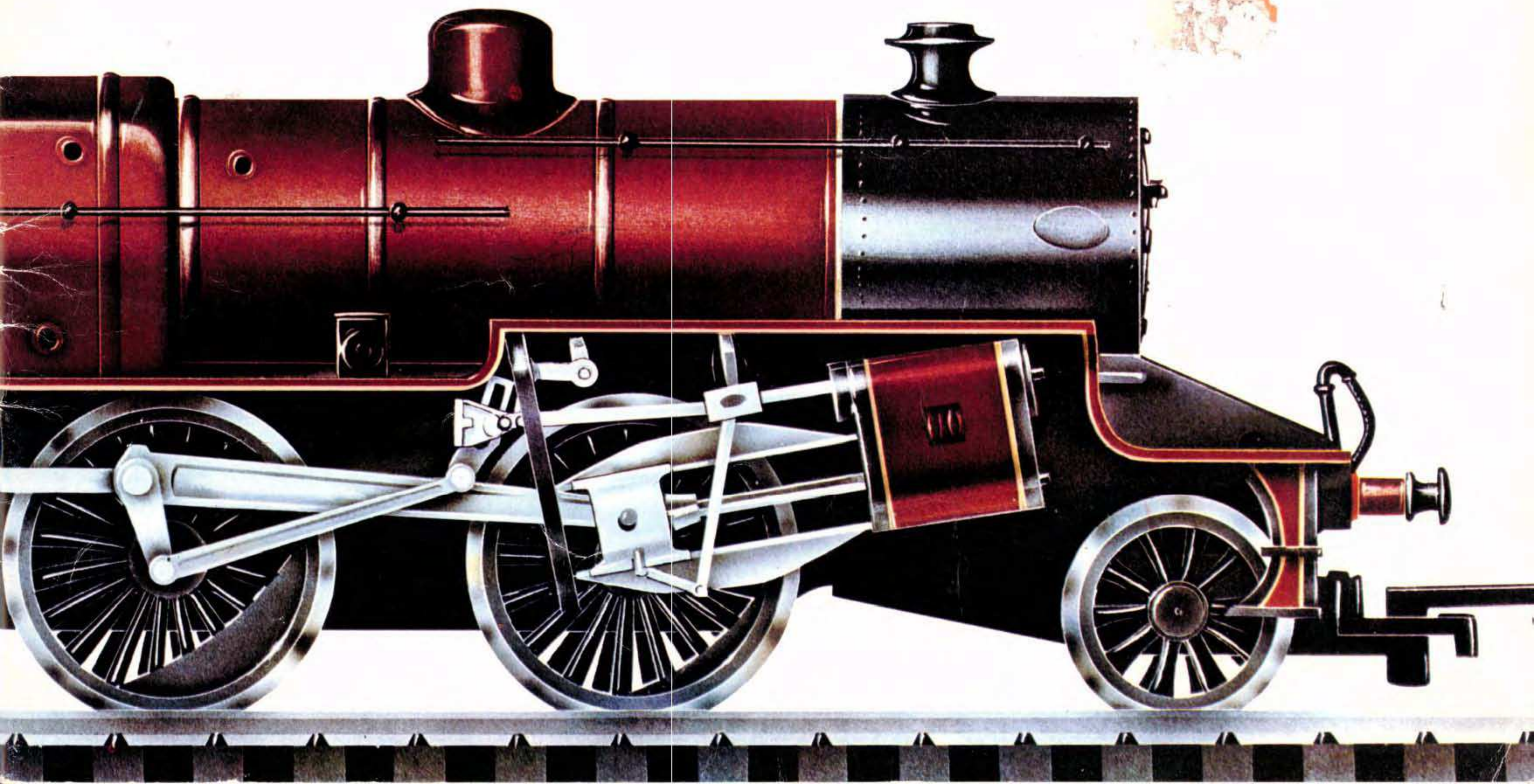


# THE COMPLETE GUIDE TO LIMA MODEL RAILWAYS 1978/79

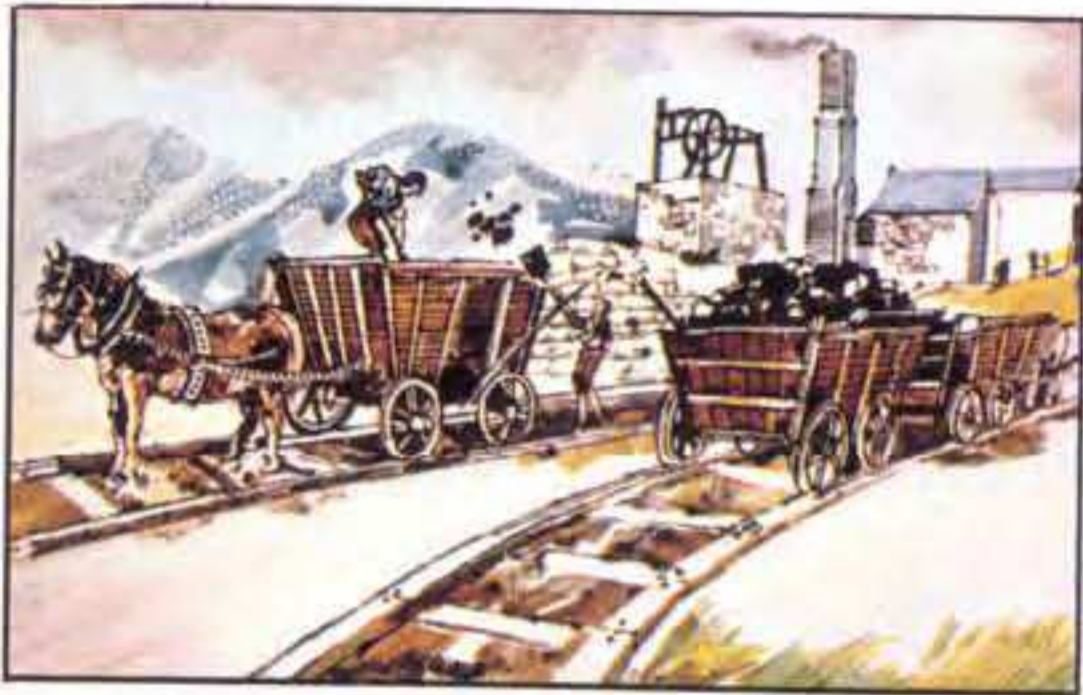


BRITISH EDITION

O O SCALE, N GAUGE, O GAUGE



# THE HISTORY



regular communications, and it is safe to say that without the success of the railways, the development of modern industrial society would have been well nigh impossible.

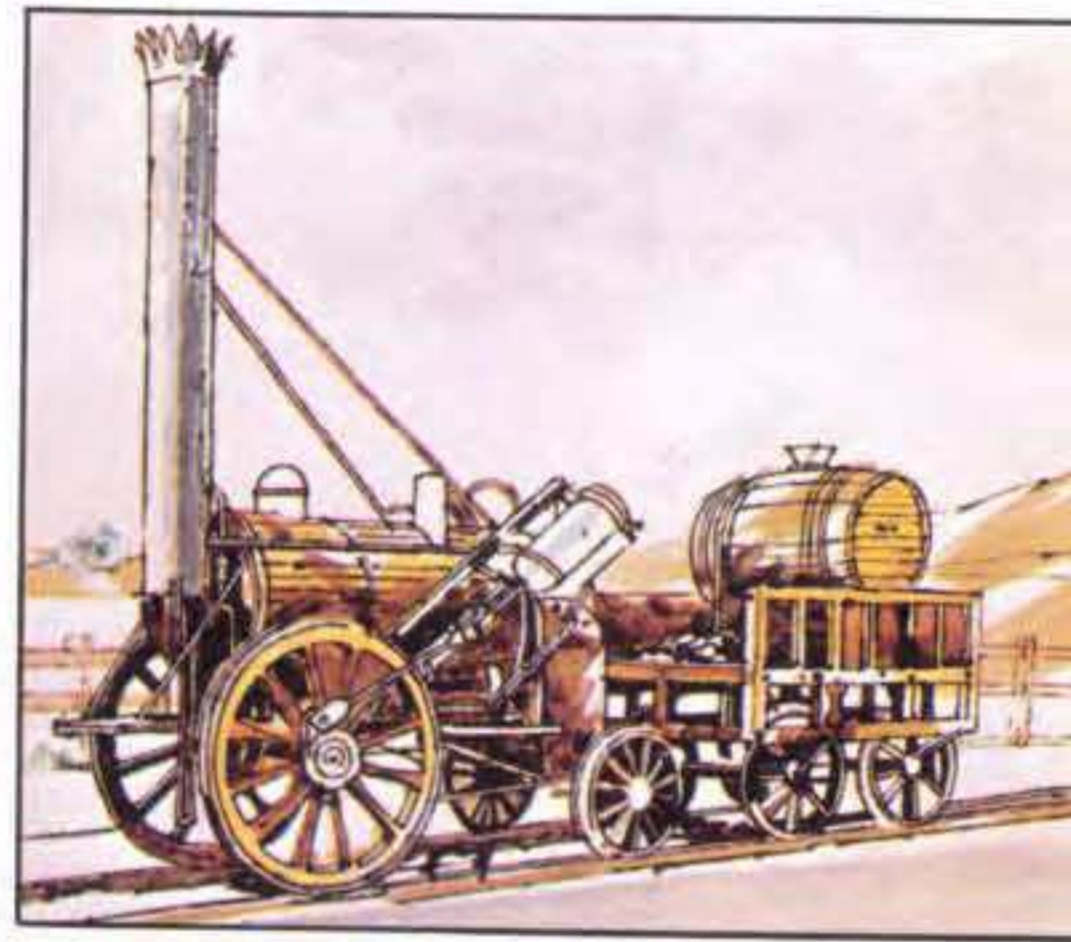
## THE PIONEERS

The introduction of the railways, and their subsequent development, can be traced back through history to the formation of one simple idea. The invention of metal wheels with flanges, enabling them to run on a fixed track made up of parallel lines. In fact, this principle was developed as long ago as the 8th century A.D. and for centuries animal power was the main form of propulsion.

The invention of railways as we know them today can probably be traced back to the work of a number of scattered pioneers, working all over Europe, during a period of about 200 years between 1600 and 1800. The stimulus coming from the beginning of large scale coal mining. Wagons were used to carry materials from the pit to a nearby point where the coal could be loaded into larger road wagons, for transporting inland or to the sea ports.

Without a doubt, the railways have played a major part in the development of civilisation as we know it today. Before the introduction of the steam locomotive running on an iron railway track in the early 1800s, the only means of inland freight carriage and passenger movement was by horse or pack animal. A method that was slow and unsure, to say the least.

An industrialised economy demands fast and



## THE COMING OF STEAM

The first steam locomotive to haul a load along a railway track was the work of a remarkable Englishman, Richard Trevithick. Running

on the nine-mile plateway at the Penydarren Iron Works in Wales in 1804, his single-cylinder creation easily hauled a twenty-five ton load.

By 1814 George Stephenson had built a steam locomotive for the wagonway at Killingworth, and though it was not particularly successful, in the following years Stephenson made a number of improvements which he incorporated in other locomotives.

In 1825, the first public railway to use steam locomotives, the Stockton and Darlington Railway was opened. However, horses were still used to pull some trains.



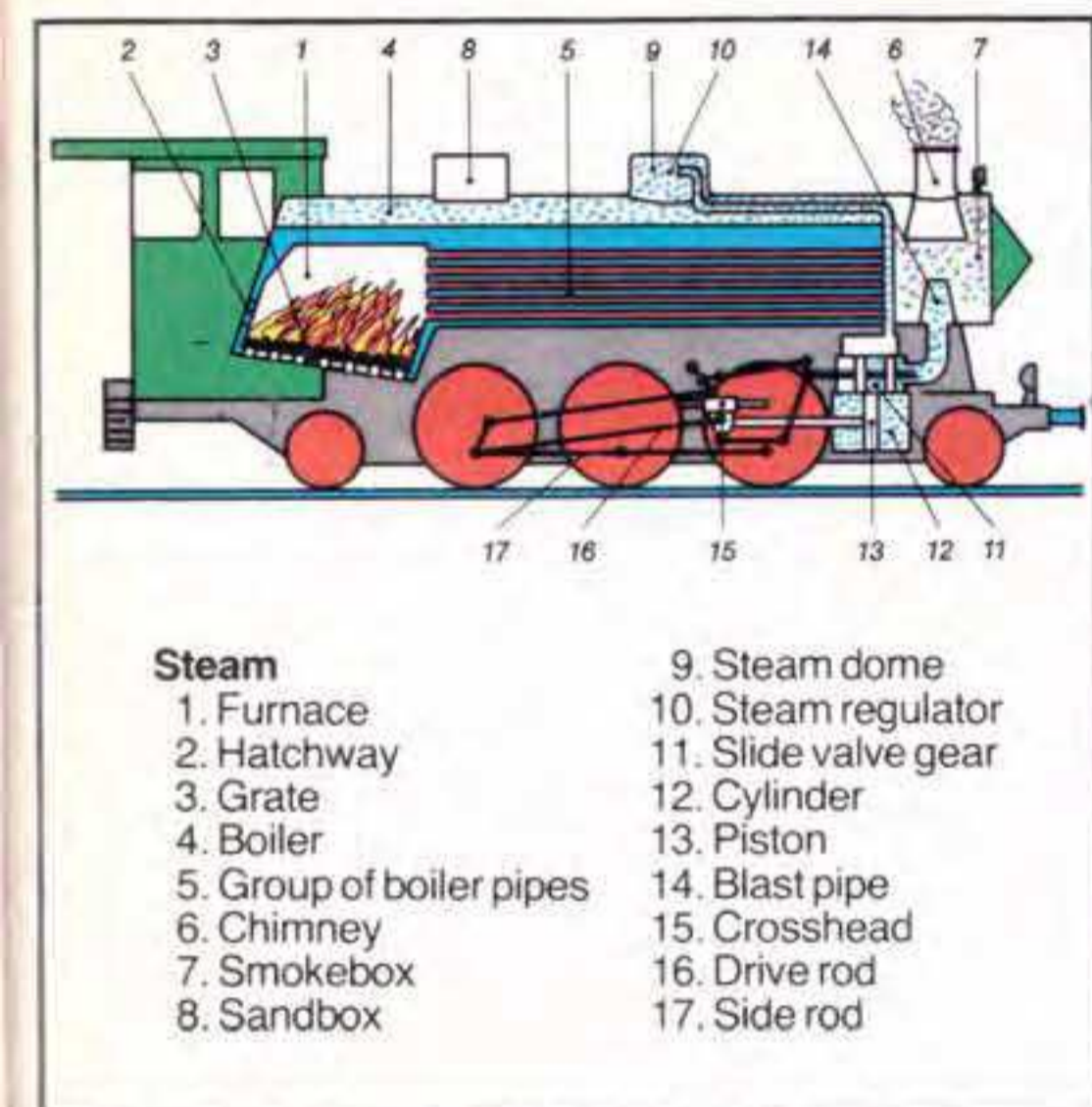
The Liverpool and Manchester Railway planned to use steam locomotives from the start. A competition was held to find the best type, and this was won by Stephenson's famous 'Rocket.'

Following the initial success, railway systems were produced by the hundred, some lines being promoted merely to compete with others. In this period of railway mania, many people lost money which they had invested unwisely, and many railways built as purely local lines began to realise the advantages of amalgamating with others to form longer routes.



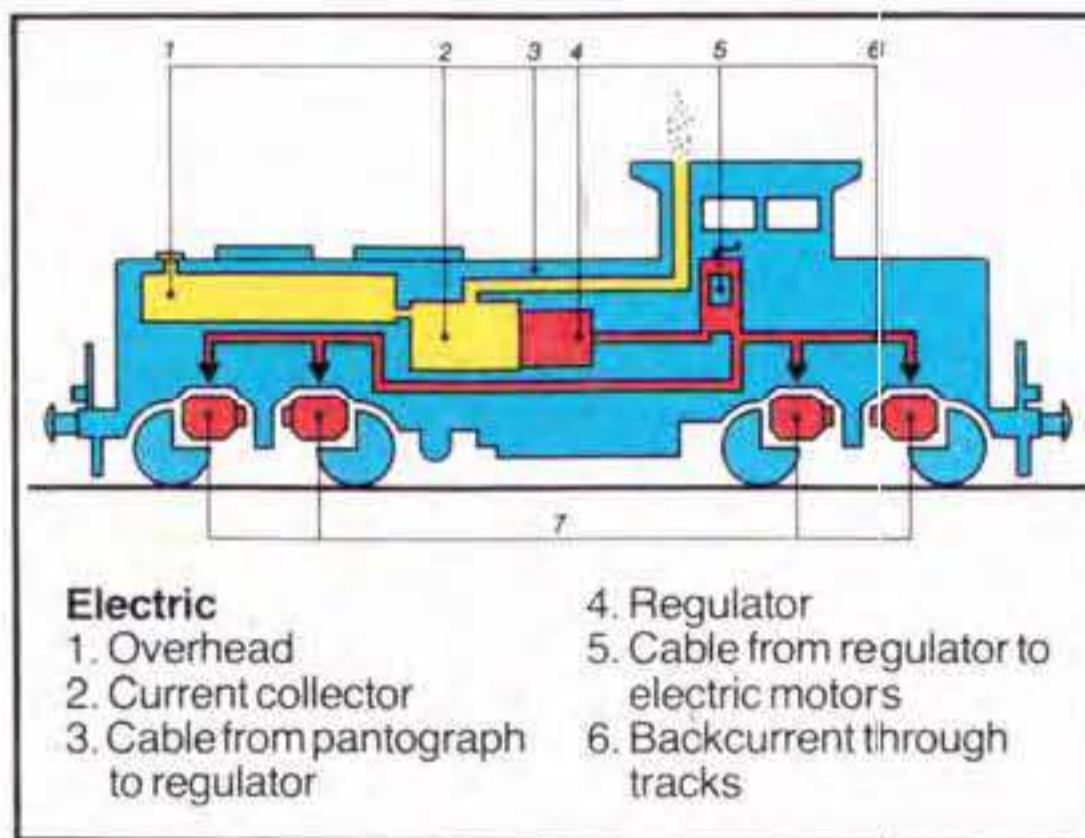
# OF RAILWAYS

Larger locos, the forerunners of 20th century locos, were beginning to come into widespread service. While by the 1860s, the railway map of Great Britain had assumed a shape that still forms the basis for the present system. The principal main lines between London and the South Coast, to the West Country, South Wales, the Midlands, North East and North West England and to Scotland were largely complete – although sometimes by roundabout routes.



The 'Cornish Riviera Express,' probably the Great Western Railway's most famous train, was introduced in 1904, and reached its peak of elegance in the Twenties with the powerful 'King' class 4-6-0 locomotives hauling their distinctive chocolate and cream coaches.

In 1921 the four great companies were formed:— The London, Midland and Scottish Railway (LMS) with its locomotives and rolling stock in rich, maroon livery. The Great Western Railway (GWR) whose locos were painted in their famous dark green and their coaches in chocolate and cream. The London and North Eastern Railway (LNER) with locos in apple green and coaching stock in superb varnished teak and The Southern Railway resplendent in dark green for both locomotives and coaches. Since Nationalisation in 1948, and the formation



of British Railways, these liveries have changed several times and were frequently under review. In terms of overall mileage Britain's railways reached their peak in the early years of the present century before the advent of competitors such as motor buses, cars and road haulage vehicles.

Gradually, diesel and electric trains replaced the old steam locomotives, and on August 11th 1968 British Railways ran their last main line steam train.

However, the romance of steam still lives on in many private collections, such as the National Railway Museum, and Railway Preservation Societies throughout the country. The study of these great machines has grown to become the second most popular hobby in the United Kingdom.

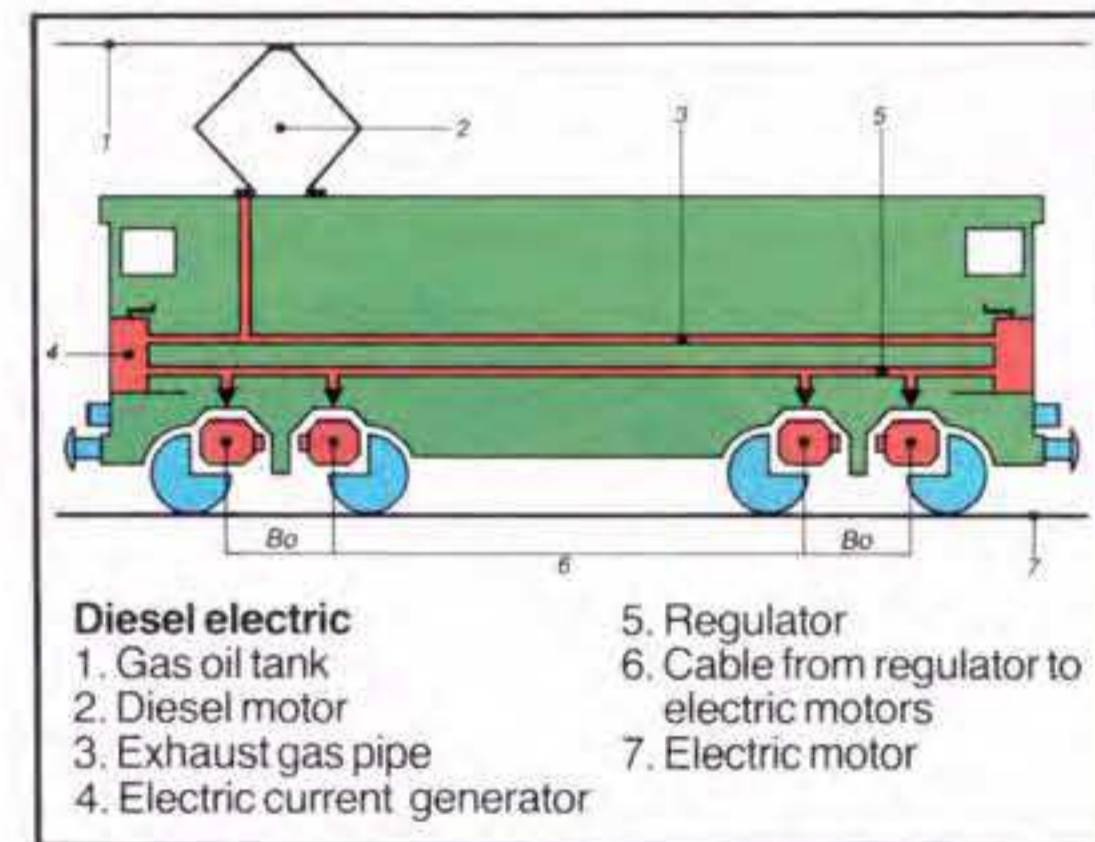
Through the hobby of railway modelling we can still enjoy the thrill of these majestic trains, and recreate their epic journeys of the past. Reliving once again the greatest days of the railways – the days of steam.

## THE SEARCH FOR POWER

In the early days of the railways, steam reigned supreme. Over a long period, the powers of the steam locomotive were developed to a point which the pioneers can never have envisaged. They developed speed – Britain holds the record with 126 m.p.h. by Sir Nigel Gresley's streamlined Mallard – and power – the U.S.A. had 570-ton locomotives capable of hauling 18,000 ton ore trains. Steam locomotives could

be built for almost any task. Why then, have they vanished from many areas, and are being phased out in many others?

The reasons are partly economic and partly social. The diesel and electric locomotives which are taking the place of their steam forebears are more costly, but they are available for work over much longer periods. A steam locomotive must visit the depot for attention every day. When its fire is out it takes a long time to light it and reheat the boiler to raise a working pressure of steam. By contrast, a diesel shunter can work twenty-four hours a day for a whole week or more, before paying a short visit to its depot. Thus, because diesel and electric locomotives can do more work, fewer are needed. Furthermore, they can maintain higher average speeds than steam units and work more trains as a result – with a smaller crew.



On the social side, the unavoidable dirt and grime connected with steam locomotive work of all kinds has become unacceptable today. Sadly, the day of the steam train almost everywhere in the world seems to be drawing to an end.

## TRAIN SAFETY

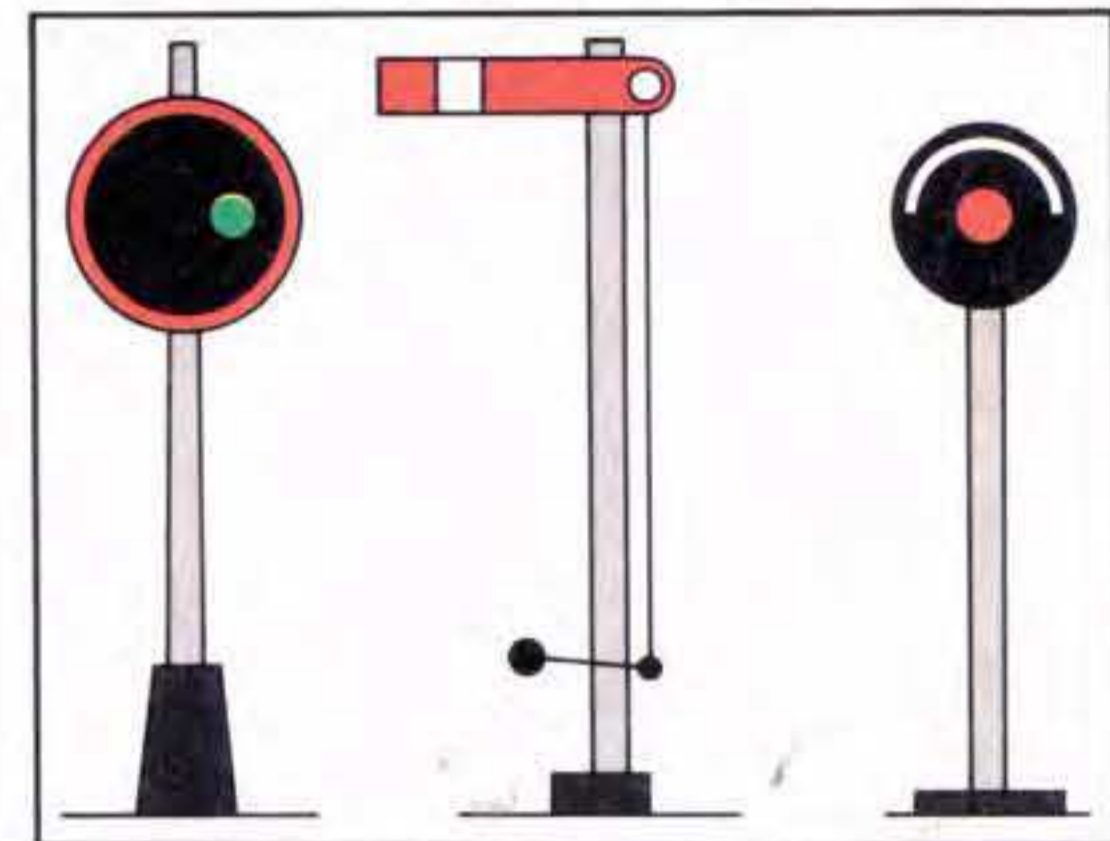
When the railways were young signalling was not needed. With early steam, speeds were low and loads small.

As speeds rose the great advantage of railways – low friction between rail and wheel – became a disadvantage. Trains could not stop quickly, and as railway traffic grew beyond the point where trains were so few and far between

they could never come together, something had to be done to tell the drivers where other trains were.

It took the introduction of signals, especially the electric telegraph, to overcome these problems.

The earliest forms of standardised signals included the disc and crossbar – which rotated horizontally on a post – and the semaphore using a wooden arm – horizontal for 'danger,' lowered at 45 degrees for 'caution,' and vertical to indicate 'all clear.' Now, however, these are giving way to signals in which the indications are given by coloured lights – controlled by circuits on the track.



## THE FUTURE

For the last century and a half, railways have risen, flourished, and apparently declined, only to rise again. The magic of steel wheels on steel rails still holds good, as today's upsurge in urban mass traffic testifies.

Railway engineers are already thinking of a time when trains will drive themselves. And development is already going on to replace the conventional steel track with more advanced forms. It seems that the hovertrain will be the transport of the future, travelling at up to 300 m.p.h. on concrete beams.

But even if rails and wheels give way to guiding beams and air cushions, it is certain that the railways will be with us for a very long time to come – to the continuing delight of enthusiasts the world over.

# HOW LIMA TRAINS HAVE

The history of railways throughout the world makes a fascinating study. But how much more fascinating to re-create this history in your own home, with a Lima model railway system.

All the romance of the railways is yours in miniature – with the incredible range of Lima rolling stock, locomotives and accessories.

In fact, Lima trains are in use in literally millions of homes all over the world because they produce more model railways and accessories than any other manufacturer. So you can rely on Lima's experience and knowledge.

## LIMA EXPERTISE

When you buy Lima you buy expertise.

Technical expertise, ensuring that your trains will always run on time – year after year.

Modelling expertise, so that every tiny detail is right, and your model railway really comes alive.

Plus an unrivalled choice of rolling stock and accessories, in three different scales. So your railway system can grow and develop into a lifetime hobby.

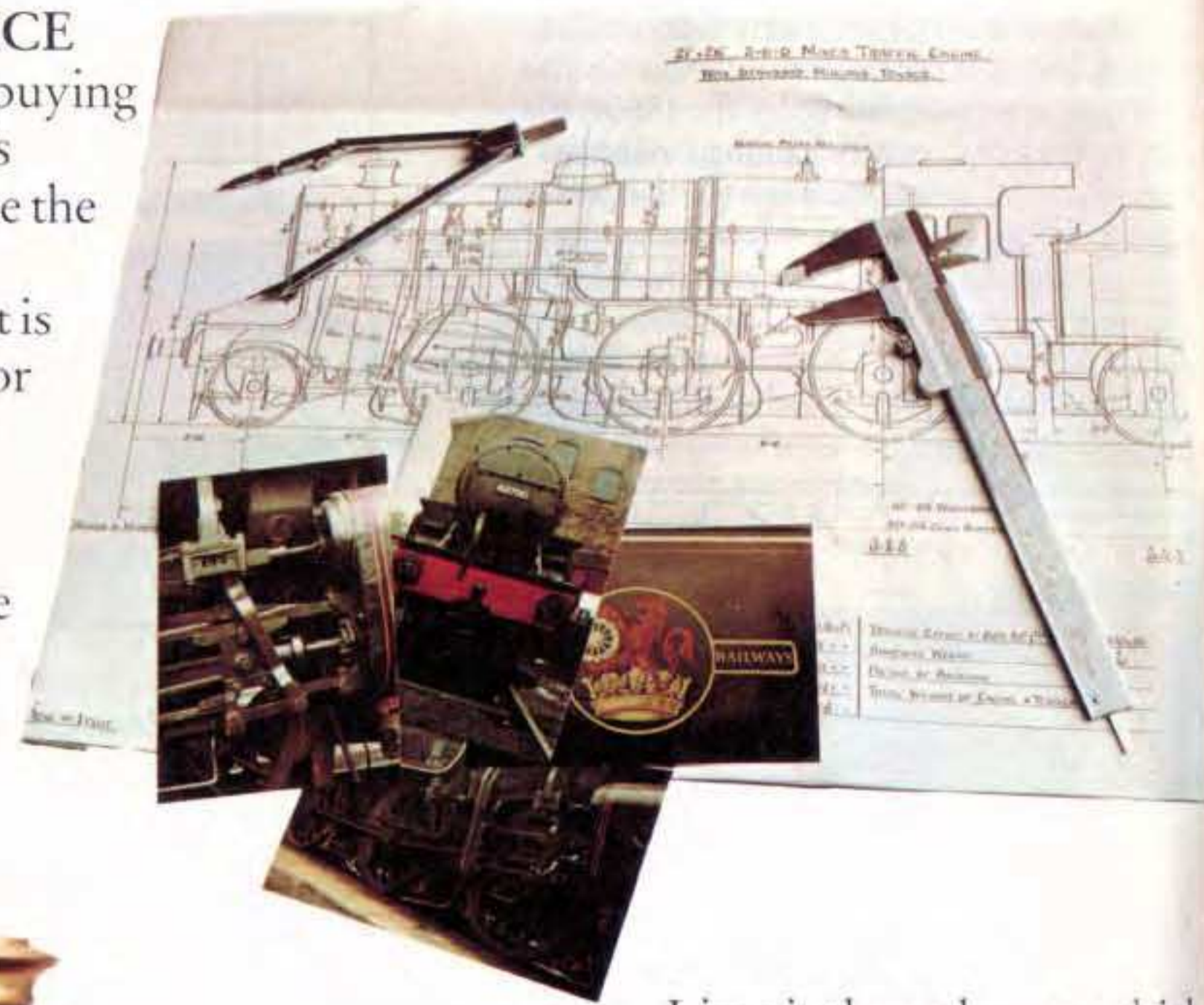
But perhaps most important, Lima expertise gives you the kind of value for money that makes your model railway a lasting investment.

## LIMA CHOICE

When you're buying a model railway, it's important to choose the right gauge.

The gauge that is right for you, and for the space you have available in your home.

With Lima the choice is easy. Of all the major manufacturers,



Lima is the only one which can offer you all 3 important gauges.

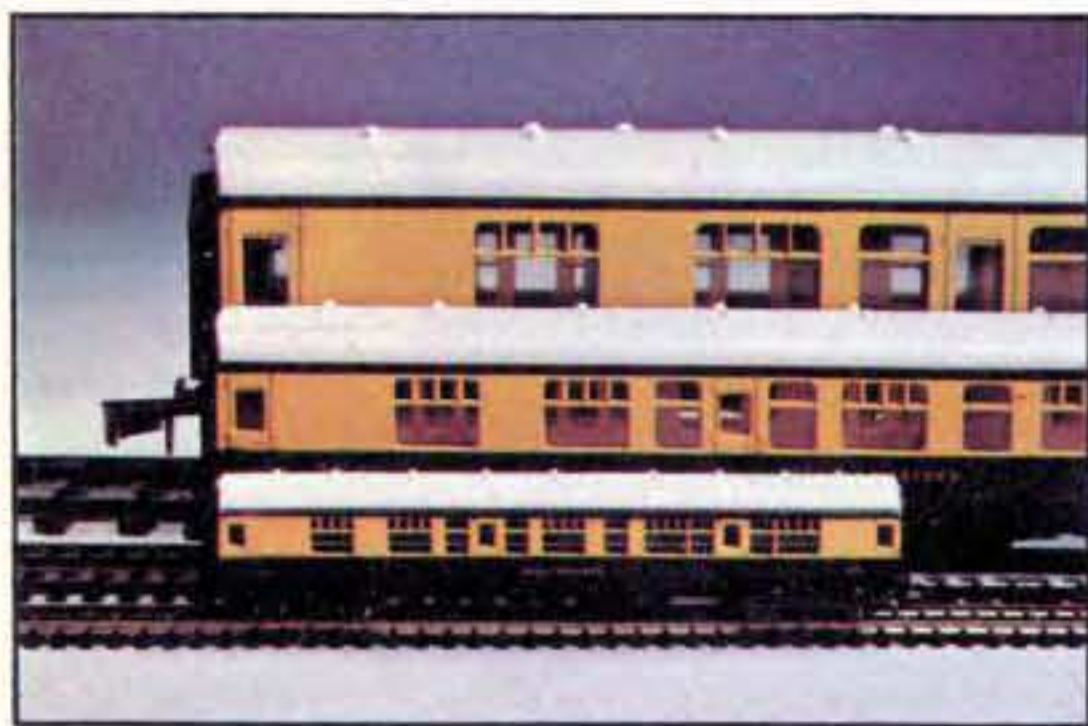
'OO' scale – the favourite with modellers and Lima offer a vast new range of British outline stock, all with British Standard Couplings.

'N' gauge – the mini-gauge. Superbly engineered micro models, ideal for those with limited space to set up their layout.

'O' gauge – maxi-trains. The giant size classic gauge. Uniquely effective out of doors.



# CAPTURED THAT HISTORY



## LIMA REALISM

If a thing's worth doing it's worth doing well – that's the Lima philosophy. So every new model is painstakingly researched, with no

a hand-finished mould of hard steel. Then the production models are formed under pressure in modern high impact polystyrenes.

Spray painting is used to colour and protect, while highly advanced machinery applies 4-colour transfers to all sides of the model simultaneously.

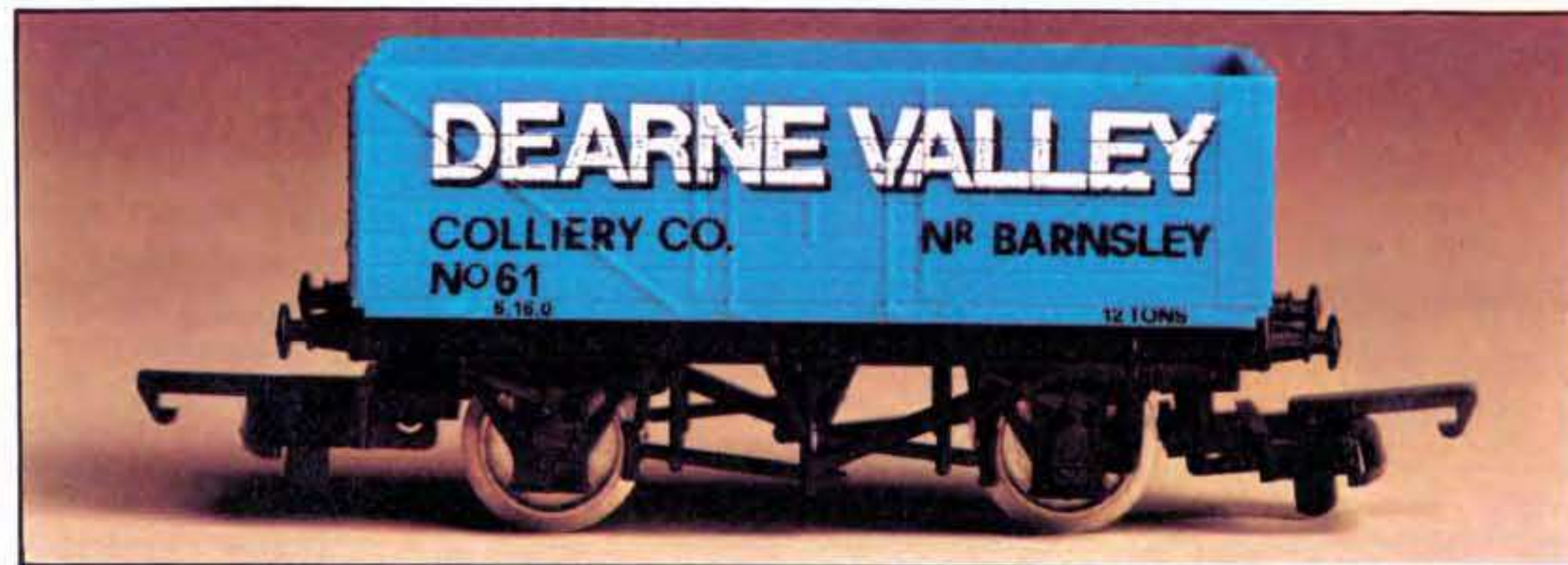
Finally, the body is checked, and each model is finished off by hand.

## LIMA POWER

Every Lima loco is powered by a well proven, 3 pole electric motor.

and reliability that has come to be expected from all Lima models.

job of work – hauling a big payload of rolling stock under the eagle eyes of



## LIMA ROLLING STOCK RUNS SMOOTHLY

Lima axles are made from toughened metal and have conical points to lessen friction and to give extra smooth running. While each wheel is insulated from the axle to prevent the risk of short circuits.



## DOUBLE CHECKED TO STAND THE TEST OF TIME

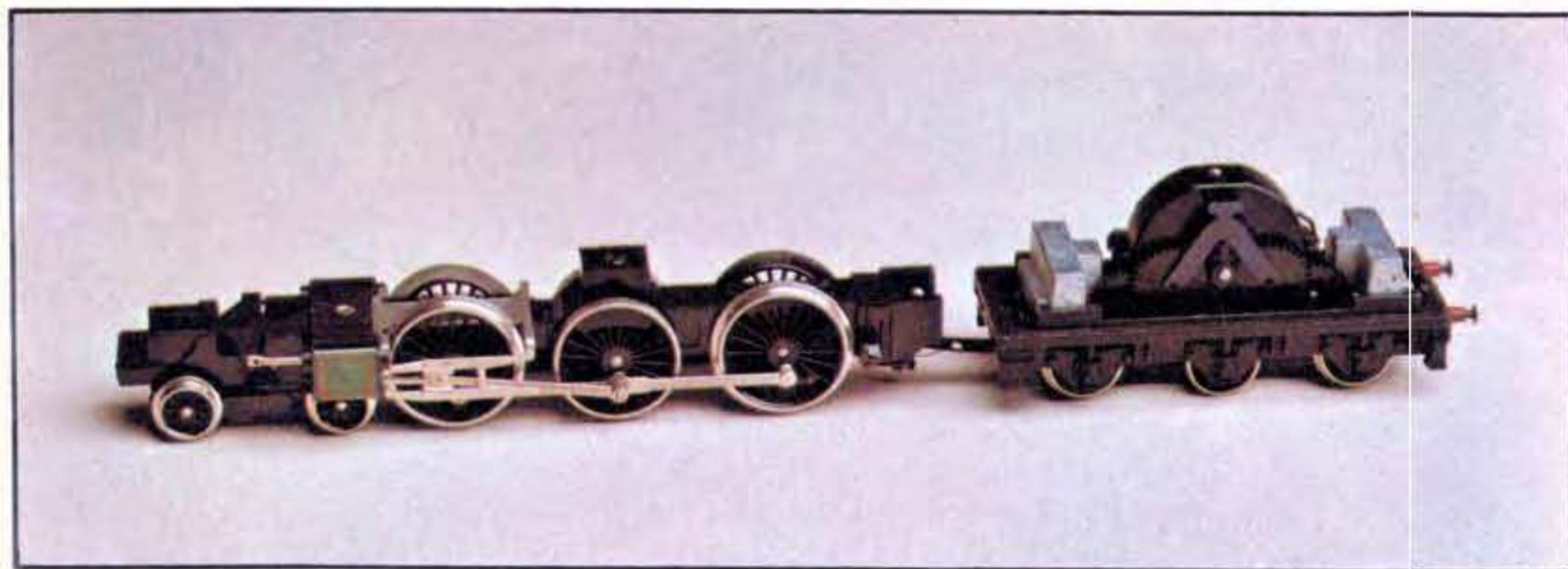
Before any Lima model leaves the factory it is individually tested to make sure that everything is perfect. Then each loco performs its first real

the testers.

## A PIECE OF HISTORY IN YOUR HOME

Lima models are made with the same love and care that was lavished on real life originals on which they are based – and it shows. Enabling you to re-create, in your own home, the great railways of the past and present, with a vividness that enchants both young and old alike.

With Lima, railway history really comes alive.



time or effort spared to get the right result.

Every loco and piece of rolling stock is designed from the original blueprints and photographs of the real thing. In close consultation with railway authorities, museums and historians throughout the world.

From the finely detailed scale drawings, skilled toolmakers prepare

This tough, reliable unit has two permanent magnets, and works on up to 12 volts direct current.

The care that Lima lavish on all their products is especially apparent in the assembly of these famous motors which were first made in 1946, and have been continuously improved upon since. Each armature is carefully tested, to give the long life

Whilst every attempt is made to ensure the complete accuracy of all items in the Lima range the manufacturers have altered/amended designs, specifications, materials, etc., as necessary, to enable them to produce such models by current production methods.

# LIMA GIVES YOU MORE CHOICE



If you want to start the hobby of model railways, it is possible to buy separately all the individual components, such as locos, coaches, wagons, track, power units and accessories. But the simplest, the most economic and certainly the most satisfactory way to begin is with a complete Lima Train Set.

Only Lima offers all the important gauges – 'OO', 'HO', 'N' and 'O'. So you can tailor your Lima system to your exact needs.

Indeed, Lima produces a bigger range of

locomotives, rolling stock and accessories than any other manufacturer.

Lima Train Sets range from the most simple circle layout, to advanced systems containing sophisticated track accessories such as containers, unloading depots, bridges and level crossings.

All types of trains are supplied in sets or separately, steam goods, steam passenger, diesel goods, diesel passenger, etc. – the choice is almost endless.

Also available are additional track packs and accessories which can turn a simple train set into a lifetime hobby.



# OO SCALE

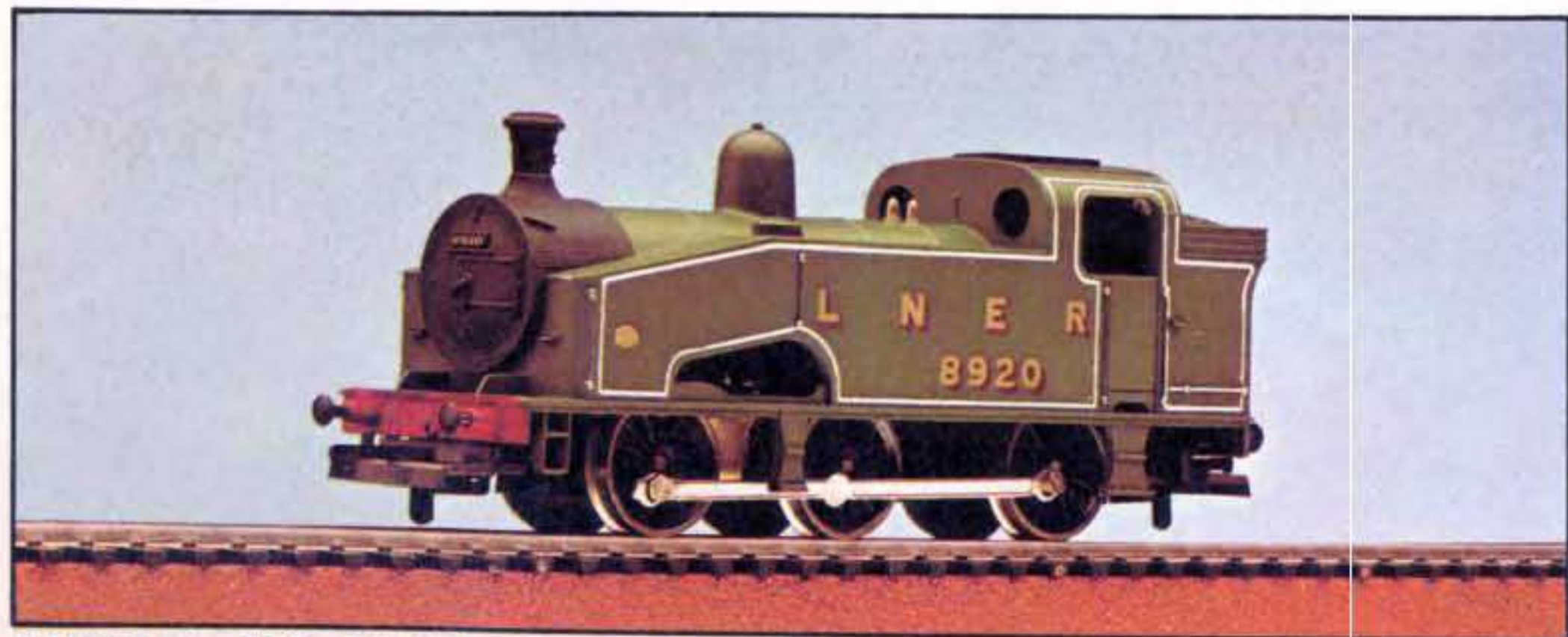
'OO' has become the most popular and widely used scale in the U.K., and Lima offers an enormous range of locomotives and rolling stock in this scale. The gauge (between the rails) is 16.5mm and the general dimensions are to 'OO' scale (4mm:1ft.)

Most other countries use the 'HO' scale (3.5mm:1ft) and certain items in the Lima range are based on this International outline. These wagons & locos are larger in real life than their British counterparts, but since their buffer beam heights are the same, the two systems are compatible when mixed. The track gauge for both 'OO' and 'HO' is 16.5mm.

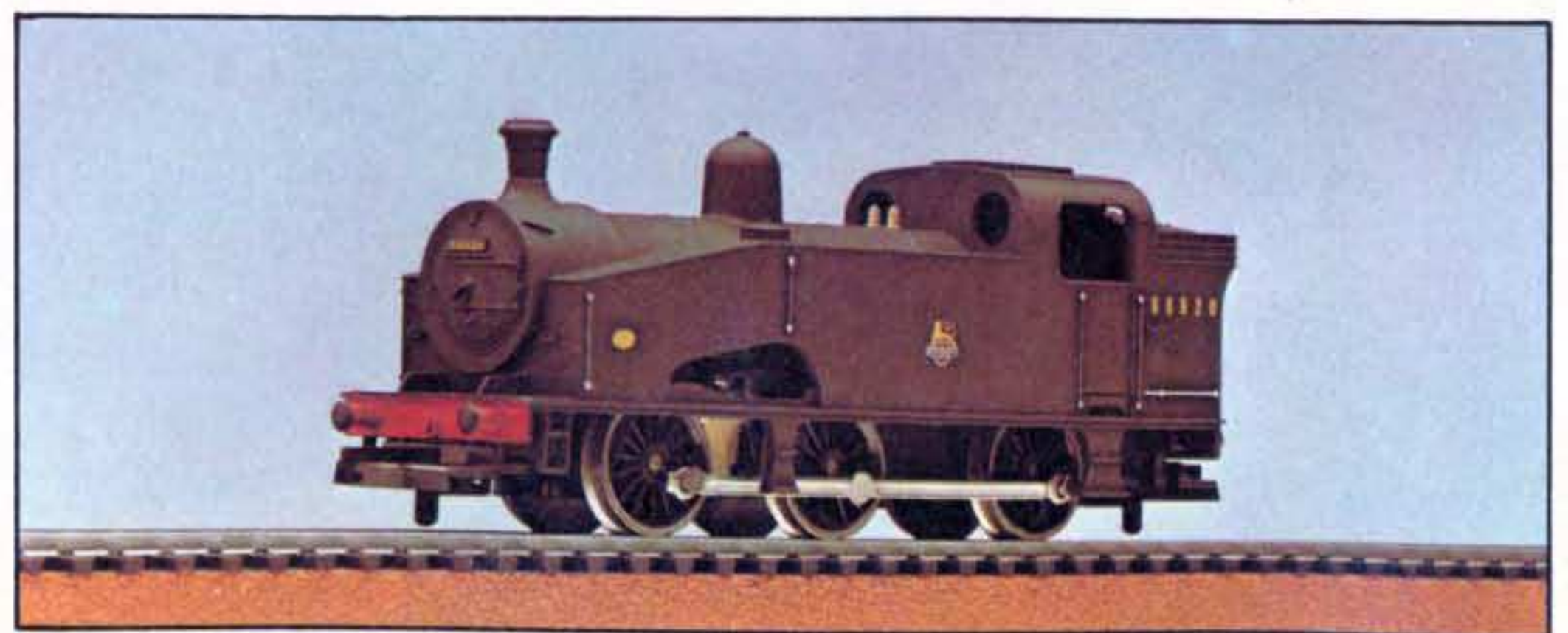




205101/2 0-6-0 Pannier Tanks were considered by the LNER to be the most suitable type of locomotive for short haul and shunting duties. The distinctive lines of the J.50 Class were designed by Sir Nigel Gresley in 1914 based on earlier saddle tanks produced by Patrick Stirling in 1874. Lima's model is of engine No. 8920 built at Doncaster works in 1924, re-numbered 68920 by B.R. in 1948, was finally withdrawn from service in July 1961.



205101M 0-6-0T Class J50 Tank Locomotive. LNER Livery.



205102M 0-6-0T Class J50 Tank Locomotive. BR Livery.



00 SCALE

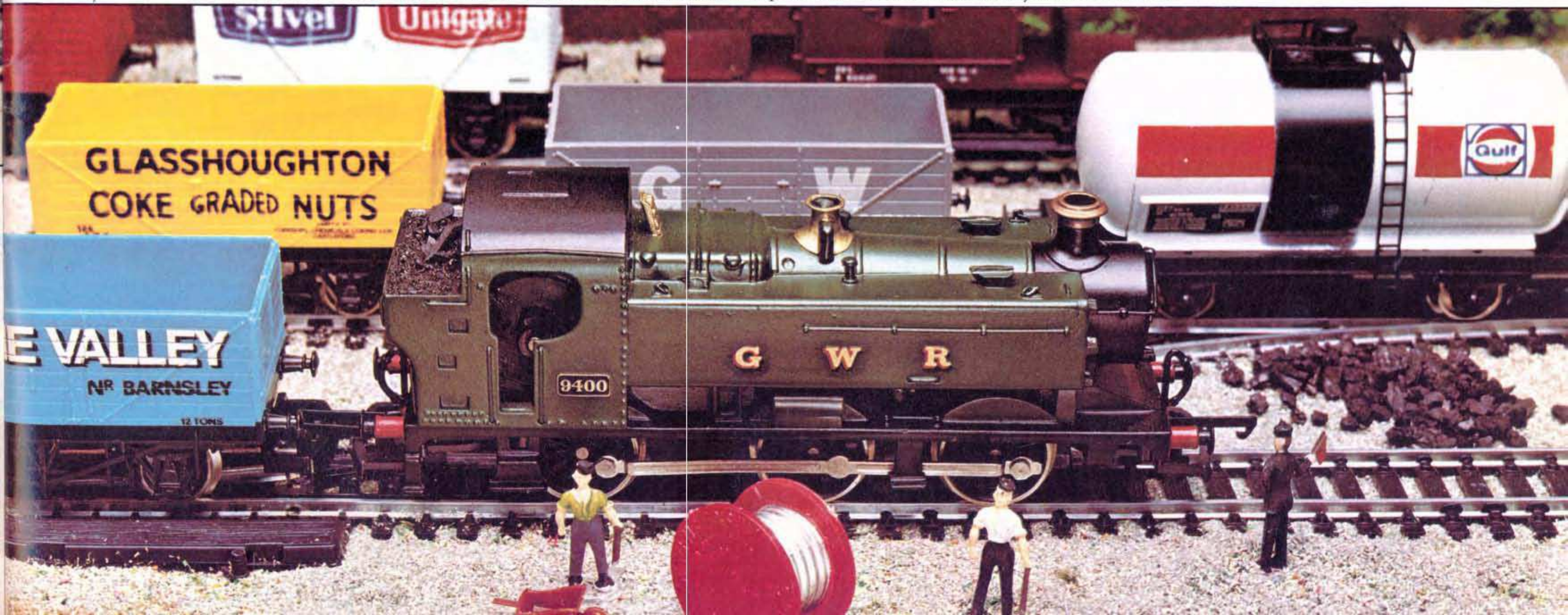


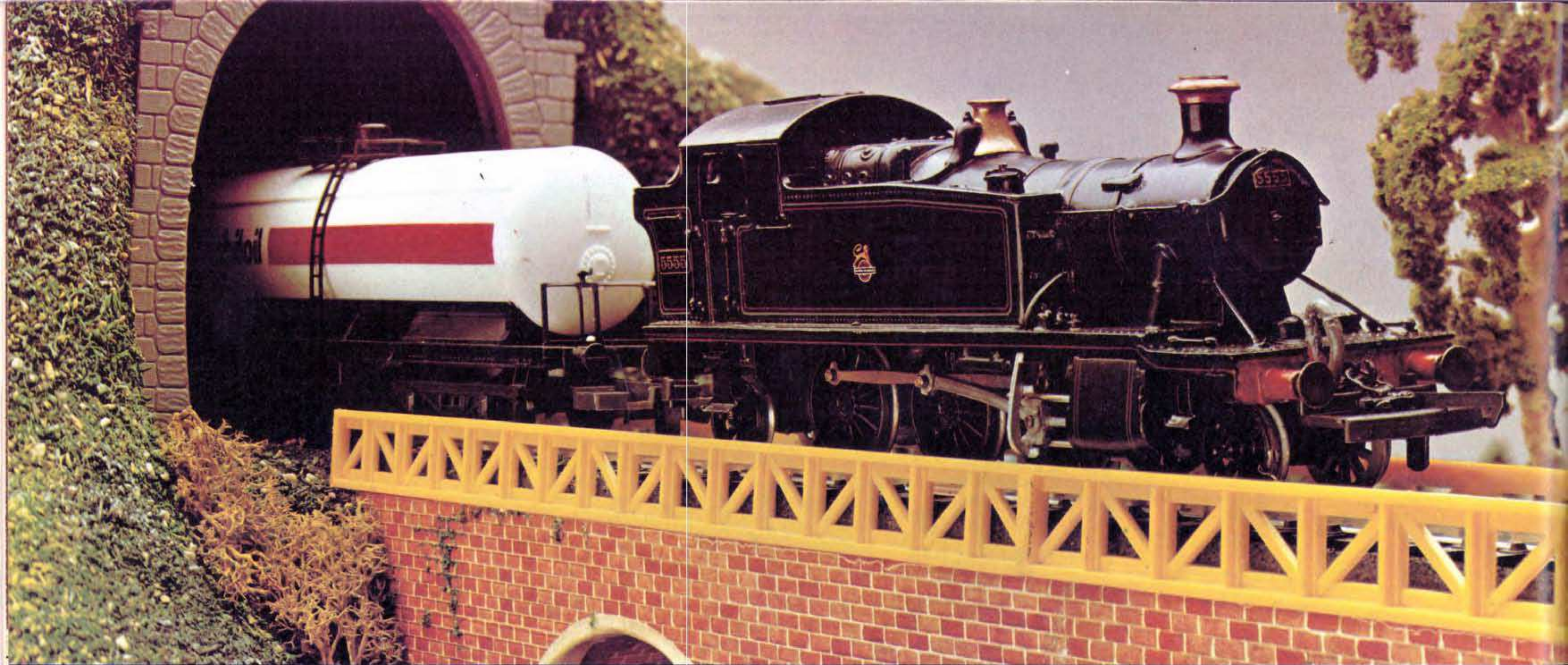
205117M 0-6-0T 94 xx Class Tank Locomotive GWR Livery.



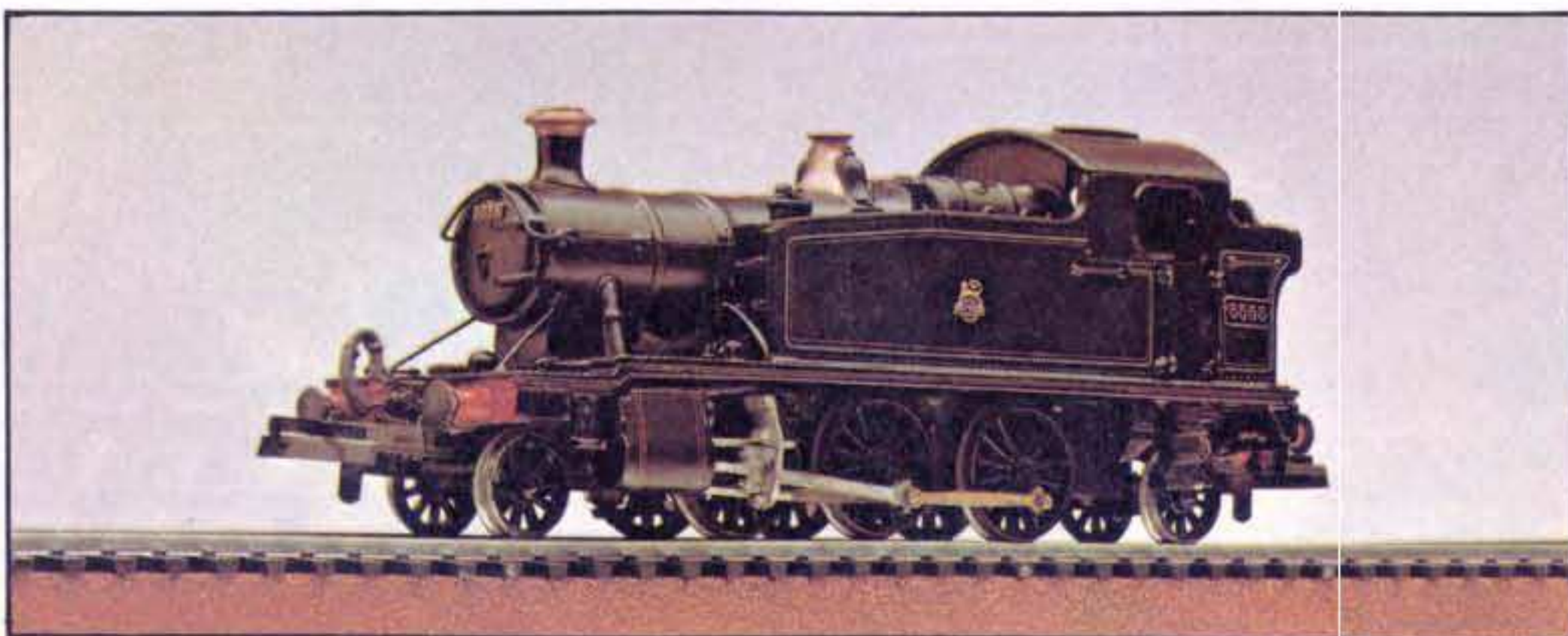
205118M 0-6-0T 94 xx Class Tank Locomotive BR Livery.

205117/8 Last in the line of pannier tanks produced for the G.W.R. at Swindon the 94XX class was intended for heavy shunting work and passenger traffic. Designed by F. W. Hawksworth and built in 1947 engine No. 9400 had all-welded tanks and an incredible coal capacity of 3½ tons. It was withdrawn from service in 1959 and is now preserved at the Great Western Railway Museum at Swindon.





205110/1 One of G.W.R.'s Standard Tank locomotives for cross country and branch line passenger work. The 45 xx Class was designed by G. J. Churchward and 175 were built at Swindon Works between 1906-1929. These small Prairie tanks weighed 57 tons, produced a pressure of 200 lbs and had tractive effort of 21250 lbs superheated.



205110M 2-6-2T Class 45 xx Prairie Tank Loco. BR Livery.

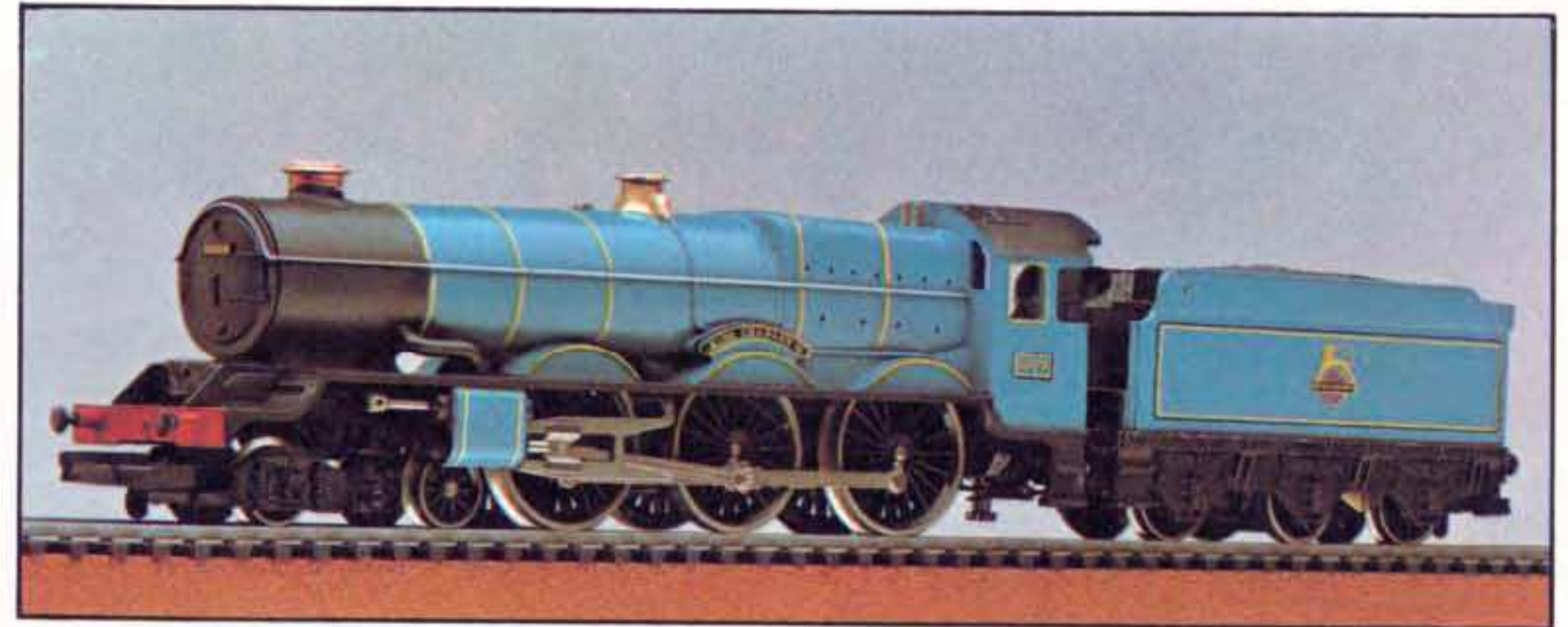


205111M 2-6-2T Class 45 xx GWR Prairie Tank Locomotive.

00 SCALE



205103M 4-6-0 'King' Class Express Locomotive. GWR Livery.



205104M 4-6-0 'King' Class Express Locomotive Experimental BR Livery.

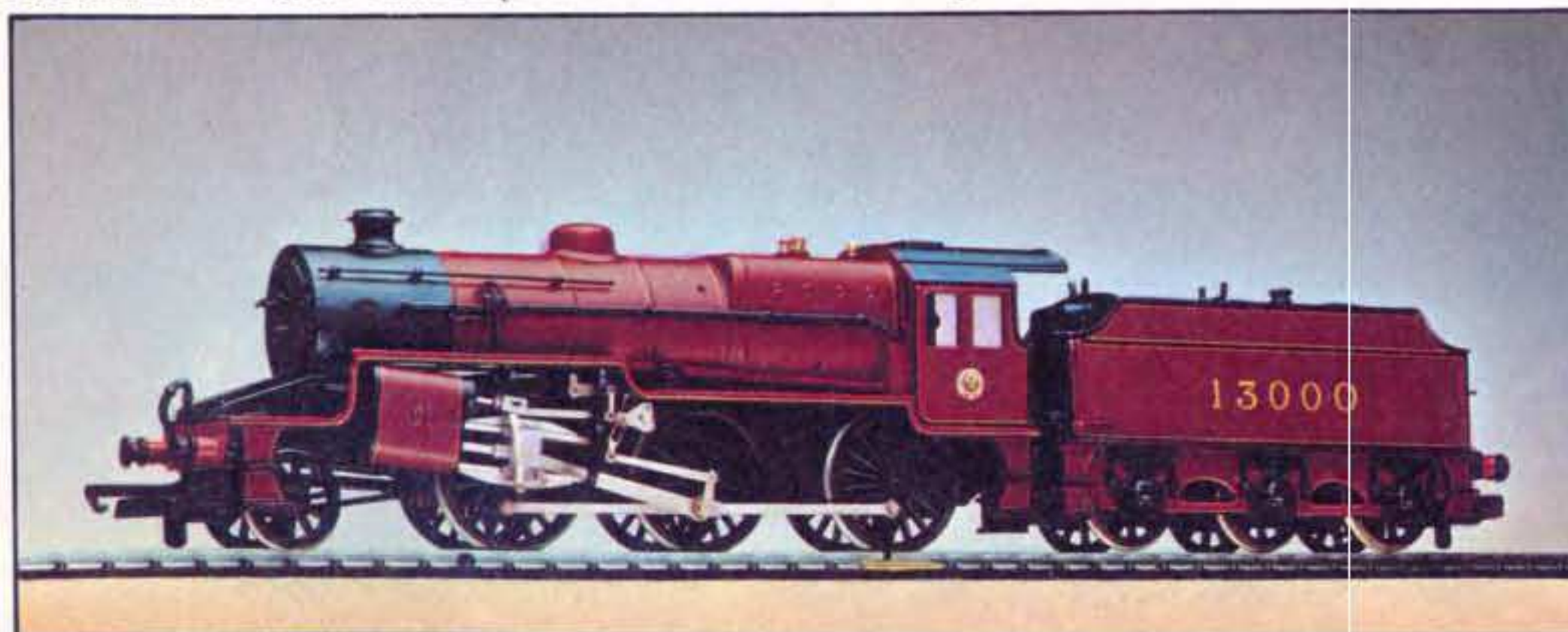
205103/4 Possibly the most famous of all G.W.R. locomotives, these magnificent express passenger engines were built by C. B. Collett at Swindon and introduced in 1927. The original No. 6000 King George V spent some time in the United States where its unusual bell was fitted. Withdrawn for preservation in 1962 this loco can be seen running over B.R. approved routes during its periodical steam excursions.





205119/20 These most impressive mixed traffic locomotives were introduced in 1926 and were designed by George Hughes C.M.E. Over 240 were built at Horwich and the design proved most successful. Their somewhat unusual valve gear and high running plate caused railmen to affectionately nickname them "Horwich Crabs." The angling of the cylinders was necessary to keep dimensions within the Midland loading gauge.

205119M 2-6-0 'Crab' Class Express Locomotive LMS Livery.



205120M 2-6-0 'Crab' Class Express Locomotive BR Livery.



00 SCALE



205114M BR Class 33 Bo-Bo Diesel Locomotive.



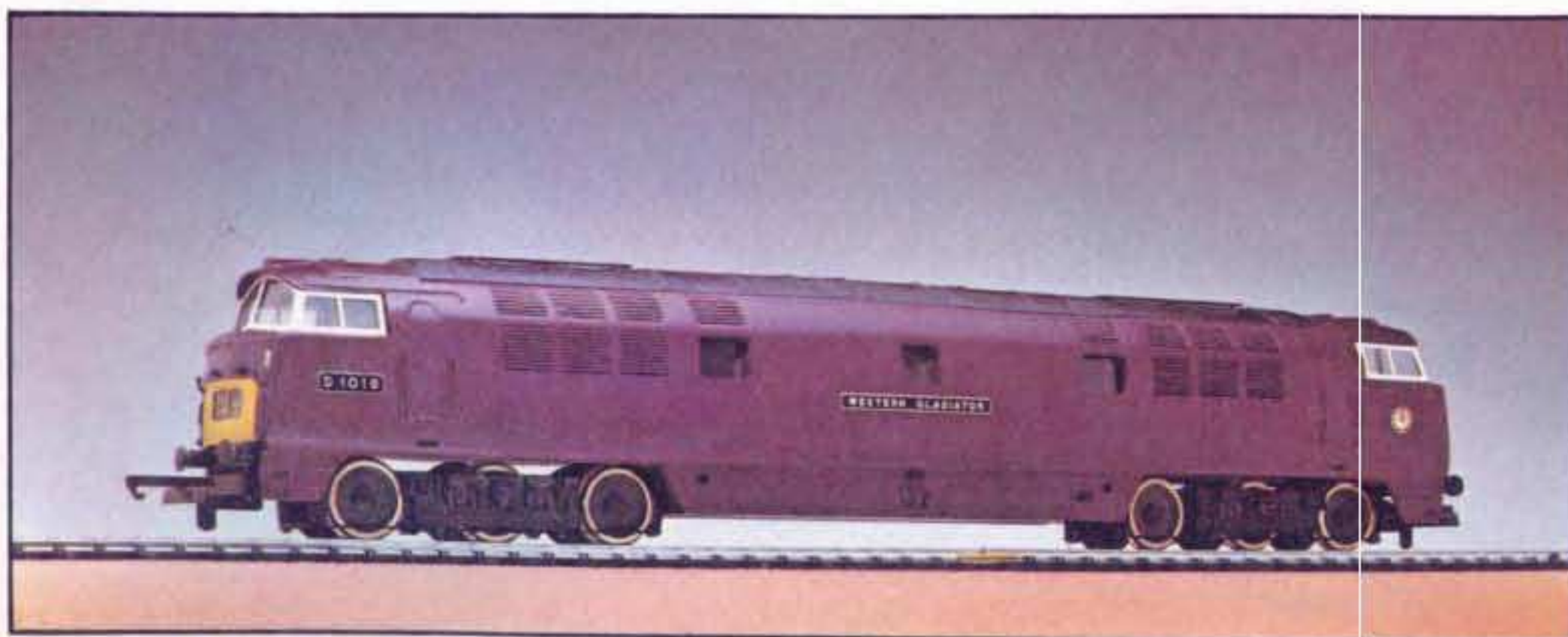
205115M BR Class 33 Bo-Bo Diesel Locomotive. Early BR Livery.

205114/5 Based on the earlier Class 26 these diesel electric Bo-Bo's were manufactured by the Birmingham Carriage Company, and in 1960 the first engines were allocated to the Southern Region. These medium sized locomotives weigh 73 tons, have a fuel capacity of 800 galls. and reach a maximum speed of 80 m.p.h.

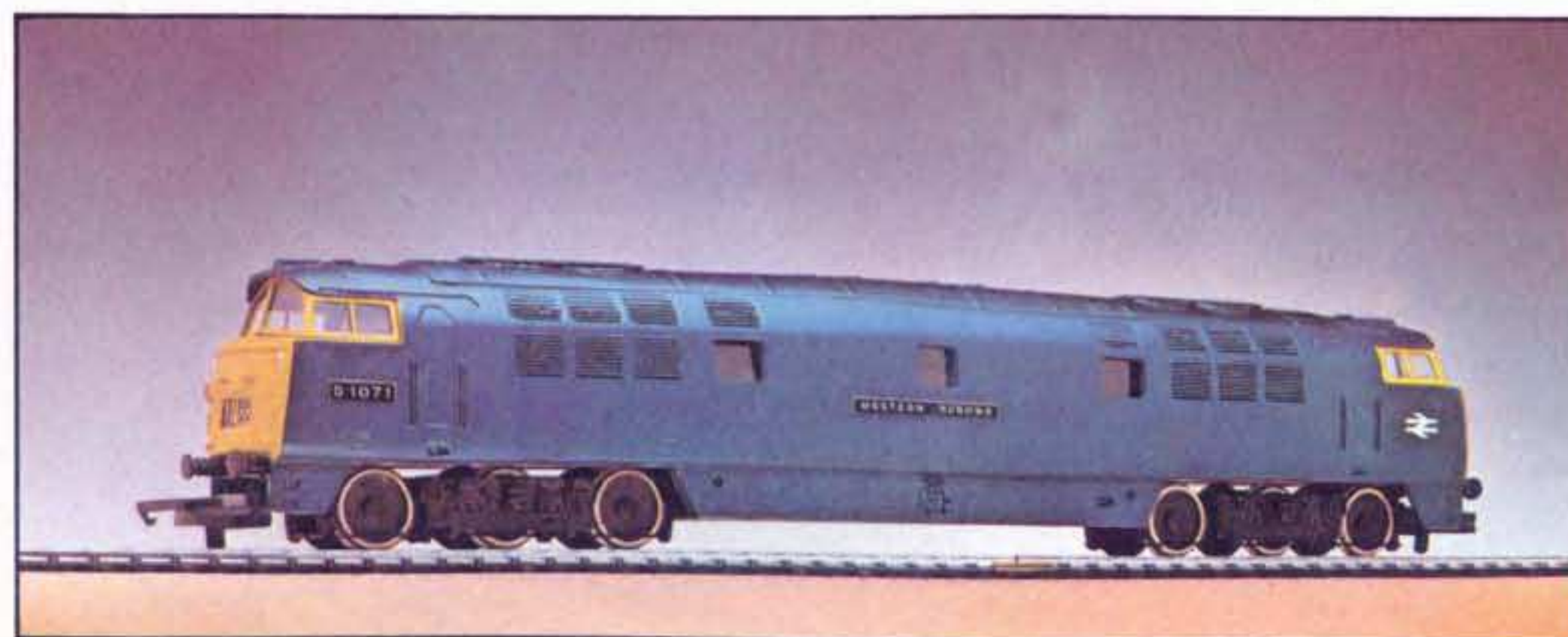




205121/2 Designed by the British Transport Commission and built at B.R.'s workshops at Swindon and Crewe the Class 52 "Western" diesel-hydraulic entered service in 1961. Based on the earlier Class 42 "Warships" they were given a re-styled body design and their two Bristol Siddeley Maybach engines were up-rated to 1350 b. h. p. to give the greater tractive effort felt necessary for the then increasing passenger traffic. These locomotives have now been withdrawn from service.



205121M BR Class 52 'Western' Diesel Hydraulic Locomotive.  
Western Maroon Livery.

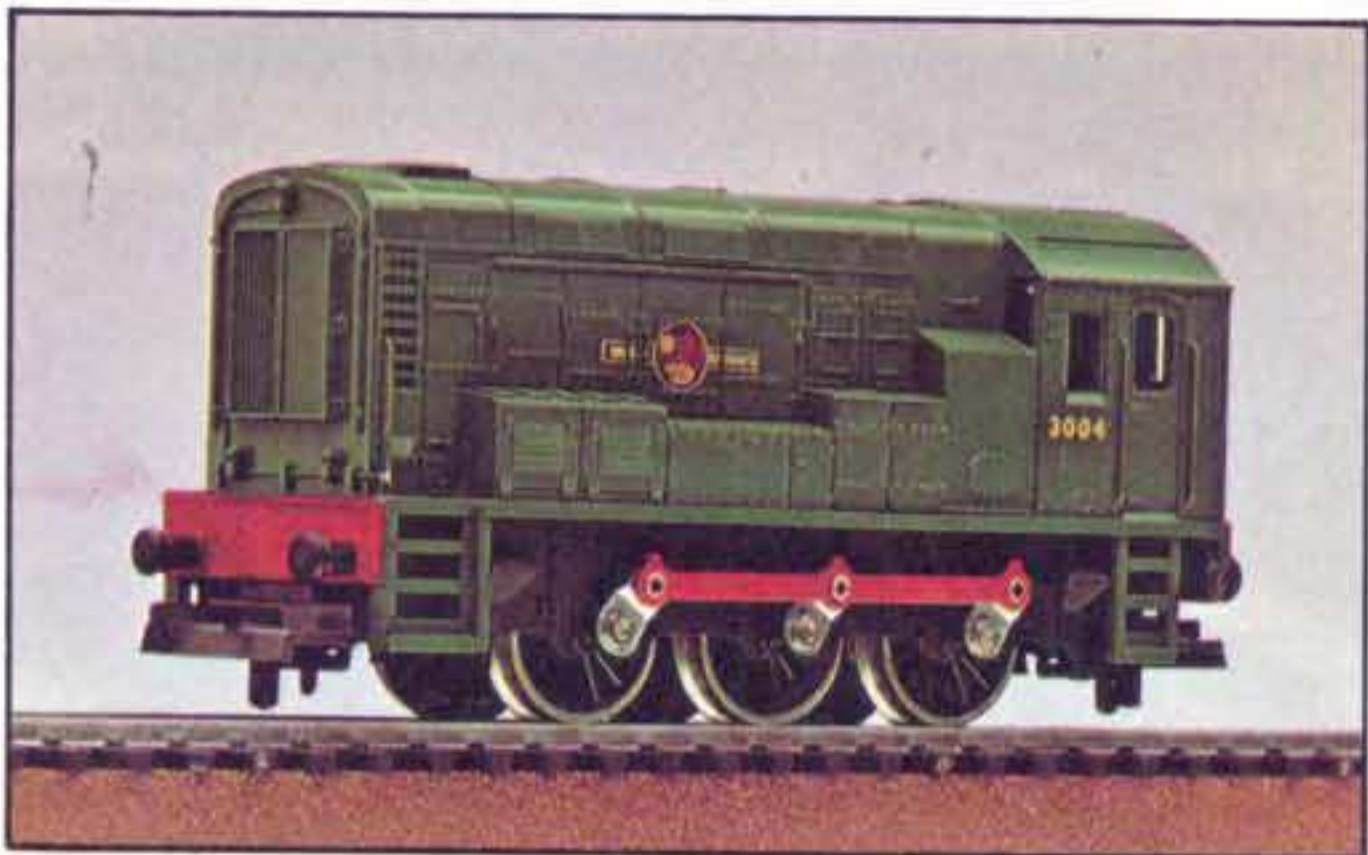


205122M BR Class 52 'Western' Diesel Hydraulic Locomotive.

205107/9 Manufactured by the English Electric Company at Derby works in 1945 these diesel electric units formed the basis for many more shunters built by various regions of B.R. Of the 120 built most are still working today on a variety of duties. These engines produce a tractive effort of 35,000 lbs, a vast improvement over the 10,500 lbs effort of the original 132 h.p. units built by the Hanslet Engine Company in 1932.



205107M 0-6-0 Class 09 350 BHP Diesel Shunter. BR Livery.



205108M 0-6-0 Class 09 350 BHP Diesel Shunter. Early BR Livery.



205109M 0-6-0 Class 09 350 BHP Diesel Shunter. LMS Livery.



00 SCALE



205105M BR Class 55 'Deltic' Co-Co Diesel Loco. Early BR Livery.



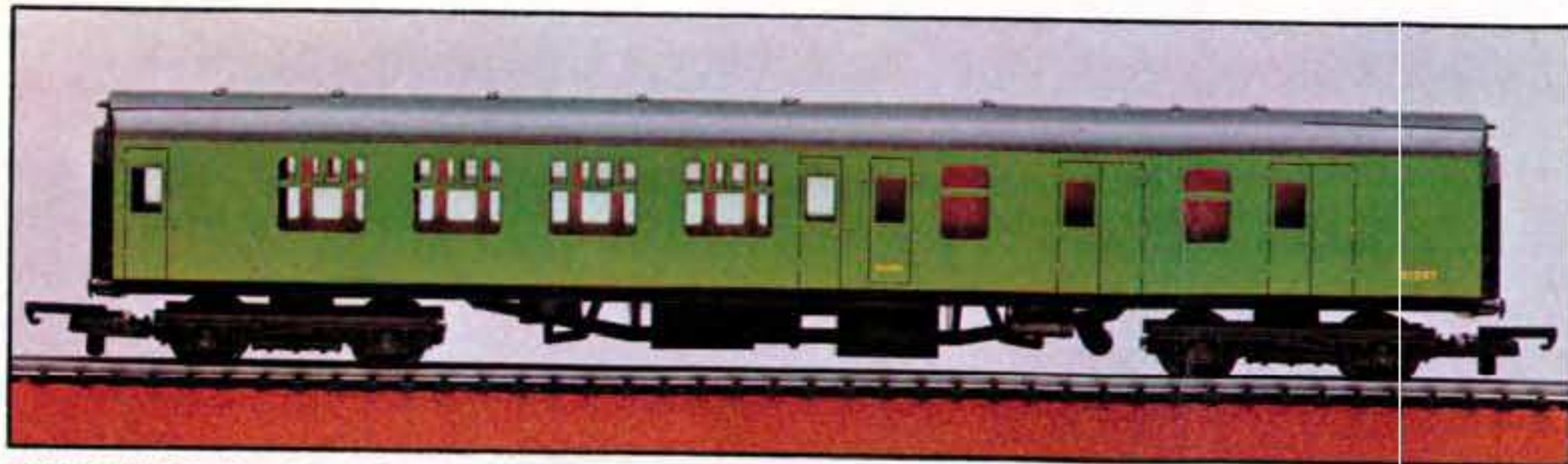
205106M BR Class 55 'Deltic' Co-Co Diesel Locomotive.

205105/6 Considered by many to be the "King" of diesels the Class 55 "Deltic" was introduced for main line working on the Eastern Region in 1961. Currently running between Kings Cross and Edinburgh these engines carry the name and insignia of famous Scottish Regiments such as "The Fyfe and Forfar Yeomanry." Manufactured by the English Electric Company the most impressive locomotives are capable of a maximum speed of 100 m.p.h.

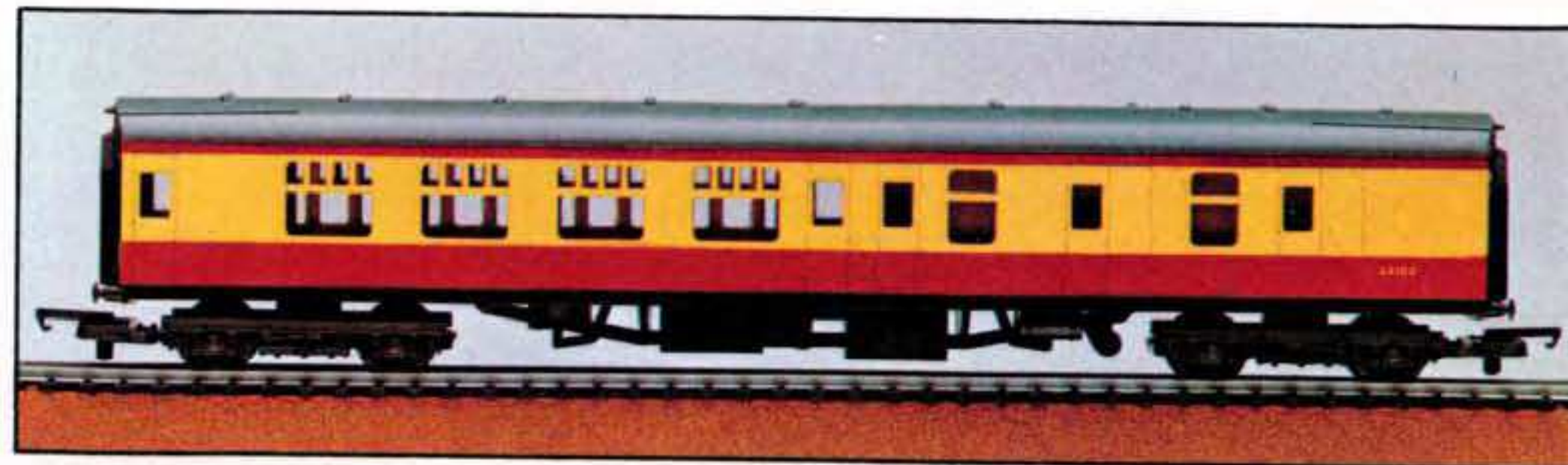




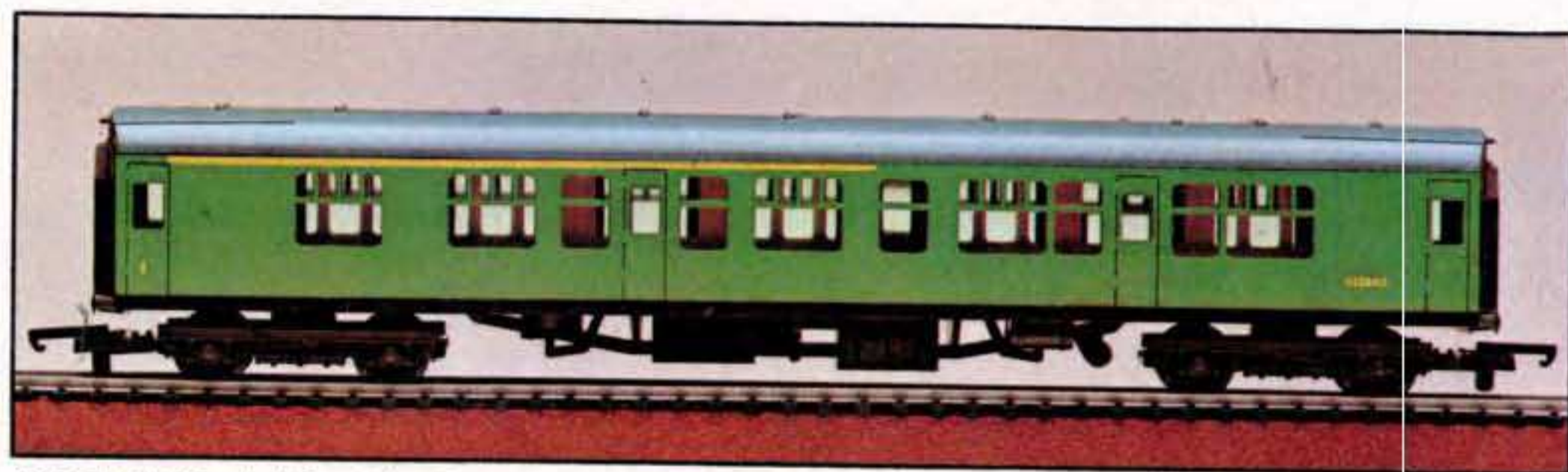
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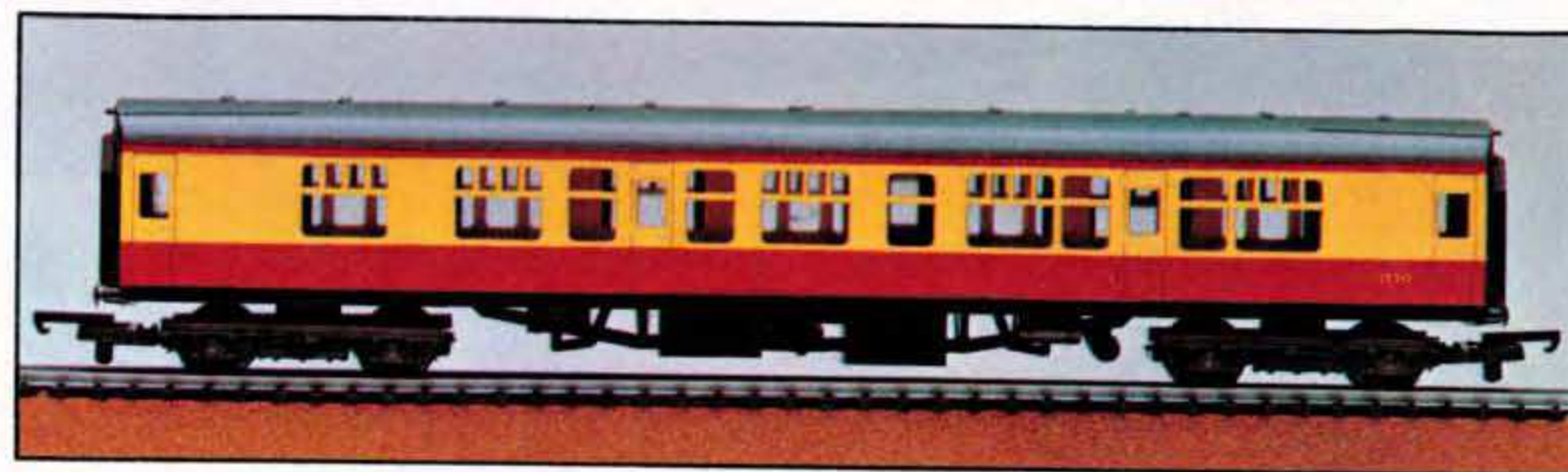
305314 SR Mark 1 Corridor Brake Coach.



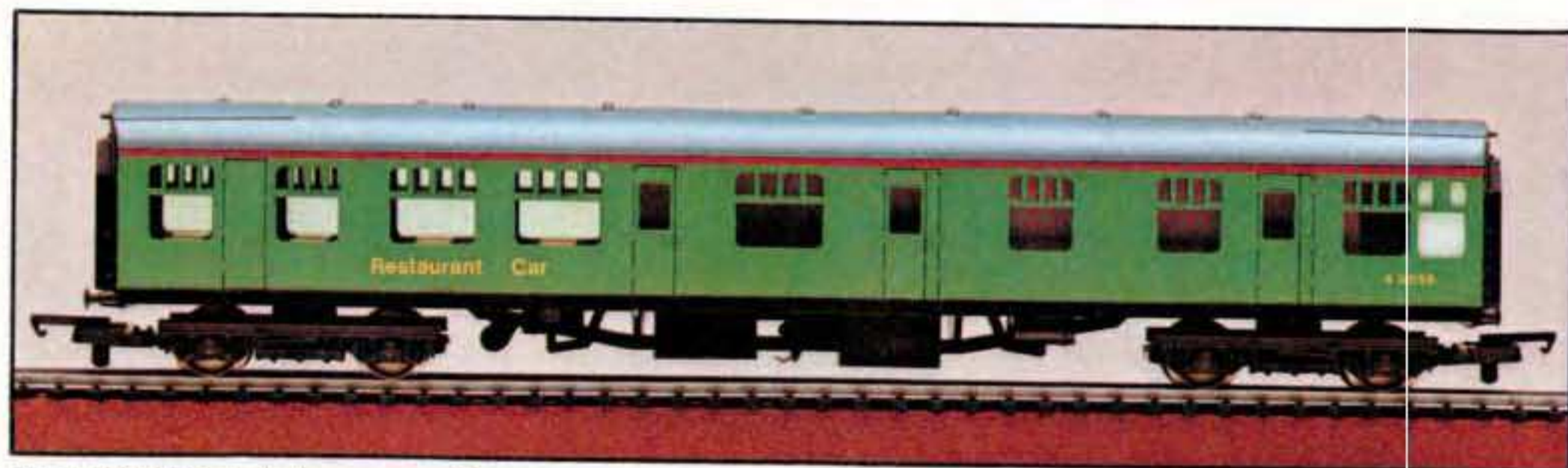
305311 BR Mark 1 Corridor Brake Coach.



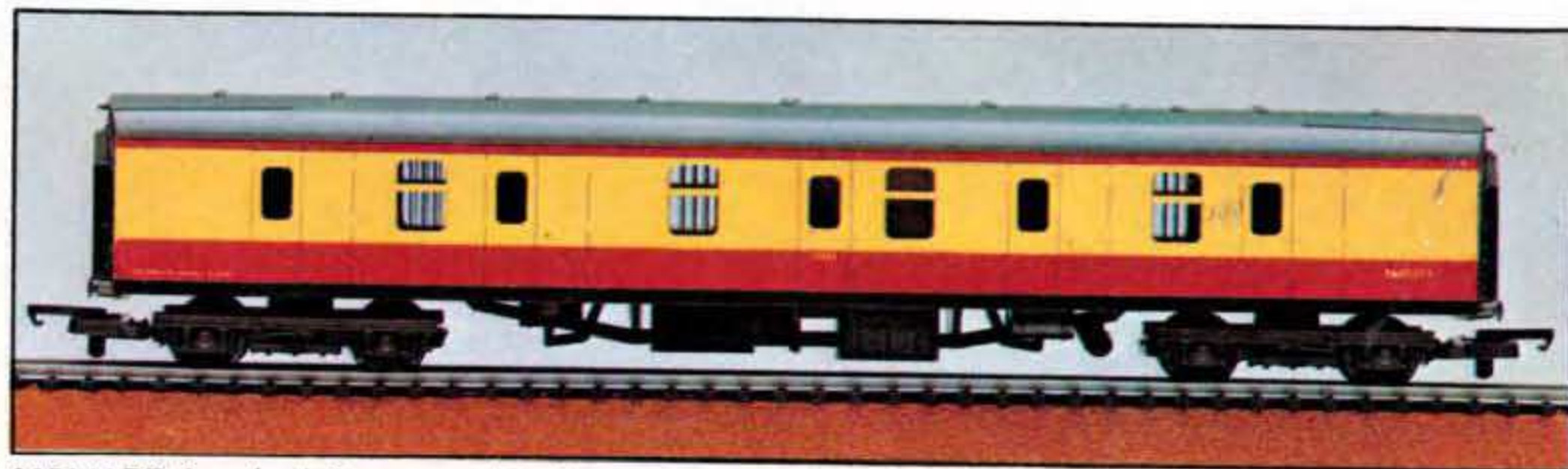
305334 SR Mark 1 Corridor Composite Coach.



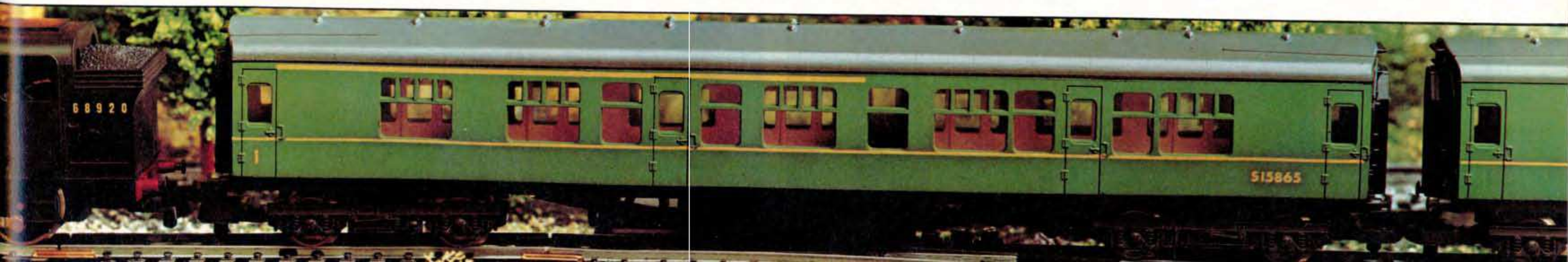
305331 BR Mark 1 Corridor Composite Coach.

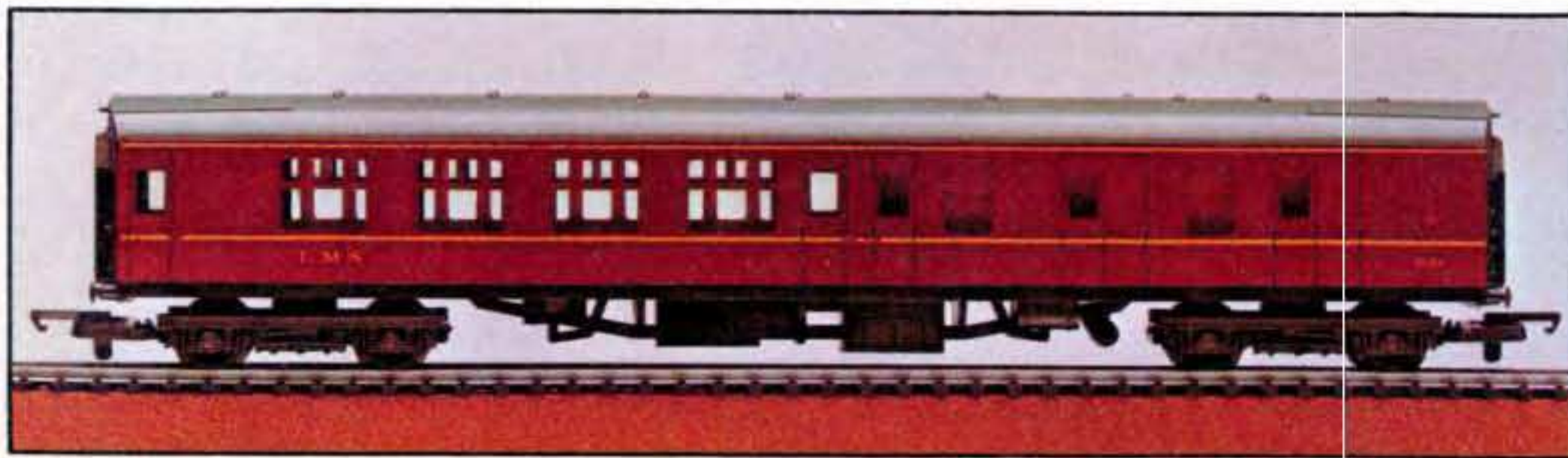


305324 SR Mark 1 Restaurant Car.



305344 BR Standard Gangwayed Brake Van.





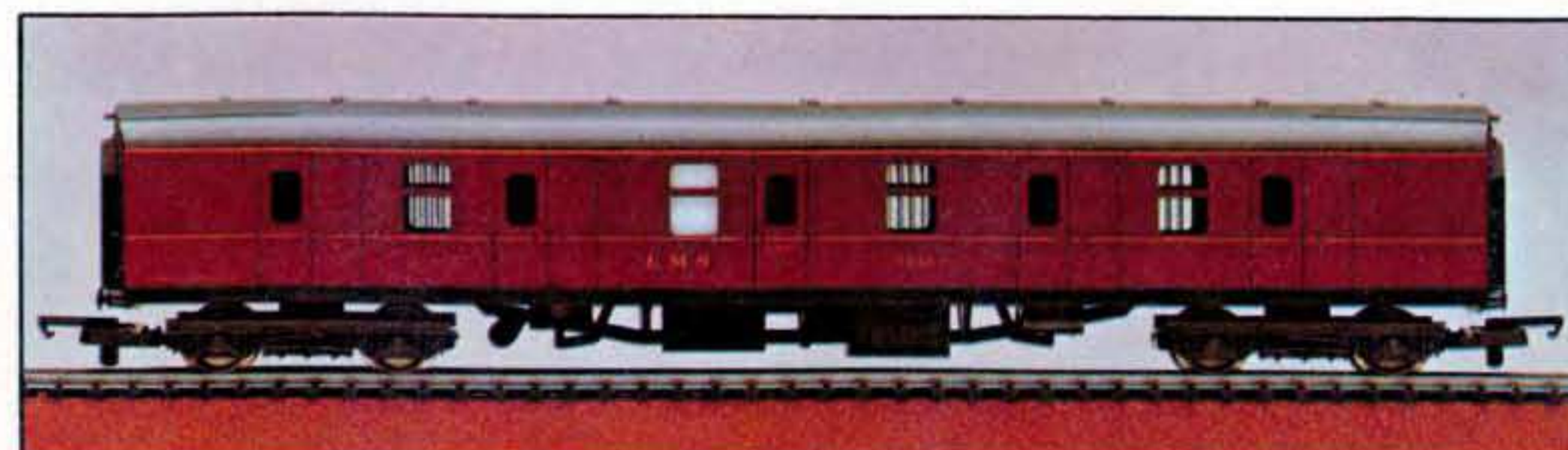
305332 LMS Mark 1 Corridor Composite Coach.



305323 LMS Mark 1 Restaurant Car.

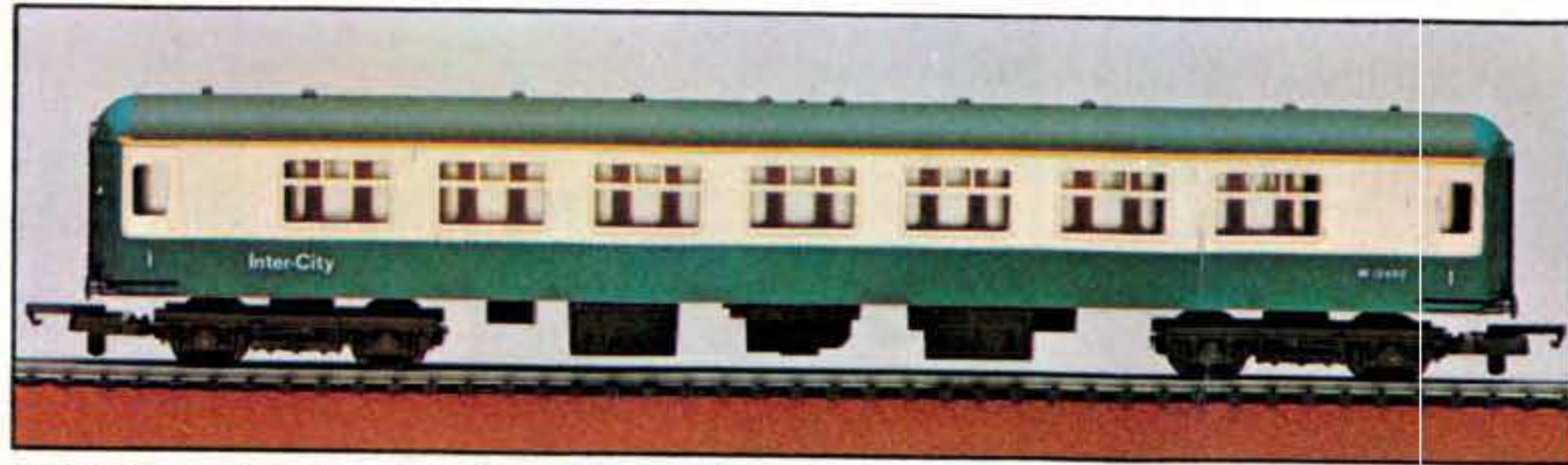


305312 LMS Mark 1 Corridor Brake Coach.



305342 LMS Standard Gangwayed Brake Van.

00 SCALE



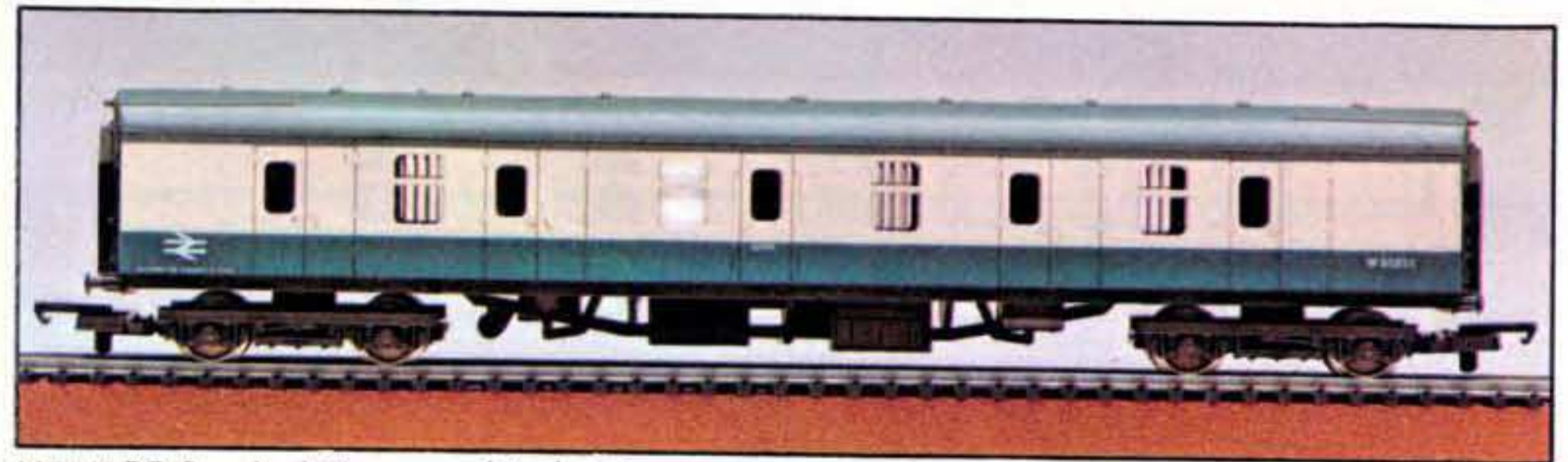
305301 BR Mark 2B Inter-City First Class Corridor Coach.



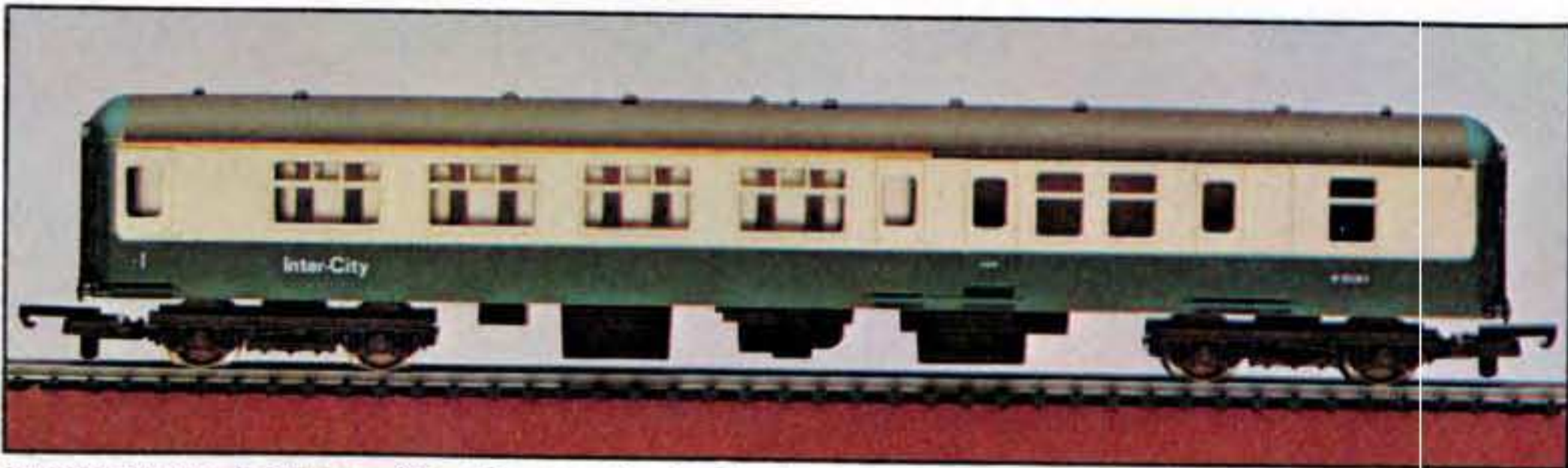
305321 BR Mark 1 Restaurant/Buffer Car.



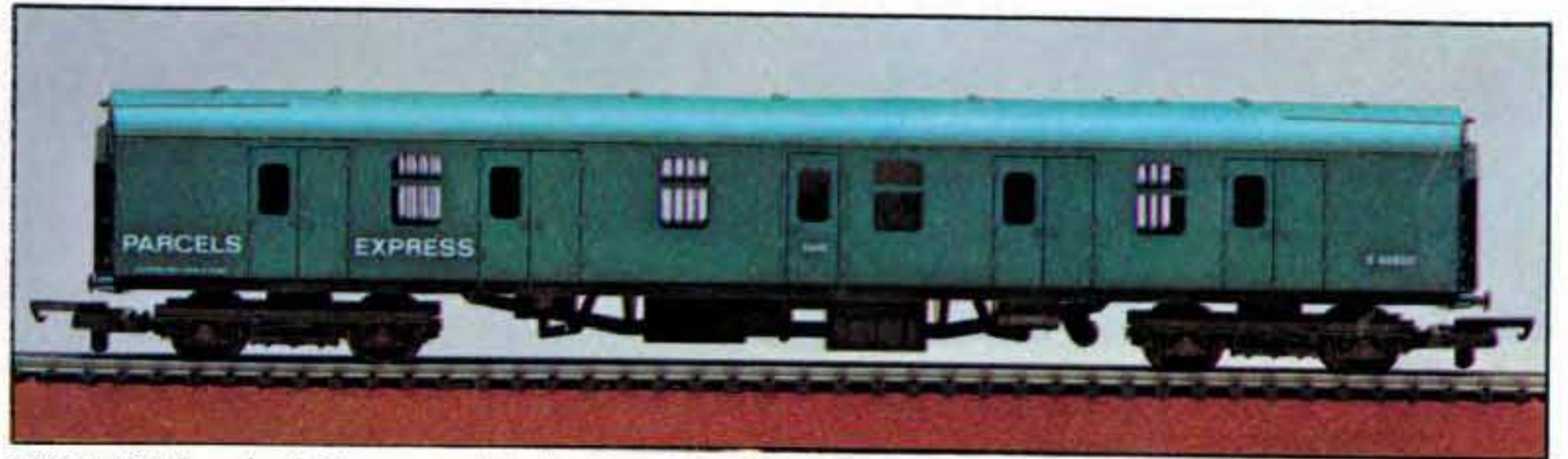
305302 BR Mark 2B Inter-City Open Coach.



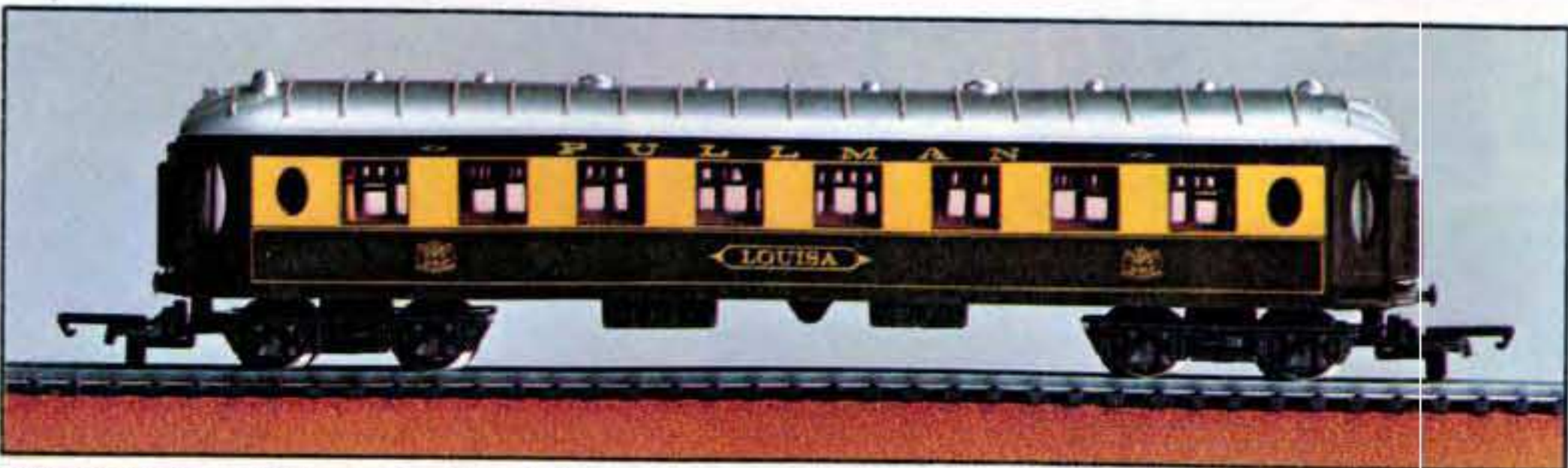
305343 BR Standard Gangwayed Brake Van.



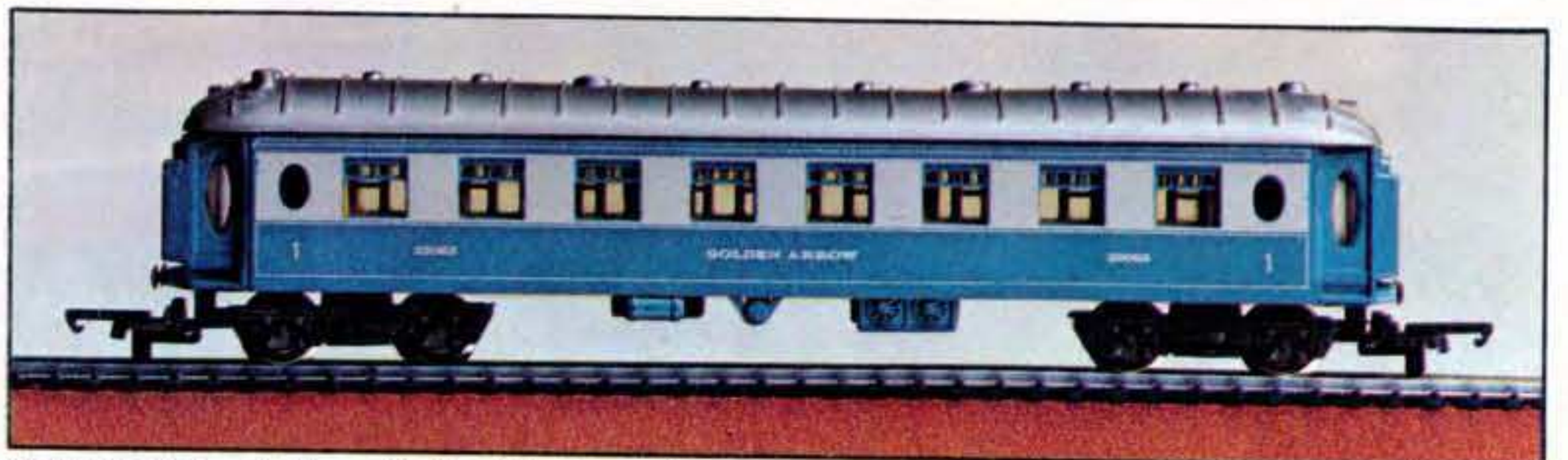
305303 BR Mark 2B Inter-City Corridor Brake Coach.



305341 BR Standard Gangwayed Brake Van 'Parcel Express'.



309199 1st Class Pullman Car 'Louisa'.



309200 1st Class Pullman Car 'Golden Arrow'.

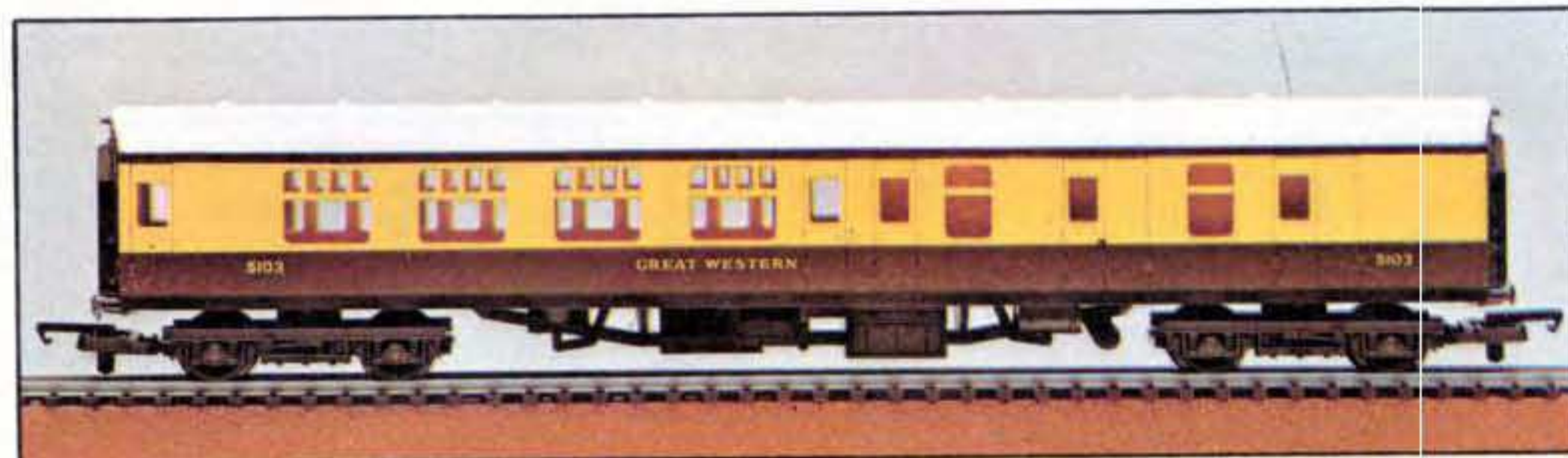
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305313 GWR Mark 1 Corridor Composite Coach.



305322 GWR Mark 1 Restaurant Car.



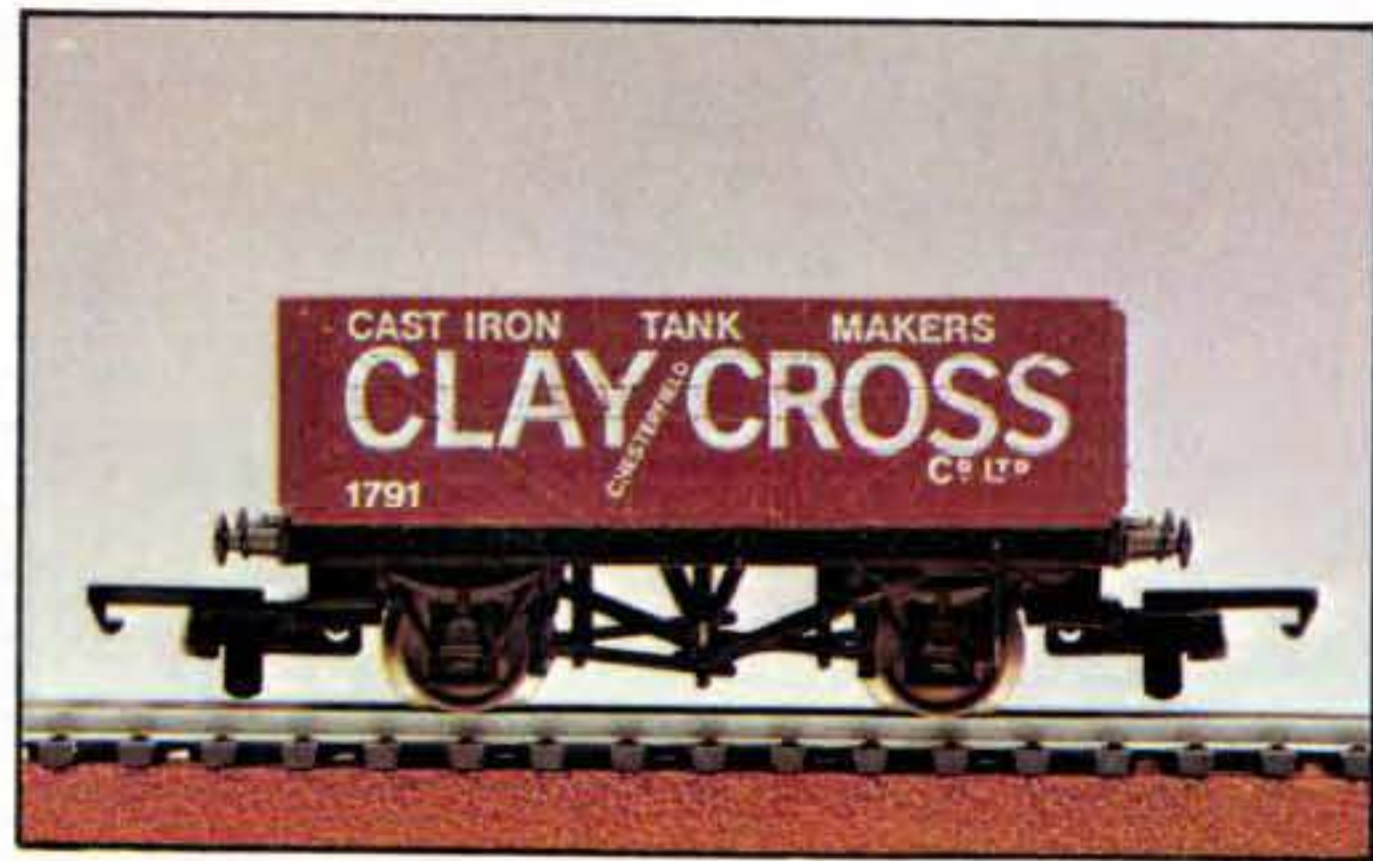
305333 GWR Mark 1 Corridor Brake Coach.



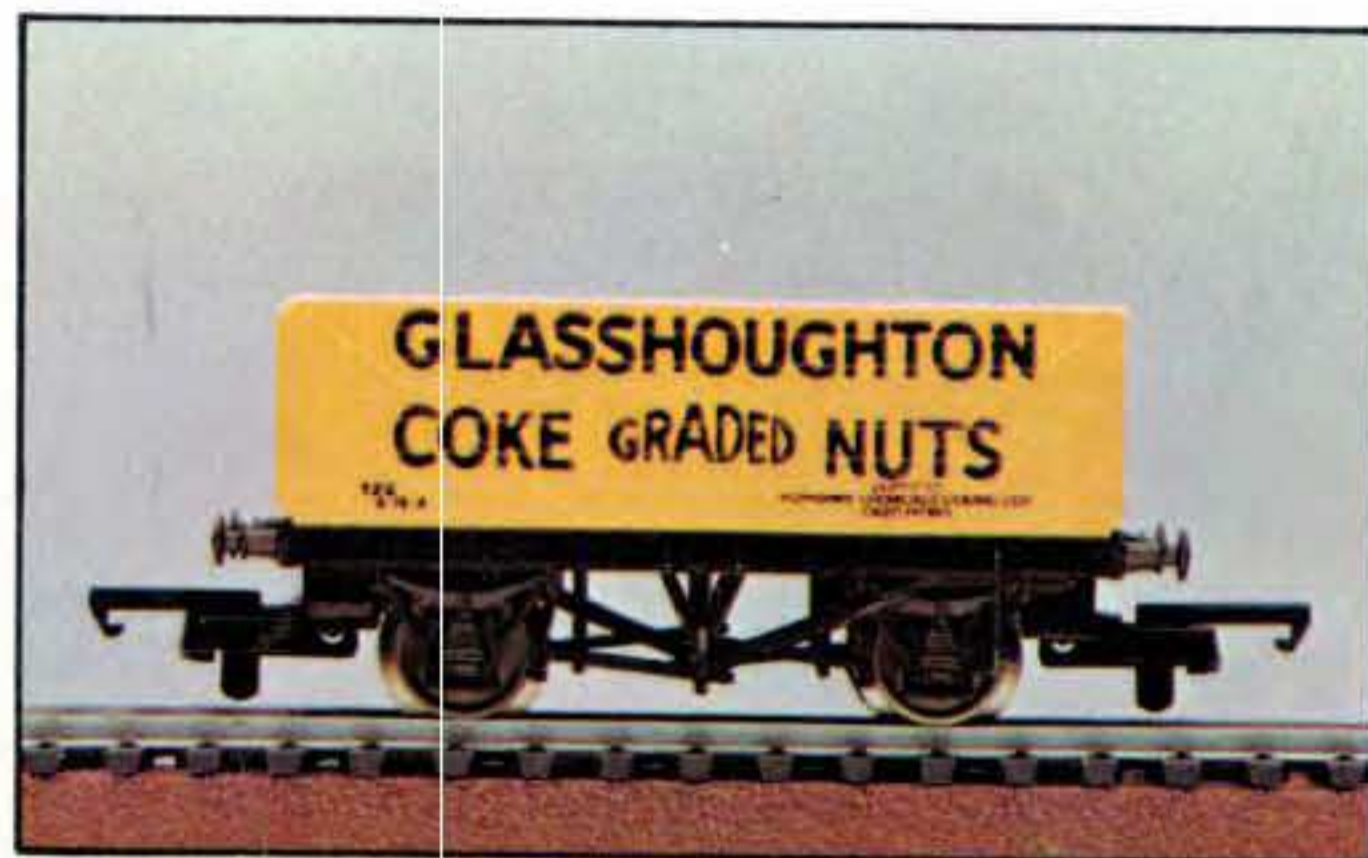
305345 GWR Standard Gangwayed Brake Van.



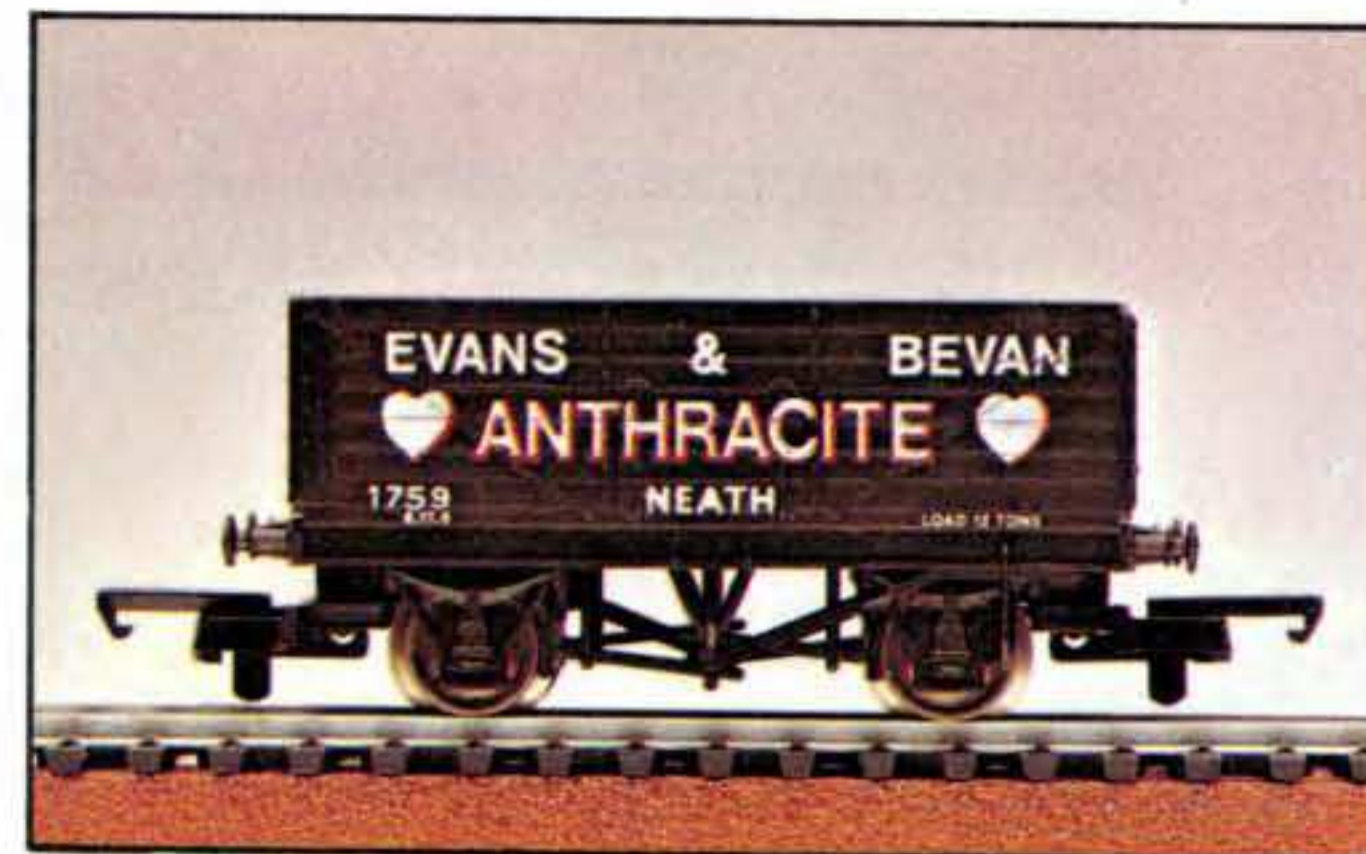
00 SCALE



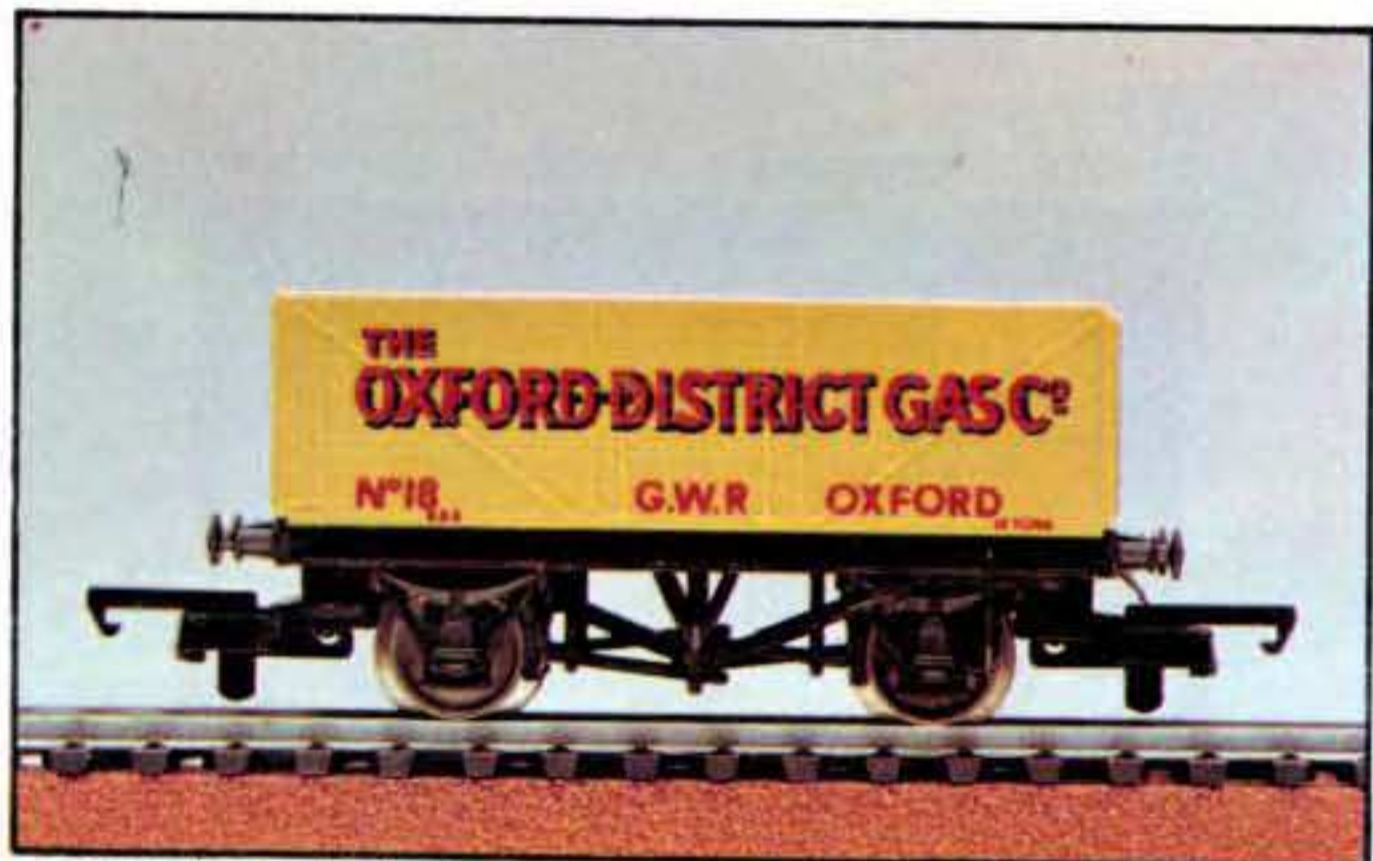
305611 'Clay Cross Co. Ltd.' 7 Plank Wagon.



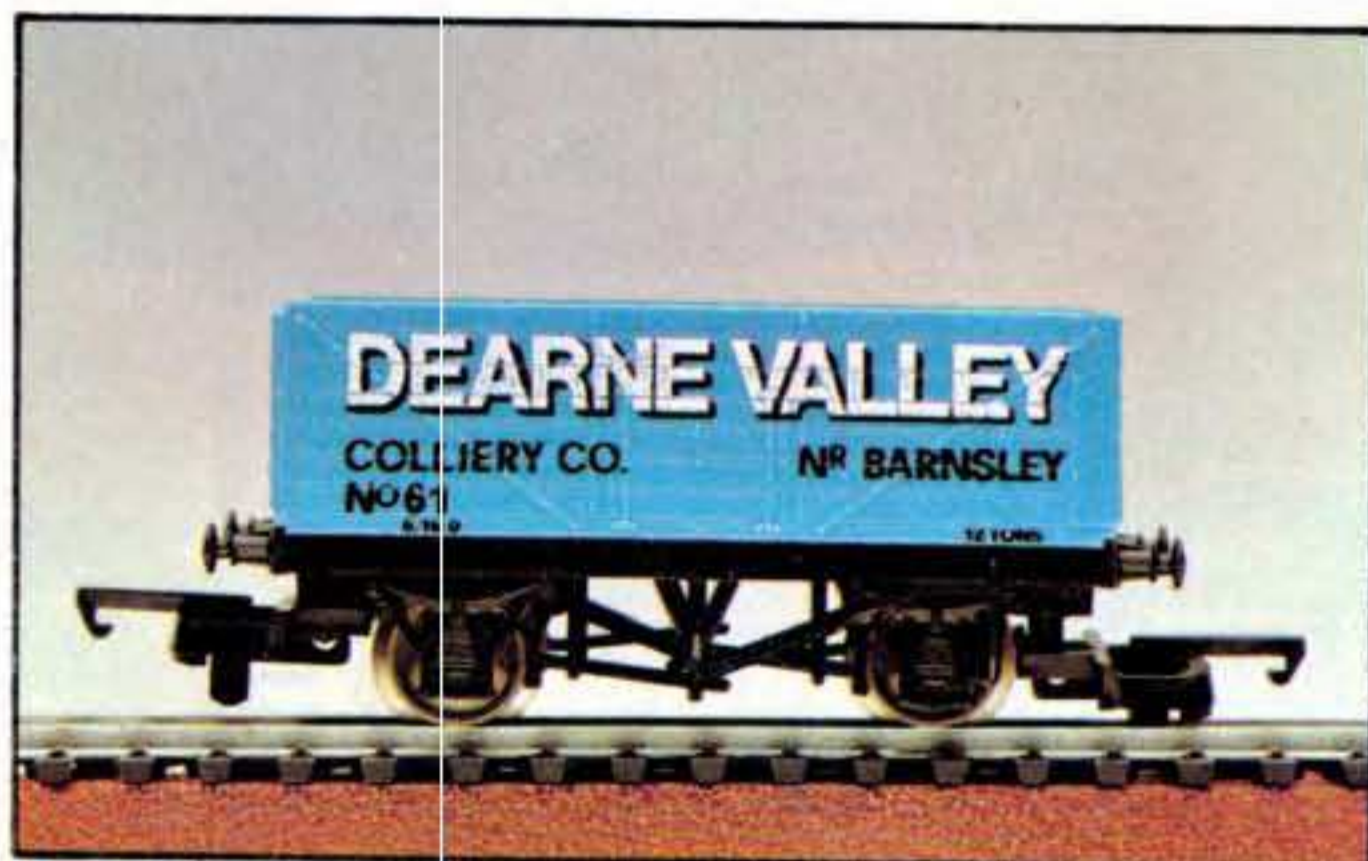
305612 'Glasshoughton Coke Nuts' 7 Plank Wagon.



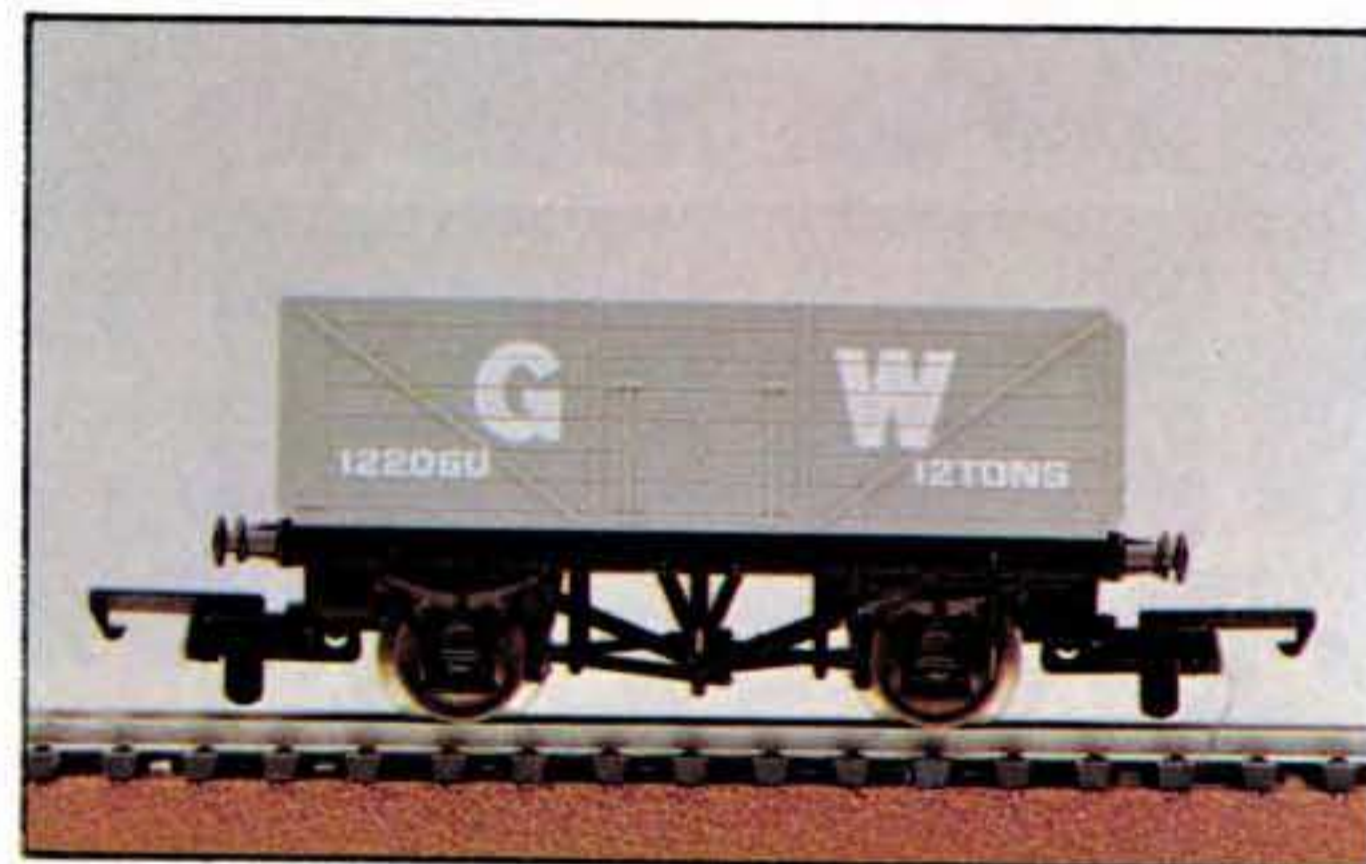
305613 'Evans & Bevan Anthracite' 7 Plank Wagon.



305614 'Oxford District Gas Co.' 7 Plank Wagon.



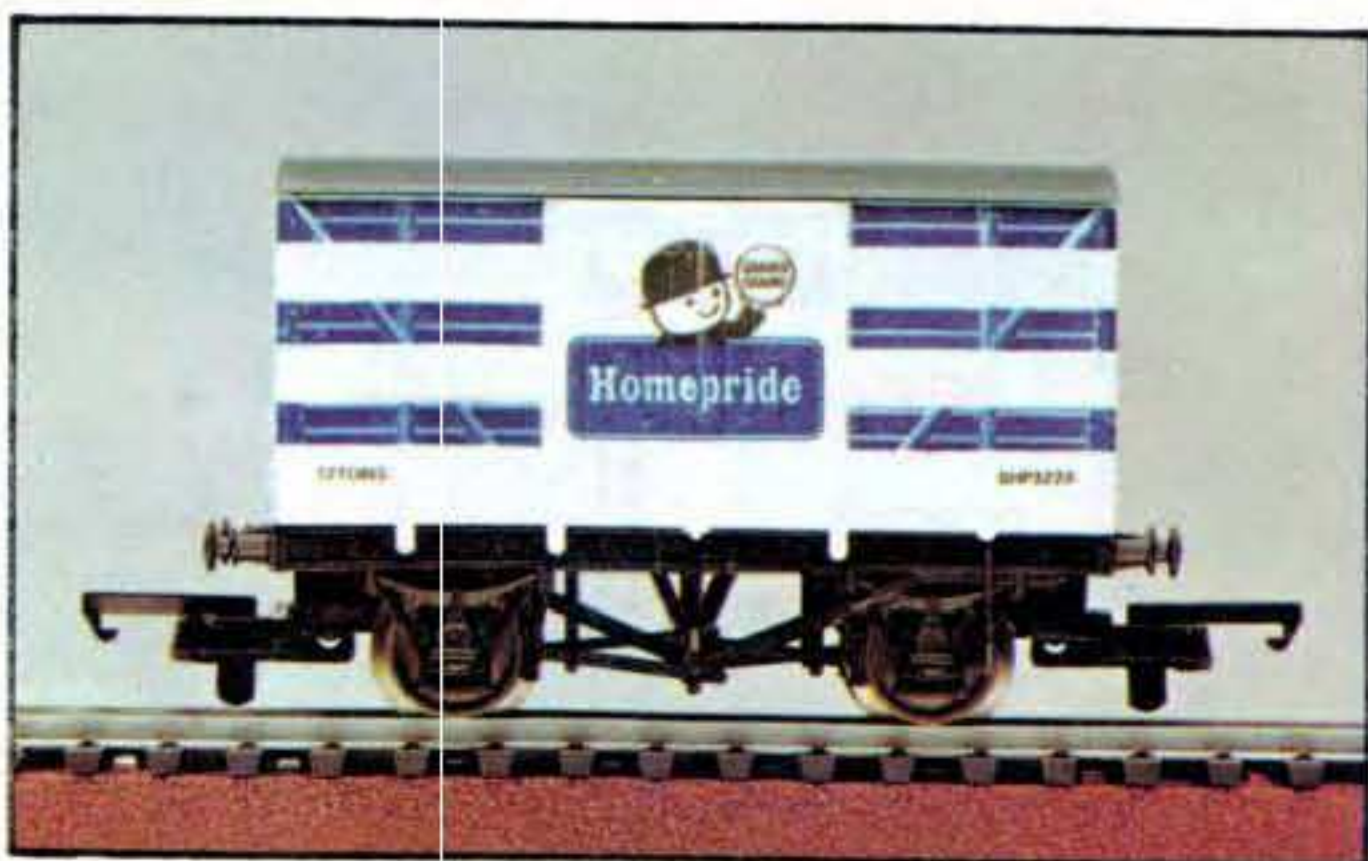
305615 'Dearne Valley Colliery' 7 Plank Wagon.



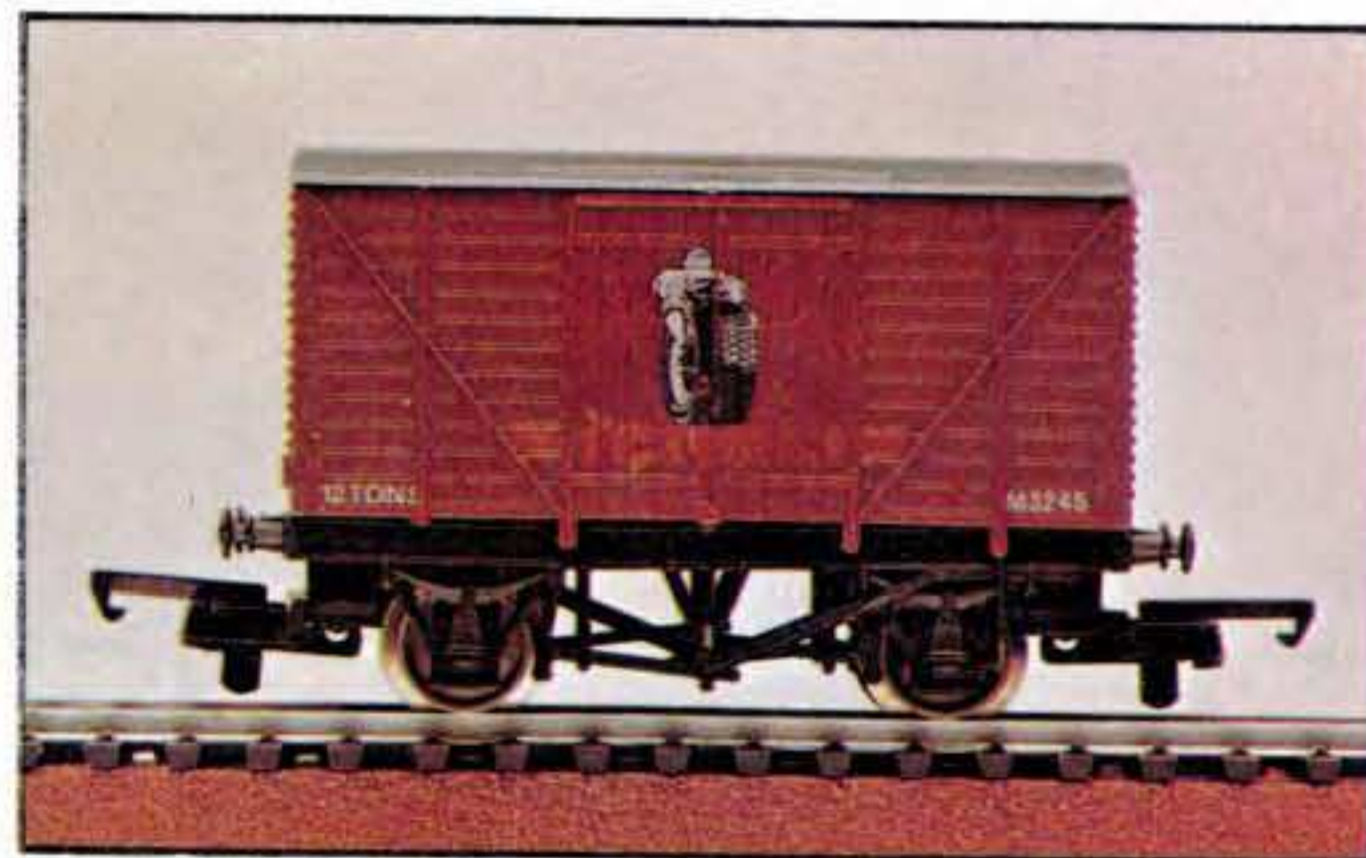
305616 GWR 7 Plank Wagon.



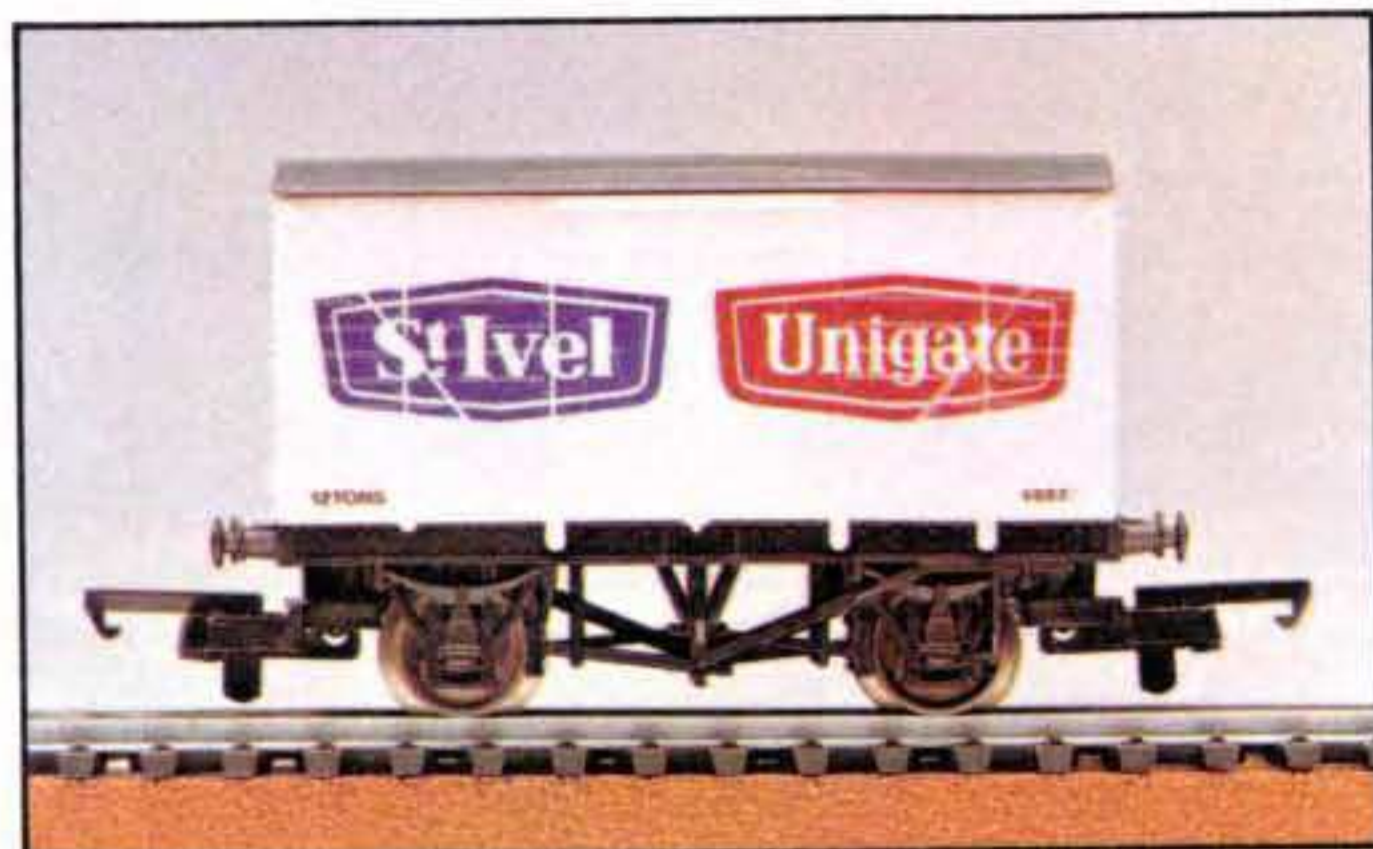
305601 'Typhoo Tea' 20 Ton Box Van.



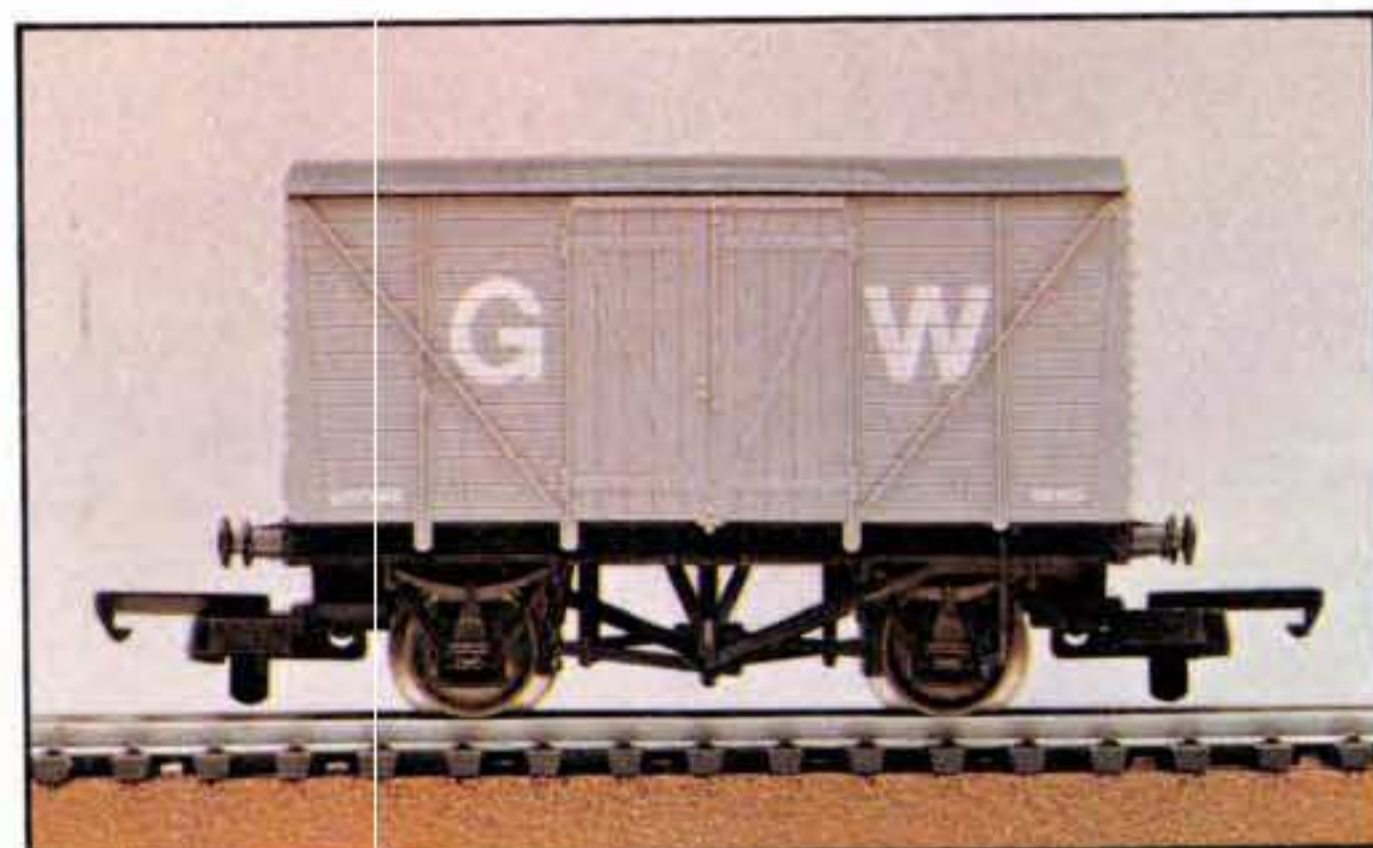
305602 'Homepride Flour' 20 Ton Box Van.



305603 'Michelin Tyres' 20 Ton Box Van.



305604 'St Ivel Dairy Products' 20 Ton Box Van.



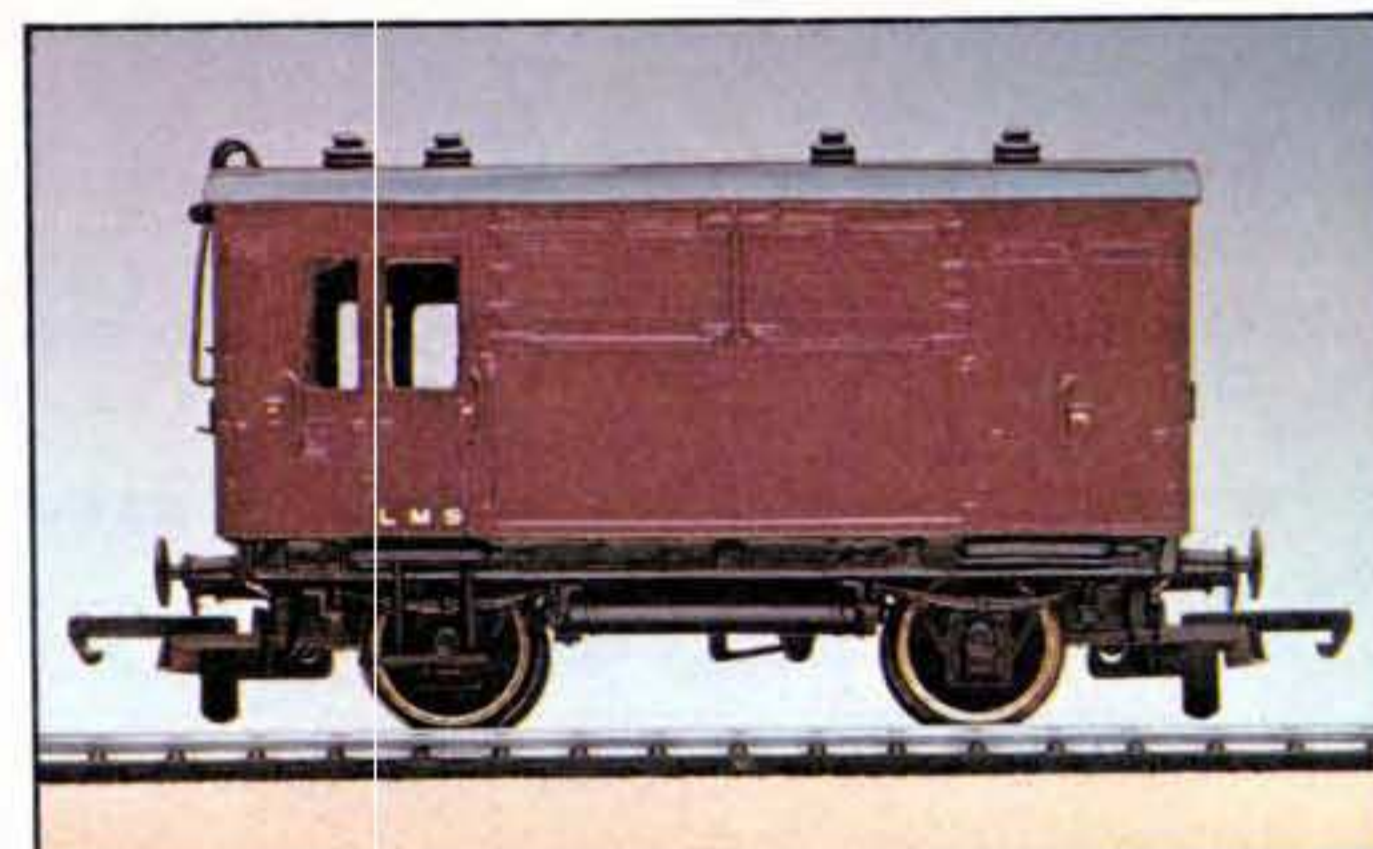
305605 GWR 20 Ton Box Van.



302805 'Blue Circle' Twin Tank Cement Wagon.



305625 GWR 2 Axle Horse Box.



305626 2 Axle Horse Box LMS Livery.



305628 2 Axle Horse Box SR Livery.



302822 'Watneys' Triple Cask Beer Wagon.

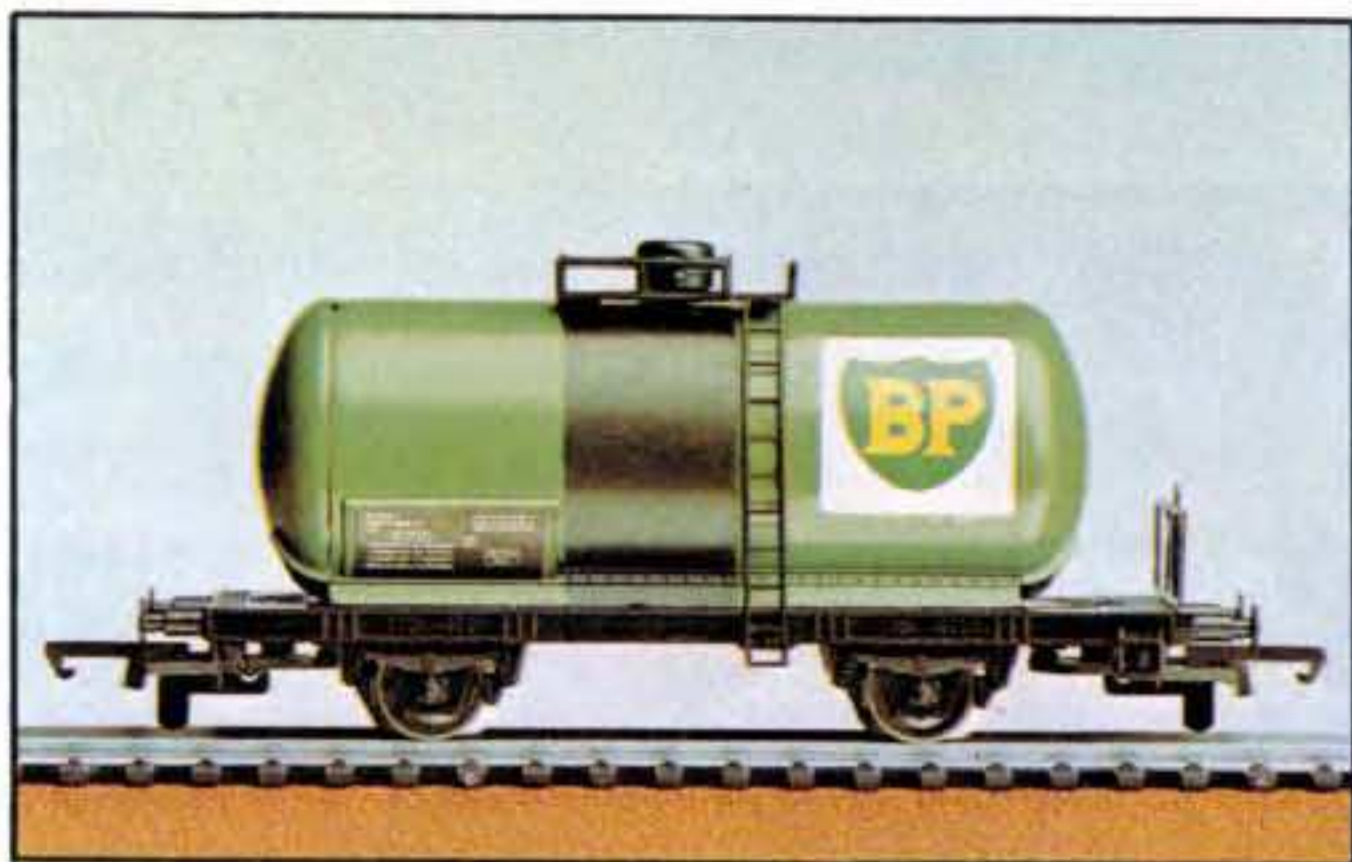


302721 'Unigate' Milk Tank Wagon.



302720 'ICI' Chemical Tank Wagon.

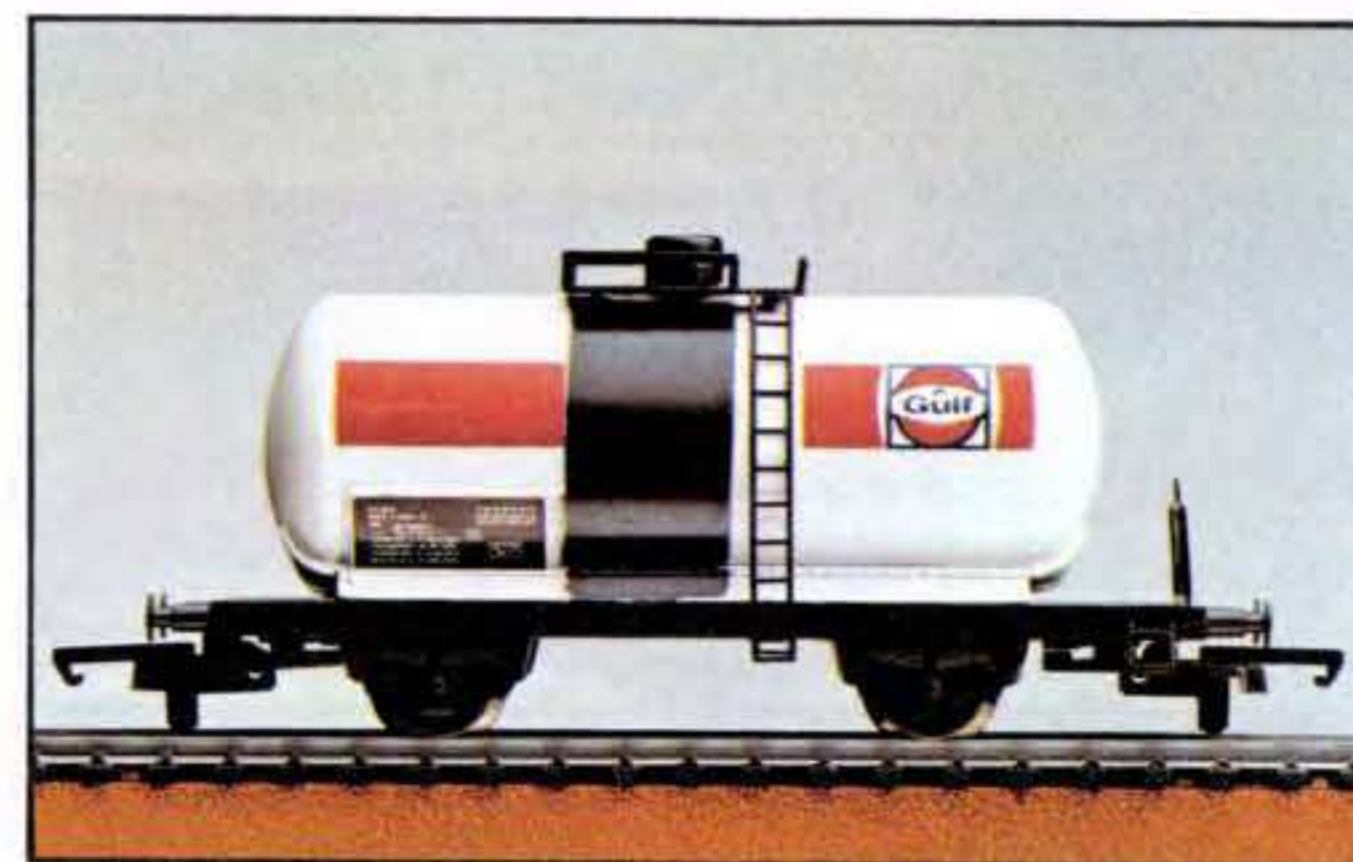
00 SCALE



302715 'BP' Tank Wagon.



302713 'Shell' Tank Wagon.



302718 'Gulf' Tank Wagon.



302904 'Shell Gas' Bogie Tank Wagon.



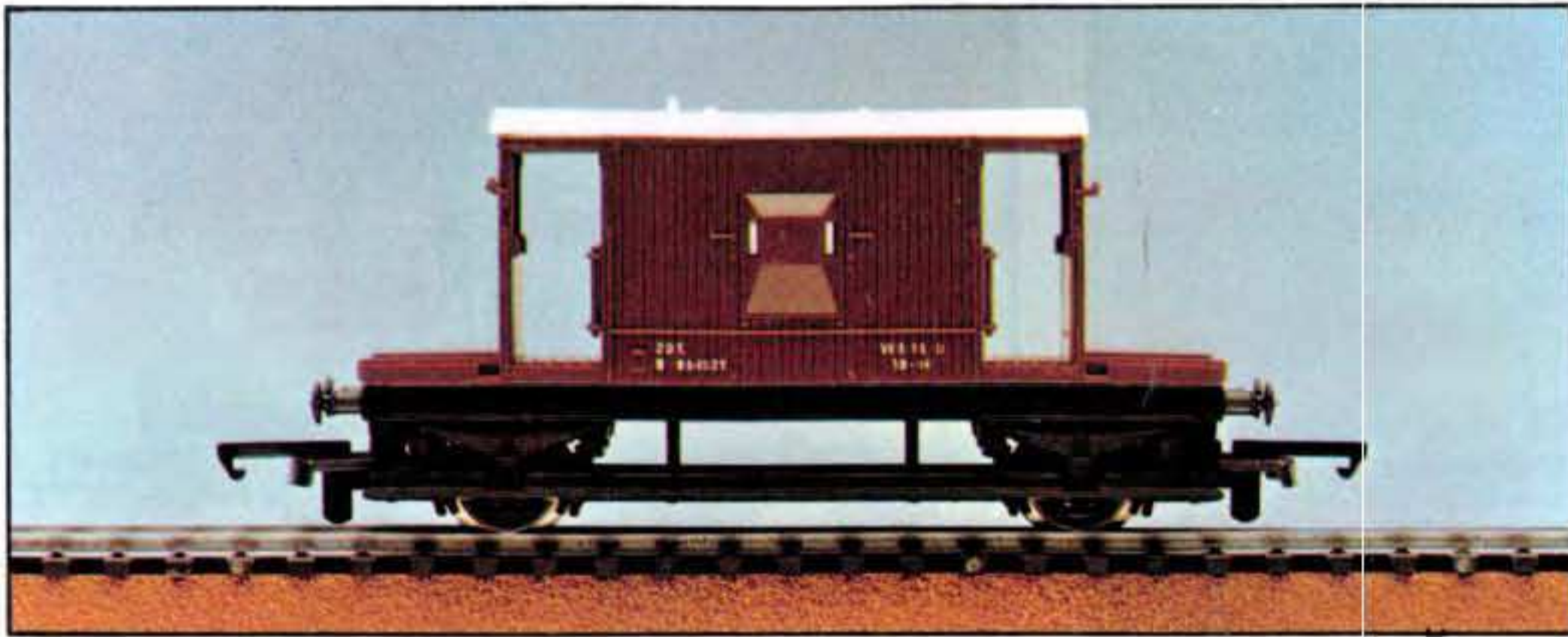
302911 'Milk' Bogie Tank Wagon.



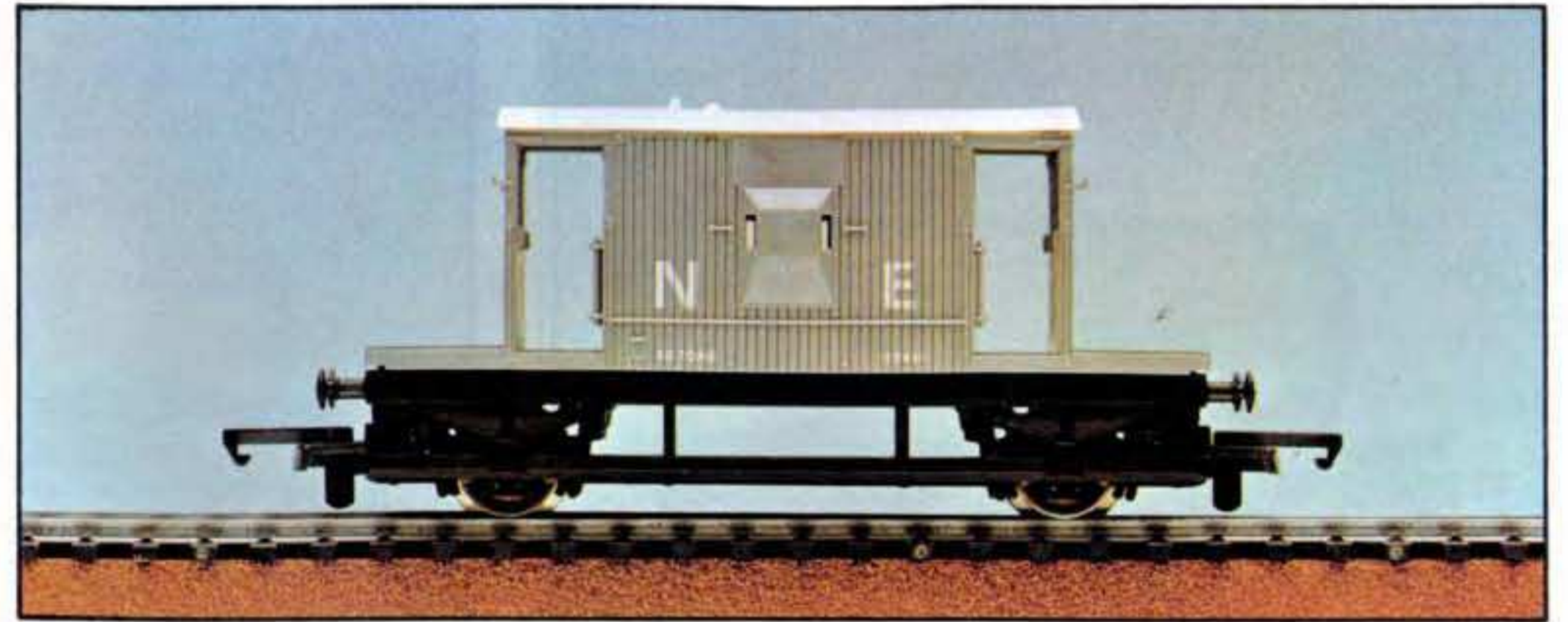
302913 'Amoco' Bogie Tank Wagon.



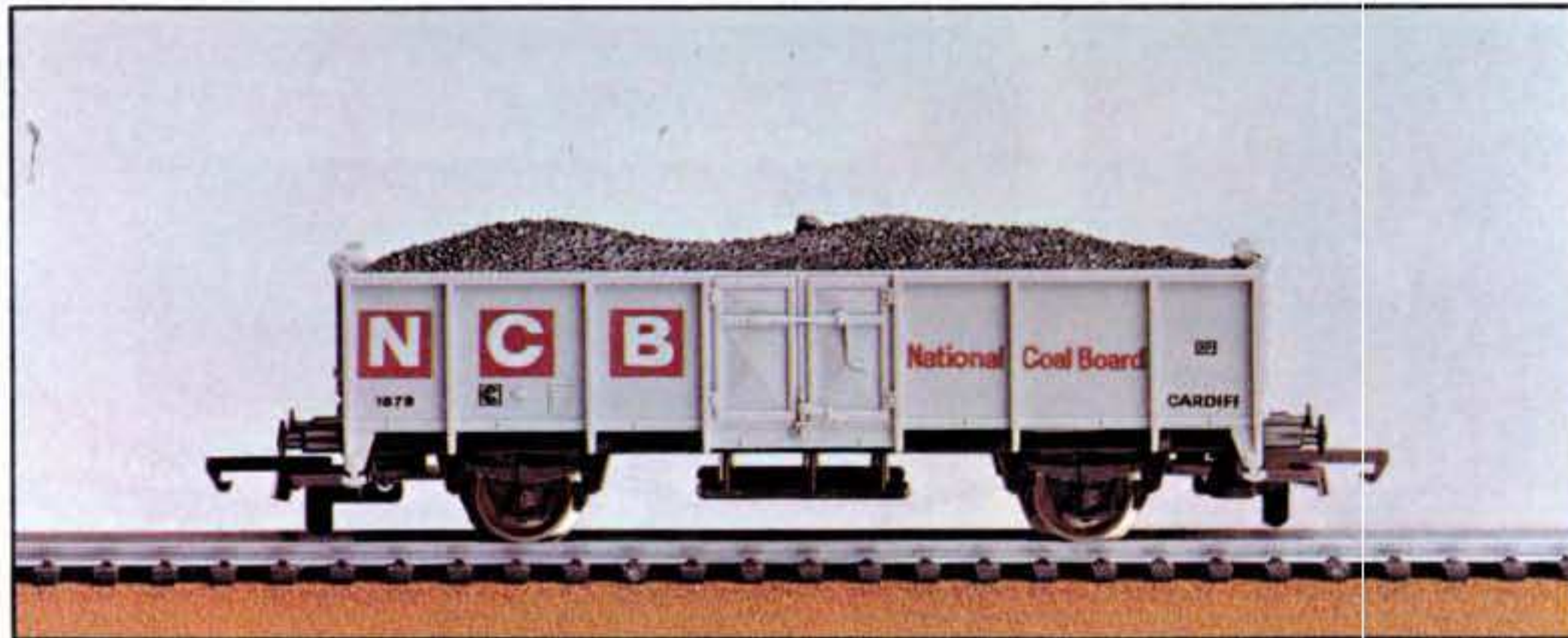
302916 'Texaco' Bogie Tank Wagon.



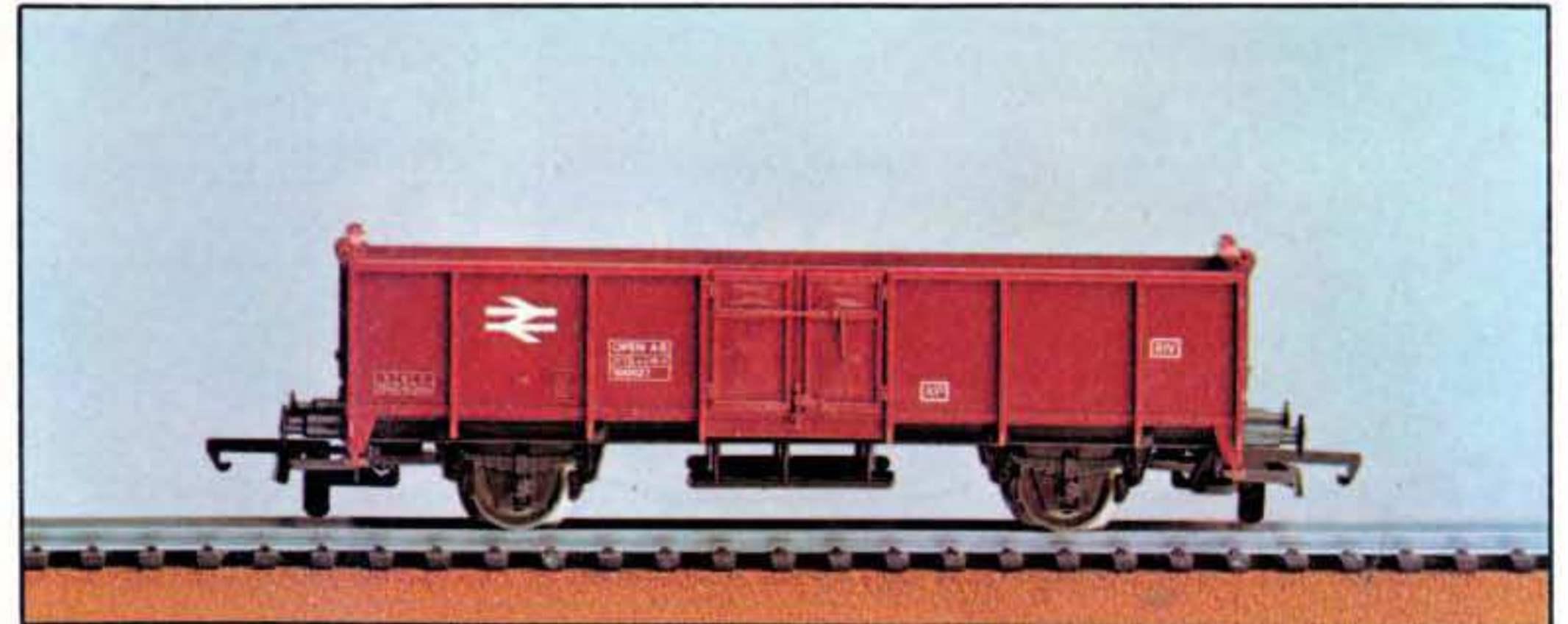
305620 BR 20 Ton Brake Van.



305621 LNER 20 Ton Brake Van.



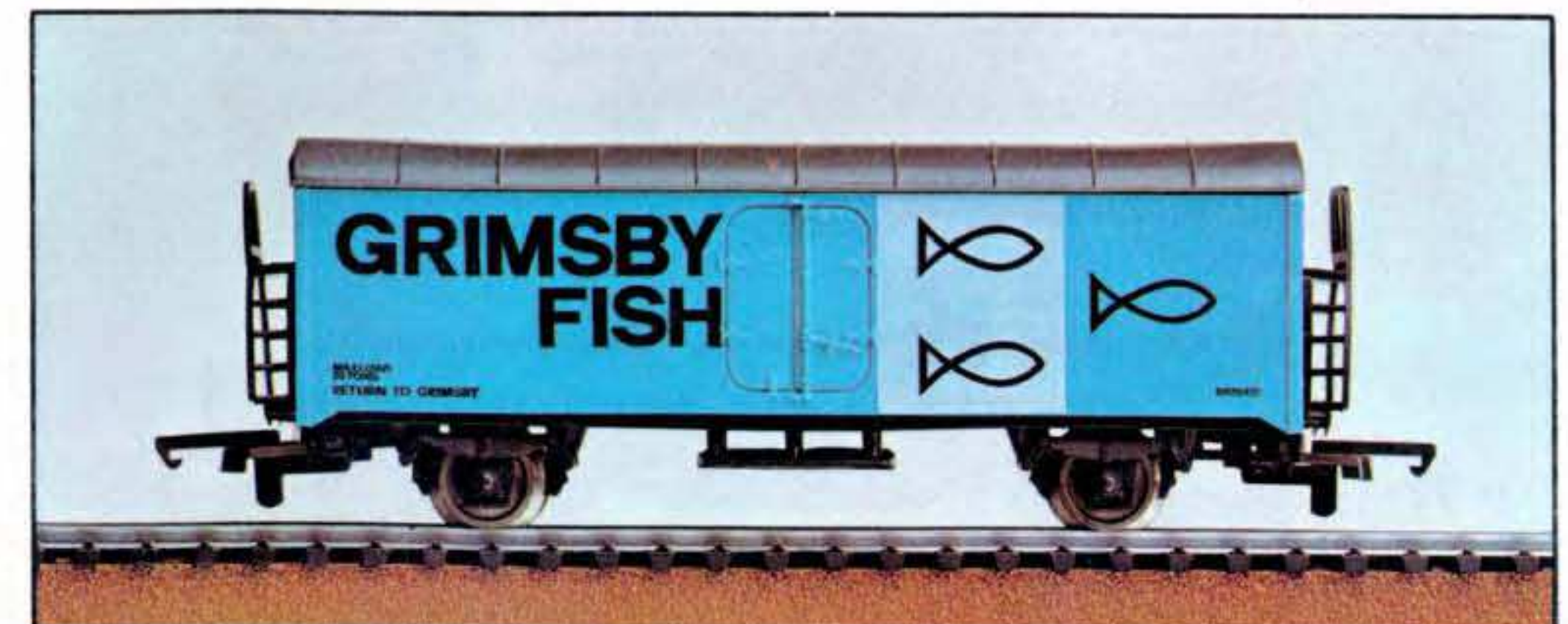
303173 'National Coal Board' Mineral Wagon.



303175 BR Long Wheelbase Mineral Wagon.



303118 'Schweppes' Refrigerator Van.



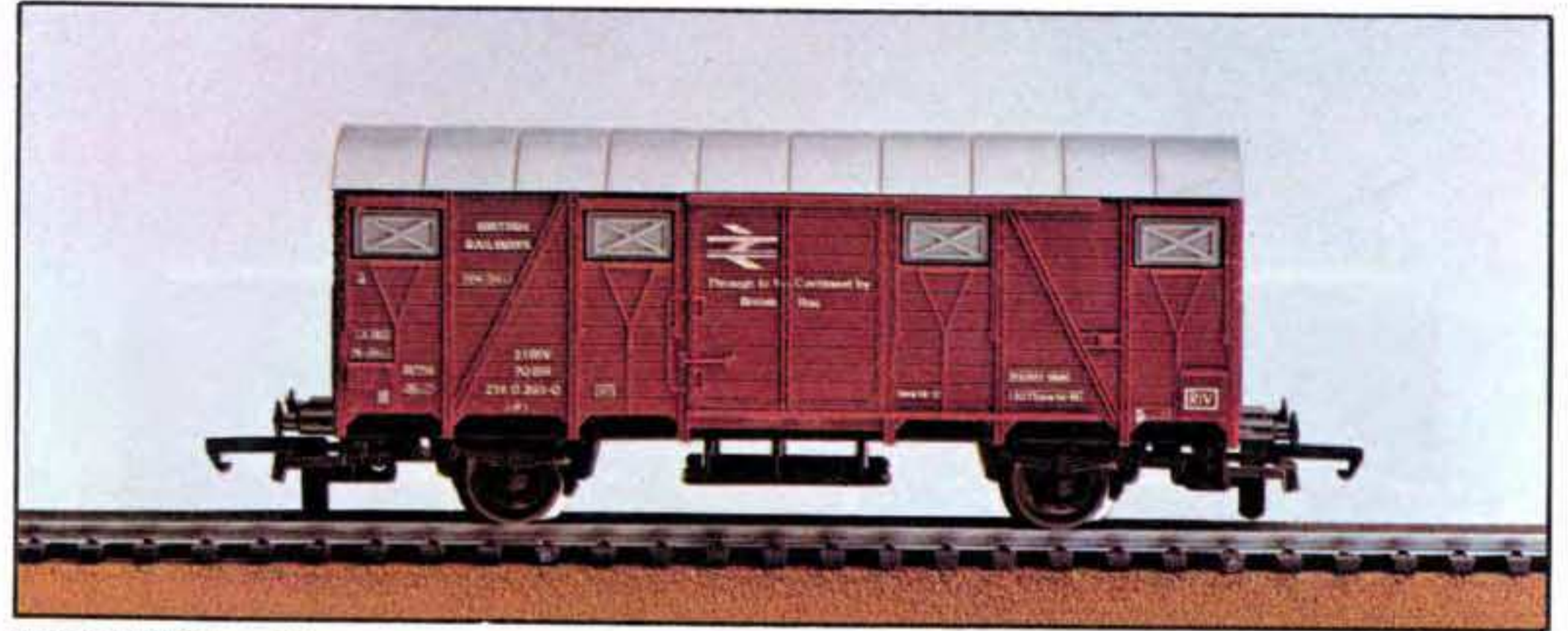
303114 'Grimsby Fish' Refrigerator Van.



00 SCALE



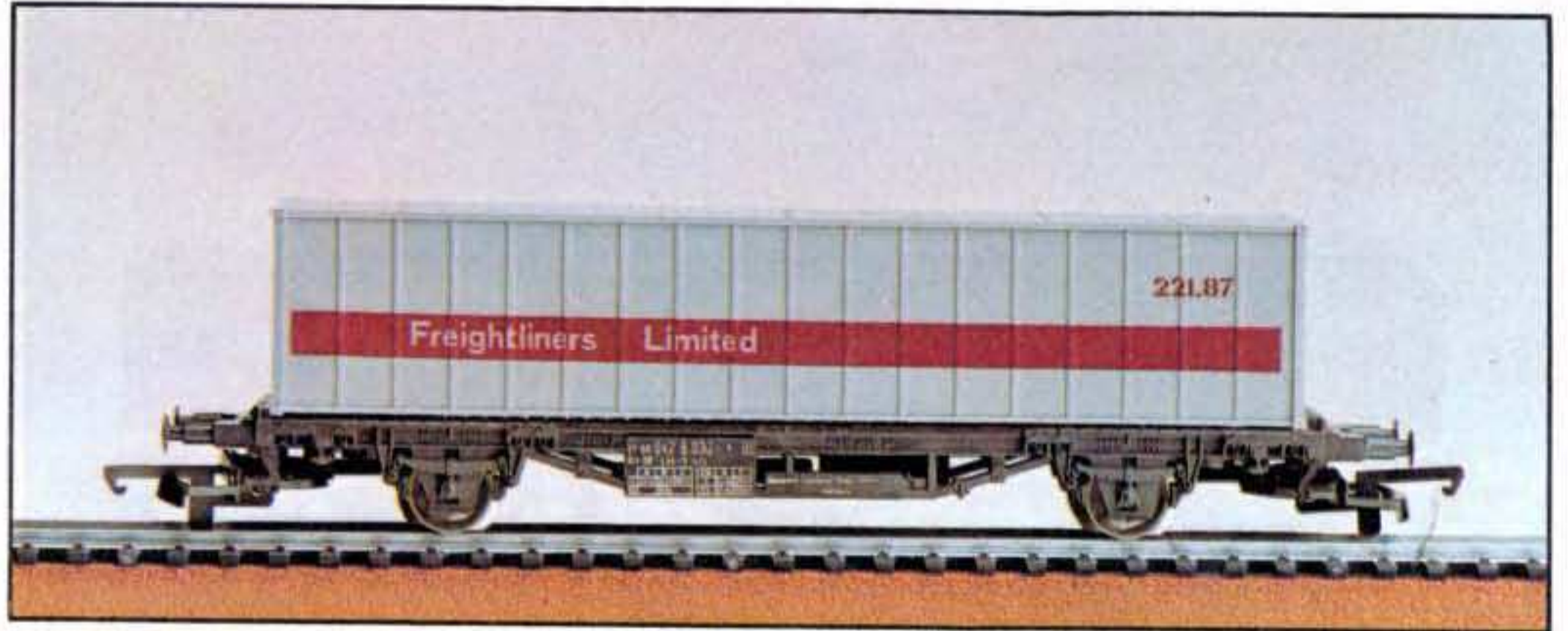
303155 'East Anglian Meat' Closed Van.



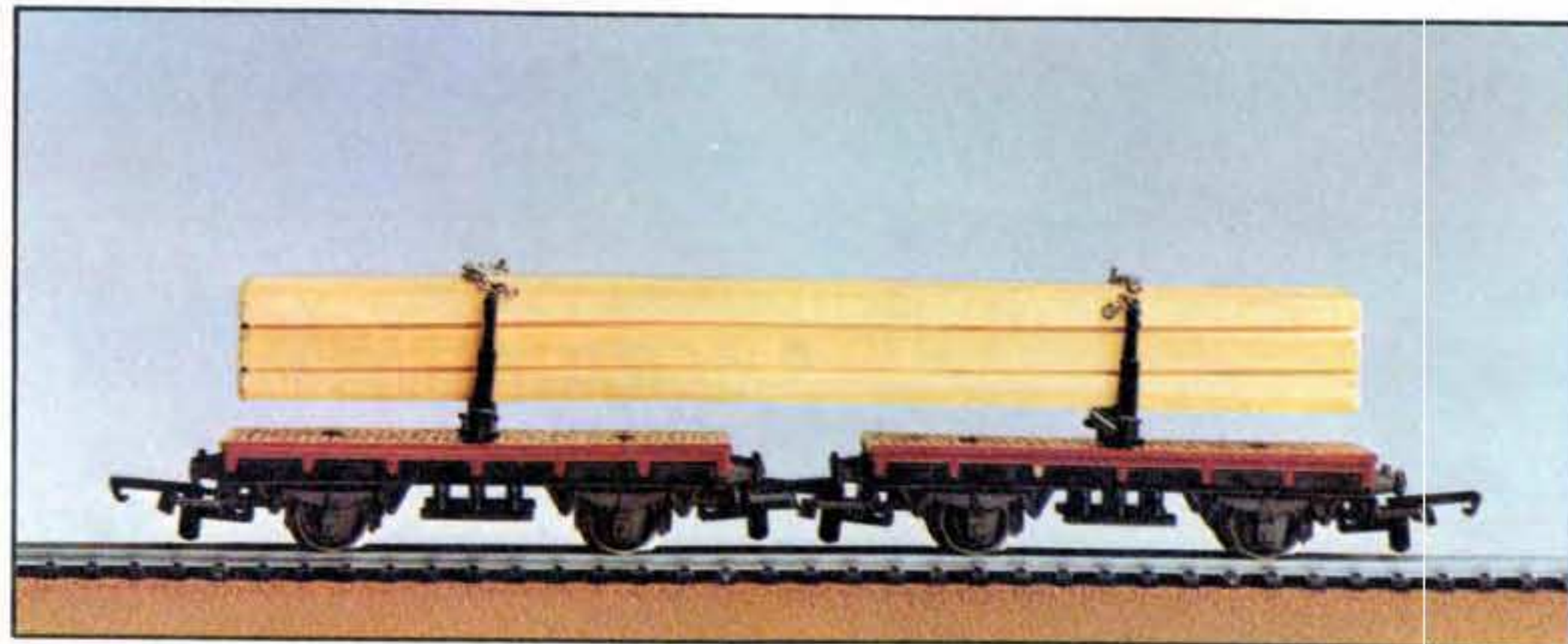
303165 BR Closed Van.  
303162 BR Closed Van with Lima Convertor Coupling.



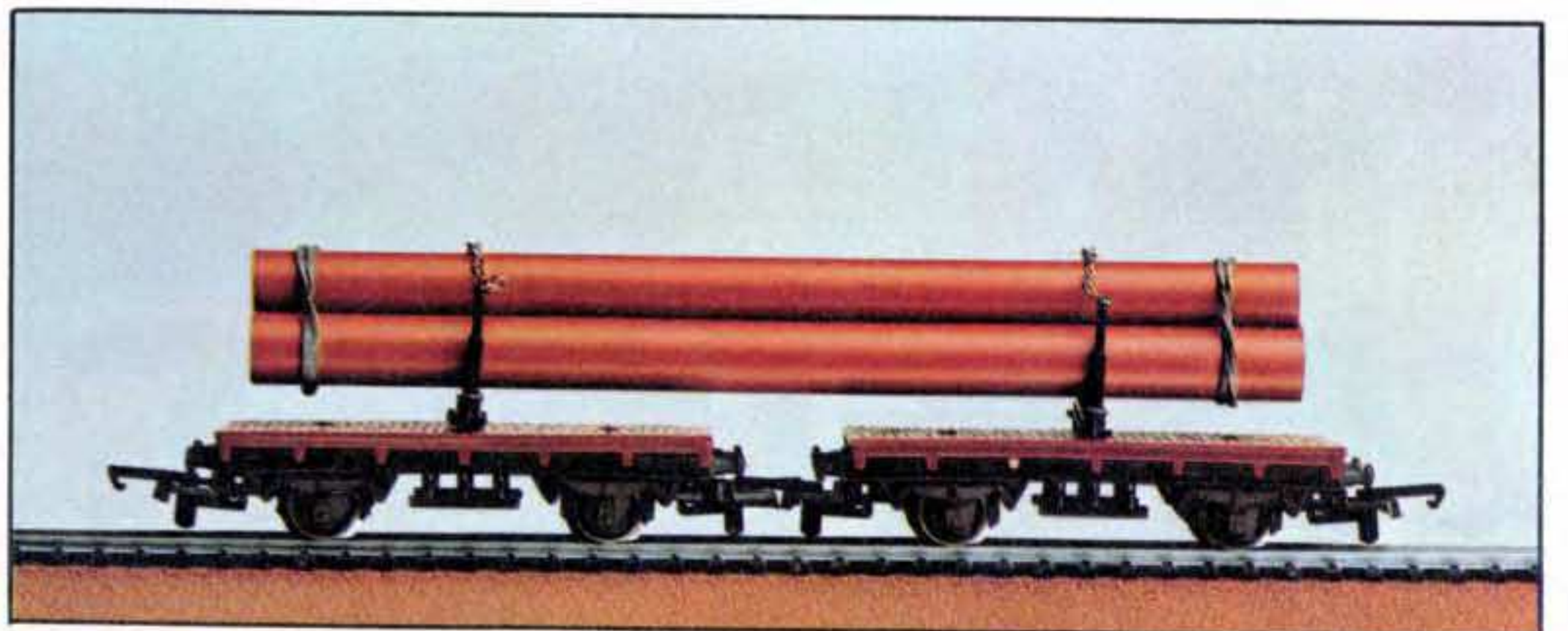
302852 'Scotch Beef' Container Wagon.



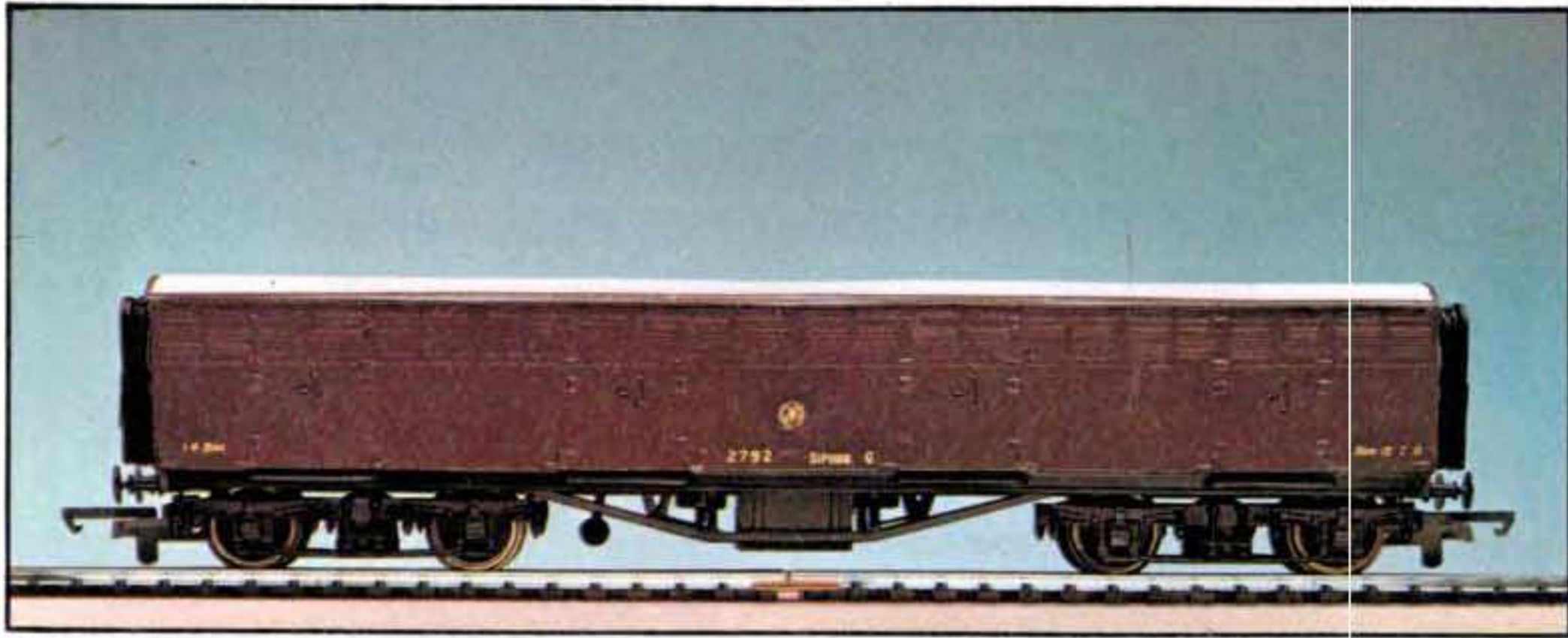
302871 'Freightliners Ltd' Container Wagon.



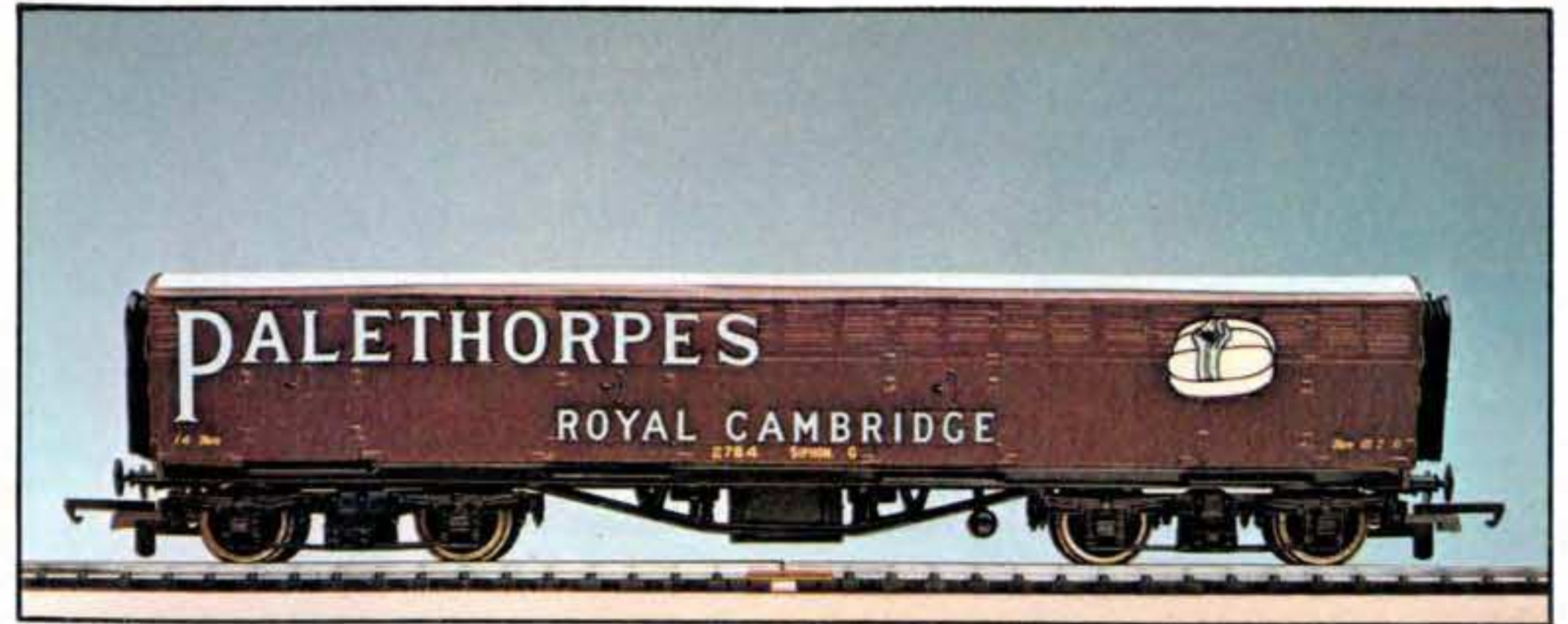
309038 Twin Trucks with Planks.



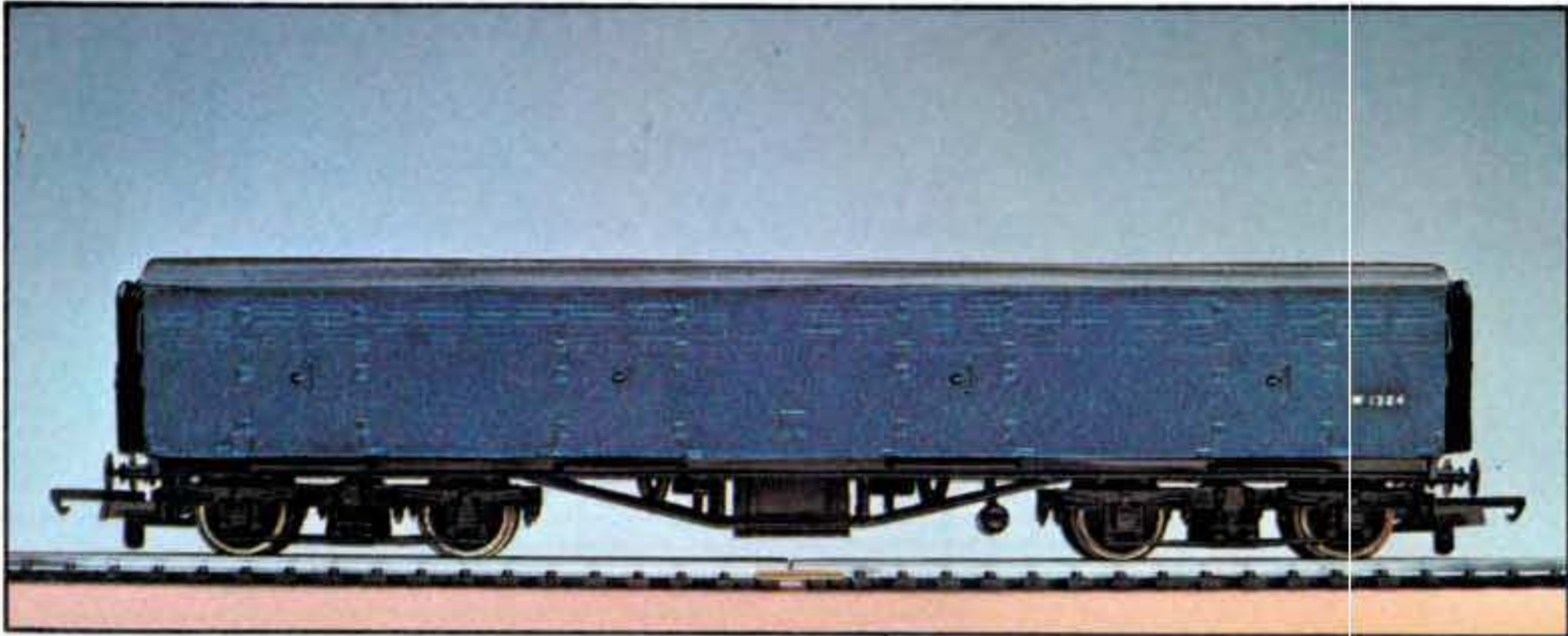
309039 Twin Trucks with Pipes.



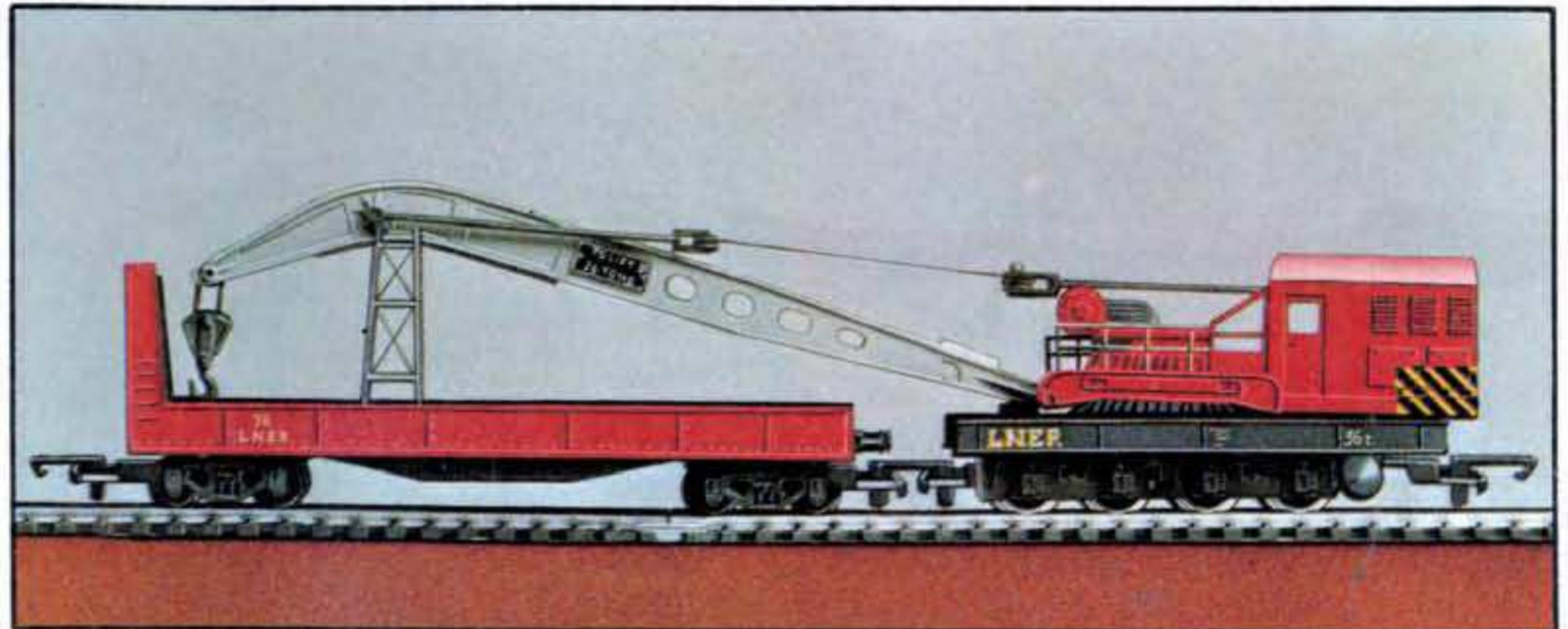
305351 GWR Bogie Parcel Van 'Syphon G'



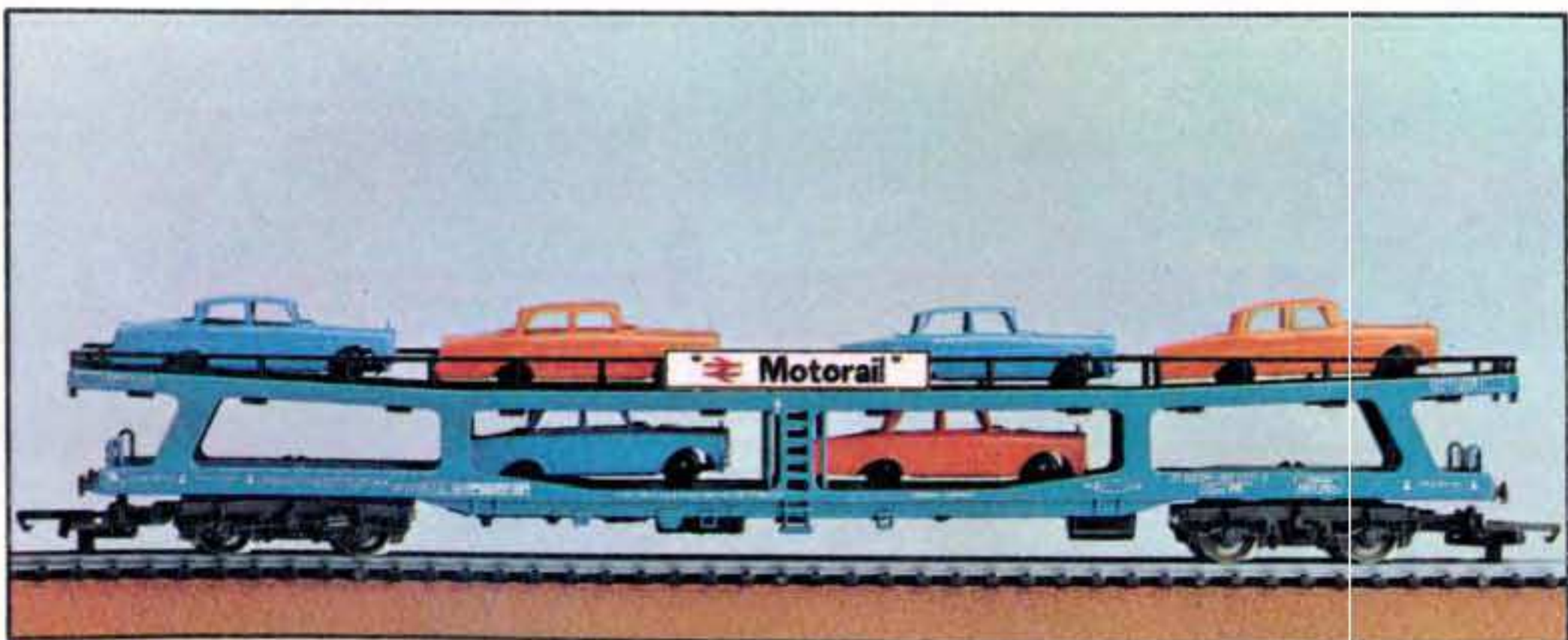
305352 GWR Bogie Parcel Van 'Syphon G' Palethorpes Sausages.



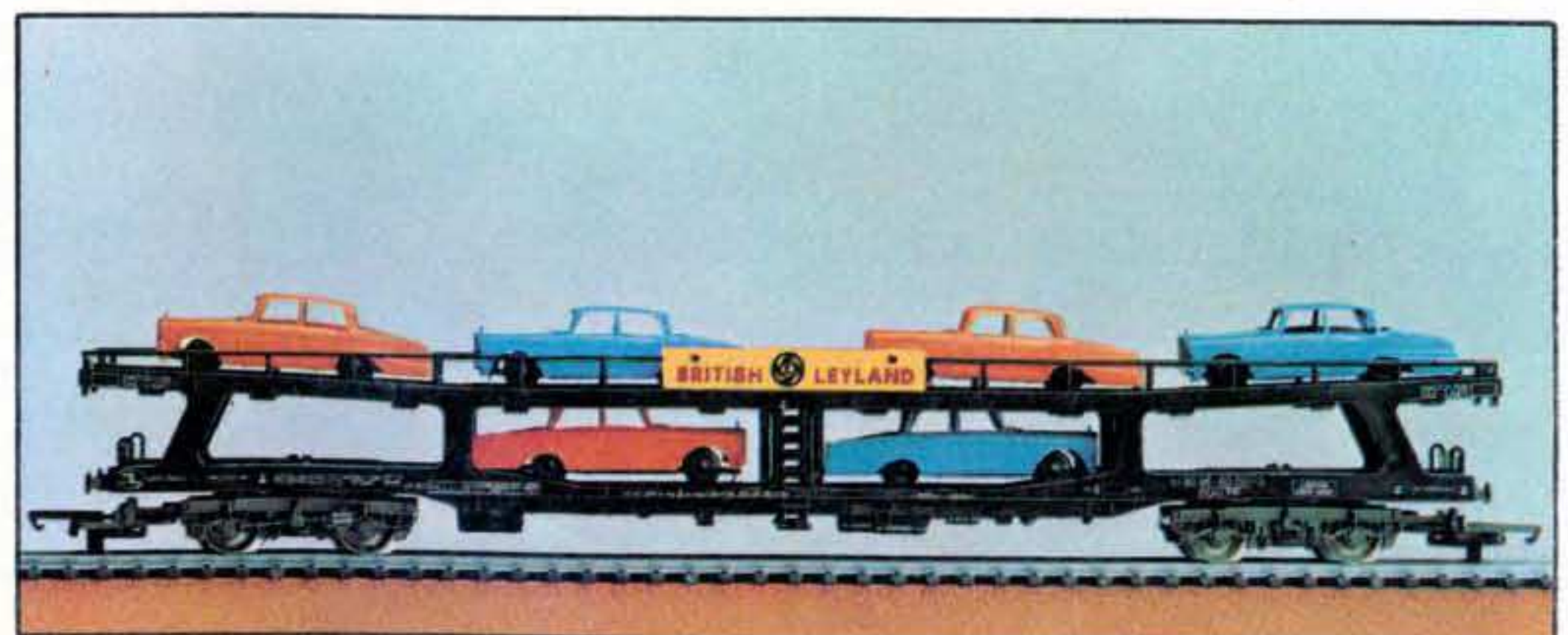
305353 GWR Bogie Parcel Van 'Syphon G' BR Livery.



309059 35 Ton Breakdown Crane and Flat Car. LNER Livery.

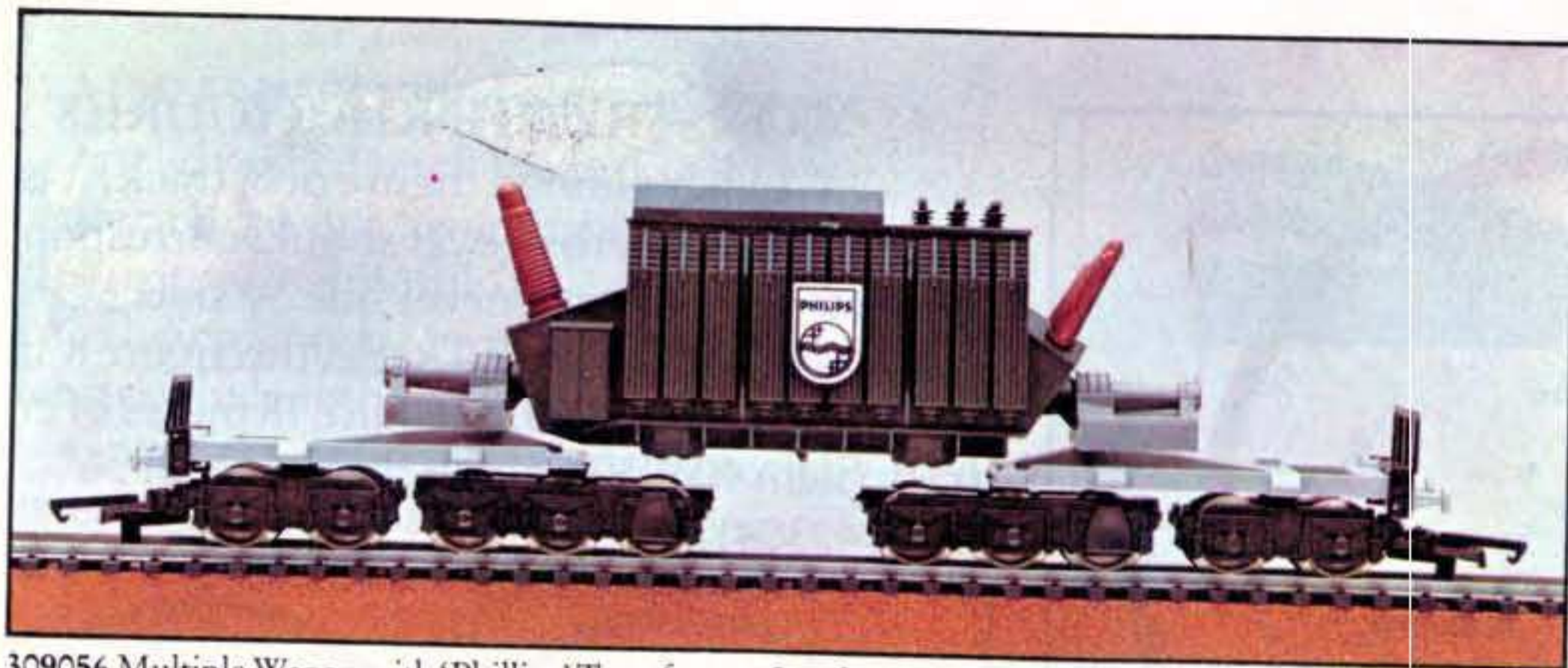


309053 'Motorail' Car Carrier.

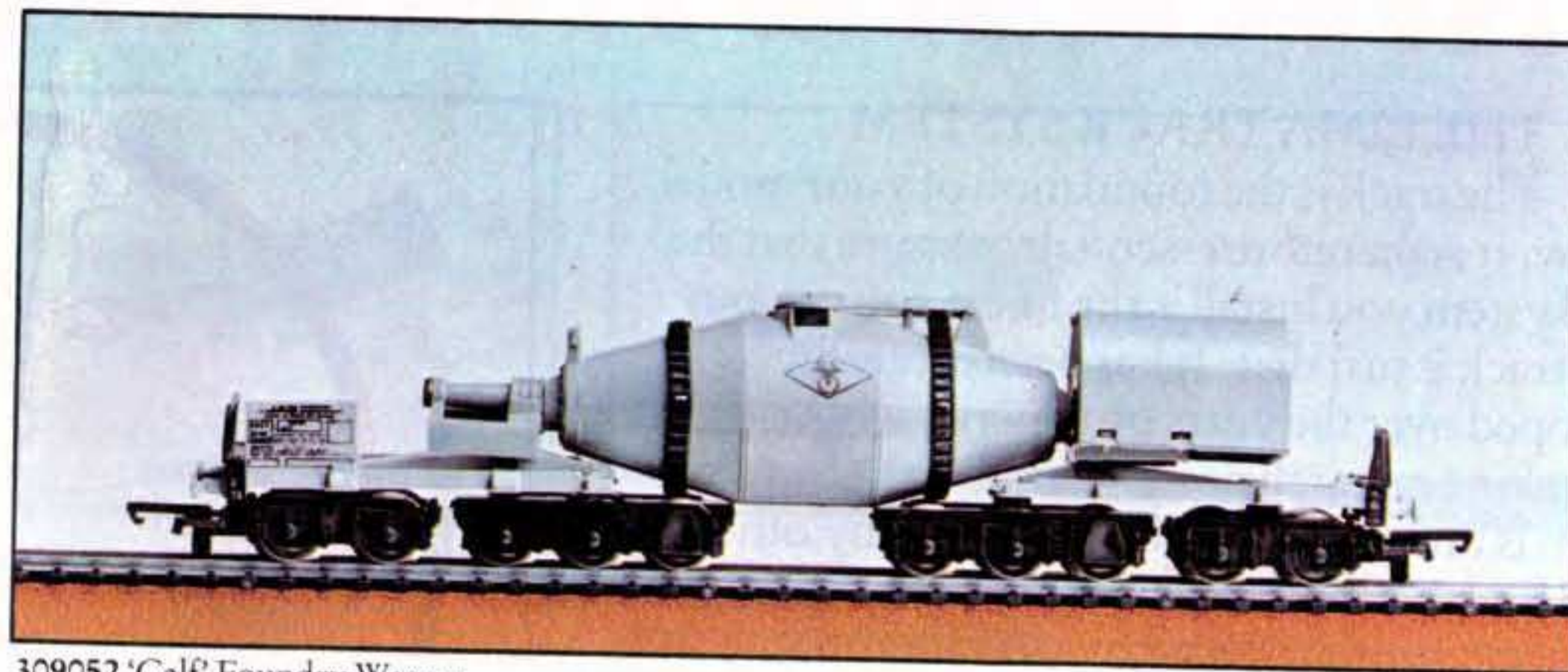


309057 'British Leyland' Car Carrier.

00 SCALE



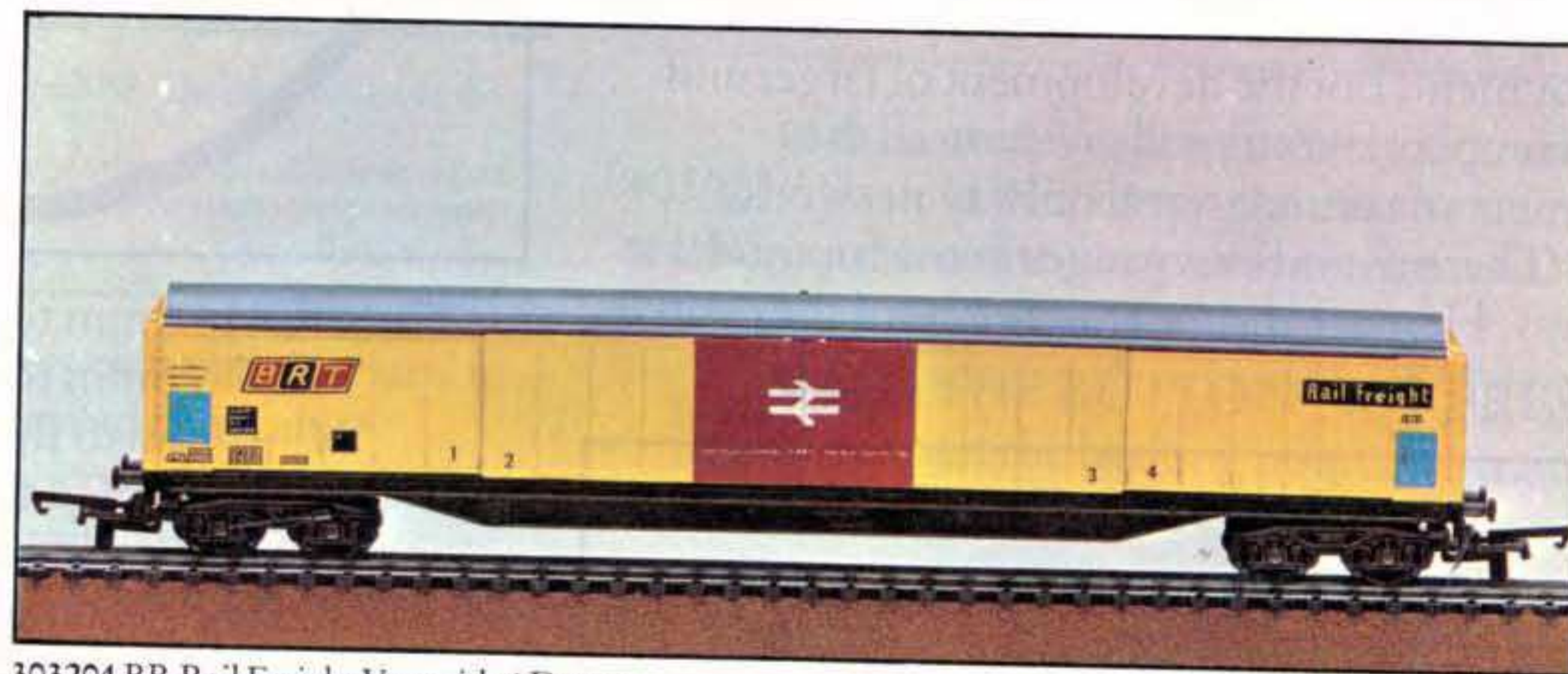
309056 Multiple Wagon with 'Phillips' Transformer Load.



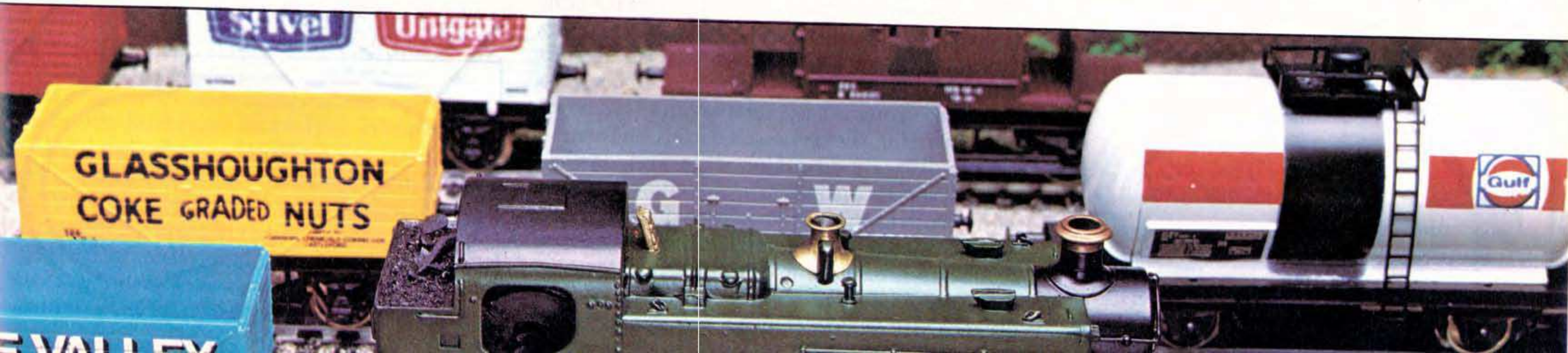
309052 'Calf' Foundry Wagon.



303199 Supply Wagon. 'BP Offshore Services.'



303204 BR Rail Freight Van with 4 Doors.



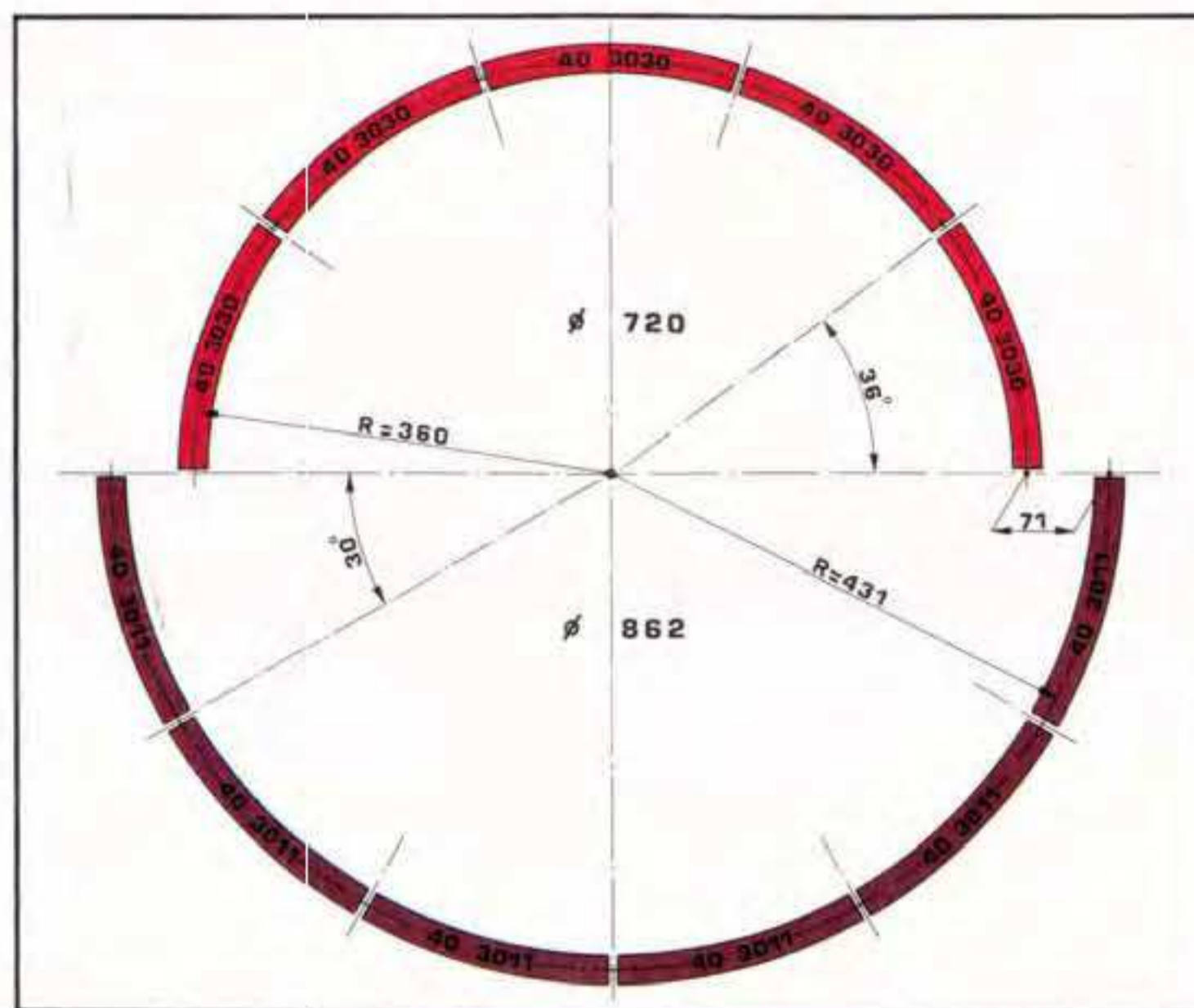
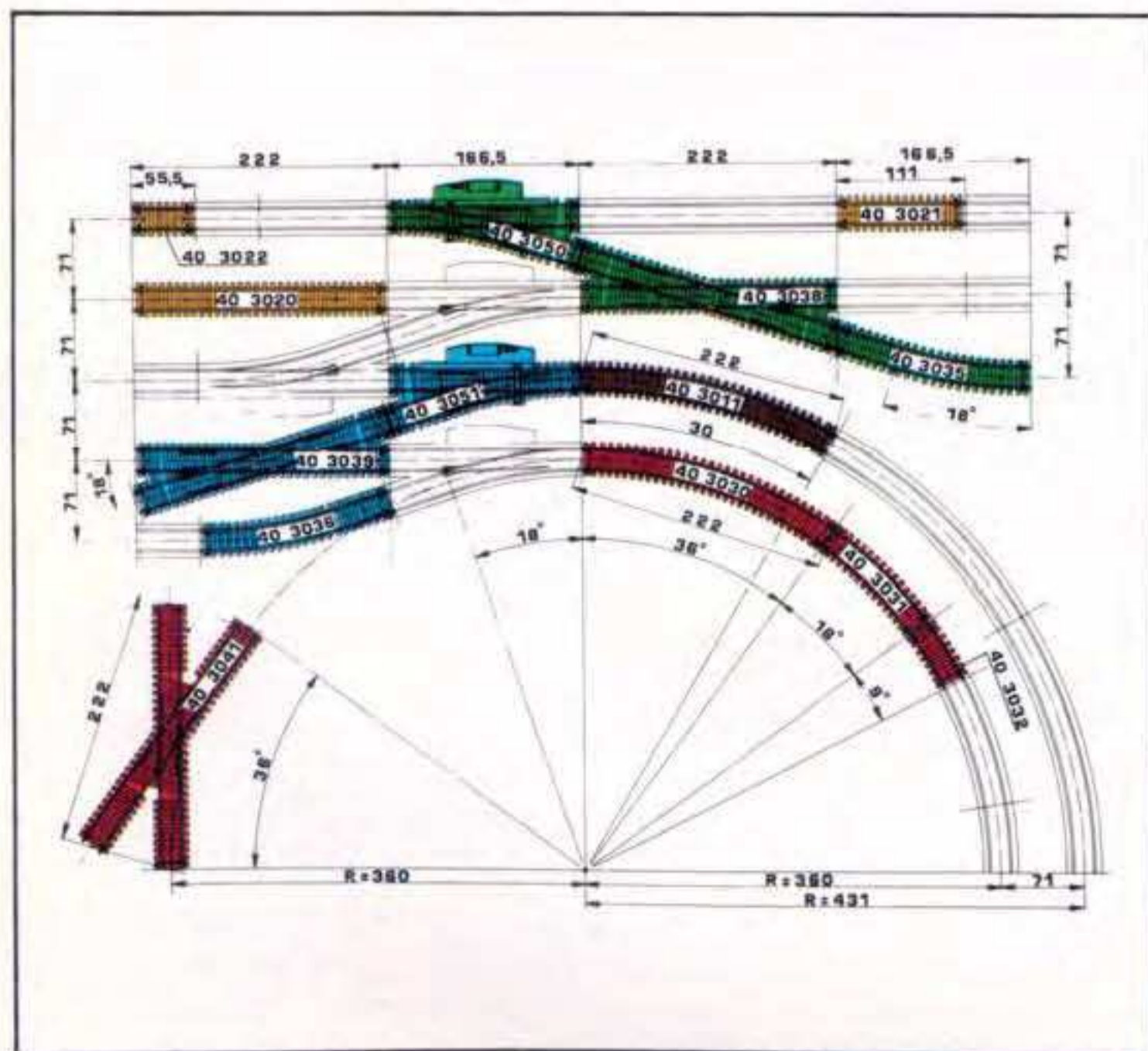
# TRACK INSTALLATION

## THE LIMA TRACK SYSTEM

The track is the foundation of your model railway. It is therefore essential to ensure that the track system you install is the finest you can buy. Lima track is just that. It has been carefully developed over the years by experts, whose painstaking research now means that the Lima track system is unique and unsurpassed by any other. You'll find the time and trouble taken at this stage of your hobby amply repaid by smooth running and increased enjoyment later.

Even the smallest layout can provide hours of enjoyment, but the development of larger and more complex layouts will give you all the excitement of running a real railway network.

There are various gauges in use for model railways. Here are the measurements of the main types:—



'OO' 16.5mm to the scale of 1:76

'HO' 16.5mm to the scale of 1:87

'N' 9mm to the scale of 1:160

'O' 32mm to the scale of 1:45

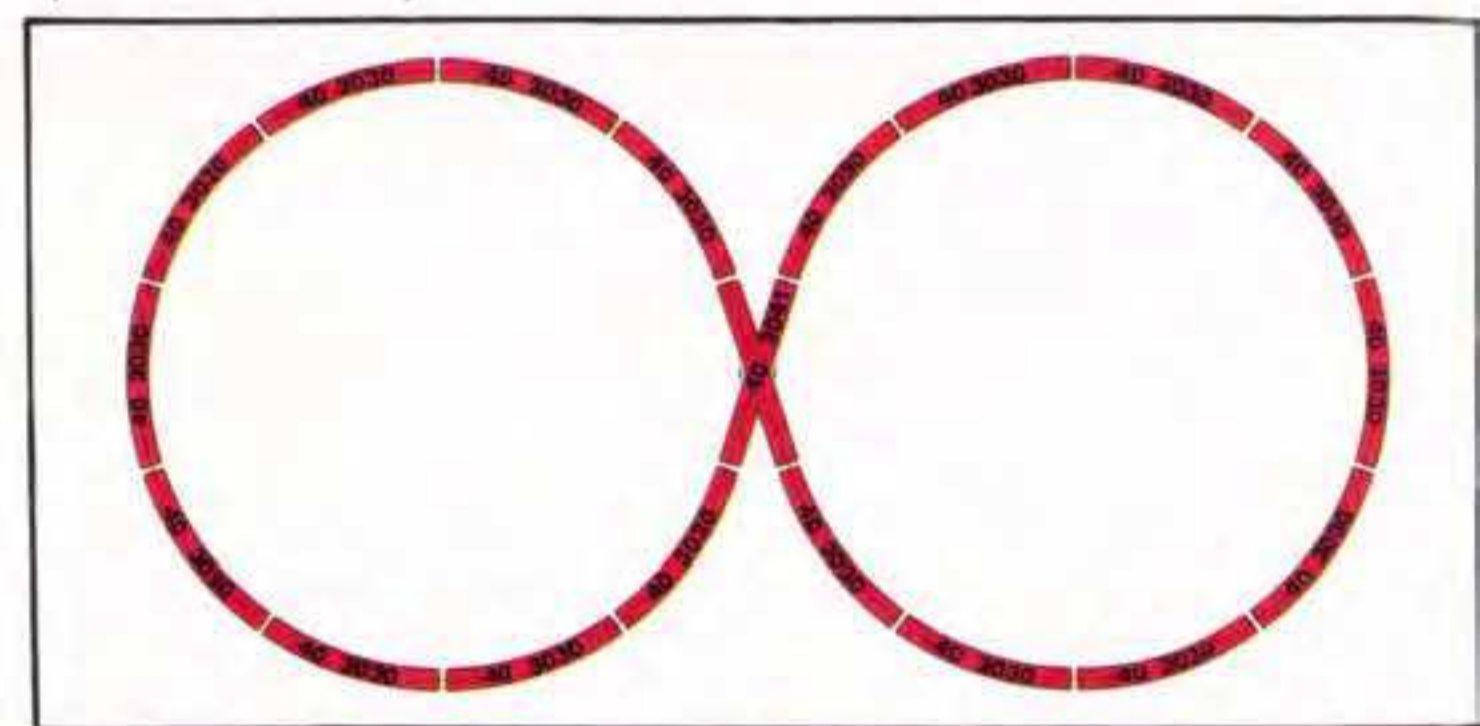
One of the main essentials to remember when installing your track is to ensure that the trains on adjoining tracks can circulate freely without touching. For example, in a Lima 'OO/HO' scale system the correct distance between track centres is 71mm, maintained both in straight runs and through the curves. For two concentric circuits, as illustrated, you must use curves with a different radius. In the Lima 'OO/HO' system these two types of curves have respectively 36° (item 403030) and 30° (item 403011) of sweep.

With 10 pieces of 36° sweep you get a circle of 720mm diameter. While with 12 pieces of 30° sweep the circle will be 862mm. The difference between the sweeps of the two circles is 71mm, our safe distance between track centres.

## CONSTRUCTING A 'FIGURE 8'

When building a 'figure of 8' track, it is essential that the cross-over should correspond geometrically to two curves side by side.

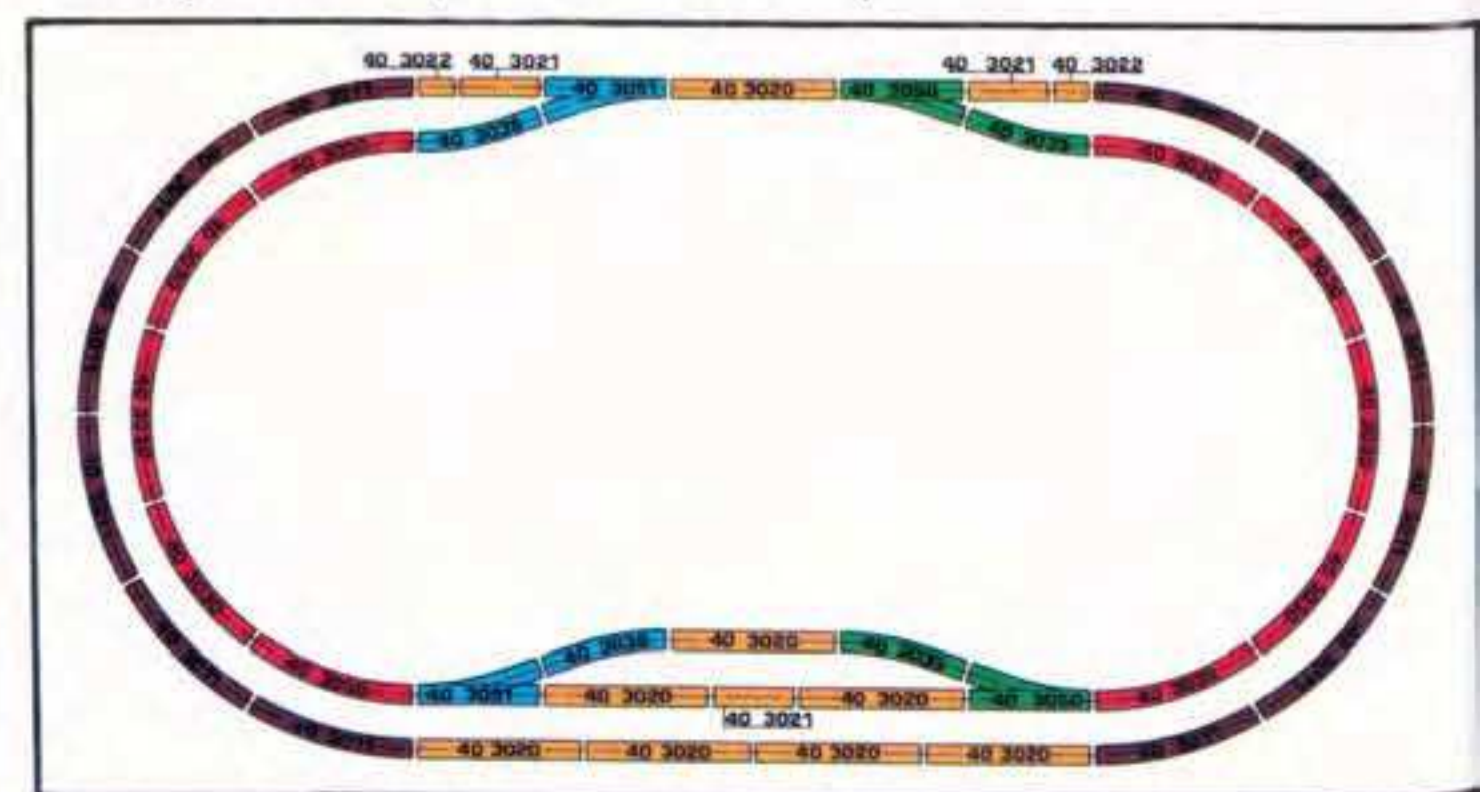
Thus in 'OO/HO' scale, the 'figure 8' circuit illustrated below would require 18 pieces of curved track (item 403030), plus a cross-over of 36° (item 403041).



## CONSTRUCTING A PASSING LOOP

Use two points (one left hand and one right hand) with the appropriate compensating tracks to maintain the correct spacing between tracks.

The Lima system is so geometrically precise, that the chord of the arc of each of the two curved elements is exactly the same as the length of the straight track (see illustration).

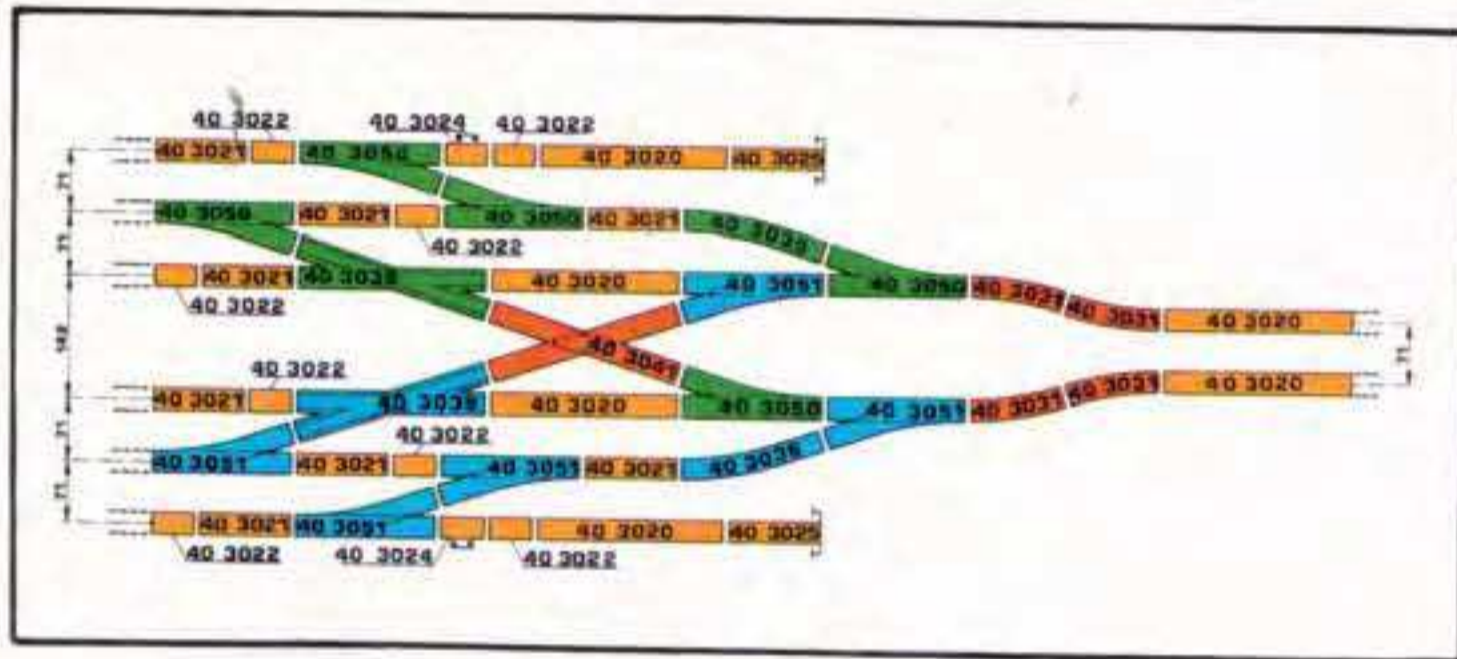


## ADVANCED TRACK LAYOUTS

For advanced track layouts including gradients or descents, 'extendable track' (item 403026) may prove useful. This special track has the facility of being extended from half straight to three quarter straight length by means of a sliding section.

Groups of points and crossings can be used to convert two tracks of main line into six tracks at the entrance to a station (see illustration).

In other cases, flexible track can be used to produce special curves and can be cut to size with an ordinary (fine-tooth) hack-saw.



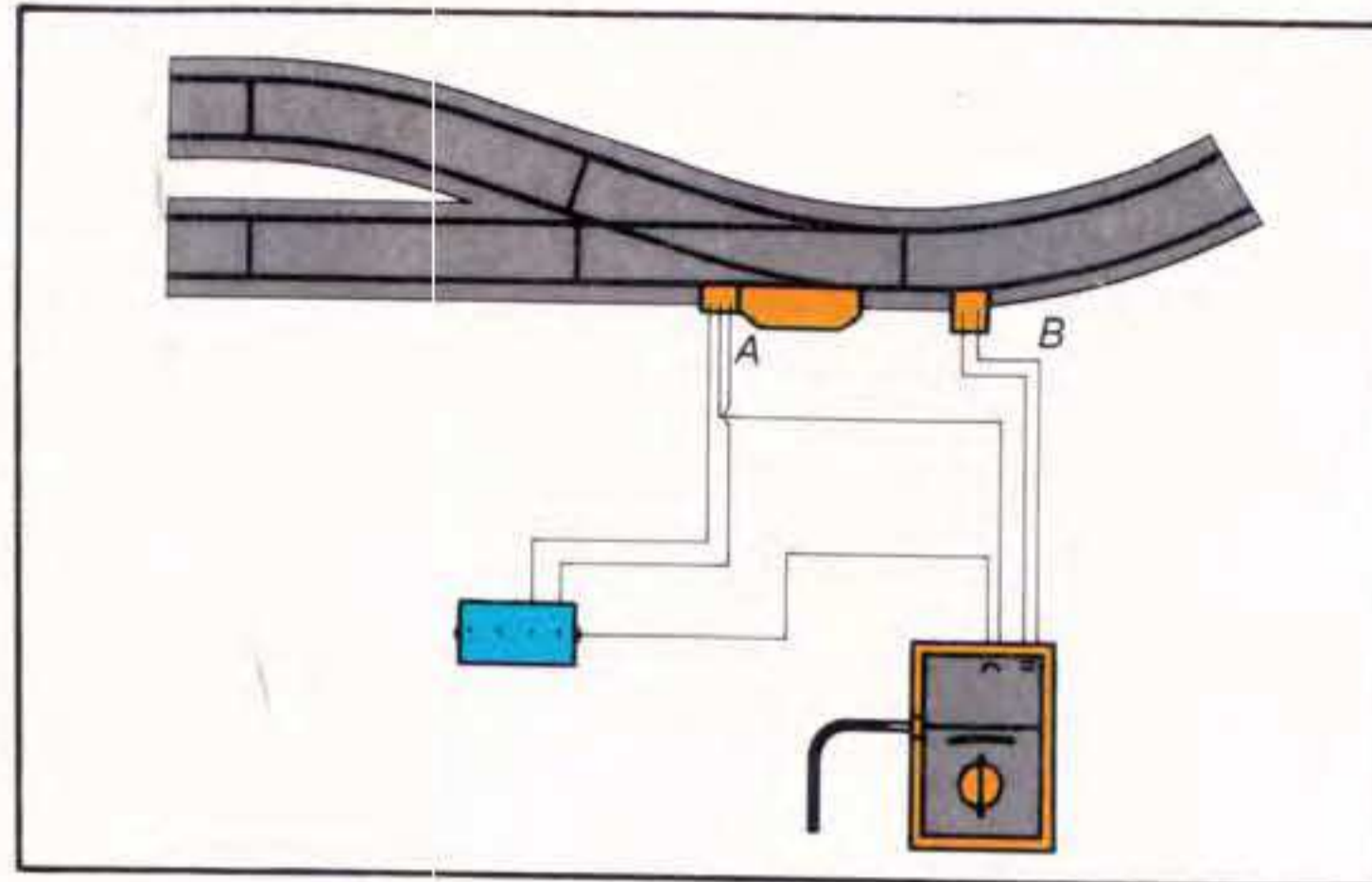
## POINTS IN YOUR TRACK SYSTEM

### Points in your track system

Even on a simple layout points are a necessity. Lima manufacture two types – the manually controlled type, and the electrically controlled type which allows 'remote' operation and is powered by 'alternating current' from the power unit. Both types are available in both left-hand and right-hand versions.

The electric point is fitted with two electromagnets which, once the power is applied, move the blade of the point from side to side.

There are 3 connecting wires on the electric point: One 'neutral' (in the centre) and two positive for the two operating positions. When using this



USE OF POWER UNIT – 502058. The diagram shows the correct wiring. A = electric point operated by alternating current through control box 503065D. B = connection of the power feed to the track (direct current) through curved track 403030C.

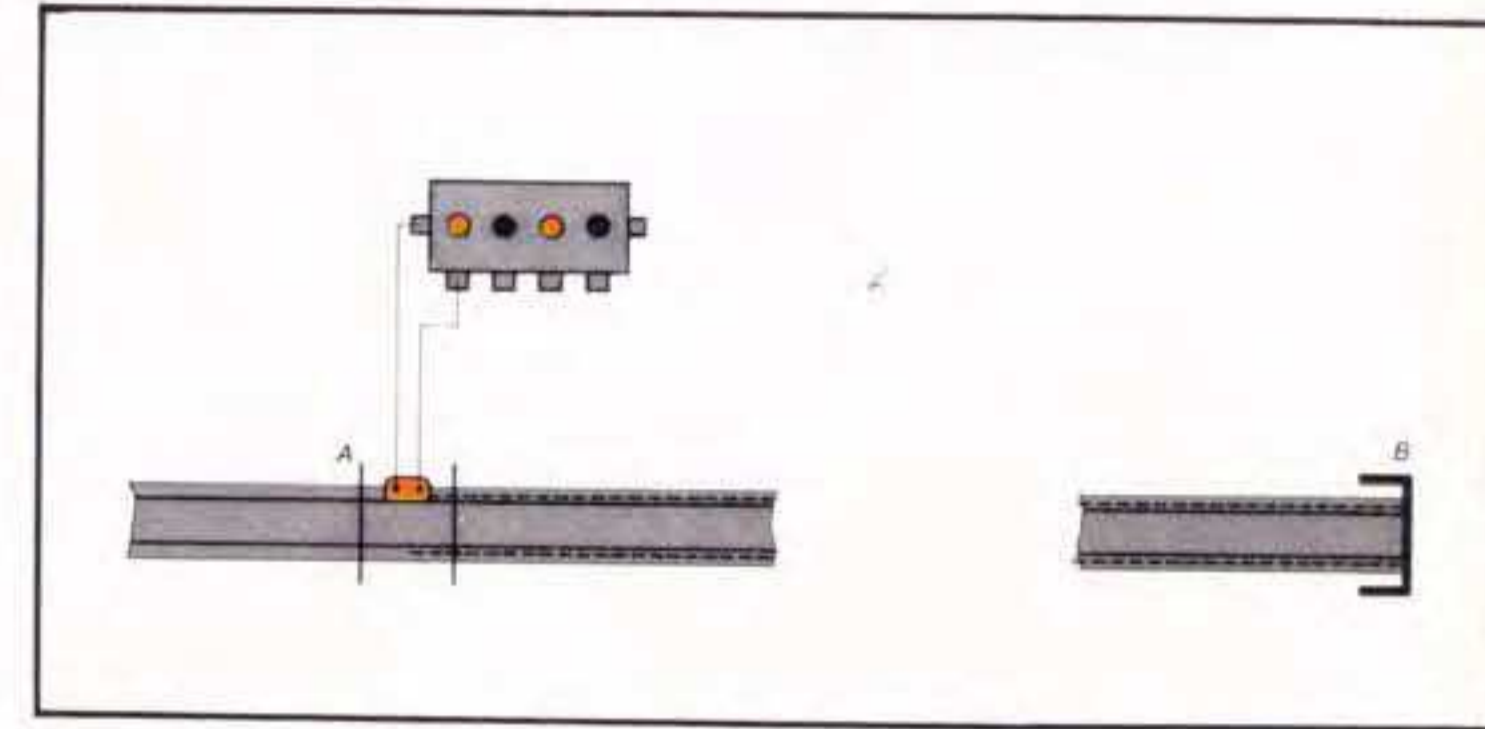
kind of point the control box must be operated in short sharp movements to avoid the coils overheating. Never keep the control button pressed down as this can cause the coil to fail.

## ISOLATING SECTIONS OF TRACK

For the most realistic results, many railway modellers run more than one train on a given section of track. However, care must be taken that the various trains do not collide, and can stop at the right moment and the right place to let other trains through.

The use of an 'isolated stretch of track' allows one train to be held stationary while another train is operating. This works by cutting off the electric current from the locomotive of the train it is required to hold.

The simplest way of using an 'isolated stretch of track' is to install a siding ending with a set of buffers.



ISOLATING TRACK. From A to B in the marked section power to the track is cut off unless the left-hand button on the control box 503065 is pushed.

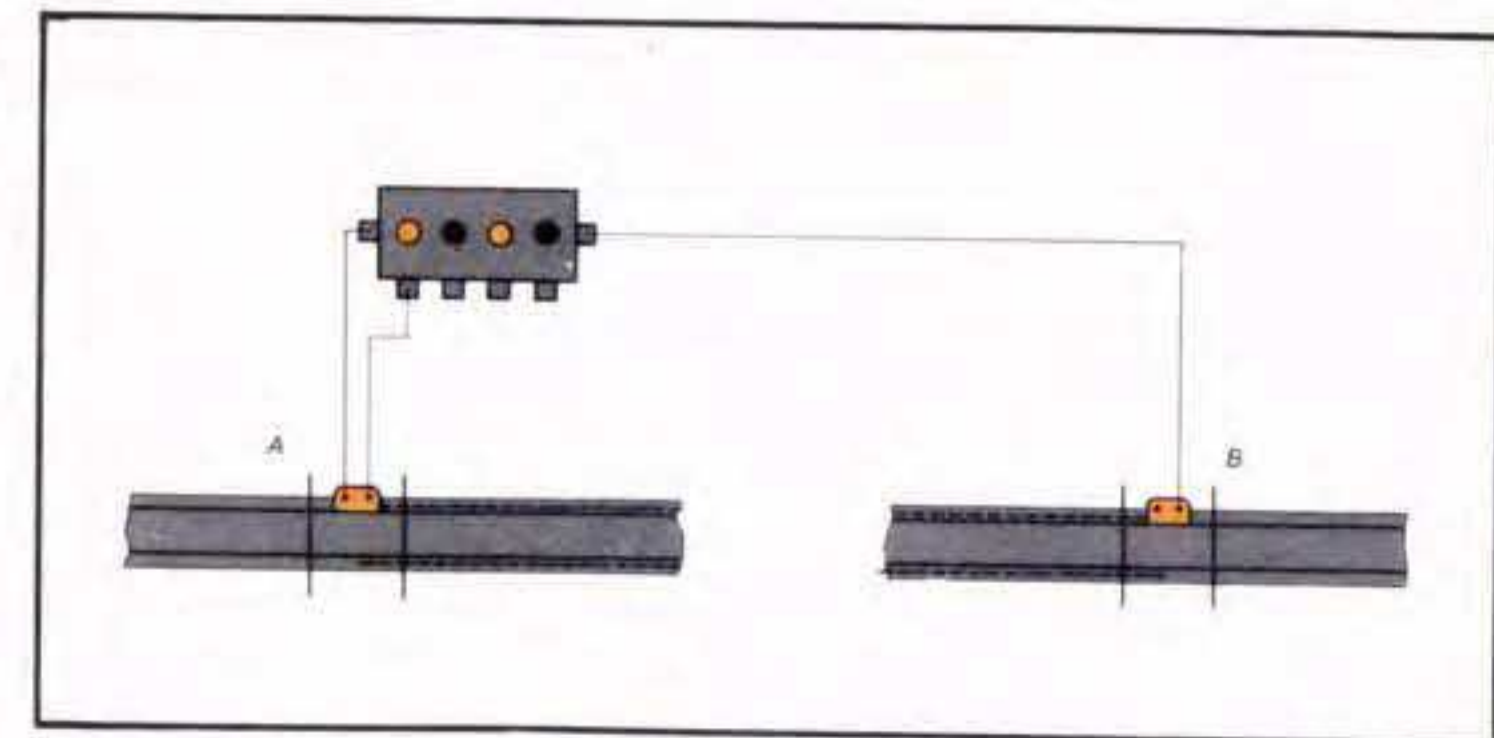
In this case a  $\frac{1}{4}$  straight isolating track (item 403024R) would be incorporated in the siding section connected to a control box (item 403065). This operates as follows:—

### WITH THE BUTTON NOT PRESSED

Once past the braking point, the train will stop – with all power to it cut off.

### WITH THE BUTTON PRESSED

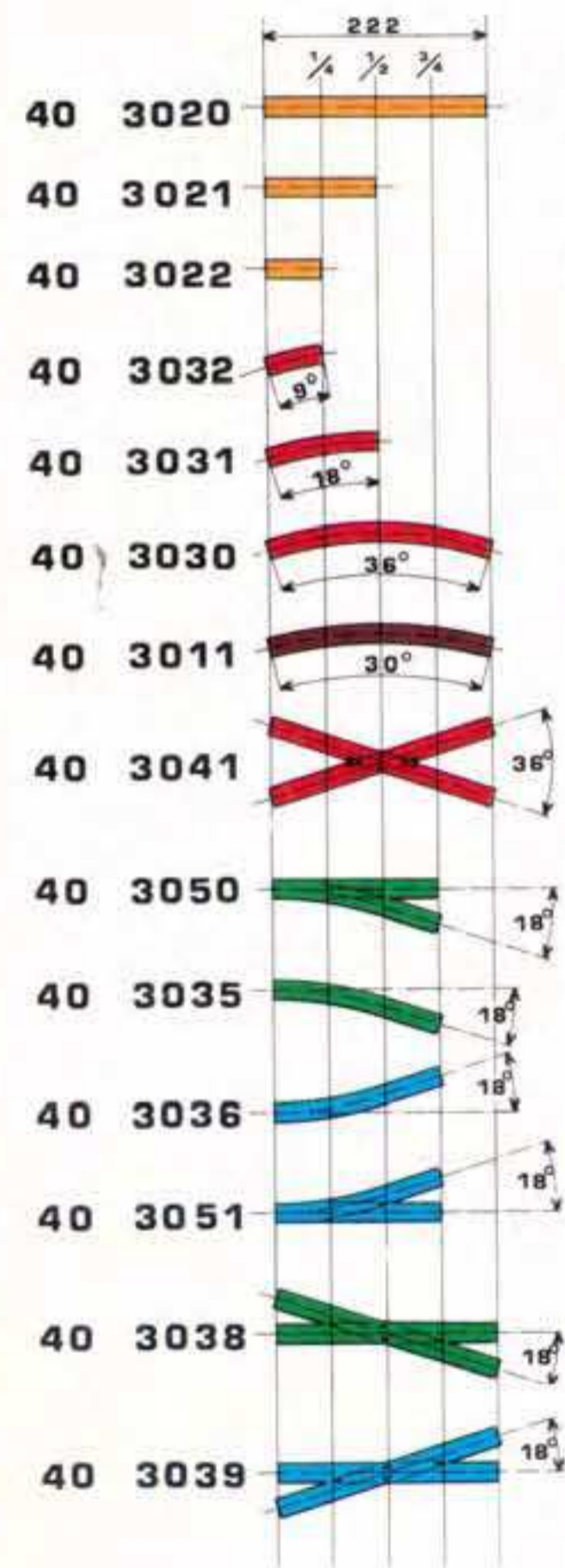
Power is restored – and the train is able to move again.



ISOLATING TRACK USED AS A PASSING TRACK. From A to B in the marked section power to the track is cut off unless the left-hand button on the control box 503065 is pushed.

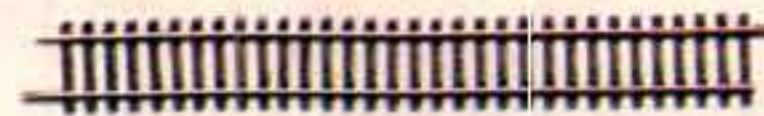
# TRACK

The elements of track in the LIMA system. Please note that each element is based on a measurement of 222mm and its fractions. This example is 'OO' scale.



This track diagram is colour-coded to illustrate the different track components, i.e.:

- ORANGE: straight track
- RED: 1st radius curved track
- BROWN: 2nd radius curved track
- GREEN: right hand points
- right hand compensating track
- BLUE: left hand points
- left hand compensating track
- left hand crossing
- YELLOW: special tracks.



403020  
straight track (220mm)



403021  
1/2 straight track (110mm)



403022  
1/4 straight track



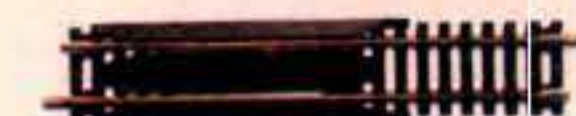
403024  
1/4 straight with power clip



403024R  
1/4 straight isolating track.



403025  
1/2 straight with buffer stop.



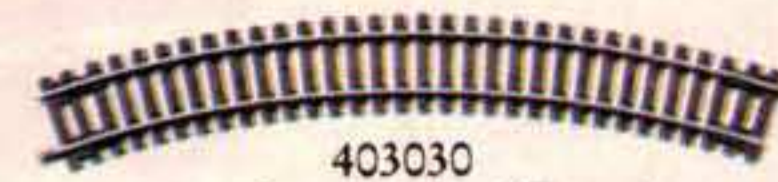
403026  
extendable track 1/2 to 3/4.



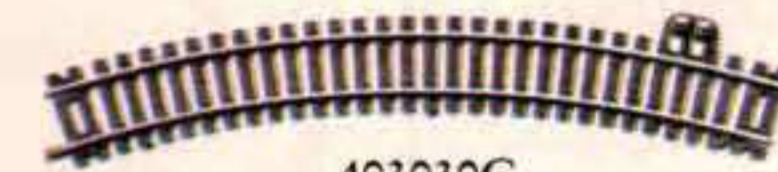
403028 Wagon uncoupler.



403042  
flexible track (90cm).



403030  
curved track (dia. 720mm).



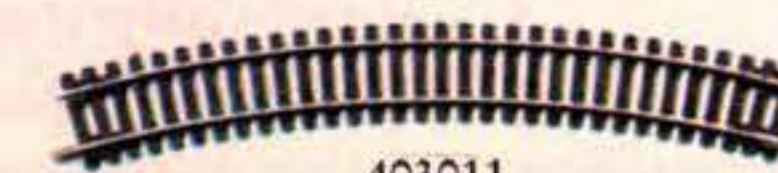
403030C  
curved track with power clip.



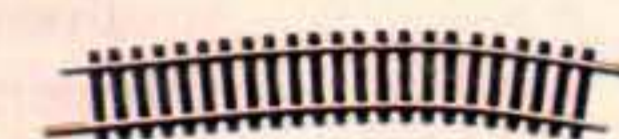
403031  
1/2 curved track.



403032  
1/4 curved track.



403011  
curved track (dia. 860mm).



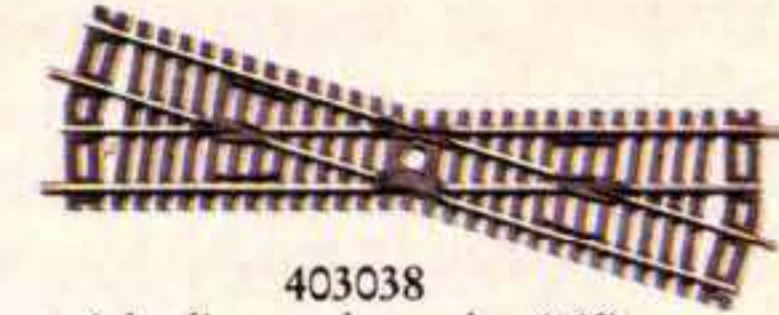
403036  
compensating track  
right



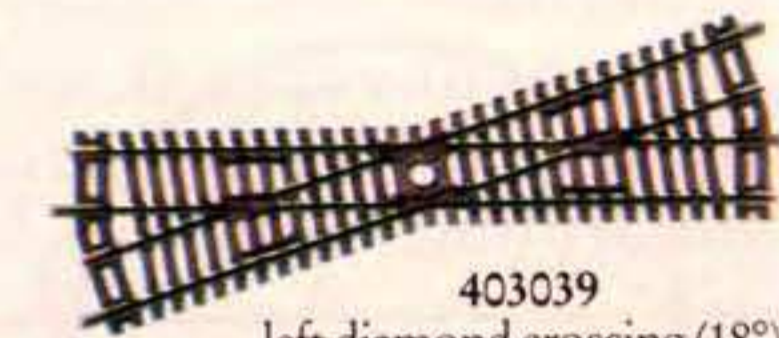
403035  
compensating left track.



600002 Ramp.



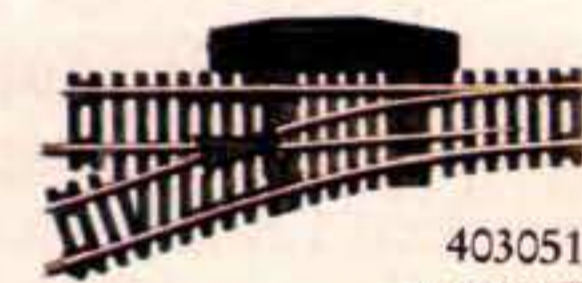
403038  
right diamond crossing (18°).



403039  
left diamond crossing (18°).



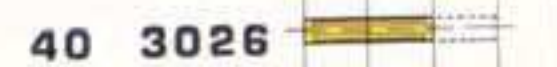
403041  
diamond crossing (36°).

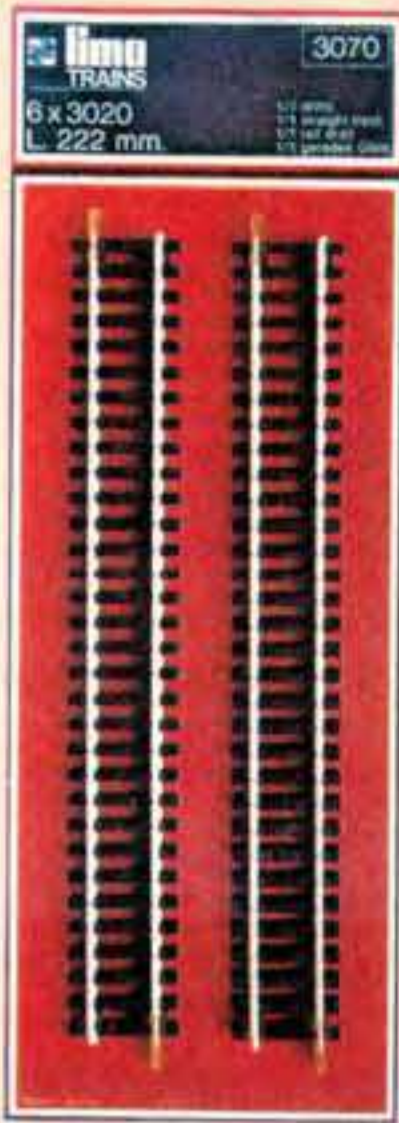


403051  
403051 E  
left-hand point (manual).  
left-hand point (electric).



403050 right-hand point (manual).  
403050 E right-hand point (electric).





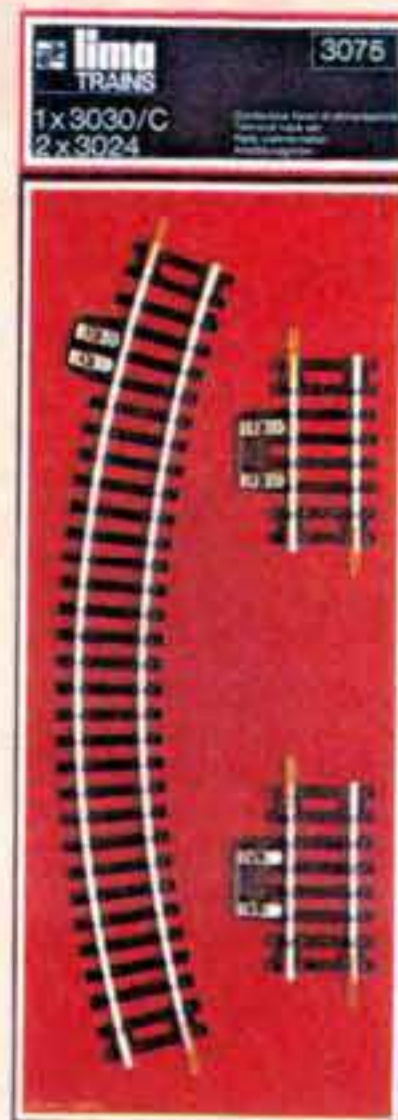
**403070**  
6 pieces  
straight track  
(220 mm)  
403020.



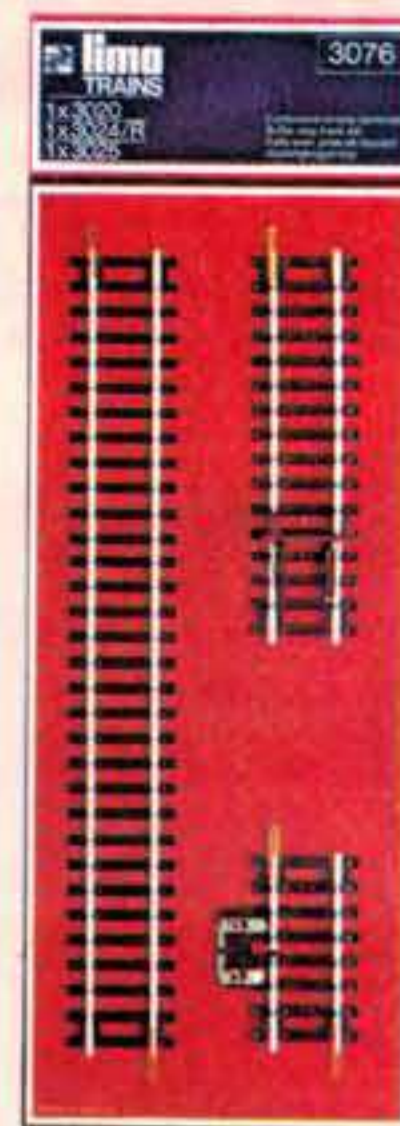
**403080**  
6 pieces  
curved track  
(diameter  
7020 mm)  
403030.



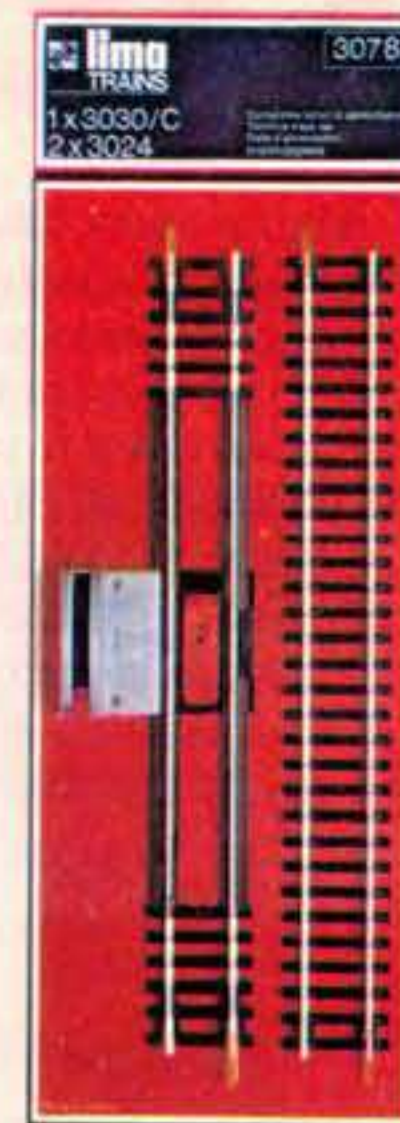
**403086**  
6 pieces  
outer curved  
track  
(diameter)  
860 mm  
403011.



**403075**  
1 curved  
track with  
power clip  
403030C,  
2 ¼ straight  
tracks with  
power clip  
403024.



**403076**  
1 straight  
track 403020,  
1 ½ straight  
track with  
buffer stop  
403025,  
1 ¼ straight  
isolating  
track  
403024R.



**403078**  
1 straight  
track  
(220 mm)  
403020,  
1 hand-  
operated  
uncoupler  
403028.



**403050**  
Right hand  
points,  
hand  
operated.

**403050E**  
Right hand  
points,  
electrically  
operated.



**403051**  
Left hand  
points,  
hand  
operated.

**403051E**  
Left hand  
points,  
electrically  
operated.

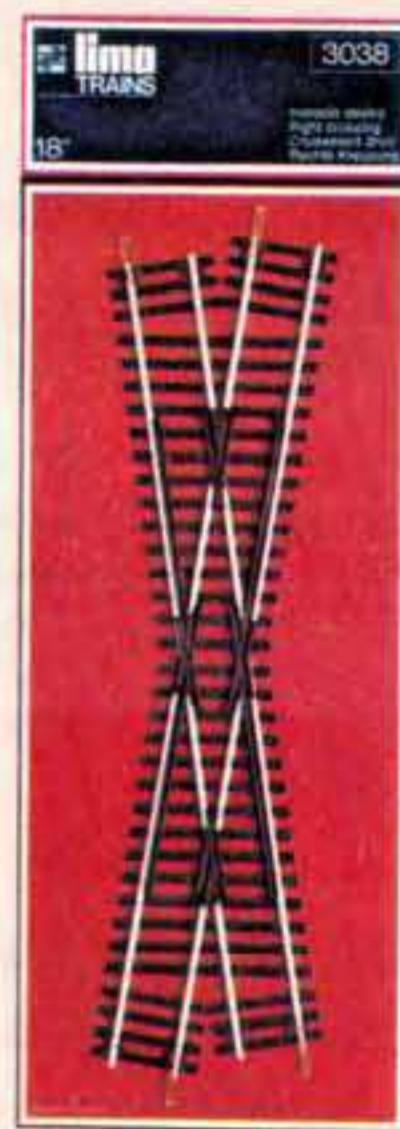


**403079**  
2 x: 403035  
(right  
compensating  
track),  
2 x: 403036  
(left  
compensating  
track).



**403048**  
1 x 403050,  
1 x 403051,  
1 x 403036  
(left),  
1 x 403035.

**403048E**  
1 x 403050E,  
1 x 403051E,  
1 x 403036  
1 x 403035



**403038**  
Crossing 18°  
right hand.

**403039**  
Crossing 18°  
left hand.



**403041**  
Crossing 36°.



**403071**  
6 pieces  
½ straight  
track  
(110 mm)  
403021.



**403081**  
6 pieces  
½ curved  
track 403031.



**403077**  
4 pieces  
¼ straight  
track 403022,  
2 pieces  
¼ curved  
track 403032  
insulated fish  
plates 600015.



**403026**  
Variable  
length track  
(½ to ¾).

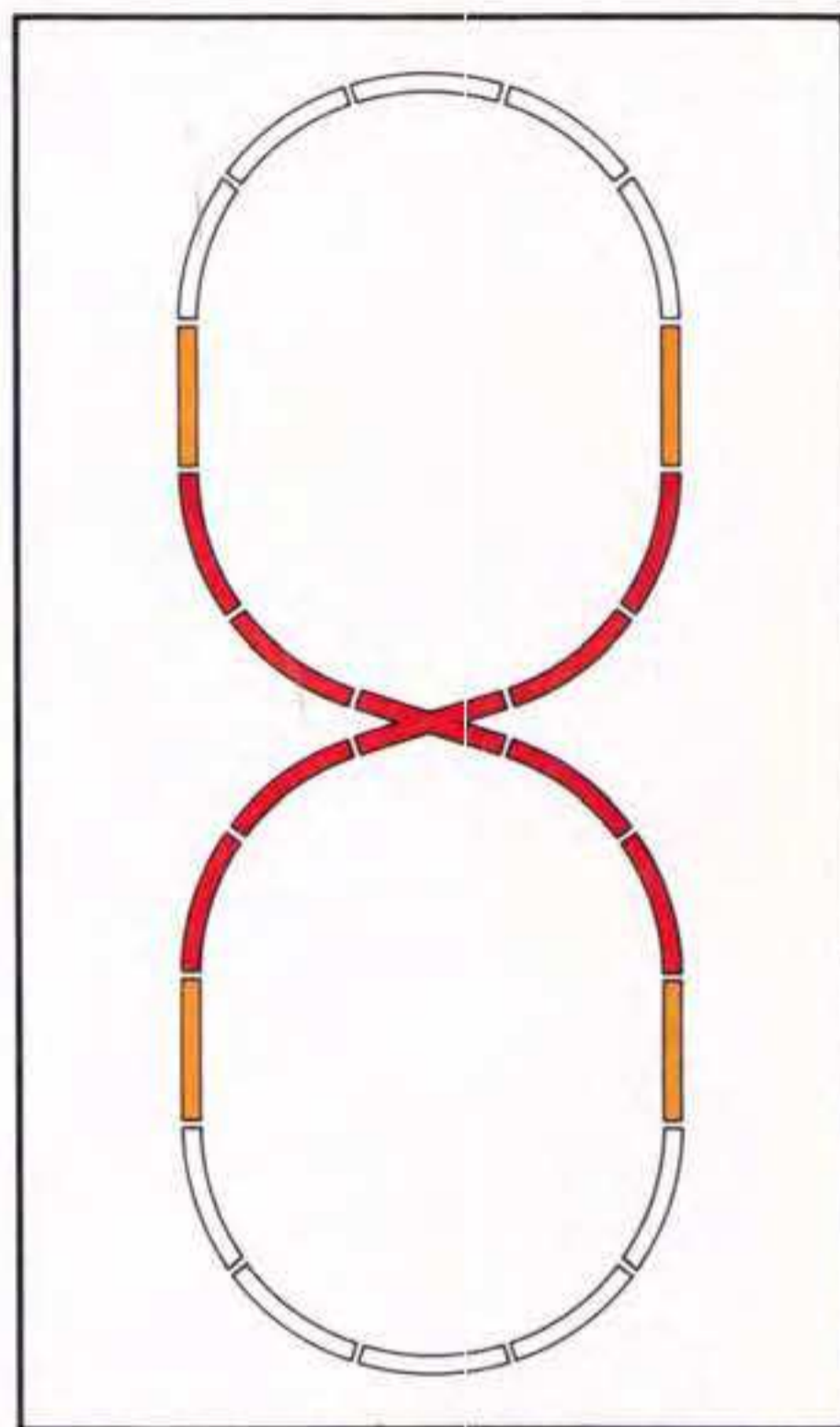


**600008**  
Fishplate  
for track.

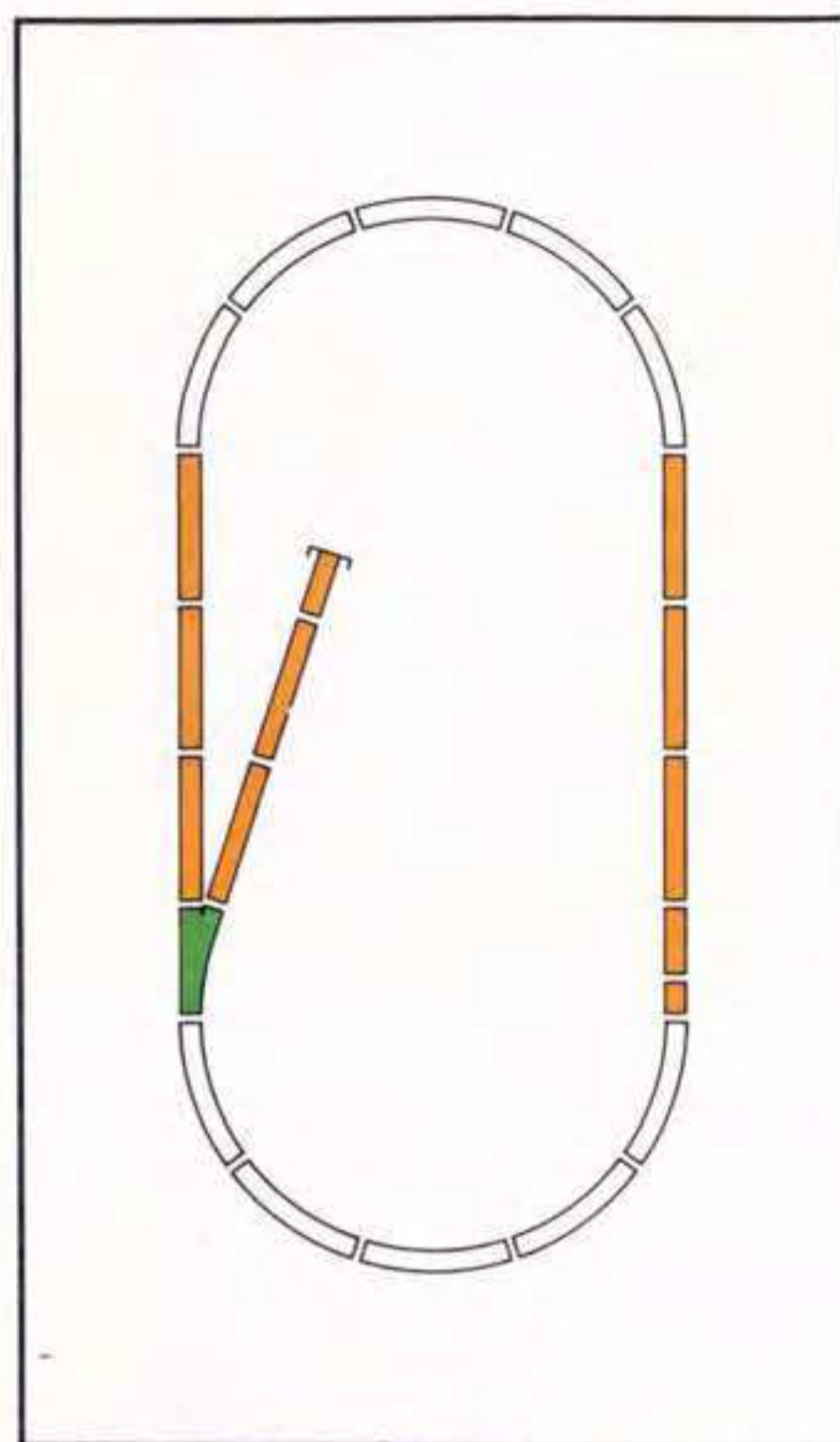
**600015**  
Insulating  
fishplate.

# EXTENDING YOUR SET

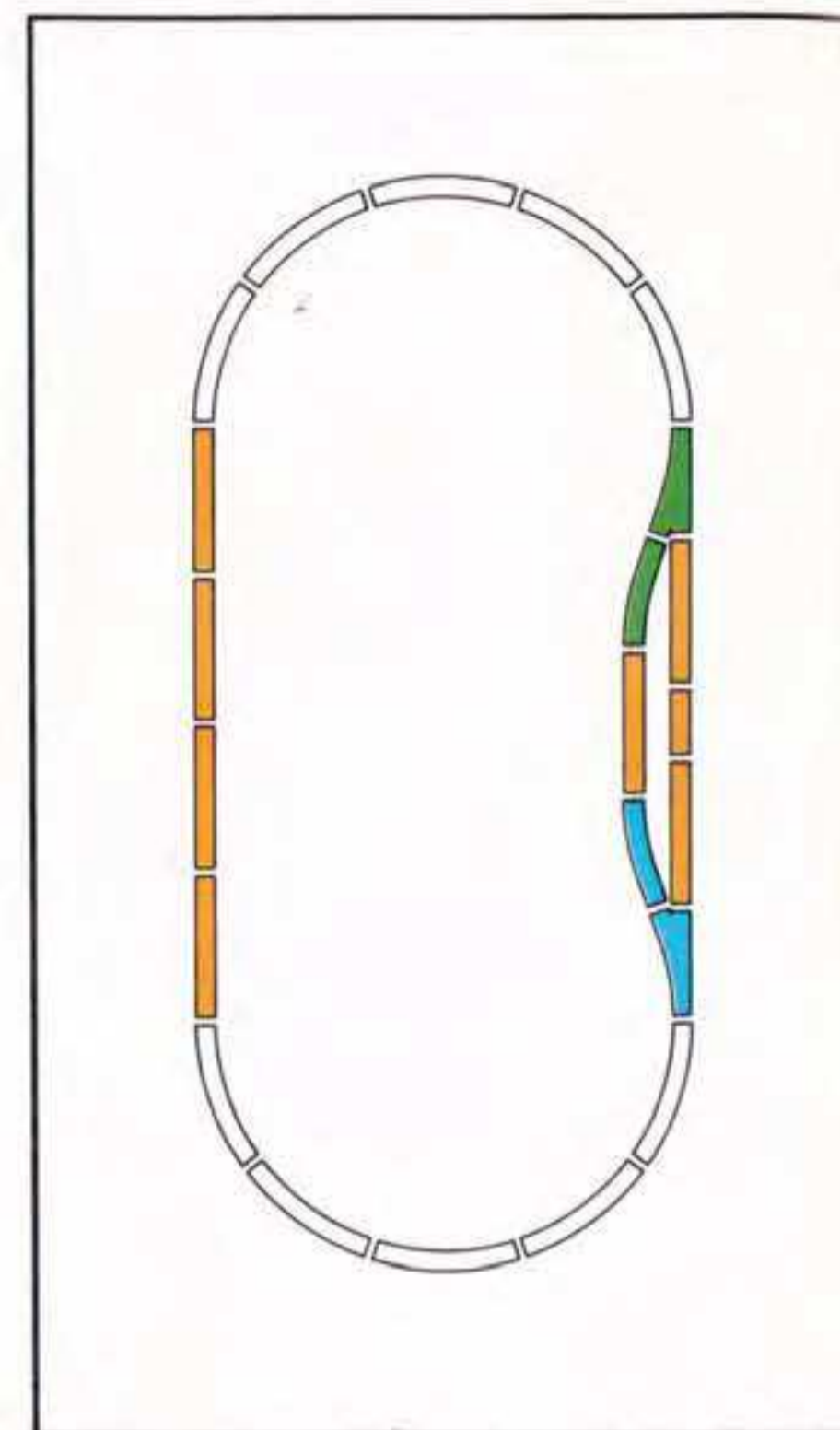
If you have purchased a simple Lima set, perhaps containing only a circle or an oval of track, it's a good idea to consider at the same time the range of Lima track extension packs. In this way you are able to instantly turn your simple layout into an exciting system with designs suitable for passenger terminals, goods yards, signal gantries and much more. These packs contain all the necessary pieces of track to add to your original train set to build it up into a much more complete system.



404051 8 pieces curved track (diameter 720 mm) 403030, 4 pieces straight track (220 mm) 403020, 1 piece diamond crossing (36°) 403041.

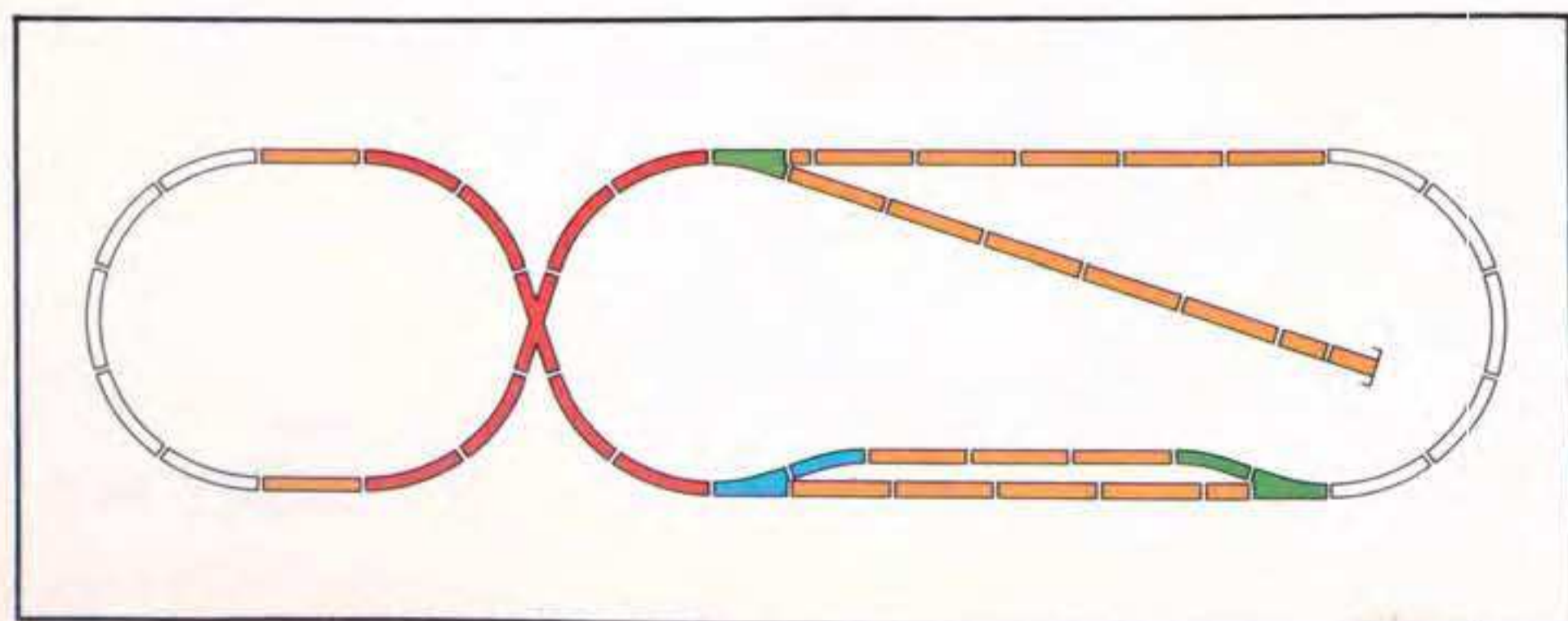


404052 8 pieces straight track (2020 mm) 403020, 1 piece 1/2 straight track (110 mm) 403021, 2 pieces 1/4 straight track 403022, 1 piece 1/2 straight track with buffer stop 403025, 1 piece right-hand point (manual) 403050.



404057 7 pieces straight track (220 mm) 403020, 1 piece 1/2 straight track (110 mm) 403020, 1 piece right hand point (manual) 403050, 1 piece left hand point (manual) 403051.

*This layout is built by adding the track packs A+B+C to the existing circle.*



A+B+C





# BRIDGES

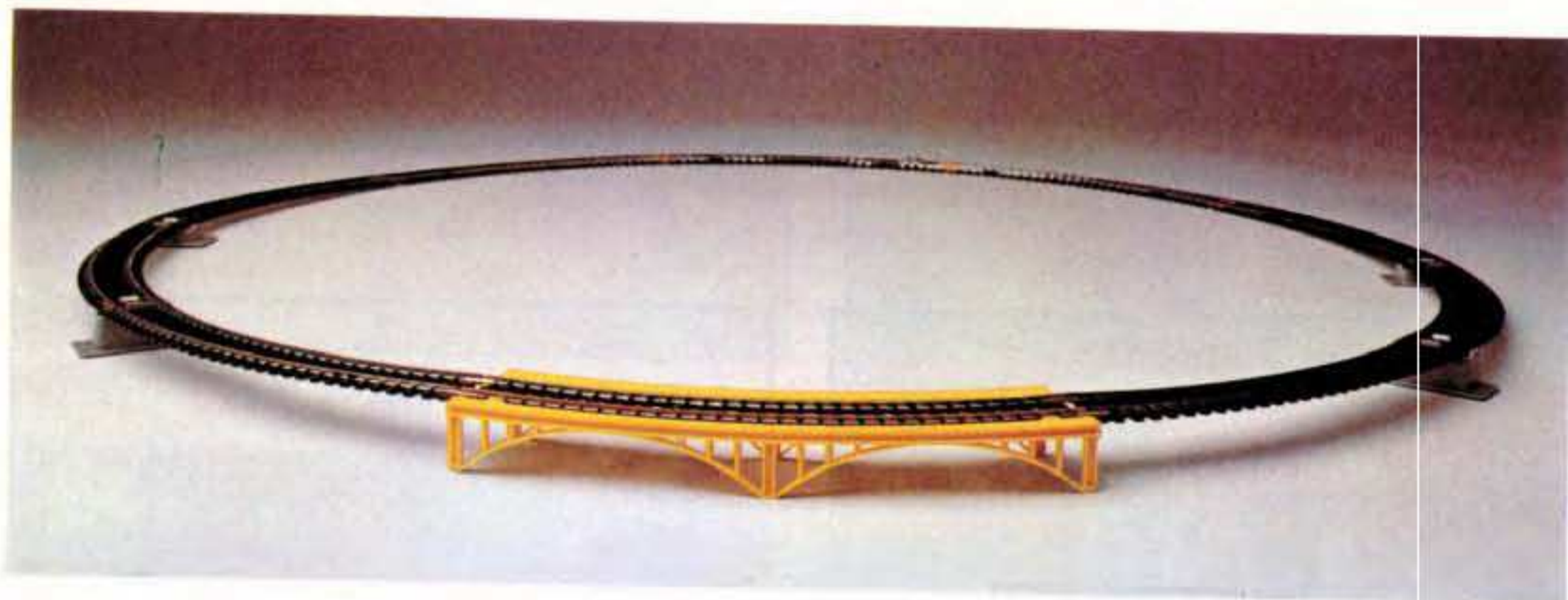
One of the biggest problems facing railway modellers is the lack of space. One answer is build up another layout some 8-10cm above the first – but it is important to remember that a locomotive can only climb certain gradients. If the incline is too steep the driving wheels will spin and the locomotive may stop, unable to reach the top.

As a general rule, if the gradient is of 3% the ramp must not exceed 3cm of track per metre. Thus in this case, for the ramp to give a height of 9cm the gradient must be spread along 3 metres of track.

Where short trains are used a steeper incline is possible – up to 4.5%. Giving a gradient spread along 2 metres of track where a height of 9cm is desired. Lima supply three basic sets of ramps:

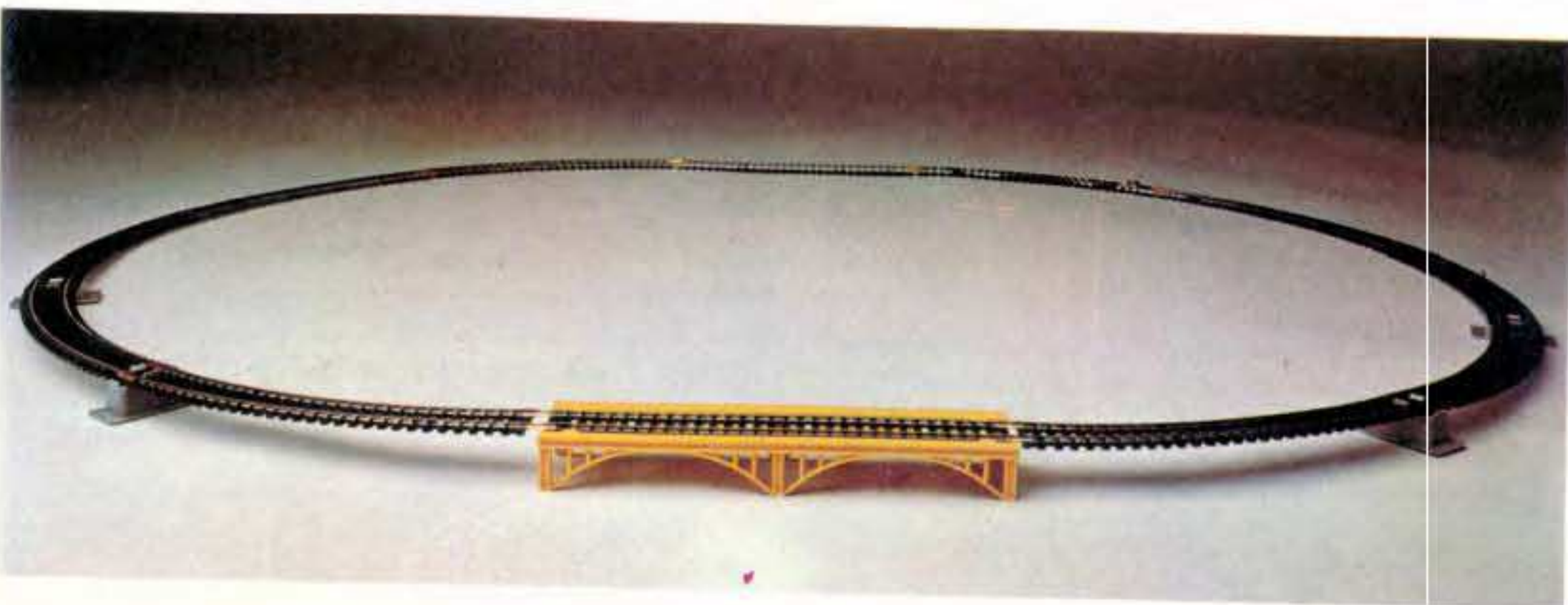
## 600055 BANKED BRIDGE IN A CURVED STRETCH

If you have a small circle of track with 720mm diameter, you can use bridge 600055 and the respective trestles to build up a viaduct with a banked stretch.



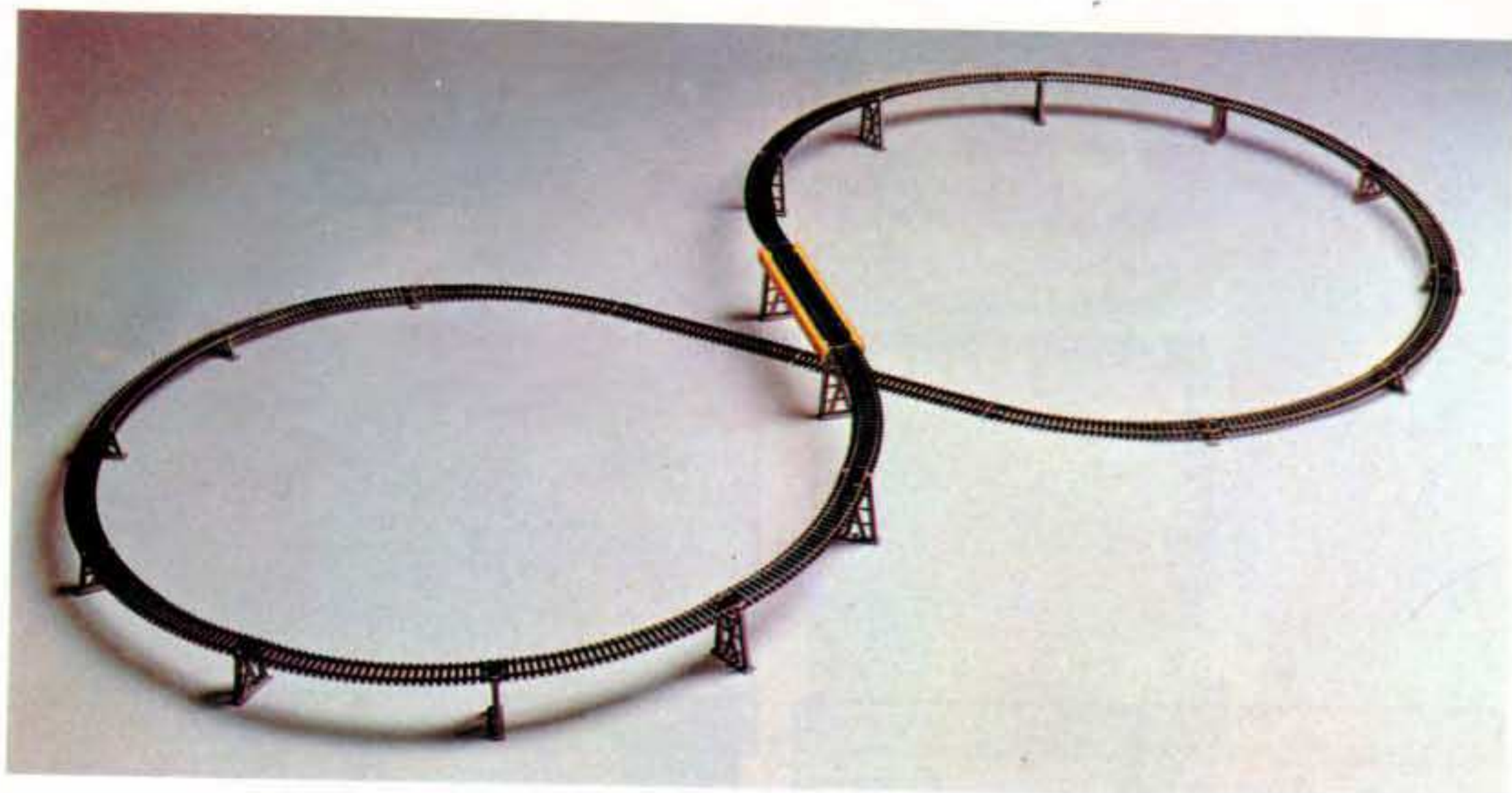
## 600057 BANKED BRIDGE IN A STRAIGHT STRETCH

You can transform a small circle into an "oval" by adding a straight piece of viaduct and two straight pieces of track (item 403020).



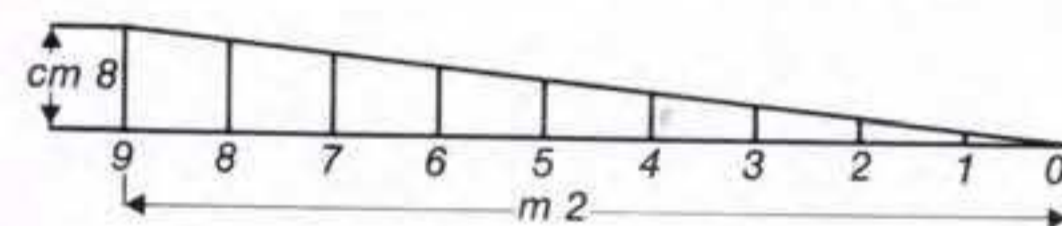
## 600911 BRIDGE FOR A FIG. 8 BANKED CIRCUIT

Using 600911 you can construct a figure "8" circuit passing over the track by means of a straight piece of viaduct (item 403020) and nine trestles of increasing height for each one of the two ramps.

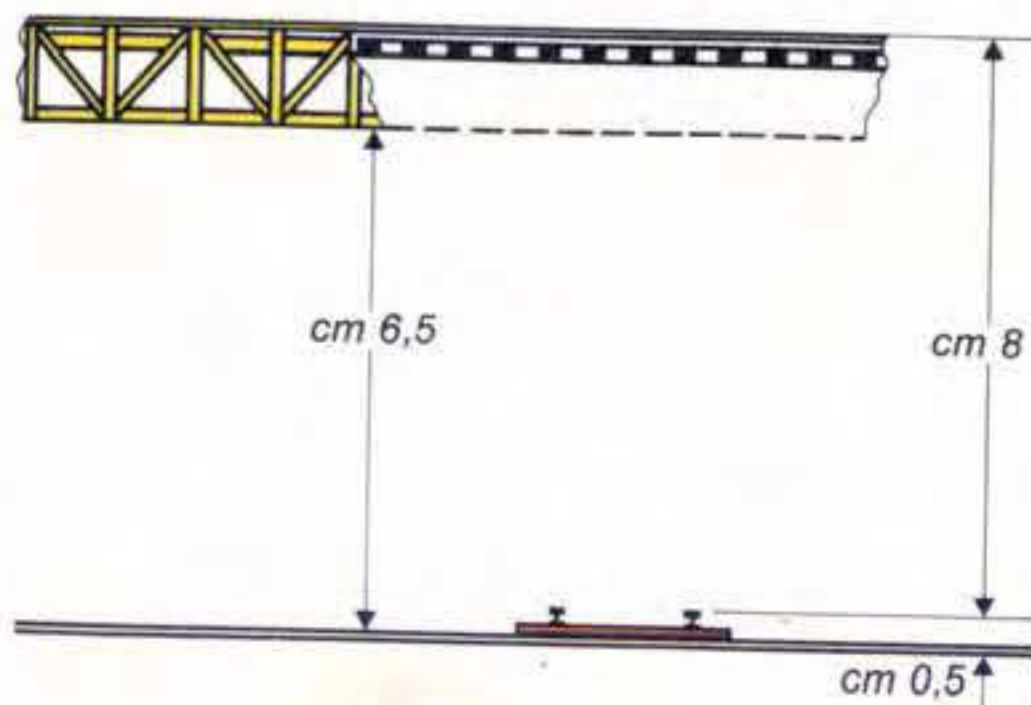


Central point of the figure "8". The height measurements refer to the point where one track passes over the other. A gap of 65mm is necessary to allow trains to run on the lower track.

Gradual incline. Use item 600911. Every Lima locomotive can climb such an incline, even when loaded with a normal complement of wagons or coaches.



The bridge in item 600055 gives a track height of 2.8cm maximum. The circle can be enlarged by adding two or more sections of straight track (item 403020).



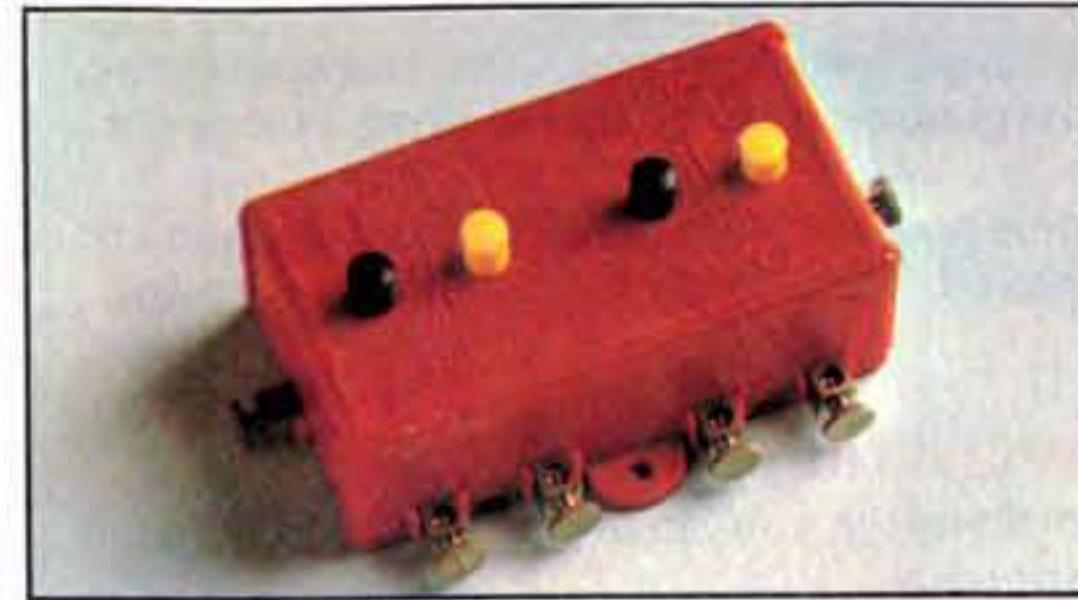
The bridges and piers of item 600911 give a track height of 8.6cm and allows a train to pass under the top tracks. There are nine piers for each ramp, limiting the gradient to 4%.

Please note that if you are using an electric locomotive with a pantograph, the pantograph must be lowered to avoid collision with the bridge.

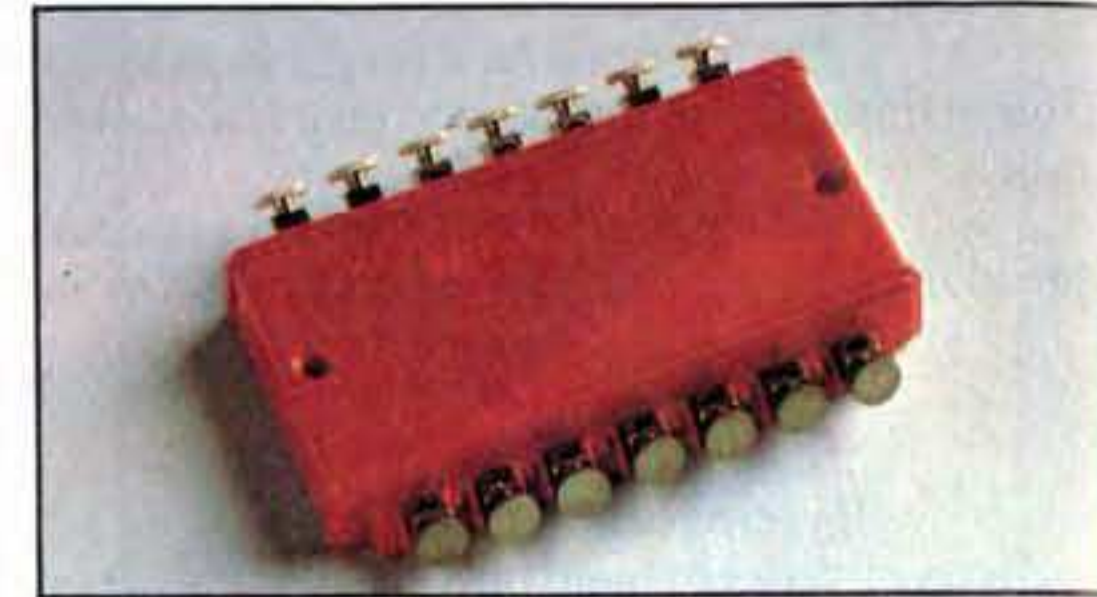
# POWER CONTROLLERS

The transformer is basically a piece of equipment which takes current from the mains and converts it to the appropriate voltage, A.C. or D.C., to feed the various locomotives and accessories of a model railway system.

Lima manufacture a whole range of power units, for a whole range of different applications. Each one protected from any possible short-circuit or overload by means of fuses or automatic cut-outs, giving complete safety of operation.



503065 Control Box. Suitable for operating up to 2 accessories (electric points, etc.).



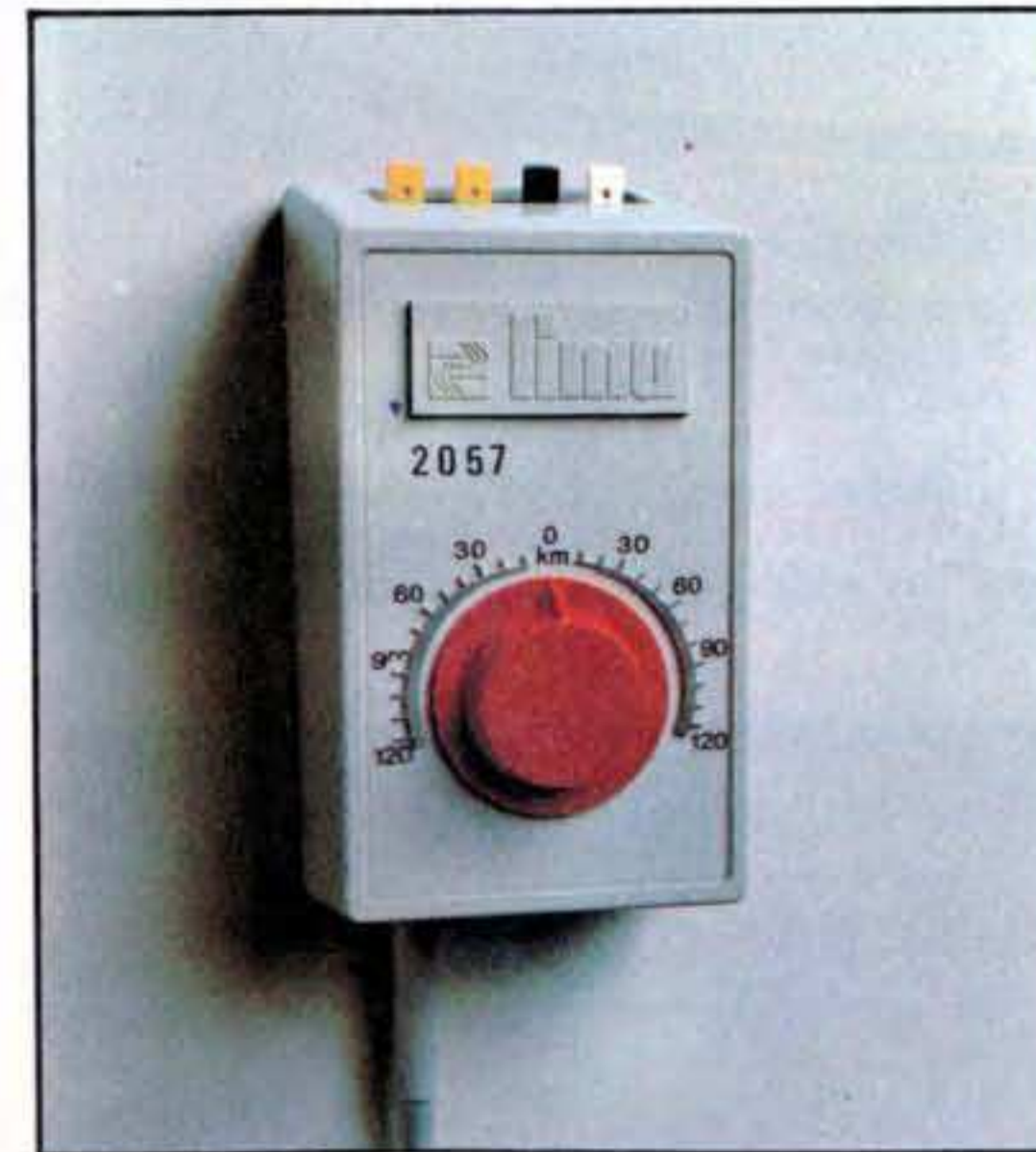
503066 Junction box.



502054 Transformer. Power 3.6VA. Input 220V AC. Output 0-12V DC. Designed to operate one train or DC accessories.



502056 Transformer for 2 trains. Input 220V. Output 0-12V DC or 0.5A.

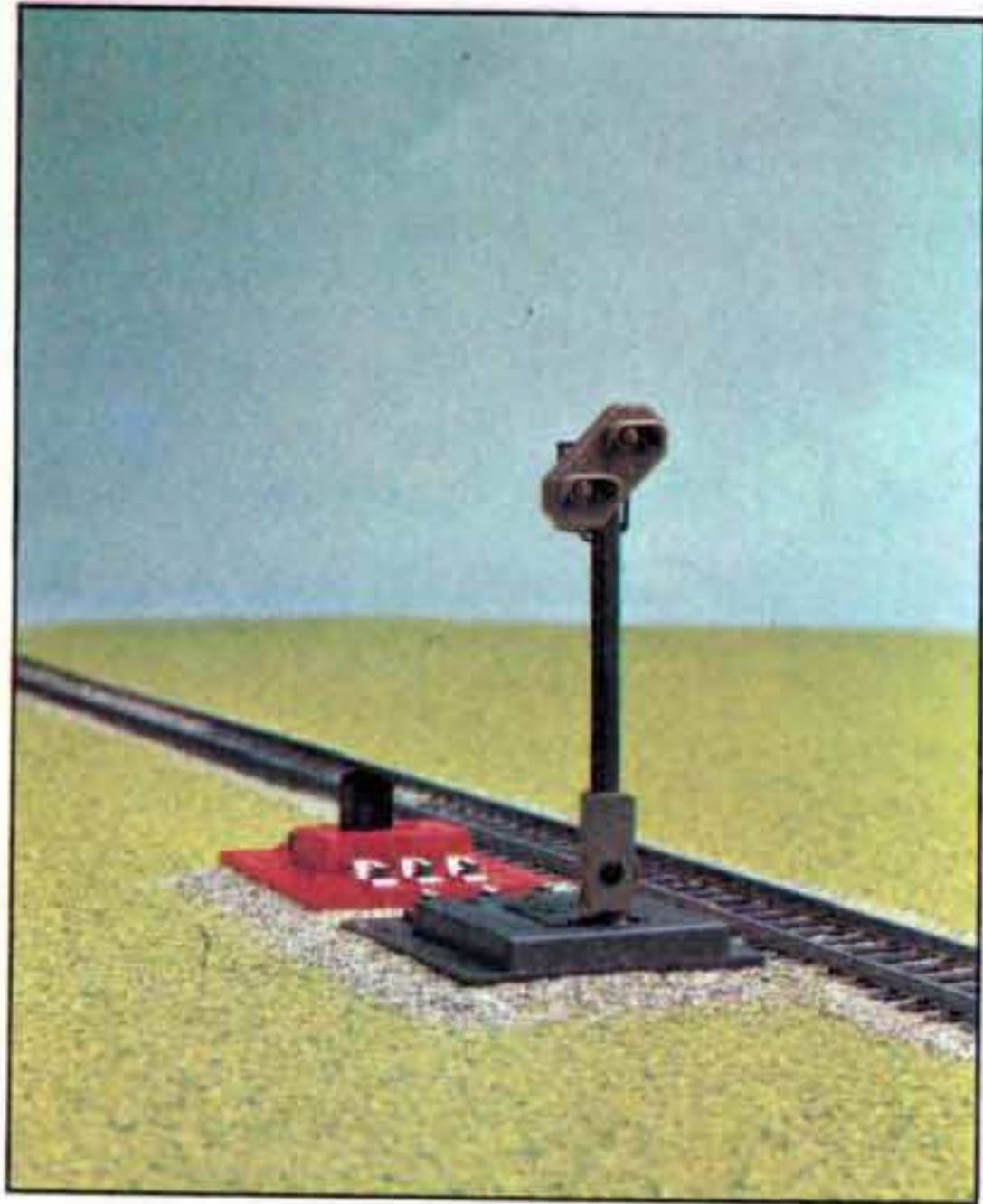


502057 Transformer for 2 trains, points and electrical accessories. Input 220 V. DC Output 0-12V at 0.7A. AC output 14V at 0.5A. Protected against short circuits by thermal cutout.



502059 Transformer for several trains, points and accessories. 220V input. DC output 0-15 at 2A. AC output 14 V at 1.2A. Protected against short circuits by thermal cutout.

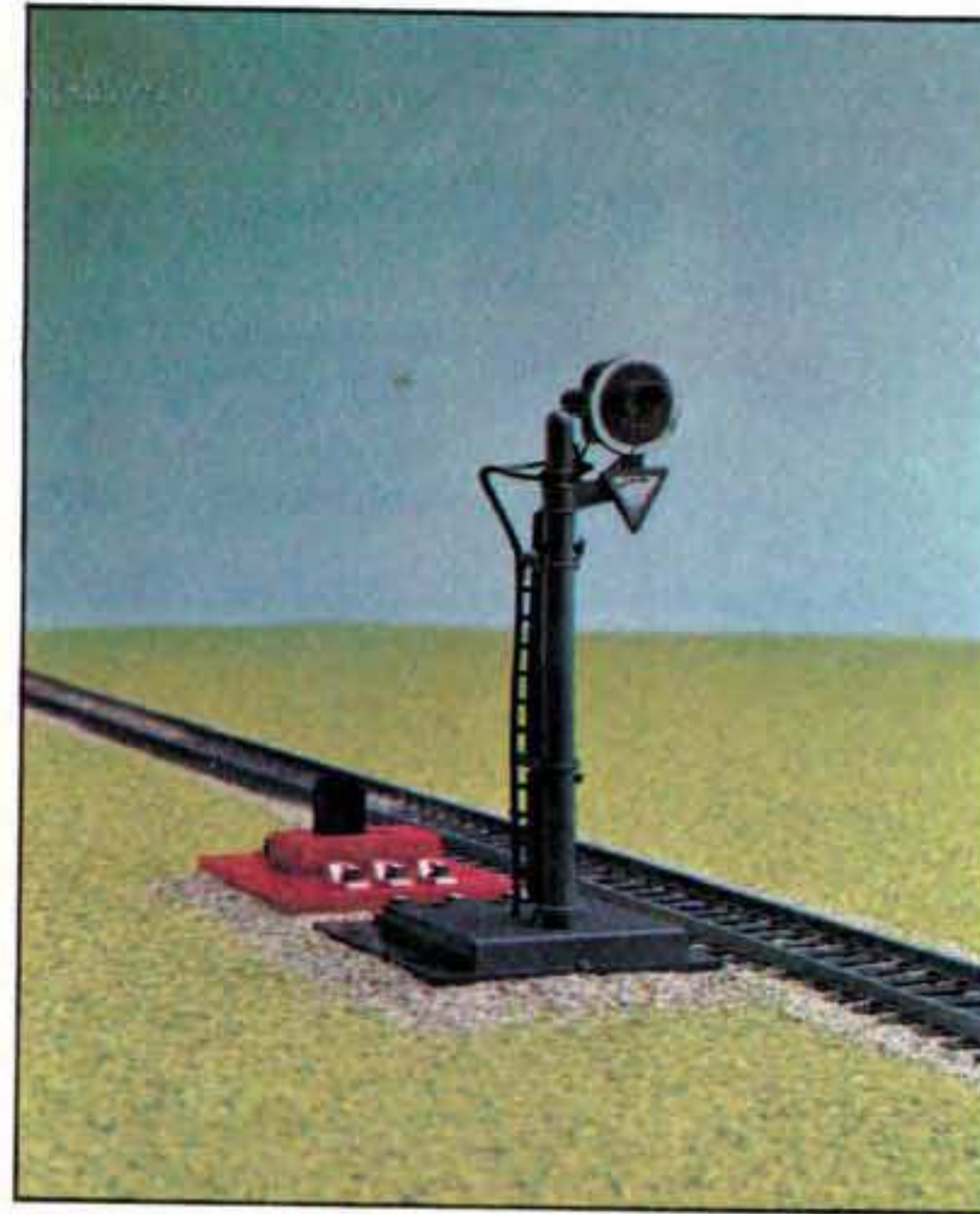
# SIGNALS



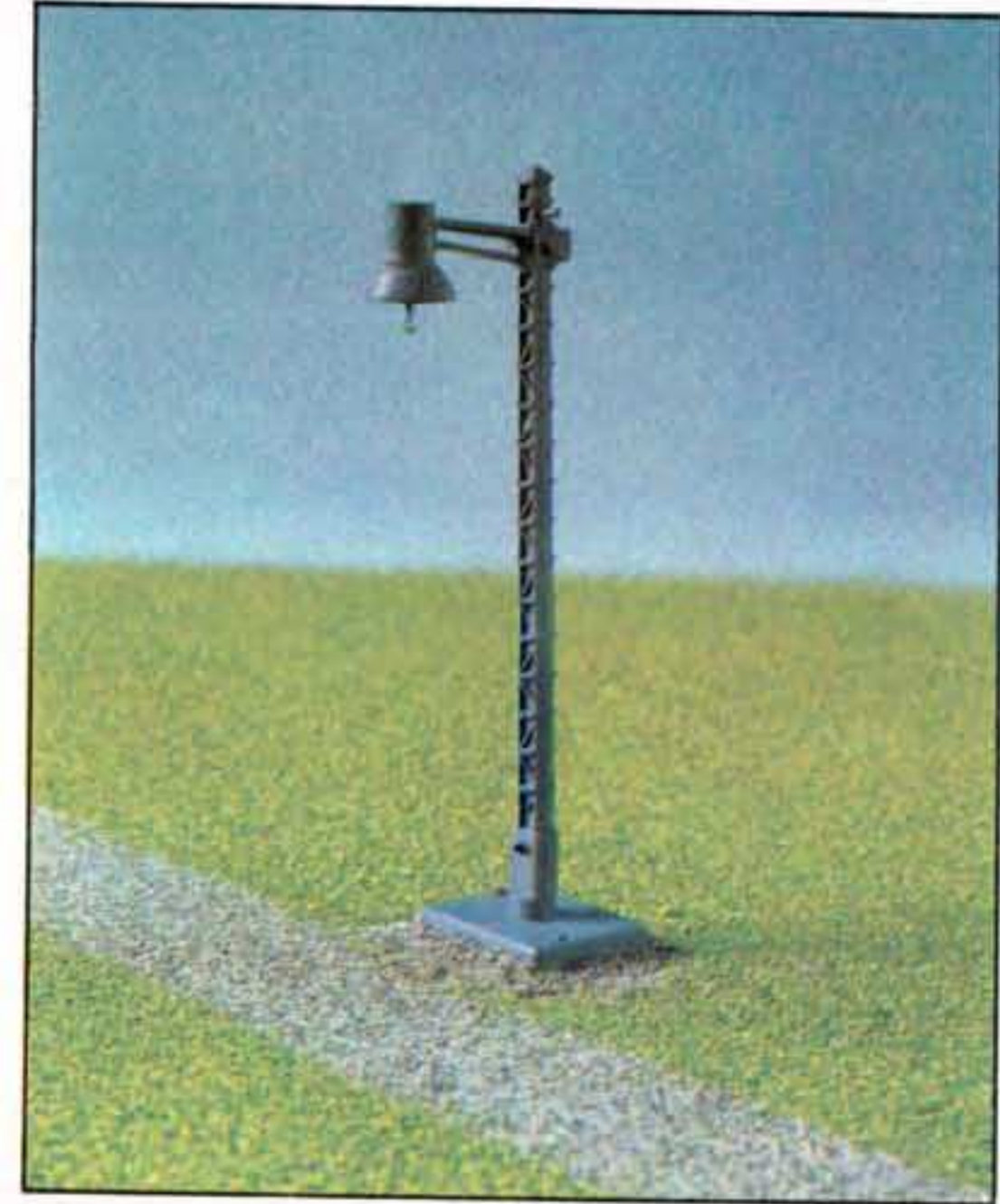
600023 Signal with Four Lights.



600028 Signal.



600022 Signal with Two Lights.



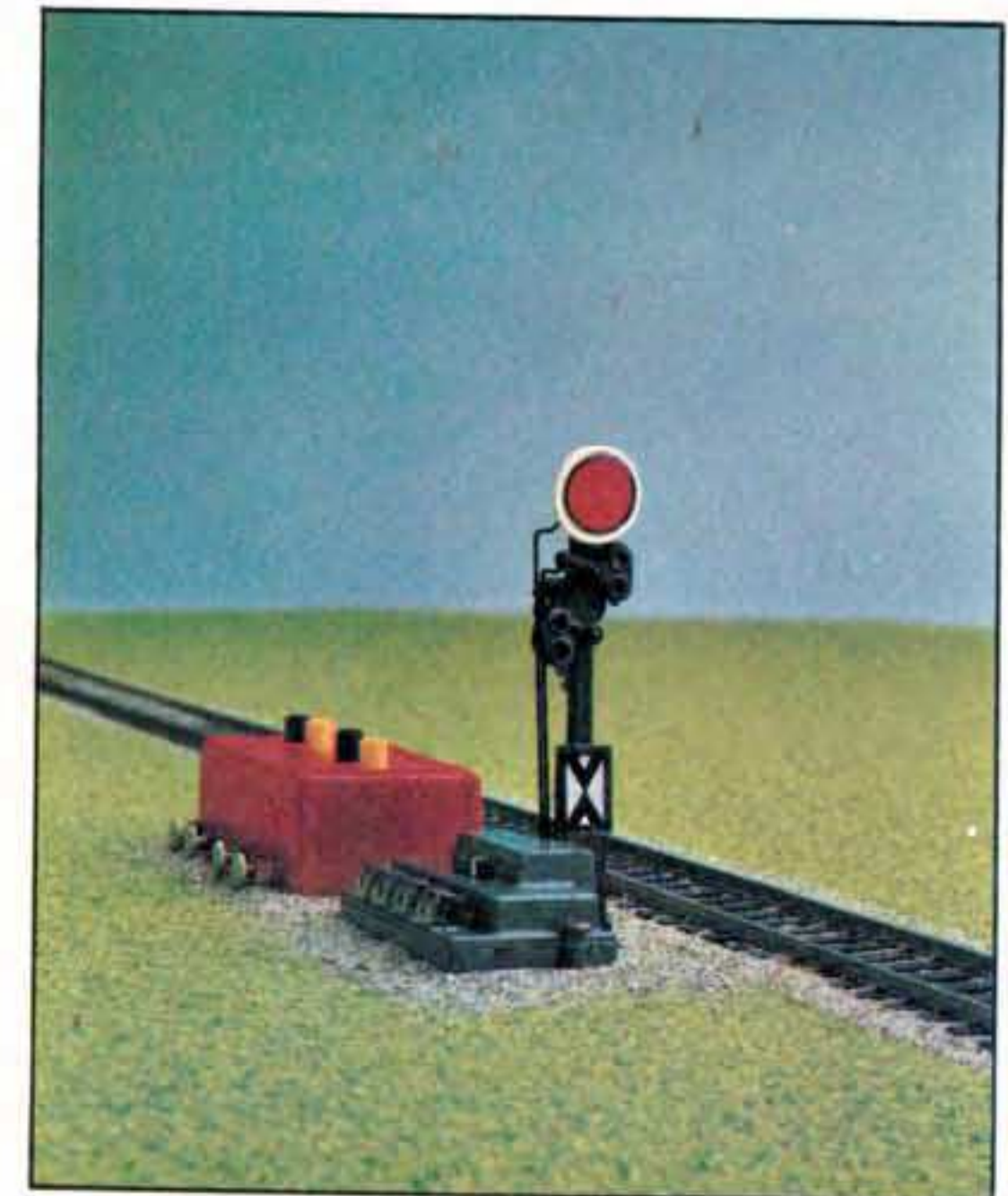
600026 Single Street Lamp.



600025 Overhead Gantry Signal with Level Crossing.

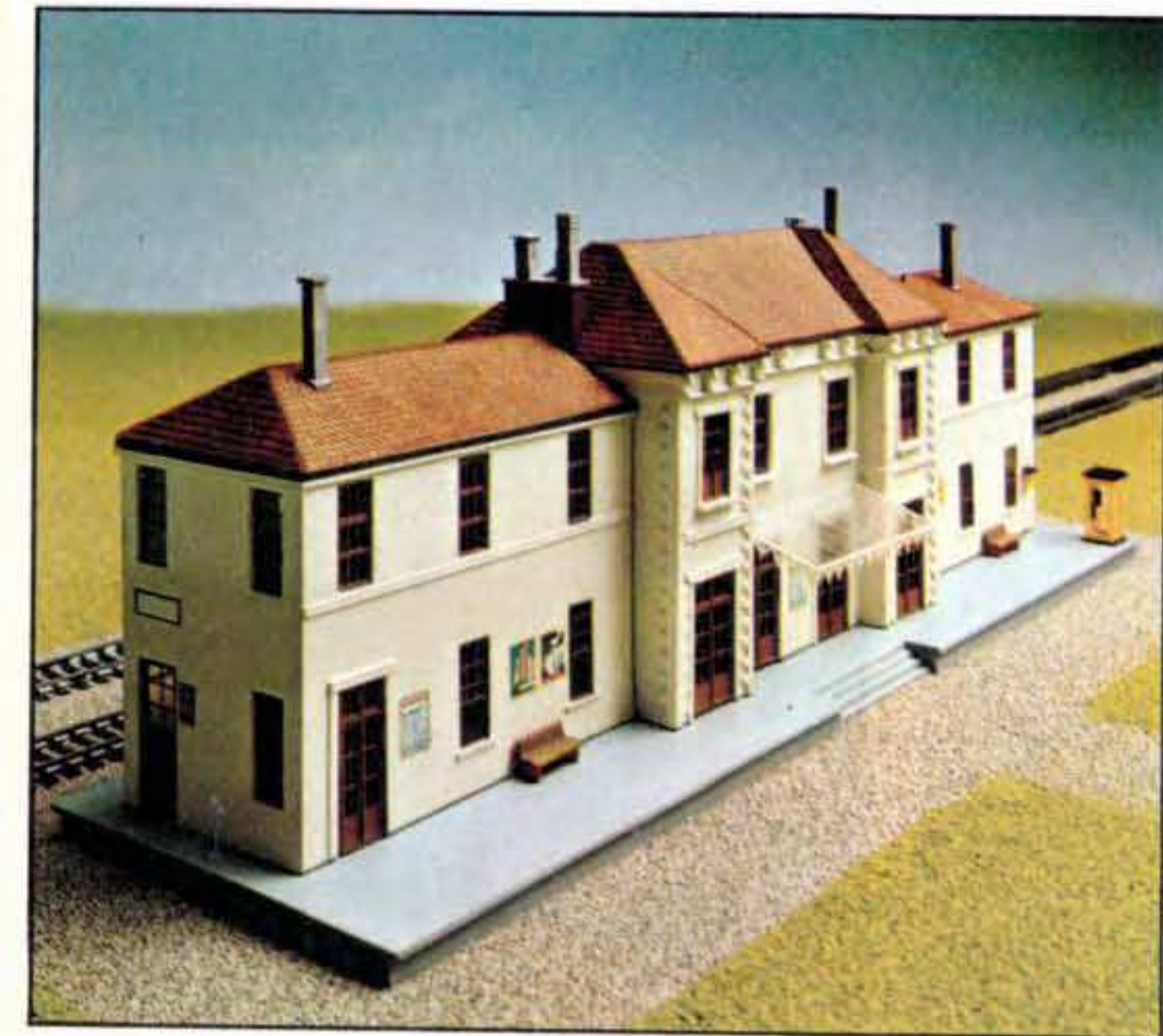


600027 Street lamp with two arms



600030 Signal

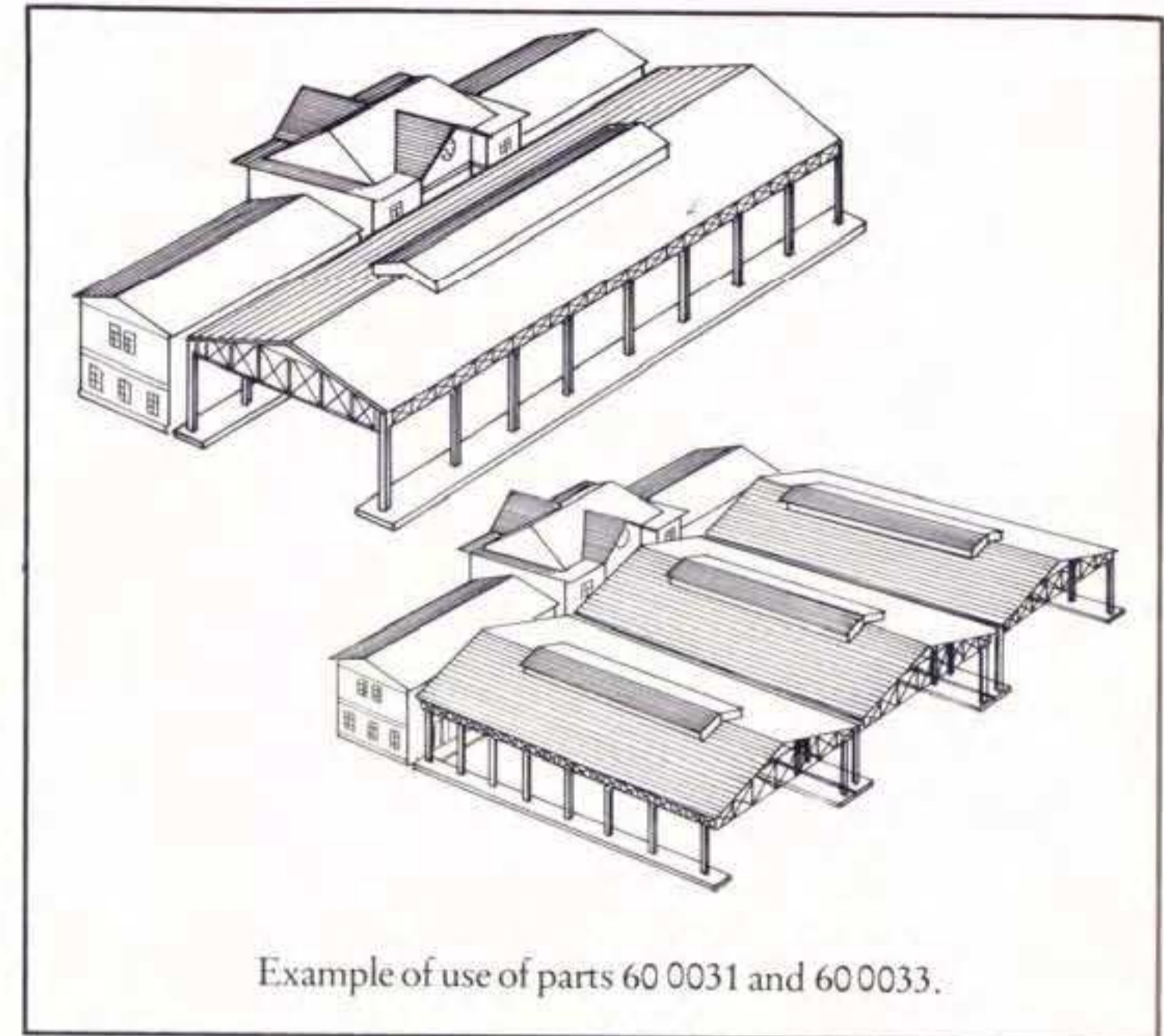
# ACCESSORIES



600033 Station.

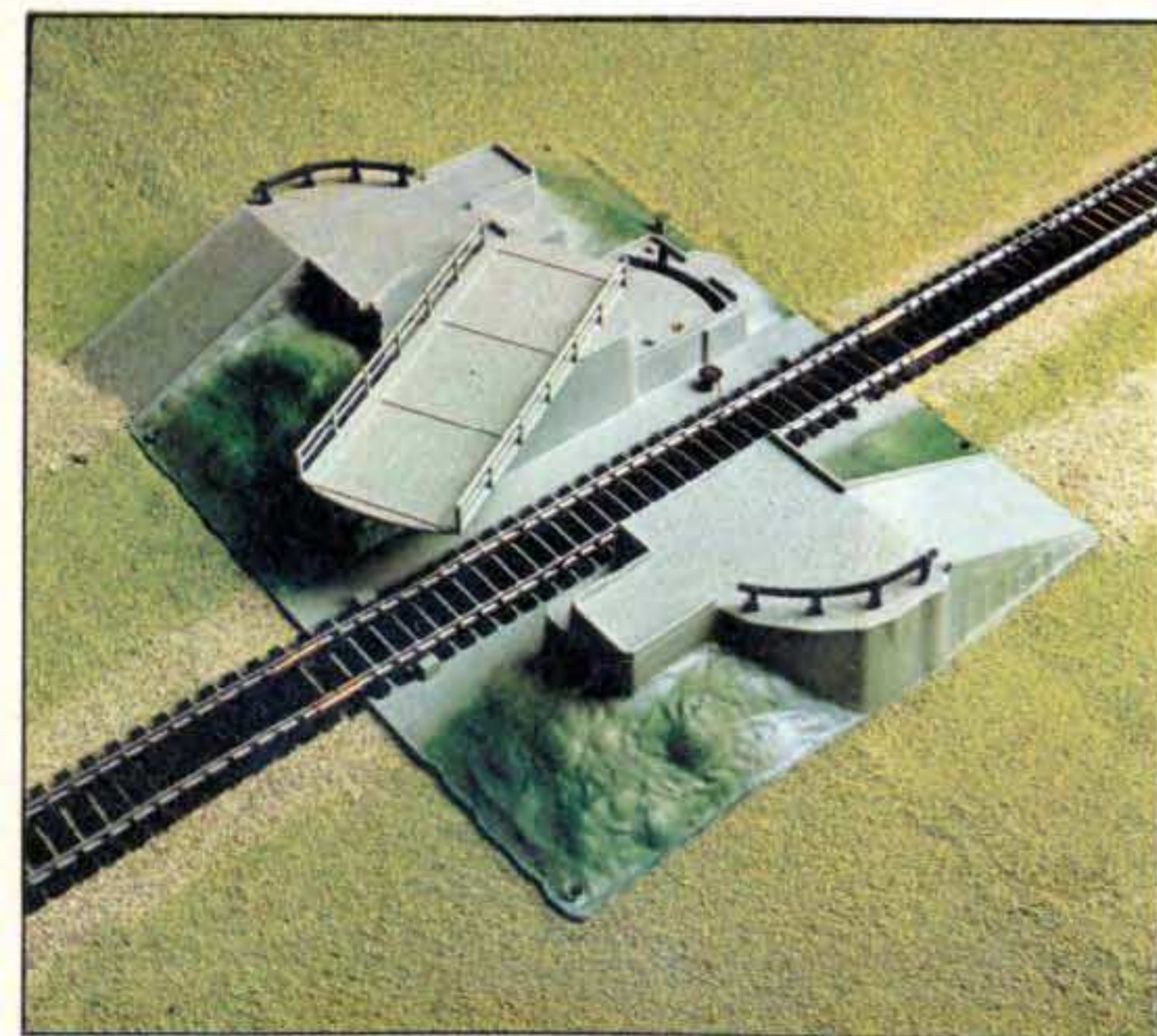


600031 Station Canopy.

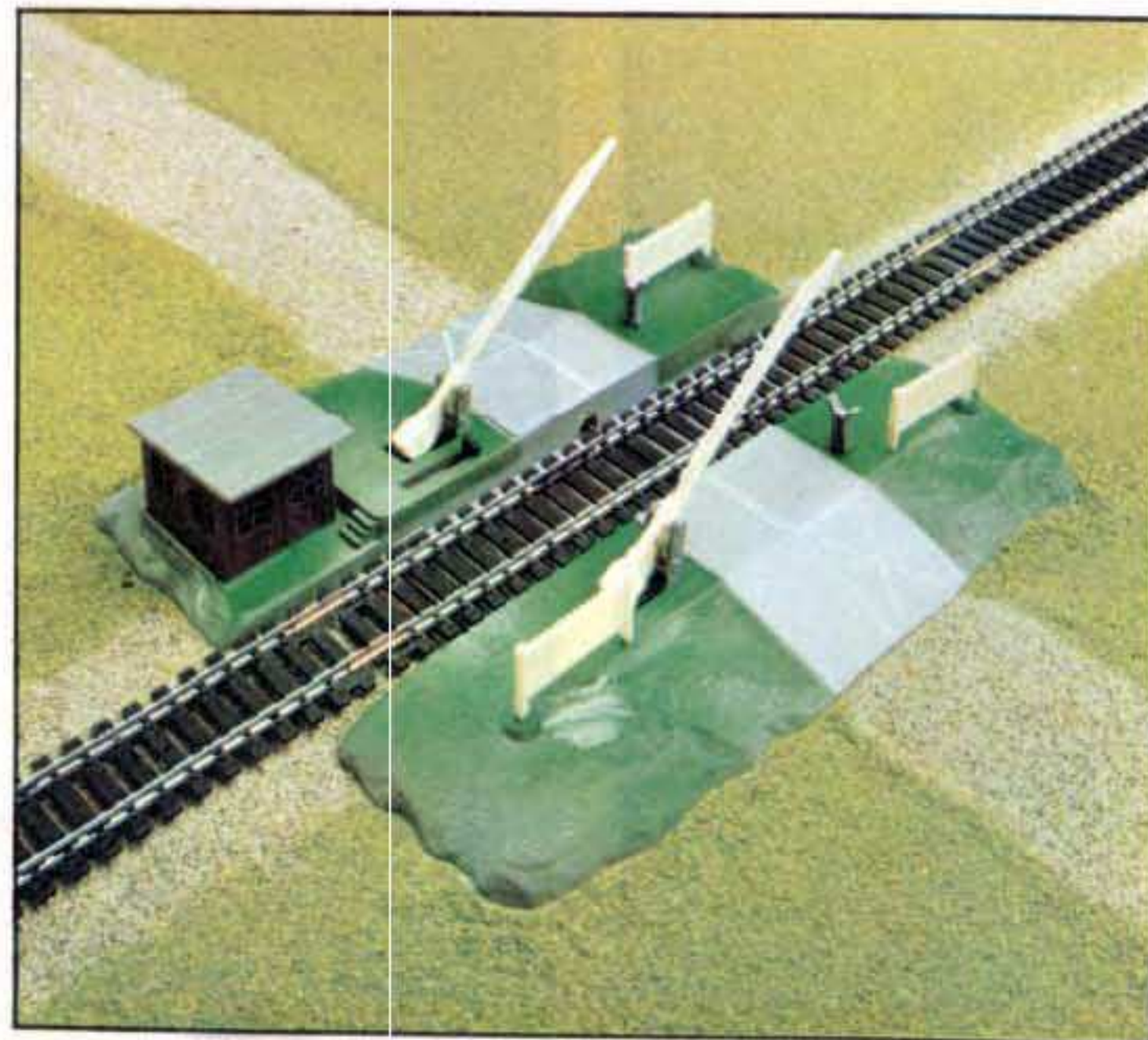


Example of use of parts 60 0031 and 60 0033.

Terminal station with one unit 600033 and three units 600031.  
Through station with one unit 600033 and one unit 600031.



600052 Mechanical Swing Bridge with Auto Train Stop.

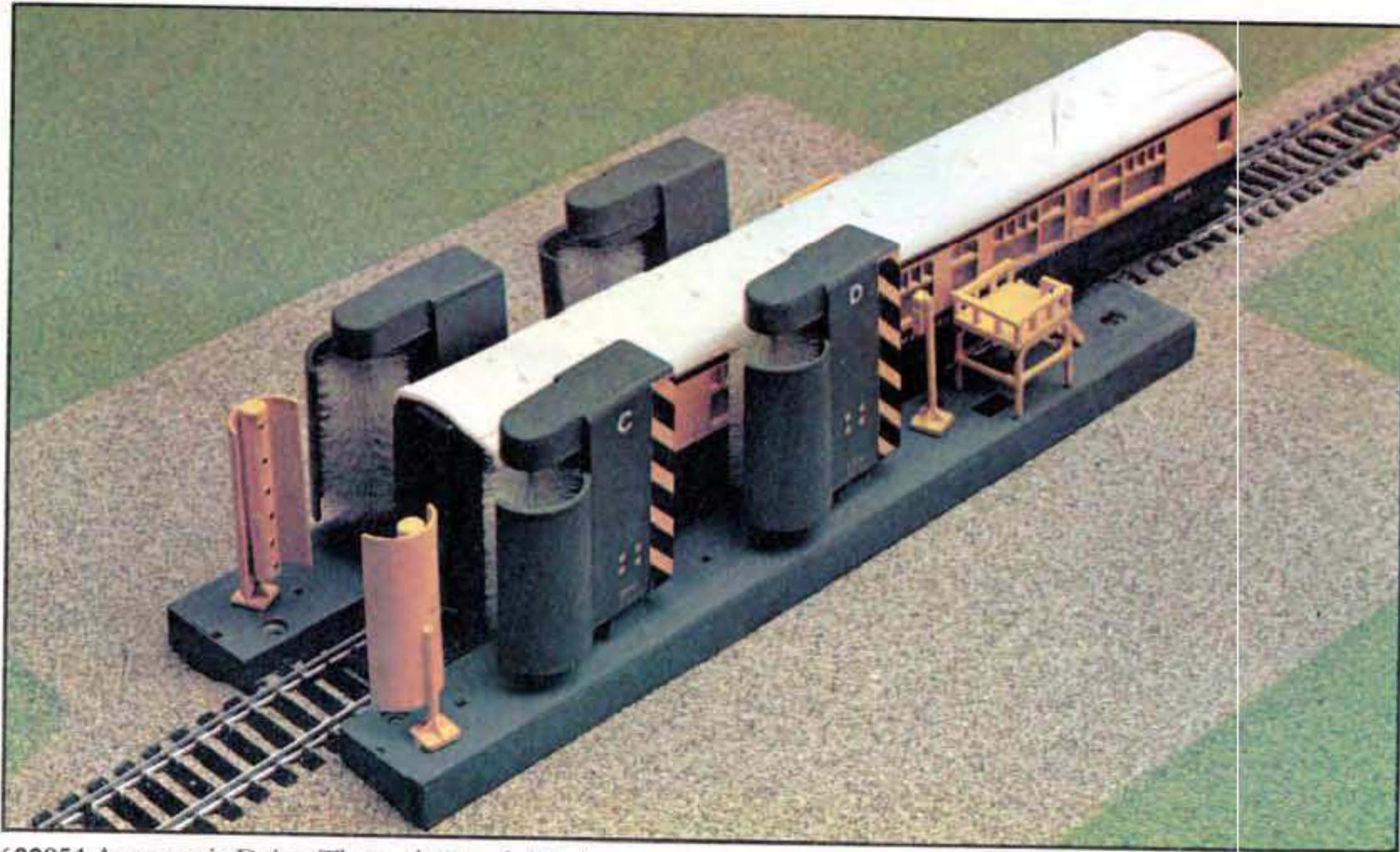


600021 Automatic Level Crossing.

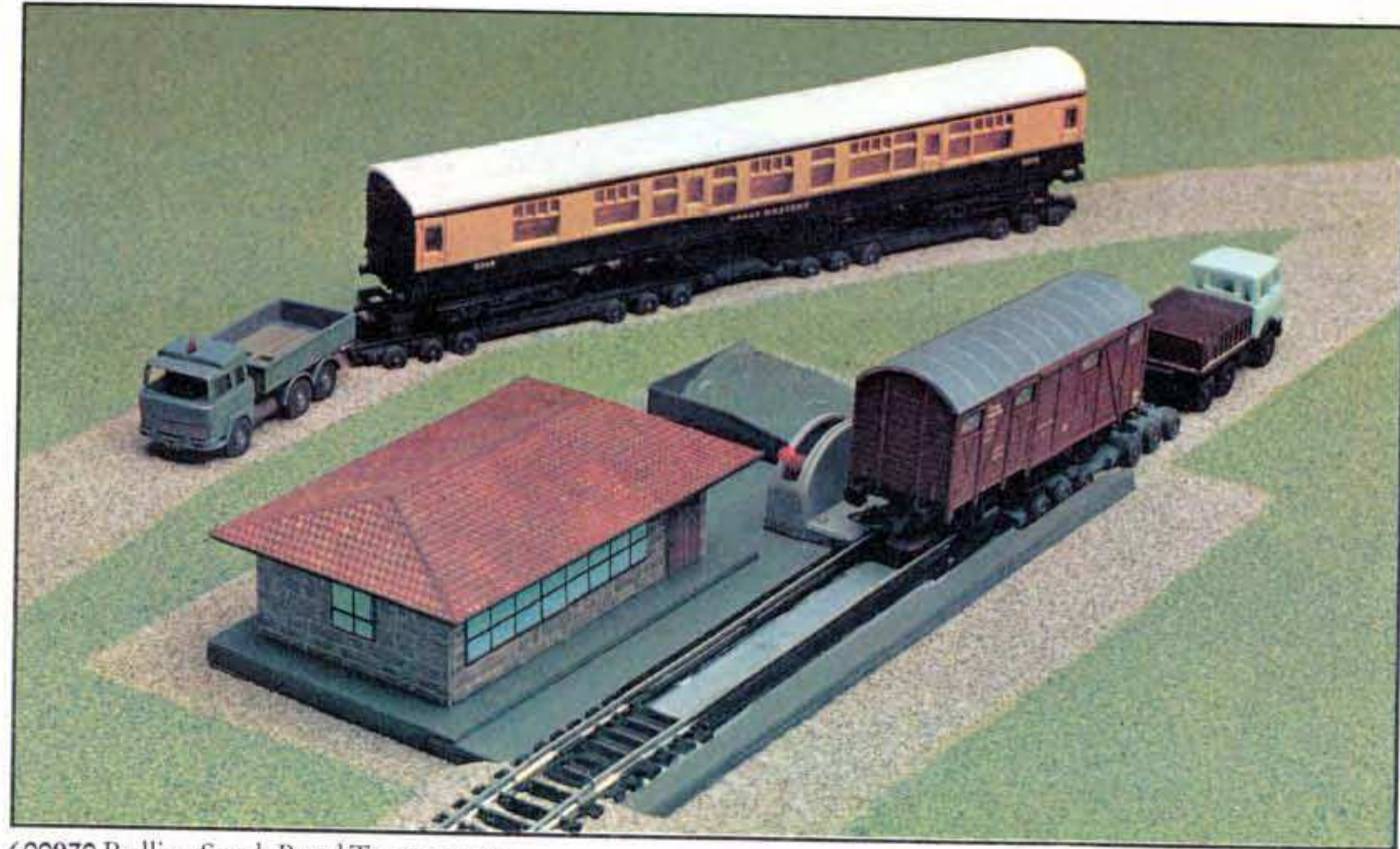


602080 Tunnel.

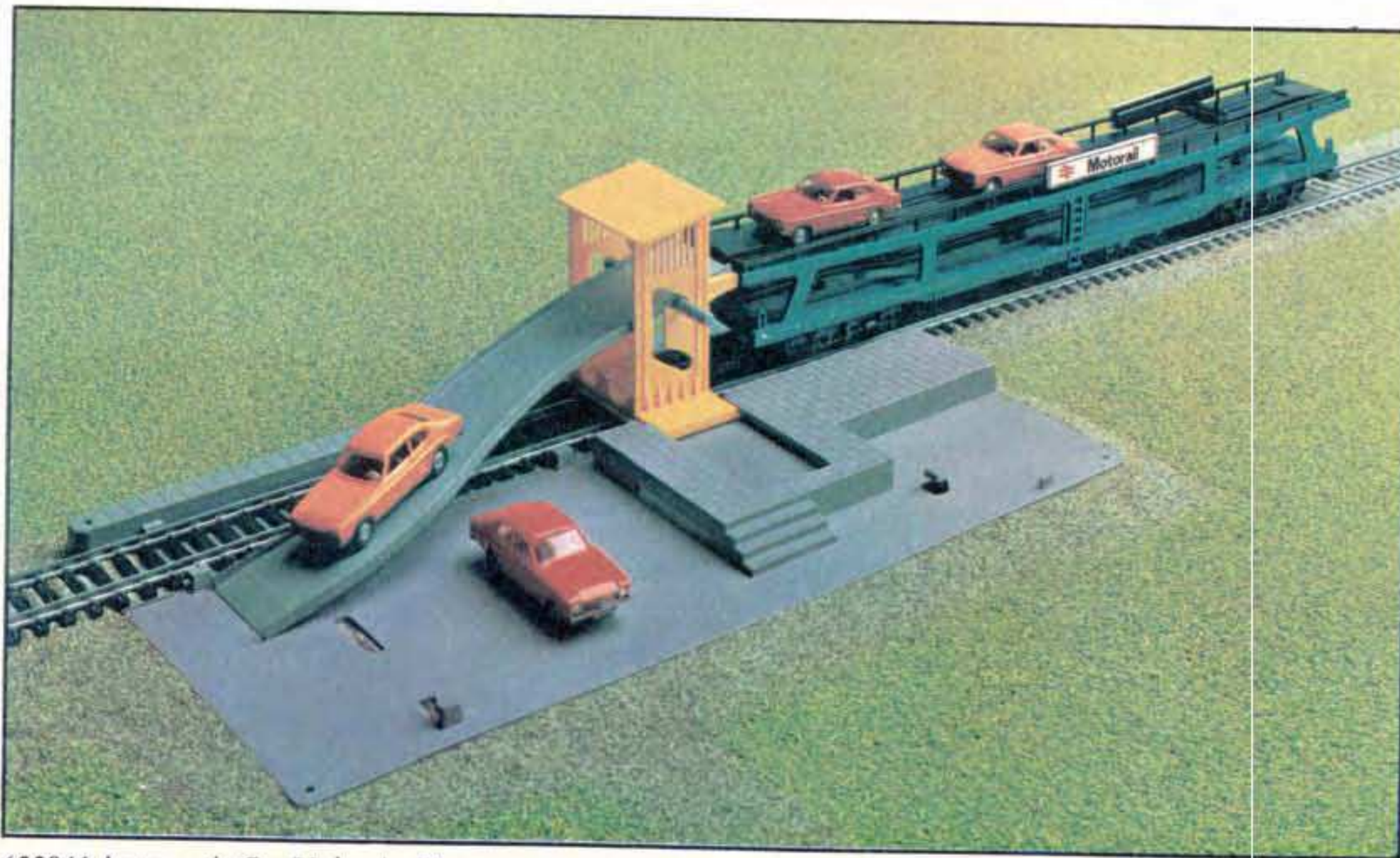
# ACCESSORIES



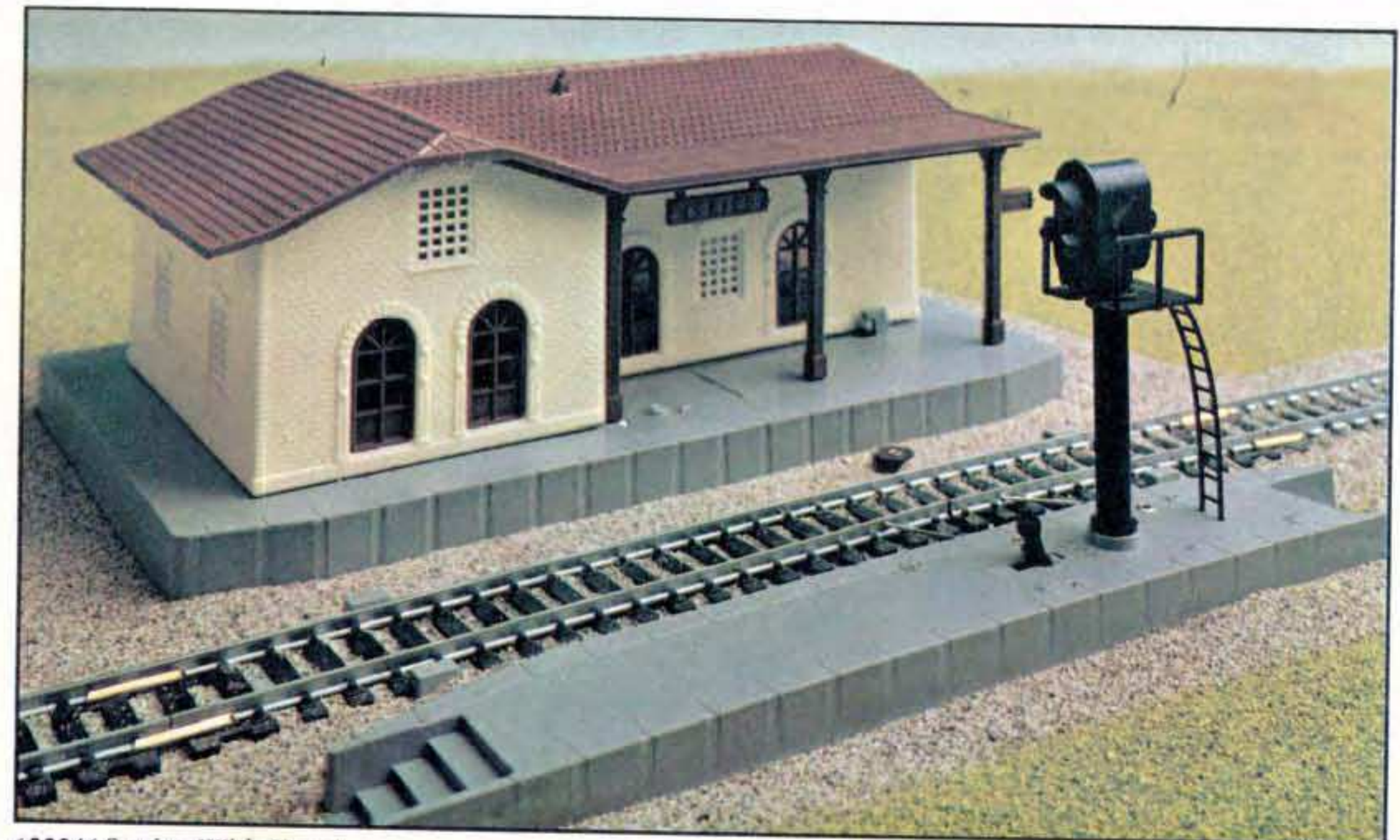
600951 Automatic Drive-Through Coach Wash.



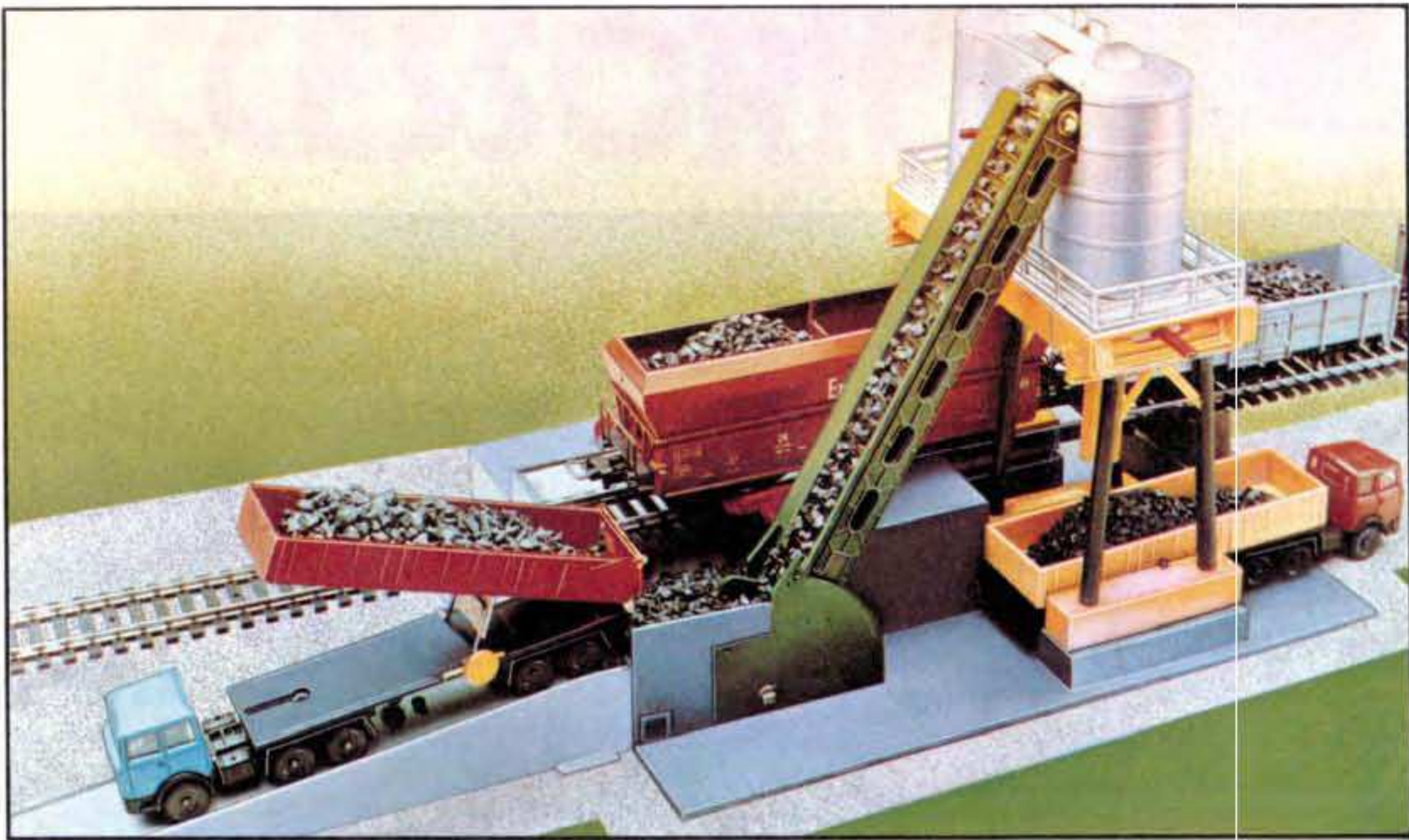
600970 Rolling Stock Road Transporter.



600941 Automatic Car Unloader Base.



600046 Station With Signal.



600961 Operating Terminal for Loading/Unloading Containers.



602892 "ICI Salt" Hopper Wagon with automatic unloader terminal.

600822  
Ford Capri.

600820  
Mercedes.

600823  
FIAT 131

600804  
Shell  
Petrol  
Tanker.

600803  
Builders  
Merchant  
Lorry.

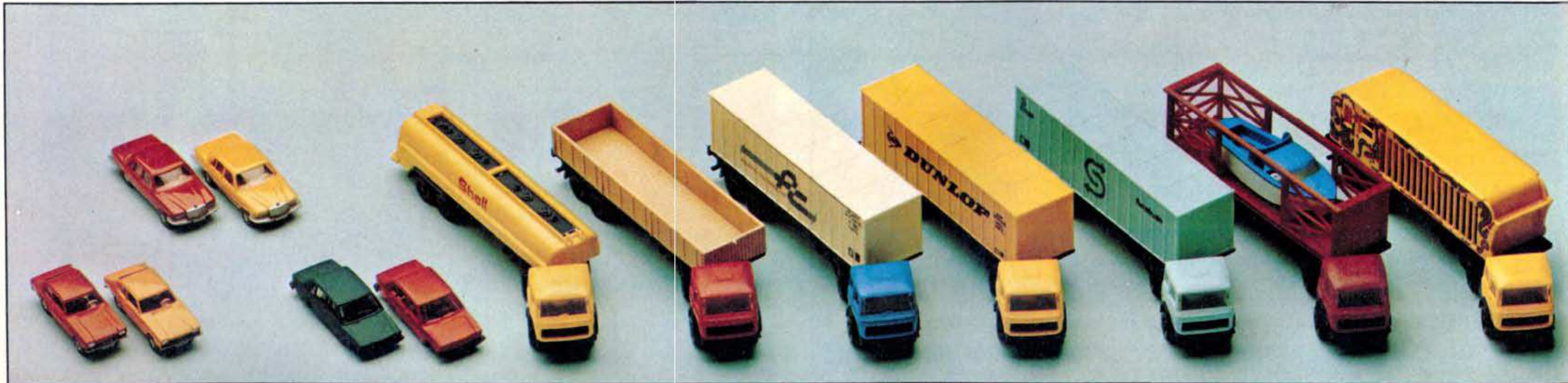
600801  
Atlantic  
Container  
Lorry.

600807  
Dunlop  
Container  
Lorry.

600805  
Seatrain  
Container  
Lorry.

600802  
Boat  
Transporter.

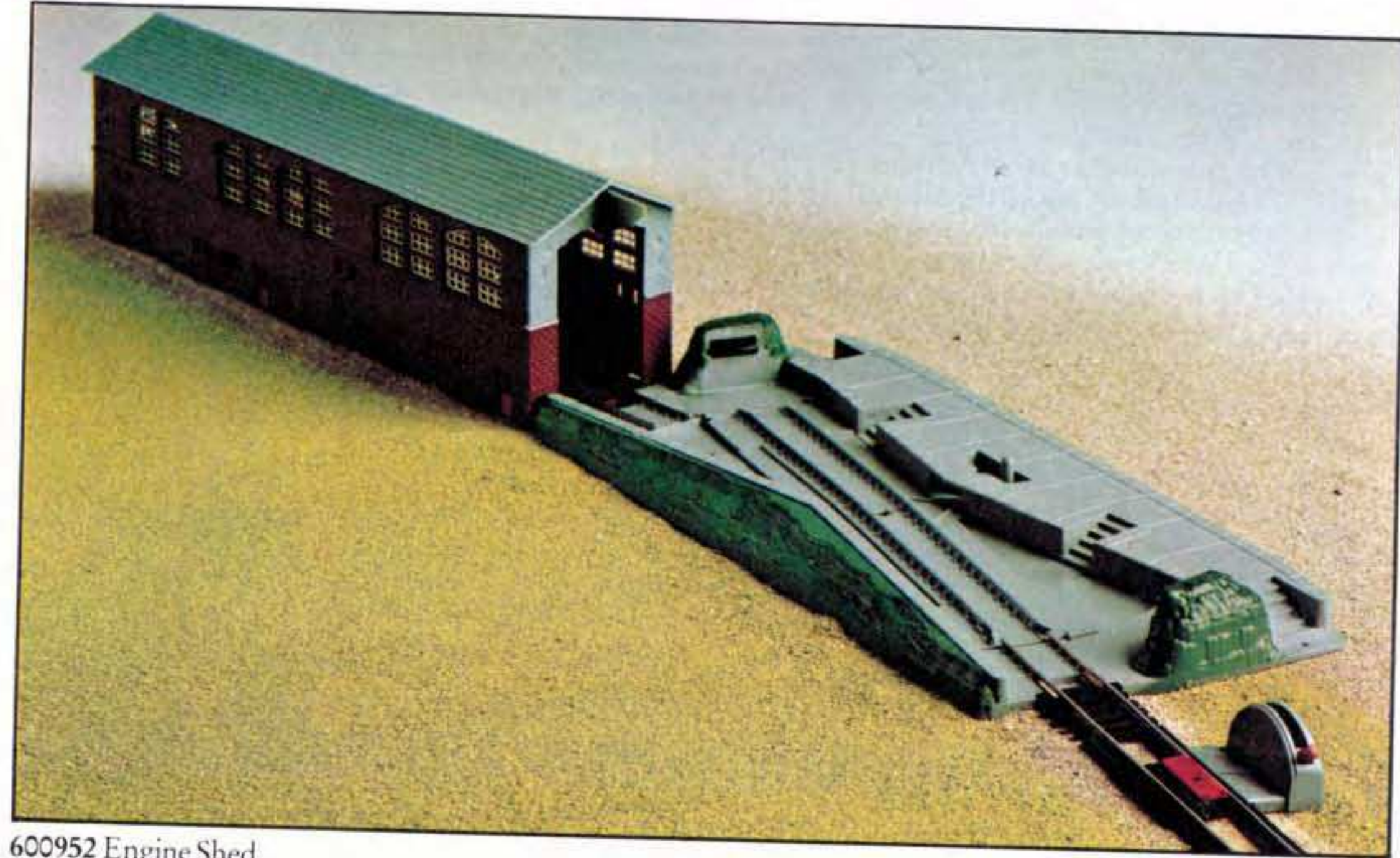
600806  
Circus  
Animal  
Transporter.



# ACCESSORIES



600963 Container Terminal and Unloading Siding.



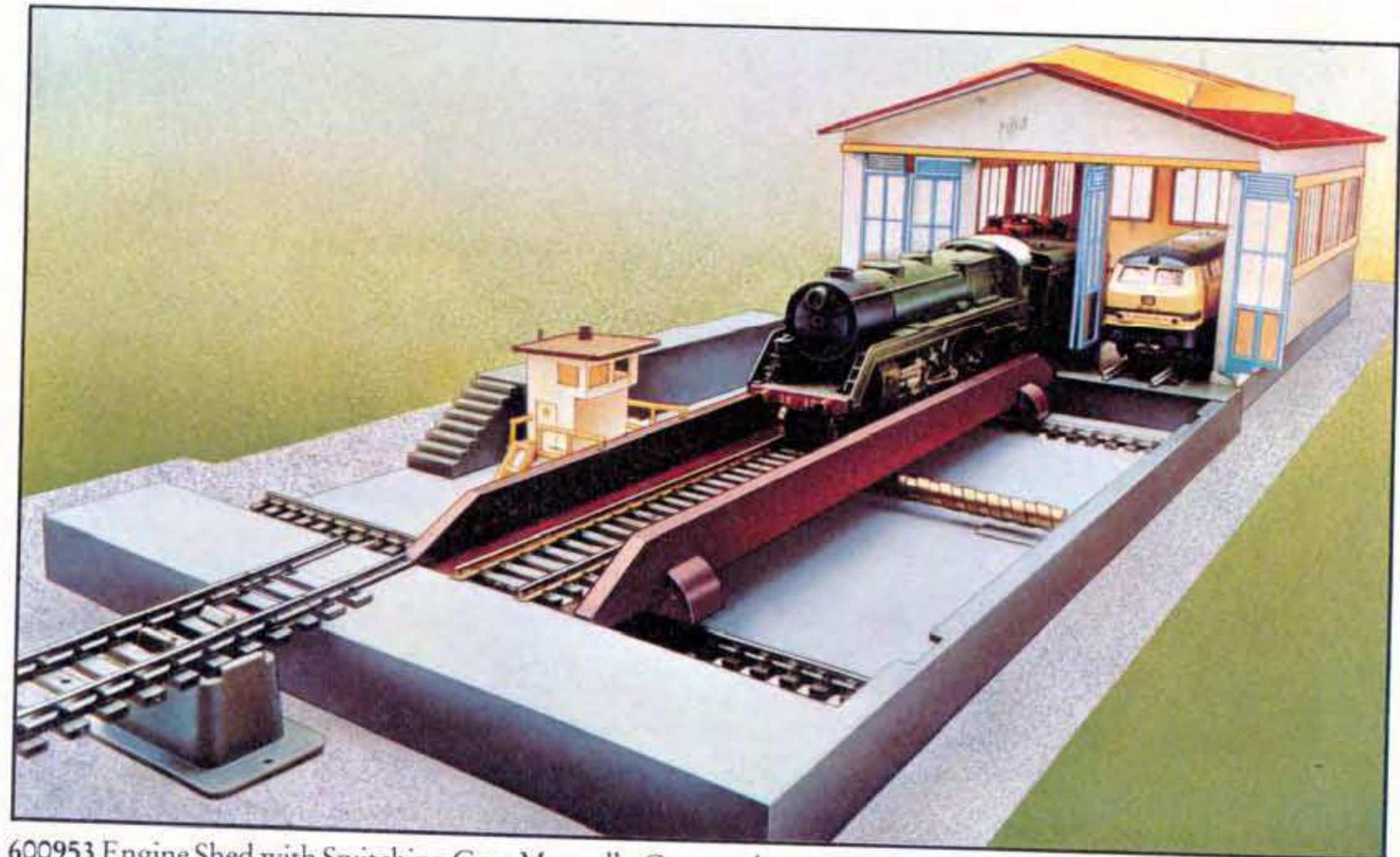
600952 Engine Shed.



600830

600831

600832



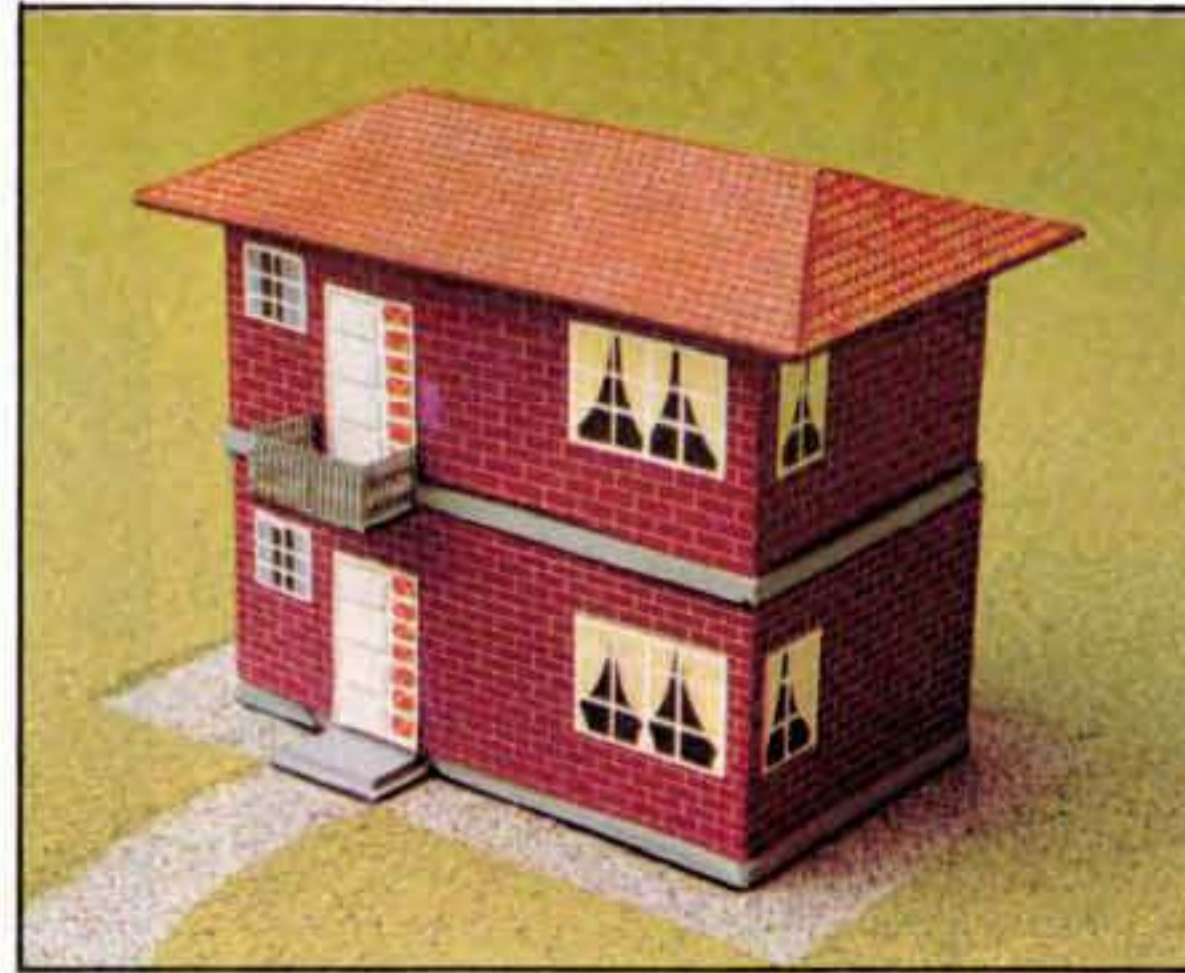
600953 Engine Shed with Switching Gear Manually Operated

# HOUSES

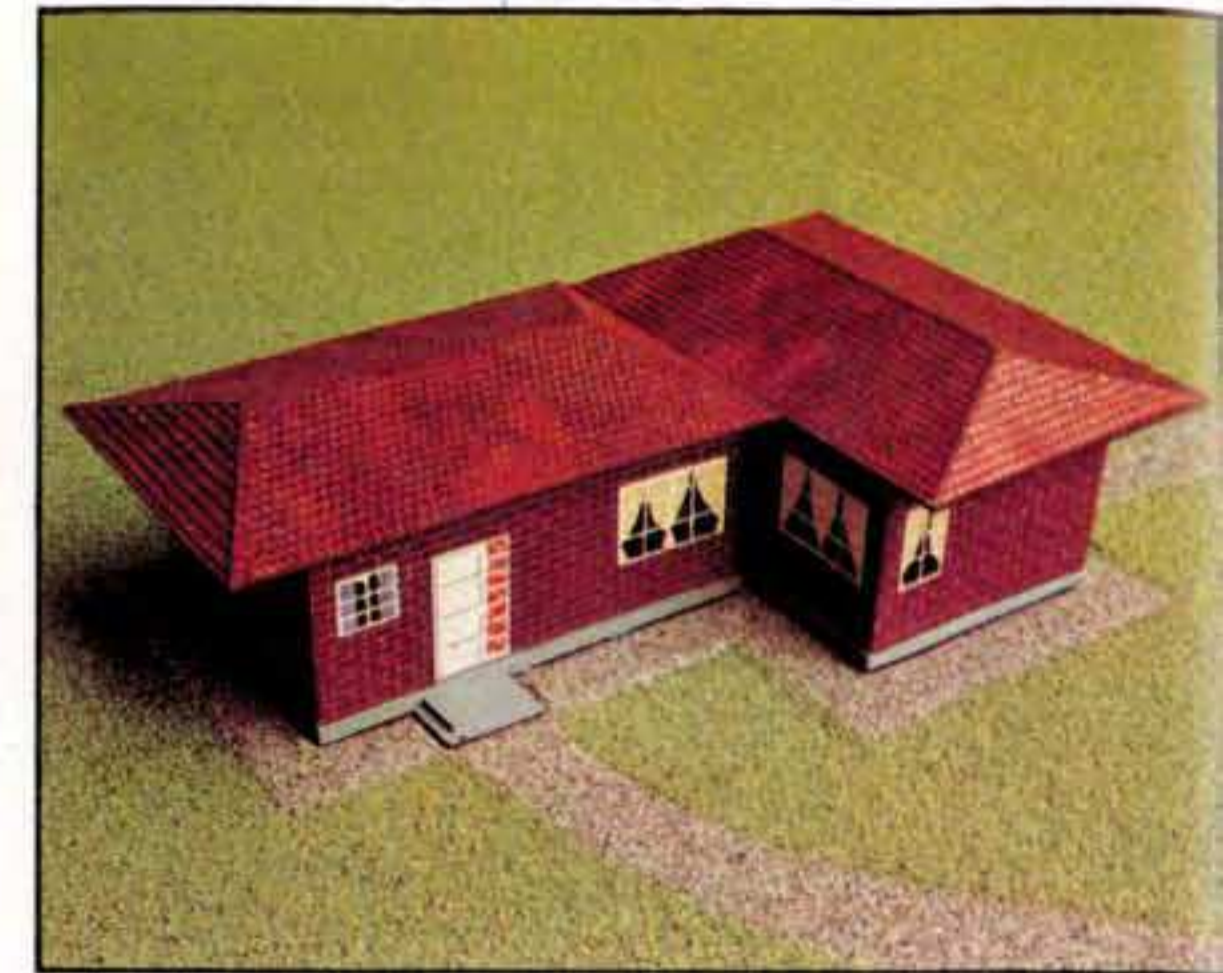
Lima have this year designed and developed a new idea in houses which enables them to be adapted to many shapes and sizes. There are two basic styles in the new range:- an OO scale House and Bungalow. These basic items can be fitted together to produce four very attractive combinations as follows:-

1. One Bungalow on top of the other.
2. Two Bungalows placed together to form an L-shape.
3. A House on top of the Bungalow.
4. Two Houses placed end to end.

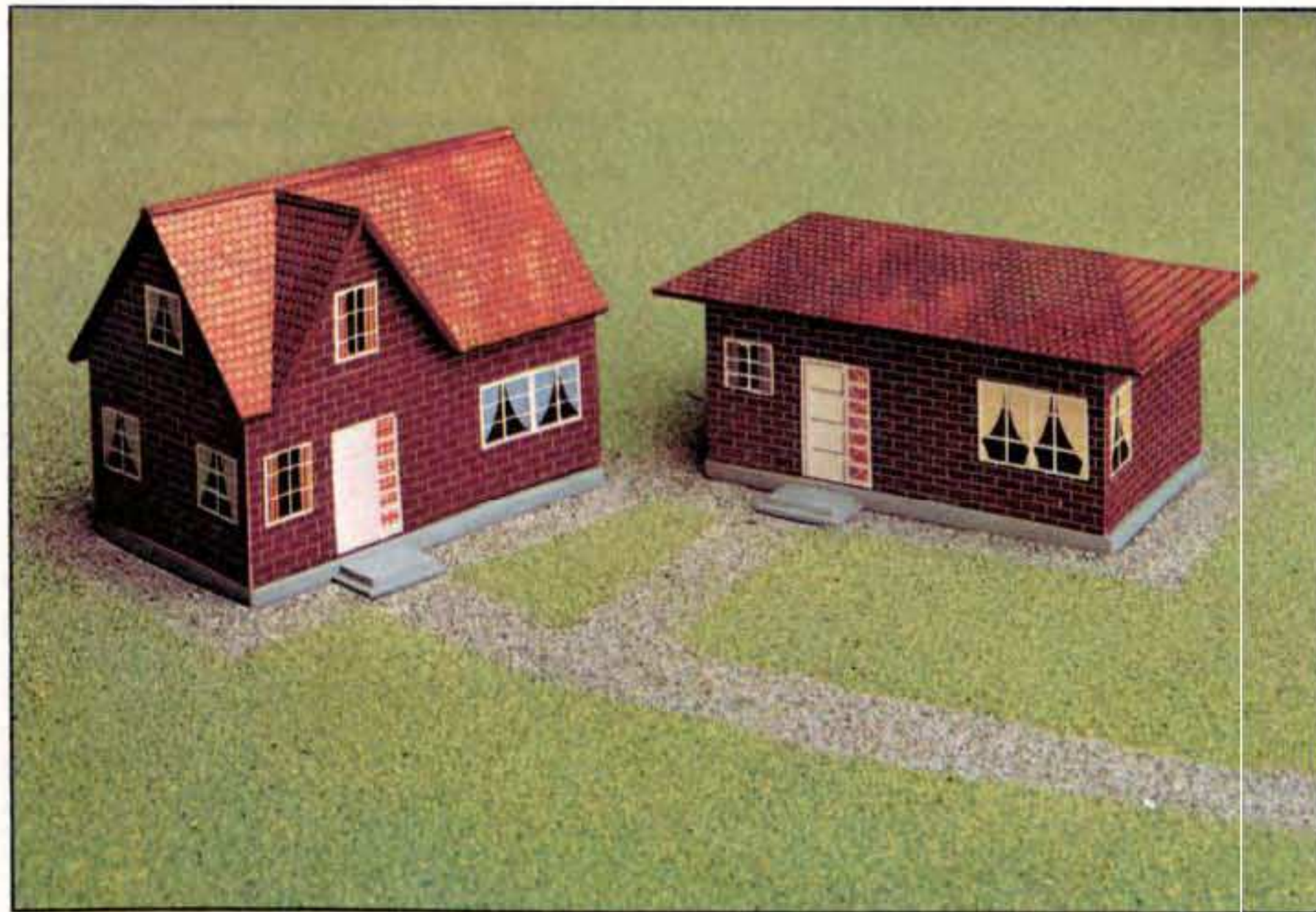
The fact that this new system is so versatile will enable you to enhance your layout in many ways with Lima's new range of houses.



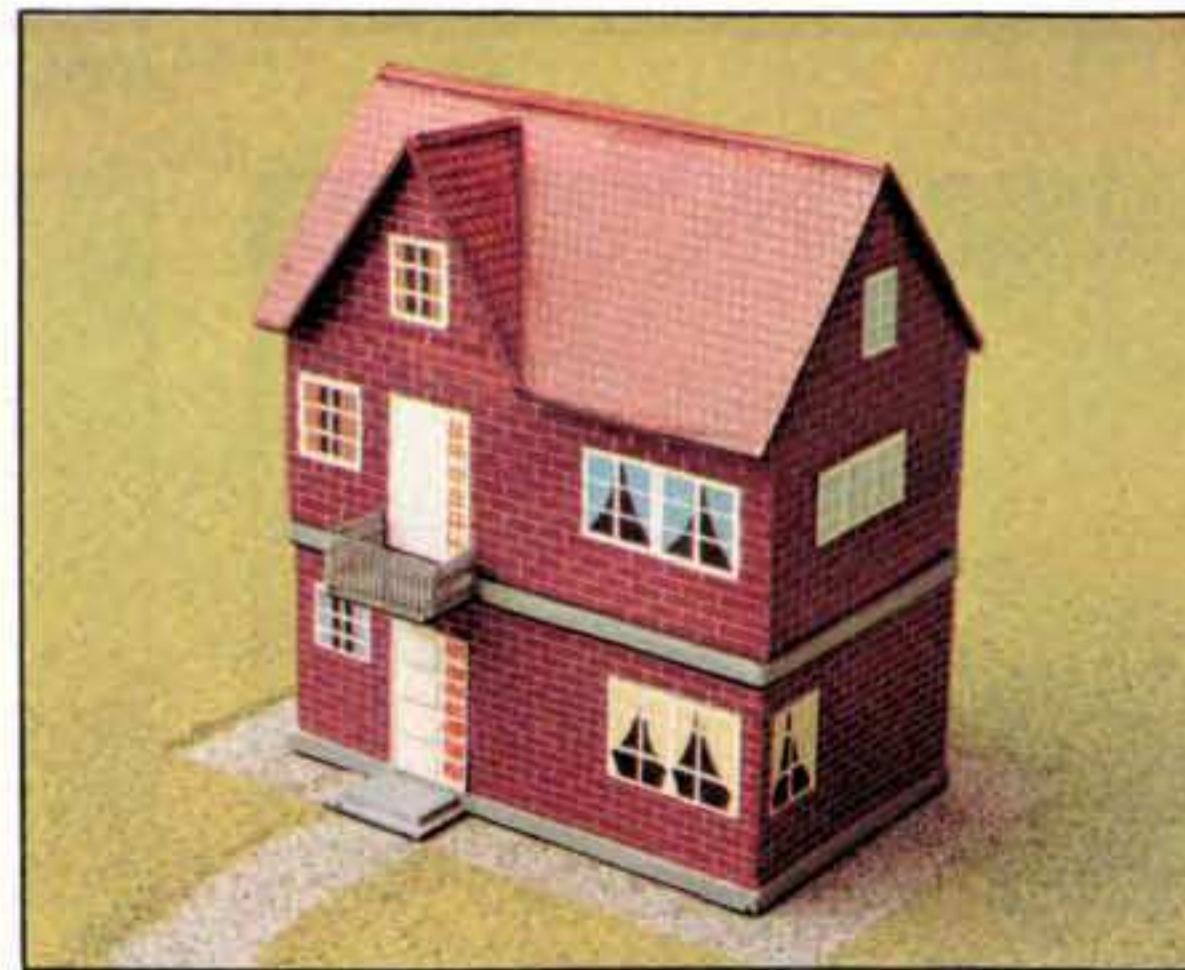
1. One Bungalow on top of the other.



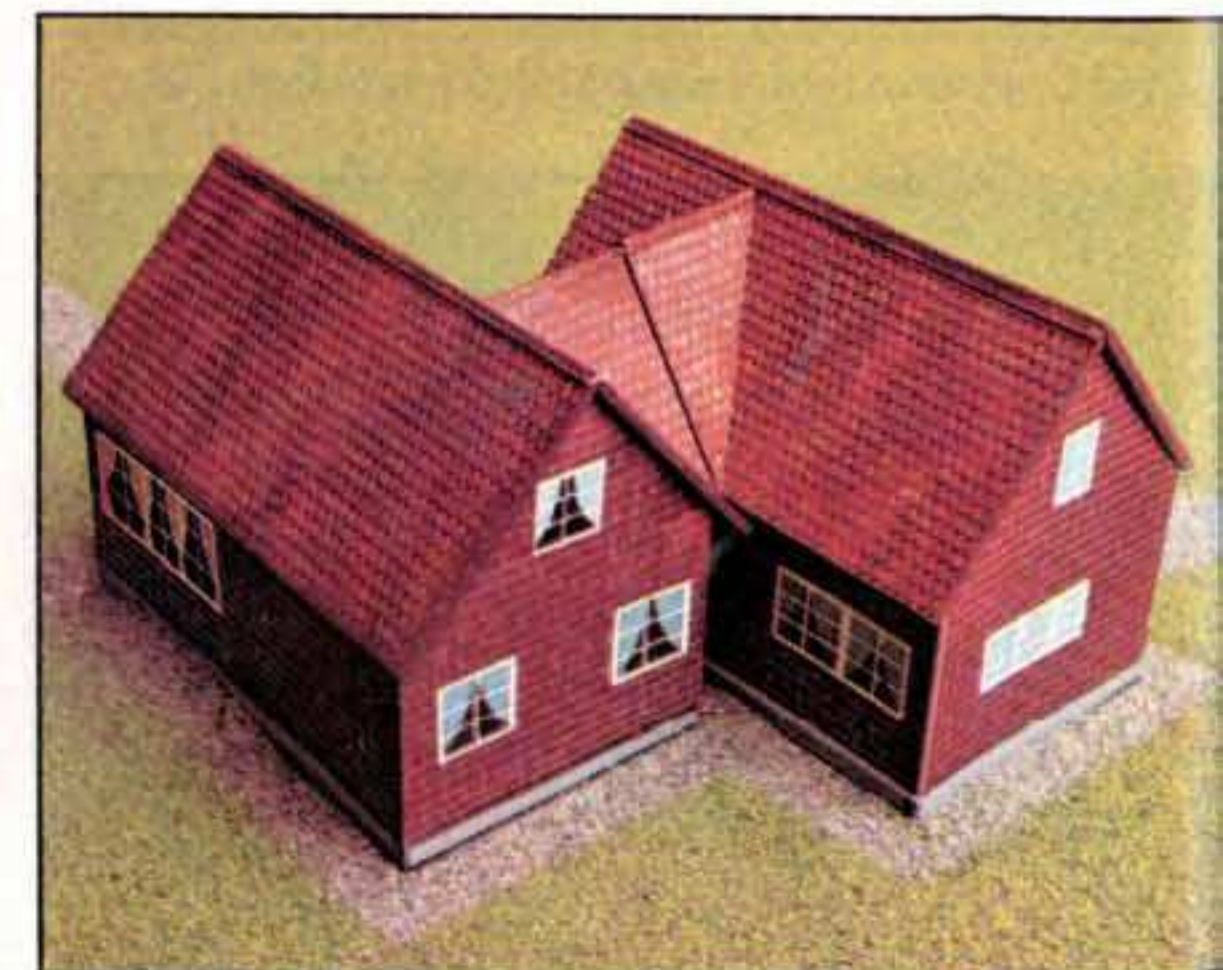
2. Two Bungalows placed together to form an L-shape.



600050 British house in cottage style. 601048 Bungalow, suitable for town or country settings.



3. A House on top of the Bungalow.



4. Two Houses placed end to end.



# N GAUGE

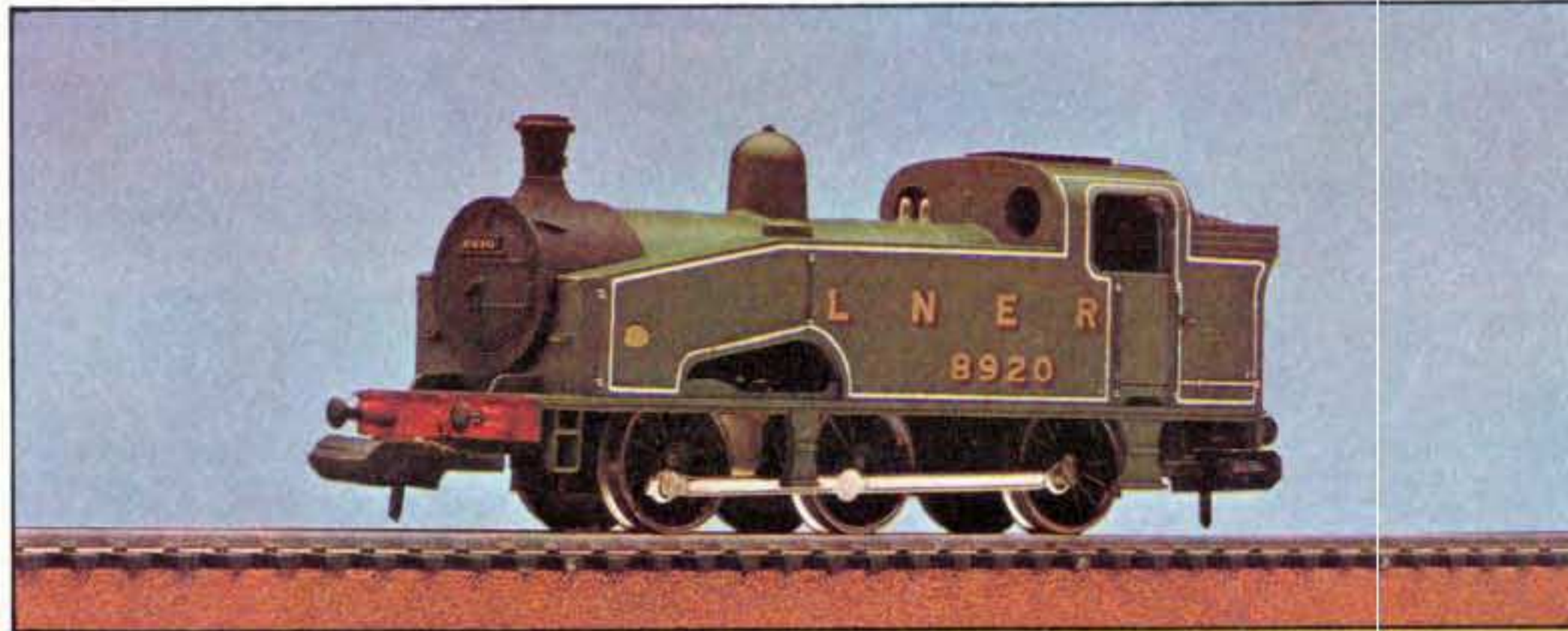
One of the newest developments in model railways, 'N' Gauge, is especially suited to today's living conditions where space is at a premium.

Many people just don't have room for a permanent 'OO/HO' system — but a really intricate 'N' Gauge layout can easily fit onto a baseboard as small as 92cm x 61cm. Another important factor is that the modeller who wishes to be creative with his scenery can incorporate much more into an 'N' Gauge layout with its facility to create a larger 'backdrop.' The gauge used for 'N' is 9mm to a scale of 2mm:1 ft.

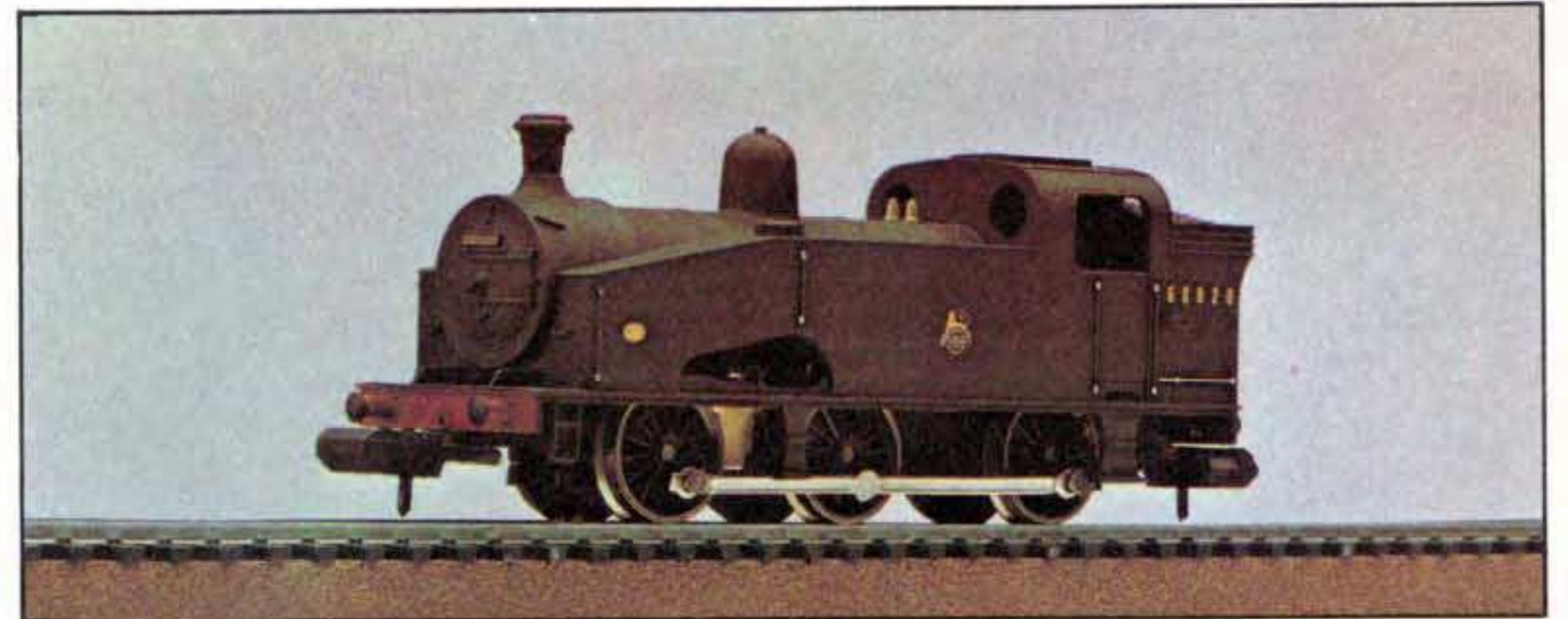
Lima have an enviable world-wide reputation for packing both reliability and a wealth of fine detail into their 'N' Gauge models. A reputation built up over many years of experience with this scale.



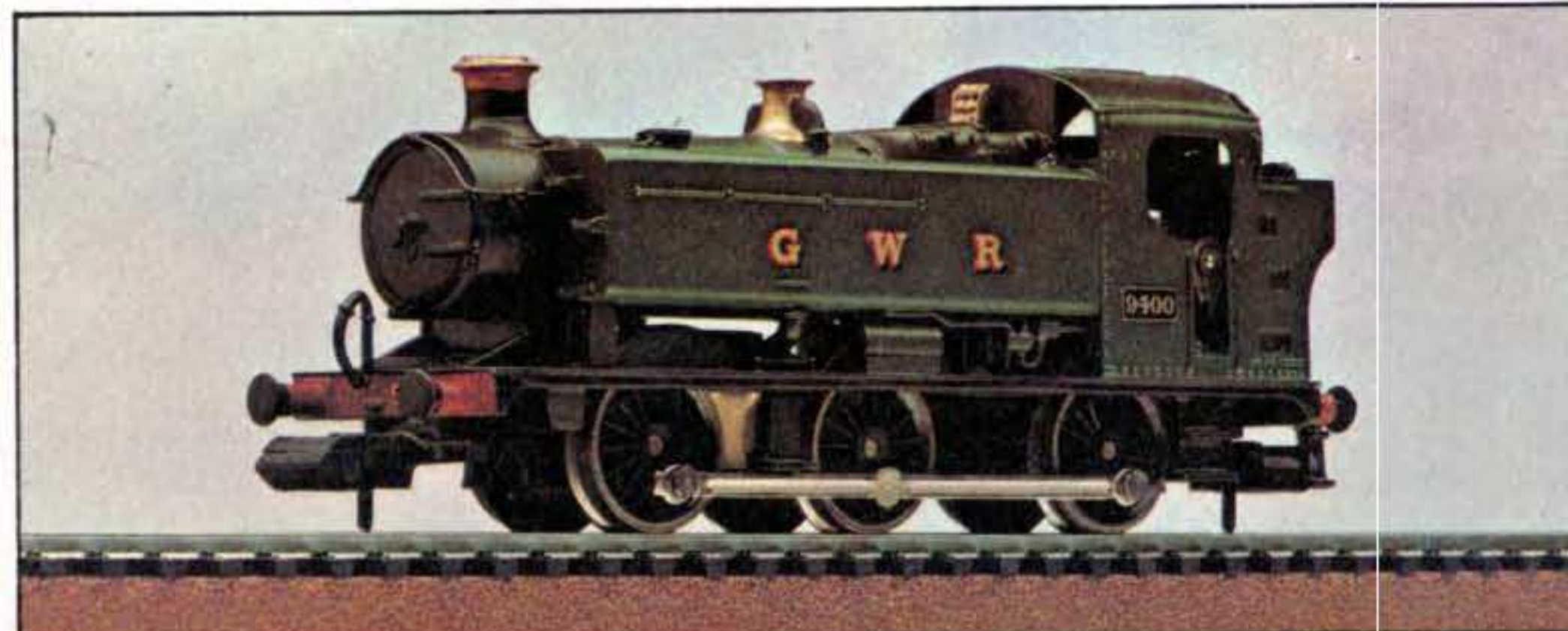
N GAUGE



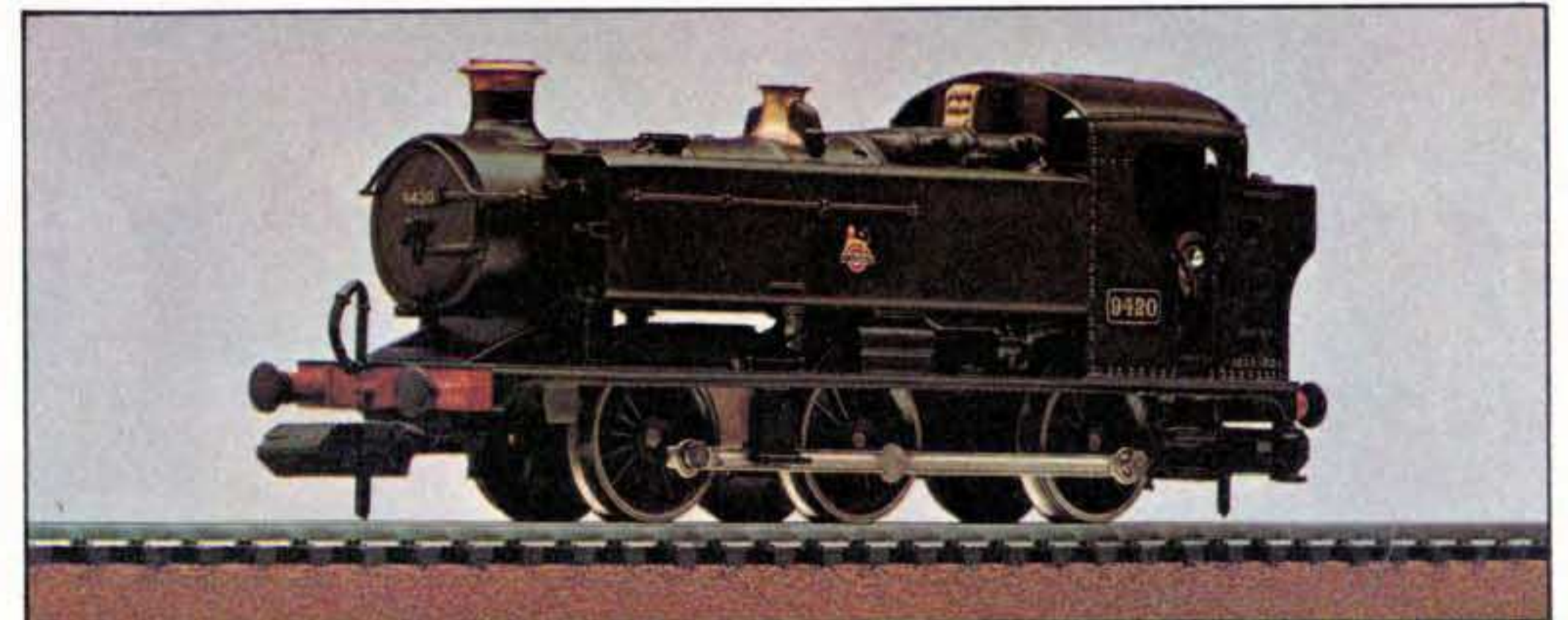
220254 0-6-0T Class J50 Tank Loco. LNER Livery.



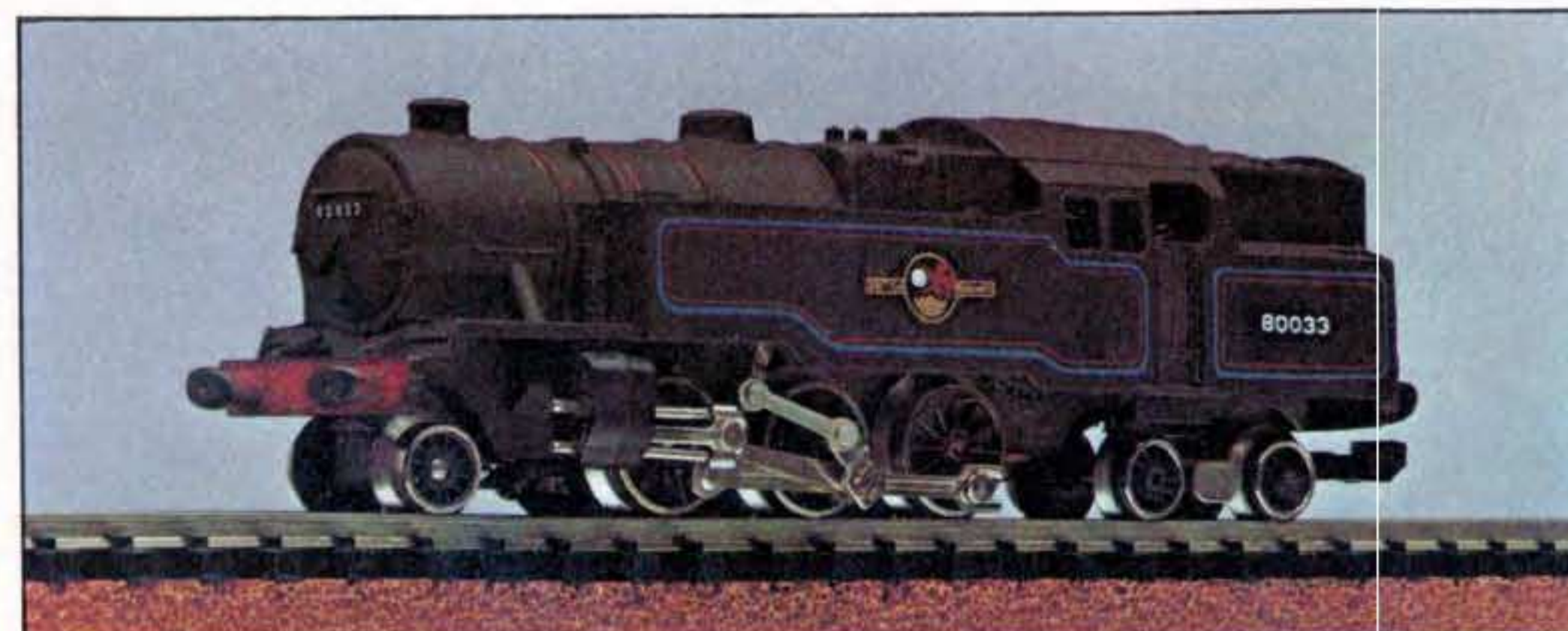
220255 0-6-0 T Class J50 Tank Locomotive. BR Livery.



220240 0-6-0T 94 xx Class Tank Locomotive. GWR Livery.



220241 0-6-0T 94 xx Class Tank Locomotive. BR Livery.

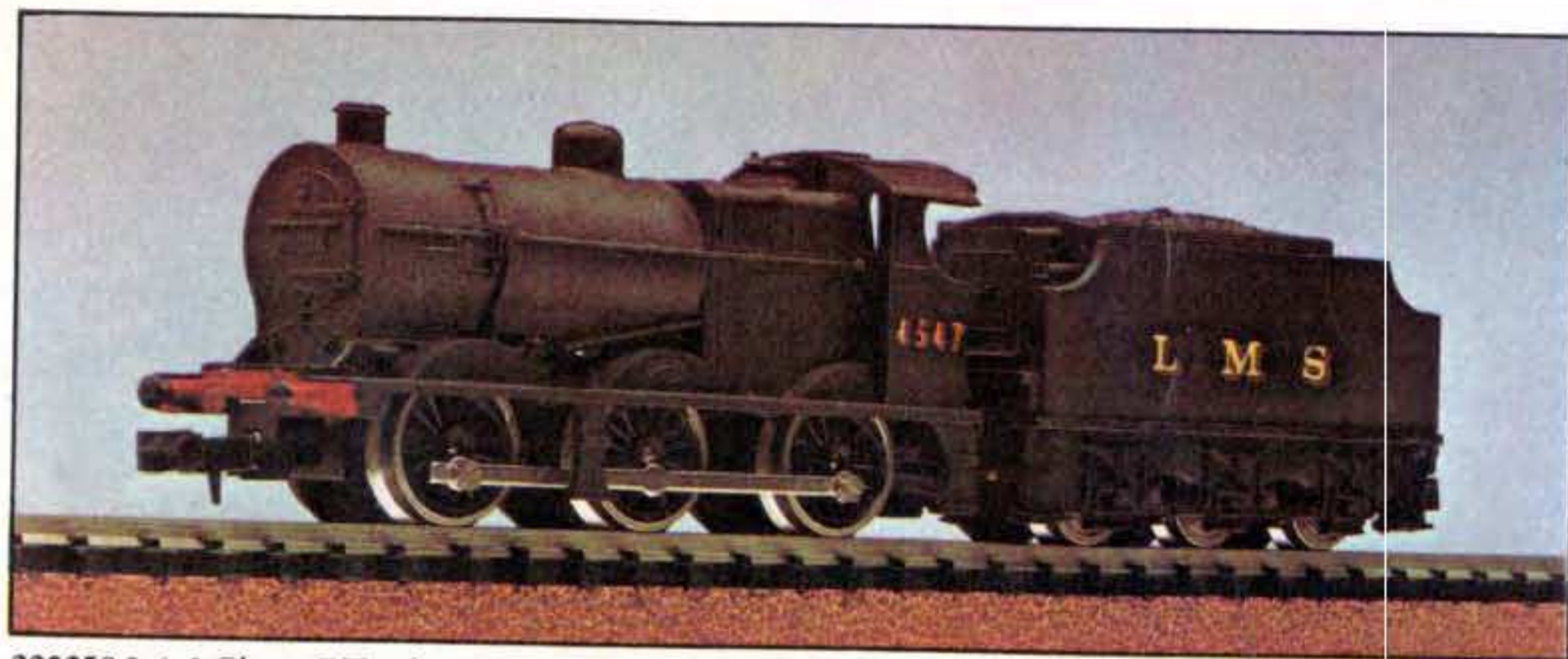


220227 2-6-4T Class 4 Tank Loco. BR Livery.

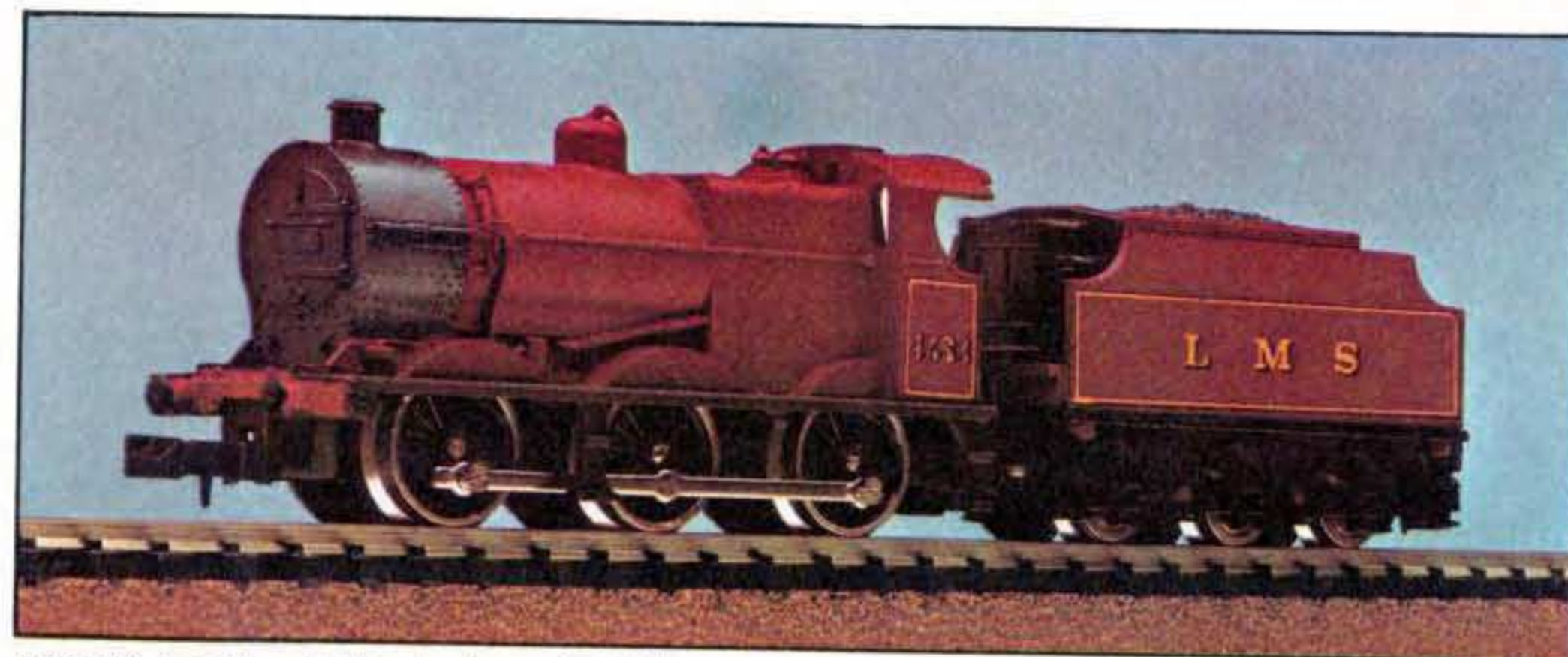


220228 2-6-4T Class 4 Tank Loco. GWR Livery.

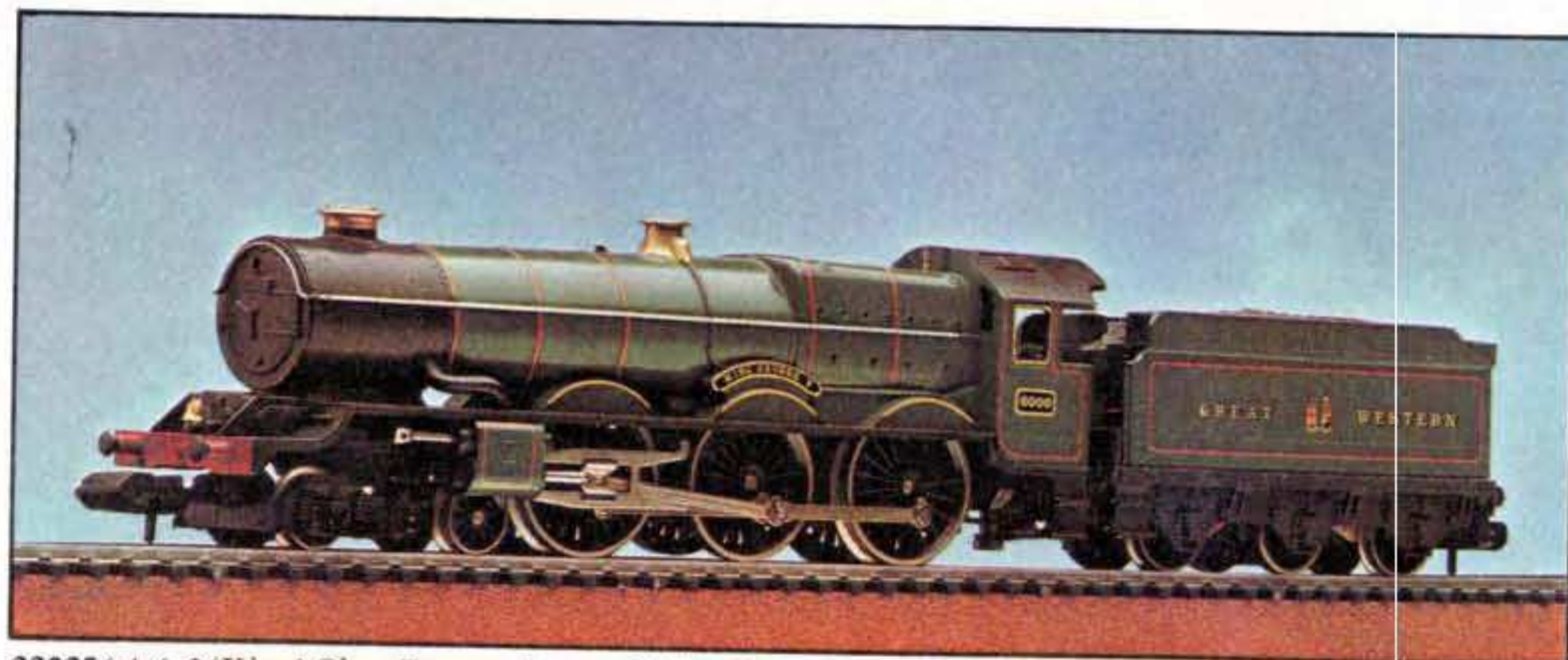
N GAUGE



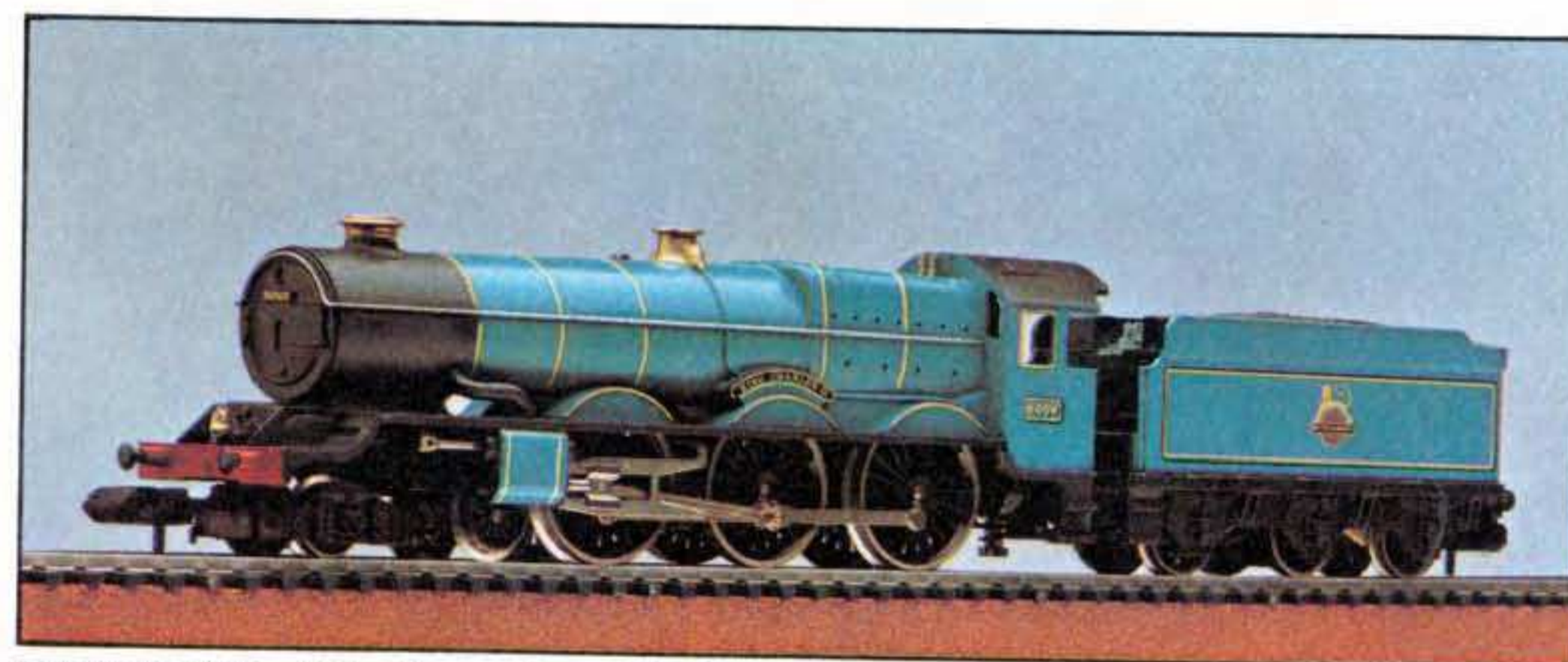
220258 0-6-0 Class 4F Tender Loco. BR Livery.



220259 0-6-0 Class 4F Tender Loco. LMS Livery.



220256 4-6-0 'King' Class Express Loco. GWR Livery.



220257 4-6-0 'King' Class Express Loco. BR Livery.

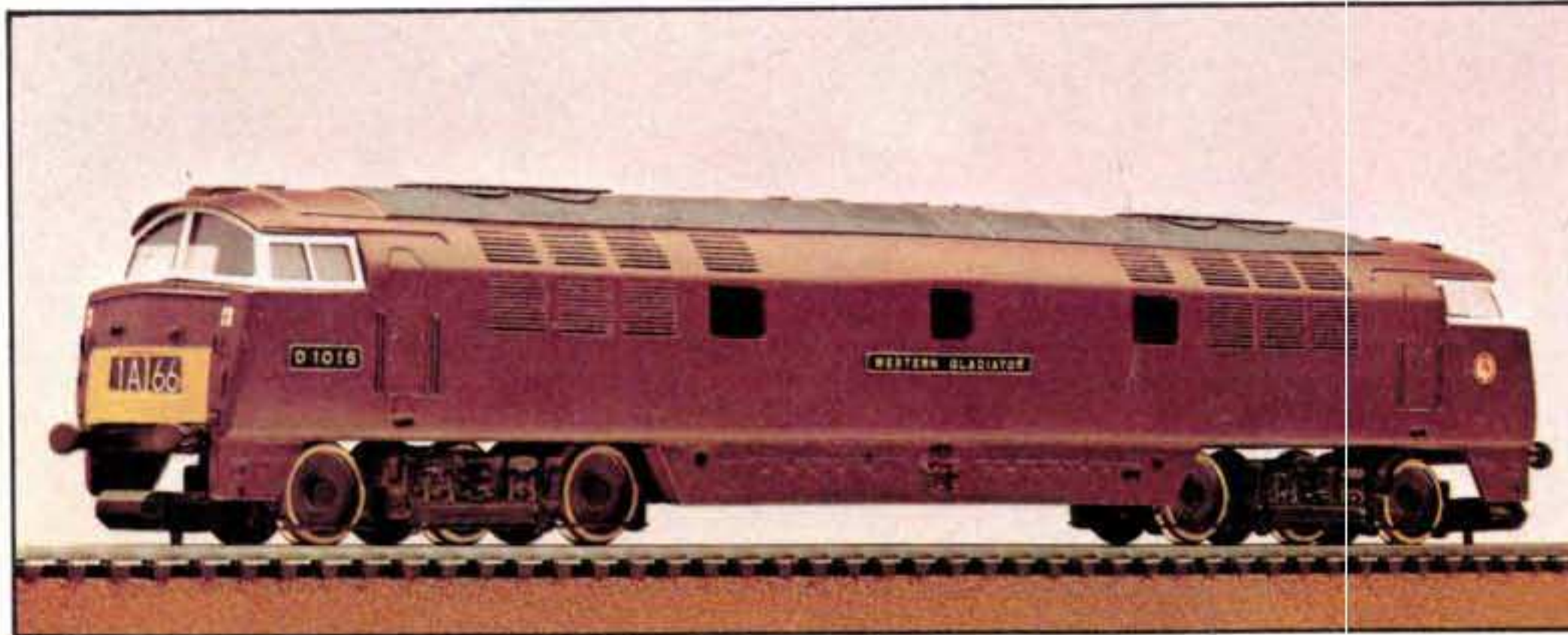


220217 BR Class 55 'Deltic' Co-Co Diesel Locomotive.

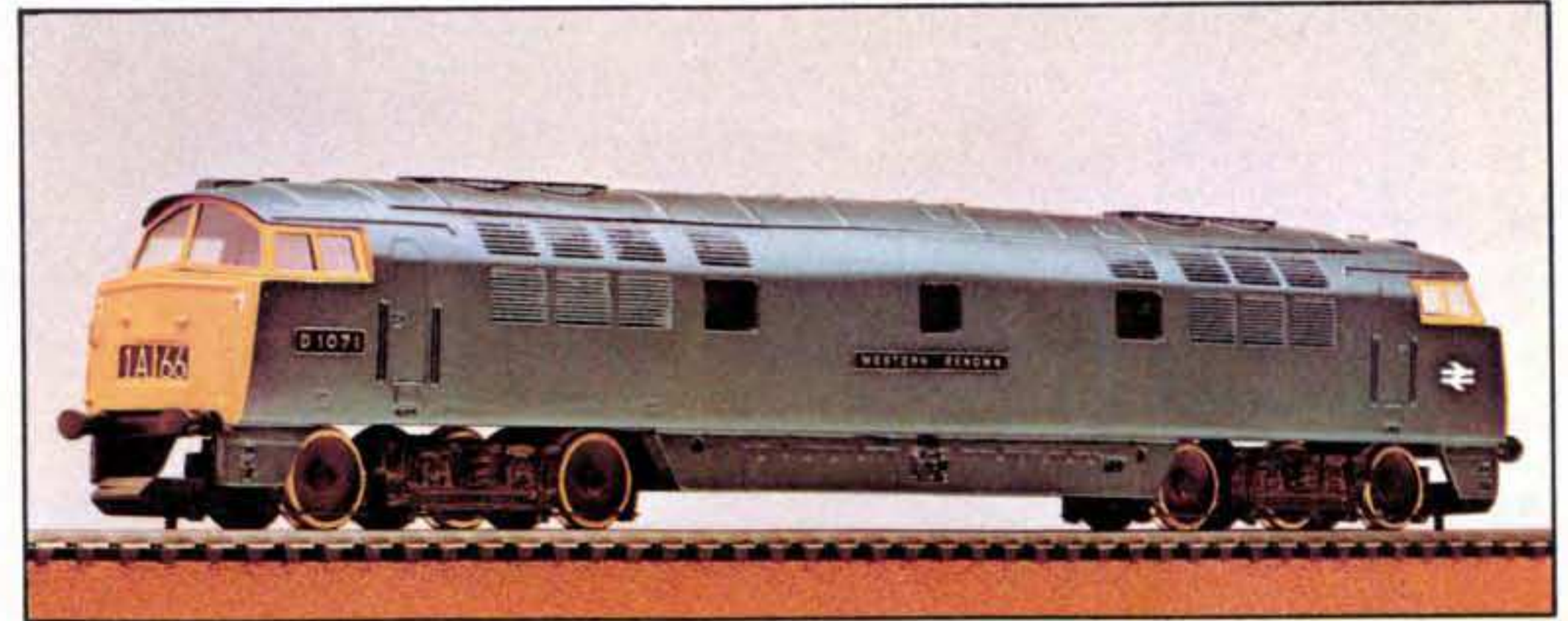


220253 BR Class 55 'Deltic' Co-Co Diesel Locomotive. Early Livery.

NGAUGE



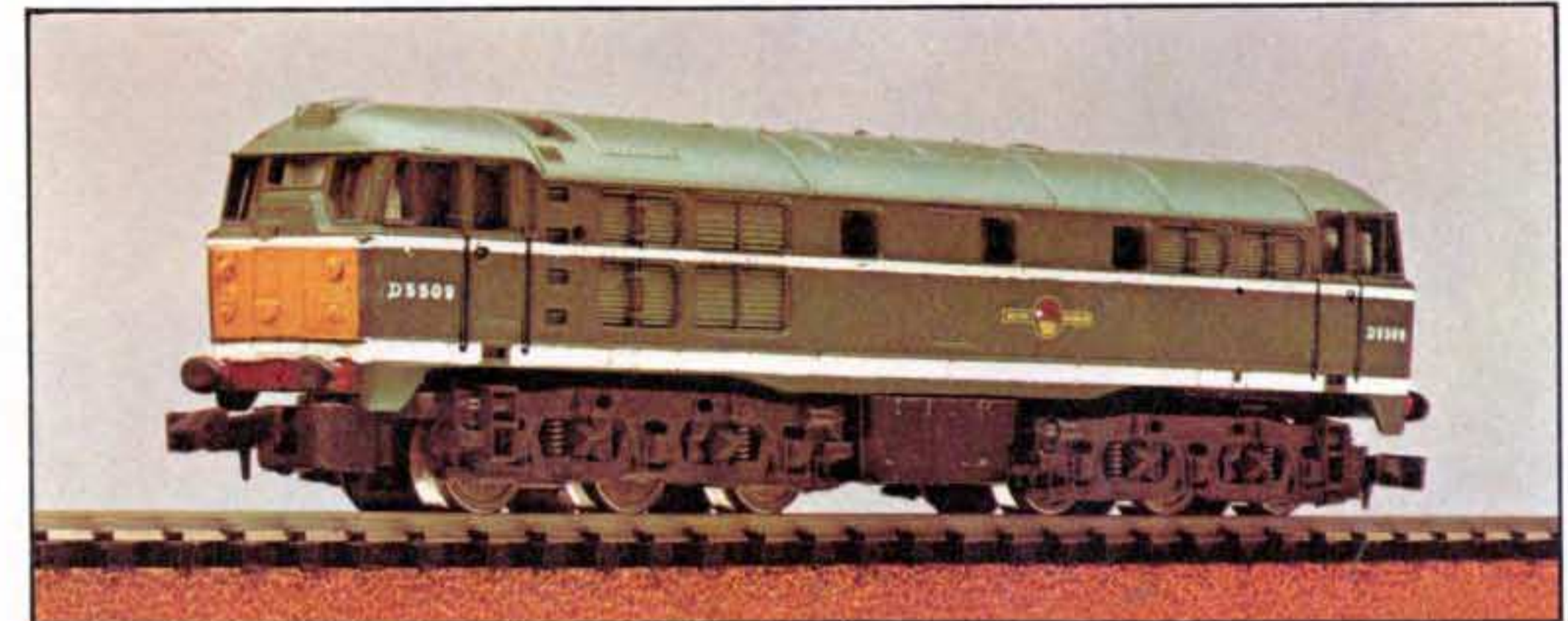
220242 BR Class 52 'Western' Diesel Hydraulic Locomotive  
Western Maroon Livery.



220243 BR Class 52 'Western' Diesel Hydraulic Locomotive.



220209 BR Class 31 AIA-AIA Diesel Locomotive.



220214 BR Class 31 AIA-AIA Diesel Locomotive.



220210 0-4-0 Diesel Shunter. Early BR Livery.



220211 0-4-0 Diesel Shunter. BR Livery.

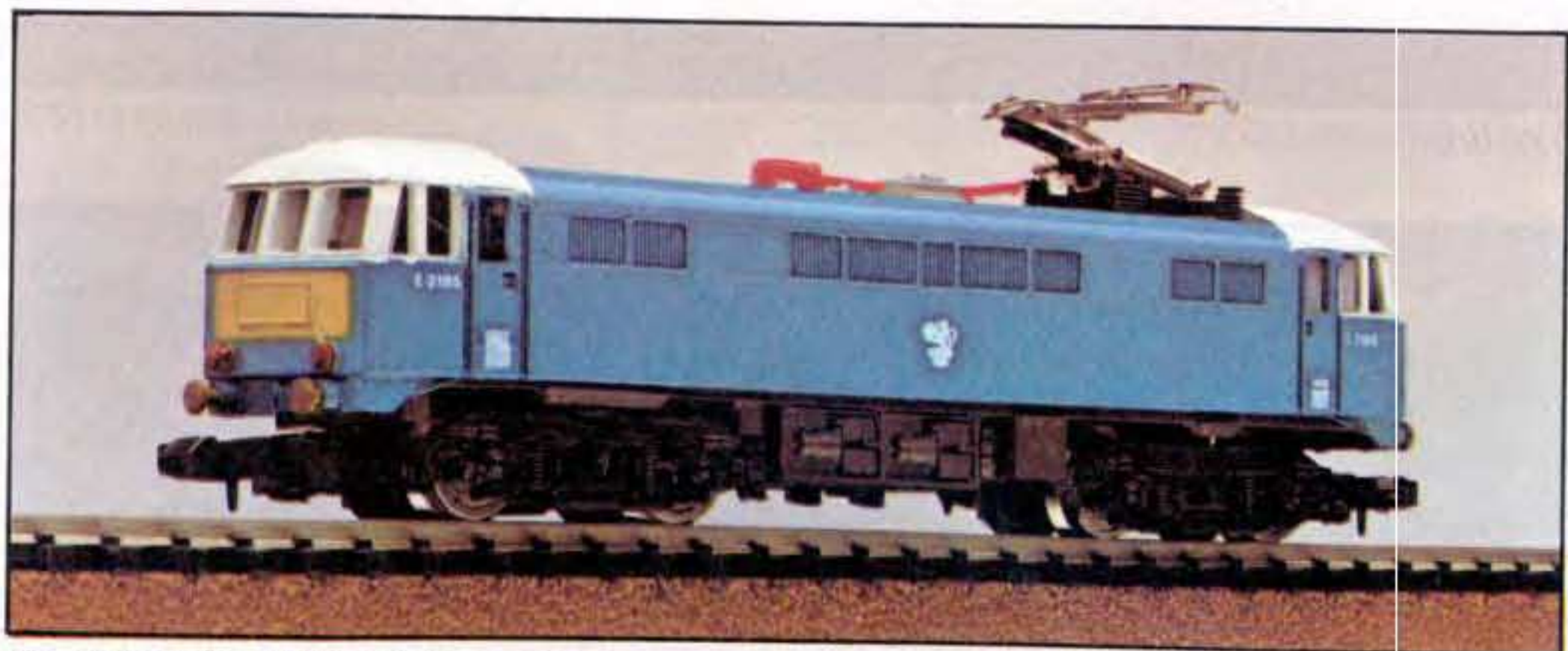
# N GAUGE



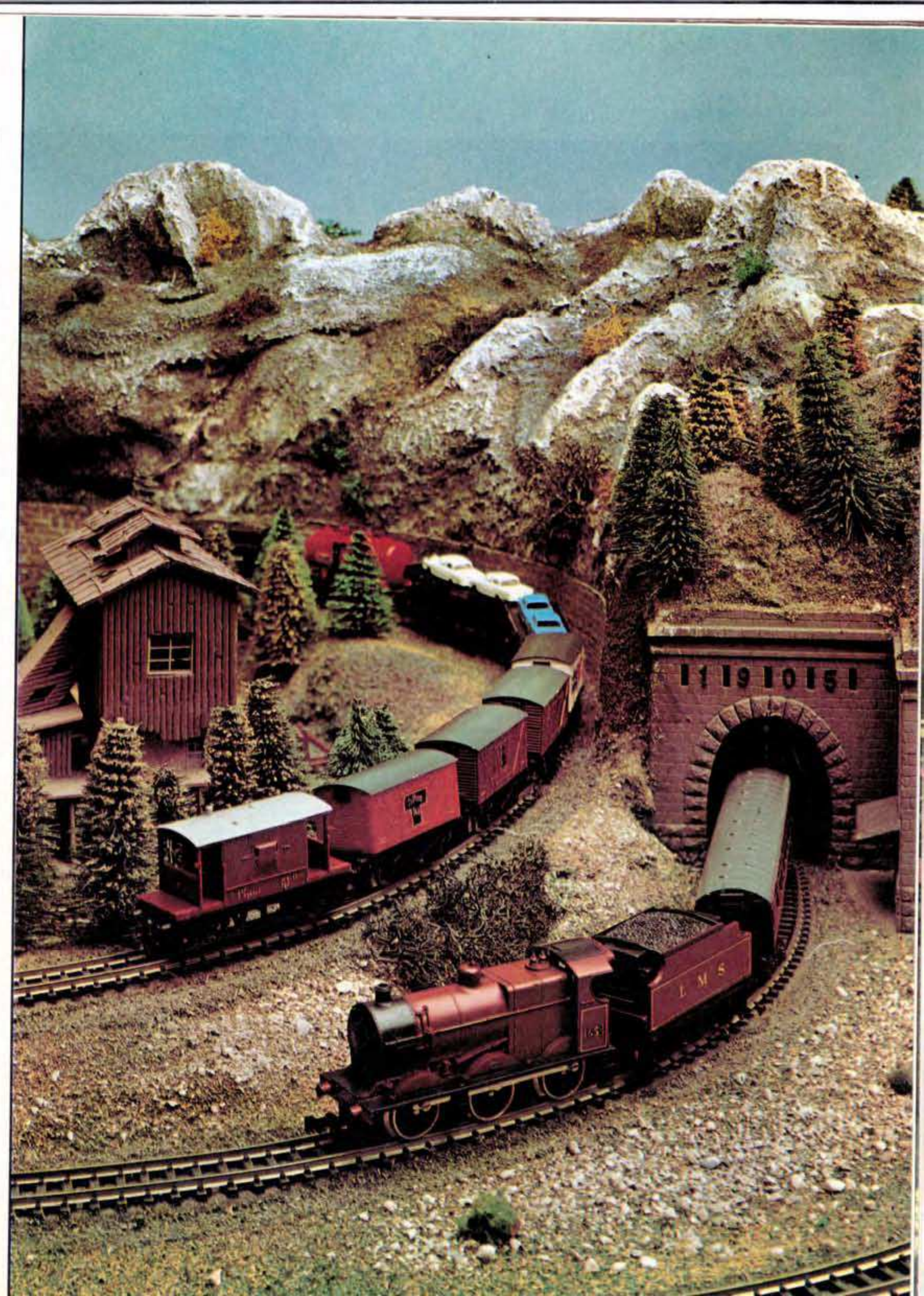
220212 Centre Cab Bo-Bo Diesel. Early BR Livery.



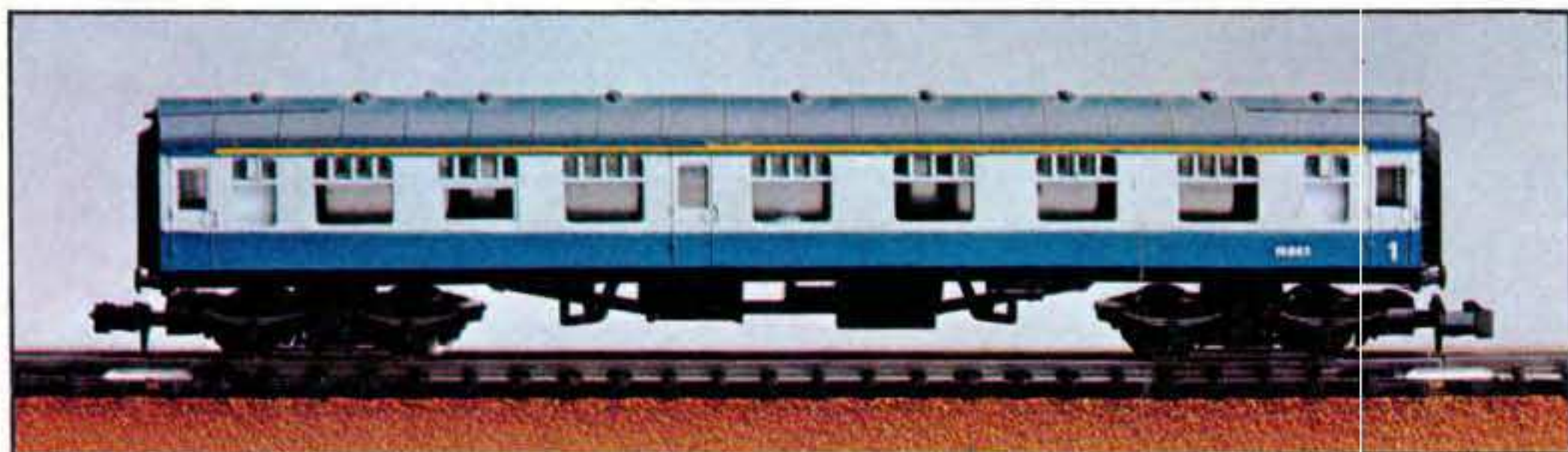
220213 Centre Cab Bo-Bo Diesel. BR Livery.



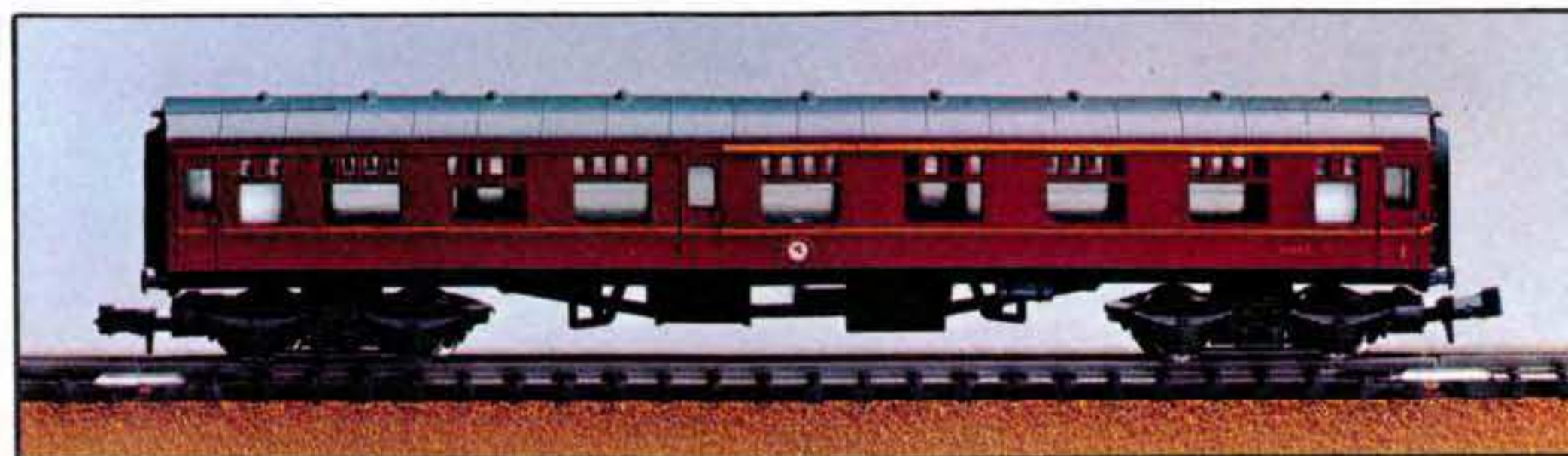
220205 BR Class 81 Electric Locomotive.



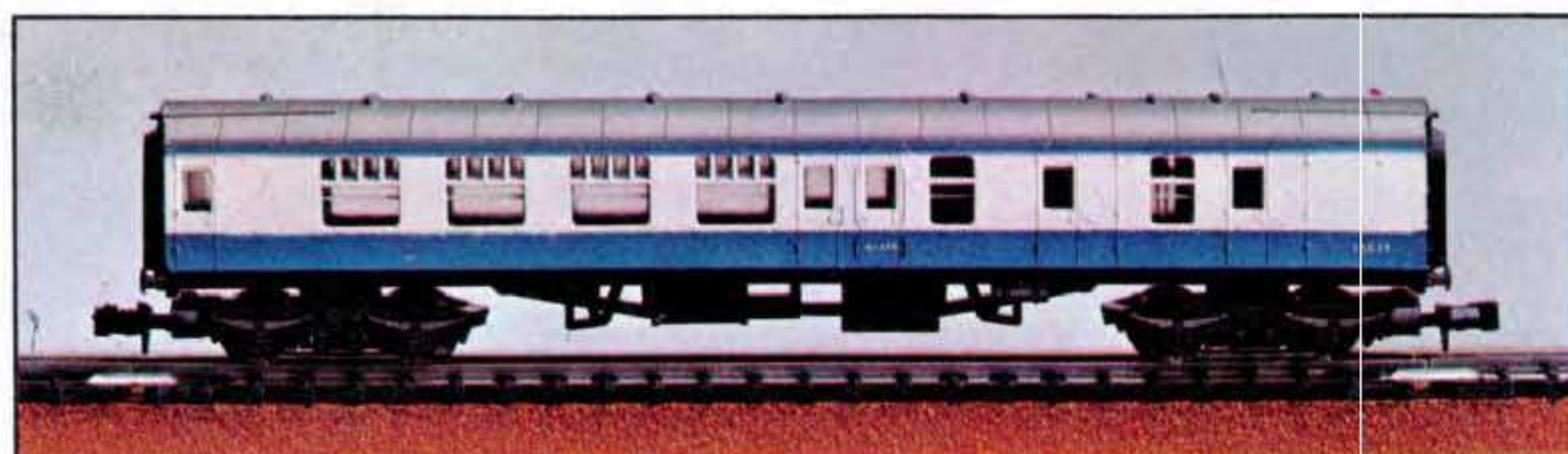
N GAUGE



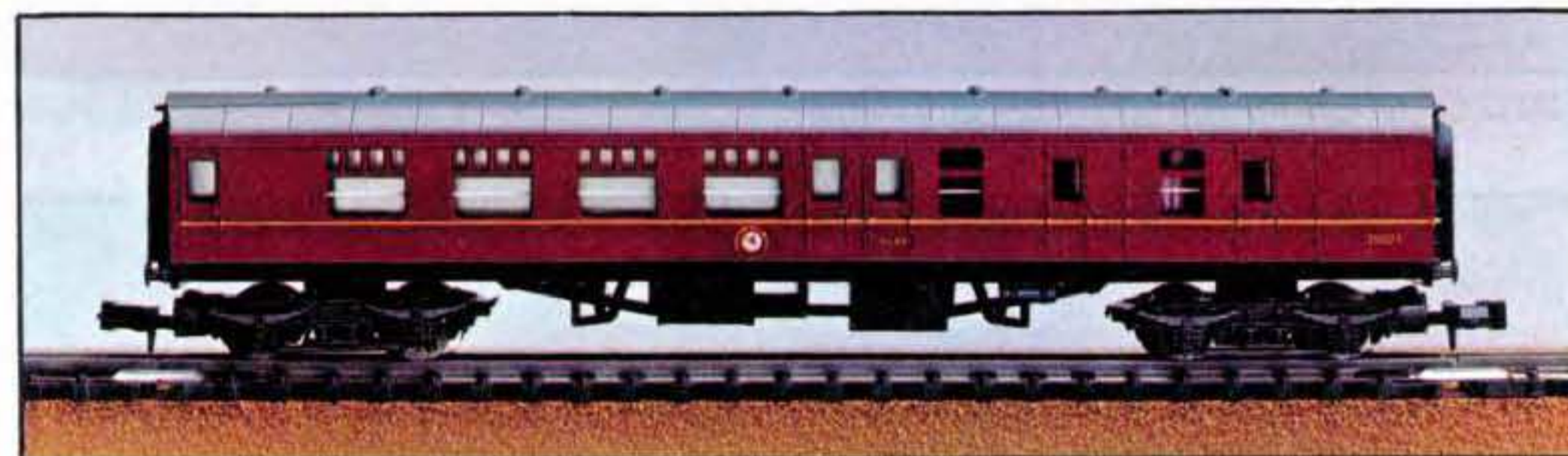
320306 BR Composite Coach.



320314 BR Composite Coach.



320307 BR 2nd Class Brake Coach.



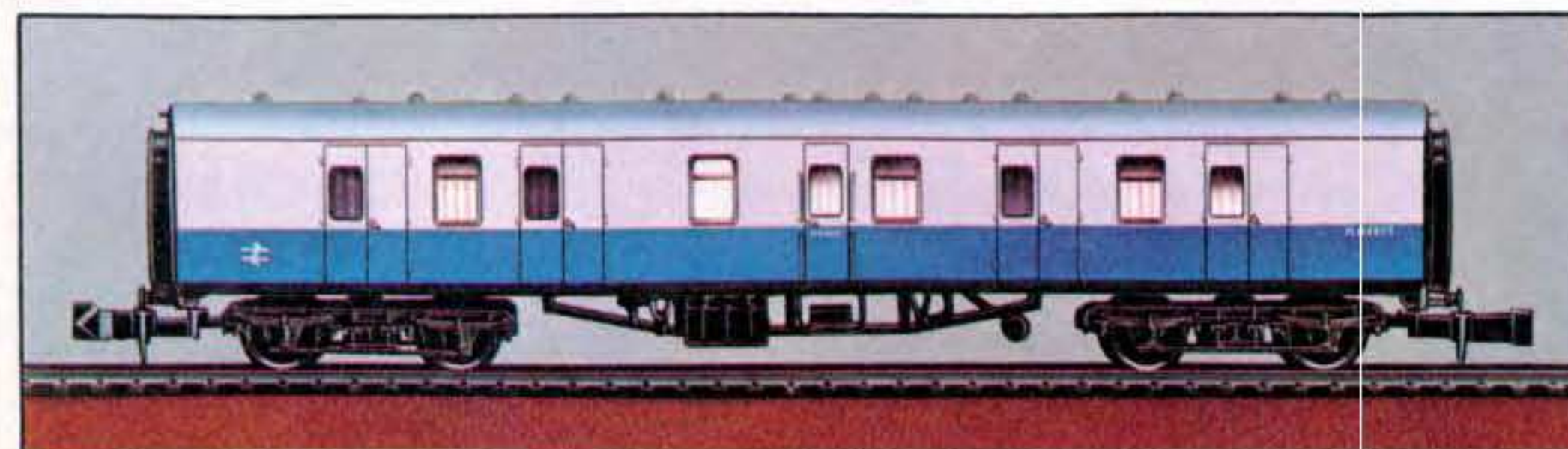
320315 BR 2nd Class Brake Coach.



320313 BR Buffet Car.



320316 BR Buffet Car.

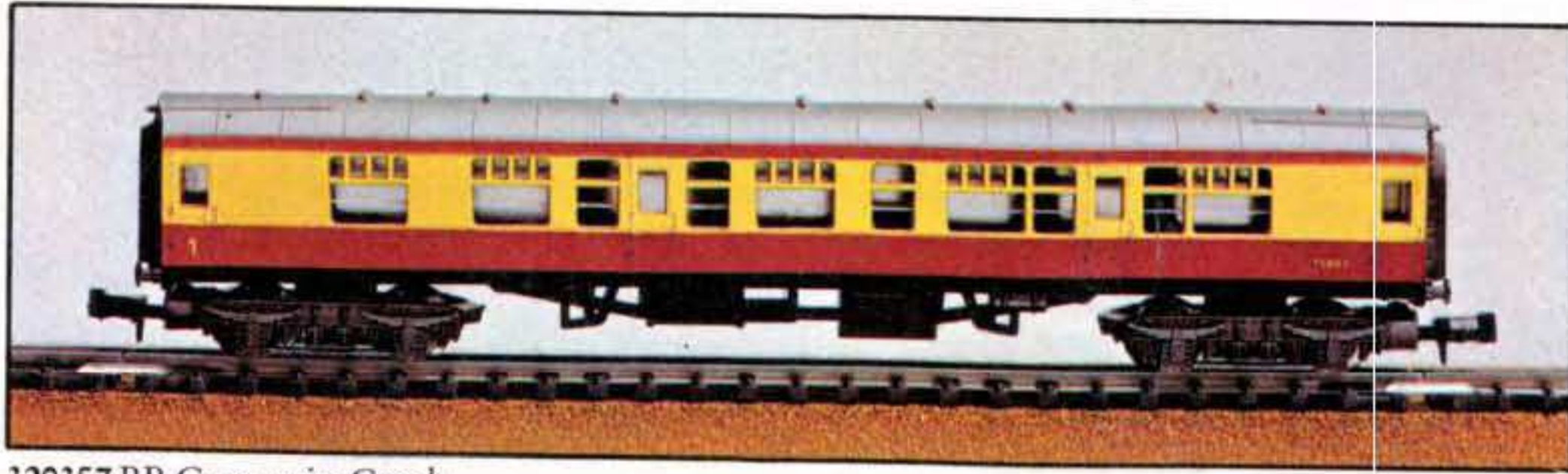


320368 BR Standard Gangwayed Brake Van.

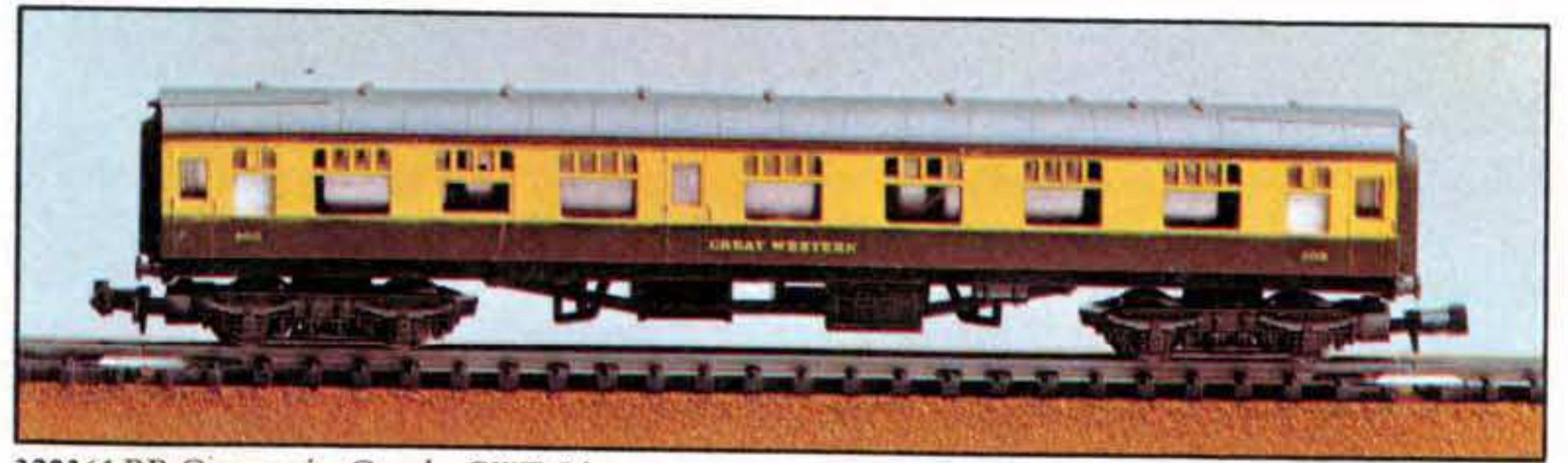


320367 BR Standard Gangwayed Brake Van.

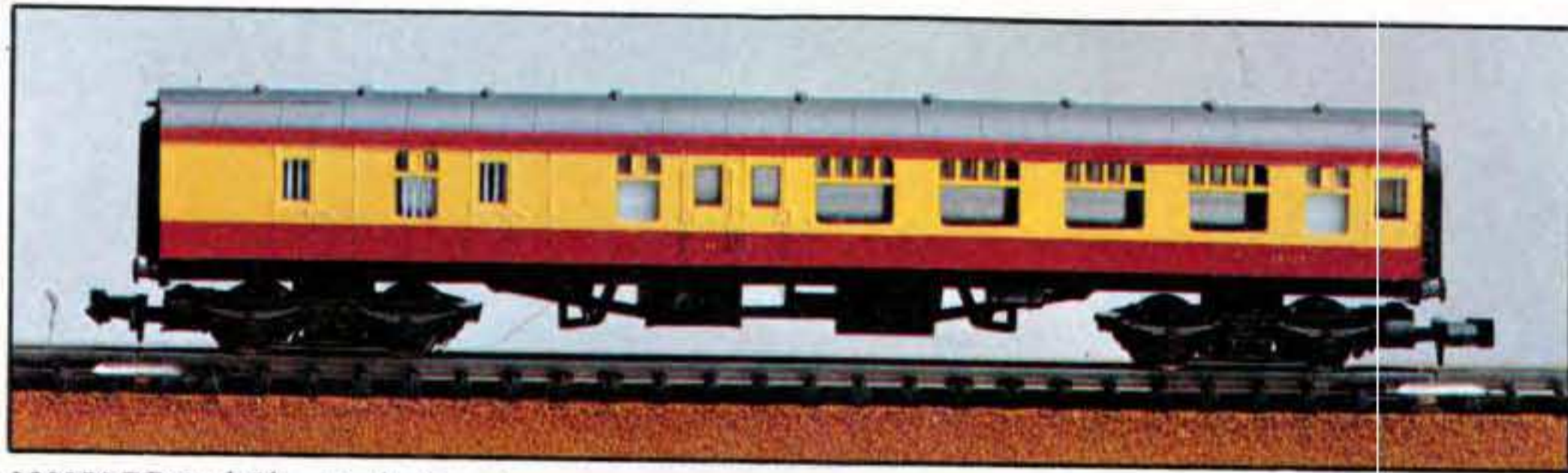
N GAUGE



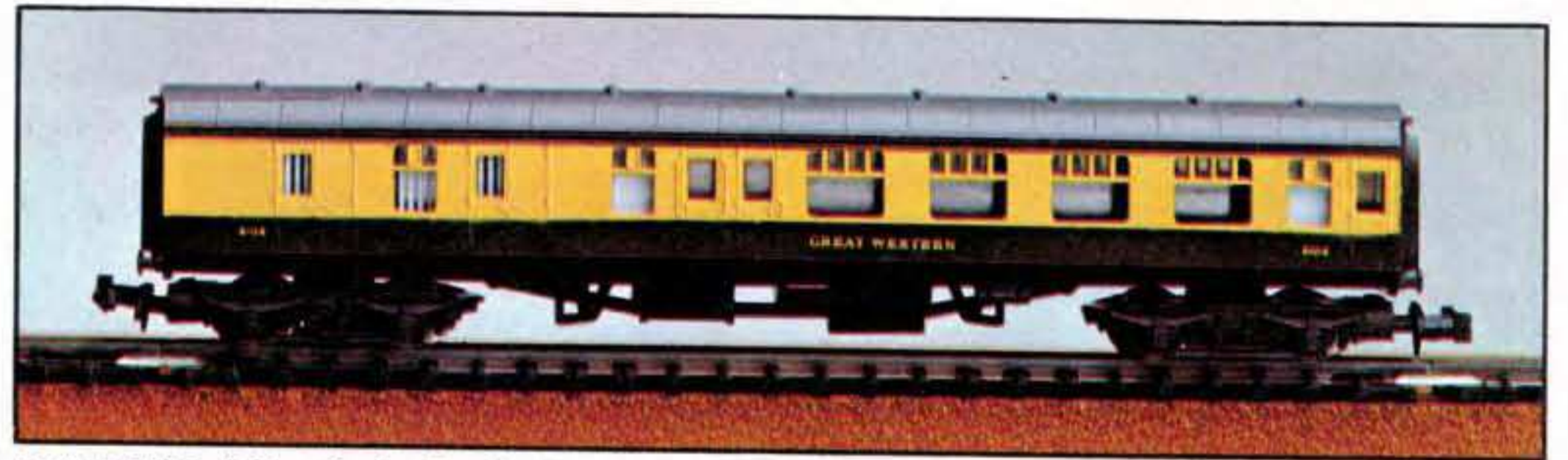
320357 BR Composite Coach.



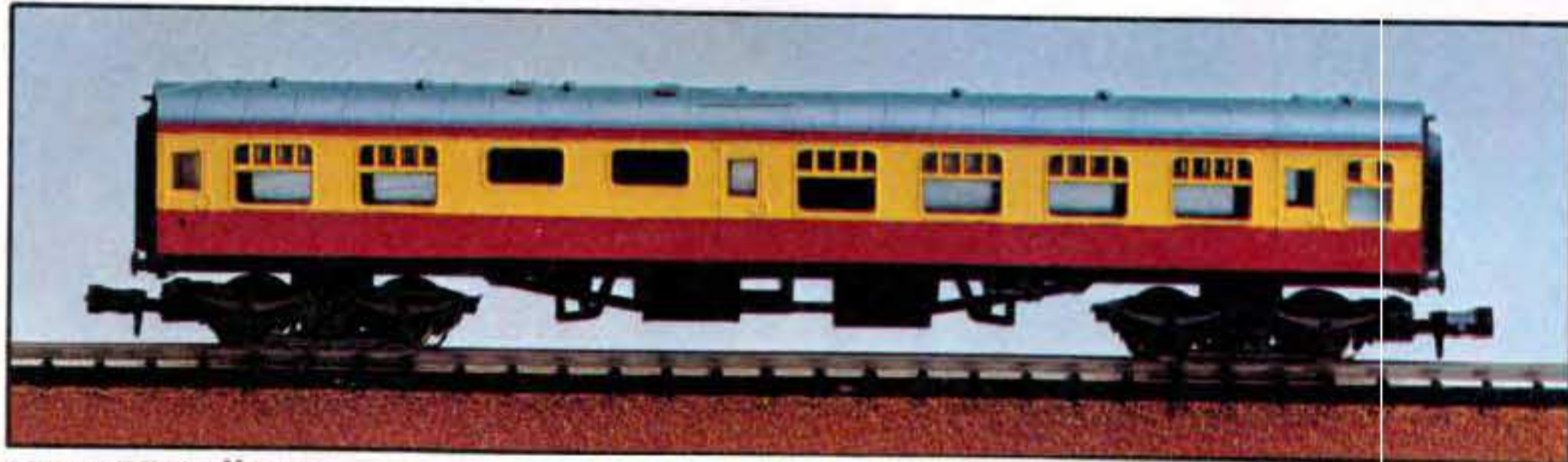
320361 BR Composite Coach. GWR Livery.



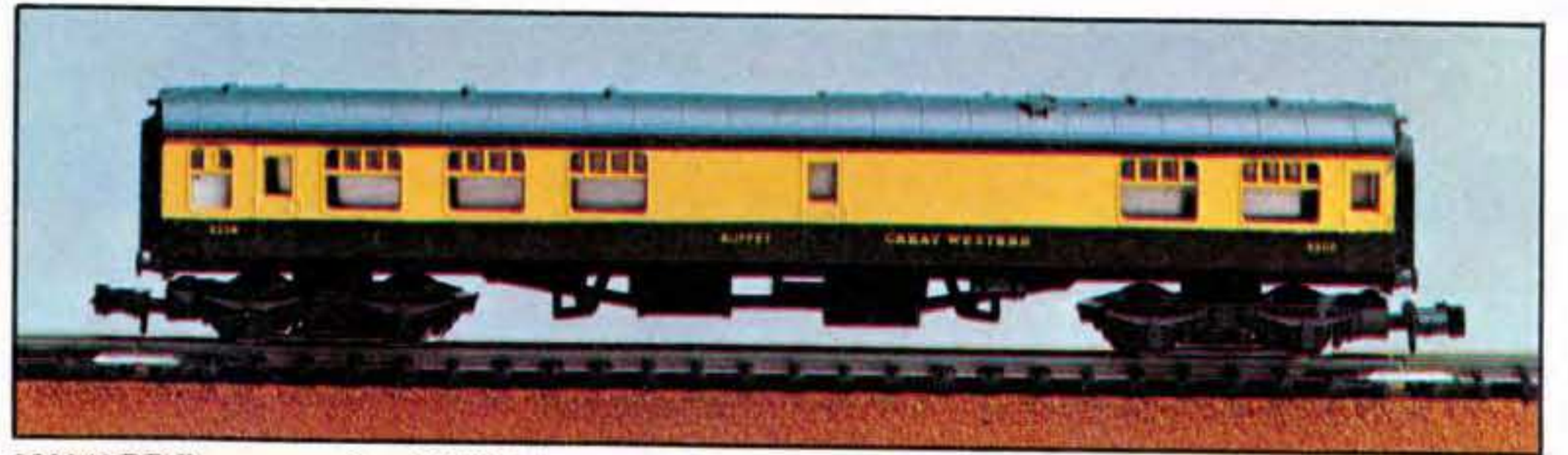
320358 BR 2nd Class Brake Coach.



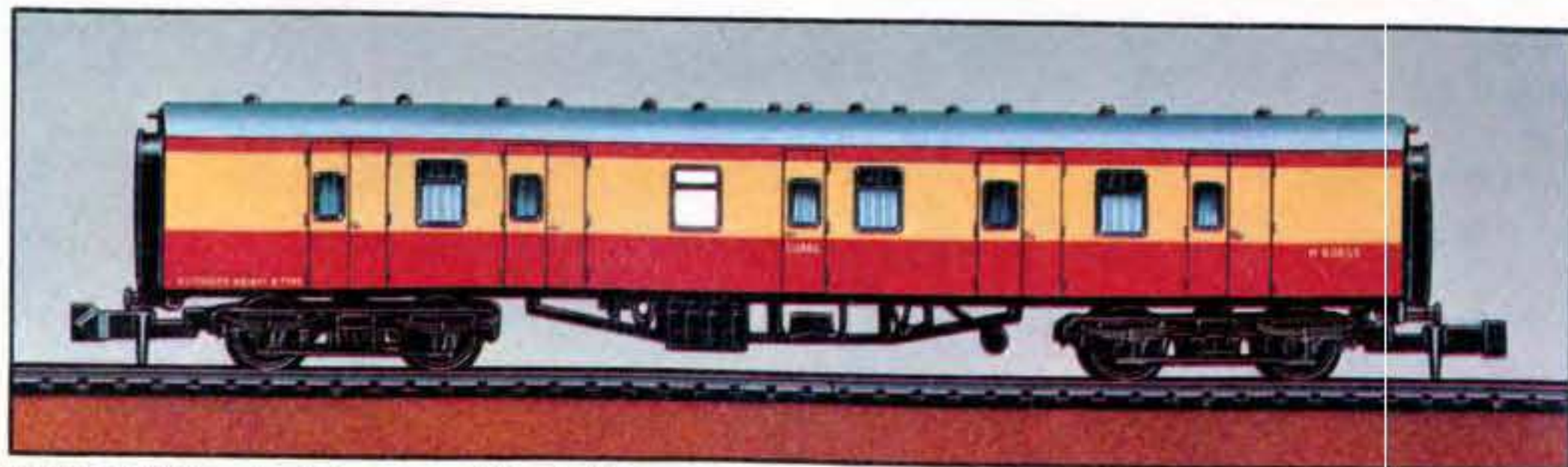
320362 BR 2nd Class Brake Coach. GWR Livery.



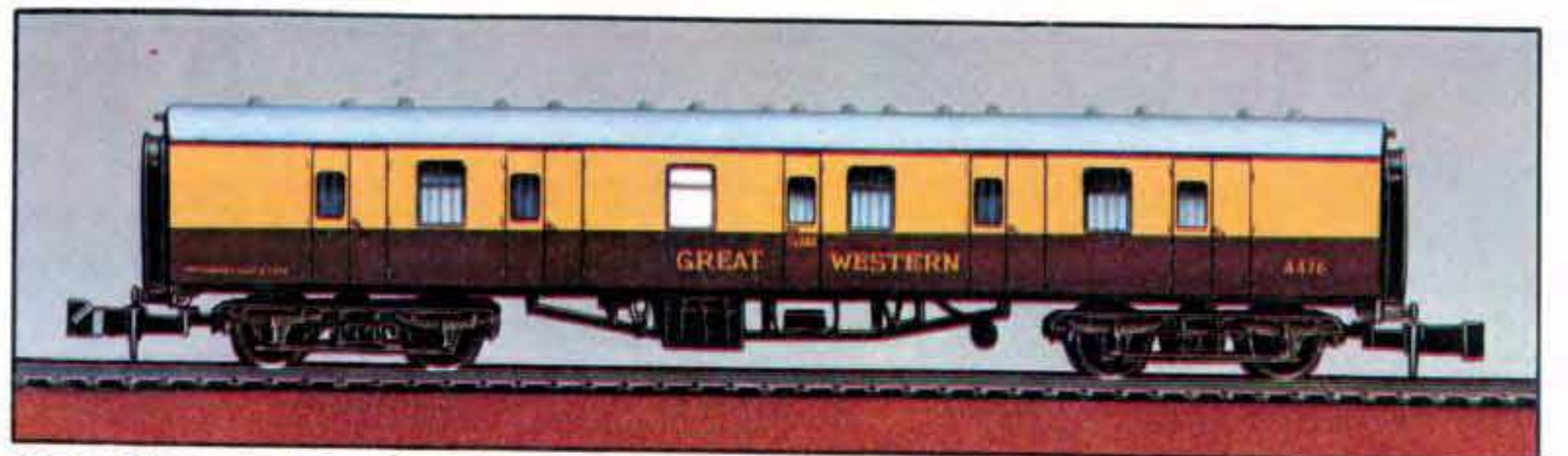
320359 BR Buffet Car.



320363 BR Restaurant Car. GWR Livery.



320369 BR Standard Gangwayed Brake Van.

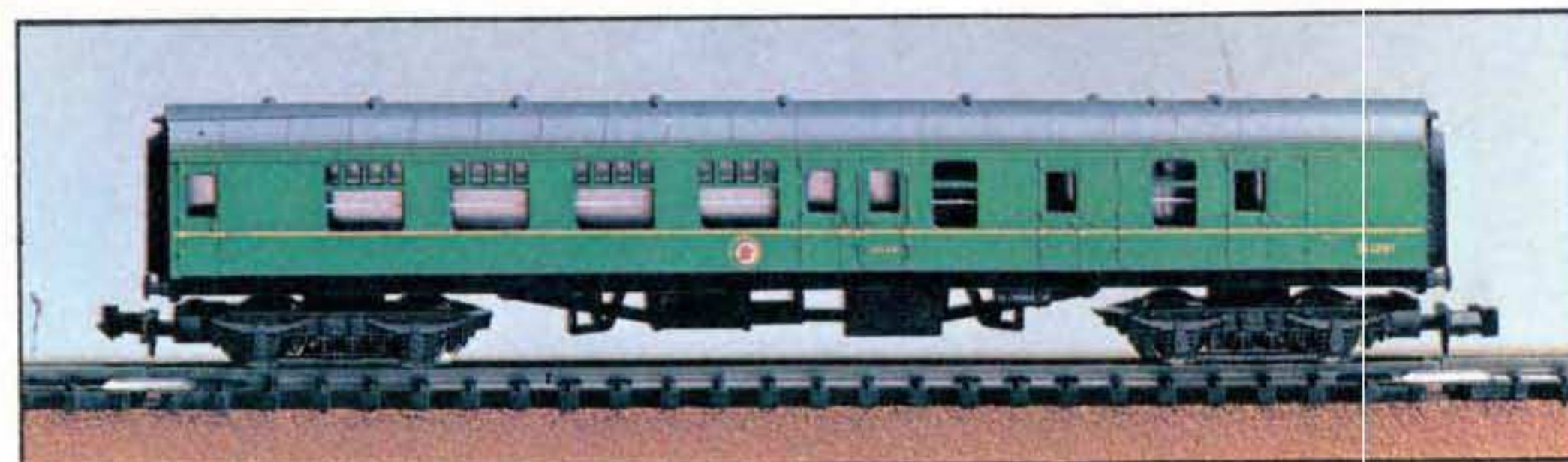


320366 BR Standard Gangwayed Brake Van. GWR Livery.

# N GAUGE



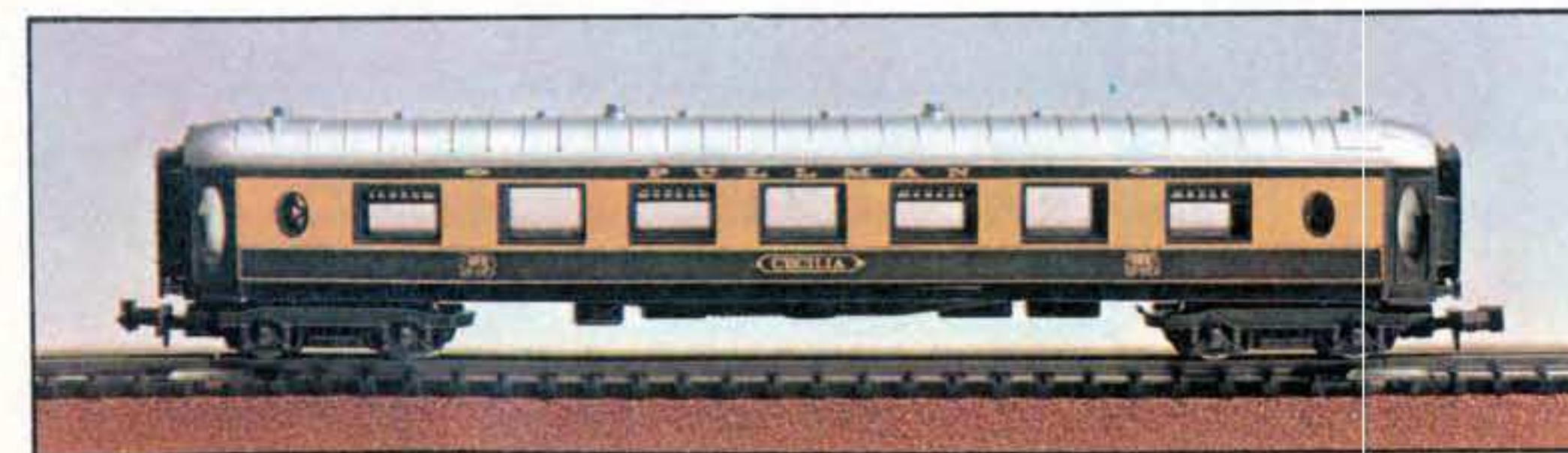
320352 BR Composite Coach. SR Livery.



320353 BR 2nd Class Brake Coach. SR Livery.



320354 BR Buffet Car. SR Livery.



320355 BR 1st Class Pullman Car 'Cecilia'



320356 BR 1st Class Pullman Car "Golden Arrow"

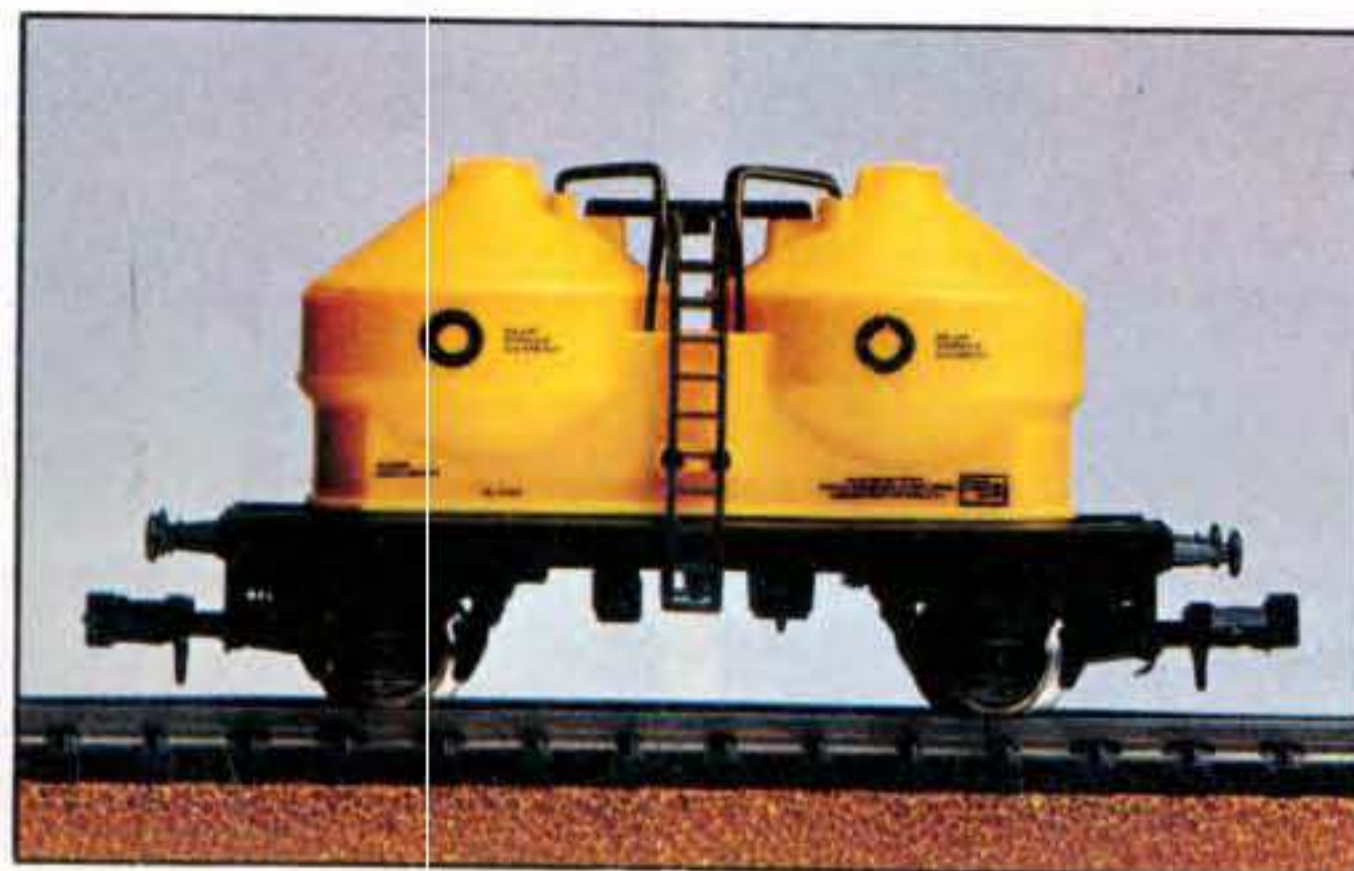




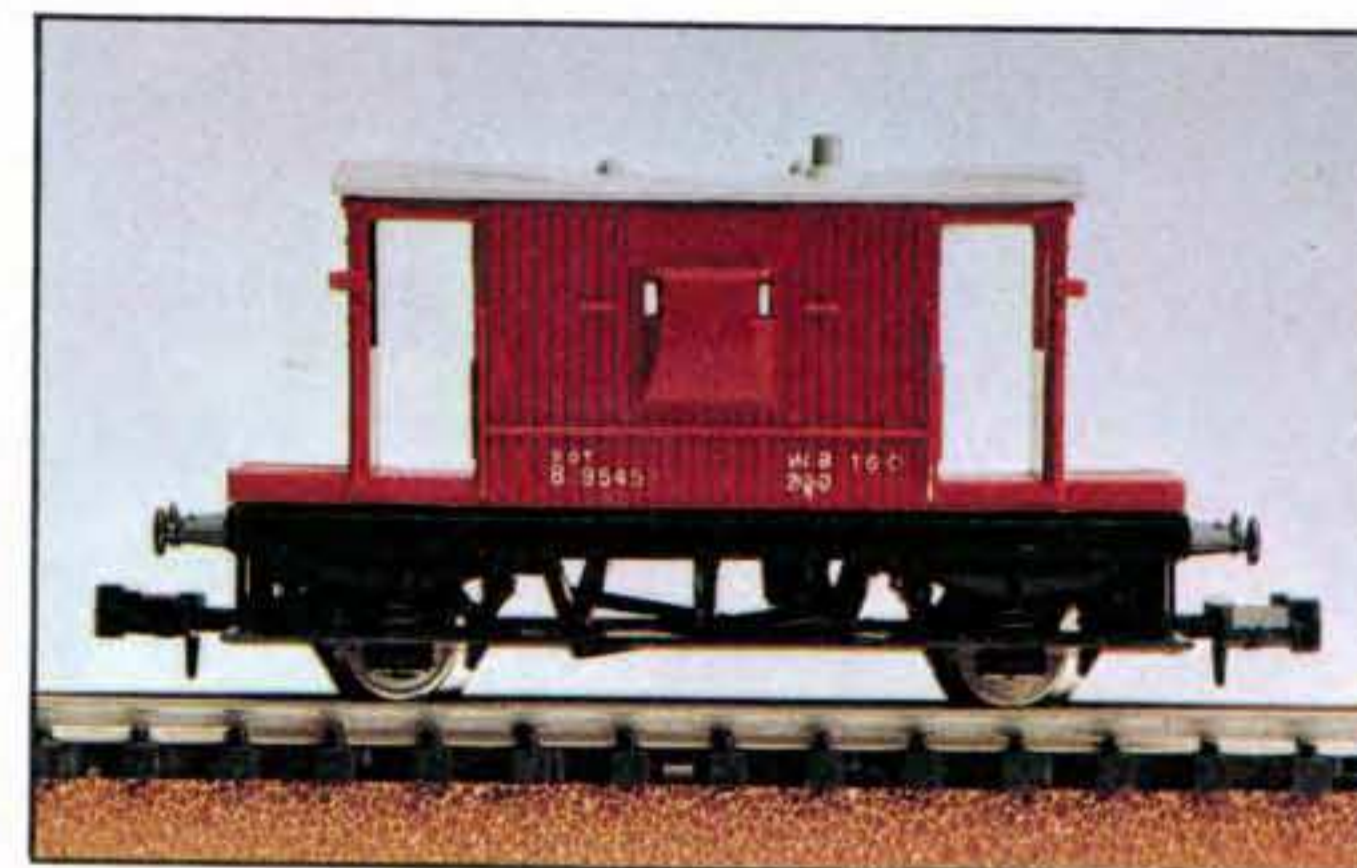
N GAUGE



320477 LMS 20 Ton Box Van.



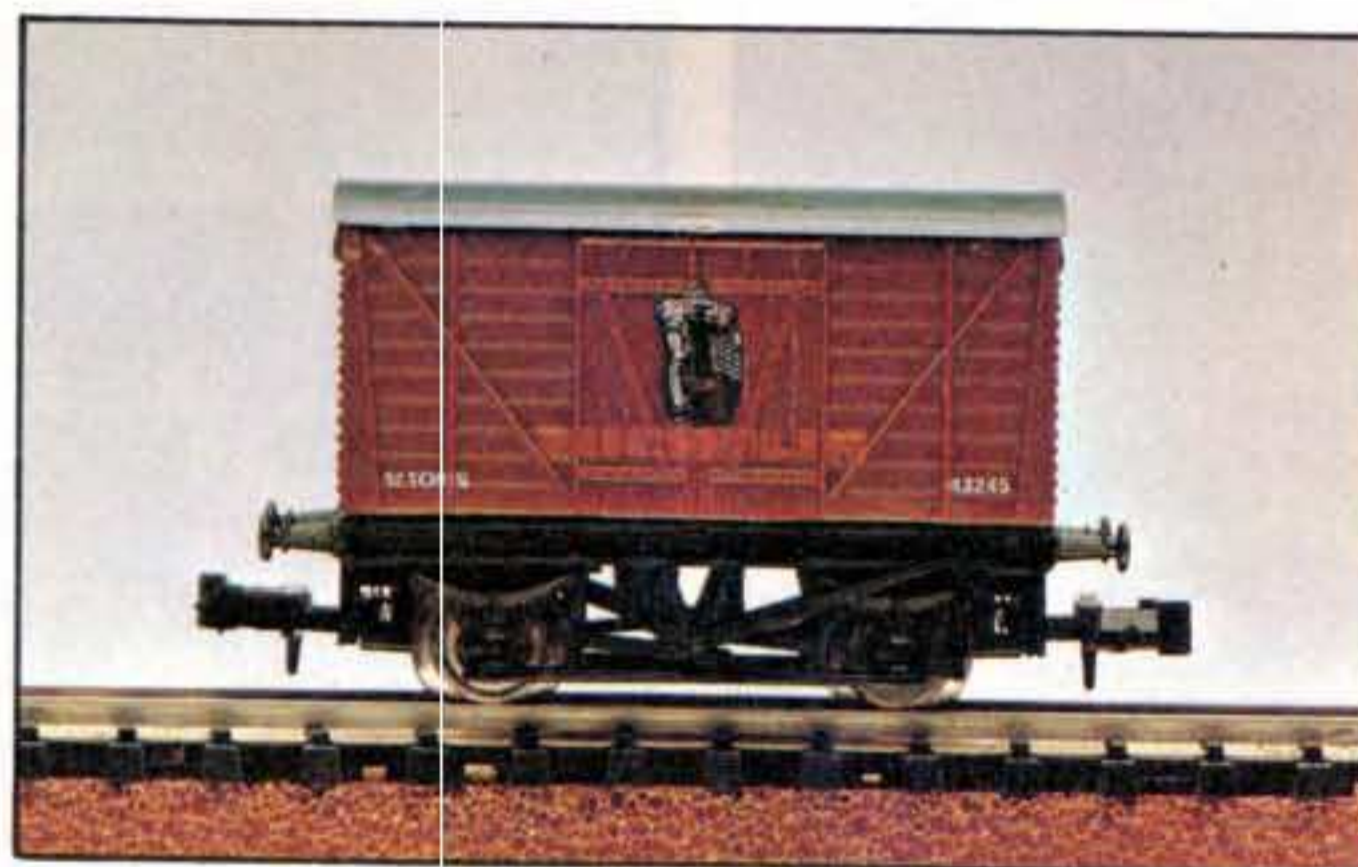
320729 'Blue Circle' Twin Tank Cement Wagon.



320405 BR 20 Ton Brake Van.



320740 SR 20 Ton Box Van.



320613 'Michelin Tyres' Box Van.



320612 'Homepride Flour' Box Van.



320611 'Typhoo Tea' Box Van.

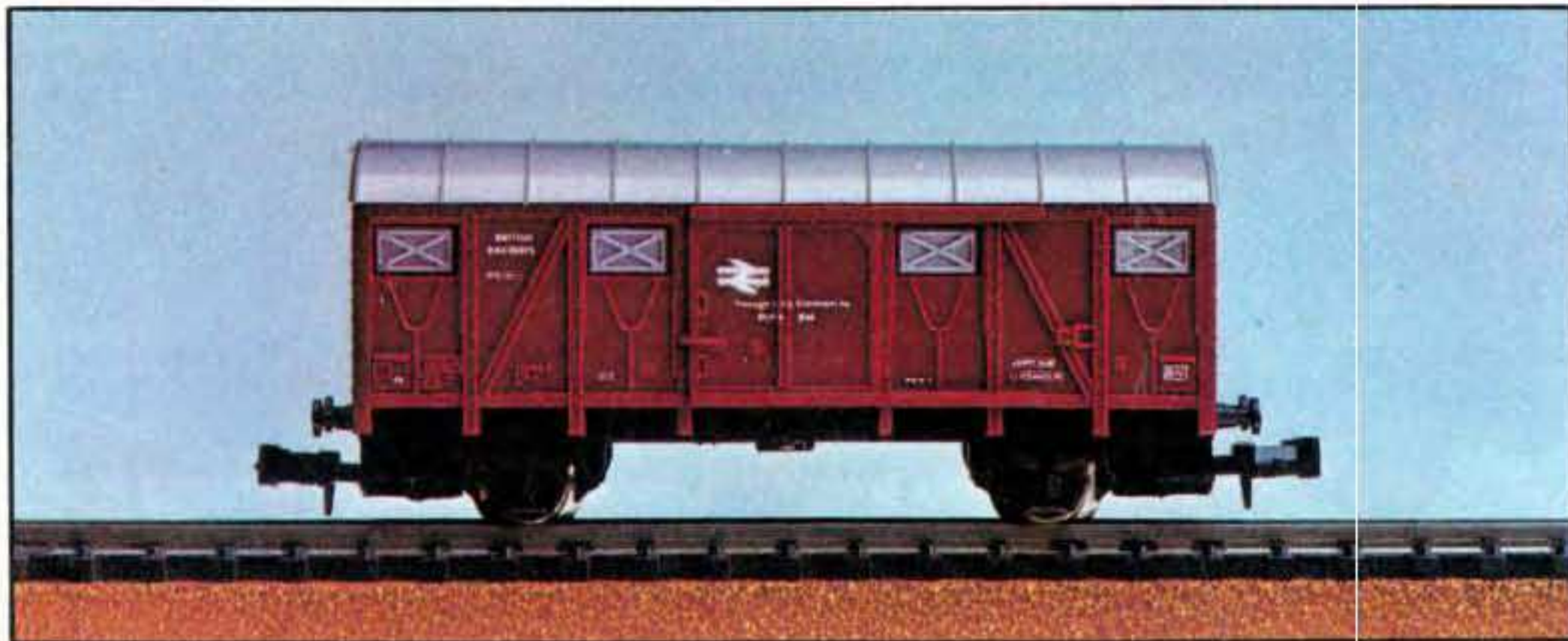


320614 'St Ivel Dairy Products' Box Van.

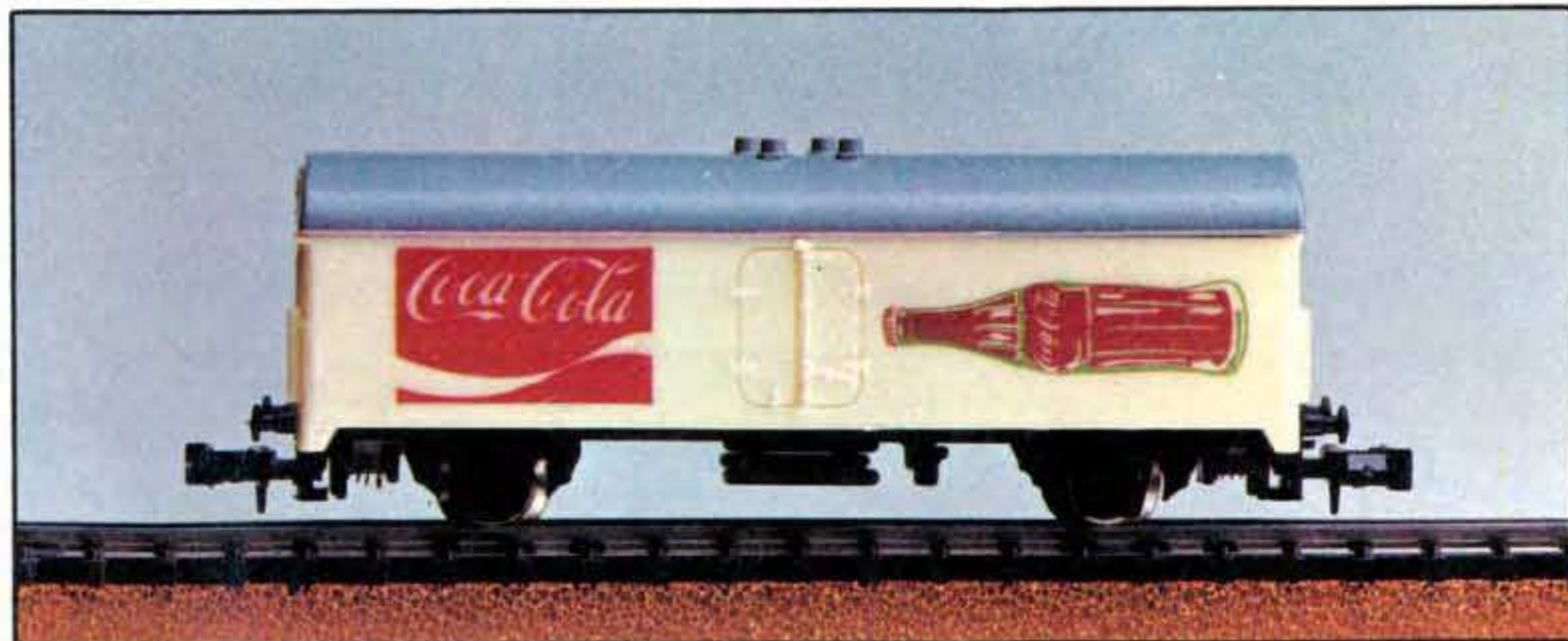


320615 GWR Box Van.

N GAUGE



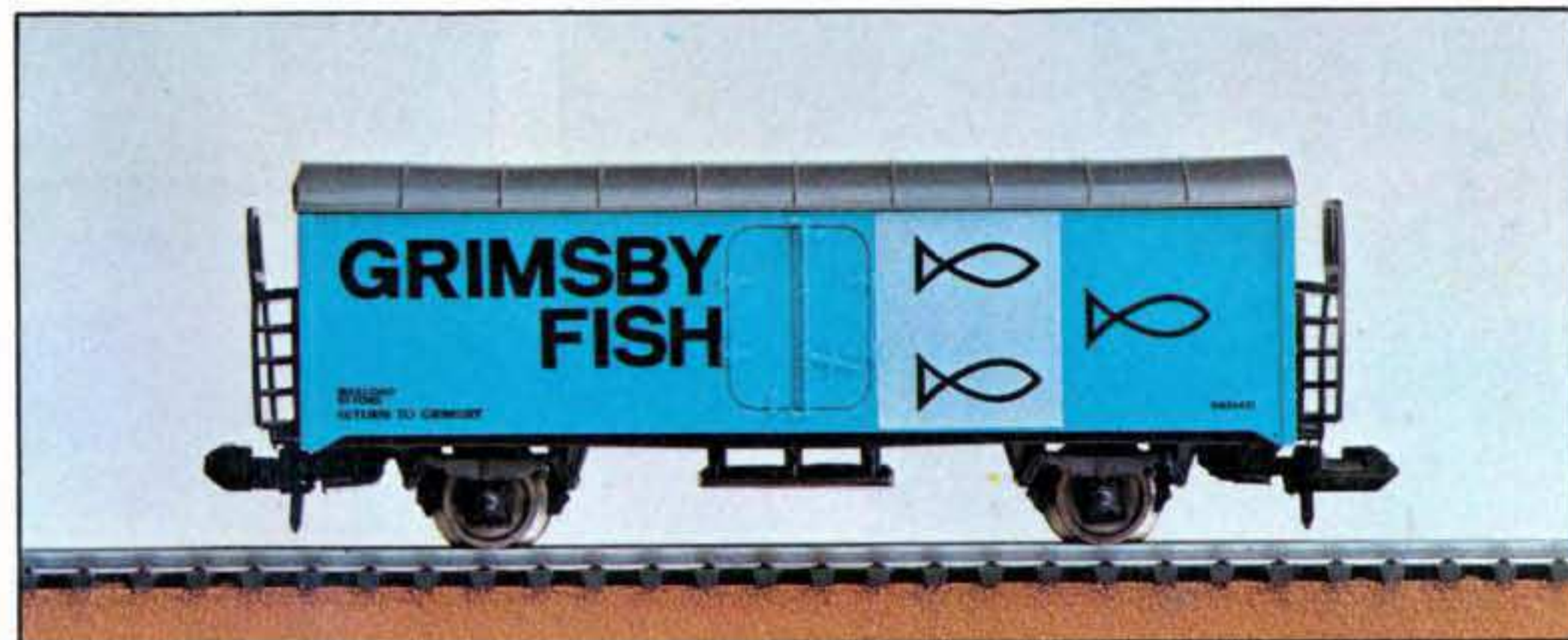
320400 BR Closed Van.



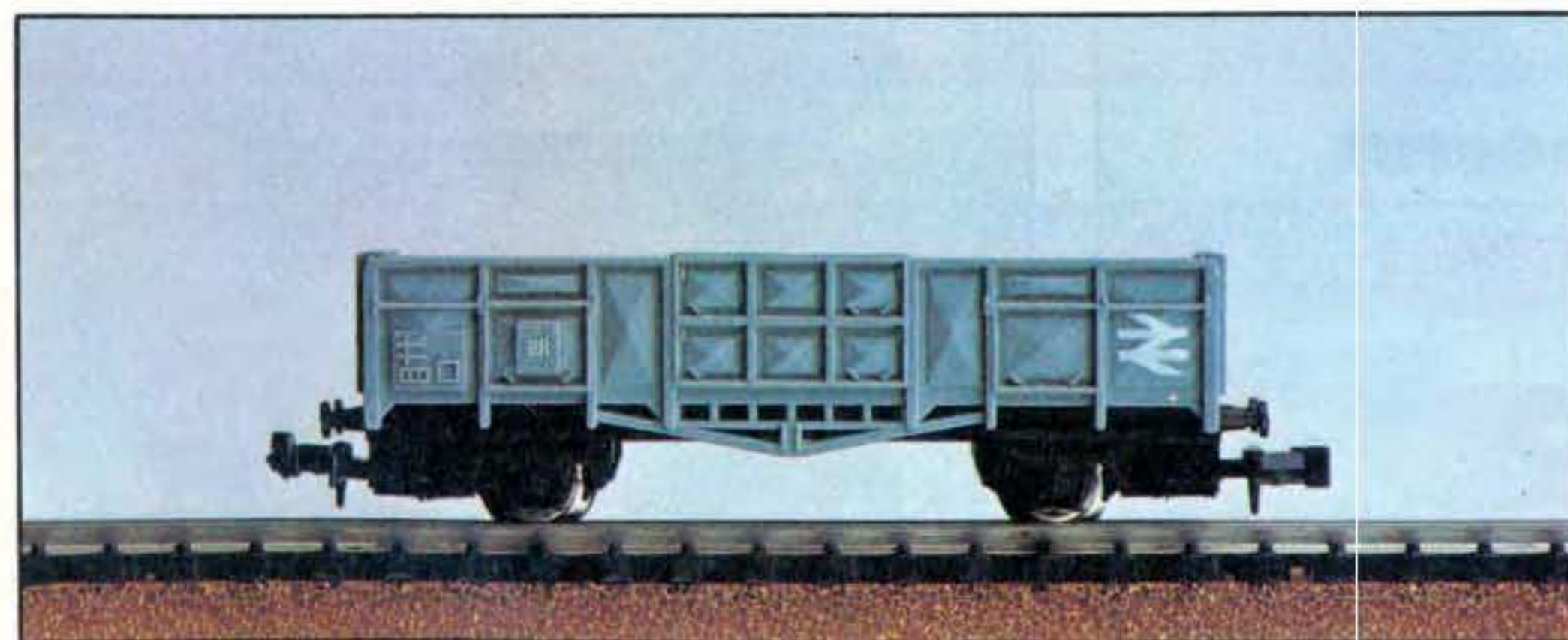
320479 'Coca Cola' Closed Van.



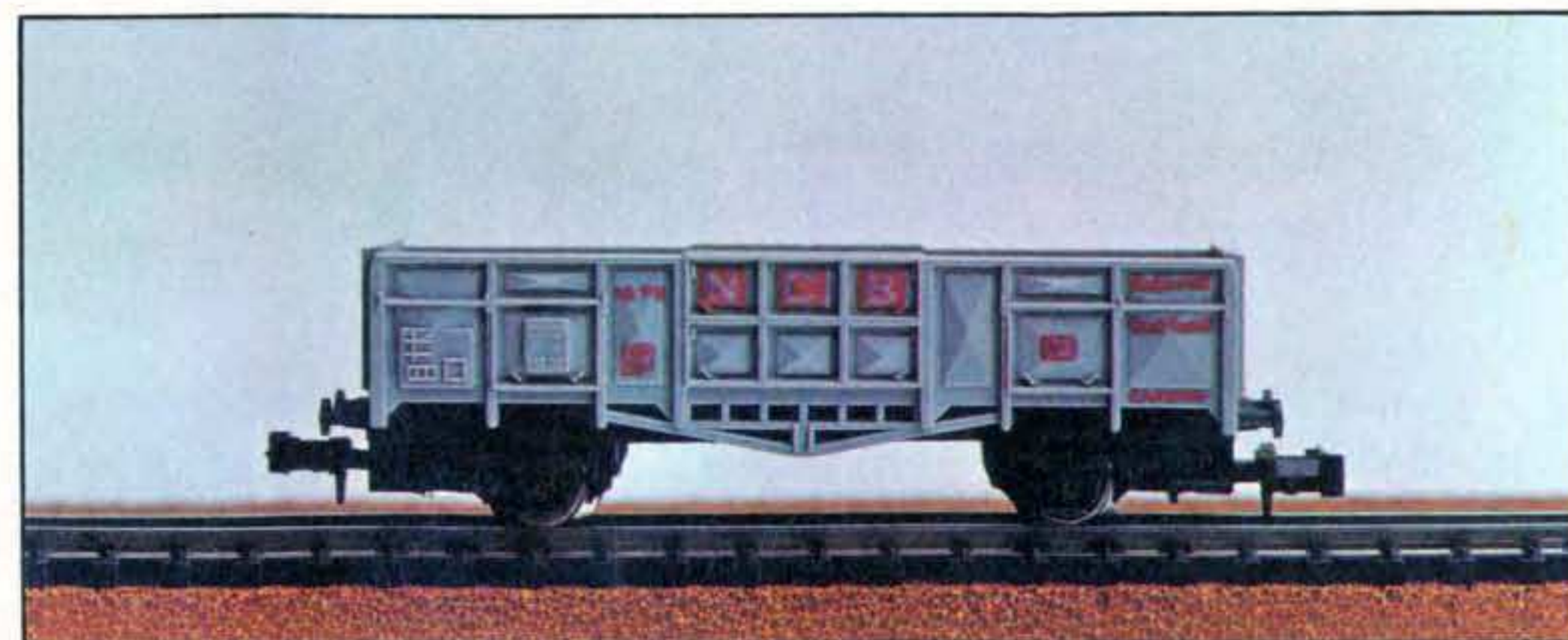
320462 'East Anglian Meat' Closed Van.



320463 'Grimsby Fish' Refrigerator Van.

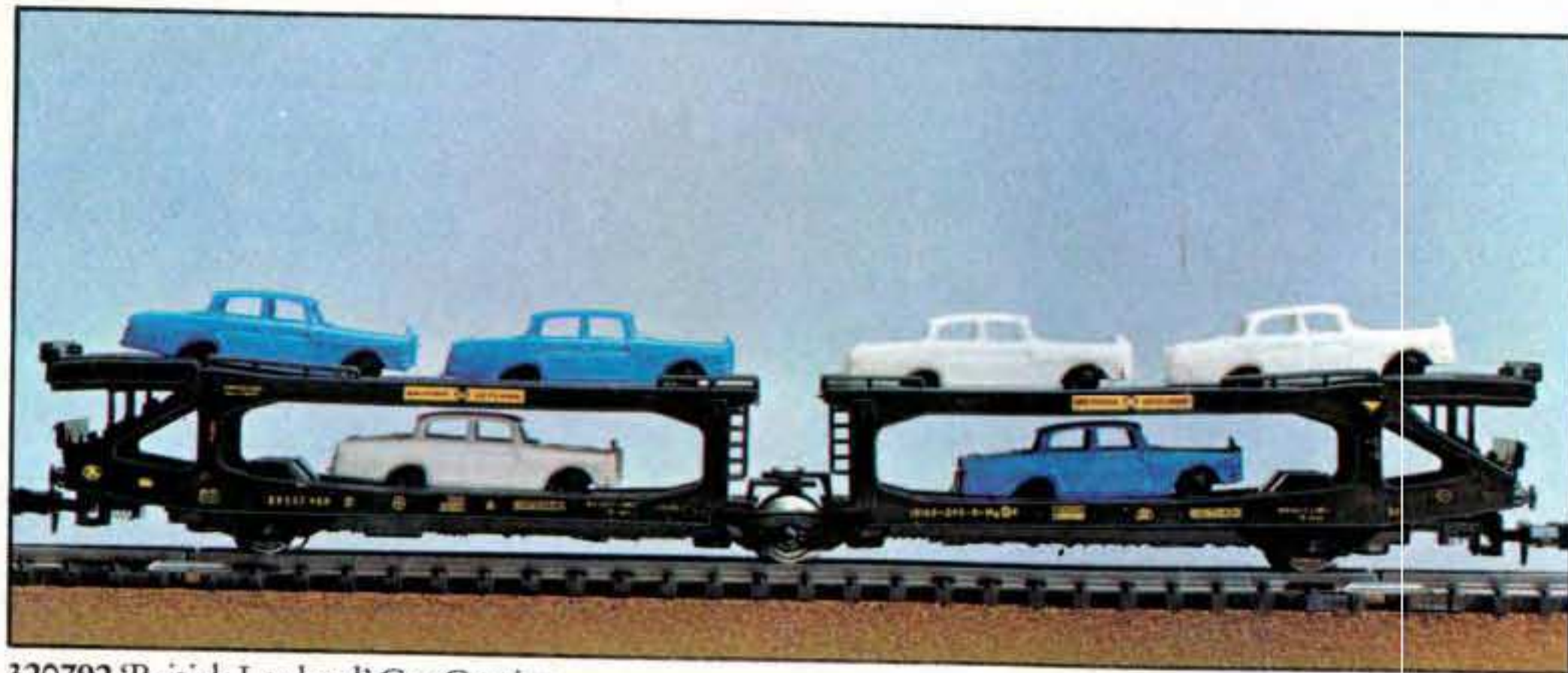


320725 Mineral Wagon.

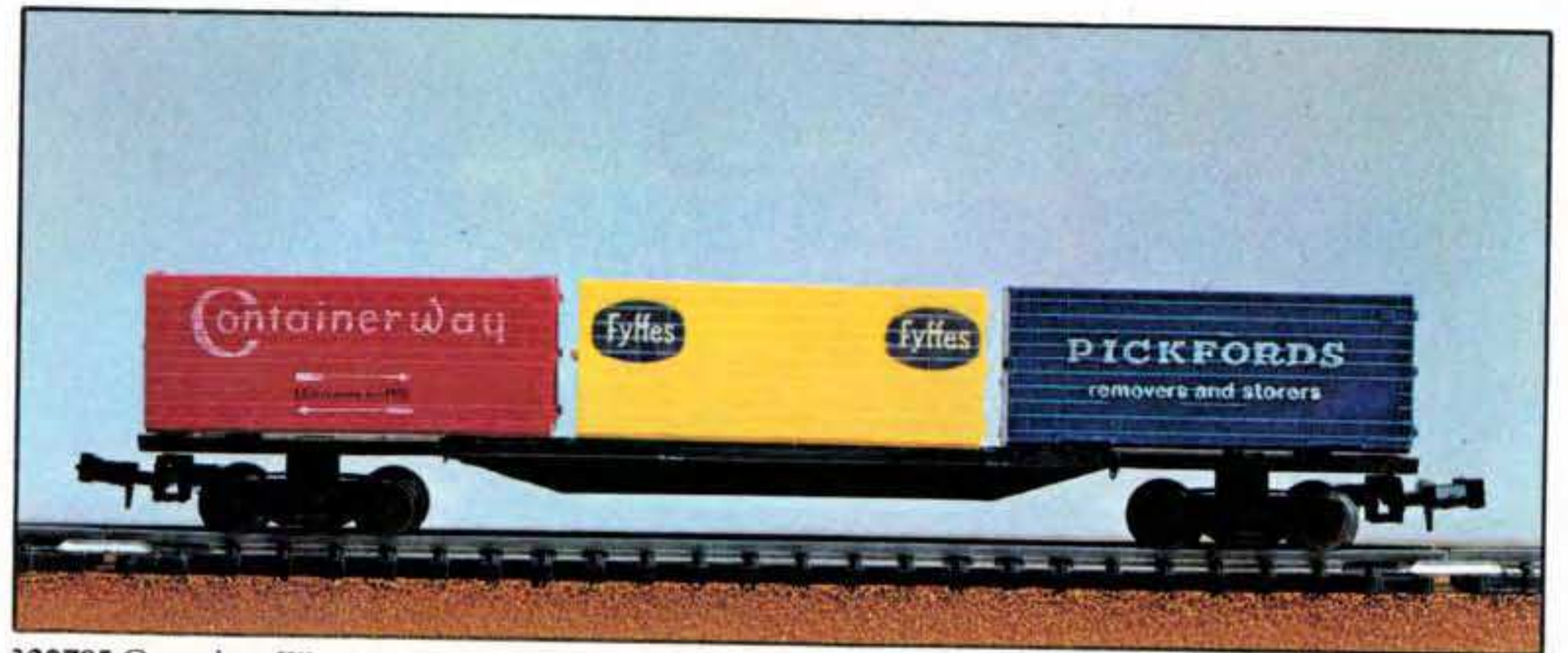


320726 'National Coal Board' Mineral Wagon.

N GAUGE



320792 'British Leyland' Car Carrier.



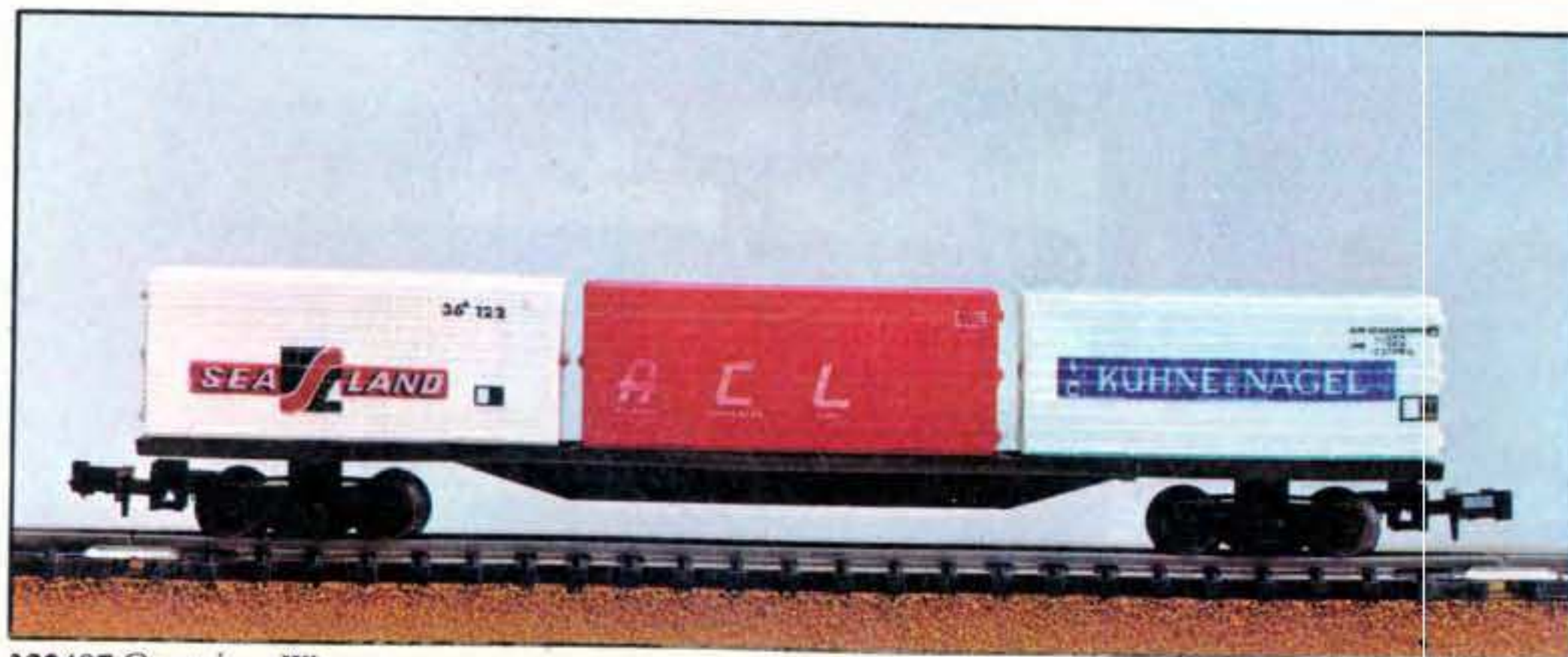
320795 Container Wagon.



320485 Container Wagon.



320486 Container Wagon.



320487 Container Wagon.



320484 Freightliner Wagon.



320452 'Shell' Tank Wagon.



320454 'BP' Tank Wagon.



320781 'Mobil Oil' Tank Wagon.



320455 'Texaco' Tank Wagon.

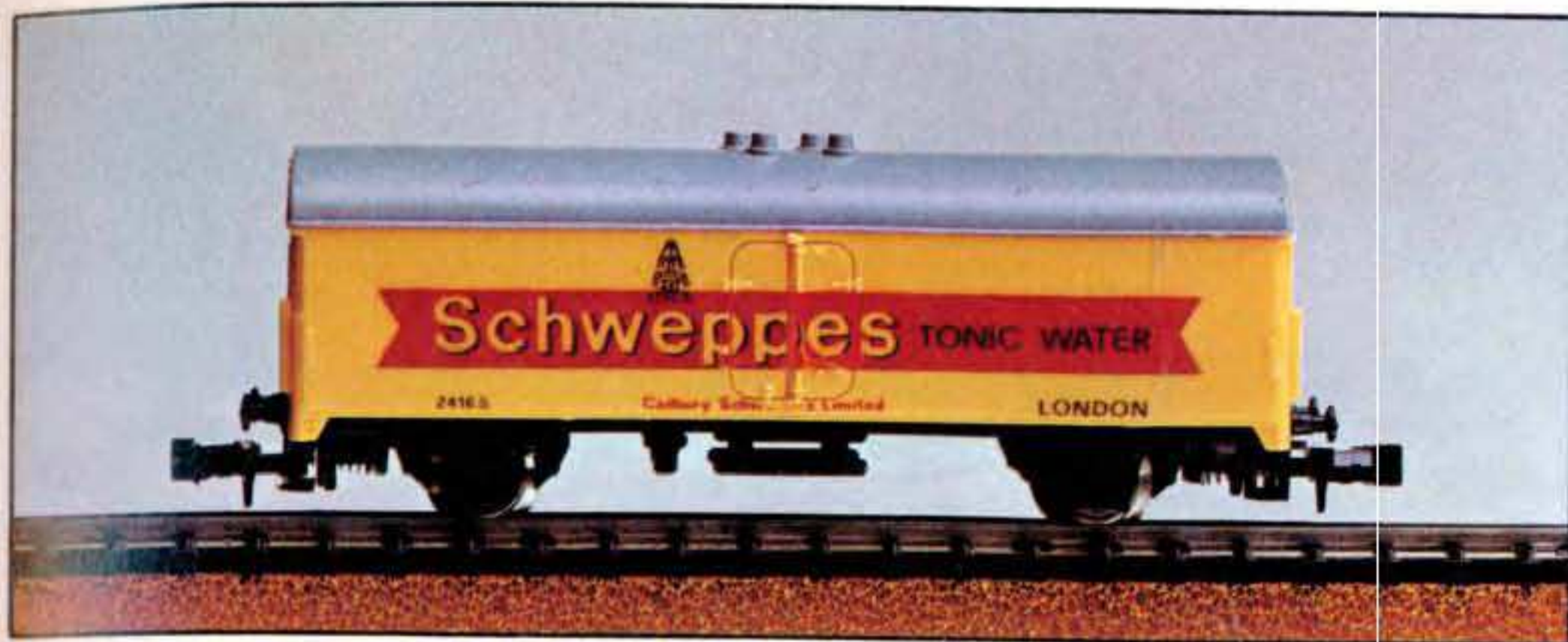


320780 'Gulf' Tank Wagon.

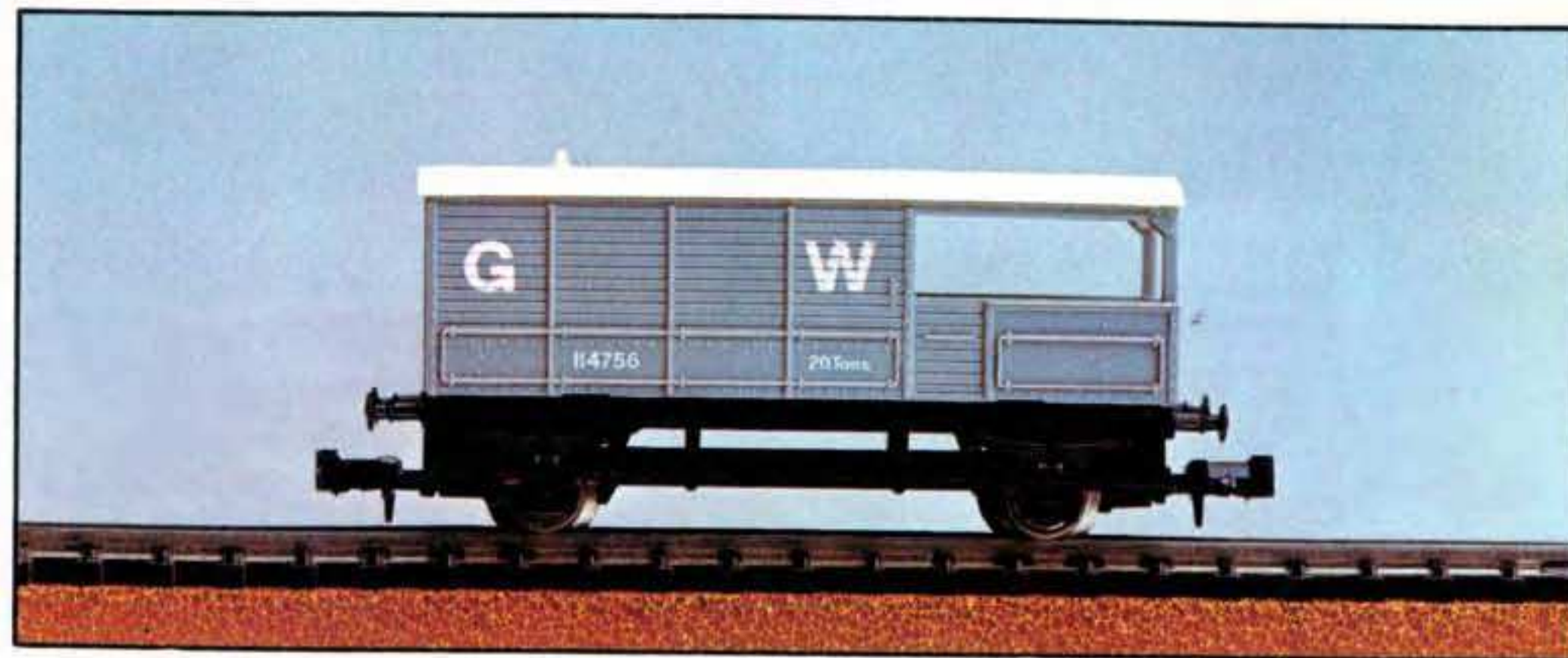


320782 'ICI Chemicals' Tank Wagon.

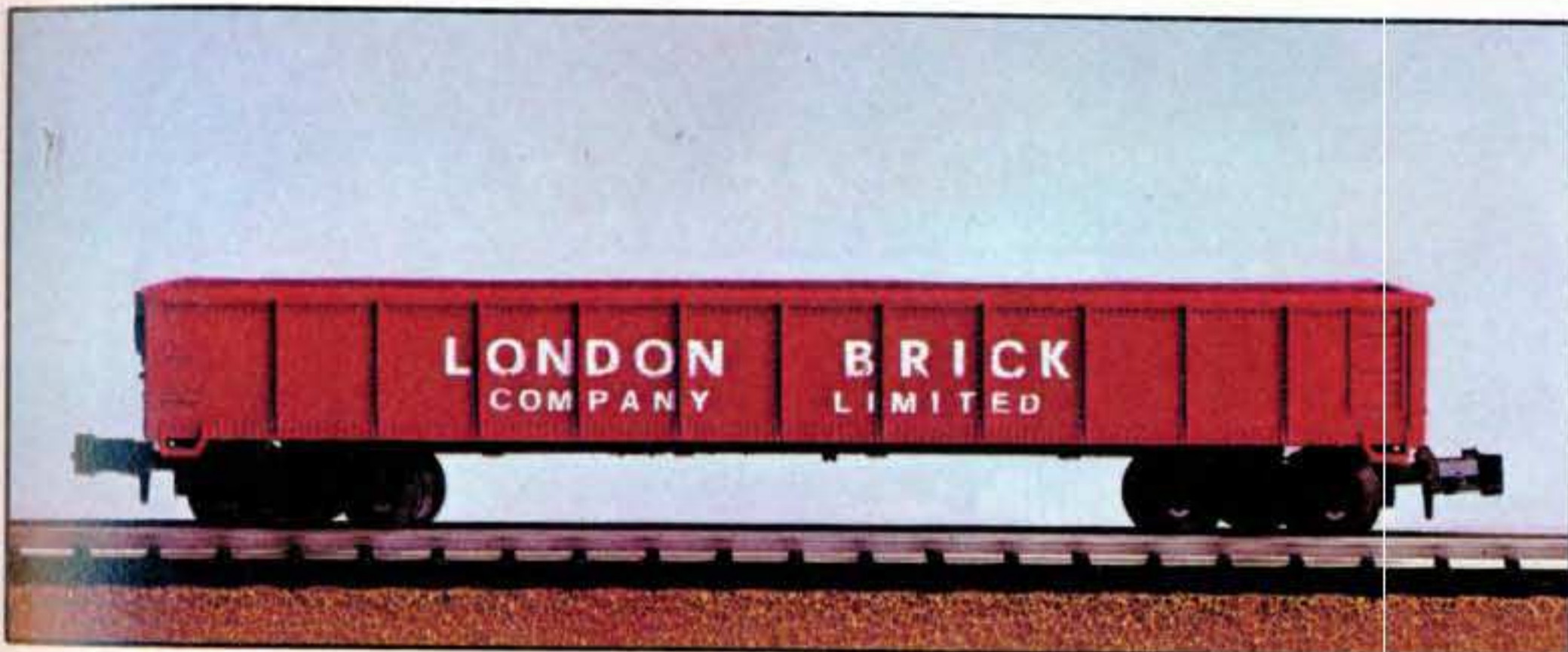
N GAUGE



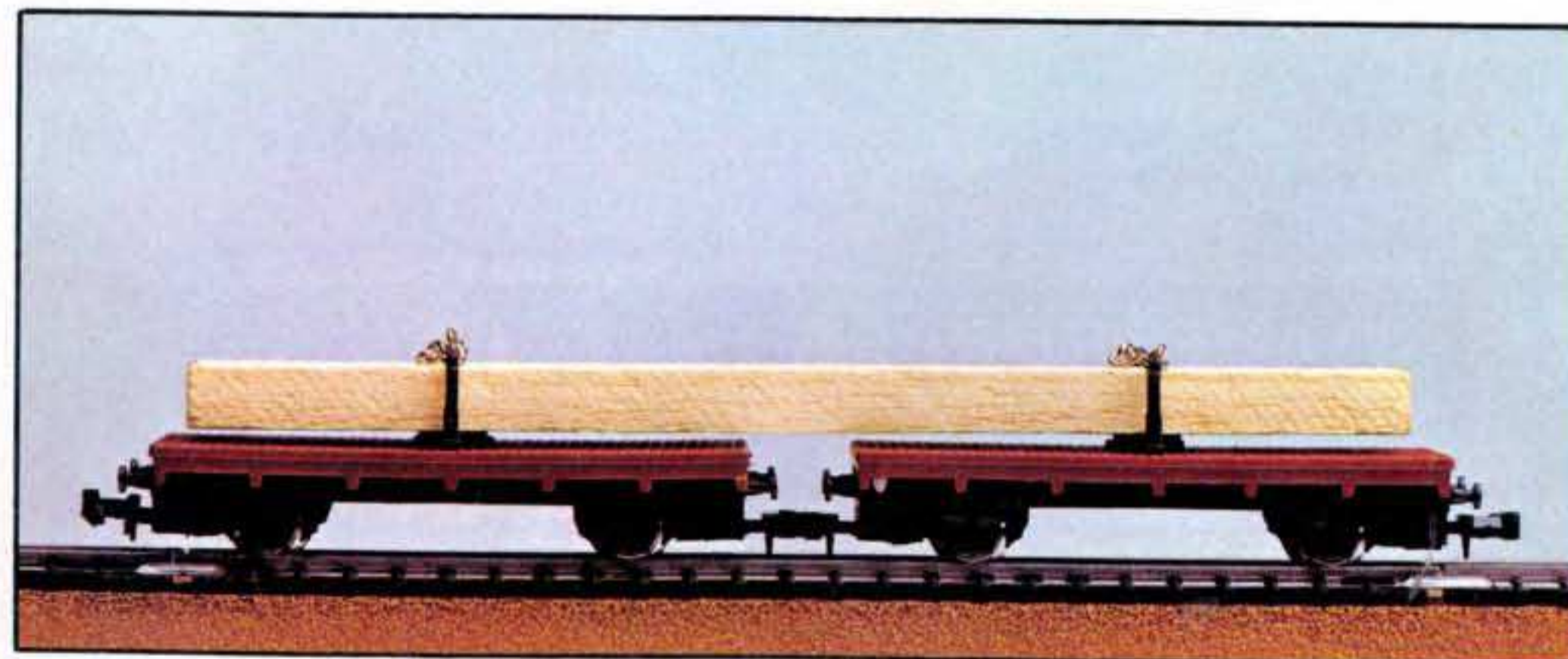
320474 'Schweppes' Box Van.



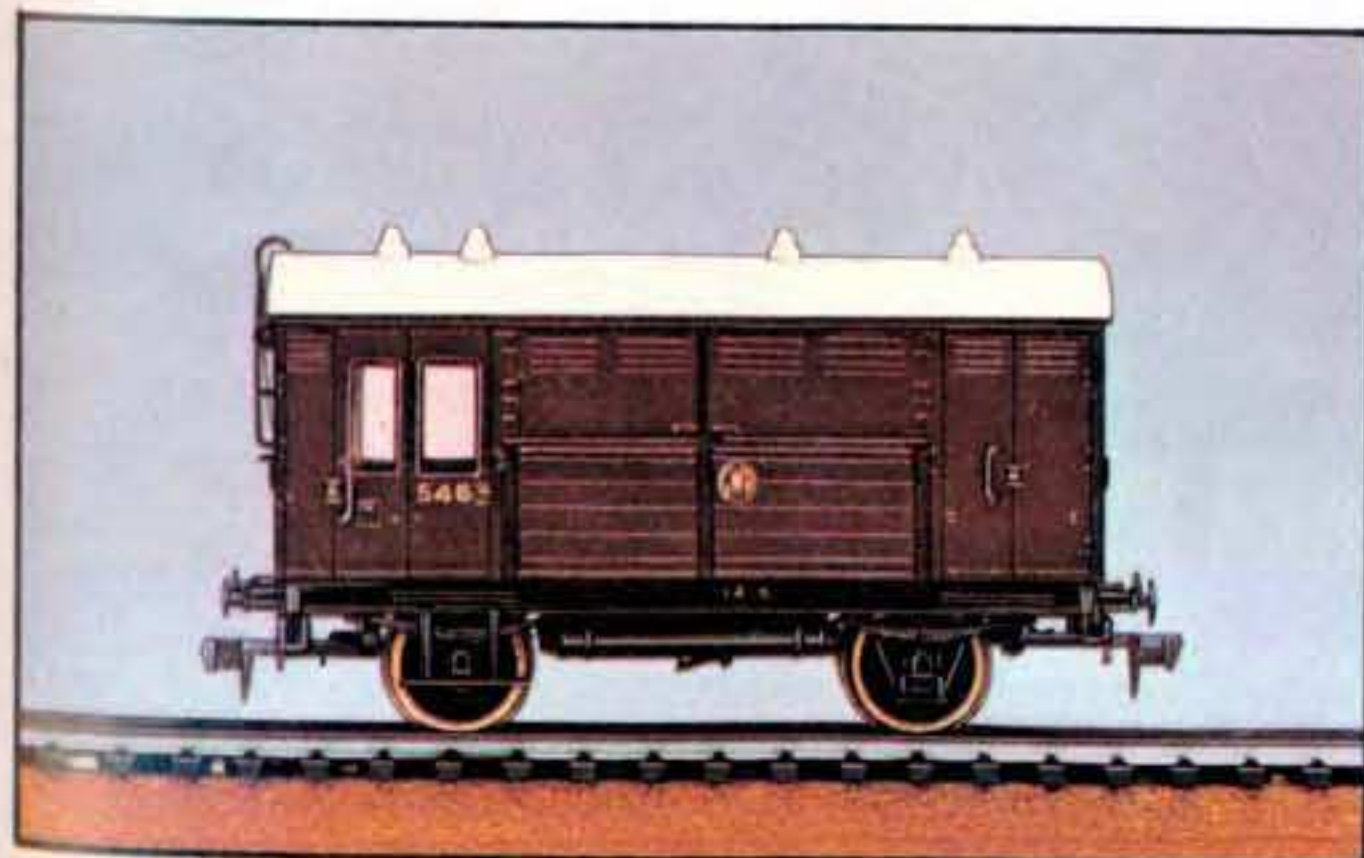
320410 GWR Brake Van.



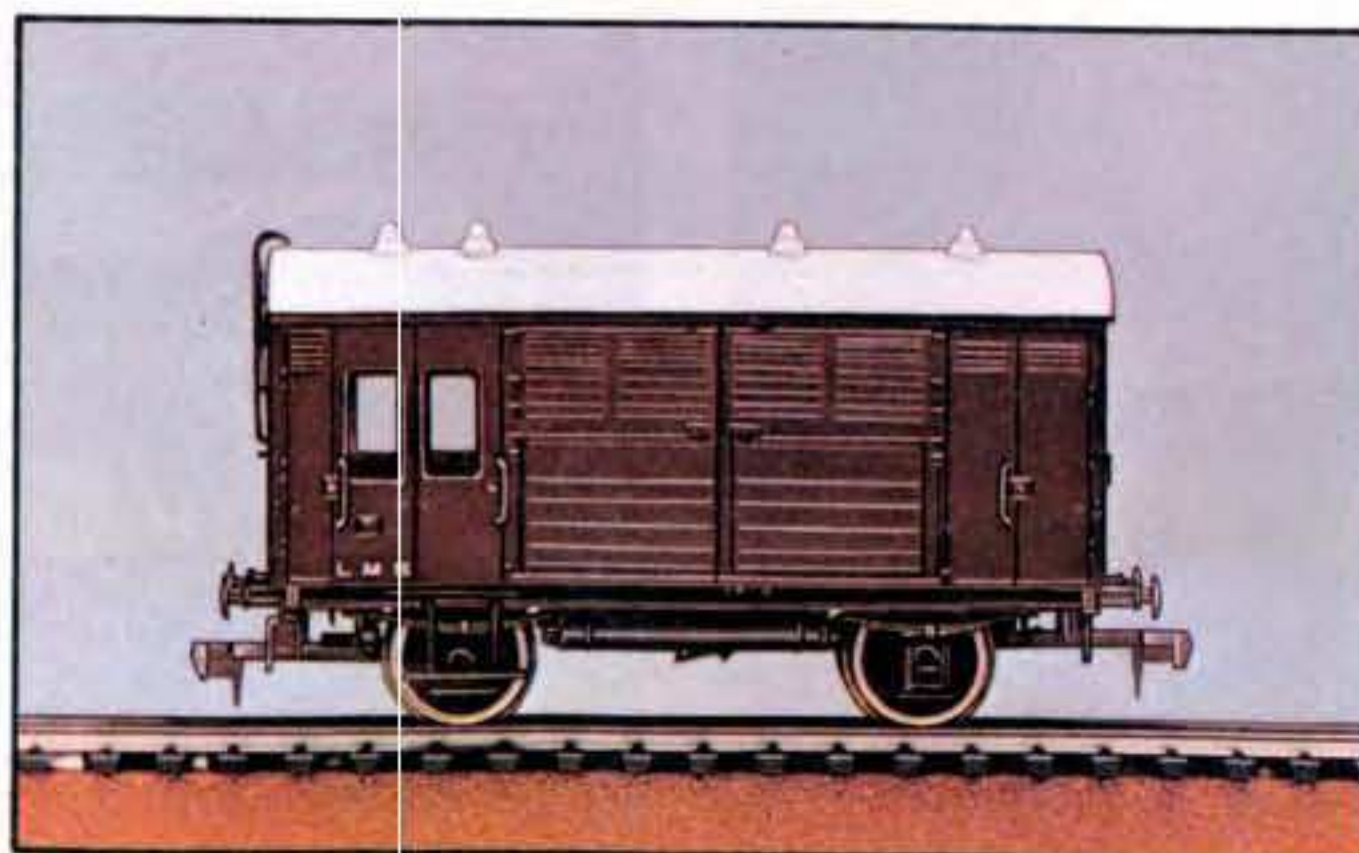
320720 'London Brick' Bogie Wagon.



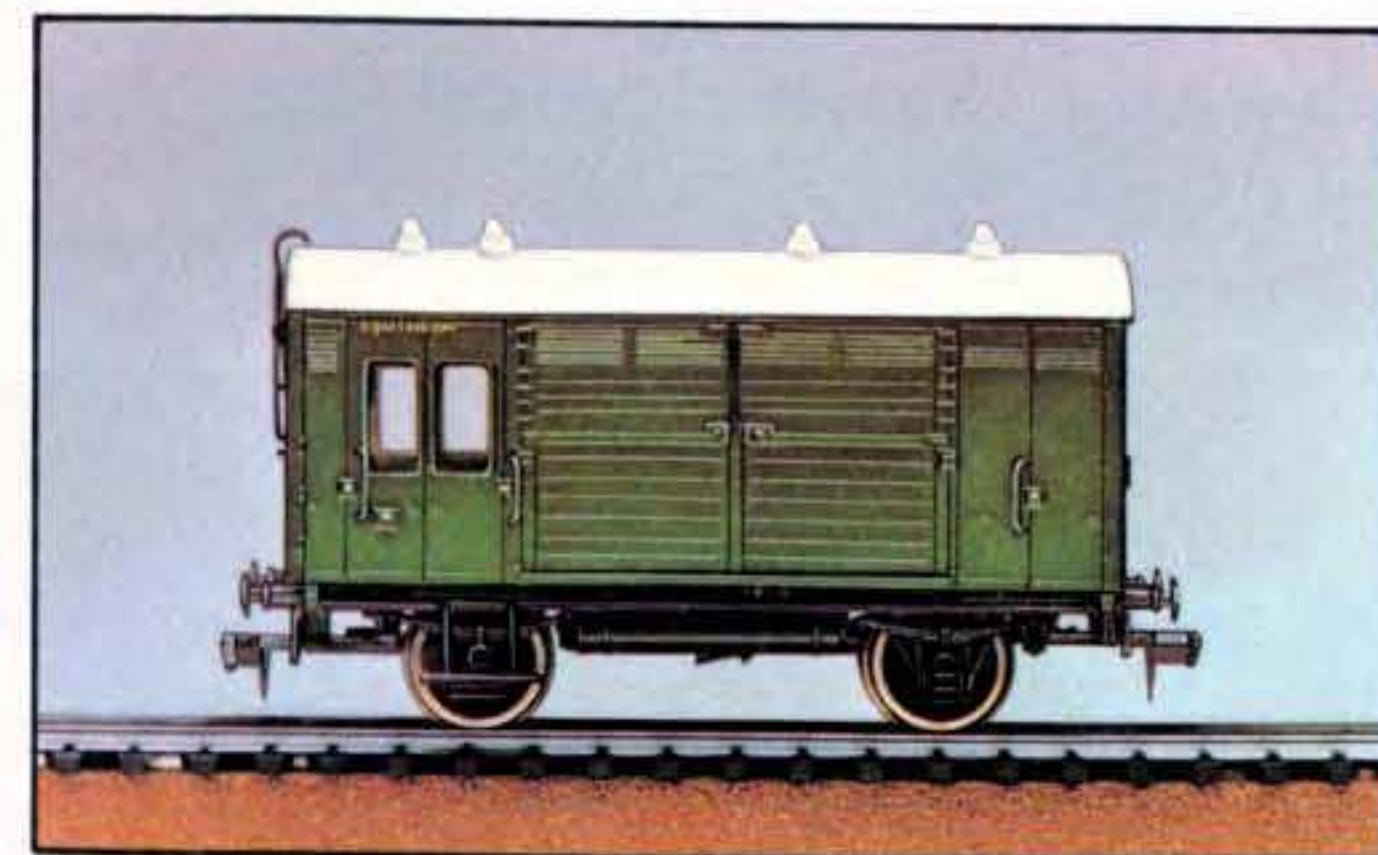
320483 Twin Trucks with Planks.



320616 GWR 2 Axle Horse Box.



320617 2 Axle Horse Box LMS Livery.



600619 2 Axle Horse Box SR Livery.

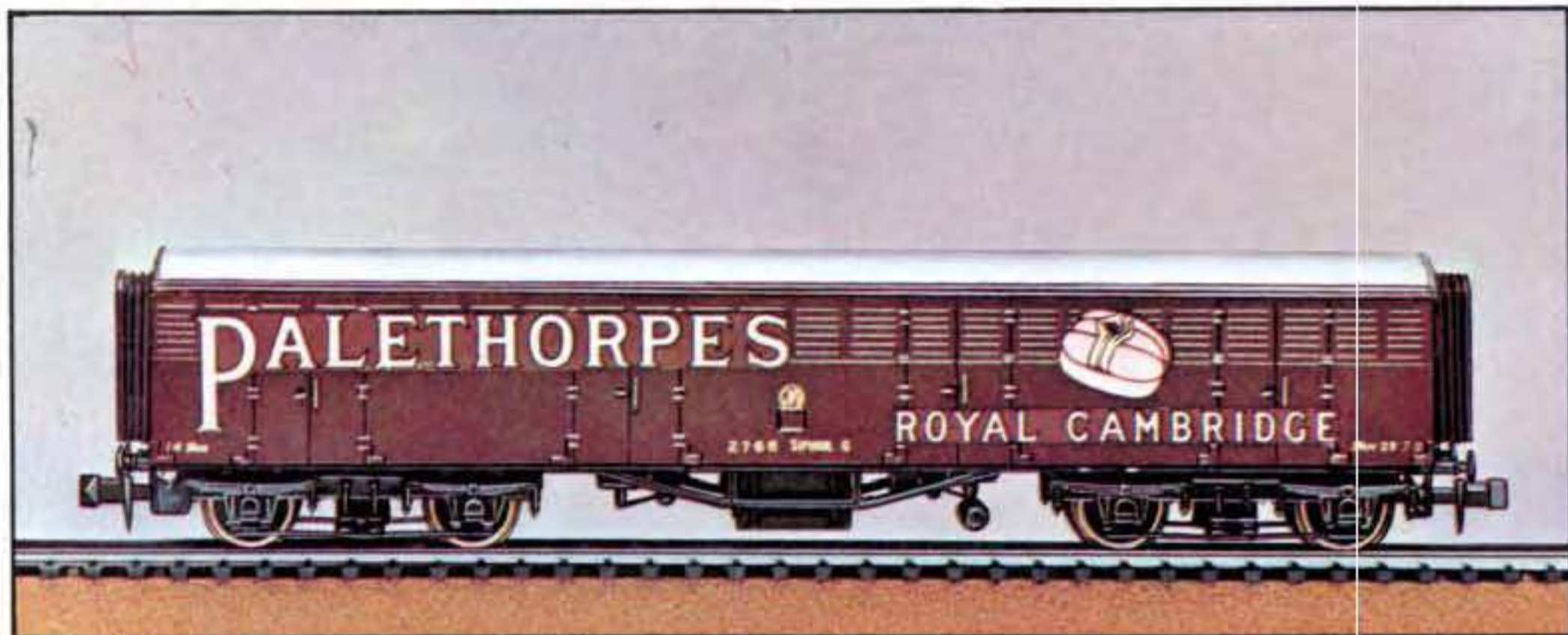
N GAUGE



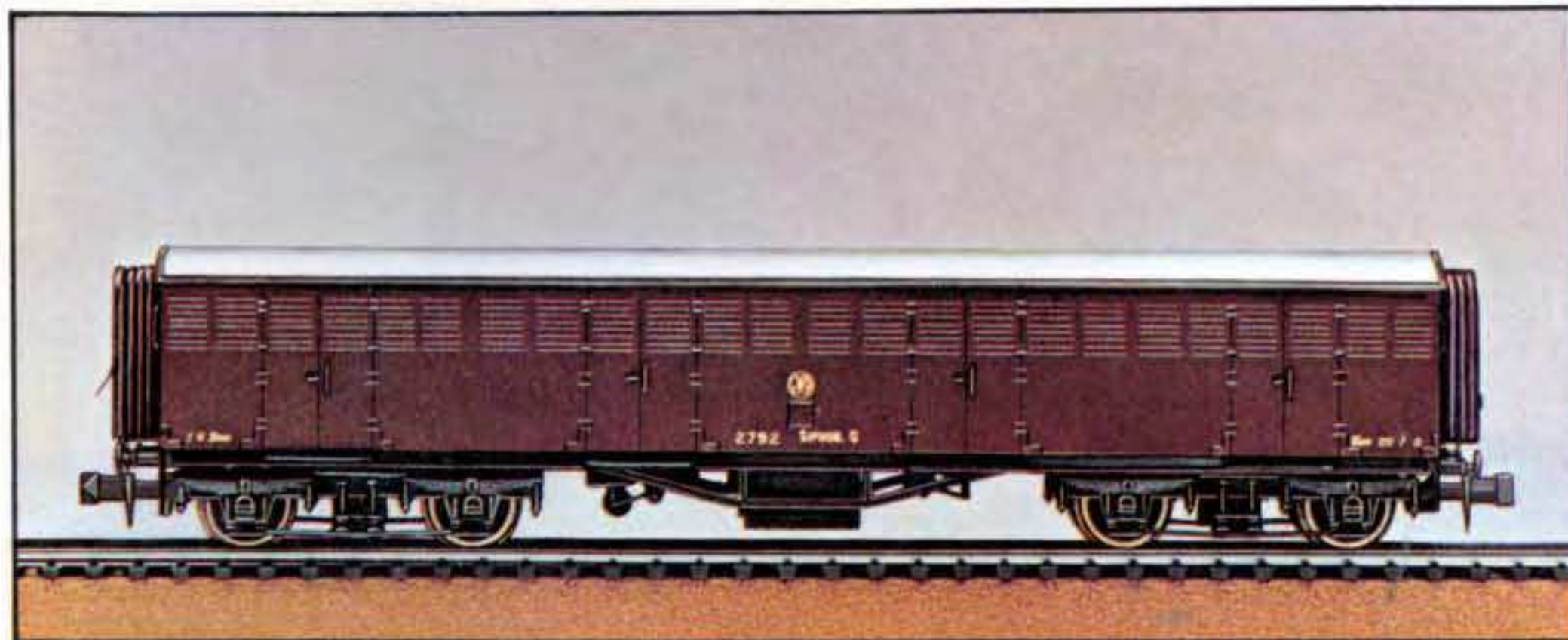
320622 'Amoco' Bogie Tank Wagon.



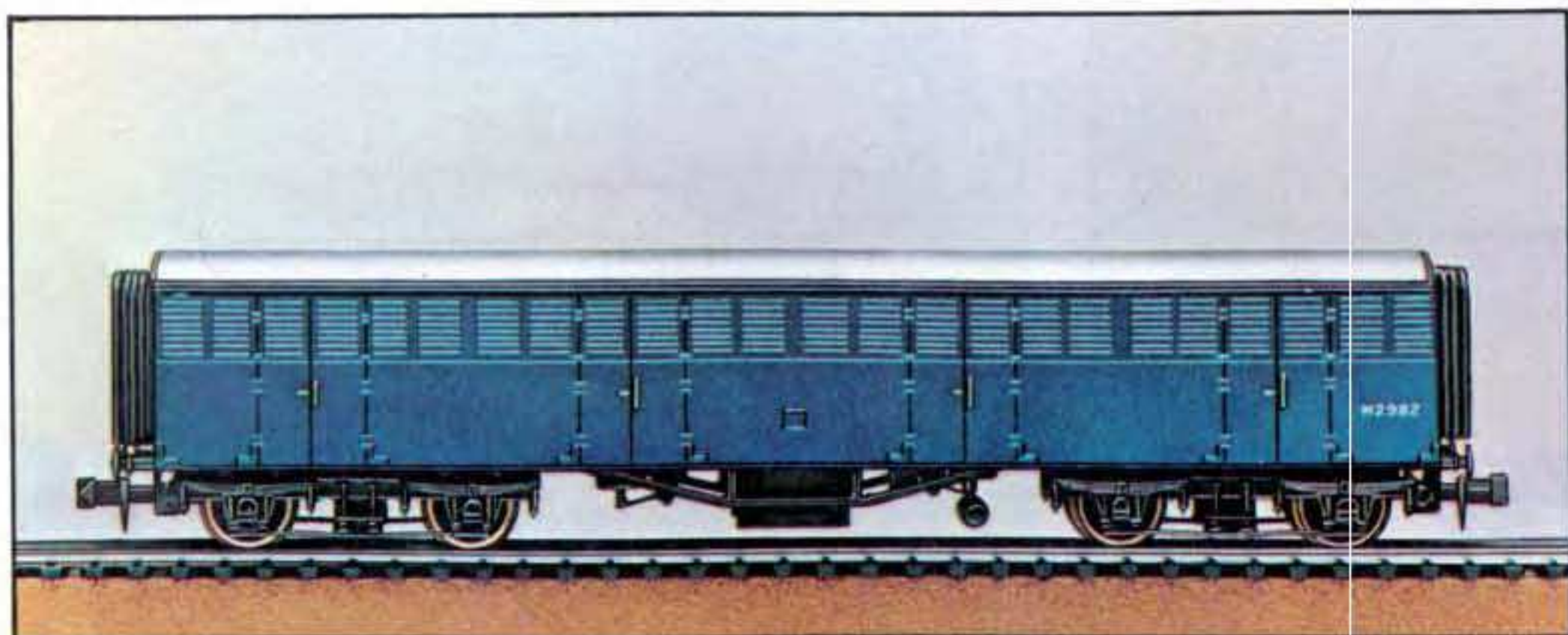
320623 'Texaco' Bogie Tank Wagon.



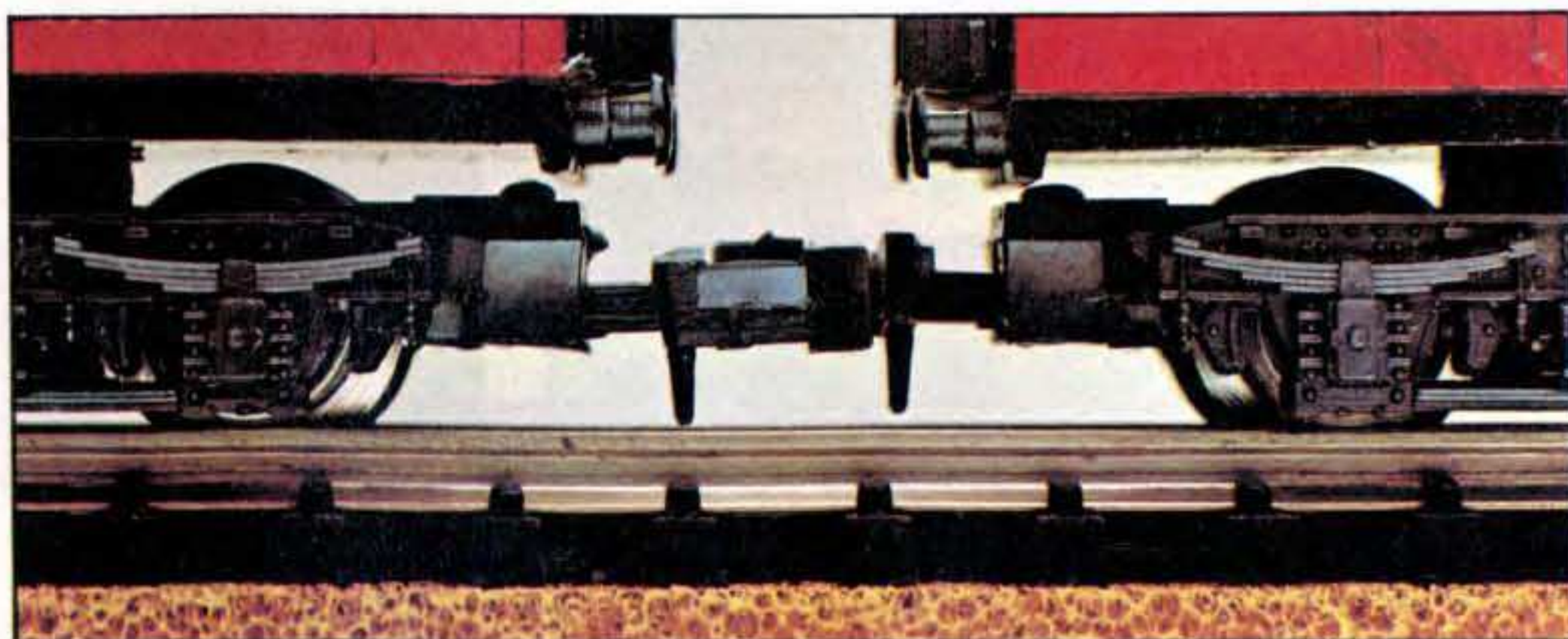
320863 GWR Bogie Parcel Van 'Syphon G' Palethorpes Sausages.



320862 GWR Bogie Parcel Van 'Syphon G'

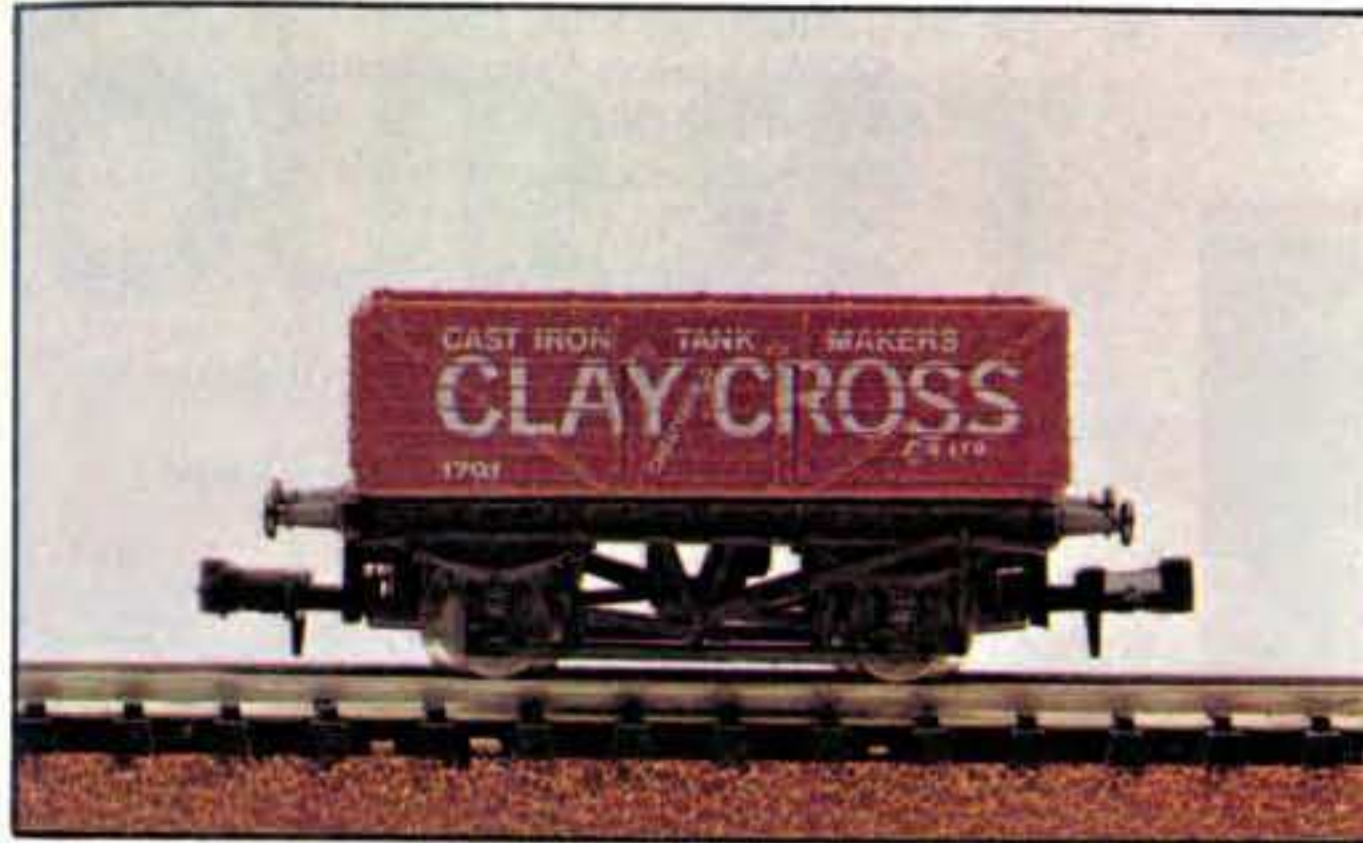


320864 GWR Bogie Parcel Van 'Syphon G' BR Livery.

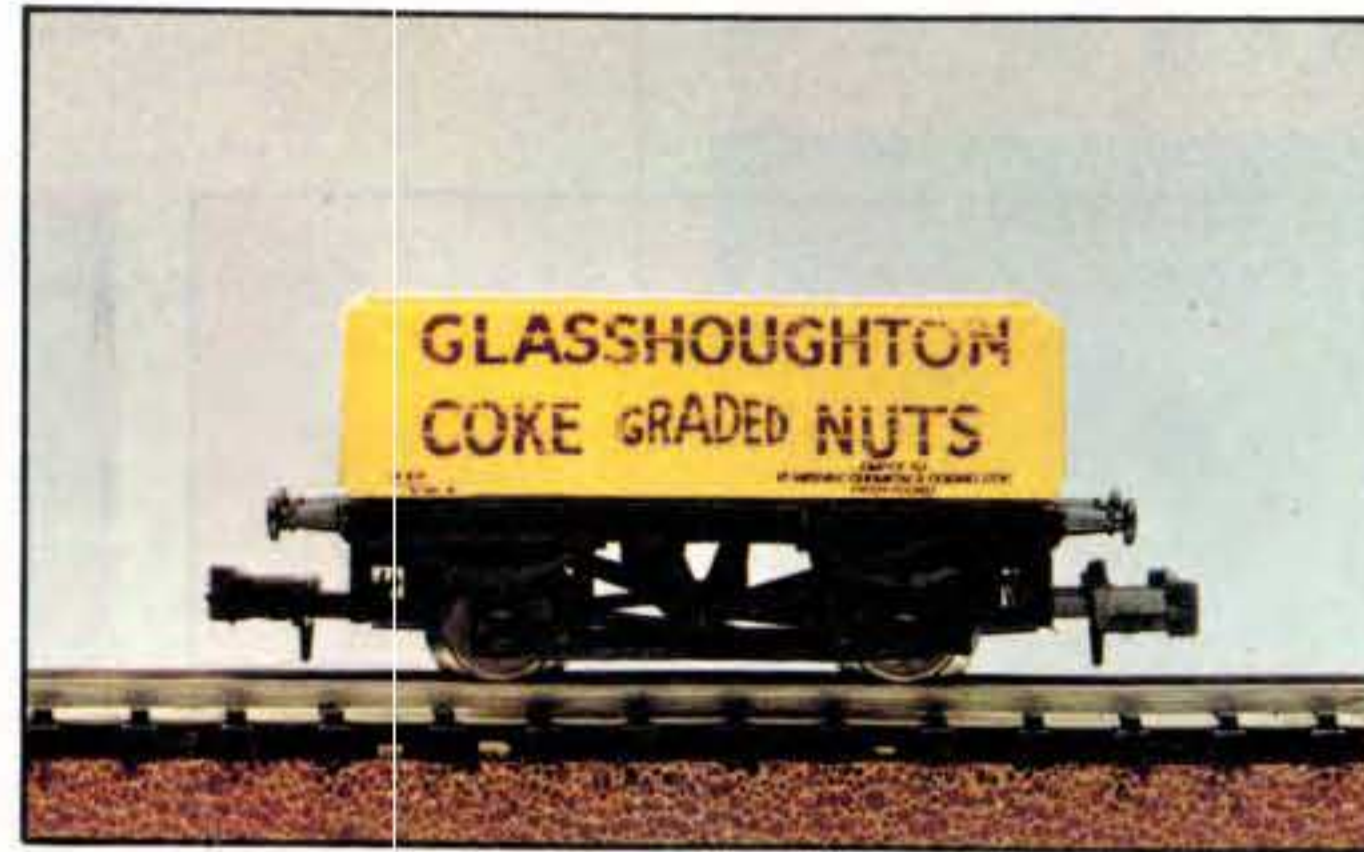


Lima "N" Gauge features "Universal Coupling", as used throughout the world. And seen here on two Lima wagons.

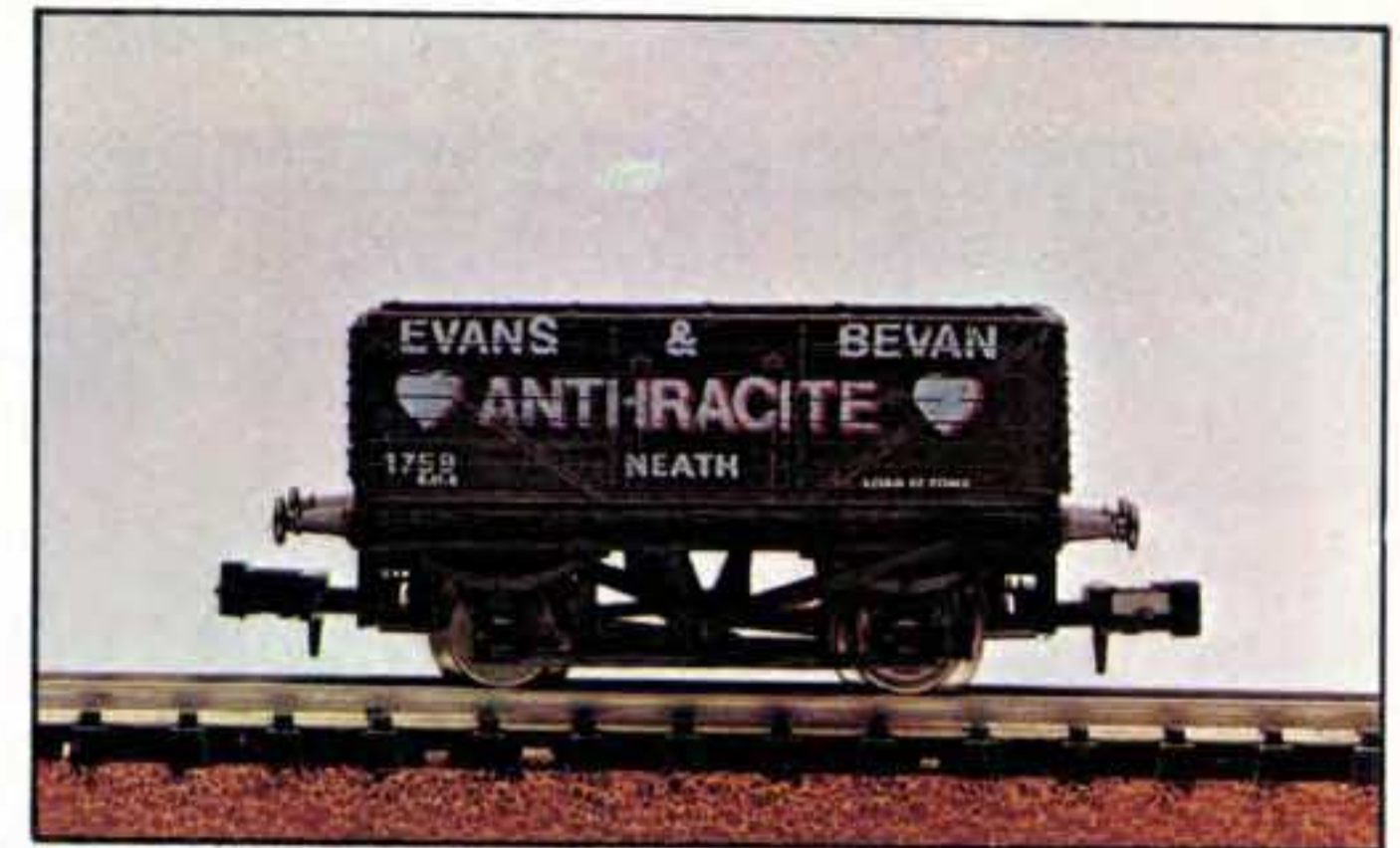
# N GAUGE



320601 'Clay Cross Co. Ltd.' 7 Plank Wagon.



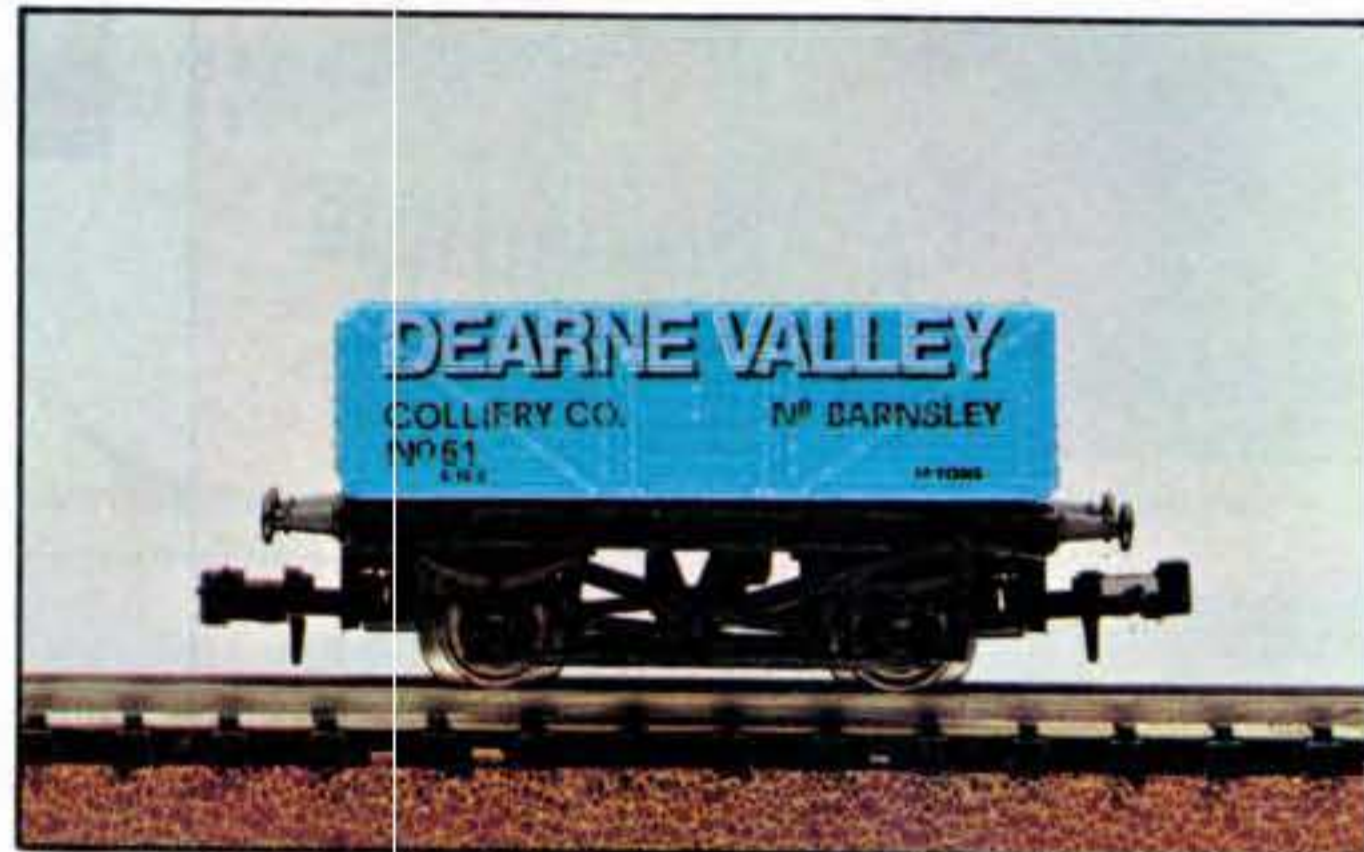
320602 'Glasshoughton Coke Nuts' 7 Plank Wagon.



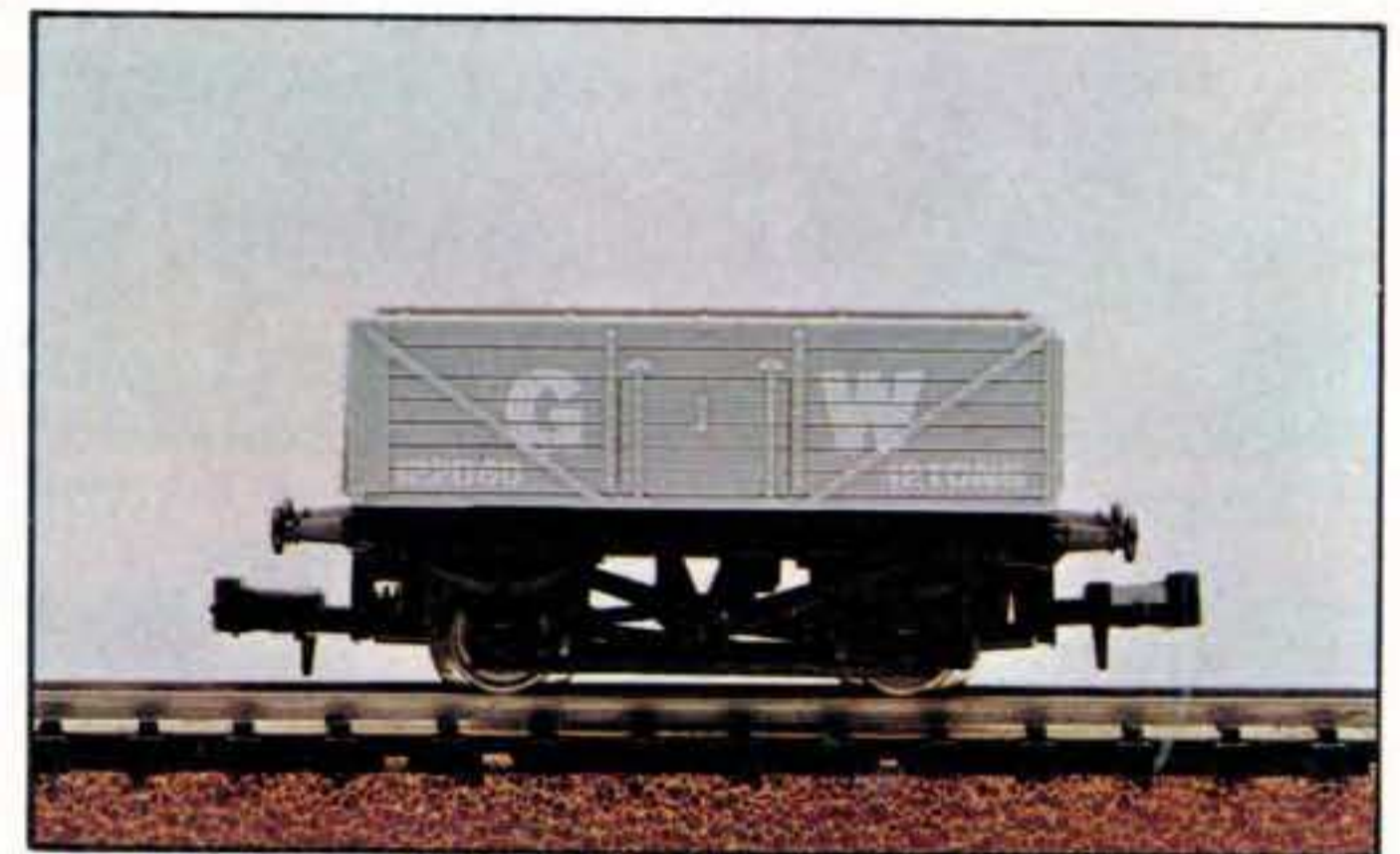
320603 'Evans & Bevan Anthracite' 7 Plank Wagon.



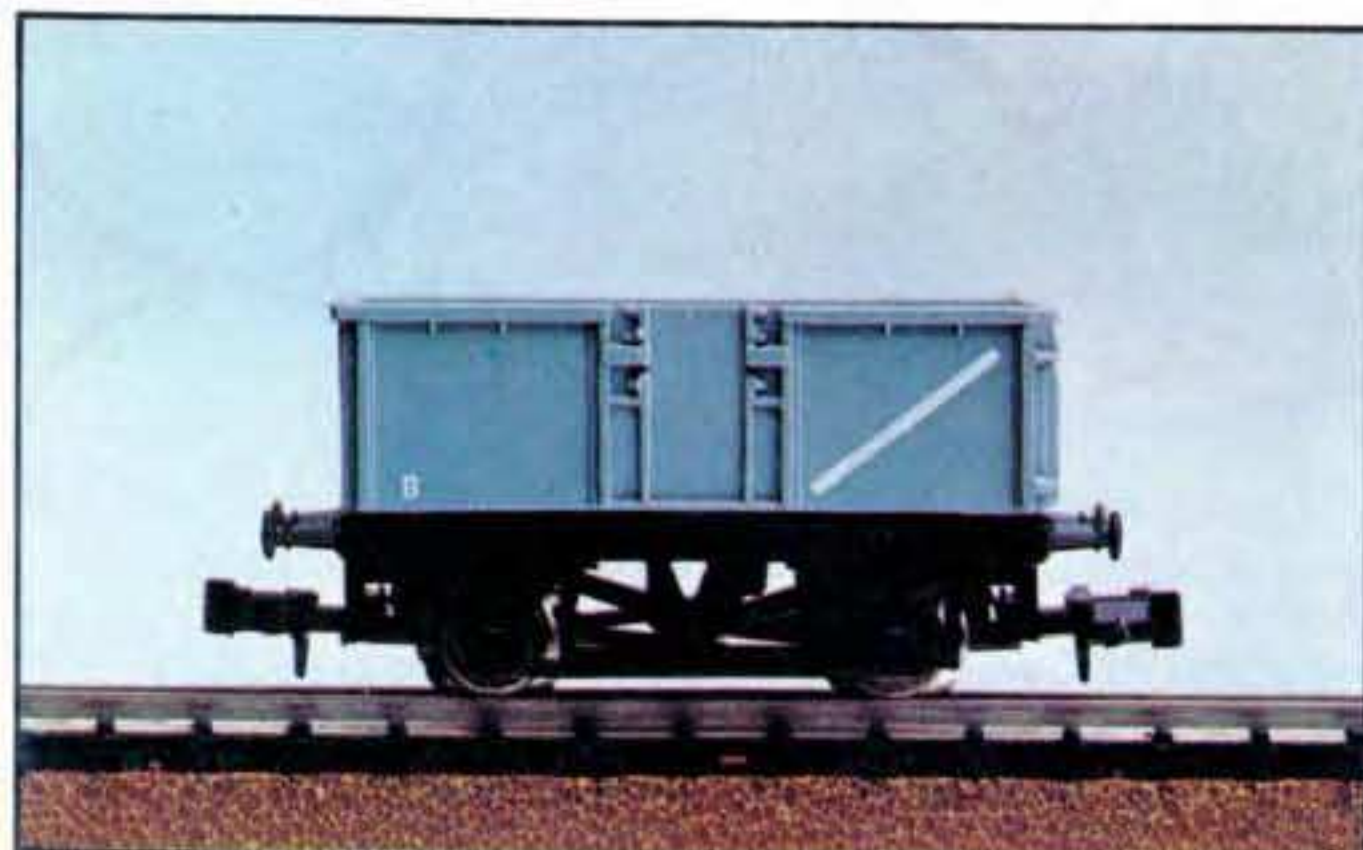
320604 'Oxford & District Gas Co' 7 Plank Wagon.



320605 'Dearne Valley Colliery' 7 Plank Wagon.



320606 GWR 7 Plank Wagon.



320406 Open Mineral Wagon.



320407 'North Thames Gas' Open Wagon.



Lima's painstaking attention to detail extends even to the Bogies.

# TRACK



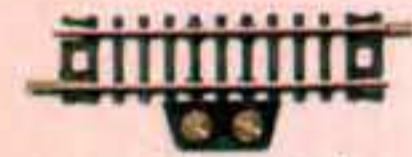
420561 straight track (124mm).



470562 1/2 straight track (62mm).



420563 1/4 straight track.



420564 1/2 straight with power clip.



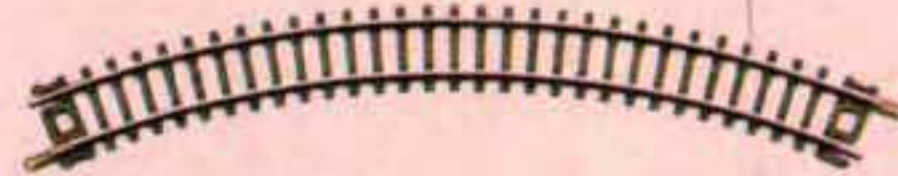
420564R 1/2 straight with power terminal.



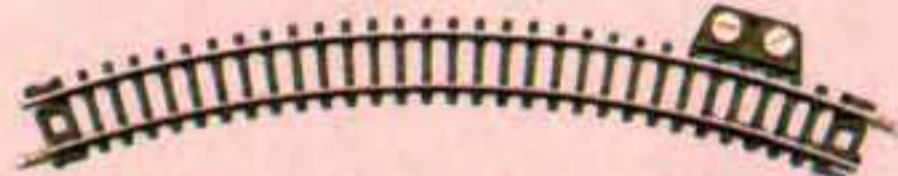
420565 1/2 straight with buffer stop.



620721 Railer.



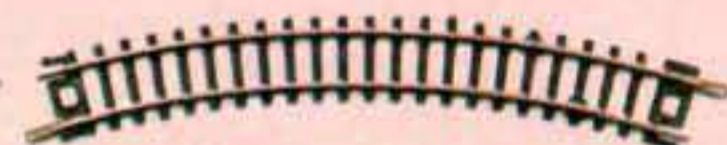
420571 curved track (45°).



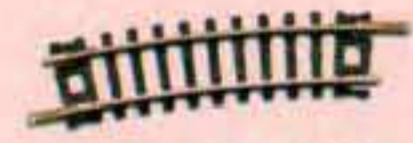
420571C curved track with power terminal.



420572 1/3 curved track (15°).



420551 curved track (dia 472mm).



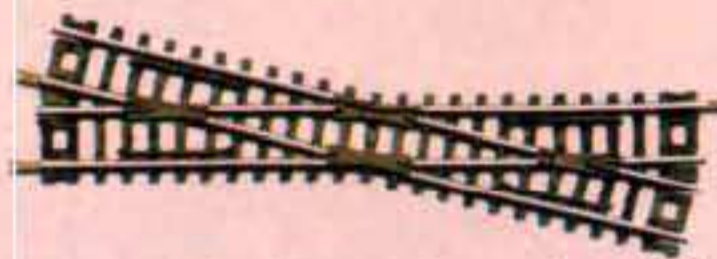
420552 1/2 curved track (dia 472mm).



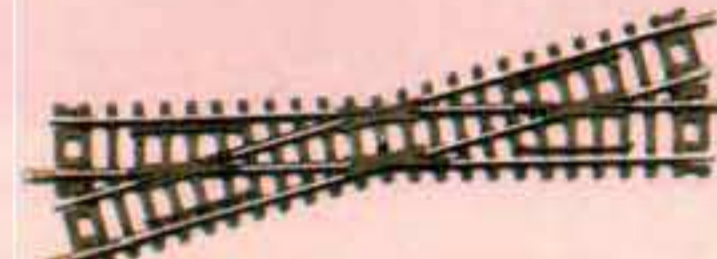
420553 compensating curved track.



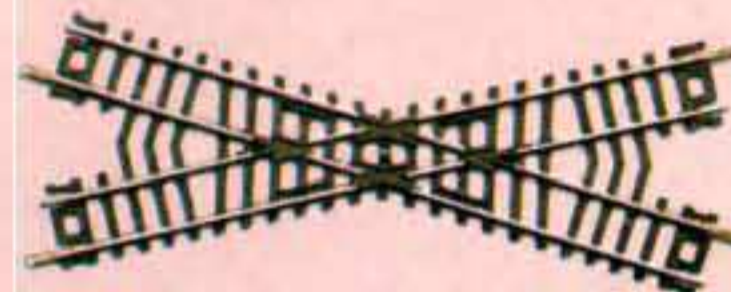
600018 'N' Gauge fish plates (metal) for new flexible track 420511.



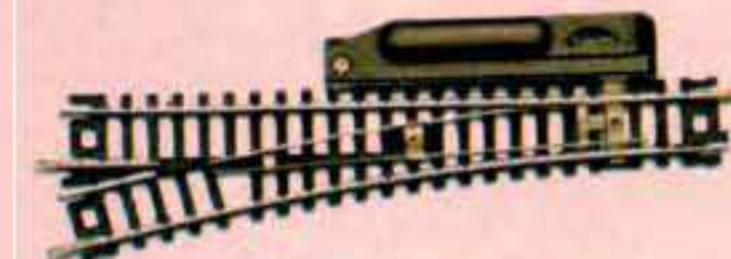
420521 right diamond crossing (15°).



420524 left diamond crossing (15°).

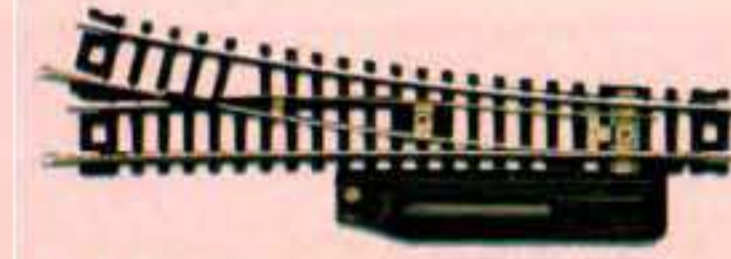


420522 diamond crossing (30°).



420526 left-hand point (manual).

420526E left-hand point (electric).



420525 right-hand point (manual).

420525E right-hand point (electric).

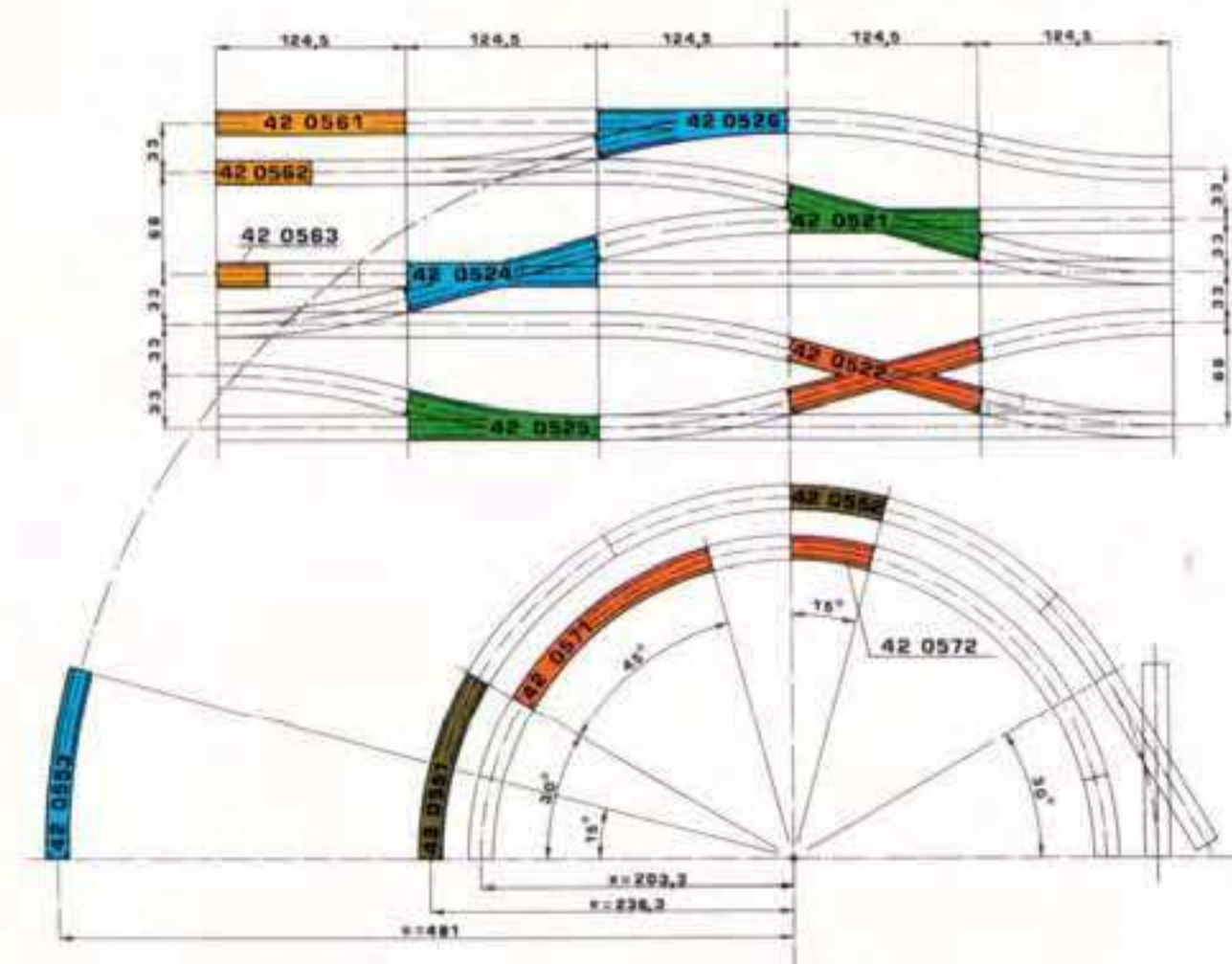


600017 insulated fish plates.

Extra track is available in the following packs:



420580 6 pieces straight track (124mm) 420561.  
 420581 6 pieces 1/2 straight track (62mm) 420562.  
 420590 6 pieces curved track (45°) 420571.  
 420592 6 pieces 1/3 curved track (15°) 420572.  
 420591 6 pieces curved track (diameter 472mm) 420551.  
 420593 6 pieces 1/2 curved track 420552.  
 420585 1 piece curved track (45°) 420571.  
 1 piece curved track with power connecting terminal 420571C.  
 420586 1 piece 1/2 straight track with power connecting terminal 420564R.  
 2 pieces 1/4 straight track 420563.  
 insulated fish plates 420017.  
 420587 1 piece straight track (124mm) 420561.  
 1 piece isolating track with power connecting terminal 420564R.  
 1 piece 1/2 straight track with buffer stop 420565.



Remember when installing your track that trains on adjoining tracks must be able to pass freely without touching.

In Lima 'N' Gauge the basic measurement to be born in mind is represented by a distance between tracks of 33mm., maintained in both straight lines and through the curves.

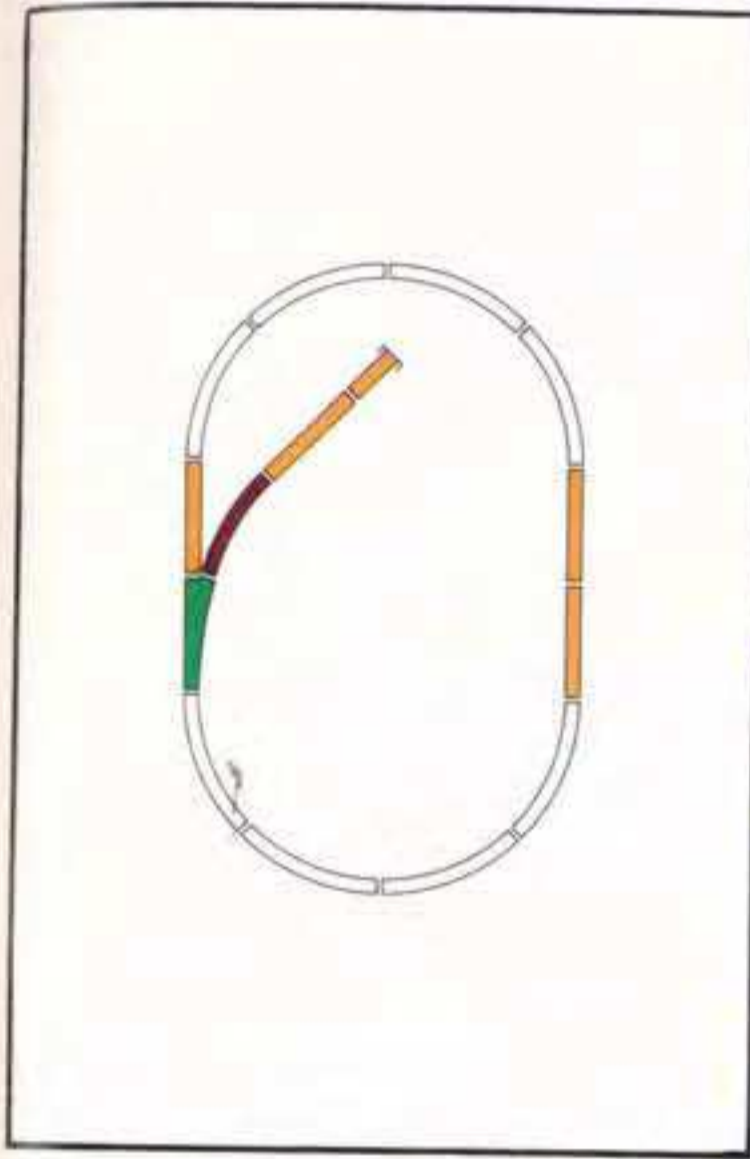
For instance the compensating curve 420533 when used with points 420525 and 420526 maintains this basic 33mm spacing.



420511 flexible track length 736mm.

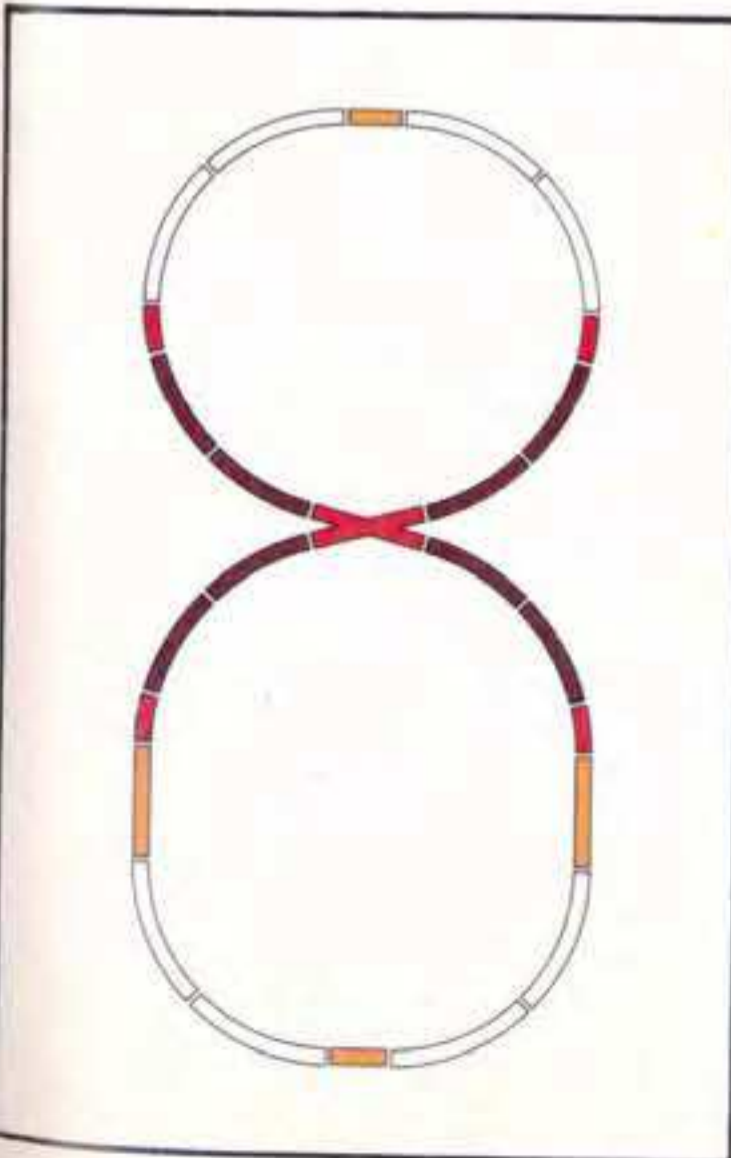
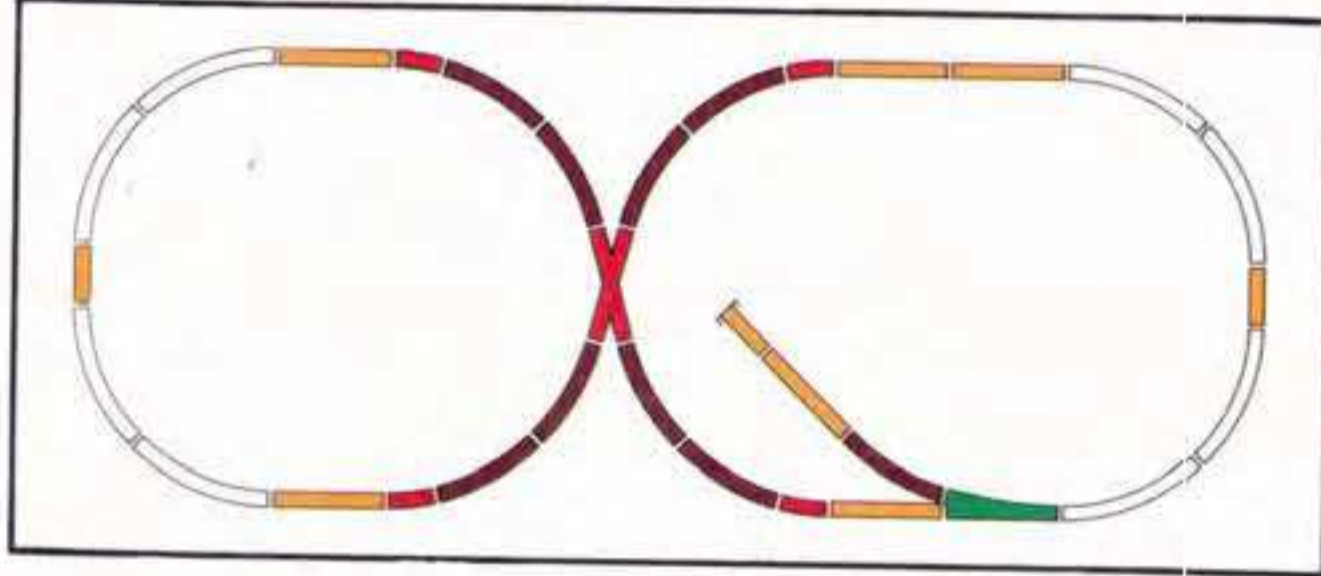


# EXTENDING YOUR SET



420540 1 piece right-hand point (manual)  
420525, 1 piece 1/2 straight track with  
buffer stop 420565, 4 pieces straight  
track (124mm), 1 piece curved track  
(diameter 472mm) 420551.

420540+420541



420541 1 piece 30° diamond crossing  
420522, 8 pieces curved track (diameter  
472mm) 420551, 4 pieces 1/3 curved track  
(15°) 420572, 2 pieces 1/2 straight track  
(62mm) 420562, 2 pieces straight track  
(124mm) 420561.



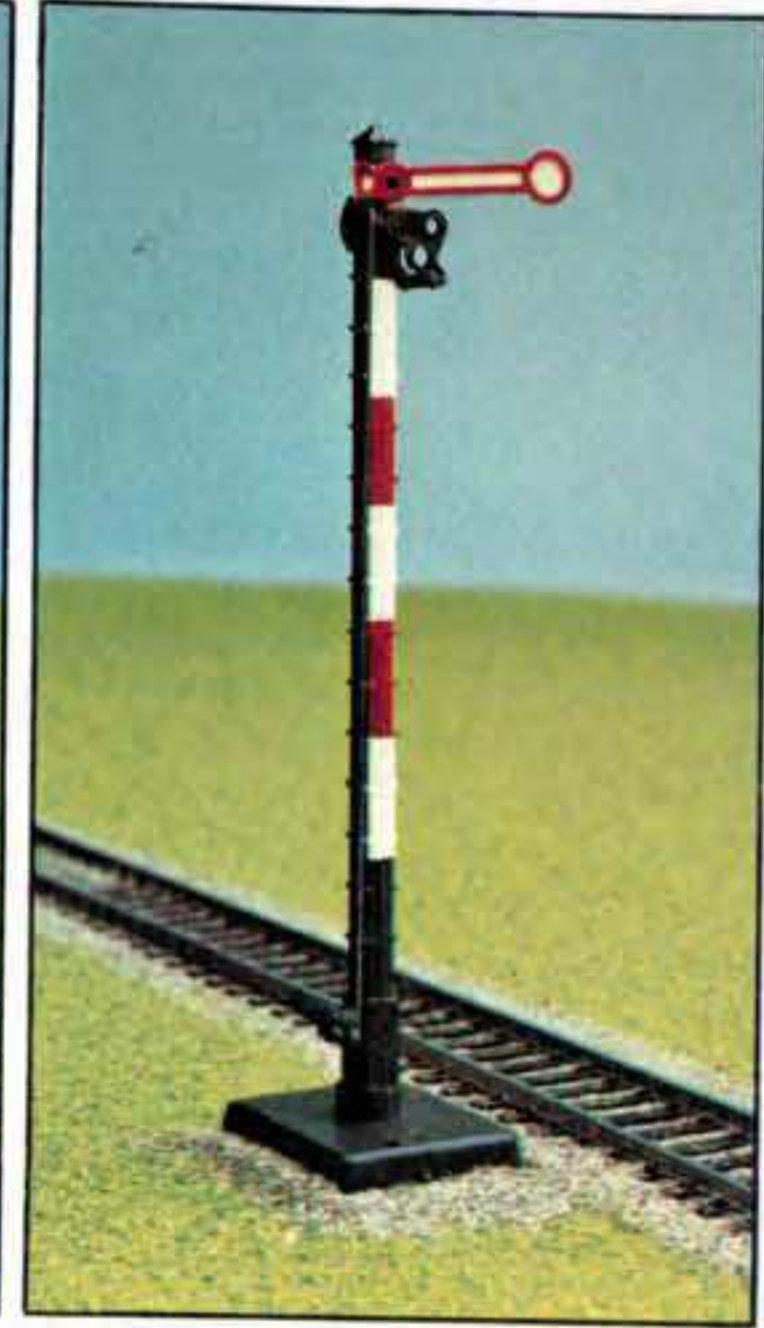
# SIGNALS



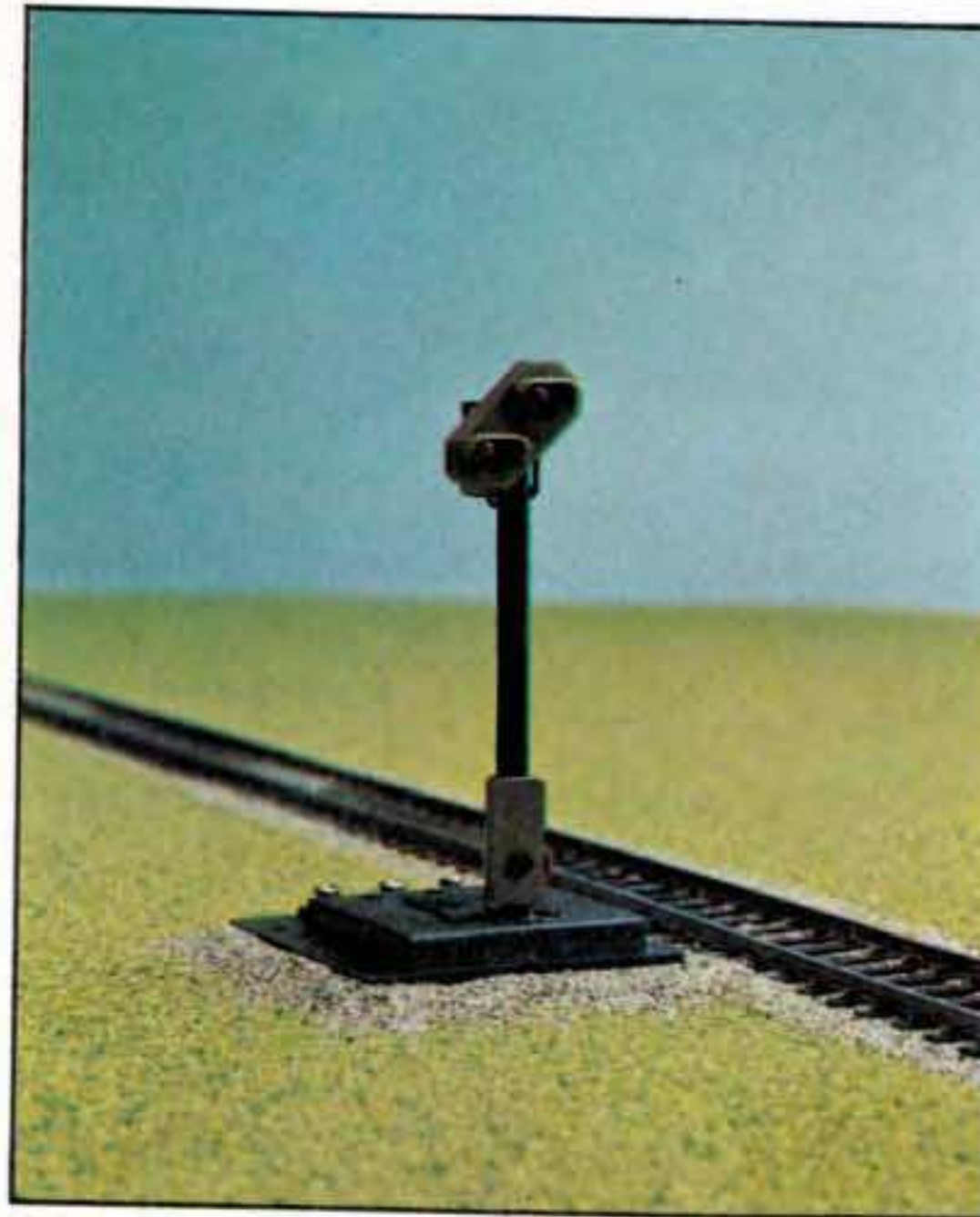
620710 Single Street Lamp.



620711 Double Street lamp.



620709 Semaphore Signal.

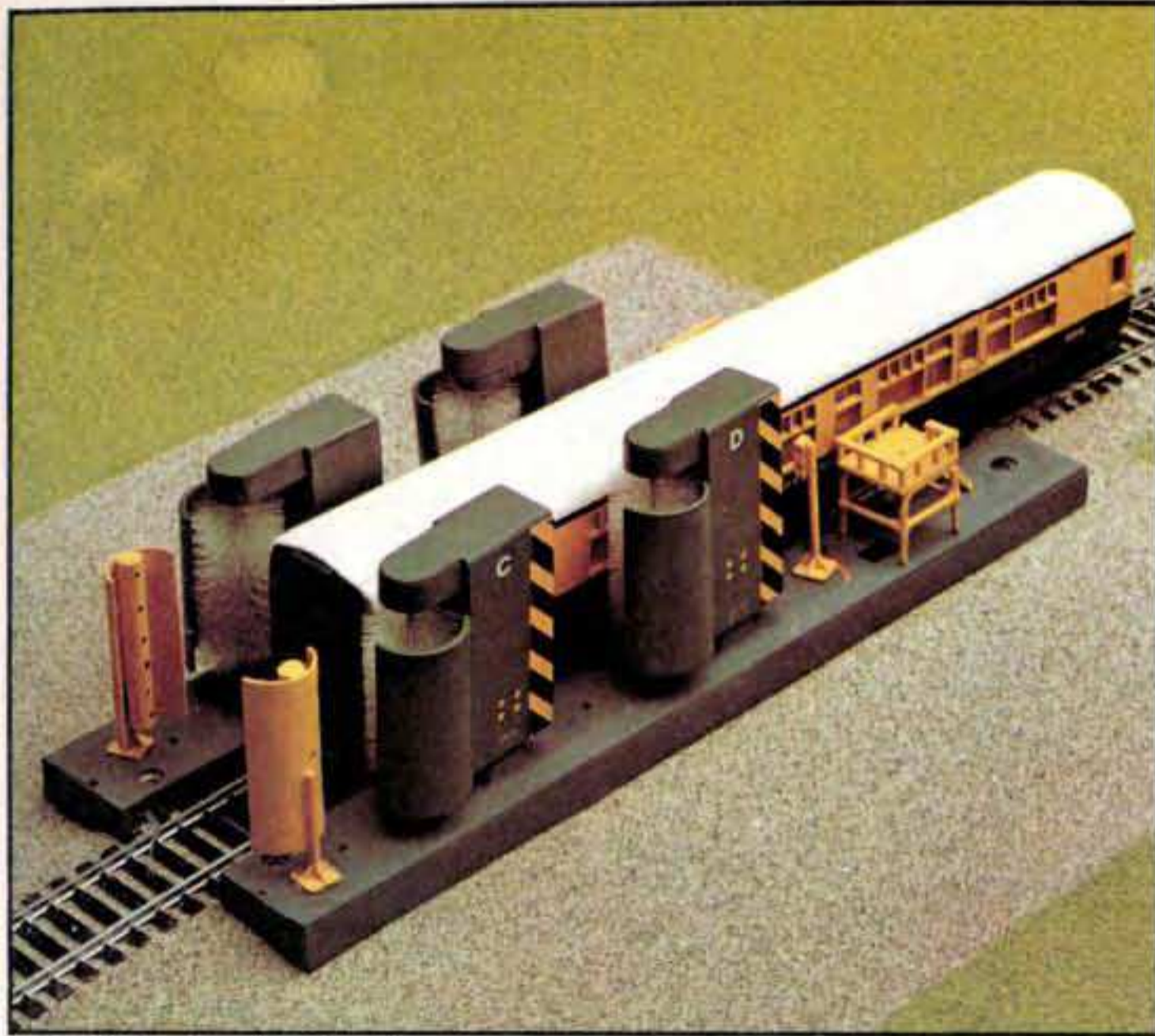


620712 Signal with Four Lights.

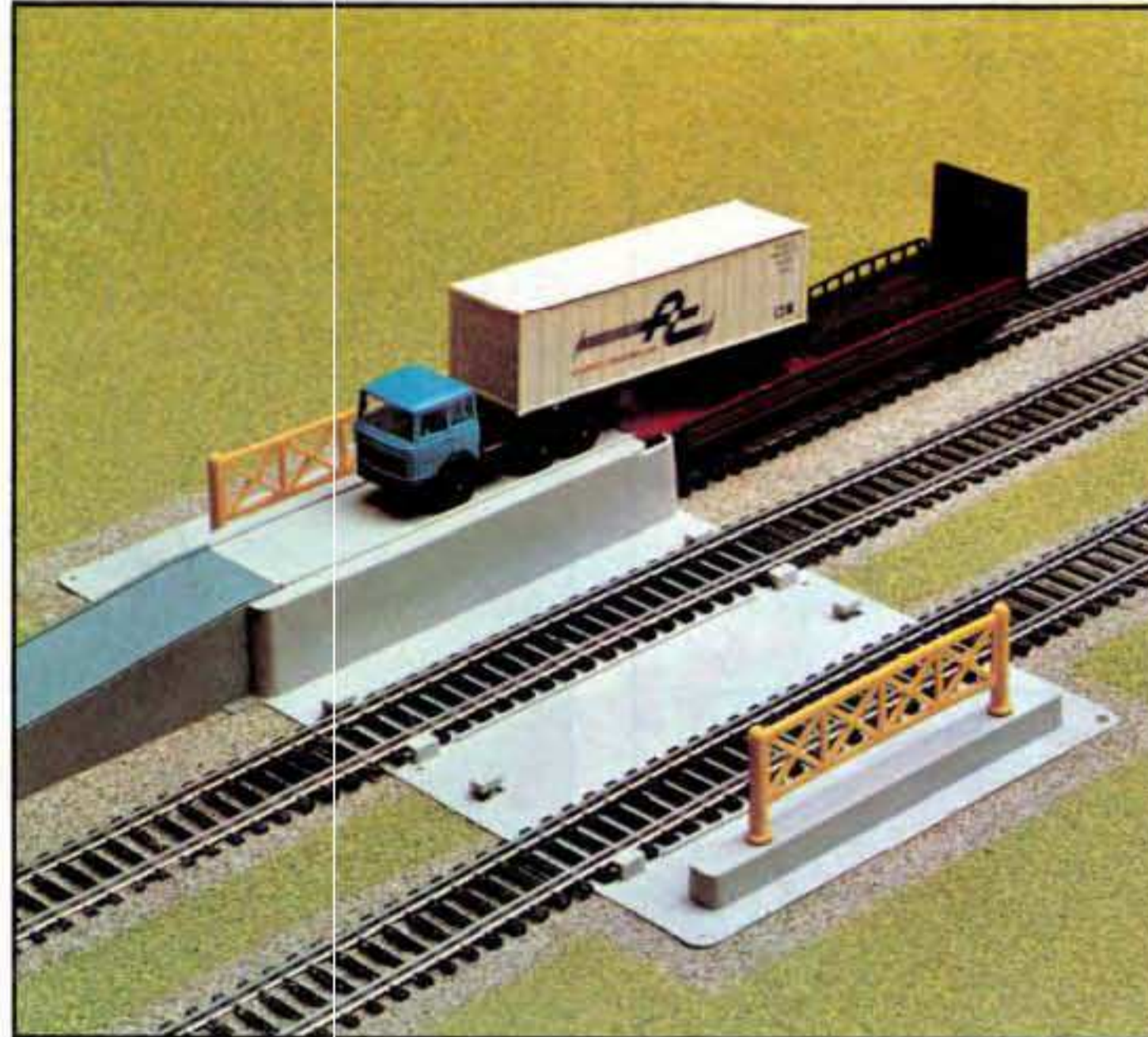


620713 Signal with Two Lights.

# ACCESSORIES



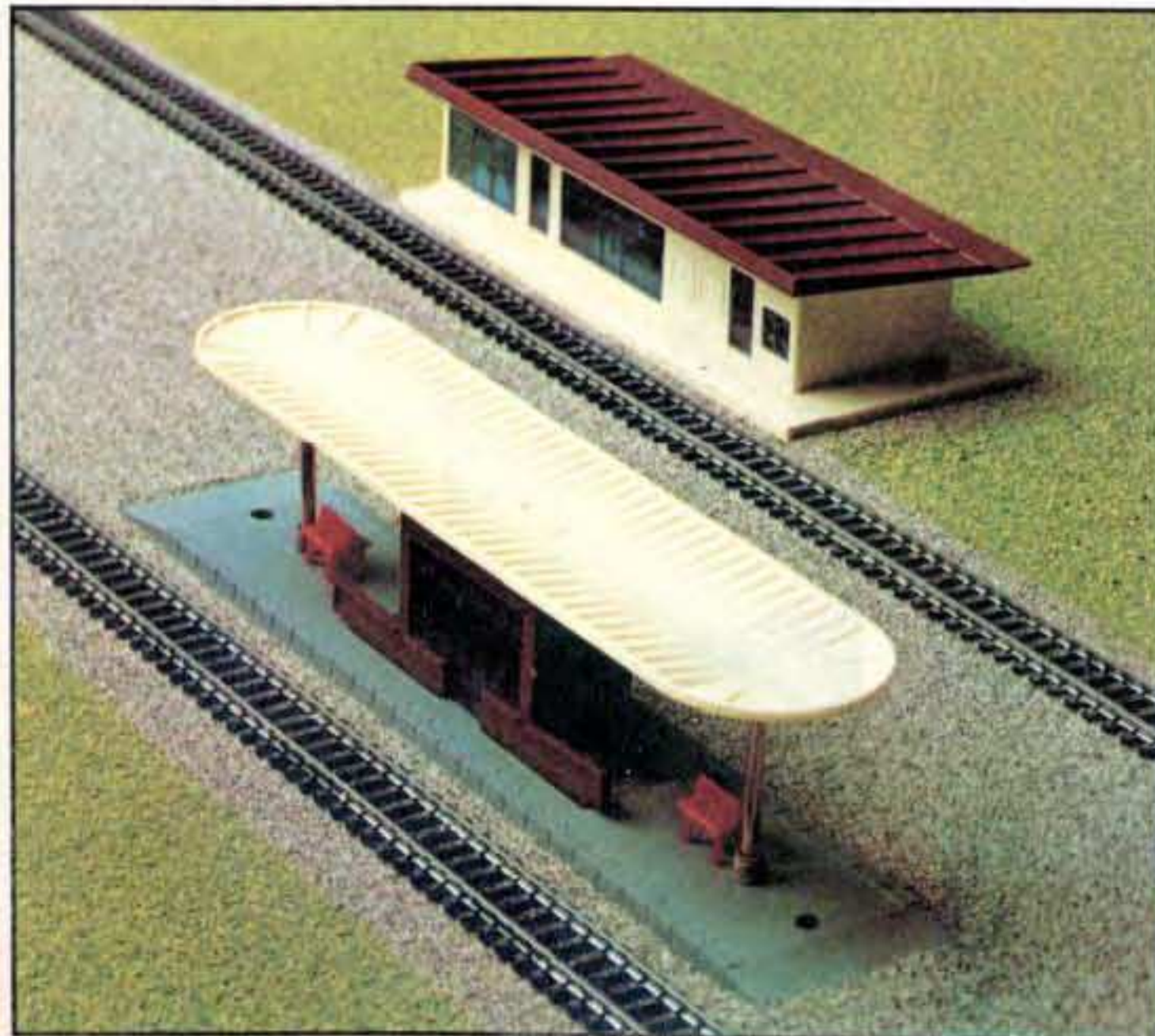
620700 Station for cleaning wagons.



620706 Wagon carrying container, with unloading platform and road transporter.

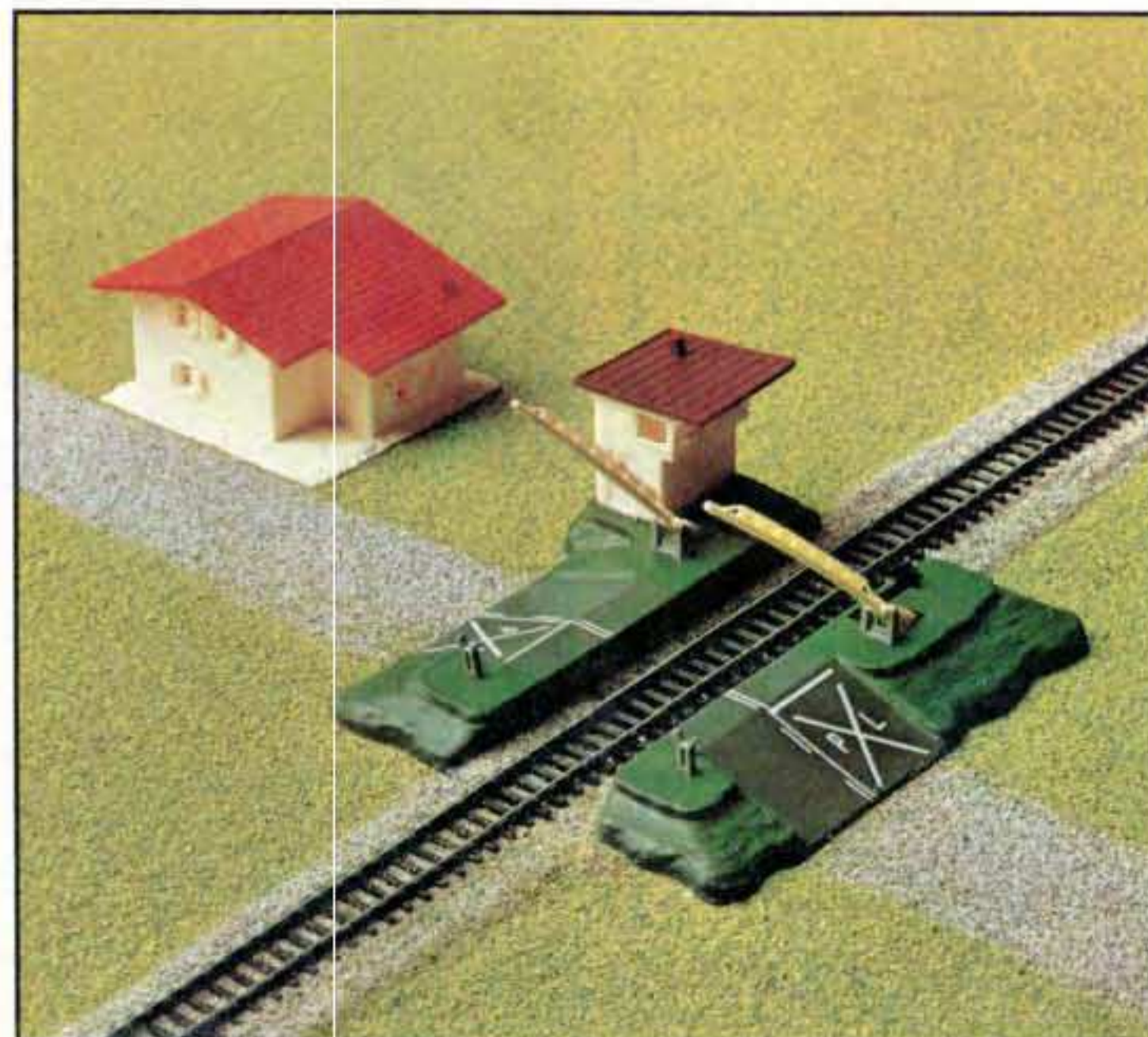


620707 Platform truck carrying containers "LHB-SCOTCH BEEF," gantry crane for loading/unloading, and road transporters.



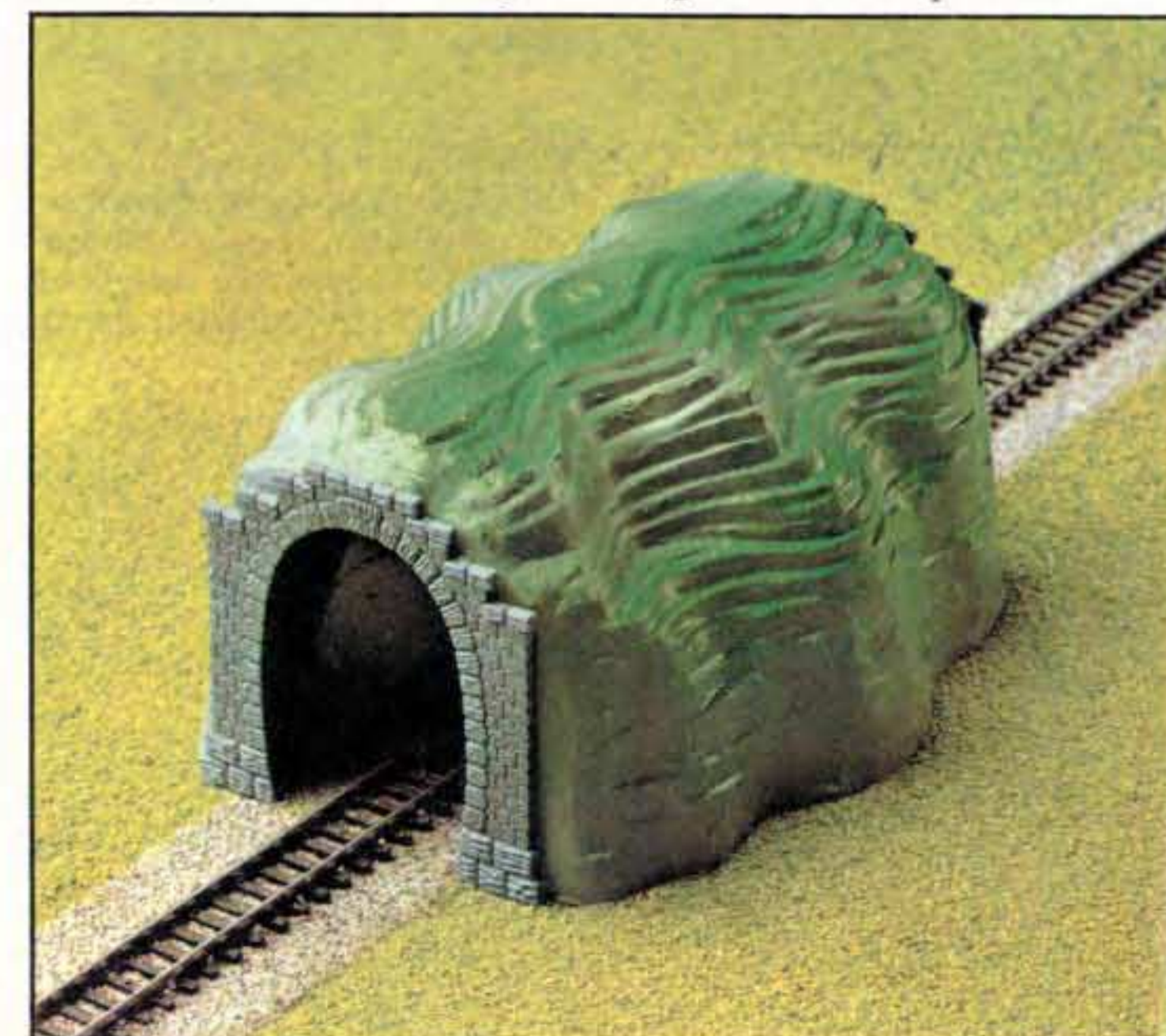
620702 Station roof.

620714 Station.

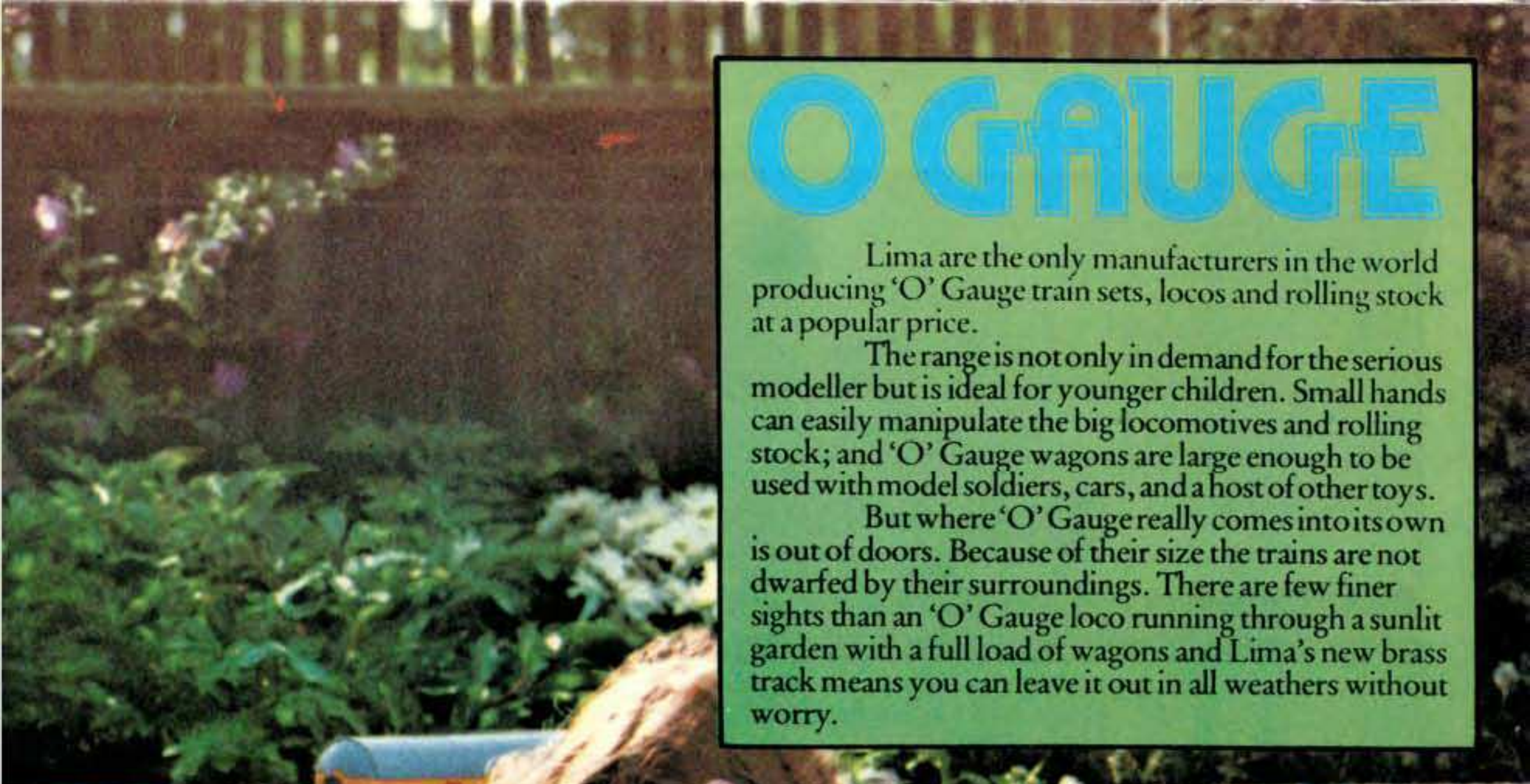


620715 House.

620722 Level crossing.



620705 Tunnel.



# O GAUGE

Lima are the only manufacturers in the world producing 'O' Gauge train sets, locos and rolling stock at a popular price.

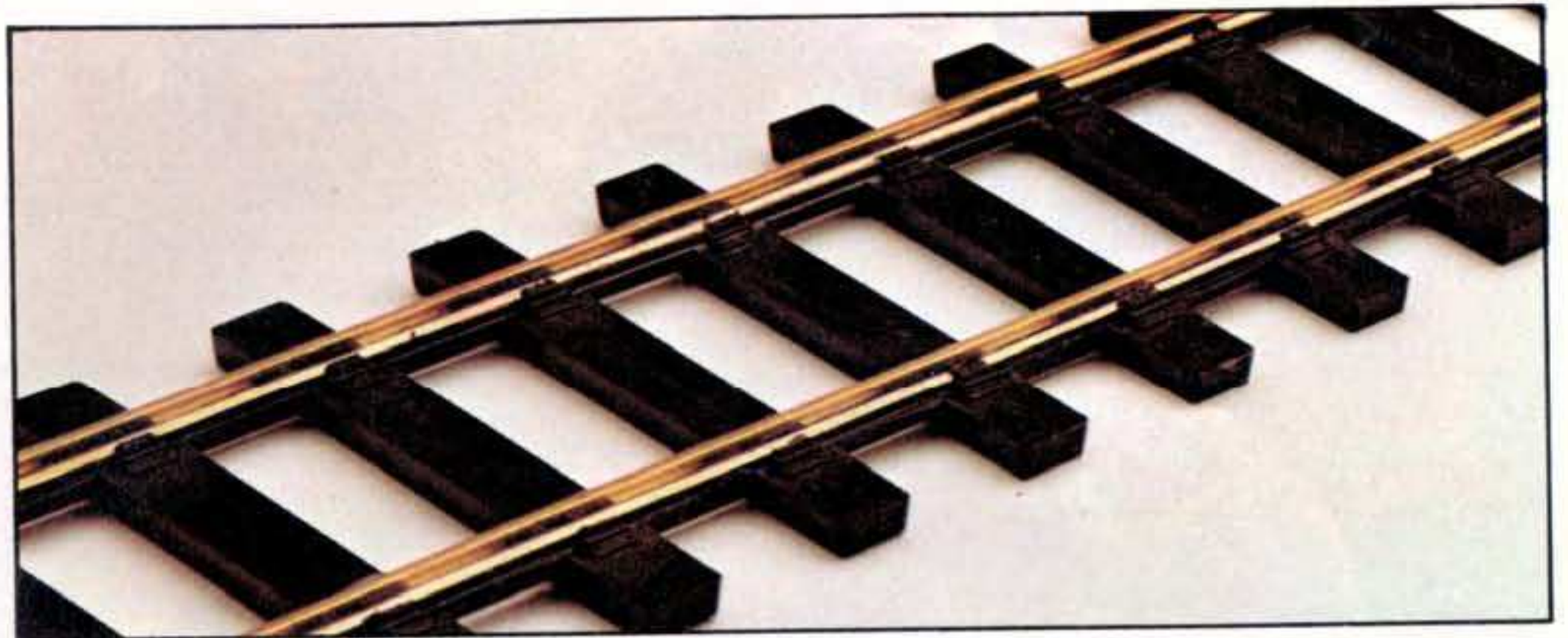
The range is not only in demand for the serious modeller but is ideal for younger children. Small hands can easily manipulate the big locomotives and rolling stock; and 'O' Gauge wagons are large enough to be used with model soldiers, cars, and a host of other toys.

But where 'O' Gauge really comes into its own is out of doors. Because of their size the trains are not dwarfed by their surroundings. There are few finer sights than an 'O' Gauge loco running through a sunlit garden with a full load of wagons and Lima's new brass track means you can leave it out in all weathers without worry.

0 GAUGE



216546 0-4-0 Diesel Shunter. BR Livery.



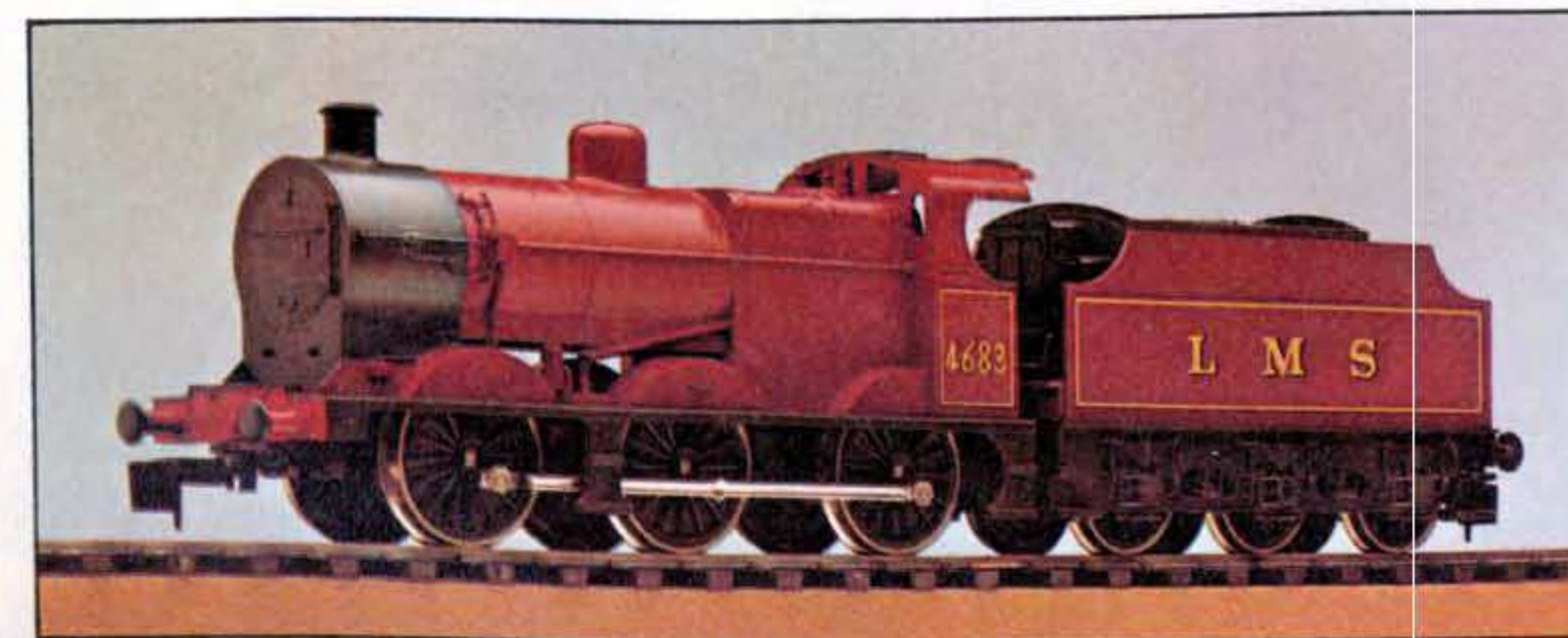
Lima's new, durable brass track is ideal for outdoor use.



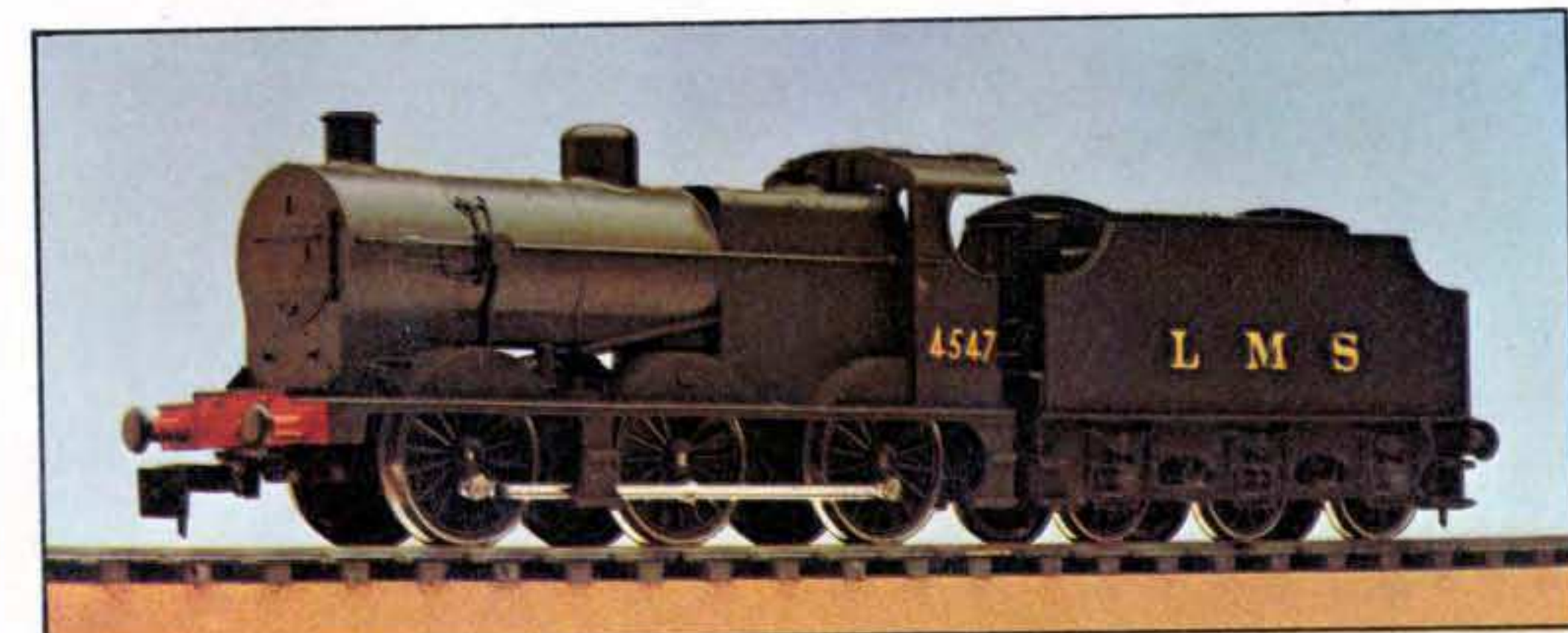
216576 BR Class 33 Bo-Bo Diesel Locomotive. Early Livery.



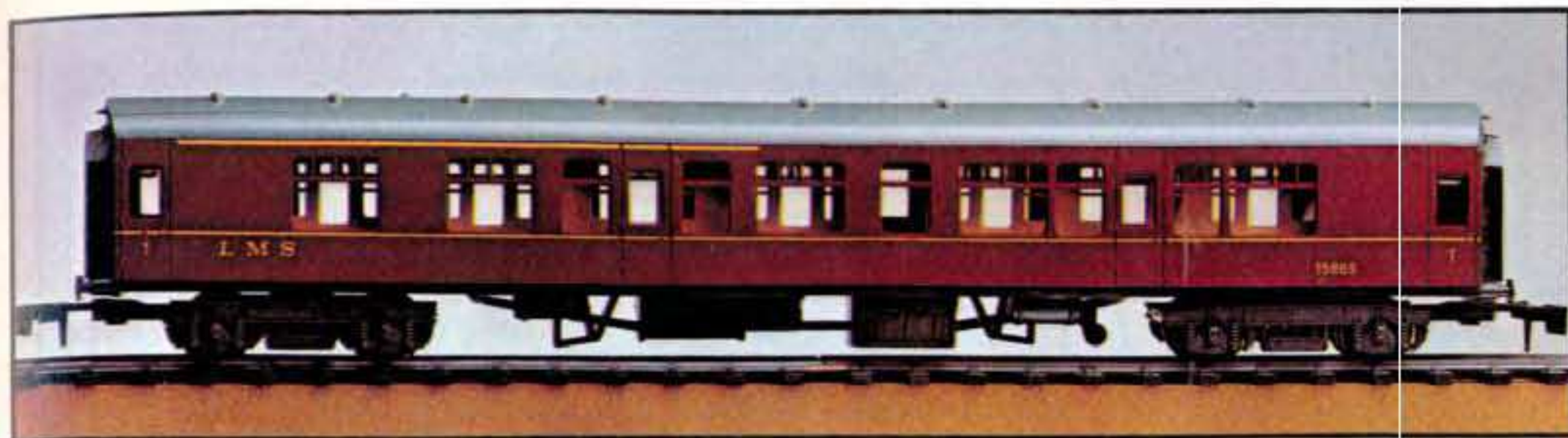
216577 BR Class 33 Bo-Bo Diesel Locomotive.



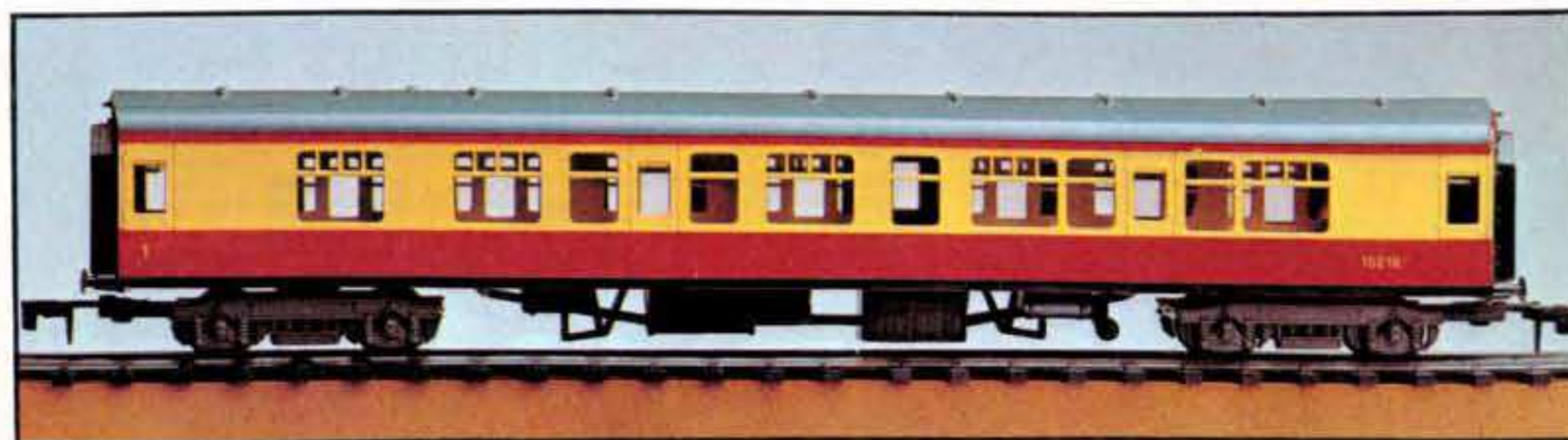
216534 0-6-0 Class 4F Tender Locomotive. LMS Livery.



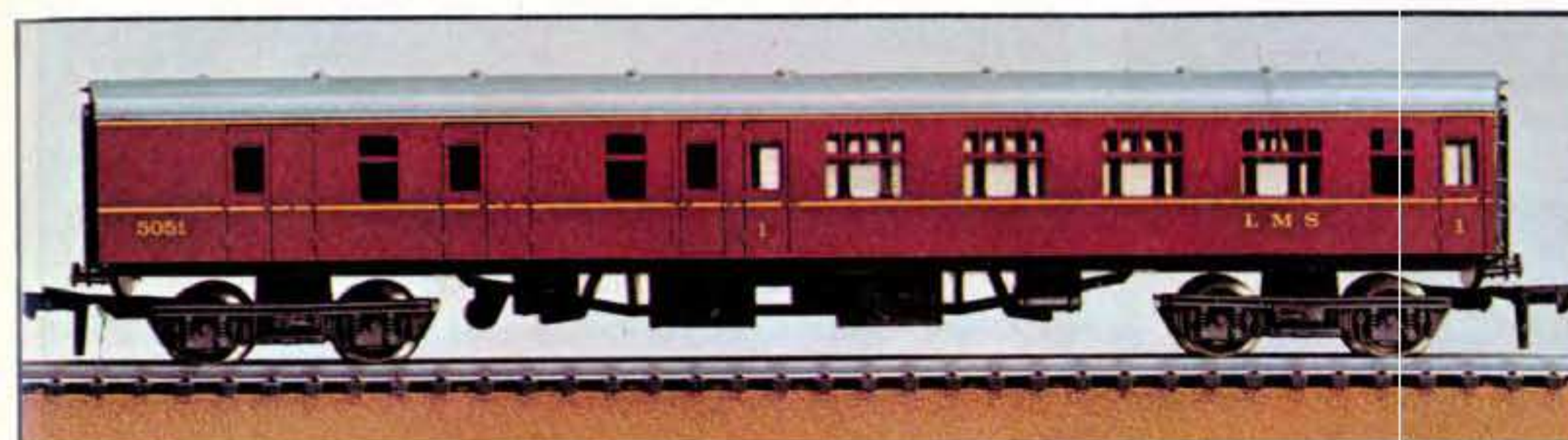
216533 0-6-0 Class 4F Tender Locomotive. BR Livery.



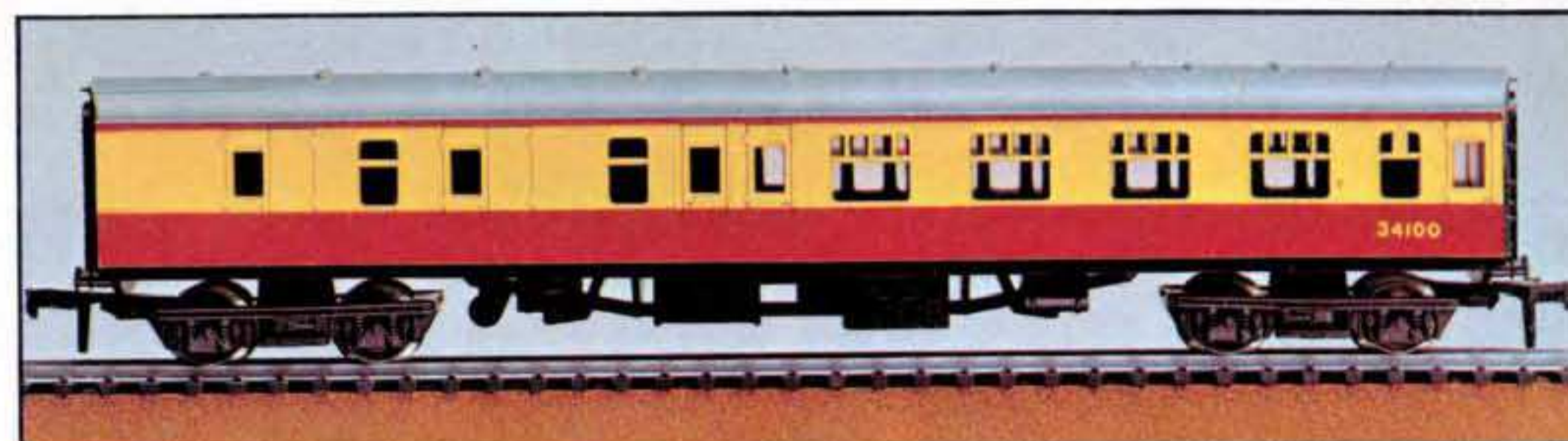
316616 BR/LMS Mark 1 Composite Coach.



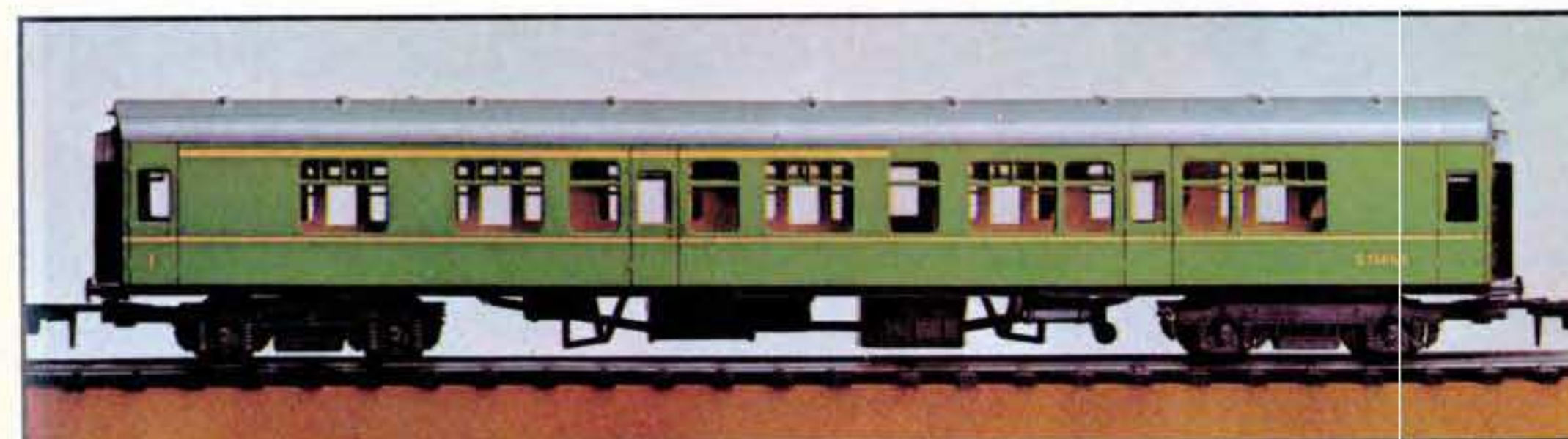
316618 BR Mark 1 Composite Coach.



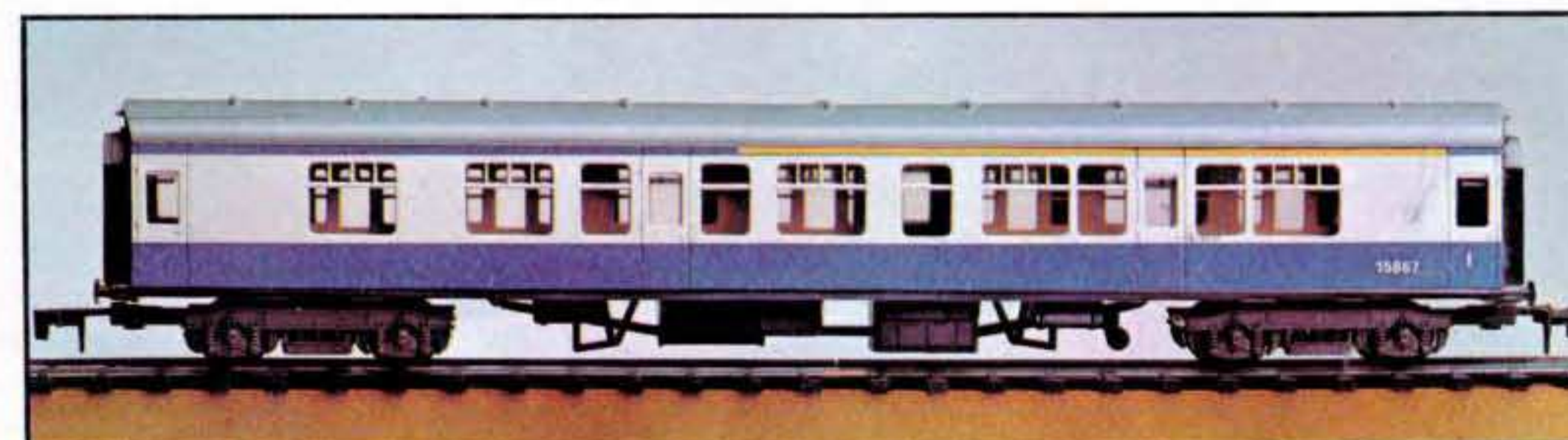
316645 BR/LMS Mark 1 Corridor Brake Coach.



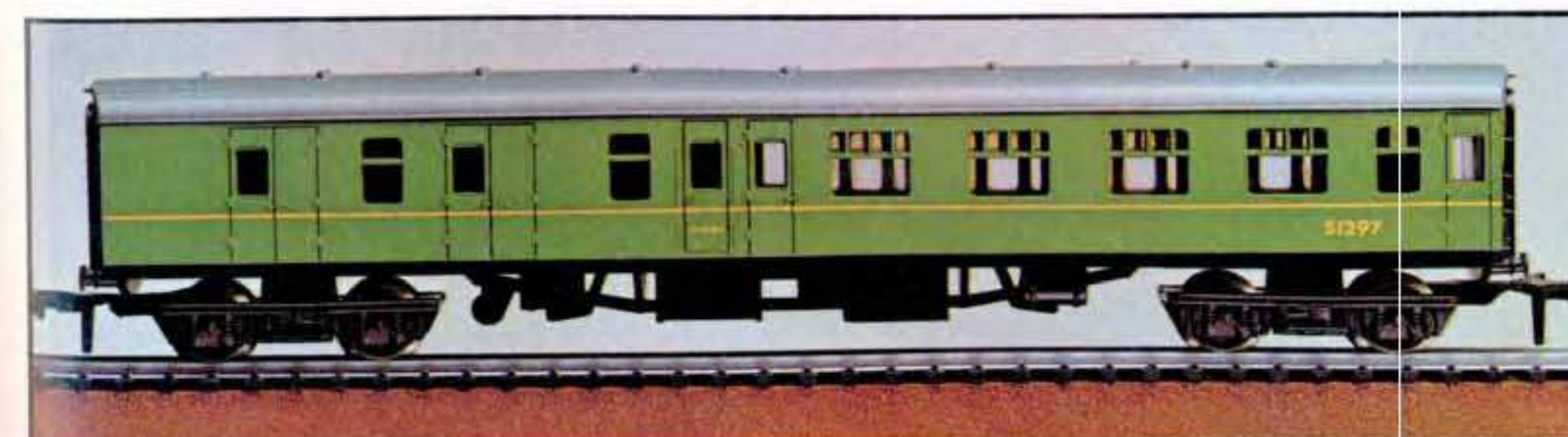
316644 BR Mark 1 Corridor Brake Coach.



316617 BR Mark 1 Composite Coach.



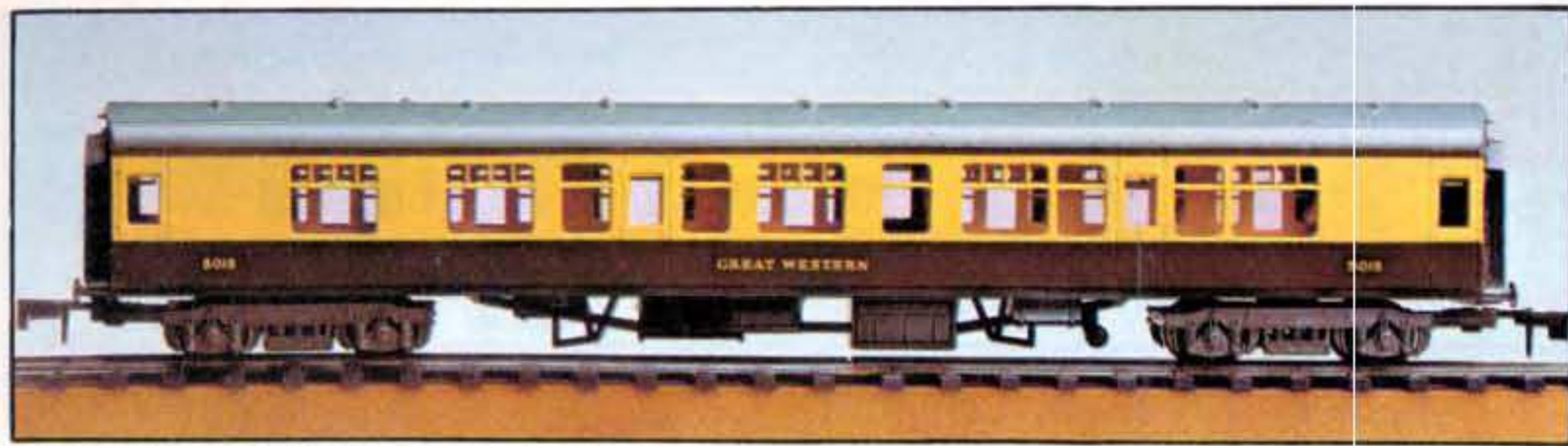
316619 BR Mark 1 Composite Coach.



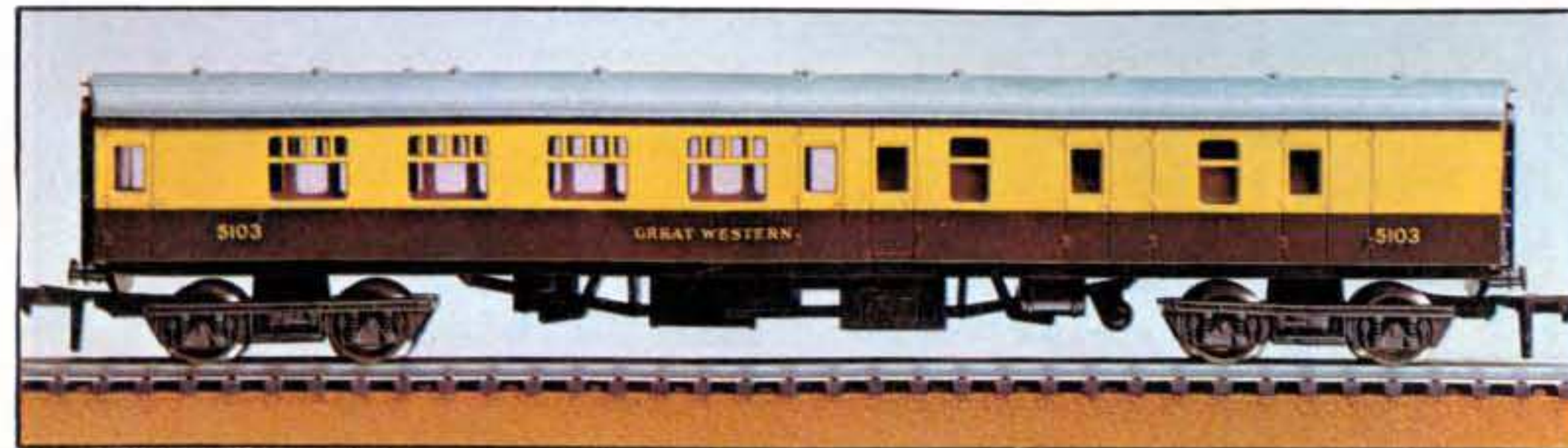
316647 BR Mark 1 Corridor Brake Coach.



316654 BR Mark 1 Corridor Brake Coach.

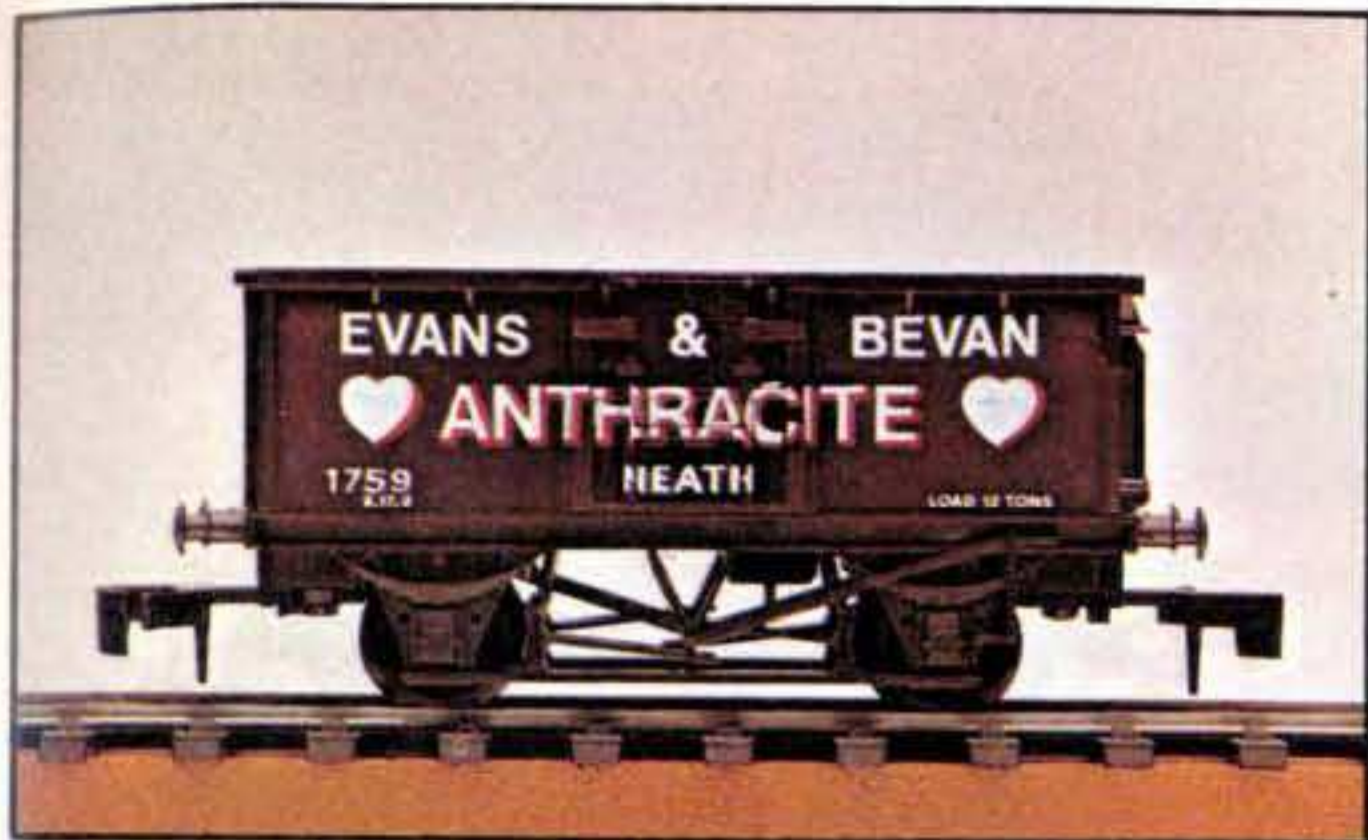


316620 BR/GWR Mark 1 Composite Coach.

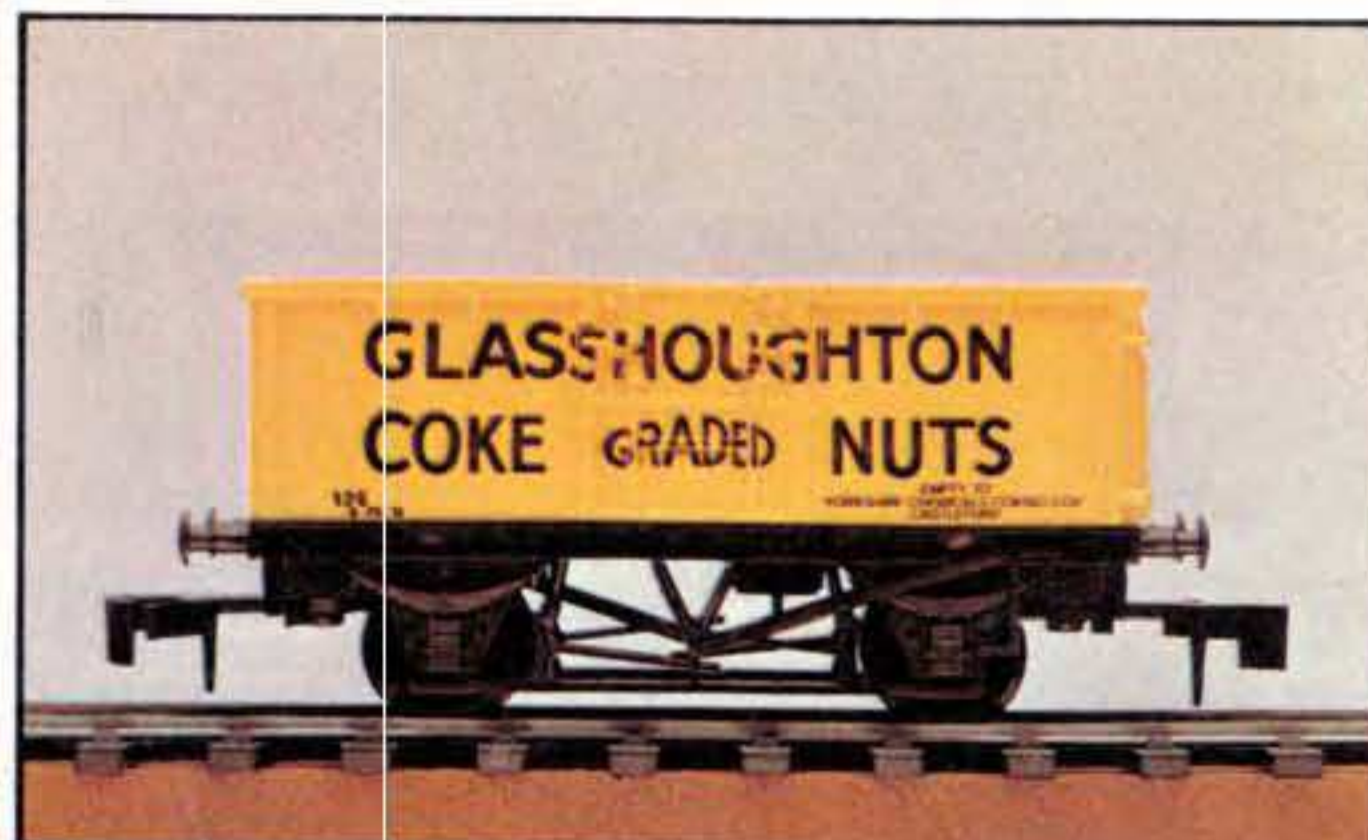


316646 BR/GWR Mark 1 Corridor Brake Coach.





316756 'Evans & Bevan Anthracite' Mineral Wagon.



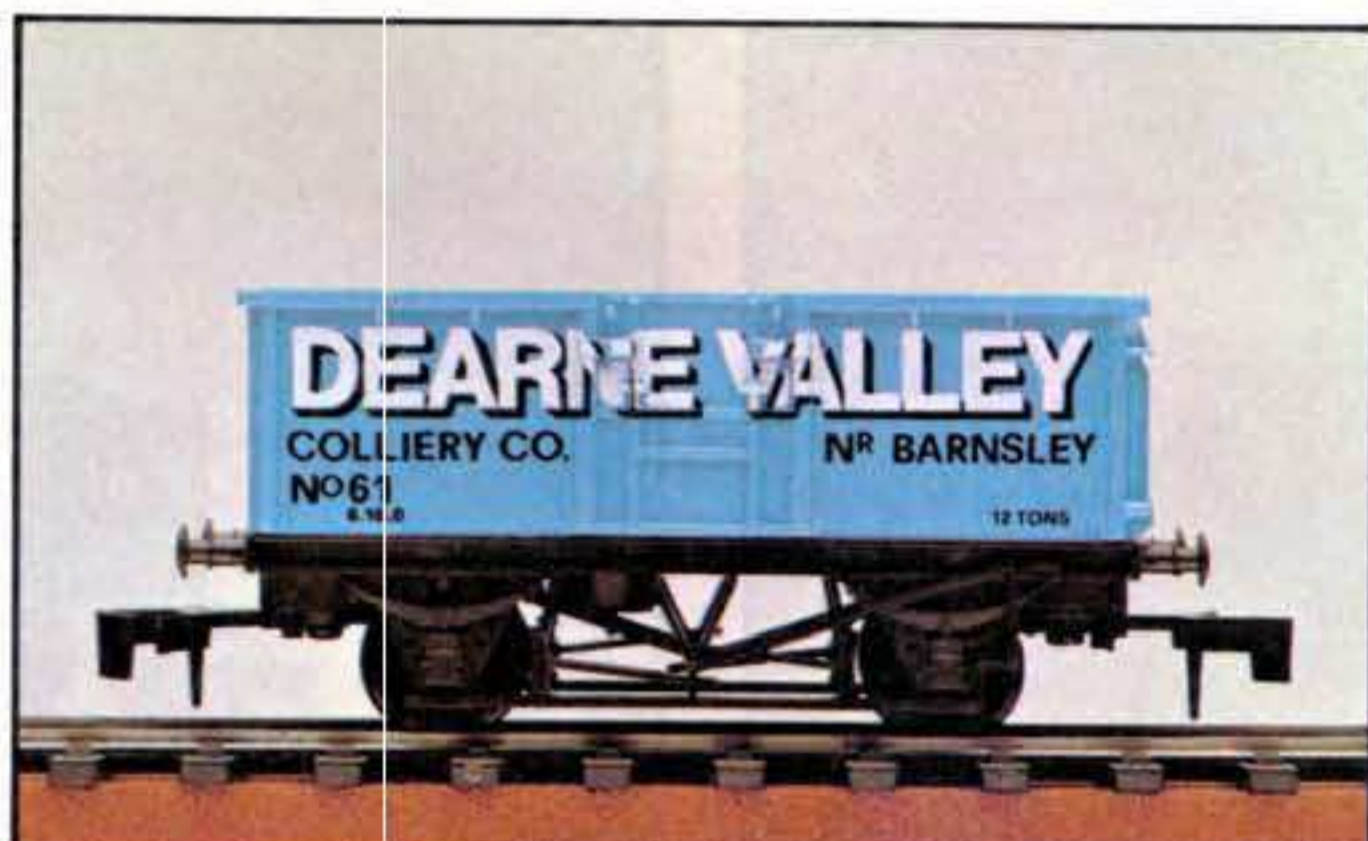
316755 'Glasshoughton Coke Nuts' Mineral Wagon.



316754 'Clay Cross Co Ltd' Mineral Wagon.



316737 'Oxford & District Gas Co' Mineral Wagon.



316738 'Dearne Valley Colliery' Mineral Wagon.



316739 GWR Mineral Wagon.



316733 'Hall & Dean' Mineral Wagon.



316729 'North Thames Gas' Mineral Wagon.

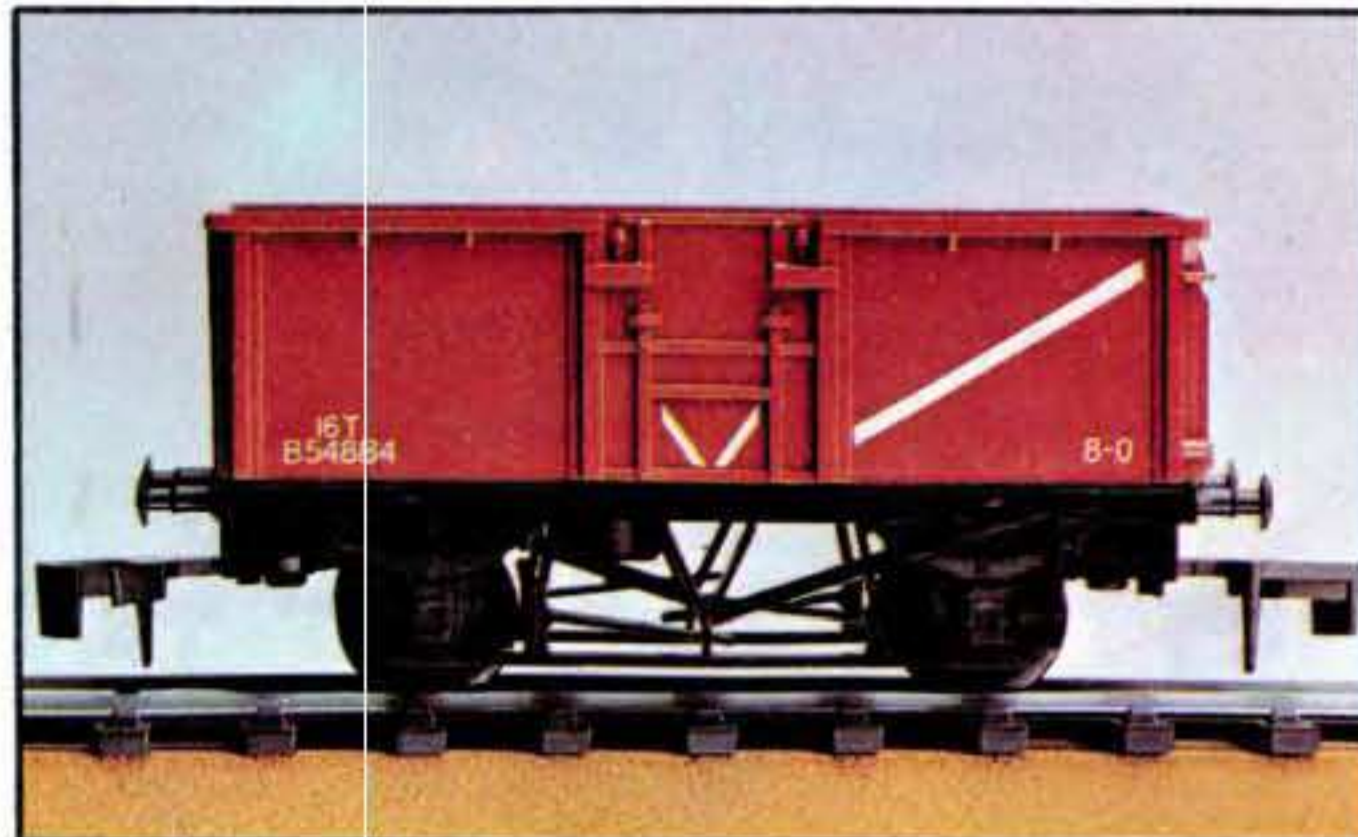


316730 'Chas. Kendall' Mineral Wagon.

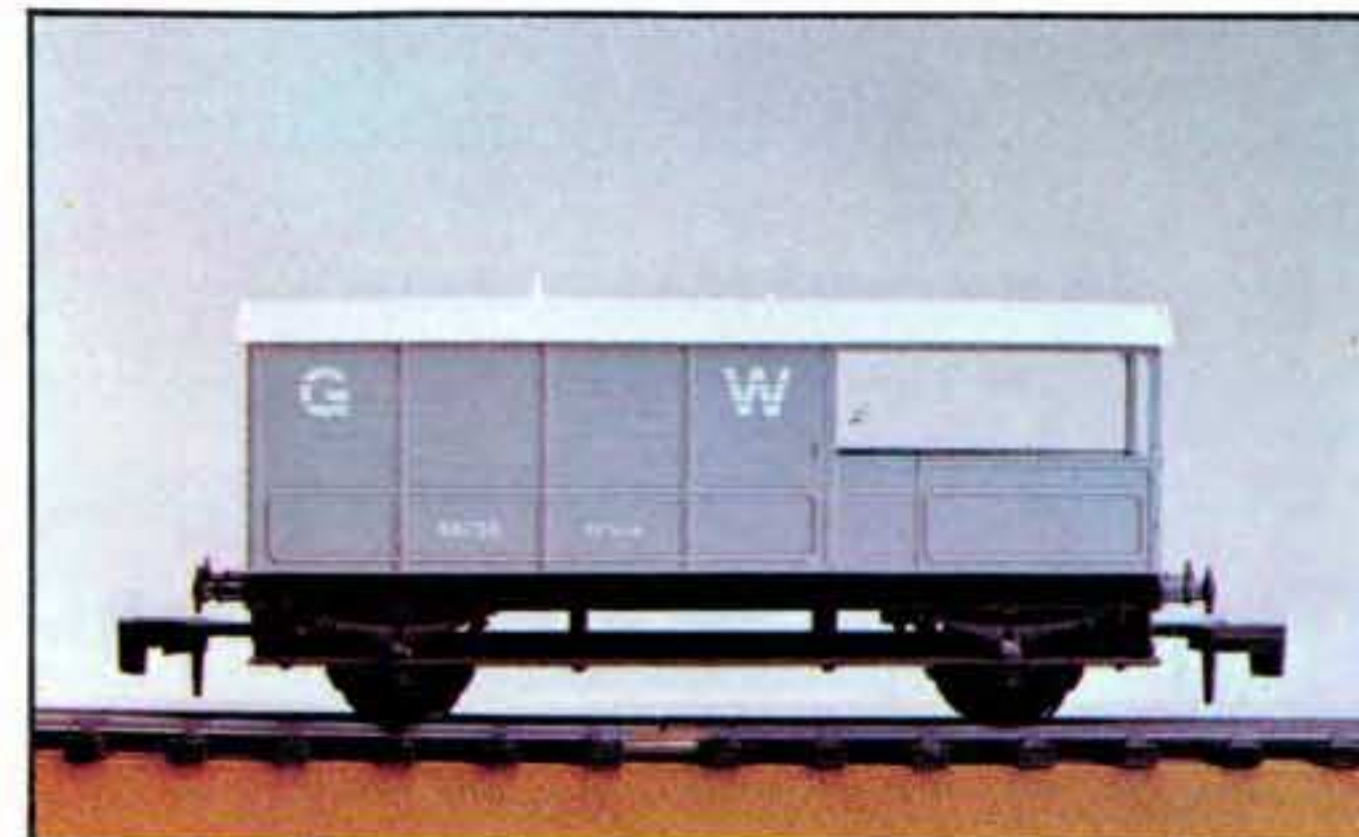
0 GAUGE



316731 'Caxton' Mineral Wagon.



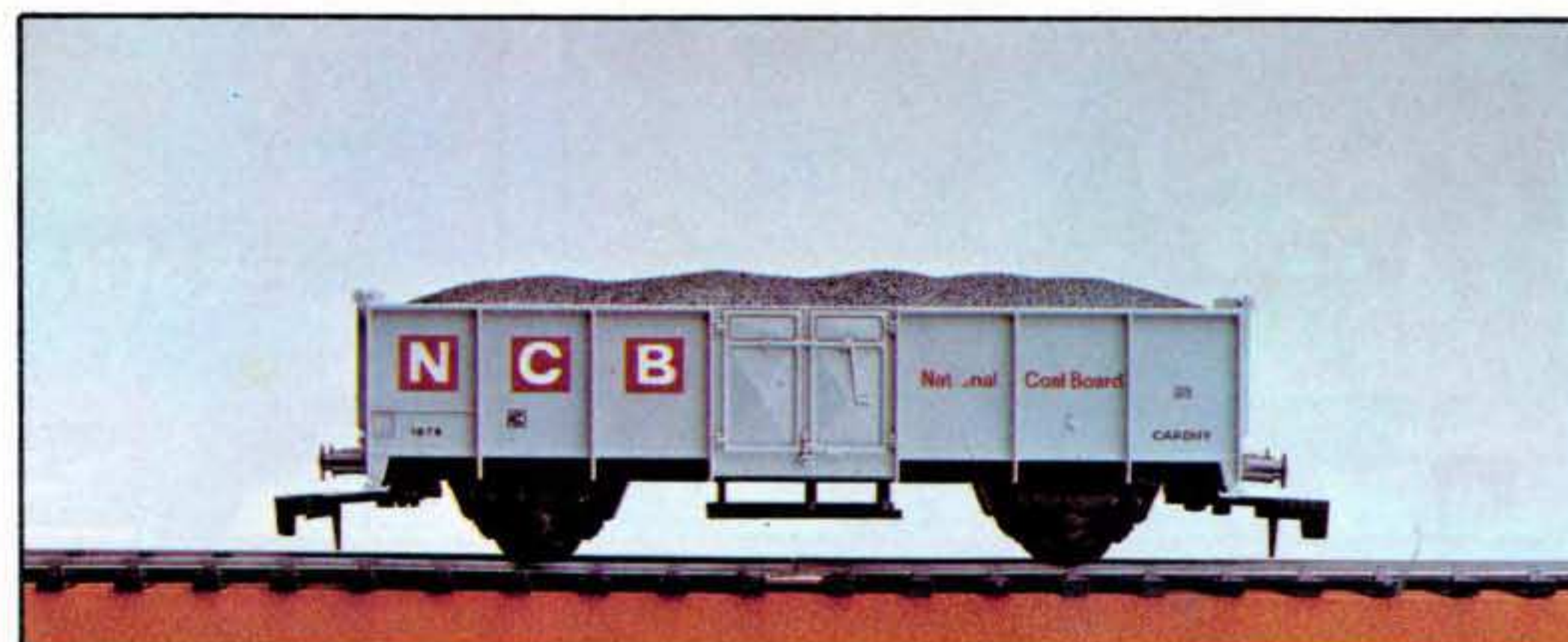
316732 Open Mineral Wagon.



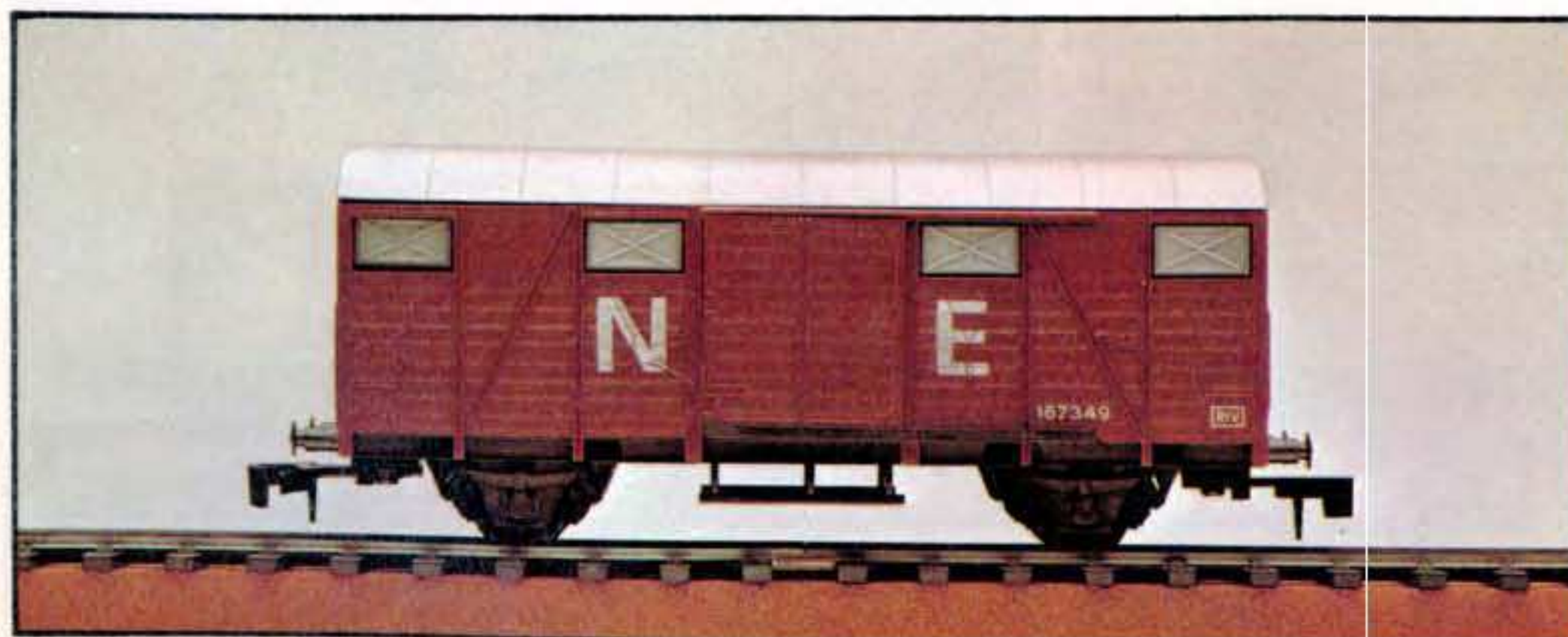
316746 GW Brake Van.



316770 Tank wagon TEXACO.



316726 NCB wagon with coal.

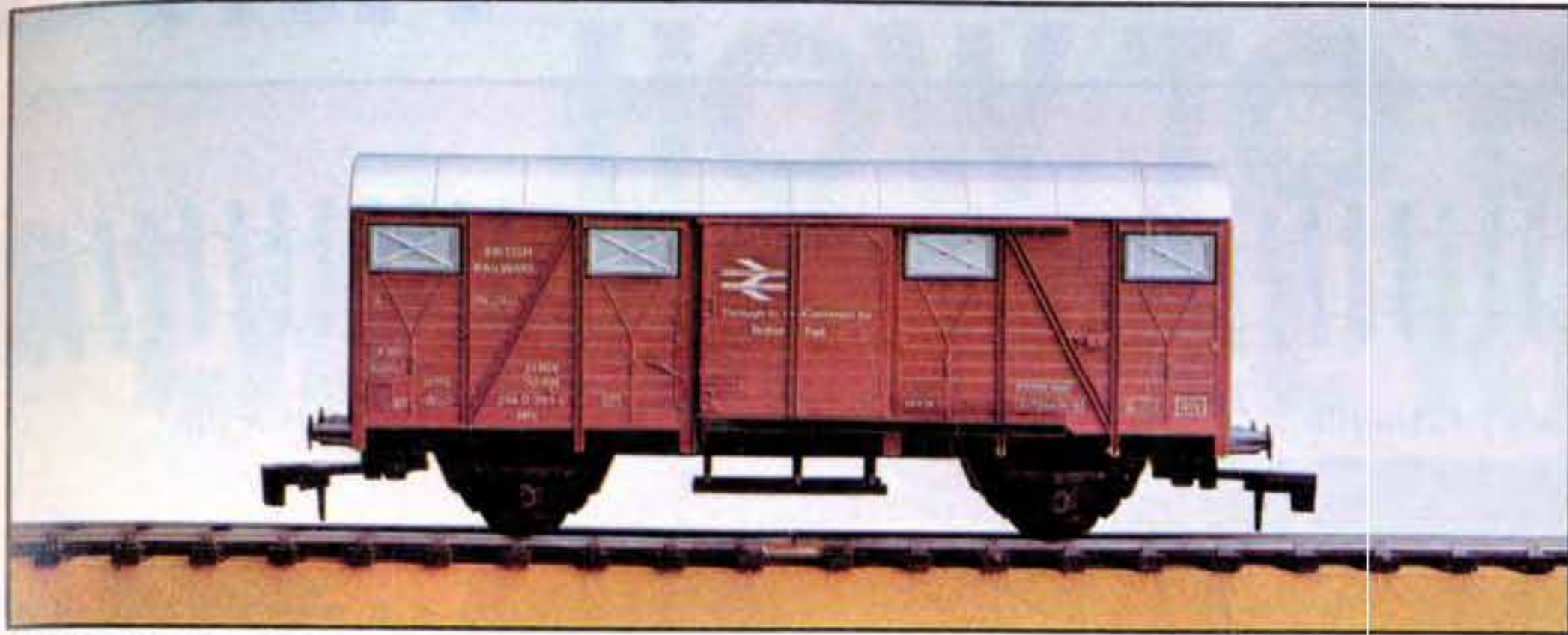


316751 NE 20 Ton Box Van.

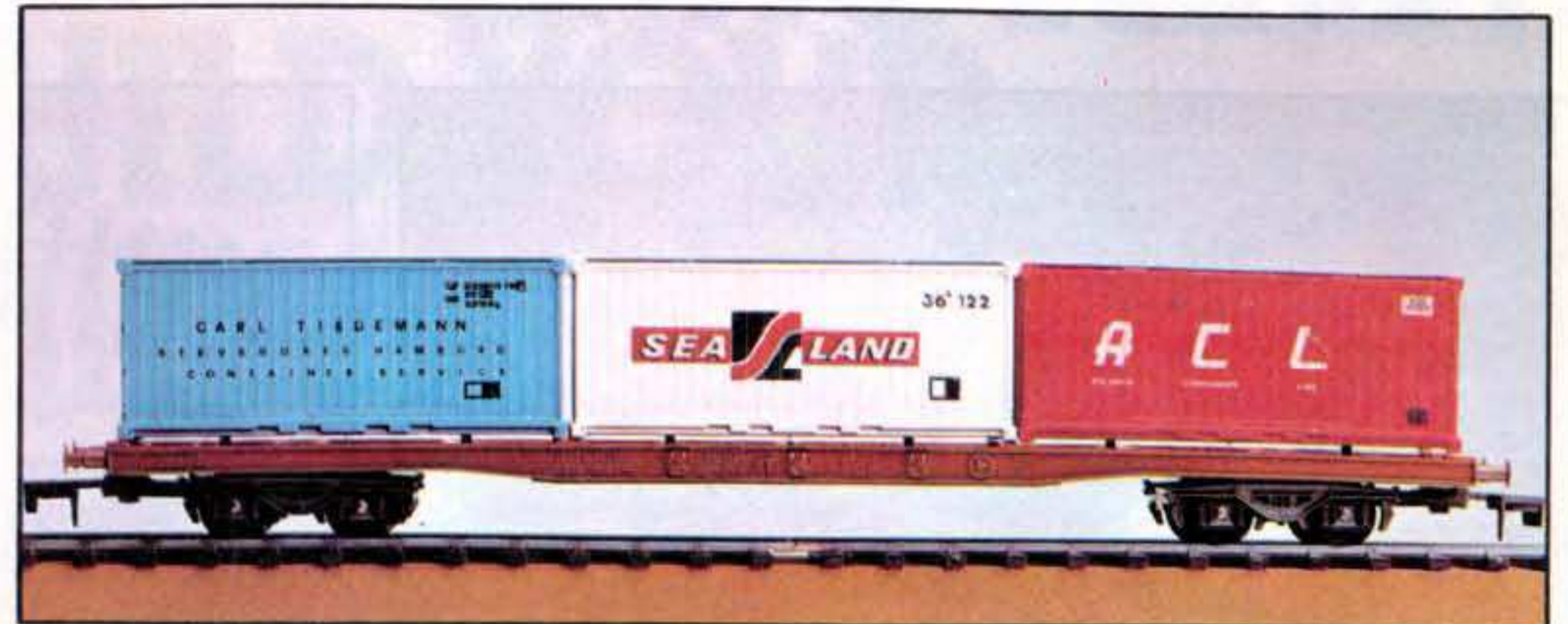


316710 SCHWEPPE'S refrigerator van.

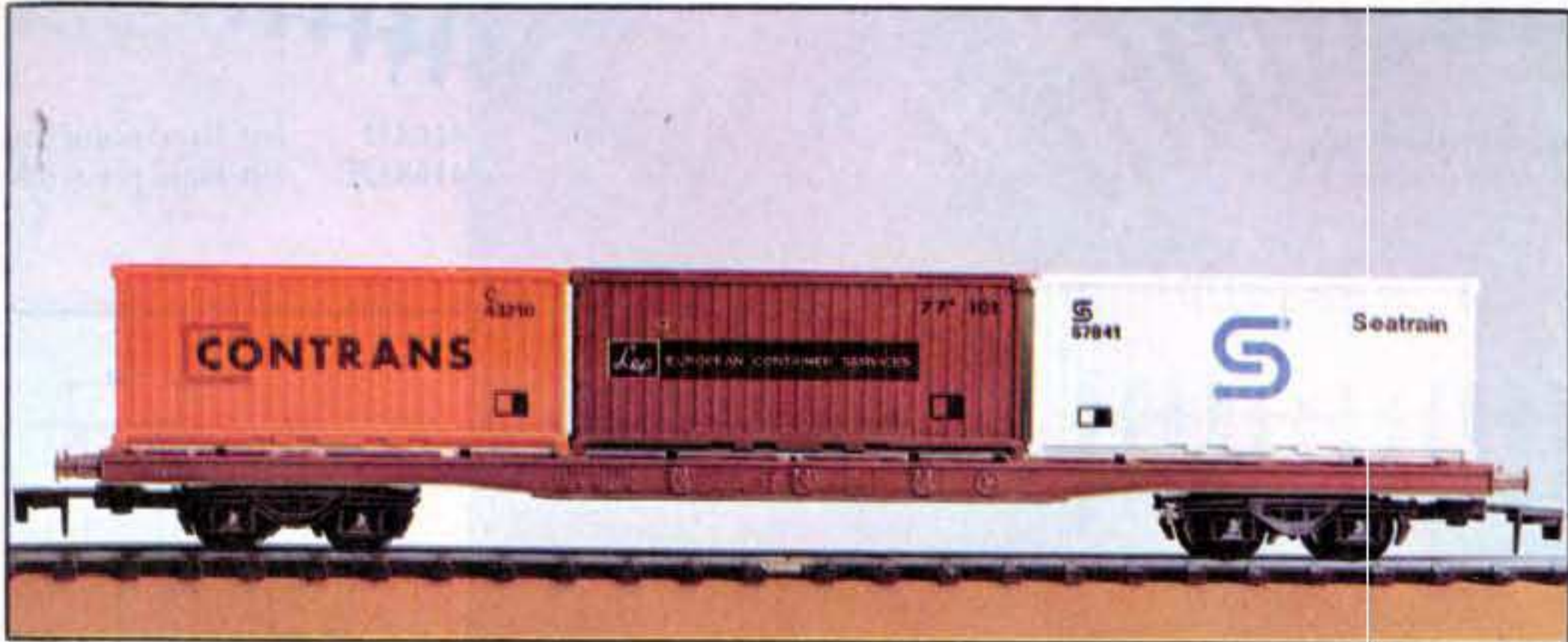




316745 BR Closed Van.



316783 Container Wagon.



316784 Container Wagon.



316768 'Mobil Oil' Bogie Tank Wagon.

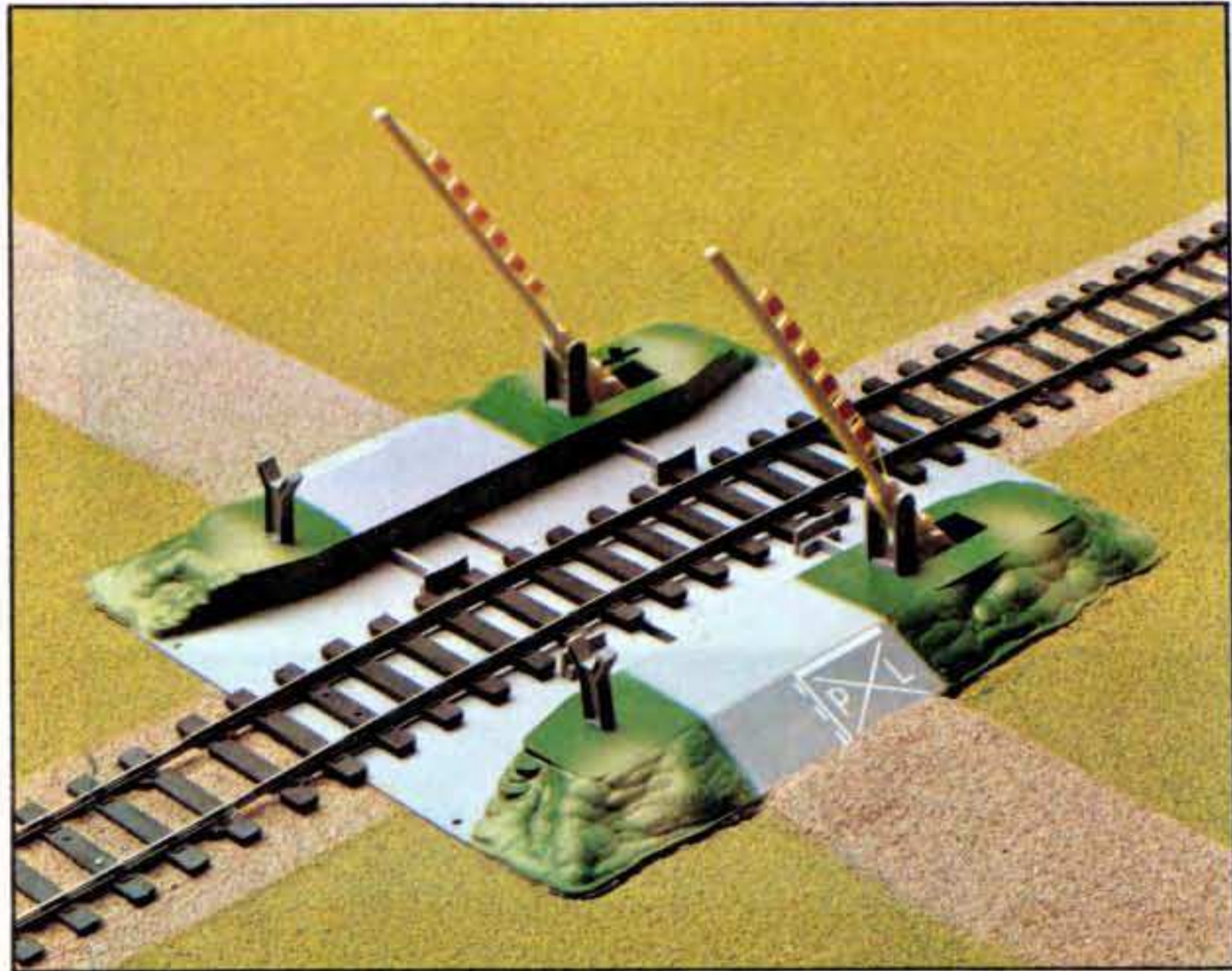


316765 'Shell' Bogie Tank Wagon.

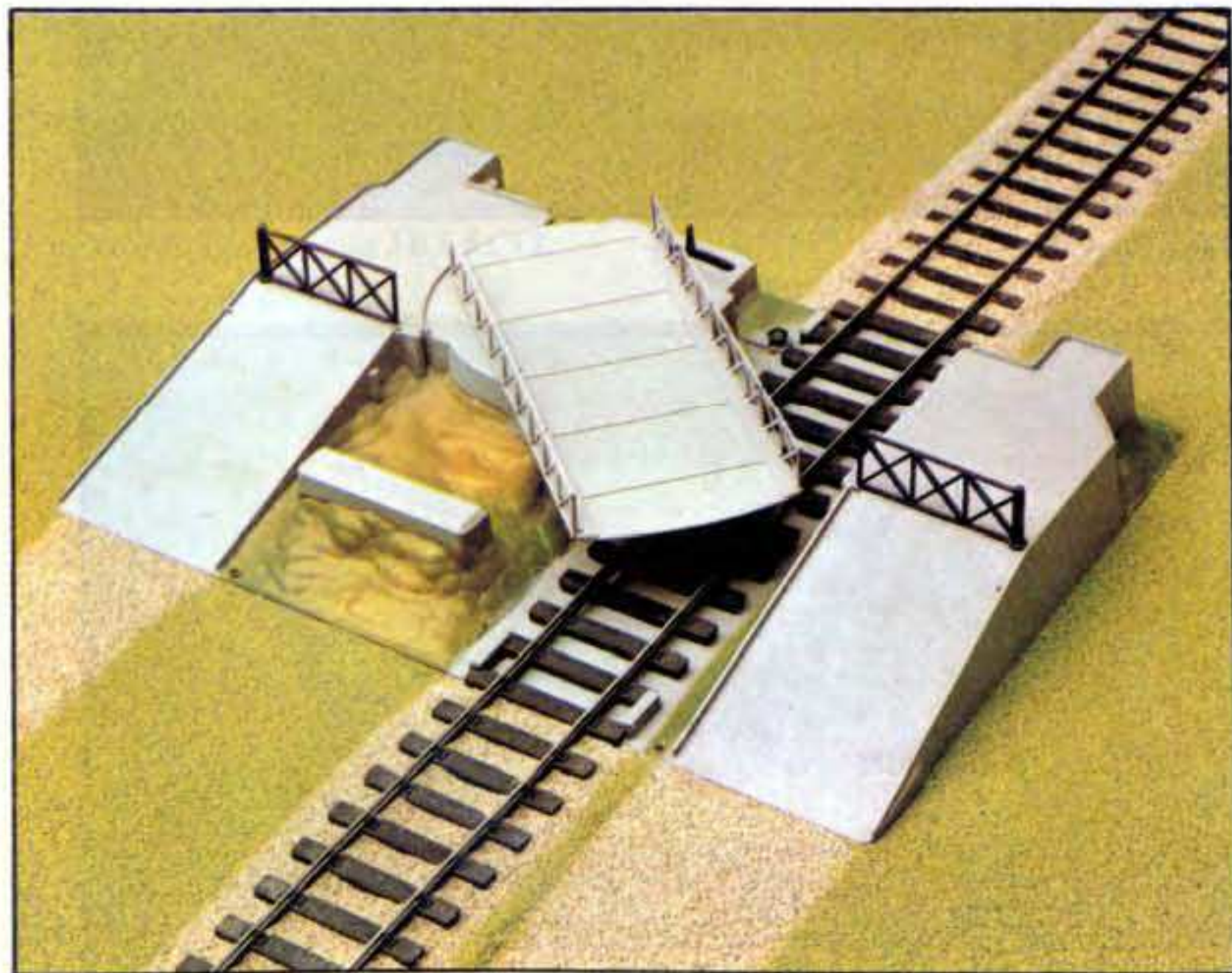


316766 'BP' Bogie Tank Wagon.

# ACCESSORIES



616850 Automatic level crossing.

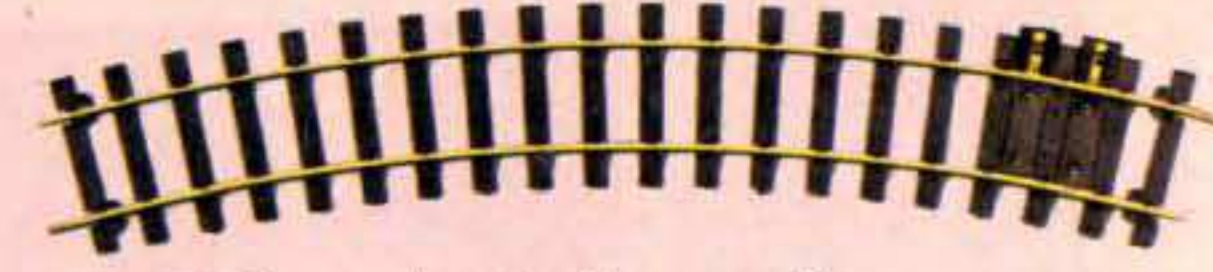


616851 Swing road bridge

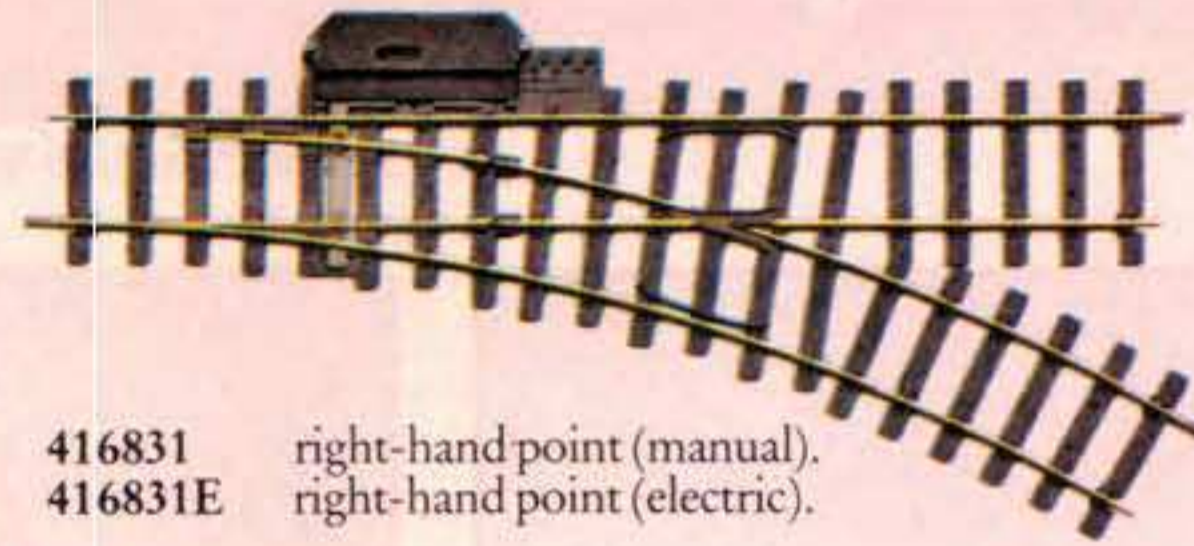
# TRACK



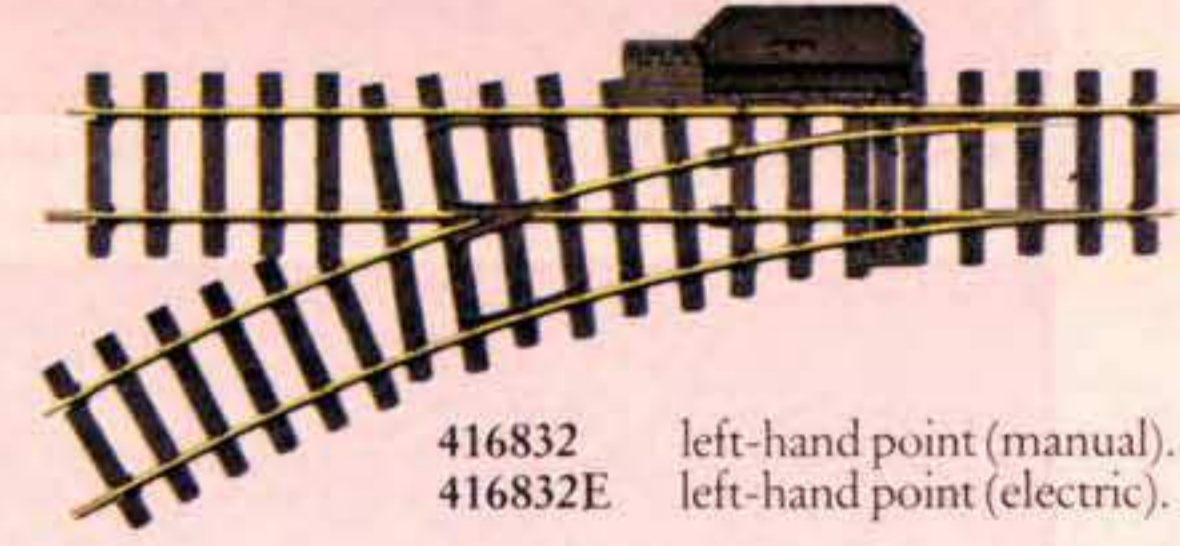
416811 curved track (1400mm dia.).



416811C curved track with power clip.



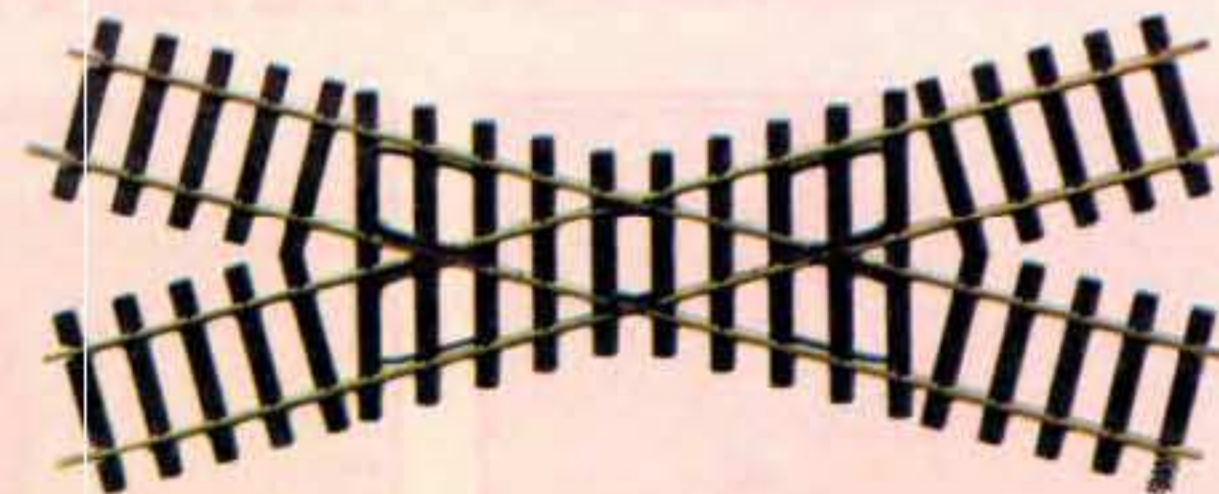
416831 right-hand point (manual).  
416831E right-hand point (electric).



416832 left-hand point (manual).  
416832E left-hand point (electric).



416801 straight track (350mm).



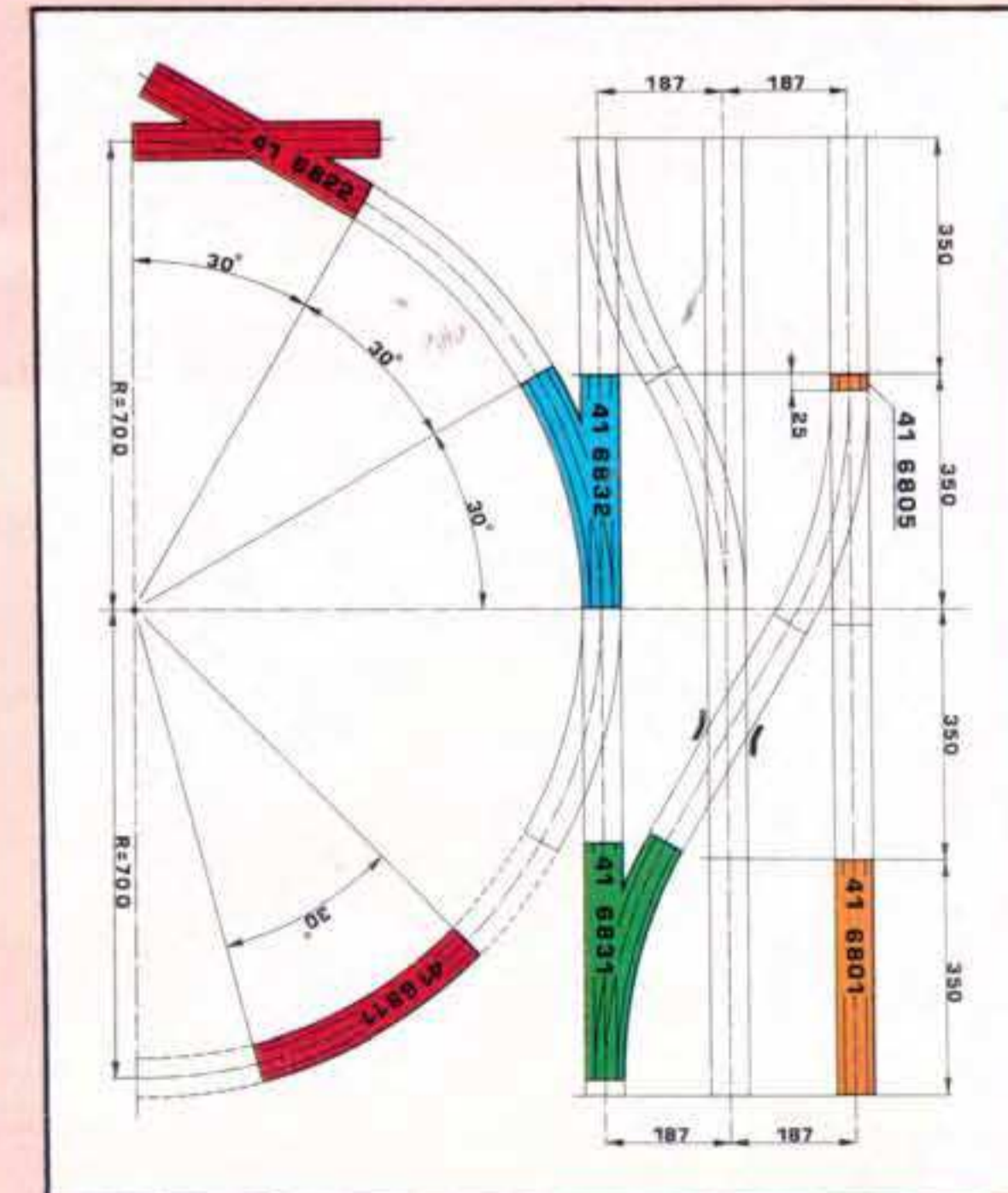
416822 diamond crossing (30°).



416841 buffer stop.



416805 compensating track.



# HOW TO BUILD YOUR LIMA MODEL RAILWAYS SYSTEM

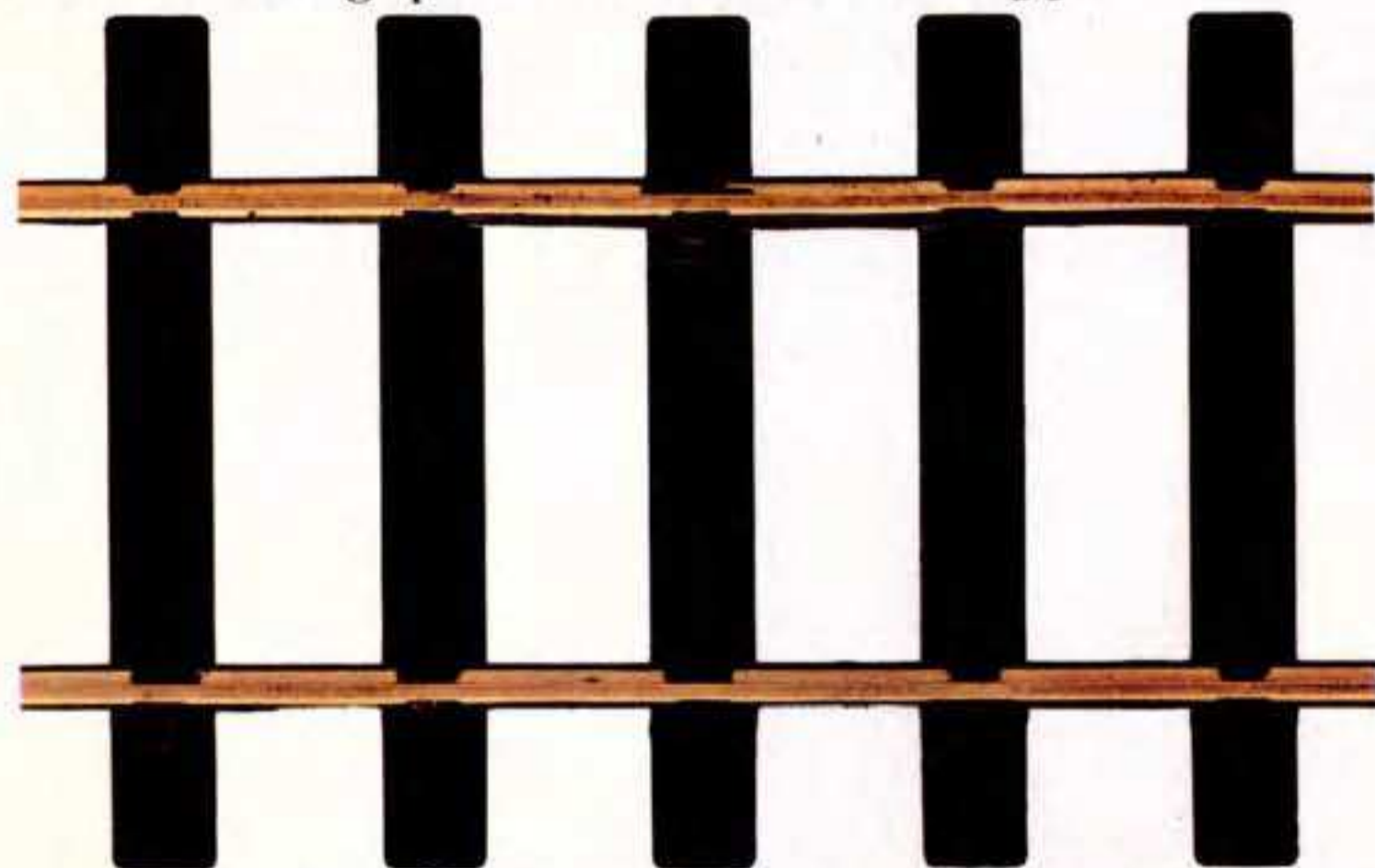


# MAKING A START

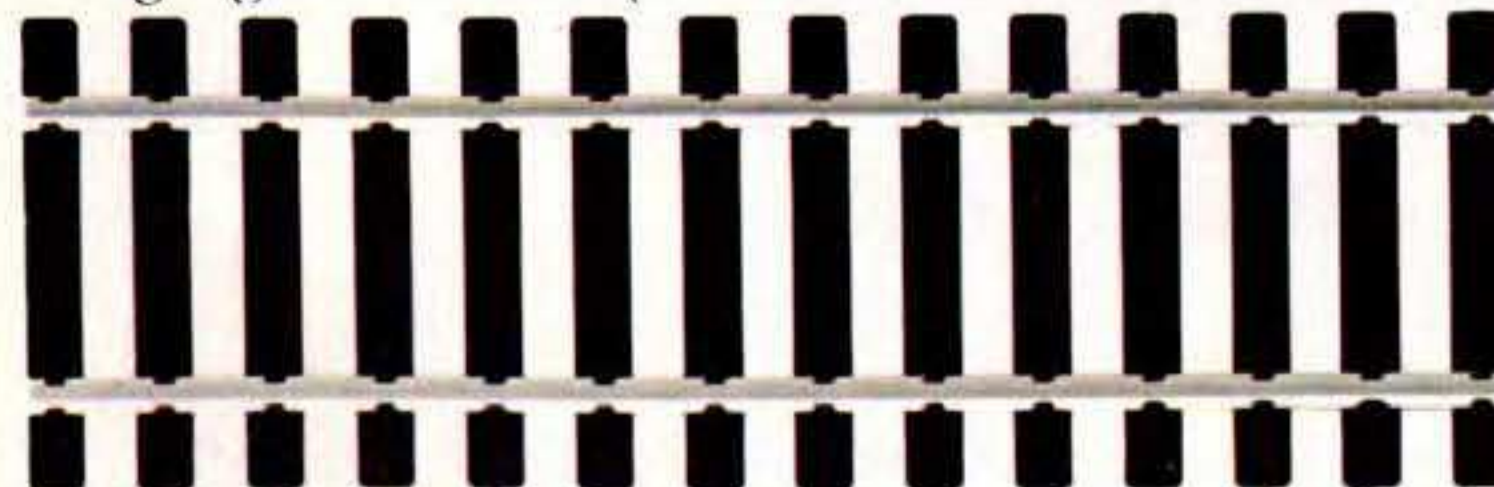
## CHOOSING THE RIGHT SYSTEM

It's important to consider at the outset the two major factors which will determine the system you choose: the space available to you, and the type of layout you prefer (whether it has lots of complicated scenery or intricate shunting systems or is a simple layout to begin with). 'N' gauge is most suitable where space is very limited. 'O' gauge is ideal for very large rooms or out of doors. While 'HO/OO' scale, the most popular of all, makes a versatile compromise.

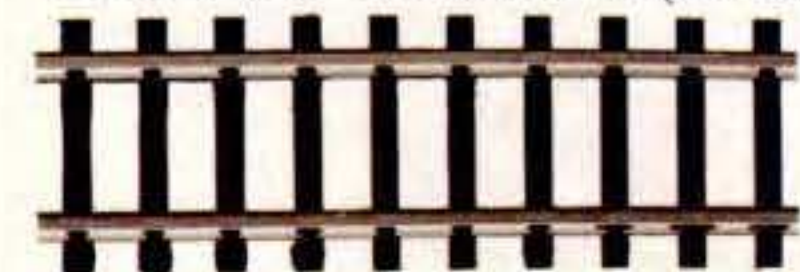
An 250cm x 125cm baseboard mounted on 5cm x 5cm legs provides an ideal starting point.



'O' gauge Actual size (32mm between track)



'OO' scale Actual size (16.5mm between track)



'N' gauge Actual size (9mm between track)

## THE BASEBOARD BEGIN WITH THE RIGHT TOOLS

Before starting on the construction of your baseboard, you must ensure that you have the correct tools for the job. The Lima tool set shown here contains all the important tools you will need to begin.



The Lima Tool Set contains the basic tools you will need to make your layout: a hacksaw (with one blade for metal and one for wood), two fine files, one rasp, pliers, tweezers, a hand drill (with extra bit), a screwdriver and a hammer.

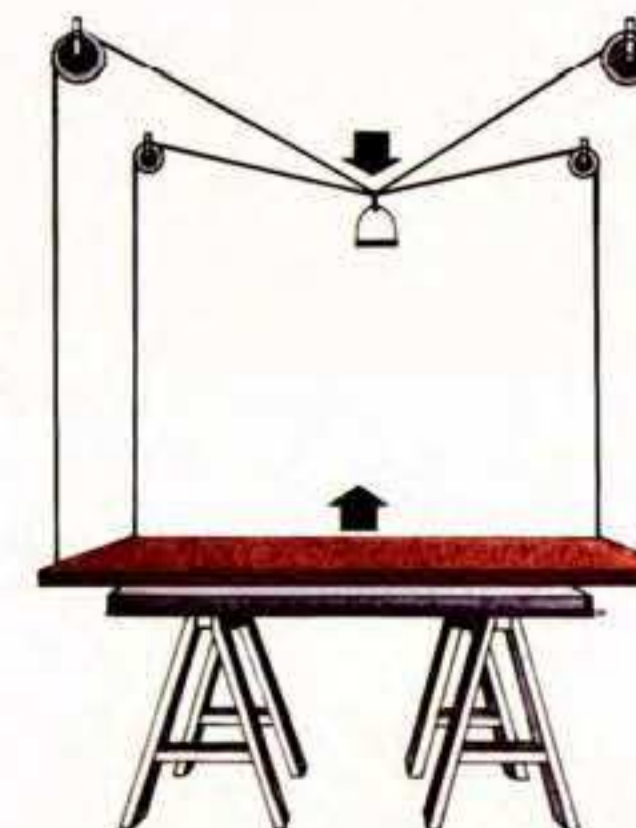
Start the baseboard by fastening with oval nails an 250cm length of wood (about 5cm x 2.5cm in section) on edge on one side of the plywood top. Then lay another 250cm length alongside this as an easy guide for marking the lengths of the crosspieces and ends. Fasten the shorter pieces and the ends next, and the other long side last. The corner blocks should be



made from two short lengths of 5cm x 10cm timber and cut at 45° angles to fit. Nail these to the ends and side.

The baseboard can now be mounted on legs, or suspended from the ceiling by means of a pulley. Alternatively, it can be attached to the wall on hinges with a pulley as we show in the illustration.

Alternatively, it can be attached to the wall on hinges with a pulley, mounted on wheels to fit behind the wardrobe, or simply stored under the bed.

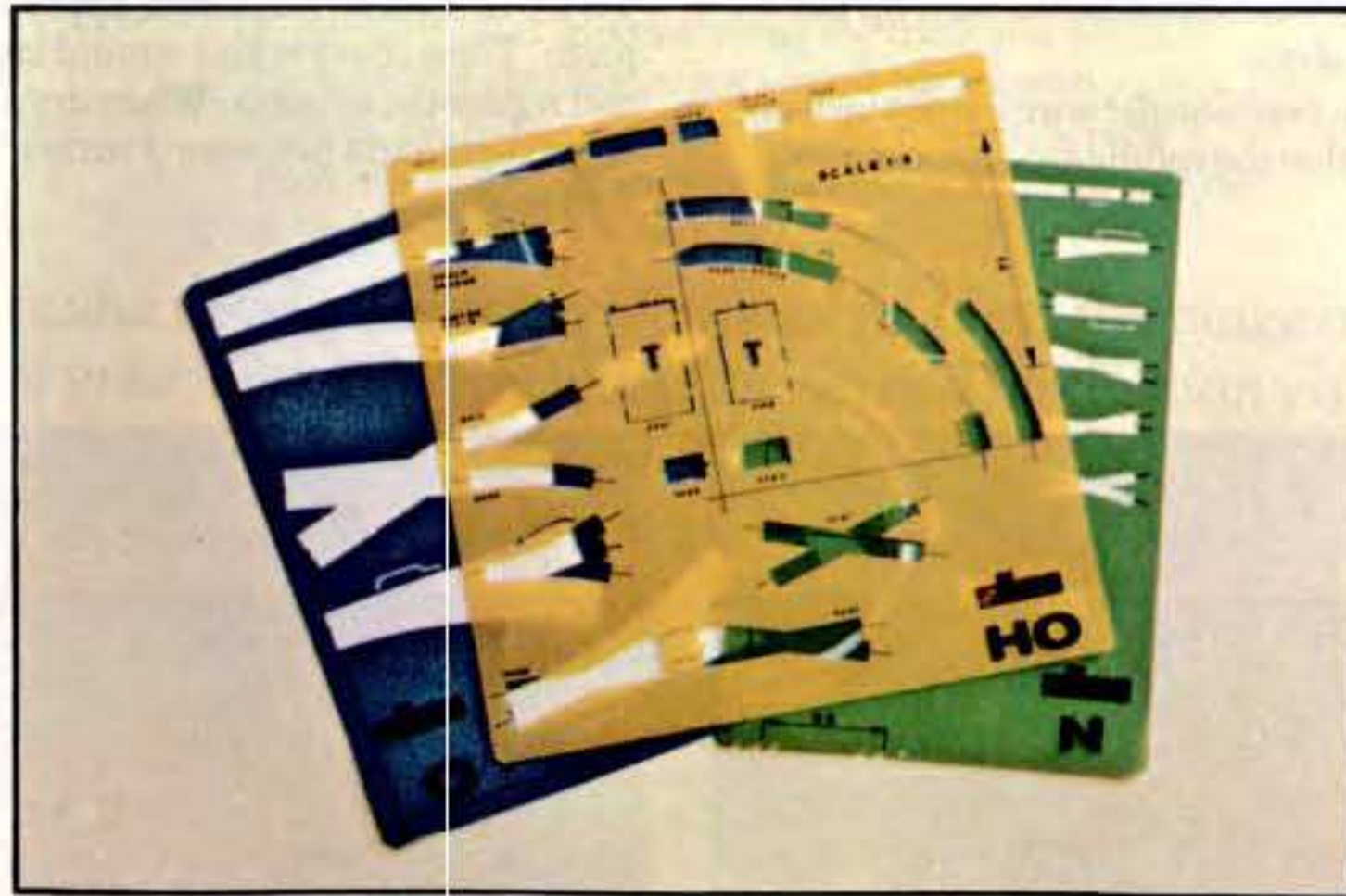
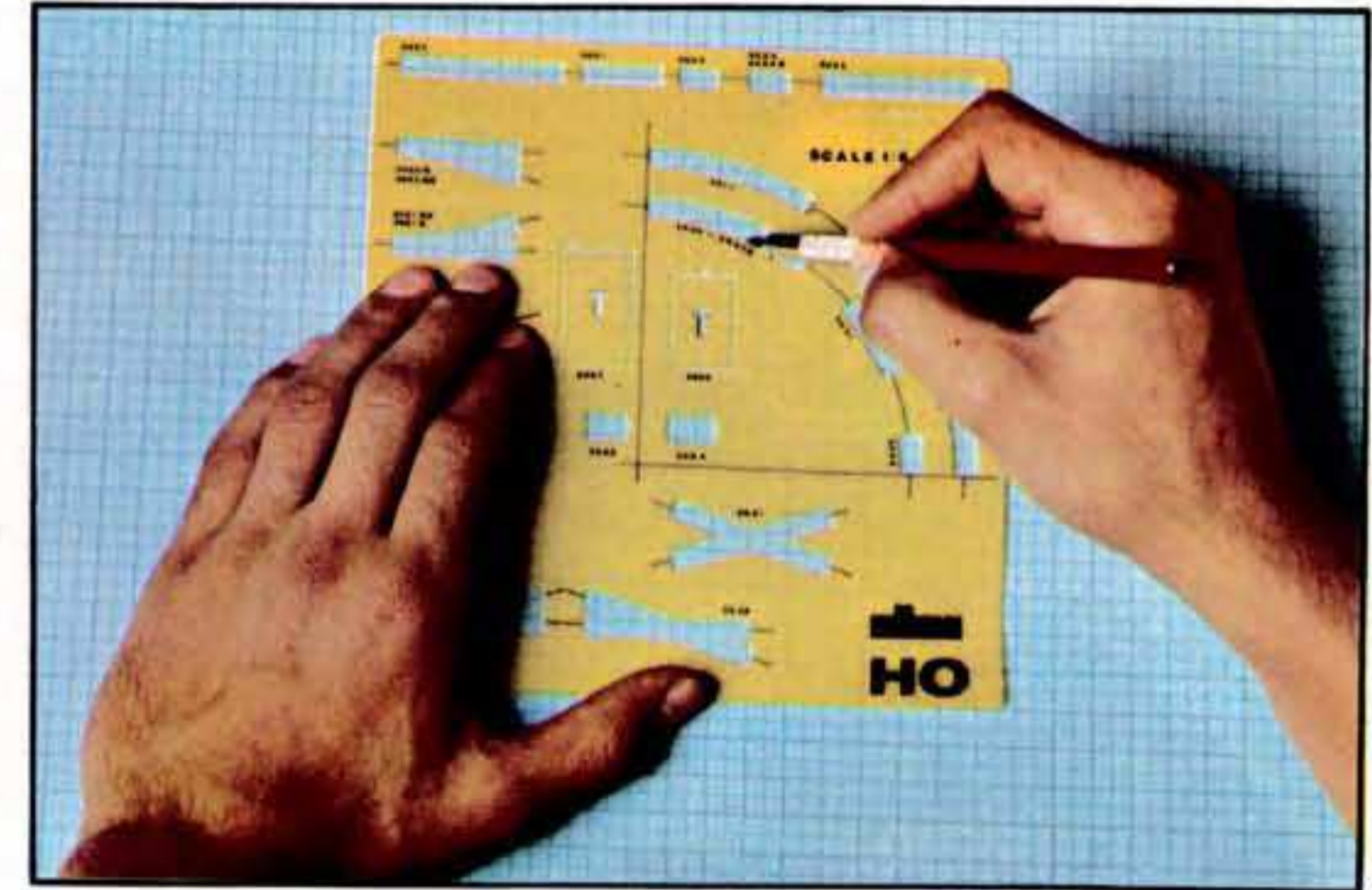
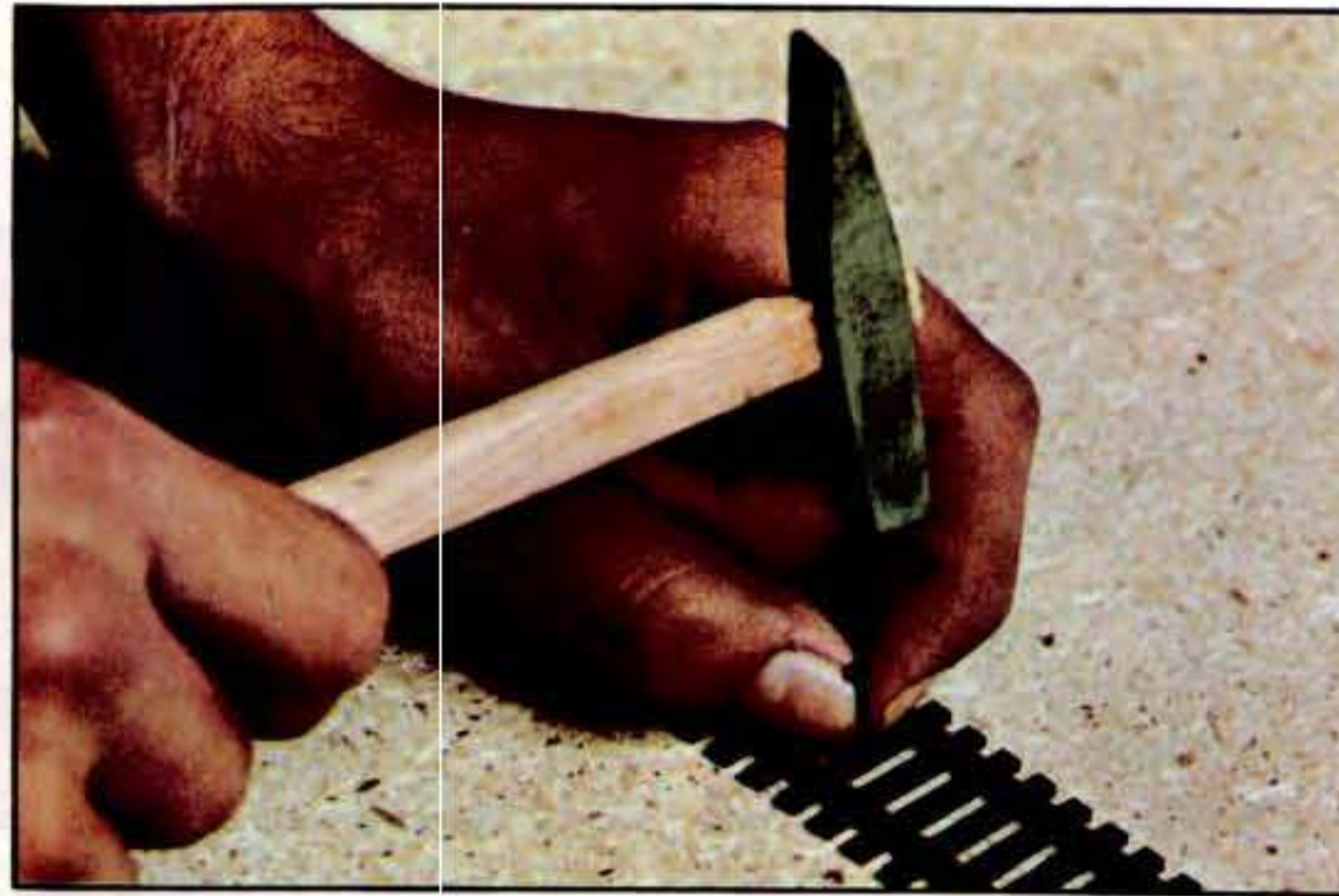


## PLANNING THE TRACK

Locate the track sections in the exact order shown on your plan, so you'll have no trouble fitting in the power feed to the track and positioning the power controllers and circuit control units. These should be placed near a corner of the layout to give the operators room to work.

Fasten the track temporarily and check the alignment carefully – ensuring that the locomotives and rolling stock can pass each other without fouling on curves or in tunnels.

Now fix the track flat to the table with Lima fixing pins (item 60 0003).



'OO' 60 0062    'N' 60 0063    'O' 60 0064

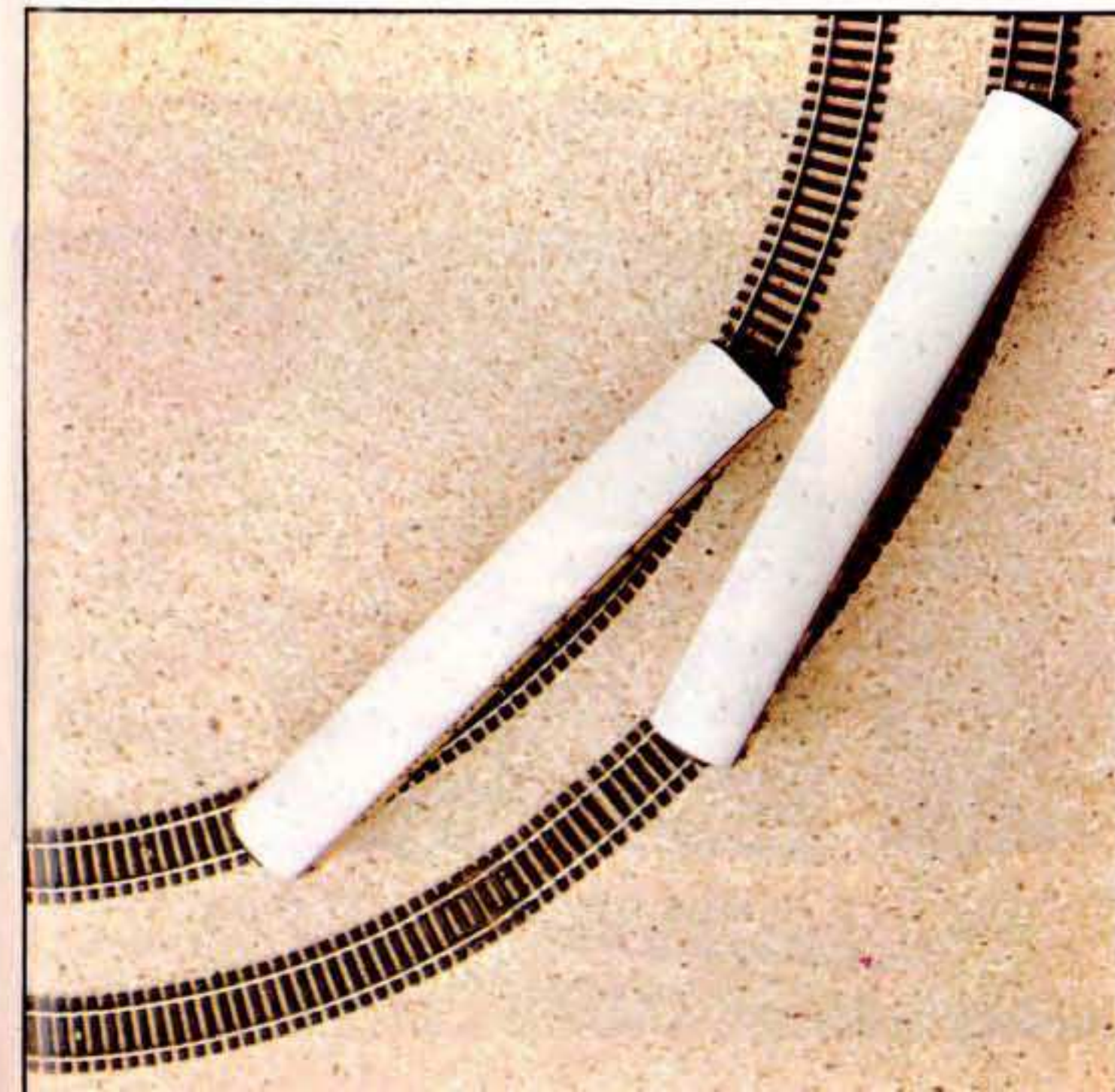
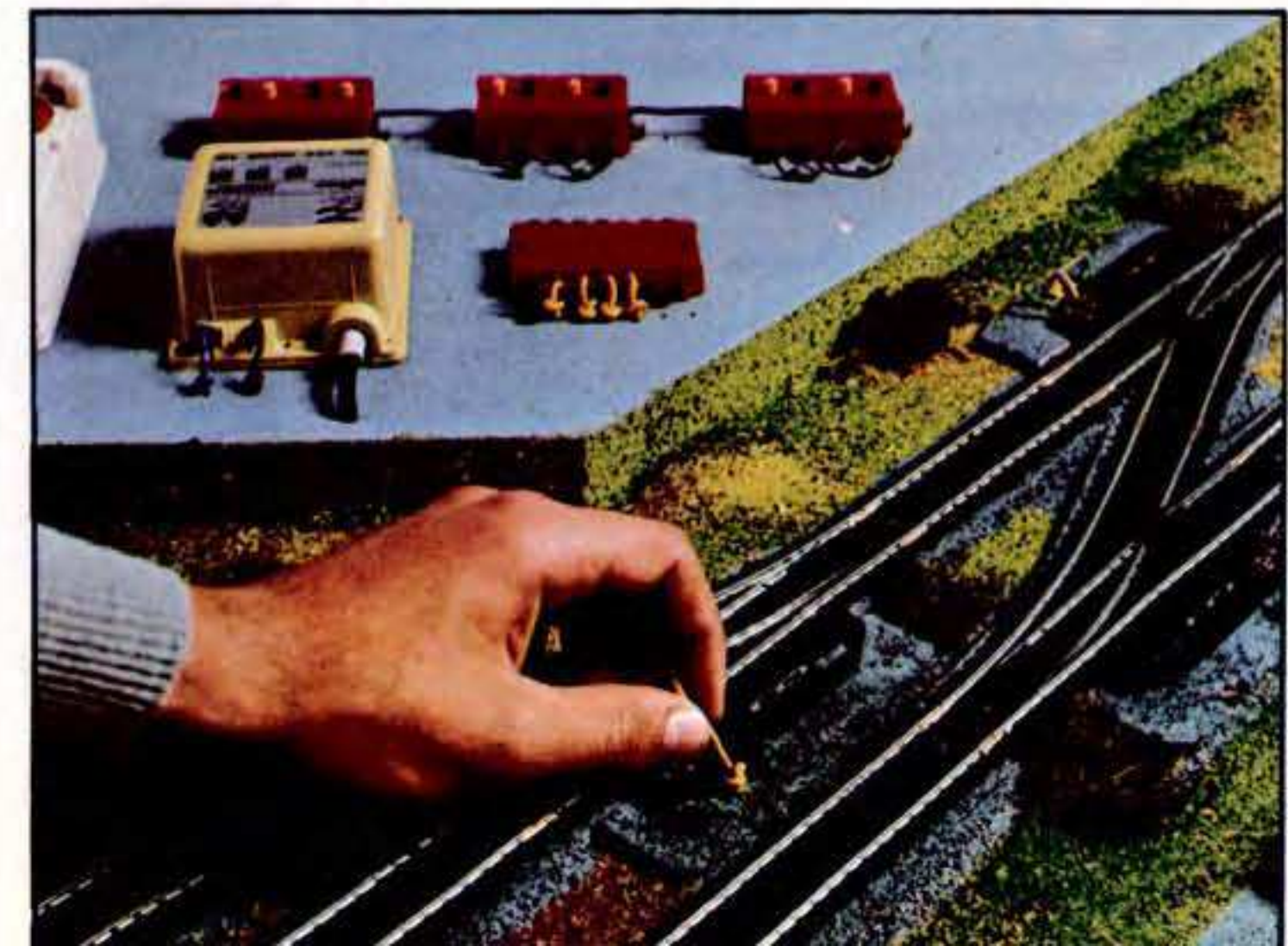
## TRACK PLAN STENCIL

Specifically designed to help you when making plans for your layout, the Lima Track Plan Stencil is available in 'OO', 'O' and 'N' scales.

By drawing through the cut-outs in the stencil you can make accurate scale drawings of track, points, crossovers and control boxes, etc. In this way you can see precisely how the finished system will fit together, and the exact space needed to lay it out.

## WIRING THE LAYOUT

Wiring that runs across the top of the baseboard spoils the look of the layout and may get entangled with the trains. So always drill holes to take it underneath. Tie a knot in the leads, just above the baseboard hole, so they cannot be pulled through accidentally.

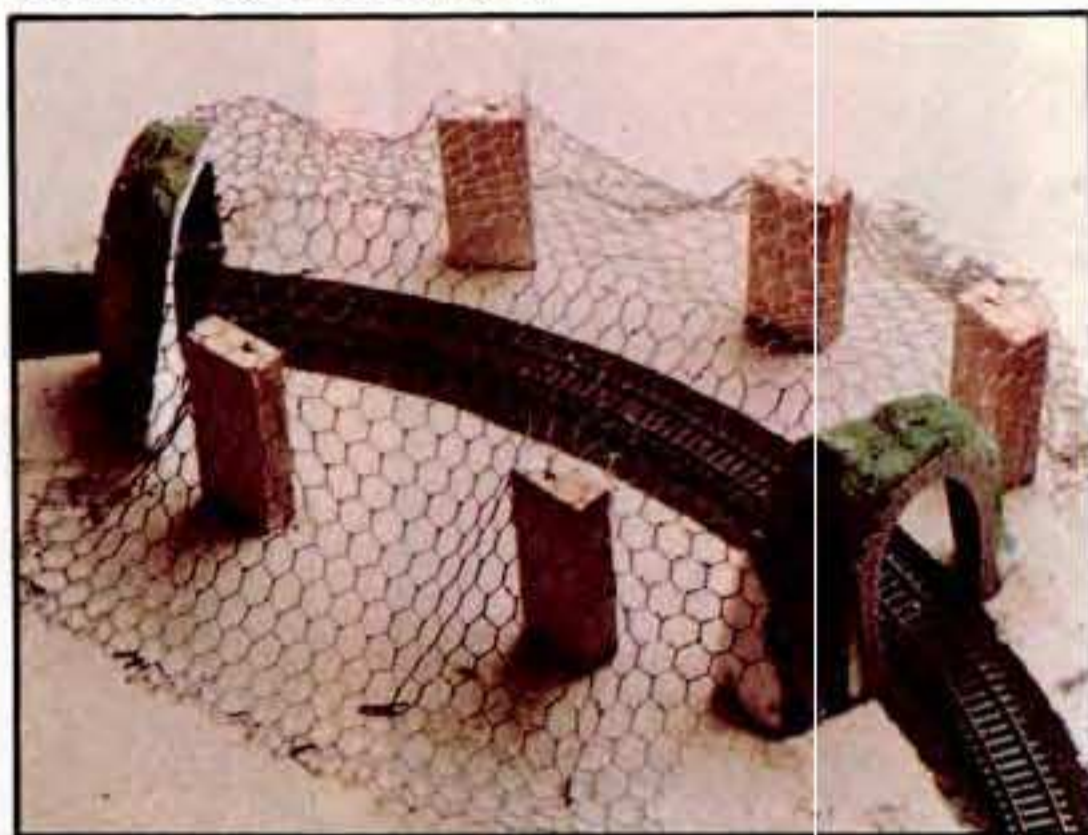


# MAKING SCENERY

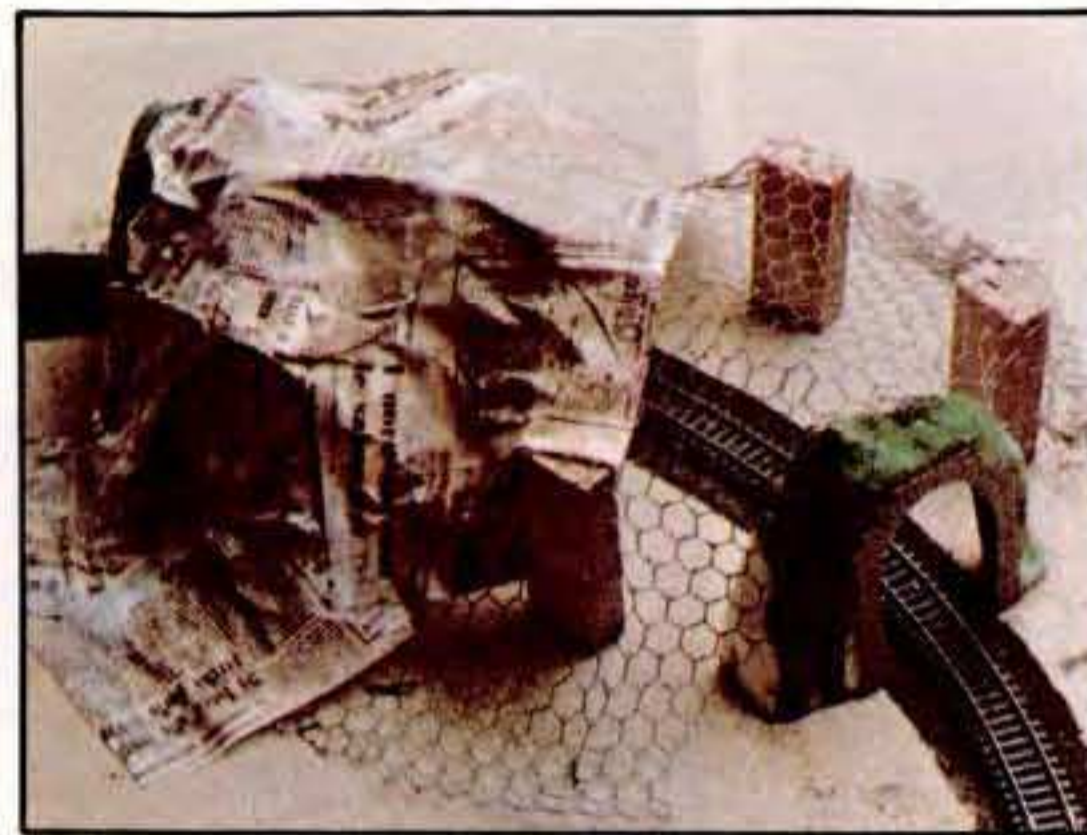
The first rule in making scenery is to follow nature. Observe the colours, slopes, textures and groupings found in real life. Keep things in proportion to your locomotives and rolling stock, and be certain that the change from wild areas to villages etc. is gradual and natural.

Scenery-making should proceed in several stages. First plan your contours and features with a rough sketch. Deciding where you want a river, which areas will be high and which low. And allowing for villages, stations and tunnels.

## LANDSCAPING



1. For landscaping and hills, chicken wire is the ideal material. It provides a firm base, yet is easily moulded to the required shape. But remember to turn up the ends of the wire for safety.  
2. Before you cover it, position the wire framework on the layout and check that the rolling stock doesn't foul against it.

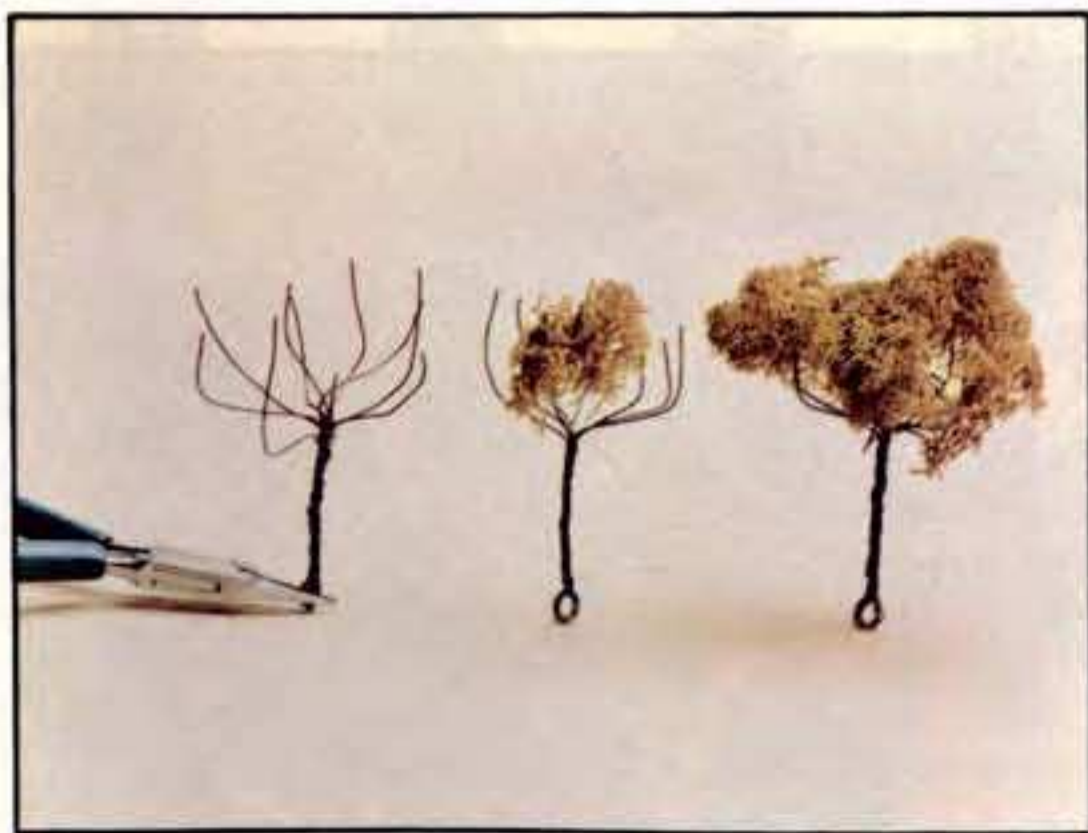


3. Now dampen strips of newspaper and lay them onto the wire. Criss-crossing to provide strength. When the wire is completely covered, apply a coat of wallpaper paste. Then cover with a second layer of damp paper and repeat the process. When dry, test for strength using light hand pressure. Further layers can be added if needed.



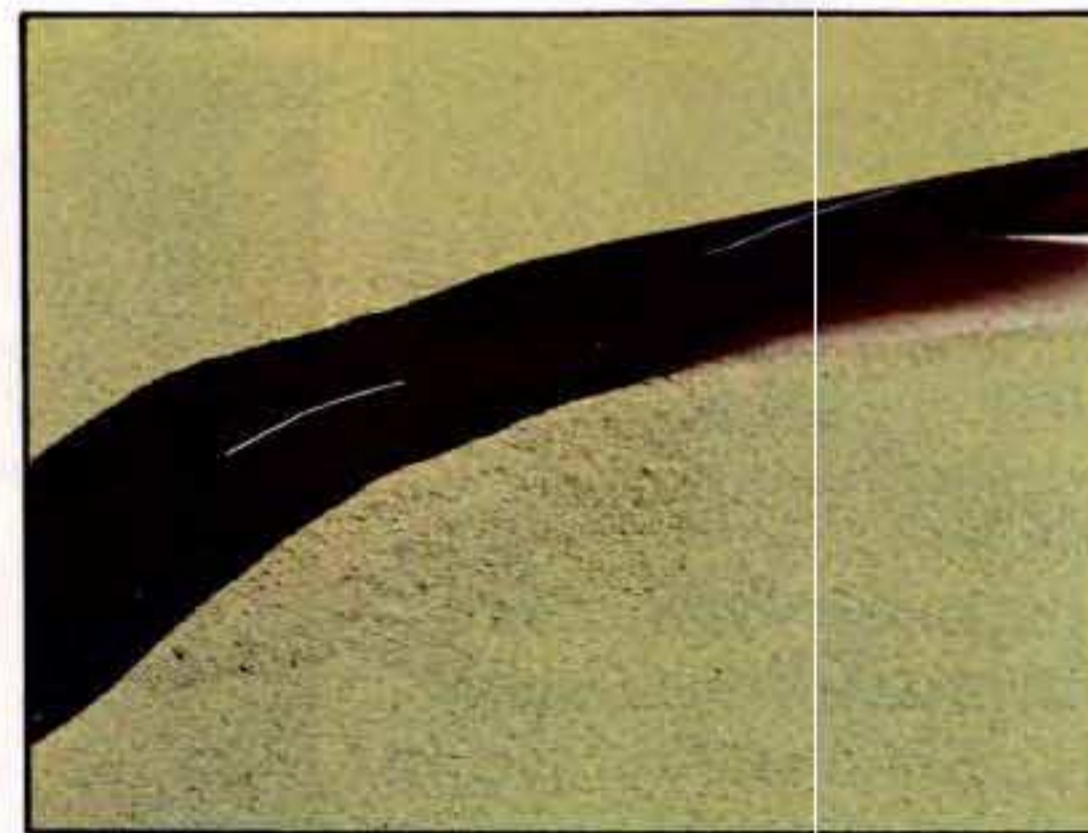
4. You can easily build a Lima Tunnel (item 602080) into your hill before you position the chicken wire. It creates a really authentic effect.  
5. Finally, colour the model so it blends in with the rest of your scenery.

## HOW TO MAKE TREES, HEDGES OR SHRUBS



1. Pieces of lichen, mounted on wire make ideal trees.  
2. Twist a few strands of soft wire to form a trunk, using the ends for the branches.  
3. Then push the lichen onto the branches and the tree is complete!

## ROADS



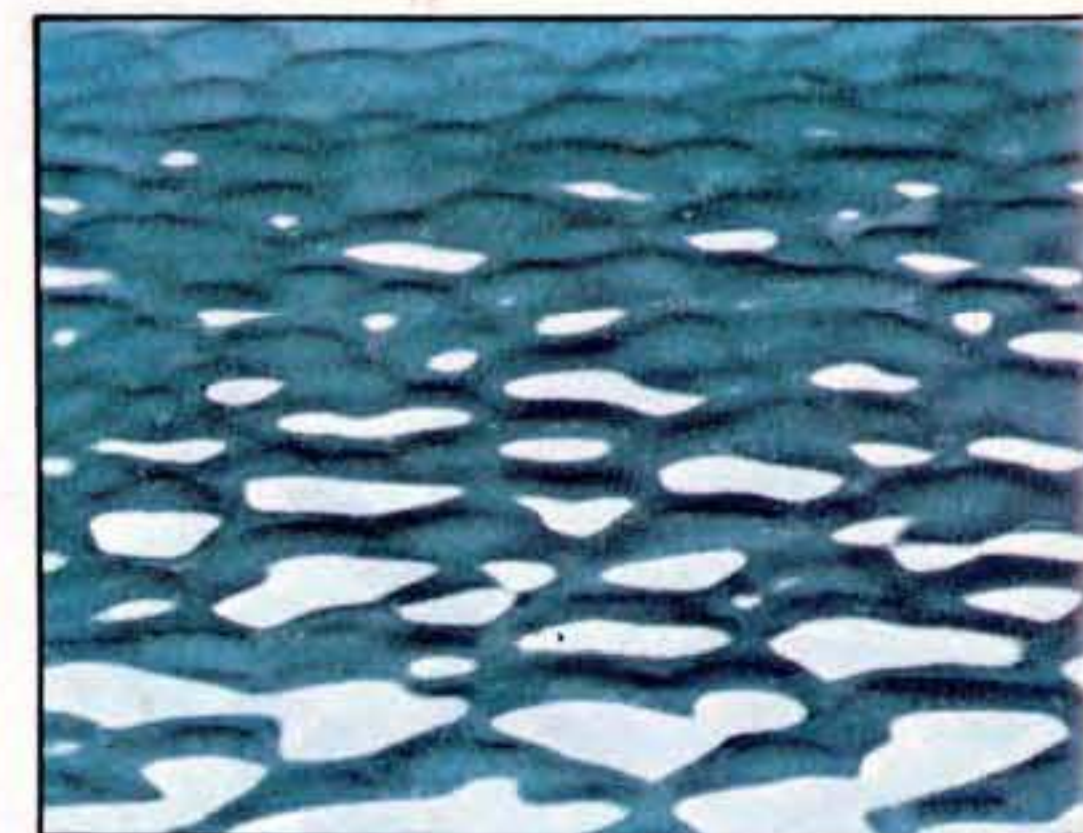
1. Roads can be constructed by cutting lengths from readily available scenic mats, fastened down with suitable adhesive.

## FENCES



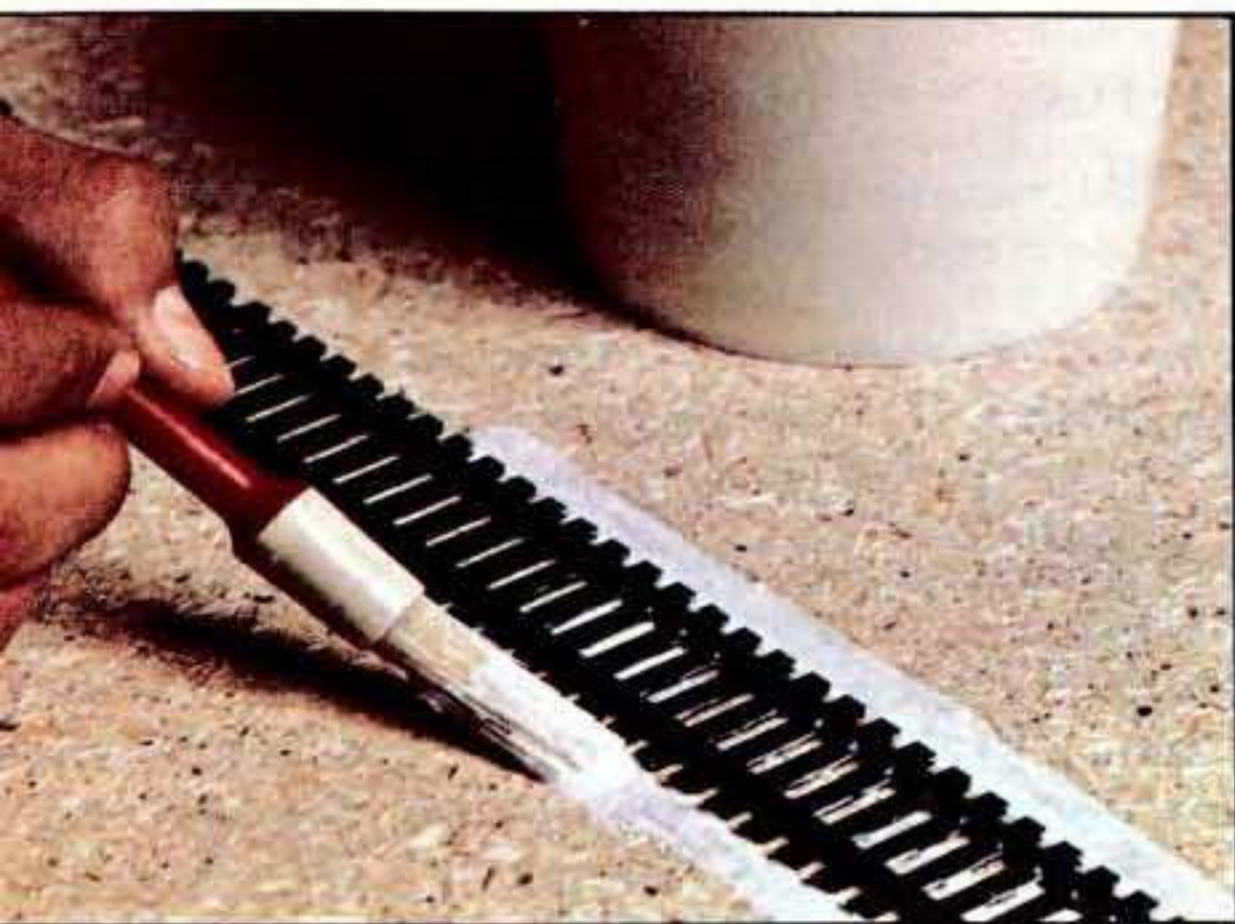
2. Realistic fences can be made from cotton wool round matchsticks – or use proprietary kits.

## RIVERS



3. Patterned glass preferably with a 'ripple' effect is best for rivers. Simply spray the underside with a suitable blue paint.

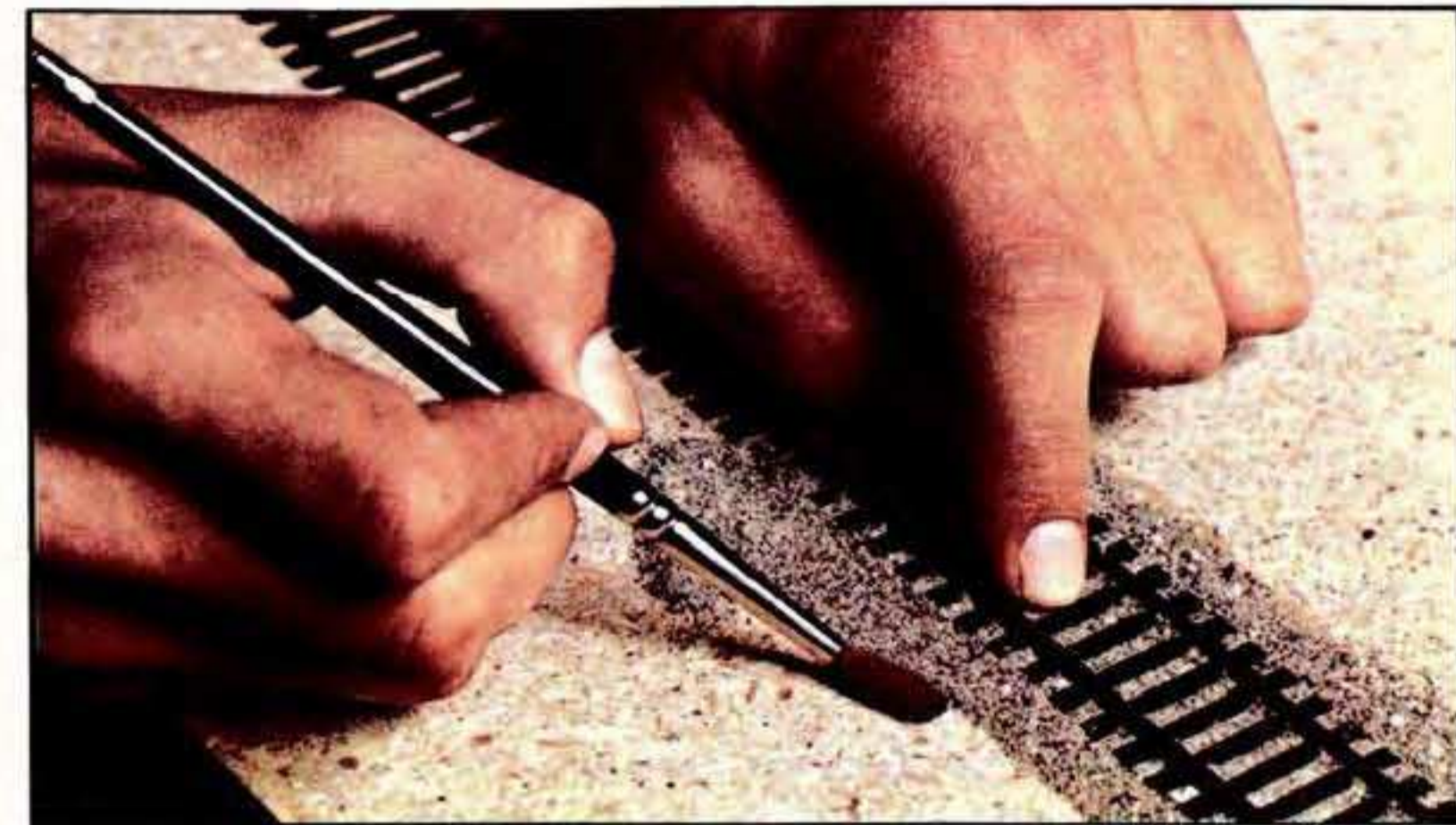
## BALLAST ROUND YOUR TRACK



1. Use a white marker to paint the area to be covered with glue.



2. Spread ballast mixture along the track and work it between the sleepers, using a small paint brush.  
3. Push the ballast down with your fingers. Scrape away any that extends more than 4mm from the sleepers at the trackside.



4. When the ballast is where you want it, allow to dry and you'll have ballast that's firm, but looks realistically loose.  
5. Consult your local Lima stockist for details of available materials.

**Make buildings work in your system** With care and good planning from the beginning, the range of Lima houses, stations and engine sheds will heighten the realism of your layout and increase the fun and fascination you and your friends will have with model railways.



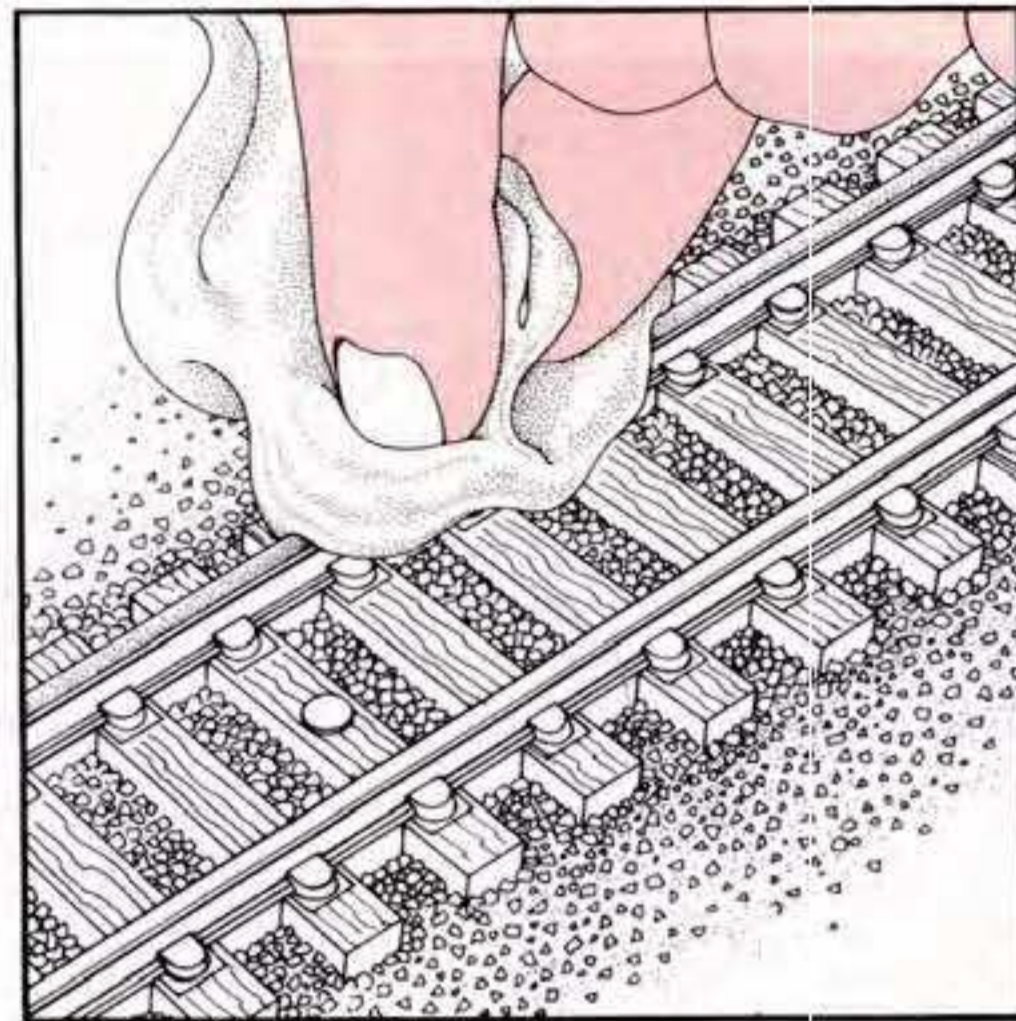
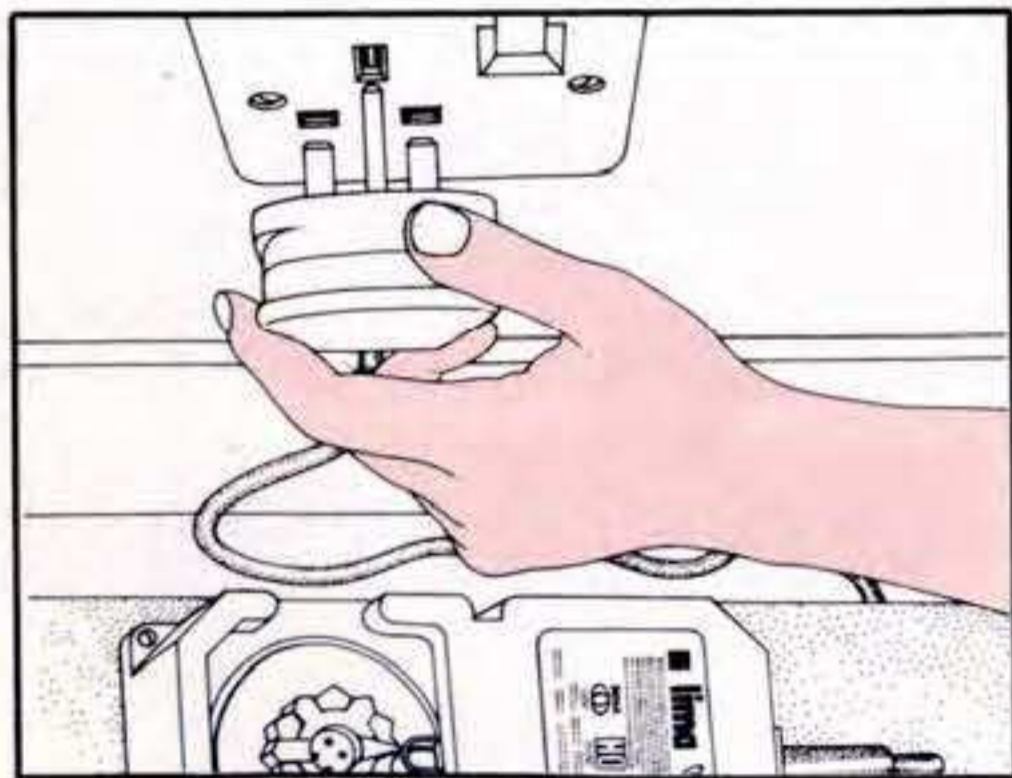
# OPERATING AND MAINTENANCE.

Lima model railways have been designed to incorporate the latest advances in precision model engineering.

A little care and regular routine servicing will ensure reliable and trouble-free running.

## GENERAL

Lima micro motors run at between 4 and 12 volts DC from either the battery box supplied with each set or with a Lima power unit/transformer that has a variable speed control and forward and reverse action. When using a power unit with secondary output terminals, always ensure that the controlled DC terminals only are connected to the track. The AC output should only be used for trackside accessories, such as points. Before plugging into the mains, check that the correct amp fuse has been fitted in the plug. When not in use, disconnect the controller from the mains.



## LOCOMOTIVE MAINTENANCE

For smooth and trouble-free running, the tracks should be kept clean and dust-free by wiping with a soft cloth moistened with a little methylated spirit. Also check that the fish plates are correctly aligned and are making good contact. Drive wheels of locomotives should be cleaned periodically by using a light abrasive paper.

Do not oil the brushes or commutator. (These should be kept clean by using a cloth moistened with a little carbon tetrachloride.)

## CARBON BRUSH REPLACEMENT

After a considerable period of use (150 hours approx.) the two carbon brushes may need replacing. The method, which is quite simple, is as follows:

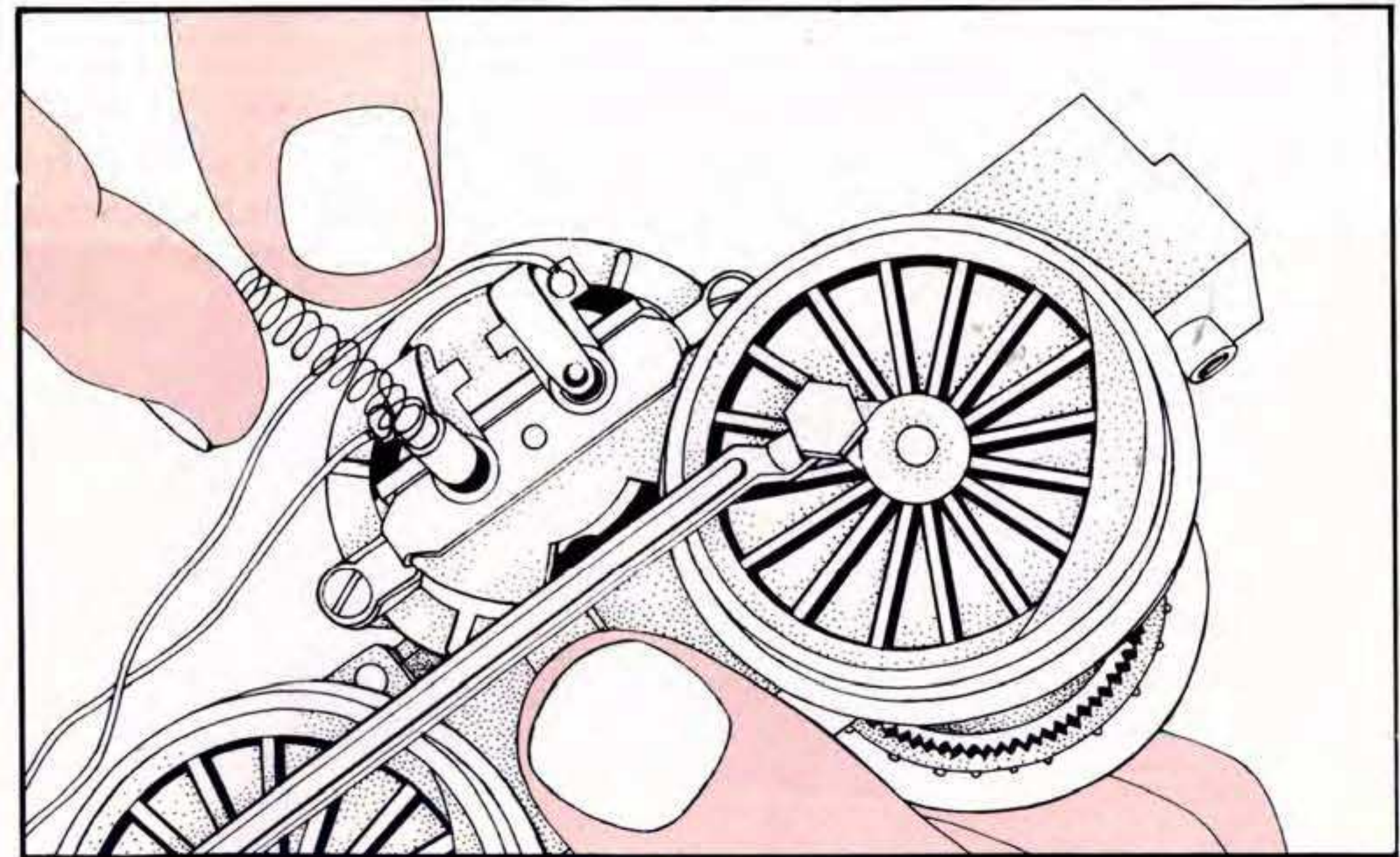
1. Remove the chassis and motor unit from the body.
2. Lay the chassis on its side with the brush retaining contact, arms on top.
3. With a screwdriver or similar object, ease the brush spring retaining arm away ensuring that the spring does not jump out.

4. After removing the spring, clear away any remaining part of the carbon brush with a pin. The brush housing should then be cleaned out with a twist of paper. Finally, blow any dirt particles clear.

5. Insert the new brush into the housing, replace the spring and carefully bend the retaining contact arm back into position.

6. Repeat the procedure for the other brush.

And don't forget, when servicing adjustments are required, your Lima Service Dealer is always ready to help you.





# TRACK PLANS

# OO SCALE

What makes a model railway different from other hobbies involving scale-models? The fundamental answer is the track. This is where the fascination of miniature railways really begins.

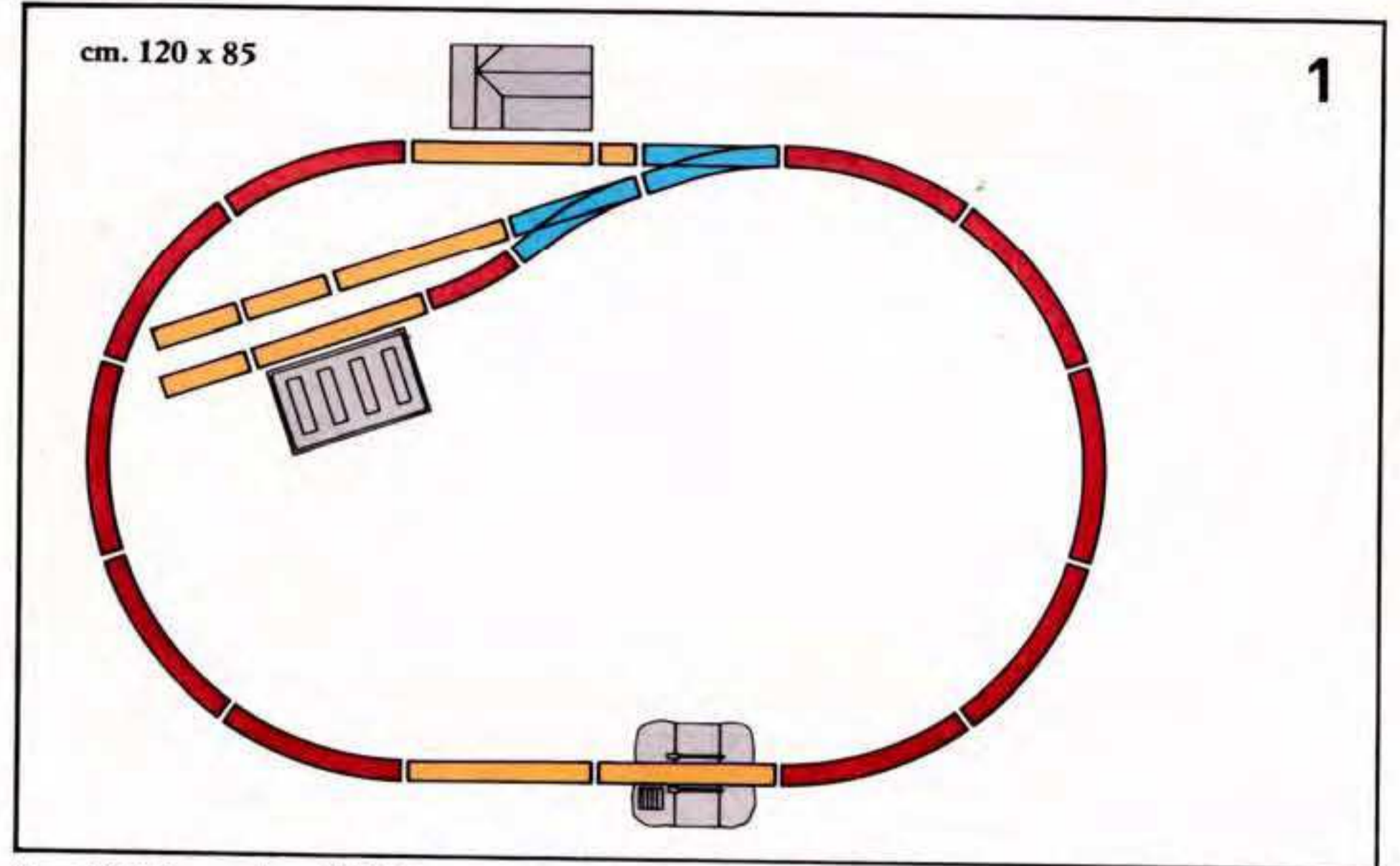
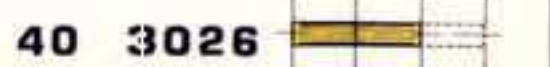
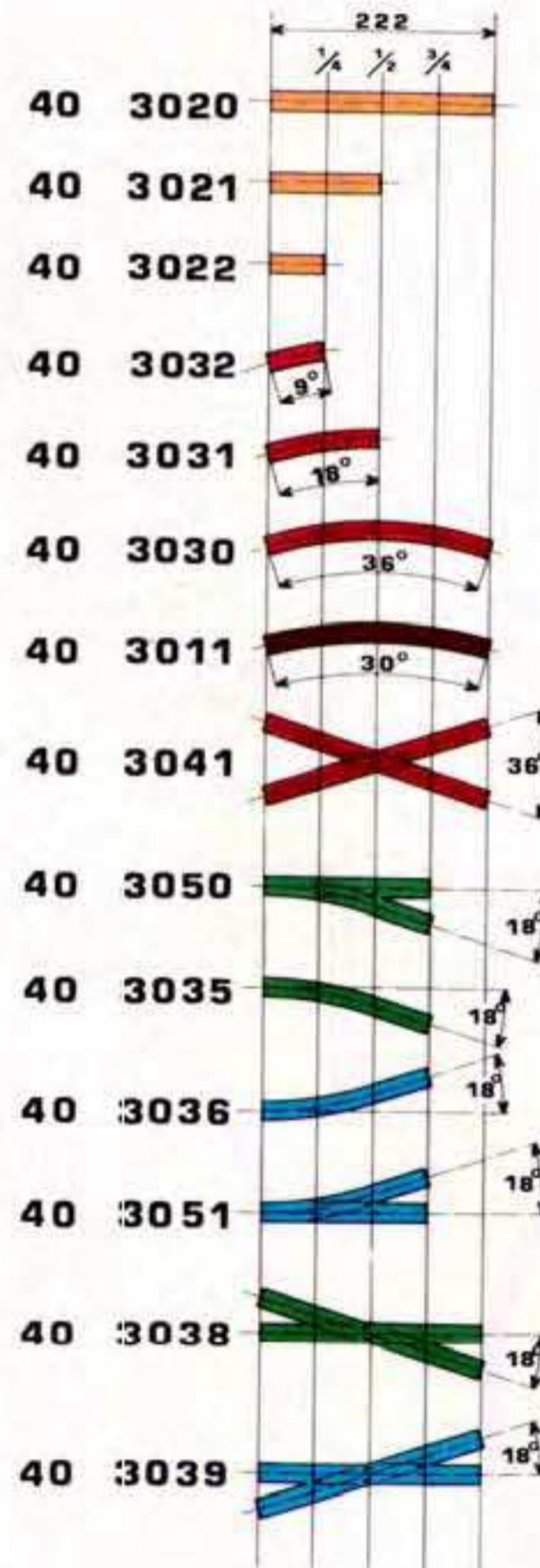
While a lot of fun can be had with a basic train set, building this up into a proper railway layout can turn railway modelling from a pleasant pastime into a lifelong hobby, in the true sense of the word.

On the following pages you'll find a number of track plans – designed to help you develop and extend your system. The components of each plan are numbered and described, to assist you in planning a change from one layout to another.

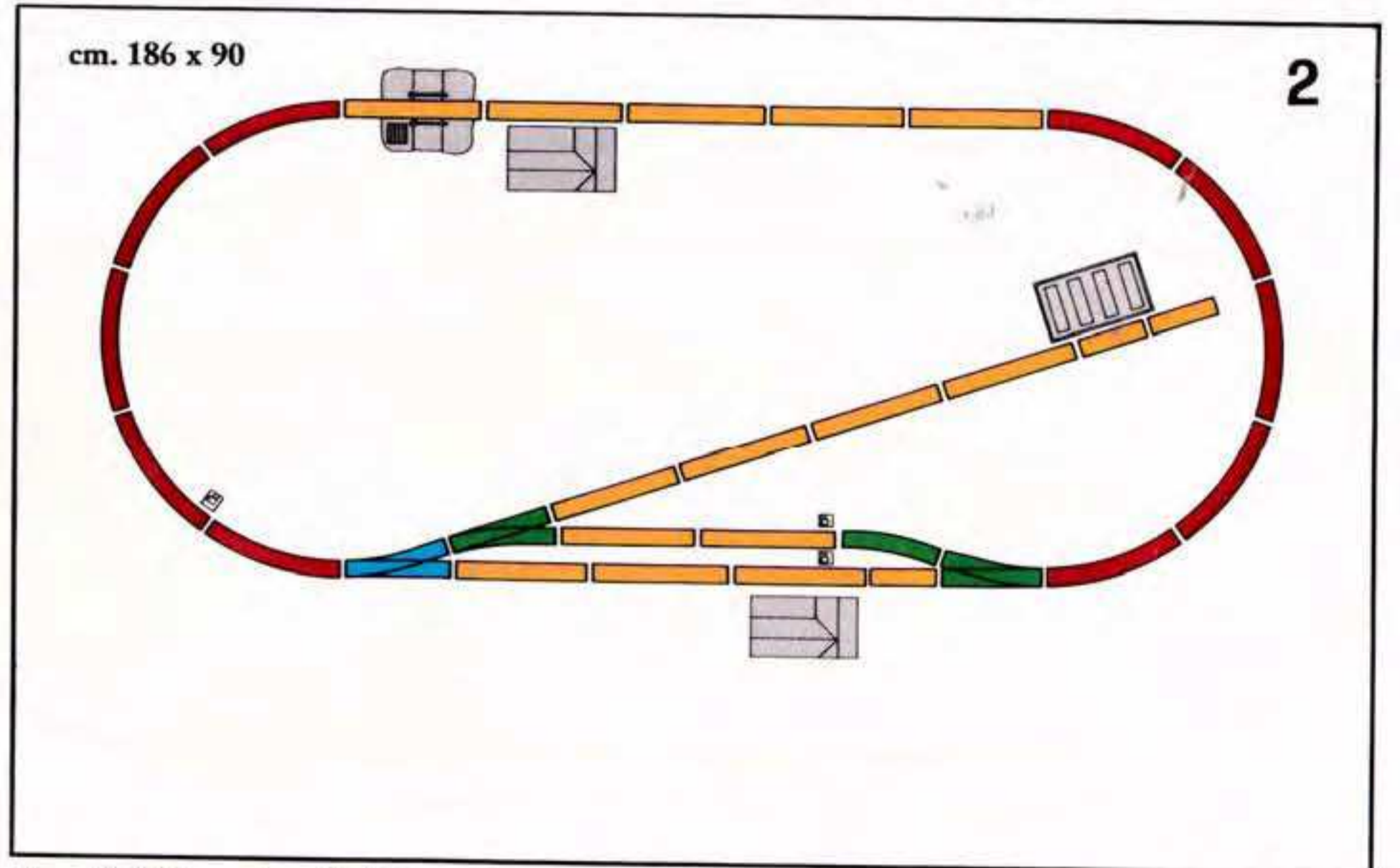
But remember, don't be over-ambitious at the outset by building a bigger and more complex layout than you can handle. Even the simplest of these layouts will give you a considerable amount of pleasure – both in building and running. And you'll have a lot more fun if you take things easily, stage-by-stage, as your skill and experience develops.

Also remember that for smooth and safe operation, the track assembly must be done with maximum care. Lima have produced a special system (System 222) to make this easy. All parts are geometrically based on the length of a straight track section of 222mm or its fractions. Straights and curves are divided into 2 categories: basic and subsidiary, which are equal in length so that either may be connected to the layout without altering its geometry.

So if you follow these track plans carefully, you simply can't go wrong.

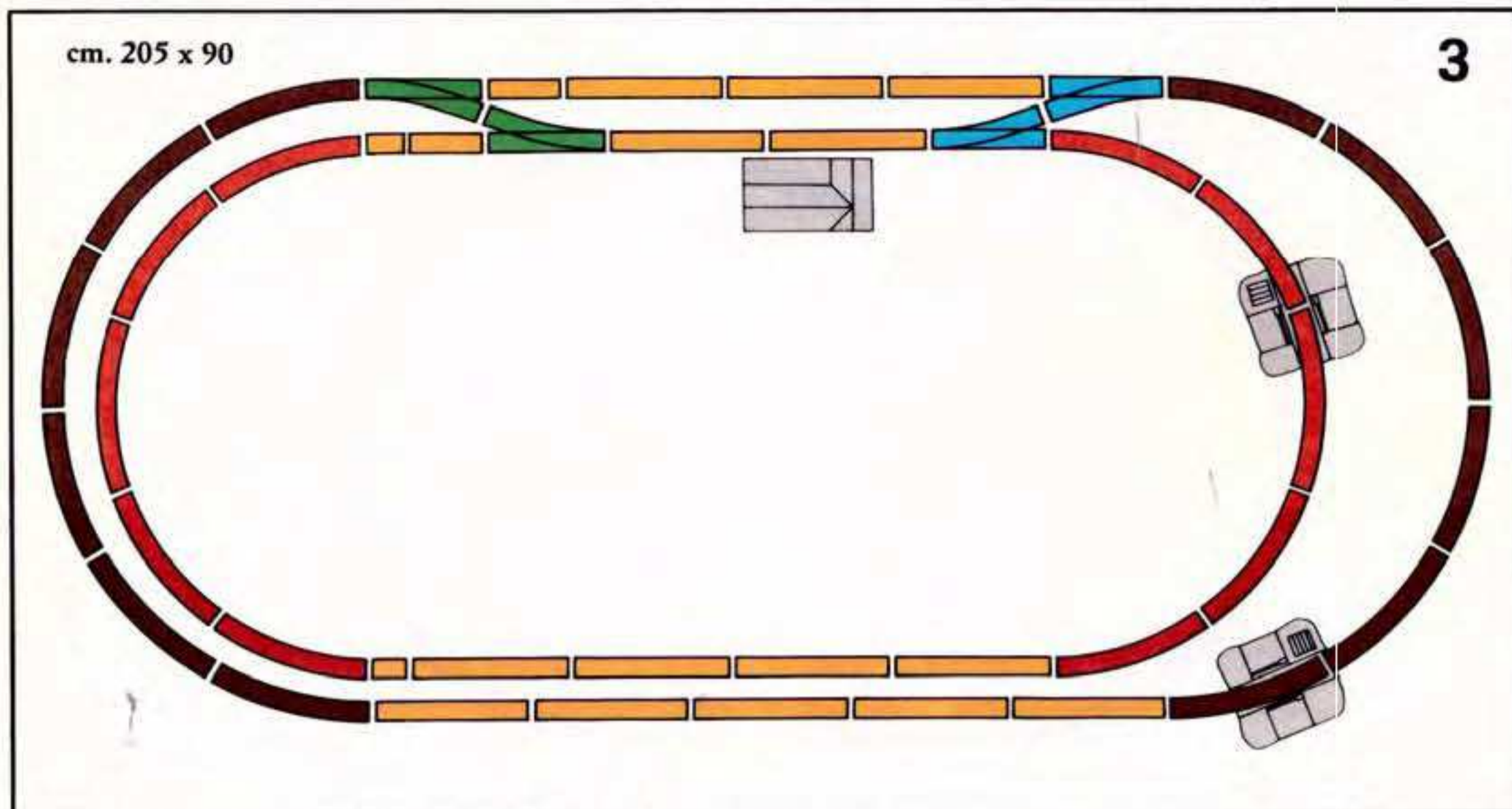


- |            |            |             |            |            |            |
|------------|------------|-------------|------------|------------|------------|
| 5 - 403020 | 1 - 403022 | 9 - 403030  | 1 - 403031 | 1 - 600021 | 1 - 600041 |
| 1 - 403021 | 2 - 403025 | 1 - 403030C | 2 - 403051 | 1 - 600045 |            |

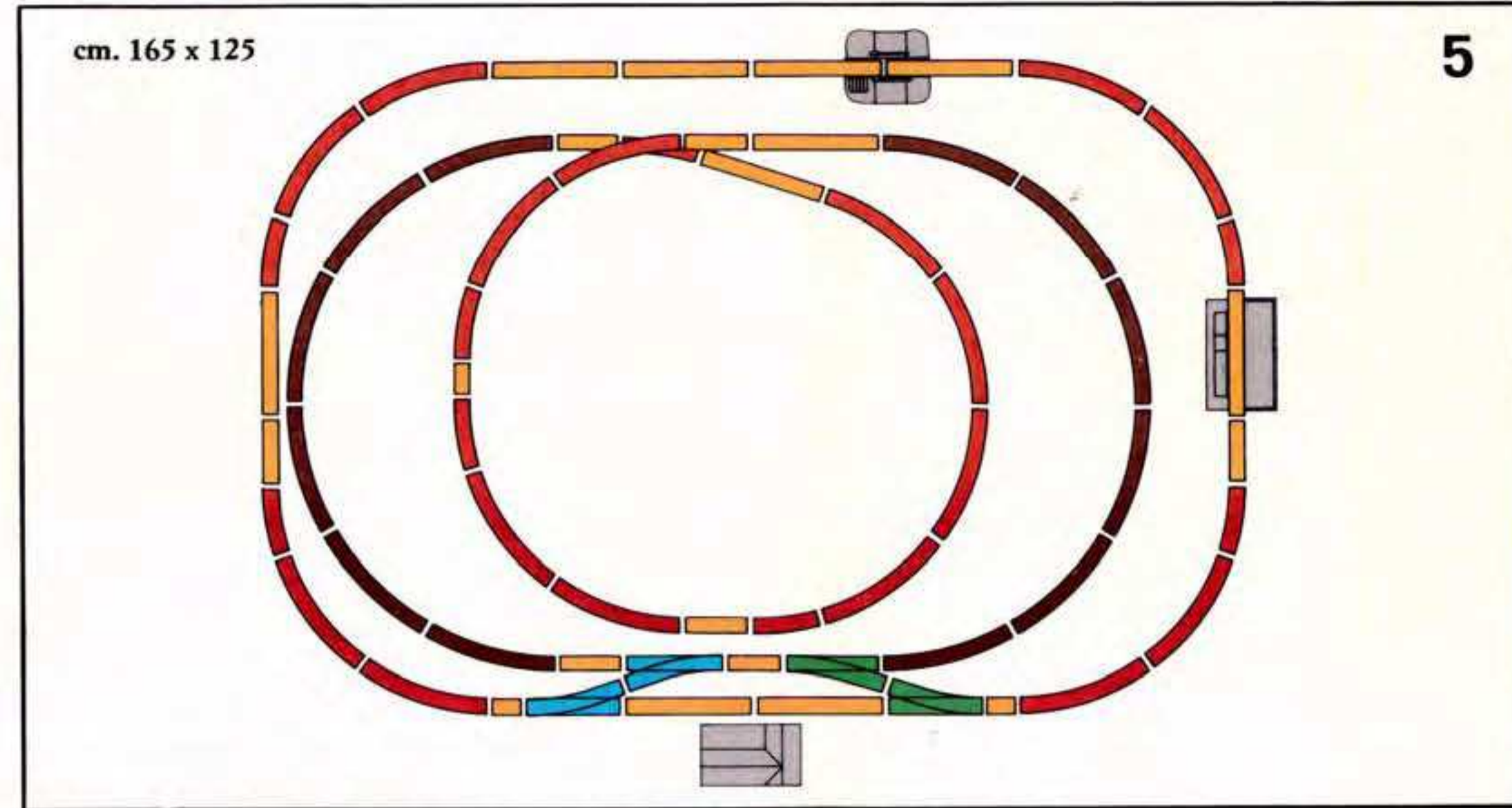


- |             |            |             |            |            |            |
|-------------|------------|-------------|------------|------------|------------|
| 14 - 403020 | 1 - 403025 | 1 - 403030C | 1 - 403051 | 2 - 600045 | 1 - 600021 |
| 2 - 403021  | 9 - 403030 | 2 - 403050  | 1 - 403035 | 1 - 600041 | 3 - 600022 |

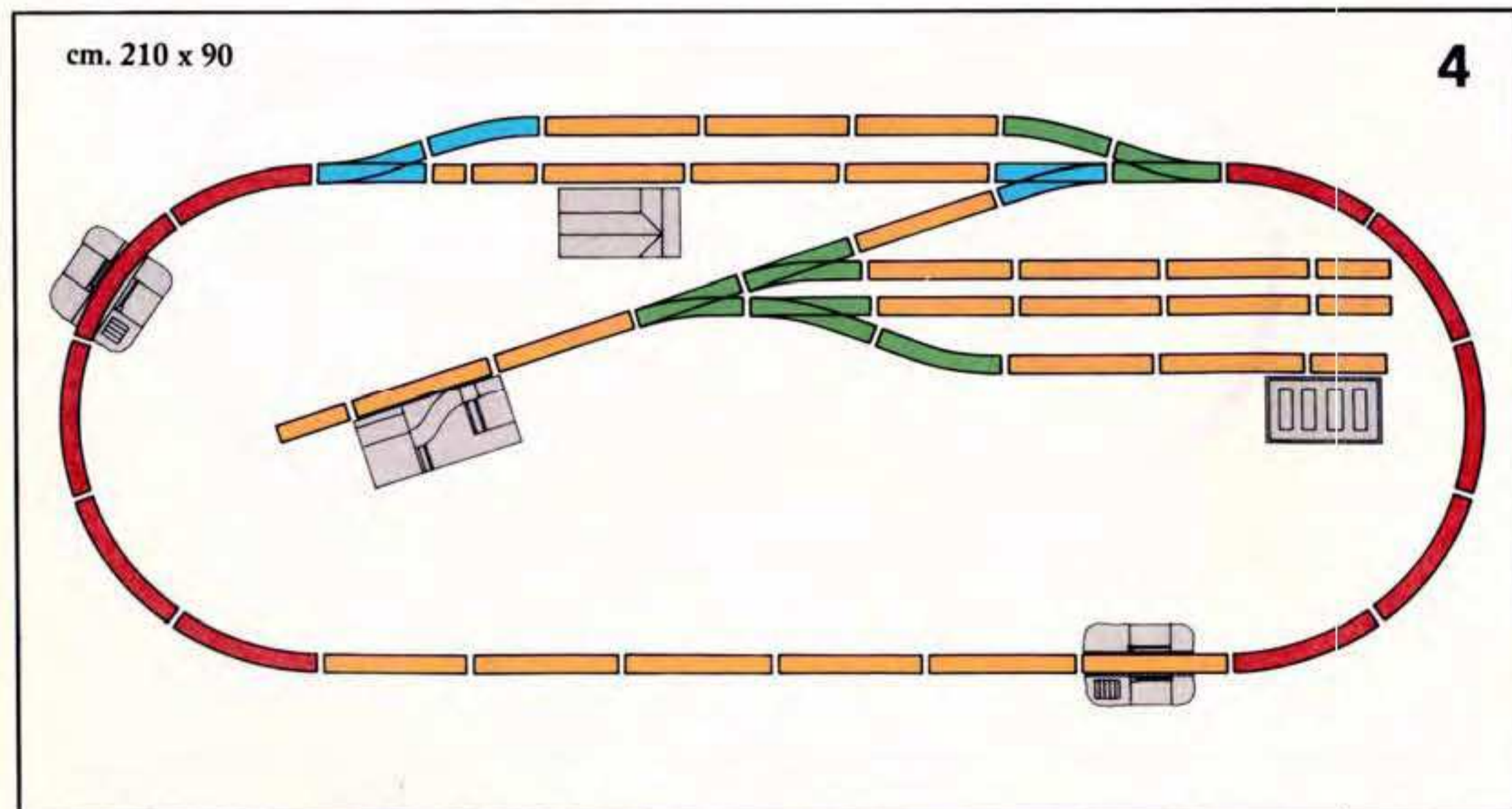
# OO SCALE



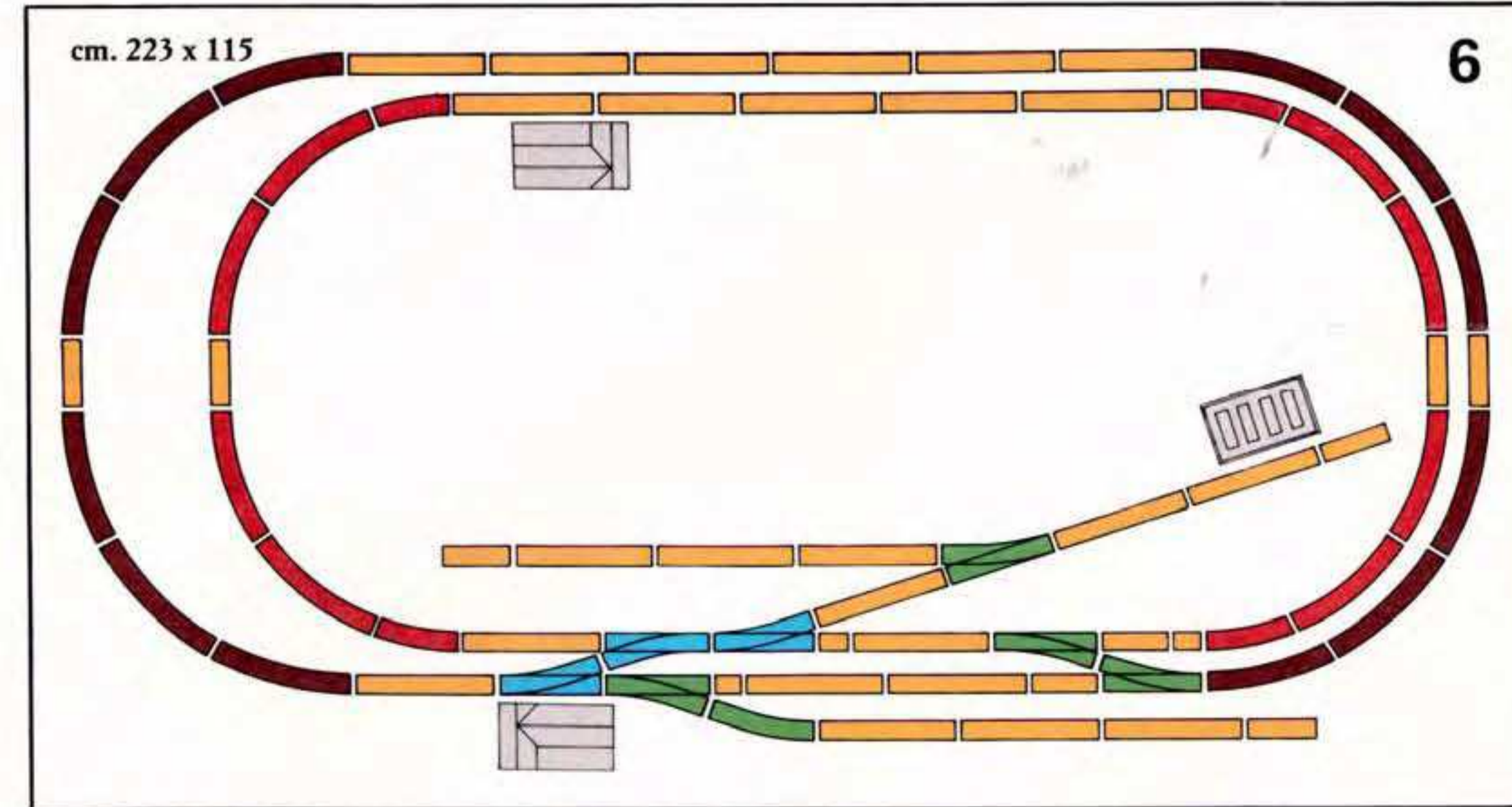
14 - 403020	12 - 403011	2 - 403050	1 - 600045
2 - 403021	9 - 403030	2 - 403051	
2 - 403022	1 - 403030C	2 - 600021	



10 - 403020	12 - 403011	8 - 403031	1 - 600021
7 - 403021	15 - 403030	2 - 403050	1 - 600045
3 - 403022	1 - 403030C	2 - 403051	1 - 602080



23 - 403020	4 - 403025	2 - 403051	2 - 403035	1 - 600041
1 - 403021	9 - 403030	4 - 403050	2 - 600021	1 - 600940
1 - 403022	1 - 403030C	1 - 403036	1 - 600045	

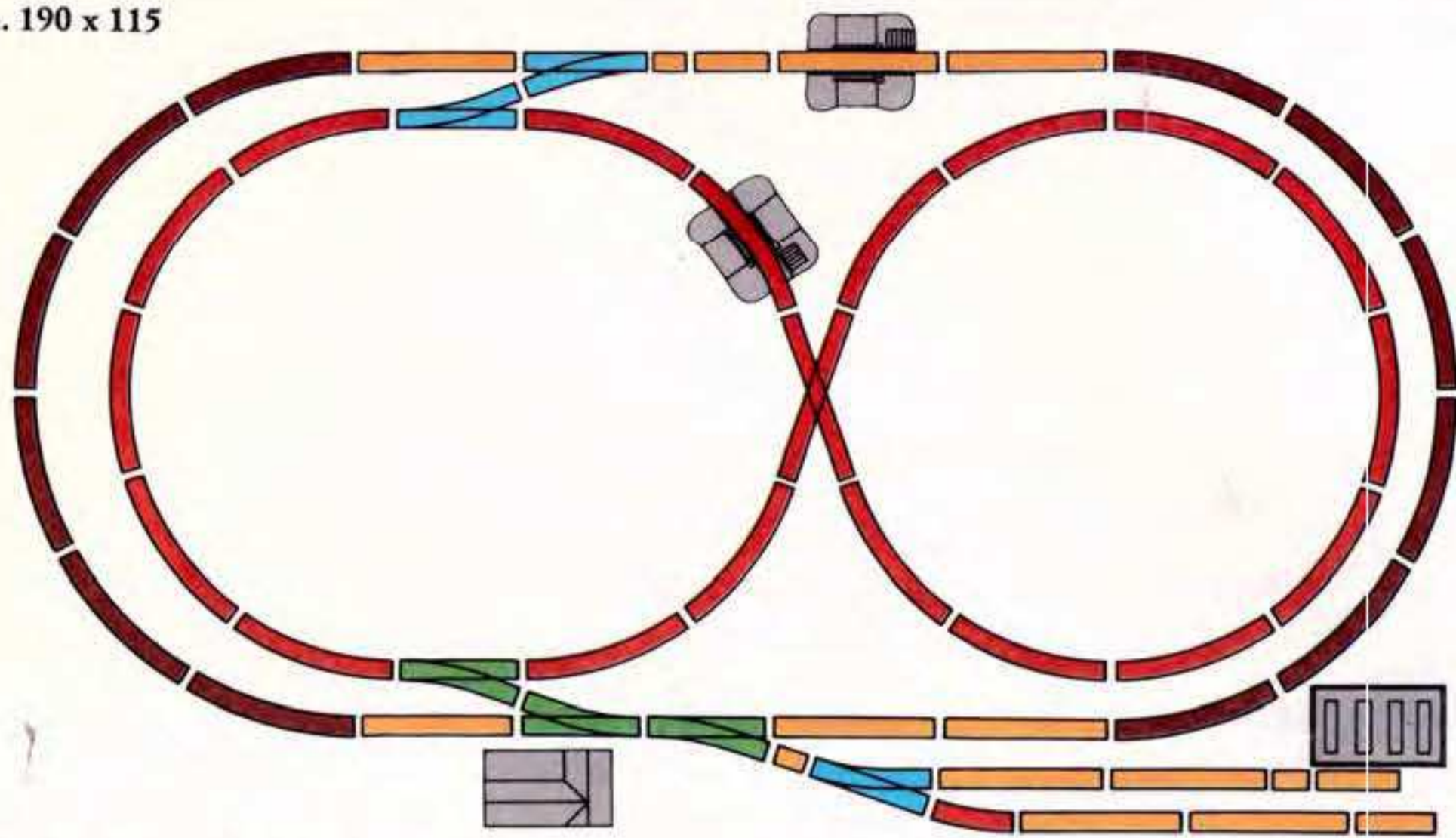


25 - 403020	3 - 403025	1 - 403030C	3 - 403051	1 - 600041
6 - 403021	12 - 403011	4 - 403031	1 - 403035	
4 - 403022	7 - 403030	4 - 403050	2 - 600045	

# OO SCALE

cm. 190 x 115

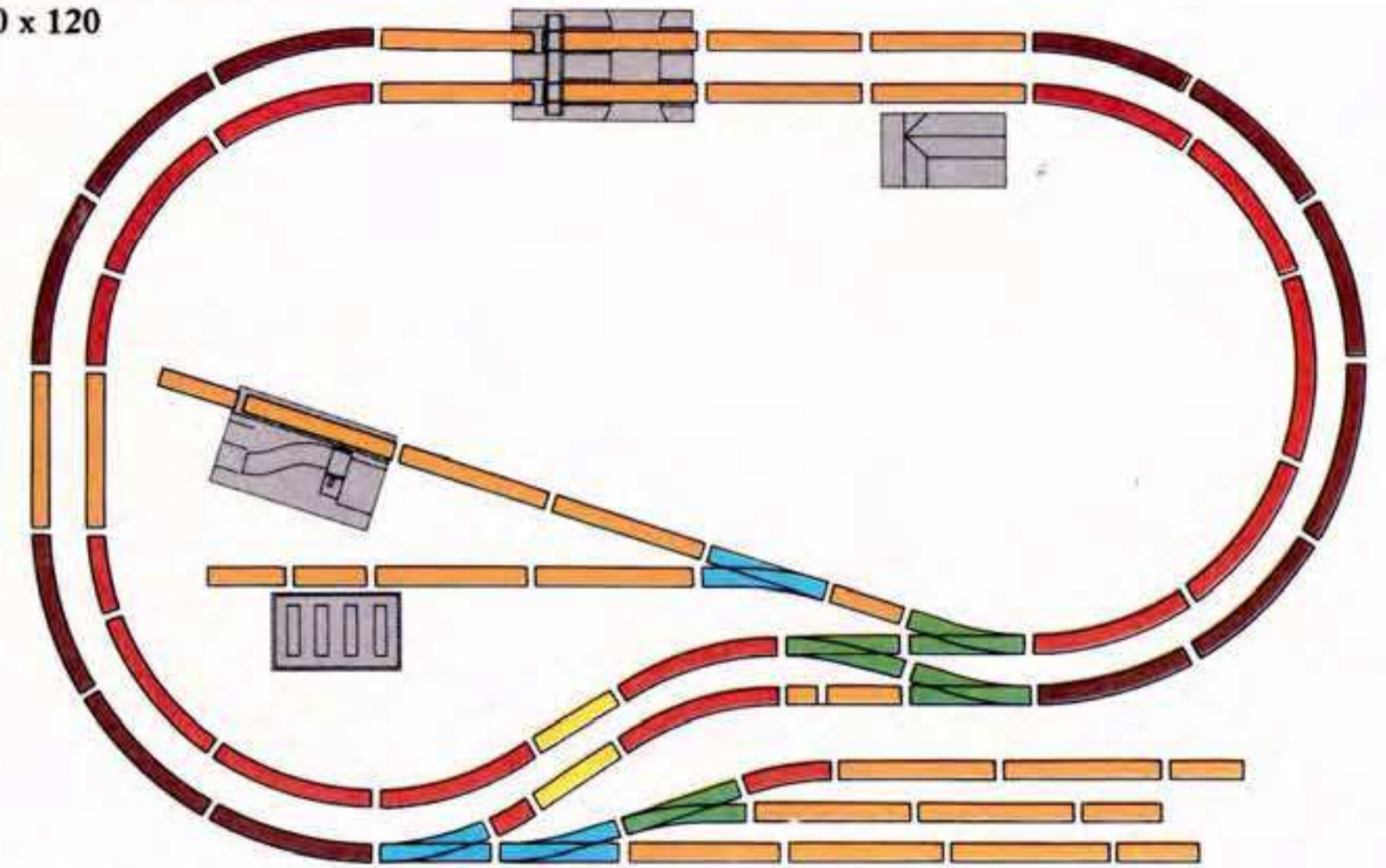
7



- |             |             |             |            |            |
|-------------|-------------|-------------|------------|------------|
| 10 - 403020 | 2 - 403025  | 1 - 403030C | 3 - 403050 | 1 - 600041 |
| 1 - 403021  | 12 - 403011 | 1 - 403031  | 3 - 403051 | 1 - 600045 |
| 3 - 403022  | 17 - 403030 | 1 - 403041  | 2 - 600021 |            |

cm. 180 x 120

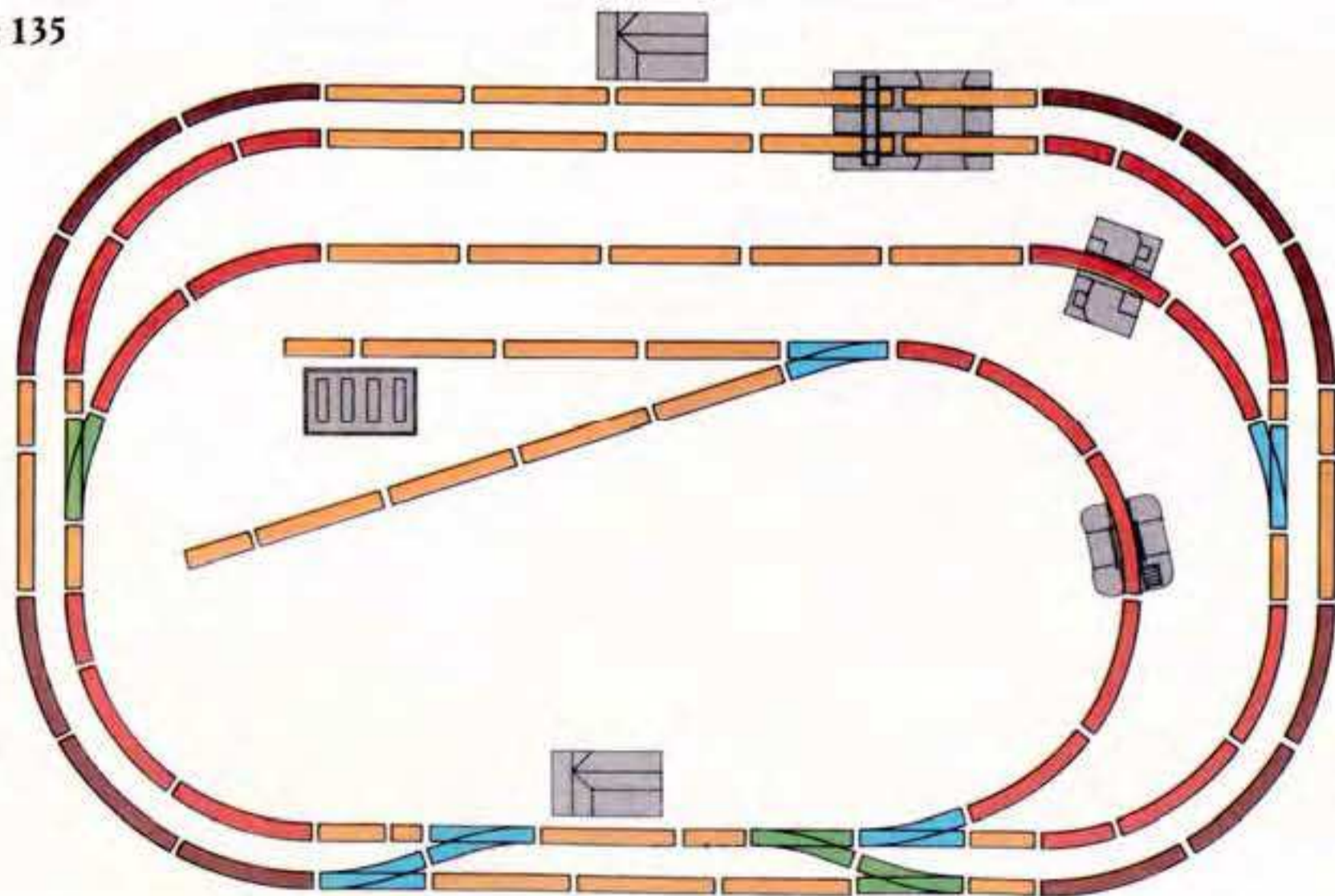
9



- |             |             |             |            |            |            |
|-------------|-------------|-------------|------------|------------|------------|
| 22 - 403020 | 5 - 403025  | 1 - 403030C | 3 - 403051 | 1 - 600025 | 1 - 600045 |
| 3 - 403021  | 12 - 403011 | 3 - 403031  | 4 - 403050 | 1 - 600940 |            |
| 1 - 403022  | 11 - 403030 | 1 - 403032  | 2 - 403026 | 1 - 600041 |            |

cm. 205 x 135

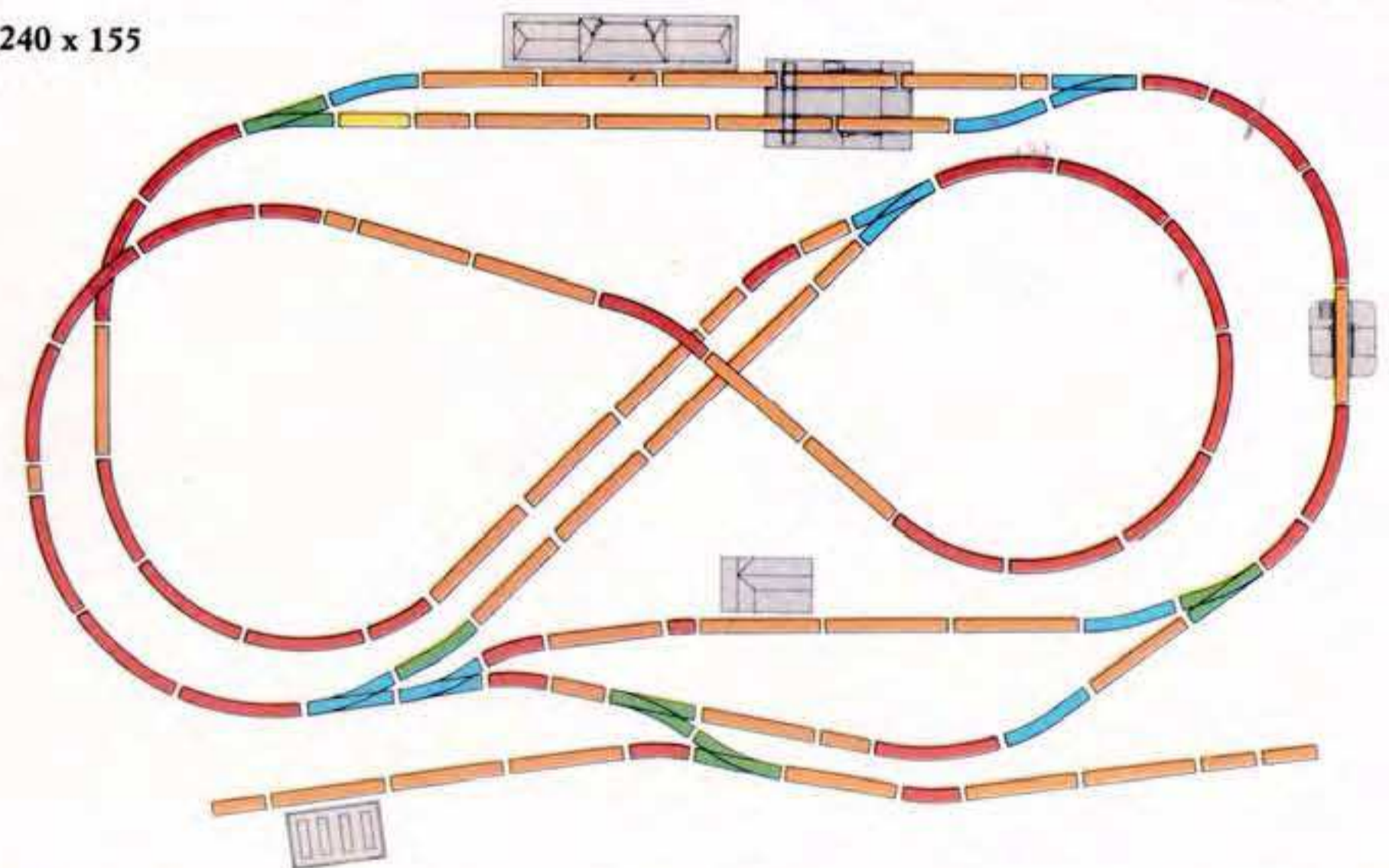
8



- |             |             |             |            |            |
|-------------|-------------|-------------|------------|------------|
| 28 - 403020 | 2 - 403025  | 1 - 403030C | 3 - 403050 | 1 - 600021 |
| 8 - 403021  | 12 - 403011 | 5 - 403031  | 2 - 600045 | 1 - 600052 |
| 3 - 403022  | 15 - 403030 | 5 - 403051  | 1 - 600041 | 1 - 600025 |

cm. x 240 x 155

10

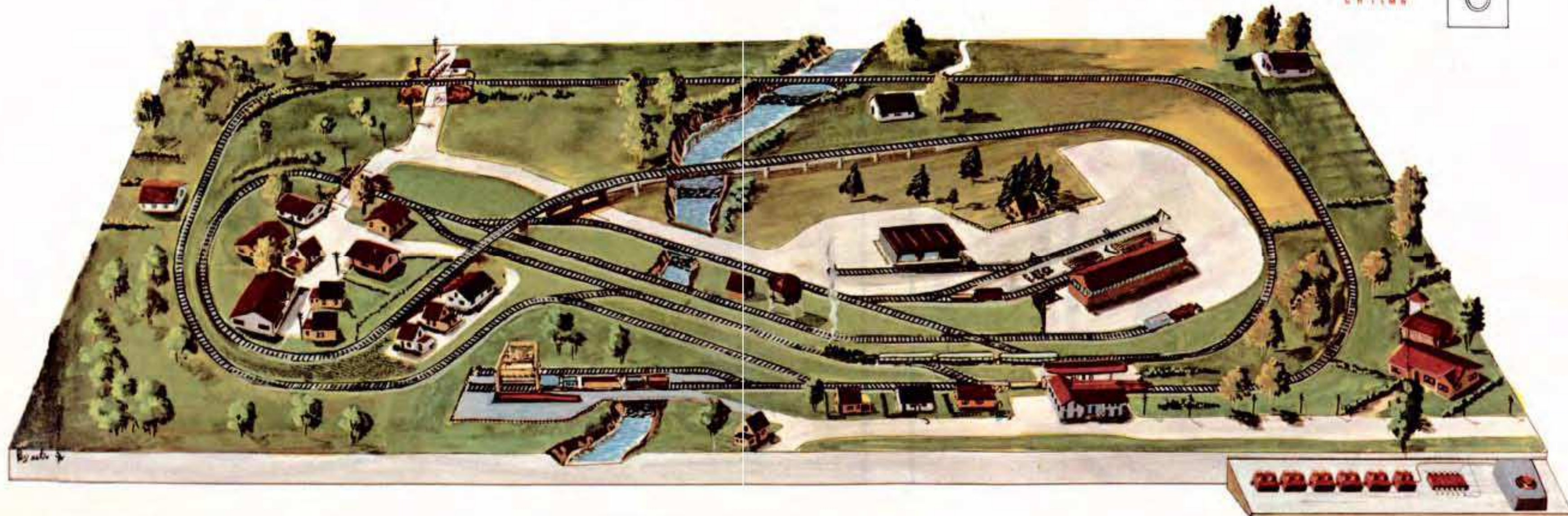
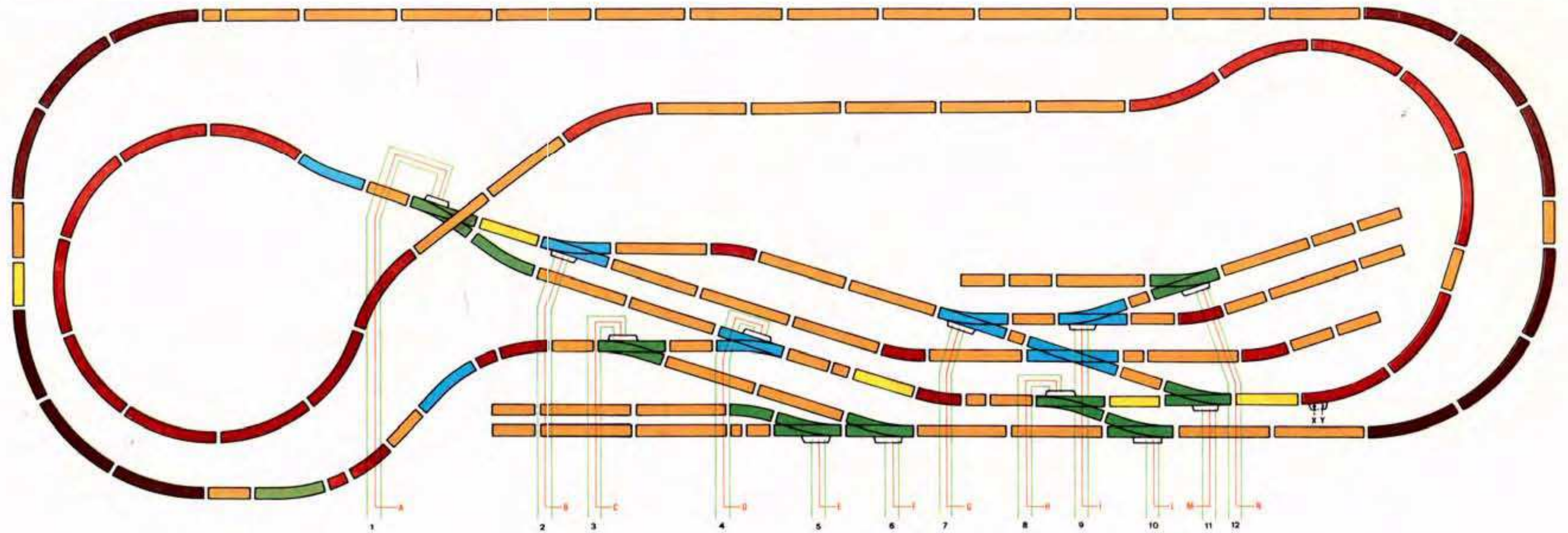


- |             |             |             |            |            |            |
|-------------|-------------|-------------|------------|------------|------------|
| 34 - 403020 | 2 - 403025  | 1 - 403030C | 4 - 403050 | 1 - 403035 | 1 - 600021 |
| 7 - 403021  | 1 - 403026  | 9 - 403031  | 4 - 403051 | 1 - 600033 | 1 - 600041 |
| 3 - 403022  | 22 - 403030 | 1 - 403032  | 4 - 403036 | 1 - 600025 | 1 - 600045 |

# OO SCALE

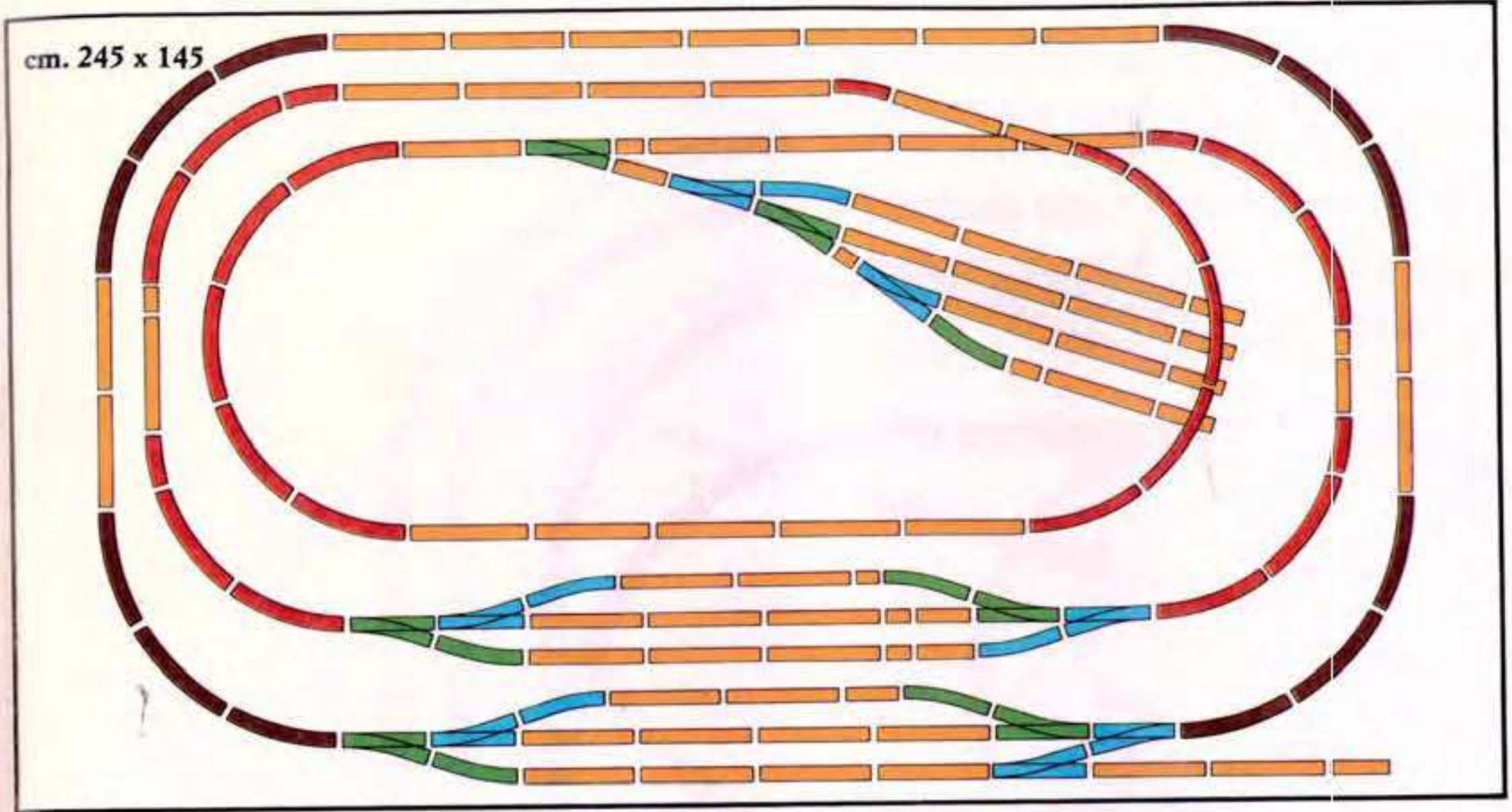
cm. 370 x 120

11

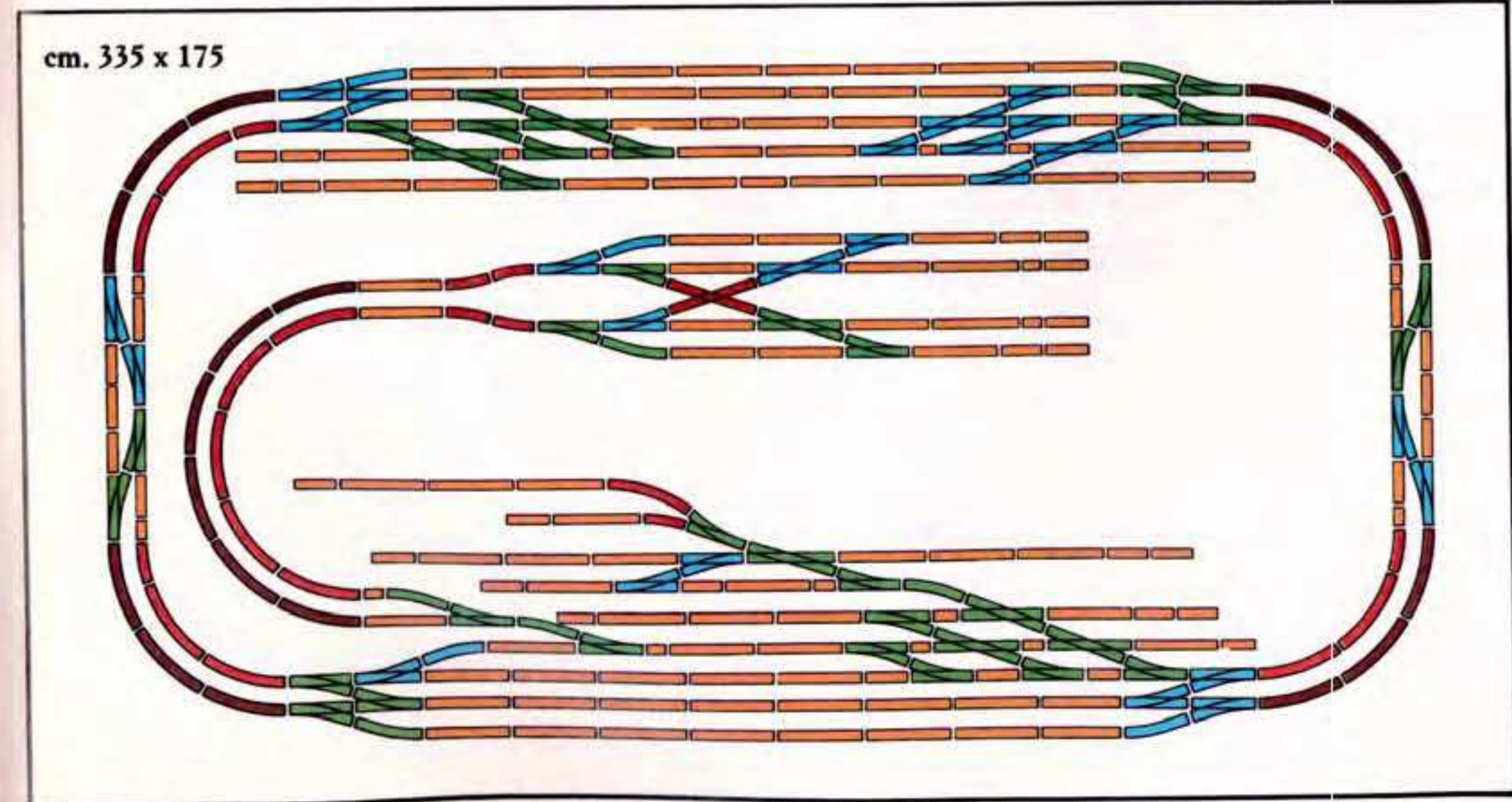
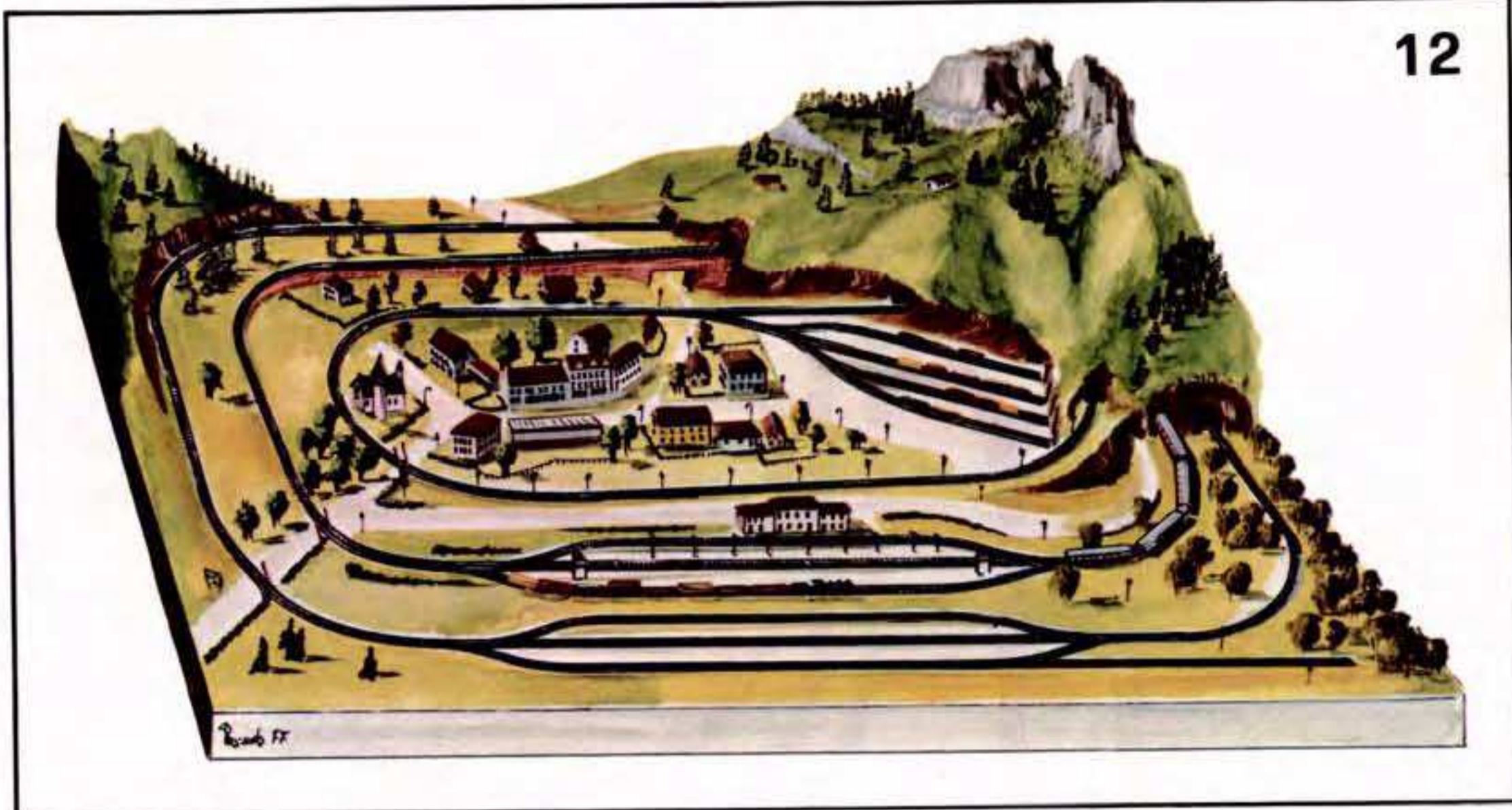


- |             |             |             |            |            |            |
|-------------|-------------|-------------|------------|------------|------------|
| 1 - 403030C | 2 - 403032  | 18 - 403021 | 5 - 403026 | 8 - 403050 | 6 - 503065 |
| 16 - 403030 | 12 - 403011 | 7 - 403022  | 3 - 403035 | 4 - 403051 | 1 - 503066 |
| 7 - 403031  | 42 - 403020 | 6 - 403025  | 2 - 403036 | 1 - 403039 | 1 - 502057 |

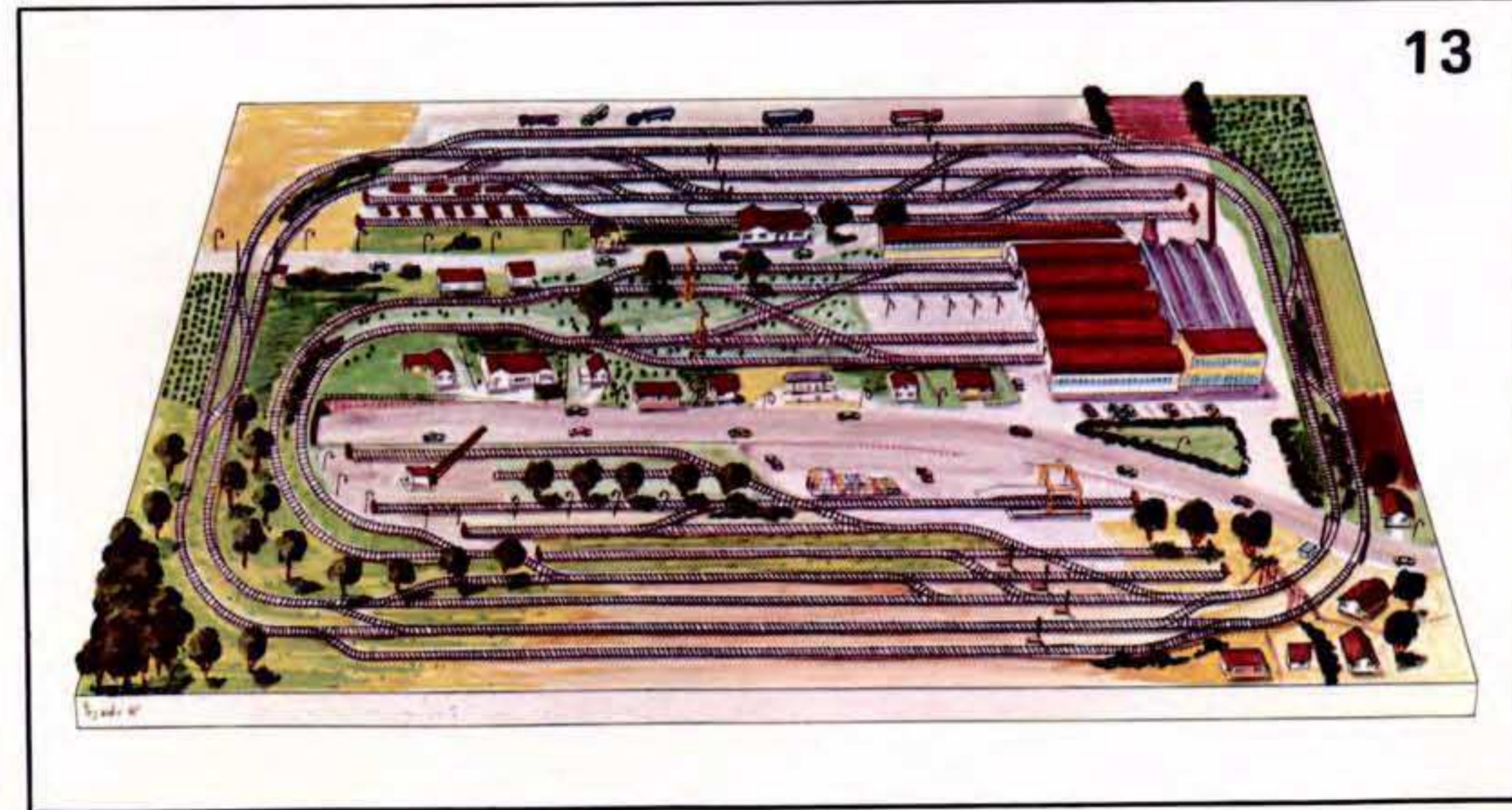
# OO SCALE



- |             |             |             |            |
|-------------|-------------|-------------|------------|
| 56 - 403020 | 5 - 403025  | 1 - 403030C | 7 - 403051 |
| 6 - 403021  | 12 - 403011 | 6 - 403031  | 4 - 403036 |
| 8 - 403022  | 16 - 403030 | 6 - 403050  | 5 - 403035 |



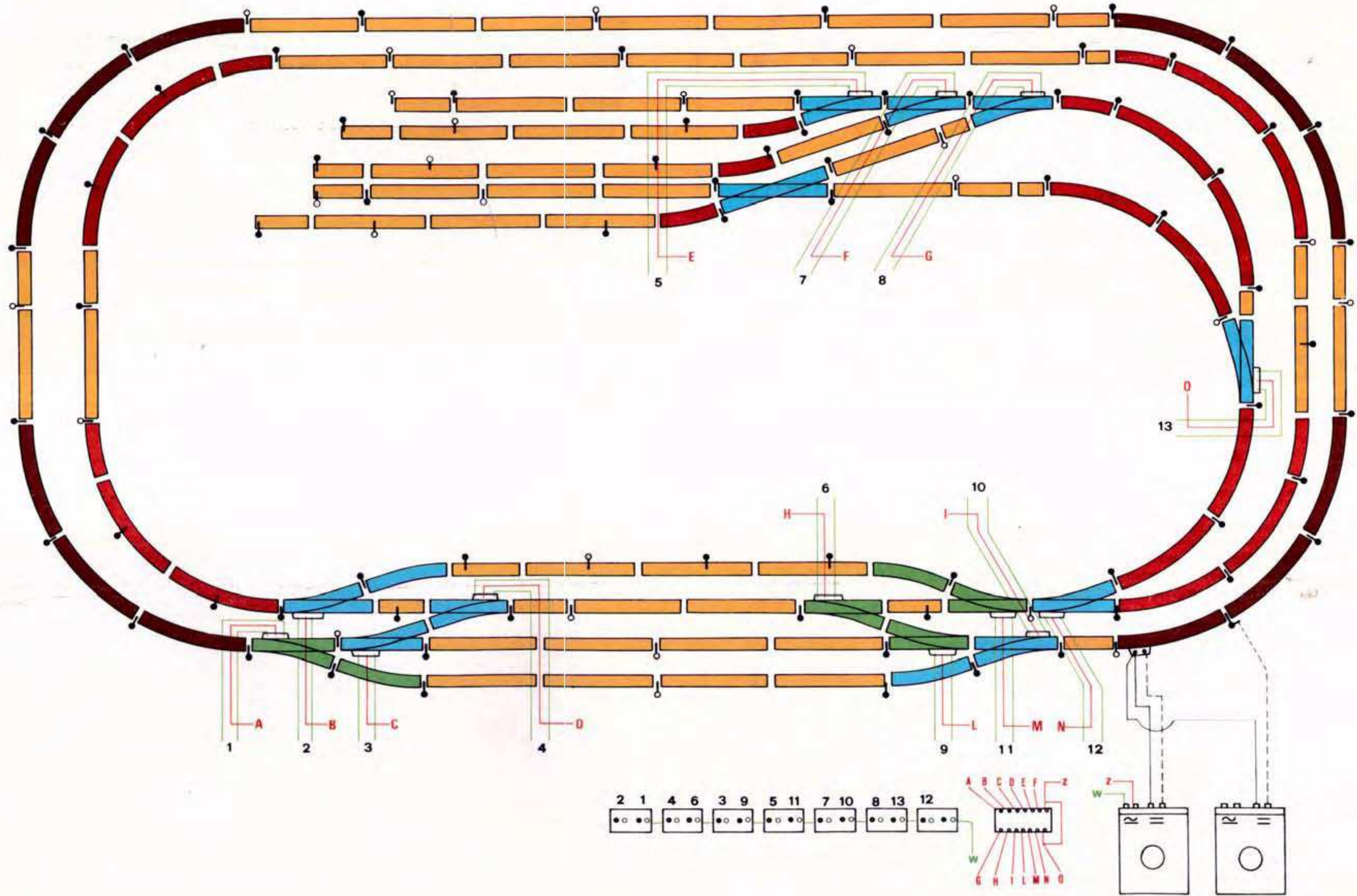
- |             |             |             |             |            |
|-------------|-------------|-------------|-------------|------------|
| 1 - 403030C | 18 - 403011 | 16 - 403022 | 4 - 403036  | 3 - 403039 |
| 13 - 403030 | 84 - 403020 | 16 - 403025 | 28 - 403050 | 7 - 403040 |
| 9 - 403031  | 27 - 403021 | 6 - 403035  | 22 - 403051 | 1 - 403041 |



# OO SCALE

cm. 256 x 130

14



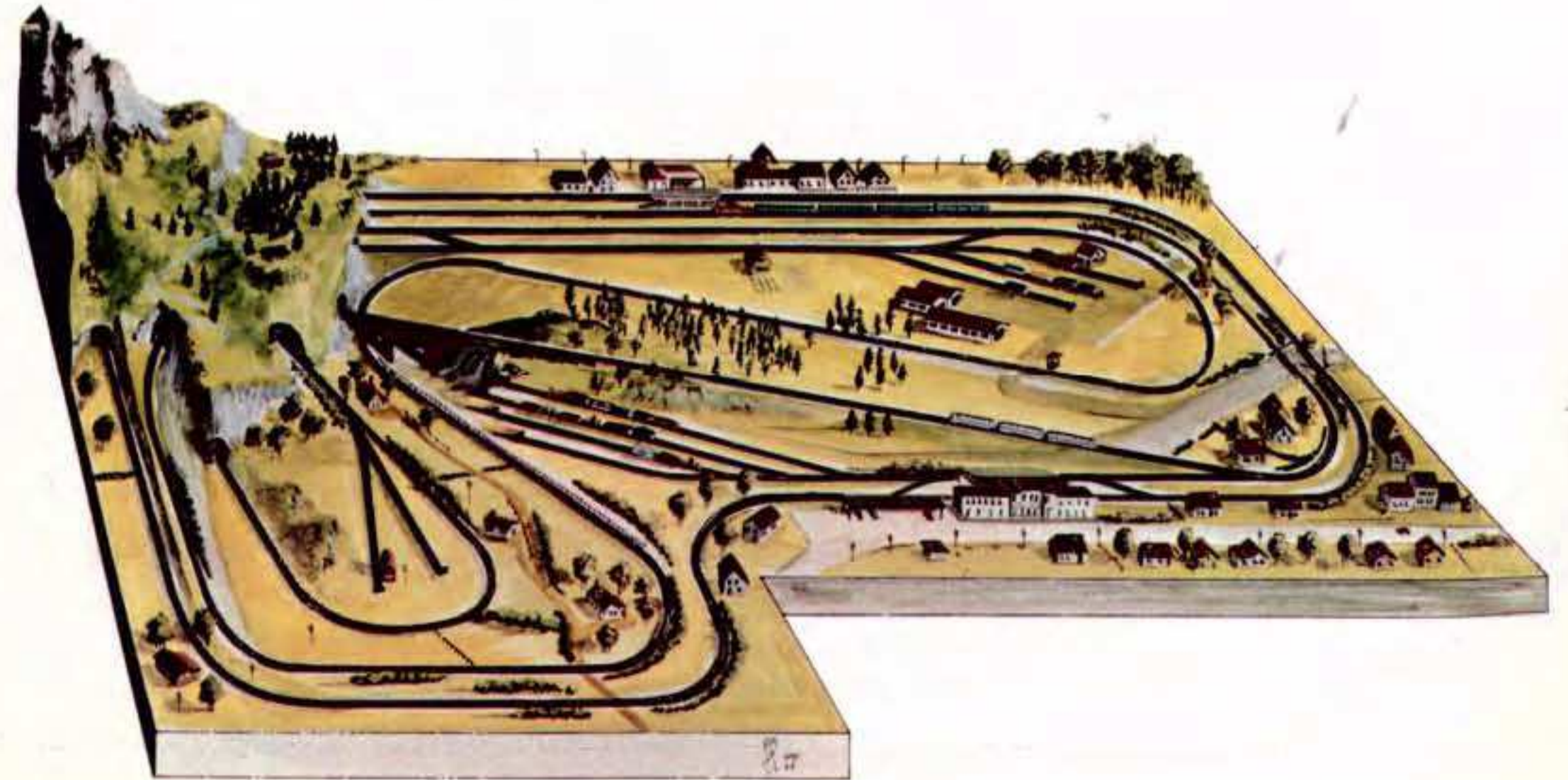
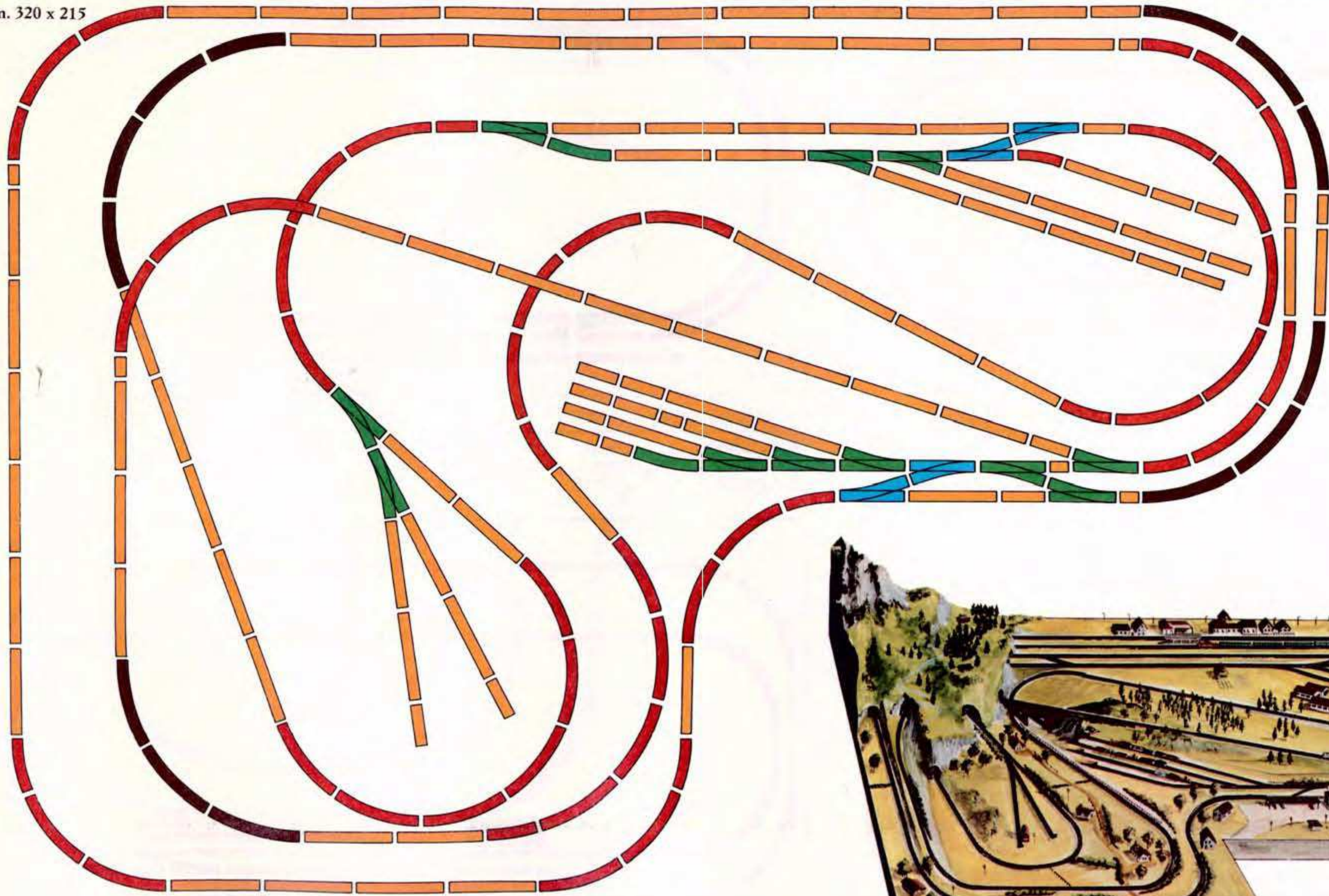
- |             |             |             |             |             |            |            |            |
|-------------|-------------|-------------|-------------|-------------|------------|------------|------------|
| 1 - 602952  | 16 - 602960 | 2 - 602962  | 4 - 403022  | 13 - 403030 | 1 - 403039 | 2 - 403035 | 1 - 503066 |
| 26 - 602951 | 56 - 602961 | 49 - 403020 | 5 - 403025  | 1 - 403030C | 4 - 403050 | 2 - 403036 | 2 - 502057 |
| 73 - 602950 | 29 - 602963 | 11 - 403021 | 12 - 403011 | 8 - 403031  | 9 - 403051 | 7 - 503065 |            |

NOTE: CATENARY ITEMS SHOWN ON THIS PLAN ARE NOT AVAILABLE IN THE U.K. AT PRESENT.

# OO SCALE

cm. 320 x 215

15

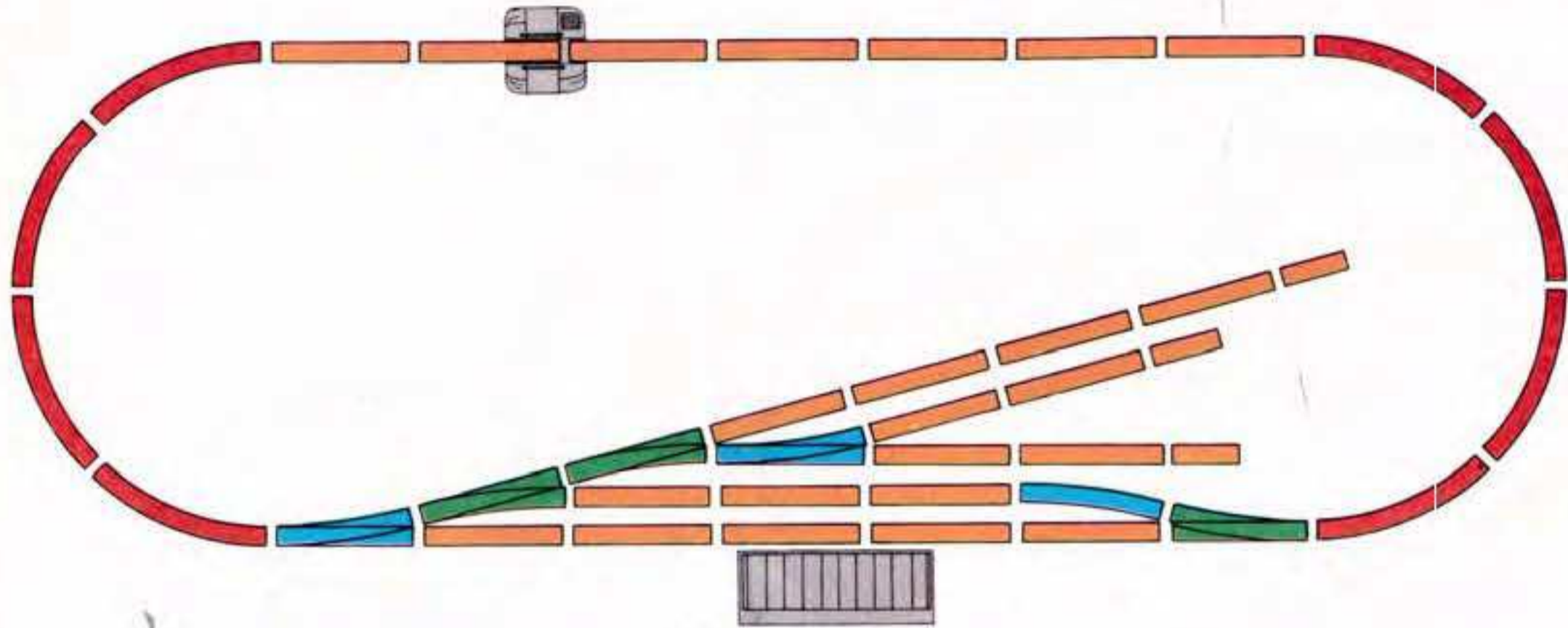


- |             |             |             |            |
|-------------|-------------|-------------|------------|
| 80 - 403020 | 9 - 403025  | 1 - 403030C | 4 - 403051 |
| 9 - 403021  | 13 - 403011 | 10 - 403031 | 2 - 403035 |
| 9 - 403022  | 37 - 403030 | 11 - 403050 |            |

# N GAUGE

cm. 118 x 55

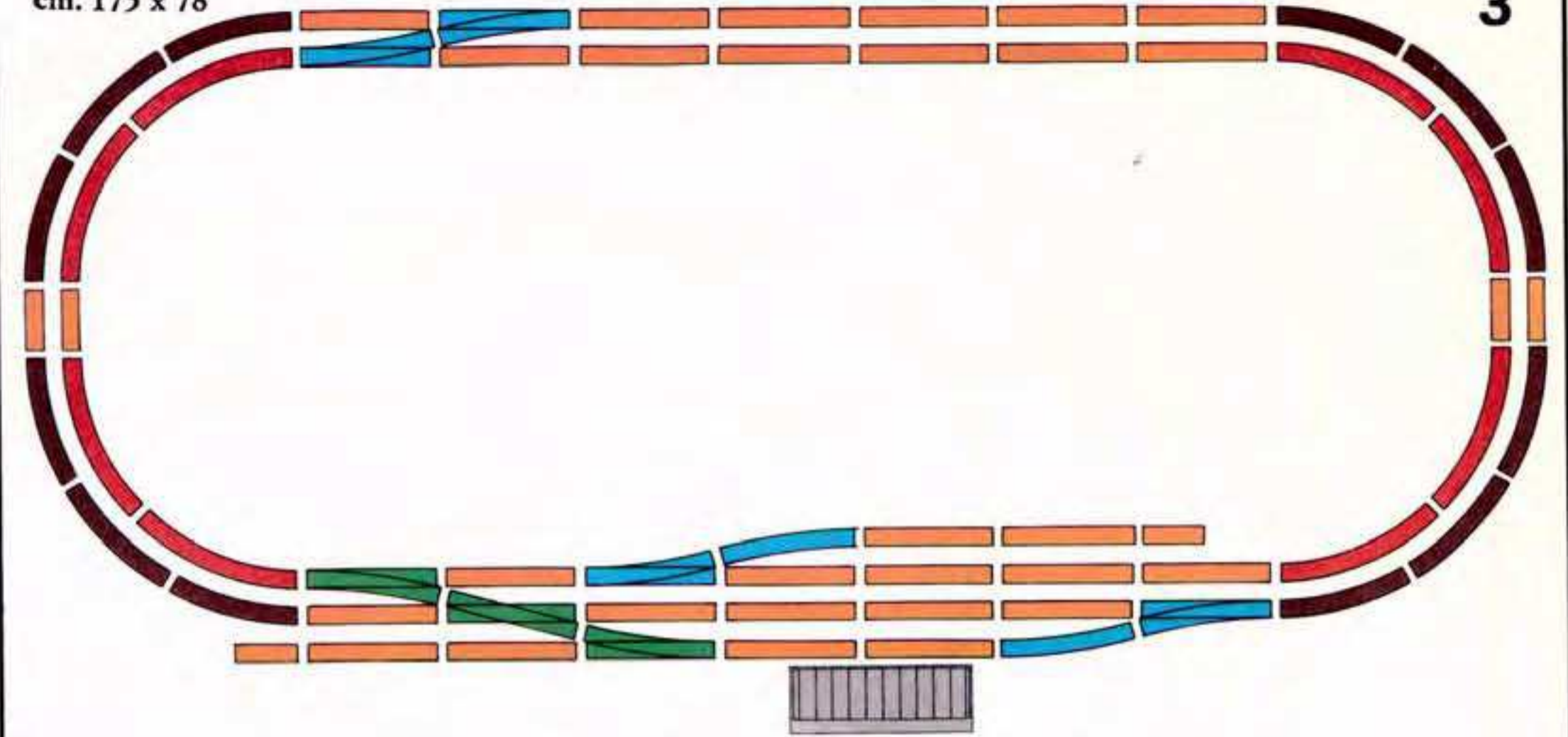
1



23 - 420561	1 - 420571C	1 - 420553
3 - 420565	3 - 420525	1 - 620714
7 - 420571	2 - 420526	1 - 620722

cm. 175 x 78

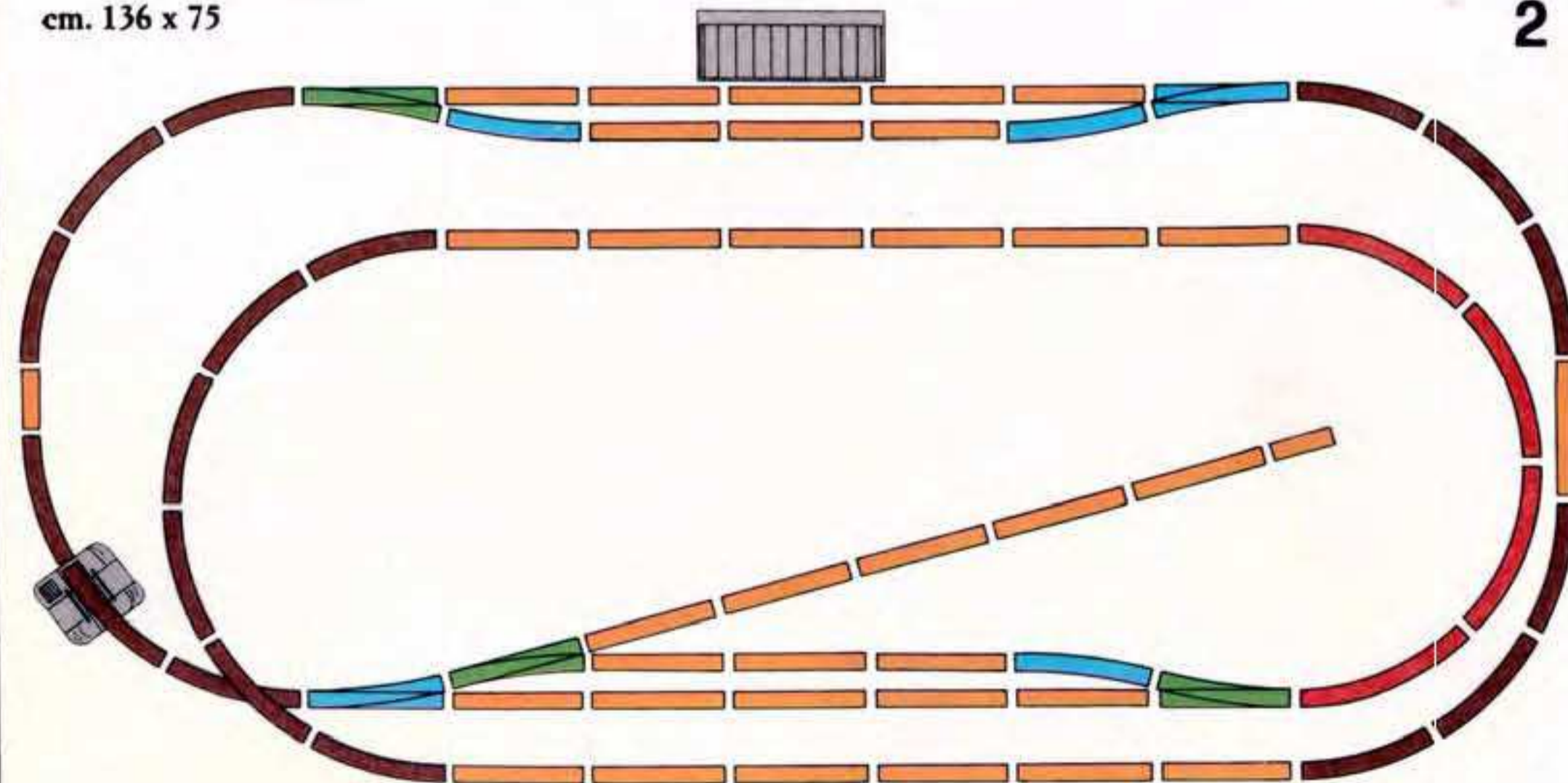
3



28 - 420561	12 - 420551	4 - 420526	2 - 420553
4 - 420562	7 - 420571	2 - 420525	1 - 620714
2 - 420565	1 - 420571C	1 - 420521	

cm. 136 x 75

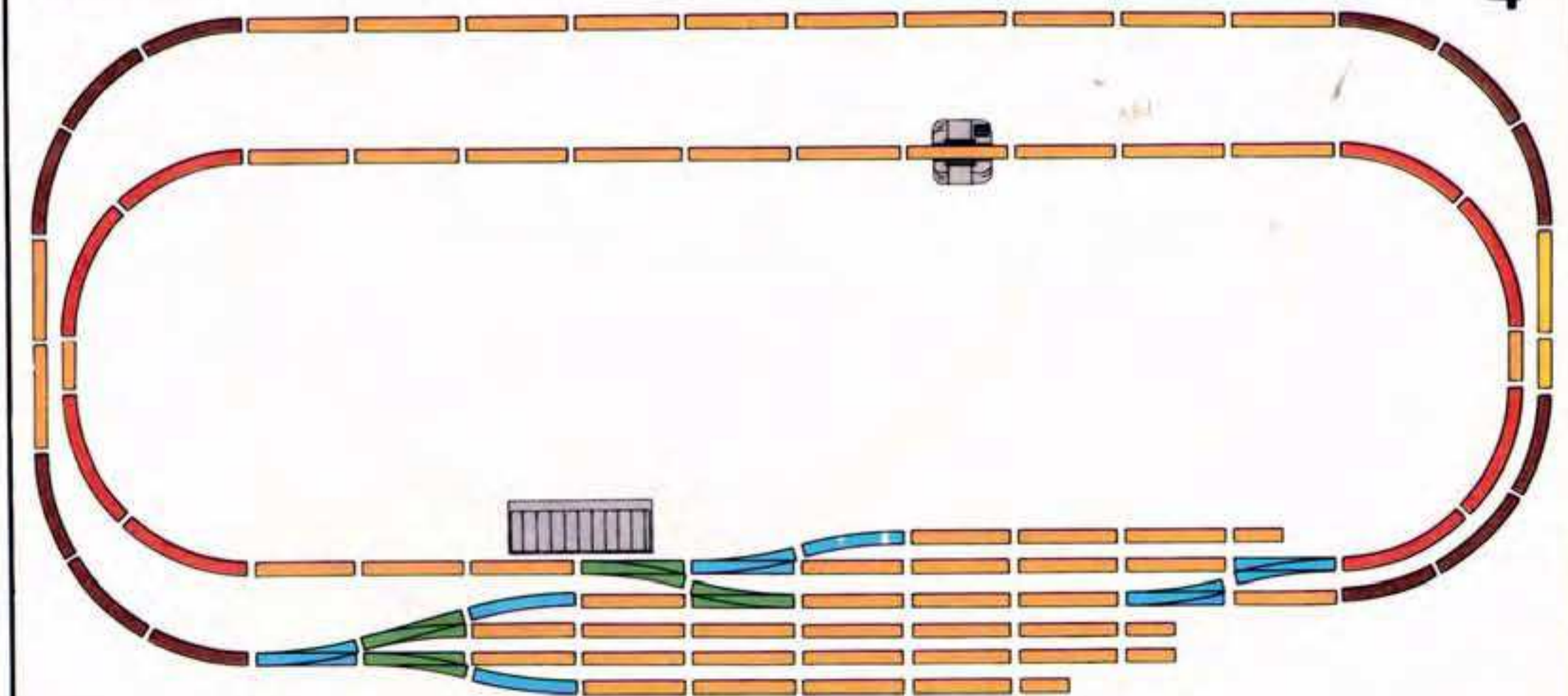
2



34 - 420561	18 - 420551	2 - 420526	1 - 620714
1 - 420562	3 - 420571	3 - 420553	1 - 620722
1 - 420565	1 - 420571C	3 - 420525	

cm. 136 x 70

4



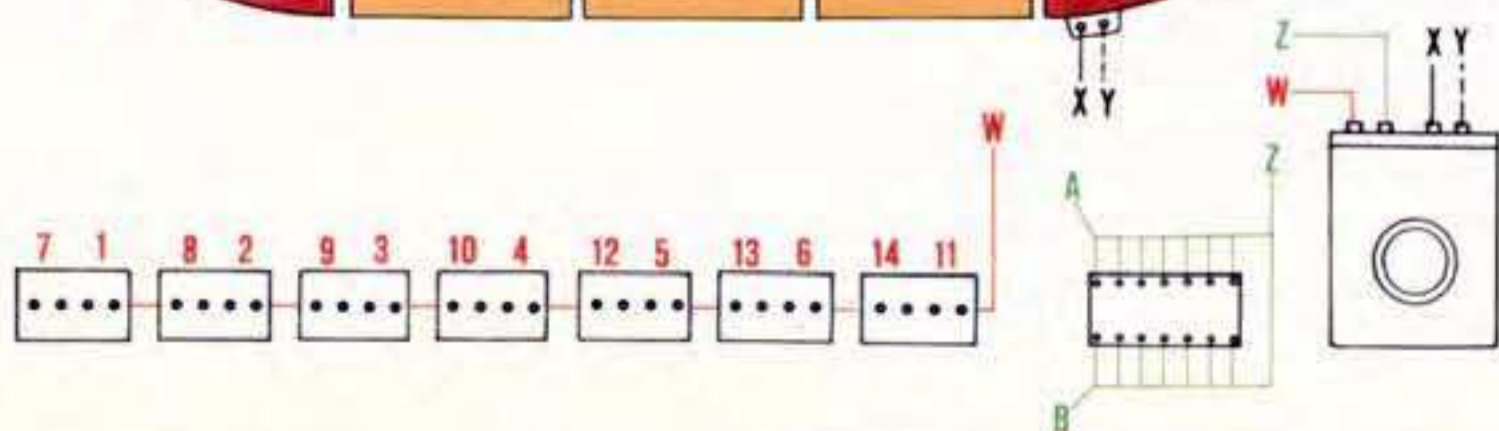
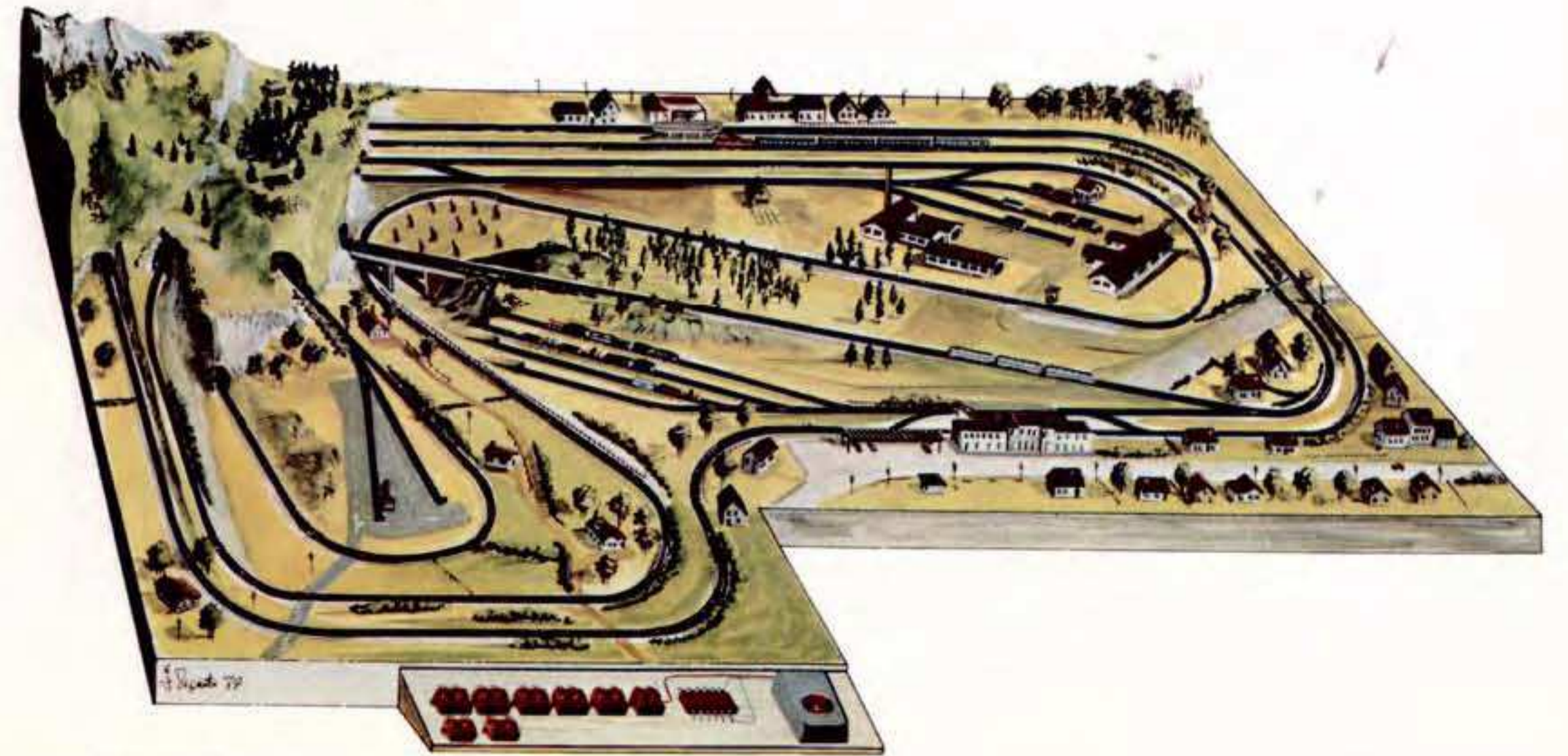
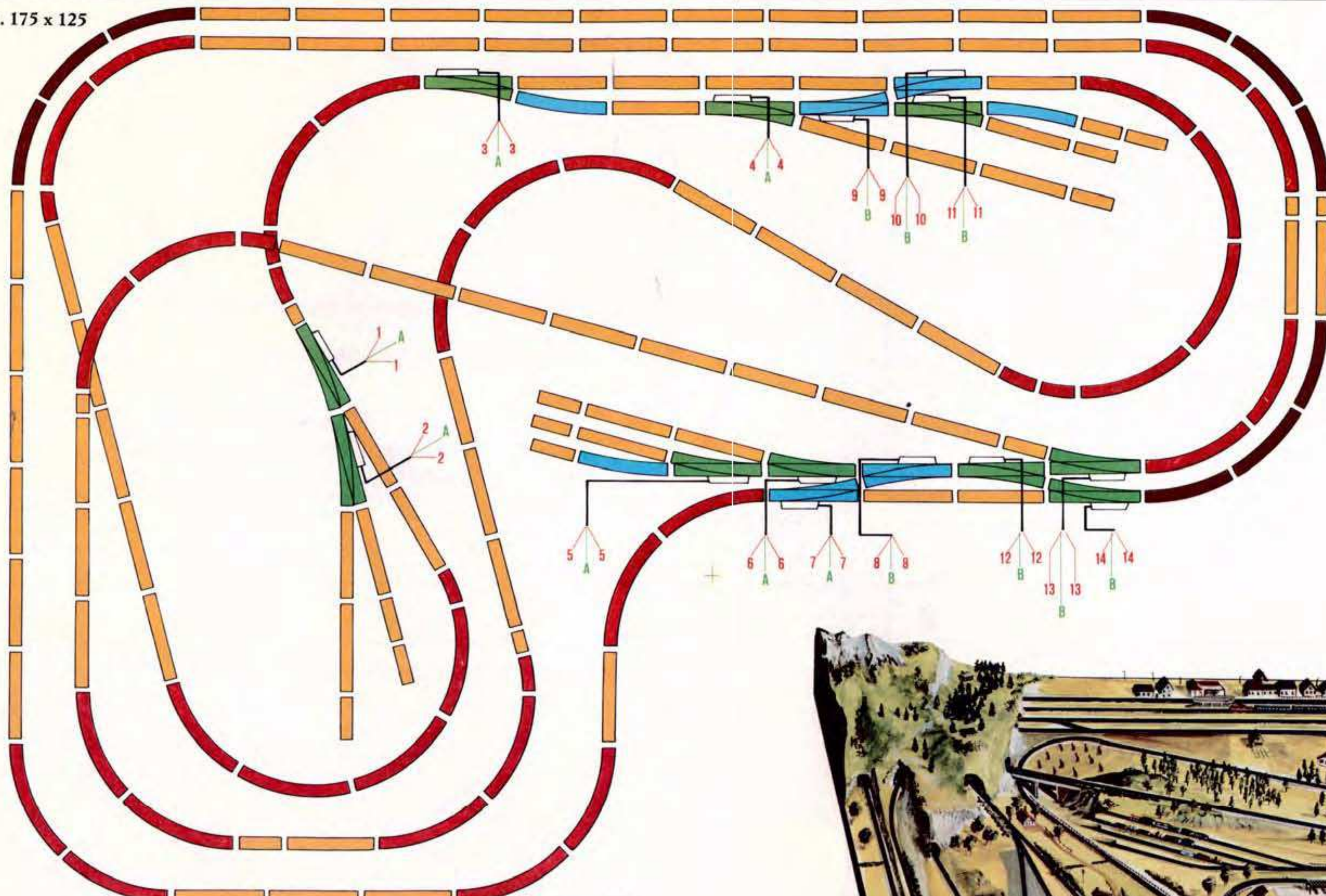
54 - 420561	12 - 420551	4 - 420526	1 - 620714
3 - 420562	7 - 420571	4 - 420525	1 - 620722
4 - 420565	1 - 420571C	3 - 420553	



# N GAUGE

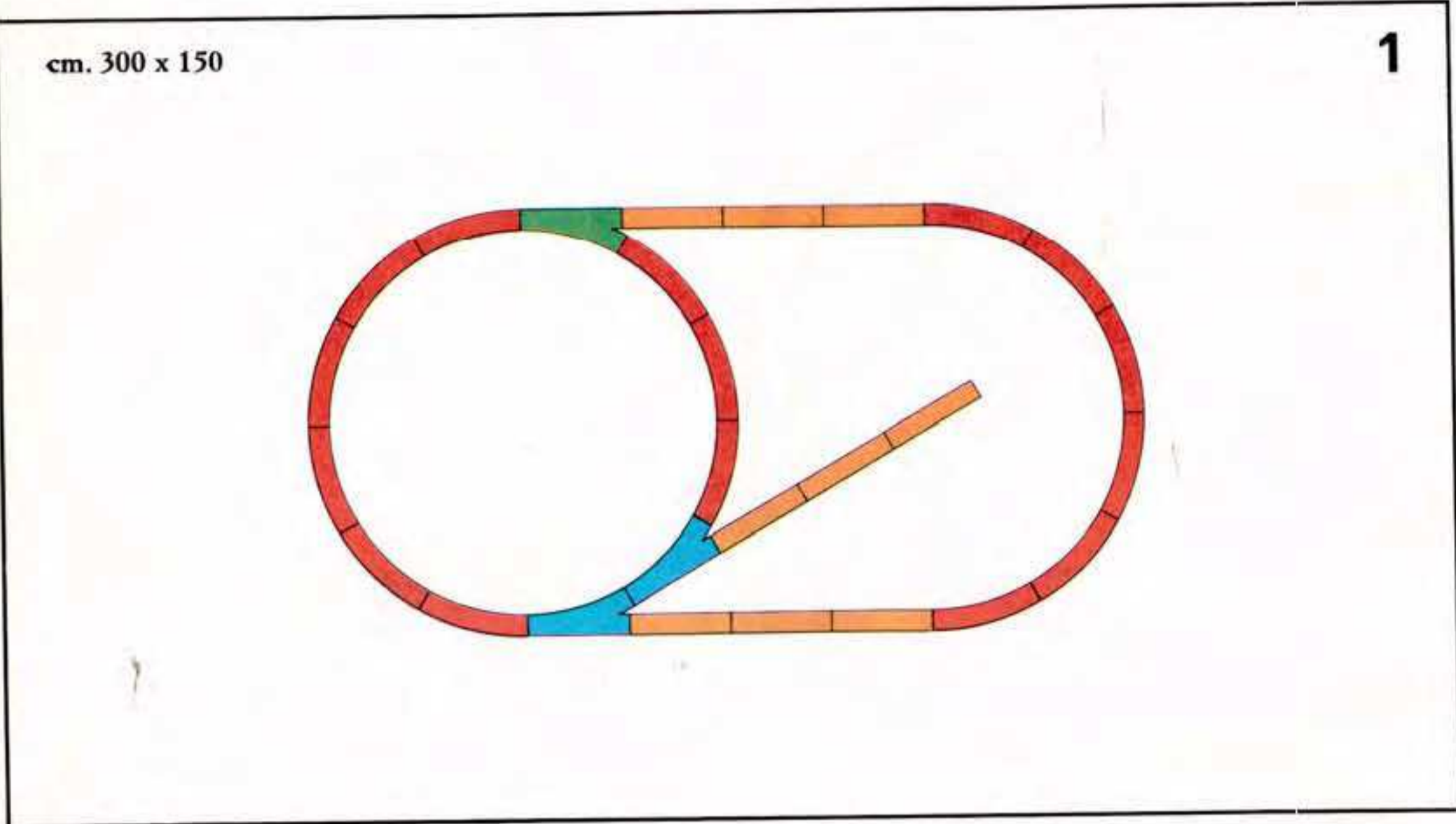
cm. 175 x 125

5

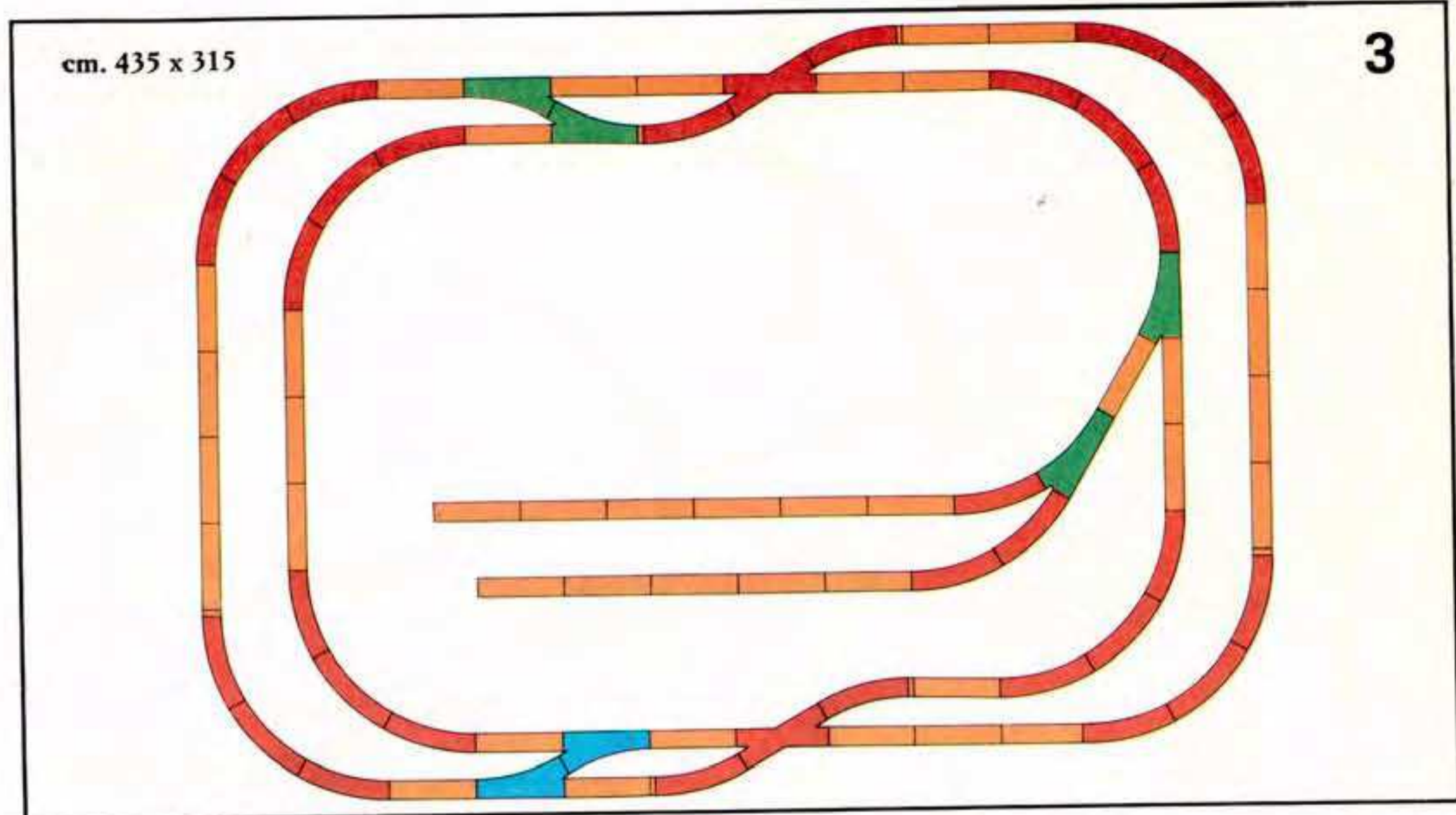


- |             |            |            |              |            |
|-------------|------------|------------|--------------|------------|
| 76 - 420561 | 4 - 420562 | 8 - 420572 | 10 - 420525E | 1 - 503066 |
| 1 - 420571C | 5 - 420563 | 9 - 420551 | 4 - 420526E  | 1 - 502057 |
| 30 - 420571 | 8 - 420565 | 3 - 420553 | 7 - 503065   |            |

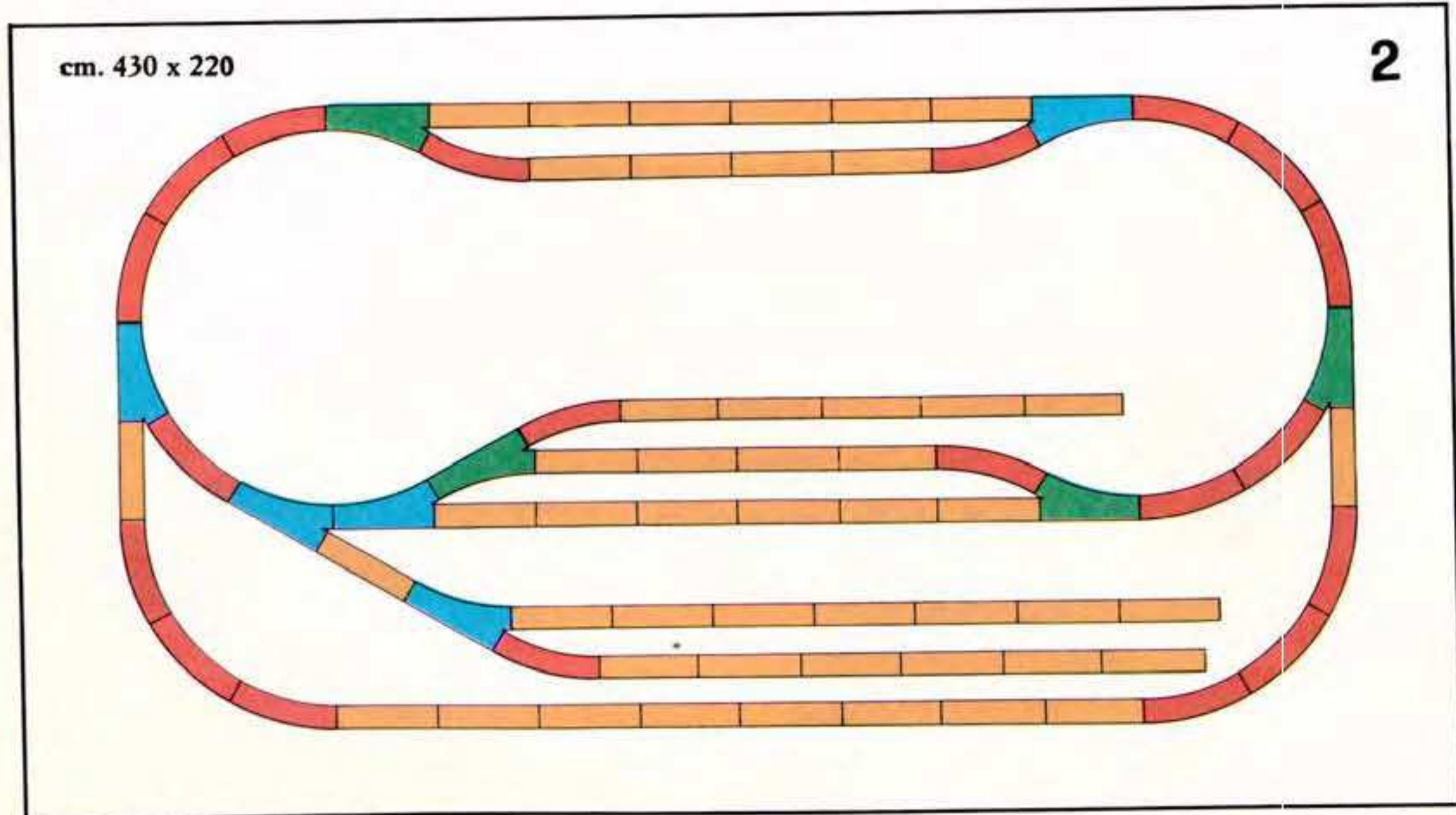
# O GAUGE



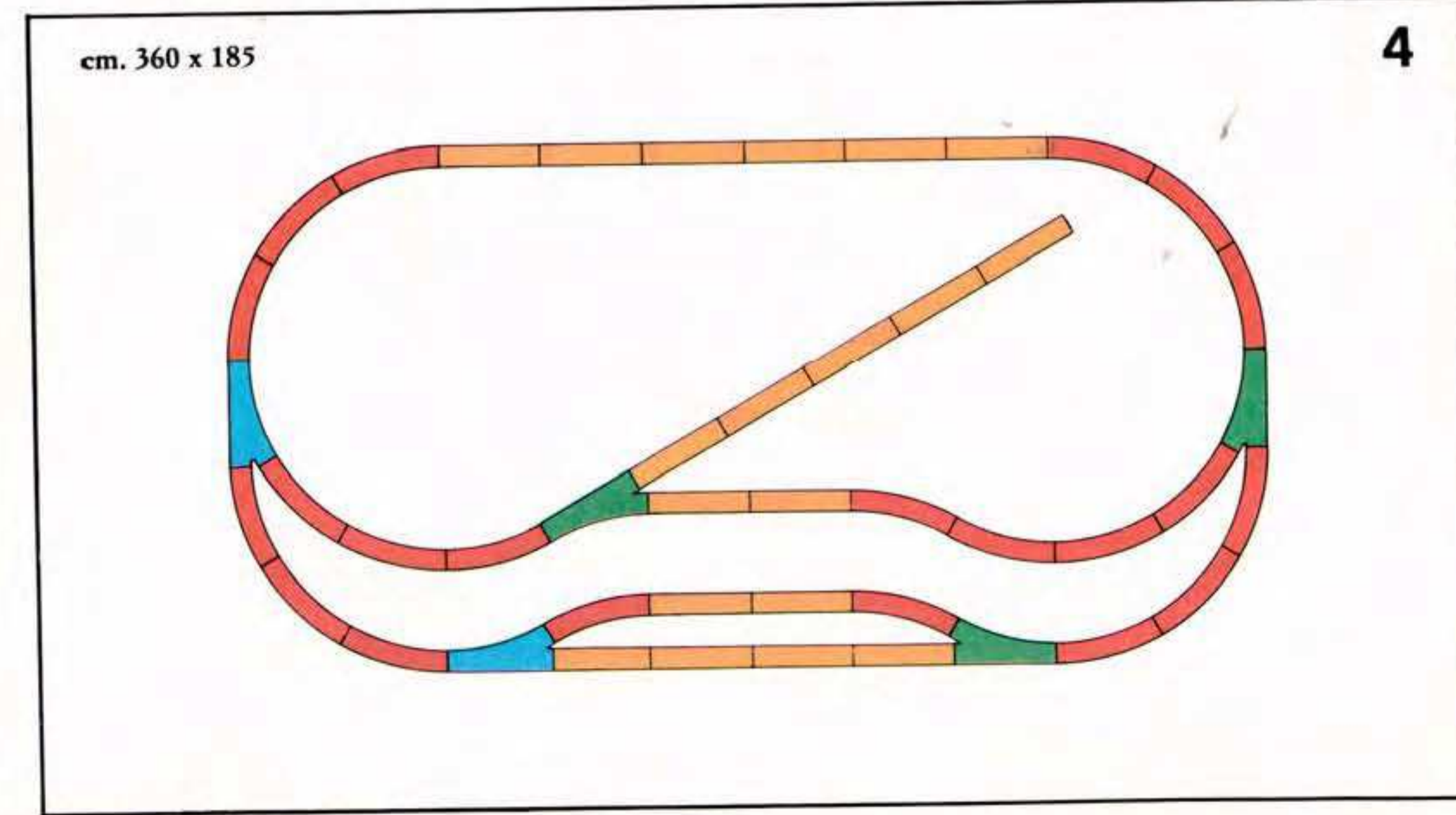
- 1 - 416811C    2 - 416832
- 14 - 416811    1 - 416831
- 9 - 416801    1 - 416841



- 1 - 416811C    6 - 416805    2 - 416832
- 30 - 416811    2 - 416822    2 - 416841
- 41 - 416801    4 - 416831



- 19 - 416811    5 - 416832
- 49 - 416801    3 - 416841
- 4 - 416831    1 - 416811C



- 1 - 416811C    3 - 416831
- 20 - 416811    2 - 416832
- 19 - 416801    1 - 416841





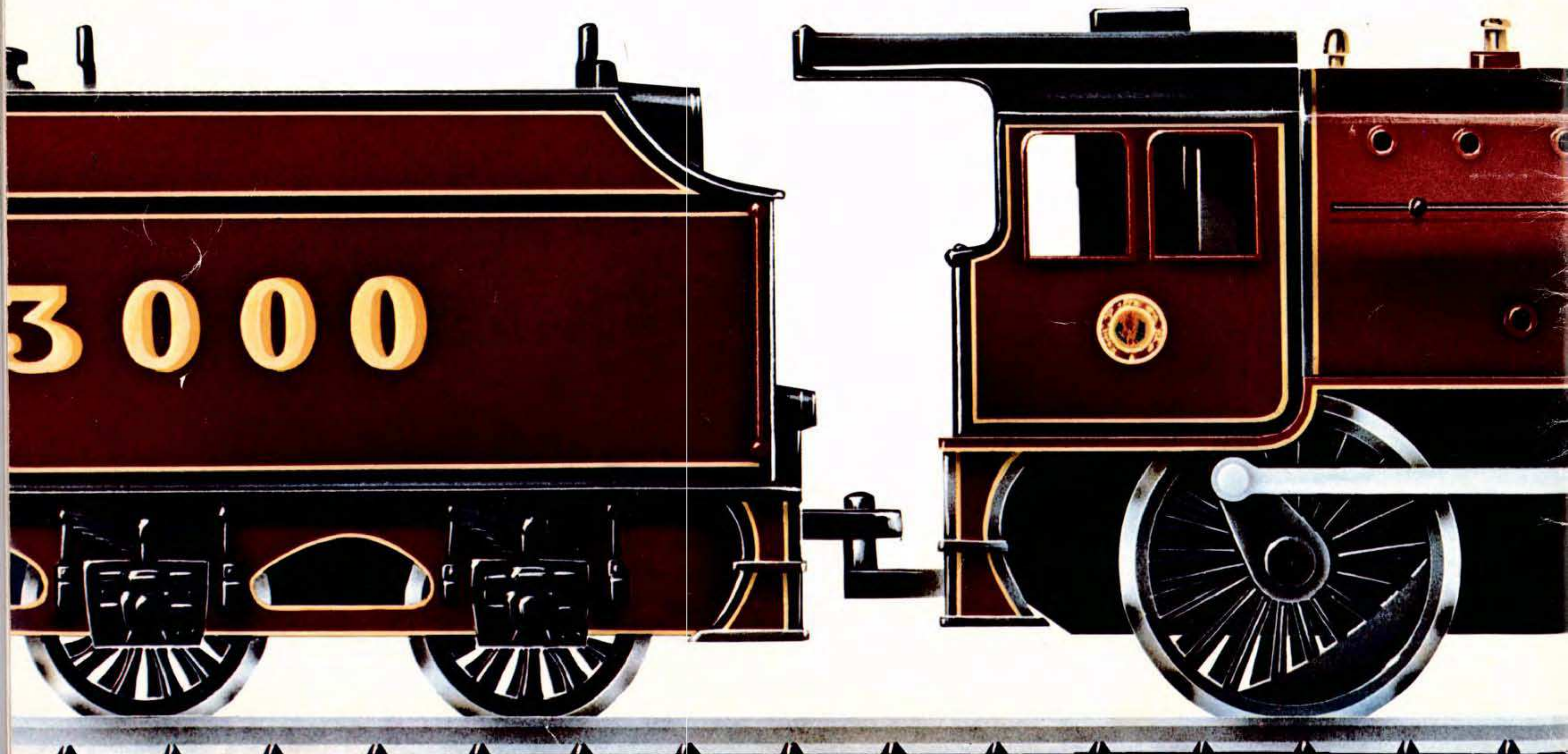
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