VOL. XLVI. No. 9 SEPTEMBER 1961

MECCANO MAGAZINE

1/3

STATION SCENE ON
THE FLAAM LINE

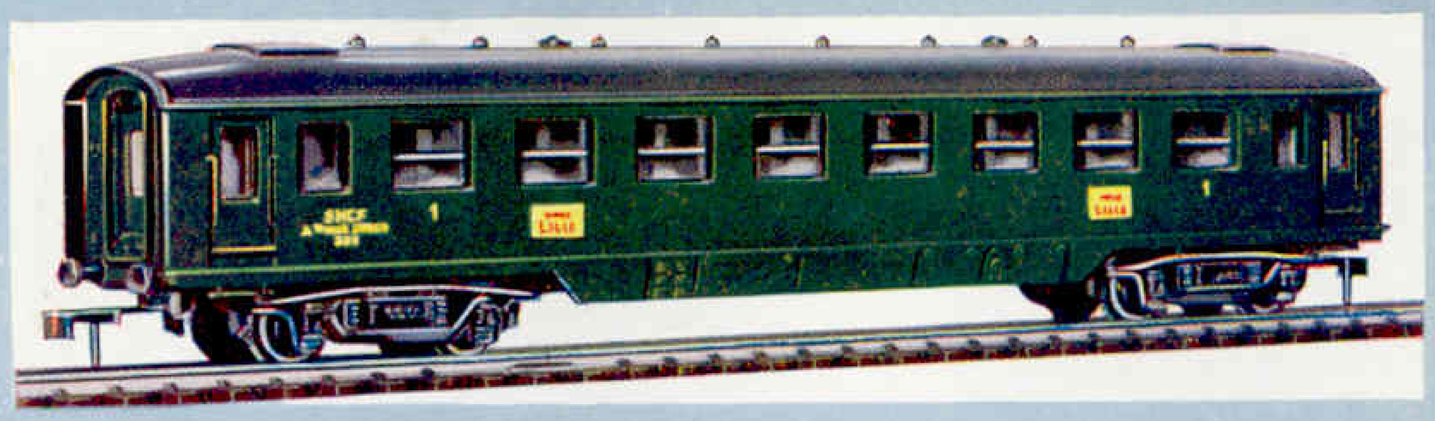
JUST ARRIVED
from Paris

French-type Electric Locomotive and Coaches. Suitable for Hornby-Dublo 2-rail track

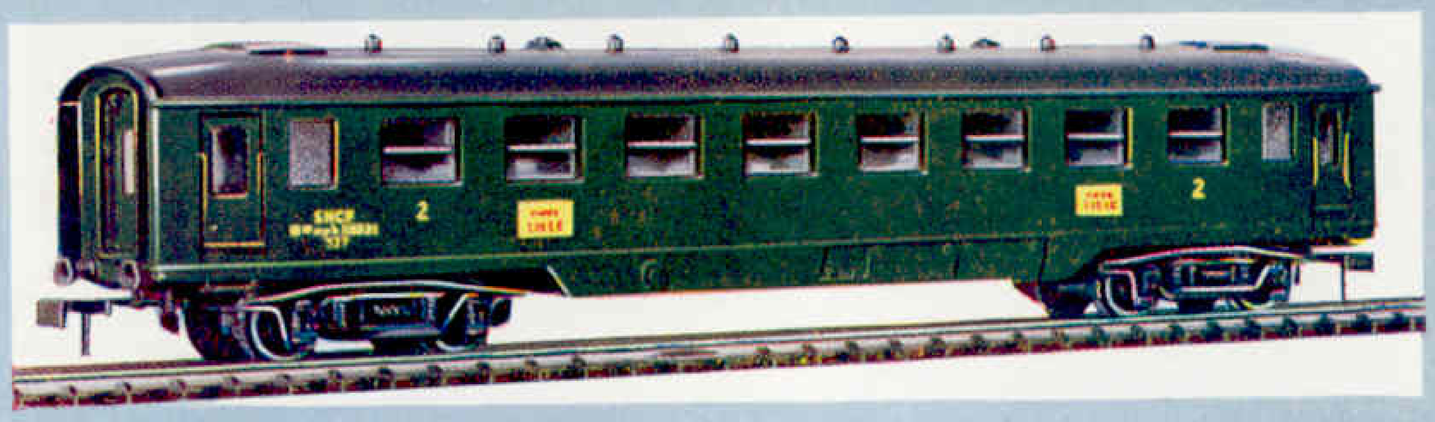
No. 638 Locomotive Series BB 16000 (with pantographs) Length 8 in. Price **£5.10.0**

This attractive model represents the French railways (S.N.C.F.) BB 16000 class expresspassengerlocomotive built for use between Paris and Lille. It is produced by our Paris Works under the trade name of Hornby-Acho, which is HO gauge, but suitable for running on Hornby-Dublo 2-rail track. Dummy pantographs are fitted on the roof.

The passenger coaches are representative of those used in main line service in France. They are of corridor type, with doors at each end.



No. 734 Coach 1st Class
Length 9¼ in. Price **16/6**



No. 733 Coach 2nd Class
Length 9¼ in. Price **16/6**

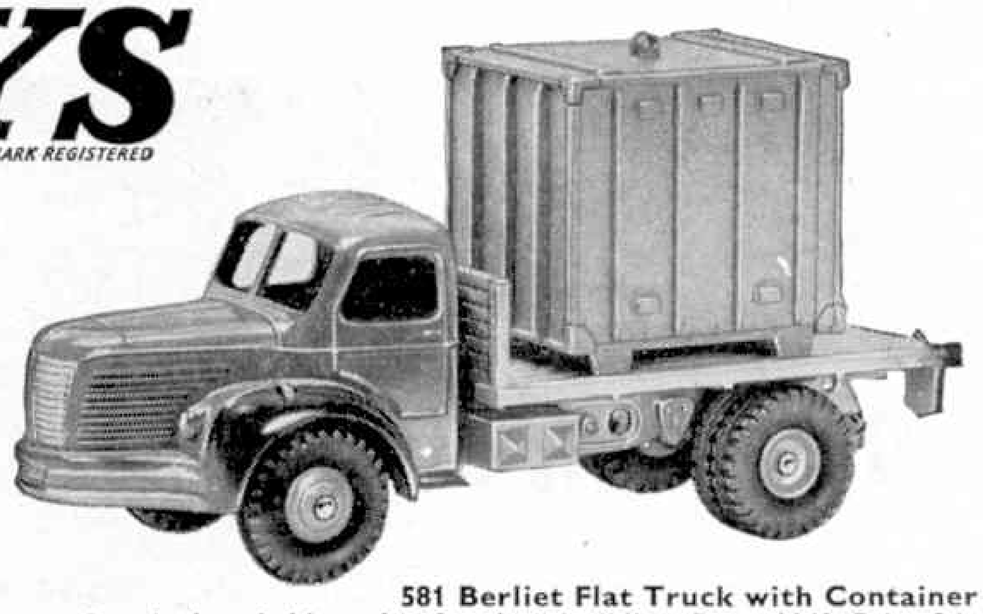
HORNBY-DUBLO
ELECTRIC TRAINS
MADE BY MECCANO (FRANCE) LTD.

DINKY TOYS
TRADE MARK REGISTERED

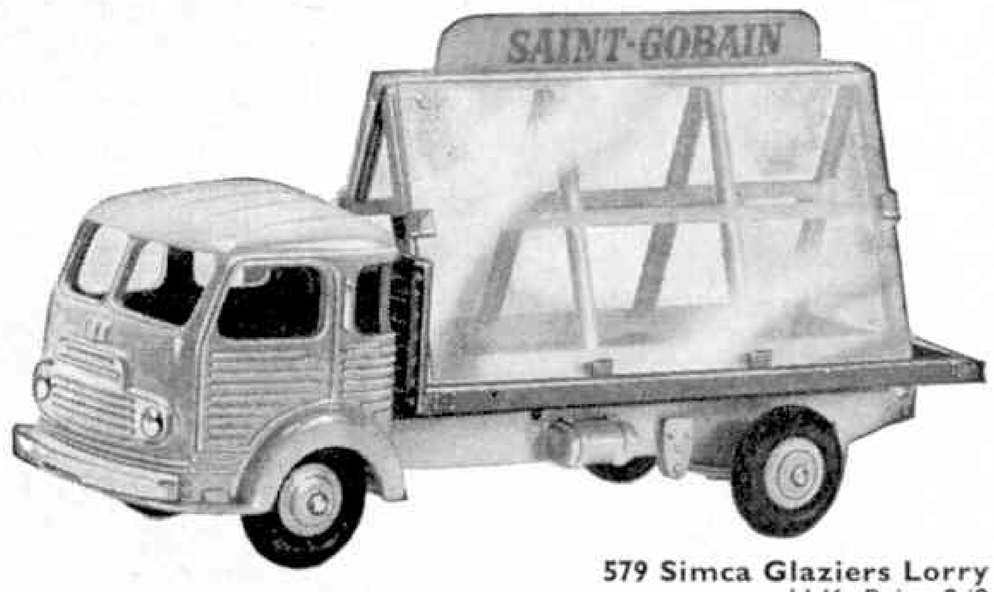
from PARIS

A separate range of Dinky Toys is made by Meccano (France) in Paris. Several of these French models have been imported into the U.K., and they are illustrated here. Ask your Dinky Toys dealer to show them to you.

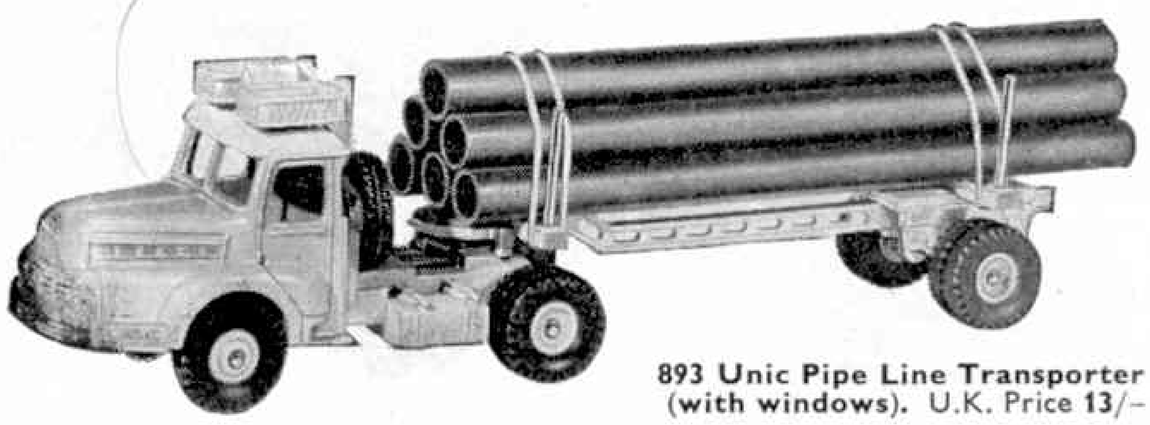
★ ★ ★



581 Berliet Flat Truck with Container
The container is detachable and is fitted with sliding door. U.K. Price **9/–**



579 Simca Glaziers Lorry
U.K. Price **8/8**



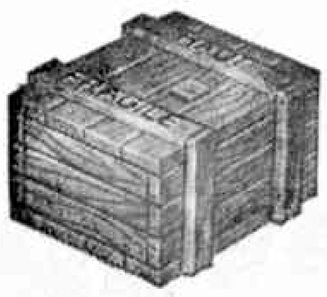
893 Unic Pipe Line Transporter (with windows). U.K. Price **13/–**

LOADS FOR YOUR LORRIES

Here are some fascinating accessories from our Works in France. They may be used most realistically with Dinky Toys lorries and wagons, and with Hornby-Dublo electric trains. They are made in plastic, and the cases are splendid imitations of wooden packing cases, one side of which is removable. The barrels consist of two halves which can be fastened together and opened by pressing a small "bung" in the centre, and the bottles may be removed from the containers in which they are placed.

846

847



849

850

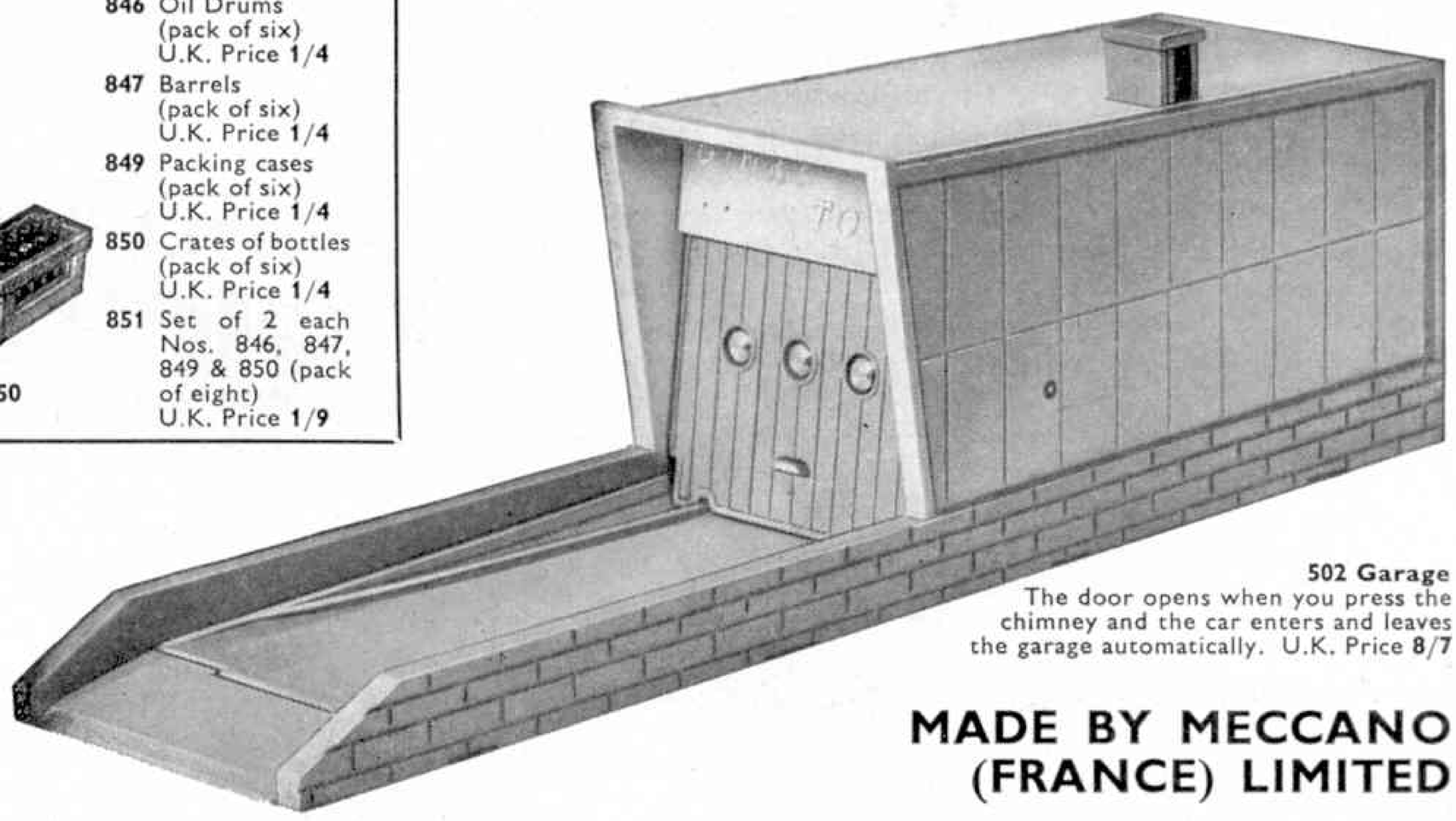
846 Oil Drums (pack of six) U.K. Price **1/4**

847 Barrels (pack of six) U.K. Price **1/4**

849 Packing cases (pack of six) U.K. Price **1/4**

850 Crates of bottles (pack of six) U.K. Price **1/4**

851 Set of 2 each Nos. 846, 847, 849 & 850 (pack of eight) U.K. Price **1/9**



502 Garage
The door opens when you press the chimney and the car enters and leaves the garage automatically. U.K. Price **8/7**

MADE BY MECCANO (FRANCE) LIMITED

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Pyruma, plastic and ready to use from its tin, can be fashioned into the widest variety of models imaginable. Buildings for your model railway set, houses, ship models, animals and figures, ashtrays and plaques—all of which, when set or baked to stone-hardness, can be finished in natural colours. Get the Pyruma Model Instruction Book—see Coupon, and start making things like those shown below.

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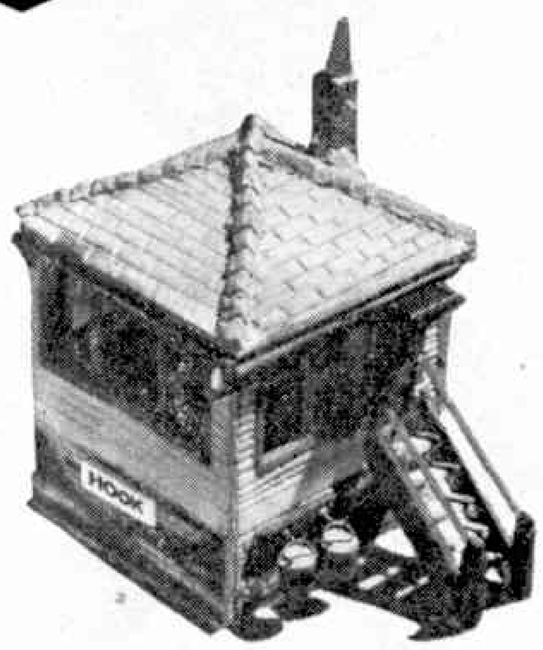

Made by amateur modellers, this signal cabin and lighthouse show how, with Pyruma, you can get the effects of tiles, wood, brickwork, chimney pots, concrete—and even the rocks of the sea. The book offered below tells you how. Pyruma is obtainable from your local Ironmonger, Hardware Store or Art Material dealer.

POST THIS BOOKLET COUPON TODAY

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I enclose P.O. 6d. (not stamps) for a copy of Pyruma Modelling Instruction Booklet, post free to:

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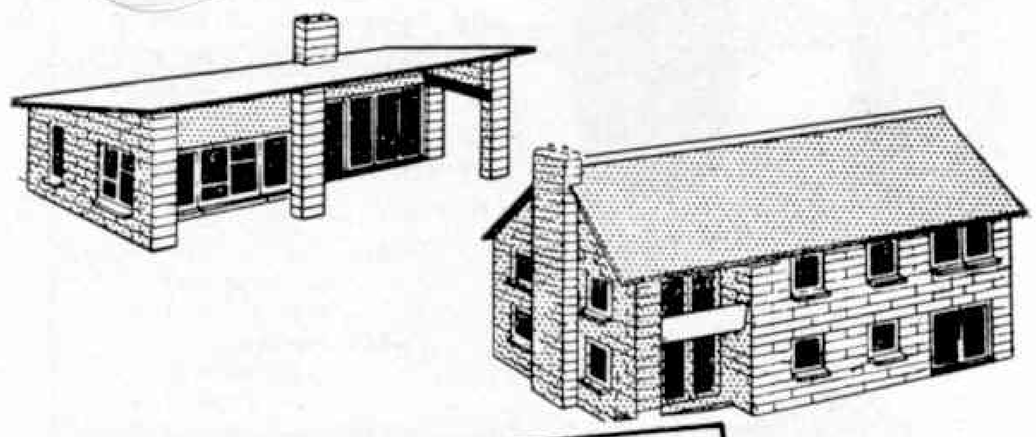

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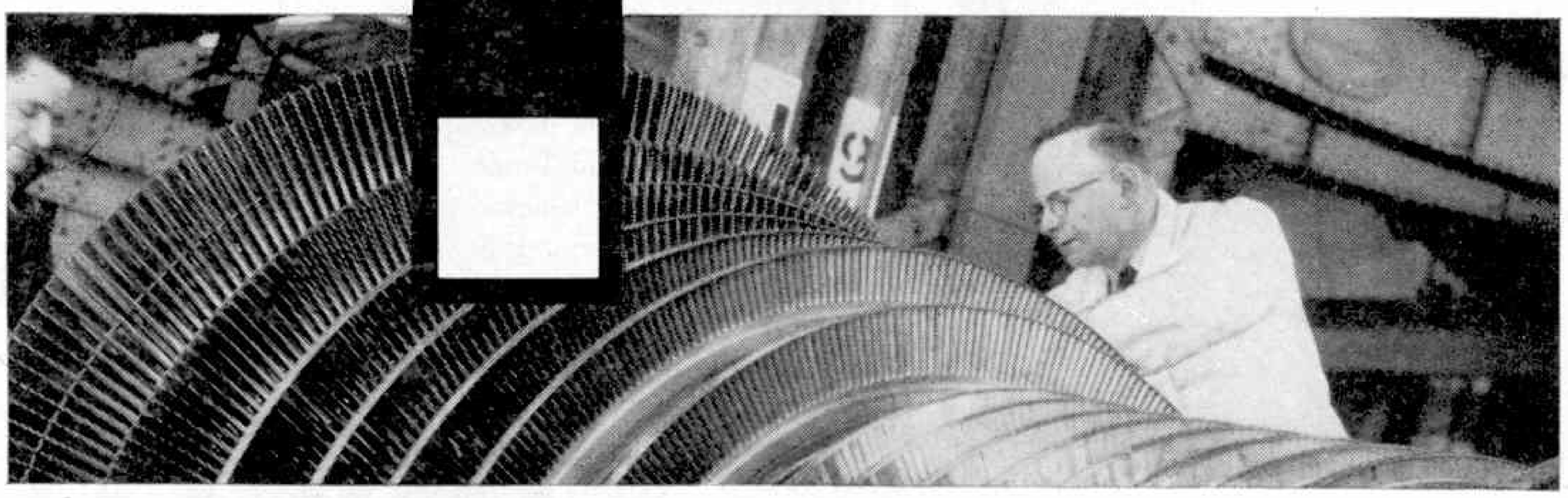
Does this seem familiar



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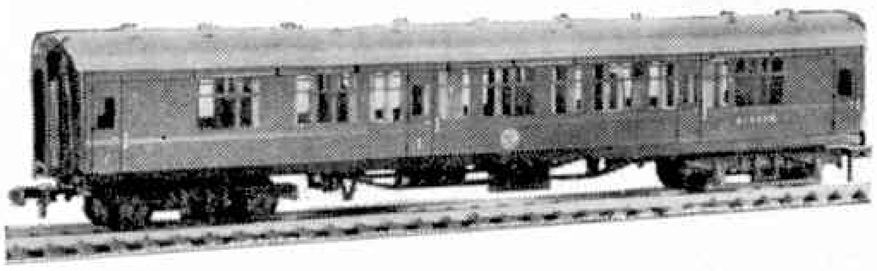
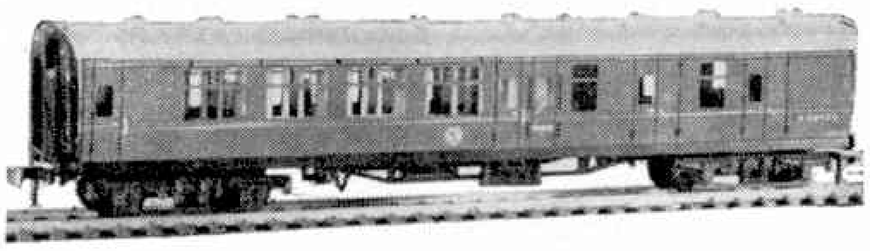
TRAFFORD PARK, MANCHESTER 17

A/A101

NEW Coaches on the "TALISMAN" Train Set



No. 4052 1st/2nd Corridor Coach B.R.
Length 9¾ ins. U.K. Price **16/2**



No. 4053 Brake/2nd Corridor Coach B.R.
Length 9¾ ins. U.K. Price **16/2**

Set No. 2014 "The Talisman" Passenger Train E.R. (for 2-rail track) is now available with the NEW Corridor Coaches **Nos. 4052** and **4053** hauled by "Golden Fleece" Locomotive and Tender E.R. This is an excellent model of a famous train. Complete with 2-rail track forming an oval requiring a space of 4 ft. by 3 ft.
U.K. Price **£6.14.4**

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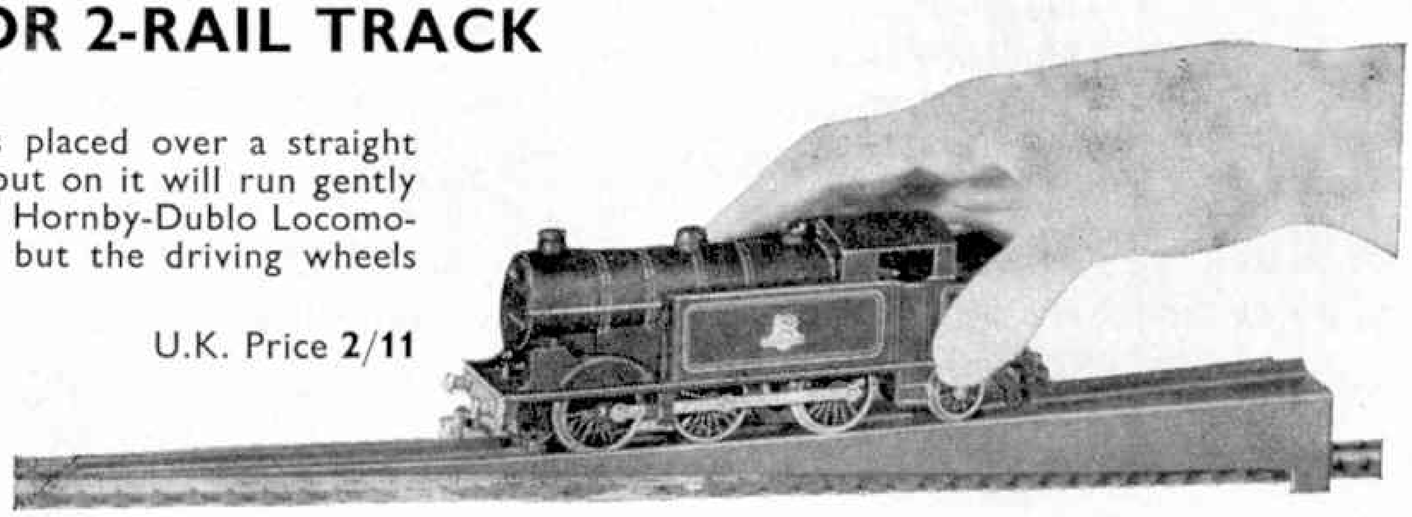
ELECTRIC TRAINS

NEW HORNBY-DUBLO RAILER FOR 2-RAIL TRACK

When the Hornby-Dublo Railer is placed over a straight length of track, a coach or wagon put on it will run gently down, coming to rest on the track. Hornby-Dublo Locomotives can be slid down the Railer, but the driving wheels must not be forced to revolve.

No. 2900 U.K. Price **2/11**



HORNBY-DUBLO

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27/6

RISK!

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BY **WADDINGTONS** MAKERS OF THE FAMOUS **'MONOPOLY'**

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Model 1A as illustrated Double Ball Bearing Skates (192 balls per pair). Rubber composition wheels. Self Steering. Girder type chassis mounted on oscillating trucks fitted with rubber cushions. Extra wide rubber composition wheels. Rubber toe brakes. **33/9**

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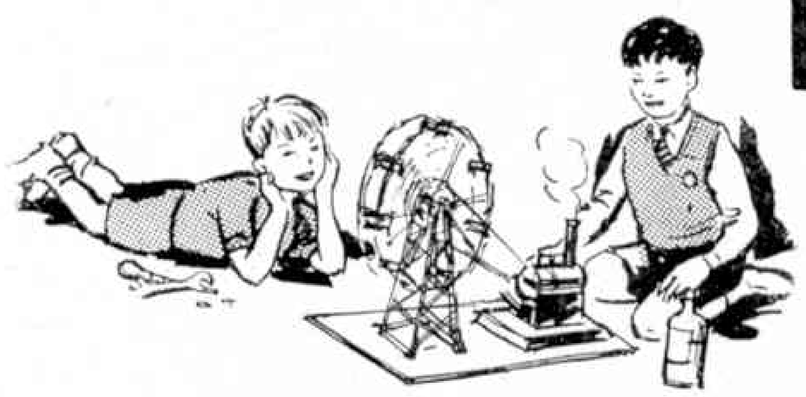
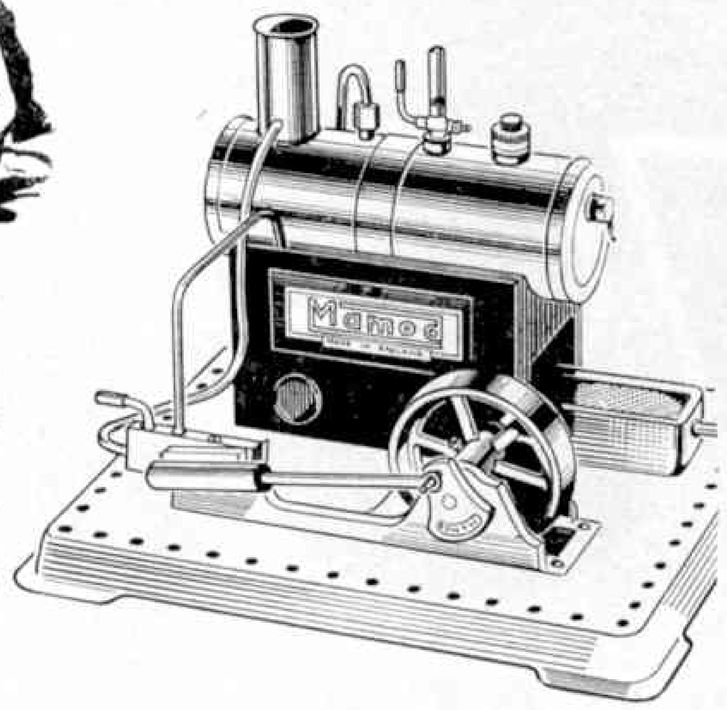
Thrill to the rhythm of STEAM— Get a Mamod





A real, working steam powered engine to operate other models or to work on its own. Thrill to the hiss and puff of steam, the flash of moving pistons and the smooth rhythm of the revolving flywheel.

Absolutely safe, beautifully made and smartly finished, a MAMOD steam engine is a possession you'll always be proud to own and to show your friends.

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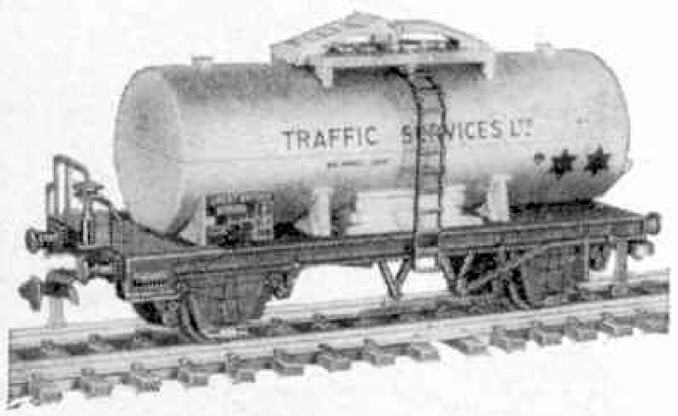
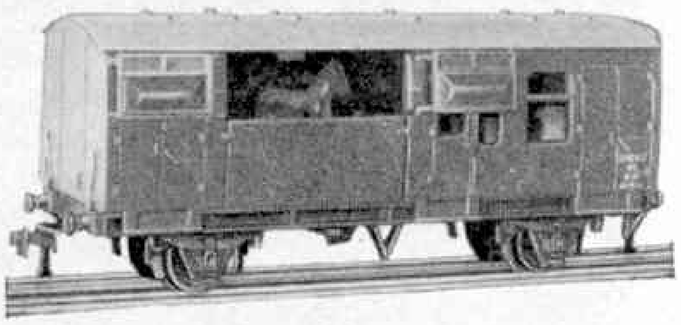
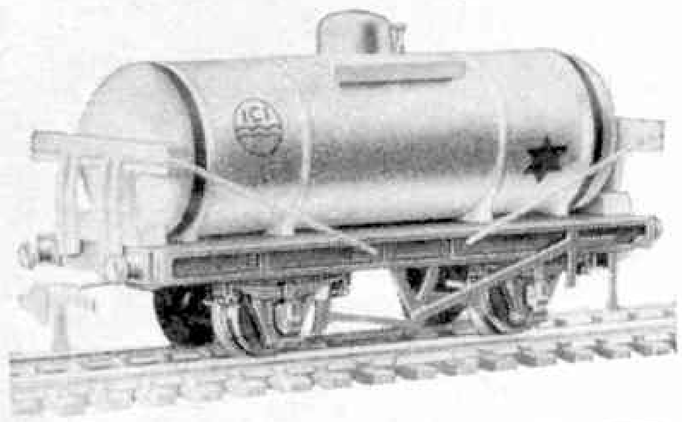


No. 4679
Traffic Services Limited
Tank Wagon
Length 4⅛ in. U.K. Price **10/7**



No. 4316
Horse Box
(S.R. Green) with horse
Length 5 $\frac{5}{16}$ in. U.K. Price **10/7**



No. 4675
I.C.I. "Chlorine"
Tank Wagon
Length 4¼ in. U.K. Price **9/9**

HORNBY DUBLO
ROLLING STOCK

MADE IN ENGLAND BY MECCANO LTD.

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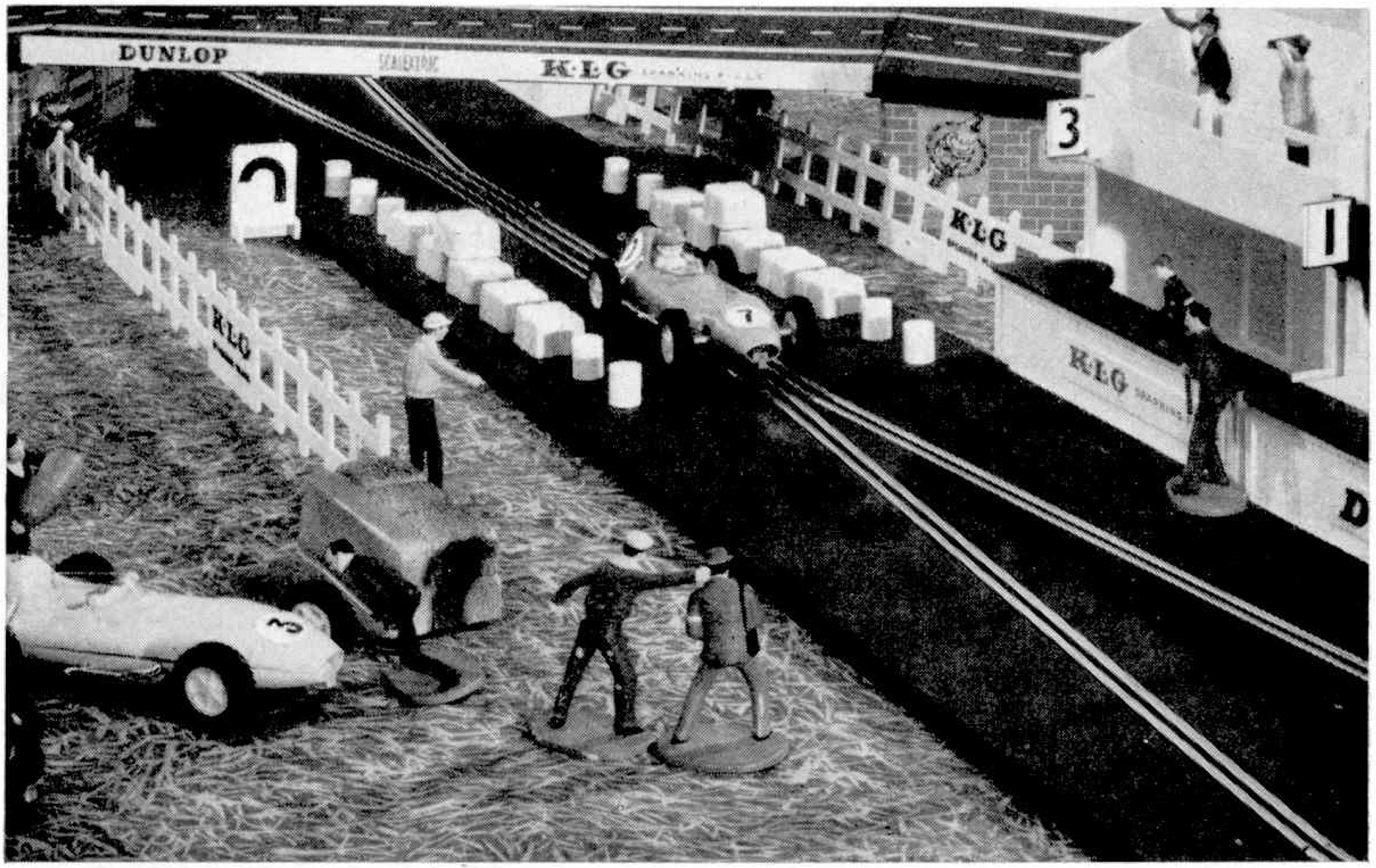
REG'D

ELECTRIC MODEL MOTOR RACING



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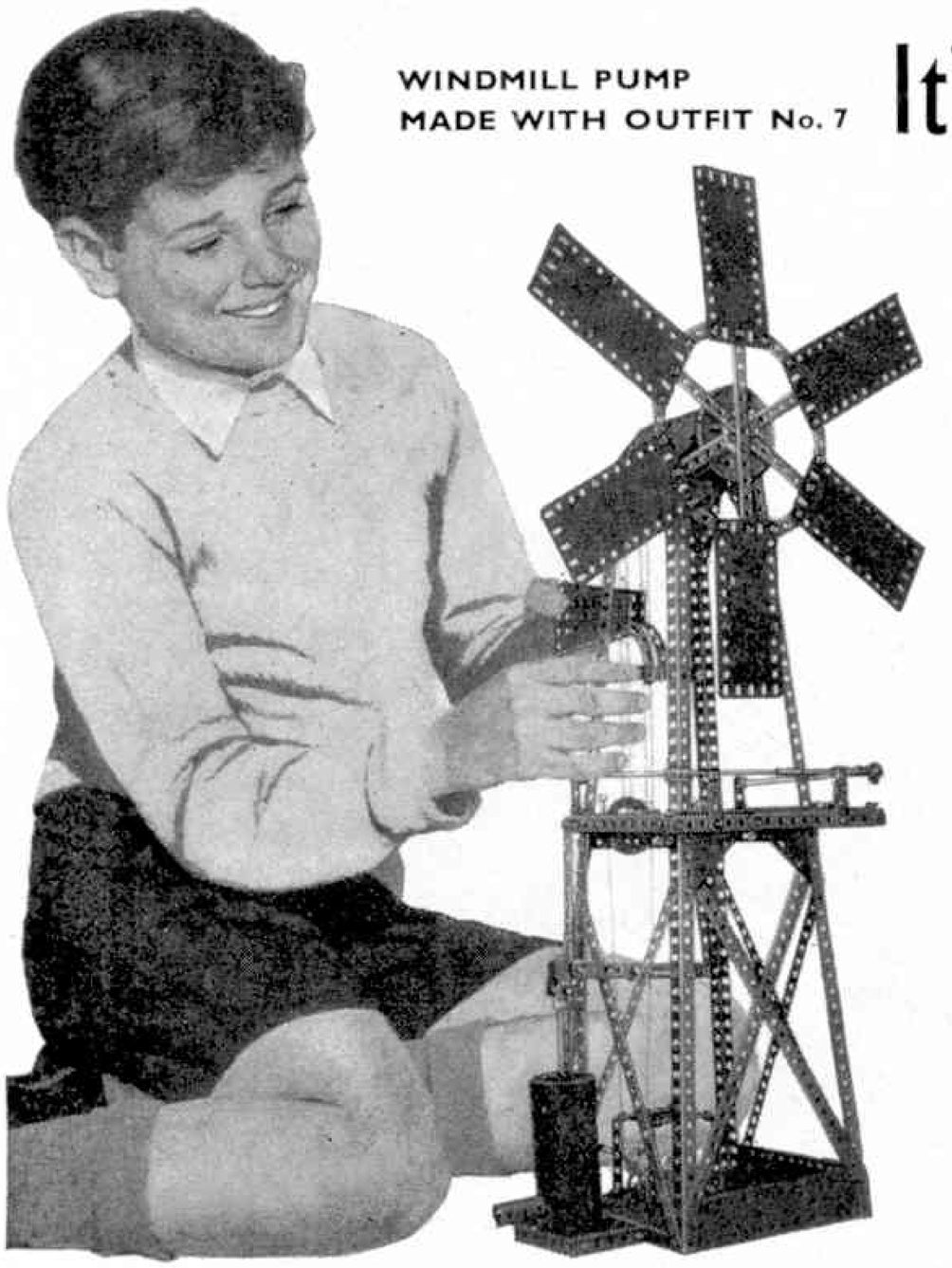

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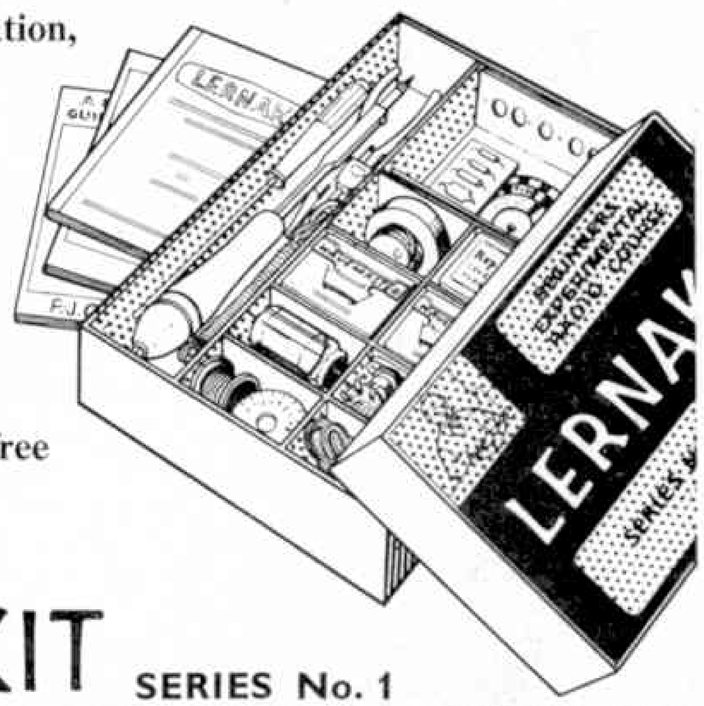

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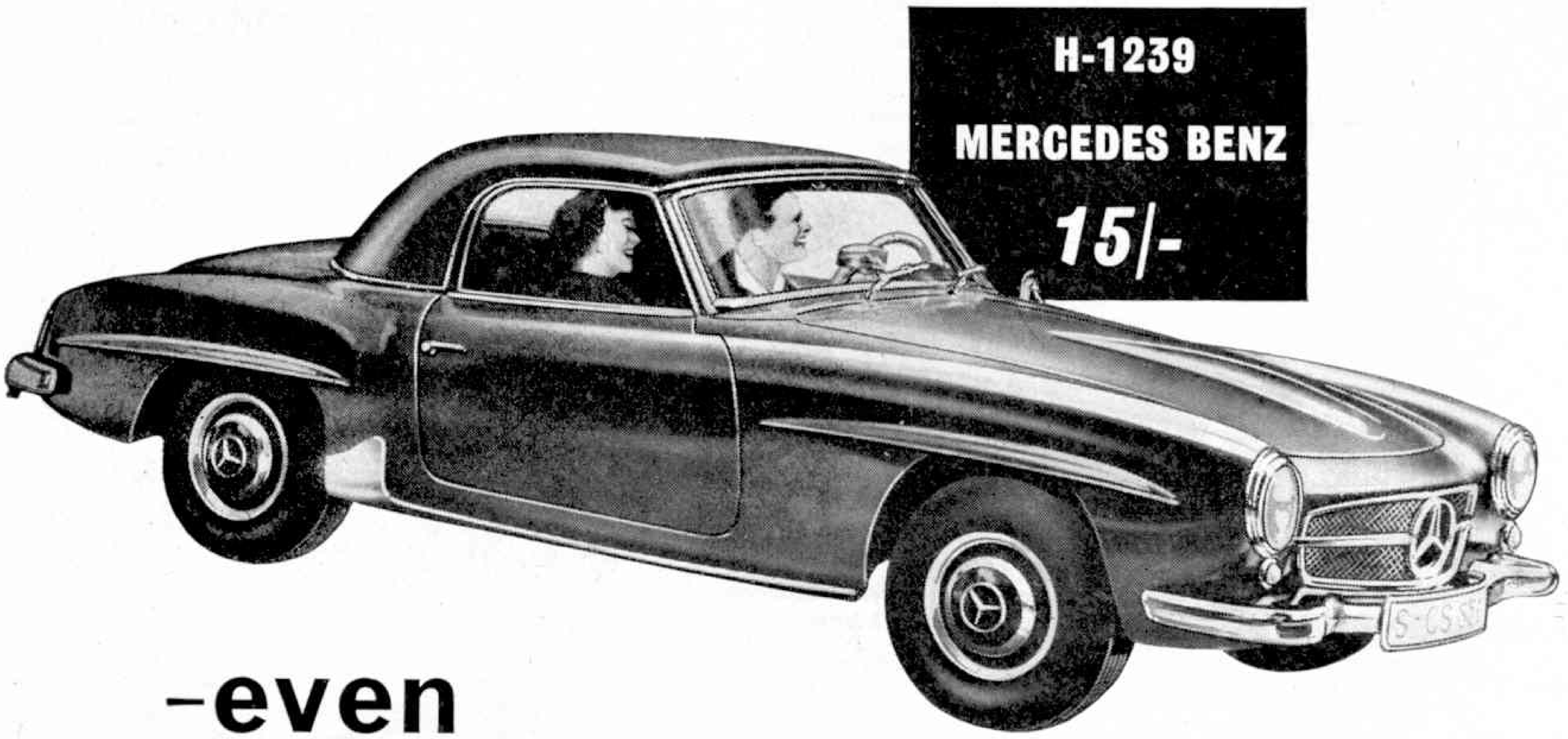

-even the floor mat is shown!

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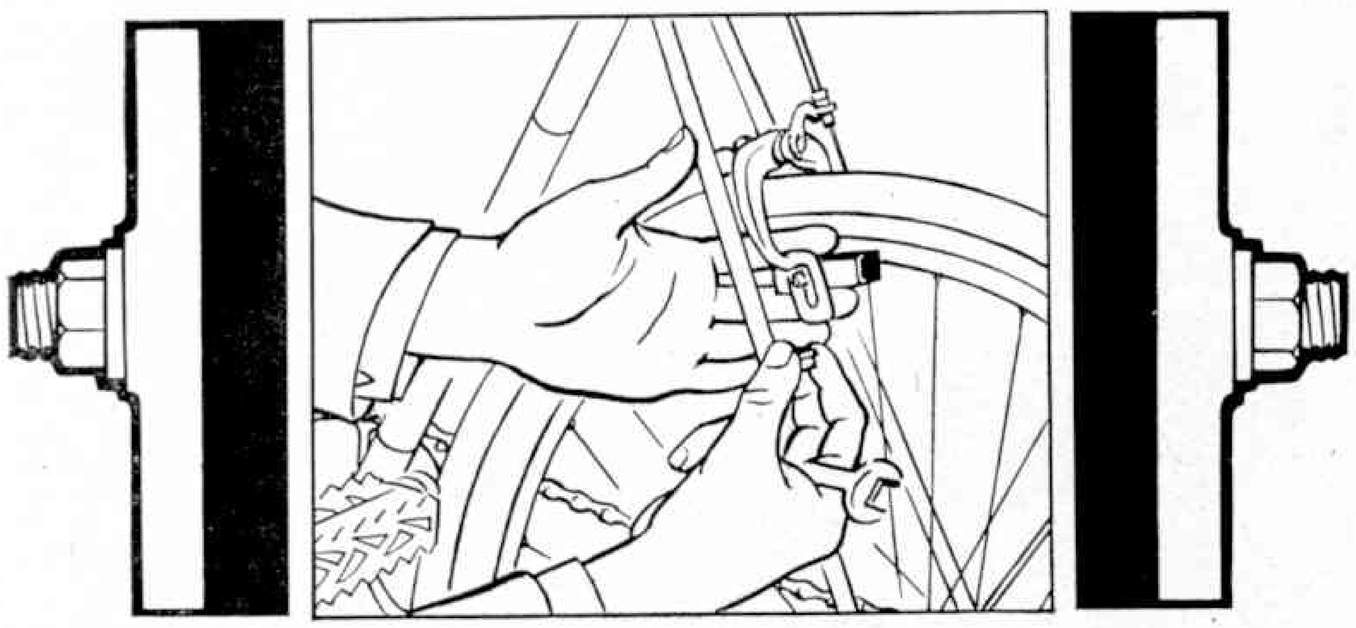
New Ferodo blocks with AQUON give racing performance under all weather and road conditions



In dry weather, new Ferodo Brake Blocks with special ingredient AQUON give *extra* control. Under wet conditions, braking performance is THREE times better than ordinary blocks can give.

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At your cycle shop now— unmounted blocks or blocks mounted in shoes.

10/30

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AA11/QP

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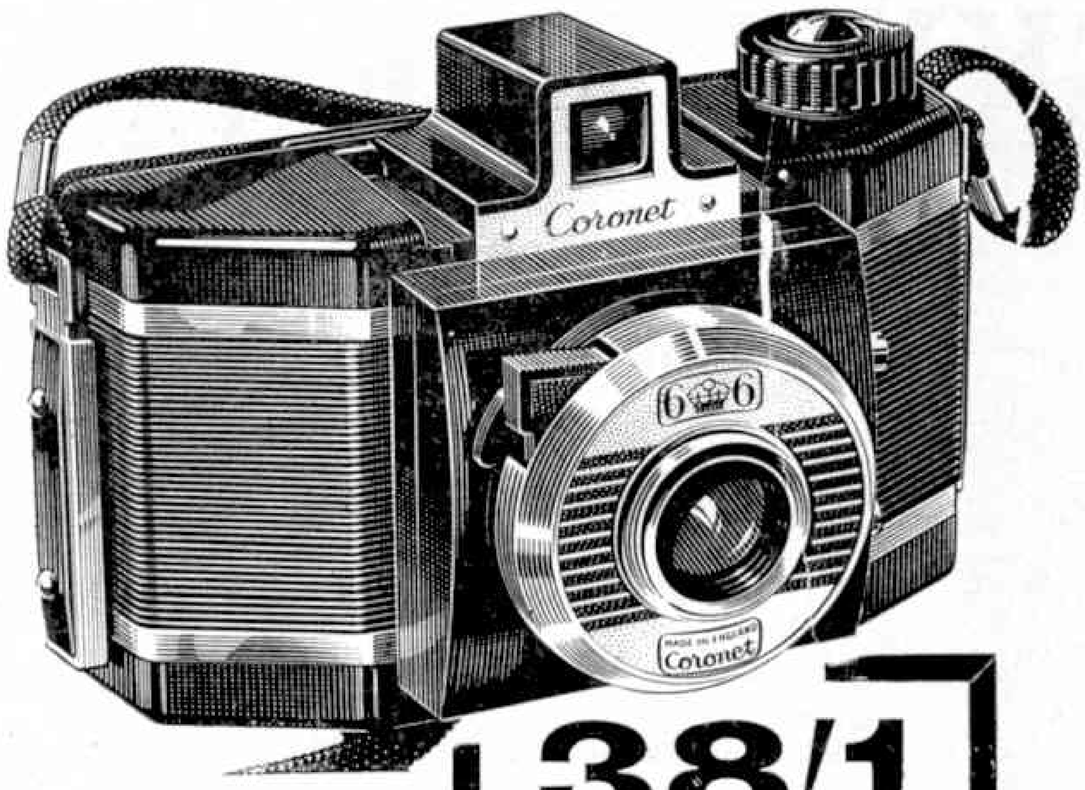

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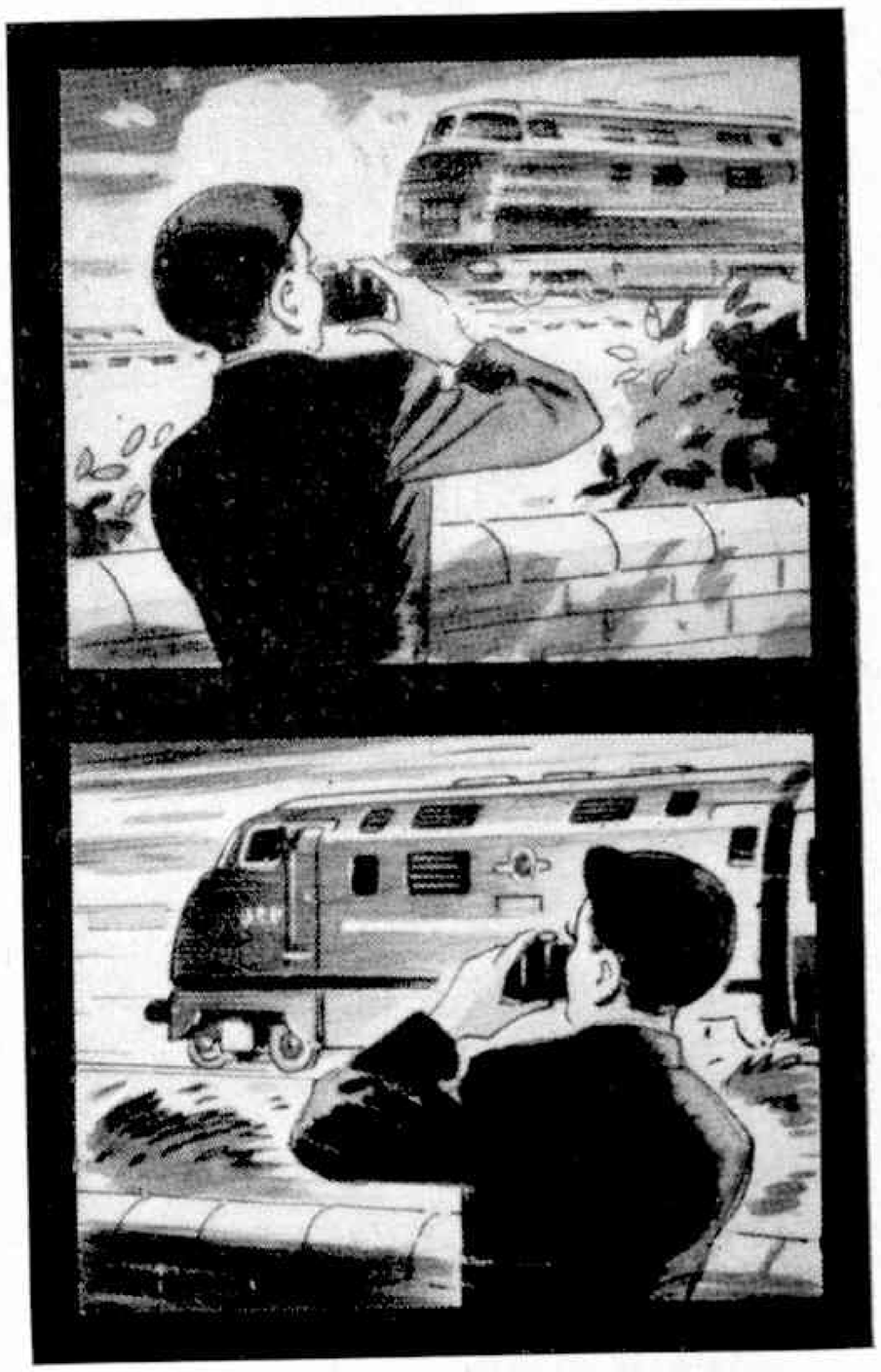
coronet



6 6

FREE BOOKLETS!

Write to Coronet for FREE literature, including this helpful folder "Coronet takes you Train Snapping."

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MECCANO MAGAZINE

Volume XLVI **No. 9** **September 1961**

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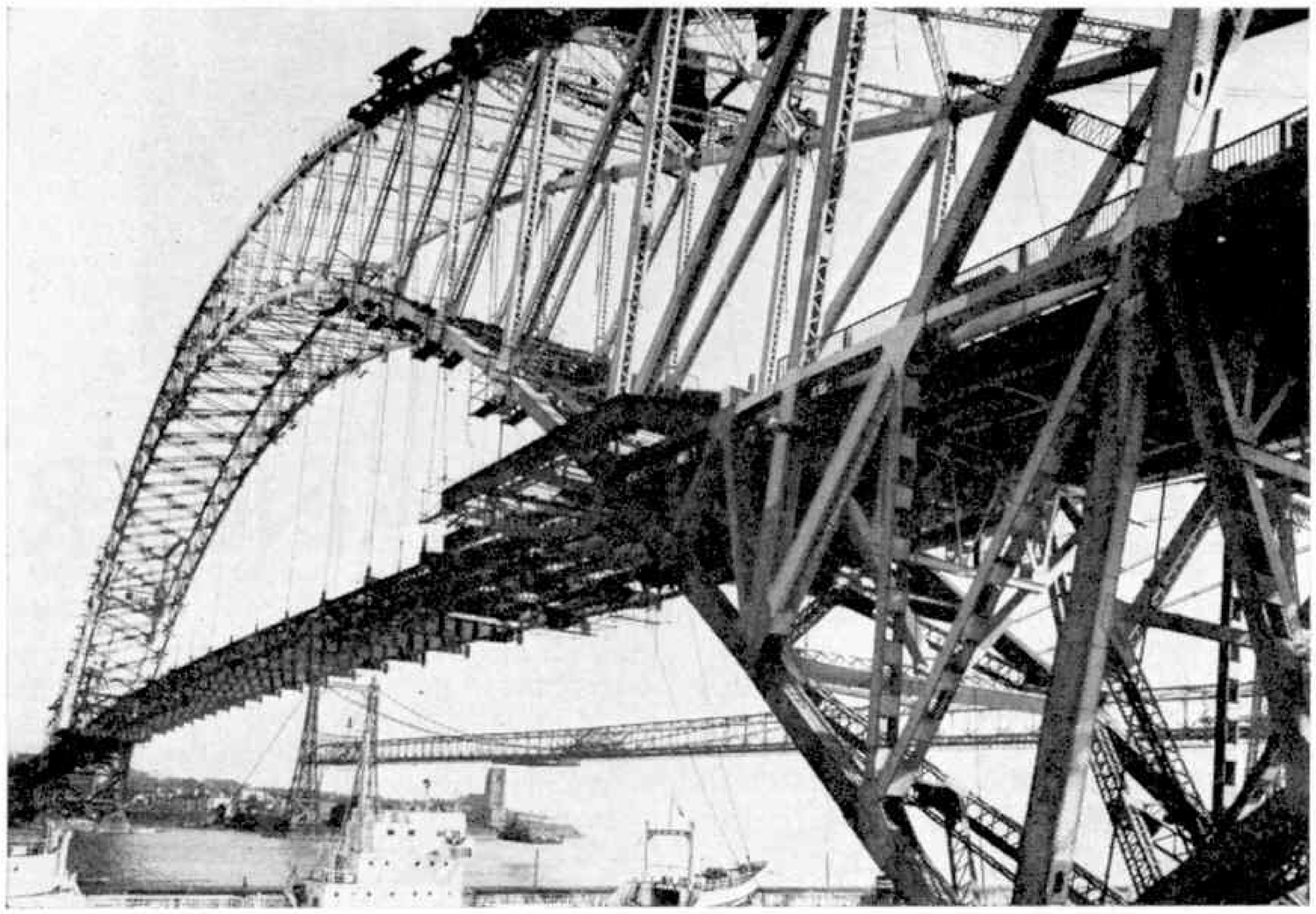
Asst. Editor:
ERNEST MILLER



A New Northern Landmark

THERE can be little doubt that one of the engineering feats which has gripped the minds of the public in recent months has been the construction of the new high-level bridge between Runcorn and Widnes, linking the Cheshire and Lancashire banks of the Mersey, which was opened by Princess Alexandra on July 21. There are many reasons for this interest, of course—the modern style of the bridge itself, which is a high arch structure of simple grandeur, making it a new northern landmark, the build-up of the flyovers which carry traffic on either side of the bridge, and the fact that the structure runs parallel with the world-famous Widnes Transporter Bridge, although this is to disappear now the new crossing has come into being. To have seen the Transporter making its way over the river, its deck a huddle of cars, vans, cyclists and pedestrians, was a sight to remember for all time. You see a picture of the new bridge above and the story of its construction appears inside.

Readers will also find, on page 344, the first article in a new series dealing with buses and coaches which has been requested by many readers. The number of enthusiasts who study service vehicles just as seriously as locomotive spotters go about their job is increasing, and I hope these notes will satisfy their tastes. There are now many clubs to cater for spotters, and there is a wide range of publications dealing with bus spotting. One group in Glasgow has even ventured into the realm of producing gramophone records of bus sounds.

Finally, I am sure that *M.M.* readers will be glad to know that the three Pullman cars which are to form the Pullman Train Set S.R.—shortly to be introduced into the Hornby-Dublo series—are now available separately. Details appear in our advertising columns this month. The story of Pullman cars, and a detailed description of the Hornby-Dublo Set, will be given in next month's *Meccano Magazine*. **THE EDITOR.**

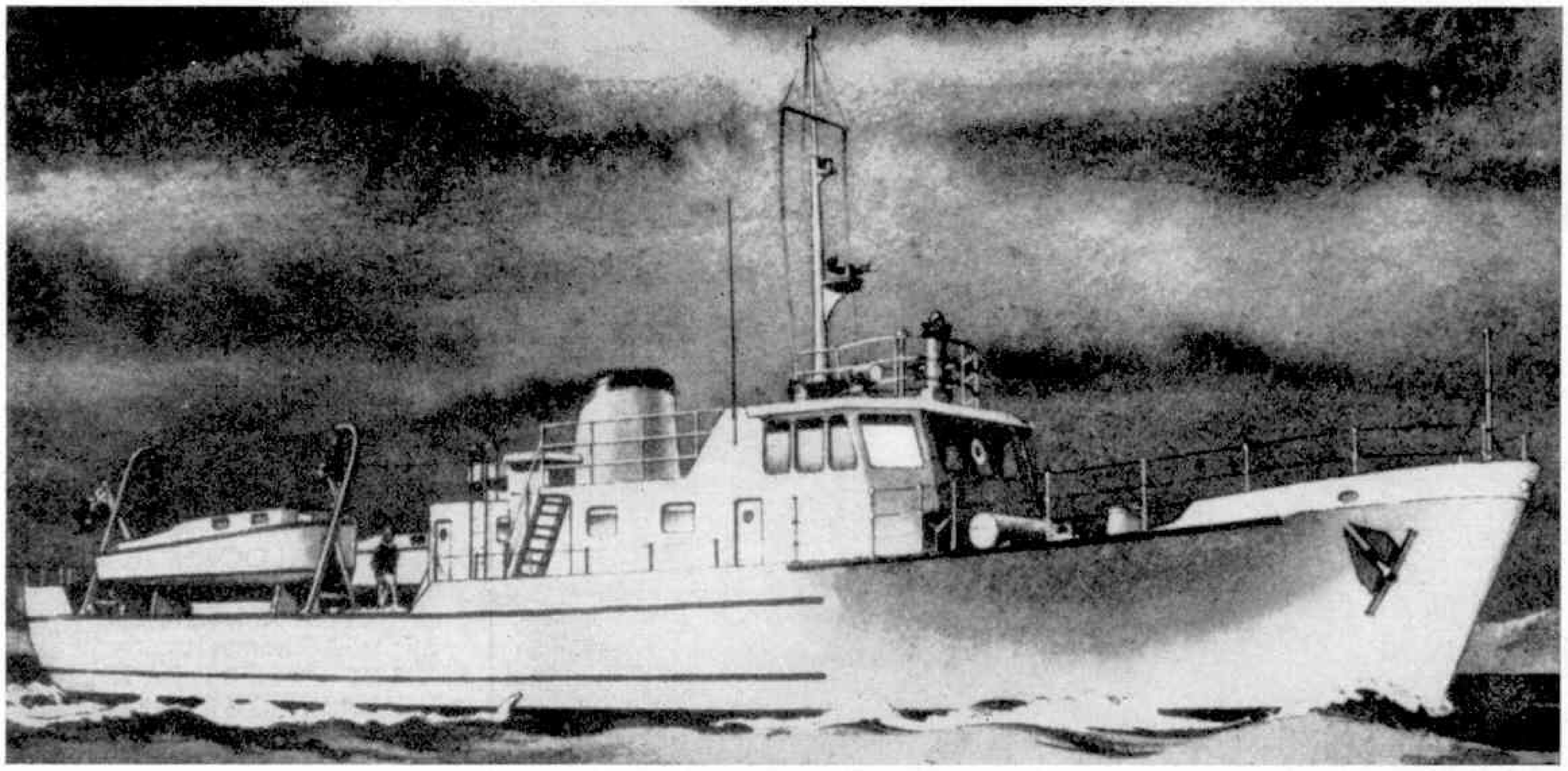
Next Month: NEW SERIES ON 2-RAIL LAYOUTS

THIS MONTH'S CONTENTS INCLUDE—

	Page
SHIPS THAT LOOK FOR DANGER By A. M. Street	310
THE RUNCORN BRIDGE	312
By Dr. J. Thomas	
PHOTOGRAPHERS' PAGE.. ..	317
A WHEELWRIGHT IN KENT ..	320
By W. H. Owens	
A FLYING START	324
By Humphry Gore	
MECCANO TUG BOAT	332
By "Spanner"	

OUR FRONT COVER

Our cover picture this month shows an electric train about to depart on the fantastic journey from Flaam, a village on the Aurland Fjord in Central Norway, to Myrdal, a main-line station on the famous Oslo–Bergen Railway, twelve miles away. But in those twelve thrill-packed miles, the train climbs from sea level to 2,800 feet, encounters gradients of 1 in 18 and drives through no fewer than 20 tunnels. The Flaam Line has everything from snow-tunnels and figure-eight circuits to river and waterfall crossings, yet this train is the only one we know of which halts specially for passengers to take photographs! Frank Bunce tells the story of the Fabulous Flaam Line on page 316.



SHIPS THAT LOOK FOR DANGER

TYPICAL of the little ships that deliberately seek out danger to ensure safe sea travel are those of the Canadian Hydrographic Service. Yet few, if any, similar sea services face so perilous a task, of such immense proportions, as that which confronts these special Canadian ships each Spring. It is then that they leave the safety of their winter ports to fan out along the water routes of the Atlantic, the Pacific, and the Arctic, as well as the inland waterways and lakes which include the St. Lawrence Seaway and the Great Lakes.

Consider the multiplicity of duties and tasks—some exciting, some dangerous, but many monotonous—that fall to the lot of men who run these ships. For example, taking water temperatures at different levels, taking water samples to study their nutrient salts, analysing tides and tidal current phenomena, investigating water surface levels, charting and sounding channels and navigable waters.

By John Drummond

From such tasks, faithfully accomplished in good weather and in bad, amid some of the world's most dangerous waters, come the volumes of tide tables, the water level bulletins, the charts and books of pilot and sailing directions, the graphs and reports which make seafaring safer for the merchant ships of all nations that use the peril-strewn waters of the North American Continent.

Yet, this is only a part of the use to which this knowledge is put. For instance, the information is also used by coastal industry, as well as by scientific and defence interests, in choosing safe waterways. It is used in the location of harbours and the design of docks, causeways and other engineering projects which, in these days, are springing up along the shores of Canada's seas, rivers and lakes.

Examine a map of Canada and you will perceive how vast is the region for which the hydrographic service is responsible—a region which includes the greatest freshwater system in the world. Yet, the work is carried out by fewer than a dozen small ships and about 800 men and women, including those who work ashore.

These ships, ranging in size from craft of just over 100 tons to vessels of nearly 3,500 tons, are all equipped with one or more launches, while some have helicopters. Operating with this fleet are an additional 30 or so special launches for use in inland and coastal waters.

Undivided attention

All engaged in this work, from ships' captains to seamen ever alert to the perils of their task; from scientists trained to use modern electronic surveying and navigational equipment to the office girl operating an electric eraser as she works on a chart, must give undivided attention to their individual tasks, for people's lives depend on their accuracy and skill.

We may appreciate this better when we remember that although some regions of these marginal seas are relatively clear of dangers, other than sudden storms, other areas are bristling with pinnacle rocks and threatening shoals. Even when these have been duly charted, the hazards are still there . . . waiting for one single careless manœuvre of the helm.

And how vast is the task facing the service. In the northern seaways especially little is known, even today, about the shores, the river deltas, the bays, the capes and the harbours. Note, too, that the coastline bordering the three oceans (Pacific, Arctic and Atlantic) is nearly 18,000 miles long, apart from the complex shorelands of coastal and Arctic islands.

Constantly changing

Add to this the work involved in charting Canada's vast submerged continental shelf, the area of which is estimated at 1,500,000 square miles, together with the 1,400-mile St. Lawrence Seaway, the Great Lakes, Great Slave Lake, Lake Winnipeg, Lake Simcoe, the Mackenzie River and many other areas of navigable water scattered throughout Canada, and one begins to appreciate the prodigious extent of this undertaking.

Account has also to be taken of the fact that the topography of the ocean floor and lake bottoms is constantly changing, due to the ravages of raging waters and other agents of nature. Currents, ice and pounding seas erode cliffs and shift sandy

Reproduced at the top of this page is an artist's drawing of the *C.H.S. Maxwell*, one of the newest additions to the Canadian fleet engaged on hydrographic work.

Fuel and diesel oil are foremost items on the list of supplies for Canada's Arctic weather stations. The picture on the right shows the crew of the icebreaker *d'Iberville* pumping oil ashore from barges anchored offshore at Eureka. To facilitate operations, the supply hose is supported by empty oil drums.

shoals, gradually changing the visible appearance of shipping lanes. This lays on the service the heavy burden of being continually alert to such changes, of making new surveys from time to time and of issuing new charts.

The discovery of new reefs, the building of new lighthouses and removal of old ones, the disappearance of some distinctive landmark—all necessitate changes on existing charts. In a recent year, well over a million such changes were made, to ensure the safety of the thousands of ships and small craft using these seas.

With the passage of time, this vast task seems to grow larger, due in part to Canada's expanding economy and hence to a rapid increase in passenger and freight traffic on the shipping lanes and waterways.

Greater accuracy

Happily, new aids—such inventions as radar, echo sounders and the Decca electronic system of measuring—now standard equipment on the ships of this service, have helped to ensure greater accuracy in establishing the nature of the sea bed, noting reefs, pinnacles, shoals and other obstacles to safe navigation, and making it possible for this work to continue in fog and out of sight of land.

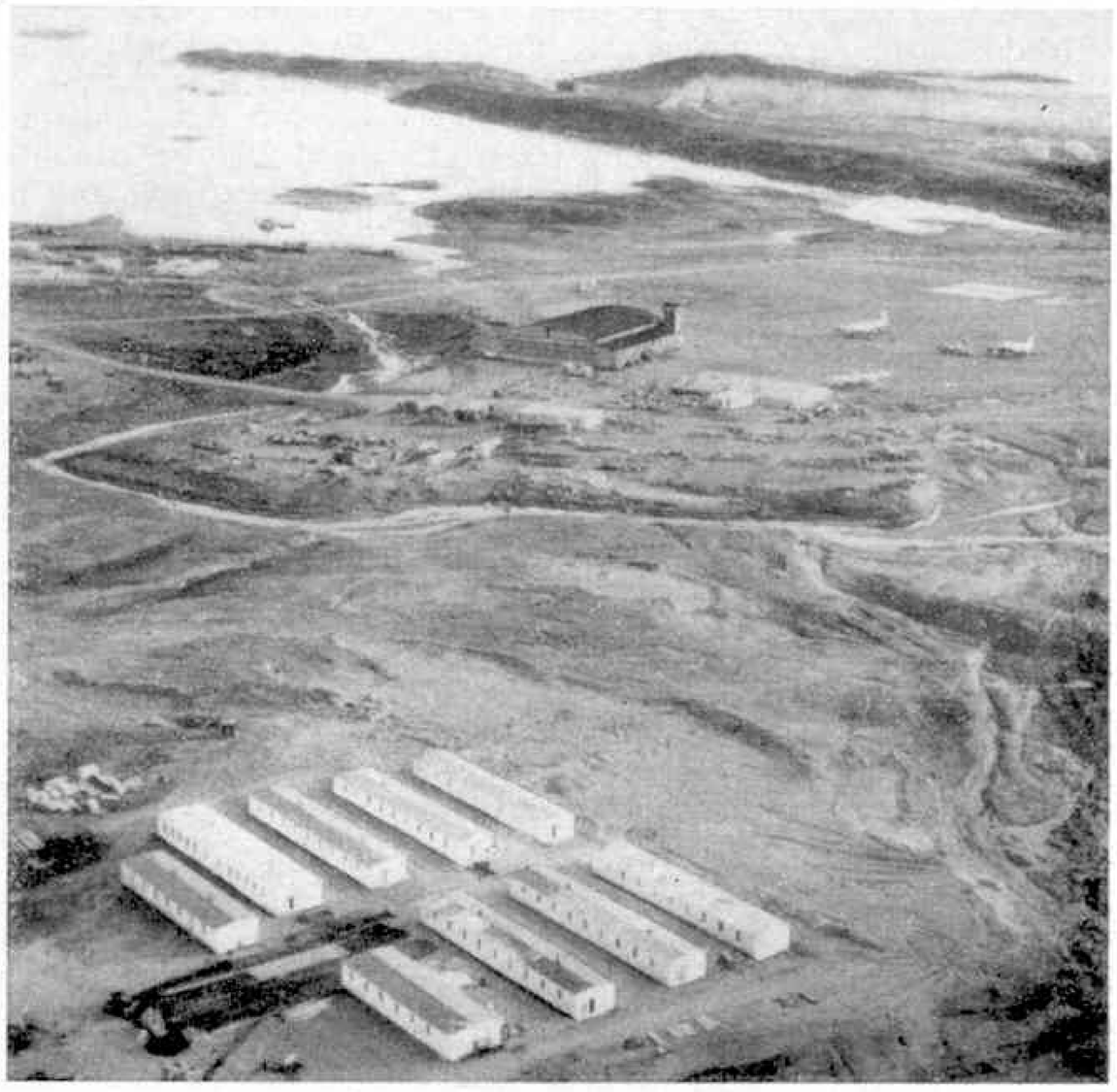
Even more important in some ways has been the acquisition in recent years of new ships for the hydrographic fleet. Of these, outstanding and especially invaluable is the 3,500-ton *C.G.S. Baffin*, a 4,000,000-dollar ship built especially to gather marine information on the Arctic for scientific, defence and other purposes.

Fitted with the most modern hydrographic and navigational equipment, and having a cruising radius of 14,000 miles on one fueling, *Baffin* is able to penetrate deep into the cold northern seas as she seeks to wrest from Nature secrets never before known to man. In this work she is helped by six launches for inshore work, and by two helicopters housed on board ship. The helicopters are used not only for reconnaissance and rapid transport of men and equipment, but also for rescue operations and in medical emergency work.

Latest addition to this fleet, operating on Canada's eastern seaboard from the Spring of this year, is the *C.H.S. Maxwell*, a ship especially designed for inshore survey work. Described as "a launch carrying launches", the 115-ft. long *Maxwell* is a craft of intermediate size between normal launches and the fully-staffed larger ship. Among her up-to-date equipment are navigational aids such as radar, a gyro compass, radio-telephone ship to shore, automatic steering, and hydraulically-operated deck machinery to facilitate work in icy weather. Although *Maxwell* is also fitted with a small laboratory for oceanographic research, her normal duties will largely be hydrographic.

These, then, are the ships which dedicated men operate for some six or seven months each year, dangerously seeking information that will provide invaluable charts and sailing directions. These, in turn, are the guarantee of safe passage for all kinds of vessels using the channels, straits, bays, estuaries, rivers and lakes which constitute Canada's coastal and inland waterways.

Below: Eskimos aboard the *C.D. Howe* await a medical check-up by a Department of National Health and Welfare team. (Right) Frobisher Bay showing the airport, with the dock in the background.



NORTH'S NEW HIGH-LEVEL BRIDGE

By
Dr. J. Thomas, M.A., F.R.S.A.

MORE than 5,600 tons of structural steelwork, most of it high tensile steel, went into the building of the latest link between Lancashire and Cheshire—the huge £3,000,000 Runcorn Bridge, which was opened on July 21 by Princess Alexandra and which, by reason of its modern style and enormous centre span archway, dominates the countryside for miles around.

The bridge runs from Runcorn on the Cheshire side to Widnes, in Lancashire, and crosses both the River Mersey and the Manchester Ship Canal, the road level being 80 feet above these two waterways. It has a total length of 1,628 feet from bank to bank, with a 33-ft. carriageway and two 6-ft. footpaths. Its main single arch span of 1,082 feet is the longest arch span in Europe and the third longest in the world. The two longer ones are those of the Bayonne Bridge, New York, and the Sydney Harbour Bridge, in Australia, the latter having been built by Dorman Long of Middlesbrough, who were also builders of the new Runcorn Bridge. Designers of the new bridge were Messrs. Mott, Hay and Anderson, Consulting Engineers, of London.

A striking view of the new high-level bridge between Runcorn and Widnes, with the railway bridge in the background. Photograph by courtesy of Mott, Hay and Anderson, London.

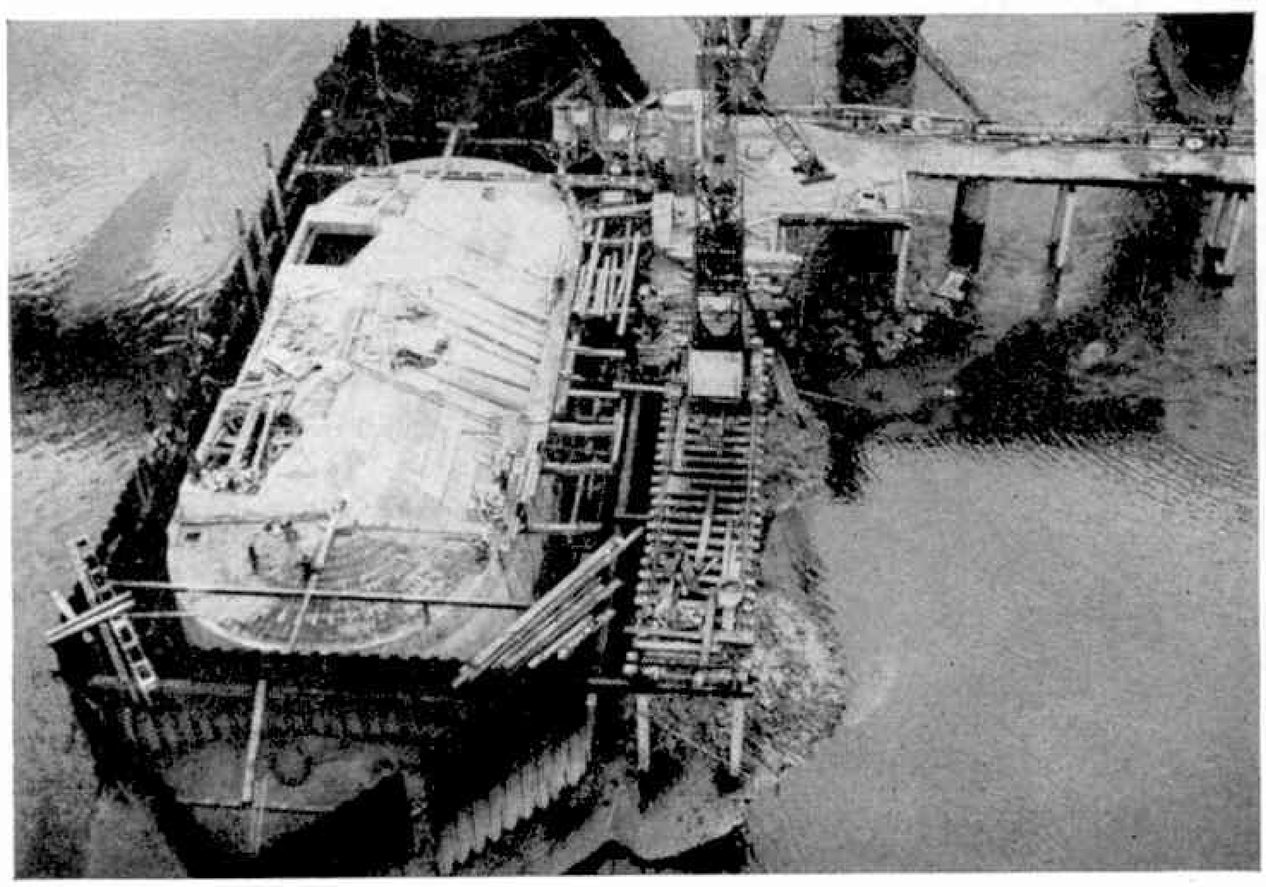
Sandwiched between the old Transporter Bridge, soon to be demolished, and the older railway bridge, the sheer stark beauty of the new bridge is rather obscured at close quarters. But seen in perspective at a distance, as viewed by the writer on a recent trip on the Manchester Ship Canal, from a vantage point above the Queen Elizabeth II Dock at Eastham, it is a majestic sight. In the setting sun, the arch of the bridge, standing at its tip 280 feet above the level of the River Mersey, shimmered like a silver rainbow in the sky.

The steel structure of the high-level bridge itself rests on two skewback ferro-concrete piers, one of which is on the Runcorn bank, just beyond the Manchester Ship Canal. This pier is founded on soft red sandstone 14 feet below the level of the canal, and 4,000 tons of concrete went into its construction. On the Widnes side, the main skewback pier and the pier supporting the end of the side span are sited on the foreshore of the River Mersey where, at spring tides, there is a tidal rise of 20 feet. These piers were built inside steel sheet pile coffer dams. As at Runcorn, the Widnes piers are founded on soft red sandstone which forms the bed of the river. The foundation piers were constructed by Leonard Fairclough Limited, of Adlington, London and Manchester, who were also contractors for the two approach roads which are such an outstanding feature of the new bridge.

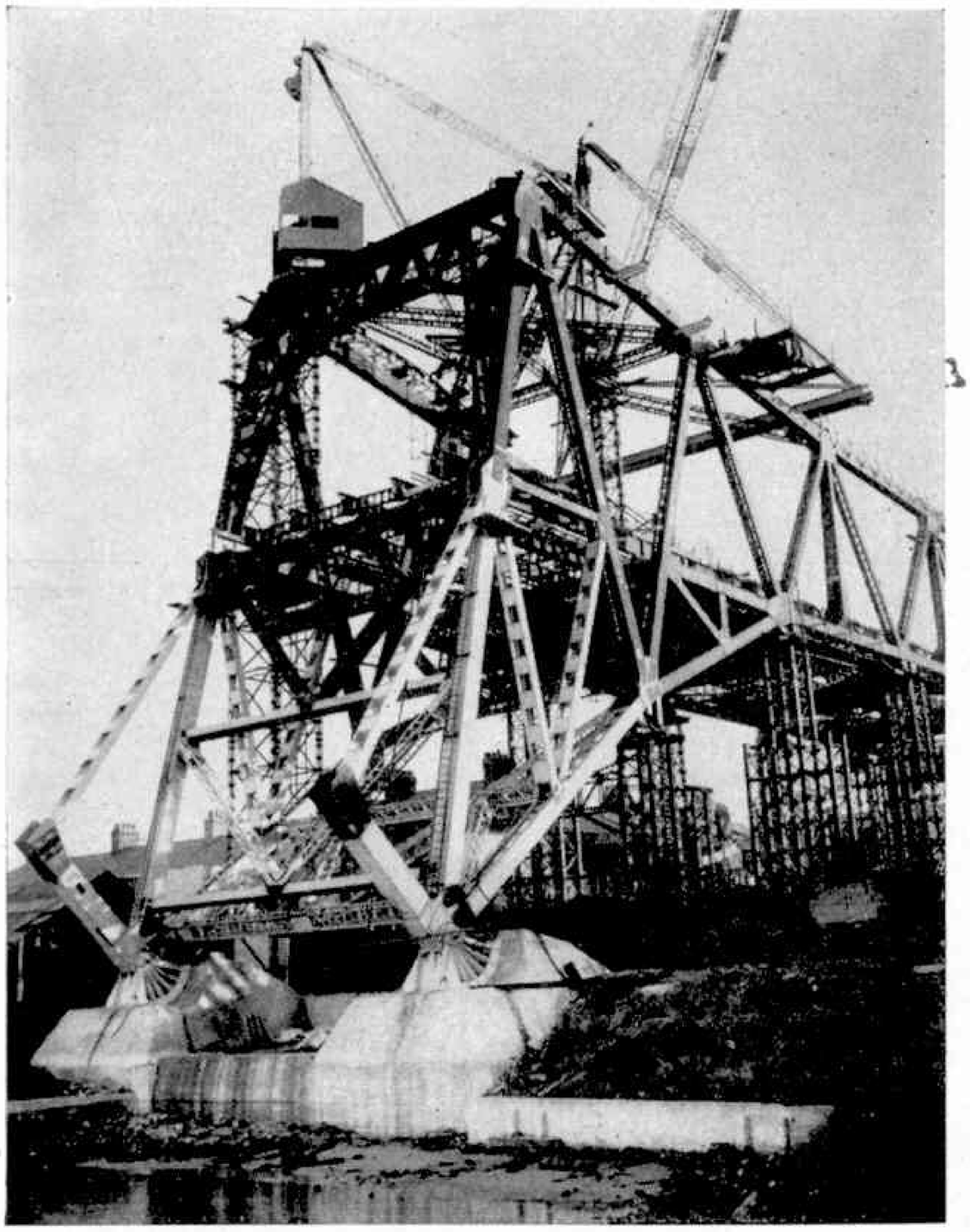
They are, in fact, viaducts which curve gently through surrounding property to connect with the massive bridge, overshadowing nearby property. Within a few hours of the bridge being opened the approach roads, like the bridge itself, were carrying thousands of vehicles, many travelling between the industrial north and counties to the south of the Mersey. A speed limit of 40 miles an hour is in force for vehicles crossing the bridge.

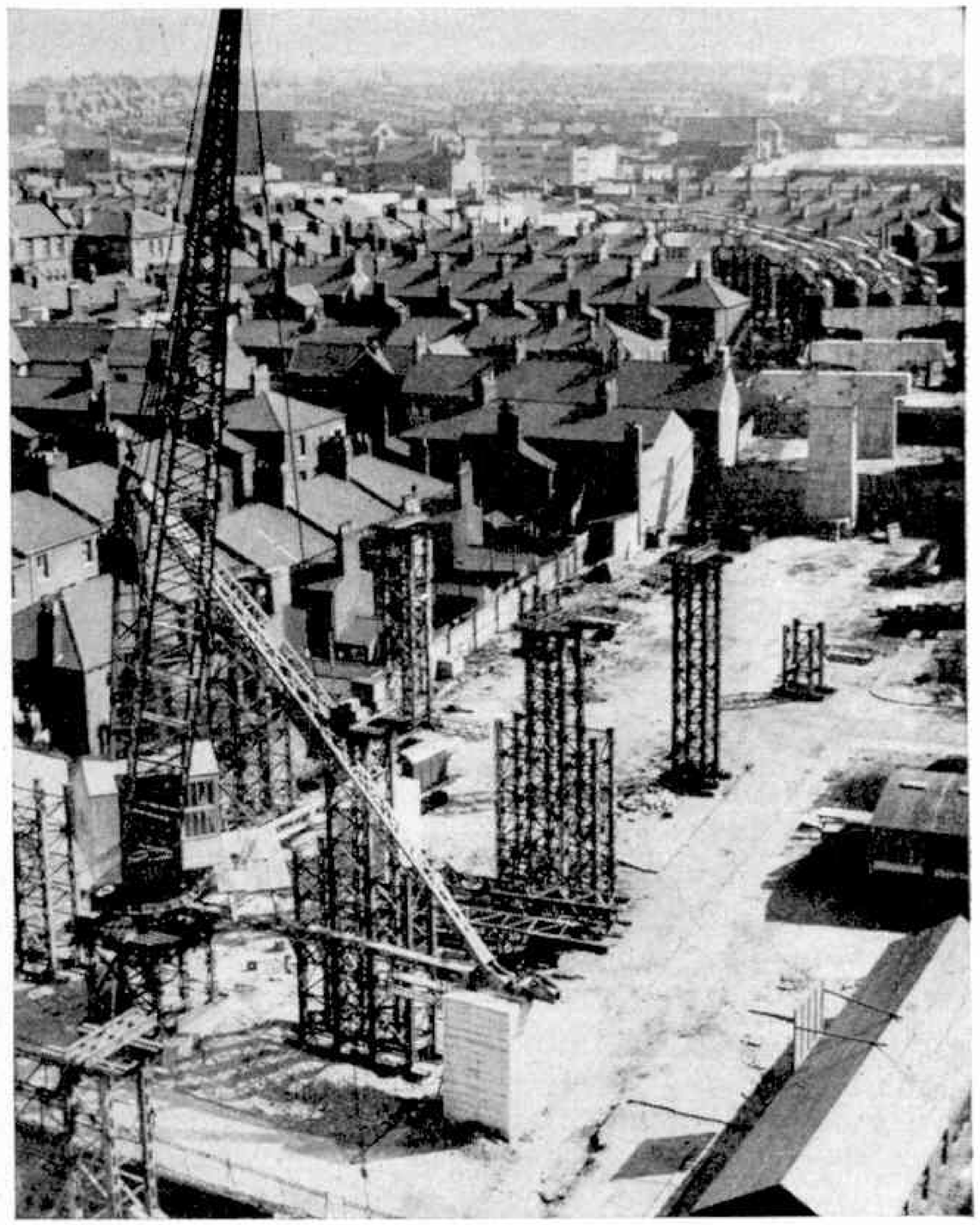
The approach roads run outwards from the bridge terminals on high, T-shaped ferro-concrete piers. Fifteen are on the Runcorn side and five carry the shorter Widnes approach road. The heights of the piers range between 17 feet and 41 feet, being determined both by the gradient of the approach and the contour of the ground.

An average of 130 cubic yards of concrete was used in these T-shaped piers, with about 20 tons of mild steel reinforcement. The concrete beams carrying the approach roads on the piers themselves were pre-cast on the ground alongside their final positions. A point of historic interest is that on the Runcorn side, the approach road is carried over a bridge spanning the Bridgewater Canal which



The early stages: One of the skewbacks nearing completion. In these concrete foundations the main bearings of the arch are located. Photograph: Chesmore, Runcorn.





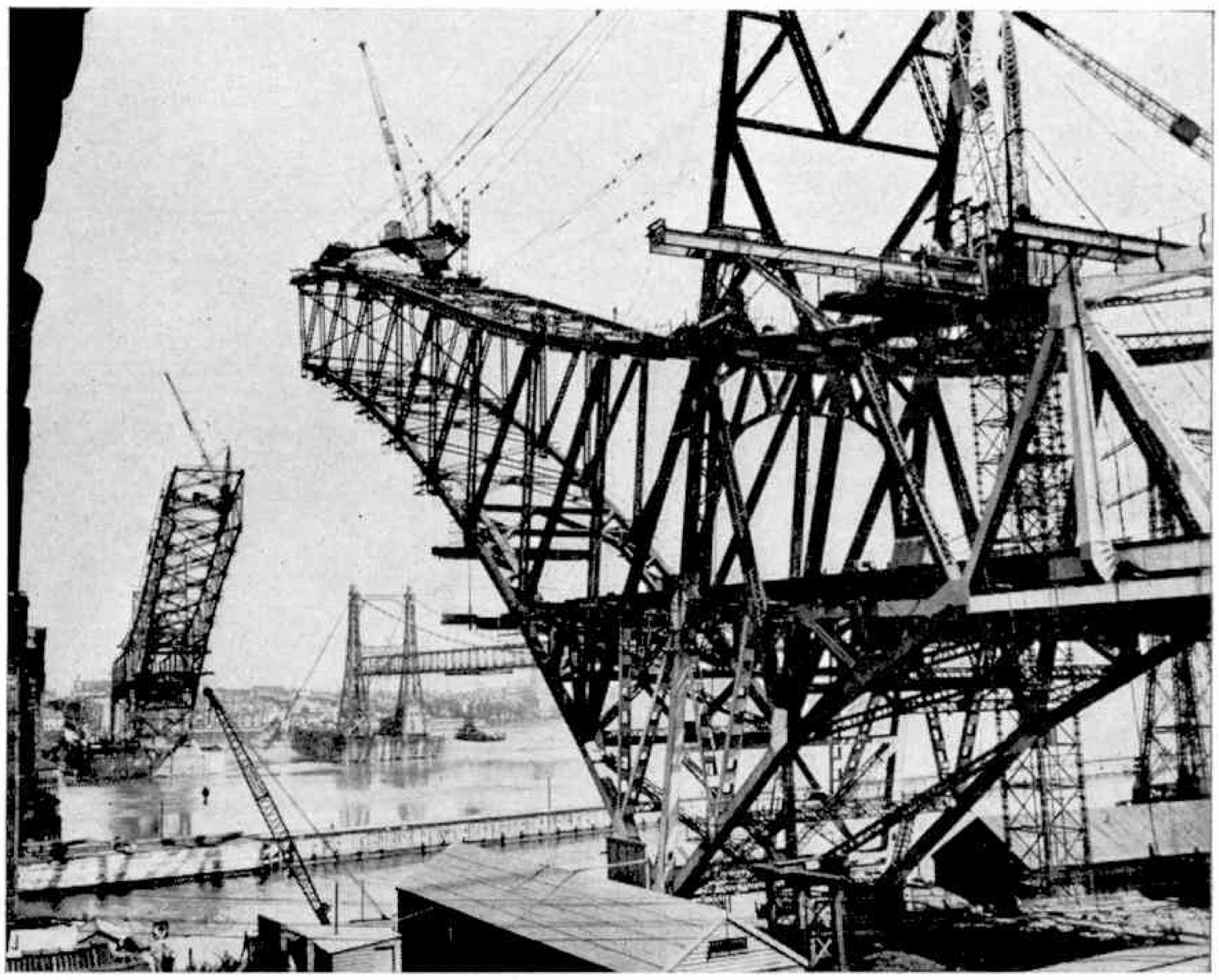
During construction: (top left) One of the main bearings set in the skewback, with the bridge structure itself being formed on top. Photograph: Chesmore, Runcorn. (Right) Building one of the bridge approach roads. Note the T-shaped concrete piers, carrying the roadway, at the top right of the picture. Photograph by courtesy of Dorman Long Limited.

was constructed by the famous engineer James Brindley in 1772.

The point on the River Mersey where the new bridge, and its predecessors, are sited is known as the "Runcorn Gap". The ancient Britons must have attempted to cross this narrow gap, all those centuries ago, by ferrying in small boats possibly no bigger than the coracles still used today by Welsh fishermen on the River Teify. The Roman legions from Chester also had an outpost on the Runcorn peak of the gap, and they probably rowed their soldiers across this narrow estuary in small galleys. Subsequently, on the site of this Roman fort, the later Kings and Princes of Mercia erected a castle, from the ramparts of which their mercenaries ferried across the Mersey to the Widnes bank. Yet, though the river was ferried over a period of many hundreds of years, not until the eighteenth century were there specific plans to construct a bridge across the River Mersey at that point.

Two plans were put forward by Britain's foremost canal engineers—James Brindley and his successor, Thomas Telford. First of all, Brindley submitted a scheme to the Duke of Bridgewater to carry his canal from Runcorn Locks by constructing an

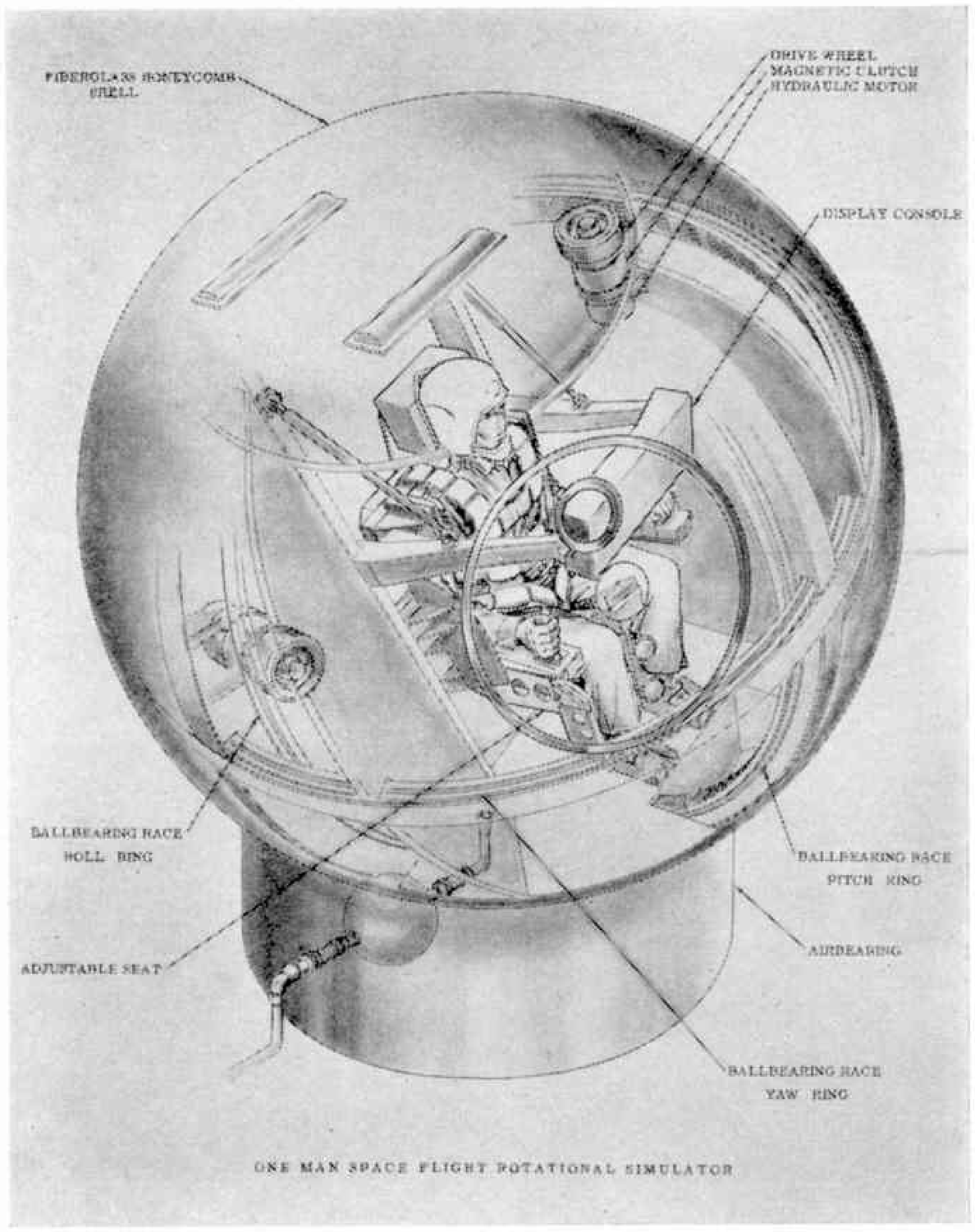
(*Continued on page 315*)



This picture by Clayton Photos. Limited, of Liverpool, shows the bridge before the centre span was completed. Creeper cranes are at work on the crowns of the existing arches.

SPACE NOTES

A Satellite Simulator



ONE MAN SPACE FLIGHT ROTATIONAL SIMULATOR

WITH the first manned satellite flight a historical fact, and further flights promised, more facilities will be required for ground-testing prospective pilots. One such new facility is a spin simulator built by the Norair Division of the Northrop Corporation. Although spin simulators have been built before, this new one will spin at up to 70 r.p.m.—more than double the speed previously achieved. The 4,300 lb. spherical simulator, constructed of bonded sandwich-type fibre-glass honeycomb, rides on a virtually frictionless circular stream of air six feet in diameter. Control and rotation are provided by three inertia rings rotating within the inner surface of the sphere. The rings, mounted on the axes of roll, pitch and yaw and powered by 20 h.p. motors, create the tumbling and spinning effect of a vehicle in space and provide control of the simulator by the pilot. Besides being more than twice as fast as other simulators, this new machine provides smoother rotation and a lower noise level.

MANŒUVRABLE SATELLITES

Within a few years permanent space stations, such as were described in the March *Space Notes*, will be in orbit and the scientists employed will be required to be "on duty" for a period of weeks, or even months, at a time. They will be transported to and from the station by means of a small ferry which will have to be manœuvred very precisely.

Schemes so far proposed have relied very heavily on accuracy of launching and timing, or have required a vehicle carrying an excessive amount of rocket propellent in order to furnish the thrust needed to match orbits.

Norair have recently proposed a scheme that does not require the launching of the ferry satellite at a precise instant to coincide with the passing of the target satellite. Instead, the manœuvrable satellite would be launched in the same orbital plane as the target satellite, but at a lower altitude. The period of rotation of the lower altitude orbit is shorter, so that the manœuvrable satellite would close the gap until it was within radar range of the target. It would do this without using manœuvring rockets, thus saving fuel. Using radar and a computer, the manœuvrable satellite would then compute the rocket thrust magnitude and direction necessary to bring it to the target satellite's altitude at a point where the two could rendezvous. A homing device to guide the manœuvrable satellite during the last few miles of its approach, and a retro-rocket to slow it for coupling, would complete the system.

Tumbling and spinning effects of satellite flight are studied in the unique simulator shown at the top of the page. Note the three inertia rings which drive and control the sphere.

By

J. HUMPHRIES

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

By using such economic ferry satellites it should be possible to establish and maintain manned space stations, using Atlas or Titan launching vehicles, without waiting for the development of such large rockets as Saturn and Nova.

LUNAR EXPLORATION

The Moon is destined to play an important part in the exploration of space. As it circles the Earth at an approximately constant distance, it can be reached at any time of the year. To reach the planets, the times of take-off from the Earth have to be carefully planned so that the space-ship reaches the planet's orbit at the same time as the planet. Again, the Moon's gravitational pull is very low, so that the landing and take-off can be accomplished fairly easily and with comparatively little use of propellent.

To reach any of the other planets with a manned space ship will—unless some radically new means of propulsion is discovered — involve re-fuelling on the journey. It is often proposed that the extra propellent should be sent up into an orbit around the Earth—but this is obviously an expensive business. It would be far better if the necessary propellent were already at the refuelling station waiting to be collected—and this is where the Moon comes in. By the time manned planetary flights are feasible, it seems likely that we shall be using atomic-powered rockets for the main propulsion units. These will consist of an atomic reactor in which a propellent—quite possibly water—is heated to a very high temperature and then expanded through a nozzle. Although sufficient atomic fuel can be carried for a very long flight, the water will need to be replenished.

The Moon was for a long time thought to be a completely dead world, but now many astronomers believe there may be some very primitive plant-life in the craters, sustained by small seepages of water. This water may come from under-

ground deposits of ice—the dust on the surface would be a very good insulator from the high daytime temperatures. These deposits may, indeed, be far more valuable to future space travellers than any other minerals on the Moon.

After the first man has landed on the Moon, prospectors will follow, looking for—ice! Long journeys may be needed during this work and as the Moon has no noticeable atmosphere these will have to be overland. Almost certainly large areas of quite thick dust will have to be crossed, as well as wide fissures in the rocks. For this purpose a light-weight vehicle with the ability to bridge gaps is needed, and one such vehicle might be the unicycle shown in the picture. This would be constructed entirely of inflated, rubberised fabric—with the exception of strengthening members and hatches. Gyros would stabilise and steer the vehicle and electric motors furnish the driving power, the electricity coming from solar batteries mounted in the "parasol". The upper deck would be for navigation and communications, the middle deck for living quarters and the bottom deck for supplies and spares.

WEIGHTLESSNESS

What effect will long periods without gravity have on Man? Even Major Gagarin, in his orbit of the Earth, was weightless for less than two hours and it appears that he acted simply as a passenger and took no part in controlling the flight. Will an astronaut who has to spend several days in space be in a fit mental and physical state to control his vehicle?

The nearest thing on Earth to long-term weightlessness is floating in water, and several week-long tests have been carried out. These show that very little sleep is needed—in one case only seven hours—but the body condition deteriorates rapidly. The body becomes very sensitive to small changes in temperature and judgment suffers. There is no doubt that the answers from this research work will be needed before detailed planning of long-period manned flights can be attempted.

The 30-foot high unicycle illustrated below (right), is designed for preliminary exploration of the Moon, once a base camp has been established. Photograph by courtesy of American Bosch Arma Corporation and Frank Tinsley.

The Runcorn High-Level Bridge—

(*Continued from page 313*)

aqueduct, similar in structure to, but longer than, the Barton Aqueduct he had already built to carry the Bridgewater Canal over the River Irwell. Alas, Brindley died in 1772, a year before the Runcorn Locks terminal of the canal was completed, so his scheme was not proceeded with. In 1814, Thomas Telford, who was famous not only for his canals and canal aqueducts at Pontycysyllte and Chirk, but also as a road engineer, was approached by gentlemen of Liverpool to submit a plan for a bridge to cross the Mersey, linking Widnes and Runcorn, so as to shorten the distance by coach from Liverpool to London through Cheshire.

Telford proposed a suspension bridge with a span of 1,200 feet between the Runcorn and Widnes banks of the Mersey, but there were difficulties in raising the money to construct it, and so the scheme was dropped.

The first bridge actually to be constructed across the Runcorn Gap was the L.N.W. Railway Bridge, in 1868, and the second the Transporter Bridge, linking the Widnes road with the Runcorn road and offering a crossing of a rather unique type for motorists and pedestrians. It was constructed in 1905, but has proved utterly inadequate for the traffic encountered today. Now its huge, suspended "carriage", with its burden of trucks, cars and people, has made its last trip. To take its place is the new high-level bridge. May its rainbow shape herald a "happy crossing" to all who traverse it.

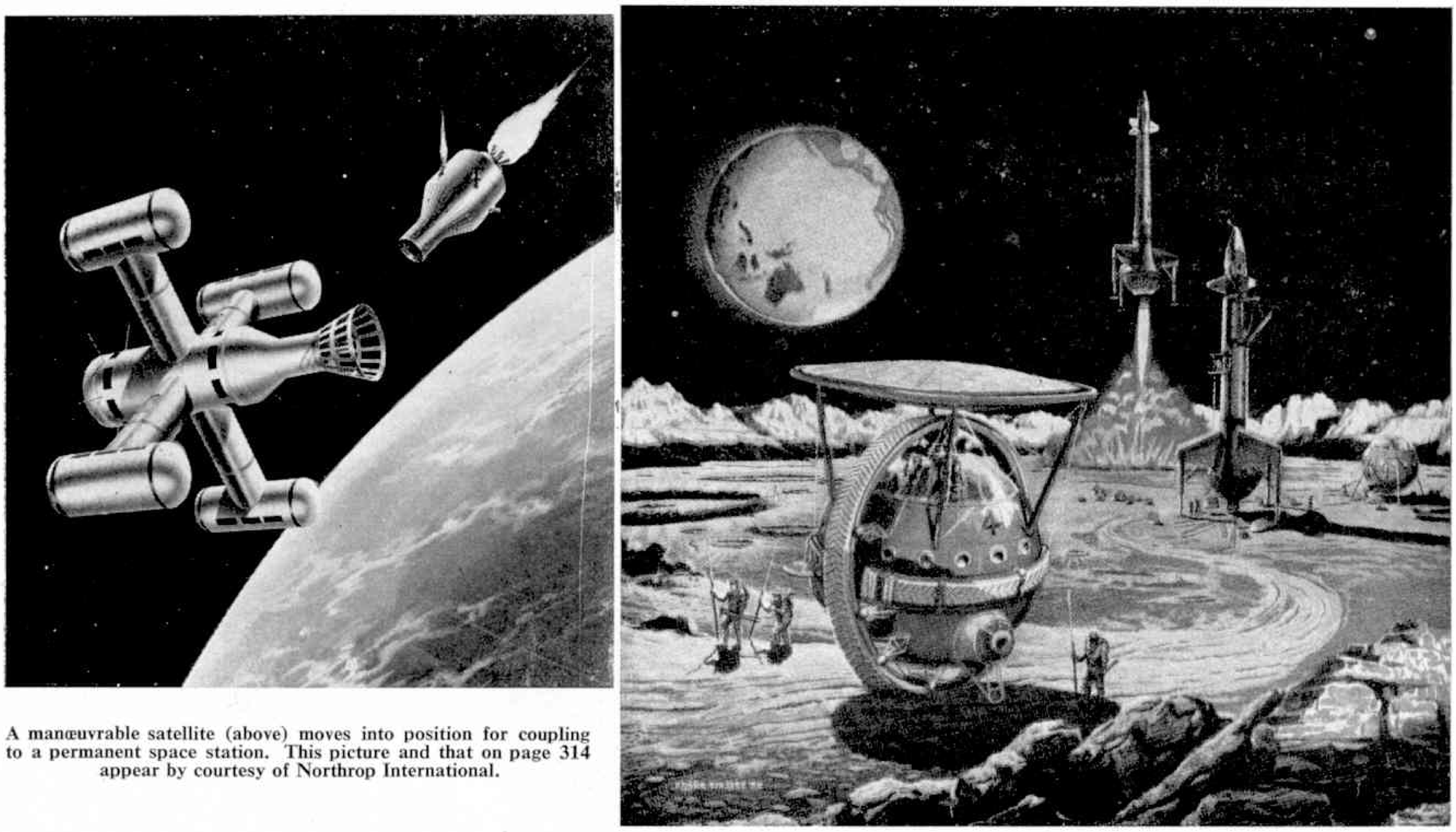
Norway's Fabulous Flaam Line—

(*Continued from page 316*)

from any possibility of snow-blockage. And to reach a railway station 2,000 feet above sea level which is entirely enclosed and as dark as the London Underground is an experience which many tourists never forget.

When the train emerges from the Bakli Tunnel, and the village of Vatnahalsen is reached, it is only a mile or so to Myrdal and its connection with the Bergen Railway. But for every dismounting passenger, the spell of the Flaam Line has already been cast, and the air is full of superlative descriptions of the wonders they have so recently seen.

Only one word can be said to sum it all up, and that, in the modern idiom, is —fabulous.



A manœuvrable satellite (above) moves into position for coupling to a permanent space station. This picture and that on page 314 appear by courtesy of Northrop International.

NORWAY'S FABULOUS FLAAM LINE

By
Frank Bunce

IF a train in Britain consistently took almost an hour to cover a distance of twelve miles, it would not be long before the service was discontinued and the line closed on the grounds of economy. And yet, in Norway, such a railway exists and continues to flourish in spite of the fact that this is a country where, pre-war, every yard of railway track cost as much as £67 to construct. The railway is known as the Flaam Line and is a branch of the famous Oslo–Bergen Railway which connects Myrdal, in Central Norway, with Flaam, a tiny village situated on an arm of the Sogne Fjord just twelve miles away.

Everything about the Flaam Line is contrary to accepted principles. Normally, a train in any country of the world takes less time to travel down a mountain valley from top to bottom than it does from bottom to top. The Flaam Line, however, is different. In travelling down from 2,800 feet at Myrdal to Flaam, at sea level, the journey takes 53 minutes, whereas the trip up the valley in the other direction is covered in only 45 minutes. This immense difference in height over so short a distance and where a maximum gradient of 1 in 18 is reached, is unique in the history of railway engineering. Incidentally, each carriage is fitted with no fewer than five independent brakes, all geared to halt the entire train in an emergency.

* * * *

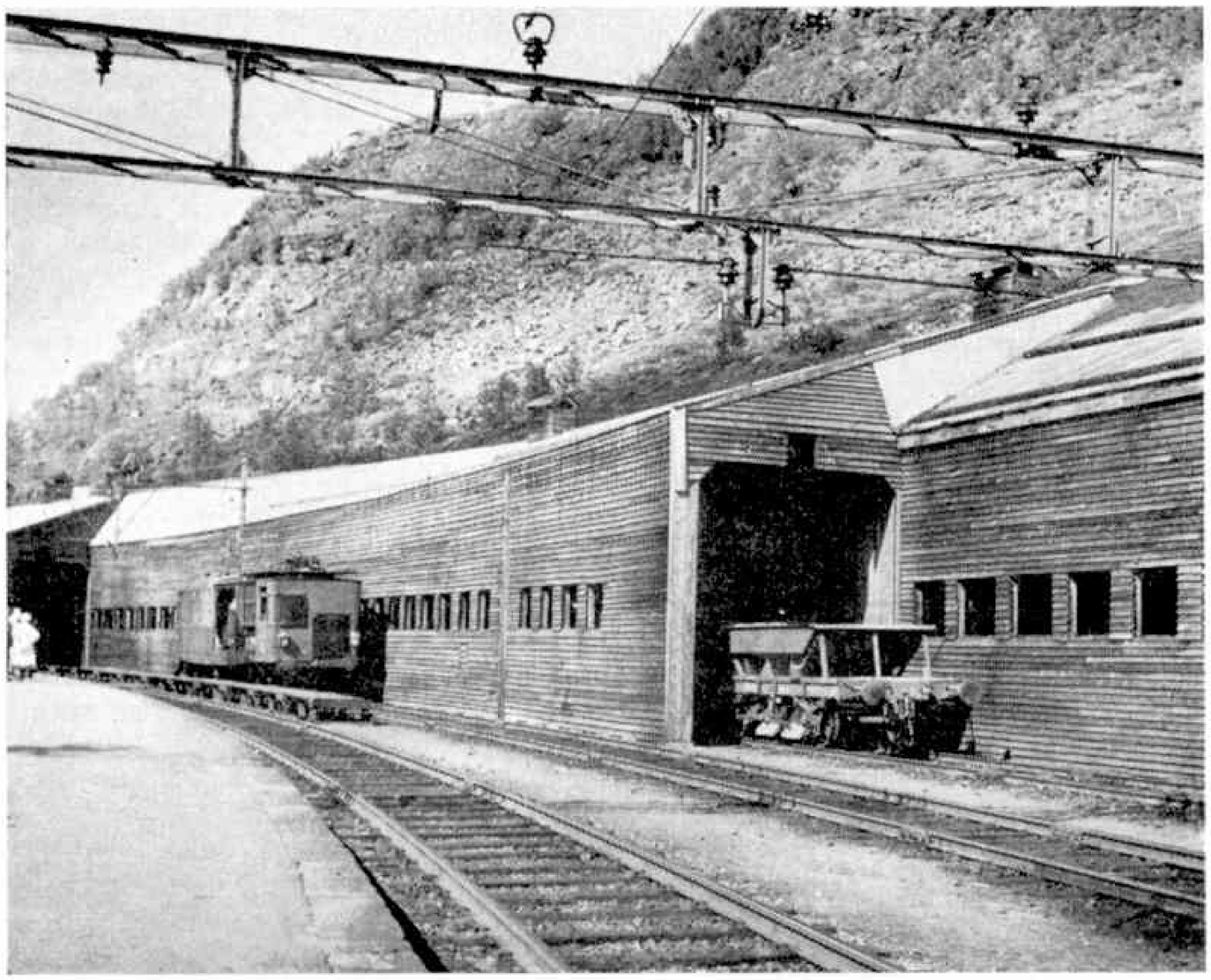
Not unnaturally, the railway follows the course of the Flaam River for much of its course and, in doing so, crosses it at three points where the line swings from one side of the valley to the other. There are no bridges enabling trains to cross the river and the fording which takes place at Blomheller and Kjosfossen, for instance, occurs actually inside the mountains. Here, the river has fashioned its own bed and runs beneath the point where the railway crosses it. Similarly, at Hoga, engineers have constructed a tunnel in the mountainside so that the Flaam River passes under the line on this section also.

The longest of the Flaam Line's twenty tunnels occurs at Nali and is over three-quarters of a mile in length. When travelling south up the valley, the train emerges from Nali Tunnel to give an unprecedented view of the track ahead, perched precariously upon three ledges —one above the other. To the right, passengers see a fantastic road with 21 hairpin bends threading a tortuous path up the side of the mountain known as Myrdalsberget. This roadway, incidentally, was built towards the end of the last century and was designed to carry supplies and materials to assist in the construction of the Bergen Railway. At this point there are, within a distance of less than one mile, five railway tracks, and the fact that one line appears to run above the other is due to the construction of a series of figure-eights built inside the mountain.

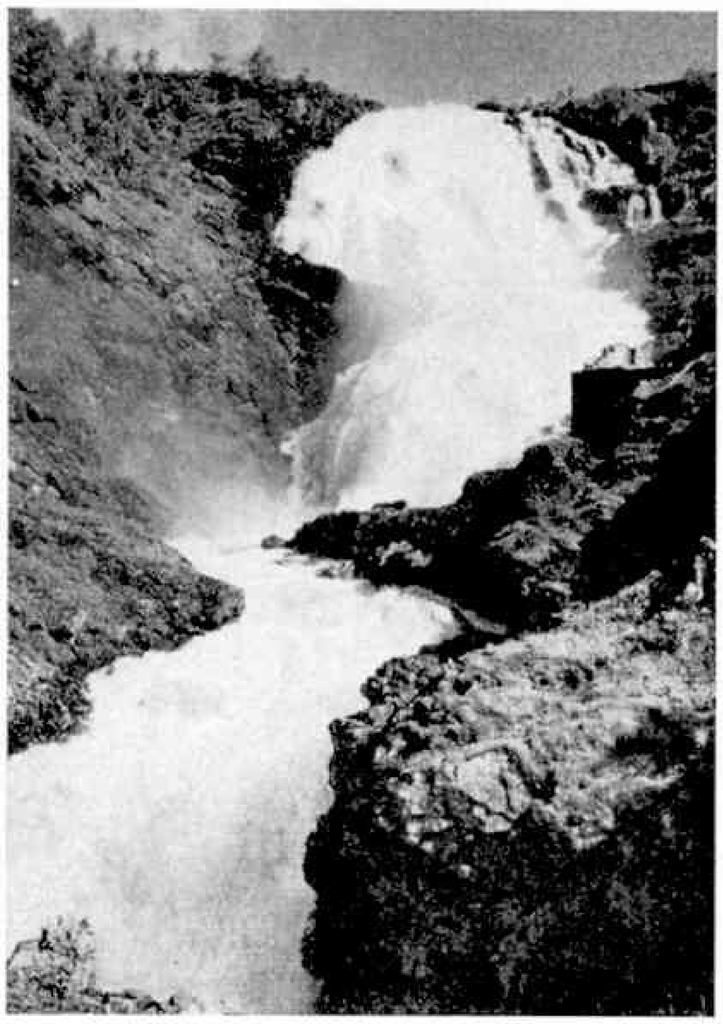
There are two fantastic waterfalls in the Flaamsdal—the breakneck Rjoandefoss Falls—which thunder 400 feet down the side of the Vibmesnosi Mountain, near Lunden—and the Kjosfoss Falls on the east side of the track, just before entering the Bakli Tunnel. Here the train, which is already travelling slowly in order to give passengers a better view of the passing scenery, halts for several minutes on a narrow stretch of track about 100 yards long spanning the mid-way point of the roaring falls.

* * * *

At Blomheller, nearing the figure-eight circuits already mentioned, the Trollaskred, or Troll's Avalanche, is a very real danger in winter. Great falls of snow thunder down towards the railway track and are only halted by the many wooden protective snow-screens in their path. Wooden snow-tunnels, too, as in the case of the Bergen Railway, are a fascinating feature of this line, for where these occur, they cover the permanent way completely, isolating them (*Cont. on previous page*)



Tremendous snowfalls are a problem on Norwegian railways and that is the reason why they have many wooden locomotive and wagon sheds such as those seen in this photograph. This picture, and that at the foot of the page, were taken by the author.



Trains on the Flaam Line make a practice of slowing down, and even halting, to give travellers a clearer view of the scenery. One of the halts is on a 100 yard embankment which passes over the rushing waters of the Kjosfoss Waterfall, seen here.

Getting Things In Focus

THE letter *f* is very important in photography. By itself, it stands for the focal length of a lens, *f*=2 inches, for instance. If you focus the lens of your camera on an object very far away—that is, at *Infinity*—then the distance between the lens and the film equals the focal length. Strictly speaking, focal length is measured from a point inside the lens to the film plane. In modern lenses this point is near the position of the diaphragm or stop.

When followed by a number, however, *f* means something different. The *f* numbers tell you how much light is passing through your lens and, to give you an example, are written, *f* 8, or, more accurately, *f*/8. The figures are fractions and are simply the focal length of the lens divided by the diameter of the hole, or aperture, through which the light passes. If our 2-inch lens has an aperture of *f* 4, this means that the aperture measures one quarter of 2 inches, or ½ inch.

BY H. G. FORSYTHE

All but the simplest lenses have adjustable apertures so that you can control the amount of light going through. Iris diaphragms or "stops", a series of holes drilled in a metal slide, are used. The various settings are numbered, usually in a series like this:

f 4, *f* 5.6, *f* 8, *f* 11, *f* 16, *f* 22, *f* 32.

This complicated looking series of numbers is really beautifully simple because it has been especially chosen so that each *f* number lets through half the amount of light of the previous one. If you look at the diagram you will see how this works.

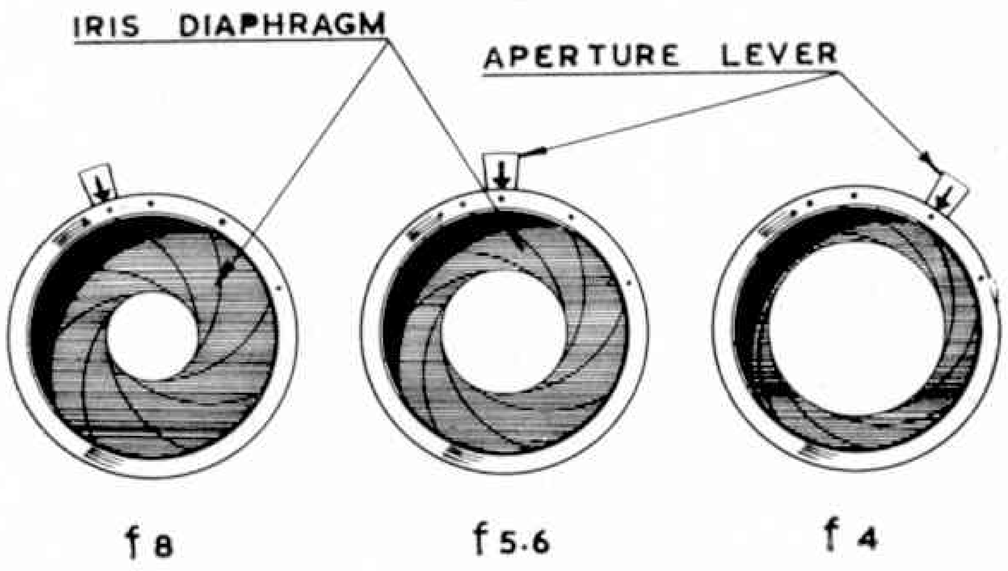
With the aperture lever set at *f* 4 the aperture is large and a good deal of light is let through. At *f* 5.6, the aperture is smaller and only half the amount of light can get through. At *f* 8 it is even smaller still, letting through half the amount of light passed by *f* 5.6, and *four times* less than *f* 4.

Some lenses are marked with other numbers. There are intermediate values like *f* 4.5, *f* 6.3, etc. For practical purposes we can call these the same as the nearest number in the series, i.e. *f* 4.5 nearly the same as *f* 4. Some cameras have their own setting numbers, but these are nearly always related to the fundamental *f* number series.

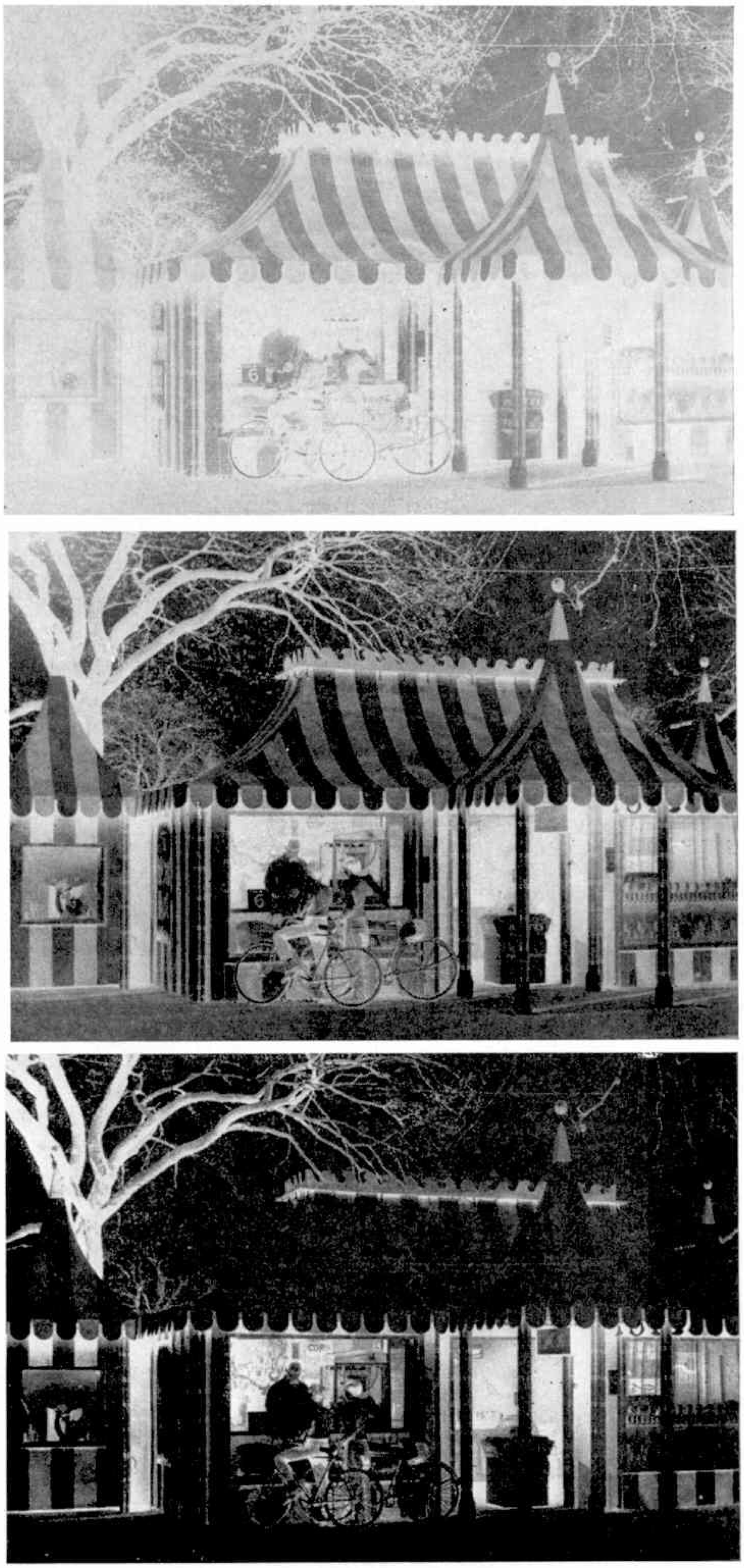
Exposure is the total amount of light acting on the film when a picture is taken. The diaphragm controls the amount of light reaching the film; the shutter controls the time the light is allowed to act. Shutter speeds, numbered in fractions of a second, are arranged like this:

1/25, 1/50, 1/100, 1/200.

Notice that each shutter speed is one (*Cont. on p. 321*)



An adjustable iris diaphragm.



A Veteran Flies Again

AIR NEWS

By John W. R. Taylor

MY earliest memory of anything to do with aviation is of the occasion when, at the age of about eight, I was taken by my father to the R.A.F. Station at Duxford, in Cambridgeshire. The most impressive part of the visit was the sight of a number of Bristol Bulldog fighters stripped down for maintenance in one of the hangars. That is why the recent news that Bristol Aircraft have restored a Bulldog to flying condition was of special interest to me.

There was always something about the aggressive little Bulldog that singled it out as one of the great warplanes of history. The R.A.F. had a total of 293 of the standard single-seat version, plus 55 two-seat trainers, and in the early 'thirties they made up 70 per cent. of Britain's fighter defence force. Others were used by eight foreign air forces.

The particular Bulldog which has been rebuilt made its first flight in 1930. From 1931 to 1935, powered by a French-built Jupiter IV engine, it was based at Filton as a demonstration aircraft. It last flew in 1936, when it was used as a test-bed for the Bristol Aquila sleeve-valve engine, and was presented to the Science Museum three years later.

There could be no better proof of the quality of its all-steel construction than that, after many years at the museum and in store, the basic airframe structure required no repairs. Bristol Siddeley Engines were, however, presented with something of a problem in finding a Jupiter engine of the correct mark to fit in the Bulldog. Eventually, with the help of the Air Ministry, they collected four Jupiters of various types which had been used by the A.T.C. for demonstration purposes. Some had been sectioned, all were incomplete; but between them they contained sufficient good parts to make up the required Jupiter VII. When test run, it developed a power not far from its original 490 h.p.

First flight of the rebuilt Bulldog was made on June 22 by Bristol's chief test pilot, Godfrey Auty. He is reported to have enjoyed the experience, although the little fighter, with its top speed of 174 m.p.h., is unlikely to help much in his preparations to fly the 1,500–2,000 m.p.h. Bristol 188 in the near future.

BIRDS BY THE MILLION

Approximately 7,000,000 young birds are travelling to the Continent by B.E.A. this summer—not in the form of chicken meals either, although that may be the ultimate fate of many of them. As day-old chicks they are providing a total of 350 tons of air cargo, flown by the airline to all parts of Europe.

CHEAPEST AIR SERVICE

More news from B.E.A. is that this airline will offer the cheapest scheduled air fares in the world to passengers flying between London and Scotland this winter. The rate will be only twopence a mile, which is less than the present ordinary second-class rail fare.

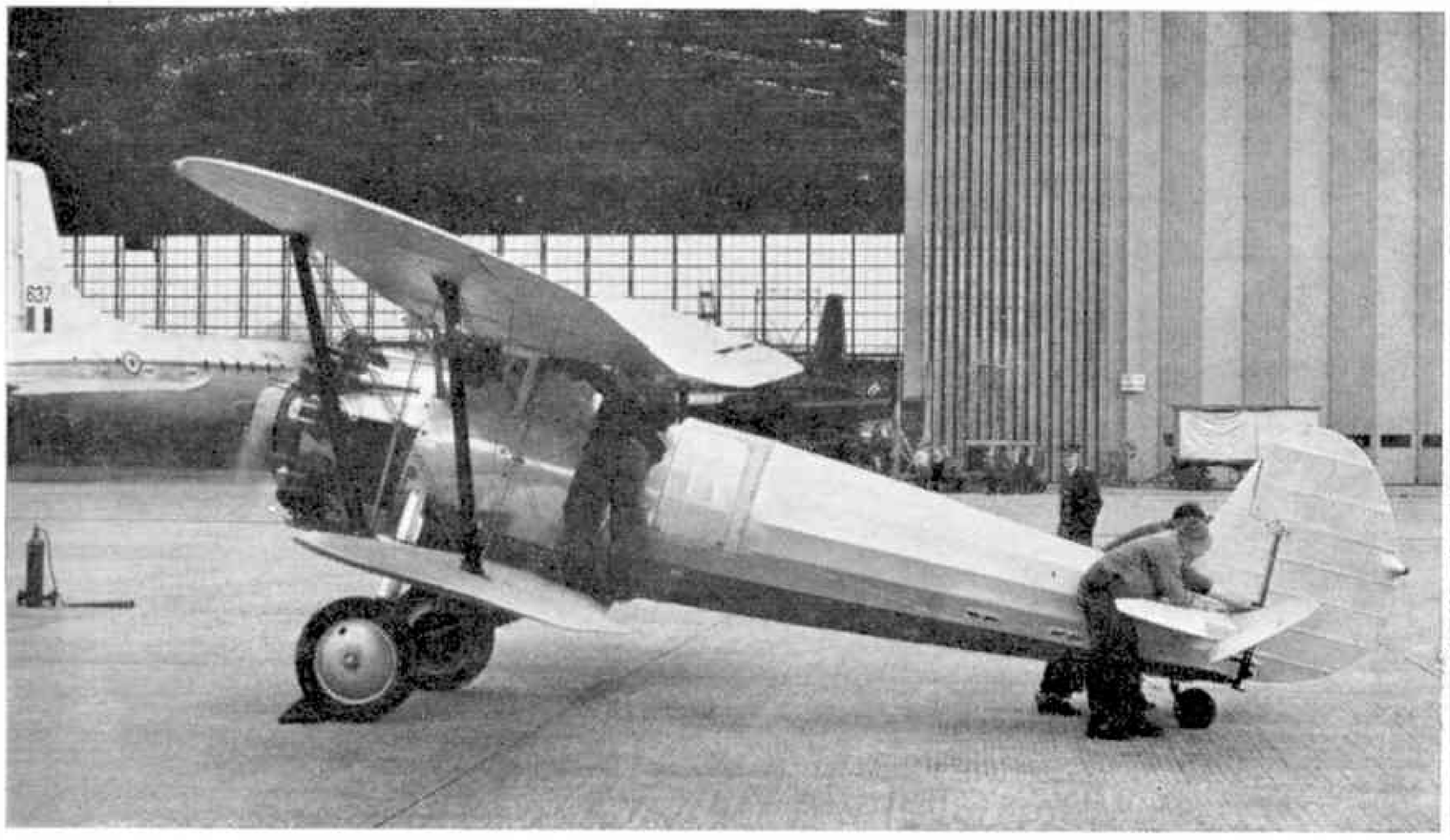
What is more, the people who travel on these services will fly more quickly as well as more cheaply, because B.E.A. are introducing the newest of their turboprop Vanguards, the model V 953, on the route. North-bound flights will leave London (Heathrow) Airport each night at 11.40 and will arrive at Renfrew, Glasgow, only 85 minutes later. From there they will carry on to Turnhouse Airport, Edinburgh. Return flights will leave Turnhouse at 10.15 every night.

The single fare will be as little as 63s. made possible by the great size and low operating costs of the Vanguard, which will be able to carry several tons of newspapers and other freight as well as 139 passengers on the cheap night flights.

PROJECT ASH CAN

Four Vertol H–21 Work Horse helicopters of the U.S.A.F. are spending their time chasing balloons for thousands of miles in the vicinity of Goodfellow Air Force Base, San Angelo, Texas. Needless to say, the balloons are not toy ones. They

An engine run in progress on the Bristol Bulldog fighter which has been rebuilt to flying condition at the Filton works of Bristol Aircraft Limited (left). On right, a view of the 1931 Bristol Jupiter engine rebuilt for the Bulldog fighter.



Above: The first Carvair pictured in flight. Below: The Flying Doctor Service de Havilland Drover Mark III, George Simpson, at Brisbane Airport, Queensland.

each have a diameter of about 90 feet and carry a filter unit to measure radioactive dust in the upper atmosphere resulting from atomic explosions. A close check must be kept on the quantity of this dust, as too high a concentration would be dangerous to all forms of life on earth.

The job is named Project Ash Can because of the shape and size of the original filter units carried by the balloons. Usually, five balloons are released each month, and tracking them is no easy task, for they are sometimes whipped along at more than 150 m.p.h. by jet streams in the stratosphere.

One pair of H–21s chased a balloon for two days, during which it travelled 900 miles from San Angelo to Americus, Georgia. In the end they managed to retrieve it with their special recovery gear and the filter samples were sent, as usual, to radiochemical laboratories for analysis.

A CHANGE OF SHAPE

It is not easy to believe that the bulbous aeroplane in the picture on this page started life as a slender and graceful DC–4 Skymaster airliner. But it did. In fact, the only changes that have been made are the building on of a new front fuselage and an increase in the size of the tail surfaces to "balance" the nose.

The result is known as the Carvair and, although it is not beautiful, it promises to be one of the most useful medium-size freight-planes in the world. By raising the flight deck above the level of the cabin and hinging the nose to form a loading door, its designers, Aviation Traders, Ltd. of Southend Airport, have given it the ability to carry five family cars and twenty passengers at a cruising speed of over 200 m.p.h.

The prototype Carvair, G–ANYB, flew for the first time on June 21. It is the first of ten that will be operated by Channel Air Bridge—beginning in the autumn—to destinations, deep in the Continent, such as Lyons, Strasbourg, Dusseldorf, Bremen, Basle and Geneva, provided that Government approval for such services is obtained.

ABORIGINE HIRED PLANE

An Australian aborigine recently chartered an aeroplane, at a cost of £21, so that he could attend a traditional corroboree with other members of his tribe at Snake Bay, Melville Island.

His brother had died in 1960 and, by tribal law, the brother's house could not be occupied or even entered until it had been painted with ochre to indicate that it had been hidden from the eyes of the dead man's spirits. This had to be done by a near relative exactly one year after the man died. Hence the flight, which must have been the first ever made to lay a ghost!

BOMBER HITCHES A LIFT

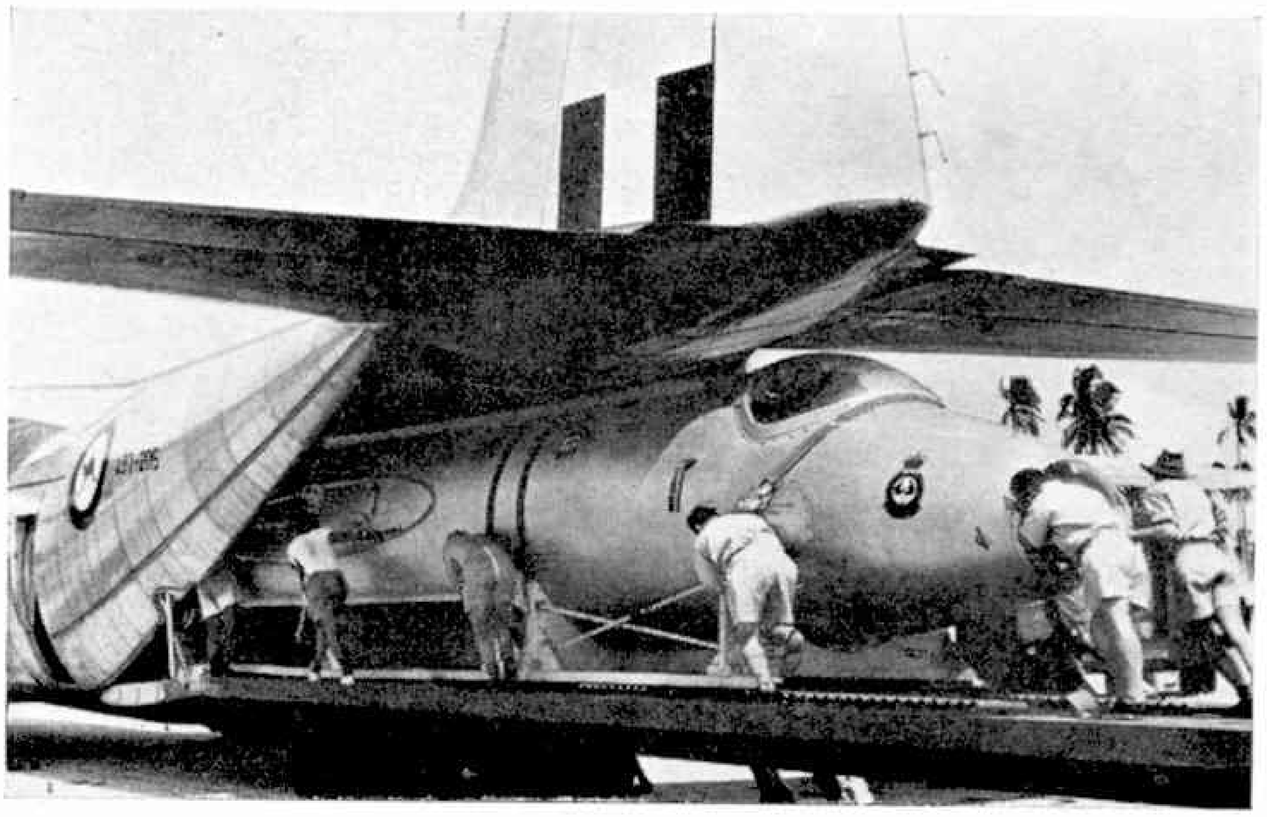
It is no new thing for a damaged aeroplane to be carried to a repair base inside a large transport aircraft; but the casualties are seldom as big as the Canberra bomber which is seen being pushed into the hold of a C–130 Hercules freighter in the picture at the foot of this page.

The Canberra belongs to No. 2 Squadron of the R.A.A.F., based at Butterworth in Northern Malaya. Its fuselage had to be sent back to Australia for major overhaul, so it was decided to see if this would go into a Hercules. It did, and was soon on its way, via Singapore and Darwin, to the R.A.A.F. base at Amberley, Queensland. Before long it will be back in service, with the distinction of being the only Canberra to have flown several thousand miles without wings!

FLYING DOCTOR CHANGE

Readers who watch the popular "Flying Doctor" films on TV will probably notice that there is something different about the Drover ambulance-plane illustrated on this page. Named *George Simpson*, after one of the original Australian flying doctors, it belongs to the Queensland Section of the Royal Flying Doctor Service, and is one of 7 aircraft of this type being fitted with more powerful engines.

Designed and built by the Australian de Havilland Co., the original Drover Mk.1 had three 145 h.p. Gipsy Major engines. These are replaced in the Mk.3 version by 180 h.p. Lycoming engines, which give the aircraft a reserve of power when flying in hilly country or in bad weather.



'Plane within a 'plane—the R.A.A.F. Canberra being loaded into the Hercules.

W. H. Owens Tells The Story Of...

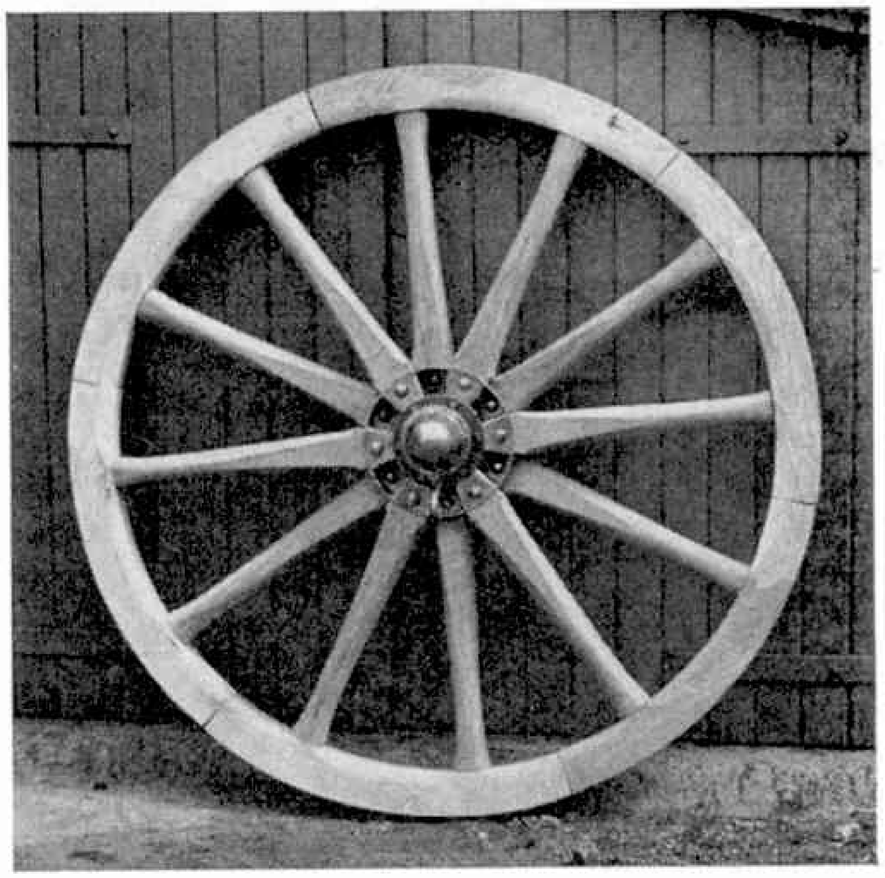
A WHEELWRIGHT IN KENT

ALTHOUGH the horse and cart have in great part vanished from the farms and lanes of Britain, there are still a few village wheelwrights following their ancient trade. But with a difference. For these craftsmen have survived because they have moved with the times, adapting their skill, and modernising their tools and workshops, to meet the changed needs of the countryside.

I called recently on a famous wheelwright in the heart of Kent, who makes the gun carriage wheels for the Queen's Troop, Royal Horse Artillery. Mr. Isaac Ellis of Tudeley, near Tonbridge, has been working at the trade for more than 50 years and is known throughout the county. Today, his son Ernest is a partner with him in a flourishing business that combines the old hand skills with modern engineering practice.

In the yard surrounding the small workshop on Tudeley Green I saw wagon wheels of all sizes. A very fine, brightly-varnished one, over four feet high, stands just outside and serves as the Ellis sign, or trade-mark. Inside the workshop, however, father and son were busy putting the finishing touches to a special commercial body for a Ford 12 cwt. chassis and cab.

Vehicle body building, as Mr. Ellis told me, is an important part of the modern wheelwright's trade. It requires much of the same kind of skill as the old-time farm wagon construction, and there is always great demand among rural tradesmen and others for these special bodies.



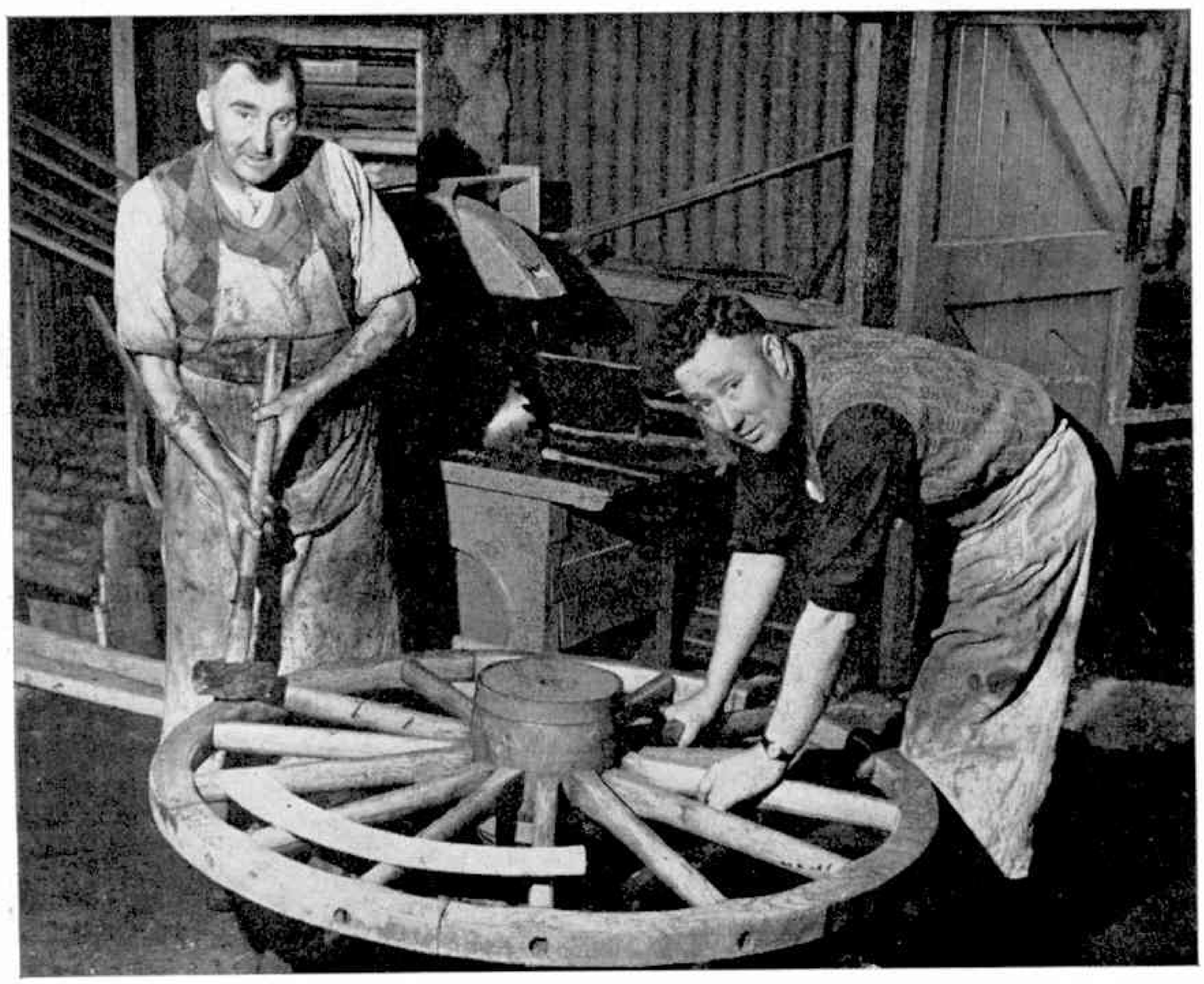
A gun carriage wheel, made for the Royal Horse Artillery, before the tyre has been fitted.

Nevertheless, Isaac and Ernest Ellis, like all working wheelwrights, can produce superb wagon or carriage wheels in the traditional way whenever these are required. They are the only two craftsmen in Britain who now make the wheels for Army gun carriages, and the carriage that represented the Royal Horse Artillery in the procession at Queen Elizabeth's Coronation was fitted with wheels produced at Tudeley.

Wheel's three parts

A wheel consists of three parts, namely, the hub, the spokes and the felloes (pronounced "fellies"), which form the outer rim. In the case of gun carriage wheels, special hubs are supplied by the Ministry concerned. But the hubs of all other wheels are turned on a power-driven lathe from blocks of prime oak. Mr. Ellis, incidentally, reminded me of the days when they had to be laboriously hewn to shape with hammer and chisel!

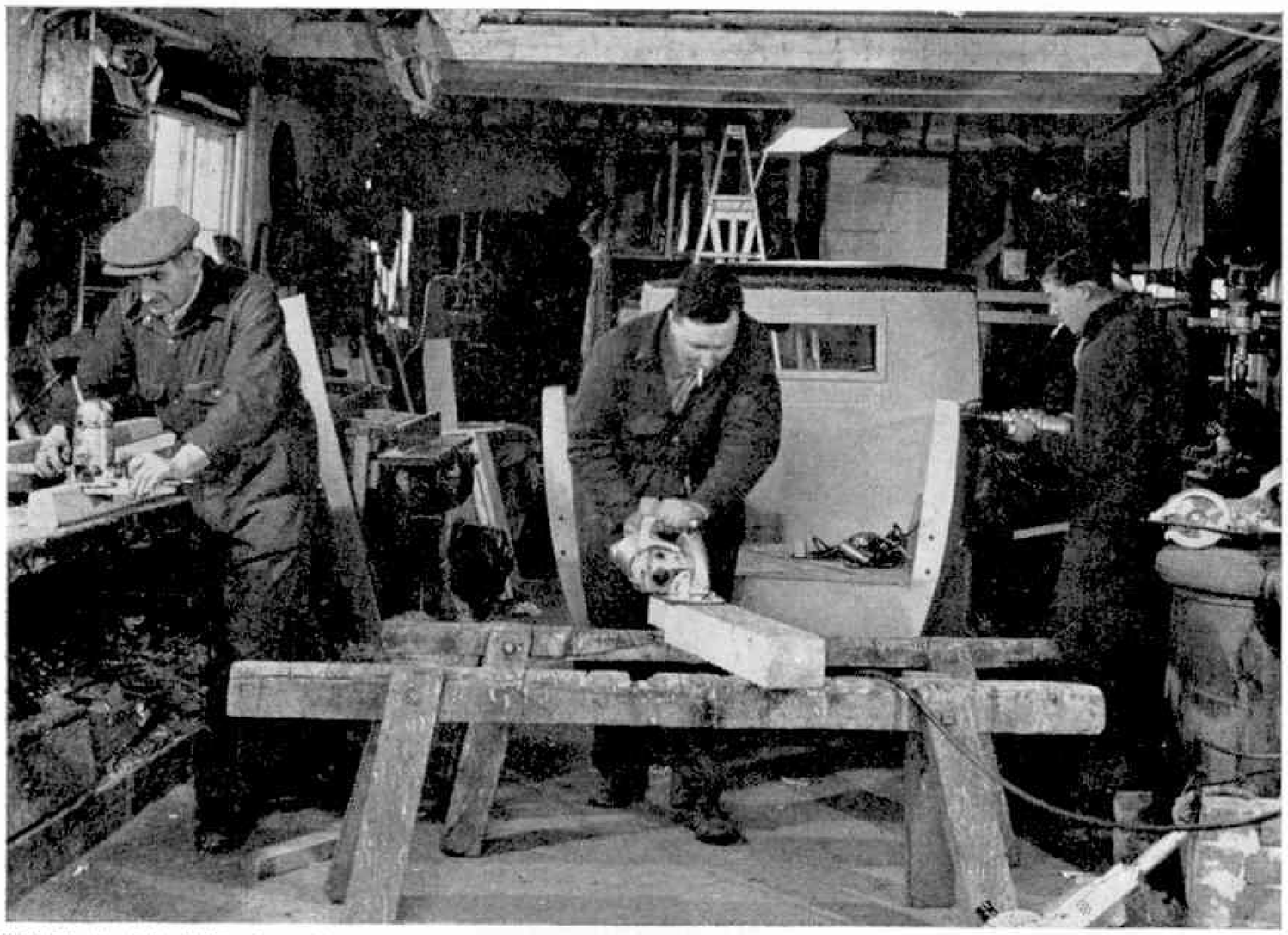
The spokes are still finished by hand before being knocked into the holes drilled for them around the hub; then the felloes are cut to shape from planks of ash wood,



Mr. Ellis and his son Ernest are seen fitting the spokes to a new wheel in their workshop at Tudeley. Picture by courtesy of the *Kent and Sussex Courier*.

three and a half inches thick, and drilled on the inner side to hold the tapered ends of the spokes.

Making and fitting the iron tyre is a job for the blacksmith, and is still done the old way. The wheel is laid flat on the ground and the red-hot hoop of iron placed round it. Then the tyre is rapidly cooled with water so that it contracts and grips the wheel tightly. Under this treatment the spokes become firmly embedded in the felloes, making the whole wheel secure.



Vehicle bodybuilding is an important part of the modern wheelwright's job. Here Mr. Ellis, his son and their assistant are pictured building a small van body. This photograph and that at the top of the previous page are reproduced by courtesy of Ellis & Son.

Because the two crafts were interdependent, the wheelwright's shop and blacksmith's forge usually stood side by side in every village. So, in Tudeley today, the Ellis workshop adjoins the forge of Mr. Wigmore, the blacksmith. The men work together in friendly co-operation, not only over the making of wheels but in all sorts of other farm construction jobs that require the skills of both.

Differences in design

Wheelwrights were always among the most individual of country workers, since in the old days farm wagons had to be built specially to suit the local soil conditions and contours of the land. Wagons built by a wheelwright in one county might be very different in design from those made by a craftsman in the next. Old farm wagons are, therefore, most interesting examples of bygone craftsmanship. Here and there in the countryside you may come across ancient wagons which, although long since retired from active farm work, are still in a perfect state of repair. While such differences count for much less in the modern farm trailer, Ellis-built trailers are, nevertheless, designed individually according to each customer's special needs.

Isaac Ellis was born in the village of Five Oak Green, only a mile away from his present workshop, and on leaving school immediately became apprenticed to a local wheelwright, who taught him every facet of the ancient trade.

A far-sighted move

After serving with The Buffs in the 1914–18 War, he realised that motor transport was, even at that period, developing so quickly that it might one day threaten the livelihood of the traditional wheelwright. So the far-sighted young man went up to London and spent some years with a firm of motor body builders in the Euston Road, heart of the capital's car trade. Then, after a further spell with coach builders in Tunbridge Wells, he set up in business for himself at Tudeley.

Those earlier years were well spent, for today something like threequarters of all the work handled by Ellis and Son is coach building of one sort or another. There is also a good deal of repair and maintenance of farm machinery and equipment, the making of harrows, ladders and so on.

But Mr. Ellis is naturally proudest of his wheels, which have been exhibited at agricultural and other shows all over the country, and even at international displays both here and abroad.

Photographers' Page—

(*Continued from page 317*)

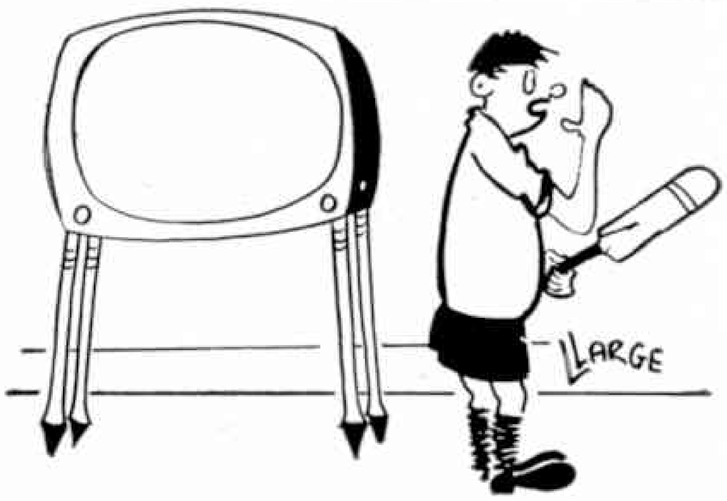
half of the previous one. This means that it is very easy to use diaphragm and shutter together to give a wide control of exposure. Here is an example: 1/25 second at an aperture of *f* 8 is a certain exposure. It is actually the same as 1/50 second at *f* 5.6, or 1/100 second at *f* 4. Work out some similar examples for yourself, and you will soon see how easy it is to understand.

Getting the right exposure is essential for good results. Our picture this month—on page 317—all of the same scene, are reproductions of *negatives*. Study them carefully and compare them with your own. Number 1 is under-exposed. It is very thin, with little detail visible. This negative would give a dull, grey, lifeless print. Remedy: More exposure. Use a slower shutter speed and/or a wider aperture.

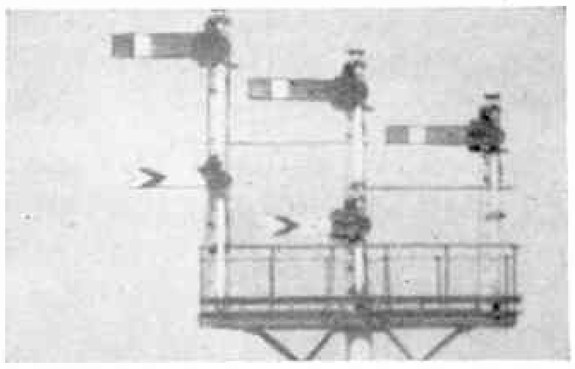
Now consider No. 3. That is over-exposed. It is black and will not make a good print. Much detail is lost in the dense black parts. Remedy: Less exposure. Use a faster shutter speed and/or a smaller aperture.

Finally, look at negative No. 2. That is just right—clear and full of detail everywhere.

Next month: Choosing the right aperture for the job, and another "mysterious" subject: "Depth of Field".



"Dad . . . Can I have my wickets?"

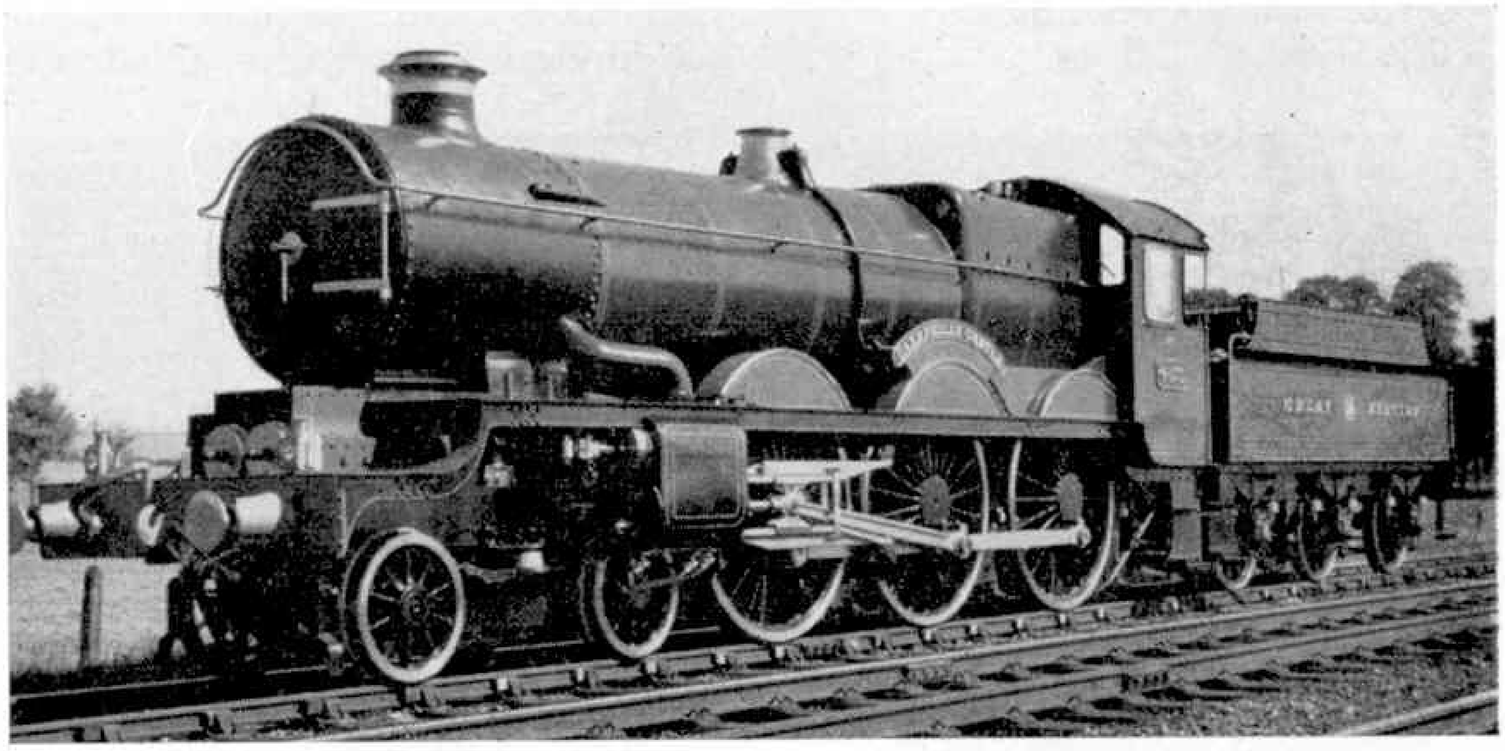


RAILWAY NOTES

Contributed by R. A. H. Weight

ELECTRIC SUBURBAN SERVICES

IN my article *Spotlight on the Great Eastern Line* (published in the *M.M.* for November 1960) I mentioned that considerable electrification was imminent as an extension of local and outer suburban services based on Liverpool Street terminus. Additionally, there is the conversion from the 1,500-volt D.C. system, in use until last winter for the trains to Shenfield, and thence to Southend-on-Sea or Chelmsford, to general use of the high voltage 50-cycles A.C. overhead system as already employed on the G.E. Line, Clacton–Colchester section (soon to be joined to the Chelmsford–Liverpool Street service) and between Manchester and Crewe. This requires rather lighter wiring and catenary equipment. The full 25,000-volt system is restricted to the outer lengths north of Shenfield



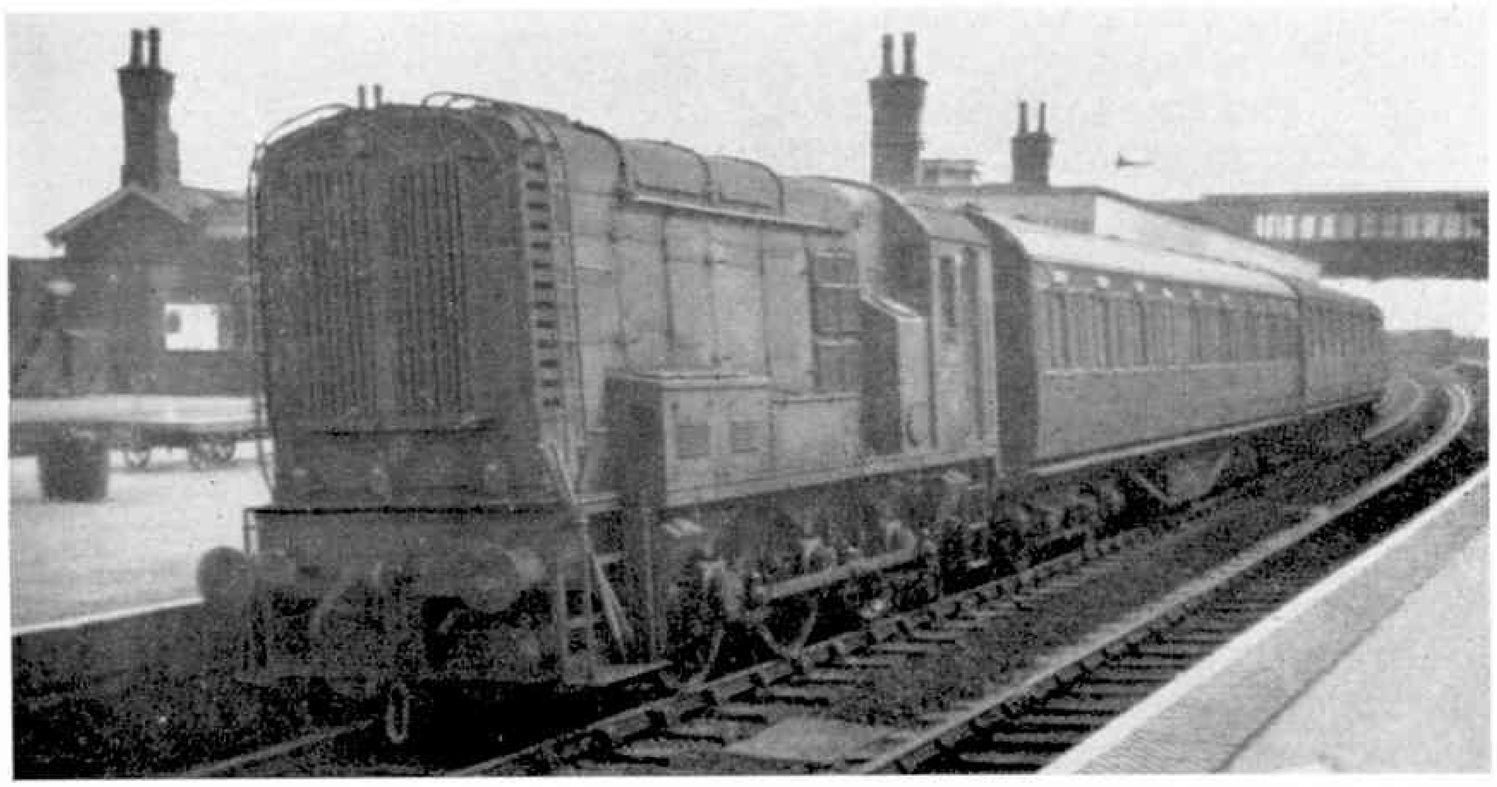
A striking view of G.W.R. No. 4073 "Caerphilly Castle" built in 1923, the first of a distinguished locomotive class, as recently restored for preservation. The low-sided type of tender shown was attached to the earlier Castles. B.R. Western Region official photograph.

or Cheshunt, the bulk of the new working being with current taken at 6.25 kV in all the built-up suburban areas where there is dense population and traffic.

There were, for a time, occasional electrical and other troubles in connection with this entirely new system of traction for intensive passenger service, although I found all running well. Regular, frequent-interval trains were capable of remarkable acceleration, providing strikingly quicker overall journeys—including stops between London and Chingford or elsewhere—compared with experience of steam tank engines spread over many years.

The Chingford trains diverge from the other 10–11 mile suburban route which has stations close together—to Enfield Town—at Hackney Downs, three miles from Liverpool Street. Up to Lower Edmonton, and over the non-stop section southwards from that point, the latter tracks are also used by the new outer suburban service to Bishops Stortford. This conveys through portions for Hertford (East), detached at Broxbourne, and running via the hitherto little-used Southbury loop line (now reconditioned) to join the Cambridge main line at Cheshunt. The fourteen miles south of Cheshunt, on the main route, are covered for local purposes by diesel trains running to and from Liverpool Street or Stratford.

Very fine new stations have been built at Broxbourne and Harlow Town, and much preliminary bridgework, new signalling and other improvement schemes have been completed as part of the great transformation. The trains in which I travelled were formed of two three-coach sets: each consisting of a driving trailer, motor coach with guard's van and pantograph (centre), and another driving trailer, all second class. There are also four-car sets including first-class accommodation for the longer distances. Some of the present



A diesel-shunting locomotive at Wellingborough moves off to the sidings with two coaches detached from the rear of a departed train. Photograph by J. K. W. Pearse.

rolling stock is intended for the London, Tilbury and Southend line, soon to be electrified from Fenchurch Street.

DISC-BRAKED FREIGHT WAGONS

The first railway vehicles in the world to go into regular service fitted with disc brakes are a new type of large, 21-ton coal wagons which discharge their loads through doors in the bottom of the trucks. The automatic, two-stage disc brake consists of a double-fulcrum device mounted on a horizontal vacuum cylinder. The force from the vacuum cylinder is transmitted to a caliper mechanism that presses non-metallic brake pads against machined faces on the webs of the rail wheels. The system, developed by British Railways' Central Staff in conjunction with Girling Ltd., can achieve a more consistent braking performance, it is claimed, with less possibility of local overheating.

These disc-braked wagons run regularly in express freight trains conveying bulk loads of coal from Nottinghamshire pits to a distributing depot at Palace Gates, in North London, on the G.E. Line, and close to a junction with the Great Northern. Other mineral wagons of different sizes are to be similarly equipped and tried out, and are expected to yield considerable advantages.

TWO SPLENDID EXHIBITIONS

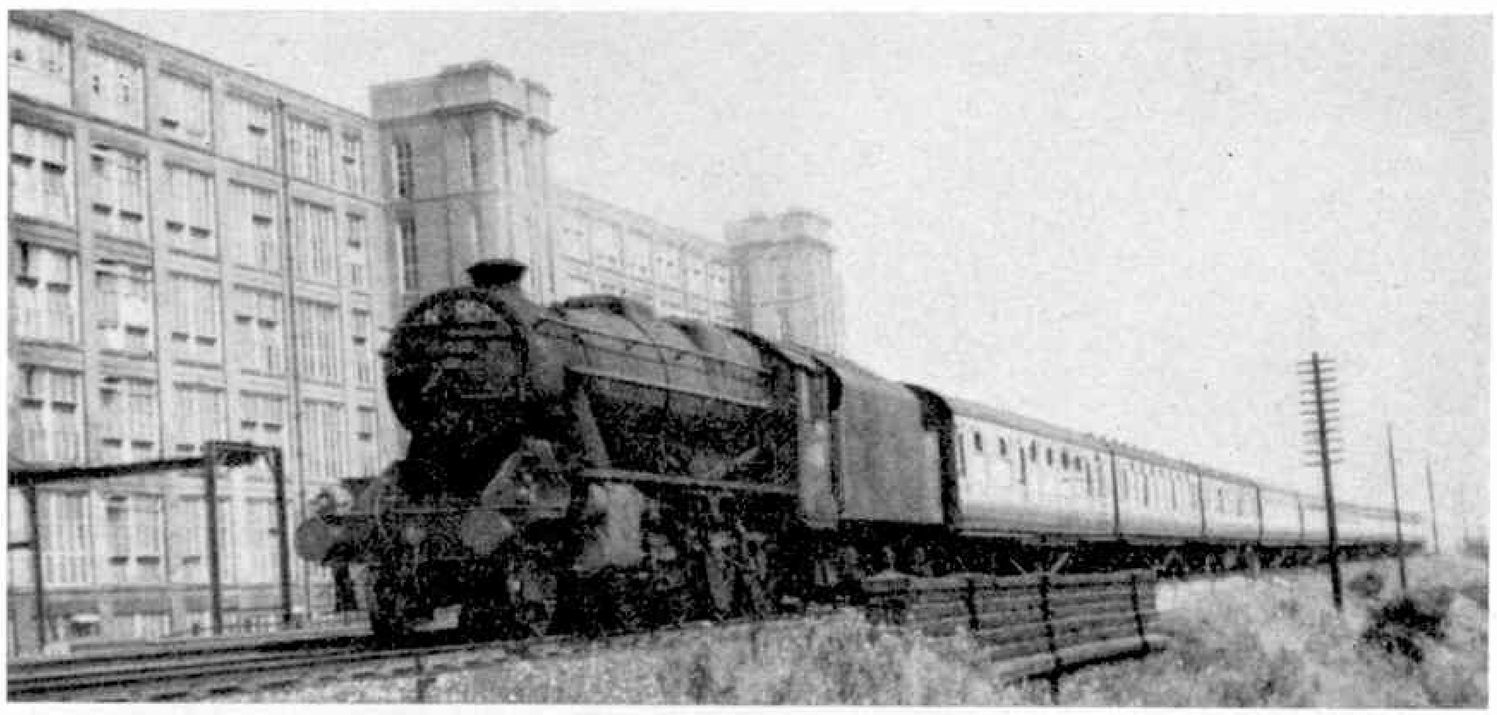
The British Transport Commission recently organised, in London, two fine exhibitions, one in connection with the golden jubilee of the Institution of Locomotive Engineers, which took place in May, and the other at the International Architects' Congress, held in July. Both displays were open to the public on several days. The first one, at Marylebone Parcels Depot, featured an impressive range of new and recent locomotives parked in the sidings, including diesel-electric No. D9003, diesel-hydraulic No. D7000, gas turbine No. GT3; 2–10–0 *Evening Star* and 4–6–2 *Duke of Gloucester*, both steam. Famous engines of older styles, in spotless condition, were the streamlined Pacific *Mallard* and the restored Midland compound 4–4–0 No. 1000.

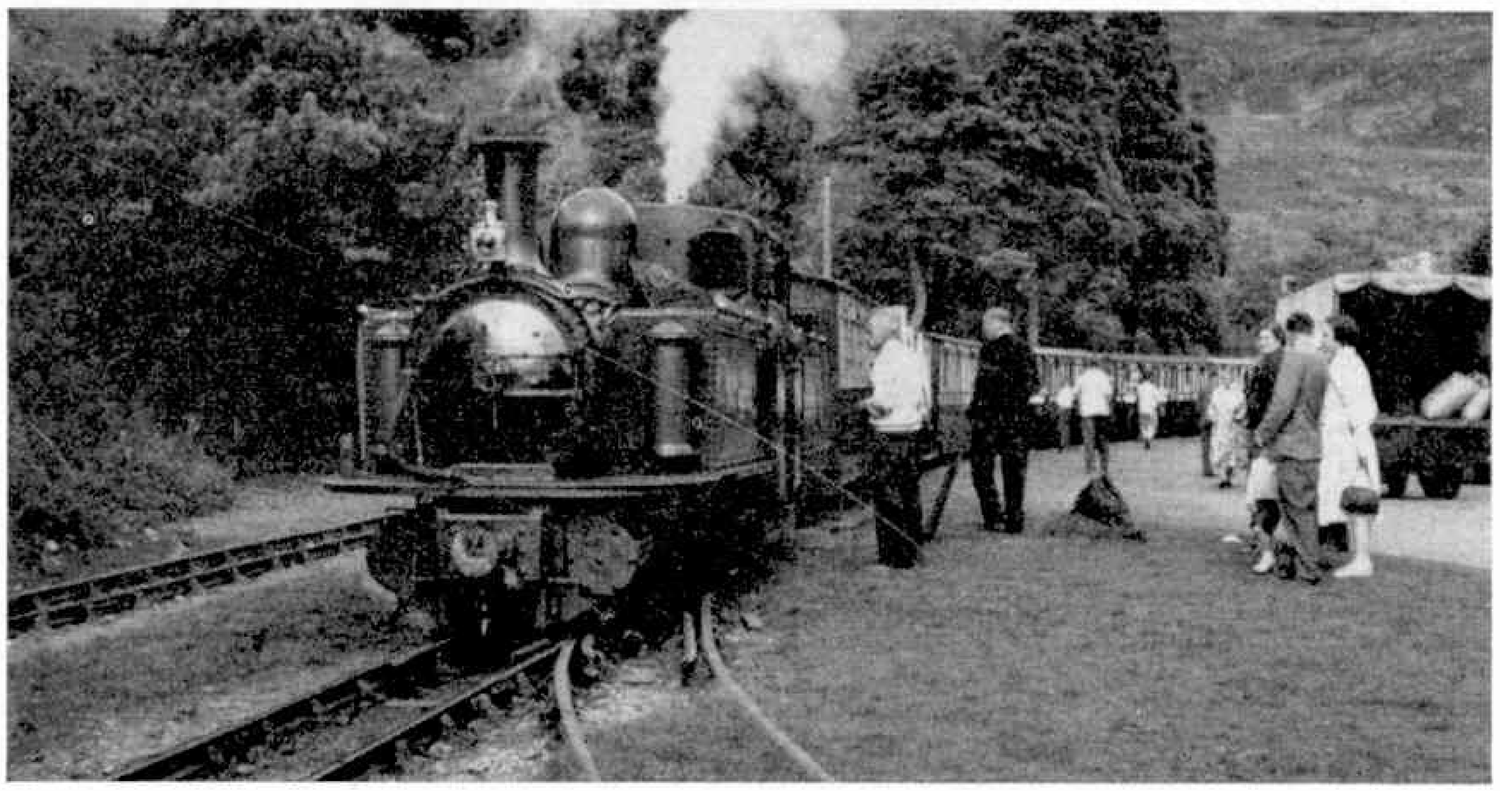
Electric main line and other diesel locomotives were also on display, together with choice examples of modern coaching stock, such as sleeping and restaurant-buffet cars, and diesel and electric train vehicles including new-type A60 "silver" coaches for the London Metropolitan extended electric services.

Seen for the first time was the remarkably equipped Western Region's new dynamometer car, for general British use, which was converted from a corridor carriage. The elaborate testing equipment in this car will enable every kind of locomotive or traction performance—such as speed, drawbar horse power, tractive effort, brake pressure and so on—to be measured with meticulous accuracy and visually recorded on charts by electronic and other means. The car also contains comprehensive staff accommodation, a mobile laboratory and powerful diesel-electric generating set. It usually runs attached to an ordinary or special train.

The other exhibition was indoors, and comprised models of the latest rebuilt stations—and of some now in hand—together with other constructional plans and drawings prepared by British Railways' or London Transport architects, and colour transparencies. Other design displays included attractive furniture for stations and ships, in full size; sections of the most modernised refreshment rooms, and a docks passenger terminal at Hull.

Below (top): L.M.R. No. 48202, an 8F 2–8–0, lends a hand with passenger traffic on a Blackpool Special photographed passing Castleton Mill by R. S. Greenwood. (Bottom): One of the well-known double Fairlie locomotives of the Festiniog Railway, "Taliesin", since re-named "The Earl of Merioneth", prepares to leave Tan-y-Bwlch with a train for Portmadoc. Photograph by R. F. Roberts.





BRITAIN'S FASTEST TRAIN

The recent supremacy of the W.R. *Bristolian* and the current 68 m.p.h. Swindon–Reading quickest short run will be ended (and their running allowances increased as a part of the revised standard-time services announced in last month's *M.M.*) from mid-September, when the autumn–winter timetables come into force. Then, the northbound *West Riding*—leaving King's Cross at 7.45 a.m. for Sheffield, Leeds and Bradford—will be booked to cover the 106½ miles between Hitchin and Retford in 89 minutes start to stop, at an average of almost 72 m.p.h. This is decidedly the quickest-ever for such a journey, although for two years or more immediately prior to the outbreak of war in 1939 the L.N.E.R.'s streamlined limited-load "flyers", hauled by A4 Pacifics over longer distances, averaged just over 70 m.p.h. from London to York or Darlington. So did the G.W.R. *Cheltenham Flyer* (as it was generally known, although not so described in timetables) over the shorter 77-mile course from Swindon to Paddington, with Castle 4–6–0 haulage and seven coaches.

Other very considerable accelerations are also taking effect along the East Coast main line to and from Kings Cross, with more expresses intended for haulage by Deltic Type 5 D9000 class diesel-electric 3,300 h.p. locomotives. Newcastle and Leeds will be brought within four and a quarter and three hours respectively of London by the quickest businessmen's services, and there will be a number of other start-to-stop schedules averaging 60–67 m.p.h., including various gradients and slowing-down points.

The fastest 67 m.p.h. W.R. timings will be provided by *Bristol Pullman* diesel express runs from Paddington to Chippenham or Bath, etc.

A FLYING START...

STORY OF THE R.A.F. APPRENTICES' SCHOOL, HALTON

THIRTY-FOUR years after Lindbergh's solo flight across the Atlantic, a jet bomber completed the same 3,669-mile journey in three hours and nineteen minutes. This feat would not have been possible but for a Halton apprentice named F. Whittle, the inventor of the jet engine, who was later to become Air Commodore Sir Frank Whittle, K.B.E., C.B., F.R.S. The Aircraft Apprentices' School at Halton, in Buckinghamshire, owes its existence to the foresight of another famous man, Lord Trenchard, the first Chief of Air Staff and the "father" of the Royal Air Force. More than 25,000 men have passed through this apprentice scheme since the first entry in June 1919. Some have achieved high rank, some have won coveted awards; many gave their lives during the war so that others might enjoy the peace which followed.

By
HUMPHRY GORE

More than 5,000 ex-apprentices have been commissioned, but this figure includes the war years, when there were more than the normal opportunities for gaining a commission. One ex-apprentice is now a padre with the rank of wing commander; another is Mr. Cliff Michelmore, of television fame.

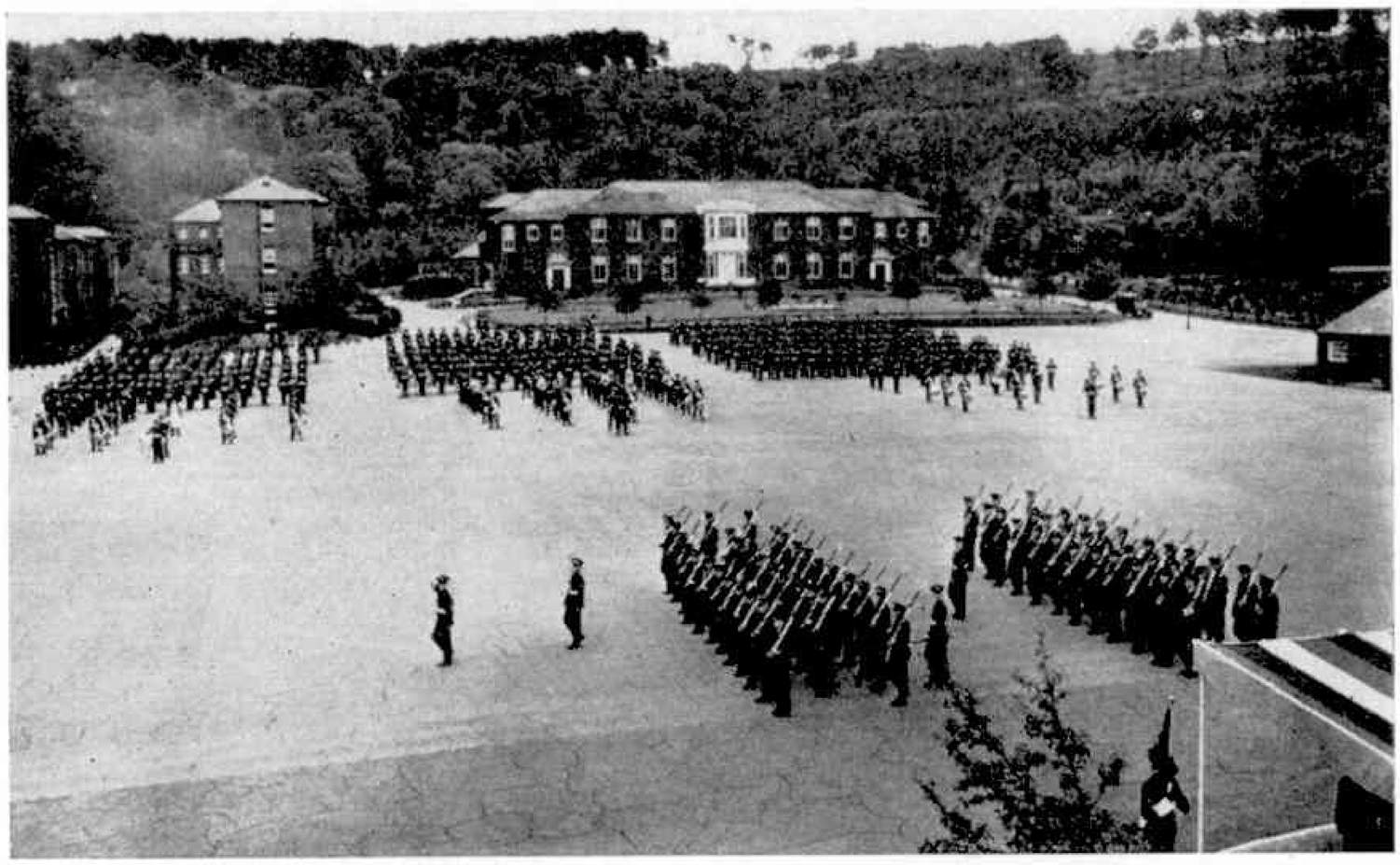
The present Commandant of Halton is Air Commodore T. N. Coslett, C.B., O.B.E., who is the first apprentice to command the station from which he graduated. He is now to be promoted to command the Group of which Halton is one of the stations. A large number of one-time apprentices there are now holding responsible and well paid jobs in the aircraft industry.

* * * *

The glittering achievements of some individuals should not obscure the fact that Halton's task is to turn out trained technicians—experts at servicing airframes, engines, instruments, armaments and electrical fittings. There are also dental technicians. The majority of apprentices rise to senior non-commissioned or warrant rank from which there are opportunities of obtaining branch commissions at the age of about thirty. A few apprentices of exceptional ability are selected, at the end of their training, for Flight Cadetships at the R.A.F. College, Cranwell, or Technical Cadetships at the R.A.F. Technical College, Henlow, or for direct commissions.

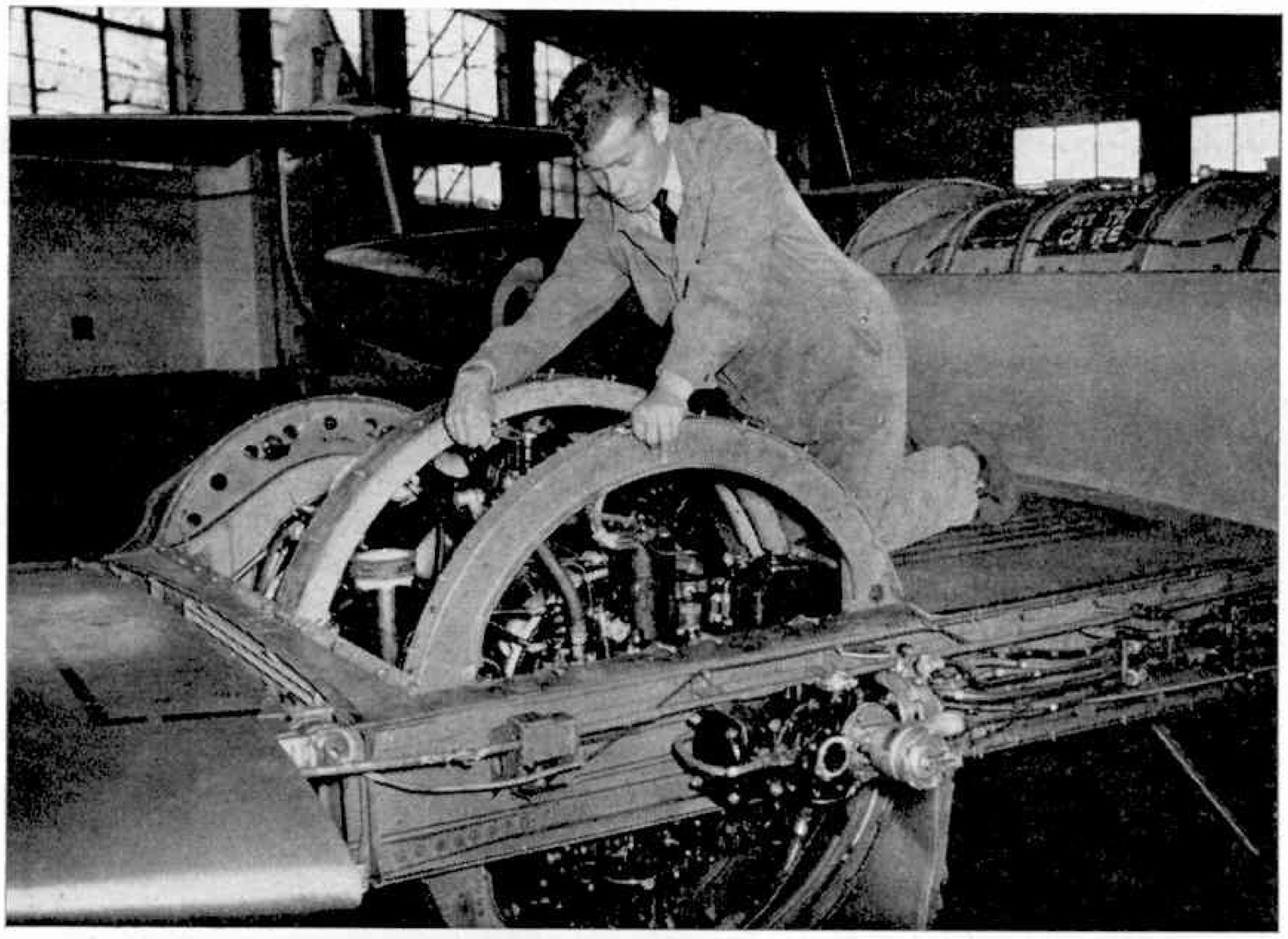
A fair proportion of boys are from grammar schools, but there is also great scope for the secondary modern schoolboy who wants to gain further education and a qualification.

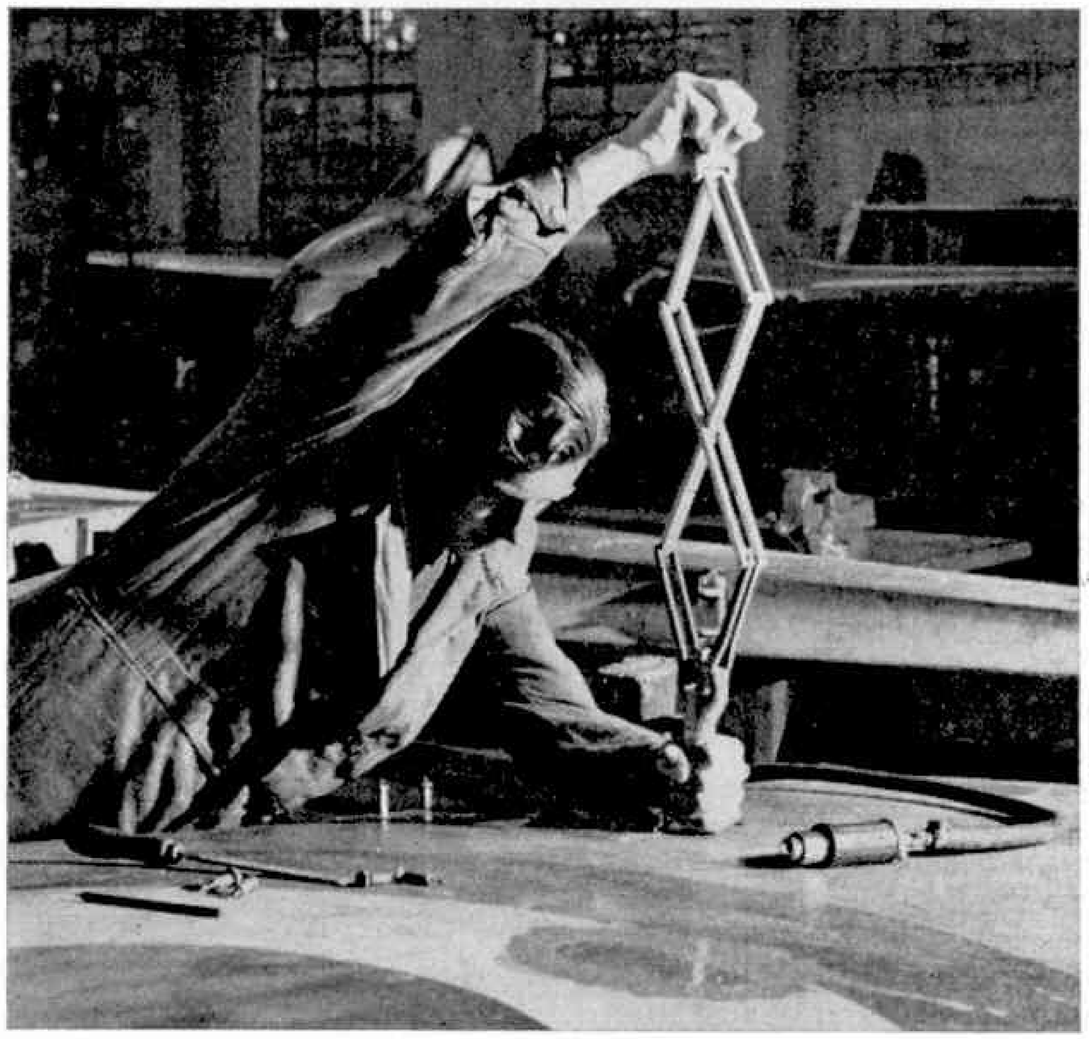
Apprentices in the top stream can take the Ordinary National Certificate without going to a civilian technical college: many



R.A.F. Cadets march past the reviewing stand during a passing-out parade at Halton. All the pictures illustrating this article are British Official Photographs (Air Ministry): Crown copyright reserved.

Recreation plays its part in the activities at the R.A.F. Apprentices' School. Here two apprentices with a love of horses are practising jumping.





Corporal Aircraft Apprentice M. A. Sutton is seen here at work on a Meteor engine at Halton.

Learning to be an airframe fitter is the Leading Aircraft Apprentice seen on the left. He is riveting a mainplane.

others take City and Guilds examinations. G.C.E. examinations are held twice a year and each time there are between 350 and 650 subject entries from Halton. Up to 70 per cent. have been successful. A few apprentices even take subjects at "A" level.

For the apprentice who gains a Cadetship to Henlow there is a chance of taking a degree course, and two former apprentices at Halton are at university now.

One quarter of the instructional time is devoted to education to ensure that the boys have sufficient background knowledge to absorb the technical instruction.

Discipline is essential to Service life. This is sensibly applied, leading to a sense of self-discipline. Crime, in the Service sense, is extremely rare. Unlike an airman of 17½, an apprentice of the same age is not regarded as being on "man's service" and is subject to more restrictions. This is cheerfully accepted, bearing in mind the greater rewards which can follow the successful completion of the course.

Under the Commandant are two Group Captains—one responsible for education and the other for technical training. There are three Wings, each of which is divided into three Squadrons of two or three Flights.

Squadrons contain two or three hundred boys and each new "entry" of boys becomes the junior Squadron of the junior Wing. After the first year, the boys are transferred to one of the two senior Wings where they remain for the last two years of the three-year course.

For the instructors, Halton is not just a quiet home posting with regular hours. Taking a real interest in each apprentice means that not only must they keep meticulous records of progress at every stage, but that they must also take part in the many outside activities, from gliding to bell ringing.

Boys from Ceylon, Venezuela, Rhodesia, Burma and elsewhere are given extra help in adjusting themselves to a strange environment and learning highly technical subjects in what may be a foreign language. Officers and NCOs are specially selected for service at Halton.

For students and staff it is far from being all work and no play. The playing fields, indoor heated swimming pool and gymnasia compare more than favourably with those of the best public schools. Forty Soccer pitches, a dozen cricket pitches, facilities for hockey, Rugby Union football, tennis and squash, a nine-hole golf course and a running track and stadium are all to hand without time-wasting journeys in draughty lorries.

Every summer there is a two weeks' camping period which develops resource and initiative. This year, it includes an escape and evasion exercise on the wild moorlands of the West Country.

Sailing has always had official support from the R.A.F., for not only does it teach self-reliance, but the ability to handle a small boat may save lives in the event of an aircraft ditching in the sea. Near to Halton is a reservoir where the sailing club has a large and enthusiastic membership.

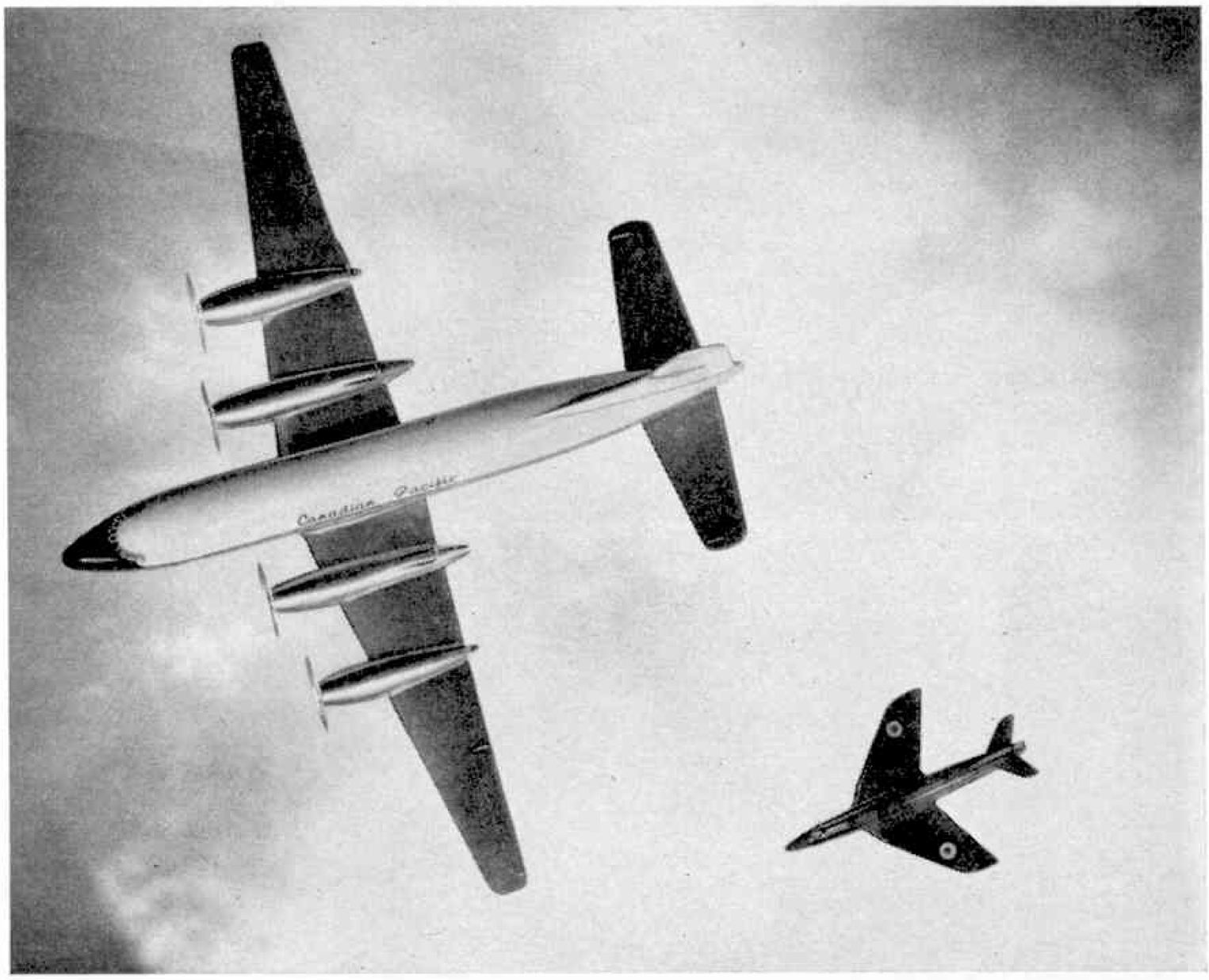
Boys are encouraged to develop as wide a range of interests as possible and in this the Halton Society plays a big part. Drama, art, chess, photography, angling, natural history, Scouting, printing and archery all have their devotees. The apprentices themselves do most of the organisation with the minimum of official supervision.

During their last term, apprentices do airfield training when they service aircraft under conditions similar to those they will find in an operational squadron. Each boy has at least a couple of flights in training aircraft which are often piloted by the officers of their Wing.

Towards the end of the three-year course the training of the different trades overlaps to some extent. An engine fitter, for example, must have a good knowledge of the electrical trade. An electrical or instrument fitter must have a good idea of the problems facing the armament fitter, for modern armaments have complicated electrical systems. This broadening of the field of knowledge is vital to a senior NCO or technician in charge of a team of different tradesmen working on a large aircraft which may contain up to twelve miles of electrical wiring. Aircraft are, indeed, becoming more complex all the time.

Radio and radar are vital to any aircraft, but these trades (*Cont. on page 345*)

How To Take An "Aerial" Shot



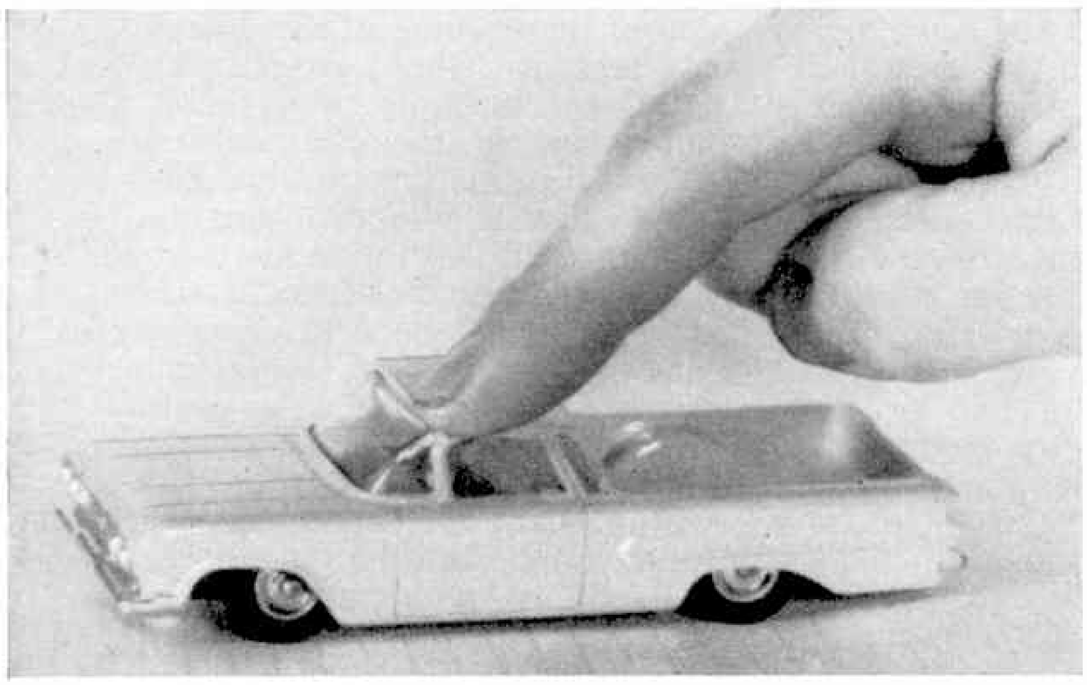
Just how realistic you can make your model aircraft appear can be seen from this picture. Full details are given in the text.

AT first glance, the picture on the right, which appears to be an aerial shot of a Bristol Britannia and a Hawker Hunter flying above cloud, might have come from the pages of an aircraft journal. But no aerial photographer took this picture. It was taken at "studio level"—if one may use that phrase—and is a case of clever use of trick photography. Actually, the aircraft shown are both Dinky Toys models, the Bristol Britannia being No. 998 and the Hawker Hunter No. 736 on the Dinky Toys list.

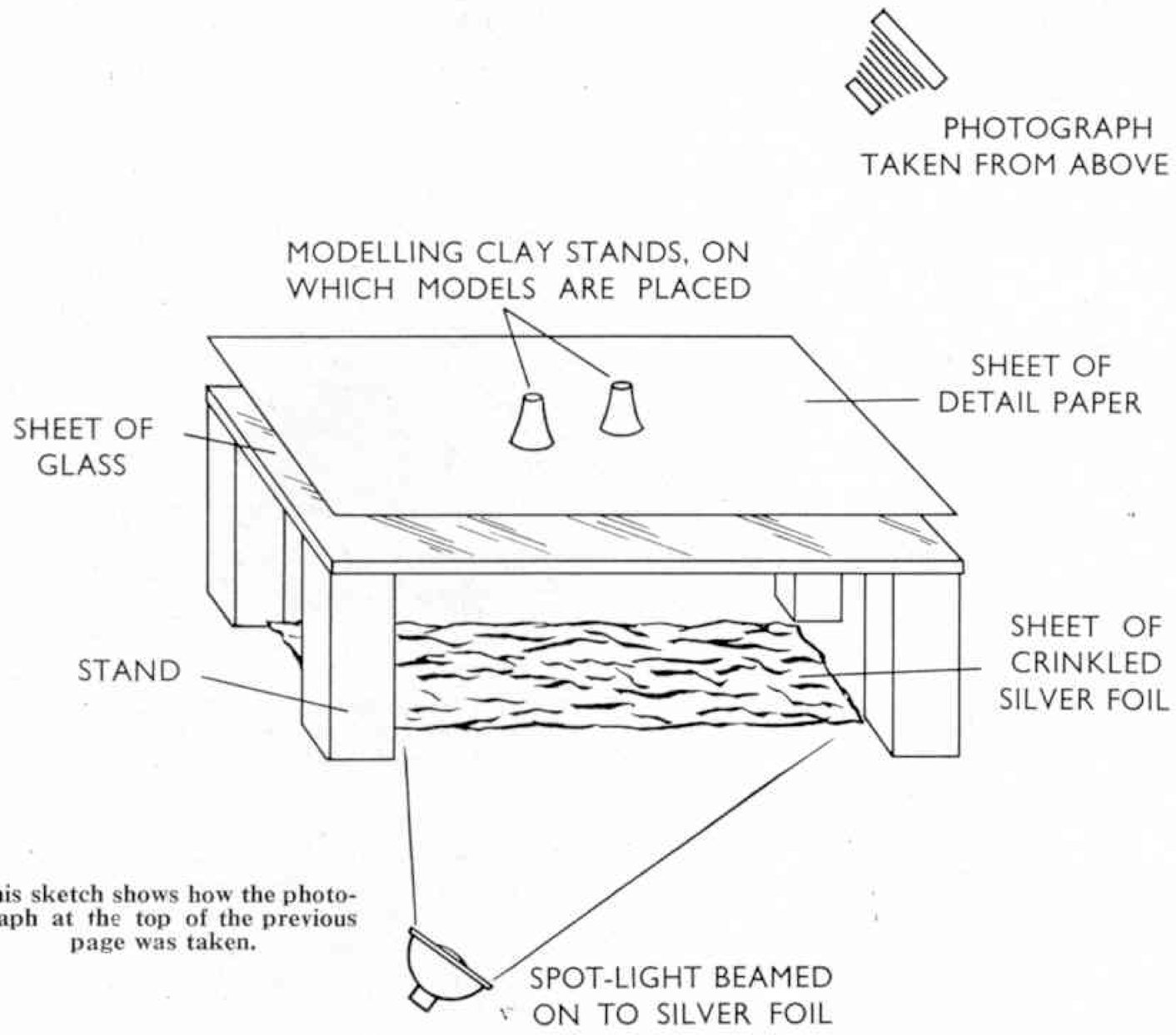
I have provided a sketch, which appears at the top of the next page, showing how this was accomplished. A piece of crinkled silver foil was placed a short distance beneath a plate of glass on which was laid a clean sheet of tracing paper. The models to be photographed were then fixed above the tracing paper by means of modelling clay or Plasticine. A spotlight or strong electric lamp was then trained on the silver foil and a photograph was taken from above the models. On the sketch opposite, the position of the camera is approximate. If you attempt to take a picture of this sort remember that the camera itself should be at such an angle as to ensure that the modelling clay which holds the models in place is completely hidden by them. One other point—the nearer the silver foil is to the tracing paper, the heavier the clouds appear.

The whole apparatus must also be lit from above, so that details of the models can be seen. If overhead lighting is not supplied, the models will appear only as silhouettes. I think you will agree that the apparatus is not very complicated. By using it you can get a number of interesting effects.

And while on the subject of effects, I should mention that I have received a large number of letters from enthusiasts asking what they can use to represent water in a stream. The answer to this is, again, silver foil. When it is crinkled and fur-



Left: Operating finger-tip steering on No. 449 Dinky Toys Chevrolet El Camino Pick-up Truck. Below: The Opel Kapitän pictured as the front wheels turn.



This sketch shows how the photograph at the top of the previous page was taken.

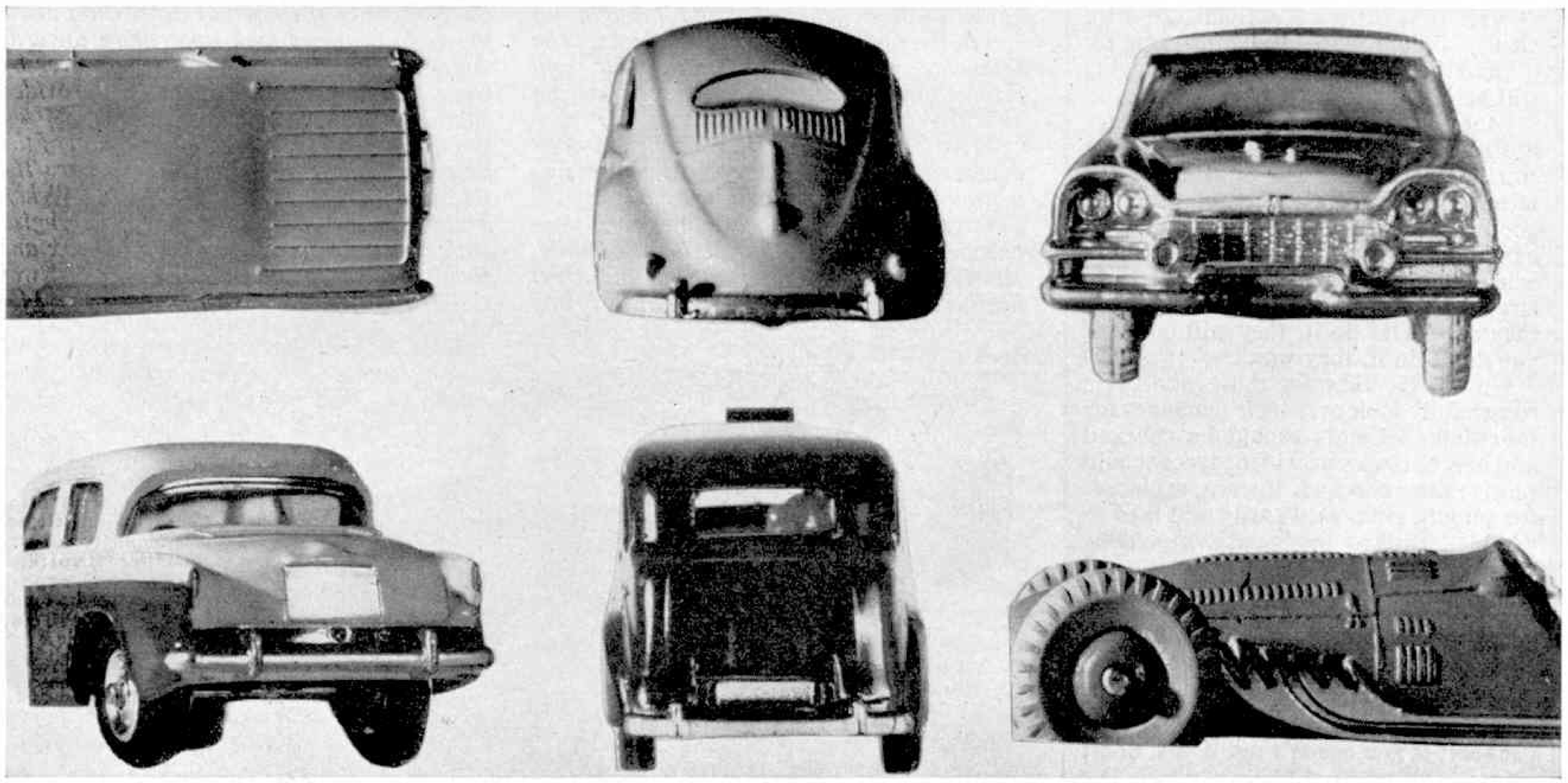
rowed correctly to represent swirls and eddies, such as one sees in rivers and streams, a very realistic result can be obtained.

One of the most intriguing features about recent Dinky Toys models has been the introduction of Directional Control, or "finger-tip steering", as it is perhaps more popularly known. Two pictures at the foot of the previous page are used to illustrate, firstly, how simple this method is to operate, and, secondly, how effective it looks. The model in use in the picture on the left is the new Chevrolet El Camino Pick-up Truck, which was described fully in these Notes last month. Those who are new to Dinky Toys fitted with this excellent steering method will see from the picture that simply by resting a finger on the left-hand front corner of the driver's cab, and exerting a slight downward pressure, the Dinky Toys model can be made to turn in that direction. Conversely, pressure on the right-hand side of the cab, or on the bonnet, will steer the car to the right.

Our second picture was posed to show how realistic the steering can look when a Dinky Toys model is on the turn. The car in this illustration is the Opel Kapitän (No. 177). All Dinky Toys collectors will be interested to know that the use of their trade name on this model, and the manufacture of the model itself, has been approved by Fa. Adam Opel, A.G., makers of the actual car.

Now I want you to turn your attention to the picture at the foot of this page, which forms the basis of a competition in which, I am sure, many readers will want to take part. As you can see, it shows the views of six vehicles, all taken from different angles. In point of fact all the pictures are of Dinky Toys models and what you have to do is to write down the full catalogue names and numbers of these models in the order in which they appear on the page, i.e. 1 to 6. Your entries should be done in ink, and they may be sent by postcard or by letter, simply stating, "I identify the six Dinky Toys models on page 327 of the September *M.M.* as: 1. ——, 2. ——, etc."

Entries, which should be addressed to "Recognition Test, *Meccano Magazine*, Binns Road, Liverpool 13," must be received not later than first post, Monday, October 2. The senders of the first ten all-correct entries to be opened will each receive a prize of Dinky Toys to the value of £1, which they may choose themselves.



1 2 3

4 5 6

The Editor's decision in this competition is final, and no correspondence can be entered into regarding it.

Now I want to mention a fact which I believe to be something of a record in the field of Dinky Toys collecting. I recently received a letter from Richard Young, of St. Helens, Lancashire, and part of it ran as follows, "I would like to tell you about my little brother (aged three), who has, I think, the largest collection of Dinky Toys for one of his age—325 to date."

Richard goes on to say, "About two years ago we started him on his collection with a Studebaker Golden Hawk. Since then he has inherited most of my Army and commercial vehicles, and I hope he has as much fun with them as I have had in my thirteen years of collecting them."

Praise from Japan

Among other letters received recently is one from Katsuyuki Iguchi of Japan who comments, "Dinky Toys are very, very good and are wonderful de-luxe miniature cars."

Interest which adults find in many of our models is mentioned by T. A. Pastore of Manchester, who writes, "My father knows a man who collects Dinky Toys and arrays them on shelves around his rooms. All his friends remark on the superb detail, so that is another feather in your cap."

Road Safety Notes

SETTING A GOOD EXAMPLE

THE first signs of autumn are with us—falling leaves, days drawing in, and before very long our thoughts will be on Christmas.

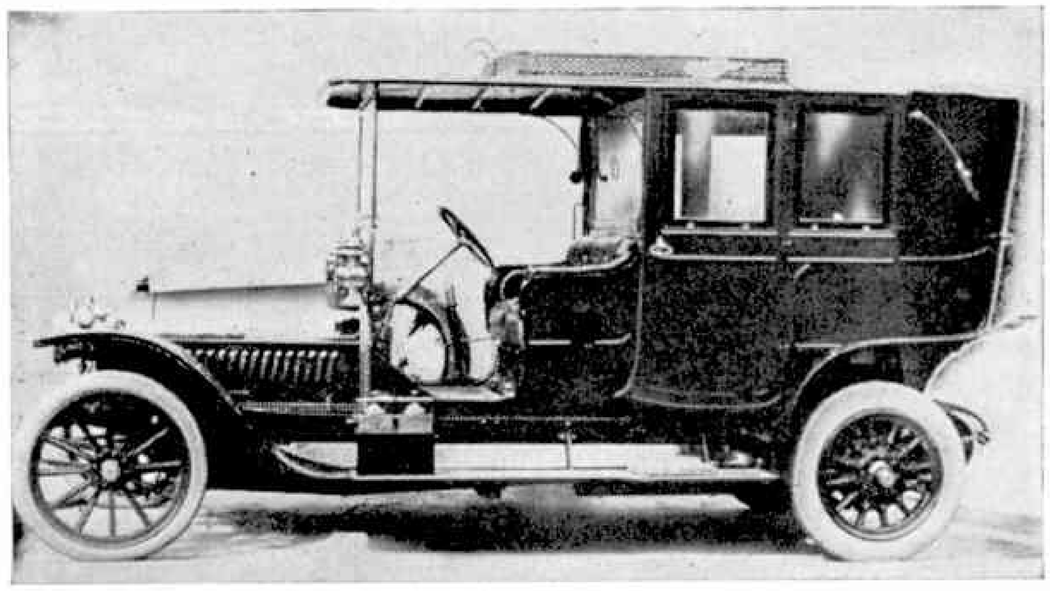
Many readers will have younger brothers or sisters, some of whom will be starting school for the first time this term. Help to train them to become good road users. Set them a good example by your own road conduct and when you cross the road with them, stress the importance of Kerb Drill. If they see YOU do it, they will copy; if you don't do it, they won't.

Now is the time for those who cycle to carefully look over their machines for the winter. Lights should be checked and new batteries provided; tyres should receive attention and, if worn, replaced, for smooth tyres skid easily and lead to trouble. Broken mudguards should be renewed; they are ineffective as protection and a positive danger to the rider.

Remember, too, with earlier darkness, to light up in good time, for dusk is a period of poor visibility and misjudgment of speed and distances. Don't take chances; if you haven't got lights, don't ride.

THEY WERE DIFFERENT THEN

No. 7: The House Of Opel



Prince Louis of Battenberg's 50 h.p. Opel car with Peter Union tyres, supplied by the British Electromobile Company Limited. Photograph by courtesy of Autocar.

BY PATRIC BAKER

IN 1837, the year in which Queen Victoria ascended the throne of England, Adam Opel was born at Russelsheim, in Germany. The son of a master locksmith, he became interested as a young man in sewing machines and in 1868 founded his own sewing machine factory. Opel had five sons who later persuaded him to build bicycles as well, and after his death in 1895, two of the sons, Carl and Wilhelm, began to manufacture motor cars. The first of the "Opel-Patent-Motor-Cars" appeared on the market in 1898.

For a couple of years things were difficult, but by 1905 Opel cars were winning races all over the world and Fritz Opel, the designer in the family, became a famous racing driver.

In 1911, a big fire severely damaged the factory, but the disaster resulted in the appearance of new buildings and in modernisation generally, and brought an end to the making of sewing machines. The following year 300 cars were built, and production was further increased during World War I.

From 1918, when the French troops occupied the plant, to the early 'twenties was a time of inflation and almost despair. Foreign cars, particularly American, were cheaper and better than the local product. Always receptive to new ideas the Opel brothers visited the United States and examined a number of plants, including that of General Motors. Convinced that mass production of a few models was the reason for American success, Carl and Wilhelm changed their methods.

The first conveyor in a German factory was introduced into the Opel factory in 1924. People in Germany needed a small, inexpensive car that was cheap to run. The answer was an Opel four-cylinder 4 h.p. car nicknamed the "tree frog", because of its green colour. It became the most popular car in the country; by 1927 production had increased tenfold, and the price was reduced. Soon Adam Opel AG were responsible for nearly one-third of Germany's export trade in cars.

By the following year heavy taxation and the first signs of the great depression made the Opel brothers look once more towards America. Opel shares were taken over by General Motors who, in turn, provided capital, know-how and machinery.

The year 1936 saw the introduction of the first Opel cars to Britain—these were the P4 and "Olympia" models. The "P4" had a side valve 1066 c.c. over-square engine with coil ignition, four-speed gear box and Bendix brakes. The "Olympia" was slightly larger with (Cont. on page 345)

This illustration shows the elegant simplicity of the Opel Kapitän's design, representing the most modern body styling.

What's New In The World Of Books

● *The books mentioned on this page are reviewed by Ernest Miller, Robert Bruce and Christopher Jelley, of the* Meccano Magazine *Staff, and by* M.M. *contributor, Humphry Gore.*

A SHORT introduction to that fascinating world below the surface of the sea is contained in *Snorkel Diver*, by R. B. Matkin and G. F. Brookes (Macdonald, 12/6). Illustrated with diagrams and photographs, the book gives the novice diver sound advice on basic equipment, diving and life saving. "Never dive alone" is one of those rules like "Never point a gun" which prevent accidents from happening in the first place. Underwater photography, spear fishing and a list of useful books complete this comprehensive little volume, together with a chapter on how to pursue this hobby with the help of the British Sub-Aqua Club, the Boy Scouts' Association and the Youth Hostels Association.

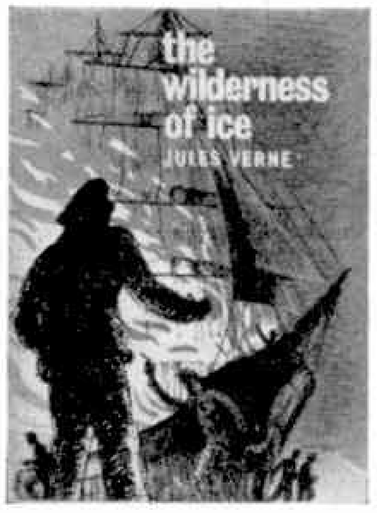
The technical writing is excellent but the description in the opening chapter is a little lush for some tastes. A few pictures, and some mention of snorkel diving in warmer waters, would have been a help to those who holiday abroad.

* * *

NEWSPAPERS are full of articles complaining that young (and old) people watch football matches or gaze at television instead of doing something worthwhile themselves. *Make it Yourself* (No. 1), by Barry Bucknell (Arco Publications, 10/6) is the first of a series of books showing young people how to make things. Sixteen widely different subjects are economically described and clearly illustrated. Suggestions range from a bird larder to a bagatelle board; model theatre to a toboggan. One of the attractive features is the list of materials required for each item and, in some cases, the approximate cost.

Making these useful and desirable things is just as much fun as owning them. Although this book is written for children and teenagers—boys and girls—who enjoy handicrafts, parents of the "Do it Yourself" kind will be the first to borrow it.

ARCO PUBLICATIONS have also issued a new series of books by Jules Verne, whose insight into the exploration of the Earth, above and below it, when he first began to write nearly 100 years ago, was almost mystical in the light of the happenings of recent years. The series has been translated from the French, and edited by I. O. Evans, F.R.G.S. Each book is priced 12/6.



In *Journey to the Centre of the Earth*, the reader makes the acquaintance of a German mineralogist, Professor Otto Lidenbrock, and his nephew, and follows their exciting adventures as they endeavour to reach the centre of the Earth by descending the crater of an extinct volcano.

Propeller Island is a story about a floating island of that name, of metal construction and owned by a rich American company. It is good science-fiction, and everything that happens is told so skilfully that the events do not seem at all far-fetched in the light of the scientific wonders of our own time.

During most of the nineteenth century Polar exploration aroused much the same sort of enthusiasm as do the prospects of space travel today, and provided Jules Verne with excellent material for several of his books. *At the North Pole* is one of the best of his stories of heroic adventure, and he ingeniously weaves into it much of the history of early Polar exploration. The story centres around the intrepid Captain Hatteras, of the brig *Forward*, who has a mania for geographical discovery, and we meet him again in *The Wilderness of Ice*. Here the captain is really up against it, as he has driven his crew so mercilessly that they have mutinied, and during his absence on an Arctic island in search of coal for the ship's engines they set the *Forward* on fire. He returns just as the ship blows up. Although lost among the ice-fields, without resources, and with only a handful of faithful followers, he declares his intention of pressing on to the North Pole. The story tells how he and his party struggle against colossal odds — intense cold, storms, and the hazards of unknown seas —in his determination to reach his goal.

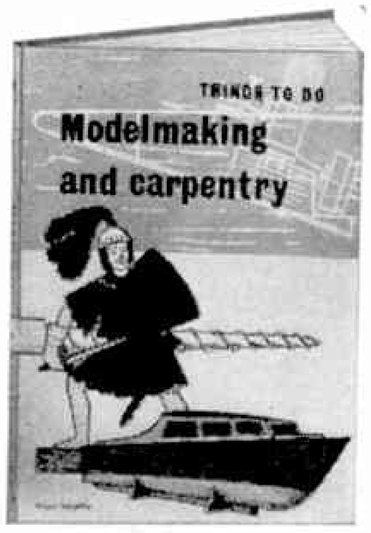
* * * *

MORE and more countries are establishing life-boat services, and during the last few years the Royal National Life-Boat Institution has been privileged to help Uruguay and Guatemala in this respect. The Institution is well equipped to do this, for it has had over 130 years' experience of running a life-boat service. Every year adds to its long list of life-saving achievements and to the already considerable total of lives saved. The annual publication of the R.N.L.I. handbook *The Story of the Life-Boat* provides both a timely reminder of the brave and often hazardous work of R.N.L.I. crews and an opportunity to record outstanding rescues during the year under review. Other articles of special interest in the latest edition deal with the various methods of launching life-boats, with life-boat equipment, and first aid in life-boats. There is, as usual, a brief but fascinating account of the history of the life-boat service in Britain, and of the evolution of the life-boat as it is today.

The handbook is illustrated with many half-tone illustrations, and copies can be obtained from any of the Institution's branches or life-boat stations, price 1/6, or direct from The Royal National Life-Boat Institution, 42 Grosvenor Gardens, London S.W.1, price 2/3 including postage.

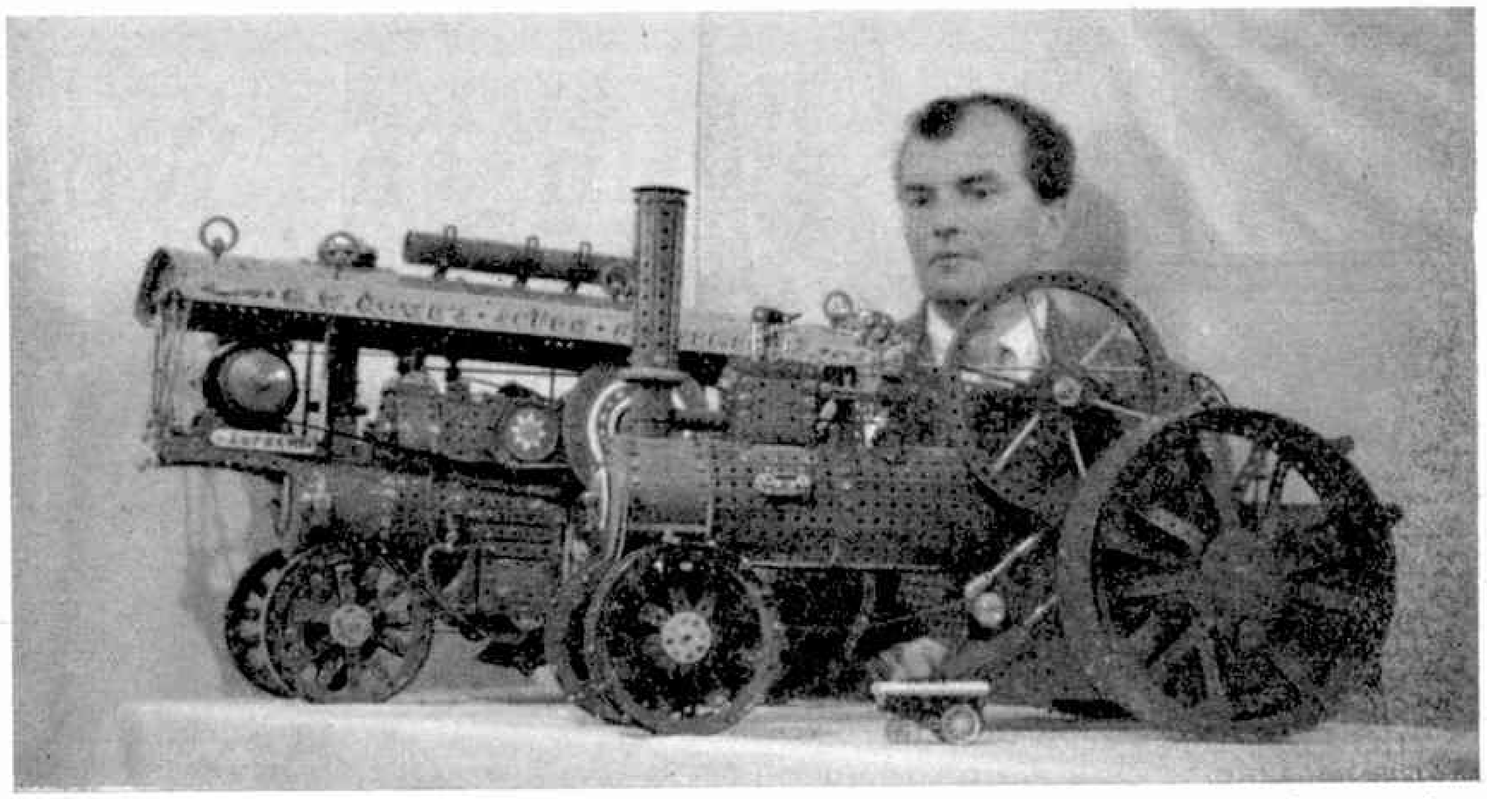
* * * *

THE "Things to Do" series of books just published by Ward Lock and Company Limited, price 4/6 each, is designed to provide a host of valuable ideas and really practical suggestions on some of the most interesting hobbies and ways of spending one's spare time. Each chapter in each book describes what can be done, what is needed to begin, an idea—where possible—of how much things cost, and how to make a start.



Modelmaking and Carpentry begins with basic information on building up a tool kit, the handling of tools, wood, adhesives, paints and polishes, and goes on to describe in simple terms (*Cont. on page 345*)

AMONG THE MODEL-BUILDERS



Two fine model Traction Engines and their builder B. W. Rowe, Newton Abbot. Mr. Rowe is a very keen Meccano constructor, and many examples of his work have been illustrated in the "Meccano Magazine" from time to time. His models are always impeccably neat, finely proportioned and full of skilfully executed details.

By "Spanner"

RATCHET LEVER

Fig. 1 shows a simple ratchet mechanism for control levers in models such as cranes, and it is small enough to be used also in model vehicles as a hand brake lever.

The brake lever is a Rod 1 fixed in a Coupling 2, which is screwed to one end of a short Screwed Rod. This is fitted with a nut and a $\frac{1}{2}$" Pinion 3, and is then passed through the model framework 4 and fitted with a second nut. The two nuts are tightened to fix the Screwed Rod firmly in place and to prevent Pinion 3 from rotating, but Coupling 2 must be free to pivot.

A bolt 5, fitted with two Washers, is passed through an Angle Bracket 6 and is screwed tightly into one of the threaded holes in a Collar. A $\frac{3}{8}$" Bolt passed through the Collar is screwed into Coupling 2, leaving the Collar free to turn on the Bolt. A $2\frac{1}{2}$" Driving Band is slipped over the Bolt 5, through the slotted hole in Angle Bracket 6, round Coupling 2 and over a bolt in the Coupling. This holds the Angle Bracket against the teeth of Pinion 3 to form a ratchet. The ratchet can be released by a lever 7 formed by a Pawl pivoted on a Bolt screwed into a Collar on Rod 1. A short length of wire connects lever 7 and Angle Bracket 6.

FRICTION GRIP TACKLE FOR CRANES

Fig. 2 shows a useful friction grip for use with block-setting cranes. This is quite simple to build and is suitable as an attachment for small models of this kind.

The apparatus comprises a framework built up from $3\frac{1}{2}$" Strips 1 bolted to transverse $5\frac{1}{2}$" Strips 2 and $1\frac{1}{2}$" Strips 3. The framework is in duplicate, and the two sides are spaced apart by means of Washers placed on the four securing bolts. The $3\frac{1}{2}$" Strips 4, secured to a Hook 5, are arranged to slide between the Strips 3. They are guided in this movement by means of two $\frac{1}{2}$" loose Pulleys 6, one on each side, which are mounted on a short Rod and held in place by Collars.

The ends of two $2\frac{1}{2}$" Strips 7 are mounted pivotally on the same Axle Rod between the Pulleys, and are connected at their outer ends, by means of lock-nutted bolts, to $5\frac{1}{2}$" Strips 8. The latter are free to pivot on bolts 9 passed through the $5\frac{1}{2}$" Strips 2. A short operating cord 10 passes round one of the $\frac{1}{2}$" Pulleys 6, and is secured to Strips 2.

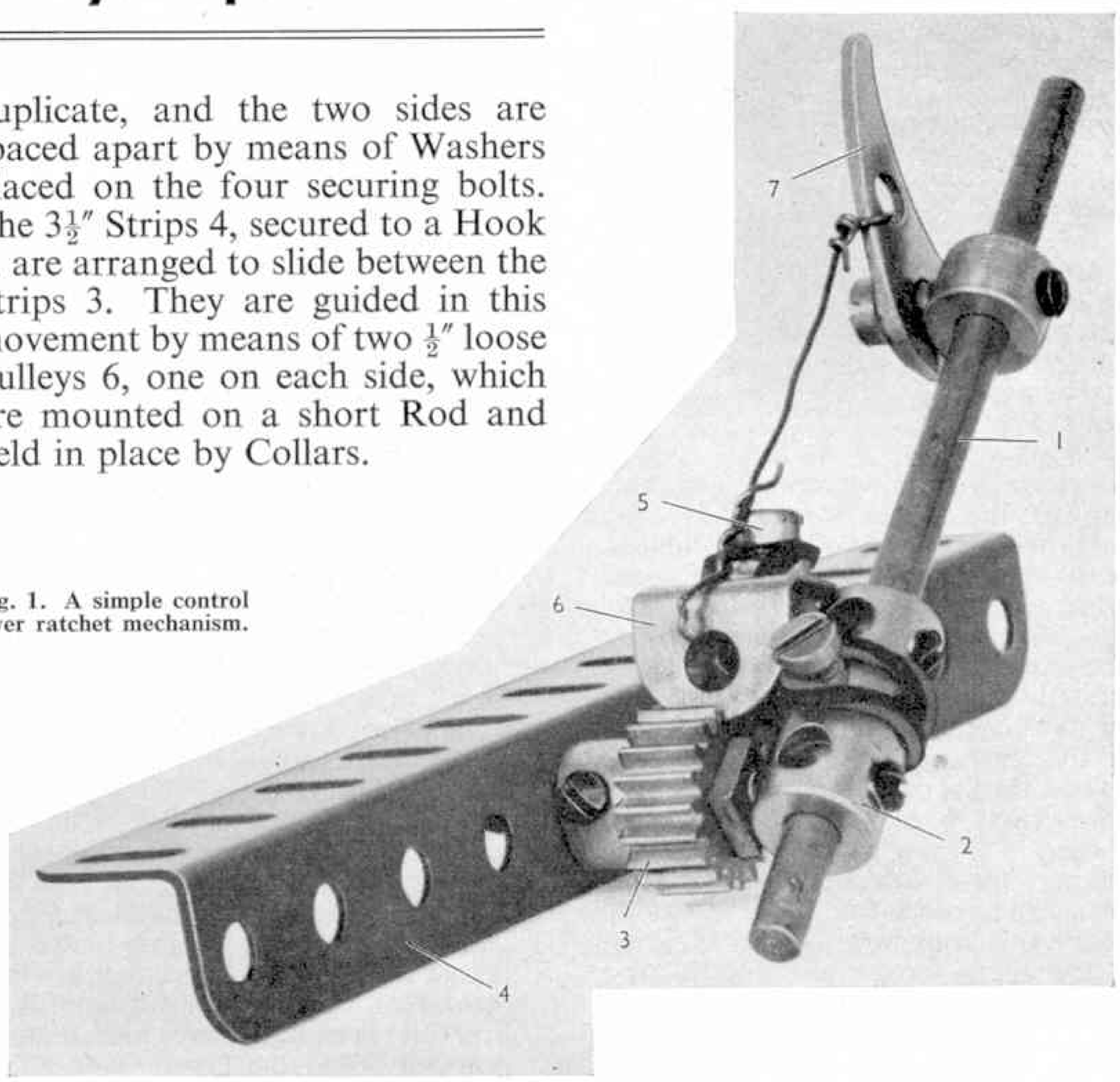


Fig. 1. A simple control lever ratchet mechanism.

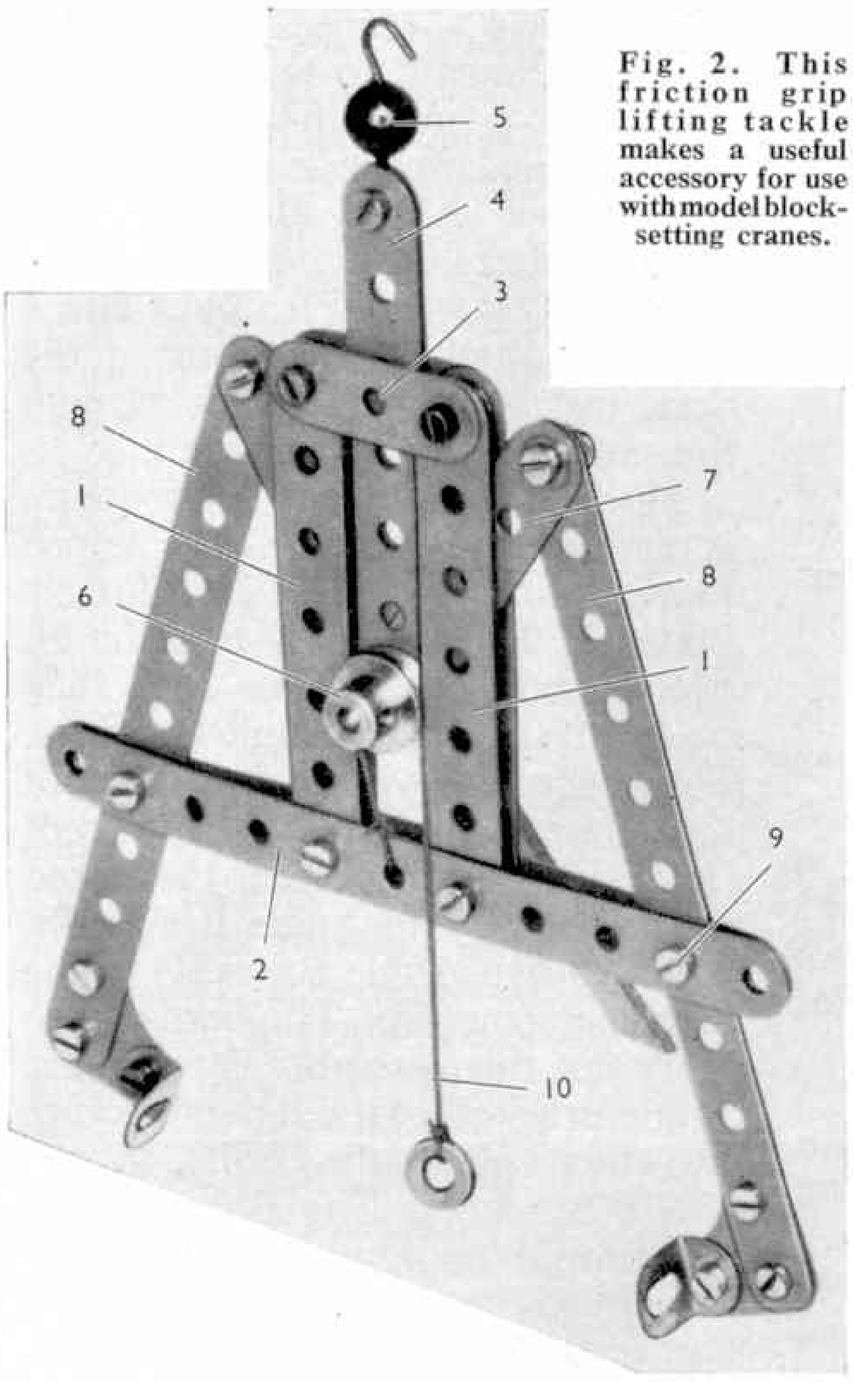


Fig. 2. This friction grip lifting tackle makes a useful accessory for use with model block-setting cranes.

Upon pulling the cord, the jaws of the grip are opened so that they fall on either side of the block that is to be raised; it is then released and the pull of the hoisting cord attached to the Hook 5 acts through the levers 7 and 8 and causes the jaws of the grip to close very tightly on the block. The actual dimensions of the blocks that may be picked up are confined within certain limits, but these limits may be varied to some extent by moving the pivots of the $5\frac{1}{2}$" Strips 8 to some other position in the transverse Strips 2.

AN AUTOMATIC REVERSING MECHANISM

The device shown in Fig. 3 will be found extremely useful in models used for display and exhibition. It enables models such as Pit Head Gears and Elevators to operate for considerable periods without any attention, as the reversing of the winding drum controlling the hoisting and lowering of the cage is carried out automatically.

The Rod 1 is driven by the Motor, and is fitted with a $\frac{1}{2}$" Pinion 2, a Worm Gear and a 1" Gear. The Rod 3 is free to slide in its bearings, and it carries a $\frac{1}{2}" \times \frac{1}{2}"$ Pinion and a $\frac{1}{2}" \times \frac{1}{4}"$ Pinion and a 1" Gear fitted at each end of a Socket Coupling. A third $\frac{1}{2}$" Pinion 4 is loose on a $\frac{3}{4}$" Bolt secured to the side Plate of the mechanism.

The Worm on the Rod 1 meshes with a 57-teeth Gear locked on a short Rod 5. This Rod is journalled in two $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips. A Coupling is secured by its centre hole to the upper end of this Rod.

The required gears are selected by a simple mechanism that consists of a $2\frac{1}{2}$" Strip passed through a Slide Piece that is free to turn in the centre hole of a Double Angle Strip. One end of the $2\frac{1}{2}$" Strip carries a small Fork Piece and the other end is pivotally attached to the Coupling on the Rod 5. A Coupling is secured in the jaws of the Fork Piece by a $\frac{1}{2}$" Bolt, and two 1" Rods

held in this Coupling engage the groove on the Socket Coupling on the Rod 3.

The drive to the winding drum is taken from the $\frac{1}{2}" \times \frac{1}{2}"$ Pinion on the Rod 3 to a $2\frac{1}{2}$" Gear on the winding shaft.

Before a model is set in motion care should be taken to ensure that there is no excessive play in the selector mechanism and that the positions of the gears on Rod 3 allow a brief period in neutral, otherwise the mechanism will be jammed.

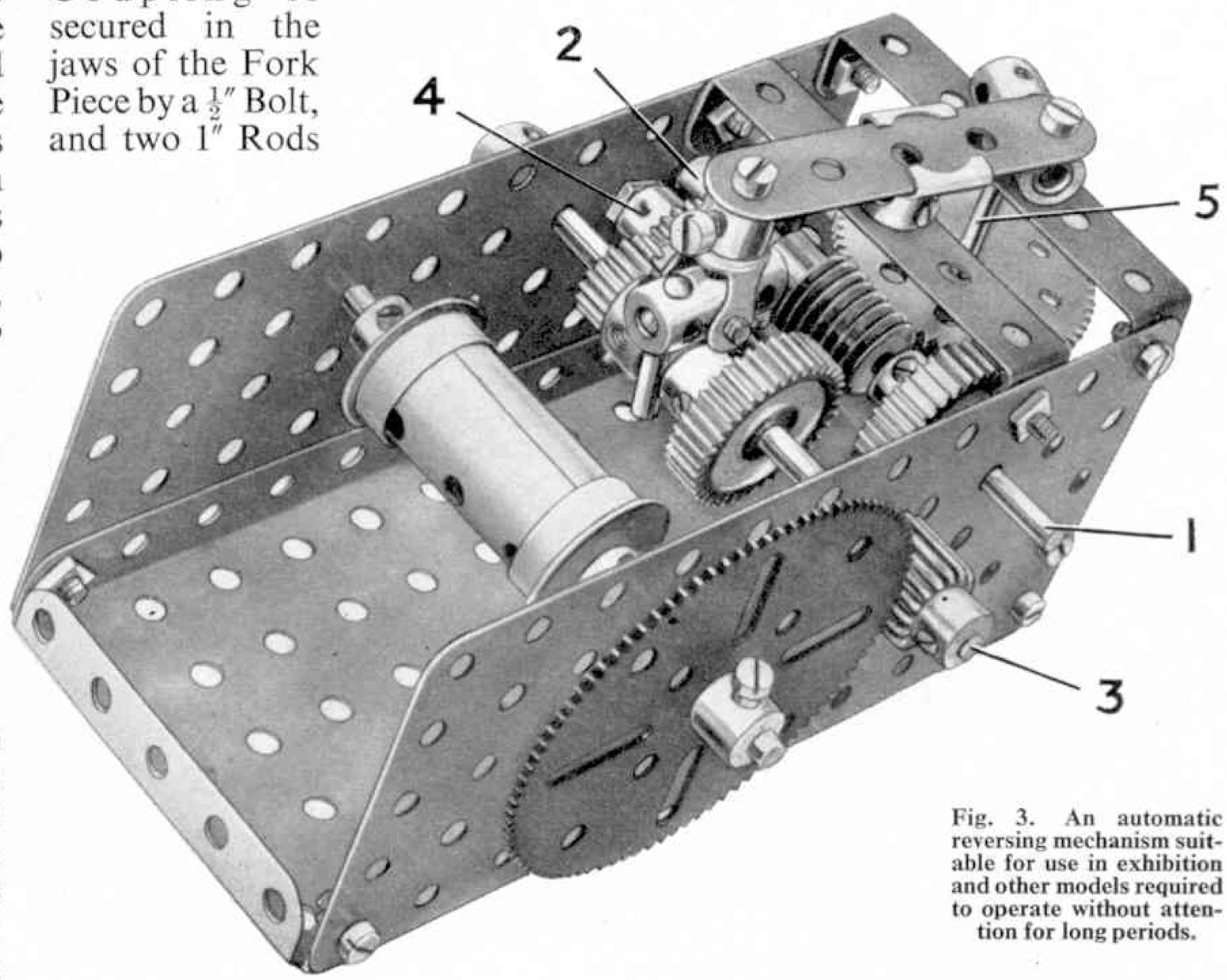


Fig. 3. An automatic reversing mechanism suitable for use in exhibition and other models required to operate without attention for long periods.

BUILD THIS FINE MODEL

A Meccano Tug Boat

ALL *M.M.* readers, particularly those who live near a port, will be familiar with the duties of the ubiquitous Tug Boats which busy themselves day and night in assisting liners and big cargo ships into, and out of, port. Although tiny vessels themselves they fill a big role in Britain's maritime activities. Here is a model tug boat for Meccano enthusiasts to build. As you can see from the illustrations on this page and the next, it looks most attractive.

The deck of the tug boat is formed by four $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plates 1 overlapped one hole to form a built-up Flat Plate $10\frac{1}{2}'' \times 4\frac{1}{2}''$; a $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plate 2 is then bolted to it, overlapping one hole to make it into a $12\frac{1}{2}'' \times 4\frac{1}{2}''$ built-up Flat Plate.

Three $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates 3 form the sides of the hull and they are strengthened at the joints by $1\frac{1}{2}''$ Strips and are bolted to the deck by three Angle Brackets at each side. The two Flexible Plates which overlap at the front are then joined by Obtuse Angle Brackets, at the same time bolting in two $3\frac{1}{2}'' \times 1\frac{1}{2}''$ Triangular Flexible Plates 4 to form the bow. The stern is made from three $5\frac{1}{2}''$ Strips joined to the Flexible Plates by Obtuse Angle Brackets and strengthened in the middle by a $1\frac{1}{2}''$ Strip. A $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate 5 is then bolted to the front of the deck overlapping three holes, and the same is done at the stern.

The fore part of the superstructure is made from two $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plates 6 and two $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plates 7. Two $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plates, overlapped one hole, are then bolted to the top by Angle Brackets. These should overlap one hole at the side and two holes at the front (Fig. 2). This structure is then fixed to the deck by an Angle Bracket 8, and also two Angle Brackets inside the superstructure. The best way to carry out this assembly is to fix the Angle Brackets to the superstructure and then place the Bolts in the Angle Brackets. The Bolts should be allowed to dangle through the Flat Plates and the nuts can then be placed on them from the other side.

The other half of the superstructure is formed by two $3\frac{1}{2}''$ Angle Girders 9 and two $1\frac{1}{2}''$ Angle Girders 10. These, along with a $2\frac{1}{2}''$ Angle Girder 11 and two $1\frac{1}{2}''$ Strips 12, are bolted together to form a rough box shape.

The sides are then filled in with two $3\frac{1}{2}''$ Strips and the stern end with two $2\frac{1}{2}''$ Strips. The top is covered with a $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate 13, and the whole structure is bolted to the deck in a similar manner to the other half of the superstructure.

The bridge is constructed as follows. A $2\frac{1}{2}''$ Strip is bolted to each end of two $2\frac{1}{2}''$ Double Angle Strips 14 and these are joined together by $1\frac{1}{2}''$ Strips 15. A $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flanged Plate 16 is then fixed to the upper ends of the $2\frac{1}{2}''$ Strips to form the roof. A $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate 17

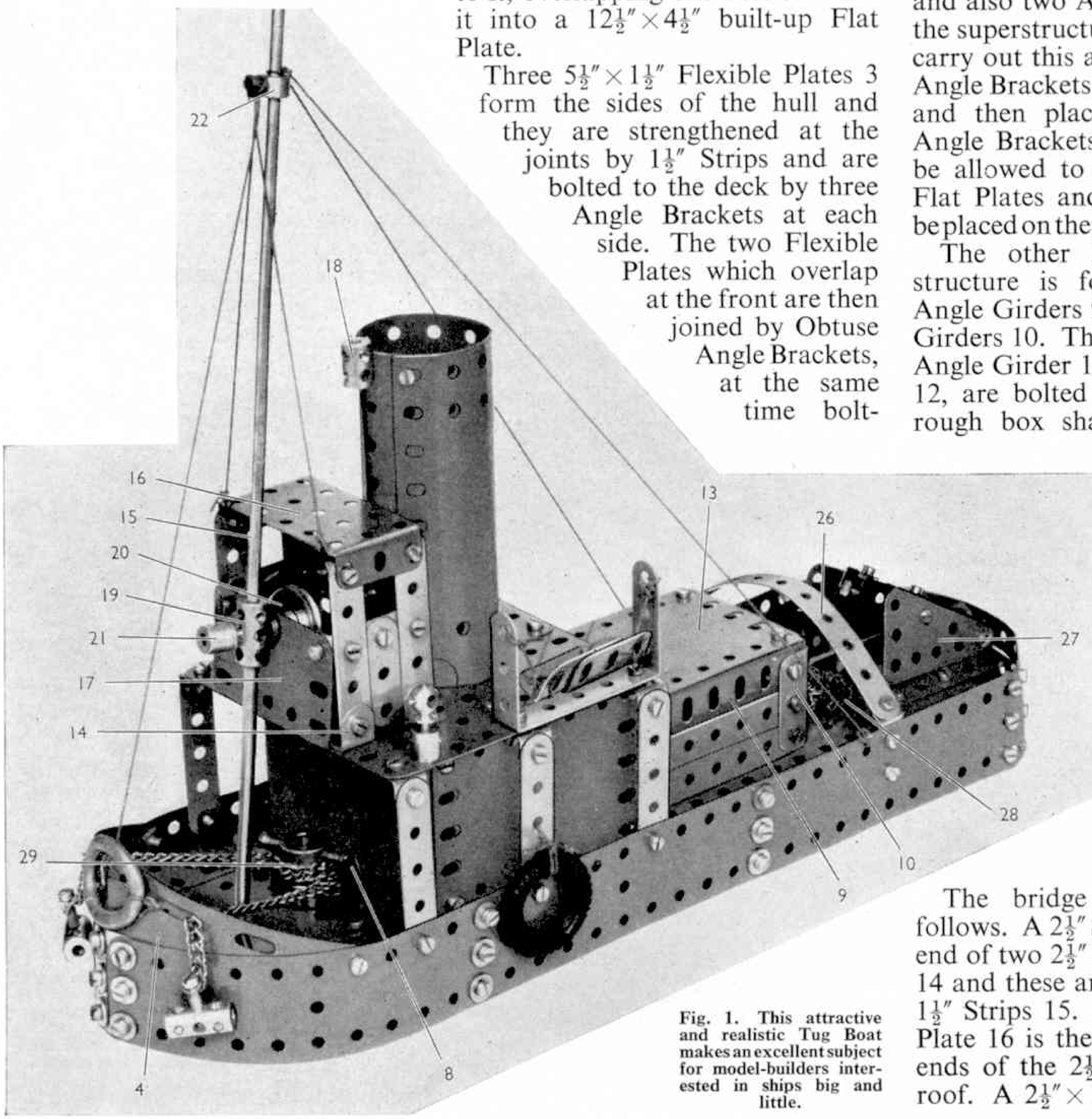


Fig. 1. This attractive and realistic Tug Boat makes an excellent subject for model-builders interested in ships big and little.

is fixed to the front by Angle Brackets and a similar Plate is fixed at the rear. The sides are then filled in with $1\frac{1}{2}$" Strips.

The funnel consists of a boiler overlapped three holes and bolted to the back of the bridge. A Short Coupling 18 is bolted to the top. The mast is a $11\frac{1}{2}$" Rod passed through a Coupling 19. This Coupling is joined to the bridge by a $\frac{3}{4}$" Bolt which is also passed through a 1" Pulley 20. The Coupling 19 is spaced from the bridge by two Washers. A Rod Socket 21 is then screwed into the Coupling and a Collar 22 is fixed near the top of the mast as shown.

The overhanging edges of the Flat Plates forming the roof of the main superstructure are connected to the hull on each side by means of three $2\frac{1}{2}$" Strips 23. The bolts that hold the rearmost two Strips to the roof also fix in place a $2\frac{1}{2}" \times 1\frac{1}{2}"$ Double Angle Strip 24 which forms the davits for the life-boat, which consists of two $1\frac{1}{2}$" Angle Girders bolted together. The port and starboard lights 25 are Threaded Couplings bolted to the deck, with a Handrail Support screwed into their tops.

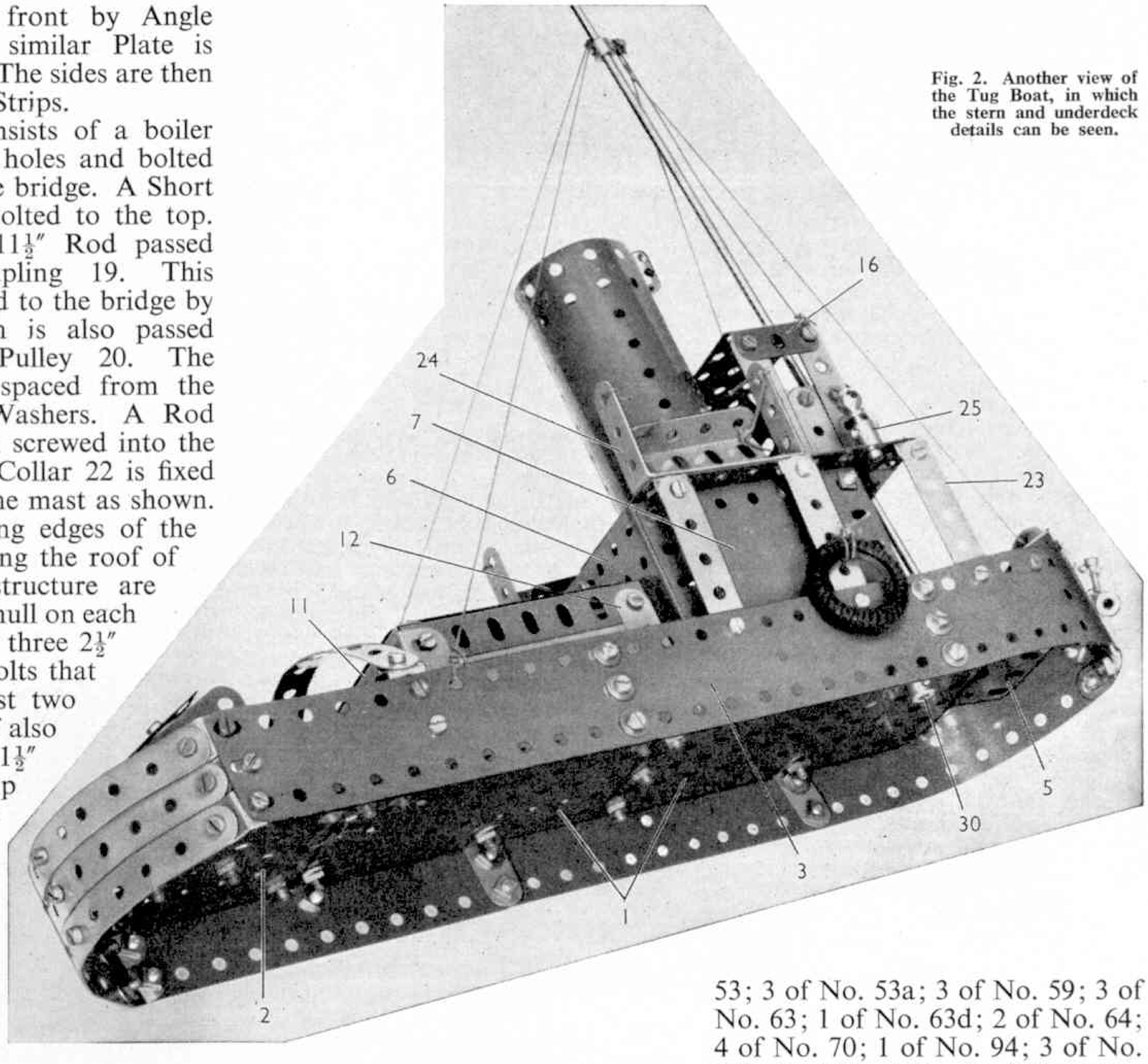


Fig. 2. Another view of the Tug Boat, in which the stern and underdeck details can be seen.

The towing arch 26 is a $5\frac{1}{2}$" Strip curved as shown and fixed to the sides of the vessel with Obtuse Angle Brackets. Next to be fitted is the small hatch cover in the stern. This is made from two $2\frac{1}{2}" \times 1\frac{1}{2}"$ Triangular Flexible Plates 27 and a $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate, which are connected together with Angle Brackets and also fixed to the deck with Angle Brackets.

A $\frac{3}{4}$" Bolt is then fixed in the deck between the superstructure and the hatch, and round this is wound a small length of Sprocket Chain 28. The anchor capstan is a Socket Coupling 29 with a Collar in its top end. This Collar holds a 1" Rod, which is passed through the deck and is fixed in place by a second Collar 30 (Fig. 2). A length of sprocket chain is then wound round the Socket Coupling and passed through the Triangular Plates 4. The anchors are made from $\frac{3}{4}$" Bolts and Couplings.

All that now remains to be done is to tie two 1" Tyres to the sides of the hull to serve as fenders. A 1" Rubber Ring is slung at the bow, and rigging lines are arranged as shown in Fig. 1.

Parts required to build the model Tug Boat: 4 of No. 2; 4 of No. 3; 12 of No. 5; 11 of No. 6a; 2 of No. 9b; 2 of No. 9d; 6 of No. 9f; 32 of No. 12; 11 of No. 12c; 1 of No. 13; 1 of No. 18b; 1 of No. 22; 162 of No. 37a; 162 of No. 37b; 20 of No. 38; 1 of No. 40; 2 of No. 47; 2 of No. 48a; 1 of No. 51; 2 of No. 53; 3 of No. 53a; 3 of No. 59; 3 of No. 63; 1 of No. 63d; 2 of No. 64; 4 of No. 70; 1 of No. 94; 3 of No. 111; 1 of No. 111a; 1 of No. 111c; 2 of No. 136; 2 of No. 142c; 1 of No. 155; 1 of No. 162; 1 of No. 171; 1 of No. 179; 3 of No. 188; 6 of No. 189; 2 of No. 190; 2 of No. 190a; 2 of No. 221; 2 of No. 224.

ANSWER TO "JUDGE FOR YOURSELF"

The postman lost his case. The judge explained that Mr. Pett would only be liable for personal injuries which Chummy caused if he knew Chummy was likely to cause them. Here there was no evidence that Chummy had ever bitten anyone before. If he did it again, of course, Mr. Pett would be liable.

Mr. Trim lost his claim for compensation for the flowers, since it was up to him to protect his own property by fencing or wiring it off. But he did win his other claim. A special Act of Parliament, the Dogs Act, makes owners liable for harm their animals do to poultry—whether or not they know such harm is likely.

WITH THE SECRETARY

Club and Branch News

THE INDOOR SEASON

The first of the 1961/62 winter Sessions will begin towards the end of this month, and most Clubs and Branch committees will have already drafted their programme for the three months immediately ahead. With Meccano model-building as the "backbone" of Club schedules and Hornby-Dublo operations forming the principal activity of H.R.C. Branches there should still be room for other recreational activities as an occasional change, and I have no doubt that a happy medium will be struck in the programmes drawn up.

CLUB NOTES

NORTH END (PORTSMOUTH) M.C.—The Club put on an excellent Meccano models display at St. Alban's Church Carnival Fête at Leigh Park. Roger Scutt's model battleship was a great attraction. The Leader, Mr. A. J. Nicholson, took along his microphone and amplifier and used them to draw the attention of visitors to the display and to invite them to inspect it. About 200 people, adults and children, accepted his invitation. The fête, and the Club display there, were reported in the local Press. *Leader:* Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.

ASHTEAD FREE CHURCH M.C.—Summer outdoor activities have continued, with cricket, rounders, hares and hounds, and other games, and a model aircraft (flying) meeting. Activities of the senior section have included photography, table tennis and other games and a radio talk about the crystal set. *Secretary:* Brian Mayes, 54 Newton Wood Road, Ashtead, Surrey.

AUSTRALIA

MAYLANDS M.C.—Members attended the opening exhibition of the University Engineering School during the opening night, and there was so much of interest to see that they paid a second visit the following day. During their visits the party met an ex-member of the Club who is in his fourth year there and will be on a scholarship tour of the Snowy Mountain Project and the Murray River Irrigation Scheme. He was giving demonstrations, with working models, in the Civil Engineering Department.

The Club recently appeared in a commercial TV show, in which the models demonstrated were Keith Bell's original Go-kart, John Carter's Ferris Wheel, Warren Bransby's block-setting crane and a twin-cylinder steam engine specially built by him which was powered by a 250 v. motor with reduction drive. This motor was donated to the Club by Meccano Limited's Western Australia agents in acknowledgment of the Club's services during the 1960 Industries Fair. *Secretary:* Trevor Criddle, Maylands Meccano Club, 16 Kennedy Street, Maylands, Western Australia.

NORTHERN NIGERIA

GINDIRI BOYS' SECONDARY SCHOOL M.C.—The Meccano model-building proficiency of the members, almost all of whom are new to the hobby, has increased remarkably in the short time since the current Club year began. Many interesting models have been built, including the mechanical horse trailer, platform weighing machine, pithead gear, and a Meccano flying boat. Model-building was suspended for a week while most of the members went for a week's camping, and the remainder went on a "Spartan's" trek over difficult country. After a further break for a month's summer holiday Club activities will be resumed in earnest. *Secretary:* James T. Akuse, Boys' Secondary School, Gindiri, P.O. Barakin Ladi, Via Jos, Northern Nigeria.

BRANCH NEWS

NORTH END (PORTSMOUTH)—Part of the Branch layout was damaged in transit to the carnival fête at Leigh Park. A "repair gang" was formed and at once went into action, with the result that the model was put right and assembled in good time for operation at the fête. *Leader:* Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.

NORTHERN NIGERIA

GINDIRI BOYS' SECONDARY SCHOOL—The old track layout has been dismantled, and it is hoped to construct a succession of different layouts during this term, and to improve the Hornby Railway section as a whole. The members are very enthusiastic. *Secretary:* James T. Akuse, Boys' Secondary School, Gindiri, P.O. Barakin Ladi, Via Jos, N. Nigeria.

These photographs were taken during a visit by members of the Ashtead Free Church M.C. to the B.R. (Southern Region) Lancing Carriage and Wagon Works. Above: Gregory King, Derek Underhill and John Rennie entering the driver's cab of an electric train set. Left: Bob Nagel (ex-Secretary), Keith Lambert, Michael Dennis, John Rennie and others "framed" by the corridor connection of a Southern main line coach.

WORLD-WIDE COLLECTION OF TICKETS

Souvenirs of The Chocolate Express and the Never-Stop Railway

TICKETS issued by public transport undertakings have been a source of increasing fascination ever since the first Bell Punch varieties were adopted by the London General Omnibus Company in 1893. Ex-Leading Fireman Harry Gorick, who lives in the West Sussex downland village of Storrington, started collecting train, tram, bus and ferry tickets while he was still a boy at school.

Now, at the age of 56, he has a collection of international specimens which would stir the imagination of every keen student of public transport. The collection contains approximately 300 varieties and includes a wide range of British issues as well as those from the Continent, Asia and Africa.

Many tickets have been discovered in secondhand books; others have been given to him by friends who willingly aid him in his task of improving the quality of his collection and enlarging its scope.

A number of such treasures travel long distances from people who have heard of Mr. Harry's absorbing hobby and special efforts have been made to sort out neglected lumber in the hope of making a useful discovery. A recent prized addition, for instance, was a 75 cents Khormaksar (Aden) Bus Service ticket which was sent from Worthing, only fifteen miles from Mr. Gorick's home.

Some tickets have gained a place in the neatly-stocked album through unusual circumstances.

"See that 1d. joker there?" he asked, pointing to a long, buff-coloured, well-worn ticket. "Well, that was issued by the Clyde Navigation's Erskine Ferry, and you'll never guess how I came by it."

Harry, now warming to his subject, settled in his favourite armchair and fussily adjusted the ticket in its slots.

"Well, I'll tell you," he continued. "I saw it lying in the road when cycling through Rottingdean, Brighton, oh! I don't know how many years ago, and I said to myself, "That looks a strange 'un for these parts. I'll have you, my pretty joker.' And there it is."

Whetting the appetite

One page of the Gorick album is sufficient to whet the appetite for more. Southdown, Vectis, East Kent, Western National and Aldershot and District Traction bus tickets are displayed to advantage alongside early specimens issued by Croydon Corporation, South Metropolitan and London County Council Tramways.

Tramways and light railways have always intrigued Mr. Gorick, whose storehouse of memories includes boyhood excursions on open-deck trams through some of South London's tree-lined suburbs.

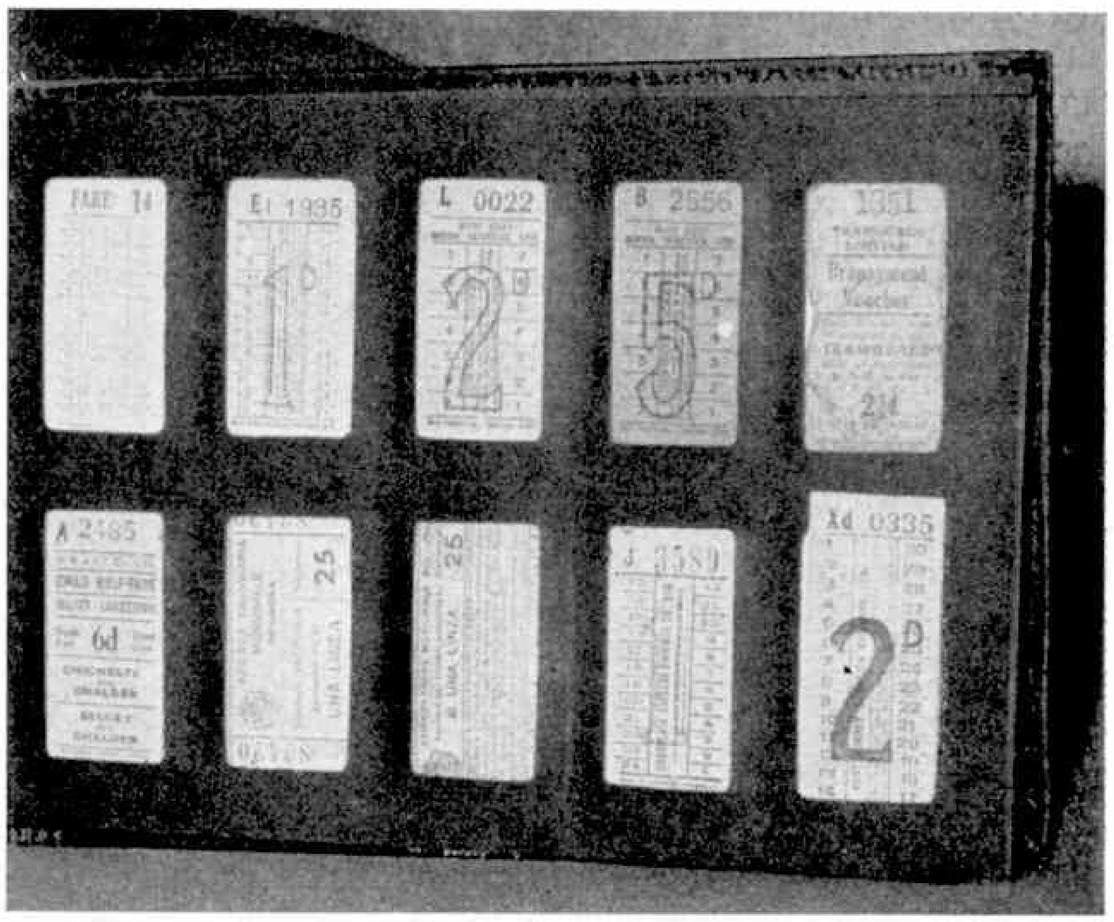
"Those rides were a real delight for any boy," he muttered, reflectively. "And the most wonderful time was in the spring, when we small lads looked down from the top of the car on to the waving blossom beneath."

He added, still in nostalgic mood, "That was an experience many of my young friends of today would have enjoyed."

Among this fine array of tickets are some which defy quick recognition. For example, would you like to know more about the Chocolate Express, the Never-Stop Railway or the Hundred of Manhood and Selsey Tramways?

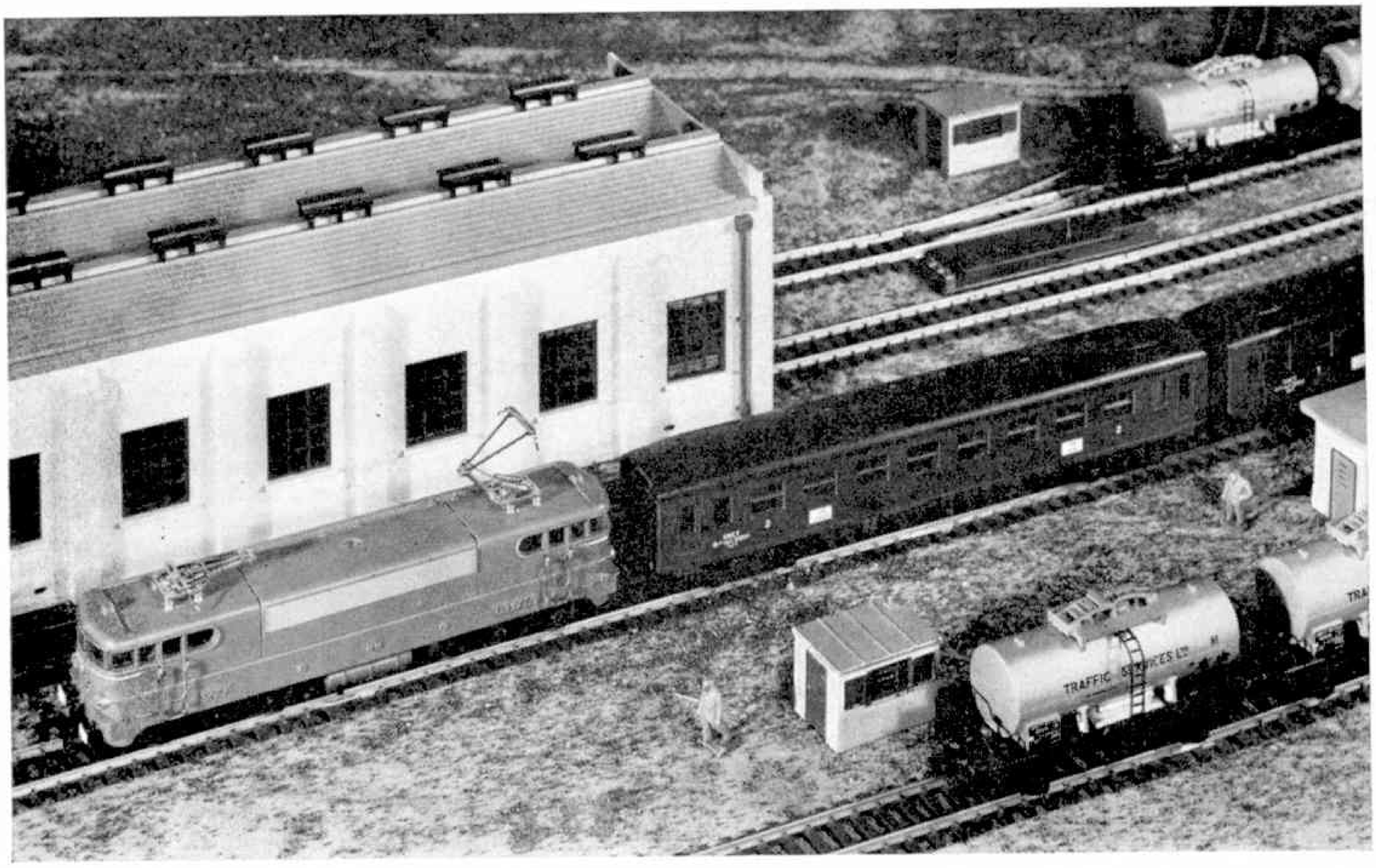
Well, the Chocolate Express was one of 30 "pirate" bus companies operating in the London Metropolitan area some 30 or 40 years ago. The Never-Stop Railway never did stop when picking up visitors wishing to tour the great British Empire Exhibition at Wembley in 1924–25, and the "HM and ST" was a humble little tramway that plied between Selsey and Chichester, in West Sussex.

Harry Gorick can talk with confidence on many aspects of passenger travel, whether the conversation is concerned with "B"-type vehicles, London's first standardised motor (*Cont. on page 345*)



Left: Mr. Gorick glances through his well-stocked ticket album. Above: one of the pages of the album with various tickets neatly displayed.

NEW LOCOMOTIVE FROM FRANCE



Express Electric With Attractive Coaches

IT will be a pleasant surprise to many Hornby-Dublo owners to find on sale in this country Hornby-Dublo models of a French electric locomotive and passenger coaches. These are manufactured by Meccano (France) Ltd., at Bobigny, near Paris, and limited supplies are now available from our Dealers in Great Britain.

The locomotive represents the French Railways, or S.N.C.F. to use initials, BB 16000 class express passenger electric locomotive with the Bo–Bo wheel arrangement, built for use on the main line between Paris and Lille. This route was recently electrified on the 25,000-volt 50-cycle overhead-wire system—the system also adopted by British Railways for the Manchester and Crewe electrification completed last year, and for the Liverpool–Crewe–London electrification scheme still in process of installation.

The S.N.C.F. locomotives, of 4,920 horse power, have a maximum speed of 100 miles an hour. They work express passenger trains during the day and parcels trains at night.

The passenger Coaches, one First Class and the other Second Class, are representative of those used in main line service in France. They are of the corridor type with doors at each end, and are finished in the dark green livery familiar in Continental practice.

The real S.N.C.F. locomotives have pantographs of the Faiveley type and the Hornby model has two beautifully-

Hornby Railway Company

By the Secretary

detailed reproductions of these fittings, one at each end. As the miniature locomotive is intended to operate on the standard Hornby-Dublo Two-Rail system, the pantographs are dummies, current collection and return being arranged via the wheels and the running rails. The pantographs can, however, be raised to the "operating" position, or lowered, as required.

You will notice that the rear pantograph is raised in our picture, this being the usual practice. If the leading pantograph were in use and some obstruction were encountered it might cause damage to the second pantograph. If the second one is in use and sustains damage, then the leading one still remains and the train can carry on, provided, of course, that the overhead wire system is still intact.

The livery of the Locomotive is the pale, but attractive, blue-grey of the S.N.C.F. and the addition of this quite impressive machine to the range of Hornby-Dublo Two-Rail Locomotives provides still further variety in the matter of motive power. Most Hornby-Dublo owners like to have a good choice of engines and they may now consider themselves well served, with an electric type locomotive, several diesels and numerous steam type engines available.

You will be aware that there are locomotives of similar general character to the S.N.C.F. electric in use on certain routes in this country on which overhead-wire electrification has been applied. The

Hornby-Dublo S.N.C.F. Electric Locomotive BB 16009 is seen (above) with its train of typical French coaches. The Traffic Services Ltd. Tank Wagons in the foreground are appropriate to the scene as they represent British vehicles used for through Continental traffic via train ferry.

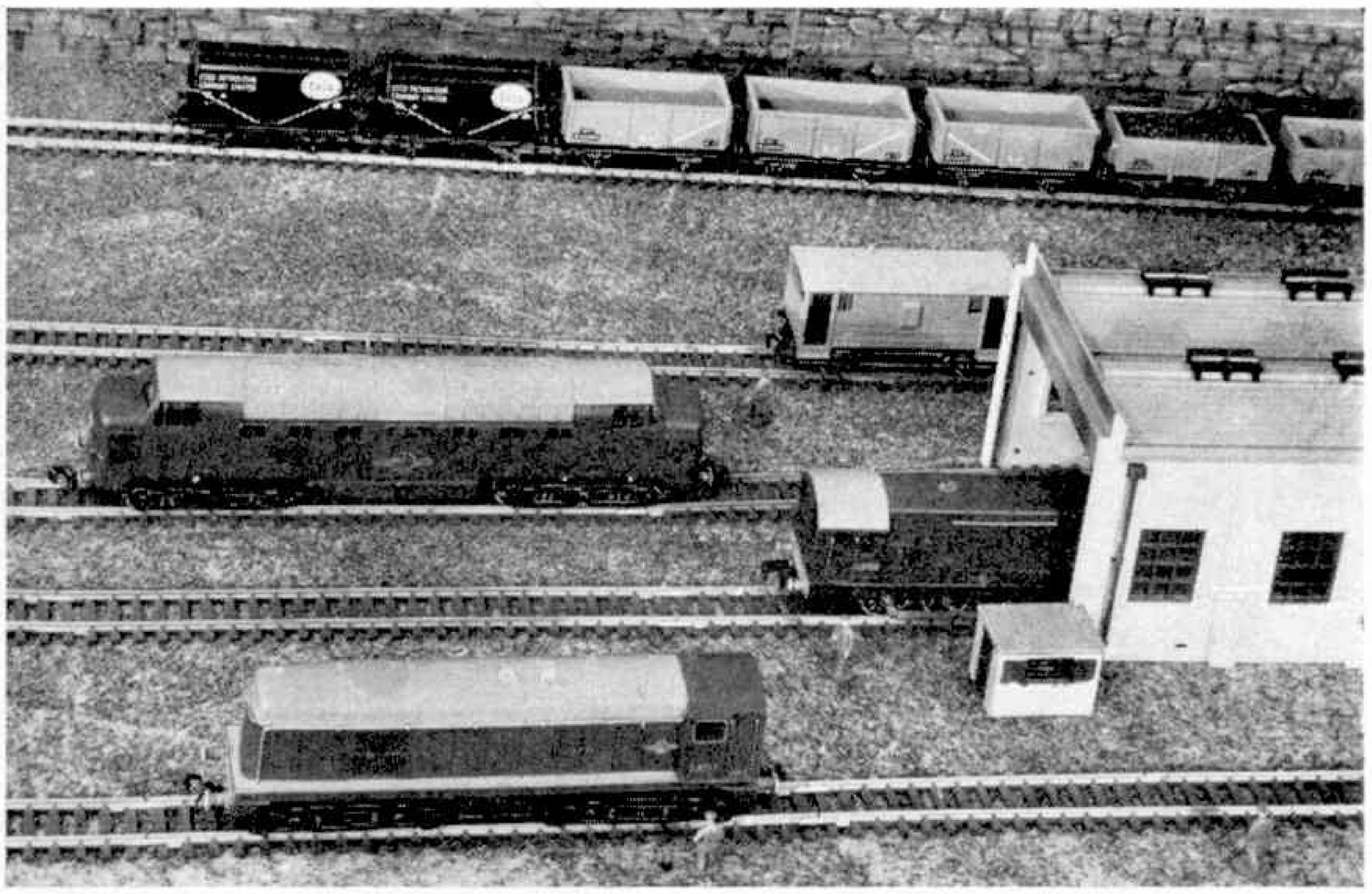
Bo–Bo and Co–Co electrics of the Manchester–Sheffield route have been in service for several years and, more recently, the opening of the Manchester–Crewe electrification scheme described in the *M.M.* in November 1960 saw the introduction of further electric locomotives, these having pantographs of the type represented on the Hornby-Dublo S.N.C.F. model. The latter, as I have said, runs on standard Hornby-Dublo Two-Rail track and, as it has the standard type of Hornby-Dublo automatic coupling, can be made to haul British-type rolling stock.

Although it runs on rails of the same gauge as the British Hornby-Dublo products, it is slightly smaller in its general proportions. The scale employed for the bodywork is 3.5 millimetres to 1 foot—or what is known as HO—as opposed to the 4 millimetres standard scale used for Hornby-Dublo products in this country.

I am sure many of you will find this new Locomotive a useful and most attractive addition to your stock which, no doubt, already includes at least one of the Hornby-Dublo Diesels now available.

The Co–Co Diesel, which has been available for some months, is ideal for the heaviest main line duties for which it may be required in miniature, and you would not really be wrong in using it for express freight as well as for heavy and fast main line passenger duties. Possibly it is only in this way that you can obtain the greatest possible "mileage" from your engine which, in any case, is the aim of diesel motive power operation in actual practice.

Work of a more intermediate character can be handled satisfactorily by the Bo–Bo Diesel, the first diesel type to be represented in the Hornby-Dublo System. This is primarily intended for freight train work but, in summer, when the need for train heating does not arise, this type of locomotive can sometimes be found, in actual practice, on passenger trains. There was, in fact, an instance of this sort of thing in one of our *Railway Notes* pictures last month.



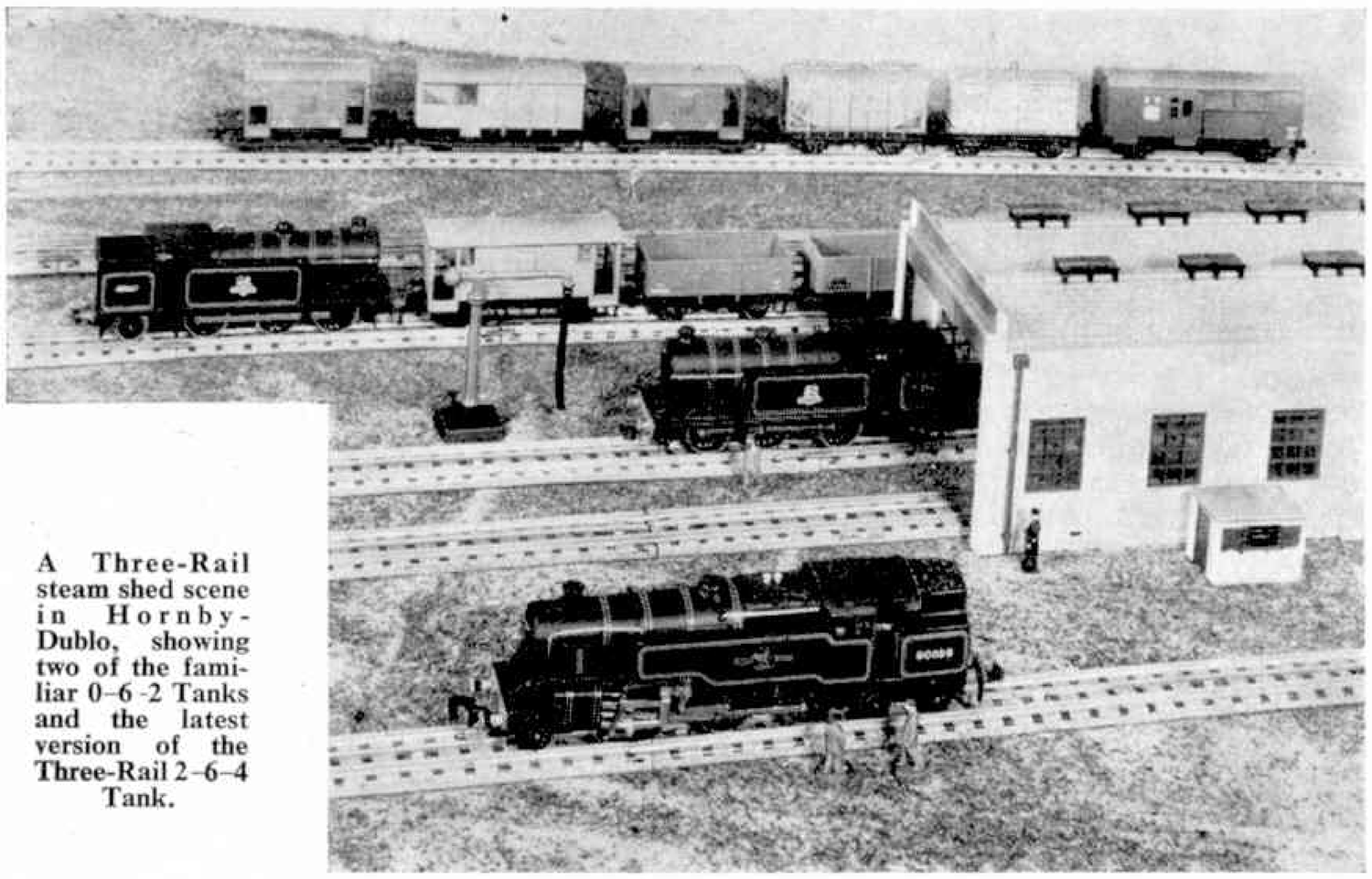
The three Hornby-Dublo Diesel Locomotives seen here are familar on many layouts nowadays. The building representing a diesel depot has been assembled from the standard Engine Shed Kit. Fuel Oil Tank Wagons are standing by in the background.

The purpose of the Hornby-Dublo 0–6–0 Diesel Shunting Locomotive is obvious from its name and there can be few layouts on which this useful little engine does not find a place. One of these neat little shunters appears in the Hornby-Dublo diesel depot scene on this page. The picture suggests that the shed building, assembled from the standard Engine Shed Kit, forms a depot for diesels only. If you have several Hornby-Dublo Diesels on your layout you may consider the possibility of having a separate shed for them. I gave you several suggestions in this connection last May, when we had a talk about Hornby-Dublo Diesels in Three-Rail.

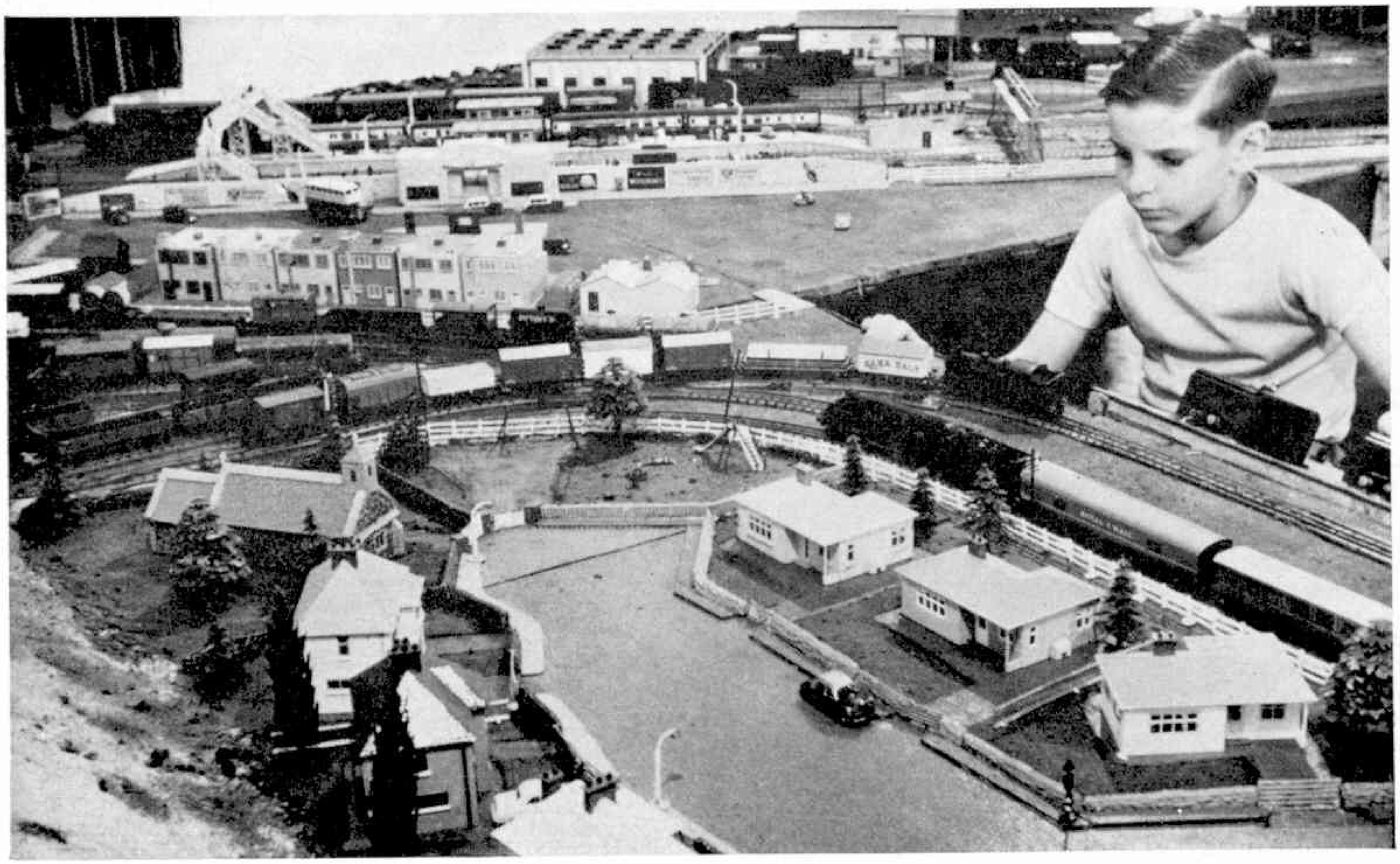
On the other hand, on many layouts Diesels are quartered at the same depot as the steam-type engines on the system. This still applies in many places in actual practice, although there is a growing number of depots reserved entirely for diesels.

I don't suppose there are many layouts operated entirely by Diesel types, for the steam-type Locomotives in the Hornby-Dublo System continue to be in very great demand. This is hardly surprising when we consider the different "breeds" that are represented. The attractive 4–6–2s, both Pacifics, yet both distinctive—*City of London* and *Golden Fleece* respectively—are splendid engines for fast and heavy long-distance trains. Then there is *Cardiff Castle* with its characteristic Swindon outline and finish, and the 8F 2–8–0. Both are provided with the remarkably efficient Ring Field Motor. The powerful characteristics of this motor are well-known, yet, with a suitable power unit, it is extremely controllable. This is particularly useful in the case of an engine such as the 2–8–0 that is likely to spend much of its time in hauling long freight trains, and in shunting and marshalling movements.

Passenger or freight work of local character can be tackled efficiently by any of the Tank locomotives in the Hornby-Dublo range. In addition to such ordinary work, which is none the less necessary, the 2–6–4 Tank also can be used effectively for longer-distance trains, even of express character. As a matter of interest I must point out that a Three-Rail 2–6–4 Tank of recent production is one of the engines in the shed scene at left. Moulded couplings, now standard in Hornby-Dublo, are fitted and the chimney on this new Locomotive is now a separate casting, as it is already on the Two-Rail version.



A Three-Rail steam shed scene in Hornby-Dublo, showing two of the familiar 0–6–2 Tanks and the latest version of the Three-Rail 2–6–4 Tank.



A LAYOUT OF MANY PHASES

MOST layouts, as I have often remarked in these Notes before, are in a constant state of development. That pictured at the top of this page is the sixth version of a railway which has been extended in one form or another for eleven years. It has been built by Mr. A. R. G. Pearce of Assam (India) and operating the layout in the picture is his son, Arthur Pearce. Arthur has, in fact, appeared in the pages of the *M.M.* before, for an earlier layout built by his father was described in our pages some years ago.

Because of changing locations brought about by the business interests of Arthur's father, complete revisions of this extensive three-rail system are often necessary. Arthur himself is at school in England and so it is only when he is on holiday with his parents, overseas, that he gets the chance to operate this very wonderful layout.

* * * *

Since the pictures appearing in this month's issue were taken, the general scheme of Mr. Pearce's layout has again been changed, but I wanted readers to have the opportunity of seeing these photographs because they are clear and interesting, and because they depict in general the very effective style adopted on all the layouts operated by the Pearces. Special attention has always been given to lineside and engineering features, as you can clearly see from the pictures presented here.

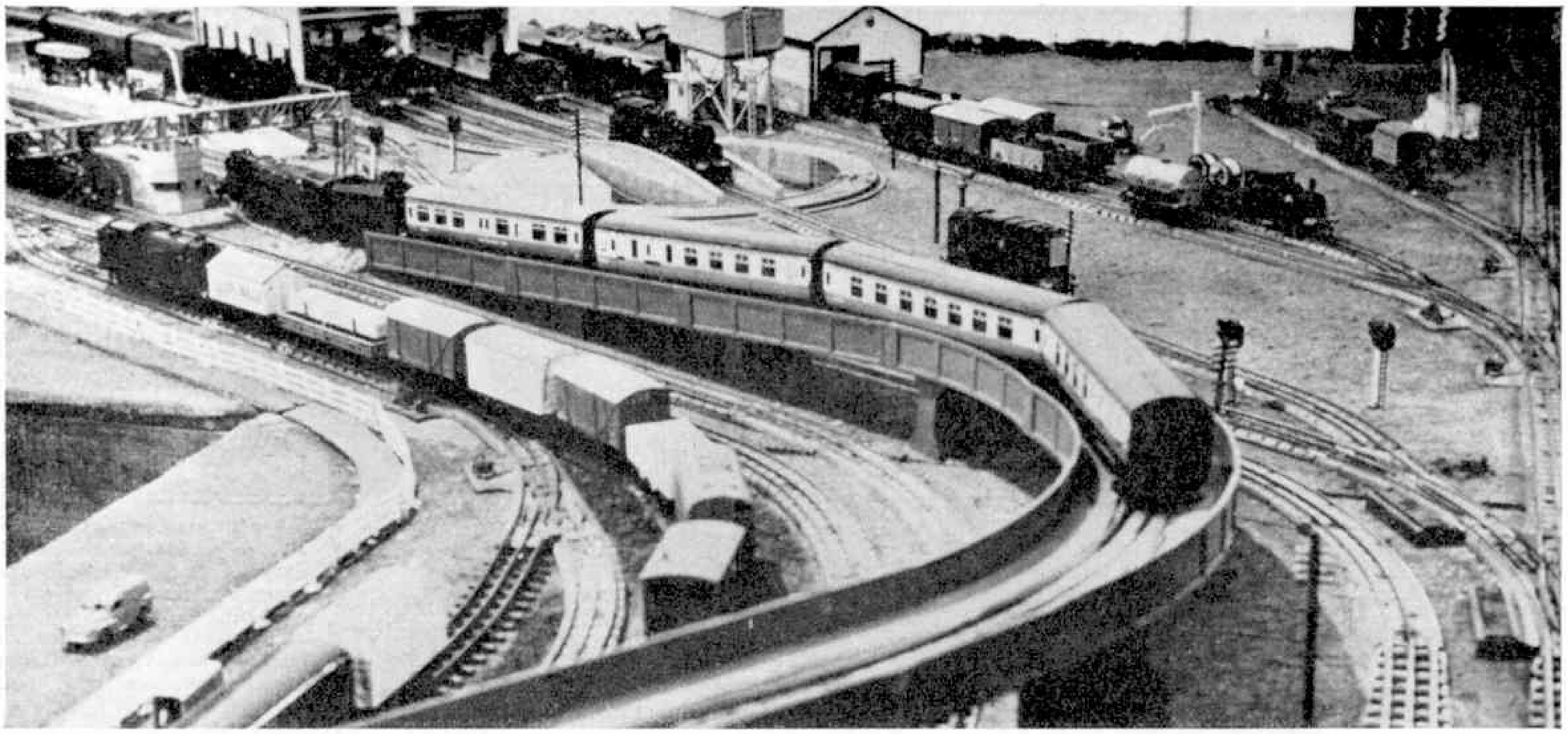
BY LAYOUT MAN

The present layout has been developed on a site measuring 18 feet by 12 feet, a generous amount of space of which the fullest advantage has been taken to build up a track well suited to long-distance, continuous running between the two main stations. Double track is provided throughout, the complete main line being basically of "figure-eight" form, but with one loop inverted, as it were, and enclosed within the other. The routes do not intersect on the level, as is usual on the simplest "figure-eights". The amount of space available has made readily possible the arrangement of the various tracks at three different levels, and one double track main line is led over the other by means of a bridge crossing diagonally above the end of one of the two stations. The gradients involved in no case exceed 1 in 36.

The double track nature of the main line allows traffic to be worked correctly in the up and the down direction, and a feature of the system which is most useful where continuous running is required, is the provision of fairly long running loops in certain places. In addition, there are connections between the tracks at different levels whereby the direction of trains can be changed from down to up, and vice-versa. This sort of thing is often useful in the course of a running programme, and the fact that the connections between the different levels are carried through tunnel sections adds to the variety and apparent activity on the line.

A long tunnel also covers a level, straight main line stretch and inside this tunnel section each main track, up and down, has a corresponding loop line alongside. These loops are intended for storing trains temporarily during the course of running operations, as the loops are arranged so that they can be isolated

The picture above shows Arthur Pearce intently watching the traffic on his Hornby-Dublo layout. The trains passing are a local freight, behind a 0–6–2 Tank, and a mail express hauled by a streamlined Pacific.

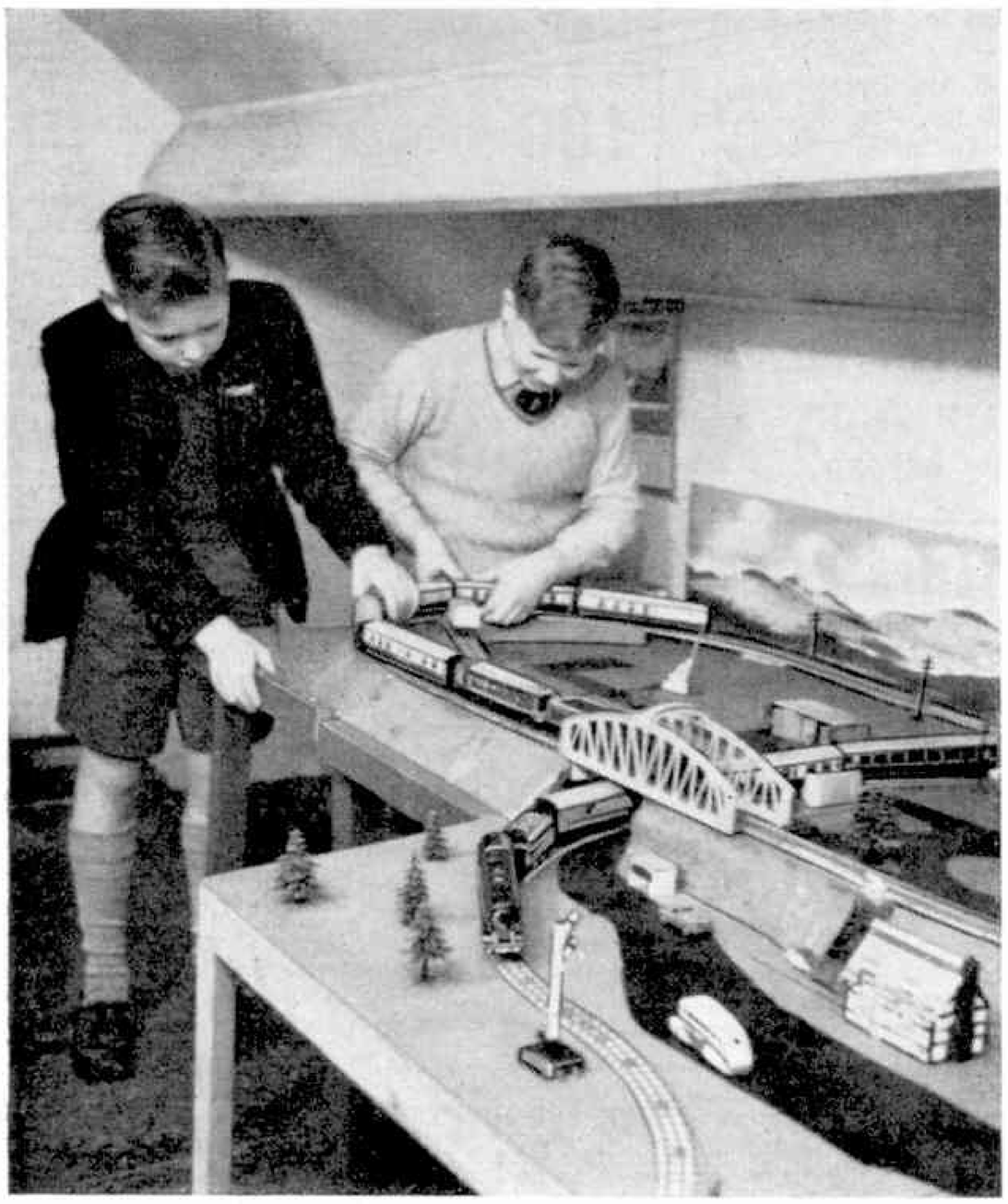


A fine view across a busy part of the Pearce layout, looking towards the locomotive yard.

electrically. In this way a given train can pass out of sight and remain hidden from the observer for as long as the operator finds convenient. The siting of the loops in tunnel is perhaps a little unusual, but it has its advantages, as we saw on the "Crewe" layout described in these pages last May. A track circuiting and indicator lamp arrangement has been fixed up by the railway's own engineers to show the operator whether the loops are occupied or not.

Further isolating arrangements are incorporated on the up and down main lines, each of which is divided into eight sections. This, and the fact that the platform lines and sidings form individual sections connected to isolating switches, makes it readily possible for shunting and other operations to take place independently of traffic elsewhere.

The control site is located virtually in the centre of the system, so that the operator can survey everything that is going on. At the same time, as we have seen, he is also aware of the situation in the main line tunnel sections. Further, his position when working the railway also gives him a complete view of the fairly extensive marshalling yard lying before him. This yard, like the locomotive depot and goods yard section in one corner of the layout—as well as the individual up and down tracks—is subject to its own separate control unit. Although independent operations in these main sections are readily possible, trains can pass freely from one main section to the other so long as the operator adjusts the controllers concerned to about the half-speed position, and to the same direction of travel. The main section that is to receive a train from another one must, of course, be clear, but this is readily effected as the result of the generous provision of isolating sections on the layout.



H.R.C. Member D. Hanson and his friend John Beale are busy in this picture with their jointly-owned Hornby-Dublo layout.

There is plenty of rolling stock to make up trains for the various services. Hornby-Dublo Coaches number twenty at the moment and there are more than 70 items of goods rolling stock. Further additions are made as new vehicles are introduced into the Hornby-Dublo range. At present the storage of these does not appear to present any particular problem, but there must come a time on any railway when the number of vehicles tends to outgrow siding capacity. When this point is reached, no doubt Arthur and his father will devise yet another version of their layout!

At the period when these notes were prepared there were nine locomotives in service on the railway, one of each of the well-known Hornby-Dublo 4–6–2 express classes, together with several of the familiar tank locomotives of 2–6–4 and 0–6–2 types. A further development that will have taken place by the time you read this is the addition of two new Hornby-Dublo Diesels, a Co–Co and an 0–6–0 Shunting Locomotive, as Arthur was planning to take one of each of these with him when going home for the summer vacation. It is quite certain that these locomotives, like the steam-type engines familiar on the layout for so long, will help to provide more variety and enjoyment of the running of the system. The Pearce railway is not a father-and-son affair only; it is something of an institution locally, for considerable interest is taken in it by grown-ups and other more youthful enthusiasts in the area.

* * * *

Two other young Hornby-Dublo owners appear in our third picture. They are D. Hanson (H.R.C. No. 299263), and his friend John Beale, both of Pontefract. They operate a jointly-owned railway which is situated on a permanent baseboard built in a (*Continued on page 345*)

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FOR OTHER STAMP ADVERTISEMENTS SEE ALSO PAGE 343

For Stamp Enthusiasts

Birds in the Album

By F. E. Metcalfe

I HAVE just been examining a set of stamps issued by the Netherlands, which I will refer to again later on. The designs have to do with birds, and this recalls a stamp collection I saw some time ago devoted exclusively to these feathered creatures. I don't think there is anyone who does not like birds, and although we rarely see more than sparrows, blackbirds, and starlings in our garden, if I had to choose between these and the flowers I would plump for the former. All this being the case, no wonder one of the most popular subjects with thematic collectors is birds. And because of this, those postal administrations which have their eyes on the pockets of collectors—and there are many of them—are seeing to it that there are plenty of new issues carrying the right kind of picture.

New Zealand, for instance, got wise to the trend, and for the past two years the "Health" stamps of that country have illustrated teals, kingfishers, etc., and very

nice stamps they are, too. Moreover, the face value was low, and the cause behind these issues a very worthy one; so I, at least, am not complaining.

The "Iron Curtain" countries have really "gone to town" on this subject, and some of the birds depicted on Polish and Hungarian stamps are delightful. I wish there was room to illustrate several of them. One advantage about these stamps is that they are quite cheap generally, and a wonderful show can be made for the expenditure of very little cash.

I mentioned earlier on that, in common with most people, I love birds, but by reason of that affection there is one which I dislike very much. Referring to Hungarian stamps reminds me of what I was once told when I was living in that country. We were driving through the Great Plain, as they call it, and I was struck with the fact that there were very few small birds to be seen. With so much feed about, in the way of growing grain, etc., one would have thought that there would be flocks of small birds around, but this was not the case. I mentioned this to my companion, and asked why it was so. He pointed to three magpies (there were plenty of these about) and replied, "Those

are the culprits. They rob all the small eggs they can find, and they are dab hands at finding them."

I regret to say that latterly I have noticed more magpies in Britain. I hope they do not multiply further. Of course, I know that kingfishers are equally to blame for robbing nests, but somehow these birds are so handsome in themselves that I cannot have the same feelings against them as I have against their black and white fellow-robbers.

Incidentally, as already mentioned, there is a kingfisher depicted on the New Zealand Health stamp for 1960, on the 2d.+1d. value (CW H47). And while I am writing about these Health stamps I would like to refer to those issued in miniature sheet form. These little sheets of six stamps look most attractive when mounted. They were introduced in the first place to facilitate the sale of the Health stamps. You see, the surcharge on each stamp goes to help to pay the cost of Health Camps for children. It is the practice of New Zealand Boy Scouts, and similar organisations, to go round selling the stamps from door to door, and as they found it very difficult to handle large sheets, the operation was simplified by making some of the stamps small.

I also referred earlier on to the Netherland's "Summer" set, which this year depicts birds. Naturally, there is nothing very exotic about those illustrated, nor do they include any that we do not see in England; but it is a beautiful little set, and inexpensive. The surcharge is for a good cause, and the six stamps will make a fine addition to any collection. Incidentally, the Post Office Philatelic Service, at The Hague, has published a brochure which not only illustrates the stamps but also reproduces the photographs from which the designs were derived. In addition it tells you all about the habits of the birds.

Returning to the Commonwealth again, I must mention two handsome stamps which Norfolk Island issued on May 1. These were the 3d., showing a White Tern, and the 2/–, the Providence Petrel. Norfolk Island uses Australian currency, and as this runs 20 per cent. below Sterling the stamps come out a bit cheaper. Anyhow, like many of the stamps this now very popular country is issuing at the moment, the pair mentioned here will make a fine show in your bird collection.

Another bird stamp I like very much is the Canadian 5c. "Whooping Cranes" stamp issued in April 1955 to mark the National Wildlife Week. It is illustrated on this page. A copy only costs a copper or two used, and for that small sum you get a most attractive item. I remember that when it was issued there was a good deal of publicity about the birds shown, as they are in danger of becoming extinct. There are only a few of them left, and, if I am not mistaken, they nest in Texas. I believe the Americans are also doing their best to preserve them.

Coming to something really classy, we have the Fiji 4/– stamp which handsomely portrays a Kandavu parrot. I am mentioning this stamp because British designs come in for a lot of criticism from people who are more vocal than knowledgeable. Well, of all the stamps issued in 1959 in Oceania this Fiji stamp was, at the Monaco Exhibition, given the award for the best stamp of the year. I think that the prize (a gold medal) was well earned.

Of course, among all the colourful stamps which Ghana has issued since that country became independent there are naturally one or two bird stamps. Among the current definitive set, for instance, the 6d. shows a Fire-crowned Bishop, the 1/3 a Penant-winged Nightjar—a most startling bird, this—the 2/– stamp a pair of flying Crowned Cranes, and the 2/6 the Giant Plantain Eater. My word, Ghana must be a wonderful country for birds.

There are magnificently-plumaged birds in all the tropics, of course, and some of them are really incredible. I remember once staying in the north of Argentina, right out near a large forest in Misiones. At night it would have been sheer delight to sit on the veranda and just listen; alas, if one attempted such a thing one was kept far too busy swatting mosquitos!

Anyhow, if you like birds try collecting them on stamps. You can make a wonderful show for very little cost.

Stamp Gossip

Postage Dues

RECENTLY, I received two letters, one from a young Surrey collector and the other from Glasgow, and both were about postage dues. Apparently these readers only collect the stamps of one or two countries, and, perhaps to make up a bit, they wanted to know if they should add postage dues to their collections. One writer remarked that he had done so already, but an old philatelist had told him they were not really postage stamps at all. Both letters ended by asking what I thought.

Well, first of all that philatelist could not have been particularly knowledgeable, as postage dues *are* a form of postage stamp, and they are also growing in popularity as there are not many of them and they are generally quite cheap. When the African Protectorates (Basutoland, Bechuanaland and Swaziland) changed their currency from pounds to rands they brought out a number of postage dues overprinted, but I am afraid these are not very cheap. Still, there are plenty of others to go after, and by all means do this if you limit your collection to a few countries which issue them.

THE NEW SEASON

It seems only yesterday that I was warning you to store your stamp collection carefully if, during the summer, you would be busier out of doors than in. Now the new catalogues are appearing, which means that "Stamping" is again in season. About the time these lines appear in print Gibbons' Simplified Whole World Catalogue will be about ready for issue. At the time of writing I don't know what

the price will be, but up to now this catalogue has always been very good value, costing a little over one pound. Another catalogue which will have appeared is the Commonwealth KGVI Catalogue, and this will cost 8/6. It is the only catalogue devoted exclusively to the British Commonwealth stamps of the KGVI reign, and for that reason it has a big following. Anyhow, whatever you collect don't make do with an old catalogue for, with values, etc., changing all the time, it is really false economy. Some people think it is better to buy stamps than knowledge. Frankly, as an old hand—if I may thus style myself—I think that is a wrong idea, and those who hold it often are very heavy losers. Anyway, good hunting for the new season.

STAMP BOOKLETS

Lately, the Post Office has been giving a lot of publicity to stamp booklets for, as I previously pointed out, if they can increase the sales of these handy items they can decrease counter work, and saving labour means more profit. Well, booklets are getting more popular with collectors all the time (that's good profit for the P.O., if you like), and hundreds are also going to American collectors, so all in the garden really is lovely, so far as the Post Office is concerned.

But—and this is where we come in—some of these booklets are worth a good deal more than they cost to buy in the Post Office, and here I will mention one worth looking for. In April 1959 a new 2/– booklet appeared with a salmon-pink cover, and the stamps it contained all had the E2R Crown watermark. Later, toward the end of last year, the same type of booklet appeared, but with stamps bearing the Crown watermark only (you know those stamps; the same as you buy now in the Post Office with the watermark showing small crowns only). Collectors had hardly noticed the change-over when more booklets appeared, this time with a yellow cover, but it is the ones with the salmon-pink covers and C watermark stamps which you should look for. They cost around 6/– each just now, but I think the price will go higher. Maybe you have one.

OUR SPECIAL ISSUES

We are now in the midst of this year's special issues of stamps by our own Post Office, as detailed in last month's *M.M.*, and it is quite fun to look at all envelopes or packets to see if they bear any of these new stamps. I mentioned then that nicely-cancelled copies would be well

(*Continued on next page*)

By E. W. Argyle

Locomotives On Stamps

THE 101–7 tons giant locomotive shown above was built in 1955 at the Czecho-Moravian Works of C.K.D. at Sokolovo, Czechoslovakia. A 477–0 class, it is a three-cylinder tank engine with four coupled axles, used for hauling express and goods trains in mountainous areas. Water is stored in a tank behind the cab and at the sides of the locomotive. With a 2–D–2 wheel arrangement (4 ft. 8½ in. gauge) the engine has a total length of 56 ft. 9½ in., and an overall width of 10 ft., with a height of 14 ft. 7 in. The boiler is of all-welded design.

An old-fashioned wood-burning locomotive with its train is seen passing a country station on the Bytown and Prescott Railway, Canada, in the year 1851, on above Canadian stamp. The first Canadian-built, streamlined, diesel-electric train, built at the Montreal Locomotive Works in April 1950, is shown, at top right corner of stamp, pulling a C.P.R. train.

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FOR OTHER STAMP ADVERTISEMENTS SEE ALSO PAGE 340

Stamp Gossip—

(*Continued from previous page*)

worth getting hold of. The lower values, such as the 2d. and 3d. denominations, will never be very scarce, but even so I think they should be put away and, of course, don't overlook getting a mint set of each. But a word of warning—do not be tempted to put a lot of mint sets away. Many collectors may be doing just that, perhaps, and all that will happen to such stamps is that they will have to be used later on for postage. No loss you will say, but no gain either.

NEW ALBUMS

This is the time of the year when a lot of new albums are bought, and as these are expected to last a long time it is important that they should be well built, as it were. Now it is also a fact that a lot of cheap Continental albums and stock books are coming over, and in some cases they look cheaper than those manufactured in our own country. As one who has had a lot to do with albums, for many years, I would say without any hesitation that it is false economy in the long run to buy any albums but British, for the latter are the world's best. So when buying, see that you buy British.

THE TIP OF THE MONTH

As everybody knows, South Africa has left the Commonwealth. Some might think that British collectors, in consequence, may drop collecting the stamps, but not only will they remain listed in the Commonwealth Catalogue, but in Gibbons as well; and moreover, as far as I can see, there will be no change anywhere. Now this brings me to the "decimal" stamps, which were on sale from February 14 to May 31. Some of these values are quite scarce, and my tip is to make sure that you complete your used set just as soon as you possibly can. I think you will be glad later that you did so.

JUDGE FOR YOURSELF

AN UNDERGROUND COAL CARRIER

A tipper chassis shipped out to South Africa by Albion Motors Ltd., of Glasgow, has been specially adapted there for use as an underground coal carrier and is now operating at a Witbank colliery. Based on a 94 h.p. diesel-engined Albion Chieftain chassis, the vehicle was re-assembled underground after being transported down the mine shaft in two sections.

Modifications to the chassis included the replacement of its constant mesh gearbox by a Brockhouse torque converter, because of the vehicle's continuous "stop-start-reverse" cycle of operations over a run of about 200 yards. It also has a special dashboard, on which warning lights have been included among the normal instruments, for easy recognition in bad lighting at the coal face.

The Chieftain is equipped with a special tipper body by More-Wear Body Construction (Pty) Ltd., of Elandsfontein, which accommodates wheel arches designed so that no coal stays behind the arches after tipping. The body is tipped by twin Meiller rams set very low in the chassis. This has allowed the body to be mounted low so that it can tip in less than 9 ft. 3 in. headroom.

MORE MECHANISED "PIT PONIES" FOR I.C.I.

The fleet of mechanised "pit ponies"—A.E.C. "Mammoth Major" six-wheel trucks employed underground by Imperial Chemical Industries in their anhydrite mine at Billingham—is to be increased to seventeen as a result of a recent order for three additional vehicles.

Faced with a particularly hard life underground and subject to high standards of fire precaution, the new vehicles will be specially adapted for their specialised duties by the Scottish Land Development Corporation. The numerous modifications will include fitting an audible warning to the air-pressure system and divided-circuit brakes, since, when fully loaded, the vehicles regularly encounter gradients of 1-in-4 in restricted working spaces.

A DOG'S DAY

One day, Mr. Pett's dog Chummy caused a great deal of trouble. He went next door into Mr. Trim's garden and attacked his chickens. Then he dug up Mr. Trim's flowers, and finally bit the postman.

BY A BARRISTER

Mr. Trim and the postman both sued Mr. Pett. Mr. Pett had to admit that Chummy was a very mischievous dog, but he proved that he had never actually bitten anyone before.

Did Mr. Trim and the postman win their cases?

(Answer on page 333)

CALLING BUS AND COACH SPOTTERS!

Well over 100 elderly vehicles ranging from a 106-seater tram car down to a minibus, and dating from almost 100 years ago up to the 1930s, have now found resting places in museums or even at private houses up and down the country. This is proof of the interest now taken in items of road transport past and present by an ever-growing army of people. Believing that many of its readers take an interest in public service vehicles, the "Meccano Magazine" this month introduces a new feature dealing with this topic.

By David Kaye

BY the time you read this, the trolleybus will have almost disappeared from the London scene, for eleven out of the fourteen stages by which these electric vehicles are being replaced by diesel buses will have taken place.

The once huge fleet of more than 1,500 trolleys has now sunk to a few hundred, and before the end of May next year these, too, will have become only a memory.

The Q1 class of B.U.T. vehicles, which came in two batches after the last war, namely 1765–1841 (HYM 765–841) and 1842–91 (LYH 842–91), have mostly been sold to Spanish operators, such as San Sebastian and Bilbao, but for the majority of the remainder it has meant a final journey to Cohen's scrapyard at Colindale. However, 796 (ELB 796), a Leyland of class H1, has gone on a much more exciting farewell trip—to Paris, where it is being preserved by the French Vehicle Museum Society.

Experiments were tried in London with class X5 A.E.C. trolley 1379 (EXV 379), just before the second world war, to run this type of vehicle down the Kingsway tram subway from Holborn to the Thames Embankment, but apparently these were not a success. This was a pity, because one reason for the abandonment of trolley buses in a place like the Metropolis was that they can cause congestion, and one-way street plans cannot be carried out as they were after the conversion of the Tottenham Court Road services this Spring.

* * * *

London is not alone in deserting these faithful forms of transport; several authorities have banished electric traction from their streets before now. Birmingham was one of the first, but its trolleybus system was never anything like as large as its tramway or diesel bus network. Trolleybuses have also vanished in the past two years from Brighton, Hastings, Darlington, Mexborough, Swinton, Grimsby and Cleethorpes, while Portsmouth, Ipswich and Hull have started to reduce their trolleybus services. On the other hand, Reading recently took delivery of brand new vehicles.

However, just as Glasgow and Blackpool have become the last refuges of the tram, so Bournemouth and Bradford are likely to remain the rallying points for trolley enthusiasts for many years to come. The south coast resort normally buys its own distinctive double entrance and staircased trolleys, although economy has dictated that its next batch shall be without front stairs, but with the front entrance remaining. Nevertheless, Bournemouth did purchase three of the only trolleys ever owned by the British Transport Commission which were in the Brighton, Hove and District Omnibus Company fleet (now Nos. 292–4, DNJ 922–4) and four from Brighton Corporation (now Nos. 288–91, HUF 45–8), but none of these received the time-honoured dual entrance look.

Maidstone Corporation, with its unusual livery of brown, may not be one of the best known operators, but its small trolleybus system has also recently absorbed outcasts from elsewhere in Southern England in the form of Brighton Corporation 51/2 (LCD 51/2) and Hastings 32/4/5/42/3 (BDY 807/9/10/7/8).

* * * *

Bradford deserves a paragraph of its own, for there you can see trolleybus history in action. It was in this centre of the woollen industry, in 1911, that the trolleybus first saw the light of day—a rather uninspiring single-decker with solid tyres and tramlike controllers. But Bradford is proud of those pioneering days. Likewise, this town was the first to run double-decker trolleys—ten years later, in 1921. At the moment they welcome into their ranks exiles from all over this island. Ashton-under-Lyne, Cleethorpes and Grimsby, Doncaster, Brighton, Darlington, Hastings, Llanelly, Mexborough, Swinton and St. Helens have all sold batches to Bradford. The older ones and the single-deckers are sent across the Pennines to the East Lancashire Body Works to receive new double-deck bodies; the remainder are thoroughly (*Continued on next page*)

New This Month

There's Nothing Like Starting Young!

It's quite a difficult job getting hold of big brother's "Meccano Magazine". Daddy always has to have a look at it, of course, but I usually get round to having a glance at it in the end—even though it may take a month or two!

Calling Bus and Coach Spotters!—

(*Continued from previous page*)

overhauled at the Thornbury Works of the City Transport Department, under the watchful eye of Mr. Barnett, Works Manager, and Mr. Humpidge, Chief Engineer and a great trolleybus enthusiast.

What of the future? With fewer and fewer new trolleybuses being ordered it becomes increasingly unprofitable for firms to manufacture them. Many have ceased to do so, and replacements will become a headache in a few years' time. Meanwhile, certain big cities such as Newcastle-on-Tyne and Manchester wait to see which way the wind is blowing. Glasgow has the choice of replacing its tramways by diesel buses, which may last fifteen years, or by trolleybuses, which may cost twice as much initially but last twice as long. One can only face the future pessimistically, I am afraid.

What do you feel about trolleys? Should they go as part of the price of "progress", or are they a worthwhile form of public transport? Write and let me know your views. Address your letters to me, c/o Editorial Department, *Meccano Magazine*, Binns Road, Liverpool 13. You must enclose a stamped addressed envelope if you require a reply through the post.

A Flying Start—(*Continued from page 325*)

are not taught at Halton. They are dealt with at a special Apprentice School at Locking, in Somerset, where training includes bad weather landings and air-sea rescue operations.

The cost of training an apprentice is considerable—between three and four thousand pounds. The great care taken in selection ensures that the standard is kept high and that failures are few. The age of entry is between 15 and 17½, but most boys start at about 16. Normal physique is essential, and for trades where colour coding is involved colour blindness is a bar. Naturally, the R.A.F. expects to get full value from its apprentices, and they are required to serve for twelve years from the age of eighteen, or for nine years, followed by three years on the Reserve. It is possible to buy oneself out in special circumstances.

To attract the best type of boy the R.A.F. is prepared to pay well. A youngster in his first year gets £2 2s. 0d. a week, rising to £6 9s. 6d. at the age of 17½ years and £9 9s. 0d. a week on satisfactory completion of training. Food, accommodation, clothing and travel home on leave are free. Apprentices draw full pay on leave and an allowance equal to the value of the daily ration.

Wisely, the authorities operate a compulsory savings scheme which ensures that an apprentice has sufficient money for leave and special occasions. The money is in no sense frozen and can always be drawn upon for good reasons, such as buying presents for relations or getting a new camera, tennis racquet, or civilian shoes.

When an apprentice leaves Halton he can be promoted to corporal almost at once; ten to twelve years later he can be a warrant officer or a master technician earning some £18 a week. At this stage, he can try for a branch commission, continue his service to earn a pension in a non-commissioned rank, or go into industry as a skilled tradesman recognised by the trades unions.

The sort of boy who enjoys building with a Meccano outfit, and has a mechanical bent, can be assured of a worthwhile career if he becomes an apprentice at Halton. His parents can be equally certain that their son's moral, spiritual and physical welfare is in good and experienced hands.

World-Wide Collection of Tickets—

(*Continued from page 335*)

buses, introduced in 1910, or the Atlantean, the huge contemporary bus equipped with rear engine and front entrance.

"But those veteran buses demanded a greater skill on the part of their drivers than do the labour-saving modern vehicles," was his comment.

Many of his former colleagues at the local fire station are always on the lookout for any possible addition to the Gorick Collection, and some tickets they have unearthed have proved to be very interesting additions indeed.

"I'm always hoping that some of the chaps will follow my example and become ticket collecting zealots themselves," said Mr. Gorick, whose travels in search of even rarer specimens have so far failed to realise one acquisition—a ticket issued by the Isle of Man's Snaefell Mountain Railway.

"Ah, yes, but that is only one of many I still want to get my hands on," laughed Harry as he replaced his bulky album between a volume dealing with veteran and vintage motor-cars and an impressive stack of British and foreign guide books.

—ERIC JOYCE

A Layout of Many Phases—

(*Continued from page 339*)

room used for railway purposes only. In this respect our friends are fortunate, as they can look after their railway quite easily without anything being in the way. The baseboard is a raised one, as you can see, and very wisely there is a protective wall along the edge so that if there are any mishaps the trains are not liable to fall on to the floor.

There are some electrically-operated, as well as hand-operated, Points on the layout, while Hornby-Dublo Colour Lights, electrically-operated and hand-worked Semaphore Signals are included. Among other electrically-operated items is a T.P.O. Mail Van Set. Very wisely, the owners have provided a separate source of power for working the T.P.O. and the electrically-operated Points. The whole installation is very complete in an electrical sense, there being three power units on the control panel, as well as the transformers used for accessory purposes.

The main line expresses are worked by one of the older Hornby-Dublo 4–6–2 locomotives, *Duchess of Atholl*, with a more recent addition in the shape of 4–6–0 *Bristol Castle*. Hornby-Dublo Tank engines, a 2–6–4 and a 0–6–2 respectively, share the operation of local traffic and there is a Type 1, or Bo–Bo, Diesel to deal with local freights.

Book Reviews—(*Continued from page 329*)

how to make model aeroplanes and boats, a puppet theatre and model racing car, and various simple things for use about the house. *Hobbies and Handicrafts* deals with fretwork, block printing, lino cuts, plastics, bookbinding, pewter-work and leatherwork. *About the Home* extends the scope of the handicraft enthusiast, and explains how to carry out furniture and upholstery repairs, plumbing and electrical repairs, repairing window frames and panes, simple decorating, and how to make certain things for the garden. The fourth book, *Outdoor Pastimes*, gets farther afield, and gives practical advice on camping and camp equipment, walking and hiking, cycling, fishing, bird watching and observation of wild life, archery and—coming back home—keeping rabbits.

Each book is well illustrated with half-tone photographs and many helpful line drawings.

They Were Different Then—

(*Continued from page 328*)

a 1,279 c.c. engine, three-speed gear box, independent front suspension, anti-roll bars and built-in headlamps. Adam Opel was one of the first manufacturers to dispense with the conventional chassis and integrate it with the body.

In the following year imports to Britain included the Opel "Cadet", with a four-cylinder 1,074 c.c. engine, aluminium pistons, and a three-speed gear box. The standard model cost only £125 and the de luxe £10 more. There were also the 2½ litre o.h.v. model and the 3.6 litre "Admiral".

After the second world war the company had to start from scratch. This was accomplished with the aid of General Motors, and by 1948 production began to rise.

The Opel Kapitän (pronounced "capitaine") is the latest of a long line of successful cars. The 2.6 litre, six-cylinder engine gives acceleration from 0–62 m.p.h. in 17 seconds and a top speed of 93 m.p.h. The automatic transmission means there is no need for a clutch pedal, and a selector lever replaces the normal gear shift lever beneath the steering wheel. With the selector at "D" (for drive) the transmission automatically shifts into the right gear depending on speed, driving situation and accelerator position. Room, comfort, excellent visibility and good brakes make the Opel Kapitän one of Europe's foremost family cars. A replica of this fine vehicle has recently been introduced into the Dinky Toys series.

Fireside Fun

The quack, ranting at the top of his voice, told his audience, "This elixir, here, would enable anyone to live to a great age."

"Look at me" he shouted, pointing a finger at himself "I'm hale and hearty and over 300 years' old."

"Is he really as old as that?", a listener asked his youthful assistant.

"I don't know," the assistant replied, "I've only worked for him for 100 years."

* * * *

The judge spoke sternly. "You're a menace to pedestrians. No more driving for two years."

The defendant whined, "But, your honour, my living depends on it."

"Quite true, and so does theirs," replied the judge.

* * * *

A door-to-door salesman asked a housewife "Do you have any children, madam?"

"Yes, I have two small boys," she told him.

"Well, then," said the salesman, enthusiastically, "you will be interested in our new Space Soap, especially concocted to remove rocket grease, interplanetary smudge, comet grime and stellar dust."

* * * *

It was dark when she stopped at the roadside filling station.

She: I want a quart of red oil.

Attendant: Are you sure you want red oil?

She: Certainly. My tail-light has gone out.

New Employee: It is disgraceful the way this office is run. The work here is dull and drab; all slogging and no reward. The boss is very nasty. I will leave here if he doesn't take back what he told me this morning.

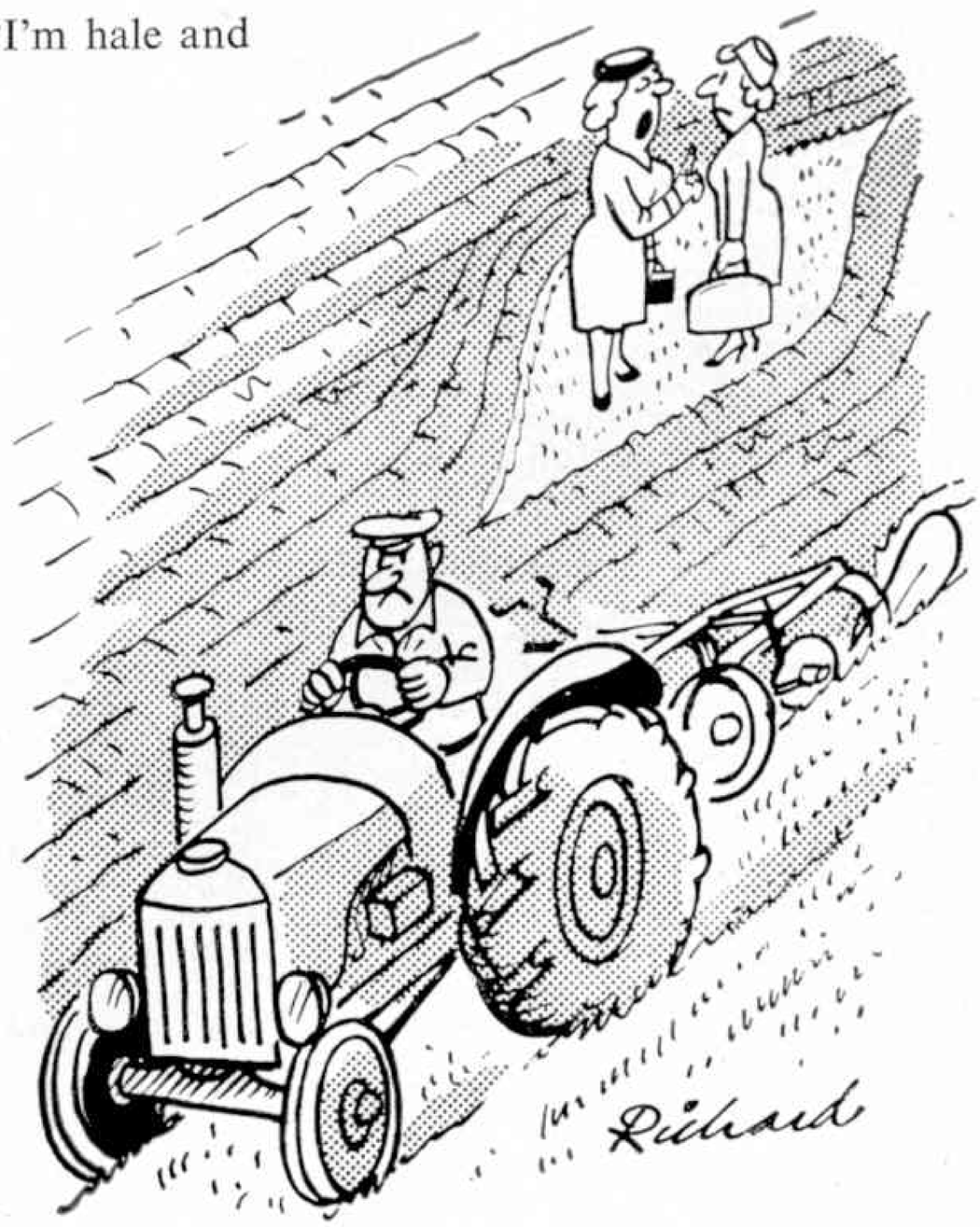
Old Employee: What did he say to irritate you?

New Employee: He said I was a stinker and asked me to quit forthwith.

* * * *

Lady (holding a biscuit above the dog): Speak, speak!

Dog: What'll I say?



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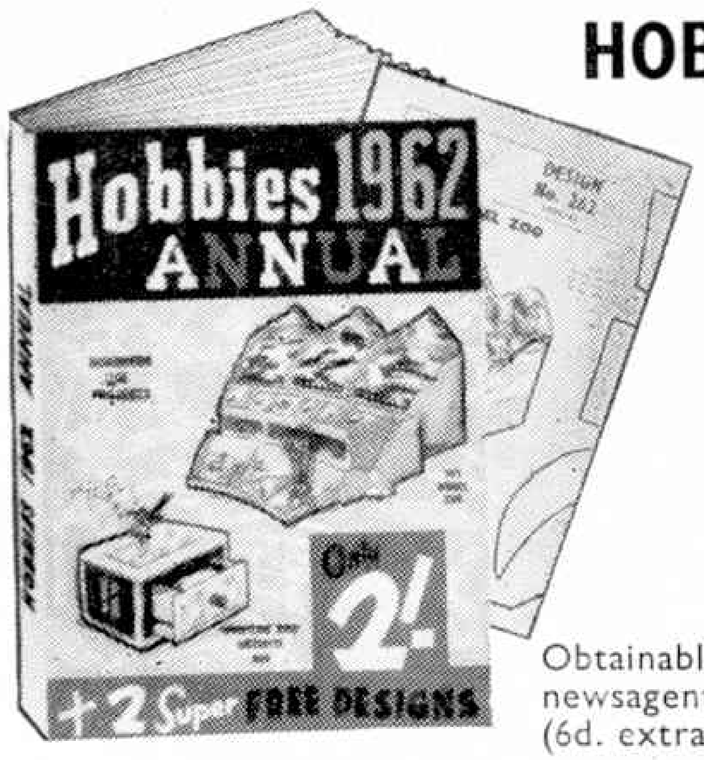

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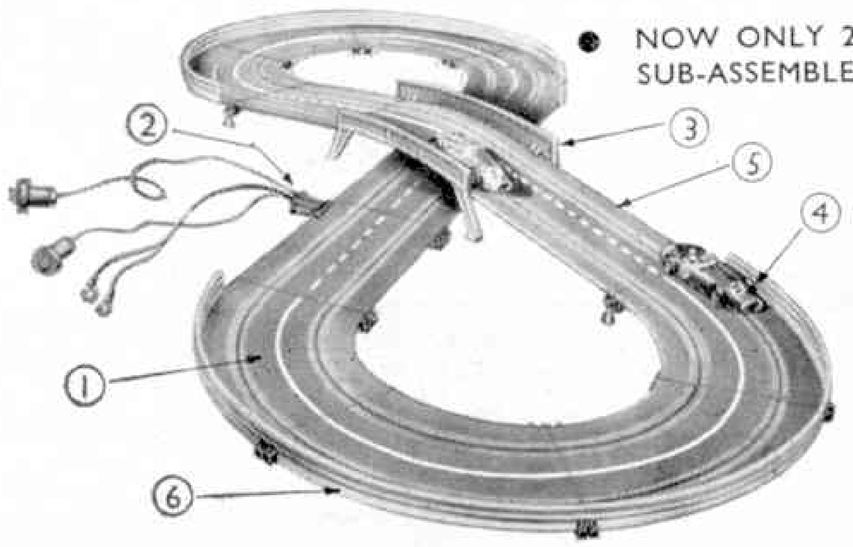

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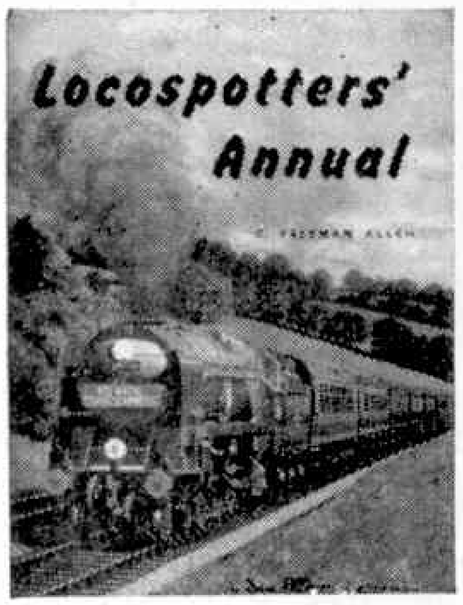

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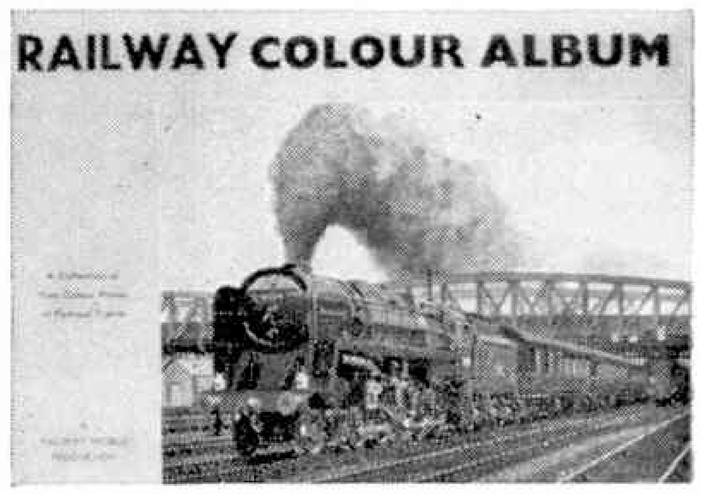

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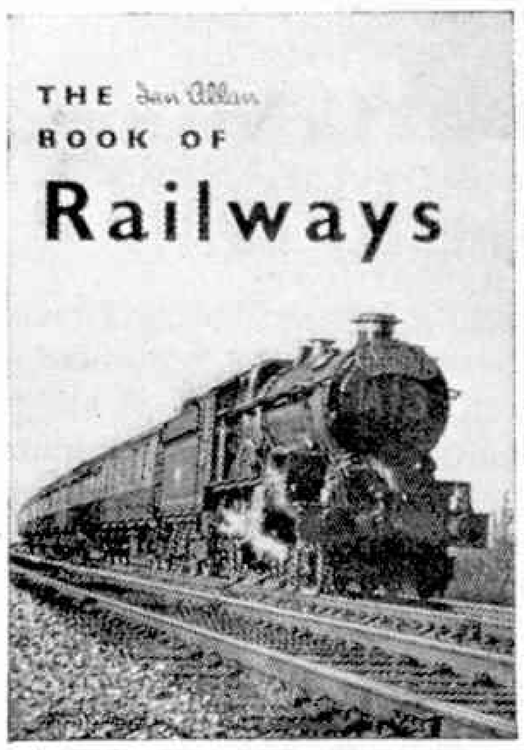

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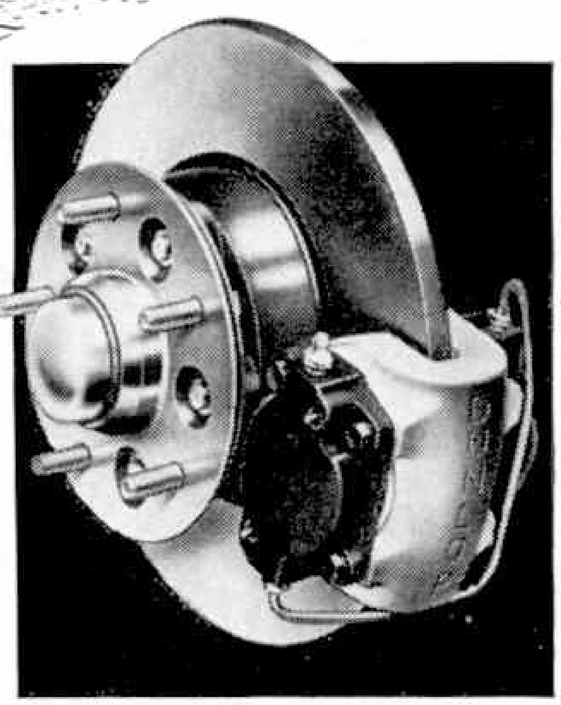

HOW TIMES HAVE CHANGED

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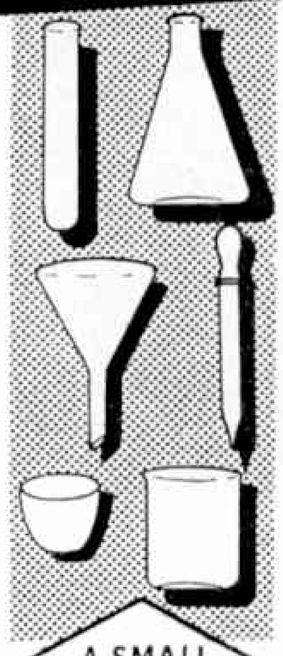

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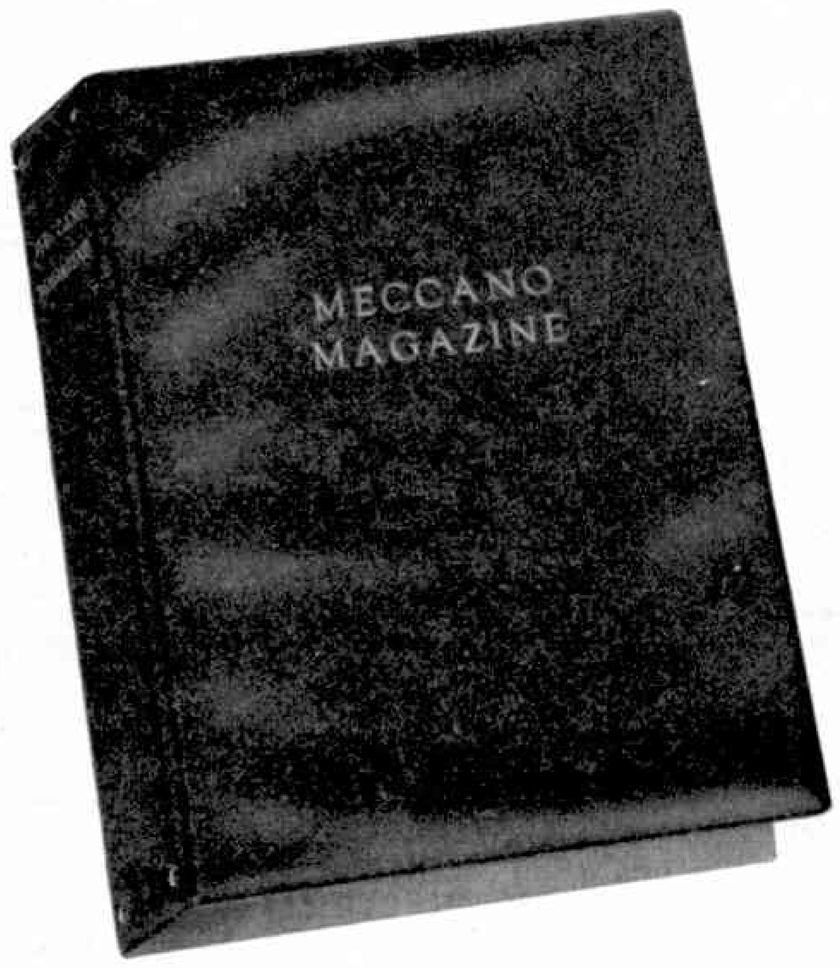

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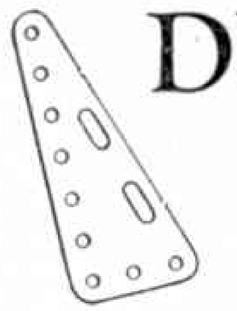

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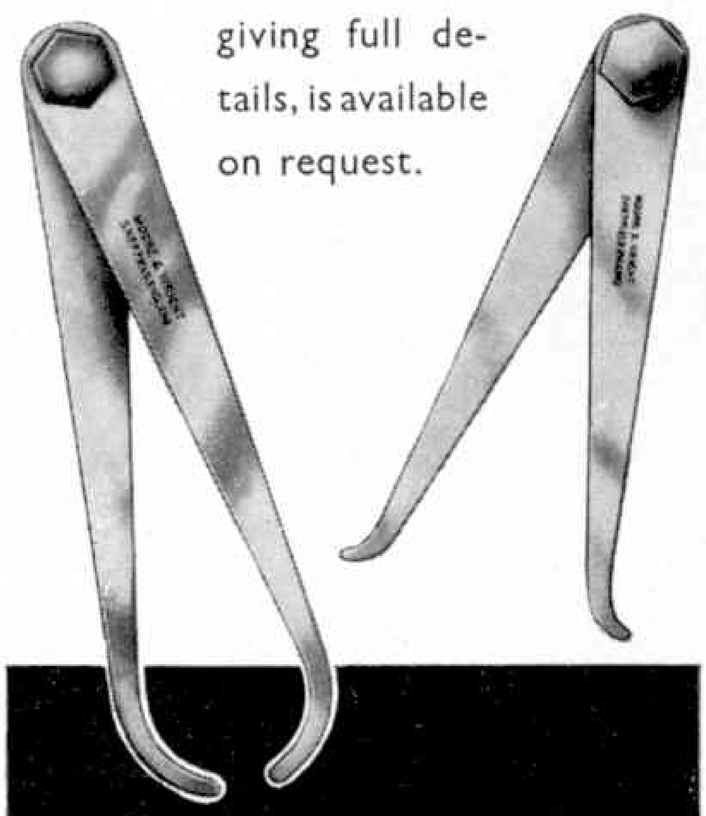

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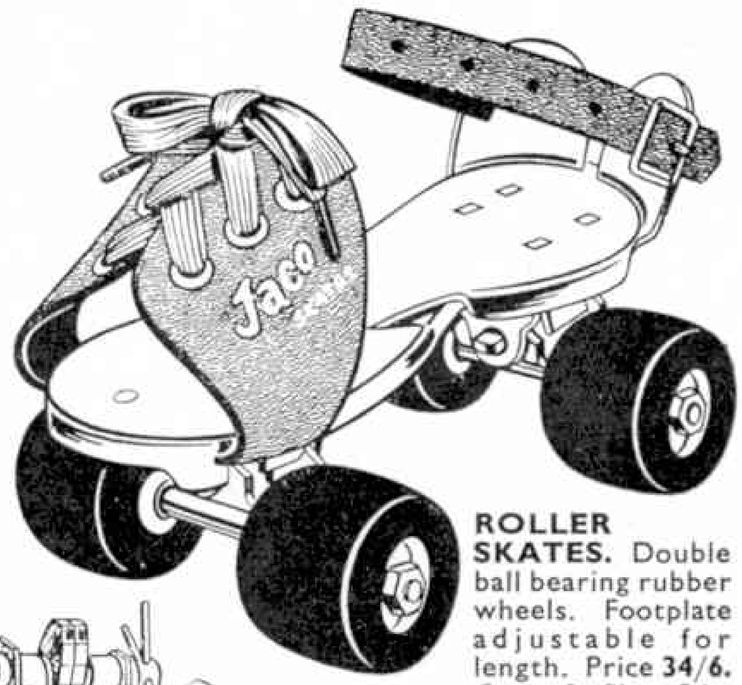

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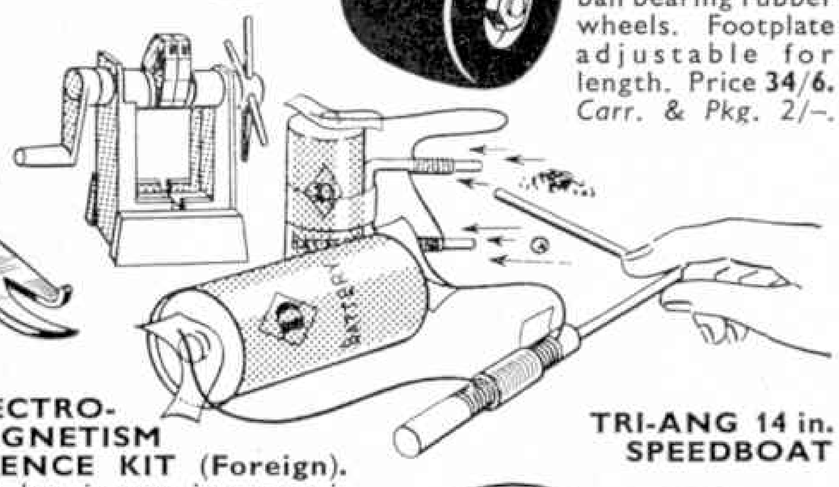

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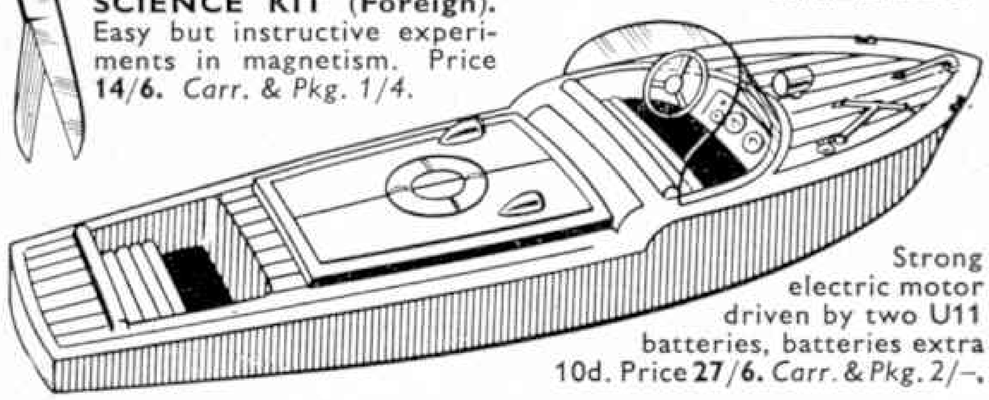

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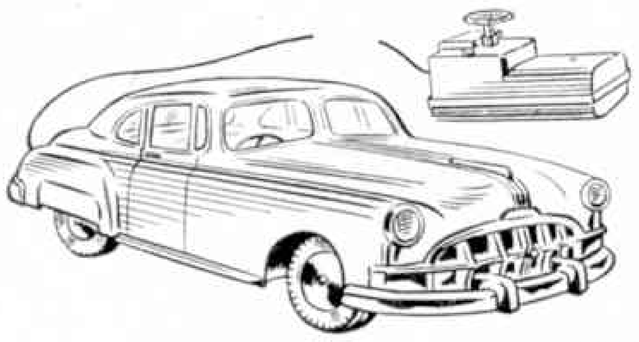

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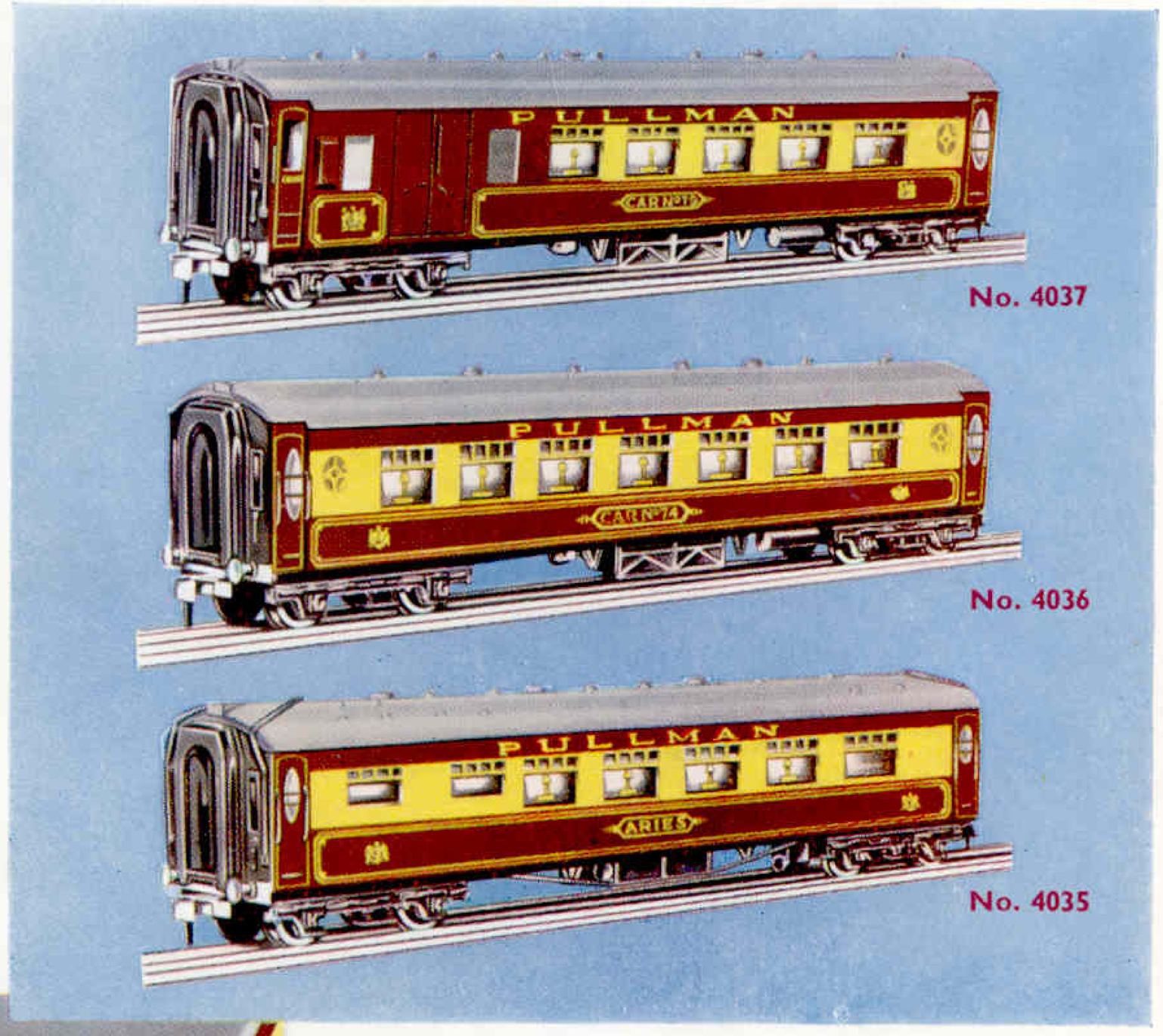

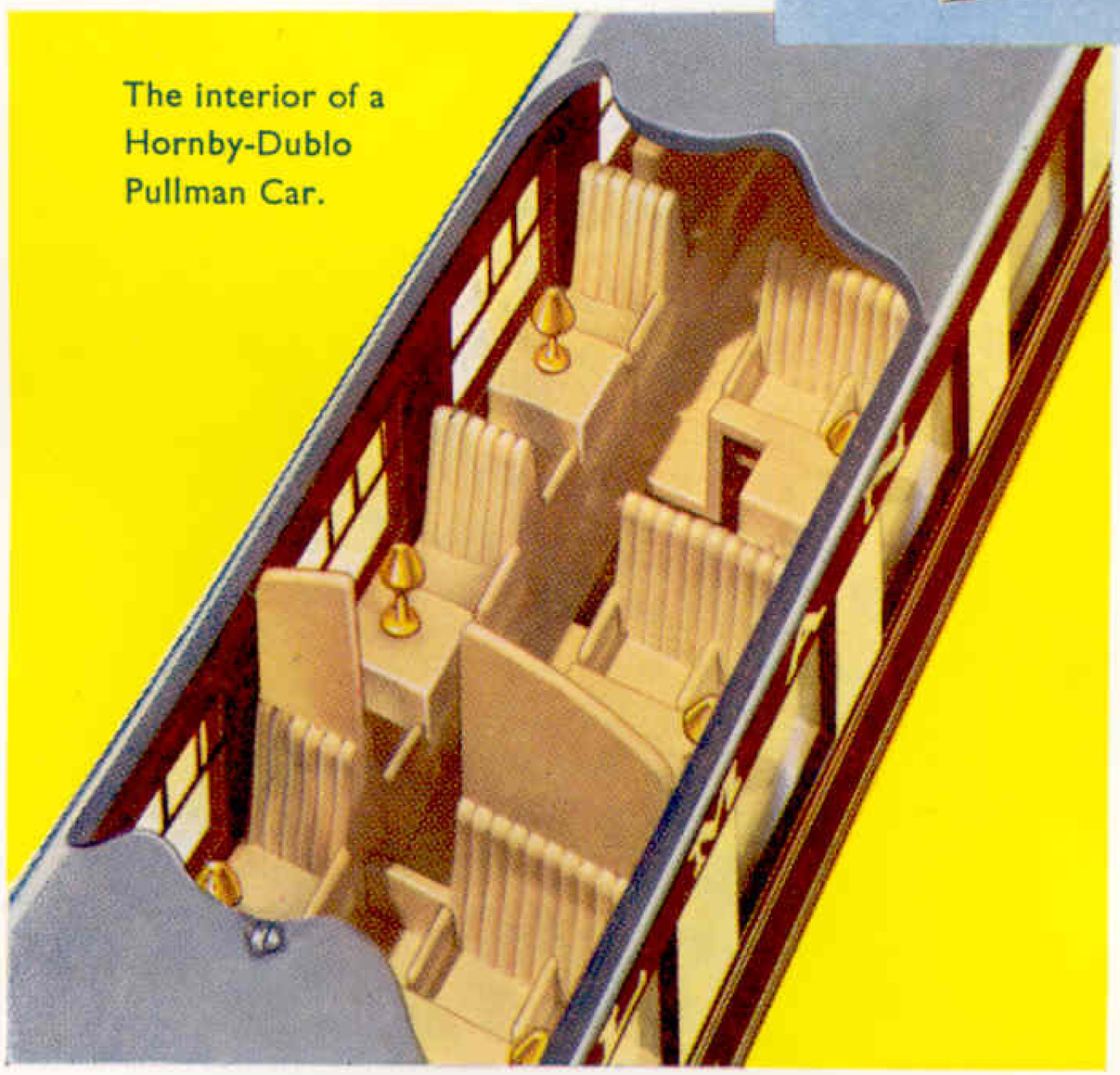

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