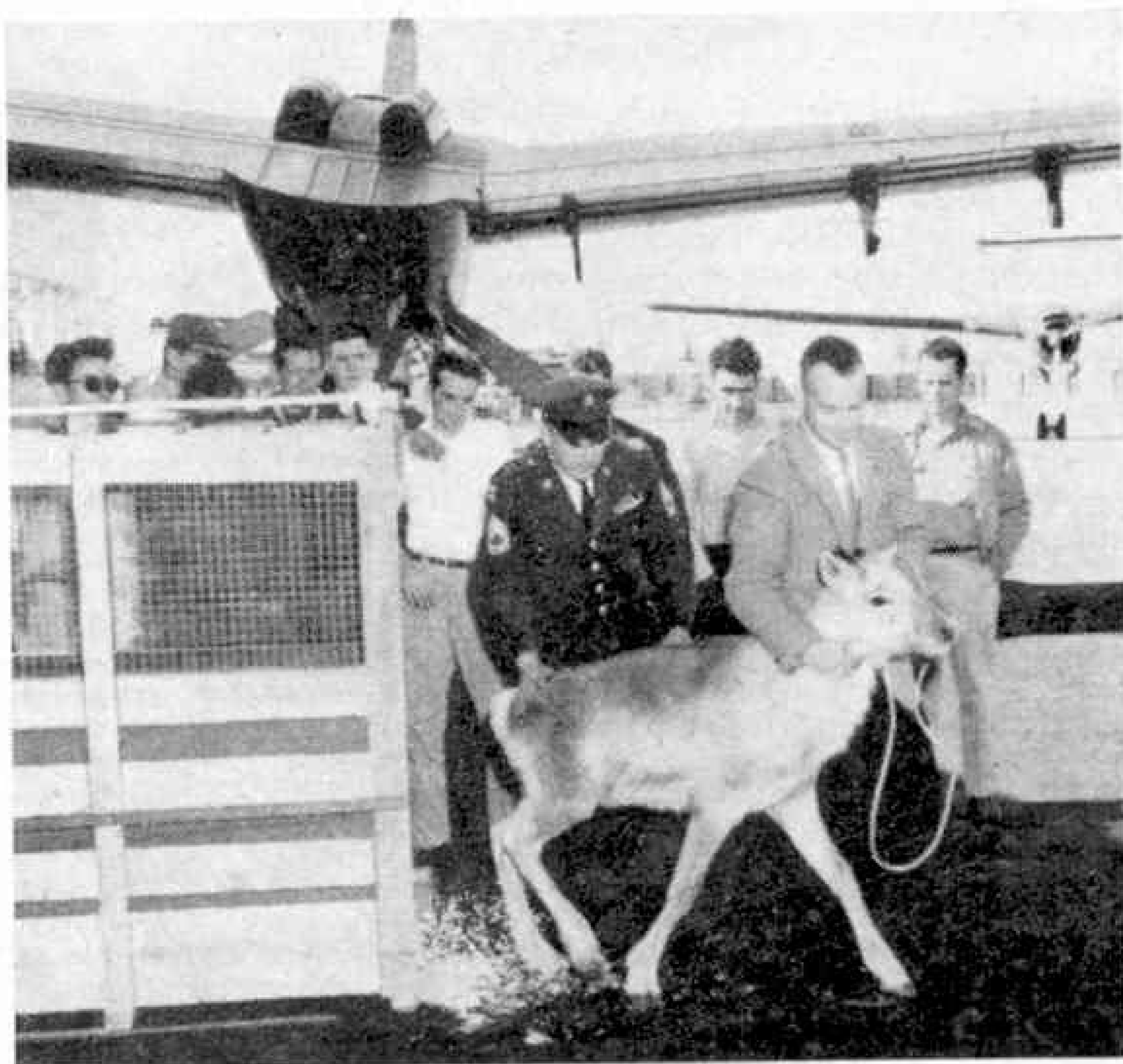
The Canadian de Havilland

Company happened to be delivering three of their new twin-engined Caribou transport aircraft to the U.S. Army at Fort Rucker, Alabama, at the time. So, after flying the first leg of their trip, to Toronto, in a T.C.A. North Star, the baby animals were able to change 'planes, and the 500 schoolchildren who were at St. Louis Airport to welcome them were treated to the unusual sight of a big Caribou carrying two little ones.

Flying Banana Boat

Some of the money that has been spent on building Britain's second hovercraft, the Britten-Norman Cushioncraft, has been provided by the famous fruit importing company of Elders & Fyffes. The reason is that they believe it will solve the problem of transporting quickly such delicate cargoes as bananas in areas where roads are either rough or non-existent.

Few details of the Cushioncraft have yet been released, except that it is slightly smaller than the Saunders-Roe SR-N1 Hovercraft, with a diameter of just under 20 ft., and is powered by a racing-car engine which drives a horizontal rotor. It is being built at Bembridge in the Isle of Wight and is expected to do some of its flight tests in the Cameroons, which are in Africa, just north of the equator. If it proves successful, bigger versions with a payload of about fifteen tons will probably



One of two baby caribou flown in the United States Army Caribou seen in the background, as described on this page.



be built for transport duties in banana-growing regions, cruising quickly above rivers or rough-cleared tracks.

Eight into One Will Go

A good idea of the capabilities of the new Armstrong Whitworth Argosy transport aircraft was given when eight Morris Mini-Minors were driven into its huge freight hold and then unloaded all in a matter of minutes. Even bigger loads can be carried when the cars are disassembled, as they often are for export overseas. For example, the Argosy could carry 15 C.K.D. (completely knocked down) Triumph Heralds.

If you cannot imagine why anyone should want to carry eight Mini-Minors all at once, Silver City Airways can provide the answer. Early this year there was such a demand in France for the Mini-Minor's

Morris Mini-Minor cars being unloaded from an Armstrong Whitworth Argosy transport aircraft.

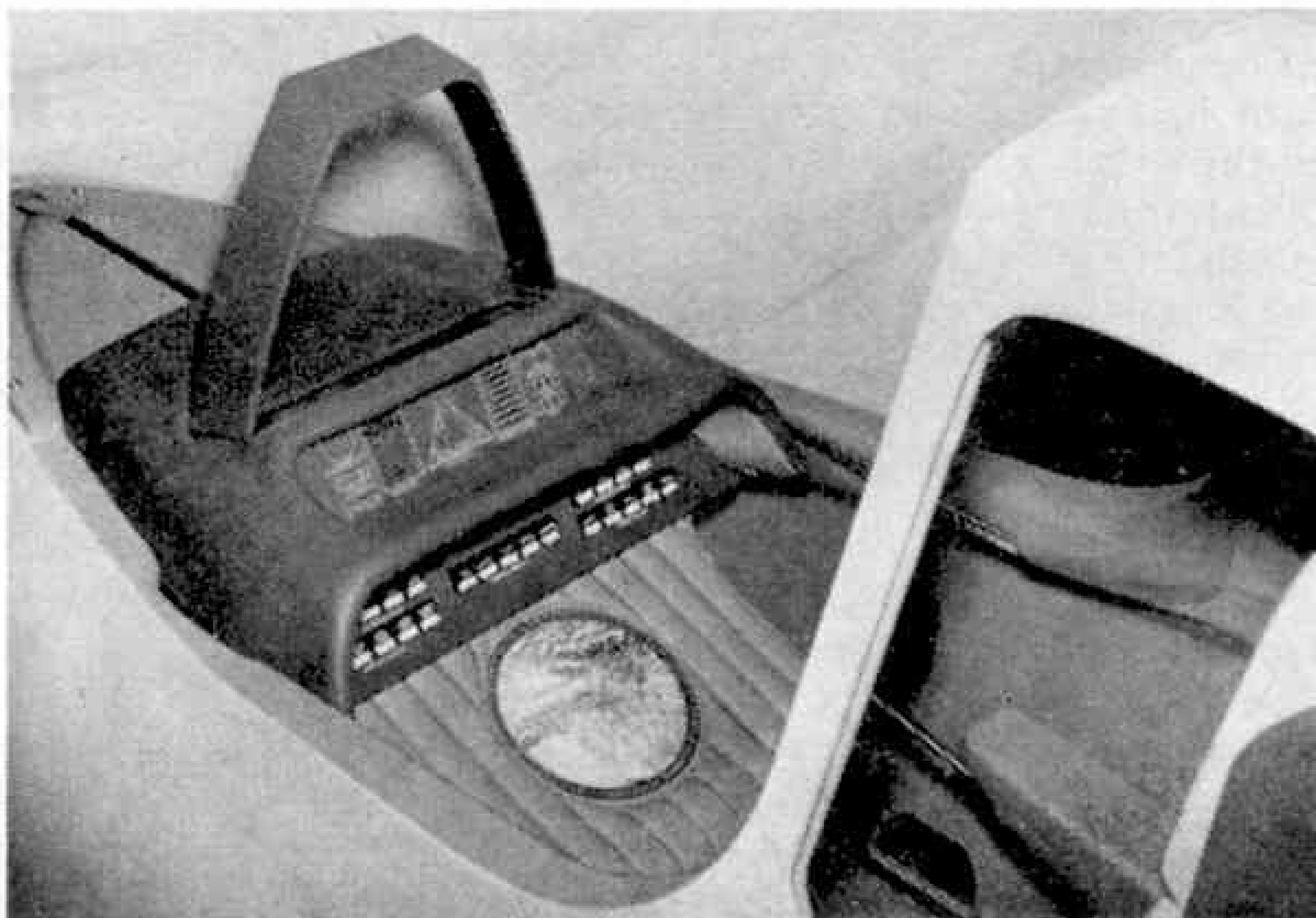
"twin", the Austin Seven, following the ending of import restrictions on British cars, that the British Motor Corporation had 100 of the little cars driven down to Ferryfield Airport and flown over the Channel by the Silver City air ferry service. Even larger numbers of Renault Dauphines have been flown in the reverse direction.

Cockpit of the Future

The pilot of a modern fighter 'plane, flying at supersonic speed, has little time to keep an eye on the bewildering array of cockpit instruments and controls that confronts him. So, for the past six years, about 30 companies in the United States have been working to develop a completely new type of instrument panel under an Army/Navy Instrumentation Programme (ANIP).

One result of their work is illustrated on this page, and although it might look strange and incomplete, the Douglas Aircraft engineers who designed it claim that this display gives as much data as the average present-day maze of dials.

Items such as airspeed and altitude are shown as straightforward easy-to-read figures on the panel at the top, instead of by pointers on a dial. A sub-miniature computer and electronic "black boxes" work out the aircraft's position in space, and the pilot navigates simply by following a



The new type of cockpit instrument panel designed by the engineers of the Douglas Aircraft Company, U.S.A., to simplify the work of air pilots.

"pathway in the sky" marked out on a map on the television-type screen in the centre.

Mighty Mite

Hiller's model 12E helicopter might look small, but it is capable of doing big jobs, as can be gathered from the illustration on this page, which shows it lifting a damaged aeroplane in Caracas, Venezuela. The main reason is that it is the highest-powered American helicopter in its class, with a 305 h.p. Lycoming VO-540 engine. This not only enables it to lift vertically a load of 1,000 lb., equivalent to nearly 60 per cent of its own weight, but to work with ease at altitudes of 10,000 feet or more.

Normally a three-seater, the 12E can be equipped to carry four people in its cabin, or two inside and two casualties on stretchers mounted above its under-carriage skids. It cruises at up to 95 m.p.h.

First Supersonic Airliner?

General Thomas D. White, Chief of Staff of the U.S.A.F., told members of the House of Representatives recently that a new Russian four-engined aircraft has been seen which weighs about 150 tons and can fly faster than sound. This could be the delta-wing bomber to which N.A.T.O. air forces have given the code-name Bounder; but General White added later that the Russians are developing a transport that could operate at supersonic speeds.

It looks, therefore, as though Soviet designers are now setting the pace in airliner progress, for it is expected to be five to ten years before Britain or America has a supersonic airliner ready for service. There is no doubt that Russia has engines suitable for such aircraft, because the Type D-15 turbojets fitted in the four-engined "201-M" and "103-M" aircraft—which have been used to set up several speed and load-carrying records in the past six months—each develop no less than

28,660 lb. of thrust. This makes them more powerful than any engines yet flown in the West.

A New Kind of Porter

Swiss climbers who will shortly attempt to scale the 26,810-ft. Himalayan peak of Dhaulagiri, highest unconquered mountain in the world, will have the assistance of a new type of porter. As well as the tough little Sherpas who act as guides and carry the equipment for most expeditions in the area, the Swiss are taking with them one of the new six-seat PC-6 Porter high-wing monoplanes produced by the Pilatus company of Stans, near Lucerne.



Hiller model 12E helicopter lifting a damaged aeroplane in Caracas, Venezuela.

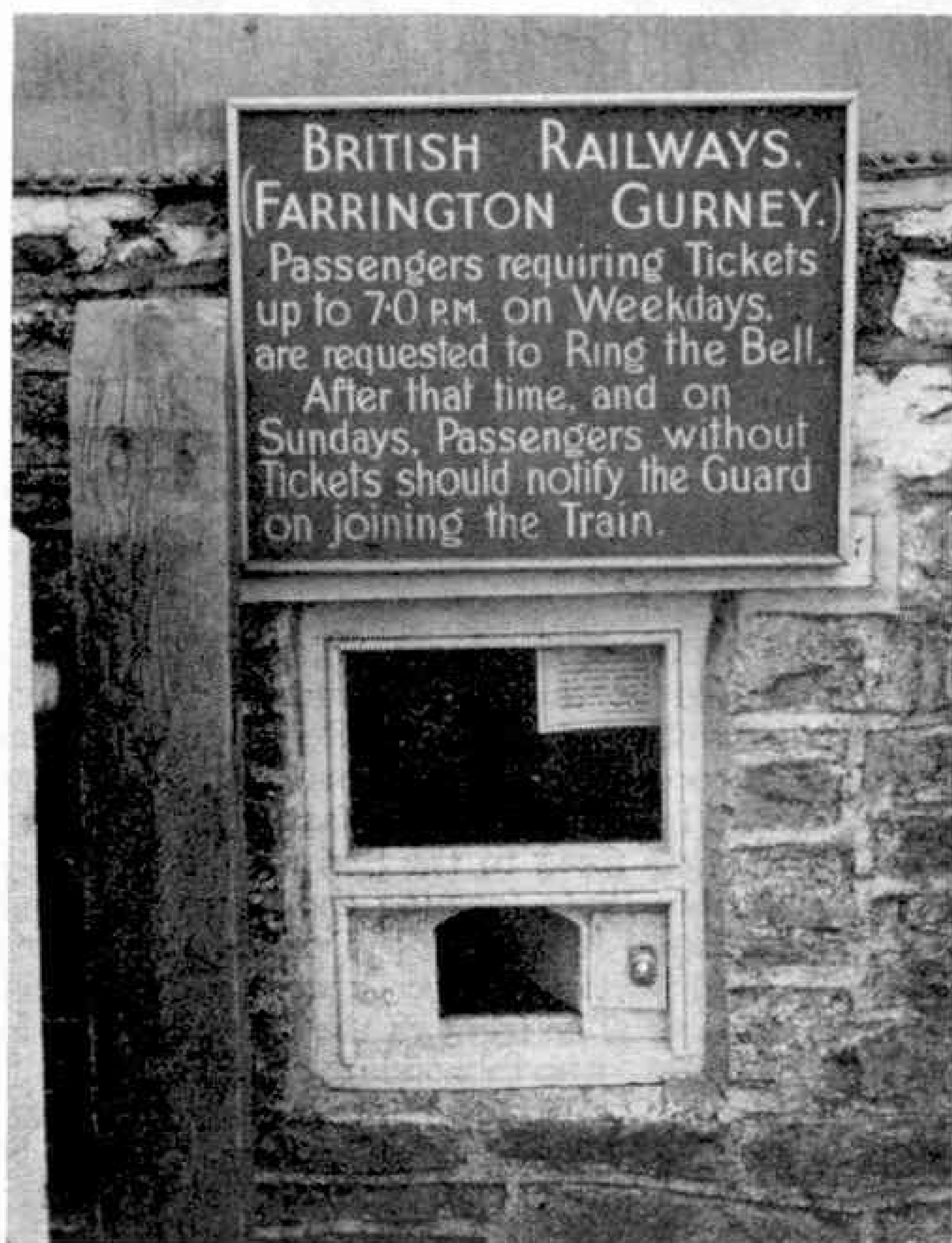
Powered by a 260 h.p. Lycoming engine, and able to operate on either wheels or skis, the Porter has been specially designed to get in and out of small areas in mountainous regions. It will be used not only to carry men and equipment, but, so we are told, to hunt once more for the Abominable Snowman, who is said to live on the high slopes of the Himalayas.

Paracats Rout Rats

During a recent anti-malaria spraying in the Kelabit Highlands of Sarawak, all the cats in the district were killed. This left the local rice crop at the mercy of rats, so the villagers appealed to the R.A.F. for help. Quick as a flash, 24 cats were packed into padded wicker baskets and parachuted from a Beverley to deal with the four-footed enemy.

MECCANO MAGAZINE

Junior Section



MAY is here, and with it the May Day parades, when horses are gaily decked and wear ribbons and fancy bows on their tails and manes. In Minehead, the parade is different from that in many other towns. You see a photograph of it above, with youngsters taking part in a Hobby Horse dance. Minehead folk consider this is older than the Morris Dance itself, and that it may date from the time when armed men rode pony patrols to protect Britain's coast from invaders. A team of four takes part in the dance. A one-man band provides the music and one member collects cash from passers-by. The horse wears a fearsome mask of cardboard and has a body of gay material, decked with bright ribbons. It has a tail with which it is supposed to lash delinquents and those who refuse to pay, but it will bow to those who give money.

Left—Where you buy your railway ticket at the inn. This booking office is in the yard of the Miners' Arms Hotel at Farrington Gurney, twelve miles south of Bristol. The landlord's wife is the booking clerk,

Easy Model-Building

Simple Models for those with Small Outfits

By "Spanner"

FOR the amusement of younger model-builders I have produced a little model I have called "The Fencers". It can be built from parts in an Outfit No. 1 and as you can see from the picture of it on this page, it consists of two figures mounted on a baseplate. This baseplate is a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate. With the exception of one hand the construction of the two figures is identical. Their legs and feet are formed by a $2\frac{1}{2}"$ Strip 1 and an Angle Bracket, and a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 2. These are bolted to a Flat Trunnion that represents the body, and the head, which is a 1" Pulley with boss, is fixed on a $\frac{3}{8}"$ Bolt 3 passed through the upper end hole of a $2\frac{1}{2}"$ Strip. This Strip is bolted vertically to the Flat Trunnion. The shoulders and arms are formed by a $2\frac{1}{2}"$ Stepped Curved Strip 4. In one figure the hand that holds the rapier, which is a $3\frac{1}{2}"$ Rod, is formed by a Reversed Angle Bracket 5, and in the other figure by two Angle Brackets 6 and 7 bolted together to form a built-up reversed angle bracket. The other hand of each figure consists of a Fish-plate and an Angle Bracket. The Rods representing the fencing rapiers are held in the hands by Spring Clips.

Each figure is attached to the baseplate by one $\frac{3}{8}"$ Bolt 8 through the lug of the Double Angle Strip forming one of his legs.

A list of the parts required to build "The Fencers" is given at the end of this article.

The other model I have for you this month is a little more ambitious, but is still quite an easy one to assemble. It is a Rear-tipping Truck, with which you can have a lot of fun, and all the parts needed to build it can be found in an Outfit No. 2. The model is seen completed in Figs. 2 and 3. The tipping body is made from a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate, to the sides of which $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates are bolted. A $2\frac{1}{2}" \times 1\frac{1}{2}"$

Flexible Plate is then fixed to one end of the Flanged Plate and attached to the $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plates by Angle Brackets. The body is mounted on bolts lock-nutted to Angle Brackets bolted to Trunnions 1 secured to $5\frac{1}{2}"$ Perforated Strips 2 of the Truck Chassis. Flat Trunnions 3 are bolted to the front ends of these Strips and a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 4 is attached to them. Stepped Curved Strips 5 forming the wheel arches,

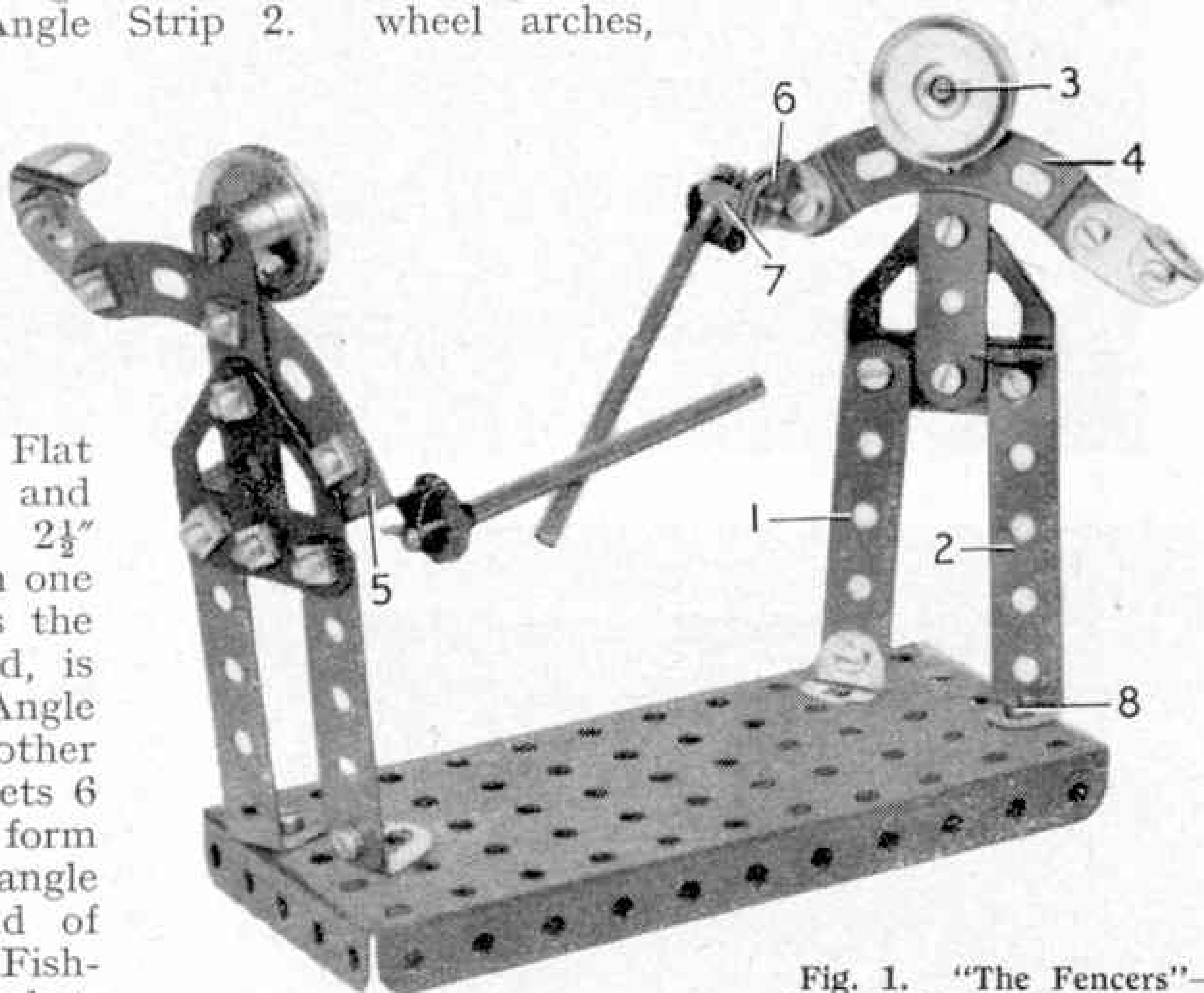


Fig. 1. "The Fencers"—a simple little model that can be assembled from parts in Outfit No. 1.

are held by the same bolts, and they are secured at their other ends by bolts that fix in place also two $2\frac{1}{2}"$ Strips 6. The back and roof of the cab are formed from a $4\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate 7 fastened to Angle Brackets fixed to the Strips 6. A $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate forming the floor of the cab is secured to a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip bolted between the lower ends of the Strips 6. The front of the cab consists of a $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate attached to a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 4, and 2" Rods 8 are fixed to this with Spring Clips 9 as shown.

The front axle is pushed through the end

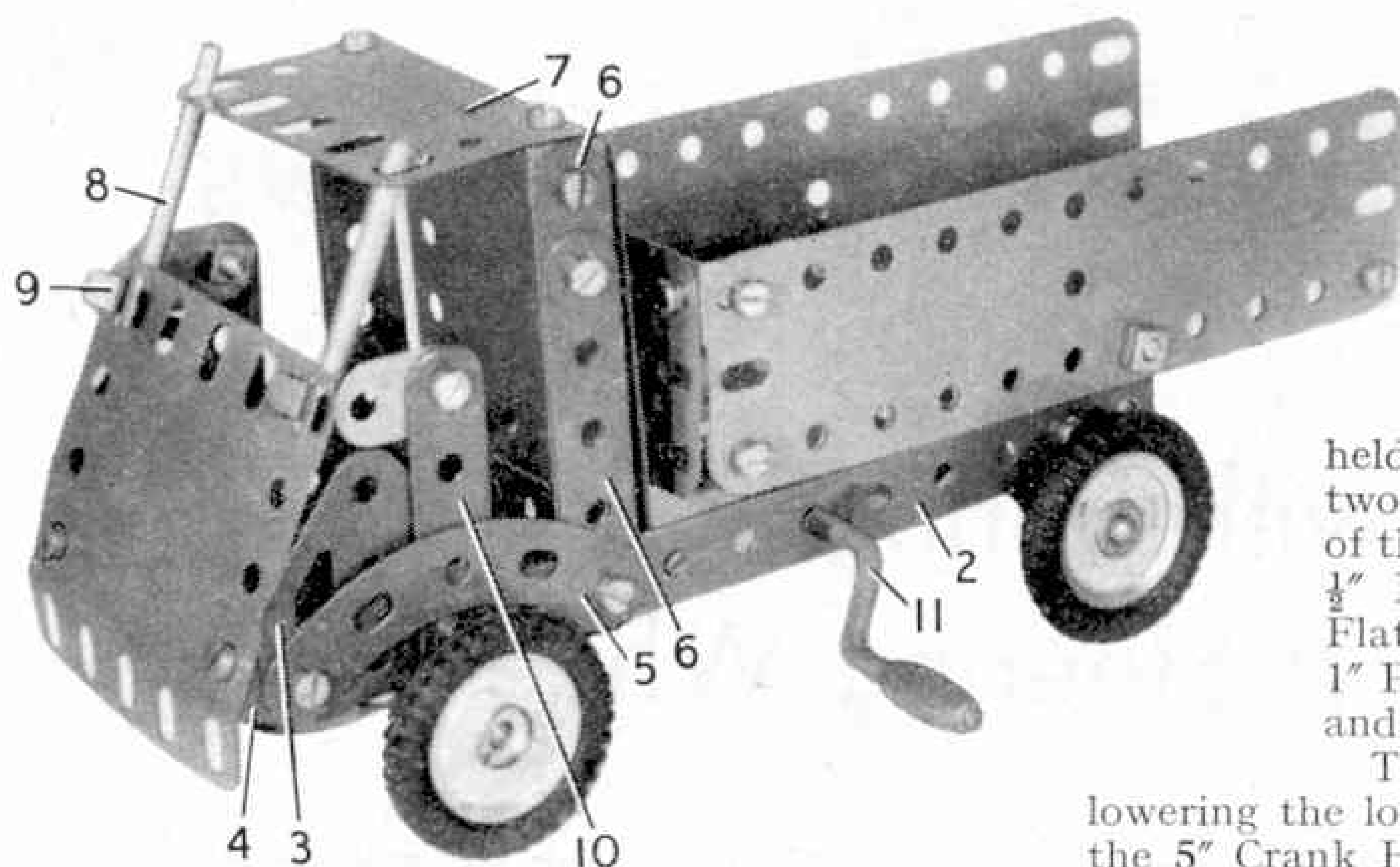


Fig. 2. Owners of Outfit No. 2 can have a lot of fun building this Rear-tipping Truck.

holes of 2½" Strips 10 bolted to the 5½" Strips 2. Two Fishplates are attached to the upper ends of Strips 10. A 3½" Crank Handle 11 is passed through the Strips 2 and is fitted with a Bush Wheel. Two Fishplates, bolted together, are secured to the Bush Wheel and a Reversed Angle Bracket 12 is attached to them. When the Crank Handle is turned the Reversed Angle Bracket pushes the rear of the Tipper upward. The Handle is then turned the other way to lower the body after tipping.

Parts required to build the Rear-tipping Truck: 2 of No. 2; 6 of No. 5; 4 of No. 10; 8 of No. 12; 2 of No. 16; 2 of No. 17; 1 of No. 19g; 4 of No. 22; 1 of No. 24; 4 of No. 35; 40 of No. 37a; 38 of No. 37b; 8 of No. 38; 2 of No. 48a; 1 of No. 52; 2 of No. 90a; 1 of No. 125; 2 of No. 126; 2 of No. 126a; 4 of No. 142c; 1 of No. 188; 2 of No. 189; 2 of No. 190; 1 of No. 191.

Parts required to build "The Fencers": 4 of No. 5; 2 of No. 10; 6 of No. 12; 2 of No. 16; 2 of No. 22; 4 of No. 35; 22 of No. 37a; 19 of No. 37b; 2 of No. 48a; 1 of No. 52; 2 of No. 90a; 4 of No. 111c; 1 of No. 125; 2 of No. 126a.

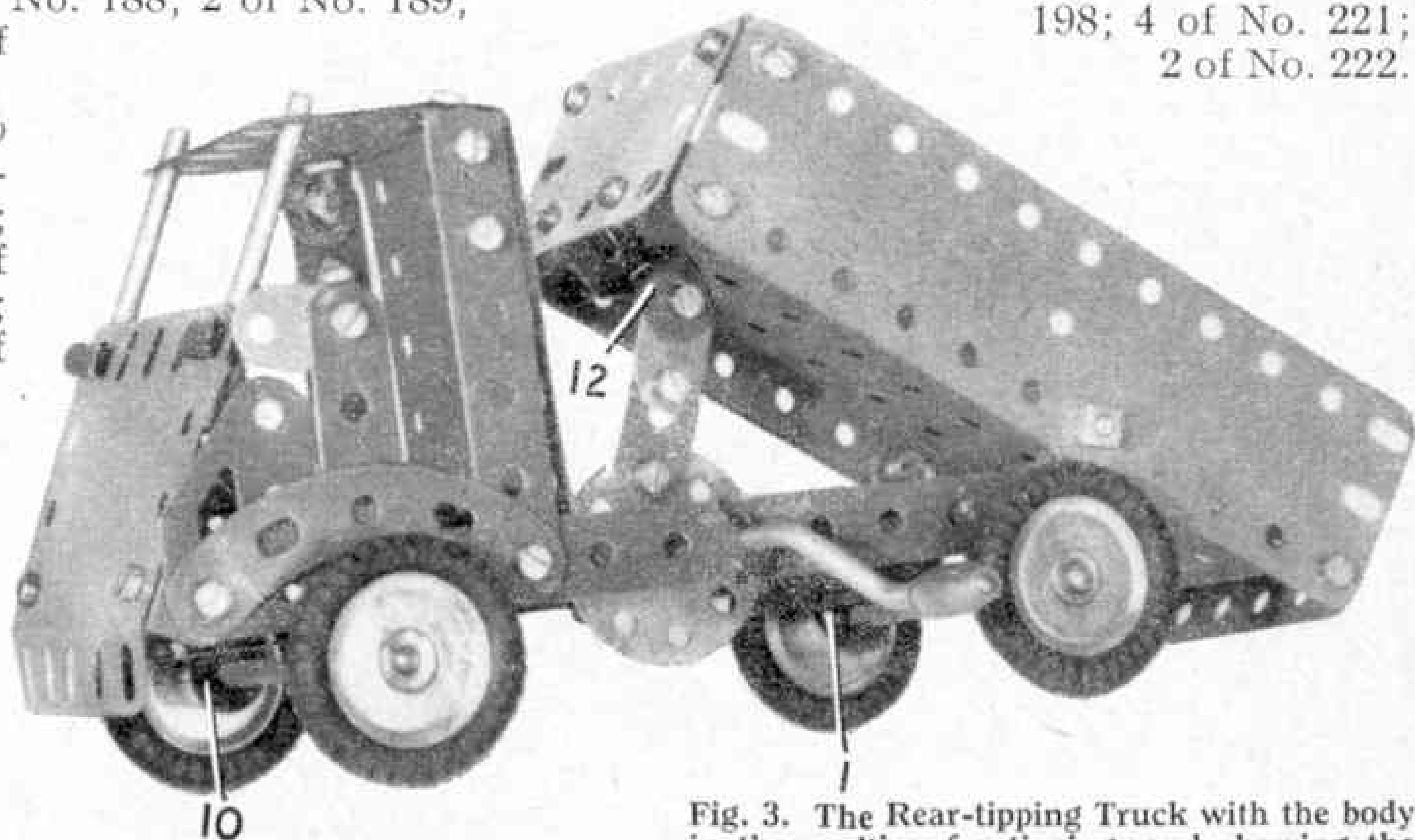


Fig. 3. The Rear-tipping Truck with the body in the position for tipping, and showing the tipping operating mechanism.

Railway Service Crane—(Cont. from page 253)

The block consists of two Flat Trunnions joined by two Angle Brackets. A Loaded Hook is held on a ¾" Bolt fixed by two nuts in the apex holes of these Flat Trunnions. A ½" Rod also held in the Flat Trunnions, carries a 1" Pulley without boss 12, and a Stepped Bent Strip.

The cord for raising and lowering the load block is secured to the 5" Crank Handle 11 passed over one of the 1" Pulleys at the jib head, around the Pulley 12, over another Pulley at the jib head, and is then tied to the Stepped Bent Strip of the load block.

Parts required to build the Railway Service Crane: 9 of No. 2; 6 of No. 3; 2 of No. 4; 12 of No. 5; 4 of No. 6a; 8 of No. 8; 1 of No. 10; 2 of No. 11; 10 of No. 12; 4 of No. 12a; 7 of No. 12c; 2 of No. 15; 3 of No. 15a; 2 of No. 16; 2 of No. 17; 1 of No. 18a; 1 of No. 19h; 2 of No. 20a; 4 of No. 20b; 4 of No. 22; 2 of No. 22a; 1 of No. 23; 1 of No. 23a; 1 of No. 24; 1 of No. 27a; 1 of No. 32; 10 of No. 35; 120 of No. 37a; 116 of No. 37b; 14 of No. 38; 1 of No. 40; 1 of No. 44; 2 of No. 48; 8 of No. 48a; 2 of No. 48b; 2 of No. 52; 3 of No. 53; 1 of No. 57c; 5 of No. 59; 2 of No. 62; 4 of No. 90a; 1 of No. 111; 4 of No. 111c; 2 of No. 115; 2 of No. 126; 3 of No. 126a; 1 of No. 176; 5 of No. 188; 5 of No. 189; 3 of No. 190; 1 of No. 191; 2 of No. 192; 1 of No. 198; 4 of No. 221; 2 of No. 222.



DINKY TOYS NEWS

Bus with Springing, Seats and Steering Wheel

A **S**PLENDID new bus makes its appearance this month in the widely-varied list of Dinky Toys—a vehicle that not only has windows and four-wheel suspension, on the lines of the popular Rolls-Royce, Humber Hawk, Triumph Herald and Volkswagen Karmann Ghia, but also boasts interior seating and a steering wheel.

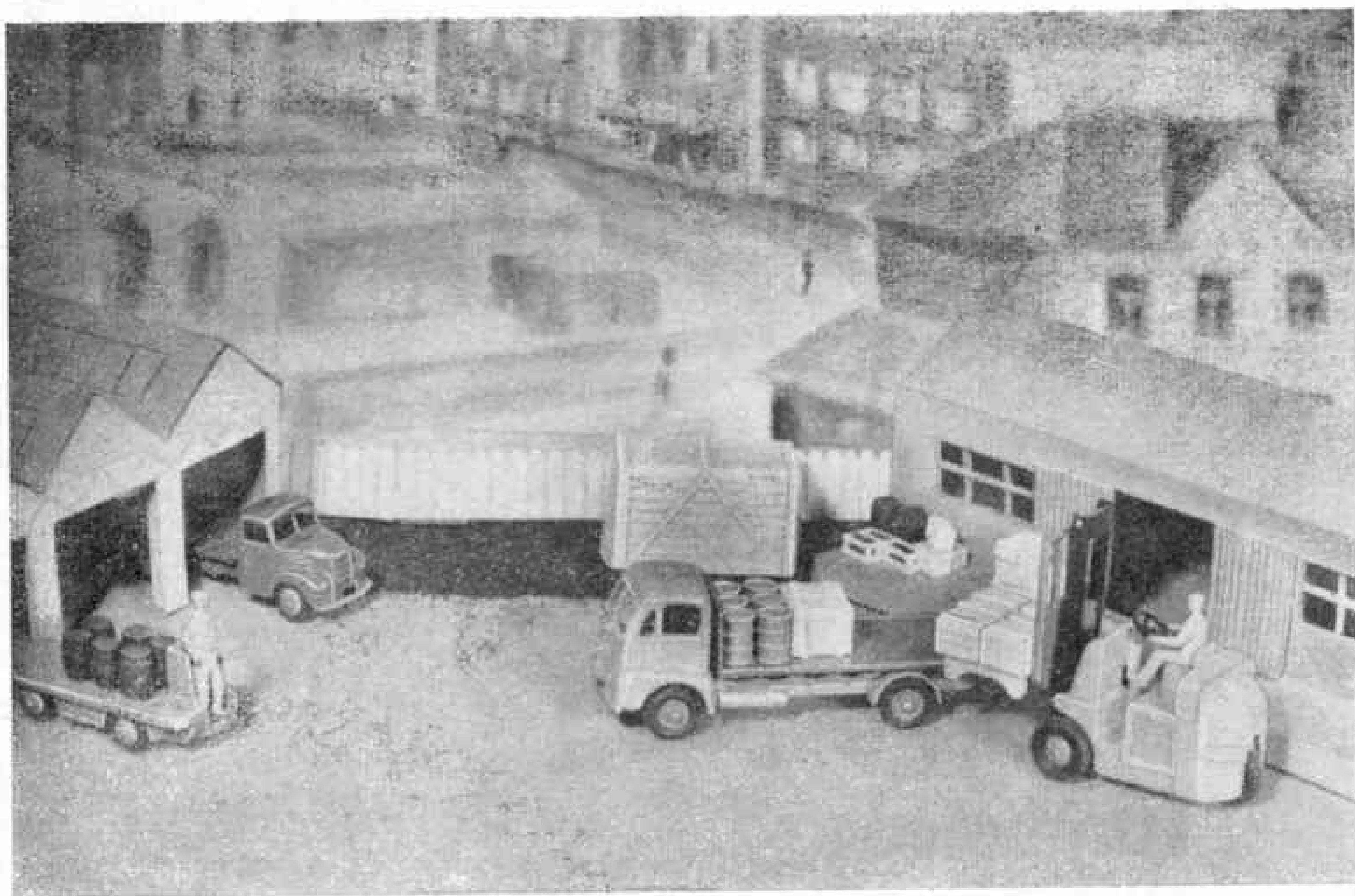
It is the Standard Atlas Bus, numbered 295 on the Dinky Toys list, and I am sure

By **THE TOYMAN**

that all our collectors will be thrilled to add it to their collections. Priced 3/9d., it is beautifully finished in pale blue and grey, with bright red seats, and is a wonderfully realistic miniature of the actual vehicle, which has an Atlas body with conversion by Kenex. You see a

picture of it at the top of the opposite page and from this you will gather that the new model carries a wealth of detail which includes small, neat steps on the nearside, and another step (not visible in the photograph) at the rear.

Now, before I go on to mention other interesting items recently added to the Dinky Toys range, I want you to look at the pictures at the foot of page 243. At first glance they appear to be almost identical views of Corporal Missiles with their Servicing Arms. That, indeed, is the case. The important point is that the picture on the left shows the actual Corporal Missile being serviced by the troops who man it, while the reproduction on the right shows the Dinky Toys models of the two vehicles. When you see the Missiles pictured in this way in similar proportions brought about by photography,



Busy scenes like this can be seen at any seaport and industrial town. The goods on the lorry and on the Fork Lift Truck and B.E.V. Electric Truck, which are helping in the loading, are the latest accessories to be included in the Dinky Toys range.

you realise just how fine a replica the Dinky Toys product is. The chassis of both of the Dinky Toys models are die-cast in solid metal and the Missile itself is of moulded nylon with a harmless rubber nose cone. It can be launched from its platform several feet into the air.

All youngsters who like their road layouts to be as near to the actual thing as possible will be glad to know that British Road Signs, which have been available for some time as a set of 24, are now obtainable in four separate sets, each priced at 2/8d. Two sets (Nos. 766 and 767) represent country signs and the two other sets (Nos. 768 and 769) those found in the towns.

Fine Accessories

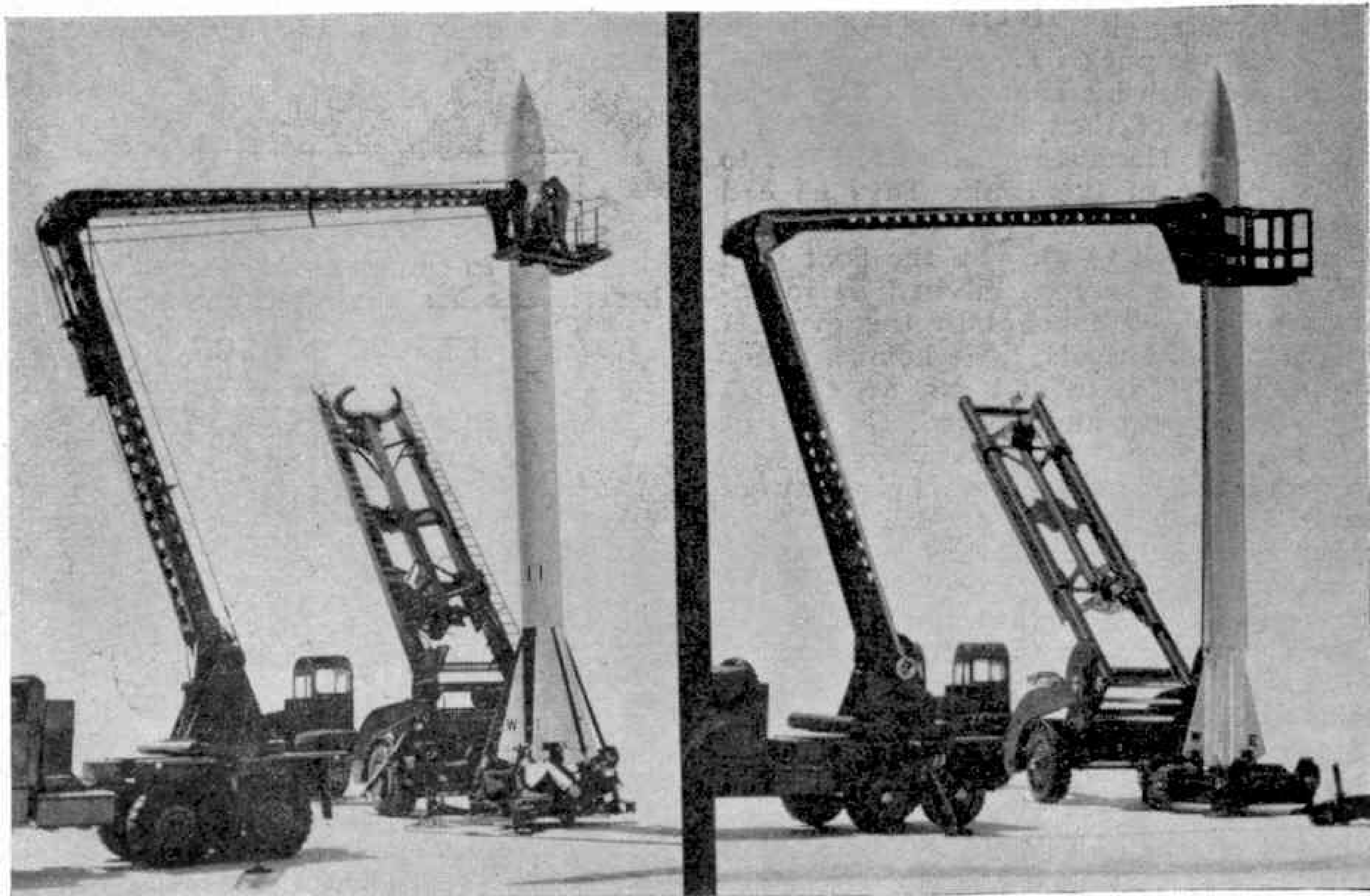
Finally, from our factory at Bobigny, near Paris, come some excellent accessories which can be used as loads for Dinky Toys lorries and wagons and for Hornby-Dublo Electric Trains. They consist of packing cases, barrels, oil drums, and bottles, made up in sets and packed in cellophane. All the items are plastic and the crates have a removable side. The barrels can be opened by pressing a small "bung" in the centre, and the bottles can be removed from the containers in which they are placed. The actual Set numbers are: No. 846, Oil

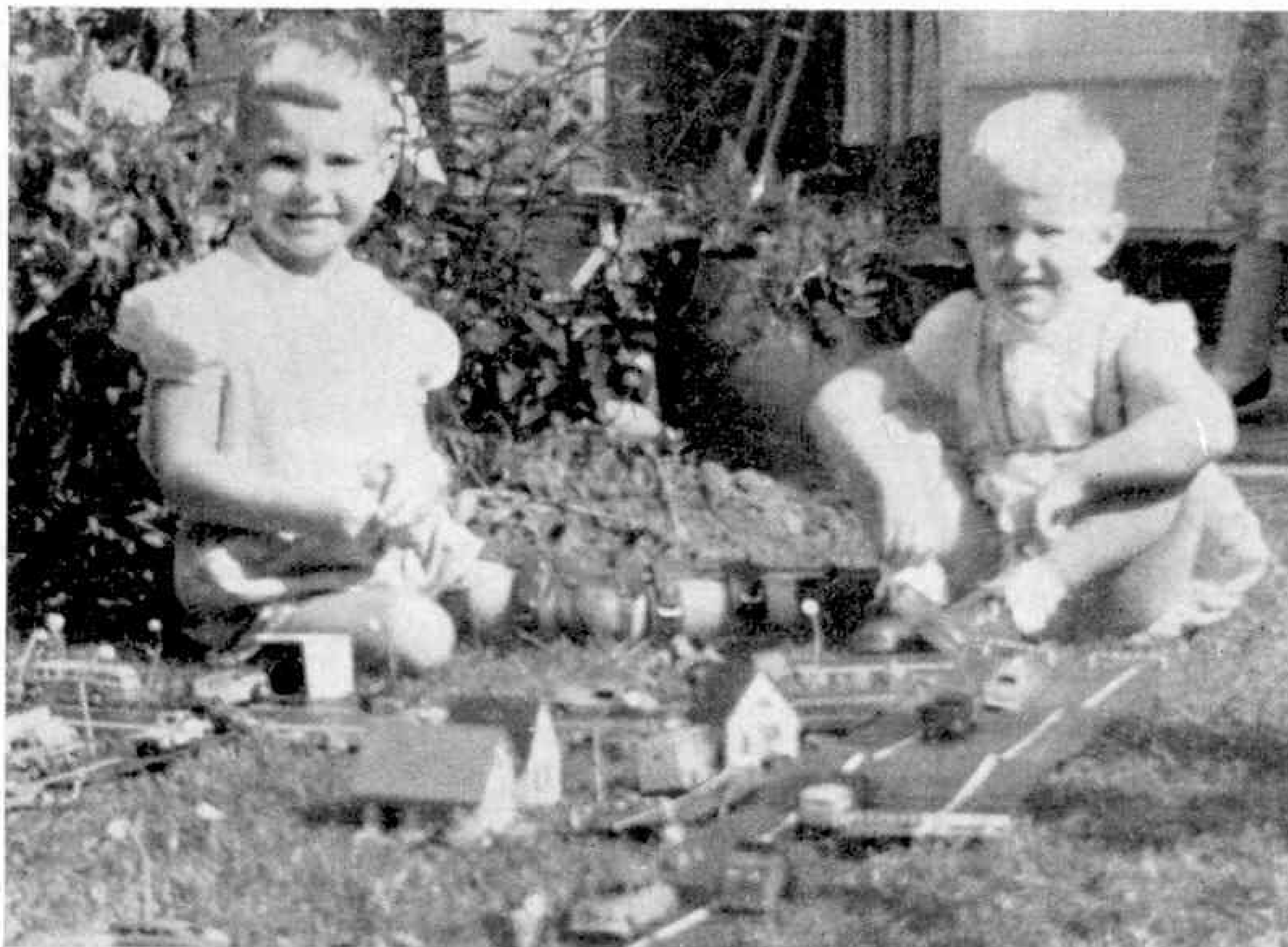


A nearside view of the Standard Atlas Bus, a new addition to the Dinky Toys range. The steering wheel and seating can clearly be seen.

Drums; No. 847, Barrels; No. 849, Packing Cases; and No. 850, Bottles; each Set costing 1/3d. In addition there is a Mixed Set, No. 581, priced at 1/9d., which contains two of each of the four accessories mentioned.

And now I want to tell you the story of the little boy whose photograph appears at the top of page 244. He is six-year-old Hans Terreehorst, of Rotterdam, who has been a polio victim since he was three. He has learned to walk again, after long illness in bed, by pushing Dinky Toys along the floor of his home. Let his father, Mr. P. J. Terreehorst, take up the story for a moment:





Hans Terreehorst, of Rotterdam, whose father has built a model village for him to help him recover from illness, is seen here (left) in the garden of his home with his brother.

Started to Play

"When Hans was in hospital we gave him a Dinky Toys model whenever we visited him, because he liked them better than anything else. When he came home again he was put on a 'resting' bed, where he played with his Dinky Toys, but occasionally one of them fell on the floor.

"One day Hans struggled out of bed to pick up one of the Dinky Toys he had dropped. We let him go his way and found that he started to play on the floor with his toy. The surgeon advised us to encourage him, so, touched by this event, I began to build roads, little houses, traffic signs, hedges, trees and garages through the whole room and, indeed, throughout the house.

"We found that each new Dinky Toy acted as a stimulus and a push in the right direction. Hans has not yet recovered, but he creeps on hands and feet almost faster than his quick-moving brother. In the Kindergarten he baffles everyone by going on the slide and the swings . . . without help. Dinky Toys have proved to be a valuable medium in his battle against the effects of polio."

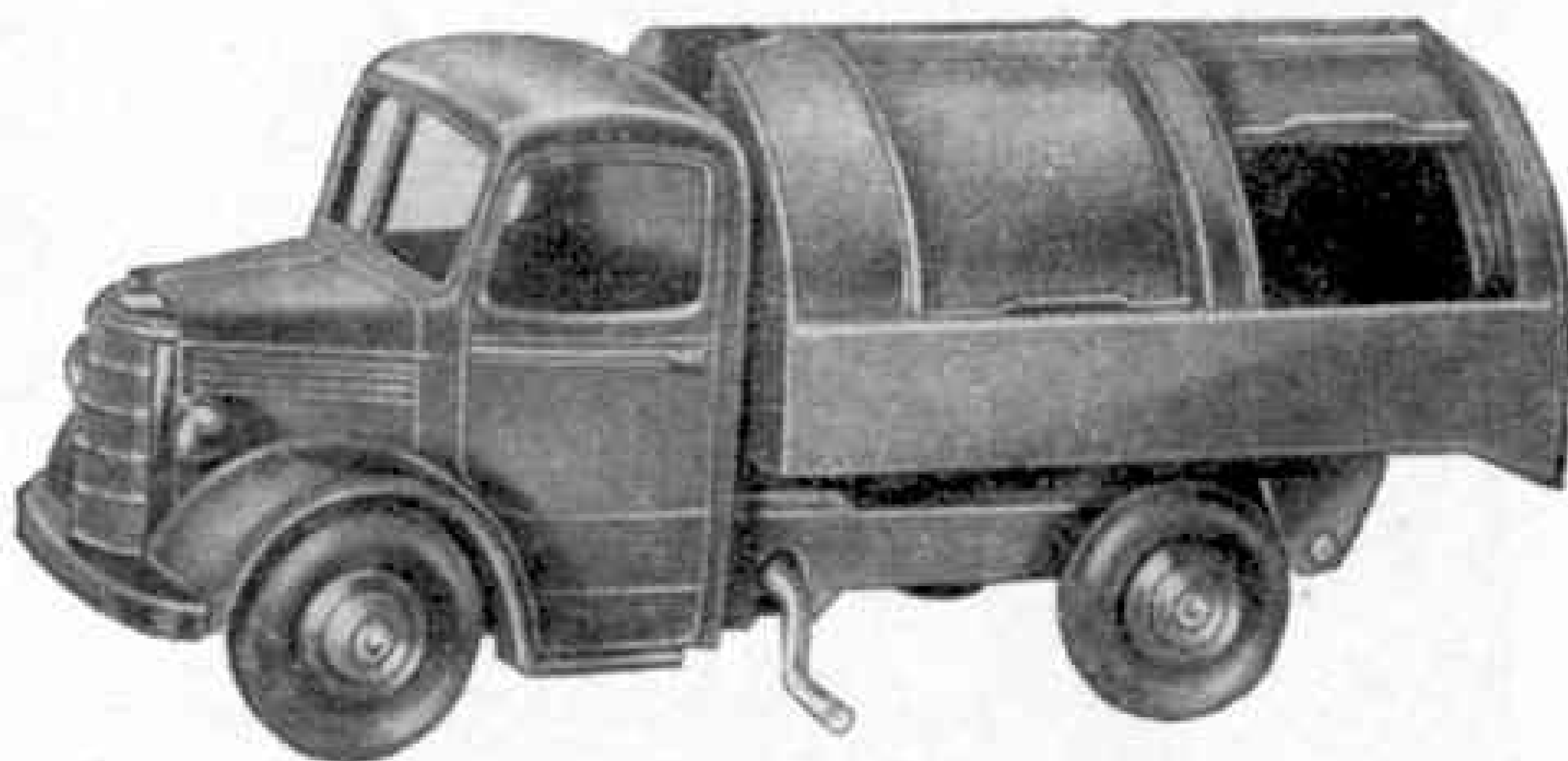
I am sure you all admire the courage of this brave little boy.

Now, just a reminder about the Clean Licence Competition, full details of which I gave last month. Remember—entries must be sent in between June 1st and June 30th. Dinky Toys to the value of £1 will be awarded as prizes to the 20 winning competitors.

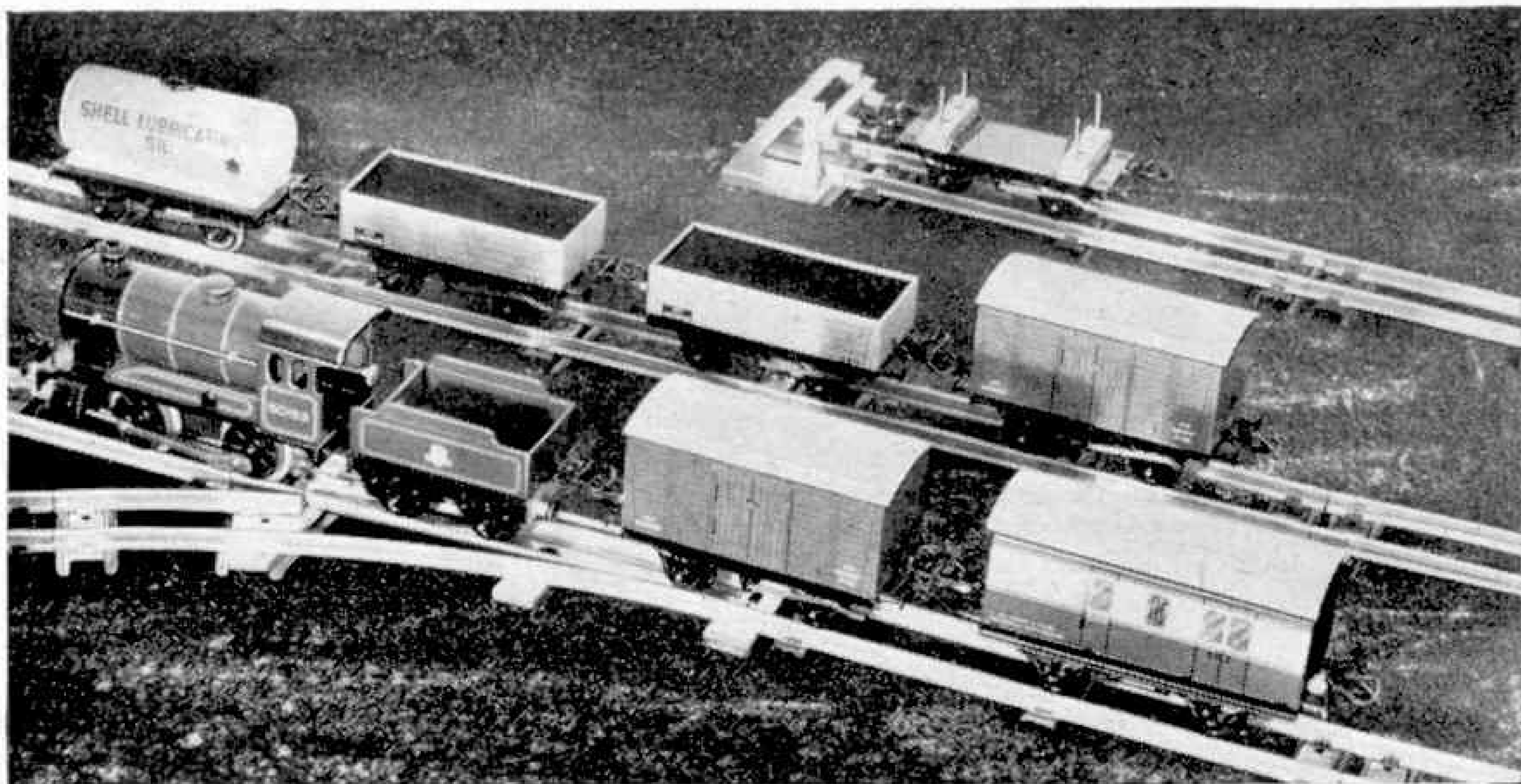
Dinky Rhymes

Finally, to complete this month's notes, here is another Dinky Rhyme:

REFUSE WAGON



*Truly a working model this
And lots of children choose it:
No matter where the rubbish is
It won't (yet does!) refuse it.*



More About Couplings, and Some Mixed Loads

By "Tommy Dodd"

YOU will remember that our talk last month dealt largely with Hornby couplings. There is a further point on this topic that will, I am sure, be of interest to many of my younger friends who have made a start with one of the small Train Sets of the Hornby system and who wish to extend their layouts and operations and to use the somewhat larger Hornby Locomotives and rolling stock that require 2 ft. radius curves. Naturally, such enthusiasts do not wish to leave their original equipment out of things when train running on the more developed layout begins, so that I am sometimes asked whether the various kinds of rolling stock in the present Hornby Gauge 0 System can all be used together.

As you probably know, the Nos. 20/21 and 30/31 vehicles specially suited to 1 ft. radius layouts can be used together, although the couplings of these "twenties" and "thirties" are different in form. There is a very slight difference in their effective heights, but this is readily adjusted by a little careful bending.

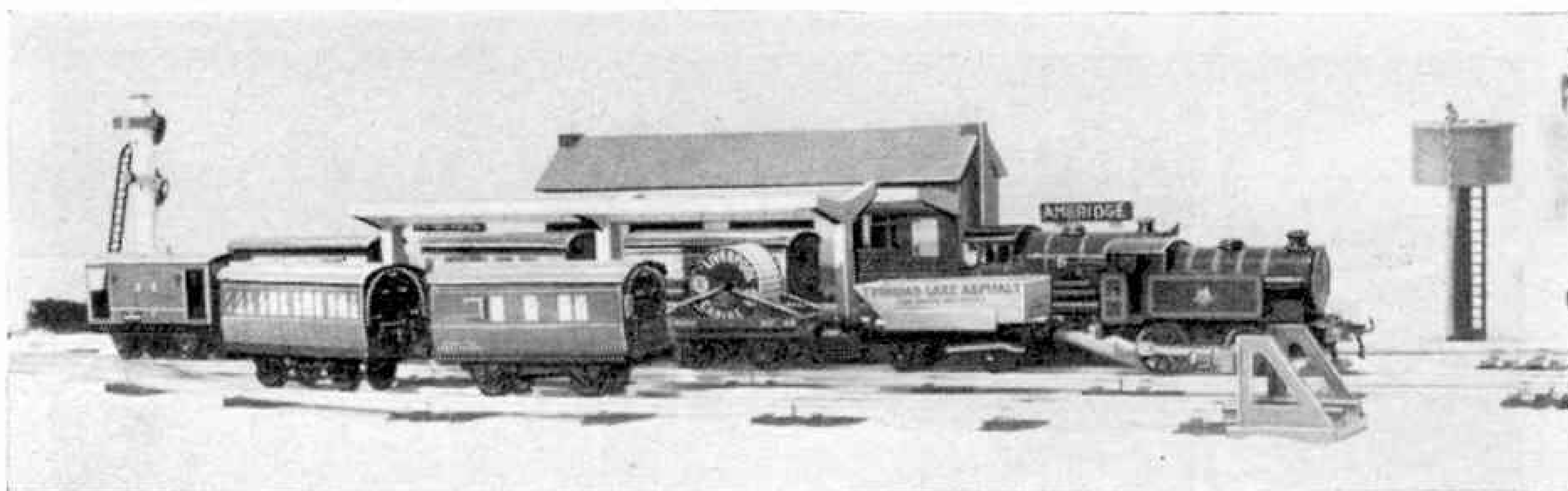
So far so good, but what happens when equipment of the larger kind, Nos. 40/41 and 50/51, fitted with automatic couplings is obtained? Clearly the automatic couplings are very different from those

fitted to, say, the "thirties" stock and the automatics are set at a slightly greater height above rail level. Strictly speaking, it is not good practice to attempt to combine the two types of stock. But it can be done, purely from a coupling point of view, by bending slightly downward the automatic type of coupling so that the tongue of the No. 30 type coupling can be hooked into the loop of the automatic. This need not interfere with the working of the adjusted automatic couplings with similar couplings,

that have not been altered, on other automatic-fitted stock, provided that the adjustment is carried out with care.

Not all users, quite rightly, may favour this type of alteration, but it is a possible way of using the two kinds of stock together. It is wiser to assemble the "thirties" vehicles as a group and to couple these as a trailing load behind whatever "forties" or "fifties" vehicles compose the rest of the train. When the engine is pulling, no particular problems crop up, but you may have one or two little difficulties to overcome if shunting is attempted. This invariably means that the train must be pushed through reverse curves in order to reach the sidings. But with care, all may be well; and in any case the young shunter is

Above, a short special of one Van and a Brake Van is hurried along by a Hornby No. 50 Locomotive. Odd vans are worked in this way at times in real practice.



"Ambridge" Station on the Hornby Gauge 0 layout of Richard and Neville Sleigh. A description of the layout appeared in these pages in January last.

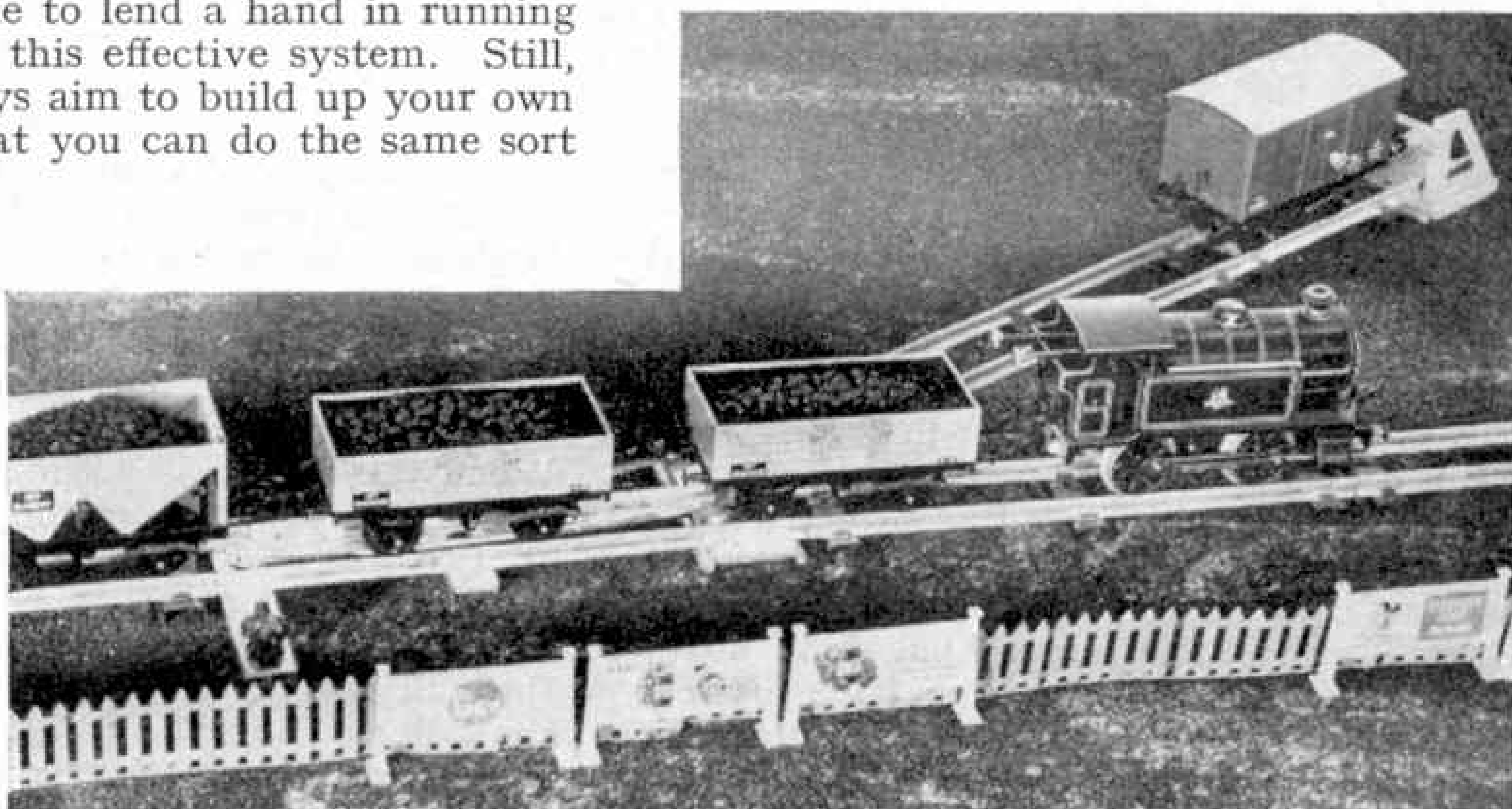
usually able to deal with these little things.

I hope these notes will be useful to those of you who are faced with problems of this kind. It is probably better to adjust only one or two of the automatic couplings and use the vehicle so treated as a kind of adaptor between the different kinds of stock. Again, we should avoid placing Nos. 30/31 vehicles singly, or in groups, between the bigger and heavier ones of the Nos. 50/51 types.

I am glad to be able to show you a further picture of part of the Hornby railway operated by H.R.C. members Richard and Neville Sleigh, of Churchdown, a description of which appeared in these pages last January. *Ambridge* is the name of the home-built station included in the picture and the photographer obviously paid his visit when things were busy there. There is a goods train held in the loop line, while a passenger train is standing at the far platform, on which the main station building is situated. Thus, an ordinary everyday railway situation has been reproduced successfully with Hornby Gauge 0 equipment and I am sure many of you would like to lend a hand in running the trains on this effective system. Still, you can always aim to build up your own railway so that you can do the same sort of thing.

You may possibly recall from the earlier description that loads are carried as a regular thing and in the picture above you can see a Cable Drum loaded on the Low-Sided Wagon. Probably some of you already use the imitation Coal and imitation Gravel, bags of which are listed in the range of Dinky Toys. These substances are light, which is an advantage, and they can be used in full wagon loads if you have sufficient of either material. Or you can apply them in conjunction with the scheme, which I have described once or twice before, of making up a false bottom of card for your Open Wagons. In effect, this is made something like the lid of a box, but to fit inside the vehicle. The upper surface is glued and covered with the particular loose material you are using for a load.

Many Hornby, as well as Hornby-Dublo, train owners will welcome the addition to our range of products of the miniature oil drums, barrels, packing cases and crates mentioned elsewhere in this issue by my friend *The Toyman*, although they may seem a little small for Hornby Gauge 0 purposes.



Here is a coal train with a Hornby No. 40 Tank in charge.

Of General Interest



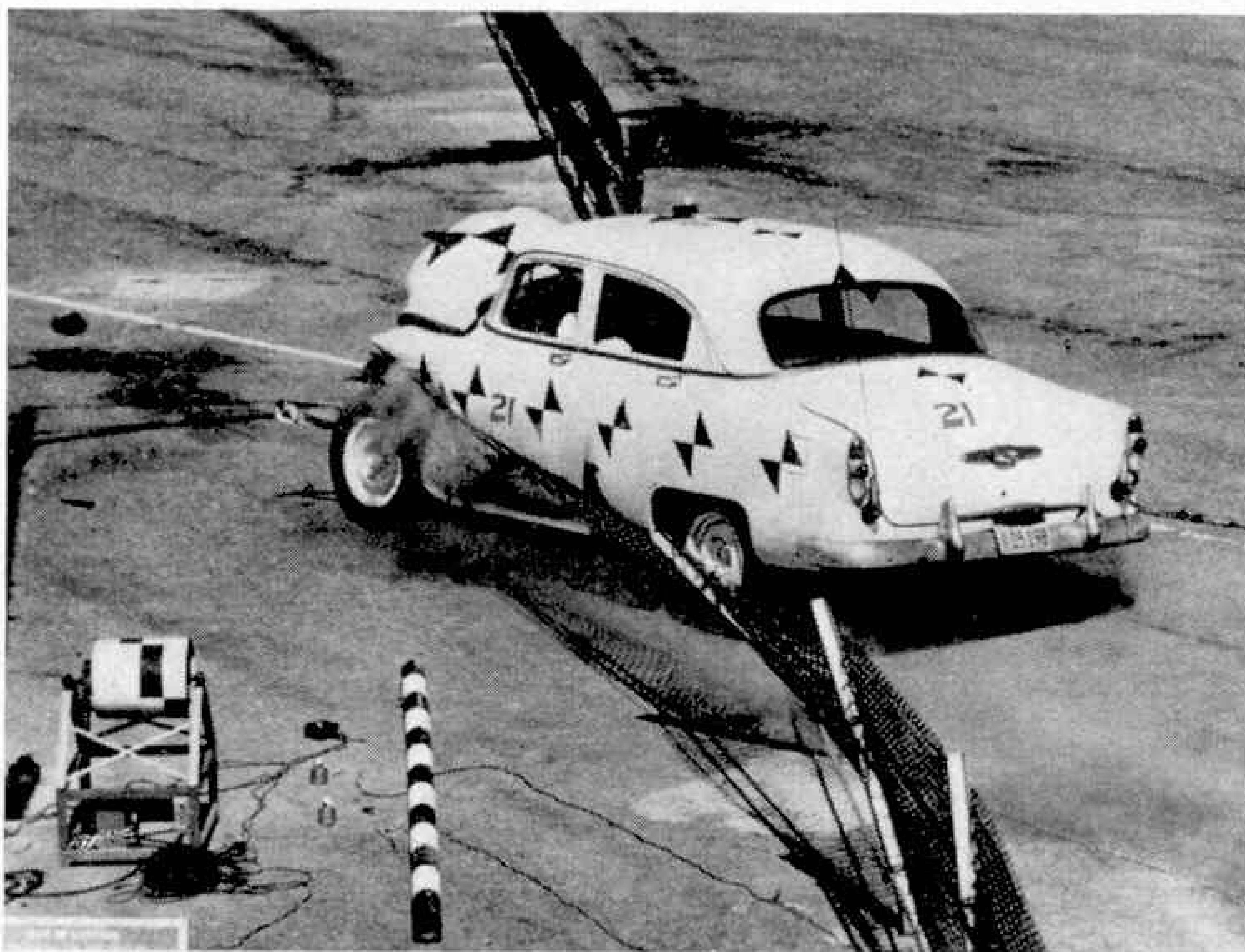
Family's 160-Year Link with River Ferry

THE article in the February issue of the *M.M.* describing the passenger ferry service across the River Avon reminds a Liverpool reader that there is a similar type of ferry not far from Merseyside. It is the Higher Ferry, across the River Dee, which connects Saltney with Blaenau and it is unusual in the fact that it provides a free service for passengers. The trip across the river saves a tiresome journey by road, and the ferry itself has a long history of service. It was established about 1740, in the reign of George III, and was one of the two ferries across the Dee which, by Act of Parliament, were declared free of toll. The other, the Lower Ferry, ceased to exist when a bridge was built on the spot during Queen Victoria's reign and that bridge, at

Queensferry, is now famous throughout the north of England as the gateway to Wales.

Today, service on the Higher Ferry is provided by a large open craft driven by an outboard motor, and capable of holding 14 passengers with their cycles. It is operated by the Chief Ferryman, Mr. R. Manifold, and his son Peter, and operates daily from 5 a.m. until about 10 o'clock at night.

Mr. Manifold is also a boat builder and salmon fisher, and five generations of his family have ferried people across the Dee over a period of approximately 160 years. Until two or three years ago, Mr. Manifold and his son had to row their boat, with its load of passengers and cycles, across the river. Our photograph shows the ferry leaving Blaenau.



A test car colliding with the safest type of barrier—chain link and steel post.

TODAY the small family saloon car is equal in performance to many of the smaller pre-war sports cars. The power of the bigger cars is also much greater and on the modern stretches of highway now being built speeds of up to a hundred miles an hour are not uncommon.

The new roads are much safer than many of the old narrow highways. They are really two roads in one, so that moving traffic is kept apart according to the direction in which the vehicles are moving. As long as all goes well this is a very good idea. But when a car skids or touches another car on the same highway there is the danger of a car crossing the central strip between the two highways and coming into head-on collision with another car on the other half of the road. When it is remembered that the two vehicles may collide at a combined speed of up to 200 m.p.h., the results of the accident can be imagined.

This kind of accident has been troubling police and highway engineers in the United States and Canada for a long time. They have another problem too—on the long,

straight stretches of their highways drivers sometimes fall asleep and crash off the road.

On very dangerous stretches of road barriers can be placed along the edges of the highway. If a crashing car leaves the road it is simply pushed back on to it again by the barrier.

Radio-Controlled Car Crashes

By R. J. Salter

Unfortunately, the problem is not as simple as all that, for with some kinds of barrier more damage and injury is caused by the car colliding with it than if the car had just run off the road. Other types of barriers bounce the crashing car back into

the road so violently that it collides with other cars, causing more trouble.

To help solve this kind of problem the California Department of Highways has been carrying out full-scale tests.

Believing that the lives that could be saved more than made the expense worthwhile they took over a disused airfield. Barriers of many different kinds were put up and then cars, and even buses, were radio-controlled so that they crashed into the barriers. By taking high-speed photographs of the actual crashes it was

possible to see what happened during the split second of the crash.

The cars used were ordinary four-door saloons. The back seat, the spare tyre and the petrol tank were taken out and radio equipment was fitted into the car's boot. An aerial was also fitted on the car to receive radio signals from the controlling car.

Petrol Safeguard

A very small petrol tank fitted with valves was fixed in the car so that if it overturned the petrol would not be spilled.

To start the car, the engine was switched on and the vehicle was pushed along by a wagon until the engine fired. The car built up speed until 60 m.p.h. was reached and radio controls were then used to guide the car into the barrier.

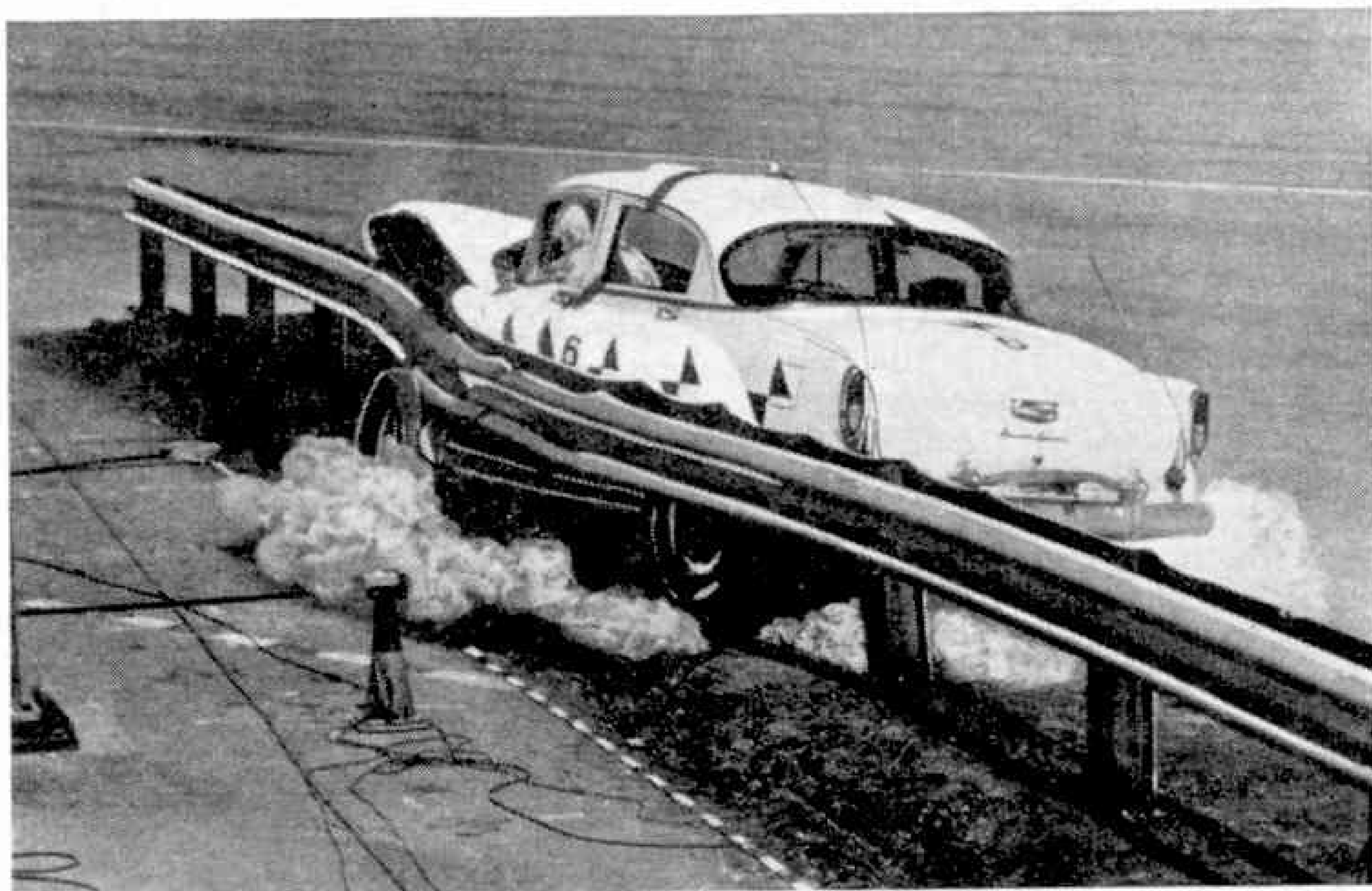
As can be guessed, accurate steering by radio is important and this was done by fitting a small electric motor on to the floor beneath the steering wheel. A pulley belt ran between the motor and the steering

wheel. The electric motor and the steering wheel were made to move by radio control and, as a safety measure, the brakes could also be put on by the remote control.

The safest barrier was found to be that which sliced through the thin metal body of the car, and became wedged between the front wheel and the stronger inside frame of the car. This prevented the car from bouncing back on to the road, and gradually slowed it down.

What happens to the drivers and passengers in a car crash is very important, for many injuries are caused by people being thrown about inside the car. Dummies were fitted into some of the cars and into a 24-seater bus which was also crashed. The cameras revealed very clearly how many lives safety belts would save.

Next time the speedometer of the car you are travelling in reaches 60 m.p.h. remember these radio-controlled crashes and how the experiments in which they are used can help to reduce the growing toll of the roads.



Collision with a metal beam and wood post type of barrier, the second most satisfactory type. The dummy driver can be seen in the front seat.

"CYCLING MANUAL, 24th EDITION"

By H. H. ENGLAND

(Temple Press, price 5/-)

This well-known manual has been fully revised and brought up to date, and the latest edition ranges over the entire field of cycling from cycle touring to track racing. There is also much good advice on choice of model and correct riding position and the

many interesting chapters deal with such things as tyres, brakes, saddles, and lighting equipment, with a special section on variable gearing. The text is supplemented by twelve appendices containing information on the world's champions, road record holders, etc. This book is written in non-technical language and contains nearly 100 illustrations, being a worthy successor to its twenty-three predecessors.

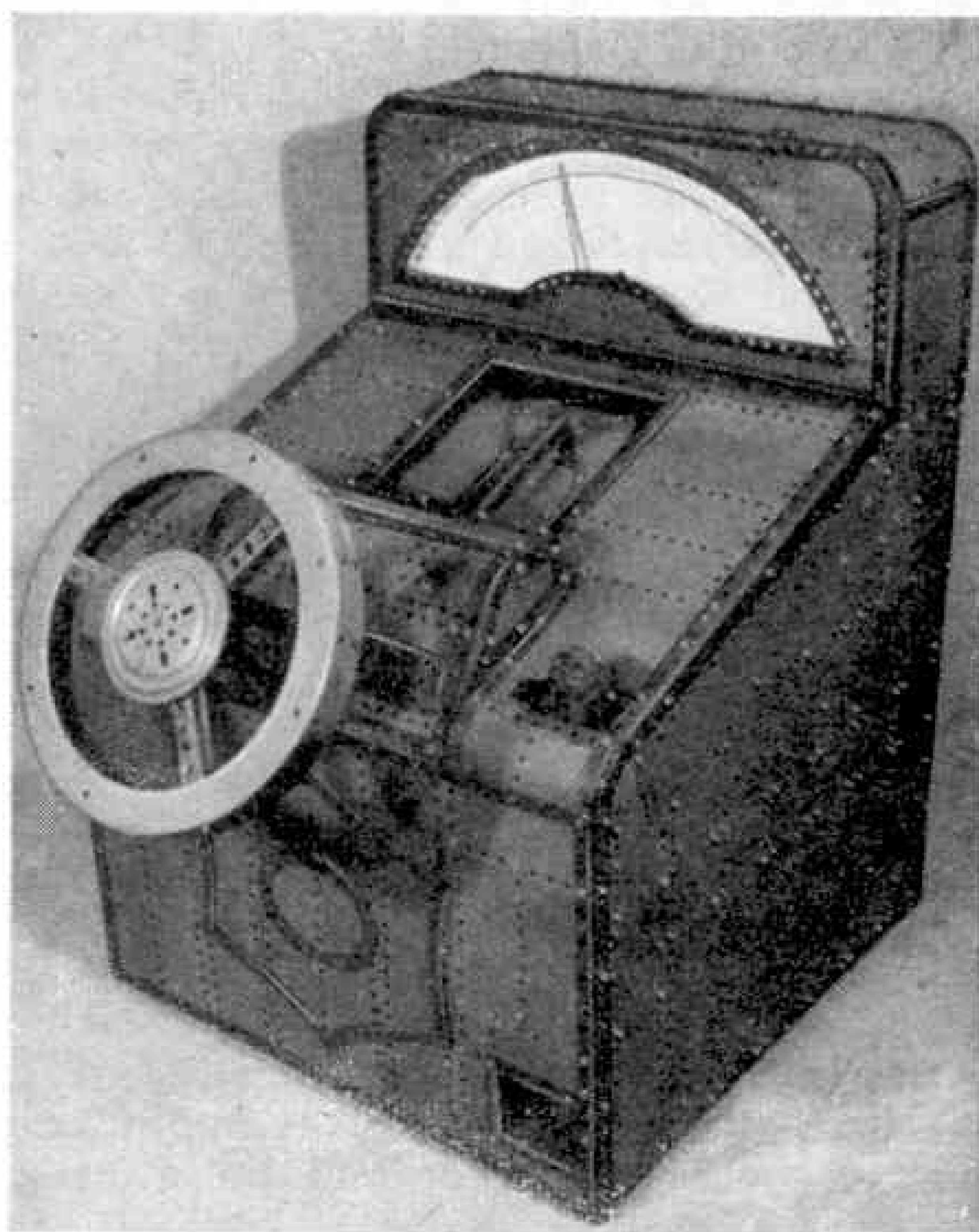
Ideas and Suggestions for Meccano Experimenters

Compiled by "Spanner"

MANY model-builders lucky enough to have a good assortment of parts at their disposal are very successful in finding "off the beaten track" subjects to model. One of these that has come to my notice recently is John Sturrock, Dundee, who has built a most attractive Driving Skill Machine. It is based on the popular "Driving Test" machines found in many amusement arcades, and a picture of the model is shown on this page.

The machine consists of two main features, a winding road outlined by Sprocket Chain fixed to an endless moving belt, and a contact arm, representing a car, which is manœuvred along the road by a steering wheel. When the machine is in action, the winding road moves rapidly under the contact arm and it is the task of the operator to steer the "car" along the curves of the road without touching the sides formed by the Chain. The Chain and "car" form part of an electrical circuit and if the "car" touches the Chain the circuit is completed and a "fault" is registered on a dial fixed at the back of the machine.

The machine is made "live" by placing a penny in a slot provided. This operates a mechanism that switches on the Motor that drives the "road", and any one of three speeds can be engaged, according to the wish and skill of the operator. When



Here is a fine model for advanced constructors and one that will provide much pleasure and amusement when completed. It is a "Penny in the Slot" Test Your Skill Machine, and brief details of it are given on this page.

the Motor is stopped, the contact arm is raised clear of the road, and if less than five faults are recorded on the dial, the penny is returned. After 20 seconds the dial resets itself to zero.

There is plenty of scope for applying your ideas and model-building skill in assembling models of this kind—so what about having a go you advanced model-builders? I shall be very pleased to receive details and photographs of any other models of this type built by readers of these notes, and

if you are on the look-out for an unusual subject here is just the thing for your attention.

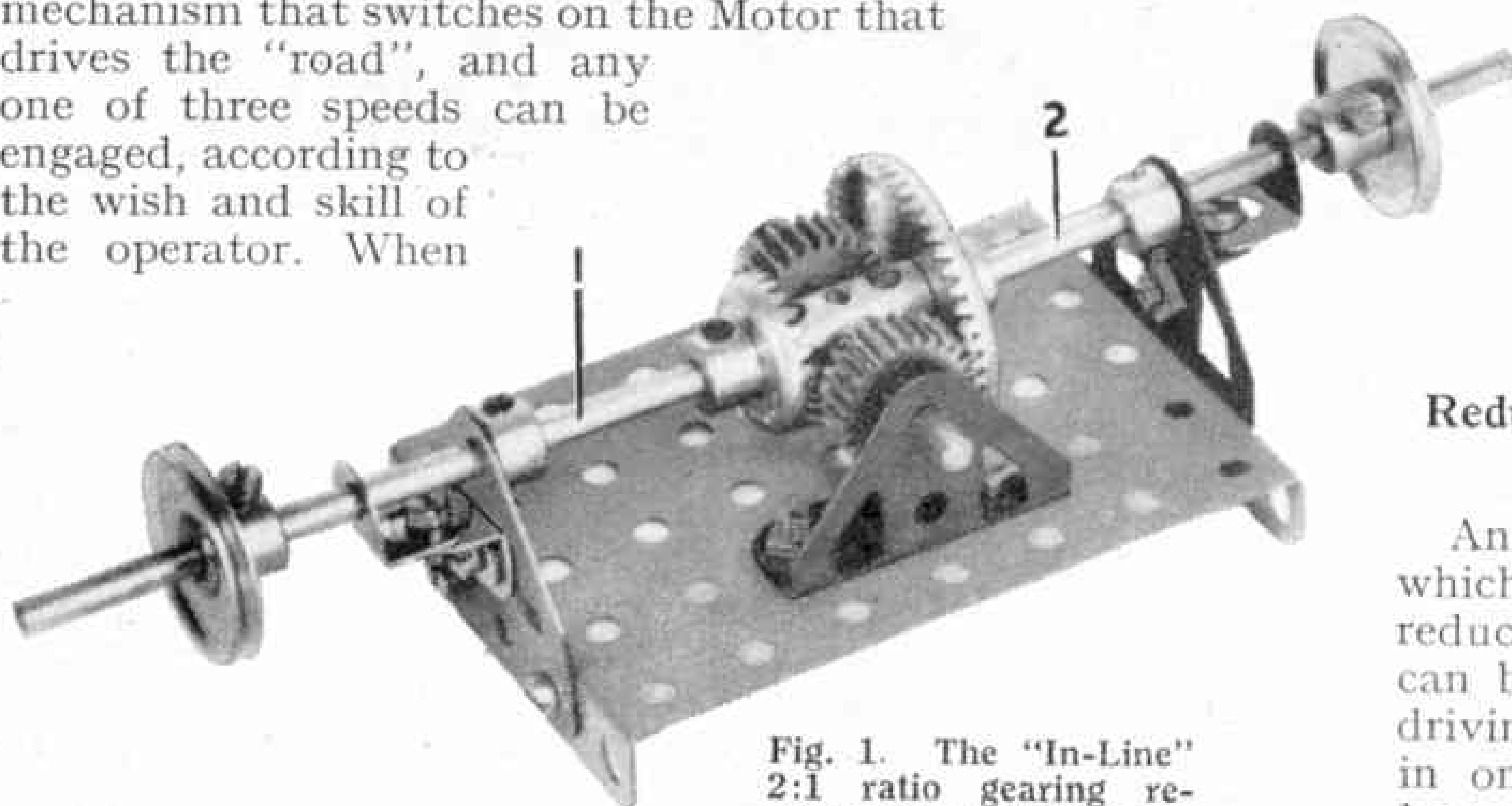
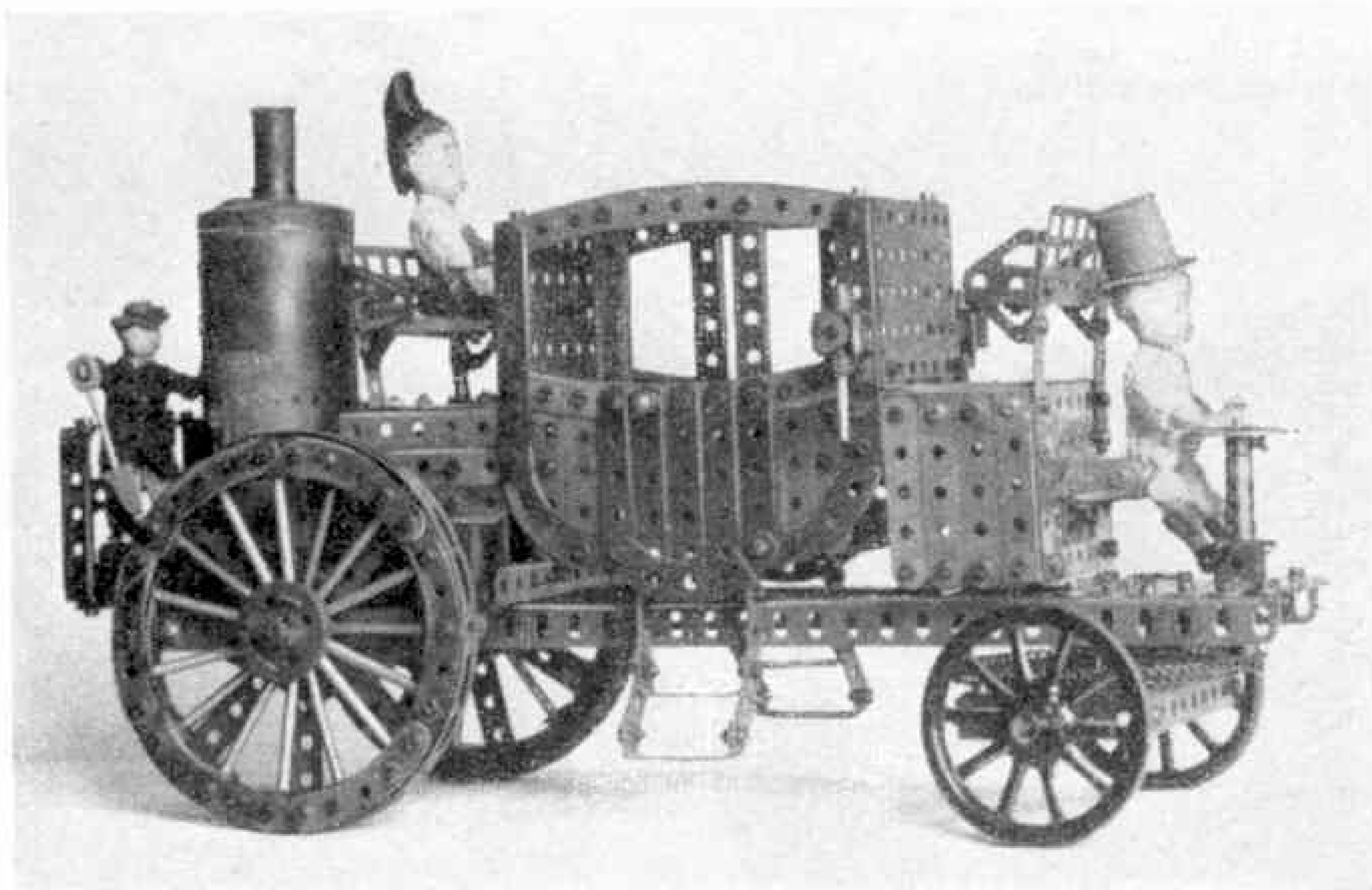


Fig. 1. The "In-Line" 2:1 ratio gearing referred to on this page.

An "All in Line" Reduction or "Step up" Mechanism

An arrangement by which a "step up" or reduction in driving speed can be obtained with the driving and driven shafts in one line, is suggested by H. H. Taylor,



A reminder of a world that has vanished is provided by this realistic and attractive model of an old-time steam-driven carriage. It was designed and built by Lt.-Comm. J. D. Richard, R.N., Derby.

of the *Meccano Magazine*. However, I have always had difficulty with clutches owing to end thrust on the bearings, due to the spring pressure. This spring pressure slows the power unit down considerably, and although this

Huddersfield. His mechanism is shown in Fig. 1, and it gives a speed ratio of 2 : 1 between the input and output shafts.

Two Flat Trunnions are bolted to the ends of a $3\frac{1}{2} \times 2\frac{1}{2}$ Flanged Plate. Then two reversed angle brackets, each assembled from two Angle Brackets, are attached to the Flat Trunnions and in them are journaled a 4" Rod 1 and a $3\frac{1}{2}$ " Rod 2. The 4" Rod is fitted with a $\frac{3}{4}$ " Contrate Wheel and a 1" Pulley, and the $3\frac{1}{2}$ " Rod carries a $1\frac{1}{2}$ " Contrate Wheel and a 1" Pulley, both the Rods being held in place by Collars. The inner ends of these Rods project into the longitudinal bore of a Coupling, through the centre transverse hole of which a 2" Rod is passed. This Rod is journaled in a Trunnion bolted to the Flanged Plate. The Contrates mesh with one of two 25-tooth Pinions fixed on the 2" Rod as shown.

Reader's Suggestion for a Clutch Mechanism

In my correspondence recently was a letter from A. Wenbourne, Rochester, the gist of which was as follows: "Being one of the many Meccano enthusiasts who take a great interest in building motor vehicles, I have constructed many transmission systems, with the help

may not matter greatly in the case of a vehicle, it may be a disadvantage when used in other models. In any case this difficulty encouraged me to try to design a clutch that would eliminate this trouble and I finally succeeded in doing so by means of the arrangement shown in the accompanying sketches" (reproduced as Fig. 2). In the arrangement I have made, the clutch tends to stay in the disengaged position. If this is undesirable a spring can be placed in the linkage to return it to the engaged position, and a stop so that it does not bear on the clutch.

The construction of the clutch is as follows: To the four outer holes of a $2\frac{1}{2}$ " dia. Gear Wheel 1, Threaded Bosses 2 are bolted, two opposite (Continued on page 266)

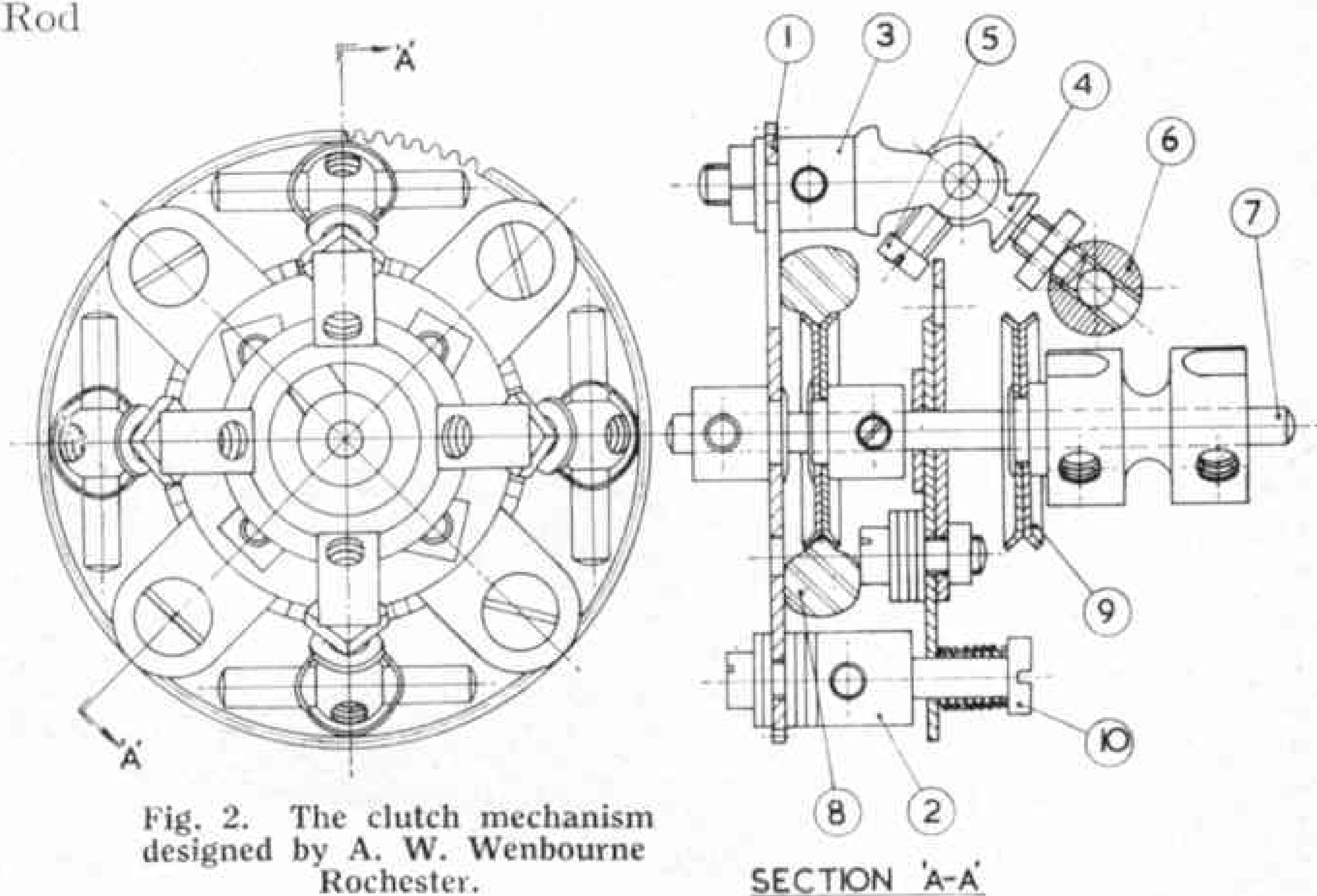
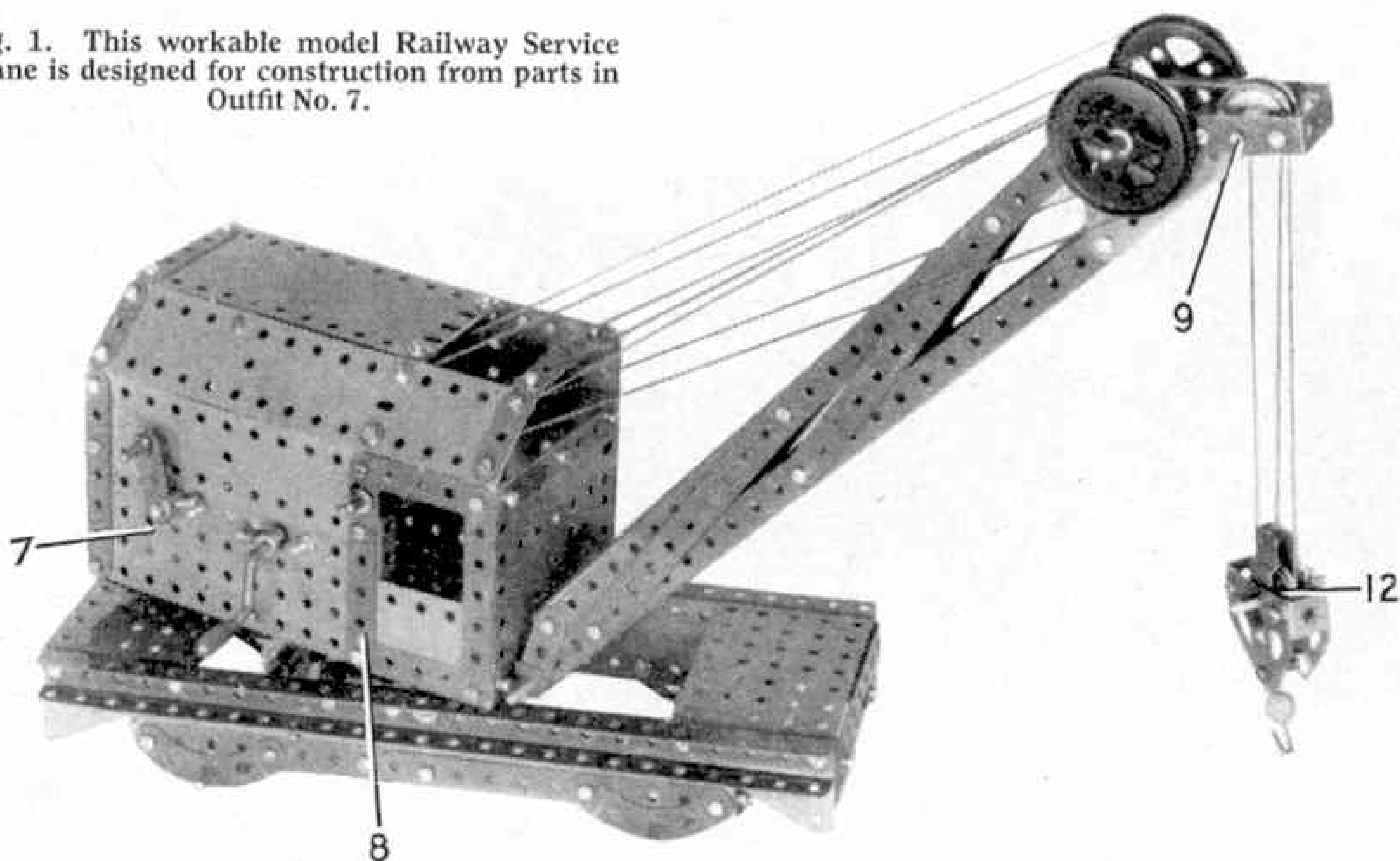


Fig. 2. The clutch mechanism designed by A. W. Wenbourne Rochester.

SECTION 'A-A'

Fig. 1. This workable model Railway Service Crane is designed for construction from parts in Outfit No. 7.



Railway Service Crane

A Model for Outfit No. 7

IN building the Railway Service Crane shown in Fig. 1, it is advisable to begin with the chassis. For this four $12\frac{1}{2}$ " Angle Girders are bolted in pairs to the flanges of $3\frac{1}{2}$ " $\times$ $2\frac{1}{2}$ " Flanged Plates 1 and 2. Two $5\frac{1}{2}$ " $\times$ $1\frac{1}{2}$ " Flexible Plates are overlapped three holes and bolted to each pair of Angle Girders so as to leave three holes at each end. At the ends of the pairs of Angle Girders $2\frac{1}{2}$ " $\times$ $1\frac{1}{2}$ " Triangular Plates are bolted. The lower edges of the Flexible Plates are stiffened by bolting to them two $5\frac{1}{2}$ " Strips, overlapped three holes. The bearings for the wheel axles are provided by four Stepped Curved Strips bolted to the $5\frac{1}{2}$ " Strips. The ends of the $5\frac{1}{2}$ " Strips are joined by a $2\frac{1}{2}$ " $\times$ $\frac{1}{2}$ " Double Angle Strip, extended two holes by a $2\frac{1}{2}$ " Strip, which has an Angle Bracket fixed in its end hole. The ends of the Angle Girders at each side of the chassis are joined by a $3\frac{1}{2}$ " $\times$ $\frac{1}{2}$ " Double Angle Strip. Below this, on each side, is a 1 " $\times$ 1 " Angle Bracket, the two being connected by a $2\frac{1}{2}$ " $\times$ $\frac{1}{2}$ " Double Angle Strip.

A $2\frac{1}{2}$ " $\times$ $\frac{1}{2}$ " Double Angle Strip 3 is fixed to the apex holes of two Trunnions bolted one each side of the chassis, and the centre hole of the Double Angle Strip provides a bearing for the 2" Rod 5 on which the crane is pivoted. This Rod also passes through a second $2\frac{1}{2}$ " $\times$ $\frac{1}{2}$ " Double Angle Strip 4, which is extended at one end by a $2\frac{1}{2}$ " Strip and Angle Bracket. This Angle Bracket and the lug of the $2\frac{1}{2}$ " Strip hold the assembly in place. A 57-tooth Gear Wheel is fixed to the Rod 5 and meshes with a Worm on a Crank passed through the sides of the chassis and held in place by Collars.

One side of the cab consists of a $5\frac{1}{2}$ " $\times$ $2\frac{1}{2}$ " Flanged Plate 7 connected by $3\frac{1}{2}$ " $\times$ $2\frac{1}{2}$ " Flanged Plate 6.

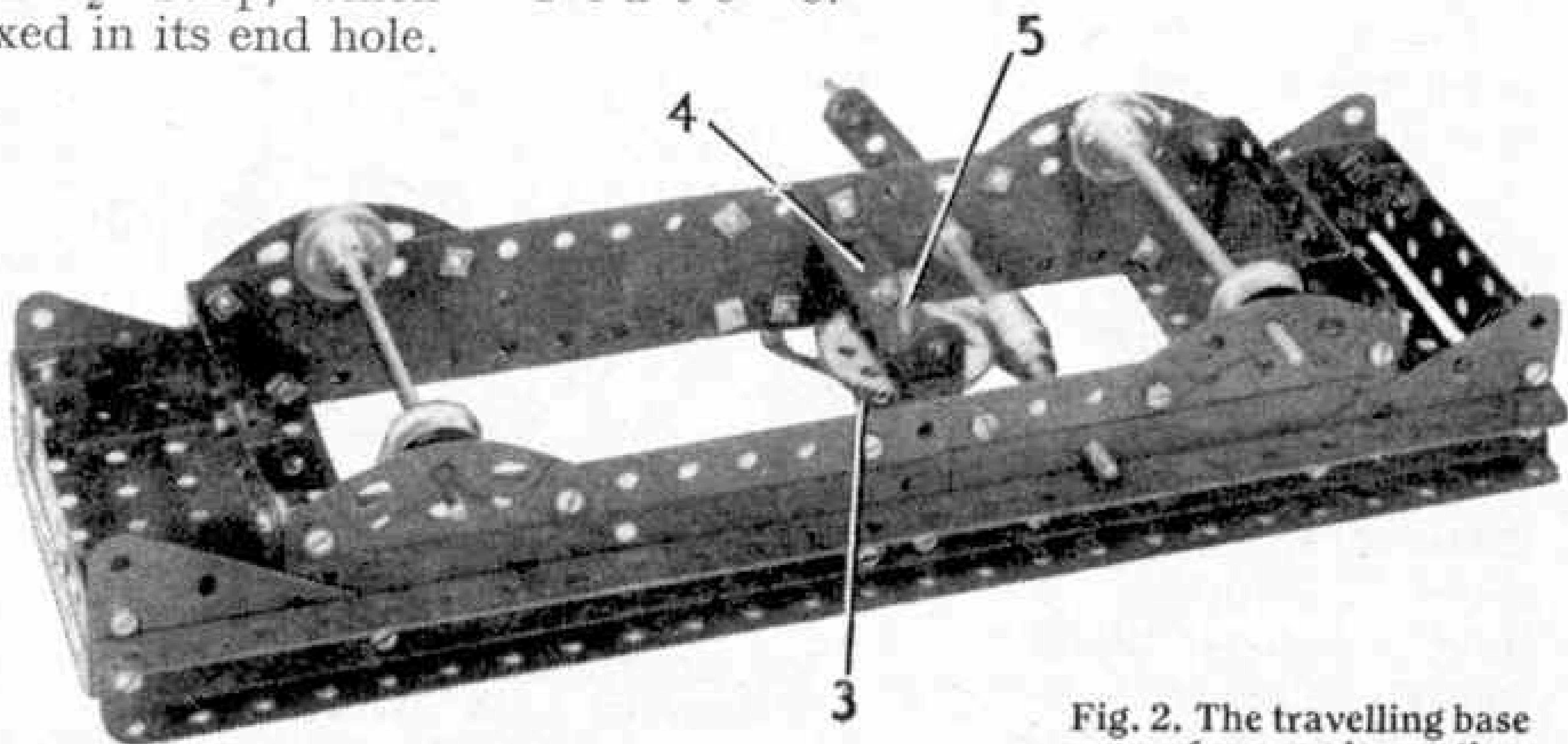


Fig. 2. The travelling base seen from underneath.

The Flanged Plate has a Bush Wheel bolted to it in which the 2" Rod 5 is fixed. Two 3½" Strips are bolted vertically to the Flanged Plate 7 with two holes projecting upwards, and a 5½"×1½" Flexible Plate is bolted in these holes and also to the Flanged Plate 7.

On one side a window is formed, and this is framed by 3½" and 2½" Strips 8, the lower part being filled in by 2½"×1½" Flexible Plates. The front of the cab consists of 2½"×1½" and two 2½"×2½" Flexible Plates, assembled to form a 3½"×3½" built-up plate. It is stiffened along its top and bottom ends by two 3½" Strips.

The other side of the cab is built up around a Flanged Plate 7, and a 5½"×2½" Flexible Plate. A door is formed by half of a Hinged Flat Plate. This assembly is framed at each end by two 2½" Strips overlapped and a 2½" Strip and 5½" Strip overlapped,

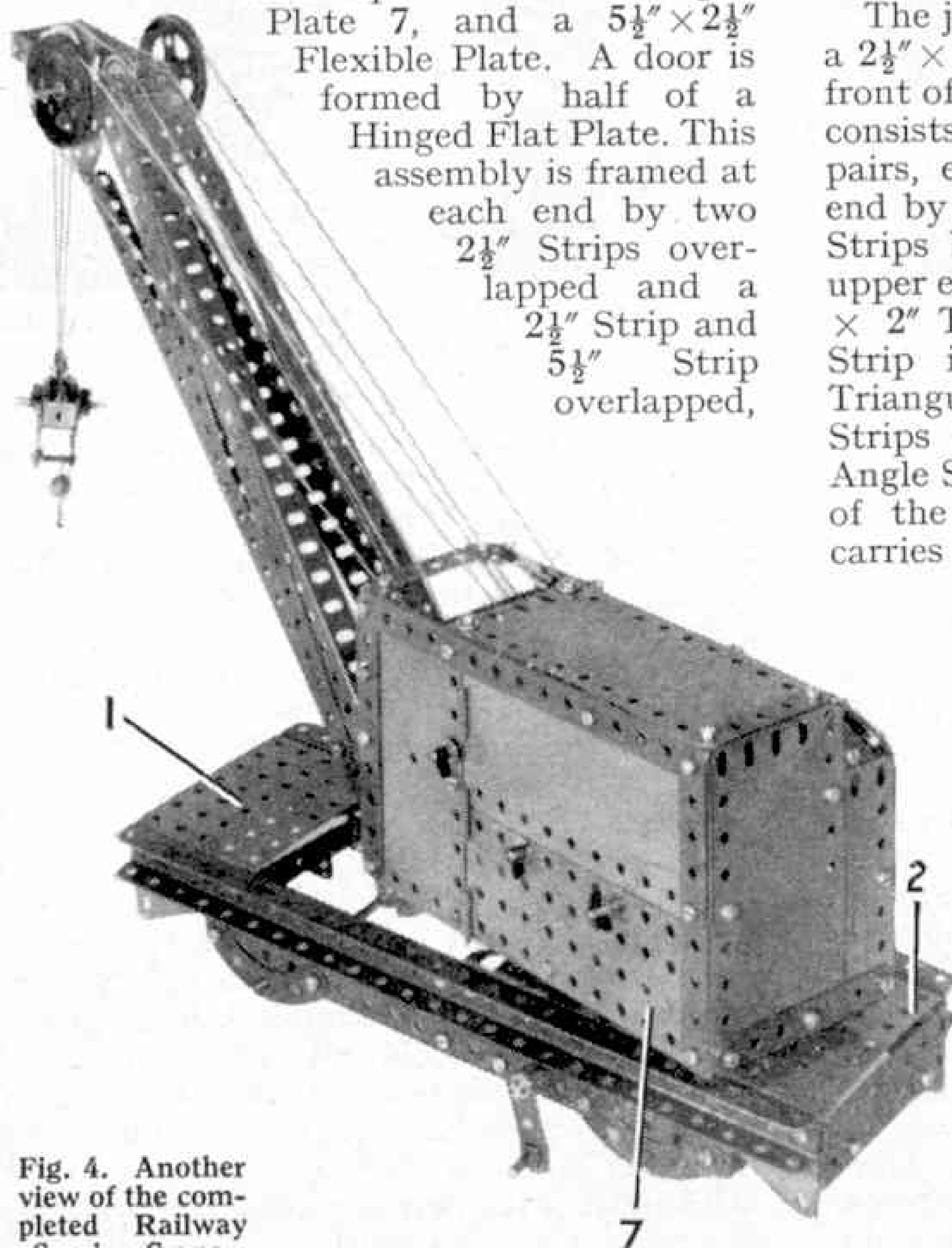


Fig. 4. Another view of the completed Railway Service Crane.

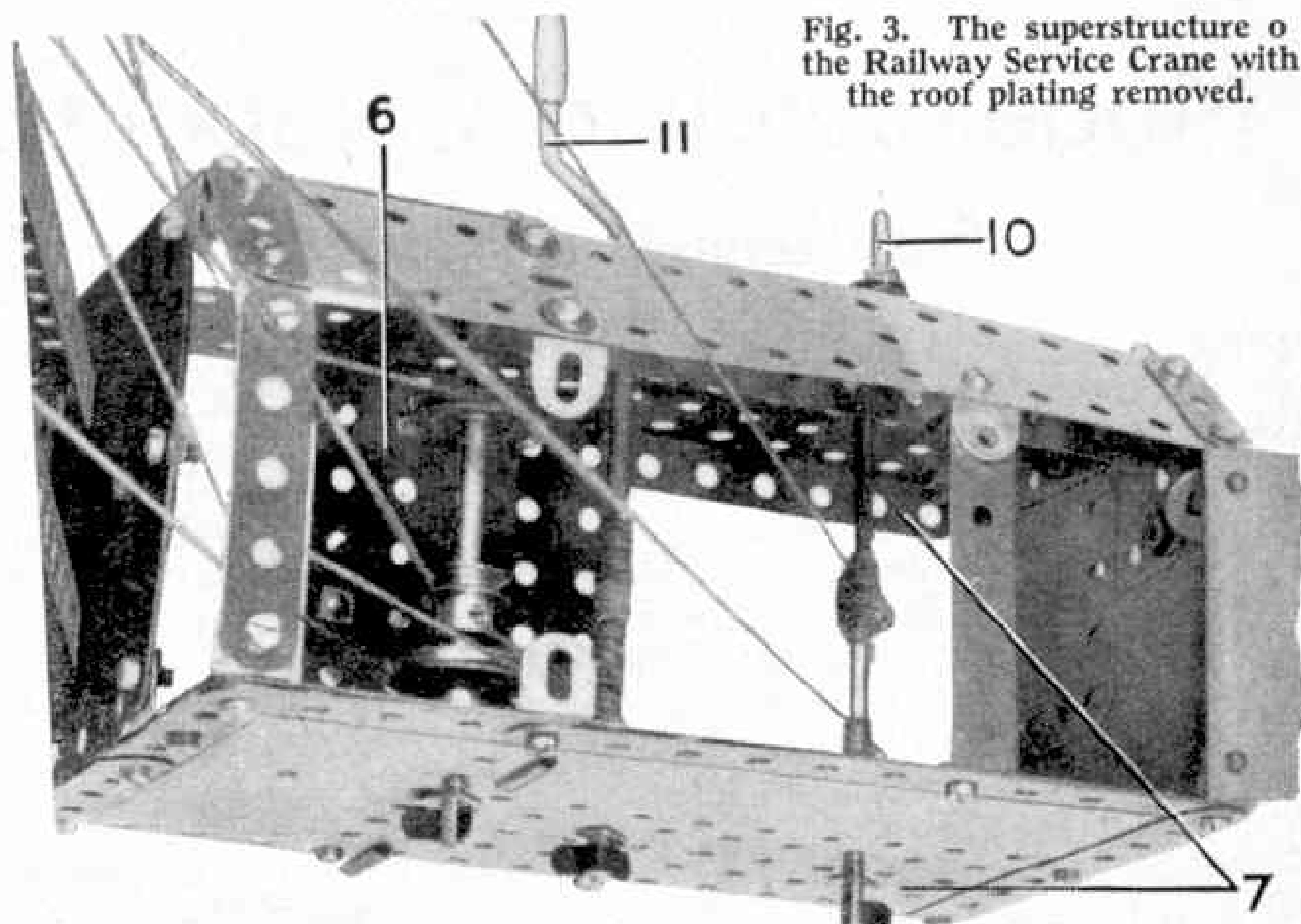


Fig. 3. The superstructure of the Railway Service Crane with the roof plating removed.

and a 2½" Strip and 5½" Strip overlapped along the top.

Details of the roof of the cab can be seen in the illustrations.

The rear of the cab is filled in with a 4½"×2½" and a 2½"×2½" Flexible Plate and a 2½"×1½" Flexible Plate.

The jib is pivoted on a 3½" Rod carried in a 2½"×1½" Double Angle Strip fixed to the front of the cab as shown in Fig. 1. The jib consists of four 12½" Angle Girders set in pairs, each pair being joined at its lower end by a 1½" Strip, and braced by two 5½" Strips bolted along their sides. Into the upper end holes of each pair of Girders a 2½"×2" Triangular Plate is bolted and a 3" Strip is bolted along the side of the Triangular Plate. The ends of these two 3" Strips are joined by a 1½"×½" Double Angle Strip. A 3½" Rod in the second holes of the Triangular Plates and 3" Strips carries two 2" Pulley Wheels, over which the Cord that raises and lowers the jib is passed. This Cord is first tied in the end hole of the upper Girder, passed around a 1" Pulley on the 4½" Rod 9 back over the 2" Pulley Wheel, and from there is passed back into the cab to be tied to the 4½" Rod 10 at the rear of the cab.

A 2" Rod in the next-to-end holes of the two 3" Strips carries a 1" Pulley, a ½" Pulley without boss, and another 1" Pulley, in that order. Over these Pulleys is passed Cord by which the load pulley block is raised and lowered.

(Continued on page 241)

Model-Building Competition Results

Prize-winners in the November Contest

THE full lists of awards in each of the Sections A and B of the November Model-Building Competition are as follows:

Section A. (Competitors under 14 years of age)

First Prize: Cheque for £4.0.0. D. H. Cowie, Tunbridge Wells; Second Prize: Cheque for £2.0.0. I. Taylor, Redcar; Third Prize: Cheque for £1.0.0. D. J. Hay, Bangor, N. Wales.

Ten Prizes each of 10/-. D. Kaushal, Nairobi; H. Jenkins, Newcastle upon Tyne; M. Kemp, Lower Hutt, New Zealand; I. C. Calderwood, Ilford; R. Brownhill, Harpenden; K. R. Underwood, Guildford; J. and W. Slosse, Antwerp; W. P. S. Bruges, Edinburgh; P. R. Teague, Sevenoaks; D. and K. Edwards, Walsall.

Ten Prizes each of 5/-. Yehuda van Crevald, Ramat-Gan, Israel; P. Greenwood, Morecambe; B. Taylor, Faringdon; Harjit Singh, Nairobi; E. Scharf, London; P. Herr, Johannesburg; K. D. Marolia, Bombay; R. A. Prestwood, Lugwardine, Hereford; R. Smith, Nether Heage, Derbys; M. J. Poore, N. Harrow.

Section B. (Competitors over 14 years of age)

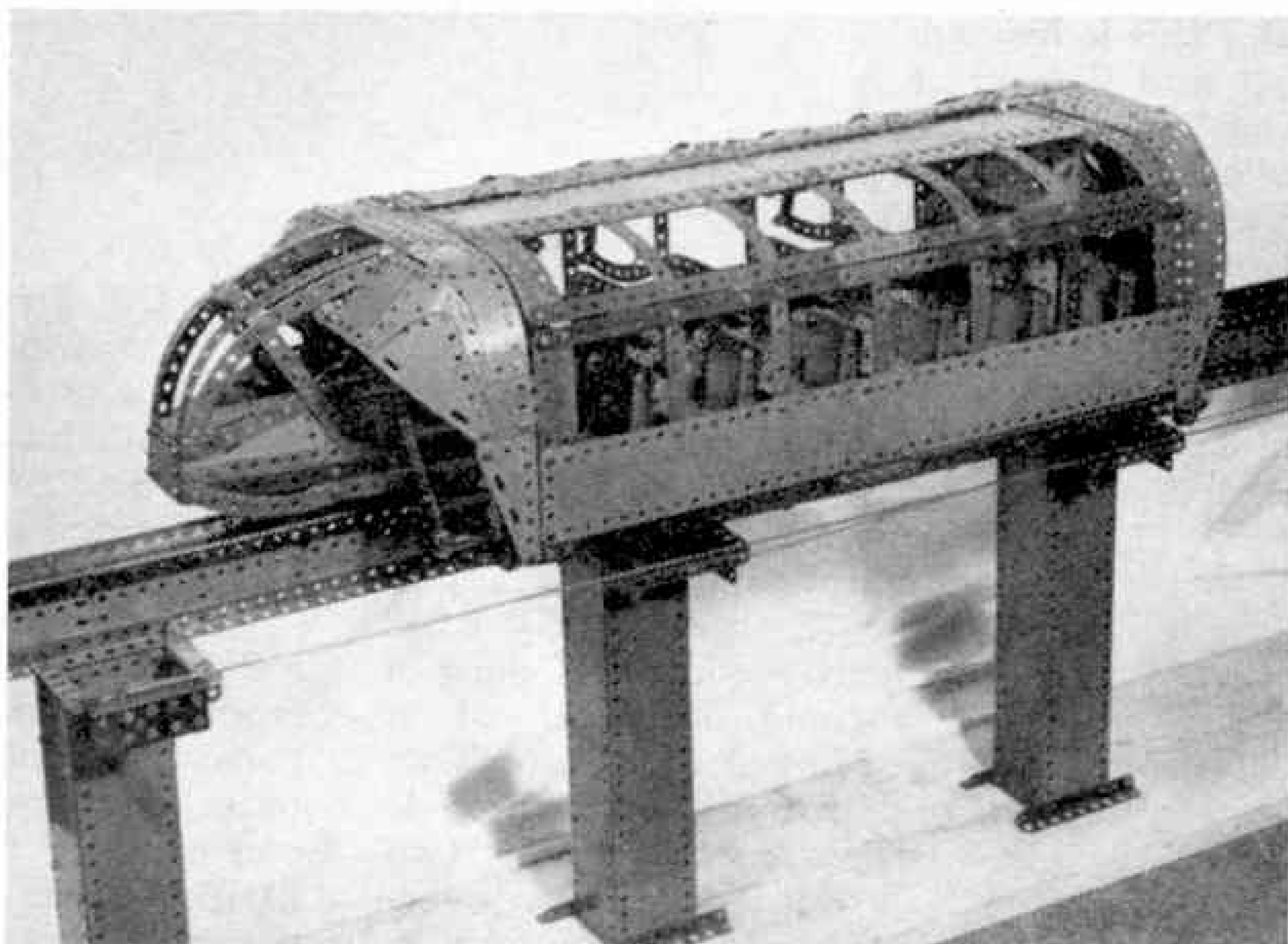
First Prize: Cheque for £4.0.0. W. Hirst, Timperley; Second Prize: Cheque for £2.0.0. H. W. Henry, Rochester; Third Prize: Cheque for £1.0.0. P. Edmonds, London.

Ten Prizes each of 10/-. J. Beckett, Auckland; E. Singh, Calcutta; R. R. Hall, Leeds; B. Fields, Norwich; H. Starck, Verviers, Belgium; M. Marcel, Nogent-en-Bassigny, France; J. Atland, Maroa, Malta, G.C.; B. Bickerdyke, Leeds; W. Hello, Rotterdam; S. Guiseppe, Piacenza.

Ten Prizes each of 5/-. P. P. Bakrania, Baroda; P. Collin, Newmarket; E. R. Rebecca, Aberdeen; J. Climo, Dunstable; H. Hyland, Brisbane; R. Hardwick, Christchurch, N.Z.; D. J. R. Jayawardena,

Ja-ela, Ceylon; F. Wiesner, Walmaransstad, S.A.; A. R. Gough, Hamilton, N.Z.; Kwa Chong Guan, Singapore.

The first prize in Section "B" of the "November Model-Building Competition" was awarded to Mr. W. Hirst of Timperley, Cheshire, for his excellent model of a Gear Hobber. The actual machine on which Mr.



This model Monorail system won Second Prize in the November Competition for H. W. Henry, Strood, Rochester.

Hirst based his model was one of earliest British designed and built completely automatic gear-cutting machines, and was specially designed with automation in view. Mr. Hirst's model is approximately $\frac{1}{8}$ th scale and, like the original, is completely automatic in operation. But while the original is largely hydraulically operated, the model is entirely mechanical, the various movements being provided through a gearbox with four output shafts, three of which can be reversed.

A monorail system built by Mr. H. W. Henry of Strood, Rochester, won second prize in Section "B". This model is illustrated on this page, and it is based on a monorail system suggested for Seattle, U.S.A., by the Lockheed Company. It is powered by two electric motors, one of which provides the traction power while the other operates the doors, which run the full length of the carriage and open upwards in a novel butterfly fashion.



Club and Branch News



WITH THE SECRETARY

More Photographs Please!

I should very much like to receive more Club and Branch photographs, and portraits of officials, for reproduction on this page. The appearance of such a photograph always gives great pleasure to members of the Club or Branch represented, and therefore Leaders and Chairman should keep my request firmly in mind.

It is not always possible to arrange for studio photographs. In most Clubs and Branches, however, there are members who are fairly expert in photography, and we have again reached the time of year when these enthusiasts should be encouraged to use their cameras by taking pictures of their fellow members either suitably posed for the occasion or engaged in any of the outdoor recreations indulged in during the summer Sessions.

Pictures obtained in this way will be of great interest to fellow members, and the best of the photographs should certainly be sent along for me to see. If they are suitable for reproduction in the *M.M.* I shall be delighted to use them in this way.

CLUB NOTES

ASHTREAD FREE CHURCH M.C.—An interesting discussion on the Model Engineer Exhibition was held at one meeting. Outstanding models in a model-building competition were a windmill, combine harvester, and a projector. An excellent layout was put down for a Hornby Gauge 0 evening. *Secretary:* D. J. D'Arcy, 39 Newtonwood Road, Ashtead, Surrey.

CONSETT Y.M.C.A. M.C.—A feature of the past winter Sessions has been the influx of new, young members, who have had to be trained right from the beginning in Meccano model-building, starting with small, simple models and graduating to the big working models featured at the Club's model-building displays. At the time of writing members are busy constructing models for the Y.M.C.A.'s annual Open Day. The three main models are an 0-6-0 crane tank locomotive,

a bulldozer with 12 in. blade, and a new model of a Joy type loading machine. *Secretary:* J. R. Goodrum, 7 Tees Grove, Leadgate, Consett, Co. Durham.

BORDEN GRAMMAR SCHOOL (SITTINGBOURNE) M.C.—Recent meetings have been devoted mainly to constructing scenery for the model railway layout. Another successful film show has been held; this time the film was *Powered Flight*. *Secretary:* B. L. Sedge, 19 Cavour Road, Sheerness, Kent.

NEW ZEALAND

CHRISTCHURCH M.C.—The Club display at the New Zealand Industrial Fair in February last was a great success, and was a fine start to this year's Club programme. The wide range of models on show included an electric sign advertising the Club, a 3 ft. high dockside crane, hydraulic lift, snow plough, model workshop, Ferris wheel, Meccanograph, robot, and paper-punching machine. There were so many fine models, in fact, that although the Club had been allotted more space than ever before it was a tight squeeze to accommodate all the models. *Secretary:* Mr. C. E. Saunders, 6 Walsall Street, Riccarton, Christchurch, S.W.1, New Zealand.

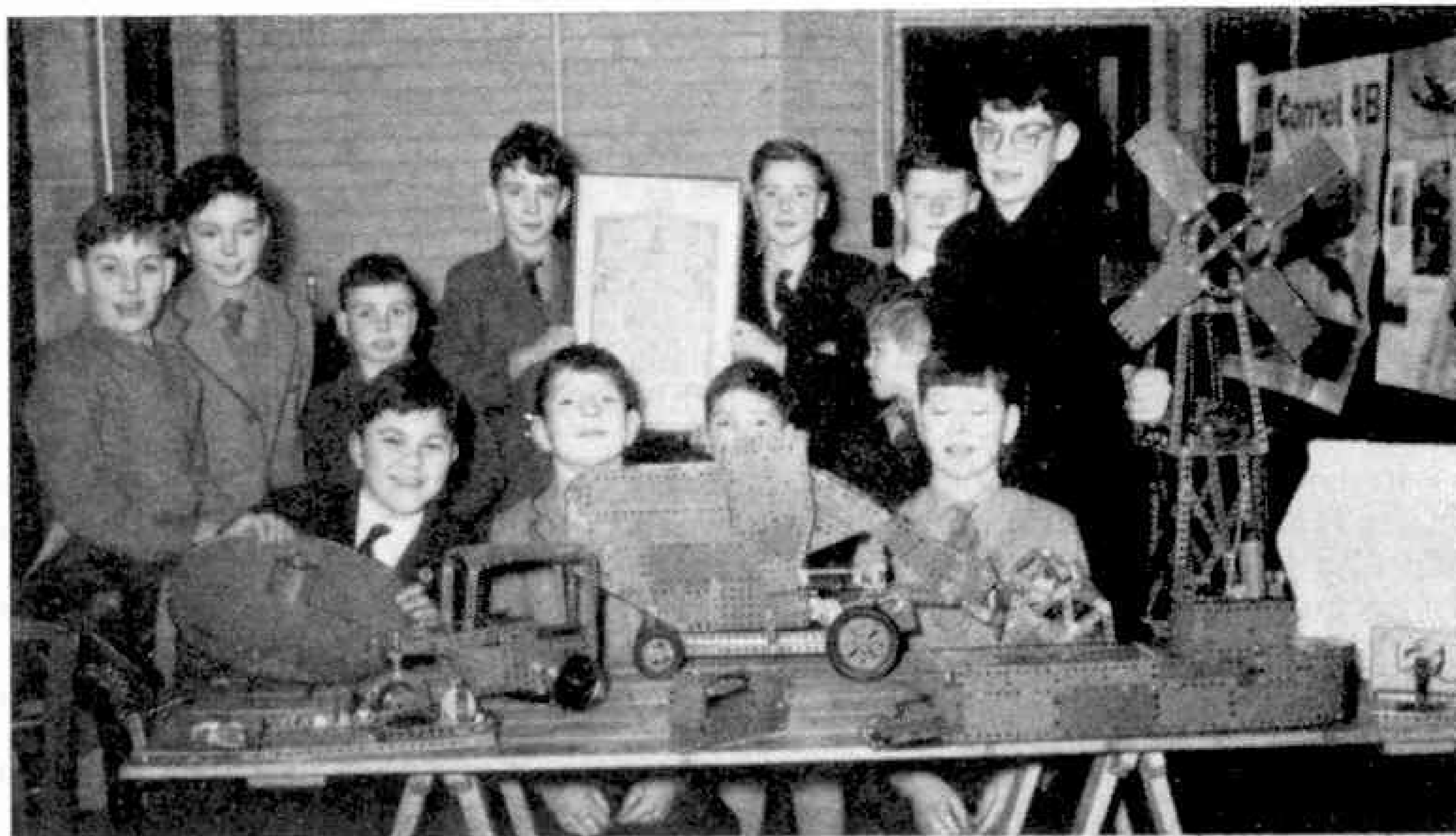
BRANCH NEWS

LUTON COUNTY SECONDARY TECHNICAL SCHOOL.—The Monday evening meetings for senior members have featured a series of talks on various aspects of model railway working, and the Monday lunch-time meetings for the junior section have been given over to track running and the construction of model railway scenery. The weekly subscription has been reduced to 3d., and more students are being encouraged to join the Branch. *Secretary:* R. J. A. Scott, 7 Victoria Road, Hitchin, Herts.

AUSTRALIA

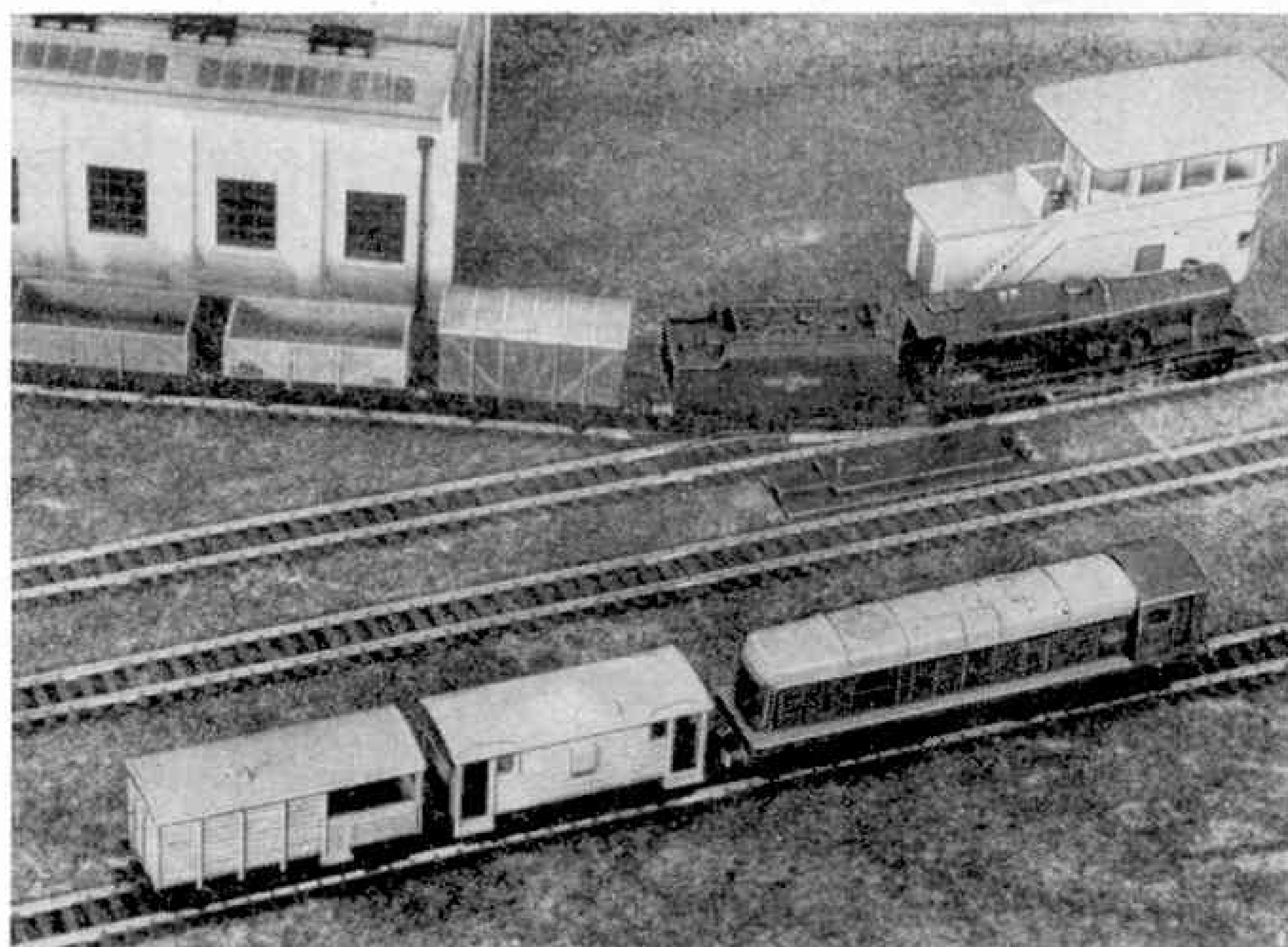
ST. ALBANS AND NORTH PORT RAILWAY (HABERFIELD).—The new baseboard is now in use. It has provided enough space for a new five-track running shed, new main running line and new through station. *Secretary:* Mrs. A. M. Skiller, 101 Chandos Street, Haberfield, N.S.W., Australia.

Members of the Ashtead Free Church M.C. with some of the models displayed on the occasion of a recent model-building competition. Outstanding models were the fine combine harvester, seen in the centre foreground, and an excellent likeness of the SRN-1 Hovercraft which moved along the table as it worked.



HORNBY RAILWAY COMPANY

By
the Secretary



Our Diesel, in Two-Rail

AT the moment there is only one type of diesel locomotive represented in the Hornby-Dublo range, this being the B.R. Standard 1,000 h.p. Type I double-bogie locomotive of English-Electric construction. The remarkably detailed Hornby-Dublo model is now well-known to most of you and it is the Two-Rail version, bearing the number D8017, to which I wish to devote attention in this chat. Incidentally, just how well detailed the model is can be judged by comparing it with the upper picture on the next page, where the real No. D8015 of the same class appears.

As with any Two-Rail locomotive, it is important to see that the rails and wheels are always maintained in a thoroughly clean condition, if really efficient working is to be obtained. This point is stressed in the instruction booklet that goes out with Hornby-Dublo locomotives, and I expect that most of you who have Two-Rail Diesels on your railways have found out the importance of this.

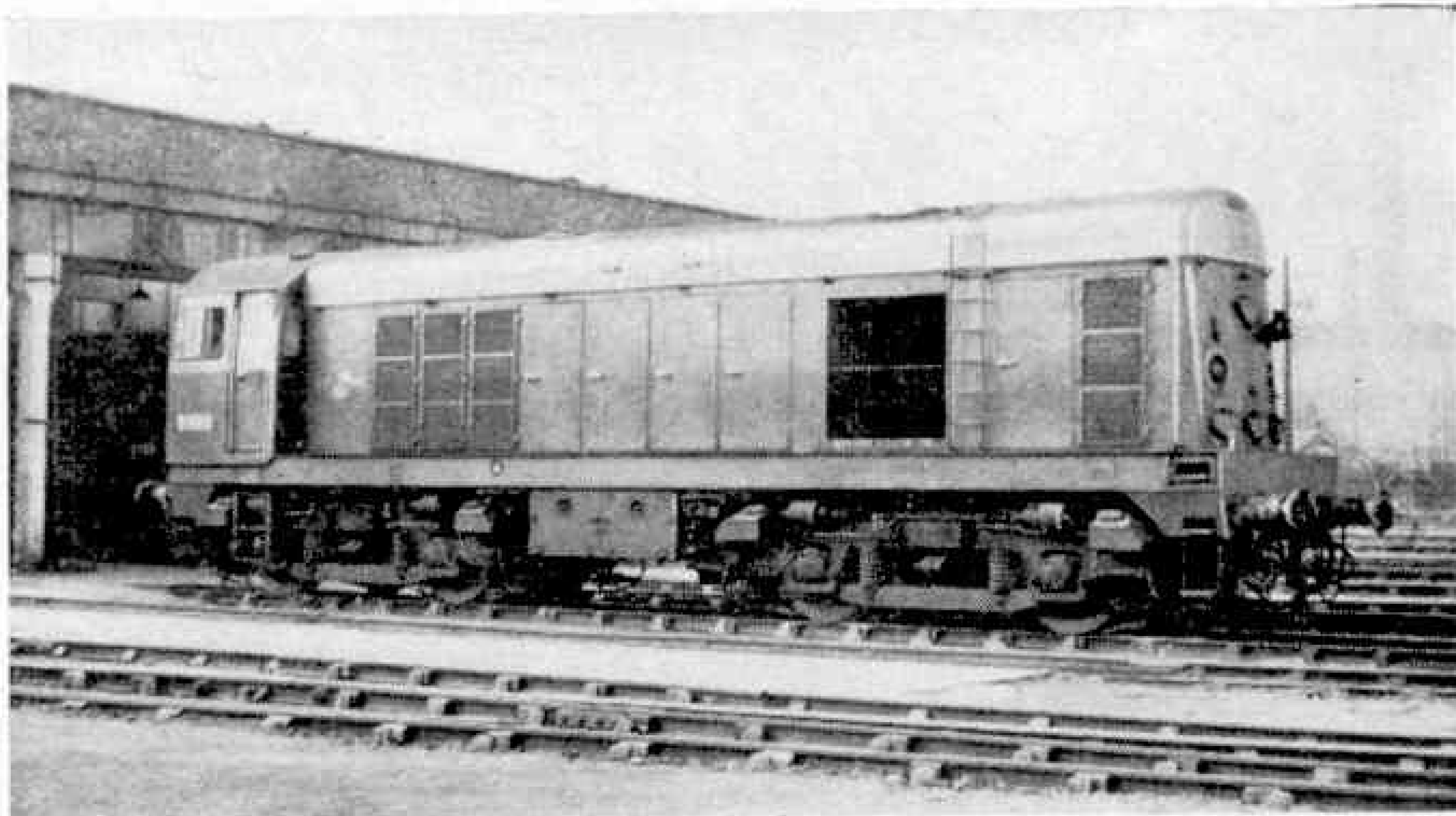
It is particularly necessary to see that no oil finds its way to the rubber tyres that are fitted to one pair of the driving wheels on

the motor bogie, that is, the one at the cab end. The tyres may stretch in service, and uneven running will result, if sufficient attention is not given to this point. Any irregularity in the running surface caused by tyres in this condition can affect the necessary contact between wheels and rails. Frequent lubrication is not a bad thing, but you must use the correct grade of oil and above all apply it *sparingly* to the oiling points. Your Diesel instruction booklet will show you where these are.

There must be many Two-Rail Diesels now on different miniature railways and they can be used for a fair variety of traffic. Usually the real engines do not appear on passenger trains, at least during the winter season, although it is possible to see them hauling passenger stock during the summer months, as you will have gathered from illustrations that have appeared previously in the *M.M.* from time to time. A duty with which the real diesels of the type represented are specially identified is the working of freight trains and a group of type I diesels allocated to Devons Road Motive Power Depot, London, where the

Above, the Hornby-Dublo Diesel propels two Goods Brake Vans along a loop line. In the background a 2-8-0 and train is leaving the siding alongside which is an engine shed, here used as a warehouse.

B.R. No. D.8015 at Devons Road Motive Power Depot. This is the type of engine represented by the Hornby-Dublo Diesel. Photograph by P. J. Sharp.



real No. D.8015 was photographed, specialises in this activity.

They are particularly concerned with what is known as transfer freight, that is traffic being moved from one region to another by means of the various interconnecting lines in the London area. As you can well imagine, a wide variety of traffic is dealt with in this manner. So that you can assemble trains for Diesel haulage quite easily from the fine selection of vehicles now included in the Hornby-Dublo range.

Not all the Type I diesels are employed in this way, of course. Some work freight trains of the more intermediate classes on main and branch lines and there is no reason why this sort of thing should not be done in miniature as well.

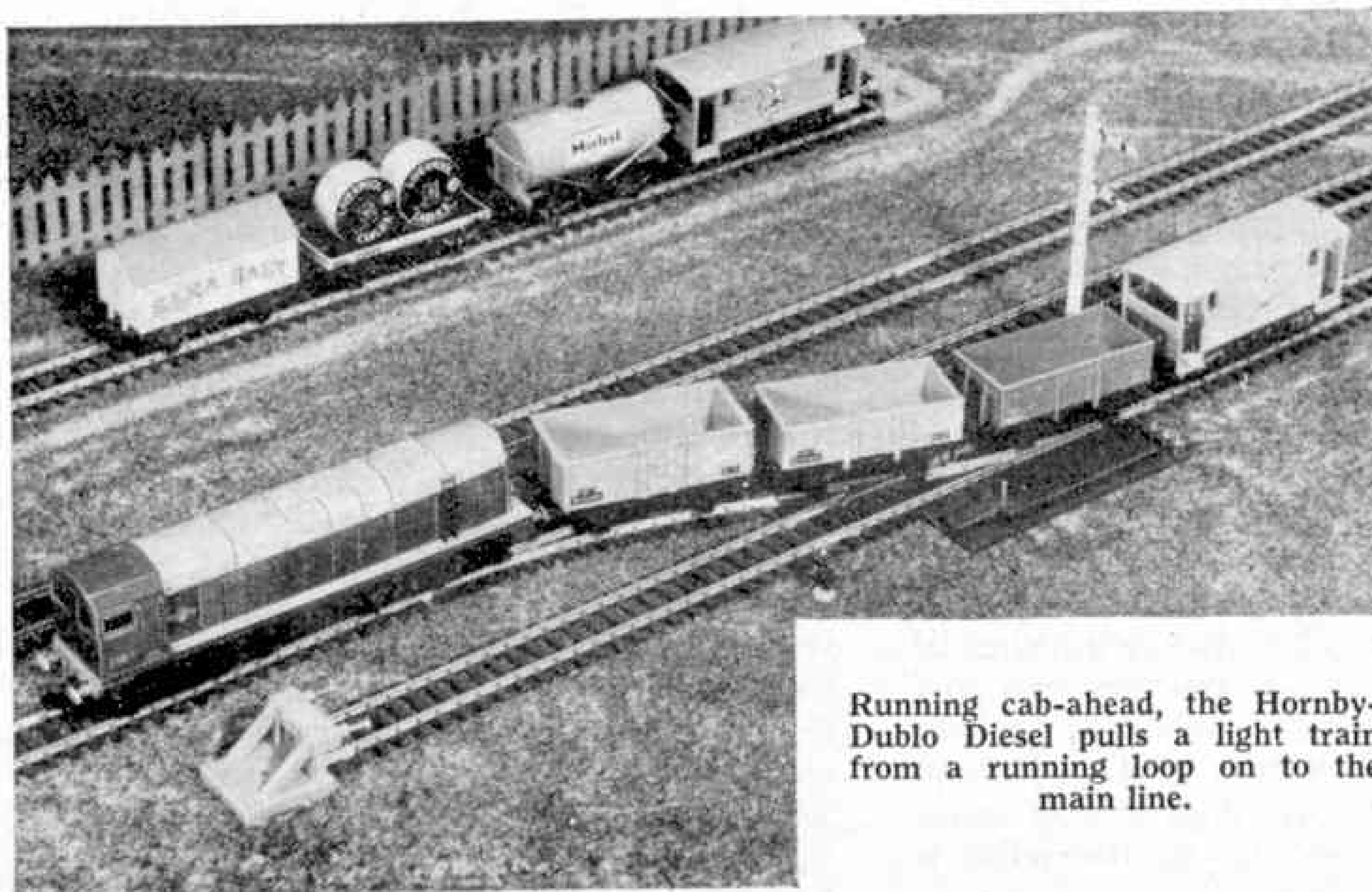
In fact, if you wish, you can quite reasonably operate a through fast freight service according to the requirements of your layout, with Diesel haulage. This may, for traffic purposes, have to be made up of vehicles all of one type, such as a series of Low-Sided Wagons carrying either type of Containers familiar in the Hornby-Dublo system. For a train of this nature, no doubt

supposed to be fully-braked throughout, you would require the B.R. Standard Goods Brake Van to bring up the rear.

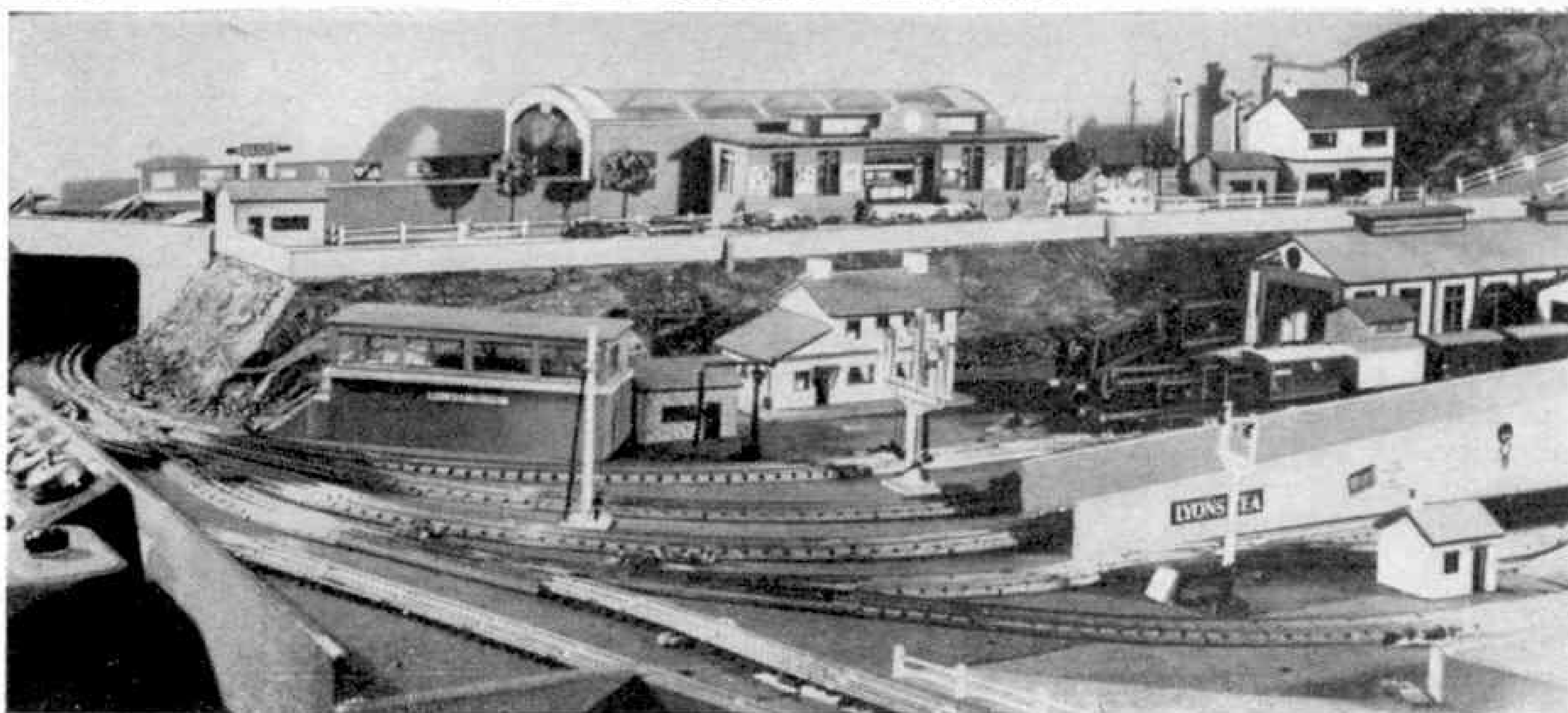
Reference to transfer freight earlier reminds me of a rather special type of traffic, not between regions of British Railways, but operated between this country and the Continent, via train ferry. A type of vehicle familiar on such services is now included in Hornby-Dublo in the shape of Traffic Services Ltd. Tank Wagon recently introduced. This is the first vehicle of international character to be represented in Hornby-Dublo and its long wheelbase and other characteristics make it specially attractive. As such wagons have to comply with special regulations affecting vehicles that operate internationally, the real ones are very fully equipped and carry a number of special markings indicating that various requirements have been fulfilled. In addition to Continental conditions, the

wagons have to comply with requirements for operation in this country.

The finish of this new Tank Wagon is striking, the tank being aluminium, with various markings in black. Apart from these there is at one end of the Wagon a short platform, with dummy brake wheel.



Running cab-ahead, the Hornby-Dublo Diesel pulls a light train from a running loop on to the main line.



A high-level station appropriately named "Hillside" on the Hornby-Dublo layout of W. Moyle. The junction in the foreground is a busy one, with the control panel conveniently sited alongside.

How a Railway Grew

By "Layout Man"

THE Hornby-Dublo layout shown above, and in the upper illustration on the next page, is a good example of a system that has grown section by section in definite stages rather than in a piecemeal fashion. This railway has been built up by Mr. W. Moyle, of Southport, and his son. Of course there have been odd developments on the original baseboard, but extensions of the original system have chiefly involved the provision of extra sections of baseboard to carry the track and so on.

The line made a good start some years ago, as the original base was of fairly generous proportions, 8 ft. by 4 ft. So to the single track originally laid on this base there was quickly added an outer circuit, making a double track formation, with independent power supply and control arrangements to each track. This baseboard did not have specially prepared supports, but rested partly on an old table, and partly on a chest, the drawers in which have proved most useful for the storage of tools and various materials used in the construction and subsequent maintenance of the railway.

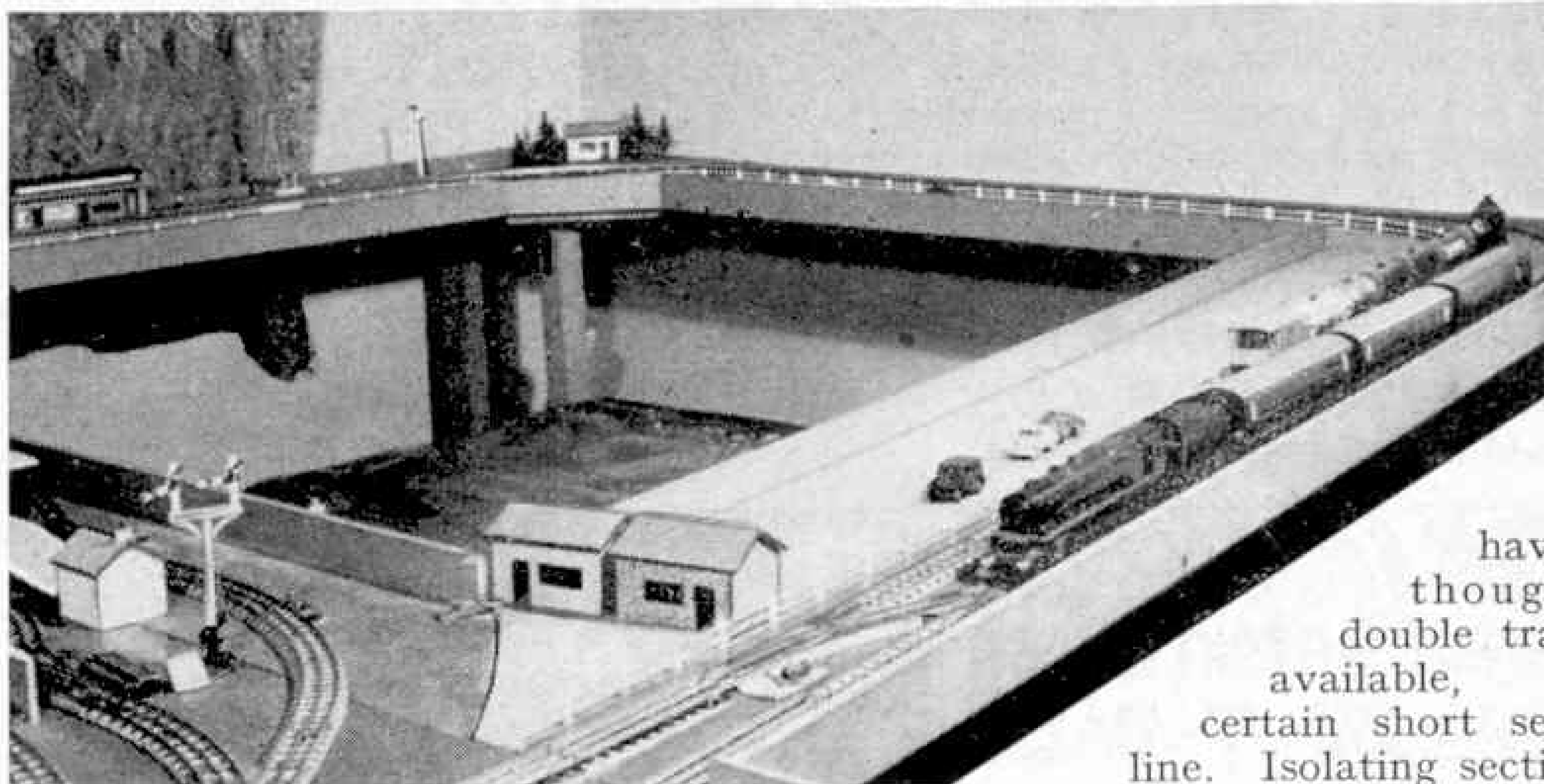
Further developments include the provision of an incline section, the beginning of which you can see between the two low walls on the right-hand side of the picture above. The incline takes a single track upwards and across one end of the main track so that it ultimately reaches what is

known as *Hillside (High Level)*. This is the station of which you can see the curved glazed roof, and there are also further buildings on this high-level section. The main line is carried underneath in a sort of covered way, one end of which is clearly seen in the picture on this page.

The success that attended the running of the system up to this point suggested the forming of a further section. This involved the first extension of the baseboard, at right angles to the length of the main board. On this a two-road engine shed was built, the tracks themselves being divided into separate sections to allow several engines to stand there.

Later developments still have caused the rearrangement of this particular part, the main line having been extended past the original engine shed site, and then turning to run straight into a station known as *Wallsend*. This was indeed a suitable title as it did then mark the end of the line, and it was, moreover, situated right by the wall.

Although the railway had by now reached a reasonably complete state, with lineside buildings and a certain amount of scenic effects, the urge for extension was still strong. So in order to avoid the dead-end formerly presented by the layout at *Wallsend*, a further section of baseboard was arranged. This was the obviously new length in the upper picture on the next page, converting the former branch into a further



A *Duchess* approaches the junction with its train along a section added to the original layout, as is clear from the lighter shade of the newer woodwork.

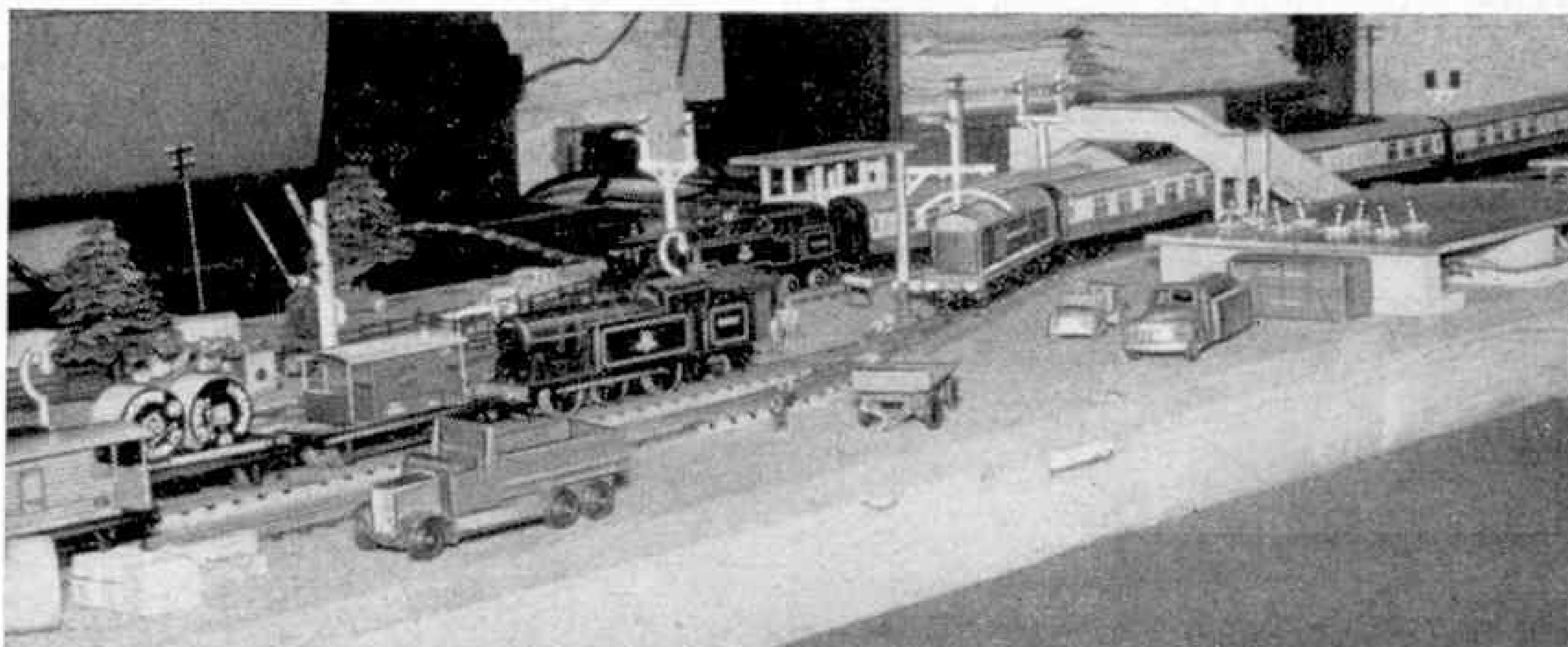
continuous main line.

During the period in which this work was going on, attention was given to the line-side generally. Some of the results will be obvious from the illustrations and we have already noted *Hillside* station, which has outside it a roadway forming the station approach built up from the baseboard section on an embankment. The latter was developed further to form a hill in one corner of the room. The method used may be of interest to those who wish to carry out similar earthworks. Over the rough shape of the hill or bank, formed from odd pieces of wood, wire netting was laid and secured, this then being covered with stiff brown paper. A coat of strong size was next given and then followed painting variously with green, grey and brown. Apart from natural effects of this kind, special attention has been given to the actual buildings, some of which are fitted with electric lighting.

Arrangements for dealing with traffic

have been well thought out and double track running is available, except for certain short sections on the line. Isolating sections have been provided on a generous scale, so that several locomotives can be on the track here and there without interfering with those actually running. These and the number of Electrically-Operated Points, which are of remarkable convenience on a layout such as this, mean that the control panel or bench is fairly extensive, as it has to accommodate several groups of D1 and D2 Switches required for the various purposes.

By way of contrast in its general scheme there appears below part of a layout that has already been described in these pages, that of the Wilman family, of Hereford, that was referred to in some detail in October 1959. This railway consists of a terminal station and its approaches only, principal interest being concentrated in the working of trains in and out, the engine movements, and the marshalling and disposal of rolling stock. This railway could, in fact, form a section of a larger scheme, should it become necessary or desirable for this to take place.



The other end of a layout you have seen before in these pages, in October 1959. This is the portable Hornby-Dublo railway of Roger Wilman, of Hereford, and his sisters.

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Stamp Collectors' Corner

By F. E. Metcalfe

Old Stamps—New Prices

It is sometimes very difficult to get a non-collector to believe that age in a stamp has little or nothing to do with its value. Its worth is mostly a case of scarcity, which is bound up with the philatelic popularity of the country concerned plus the condition of the stamp or stamps.



In saying that age does not matter, I do not mean to imply that, as time goes on, a good stamp does not improve in value, but a common stamp goes up very little. There are odd exceptions, of course, as there always are, and the first stamp, the ubiquitous "Penny Black" is among those which are exceptions to the rule. The demand for this stamp is so large, and so much work has been put into it, by specialists who go in for all the eleven plates with which the stamp was printed, that in spite of the fact that there are hundreds of thousands of copies in existence, not only do fine copies make handsome prices, but even the experts are deceived by the constantly rising values.

A good example of this occurred recently at an auction held in Bond Street by a world-famous firm of stamp auctioneers. Some time ago, a large block of Penny Blacks (43 copies in all) were discovered in a box—the biggest block found in recent times. Nevertheless, it should not be overlooked that thousands of mint copies exist, and none could be more expert in assessing values than the people concerned in the sale. After the most careful consideration, they calculated that the stamps would bring around £2,000.

This is a nice return for stamps which, when bought in the first place, cost less than four shillings. Anyhow, all was set for

the sale, which the television people considered to be worthy of their attention. Then the sale took place, and the £2,000 item actually sold for £4,300, or a £100 a copy. That is one side of the picture but, alas, it is generally the other side the public encounter when they have any old stamps to sell. In a newspaper recently a reader revealed that all she had been offered for an old collection was 10/-.

A big factor nowadays is the condition of a stamp for, even if it is scarce, unless it meets with the approval of a collector it will not bring a tithe of what it would sell for if it were considered satisfactory. And here I must mention yet another snag. There are some clever fellows about who can repair stamps and clean them up. Some of these treated items are very difficult to detect, for it is amazing how a piece of paper can be added to a torn copy, and part of the design painted in.



Fortunately, as the fakers grow more skilful in their art, so do collectors in detecting the fakes. For instance, I possess, for my own amusement, a quartz lamp. When a stamp is put under its light, it can generally be seen whether new paper, etc., has been added. These lamps are a veritable godsend, and I remember with amusement how, some years ago, I asked a dealer, since dead, for approval books of early Argentine and Uruguayan stamps. Yes, he had plenty, he said; then he started, with all the skill in the world, to

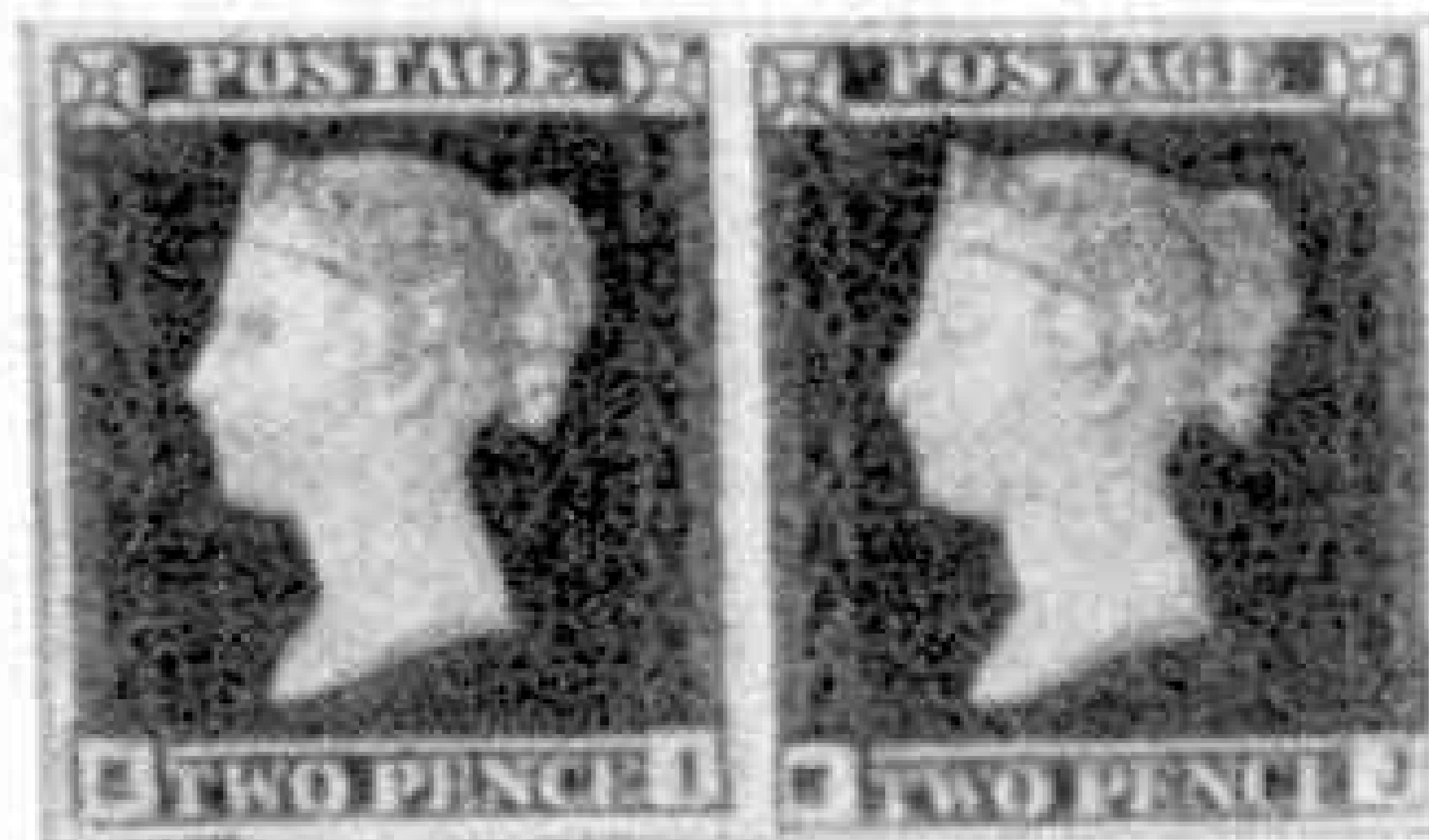
find out whether I had a quartz lamp. I knew exactly what he was getting at, and replied that I had no lamp. As he was pulling out some books for me I dashed his hopes (and mine of getting any stamps that time) by laconically remarking that a friend of mine had a

quartz lamp and that he shared the use of it with me.

Don't think it's all faking. This is not the case by any means, but I felt I must warn you about one serious pitfall which can face the inexperienced collector.

There is no doubt about it that many people who are attracted to stamps show a marked preference for those of the last century, and there is not the slightest reason why they

(Continued on page 265)



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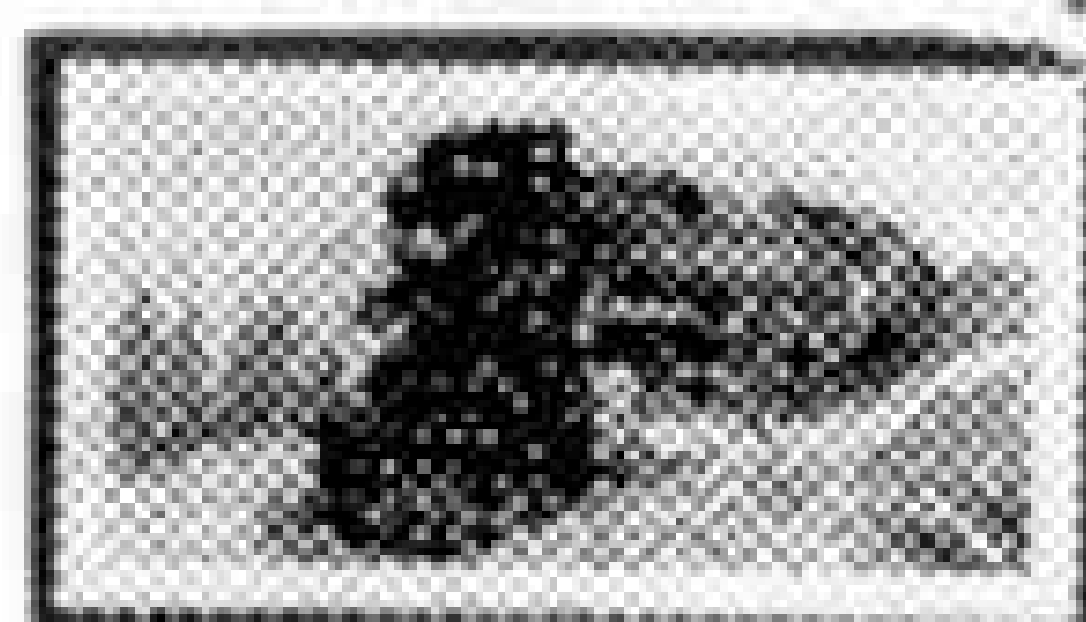
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Stamp Gossip

CORONATION STAMP

We can begin this month with a nice little stamp issued on 10th February to commemorate the coronation of the Sultan of Johore. As a mint copy it will not cost above sixpence, and a used one about the same, so all who want this interesting item will not be barred on the score of cost from getting it. There are lots of new stamps of course, but I am mentioning this particular issue to draw attention to the stamps of Johore itself, for the present definitive set, which bears the portrait of the former sultan, will soon be changed also, so now is the time to buy that set as well. It will be cheaper used, for one in that state, even up to the \$5 value, will only cost a few shillings.



There is a rather interesting story told about this set. As all know the ten Malayan states, of which Johore was one

(but not Singapore, although this territory will no doubt join in later), federated in 1957, and it was decided that all should have the same designs for their stamps, the only difference being that the names of the various territories would be shown, as well as portraits of the particular ruler of the state concerned. The exception so far as the portrait was concerned was Negri Sembilan, for as this is a Moslem state, portraits are barred. All had been arranged when the then ruling Sultan of Johore changed his mind, and what do you think was the reason he gave? Well, one of the designs featured a tiger breaking cover, and while it was not denied there were tigers in Johore, the sultan's objection to the 10c. stamp (one belonging to another state is being illustrated) was that it would give a wrong impression of Malaya. So he contracted out, and the set showing only his portrait is still current, but as mentioned is due for a change.

There are a lot of interesting points about Malayan stamps, and as quite a nice collection can be got together for very little money, I will return to these stamps sometime later. Meanwhile, don't forget to see what you can do about a cheap set of the present Johore issue.



CENTENARY ISSUE

When we visit some of the wilder parts of the country and see the hundreds of acres planted by the Forestry Commission, not

all of us like what we see, although a walk through one of the older plantations which has had time to mature somewhat is an interesting experience. But the point I want to make is that while, so far as Britain is concerned, the idea of state planting is comparatively new, in Sweden, for instance, more than a century has elapsed since the formation of their Crown Lands and Forests Administration, and since the timber that these forests yield is of such great economic importance, it is only natural that Sweden should say it with stamps. The result has been two stamps issued to mark this centenary. Both are of the same design as that illustrated, which, I think you will agree, is quite a little gem, simple, yet striking. How I wish some of our commemorative issues were as apt.

THOSE NEW FRANCS

Stamps are nothing if they are not instructive, always assuming, of course, that you take care to study the designs and are not just content to stick them in a book, without thought or care. We all know that at the beginning of the year France knocked the noughts off her currency, and those of us who go to France occasionally, as so many of us do, will get quite a shock this summer, when we are asked a mere franc or two for something which cost us many hundreds previously. But the real shock



(Continued on page 265)

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Stamp Collectors' Corner—(Continued from page 261)

should not go in for them, even if the cash they can afford is limited. But they will soon and that they will have to cast a very wide net if they are to get many stamps together. By that I mean that they will have to collect the stamps of many countries, and be content with incomplete sets, etc., for it is a fact that most of the older issues contain one or more stamps which are not cheap to buy.

And this is another very important point: do please remember what you paid for your stamps and the fun they provided, which will have to be considered as your dividend, and don't expect the world for them if you ever decide ever to sell. Unless you have a slice of luck and pick up by accident a good stamp or two (a dealer, like anyone else, sometimes nods) you are hardly likely to get back all the money you have spent.

I have already mentioned how important condition is in stamps, not just old, but new as well. I remember some time ago discussing with a provincial dealer a collection which was in an old Lincoln album. I was there when he was making the purchase, and saw him pay out, I think it was, £6. When the seller, a woman, had left the shop, looking very glum, the buyer remarked that she did not look very pleased. As I had merely stood apart, and had only seen the pages turned over from a distance, I answered that I did not wonder at it for there seemed to be a lot of nice old stamps in the collection. The reply came pat, "All right; I'll sell you the collection for £8." Not being in a buying mood, I turned the offer down, but was given the album to examine and this is where I must issue the warning which is my reason for relating the incident.



The dealer had given at least £1 more than I would have done. In fact, the woman had struck quite a bargain, which is good going when you take into consideration that she knew little or nothing about stamp values and the dealer knew plenty. But just as I would have thought twice about buying that little lot for a fiver, had the rarest stamps been in fine condition (as some of them will, perhaps, look one day, if they get into the faker's hands) I would have been happy to have bought for ten times that amount, and what a nice profit I would have been in for.

So, the moral to be drawn from that little tale is that it is not age, but Condition (with a capital C) which is all important. It is becoming more so every day. And to sum up, even if your stamps left by Grandpa are as old as the hills, don't think that because a dealer offers you ten bob for the lot he is *ipso facto* a double-dyed villain.

You may have some good stamps in that old collection although the odds are

against it, and, in any event, if you feel that you really have something worthwhile then go to a well-established dealer and pay a few shillings for a proper valuation, stipulating that you don't want to sell just at that moment.

And if you do land something nice, well, those old stamps in your collection will bring new prices, which are sometimes very nice even if some, alas, are anything but nice.

Stamp Gossip—(Continued from page 263)

will come when we see what few francs we get for our good pounds, as we come to change them. However, collectors of French stamps will be well forewarned, for they will have noted the changes already on those bits of paper we treasure so much.

Just look at the two stamps illustrated. The design is the same, but the one to the left shows 25f and the one to the right a mere 25 centimes; the old and the new, but both have actually the same value. I must say that I think it is not only foreigners who have been confused by the change.

NOT JUST STAMPS

Those who know nothing about our hobby often imagine that it is just a case of spending good money on bits of paper with attractive (or otherwise) designs—money which could be put to more interesting uses. Well, I suppose that is all there is in stamp collecting for some people, but there are many who take a much wider view of



the possibilities of philately, and even the Post Offices which issue the stamps are given consideration.

I was discussing this point recently with a young collector, and he surprised me with his knowledge of the huge strides the British Post Office is making to maintain its position in the forefront of the world's post offices as far as efficiency is concerned. He told me what is happening in his home town of Leeds; how push-button machines have been installed for sorting parcels. This, with other gadgets, makes Leeds Sorting Office the most highly mechanised in Europe.

Very shortly, the same Post Office, as well as those at Liverpool and Southwark, will have machines installed (I mentioned them recently) for facing letters electronically. Stamps with black lines running down the backs, which assist the operation, will be put on sale in the cities mentioned. Yes, the British Post Office is an exciting place just now, not only for those who are mechanically minded, but for all stamp collectors, who take a wide and intelligent view of their hobby.

TIP OF THE MONTH

As I remarked some little time ago, the modern stamps of India are growing in popularity. This is due to the fact that, not only are the stamps issued since India obtained her independence greatly improved in design, but also because the Indian Post Office is acting very fairly to collectors. Apart from the fact that these stamps are attractive, there are always plenty to go round, and their low face value—I refer, of course, to the special issues—enables anyone to afford them.

This increase in popularity is having the effect of making the earlier specials more difficult to obtain, and naturally prices are going up slowly, but surely. Now there is one set which I fancy will get much more expensive to buy, as time goes on, and to those interested in Indian stamps—and I know they are many—I would say buy the Postal Centenary Issue of 1954 used as soon as you can come

across nice copies, and a mint set where the price does not exceed, say, around four shillings.

The Indian Uprising issue of 1957 is also worth picking up at the present price, for the 90rp value is becoming quite difficult to find. But it is the Postal Centenary issue which I like better. One word more—don't buy any of these stamps just to make money, for that is not stamp collecting at all; it is stamp speculation. It is one thing to try to save money on stamps for collections; it is another to try to buy stamps for profit. The latter spoils the fun.

Scenic Grandeur on Scottish Railways—*—(Continued from page 220)*

During an interesting morning spell I watched departures for Nairn and Forres; for the farthest-north, with buffet-car, to Helmsdale and that to Kyle with an ex-H.R. mail sorting carriage in front, built at Inverness in 1916. The 12-wheeled restaurant car in rear would be left behind, on the way, at Achnasheen and attached, by the train engine of the corresponding up service, for a return luncheon working to Inverness, the trains crossing at Achnasheen—a rather unique far-north working.

The Royal Highlander, from Inverness at 5.40 p.m., conveyed four "sleepers" and four coaches through to London (Euston) 568 miles away, with a dining car and open second in front as far as Perth. At Aviemore, close to the mighty Cairngorm mountains stretching away to the east, we attached four more "sleepers" and through carriages from the older Nairn-Forres line. Thus the two class 5 4-6-0s, Nos. 45476 and 44785, had 517 tons tare, about 530 in all, behind them, many of the cars being very heavy to haul up the long climb steepening to 1 in 80, and they held a minimum of 30 m.p.h. to get over Drumochter, the 1,484 ft. high pass through a saddle in the Grampians. This is the highest British main line or standard gauge summit, and we passed it as the sweet course was being served at dinner.

Previously, with the 10 on we had climbed from the Moray Firth through more pastoral country, at about the same minimum speed of 1 in 60 to Slochd summit (1,315 feet), a pass through moorland heights. Highlights of scenery on this justly famous main route, which has a good deal of single track, included the lovely narrow, wooded pass of Killiecrankie and the beauty of the Tay Valley on the descent to Perth, which was reached before time in late evening daylight.

The stout 4-6-0s and the dining section went off, and a van was attached by 4-6-2, No. 46241, *City of Edinburgh*, facing a 291-mile run to Crewe over Beattock and Shap summits with some delays and stops. And so I settled down in my sleeping berth, having been privileged to enjoy some 350 miles of our finest scenery in extreme comfort as part of a memorable route from the south which covered 1,300 miles in all.

Space Notes—(Continued from page 227)

instruments on the Moon.

Liquid hydrogen has about three times the energy content of the more conventional fuels and, when burned with liquid oxygen, produces about 40 per cent. more thrust. Liquid hydrogen is colourless and odourless and is extremely light—only 1/14th as dense as water. It boils at -253°C . and consequently has to be stored in well-insulated vessels. At this temperature all other substances except helium and hydrogen itself are solid.

An ingenious feature of this engine is the manner in which the propellents are fed to the combustion chamber. The liquid hydrogen is pumped round the outside of the chamber to cool it where it evaporates. It is then used to drive a turbine, which is coupled to the pumps, and is finally passed, as a gas, into the combustion chamber where it burns with the liquid oxygen. Of course, to get the rocket started the pumps have to be run up by a separate power source.

As this engine is intended for use above the atmosphere, provision has been made for starting and running it under vacuum conditions. The engine on the test bed fires into a sealed tube which is continuously evacuated by means of large vacuum pumps.

ELECTRONIC COMPONENTS

A great deal of the success of satellite experiments must be attributed to the instruments and telemetry equipment. For years electronic components have been getting smaller and more reliable. The development of the transistor has also allowed equipment to be built which uses only a fraction of the power of the equivalent valve circuit.

We are now on the threshold of a further revolutionary development which will reduce electronic equipment weights and sizes by a very large factor. By taking what is effectively a transistor and depositing

metal on it, and etching part of it away, complete circuits can be built up comprising transistors, resistors and capacitors. The top photograph on page 227 shows a complete circuit consisting of two transistors, two capacitors and eight resistors. This represents a component density of 30,000,000 parts per cubic foot: in other words, if household TV sets were condensed to this extent you could get over 50 of them into a match-box!

Practice Count-down on a Missile Site*—(Continued from page 229)*

of 60 missiles and 4,000 men, of whom a large proportion are highly-trained N.C.O.s.

A Brighter Side

These men know that, at best, they are likely to take part in only one or two practice firings, in America, while they are with the squadrons. Their life might, therefore, seem boring and frustrating; but they also know that if even one Thor is ever fired from England, the weapons will have failed in their job as a deterrent. So they take a pride in ensuring that every missile is always ready for action within 15 minutes of an order to fire.

When I drove back across the Fens that same evening and remembered that the missiles alone cost the U.S. Government about £68,000,000, it seemed an awful waste of money. But there is no alternative until men everywhere learn to live peacefully together.

There is a brighter side to the picture, for these same Thors have been used to put satellites into orbit around the earth, bringing nearer the day when man himself will be able to venture out into space. When that time comes, the nations of the world may have to work together to provide the engineering skill and money that will be needed to explore even a minute corner of the boundless universe around us.

Ideas and Suggestions for Meccano Experimenters*—(Continued from page 251)*

each other being spaced from the Gear by two Washers, the other two by three Washers.

In the outer ends of the four slots Small Fork Pieces 3 are secured by Pivot Bolts. Each Fork Piece carries a Handrail Support 4, held in place on a 1" Rod by a 7/32" bolt 5 projecting inwards. The threaded portion of the Handrail Supports has a Collar 6 locked to it by a nut.

A Rod 7 has a 1" dia. Pulley fitted with a Motor Tyre 8 fixed to it. An eight-hole Wheel Disc has two 2½" Strips bolted to it at right angles to each other by ½" Bolts, two of the bolts carrying three Washers under the head, and the others having two Washers, so that the bolt heads are level. This assembly is arranged on the shaft so that the bolt heads engage the Pulley 8, and the outer ends of the 2½" Strips are equally spaced from the Threaded Bosses 2, with the bolts 5 located between the Pulley and the Wheel Disc.

Another 1" dia. Pulley 9 is fixed into a Socket Coupling placed on the shaft. Then Pivot Bolts fitted with Compression Springs 10 are passed through the 2½" Strips and screwed into the Threaded Bosses. The clutch is disengaged by withdrawing the Pulley 9 so that the Collars 6 engage in its groove.

It should be mentioned that this clutch is unsuitable for running at high speeds, such as from the armature shaft of an E15R Electric Motor, due to the effect of centrifugal force on the Collars 6, which tends to disengage the clutch, but at slower speeds an elastic band passed over the four Collars will hold them in place and also prevent them from rattling due to their free movement.

These details are reproduced in full in the hope that readers will find the mechanism interesting and will wish to experiment with it for themselves.

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Copies of the Magazine are held in position by specially designed wires fitted on stout and well-secured leather thongs. The cover is in maroon. The binding cases hold 12 copies and single copies can be inserted as received. Price 9/6, post free. Write to *Meccano Magazine*, Binns Road, Liverpool 13, enclosing P.O.

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.

Long John Silver's Inn

During a recent visit to Bristol I found my way to the old part of the port and there, in King Street, I saw the original of Long John Silver's Inn, "The Spy-Glass", where Jim Hawkins first met the one-legged sea-cook in *Treasure Island*.

The real name of this seventeenth-century sailors' hostelry, which bears the date 1664, is "Ye Llandoger Trow", the name being that of a now vanished type of Welsh sailing coaster once common in the Bristol Channel. It was during a visit to the West Country in the eighteen seventies that Robert Louis Stevenson first saw the old Bristol inn, and soon it appeared in his greatest boys' story.

I should have liked to see some tobacco-chewing seamen, with tarry pigtailed and ear-rings, hanging around its door, but only a parked Austin A35 found its way into my picture.

On the opposite side of King Street to Long John Silver's Inn is the Theatre



"Ye Llandoger Trow" in King Street, Bristol, believed to be the original of Long John Silver's Inn, "The Spy-Glass". Photograph by C. R. Rowson, Liverpool 12.

Royal, the oldest playhouse in England, whose stage has been trodden by Garrick, Mrs. Siddons, and other great actors of the past.

C. R. ROWSON (Liverpool)

Largest Freshwater Springs

The largest freshwater springs in the world are several miles from Takaka in the Nelson Province of New Zealand. The Maoris called them the Waikaremunu Springs which means 'twin springs', but they are more commonly known as the Pupu Springs—a shortened form of the Waikoropupu River into which they flow.

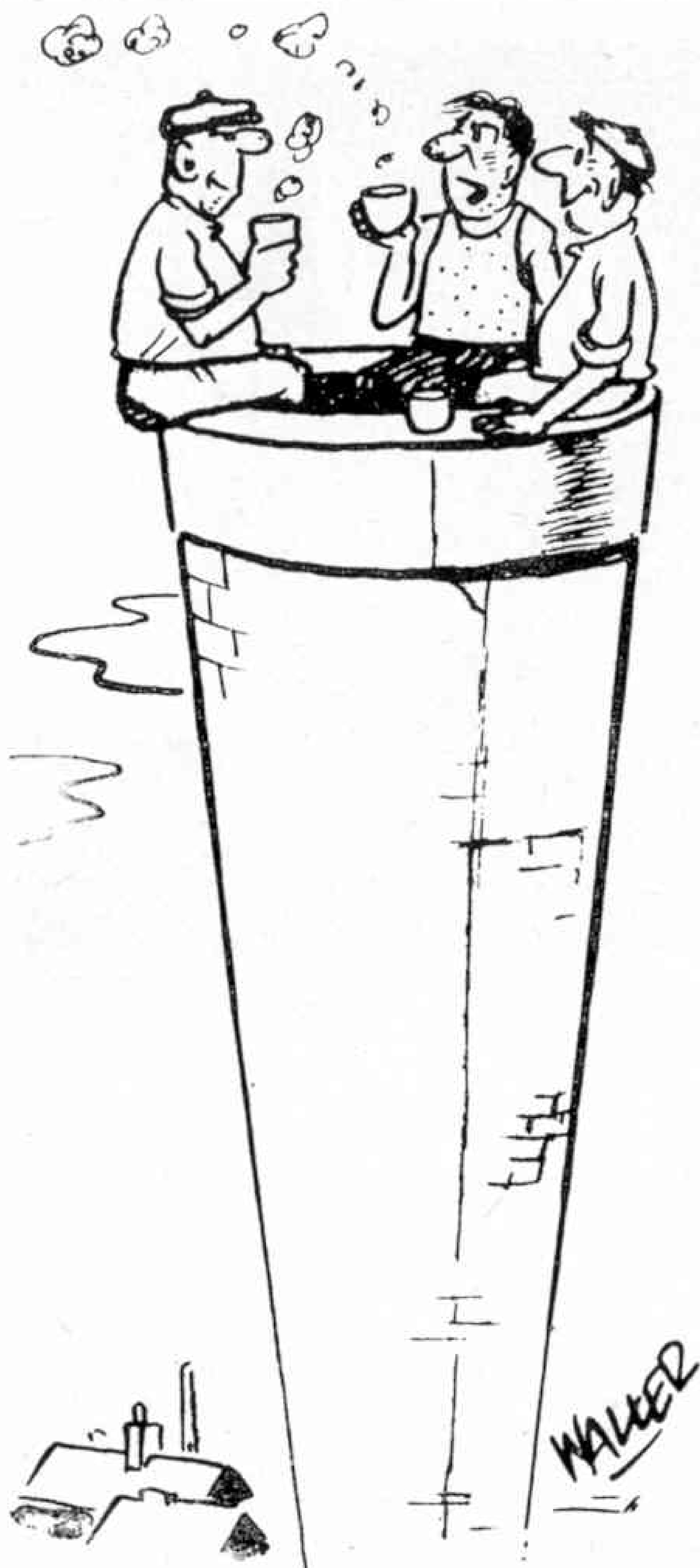
The water is very cold and the rate of flow is approximately 400,000,000 gallons in every 24 hours. The springs bubble up through the limestone rock from an underground source.

In my illustration (on the left) the two springs can clearly be seen, one in the foreground, the other further back on the right. The photograph was taken from a 10-ft. high observation tower near the springs.

N. A. EVANS
(Dunedin, New Zealand)



Waikaremunu Springs, New Zealand. Photograph by N. A. Evans, Dunedin, New Zealand.



"'Certainly I'll give you a rise', he said. 'As from Monday, you can help Boskins on that chimney job!'"

Mother: Well, John, what did your music teacher think of your rendering of 'Morning, Noon and Night'?

Johnny: After two bars he told me to call it a day.

"Television mad she is, Mrs. Jones. Switched 'er radio on by mistake last night—and nearly screamed 'er 'ead off."

"Whatever for?"

"Thought she'd gorn blind!"

An Edinburgh man says that the Irish really invented the bagpipes and sent them to Scotland for a joke. The Scottish have not seen the joke yet.

Tom: I can't afford a motor car.

Ben: I thought you had one.

Tom: I have. That's how I discovered I can't afford one.

Fireside Fun

"Oh, my goodness!" shrieked the nervous old lady to the bus conductor, "I do wish the driver wouldn't go so fast round these dangerous corners!"

"Don't worry your 'ead, ma", soothed the conductor. "Just you shut your eyes the same as 'e does!"

* * * *

"Another bite like that," a father told his young son, "and you'll leave the table."

"Another bite like that and I'll be finished."

* * * *

A luxury liner, on a cruise to Europe, hired a magician. After completing each trick, a parrot owned by one of the sailors squawked, "Fake! Fake!"

Suddenly a boiler blew up and the ship sank to the bottom of the ocean.

Sole survivors were the magician and the parrot, each perched at the ends of a small raft. Several days passed and neither spoke. Finally the parrot said, "All right, wise guy—what did you do with the ship?"

* * * *

A woman asked her husband if he had a good memory for faces.

"Yes, I think I have," he replied, boastfully.

"Thank goodness for that," she said. "I've broken your shaving mirror."

* * * *

"What is your father's occupation?"

"He's a worm imitator."

"What is that?"

"He bores holes in furniture for an antique dealer."

* * * *

Joe: I want a tablet of soap, please.

Shopkeeper: Will you have it scented?"

Joe: Oh, no, I will take it with me.

* * * *

Judge: Have you ever appeared as a witness before?

Accused: Yes, your honour.

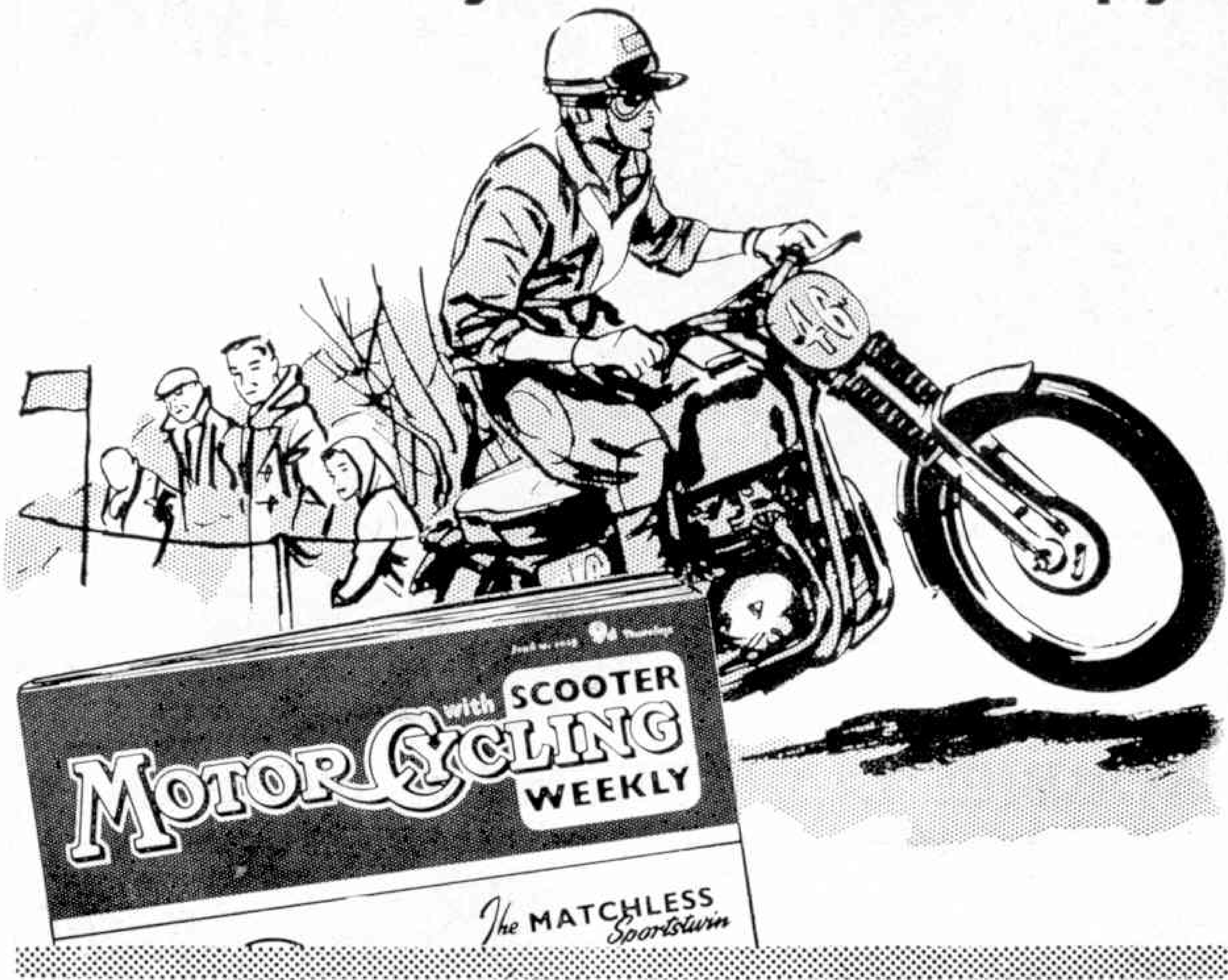
Judge: In what suit?

Accused: My blue serge.

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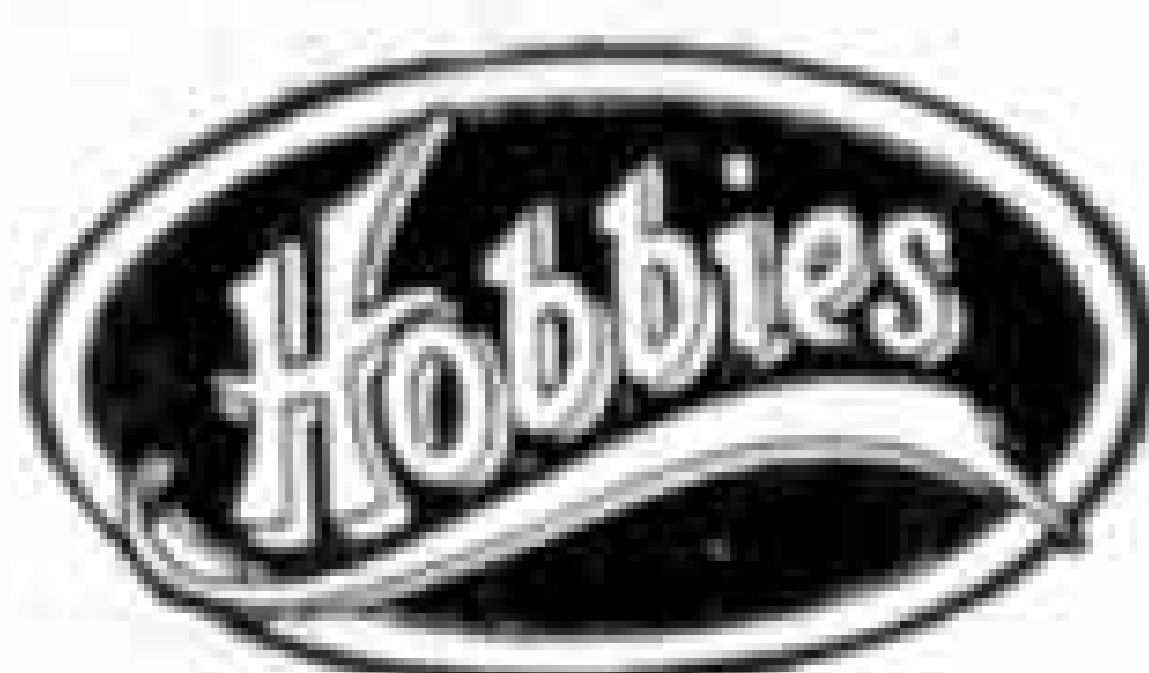
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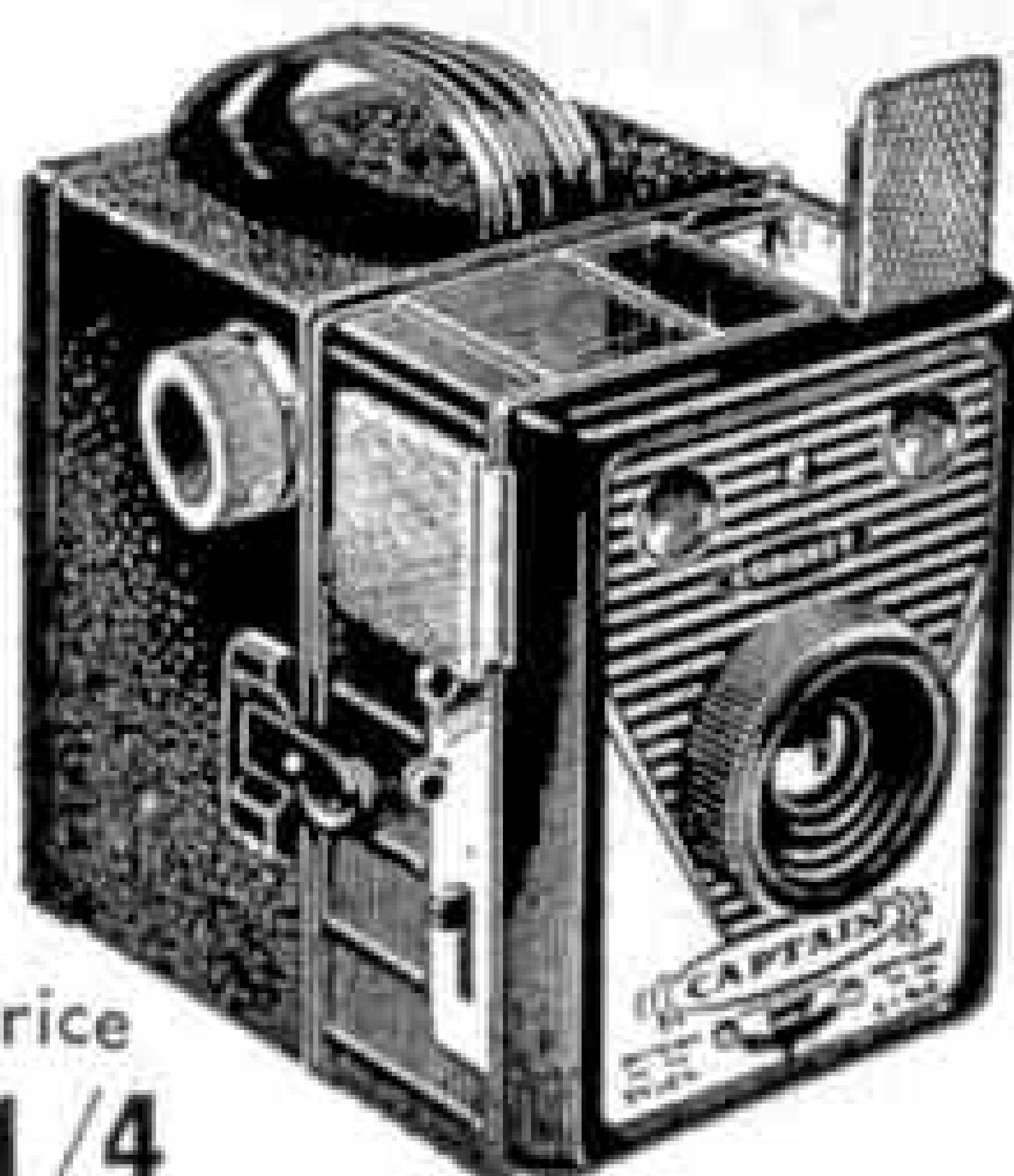
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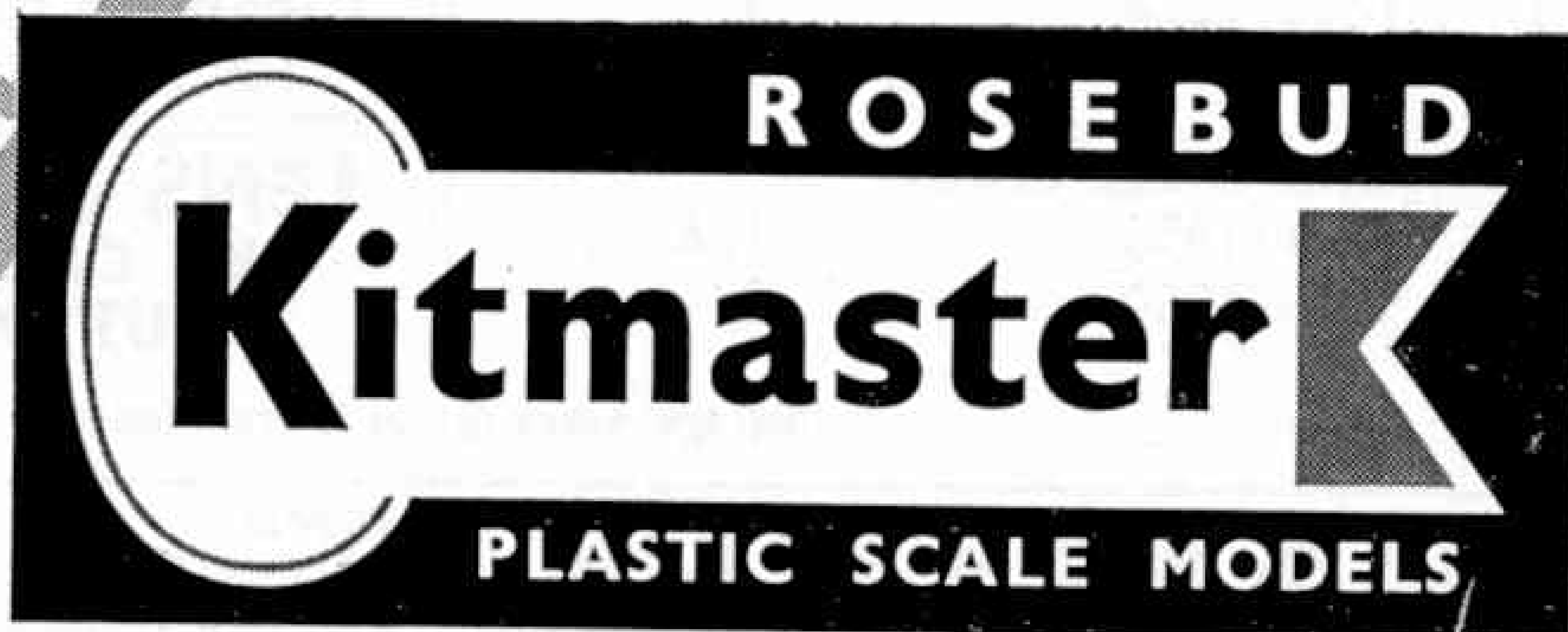


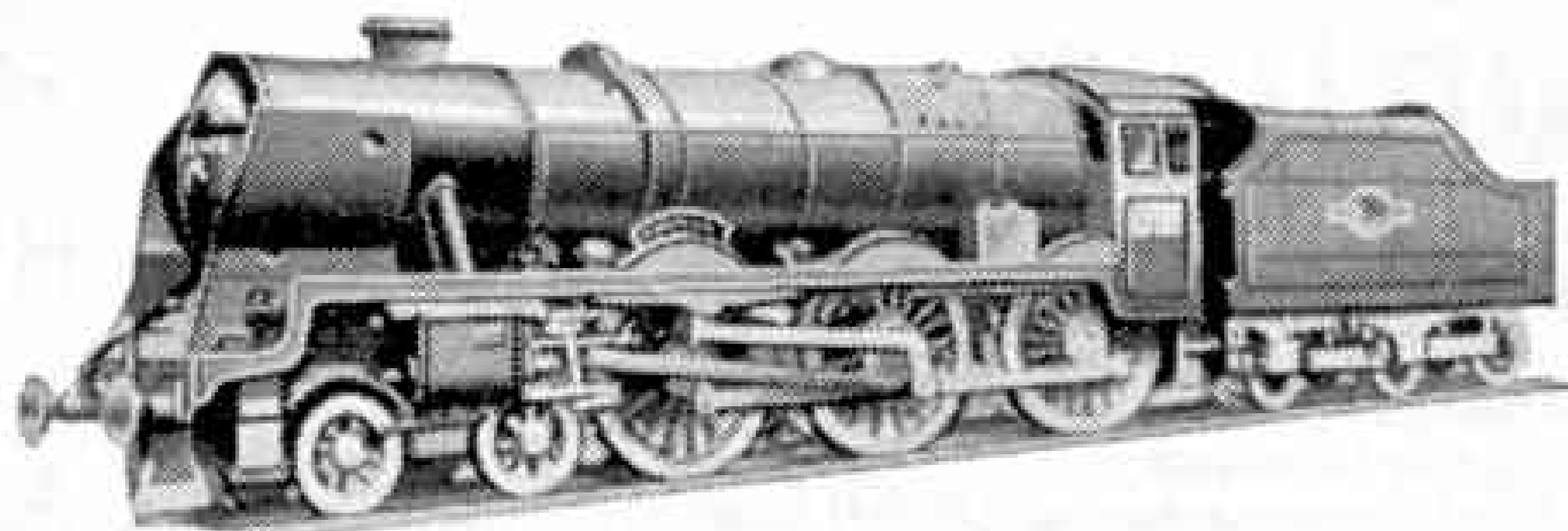
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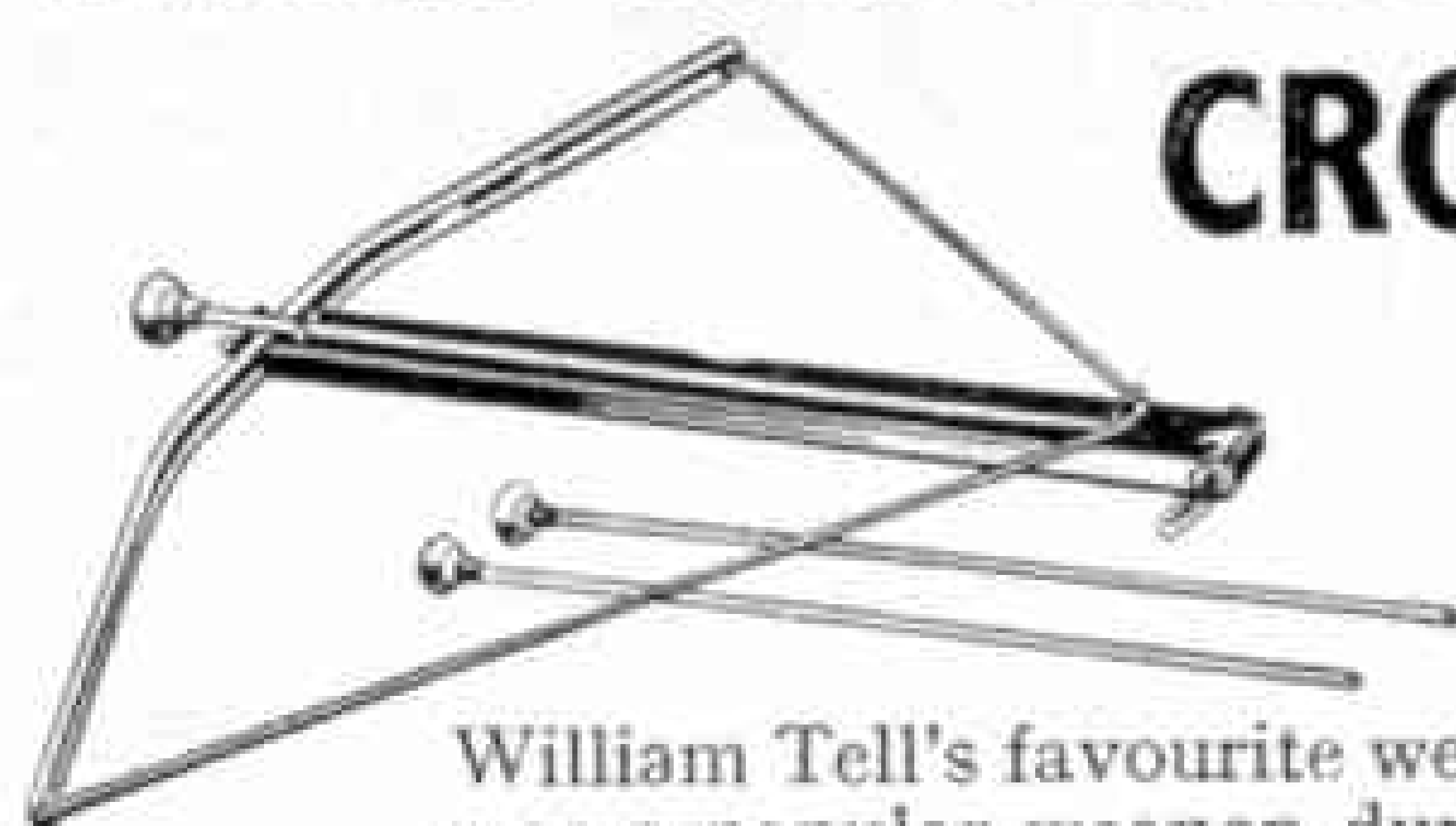
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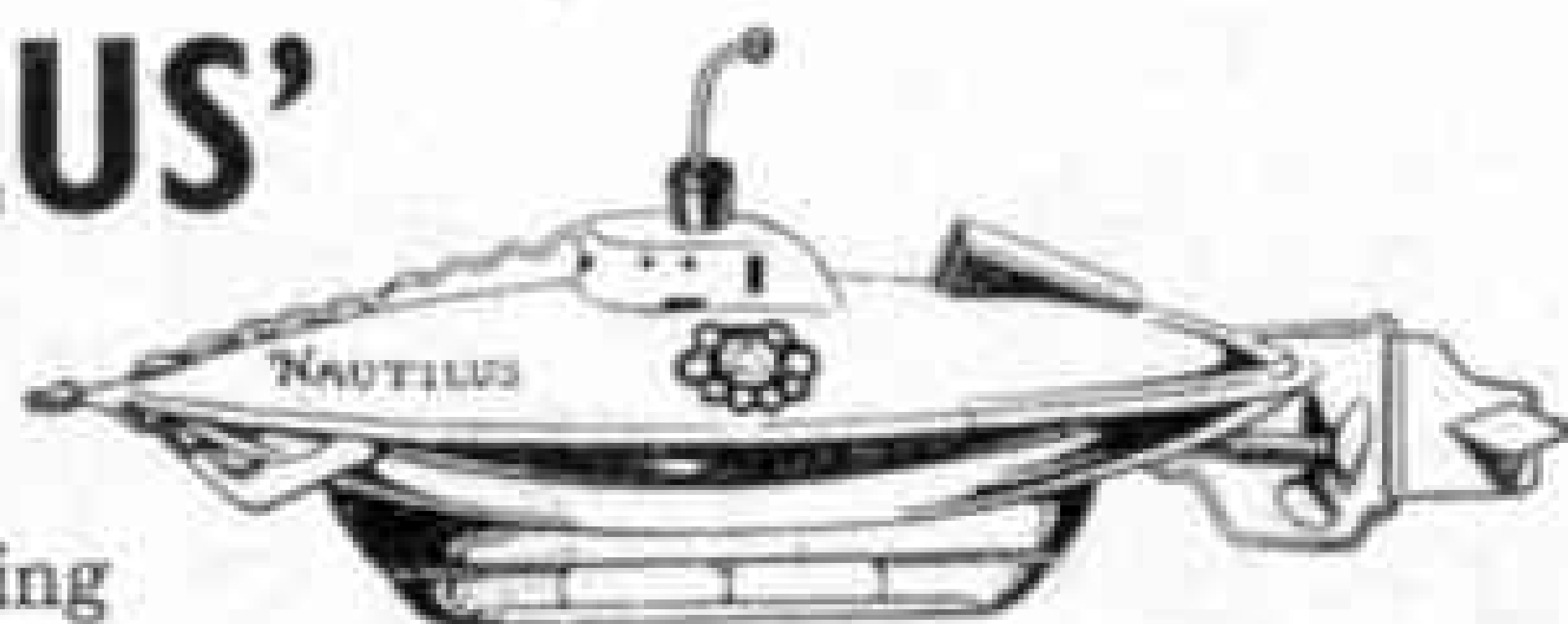
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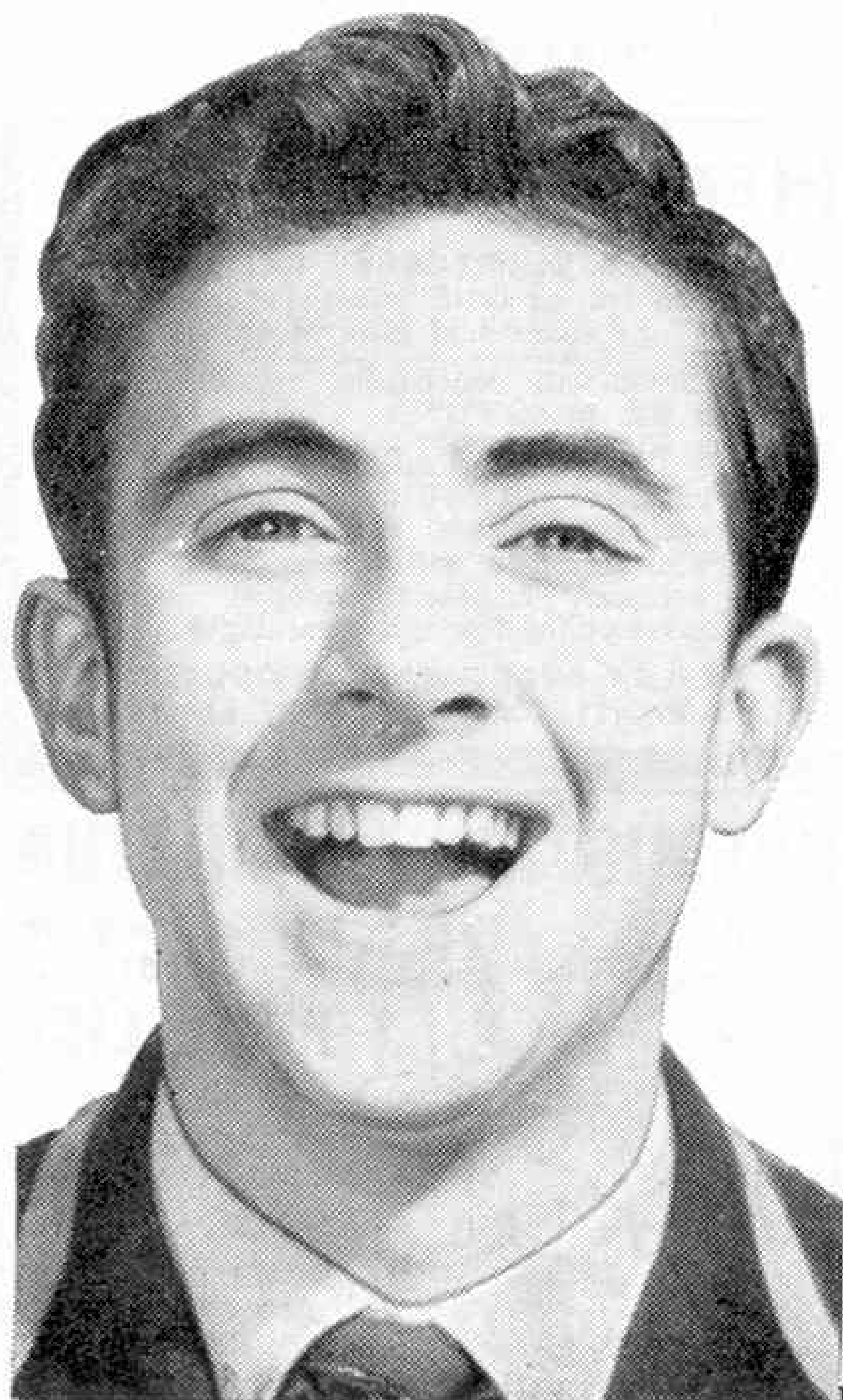


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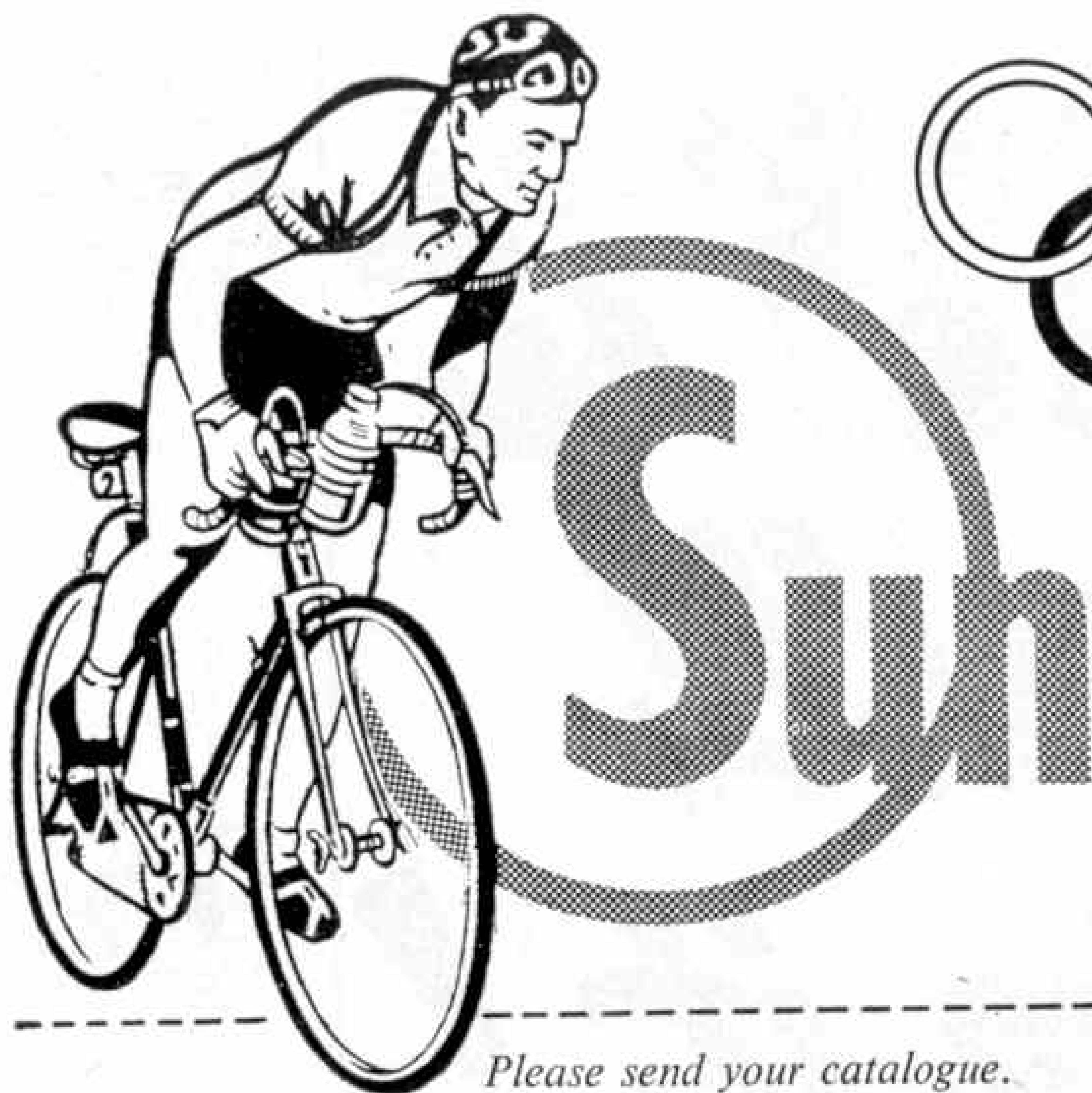
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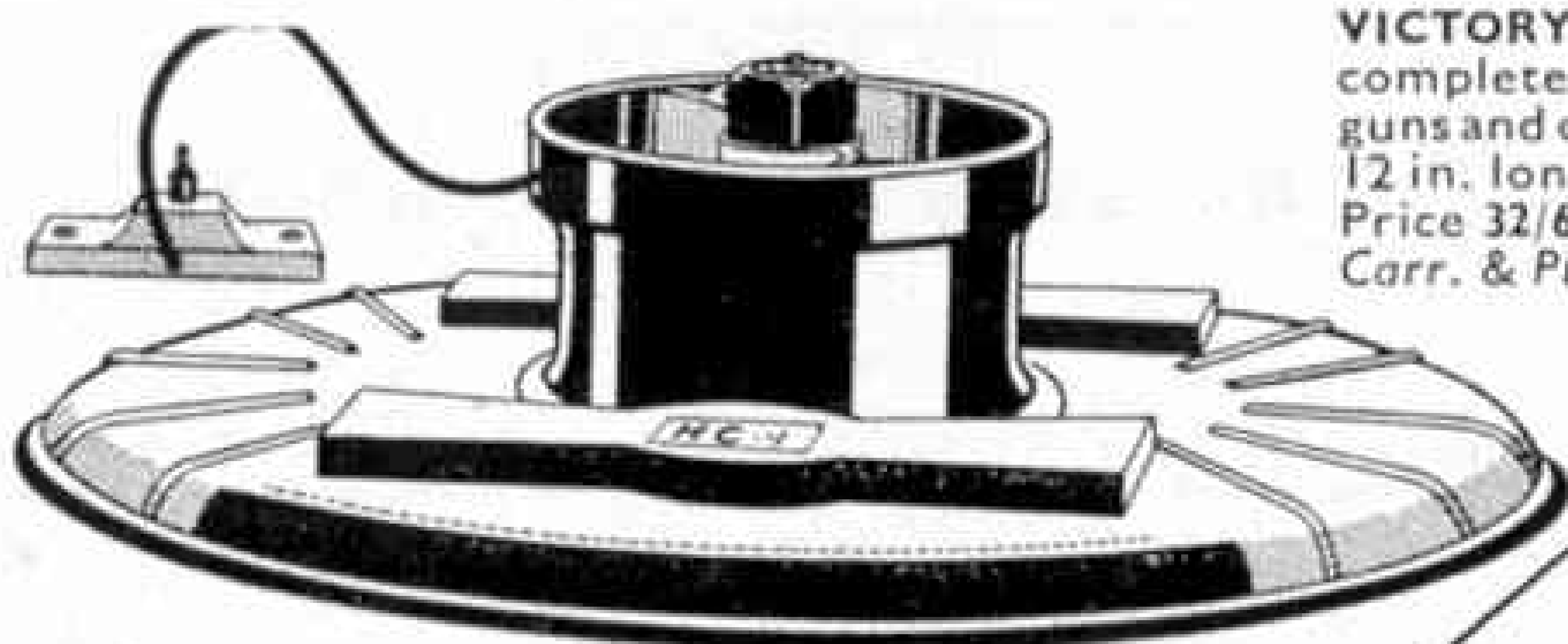
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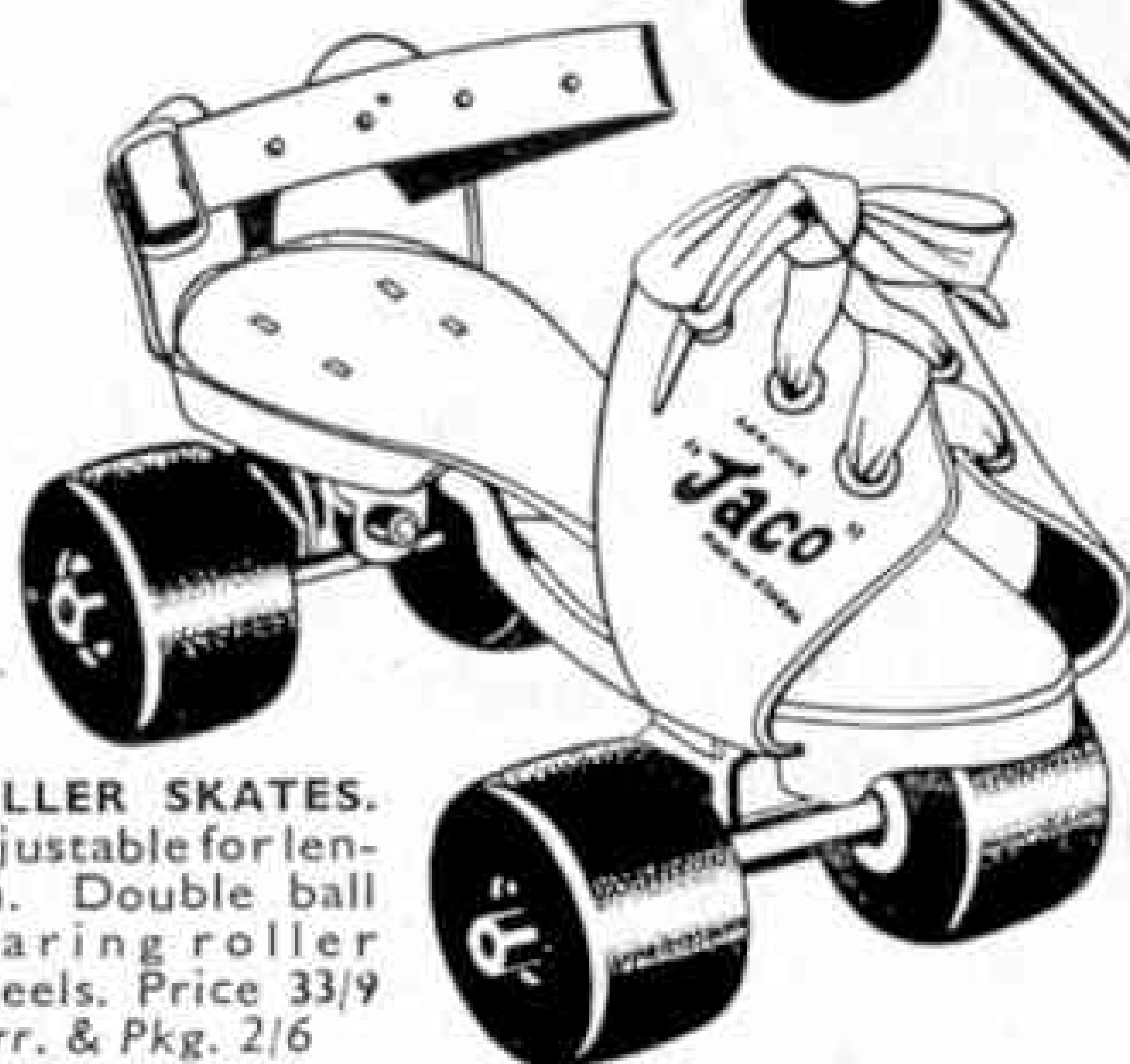
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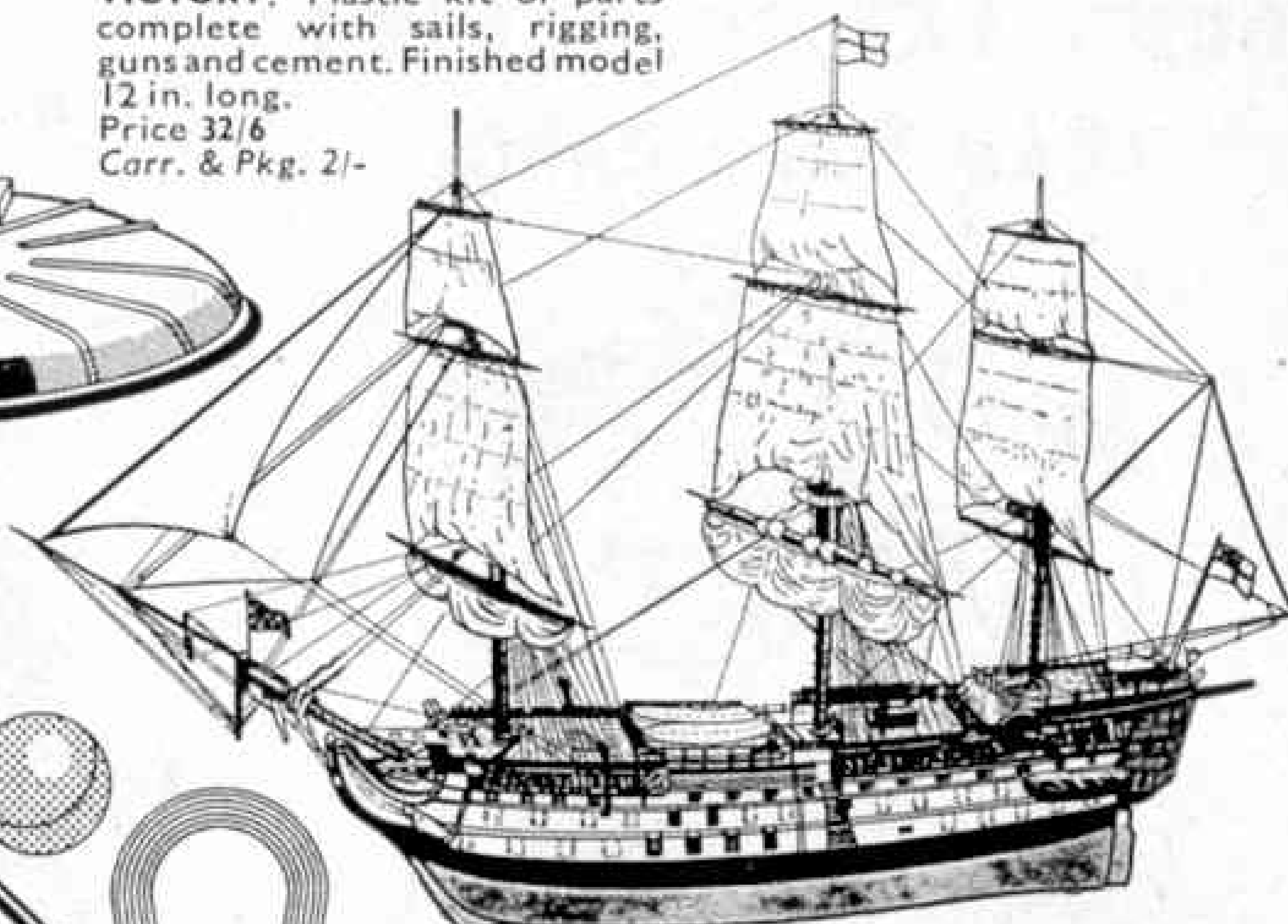
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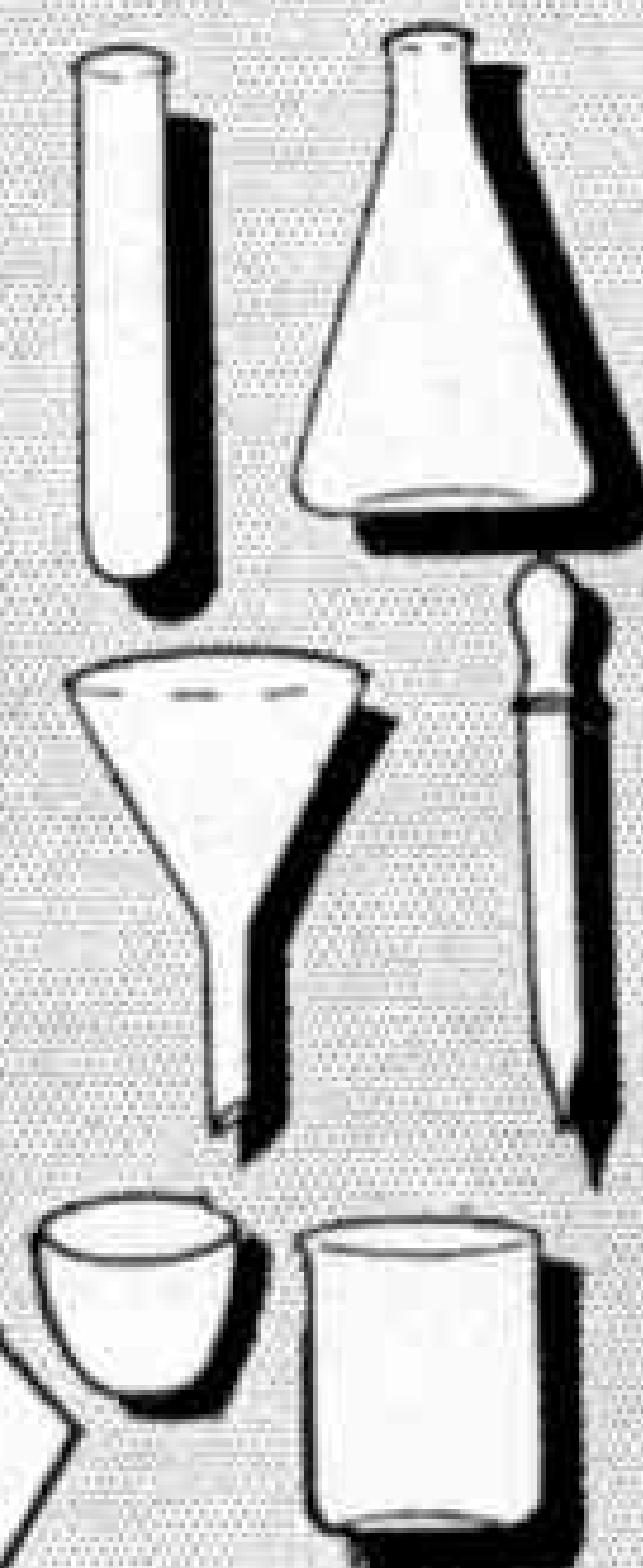
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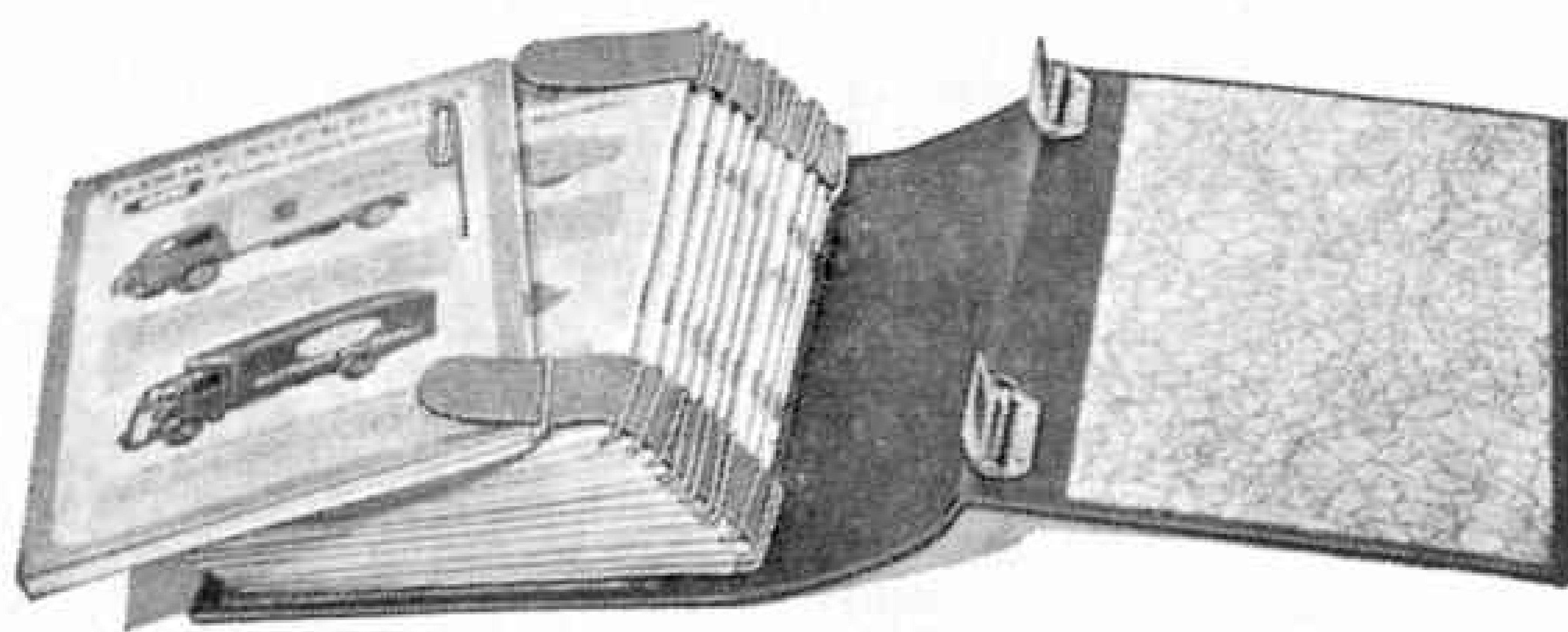
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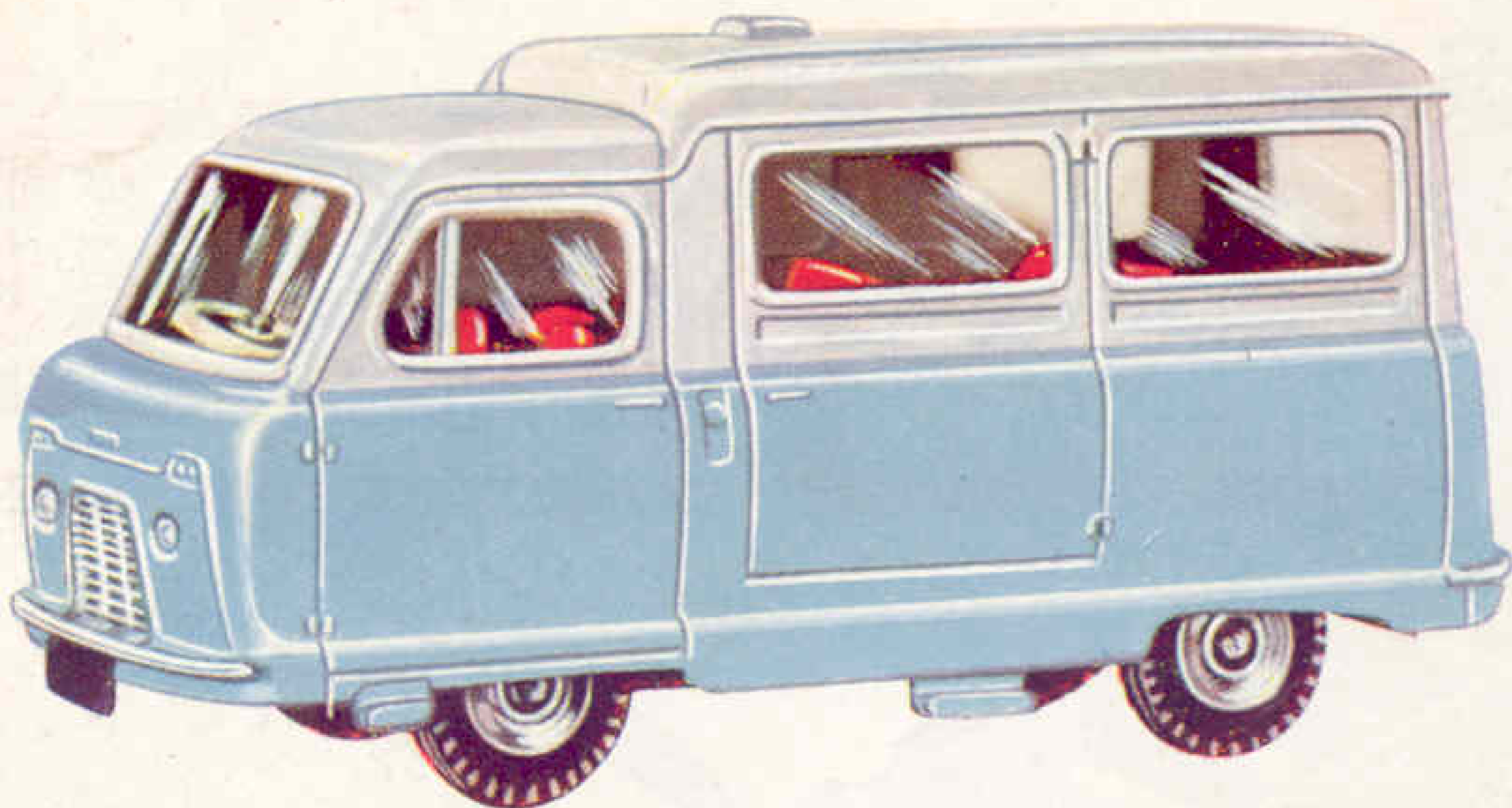
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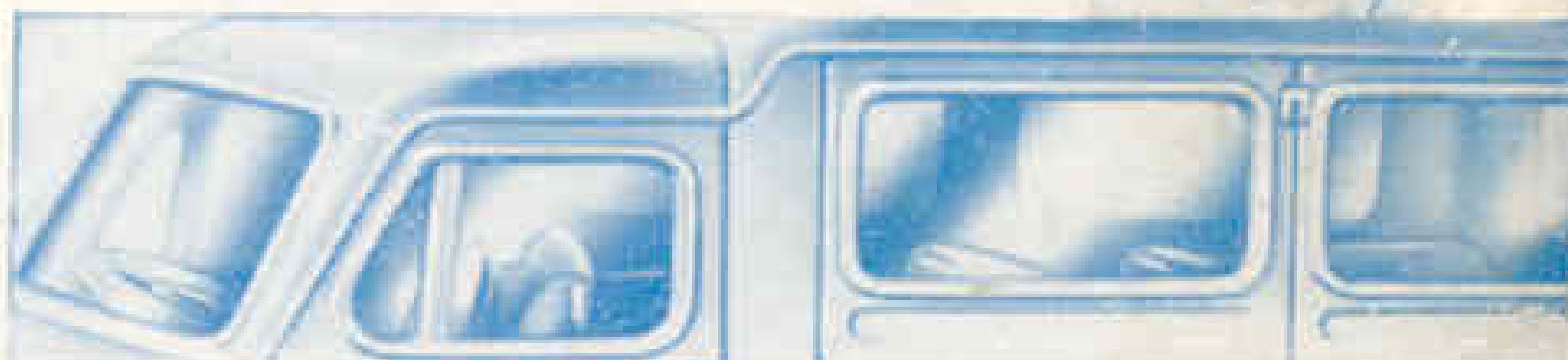
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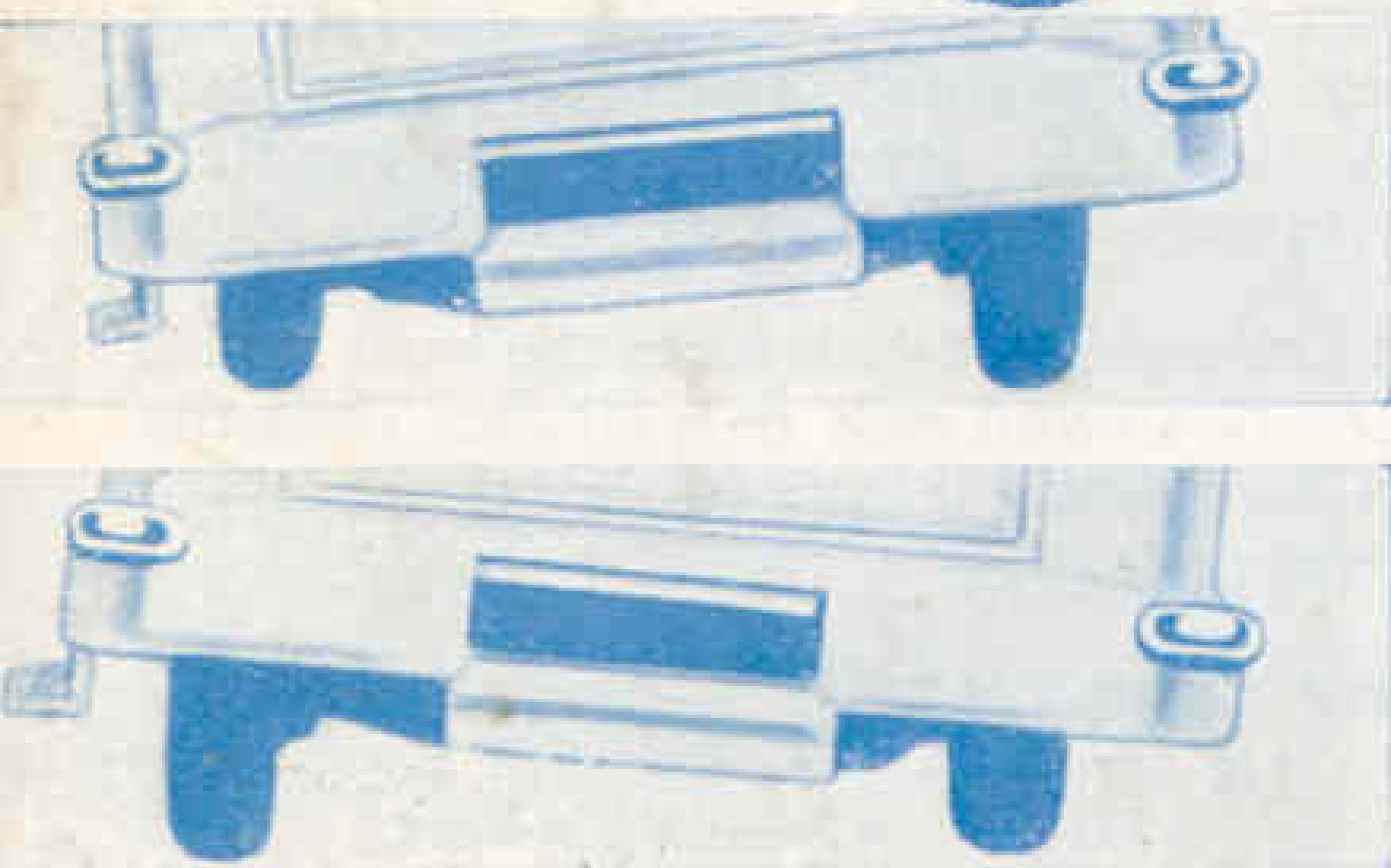
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