VOL. XL. No. 2 FEBRUARY 1955

MECCANO MAGAZINE

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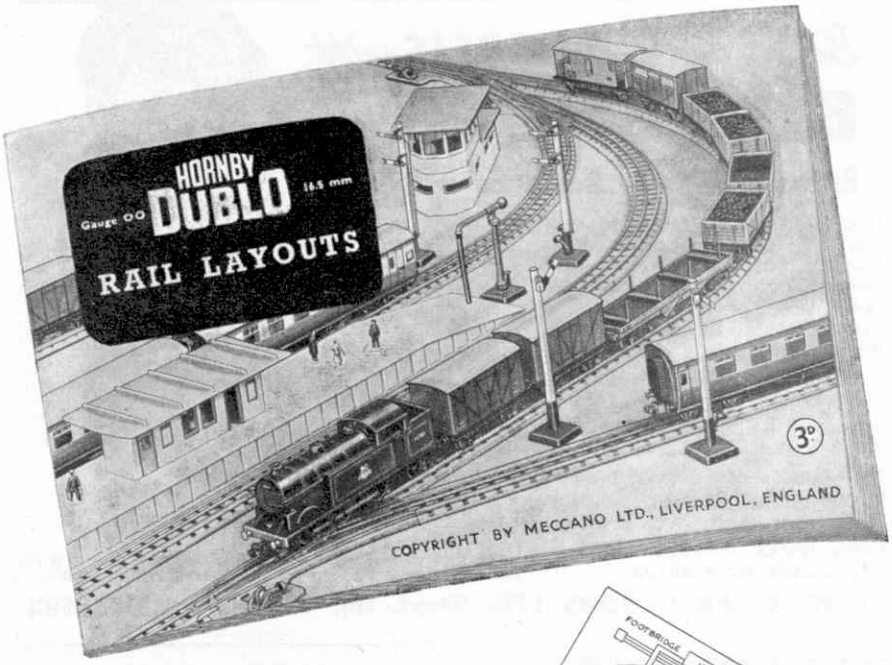

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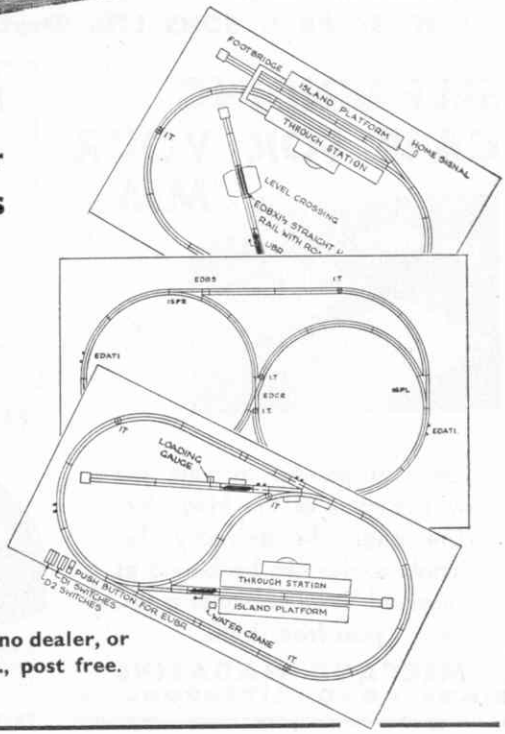

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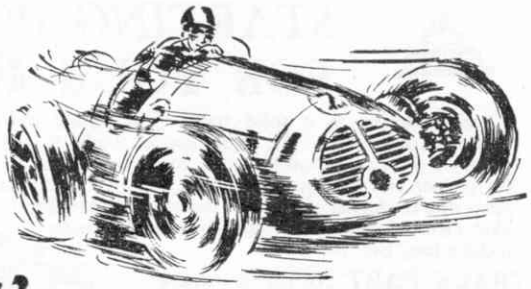

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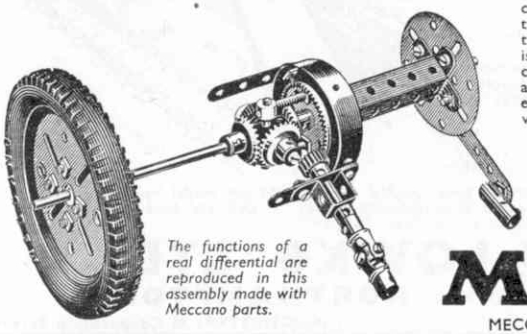

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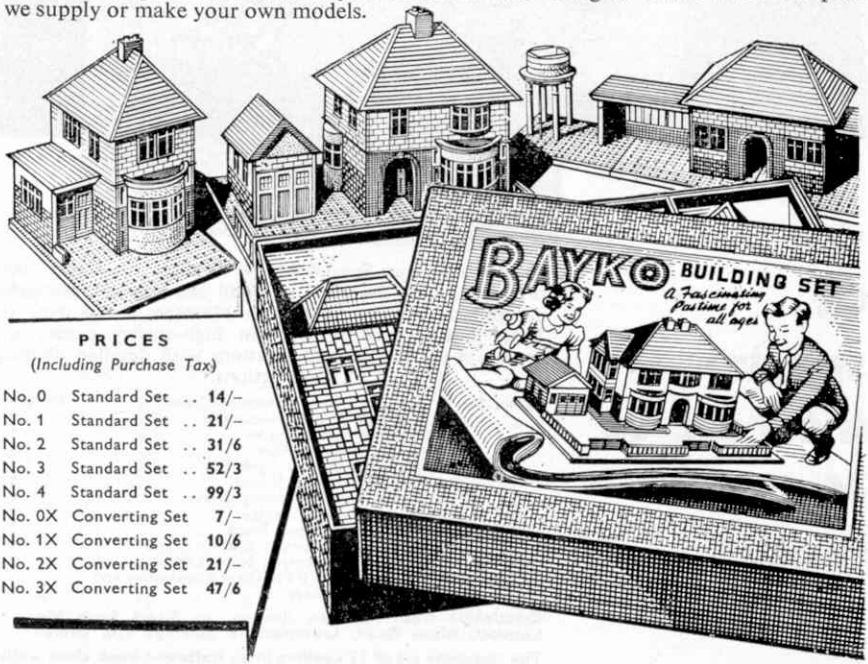

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Next Month: "SMUGGLERS' HAUNTS." By A. Gaunt

MECCANO MAGAZINE

Editorial Office:
Binns Road
Liverpool 13
England

EDITOR : FRANK RILEY, B.Sc.

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How to Keep Young

I shall long remember Christmas 1954 and the coming of 1955 for the remarkable exchanges of goodwill between my readers and myself that they brought. The flow of Christmas and New Year cards seemed endless and there were also shoals of letters conveying the good wishes of readers to the *M.M.* and its staff. It was quite a task to acknowledge all of them, but I think that no reader who sent a card or a letter was missed. I and all the members of the staff of the Magazine are too keenly interested in those for whom the *M.M.* is provided to allow that.

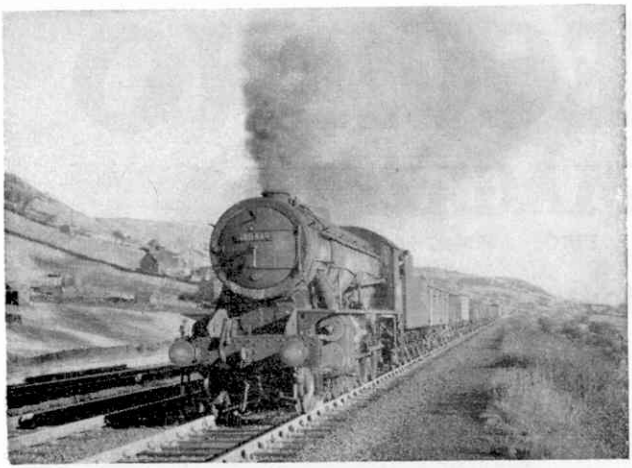
With the coming of 1955 my correspondence with readers is growing in a remarkable way. I hope this means that the *M.M.* is being found more and more attractive and useful to all of you, but it seems to me that there are too many readers who "suffer silently." They certainly enjoy the *M.M.*, for they are regular readers, and from time to time some of them break their silence by writing to me on some particular article or feature that has stimulated their interest.

I hope that this year the number of those who *begin* to correspond with me will increase rapidly. Remember that every letter to the Editor in itself is a friendly gesture, that can bring nothing but good to both the writer and to the *M.M.* This is so even if a first letter is critical. Letters indeed should be critical, for everybody must have some idea that would help the Magazine and its readers.

"There you are! It works." It could scarcely do otherwise. This fine model was built by David Coombs for the Annual Exhibition of the All Saints, Queensbury, Boys' Club. Wembley News photograph.

This reminds me that next month will see the beginning of one new idea that has been thought out for this purpose—the inclusion of a special section for younger readers. I shall be interested to know what you think of this, whether you are "old" or "young." After all, reading the *M.M.* is one way to keep young!

The Editor



An ex-W.D. or Austerity 2-8-0 No. 90339 hauls a westbound freight train up the long climb to Standedge Tunnels.

Railway Through the Pennines

By Yorkshireman

THE 1830's were stirring years in British history. The industrial revolution was in full swing, and great mills and works equipped with machines were springing up in such places as the West Riding of Yorkshire. These were also the years that saw the beginnings of the spread of railways, following on the opening of the Stockton and Darlington and the Liverpool and Manchester lines.

The growing town of Huddersfield was one of those in which manufacturers were expanding their trade and thinking along these lines. The prospects railways offered of speedy transport of goods were not lost on the thrifty manufacturers in this Yorkshire woollen town. When overtures to include it in a scheme for a railway between Manchester and Leeds were repulsed by the promoters, who later offered second rate plans to include the town, a body of far-sighted citizens decided they would have none of it, but would build a railway of their own. After a false start, and the conflict of several contradictory schemes of the kind prevalent in the period, there was born on 21st July 1845 the Huddersfield and Manchester Railway Company.

Our cover, based on a photograph by K. Field, Huddersfield, shows an L.M.R. westbound slow for Manchester meeting an eastbound special on Saddleworth Viaduct, which is 950 feet long and stands 66 feet above the Tame Valley Floor. The viaduct, one of several on the route and built in local quarried stone, was completed early in 1849 by the Huddersfield and Manchester Railway Company.

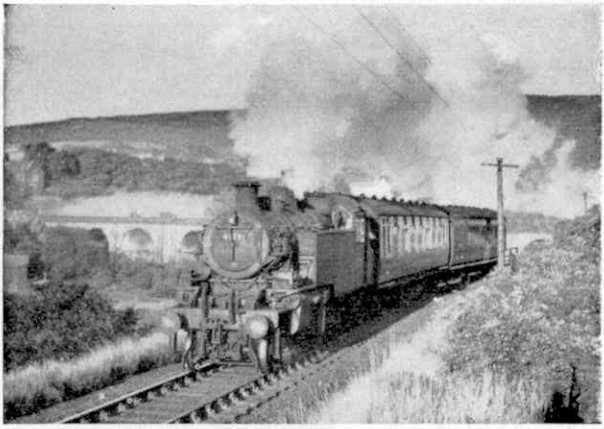
The new company was certainly a lusty brain child, for between these places there lies the barrier of the Pennine Hills, approachable on either side only by ravine scarred valleys. So the whole undertaking, which took but four years to complete, was faced with major engineering works at the outset. There was one available loophole, however. At its narrowest part the Standedge moor was already pierced by a canal tunnel, and no time was lost in coming to agreement with the canal company to form a joint undertaking, their tunnel providing a ready means of access for the construction of a railway tunnel.

Four years before this the Leeds and Manchester Railway by way of Rochdale and Todmorden had been opened throughout to Normanton. The nearest station to Huddersfield on this line was three miles to the northward at Cooper Bridge, where by the way the station platform was movable to align with the trains. Early railway brakes were not so precise in action as those of today!

A start on the construction by the Huddersfield and Manchester Company of a line to connect with that of the Leeds and Manchester was deemed expedient. Arrangements were made that on its completion Huddersfield and Manchester trains should be allowed to run a short distance over that company's metals to a junction at Ravensthorpe with the Leeds and Dewsbury line. This was in September 1848; the first trains from the Huddersfield and Manchester line to reach Leeds did so via Normanton, but when through running powers were agreed between these two

Companies a second direct route between Leeds and Manchester was brought into existence.

This short line, which joined the Leeds and Manchester at Heaton Lodge, where a small station was built, was the first part of the Huddersfield and Manchester to be completed, and it was opened to traffic in August 1847, one month after the Huddersfield and Manchester and the Leeds-Dewsbury companies agreed to amalgamation with the L.N.W.R.

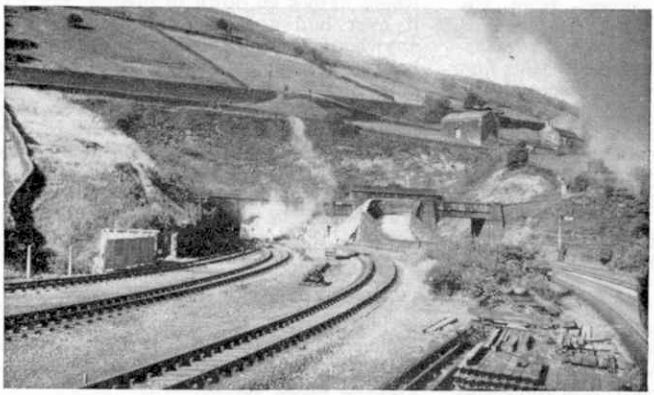


L.M.R. No. 41281 curves away from the main line along the Delph branch. Saddleworth Viaduct can be seen in the left background.

Meantime work had gone forward on the line through the Pennines, and in July 1849, through six tunnels and over six viaducts, the first train journeyed to Stalybridge. From there Manchester was reached over the rails of the Sheffield and Manchester Railway via Guide Bridge, as the planned route to Miles Platting and a junction with the L. and Y. was not yet ready.

In the Leeds direction five viaducts and one tunnel almost two miles in length were the major features of the original 17-mile route from Huddersfield, trains arriving in Leeds over the Leeds Northern Railway's metals at a joint North Midland and Leeds Northern station at Wellington Street. In the 35 miles of line from Leeds to Stalybridge there were altogether eleven large stone viaducts, one of which was the fine Saddleworth Viaduct seen on our cover, and seven tunnels; and in 1882, a few years after the L.N.W.R. completed a new joint station in Leeds with the North Eastern Railway, a further long and sinuous brick viaduct was added at Holbeck.

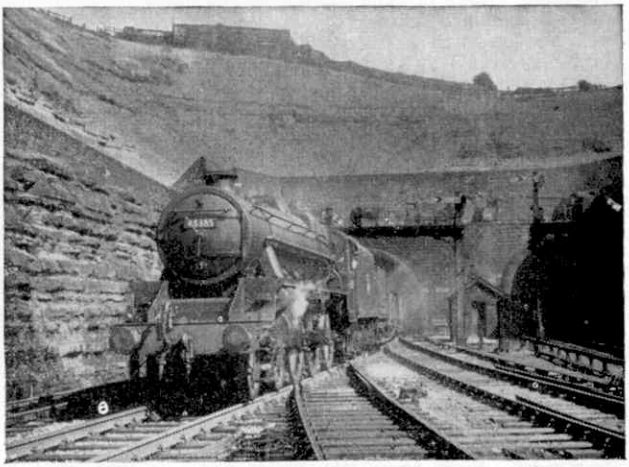
The major undertakings of the full scheme were the building of the Standedge and Morley tunnels. The former single line bore penetrates the Pennines. It is 3 miles 64 yards in length, and was completed in 1848. Headings from the canal tunnel helped to speed up construction, the work taking a mere 2½ years. A second single bore was opened in 1871, and finally, bridging the canal at either end, a double line tunnel was bored in 1894. With the canal tunnel this made the number of bores through the hills four at this one point of interest. In the 1894 tunnel there are water pick-up troughs, laid



The curving approach to the Eastern portal of the Standedge Tunnels, with the moorland rising high above the railway.

on the only level stretch of line throughout the route, and the only water troughs in a tunnel in Great Britain.

The railway builders were fortunate in having ready to hand good supplies of suitable stone, and their work is a lasting memorial of craftsmanship. Huddersfield station also was fashioned in local stone, and its pillared entrance is rivalled only by Euston's Doric arch. A feature of the station's early days was its single platform, with a bay at either end. The Manchester and Leeds, which developed into the Lancashire and Yorkshire Railway, had entered the station when it bought out the 13-mile Huddersfield and Sheffield line. The booking offices at the station still bear the coats of arms of the two companies.



Class 5 4-6-0 No. 45385 bound for Manchester leaves the Huddersfield Tunnels. The Penistone line diverges at this point.

From the first train, the line became a major partner in the second cross-country route from Liverpool to York and Hull, the L.N.W.R. enjoying good relations and services with its two partners the L. and Y. and the N.E.R. Many present day trains are traceable back to the earliest workings. The gradients of the line have always demanded plenty of power from the locomotives employed. These have ranged from early "Allen" 2–4–0s to the present-day rebuilt Scots, and even the latter find the going heavy when mists shroud the hills and valleys.

As I stand at my front door looking south westward up the Colne Valley on an October evening, with storm clouds pushing over the ridge of the Pennines and brilliant sunshine dancing on the metals over Crimble Viaduct and on the snaking S bend through Slaithwaite, the reason why and how the line was built comes home to me. The Huddersfield and Manchester was a bold conception by a few hard-boiled Yorkshiremen, who did not mean to be outdone by anyone. After seeing the line opened they quickly faded from the scene, and with a few exceptions their names now go unrecorded. As in most cases, the iron way brought prosperity in its wake. The Delph branch, which was part of the original scheme, was opened in September 1851, followed later by the Friezland loop in May 1886, and the new line to Leeds, in October 1900, both ventures needing further tunnels and viaducts. The passenger stations of both of the two last named lines are now closed. The Kirkburton branch was opened in 1867.

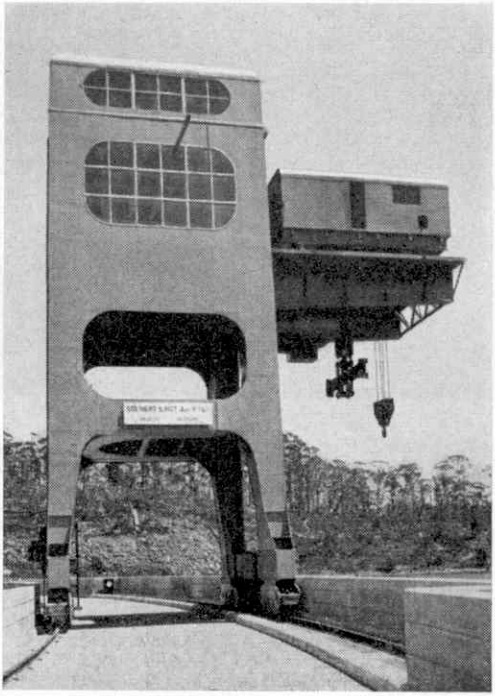
Despite its history and the undoubted increase in commerce it brought to the district, the line itself, like its promoters, was content to step back and become a part of the London and North Western machine. It has never known the glamour trains whose names go down in history, nor has it ever had a *really* express service to anywhere, though point to point timings have been good and tight. There has never been a direct service in its own right to London, though there might have been had the Midland had its way. Instead, bits of trains have been worked to Stockport or Wakefield and, after 1910, when the Midland had obtained concessions, to Horbury.

Huddersfield drivers used to work to all points of the compass, and many a tale they could have told of hectic runs to Blackpool with the holiday crowds and to London with freight. Alas, only the former working is in the book today, and then only at holiday times. In fact, it is only the goods traffic that has kept open many of the stations along the route.

An Unusual Crane Design

MOST of us think of a crane as a steel affair with a long jib, usually built up of girders with diagonal bracing, and indeed most cranes that we see actually look like that. But here on the right is a picture of a crane with an entirely different look about it. It was built by Stothert and Pitt Ltd. for use on the dam of a hydro-electric station in the Tasmanian highlands.

Why was this crane given its unusual form? One reason lies in the fact that the Tasmanian highlands are of great natural beauty. The hydro-electric station where it is installed is distinguished by the graceful curving wall seen in our picture, which is known as Clark Dam. The whole project was designed with an eye to preserving as far as possible the natural beauty of its surroundings, and the design of the crane also was considered from this point of view.



The unusual crane seen above is used for raising and lowering the emergency gates at the Clark Dam hydro-electric power station, in Tasmania. Photograph by courtesy of Stothert and Pitt Ltd.

The principal work of the crane is to lower and raise emergency gates down the face of the dam and up it, to close or open the large conduits that carry water through the retaining wall to the turbines of the power station. It is electrical in operation, drawing current from the mains, but it must be instantly available for use in conditions of emergency, so a second source of power is provided in the form of a complete 70 k.v.a. diesel-alternator set for use in the event of mains power failure.

The depth through which emergency gates have to be lowered is as much as 171 ft. The gates weigh 26 tons, but when they reach the bottom of the wall, and come within the influence of the pull of the water rushing through the conduits, their effective weight becomes as much as 60 tons. This means that there is a tendency for them to run away, and to crash into the setting at the bottom. A complex automatic electrical braking system therefore is incorporated to check the fall, and this acts even if no electrical power happens to be available at the switch board.

The driver of the crane cannot see the point at which the emergency gates enter their guides when being lowered. He is therefore provided with an electrical signalling system, with the aid of which he can spot the gates exactly.

Another remarkable feature of this unusual crane is that the grab, that is the portion from which the load is suspended, can be moved back into the main structure, which can then be closed by steel roller shutters. The reason for arranging this is that in winter conditions in the highlands of Tasmania are very severe, and snow would be deposited and ice formed on the grab if it were not protected in this way.

The complete crane weighs 140 tons. It was transported to the site in large welded sections carried on low loading vehicles that during erection were welded together.

Dew-Ponds

By W. H. Owens

SCATTERED far and wide over the chalk hills of the South, from Sussex westward to Wiltshire and Dorset, are lonely sheep pools, mostly at the highest altitudes. All are quite remote from ditches, streams or springs. For centuries these dew-ponds or mist-ponds, as they are termed, served to water the downland cattle and the great sheep flocks once reared on the grassy slopes.

Kipling's lines, *Only the dew-pond on the height, unfed, that never fails*, are not quite accurate, because these ponds do sometimes run dry, and for unaccountable reasons. Nevertheless, they had a high reputation for reliability among the sheep farmers of the downs; a great many dew-ponds have survived the longest periods of drought, remaining fairly full even when used by large numbers of animals. Sussex records tell of villagers climbing the downs to fetch water for their homes when the valley sources had all dried up.

The illustration at the head of the page shows Ditchling Beacon dew-pond, four miles from Brighton, Sussex, which is 750 ft. above sea level.

Early in the present century there were hundreds of dew-ponds in good repair throughout the chalk counties. But to-day they are fast disappearing, and the walker on the downs is likely to come across many more dry or overgrown hollows than ponds containing water. The dew-ponds were neglected during the last war, and farmers have been reluctant to preserve them because of the changed agricultural conditions and a big fall in the sheep population compared with former times. In any case, it would be difficult nowadays to find men with the necessary knowledge and skill to repair or re-make the old ponds.

Even though their usefulness has declined, the surviving dew-ponds are among the most fascinating and ingenious of man's works in the countryside. For many people they have an element of mystery in the way they contrive to remain well filled through dry seasons. Their origin too has aroused a good deal of controversy in recent years among antiquarians, archæologists and scientists.

At one time the services of the dew-pond makers were much in demand. These craftsmen travelled around the upland farms making new ponds or repairing old ones, and occasionally they also cut ornamental ponds and lakes in the grounds of large country houses. More than thirty drinking ponds at Whipsnade Zoo, on the chalk downs in Bedfordshire, were made by an old dew-pond maker between the wars. It was from such a craftsman, whose forbears had followed the same occupation for generations, that I first learnt the secrets of their art.

Clay, lime and straw are the basic materials in a dew-pond and the skilful use of these would set up condensation to

conjure water, as it were, out of the air. Rainfall is an important source of replenishment, of course, but considerably more water is provided by condensation in a year than by rainfall, and condensation is the only means of maintaining the pond's level in dry summers.

The first step in making a pond was the cutting of a saucer-shaped hollow, thirty feet or more in diameter and from four to six feet deep at the centre. The bottom of the pond would be covered with puddled chalk or puddled clay, mixed with lime and well beaten down to form a watertight base. This is the essence of the dew-pond. Above the clay came a layer of dry straw, to a depth of four to six inches, and finally a top layer of broken chalk, stones or rubble. Water had to be poured in at first to give the pond a start, but thereafter it would function unaided so long as the base remained watertight.

This dew-pond is on the South Downs, above Fordingley, in Sussex.

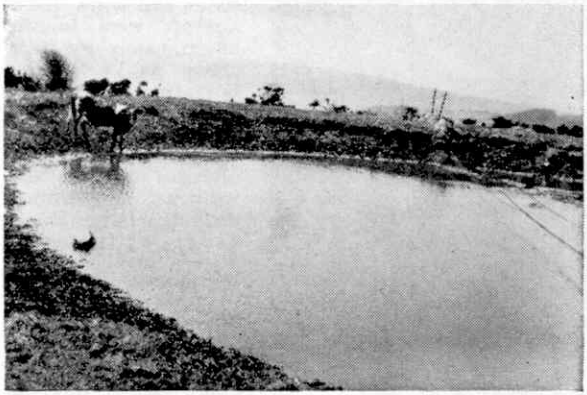
Individual craftsmen had their own methods of using the materials and so the arrangement of layers might vary from district to district, even from pond to pond. Some ponds, for example, were made simply of puddled chalk or clay without any straw, though most would have straw layers somewhere in their construction, either above or below the puddle.

The principle on which a dew-pond works is simple enough. Straw, which is a non-conductor of heat, checks the radiation from the ground underneath the pond. On summer nights, therefore, the water in the pond and the surrounding clay rim is much cooler than the surrounding area and it naturally attracts more moisture from the atmosphere. In warm weather the greater is the contrast between the pond and its surroundings, and so the amount of condensation is heavier.

The name "dew-pond" is not really an appropriate one, because experiments have shown that dew actually plays little part in keeping the water replenished. A much more helpful agent is the mist that gathers about the hills during the hours of darkness, especially the sea mist that blows in over the Sussex Downs. Old-time craftsmen would select sites for their ponds very carefully. The best sites were those parts of the hills where banks of mist tend to settle.

Over the years numerous experiments have been carried out in various parts of the chalk country to

(*Continued on page 102*)



The Greystones, or Gravestones dew-pond is also near Brighton, at Standean, on the side of the Sussex Downs.

"Stringbags" to Swift

The Story of Mike Lithgow

By John W. R. Taylor

Michael J. Lithgow, Chief Test Pilot of the Supermarine Division, Vickers-Armstrongs Ltd.

WHENEVER I hear the name of Mike Lithgow, my mind flashes back to a Sunday afternoon in July 1953. The Air France Skymaster in which I had flown back from Paris was trundling gently around the taxi-track at London Airport, with its engines ticking over quietly. Everything seemed peaceful, as it always does at the end of a flight.

Suddenly, there was a tremendous snarling roar right overhead, which almost made me jump out of my seat. A dozen noses flattened against a dozen windows, just in time to see a small blue aeroplane disappearing at fantastic speed past the control tower building. Mike Lithgow too had arrived home after demonstrating the Supermarine Swift jet fighter at the Paris Aero Show.

A few hours earlier, I had watched his arrival at Le Bourget Airport in Paris, 19 minutes 5.6 seconds after he had left London Airport. His speed of 669.3 m.p.h. for the 212-mile journey still stands as an international record; but only because he encountered strong headwinds on the return trip, which prevented him beating his own time. To make up for the disappointment, he switched on the "reheat" installation to boost the power of the Swift's Avon engine as he approached London Airport, and flashed across the runways at well over 700 m.p.h.

Two months later, at the S.B.A.C. Display at Farnborough, Mike Lithgow and Dave Morgan gave an equally thrilling display to well over 100,000 people, by climbing together in two Swifts to about 40,000 ft. and then diving through the so-called sound barrier to produce a double supersonic "bang," before hurtling down the runway at incredible speed, still in close formation at a height of about 20 ft.

Yet it is only 13 years since Lithgow, as a Fleet Air Arm pilot, flew into battle in the slowest operational warplanes in the world.

He joined the Navy as a midshipman in March 1939 and, after completing his basic training, was posted to a TBR (Torpedo, Bombing and Reconnaissance) Squadron equipped with Fairey Swordfish biplanes. Because of their profusion of struts and wires, these aircraft were known affectionately by their crews as *Stringbags*; but they carried a prodigious load of bombs, mines, torpedoes, depth charges and other weapons, and earned undying fame in a score of gallant actions in the second World War.

In his autobiography,* published before

Mike Lithgow's Swordfish flying near the first aircraft carrier named Ark Royal. This famous carrier was sunk later during the war.

*"*Mach One.*" *Published by Allan Wingate Ltd., price 12/6.*

Christmas, Mike Lithgow describes the thrill of practice torpedo attacks in a Swordfish. These were usually done in sections of three aircraft, and he writes that "The first intimation of impending attack was a belly-view of one's next-ahead as he entered an incredibly steep dive. The only way not to be left behind was to achieve an even more incredibly steep angle; so No. 3 of the formation usually had a pretty thin time of it.

"At about 200 ft., all three aircraft would wheel sharply in through 90 degrees towards the target, the formation thus becoming line abreast, ideally some 200 yards apart. Sights were set to the correct target speed and the range closed to 800 yards, speed 120 knots, 50–80 ft. altitude, at which point the torpedo was dropped."

Lithgow's Supermarine Swift at high speed during its successful world speed record attempt in North Africa, September, 1953.

It sounds exciting and highly dangerous—and it was! Especially in May 1941, when Lithgow was one of the pilots who set out from the famous aircraft carrier *Ark Royal*, sunk later during the war, to attack the German battleship *Bismarck*. Flying into the concentrated cross-fire of the ship's mighty guns, the little force of *Stringbags* scored three torpedo hits, crippling the enemy, so that it was brought to bay and sunk next morning by ships of the Home Fleet.

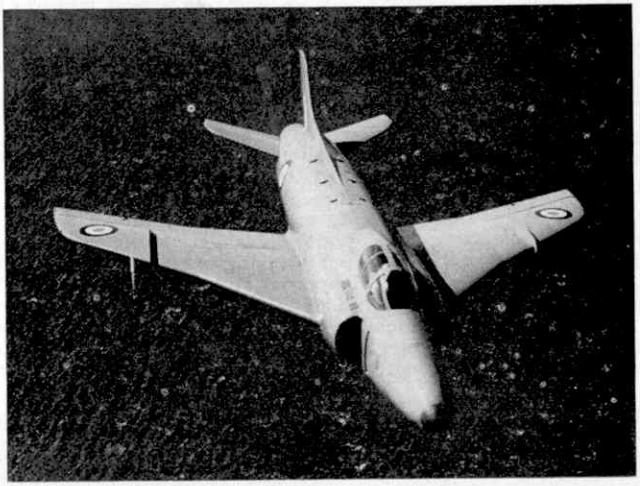
Nor was there danger only in action. Towards the end of 1941, Lithgow converted on to the newer, more streamlined Albacore biplane and, in due course, was embarked on H.M.S. *Formidable*. Whilst doing practice torpedo attacks at night from this ship, he flew into the combined wake of five other aircraft, lost control and went slap into the sea at something like 140 m.p.h. Although the Albacore sank immediately, he managed to squeeze through a side window; but he and his crew were in a pretty hopeless position, being three very small people in a very big ocean, in the dark and with the carrier still steaming away from them. Suffice it to say that after five hours in the water, by a miracle, they were picked up by *Formidable*, which zigzagged so close to them that their

Supermarine 535, one of the prototypes that preceded the Swift. The very similar Type 541 was the aircraft in which Lithgow encountered serious aileron flutter.

shouts were heard by the ship's crew above the noise of its engines.

After taking part in the Madagascar operation *Formidable* returned home, and Mike Lithgow was sent to do some development test flying at the Aeroplane and Armament Experimental Establishment, Boscombe Down. He expected to go from there to command a squadron of the new Barracuda torpedo-bombers; but, in fact, never went to sea again as a Naval pilot.

Instead he was sent to America to help demonstrate the latest types of British aircraft to the U.S. Navy, before returning to Boscombe to take an Empire Test Pilot's course. From that point his future career could hardly be in doubt, for the graduates of E.T.P.S. courses get such a thorough grounding in the theory of flight and in flight testing every conceivable type of aircraft that they are worth their weight in gold to the aircraft industry.



A Supermarine Swift Mk. 4, being piloted by Mike Lithgow. Photograph by courtesy of Vickers-Armstrongs Ltd.

Mike Lithgow had not quite finished with the Navy. He did a spell of test flying at Supermarine's; but was then sent back to the U.S. Naval Air Station at Patuxent River, where he flew every new U.S. prototype that came along, including the Bell Airacomet—America's, and his, first jet. When the war ended he joined Supermarine's as test pilot, and has been there ever since.

It would be a pity to describe in detail the excitement and immense value of his work in the last eight years, when he has done it so well himself in *Mach One*. Certainly, no air-minded youngster could read the book without wishing that he too could be a test pilot one day; and it is the perfect answer to those who claim that flying was an adventure only in the old pioneer days before the 1914–18 War.

These are the new pioneer days in the air, and Mike Lithgow has done more than his share of pioneering. Take, for example, the occasion when he flew one of the Swift prototypes—a Supermarine 541—in formation with a Spitfire, so that a photographer could get pictures of the "old" and the "new" together.

When the photography was over, he opened the throttle and roared away. Suddenly, the whole aeroplane started to shake with the most alarming violence. The control column jumped about all over the cockpit so energetically that he could hardly catch it and hold it still. To make matters worse, the engine chose that moment to stop. In his own words "I put the airbrakes out, and after a while the shaking stopped — on the aeroplane at least." Then he landed.

The reason for the shaking was obvious, because nearly all high speed aircraft built since the war have experienced aileron flutter as they approached the "sound barrier." It was eventually cured on the Swift by fitting hydraulic powered controls, and, after that, the fighter was able to fly faster than sound with little further trouble.

The Supermarine 508 too had its aileron flutter problems, and in December 1951 the buffeting became so bad on one occasion that Lithgow "blacked out" and, when he came to, was doing a vertical upward roll at 11,000 ft.

So there is still plenty of danger as well as adventure in test flying. Plenty of variety too, because since he joined Supermarine's Lithgow has tested the last of the famous (*Continued on page 102*)

S.O.S. Underground

Britain's Mines Rescue Service

By Arthur Turner

ONE of the most dreaded disasters that can occur in industry is the pit explosion. Until totally different methods of obtaining coal can be put into operation, coal mining will remain one of the most hazardous occupations. The provision of a properly equipped and carefully organised rescue service, which can swing immediately into action, is therefore one of the most important features of the coal mining industry.

Today, highly efficient trained teams of rescuers are attached to more than 40 stations up and down Britain. The permanent staff, including mechanics, instructors, and members of the actual teams who go underground to risk their lives for others, total more than 250, but in addition more than 4,000 part-time rescuers are always ready to help.

The Rescue Team at Lofthouse Colliery, near Wakefield, treating a casualty found in a low roadway after a supposed explosion.

Rescue operations in the bowels of the Earth are among the most complicated and most dangerous tasks which can arise. Not only has the job to be performed in a confined space, but there is the ever-present danger of deadly fire-damp, outbreaks of fire, roof falls and further explosions. The rescue worker has to be fully conversant with the best methods of meeting such hazards, he has to have a good knowledge of first aid—and above all he must be physically fit.

Britain's Mines Rescue Service consists of 13 "A" or first-rank stations, manned by full-time teams operating on a three-shift basis, and 34 "B" stations, manned by trained rescuers who can be called upon as the need arises. At these stations high-powered motor ambulances, their engines kept electrically warmed, stand ready for action.

They carry a team of rescue workers and the latest resuscitation apparatus, fire sprayers, signalling equipment, ration packs and portable telephones. The aim is to make these units self-supporting and self-contained. The rescue brigade may have to face a raging inferno a thousand feet down, and it is almost certain that the water supplies will have been cut off, so pumps are carried. Electric generators are also part of the standard equipment, and even if the pithead gear has been made unworkable by the explosion the team will not be deterred. Trailers fitted with winding-gear get over this difficulty.

The most important part of each man's equipment is his breathing apparatus, which enables him to enter smoke-filled or gas-filled sections of the mine. Though the underlying principle of this apparatus is simple, the equipment itself is complex, and may weigh more than 13 lb. It is

A member of the Coatbridge Mines Rescue Team putting a canary into a "humane" cage to take it underground.

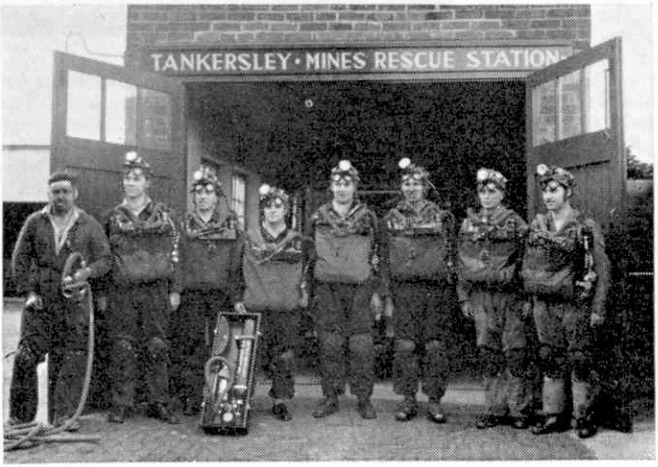
fitted with a compressed oxygen or liquid air container, and will enable a rescue worker to remain in an irrespirable atmosphere for two hours. At the end of that time he must return to the fresh air base, which may be at the base of the pit shaft, to have the container replenished.

There are two main types of breathing apparatus, one in which the exhaled air is "purified," that is freed from carbon dioxide by means of a chemical absorbent, and another in which the air from the cylinder carried by the wearer is not regenerated after being breathed, but is discharged into the surrounding atmosphere. Each member of the team is responsible for maintaining his own equipment at all times, and has to make himself so conversant with its use that he can operate it automatically.

Since physical fitness is essential, regular medical tests are imposed—annually—and no man over 45 is kept on the active strength of the corps. One test consists of loading the man with a pack made up to one-third of his weight, and then requiring him to step up and down on a 16-inch block for five minutes, 150 times altogether. His pulse is then recorded. Or he may be called upon to lift a 56 lb. weight without distress in a smoke-filled chamber.

Stations equipped for such tests, and elaborately fitted out for training rescue teams, exist at a number of places, such as Coatbridge, near Glasgow, and Wakefield. Here are honeycombs of small pit roads where the conditions encountered in rescue operations can be cunningly reproduced, complete with roof-falls, gases, smoke, subsidences, and other hazards likely to be encountered when a real S–O–S has to be answered.

Tests, exercises, and rehearsals are regularly carried out, so that when a real call comes the men may meet it with all the skill and knowledge which can be



After a practice drill. The team of the Tankersley Rescue Station, nr Barnsley.

mustered. Part of the training concerns surface fires, too, for the teams may be called out to deal with such occurrences.

Another duty is to look after a small aviary, for the first rescue van invariably carries a cage containing two canaries. Such birds are quickly affected by carbon monoxide—the death-dealing fire-damp—and from their actions the rescuers can obtain warning long before the insidious effects of the gas are apparent to human beings. To revive the birds the cages are fitted with an oxygen supply, or the canaries are removed to the fresh air base and placed in a similarly equipped cage kept there.

The keeping of canaries for gas tests is nowadays required by law, and every mine has a number of these birds. Various other regulations are also in force to ensure that the risks in mining shall be minimised, and that the effects of an accident shall be kept to the minimum when it does occur.

By law, the resources of collieries are pooled at such times, district by district, and when one rescue team goes into action two adjoining collieries send a team to the scene, so that the rescue work may be continued when the first team become exhausted. Every colliery in Great Britain has a central rescue station within about 15 miles, as well as its own team trained on a part-time basis.

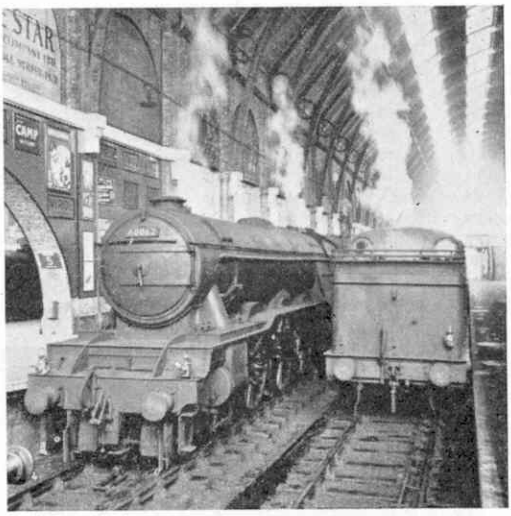
As dealing with a big mine disaster may take several days, mobile dormitories are provided, where the rescuers may rest after a spell underground. These monster vehicles are fitted with as many as fourteen bunks, and have hot and cold water, so that they can serve as living quarters for two teams.

Scientists, too, are continually striving to reduce the dangers of mining and minimise the effects of accidents underground. They have found, for instance, that it is better for miners trapped by an explosion to remain at the coal face, rather than attempt to make their way to safety in the wake of the explosion. After-damp remains in the airways, having been forced there by the blast, and often forms a fatal barrier. To get over this difficulty, rescue teams often reach the stricken part of a mine by a roundabout route, or may even break through from adjoining workings.

One of the most interesting scientific aspects of this subject, however, is that treacherous fire-damp itself has now been harnessed to useful purposes! This noxious gas, three times hotter than coal gas, has been extracted from some coal seams in Britain and made to heat pithead boilers. Experiments along this line were begun more than three years ago at Point of Ayr Colliery, Flintshire, and over 800,000 cubic feet of pure methane—the scientific name for fire-damp—are being withdrawn daily today, through pipes sunk deep into the coal seams.

The success of these operations may not only point the way to new sources of gas for home and industry, but may also help to make mines safer, since the extraction of the dangerous methane would reduce the risks of explosions. Yet, so long as the present method of obtaining coal remains, there will always be a need for an ever-ready rescue service, manned by trained personnel who are willing to undertake the immense risks involved in saving lives underground.

The Senior Instructor of the Coatbridge Mines Rescue Team telephones men dealing with a mock fire during a demonstration. In front of him is a "humane" cage, with a canary in it.



Where engines stand. A familiar scene on the arrival side of King's Cross, with No. 60062 Minoru near the buffer stops. Photograph by R. D. Stephen.

Railway Notes

By R. A. H. Weight

European Railway Developments

From the bulletin issued by the European Railways' Information Centre in Rome I learn that more new cable and funicular railways are under construction or just completed in Austria providing speedy travel to noted viewpoints or ski centres. Some years before the last great war I was in Switzerland during the winter season, when mountain sports were in full swing. Some of the towns and resorts are several thousand feet above sea level, some at a greater altitude than the top of Ben Nevis or Snowdon, the highest peaks in Britain, so that on account of the difficulty of road transport over deep snow the railways of standard or narrow gauge sometimes provide at this time of the year almost the only means of transport for passengers and freight over anything like long distances.

Some of the gradients surmounted by the large electric locomotives hauling standard gauge main line trains, and by the smaller ones on the metre-gauge Rhaetian Railways, for example, serving the spectacular mountain resorts of Davos and St. Moritz amid the grand scenery of the Engadine in Eastern Switzerland, are as steep as the famous Lickey incline here on the former Midland line with its bevies of banking engines. Swiss railways handle large volumes of through international traffic including sleeping cars, ordinary corridor portions and wagons from the French channel ports. The bulletin tells us that more than 200 million passengers are carried each year, representing an increase of about 90 per cent. compared with 1939 or earlier.

Air-conditioned, stainless steel first class coaches with bars are running in the French high-speed *Mistral* express between Paris and Nice or other Riviera coast towns, hauled a good deal of the way by large electric locomotives supplied by overhead power lines as in Switzerland and elsewhere.

It is intended to change the colour schemes for rolling stock in Holland. Streamlined electric stock will be painted light green with two red bands, instead of the more usual Continental dark green; diesel coaches will be light blue with a red band; diesel electric locomotives unless used for shunting only will receive a mahogany finish; electric locomotives and the metal coaches they haul on what are called the internal express trains will be dark blue with one or two yellow bands. Many will regret to note the lack of provision in this scheme for distinctive painting of steam locomotives in the Netherlands, but they are being withdrawn from service to a considerable extent. Important plans are in hand for bridge and station reconstruction, at Moerdijk, Amsterdam and Rotterdam, for example.

Locomotive Stock Changes: New and Old!

At Swindon Works construction of ten 16xx 0–6–0 small pannier tank engines is in hand, as Lot 417, commencing at No. 1650; four or five have been completed for service. Nos. 82026–8 also built there of the class 3 B.R. 2–6–2T type have gone to the North Eastern Region, the first two being allocated to 51H, Kirkby Stephen, the next one to 51A, Darlington. Their appearance on the Darlington-Tebay-Penrith lines across the wild moorlands into Westmorland has been quite a novelty. Tender engines have held sway almost entirely for a long while and they were of very elderly designs until the recent advent of light standard 2–6–0s. No. 82025 was the last of the batch of four allocated to the Southern, as are Nos. 13091–3, which continue the series of Derby-built diesel-electric shunters and which follow Nos. 13089–90 stationed at 5B, Crewe South.

The first of the five class 4 2–6–4Ts due from Derby is out at the time of writing and intended for Scotland numbered 80054; 80095 stationed at 14C, St. Albans, and 80096–8 to 33A, Plaistow, are further additions from Brighton Works. Class 5 4–6–0s constructed at Derby numbered 73070–1 are allocated to 6A, Chester. 78036–7 to 10B, Preston, 78038 to 3A, Bescot, and 78039 to 6K, Rhyl continue the small class 2 Mogul series in hand at Darlington. Small diesel mechanical shunters of 153 h.p. having the 0–4–0 wheel arrangement have been completed, numbered 11500–1, for duty at 32B, Ipswich. Three of these were ordered from the Hunslet Engine Co. Ltd.

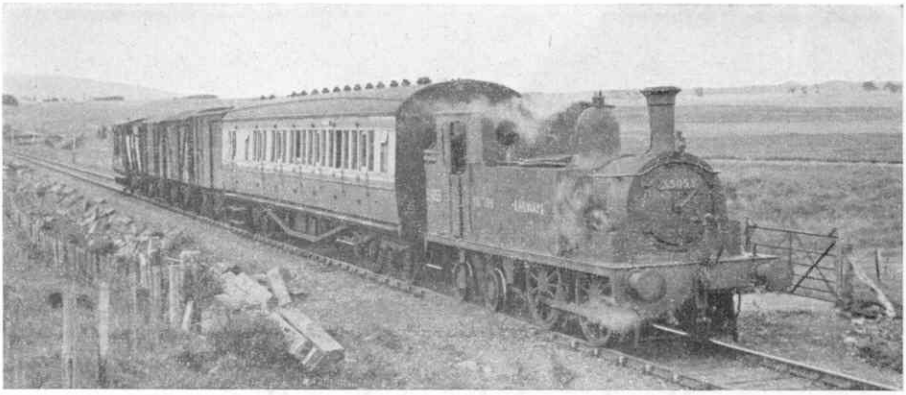
Last but by no means least for announcement are considerable additions to the new fleet of class 9 2–10–0s built at Crewe. They are now becoming more numerous on the Eastern Region as No. 92031 was allocated to 31B, March shed; Nos. 92032–40 to 35A, Peterborough.

Class J1 was rendered extinct by the withdrawal of No. 65013 of the former Great Northern 0–6–0 mixed traffic type originally numbered 1–15, having 5 ft. 8 in. driving wheel diameter and used at one time for quite long distance passenger also fast freight services.

Other engines condemned as unfit for further service include 4–4–0 and 0–6–0 tender types of older designs, as well as 0–6–2, 0–6–0 and 0–4–4Ts from various Regions and areas.

London Transport Looks Ahead

Orders have been placed with three well-known firms, each of which is to build a 7-car prototype tube train incorporating lightweight alloy coachwork, rubber suspension of bogies and wheels, also fluorescent lighting. Each set will be divisible into a 3 or 4-coach unit if necessary. Underframes will be steel and the body side panels consist of unpainted light alloy metal, such as has already been tried successfully to some extent on the District line R-stock; the



A mixed train between Dornoch and Embo, Scottish Region. The engine is a "Dornoch Puggie," No. 55053, one of the last of the former Highland Railway engines to remain in service. The class were specially built for light branch line work. Photograph by C. Lawson Kerr.

whole object being to provide the best possible equipment and passenger accommodation while at the same time securing a reduction in weight.

As Wembley Park station, Middlesex, has to handle a large proportion of the huge crowds attending great sporting or other events at the adjacent Stadium and is also an important open-air junction and passenger exchange point, the widening, reconstruction and resignalling work recently completed there will considerably facilitate operation of the intensive electric services. There are now burrowing junctions north and south of the station, the former in connection with the divergence of the Stanmore branch, the latter providing connections between sets of tracks as well as to the carriage sidings and depot to the south, enabling crossover movements to take place without fouling adjacent running lines.

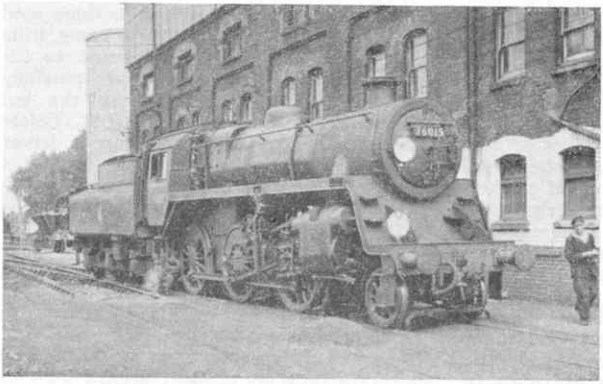
Bakerloo line trains using the inner pair of tracks from the Finchley Road and Willesden Green direction and terminating at Wembley Park, can run straight into sidings and back again clear of the other running lines. Alternatively, like Metropolitan (Baker Street) ones normally running on the outside London Transport lines to the south, they can be transferred to the Stanmore branch or to the main line onward through Harrow-on-the-Hill. The rebuilt signal box contains a control desk on which 47 push-buttons control the whole of the signalling over a considerable area. Each button when pressed operates points and signals for a particular route electrically. As at Ealing Broadway, the signalman after setting up a route is able to press another button at once for a second train movement which will operate automatically as soon as the first train has passed through and cleared.

While I was at Wembley Park watching operations on an ordinary afternoon, a Metropolitan electric locomotive, *Sherlock Holmes*, passed through with an Aylesbury-City train on No. 6 platform line; a similarly hauled northbound outer-suburban train went by at speed through No. 1; fast and slow Metropolitan and (tube sized) Bakerloo trains came and went in quick succession, stopping at the island platforms served by tracks 2–5. Parallel with this network, on the west side but without platforms, are the erstwhile Great Central steam main lines carrying Marylebone trains. The down semi-fast Manchester and the up *South Yorkshireman* express each had V2 2–6–2 engines that day.

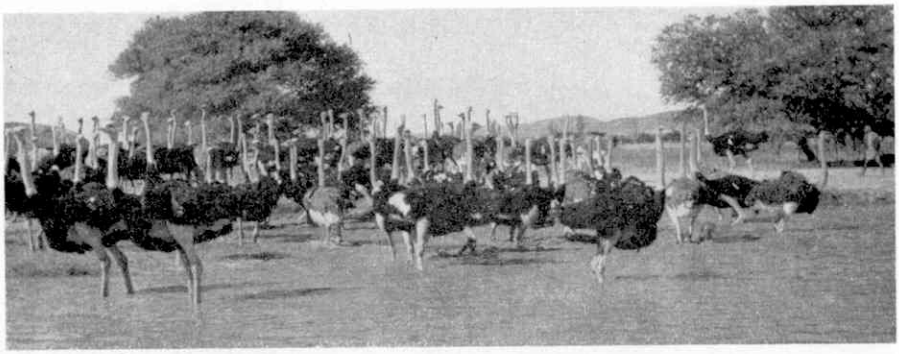
Special Trains of Unusual Interest

The remarkable combination of G.N.R. Atlantic No. 251 with Director 4–4–0, *Prince Albert*, whose special train trip to Liverpool was mentioned in the *M.M.* last November, was seen again the following weekend heading south from Doncaster to Basingstoke, S.R., and back in charge of an excursion conveying Royal Observer Corps parties visiting the Farnborough Air Display. Along the Southern main line from Farnborough to Basingstoke 2–6–0s numbered 31627 and 31798 headed the special.

Among railway tour trains last autumn organised for members and friends by the Stephenson Locomotive, or Railway Correspondence and Travel, Societies, were the West Cumberland Special (which the Manchester Locomotive Society jointly sponsored) round about Sellafield, Whitehaven and Workington including steep gradients and lines not normally used for passengers. The train engine was one of the few remaining ex-Furness Railway 0–6–0s, No. 52501.



An interesting study of a locomotive at Eastleigh by the camera of R. Russell. The engine is B.R. Standard 2-6-0 No. 76015.



Birds of Fine Feather

By R. H. Ferry

YOU have only to look at the ostriches strutting about in a Zoo to know that they are no ordinary birds! They are certainly the biggest in the world; yet they cannot fly. And though the ostrich is reputed to be the most foolish of feathered creatures, there is a look of cunning and wisdom in its quizzing bright eyes, as if there were no doubt in the bird's mind as to the foolishness of human beings.

The whole make-up and character of these 'birds of fine feather' is strange and interesting. They attempt to roar like lions; but achieve nothing more than the bellow of a calf. They have the digestion of a bullock; and they kick like cows. Seemingly the only thing they are capable of doing in the same way as other birds is laying eggs. Even so, one cannot really compare ostriches with other birds, for their character is unique—simply and solely, ostrich.

The true home of the ostrich is, of course, the African bush. Wild ostrich flocks or herds still strut, graze and behave foolishly in the fine sand and sunshine of the veld, but it is now a rare sight to see more than a few wild birds together.

In years gone by, wild ostriches were shot by ivory hunters and robbed of their feathers—a lucrative side-line helping to pay for the cost of safari. Then in 1867 Arthur Douglass, a British settler, thought of the "mad idea" of keeping and breeding these big birds in captivity. This scheme proved so successful that it led to a boom emulating those in gold and diamonds, and ostrich eggs were soon worth their weight in gold—there were fortunes to be made in feathers.

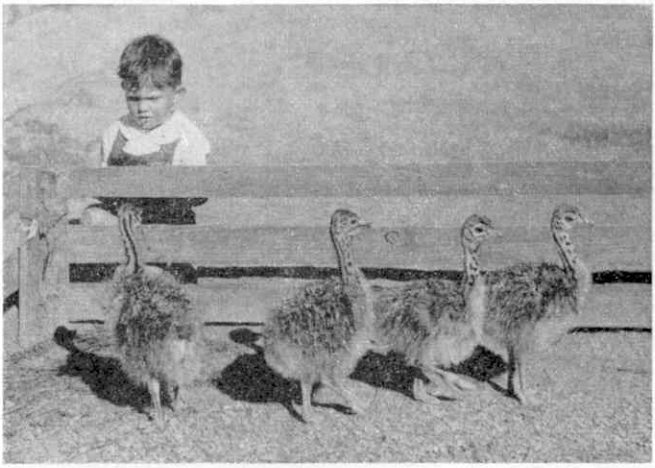
Ostrich farming thrived to such an unpredictable extent that in 13 years the founder was able to boast for the industry a capital of £10,000,000. The Union of South Africa was soon exporting a million pounds worth of feathers, valued at £15 per lb., and before the Great War in 1914 the export figures had reached three millions annually and a million birds were being farmed.

During the war the great slump came. The export of luxury goods to England suddenly ceased and many valuable birds were killed simply for meat. After the war fickle fashion turned her back on the once popular birds and the industry never returned to the boom days. In recent years, however, helped greatly by the Coronation and royal patronage, there has been a marked revival, and the popularity of the bird and its feathers is once more established.

About 80 per cent. of the feathers used in this country by the trade come from South Africa. No hurt is caused to the birds by the clipping and plucking operation; on the contrary in the hot climate the birds seem to enjoy it. Before the feathers are removed the bird is driven between wooden fences, where it cannot kick, and a small black sack or stocking is placed over its head and bright enquiring eyes.

The best feathers are clipped with sharp scissors from the wings of the young cock birds at about seven months old. The stumps are left in the skin and extracted some months later, when they are ripe. The smaller feathers, which would fall in a natural moult, are plucked out and used for feather dusters and similar articles.

In captivity ostriches are kept in big paddocks, where green fodder crops are especially grown for them and sheds supplied as shelters. They are driven to water daily in much the same way as cattle, but ostrich herding is known as riding. The young chicks—about the size of a hen—take 40 days to hatch, and grow at the colossal rate of a foot a month. A fully grown bird may reach 8 feet in height and weigh twice as much as a fair-sized man! The huge legs, supported on only two toes, consist of solid bone and are capable of a horse-like kick, but one which is delivered in a cow-like fashion.



"Funny looking things, these baby ostriches. I wonder why this one is so interested in me?"

"It's only a baby yet, and seems to like being stroked."

If allowed to nest naturally on the veld, the cock bird scrapes out a shallow depression in the soil with his breastbone. A large clutch of about 18 eggs is then laid by the hen and a layer of sand scraped over it. Both parents take turns to sit, the cock taking the night shift. At the beginning the egg-shells are too fragile to be "sat" on and the birds are forced to crouch. Only later, as the heat toughens the shells, are the ostriches able to lower their weight and sit in a more comfortable fashion.

One may well expect a large egg from the largest bird in the world, and in this respect the ostrich certainly does not disappoint. One egg weighs 2 to 3 lb. and will make an omelet 2 feet across that is sufficient for 22 people. In a boom, however, eggs may be worth £2 to £4 each—not a poor man's breakfast!

The native method of cooking is curious, but practical. An egg is placed between two stones on a red hot cowdung fire and a stick is inserted through a hole made in the top of the shell. The stick is then twirled between the palms of the hands, the contents being whipped up or "scrambled" as they cook! When on trek in the bush, empty shells are useful as storage for sugar or coffee, and cut in half they make a strong utility drinking cup. In more warlike times the bushmen used the shells for water storage in arid bush country, burying them in the ground in secret caches.

The small wild flocks still remaining in the veld are now protected, but natives in

the remoter districts still hunt the ostrich for meat. The hunter dresses himself up grotesquely but realistically in an ostrich feather hide outfit, and approaches a grazing flock openly till he gets to close quarters. Roger Courtney, the white hunter, in his book *Claws Over Africa* mentions an amusing incident that occurred when he was stalking ostriches camouflaged as one of them. He had arrived in the midst of a flock when his feathered chassis slipped, and he was left fully exposed to the incredulous gaze of a cock bird who hastily shepherded his harem to a safe distance.

One of the many curious features of these unique birds is their foolproof digestive system. As big birds they eat large quantities of roughage and this is ground up in the mill-like gizzard. In order to aid the grinding process, the birds swallow all manner of hard and sharp matter, and anything bright that catches the eye. It is not uncommon to find nails, buttons, coins, razor blades, etc., in the crop. On some farms where there is a lack of hard flinty stones in the soil, a small ration of broken glass is given to the birds to satisfy their craving.

And lastly there is an age old problem—do ostriches really foolishly hide their heads in the sand? A rather strange new light has been thrown on this problem in recent times. The scientists in an expedition studying ostriches in their sandy haunts report that the hen birds do stick their heads in the sand to conceal their conspicuous bare necks with their grey-brown feathers. The male ostriches hold their heads high. At times, however, ostriches can be typically "ostrich foolish," chasing hysterically over the veld till they are exhausted to the point of death, and stepping carefully over fences that are no longer in their camp, but which they have been accustomed to seeing.

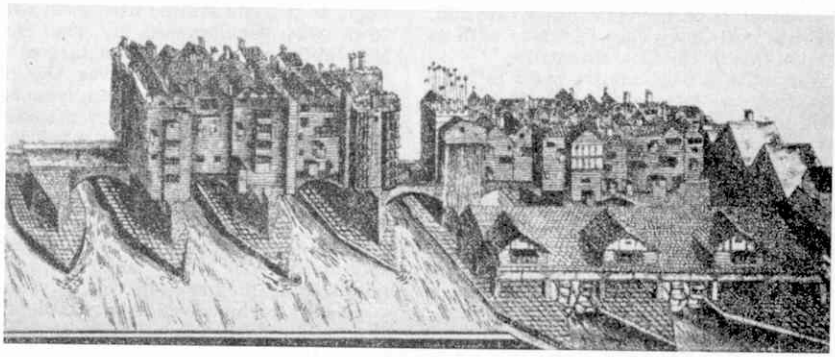
"If only that fence were not there!" Stroking an angry full-grown ostrich does not seem to appease it.

When I see ostriches in an English Zoo, the Call of the Veld comes to me strongly, for they are essentially birds of Africa, and though they are now farmed and domesticated, they have retained much of their wild character. One sees at once the white thorned 'wait-a-bit' trees, the massed wild flowers of the Cape, the vast stretches of solitary veld—and in the background, as the only natural fence to the panoramic scene where ostriches have their being, the towering blue mountains of the Drakensburg.

One feels that Walt Disney would at once be inspired to make a new film if he watched ostriches in the veld, or in the farm paddocks of the Cape. Though big and heavy, these birds have an elan and joie de vivre that lends itself well to the dancing sunshine and the crazy patterned shade cast by the pepper trees and mimosa scrub. But when you see the great cocks strutting along with a self-assured importance, they seem somehow unreal birds—a little ludicrous. Perhaps Disney would be able to make them fly!

Ostriches are long-lived creatures. It is indeed impossible to say what venerable age they may be capable of attaining, for however old they become they never show signs of decrepitude, nor do their feathers deteriorate. I have never heard of an ostrich dying of old age! It is accident that sooner or later ends the career of nearly every bird, and in ninety-nine cases out of a hundred this is the result of its own stupidity. When it has come to grief, it resists every attempt to cure its injuries.

The character of the ostrich was well summed up in the Book of Job—"God hath deprived her of wisdom, neither hath He imparted to her understanding."



Tide Mills

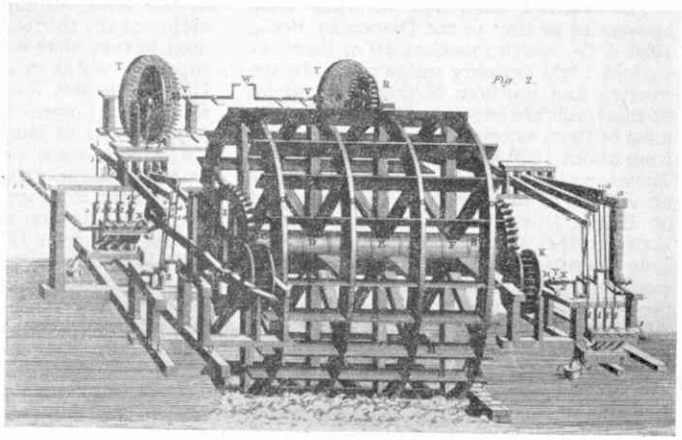
Power Provided by the Sea

By A. T. Nolthenius and F. W. Robins

WINDMILLS are reputed to have come into use, in this country at any rate, no earlier than the fourteenth century of our era. Mills of various kinds driven by water power are far older, and the oldest mills of all seem to have been worked by animal power, or even by human agency. Mills of this last type existed in Pompeii when it was destroyed in 79 A.D. and one is depicted on a Roman lamp as being worked by a donkey.

Water mills, in the ordinary sense, were of two main classes — overshot and undershot. In each case the water was conducted to a large wheel by means of a leat, or millstream, forming a diversion from or an offshoot of a river. In the case of the overshot wheel, the water was shot on to the top of the wheel, against paddles, which caused the wheel to be turned by the impact. In the undershot type, the wheel was turned by the water's impact on the paddles projecting at the underside of the wheel. In each case, of course, the wheel was connected by a shaft with the mill machinery.

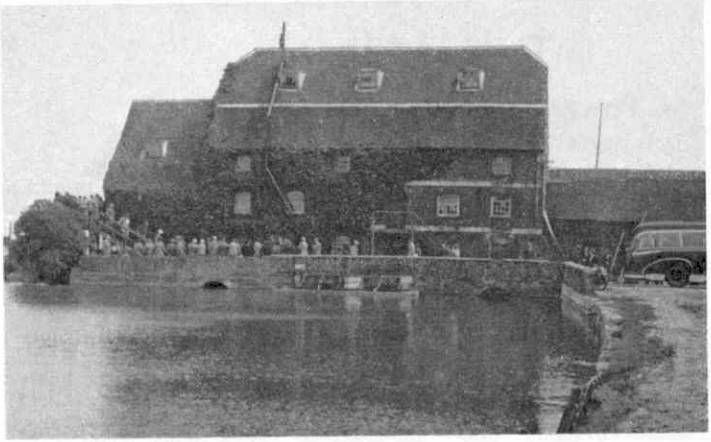
A tide mill, though working on the same principle, is distinct from an ordinary water mill in that the power is provided, not by a continuous flow of water along a channel specially constructed or adapted for the purpose, but by the natural ebb of the tide, usually in a river estuary in which the mill is sited. Naturally, the working is intermittent. Such mills could hardly have been evolved or used by the ancient civilisations of the Mediterranean basin, as the "Middle Sea" has practically no tides. A rise or fall of merely four feet or



The illustration above shows old London Bridge at the south end of which the tide-operated wheels of the corn mill are seen. On the right, a London Bridge tide mill with water pumps.

so, however, is sufficient to work a tide mill, and such mills have been in action with as little as this in the Low Countries.

Tide mills in this country seem to have been more or less confined to the south coast, the southern portion of the east coast and the south west. Wailes, in 1938, named some 68 but, with probable additions, the number of tide mills in England must have been at least 75, and no doubt some have disappeared without trace. There were also two in the Orkney Islands and five or six in the Edinburgh area. In 1938 ten were still in use, seven others had the machinery, the buildings of seven more still existed, and two had auxiliary engines. In addition the foundations of nine no longer existing were still to be seen.



What was once a tide mill building at Ashlett, on Southampton Water is now the home of the Recreation Club for those employed at Fawley Oil Refinery.

The earliest reference to tide mills appears to be that in the Domesday Book, 1080 A.D., which mentions 10 of them, as against 1,500 ordinary water mills. In the western and southern Netherlands, where 21 tidal mills are known to have been in use, most of them as corn mills, the oldest dates from about 1220 and the latest from 1697. They were in use until 1889. In view of the prevalence of these mills in the south east of England, the close trading contacts between the East of England and the Low Countries, and the renown of Dutch engineers in this field, it is more than probable that the development of this method of securing mill power was largely due to the influence of the lands across the North Sea.

One advantage claimed for the tide mill was that it was of special value in time of siege, as it could still be used even when a town was encompassed by the enemy. Windmills were conspicuous targets and, in the days when wood was the usual material for their construction, were easily destroyed by fire. If an army marches on its stomach, much more does a beleagured town hold according to its bread supply.

Usually a tide mill was used for the essential grinding of corn, but one at Hayle, Cornwall, was for the purposes of a brass foundry. Another at Bidston, Cheshire, was at an iron works, and one provided power for drilling cannon. Six, at Chester, were used for fulling mills. One mill, still in use in 1938 at Pembroke, was built with material from a wreck, and most of the mill buildings, whatever their period, were of wood. At first, the wheel itself was of timber too, but later on iron wheels were introduced.

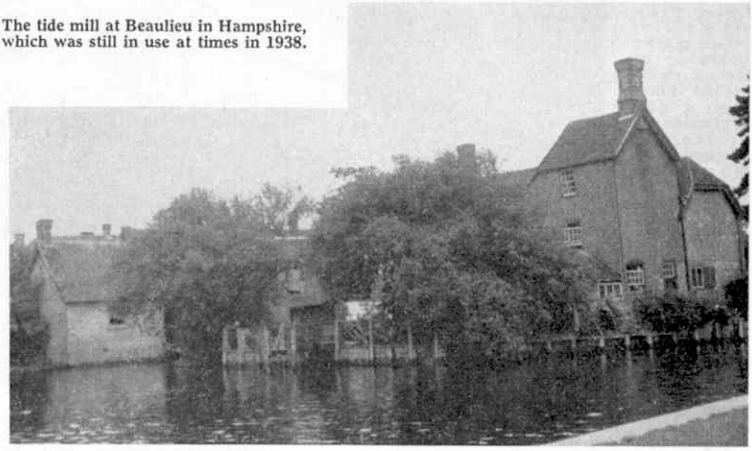
Perhaps the most famous tidal installation was that at London Bridge, where the force of the tides rushing through the narrow arches of the thirteenth century bridge was used to turn wheels working pumps for the supply of water to a large part of the city. Under the first four arches on the north side there were tide mills built by Peter Morris or Morice, a Dutchman, who may have seen similar water mills at Dantzig. Eventually, five arches were so utilised and 528 copper pumps were worked by them. Under the two southernmost arches there were tidal corn mills.

The great fire of 1666 destroyed the London Bridge mills, but they were reconstructed by the famous engineer of the period, Sorocold, who built a number of water mills up and down the country for raising water by means of a wheel. It was then possible to raise or lower the wheels, which were over eighteen feet in

diameter and about twelve feet wide, according to the tide.

Apart from those at London Bridge, there were in the London area mills that were probably tidal at Southwark (the Vauxhall Waterworks), Millbank (1673-1727), Lambeth Waterworks, Somerset House (1655, used for eight or nine years only), York Buildings Waterworks, Broken Wharf, Bank End (1720-1771), Wapping and Shadwell, in the London area. Of other English tide mills, those still in use in 1938 included mills at Woodbridge, in Suffolk, Stambridge, Emsworth, Hampshire, Eling, near Southampton, Beaulieu — intermittently — Bembridge, East Medina, in the Isle of Wight, and Pembroke. Others have been converted to different purposes or provided with another form of power, usually steam or electricity. The still standing tide mill at Ashlett, on Southampton Water, has become a recreation club for the great Oil Refinery at Fawley. At Beaulieu, tidal power is still used occasionally; though close to the famous Cistercian Abbey, this mill was not the monastic one, the remains of which are to be found near the great gateway. This, too, was probably a tide mill.

The tide mill at Beaulieu in Hampshire, which was still in use at times in 1938.



At St. Osyth, Essex, another monastic establishment, the machinery is still intact, though the mill, dating from 1491, near the close of the monastic era, has been idle more than 20 years.

At Wootton, in the Isle of Wight, the tide mill, one of seven or eight in the island, was working until some 50 or 60 years ago. A description of the Island in 1793 refers to Wootton Bridge as "a long narrow causeway, more than three hundred yards in length, constructed across the creek for the purpose of penning back the tides that work the corn mill on its banks . . ." The reader may form an idea of the uncommon shallowness of the water when he is informed that although it covers a hundred acres, it is all consumed in the space of five hours, by the operation of a single mill.

As the period which saw the start of real development of all sorts of power, the sixteenth and seventeenth centuries, was also the era of Colonial development, it was not surprising that the tide mill idea crossed the Atlantic, 50 to 60 having been erected on the western seaboard of the United States between 1635 and 1865. There were 70 in Surinam, Dutch Guiana, built by Dutch settlers and engineers, and 11 in British Guiana. In the last two cases the prime use of the mills was for work in connection with the sugar plantations. In France, the existence is known of 41 tide mills, dating from 1120 to 1788, and there were nearly a score in Belgium and 16 in Spain, all on the Atlantic Coast.

Every now and again the idea of harnessing the power of the tides has been revived in modern times, chiefly for the generation of electricity. With the possible exception of the much discussed Severn Barrage scheme, however, the schemes have proved too costly, or impracticable on account of the insufficient or inconstant head of water provided in the estuaries of English rivers. With the gradual closing down of small local flour mills, there is little scope these days for the use of tide mills for the main purpose for which they were used.

Air News

By John W. R. Taylor

Now the Coléoptère

Latest strange word to appear in the language of flight is "Coléoptère." It is the name of a new type of vertical take-off aircraft being developed by the French Snecma engine company, which combines direct jet lift by engine power as used in Rolls-Royce's "Flying Bedstead", with lift from a special form of cylindrical wing.

The "wing" is said to consist of two tubes of different diameter, one inside the other, with the engines mounted vertically in the space between them. The Coléoptère is intended to take off and land vertically, and to tilt to a nearly horizontal attitude for cruising flight—all of which sounds very entertaining for its pilot and passengers!

Supersonic Midge

Latest news of the splendid little Folland Midge, described in last month's *Meccano Magazine*, is that it was dived through the "sound barrier" twice in one day recently in the course of its flight trials from Chilbolton Airfield, near Winchester. Starting the dives at 37,000 ft., Sq. Ldr. Tennant, Folland's Chief Test Pilot, reached supersonic speed at about 24,000 ft., and held it for five or six seconds. Throughout the dives, the Midge remained under perfect control, experiencing only the inevitable slight change of trim as it passed the speed of sound.

This view of Bristol Sycamore helicopters on the assembly line at Filton gives a good impression of helicopter production in this country. Photograph by courtesy of Bristol Aeroplane Co. Ltd.

Making Rain

Surprising as it may seem to us in England, some countries do not get enough rain, and an R.A.A.F. Dakota was flown to Honolulu a few weeks ago to co-operate with the U.S. Navy in extensive rain-making experiments over Hawaii. The area was chosen because it is an ideal natural laboratory for the study of rainfall from non-freezing clouds—a phenomenon that occurs almost daily there. The results may bring new life to parched areas of Australia in the years ahead.

New Air Ferry Routes

Silver City Airways have applied to the Air Transport Advisory Council for permission to extend their air ferry services over several new routes. Up to 12 more cross-Channel vehicle and passenger ferry services a day are planned from Southampton and Ferryfield to Deauville and Le Havre. A similar number each day are projected on the 35-mile route from West Freugh, near Stranraer in Scotland, to Newtownards Airport, Belfast; and a daily all-freight flight between Blackbushe in Hampshire and Newtownards, with stops at Birmingham and Woodvale, Lancs. In the case of the last service cars would be carried only between Woodvale and Belfast.

The Last Seafire Squadron

Yet another famous wartime aeroplane has disappeared from front-line service with the disbanding of No. 764 Squadron—the last Fleet Air Arm Unit equipped with Seafires. It is more than 13 years since Spitfires were first fitted with folding wings and deck arrester gear to enable them to operate from aircraft carriers. Renamed Seafires, they later flew from almost all of the Navy's great carriers, in every theatre of war. Since the war, all Naval fighter pilots have received instruction on Seafires; but, as in the R.A.F., they will now be taught on Vampire jets. Some Seafires will still be seen, however, in service with the R.N.V.R.

U.S. Aircraft Orders

Some idea of the vast amount of money being spent in America on helicopters was given in the announcement that the U.S. Army and Marine Corps have between them ordered over £40 million worth of the new twin-engined Sikorsky S-56 26-seat helicopter. It will be known as the Army H-37 and Marine HR2S-1.

Other new orders include £45½ million for twin-jet sweptwing Douglas B-66 bombers and RB-66 reconnaissance-bombers, and £56 million for the Grumman F9F-9 Tiger carrier-based jet fighter.

Special Watch for Arctic Flights

Pilots and navigators flying on Scandinavian Airline System's new Polar route from Europe to America, across "the roof of the world", carry watches specially developed for this type of flying. Known as the Polarouter, the new watches are produced by the Swiss Universal company and are non-magnetic, highly accurate and able to withstand rough treatment and sub-zero weather conditions.

* * * *

A Boeing Stratojet bomber was in the air more than 47 hours and covered 21,000 miles without landing during a recent flight from the United States to England. Airfields in Britain were closed by bad weather; so the bomber shuttled back and forth to North Africa for flight refuelling while waiting for the weather to clear. 75,000 gallons of fuel were used!

The U.S. Air Force YC-130 turbo-prop transport described on this page. Photograph by courtesy of Lockheed Aircraft Corporation, U.S.A.

U.S. Turbo-Prop Transport

First U.S.A.F. transport aircraft designed from the start with propeller-turbine engines is the Lockheed YC-130 Hercules, illustrated above. It is well-named, because the original Hercules was the strong man of Greek mythology, and his modern mechanical namesake will also have to tackle some formidable tasks in military service.

Its clean lines disguise its size; for it is a large aeroplane, with a wing span of 132 ft. and a big enough freight hold to accommodate a light tank or any other vehicle or piece of equipment weighing 12-20 tons. Powered by four 3,750 h.p. Allison T-56 propeller-turbines, it is intended primarily to fly over long distances faster and higher than any existing U.S. military transport aircraft; but will also have to carry troops and supplies in low altitude, short-range assault missions right into combat areas.

The Hercules is fully-pressurised for high-altitude missions. Other features are the two-in-line main undercarriage wheels in fairings on each side of the fuselage, which permit operation from small, muddy airstrips; and the low ground clearance of the cabin which, combined with the sharply upswept tail, enables vehicles to be driven quickly and easily up a ramp into the rear of the freight hold.

Atlantic Non-Stop Service

Pan American World Airways have modified their Stratocruiser air liners to make possible luxury, non-stop services from New York to London and Paris all the year round. Such services have been impossible in the past whenever bad weather slowed up a flight and necessitated a stop for refuelling.

Changes made on the new Super Stratocruisers include a redesign of the engine turbo-superchargers to make them more efficient; reduction of the propeller speed from 2,120 r.p.m. to 1,980, whilst keeping the horsepower the same as used at the high r.p.m.; and installation of extra fuel tanks, with a total capacity of 410 gall., on the tip of each wing. The conversion programme cost about a million dollars.

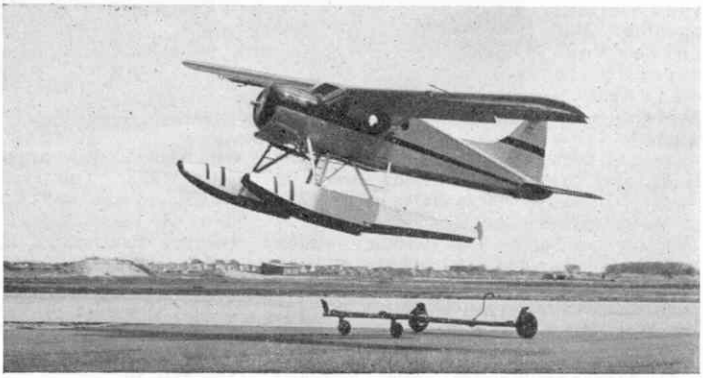
Beaver Exports

Both the Australian Qantas airline and the newly formed Nieuw Guinea Luchtvaart Maatschappij have bought de Havilland (Canada) Beaver "bush transports" for service in New Guinea. They could have made no better choice than this rugged, reliable 7-seater, for Dutch New Guinea, in particular, is a land without roads or railways, where the seas are full of shark, the rivers full of crocodiles, and the jungles full of people who are, to say the least, somewhat unpredictable!

One of the four Qantas Beavers and both of the Dutch machines will be fitted with floats for operation from the numerous waterways. They bring to 32 the number of countries in which Beavers are flying.

Convair V.T.O. Success

From the United States comes news that, after making its first transition from vertical take-off to horizontal flight on 2nd November 1954, the Convair XFY-1 experimental turboprop-powered fighter is now repeating the process in almost daily flight tests from Brown Naval Auxiliary Air Station, near San Diego. Piloted by J. F. "Skeets" Coleman, it usually arches into horizontal flight before reaching a height of 200 ft., immediately after take-off.



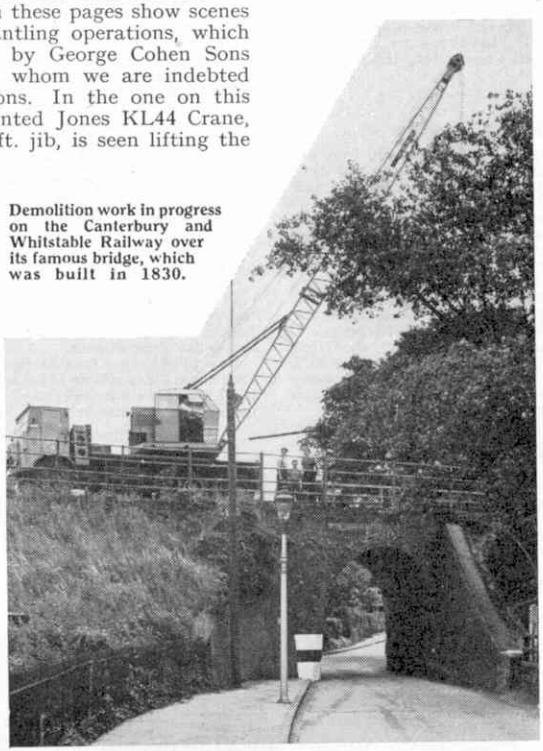
D.H. Canada solve take-off problems for float-equipped Beavers built at their Toronto factory by flying them off trolleys. Photograph by courtesy of de Havilland Aircraft of Canada Ltd.

A Famous Pioneer Railway

End of the Canterbury and Whitstable Line

THE curtain came down on the old Canterbury and Whitstable Railway line in November 1952, with the running of the last regular passenger train. In February of the following year the line was used again as an emergency measure, when the Whitstable floods occurred, but in the following May dismantling began and now nothing is left of the track.

The pictures on these pages show scenes during the dismantling operations, which were carried out by George Cohen Sons and Co. Ltd., to whom we are indebted for our illustrations. In the one on this page a lorry-mounted Jones KL44 Crane, fitted with a 50 ft. jib, is seen lifting the rails over the famous bridge at Whitstable.



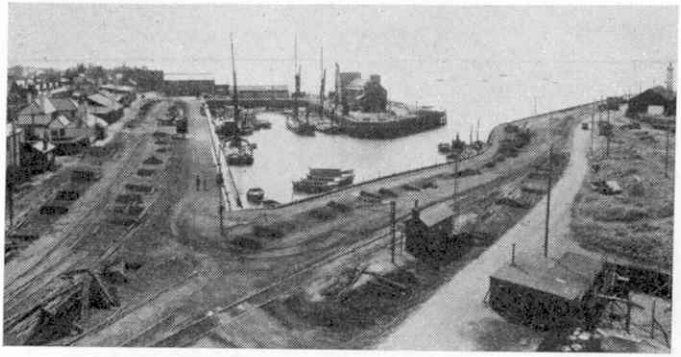
Demolition work in progress on the Canterbury and Whitstable Railway over its famous bridge, which was built in 1830.

For this venerable structure the claim has been made that it is the oldest railway bridge in the world. It was built in 1830, and the passenger trains of the Canterbury and Whitstable line certainly ran over it on 4th May in that year, the day following the official opening. But there were already in existence bridges over which iron ways had been constructed. One of these is Causey Bridge, or Tanfield Arch, in County Durham, which dates from 1727 or even earlier. Another was built in 1803 on the Surrey Iron Railway, which ran from Croydon to Merstham and Godstone, and there were certainly bridges over the Skerne and Gaunless on the Stockton and Darlington Railway, which was officially opened in September 1825.

A second unfounded claim concerns Tyler Hill Tunnel, at the Canterbury end of the line. The story has grown up that the directors of the original company demanded a tunnel when the railway was being planned and constructed, because this was regarded as an indispensable passenger attraction. There is no ground for this. The tunnel was a necessity from an engineering point of view, and it so happened that it was the first to be used for regular passenger traffic.

There was plenty of interest in the Canterbury and Whitstable line to make it quite unnecessary to advance claims that have no foundation in fact. It was projected as early as April 1823 by William James, a land agent and engineer who tried to promote many early railways, usually unsuccessfully. A company was formed to make the line and George Stephenson was appointed engineer in June 1825. The great railway pioneer supervised the work of construction, but two of his assistants who themselves became famous in the early days of railway construction actually did the work. Joseph Locke laid out the line and John Dixon superintended its construction.

Like many early railways lack of funds stopped the works for a time, and in the end they were completed by Robert



Whitstable Harbour, the northern end of the Canterbury and Whitstable Railway.

Stephenson. The opening ceremony took place on 3rd May 1830, and public passenger and goods working began on the following day.

For the opening the famous Stephenson pioneer locomotive *Invicta* came on the scene. It had been delivered by sea at Whitstable, and at the ceremony it was driven by Edward Fletcher, who afterwards became locomotive superintendent of the North Eastern Railway, a capacity in which he served for 28 years, from 1854 to 1882.

Although the *Invicta* was used on the opening date, stationary engines hauling trains by cables were employed in practice until 1846, as the line was steeply graded and it was thought that locomotives could not handle the traffic. The *Invicta* is still in existence, for it was bought by Sir David Salomons, who presented it to the city of Canterbury, where it can still be seen in Dane John Gardens.

Mr. Arthur G. Wells, a reader of the *M.M.*, visited the site of the railway in August last. A kind of fence had been placed across the southern opening of the Tyler Hill Tunnel, but he was able to enter and walk right through to the north entrance, which is smaller than the southern one and is horse-shoe shaped instead of semi-circular. At one time this tunnel was fitted with gates, the hinge pins of which are still in position at the Canterbury end. There was no barrier at the northern end, nor could any signs be detected of the existence of a gate there. This end is in the middle of woods, and probably a gate was not thought necessary.

All along the line the track had been removed entirely, but the old bridge was still in position at Whitstable, still carrying the plaque placed there by the Whitstable Historical Society, making the claim that the structure is the oldest railway bridge in the world. As our illustration shows, the bridge is a very short one, so that the roadway beneath it is extremely narrow, capable of carrying only a single line of traffic. So it may have to disappear. The demolition of this historic relic of early railway days will be regrettable.

The running of the last Canterbury and Whitstable train was attended by a certain amount of sad ceremony, but the lifting of the last rails, the true end of the line, passed almost unnoticed. It was watched in melancholy silence by Mr. Albert Fullager, driver of the last engine to pass over the track, and by two others who had worked for many years on the line. They alone were there to watch the end of a story begun in 1825.

Lifting track in Tyler Hill Tunnel.

DINKY NEWS

BY THE TOYMAN

Winter in Dinkyland

AT this time of the year snowfalls are to be expected in many parts of the world. I suppose most of you look forward to mornings when you will wake up to find that overnight the usual drab winter scene has changed and the world around you has been made beautiful by a thick layer of sparkling snow.

The enchanting prospects of sleigh rides, snowballing and other fascinating games associated with a snowfall excite all of us when young, but as we grow older most of us regard the changed outlook with considerably less enthusiasm, and after an initial bout of shivering we begin a hasty search for rubber boots and overshoes that have lain neglected and forgotten since the previous winter! However, even the most staid of us must agree that a layer of glistening snow makes a charming picture, and brightens up a winter day.

The picture at the top of this page shows snow clearing operations in progress in Dinkyland. Learn how to make these attractive layouts from the article on this page.

Probably you are wondering what all this has to do with Dinky Toys. It is impossible to reproduce in the playroom all the varying weather conditions experienced in real life, and indeed they are not known in Dinkyland. Dinky Toys people do not expect fog or heavy showers of rain, because their Weather Clerk cannot arrange to inflict these upon them without running grave risks of seriously disturbing the tranquility of the household! Arranging a fall of snow, however, causes no such trouble. Real snow, of course, cannot be used indoors, for obvious reasons, but there is a ready-made substitute in ordinary table salt. A liberal sprinkling of salt—one or two small packets will be sufficient—will soon transform your usual layout into a most realistic winter scene, and will provide you with endless opportunities for novel arrangements. A word of warning, however, make sure that the "snow" is confined to the layout!

Arrange your layout in the normal manner and then spread the salt carefully over it, but to obtain the most realistic effect the layer should not be made too even. For instance, some parts of the layout, such as the ground behind hedges or areas sheltered by buildings, need only a thin covering with the original surface showing through in places. In bleak and exposed areas however, the salt can be banked up in deep drifts, to resemble those seen after a snowstorm.

Naturally the roofs of the houses and shops will have to receive their share of snow, but if you are observant you will have noticed that in real life there is a tendency after a while for the snow to slide

A shepherd and his dogs discover a car abandoned in a snowdrift on the moors.

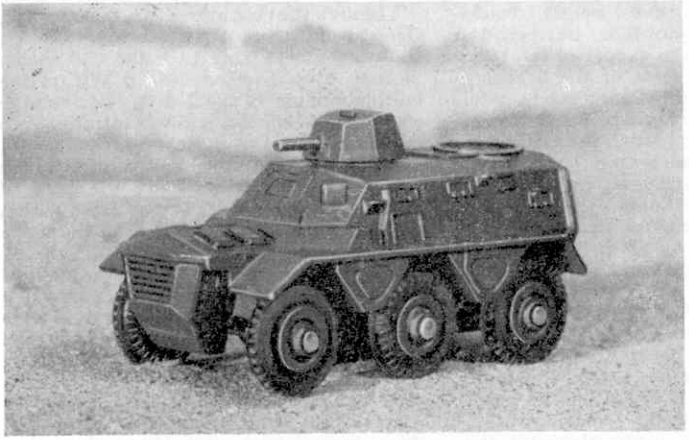
down the sloping surface of a roof. This is particularly noticeable in the warm areas surrounding the chimneys, and you will see that I have attended to this point in arranging the town scene shown at the top of the opposite page. I did not arrange any falls of snow from the roofs on to unsuspecting passers by, but you can, if you wish!

The effect of a heavy fall of snow in remote country areas brings its own special problems for motorists and all who have to use the roads. Very often an unexpected and heavy storm can lead to roads becoming impassable, so that a motorist may be compelled to abandon his car and try to proceed on foot to obtain shelter and warmth. I have arranged a scene of this kind for one of my pictures, which shows a car abandoned on a moor road attracting the attention of a passing shepherd on the way to rescue his sheep scattered on the moor. For this I used the Shepherd and Dogs from the Dinky Toys Set No. 006. I think I should mention, however, that only one Dog is included in this Set.

Now I turn to another new Dinky Toy—a fine addition to the series of Army models. As I explained last month, the demand for the existing range has been so great that it has been impossible to introduce any new models during the last two or three months, but I think you will agree that the latest addition has been well worth waiting for.

Dinky Toys No. 676, Armoured Personnel Carrier, which is shown at the foot of this page, represents one of the latest Army vehicles, the striking appearance and solidarity of which are reproduced in full measure in the model. There is the usual wealth of detail that has made Dinky Toys such firm favourites. The model is fitted with a gun that can be swung in a full circle, and as with all other Dinky Toys Army vehicles Royal Armoured Corps transfers are applied in the correct positions.

The model is finished in the usual service green like the other items in the series.



The new Armoured Personnel Carrier, Dinky Toys No. 676.

On the Footplate in Hong Kong

By Nicolas B. Watson

KOWLOON, on the mainland of Hong Kong, is the southern terminus of a railway system in China extending through Canton as far north as Hankow. Before the Communists swept through China in 1949, this railway formed part of a direct overland route to Hankow and Shanghai and, in pre-war days, to places as far away as Paris! Since 1949 all through traffic has been suspended, however, and at present 11 trains daily make the return journey from Kowloon to Lo Wu, the British border station.

The 22¼ mile Government-owned line between Kowloon and the frontier was built about 1906, and is now known as the Kowloon-Canton Railway (British Section). Two trains a day run from Canton to Sham Chun, the Chinese border station, over the 72-mile southern section of the Hankow-Canton Railway. One or two freight trains also arrive daily at Kowloon, but because of the embargo on the export of strategic materials to China, most of the outgoing freight is loaded into one goods van, which can be included in a passenger train.

Kowloon Station, the Southern terminus of the Kowloon - Canton Railway (British section) is a well-known landmark on the waterfront. This picture was taken from the Ferry.

On arrival at the border freight is not transferred from one wagon to another. Instead the wagon is shunted on to a train waiting to leave for Canton. In order to make the interchange of rolling stock easier, the coupler heights on all British Section locomotives, carriages, and wagons have been lowered.

The K.C.R. suffered badly in the war, losing most of its stock. Immediately after the war, locomotives, rolling stock, and other vital equipment were supplied through UNRRA. All stock is now shipped from Great Britain, though some of the locomotives on the Hankow-Canton Railway come from Czechoslovakia.

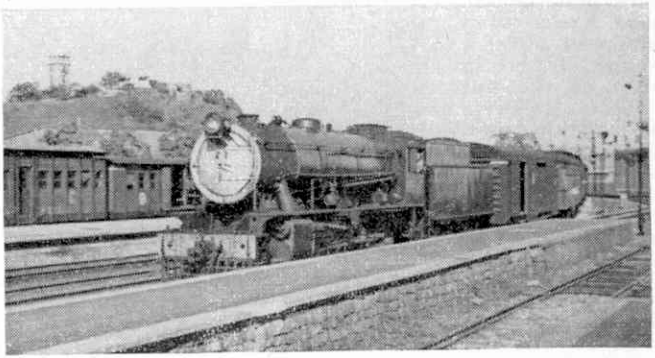
In 1948 the task began of replacing the war-torn track with 95-pounds to the yard lengths of flat-bottomed rail. Now the K.C.R. has 16 locomotives at work, including eight coal-fired and four oil-burning ex-W.D. 2–8–0s for express passenger work, and two tank engines for shunting duties. In addition, there are two 8-wheeled rail-cars—Bedford and Dodge—each having a cab at each end. Before the 2–8–0s arrived, all traffic was worked by 4–6–4 or "Baltic" and 2–6–4 or "Adriatic" tank engines. Shunting duties were performed by odd little 2–6–0 saddle-tanks, none of which is now used.

Through the courtesy of Mr. I. B. Trevor, General Manager of the Kowloon-Canton Railway, I was able to make the return journey from Kowloon to Lo Wu on the footplate of one of the 2–8–0s. I joined the engine at the station, and was introduced to the Chinese crew by the stationmaster. Their mount, No. 22, was oil-fired, and bore evidence of much work on the part of conscientious cleaners. It was fitted with a powerful electric lamp in front of the chimney and one on the back of the tender, and a cowcatcher. Its livery was unlined black, with vivid scarlet wheels, the number being painted on the cab side in red and gold. Most of the other engines we passed on the way were apple-green, and their smoke-boxes and cab interiors were painted aluminium.

Our train consisted of one first-class, three second-class and three third-class

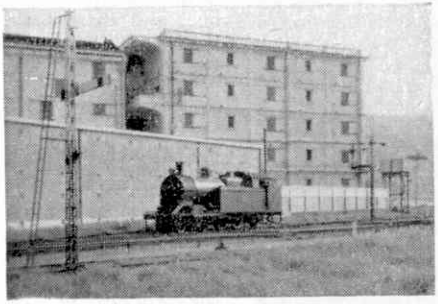
coaches, and a goods van. The seats in the second and third coaches were wooden, whilst those in the first-class carriages were of padded leather. In each a gangway ran down the centre, and the carriages were connected by small bridge-like platforms, chiefly it seemed, for the benefit of people selling sweets and soft drinks.

At last we were ready to leave. The fireman beckoned to me to use his seat, and then watched for the guard's green flag to appear among the milling throng of late passengers. At twelve minutes past four the *Right-away* was given, and giving a long and a short blast on the whistle, the driver eased open the regulator and off we went, tender first.



Ex-W.D. 2-8-0 No. 23 of the Kowloon-Canton Railway brings in an afternoon express from Lo Wu to Kowloon.

Because of the small-diameter wheels, our acceleration was fairly rapid as we swung the seven-coach train round the bend from Kowloon terminus. A long blast on the whistle, about a quarter of a mile from the station, heralded our approach to the engine sheds and repair shops. Still rounding a curve, we roared through a cutting, gathering speed to attack the 1 in 100 gradient leading to our first stop, Yaumati, a suburb of Kowloon. Tablets had to be exchanged here because the line is single, with passing-loops at each station. Each tablet is enclosed in a leather pouch, as it often is in England, and strapped to a large bamboo hoop. The exchange of tablets was, of course, carried out at each station along the line.



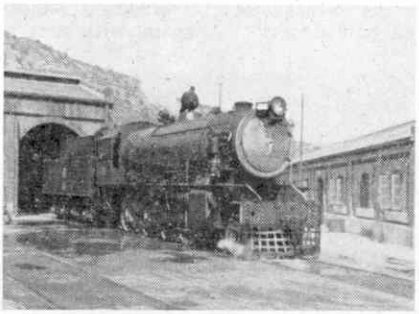
Kowloon-Canton No. 4 is a 2-6-4 tank that has outside cylinders, yet retains the straight footplating characteristic of so many British-built engines.

Within a minute we were on our way again, with four more stops ahead before we reached the border. Again the locomotive barked its way up a 1 in 100 incline, to the mile-long Beacon Hill tunnel, the longest of the five tunnels. The engine was now working really hard, and one could feel the surge of power as the regulator was opened wider. Then, with a long wailing whistle, we plunged into the dank atmosphere of the tunnel. When going through a tunnel in a carriage in England, I had often wondered whether the comparatively open cab is immediately filled with smoke and fumes, like a compartment with a window open. On the return trip, when we were running forward, I was interested to see that the exhaust passed well clear of the cab roof before it blew down on to the rest of the train.

Although we were travelling tender-first, my view was not obstructed. The WD-type tender, with its cut-away sides, allowed me to scan the way ahead through the tunnel. As the walls were very close to the engine, the noise of the roaring oil-jets, the injector, and the pounding of the wheels on the rails was deafening. The swaying cab was lit by a small electric light, and by the flames glowing through a small hole in the firedoor. As the tunnel was curved for part of its length, it was not until we were about half-way through that we sighted the tiny point of daylight at its end. Till then, we just seemed to be chasing a circle of yellow light made by the powerful

lamp on the tender. At last, after nearly two deafening minutes, the train burst into the open, accelerating as it descended to the coast, where junks and sampans moved leisurely over the calm blue of a great bay of the South China Sea.

As the locomotive was oil-fired, the duties of the fireman were easier than with coal firing, a welcome feature in view of the hot weather we were having at that time. He kept constant watch on the water level — I noticed that the safety valves were never allowed to "blow-off" hard — and he glanced periodically at the exhaust, making the necessary adjustments so that it was almost invisible for most of the run. He was also responsible for changing the tablet.



Above 2-8-0 No. 21 is seen outside the running sheds at Kowloon, having the safety valves adjusted. The illustration below shows one of the two petrol engined railcars of the Kowloon-Canton Railway used for inspection duties.

The brakes were applied on nearly every curve as we snaked round the rocky coast, through the fishing villages of Sha Tin and Taipo, then across country through a patchwork of beautifully farmed paddy-fields to Fanling. There quite a number of people left the train, as it is the last fair-sized village before the border. The following stretch between Fanling and Lo Wu is almost straight, and there is a 1 in 400 downward gradient. I expected some lively running at this stage of the journey, but was disappointed, as our speed was reduced to walking-pace simply because a band of women weeding between the rails seemed determined not to leave their work for a few seconds, in spite of prolonged whistling.

About a minute after leaving Sheung Shui, the last station before Lo Wu, we arrived at the frontier, where crowds of men, women and children squatted at the lineside waiting for us to return to Kowloon, The actual station is small, but modern-looking, and is surrounded by a high wire fence. No one seemed in the least perturbed at my presence, though Europeans are not usually allowed there.

The track has not been broken at the exact position of the border, but a heavily-guarded gate marks the boundary. This was opened to allow our engine to run clear of the engine-release crossover, and so run round its train. About five yards on our side of the gate stands a Hong Kong police lookout post and the Union Jack; on the other side is a lookout post manned by Chinese troops, with the flag of the People's Republic of China. Passengers for Canton pass over a wooden bridge, through the gate and the customs shed, and then on to Sham Chun station. The arrangement seems to be quite a satisfactory one, and there have been no incidents worth reporting.

Soon all was ready for the return run, and dead on 5.43 we began the trip home. This time the engine was running forward, and although it was a very hot afternoon, a pleasant cooling breeze blew through the window in the front of the cab. This extended down to the actual footplate, but it had the disadvantage of allowing oily water from the Westinghouse "donkey-pump" to blow all over me.

I have not recorded any speeds on this return trip, as they were not spectacular, mainly because of the constant undulation of the line, and its sharp curves.

BOOKS TO READ

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

"ABC BRITISH RAILWAYS LOCOMOTIVES"
Parts 1–4 (2/- each)

"ABC LONDON TRANSPORT"
(Ian Allan Ltd. 2/-)

The Parts of the ABC locomotive books constitute the latest editions of these familiar publications. In addition to the usual number and name details in all Parts of the various steam locomotive classes, diesel and electric locomotives are included in Part 2 and each Part also records such motive units as electric train stock, diesel railcars and so on as appropriate. B.R. Standard locomotives appear in Part 4 by virtue of the high numbers that they carry.

The *ABC of London Transport Railways* merits special attention because, unlike the locomotive books just noticed, it is four years since the previous edition appeared. It includes the numerical details that one associates with ABC publications, and there are useful notes on the various types of tube and Metropolitan and District line rolling stock. Illustrations are plentiful, as is usual, and in this instance they show how a "new look" has gradually been assumed by London's Underground trains.

It may surprise some to know that the London Underground Railways still have some steam locomotives and details of these, and of the well-known electric Metropolitan engines, are included.

ALL ABOUT AIRCRAFT
By D. M. Desoutter (Faber and Faber. 25/-)

Why so much fuss about flight at the speed of sound? What are shock waves, and what causes those supersonic bangs? How does a jet engine work, and what is the difference between it and a turbojet? These are a few of the many technical questions about aircraft that are answered in this comprehensive book of close upon 500 pages.

All About Aircraft explains the basic theory of flight, both of aeroplanes and helicopters, and its history of the conquest of the air includes a list of the most important dates in aviation. More than 100 aircraft are described, each with an accompanying photograph and drawing. The way in which speed and height records are supervised and certified by international authority is described, and there is a list of notable aviation records of the past 50 years.

New methods of construction, swept wings and delta wings, rockets, ram-jets and special equipment like the pilot ejector seat, are all dealt with here. Information about modern aero engines also is tabulated for easy reference, and modern methods of research with full-scale aircraft and in wind-tunnels are explained.

In fact, one cannot read this book without realising how the science-fiction writers are being slowly overhauled by the performances of modern research aircraft, and how flights now being made are bringing interplanetary travel one stage nearer reality.

A very useful chapter deals with careers in aviation, and covers both the Services and industry.

"THE LOCOSPOTTER'S SPECIAL"
(Ian Allan. 5/-)

Every boy who regards himself as a locomotive "spotter," and many who consider themselves to have grown out of the simple number-taking stage, will welcome this "Special." The "driver," or rather the Editor, is G. Freeman Allen and with the other members of his "crew" he gives the reader some pleasing views, behind the scenes as it were, of railway working.

Royal journeys are always news and something of the careful and detailed work that is involved in the organisation of them is detailed in the first chapter. Then comes a story, an account of the work of the Rugby Locomotive Testing Station, a chapter on speed, and the story of a ride with the guard. In view of current railway happenings in the U.S.A. and elsewhere the description of the biggest steam engines in the world that follows is appropriate, and the book ends appropriately with two rather special night subjects, *Night Ferry* and *Night Mail* respectively.

As is usual there are plenty of illustrations, with a double page railway view in colour.

"MACHINES WHICH SEEM TO THINK"
By Marie Neurath (Max Parrish. 6/-)

Have you ever wondered how the familiar road traffic lights work, or how an alarm clock manages to ring just at the moment it is required to do so; or about the electric kettle that automatically shuts off the current when the kettle is in danger of boiling dry? These and other fascinating puzzles of everyday life are answered clearly and accurately by means of coloured diagrams and brief paragraphs in this attractive little book.

AIRCRAFT TODAY
Edited by John W. R. Taylor
(Ian Allan. 9/6)

This book does not attempt to go deeply into the subject of modern aviation, but gives an excellent general survey that ranges from commercial flying to high-speed testing, from gliding and model aviation to rocket-ships and flying saucers. Its editor, who is a regular *M.M.* contributor, has brought together some sixteen writers who are good authorities on their subjects. For instance, Sir Frederick Handley Page, Kt., C.B.E., in reminiscent mood, looks back to the earliest days of flying and reviews briefly the great developments in aircraft design since that time and in which his Company have played an important part. Lt. Cdr. "Mike" Lithgow, whose life story Mr. Taylor relates in this issue of the *M.M.*, contributes to *Aircraft Today* a fine chapter on the modern jet fighter.

The book has many excellent half-tone and line illustrations, and there is a striking coloured frontispiece.

A PROUD HERITAGE
By John L. Salmon
(The Railway Convalescent Homes. 2/6)

A railway is much more than a collection of locomotives and rolling stock running over track stretching from station to station. In fact, the more we consider railways as a whole, the more we are impressed by the extraordinary variety of activities and interests that are included in their organisation.

This book records in an interesting manner the progress of the Railway Convalescent Homes movement, which has been in existence rather more than 50 years. After small beginnings, in frequently disheartening circumstances, there came a period of development and expansion, with the result that ten Convalescent Homes for Railwaymen have been opened during the past half century. All this makes an interesting story and those of our readers who are railwaymen, and those who have a really deep interest in railway matters, will do well to read it.

Copies can be obtained for 2/9 including postage from The Secretary, Railway Convalescent Homes, Speen House, 124A, Baker Street, London W.1.

Ramsbottom's Chimney

A Railway Relic with a History

LIVERPOOL and its surroundings are richly steeped in railway history, and even today, 123 years after the opening of the Liverpool and Manchester Railway, there are to be seen in the city many examples of buildings and other installations of early railway days. Most of these are practically forgotten, except by the few who still hold in reverence the achievements of the great engineers of the last century.

Illustrated on this page is an example of the work of a railway pioneer that today is almost ignored, although it is certainly big enough to see easily! Those who pass regularly through the district where it can be seen probably just know it as an old chimney they have often seen and never wonder about its purpose. Travellers in trains passing through the great cutting between Lime Street, Liverpool, and Edge Hill may be puzzled by it, if they look upwards, for it is at the lineside. Just beneath its base is a large cavern, excavated from the sandstone high up in the wall of the cutting, that once was filled with machinery, and the chimney and cavern are indeed reminders of the early days of the London and North Western Railway, now part of the London Midland Region.

This giant chimney, to be seen in Liverpool alongside the L.M.R. line from Lime Street Station to Edge Hill, was built in 1870 as part of the system of ventilating the long tunnel through which the line then ran.

Originally the tracks between Edge Hill and Lime Street, opened in 1836, were double and traversed the full distance of nearly a mile and a half in tunnel. There is a rising gradient of 1 in 88–93 from Lime Street and in the earliest days trains were hauled up it by cable. The coaches of trains arriving at Edge Hill were attached to special braketrucks that were fastened to the rope to be run down through the tunnel into Lime Street Station. The winding engine was situated at Edge Hill Station. It had a giant chimney, soaring to a height of 310 feet, that was demolished in 1937. Only its circular base can be discerned today.

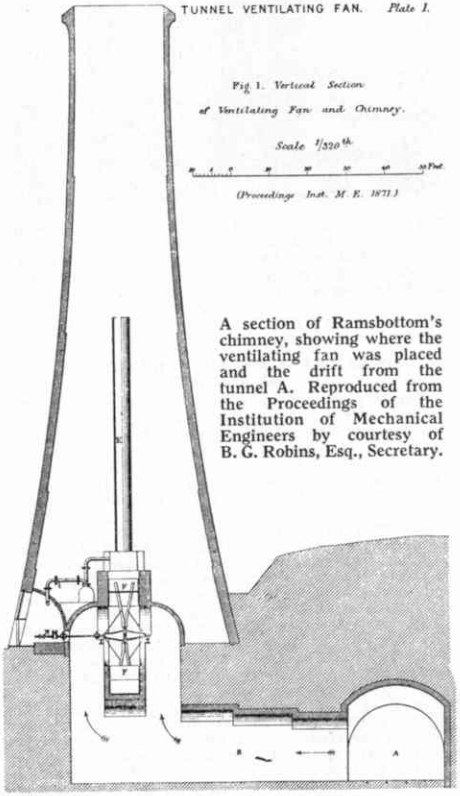
The cable system between Edge Hill and Lime Street was abandoned in 1870, and steam locomotives began to run through the tunnel. Means then had to be found of clearing away smoke and steam. It was therefore decided to construct a steam-driven ventilating fan, and this was duly installed in the cavern to which reference has been made, with a great chimney or shaft above to carry the smoke and gases high enough to avoid inconvenience to those who lived in the district.

This is the chimney of our illustration, still standing but its work long since over. In its position on the south side of the cutting, at a point below Edge Hill Station, it provides a notable Liverpool landmark, though few seem to know anything about its origin and purpose. The fan and the engines driving it were hidden away at its base, inside the great shaft itself, and when it was in use the only external sign of its existence was the smoke that poured out of the top of the shaft as trains ran through the tunnel.

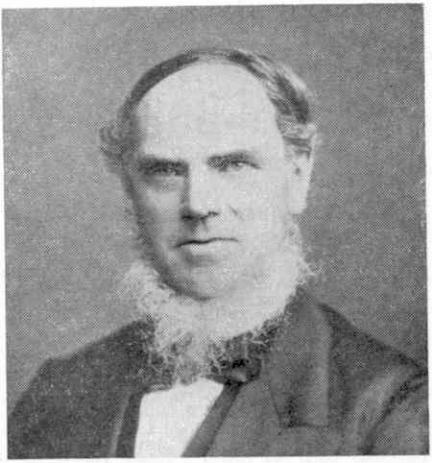
Both the chimney and the ventilation machinery were designed by John Ramsbottom, Chief Mechanical Engineer of the L.N.W.R. from 1857 to 1871, who achieved fame by the invention

of track troughs and water pick-up apparatus for locomotives. At the time when they were installed Ramsbottom was President of the Institute of Mechanical Engineers, and an account of their construction was given at one of the meetings of the Society, and afterwards reported in its Proceedings. From this we learn that the chimney has a diameter of 54 ft. at the base and 23 ft. at the top, which is 198 ft. above rail level. The fan consisted of twelve straight vanes set radially round a horizontal axle. They were formed of steel plate and were 7 ft. 6 in. wide and 7 ft. 2 in. long. The external diameter of the fan was 29 ft. 4 in. The central openings were 15 ft. in diameter, and practically the whole of this central area was available as an air passage.

The design of the installation was so arranged that there was free passage through it for air from the tunnel when the fan itself was not in operation. The reason for this was that the fan was in action only



A section of Ramsbottom's chimney, showing where the ventilating fan was placed and the drift from the tunnel A. Reproduced from the Proceedings of the Institution of Mechanical Engineers by courtesy of B. G. Robins, Esq., Secretary.



John Ramsbottom, who designed and built the ventilation system described in this article.

when trains were passing through the tunnel. An electric bell set ringing by a "policeman" gave the signal to the engineman to start it when a train entered the tunnel at the lower end. Once started, it was kept revolving until the discharge was quite clear, which meant that no steam or smoke remained in the tunnel. A similar bell in the boiler house enabled the fireman to adjust his fires as required.

The two horizontal steam engines driving the fan had cylinders 26 in. in diameter and 24 in. stroke. Steam was supplied by two boilers, 5 ft. 9 in. in diameter and 30 ft. long, and a third boiler was kept in reserve.

Working was so effective that the tunnel was cleared of smoke and steam in about eight minutes. Without the fan running, the natural circulation, stimulated by carrying the boiler flues into an iron funnel inside the main shaft, resulted in a gradual clearance in about three quarters of an hour. At night, after the late trains had gone, it was not thought necessary to operate the fan at all. Smoke from the last train was just allowed to drift out through the shaft.

The installation, effective though it was, had a fairly short life, for most of the tunnel was opened out in 1881, and four years later an extensive programme of widening the cuttings and the remaining tunnels was carried out to give room for four tracks. The tunnel section adjacent to the chimney became a cutting in these changes, so the ventilating shaft and fan fell into disuse.

Among the Model-Builders

By "Spanner"

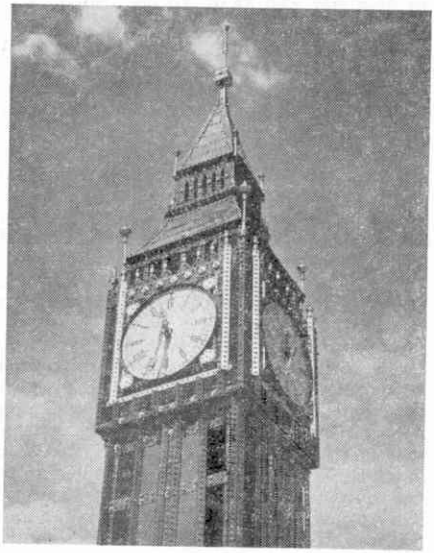
BIG BEN IN MECCANO

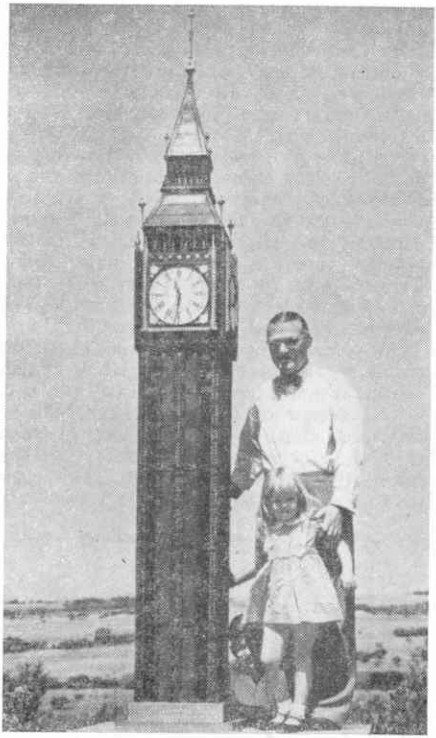
London's famous clock, which can fairly be claimed as the best-known clock in the world, has been modelled in Meccano many times, but seldom if ever have the builders succeeded in producing such a realistic and striking effect as in the latest example of this kind to come to my notice, which was built by Mr. J. W. Palmer, Johannesburg, South Africa. Two pictures of this splendid model are reproduced on this page and I am sure that readers will appreciate the fine work Mr. Palmer has done.

Mr. Palmer was inspired to start work on this model during a stroll in New Delhi some years ago, when he happened to catch sight of a copy of the December 1945 *M.M.* on a bookstall and was very impressed with the cover, a colour illustration of the clock tower of the Houses of Parliament, London. He decided to have a shot at building the tower complete with clock, and after fifteen months of steady work he succeeded in producing the highly pleasing result that appears in the illustrations on this page.

The clock runs for about 24 hours on one winding, and is operated by a falling weight of 26 lb. The tower is over 10 ft. in height, and more than 2,500 nuts and bolts are used in the construction. The time is shown on three dials and the clock is quite accurate in its working.

The very fine clock dials are exact reproductions of the actual dials and were made for Mr. Palmer by a young man of his acquaintance. In the lamp house at the top of the tower is a 6-volt bulb supplied from a transformer housed in the tower itself. With the exception of the wood base, the weight and its suspension cord and the dials, the clock is made entirely from Meccano parts.





The splendid model of the clock tower of the Houses of Parliament, London, referred to on this page, photographed with its builder, Mr. J. W. Palmer, Johannesburg, and his daughter. A close-up of the clock housing and the realistic dials is seen below.

MOBILE CRANE BEARING AND STEERING MECHANISM

One of the points that crops up very often in my correspondence concerns the assembly of a suitable steering mechanism for the wheeled base of a mobile crane. In detailed models of this kind the drive transmission to the wheels is usually taken from a Motor mounted in the cab to a vertical Rod that is free to turn in the centre of the bearing that supports the superstructure. This allows the drive to be transmitted irrespective of the position of the cab in relation to the base, and most model-builders are familiar with the arrangement. The provision of a separate steering mechanism controlled from the cab is rather difficult however, since the steering also must work irrespective of the slewing motion of the superstructure. Some model-builders overcome the difficulty by mounting the steering control on the base, but this is not really satisfactory, as in actual practice the steering wheel is operated by the driver from the crane cab.

In most real cranes the steering shaft and the driving shaft to the wheels are arranged concentrically through the centre of the bearing unit; that is, one of the shafts is in the form of a tube and the other is free to turn inside it. This construction cannot be reproduced exactly in Meccano, but a reasonably

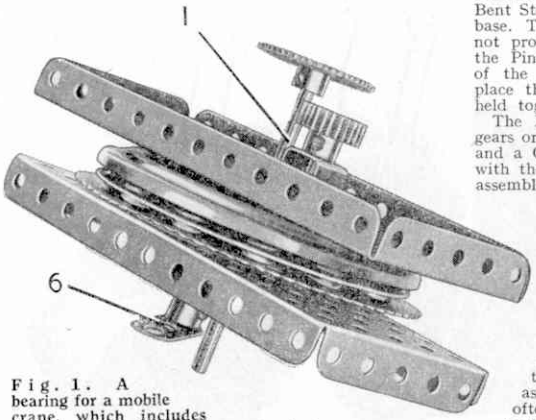
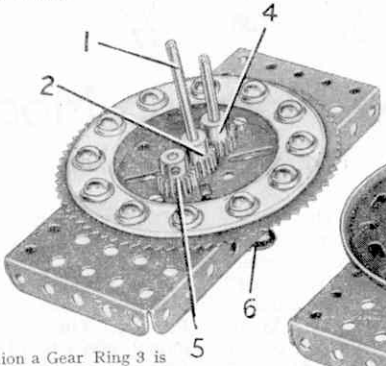


Fig. 1. A bearing for a mobile crane, which includes provision for steering the road wheels.

satisfactory alternative can be arranged as shown in Figs. 1 and 2. This mechanism uses a Ball Thrust Bearing to support the cab, and is suitable for fairly small models.

The Ball Thrust Race Toothed Disc is bolted to the top of the wheeled base, and the Flanged Disc is fixed underneath the crane superstructure. The Rod 1 that transmits the drive to the travelling wheels is passed through the centre of the Thrust Bearing and is free to turn. A ½" Pinion 2 is loosely mounted on the Rod, and in order to accommodate this Pinion a Gear Ring 3 is placed inside the Ball Thrust Race Flanged Disc and acts as a spacing piece. A ½" Pinion 4 is fixed on a short Rod that projects inside the superstructure, and another ½" Pinion 5 is carried by a Rod that passes into the wheeled base. The bearings for the Rods carrying the Pinions 4 and 5 are strengthened by bolting Double Bent Strips to the superstructure and to the wheeled base. The Rod on which the Pinion 4 is fixed must not project inside the base, and the Rod carrying the Pinion 5 must be arranged so that it is clear of the superstructure. When the Pinions are in place the superstructure and the wheeled base are held together by Collars fixed on the Rod 1.

The Rod carrying the Pinion 4 is connected by gears or Sprockets and Chain to the steering column, and a Crank 6 on the lower end of the Rod fitted with the Pinion 5 is suitably linked to the steering assembly.



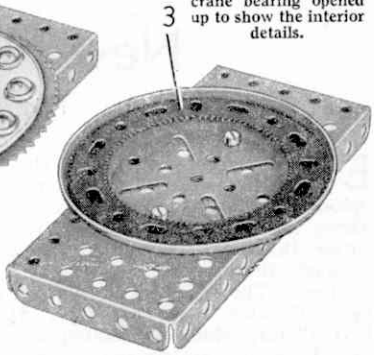


Fig. 2. The mobile crane bearing opened up to show the interior details.

A USEFUL RATCHET BRAKE LEVER

Usually in all but the most simple Meccano models some form of brake is fitted to slow down or stop the action of the mechanism when necessary. The brakes can be controlled by foot pedals or by levers, depending on the type of model and the exact braking arrangement required. Usually a foot pedal is arranged so that the brake comes into action when the pedal is depressed and is released as soon as the pressure is taken off the pedal. Very often however, it is advisable to fit a brake control device that allows the braking effort to be maintained even when the operating pressure is removed. Fig. 3 illustrates a simple ratchet brake lever that enables the brake to be left in the "on" position until the release plunger is operated.

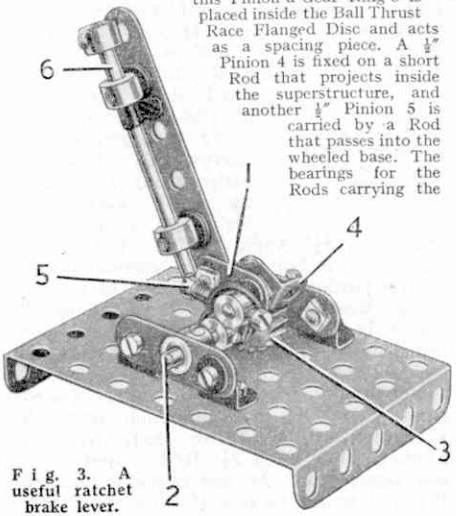
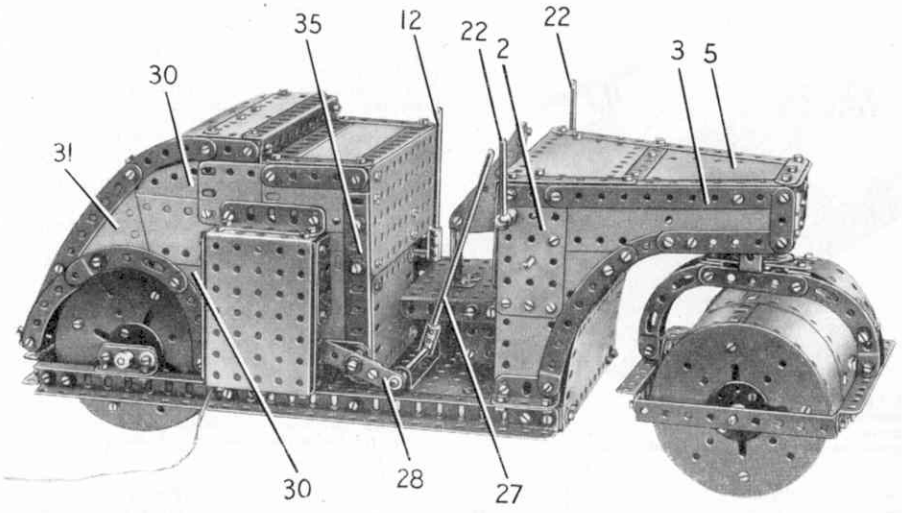


Fig. 3. A useful ratchet brake lever.

The lever is a 3½" Strip to which a 1" Triangular Plate 1 is bolted. It is pivoted on a short Rod 2 fixed in the bosses of two Double Arm Cranks, and these are supported by Angle Brackets bolted to the base frame. A Ratchet Wheel 3 is fixed on the Rod. The ratchet pawl is an Angle Bracket 4, in which a ½" Bolt is fixed tightly by a nut. The Bolt is passed through a hole in the Triangular Plate 1 and on it is fixed a Collar fitted with a 7/32" bolt and a ⅜" Bolt 5. A 2½" Driving Band is looped over Bolt 5, is taken round the Collar and is bolted to the base frame, so that the tension of the Band serves to keep Angle Bracket 4 against the Ratchet 5.

The release plunger is a Rod 6 that is free to slide in two Collars. Each Collar is screwed on to a bolt passed through a hole in the brake lever and fitted with two Washers. These Washers are placed one on either side of the 3½" Strip. The lower end of the Rod bears against the head of the Bolt 5, and a Spring Clip is used to keep the Rod in place.

When the lever is moved to the "on" position the Angle Bracket 4 engages the Ratchet 5 and prevents the lever from returning to "off" until the release plunger is operated.



New Meccano Model

Tandem Road Roller

EACH side of the chassis of the model consists of two 12½″ Angle Girders bolted together to form a channel girder. These girders are connected by 1″×1″ Angle Brackets at each end to further channel girders, made from 5½″ Angle Girders. The chassis is plated by a 5½″×2½″ Flat Plate and two 5½″×3½″ Flat Plates, which are bolted to one of the 5½″ channel girders and to two 5½″×½″ Double Angle Strips fixed between the chassis side-members.

The raised or swan-necked section of the chassis above the rear steering roller is made by bolting a 5½″×2½″ Flanged Plate 1 in the position shown. A 2½″×1½″ Flexible Plate is bolted to each side flange of the Plate 1 and is connected to the chassis by a 1½″ Angle Girder. The Flexible Plate is extended upward by a 3″×1½″ Flat Plate 2, to which a horizontal 5½″×1½″ Flexible Plate is bolted. The top edges of the Flexible Plate and the Plate 2 are strengthened by two 5½″ Strips 3 overlapped nine holes. A 3″ Strip is bolted to the lower edge of the 5½″×1½″ Flexible Plate and is joined to the 1½″ Angle Girder by a 4″ Stepped Curved Strip extended by a 2½″ Curved Strip. A 2½″×2″ Triangular Flexible Plate is bolted between the Plate 2 and the Curved Strips.

Fig. 1. This fine Diesel Road Roller is driven by an E20R type Electric Motor. A novel feature of the model is the power-operated steering mechanism.

The ends of the Strips 3 and the 3″ Strips are connected by a 2½″×1½″ Flanged Plate 4. The cover over this part of the model consists of two 4½″×2½″ Flexible Plates overlapped lengthways by four holes, with another 4½″×2½″ Flexible Plate 5 bolted to them at right angles. A 2½″×1½″ Triangular Flexible Plate is fixed along each side of the Plate 5. The cover is edged at its narrow end by a 2½″ Strip, along each side by a 4½″ and a 3″ Strip and at its wide end by a 5½″ Angle Girder. A 5½″×2½″ Flat Plate is bolted to the vertical flange of the Girder. The cover is attached to Angle Brackets bolted to the Plates 2 and 4, but it should not be fixed in place until the steering mechanism is assembled.

An E20R Electric Motor is attached to the chassis by four ¾″ Bolts, but is spaced from it by two nuts on each Bolt. A ½″ Pinion on the Motor shaft drives a 57-tooth Gear on a 2½″ Rod supported in the side-plates. At the opposite end of the Rod to the Gear a ½″ Pinion is fitted,

and this is arranged to mesh with a 1" Gear 6 by adjusting the nuts on the ¾" Bolts used to fix the Motor to the chassis. A Worm is fixed on the 2½" Rod between the Motor side-plates.

The Gear 6 is fixed on one end of a 5" Rod, which is supported in the Flanged Plate 1 and in a 1"×1" Angle Bracket spaced from the chassis by two Washers on each of two bolts. The 5" Rod carries at its other end a Worm 7. The Worm on the 2½" Rod mounted in the Motor side-plates drives a 1" Gear on a 2½" Rod 8. This Rod is free to slide in two 2½"×1½" Flanged Plates bolted to the chassis and connected at their upper ends by two 1½" Strips. A 1½"×½" Double Angle Strip 9 is fixed to the Strips.

Rod 8 carries a 1" Gear 10 and a ½" Pinion 11, and its sliding movement is controlled by a lever 12. This is a 3½" Rod held in a Coupling, which is fixed on a 4" Rod mounted in Double Angle Strip 9. A Crank on the 4" Rod is extended one hole by a 2" Strip, and a ¾" Bolt fixed in the Strip by two nuts is located between the Gear 10 and the Pinion 11. The 4" Rod is held in place by a Collar, with a Compression Spring between it and the lug of Double Angle Strip 9.

A ½" Pinion is free to turn on a ¾" Bolt, which is fixed in one of the 2½"×1½" Flanged Plates by two nuts. A 2" Rod is mounted in the Flanged Plates, and is fitted with a 1" Gear 13, a ½" Pinion 14

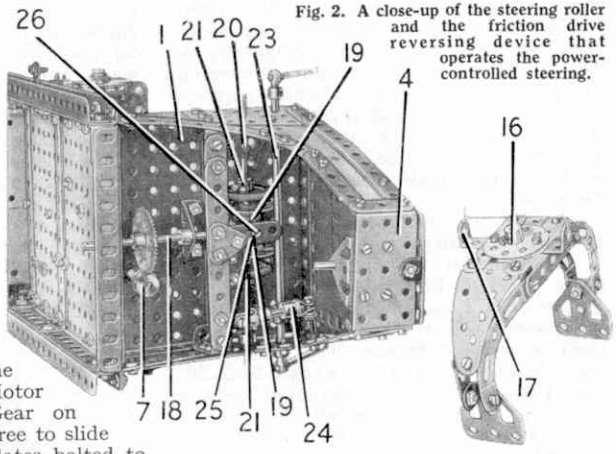


Fig. 2. A close-up of the steering roller and the friction drive reversing device that operates the power-controlled steering.

and a ¾" Sprocket 15. The Sprocket 15 is connected by Chain to a ¾" Sprocket on a 1" Rod. This Rod is supported in a Trunnion and a Flat Trunnion bolted to the chassis, and it carries a ½" Pinion that drives a Gear Ring attached to the driving roller.

The roller is made by bolting four 4½"×½" Double Angle Strips between two 4" Circular Plates, with a spacing Washer on each bolt. It is plated by four 5½"×2½" Flexible Plates and two 1 11/16" radius Curved Plates, which are held by nuts on bolts passed through the Double Angle Strips and fixed in them by nuts. The Gear Ring is spaced from the roller by four Washers on each of the ⅜" Bolts that holds it in place.

A Bush Wheel bolted to each Circular Plate is free to turn on a 6½" Rod fixed at each end in a Double Arm Crank, which is connected to the chassis by a 1½" Angle Girder.

The steering roller is made in the same way as the one already described, but its Bush Wheels are fixed on 1" Rods mounted in two 4½"×½" Double Angle Strips. These are connected by 5½" Angle Girders, to which Flat Trunnions are bolted. Each Flat Trunnion is lock-nutted to a Double

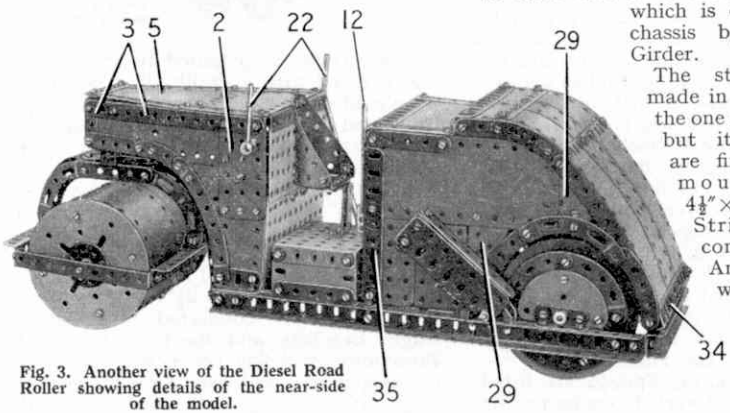


Fig. 3. Another view of the Diesel Road Roller showing details of the near-side of the model.

Bracket that supports two 3" Stepped Curved Strips spaced apart at their upper ends by a 1½"×½" Double Angle Strip. The two Double Angle Strips are connected by four 2½" Strips, two of which support a Bush Wheel 16 and a 2½"×½" Double Angle Strip 17. A 2" Rod fixed in the Bush Wheel is mounted in Trunnions bolted to the Flanged Plate 4 and is held in place by a Collar.

The Worm 7 drives a 57-tooth Gear on a 3" Rod 18, mounted in the chassis and in a Trunnion bolted to the Flanged Plate 1. The Rod is held in place by Collars and it carries at its upper end a ¾" Contrate. This Contrate meshes with each of two ¾" Pinions 19 placed with their bosses inwards on a 6½" Rod 20. The Pinions are freely mounted on the Rod, but each is connected to a Wheel Disc (8-holes) by four bolts fixed in the Wheel Disc by nuts. The nuts are arranged so that one corner of each engages between two of the teeth of the Pinion.

A Compression Spring is placed between each Wheel Disc and a 1" Pulley 21 fitted with a Rubber Ring. These Pulleys are fixed on the Rod 20, and by sliding one of the Pinions 19 the bolt heads of one of the Wheel Discs are pressed against the Rubber Ring of the corresponding Pulley. This completes a friction drive to the Rod 20. When the first Pinion is released and the second is moved the other Wheel Disc engages its Pulley and completes the drive as before, but in the opposite direction.

The sliding movement of the Pinions 19 is controlled by twin levers 22, each of which is a 2" Rod held in a Handrail Coupling fitted at one end of a 6½" Rod 23. A Crank is fixed on the Rod and is connected by a ⅜" Bolt to an End Bearing 24. This is joined by a 1½" Rod to another End Bearing, which is lock-nutted to a 2" Strip bolted to one arm of a Bell Crank 25. The Bell Crank is freely mounted on a Pivot Bolt fixed by its nuts in a 1" Triangular Plate. The latter is supported by two 4½" Strips overlapped eight holes and bolted to the lugs of 1½"×½" Double Angle Strips fixed to the Plates 2. A ⅜" Bolt 26 is passed through the Bell Crank, and on it are placed three Washers before it is screwed tightly into a Threaded Boss. The Threaded Boss is located between the inner faces of the Pinions 19.

Two Cord Anchoring Springs are fitted on the Rod 20 and each is connected by a length of Cord to one lug of the Double Angle Strip 17. The Cords are wound on the Rod in opposite directions, and when the levers 22 are operated the steering roller is turned to steer the model through the action of the Cords winding on the Rod 20.

The Electric Motor switch is controlled by a lever 27, formed by a 5" Rod in a Coupling. The Coupling is fixed on a 3½" Rod, which is held by a Collar in a 2½"×½"

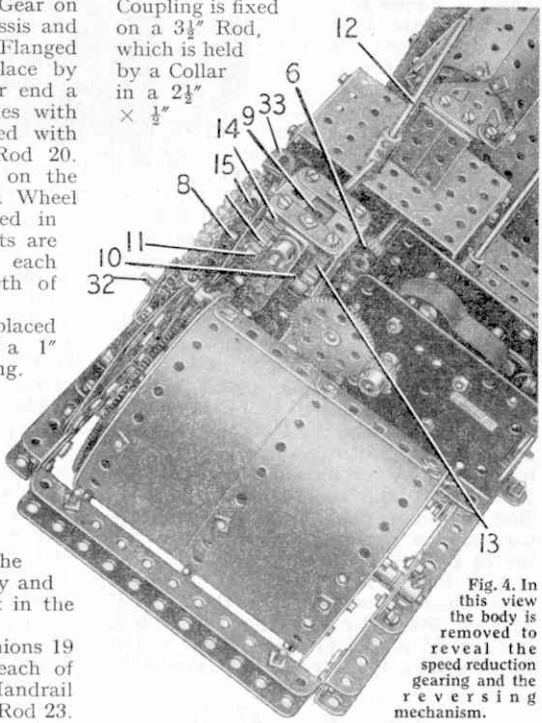


Fig. 4. In this view the body is removed to reveal the speed reduction gearing and the reversing mechanism.

Double Angle Strip bolted to the chassis and is fitted with a Crank 28. The Crank is extended by a 2" Strip, and this is connected by a 1½" Strip to one arm of the switch. The bolts that join the Strips to the arm are fitted with lock-nuts.

The platform under the driver's seat is a 3½"×2½" Flanged Plate supported at one side by a 2½"×1½" Flexible Plate and a 2½" Angle Girder, and at the other side by a 1½" Flat Girder and an Angle Bracket. The seat consists of two 2½"×2" Triangular Flexible Plates connected by Obtuse Angle Brackets and fixed to two Flat Trunnions by Angle Brackets. The seat is supported by two 1½"×½" Double Angle Strips.

(*Continued on page 102*)

The Jones KL66 Mobile Crane Contest

Closing Date Now Drawing Near

ONE of the most important Model-building Competitions we have organised for some time closes at the end of this month. This is the Jones KL66 Mobile Crane Contest, in which Meccano Ltd. and George Cohen, Sons and Company, Ltd., in conjunction, are offering many cash prizes for the best Meccano models of the well-known Jones KL66 Mobile Crane.

Full details of the Competition, together with illustrations and descriptions of this Crane, appeared in the November and December 1954 issues of the Magazine, and a brief summary was also given in last month's issue. As you will see from the panel on this page, the prizes offered are well worth winning, and if you want to be one of the recipients you must prepare and send in your entry without further delay.

The Competition is open to model-builders of all ages, living in any part of the world, and all you have to do is to build as good a model as you can of the KL66 Crane, an illustration of which appears on this page. You must then obtain either a photograph or a good sketch of your model and send this, together with a brief description of its principal features to *Jones KL66 Crane Competition, Meccano Ltd., Binns Road, Liverpool 13.* Your age on the 28th February next, and your name and address, must be stated on the back of each photograph or drawing you send.

THE PRIZES

The following Cash Prizes will be awarded in Sections A and B of the important Model-building Competition announced on this page.

Section A (for competitors under 15 years of age on 28th February 1955).

	£	s.	d.
First Prize, Cheque for	10	0	0
Second Prize, Cheque for	5	0	0
Third Prize, Cheque for	3	0	0
Fifteen Prizes, each of a Cheque for	1	0	0
Fifteen Prizes, each of a Postal Order for	0	10	0

Section B (for competitors over 15 years of age on 28th February 1955).

	£	s.	d.
First Prize, Cheque for	15	0	0
Second Prize, Cheque for	8	0	0
Third Prize, Cheque for	5	0	0
Fifteen Prizes, each of a Cheque for	1	10	0
Ten Prizes, each of a Cheque for ..	1	0	0

If you did not see the detailed description of the crane in the November *M.M.* the following brief summary of its main features will prove helpful.

The Crane is driven by a diesel engine, which provides power for travelling, load hoisting, slewing of the jib and superstructure, and derricking or luffing of the jib. From the engine the drive is taken through a clutch to a 3-speed gearbox, the output shaft of which is connected by a flexible coupling to a main drive transmission unit. From this, separate drives are taken by flexible couplings to the jib derricking drum and to the load hoisting drum. Separate clutches and brakes are provided for each drum.

The transmission unit provides also two other drives, one to the crane undercarriage wheels and the other for slewing the jib and superstructure.

The Jones KL66 Mobile Crane that forms the subject of the Competition referred to on this page.

HORNBY RAILWAY COMPANY

By the Secretary

Developing a Hornby-Dublo Town

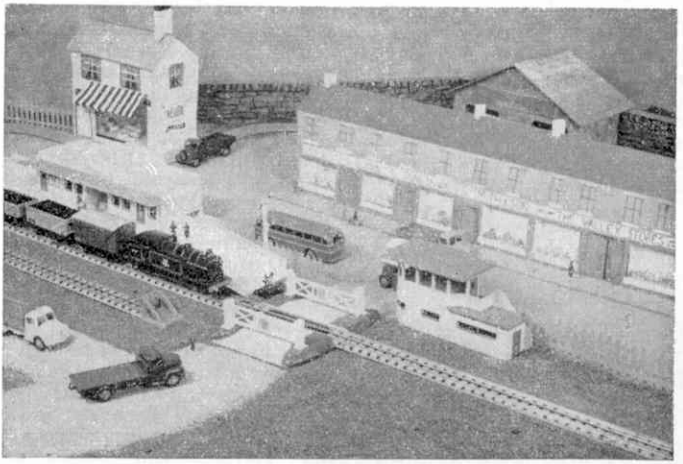
ONE of the problems that face the Hornby-Dublo or indeed any railway owner sooner or later is that of providing a certain amount of "lineside" for his railway. From time to time we have given one or two hints on the subject and there have been of course several readers' layouts described in these pages that have incorporated lineside effects to a more or less considerable extent.

It is not always easy, especially on a small layout baseboard, to obtain the effects desired. If the railway is a continuous one, and most Hornby-Dublo layouts of this kind are, then the railway has a way of turning up in some part of the lineside village or town where its presence is a little bit of an embarrassment!

On this page I am showing a scene, part of which will already be familiar to many of you. Obviously a new railway has been built to serve the town that is represented by the row of miniature shops that has served as part of a Dinky Toys layout. I hope that my friend "*The Toyman*" does not resent this rail invasion of his township for, after all, this is for the benefit of his miniature community.

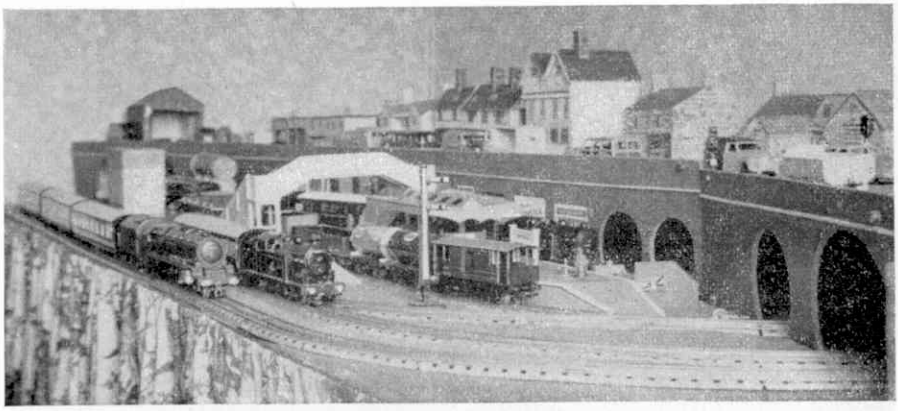
The scene shows in an effective way the use of the Through Station and the Hornby-Dublo Level Crossing together, and the effect is improved considerably by the miniature roadway system. Judging by the number of enquiries that reach me on points of this kind, I think that many of you must be devoting more and more attention to this subject. I shall look forward to hearing of any specially interesting developments, particularly if you are able to send along some good clear photographs showing what these are.

Where only a moderate amount of space is available for the layout and the owner wishes to incorporate lineside or scenic details as well, he is frequently faced with the problem of how to accommodate roadways and so on without interfering with the railway, and vice-versa. Obviously they cannot be kept completely separate from one another and yet there must be some distinction between the railway and the road. This problem has been solved very neatly in the two illustrations on page 93, which show parts of the Hornby-Dublo system developed by Mr. K. G. Lee of Birmingham, who with his son has developed this interesting system.



A brand new railway has come to the township that many of you will recognise by the row of shops that has appeared in various Dinky Toys articles.

The railway layout is simple and consists mainly of a continuous track with, in the foreground facing the operator, a station arranged to represent a centre of some importance. At each end of the station the track curves and passes into tunnel mouths leading the railway underneath the miniature town that has been developed on the rear half of the baseboard. This arrangement has various advantages. From the railway point of



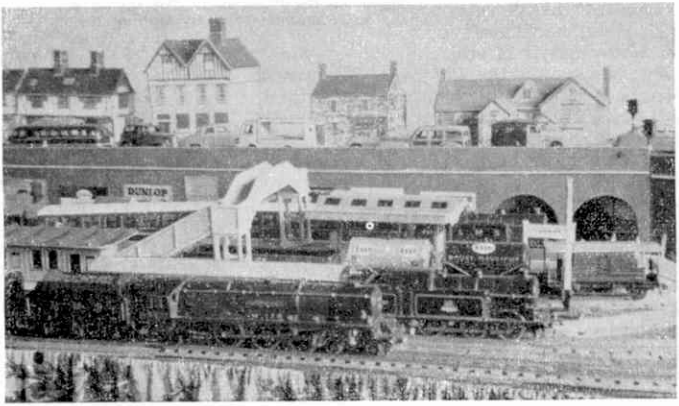
On this page are views of the Hornby-Dublo layout of Mr. K. G. Lee and his son, of Birmingham. The railway is carried beneath the township which is arranged on a built-up section of the baseboard.

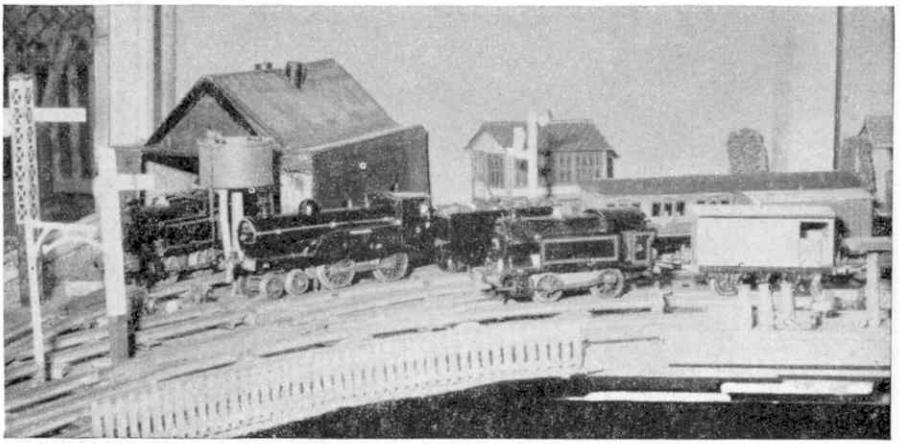
view, the trains disappear into the tunnels and are thus out of sight momentarily at least, and this always adds to the interest of things.

The fact that trains can be held in the tunnels for as long as the operator wishes is a convenience and makes various operating schemes possible. The operator must of course not forget where the hidden trains are, but in case a mishap *does* occur in the tunnel the structural work that provides the high-level base for the township is made so that ready access to the track is possible at the rear of the layout. The whole track is laid on hardboard suitably strengthened. The roadway too and the wall are of hardboard, which has been found satisfactory for the purpose. It is well supported and stiffened by battens, as is always necessary with this material.

Road and building developments "on top," within the limits set by the retaining walls behind the station, can be carried out exactly as the layout owner wishes. In this particular instance there is a busy main street, actually 1 ft. wide, with plenty of motor transport of various kinds represented by the ever-useful Dinky Toys. The miniature buildings are for the most part made up of the "Bilteezi" series of coloured cut-outs that have been referred to before in the *M.M.* They are available at most shops catering for the miniature railway hobby.

Although so much appears to have been included in the system it is rather remarkable that the baseboard itself measures no more than 7 ft. long by 4 ft. wide. The apparent low level of the railway is interesting and unusual and I am sure that many of you will wish to carry out similar schemes. Those who do will no doubt develop some interesting variations to suit the space and the equipment that they have.





Life In Gauge 0

LAST month we talked about some of the simpler things connected with the running of Hornby Clockwork Trains. It does not take long to get used to the operation of a clockwork engine, but the same amount of care always should be given to the job as when the engine and train are new. When properly looked after Hornby Clockwork Trains will last an astonishingly long time.

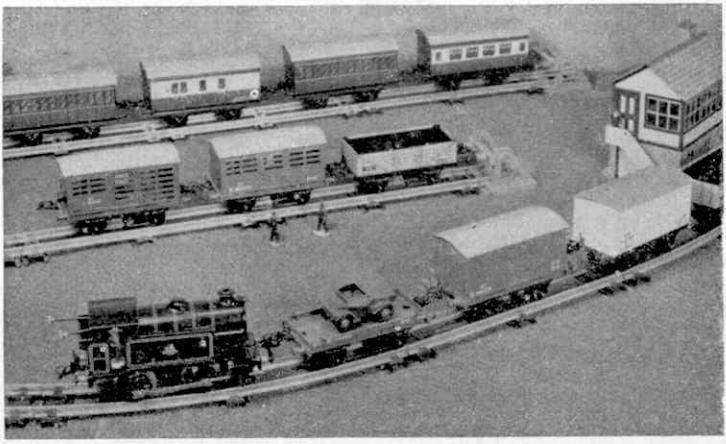
Remarkable proof of this is afforded in the illustration on this page. In this there are three elderly Hornby Clockwork Locomotives. Two of them are Tank engines of the immediate pre-war years, but the real veteran is the old 4–4–0, placed rightly in the centre of the picture. This dates back nearly 30 years and it is still going strong on the layout of its owner, Mr. K. Adams, of Gloucester. Here, then, is a challenge to present-day Hornby Train owners. See if that new engine you have just bought can be so used and maintained that it can do a good day's work as many years ahead!

Above is shown a corner of the layout of Mr. K. Adams, of Gloucester. This railway is remarkable for the long life of its Hornby Clockwork Locomotives, three of which appear in the illustration. The signal on the extreme left is not a Hornby one.

The layout referred to is interesting, not because of an elaborate track layout of the usual kind, but because it actually works on the end-to-end system. There are therefore two terminal stations, with an important intermediate through station and two further wayside stopping places. As long as the track layout at each end of a line of this kind allows for the necessary movements of locomotives and rolling stock there is a good deal to be said for a railway arranged in this way. For its operation clockwork engines are ideal, especially if a system of regular or timetable working is developed.

Such a system of operation is usually approached gradually, as once the rolling owner becomes well practised in the working of his train he usually seeks to develop the layout itself to a certain extent. The obvious first step in this direction is to add accessories and, as you know, the Hornby System includes a good range of these. In addition, much can be done by the home worker in making lineside walls, fencing and even buildings to suit the layout and general situation of the line. Here again we may draw attention to the Adams railway, as in the picture at the head of the page one corner of the system is well filled by a simple home-made engine shed. Corners can scarcely be avoided on most miniature railways and how to make them look less like corners and more like parts of a railway is one of the challenges that face the Hornby Railway engineer. Background scenery will help a great deal in some situations, but well placed accessories, especially where scenery is not possible, will do much to get rid of an awkward "corner" effect.

Our trains must have some reason for running. Like real ones, they are supposed to transport people and goods from place to place, so there must be some evidence of miniature people and merchandise about the railway. This is where the miniature figures of passengers and railwaymen that are listed in the Dinky Toys range are so useful. They add life to the scene whether they are on the station platforms or about the railway generally. We can hardly make them ride in the trains, but there is always room for one or two more little people here and there on the system.



Variety in rolling stock characterises this scene, where the local goods train is conveying a Dinky Toys Scout Car on the Flat Truck next to the engine.

Once these have been placed in position don't leave them where they are for ever. A change is good now and again, and it freshens up the scene considerably if you fix up a different setting with the figures in varied positions from time to time. You will get a lot of enjoyment out of this, too. It is quite good fun to try out different arrangements and now and again to build up different scenes of platform interest.

This sort of thing can be done in the goods yard as well, but for the most part goods activity will involve the movement of miniature loads. Hornby open Wagons and Flat Trucks can carry a variety of articles that owing to the construction of the vehicles can be seen when being moved from place to place. With vans it is rather different, but there is the special fun of loading up any of the Hornby Goods Vans of current types, all of which are provided with doors to open.

There is no end to the variety of loads that can be arranged by the observant miniature railway owner. Taking standard products first, the Meccano Loaded Sacks and the Hornby Milk Cans are well-known, while there is plenty of scope for the use of Dinky Toys, particularly those of military or farmyard character in the loading up of a Hornby Goods Train.

The goods yard staff are looking over two vehicles that are shortly to form part of a goods train. The Hornby Wagon carries a cargo of Meccano Loaded Sacks.

Crossings and Points in Hornby-Dublo

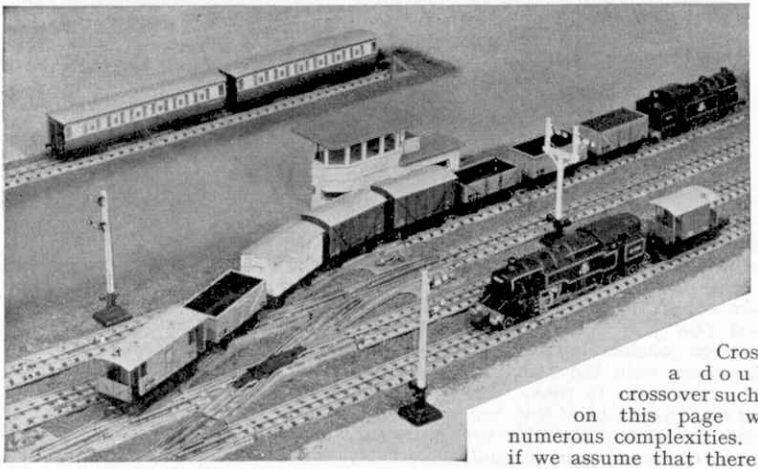
THE Hornby-Dublo Diamond Crossings recently introduced have already become well-established parts of the Hornby-Dublo track system. Most Hornby-Dublo layouts already include one or two of the useful pieces and no doubt many Dublo owners, particularly those who have not adopted a permanent track system, have carried out experiments in order to exploit the possibilities of the Crossings to the fullest extent.

Readers still enquire from time to time why there should be two patterns of the Crossing, a left-hand one and a right-hand one respectively. The answer is that the geometry of the Hornby-Dublo track system makes this necessary, as the Crossings are designed to fit in with left-hand and right-hand Points respectively in the formation of various junction turnouts. Once you have a Crossing, and you endeavour to use this in various ways, the necessity for the two separate patterns is realised.

Another point that is not quite clear to some, although it has been mentioned in the *M.M.* previously, is that the two intersecting routes at a Diamond Crossing are quite separate electrically. The respective centre rails are not carried through the centre part of the Crossing; the actual centre is a plastic moulding that looks after the job of getting the wheels of the train over the Crossing in safety, and it does of course form an insulator.

The continuity of current supply from one side of the Crossing to the other is afforded by wiring "underground," that is within the base of the whole unit.

Each Crossing arm is connected to the corresponding opposite arm only, so that the separation of the routes electrically is ensured. If this were not so, it would not be possible to use a Crossing to lead a connection from one main track across the next, and into a further main line or siding, without interference between the respective circuits. Again, the arrangement of Points and Crossings forming a double track crossover such as that shown on this page would involve numerous complexities. As it is, even if we assume that there is a separate electrical supply to each track, things are no more complicated than in a simple crossover between up and down main lines. And from the track point of view, the left-hand Points shown require left-hand Diamond Crossings and the result is an effective and rather spectacular piece of track work.



This four-road section of a Hornby-Dublo main line has connections from the fast tracks to the slow arranged by means of left-hand Points and left-hand Diamond Crossings.

This sort of formation is often found where there are separate up and down pairs of tracks for fast and slow traffic respectively. In order to make the best use of the tracks trains are frequently crossed from slow to fast lines and vice-versa. So, in the picture a goods train has just left the "up slow" in order to make use of the "up fast." There may be sidings on that side further on, where the train has some roadside work to do.

Club and Branch News

WITH THE SECRETARY

MERIT MEDALLIONS

During the twelve months since I published my previous annual list of Merit Medallion awards, 34 members have been nominated by their respective Leaders as worthy to receive this official recognition of good work for their Clubs and for the Guild. This is excellent. There is scope for greater use to be made of this attractive award, however, and I hope that as a result of my reminder on this page last month Leaders will avail themselves to the full of the Merit Medallion during the ensuing twelve months.

I am glad to have this opportunity of congratulating the following Club members on winning this award during 1954: CHRISTCHURCH (NEW ZEALAND) M.C.—M. Fraer. COPDOCK AND WASHBROOK M.C.—C. Pearson; R. Steward; M. Warren; K. Whitten. EXETER M.C.—R. Bradford; D. Bruce; J. King; D. Lawer, C. R. Williams; C. Willis. FREMANTLE AND DISTRICT M.C.—M. Collins; L. Smith. HORNSEA M.C.—H. Franks; D. Stevenson. MAYLANDS (AUSTRALIA) M.C.—M. Costello; I. Davies; K. Duffy; E. Hall; G. Heron; I. Horrocks; M. Parker; R. Perkin. MILE END (PORTSMOUTH) M.C.—C. Lewis; M. Mack; H. Sergeant. MYSORE (INDIA) M.C.—B. Jayaram; K. Ramanna; H. S. A. P. Rao; N. Raja Urs. STRENSALL M.C.—L. Edwards; T. Moore; J. Nurse; A. Sellars.

THE VERY THING FOR THE BRANCH ROOM!

H.R.C. Branches on the lookout for appropriate pictures with which to adorn their Branch room walls will be interested to hear that the British Transport Commission have published an excellent colour print showing the 21 different types of British Railways' locomotives. The engines range from the heavy electric, gas-turbine and diesel units through the whole range of B.R. Standard steam designs to the smaller diesel shunters. The illustrations are numbered, and an identification list is given in the lower part of the print, which measures 20 in. long by 15 in. deep, and costs 5/- post free. Copies can be obtained from The Publicity Officer, British Transport Commission, 222 Marylebone Road, London, N.W.1.

If mounted on a thick sheet of cardboard the colour print would make a very useful picture for the Branch room.

PROPOSED BRANCH

CHESTER—Mr. R. Beale, c/o Mrs. Waite, 5 Mason Street, Chester.

CLUB NOTES

CRYPT GRAMMAR SCHOOL M.C.—The subjects of two Model-building competitions held during the first Winter Session were *Private Cars* and *Bridges* respectively. Both contests produced some excellent models, the latter including two Tower bridges! Club roll: 30. *Secretary:* R. J. Carter, "Daneway," 162 Hucclecote Road, Hucclecote, nr. Gloucester.

HORNSEA M.C.—Meetings have been devoted to Meccano model-building, film shows and games. Chess is the latest game to be introduced. Club roll: 9. *Secretary:* J. Gosnold, Sunnybrae, Belgrave Drive, Hornsea.

AUSTRALIA

FREMANTLE AND DISTRICT M.C.—The introduction of factions has resulted in an improved standard of Meccano model-building, the spirit of competition spurring on members to build better and more complicated models in order to win the shield for their faction. The shield is almost completed, and is a credit to all who have helped to make it. This all-round progress should ensure a first-rate display when the Club hold their next Exhibition. Club roll: 10. *Secretary:* M. Byrne, Beaconsfield Hotel, Fremantle, Western Australia.

BRANCH NEWS

NORBURY (LONDON)—Members have visited the B.R. locomotive depots at Old Oak Common, Willesden, Gillingham and Faversham. An interesting talk by Mr. Chapman on railway stations and their design was illustrated with photographs. Members took part in preparations for the Norbury M.C. Exhibition, which was very successful. *Secretary:* L. Woolf, 52 Portland Road, South Norwood, London, S.E.25.

HALE END (LONDON)—At one meeting a member brought along his new Hornby-Dublo 2-6-4T locomotive, and its fine performance was greatly admired. *Secretary:* A. L. Coe, 463 Hale End Road, Highams Park, London E.4.

NEWPORT (I.O.W.)—Mr. Seaman gave a very interesting talk about his work as a railway freight train guard, and afterwards answered members' questions. *Secretary:* E. Cousins, West Street, Newport, Isle of Wight.

Officials and members of the Kentish Town (London) Branch No. 548, with Mr. J. Tenant, Chairman in the centre foreground. Mr. J. B. Kirby, Secretary, is on his right. This progressive Branch was incorporated a year ago, operates a fine up-to-date layout, and is already seeking larger premises.

For other Stamp Advertisements see also pages 100 and xvi

Stamp Collectors' Corner

By F. E. Metcalfe

MOTHER INDIA

INDIA has been much in the philatelic news lately, and it is not only the new stamps that are making the news. About these I will have something to say later in this article, but first I would like to comment in general terms on Indian stamps. Until India became a sovereign nation, in 1947, her stamps, though popular enough, were mostly dull in design.

There has been a big change since then, and now that machinery has been installed for printing stamps in photogravure, India is producing set after set. While these lack the interest for students that the older issues had, they are appealing much more than ever before to ordinary collectors.

I have written previously about the early issues of India, and I do not propose to say much about them now, but I must draw your attention to the illustration of the "invert." No, the stamp itself is not upside down, nor is the centre. In reality it is the frame that is inverted, as shown.

There are only 20 specimens known in this form, and of these only three are cut square, which adds to its value. Most of the specimens were cut in the form of the design, and are not as valuable. Anyhow, the stamp illustrated is very rare, and where do you think it was found? In a collection worth apparently only a few shillings or so that belonged to a young lady in New Zealand, who very diffidently showed the stamp to a famous firm of London stamp auctioneers. She never really believed that it was the real thing, but when she got a big fat cheque, after the sale by auction, she no longer doubted. I suppose that such happenings have something to do with the continued popularity of postage stamps.

India's first big set after the breakaway was the one known as the Archæological and Architectural Issue of 1949. Unfortunately the offset-litho style of printing did not show up some really wonderful designs. But these stamps are easily come by in a used condition and I urge collectors to get a complete set, and study those designs. Go to the local public library, and try to fathom what these designs mean. The labour involved will be repaid a hundred times, for India and its past provide fascinating studies.

For the collector interested in good shades, I would commend the 10r. value. Some stamps of this issue have a very dark blue frame, whilst others have a frame that is of a quite light blue. Then there are shades of the 3p., 6p. and 1a. These are all listed in the Commonwealth Catalogue and are quite cheap. But whether you go in for shades or not, do go in for the set. It has now been replaced by the one supposed to feature the five year plan. India is very earnest about its plans for improving the lot of the workers and peasants.

Indian commemoratives are much sought after, particularly the pair issued in 1953 to commemorate the Conquest of Mount Everest—incidentally, the same mountain figures on the New Zealand "Health" pair of 1954. We all remember what a thrill we got that wet Coronation Day, when the news of the conquest came through. The pair of stamps that India issued were all that commemorative stamps should be. Pity we did not issue one as well. Can you imagine any other country letting slip such an opportunity?

Another very popular commemorative stamp is the black 2a issued in 1953 to celebrate the centenary of the first Indian Railway. I am sure that *M.M.* readers will be particularly interested in this one. But I must admit that my favourite Indian commemorative stamp is that issued in 1951 to mark the centenary of the Geological Survey of India. It shows a pair of that remote predecessor of the Indian elephant—the *Stegodon Ganasa*. Printed in offset-lithography, the design does not show up as well as it would if the process used had been photogravure, but I still think it is a fine stamp. Those two brutes must have been awkward to meet!

One can pick all over the place for interesting commemoratives. Take, for example, the Inauguration of Republic issue. Perhaps to stamp collectors, however, the set issued in 1954 to commemorate the centenary of India's postage stamps is the most interesting. Mr. Kooka has sent very useful information about this set. In fact, this reader keeps us posted all the time on Indian stamp matters, and I am sure that we are all very grateful for his help.

The Postal Centenary issue consists of four stamps, depicting various modes of transport. This will perhaps be the only set commemorating such an event that has not shown something of the original stamps, which in this case showed portraits of Queen Victoria.

For other Stamp Advertisements see also pages 98 and xvi

Stamp Gossip

OLYMPIC GAMES

IT seems only yesterday when we were scratching round for gold medals at Helsinki, and only getting one, not through a runner or anything like that, but with the aid, of all things, of a horse. Now Australia is preparing for the next games, which are to be held at Melbourne in November and December 1956. To draw attention to the great event—and no doubt for the Post Office to make a bit on the side, for the stamp concerned has the relatively high face value of 2/—a special stamp was issued on 1st December. As can be seen from the illustration, the design is not a world beater, even if the object behind the emission is a worthy one.

WATCH YOUR STAMPS

Most will remember the handsome pair of stamps issued last May by Eire—or is it Ireland? I wish I knew for certain—to commemorate the Marian Year Centenary. Well, a very interesting variety is to be found on the top row (fifth stamp) of the 3d. value of Plate 1B. It takes the form of a re-entry that can be seen quite clearly by the naked eye, if one has normal eyesight. The right hand of the child appears to be lined in, as it were, one of the lines being a curl in the palm.

I understand that there was a correction as soon as the variety was found, which no doubt accounts for the scarcity. However, there are a lot of used copies about, and if you find one nicely cancelled, you have a stamp worth round about 10/-. Incidentally, the variety will be listed in the Commonwealth Catalogue, as it is an interesting item.

MORE ERRORS

Collectors of K.G. VI stamps are still hunting the watermark errors, and I suppose that a number of Meccano readers must be doing the same, for an awful lot go in for the stamps of the previous and present reigns. Most know what the hunt is about, but perhaps some don't, so here are the details, as the announcers on the Irish radio used to say.

Way back in 1950–51 one or more of those bits of metal fastened on to the dandy roll, which make the impressions on paper which we call the watermark, came off. Apparently some paper was made before the loss was noted, so there we get the missing watermark variety, a stamp on which there is a blank instead of the usual crown. Next, when the omission was noticed, two crowns—I think it was two, though when the varieties were first spotted, it was thought that only one was concerned—were affixed to the mesh, but these crowns were not of the usual pattern. They were St. Edward's Crowns, and the chief difference is that the top of this crown dips.

Well, there you have the varieties that have caused so much fun. They have been given a lot of cleverly-managed publicity, and hence the big hunt. They have been found on a number of postage due stamps, also on most of the values of Seychelles of the 1952 issue, and other odd stamps such as the St. Kitts-Nevis "Anguilla" 1½d. etc.

SOME BLOT!

Few who read these lines have not by accident made a blot at some time or another. Above is a stamp with a blot made by design and not by accident, and thereby one of the most interesting I have ever seen. Don't you agree?

Greece has issued this stamp, with six values all of the same design. It shows a page from Hansard, a report of a debate in July last on the question of Enosis, and the big blot has been added for obvious reasons. The writer remembers standing in Tottenham Court Road at that time and seeing a procession of Cypriots who, as part of their protest in favour of union with Greece, had covered their mouths with black gags. All very original, and all pointing out how seriously they take the affair.

OUR OWN STAMPS

It is not often that we get a chance to discuss new stamps for our own country, for unlike most other nations we are very sparing about new issues. More's the pity. In these days, when countries as well as individuals feel the necessity for publicity, there is no better medium than postage stamps to accomplish this end.

In view of this the news that British stamps are to have a new watermark has fired stamp collectors with great interest. But it will mean nothing to the man in the street, who knows nothing about such things. There has been a change that all will notice, however. I refer to the new embossed stamps, which have recently appeared on registered envelopes. I am illustrating one of these.

The new design for the embossed stamp is very fine, and will play its part in arousing further interest in the particular branch of philately to which I have just referred. While the average collector will not perhaps want to collect all the envelopes on which these stamps are embossed, they can be easily cut out and mounted like an ordinary postage stamp. And in doing that collectors of today will be emulating collectors of the past, who were as keen on them as on ordinary stamps.

Dew-Ponds—(*Continued from page 59*)

determine the kind of weather conditions most helpful to the replenishment of dew-ponds. A Berkshire farmer, for instance, kept a careful check on one of his ponds for this purpose. During five summer nights of misty weather the water in the pond rose by seven or eight inches over its previous level. Then he measured again over five nights when there were no mists, but rather heavy dew. This time the rise in the water level was less than three inches.

Some writers have declared that the dew-pond was unknown until the eighteenth century, but there seems little doubt that this method of making an artificial water supply where none exists naturally is of ancient origin. The remains of fortified camps and earthwork towns along the chalk heights of southern England remind us that these hilltops were inhabited by communities long before any villages or towns grew up in the valleys below. Such communities must have devised means of water supply both for domestic purposes and for watering their flocks and herds. The pond of puddled chalk or clay would seem to have been the obvious solution.

It is extremely difficult to distinguish between ancient and modern dew-ponds, and it is highly improbable that any have survived from early times. Nevertheless, the ponds existing near such prehistoric camps as Cissbury Ring in Sussex and Bradbury Rings in Dorset, and perhaps some on Salisbury Plain, may well occupy the sites of those cut by the hill-dwellers of long ago.

Visiting the lonely, half-forgotten hill ponds today, it is fascinating to speculate on such theories and to recall the significant part they have played in the story of our agriculture. Without the dew-ponds it would have been impossible to raise the great downland flocks of sheep which contributed so much to this island's progress and well-being.

"Stringbags" to Swift—(*Continued from page 62*)

Spitfire-Seafire-Spiteful-Seafang family of piston-engined fighters, ashore and afloat.

Little wonder that he enjoys his work. After all, what other job offers a man the satisfaction of travelling faster, officially, than anybody else in the world, as he did in September 1953; or of meeting and performing before Kings, Presidents and hundreds of thousands of their subjects in half a dozen countries in almost as many days? Of course, Mike Lithgow probably would not put it in those words. In *Mach One* he comments simply that: "Having got into the groove of test flying, any other sort of occupation seems unthinkable . . . . . So come on you future test pilots."

New Meccano Model—(*Continued from page 90*)

The general arrangement of the engine cover can be seen clearly in Figs. 1 and 3. At one side two 2½" × 1½" Triangular Flexible Plates 29 are used in the plating, and on the other side two similar Triangular Flexible Plates 30 and a 2½" × 2" Triangular Flexible Plate 31 are fitted. The sides and top of the cover are connected by Angle Brackets.

The guard over the chain drive is attached to a ½" Corner Angle Bracket 33. The 5½" Angle Girder 34 at the front of the cover is fitted over ⅝" Bolts held in the chassis by nuts, and the 4½" Angle Girders 35 are connected to the chassis by Angle Brackets.

Parts required to build the Tandem Road Roller: 5 of No. 2; 4 of No. 2a; 2 of No. 3; 4 of No. 4; 9 of No. 5; 3 of No. 6; 8 of No. 6a; 4 of No. 8; 11 of No. 9; 2 of No. 9a; 2 of No. 9d; 4 of No. 9f; 7 of No. 10; 2 of No. 11; 15 of No. 12; 5 of No. 12a; 2 of No. 12b; 2 of No. 12c; 3 of No. 14; 2 of No. 15; 1 of No. 15b; 3 of No. 16; 2 of No. 16a; 4 of No. 17; 1 of No. 18a; 3 of No. 18b; 2 of No. 22; 5 of No. 24; 2 of No. 24a; 2 of No. 25; 5 of No. 26; 2 of No. 27a; 1 of No. 29; 4 of No. 31; 2 of No. 32; 377 of No. 37a; 309 of No. 37b; 142 of No. 38; 1 of No. 40; 7 of No. 48; 2 of No. 48a; 2 of No. 48b; 10 of No. 48c; 2 of No. 48d; 2 of No. 51; 52 of No. 52; 2 of No. 52a; 2 of No. 53; 7 of No. 59; 3 of No. 62; 2 of No. 62b; 2 of No. 63; 1 of No. 64; 3 of No. 70; 3 of No. 73; 1 of No. 77; 2 of No. 89; 6 of No. 89a; 2 of No. 89b; 8 of No. 90; 2 of No. 90a; 1 of No. 94; 2 of No. 96a; 1 of No. 103d; 1 of No. 103f; 1 of No. 103g; 1 of No. 103h; 1 of No. 111; 2 of No. 111a; 16 of No. 111c; 3 of No. 120b; 4 of No. 126; 5 of No. 126a; 1 of No. 128; 3 of No. 136a; 4 of No. 146a; 1 of No. 147b; 1 of No. 154b; 2 of No. 155; 2 of No. 166; 2 of No. 176; 1 of No. 180; 9 of No. 188; 4 of No. 189; 1 of No. 190a; 3 of No. 191; 13 of No. 192; 6 of No. 200; 1 of No. 214; 7 of No. 221; 5 of No. 222; 1 E20R Electric Motor.

A FINE L.M.R. MIRROR

The mirror on the compartment partition has been a familiar and much appreciated feature of British Railway coaches for many years. A recent London Midland development, at present in the experimental stage, has been the installation of mirrors on which, without reducing their effectiveness, a clear map showing London Midland routes is shown. We have received one of these mirrors, and found it admirable and effective.

We have also received a striking coloured poster showing L.M.R. express passenger and coal trains, both electric hauled, in a characteristic Pennine setting on Britain's first electric main line, between Manchester and Sheffield. The poster draws attention in a very effective way to the electrification and equipment of the busy line that once formed part of the Great Central Railway.

AIR-BRITAIN

Readers who are keen on aeroplanes will be interested to learn of Air-Britain, a National Association founded in 1948 to cater solely for aviation enthusiasts, and now having a world-wide membership. It is open to all aviation enthusiasts, irrespective of age or sex. The membership fee is 5/- a year.

The organisation includes a London headquarters and some 20 specialist agencies, that cover the whole range of aviation endeavour from Aerodynamics to the Registration of Aircraft. Each agency is run by what Air-Britain calls a Data Specialist, an expert of experts in his particular field, whose duties include the answering of letters from members, cataloguing of new facts, and production of bulletins, pamphlets, photographs, etc.

Air-Britain is responsible for several excellent aviation publications, and details of these, together with an enrolment form, can be obtained from Mr. D. K. Fox, Honorary General Secretary, Air-Britain, 31 First Avenue, Acton, London W.3.

This Month's Special Articles

From Our Readers

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

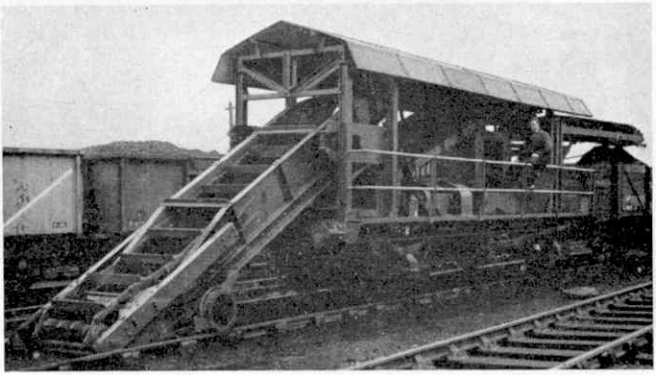
THE COAL MACHINE

When I am working on the footplate and see the engine spotters at work, I cannot but think that the one engine the majority have never booked is the one shown on the enclosed photograph. Possibly this may not attract notice because it has no number, as a "real" engine has, but it is self-driven. We who work on the footplates of locomotives call it the "coal machine."

Sidings throughout the country are liable in time to become clogged with coal that falls from wagons during shunting. The coal machine is brought to the siding to clear away the fallen coal. As can be seen in the photograph, metal claws in front of the conveyor belt revolve as the machine moves forward. The coal picked up passes on to the conveyor belt which runs under the cab roof, and then falls into the collecting wagon.

On the coal machine power is derived from a diesel engine which is controlled by the driver. When required in other parts of the country the machine does not travel on its own power, however, but is taken there by a steam engine.

J. BALMOND (Birmingham).



A diesel-driven machine used to clear coal from sidings. Photograph by J. Balmond, Birmingham.

A LONELY POST-BOX

The centenary of a famous Dartmoor tradition occurs this year. This concerns the lonely post-box at Cranmere Pool, in the centre of the northern half of the Moor. This originated in 1854 in the form of a jar wherein visitors could leave their cards. There followed a succession of various receptacles. The existing box dates from 1937 and formerly had an iron door; recently the new teak door shown in the accompanying illustration was fitted, at a cost of £50.

No Dartmoor explorer worthy of the name fails to seek this elusive and isolated spot where, having applied the Cranmere postmark with the rubber stamp provided, he may leave mail for collection by later visitors, who post it at the nearest Post Office.

Once the Pool justified its name, but it has long since been drained and is now merely a peaty hollow in a treacherous and desolate region of bog and morass. This marks the approximate source of the West Okement river.

C. E. WRAYFORD (Bovey Tracey).

The lonely post-box at Cranmere Pool, Dartmoor. Photograph by C. E. Wrayford, Bovey Tracey.

A BLASTED HEATH

About four miles out from Nairn, near Inverness in Scotland, is a bleak wind-swept heath known as Hardmuir. It was over this lonely expanse of scrub and coarse grass that the victorious generals, Macbeth and Banquo, were supposed to have passed on their way to Forres, just over 900 years ago.

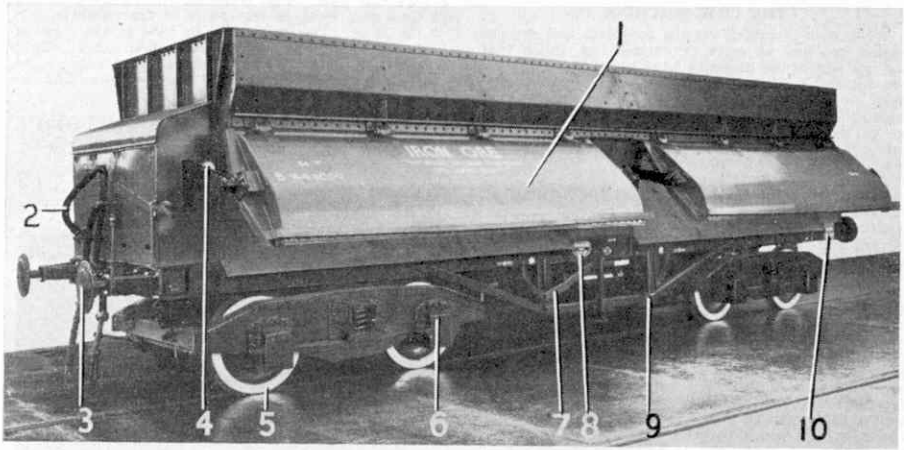
Tradition has it that as they were crossing the heath, and approaching a little knoll against the fury of a violent thunderstorm, they were accosted by three withered, bearded old women, whose prophecies led to the murder of a king and to the death of Macbeth at Lumphanan. To me the place looked eerie even in the light of day, and while returning to the road, I caught myself glancing over my shoulder, half expecting to see a witch disappearing over the brow of the hill!

ROBIN J. SMITH (Portobello).

Competitions! Open To All Readers

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

An Easy Railway Wagon Contest



Readers who are railway enthusiasts—and our correspondence indicates that almost all of them are!—will welcome this further identification competition. This time, however, the subject is not a locomotive, but a high capacity wagon, illustrated above. We have added to the picture several reference numbers, with guide lines to the parts concerned, and we invite readers to identify these components, and to give a short description of the purpose of each part, explaining in only a few words what it is intended to do.

For example, the item numbered 1 will be recognised as one of the side-discharging doors. These doors are opened for the unloading of iron ore carried in the wagon.

When a reader is satisfied that he has identified all the parts, or as many as he can, and has given their purposes correctly, he should write them down in numerical order, using only one side of the paper. Do not forget to write your full name, address and age on the back of your entry.

The Competition will be divided into two sections, for Home and Overseas readers respectively, and in each section there will be prizes to the value of 21/–, 15/– and 10/6, together with a number of consolation prizes. If there is a tie for any prize the judges will take neatness and originality of the entries into consideration when awarding the prizes.

Entries must be addressed to *February Wagon Contest, Meccano Magazine, Binns Road, Liverpool 13.* The closing dates are: Home Section, 31st March; Overseas Section, 30th June.

A "Soccer" Competition

Our second contest this month will appeal specially to readers who are interested in Association Football. Below are ten clues, each of which indicates some feature or aspect of this great national game, and we invite readers to solve these little mysteries.

1. He does not really retain it.
2. A price to pay for being there?
3. Successful fishing.
4. Takes a shrill part in the game.
5. The "second string."
6. Given away.
7. It takes at least ninety of them.
8. Sounds like a telephone job.
9. Scene of annual grand climax.
10. Often hit, but never retaliates.

When a competitor is satisfied that he has found the answers he should make a list of them in numerical order on a post card, adding his full name, address and age.

There will be the usual two sections, Home and Overseas respectively, and in each prizes to the value of 21/–, 15/– and 10/6 will be awarded for the best efforts in order of merit. There will also be a number of consolation prizes.

Entries should be addressed to *February Soccer Contest, Meccano Magazine, Binns Road, Liverpool 13.* The closing dates are: Home Section, 31st March; Overseas Section, 30th June.

Competition Results and Solutions

HOME

AUGUST 1954 CAR FACES CONTEST

1st Prize: G. W. A. Fogarty, Portadown. 2nd Prize: C. J. Dodson, Bramhall. 3rd Prize: M. Jones, Birmingham 32. Consolation Prizes: A. Graham, Hawick; B. Steele, Rustington; G. Greatorex, Ulverston; A. Smith, Malvern.

SEPTEMBER 1954 CROSSWORD CONTEST

1st Prize: R. Bruce, Ashtead. 2nd Prize: A. Halliday, Lanark. 3rd Prize: E. Vellacott, Cambridge. Consolation Prizes: I. R. Burgess, Hounslow; A. Morgan, Aldershot; P. Harding, Reigate; G. L. Jones, Southampton; J. C. Ellis, Northleach.

SEPTEMBER 1954 AIRCRAFT CONTEST

1st Prize: R. Brown, Isleworth. 2nd Prize: T. L. Whomes, Lowestoft. 3rd Prize: J. Adams, Middlesbrough. Consolation Prizes: R. J. Cox, London S.W.1; A. Bain, Chester; N. Burke, Brighton.

OCTOBER 1954 LOCOMOTIVE CONTEST

1st Prize: B. Kerr, Stanmore. 2nd Prize: M. Newman, Gt. Wyrley. 3rd Prize: J. L. Smith, Birmingham 28. Consolation Prizes: I. Lamb, Edinburgh 11; A. Morris, Leicester; J. Cuncannon, Crewe; A. Grieve, Musselburgh.

NOVEMBER 1954 BEAUTY SPOTS PHOTOGRAPHIC CONTEST

1st Prize, Section A: K. G. Lambert, Bridlington; Section B: A. Fearnley, Middlesbrough. 2nd Prize, Section A: R. K. Evans, Hessle; Section B: C. W. Hird-Jones, Chester. 3rd Prize, Section A: E. Jones, Caernarvon; Section B: B. Boyce, Surbiton. Consolation Prizes: R. W. Lucas, Sutton Coldfield; J. G. Crawford, Darlington; D. A. Abbot, North Harrow; R. M. Minshull, Macclesfield; J. Lindsay Walls, Edinburgh 3; J. I. Booth, Hull; A. Jamieson, Tullibody; P. C. Harrod, Hessle; T. G. Brown, Ackworth; N. Hunt, Leigh-on-Sea.

OVERSEAS

MARCH 1954 RAILWAY PHOTOGRAPHIC CONTEST

1st Prize, Section A: R. Hepburn, Gisborne, N.Z.; Section B: A. Lyell, Hawthorn, Victoria, Australia. 2nd Prize, Section A: J. Vergaert, Ghent, Belgium: Section B: I. Moreland, Hamilton, N.Z. 3rd Prize, Section A: N. F. Corness, Edmonton, Canada; Section B: A. Walker, Umtali, S. Rhodesia. Consolation Prizes: S. T. Allen, Te Puke, N.Z.; S. D. Smith, Westmount, P.Q., Canada; M. Elmslie, Sydney, Australia; R. Merchant, Pennant Hills, Australia.

APRIL 1954 SPRING PHOTOGRAPHIC CONTEST

1st Prize, Section A: J. W. Andrews, Blackrock, Eire; Section B: B. R. Narayan, Penang, Malaya. 2nd Prize, Section A: T. Campbell, St. Julians, Malta, G.C.; Section B: S. E. Lockyard, Perth, Australia. 3rd Prize, Section A: C. Belderson, Colombo, 3, Ceylon; Section B: A. D. Bone, Hastings, N.Z. Consolation Prizes: M. Sneddon, Napier, N.Z.; L. Coulter, Johannesburg, S. Africa; N. Mills, Gibraltar; J. O. Wilkinson, Mbale, Uganda, B.E.A.; R. Bolland, Pennsylvania, U.S.A.; R. Campbell, Copenhagen, Denmark.

MAY 1954 AIRCRAFT CONTEST

1st Prize: R. F. Keys, Dunedin, N.Z. 2nd Prize: P. Vaculik, Jamaica, B.W.I. 3rd Prize: D. A. Hall, Plumtree, S. Rhodesia. Consolation Prizes: K. Dunigg, Armidale, N.S.W., Australia; C. B. McLane, Inverell, N.S.W., Australia; D. F. Hegarty, Dublin, Eire.

MAY 1954 CROSSWORD CONTEST

1st Prize: J. G. S. Smith; Hamilton, N.Z. 2nd Prize: K. Prentice, Durban, S. Africa. 3rd Prize: N. Butler, Cashel, Eire. Consolation Prizes: R. Dumont, Dorion-Vaudreuil, P.Q., Canada; A. M. Anderson, Warkworth, N.Z.

SOLUTIONS

JUNE 1954 MOTOR SLOGAN CONTEST

1. Atkinson. 2. Fordson Thames. 3. Daimler Conquest. 4. Jaguar. 5. Standard Vanguard. 6. Thornycroft. 7. Foden. 8. E.R.F. 9. Vauxhall. 10. Humber Snipe. 11. Wolseley. 12. Land Rover.

JULY 1954 FREIGHT TRAIN CONTEST

Wagons, raw, industries, conveyed, powerful, brakes, trains, fitted, engine, shunting, marshalling.

AUGUST 1954 CAR FACES CONTEST

1. Standard Vanguard. 2. Daimler Conquest. 3. Sunbeam Talbot. 4. Lanchester 14. 5. Riley Pathfinder. 6. Jowett Jupiter. 7. M. G. Magnette. 8. Rover 90. 9. S.M.1500. 10. Vauxhall Velox.

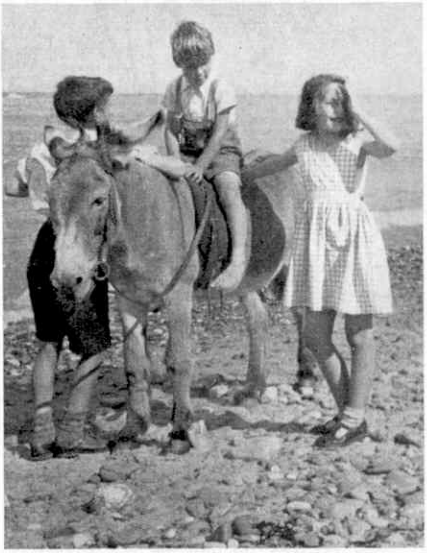
SEPTEMBER 1954 CROSSWORD CONTEST

Across: 2. Ascot. 7. This. 8. Yeoman. 9. Sugar. 10. Isle. 11. Escarp. 15. Sine. 16. Isis. 18. Landau. 20. Secret. 22. Crib. 24. Auto. 25. Target. 29. Rope. 30. Hiker. 31. Corona. 32. Arch. 33. Whorl. *Down:* 1. Thesis. 2. Assess. 3. Cogent. 4. Tyre. 5. B.O.A.C. 6. Hair. 12. Slat. 13. Adder. 14. Plumb. 16. Inset. 17. Incur. 19. Cede. 21. Cuckoo. 22. Corral. 23. Impact. 26. Ahoy. 27. Glow. 28. Thaw.

SEPTEMBER 1954 AIRCRAFT CONTEST

H	A	S	T	I	N	G	S		
B	*E*	V	E	R	L	E	Y		
V	A	*L*	I	A	N	T			
F	R	E	*I*	G	H	T	E	R	
R	O	T	O	*C*	O	A	C	H	
S	T	R	A	T	*O*	J	E	T	
			V	A	M	*P*	I	R	E
			M	A	R	A	*T*	H	O	N
			S	T	U	R	G	*E*	O	N
			S	Y	C	A	M	O	*R*	E

In the judging of this contest, due allowance was made for alternative solutions submitted.



A charming holiday snapshot by H. Arnold, Dublin. Awarded 1st Prize, Section A (Overseas), July/August, 1954 Photographic Contest.

Fireside Fun

Over Cautious Driver: "What was it that whizzed past just now?"

Passenger (used to sports cars): "It passed too quickly to see properly, but I think it was a traction engine."

* * * *

"Be careful with that gun. You only just missed shooting me."

"Did I? I'm very sorry."

* * * *

Judge (to prisoner aged sixty): "The sentence is 20 years imprisonment."

Prisoner: "My Lord, I shall not live long enough to serve the sentence."

Judge (in a kindly tone): "Don't worry. Do what you can."

* * * *

"Now just make your mind up, Guv'nor—either I get a rise or you get a drop!"

* * * *

Passenger: "Conductor! Conductor! The tram's dashing backwards down the hill. What ought to be done? We shall all be . . . . . ."

Conductor (all amazed): "Quick, out of my way. I must turn the destination boards!"

* * * *

HOWLERS

An antiquarian is a place you keep fish in.

A net is a thing used by fishermen. It is made by tying string around a lot of holes.

The King wore a scarlet robe trimmed with vermin.

"Ali Baba" means being away when the crime was committed.

* * * *

"Are these vests all wool?"

"Yes, madam."

"Then why does that card you took off them just now say 'Cotton Mixture'?"

"Oh, we have to do that in order to deceive the moths."

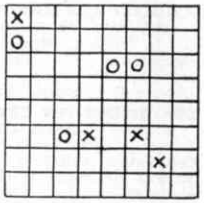
"Was the soup satisfactory, sir?" asked the new cook.

"The soup, my good man?" replied the master acidly, "If you had added water to it, it would have been stronger."

* * * *

BRAIN TEASERS

How may the diagram alongside be divided into four equal parts, each of the same shape and each containing one cross and one nought. The divisions must be made along the horizontal and vertical lines in the diagram.



* * *

FIND THE BIRDS

The first and last letters, spelling downwards, of the five five-letter words indicated by the following clue phrases, give the names of two well-known birds.

Summerfield

Clues: 1. A plan of a journey; 2. The first letter of the Greek alphabet; 3. Competing; 4. An artist uses this; 5. Part of the body.

* * * *

FIGURE THIS OUT

Mr. Ree went to the dentist, who afterwards made out his bill by writing down six consecutive figures. How much was Mr. Ree charged?

* * * *

SOLUTIONS TO LAST MONTH'S PUZZLES

Tricky Figures

The solution to the four sevens puzzle is as follows:

$7 \times 7 + 7/7 = 50$. Did you get it?

* * * *

The Hidden Name

The seven words to which clues were given are:

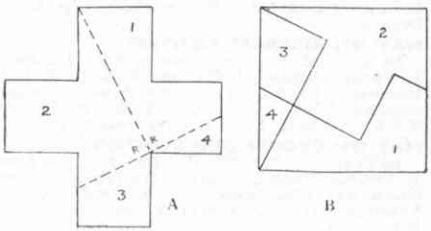
C O M E T
P O E M S
L U C K Y
R O C K Y
P L A C E
T U N E S
S M O K E

The centre letters read downwards spell the word "MECCANO."

* * * *

Squaring the Cross

The cross should be cut as indicated by the dotted lines in sketch "A" below, taking care to form right-angles at the points R as shown. These two cuts will separate the cross into four pieces, which can then be placed together to form a square, as shown in sketch 'B.'



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(see also pages 98 and 100)

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There are still a few copies of the December 1954 and January 1955 issues available, price 1/2 each including postage, etc. Write immediately to the Editor, Meccano Magazine, Binns Road, Liverpool 13, enclosing Postal Order.

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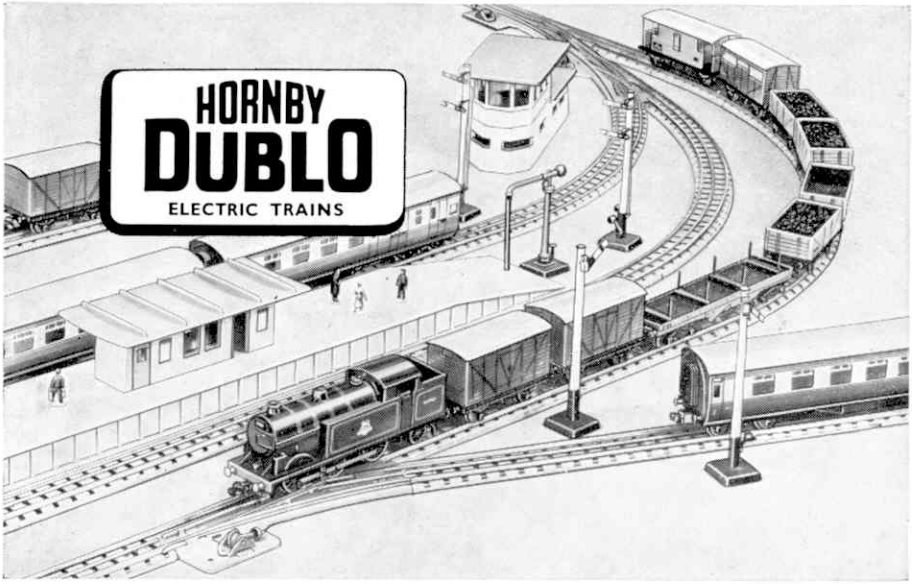

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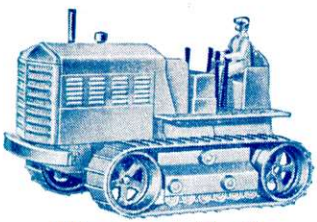
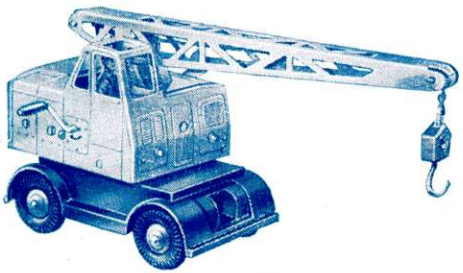
DINKY SUPERTOYS

No.	*Description*
901	Foden Diesel 8-wheel Wagon
902	Foden Flat Truck
903	Foden Flat Truck with Tailboard
905	Foden Flat Truck with Chains
917	Guy Van SPRATTS
941	Foden 14-ton Tanker MOBILGAS
955	Fire Engine with Extending Ladder
961	Blaw Knox Bulldozer
962	Muir-Hill Dumper Truck
963	Blaw Knox Heavy Tractor
964	Elevator Loader
971	Coles Mobile Crane
973	Goods Yard Crane
981	Horse Box
982	Pullmore Car Transporter
991	A.E.C. Tanker
999	D.H. Comet Airliner

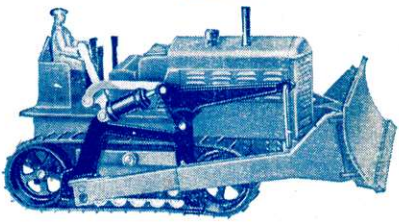


Dinky Supertoys No. 963
Blaw Knox Heavy Tractor
Length 4½ in.
Runs on creeper track

Dinky Supertoys No. 955
Fire Engine
with Extending Ladder
Length 5⅝ in.
The ladder mounting rotates and the ladder can be raised and extended



Dinky Supertoys No. 971
Coles Mobile Crane
Length 3½ in. Length of jib 5½ in.
Hoisting, jib raising, slewing and travelling movements



Dinky Supertoys No. 961
Blaw Knox Bulldozer
Length 5⅜ in.
Runs on creeper track and the blade can be raised and lowered

Dinky Supertoys No. 982
Pullmore Car Transporter

This model can carry 4 Dinky Toys passenger cars

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