

VOL. XXXIX No. 3

MARCH 1954

MECCANO

MAGAZINE



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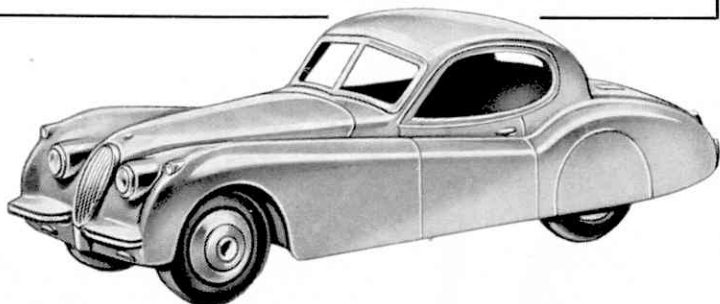
THE MECCANO MAGAZINE

DINKY TOYS

TRADE MARK REGD.

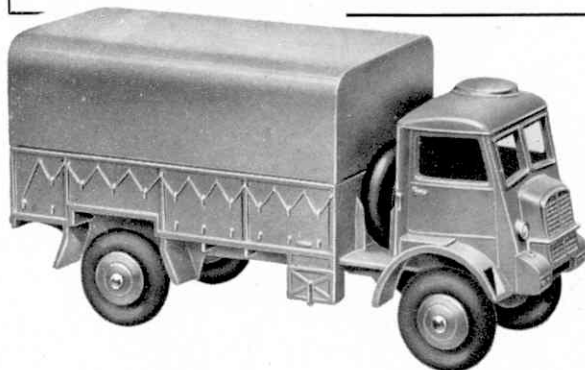
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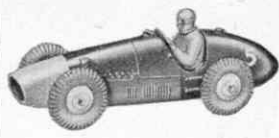
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No. 231 (23n)
Maserati Racing Car
Length $3\frac{1}{2}$ in. 2/6



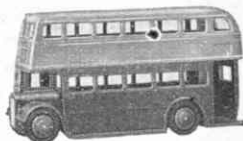
No. 235 (23j)
H.W.M. Racing Car
Length $3\frac{1}{2}$ in. 2/6



No. 234 (23h)
Ferrari Racing Car
Length 4 in. 2/6



No. 252 (25v)
Refuse Wagon
Length $4\frac{1}{2}$ in. 5/6



No. 290 (29c)
Double Deck Bus
Length 4 in. 3/9



No. 430 (25x)
Breakdown Lorry
Length $4\frac{1}{2}$ in. 4/11



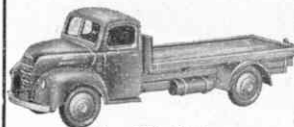
No. 161 (40j)
Austin Somerset Saloon
Length $3\frac{1}{2}$ in. 2/2



No. 158 (40a)
Riley Saloon
Length $3\frac{1}{2}$ in. 2/2



No. 159 (40g)
Morris Oxford Saloon
Length $3\frac{1}{2}$ in. 2/2



No. 422 (30r)
Fordson "Thames" Flat
Truck
Length $4\frac{1}{2}$ in. 2/4



No. 254 (40h)
Austin Taxi
Length $3\frac{1}{2}$ in. 2/11

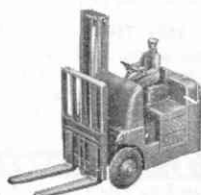


No. 253 (30h)
Daimler Ambulance
Length $3\frac{1}{2}$ in. 2/8



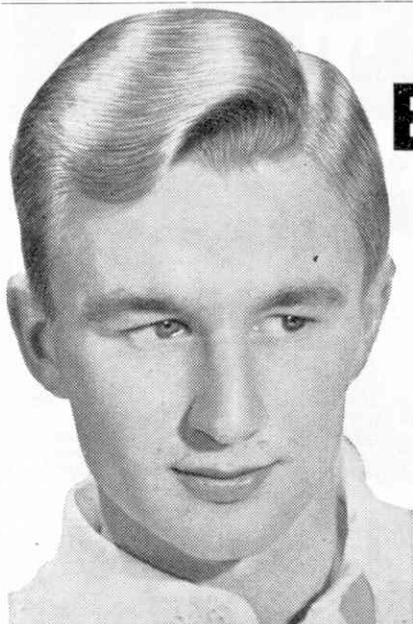
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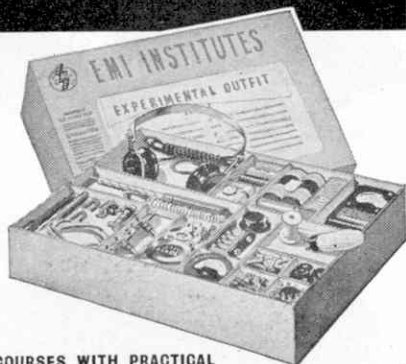
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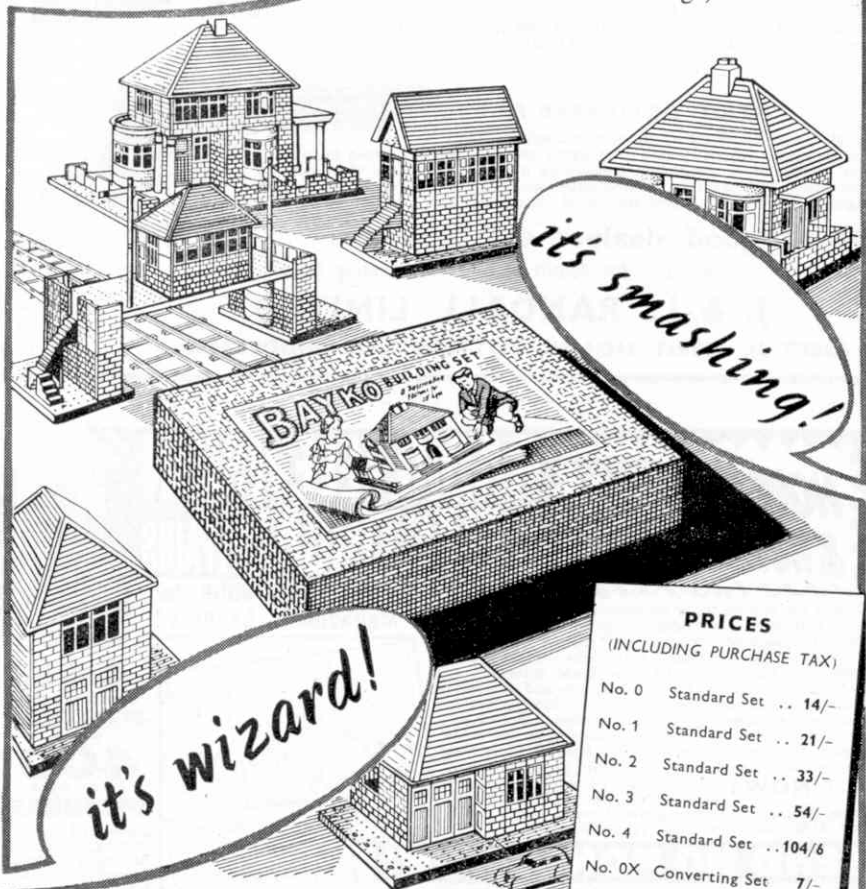
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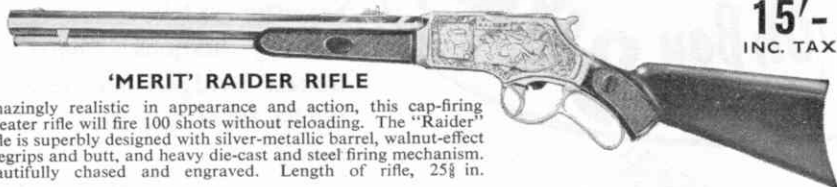
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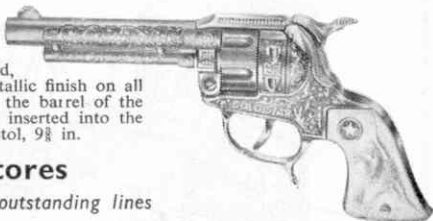
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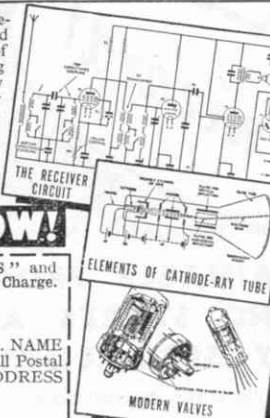
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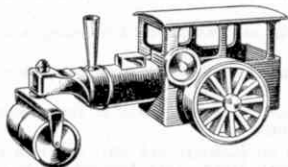
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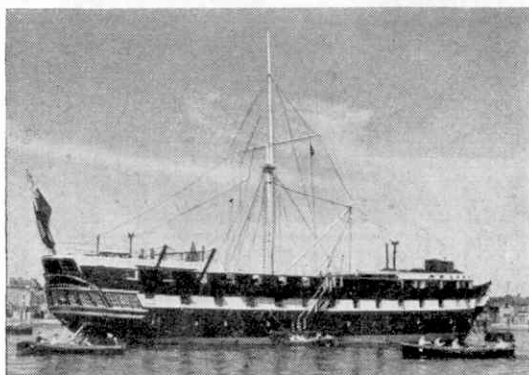
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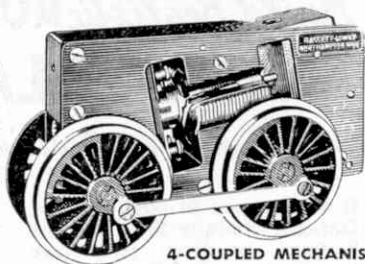
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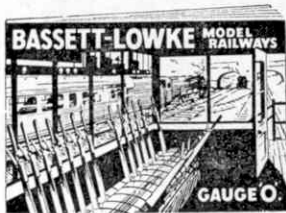
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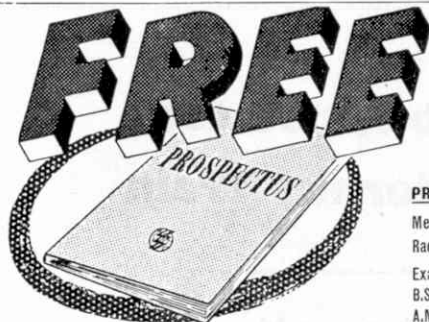


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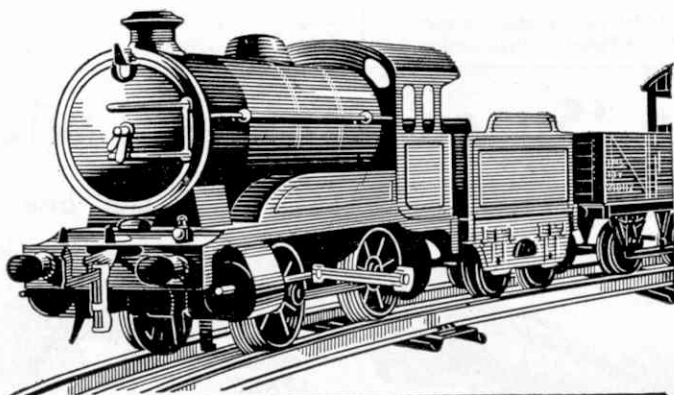
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MAGAZINE

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Vol. XXXIX
No. 3
March 1954

The Conway's End

As this is a Merseyside number I have chosen a photograph of the training ship *Conway* for my picture this month. It is

War she was moored in the Mersey, where for many years she was a training ship for Merchant Navy officers.

Monte Carlo Again

Well, the 1954 Monte Carlo Rally is over. Only one competitor can be first in an event of this kind, and to the winner, the veteran racing driver L. Chiron, and to his co-driver C. Basadonna, must go our congratulations on success in this outstanding event.

Stirling Moss, with his two companions A. J. Cooper and Desmond J. Scannell, had chosen what turned out to be the most difficult route of all as far as weather was concerned. They started from Athens and experienced real difficulties and hardship on the frozen roads and passes of Greece and Jugoslavia, over which they blazed the trail as they led the little group of cars from the Greek capital. In spite of this they succeeded in gaining 15th position on general classification, and their Sunbeam-Talbot was one of three in the team that gained the Challenge Trophy for the best team performance.

Stirling also won a special distinction by making the fastest time of any car over the dreaded Col des Lecques, where his speed was almost 40 m.p.h., and for this was awarded the special Cup.

Jack Reece and his cousin P. B. Reece were 24th in the Rally, a real achievement when it is recalled that the list of finishers included 329 cars. Actually they were only 3.03 penalty marks behind Stirling Moss and his Sunbeam-Talbot crew, and 15.3 marks behind the winner. Congratulations to both *M.M.* teams!

The Editor



The lighting necessary to secure the unique photograph of H.M.S. Conway reproduced here was right only at 5.30 a.m. on a summer morning. The photographer was E. Emrys Jones.

rather a sad picture, for it shows the bows of this famous old wooden vessel as she lay aground in the Menai Strait, following on the mishap that occurred when she was being towed to new moorings in the Conway river.

I wonder how many of you know the connection between this vessel and Merseyside. It is simply that until the

Liverpool's Bus System

Traffic Features of a Great City

LIVERPOOL, as you know, is the home of Meccano; it is also the Mecca of merchant shipping, and the Western gateway to the homeland. Meccano belongs to the Liverpool of this century, but, though the City's real growth is comparatively recent its origins go back into early history. The first Royal recognition of it as a free borough indeed came as long ago as 1207, when King John granted a charter, inviting settlers to join the burgh.

cotton market and cold-storage building, and in recent years the largest under-water traffic tunnel, opened in 1934—all this besides opening the first ship-to-shore radio-telephone in 1921, the first large-scale port-radar station in 1948, and the first scheduled helicopter passenger service in 1950. The town's growth and eminence were recognised by the conferment of City status in 1880, and of a lord-mayoralty in 1893. During the 1939-45 war the Germans paid an unwelcome tribute to the

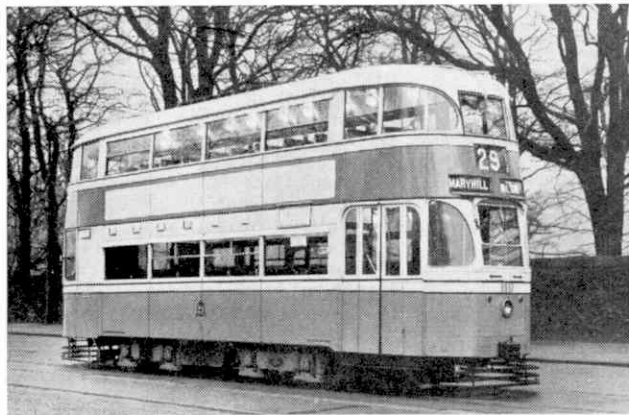
chief Atlantic port by subjecting it to intense and protracted bombing, leaving scars that will take long to heal.

Though it is primarily a port, its Corporation has wisely been pursuing a planned development of other industries to make the livelihood of its citizens more independent of shipping slumps. Three vast Trading Estates have been developed, and many national firms have been encouraged to open factories for light engineering, rubber, metal and wood

manufactures, chemicals, food-processing, textiles, and so on.

It is the Corporation Passenger Transport Department's task to serve this great industrial concentration, embracing besides the City itself the neighbouring borough of Bootle and six other adjacent authorities, with a combined population of over 1,000,000. In its growth the Department has kept pace with the rapid development of the City and its satellites.

An experimental street line laid in 1861 along part of the main road to Prescot was followed in 1869 by the opening of the Liverpool Tramway Company's first horse tram route. The amalgamation of this Company ten years later with the Liverpool Omnibus Company was followed in 1897 by the acquisition of the whole system, 267 horse trams and 100 horse buses, by



This fine tramcar, with Maley Taunton trucks and G.E.C. motors, is one of 24 sold to the Glasgow Corporation by Liverpool Corporation Passenger Transport, now being converted to bus operation. It is seen as in service in Glasgow.

During the Civil War the Parliamentary-minded town changed hands three times in furious fighting. It does not seem to have flourished generally until the enterprise of its public men and merchants sensed the dawn of a new age, in which transport and its key position would unlock the door to prosperity. Then successive generations of them financed the Duke of Bridgewater's and other great canal ventures; built in 1715 the first commercial tidal-water dock of the modern world, and in 1830 the world's first all-purpose railway; commenced in 1840 the first trans-Atlantic shipping service; raised the first electrically-operated elevated railway, along the docks, in 1893; has in the Mersey Railway the first steam-operated line in Britain to be converted to electric working; built the greatest floating landing stage, warehouse,

the Corporation. Quick to exploit the new possibilities of electric traction the Corporation electrified the entire system within three years, with great popular success, and crowds flocked to see the strange new contraptions which, scorning any visible means of propulsion, drew their power from an aerial wire by a turn of the driver's wrist.

A period of peaceful expansion during the Edwardian era, culminating in the opening of the first grass reserved track, was abruptly halted by the outbreak of the Great War, but progress and experiment resumed as soon as the war was over; new grass tracks, eventually to total 25 miles, kept abreast of the expanding perimeter of the City creeping outward with housing development, and more powerful trams were built to take advantage of them. Improvements in trucks and springing progressed, and the continual experiments included an interesting trial of a 34-foot long single-deck car with 44 seats, which never got beyond the prototype stage because of its difficulty in coping with the City's sharp curves and dense loading.

In 1933 appeared a new, bigger and heavier type of bogie car, at first with English Electric and then with E.M.B. and some Maley-Taunton trucks, in a new green livery instead of the old maroon-and-cream. These led to the Department's crowning achievement in tramway



A scene in the L.C.P.T. depot in Edge Lane, showing two A.E.C. Regent Mk. III buses, with L.C.P.T. bodies on Weymann shells.

traction—the construction of a streamline fleet of 163 eight-wheel cars with E.M.B. bogies and 100 four wheelers with single trucks. They had high speed and acceleration, and could seat up to 84 people. Of these, 24 that have become surplus now that the Department has converted most of its system to bus operation, are running most satisfactorily in Glasgow, as are many trucks in Leeds.

It is worth remarking that these splendid trams, as well as many of the huge fleet of buses replacing them under the conversion programme, were built at the Department's own Edge Lane Works, where 1,000 local men are employed in the largest municipal factory of its kind in the country, which incidentally is only a few hundred yards from the Meccano works in Binns Road.

Little mention of buses has been made yet because until 1945, when the Corporation decided to replace the tramway system by diesel engine buses, Liverpool had always been a tram-minded town. True, buses had first been operated in 1911, but for twenty years they were run mainly as a side-line, as feeders to tram routes and to places inaccessible to trams. Between 1927 and 1931 186 single-deck and 19 double-deck buses



A Leyland bus at a stop in Green Lane, in the Old Swan district of Liverpool.

were built at Edge Lane Works, but it was in 1935 that the first significant step in the transformation of the bus position was taken with the ordering of the first batch in a long series of diesel-engined vehicles—A.E.C. Regents with Weymann bodies.

The object of this was to build up a homogeneous fleet, but the outbreak of the Second World War, while creating enormous problems of operating in black-out and raids and transporting warworkers and troops, disrupted this plan and compelled the incorporation of whatever few buses, of various makes and in small numbers, the Government could allocate. The experience of war was not entirely negative, however, since besides the acceptance at last by the general public of an orderly queue-system, improved maintenance methods prolonged vehicle life by as much as 50 per cent, and thus reduced to some extent both the total bus requirements and the time scale of the tram-to-bus conversion on which the Department embarked in 1948.

This longer vehicle-life was of invaluable aid during the earlier stages of the conversion, when bus deliveries—still Government-controlled—languished so far behind expectation as to force postponement of the scheduled changeover dates for many routes. But it is a tribute to the success of the planning that now, a little over half-way through the estimated total time scale of ten years, 29 of the 37 main routes and six of eight industrial services have been converted, leaving only eight main and two subsidiary routes. For the fully converted system 1,250 buses will be needed, whereas in 1943 at the peak of its strength the fleet had numbered 744 trams and 297 buses. The present total is 884 buses and 220 trams. Some of the conversion considerations so successfully mastered have been the condition of the various tracks (determining the order of route conversions), the supply of new buses, the provision of garages and servicing, the training of tram employees for bus operation, the removal of track, tram poles and wiring, and the cost of reinstating the roadway. Eventually, the only relics of

Liverpool's once universal tramways will be their grass tracks, enhanced by trees into boulevards, running like pleasant green ribbons down the centres of the City's fine suburban radial roads.

It is impossible here to detail, let alone describe, the numberless activities of a vast transport organisation; a few only can be mentioned, in which Liverpool has pioneered. A short-wave two-way radio network controls traffic movement, under the supervision of patrol cars and breakdown vehicles operating to the instructions of a central control-room and transmitter; the proved advantages are greater efficiency, time and money saving, and the elimination of "guesswork" from traffic planning and control. This is of incalculable value on such occasions as the Grand National, which attracts crowds of 350,000. A unique training school, admired by visitors from undertakings at home and abroad, trains drivers and conductors for their heavy and responsible tasks; and in four years, 1,200 learner-drivers have been



Down in the city. A Leyland PD2/12 passes the Picton Reference Library, in William Brown Street, Liverpool.

trained successively in classroom, cinema, concrete-strip, suburban roads and city streets, covering 500 miles before being submitted to the Government driving test.

A full-time medical officer and assistant watch over the health of employees, ensure legal physical standards in recruits and trainees and investigate occupational disorders, and they have developed a capable first-aid organisation whose representative team have been national competition finalists (Continued on page 154)



Survey Ship "Vigilant"

A New Mersey Docks and Harbour Board Vessel

THE splendid vessel shown in the illustration at the head of this page is clearly a remarkable one. She is in fact a type of vessel that to most readers of the *M.M.* will be unfamiliar, for she is the new twin-screw survey vessel of the Mersey Docks and Harbour Board. Her name is *Vigilant*, and she was built by John I. Thornycroft and Co. Ltd., Southampton.

Many uses for the vessel had to be kept in mind in designing and building her, and in fitting her out. Normally she is used for surveying in Liverpool Bay, one of the world's greatest sea approaches, where countless vessels sail between Liverpool and almost every part of the world. It is of course of the greatest importance that the depths of the channels and other details of this kind required for navigation purposes shall be constantly measured and recorded, and with the *Salvor*, an earlier vessel of this type owned by the Mersey Docks and Harbour Board, she plays an essential part in ensuring

safe passage for Liverpool's sea-going traffic.

Other work on which the *Vigilant* is engaged is placing buoys in position, or removing them for repair and maintenance and replacing them, and the removal of wrecks, which can present serious dangers to navigation. Actually there are still some wartime wrecks in the area in which she serves that have not yet been completely removed. Besides these tasks the *Vigilant* may be called upon at short notice for emergency salvage work or for the more spectacular, but rather terrifying and essential

task of fighting fire in ships in the river approaches or berthed in the Board's docks, or even for dealing with fires in the warehouses where their cargoes are stored.

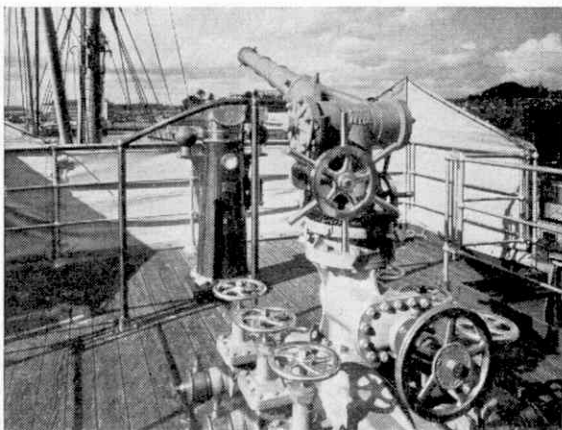
One never knows when such a vessel may be wanted for some urgent task. So both the *Vigilant* and the *Salvor*, which also is equipped for salvage and fire fighting, are manned continuously, with two complete crews in each case, the men

At the head of the page is a general view of the "Vigilant," the new survey vessel of the Mersey Docks and Harbour Board. This splendid ship is fitted for fire-fighting, buoyage and salvage, and wreck work as well as for surveying, and was constructed by John I. Thornycroft and Co. Ltd., Southampton.

being on duty for 24 hours and then off for the next 24. One of the two vessels is always available for operations at 15 minutes' notice and the other at an hour's notice.

A few details of the *Vigilant* will be of interest to readers. Her length overall is 172 ft. 6 in. and her breadth 35 ft. At average load she has a draft of 11 ft. 1 in. and her speed at full power on load draft is $12\frac{1}{2}$ knots. A glance at the picture shows that the vessel has a raked stem, and she has a cruiser stern. The final form given to her hull was decided only after models had been run in the Thornycroft Tank. She has a continuous main deck, above which is a bridge deck, extending aft from just forward of midship, leaving a short working space at the stern. Forward of the bridge is the main deck auxiliary machinery, which includes a 20-ton steam winch, two 10-ton electric capstans, one on the port side and the other to starboard, and a 5-ton warping and cable capstan on the port side, working an anchor that is recessed into the starboard shell. There is also a 4-ton warping capstan fitted aft.

The *Vigilant* has a partial double bottom, forward of the main machinery space, and



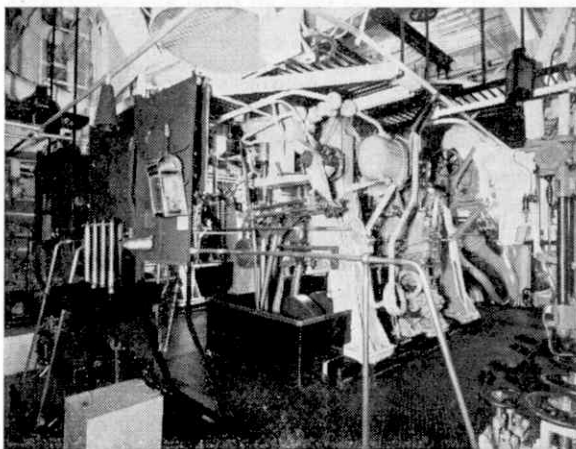
One of the two 6-in. fire monitors of the "*Vigilant*." These have a capacity of 1,000 gallons a minute, and there are also 14 other monitors that can be fitted at seven points on each side of the vessel.

this is divided to allow for the carriage of oil fuel and fresh water, while there is a double bottom tank under the main engine for boiler feed water.

The foremast is one of the features that gives the *Vigilant* her unusual appearance. It is tubular, and is equipped with two heavy tubular derricks. The fore derrick has purchases to take lifts of 5 and 10 tons, and the one aft is fitted with separate purchases to take lifts of 5, 12 and 15 tons. Another interesting feature is the special heavy bow casting that is fitted. This is

capable of taking a load of 100 tons, and on the forward main deck are bollards, samson posts, eyeplates and fairleads to cope with heavy salvage operations. There is also an anchorage to take a 100-ton purchase, and this is arranged to line up with the bow casting.

The vessel is driven by twin-screw triple expansion reciprocating engines that are capable of developing collectively 1,400 indicated horse power, and of giving 1,300 I.H.P. for continuous service. Steam for the engines is supplied by two oil-fired forced draught boilers with a working pressure of 220 lb. per sq. in. All the auxiliaries associated with the propelling machinery are



In the engine room of the "*Vigilant*," looking aft. Her twin-screw triple expansion engines give her a speed of $12\frac{1}{2}$ knots.

driven independently from the main engines. They include two steam-driven air pumps, a pair of feed pumps, a bilge pump, two forced draught fans, a duplex oil feed pumping and heating unit, and a motor driven general service pump of large capacity. An exhaust type feed water heater also is fitted.

For ship's lighting there are two generating sets, one steam and the other diesel driven, both supplying direct current at 220 volts. Special provision of course has been made for fire fighting and salvage work. This includes two diesel generating sets, each of which has an output of 150 to 180 kW at a maximum voltage of about 350 d.c. for operating the fire and salvage pump, and these sets serve also capstans, air compressors, overside supply and other services at any voltage between 110 and 220 d.c. The fire and salvage pump is driven by a 435 h.p. motor. On fire duty it is capable of delivering 440 tons of sea water an hour, at a pressure of 230 lb. per sq. in. at the base of the monitors.

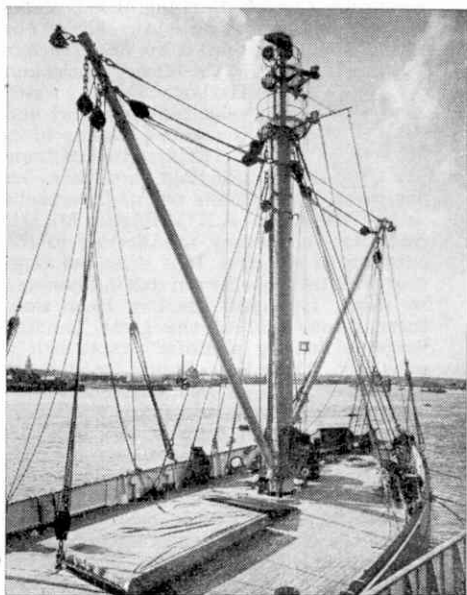
The *Vigilant* is well fitted to cope with fires. There are two six inch fire monitors, each with a capacity of 1,000 gallons a minute, one on the flying bridge and the other at the after end of the boat deck. There are also 14 rail monitors that can

be fitted at seven points on each side of the vessel, or can be operated from the masthead. Additional fire fighting equipment includes two Pyrene mechanical foam generators, each of which is capable of giving 900 gallons of foam a minute. They can give continuous operation in normal conditions for two hours. The nylon hose carried is of the latest type, lined with latex, and there is more than a mile of it. Sprays on the foremast, the funnel and the mainmast are provided for damping down the upper decks during fire fighting operations, and fires on board the vessel herself can be dealt with by means of steam drenching pipes and a carbon dioxide system.

The vessel is equipped for diving operations, which of course are essential in dealing with wrecks and other work under water. A Siebe Gorman compressor set, driven by a steam engine, is housed in a separate compartment on the main deck near the engine room, and there is also a hand-operated portable diver's pump with 280 ft. of air pipe and the necessary equipment for two divers.

One of the two life-boats carried by the *Vigilant* can be used to carry the divers and their gear. The life-boat on the starboard side, which can be seen in the picture on page 111, is fitted with a motor, for propelling purposes, and both boats are capable of accommodating 42 persons. They are carried by Welin-McLachlan gravity davits, and special power winches are fitted to allow for rapid hoist. The motor in the starboard life-boat is a Thornycroft R.J.2/1 diesel engine, developing 20 h.p. at 1,200 r.p.m. The port side boat, the one fitted for use in diving operations, has a square stern.

The surveying room of the vessel is on the navigating bridge deck, aft of the wheelhouse. There is accommodation for a marine surveyor and two assistants in single cabins, and a wreck party of 11 can be carried below, on the lower deck, just forward of the machinery space, and there is a separate cabin for two divers. Equipment for salvage and all other purposes is ample, and a noteworthy part of the surveying equipment is a Kelvin and Hughes survey echo sounder, which measures depths by finding how long it takes for sound impulses to reach the sea floor and return to the ship. This uses dry paper for recording depths, so that the record is permanent. It allows depth figures to be plotted to within three inches.



The foredeck and heavy tubular foremast of the "Vigilant."



This fine aerial photograph shows Liverpool Pier Head, with the towering Liver Building and the great floating Landing Stage, alongside which are two large vessels, one with tugs in attendance, and St. George's Dock, behind the Landing Stage.

I LIKE the cover of this month's *M.M.* As the scene is a Liverpool one, to me, and to all who are concerned in the design and production of Meccano, Hornby and Hornby-Duble Trains and Dinky Toys, it naturally has a very homely appearance. Those of us who live on Merseyside of course are not the only ones who will recognise the picture at once, for it is one that must have memories for practically all who have visited Liverpool or the surrounding boroughs, and for those who have sailed to distant lands from this great port, or have returned home to be greeted by the sight of the huge buildings at the city's Pier Head.

One cannot be in Liverpool long without hearing or seeing something of the Pier Head, for many buses and tramcars in the city exhibit this name as a destination. Enter Liverpool as a stranger and ask the first person you meet where the Pier Head is and whether it is worth visiting and you will probably be looked at with amazement. Surely everybody knows where and what the Pier Head is! After the first surprise you will soon have explained to you how to get to it and what you will see there, and it will not be long before you are on a bus or a tramcar on your way to it.

What is there to see at the Pier Head?

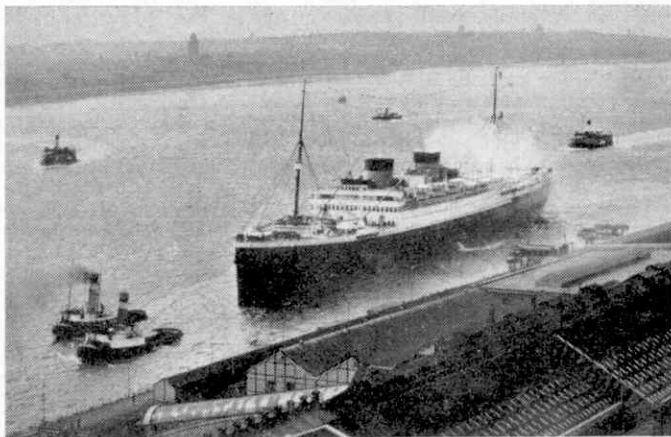
The answer is a magnificent open space in front of three famous buildings, and beyond it—the whole wide world. The tallest of the three buildings on its landward side is the Royal Liver Building, with its great clock gleaming white on the outward faces of the towers at the ends, which are surmounted by representations of the fabulous Liver birds, with their wings outstretched. The clock faces are so large that 39 guests sat round one of them for lunch before it was installed, and each had plenty of room! Next to the Royal Liver Building is the handsome Cunard Building, head offices of the famous transatlantic line. The third is the headquarters of the Mersey Docks and Harbour Board, which rules the great port and the waters leading to it.

By The Editor

Mersey Views

The first two of these buildings are seen on our cover, which shows one of Liverpool's newest buses, an A.E.C. Regent Mk.III, ready for its journey to Allerton, in the outskirts of the city. It is these buildings that greet the traveller arriving in Liverpool by water, for across the Pier Head from them is one end of the great Landing Stage, a floating platform almost half a mile long. There liners bound for all parts of the world can be seen. The fine vessels maintaining the regular services for Belfast and Dublin depart from it, and it is the starting point also of magnificent holidays for the many thousands who travel to the Isle of Man in the fine ships of the Isle of Man Steam Packet Co. Ltd. The part of the Landing Stage immediately in front of the Pier Head, reached by bridges that at high tide are about level but at low tide slope downward to the Stage, is used by the ferry boats that ply busily

A sight that visitors to Liverpool find enthralling — a great liner arriving and being edged into position alongside the Landing Stage by tugs. The liner is the Cunard White Star motor vessel Britannia. Photograph by courtesy of the Cunard Steamship Co. Ltd., Liverpool.



between Liverpool and Birkenhead, Wallasey and New Brighton, on the Cheshire shore of the wide Mersey estuary.

This then is the Pier Head, a place where hours can be spent in merely seeing what is going on. It is interesting enough to watch buses and tramcars arrive, the latter running round one of the three circular tracks that form the terminii and the former going to their appointed stops to discharge their loads of passengers and to take on others who have just arrived by water. Away to the left is a monument to the British merchant seamen who gave their lives during the war while serving in the Royal Navy and, in the words of the inscription, have no grave but the sea. It is well worth while to visit the site of the monument, and to

study it and reflect upon its meaning.

One thing that is very noticeable, both at the Pier Head itself and on the Landing Stage in front of it, is the constant flow of people. Dr. Johnson is said to have asserted that if anyone wished to meet a friend whose whereabouts he did not know all he had to do was to wait for him at Charing Cross, London, where sooner or later he would make his appearance. The same has been said of the Liverpool Pier Head and Landing Stage. An exaggeration, perhaps. But there may be something in the idea in view of the fact that Liverpool is the gateway to almost every country in the world.

But every visitor quickly forgets everything else and eagerly chooses a viewpoint from which to look out over the compelling Mersey itself, a wonderful and fascinating scene. Apart from the vessels lying at the Landing Stage there will be ships at anchor and others moving up or down the river, or



The Cunard White Star liner Mauretania and the Canadian Pacific Steamship Empress of Australia in Gladstone Dock, Liverpool. Beyond the warehouses behind the former vessel is the Gladstone Graving Dock.

entering or leaving the great docks, with tugs in attendance, small vessels perhaps, but expressing power and importance with every movement. To add to the variety there may be a string or two of barges from inland waterways on their way to or from the docks that line the Liverpool side for miles and miles, both north and south of the Landing Stage. The ferry boats too are a never failing source of interest as they arrive and depart. Often two of them approach almost together to

run far inland, and startle travellers in the Wirral with the unexpected sight of great ships carrying grain, iron ore and other products apparently in the heart of Birkenhead or in the open country beyond it.

There is something else to be seen that has made Merseyside famous. Shipbuilding and ship repairing are a major industry here, and southward from Woodside there are building and repairing yards, the most famous of which is that of Cammell Lairds,

builders of the Cunard White Star liner *Mauretania* and of many other famous vessels, including a great



At the mouth of the Mersey, on the Cheshire side, is New Brighton. This view from the air shows the Pier, and the Tower Grounds, and in the distance is New Brighton Lighthouse.

be manoeuvred with amazing precision and speed into adjoining berths, where their gangways are lowered and their passengers are rapidly disgorged, to make way for others crossing to the Cheshire side.

By the way, don't think that I have tripped in speaking of north and south along the banks of the Mersey. Those who are not familiar with it are liable to think of the Mersey as flowing out westward from its origin in the Pennine hills, but actually it ends by making a tremendous sweep round and when it enters Liverpool Bay it is running almost directly north.

The background to this wonderful river scene is no less interesting. Away on the Cheshire side are the floating stages, smaller of course than the great Liverpool Landing Stage, to which the Birkenhead and Wallasey ferry boats make their way. Behind the Woodside Landing Stage, as that at Birkenhead is called, can be seen the roof of Woodside Station, the Birkenhead terminus of London trains from both Paddington and Euston. Between the two landing stages are the entrances to the Birkenhead Docks, which

range of warships. Before the war the giant hull of the *Ark Royal*, Britain's most famous aircraft carrier, could be distinguished

easily from the Pier Head when she had been launched and was in the fitting-out basin, and years before her the giant battleship *Rodney* had become equally familiar to Merseyside folk.

But now I have filled the space allowed for this article, and as yet I have told you very little of what can be seen from the Pier Head, nor have I even suggested that you should cross one of the bridges to the Landing Stage itself, a fascinating place indeed, stretching away to the berths used by liners, where other bridges lead to the buildings, a roadway and Riverside Station. Yes, there is a station just behind the Landing Stage, where visitors arriving by boat can depart for London direct.

And there is also another railway of outstanding interest, the only one of its kind in the British Isles. This is the Overhead Railway, the first electrically-operated overhead railway in the world, which runs just behind the Royal Liver Building and right along the seven miles or so of docks north and south. A trip on it is a revelation to any visitor.

A Railway Photographic Record

By P. S. S. Wilson

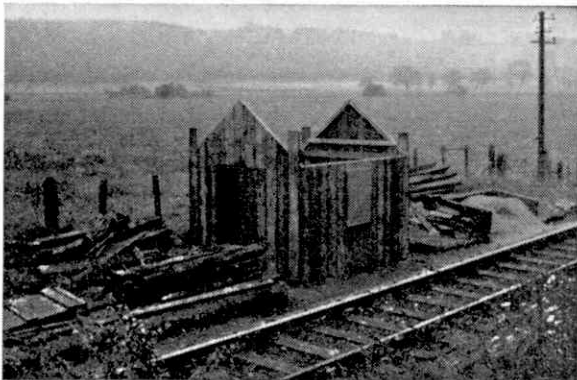
MOST railway photographers seem to concentrate on taking locomotives or moving trains. I wish to suggest a rather different aspect of railway photography, namely, making a photographic record of one particular stretch of line. Branch lines are usually much the most rewarding, as often they have old pre-group signals and other equipment not often seen elsewhere.

A very interesting album can be made up by taking a series of photographs of each station on the line selected, and of its bridges and other features, such as cuttings, tunnel mouths and so on. In time this yields a comprehensive picture of the line in question.

Such features as station lamp posts often vary greatly from one station to the next, and sometimes have the original owning company's name cast on them. Small bridges are as worthy of attention as the large ones. Mile and gradient posts are of almost unlimited variety, even sometimes in quite a small area.

Most of these features may be photographed quite easily from the platform or from outside railway property

but if in doubt seek the Stationmaster's permission first. If the line has any abandoned sidings, or short branches leading off it, include them as well to make the record complete. A camera capable of fast exposures is not essential, as most



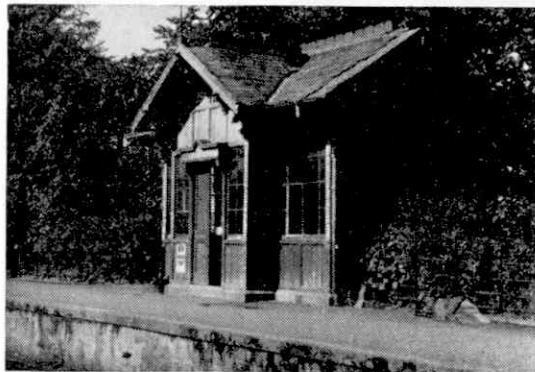
Building a platelayers' hut on the former N.B.R. Devon Valley line, between Dollar and Tillicultry.

subjects are stationary.

A loose leaf album is required so that the prints may be arranged in order, from one end of the line to the other, and further photographs added as obtained. It is a help to keep all prints the same size and mount them in pocket corners, so that if necessary they may be rearranged without difficulty.

This set of photographs of the static features of the line may be supplemented by another series of the operational features, covering the train services with the varying locomotives and rolling stock used. On some lines there may be little change or variety over a long period, but on others, like the line serving my home town, there may be great variety, even with only a few trains a day.

Always note the date on which each photograph is taken, as well as the place and other details. If you do not, much of the value of the collection will be lost in years to come; if you do you will compile an interesting record.



The roof of this platform shelter at a wayside station is under repair. This photograph was taken at Taynuilt on the Oban line of the former Caledonian Railway.

Air News

By John W. R. Taylor

Bristol 173 Tested at Sea

The prototype Bristol 173 Mk.1 twin-engined helicopter, resplendent in military markings, has completed successfully a series of trials at sea aboard the aircraft carrier H.M.S. *Eagle*. Purpose of the trials was to test behaviour of this lengthy, twin-rotor aircraft in varying winds and deck motion, particularly during landing and take-off; to determine ease of manoeuvrability on the flight deck and ease of stowage in the below-deck hangars. The trials lasted for three days, during which the 173 was flown by Mr. C. T. D. Hosegood, Bristol's chief helicopter test pilot.

New de Havilland Rocket Motor

The fact that both America and France are known to be developing lightweight supersonic fighters with mixed jet and rocket power gives added interest to news of de Havilland's latest rocket motor—the Super Sprite.

All aircraft can fly with a far greater load than they can lift off the ground, and one of the main

£100,000 on a new supersonic wind tunnel that will enable scientists to see what happens to aircraft and guided missiles travelling up to 2,000 m.p.h.—about three times the speed of sound. When it is in action, the tunnel's 7,700 h.p. motor will eat up a twentieth of Coventry's total electricity supply.

Shorts to Build Britannia

Great worldwide interest in the Bristol Britannia turboprop air liner is expected to follow its introduction into service with B.O.A.C. later this year, and a second production line of Britannias is therefore being set up in Short and Harland's Belfast factory.

At the moment firm orders amount to only 39 aircraft. Of these, B.O.A.C. will receive 15 of the early Series 100 Britannias, 10 Series 300 machines with longer fuselage, five Series 250 mixed passenger/freight transports and three unspecified long-range type; and Qantas Empire Airways have ordered six Series 250 Britannias. But already seven more airlines are seriously interested in this fine 100-passenger British air liner, and Bristol have hinted that firm orders may well total nearly 100 before long. Between them, Bristol and Short could build about 50 Britannias a year without difficulty.

News from Canada

The Britannia is also in the news in Canada, following the R.C.A.F.'s decision to order a military version of this aircraft to replace

their maritime reconnaissance Lancasters. No details have been given, but the initial order will probably be for 50 Britannias, which will be built by Canadair Ltd., at Montreal. Most important change to adapt the aircraft for its new role will be the installation of American engines—probably Wright Turbo-Cyclones—instead of the Proteus turboprops of the air liner version.

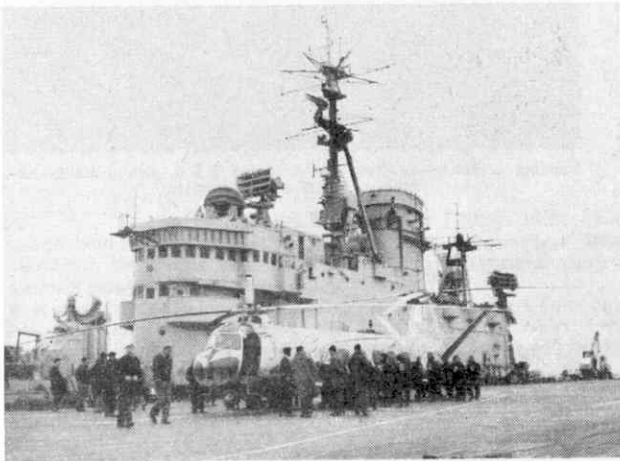
Meanwhile, the Royal Canadian Navy have, apparently, decided to standardize their carrier-based aircraft with those of the U.S. Navy. Following a recently-announced order for McDonnell F2H-3 Banshee jet fighters to replace their piston-engined Sea Furies, they have now chosen the twin-engined Grumman S2F-1 to re-equip their anti-submarine squadrons, and some 100 of these aircraft will be built under licence by de Havilland at Toronto. Only the desire to standardize equipment with America could have persuaded the R.C.N. to order a piston-engined aircraft when the Royal Navy and Royal

Australian Navy have ordered the superb, formidable turboprop Fairey Gannet.

Fastest Research Plane

The U.S.A.F. claim that their Bell X-1A rocket-powered research aircraft reached a speed of more than 1,600 m.p.h. during tests from Edwards Air Force Base, California, on 12th December last. Pilot was Major Charles Yeager, who flew the original Bell X-1 in the world's first supersonic flight on 14th October, 1947.

The U.S.A.F. may send its first squadrons of Martin B-61 Matador pilotless bombers to Europe this year, following two years of training with the missiles at Patrick Air Force Base, Florida. The Matador, which is powered by an Allison J-33 turbojet, is able to carry an atomic bomb.



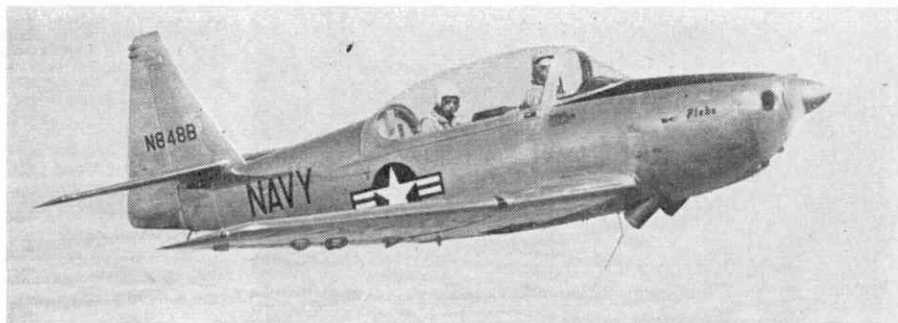
"Bristol" technicians and Royal Navy personnel stand by during a pause in the trials of the prototype Bristol 173 Mk.1 helicopter aboard the aircraft carrier H.M.S. *Eagle*. Photograph by courtesy of The Bristol Aeroplane Co. Ltd.

problems of air force and airline chiefs is to devise ways of lifting heavy loads without continually increasing the size of engines and runways. One of the best answers is rocket-assisted take-off, which supplies greatly increased power for just long enough to get an aircraft into the air; because by the time its fuel is exhausted the rocket motor weighs very little.

The Super Sprite gives 4,000 lb. of thrust for 40 sec. and weighs only 600 lb. Its main fuel is hydrogen peroxide, and most of the engine's thrust results from the break-down of this fuel into gaseous steam and oxygen by a solid catalyst. Kerosene or petrol is injected into the exhaust stream and burned to produce additional thrust or, alternatively, to increase duration of run.

Supersonic Wind Tunnel

Armstrong Whitworth are spending more than



The Temco Plebe primary trainer that was designed, built and test-flown within 75 days.

75-Day Wonder

The neat little Temco Plebe primary trainer shown above was designed, constructed and test-flown within 75 days, despite the fact that Temco had never before built an aircraft entirely of their own design.

Its story began early last June when the company learned that the U.S. Navy needed a new two-seat training aircraft to replace their Harvards, and that evaluation tests of various types were due to start on 28th September at Pensacola Naval Air Station. Not only was the prototype Plebe ready on time; it promptly exceeded its estimated performance figures. Powered by a 225 h.p. Continental 0-470-13 engine, it has a top speed of 192 m.p.h. and range of over 400 miles at 178 m.p.h. Wing span is 31 ft. 2 in. and loaded weight only 2,500 lb.

New Flying Boat Service

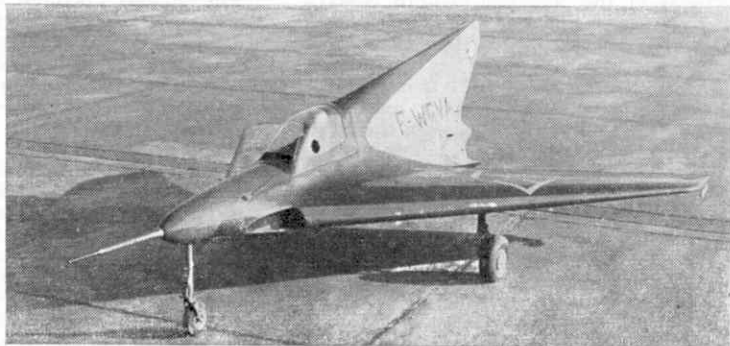
Britain's only flying boat operators, Aquila Airways, will make proving flights from Southampton Marine Airport to Capri next month, in preparation for their regular air service to the island, due to start in May. Hythes and Solents will be used for the flights, which will take six hours, non-stop.

Aquila have also announced that they have offered more than £1,000,000 each for the three giant Saunders-Roe Princess flying boats; so we may yet see these superb 200-seat, 3,500-mile range aircraft setting an unrivalled standard of comfort and performance in airline service.

U.S. Test Supersonic Propellers

One of the two McDonnell XF-88 Voodoo prototype long-range jet fighters has been modified into a flying test bed for Curtiss Electric, Hamilton Standard and Aeroproducts supersonic propellers. Designated XF-88B, the modified Voodoo retains its two fuselage-mounted 4,000 lb. thrust Westinghouse J-34 turbojets, in addition to the Allison XT-38 turboprop which is now mounted in its nose. So

The little Payen P-49 delta aircraft designed for research into problems of high-speed flying.



there is little doubt that it is able to test the propellers at very high speeds.

Initial flights were made with a 10-ft. diam. Curtiss four-blade propeller, but later tests will include combinations of three and two-blades, with diameters of 10, 7 and 4 ft.

Westland Sikorsky Helicopters Named

The name Whirlwind has been chosen for Sikorsky S-55 helicopters built by Westland Aircraft Ltd., at Yeovil. The Royal Navy's Whirlwind H.A.R. (Helicopter Air Rescue) Mk.1 and R.A.F.'s H.A.R. Mk.2 have 600 h.p. Wasp engines. The Navy's H.A.R. Mk.3 will have an 800 h.p. Cyclone, and a longer, more tapered nose.

Smallest Delta

If anyone believes that flying today lacks the adventure and hazards of the old stick-and-string pioneer days, he should take a look at the fantastic little Payen P-49 delta, illustrated at the foot of this page, and then at the Douglas X-3 supersonic research aircraft which I described last month.

The two machines appear to have little in common. The P-49 is a flying wing; the X-3 has the smallest possible wings. The P-49's 352 lb. thrust Turboméca Palas turboprop develops only one-twentieth of the power of the X-3's two Westinghouse J-34s. Its light wooden construction contrasts sharply with the costly titanium structure of the 13-ton U.S. research plane. But both aircraft have been designed to overcome problems of high-speed flying, and their pilots—test pilot Bill Bridgeman in America and fighter pilot Oshenbein in France—are both risking their lives in these revolutionary aircraft to make flying safer for the airmen of tomorrow.



Car delivery drivers have their own trade plates, which they take with them on all occasions. Photograph by courtesy of the Nuffield Organisation.

THIS is going to be a good year for motorists who are keen on continental travel, and I have no doubt many of you will see new and exciting places from that magic carpet—the family saloon—or for all I know, an XK 120 or a DB 4, you lucky people! I believe British Railways are planning to attract many more cross-channel motorists, with cheaper fares, but the best news of all, in my opinion, is that Silver City Airways have once more made substantial reductions on their air ferry service. It is not my business to advertise their services, but I do feel that it is a good thing when one can take a small car across from Lympe to Calais for £6, and when the equivalent fares for a motor cycle and a pushbike respectively are 27/- and 4/6!

Not long ago I paid a visit to my good friends of the Vauxhall-Bedford concern at Luton. This was very instructive, because I was shown just how they do all their export packing. That is quite a science, believe me, and I mean science literally, because to protect machinery these days they use all manner of chemicals and special materials. The main thing is to stop the ravages of rust, dust, salt spray and so on, and protection must start as soon as parts leave the factory production-lines.

For instance, it might not seem to be much use trying to keep out the wet, and stop rust, if the metal has already been made surface-moist because it has been handled by a number of people with

perspiring hands. But in point of fact, this difficulty is overcome by putting a single sheet of special rust-inhibiting paper over the contents of the crate. They used to put a coating of lanoline over all such parts, but this remarkable paper, which is impregnated with a petroleum-based liquid, does the job with far less trouble.

Some parts, such as gears and bearings, are given additional treatment, as a safeguard against the kind of corrosion that can make such parts wear out in a remarkably short time. They are dipped in fluids that dry on as tough, almost indestructible skins.

Most of the export packing is what is known as C.K.D. That is to say, "completely knocked-down." That is not as bad as it sounds! It simply means that cars or lorries are being sent out to overseas countries in bits and pieces instead of as complete assemblies or, say, complete chassis, cabs and bodies.

Fork trucks are used a good deal in connection with the export packing. Fascinating things, fork trucks. I should like one to play with around

On the Road

By J. Dewar McLintock

the house, but I feel that more harm than good might result!

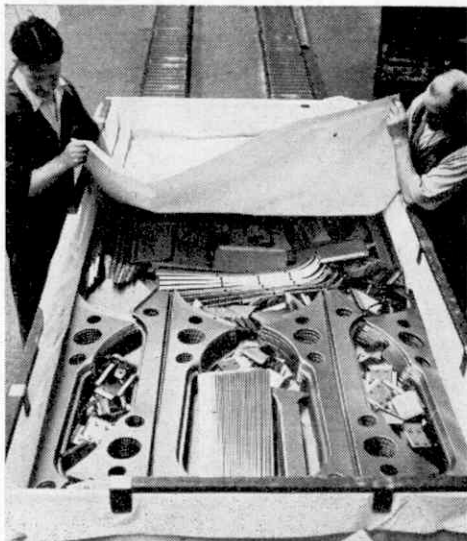
The famous London-Exeter Trial took place again at the turn of the year. The M.C.C., which has for long been as much concerned with cars as with motor cycles, has lost none of its magic in organising these long-distance events, and 300-odd competitors started out in fog and frost to make their way to Exeter and thence via numerous slimy, rocky and very steep hills as well as more "civilised" roads to Bournemouth. In the early 1930s we regarded many of these hills as "out of date" because they were not stopping many of the sports cars, but nowadays they seem to rate as considerable obstacles to many modern cars, and it is left to the boys with the "specials" to roar up them.

Batches of light pressings are here seen packed carefully for export at the Vauxhall Works, Luton. The covering is of paper that neutralises corrosive effects.

A few motor cycle notes. I learn that a Hertfordshire engineer had made a motor cycle, in 2½ years of spare time. Not content to make something simple, he had to go and choose a 250 c.c. twin-cam four-in-line engine across the frame, with gear-box in unit construction! This man obviously has that kind of genius consisting of what they call an infinite capacity for taking pains, for he also used his precision-engineering ability to make junction boxes for the air and throttle controls of the four carburetters, his own design of swinging-arm rear forks, and light metal wheel hubs! He intends to race this machine, I understand, and that kind of motor should have plenty of power.

The German Zundapp firm, I hear, have made arrangements with an English company to sell the Bella motor scooter over here. It is a beautifully-made two-stroke in which light metals are widely used—for example, for the disc-type wheels and the supports for panniers.

One of my pictures shows a Nuffield delivery driver fitting his trade number plates to a new Minor. These men do nothing else but drive new cars to dealers, private individuals, etc., and to the docks for export. They almost always have their



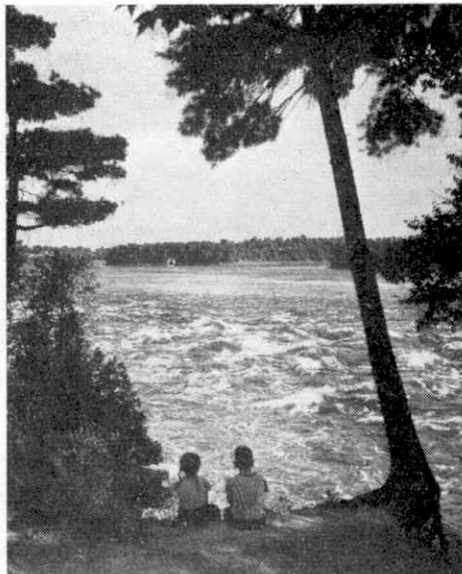
own trade plates, which they often carry in smart canvas cases. This particular driver is over 70 and has done well over a million miles at this game . . . and remember that these men have to keep down to a steady thirty, because the cars they drive are still a little stiff. Delivery drivers have a pleasant life, if they like driving, and they are to some extent their own masters, so that the pay of something like £7/10/- a week is not unreasonable. I may add that most of them like cars with heater and radio!

Another picture in this feature shows two young men at their drawing boards in Ford's training school. Fords do a good job of producing new technicians for the manufacturing side of the industry, and now I learn that the Institute of the Motor Industry, through Loughborough Technical College, is to do the same where the retail, distributive, and repair sides are concerned. They are instituting a four-year residential course, the President of the Institute tells me.

Finally—a passenger-vehicle item. Leylands have instituted two-pedal control, with a "pneumo-cyclic" gearbox—an unhappy title, perhaps—and a fluid flywheel. No pedal movement is necessary for gear changing—just the movement of a miniature lever through a gate.



Students of the Ford Trade School, Dagenham, at work in the drawing office.



The Long Sault Rapids sweep past Sheek Island with a roar like Niagara Falls. All but the centre of the Island will be flooded when the river level is raised 40 ft. to form a navigable waterway along the boundary between Canada and the United States.

Just as it led, in the first place, to the discovery of Canada and the opening up of her vast western prairies—now the “granary of the world”—so it has been a major factor in the growth of population, and the industrial and commercial development, of the Dominion.

To-day the St. Lawrence-Great Lakes system is a trade route of first-rate importance. During the last war it was one of Britain's most vital life-lines. For along this seaway flows Canada's huge wheat surplus, which helps to feed Europe, and cargoes of her great mineral output, which includes, among considerable quantities of other metals, nine-tenths of the world's nickel and the second largest production of aluminium. The canal and lake steamers carry freight not from Canadian farms, mines and factories alone, however, but also from big industrial centres of the United States, such as Cleveland, Detroit and Chicago, which lie around the southern shores.

At present ocean liners and freighters can sail 1,000 miles or so up the St. Lawrence as far as Montreal, whose prosperity has been built up on maritime trade with the world. Above the city the passage of such ships is barred by the river shallows and rapids, and there is thus a bottleneck between Montreal and

the Great Lakes, which themselves form another 1,000 miles of waterways deep enough to float vessels of ocean tonnage.

The proposal for the St. Lawrence seaway is to create a continuous channel of 1,200 miles, 27 feet or more in depth, from Montreal to the head of the Great Lakes. Together with the existing ship canal below Montreal, this will give large vessels an uninterrupted passage of 2,250 miles from the Straits of Belle Isle, between Newfoundland and Labrador, to Fort William and Port Arthur, the big grain ports on the western shores of Lake Superior. In other words, ships will sail nearly halfway across the North American continent.

When completed the seaway will be able to carry twice its present tonnage.

WITHIN the next ten years ocean-going ships will be able to sail more than 2,000 miles from the Atlantic into the heart of the North American continent. From the busy inland ports of the Great Lakes they will carry cargoes of Canadian wheat, iron ore, oil and other raw materials and manufactured products direct to all parts of the world. At the same time a great new hydro-electric scheme, producing more power than the Niagara Falls, will be developed to serve the expanding industries of central Canada and the United States.

This imaginative project, which has been under discussion for the past half century, is of tremendous importance to the future development of Canada. But it will also benefit all the free nations of the world, and especially those of the ocean-linked British Commonwealth, by speeding up the shipments of raw materials and goods at lower freight costs.

When the early explorers of North America sailed up the St. Lawrence River to the Great Lakes some four hundred years ago, they could not have dreamed that some day this would become the busiest inland waterway on Earth.

The St. Lawrence Seaway

By W. H. Owens

Moreover, the new power plants to be built along its shores will develop enough electricity to make the St. Lawrence basin one of the greatest industrial regions of the world.

Canadians first visualised a through seaway to the Great Lakes some fifty years ago, when the present 14-ft. canal system was built along the upper reaches of the St. Lawrence to expedite the shipment of grain from the rapidly expanding wheatlands of the west. After the first World War a joint Canadian-U.S. Government Commission was set up to study the problems of deep channel construction. Agreements for the project were actually signed in 1932 and 1941, but American opposition to the seaway has until very recently delayed the start on the work.

So now Canada has decided to go ahead on the navigation part of the project, with or without United States participation. It is hoped that hydro-electric development, which affects U.S. territory, will be undertaken in co-operation with the State of New York.

As I have shown, a very large part of the seaway is already in existence. The biggest task facing Canadian engineers will be the removal of the bottleneck on the upper St. Lawrence, where new and deeper canals must be cut and bigger locks built. Along some 115 miles of the waterway the turbulent rapids, dropping through 222 feet, are by-passed by a series of ancient canals with small locks, where the draught of ships is limited to 14 feet of water. The largest vessels able to pass through these canals carry less than 3,000 tons, compared with the 20,000 tons

carried by Great Lakes shipping. The proposed development will raise the river level by 40 feet, flooding out the rapids and creating an inland lake easily navigable by the largest ships afloat.

In the Great Lakes system it will be necessary, to achieve the new seaway standards, to deepen the communicating canals and channels to 27 feet. The locks already are of ample size for even deeper channels. This work would be little more than the continuation of improvement schemes which have been going on now for over a century.

One of the most important links in the 2,000-mile seaway is the Welland Ship Canal, which made history when it was built by Canadian engineers more than twenty years ago. This canal extends for nearly 27 miles and by-passes the considerable drop of the Niagara Falls between Lake Erie and Lake Ontario. By a series of twin-flight locks ships are raised or lowered ladderwise over 307 feet, and so the barrier of the Falls is overcome. Five hundred miles to the north-west are the locks of the Saulte Ste. Marie Canal in Northern Michigan, by which grain ships and other freighters pass from the high level of Lake Superior down into Lake Huron, and so through Lake Erie to the lower waterways.

Fabulous indeed is the traffic movement of the Great Lakes and the St. Lawrence during the months of the year when the waterways are clear of ice. Almost 100,000,000 tons of shipping, as distinct from freight tonnage, clear through the locks at Saulte Ste. Marie in an average season. This traffic is twice as much as is handled annually on the inter-ocean

Toronto, the business section of which is seen here, has almost a million inhabitants. The tallest structure seen is the Bank of Commerce Building, claimed to be the tallest in the British Commonwealth.



Ships loading grain at Port Arthur, built on the rocky terraces along the shore of Thunder Bay, at the western end of Lake Superior.



Panama Canal. Every year the Welland Ship Canal carries more than 10,000,000 tons of freight.

Grain ships form a big part of the seaway traffic. Railheads all over the western prairies handle grain collected from something like a quarter of a million widely scattered farms. From the railheads it goes on by special trains to the huge terminal elevators of the lake ports. Towering over all the other commercial buildings at Fort William is Canada's most gigantic grain elevator. Its normal capacity is 2,500,000 tons of wheat, but this can be extended as required to 10,000,000 tons. The elevator is equipped with twelve feed pipe-lines and a corresponding number of conveyor belts enabling three large lake freighters to be loaded at the same time and at the rate of about 10,000 tons of grain per day.

Canada urgently needs this through link with the oceans and ports of the world because of her rapidly expanding industry and export trade. The outputs of the prairie wheatlands, the mines, paper mills, oil wells and so on has increased on a big

scale during recent years, and this expansion, particularly in the north of the Dominion, is likely to continue for many years to come. Another factor which has given the seaway project a new importance is the discovery of immensely rich iron ore deposits in the Quebec-Labrador area. Water transport will provide the best and cheapest means of getting the ore away to the smelters.

As things are to-day the heavy traffic of freight ships jams the narrow canals of the upper St. Lawrence, and the consequent hold-ups cause serious overcrowding of storage facilities at the lake ports. Only a direct outlet to the Atlantic and the ending of delays in transferring freight from deep-draught vessels to smaller craft in the river narrows would relieve this shipping congestion.

Equally important are the benefits to be gained from harnessing the untamed waters of the St. Lawrence, which provide the last great undeveloped power reserve close to the chief industrial areas of Canada and the United States. The entire Great Lakes - St. Lawrence system is capable of developing some 8,000,000 horse power of hydro-electricity for use in both countries, but so far only a little more than one-third of it has been harnessed.

Semi-refined oil from Carapito, Venezuela, is piped off the "Imperial Fredericton" at Montreal. Canada's own oil industry is expanding and the St. Lawrence Seaway is needed for the movement of its petrol and crude oil.



Through the Pennines on a Scot

By "North Western"

OVER the years the "9 o'clock Leeds" from Liverpool, Lime Street, has become something of an institution. There was a "9 o'clock" as long ago as 1919, but the train concerned did a lot of roadside work on the way; broadly speaking the 8.30 seems to have been the train corresponding to the present day service, for it made similar stops and reached Leeds (New), as it was then called, at 11.5.

In my oldest L.N.W.R. timetable, one for 1916, the 8.35 a.m. was duly noted as "Through Express, Liverpool and Manchester to Newcastle on Tyne." Similarly, Newcastle is in fact the destination of the present train, which is always known as the "9 o'clock Leeds" by the enginemmen who work it from Liverpool, because that is as far as they and their engines go. The train is due in Leeds at 11.14 and there the engine waits for its return run at 12.58, with a through train from Hull.

None of the various routes through the Pennines could be called easy from the gradient point of view, as is only to be expected. Similarly, the

Haydock Crossing, at Earlestown Junction, with a Newcastle-Liverpool train approaching. The engine is No. 46149 The Middlesex Regiment. Photograph by W. S. Garth.

cross-country trains that traverse them, such as the Leeds and Newcastle trains from Liverpool, are of special interest because of the number of different points they serve. Although more hefty motive power is now provided—Britannias even have worked between Liverpool and Leeds—trains such as the 9 o'clock are heavier than they used to be—and the gradients of course have lost none of their steepness.

A little while ago, by permission of British Railways, I was able to make a footplate trip on the engine of the "9 o'clock." When I reached Edge Hill Motive Power Depot I was pleased to find

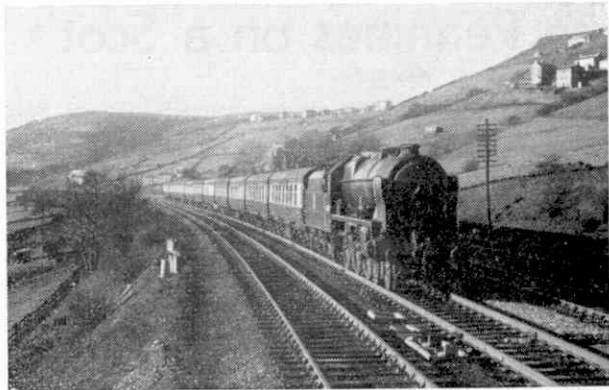
a nicely cleaned converted Royal Scot, No. 46164 *The Artists' Rifleman*, waiting for me, with an old friend on the footplate in the form of Driver Turner, with whom I travelled down from London on the former Turbomotive some years ago.

I was quickly made welcome—the footplate is a wonderful place for getting friendly quickly. Soon Fireman O'Donnell came aboard, and we moved off, to wait a few minutes at the shed outlet known as the *Black Hole* before we joined the main line. We ran gently through Edge Hill station down through the red sandstone canyon of the cuttings into Lime Street. When we had hooked on the guard told us that we had "11 on, 369 tons," one coach less than on the previous day, so the train evidently loads well.

With departure time drawing near, Fireman O'Donnell had built up his fire with care, and as the pressure gauge needle came round to the 250 lb. mark the injector was put on to stop any



safety valve music in the station. We got away gently, with the engine feeling its feet. There was a slip, but it was only momentary, and we began to mount the 1 in 88/93 incline up to Edge Hill in business-like style. From below came the rumble of wheels and a rhythmic *Rhoomp, Rhoomp*, as the side rods passed their dead centres. The tender contributed its *tap, tap, tap*, as its three pairs of wheels passed each rail joint and the characteristic 3-cylinder exhaust beat of one-two-three, one-two-three, slightly syncopated, re-echoed in



No. 46124 "London Scottish" on a Liverpool-Newcastle Express between Marsden and Slaithwaite. Pule Hill, through which Standedge Tunnel runs, is just to the left above the tail of the train.

the cutting, and through the various tunnels on the way up. Once upon a time it was tunnel all the way, but the original two roads were opened out to four tracks and the tunnel then became a cutting for the most part. Rather a remarkable cutting this, very deep in parts, at times thick with engine smoke and winter gloom, at others its shadow divided by sloping shafts of sunlight when the road ahead is seen through the succession of short tunnels.

We topped the rise with 200 lb. of steam showing on the gauge and the water at "half a glass." Soon we were off again and we got quickly into speed as the engine was linked up briskly to 15 per cent. So we sailed past Edge Hill Motive Power Depot and over a stretch of roaring rails before entering Olive Mount, another remarkably deep cutting through red sandstone that stretches practically the whole way to Broadgreen station.

This stretch of the line, Stephenson's original Liverpool and Manchester route, is the best running part of the Leeds trip, but there was a permanent way slack in operation from Collins Green to Earlestown and there the speed was reduced. In spite of this and a signal check at Newton-le-Willows we reached Manchester at 9.52, only three minutes late.

We did not wait long in Manchester, for we were again off at 9.54. The start

out of Manchester is difficult, for the line goes up at 1 in 49. So we took a banker in rear, the prescribed exchange of "Crows" on the whistles being made before setting off. We were working hard on the way up, the reverser being advanced to 30 per cent. position with the regulator well open. Even with this strenuous business pressure did not

fall lower than 225 lb. and water level was well maintained.

As we blasted our way up to Miles Platting, a deep rift full of buildings separated our route from that of the former Lancashire and Yorkshire line on its way to Newton Heath. Near Clayton Bridge, on an easier slope, a hoot on our whistle was the prelude to a winding stretch of track where a permanent way slack was in force and the surfacemen were busy. Easy progress then was the rule for some distance until at Ashton the regulator was opened once more.

At the stop in Stalybridge Station boiler pressure was back again at 250 lb., and the water was showing at about half a



A Liverpool-Newcastle Express in Pennine country, headed by No. 45534 E. Tootal Broadhurst. Photographs on this and the next page are by K. Field, Golcar, Huddersfield.

glass. In the tunnel following the exit from the station where we were not, of course, going very fast, it became hot on the footplate, while sparks from our chimney bounced off the coach roofs of a passing train.

Hills could be seen ahead as we came out into the open, and cut-off was

down the valley as well as that at Huddersfield and the Motive Power Depot there.

Standedge Tunnel is at the top of the rise on the western slope of the Pennines and reaching it brought a long spell of hard work for the engine to an end. With the regulator shut we drifted down from



lengthened to 30 per cent. in view of the climb that followed. We went steadily up through Mossley with its tremendous cutting, passed Greenfield, and then went on through cuttings and over embankments to Saddleworth. Throughout this length our route was on one side of a valley while on the other I could see from time to time the alternative Friezland loop, which detached itself from our path at Stalybridge to rejoin us at Diggle Junction before plunging into the tunnels through the Pennines, two single bores built in 1849 and 1871 respectively and a double bore completed in 1894, all over three miles long.

Our path led through the most recent of these tunnels, the double line one. Near to its Diggle end are water troughs, surely the most curiously-placed in the world, but picking up from these in the dark was made to look the easiest of tasks by Fireman O'Donnell, and with a full tank we rumbled on through the long bore.

At the Marsden end of the tunnel the line curves sharply round and looking back I was able to get a splendid view of our train and each of the tunnel mouths. Between our pair of tracks and the other two there cascaded down a series of steps the water from the reservoir on the hilltop which, incidentally, serves the stations

Marsden past Slaitthwaite and Longwood, and then through two short tunnels, and a longer wide one, into Huddersfield station.

On leaving, with 225 lb. of steam and a full boiler, there was slight slipping from the engine as we made our way over the viaduct across the town, but we were soon through to the area of colour-light signals characteristic of the Mirfield district.

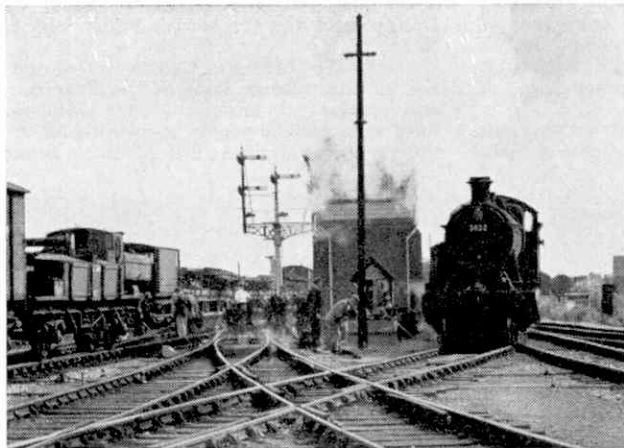
A yellow light ahead caused the regulator to be shut and brakes applied as we approached Thornhill Junction, where we bore to the left. With the cut-off now at 20 per cent. we were soon climbing again up into Dewsbury.

Batley and the quaintly-named signal cabin known as Lady Ann Crossing followed and then, while still climbing, a hoot from the whistle betokened our approach to Morley Tunnel. Inside its blackness the blinking headlamp of a slow freight travelling the opposite way approached us, and then the sight of tunnel workers' lights ahead drew forth a long warning call from our whistle.

The gradient changes in the tunnel and we were moving down hill again now, our engine gradually taking shape once more in the increasing daylight as we approached the end of the bore. The regulator was shut and the

In the illustration above the "9 o'clock Leeds" is seen entering City Station behind No. 45521 Rhyll, one of the Patriot class rebuilt with a large tapered boiler and double chimney.

(Continued on page 154)



A W.R. through freight train is diverted round the site of permanent way operations at Swindon. The approaching engine is No. 3822. Photograph by T. Richards.

Railway Notes

By R. A. H. Weight

British Railways New Rolling Stock Programme

Plans for the current year include the provision of 2,750 new passenger vehicles, 325 locomotives and 53,000 freight wagons. It is welcome news that no less than 1,820 passenger coaches are to be put in hand, as well as a number of new guards' and baggage vans. All-steel designs will continue to be employed. Comprised in the locomotive building scheme will be 254 engines of B.R. standard types, including 40 of the latest and heaviest class 9 2-10-0 freight. For shunting or similar duty there will be 50 steam tank engines and 14 employing diesel-mechanical propulsion.

New wagons will include 3,000 for conveyance of steel in loads up to 50 tons, as well as some of special design for particular heavy traffic capable of carrying up to 65 tons, together with many for general freight or perishable traffic. Contractors will share with British Railways Workshops in effecting this large constructional programme.

A Visit to Crewe Works

I had the privilege one day last January of joining a party of railway officials and Press representatives invited to travel from London for the purpose of inspecting some of the new 2-10-0s mentioned above, completed and under construction; and also the pleasure of meeting the Editor on arrival and accompanying him on a most instructive and well organised tour of the sections of the vast works where the big locomotives were in hand up to No. 92011.

An ex-Midland corridor coach hauled by 2-6-2T No. 41250 was thoughtfully provided to expedite our progress from point to point so that we were able to see various stages from cutting out the frames, then boilers and fire-boxes, wheels, motion and other components in course of production and erection and so on, right up to a footplate inspection of one in steam.

Opportunity was given for close-up views of various parts, such as the regulator before fitting in position, which moves horizontally when actuated by rodding

from the driver's handle in the cab and a pair of driving wheels and axle boxes, with ample explanations by expert technicians and guides.

The first four completed engines looking most impressive were drawn up in echelon, so to speak, near the paint shop, so that one could obtain views of all. Two or three had then been out for trial runs. In striking contrast, close to stood one of the Webb L.N.W.R. 0-6-0 goods engines of 60 years ago, looking so diminutive yet trim and workmanlike, though quite incapable of tackling 70-wagon coal trains at accelerated speeds, which the Chief Regional Manager indicated was one of the intended tasks for their latest big successors. Under overhaul in the works I noted among others the express locomotives: *Princess Alice*, *Princess Louise*, *Duchess of Kent*, *Royal Irish Fusilier*, *Welsh Guardsman*, *Bellerophon*.

With heavy trains weighing over 500 tons, 17 coaches on the 10.40 a.m. from Euston hauled by 4-6-2 No. 46249 *City of Sheffield*, and 16 on the 4.24 p.m. up from Crewe in charge of No. 46241 *City of Edinburgh*, we enjoyed good runs in north expresses, calling at Rugby. The former was characterised by steady running uphill and down; the latter by high speed sprints in between signal and other extra slowings, which prevented a punctual arrival despite the enginemens' enterprise.

Eastern and North Eastern Regions

New locomotives placed in service include Nos. 76030-4, class 4 2-6-0s fitted with cab shelters on the tender to facilitate tender-first running on cross London freight duties, the first of the type allocated to Stratford; class 2 2-6-0s Nos. 78010-1, 51F, West Auckland; and 2-6-4Ts from Brighton Works numbered 80069-76 to 33A, Plaistow. Diesel-electric shunters Nos. 13070-5 are at Hull and No. 13069 at 38E, Woodford Halse. Diesel-hydraulic No. 11701 is at 51C, West Hartlepool.

No. 27000, type EM2, commencing the larger Co: Co main line electric locomotive series, is also out, with others following. No. 69903 was transferred to Immingham, being one of the large 0-8-4 banking tanks lately stored at Mexborough. A3 Pacifics, *Persimmon* and *Flying Scotsman* moved from the G.C. Section to Grantham, also *Doncaster* appropriately to that shed, while *Melton* and *Gay Crusader* went from the G.N. to the G.C. Division. No. 60814 of the large V2 2-6-2 class caused no little surprise when making a trial run to Liverpool Street, including platform clearance tests there.

Authority has been given for the installation of a 70 ft. vacuum-operated turntable at Cleethorpes, Lincs., where up to 95 engines are turned during a summer week-end when holiday traffic is at its height. Some of the largest and heaviest classes of locomotive are permitted to work to Cleethorpes.

On New Year's Day 1954 all up expresses due into King's Cross from 1.5 to 2.33 p.m. were early, some decidedly so, the engines being two A3, one B1 from Grimsby, two A4s returning to King's Cross from Leeds and Newcastle respectively, and one A1 on the *Yorkshire Pullman*, which with 11 cars weighing about 470 tons full arrived about 10 min. early two days running. It was then hauled by Leeds (Copley Hill) locomotives.

On 5th January the 1.53 Leeds arrival passed Hornsey four miles out from the terminus at 1.36 with

12 on, headed by *Sir Nigel Gresley*. It was followed by the *Tees-Tyne Pullman* at 1.41 (l) worked by *Dominion of Canada*, 8 cars, 330 tons, so that 228 miles from Darlington start had been covered in no more than 212 min., and the train was in King's Cross 11 min. early at 1.49, having averaged about 63½ m.p.h. overall, including extra slowing at Potters Bar and other slacks. It was very cold, fine weather with a northerly wind. Both crews were King's Cross men.

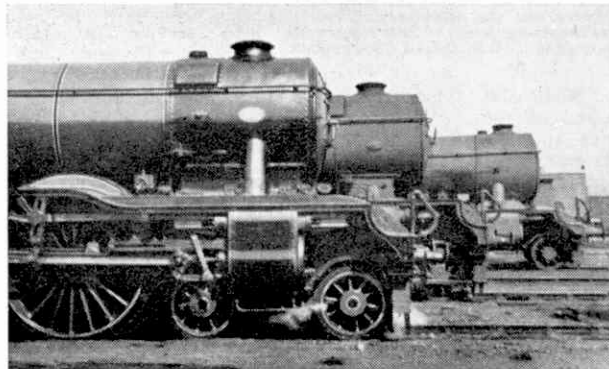
A few days earlier, on 29th December, the latter Pullman express came up from Darlington in 223 min. actual for 232½ miles, the engine being *Woodcock*, also of the streamlined King's Cross Pacific series and as on 5th January with a driver recently promoted to the top link. The 1.5 York and Hull, the 1.35 Sunderland, the 1.53 Leeds and the 2.33 *Yorkshire Pullman* inward expresses were also well ahead of time at Hornsey on that date. Other good reports have come in, including excellent runs by A3 4-6-2s.

Striking Developments in Holland

From a recent interesting information bulletin published by the European Railways' publicity centre in Rome I received the rather startling news that by 1958 the stean locomotive will have disappeared from passenger train working on the Netherlands Railways. For many years engines of British design or construction were prominent in Holland. Electrification, both main line and suburban, has been extended on a considerable scale in conjunction with an enormous amount of general reconstruction necessary after the recent war, together with modernisation of signalling and provision of more track circuits. Diesel-electric locomotives, railcars and two-coach sets are also on order. Many of the runs between towns or stops are short and timings fast.

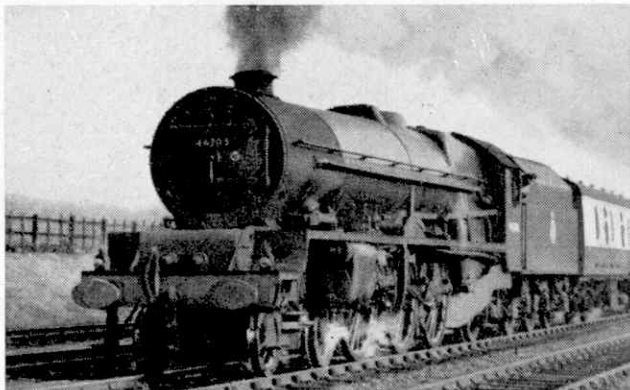
Southern Tidings

It was recently learned that the preserved locomotives *Boshill*, of the L.B.S.C.R. 0-6-0 Terrier tank type,



A "big-engine" trio caught by the camera of R. D. Stephen at Edinburgh Haymarket Motive Power Depot. The scene is all the more interesting in that the engines were not specially posed.

and L.S.W.R. outside cylinder 4-4-0 No. 563, together with one of that company's coaches which was exhibited with the engine some years ago in connection with the centenary of Waterloo station, all in original colours, have been towed from Farnham to be locked up for the time being at Salisbury in what was the Great Western Motive Power Depot. It is hoped that it



Bound for Merseyside "The Red Rose" is getting along in good style near Rugby. The engine is No. 46204 "Princess Marie Louise." Photograph by K. Graham.

will be possible for those and other interesting relics to be displayed within public view.

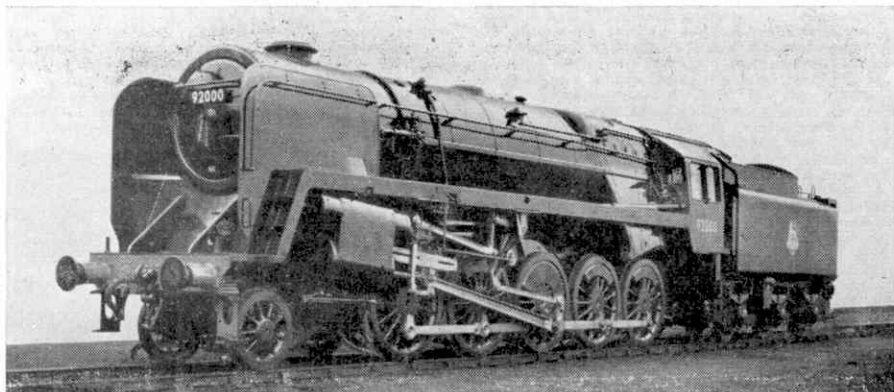
Owing to the turntable at Reading, S.R., being out of use and under repair, for some time passenger trains on the 46-mile Reading-Redhill service were hauled a good deal by tank engines, including class 4 L.M.S. type 2-6-4, M7 and H 0-4-4 types. This route has long been noted for its locomotive variety.

An M7, fitted for push-and-pull working, No. 30129, usually seen on branch runs from Brighton to Horsham and Guildford, operated at Christmas to Eastbourne and Hailsham. About that time four different Atlantic or 4-4-2 express engines, of the remaining five, were at work on coastal parcels trains also on relief through Midlands services south of Redhill.

Engine headboards indicating the name of the steamship company or its principal route concerned are carried for Waterloo-Southampton boat train runs such as *Cunarder*, *The South American*, *Union Castle Express* or similar romantic titles!

Bread and Cakes by the Ton!

Heavy traffics in fish, vegetables and other eatable commodities of a perishable nature are a commonplace on British Railways, being conveyed in many instances in specially contrived vehicles. Bread is very largely a locally baked product not requiring large scale bulk transit for any great distances. I recently received reports, however, of regular conveyance of bread in large quantities to country and inland destinations from Belfast and Londonderry. Conveyor belts at a bakery allow loading straight into containers, two of which were carried on a 4-wheeled truck, or six on bogie trucks adapted from former G.N.R.(I.) passenger coaches.



B.R. 2-10-0 Locomotives

New Design for Heavy Freight Duty

By the Editor

NO railway enthusiast could possibly resist an invitation to visit the great locomotive works at Crewe, especially when a new class of locomotive is under construction. So when I was asked there to see the new British Railways 2-10-0 heavy freight locomotives, principally for mineral traffic, I simply had to accept the invitation.

The thrills began when I and other visiting enthusiasts gathered together in a large and splendid room that had been the office of a succession of famous Chief Mechanical Engineers of the former L.N.W.R. and is today the office of the Manager of Crewe Works, and I thought of such legendary figures as Ramsbottom, Webb, Whale and Bowen-Cooke, as I looked round at the pictures of famous locomotives and the coats of arms displayed on its walls.

But it was the works I had come to see, and particularly the erecting shops. I went there in a saloon coach hauled by a small tank locomotive—Crewe Works cover an enormous area—and straightaway saw several of the new locomotives in various stages of construction. These were designed under the direction of Mr. R. A. Riddles, C.B.E., who until his recent retirement was the Railway Executive member for Mechanical and Electrical Engineering. They are truly representative

of British Railways as a whole. The parent office for the actual design was Brighton, which of course is in the Southern Region; certain sections were designed at Derby, Doncaster and Swindon, the two latter of which are in the Eastern and Western Regions respectively; and construction is proceeding at Crewe, in the London Midland Region, to which the Derby shops of course also belong.

The engines form a new locomotive power class numbered 9, and the initial order is for 20 of them, to be numbered 92000 to 92019. By the time this article appears a few will have passed into service on the Western Region, and perhaps elsewhere, and many readers no doubt will have seen them.

With 10 coupled wheels, it will be obvious that the purpose of the new engines is to haul goods trains. An interesting point is that these wheels are 5 ft. in diameter, which is larger than is usual for heavy freight work. This means that besides possessing great hauling powers—their tractive effort is 39,667 lb.—they will be able to get up quite a good speed, and will haul trains faster, or will haul heavier trains, than the 2-8-0 and other goods classes now in regular operation.

The engines look enormous, and it is therefore no surprise to learn that they weigh 86 tons 14 cwt., and with the

At the head of the page is a splendid picture of the first of a new type of locomotive intended principally for working mineral traffic. These locomotives are being built at Crewe, and the accompanying article gives interesting details of their design and construction. B.R. Official Photographs.

tender in working order the full weight is 139 tons 4 cwt. They are simple, with two outside cylinders of 20 in. diameter and 28 in. stroke respectively. The wheels of the leading pony truck are 3 ft. in diameter, and the wheelbase of engine

and cylinder barrel. A glance at the illustrations will already have shown readers that piston valves are fitted. These have a nominal diameter of 11 in. and are driven by Walschaerts valve gear.

A boiler of new design is used for these

locomotives, although it incorporates pressings and other parts of already existing boilers. The reason for this is that the fire-box has to be placed over the trailing pairs of coupled wheels, which stand higher than is usual in heavy goods engines. The grate is of the rocking type, consisting of twelve rocking sections, fitted

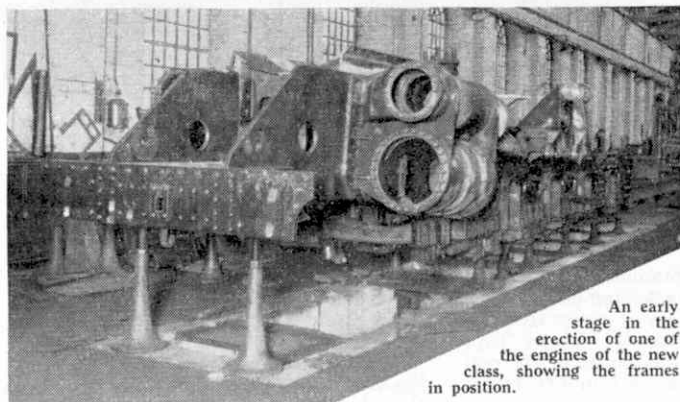
with 12 grid type fire bars. It is divided down the middle from front to back, so that the right and left hand sides can be rocked separately.

The locomotives are intended to be used in different Regions—the first to be made have been allocated to the Western Region—and for this reason various arrangements of tender will be fitted. Some Regions require a high water capacity, particularly for routes where water troughs are infrequent or wholly absent, while elsewhere, for long distance freight work on lines where troughs are provided at frequent intervals, a high coal capacity is wanted.

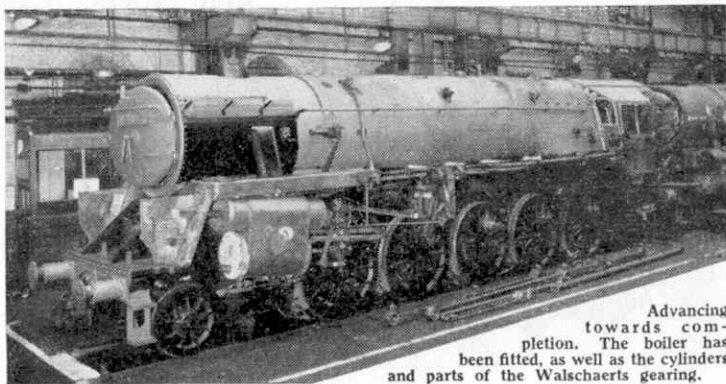
and tender is 55 ft. 11 in. The fire grate has an area of 40.8 sq. ft. The total heating surface, tubes and fire-box, is 2,015 sq. ft. and the superheater surface is 555 sq. ft. The boiler pressure is 250 lb. per sq. in.

Walking down the line along which were several of the new locomotives at various stages of erection, I was interested in the frames of the engines. They are particularly rigid and robust, with frame plates $1\frac{1}{4}$ inch in thickness, strengthened adequately where required and stiffened along their bottom edges by means of steel castings with the shape in section of an inverted T. The hornblocks, in which the axle-boxes fit, are symmetrical and of horse-shoe form, welded in the main frames so that they distribute the piston loading evenly.

The cylinders are steel castings, with cast iron liners to both steam chest

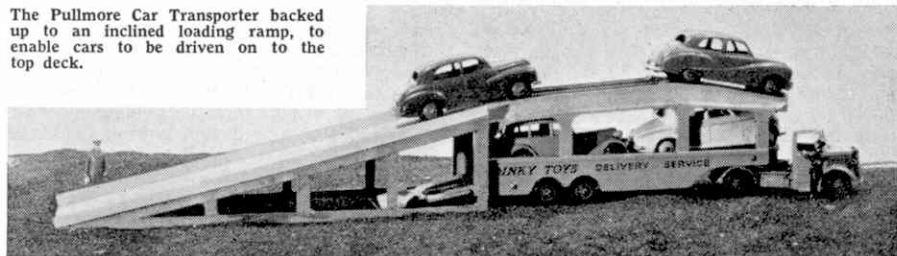


An early stage in the erection of one of the engines of the new class, showing the frames in position.



Advancing towards completion. The boiler has been fitted, as well as the cylinders and parts of the Walschaerts gearing.

The Pullmore Car Transporter backed up to an inclined loading ramp, to enable cars to be driven on to the top deck.



DINKY NEWS

By THE TOYMAN

Playing with Dinky Toys

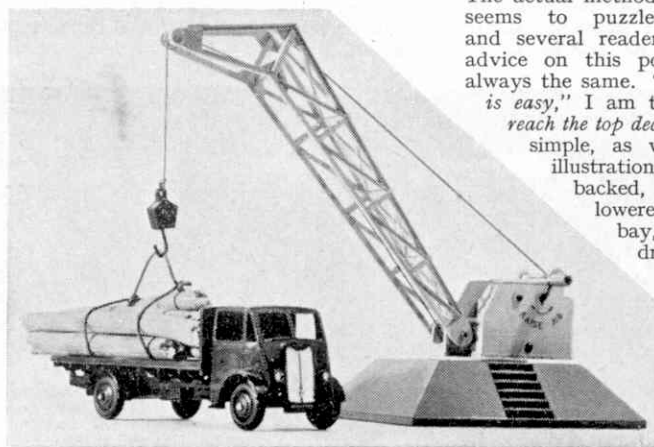
ONE of the most fascinating features of the Dinky Toys collecting hobby is the almost unlimited variety of games that can be played with the models. Dinky Toys are not only perfect miniatures of the real things; they are also toys in the truest sense of the word, and every model can and does provide its owner with endless possibilities for games that will give him countless hours of real pleasure.

This month, as a change from the comprehensive layouts described in previous articles, I am concentrating on the use of individual models as playthings. I have chosen for my subjects three fairly recent additions to the Dinky Toys range. The models are very different from each other in type, but they all have one thing in common—they are toys with a lot of real play value as well as being true-to-life

copies of the vehicles and machines they represent.

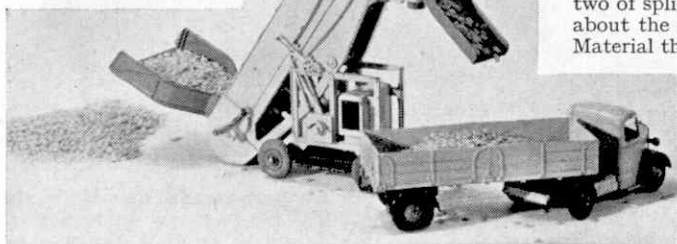
To begin with, let us see what can be done with the Pullmore Car Transporter, Dinky Toys No. 582, seen in the picture at the head of this page. Since its introduction this model has rapidly become one of the most popular of all Dinky Toys. Its uses are fairly obvious, and many readers will know what these are from having seen the real vehicles hurrying along the roads with loads of new cars, bound for the nearest seaport for shipment overseas. Now this operation is one that can be carried out in play fashion using the Dinky Toy miniature and it will provide a lot of fun.

Finding a suitable load for the Transporter offers no difficulty at all for the Car Transporter is designed to take almost any of the cars in the Dinky Toys range. The actual method of loading the vehicle seems to puzzle collectors, however, and several readers have asked me for advice on this point. The question is always the same. "*Loading the lower deck is easy,*" I am told. "*But how do cars reach the top deck?*" Well, the answer is simple, as will be seen from the illustration. The Transporter is backed, with its hinged ramp lowered, up to a sloping loading bay, and the cars are then driven up the incline straight into position on the top deck. The loading bay shown is made of



A Goods Yard Crane makes light work of lifting a load of logs on to a Guy Flat Truck.

The Elevator Loader in action. The material to be loaded can be seen sliding down the chute into the waiting lorry.



cardboard but Meccano parts could be used. Unloading can be carried out by using another ramp—or even by lifting the models from the Transporter by a crane, which in itself is great fun.

This suggests that the next on my list should be the Goods Yard Crane, Dinky Toys No. 752, and so it is. Of its two winding handles, one controls the angle of the jib, and the other is used for raising and lowering the load. In addition the crane can be swung round on its base so that loads can be picked up or set down from any position round the base. So altogether it is a fine, handy affair. It is indeed just the thing for lifting heavy loads on to Dinky Toys lorries, and my picture shows it in the act of piling miniature logs on to a Guy Flat Truck. Its ideal situation, of course, is in a Hornby Train goods depot, where road and rail transport meet, and loads can be transferred from Hornby wagons into a waiting fleet of Dinky Toys lorries. But even if you have no Hornby Railway you are sure to find plenty of ways in which you can use it with real enjoyment.

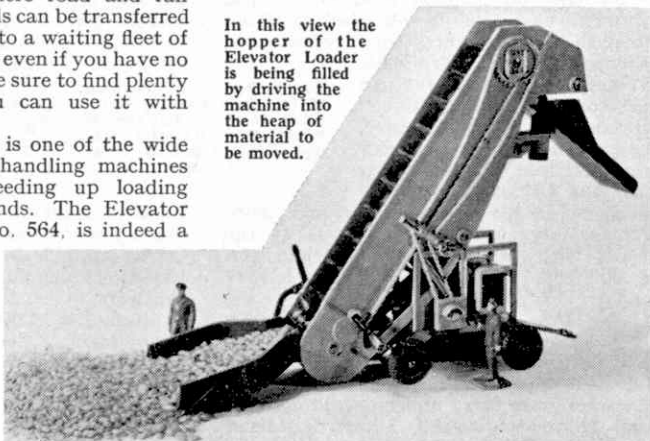
My third Dinky Toy is one of the wide variety of mechanical handling machines now available for speeding up loading operations of many kinds. The Elevator Loader, Dinky Toys No. 564, is indeed a working model, and with it all the essential movements of the real machine can be carried out speedily and faithfully. The model includes a wealth of detail, and as will be seen from the illustrations,

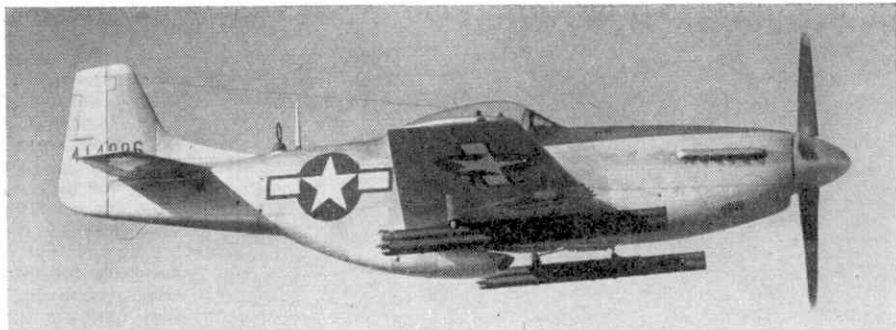
when it is set to work loading a Dinky Toys lorry the result is as true-to-life as even the most ardent enthusiast could wish. It can handle an endless variety of materials, but for the purpose of my pictures I chose a handful or two of split peas. These are just about the right size for the job. Material that is too fine is apt to slide off the conveyor, and maybe to fall into the mechanism that operates the conveyor belt, with a possibility of jamming it.

In the lower picture the Elevator Loader is shown in position after it has been run into a heap of the material to be loaded, to fill the hopper. The next step is to operate the side lever to raise the hopper, so that the split peas fall down to the conveyor belt and then, as the handle is turned, they are carried up by the belt to be shot out down the chute. The other picture shows the actual loading operation, with the split peas falling in a continuous stream into the waiting Articulated Lorry. Try this. The rattle as the split peas fall into the lorry is a very satisfying noise!

The discharge chute is pivoted, so you can swing it from side to side to spread the load evenly over the length of the lorry platform, and for a change you could have two lorries backed in side by side, so that you can deliver first into one and then into the other.

In this view the hopper of the Elevator Loader is being filled by driving the machine into the heap of material to be moved.





TOWARDS the end of last year, North American Aviation became the first company in the world to have built 50,000 aeroplanes. This total, which represents one-tenth of all the aircraft produced in the United States since the Wright brothers first flew 50 years ago, is all the more remarkable in that North American did not fly their first aeroplane until 1936, by which time most of the other big U.S. companies already had several hundred aircraft to their credit.

From the start the young company showed plenty of initiative. With an Army Air Corps contract for 82 trainers in their order book, they built their first small factory in the Los Angeles district of California, where they could count on good flying weather all the year round.

By the end of 1936 their BT-9 basic trainers were rolling off the assembly line in fair numbers—and aircraft they were too. Wisely, North American decided to concentrate on training aircraft for a time, and by 1940 the little fixed-undercarriage BT-9 with its 400 h.p. Cyclone engine had been succeeded by a larger and more refined advanced trainer known as the AT-6, with retractable undercarriage and a 600 h.p. Pratt and Whitney R-1340 engine.

The U.S. Army Air Force and Navy ordered hundreds of AT-6s; and as the Royal Air Force were looking for a new advanced trainer at the time, and our own factories were busy churning out fighters and bombers, the Air Ministry ordered them too. The U.S. Navy renamed theirs

SNJ Texans, and we called ours Harvards. The fact that the buzz-saw drone of their engines can still be heard in British skies after 14 years is the finest possible tribute to their quality.

Altogether, between 1936 and 1945, North American built 5,714 early-type trainers and 10,554 of the AT-6-Texan-Harvard family, which were used by 33

different Allied air forces during the war. But, except for 238 Type O-47

The First Fifty Thousand

By John W. R. Taylor

observation planes, which looked rather like tubby, mid-wing versions of the Harvard, they had little experience of designing and building operational aircraft when Britain declared war on Germany in September 1939.

So when the British Purchasing Commission asked them to build an existing type of fighter for the R.A.F. it seemed certain that they would welcome this chance of expanding their factory and making a lot of money at a time when America was still neutral. But not a bit of it! They pointed out that the fighters concerned could not be built easily by their simplified, quantity production methods, and that they would much prefer to produce a completely new fighter of their own design, incorporating lessons learned in the first six months of the war.

"Right-ho," said members of the British Commission, "design and build us a prototype that will do all the things we need, *within 120 days*, and we'll think about it."

Within 100 days more than 2,800 design drawings were produced, translated by

The photograph at the head of this page shows a North American P.51 Mustang of World War II, with U.S. type rocket launchers under its nose.

skilled workers into thousands of component parts, and the prototype fighter was complete, except for its engine. Nor did it show any signs of being a "rush job." Indeed, it was by far the most advanced fighter designed in America up to that time.

Typical of its designers' ingenuity was the wing, which used a new NACA "laminar flow" section, designed to reduce drag by as much as 50 per cent. Little was known about "sound barrier" compressibility effects at that time; but the new wing was one of the first designed to combat the frightening shock waves that can batter an aeroplane to pieces in a high speed dive.

It was quite a gamble to design the new fighter around such a revolutionary wing with only 120 days to go; and the designers were given permission to try it only on condition that, if it proved a failure, they could get a conventional wing designed and built in 30 days. But it was not a failure, and, combined with the "cleanest" fuselage ever put behind an in-line engine, it gave the new fighter superb handling qualities.

North American called their fighter the

loads to be carried, two Mustangs were joined together in 1945 to form the unique Twin Mustang, complete with relief pilot in the second cockpit.

Both the P-51 (later F-51) Mustang and F-82 Twin Mustang remained in front-line service with the U.S. Air Force until last year, and achieved many successes in the early stage of the Korean war. Altogether 15,302 of them were built, and they are certain to remain in service for training, especially with smaller air forces, for several more years.

Another veteran wartime North American aircraft still to be seen in many parts of the world is the B-25 Mitchell twin-engined bomber, first flown in 1940. Most famous exploit by a Mitchell squadron was General Doolittle's gallant "one-way ticket" raid on Tokyo from the aircraft carrier *Hornet* in April 1942; but 10,970 were built and they did splendid work in every theatre of war, displaying the qualities of high performance, heavy punch and rugged construction which have become a hall-mark of North American warplanes.

Unfortunately, even the best piston-engine fighters and bombers are no longer good enough, and every major air force in the world has re-equipped with jets. North American were



North American FJ-2 Fury of the U.S. Marine Corps, a type comparable to the U.S. Air Force's F.86 Sabre jet fighter in speed and performance.

not slow to realise the effect that jet-propulsion would have on aircraft development, and began designing their first jet fighter in

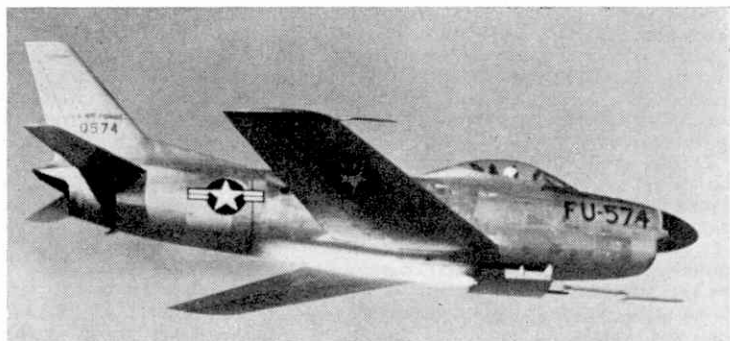
1944. In the following year they received a U.S. Navy contract for three XFJ-1 Fury fighters, followed by an order for 30 production aircraft, which became in 1948 the first operational U.S. Navy jet fighters to take off and land on a carrier.

The U.S.A.F. also ordered in 1945 three prototype jet fighters similar to the straightwing, tubby FJ-1, but stripped of its naval equipment. Then the Allies captured German research data which proved conclusively the value of sweptback

Apache; the Royal Air Force renamed it Mustang. Unfortunately, with its original Allison engine, its performance was good only at low altitudes; so the R.A.F. used it for Army Co-operation duties. But later, re-engined with a Packard-built Rolls-Royce Merlin, it became one of the greatest fighter planes of World War II, with a speed of 445 m.p.h., heavy armament and sufficient range to escort heavy bombers to Berlin and back. To achieve still greater range and enable even heavier

loads to be carried, two Mustangs were joined together in 1945 to form the unique Twin Mustang, complete with relief pilot in the second cockpit.

The rocket-armed F-86D Sabre interceptor fighter with radar "nose" is here shown firing its rockets.



wings for delaying "sound barrier" shock wave troubles. The XP-86 was redesigned with thin, sweptback wings and a longer, slimmer fuselage. The result, flown on 1st October, 1947, was the first F-86 Sabre, most famous and successful jet fighter yet built in quantity.

Powered first by an Allison J35-GE-3 engine and then by a General Electric J-47, and designed to fly 1,000 miles at very high speed, the Sabre looked good. On 15th September, 1948, we were shown just how good when Major Richard L. Johnson raised the World Speed Record to 670.981 m.p.h. in a standard production F-86A, complete with full military load.

Since then the Sabre has achieved almost legendary greatness. Successive versions have introduced new, more powerful engines, deadly new operational equipment, an "all-flying tail" in which both elevators and tailplane are geared

to move together to give improved control at high speeds, and other features. As a result, all Sabres are able to dive faster than sound with no ill-effects, and their combination of manoeuvrability, ruggedness, radar gun-sight and armament of six .50 in. machine-guns enabled them to emerge from the grim test of war in Korea with a tally of 800 formidable Russian-built MIG-15 jet fighters destroyed, for a loss in air combat of only 58 Sabres.

Up to the time when North American produced their 50,000th aeroplane they had built 5,954 Sabres, and hundreds more had been produced in Canada for the R.C.A.F. and R.A.F. by Canadair Ltd. Current production version is the F-86H, which has a tremendously powerful General Electric J-73 turbojet and even better performance than earlier versions, including a combat range of 1,200 miles. Generally similar in appearance and performance are

the FJ-3 Fury with Wright-built Sapphire turbojet, in production for the U.S. Navy and Marine Corps, and the Sabres being built in Australia by the Commonwealth Aircraft Corporation, with Avon engines.

But even the Sabre has now been succeeded by something better, for the 50,001st aeroplane built by North American was one of the new F-100A Super Sabres, for which the U.S.A.F. have awarded the company a \$250,000,000 contract.

From its fish-like nose to its massive tail, the new fighter is the embodiment of sleek (Continued on page 154)



North American's 50,001st aeroplane—one of the new F-100A Super Sabres in production for the U.S. Air Force.

BOOKS TO READ

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

"HOW I BECAME AN ENGINE DRIVER"

By NORMAN MCKILLOP (Nelson 5/-)

Here is a book that will be read with tremendous interest by every steam locomotive enthusiast. It is not exactly an autobiography, but the author, an engineman of note, takes the reader through the various stages that lead from the cleaner's cloth to the responsibility of handling as a top link driver the locomotive on a crack long-distance express. His easy manner of using typical experiences brings the whole breezy atmosphere of the footplate, the hard work, the skill and the concentration, into the chapters of the book.

The reader meets characters that many an engineman will recognise. The influence on the work demanded of the footplate men of the road, the type of train and the weather, quite apart from the condition of the engine, is well brought home. The final chapters deal with different types of locomotives, and relate some hectic moments in the author's own career.

Illustrations are not numerous, but they are all good and the diagrams especially aid considerably in the understanding of the text.

"ABC CONTINENTAL MILITARY AIRCRAFT"

By JOHN W. R. TAYLOR (Ian Allan 2/6)

Previous books in this series of Aircraft ABCs have dealt only with aircraft seen over the United Kingdom. This one describes and illustrates all important military aircraft built on the Continent of Europe, including major Russian types based in East Germany. British and U.S. designs already covered in *ABC of Military Aircraft Recognition* are not included. Over 80 different machines are described and illustrated, and there are three-view identification drawings of 51 of them. Dimensions, armament, and performance are given where available.

In a book of this modest size a few omissions are inevitable, but these are chiefly among training aircraft and old machines now passing out of service. As it stands, the book is designed to give spotters and collectors all the data they want on all the aircraft that really matter.

"CYCLING ANNUAL"

By H. H. ENGLAND (Temple Press 3/6)

Cycling is more than a cheap and easy means of getting to and from school or work, or of going errands; it is also a delightful form of outdoor recreation, as the great popularity of cycling clubs indicates. This excellent handbook was first published in 1917 and has long been recognised as a standard work on the care and maintenance of a bicycle, so much so that it is now in its 23rd edition. It is a complete introduction to cycling, to the machine and to the needs of the cyclist himself, and although written for the novice it contains much that makes it an authoritative reference book for the experienced rider as well. This new edition has been brought right up to date, and its legal advice on brakes and lighting takes into account the latest Acts and Orders relating to bicycles.

In addition to the usual valuable chapters on the components of a bicycle and their functions, the author gives useful advice to the prospective rider on how to position himself so as to obtain that effortless style that makes cycling such a real joy. There are also chapters on cycle touring and camping, track racing, tandems and tricycles. The several appendices at the end of the book include a valuable maintenance guide, gear tables, table of railway rates for bicycles, and lists of cycle championship winners. Finally there is a good index.

The book is illustrated with about 100 excellent half-tone pictures and line drawings.

"GENERAL MOTOR BUS ALBUM"

(The Oakwood Press 3/-)

This booklet consists mainly of a collection of 43 photographs, some full-page size, of various types of motor buses operated by the former London General Omnibus Company. These illustrations, which include some steam and petrol-electric vehicles, form a valuable record of some of the diverse types of motor bus to be seen on the streets of London from the early years of the present century up to the time of the formation of the London Passenger Transport Board in 1933. All the photographs are printed on one side of the paper only so that they can be cut out and mounted in albums if desired.

On the rear cover of the booklet there is an interesting panel of radiator outlines, which should prove helpful in identifying buses appearing in old photographs.

Copies of the booklet can be obtained from the Oakwood Press, Tanglewood, South Godstone, Surrey, price 3/3, including postage.

"ABC OF BRITISH RAILWAYS LOCOMOTIVES"

Part 1 (Western Region)
Part 2 (Southern Region)
Part 3 (London Midland Region)
Part 4 (Eastern Region)

(Ian Allan Ltd. 2/- each part)

These welcome ABC parts in their usual familiar form give details, in numerical order, of all the steam locomotives in B.R. service. Part 1, dealing with the Western Region, covers the number block 1-9999, and so includes all the well-known Swindon and South Wales types. Part 2 covers the number block 10000-39999 and takes in steam locomotives of Southern origin and all Southern electric train units as well as the various diesel, electric and gas turbine locomotives in service.

Part 3 covers the number block 40000-59999 and includes all steam locomotives of L.M.S. origin and the electric motor coaches now operated by the L.M.R. Finally, Part 4, covering the number block 60000-99999, deals with ex-L.N.E.R. steam locomotives, B.R. Standard steam locomotives and the ex W.D. types as well as electric units of the former L.N.E.R.

A good deal more than names and numbers is included in the various books, for photographic reproductions, tables of dimensions and lists of B.R. Motive Power Depots and their codes are given. Each part is good value at 2/- and the size of the books allows them to fit readily in one's pocket.

"PASSE-PARTOUT FOR SCHOOL AND HOME"

By FREDERICK T. DAY (Newnes 8/6)

The author of this book is already an accepted authority in the educational world on the subject of coloured papercraft work, and in this new book he provides a fascinating guide to passe-partout binding and framing, modelmaking and decorative work of all kinds. The necessary tools and materials are cheap, and once a knowledge of the handicraft is obtained it can be developed at reasonable cost to suit individual tastes and requirements.

The book meets the requirements of both beginner and more advanced follower of the hobby. It is lavishly illustrated with excellent line drawings, half-tone illustrations and coloured plates.

"JEWELLERY MAKING"

By LESLIE WOOLLARD (Foyle 2/6)

With a copy of *Jewellery Making* and ten shillings or so to spend on initial equipment and material, anyone can make a good start in this fascinating craft. The instructions given here cover every essential process, technique and principle. Nearly 200 neat diagrams help to make matters as simple as possible.

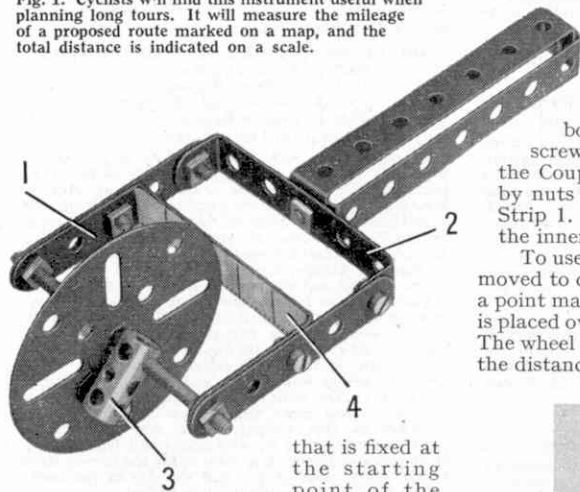
Among the Model-Builders

By "Spanner"

A Useful Measuring Instrument

At this time of the year *M.M.* readers keen on cycling will be checking over their machines in readiness for runs and tours planned for the summer months. It is always helpful to know the exact mileage to be covered on a proposed run, particularly if it is to be spread over several days, as the journey can then be split into convenient stages. Most boys are familiar with the time-honoured method of measuring distances on a map, using a length of string tied at one end to a pin

Fig. 1. Cyclists will find this instrument useful when planning long tours. It will measure the mileage of a proposed route marked on a map, and the total distance is indicated on a scale.



that is fixed at the starting point of the trip. It is

rather difficult to use this method to trace a long journey accurately, however, especially if the route to be followed is a winding one, and a more accurate result can be obtained by using a simple instrument of the kind shown in Fig. 1. This easily made instrument is used simply by rolling the wheel with which it is provided along the desired route on the map.

The frame of the instrument consists of a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Double Angle Strip 1 fitted at each side with a $2\frac{1}{2}''$ Strip. The top ends

Master F. Mahnen, Esch on the Alzette, Grand Duchy of Luxembourg, is not yet seven years old, but he is already an enthusiastic model-builder. He is seen here with one of his models, an articulated fire engine and escape.

of the Strips are connected by a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 2, which supports a handle made from three $3\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips.

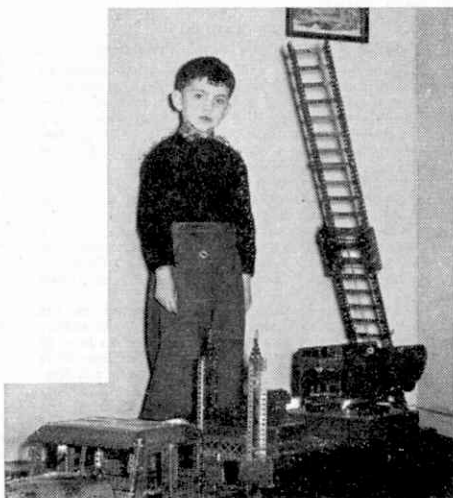
The tracing wheel is a Face Plate that is fitted with a Coupling 3. This Coupling is

attached by a bolt, but is spaced from the Face Plate by a Washer. A 3" Screwed Rod is passed through the boss of the Face Plate and is screwed through a threaded hole in the Coupling. The Screwed Rod is held by nuts in the lugs of the Double Angle Strip 1. A calibrated scale 4 is glued to the inner face of the Double Angle Strip.

To use the instrument the Face Plate is moved to one side of the Screwed Rod, and a point marked on the rim of the Face Plate is placed over the starting point on the map. The wheel is then rolled over the route, and the distance read off on the scale.



Master R. P. Siesling, Zwolle, Switzerland, a keen model-builder who won a prize in Section A of the 1952-53 International Model-Building Competition.



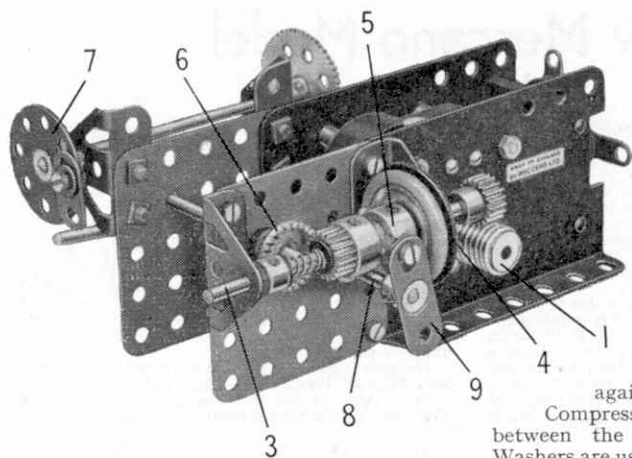


Fig. 2. An intermittent motion mechanism for use in automatic pile drivers and other models where an interrupted drive is needed. The drive is engaged through a simple friction clutch.

A Friction Clutch Intermittent Drive

Intermittent motion devices are among the most useful of all Meccano mechanisms. They can be used in models such as pile drivers to operate the ram, in cranes to control the raising and lowering of a load automatically, and in countless other models where an interrupted drive is an essential part of the mechanism. In most cases the drive is engaged and disengaged through a dog clutch or through sliding gears in and out of mesh, but in models operating at fairly high speeds it may be a disadvantage to use a positive clutch engagement of the kind provided by gears or a dog clutch. Figs. 2 and 3 show an intermittent drive mechanism that gives a smooth take-up and release through a simple friction clutch.

The side-plates of an E20R Electric Motor are extended by $2\frac{1}{2} \times 2\frac{1}{2}$ " Flat Plates, which provide bearings for the Rods used in the mechanism. This results in a compact arrangement that can be bolted as a unit into a model. Each end of the

Motor armature shaft carries a Worm, numbered 1 and 2 in the illustrations.

The Worm 1 drives a $\frac{1}{2}$ " Pinion fixed on a Rod 3 supported in Trunnions bolted to the Flat Plates. This Rod is fitted with a Bush Wheel 4 locked in place, and a unit 5 free to turn on the Rod. This unit consists of a 1" Pulley with Rubber Ring, and a $\frac{1}{2}$ " Pinion held in a Socket Coupling.

The Rubber Ring is pressed against the Bush Wheel 4 by a Compression Spring, which is fitted between the $\frac{1}{2}$ " Pinion and a Collar. Washers are used for spacing purposes. The output shaft is a Rod (Continued on page 154)

MORE PRIZES FOR MODEL-BUILDERS

We wish to remind readers that the "Winter" Model Building Competition is open for entries until 30th April next. Full details of this Competition were given in the February issue of the Magazine, but for the benefit of readers who did not see that issue we are repeating the main particulars here.

Models of any kind or size are eligible for entry in this Competition and it is open to model-builders of all

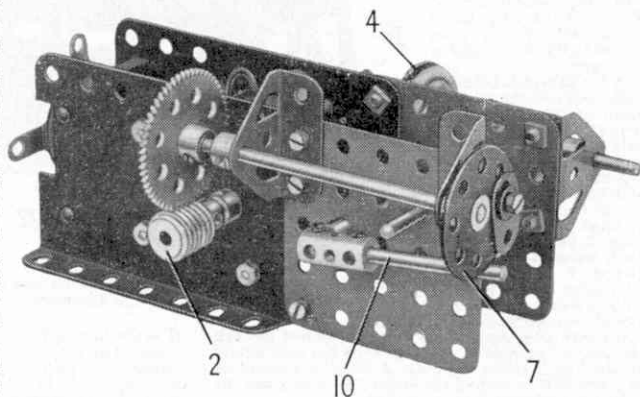


Fig. 3. Another view of the intermittent motion device, showing the drive to the built-up cam that controls the clutch release lever.

ages, living in the British Isles or Overseas. There will be two Sections, A, for competitors under 14 years of age, and B, for competitors over 14 years of age.

It is not necessary to send the actual model. A photograph or a good sketch is all that is required, and this should be forwarded to "Winter Model-Building Competition, Meccano Ltd., Binns Road, Liverpool 13."

The following Prizes will be awarded in each Section of the Competition. First, Cheque for £4/4/-. Second, Cheque for £2/2/-. Third, Cheque for £1/1/-. Ten Prizes each of 10/-. Ten Prizes each of 5/-. A number of Certificates of Merit will also be awarded.

New Meccano Model

Double Deck Bus

THIS month's cover shows one of the latest Liverpool Corporation buses, and the attractive model pictured below is based on a modern public service vehicle of this kind.

Each side member of the chassis consists of two $1\frac{1}{2}$ " Angle Girders bolted together by their slotted holes to form a U-section girder, and extended forward by a $5\frac{1}{2}$ " Strip that overlaps the girder by two holes. The side members are connected by two $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Double Angle Strips 1 and by two similar Double Angle Strips 2.

An E20R Electric Motor is bolted to one of the $5\frac{1}{2}$ " Strips at the front of the chassis, and is connected to the other Strip by an Angle Bracket. A $\frac{1}{2}$ " Pinion on the Motor armature shaft drives a 57-tooth Gear on a 2" Rod that is held in the side-plates by Collars. The Rod carries between the side-plates a $\frac{1}{2}$ " Pinion, and this engages a $1\frac{1}{2}$ " Contrate 3 on a 4" Rod supported in the Double Angle Strips 2. A Universal Coupling is fitted to the 4" Rod, and the driving shaft is completed by a 4" and a 2" Rod joined by a Coupling. The rear end of the driving shaft carries a $\frac{1}{2}$ " Pinion 4, and is supported in a Coupling freely mounted on the rear axle between a Collar and a $1\frac{1}{2}$ " Contrate 5. The rear axle is a 5" Rod mounted in $1\frac{1}{2}$ " Strips bolted to the chassis, and the Pinion 4 engages the Contrate 5. The rear wheels are 2" Pulleys fitted with Motor Tyres, with Wheel Discs bolted to the outer wheel of each pair.

A Trunnion 6 is bolted to each side of the chassis. Each of the front wheels is fixed on a $1\frac{1}{2}$ " Rod that is held by a Collar in a Double Bracket and the wheel is spaced from the Double Bracket by three Washers. One of the Double Brackets is fixed tightly to a $1\frac{1}{2}$ " Strip 7 by a nut on a $\frac{1}{2}$ " Bolt, which is then passed through one of the Trunnions 6 and is fitted with lock-nuts. The second Double Bracket is similarly fitted with a $1\frac{1}{2}$ " Strip 7, the $\frac{1}{2}$ " Bolt is passed through the second Trunnion 6, and a $1\frac{1}{2}$ " Strip 8 is held tightly on the Bolt between two nuts. A Collar is screwed on to a bolt held in each of the Strips 7 by a nut, and the Collars are connected by a $4\frac{1}{2}$ " Rod.

The steering column is a $3\frac{1}{2}$ " Rod, supported in an Angle Bracket bolted to the chassis and in a Fishplate fixed to the top flange of the E20R Motor. The Rod is held in place by a Collar and a $\frac{1}{2}$ " Pinion 9, which engages a 57-tooth Gear freely mounted on a Pivot Bolt that is gripped by its nuts in a Trunnion bolted to the chassis. A $2\frac{1}{2}$ " Strip is lock-nutted between the 57-tooth Gear and the end of the Strip 8. A Wheel Disc is attached to each front wheel by two $\frac{1}{2}$ " Bolts.

The rear platform is supported by two $4\frac{1}{2}$ " Strips 10 that extend the chassis girders. The platform is filled in by a $4\frac{1}{2}$ " Angle Girder 11 and a $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate edged at the front by a $5\frac{1}{2}$ " Angle Girder. A second $5\frac{1}{2}$ " Angle Girder 12 is bolted to the upright flange of the first Angle Girder. The floor of the lower

saloon is filled in by a $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plate 13 on each side at the front, and by four $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plates bolted across the chassis and strengthened underneath by $5\frac{1}{2}$ " Strips. Two $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plates 14 are fixed between the rear wheels as shown in Fig. 2, one of these Plates being curved so that it clears the Contrate 5.

Each side of the lower saloon consists of a $4\frac{1}{2}$ " \times $2\frac{1}{2}$ " and a $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate, a $5\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plate 15 and two Semi-Circular Plates 16 (Fig. 1). The side is bolted to $5\frac{1}{2}$ " Strips 17 (Figs. 1 and 3) and is connected to the floor of the saloon by Angle Brackets. The rear wheel arch is formed by two 3" Stepped Curved Strips. The remaining window divisions are 3" Strips.

The side seen in Fig. 3 is extended at the rear by a $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plate 18, and is edged by two built-up strips 19 and 20. The strip 19 consists of a $12\frac{1}{2}$ " and a 9" Strip 19 overlapped four holes, and strip 20

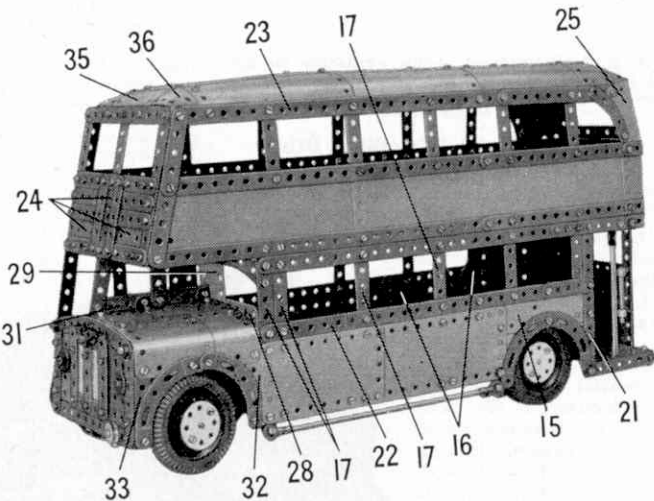
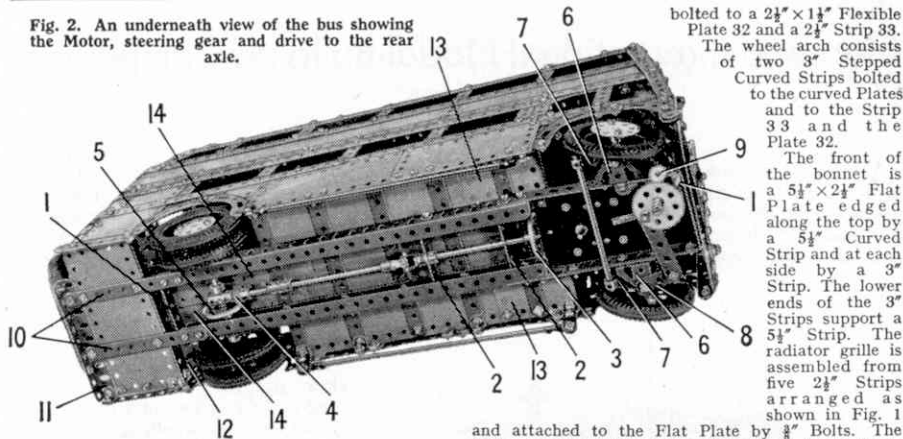


Fig. 1. A fine double-deck bus based on one of the latest types in service in Liverpool.

is made from a $12\frac{1}{2}$ " and a $4\frac{1}{2}$ " Strip overlapped two holes. The side seen in Fig. 1 is similar to the one already described, except that the Plate 18 is replaced by a $5\frac{1}{2}$ " Strip 21 and the strip 19 is replaced by a strip 22 made from a $12\frac{1}{2}$ " and a $2\frac{1}{2}$ " Strip.

The sides of the upper saloon are each made from a $12\frac{1}{2}$ " \times $2\frac{1}{2}$ " and a $9\frac{1}{2}$ " \times $2\frac{1}{2}$ " Strip Plate overlapped six holes and edged by $12\frac{1}{2}$ " and $7\frac{1}{2}$ " Strips, and they are attached to the top ends of the Strips 17. Each side is strengthened on the inside by an $18\frac{1}{2}$ " Angle Girder, and four $5\frac{1}{2}$ " Strips bolted between these Girders support the floor of the upper saloon. The floor consists of two $12\frac{1}{2}$ " \times $2\frac{1}{2}$ " Strip Plates and two $5\frac{1}{2}$ " \times $2\frac{1}{2}$ " Flexible Plates. The upper saloon window frames are $2\frac{1}{2}$ " Strips, and they support a strip 23 on each side, made from a $12\frac{1}{2}$ " and a $5\frac{1}{2}$ " Strip bolted end to end. The front of the upper saloon consists of a series of $5\frac{1}{2}$ ", $2\frac{1}{2}$ " and $1\frac{1}{2}$ " Strips arranged as shown in Fig 1 and backed by three $2\frac{1}{2}$ " \times $1\frac{1}{2}$ " Flexible Plates 24 to represent the number and destination indicators.

Fig. 2. An underneath view of the bus showing the Motor, steering gear and drive to the rear axle.



The front is attached to the sides by Angle Brackets. The rear panelling is made by opening-out slightly seven U-section Curved Plates. Five of these are fixed to the side seen in Fig. 3 and the other two are fixed to the side seen in Fig. 1. Two of the Curved Plates, indicated at 25, are attached at a slight angle and are edged by 2 1/2" Curved Strips.

The Strips edging the sides of the upper and lower saloons are extended by Formed Slotted Strips as shown in Fig. 3. The rear panelling of the top deck is completed by a 3 1/2" x 2 1/2" Flanged Plate 26, a 3 1/2" and a 2 1/2" Strip. The upper rear window consists of two 2 1/2" and two 3 1/2" Strips, the lower of the latter Strips being bolted to a 3 1/2" Strip fixed vertically to the Flanged Plate 26.

The lower rear panelling consists of two 3 1/2" x 2 1/2" Flexible Plates 27, edged by two 3 1/2" and a 5 1/2" Strip. The centre handrail of the door is a 5" Rod held in a Rod and Strip Connector, and the rear handrail is a 2" Rod supported in two Collars screwed on to bolts passed through the panelling.

A 5 1/2" Flat Girder 28 is bolted to Angle Brackets fixed to the sides of the lower saloon and a 2 1/2" x 1 1/2" Flexible Plate 29 is bolted to the Flat Girder and to a Trunnion fixed underneath the floor of the upper saloon. The off-side of the driver's cab (Fig. 3) is made by bolting a 4 1/2" Strip 30 in position. This Strip is fitted at the front with a 2 1/2" Strip, and with a 3" Strip in the next-to-end hole from the rear. The wheel arch is made from two 3" Stepped Curved Strips bolted between the lower ends of the 2 1/2" and 3" Strips and the Strip 30. The rear Curved Strip is connected to the saloon panelling by a Fishplate. The window divisions of this side of the cab are two 3" Strips.

The near side of the driver's cab (Fig. 1) is made by bolting a built-up strip 31 to the Flexible Plate 29. This strip consists of a 2 1/2" x 1 1/2" Double Angle Strip and a 2 1/2" Strip overlapped two holes, and it carries the window divisions, which are represented by a 2 1/2" and a 2" Strip. The top of the bonnet is formed by four 2 1/2" x 2 1/2" Flexible Plates bolted together as shown, and attached to the strip 31 by three Angle Brackets. The outer two Plates are curved to form part of the side of the bonnet, and are

bolted to a 2 1/2" x 1 1/2" Flexible Plate 32 and a 2 1/2" Strip 33. The wheel arch consists of two 3" Stepped Curved Strips bolted to the curved Plates and to the Strip 33 and the Plate 32.

The front of the bonnet is a 5 1/2" x 2 1/2" Flat Plate edged along the top by a 5 1/2" Curved Strip and at each side by a 3" Strip. The lower ends of the 3" Strips support a 1 1/2" Strip. The radiator grille is assembled from five 2 1/2" Strips arranged as shown in Fig. 1

and attached to the Flat Plate by 3/8" Bolts. The Strips are spaced from the Plate by eight 2" Rods, which are held in position by the Strips.

Each side of the roof consists of three 5 1/2" x 2 1/2" Flexible Plates and a 2 1/2" x 1 1/2" Flexible Plate curved as shown and bolted at the centre to a 1 1/2" x 2 1/2" Strip Plate, a 5 1/2" x 2 1/2" Flexible Plate 34 and a 1 1/2" radius Curved Plate 35. Each corner of the roof is filled in by a 2 1/2" x 1 1/2" Flexible Plate 36.

Parts required to build the Double Deck Bus: 10 of No. 1; 1 of No. 1a; 4 of No. 1b; 32 of No. 2; 7 of No. 2a; 7 of No. 3; 11 of No. 4; 35 of No. 5; 1 of No. 6; 6 of No. 6a; 2 of No. 7a; 4 of No. 8; 2 of No. 9; 1 of No. 9a; 2 of No. 10; 2 of No. 11; 26 of No. 12; 4 of No. 12c; 2 of No. 13a; 2 of No. 15; 1 of No. 15a; 3 of No. 15b; 13 of No. 17; 2 of No. 18a; 6 of No. 20a; 1 of No. 23; 4 of No. 24a; 1 of No. 25; 3 of No. 26; 2 of No. 27a; 2 of No. 28; 388 of No. 37a; 350 of No. 37b; 60 of No. 38; 2 of No. 38d; 5 of No. 48a; 1 of No. 53; 12 of No. 59; 2 of No. 63; 1 of No. 70; 1 of No. 89; 8 of No. 89a; 4 of No. 90; 1 of No. 103; 4 of No. 111a; 20 of No. 111c; 4 of No. 126; 1 of No. 140; 6 of No. 142a; 1 of No. 147b; 2 of No. 147c; 1 of No. 185; 14 of No. 188; 4 of No. 189; 5 of No. 190; 2 of No. 190a; 2 of No. 191; 17 of No. 192; 2 of No. 196; 5 of No. 197; 7 of No. 199; 1 of No. 200; 5 of No. 212; 4 of No. 214; 8 of No. 215; 1 E20R Electric Motor.

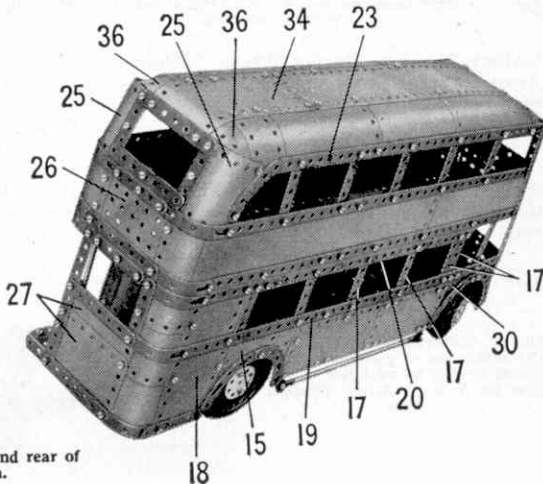


Fig. 3. The panelling of the roof, off side and rear of the bus, is seen in this illustration.

Meccano International Model-Building Competition

By "Spanner"

More Prize-winning Entries

AMONG the many outstandingly good models in this Competition that I have not so far been able to mention is a compactly-built one of a triple-expansion marine steam engine. It was built by

pressure cylinder housing and two flat sided valves, which operate together, control the working of the intermediate cylinder. Another flat-sided valve, arranged on the outside of the low pressure cylinder, completes the valve system. A special reversing cylinder, operating through Stephenson's type reversing gear, is placed between the intermediate and low pressure cylinders at the front of the model. The handwheel controlling the action of the reversing cylinder is fitted low down near the foot of the centre standard.

Other features of the engine include a condenser, oil, air and water circulating pumps, and a ladder from the base to the top of the condenser.

Considerable ingenuity has been displayed in the construction and assembly of these various units, and the completed model is a splendid example of sturdy, neat and realistic workmanship.

Among the many aeroplane models entered in the Competition, is a beautifully streamlined example of a modern delta wing jet fighter-bomber. It is shown in Fig. 2 and was submitted by A. A. C. Brewis, Royton, Lancs.

This competitor calls his model the Brewis "Kestrel," and he has designed it as a two-seater twin-engined machine. It is fitted with clockwork-operated mechanism for lowering and retracting the undercarriage and this is controlled from the cockpit. When retracted each leg of the undercarriage is covered by two doors.

Brewis deserves congratulations for the

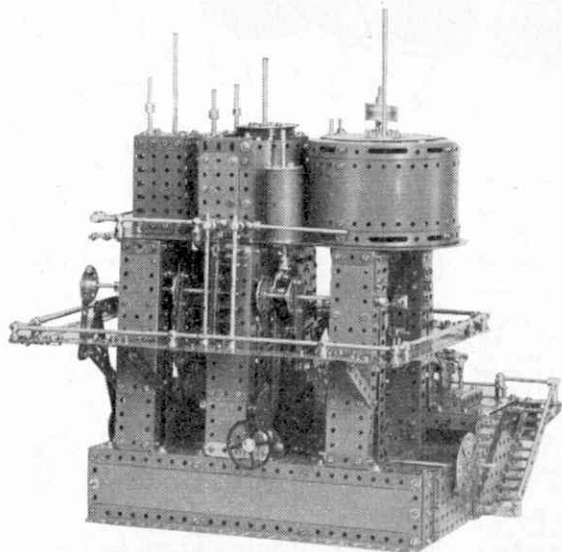


Fig. 1. A triple-expansion marine steam engine built by S. W. Clift, Victoria, Australia.

Sydney W. Clift, Moonee Ponds, Victoria, Australia, and one of the several fine photographs of it that Clift sent in is reproduced in Fig. 1.

The model is based on the engine installed in the S.S. *Iberia*. As its type implies it has three cylinders, high, intermediate and low pressure. A piston-type valve is incorporated in the high

Fig. 2. Streamlining in Meccano. The skilful use of parts in making this delta wing jet aeroplane won a prize for A. A. C. Brewis, Royton, Lancs.



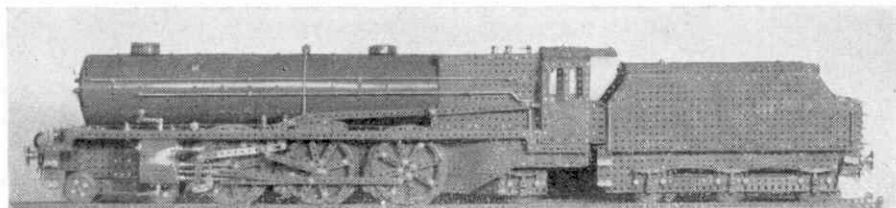


Fig. 3. D. Brawn, Kingsthorpe, Northampton, was awarded a prize in Section C for this detailed model of the 4-6-2-locomotive, "Princess Elizabeth".

realism and smoothness he has achieved in reproducing the highly streamlined shapes involved in modern aircraft design. This is not by any means an easy matter, and on this score alone his model is worthy of the prize it was awarded jointly with a splendid model of a Swedish iron-ore boat, which also formed part of the entry sent by this competitor.

The truth of the claim that Meccano is the finest hobby in the world for young

of the most original models, the walking elephant seen in Fig. 4, for which he was awarded a prize in Section C. Mr. Queseda sent also several other good models.

The body of the elephant is constructed mainly of Strip and Flexible Plates curved to give the required shape, and the legs are made from Flanged Sector Plates and Flat Plates. The upper end of each leg is pivoted to the body, and is connected by a lever to a Pivot Bolt held in a Bush Wheel on a Rod that is mounted across the body. This Rod is driven very slowly by an E20R Electric Motor, through a large speed reduction ratio obtained from an arrangement of Gears and belt drives.

An interesting feature of the animal is that its head is pivoted to the body, and sways realistically up and down when the elephant is set in motion. The swaying movement is obtained through the action of a Strip bolted to the head. The Strip passes inside the body, and its rear end is located between two pins fitted to one of the reduction Gears. As the Gear rotates the pins impart an oscillating movement to the Strip, which moves the head up and down.

The lower end of each leg is fitted with 1" Pulleys with Tyres so that the model travels smoothly along the ground.

Mr. D. Brawn, Kingsthorpe, Northampton, another successful competitor in Section C, was awarded a prize for the fine locomotive and tender seen in Fig. 3. This model is based on the L.M.S. 4-6-2 locomotive No. 6201, *Princess Elizabeth*, and is driven by an E20R Electric Motor housed in the firebox. The driving arrangements include a compact three speed and reverse gear-box connected by levers to a control placed inside the cab. The Walschaerts valve gear also can be controlled from the cab.

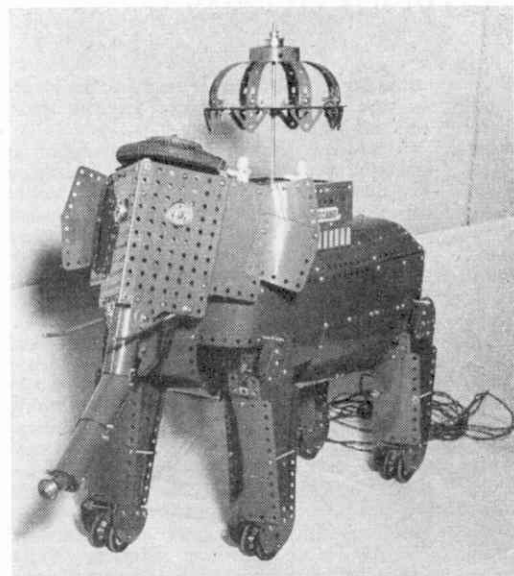
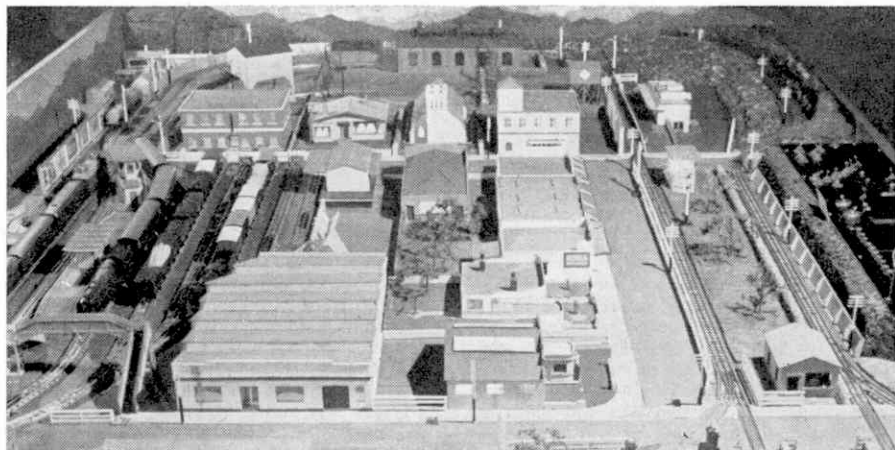


Fig. 4. This walking elephant was one of the most original models entered in the Competition. It was built by the oldest competitor, Mr. V. M. Queseda, Lima, Peru.

and old alike was well illustrated by the entries in the International Model-Building Competition. One of the prize-winners was Mr. V. M. Queseda, Lima, Peru, who was 82 years of age when he sent in his entry. In addition to being the oldest competitor in the Contest, Mr. Queseda designed one



HORNBY RAILWAY COMPANY

By the Secretary

Layout Ideas

THERE is nothing I enjoy more than reading the descriptions of their layouts that Hornby-Dublo enthusiasts send me, and I am always learning something new from them. One of the most interesting things they have shown me is how greatly conditions or circumstances affecting the railway influence the actual form of the layout. This is particularly evident in the layouts seen in the illustrations on these pages. The inspirations of individual owners account for most of the variety that is found in Hornby-Dublo railways as a whole, but their ideas sometimes have to be modified or adapted to suit conditions.

A good example of the type of railway that sets out to serve a miniature community is that shown in the upper illustration on this page. This only shows a section, but an important one, of the 11 ft. by 6 ft. system developed by Mr. W. Jackson, of Cobden, (Greymouth), New Zealand, that was referred to briefly in the *M.M.* last November. The judicious selection and placing of the different buildings, most of them made at home, has resulted in a splendid miniature town, and in this instance the railway has been finely planned to fit. It does not just run around, as is

often the case, but really seems to penetrate to the different districts in the most natural way.

The view shown in the illustration is particularly striking because of the compact arrangement of the goods yard and depot on the left hand side of the picture. Buildings press up to the yard, as they usually do in real life in such busy places, and the whole aspect of the depot, with its strings of wagons being loaded or unloaded, is most convincing.

In the illustration above is a fine concentration of realistic town and railway features on the layout of Mr. W. Jackson, Cobden (Greymouth) N.Z. The goods terminal on the left hand side of the illustration is particularly striking.

The scene does not end merely with the loading platforms and goods warehouse. The township continues across to the railway track and the station that appear towards the upper corner of the layout on the right hand side. Passenger

traffic is dealt with here at a standard Hornby-Dublo Through Station, which fits in well with its immediate surroundings. The system of course is a permanent one, which is of considerable advantage with a layout of this kind.

By way of contrast the layout shown in diagram form is not a permanent one. This has been developed by Brigadier J. D. A. Lamont, D.S.O., M.B.E., Preston, and his son, and it is a very good example of a really workable system. The track is put down on a baseboard at holiday times

and it remains installed until term time comes round again. The track is laid on hardboard sheet and it may interest readers who are contemplating a temporary system to hear that the baseboard is supported on tea chests. It is quite a good scheme to use chests or boxes associated with some particular product, because they are usually uniform in size and so keep the railway nicely level.

There is a main oval track, providing up and down routes in the usual way, but there is also a terminal branch with a station and accommodation for goods traffic, empty coaches and for locomotives.

A particularly interesting point is the inclusion of a feature that is overlooked on many a miniature layout—a shunting neck, or "headshunt" in the diagram, so placed in relation to the other terminal roads that movements along it can be made easily and with plenty of room for the shunting train. Points forming crossovers are strategically placed on the system and in conjunction with the "S" or return loop across the centre of the main oval these allow a train to be run practically from any one point to any other on the system, and back. Two Transformers and Controllers are provided so that independent control on the up and down tracks is afforded, while suitable isolating arrangements make it possible for trains to cross from one track to the other as necessary. Again, a station pilot locomotive can stand isolated in the headshunt while a train arrives at the terminus.

The arriving engine is uncoupled and isolated, then the station pilot can run on to the tail of the train, draw out the "empty" stock and dispose of it.

All points are hand

operated in view of the temporary nature of the layout. Isolating Switches are not banked together at the control centre. Instead, they are placed near to the sections to which they relate. This means a

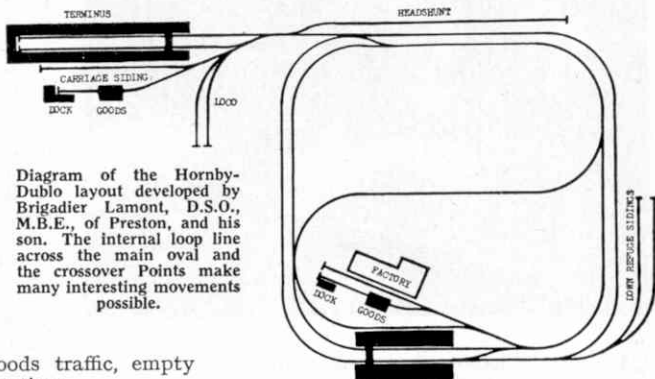
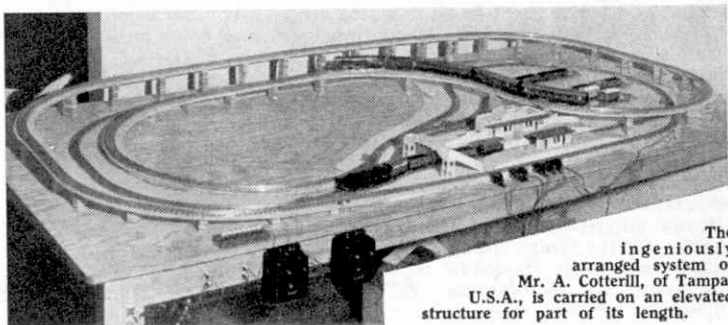


Diagram of the Hornby-Dublo layout developed by Brigadier Lamont, D.S.O., M.B.E., of Preston, and his son. The internal loop line across the main oval and the crossover Points make many interesting movements possible.

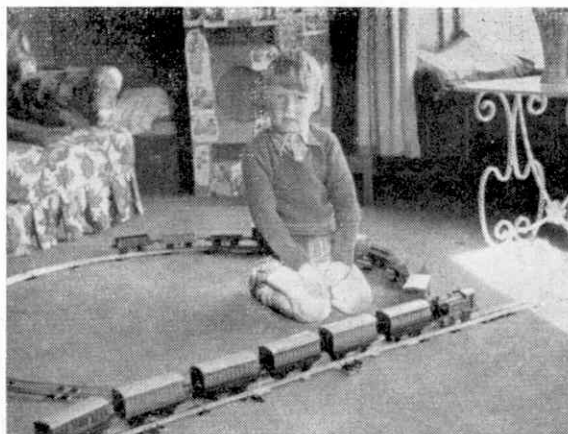
certain amount of moving about on the part of the operators, but this is not a serious disadvantage.

Our third layout comes from the U.S.A., where Mr. Arthur Cotterill, of Tampa, Florida, U.S.A., has built up an ingenious system on a baseboard table. This is a two-level affair as our picture shows, and the tracks wind about in an interesting manner that will be very spectacular when the layout is completed. In its present state the prepared supports and approaches to the high-level track are plainly evident.

It is planned to landscape the layout and provide natural features that will of course hide the constructional work now visible. This part of the job will be managed by Mrs. Cotterill, who is specially skilled for this type of work in view of her former occupation as a terrain modeller for the U.S. Navy.



The ingeniously arranged system of Mr. A. Cotterill, of Tampa, U.S.A., is carried on an elevated structure for part of its length.



Sheldon Brown, of Christchurch, New Zealand, having a happy time with his Hornby Train. The type of layout shown and some possible developments are dealt with on this page.

HERE is a happy picture of a Hornby train owner busy with his railway. The boy enjoying himself is Sheldon Brown, of Christchurch, New Zealand, and he has lots of fun with his trains although the extent of the layouts that he can put down is regulated somewhat by the furniture in the room that he uses.

Space may not allow the development of a very extensive system, but laying down of the railway each time it is wanted has one advantage—

the practice of experimenting with different arrangements of track is encouraged. Exploring the floor space in this pursuit and dodging table legs and similar obstacles provide plenty of fun in the early days of anybody's acquaintance with the model railway hobby, and what Sheldon has made in his efforts of this kind is shown in the diagram below. Now a circular layout is often thought to be monotonous, but it is the simplest form of continuous track that it is possible to put down. It has its limitations of course, but at any rate it provides a compact track that can be regarded as a main line, while Points provide the means of branching off into sidings or terminal roads.

This is exactly the situation in the diagram. Right-Hand and Left-Hand Points adjacent to one another at one point of the ring circuit allow two single tracks to be taken off in opposite directions to one another.

In the diagram one of them is further developed by the addition of another set of Points, which provides a siding, and where the parts are available there is no reason why a similar development should not be included on the other side of the system. The layout provides in effect two terminal sections opposite to one another, but trains running from one to the other also have to make one or more journeys round the circular track.

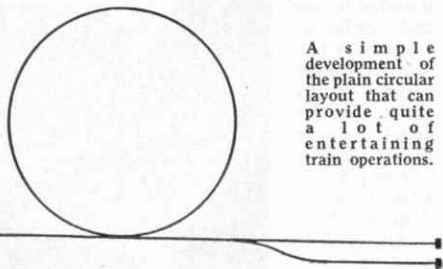
For a one-engine system the layout shown is quite a good one. The circular track always allows the engine to get round its train when required. This will happen, for example, at the end of a journey, when the train runs into any one of the dead-end roads at the bottom of the layout. After disposing of its "passengers" or "goods," the train must be backed out on to the circle. The engine can then

be uncoupled and taken to the other end of the train, which is then pushed into a

terminal road again ready for the next journey.

Passenger and goods trains can be worked in this way and if the two-siding scheme mentioned previously is adopted, and there are two engines, then quite an intensive system of working can be devised. Where space and material permit the layout can be extended to provide further siding accommodation, and possibly a turntable, or a track on which the engines can stand.

Fun on a Ring Railway



A simple development of the plain circular layout that can provide quite a lot of entertaining train operations.



Club and Branch News



WITH THE SECRETARY

CLUB FUNDS FOR OUTINGS

A month hence we shall be at the beginning of the first of this year's Summer Sessions, but planning for this needs to be begun now. From time to time I hear of Clubs that, owing to lack of funds, are not able to take advantage of the long fine summer days to carry out excursions to places of interest, or arrange a summer camp or other holiday activity.

This unfortunate state of affairs can be avoided by a little long-term planning, and it is a very sound idea to have a permanent Outings Fund to which members pay a few pence per week all the year round. By this means there is quite a nice sum in hand by the time the outdoor season comes round again. The Club is then in the happy position of being able to use this fund as occasion demands, instead of having to call upon members for more cash every time that an excursion is planned, or perhaps having to abandon the project altogether.

CLUB NOTES

CRYPT GRAMMAR SCHOOL (GLOUCESTER) M.C.—The subject of a recent monthly Model-building Competition was *Cranes*, and some very good models were entered. A "General" competition the following month was won by a fine model of a tug, a copy of one of the tugs which can be seen chugging up and down the Gloucester and Berkeley Canal. The member concerned had included a wealth of detail, from the collapsible mast to the vessel's name. The subject chosen for the next of these monthly competitions is: *Anything that flies*. Club roll: 44. Secretary: R. J. H. Carter, "Red Roofs," Barnwood Avenue, Gloucester.

COPDOCK AND WASHBROOK M.C.—Club funds have been increased by the sale of calendars made by the Fretwork section and by the proceeds of a Whist Drive. The Model Aeroplane section is making good progress. Club roll: 13. Secretary: K. E. Whitten, The Street, Copdock, nr. Ipswich.

HORNSEA M.C.—Increased membership, improved attendance and general enthusiasm have combined to make meetings very enjoyable and successful. Model-building and games, particularly table tennis, maintain their popularity. Interesting talks have been given by M. Gall, aged 12 years, on his life in Malaya, where his father has a rubber plantation, and by the Club Secretary on Prehistoric Man. Subjects of recent film shows have included Whaling, Nature, and one on how railway signalling is carried out. Club roll: 13. Secretary: D. M. Stevenson, 29 Southgate Gardens, Hornsea, E. Yorks.

LEADGATE AND DISTRICT M.C.—Interesting model-building meetings have been held, at which the members have been mainly occupied in constructing a large

crane. Club roll: 7. Secretary: J. N. Barron, 4 Garden Place, Leadgate, Co. Durham.

MILE END (PORTSMOUTH) M.C.—A General Meeting was held to review the Club's progress during 1953 and to discuss future activities. A member has demonstrated a Meccano Motor Car Chassis, complete with all gears, differential, etc. Other models built have included a Scotch type derrick and a small Meccanograph. Members have been busy preparing for an Open Night. Club roll: 52. Secretary: Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.

AUSTRALIA

FREMANTLE AND DISTRICT M.C.—Models built by the Club and exhibited at the Perth Royal Show included a fine one of an overhead railway, a locomotive, semi-trailer, landing barge, breakdown truck and a racing car. As no power was available the models were worked from batteries, the use of which was kindly donated by a Fremantle firm. The verandah space taken up by the Club display was kindly donated by Millers Timber and Trading Company. Club roll: 15. Secretary: G. Shea, 12 Foss Street, Palmyra, Western Australia.

MAYLANDS M.C.—Outdoor games evenings are popular again with the coming of the warmer weather, and there is a lull in model-building activities. The Christmas party, at which several of the boys' parents provided the eatables and waited at table, was the best ever held by the Club. The evening concluded with games and a film show. An Electrical session, covering a wide range of subjects, is a feature of the 1954 programme. Club roll: 46. Secretary: B. Lee, 16 Kennedy Street, Maylands, Western Australia.

BRANCH NEWS

AVIARY (LEEDS)—An interesting talk entitled *Canadian Journey* has been given by the Chairman, Mr. W. H. Myers, in which he described an imaginary coast-to-coast trip by rail across Canada, based on his actual experiences. Other interesting talks have included one by a Mr. Varley on the working of the telephone, and one by a Mr. Winteringham on the evolution of railways which was illustrated by photographs and drawings. Other programme features have been Meccano model-building and the

construction of cardboard models. Secretary: P. Foster, 3 Aviary Street, Armley, Leeds 12.

KENTISH TOWN (LONDON)—The Christmas party of this recently incorporated Branch was a great success. Plans are in hand for a visit to a local electrical power sub-station. Secretary: S. A. Kirby, 9 Busby Place, Kentish Town, London N.W.5.

We regret that we omitted to state in last month's *M.M.* that the photograph of the Belgrave Union M.C.'s Hornby-Dublo display was reproduced by courtesy of the *Leicester Evening Mail*.



Mr. A. J. Nicholson, President of the Mile End (Portsmouth) M.C. and Chairman of the associated Mile End H.R.C. Branch. Mr. Nicholson was the founder of these twin organisations, and their success is due in large measure to his energy and enterprise.



Ijazul Haque Imami is Secretary of the Oliver Senior Boys M.C. in Lahore, West Pakistan.

Display Schemes and Scenery

HORNBY-DUBLO owners sometimes have their layouts on show in connection with some local exhibition or other function and there is little doubt that the display of a working railway in this way is a joy to all concerned. Sometimes we are asked to give advice on the type of layout that should be employed, and invariably a continuous track of fairly simple type is recommended. Much of course depends on the site and the conditions, as obviously the character of the layout must be governed to some extent by the space available, whether a baseboard with the track ready laid or a temporary table-top is to be used.

Now, why advise using a continuous track? Simply because it allows traffic to be kept moving, which is a definite advantage for exhibition purposes. A simple layout that is well run gives a very much better impression to those who watch it than one on which traffic working is complex and liable to delays. Where shunting operations are carried out, and they can of

to occupy a given number of minutes. It must not be forgotten that the operator is liable to be interrupted by enthusiastic remarks or questions.

It is worth noting that even large layouts at trade and similar exhibitions are basically simple, even though their extent may cause them to appear complicated to the onlooker. Not all those who see an exhibition layout are miniature railway or even railway enthusiasts, but they can follow operations more easily and are more liable to become enthusiasts themselves if what they see is reasonably simple.

A splendid example of an exhibition layout of simple character, although undoubtedly effective, is shown in the illustration here where Mr. W. R. G. Russell, of Didcot, is working a Hornby-Dublo railway that he arranged recently for a local function. This has continuous main tracks

Mr. W. R. G. Russell, of Didcot, operating the Hornby-Dublo layout that he arranged for display purposes. In addition to the railway, realistic scenic detail is incorporated. Photograph by Studio Atlanta, Didcot.

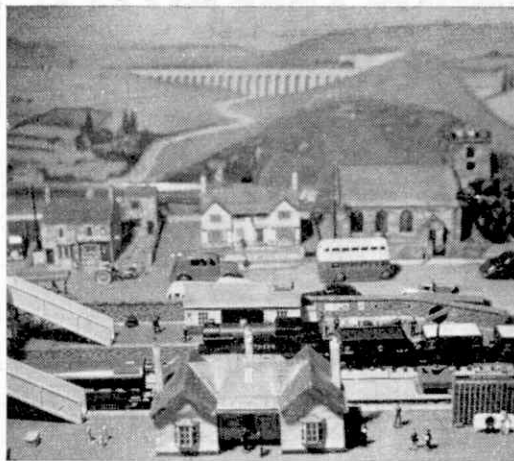


course be very fascinating, it is a good scheme not to have too many vehicles involved as this tends to make the operation become tedious.

If a definite cycle of working is adopted things are made more easy for the operator, but of course variations can be planned in order to provide some variety. An important thing to remember is that each particular performance should finish with the engines and rolling stock ready to begin the next cycle. As a rule it is wise not to attempt timetable working and in any case a continuous layout does not really lend itself successfully to this sort of thing. Trains can be run at regular intervals and a particular cycle or episode can be timed

so that one train at least can be kept on the run while more detailed operations including shunting and uncoupling are carried out with another. Particular care was taken not to run the trains or to carry out movements at excessive speed. Starting and stopping were carried out gently and a very realistic impression was thus given.

This is a point sometimes missed by younger operators. Hornby-Dublo engines are perfectly controllable and the skill required for perfect operation is soon attained. There is no need for an engine



that is backing on to its train to run into it violently. An easy approach that results in the couplings engaging without moving the train is very much better. This applies to goods train operations, including shunting, as well. On the other hand it is necessary to move the wagons along smartly up to the point of uncoupling and then to check the engine quickly so that vehicles detached run along a siding for a little distance, but this is usual of course in real "fly-shunting." The reversing of an engine that is shunting should not be too rapid; in real practice this is quite a deliberate business.

On Mr. Russell's layout some attention was devoted to lineside affairs with considerable success, as the illustration clearly shows. Wisely, no attempt at scenic detail was made on the outer side of the track as this can sometimes interfere with the view of the trains in motion. A certain amount of restraint is necessary when scenic detail is attempted, whether a layout is a temporary one for exhibition purposes or a permanent installation at home. It is possible to overdo things, especially in the matter of detail, and then the realistic impression that is aimed at can be missed.

A nice balance between actual lineside details and scenic background features is

The illustrations on this page show parts of the well-developed scenic Hornby-Dublo railway of Mr. K. W. J. Austin, of Taunton. Apart from actual lineside features the background scenery is most effective, as these pictures show.

characteristic of the two illustrations on this page. These show part of the system of K. W. J. Austin, of Taunton, which has been referred to previously in the *M.M.* The railway itself is not elaborate in its track plan, but like all good railways the operations that it makes possible provide for the ready movement of traffic, both passenger and goods. Similarly, shunting movements involved in the making up and despatch of trains and in their subsequent disposal are easily made.

The immediate lineside buildings fit in well with the general scheme and the opportunity has not been neglected of introducing numerous Hornby-Dublo and other miniature figures on the platforms and elsewhere. Quite frequently, although most layouts give some attention to Dinky Toys road traffic, the "human" element is apt to be neglected. After all, if there are no people there is no need for the railway, the motors or even the town that they serve!

There is no hint of crowding together in the various features that go to make up the layout and the scenic background provides the final touch to the whole scheme. It

gives a splendid effect of distance, and it is difficult for the observer to tell where the actual modelling ends and the background begins. This is an ideal that is constantly sought, but it is not always realised so successfully.



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Stamp Collectors' Corner

By F. E. Metcalfe

SUNNY BERMUDA

IT is hard to believe that while we shiver through the winter months, only a few hours away, by B.O.A.C., lie the sunny isles of Bermuda. There such an interesting set of stamps has recently been issued that in spite of so many other new stamps coming out in these days, we really must give it full attention. As I have not dealt with this colony's stamps before, now is a good time to do so.



When dealing with the philatelic side of a country, I always try to avoid cramming in more history than is necessary. But if a collector

is going to get things in proper perspective, and write up his collection as it should be done, then a few facts must be given. Quite apart from the writing-up angle, it is only by knowing something about the country itself that one can understand what some of the designs of the latest set are about. So here goes for a very few facts and figures.

Juan de Bermudez, a Spanish sailor, is said to have been the first European to discover the Bermuda Islands. Admiral George Somers' ship *The Sea Venture* was shipwrecked off one of the islands in 1609, and in that modest fashion of ours we ignored all that had happened before, and named the group Somers' Islands. Three years afterwards the Virginia Company was given control, and a party headed by one Henry More took over. Since then there have been great changes, and today Bermuda has a great floating-dock and is a very important base for Great Britain. The climate is delightful, but one snag is a lack of a plentiful fresh water supply, but as these lines are being written, just as when they are being read, what would we all not give to be bathing in that very plentiful supply of salt water?

Bermuda has had a very long spell as a country

with its own postage stamps, actually more than 100 years. In 1848 Mr. W. B. Perot, the postmaster at Hamilton, prepared some circular stickers, and what these were like can



be seen in the centre of the design on the 1d. stamp which is being illustrated. Incidentally on 11th April 1949 the centenary of these "Perots" was commemorated by three stamps, and so popular were they that many were bought, and it is still possible to buy a set for about 1/6. In 1865 we got the first set for Bermuda printed in England, by Messrs. De La Rue; the values were from 1d. to 1/-, and while a pound or two will buy all the normal stamps,



there is an imperforate 1d. value which is catalogued by Gibbons at £17.5 mint and £100 used. While copies do not bring as much as that actually we'll still

have to go without one!

We need not worry too much about that however, for these first Queen's Heads are a dull lot. It is when you examine these, and many other of the older stamps, that you see how silly are the comments of those who crack up the old issues on every occasion and at the same time criticise modern pictorials, which are often so much more beautiful.

These dull Queen's Heads continued on sale until the turn of the century, but in 1902 a short set was issued, depicting the floating dock, just installed, to which I have already referred. The stamps were still typographed, but in 1910 Bermuda got its first line engraved set. Somers' ship was depicted, and though the stamps were still small, they were quite attractive. In 1918 high face values from 2/- to £1 made their appearance. These are known as the head type, and bear the portrait of King George V. During the first World War however, 1d. stamps were overprinted War Tax, but so many were used that they still bring only coppers.

In 1920 Bermuda had its first commemorative set. The actual governor was the designer, and the object was to commemorate the "Tercentenary of Establishment of Representative Institutions."

Believe it or not, all that long title is to be found on the stamps themselves; as a set costs about a couple of pounds, maybe some will have to take my word for it.



Bermuda got its first pictorial set in 1936, and three values remained on sale until withdrawn on 7th November 1953. King George VI's reign was heralded by a pictorial set of 1/-, designs adapted from the previous set, of large head type stamps from 2/- to £1, and no set in the whole catalogue has provided more material for philatelic students than these KG VI "Head Type". Even yet collectors have still something to learn about them. And my, some of them cost a lot of money too. For instance, first printings of the 10/- and £1 values would knock one back about £20 to buy. A pale yellow shade of the 12/6 value appeared in 1947 and this costs about £8 a copy.

Another rare stamp is the 2/6 perforated 14½. Gibbons do not list this variety, but it is in the Commonwealth Catalogue and brings about £15. Just that ½ in the perforation makes all that difference; there are other values in the same perforation and these also make a big premium over normally perforated stamps. All that is proof, if proof were needed, that collectors do consider of importance the question of stamps differing a ½ in perforation, and shows how wrong those who took the other view were. Moral—carefully study your stamps. You may be lucky and find one in your collection.

In 1940 a shortage of ½d. stamps for Christmas cards led to the surcharging (Continued on page 154)

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Stamp Gossip

SHIPS! SHIPS!

LET me admit it, I do like a good picture of a ship on a stamp, so all those pages of ship stamps on view at the London Exhibition were given much more attention than those so-called classics which are supposed to be worth so much more. And isn't this Peruvian effort a beauty? Better still, a copy can be bought for something near a shilling.

The 500th anniversary of the birth of the great queen Isabel produced a number of commemorative sets of stamps for various countries, and among them were some very interesting stamps. But who can resist this picture of three of Columbus' ships, the *Santa Maria*, *La Pinta* and *La Nina*. Those were the days when ships were worth looking at, and as far as I am concerned you can have all your big liners!



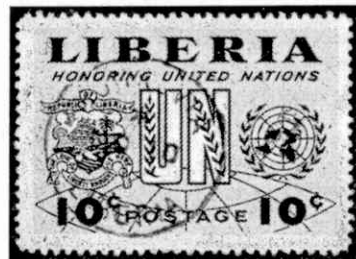
LIBERIA

The ancestors of the inhabitants of the "Black Republic" knew what it was to be oppressed. Small wonder then that they take such a lively interest in the doings of the United Nations that they should issue a set of three stamps in honour of that institution. All kinds of good works are being carried out by the United Nations in many fields of endeavour and Liberians will know all about that angle.

These Liberian stamps are very attractive, but the post office of that country has a distressing habit of letting its stamps out at a low price, cancelled to order, when they go obsolete; so don't pay mint current prices whatever you do, but wait for the used.

DESIGNS

Last month I told you which I considered the



best foreign stamp issued during 1953, and promised to name my choice for the Commonwealth. This isn't easy, while the field of selection is not so extensive, there were none particularly outstanding. In the end I thought it a tie between the 1/6 Coronation stamp of New Zealand and the new 6d. stamp of Bermuda, the one that has been also overprinted for the Three Powers Talk.

Mind, our own 4d. stamp is a real little beauty. Here we get a simple and effective design in a really beautiful colour, and while I have had some sharp things to say about our commemoratives, I really do think our ordinary set makes a lovely page. From a technical point of view no stamps printed are superior.



THOSE ROYAL VISIT STAMPS

These are of course very popular now, and because those issued for the big trip of the Queen and the Duke of Edinburgh are only on sale for a short time some think that they are likely to be very scarce. Don't worry, there are plenty about. For instance, all orders for the Jamaica stamp were cut by the Crown Agents, but some of the larger buyers had anticipated something of the sort, and ordered more than they even wanted. A set is well worth having, and it is a good job that there are enough to go round.

NOT ONIONS!

Some time ago, a reader wrote to say that while I referred to all kinds of countries, I never mentioned Greece, though this country is producing many really nice stamps. To this I would like to add that it is not only true that Greece is issuing attractive stamps, but they are easily obtainable and cheap, and in a used form are



certainly worth our attention. But I have referred to them previously, if some time ago, and maybe in the near future I'll have more to say. In the meanwhile one belonging to a set issued last July to give publicity to national products is now illustrated.

When I was in a stamp shop the other day, a youngster came in and asked to be shown a sheet of stamps from the window. Pointing a rather grubby finger to one of the stamps stuck on the sheet, he asked if he might be given that one showing the basket of onions! I am sure that M.M. readers will all know what that basket does contain.

OVERPRINTED STAMPS

After the war current stamps of our country were overprinted for places like Eritrea, Tripolitania, etc., and now all of them are obsolete. The Commonwealth Catalogue gives figures of numbers sold, obtained from official sources, and these show how awfully scarce a number of these stamps are. Sets to 1/- will surely be within your pocket, as the stamps are priced at the moment; but take a tip—buy now!

And here is another tip. Make sure that you have your Coronation set of New Zealand used, particularly the low values.

Liverpool's Bus System—*(Continued from page 110)*

every year since its formation. A Welfare Section combines the official tasks of licences, staff records, wages and recruitment with the social services of feeding, education, advice in domestic and personal problems, and recreation, though most of the latter is the special care of the employees' own Social and Athletic Society, actively aided by the Department, which maintains, with a membership of 83 per cent. of the total staff, facilities at depots and the largest sports ground in the North of England.

Perhaps we may close with some facts and figures concerning this vigorous trading undertaking. Every weekday a fleet of 1,100 vehicles runs 107,000 miles, covering 224 miles of routes, and serving an area of 77 square miles. Besides giving free travel to many thousands of blind people, disabled ex-Servicemen and civilians, and old-age pensioners, it carries daily more than a million passengers. Of these 350,000 are industrial workers at 2,000 factories and 54 docks. The rest are a medley of schoolchildren, breadwinners, housewives and holidaymakers, forming in fact a cross-section of human society. The huge wheel of transport rotates to the thrust of 7,000 staff—drivers, conductors and conductresses, and men of more than sixty skilled trades, from crane drivers to cooks. It is indeed the driving wheel in the machinery of Liverpool's industry and commerce.

The information in this article and three of our four illustrations we owe to the courtesy of Mr. W. M. Hall, B.Sc., M.I.Mech.E., General Manager, Liverpool Corporation Transport. The lower photograph on page 109 is reproduced by permission of Leyland Motors Ltd. For the photograph on which our cover is based we are indebted to A.C.V. Ltd.

Through the Pennines on a Scot—*(Continued from page 127)*

motion eased out into full gear for us to drift smartly down to Farnley Junction and engine depot, and into the smoky, industrial atmosphere of Leeds. Our approach lay over a long curved viaduct and with Holbeck Motive Power Depot spread out below, we curved sharply round to the left and then again to the right, with our flanges squealing at the sharpness of the approach.

Former L.N.E.R. Pacific No. 60074 *Harvester* was waiting to back on to our tail as we came into Leeds (City) Station as the train reverses here and goes out via Holbeck for Harrogate, Ripon and the North East. We were nicely on time and here I was sorry to leave my footplate friends, experts both, to take their engine out to the turntable and wait for their return trip to Merseyside.

The First Fifty Thousand—*(Continued from page 136)*

deadly, supersonic efficiency. Wing sweep has been increased from 35 to 45 degrees. The wing section is even thinner. Its bulky fuselage houses one of the new Pratt and Whitney J-57 turbojets, offering 10,000 lb. of thrust even without the afterburner, and sufficient fuel for more than 1,000 miles of flying. As for speed—the fact that it is officially the world's fastest aeroplane, with a recorded speed of 754.98 m.p.h. over a 15 km. course, speaks for itself.

We shall hear a lot more about the F-100 in the next few years, and have every reason to be glad that it is "on our side." Together with our British Hunter and Swift, it should do much to ensure continued British-American supremacy in the sky.

Those are some of the highlights of the North American story; but there would be much more to tell if I had the space. No mention has been made of the 139 Tornado four-jet bombers, some of which served in Korea; the rocket-armed F-86D Sabre with a radar "nose," which can hunt out and destroy enemy bombers almost automatically in any weather or at night; the Savage, first naval aircraft designed to carry an atomic bomb; the superb T-28, which

has succeeded the Harvard as standard trainer with the U.S.A.F. and U.S. Navy; or the first products of the Company's 4,000-strong guided weapon design-engineering staff, which have left little doubt that North American intend to maintain their tradition of leadership in America when even the F-100 has to give way to pilotless, "push-button" weapons.

Among the Model-Builders—*(Cont. from page 139)*

fitted with a $\frac{1}{2}$ " Contrate 6 that is in constant mesh with the $\frac{1}{4}$ " Pinion.

The intermittent drive is operated by a 57-tooth Gear driven by the Worm 2. This Gear is fixed on a Rod mounted in Trunnions as shown, and fitted with a Bush Wheel 7. A Fishplate is bolted at an angle to the Bush Wheel to make a simple cam.

A Rod 8 is supported in the Flat Plates and carries at one end a Double Arm Crank 9 and at the other end a Coupling that holds a Rod 10. A $\frac{1}{2}$ " Bolt in the Double Arm Crank engages the groove in the Socket Coupling of the sliding unit 5. The position of the Coupling is adjusted so that with the clutch unit engaged the Rod 10 bears lightly against the edge of the Bush Wheel. As the Bush Wheel rotates the Fishplate bolted to it depresses the Rod 10, and the action of the Double Arm Crank 9 forces the Rubber Ring away from the Bush Wheel 4 to disengage the drive.

Stamp Collectors' Corner—*(Cont. from page 151)*

of current 1d. stamps. This brings us to the new set, and a real beauty it is, both in colours and in diversity of designs. The date of issue was 9th November, 1953.

With so many stamps coming out that are beautiful, and with pocket money so tight, I feel it is better to refer to cheap stamps rather than to a lot of rarities, which are quite beyond us. Now this new Bermuda set goes up to a top face value of £1, but even if we have only a shilling or two to spare we can take up to the 1/- value, and still have a very attractive set. Better still, if all we have to spare is a single shilling, we can obtain all the stamps illustrated, which is the reason why I am asking the Editor to let us stick to low face value stamps on this occasion. Of course if you do happen to be flush, and can go the whole hog, be sure that your cash will not be wasted, for these colonial mint sets always have a good resale value. That is if you have taken care to mount them properly—so many ignore this very important factor—and have kept them clean.

This Q.E. set was not the end of Bermuda's philatelic adventures, for on 8th December last the 3d. and 1/3 values of the new set were overprinted to commemorate the meeting in Hamilton of what are called the Big Three. Only on sale in the colony, it was feared that it might have been difficult to obtain supplies, but apparently quite a few stamps were overprinted, and this pair nicely rounds off our philatelic jaunt to Sunny Bermuda.

THIS MONTH'S SPECIAL ARTICLES

	Page
Liverpool's Bus System	108
Survey Ship "Vigilant"	111
Mersey Views	114
A Railway Photographic Record by P. S. Wilson	117
The St. Lawrence Seaway by W. H. Owens	122
Through the Pennines on a Scot by "North Western"	125
B.R. 2-10-0 Locomotives	130
The First Fifty Thousand by John W. R. Taylor	134

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

THE WESTBURY WHITE HORSE

I was interested to read the article on White Horses by Reece Winstone, which appeared in the December 1953 issue. During the summer of 1953 I climbed up to the Westbury White Horse in Wiltshire and it was only then that its enormous size really impressed me. My photograph shows the eye of the animal, and its dimensions can be realised by comparison with the lady behind.

This particular horse has been scheduled as an ancient monument, and is therefore now preserved by the Ministry of Works. The flat stones and cement shown in the photograph prevent the soil and the grass from creeping on to the horse and consequently greatly facilitate the grooming of the animal. The ground above the horse is covered with wire-netting, which helps to bind the thin layer of loose soil and turf on the hillside over the horse.

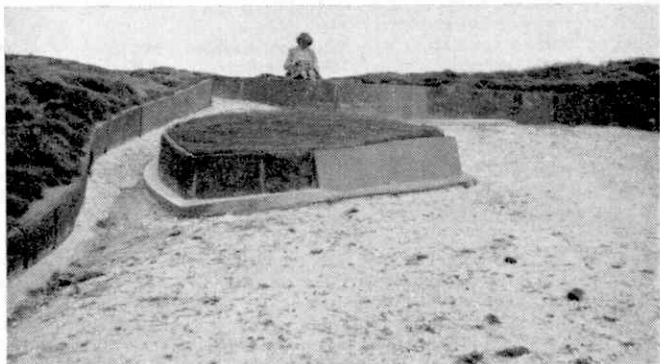
During a fall of rain the large area of the horse receives quite a large volume of water, which runs down the legs and tail of the animal. This water is now carried away by means of little grates and drain pipes situated in each hoof and at the tip of the tail and also at the nose. These and other steps that are to be taken will help to maintain the correct appearance of the Horse.

J. C. D. SMITH (Bristol 6).

PRESERVING AN ANCIENT MONUMENT

May I add a little to the information in the article on White Horses by Reece Winstone, in the December *M.M.*?

Chalk is soft, and hence is easily eroded. Rain scours away much of the surface of these hill figures, and their



The giant eye of the Westbury White Horse. Photograph by J. C. D. Smith.

outlines become ragged, a process aided by the encroachment of surrounding vegetation. In an attempt to make permanent these unusual and attractive objects in our chalk downlands, the Ministry of Works, under whose care as ancient monuments these figures are placed, have been carrying out resurfacing experiments at Uffington in Berkshire, and more recently at Bratton, near Westbury, in Wiltshire.

I visited the Westbury figure in September 1953, and found the horse's tail being excavated to a depth of about a foot, and replaced by a special concrete mixture of cement, chalk, and gravel. This sets very quickly, and dries out a really vivid white. The work took four men 10 days to complete. More than seven tons of cement alone were used, and all the gear had to be carted to the top of the downs, 700 feet high.

Only the tail has been thus treated yet. If it weathers the winter rains and March winds, the remainder of the animal will be similarly treated. That will undoubtedly be an immense undertaking, which should eventually give the Westbury White Horse a permanently well-groomed appearance. Well-drained extremities will help in maintaining this, and new drains will be made for this purpose.

GEOFFREY N. WRIGHT
(Limpey Stoke).



Replacing the tail of the Westbury White Horse by a mixture of cement, chalk and gravel. Photograph by Geoffrey N. Wright, Limpey Stoke.

Competitions! Open To All Readers

Prize-winning entries in M.M. competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.

A Price Code Contest

Most readers, when walking round a department store, or large shop, will have noticed that the neat little price tickets attached to articles displayed for sale carry letters instead of figures. These letters are taken from a price code based on some easily memorised word or phrase consisting of 10 different letters, which represent the numbers one to nine and the cipher 0. The assistants are familiar with the code, and can quickly read off the letters as figures. For instance, the code word might be *Regulation*. In this the letter R would represent the figure 1, E would represent 2, and so on; and an article priced at 10/6 would be marked RN/A.

Readers are invited to imagine that they are visiting a store where this system is in use, and where the 10 articles listed in the panel on this page are marked with the code prices shown here. The articles are all familiar, and their nature provides clues to the scales of prices involved.

Television Receiver	MC/R/-
Radio Receiver	EH/-/-
Mouth Organ	CD/S
Refrigerator	OF/E/-
Bookcase	CL/CD/-
Lawn Mower	E/M/O
Electric Torch	L/F
Bicycle	CM/CF/S
Bicycle Lamp	M/R
Model Yacht	EM/-

Readers are invited to study the code prices of the articles and to give the actual figures. When this is done it will be found that the code word used is the name of an important British town.

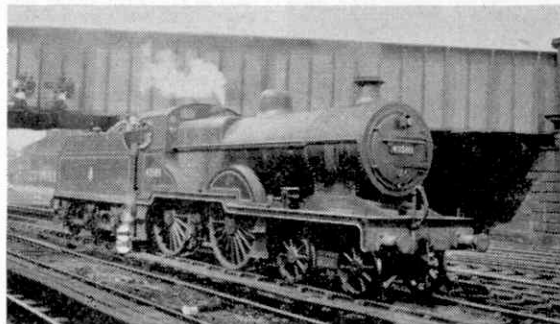
There will be the usual two sections in this contest for Home and Overseas readers respectively, and in each prizes of 21/-, 15/- and 10/6 will be awarded to the senders of the nearest solutions in order of merit, and there will be consolation prizes for the next best entries. In the event of a tie for any of the prizes, the judges will give preference to those entries displaying the neatest or most novel presentation.

Entries must have the full name, address and age of the competitor written on the back, and should be addressed *Price Code Contest, Meccano Magazine, Binns Road, Liverpool 13*. Closing dates: Home Section, 30th April; Overseas Section, 31st July.

Railway Photographic Contest

The photography of railway subjects is good fun, and this month we give readers a chance to win some pocket money by sending us any photograph of a locomotive,

train, or of any subject of railway interest. Each competitor may submit only one photograph, which must have been taken by himself, and on the back of his print must be stated his address, age and exactly what the photograph represents.



This typical reader's photograph, showing L.M.R. 4-4-0 No. 40589 at Chester, was taken by G. Rose, Liverpool.

The contest will be in two sections, A for readers aged 16 and over, and B for those under 16. Each competitor must state in which section his photograph is entered. There will be separate overseas sections, and in each section prizes of 21/-, 15/- and 10/6 will be awarded. Entries should be addressed *Railway Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13*. Closing dates: Home Section, 31st March; Overseas Section, 30th June.

(See paragraph at the top of this page regarding the return of photographs.)

Competition Results and Solutions

HOME

OCTOBER 1953 LOCOMOTIVE CONTEST

1st Prize: A. Ogborn, Sutton Coldfield. 2nd Prize: G. J. Brannan, London E.7. 3rd Prize: G. Rawling, Blackpool. Consolation Prizes: A. Barnes, Southsea; P. Hallam, Rossendale; J. Howard, Langley; R. Taylor, Grays; D. J. Maidment, East Molesey.

OCTOBER 1953 SHIP DRAWING CONTEST

1st Prize, Section A: E. G. Burrows, Alverstoke; Section B: C. P. Runeckles, Worcester Park. 2nd Prize, Section A: A. F. Stevens, Laleham; Section B: I. Heath, Devizes. 3rd Prize, Section A: C. Roberts, Worsley; Section B: P. J. Lilley, Birmingham 27. Consolation Prizes: B. S. Ireland, Gosport; W. M. Vincent, Ilford; C. Nixon, Carlisle; D. Pendleton, Liverpool 20; P. G. Ellam, Dewsbury.

OCTOBER 1953 PHOTOGRAPHIC CONTEST

1st Prize, Section A: S. Charlesworth, Nelson; Section B: J. R. Hampton, Holt. 2nd Prize, Section A: J. H. Smith, Compton; Section B: M. Hinitt, Elstree. 3rd Prize, Section A: H. E. Brimer, Orpington; Section B: M. Johns, Kelham. Consolation Prizes: R. Campbell, Stourton; R. Young, Liverpool 19; A. J. Potten, Ash Green; P. Gannaway, Lynton; C. Wilde, Denton; A. N. Doerr, Westcliff-on-Sea; J. Bursell, Cottingham.

NOVEMBER 1953 RAILWAY PAINTING CONTEST

1st Prize, Section A: I. G. Trainer, Liverpool 10; Section B: D. Lawer, Exeter. 2nd Prize, Section A: A. J. Stroud, Silchester; Section B: A. Heath, Liverpool 23. 3rd Prize, Section A: R. Wood, Shafton; Section B: D. A. Hampson, Fenny Compton. Consolation Prizes: C. J. Lamb, Stainland; B. Chapman, London E.11; J. Calver, Newcastle-on-Tyne 4.

NOVEMBER 1953 CROSSWORD PUZZLE

1st Prize: A. B. Partridge, Northampton. 2nd Prize: R. Driver, Wolsingham. 3rd Prize: W. P. T. Smith, Newcastle-on-Tyne 3. Consolation Prizes: S. Studley, Kinghorn; R. L. Howard, Tolworth; A. V. Rodgers, Uxbridge; H. E. Travis, Sheffield 10.

OVERSEAS

JULY 1953 CROSSWORD PUZZLE

1st Prize: P. R. L. Goddard, Brighton, S. Australia. 2nd Prize: M. C. H. Palmer, Matale, Ceylon. 3rd Prize: M. A. J. Stevens, Invercargill, N.Z. Consolation Prizes: W. McCarroll, Lower Hutt, N.Z.; M. T. Scroll, Durban, S. Africa.

JULY 1953 HISTORIC LOCOMOTIVE CONTEST

1st Prize: K. W. Turton, East Malvern, S.E.5, Australia. 2nd Prize: R. Neal, London, Ontario, Canada. 3rd Prize: J. R. Gleave, Christchurch, N.W.2, N.Z. Consolation Prizes: M. J. Stapp, Port Elizabeth, S. Africa; T. W. Smith, Dublin, Eire.

JULY 1953 PHOTOGRAPHIC CONTEST

1st Prize, Section A: P. E. Nelson, Edmonton, Canada; Section B: L. Eden, Nicosia, Cyprus. 2nd Prize, Section A: M. Nicholls, Madras, India; Section B: J. Kershaw, Chingola, N. Rhodesia. 3rd Prize, Section A: C. H. Veiriere, Stockholm, Sweden; Section B: G. Lawson,

Ohio, U.S.A. Consolation Prizes: F. D. Aria, Bombay 8, India; A. G. Dehled, Nigel, S. Africa; G. Martin, Dublin, Eire; J. Kit, Canberra, Australia; V. R. Vaghjee, Port Louis, Mauritius; D. Innes, Christchurch, N.Z.; A. Bone, Hawke's Bay, N.Z.

AUGUST 1953 HOLIDAY DRAWING CONTEST

1st Prize, Section A: R. B. Adams, Perth, Australia; Section B: C. Trapper, Montreal, Canada. 2nd Prize, Section A: L. W. Outram, Madras, India; Section B: V. P. Hewitt, Freetown, W. Africa. 3rd Prize, Section A: T. Bollinger, Ohio, U.S.A.; Section B: A. D. Adroit, Buenos Aires, Argentina. Consolation Prizes: I. Wylie, Ohiro Bay, N.Z.; V. E. Spratt, Colombo, Ceylon.

SOLUTIONS

JULY 1953 CROSSWORD COMPETITION

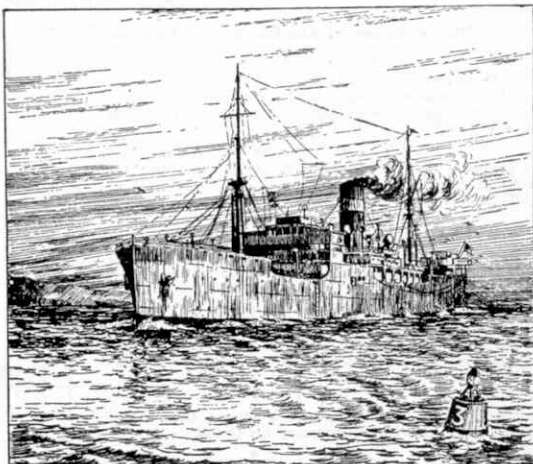
Across 1. Bramble. 5. Fig. 7. Aria. 8. Succumb. 11. Urn. 12. Uno. 13. Against. 15. Press. 17. Canberra. 21. Locum. 22. Firefly. 24. Eel. 25. Man. 26. Yorkist. 29. Evil. 30. Say. 31. Jollity. Down: 1. Bus. 2. Arc. 3. Bruin. 4. Trooper. 5. Paupers. 6. Genesis. 9. Urge. 10. Butterfly. 14. Ida. 16. Columns. 17. Cockney. 18. Nemesia. 19. Ace. 20. Alas. 23. Rural. 27. ICI. 28. Tay.

JULY 1953 LOCOMOTIVE CONTEST

1. Locomotion. 2. Rocket. 3. Josephine. 4. Henry Oakley. 5. Columbine. 6. Lion. 7. Hardwicke. 8. Gladstone. 9. Le Continent. 10. Pioneer. 11. City of Truro. 12. Thatcher Perkins.

AUGUST 1953 LOCOMOTIVE CONTEST

1. Smokebox door handles. 2. Smoke deflector plate. 3. Top feed clack valve. 4. Ross 'pop' safety valve. 5. Regulator operating rod. 6. Windshield. 7. Tender ladder. 8. Vacuum brake hose connection. 9. 'S.C.' plate. 10. Drain cock pipes. 11. Lubricator driving rod. 12. Balance weight. 13. Coupling rod. 14. Reversing rod. 15. Tank sump.



This fine pen sketch, "S.S. Seamist," by E. G. Burrows, Alverstoke, aged 25, was awarded 1st prize in Section A of the October 1953 Ship Drawing Contest.

Fireside Fun

Big Game Hunter: "I had lost my gun and the lion was coming straight at me, so I sat down and just stared at him. He didn't even touch me."

Bored Listener: "Strange, how do you explain that?"

Hunter: "I was sitting on a high branch of a tall tree."

"It's good of you, doctor, to have come so far to see my husband."

"Not at all, madam, not at all; I have a patient next door; so I thought I'd just kill two birds with one stone."



"If you ask me its a barefaced crib from Dinky Toys!"

"Where did you learn to sing?"

"In a correspondence school."

"Well, some of your lessons must have been lost in the post."

Teacher: "How old would a person be who was born in 1920?"

Tommy: "Man or Woman?"

Teacher: "How is it you cannot answer any of my questions?"

Pupil: "Well, if I could, what would be the use of my coming here?"

Teacher: "Johnny Jones, spell 'weather.'"

Johnny: "W.e.t.t.h.u.r."

Teacher: "Well, that's the worst spell of weather we've had for a long time."

Definition: Nail—A small piece of iron that a man uses to aim at while hammering his thumb.

Diner: "This steak is like the weather this evening; rather raw."

Restaurant Manager: "Yes? Well, your bill is like the weather too; extremely unsettled."

Tourist: "Good river for fish?"

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

Jimmy: "Father, are caterpillars good to eat?"

Father: "Don't talk about such things at the dinner table. We'll discuss it later."

Jimmy: (A short time later) "Never mind, father. That caterpillar was on your salad, but he's all gone now."

After listening patiently to the first part of the orchestral concert, the little boy asked his father a question.

"What's that book the conductor is reading?"

"That's the score."

"Is it? Who's winning?"

Guide: "There's a leopard! Shoot him on the spot!"

Hunter: "Which spot?"

Jack: "Did you hear the one about the bed?"

Mack: "No."

Jack: "No wonder, it hasn't been made up yet."

Little Boy: "Mother, our new neighbour talked to me."

Mother: "What did he say?"

Little Boy: "Get off my grass before I throw you off."

Lift Girl: "Here's the 5th floor, sonny."

Boy: "O.K., but don't call me sonny. You're not my mother."

Lift Girl: "I brought you up didn't I?"

BRAIN TEASERS

NOT SO HARD AS IT LOOKS

Can you arrange in succession the numbers 1 to 9 so that they equal 100? S.W.C.

BUT THIS LOOKS LONG

Can you find an English word of 28 letters?

CAN YOU IDENTIFY THESE CHARACTERS?

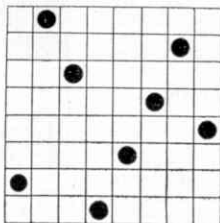
Can you find the names of six famous characters who can be identified from the following features:

1. A cigar. 2. A scented orange. 3. A lamp. 4. A cherry tree. 5. A spider. 6. A falling apple.

SOLUTIONS TO LAST MONTH'S PUZZLES

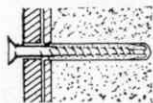
The solution to the puzzle concerning the bank clerk is as follows: the numbers of bank notes in the 10 separate bundles were respectively 1, 2, 4, 8, 16, 32, 63, 127, 254, 493.

The accompanying sketch shows the solution to the draughtsmen puzzle.



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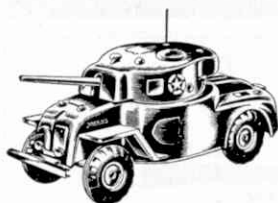
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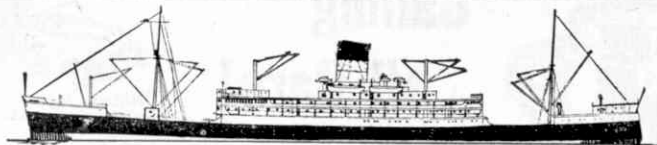
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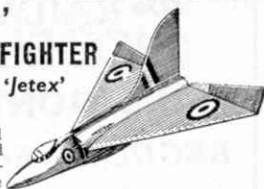
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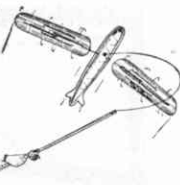
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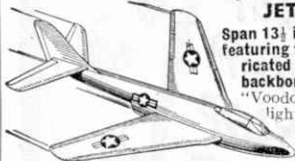
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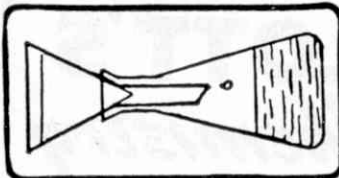
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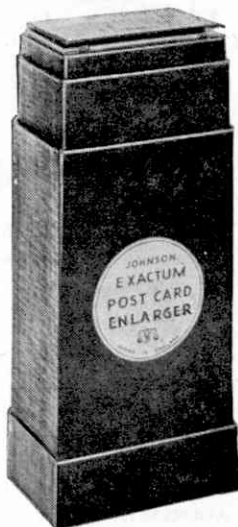
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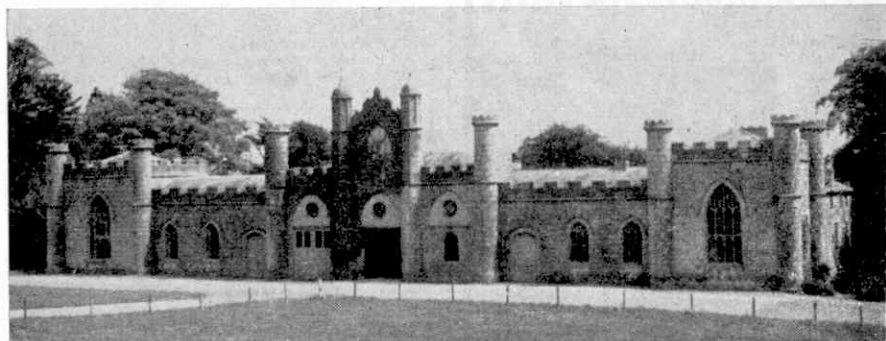
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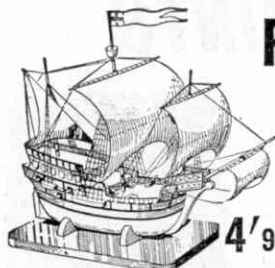
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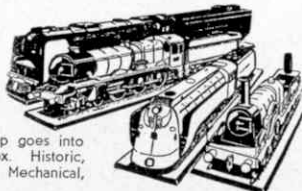


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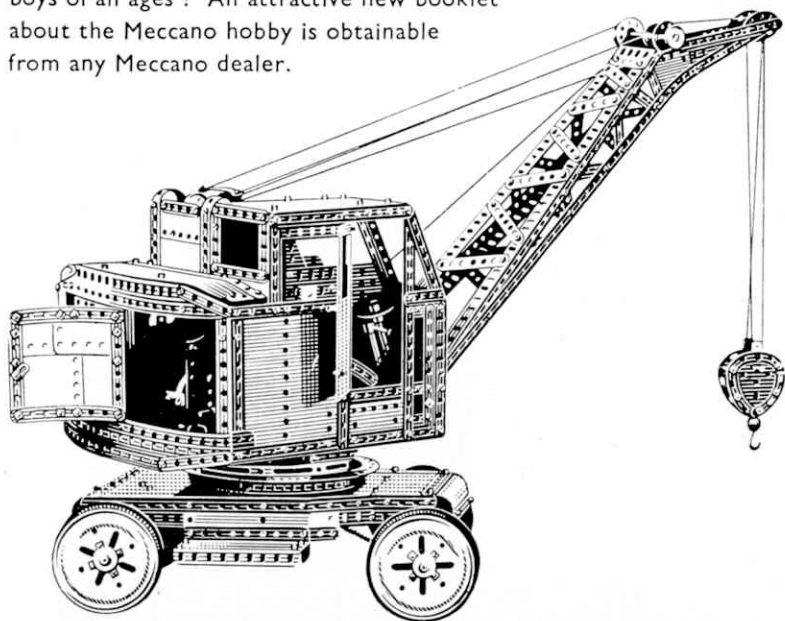
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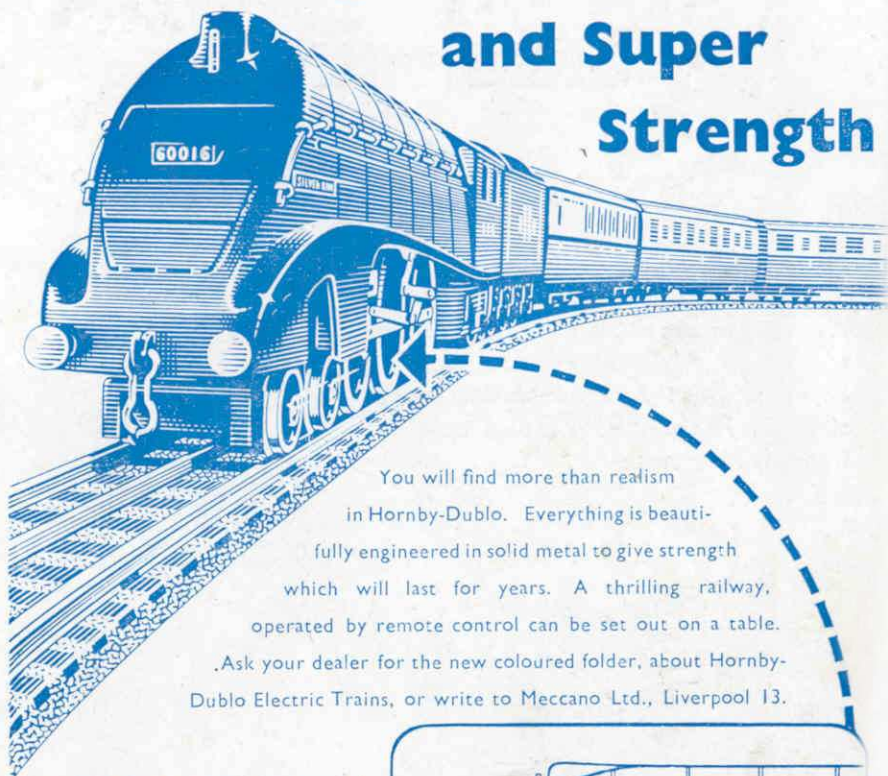


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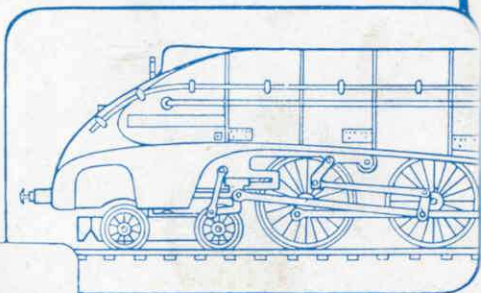
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