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VOL. XLI. No. 5 MAY 1956

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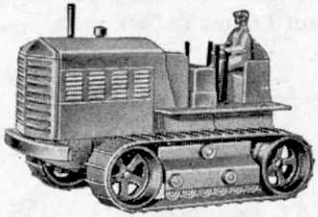

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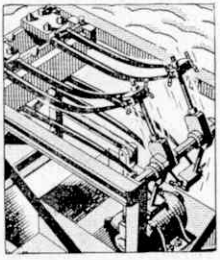
THE FRONT FORK TEST
10 million jolts worth of high speed vibration in this machine proved the toughness of the Triumph front fork.



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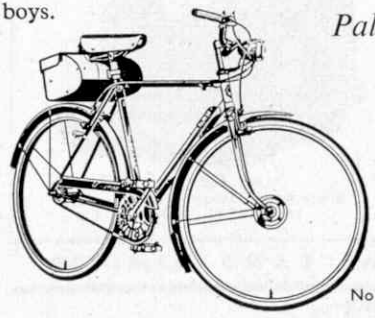

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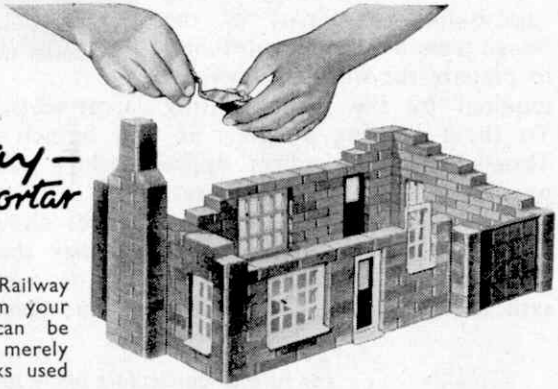

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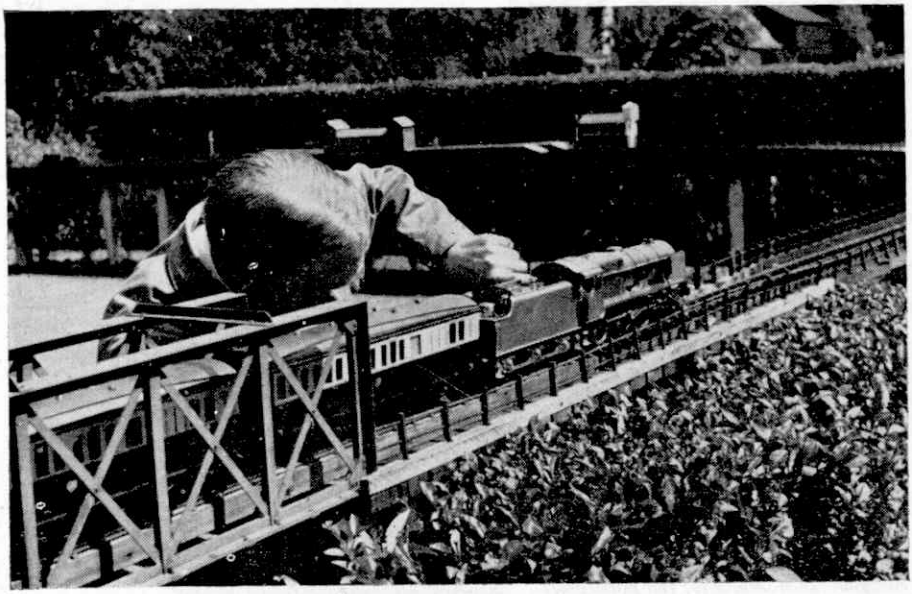

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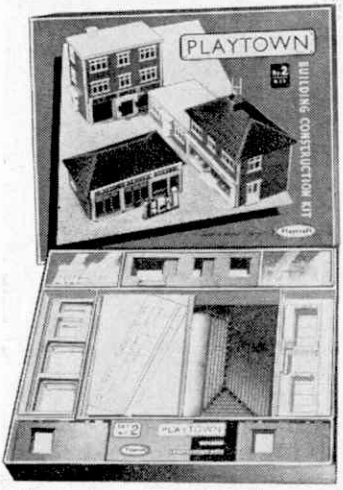

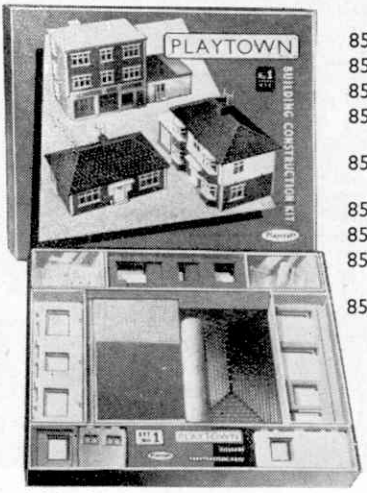

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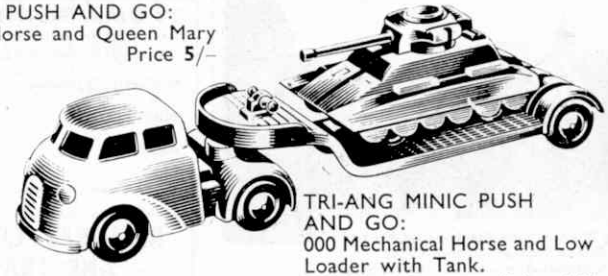

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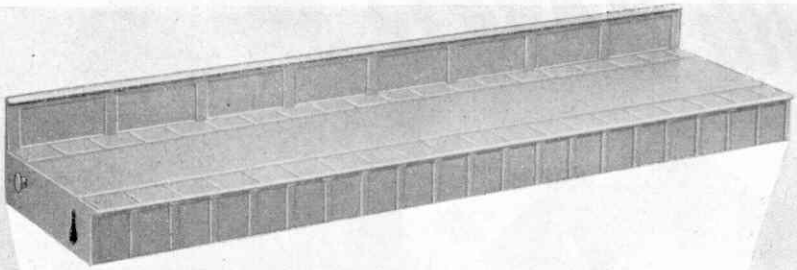

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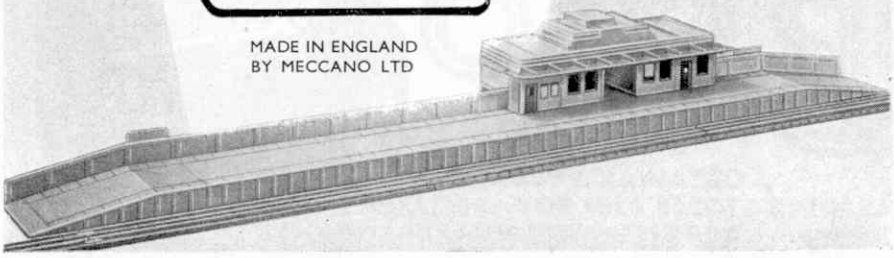

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Next Month: WORLD'S FASTEST FLIERS

MECCANO MAGAZINE

Editorial Office:
Binns Road
Liverpool 13
England

EDITOR : FRANK RILEY, B.Sc.

Vol. XLI
No. 5
May 1956

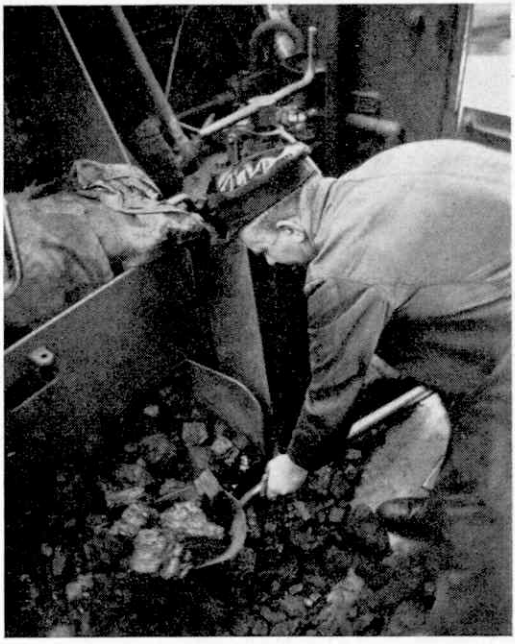
Curiosities!

Have you heard of a canal that was "laid down" for a short time and then "taken up"? There was one of this kind at the Shell Oil Refinery at Stanlow. Walls were built for the canal, and for the compounds or spaces between which five 300-ton tanks had to be moved, and 24 million gallons of water were pumped in from a river flowing through the refinery. This gave a depth of 3 ft. 6 in., along which the tanks were hauled to their new positions by gangs of men, with tractors standing by to help if necessary. When the tanks reached their new compounds they were sunk by opening their sea cocks, frogmen helping in this and in placing them. Then the walls were demolished. So the canal, more than a quarter of a mile in length, disappeared very soon after it came into existence.

On the road in Northern Rhodesia between Lusaka, the capital, and Fort Jamieson, there is a one way section 100 miles long. This climbs a steep escarpment by a series of hairpin bends and is very narrow. So from three o'clock in the afternoon until three next morning only eastbound traffic runs on it, westbound vehicles using it for the rest of the day.

Station names provide very many curiosities. In Great Britain we have Twenty and Counter Drain, Tram Inn, Fleur-de-lis and its neighbour Maesycwmmer, Pant and Doublebois—give this English pronunciation!

Even odder station names are to be found in the United States, where there are an Amos and an Andy, a Mutt and a Jeff. Every President of the United States seems to be represented by a station name, with the exception of Mr. Eisenhower—but there is an Ike, in Texas! And there are a Jo Jo, a Ty Ty and a Jay Jay.



Fireman J. H. Fountain satisfies the appetite of Eastern and North Eastern Regions Pacific No. 60500 "Edward Thompson" for coal. Photograph by John Topham.

Do you know of any such curiosities? Keep a look out for them and let me know if you find any.

The Editor

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Speed Across a Continent

The C.N.R. "Super Continental"

By the Editor

THE last few years have seen great improvements in the main line services of Canadian railways. An excellent example is provided by the trans-Continental train of the Canadian National Railways that began running on 24th April, 1955. This new train was given the name *Super Continental*. Leaving Montreal at 3.25 in the afternoon, it covers the 2,930 miles to Vancouver in 73 hours 20 minutes, a saving of more than 14 hours when compared with the fastest previous trans-continental service of this railway. The *Super Continental* is seen on the cover of the present issue, with Mount Robson, the 12,972 ft. peak of the Canadian Rockies, in the background.

Typifying the ceaseless shuttle of Canadian National Railways' weaving together the huge areas of Canada, a C.N.R. crack express is seen in the picture at the top of the page crossing the Richelieu River at Beloeil, Quebec, with one of the newest Diesel locomotives at its head.

The explanation of the speed-up of these trains is the adoption on a large scale of diesel locomotives by the C.N.R. These give higher running speeds, whether over the level prairies or through mountain sections such as that traversing the Rockies, and make equally important and significant contributions to the reductions in running times, especially over long distances, by the saving in time they allow at stops for servicing in comparison with steam locomotives.

Another factor in this is the introduction in recent years of up-to-date passenger cars, which also require less attention at divisional points than did the older cars they superseded. With the speed up and the reduction in the lengths of stops, through passengers on the *Super Continental* between Montreal and Vancouver spend three nights on the train instead of the four with the previous best services.

There is no doubt too that diesel haulage adds greatly to the comfort of travel. Diesel hauled trains start more smoothly and stop with less fuss and commotion than steam trains, with the result that the ride is easier and more comfortable. The use of roller bearings on the cars of the trains contributes to this improvement. Smooth travel is of special importance for long distance trains such as the *Super Continental*, in which travellers over the whole distance spend nights as well as days in the train, so the general

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improvements that the C.N.R. have made are very greatly appreciated.

The *Super Continental* is hauled by diesel engines all the way across the North American Continent. It has two departure points in the East. These are Montreal, already referred to, and Toronto, the section from the latter starting at 6 p.m. and calling at Ottawa, the Canadian capital, on its way.

The two sections of the train unite at Capreol, in northern Ontario. Winnipeg, in Manitoba, is reached at 10.30 p.m. on the following day, and by the afternoon of the next day the train reaches Edmonton, the capital of Alberta. Then follows the run through the Yellowhead Pass and the mountain region of British Columbia. The final stage of the journey takes the traveller down the valley of the Fraser River to Vancouver, which is reached at 1.45 p.m. on the following day. So a traveller across the Continent who sets off from Montreal or Toronto on a Sunday afternoon reaches his destination, Vancouver, shortly after lunch on Wednesday, spending only three nights in the train, against four by the previous fastest services.

A point to keep in mind is that time is not the same right across the Continent, over the whole 2,930 miles. Between Montreal and Vancouver there are four time zones, each differing by an hour to allow for the later times of noon in the western regions. When it is 11 a.m. in Toronto, where Eastern Time prevails, it is only 10 a.m. in the Central Time Zone, and 9 a.m. in the Mountain Time Zone, which begins in Saskatchewan and ends at Jasper, in the famous Jasper National Park of British Columbia. Beyond Jasper to the westward is the Pacific Time Zone, where it is still 8 o'clock in the morning. After allowing for these changes in clock times, the journey time to Vancouver from Montreal is 73 hours 20 minutes, and from Toronto 70 hours 45 minutes.

Thundering along the straight out of Montreal, C.N.R.'s "Super Continental" starts its run across the continent to Vancouver, in British Columbia.

Life on trains in which the traveller remains for three days and nights is of

(*Continued on page 278*)

The "lead" and "booster" units of C.N.R.'s "Super Continental" hauling power. Each unit develops 1,500 h.p. and operates the longest single diesel run on the North American continent—2,930 miles in 73 hours, including 30 scheduled stops.

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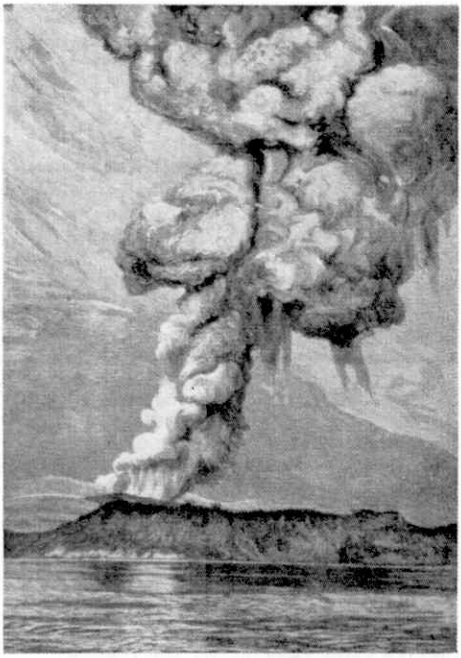
The World's Biggest Bangs!

By Leslie E. Wells



MANY people imagine that man has created the most devastating and mightiest of blasts in the atomic or hydrogen bomb. But they are wrong. In a rage, Mother Nature still holds the record for creating the Earth's biggest bangs, which cause more damage than anything yet conceived by man. The blast of the hydrogen bomb may not be felt by people a few hundred miles away; but Nature's angry moods are felt for thousands of miles, and sometimes the world over!

Take, for instance, the terrific bang of the volcano Krakatoa, which blew up in 1883. The sound of the explosion was heard at Rodriguez Island, near Madagascar, about 3,000 miles away. People in Diego Garcia, in the South Chagos Islands, 2,200 miles away, thought that somewhere a naval battle was in progress because of noises sounding like big gun-fire. Similarly, people of Victoria Plains, Western Australia, 1,700 miles from the eruption, were mystified by sounds like artillery fire; and at Achean, in North Sumatra, 1,073 miles away, a whole regiment of troops was turned out to defend the port because it was thought an attack was being made. At Singapore, two vessels put out to sea because sounds were heard which were believed to be from a ship in distress, firing her guns for help.

The picture at the head of the page is reproduced from a drawing showing the eruption of the volcano on the island of Krakatoa, in the Straits of Sunda, which separate Java and Sumatra. Dust from the eruption encircled the globe, and the roar of the vast explosion was heard about 3,000 miles away. Picture Post Library.

Such was the loudest noise ever recorded by man, but what was, perhaps, even more remarkable was the effect of volcanic dust on the atmosphere. Something like a cubic mile of pulverized rock was flung 30 miles high and remained in the stratosphere for many months. The dust was caught by a stratospheric gale and encircled the whole globe in the short time of thirteen days! Tiny particles of ash fell on the decks of ships 2,600 miles away in the Indian Ocean.

In some places the Sun's rays were filtered through a veil of dust, causing it to appear blue and the Moon green. Beautiful sunsets were experienced throughout the world, and these continued for two years, until the dust particles had subsided. One November morning people crossing London Bridge were so amazed at the light of a deep flush in the east that the fire brigade was called to put out the fire! Similarly, in New York fire brigades were kept busy scurrying through the streets looking for imaginary blazes. The same false alarms were pursued in many towns on the Continent.

Equally without parallel was the effect of the explosion on the seven seas. Thousands of dead fish were floating belly-up on the churning hot sea and those driven inland were sold by the natives.

Superheated ash, rock and pumice came crashing down from a height of four to five miles causing a displacement estimated at two hundred billion cubic feet. The tidal

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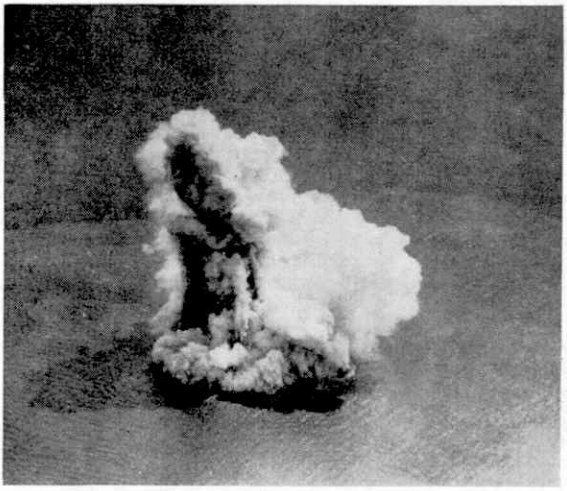
wave that resulted was over 100 feet high. It completely wiped out towns and villages, wrecked dozens of ships and caused a loss of 36,000 lives. The Dutch warship *Beroun* was torn from her moorings and landed two miles away in a jungle over 30 feet above sea level.

Continuing its journey, the wave travelled right across the Indian Ocean and on reaching Table Bay, 5,100 miles away, it was still 18 inches high. Rounding the Cape of Good Hope, it turned northward into the Atlantic, along the coast of Africa and finally fizzled out in the English Channel. In all the wave covered over half the world and was recorded 10,000 miles away from its origin.

Where once stood a mountain on Krakatoa Island, there is now a huge hole over 1,000 feet deep and about a mile across. But the old volcano is not altogether dead! One day in 1929, beneath a solid floor of rock the sounds of rumblings and hissings were heard. These culminated in a spout of steam and ashes, and again dead fish were to be seen floating on the surface of a super-heated sea. But this time the disturbance was the work of a geyser pushing its way through the ancient crater, which acts as a sort of safety valve for the enormous pressure generated by the lava below.



Krakatoa is still active and here is a photograph of an eruption in 1937 taken from a Dutch air liner, the pilot of which described the scene as beautiful but terrifying.

Natives call the new volcano Anak Krakatos, meaning the *Child of Krakatoa*.

A disturbance that may be described as Nature's second angriest display to our knowledge also took place in the eighties, when Mount Tomboro, in the Dutch East Indies, exploded. Red-hot ashes and dust were blasted into the air in sufficient quantity to make three mountains the size of Mont Blanc. The disaster killed 66,000 people and laid miles of land completely barren.

Thirty years later dust from Hecla in Iceland showered the Orkney and Shetland islands for ten hours.

The biggest bang of the present century was the terrible eruption in Martinique in 1902, which completely blotted out the town of Pierre and killed 30,000 inhabitants in two minutes!

A more recent example of Nature's fireworks took place in the Dexalezado group of eight volcanic islands in South America. The eruptions rained dust and pulverized rock on three cities and half the South American continent. In Mendoza, over three hundred miles away, people deserted the city because they were unable to breathe the sulphurous gases.

Ashes were blown something like five miles high and fell on an area as large as England, which became covered over three feet thick. Several towns were totally blacked out when the Sun's rays were intercepted by clouds of volcanic dust. In Buenos Aires people had to use their scarves for protection against harmful gases, while housetops and cars were heavily coated with fine ash. Over 3,000 tons fell in this area alone.

In 1943 a new volcano erupted on the mountain of Pericutin, Mexico, which devastated acres of crops, killed hundreds of cattle and forced over 10,000 peasants to abandon their homes. Ashes fell in Mexico City, 180 miles away and coated its streets to a depth of twelve inches! For days transport was at a standstill.

To most of us the word volcano brings to mind Vesuvius—destroyer of Pompeii and the subject of thousands of picture

(*Continued on page 278*)

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Seeking Coal Under the Sea

By Trevor Holloway

WHEN the seams of an inland colliery show signs of becoming exhausted, it is a comparatively simple matter to make test borings from the surface in an effort to discover where fresh reserves of coal may be found. In the case of coastal collieries, however, the problem is much more complex. The time has come when the extension of these pits is urgently necessary, but to exploit underseas reserves economically it is essential to know in which direction to extend the workings and at what levels. Hit-or-miss methods would waste time and money, and very probably some of the richest deposits would be missed.

A mystery tower in the Firth of Forth that puzzled passengers in trains crossing the Forth Bridge is seen in the illustrations on these pages. The one above shows the 500-ton tower being towed to a position about 1½ miles off the Fifeshire coast, to be used in boring for coal under the sea. Our pictures are reproduced by courtesy of the National Coal Board.

It was obvious from the outset that a new technique was called for—drilling for coal at sea. The N.C.B. looked for a drilling unit or tower that could be refloated after one borehole was completed, towed to another position and grounded for a second and subsequent borings. Drilling for oil has been carried out by somewhat similar methods in sheltered waters in other parts of the world. But no country had attempted a search for coal under conditions of sea and weather likely to be encountered off the coast of Britain.

The Board eventually entrusted Maunsell, Posford and Pavry, consulting engineers, London, with the work of designing the unique drilling tower. Steelwork for the pontoons, base girders and upper decks was supplied by the Cleveland Bridge and Engineering Co. Ltd., the main contractors. Messrs. Tubewrights Ltd. were appointed to produce the welded tubular steelwork at their Glasgow works and the Foraky Boring and Shaft Sinking Co. undertook to carry out the actual drilling operations. The tower was built in the shipyard of Jas. A. White and Co. Ltd., St. David's Harbour, Inverkeithing.

The experience of the consultants proved of great value, for during the war they were responsible for establishing nearly fifty sea forts, some of which were placed 30 miles off shore.

The drilling rig, machinery and equipment, as well as living accommodation for the crew, had to be supported on a tower that was high enough to keep the deck about 40 ft. above the sea when the base of the tower was resting on the sea bed in depths that in places were as much as 120 ft.

As the tower would have to be used in the seaway it was decided that it should be made of tubular steel, as tubular section presents less obstruction to the elements and reduces the surface area by 40 per cent.

So it came about that people crossing the Forth Bridge last spring were greatly puzzled to see a curious tower-like structure growing up from the shore in St. David's Harbour. The Coal Board's dream was becoming a reality. On

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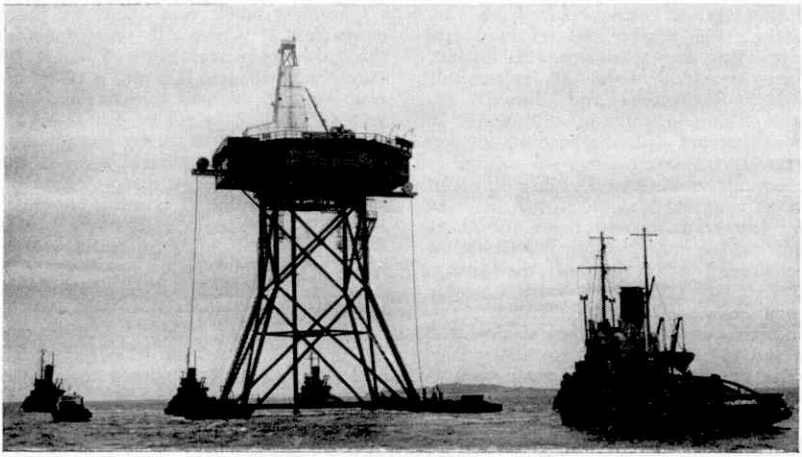


The boring tower drawn up ready for anchoring and lowering into position to carry out drilling operations.

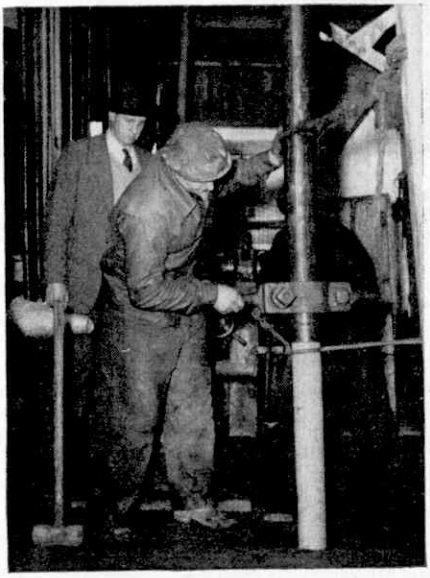
22nd May the strange erection was launched and towed down the Firth of Forth by Admiralty tugs, and was grounded at a point about 1¼ miles off Seafield Colliery, near Kirkcaldy, Fife.

In appearance, the boring tower resembles somewhat the end section of a pleasure pier that has been cut away from the main structure and made into an independent unit. The tubular steel tower is built up from a heavy steel box girder base, X-shaped in plan. Each of the two members forming the X is 163 ft. long, 3 ft. wide and 7 ft. deep. They are hollow so that they can be pumped dry when the tower is to be floated, or flooded when the structure is lowered on to the sea bed.

At the top of the tower is an octagonal steel deck surfaced in timber, measuring 86 ft. from side to side. This deck is 130 ft. above the base of the X-shaped girder. The deck carries the drilling rig, which is 54 ft. high and is of the same type as that used on land. There is space on the deck for racking the drilling rods, and for storing up to 90 tons of tubular casing for the borehole. Incidentally, drilling and recovery of "cores" is achieved by methods similar to those employed on land, except that a tubular casing 160 ft. long and 24 in. in diameter is required to shield the drilling rods down into the sea bed.

Beneath the main deck is slung an accommodation deck, comprising cabins for 25 men, a Boremaster's office, galley, mess room, recreation room, and mechanical and electrical stores. There is also a sound-proof generator room equipped with three diesel generating sets to supply power for sea water pumps, and for heating, lighting and signalling.

Fresh water is obtained through a



A drilling rod being adjusted inside the 54-ft. high drilling rig on the top deck of the tower.

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distillation plant and cooking is by electricity. The tower and its crew are self-supporting for a considerable period, and are provided with all reasonable amenities. Bathrooms and showers are available, there is hot and cold water in all the cabins and all living accommodation is thermally insulated.

Fog signals, navigation lights, a life-boat and a raft as well as a motor boat to convey the crew to and from the shore base are among many other provisions for the successful operation of the tower, which with its equipment weighs nearly 500 tons.

Two steel pontoons are used to float the tower and to allow it to be towed by tugs to its sea station. Each pontoon is 170 ft. long by 17 ft. 6 in. wide and 7 ft. deep, and each weighs 125 tons in full working order. These pontoons carry the tower on four sets of heavy twin hawsers. When the boring site is reached the tower is gently lowered to the sea bed by winches aboard the pontoons, which are powered by generators on the tower itself. As soon as the tower has been securely grounded the hawsers are cast off, and the pontoons are towed back to port and laid up until the time comes to transport the tower to a fresh drilling location.

When the tower was lowered to the sea bed prior to commencing the first borehole, it was found that it had established itself only half a degree from the vertical and it was possible to drill satisfactorily within this tolerance.

The first week was spent in checking equipment. When all was satisfactory the guide tube was lowered to its fullest extent into the sea bed and a 12 in. casing was inserted to seal off the silt and sea water. Drilling began at the end of May and by mid-June the casing was successfully cemented into solid rock at a depth of 210 ft. from the platform.

Favoured by good summer weather, the borehole went down at the rate of 130 ft. a week, which is comparable with the best speeds achieved on land. Index limestone, which is the marker band for the top of the limestone series, was reached on 1st October, 1955, at a depth of 2,340 ft. Five foot coal was cut at 2,914 ft. and boring continued down to 3,100 ft.

The National Coal Board are well satisfied with the results obtained so far by means of their unique boring tower. The limestone group of coals has been sought and proved and it has also been revealed that the main productive coal measures lie much nearer to the Fife shore than was anticipated.

In this picture the National Coal Board's experimental drilling tower is seen set down on the sea bed, with drilling in progress.

After operations off Seafield Colliery are completed it is expected the tower will sink boreholes off the coastal collieries of Durham, Northumberland and East Scotland.

Built almost in the shadow of that masterpiece of structural engineering, the Forth Bridge, this new example of the versatility of tubular steel is considered one of the finest pieces of British constructional engineering of the day.

By the time these notes are in print the world's first off-shore borehole for proving undersea reserves of coal will have been completed and, weather permitting, the drilling of a second borehole will be well under way.

It is possible that Britain will construct similar towers for other countries.

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The late Glenn Luther Martin.

The Story of Glenn L. Martin

By John W. R. Taylor

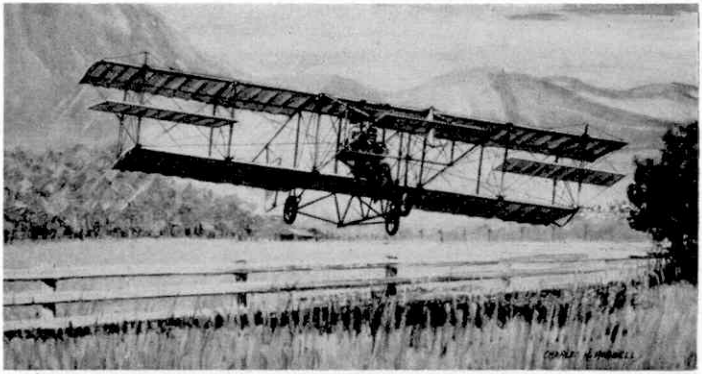
THERE can be few readers of the *M. M.* who have not heard of the Hawker Hunter fighter, de Havilland Comet jet-liner, Douglas DC-3 Dakota, or the Bell X-1A, which has flown faster than any other aeroplane in the world. Yet—how many know the stories of the men whose surnames have grown so familiar through these aircraft—Harry Hawker, Sir Geoffrey de Havilland, Donald Douglas and Larry Bell?

It would be tragic if we forgot the achievements of such men, for they have been more than mere figureheads or financial wizards. Harry Hawker, for example, was one of the finest racing and test pilots of all time, and nearly became the first to fly the Atlantic non-stop in 1919. Sir Geoffrey de Havilland began even earlier, and was designing and test flying aeroplanes more than 45 years ago. So was a young American named Glenn Luther Martin, and when he died last December aviation lost one of its great pioneers.

His story began in the year 1892, long before anyone, even the Wright brothers, had flown in a powered aeroplane. He was only six at the time, but had already learned to build and fly box-kites better than any other boy in his home town of Liberal, in Kansas. So, with an eye to business inherited from his father, who ran a wheat farm and hardware shop, he started a box-kite production line on the floor of his mother's kitchen. The charge was about a shilling per kite.

Soon afterwards he began to use the power of the wind for propulsion as well as "lift", by fixing sails first to a toy wagon, then to his arms when he went skating, and finally to his bicycle. It taught him a great deal about air currents, to which he added engineering experience by working in a bicycle shop while he was at high school, and the benefits of a two-year business course at Kansas Wesleyan University.

This was the time when the first motor cars were appearing all over the United States. They were none too reliable, and garages made a lot of money by repairing as well as selling cars. With his love of things mechanical, Glenn Martin had no difficulty getting into the new business and, after working for other people for a few months, he opened his own garage in Santa Ana, California.



Glenn L. Martin's first aeroplane, 1909. From a painting by Charles H. Hubbell.

One day he read in the newspapers that Orville Wright had flown in an aeroplane for 100 seconds, and this convinced him that the future was in the air, not on the roads. Like the Wrights, he built up his experience gradually. Only after flying a biplane glider from the hills near Santa Ana for many months did he rent an abandoned church and begin to build a powered biplane.

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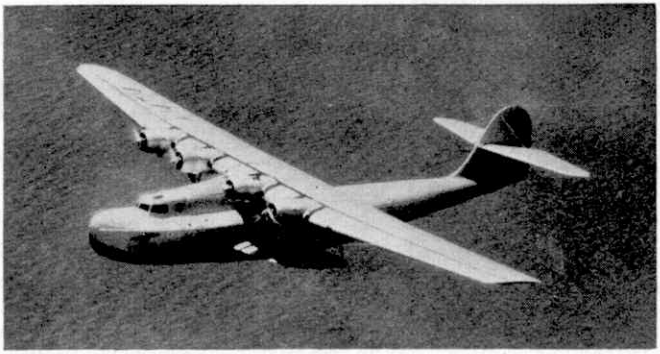

The Martin 130 flying boat "China Clipper", which made the first commercial flights across the Pacific.

Working in his garage during the day, he spent the nights on his aeroplane. There were no text books for reference, no blueprints or records of past experience to guide him, and this first machine cost him more than £500 and two years of work.

It was quite small, built of bamboo, spruce and varnished cloth, and was powered by a 12 h.p. Ford motor car engine.

Still determined not to rush things, young Martin spent several days taxying up and down a meadow to get the feel of the controls. Finally, in August 1909, he left the ground, covering 100 ft. at a height of two feet. Week after week, he continued to make short hops, followed by slight adjustments to the aircraft, until it could be flown safely and confidently for 100 yards, 15 ft. above the ground. Then he exchanged the Ford engine for a 30 h.p. Eldridge, and began to fly proper circuits.

By the summer of 1910 Glenn Martin was an accomplished aviator. Newspaper accounts of his flights attracted large crowds to Santa Ana, and his biplane was put on show at a small charge, which raised several hundred dollars towards the cost of a second aircraft. That was only a start, for soon he was in great demand at county fairs and local celebrations.

Barnstorming all over the western states, he became one of the most famous pilots in America. The crowds believed him a dare-devil. In fact, he never flew without checking carefully every inch of the aircraft and knew precisely the manœuvres it would perform with complete safety. But few people saw any commercial or military future for aeroplanes, and the only way to build up public interest and make money was by stunts. So, Martin became the first to deliver newspapers by air and to drop a baseball into a catcher's mitt from an aeroplane. He tossed a bouquet of flowers from the air into a May Queen's lap, bombed a dummy fort, and used his biplane to hunt coyotes and escaped convicts, to pick up a passenger from a boat, to search the sea for missing airmen, to take films from the air and to scatter advertising leaflets over towns.

A MartinB.26 Marauder. These famous attack bombers in World War II, carried a crew of seven and had a top speed of 282 m.p.h.

On a more serious note, he fitted his aircraft with floats and flew it 38 miles from Newport Bay, near Los Angeles, to Catalina Island and back, a feat which was hailed as the start of the first air ferry. One or two financiers were interested sufficiently to put their money into his small aircraft factory in a disused cannery

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at Santa Ana. Then they changed their minds!

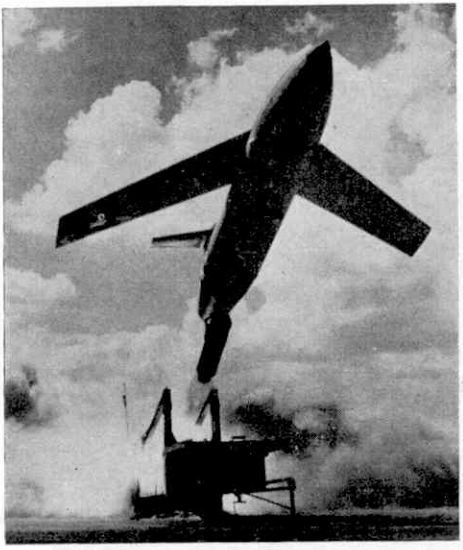
But nothing could deter Martin, now an old hand at both flying and business, at the age of 26. In 1912 he collected £1,000 in prizes at an international flying meeting in Chicago, moved his factory to Los Angeles and started a flying school in which many of the future great men of aviation gained their wings. Some of them were Army officers, because the U.S. Services had begun at last to realise the military value of air reconnaissance. Between work on his aeroplanes, he invented a bomb-sight and one of the first automatically-opened parachutes, which caused a sensation when demonstrated by a young lady named Tiny Broadwick, from an aircraft piloted by Martin himself.

His aircraft became more and more efficient, which was just as well for the U.S. Army, because their newly appointed aeronautical engineer, Grover Loening, had just declared all their Wright and Curtiss "pusher"-engined trainers unsafe to fly, following a series of fatal accidents. This left the Army without training aircraft, until Loening persuaded Martin to fit one of his new Model TT "tractor" biplanes with dual controls. With this, training was resumed with great success, and the resulting order for 17 Model TTs was the largest placed by the U.S. Army up to that time.

When America entered the war in 1917, Martin merged his company with that of Orville Wright, to form the Wright-Martin Aircraft Corporation; but before long he was on his own again, with a new factory at Cleveland, Ohio.

There he built one of the most important aircraft in aviation history—the big twin-engined MB-1 bomber, which could carry 1,500 lb. of bombs and was years ahead of its time in performance. He took the design to Washington in January 1918 and was given an immediate contract for a production batch. The first rolled out of his factory in the unbelievably short time of six months, but it was just too late for service in the war.

However, in 1921-3, General "Billy" Mitchell, fiery head of the U.S. Army Air Service and one of the greatest-ever champions of air power, used developed versions of this bomber to sink a number of old battleships at sea. Claiming that this showed that warships were out-of-date, he crossed swords with senior U.S. officers, was court-martialled and suspended from duty. But the experiments were not forgotten, and when World War II proved the power of the heavy bomber, Mitchell was awarded a posthumous Congressional Medal of Honour —America's V.C.



Martin Matador 650 m.p.h. pilotless radio-controlled bombers are now in service in the United States and in Europe with the U.S. Air Force.

Honours came to Glenn L. Martin too, as the tiny company he had founded grew into a giant, employing more than 50,000 people in 1945. It had moved to a new site near Baltimore in 1929 and from there came the BM-1, the first practical dive-bomber, followed by the B-10 monoplane, which represented the greatest single advance in bomber design since the Handley Page 0/400 of 1916. Its speed of 212 m.p.h. enabled it to outfly most fighters of its day, and it introduced such refinements as a retractable undercarriage, enclosed cockpit and internal bomb-bay. It also earned Glenn Martin the coveted Collier Trophy, which is awarded each year for the greatest aviation achievement in America.

Since then, the Glenn L. Martin Company have built many famous aircraft, including the *China Clipper* flying boat which made the first commercial flights across the

(Continued on page 278)

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Road and Track

By Peter Lewis

THE Tulip Rally—one of the events counting towards the 1956 Touring Championship of Europe—takes place this month. Competitors will start from one of nine European Control Points, and those who choose London will have to motor, in the first instance, some 500 miles to Champagnole in the French Jura, the Concentration Point for all preliminary routes.

From there competitors travel south to Monte Carlo, then back across Europe to the famous Dutch seaside resort of Noordwijk, in the heart of the bulb fields.

The Harrison-Furse Ford Anglia at speed in the Monte Carlo Rally. Our contributor drove this car a few days after its return and gives his impressions of it on these pages.

They will cover some 2,000 miles between the morning of 6th May and mid-day on the 9th, followed by a speed test on the Dutch Grand Prix circuit at Zandvoort.

Apart from the fact that I should like to see a British car win this year—J. W. E. Banks with his Bristol 401 was second in 1955 after a magnificent effort in the final test at Zandvoort—I shall be watching the performance of the British works Fords with special interest; for I was able to borrow a works Anglia a few days after it had returned from the Monte Carlo Rally in which it finished 15th in general classification.

When I collected the cream Anglia car from the Ford Competition Section at Brentford, I expected to find a vehicle bristling with gadgets. But apart from the normal equipment for rally work, such as two-speed wipers, fire extinguisher, screen spray, map light, fog lights and a reversing lamp, the Anglia had very few extras.

There was a navigator's seat with a headrest rather like that of a dentist's chair, and both front seats had been built up at the sides to hold the occupants firmly in position when cornering fast. Town and Country Tyres had been fitted all round, the brakes had racing linings, and the front wheels had shock absorbers with increased resistance. Aluminium duct extensions from the demister vents supplemented an electric windscreen defroster in the centre of the screen, and a Perspex "snow deflector" was positioned immediately in front of the screen, across the full width of the bonnet.

I was fascinated and impressed by a new German invention, the Antiblenda, which lessens eye strain at night. A chromium extension arm, with a small light aperture, is fixed to the door pillar so that this can be positioned centrally above the driver's head. It is controlled by a rheostat switch and throws a restful green light on the inside of the screen, just below roof level. In effect, I found the approaching headlights on the busy Great North Road did not dazzle me as much as they usually do. The green glow prevented the eyes having to make frequent adjustments between pitch darkness inside and outside the car, and dazzling brightness from oncoming headlamps.

Mechanically, the Anglia was absolutely

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standard and, bearing in mind that she had only just completed the Monte Carlo Rally, astonished me with her brisk performance. She cruised happily at just over 60 m.p.h., reached 75 m.p.h. on several occasions and covered 75 miles in 105 minutes from north west of London to Ely, at an average speed of nearly 43 m.p.h.

From every angle the new B.R.M. looks right. Detail finish is superb, and the car has tremendous power.

I was able to check the average by using the one other extra I have not mentioned, a Time/Flight Clock. For a particular section, the clock is set to zero, the mileage noted to the nearest tenth and the clock set in motion. Later, the clock is stopped by a push button and the average speed is arrived at by checking time taken and mileage covered.

When I returned the car to Brentford, I spent an interesting morning with Mr. J. Welch, in charge of the Competition Section there. He has a team of ten assistants, every one an enthusiast. One of the department's main functions is to prepare Ford cars for rallies and to supply information to Ford agents in the same connection.

It takes 100 hours to prepare a standard car and a further 50 hours to get a modified car ready. These times do not include development work, which is being carried out on modified engines continually. In 1955 as many as 100 cars were prepared at Brentford for international and local rallies.

On recent journeys about the country I have noticed an increasing number of A.A. patrols equipped with radio. How many people, I wonder, realise that the A.A. first used a radio link in 1949 when Fanum House—the Association's Head Office in London—communicated with two breakdown vans in the London area. Today, the A.A. operates 17 transmitting stations, covering an area of some 30,000 square miles or approximately one third of England, Wales and Scotland, including the Highlands.

No comparable service is available anywhere else in the world and patrols linked by radio to H.Q. can operate in a similar manner to police cars, asking for and passing back information to a central control.

I do not think A.A. members themselves appreciate just how quickly they can obtain assistance. For instance, a member putting a telephone call through to an area H.Q. will find that a roving motor cycle patrol is diverted by radio to his assistance within seconds of the receiver being replaced. (Continued on page 278)

An A.A. patrol, using the latest type of safety helmet, in contact with his headquarters by radio telephone.

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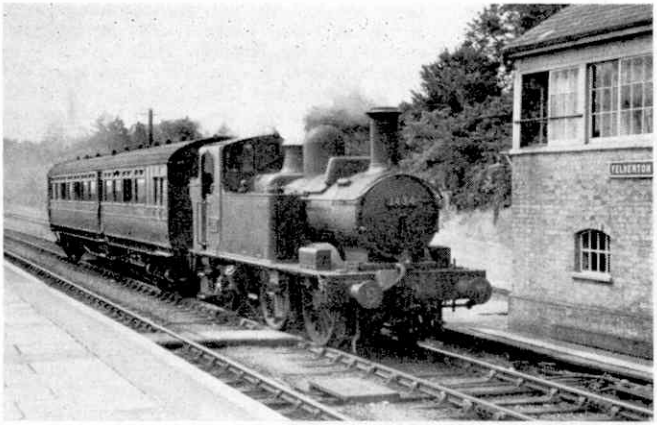

A pleasing view of a Western Region motor train or push-pull unit approaching Yelverton on its way to Tavistock from Plymouth, Road North. The engine is 0-4-2T No. 1434. Photograph by R. E. Vincent.

Railway Notes

By R. A. H. Weight

An Array of Long and Fast Runs

This island by no means possesses the great lengths of main line found, for example, on the mainland of Europe or in the United States and Canada. Nevertheless British Railways express passenger time tables currently in force for winter and spring show well over 120 scheduled non-stop runs exceeding 100 miles in length for every ordinary weekday.

The largest proportion of these is found on the Western Division, L.M.R., headed by the 299-mile Carlisle-Euston run by the *Royal Scot*, in 318 min., which is the longest all-the-year break and the longest journey made continuously by one driver and fireman. Night sleeping car expresses each way also do it. There are non-stop runs between Euston and Crewe, Preston, Liverpool, Manchester, Stoke-on-Trent, Stafford; Crewe and Carlisle; Crewe and Watford Junction; St. Pancras and Nottingham or vice versa; and so on.

Along the E. & N.E. Regions' tracks the long non-stop runs extend to a night journey each way over the 268 miles between King's Cross and Newcastle, and between Darlington and King's Cross, 232 miles in 227 min., the fastest regular long run. There are others between London and Leeds, York, Doncaster, Grantham, between Grantham-Newcastle each way by the *Flying Scotsman* in 3 hrs., between Peterborough and York, etc.

The W.R. *Cornish Riviera*, load permitting, makes the 226-mile Paddington-Plymouth non-stop trip each way, but if an assisting engine is required over steep gradients west of Newton Abbot, making a stop there necessary, it is only allowed 190 min. westbound for nearly 194 miles to Newton, averaging 61 m.p.h. The *Torbay Express* is booked both ways without a halt between Exeter and London on a fast schedule. Others are shown between Paddington and Bath, Bristol, Newport, Taunton, etc.

The Southern, without water troughs, does not come into this category at present, but there are a number of runs traversing Scottish territory chiefly between Newcastle and Edinburgh, and between Carlisle and Glasgow.

There are more than 50 regular start to stop timings requiring an average of 60 m.p.h. or more, varying in distance from the 232 miles on the *Tees-Tyne Pullman* just mentioned to two sharply timed Paddington-Reading snippets in 35 min. for 36 miles. They include the 67 m.p.h. *Bristolian* each way; 66 and 65 m.p.h. by business expresses on the E.R. between Hitchin and Retford; 65 m.p.h. from Paddington to Bath; and an average of 64 as the fastest of the remarkable 13 daily runs booked at 60 or over in each direction along the 44-miles nearly level York-Darlington stretch.

In addition there are 63 m.p.h. by the *Broadsman* from Ipswich to Norwich; and quite a batch of L.M.R. sprints at mean speeds ranging from 60-63 m.p.h., with heavy as well as lighter loads, the longest being three Crewe-Euston runs, 158 miles in 155 min. The eight expresses, four each way, timed at exactly 60 m.p.h. between Coventry and Euston, on the Wolverhampton-Birmingham-London fastest service, are the most concentrated examples between two points.

The *Atlantic Coast Express* is allowed only 83 min. to Salisbury from Waterloo, nearly 84 miles away. There are steam and electric schedules on the Southern requiring averages little below the mile-a-minute mark, and many similar timings on routes where gradients, curvature, speed restrictions through junctions or the like can affect considerably the average speed, as well as the power output involved.

Figures are quoted to the nearest whole number. In summer to cater for holiday and other extra traffic, a number of additional long non-stop runs are added on certain Regions and lines.

Locomotive News

The standard class 4 2–6–4 tanks built at Brighton are still coming into service and are now found at many depots on all Regions except the Western. King's Cross has been added to the list, as No. 80131 was lately allocated there. Other new engines entering service recently included 2–10–0s Nos. 92073-5, stationed at 36A, Doncaster; diesel-electric shunters Nos. 13235-6, to 53A, Hull, Dairycoates; Nos. 13237-40, 50A, York; diesel-mechanical Nos. 11117-8, 6C, Birkenhead, and Nos. 11152-3, 40B, Immingham.

Class 5 4–6–0s numbered 44911 and 73071, of respectively L.M.R. and B.R. type, have been on loan to King's Cross, whence on the main lines to and from Grantham automatic train control installations are being extended and operated experimentally at distant signals. Many engines are fitted with the necessary electric contact gear. Reports are to hand from Scotland of good work by the latest series of Britannias with large tenders, and of the Compound 4–4–0s being prominent not long ago on workings from Dumfries and Stranraer over the Galloway hills. There is considerable interchange along various routes among locomotives of former L.M.S. or L.N.E.R. origin, which now intermingle with growing numbers of more recent standard types.

On the Southern, classes D15, E5, E5x and R

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L.M.R. No. 46125 "3rd Carabinier" gets away from Holyhead with the up "Irish Mail." Photograph by G. Clarke.

(0–4–4T) have become extinct. All the 4–4–0s stationed at St. Leonards are of the Schools class. As the remaining unrebuilt D 4–4–0s are allocated to Guildford, after many years they have disappeared from the long familiar Kent rosters, though some D1 and E1 rebuilds remain and continue to shine sometimes on Chatham main line semi-fast duties. One of the large Lord Nelson 4–6–0s, *Lord Hood*, hauled the early Sunday morning London Bridge-Brighton newspaper and passenger train, when travelling for works attention at Brighton, where representatives of unusual types are seen when sent there for scrapping or overhaul. Nelson and new class 5 4–6–0s appeared early in the year on the *Bournemouth Belle* as well as on other Waterloo-Weymouth or Exeter fast trains, while a number of Pacifics were being overhauled, repainted, etc.

Fast Running on Great Central Line

As express engines go, many of the Gresley A3 4–6–2s are approaching the elderly or veteran stage, though they are still performing splendidly on various important main line turns in England and Scotland. For example, all the Pacifics on the Great Central Section, E.R., are of this type.

Over a distinctly hilly route, *Gay Crusader* made light of an 8-coach, 275-ton fast train heading for Marylebone, calling at principal stations, regaining 2¼ min. between Rugby and Woodford Halse with a minimum of 50 m.p.h. at the top of the long rise to Charwelton. Then from Woodford to Aylesbury, 4¼ min. were knocked off schedule, with 77 m.p.h. averaged for 16 miles largely downhill, though including two slowings. Grendon Underwood Junction, 22¼ miles from the restart, was passed in 20¾ min. Both these were comparatively short start-to-stop runs of just over 14 and 31 miles respectively.

Coaching Stock Liveries

Many readers probably miss the distinctive colours and finish which used to characterise the separate companies' rolling stock. I certainly do, attractive though the red and cream can be! No immediate decision is expected, but proposals to paint the carriages used on some of the principal expresses differently, say chocolate and cream from Paddington, have been considered, so the coming summer may see developments in that direction.

New Works and Finer Stations

Among many structural and track improvement schemes announced or already in hand are the complete rebuilding of North Road station, Plymouth, W.R., also used by S.R. trains. It is to have an additional down platform line, with multiple aspect signalling controlled from one very modern signal box, office buildings and much improved accommodation for passengers.

Improvements and embellishments also are promised for Southend, Central, E.R. station.

A difficult and costly scheme for rebuilding parts of Cannon Street, London City S.R. terminus, will enable the platforms at the street end to be lengthened to take 10-coach electric suburban trains. The ground floor apartments in Southern House, an office block at the entrance, will be removed, and new booking, waiting, refreshment and staff rooms will be erected in their place. The outer ends of the platforms are almost on the bridge over the Thames. Cannon Street handles about 68,000 passengers daily, largely during morning and evening peak hours, when a number of fast steam trains arrive or depart to and from the coast.

Fine new buildings at Berth 102, Southampton Docks, regularly used by Union-Castle liners on the South African service, provide excellent accommodation for passengers, baggage and cargo.

The London Transport Executive announces plans to ease congestion and afford quicker service by rebuilding and resiting station buildings at Notting Hill Gate, and by laying in a new junction between South Kensington and Gloucester Road.

Looking at the Forth Bridge from Dalmeny Station. The camera of J. D. Pawley has caught an approaching fast freight train in charge of a Pacific.

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American England

By Arthur Nettleton

AN historic event of 336 years ago is soon to be repeated, for a replica of the *Mayflower* will sail from Devon to Massachusetts during the coming summer, reliving the memorable voyage of the Pilgrim Fathers.

England is rich in souvenirs of those brave pioneers, and there are numerous mementoes of other men famous in early United States history, literature, and education.

Buckinghamshire is outstanding for its links with the makers of modern America. Within a few miles of Beaconsfield lie places associated with both the Pilgrim Fathers and the founder of Pennsylvania. The most remarkable American treasure in Britain is a barn at Jordans, east of the Uxbridge-Beaconsfield road, for there are strong grounds for the belief that it contains timbers from the *Mayflower*!

The ship is said to have been the property of the owner of the barn, and he is believed to have had parts of the vessel brought to Jordans when the ship was broken up. Striking evidence in support of this belief is a great cracked beam in the barn, for its measurements tally exactly with those of a beam in the *Mayflower*, while the crack is identical with one described in the journal of the voyage in 1620.

Oddly enough, near at hand is also the grave of a famous early American colonist, William Penn. He was laid to rest in the burial ground adjoining the Quaker meeting-house at Jordans, and the inscription on his simple headstone can still be read. His two wives sleep close by, and the meeting-house is a Mecca for anyone seeking links with the men and women who left England in the 17th century to find religious freedom across the Atlantic.

The great barn at Jordans, Bucks., seen in the picture at the head of the page, is believed to contain parts of the "Mayflower," the famous ship of the Pilgrim Fathers. On the right is the village sign at Ringmer, Sussex, which bears the name of William Penn.

Incidentally, the Southern tourist will find a connection with the Penns at Ringmer, near Lewes, where the village sign refers to the fact that one of the wives of the founder of Pennsylvania hailed from this part of Sussex.

The original home of the Penn family was at the village of Penn, Bucks. Henry VIII gave lands there to the ancestors of William Penn. The church at Penn contains a memorial to one of William Penn's descendants, and describes him as *proprietor* of Pennsylvania. The description is literally correct, since

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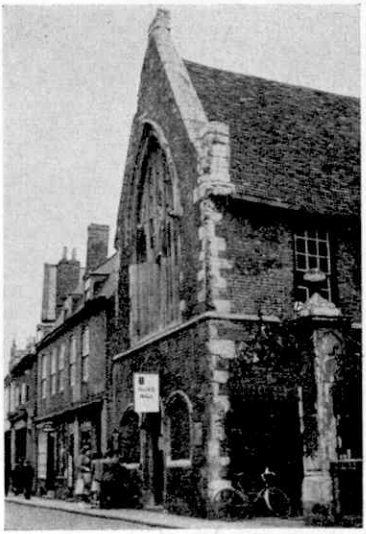


The Guildhall, Boston, where some of the Pilgrim Fathers were imprisoned.

William Penn obtained a grant of land in North America in commutation of a claim against the Crown.

Penn Church has other oddities worth inspecting, including a fine single-handed clock and a rare Norman font bowl made of lead.

Boston, in Lincolnshire, ranks high among places associated with the Pilgrim Fathers. This was the port from which they planned to sail to Holland in search of religious liberty, but their original scheme was disclosed to the authorities, and the leaders found themselves in the gaol of Boston Guildhall for plotting to leave the country without permission.

The Guildhall, a fine brick building near Boston marketplace, still has the iron-grated cells where the future pioneers languished while they awaited trial. That was in 1607, and in 1608 they received a begrudging Government's sanction to sail for Holland, where after 12 years of further vicissitudes they decided to go to North America, calling in England *en route*.

Immingham Creek, near Grimsby, has a monument commemorating the departure of the company, numbering about 100, and Southampton remembers that they put in there, a copper model of the *Mayflower* surmounting a memorial to them on the west shore. At Plymouth, where their companion ship the *Speedwell* had to be left behind, is another token in their honour, an inscribed tablet showing just where they finally embarked on their hazardous voyage across the Atlantic.

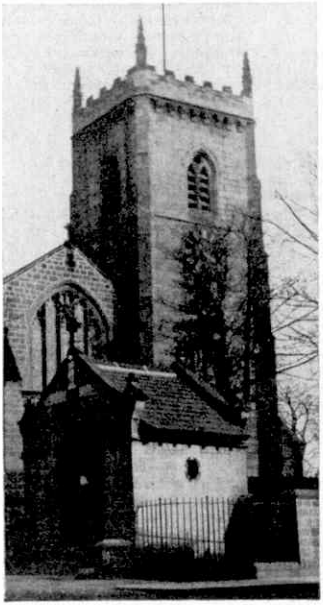
The homes of some of the Pilgrim Fathers exist today up and down England. William Brewster, who is thought to have originated the plan to leave England, lived in what is now a farmhouse at Scrooby, Notts., and although the church font is in America, the old pew occupied by the Brewster family remains.

The house in which another of the pioneers was brought up can be seen at Austerfield, only a few miles from Scrooby. He was William Bradford, who became Governor of the new American colony. He also wrote the log of the *Mayflower's* voyage.

Miles Standish, who was not only one of the Fathers of New England but also was immortalised by Longfellow, was a member of an old-established Chorley family. Their home, Duxbury Hall, stands in a great park outside the town, and though it was rebuilt soon after Miles Standish sailed from England, there are souvenirs of the family hereabouts to this day.

One of the most interesting of these is a pew in Chorley parish church where the family worshipped. It is an exceptionally large affair capable of seating at least twenty persons, for in the

(Continued on page 278)



Guiseley Church, Yorkshire, has memorials to ancestors of the poet Longfellow.

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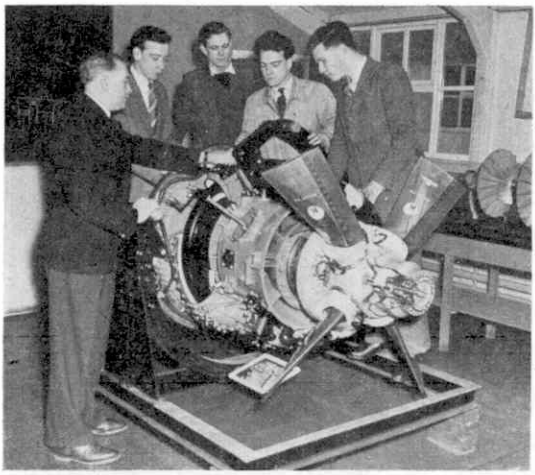
Air News

By John W. R. Taylor



A full-size sectional model of a Rolls-Royce Dart 505 turboprop and the four B.E.A. apprentices who built it under the guidance of Engineer Instructor H. S. Allen, seen on the extreme left.

Apprentices Build Turboprop

Four young B.E.A. apprentices have built a full-size sectional model of a Rolls-Royce Dart 505 turboprop from scrap materials. It took two months to complete, under the guidance of Engineer Instructor H. S. Allen, and will be an invaluable training aid for apprentices, engineers and aircrew at the Corporation's Viking Centre.

As can be seen in the illustration above, the model is beautifully finished, despite the fact that most of the work of dissecting the main components and ancillaries had to be done with simple hacksaws and files. It can be set in motion by a manual control to show the working of each part.

New Canberra Record

When an English Electric Canberra B(I).8 intruder bomber recently flew from Farnborough to Cairo in 3 hr. 57 min., at an average speed of 551.8 m.p.h., it set up the 18th international record captured by Canberras. The pilot and navigator, Peter Hillwood and D. A. Watson, were not new to record-flying, as they had accompanied Wing Cdr. Beamont, English Electric's chief test pilot, on the first two-way crossing of the North Atlantic in one day, in August, 1952.

The Canberra (Serial No. WT329) was on its way to Aden for hot-weather trials, and was painted in the new intruder camouflage, with dark grey and green top surfaces and black undersurface. Powered by two of the latest Rolls-Royce Avon engines, the B(I).8 is armed with a box of four 20 mm. cannon under its fuselage and has racks for bombs or rockets under its wings. It is intended to attack any targets it can discover by night in enemy territory and to shoot down enemy aircraft over their own airfields.

6,600 m.p.h. Research Aircraft

More details have been given of the high altitude piloted research aircraft being developed by North American Aviation under a joint U.S.A.F./U.S.N./N.A.C.A. contract. Designated X-15, it is intended to reach a speed of Mach 10 (about 6,600 m.p.h.) at 250,000 ft. and an ultimate height of 100 miles (528,000 ft.). It will be powered by a rocket engine developing 20,000 lb. of thrust.

Big problem will be to reduce speed on the return journey, because if the X-15 dived straight back into the atmosphere, without any form of braking, it would burn up like a meteorite. It will probably use aerodynamic braking, skimming the fringe of the atmosphere time after time for just long enough to reduce its speed progressively by air friction.

An Aerial Lighthouse

A Lockheed P2V-5 Neptune patrol-bomber acted as an aerial lighthouse when the pilots of four single-engined aircraft became lost in the dark, with little fuel left in their tanks, near the Naval Air Station at Iwakuni, Japan. Overhearing their plight on his radio, the Neptune's pilot, Lt. W. S. Thompson, offered to guide them to safety with the 70,000,000 candle-power searchlight carried under his right wing-tip. He climbed to 8,000 ft. and was spotted by the other pilots from a distance of 50 miles even before he had completed his first 360-deg. turn. They simply flew towards him and were able to make a safe landing at the Station.

Runway of Gold

More than £20,000 worth of gold will lie buried in the new main runway which is being built at Kalgoorlie Airport in Australia. The builders are using quartz ore from the famous old gold-mining centre of Kanowna to form the runway's foundation, because the gold content of the ore—about 18 grains to the ton—is too low to make it worth processing. Altogether, about 40,000 tons of ore will go into the runway, which will therefore contain nearly 1,000 oz. of gold.

World's Busiest Airport

Midway Field, Chicago, retained world leadership as the busiest air terminal in 1955, by recording 304,276 scheduled airline arrivals and departures. This was a 15 per cent. increase over 1954, and represents more than one take-off or landing every two minutes of the day and night.

* * * *

Since the Royal Navy introduced the angled flight deck and mirror landing aid on its aircraft carriers, the accident rate due to pilot error has been reduced to less than one-fifth of the previous figure. Little wonder the U.S. Navy has adopted these fine British inventions.

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A Twin-Engined Piper

Piper Aircraft are, of course, famous for their Cub family of small single-engined monoplanes, so it caused quite a stir when they announced that they were designing a twin-engined "business" 'plane named the Apache. That was four years ago, since when the Apache has helped them to keep their position as the world's leading lightplane builders.

The new 1956 model, illustrated on this page, can carry four or five persons and has extra fuel tanks that give it a maximum range of 1,200 miles at 170 m.p.h. Its two 150 h.p. Lycoming engines enable it to climb to 20,000 ft., and it can maintain a ceiling of 6,750 ft. on only one engine with full load. For ambulance duties a stretcher can be carried on one of the rear seats, with an attendant alongside. Alternatively, the rear seats can be removed entirely, to convert the Apache into a freighter with 80 cu. ft. of cargo space. The standard version costs about £12,000; and it can be fitted with a wide range of the latest radio navigation and safety aids. The wheels protrude slightly when retracted to reduce damage in a belly landing.

The Piper Apache light civil transport aircraft referred to on this page.

First British Air-to-Air Missile

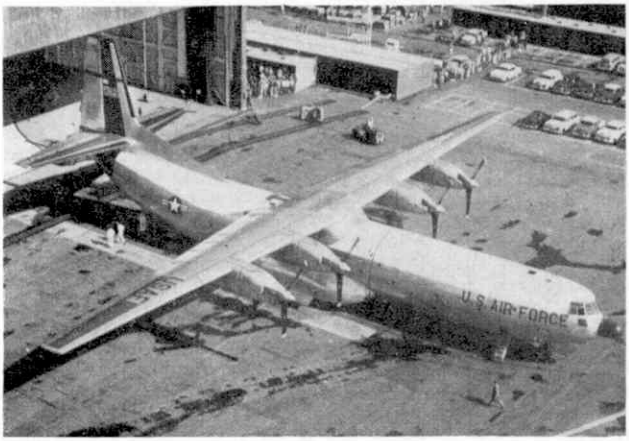
Following development tests in which it became the first British air-to-air guided missile to destroy a pilotless target aircraft, the Fairey Fireflash has been ordered into production for the Royal Air Force. It will be fitted initially to a special version of the Supermarine Swift jet fighter; and may also be carried in due course by the Hunter and the Javelin.

No details of the Fireflash have been announced, but it is believed to be a beam-rider, which means that it flies along a radar beam, locked automatically onto the target by search radar in the aircraft from which it is fired. When near to the target, it is exploded by a proximity fuse, with sufficient force to destroy the largest aircraft flying.

Giant New Freighter

The new Douglas C-133A transport shown at the foot of this page is the biggest air freighter ever put into production, with a wing span of 179 ft. 8 in. and loaded weight of nearly 114 tons. This is 31 tons heavier than the C-124 Globemaster, which is itself regarded as an aerial giant, and it carries about twice the payload of the C-124.

Powered by four 6,000 h.p. Pratt and Whitney T34 turboprops, the C-133A could, for example, carry 16 loaded jeeps, two 18-ton prime movers, more than 200 troops or a huge number of stretcher patients if used as an air ambulance. There is hardly any military vehicle that could not be driven up the rear loading ramp and into its 90 ft. long cabin. But, say Douglas, if you think this is big, wait until you see our XC-132, which will weigh 156 tons and have four T57 turboprops, each developing 15,000 h.p.



This huge Douglas C-133A, the largest air freighter ever put into production, is for the U.S. Air Force.

First 1,000 m.p.h. Speed Record

When the Fairey Delta 2 research aircraft recaptured the official World Speed Record for Britain, on 10th March last, with an average of 1,132 m.p.h. in two runs over a 15 km. course at a height of 38,000 ft., it became also the first aeroplane ever flown at more than 1,000 m.p.h. *over a measured course in straight and level flight.* The pilot was Peter Twiss, who flew naval fighters and Mosquito intruder bombers in World War II and was awarded the Distinguished Service Cross and bar.

The Bell X-1A has flown at 1,650 m.p.h., but it was air-launched from a parent aircraft and has insufficient fuel to make two full-power runs over a measured course, so cannot set up an official record.

A special article in next month's *M.M.* will tell more about Peter Twiss, and deal also with that other great pilot—Major C. Yeager, of the U.S.A.F., who, in the Bell X-1A, attained the above unofficial record speed.

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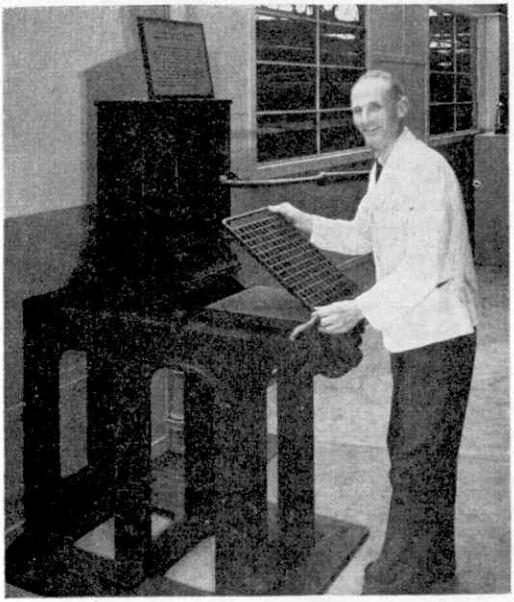
Biscuits by the Million

By Arthur Gaunt

ALTHOUGH you would scarcely expect to find a connection between printing and biscuit-making, such a link does exist, for the inventor of the first machine for producing biscuits got his idea by studying a printing machine!

That was more than a hundred years ago, and the inventor was Jonathan Dodgson Carr, a Carlisle baker who had built up a confectionery business in the town. His biscuits were at first all cut out by hand, but this branch of his trade expanded so swiftly that some mechanical means of cutting them became necessary.



The first biscuit-cutting machine ever made. It was invented by Jonathan Dodgson Carr, and is still to be seen at the works of Carr and Co. Ltd., Carlisle.

The problem was solved by enlisting the services of a blacksmith, who built a machine resembling a flat-bed printing machine. In place of the bed of type, dough was rolled out on the table. The pressure plate, which on a printing machine brings the paper into contact with the type, was replaced by a sheet of metal bearing 150 cut-out shapes, thus producing that number of dough biscuits ready for the oven.

Today, with millions of biscuits being sold, machines that are worked by hand, as this one was, would be totally inadequate, and a host of improvements have been introduced. Mechanical processes are used at many stages, some of the machines being monsters capable of producing six tons of biscuits a day.

On the other hand, not all biscuits are made entirely by machinery. Certain fancy varieties undergo hand treatment. Biscuits, indeed, are made in greater variety than any other kind of foodstuff, for shipment to all parts of the world as well as for distribution in the United Kingdom.

Though flour is the main ingredient, huge quantities of other raw materials are needed in a biscuit factory—fats by the ton, sugar by the truck-load, cocoa for chocolate covering, salt, and such incidentals as colouring for some of the decorative icing applied to certain varieties. Eggs, butter, milk, ginger, currants, sultanas, arrowroot and various flavourings also go into the making of biscuits. All these must be chosen with the greatest care. The type of flour selected is most important, since it is impossible to get satisfactory results with even the highest quality if it is not of the right kind. Actually, careful blending is employed to produce a flour that is soft, but is not excessively glutinous or overconditioned.

Again, although a number of varieties of wheat are suitable for biscuit manufacture, there is a marked difference between them when they are grown in different areas and subject to different climatic conditions. Thus, an ideal biscuit wheat grown in East Anglia is not necessarily ideal if grown in Northumberland. The moisture content also is an important factor. While it must not be too high, a very dry season results in a strong flour liable to blister and break during baking.

The flour is therefore tested, sieved,

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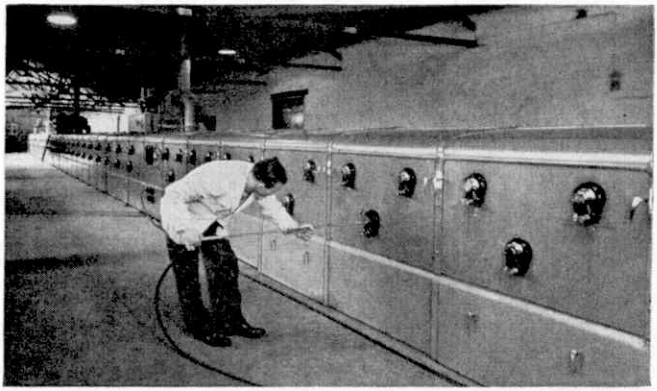
blended, and re-sacked before it is sent by overhead conveyors to the spacious mixing rooms of the dough making department. There it is chuted into dough tubs, with other ingredients, ready to be wheeled to the monster mixing machines. These resemble huge cauldrons and are fitted with mechanically operated beaters or mixing arms, which knead the dough to the right consistency before passing it to the rolling and cutting machines.



This oven for biscuit baking forms a continuous tunnel, through which the cut dough is carried on steel conveyors. Photograph by courtesy of Carr and Co. Ltd.

The next step is to reduce the dough to the right thickness, and this is done by carrying it forward in a continuous strip similar to a length of cloth, during which it passes under rollers. The number of rolling stages varies according to the type of biscuit—for instance, "short" varieties undergo less rolling than others.

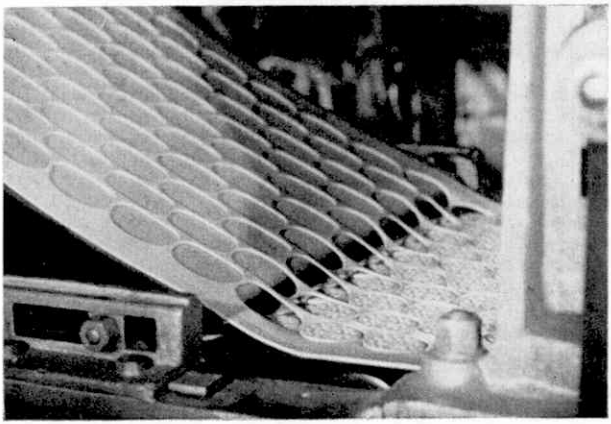
A stamping unit immediately after the final rollers descends with a swinging motion to cut biscuit shapes from the moving strip of dough. At the same time the dies imprint the trade name and any other markings that are to appear on that particular kind of biscuit.

The machines even return the scrap dough to other machines for soft short-cake dough production, or for water biscuits and crackers, so that nothing is wasted.

The focal point of all the operations is of course the bakehouse, where the biscuits are carried on steel conveyors through long tunnel-like ovens at a predetermined speed. To prevent the biscuits from sticking, the belt is automatically cleaned and re-greased before making the return journey.

The time taken for the journey through the ovens is adjusted according to the kind of biscuit. Marie biscuits, for example, are allowed 8-9 minutes for the journey, whereas cream crackers go through at double this speed. Both gas and electric ovens are used, but the heat-retaining qualities of brick make it the ideal material for oven building today, as it has been for centuries.

The fully-baked biscuits come from the ovens on conveyor belts that take them to cooling rooms. After cooling they may go to the packing rooms, or to other departments for further processing. Cream biscuits, for instance, are made mechanically by sandwiching machines, but iced biscuits are often



Biscuit shapes are cut from the dough by machines that also impress the design on the biscuit. Photograph by courtesy of Huntley and Palmers Ltd.

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decorated with designs in icing by hand.

Though some simple iced designs can be added by machinery, the more elaborate ones are dexterously and swiftly decorated by girls using stencils. The shape of the biscuits also partly decides whether they can be finished by machines, since those of irregular shape are difficult to process mechanically.

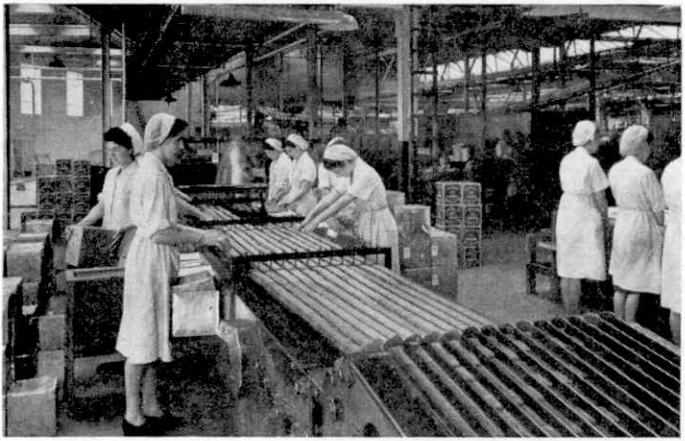
"Enrobing," the term given to the process of covering ordinary biscuits with chocolate, is done by machinery. Liquid chocolate, actually made on the premises from cocoa beans in some modern biscuit factories, is pumped through heated pipes straddling the conveyor belt.

Holes in these pipes allow the liquid chocolate to drip on to the biscuits passing beneath, the surplus chocolate then draining away for return to the source, so that it can be used for coating later biscuits. When the coating has set, the biscuits proceed to the inspection and packing sections.

Oddly, most biscuits are not true biscuits, for the name really means *twice cooked*. Rusks or cracknels, however, are an exception, for they do undergo two different cooking or baking processes. The dough, cut to shape, is first thrown into boiling water. The heat causes aeration and the biscuits rise to the surface. They are then skimmed off, plunged into cold water, and baked in a quick oven.

As the biscuits enter the packing department they are automatically turned over by the belt to permit inspection of the underside. Next they pass through rails that stand them on edge so that the packers can handle them more easily.

The packing section comprises three conveyors, one above another, the top one carrying empty tins from the tin-making department. The bottom conveyor carries the biscuits on edge between rails, fences opposite each packing station preventing further travel along the line.



Biscuits are delivered to the packers on edge.

Each girl neatly and quickly lines her tin with paper, places the tin on special scales, and packs it with biscuits. The full tin is then put on the centre conveyor, which carries it to the end of the line. There the weight is checked before the tin is labelled and placed on another conveyor leading to the despatch department.

Incidentally, all ingredients in biscuit-making are thoroughly tested for purity and standard of quality, laboratories being maintained for the purpose.

The expansion of the ice cream industry during the last few years has greatly increased the demand for wafer biscuits, and one biscuit factory alone is equipped to produce 30,000 standard-sized wafers each working day. They are made in a gas-fired oven, the method being to press thin batter on to a baking plate measuring $11\frac{1}{2}$ in. by $18\frac{1}{2}$ in. A second plate is put on top, and the "sandwich" is then passed through the oven. The plates can be set for the production of all kinds of wafers.

Mechanisation cannot be used to the same extent in packing assorted boxes and tins, but the job has been speeded up by "motion study" methods, in which every movement made by the packers is facilitated by careful arrangement of the tins and boxes. These are so placed that time-wasting movements are avoided, and special stands have been designed for the tins containing the bulk supplies, so that each variety can be transferred with the least effort. The biscuits, paper for the cartons, the paste, and the end seals are all within easy reach, so that the work of packing goes on swiftly and easily.

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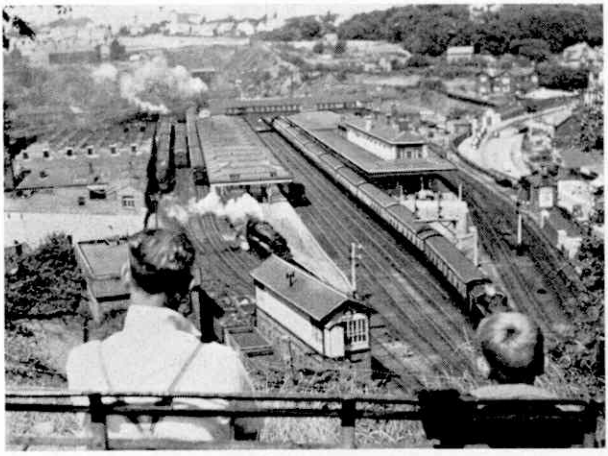
MECCANO MAGAZINE

Junior Section

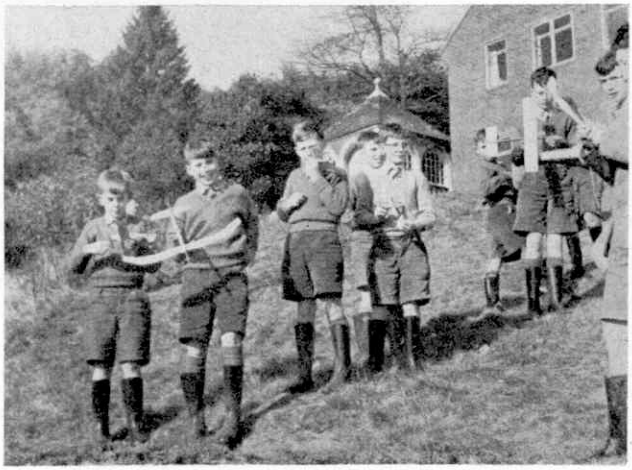


Geoffrey Anders, of Leasowe, Moreton, Wirral, and his father enjoying a splendid railway view during a sunny holiday.

WHAT a wonderful place the two *M.M.* enthusiasts seen in the picture above have chosen to enjoy a fine railway scene! They are Geoffrey Anders and his father, and the station below them is at Bangor, in North Wales. The station lies between two tunnels, and this view of it is taken from a vantage point about 100 ft. above one of them, while in the distance is the smoke and steam from a train emerging from that at the far end of the station. Apparently only one regular feature of this splendid railway scene is missing—the seagulls that usually perch on the water tank on the left of the station!

An interesting point about this scene is its resemblance to a Hornby-Dublo railway, for which indeed it would form an admirable model. There are four platforms, with plenty of tracks, and the layout can be simplified for miniature purposes without losing any of its character.

I hope that many of you will be able to find splendid viewpoints such as this during the coming holiday season. Then is the time to see new stations and track formations, and it is remarkable how often a pleasant time such as that being enjoyed by our two readers in the picture can lead to equally happy hours during the following winter with a miniature railway that is a pleasure in itself and a delightful reminder of a holiday.



Boys of Woolpit School, near Cranleigh, Surrey, take their aeroplane models out to the glider bank for testing. Photograph by the Rev. B. Croft.

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The New Thirties

By "Tommy Dodd"

GOOD news for the younger Hornby Train enthusiasts this month! This is the appearance in the Hornby System of two new Train Sets, the components of which appear in two of the accompanying illustrations. These Sets are respectively the No. 30 Goods Train Set and the No. 31 Passenger Train Set. Both Sets include 1 ft. radius curves and in this respect they correspond to the M1 Sets, which they will ultimately replace.

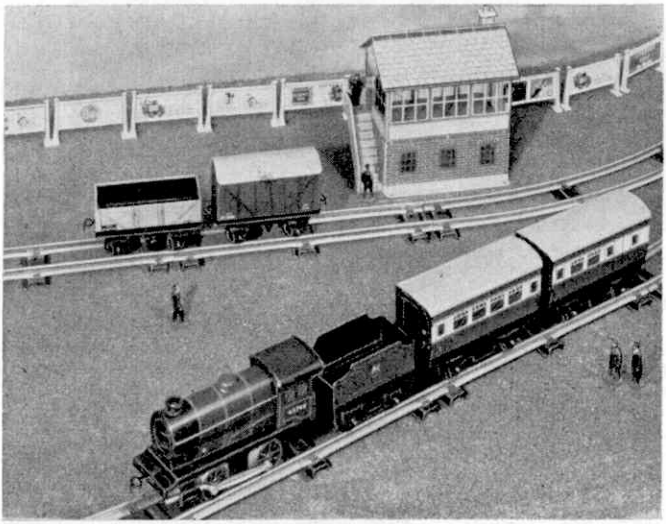
Needless to say, the engine and stock of the new Sets are in B.R. standard livery, and I am sure that all of you will be very pleased with their smart appearance. The same engine and tender is included in each Set, the No. 30 Locomotive being a re-designed version externally of the M1, which has proved a popular long-running engine. The cab is more modern in style and instead of being developed in one piece from the boiler pressing, as on the M1, it forms a separate "house." This arrangement gives a great deal of strength to the structure as a whole and one result of adopting it is the appearance of look-out windows in the cab front or weatherboard, which is a great improvement. This is a hand-reversing Locomotive, remember, and brake and reversing levers project through slots in what enginemen call the "front," on which are printed representations of the various cab fittings.

The No. 30 Tender is completely new and suits the engine very well. It is good to look at, with flat sides, and the body is mounted on a stout base. The main frames bear embossed representations of the springs and axleboxes that are such characteristic features of the real thing.

The new No. 30 Wagon and No. 30 Goods Van both have the same type of base with a nice amount of embossed detail. The bodywork has a printed finish, in B.R. grey for the Wagon and, for the Van, the red-brown shade known as bauxite. B.R. Standard vehicles are represented in the printed designs, the planking, strapping and door details being carried out very neatly. An excellent bit of detail is that the ends of the Van show a representation of the brake pipes seen on the real thing.

The body construction is very stout and the Van is built up in a different way from that previously used for Hornby Rolling Stock. The sides and roof are made in one piece, the separate ends being lugged on.

Before describing the Passenger Coaches of the No. 31 Set, I must point out that a new form of coupling has been developed and applied to these new trains. This takes the form of a combined loop and tongue. Vehicles can be coupled either way round without difficulty. To couple up all you have to do is to lift the end of one vehicle



Components of the new Nos. 30/31 Train Set appear in this illustration. The two Coaches shown make up the Passenger Train Set, while the two goods vehicles of the other Set stand on the track by the Signal Cabin.

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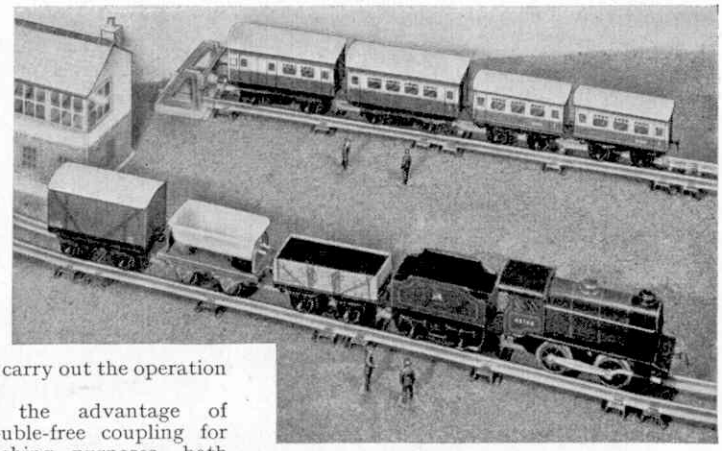


Here we have some of the new stock coupled to vehicles of the Nos. 20/21 Sets. Their use together in this way is something that will appeal to many younger readers.

slightly, so that the tongue of its coupling drops into the loop of the coupling on the next wagon. To uncouple, which is just as easy, you simply carry out the operation in reverse.

Apart from the advantage of providing a trouble-free coupling for pulling and pushing purposes, both being very necessary when running your trains, the new couplings have the advantage that they can be made to engage with those of the smaller Nos. 20/21 rolling stock. Thus the two kinds of stock can be used together quite satisfactorily and a railway that begins with one of the smaller Sets can be developed by the addition of one of the new ones.

But bear in mind that when the engine is pushing the train it is not advisable to try and push too many vehicles, especially on 1 ft. radius curves, as the side thrust of the couplings may be liable to cause derailment.

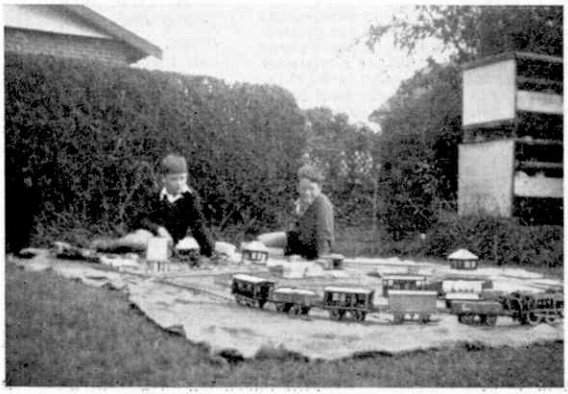
Another point to which I should draw attention here is that the stock of the Nos. 20/21 and 30/31 Sets cannot be coupled to standard Hornby vehicles having automatic couplings, because of the difference in coupling heights.

You will notice that the new No. 31 Coaches are, of course, bigger than those of the No. 21 Set. These new vehicles form a great step forward for rolling stock of this class, and their general shape and style reproduces B.R. practice in a very pleasing manner for the younger Hornby railwayman. Here again one-piece construction of sides and roof is employed and the smooth build-up from sides to roof gives just the impression of modern coaching stock.

The coach bodies are what is known as bow-ended in form, that is they curve outward beyond the headstocks or ends of the underframes, the result being that the effective distance between the Coaches at the centre is reduced. This gives a fine close-coupled look to our new trains that I am sure you will all like.

The coach bodies have a smart printed finish in B.R. crimson and cream. There are two versions. One is a plain Coach or first-third, and to complete the train correctly there is also a brake-third Coach, marked by the representation of guard's and luggage accommodation at one end.

I am sure that you will welcome these new trains into the System, and I have no doubt that you will watch out keenly for the various features to which I have drawn your attention.



Geoffrey Murray, Otago, N.Z., on the left, and a friend have a good time on the lawn with their Hornby Trains.

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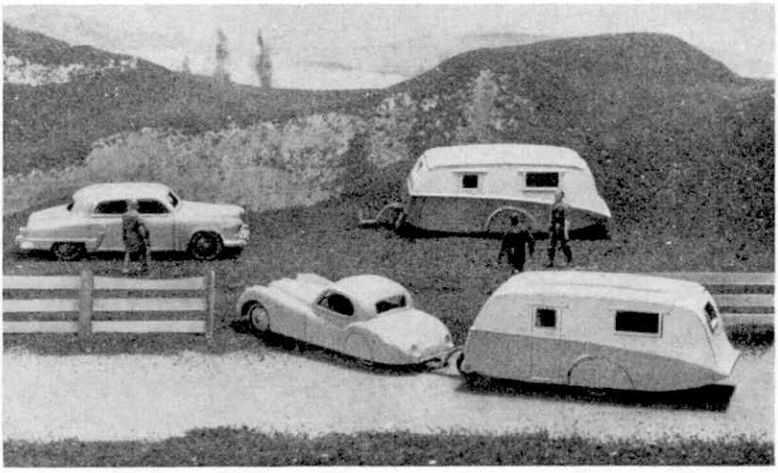

DINKY NEWS

Caravan Holidays!

By **THE TOYMAN**

THIS month I have good news for the many Dinky Toys enthusiasts who have asked for a miniature caravan to be added to the range. Caravan holidays are very popular these days, and caravans being towed by cars along the roads or grouped in good camping grounds are indeed familiar sights. Dinky Toys collectors must follow this trend in miniature, of course, and now they too, or at least the little and perhaps imaginary folk who live on their layouts, can enjoy a caravan holiday this summer.

Older readers may remember a model caravan in our pre-war range. This was withdrawn for a very good reason. Since the war improvements have been made in the design of the base plates and axle mountings of Dinky Toys cars, and the towing bar of the original caravan is unsuitable for coupling to the latest cars. The new Dinky Toys Caravan can be towed perfectly.

Dinky Toys collectors are very observant—as I have good cause to know when I have made an occasional slip in my monthly chat with you!—and I expect most of you have noticed the half-moon shaped hole cut at the back of the base of each of the latest cars, and indeed in some older ones. This hole has an important part to play in the coupling mechanism of the new Caravan, as you will see when I describe the towing attachment.

There will be caravan holidays for Dinky Toys people this year, for a Dinky Toys Caravan has made its appearance. It is shown in two different scenes on these pages. The picture above shows Dinky Toys Caravans, No. 190, at a miniature caravan site. The ingenious towing device of the new Caravan can be seen. At the head of the next page this new Dinky Toy is seen in a picturesque setting along the bank of a river.

The new model is thoroughly up-to-date in appearance, with an attractive streamlined shape typical of modern caravans. It has a window at each end, and two windows along one side. The other side has only one large window, but a smaller window is fitted in the door marked on this side of the model. The centre section of the roof is raised to provide added headroom inside, and ventilators are indicated along the edges of this raised section. The Caravan can be obtained in two attractive colour schemes—cream and blue and cream and yellow.

The model is supported by two centrally placed main wheels, and by a single small wheel mounted in a special bracket at the front. This small wheel keeps the Caravan

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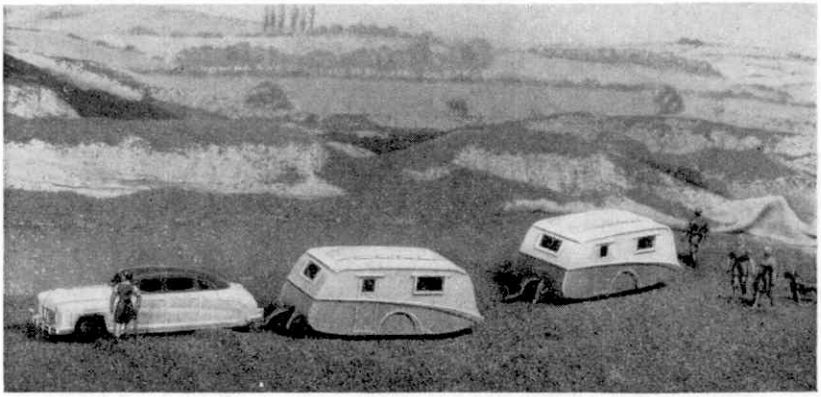

level when it is parked and when it is being towed, and no additional supports are needed.

Now for the towing attachment, which is simple but ingenious in design and operation. It consists of a specially shaped bar pivoted at the front end of the Caravan and extended so far inside that the weight of the part within normally keeps the front end of the bar raised. This end is shaped into a hook. By depressing the bar the end of the hook can be slipped upward into the half-moon shaped hole provided in the bases of many Dinky Toys cars and in all of the more recent ones, and it remains there until the towing bar is depressed again by hand. This of course is all that is necessary to uncouple the Caravan.

As you can see from two of my pictures, and from the illustration in colour on the back cover of this issue, the Caravan is a splendid model and looks really well whether on tow or in position at a camping site. It represents a fairly big caravan and if possible it should be towed by the larger and more powerful cars in the range. If your models are confined to the smaller cars, however, there is no need to worry. In miniature even the smallest Dinky Toys car can be used successfully for towing, and after all the main thing is to have as much fun as you can with your models.

My third picture this month shows the latest addition to the range of Dinky Toys aeroplanes. It is another Royal Air Force machine, and is modelled on the famous delta wing Gloster Javelin. Produced as a two-seat, all weather fighter, the Javelin is powered by two powerful jet engines. The model is a faithful reproduction of the real machine, and is finished in camouflage colours with Royal Air Force insignia.

The Gloster Javelin, No. 735 in the range, is sure to make an immediate appeal, especially to the many collectors who are building up fleets of Dinky Toys aeroplanes.

Recently I have had several letters from readers who have built miniature aerodromes. These collectors have had a lot of fun building and playing with their airport layouts, and I hope other Dinky Toys enthusiasts will follow suit. The requirements are very simple, and need consist of no more than a baseboard and a few buildings to use as a control tower and hangars. If you have already made or intend to build an aerodrome, no matter how simple, write and let me have details of your scheme. I shall be delighted to hear from you.

A striking view of the latest Dinky Toys aeroplane, the Gloster Javelin Delta Wing Fighter, No. 735.

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Easy Model-Building

Spanner's Special Section for Juniors

ONE of my two new models this month is an attractive Motor Coach that should delight those who have an Outfit No. 2 and a *Magic* Motor. For model-builders with an Outfit No. 3 or one larger, there is a working Windmill, which is also fitted with a *Magic* Motor as the power unit.

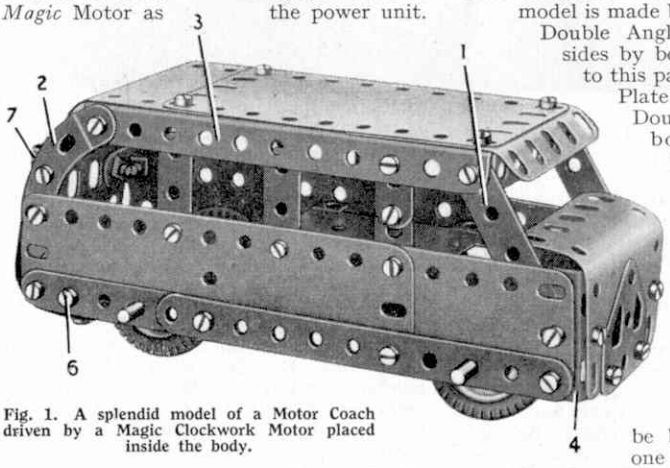

Fig. 1. A splendid model of a Motor Coach driven by a Magic Clockwork Motor placed inside the body.

Let us start with the Motor Coach, which is seen in Figs. 1 and 2 on this page. Each side of the Coach is formed by a $5\frac{1}{2}'' \times 1\frac{1}{2}''$ and a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate. These Plates are strengthened along their lower edges by two $5\frac{1}{2}''$ Strips overlapped seven holes. A $2\frac{1}{2}''$ Strip 1 is fixed at an angle to the front end of each side, and a $2\frac{1}{2}''$ Stepped Curved Strip 2 is bolted to the rear end. A $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate 3 is supported by the Strips 1 and the Curved Strips 2 of the sides, and the window frames on each side are represented by two $2\frac{1}{2}''$ Strips and two Fishplates bolted together.

The front of the Coach is made by bolting a Trunnion 4 to each side, and to these Trunnions is fixed a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate curved as shown and fitted with a Flat Trunnion. The rear end of the model is made by attaching a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip between the sides by bolts 6 and then fixing to this part a U-section Curved Plate 5. A further $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 7 is bolted between the Curved Strips 2.

The roof is completed by bolting a $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate, a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate and a $1\frac{11}{16}''$ radius Curved Plate to the Flanged Plate 3.

If a *Magic* Clockwork Motor is available it can be bolted by its lugs to one side of the model (see Fig. 2), and its pulley connected by a Driving Band to a $\frac{1}{2}''$ Pulley on the rear axle.

Parts required to build the Motor Coach: 4 of No. 2; 6 of No. 5; 4 of No. 10; 2 of No. 12; 2 of No. 16; 4 of No. 22; 43 of No. 37a; 40 of No. 37b; 4 of No. 38; 2 of No. 48a; 1 of No. 52; 2 of No. 90a; 3 of No. 111c; 2 of No. 126; 1 of No. 126a; 4 of No. 142c; 2 of No. 188; 2 of No. 189; 2 of No. 190; 1 of No. 191; 1 of No. 199; 1 of No. 200; 1 *Magic* Clockwork Motor.

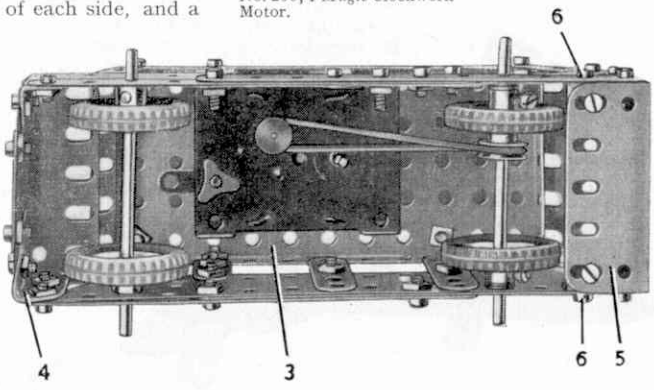

Fig. 2. This picture of the Motor Coach shows how the Magic Motor is connected to the rear wheels.

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Now for the Windmill, which is pictured in Figs. 3 and 4. Let us start building the Windmill at the base, which is a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate. The curved $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates that form the supporting column 1 are attached to it by Angle Brackets, and the top edges of the Plates are strengthened by four Formed Slotted Strips.

Each side of the windmill body is a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate, with its upper and lower edges strengthened by $2\frac{1}{2}''$ Strips. The sides are connected at the top by $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips, each of which supports a Semi-Circular Plate 2. The lower edge of each side is attached by a bolt 3 to a $\frac{1}{2}''$ Reversed Angle Bracket that is bolted to the column 1. The top of the body is a curved $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate bolted to the sides.

At the front the sides are connected by Angle Brackets to two $2\frac{1}{2}''$ Strips 4 overlapped three holes, and these Strips are attached to a Fishplate bolted to the column 1. Two $2\frac{1}{2}''$ Stepped Curved Strips 5 at the rear are bolted to the column 1 as shown and are connected to the sides of the body by Angle Brackets.

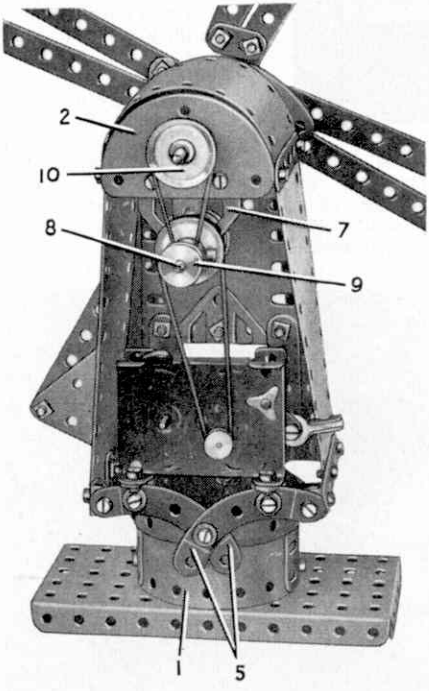

Fig. 4. This view of the Windmill from the back shows the drive to the sails in detail.

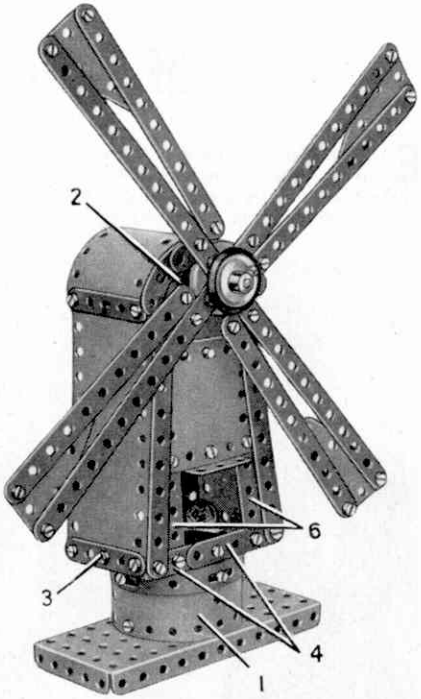

Fig. 3. Another fine model driven by a Magic Clockwork Motor. This Windmill can be built with parts in a No. 3 Outfit.

The front of the mill is filled in by two $5\frac{1}{2}''$ Strips, a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate, a $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate and two $2\frac{1}{2}''$ Strips 6. The $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plate is bolted to the Semi-Circular Plate 2 at the front, and the Strips 6 are fixed between the $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate and the Strips 4. Two $2\frac{1}{2}''$ Stepped Curved Strips are fixed to the front Semi-Circular Plate as shown, and a Trunnion is bolted to the lower edge of the $2\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate. A Flat Trunnion 7 is attached to the Semi-Circular Plate at the rear.

A *Magic* Clockwork Motor is supported by two Angle Brackets bolted to the Curved Strips 5. The Motor pulley is connected by a Driving Band to a 1" Pulley on a 4" Rod 8, which is mounted in the front of the mill and in the Flat Trunnion 7. A $2\frac{1}{2}''$ Driving Band is passed over Rod 8, and is held on the Rod by a $\frac{1}{2}''$ Pulley 9, which is supplied with the *Magic* Clockwork Motor. The $2\frac{1}{2}''$ Driving Band is passed round a 1" Pulley 10 that is

(Continued on page 278)

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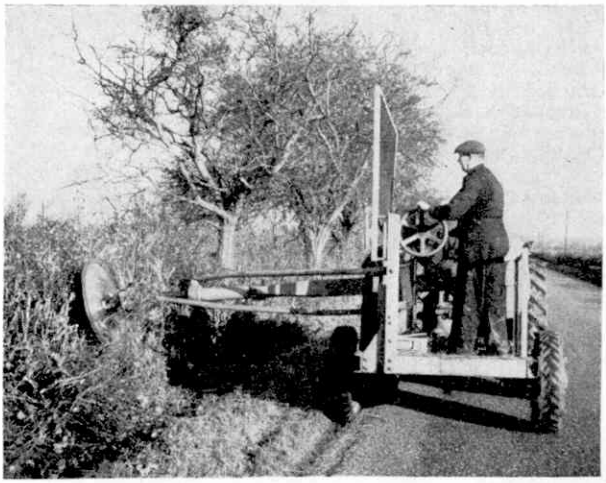
Of General Interest

EASY hedge cutting is the theme of the upper illustration on this page. The cutting is done by a circular saw driven by its own power unit, mounted on a tractor.



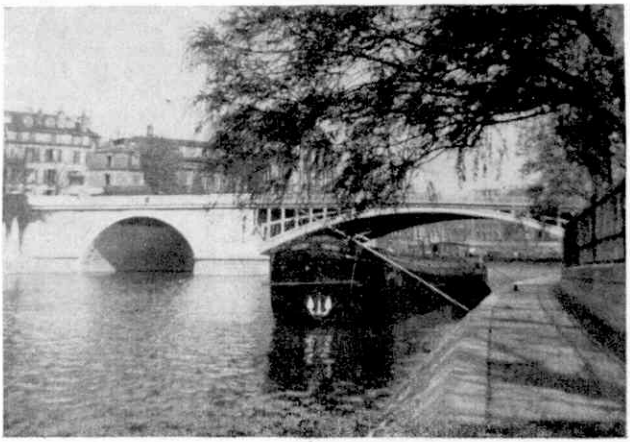
A mechanical hedgecutter with which a mile or more of hedge can be trimmed in a day. Photograph by W. S. Eades Birmingham.

With this two men can cut a mile or more of hedge in a single day, and they can do it safely, for there is a sturdy wire frame to protect them from flying twigs and branches.

The lower picture on this page interested me when I first saw it because of what seemed to be the two distinct halves of the bridge illustrated. This crosses an arm of the Seine and is known as the Pont de Sully. In fact, there are two Ponts de Sully, for there is a second bridge crossing a larger parallel arm of the Seine at this point.

The bridge seen in the picture is incomplete. The cast iron arch seen on the right is really the middle arch of the bridge, and is flanked by *two* stone arches, only one of which is seen in the picture. The full length of this bridge is 93 metres, or about 101 yards, while the second bridge, crossing the larger arm of the Seine, is 163 metres long. They were built between 1874 and 1876. Other bridges of similar design, that is with a cast iron span between two stone arches, were built about the same time, the period being one when cast iron was largely used in constructional work.

It is not only the world's mighty bridges that attract us. There is real interest in the smaller bridges, of all ages, which have played a wonderful part in opening up our world to civilisation.



The Pont de Sully, Paris. A second stone arch on the right completes the three arch bridge. Photograph by C. H. Lovelock, Reading.

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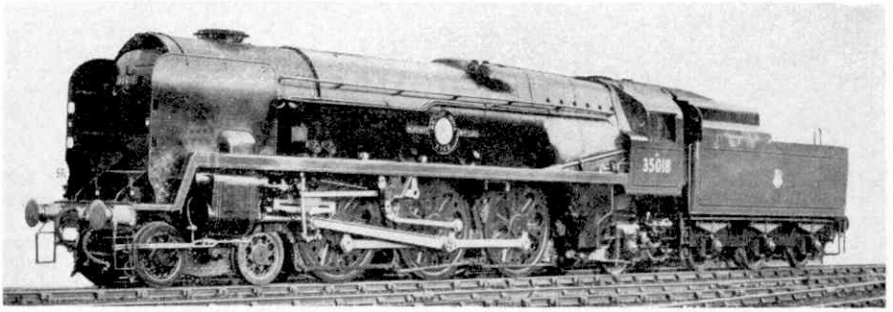

Modifying the Merchant Navies

THE first Merchant Navies appeared on the Southern Railway in 1941 and as a class they have hauled the heaviest and fastest trains on the Southern main line to Bournemouth and to the West of England, as well as many of the boat trains to the Channel ports. They have given good service and have been able to handle their trains to time, and they made an excellent showing during the trials carried out by British Railways in 1948, one of them being responsible for two momentous runs from Penrith over Shap Summit on the L.M.R. But they have always had the drawback that in doing their work their consumption of coal, oil and water has been high in comparison with that of other modern locomotives.

So alterations have now been made to No. 35018 *British India Line* to improve their performance, and also to make for easier servicing and maintenance. The changes indeed go further than just the removal of the outer casing that gives the class its distinctive appearance.

The well-known "air-smoothed" locomotives of the Southern Region created quite a sensation among railway enthusiasts when they made their appearance away back in 1941. Many of us have wondered at one time or another what they would look like if their outer casings were removed. British Railways have now provided an answer to this in Merchant Navy No. 35018, which is seen in its new form above. This article explains why and how it has been modified.

In the first place, although the outside pair of the three original cylinders has been retained, a new inside cylinder has been provided, with the substitution of Walschaerts gear for all three instead of the chain driven motion that formed a novel part of the original design. Then the oil bath formerly enclosing all the motion and the inside connecting rod has been dispensed with. Its application was ideal in principle, but unfortunately this did not work out in practice. Further, hand reversing has been provided instead of the former steam reverser.

Now for more obvious outside changes. At the front end, the irregularly shaped smoke-box of the original design has been replaced by a circular one, flanked by a pair of "blinkers" or smoke deflectors. Within the smoke-box the multiple jet blast pipe is retained, and on top of it there is now a cast iron chimney of large diameter, but the original well-domed smoke-box door is retained.

The boiler is unaltered, but to bring the engine into line with recent standards a rocking grate of standard B.R. type is fitted, to improve combustion and to help reduce turn-round time at the end of journeys. The self-emptying ashpan, in three sections as before, will help in this direction.

The sanding arrangements, which had already seen some changes, have been modified to provide steam sanding to leading coupled and driving wheels, and the foot-framing above the wheels resembles closely that on all B.R. Standard engines. In outward appearance the cab remains much the same, but the lower section of the side sheets is cut away to provide greater accessibility for repair purposes, and to conform with the altered external appearance of the engine and tender. The tender has been modified and now shows a flat tank top at the rear.

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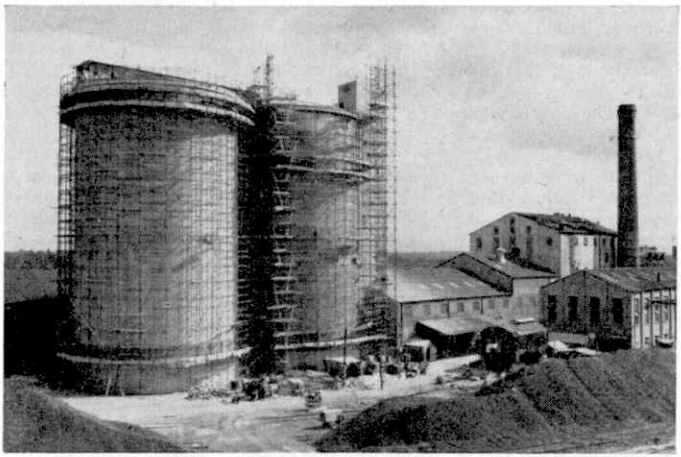
Silos for Sugar

NOWADAYS an increasing range of goods of all kinds is sold ready packed. One of our most important foods, sugar, is concerned in this trend, which has also brought about interesting changes in handling. Until recently it was the practice to store sugar in 1 cwt. or 2 cwt. bags, piled high in warehouses. Now bulk handling is called for, and one way of meeting this is to store the sugar in silos.

Storage silos for sugar have already been built in the United States and in Europe, generally of steel lined with wood, or of concrete. Where the latter material was used the silos were small in diameter and had thick reinforced concrete walls to carry the thrust of the sugar contained in them. Now a further step forward has been taken by the construction in Great Britain of two silos of unusual size at Poppleton, near York, for the British Sugar Corporation. They are 66 ft. in diameter and 120 ft. high. In them 15,000 tons of sugar can be stored, and it can be taken from them to be bagged or put into packets as required, or to be delivered in bulk in special road tankers.

These bulk storage silos, the first of their kind to be constructed in the country, have been made possible by the development of ways of pre-stressing concrete. The ground on which they are built is rather unstable, so to avoid movement and to provide a firm base, a large number of concrete piles were driven into the ground to a depth of nearly 30 ft. where they rested on a hard bottom. Altogether 483 of these piles were used.

On top of the piles a heavy reinforced concrete slab 21 in. thick was built to form the base of each silo. On it a circular wall 12 in. thick was built, and columns 18 in. square and 9 ft. 6 in. tall, spaced 8 ft. apart, were erected. Another heavy reinforced concrete slab was constructed on top. The space between the two concrete slabs is the basement of the silo, in which conveying machinery for the sugar is housed. The ceiling of this basement is the floor of the silo itself, and there are 49 openings in it through which the sugar can be withdrawn as required.



Giant silos for storing refined sugar at Poppleton, near York, in course of erection. Illustrations by courtesy of the British Sugar Corporation Ltd.

To complete the silo a circular wall 8 in. in thickness was then built in concrete lightly reinforced with steel rods. In this way a cylinder of concrete 66 ft. in diameter and 108 ft. high was formed. On top of it is a rim similar to the top of a jam jar, and from this rim the roof is started.

The two silos were built side by side, as seen in the picture on this page, and a high conveyor bridge crosses the two. This is 13 ft. wide and 18 ft. high, and in it is the machinery by which the sugar is delivered into the silos for storage. It reaches the top of the silos up a square

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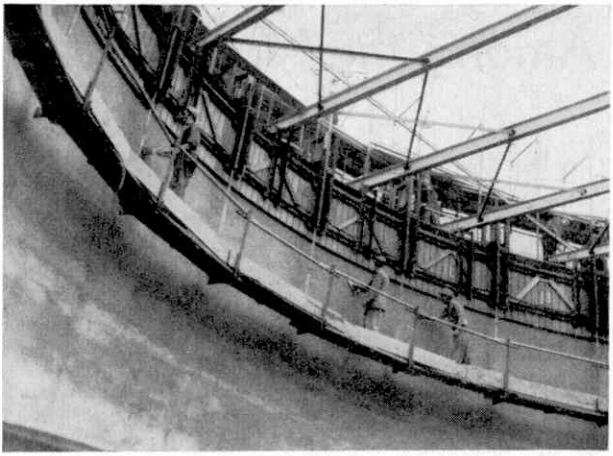
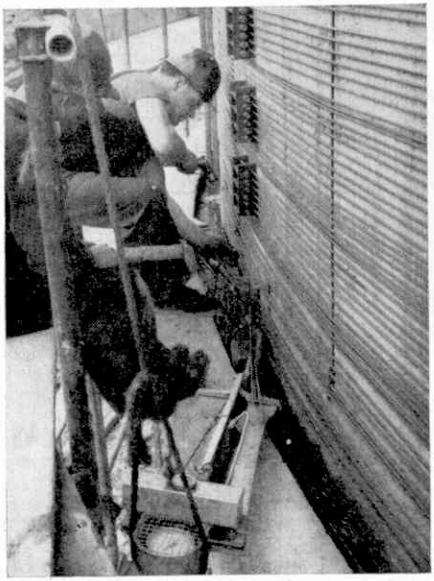
elevator tower 145 ft. high constructed at the end of the line of the two silos.

Novel methods were used in building the two silos. Owing to the large diameter, the full height of the column of sugar contributes to the thrust on the walls at the base. Yet walls only 8 in. in thickness are sufficient to withstand the thrust because the cylinder is pre-stressed. Round it wires a little more than a quarter of an inch in diameter have been passed, and these have been tensioned to resist the thrust. The stressing wires are separated from the concrete by vertical mild steel bars of small diameter in order to reduce friction when the wires were being stressed.

Another innovation was that the steelwork of the roof was built at ground level and attached to the shuttering used for forming successive sections of the concrete walls. As the shuttering was moved up on the completion of each section, the roof went up with it, so that at the end of the concreting it was in place at the top of the silo.



Sliding shutters for concreting were raised by hydraulic jacks. A platform for rubbing up the concrete was suspended from the shutters.



Fixing wires round the walls of the silos in readiness for pre-stressing.

This unique method of construction made sure that a true circle was kept during concreting.

It will be seen that during the building the shuttering, and with it the structural steelwork of the roof, had to be raised after each stage in the concreting had been completed. This was done by climbing jacks, a system of raising shuttering for concreting that has been developed by Tangyes Ltd., and was used here on a full scale for the first time.

There were 40 of these climbing jacks, spaced evenly around the silo wall to support and raise a total load of 80 tons. Through the centre of each jack passed a steel climbing bar 1 in. in diameter. The jack casing was fixed to the shuttering. There were two sets of gripping gear built into the jack. One set allowed upward movement only of the jack casing over the climbing bar, and when oil was pumped into the jack to a pressure of 16 lb. per sq. in. the casing ascended the climbing bar, while the piston remained stationary. This of course gave the required lift to the shuttering and to the roof steelwork. When the pressure was released the piston also ascended the climbing bar under spring loading, the second set of gripping gear allowing this. Each stroke of the piston elevated the jack by an inch.

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Among the Model-Builders

By "Spanner"

Mr. Brian W. Rowe, Newton Abbot, the builder of the fine Showman's Traction Engine seen on the opposite page.

A Fine Showman's Traction Engine

Mr. B. W. Rowe, Newton Abbot, Devon, whose portrait appears on this page, is an experienced model-builder whose activities will be familiar to every regular reader. From time to time I have been able to include pictures of some of the outstanding models built by Mr. Rowe, and this month I am illustrating yet another example of the exceptionally high standard of model-building reached by this Meccano enthusiast.

The model shown in Fig. 2 is based on the last Showman's Traction Engine to be built in this country. The prototype is the *Supreme*, No. 20223, made by Messrs. J. Fowler and Co. Ltd., Leeds, and as far as possible the Meccano model is built to scale and reproduces every important feature of the real machine. Details include full working valve gear, governor and pumps, steering operating in the correct way, differential and brake mechanisms on the rear axle, and fully sprung rear wheels. The model is driven by an E20R Electric Motor.

Mr. Rowe is to be congratulated on the design and construction of this first-class model, which was a great attraction for other enthusiasts when displayed by a Meccano dealer.

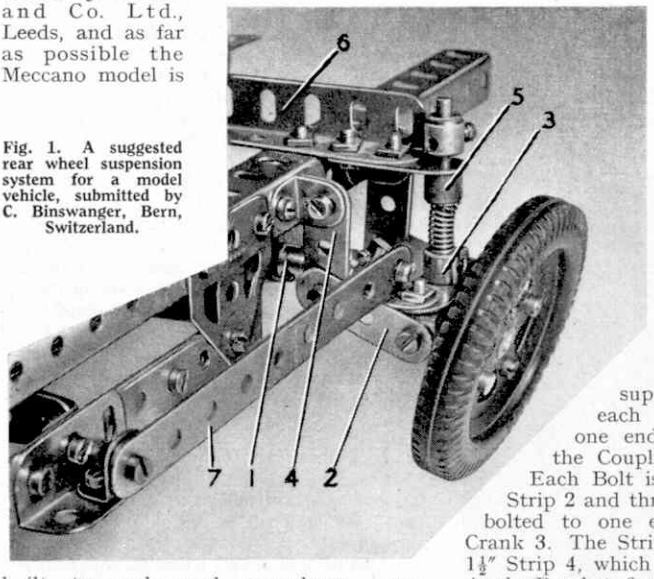

Fig. 1. A suggested rear wheel suspension system for a model vehicle, submitted by C. Binswanger, Bern, Switzerland.

Independent Rear Wheel Suspension

For his entry in a Meccano model-building competition C. Binswanger, Bern, Switzerland, built a fully-equipped model of a motor chassis. An interesting feature of the model is that the rear driving wheels are independently sprung and the differential mechanism is bolted to the chassis. A close-up view of one side of the springing arrangement is reproduced as Fig. 1.

The road wheel is fixed to a 1½" Rod that is mounted freely in the centre cross hole of a Coupling. The inner end of the 1½" Rod is fixed in a Universal Coupling 1, which is connected also to the outer end of one of the differential half shafts.

The Coupling is supported by two ¾" Bolts, each of which is fixed in one end of the long bore of the Coupling by a Grub Screw. Each Bolt is passed through a 1½" Strip 2 and through an Angle Bracket bolted to one end of a Double Arm Crank 3. The Strip 2 is lock-nutted to a 1½" Strip 4, which is bolted tightly to an Angle Bracket fixed to the chassis.

A 2" Rod is held in the boss of the Double Arm Crank 3 and a Compression Spring is placed on the Rod, which is free to slide in the boss of a Crank 5. This Crank is bolted to an Angle Girder 6 fixed across the chassis. A Collar on the upper end of the 2" Rod prevents it from sliding clear of the boss of the Crank 5.

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The suspension system is braced by a $4\frac{1}{2}$" Strip 7. This Strip is lock-nutted to an Angle Bracket at each end. One of the Angle Brackets is bolted to the Double Arm Crank 3, while the other is supported by a $1\frac{1}{2}$" Angle Girder fixed to the chassis.

In actual practice this form of rear wheel suspension offers many advantages.

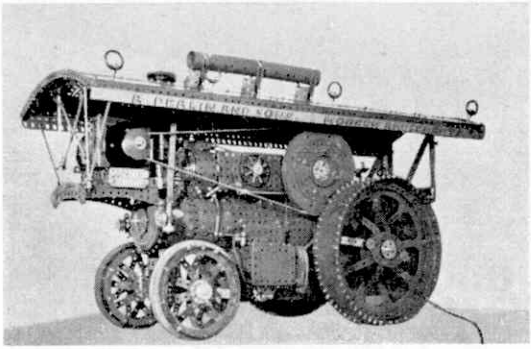

Fig. 2. A much detailed model of an actual Showman's Traction Engine that is full of interest for discerning model-builders. It is the work of Mr. B. W. Rowe.

The improved springing resulting from the independent movement of each driving wheel is an obvious asset, but another important feature is that the unsprung weight of the vehicle is greatly reduced. With the conventional type of rear axle the complete axle unit, with its differential, brakes and driving gear, is unsprung, and it will be appreciated that this unit represents quite a considerable proportion of the weight of the whole vehicle.

With this independent suspension arrangement the weight of the differential mechanism is supported directly by the chassis, and the unsprung weight can be reduced still further by placing the brakes close to the differential at the ends of the half shafts. Thus the unsprung weight is limited mainly to the wheels and the universally mounted shafts between the wheels and the differential.

Friction Clutch

Fig. 3 illustrates a compact clutch for vehicles that makes use of a novel method of connecting the sliding clutch member to the driven shaft. The fixed clutch plate is a 1" Pulley fitted with a Rubber Ring that forms the friction surface. The 1" Pulley is fixed on the driving shaft.

A $1\frac{1}{8}$" Flanged Wheel 1 is loosely mounted on the driven shaft, but is made to turn with this shaft by a Collar 2. This Collar is fixed in place by two $\frac{7}{32}$" bolts, which engage the shanks of four bolts fixed by nuts in holes in the Flanged Wheel. The Flanged Wheel is pressed against the Rubber Ring on the 1" Pulley by a Compression Spring, which is placed between the boss of the Flanged Wheel and a Collar fixed on the output shaft.

When the clutch is used in a model vehicle the 1" Pulley fitted with a Rubber Ring should be fixed at the end of the Rod that takes the place of the crankshaft in a real car or lorry. The Flanged Wheel 1, the Collar 2, the Compression Spring and its retaining Collar, should be placed on the input shaft to the gear-box. Care must be taken to ensure that the two Rods are exactly in line, otherwise the clutch will not rotate freely when the drive is engaged.

The Compression Spring should be adjusted so that the Flanged Wheel 1 is pressed firmly against the Rubber Ring on the 1" Pulley, but the Spring must not by fully compressed when the clutch is in its driving position. Sufficient play must be available to allow the Flanged Wheel to be withdrawn on its shaft until it disengages the Rubber Ring.

The clutch withdrawal levers should be arranged to engage the flange of the Wheel 1.

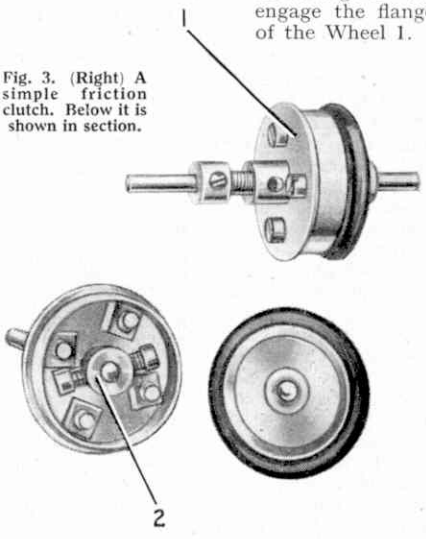

Fig. 3. (Right) A simple friction clutch. Below it is shown in section.

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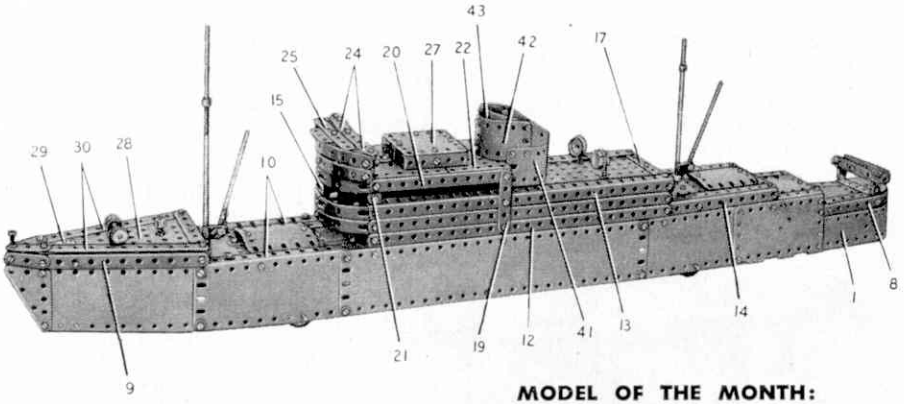

MODEL OF THE MONTH:

Passenger and Cargo Liner

ONE of the outstanding features of the Meccano hobby, and one that is appreciated in full measure by every model-builder, is the almost endless variety of models it is possible to build, using the same parts over and over again. This point is well illustrated by the models described in this series, for so far we have had a Gantry Crane and a Car Transporter, and now this month we turn to the fine Passenger and Cargo Liner shown in these pages. This splendid model can be made with parts in a No. 7 Outfit, as also can the Gantry Crane featured previously, yet it is hardly possible to find two models so widely different in both design and application.

Fig. 1. Ships are a very popular subject with Meccano model-builders. This fine Passenger and Cargo Liner can be made with parts in a No. 7 Outfit.

Model ships have a fascination of their own, and appeal to practically every model-builder, for although they are simple to make and require little in the way of mechanisms, they are fun to build and make most attractive models. In Meccano it is usual to make what are known as waterline models, and our model this month is an excellent example of this type of construction. The term "waterline" means simply that only the upper part of the hull and the deckworks are represented in the model, and no attempt is made to reproduce the section of the hull that normally is below water level. This system is ideal for a Meccano model, for it enables parts that would otherwise be required to build the complete hull to be used to make a larger and more detailed waterline model, yet the result is just as realistic.

Another advantage, especially for younger model-builders who like to play with their completed models, is that small wheels can be fitted to enable the model to be pushed easily along the floor.

A vessel of the type represented by our model is used to carry both passengers and cargo, and the model is a good example of the modern trend in the design of this kind of ship. Some of its distinctive modern features that will be readily apparent are the smoke deflecting funnel, rounded bridge and sharply raked stem. It will be noticed that good use is made of Triangular Flexible Plates in reproducing the bows and in giving a streamlined shape to the single funnel. Fore and aft hatch covers are provided, together with derricks mounted on the

This new feature is intended specially for owners of the larger Meccano Outfits and model-builders who have good stocks of parts at their disposal. Each month a specially selected model is illustrated and its main features described. When possible some details are also given of the actual vehicle, machine or other subject on which the model is based. Full constructional details of the model and a list of the parts required to build it can be obtained free of charge from the Editor on request.

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masts so that they can be swung over the hatches to handle the cargo. An interesting feature is the use of $\frac{3}{4}$" Flanged Wheels to make realistic ventilators.

In building any kind of model of the larger type it is always advisable to first study the subject carefully and form a plan of campaign. In the case of the present model it is best to begin by bolting together the Plates that form each side of the hull, together with the strengthening Strips and Angle Girders seen in Fig. 3. The sides are then joined together to complete the hull, and the Plates that form the fore and aft decks can be bolted in place and supported as indicated. The next step is to build the upper deckworks and the bridge and attach them to the hull. The final stages in the construction of the model are to assemble the funnel, masts, winch and other deck fittings and to fix them in place.

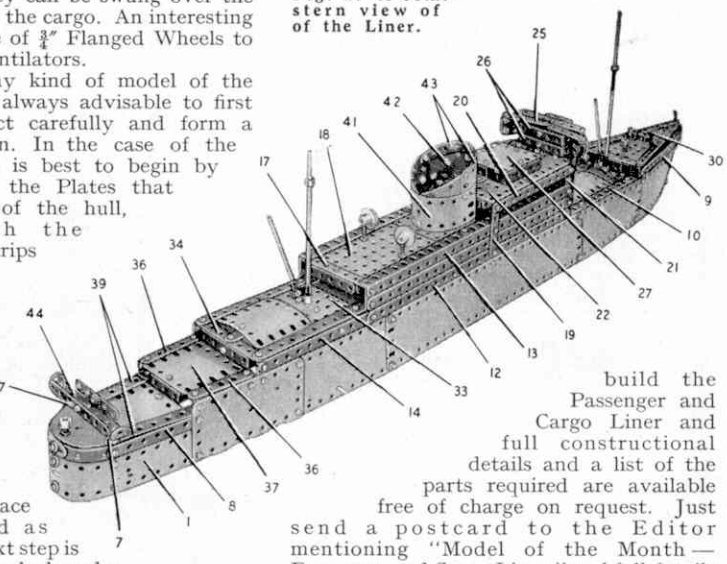
When the constructional work has been completed, a further touch of realism can be added by fitting rigging to the masts and arranging a radio aerial between them. Meccano Cord will be found useful for these functions and there should be no difficulty in arranging it satisfactorily.

Although the model is easy to build its construction provides plenty of interest and if the assembly is carried out neatly, the finished effect is most attractive and the ship has both a realistic and a handsome appearance.

Many readers no doubt will want to build the Passenger and Cargo Liner and full constructional details and a list of the parts required are available free of charge on request. Just send a postcard to the Editor mentioning "Model of the Month — Passenger and Cargo Liner," and full details will be sent to you as soon as possible. Please make your application early, otherwise you may find that supplies have run out! We have prepared sufficient copies of the instructions to cover an estimate of the number of requests we will receive from model-builders, but in the event of an unprecedented demand it is just possible that supplies may prove inadequate. Special arrangements have been made to reserve copies of the instructions for model-builders living overseas.

At present we do not intend to compile a regular mailing list for the supply of Model of the Month instructions. Readers are requested therefore to write to the Editor for the instructions for any particular model in which they are interested.

Fig. 2. A semi-stern view of of the Liner.



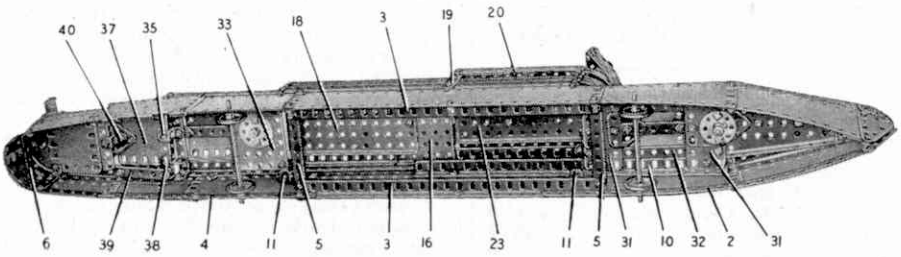


Fig. 3. The interior bracing of the hull can be seen in this underneath view.

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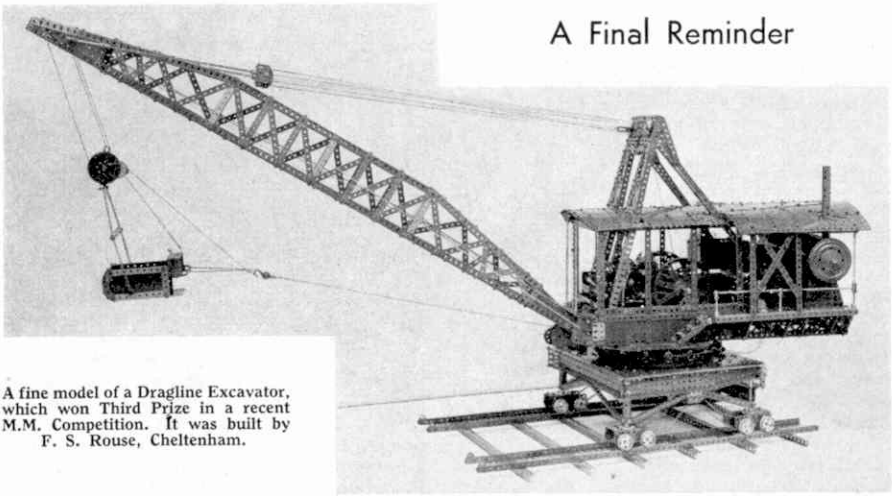
Meccano Model-Building Competition

A Final Reminder



A fine model of a Dragline Excavator, which won Third Prize in a recent M.M. Competition. It was built by F. S. Rouse, Cheltenham.

THE closing date for this contest is 31st May, and although intending competitors can build their models and send in their entries up to the end of this month, time is running rather short if they wish to make sure their efforts are as attractive as possible.

The contest is one of the popular general model-building type, in which there are no restrictions on the subjects of the models, and in which competitors can use any number and variety of Meccano parts they need to build their models sturdily and realistically.

Although each competitor can use as many parts as he likes to build his model, careful thought should be given to the choice of subject. It is far better to build a small model really well than to attempt a large and ambitious model that you are unable to build satisfactorily with the parts you have available. Remember, mere size alone will not gain an award. The judges will look for neat design and sturdy construction.

Another point worth watching when looking for a subject is that this should be original, if possible, or at any rate a novel variation of one of the more usual subjects. Other things being equal, preference will be given to competitors who have shown originality in choosing their subjects.

As usual there are two Sections in this contest: Section A, for model-builders who are under 14 years of age on 31st May next, and Section B, for competitors who will be 14 or over on 31st May next. Details of the fine Cash Prizes to be awarded in each Section are given in the panel on this page.

The conditions of entry are very simple. *The actual models must not be sent.* Instead you should prepare sketches or obtain photographs of your models and send these along, together with any constructional notes you consider necessary. All entries must be addressed *March General Model-Building Competition, Meccano Limited, Binns Road, Liverpool 13,* and must reach us not later than 31st May next.

Don't forget to write your name and address clearly on the back of each print or drawing you send, together with the age you will be on 31st May next.

THE PRIZES

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

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

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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.

A CORAL ISLAND PARADISE

Fifty miles south of Kota Bharu and ten miles off the East coast of Malaya are the Perhentian islands. Pulau Perhentian Besar, the island I visited, is a storybook coral island paradise. The two hour trip by launch from Kuala Besut on the mainland was made more interesting by the occasional glimpse of a school of dolphins and a few flying fish. As the launch entered the bay, the crystal clear water, transparent to a depth of at least 30 ft., was so inviting that some of us dived overboard and swam ashore without waiting for a perahu to ferry the passengers ashore.

The time has come for reader L. A. Beath, Kelantau, to be taken back by launch from a coral island paradise off the coast of Malaya.

The small bay is crescent shaped, with glistening white sand that shelves away gently to the water's edge. The top of the beach is lined with coconut palms, gradually giving way to jungle-clad hills. A small stream of fresh water at one end of the beach meanders leisurely into the sea. To increase the illusion of privacy, each horn of the crescent beach is blocked not only by thick steep jungle, but by huge exciting-looking boulders calling you to come and explore them.

For me, the main attraction of the island was the coral reef lying a hundred yards from the shore. The water was shallow enough in places to allow wading, but the reef scenes were best in the deeper water. So beautiful was the coral that time passed unnoticed as we lazily floated and swam staring into the sunlit coral depths. It was like swimming in a tropical aquarium. The colours and shapes of the corals, shells and fish were more vivid than Walt Disney could portray. Staghorn, Brain and Mushroom corals seemed to predominate, while weaving in and out of this undersea fantasy were the fish of the coral reef; some were black, others blue or green or golden, but most were patterned in all manner of combinations of the colours of the spectrum. Nor were they frightened of us. They stared back as goggle-eyed as we were.

Living among the coral were spiny black sea urchins and ugly looking sea slugs, a Chinese food delicacy. There were plenty of clams too, with their gaping maws ready, it seemed, to catch the unwary.

L. A. BEATH (Kelantau, Malaya).

The tower of the former Church of St. Hilary, Wallasey, which was burned out nearly a century ago. Photograph by M. Warriner, Wallasey.

AN OLD CHURCH TOWER

The photograph shows the tower of the old church of St. Hilary, Wallasey, which was destroyed by fire in 1857. The church tower stands on one of the highest points in the borough. The date on it is 1530.

There is a long history to the church of St. Hilary. It is believed that the first church was built on this site before the Norman Conquest. In the time of the "Wallasey Wreckers" the church tower was used to hide booty in. The minister at that time has been said to be in league with the wreckers. It is believed that the fire which destroyed the church was caused by over-heating in a stove that set fire to some bacon that had been taken from a wreck.

The tower is in a fair state of preservation today, and is surrounded by very old tombstones.

The present church of St. Hilary is a very beautiful structure, built in 1857. So next year the church will celebrate its centenary.

M. WARRINER (Wallasey).

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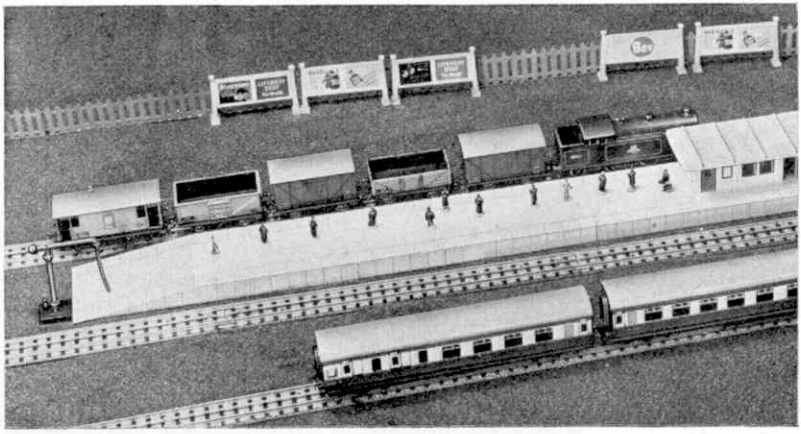

HORNBY RAILWAY COMPANY

Platforms and Containers

By the Secretary

AS promised at the end of our talk last month, I am now able to say something more about Platform Extensions. You will recall that I have already dealt with the Island Platform Extension, seen in the picture above, and you will be glad to know that the Platform Extension for the D1 Through Station is now available. This is uniform in shape and style with the existing Through Station unit, and has a length of wall attached to it, so that it matches exactly the wall already fitted on the platforms and ramps of the D1 Through Station. The picture of this extension on page iii of the cover of last month's *M.M.* will show this.

The picture seen above shows a Hornby-Dublo Island Platform with a Platform Extension added to it. The improved appearance of the lengthened platform is very pleasing.

Any number of these Extensions can be added to a D1 Through Station, and you can arrange matters so that the station building is either in the centre, or is offset towards one end or other of the platform as a whole.

The arrangements for securing the new Extensions to the existing platform and ramp sections are the same as those already used on these parts. Each meeting end of the components carries a short projecting stud and is pierced as well with a small keyhole shaped slot. The studs engage the corresponding slots of the opposite component, and when correctly lined up the platform, its extension and ramps are locked together.

The length of each Platform Extension is the same as that of a standard Straight Rail, and, incidentally, the same as that of the existing centre section of the D1 Through Station. It is easy, therefore, for the Hornby-Dublo enthusiast to work out what length is needed for his Station, when extended, or how much track will be necessary to run alongside such extensions.

From platforms for passengers we must pass on to another Hornby-Dublo introduction this month that I know will be welcomed by all of you. Many enthusiasts have pointed out that the Low-Sided Wagon finished in bauxite red would be an ideal vehicle for carrying a miniature container. Well, now a Container has been introduced, and the upper picture on the next page shows just how this looks loaded on the Low-Sided Wagon.

You will all be familiar with the Wagon itself, but details of the Container will be of interest. This is based on the B.R. standard design intended primarily for furniture and similar traffic. The sides, ends and roof are correctly detailed to represent the chief

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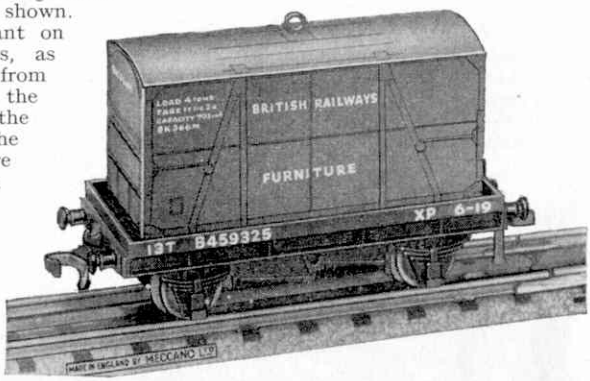
features of the original. The smart red colour and grey roof, and the wording *British Railways* leave no doubt as to its ownership, and the necessary lettering, in yellow, giving the load, the tare weight and the capacity are of course shown.

"On top" detail is important on miniature railway components, as they are invariably viewed from above, and you will see in the illustration lines representing the various features on the roof of the real thing. A little miniature railway licence has been introduced for the very practical purpose of making it possible to lift the Container in a satisfactory manner. This is the fitting of the lifting eye mounted centrally on the roof. This makes handling of the Container by crane a simple matter, and those of you who have the well-known Goods Yard Crane, Dinky Supertoys No. 973, will lose no time in putting it to work when once you have a Container or two in service.

One or two Container-loaded wagons in a freight train add a realistic note and, of course, as the Low-Sided Wagon is finished in the bauxite shade indicating that the full-size vehicle has automatic brakes, we shall be able to run the vehicle and its load in a passenger train if required.

I have included the third picture, showing part of the layout of Sergeant P. T. Harper, R.A.F., because it shows how much attention is given on this railway to the matter of loads. There is a fine variety of vehicles shown in the sidings,



The Hornby-Dublo Low-Sided Wagon carrying the new Furniture Container described in this article.

and you will notice how prominent are the Hornby-Dublo Low-Sided Wagons with Cable Drums, which have been available for some time. Although in Hornby-Dublo only one size of cable drum is made, the real drums vary considerably, as I expect you will have noticed. It is not difficult to make up a miniature drum at home, and I think this is what Sergeant Harper must have done to provide the giant drum that is appropriately loaded on a Well Wagon.

Apart from the standard loads provided in the Coal Wagons, also shown in the same illustration, you will notice further cargoes of interest. A fine "tree trunk" is carried on a Bogie Bolster Wagon, this trunk being a nice straight piece sawn from a stout branch of a tree or bush. There are long poles, or perhaps tubes, loaded over one end of a High-Capacity Wagon, and there are as well several pairs of wheels and other parts in open Wagons.

This is a floor layout, for the time being, but the owner is looking forward to providing a raised baseboard, which will result in much greater convenience in operating.

A view across the track on the layout of Sgt. P. T. Harper, R.A.F.

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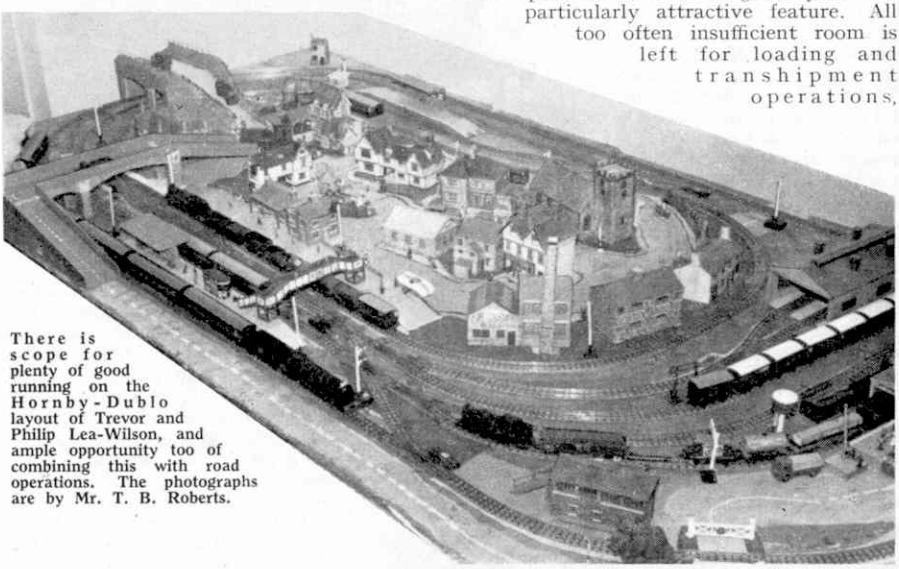
A Layout for Good Running

THE Hornby-Dublo layout shown in the illustrations here follows the popular continuous plan, but the arrangements of the tracks and the use of lineside effects are such that the "round and round" nature of the system is not immediately apparent. The layout occupies a board 9 ft. by 4 ft. 6 in. and has been developed during the past few years by H.R.C. members Trevor and Philip Lea-Wilson, with the active and keen assistance of their father.



There is scope for plenty of good running on the Hornby-Dublo layout of Trevor and Philip Lea-Wilson, and ample opportunity too of combining this with road operations. The photographs are by Mr. T. B. Roberts.

From the layout point of view the system has several features to commend it. These are seen in the diagram at the top of the opposite page. The outer main track makes its way round the board, fairly close to the edges. The inner main track runs nearly parallel to it, being farther away from it at one end and along one side. The intervening space is put to excellent use, as can be seen from the illustration on this page. It accommodates an island platform and a separate track serving it, which is prolonged to branch out and form the goods and station yards.

There are useful connections between the different tracks, arranged in such a manner that there is access to the yard and the engine shed tracks from both main running tracks. There is plenty of room for the station yard, which is reached from the roadway that runs along the edge of the board over a Level Crossing. The space devoted to the goods yard is a particularly attractive feature. All too often insufficient room is left for loading and transhipment operations, and the realistic effect is completely spoiled.

The line is quite a busy one. Traffic is handled by three Hornby-Dublo Locomotives, a "Duchess of Montrose," a 2–6–4 Tank and one of the ever useful 0–6–2 Tanks. Heavy trains are made up, so that most of the rolling stock is in use nearly all the time. So there is plenty of movement, and as there are not many odd vehicles standing about in sidings, the onlooker is given the impression that there is plenty of railway and plenty of track on which the trains can run. The photographs show trains on the main lines, while shunting operations are going on in the yard. A train of vans for an express goods is waiting in the siding for an engine to take it on a main line run.

The main station is quite extensive and

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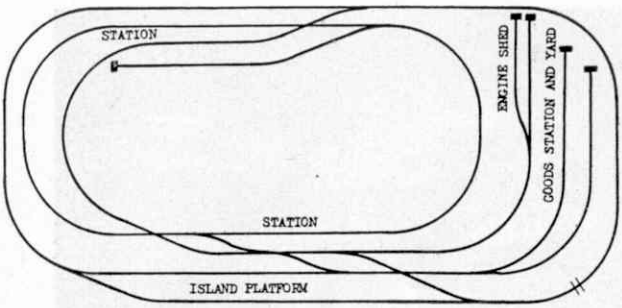


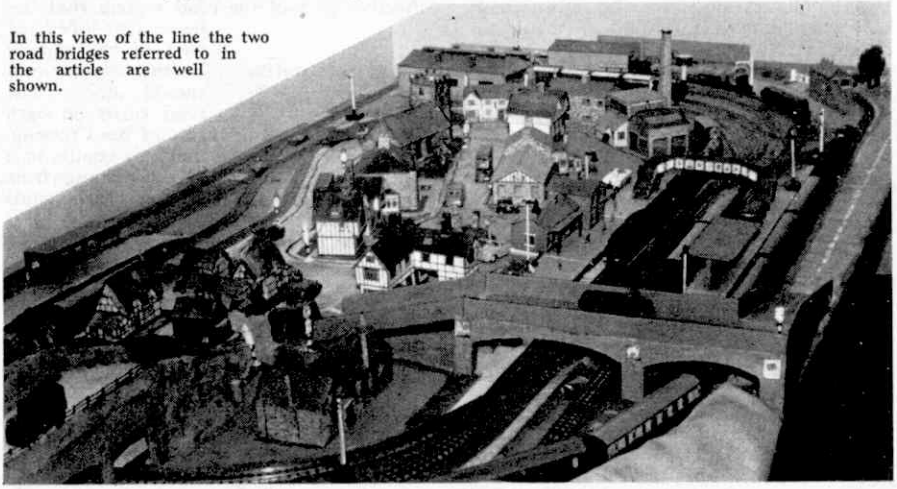
The principal features of the layout are shown in this drawing.

with plenty of tracks around it has an easy well-spread-out air. An island platform forms one side. Between this and the main part of the station there are three tracks instead of the usual two, the centre one forming part of the connections leading to the engine shed. The station buildings are on the inner main platform, as is appropriate because this is the town side of the railway, and particular attention also has been given to the road side of things, as is evident from the illustration. The two overbridges provide effective means of crossing the tracks for Dinky Toys road vehicles, and the bridges themselves give the trains something effective to run under.

To make a bridge "look right" on a flat baseboard sloping approaches are necessary. Sometimes these provide quite a problem for the Hornby-Dublo Engineer, for the slopes must not be too steep and are not easily placed realistically, as most overbridges cross the track at right angles. The arrangement here is very neat. The inner approach for the larger bridge comes up from the area inside the main line, where there is a fair amount of space, and the outer approach is parallel to the railway, turning on to the bridge itself by a right angle bend.

The other overbridge provides a simpler solution! It has a sloping approach on the inner area of the layout, but outside the track it just comes to a stop. That is the end of the board—and of the road.

This may seem unfortunate, but the scheme has sometimes to be used in miniature practice and on this particular railway the general effect is quite satisfactory. After all, some day the board may be extended. This could give the opportunity for further development of the layout outside the track and a "New Town" area could easily grow as the result of expansion of the present "Old Town." The latter, although confined within the track, has a pleasing not-too-crowded look about it. The roads and streets are wide, a good point for Dinky Toys traffic.



In this view of the line the two road bridges referred to in the article are well shown.

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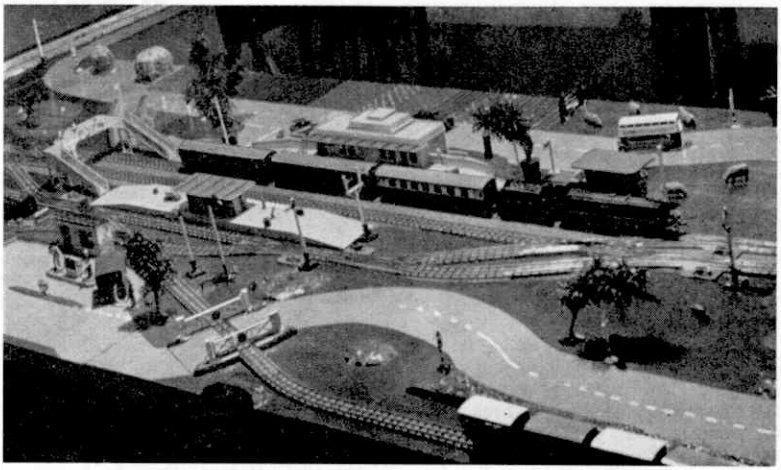

A Place for a Crossing

ALL Hornby-Dublo owners know the Level Crossing, which has been a feature of the system for some time. Most of us like to have a Level Crossing, perhaps more than one, in a layout, but we cannot always quite see how to place it to the best advantage. That is one reason why the picture above appears on this page, for it shows an effective site for a Level Crossing. The layout shown is that of *M.M.* reader Nigel Niblett, of Kuala Lumpur, Malaya, but the illustration shows the railway as it was when its owner lived in Northern Ireland.

In the photograph reproduced on this page part of the layout of Nigel Niblett, Kuala Lumpur, is seen. The general layout is well arranged, with an effective Station, and the Level Crossing in the foreground is very well placed for both road and rail purposes.

The placing of a Level Crossing has to be considered from both the railway and the road point of view. From the former, the addition of a Crossing on the main line means that there will have to be a single line section. This may not always be convenient on a layout consisting mostly of double track, but sometimes the Crossing can be placed on a diagonal track connecting opposite sides of the main oval. This indeed has been done successfully by many Hornby-Dublo owners. In this, or indeed in any position, the Crossing must have a purpose from the road point of view. When on the diagonal track suggested, the roadway over it can connect two parts of a miniature township installed inside the track, or provide a convenient outlet from the town area into a more rural district.

Another position was chosen on Nigel Niblett's layout. Here the Crossing is on a track that branches off outside the main line. The board on which the railway is laid down is big enough to allow this track, and others on the same side, to be outside rather than inside the main line.

In this position the Crossing forms an effective part of the road system that has been developed as part of the general lineside effects, as it should do. The road turns on each side of the Crossing, and this results in a pleasing change from the usual straight line set up. The bends may not be appreciated by the Dinky Toys motorists using the road.

The baseboard of the railway is 8 ft. by 6 ft. There is a space for the operator inside the main line, but access to both sides of the main section of the board is easy, as is clear from the illustration. The station shown is well arranged, with crossover Points and a loop extending round the Island Platform. The loop is extended to form a terminal road, and in addition tracks serve an engine shed, which is out of sight in the picture.

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Club and Branch News

WITH THE SECRETARY

PLANNING OUTINGS WITH OTHER CLUBS

In regard to the summer programme, with its emphasis on the out-of-doors, small Clubs whose resources naturally are very limited can gain useful experience in arranging excursions to places of interest, cycle runs, rambles, and so on, by seeking the co-operation of other youth organisations in the district. But care should be taken not to commit the Club to a series of outings that might require a greater financial contribution than the members or their parents are prepared to provide.

Friendly games of cricket with other youth organisations should not be difficult to arrange, and will help in getting the Club better known.

MECCANO CLUB RECENTLY AFFILIATED

PARKS COUNTY SECONDARY SCHOOL (BELPER) M.C.—*Leader:* Mr. F. N. Snowden, The Parks County Secondary School, Bargate Road, Belper, Derbys.

H.R.C. BRANCH RECENTLY INCORPORATED

No. 559, COOMBE HALL SCHOOL (EAST GRINSTEAD)—*Chairman:* Mr. P. Zeller, c/o Coombe Hall School, East Grinstead.

CLUB NOTES

CONSETT AND DISTRICT Y.M.C.A. M.C.—Work has progressed steadily on both the layout and the model colliery. The railway is now almost completed, and the scenic corners have been finished. The Club have been asked to display the model colliery at an exhibition in Durham. Club roll: 30. *Secretary:* Brian Ward, 10 Cyril Street, Number One, Consett, Co. Durham.

SOUTH AFRICA

CAPE PENINSULA (CAPE TOWN) M.C.—The programme recently has been devoted mainly to model-building. An interesting visit has been paid to the grain elevator at Cape Town docks. Club roll: 30. *Secretary:* K. M. Liebbrandt, "Eastbourne", Wargrave Road, Kenilworth, Cape Town, South Africa.

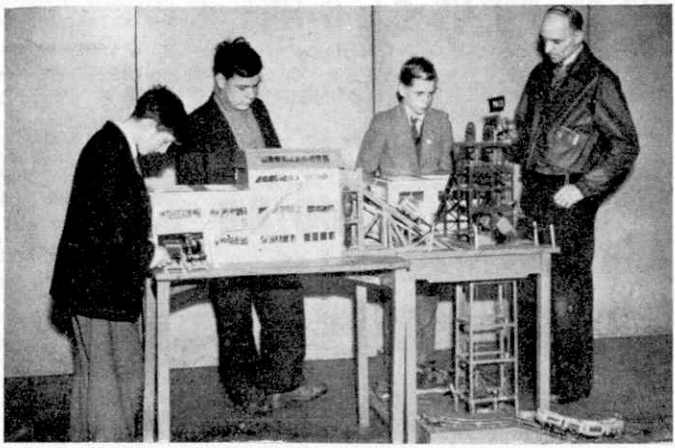
BRANCH NEWS

AVIARY (LEEDS)—Work on the Dublo layout is almost completed, and plans have been prepared for a further layout down the other side of the Branch room. The present layout measures 17 ft. × 5 ft. 6 in., and will have taken about 16 months to construct. Two members are working on a model girder bridge for it, and others are finishing the platforms and assembling the station buildings. At one meeting a talk was given by a Mr. Holdsworth, a locomotive driver, in which he took the members on an imaginary journey from Leeds to Carlisle, and described in detail each phase of the work and each stage of the journey. *Secretary:* L. Blakey, 21 Arley Street, Armley, Leeds 12.

ABBEYFIELD ROAD (SHEFFIELD)—Photographs have been taken of the Branch layout. An Army base has been constructed for the military vehicles in the Branch Dinky Toys collection. The library has been increased. *Secretary:* R. North, 132 Abbeyfield Road, Sheffield 4.

HALE END (LONDON)—At some meetings the members have been occupied in reinforcing the baseboard that carries the Branch layout, as the structure had become weakened through prolonged use. A recent novelty in the model-building class was the making of miniature motor cars, which were cut, carved, and filed out of balsa-wood. The cars will be fitted with Jetex motors, and then painted. Preparations are in hand for a Branch exhibition. *Secretary:* A. L. Coe, 463 Hale End Road, Highams Park, London E.4.

EDLINGTON COUNTY SECONDARY SCHOOL (DONCASTER)—A new running programme has been worked out that allows almost continuous track operations for 1½ hrs. Members take turn to control the movements involved in this schedule. Further progress has been made in constructing a new large baseboard, 6 ft. × 4 ft., which will most likely have a fairly large station and single branch line running to a high level as its main objects. Some time is also being given to designing and making scenic lineside effects. *Secretary:* P. Nichols, 23 Thompsons Avenue, Edlington, nr. Doncaster, Yorks.



Officials and members of the Consett and District Y.M.C.A. M.C., with the Club's fine working model of a colliery. The illustration shows the pit headgear, power station and winding engine house, and the coal cleaning and grading plant. Since this picture was taken the cages have been removed and skip winding installed. Seen around the model are, from left to right, Garth Trout, Brian Ward (Secretary), Kenneth Pattinson and the Leader, Mr. J. R. Goodrum. Photograph by courtesy of the "Evening Chronicle", Newcastle.

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For other Stamp Advertisements see also pages 274 and xvi

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Stamp Collectors' Corner

By F. E. Metcalfe

THE SOLOMONS

NO doubt many *M.M.* readers listened to the talk given on the Home Service Programme by the former Governor General of the British Solomon Islands on his recent charge. We stamp collectors would know more about that distant part of the world than the average listener, and the new set of postage stamps issued on 1st March has drawn our particular attention to it.

Although we may know more than the average about the Solomons, it was news to me at any rate that the population numbered 100,000 and that the numerous islands have a total area of over 11,000 square miles. I knew of course that there was a volcano, for it is shown on the 2/– stamp which has just been replaced and also on the 2/– value of the new "QE" set. But I don't want to make this a lesson in geography, so after mentioning that gold is again being found, on one of the islands at least, and that there is said to be some connection between King Solomon's riches and this territory, which accounts for the name, I'll get on to the philatelic side of the matter.

We need only go back to 1907 for the first set of the Protectorate's stamps, which consisted of seven values from ½d. to 1/–. These were rather crudely lithographed in Sydney, and there are one or two imperf. between varieties that are scarce enough to be catalogued by Gibbons at £25, but of course can be bought more cheaply than that.

I have always found the design, illustrating a fully-manned canoe, attractive, and when it was again adopted in 1908 for a recess printed set by De La Rue, we got a stamp that I think all collectors like. I should mention perhaps that used copies, coming from such a romantic part of the world, are particularly popular and elusive.

These small "canoe" stamps had a life of five years, and then I am sorry to say they were replaced by stamps of the relatively dull key type. These bore the head of King George V. Again printed by De La Rue, they first appeared with the word *Postage* at each side, but a year later this word was replaced on the right hand side by *Revenue*. These first King's head type were on what is known as the Mult.Crown C.A. watermarked paper, but in 1922 the new Script C.A. watermark came into use. I imagine that all readers will know the difference between these two watermarks, but for those who do not—and as collectors of colonial stamps, they ought to know, for similar changes took place with the stamps of most of the other colonies—I had better explain that what is called the script lettering is just as you would write the letters C.A.

These stamps continued in use until 1939, though of course in the meantime the Silver Jubilee set of 1935 and the Coronation issue of 1937 came in and went out. Then we got the KGVI pictorial issue, which has served right up to this year, and an interesting set it proved to be. It was the work of two printers, De La Rue and Waterlow and Sons, and besides perforation varieties of the 2d. and 3d. values, there have been a number of good shades, all of which will be found listed in the Commonwealth Catalogue for those who are interested in such things.

In 1942 the 10/– value was added to the set. The printing was not large and it soon sold out. Copies were changing hands at several pounds in no time, but there was another printing, in spite of the fact that the Japanese had over-run the Islands, and the price went back to the normal current rate. A great rarity is the imperf. between variety of the 2½d. value, which changes hands at about £100 a pair. Some time ago I had such an offer from New Zealand. I did not buy!

Another good little stamp of the same set is the 4½d. value, which brings about 10/– a copy, and in connection with this stamp, I can tell a little good-luck story. During the last war a dealer I know heard that the Japanese had taken possession of the islands, but that the Western Commissioner had got all the stamps with him in Fiji. The 4½d. stamp looked like being a good one, so he sent for twelve sheets. Believe it or not he got them, and sold many of them for 10/– a copy.

I have mentioned the volcano shown on the 2/– stamp, but there is an under-water volcano as well. This erupts from time to time, leaving a small island, which later sinks back into the sea. I remember reading once how some hardy spirits actually landed on the volcanic patch—which is all it really is. But they didn't fancy it very much, and soon moved off.

I must not overlook the Victory set of 1946, the Royal Silver Wedding set of 1949, and the U.P.U. issue also of that year, and now the new set completes our philatelic picture, with the exception of the postage due issue of 1940, which I believe is now obsolete. This latter set is very difficult to get used, but I once managed a few sets, for friends, as I had an acquaintance in Fiji who could manage the operation. Few other copies exist used.

The QEII set looks like proving a winner, and I would advise collectors to buy their sets now, for in subsequent

(*Continued on page 278*)

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For other Stamp Advertisements see also pages 272 and xvi

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Stamp Gossip

JOINED PAIRS

SOME time ago a young collector asked what was meant by joined pairs, and which particular stamps came in this category. Well, notable examples have been produced by the Australian and South African post offices. Let me say right away that dealers at least take a very dim view of them, for many collectors will only take the stamps in pair form, and if any perforations are at all split they don't want them. In 1950, 1951 and 1953 Australia issued three pairs, and in 1953 actually produced a treble! Stamps of different designs were printed in the same sheet, and hence the term joined pairs.

That was not so bad, for the paper used was tough, and the perforations did not split easily. But South Africa has been producing most of her stamps

with one in English and the other in Afrikaans alternately on the sheets. And to make it worse, they split very easily at the perforation where they were joined. Worse still was that collectors generally insisted on their stamps being in horizontal form, and as can be seen from the illustration, this makes the splitting all the easier.

Those who first made printed albums for modern colonial stamps, with spaces marked, were mostly to blame for this all horizontal pair business, for they set out the album pages in this form. It is perhaps only justice that they must have been sorry afterwards about such thoughtfulness, when they came to have to fill the spaces for their customers.

In my own collection of South Africa I have the small sized stamps in horizontal pairs, and those of double size vertical. They not only look better, but stand a better chance of remaining fully joined. It's a pity that after a bi-lingual definitive set, where only singles need be collected, South Africa has gone back to the old system.

BELGIUM

Our Editor gently reminded me recently about a very interesting set — of particular interest to *M.M.* readers, which was the reason for the reminder—issued by Belgium towards the end of last year in aid of their "Cultural Fund."

There were five stamps in the set, and each depicts a scientist or inventor. The Editor thought that the one illustrated would be of most interest, for it shows a steam locomotive, with the valve gear designed by E. Walschaerts, whose portrait accompanies it.

The complete set costs around four shillings, and as the name of each scientist or inventor is printed on the stamp, a visit can be made to the local reference library

to search out details of who they were and what they did. The set nicely mounted, with some of the data gathered neatly written beneath each stamp, would make a page of interest not only to collectors, but to others as well. You might get some new converts to the hobby this way.

SMOOTH STAMPS

The Belgium set just described was printed by the photogravure process, and this brings me to a letter I received from a young lady in the South. She sent me four or five current Seychelles stamps, and asked if they were forgeries, because they were smooth and not like the other stamps she had in her "QEII" collection.

It must be admitted that this reader had not studied her stamps very carefully, or perhaps it was a case of just having seen a few line-engraved stamps, which I suppose could be described as rough compared with those printed by the photogravure process, as are our own British stamps. Anyhow lithographed and photogravure stamps do feel smooth, while line-engraved, with their ridges of ink on the surface, have the rough touch.

TELEGRAPH CENTENARY

I know how interested many *M.M.* readers are in mechanical matters, and the neat little set of stamps issued in Finland last December, one of which is illustrated above, will be just what they like, particularly as the country concerned is so generally popular with collectors.

Three stamps were issued, and a used set can be bought for a shilling or so, though one mint costs about twice as much. I have picked out the 10m. to show you, for there is a lot to study in the design. Get the set, for it has an interesting thematic subject.

SPRING

And now as we are in spring, with all that frost and snow behind us, let's celebrate by showing a lovely little stamp from Japan. It is just one of the many that country issued from time to time, all of which are delightful, and if there are any collectors wanting to take up an easy country, one which will not be expensive, and with stamps second to none from an artistic standpoint, let them consider Nippon.

Some time ago a quite junior collector showed me his Japanese collection. Limited to modern stamps, which is what I mean when I say easy and inexpensive, every page was a delight, and I question if more than a pound had been spent on the lot. The collection was mounted in a plain album, and was neatly written up. In a printed album the stamps would have been completely lost.

There is an awful lot you can say about many of the stamps. Most of the information can be dug up at the local reference library and my friend had done that.

This Month's Tip. The Cyprus 2½p. (C.W.10, S.G.156) used is only catalogued at 1/4 and 1/3 respectively. Not only is it worth full catalogue price, but present prices will rise quite a bit sooner or later.

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Competition! 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.

Draw a Diesel

"Lady Norrie," a powerful diesel locomotive of the South Australian Railways, at Adelaide. Photograph by courtesy of The English Electric Company Ltd.

WITH the advance of diesel power on railways, particularly in Overseas countries, and with the promise of a good deal of dieselisation in Great Britain in the future, it is interesting to speculate on the appearance of the diesels to come.

Diesel-powered shunting locomotives are already well established in this country, but their outlines are simple. Diesel car trains in the main resemble multiple unit electrics, and like them look the same in whichever direction they are travelling. For the heavy main line diesel locomotive something more spectacular is looked for, and it is this that we have selected as the subject of a drawing contest open to all readers. What do you think it will look like in, say, 1960? Here is a chance to put your ideas down on paper and perhaps win a prize for doing it!

Probably the characteristic heavy looking bogies of these powerful units will remain much as they are, but there may well be changes in outward styling. Today many of them display a recognisable "bonnet" at the front end. Others, such as the familiar L.M.R. "twins" No. 10000 and 10001, have just the barest hint of a bonnet, while on others again the cab with its windscreen or driving windows is carried right to the front. The picture on this page of a powerful diesel of the South Australian Railways will perhaps give competitors something to work on.

Readers are asked to submit drawings or sketches, coloured if desired, showing what they think is the shape of diesels to come. Entries must bear the competitor's name and address, and 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 drawing is entered. There will be separate Overseas sections, and in each section prizes of 21/–, 15/– and 10/6 will be awarded for the best drawings. There will be a number of consolation prizes.

Entries should be addressed to *Draw a Diesel Competition, Meccano Magazine, Binns Road, Liverpool 13.* Closing dates: Home Section 30th June, Overseas Section 29th September.

meccanoindex.co.uk

Competition Results and Solutions

HOME

OCTOBER 1955 CODE-WORDS CONTEST

1st Prize: C. M. Mansfield, Great Harwood. 2nd Prize: D. L. Mellor, Birmingham. 3rd Prize: J. T. Buswell, Marazion. Consolation Prizes: A. C. Souter, Buckie; M. W. Gardiner, York; A. Matthews, Glasgow S.2.

NOVEMBER 1955 ALERT ENGINEMEN CONTEST

1st Prize: D. Wilson-Webb, Liverpool. 2nd Prize: J. Sharp, Huddersfield. 3rd Prize: J. T. Smith, Birmingham 28. Consolation Prizes: B. Parker, Seven Kings; I. M. Harris, Heswall; E. Smith, Bradford; R. Pearson, Kirk Ella; W. Wright, Chester.

DECEMBER 1955 CAR PROFILE CONTEST

1st Prize: G. W. A. Fogarty, Portadown. 2nd Prize: R. F. Stevens, London S.E.22. 3rd Prize: K. Mortimer, Manchester. Consolation Prizes: B. Hauxwell, Croydon; M. E. Greenway, London S.W.12; A. McL. Gillespie, Edinburgh 13; J. E. Taverner, Malvern; C. J. Chisholm, Macclesfield; M. C. Wyke, Belfast; N. Curry, Falkirk; G. W. Barley, Pershore

JANUARY 1956 COVER VOTING CONTEST (1955)

1st Prize: C. Teare, Aylesbury. 2nd Prize: P. G. Daniels, London S.W.2. 3rd Prize: B. Taylor, London E.5. Consolation Prizes: E. M. Wilks, Worcester; A. Simmons, Sutton Coldfield; F. Bryden, Ayr; R. O. Batten, Cardiff.

JANUARY 1956 SPACE SHIP CONTEST

1st Prize, Section A: A. K. Farrell, Aldershot; Section B: P. King, London N.19. 2nd Prize, Section A: W. R. Parry, Carlisle; Section B: M. Dunnett, Chester-le-Street. 3rd Prize, Section A: F. Walsh, Wrexham; Section B: L. D. Peskett, Outwood. Consolation Prizes: R. G. Holding, Colwyn Bay; C. P. Forshaw, Hove 4.; C. B. Rice, Croydon; I. A. Giles, Scunthorpe; M. Law, Countesthorpe; P. R. Meadows, Falkirk; P. Tomsett, Ashford; P. J. Belton, London S.W.19; M. Reynolds, Castleford; K. M. Wright, Nottingham; D. Knight, Newbury; M Duesbery, London N.W.8.

OVERSEAS

JULY 1955 NAMED TRAINS CONTEST

1st Prize: R. P. Hyamson, New York, U.S.A. 2nd Prize: A. Crawford, Dublin, Eire. 3rd Prize: S. C. Newbury, Perth, Australia. Consolation Prizes: D. Ferguson, Sydney, Australia; P. J. O'Donovan, Cork, Eire; D. V. Deary Christchurch, New Zealand.

AUGUST 1955 CROSSWORD CONTEST

1st Prize: D. Stanton Auckland S.E.4, New Zealand. 2nd Prize: R. B. McCallum, Christchurch, New Zealand. 3rd Prize: C. W. R. Roy, Victoria N.21, Australia.

AUGUST/SEPTEMBER 1955 SUMMER HOLIDAY PHOTO CONTEST

1st Prize, Section A: H. Swift, Salisbury, S. Rhodesia; Section B: W. F. Barclay, Winnipeg, Canada. 2nd Prize, Section A: H. Arnold, Dublin, Eire; Section B: D. de Korte, Eindhoven, Holland. 3rd Prize, Section A: R. C. Saunders, Valletta, Malta G.C.; Section B: I. L. Cooke, Adelaide, Australia.

SEPTEMBER 1955 LOCOMOTIVE FIGUREWORD CONTEST

1st Prize: K. Davies, Sydney, Australia. 2nd Prize: O. T. MacDermot, Johannesburg, South Africa. 3rd Prize: V. B. Hamilton, Cape Town, South Africa.

OCTOBER 1955 CODE-WORDS CONTEST

1st Prize: A. Keith, Ashburton, Australia. 2nd Prize: J. Burford, Cape Town, South Africa. 3rd Prize: P. Maxwell, Dublin, Eire.

SOLUTIONS

SEPTEMBER 1955 LOCOMOTIVE FIGUREWORD CONTEST

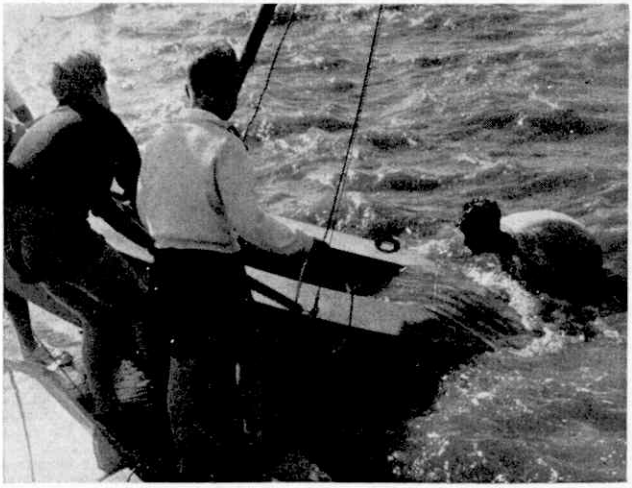
Sayajirao, Firebrand, Lightning, Blundells, Singapore, Swaziland, Persimmon, Leviathan, Wincanton. Diagonal word: Signalman.

OCTOBER 1955 CODE-WORDS CONTEST

1. Bleriot. 2. Canberra. 3. Salvadori. 4. Buckingham. 5. Lindwall. 6. Greyhound. 7. Maunsell. 8. Shackleton. 9. Mortensen. 10. Endeavour. 11. Montgomery. 12. Britannia.

DECEMBER 1955 CAR PROFILE CONTEST

1. Wolseley Six Ninety. 2. Ford Zephyr Zodiac. 3. Daimler Conquest. 4. Singer Hunter. 5. Morris Isis. 6. Armstrong-Siddeley Sapphire. 7. Humber Hawk. 8. Austin A90 Westminster.



Not perhaps a happy moment for the yachtsman, but a golden opportunity for D. W. Allan, Birkenhead; awarded 2nd prize, Section A, in the 1955 Holiday Photographic Contest.

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Speed Across a Continent—(*Continued from page 229*)

course very different from that on the shorter distance trains of a country such as Great Britain, where the longest runs are measured in hundreds of miles rather than thousands. The normal way to travel in Canada is by open car, with a passage way down the centre. In the sleeping cars there are upper and lower berths, provided with individual lights, ventilation and luggage space, and a handy folding ladder is permanently attached to each upper berth, so that the occupant can climb up or descend without having to call a porter.

There are more comfortable and luxurious ways of travelling long distances than by using open cars and "sections," as this sleeping accommodation is called. The C.N.R. have recently modernised all their main line passenger trains, bringing into service a large number of new passenger cars presenting many amenities. Passengers can get complete privacy in special compartments distinguished by such names as Duplex Roomette, Roomette, Bedroom, Compartment and Drawing Room, a list in which the degree of luxury increases towards the Drawing Room, described as rail travel at its luxurious best.

The World's Biggest Bangs!—(*Cont. from page 231*)

postcards. Her worst display took place in August of the year 79, when tremendous explosions rocked the countryside for miles around and the volcano belched forth ashes, lava and hot cinders burying houses and countryside twenty feet deep! Out of one town of 20,000 inhabitants over two thousand died, either buried or trapped by torrents of hot volcanic mud. The cities of Herculaneum, Pompeii and Stabiae were all overwhelmed by molten lava, in some places to a depth of over 30 ft. According to one onlooker a white-hot column of lava boiled over the volcano's sides, gradually widening as it flowed. Altogether over 200,000 people were killed by this, one of Nature's most vicious rages.

The Story of Glenn L. Martin—(*Cont. from page 237*)

Pacific; the Maryland, Marauder and Baltimore bombers of World War II; the great Mars flying boat and smaller Mariner and Marlin; the 2-0-2 and 4-0-4 air liners; the U.S. version of the Canberra; the 600 m.p.h. Seamaster flying boat, and the Matador, first of the U.S.A.F.'s radio-controlled pilotless bombers.

As the firm grew, it became less personal; but Glenn Martin remained a director until his death. Nor will he be remembered only for this, because in 1944–5, with his fellow-directors, he made a gift of 2½ million dollars to the University of Maryland to establish the Glenn L. Martin College for Engineering and Aeronautical Sciences. Some of the young men trained there are now working for his company on one of the most exciting developments in engineering history—Project Vanguard—the programme that will launch into space the first artificial moons next year. It will be a major step forward in a great adventure that would surely have delighted the heart of Glenn Martin, engineer, adventurer and pioneer of progress in the air.

Road and Track—(*Continued from page 239*)

This month is an important one in the motor racing world. On 5th May we have Silverstone, always one of the best international meetings of the year and, on 13th May, Round 2 of the 1956 World Championship For Drivers takes place at Monaco.

It will be interesting to see how the British cars shape up in this gruelling "round the houses" race, of full Grand Prix distance—300 miles or 3 hours' duration—as compared to the 180-mile Formula 1 race at Silverstone, which should finish in under one hour 50 minutes.

Of the three British contestants for championship honours this season I rate the B.R.M. as the best looking car of the three. The Bourne organisation is sensibly taking things quietly and making no claims. Do not be disappointed if the B.R.M. does not do well at Monaco—but do not be surprised by its performance either.

Mike Hawthorn told me earlier this season "The B.R.M. has more power coming out of corners than the works Maserati I tried at Modena before Christmas, and the disc brakes are superb." He went on to say, of the Oulton Park Meeting last year when the green car, driven by Collins, amazed everyone by its performance before retiring, "I was never more surprised in my life when the B.R.M. went by the Lancia."

American England—(*Continued from page 243*)

heydays of Duxbury Hall the Standishes attended the services *en masse*, together with some of their servants.

Such noted Americans as George Washington and the poet H. W. Longfellow have given tourist interest to a number of other places. Sulgrave Manor, near Banbury, has the Washington coat-of-arms carved on its doorway, for this house was the home of the direct ancestors of the first American President.

The Pilgrim Fathers were followed by many other emigrants in the 17th and 18th centuries, and among them were the ancestors of H. W. Longfellow, who left the Guiseley district, eight miles from Leeds, to seek better conditions in the New World.

Guiseley is still a village community and the church there has not altered greatly since the poet's forefathers attended the services. The charming Elizabethan rectory stands nearby. Other members of the family worshipped at Otley, Wharfedale, and the name Longfellow occurs several times in the parish church registers.

Easy Model-Building—(*Continued from page 255*)

fixed on the shaft supporting the windmill sails. This shaft consists of a 1½" and a 3½" Rod joined by a Rod Connector, and it is mounted in the Semi-Circular Plates 2.

The sails are made by bolting two 12½" Strips across a Bush Wheel. A 5½" Strip is then connected to the outer end of each 12½" Strip by a 2½"×1½" Triangular Flexible Plate, and the inner ends of the 5½" Strips are attached to Fishplates bolted to the 12½" Strips. The Bush Wheel is spaced from the front of the mill by a Washer and a ½" loose Pulley, and a 1" Pulley with Rubber Ring is fixed on the shaft in front of the sails.

Parts required to build the Windmill: 2 of No. 1; 6 of No. 2; 9 of No. 5; 5 of No. 10; 8 of No. 12; 1 of No. 15b; 1 of No. 16; 1 of No. 18a; 4 of No. 22; 1 of No. 23; 1 of No. 24; 56 of No. 37a; 50 of No. 37b; 8 of No. 38; 2 of No. 48a; 1 of No. 52; 4 of No. 90a; 6 of No. 111c; 2 of No. 125; 1 of No. 126; 1 of No. 126a; 1 of No. 155; 1 of No. 188; 2 of No. 189; 1 of No. 190; 1 of No. 191; 2 of No. 192; 1 of No. 212; 1 of No. 213; 2 of No. 214; 4 of No. 215; 4 of No. 221; 1 *Magic* Clockwork Motor.

Stamp Collectors' Corner—(*Continued from page 273*)

printings we may get the new St. Edward's Crown watermark, about which there is so much talk at the moment. If we do, then the new stamps will become obsolete as the values are reprinted. In any event, the stamps will never be cheaper.

And just one more point, which will please everybody. Don't forget that the currency of the Solomons is linked to that of Australia. Thus the 10/– stamp has a sterling value of 8/–, and of course all the other values have the same discount of 20 per cent. Quite nice, eh?

This may change one day. For a long time it was believed that Australia would bring its pound up to sterling, as did New Zealand, and if there were a change this would also affect the Solomons. Yes, better get your set, as soon as that pocket money allows.

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Fireside Fun

An employee entered the manager's office to ask for a rise.

"I've been here nearly ten years doing three men's work for one man's pay," he said.

"I'm sorry we can't give you a rise," said the manager, "but if you'll tell me who the other two men are, I will get rid of them."

* * * *

"Twopennyworth of sodium bicarbonate for indigestion at this time of night, when a glass of hot water would have done just as well!" cried the infuriated chemist, who had been aroused at 2 a.m.

"Weel, weel," returned Jock, hastily, "I thank ye for the advice and I'll not bother ye after all. Good nicht."

* * * *

Auntie: "If your mother gave you a big apple and a little apple and told you to give one to your brother, which apple would you give him?"

Sandy: "D'ye mean my big brother or my little brother?"

* * * *

Landlady: "Would you care to take away some views of our lovely boarding house?"

Holiday Visitor: "No thanks. I have some of my own."

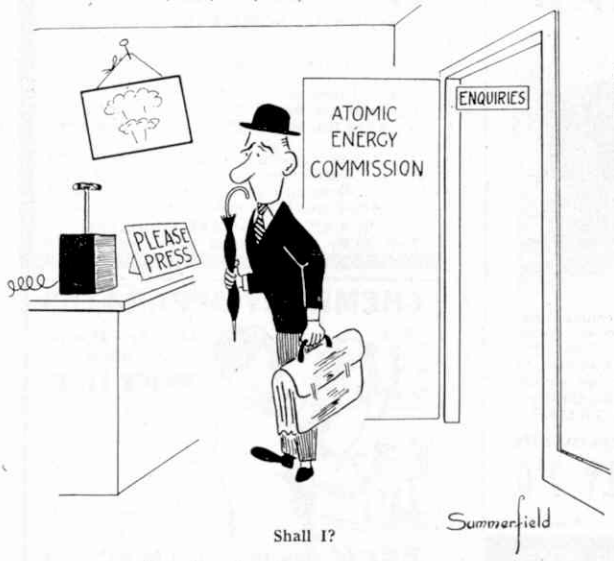
* * * *

Two old Shakespearean repertory players were boasting of their triumphs.

"When I played the death scene in Hamlet," said one, "the entire audience burst into tears. One lady had hysterics."

"That's nothing," scoffed the other. "One night I did that very scene at a small provincial town and my insurance agent, who was sitting in the third row, rushed to my house and paid my wife my life insurance."

* * * *



Shall I?

* * * *

The world-famous hosiery company was in a flap because it could not decide if the letter it received from the reigning golf champion was a compliment or a complaint.

"Half an hour after putting on a new pair of woollen socks manufactured by you," he had written, "I got a hole in one."

* * * *

Barber: "Have you ever been here before, sir?"
Customer: "Yes, once."
Barber: "I don't seem to remember your face."
Customer: "Oh, it's healed up since then."

* * * *

Teacher: "3 and 2 make 5."
Little Girl: "Oh, that can't be right, teacher. Yesterday you said 4 and 1 make 5."

* * * *

BRAIN TEASERS

Five Minute Crossword

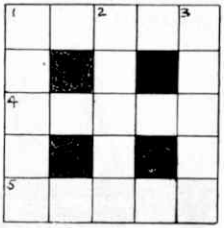
Clues

Across

1. French town.
4. Lighter—but rather old fashioned.
5. Waiters do this also.

Down

1. Levies.
2. Practically all of a late meal.
3. Brain messenger.



* * * *

LOST WILD FLOWER

Lost in the maze of letters forming the rectangle below is the eight-lettered name of a well-known wild flower. Each line contains two consecutive letters of the name. Can you find the flower?

F O U N D E R S
E X - G U N N E R
E L O N G A T E
A R C H I V E S

* * * *

ASSORTED CENTRES

Below are five names, each containing three letters. Can you add two letters at each end of each of the names and so form a seven-letter word answering the clue given?

	Clue
ANN	A useful tool
JOY	Experienced with satisfaction
DAN	A musical term
EVA	Win through
RAY	Gone off course

ANSWERS TO LAST MONTH'S PUZZLES

Try This

Let X = the greater and Y the smaller part.

$$\text{Then } Y + \frac{X}{2} = \frac{X}{6} + 2Y$$

$$4X = 12Y$$

$$X = 3Y$$

Therefore the parts of the number are 30 and 10.

* * * *

What is the Phrase?

The complete phrase is "Home Sweet Home."

* * * *

How Many Pets?

The boy had: 1 Monkey, 1 Zebra and 1 Parrot.

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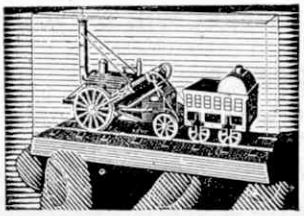

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2 *Are there any pneumatic tyres you can hammer nails into without deflating them?*

3 *Is the "Tour de France" (a) the tower of Chartres cathedral, (b) a holiday in Paris, (c) a cycle race round France?*

4 *Are Dunlop Tyres made (a) only in Great Britain, (b) only in the Commonwealth, (c) in every continent in the world?*

5 *What was the "Royal Progress"? (a) the State opening of Parliament, (b) the Prince Regent's career, (c) a tour through the Kingdom by the reigning Monarch?*

The **DUNLOP** *cadet knows all the answers*

1 (b). **2** Yes—Dunlop Tubeless Tyres. **3** (c). **4** (c). **5** (c). Commenced by Elizabeth I and extended throughout the Commonwealth by Elizabeth II.

SCORING: 10 marks for every correct answer. 50—top of the class. 30-40—good. Below 30—Smarten up there!

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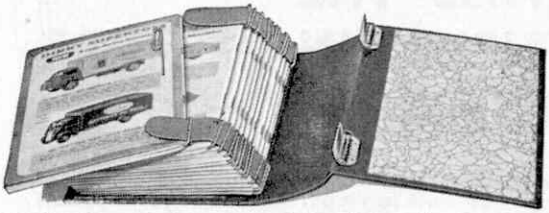

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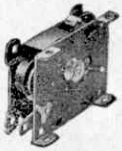

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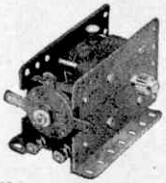

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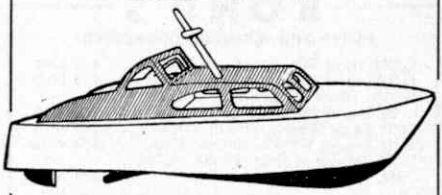

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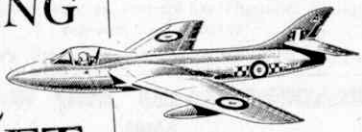

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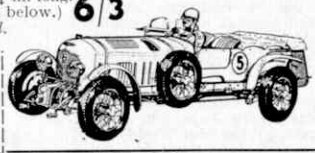

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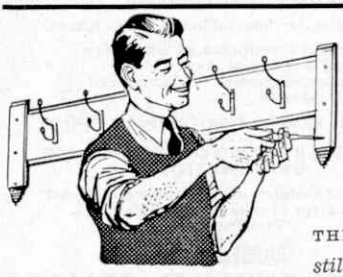

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Bassett-Lowke 0 Gauge Electric Locomotive, Turntable, Points, Track, Trucks, etc., £20 o.n.o. or sold separately.—Kindersley, Bisham, Marlow.

Diana Air Pistol, accurate 11/-. Also Ivalek Crystal Set, 9/-.—Hogg, 9 Belsay Avenue, Whitley Bay, Northumberland.

Gauge 0 Electric Model Railway 12-volt D.C. 30 ft. of Double Brass Track, two Crossovers and Points, three Engines 4–4–0 and Tender, 0–6–0 and Tender, 0–6–0 Tank, two Coaches, eight Trucks, also a quantity of Tin Plate Track, value £60, accept £40.—E. Stoddart, 10 Shildon Grove, Moor Ends, Doncaster.

"Astra" Rocket Gun, perfect condition, 12/6d.; Bayko Building Set value five guineas, sell 75/– o.n.o.; "Gibbons Simplified Catalogues" 1952–1953, 6/– each or 10/– pair; Obsolete Dinky Toys, good condition, S.A.E. for price list.—M. Patton, 34 Newlands Road, Riddings, Derbyshire.

Hornby Electric 0 Gauge 4–4–0, Clockwork 4–4–2's, Trucks and Track, Obsolete Dinky Toys, Ian Allan ABC's, Motorcycling Magazines, "Hobbies Weekly's," Stamps.—Evans, Brook Farm, Stutton, Ipswich.

Erector Set No. 8 with Metal Carrying Case, Electrical Gear, etc. Mint back numbers, "M.M.s" Stamp Magazines and others. Details—Lovie, Culross, Fife.

"M.M.s" May 1945 to June 1949 inclusive, excellent condition, offers—Wharton, 62 Cromwell Road, Grimsby.

WANTS

Pre-war Hornby-Dublo Clockwork Locomotives and Track required. Price to—G. D. Biggin, 43 Sunnyvale Road, Totley, near Sheffield.

Obsolete Tracked and Wheeled Military Dinky Toys. Good prices paid for Jeeps, Tanks, etc., in good condition.—P. J. Hembry, Home Farm, Blue Anchor, near Watchet.

00 Train Set, preferably Triang or Graham Farish.—20 Kingsmead Drive, Hunts Cross, Woolton, Liverpool.

British Locomotive Shed Directory, any condition. Write stating price and condition to—Philip Johnstone, 38 Newton Street, Ulverston, Lancs.

Hornby Gauge 0 Clockwork Double Track—particularly Curves; also Crossover Points. All in good condition for use in layout. State number of each available.—V. Knill, 19 Lynton Road, Thorpe Bay, Essex.

Bassett-Lowke 0 Coaches, reasonably priced.—Butterfield, 6 Sawley Avenue, Accrington.

"M.M.s" 192–s to 1936. Preferably bound yearly volumes. Good condition essential. Details, price, etc. to—Simmonds, 41 Hugh Road, Smethwick, Staffs.

Dinky Toys Tramcars, good condition.—J. Summerson, 1 Frenchmans Row, Throckley, Newcastle-on-Tyne.

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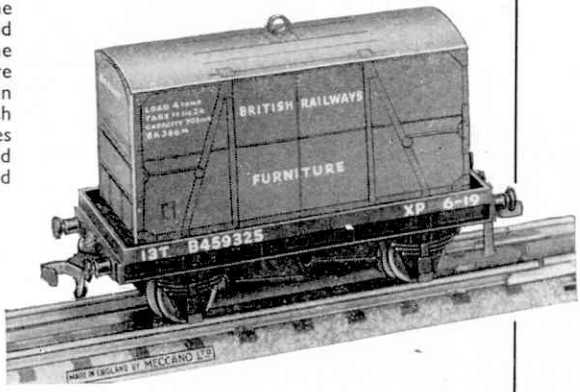

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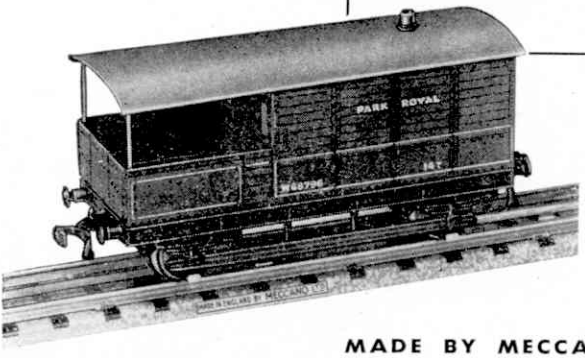

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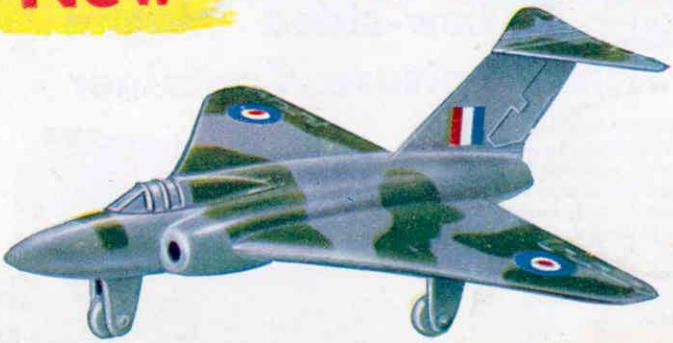

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MODEL OF THE MONTH

PASSENGER AND CARGO LINER

Building the Hull

Each side of the hull, from the bow to the stern, consists of a 2½" x 1½" Triangular Flexible Plate, two 5½" x 2½" Flexible Plates, a 12½" x 2½" Strip Plate, a third 5½" x 2½" Flexible Plate, one half of a Hinged Flat Plate, and a 5½" x 1½" Flexible Plate 1. These Plates are strengthened along their lower edges by a 12½" Strip 2, a 12½" Angle Girder 3 and another 12½" Strip 4. The sides are connected together by an Angle Bracket bolted to the front ends of the Strips 2, by two 3½" x ½" Double Angle Strips 5 fixed to the Girders 3, and by a 2½" x ½" Double Angle Strip 6 placed between the rear ends of the Strips 4. The bolts securing the Double Angle Strip 6 support also 2½" Strips, the upper ends of which are seen at 7 Fig. 2.

The rear ends of the Flexible Plates 1 are curved and are bolted together to form the rounded stern. Two Formed Slotted Strips and two 5½" Strips 8 are secured to the Strips 7, and the Strips 8 are bolted also to the halves of the Hinged Flat Plate.

A 5½" Strip 9 is attached by two Fishplates to each side of the hull at the bows. These Strips are extended forward by 1½" Strips, which are connected at their front ends by an Angle Bracket. A 12½" Angle Girder 10 is fixed to each side of the hull as shown in Fig. 3.

Details of the Upper Deckwork

Two 2½" x ½" Double Angle Strips 11 are bolted to each side, so that one clear hole projects below the top edge of the Plates forming the sides of the hull. These Double Angle Strips support a 12½" Strip 12, a second 12½" Strip and a 12½" Angle Girder 13. The Strips 12 are extended towards the stern by 5½" Strips 14, which are connected byFishplates to the halves of the Hinged Flat Plate. A Formed Slotted Strip is bolted to each of the Angle Girders 13 and the 12½" Strips below them. The Formed Slotted Strips are bolted together at the front, the bolts securing also a vertical 2½" Strip 15 Fig. 1.

The Girders 13 on each side are connected by a 3½" x 2½" Flanged Plate 16 and a 3½" Strip 17, and a 5½" x 2½" Flanged Plate 18 is bolted between these parts. A 2½" Strip 19 is fitted to each side as shown, and a 5½" Strip 20 is attached to the upper end of the 2½" Strip. The Strips 20 are supported at the front by 1" x 1" Angle Brackets 21 fixed to ½" x ½" Angle Brackets secured to the Girders 13 Fig. 2. A 3½" x 2½" Flanged Plate 22 is bolted between the Strips 20, and supports a 5½" x 2½" Flanged Plate 23, fitted at each side with a 5½" x 1½" Flexible Plate. The Flexible Plates are attached to the Angle Brackets 21.

Each of the Strips 20 is extended forward by a Formed Slotted Strip. These are connected together at the front by a bolt that passes also through the next-to-top hole of the Strip 15. The front of the bridge is formed by two 5½" Strips, curved slightly and connected at their ends by Fishplates. The lower Strip is bolted to the top of the Strip 15. The top of the bridge is filled in by two 2½" Strips 24 and a 3½" Strip 25 bolted to a Flat Trunnion. Each of the Strips 24 is secured to an Angle Bracket attached to the upper curved 5½" Strip. The bolts fixing the Strips 24 to the Angle Brackets hold also a 2½" Curved Strip on each side. The back of the bridge is formed by two 2½" x ½" Double Angle Strips 26 fixed to one arm of a 1" x 1" Angle Bracket. This Angle Bracket is used to attach the Double Angle Strips to the Strips 24 and 25, and a ½" x ½" Angle Bracket connects.

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the Double Angle Strips to the front of the Flanged Plate 23.

The deck house 27 Fig. 1 consists of a 2½" x 1½" Flanged Plate bolted underneath a 2½" x 2½" Flexible Plate. A 2½" x ½" Double Angle Strip is fixed to each flange of the Flanged Plate, and the deck house is fixed to a ½" Reversed Angle Bracket and a Double Bent Strip bolted to the Flanged Plates 22 and 23.

The Fore Deck

The fore deck is filled in by a Flanged Sector Plate 28 Fig. 1 fitted at its narrow end with a Six-Hole Wheel Disc 29. Two 5½" Strips 30 are bolted between the Wheel Disc and a 3½" Strip secured across the wide end of the Flanged Sector Plate. The 5½" Strips are connected to the Strips 9 by Angle Brackets, and are extended forward by 1½" Strips joined together at the bows by a Pivot Bolt.

Two built-up plates 31, each made from two 2½" x 1½" Flexible Plates overlapped three holes, are bolted to the Angle Girders 10. A 5½" Strip 32 on each side is attached to the plates 31, and a 3" Strip extended at one end by a Flat Trunnion is bolted between the plates. The hatch cover is a 1 11/16" radius Curved Plate spaced from the 3" Strip by Spring Clips on the ⅜" Bolts used to hold the cover in place.

A 3½" x 2½" Flanged Plate 33 is bolted between the Strips 14, and on each side a 5½" Strip is bolted to it. The rear ends of these Strips are connected by a 3½" Strip 34, and a 3" Strip is secured to the Strip 34 and the Flanged Plate 33. The hatch cover is made in the same way as the one already described, and is bolted to the 3" Strip.

A 2½" x ½" Double Angle Strip is connected to the Strip 34 by a ½" Reversed Angle Bracket 35, and a 2½" Strip 36 on each side is connected by two Double Brackets and two Angle Brackets to the halves of the Hinged Flat Plate. A 2½" x 2½" Flexible Plate 37 is clamped between the rear ends of the Strips 36 and the Double Brackets, and is supported at the front by the Reversed Angle Bracket 35 and Fishplates 38 bolted to the front ends of the Strips 36.

The Aft Deck

The aft deck is formed by a Semi-Circular Plate and a 2½" x 2½" Flexible Plate bolted together and attached by Angle Brackets to the Strips 7. The bolts secure also a 5½" Strip 39 on each side, which is supported at the front by the Double Brackets holding the Strips 36. A second 2½" x 2½" Flexible Plate is connected by a ½" Reversed Angle Bracket 40 to the Plate 37, the bolt holding also a Trunnion.

The Funnel, Masts and Deck Fittings

The funnel consists of a curved 5½" x 1½" Flexible Plate 41 and two curved 2½" x 1½" Flexible Plates 42 bolted together as shown. Two 2½" x 1½" Triangular Flexible Plates are arranged between the Plates 41 and 42, and two curved 2½" Strips 43 are fixed in position above the Plates 42. The funnel is connected to the Flanged Plates 16 and 22.

The fore-mast is made from a 5" Rod and a 4" Rod joined by a Rod Connector. It is fixed in a Bush Wheel bolted underneath one of the plates 31. The aft mast is a 6½" Rod fixed in a 57-tooth Gear bolted below the flanged Plate 33. The derrick fitted to each mast is a 3½" Rod held in a Rod and Strip Connector. The latter is bolted to a Right-Angle Rod and Strip Connector fitted over the mast and spaced from the deck by a Collar.

The winch on the fore-deck is made from two Pinions fixed on a 1½" Rod that is passed through a Double Bracket. Behind the winch

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a Collar is placed on a Threaded Pin. The ventilators are $\frac{3}{4}$" Flanged Wheels screwed on to $\frac{3}{4}$" Bolts, which are held by nuts in the Flanged Plate 18.

The aft bridge is made by bolting a $3\frac{1}{2}$" Strip 44 between $\frac{1}{2}$" Reversed Angle Brackets secured to the upper ends of the Strips 7. A $3\frac{1}{2}$" and a $2\frac{1}{2}$" Strip are attached to a Double Bracket that is bolted to the centre of the Strip 44.

Parts Required

8	of No.	1	2	of No.	16	2 of No.	48b
18	" "	2	1	" "	17	1 " "	51
6	" "	3	1	" "	18a	2 " "	52
2	" "	4	2	" "	20b	3 " "	53
12	" "	5	4	" "	22	1 " "	54
4	" "	6a	1	" "	24	6 " "	59
6	" "	8	1	" "	24a	2 " "	90
12	" "	10	2	" "	26	2 " "	111
4	" "	11	1	" "	27a	2 " "	111a
17	" "	12	6	" "	35	6 " "	111c
3	" "	12a	184	" "	37a	2 " "	115
1	" "	14	174	" "	37b	4 " "	125
1	" "	15	30	" "	38	2 " "	126
2	" "	15a	2	" "	45	2 " "	126a
1	" "	15b	10	" "	48a	1 " "	147b

4	of No.	155					
6	" "	188					
5	" "	189					
4	" "	190					
6	" "	192					
2	" "	197					
1	" "	198					
2	" "	200					
2	" "	212					
2	" "	212a					
1	" "	213					
1	" "	214					
8	" "	215					
4	" "	221					