VOL. XLII. No. 10 OCTOBER 1957

MECCANO MAGAZINE

BIRMINGHAM CITY TRANSPORT

(See Page 478)

1/3

DINKY SUPERTOYS

Superlative Masterpieces in Miniature

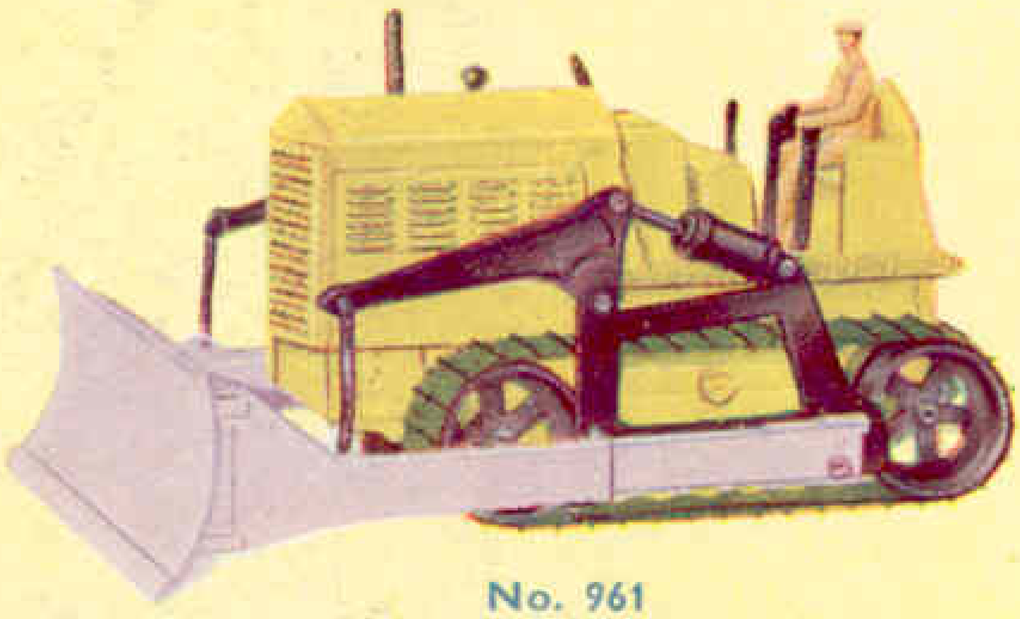
No. 962
Muir-Hill Dumper Truck
Length 4 $\frac{3}{16}$ in. 7/9

No. 923
Big Bedford Van 'HEINZ'
Length 5 $\frac{3}{4}$ in. 8/9

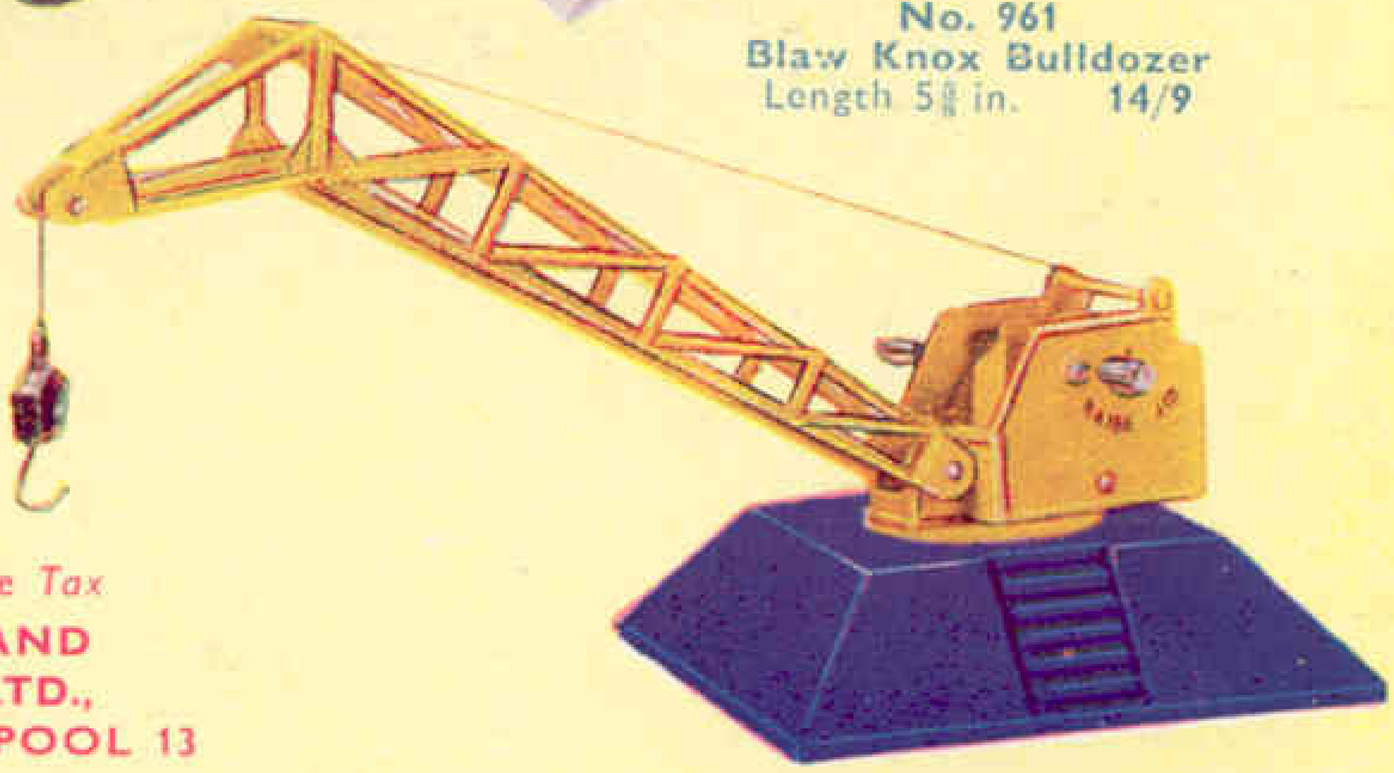
No. 902
Foden Flat Truck
Length 7 $\frac{3}{8}$ in. 8/6

No. 919
Guy Van 'GOLDEN SHRED'
Length 5 $\frac{1}{4}$ in. 8/9

No. 661
Recovery Tractor
Length 5 $\frac{1}{4}$ in. 9/6



No. 961
Blaw Knox Bulldozer
Length 5 $\frac{5}{16}$ in. 14/9



No. 973
Goods Yard Crane
Length of Jib 7 in. 11/6

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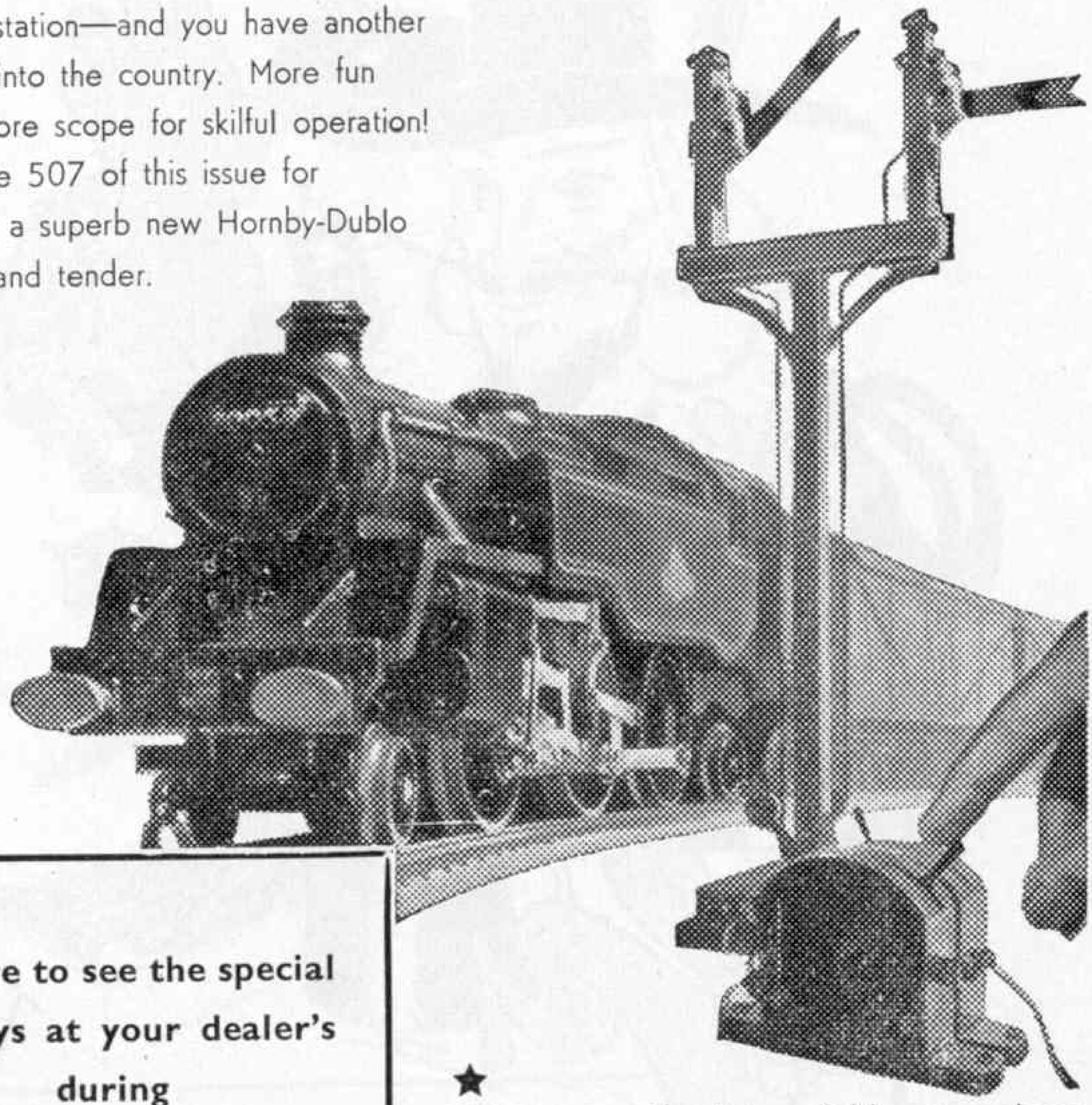

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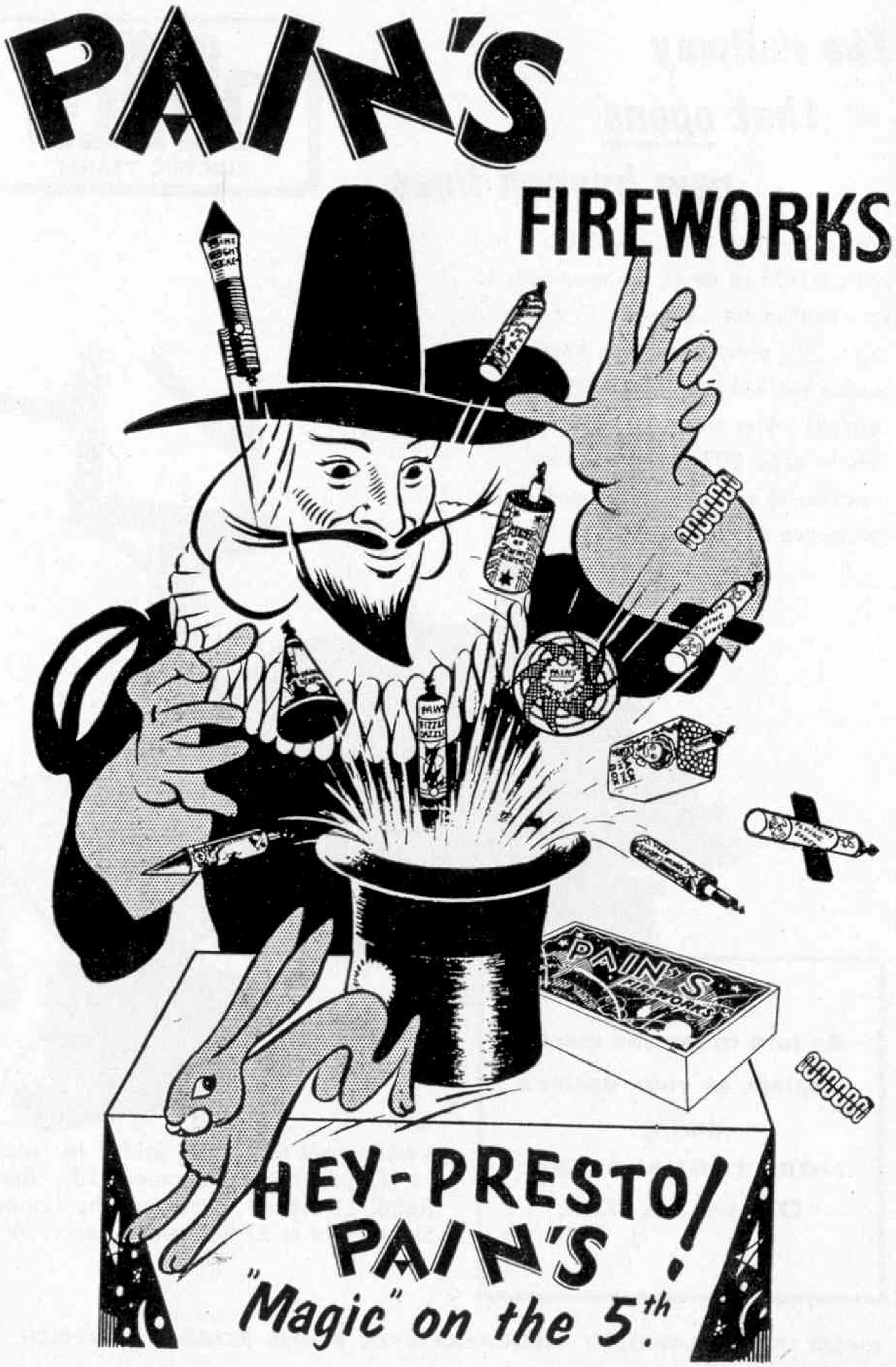
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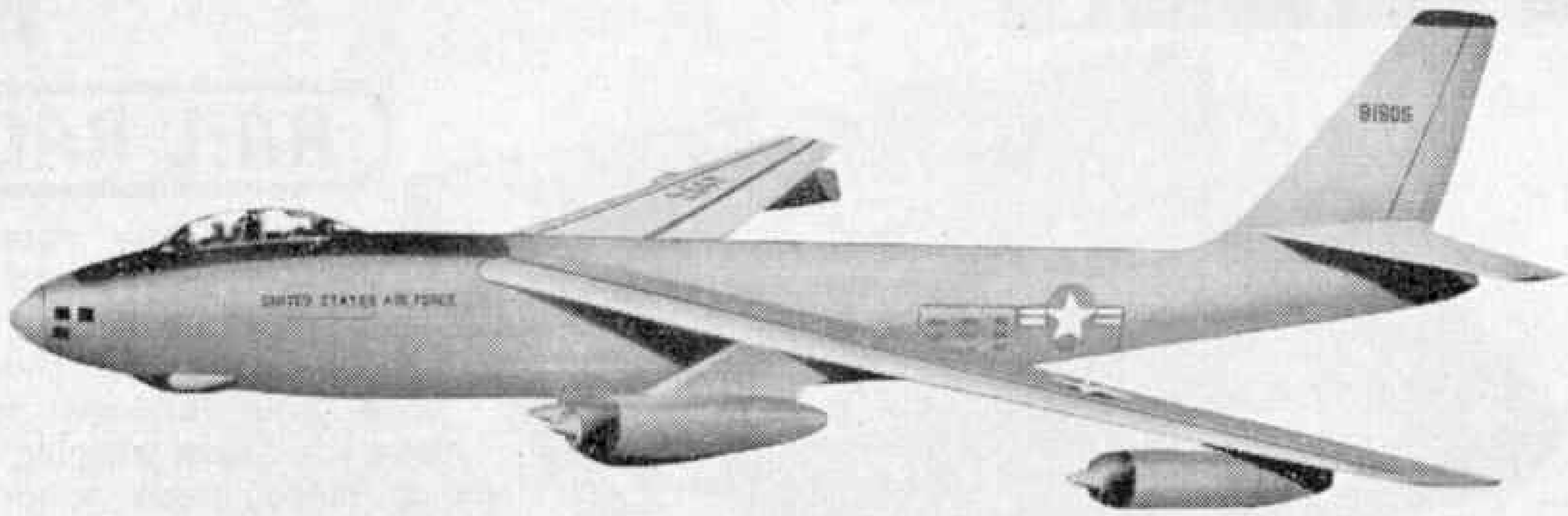
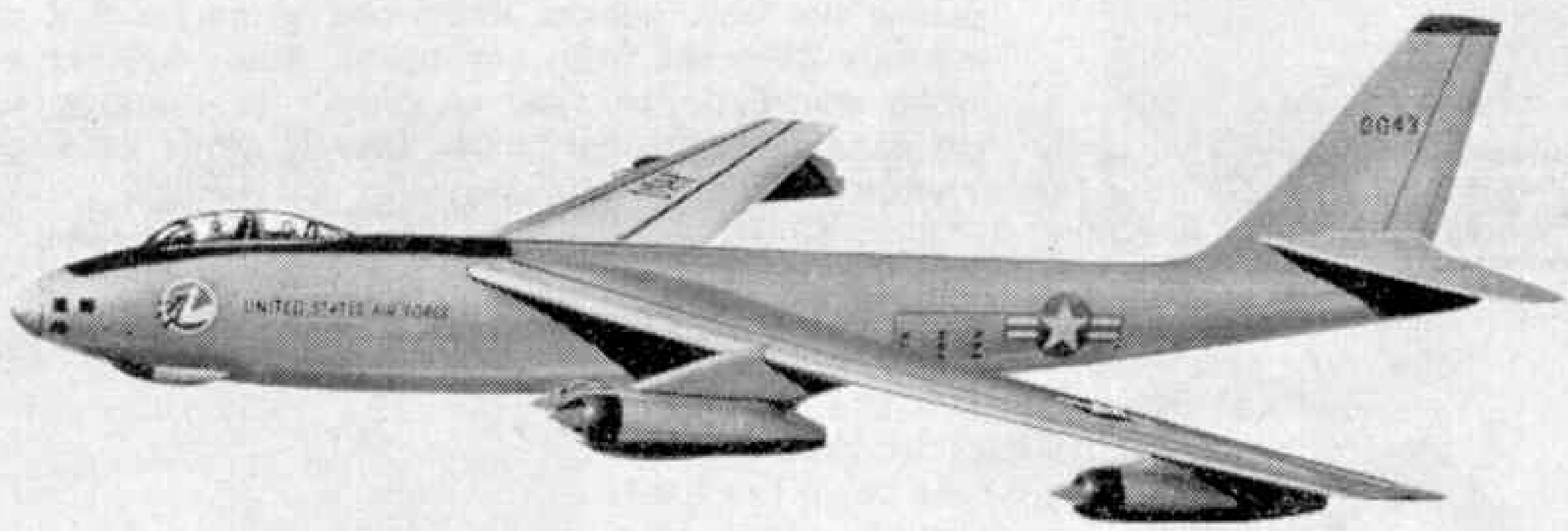


AND WHICH CAN YOU BUILD YOURSELF



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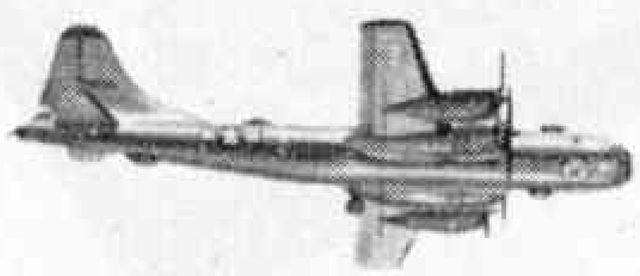

B-29 Superfortress made history in the Pacific in 1944-45. Tail gun, gun turrets, clear canopy, crew. 8/11

B-24J Liberator Bomber, World War II raider. Has flight deck, gun turrets, detailed landing gear, crew. 8/11

B-52 Stratofortress circled earth non-stop in 45 hours 19 minutes. Detailed jet pods, wing tanks. 8/11

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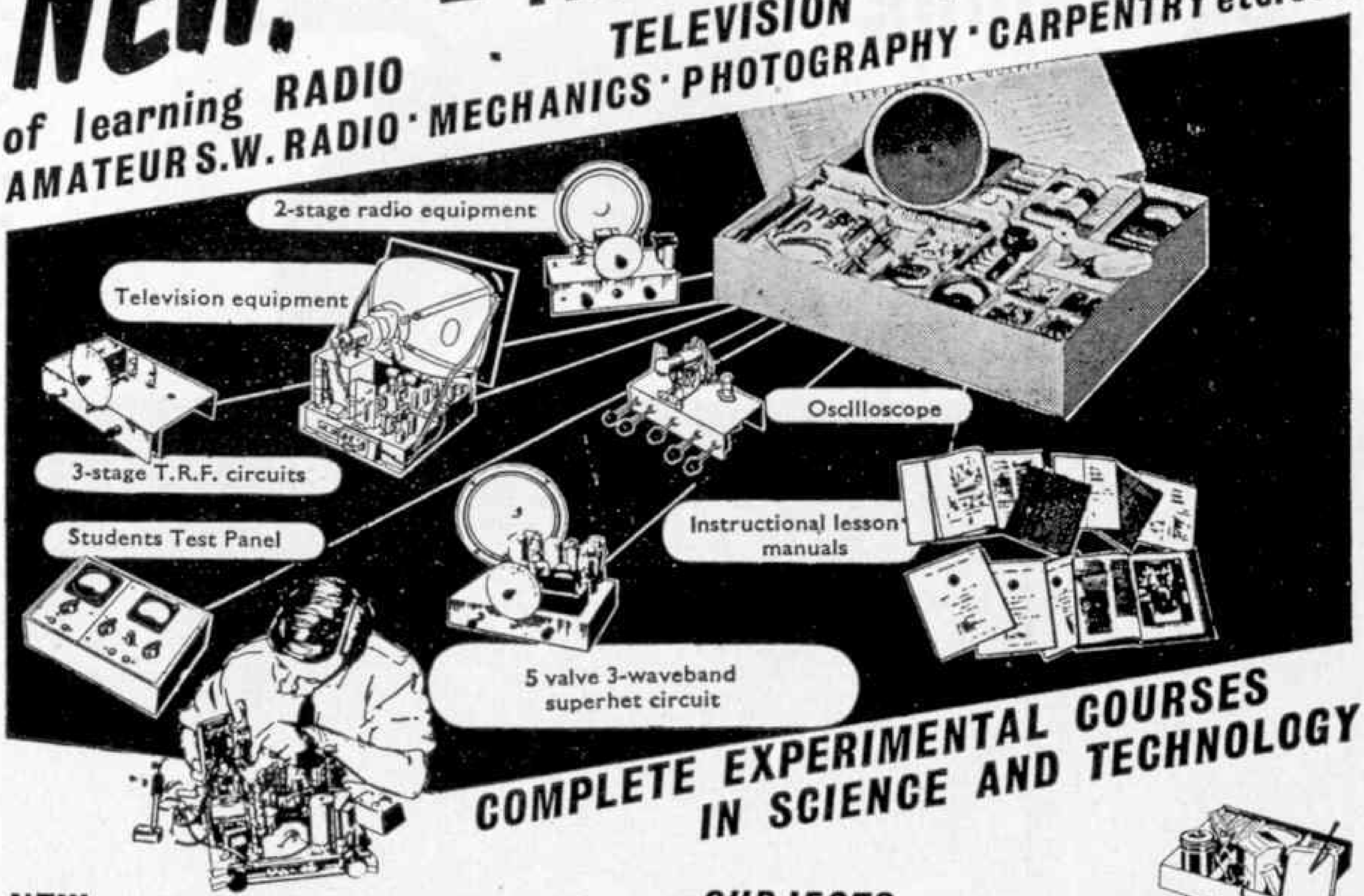

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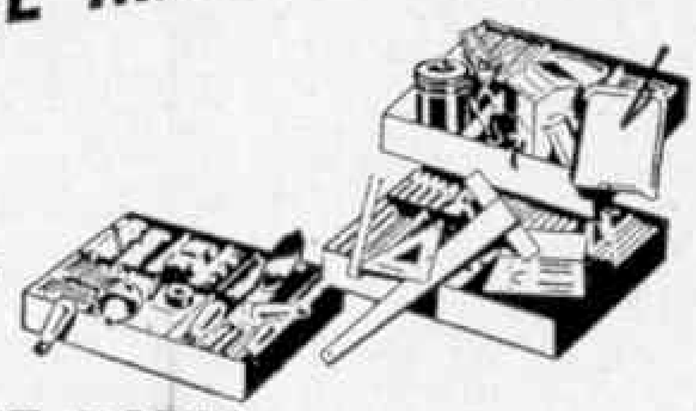

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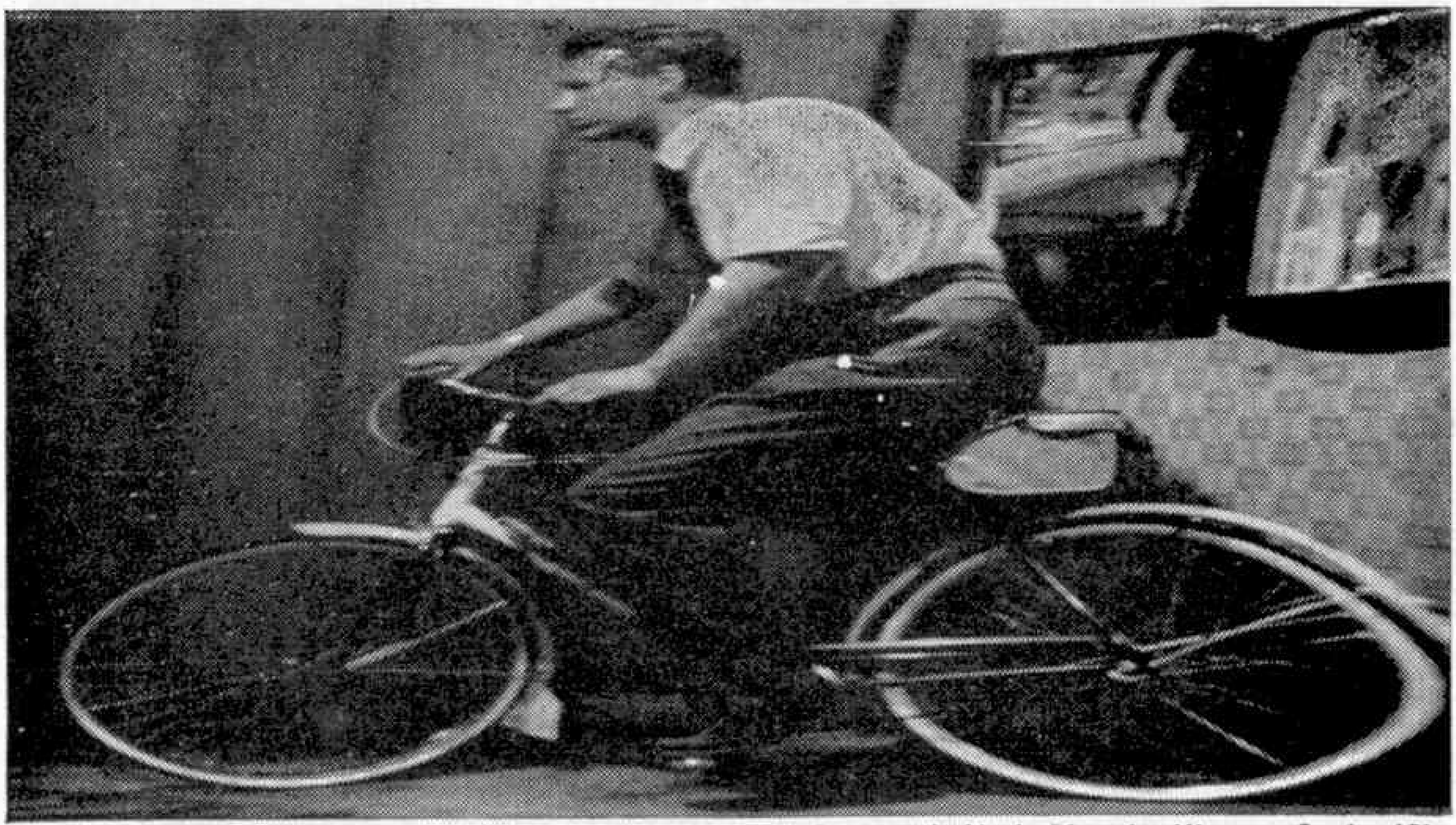

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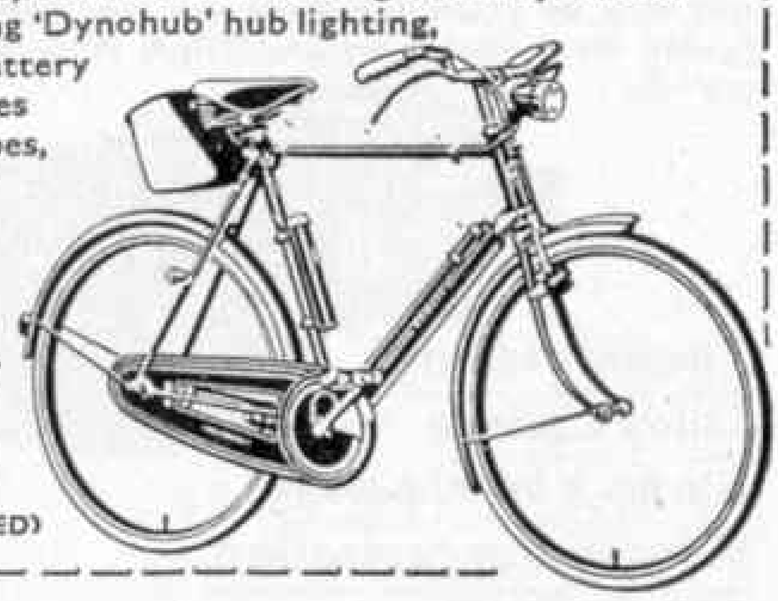

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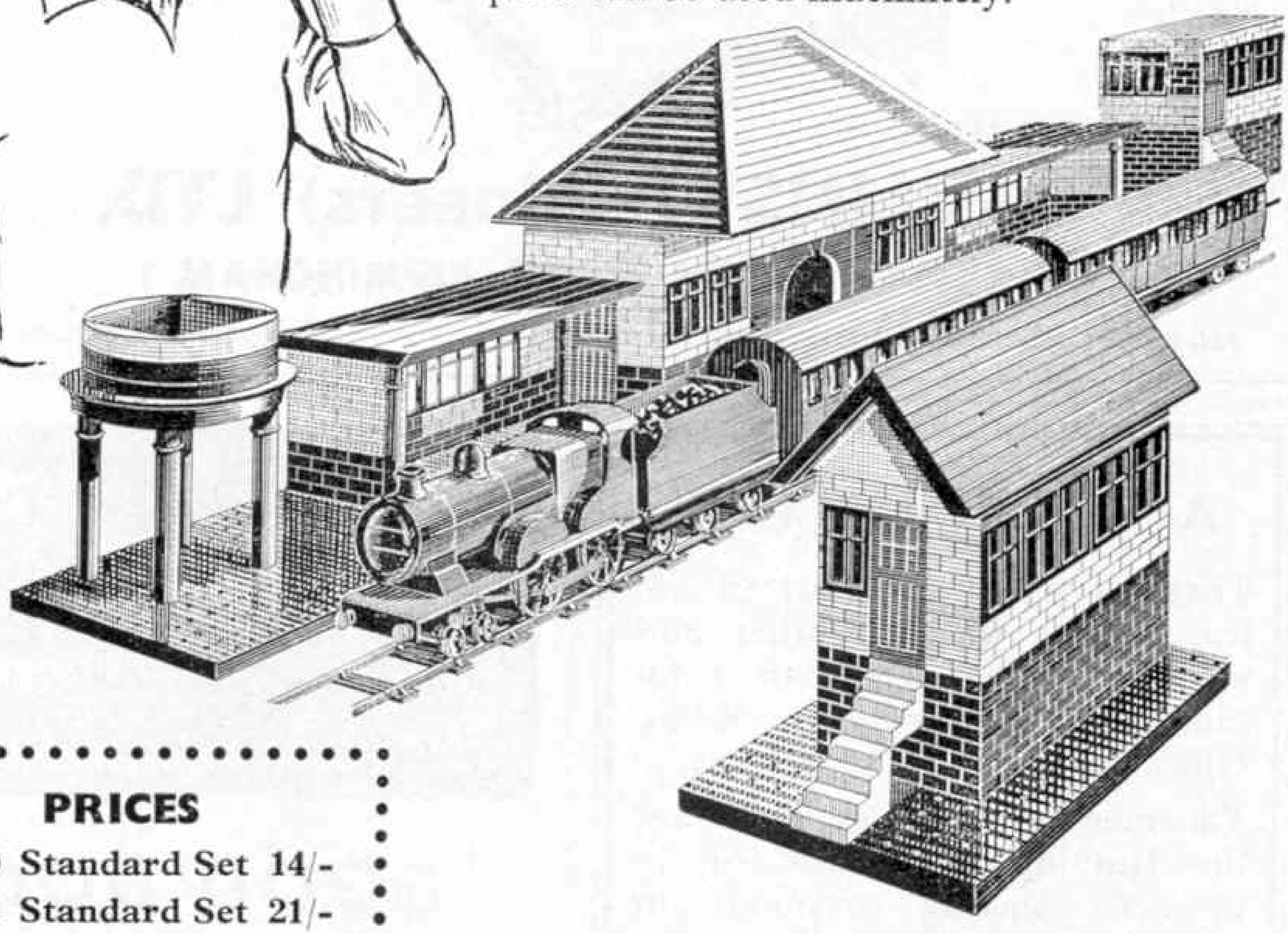

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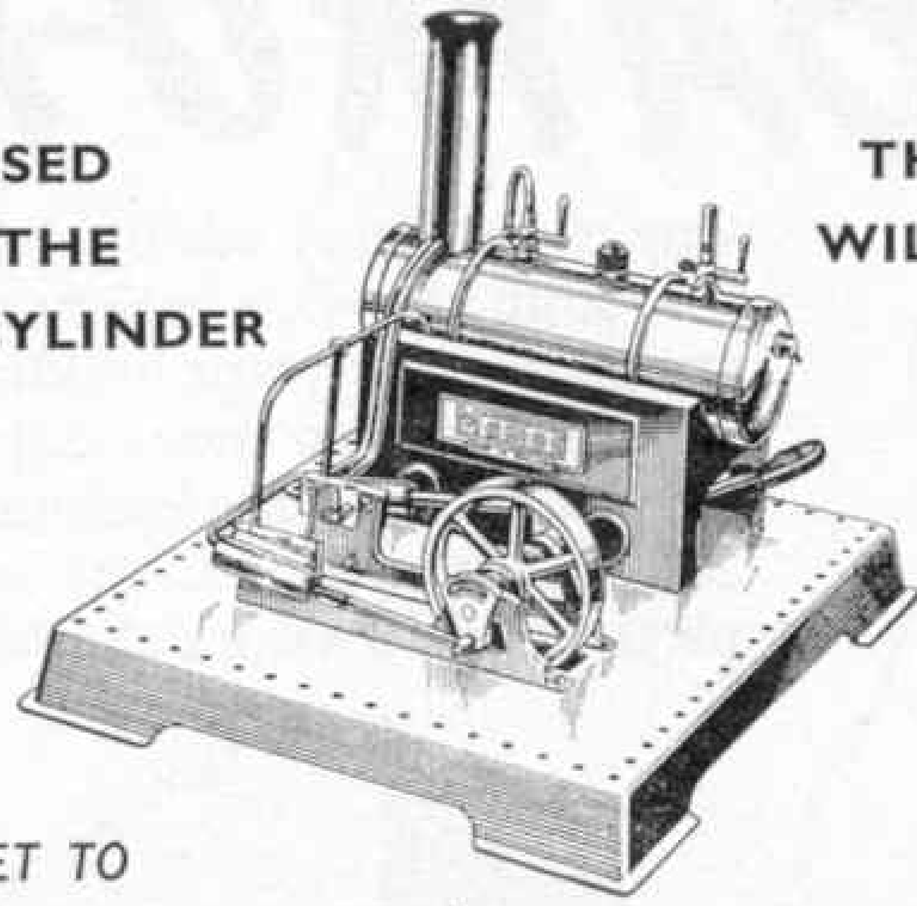

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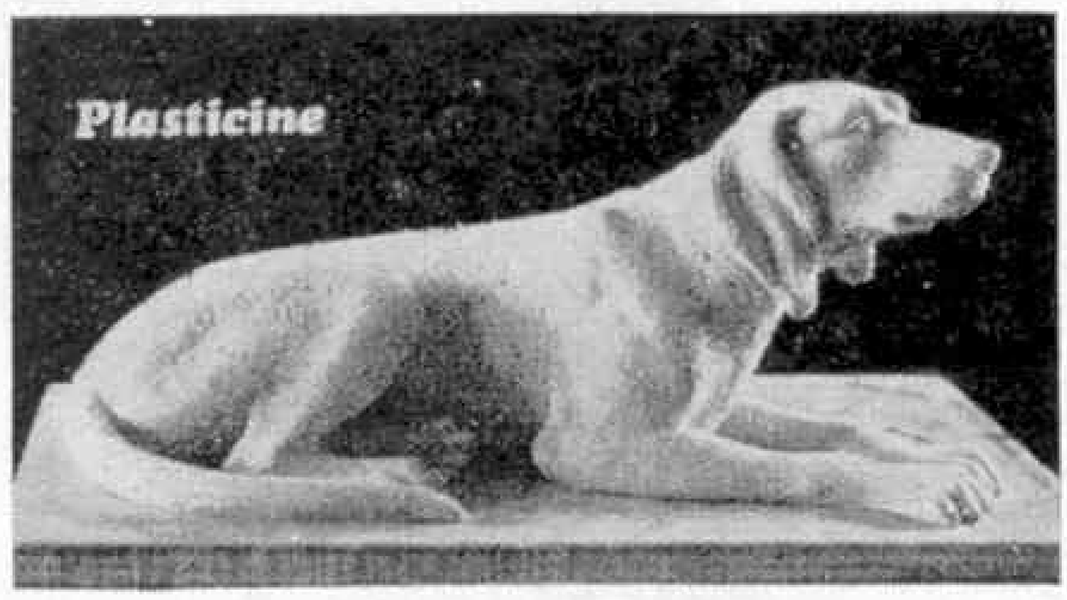

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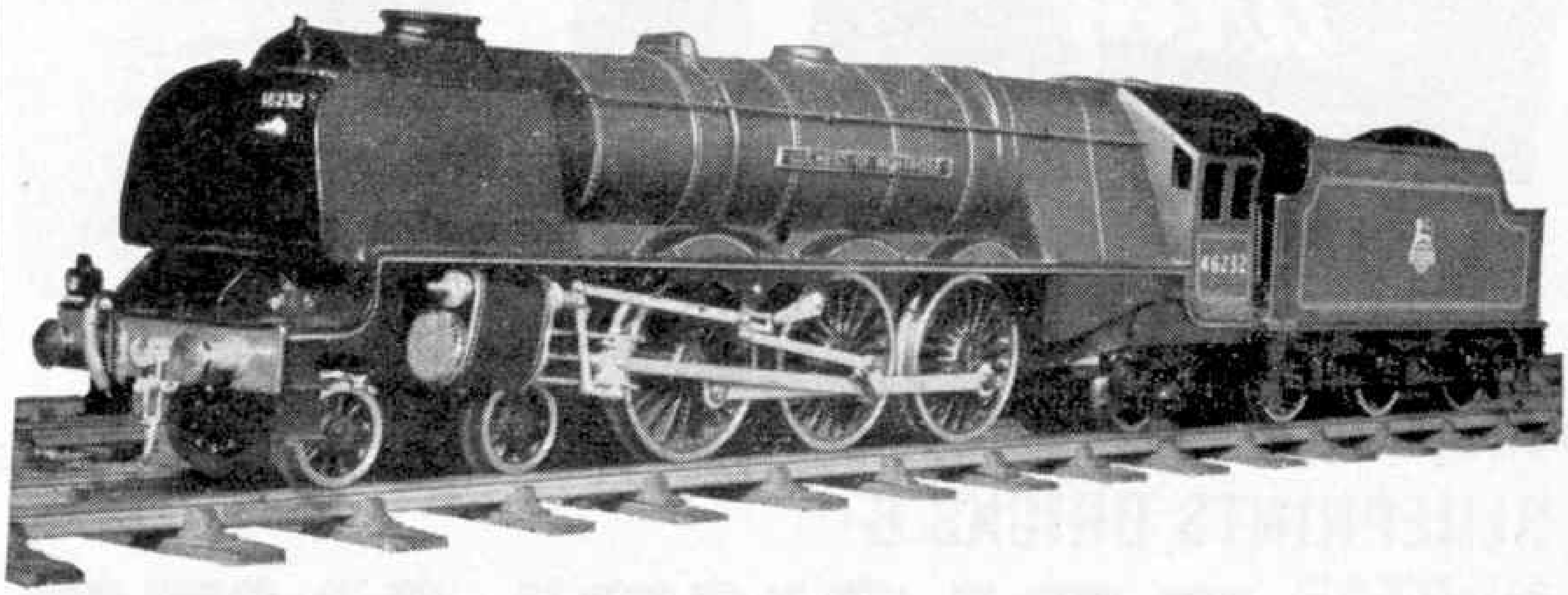

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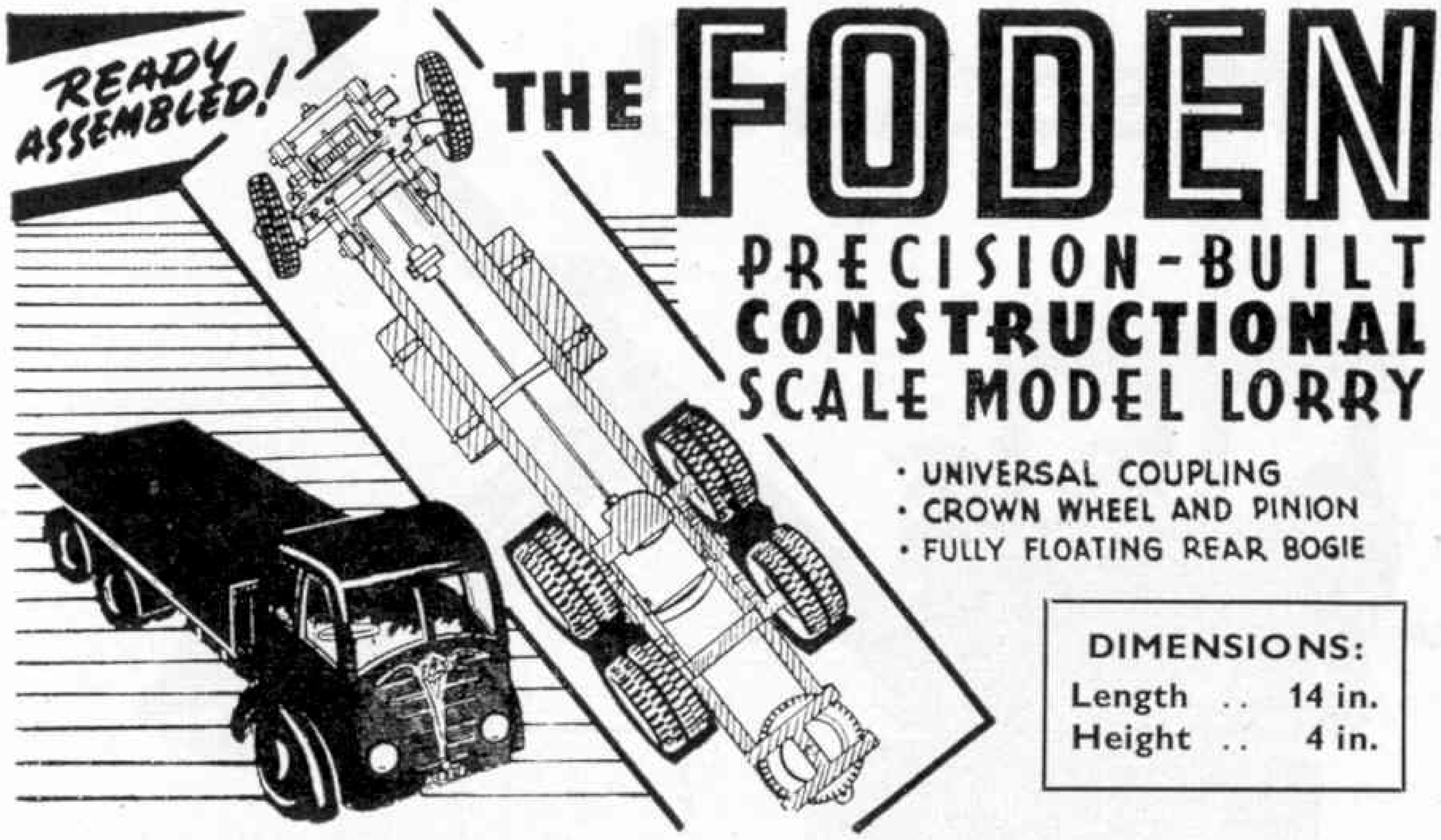

This Model of the FODEN F.G. 6-Wheel Standard Platform Vehicle has been designed to resemble the actual Lorry to a great degree, and such being the case the construction of the Model follows closely the procedure which is general practice in the assembly shops of heavy commercial vehicle manufacturers.

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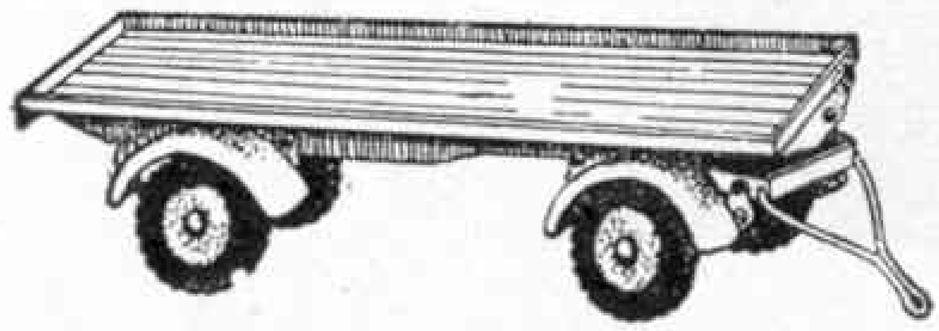

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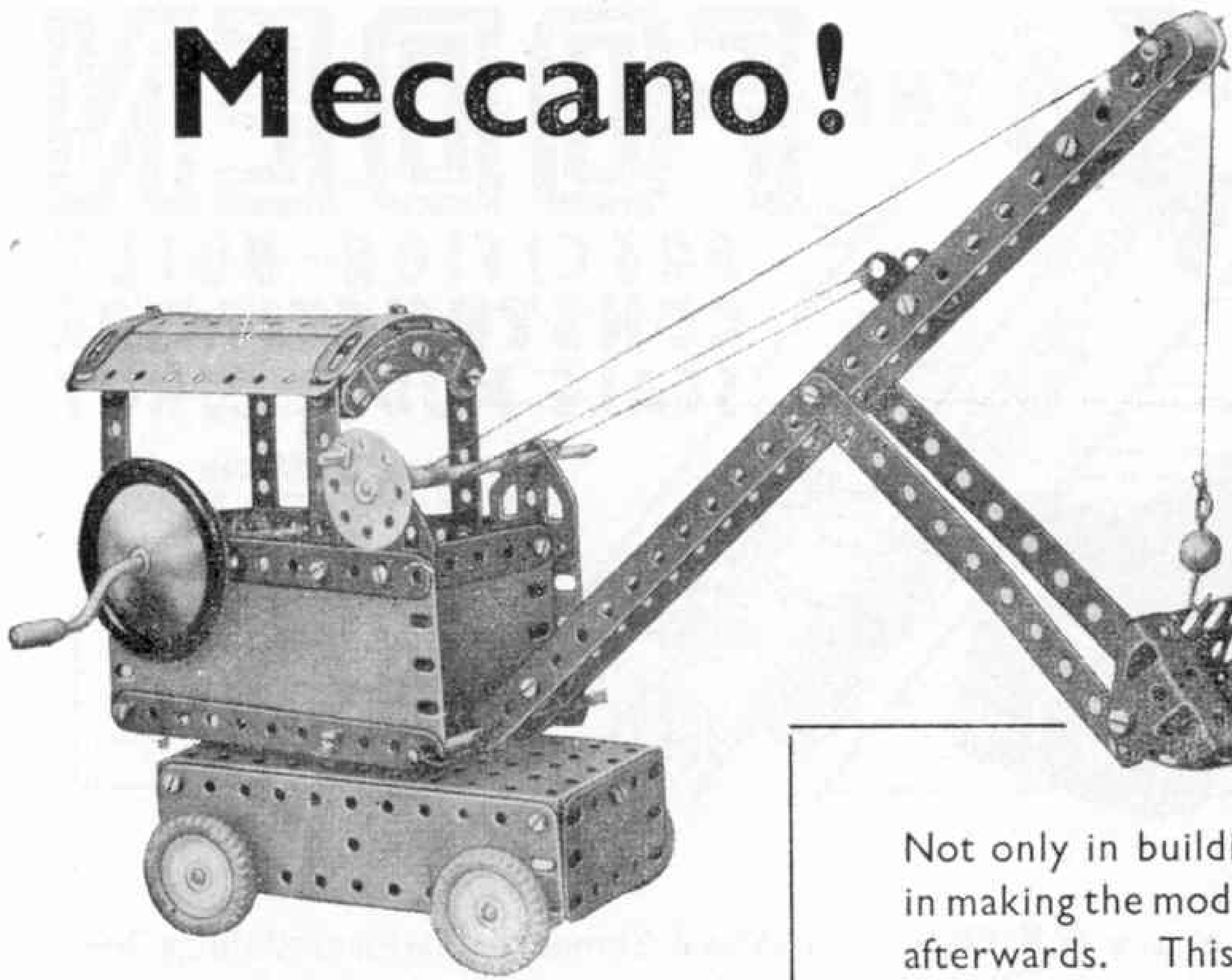

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Next Month: "JODRELL BANK RADIO TELESCOPE"

MECCANO MAGAZINE

Editorial Office:
Binns Road
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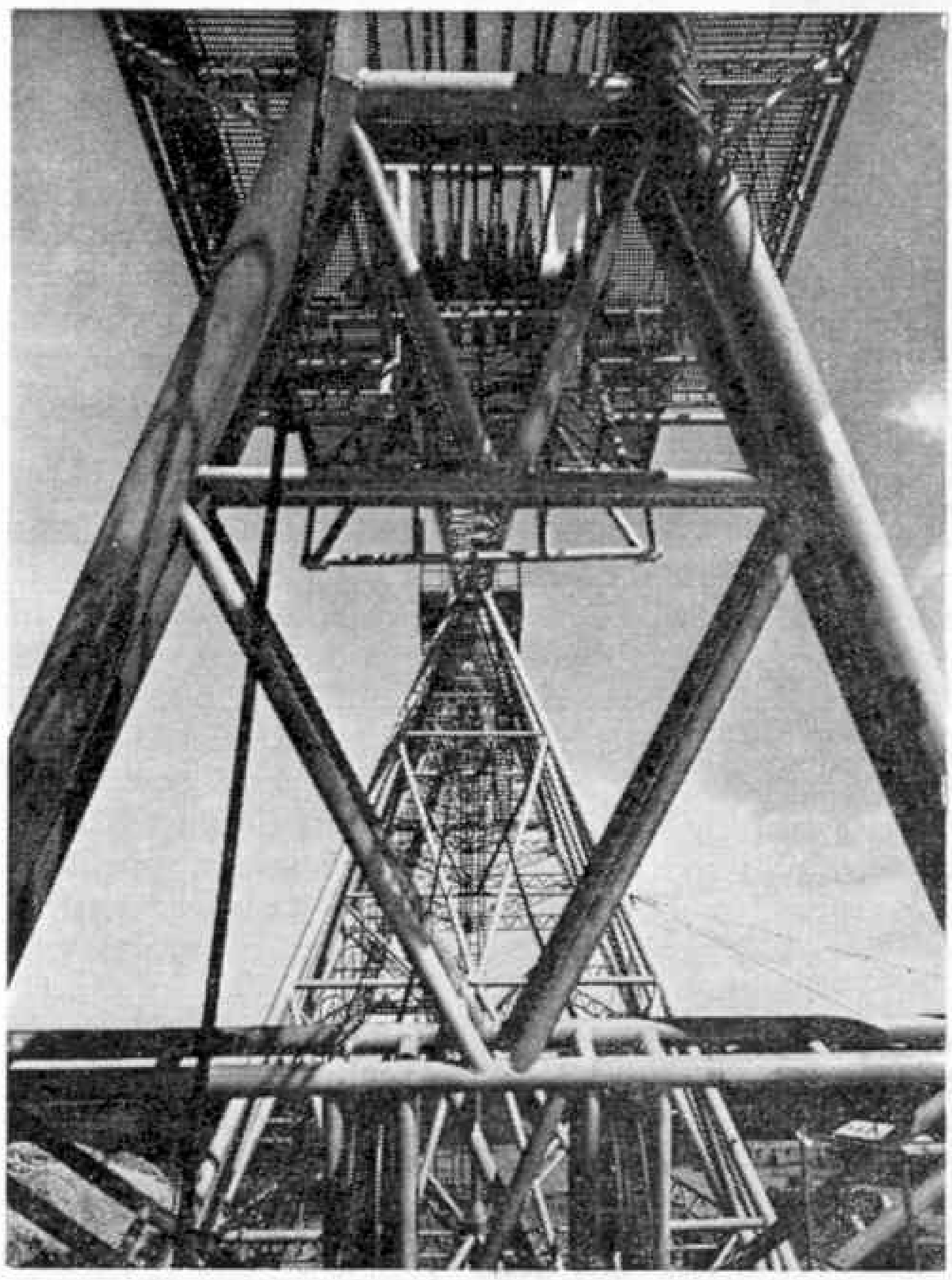
EDITOR : FRANK RILEY, B.Sc.

Vol. XLII
No. 10
October 1957

Drive in Anywhere

On page 488 of this issue there is a description, with pictures, of a drive-in cinema that has been erected at Port Elizabeth, in South Africa. Drive-in cinemas are common in America, where indeed more people see pictures in them than in the kind of picture house to which we in Great Britain are accustomed.



This striking pattern in the sky would make a good puzzle picture. It is a view looking upward along the jib of the largest walking dragline in the world. There are other pictures of the dragline on pages 484-5.

There are so many advantages in going to the pictures by car that it is not surprising to find that the idea is spreading to other parts of the world, and since the article was written I have learned of the opening of the first drive-in cinema built in Europe. This is near Rome. It can take 740 cars, arranged in rows on the usual ramps, 17 of them, and the screen is 125 ft. long and 50 ft. high. As in the drive-in cinema described in this issue, small loudspeakers to place in the car are provided, and visitors can listen to dialogue in Italian, English or certain other languages.

It might be thought that the climate would discourage the growth of drive-in cinemas in colder northern countries, but in this Italian open air picture house small electric heaters are available for each car, a plan that I believe has been followed in certain instances in the United States. This would be very helpful in colder climates.

The open air picture house is not the only place in the United States where motorists can "drive in." From their homes in the country, a very large proportion of those who live there drive down to town to their places of business, park their cars and drive back in the evening. They can "drive in" to do much of their shopping and even at golf many, if they wish, can ride round the course on small specially designed cars. And most of us board buses to go almost anywhere. Shall we one day forget how to walk?

The Editor

A Birmingham Guy bus in the city centre. For this illustration, and for the photograph on which our cover is based, we are indebted to the courtesy of Mr. W. H. Smith, M.Inst.T., General Manager, City of Birmingham Transport Department

Buses in Birmingham

The Story of a City's Transport

By The Editor

BIRMINGHAM made a very early start with buses, for as long ago as 1828 the city's first omnibus ran on its cobbled streets, drawn of course by horses. This was a year before the historical pioneer buses of Shillibeer astonished the citizens of London. Six years later a company known as the Omnibus Conveyance Company was formed, the first to operate passenger transport vehicles in Birmingham. It did not last very long, for privately owned buses also had been introduced, and its services were gradually withdrawn in face of their competition.

In 1868 another company was formed, with the name General Omnibus Company, and it ran a fleet of buses from the High Street to all suburbs. Again, private services proved too strong and the company soon went out of existence, but one result of the competition was a general improvement in road services that was of real benefit to the community.

Next tramcars were introduced, drawn by horses. The first of them appeared in 1872. In a sense this could be regarded as the beginning of Birmingham's city transport, for although the Corporation did not begin to operate its own vehicles until 1904, it had been given the power of constructing tramways within the city boundary, and it was on its tracks, leased to them, that the companies ran their vehicles. The Corporation not only provided the tracks but also maintained them.

Steam of course came into the picture, Birmingham's pioneer steam tram running for the first time in 1882 between the City Old Square and Aston. Yet another form of transport that was tried was the cable system. In this the tramcars were hauled by an endless cable laid in a duct beneath the tram track. A gripping device, that passed down through a slot in the middle of the track, could be fixed to the cable when the tramcar had to move and released when a stop was necessary.

Several authorities made use of cable tramways, the last of these to disappear being that of Edinburgh. The system was not altogether satisfactory, and in particular, a breakage in the underground cable could bring the whole service to a standstill. For this reason electric tramcars soon displaced the cable systems, but they in turn have now been almost completely displaced by the modern bus.

Birmingham has not been behind the times in bringing about this change, with the result that there is today a very fine and comprehensive service operated directly by the Transport Department of the Corporation. So there, as in other cities, the wheel has come full circle. The

original horse-drawn buses gave way to vehicles running on rails, and these in turn were displaced by buses, driven now by petrol or steam engines. The horse-drawn buses were all small vehicles, uncomfortably crowded and not too pleasant to ride in, for their wheels had iron tyres. The triumph of the modern bus, brought about by the advent of an ample and convenient source of power, is due to the increase in size and comfort thus made possible, to improvements in springing and to the development of the rubber tyre.

A Leyland Titan in Birmingham. Photograph by courtesy of Leyland Motors Ltd.

The first motor omnibuses in Birmingham were run in 1903 by the Birmingham Motor Express Company, which experimented with various types. One of these was a Thornycroft vehicle, the first motor bus made in Britain to run in Birmingham. In the following year the first municipally owned transport in Birmingham came into operation, and from that date steam lines were adapted for electric traction, with overhead wiring, a system that at first was regarded with great suspicion.

A Daimler bus passing Birmingham's Hall of Memory. Birmingham Transport Department photograph.

By 1913 there were 512 electric cars in the city, running over 105 miles of single track. It was in the same year that the Corporation began a service of Daimler buses to the Lickey Hills, the first idea of the use of vehicles of this kind being as extensions to existing tramway services. As the city spread outward, and the population gradually migrated to outer districts, new roads were constructed, and short distance travel on tramcars fell off. The obvious way of opening up the new areas was by means of the motor omnibus, for this could be done without the expense of track laying, and the buses themselves proved the more popular on routes on which both trams and buses ran.

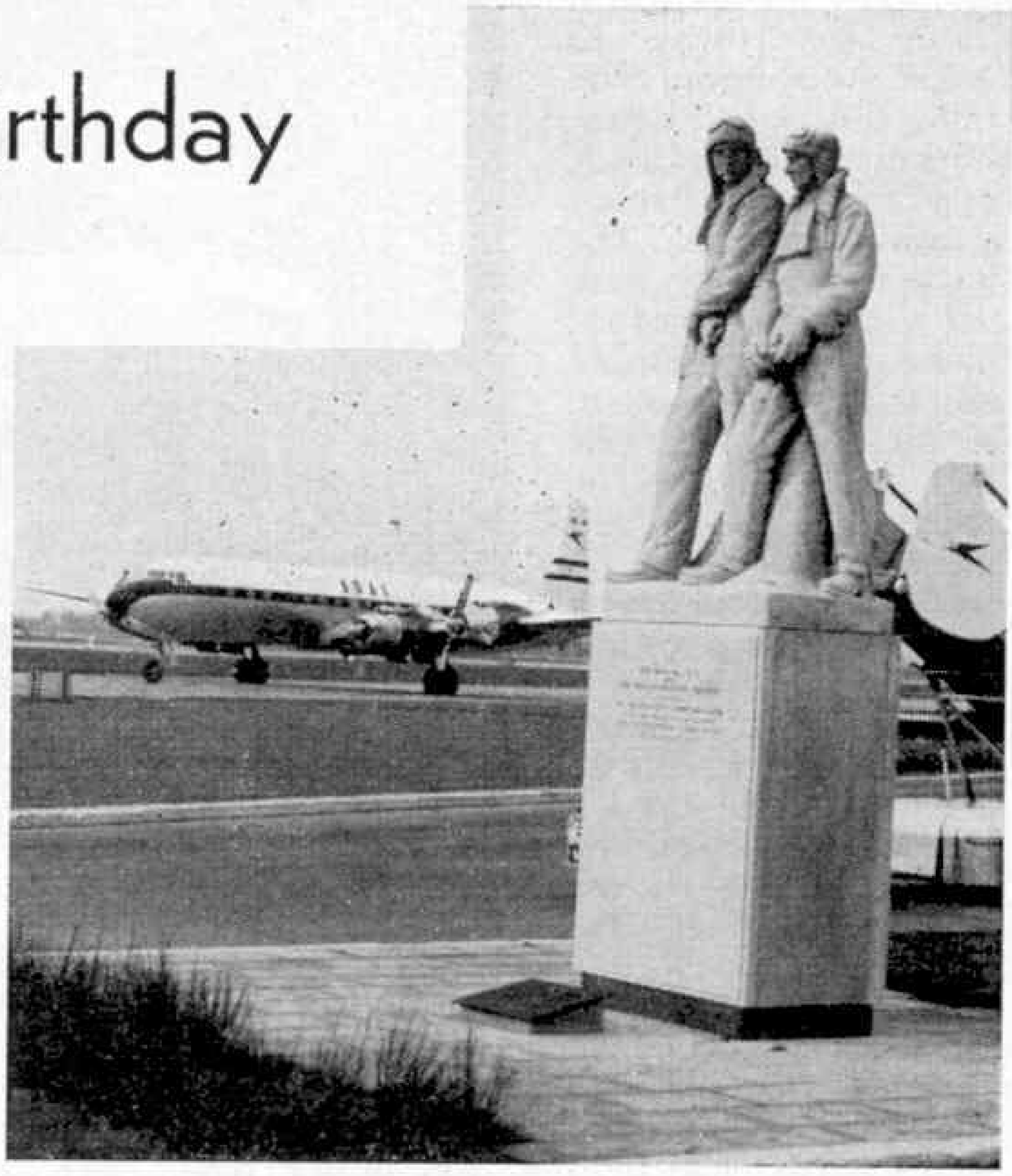
Trolley buses also were tried, and in 1922 one route was converted from tramcars. In 1934 trolley buses again replaced trams on the busy Coventry Road route. Finally, they were abandoned in favour of motor omnibuses in 1951.

This did not yet bring tramways development to an end, for many of the new routes constructed allowed the laying of a ballasted sleeper track

(Continued on page 526)

Transatlantic Birthday

By John W. R. Taylor



The memorial at London Airport to Alcock and Brown, who in June 1919 accomplished the first non-stop flight across the North Atlantic. One of B.O.A.C.'s new DC-7C's taxies past after flying from New York. B.O.A.C. photograph.

THIS year marks the twentieth birthday of the world's most important airline service, across the North Atlantic.

There were, of course, quite a number of transatlantic flights before 1937, beginning with the first crossing by an American Curtiss NC-4 flying boat in May 1919 and the first non-stop flight by Alcock and Brown in the following month. But it was not until the summer of 1937 that air liners had advanced to the stage where a transatlantic passenger service began to look possible.

At that time, the airlines of the world were very flying boat-minded. Indeed, our own national airline, Imperial Airways, had ordered a whole fleet of four-engined Short "C" class 'boats to operate on all its routes throughout the Empire. So it was natural enough that one of these should be chosen for the first experimental service from Britain to North America.

Simultaneously, Pan American Airways planned to make the crossing in the opposite direction with one of their Sikorsky *Clipper* flying boats; and the two aircraft took off on opposite sides of the formidable 2,000-mile ocean on 5th July 1937.

For Capt. Arthur Wilcockson of Imperial Airways the trip might well have seemed a somewhat hazardous adventure as he lifted the *Caledonia* off the waters of the river Shannon at two minutes to seven o'clock that evening. In fact, he regarded it almost as routine after 20 years of flying, and settled back in his seat quite unperturbed by the long journey that had cost the lives of so many of the earlier pioneers.

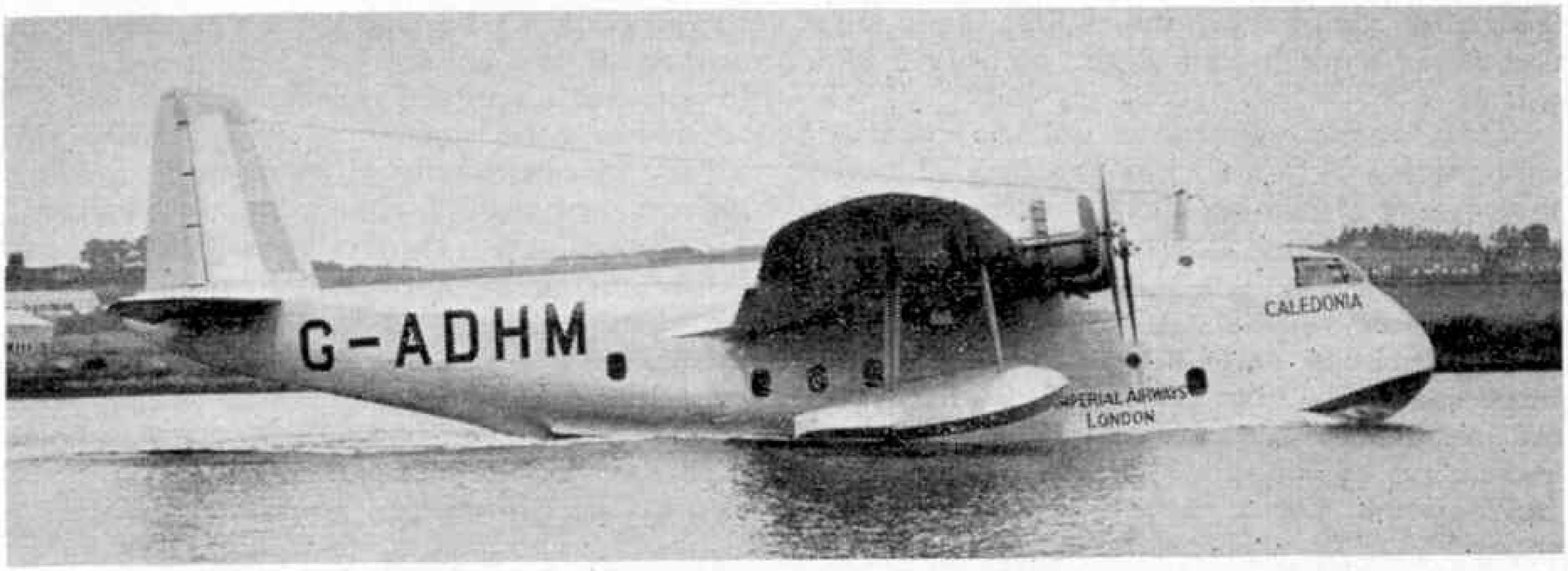
There was no radar to guide him then and the weather forecasts were seldom reliable, although on this occasion they were to prove remarkably accurate. He had a good crew, consisting of First Officer George Bowes in the co-pilot's seat to his right, and two radio operators, "Ginger" Hobbs and Tom Valette: and the promised headwinds were not too bad provided he kept down to a height of 1,000 ft. There was no question in those days of flying "above the weather".

Hour after hour they droned on, with only the steady beat of the four 910 h.p. Bristol Pegasus engines and the crackling radio to keep them company.

Their American colleagues were more fortunate. Capt. Harold Gray had a crew of six in the Pan American *Clipper III*, including a steward, and was able to dine on celery, olives, soup, salad, grilled steak, strawberries and cream, iced tea and coffee as he flew eastward at 10,000 ft. in the clear Arctic twilight, helped by a 30 m.p.h. tailwind.

Down below, in rain, darkness and a 20 m.p.h. headwind, the four British airmen had only sandwiches, coffee in vacuum flasks and a cake. However, it was quite a nice cake, baked specially in honour of the occasion by First Officer Bowes' mother, and soon the control wheel, maps and morse key were all sticky with icing.

At 4.15 a.m. on the 6th, the two flying boats passed each other, some 60 miles apart, and exchanged radio greetings. The radio officers of ships over which they



Imperial Airways' 4-engined Short 'C' class flying boat "Caledonia" was used for the first experimental air service from Britain to North America, in July 1937. Illustration by courtesy of "The Aeroplane."

flew also enjoyed the thrill of passing a navigation check to the men in the air above them. But for most of the time the sky seemed a lonely place that night, and the coast of Newfoundland must have looked especially beautiful when it rose from the sea ahead in fine weather, unshrouded by the traditional fog-banks.

Caledonia touched down at Botwood, Newfoundland, at 10.08 a.m., having averaged 132 m.p.h. for the flight of over 15 hours. The older and slower *Clipper III*, helped by its tailwind, averaged 156 m.p.h. in the opposite direction.

The newspapers were wild with excitement at the success of the experiment. But progress in the air must be gradual, and it was two more years before the first airline passengers flew the North Atlantic—except by airship—and then the war prevented operation of regular services by Imperial Airways and its successor, B.O.A.C., for six years.

Yet it was the war more than anything else that made possible the rapid build-up of transatlantic flying from 1946 onwards. Air liners like the Constellation and DC-4 were developed as military transports. Many of the great international airfields, including our own London Airport, started out as military bases. Radio, radar and navigation systems of unprecedented efficiency and reliability were perfected for war and then made available to improve the safety and regularity of the airlines. Above all, the wartime Atlantic Ferry service proved conclusively that there was no reason why regular schedules should not be maintained over the Atlantic throughout the year. And, in fact, the transatlantic route has proved to be the safest of all the world's long-range airways.

At first, the air liners used for passenger services had to hop in easy stages from London to Montreal and New York via Prestwick in Scotland, Reykjavik in Iceland and Gander in Newfoundland. But gradually newer types with longer ranges have entered service, until the DC-7C's and Starliners of today are able to fly direct between New York and West European capitals. What is more, the DC-7C can whisk its load of up to 77 passengers over the 3,490 miles between New York and London in only 13¼ hours,

Bristol Britannia 312 turboprop air liner of the type which B.O.A.C. plan to use on transatlantic service. Illustration by courtesy of Bristol Aeroplane Co. Ltd.

which is about two hours less than the *Caledonia* took for its flight of only 1,993 miles.

Even quicker journeys will be possible soon, when B.O.A.C. put the first of their long-range Britannia 312's on the Atlantic run, because these fine turboprop air liners will cruise at 390 m.p.h. carrying almost 100 passengers.

The airlines certainly need aircraft as large as this, because the number of transatlantic air travellers has been increasing by leaps and bounds since May 1952, when the airlines first introduced cheap tourist class fares. At that time, there were 33 flights a day between Europe and North America; now the average is 60 a day by aircraft from 13 different major airlines, not counting all the charter flights by independent companies.

In the first five years of tourist travel, up to the end of last April, well over two million passengers flew tourist over the Atlantic, while a further one million travelled first class. And we can expect an even bigger jump in 1958, because still-cheaper "thrift" class fares are due to be introduced by the airlines next April. These will be 20 per cent. cheaper than even a tourist ticket and only some £20 more than a tourist class fare by boat.

The terrific increase in the number of services over the North Atlantic has brought some serious air traffic control problems, especially as most airlines want to start their flights at about the same time—usually late in the evening so that passengers can sleep through as much as possible of the rather boring journey. They also want to fly at much the same height and speed, because the big piston-engined transports now in use consume less fuel and give their passengers a smoother ride if they can cruise at around 18,000 ft.

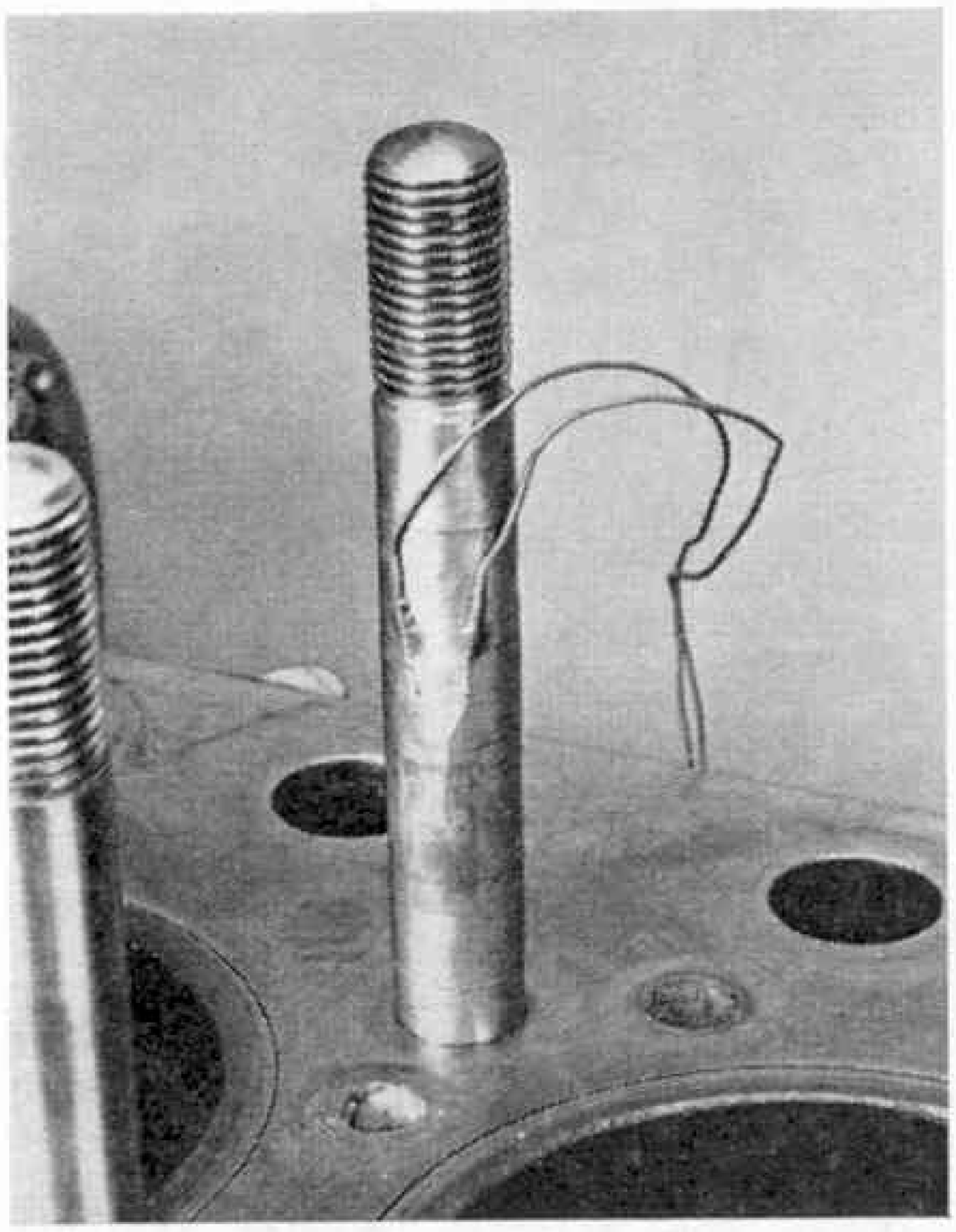
Britain is making a contribution to safety with the Dectra navigation system that is now being tested out over the route, and which shows the pilot of an air liner his position continuously on a moving map in the cockpit, by picking up signals from automatic radar stations on the ground in Britain and Newfoundland.

Fortunately not all aircraft follow the same old routes any longer, because some airlines are saving time on long journeys by flying the shortest-possible "Great Circle" routes between Europe, North America and the Far East over the Arctic Circle. Pioneers of Polar flying were Scandinavian Airlines System (SAS), who opened at the end of 1954 what has been described as the first new route since aircraft were invented. Linking Copenhagen and Los Angeles, by way of Greenland and Winnipeg, it involves flying a total of only 4,630 miles, compared with 6,400 miles on the normal airline route, via New York.

An artist's impression of the Boeing 707 Intercontinental jet-liner in Pan American World Airways dress. Illustration by courtesy of Boeing Airplane Company, U.S.A.

An even more remarkable route has since been opened by SAS, following the delivery of their DC-7C's. Linking Copenhagen with Tokyo, it includes an incredibly beautiful and interesting non-stop flight of no less than 4,510 miles between Copenhagen and Anchorage, Alaska, over the very roof of the world.

Such a journey seems wonderful even in this air age, but there are greater wonders to come. Only two years from now, the first of the great Boeing 707 Intercontinental and Douglas DC-8 jet-liners will be in airline service. With seats for 150 passengers and with some 19,000 gallons of fuel in their tanks, they will link London and New York in about 6½ hrs. at almost 600 m.p.h. Passengers leaving London at six o'clock in the evening will disembark at seven-thirty New York time—90 min. later by the clock and in good time for dinner.



The picture above shows an electrical resistance strain gauge attached to one of the studs that hold down the cylinder head of a diesel engine. Photograph by courtesy of Leyland Motors Ltd.

Looking Inside Diesel Engines

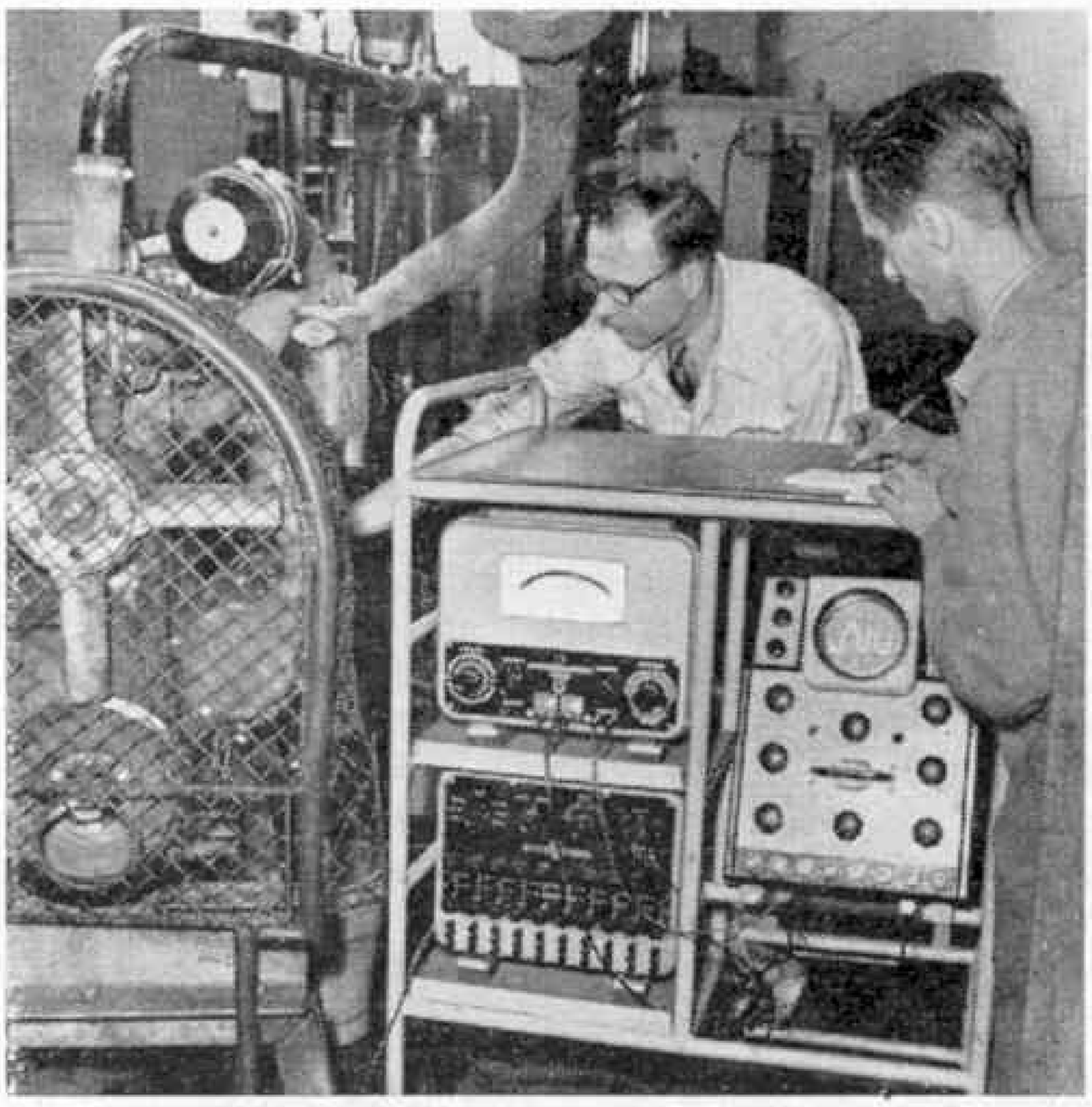
By The Editor

NOT long ago the only way to find out how the parts within a diesel engine were standing up to their work was to dismantle the engine after a run and examine them. But today designers can watch the stresses and strains taking place within an engine while it is at full load.

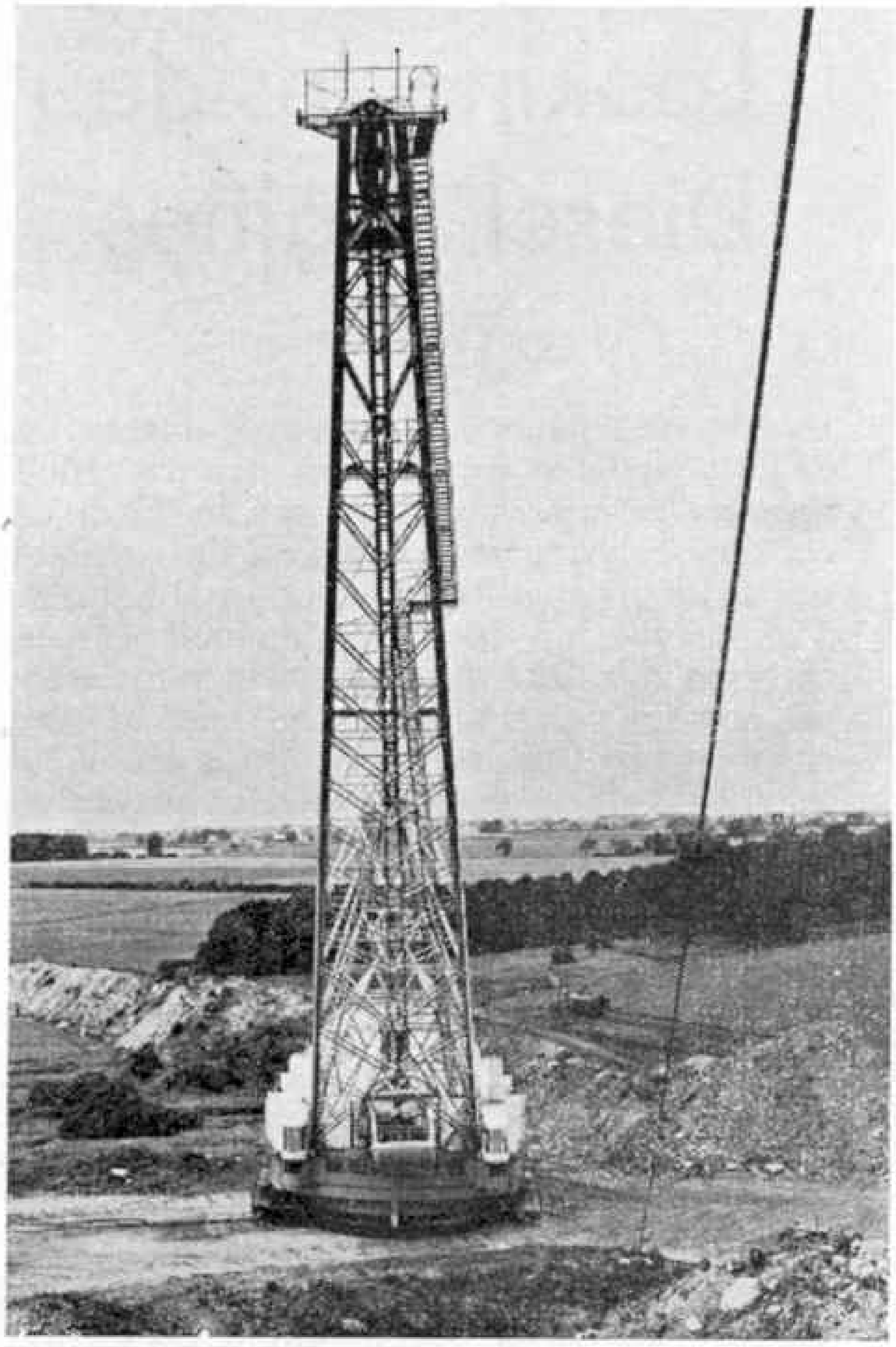
To do this use is made of what is called an electrical resistance strain gauge. You can see one of them in the illustration at the head of the page. It consists only of loops of fine wire, about a thousandth of an inch in diameter. This is cemented on to the component to be tested and connected by wiring to the source of current and to measuring instruments. Any strain that causes the component to stretch or contract in working conditions also stretches or contracts the fine wires. This alters their electrical resistance, and it is the variations of this resistance that reveal the stresses and strains of the components.

The electrical resistance strain gauge is not new in principle, but is now finding many novel uses, such as this application to diesel engine design by the research engineers of Leyland Motors Ltd. The electrical variations that reveal what is happening inside an engine while it is running are recorded for the engineers to see in the form of continuously moving curves on the cathode ray tube of what is called an oscillograph. The curves are seen on the end of the cathode ray tube in much the same way as are the pictures on the end of the cathode ray tube of a television set. The heights of the curves represent the strains to which the components are subjected.

In a test the strain gauges are attached to the internal working parts so that they can record the strains on main and big end bolts, crank case ribs, push rods and the bolts holding down the cylinder head, and even the rate of flow of water through the cylinder jackets. The necessary wires are led in by various means. Normally a total of 10 strain gauges can be used at the same time, and a contact switch arrangement allows the stresses to be picked up from each individual strain gauge as required.



A test in progress with an engine running at full load. The curve on the screen on the left of the instrumental equipment tells the research engineers how parts in the engine are behaving.



The great jib of the largest walking dragline in the world. It towers 175 ft. above ground level. Photographs by courtesy of the United Steel Companies Ltd.

An Excavator That Walks

by

The Editor

THE machine seen in the pictures on these two pages is digging out the material that covers an enormous mass of iron ore at Exton Park, near Stamford in Lincolnshire. This covering is of varying thickness, from 20 to 90 ft., and up to 1,800 tons of it is shifted every hour. The iron ore uncovered is then mined by excavators, which load it into wagons to be taken by rail to the works of the Appleby-Frodingham Steel Company in Scunthorpe, 75 miles to the north. Every week about 10,000 tons of the ore is brought out, and so vast is the quantity that it will be something like 30 years before the mine is worked out.

The machine is a dragline, which means that its bucket is swung out to the point where it is to pick up the overburden and is dragged towards the main body of the machine to fill it. It is then lifted up and swung round to the point where it is to discharge its contents. And it is called a walking dragline because it moves, not on wheels, but on huge shoes, or feet, connected to the body of the machine, that are lifted and put down on the ground in a ponderous action that resembles the walk of some huge monster. This it does backward, but more of that later. Let us look first at the machine itself.

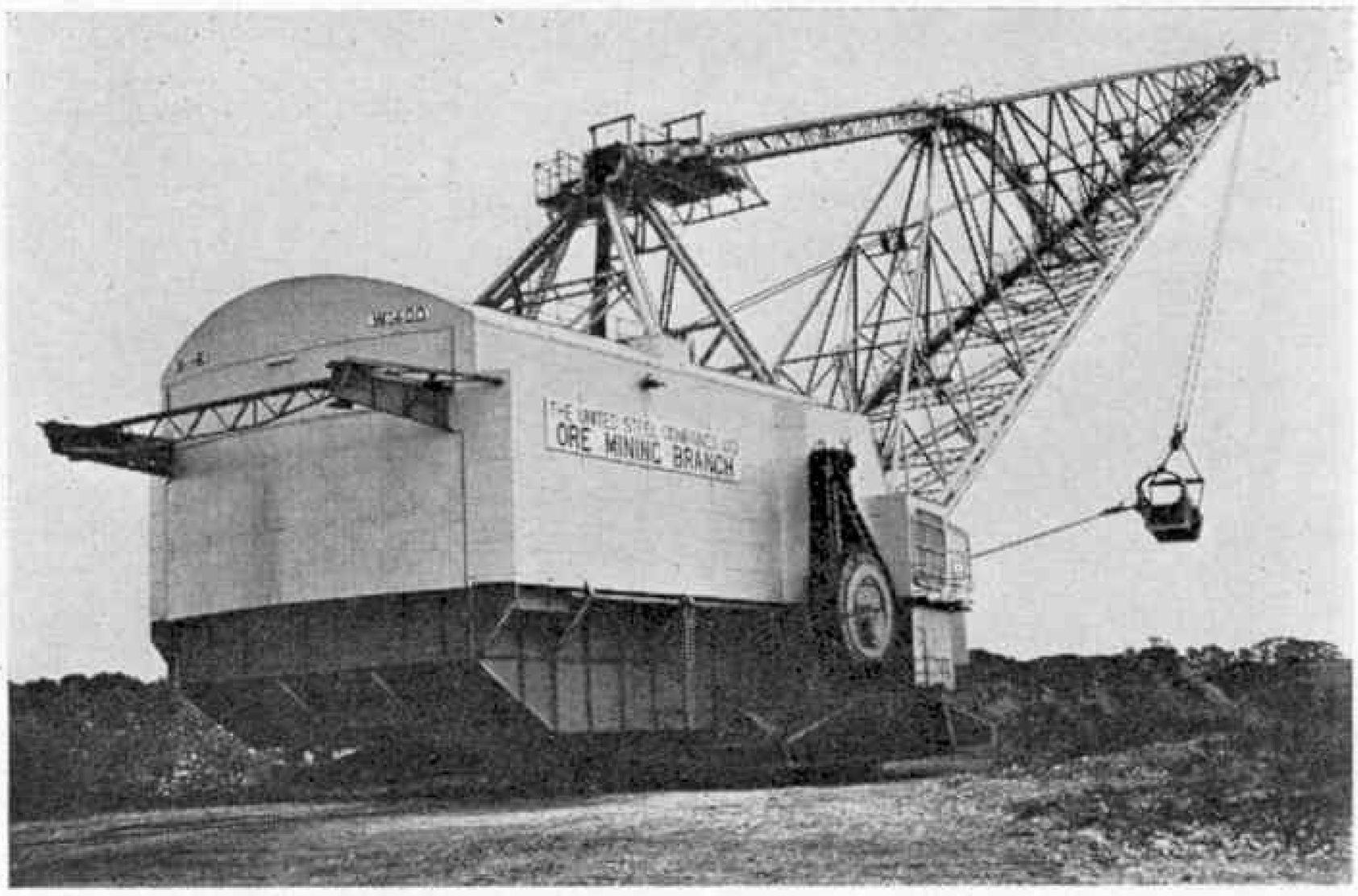
A mere glance at the pictures suggest the enormous size of this walking dragline, and it is indeed claimed to be the largest of its kind in the world. It is the RapieR W1400 Walking Dragline, designed and constructed by Ransomes and Rapier Ltd., Ipswich, for the United Steel Companies Limited, the Ore Mining Branch of which works the Exton Park ironstone mines. It is so big that it could only be built up on the site.

Some of the details of the size of the dragline seem rather startling. To begin with, the head of the jib in its highest working position is 175 ft. above the ground, higher than Nelson's Column. The jib indeed is 282 ft. long, and the overall length of the machine, when it is spread out, from the jib head to the back of the superstructure, is longer than that of a football pitch. This seems impressive, but when we turn to the superstructure which in the picture on this page seems to be only a comparatively small part of the dragline, we find that the motor room in it is as large as two tennis courts. The whole thing weighs 1,675 tons, which is only 35 tons less than that of a British destroyer of the "Zambesi" class; and if this weight of steel were reduced to wire $\frac{1}{16}$ in. in diameter, there would be enough of it to go round the Earth three times!

The electrical equipment of the machine could supply light and power for a town with a population of 25,000. It takes alternating current from the mains supply at 6,600v. through a trailing cable, and this is fed to two 1,500 h.p. motor generator sets, which in turn supply direct current to the 14 main driving motors, each of

which is of 225 h.p. These motors provide for every possible movement of the machine itself and of the jib. With the necessary controls they are housed in the spacious motor room already mentioned, which is serviced by a 25-ton overhead crane.

The bucket alone weighs 22 tons and is big enough to accommodate an ordinary saloon car. It can lift 30 tons of overburden at each bite, and in spite of its immense weight, and the size of the machine generally, the whole of its movement, consisting of the filling of the bucket, swinging it round to the point where it is to deliver the material it has dug up and returning it to the digging position, takes only a minute or so.

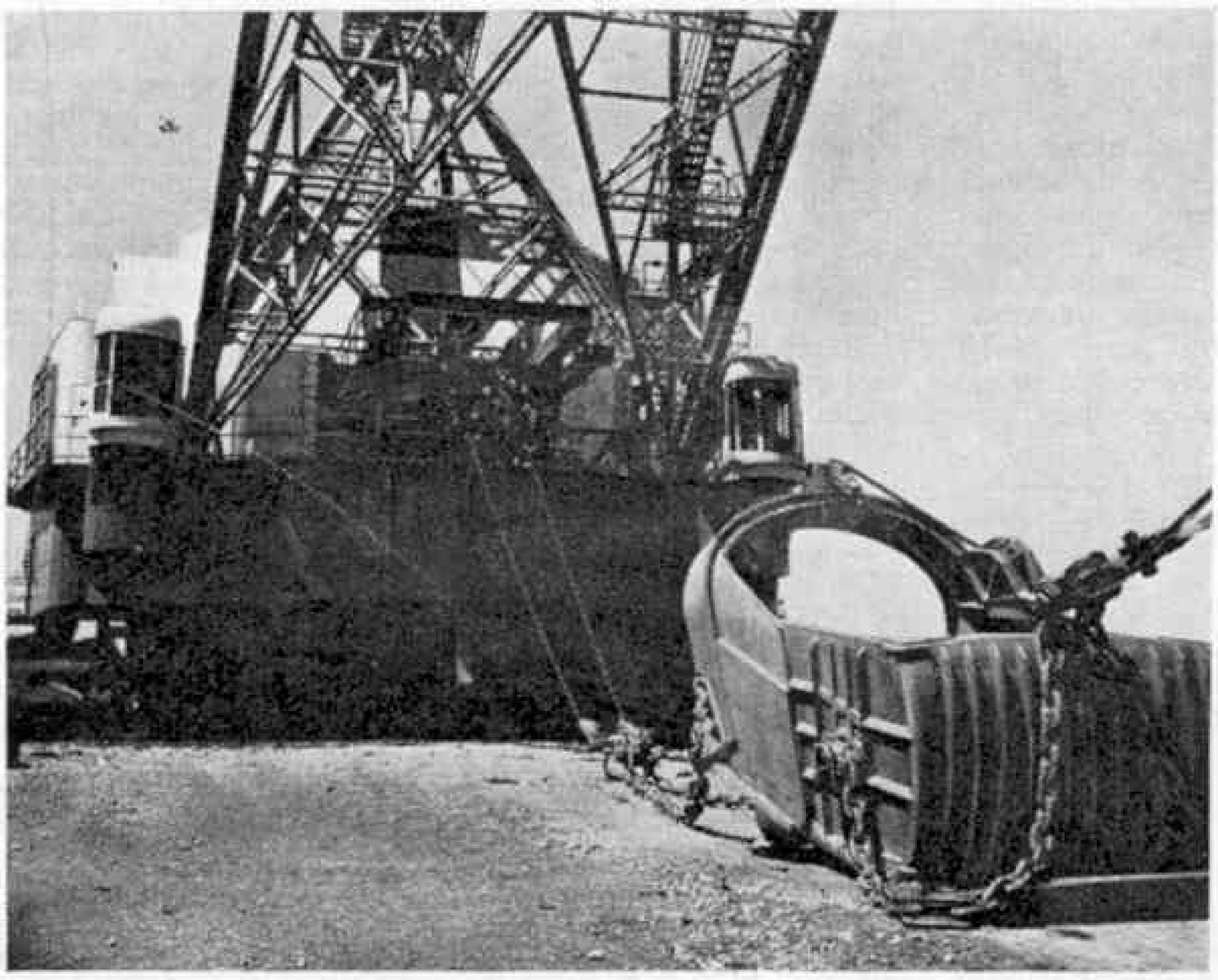


The dragline in action. It can shift its own weight of material in an hour, dumping it up to 260 ft. away, at any height up to 120 ft.

Now to see how the machine "walks." Each of its two walking shoes, one of which can be seen in the upper illustration on this page, is 48 ft. long and 9 ft. 6 in. wide, and they are carried on vertical "legs" that are driven by eccentrics. When these are rotated by their driving shafts the shoes are lowered to the ground, and as the eccentrics continue to turn the machine itself is lifted. The weight is so distributed throughout the dragline that it is tilted, the front end continuing on the ground, with the result that the machine slides backwards as the movement is completed. Each stride is 6 ft. 10½ in. long.

The superstructure rotates on its base, which is a giant roller bearing, the main roller path measuring 48 ft. across. This roller path carries a live ring of 120 tapered rollers, on which the superstructure turns, driven through a rotating rack that has 208 huge teeth on its circumference.

There are two driving cabins, one on each side, and both are well forward so that the driver has good vision for the work in hand from one or other of them. He sits in armchair comfort with all the controls mounted in a unit beside him. He has the advantage too of air conditioning, for the whole of the superstructure house is pressurised by means of air filtering and fan equipment. This provides plenty of air for cooling the electrical equipment and keeps out dust.



In front of the huge dragline is its enormous bucket, which picks up 30 tons of spoil at a time.

No. 34005 "Barnstaple," the first of the West Country class locomotives to be modified. The nameplate and coat-of-arms are strikingly displayed. British Railways Official photograph.

Railway Notes

By R. A. H. Weight

The "Inter-City" and "Cheltenham Spa" Expresses

These excellent W.R. named trains run outward in the morning, returning in early evening. The *Inter-City* from Paddington to Birmingham and Wolverhampton calls at High Wycombe for long distance passengers, and in the southbound direction only at Leamington Spa also. The *Cheltenham Spa* runs from that town through Gloucester, Stroud and Kemble to London and back.

In a run on a fine summer evening the *Inter-City* had been delayed near West Bromwich owing to another train ahead being late, but every effort was made to regain time. The almost spotless 4-cylinder 4–6–0 No. 5022 *Wigmore Castle* was at the head of 10 smart chocolate and cream painted coaches, weighing about 360 tons including passengers, etc. After leaving Leamington speed over the undulating gradients varied between 48 and 70 m.p.h. during the 60¾ miles run to High Wycombe, covered in 71 mins. compared with 75 booked, and allowing for a long slowing past Banbury yards and station, where large scale reconstruction works are in hand, and also for a severe slack at Ardley, where new tracks were being laid. Full speed running had been resumed over Souldern Viaduct after completion of restoration work I mentioned last year.

Following a stop of barely a minute to set down at High Wycombe, where there are sharp curves and then a speed restriction on the rise towards Beaconsfield, a rapid descent ensued into the London suburbs, with an 85 m.p.h. maximum near Denham. The main West of England tracks were joined at Old Oak, near the big locomotive and carriage depots, and with all signals clear we reached Paddington only a little behind time, about 8 min. being made up. The *Inter-City*, the *Royal Duchy* from Penzance due at the same time, 7.15 p.m., and the 7.20 South Wales express all arrived within a few minutes, each hauled by a Castle.

Complete with a large headboard as carried on the main line engine of that and other named trains, 2–6–2T No. 4141 brought in the 9-coach *Cheltenham Spa Express*, to be succeeded at the other end by No. 5018, *St. Mawes Castle* for the 8.15 a.m. start from Gloucester (Central), where I joined the train and reversal takes place. The two adjacent W.R. and L.M.R. stations there present an interesting and rather complicated network of tracks and junctions. For more than 7 miles the route parallels the Midland Bristol main line, and then it climbs through a pretty Cotswold valley and up to Sapperton Tunnel, where the minimum on a 1 in 60–90 grade was 29 m.p.h. There were two crawls past bridges under reconstruction. Many passengers joined at Stonehouse, Stroud and Kemble.

From the last named country junction we were away to time on a non-stop run timed at 60 m.p.h. over the 91 miles to Paddington. It was damp and drizzling. There were two track repair slowings before we ran gently round the curve passing parts of the famous Works and the Locomotive Shed at Swindon and so on to the main line through the station.

There were now less than 73 mins. left to cover the 77¼ miles over an almost perfect course, with practically no adverse gradient. Having passed the 70 m.p.h. mark, we were unfortunately brought almost to a stand by signals at Uffington. Thereafter our Castle blazed away, averaging 72 for 40 miles through Didcot, Reading, Slough, with a maximum of 77 on the level. There was a signal check at West Drayton, but a fast finish took us into Paddington only 2 min. late. Allowing for some 8½ min. delays, this was equivalent to a 64 m.p.h. unchecked average all the way from Kemble.

New Structures and Rolling Stock

A fine new passenger hall, with railway station and freight handling facilities of comprehensive type, has been installed in the recently enlarged section of Tilbury Docks, where the largest liners using the port of London are berthed.

On the L.M.R., Oldham (Mumps) Station has been rebuilt and entirely modernised, among others. Greatly improved facilities are being provided at Trafford Park Motive Power Depot, Manchester, where 73 locomotives are allocated, mainly for former Midland and Cheshire Lines service. There is a staff of 346.

Contracts have been placed with well known building firms for 69 1st and 2nd class sleeping cars of B.R. standard design; 150 ballast wagons of the side-tipping, 14-ton type; 400 4-ton containers with end and side doors which, loaded with goods, can be conveyed on railway or road wagons or lorries; and many specialised freight vehicles and passenger cars and carriages.

Locomotives in the News

New engines have been completed and allocated as follows: class 9 2–10–0 Nos. 92136–9, 21A, Saltley and Nos. 92140–4, 35A, Peterborough; and class 5 4–6–0 No. 73154, 65B, St. Rollox, Glasgow. No. 73154 was

the last steam locomotive to be built at Derby, completing the series having Caprotti valve gear. Class 4 2–6–0s Nos. 76091–2 go to 67A, Corkerhill; and Nos. 76102–3, 65c, Parkhead. The last two are Glasgow sheds. No. 76104 is allocated to 61A, Kittybrewster.

Diesel-electric 0–6–0 shunting type Nos. 13125–6 are allocated to 18A, Toton; Nos. 13355–6, D3357–61, to 87F Llanelly; Nos. D3367–70 to 10A, Wigan (Springs Branch); and Nos. D3459–66 to 73C, Hither Green, with more following.

Among locomotives lately withdrawn for scrapping were ex-G.E.R. 4–4–0 No. 62546 *Claud Hamilton;* eight W.R. outside-framed 9000 class 4–4–0s, several of which I saw at Swindon awaiting their fate in August; and No. 56350, of the still numerous ex-Caledonian Railway 0–6–0 shunting tank class 3F, Sc.R.

One of the oldest W.R. Castles, No. 4074 *Caldicot Castle*, was noted to have been modified with double chimney and extended smoke-box.

More A4 streamlined Pacifics now have double chimneys. During the busy season Clan class standard light Pacifics have rather exceptionally been at St. Pancras, Euston, Blackpool and York.

Speedier Eastern Region Services

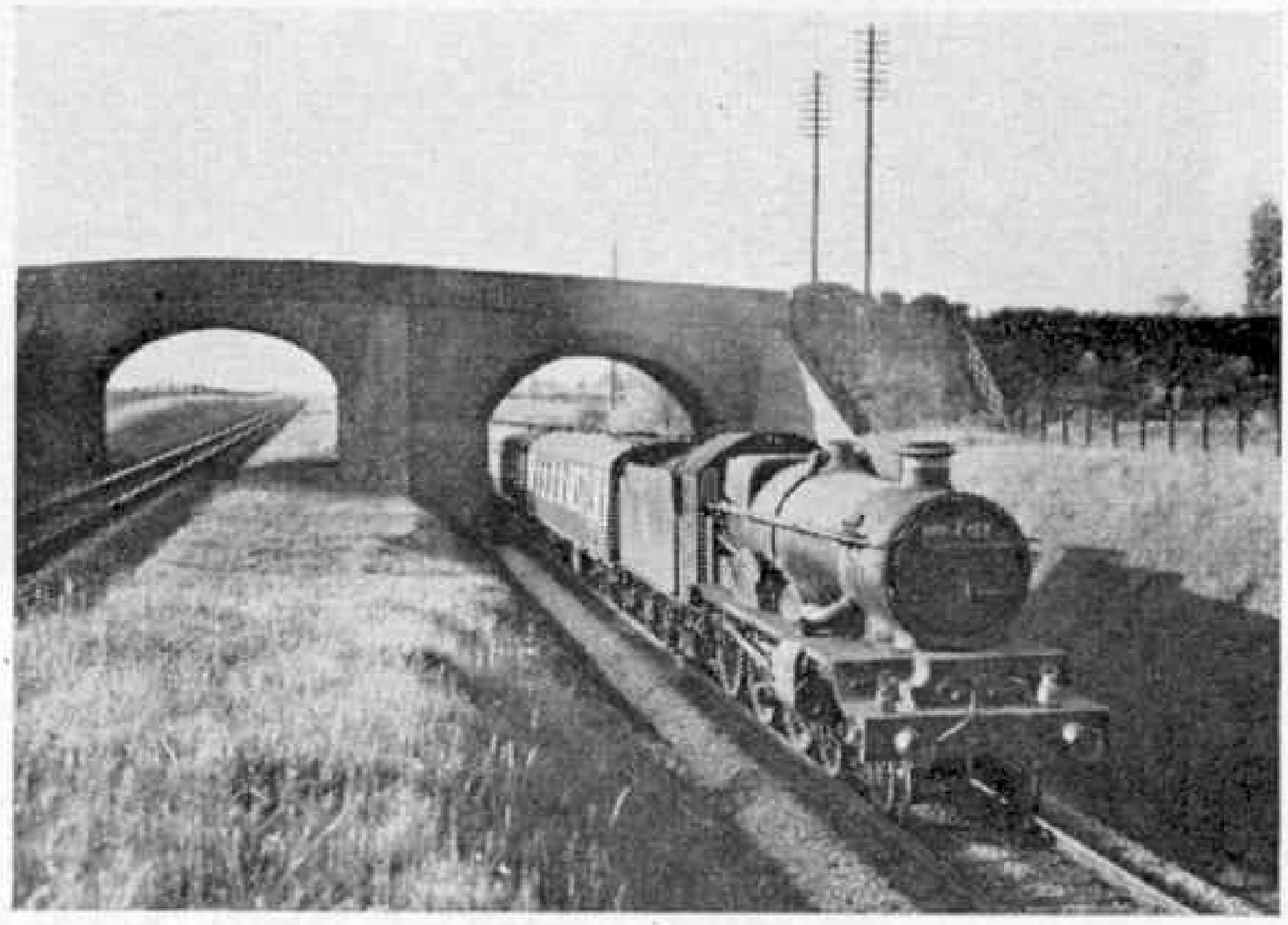
On 16th September last considerable changes were made in services on the East Coast route from King's Cross to the North of England and Scotland.

A new train, *The Fair Maid*, replaces the morning *Talisman* and, for the first time, provides an early morning service in both directions on Mondays to Fridays between London and Perth, calling at Darlington, Newcastle and Edinburgh. The new train is timed to run the first 232 miles of its journey from King's Cross to Darlington at an average speed of 60 m.p.h.

The principal expresses, running with lighter loads, now run faster. Many intermediate stops have been cut out and additional trains run to serve intermediate passengers. The revision provides a more orderly timetable, with better use of engines, coaches and train crews.

Notable changes are reductions of timing of 37 min. for the down *Flying Scotsman* and of 39 min. in the opposite direction. *The Aberdonian* sleeping car train will leave King's Cross at 10.15 p.m. instead of 7.0 p.m., and has been accelerated by 92 min., while the corresponding train from Aberdeen now leaves that city at 8.35 and its running time has been reduced by 85 min. The 1.20 p.m. King's Cross to Leeds has been speeded up by 42 min. and the 10.45 p.m. train by 35 minutes.

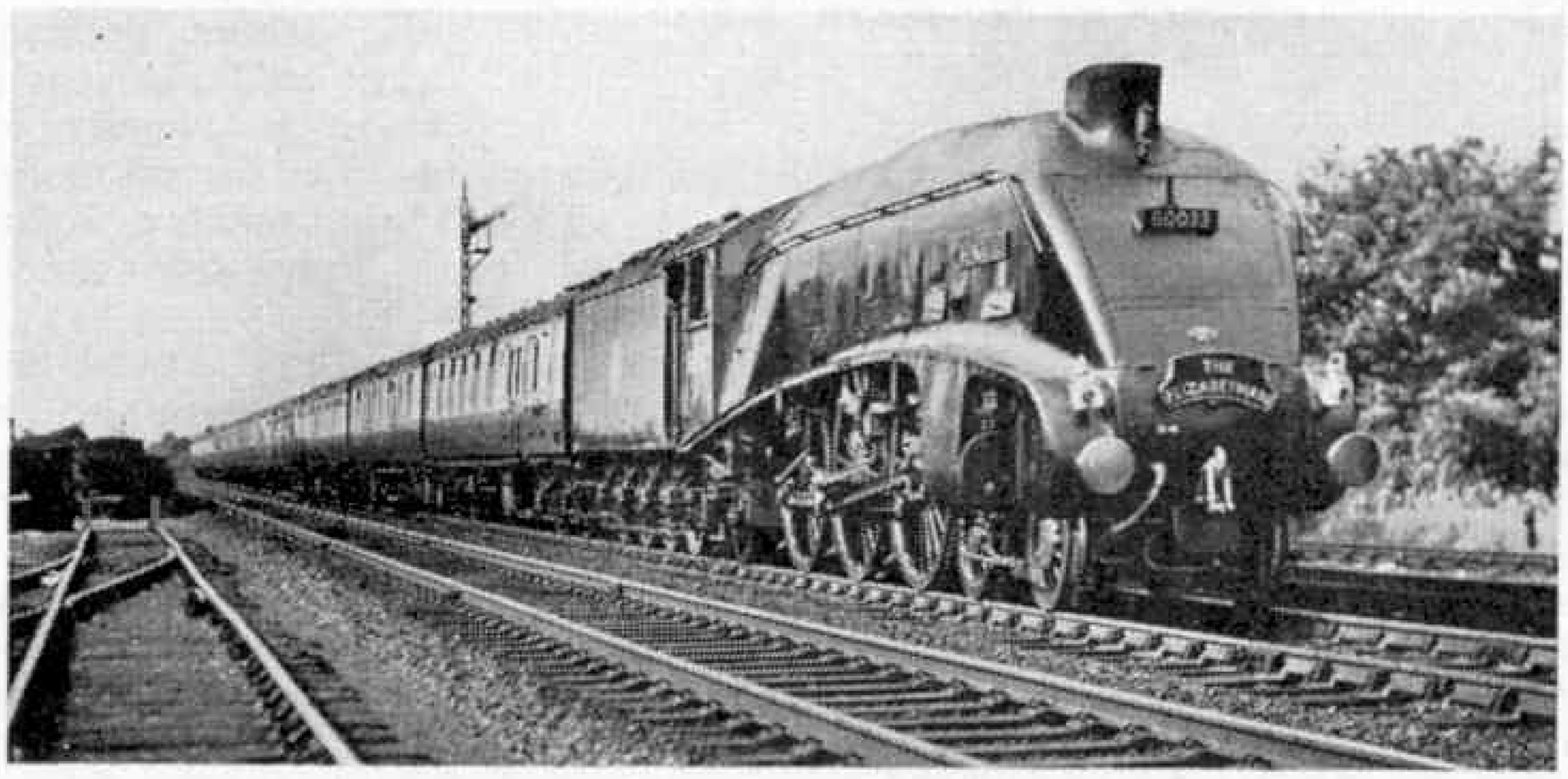
Meanwhile during the summer, with its numerous additional holiday trains, the *Elizabethan* making the world-record Monday-Friday 393-mile run without stop 'twixt London and Edinburgh has often been hauled by A4s *Mallard* and *Commonwealth of Australia*, from King's Cross and Haymarket sheds respectively. On a very busy August Saturday when the intensive summer service first introduced in 1956 with almost regular-interval departures from King's Cross was again in operation, timekeeping was remarkably good in each direction.



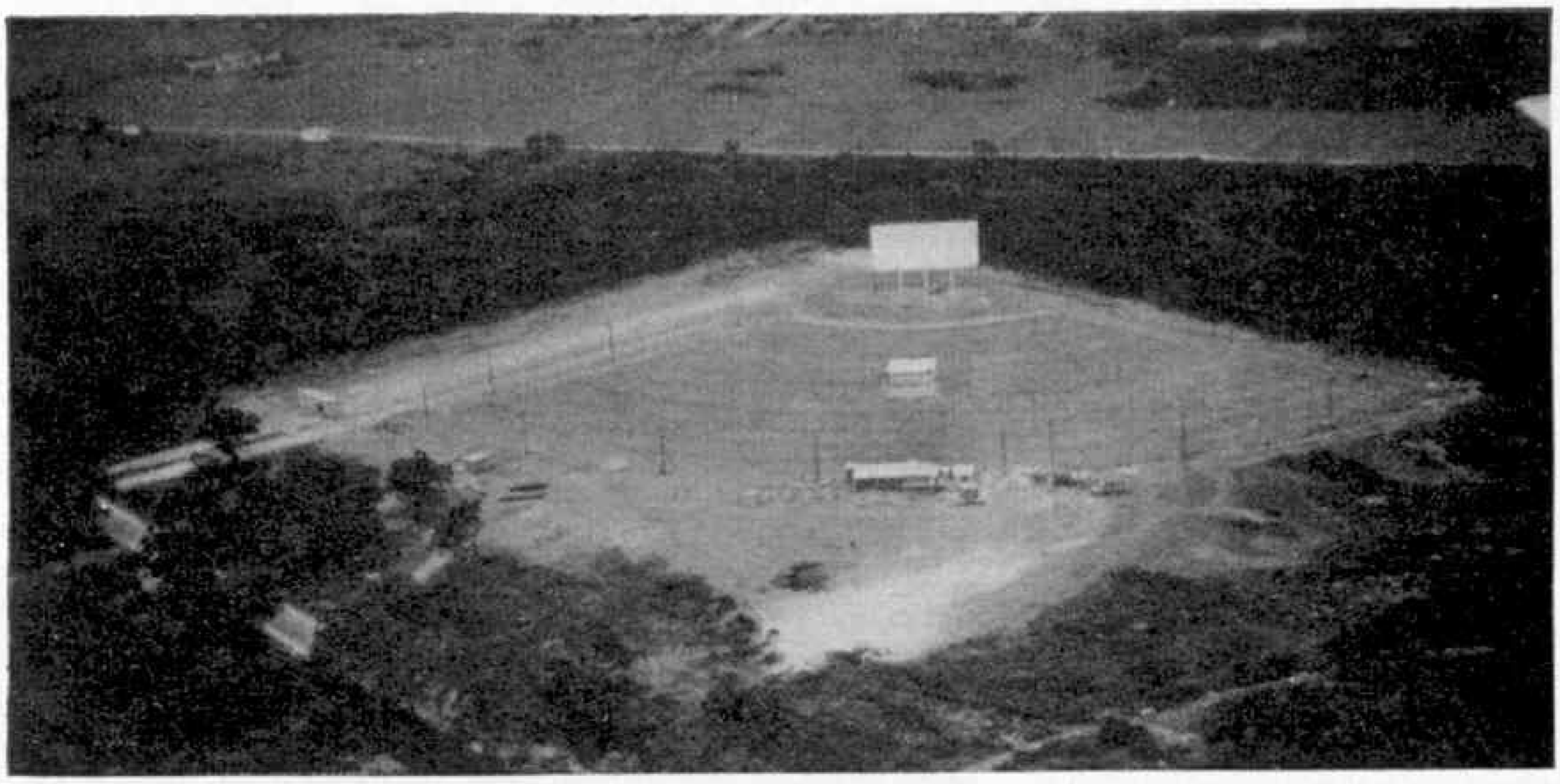
The up "Inter-City" near Saunderton Summit, headed by No. 5008 "Raglan Castle." Apparently the special nameboard was not available on this occasion when the train was photographed by C. R. L. Coles.

During about 6½ hrs. observation and recording mainly at Welwyn Garden City, 20¼ miles from King's Cross, I noted 28 different Pacifics comprising 11 of the latest A1 type; one A2 with smaller driving wheels; 8 of the oldest A3 series still handling many of the fast and principal duties ably; 8 of the famous streamlined A4s. Their trains included the *Flying Scotsman, Yorkshire Pullman, Heart of Midlothian, Northumbrian, Aberdonian*, as well as unnamed Newcastle, Leeds and Bradford, Filey and Hull expresses.

On a number of these trains, and also on the *Scarborough Flyer* and *Norseman* southbound, were no less than 18 different V2 2–6–2s. It was nice to see a few more of them painted green. Then there were nine B1 4–6–0s, two taking 12 corridors on Grimsby line fast trains, some running to Broad Street, London, and two going back north light; a "Sandringham" B17 from Cambridge; an L1 2–6–4T on a Cambridge buffet-car express; and others on outer suburban trains.



"Seagull", one of the double chimney A4s, heads northward with "The Elizabethan". The train was photographed leaving Welwyn Viaduct by M. W. Earley.



The "Drive-In" Cinema

Seeing Pictures from One's Own Car

THE climate of Great Britain may not seem suitable for open-air cinemas, apart perhaps from sheltered spots in the south or south west. Other countries are more happily placed in this respect, and in the United States, South Africa and many parts of Australia the open-air theatre in which picture goers view the screen from the comfort of their own cars either flourishes already or seems likely to do so in the coming years.

The auditorium of a drive-in cinema is specially designed to provide the necessary spaces, as can be seen in the picture on this page of a drive-in cinema at Port Elizabeth, South Africa, when it was almost complete. The plan of this cinema on the opposite page shows how the auditorium is arranged, in a series of ramps or rows into which cars can be driven. From each there is a clear view of the screen, which is generally about twice the width of that used in an ordinary picture house. Screens 100 ft. across are common, and in some of the larger drive-in cinemas the screen may be as much as 140 ft. wide.

The picture above is a view from the air of the "drive-in" cinema at Port Elizabeth, South Africa, when nearing completion. The box from which the picture is projected can be seen in front of the screen. The illustrations to this article are reproduced by courtesy of the British Thomson-Houston Co. Ltd., who provided the projection equipment for this open-air cinema.

When drive-in cinemas were first introduced the sound was produced by means of giant loudspeakers on or near the screen. But music and dialogue could be heard for a mile or so around, and naturally residents in the area complained. So today loudspeaker posts are erected between the cars, one for every pair. Two small individual speakers are hung on hooks on each post, and when a car drives in one of its occupants just stretches out an arm to unhook the nearest speaker unit, which is fitted with a volume control, and either hangs it inside the car or just places it on one of the seats. The posts are of a convenient height to allow the occupant of a car to lift the loudspeaker off without getting out, and on each there is usually a signal light that when switched on summons an attendant, who will bring meals or light refreshments, or carry out any other service required.

It is not absolutely necessary to wait for complete darkness before "opening" a drive-in picture theatre. So long as the picture brightness is appreciably higher than the natural light the picture can quite well be seen, and a drive-in cinema can usually be open in the afternoon as well as in the evening. To help visibility in daylight hours the screen is often placed on

Cars face the empty screen and the show is about to start. Between the cars are loudspeaker posts, one for each pair.

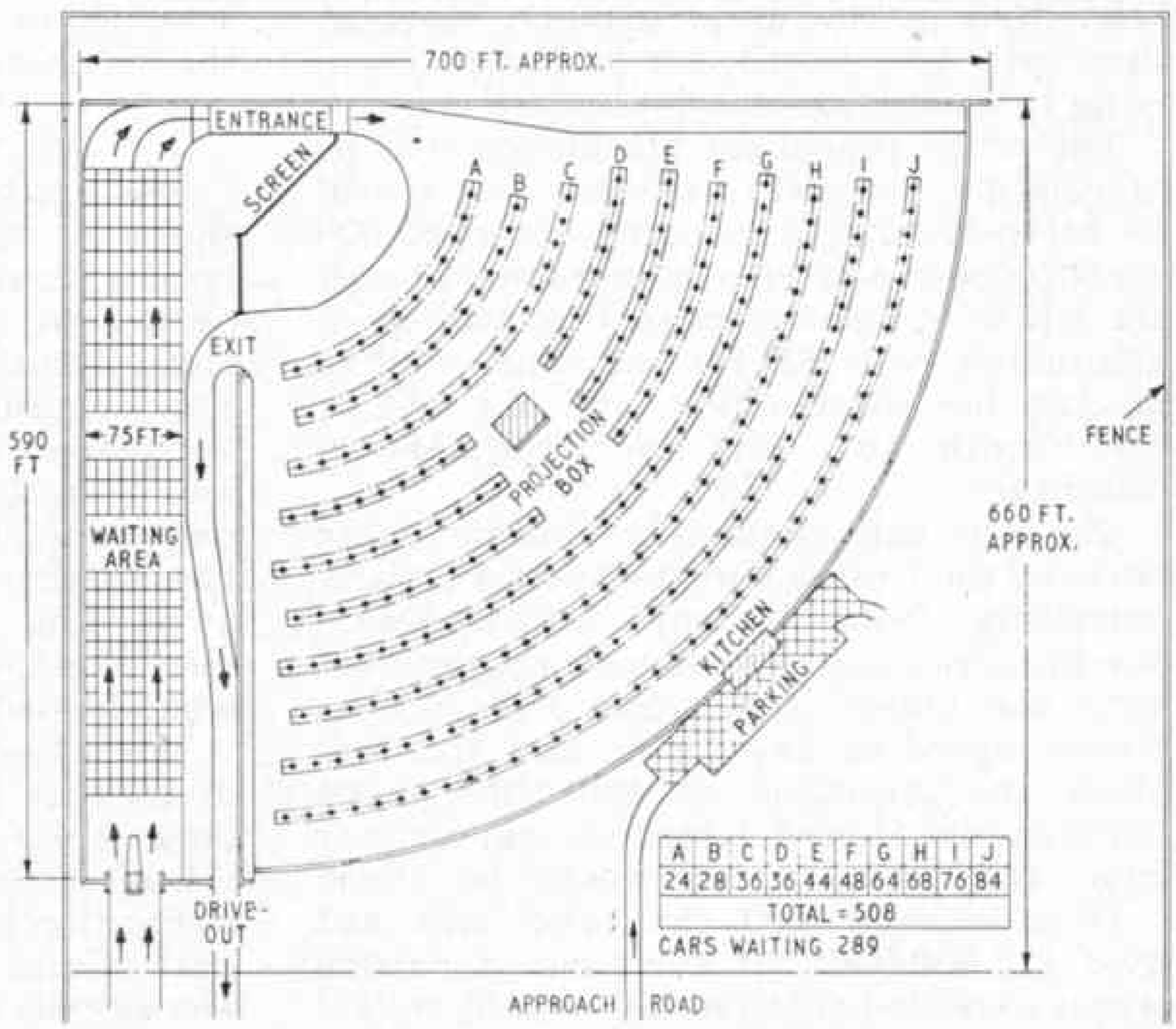
the western side of the site, and side wings are put up, or trees are planted, to diminish interference.

The most important problem in designing the equipment for projecting pictures in a theatre of this kind is that of getting sufficient light on the picture screen. There is a limit to the intensity of the light that can be allowed because of the heating of the film that takes place for the fraction of a second during which it is stationary. Various plans for cooling the film have been tried, such as blowing air jets on it or circulating water round the gate through which it passes, but these proved of little value. So the intensity of light has to be limited to well below the standard used for indoor films, with a little gain from illuminating the film to some degree while it is moving in the picture gate.

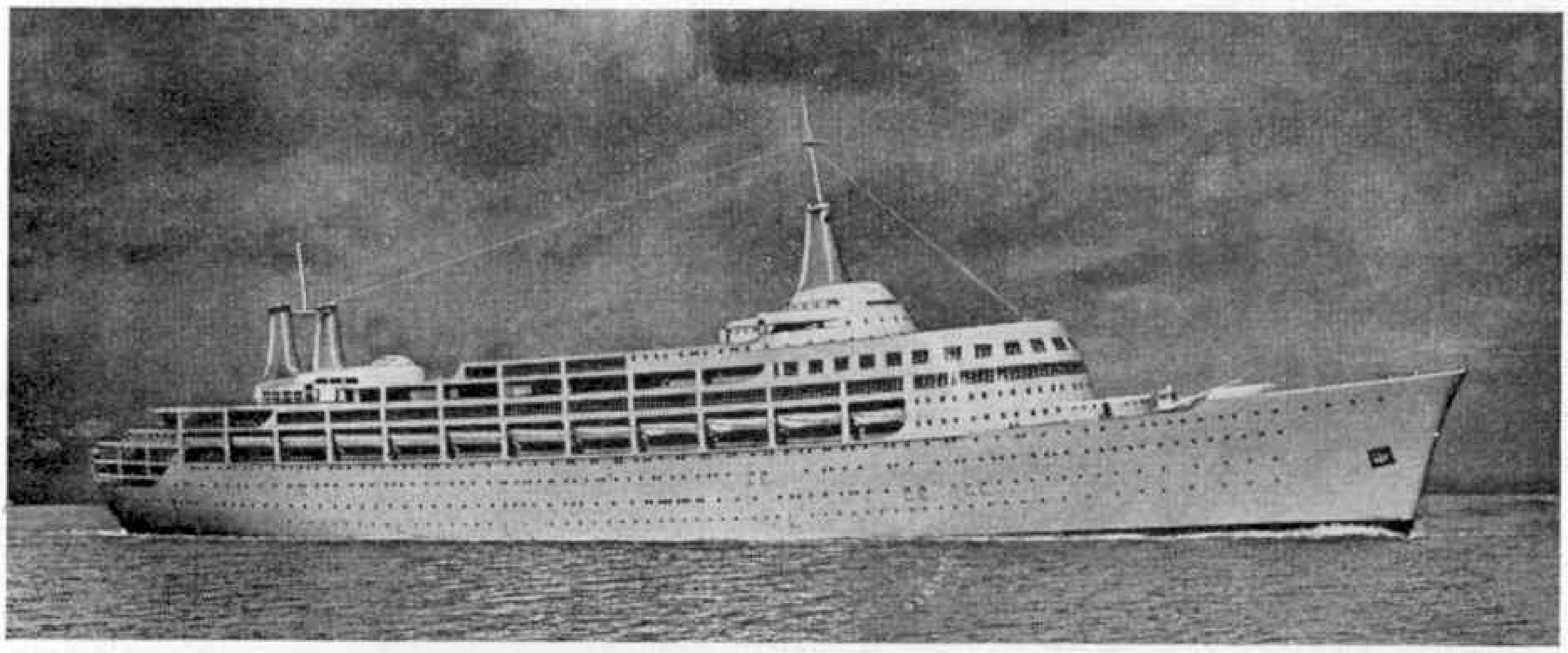
How customers enter the drive-in cinema and take up their places in the auditorium will be clear from the diagram on this page. Ample area is available for waiting if the auditorium is full, and it is easy on admittance to drive to the vacant place to be taken up, because the ramps are 20 ft. wide each and about 20 ft. is allowed between them to give ample room for turning. To make sure that the occupants of cars in the auditorium have a good view the rear edge of the ramp is raised about a foot.

The projection equipment for the Port Elizabeth drive-in cinema has been supplied by the British Thomson-Houston Company. Standard projector mechanisms are used, and they are housed in a special projection booth about half way back in the auditorium. In this position the projector is several hundred feet from the screen. To lessen the possibility of obstructing the view from behind it the booth is often sunk in the ground to a depth of 2 or 3 ft.

In the United States more people now watch films in drive-ins than in ordinary picture houses, and some outdoor theatres have room for 1,000 cars, or double the capacity of the one illustrated here. Heaters for cars are provided in cold weather. There are also children's playgrounds and amusement parks, to allow parents to see the pictures in peace, and in some cases there are even shops and banks.



Plan of the Port Elizabeth drive-in cinema.



Shipping Notes

New P. and O. Liner to be Built

Above is an artist's impression of a new ship that will be the largest built in Great Britain since the completion of the *Queen Elizabeth*, 17 years ago. She will be a 45,000-ton liner, to be built by Harland and Wolff Ltd., Belfast, for the Peninsular and Oriental Steam Navigation Company.

The new vessel will be the largest ever built for this famous Company. She will be an all-welded vessel, modern in appearance, as the picture shows. One point of great interest is that the machinery will be placed aft, which explains the position of the double funnel. Another is that her life-boats will not be carried on the boat deck in the usual manner. Instead they will be stowed three decks down, lying in flush with the ship's side.

The main propelling machinery will be unusual for a vessel of this size, for it will be turbo-electric, developing about 85,000 shaft horse power as a maximum. Almost the whole of the superstructure will be of aluminium, over 800 tons of which will be used in her construction, and she will be fitted with two sets of Denny-Brown stabilizers.

The new ship is intended for the route between the United Kingdom and Australia, extending from Sydney to Auckland, San Francisco and Vancouver in conjunction with the Orient Line. She will have a service speed of 27½ knots, and this will allow the reduction of the time taken between the United Kingdom and Sydney from the present four weeks to three.

It is believed that the vessel will cost over £12,000,000. At the time of writing it was expected that her keel would be laid in September, and that the completed vessel would be delivered to her owners towards the end of 1960. The number of passengers to be carried will be 600 first class and 1,650 tourist class, a total of 2,250, which is more than the number accommodated in the *Queen Elizabeth*. Certain cabins will be arranged on the air-light system, with a central court or verandah. Cabins leading off this will each have a window to give natural light, and generally deck space in the vessel will be put to the best possible use.

The overall length of No. 1621, as the vessel will be known in the yard of her builders, will be 814 ft. Her beam will be 102 ft. and the loaded draught 31 ft. 6 in. The height from the loaded draught to the navigating bridge will be 90 ft.

A New Thames Tug

The upper picture on the opposite page shows a very interesting vessel that is both a launch and a tug. She is the *Efgee*, owned by the F. G. Towage Co. Ltd. Our picture shows her in the port of London, and gives at once some idea of her power. She was built by P. K. Harris and Sons Ltd., Appledore, North Devon, and completed a satisfactory sea delivery trip to the Thames. She has a length of 44 ft. 3 in. and a breadth of 12 ft. 2 in. Her depth is 5 ft. 5 in., and her draught when loaded 4 ft. 3 in.

The *Efgee* has four steel bulkheads that divide her into five compartments. The crew cabins are forward and a small casing is built upon the deck extending from them to the after end of the engine room, the after part of the casing containing the cockpit. Her skipper has a good view astern as well as

A striking picture of the new Thames tug "Efgee" at speed. She is fitted with a Foden FD6 diesel engine.

ahead, provided by means of a mirror at the masthead and a viewer situated above the steering wheel.

The propelling machinery of the tug consists of a Foden FD6 2-stroke engine, which is coupled to a Thornycroft hydraulically operated gear-box. The continuous output of the engine is 100 shaft horse power at 1,800 revolutions a minute. On her trials the *Efgee* showed an average mean speed of 8.7 knots at 1,800 r.p.m.

The "Glen Sannox" in Service

In the August *M.M.* a picture was included of the Clyde steamer *Queen Mary II*, of the Caledonian Steam Packet Co. Ltd., which has been converted to oil burning. Now we have a picture of a new vessel of this fleet, the most modern of the vessels comprising it. She is the *Glen Sannox*, which took up regular sailings between the mainland and the island of Arran on 5th July.

The new ship will provide a much improved service between the mainland and the island in several respects. She is capable of carrying about 1,000 passengers, 40 motor cars and 40 tons of cargo in containers. When cargo is not carried she will be able to take a considerably larger number of cars. Vehicles and cargo will be loaded and discharged at any state of the tide at both Brodick, on the island, and on the mainland. Commercial vehicles also will be carried on the vessel, and special arrangements have been made for conveying livestock, portable stalls being provided for erection on the cargo deck when required.

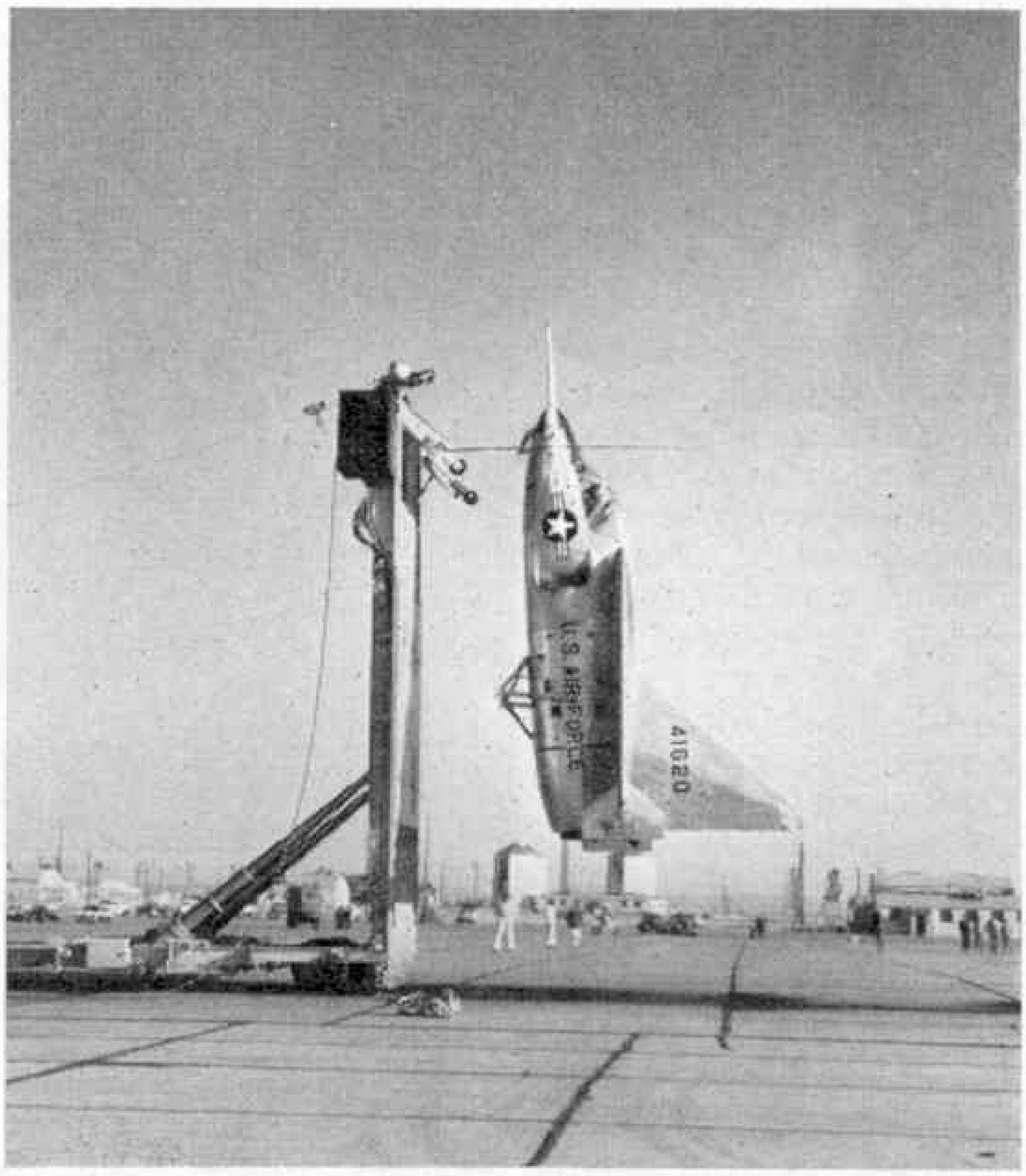
The *Glen Sannox* has an overall length of 257 ft. and a breadth of 44 ft. Her depth moulded to the main deck is 13 ft. and she has a draught of 7 ft. 4 in. Her trial speed was 17 knots. She is fitted with twin rudders, in addition to which she has a bow rudder. She has two Sulzer 8 MD 42 engines, of 2,200 h.p. each.

The "Glen Sannox," the latest addition to the fleet of the Caledonian Steam Packet Co. Ltd. B.R. photograph.

Air News

By

John W. R. Taylor



Ryan X-13 Vertijet single-seat research delta shown in the position from which it takes off vertically. Illustration by courtesy of the Ryan Aeronautical Company, U.S.A.

New Vertical Take-off Aircraft

Latest idea in vertical take-off aircraft is the little Ryan X-13 Vertijet single-seat research delta, shown in the accompanying illustration. It is a "tail-sitter", like the now-abandoned Convair XFY-1 and Lockheed XFV-1 turboprop fighters, but promises far higher performance, being powered by a 10,000 lb. thrust Rolls-Royce Avon turbojet.

The Vertijet is transported on a ground-servicing trailer, the bed of which can be raised hydraulically through 90 deg. so that it is pointing vertically upwards, with the Vertijet held in place by a hook under its fuselage.

To take off, the pilot simply opens up the engine which produces direct jet thrust as in the Rolls-Royce "Flying Bedstead" and raises the aircraft clear of the trailer. By varying the direction of the jet exhaust, he can control the aircraft until it has climbed to a safe height; after which he arches over to a horizontal position and flies quite normally. Landing is the reverse of take-off, and involves hooking the Vertijet back on to the trailer whilst hovering in a tail-down attitude.

Fighter or reconnaissance aircraft built on similar lines would be able to operate from the decks of ordinary ships at sea, or from places on land where there was no room for an airstrip. The weight saved by dispensing with the undercarriage results in higher performance and enables more fuel or heavier armament to be carried.

Project Bullet

Major John Glenn, a U.S. Marine Corps pilot, has flown a Chance Vought Crusader fighter across the American continent non-stop from Los Angeles to New York, a distance of 2,456 miles, in only 3 hr. 23 min. 8.4 sec. This represents an average speed of 725.55 m.p.h., which is well above the speed of sound at 35,000 ft., the height at which he flew. It is also much faster than the speed of a .45-calibre revolver bullet, which is why the record attempt was code-named *Operation Bullet.*

Over parts of the route the Crusader streaked along at more than 1,000 m.p.h., to make up for time lost when it had to slow down to refuel in mid-air from AJ-2 Savage tanker aircraft.

Operation Bullet reduced the U.S. transcontinental speed record by 21 min. and was no mere stunt, being intended to show how the U.S. Navy could transfer its aircraft speedily from a carrier task force in the Pacific to a similar force in the Atlantic, if necessary. What is more, as the version of the Crusader used was an F8U-1P photo-reconnaissance aircraft, it was able to take a photograph of the United States from coast-to-coast and horizon-to-horizon as it set up its record.

Glass Rockets

The idea of making rockets of glass may sound a little crazy, but Bristol Aircraft have discovered, after a great deal of research, that resin-impregnated glass-fibre is an excellent material for the tubes of rocket motors.

British Radar for Australia

Australia's two biggest airports, at Sydney and Melbourne, are to be equipped with the latest Cossor Type C.R.21 radar. This follows earlier orders for the same equipment from the New Zealand Civil Aviation Department and the Royal Rhodesian Air Force.

C.R.21 is a high-power medium-range search radar, which is intended mainly for the location and control of aircraft approaching and leaving an airport. It is similar in most respects to the earlier Cossor equipment at London and Zurich Airports, but has a special new feature which enables its operator to cancel unwanted echoes from high buildings, mountains or other obstructions, and so keep track of the aircraft more easily. It also includes a device to ensure that echoes are not received from heavy rain or snow.

The Army Air Corps

Forty years after the Royal Flying Corps was combined with the Royal Naval Air Service to form the Royal Air Force, the War Office has again persuaded the Government to let it operate its own private air force. As a result, from the beginning of last month, the Army Air Corps has been responsible for air observation post and light liaison aircraft of up to 4,000 lb. in weight.

At present, this includes only aircraft like Austers and the new Saunders-Roe Skeeter helicopters, which have previously been flown by Army officers but administered and maintained by the R.A.F. But it seems logical that eventually, as in America, the Army will also control the larger helicopters and fixed-wing aircraft used to carry troops and supplies in combat areas. If this happens, the Army Air Corps may become a very large force, because its American counterpart has many thousands of fixed-wing aircraft and helicopters.

A pair of Auster Alpha lightplanes. The Alpha can carry three adults or two adults and two children. Illustration by courtesy of Auster Aircraft Ltd.

Free Flying Lessons

A Company named Travelair Ltd. in London is offering free flying lessons to anyone who buys an Auster Alpha lightplane. The idea is to encourage British firms to operate their own "business" aircraft, and it might well catch on now increased trade with the Continent is taking our salesmen and executives abroad more and more.

The Alpha carries three adults, or two adults and two children, and can be powered by either a 130 h.p. Lycoming or 130 h.p. Gipsy Major engine, giving a maximum cruising speed of 108 m.p.h. It is built up largely of standard components from other Auster types and shares their ability to take off and land in about 100 yards. With a Lycoming engine it costs only £1,682, which makes it probably the cheapest aircraft of its type in the world.

This odd-looking aircraft is the Omega SB-12 Twin helicopter, designed for service as a "flying crane." Illustration by courtesy of Howard Levy, New York, U.S.A.

Flying Shower Bath

Jet-fighter pilots get into many strange situations; but North American test pilot Gage Mace is probably the only one who has spent several days aloft in a shower bath.

It was not the usual kind of shower bath and Mace himself did not get wet. Instead, he spent his time flying an F-100C Super Sabre in and out of showers created by a KB-29 Superfortress flight refuelling tanker 'plane which released 3,000 gall. of water through a trailing hose and perforated cone high above the desert near El Centro, California.

The tanker's shower varied from a drizzle to a downpour, and the purpose of the operation was to test the F-100's windscreen rain removal system. As Mace ducked in and out of the water, about 100 ft. behind the tanker, he took careful notes of the effect of the rain on his windscreen, and the results are now being used by North American to improve visibility for fighter pilots in bad weather.

Helicopter as Flying Crane

The Omega SB-12 Twin helicopter, illustrated below, was designed as a sturdy, easy-to-maintain "flying crane", without any frills. It is powered by two 200 h.p. Franklin engines, carried one on each side of the fuselage on tubular mountings that can be detached complete and used as servicing stands on the ground. The fuselage is a simple square-section steel-tube structure, and loads of freight or four stretchers can be slung underneath it, between the cabin and the rear legs of the four-wheel undercarriage.

The SB-12 will carry 1,000 lb. of freight, or four passengers and 320 lb. of freight, in addition to the pilot. It has a main rotor diameter of 39 ft., a loaded weight of 4,300 lb. and can fly for 160 miles at a cruising speed of 86 m.p.h.

Atomic Missile

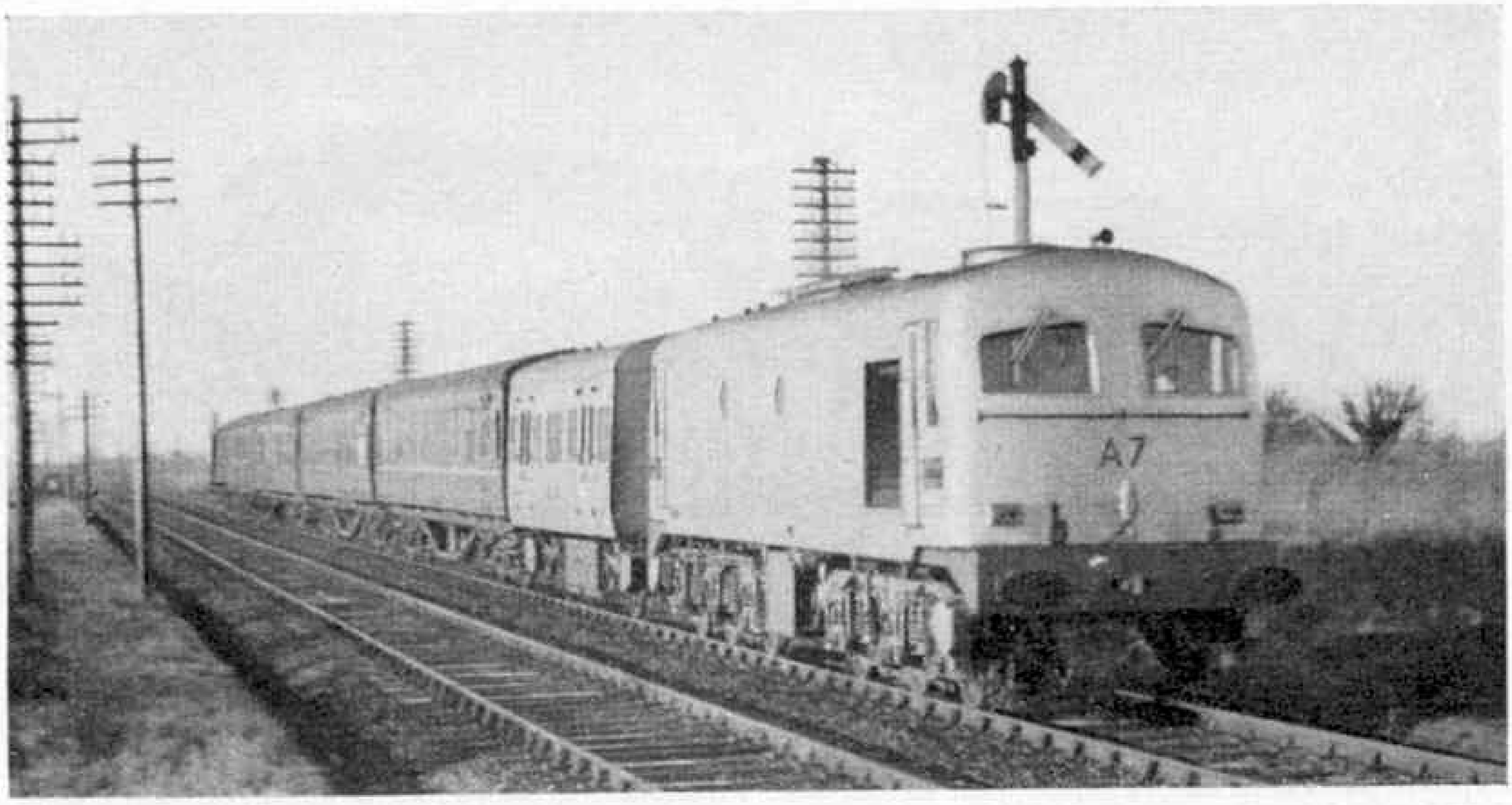
The U.S. Air Force has carried out the first operational test of the Douglas MB-1 Genie air-to-air guided missile with an atomic warhead. Known originally as Ding-Dong, the Genie was fired from a Northrop F-89 Scorpion jet-fighter, but on this occasion was detonated from the ground to avoid any possibility of harm to the fighter through a premature explosion.

Six U.S.A.F. observers stood directly under the point at which the missile was detonated, to prove that the use of nuclear air-to-air missiles at high altitudes cannot harm people on the ground.

It has been announced that Genie is already in service with fighter squadrons of the U.S.A.F.'s Air Defense Command.

Convair Fighters Named

Another item of news from the U.S.A.F. is that a name has at last been found for Convair's delta-wing F-102A all-weather interceptor. It is now officially the Dagger. The improved 1,200 m.p.h. Convair F-106A has been named the Dart. The U.S. Army also has decided to name all its aeroplanes and helicopters, after tribes of North American Indians.



Railway Surprises in Southern Ireland

By C. L. Fry

IT may come as a surprise to many English readers of the *M.M.*, in view of the giant B.R. modernisation schemes, to hear that Coras Iompair Eireann, Ireland's National Transport Company, some time ago decided to dieselise their entire system, because of the very high cost of coal and coal handling in Eire. In fact, the dieselisation programme is now almost complete, and it is quite a strange event to see a steam-operated passenger or goods train. What few steam trains remain will probably disappear within the next few months, although a certain number of steam locomotives will be retained for use in periods of emergency.

At the head of the page is a picture of a C.I.E. Co-Co diesel electric locomotive of Class A on a Cork-Dublin express near Sallins, Co. Kildare. Next to the engine is a specially fitted steam heating van.

Railway enthusiasts who have been accustomed to visit Ireland to see some of the old fashioned looking steam engines there will now have to go to Ballinamore, headquarters of the Cavan and Leitrim Narrow Gauge Railway, the only section of C.I.E. now entirely steam operated. This line at the present time is extremely busy taking coal from the Arigna Quarries for use in the Irish cement factories. The journey there is well worth while, as apart from the original outside-cylinder 4–4–0 C. & L. locomotives, fitted with cow-catchers, there are engines from two closed narrow gauge sections, and these were to have been joined by another.

These engines include two of the very fine and fast 2–4–2 outside cylinder locomotives of the old Cork, Blackrock and Passage line, which has been closed for 25 years. Equally interesting are the powerful engines from the Tralee and Dingle narrow gauge line. Three of them are 2–6–0s, while the fourth is a 2–6–2, all four being fitted with cow-catchers. They work some of the Arigna branch coal trains. The addition of a West Clare engine was considered, but instead the third Tralee and Dingle 2–6–0 was sent.

On all other lines and other branch lines there are gleaming silver coloured diesel-electric locomotives and coaches to match.

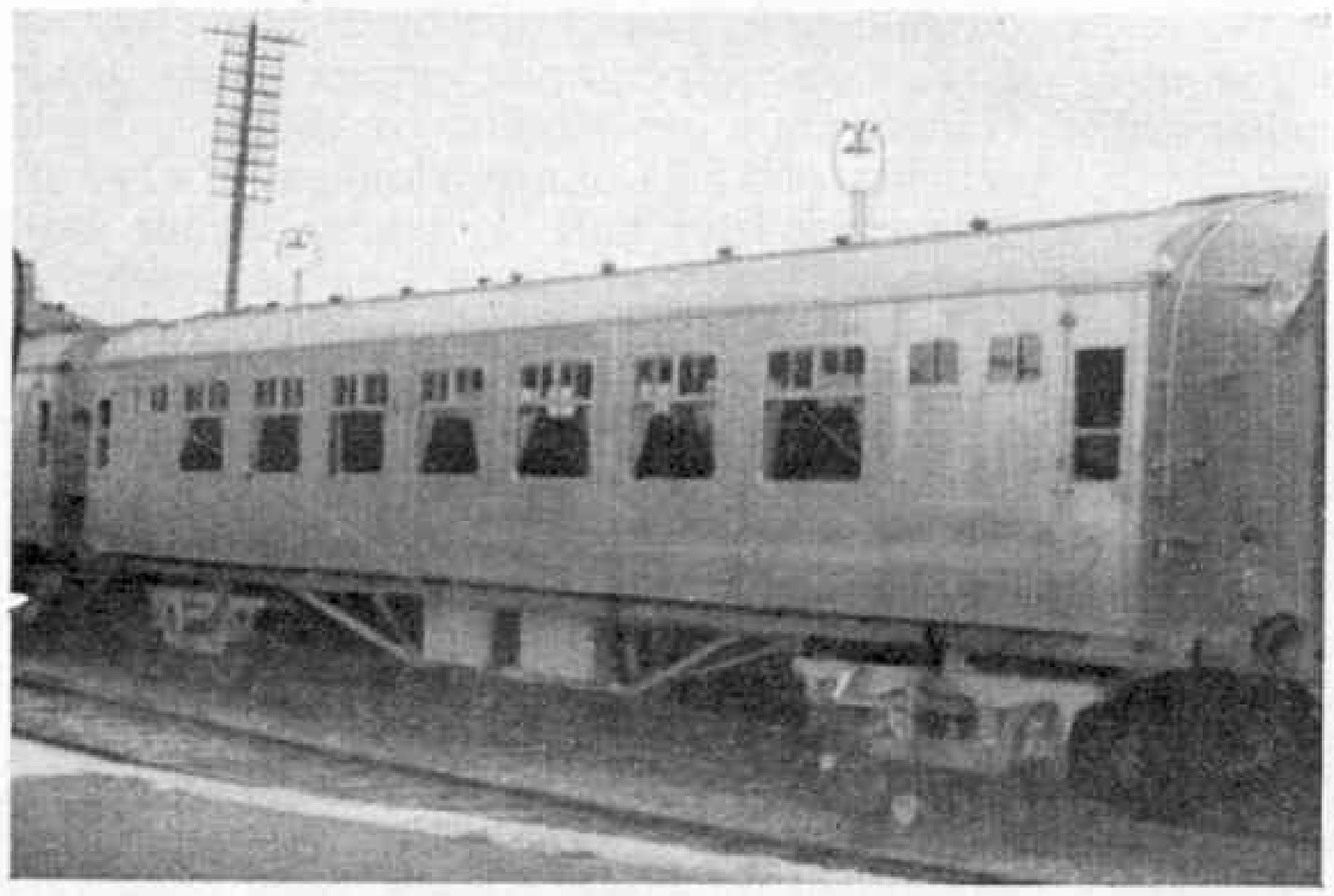
Although many of the standard gauge steam locomotives were rather ancient looking, they had from time to time been thoroughly modernised, and for most of the services in Ireland small steam engines were all that was required. Really large steam locomotives were rather the exception, but mention must be made of the very fine "Queen" class 4–6–0 three-cylinder express locomotives designed and built in Inchicore Works in 1939, by the late Great Southern Railways. In addition a considerable amount of money has been spent on an experimental locomotive designed to burn turf, the only natural fuel freely available

in Ireland. This locomotive, externally, looks somewhat similar to the ill-fated "Leader" class of the Southern Region, British Railways.

The bulk of present day heavy traffic is worked by 1,200 h.p. diesel-electric engines of the Co-Co type, that is with three separately driven axles in each six-wheeled bogie. These are known as "A" class and there are 60 of them, built by Metropolitan-Vickers Ltd. They are designed for all types of traffic, and in view of their light axle load of 14.1 tons can be operated all over the C.I.E. system.

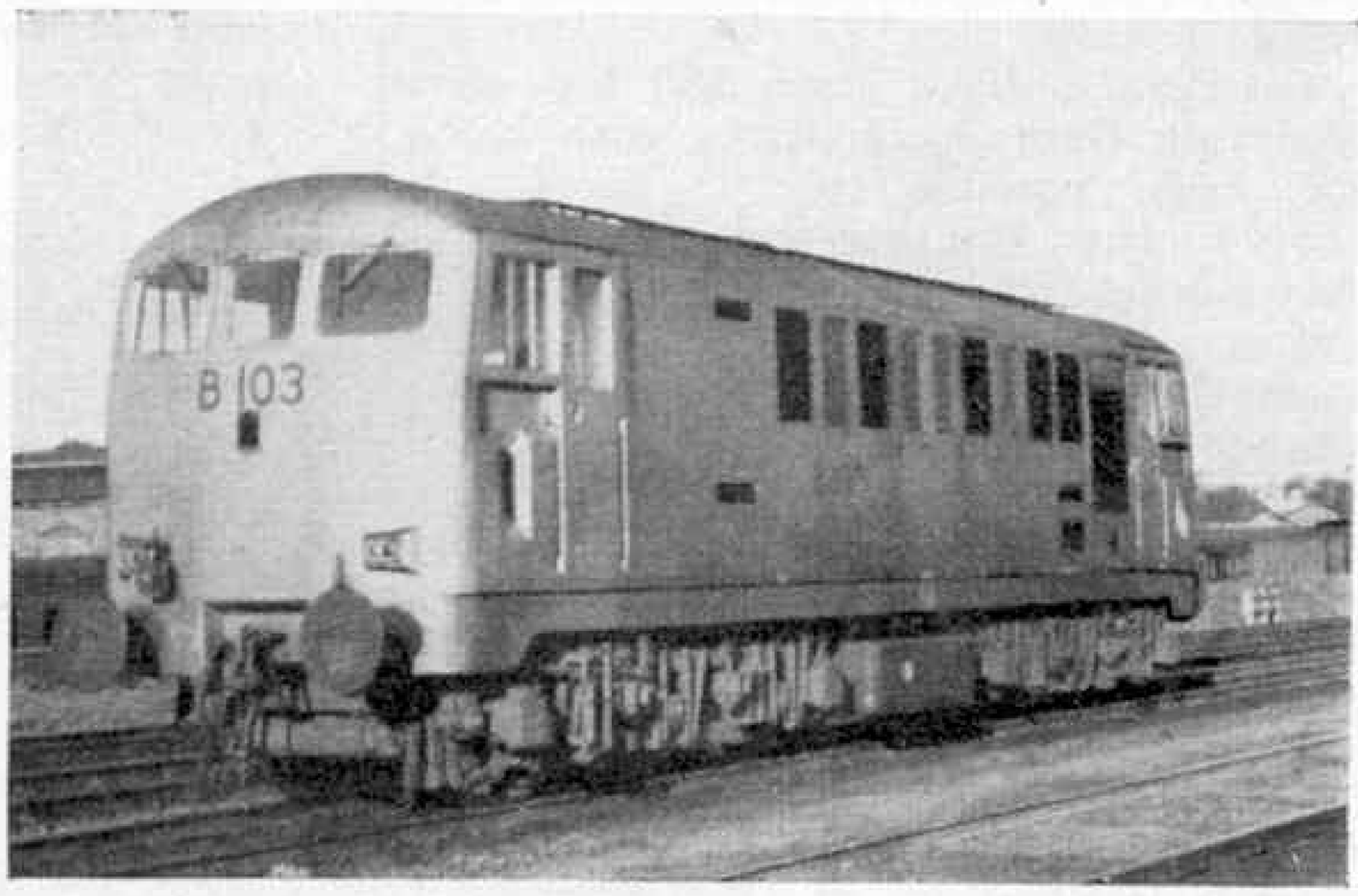
It has been my privilege to have had some footplate runs on these locomotives on heavy passenger trains, and I found their riding qualities really splendid. I had the pleasure of being on the footplate of the Up *Limited Mail* from Cork to Dublin in December 1955, when one of them took the heaviest passenger train of all time to operate out of Cork station.

Here I would like to point out some of the economies gained through dieselisation. With this heavy, high-speed train the engine used less than a gallon of fuel oil per mile, and the cost of the fuel oil for the entire journey was less than the normal cost of preparing and lighting up one steam engine for service. Our train would have required three steam locomotives to take it out of Cork station, which is on a very sharp curve and in a deep hollow.



The latest type of C.I.E. bogie coach, which has an overall width of 10 ft. 2 in.

Then there is only the driver on the diesels, as the engines are designed for one-man operation. It is not necessary for them to be turned at terminal stations. Added to all this there is no expensive



A C.I.E. 950 h.p. diesel electric locomotive of Class B.

coal handling plant to be maintained, nor coal handling staff to be paid. The oil simply flows into the engine tanks when the filling hose is connected and the pump started.

For the drivers' comfort the cab front windows are fitted with two of the latest type windscreen wipers. The plate of the dead-man's foot treadle is heated in winter to prevent the drivers from suffering from cold feet, and there is an electric boiling ring on which meals can be kept warm.

Next in line are Sulzer 950 h.p. diesel-electric locomotives of "B" class. These are of the A–1–A, A–1–A type, which means that they have the two outer axles driven in each six-wheeled bogie, the intermediate one being a carrying axle only. As you will notice, these look rather unusual, as they apparently have no buffer beams. The "A" and "B" classes together are responsible for practically all main line services, and both types power the three-hour non-stop expresses between Dublin and Cork. Here there has been an acceleration of some 25 minutes for the 165-mile journey.

For the branch lines, choice has been made of diesel-electric 550 h.p. locomotives of Bo-Bo type, that is with two driven

axles in each four wheeled bogie, and some of these have now arrived. They have taken over the steam workings on the Cork, Blackrock and South Coast section, the Mayo branch, and also the Tralee-Cahirciveen-Valentia branch, famed for its scenic beauty.

C.I.E. also have some 150 h.p. diesel-hydraulic Deutz locomotives, with which it has been possible to reopen the Banteer-Newmarket branch in County Cork and the Gortatlea - Castleisland branch in Co. Kerry. These lines had been closed for seven years, and it is hoped that in the future more of the closed lines may also be reopened. Shunting is carried out by 6-coupled diesel-electric locomotives of similar type to those used by British Railways.

A further class of six-wheeled diesel-hydraulic locomotives is being built in Inchicore Works, fitted with Maybach diesel engines of 400 h.p. The first of these is on trial as I write, and will be followed by 19 more. While they have a maximum speed of 60 m.p.h., they are intended for goods traffic on branch lines, for banking of heavy goods trains and for shunting. They are rather unusual in that there is considerable difference in the spacing of the axles, each of which is separately driven. They have outside frames.

The lightweight passenger services are operated by multiple-unit diesel-mechanical trains, each section made up of two power coaches of 250 h.p. each, with one or two ordinary coaches marshalled in between. Two, three or four coach sets like that in our fourth picture may be coupled together for multiple working, making a train of up to eight coaches. New coaches have been built to work with these trains, and are interesting, as they are the widest coaches in Europe, full use having been made of Ireland's wider standard gauge of 5 ft. 3 in. They are thoroughly up to date, and a special feature is that the bogies, which are made of cast steel, have outside equalising bars and are fitted with shock absorbers. Exterior finish is in a gleaming silver colour.

Heating the trains for winter has been carefully considered. For this purpose diesel-electric locomotives require a special boiler. So C.I.E. constructed special luggage vans, fitted with an automatically controlled oil-fired boiler, and it is from the boilers in these vans that the trains are heated. Apart from filling with water and fuel oil when necessary, they work unattended.

A Tralee-Dublin express formed of a four-coach diesel car train, seen at Banteer, Co. Cork.

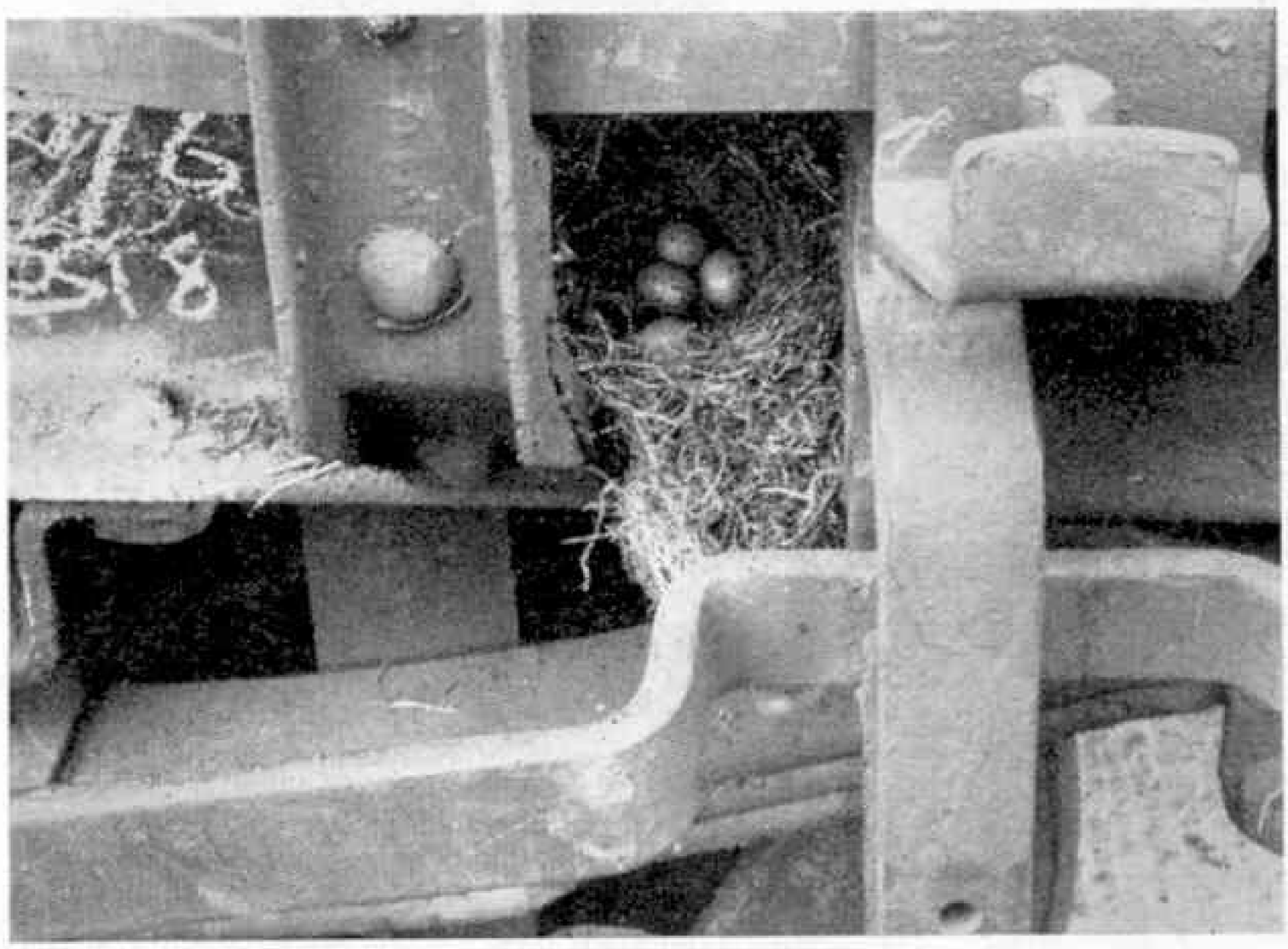
For a considerable time the well known West Clare narrow gauge section of C.I.E. has been completely dieselised, and the service considerably speeded up. For passenger services, articulated diesel-mechanical railcars are used. Bodies and underframes were built in Inchicore, and the four-coupled power units, which have outside rods, were built by Messrs. Walker Bros. In appearance, apart from their colour, they are similar to the fine diesel railcars of the County Donegal Railways. They usually pull a bogie trailer and quite often in addition haul a wagon.

For operation of goods services there are three 214 h.p. diesel-mechanical locomotives of the Bo-Bo type, which have two standardised power bogies similar to those of the diesel railcars. They too are of rather unusual appearance, having the driver's cab in the centre, with a large bonnet covering the engines at each end.

As a result of the dieselisation programme, trains all over the C.I.E. system are scheduled for faster timing, both passenger and goods, and in some cases have been accelerated by as much as an hour.

MECCANO MAGAZINE

Junior Section



A blackbird's nest, with four eggs, on a railway wagon. Photograph by A. P. Reice, Portishead.

BIRDS sometimes build their nests in very curious places, and here is one that a blackbird made on a railway wagon, in a siding near Bristol. I do not know what happened to the eggs, but railwaymen have always been very tender-hearted in matters of this kind, and I feel pretty certain that the wagon remained undisturbed in the siding until the young birds had left the nest. Perhaps the fact that the truck contained wheat feed explains why this curious building site was chosen.

Railway gardens are more familiar than railway bird's nests, and here is one photographed by a reader of the *M.M.*, J. A. Fleming, of Hampstead Heath. It is at the Gospel Oak station of the former North London Railway, now part of the London Midland Region, and in an area of British Railways with which attractive gardens might not usually be associated. When the photograph was taken the garden was a blaze of colour, with flower boxes also placed at intervals on both the up and down platforms. Incidentally, there are many other fine station gardens at such stations as Hammersmith, East Acton and Golders Green.

A North London station garden, photographed by J. A. Fleming, Hampstead.

Easy Model-Building

Spanner's Special Section for Juniors

Splendid Models for Outfits Nos. 0 and 2

THE two models I have chosen for young model-builders this month are a Tricycle for Outfit No. 0 and a Three-Wheel Runabout Car that can be built with Outfit No. 2 or one larger. Both are simple in design, and I think young Meccano enthusiasts will have a lot of fun playing with them.

I will describe the Tricycle first. You should begin making this attractive little model by bolting together two Trunnions, using the same bolts to hold in place a Flat Trunnion 1 and a Fishplate 2. Bolt an Angle Bracket to the pointed end of one of the Trunnions, and fix a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 3 to the Angle Bracket. The Double Angle Strip supports the rear axle, for which you require a $3\frac{1}{2}''$ Rod. Pass the Rod through the lugs of the Double Angle Strip, and fix on it two 1″ Pulleys fitted with Tyres.

To make the front fork of the model you must bolt together a Fishplate 4 and two Angle Brackets, then fix a $2\frac{1}{2}''$ Strip 5 to each Angle Bracket as shown. Pass a $\frac{3}{8}''$ Bolt through one of the Strips into the boss of a Bush Wheel, then fix the Bush Wheel on the Bolt by means of its set screw. Bolt an Angle Bracket to the upper end of one of the Strips 5 and attach to it a $2\frac{1}{2}''$ Stepped Curved Strip.

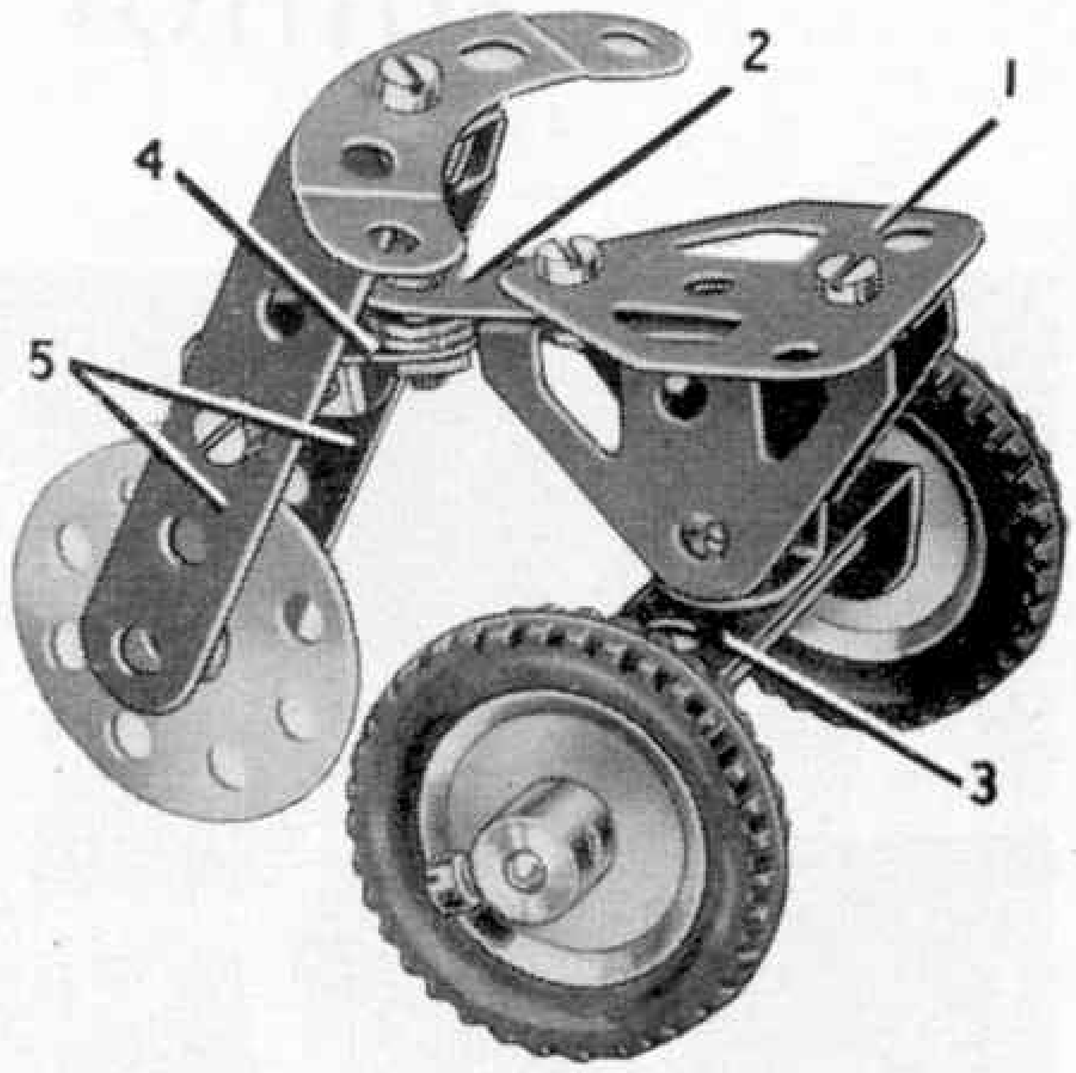


Fig. 1. This easy-to-build Tricycle makes an attractive little toy for a young owner of a No. 0 Outfit.

To complete the model you must pass a $\frac{3}{8}''$ Bolt through the Fishplate 2 and screw a nut *loosely* on to the Bolt. Now place two Washers on the Bolt, pass it through the Fishplate 4 and screw a second nut tightly in place. The Bolt must be free to turn in the Fishplate 2 so that the Tricycle can be steered.

A list of the parts required to build

Fig. 2. A splendid model based on a type of three-wheel car seen on the roads in increasing numbers. The model can be built with parts in a No. 2 Outfit.

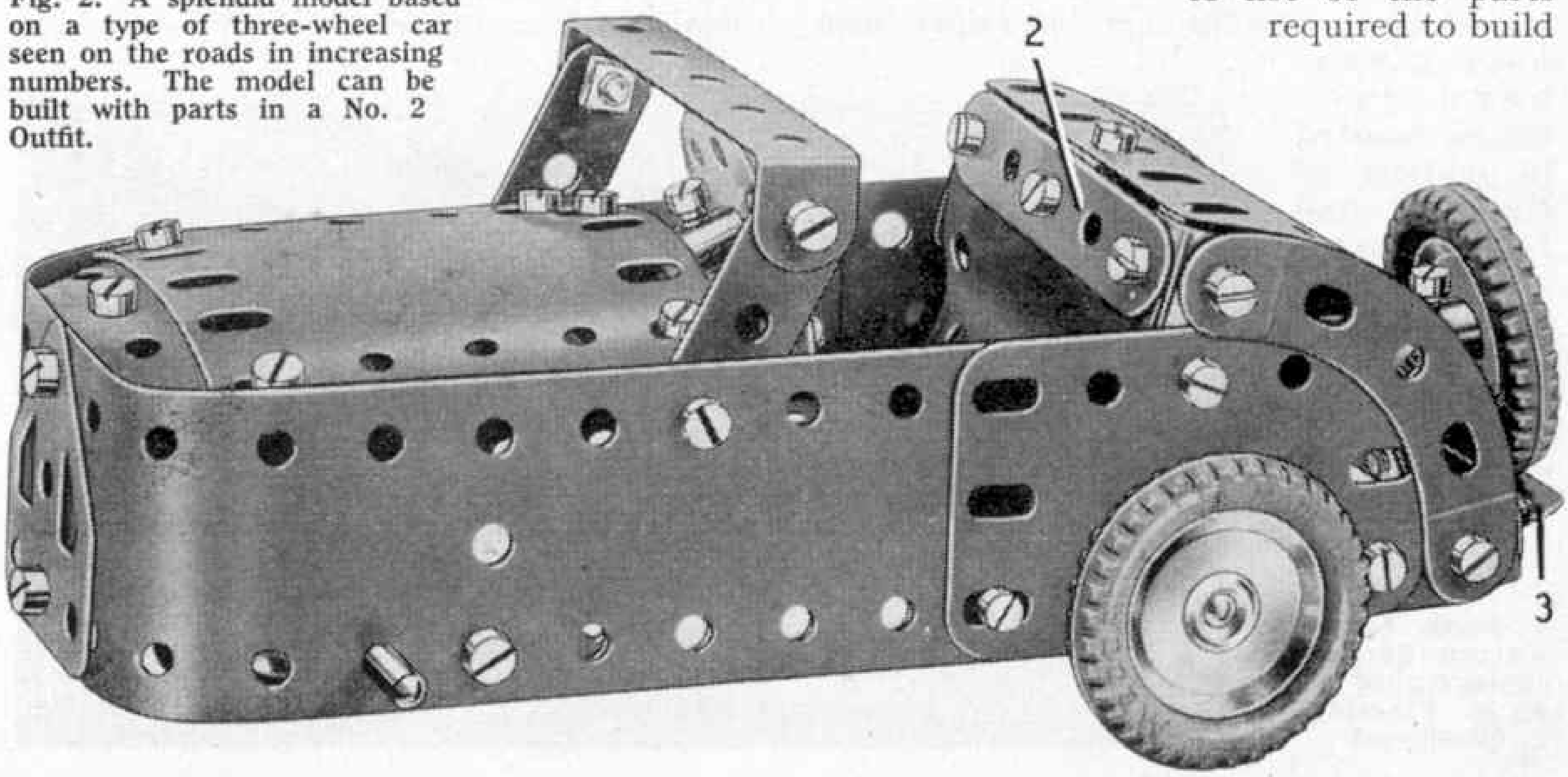
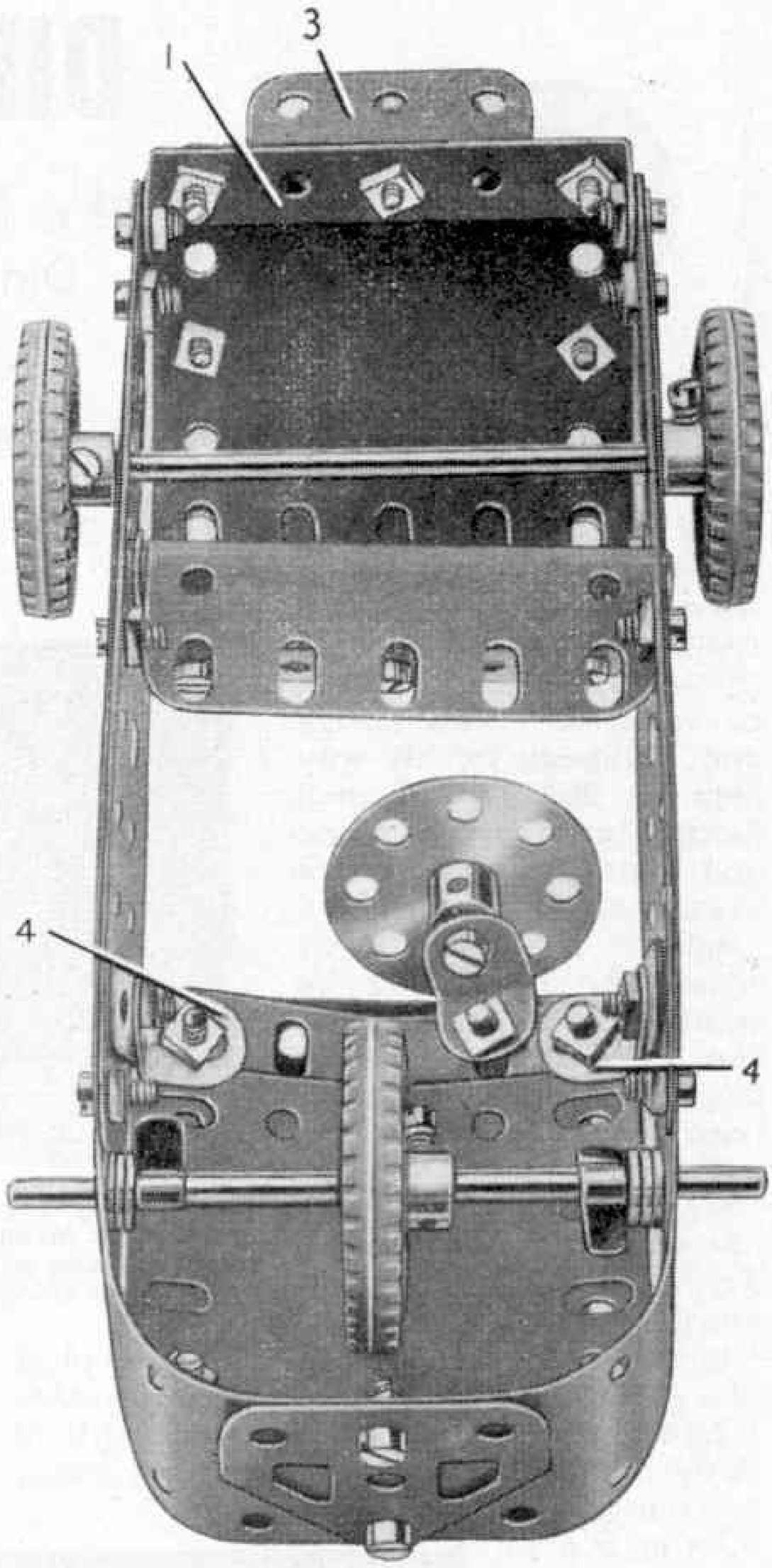


Fig. 3. An underneath view of the Three-Wheel Runabout Car showing details of the interior.



the Tricycle is given at the end of this article.

To make each side and part of the front of the Three-Wheel Runabout Car you require a 5½″ × 1½″ and a 2½″ × 1½″ Flexible Plate bolted together. Now bend the front ends of the 5½″ × 1½″ Flexible Plates as shown and bolt them together, using the bolts also to fix in place a Flat Trunnion.

Bolt a 5½″ Strip along the lower inside edges of the Flexible Plates on each side, so that the Strip overhangs the rear end by one clear hole. Fix a 2½″ Stepped Curved Strip to the 5½″ Strip, and connect the Curved Strip to the upper edge of the 2½″ × 1½″ Flexible Plate by means of a Fishplate. The bolts that support the lower ends of the Curved Strips secure also a 2½″ × ½″ Double Angle Strip 1 that connects the sides together, and the bolts passed through the upper ends of the Curved Strips are used to fix Angle Brackets in place. A U-section Curved Plate is opened out slightly, and this part and a 2½″ Strip 2 are fixed to the Angle Brackets.

The tail of the model is formed by two 1 11/16″ radius Curved Plates. Bolt these together so that they are overlapped four holes, and fix them to the Double Angle Strip 1 and to an Angle Bracket bolted behind the Strip 2. The spare wheel is a 1″ Pulley held by its set screw on a ⅜″ Bolt passed through a Trunnion 3. The Trunnion is bolted to Double Angle Strip 1.

The windscreen frame consists of two 2½″ Strips connected by a 2½″ × ½″ Double Angle Strip. Bolt the 2½″ Strips to the sides of the model, and use the same bolts to support Angle Brackets 4. For the top of the bonnet you require two 2½″ × 2½″ Flexible Plates curved slightly and bolted together as shown. Fix these Plates to the Angle Brackets 4 and to another Angle Bracket at the front of the model. The steering wheel is a Bush Wheel fixed on a ⅜″ Bolt held by a nut in an Angle Bracket, which must be bolted underneath the top of the bonnet. The road wheels of the model are fixed on 3½″ Rods mounted in the sides.

If you have a *Magic* Clockwork Motor available you can put it to good use driving this model. You should bolt the Motor by its flanges to one side of the model, and pass a 6″ Driving Band round the Motor pulley and round a ½″ Pulley on the rear axle.

Parts required to build the Three-Wheel Runabout Car: 2 of No. 2; 3 of No. 5; 2 of No. 10; 7 of No. 12; 2 of No. 16; 4 of No. 22; 1 of No. 24; 2 of No. 35; 34 of No. 37a; 33 of No. 37b; 6 of No. 38; 2 of No. 48a; 2 of No. 90a; 2 of No. 111c; 1 of No. 126; 1 of No. 126a; 4 of No. 142c; 2 of No. 188; 2 of No. 189; 2 of No. 190; 1 of No. 199; 2 of No. 200.

Parts required to build the Tricycle: 2 of No. 5; 2 of No. 10; 4 of No. 12; 1 of No. 16; 2 of No. 22; 1 of No. 24; 11 of No. 37a; 9 of No. 37b; 4 of No. 38; 1 of No. 48a; 1 of No. 90a; 2 of No. 111c; 2 of No. 126; 1 of No. 126a; 2 of No. 142c.

DINKY NEWS

For Dinky Toys Club Members and All Dinky Toys Enthusiasts

By **THE TOYMAN**

I WAS pleased to welcome at Binns Road recently a young Club Member who had travelled all the way from Australia. He was one of the first Australian boys to wear the Club Badge and, although on his way here he had visited such fascinating places as Paris and London, and had seen many of the famous "sights" of these great cities, the one thing he wanted most of all to see was the Works where his precious Dinky Toys had been made.

It was evident that this youngster had a very deep affection for his Dinky Toys and everything connected with them. I mention him merely because he is typical of a great many Dinky Toys Club members I have had the pleasure to meet. All of these have told me how much they enjoy being a member of this world-wide organisation, and how much more fun they obtain from their hobby through the feeling of fellowship with "kindred spirits" that membership of the Club brings.

This happy young Miss is Agneta Burman of Malmo, Sweden. She is a keen collector of Dinky Toys and is a member of the Dinky Toys Club.

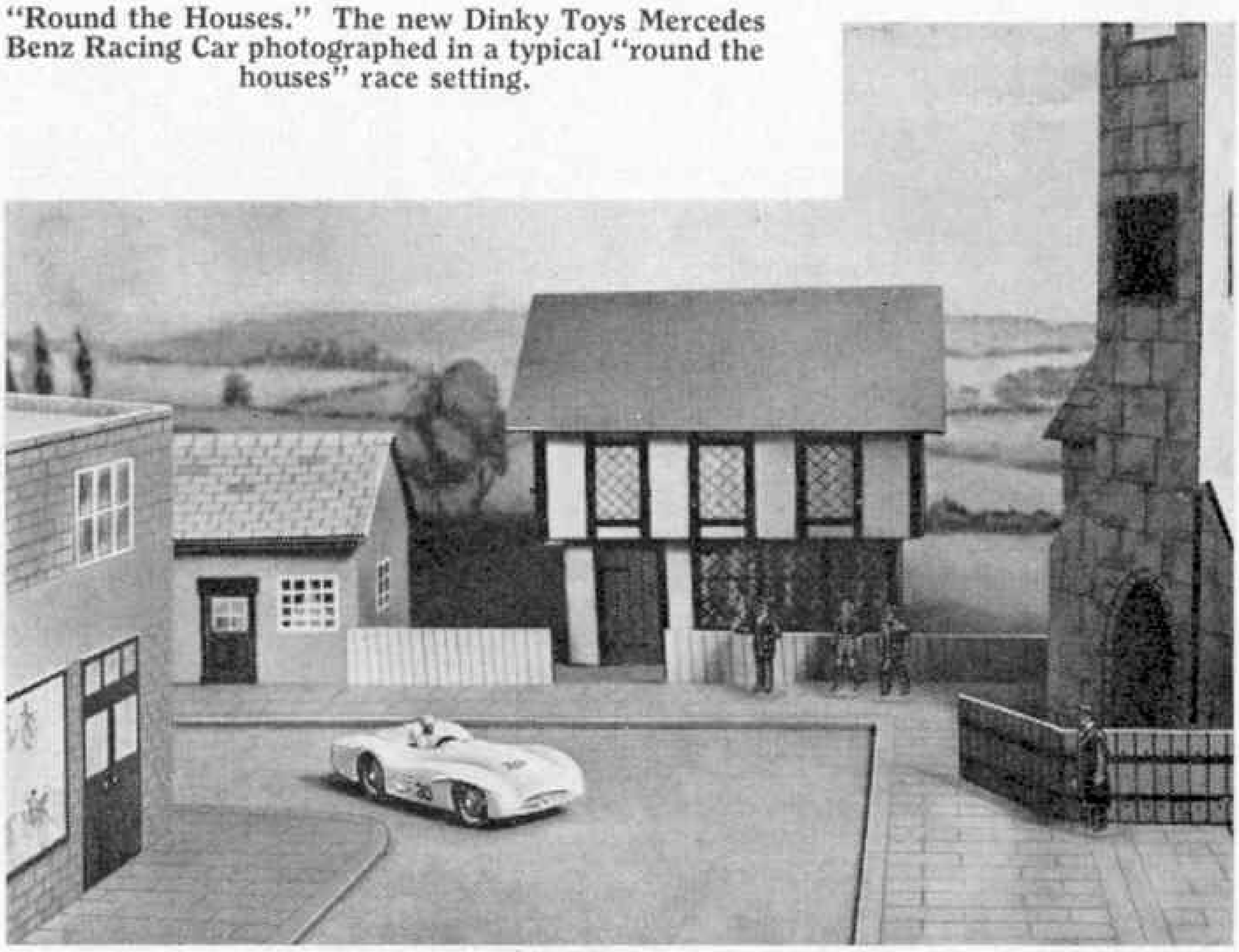
I do hope therefore that if there are any Dinky Toys collectors reading this who have not yet joined the Club, they will pick up a pen and a piece of paper and send in their applications right away. It is only necessary to write to the Secretary, Dinky Toys Club, Binns Road, Liverpool 13, stating that you wish to become a member and enclosing a P.O. for 1/– for the Badge and Membership Certificate.

And now I want to draw your attention to a very fine Dinky Toytown layout that is illustrated on this page. It was built by Mr. Everett Templeton, Nashville, U.S.A., for his son Tim, who is seen in the picture with his father.

The layout is arranged on two pieces of

Mr. Everett Templeton and his son with their fine Dinky Toys Town layout, which is arranged in the basement of their home at Nashville, Tennessee, U.S.A. Some details of the layout are given in these pages.

plywood, each measuring approximately 6 ft. × 4 ft. The many street areas are painted black, grass areas green and street signs and other markings white. Sidewalks are made of small thin strips of wood and are painted grey. The buildings are made from empty cigar boxes. Study of the illustration will show that there are buildings of almost every type found in a small town, and all are brightly painted and appropriately named.



"Round the Houses." The new Dinky Toys Mercedes Benz Racing Car photographed in a typical "round the houses" race setting.

Altogether there are well over 100 Dinky Toys of all kinds on the layout, although it was not possible to show all of them in the photograph. The layout is set up on trestles in the basement of Mr. Templeton's home, and it provides lots of fun and pleasure, not only to Tim and his father, but also to Tim's sister Penny, who is keenly interested in this fascinating scale model town that her father has created.

Incidentally another keen young Miss, who never loses an opportunity to add to her Dinky Toys collection, is seen in the upper picture on the facing page. This young lady lives at Malmo, Sweden, and of course is a member of the Club.

Now for the news all Dinky Toys enthusiasts look forward to each month, details of the latest model. As you will see from two of my pictures, this month it is an addition to the racing car series, and is a really splendid item to add to your collection. It is Dinky Toys No. 237, Mercedes Benz Racing Car. One of my pictures shows the model in a scene I arranged specially for it, and another is a close up view that shows the accurate moulding and splendid lines of the new model.

The Mercedes Benz company is one of the most famous in motor circles, and certainly one of the oldest. I am sure every reader has heard or read about the many successes of Mercedes Benz cars in the field of car racing. The car on which our new model is based is a striking example of the trend of design in modern racing cars. This car, fully streamlined to reduce air resistance to the minimum, with a low body enveloping the wheels, is indeed a worthy successor to the long line of Mercedes Benz racing cars.

The Dinky Toys model is a perfect miniature of the real thing. The die-cast body is fully detailed and a miniature driver in racing overalls is seated in the cockpit.

The new Mercedes Benz Racing Car (No. 237). It is finished in white with red wheel hubs.

How many ridiculous mistakes or errors can you spot in this puzzle picture?

The model is beautifully finished with the body enamelled in white, while the wheels, dashboard and racing numbers are in red. The grille at the front is finished in aluminium and the driver's overalls are blue.

The course on which this fine racing Dinky Toys car is seen may seem a little unusual to you. The fact is, that as a change I decided to organise a "round the town" race for the Mercedes Benz, on the lines of the Monaco Grand Prix. I found this very easy to arrange, and in fact, an ordinary Dinky Toys road layout I had built proved ideal. The more bends and twists there are in the roads forming such a layout the better. The real Monaco circuit, you will remember, is notorious for the number of its corners, including hairpin bends.

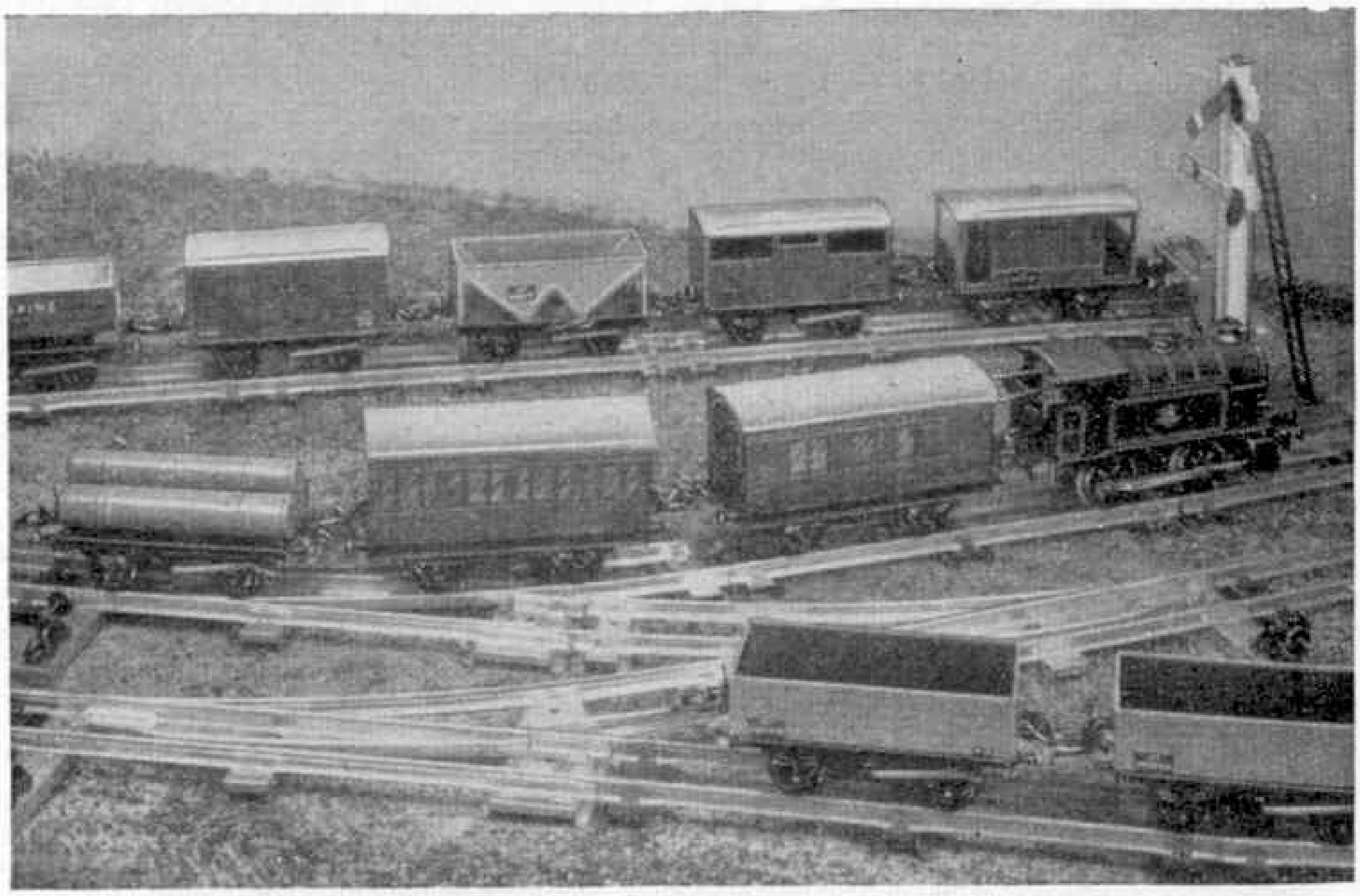
This kind of race makes a novel change from the usual type of track circuit, and in some ways it is even more exciting, for really expert "driving" is called for in steering the models round sharp corners at high speeds. A "round the town" race should appeal specially to enthusiasts who have a road layout, but who for lack of space or other reasons have been unable to build a special race track. The introduction of the Mercedes Benz, following the Jaguar type D last month, provides scope for some exciting round the town races that call for real skill on the part of the drivers.

Let me tell you about an introduction that will appeal particularly to collectors with birthdays in the offing. This is a new Dinky Supertoys Gift Set, No. 698, Tank Transporter with Tank. This splendid set consists of a Mighty Antar Tank Transporter, No. 660, and a Centurion Tank, No. 651. The models are packed in a special presentation box and together they form an attractive gift with real play value.

Finally, take a look at the busy town scene in the picture on this page, and see if you can spot anything unusual. At first glance the picture seems quite normal, but closer examination will reveal quite a few things one does not expect to find in a well-regulated Dinky Toys town! Track down all the errors you can, and then show the picture to your friends and ask them to make a list of the mistakes they discover. There are plenty to find, and it is good fun to see who can make the longest list of them.

My errors picture suggests a novel game for a group of collectors who own a layout or who have the equipment to set up a town or country scene. Each member of the group can take it in turn to arrange the vehicles and accessories on the layout, incorporating as many mistakes as he can in the scene. The remainder of the group then set to work to find as many of the errors as possible in a given time, the winner being the competitor with the longest list.

"Tommy Dodd" writes about



More No. 50 Wagons

TO complete the story of the No. 50 Hornby rolling stock that has been the subject of our talks recently, I want to say something about several vehicles in the series that so far have not been mentioned, although they have been available for a little while and I expect that many of you have already seen them.

One of these is the Hornby No. 50 Gas Cylinder Wagon, which is a miniature of an interesting vehicle that is frequently seen about the railways. In real practice these vehicles can often be seen standing in passenger stations and elsewhere, as they are often included in the make-up of passenger trains.

The purpose of a gas cylinder wagon is to transport a supply of gas under pressure to places where a suitable supply is not "on tap" or otherwise readily available, for instance, to carriage depots and stations where the servicing of restaurant cars is carried out. Gas is used for cooking purposes in some restaurant cars, so that gas tank wagons are needed to bring the gas from plants where it is manufactured. There are still plenty of gas tank wagons to be seen, although they are not now so extensively used as when there was more gas-lit passenger stock about. British Railways have over 400 of them.

The picture above shows a No. 50 Gas Cylinder Wagon attached in the rear of a passenger train. Real gas tanks are frequently conveyed in this manner.

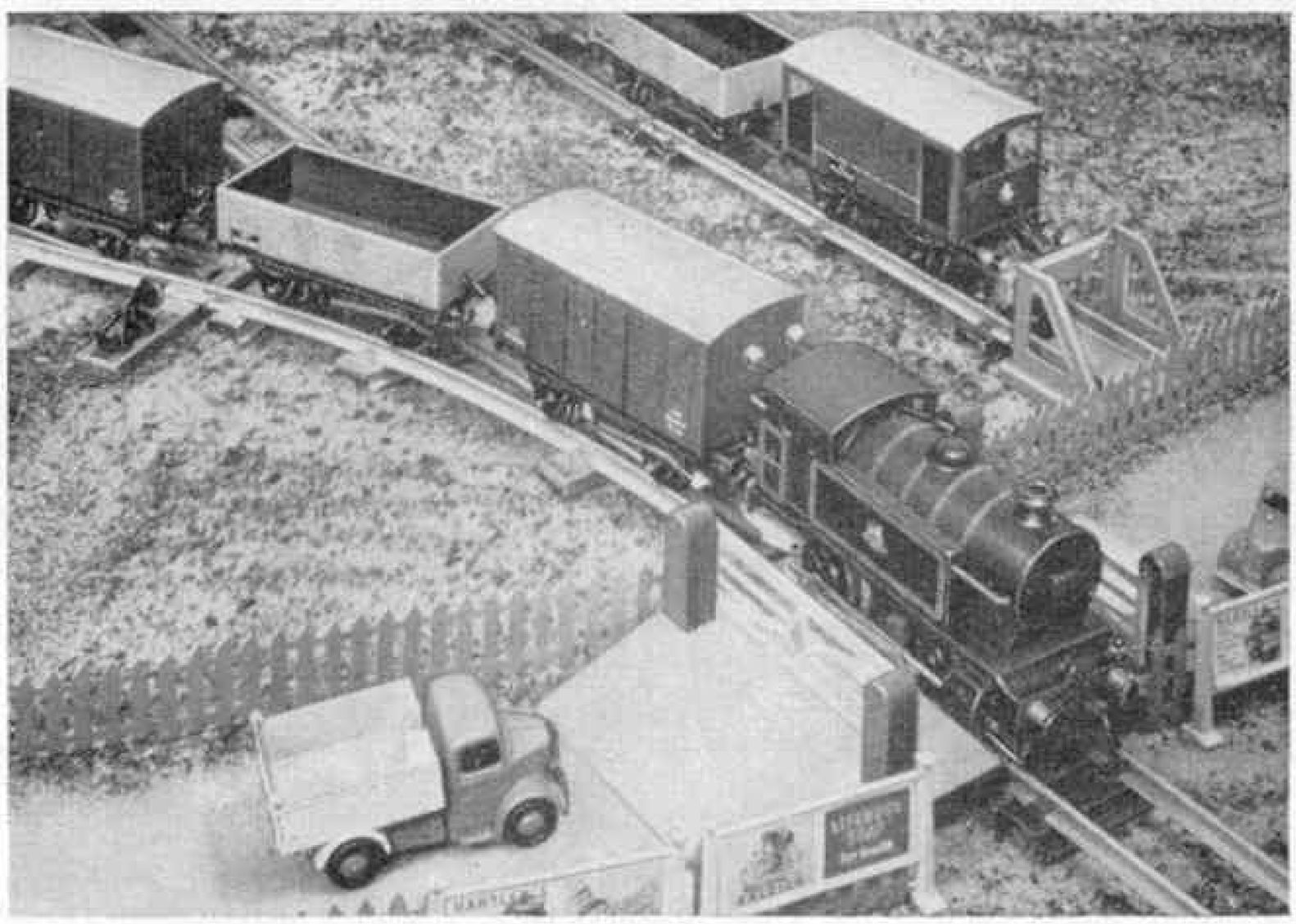
I am afraid that I have said more about the real gas tanks than their Hornby representative. This represents the type having three gas cylinders mounted together on the wagon underframe and securely anchored in position. The Hornby Gas Cylinder Wagon is of strong construction. The cylinders are mounted on the new standard base and have the usual domed ends, with prominent holding down straps to keep them in position.

The Wagon adds a colourful touch to any Hornby railway on which it is in service, for the gas cylinders are painted red to indicate the nature of their supposed contents. I am sure that the new vehicle will be as popular as the earlier one now superseded, which has been a favourite among Hornby railway owners for many years, no doubt in view of its unusual and rather special character.

You will remember that among the earliest introductions in the No. 50 series was the Low Sided Wagon, now carrying the characteristic B.R. code name "*Lowfit.*" Subsequently this became available with either a Furniture or Insulated Meat Container. Now we have a further load

variation, for the No. 50 Low Sided Wagon is available with a Cable Drum. Cable Drums have long been popular items of freight on Hornby railways, because of their attractive appearance and general hardiness, along with the fact that real cable drums are so frequently seen being transported by rail, not only for use in connection with electrical schemes in this country, but also on their way for shipment overseas. With the constant development of electric power schemes this type of traffic is likely to remain a common sight. The wagon so loaded is clearly a good thing to add to your Hornby stock.

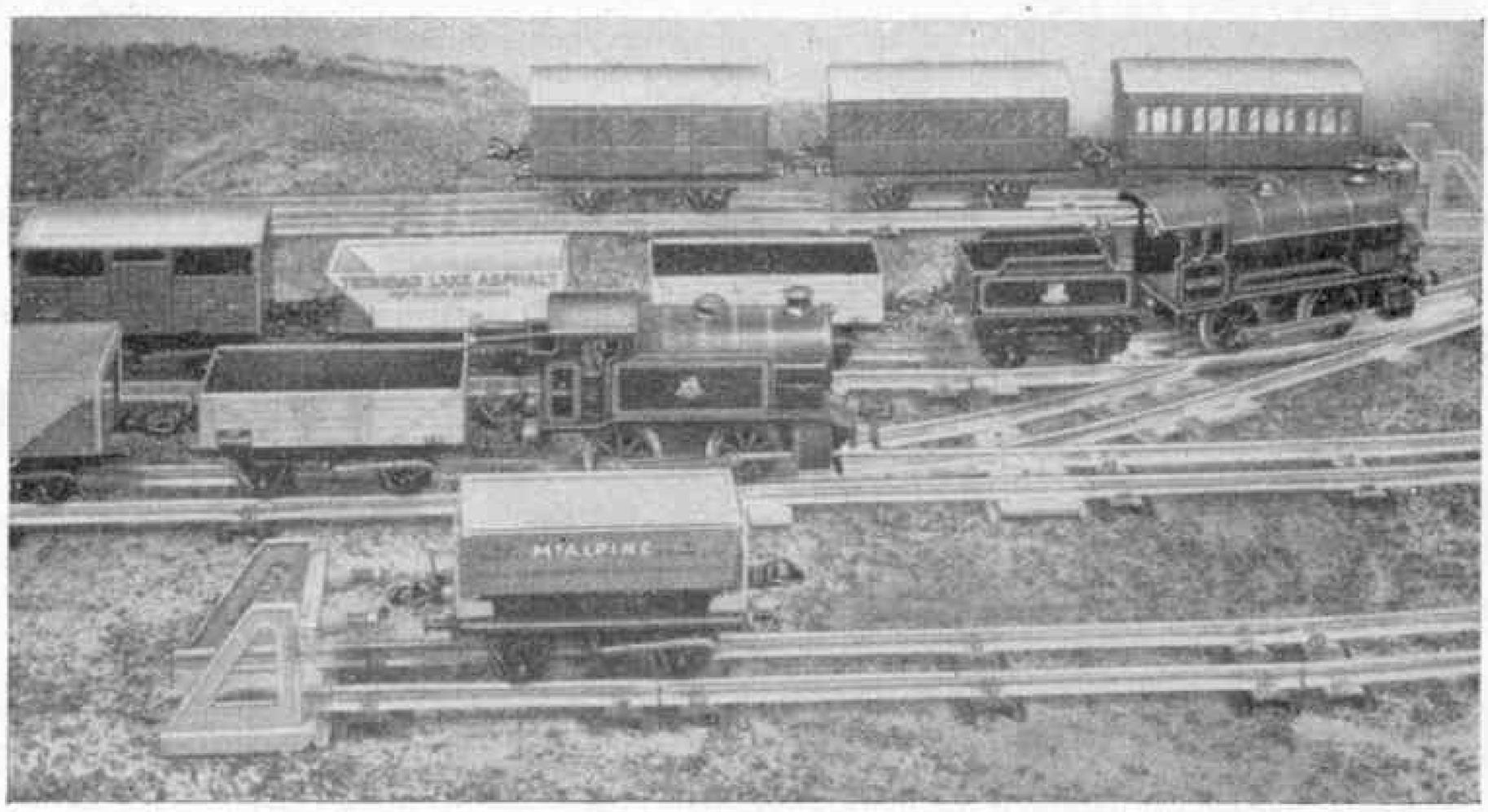
I need not tell you much about the Cable Drum itself, but its use in connection with the Hornby Low Sided Wagon brings to our notice the purpose of the four small rings or eyes that are fitted to it, two to each side of the Wagon. The purpose of these is to receive the "rope"—Meccano Cord actually—by means of which the Drum is lashed to the Wagon for safe transit. The Cord is passed through the centre hole in the Cable Drum. In actual practice it is usual to "scotch" the drums in position by means of specially shaped blocks of wood nailed to the wagon floor.



Dinky Toys road vehicles halt respectfully while a No. 40 Tank takes its train of No. 50 goods stock over the Level Crossing.

Some time ago we had a talk about the Tipping Wagons of the Hornby system. There are two varieties of No. 50 Tipping Wagon, the Side Tipping Wagon and the Rotary Tipping Wagon respectively. Up-to-date versions of these are now available on the standard base. The actual tipping bodies remain much as before, although there have been minor alterations in design, particularly in the Side Tipping vehicle.

On a Hornby system the Tipping Wagons, like the Gas Cylinder Wagon, can be regarded as vehicles for "departmental" service and therefore they are run in engineering and construction trains more frequently than in ordinary freight trains.



A busy scene on a Hornby railway in which several of the No. 50 vehicles appear, including the Side and Rotary Tipping Wagons.

Of General Interest

Football in the water, played annually at Whitsuntide at Bourton-on-the-Water. Photograph by S. A. Bennett, Shirley, Warwickshire.

WE are now well into the new football season, so in a sense the football picture on this page is topical. But playing football in water in winter would be decidedly uncomfortable. Actually the game in progress took place last Whitsuntide at the Gloucestershire village of Bourton-on-the-Water, through which flows the River Windrush, which is crossed by a number of small bridges. The game lasts about half an hour, and S. A. Bennett, who saw and photographed it, found the play fast and furious, the players seeming more intent on splashing each other and the spectators than on scoring.

From water let us turn to coal. Lorries carrying bags of coal are common sights in our streets, but they are threatened by the new coal delivery lorry seen in the lower illustration on this page. This is semi-automatic, loading a weighed amount of coal into a sack in front of the customer.

This Autobagger, as it is called, has been introduced by Charrold Ltd., London. The coal is loaded rapidly, with a fine control at the end to give accurate weighing, and the bag cannot be lifted until the machine shows correct weight. Hydraulic power then raises it to shoulder height, so that it can easily be carried away.

The new semi-automatic coal delivery lorry introduced by Charrold Ltd., London.

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.

The postmark on this card shows that it was posted on the Jungfraujoch, Switzerland, at a height of 3,457 m. or 11,333 ft.

Is this the World's Highest Posting?

I have a postcard that was posted on the Jungfraujoch, in Switzerland, at a height of 11,333 ft. above sea level. This therefore beats P. Stoker's achievement, of posting a card from the Gornergrat at a height of 10,290 ft., about which he wrote in the June *M.M.*

While on holiday with my school in Switzerland last year I ascended the Jungfraujoch by train. A rack railway took my party to Kleine Scheidegg, where we changed to narrow gauge track. The rest of the journey was mostly made in darkness, in tunnels driven through the Eiger and the Monch, two summits the names of which mean the Ogre and the Monk.

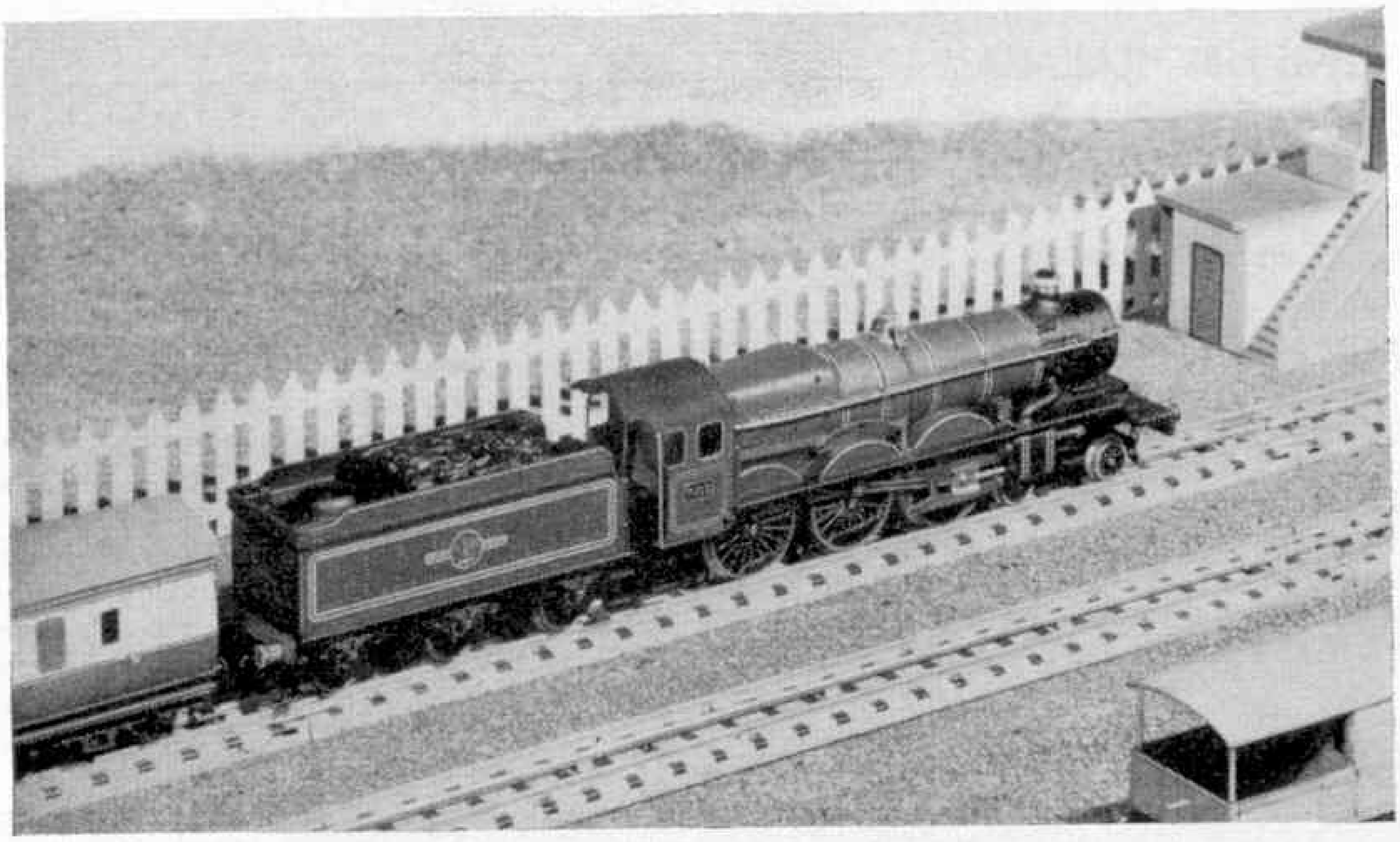
C. FINN (South Kirkby, nr. Pontefract).

An Ancient Building System

The ruined building seen in the accompanying picture is in an out-of-the-way hamlet in Cumberland, not far from Caldbeck, in the famous John Peel country. The ruinous state of its walls reveals the very interesting wooden structure forming its frame. This is built on the "cruck" system, which was used as far back as Anglo-Saxon times and continued in use into the Middle Ages. A "cruck" was formed of two beams, wide apart at ground level and fastened together at the top, thus forming a strong wooden triangle. Two or more of these crucks, joined at the top by a strong wooden ridge beam, made a sturdy framework round which the walls were constructed.

One such cruck can be plainly seen in the picture, with a second one some distance behind it. Close examination showed that the woodwork was fastened together by wooden pegs. C. DENWOOD (Penrith).

An interesting old building in Cumberland. Photograph by C. Denwood, Penrith.



Good Railways need Good Locomotives

By The Editor

ON the pages following this one there is a series of articles dealing with Hornby-Dublo railways. There are more pages on this topic than usual this month, because this issue is in a way a Hornby-Dublo number. The reason for this is that Hornby-Dublo Train Week is being celebrated this month in the Hornby-Dublo world, with special displays by dealers.

I often think that some of these articles go beyond being just technical contributions, providing guidance for the Hornby-Dublo railway enthusiast, and particularly for beginners. Sometimes they include words of wisdom that can be applied in other directions. For instance, in one of the following articles you will see a reference to the claim that *Good trains need good track*. This seems to me to be a railway application of a universal truth. Anything that is good needs good foundations, or to have good things associated with it.

This applies very much to Hornby-Dublo railways. Hornby-Dublo track is good, and such things as Signals, Points, Uncoupling Rails and, to refer to fairly recent introductions, the Hornby-Dublo Turntable and the T.P.O. Mail Van Set—all these too are good in design and work well. So they deserve equally attractive items to follow them. Everything in fact should be of the best, and there should be plenty of variety.

In a sense all this is an introduction to an event that some of you will have realised is imminent from the picture on this page—the appearance of a miniature Western Region Castle locomotive in the Hornby-Dublo system. Hornby-Dublo track deserves good locomotives, and certainly has good ones in those already included in the Hornby-Dublo system. Now comes the Castle, the first Western Region introduction based on a product of the Great Western locomotive design staff at Swindon, which has been responsible for so many brilliant efforts. A glance at the picture will show that the miniature is worthy of its original, one of the most famous of British locomitives for both its efficiency and attractive appearance.

I have seen one of the first Castles off the production line running on a track, with behind it the new Hornby-Dublo Coaches in Western Region colours, and I can assure you that in performance as well as in appearance the Castle is one of the finest introductions that even the Hornby-Dublo system has seen. Western Region rolling stock, in the correct chocolate and cream colouring of course, had to be included in the Hornby-Dublo series now that the

(Continued on page 526)

HORNBY RAILWAY COMPANY

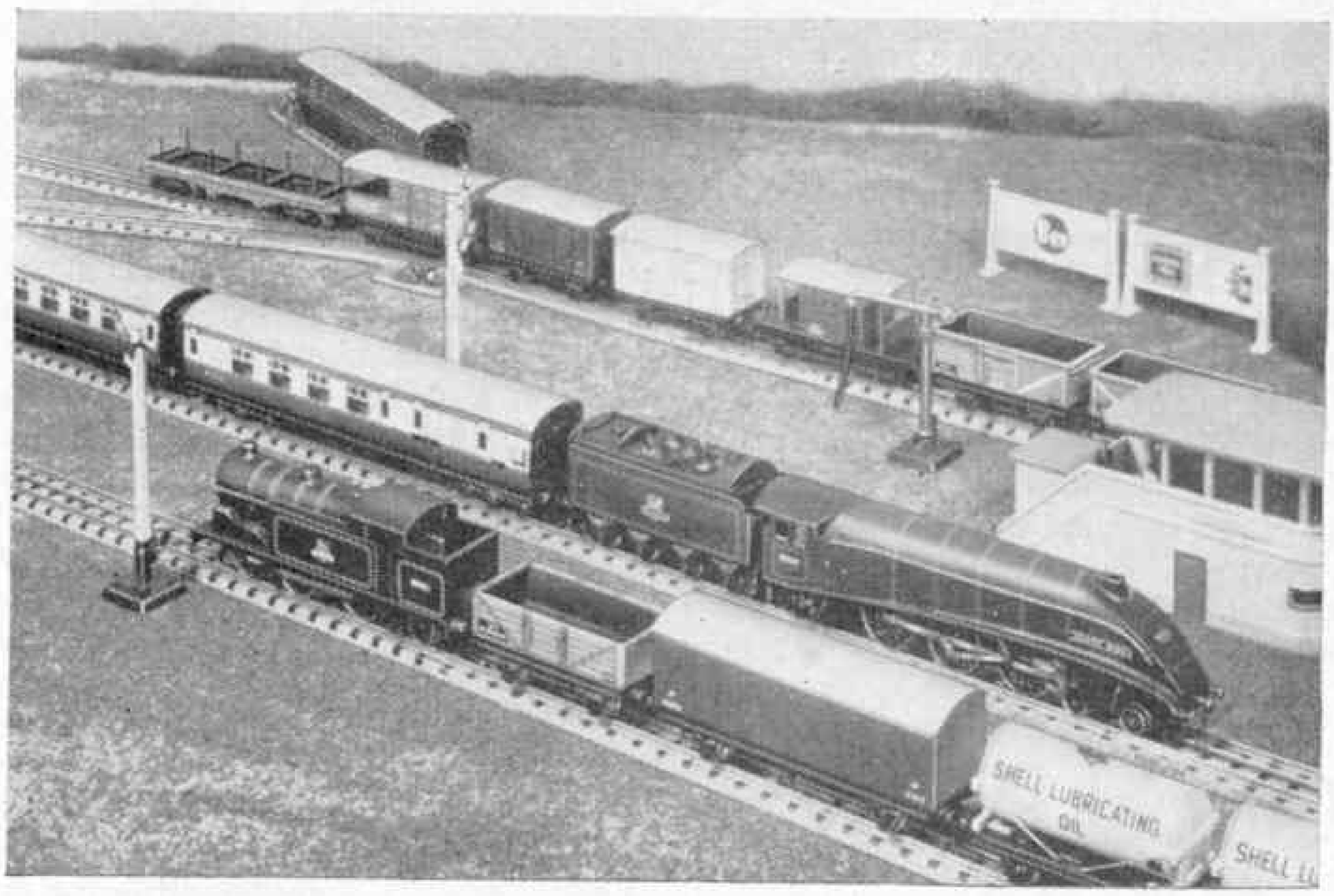
Train Services You Can Run

By the Secretary

WHEN we begin to run Hornby-Dublo railways our train working is bound to be slightly irregular. We are in the learning stage, getting used to the possibilities of various layouts, the management of the locomotive and the different movements that are necessary in order to carry out our requirements. We have still to find the most effective positions for particular items, such as Signals, or an Uncoupling Rail, and we have to become practised in controlling trains of varying lengths when shunting and other movements are taking place.

By degrees experience in different directions is built up and practice brings us to the stage when different operations are carried out smoothly. No attempt should be made to rush things. It is better to proceed calmly and methodically, taking care that all preliminaries are carried out in due order before embarking on large schemes. For instance, to obtain good results, apart from the right "feel" of the job that experience brings, you must have your track in good condition, and engines and rolling stock properly oiled, and generally in full working order, *before* you begin. So it is a good idea to have a regular cleaning session. Conditions vary on different layouts, naturally, so the individual owner will have to settle for himself at what intervals these maintenance operations should be carried out.

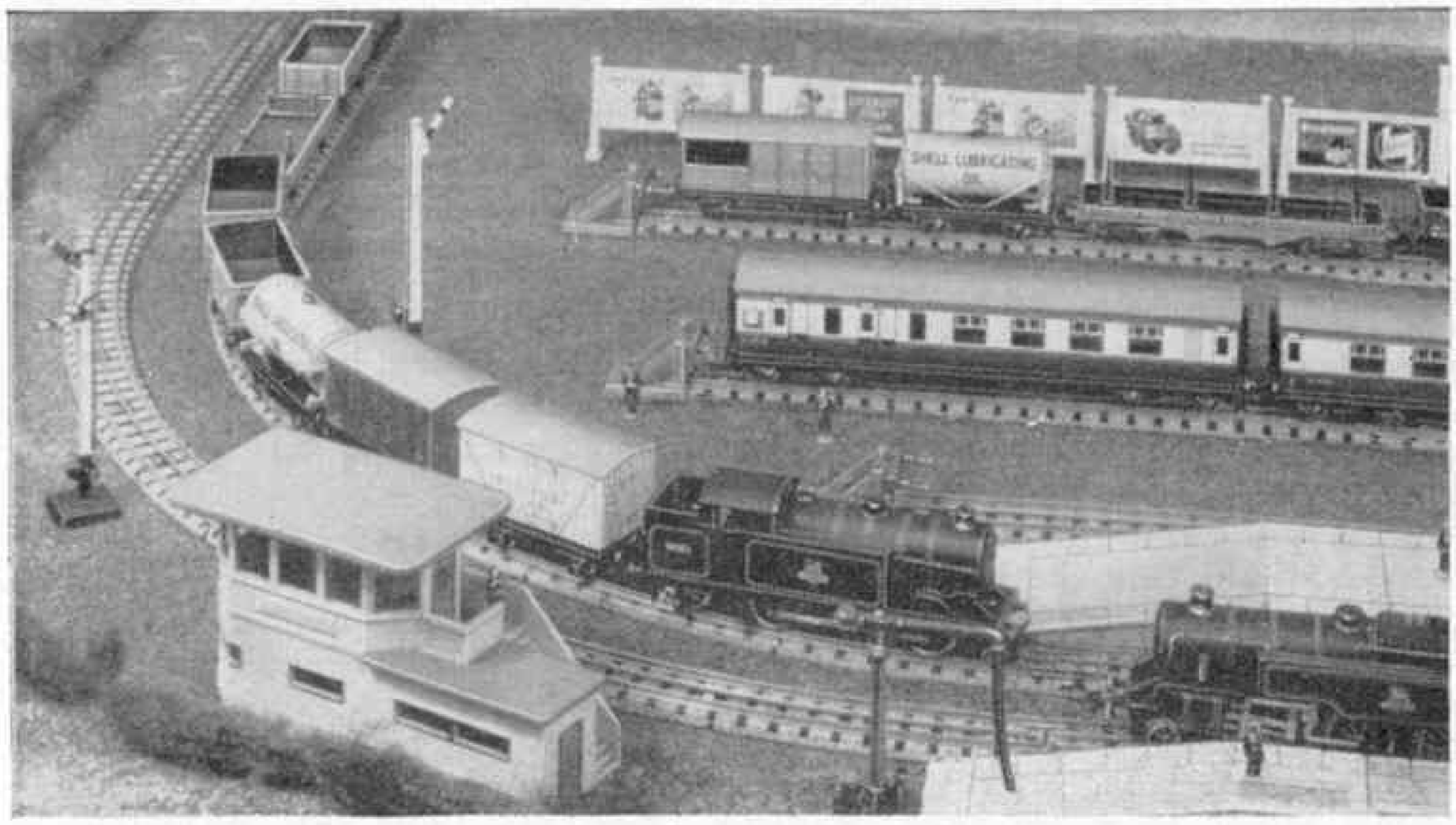
Once the layout has progressed from the elementary stages, train running becomes a more regular and better organised affair. As a rule, a definite working scheme replaces the earlier haphazard running and the train movements then follow one another in a well regulated sequence, which of course applies to oiling and other maintenance proceedings as well.



The double arm Signal shows "line clear" to the through main line express headed by the Hornby-Dublo "Silver King" Locomotive. The yard siding holds a variety of rolling stock.

Train working by timetable comes next, for both individual owners and H.R.C. Branches. A working scheme that lasts for a given period, say half an hour or so, can be quite successful, but should be changed for alternative workings, either as complete programmes or as variations within a given set of operations, before it becomes automatic or monotonous.

Remember, in this connection, that running schemes on real railways show variations. For instance, many trains run on Monday to Friday only, and there are certain alternative and many special Saturday workings while Sunday services are entirely different. Exactly how you can determine what day it is in Hornby-Dublo is something for you to work out, but you can have a series of workings that vary in a similar manner to the real ones.



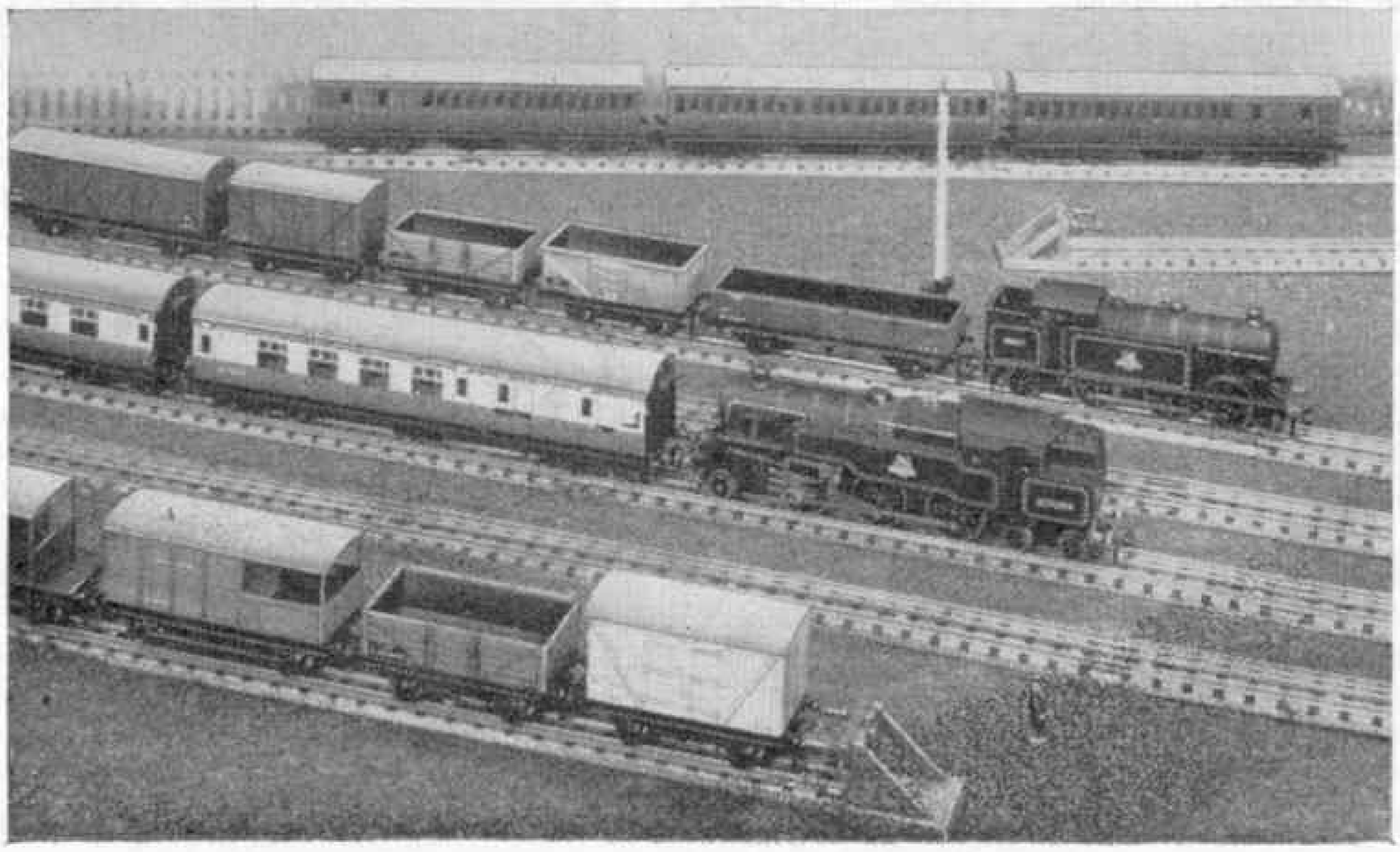
Round the curve into the Station bustles the Hornby-Dublo 0-6-2T with its mixed goods train. In the foreground the 2-6-4T is ready to leave.

In this way you can build up in miniature a finely varied system of running, and in this you should include miniatures of various expresses well known on real main lines. In Hornby-Dublo there are plenty of opportunities for this. The Sets provide for some of them, and in addition you can build up in Hornby-Dublo some of the principal long-distance trains on the routes to the north, the recent introduction of the Hornby-Dublo D22 Coaches making this sort of thing easy to arrange.

Last August I referred to the EDP22 *Royal Scot* Train Set, which includes the D22 Coaches in maroon finish. There are other "Scots" that you can run with the same engine and stock. And don't forget, this year has seen the introduction of *The Caledonian*, a limited-load special service for which the Hornby-Dublo "Duchess" locomotive and D22 Corridor stock are exactly what is required in miniature.

East Coast enthusiasts can organise their special train services too, using the D22 maroon or D12 red and cream Corridor Coaches. The recently named *Fair Maid* of actual practice, for instance, will no doubt be added to many Hornby-Dublo working schemes in which East Coast interests are prominent. The popular *Silver King* locomotive with its corridor type tender is just the engine you want for long through workings. The A4 class that it represents is still the favourite for special duties of this kind.

Don't forget that your local passenger and goods workings should be organised in the same tidy manner as your main line trains. The various services should "fit in" so that you really enjoy your train running.



Local passengers on this train are lucky, as they have the use of D12 Corridor stock on its way to a terminal station to form a main line express.

Readers' Hornby-Dublo Layouts

How to Lay Their Foundations

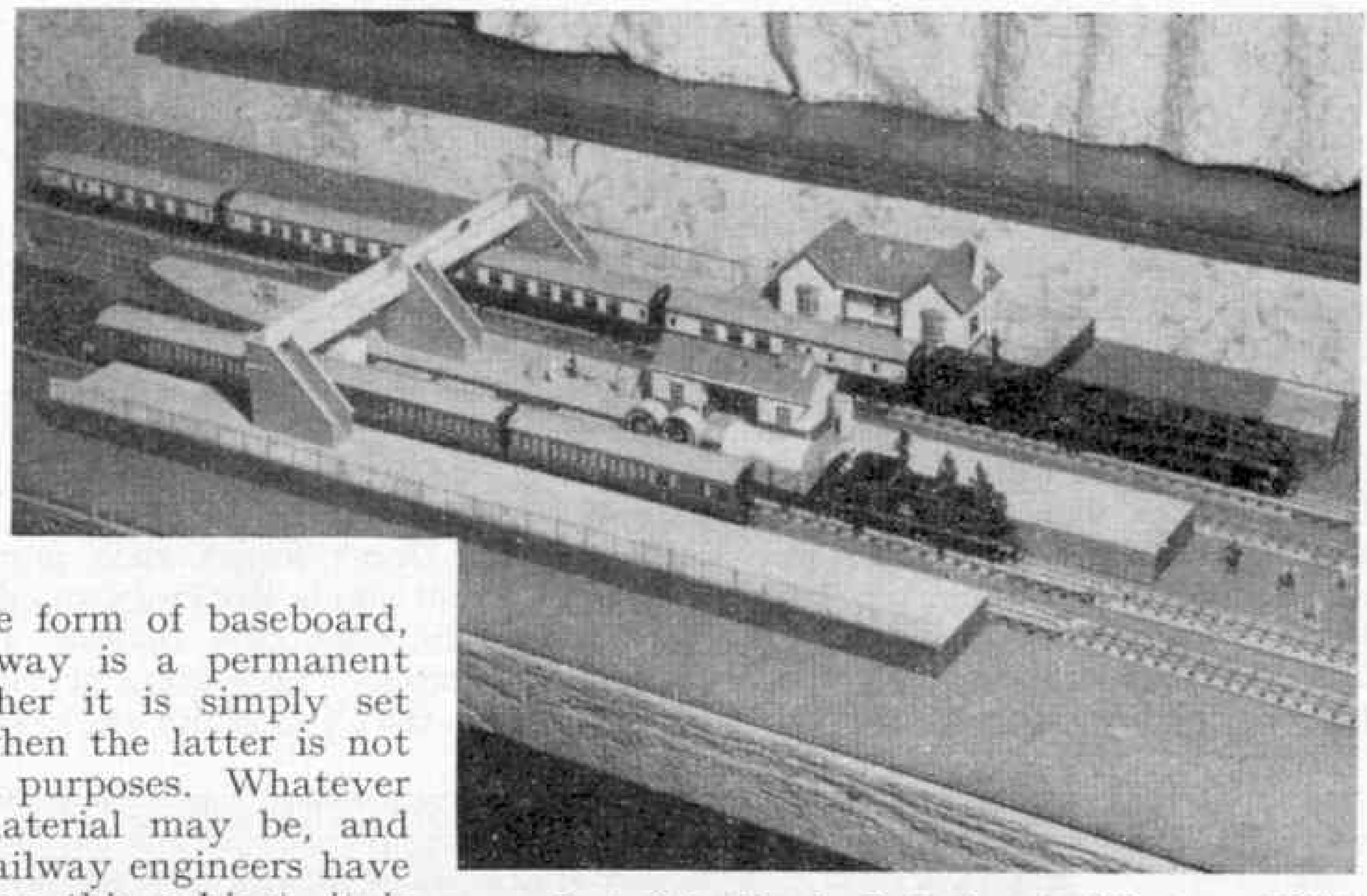
MANY Hornby-Dublo owners make a habit of corresponding regularly with Hornby Railway Company Headquarters, giving details of their layouts and any particular problems that are encountered in the course of layout planning and operations. More should do this, keeping in touch with their own special organisation, and all can be sure that news of their layouts is always welcome, particularly when recent developments are shown in one or two good photographs. Even if the pictures simply show part of the railway, with the owner operating it, provided they are sharp and clear, they are always welcome, and suitable pictures will be selected for inclusion in the *M.M.*

It is evident from the letters received that most Hornby-Dublo layouts nowadays are arranged on some form of baseboard, whether the railway is a permanent system, or whether it is simply set up on a table, when the latter is not in use for normal purposes. Whatever the baseboard material may be, and most miniature railway engineers have their own ideas on this subject, it is certain that adequate support is necessary.

Any sheet of plywood or hardboard or other material needs to be correctly stiffened by a timbered framework. This applies whether the board is permanently supported, forms part of a raised structure in a special railway room, or whether it is a separate table top affair that can be lifted into and out of position as required.

An example of a Hornby-Dublo layout in which baseboard matters have been carefully studied is that of Roger and Philip Law, part of which can be seen in the illustration on this page. These boys are fortunate in having a separate room for their railway and the baseboard is made to follow its walls. It is clear from the picture that there is a properly constructed framework beneath the base itself, and in this respect special credit is due to the boys' father, Mr. John Law, who takes a keen interest in the whole business and who at times is sure to take part in the working of the line. Fathers are often very helpful, and in any case deserve a share in the fun!

A point that deserves special notice is that the baseboard has been made of sufficient width to allow not only for the railway, but also for the inclusion of various lineside items. There is sometimes a tendency when planning baseboards to restrict the width merely to that required for the safe arrangement of the track alone. When later developments occur this is often regretted, as it is not easy to add to an existing structure without upsetting the general style of things and making it look like a collection of bits and pieces.



Part of the Hornby-Dublo layout of Roger and Philip Law. The home-made station platforms were incomplete when the photograph was taken.

Apart from the railway effects themselves it is always desirable to aim at a neat baseboard arrangement, particularly where the board has to be accommodated in a living room and is laid on top of an ordinary

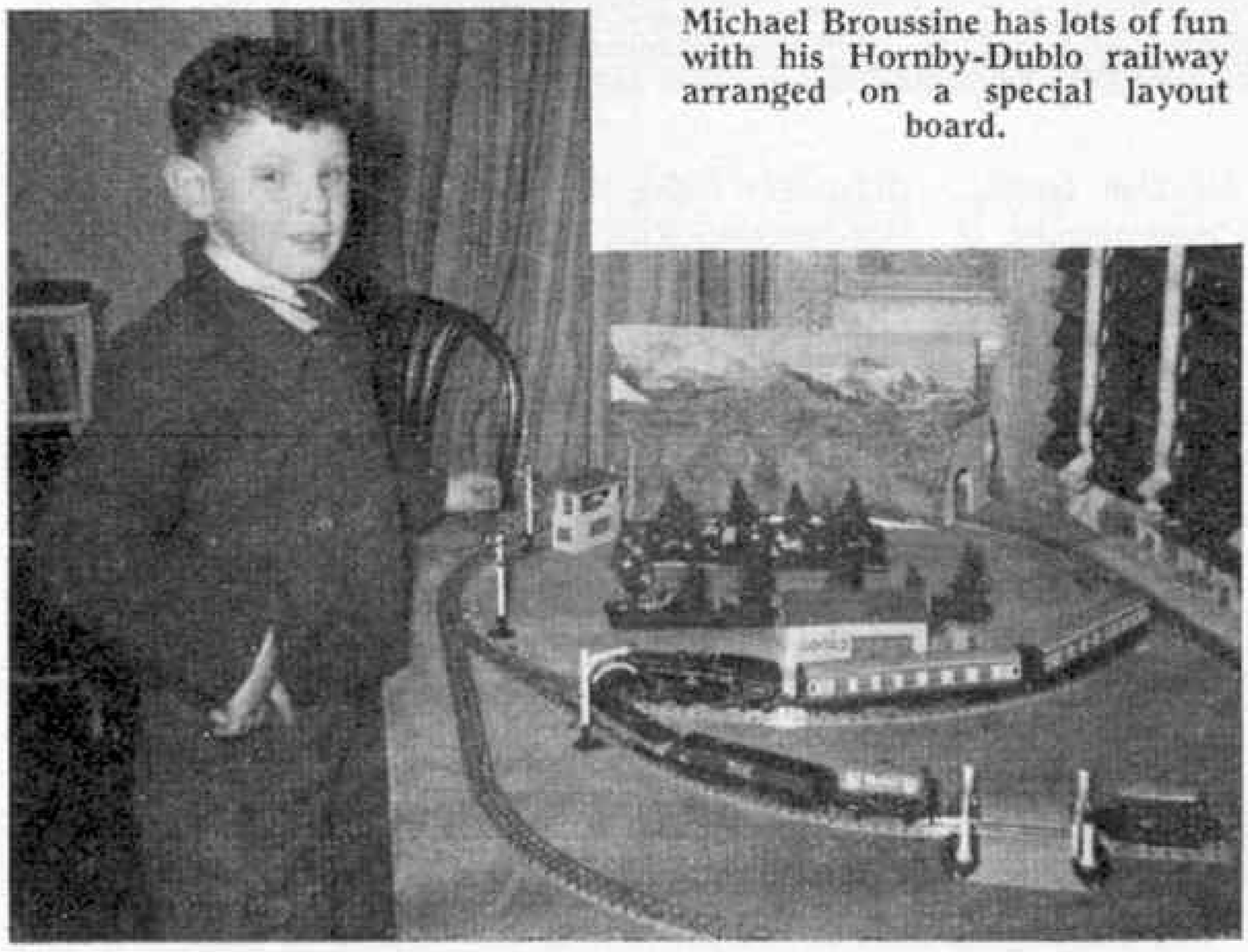
Shanti Goonewardene showing his brothers Saliya and Sryantha how well his Hornby-Dublo train performs.

table. Our two other illustrations show how this method of presentation has been applied by enthusiasts enjoying their hobby miles away from one another. In the upper illustration we have Shanti Goonewardene and his brothers, of Colombo, Ceylon, having fun with their Hornby-Dublo Train. It is quite certain that before very long Saliya, who is nine years old, and the junior member Sryantha, who is four, will be able to share in actual operations. Their railway is a well arranged one and the general baseboard effect is neat and attractive, simple yet with its varied lineside. Notice the poster on the wall. Decorations of this kind, where they can be used, help to create the right atmosphere of travel.

The same characteristics are found on a layout that is even simpler still. It is seen in the third illustration, in which Michael Broussine, of Kenilworth, Warwickshire, is pictured with his layout. This is arranged on a table top type of board. The system appears to follow, more or less, one of the simpler layouts in the publication *Hornby-Dublo Rail Layouts*, with one or two variations arranged by the owner. It is always interesting to come across instances of this sort of thing, as the layouts in the booklet should not be regarded hard-and-fast, final designs, but as railways that can grow to meet the needs of the individual owner.

As on most layouts nowadays, some attention has been given by Michael to lineside effects. Those provided are quite attractive. The tunnel shown in the background is a good piece of work and the effect of distance beyond it is well helped by the scenic background that shows immediately above the tunnel top. So many tunnels, as one correspondent has put it, "grow up out of nothing" and look as if they have been simply put over the railway. This of course is just what does happen with most miniature railway tunnels. But real railway tunnels burrow into the ground, so we should always try to give our railways the same appearance.

This is what Michael has done, with some success, considering the portable nature of his railway. There is not much suggestion of approaches to his tunnel, it is true, but these could be added in the shape of retaining walls, sloping upward from ground level to the tunnel.



Michael Broussine has lots of fun with his Hornby-Dublo railway arranged on a special layout board.

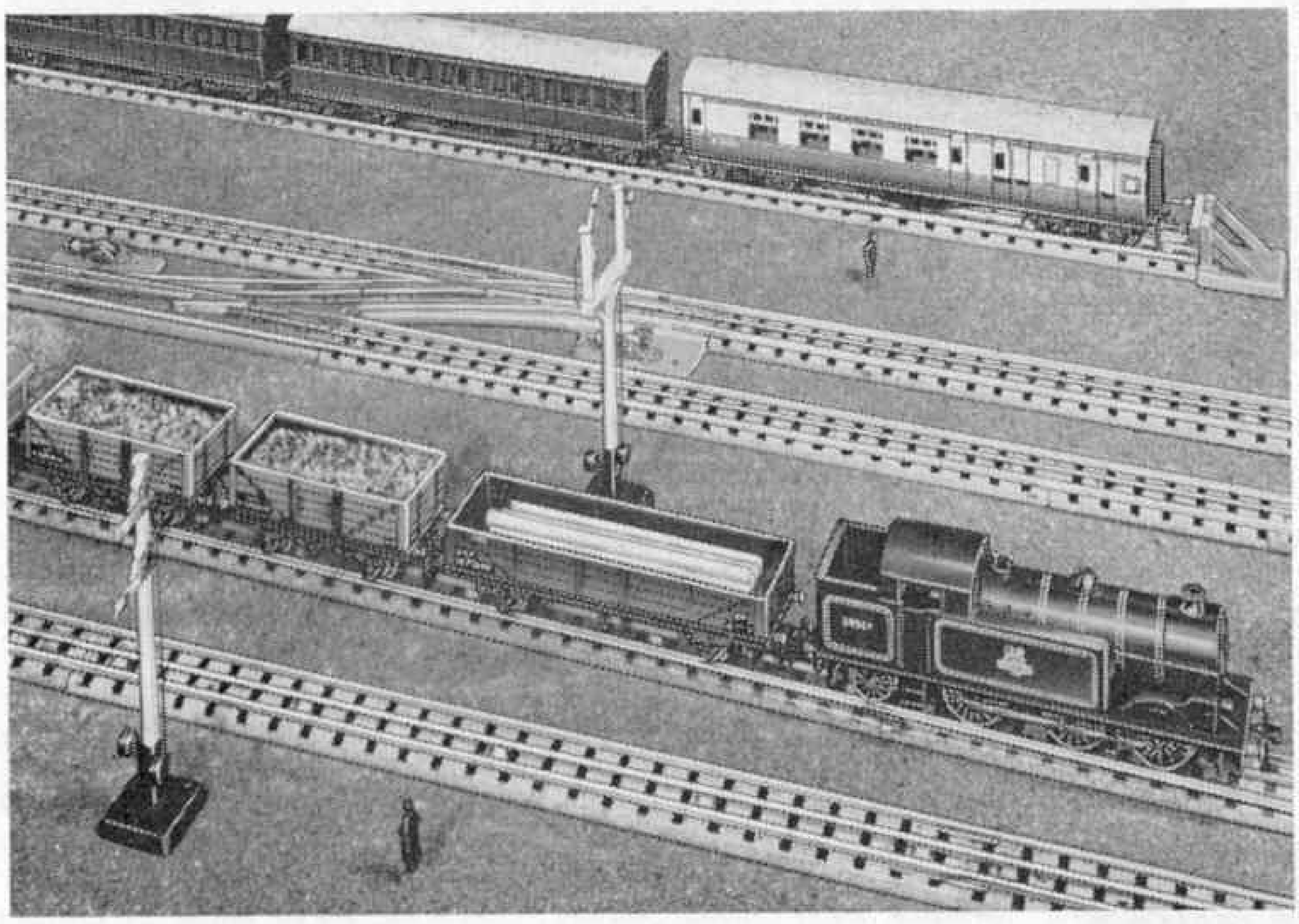
"The Road" in Hornby-Dublo

THE Road is the name by which trainmen often refer to a particular route. It may be a good one for running, or on the other hand gradients, curves and perhaps frequent junctions may make it a difficult one from the train working point of view.

"The road" in Hornby-Dublo can be just as variable according to layout conditions, but whatever the general nature of the system may be it is important to the Hornby-Dublo operator that the rails should be well and truly laid in the first instance and well maintained subsequently. *Good trains need good track*, claimed an American Railroad recently, and this is as true in miniature as in real practice. But Hornby-Dublo Trains do more than need good track. They deserve it! Most Hornby-Dublo layouts nowadays are arranged on a baseboard of some kind. This is all to the good if the board is nicely level, with sufficient strengthening members beneath it to maintain a good level surface for the railway.

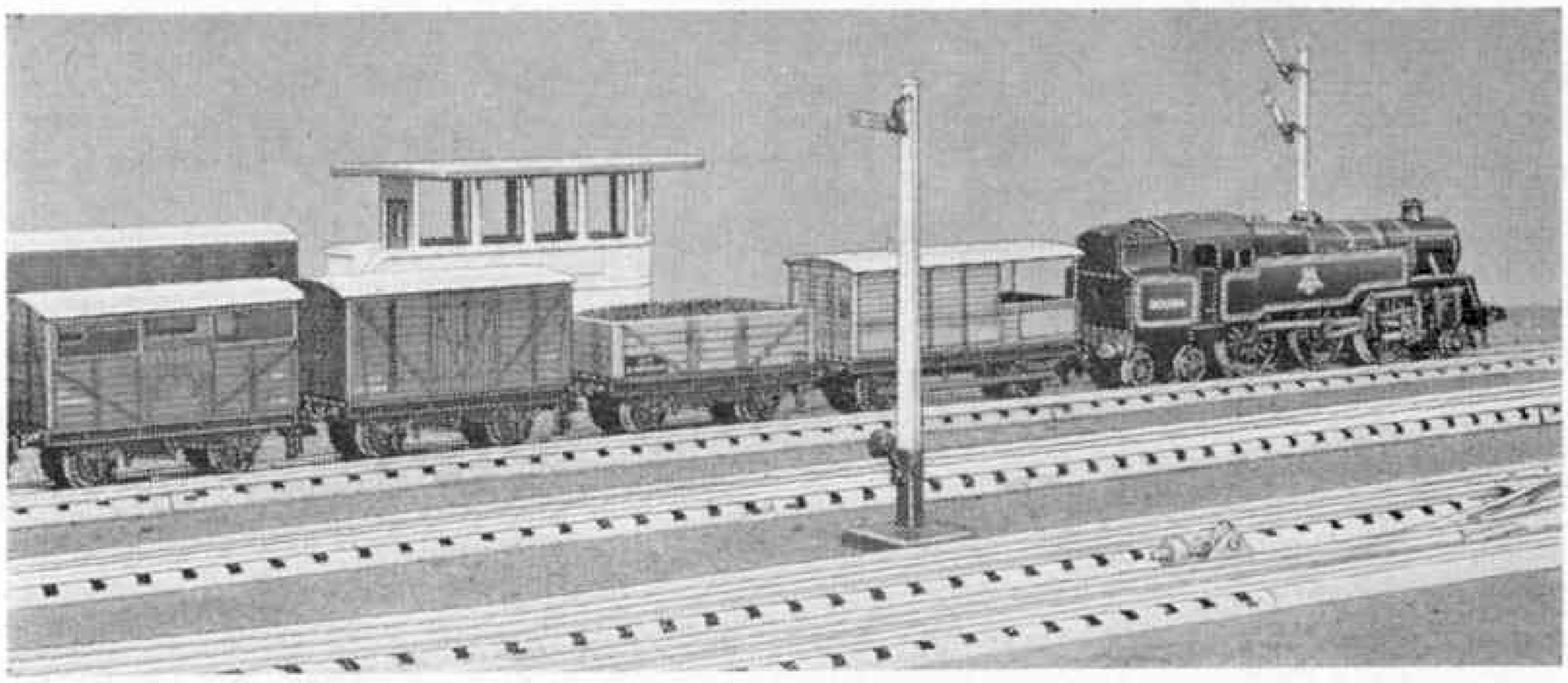
The simplest of all systems is the single track with which most beginners start operations. Fairly soon, as a rule, after the addition of sidings and loops, it is extended to form a double track layout. This increases the operating possibilities tremendously, because with suitable power and control arrangements two trains can be run quite independently of one another. A double track layout always looks neat and consistent, and what is better than the sight of a good stretch of double track, even if it does not include Points, Crossings or other additional features?

These are necessary additions, of course, as sidings and loop lines and branches have to be formed, and up and down tracks have to be connected so that movements from one to the other are possible. These add to the picture if they are properly laid in, in a trailing direction to the normal run of traffic, so that trains have to set back through the Points in order to change from the up track to the down.



A four-track section on a Hornby-Dublo layout, where main and relief lines are arranged in separate pairs.

This is the situation that you can see in the illustration on this page, where a four-track section of main line is made up of two separate pairs of up and down tracks. This arrangement of the track in pairs is quite a common practice, although it does entail crossover Points, and Crossings, in order to allow trains to be diverted from one set of tracks to the other. The upper tracks in the picture are connected by means of two left hand Points arranged to form a crossover, and these Points are correctly laid trailing to the traffic.



A broad stretch of Hornby-Dublo railway, with loop lines in the foreground.

A layout has to be fairly spacious to incorporate a four track section, but where there is ample room the arrangement of crossover roads between the two pairs of tracks has a fine spectacular effect. In such arrangements Hornby-Dublo Diamond Crossings are necessary. In these, the fact that the centre rails of each route are electrically isolated from one another is a great help in planning the supply and wiring arrangements. A train crossing over from the fast road to the slow, or vice-versa, will have no effect electrically on any train that happens to be on an intermediate road that it crosses. Effective signalling arrangements are called for at such installations, and there is of course scope for such schemes as the "Safety-First" plan described by our contributor Squadron-Leader T. W. Newberry, R.A.F., in last month's *M.M.*

Matters are simpler where the relief lines for up and down traffic are laid outside the corresponding first tracks. No crossing of other tracks is involved, because the relief lines can form loops of more or less length that are taken direct from the main line by means of facing Points, as in actual practice. They rejoin the main stem later by trailing Points. Strictly speaking, there should be two sets of Points at each end of a loop, forming a crossover, the loop itself being extended for a short distance at each end beyond the Points to form a kind of over-run section with Buffer Stops at the end. Trains can be held in such loops while others pass on the corresponding main lines if Isolating Switch Points, or Isolating Rails and the useful Insulating Tabs are used. Isolating Rails and the necessary D2 Switches are, of course, needed when there are Electrically Operated Points.

This sort of layout can be employed at a station, the platforms being situated alongside the loop lines for the benefit of stopping trains. Main line trains will continue straight through on the centre roads. This makes a convenient and spectacular arrangement that gives plenty of scope for the effective use of Signals. And it is good from the station and traffic working point of view too.

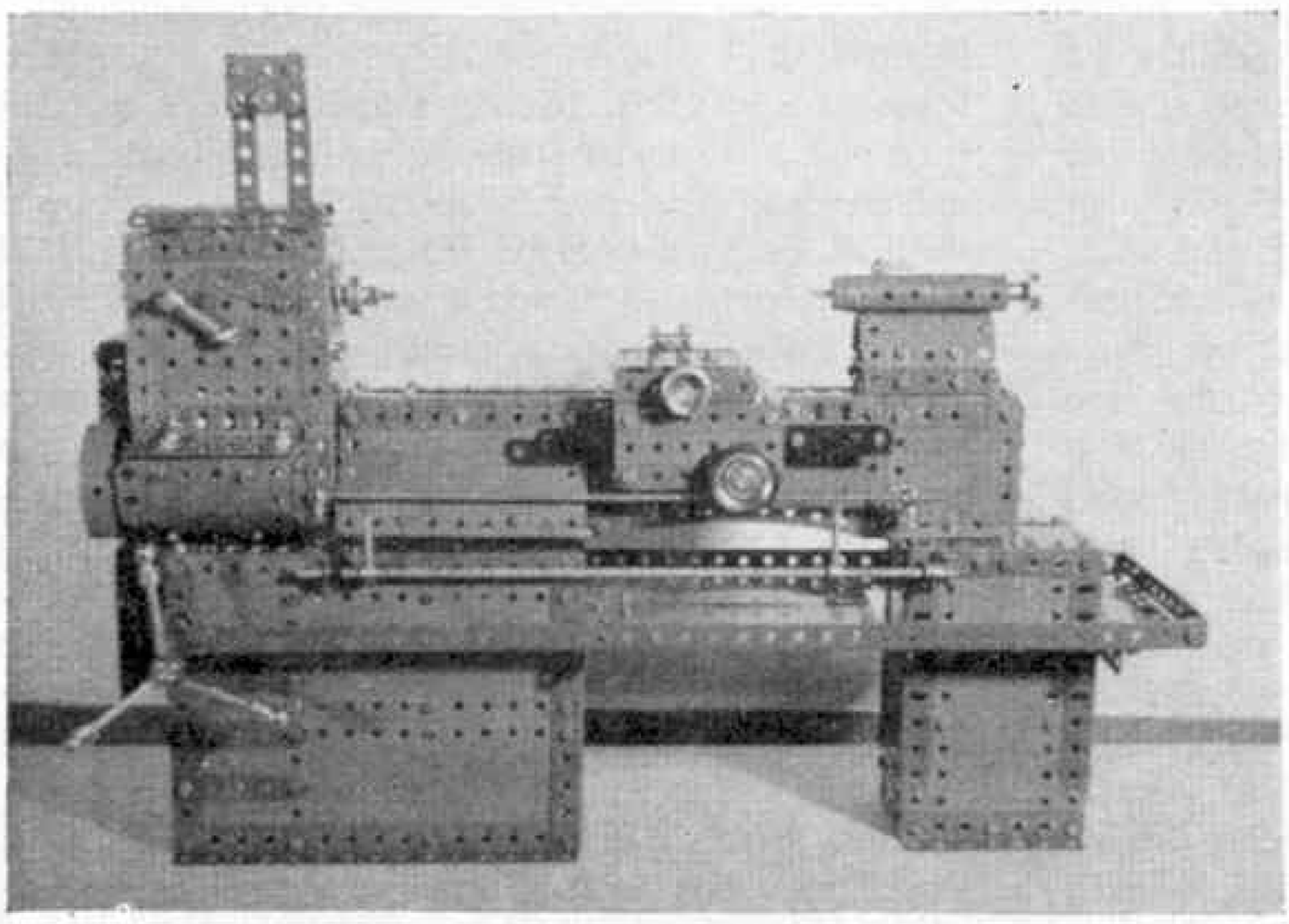
A fine length of four-track railway near Kettering, including a double junction, crossover roads and crossings. Photograph by P. J. Lynch.

Among the Model-Builders

By "Spanner"

A Meccano Lathe

It is rather surprising in view of the scope that they provide for work in mechanism construction that so few model-builders give attention to the modelling of the many different kinds of machine tools that feature in modern engineering workshops. It is only rarely that a model of this kind appears among entries for the various *M.M.* competitions.



This well designed and realistically proportioned Lathe was built by a Canadian reader, Mr. A. E. Robinson, Vancouver, B.C.

Because of this I was very pleased and interested when I received photographs and a few details of a neatly built and well proportioned lathe constructed by Mr. A. E. Robinson, Vancouver, B.C. This attractive model is shown in the upper illustration on this page. It is based on a real high-speed lathe of a well-known make, and is powered by a No. 1 Clockwork Motor.

The lever seen in the headstock controls a two-speed drive to the face plate, and the gear arrangement, which cannot be seen in the illustration, is inside the headstock housing. The slide rest can be moved along the bed by turning a handwheel consisting of a 1″ Pulley fitted with a Rubber Ring. This actuates a ½″ Pinion that is in constant mesh with a 6½″ Rack Strip. The tailstock also can be moved along the bed. The spindle is an Adaptor for Screwed Rod attached to a 3½″ Screwed Rod that is passed through two Sleeve Pieces joined by a Chimney Adaptor. The Screwed Rod passes through a Threaded Boss, which is fixed inside the rear Sleeve Piece by a bolt. By turning a small Flanged Wheel fastened to the end of the Rod, the shaft of the Adaptor can be moved in or out.

A Ratchet Reduction Mechanism

The mechanism shown in Fig. 1 was designed by Mr. A. T. C. Burlinson, Bristol, who used it to obtain a reduction in speed between the driving and driven shafts of a model.

The pawls of the ratchet mechanism are two Angle Brackets 1, each of which is attached as shown to one end of a 3½″ Strip. The Strips are bolted to Single Throw Eccentrics 2,

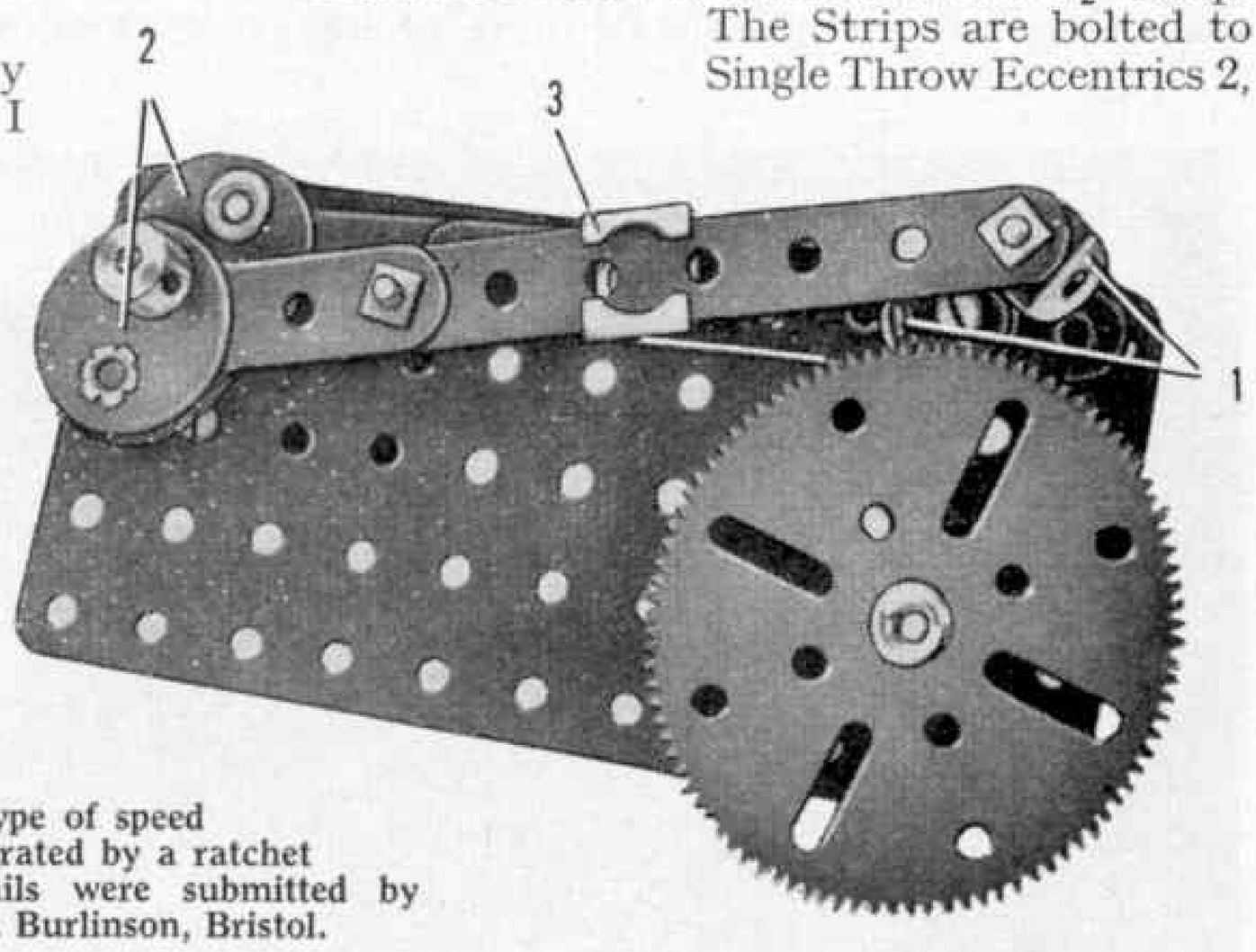


Fig. 1. A novel type of speed reduction gear operated by a ratchet mechanism. Details were submitted by Mr. A. T. C. Burlinson, Bristol.

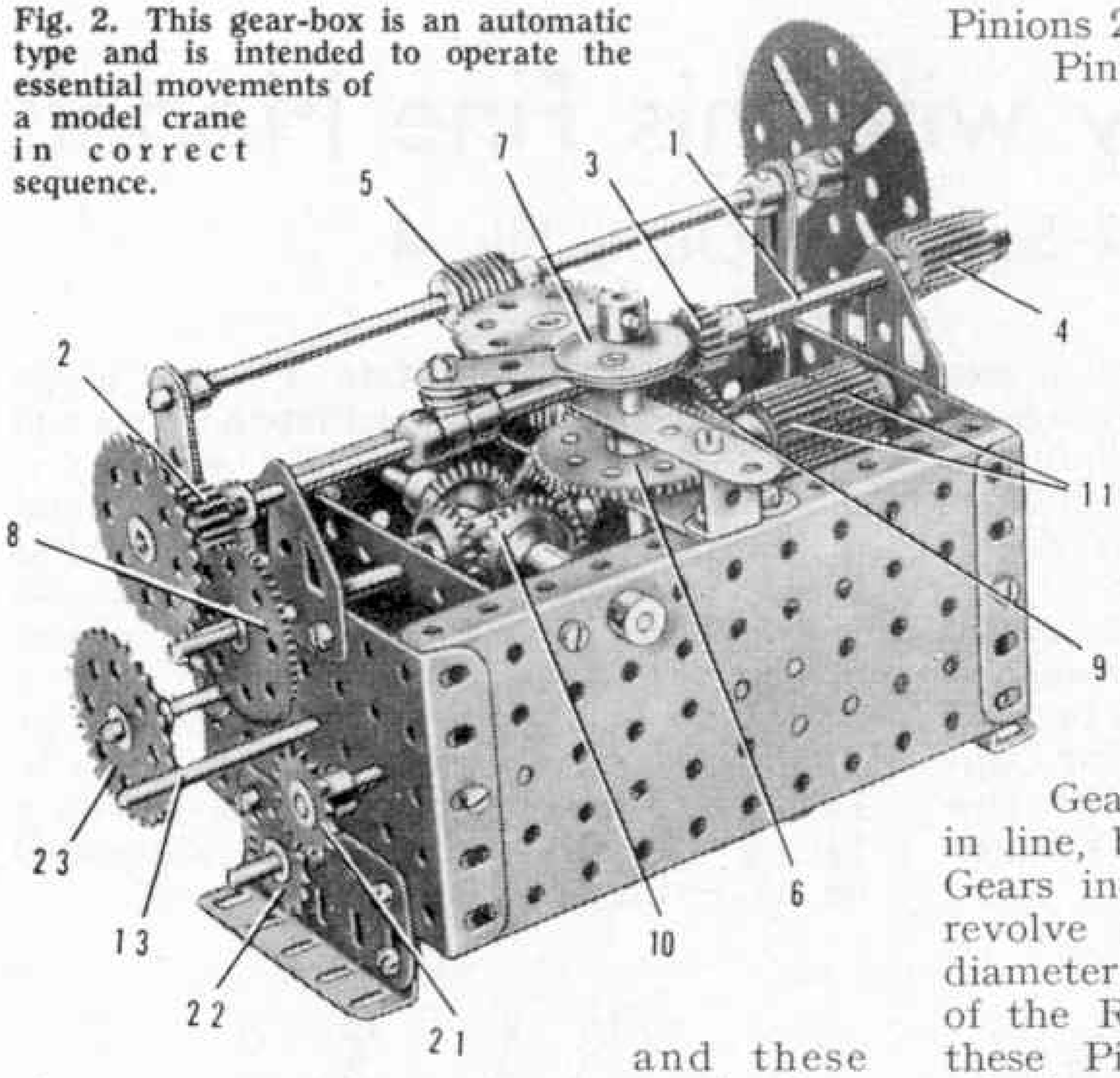


Fig. 2. This gear-box is an automatic type and is intended to operate the essential movements of a model crane in correct sequence.

and these are fixed on the driving shaft. A Slide Piece 3 is passed over one of the Strips, and is fixed on a $\frac{3}{8}''$ Bolt inserted in the third hole from the Eccentric end of the other $3\frac{1}{2}''$ Strip.

The driven member of the mechanism is a $2\frac{1}{2}''$ Gear fixed on the output shaft. The positions of the Angle Brackets should be adjusted carefully so that they engage the Gear alternately as the Eccentrics rotate.

An Automatic Crane Gear-Box

The gear-box shown in Figs. 2 and 3 was designed by Mr. K. C. Bennett for use in an automatic block-setting crane displayed by our dealers, Righton and Bennett Ltd., Gosport. The model is driven by an electric motor and the gear-box distributes the drive to the hoisting, slewing and trolley traversing movements of the crane. The movements are arranged to operate in a definite sequence, and the model operated over the Christmas period for eight hours a day for three weeks without trouble of any kind.

The drive to the gear-box is transmitted by Chain to a Sprocket on a Rod 1. This Rod carries two $\frac{1}{2}''$ diameter, $\frac{1}{4}''$ face Pinions 2 and 3 and a $\frac{1}{2}''$ diameter, $\frac{3}{4}''$ face Pinion 4. Pinion 4 drives a $2\frac{1}{2}''$ Gear on a Rod carrying a Worm 5, and the Worm meshes with a 57-tooth Gear on a short vertical Rod that carries also a $\frac{1}{2}''$ Pinion. The Pinion engages a 57-tooth Gear 6 on the same shaft as a Single Throw Eccentric 7, which is connected by a bolt to a Collar free to turn between two fixed Collars on Rod 1.

The Rod 1 slides from side to side under the action of the Eccentric, and Pinions 2 and 3 are meshed alternately with 57-tooth Gears 8 and 9. These Gears are on separate Rods mounted in line, but connected by the four Bevel Gears indicated at 10 so that the Rods revolve in opposite directions. Two $\frac{3}{4}''$ diameter, $\frac{1}{2}''$ face Pinions 11 are fixed on one of the Rods, and the direction in which these Pinions rotate is determined by whether the Pinion 2 or the Pinion 3 is in mesh with its Gear.

Pinions 11 engage a 50-tooth Gear 12 on a Rod 13, which is moved from side to side by the action of a Triple Throw Eccentric 14 on the same Rod as the Eccentric 7. Rod 13 carries also a 50-tooth Gear 15, and sliding the Rod brings the Gears 12 and 15 into mesh intermittently with $\frac{3}{4}''$ Pinions 16, 17, 18 and 19 on the three output shafts. Pinions 18 and 19 are fixed on separate shafts connected by four Bevel Gears 20 to provide a reverse drive.

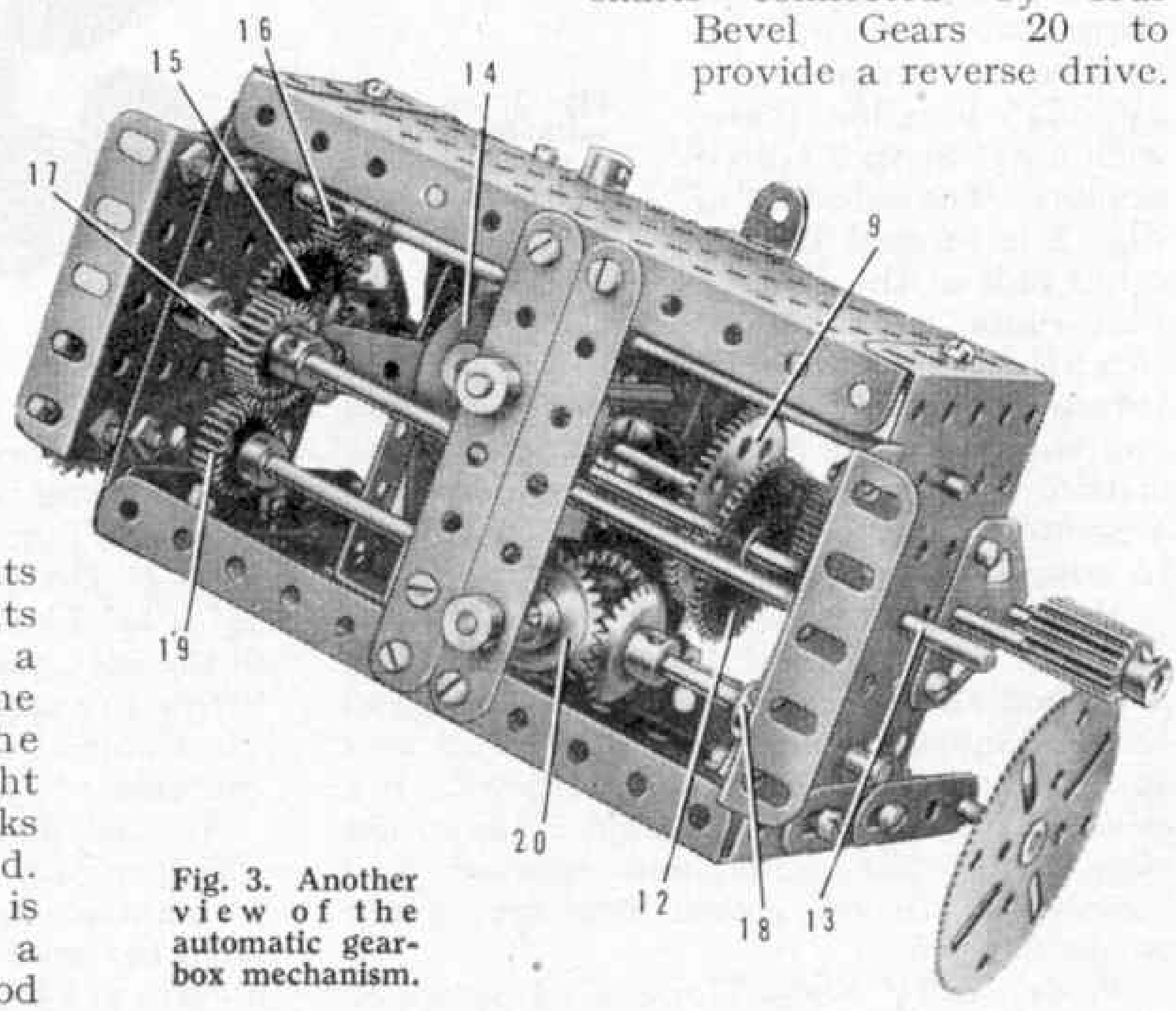


Fig. 3. Another view of the automatic gear-box mechanism.

Build and Play with this Fine Model!

A Skimmer Scoop for Outfit No. 4

FOR those with an Outfit No. 4 or one larger, here is a fine model that is easy and interesting to build and good fun to play with when completed. It is a Skimmer Scoop excavating machine and is shown complete in Fig. 1.

To make the wheeled base of the model you should pass two 4″ Rods through a 5½″ × 2½″ Flanged Plate, and fix on them 1″ Pulleys fitted with Tyres. Use Spring Clips to hold the Rods in place. Now bolt two ½″ Reversed Angle Brackets to the Flanged Plate, and use them to support a 3″ Pulley 1.

To make the sides of the cab you must first of all remove the pin from a Hinged Flat Plate so that you can use the halves separately. The side seen in Fig. 1 consists of half of the Hinged Flat Plate extended upward by two 2½″ Strips and a 2½″ × 2½″ Flexible Plate, with a 5½″ Strip 2 bolted in place. The side seen in Fig. 3 is formed by the other half of the Hinged Flat Plate, a 4½″ × 2½″ Flexible Plate and two 5½″ Strips 3 and 4. Strip 3 is extended forward by a 2½″ Stepped Curved Strip, and you should bolt a 3½″ Strip 5 between the Curved Strip and the end of Strip 4. Fix a Semi-Circular Plate to the end of Strip 3 to complete the side.

You must connect the sides by two Flanged Sector Plates and Angle Brackets arranged as shown in Fig. 2. The Flanged Sector Plates form the base of the cab, and to them you should bolt a 3″ Pulley 6. Fix one end of a 5½″ × 1½″ Flexible Plate to the base, bend the other end upward and connect it to an Angle Bracket bolted to the Strip 5.

Fasten a 3½″ Strip 7 and a 2½″ Stepped Curved Strip to another Angle Bracket bolted to the Flexible Plate. Fix the Curved Strip and a Semi-Circular Plate 8 to one end of a U-section Curved Plate, which you must open out slightly. Bolt the other end of the Curved Plate to a 2½″ × 2½″ Flexible Plate 9 strengthened by a 2½″ Strip, and fasten the Flexible Plate to a flange of one of the Flanged Sector Plates. Bolt a 2½″ × ½″ Double Angle Strip 10 between one side of the cab and the Flexible Plate 9. Bolt the upper end of the 3½″ Strip 7 to a 1½″ × ½″ Double Angle Strip supported by the Strips 4 and 5.

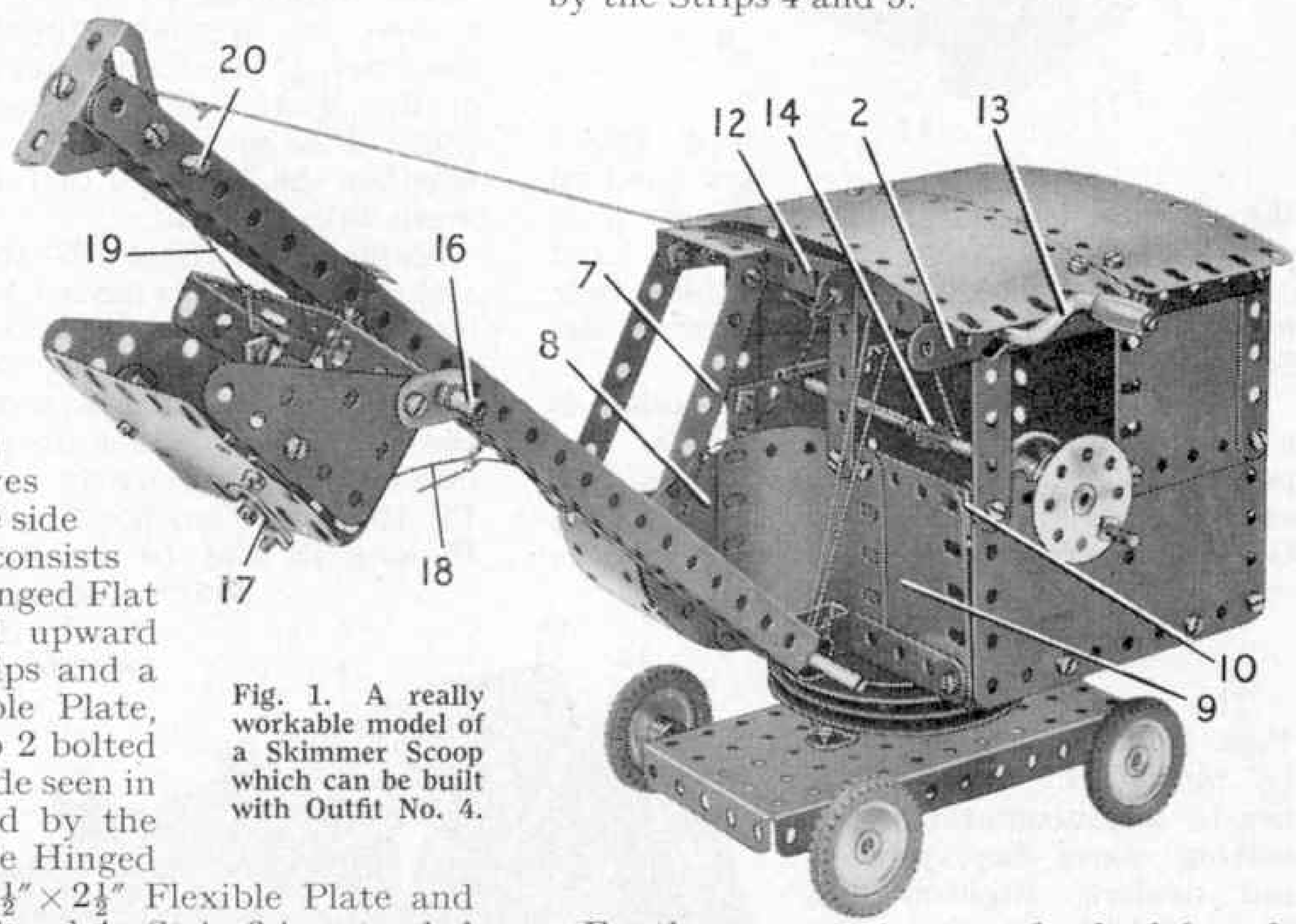


Fig. 1. A really workable model of a Skimmer Scoop which can be built with Outfit No. 4.

For the back of the cab you require a 4½″ × 2½″ Flexible Plate attached to one side by an Angle Bracket and bolted to the rear flange of one of the Flanged Sector Plates. Fix two 2½″ × ½″ Double Angle Strips between the 4½″ × 2½″ Flexible Plate and the other side of the cab, and use one of the Double Angle Strips to support a 2½″ × 2½″ Flexible Plate 11. Connect the lower corner of Plate 11 to the side of the cab by an Angle Bracket.

To complete the cab you should bolt together two 2½″ × ½″ Double Angle Strips to make a made-up strip 12, then bolt this strip between the sides of the cab. Arrange a vertical 2½″ Strip between strip 12 and the Flexible Plate 9. You must mount a

Crank Handle 13 in the lugs of one of the Double Angle Strips forming strip 12, and hold it in place by a Cord Anchoring Spring and a Spring Clip. Join a 3½″ and a 1½″ Rod together by means of a Rod Connector to make a 5″ rod 14, and mount this in the sides of the cab, using a Bush Wheel and a 1″ Pulley to hold it in position. Place a ¾″ Washer between the 1″ Pulley and the side of the cab.

To mount the cab on the wheeled base, fix a 2″ Rod in Pulley 6, pass the Rod through Pulley 1 and the Flanged Plate, and use a Road Wheel fixed on the Rod to hold the base and the cab together. The Road Wheel is placed underneath the base.

Each side member of the jib consists of two 12½″ Strips and you must space these apart by a Washer at each end. Two Double Brackets 15 must be free to slide between the pairs of 12½″ Strips. The upper ends of the Strips are connected by two Trunnions, and the lower ends pivot on a 2″ Rod mounted in a Stepped Bent Strip, which you must bolt tightly to the front of the cab. To enable the jib to be raised or lowered Cord is tied to the Trunnions, is passed over strip 12 and is fastened to Crank Handle 13.

To make the top of the digger bucket you must bolt a 2½″ × 1½″ Flanged Plate to the Double Brackets 15, but space it from them by two Washers on each bolt. Each side of the bucket is a 2½″ × 1½″ Triangular Flexible Plate, and the bottom is a 2½″ × 2½″ Flexible Plate bolted to a 2½″ × ½″ Double Angle Strip. The hinged back is a 2½″ × 1½″ Flexible Plate fitted with two Right Angle Rod and Strip Connectors that support a 3½″ Rod 16. Rod 16 is mounted in the slotted holes of Fishplates bolted to the sides of the bucket, and when the hinged back is closed its lower edge engages in front of a bolt in a Fishplate 17, which is attached to the bottom of the bucket. To release the back, the Rod 16 is pulled upward in the slots of the Fishplates by means of a Cord 18 tied to the Rod and to the cab.

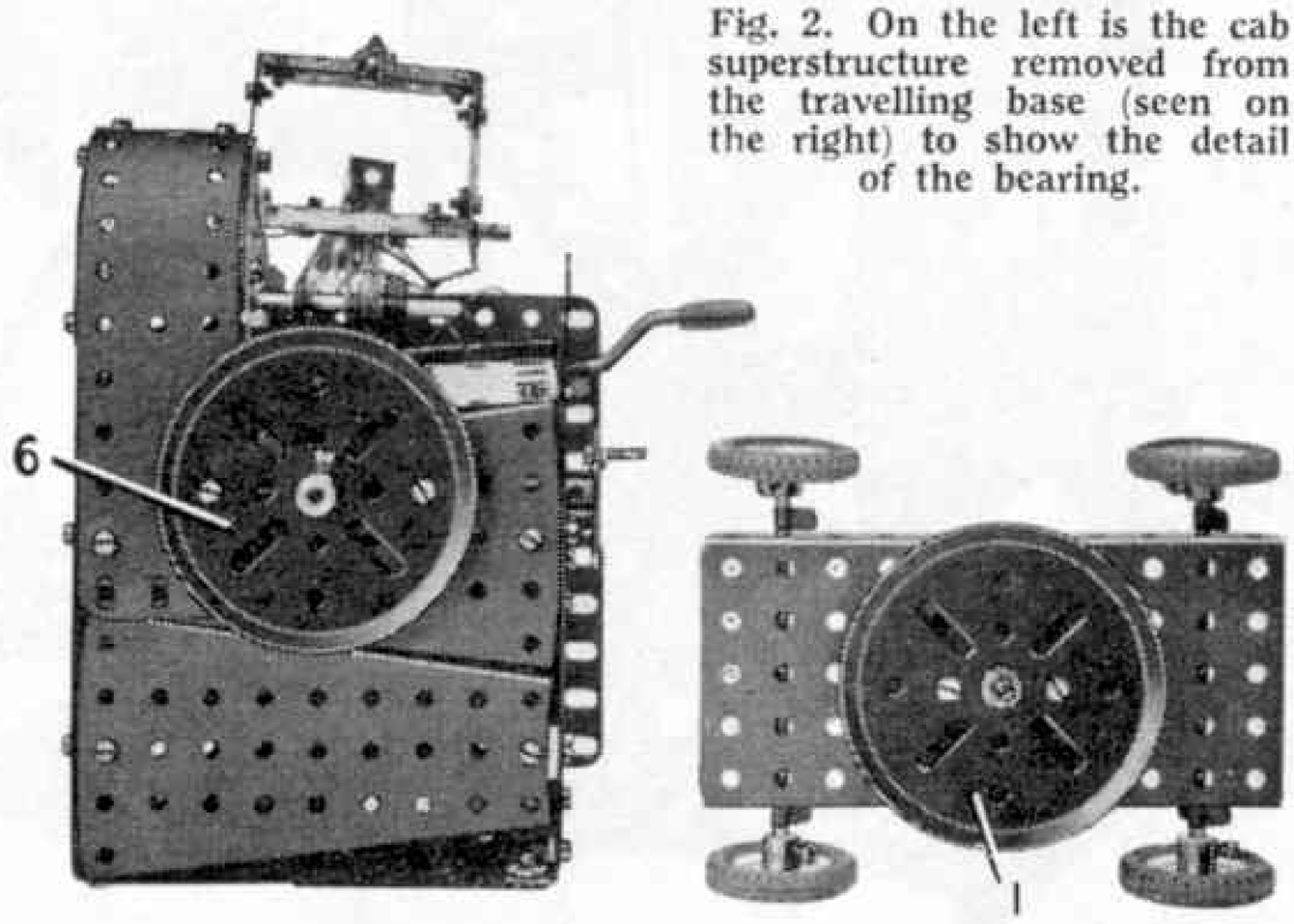


Fig. 2. On the left is the cab superstructure removed from the travelling base (seen on the right) to show the detail of the bearing.

The digging action of the bucket is controlled by a Cord 19. This is tied to the front of the 2½″ × 1½″ Flanged Plate, is passed round a 1½″ Rod 20 and under the 2″ Rod on which the jib pivots. The Cord is then wound five or six times round rod 14, is passed again under the 2″ Rod and is fastened to the rear edge of the 2½″ × 1½″ Flanged Plate.

To complete the model you should curve two 5½″ × 2½″ Flexible Plates slightly to form the roof, and attach them to Obtuse Angle Brackets bolted to the sides.

If the bucket is lined with cardboard the model can be used to dig sand or gravel.

A list of the parts required to build this model is given on page 526.

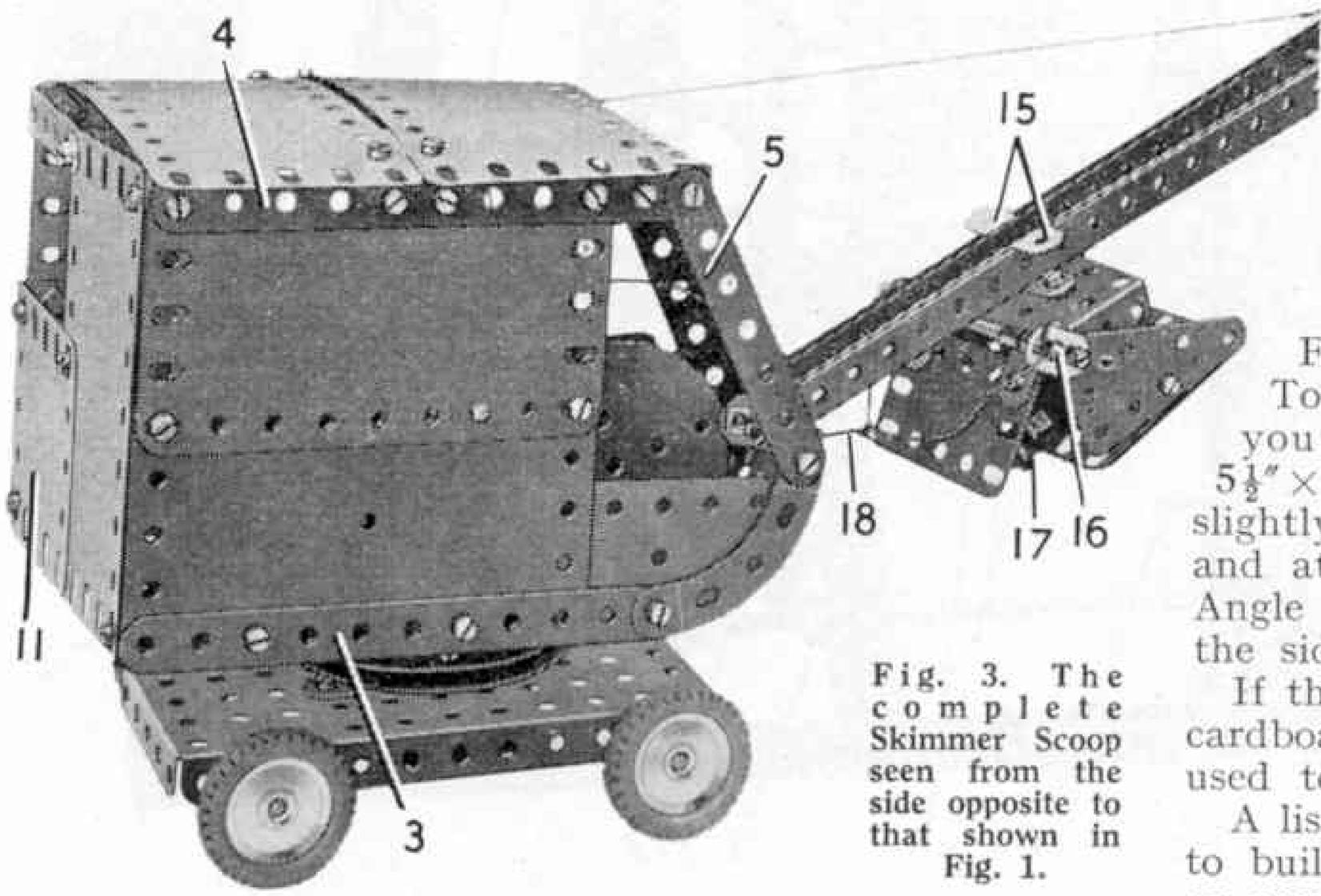


Fig. 3. The complete Skimmer Scoop seen from the side opposite to that shown in Fig. 1.

MODEL OF THE MONTH

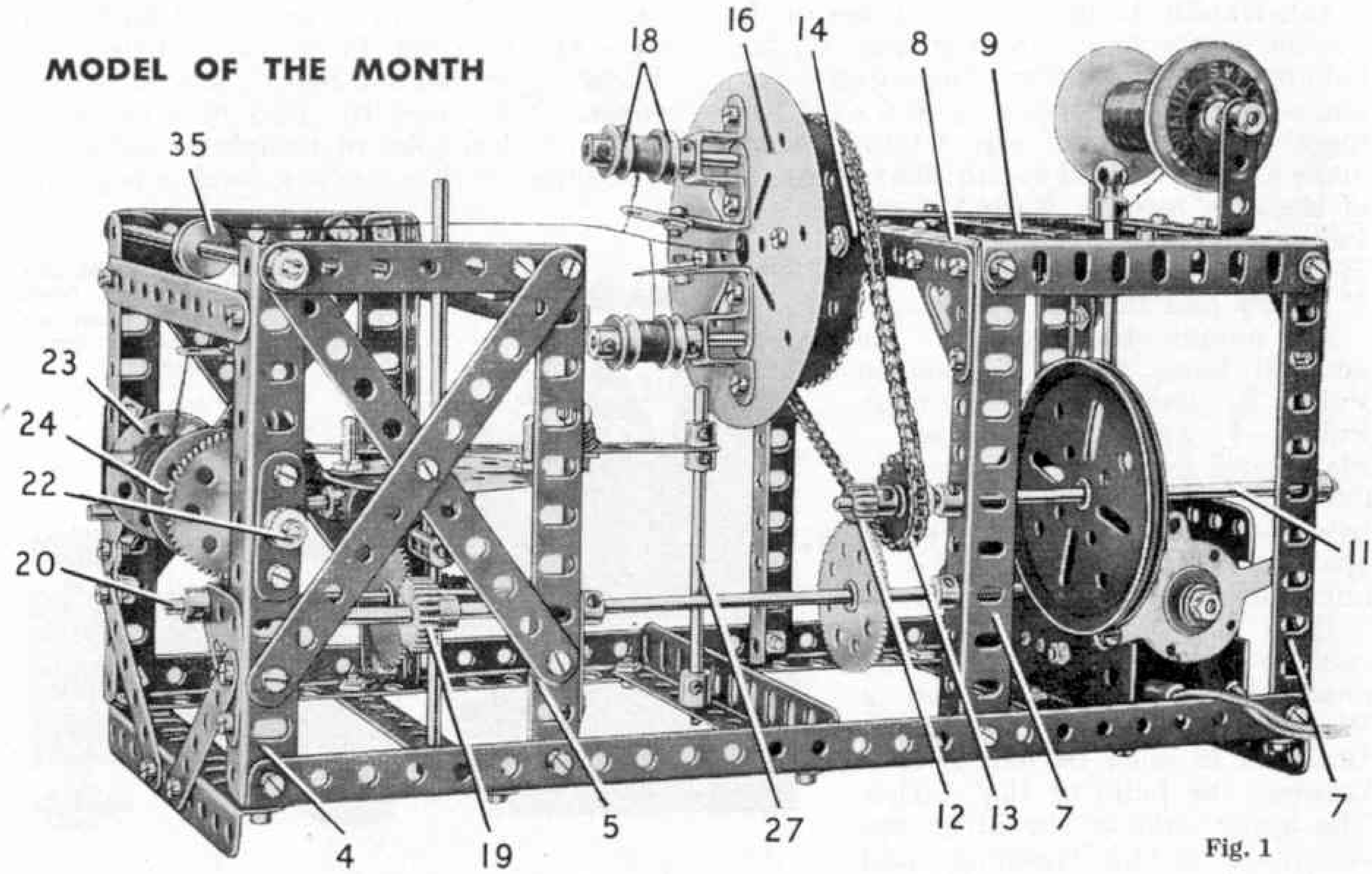


Fig. 1

Wire Covering Machine

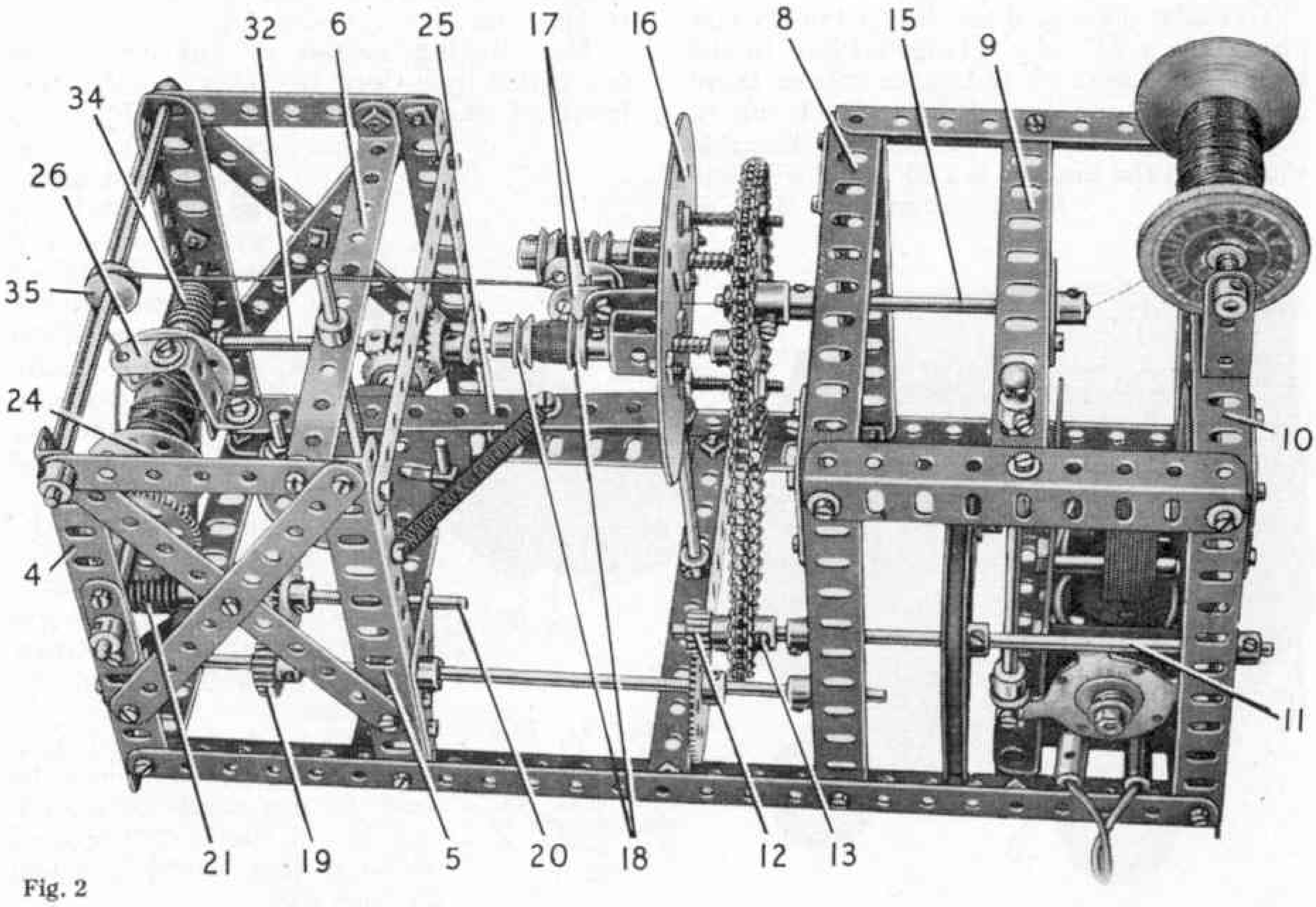


Fig. 2

Fig. 1. An attractive model of a Wire Covering Machine designed for covering wire with two layers of cotton or other insulating material.

Fig. 2. A semi-plan view of the Wire Covering Machine.

Fig. 3. The Wire Covering Machine seen from underneath.

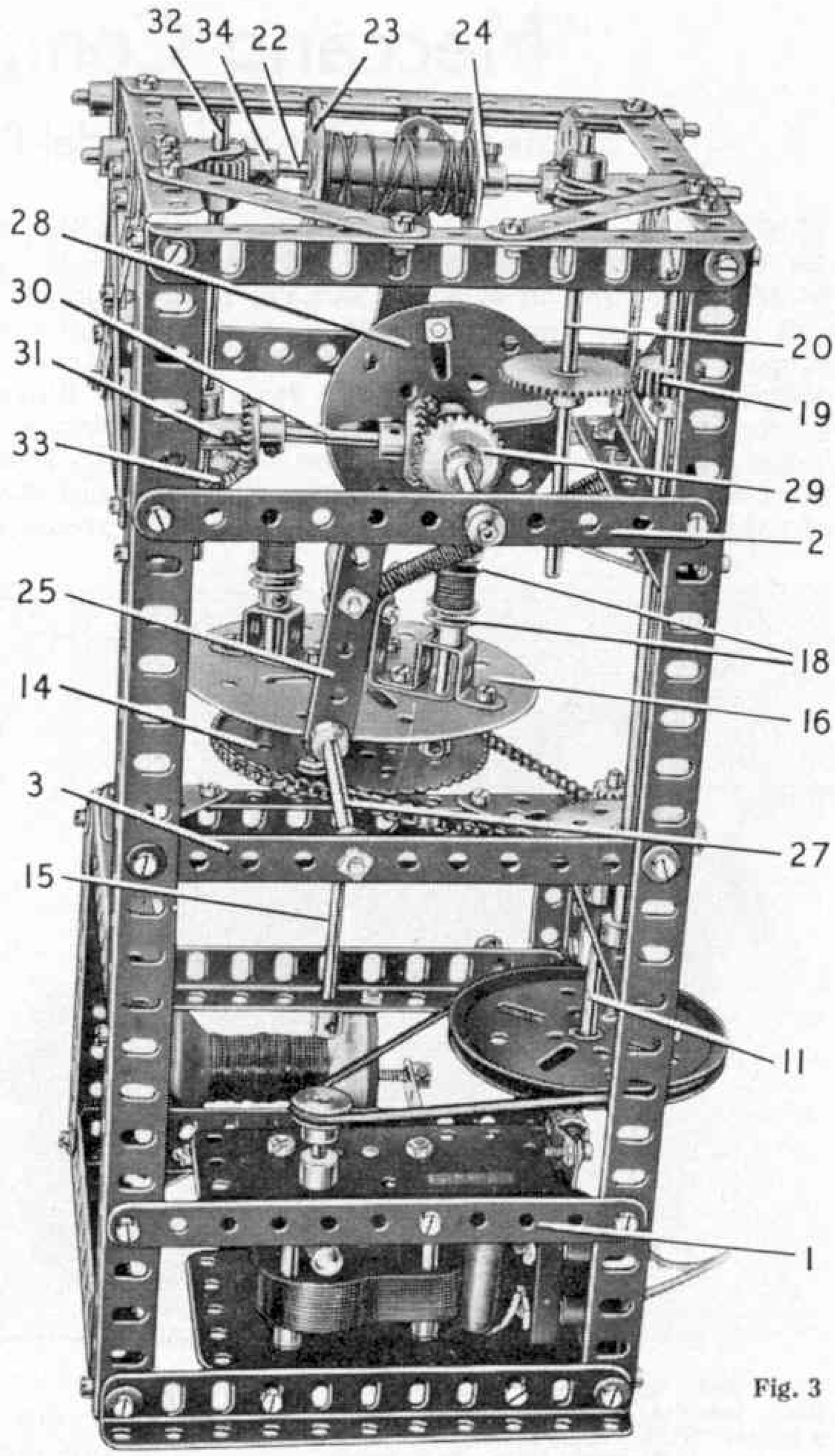


Fig. 3

OUR model this month is another splendid example of the way in which industrial machines can be reproduced with Meccano parts. It is a machine designed to insulate wire by covering it with double layers of cotton or silk, and once it has been set working the action is fully automatic.

Models of wire covering machines have been made before with Meccano, but this example is noteworthy for the outstandingly even way in which the layers of insulating material are wound on the wire. It is notable too because of the novel use it makes of one of the recent additions to the range of parts—the 4″ Rod with Keyway. The use of this part has simplified the design of the machine considerably.

The model is driven by an E20R(S) Electric Motor that provides drives to the carrier for the reels of insulating threads and the take-up drum for the insulated wire. The reels are formed by ½″ Pulleys on Rods supported by a special carrier, through the centre of which is passed the uncovered wire. The ends of the threads are tied to the wire, and the wire itself is fastened to the take-up drum at one end of the machine. This is all the setting up that is required.

When the Electric Motor is set working it rotates the thread carrier through suitable reduction gearing, and the threads are wound round the wire. At the same time the wire is pulled slowly through the centre of the carrier and is wound on the take-up drum. The wire is fed on to the drum by an ingenious cam-operated guide arm, which moves to and fro to distribute the wire evenly so that it can be unwound freely from the drum after the covering operation.

The thread carrier is mounted freely between Collars at one end of a 4″ Rod with Keyway. The Rod with Keyway is fixed in place at one end of the framework and the uncovered wire is led along its slot so that it passes through the centre of the thread carrying assembly. Thus this assembly is able to rotate on the 4″ Rod with Keyway without twisting the wire, and the wire can be drawn through the centre of the thread carrier. The uncovered wire is drawn from a reel mounted at one end of the frame.

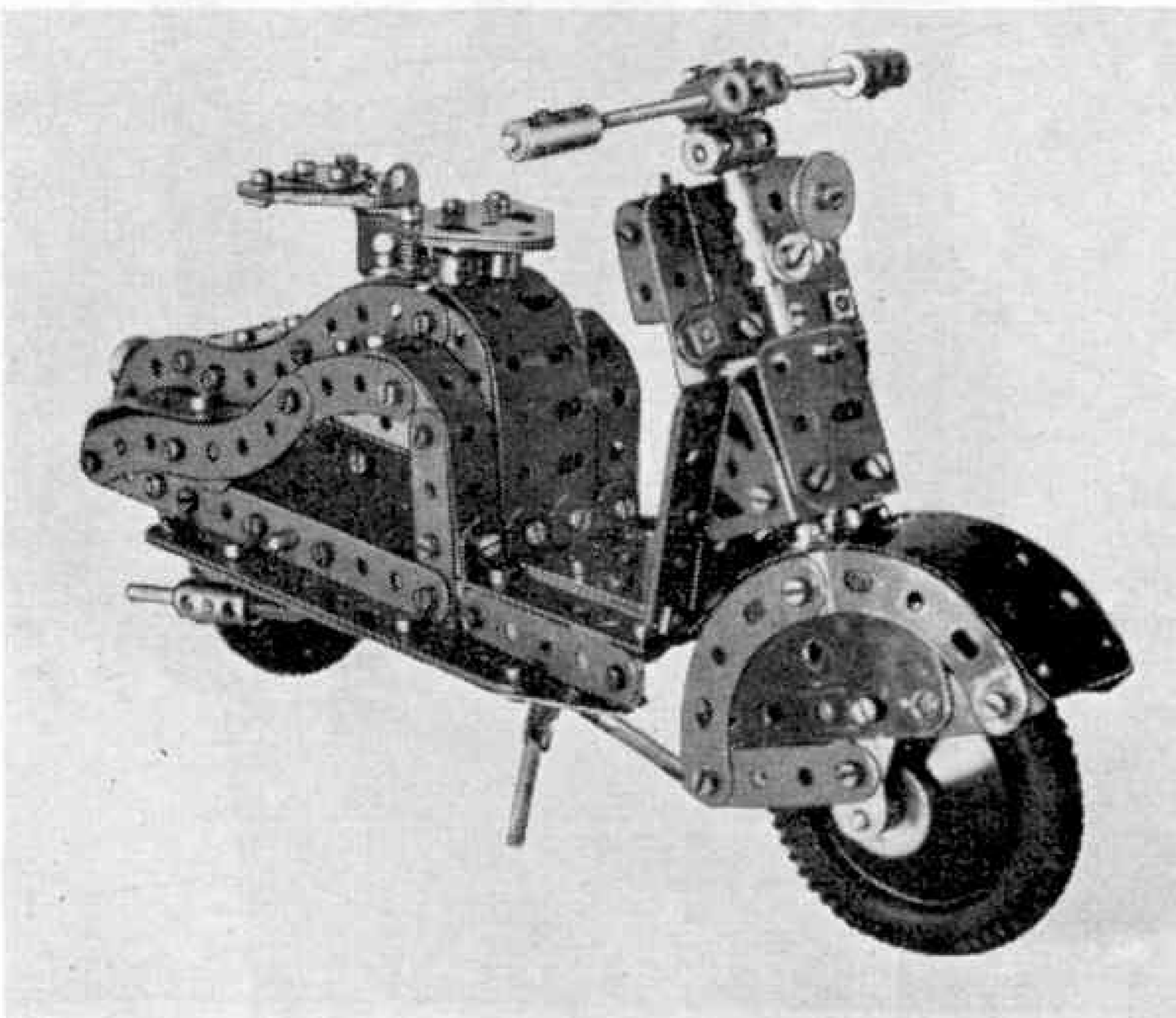
The machine is fascinating to watch in operation, and it produces covered wire that is hardly distinguishable from the commercial product. The model is remarkable for its compact design and the

(Continued on page 526)

Meccano Competition

September General Model-Building Contest

ENTRIES for the General Model-Building Contest announced in the September *M.M.* are rolling in already, but there is still plenty of time to build a model, prepare details of it and send them along before the closing date. This type of competition gives every competitor ample scope to build a really attractive model, as there are no restrictions on the choice of subjects or the sizes of the Outfits used to build the models. Indeed the parts used need not be confined to those in any particular Outfit in the range.



Its realistic appearance, obtained with only a few parts, brought success to this fine model scooter in a recent "M.M." Competition. It was built by H. L. Thomas, Herne Bay, Kent.

The first thing to do is to decide on the subject of your model. As mentioned, this can be of any kind, and you can choose a subject in which you are keenly interested, or perhaps one of which you have special knowledge. The most important point is to select a model that comes well within the scope of the parts you have available. It is of little use choosing to make a large and complicated model if you have only a small Outfit or a restricted selection of parts with which to build it. It is far better to select a simple subject you can build really well, as it will impress the judges much more than a big structure flimsily built through lack of suitable parts.

When you have built your model the next step is to obtain good illustrations of it. These can be photographs or drawings, and they need not necessarily be taken or prepared by the competitor. Write your age, name and address clearly on the back of *each* print or drawing, and send the entry to *September General Model-Building Contest, Meccano Ltd., Binns Road, Liverpool 13.* All entries must reach us not later than 31st December next.

The Contest is divided into two Sections, Section A for competitors under 12 years of age on 31st December next, and Section B for those aged 12 or over on that date. The prizes to be awarded for the best models submitted are detailed in the panel on this page, and as you can see they are well worth winning. The judges will make full allowance for the age of each competitor and for the size of the Outfit available to him, so that every entrant will have a fair chance.

Prize-winning entries become the property of Meccano Ltd. and are not returnable, but unsuccessful entries will be returned if the senders include with their entries stamped addressed envelopes of suitable size.

THE PRIZES

The following prizes will be awarded in each of the Sections A and B.

	£	s.	d.
First Prize, Cheque for	4	4	0
Second Prize, Cheque for	2	2	0
Third Prize, Cheque for	1	1	0
Ten prizes, each of		10	0
Ten prizes, each of		5	0

Closing Date for Entries: 31st December, 1957.

Club and Branch News

WITH THE SECRETARY

ENTERPRISE!

I know very well how enthusiastic and keen are the great majority of Club and Branch members, both for their hobby and for the Club and Branch that gives them an opportunity of obtaining the maximum amount of enjoyment from it. Nevertheless I am always glad to be reminded of this, as I was by a recent letter from Mr. Z. A. de Beer, the Leader of the Cape Peninsula M.C., of Cape Town, South Africa.

This is not a large Club as Meccano Clubs go, nor is it one of the oldest, but whatever it may lack on these accounts is more than offset by the excellent team spirit that prevails and by a zest for Meccano model-building that produces some very fine results. For instance, the Secretary, Colin Cohen, lives ten miles away from the Club room, but has never missed a meeting, and during the past year, Mr. de Beer tells me, he has given up many Saturday afternoons to help in getting various Club jobs done.

Cohen is also one of the keenest of model-builders, and frequently takes to Club meetings Meccano models and mechanisms that he has designed, for discussion, demonstration and exhibition purposes. So in a very practical way he has done much to foster a keener interest in model-building among the younger members. His good work for the Club has been recognised, and at a recent meeting he was awarded the Merit Award Cup for the most progress during the Club year.

Equally meritorious and a fine example of initiative and resourcefulness is the splendid service rendered to the Club by another senior member, Hugh Weir. The cost of constructing a fine series of Meccano cabinets, and of buying additional Meccano parts so that all the cabinets are fully stocked, has made heavy demands on the Club funds. When this was made clear at a committee meeting Weir decided to do something about it. So, unknown to the Club, he organised a Rummage Sale with the kindly aid of his mother. This was so successful that it realised £20, and the two of them presented the money to the Club as a "surprise gift".

I congratulate the Cape Peninsula M.C. on having members of this calibre, and I hope that their example will inspire the other members of this Club and those of other Clubs in our great world-wide organisation. It is only when members work together on behalf of their Clubs that the aims of the Guild are fully realised, and only when that is achieved do members reap the full benefit for themselves from their activities.

CLUB NOTES

St. Thomas District (Exeter) M.C.—Attendance was well maintained throughout the summer, and a high standard of model-building has been kept up. Indoor games such as table tennis, billiards and draughts continue to be popular variations from regular model-building activities. Club roll: 16. *Secretary:* E. Milton, 17 Beaufort Road, St. Thomas, Exeter.

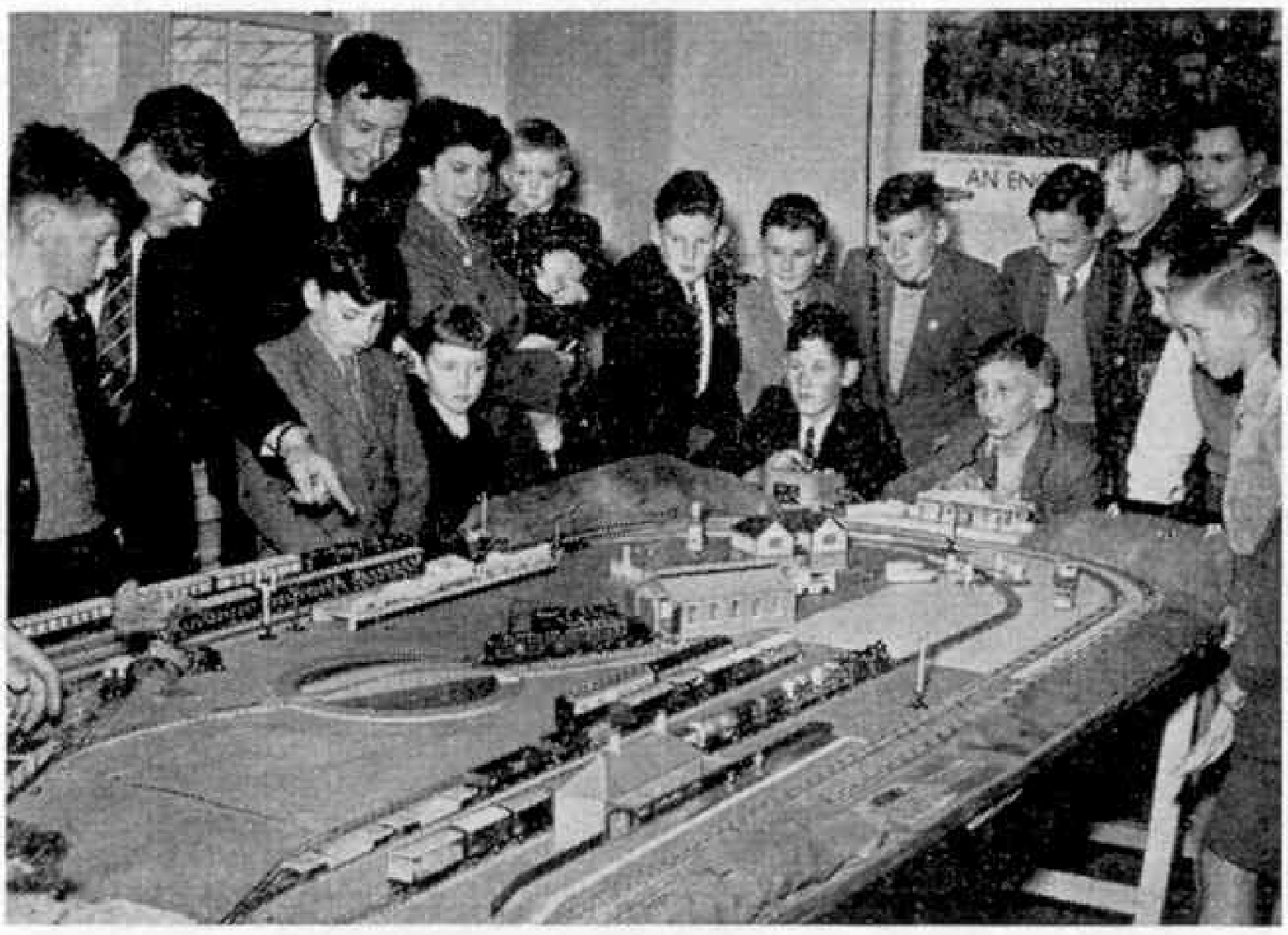
SOUTH AFRICA

Cape Peninsula M.C.—The subject of the annual Winter Competition was *Workshop Machinery*, and some very fine models were entered. First prize in the Senior group was awarded to C. Cohen for an excellent Chemical Balance and in the Junior group to M. Sprenger for a neat model of a Car Jack. Other prize-winning entries were a swing saw, printing machine, travelling gantry crane and two types of lathe. At one meeting Tony Mills, one of the foundation members, gave an interesting lecture on the various types of engineering and their courses at different universities throughout the world. On another occasion a lecture on *Angling*, by Mr. Bernstein, the father of one of the the members, proved both entertaining and informative. Club roll: 29. *Secretary:* C. Cohen, 23 Upper Rhine Road, Sea Point, Cape Town, South Africa.

BRANCH NEWS

Mile End (Portsmouth)—Preparations are well in hand for the forthcoming Branch Exhibition. All clockwork and electric rolling stock, etc., is being cleaned and oiled, and additional scenery has been painted for the Exhibition layout. *Secretary:* Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.

Hale End (London)—Several members took part in a visit to the Motive Power Depots at Willesden, where the many interesting things seen included two new main line diesel locomotives, and Cricklewood where, after touring the shed, they watched marshalling operations in the nearby yards. *Secretary:* A. Coe, 463 Hale End Road, Highams Park, London E.4.



The Launceston M.C. provides our illustration again this month, with a view of part of the fine Hornby-Dublo display at the Club's Third Annual Exhibition last spring. An interested crowd watch the operations as two of the Club members work the controls.

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For other stamp Advertisements see also pages 524 and xxiv

Stamp Collectors' Corner

By F. E. Metcalfe

SCOUTS STAMPS

There must be many scouts, living all over the world, who are interested in the postage stamps that have been issued in connection with their movement, and collectors too, whether interested in scouting or not, are attracted by stamps of this kind. So the three stamps that the British Post Office did finally agree to issue to commemorate the Jubilee Jamboree held recently at Sutton Coldfield were welcomed heartily. For a consideration, the Post Office also accepted the job of stamping covers with stamps of a face value of 1/9½ to do a postal duty in most cases of 2½d.

In view of the fact that the late Lord Baden Powell was an Englishman and his work was of such world wide significance, the least the postal authorities could have done was to issue a short set of stamps also to commemorate the centenary of that great man's birth, instead of leaving the task to countries as diverse as Luxembourg and, of all places, South Korea.

Anyhow, we got a set of three stamps, which we can say covered the Centenary and the Jamboree, and for good measure the same stamps were overprinted for use in the Persian Gulf Territories, Bahrain, Kuwait, Muscat and Dubai and Oatar. This is a troubled quarter at the time of writing, and I don't suppose that in Muscat at any rate there would be very much concern about overprinted postage stamps connected with a Jamboree!

The portrait of Lord Baden Powell has now appeared on many postage stamps, but it is rather amusing to think that while we are so careful to avoid portraits other than royalty on British stamps, the first portrait of the great scout leader was seen on a stamp that could be considered British. This was the Mafeking issue. During the siege of that town a short set of stamps was issued for use in it. One of the stamps depicted Sergt.-major Goodyear, on a bicycle, and the other Baden-Powell himself, who was the head of the besieged garrison.

There was quite a fuss about these stamps, and it is understood that this was another occasion when Queen Victoria was not

amused. They are quite scarce, but great care must be taken, for not only are there forgeries of the stamps of the Cape and Bechuanaland that were overprinted and surcharged *Mafeking Besieged* (the overprints are forged) but also of the Baden-Powell stamps.

Now some readers may remember the siege of Mafeking, or the rowdy jollifications that followed the news of its relief. I just remember the relief. Alas, I had to go to bed when the Town Hall clock struck nine and played a tune, which it did every three hours. I well remember hearing those bells playing, and being told that it was bed time. Off I had to go, and it was only the next day that I learned in a dim kind of way, for I was very young, that it hadn't been nine o'clock at all! The bells were pealing out to celebrate the relief of Mafeking. I don't remember how long it took me to get over losing a full half hour with my bricks.

Many countries have issued Jamboree stamps. Australia, for instance, has released an odd stamp on two occasions. The first was in 1948 to commemorate the Pan Pacific Scout Jamboree. The design, one depicting a fine young scout, was used again for another Pan Pacific Scout Jamboree held in Australia in 1952. These two stamps often confuse young collectors, for the only difference between them is in the dates.

A very interesting pair of scout stamps was issued by the New Zealand Post Office in 1953. These were "Health" stamps. As most collectors will know, New Zealand issues every year either two or three stamps that are surcharged, the proceeds over the actual postal charge going to children's health charities. In 1953 one of the stamps depicted girl guides and the other boy scouts.

I am glad of the opportunity to mention these stamps, for on more than one occasion *M.M.* readers have asked what those broken lines are that surround the boy scout stamp, and appear also at the top margin of the companion one. I had two enquiries in one week, just about the time there was so much discussion in the newspapers about perforation varieties, etc. Well, I am sure that none of my correspondents could have been scouts, for if they had they would have known that those broken frame lines were Morse code letters.

Among the many scout stamps, one which can be obtained for a copper or two is that issued by the U.S.A. in 1950. We must not overlook also the stamp Canada issued in 1955 for the 8th World Scout Jamboree. But the set I like best is that issued in 1953 by Liechtenstein to honour the 14th International Scout Conference. There are four values, each with a fine portrait of Lord Baden-Powell.

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For other stamp Advertisements see also pages 522 and xxiv

Stamp Gossip

LINES OR NO LINES

Some time ago a young collector raised a point that was worrying him. It had to do with a 2d. blue Great Britain (QV) postage stamp. Put briefly, a friend had once shown him a stamp that he had claimed was worth a pound or two, but when he himself got what he thought was a similar stamp, he was told it was only worth a shilling or two. How come?

Well, the answer lies in the question of lines or no lines. The stamp is illustrated here, and you will note that there are no thin white lines below the word POSTAGE or above TWO PENCE, which means that we have a copy of the stamp that was issued along with the "Penny Black."

These "no lines" stamps are not particularly scarce, but they are in such demand that a good copy brings a pound or two. In 1841, the year following the issue of the first 2d. stamp, others appeared of the same design, but with a thin white line at the top under POSTAGE and another above TWO PENCE. These stamps are not scarce.

THEMATICS

Nowadays thematic collections seem to have more or less taken the place of general collections, for with so many new stamps pouring out, it is quite impossible for one to get anywhere while trying to collect everything. Amongst favourite subjects are birds, and even if there are only a few stamps in a collection, providing they are well written up, they make a show that is attractive to everybody.

As an example of what I mean, let us take one of those Australian stamps that feature the lyre bird. Some interesting details about this stamp have been released recently by the Australian News Bureau. We are told that the lyre bird is considered the most interesting of all Australian birds. It is not easy to find, for it hides away in the well wooded parts of its native habitat. It is not surprising that the birds remain on the scarce side, for the hen only lays a single egg each year.

As can be seen from the stamp illustrated, the bird has a wonderful tail. Generally the feathers are folded back along the body, but when it gets its tail up it certainly shows something it can be very proud of. But it is its powers of mimicry that are so wonderful. Australia has a number of fascinating birds, such as the kookaburra, cockatoo, bell bird, butcher bird, etc., and the way the lyre bird can imitate their calls is incredible. It also mocks the calls of certain animals, and taking it all round a stamp depicting such a flying wonder is almost worth a page in one's album to itself.

P.O. JUBILEE

One stamp that will interest many *M.M.* readers is the Austria 1s. issued to commemorate the 50th anniversary of the first motor postal vans. It is a gem, showing a modern postal coach, and also the little rabbit-hutch on wheels used half a century ago. Three postal convoys were formed, and these toured Austria during July to show the postal flag, as it were. Special postal cancellations were in use in the towns when the troupe arrived, and this has meant all the fun of the fair for collectors.

We can only look on at such an event, and envy our continental brother philatelists and, incidentally, buy their stamps. After all, these are not as interesting to us as they would have been if they had been the products of our own Post Office. Nevertheless, the stamp illustrated is certainly a beauty, and I am not too sure that we could turn out such nice stamps, even if the G.P.O. were willing.

HEALTH FOR ALL

One of the New Zealand Post Office's brightest and most profitable ideas was to arrange to issue each year a short set of stamps, each with a small surcharge which is handed over to a children's health fund. This year two stamps were issued on 25th September. One shows a life saving team at work, and on the other, as can be seen from its reproduction here, youngsters having a high old time in the sea are depicted.

There has been a change in designers latterly and J. Berry, who has designed so many beautiful stamps, seems to have been left out. I am very sorry about this, for his designs were always very attractive. Anyhow, this year's pair will no doubt be popular enough. Yet I do hope that soon we'll see more of the work of this designer, who has given us so much pleasure in the past.

It is true that his efforts did not resemble some of those French productions that are catching the eye in these days, but give me J. Berry all the time.

THE MONTH'S TIP

It is in connection with the set of "Health" stamps mentioned above, that I make my suggestion this month. As a departure, New Zealand Post Office is releasing some of these "Health" stamps in miniature sheet form, that is in sheets of stamps of six copies only. There has been a certain amount of criticism of this, without the slightest justification. In every way the sheets are interesting items, and very popular abroad. They will be listed separately in the Commonwealth Catalogue, as are miniature sheets in foreign catalogues.

If you can buy a sheet of each, at not much above face value, you will not only have two very nice items for your collection, but they might go up in price later on. It is too early at this stage to say much on the latter point, but I like the look of the prospects very much.

Buses in Birmingham—(*Continued from page 479*)

in the middle. But in course of time the bus system was built up thoroughly, and the tramways began to prove unprofitable, with the result that tramcar services were gradually withdrawn, the last tramcar service disappearing in July 1953.

The triumph of the motor bus was due to its greater speed and freedom on the road. But it may be added that tramway enthusiasts maintain that if more up-to-date tramcars of the kind now in use in the United States and on the continent had been developed these would have proved more popular and serviceable even than the buses. This is not the place in which to enter into a discussion on the relative merits of the two systems. The fact remains that the expense of renewing tramway tracks and other considerations led in time to the disappearance of the earlier form of transport.

By 1934 Birmingham had 550 buses in service and then owned the largest municipal bus fleet in the world, a claim that is made for the service today as far as England is concerned. A notable point is that in 1923 the first covered top bus in Great Britain, and perhaps in the world, was designed and constructed by Mr. Alfred Baker, General Manager of the Birmingham City Transport Department from its beginning in 1903 to 1928.

The growth of the Birmingham system since the war is illustrated by the fact that in the financial year 1952–3 there were 1,786 motor omnibuses in service. These ran over 46 million miles during that period, and carried well over 480 million passengers. These numbers are so immense that it is difficult to form any real estimate of what they mean. The calculation that the vehicles running in Birmingham cover each day a distance equal to about five times round the world will perhaps help the reader to realise the scale on which public service is carried on today.

The makes of vehicles operating in the City today are Daimler, Guy, Leyland, Crossley and A.E.C., with bodies by the Metropolitan-Cammell, Crossley, Brush, Park Royal and Leyland companies. The standard vehicle is 27 ft. long and 7 ft. 6 in. wide, with a seating capacity of 55. Engines are either Gardner 6LW 8.4 litre, Daimler C.V.D. 8.6 litre, Leyland 600 type of engine 9.8 litre, A.E.C. 9.6 litre, Crossley 8.6 litre or A.E.C. 7.7 litre, and the majority of the vehicles have fluid flywheel and epicyclic gearbox transmission.

Good Railways Need Good Locomotives—

(*Continued from page 507*)

Castle has come along—the version of the truth I have already mentioned that applies here obviously is that *Good locomotives need good coaches.* And so the Castle will be included in a new Hornby-Dublo Train Set, with which Western Region enthusiasts, and there must be thousands upon thousands of these, will be able to set up a train service that is appropriate to the Region that they admire.

Now let us come back to the following pages, and particularly to pages 510 and 511, which deserve special mention. The heading on page 510 explains this, and the pictures of course demonstrate how important are the Hornby-Dublo layouts of readers of the *M.M.* Here are pictures of three, and it is specially interesting to me to find that one of them shows an enthusiast in Ceylon, with his two brothers, alongside his own layout, from which he must get a good deal of fun, in which his brothers obviously share.

There is a double attraction about articles of this kind. They are good to read; and to see pictures showing how other Hornby-Dublo enthusiasts build up their railways is very helpful indeed. Every owner of a Hornby-Dublo layout wishes to go ahead on good lines. The expert members of the Magazine staff can of course give some splendid advice, and they do, especially when you write to ask them how to carry out any change you have in mind, but it is particularly helpful to see what other enthusiasts have done.

I follow the fortunes of the railways of many readers who are constantly in touch with me, telling me about additions they have made, with pictures showing what their railways look like at various stages of growth, and I enjoy every new development as much as they do. That is one reason why I like to include as many illustrated accounts of their railways as I can. So if you have never previously tried to tell me how you have extended your own Hornby-Dublo railway, and made it more like the real thing, why not do so now? You may very easily provide some other enthusiast with just the information that he wants for some purpose of his own. Seeing what you have done will at any rate encourage him, which brings me back to the fact that another version of what I have already quoted may well be *Good Hornby-Dublo enthusiasts need good companions.* And they deserve them.

Meccano Skimmer Scoop—(*Continued from page 517*)

Parts required to build the Skimmer Scoop: 4 of No. 1; 3 of No. 2; 2 of No. 3; 6 of No. 5; 3 of No. 10; 2 of No. 11; 8 of No. 12; 4 of No. 12c; 2 of No. 15b; 2 of No. 16; 2 of No. 17; 2 of No. 18a; 2 of No. 19b; 1 of No. 19g; 5 of No. 22; 1 of No. 24; 8 of No. 35; 67 of No. 37a; 64 of No. 37b; 10 of No. 38; 1 of No. 38d; 1 of No. 40; 1 of No. 44; 1 of No. 48; 6 of No. 48a; 1 of No. 51; 1 of No. 52; 2 of No. 54; 2 of No. 90a; 3 of No. 111c; 2 of No. 125; 2 of No. 126; 4 of No. 142c; 1 of No. 176; 1 of No. 187; 1 of No. 188; 1 of No. 189; 4 of No. 190; 2 of No. 191; 2 of No. 192; 1 of No. 198; 1 of No. 199; 2 of No. 212a; 1 of No. 213; 2 of No. 214; 2 of No. 221.

Wire Covering Machine—(*Continued from page 519*)

comparatively few parts used in constructing an efficient working model of a wire covering machine. It is easy to build and adjust, and makes an excellent subject for the many model-builders who delight in reproducing industrial machines and processes in Meccano

If you wish to build the Wire Covering Machine, write to the Editor for full instructions and a list of the parts required, enclosing a 2½d. stamp for postage The main Meccano agents in Canada, Australia, New Zealand, South Africa, Ceylon, Italy, Rhodesia and the United States of America receive copies of the *current* Model of the Month Instructions. Readers in those countries can obtain their copies by writing to the appropriate agent, enclosing suitable stamps for postage.

THE COMMONWEALTH Q.E. STAMP CATALOGUE

The 1958 edition of the Commonwealth Catalogue of Queen Elizabeth stamps is right up to date in regard to its contents. As is now customary, outstanding shades and varieties are included, with the most notable plate flaws, retouches, etc., and there is a valuable section on booklets. The illustrations are excellent, bringing out all necessary detail.

The catalogue can be obtained from the Commonwealth Stamp Company, Liverpool 2, price 6/– post free.

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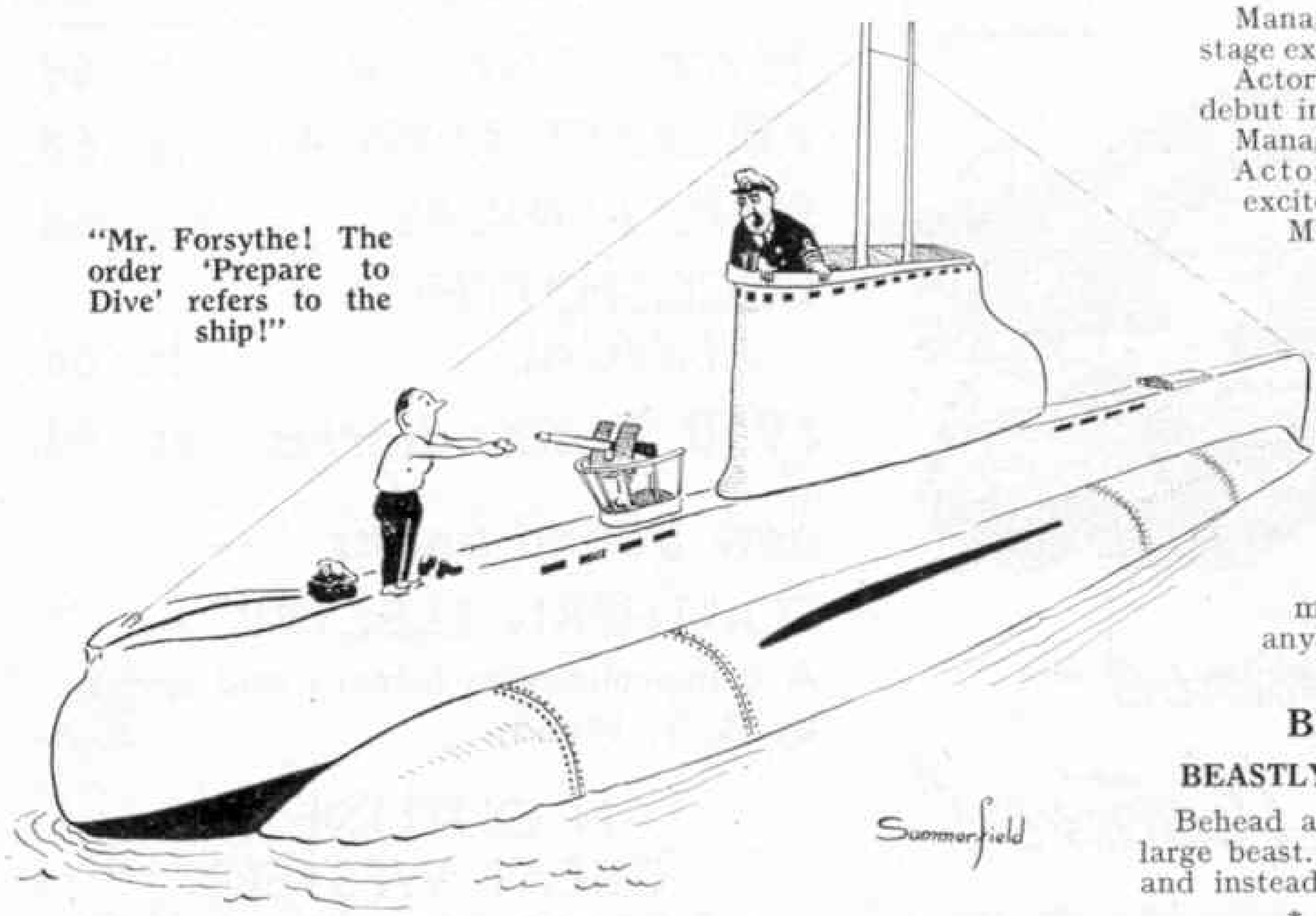
Fireside Fun



"Mr. Forsythe! The order 'Prepare to Dive' refers to the ship!"

At the wedding reception, one hungry looking guest was seen eating with his fingers.

"Didn't they give you a knife and fork?" he was asked.

"Yes," he answered, "and they was delicious."

* * * *

The sailors were lining the decks for the Admiral's inspection. Having passed down the ranks the Admiral suddenly snatched off his cap and threw it at the feet of a sailor.

"That's an incendiary bomb," he rapped out. "What are you going to do with it?"

Smartly the A.B. kicked the cap over the side

* * * *

Archie: "How many seasons are there in the year?"

Henry: "Two—football and cricket!"

* * * *

A sentry held up a car, saying to the driver: "You can't pass this way."

"I'm the sergeant," bellowed a voice from the back of the car.

The sentry stood aside. "Sorry, sergeant. I didn't realise it was you. I got orders to let no traffic through here, because the bridge ahead is rotten. But seeing it's you, sergeant, it's a pleasure."

* * * *

Employer: "Have you any references?"

Applicant: "No, sir, I tore them up."

Employer: "That was a foolish thing to do."

Applicant: "You wouldn't think so if you had read them."

* * * *

"Mama," called out the little boy left in charge of his small brother, "say something to Herbie."

"Why? What's the matter with Herbie?" the mother wanted to know.

"He's sitting on the flypaper," came the response, "and there's a lot of flies waiting to get on."

Manager: "Have you had much stage experience?"

Actor: "Well, I made my debut in Paris."

Manager: "Was it a success?"

Actor: "There was great excitement."

Manager: "I mean, did you make a hit?" Did they want you back?"

Actor: "Well, not exactly, but they dared me to come back."

* * *

Woman cleaning fish at sink to angler husband: "Why can't you be like the rest of the men? They never catch anything."

* * * *

BRAIN TEASERS

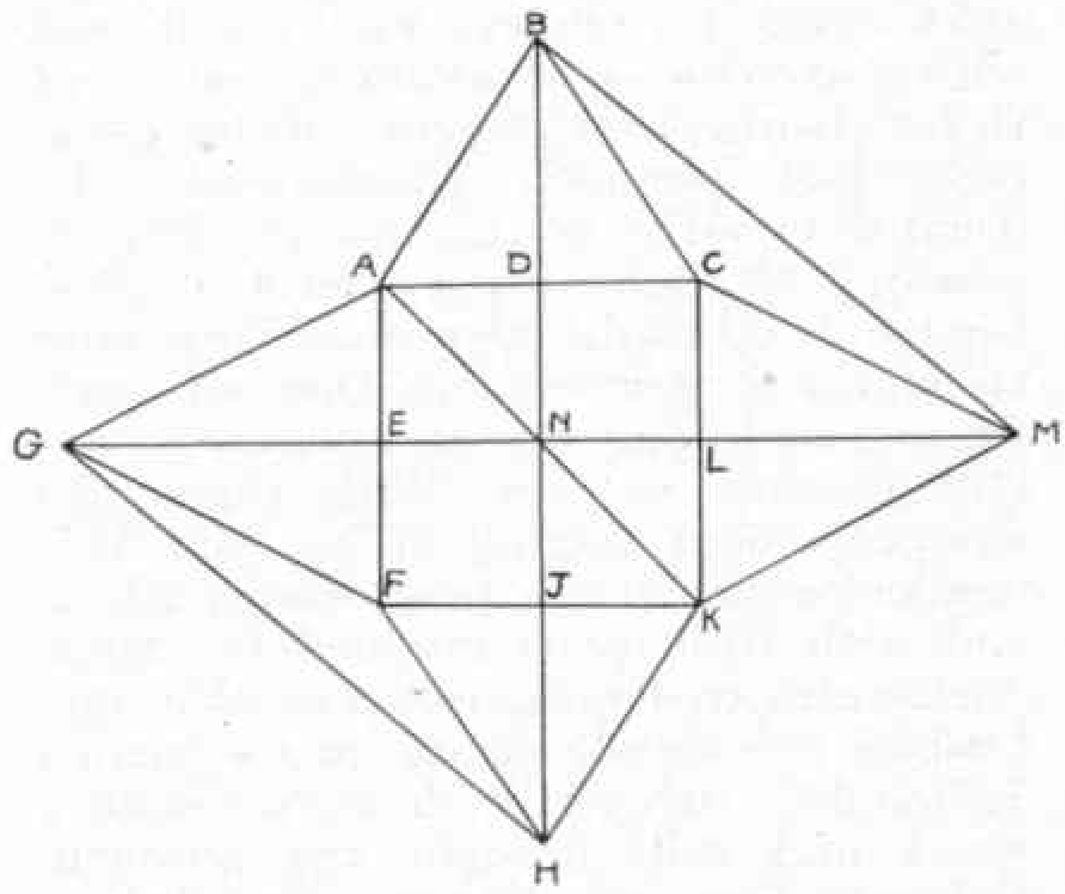
BEASTLY PROBLEM, THIS!

Behead a beast and it becomes a large beast. Behead this large beast and instead of one it becomes ten.

* * * *

A WALK AROUND TOWN

The plan below represents the main streets of a small town. If you wished to show a visitor round, which route could you take in order to cover



every street without traversing any street more than once? To enable us to give the solution next month various points in the design have been lettered.

* * * *

ANSWERS TO LAST MONTH'S PUZZLES

Five Minute Crossword

The solution to the Five Minute Crossword is shown here.

C	O	P	S	E
	A	R	T	
S	T	O	O	P
	E	S	K	
S	N	E	E	R

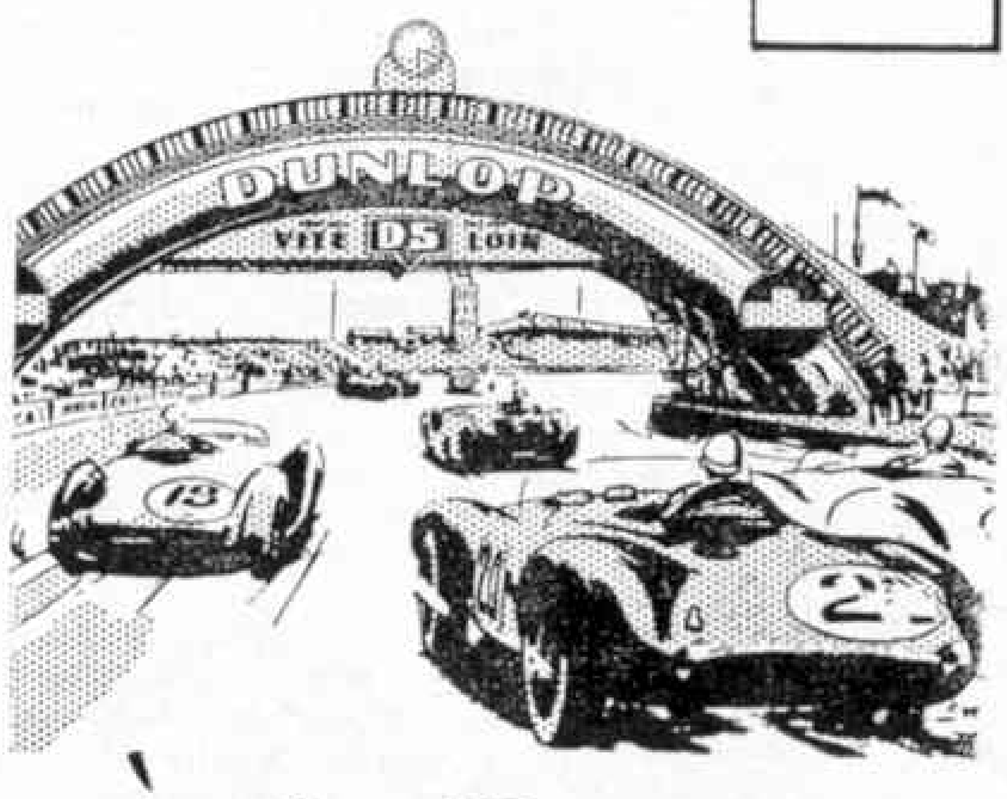
* * * *

A Railway Puzzle

The two trains are 100 miles apart one hour before they meet.

HIGHLIGHTS OF LE MANS

N°4



À la France— la Victoire!

In order to corner safely at high speeds and to prevent excessive strain on the engine, a driver throughout the gruelling 24 hours race at Le Mans has to change gear an incredible number of times. In 1938 Jean Trémoulet, well-placed and with a fine chance of winning, discovered to his chagrin that the gears of his Delahaye had jammed. Disheartened, he decided to retire from the race. But on reaching the pits, his co-driver Eugène Chaboud exhorted the dispirited Trémoulet to continue, pointing out that although the car could only run in top gear it was still possible to win. With Chaboud's encouragement ringing in his ears Trémoulet leapt back into the crippled machine and with fresh hope rejoined the fight. Such stubborn determination won the day. Despite the terrific strain on its engine, Trémoulet, driving with extraordinary verve and skill brought the powerful Delahaye first past the chequered flag, to give the Frenchmen a victory that had so nearly been lost in a moment of despair.

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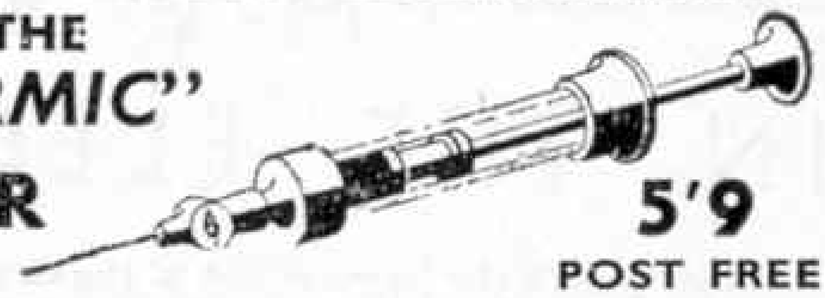

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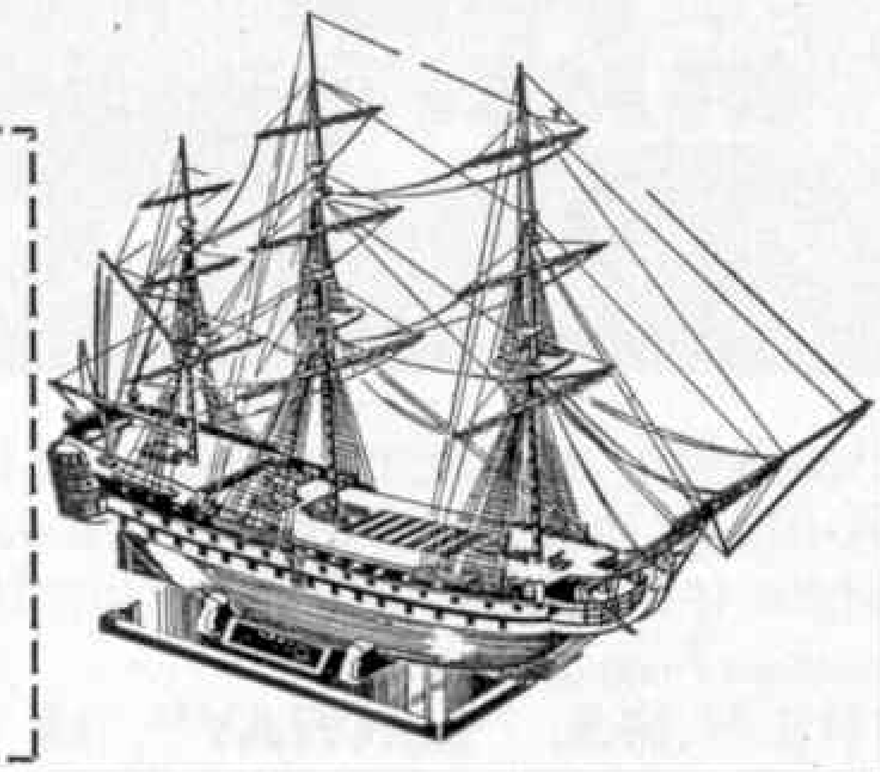

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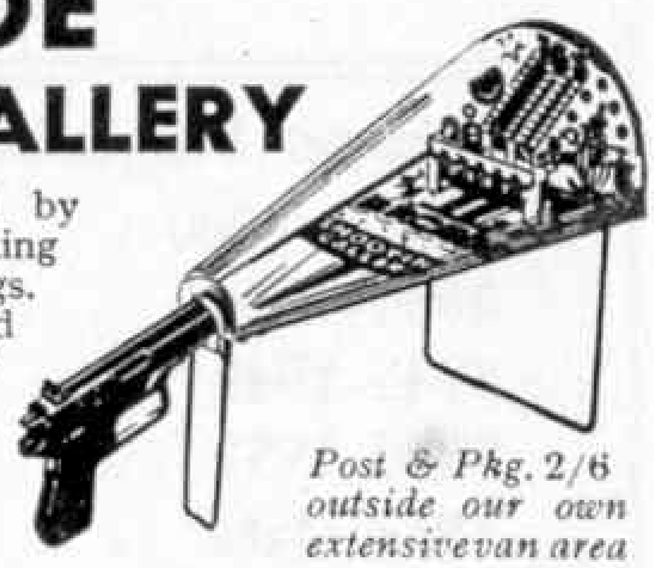

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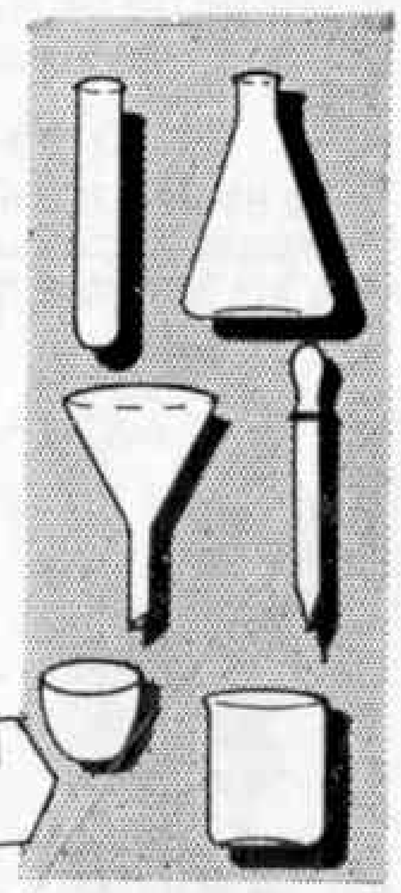

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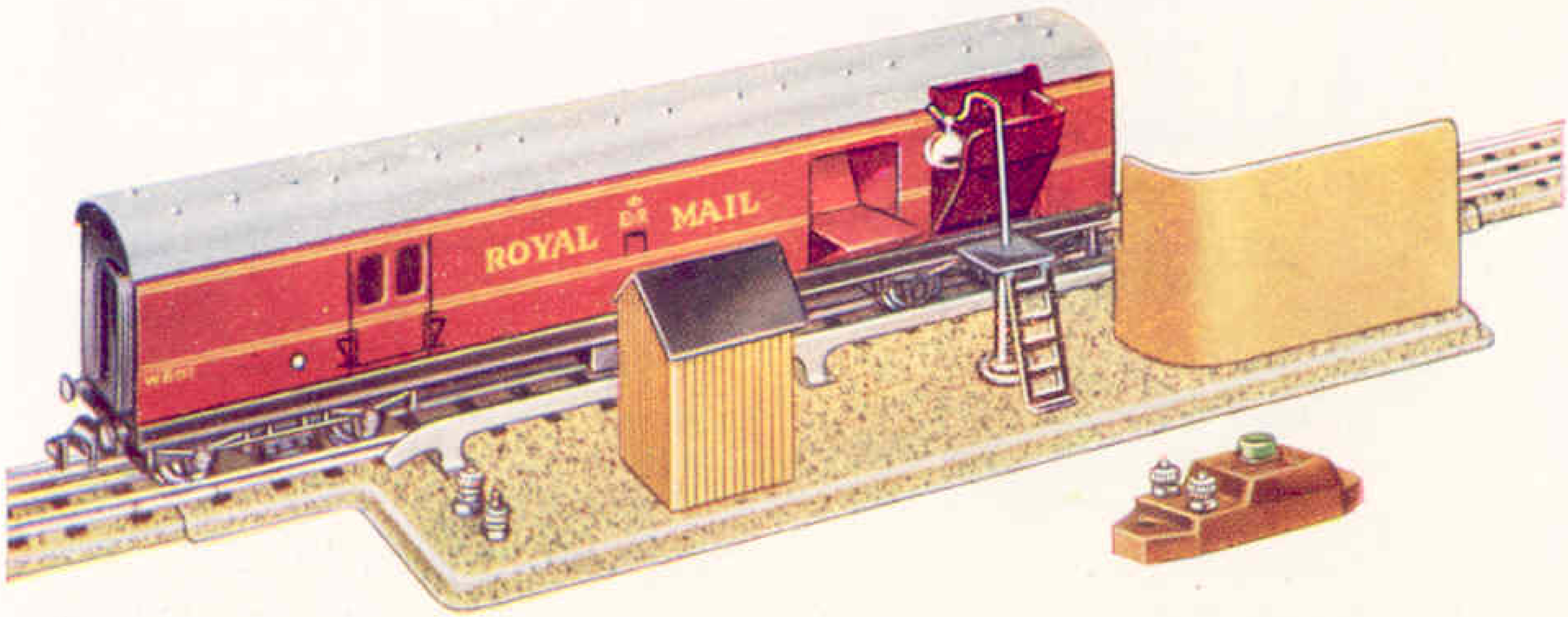

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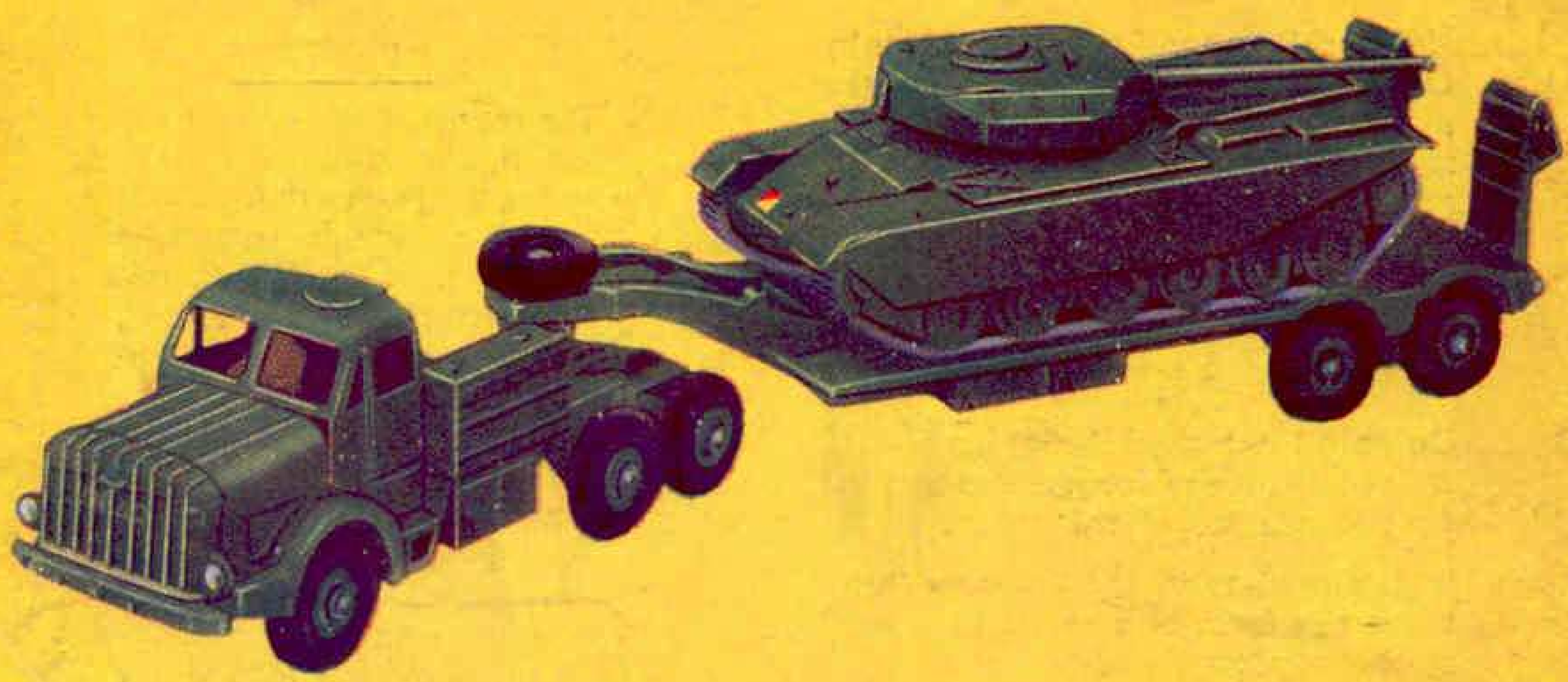

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MODEL OF THE MONTH

WIRE COVERING MACHINE

Illustrated in the October 1957 issue of the "Meccano Magazine"

Construction of the Frame

The base of the frame consists of two 12½" Angle Girders connected at their ends by 5½" Angle Girders, and with two 5½" Strips 1 and 2 and a 5½" Angle Girder 3 bolted between them as shown in Fig. 3. At one end of the base two 5½" Angle Girders 4 and 5 are fixed to each side. The upper ends of these Girders are connected by a 3½" Strip and the assembly is braced by diagonal 5½" Strips. The Girders 4 and 5 are connected to the corresponding parts on the other side by 5½" Strips, and a 5½" x ½" Double Angle Strip 6 is bolted between the 3½" Strips. The structure is braced by two 3" Strips at the end of the frame.

At the right hand end of the frame (Fig. 1) two 5½" Angle Girders 7 are bolted vertically to each side. These Girders are connected at their upper ends by a 4½" Angle Girder, and they are connected to the Girders of the opposite side by 5½" Angle Girders 8, 9 and 10. This end of the frame is strengthened by four 1½" Corner Brackets as shown in Fig. 1.

Arrangement of the Main Drive

An E20R(S) Electric Motor is bolted to the frame at one end and a ½" Pulley is fixed on its armature shaft. This Pulley is connected by a Driving Band to a 3" Pulley on a 6½" Rod 11, mounted in the Girders 7 on one side and held in place by Collars. The Rod carries a 7/16" Pinion 12 and a 1" Sprocket 13. The Sprocket is connected by Chain to a 3" Sprocket 14, which is free to turn between two Collars on a 4" Rod with Keyway 15. The Rod with Keyway is supported in the Girders 8 and 9, and is fixed in a Double Arm Crank bolted to the Girder 9. An End Bearing lock-nutted to the Motor switch carries a Rod that passes through the Girder 9 and is fitted with a Handrail Coupling.

A 4" Circular Plate 16 is fixed by nuts on two 1⅛" Bolts, and these are fixed in the Sprocket 14 by further nuts. Two Double Bent Strips and two 1" x 1" Angle Brackets are bolted to the Circular Plate. Each Angle Bracket is extended by a Fishplate 17, these being arranged slightly out of line as shown in Fig. 2 by making use of their slotted holes. Two 2½" Rods are mounted in the Double Bent Strips and the Circular Plate, and each Rod carries two ½" fixed Pulleys 18. Each Rod is held in place by a Collar with a Compression Spring placed on the Rod between the Collar and the Circular Plate 16.

The Wire Take-Up Drum and the Feeding Mechanism

An 8" Rod is supported in the Girders 4 and 5 and one of the Girders 7 of one side, and is held in place by Collars. A 60-tooth Gear on the Rod is driven by the Pinion 12, and a ¾" Pinion 19 engages a 50-tooth Gear on a 4½" Rod 20, which carries a Worm Gear 21. Rod 20 is mounted in 1½" Corner Brackets bolted to the Girders 4 and 5 of one side.

The Worm 21 engages a 57-tooth Gear on a 6½" Rod 22 supported in 1½" Strips bolted to the Girders 4. This Rod carries the take-up drum for the covered wire . The drum is made by passing a Sleeve Piece over a Socket Coupling, which is fixed to the boss of a Bush Wheel 23. A Grub Screw in the Socket Coupling engages in a hole in the Sleeve Piece to fix the drum to the Rod 22. A Chimney Adaptor is pushed into the Sleeve Piece and a Bush Wheel 24 completes the assembly.

The covered wire is fed on to the drum by a guide arm 25. This

is a $5\frac{1}{2}$" Strip fitted at one end with a 1" Reversed Angle Bracket that supports a Fishplate 26. The arm pivots between two Collars on a $3\frac{1}{2}$" Rod 27, which is fixed in a Rod Socket attached to the Girder 3. The arm is moved to and fro along the length of the drum by the action of two Threaded Pins in a Face Plate 28. The Face Plate is fixed on a $6\frac{1}{2}$" Rod mounted in the Strip 2 and the Double Angle Strip 6, and a $\frac{7}{8}$" Bevel Gear 29 is locked on the Rod. Above the Bevel Gear a Short Coupling is mounted loosely between Collars, and this supports one end of a 2" Rod 30. The other end of Rod 29 is carried in a Coupling 31, which is free to turn on a $4\frac{1}{2}$" Rod 32 between a Collar and a $\frac{7}{8}$" Bevel Gear 33. Rod 32 is supported in 1" Corner Brackets bolted to the frame. Two $\frac{7}{8}$" Bevel Gears on the Rod 30 are arranged to mesh with the Bevel Gears 29 and 33, as shown in Fig. 2. A $\frac{1}{2}$" Pinion on Rod 32 is driven by a Worm Gear 34 on Rod 22. The arm 25 is held against the Threaded Pins in the Face Plate by a Spring arranged between the arm and the side of the frame.

Operating the Model

A length of bare copper wire should be wound on a large cotton reel mounted on a $3\frac{1}{2}$" Rod supported in a 3" x $1\frac{1}{2}$" Double Angle Strip. The Double Angle Strip is bolted to the Girder 10, and a Compression Spring on the Rod is arranged to press against the reel to prevent the wire from unwinding too freely. The wire from the reel is passed along the keyway of the 4" Rod with Keyway, through the boss of the Sprocket 14 and the centre hole of the Circular Plate 16, over a $\frac{1}{2}$" loose Pulley 35 on a $6\frac{1}{2}$" Rod, through the Fishplate 26, and is attached to the drum.

A length of cotton or silk wound between the Pulleys 18 on each of the two $2\frac{1}{2}$" Rods is passed through one of the Fishplates 17, and is tied firmly to the wire.

When the Electric Motor is set working the Plate 16 revolves, and the lengths of cotton or silk are wound round the wire. At the same time the wire is wound slowly on the take-up drum, so that a double covering of cotton or silk is wound evenly on the wire as it is pulled through the centre of the rotating assembly.

PARTS REQUIRED

9 of No. 2	1 of No. 26	1 of No. 96
2 " " 3	1 " " 26c	1 " " 109
2 " " 4	1 " " 27	2 " " 111c
2 " " 6a	1 " " 27a	2 " " 111d
2 " " 8	1 " " 27d	2 " " 115
14 " " 9	4 " " 30	3 " " 120b
2 " " 9a	2 " " 32	1 " " 124
3 " " 10	88 " " 37a	6 " " 133
2 " " 12a	80 " " 37b	2 " " 133a
1 " " 13a	30 " " 38	1 " " 136a
4 " " 14	1 " " 43	1 " " 146a
3 " " 15a	2 " " 45	1 " " 163
2 " " 16	1 " " 47a	1 " " 164
2 " " 16a	1 " " 48d	1 " " 166
1 " " 17	23 " " 59	1 " " 171
1 " " 19b	1 " " 62b	1 " " 179
1 " " 23	1 " " 63	1 " " 186c
5 " " 23a	1 " " 63d	1 " " 230
2 " " 24	1 " " 94	1 E20R(S) Electric Motor.
1 " " 25	1 " " 95b	