VOL. XLIII. No. 6 JUNE 1958

MECCANO MAGAZINE

GEORGE SQUARE
GLASGOW

15c

DINKY SUPERTOYS

Superlative Masterpieces in Miniature

No. 934
Leyland Octopus Wagon
Length 7⅛ in. Price **8/11**

No. 971
Coles Mobile Crane
Length 6⅜ in. Length of Jib 5⅜ in.
Price **11/6**

No. 642
Pressure Refueller
Length 5¼ in. Price **7/9**

No. 622
10-ton Army Truck
Length 5⅜ in. Price **6/9**

No. 991
A.E.C. Tanker
Length 6 in. Price **5/11**

No. 982
Pullmore Car Transporter
Complete with Ramp
Length with Ramp 18⅜ in. Price **17/11**

MADE IN ENGLAND BY MECCANO LIMITED, BINNS ROAD, LIVERPOOL

All prices include Purchase Tax

HORNBY DUBLO ELECTRIC TRAINS

2 NEW SETS

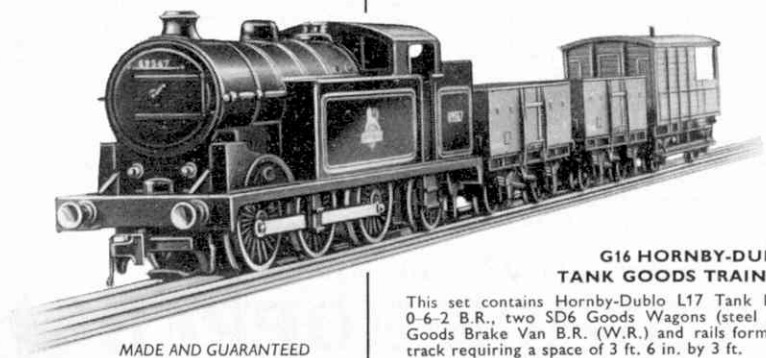
with Super-Detail Rolling Stock

Super-detail Rolling Stock is now available in two Goods Train Sets of the Hornby-Dublo range. They are illustrated and described here.

G19 HORNBY-DUBLO 2-6-4 TANK GOODS TRAIN SET B.R.

This set contains Hornby-Dublo L18 Tank Locomotive 2-6-4 B.R., SD6 8-ton Cattle Wagon, D2 Double Bolster Wagon, D1 Tank Wagon 'MOBIL', SD6 Goods Wagon (steel type), SD6 Goods Brake Van B.R. (W.R.) and rails forming an oval track requiring a space of 4 ft. by 3 ft.

U.K. Price **£6/17/6** (inc. tax)



G16 HORNBY-DUBLO 0-6-2 TANK GOODS TRAIN SET B.R.

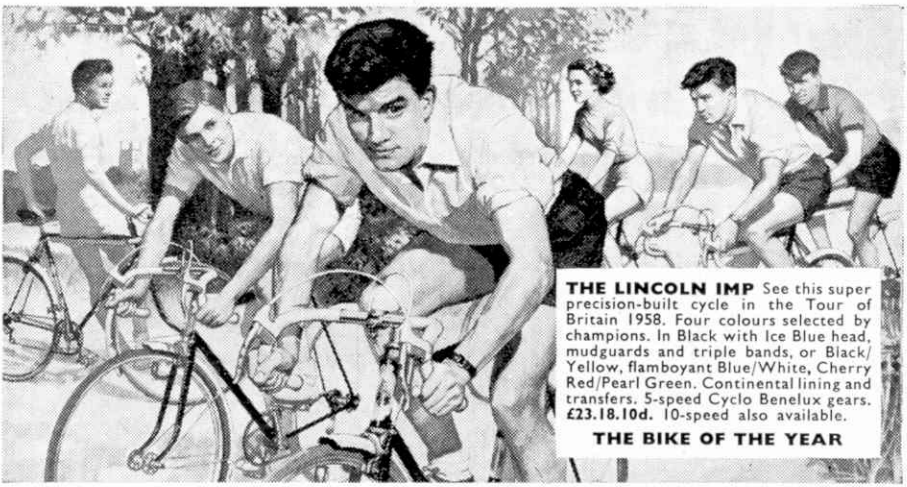
This set contains Hornby-Dublo L17 Tank Locomotive 0-6-2 B.R., two SD6 Goods Wagons (steel type), SD6 Goods Brake Van B.R. (W.R.) and rails forming an oval track requiring a space of 3 ft. 6 in. by 3 ft.

U.K. Price **£4/18/6** (inc. tax)

MADE AND GUARANTEED by MECCANO LTD., LIVERPOOL

A FELLOW CAN REALLY GO PLACES with the LINCOLN IMP *

...and get off to a flying start in a £1,000 cycling competition!



THE LINCOLN IMP See this super precision-built cycle in the Tour of Britain 1958. Four colours selected by champions. In Black with Ice Blue head, mudguards and triple bands, or Black/Yellow, flamboyant Blue/White, Cherry Red/Pearl Green. Continental lining and transfers. 5-speed Cyclo Benelux gears. **£23.18.10d.** 10-speed also available.

THE BIKE OF THE YEAR

You can't beat it! To be up in the morning sailing along the road—*then over the hills and far away!* This is the life for a fellow who has "got what it takes" and knows where he is going. *Go, man, go!* A celebrated group of designer-craftsmen had you in mind when they put their heads together and came up with the 'LINCOLN IMP'. A lot of thought and care went into creating this club model. One look tells you the 'LINCOLN IMP' is for people who understand first-class cycling.

*£1,000 FLYING START COMPETITION

You can help yourself to some of the many prizes to be won in the "£1,000 Flying Start" Competition, organised by Elswick-Hopper, manufacturers of the 'Lincoln Imp' and other craft-built models. *And you really will be helping yourself.* This Elswick-Hopper competition offers you and other young cyclists a flying start on life's road. £1,000 is to be won in cash prizes as a real practical help on the first lap of the career of your choice. You can get competition details—and your entry form—from your local Elswick or Hopper dealer. First prize is worth £250. Amounts to be won by cycling enthusiasts total £1,000. Whether you're a "lone star" or a cycling club member, you'll find this a really exciting and rewarding competition. *Call in on your local Elswick or Hopper dealer today.*

TOUR ANGLAIS DE LUXE You will be proud to own this very low priced, precision-built club cycle. Colours Black/Ice Blue, Black/Yellow, flamboyant Blue/White, and Cherry Red/Eau de Nil. 5-speed Cyclo Benelux gears. **£21.2.2d.** 10-speed also available.

LINCOLN OR ESCORT TOURIST A smart, practical cycle to delight any cyclist. Colours Black/White, flamboyant Red/White, and Blue/White. Tan spring saddle and kitbag. Chain cover and rubber pedals. **£17.4.11d.** includes tools.

The Cycling World still looks to Elswick-Hopper

ELSWICK-HOPPER

Makers of precision built cycles since 1880

If in difficulty, write for illustrated leaflet and name and address of your local agents to:
ELSWICK-HOPPER, BARTON-ON-HUMBER, LINCOLNSHIRE.

We dropped your Triumph from a helicopter!

WE TOOK a Triumph up to 150 feet by helicopter, then dropped it on to the frost-hard ground. Crazy? Not at all—we just wanted to test the bottom bracket. Afterwards we took the bike back to the laboratory and took a good look at the bracket. We found the fall hadn't done it a scrap of damage.

Your Triumph is the world's most tested bicycle. This helicopter test is just one way of proving how tough your Triumph is—that you can depend on it to take all the punishment you give it. Speed, looks, safety, reliability—all you want from a bike you get from a Triumph. It's a scientific bicycle for a scientific age.

PALM BEACH

Lightweight Tourist; Carmine or Electric Blue finish, 19½", 21", 23" frame. Dunlop 'White Sprite' tyres, 'Airseal' tubes, white celluloid mudguards. **£18.11.6** incl. P.T.

£1 DEPOSIT and 38 weekly payments of 11/3

Indispensable extras: Sturmey-Archer 3-speed gear **£2.7.7**, *Sturmey-Archer 'Dynohub' hub lighting* **£2.18.9**

The New TRIUMPH has science behind it

TI5 A PRODUCT OF RALEIGH INDUSTRIES LIMITED, NOTTINGHAM

A wonderful opportunity for all readers of MECCANO MAGAZINE

FULL LENGTH FULL SIZE

NOW'S the time to join the CHILDREN'S Book Club

YOU BUY EXCITING BOOKS PUBLISHED IN THE ORDINARY WAY AT 8/6 to 12/6 FOR 4/- ONLY

Formed to bring to boy and girl booklovers outstanding books at only a fraction of the normal price, the Children's Book Club has been enthusiastically commended by parents and educational authorities throughout the country—and, what is more important, by children themselves. Each month, members receive the Club's special edition of an outstanding recently-published book. These splendid books are printed in clear, modern type on good-quality paper. They are attractively bound —full length, full size! And although in the ordinary way these books would cost 8/6, 9/6, 10/6 or even 12/6, MEMBERS OF THE CHILDREN'S BOOK CLUB ARE PRIVILEGED TO BUY THEM FOR ONLY 4s. The Children's Book Club selections are books which every child will enjoy reading, *will be proud to own.* Through the Children's Book Club you will be able to build up—at remarkably low cost—a first-rate collection of fascinating children's books. *Now is the time to join!*

LOOK AT THESE TITLES!

Recent and forthcoming selections—at only 4s. to members—include THE WHEEL ON THE SCHOOL by Meindert Dejong (Published at 12s. 6d.); BIGGLES MAKES ENDS MEET by Capt. W. E. Johns (8s. 6d.); OPERATION SEABIRD by Monica Edwards (10s. 6d.); THE CAMERONS LEAD THE WAY by Kathleen O'Farrell (10s. 6d.); THE FOURTH KEY by Malcolm Saville (9s. 6d.); THE HUNDRED AND ONE DALMATIONS by Dodie Smith (10s. 6d.). *All wonderful value!*

Free!

You can obtain a gay contemporary MAGAZINE RACK *free* if you enrol a friend in the Club. Send your friend's name and address with 5s. (4s. plus 1s. postage) for the first book, mentioning this offer, and your magazine rack will be sent to you. Members automatically receive a splendid Badge and a monthly magazine FREE. And there are frequently wonderful gift offers for members, too!

The Children's Book Club is owned and controlled by Foyles, the world-renowned booksellers.

FILL IN THIS ENROLMENT FORM TODAY

To The Children's Book Club, 121 Charing Cross Rd., London W.C.2

I wish to join the Children's Book Club, and agree to purchase the book issued each month to members at a cost of 4s. (postage 1s.). I agree to continue my membership for a minimum of six books and thereafter until I cancel. **Meccano**/June '58

☐ * **I will pay for my selections on receipt.**

☐ * **I enclose 30s. for six months' subscription.**

* Place √ in the space above, as required.

NAME.....
(*Block letters, please*)

ADDRESS .....

Overseas members should pay by advance subscription. Prices as for inland (except S. Africa, Australia, New Zealand).

Available again to delight young builders . . .

Outfit No. 1
17/6

DINKY BUILDER

Here's the simplest of all constructional toys—DINKY BUILDER. Specially designed for young children who love to build—and pull to pieces—their own toys. Houses, furniture, wheel toys and scores of other models can be built quite easily with the brightly coloured hinged plates and steel rods in these outfits.

Outfit No. 1	.. .. ..	**U.K. Price 17/6** inc. tax
„ No. 1a	.. .. ..	„ „ **17/6** „ „
„ No. 2	.. .. ..	„ „ **30/6** „ „

(Outfit No. 1a converts Outfit No. 1 into Outfit No. 2)

★

Another fine Product of Meccano Limited Liverpool

Next Month: "THE FAIREY ROTODYNE." By John W. R. Taylor

MECCANO MAGAZINE

Editorial Office:
Binns Road
Liverpool 13
England

EDITOR : FRANK RILEY, B.Sc.

Vol. XLIII
No. 6
June 1958

Which is the Noisiest City on Earth?

Pity the predicament of the poor man seen in my picture trying to read his newspaper. On his right one boy is diligently hammering nails into a block of wood; behind him an airman of the future is whizzing his model aircraft round about his head, no doubt making what he thinks are the right noises for a powerful aeroplane of this kind; and what the boy kneeling in front of him is doing is difficult to make out, but it looks uncomfortable, and is almost certainly noisy. The last member of the family looks quiet enough now, but whether this is due to exhaustion after a day's noise making, or is just an interval for rest before starting another outbreak, it is difficult to say.

Quiet, please! Man reading. Perhaps this should be "trying to read". Noise of this kind has a homely touch about it, but noise in general, especially in large cities, is becoming increasingly harmful, as an article in next month's "M.M." will show. Picture Post Library photograph.

Now this may be fun. But noise in general is not at all amusing, and you will read of some of the evils that arise from it in this modern world of ours in next month's *M.M.* Incidentally, which is the noisiest city in the world? You will find the answer, which will probably surprise you, in the July issue.

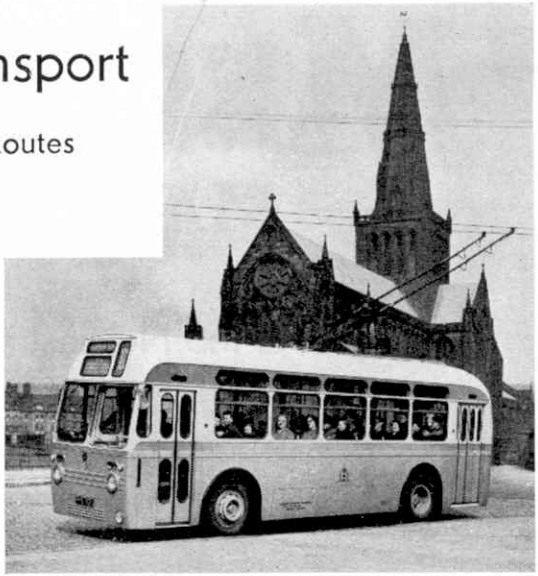
ZETA will make an appearance in the July *M.M.* This name has a fascinating sound, but perhaps some of the romantic air about it disappears when we find that ZETA is an invented word made up of the initials of Zero Energy Thermonuclear Assembly. The third word here calls for explanation. It points to the fact that what ZETA is intended for is to fuse atoms, not to split them. Fission, or the splitting of atoms, first gave us the atomic bomb, and then showed us how to get energy from radioactive material, as is now being done at Calder Hall. Fusion has given us the hydrogen bomb, and ZETA seems to show the way to the use of fusion for providing us with energy. Let us hope that we shall manage this without having first to use the hydrogen bomb in warfare.

The Editor

Glasgow Transport

Tramways and Bus Routes

By G. H. Robin



STREET tramway cars first ran in the City of Glasgow on 19th August, 1872, when the 2¼ mile section between St. Georges Cross and Eglinton Toll was brought into operation. A second line from Dalmarnock to Finnieston was opened a few weeks later.

Although the Corporation, which owned the tramways, had obtained powers to operate its own system, the trams were leased to The Glasgow Tramway and Omnibus Co. Ltd., which operated them until 1894. By that time there were 32 miles of track in the city, and all the vehicles were drawn by horses. From this small beginning there arose during the next fifty years a municipal transport system that was universally agreed to be second to none.

Towards the end of the lease period the Corporation decided after much deliberation to operate its own system, and by 30th June, 1894, had purchased 5,000 horses and 500 trams with which to commence its own services on 1st July of that year.

Electric traction was in use in several other cities by that time. In 1898 the Glasgow Corporation experimented with electric trams on the Mitchell Street to Springburn route, and the unqualified success of these trials resulted in the decision to electrify the whole system. This rather mammoth task, which included relaying existing tracks with heavier rails, was completed by the end of 1901, some of the routes to the west end being ready in time for the opening in May of that year of the Great Exhibition at Kelvingrove.

The city was growing and routes were extended and increased in numbers. Up to the time of the second World War the original routes in most cases still formed the central portions of the routes being operated at that time. But while tram lines are still in position in Cambridge, Sauchiehall and Renfield Streets, no through service along these streets from St. Georges Cross to Eglinton Toll, which formed the original route, has been operated for the past fifty years, although of course various services use all these sections in part.

At the head of the page is a picture of a Glasgow trolley bus by Glasgow Cathedral. It is a front entry "Pay as you enter" vehicle. For the illustrations to this article, and for the photograph on which this month's cover is based, we are indebted to the courtesy of Mr. E. R. L. Fitzpayne, B.Sc., M.I.E.E., M.I.Mech.E., General Manager, Glasgow Corporation Transport.

The colour scheme was a unique and intimate feature of the Glasgow tram when the panelling round the upper decks was painted in either red, blue, yellow, green or white, attractively lined, and each of these colours was allocated to specified routes; and only for one or two very short distances in the city centre did, say blue, cars of two different routes run along one street. Thus came the typical direction, *Take a red car in Argyle Street.* Other parts of the trams were painted in orange and cream, and the whole effect was most pleasing.

Before the Corporation got permission to build its own rolling stock at Coplawhill works the trams were built by outside firms, and were always of first-class quality and, for their time, most comfortable. Coplawhill maintained this standard.

The first electric trams, some of which were rebuilt from the horse vehicles, had open tops. But from 1904 onwards they began to be roofed over in the centre, with the ends left open. This resulted in one being able to travel "out in the front or back," but demands for further comfort in all weathers resulted in the top decks being totally enclosed when the trams were rebuilt in the late twenties in accordance with the 1928-1932 programme—much to the disappointment of the schoolboy, though greatly appreciated by his elders. Drivers' platforms had weather screens fitted in a programme commencing in 1911.

These trams as rebuilt have upholstered seats, air brakes and motors capable of developing 60 h.p., and were fitted with Fischer bow collectors, which then became a standard fitting.

The original electrics were thus gradually rebuilt to conform with the standard trams, and while there may be much to remind one of the story of the original axe that had been given two new heads and three new handles, some of the Corporation cars running today are basically those supplied when the system was electrified, thus being over fifty years old.

The tramcars were therefore of standard dimensions, 30 ft. long, about 12 tons in weight, and carrying 59 passengers. This continued until 1927, when some bogie cars designed to carry nine more passengers were supplied by outside builders. These were put on the Airdrie-Paisley route when they went into service, but were found to be unsuitable on the sharp right-angled curves in the city centre. So they were transferred to the London Road-Dalmuir route, which ran straight along Argyle Street, Dumbarton Road, etc., with practically no curves to negotiate.

A Glasgow tramcar, known as the Dalmarnock Bogie type, introduced 1927.

There were no other new cars until Coplawhill Works turned out the handsome "Coronation" trams in 1937 and subsequent years, and these luxury vehicles, also on two four-wheeled bogies, were immediately put on routes serving the Bellahouston Park area, which was housing the Empire Exhibition of 1938. The last lot of trams built by the Corporation were the "Cunarders", as they were popularly called, which were constructed in 1948, but although of a later design these are not so popular with the travelling public as the "Coronation" type.

In the early twenties Glasgow Corporation took over the running of the 18½-mile Paisley system and the short 3½-mile Coatbridge-Airdrie system. With the few extensions since made to existing termini, this brought

A Mark I, or Coronation, tram, the first of which was introduced in 1937.

the total route mileage up to approximately 150 miles of double line, some of which was on reserved track. The "green" car, which had originally run between Parkhead and Ibrox, was now extended to run from Airdrie in Lanarkshire to Elderslie in Renfrewshire, a distance of 20.46 miles in each direction, thus making a 40.92-mile return journey for each tram. At the time when the maximum fare on Corporation transport was twopence, the enthusiast could travel 20 miles approximately in this instance for this modest outlay. The service run from Milngavie to Renfrew Ferry was longer—22.79 miles. It also could be travelled for twopence.

Glasgow Corporation ran its first motor bus service in 1924. The buses were solid tyred, single decker vehicles that ran from Glasgow Green along the docksides to Partick and up to Maryhill. There were fourteen buses, two each of seven different makes, comprising Halleys, Albions, Leylands, Tilling-Stevens, Bristols, A.E.C.s and Commers. This venture was not a success, principally owing to the discomfort caused by the use of solid tyres on the granite setts with which the city streets were paved. The service was abandoned, therefore, except that the Maryhill to Partick section in the west was retained. This restricted service was maintained with pneumatic tyred double decker buses of Albion and Leyland makes, and to this day it is still motor bus route No. 1, but is extended east to Sandyhills now, via Dumbarton Road, etc.

The double decker motor bus was, of course, here to stay, and as suburbs extended it was petrol and diesel buses that developed new routes to serve the incoming residents. Thus the term "Tramways" no longer became synonymous with "Transport" in the City of Glasgow.

Following the Second World War staffing difficulties both in the maintaining and manning of the cars, together with the increased number of private cars and outside motor bus routes entering the city, found the tramcar losing favour with the travelling public. In addition it was no longer economically possible to limit the route availability of serviceable vehicles by their colour and so this scheme was abolished and route numbers were allocated in lieu. Thus the trams lost the individuality so long held dear in the hearts of the citizens. But the somewhat drab green panelling has now given way to advertisements, which in turn have restored some bright eye-catching colours.

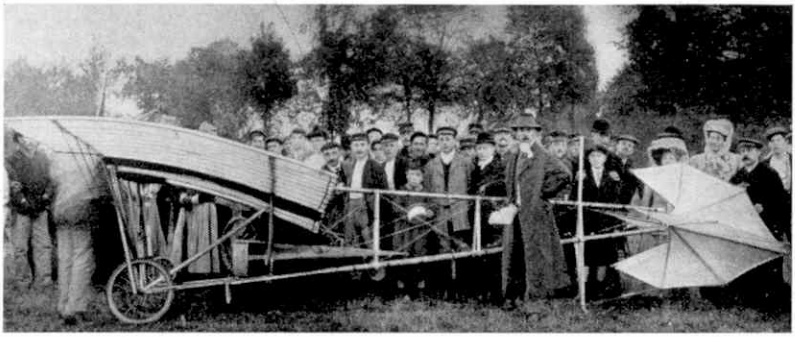
It has been the policy of the Transport Committee during the last decade or so to replace the trams gradually with trackless vehicles in the form of either trolley or diesel buses. The numbers have now been reduced from their maximum of about 1,300 vehicles to just over half that number, the scrapping commencing when the "white" cars running between Provanmill and Polmadie were replaced by trolley buses in 1949.

A modern Daimler bus in Glasgow.

This was the first route to be converted. The Clarkston route was next. It included two tram routes—previously a "yellow" and a "red" one—but as trolleys have to be limited to a maximum of 200 vehicles there will be no further extensions once the two other routes at present being converted are completed. This fleet consists of two and three axled double decker buses, with a few single decked vehicles.

Meantime, it has now been decided that

(Continued on page 304)



Home-Made Wings

By John W. R. Taylor

HAVE you ever thought how much fun it would be to build and fly your own aeroplane—not a great clumsy air liner or a noisy jet-fighter, needing acres of concrete from which to take off, but a feather-weight single-seater, so small that you would seem almost to be wearing wings yourself?

For many youngsters all over the World, this dream is coming true. In garages and sheds, even in bedrooms at their homes, they are spending every second of their spare time shaping and fitting together the fuselages, wings and tail units of aeroplanes so small that they look little more than toys. Yet they are far from toys, for many of the completed aircraft cruise at over 80 m.p.h., covering more miles on a gallon of petrol than a small family car.

Of course, the idea of building aeroplanes at home is not new. Within a year or two of becoming the first person to fly a powered aeroplane in Europe, in 1906, the gallant little Brazilian pioneer, Alberto Santos Dumont designed a tiny machine which he called the *Demoiselle*. As dainty as its name, it had an airframe of bamboo and canvas, so simple that Santos Dumont claimed anyone would be able to put it together. Complete with a 25 h.p. Darracq two-cylinder engine, it weighed only 242 lb., spanned 18 ft. and was reckoned to be as easy to fly as it was to build.

This may have been true, because several *Demoiselles* were built in France, at a cost of about £300 each, and flown without killing anybody, at a time when the number of really successful aeroplane designs could be counted on one's fingers. But the idea did not catch on, because people who flew were still regarded as either superhuman or mad, and the build-it-yourself aeroplane was more or less forgotten for 25 years.

Once again the movement started in France, where an enthusiastic gentleman named Henri Mignet designed an ugly little tandem-wing single-seater which he called the *Pou-du-Ciel*, or Flying Flea. There was no disputing that it could be built by the average handyman for about £100; and with Mignet in the cockpit it even appeared to fly, although experts were not altogether happy at the technique of tilting the front wing, which took the place of normal aileron and elevator controls.

Pous were built by the hundred, in France, Britain, and almost everywhere else. There was even a British Flying Flea display near Southend in 1936, to which owners were invited to take their aircraft, whether or not they were airworthy. The posters announced proudly that a "circus of Fleas" would take the air.

On the big day dozens of machines, in various stages of construction, were carted to Southend by their proud builders. Unfortunately, only one pilot managed to coax his tiny machine into the air during the show; although a 15-year-old boy did get another far enough off the ground, after hitting a bump, to end up in a tree.

The idea of building aeroplanes at home is not new. A pioneer in this field was Alberto Santos Dumont, of Brazil, whose little "Demoiselle", is illustrated at the head of this page.

Nobody was hurt, despite a few collisions which occurred when would-be airmen started taxying over the field in all directions in an effort to get their under-powered Fleas airborne. But before long, pilots, some of them very experienced, began to crash and get killed, and it became clear that the *Pou* was either not so easy to build as was claimed or else was unsafe. Mignet argued, with some cause, that the accidents resulted from constructors trying to change the design: but the Flea was banned in Britain.

After this unhappy episode, there was naturally a great deal of scepticism when French designers again began selling plans and kits of parts for home-made aeroplanes in the late 1940's. This time, however, the designs were for neat, entirely orthodox low-wing monoplanes, very different from the *Pou*.

Leading the field was the single-seat Jodel Bébé, made of wood and with a top speed of 93 m.p.h. when powered by a modified 26 h.p. Volkswagen motor car engine or something similar. It soon proved itself so sturdy and delightful to fly that the French authorities had no hesitation in awarding it a Certificate of Airworthiness, and within a year or so the Jodel company had sold more than 100 kits of parts to people who wanted to try and build a Bébé for themselves.

To their credit, the French Government realised from the start the importance of encouraging air-mindedness, especially among young people who could not afford to pay three or four guineas an hour to earn their pilot's licence at a flying club. Through the *Service de la Formation Aerienne et des Sports Aeriens* (S.F.A.S.A.), which governs private and sporting flying in France small orders were placed for types of aircraft that seemed suitable for home construction, to get production under way, and the Government announced that it would repay a high proportion of the cost of each aeroplane built by amateurs.

At the same time, another organisation known as *le Reseau du Sport de l'Air* (literally "the network of air sports") was formed, to provide qualified technicians to inspect and approve progress on the aircraft as they are built, to help with formalities such as obtaining Certificates of Airworthiness and Government subsidies, and generally to look after the welfare, freedom and safety of the home constructors.

With such generous help, the movement grew rapidly. By 1955, not counting other types, there were 250 Jodels on the French civil register and at least 40 more overseas, everywhere from Viet Nam to Africa, South America, Belgium, Switzerland, Germany, Spain and Italy. More than 150 student pilots gained their licences on Bébés in France during that year. And companies in other countries began turning out Jodel kits.

The enthusiasm of young Frenchmen for their new hobby spread to Britain; but there was little that would-be pilots in this country could do about it. Private flying had been all but killed by high costs, regulations and taxes, and even if a youngster could have afforded to build a machine like the Jodel, he would probably have found the expense of running it and of renewing its Certificate of Airworthiness each year too costly.

A successful ultra-light aeroplane introduced in the late 1940's is the French single-seater Jodel Bébé, which can be built up from a kit of parts.

All that has changed, because the Popular Flying Association now functions in much the same way as the French *Reseau du Sport de l'Air* to help the British amateur builder. As a start it chose some of the best French designs, had the constructional drawings put into English, and offered them at a modest cost which includes a year's

membership of the Association. But its usefulness extends far beyond this first step.

To find out how, let us imagine that you decide you would like to build a single-seat Druine Turbulent, perhaps the most popular of the P.F.A.-sponsored designs. How will you go about it?

As the total cost works out at about £500, you will probably share this, and the work, with a few friends; and this has several very important advantages, not the least being that your group will qualify for a loan if you need one to buy the materials for your 'plane.

Having ordered your set of plans, the next problem is to find a workshop of some sort with a clear space of about 18 ft. by 8 ft. No special tools are needed; but it is a great help if you can borrow a fretwork machine for cutting out parts like wing ribs, an electric drill with a saw attachment, and a sewing machine to speed the fabric covering of the wings and control surfaces.

All the wood, metal and other materials you use will have to be bought from approved dealers, to ensure that they are good enough; but the actual work of building the airframe offers few difficulties to anyone who is used to working with his hands, because the structure of these "ultra-lights" is extremely simple.

One terrific advantage is that if your work is inspected and approved by the P.F.A., as it would be, you will be able to get a Permit-to-Fly when the aircraft is completed, instead of having to pay for the usual Certificate of Airworthiness investigation. This will enable you to do almost anything but night and cloud flying and aerobatics, which are of little interest in any case to the average private pilot. And the advantage of working as a group becomes even more apparent at this stage

A French enthusiast busy assembling the parts for his Jodel Bébé aircraft.

because you can claim a 50% tax rebate on all the petrol you use—another of the ways in which our own Government is now trying to help the build-it-yourself pilot.

"All the petrol you use" may give a misleading impression, because the Turbulent, cruising at 75 m.p.h., does about 45 miles to the gallon. As a result, its total operating costs to a group would probably be no more than 20-25 shillings an hour, or 4d. a mile, which is cheap by any standards.

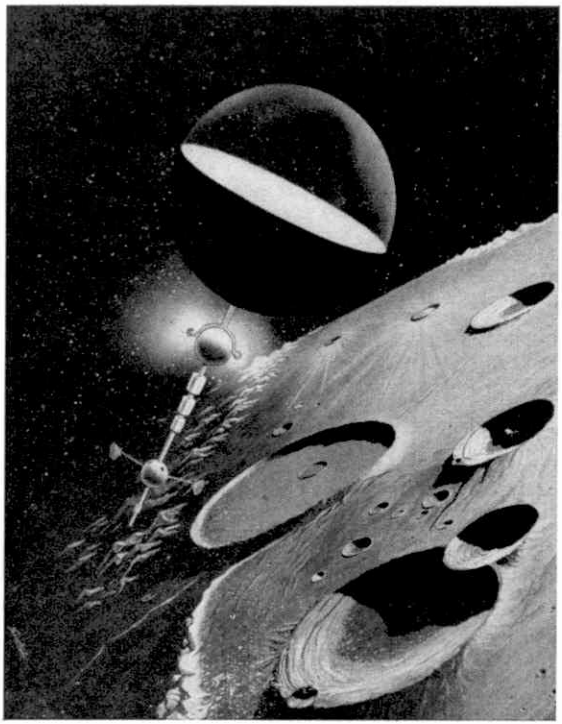
Already, many Turbulents and two-seat

(Continued on page 304)

Perhaps the most popular of the "build-it-yourself" aeroplane designs sponsored by the Popular Flying Association is that of the single-seater Druine Turbulent. A two-seater version, called the Druine Turbi, is shown in this illustration.

Space Notes

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



A solar powered space ship in orbit round the Moon. The mirror at left is kept pointing always towards the Sun to collect energy to power the rocket motors.

Artificial Meteors

The first attempt to produce artificial meteors by firing small metal particles out of a specially shaped explosive charge placed in the nose of a rocket took place in 1947. The rocket used was a German V.2, but the experiment was a failure.

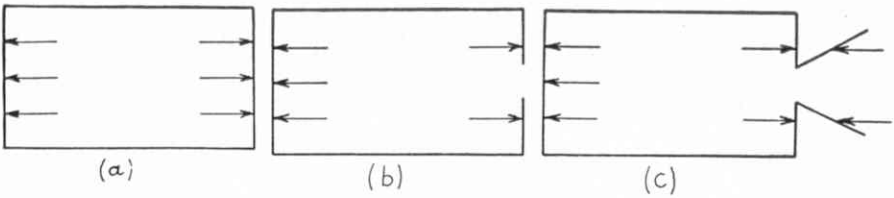
For some reason the experiment was not repeated until last October, although it is one that could be expected to yield information on the density of the upper atmosphere and on the exact manner in which meteors burn up when they enter the atmosphere. Last October the U.S. Air Force successfully fired a hundred aluminium pellets from an Aerobee rocket at 54 miles altitude. Three "shaped charges" of explosive were used to concentrate as much energy as possible in the pellets. Each charge weighed 25 lb. and the pellets were the size of small ball bearings and weighed only a few grammes each, but the concentration of energy obtained from the charge must have been remarkable, since the pellets were ejected at speeds up to 40,000 m.p.h. For comparison, the velocity required for a particle to escape from the Earth into space is 25,000 m.p.h., the lowest speed that will ensure no return.

Many of the particles presumably went into orbits about the Earth, two of them being tracked nearly a month after launching. Some will have continued in an upward path away from the Earth; one that was tracked was travelling in a path only 25 degrees off the vertical and would almost certainly fall into the gravitational field of the Sun.

Little Vanguard

Although the main theme of Space Notes is of course space-flight, and the experiments leading up to its achievement, it is as well to remember that rockets have been employed at times to perform some quite novel jobs. A recent one is that of carrying a forest fire extinguisher. This is a solid propellent rocket four and a half feet long carrying a payload of 8½ gallons of borate, water or other extinguisher over a range of up to 1,200 yards. Its prime function is to get into crevices cliffs or ravines inaccessible to foot fire fighters and to keep flames from spreading over a ridge or mountain crown.

This device can claim a tenuous connection with space-flight in that it was developed by Mr. Robert W. Green of the Grand Central Rocket Co., who was partly responsible for the development of the motor for the top stage of Vanguard. Hence its nick-name "Little Vanguard."



The three diagrams at the head of the page help to show how a rocket produces thrust by an unbalanced internal pressure, as explained on this page.

Solar Powered Space Ship

Although the conventional rocket, burning fuel and oxygen to produce exhaust gases for propulsion, will probably always be the prime mover for earth-bound high-altitude research vehicles and small satellites, many unconventional means of propulsion have been proposed for true journeys into space. Most of these methods rely on atomic energy to supply the necessary energy, but once in space there is a continuously available source of energy—the Sun. Interest has been focused on its use by the recent work of Krafft Ehricke, who worked with von Braun on the development of the V.2 and is now engaged on planning space-flight projects for Convair-Astronautics.

One of Ehricke's designs includes a large plastic sphere that is half silvered on the inside to focus sunlight on to a boiler in which liquid hydrogen is gasified and heated to a high temperature before being ejected through nozzles to provide a propulsive force to drive the ship along. Three tanks containing liquid hydrogen are below the exhaust nozzles, and below the tanks is the crew's cabin. The exhaust nozzles can be swivelled so that the mirror faces the Sun, regardless of the direction of motion of the ship.

Solar powered space ships, due to their lightness and low thrust capabilities would be best fitted for permanent operation in space between orbits. They would be constructed in space.

Sputniks

From 4th October to 18th January a total of 91,569 letters and telegrams about the Sputniks were received by the Soviet Academy of Sciences. They came from 58 foreign countries as well as the U.S.S.R. itself, and there were more than 300 packages containing photos, tape recordings and other records of both Sputniks. Nearly 1,300 persons volunteered as passengers for the first space ships—especially to the Moon.

How Rockets Work

Long-range missiles, artificial satellites, space ships, indeed all things designed to go into the thin upper atmosphere or beyond it, are propelled by rocket motors. That the rocket can work in a vacuum and does not depend on "pushing on the air" is almost universally accepted nowadays, but it is not always obvious to everyone why this should be so.

If you have any difficulty in grasping this point, then look at the drawings at the head of the page. At (*a*) is shown a container with a gas inside it under pressure. There is no exit from this container and the gas presses evenly on it from the inside; there is then no movement of the container. A blown-up balloon tied at the neck is a good example of this.

If part of one end of the container is removed, the force on the far end remains the same whilst the opposing force on the cut-away end is reduced because it is obviously not possible for the gas inside to push on the hole! We are left with an excess of push on the closed end and this constitutes the thrust of the rocket. Again the blown-up balloon can provide a good example of this, for if the neck is opened the balloon shoots across the room.

Incidentally, a far more impressive demonstration is to put a small amount of water in the balloon before blowing it up. Hold it with the neck down and release; the balloon will climb upwards, provided you have not put too much water in it, slowly at first but then accelerating away like a real I.C.B.M.!

Note that in the course of the above explanation conditions outside the container have not been mentioned—in other words a rocket will produce a thrust even if there is a vacuum outside. Indeed it can be shown that the thrust

(Cont. on page 304)

World's Largest Man-Made Lake

Hydro-Electric Power for the Rhodesias

By the Editor

IT is not very often that anyone has an opportunity of making a really great lake. An unrivalled one has been given to the engineers who are building the great dam in the Kariba Gorge, in Rhodesia, behind which to store the waters of the Zambesi River, which flows through it, for use in generating electric power. In fact, they are creating a record, for at the present time the largest man-made lake in the world is that behind the Hoover Dam, in the United States, and when the Kariba Dam is completed the amount of water that will accumulate in their lake will be four and a half times that in its American rival.

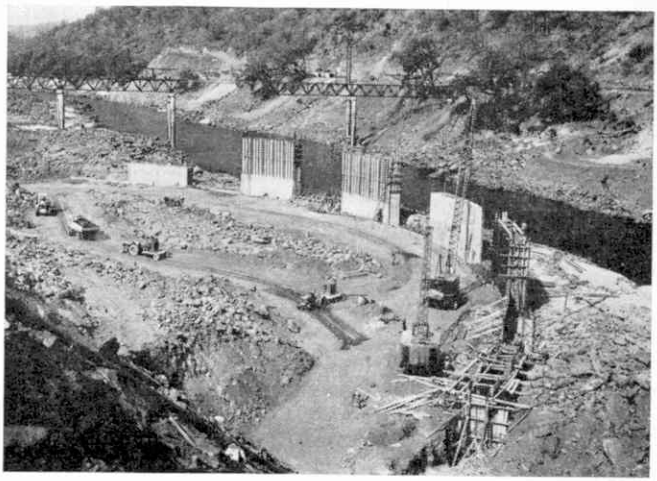
To create a great lake such as this, which will stretch backward upstream to a distance of 175 miles, *is* a great feat. It will have an average width of 12 miles and its greatest depth will be 390 ft. The water to be stored in it will be used in generating hydro-electric power for both Northern and Southern Rhodesia.

Hydro-electric power is of supreme interest in such countries as these, where coal is scarce. The lake will act as a reservoir to make sure that power can be generated during dry seasons. In most cases, in Europe for example, two or three months storage of water is sufficient, but in Central Africa it is necessary to provide not only for seven months during the year when the flow of water in the Zambesi River is low, but also to cover dry years, when seasonal rainfall is scanty. So a lake of record size had to be formed.

The Kariba Gorge is comparatively narrow, with steepish sides, and the Dam will stretch in a great arch across its whole width. It is to be a high one to allow for storing the immense quantity of water necessary, and the roadway to be built on it will actually be 416 ft. above the river bed. This means that a building of the size of St. Paul's Cathedral placed in the Gorge would not reach the top of the Dam by about 50 ft.

As these figures suggest, the Dam will be a really immense structure, containing more than a million and a quarter cubic yards of concrete. There will be four rectangular openings in it high up in the Dam wall, each 30 ft. wide and 31 ft. high, to allow water to flow over when the lake is full. In flood this spillway will pass something like 300,000 cubic feet of water a second. This may not often occur, but when it does the spectacle as the water plunges downward into the lake below will be a very notable one indeed. Even smaller flows will provide an impressive sight for visitors and others who will cross the Zambesi by the road on top of the Dam,

The site on which the Kariba Dam will stand across the Zambesi River, looking downstream. This picture shows early work in progress. The illustrations to this article are reproduced by courtesy of the Federal Information Department, Southern Rhodesia.



The cofferdam on the left bank of the river in course of construction. A road bridge and a suspension footbridge built to facilitate operations can be seen under construction in the background.

for this will be part of the highway between the two capitals, Salisbury in Southern Rhodesia and Lusaka in Northern Rhodesia.

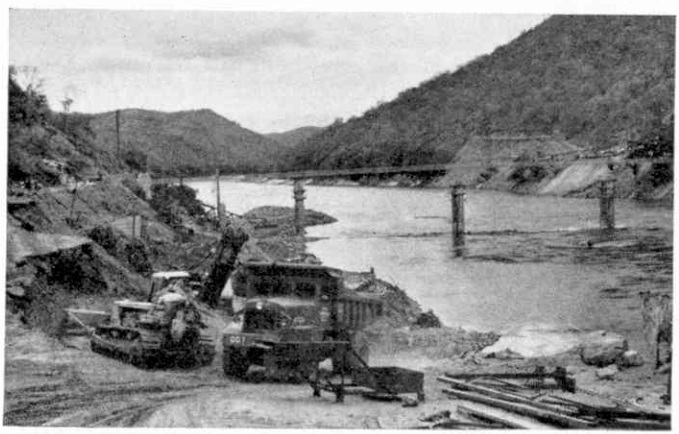
When building a dam across a river the water has to be diverted so that the foundations can be built up. With such a mighty stream as the Zambesi this work had to be carried out in instalments. So at Kariba, in the low water seasons of 1955 and 1956, a circular arch concrete cofferdam was constructed on the left bank. This kept water out of a sufficient space in which to start building the left flank of the Dam, the river meanwhile flowing through the rest of its natural channel. A diversion channel too was excavated through the cofferdam area and back to the river, but the cofferdam itself prevented any water flowing through this channel at this stage.

Attention was then turned to the right bank of the river, during the high water season of 1956-57. There the right flank of the Dam was built above flood water level, while work in the meantime was continued on the left flank, within the cofferdam already built there.

The next stage came in the low water season of last year. As the level of the river fell, the cofferdam on the left flank was demolished at the point where it crossed the diversion channel already excavated, so that water could flow through temporary openings in the Dam wall. Then a rock filled cofferdam was constructed across the main channel immediately downstream of the site. The purpose of this was to still the water immediately above it, so that another cofferdam could be built there to allow for the beginning of dam construction at that side.

Actually two arch cofferdams, forming a circle enclosing the site, were constructed, and the main dam was built within this circle. In this work great use was made of Blondins, as they were called, which were cable conveyors strung across the Gorge, so that materials could be run along them and lowered directly to the points where they were required.

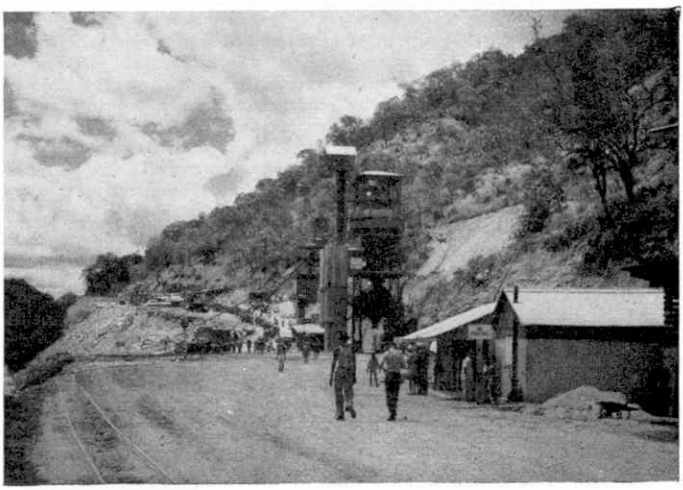
The intention



Erecting the road bridge at the Kariba Dam site.

was that the build up of water in the reservoir would begin as the construction of the main Dam continued. To effect this the temporary openings in the Dam on the left hand side of the diversion channel already referred to would have to be plugged, a difficult operation, to be carried out by dropping concrete bulkhead gates into prepared grooves so as to cut off the flow of water. This promised to be quite spectacular, as the largest of them, which was 45 ft. high and 6 ft. thick, weighed about 135 tons.

It is expected that the reservoir will be full by the end of 1964, but no really exact date can be given, as everything will depend on whether floods or droughts occur during the coming seasons. Actually a record flood, both in regard to the volume of water pouring down the Zambesi and the period during which the flow of water on a large scale continued, brought work to a standstill for a time. The tremendous flow, which was due to heavy rainfall in the mountainous districts where the headwaters of the Zambesi start, swept away a temporary road bridge built below the Dam, although this had been raised in order to put it into a safe position, and generally it battered the works very considerably.



Early work in preparation for building the Kariba Dam in progress.

In a scheme of this kind the water stored up in the lake behind the Dam is allowed to flow under regulation through giant tubes, known as penstocks, to the power house, in which are the water turbines. The rotors of these are driven by the flow of water and in turn they drive the generators that produce electric power. There was no room in the Kariba Gorge itself to place the power houses, so tunnels had to be driven in the sides of the gorge to house the generation plant.

Construction of the first of these diversion tunnels began in the early days of the scheme, when one with a length of 1,300 ft., a height of 40 ft. and a width of 33 ft. was driven through the right bank of the river. The actual power house is a gigantic cavern 460 ft. long, 70 ft. wide and 100 ft. high, and is designed to accommodate six 140,000 brake horse power turbines, each driving a 100 megawatt alternator. Other caverns hewn out of the rock near the machine hall will house the main transformers, while a switchyard and control room will be on the surface, 560 ft. above the power station, the cables from the latter passing upward through a vertical shaft. A second shaft is to provide for passenger carrying lifts to connect with the control room.

Later a second power station similar in all respects to the first one will be built on the left bank of the river. Then the total installed capacity will be 1,200 megawatts, but it may be found desirable to add further units at a later date.

"JET PLANES WORK LIKE THIS." By JOHN W. R. TAYLOR (Phoenix House, 9/6)

This book by a well-known *M.M.* contributor accomplishes the difficult task of describing in simple terms the development of jet aircraft from the little Gloster/Whittle E.28/39 of 1941 to the "flying bedsteads" and 600 m.p.h. air liners of today. The author explains the principle of jet propulsion, the different kinds of jets, and the problems tackled by designers of these strange new shapes so strikingly different from traditional aircraft. Looking ahead, Mr. Taylor describes research aircraft already being designed to fly at 4,000 m.p.h. The many excellent line drawings help to make the text perfectly clear.

Diesels in the Western Region

THE news that a demonstration run had been made between Paddington and Bristol by a diesel-hydraulic locomotive aroused great excitement in railway circles. One of the most interesting points about this run was that the new locomotive was not a diesel-electric. Instead it proved to be one that works in a somewhat similar manner to a motor car fitted with a fluid flywheel or torque converter.

The new locomotive is the first of a series of diesels for use on the whole of the Western Region lines between Newton Abbot and Penzance. These are being given the names of warships and the first of them, seen in the picture above, has been called *Active*, and given the number D600. It has been followed by *Ark Royal*, *Bulldog*, *Conquest* and *Cossack*, all four built by the North British Locomotive Company, and these have numbers D601 to D604 respectively. There are others to come; 33 of similar power are being built at Swindon, and there are to be 34 more for which orders have not yet been placed.

Active, as can be seen from the picture above, runs on two 6-wheeled bogies. It has the A–1–A, A–1–A wheel arrangement, the intermediate pair of wheels in each bogie being for weight carrying purposes. The letter A indicates that the axle concerned has a driving motor, so that *Active* has altogether four motors. In big diesel-engined locomotives the mechanical form of transmission, using an orthodox gearbox and some form of clutch, is not suitable. In that used in the new Western Region locomotive there is an oil-filled torque converter. In this the engine shaft turns an impeller, the blades of which force the oil on to the blades of a turbine that is fixed to the output shaft, which drives the wheels through gearing. There is also a fixed guide wheel or stator. All three of these members are mounted on one shaft.

There are two such transmissions in D600, for there are two diesel engines, and each includes three torque converters. Infinitely variable torque multiplication is given by each of these, but one is designed to be at its greatest efficiency at starting and low speeds, the next at intermediate speeds and the third at high speeds. One converter is filled with oil as another is emptied and the change is made without interruption in the transmission of power to the wheels. This is the distinctive feature of the Voith principle. Transmission oil is cooled in a heat exchanger, where the heat is transferred to the engine cooling water circuit, the temperature of which is regulated automatically.

Reversing arrangements are included and a safety device ensures that the locomotive cannot be reversed while it is in motion. Each main engine and transmission unit is independent of the other and can be cut out if required.

The two diesel engines are mounted on the main frame, which is built up of steel plates and sections, approximately above

(*Continued on page 304*)

The Nord 2506, the latest version of the French-built Nord Noratlas.

Air News

By John W. R. Taylor

Twin-Boom Recognition

Several readers wrote to me in April, complaining that the twin-boomed transport that I identified as a Fairchild Packet on page 177 was really a French-built Nord Noratlas. Silhouettes in their aircraft spotting books, they stated, showed that only the Noratlas has tail fin extensions under its tail-booms.

Fortunately for me, the silhouettes to which they referred were out of date, for most Packets now in service have got tail fin extensions, including the one in which the Folland Gnat fuselage was flown to India. Other features which identified this particular machine as a Packet were the twin-wheels on each undercarriage leg, the square-tip propellers and the square-section fuselage.

For comparison, above is a picture of a brand-new version of the Noratlas, the Nord 2506, which has two Turbomeca Marboré turbojets, each of 880 lb. thrust, on its wing-tips. These supplement the power of its French-built Bristol Hercules piston-engines, enabling it to take off with a full load in hot climates.

As can be seen it has a more circular fuselage than the Packet and single wheels on its main undercarriage legs. Not visible are the square-tipped fins and rather pointed propeller blades. The Noratlas is also very much smaller than the Packet, with a loaded weight of 46,200 lb., compared with the latter's 74,400 lb.

New Colouring for "L" Planes

Royal Air Force training aircraft, which have since 1935 carried distinctive yellow markings so that they can be easily identified and given a wide berth by other pilots, are now to have an even more conspicuous colour scheme.

Fluorescent orange paint is to replace the yellow used at present for the bands round the rear fuselage and the wings. In addition, the tips of the wings and tailplane are to be finished in fluorescent orange.

The Tipsy Nipper

Of particular interest this month, in view of the article on "build-it-yourself" aeroplanes on pages 263-5, is the news that Avions Fairey, of Gosselies in Belgium, are producing an aircraft of this type.

Designed by the company's Managing Director, Mr. E. O. Tips, and known as the Tipsy Nipper, it is one of the neatest ultra-light single-seaters yet flown, with a span of only 19 ft. 8 in. and loaded weight of 660 lb. Powered by a 30 h.p. Volkswagen engine, it has a top speed of 75 m.p.h. and range of 187 miles at 65 m.p.h. But the feature that will appeal particularly to pupil pilots is its nosewheel undercarriage, which greatly simplifies take-off and landing, and helps it to get off the ground in only 150 yards, even when there is no wind. The Nipper is shown in the lower illustration on this page.

Another interesting feature is that the little aircraft has been designed so that it can be towed behind a small saloon car, with the wings stowed in a cradle on the car roof.

The Nipper will be available either as a complete ready-to-fly aircraft costing less than £1,000, or as a kit of parts for home construction. The kit will cost £375, to which must be added £175-275 for the engine and about £50 for the propeller, cowling, instruments, fabric and paint. Already in production, both completed aircraft and kits should be available within about two months.

This Belgian ultra-light, single-seater aircraft is the Tipsy Nipper, produced by Avions Fairey, of Gosselies.

Austrian Airlines at London Airport

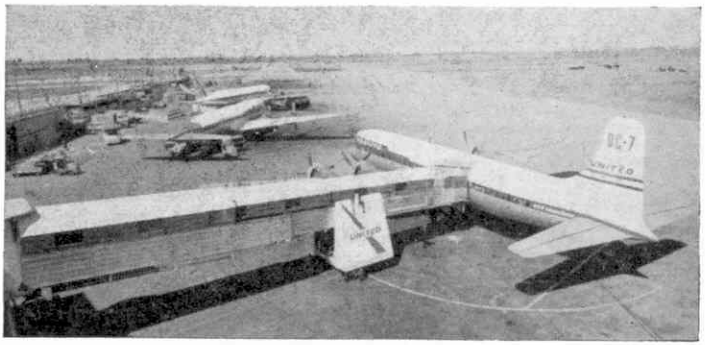
As expected, the newly-formed Austrian Airlines, AUA, have begun daily services between Vienna and London Airport, using the two Viscount 779's, LN-FOI and LN-FOK, belonging to Fred Olsen Airtransport of Oslo. The pilots, at present, are Norwegian; and the time for the 791-mile flight is 3 hr. 5 min.

Aero-Gangplank

A revolutionary new method of putting passengers on board air liners and getting them off has been introduced by United Air Lines at O'Hare Airport, Chicago. Known as the Aero-Gangplank it consists of a telescopic three-section ramp, which is attached to the side of the terminal building at first-floor level, 12½ ft. above the ground. When an aircraft lands and taxis up to the terminal, the gangplank can be extended from its retracted length of 55 ft. to a maximum of 107 ft. in 90 seconds, so that its end fits snugly against the side of the aircraft's fuselage in line with the door.

A perfect "fit" is ensured by the ramp's ability to be swung sideways through an arc of 120 degrees and to be elevated at the free end to any height from 4½ ft. to 13½ ft. above the ground, depending on the height of the air liner's cabin.

The Aero-Gangplank is completely enclosed to protect passengers from the weather, has large windows along its entire length, is lit with fluorescent tubes and is heat and sound-proofed. The fact that it eliminates the usual stair-climbing and entrance steps has already made it very popular with passengers.



Positioned between aircraft and terminal building, United Air Lines' enclosed "Aero-Gangplank" provides a weather-shielded walkway for deplaning or boarding passengers at O'Hare Airport, Chicago.

Herculean Globe-Trotter

Although it is in large-scale service with the U.S. Air Force, the Lockheed Hercules seldom seems to be in the news. So the fine picture shown below of one of these giant transports cruising past Japan's highest mountain, the 12,395 ft. extinct volcano Fujiyama, is of particular interest. It is a C-130A from Ashiya Air Force Base on Honshu Island, in Central Japan.

Soon to follow the C-130A into world-wide operation is the improved C-130B Hercules, 53 of which were ordered by the U.S.A.F. in December 1957, at a cost of £36 million. It will have more powerful Allison T56-A-7 turboprops, giving 4,050 h.p. each, extra fue for a longer range, a top speed of over 370 m.p.h. and a loaded weight of 140,250 lb., compared with the 124,200 lb. C-130A.

One of the most important jobs for which Hercules squadrons are responsible is to deliver U.S.A.F. and U.S. Army missiles like the surface-to-air Nike and surface-to-surface Matador, complete with their launching platforms and ground handling equipment, to American overseas bases. Twelve have been ordered for the Royal Australian Air Force.

A Lockheed C-130A Hercules transport of the United States Air Force flying past Mt. Fujiyama, 12,395 ft. and Japan's highest mountain.

Safety Barriers for NATO Airfields

Safety barriers resembling giant tennis nets are being installed at the end of the runways at NATO military airfields, to bring to a standstill jet aircraft that get into difficulty during take-off or landing. Made in Sweden, they extend across the runway at the approach to the overshoot section that is used in emergencies to provide extra run for aircraft.

Two steel cables, the top one supported on wooden booms, are attached to hydraulic drums on each side of the runway. Between the cables are suspended triple strands of half-inch nylon rope, so spaced that they would grip the leading-edges of an aircraft's wings, while passing clear of the nose and cockpit. Normally, the barrier lies flat, offering no obstruction; but it can be raised to an erect position within seconds by pressing a button in the control tower.

In the past accidents have occurred when pilots of damaged aircraft tried to complete another circuit of the airfield rather than risk going off the end of the runway, or when their brakes failed while landing, or their engine cut during take-off, so that they over-ran the runway into a ditch or hedge.

Now, in any of these emergencies, the controller would erect the barrier and, as the aircraft nosed into it, the drums would take up the tension, allowing the net to travel forward with the 'plane and gradually drag it to a halt. The makers claim that tests with a runaway jet have shown that a nine-ton aircraft hitting the net at 140 m.p.h. can be brought to a standstill in 120 yards.

Railway Notes

By R. A. H. Weight

Aboard "The Flying Scotsman"

As one of the most famous old-established expresses linking the English and Scottish capitals, with departures at 10.0 a.m. daily throughout the year from London (King's Cross) and Edinburgh (Waverley), *The Flying Scotsman* has become almost a tradition. During the past winter the 393 mile journey was made in about 7 hrs., with one stop only, at Newcastle upon Tyne, as hitherto during the summer.

On a bright autumn day I enjoyed comfortable southbound travel in a well-filled train including some of the specially appointed air-conditioned coaches, although in order to reduce weight the buffet lounge car that had been a regular feature for some years was omitted. Since this run was made, a "miniature buffet" service has been introduced attractively in part of a rebuilt second class carriage, as on certain East Anglian fast trains, in addition to the restaurant cars, which when I last travelled were both modern 1st-class vehicles for all passengers. In clear visibility the many miles of grand coastal and marine scenery on each side of the Border were enjoyed at their best.

It was a splendid trip from Edinburgh to Newcastle. We were soon ahead of time, the first 29½ miles to Dunbar taking only 29½ min. with a quickly attained maximum of 83 m.p.h. Berwick was passed at reduced speed in less than an hour. Then we rounded the big curve over the Royal Border Bridge with its wonderful views, and sped across Northumberland in the 70's where appropriate and hardly below 60 m.p.h. uphill. The 120 miles to Tyneside industrial outskirts were covered in 119 min., and then we passed slowly over a network of tracks among big bridges and viaducts to pull up 4½ min. early in Newcastle, Central. With 11 on, over 400 tons full, the running had equalled the schedules of the much lighter *Talisman* or *Fair Maid* flyers.

The locomotive so far had been A4 streamlined 4–6–2 No. 60019 *Bittern*, stationed at Gateshead across the Tyne. With the same crew it had hauled a sleeping car express in the early morning from Newcastle to Edinburgh. At 10.0 a.m. the previous day this engine was at King's Cross ready to leave with the 10.10 Glasgow express, having reached London overnight with the non-stop *Talisman*. The picture on this page depicts a similar occasion when *Bittern*, on this 10.10 duty, followed the northbound *Flying Scotsman* shown about to start at 10.0 headed by A1 Pacific *Aberdonian*, which was the King's Cross locomotive taking over for the 268-mile run forward to London without a stop with a restart from Newcastle at 12.18 p.m.

Later there were two slowings for track repair work, one severe and one slighter signal slack as well as the customary speed restrictions through York, Peterborough, etc. All lost time was recovered during a good steady run, with maximum speeds just over 80 m.p.h., some easy climbing and a fast finish. York was passed at 1.37, Doncaster at 2.13 and Peterborough at 3.39. Having a little in hand on the 4¾-hr. timing, at 5.0 the *Scotsman* glided out of the last tunnel into No. 2 platform; I proceeded at once to say "Thank you, driver, for a nice run!"

The Blue Spot Fish Special

The increase in faster, vacuum-braked freight and produce daily trains, keeping closely to scheduled time and providing next-day deliveries over long distances, has produced on occasion some difficulty in connection with overheating of axle boxes fitted with the usual plain bearings and lubrication. Quite a number of vans have now been fitted at various ex-L.N.E.R. Works with new sets of wheels having roller bearing axle boxes, in which oil will circulate continuously.

Those so converted display a large blue circle or "spot" on a white ground and run, for example, in the 12.30 p.m. Fish Express from Aberdeen to King's Cross, reaching London about 2.30 next morning, in time for early market. Pacific locomotives often share the haulage of such "super" freight trains.

Motive Power Depots Recoded

Latest changes announced by L.M.R. include the following fresh code indications: Woodford Halse 2F; Northwich 8E; Springs Branch 8F; Sutton Oak 8G; Trafford Park 9E; Heaton Mersey 9F; Gorton 9G; Barrow 11A; Workington 11B; Carlisle (Canal) 12C; Kirkby Stephen 12D; Bedford 14E; Coalville 15D; Market Harborough 15F; Rowsley 17C; Preston 24K; Carnforth 24L; Patricroft 26F; and Brunswick 27F.

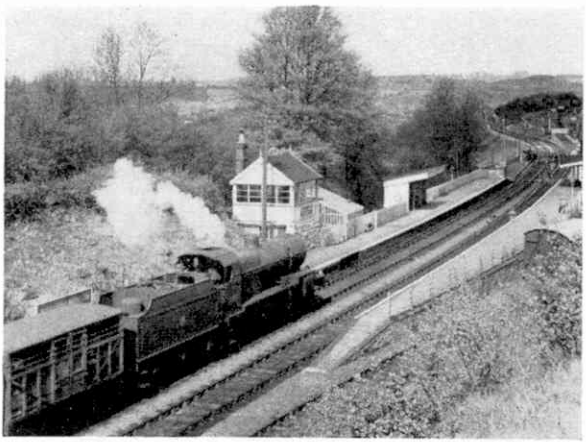
Transferred from W.R. to S.R., Weymouth Shed is now 71G and Yeovil (Pen Mill) is 71H.

No. 60158 "Aberdonian" stands proudly at the head of "The Flying Scotsman" at King's Cross, while alongside is No. 60019 "Bittern". Photograph by R. F. Roberts.

Locomotives News and Changes

New diesel locomotives have been added to stock and allocated as follows: main line type Nos. D5504–6 to 30A, Stratford; light mixed traffic, Nos. D8018-9, D8201–3, 1D, Devons Road, London; shunting classes, No. D3416, 65B, St. Rollox Shed, Glasgow, Nos. D3481–4, 36A, Doncaster, Nos. D3485–8, 34E, Peterborough, Nos. D3426–8, 88B, Cardiff, East Dock, Nos. D3608–9, 30A, Stratford and Nos. D3610–11, 31A, Cambridge; also Nos. D2013–6 with mechanical transmission, as have Nos. D2268–9, sent to 55D, Royston, Yorks., the others mentioned have electric drive.

Express diesel-hydraulic locomotive No. D601 *Ark Royal* has entered W.R. service. Steam 2-10-0s



A former Somerset and Dorset 2–8–0 No. 53801 passes the delightfully named and situated station of Midsomer Norton. Next to the tender is a former cattle wagon adapted for conveying barrels and casks. Photograph by R. E. Toop.

numbered 92188–9 have been reported respectively at Peterborough and Mexborough depots.

A number of the N.E.R. D49 4–4–0s, especially of the Hunt series, are being scrapped, as are more Sandringham 4–6–0 and Claud Hamilton 4–4–0 engines among other ex-L.N.E.R. types. The experimental Metro-Vick. gas turbine locomotive No. 18100 that ran on W.R. trains has been withdrawn, as has No. 47994, the last of the double-ended Beyer-Garratt 2–6–6–2 London Midland mineral class, of which there were once 33.

At least 14 West Country Pacifics have been rebuilt to the new standard design and allocated to the S.R. Eastern Section. Maroon (former L.M.S. red) livery like that on No. 46245 *City of London* will be applied to 20 Princess Coronation 4–6–2s when repainted after general overhaul.

The "Caledonian Single" Running Again

Round about 50-70 years ago, when speed with light trains and graceful appearance counted for more than powerful haulage or mixed traffic capacities, many of the former railway companies operated express locomotives having only a single pair of large driving wheels, as they were then thought to be capable of faster running. In suitable conditions they were very speedy.

One of the last singles in service, as L.M.S. No. 14010, was built in 1886. It took a prominent part north of Carlisle in the 1888 "railway race" from London to Edinburgh, and was withdrawn 23 years ago and put into store. During the Coronation year, 1953, this lovely little 4–2–2 engine, restored to the impressive original Caledonian Railway blue livery, with that company's lettering and its old number 123 again displayed was then placed on view in London and other centres, though not in steam, as part of a "Royal Journeys" Exhibition of rolling stock and souvenirs.

With commendable enterprise the Scottish Region has restored No. 123 to fully runnable condition and since March last, to the astonishment and delight of passengers, enthusiasts or other observers, it has headed a number of special trains from Perth, Glasgow, etc. The first of these is illustrated on this page. The trains were formed of two coaches painted as of yore, with lake bodies with white upper panels, to quote the official description.

Several other "singles" are preserved in York Railway Museum, and certain locomotive works.

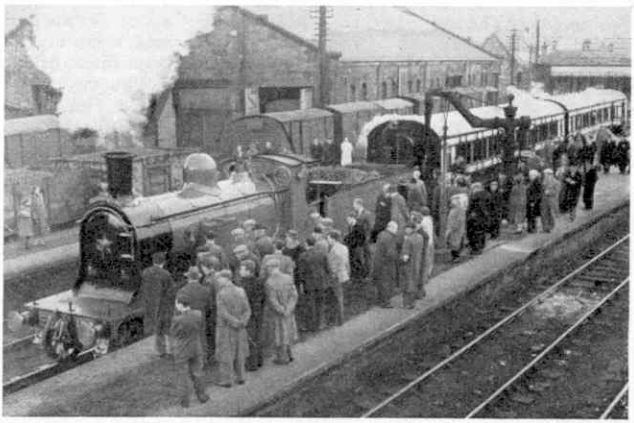
Southern Tidings

New facilities included in the summer timetables coming into force during June will be a full diesel-electric service on the London-Tunbridge Wells - Hastings line, with a number of buffet cars and accelerations. Diesel trains will also run more frequently on Bexhill West branch and between Hastings-Rye-Ashford, with some journeys on the Kent coast main route via Tonbridge-Ashford.

Other introductions are an additional daily boat express in connection with the midday Dover-Calais sailing, and an extra two-hour fast train from Waterloo to Bournemouth at 2.30 p.m., balancing an added morning northbound one running in advance of *The Royal Wessex*, calling at Southampton and Winchester.

To serve the extended Gatwick Airport at a new station on the London-Brighton main line frequent additional electric trains will run between Victoria and Three Bridges. There will be more London-Sussex coast residential services at peak periods, necessitating very close headways, with the customary week-end holiday programme of numerous extra trains, partly steam operated, running to and from resorts from Kent to Cornwall.

A contract has been placed for the construction of 45 1,550 h.p. main-line diesel-electric locomotives.

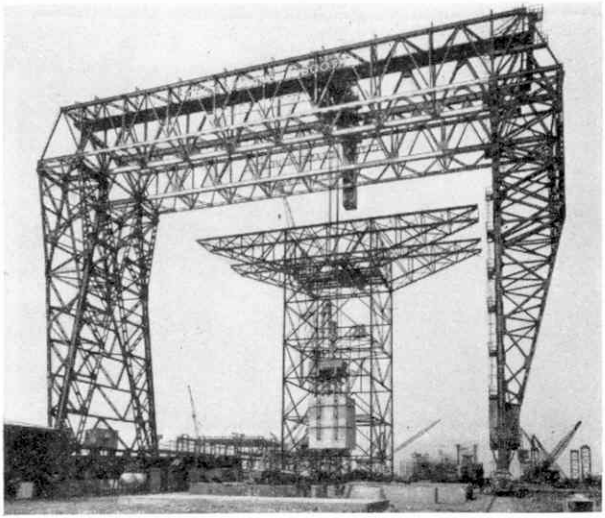


Caledonian No. 123 takes water at Stirling in the course of a special journey from Perth to Edinburgh. Both engine and coaches wear the striking liveries of the former Caledonian Railway. B.R. (Scottish Region) Official Photograph.

A 200-Ton Goliath Crane

Aids Building of Atomic Power Station

By the Editor



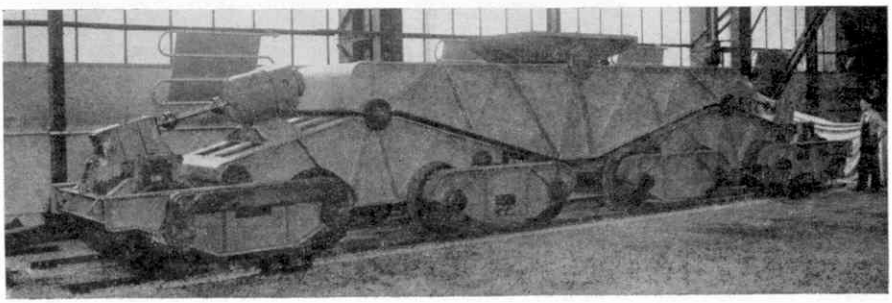
HERE is a truly giant crane, possibly the largest ever built of the type that is usually described as a Goliath crane. It stands about as high as Nelson's Column. A good idea of the size of the crane can be obtained also from the two pictures on this page. In the lower illustration is one of the four bogies on which the crane is carried, and this looks enormous in comparison with the man on the right. Yet these giant bogies are so small compared to the crane itself that they can scarcely be picked out in the upper illustration.

The crane was designed and built by Clyde Crane and Booth Limited, Rodley, Leeds, for use in lifting and placing in position the very heavy boiler and reactor equipment of the atomic power station now being constructed at Bradwell-on-Sea, Essex. For instance, in this station there will be six boilers 87 ft. high. Their shells, each weighing nearly 200 tons, will be floated by sea to the site, and will be dealt with by the Goliath crane when the time comes for placing them in position.

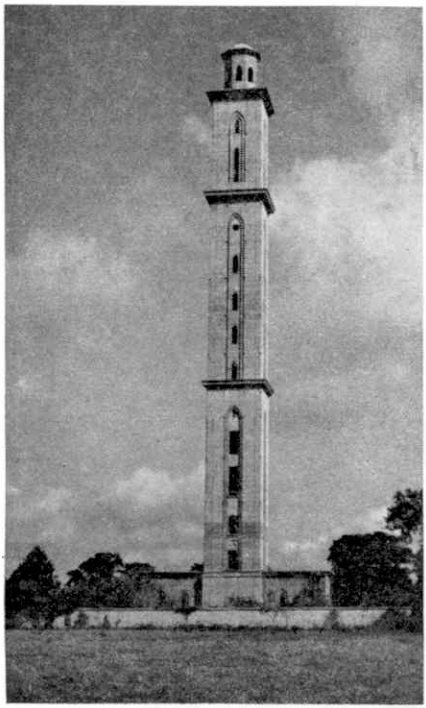
The giant steelwork legs, two mounted on bogies on each side, support the main girder assembly along which runs the crab, which carries the lifting gear, with a main lift of 200 tons, and an auxiliary hoist of 30 tons. The crab is mounted on rails along a pair of girders, so that the two movements, that of the crab and that of the whole assembly along the rails on the ground, allow for lifting or depositing loads in any position.

This giant crane took 14 months to assemble. An enormous working platform, seen in my upper picture through the open space between the legs of the crane itself, was used in this operation and has now been dismantled.

The two sets of rails along which the bogies run are 178 ft. apart, and on them the Goliath crane will straddle the reactor house buildings.



MECCANO MAGAZINE



The tower in the picture above is Sway Tower, known also as Peterson's Folly. The photograph and notes are by P. Brewser, Barton-on-Sea.

Junior Section

"Folly" with a Purpose

This great tower, 218 ft. high, stands on the edge of the New Forest, overlooking the Solent. It is known as Peterson's Folly, but it was built with two very definite purposes in mind by a Mr. Andrew Peterson, a retired Indian judge. One was to prove the qualities of reinforced concrete as a building material and the other to alleviate unemployment in the district.

A circular staircase of 330 steps has to be climbed to reach the octagonal observatory at the top. The walls are 2 ft. thick at the bottom, decreasing to 1 ft. thick at the top. For over 20 years the building has been closed to visitors, mainly because there is no protection at the windows to prevent anyone from falling out.

When the tower was built a light was placed on top, but this caused such confusion to shipping in the Solent that the authorities ordered it to be put out.

Massimo Serra, who lives in Turin, is very young, but is already interested in mechanisms, especially the models built by his father, who is a keen Meccano enthusiast.

Easy Model-Building

"Spanner's" Special Section for Juniors

Models for Outfits Nos. 00 and 3

THE two new models I have for you this month are a Level Crossing Gate, which will appeal to owners of Outfit No. 00, and an attractive Oil Tanker that I have designed so that it can be built from Outfit No. 3.

I will describe the Level Crossing Gate first. This very simple model is shown in Fig. 1. The lifting gate itself consists of two $5\frac{1}{2}$" Strips, each of which is pivoted at one end as shown to a $2\frac{1}{2}$" Strip bolted to Trunnion 1. This Trunnion in turn is bolted to a $5\frac{1}{2}$"×$2\frac{1}{2}$" Flanged Plate that forms the base of the model. The two $5\frac{1}{2}$" Strips are linked together by string as shown, and it is important to note that they are pivoted in the second-to-end hole. At the opposite end of the Flanged Plate a second Trunnion 2 is fixed, and to this is bolted a $2\frac{1}{2}$" Strip and an Angle Bracket 3 that forms a stop to prevent the gate from falling too far.

The gate is raised and lowered by turning a Crank Handle, which is mounted in two Fishplates bolted one to each side of the baseplate. The Crank Handle is held in place by Spring Clips.

A length of string is tied to the Crank Handle and after being wound a few times around it, its other end is tied in the end hole of the upper $5\frac{1}{2}$" Strip. A second piece of string 4 is tied in the end holes of the two $5\frac{1}{2}$" Strips as shown.

A list of the parts required to build this model is given at the end of this article.

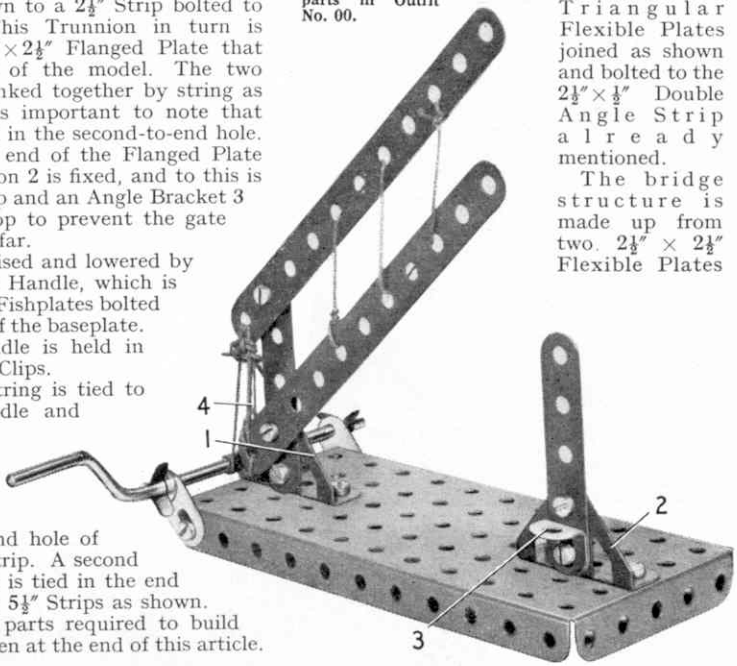


Fig. 1. A Level Crossing Gate that can be built from parts in Outfit No. 00.

Model Oil Tanker

The construction of each side of the hull is exactly the same. The bow is made up from two $12\frac{1}{2}$" Strips one on each side and two pairs of $5\frac{1}{2}$" Strips bolted at the front to a vertical $2\frac{1}{2}$" Strip by $\frac{3}{8}$" Bolts. Two $2\frac{1}{2}$" Strips 1 are bolted to the upright $2\frac{1}{2}$" Strip above the $5\frac{1}{2}$" Strips. The $5\frac{1}{2}$" Strips are bolted at their inner ends to a $2\frac{1}{2}$"×$2\frac{1}{2}$" Flexible Plate, and a $2\frac{1}{2}$"×$\frac{1}{2}$" Double Angle Strip is attached by its lugs to each of the upper $5\frac{1}{2}$" Strips. The $2\frac{1}{2}$"×$2\frac{1}{2}$" Flexible Plate in turn is bolted to a $5\frac{1}{2}$"×$1\frac{1}{2}$" Flexible Plate 2 attached to a second $2\frac{1}{2}$"×$2\frac{1}{2}$" Flexible Plate 3.

The stern consists of four Formed Slotted Strips bolted to the $2\frac{1}{2}$"×$2\frac{1}{2}$" Flexible Plates 3 and joined together at their centres by a Fishplate 4.

The foredeck consists of two $2\frac{1}{2}$"×$1\frac{1}{2}$" Triangular Flexible Plates joined as shown and bolted to the $2\frac{1}{2}$"×$\frac{1}{2}$" Double Angle Strip already mentioned.

The bridge structure is made up from two $2\frac{1}{2}$"×$2\frac{1}{2}$" Flexible Plates joined to the top holes of the side $2\frac{1}{2}$"×$2\frac{1}{2}$" Flexible Plates by Angle Brackets. One end of a $5\frac{1}{2}$"×$2\frac{1}{2}$" Flanged Plate 5, which forms the midship deck, is joined by its side flanges to the $2\frac{1}{2}$"×$2\frac{1}{2}$" Flexible Plates forming the sides of the bridge structure, and at its other end is bolted to the $2\frac{1}{2}$"×$2\frac{1}{2}$" Flexible Plates 3.

An Angle Bracket bolted to the Flanged Plate holds down the aft end of the bridge.

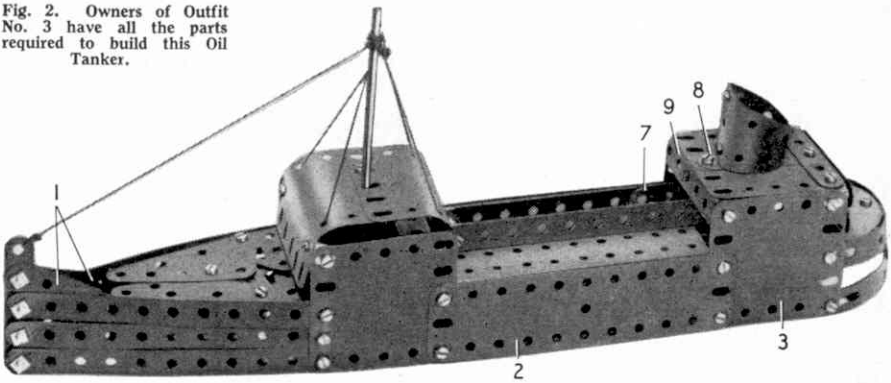


Fig. 2. Owners of Outfit No. 3 have all the parts required to build this Oil Tanker.

A Double Bracket 6 is bolted to the back of the bridge as shown. A catwalk is provided by two $5\frac{1}{2}$" Strips bolted to this Double Bracket and they are kept parallel by means of another Double Bracket 7 bolted to the Flanged Plate.

The funnel of the Tanker is made up of two $2\frac{1}{2}" \times 1\frac{1}{2}"$ Triangular Flexible Plates and is attached by an Angle Bracket 8 to two $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates. The latter are joined together and connected by means of an Angle Bracket to a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 9. This is joined by its lugs to the $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plates 3. A $2\frac{1}{2}"$ Strip 10 is bolted across the aft ends of the $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plates and it is joined to the Plates 3 by Angle Brackets. Two $2\frac{1}{2}"$ Strips 11 are bolted to a Trunnion that is then fixed by Bolt 12 to the $2\frac{1}{2}"$ Strip 10.

The rear deck is a Semi-Circular Plate joined to the Formed Slotted Strips by an Angle Bracket.

The mast is made up of a 4" Rod held in the boss of a Bush Wheel bolted to the top of the bridge structure on the inside. The rigging is set up as shown, using a length of Cord.

If three or four 1" Pulleys are available the model can be mounted on wheels so that it can be pushed along.

Parts required to build the model Oil Tanker: 2 of No. 1; 6 of No. 2; 6 of No. 5; 1 of No. 10; 2 of No. 11; 8 of No. 12; 1 of No. 15b; 1 of No. 24; 55 of No. 37a; 50 of No. 37b; 2 of No. 48a; 1 of No. 52; 5 of No. 111c; 1 of No. 126; 2 of No. 126a; 2 of No. 188; 2 of No. 189; 2 of No. 190; 2 of No. 199; 2 of No. 200; 1 of No. 214; 4 of No. 215; 4 of No. 221.

Parts required to build the Level Crossing Gate: 2 of No. 2; 2 of No. 5; 2 of No. 10; 1 of No. 12; 1 of No. 19s; 2 of No. 35; 13 of No. 37a; 11 of No. 37b; 2 of No. 38; 1 of No. 52; 2 of No. 126.

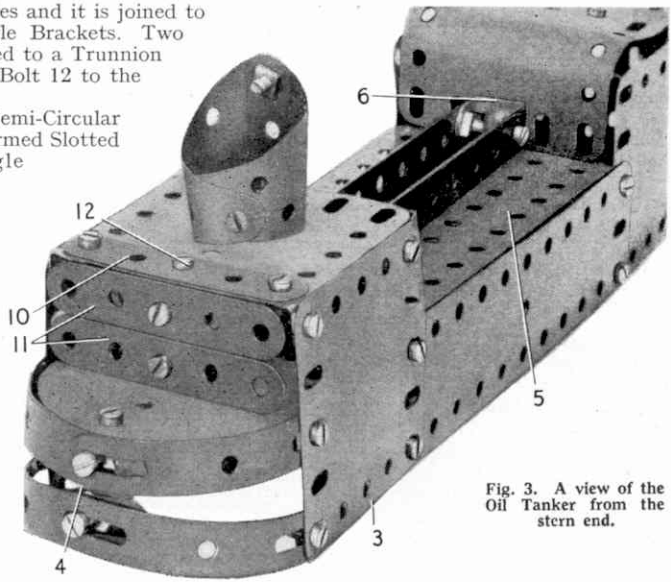
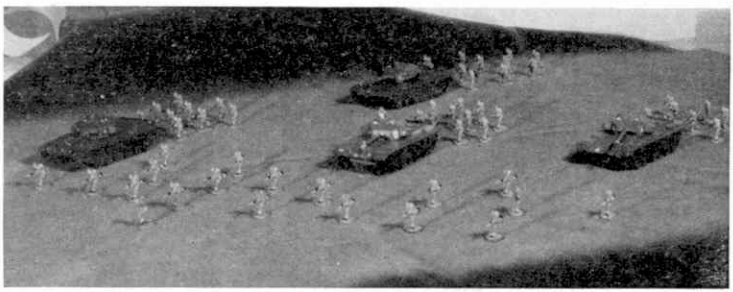


Fig. 3. A view of the Oil Tanker from the stern end.

DINKY TOYS NEWS

By **THE TOYMAN**

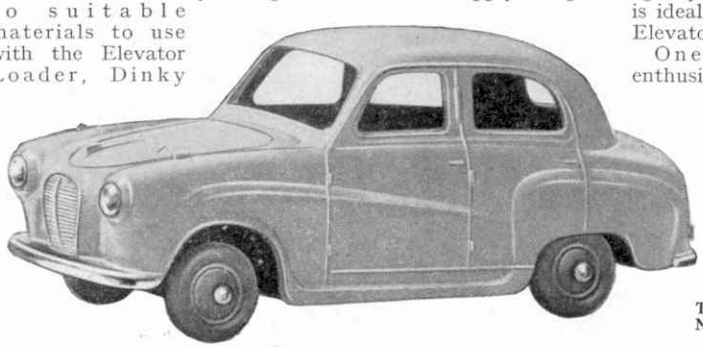
MR. EDWYN GRAY, High Wycombe, has made a hobby of collecting Dinky Toys Army models and using them in conjunction with a very comprehensive collection of scale model soldiers to lay out battle actions and military formations of many different kinds. He has found that building up his collection with such a definite aim in view has made his hobby even more enjoyable and interesting. One of the many varied battle formations that he is able to arrange is shown in the upper picture on this page, and I hope that this brief mention of Mr. Gray's hobby will give other collectors of Dinky Toys ideas for adding to the pleasures they derive from them.



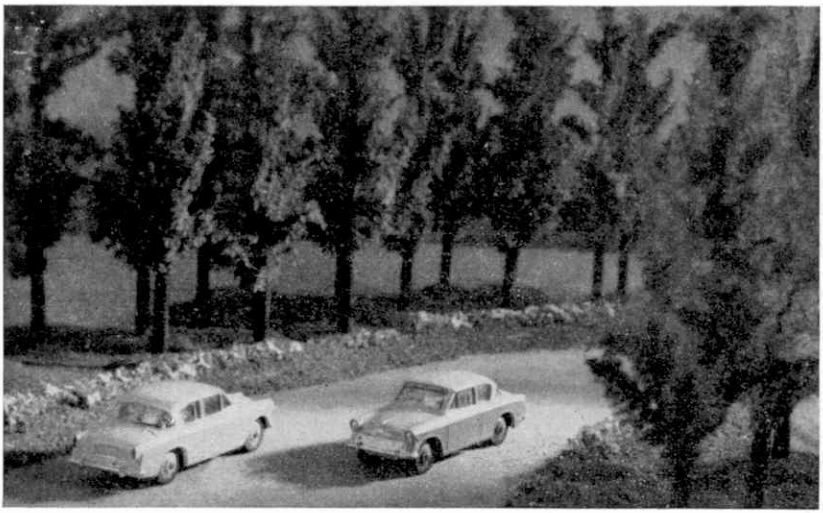
Four Dinky Supertoys Centurion Tanks advance into action, supported by infantry. This form of infantry and tank tactics was adopted by the Russians in the last war. This scene is one of many different battle action set-ups arranged by Mr. Edwyn Gray, High Wycombe, whose collection is mentioned in the accompanying article.

Several Dinky Toys Club members have written to me recently asking for advice as to suitable materials to use with the Elevator Loader, Dinky Supertoys No. 964. This model is one of the most popular in the range and a lot of fun can be had in arranging, say, a miniature building or demolition site and using the Elevator Loader for loading constructional materials into lorries. It is best not to use sand or similar fine materials, however, as these tend to clog up the mechanism of the Elevator Loader and prevent it from working. A better material is fine gravel chippings of the kind that are often used for surfacing roads. A small supply will go a long way, and the material is ideal for use with the Elevator Loader.

One Dinky Toys enthusiast tells me that he finds the small cotton wool filter tips used in making home-made cigarettes also very suitable for use with the Elevator



The new Dinky Toys No. 160, Austin A30 Saloon.



Here we see two Dinky Toys Sunbeam Rapiers passing each other on a sunlit country road. A realistic setting of this kind is easy to arrange and adds much to the pleasure obtained from Dinky Toys.

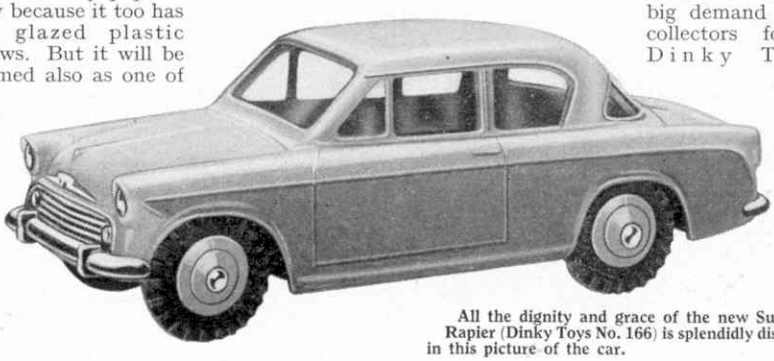
Loader! These can be obtained quite cheaply from tobacconists' shops.

Now I must say a few words about the two fine new Dinky Toys Cars that have been added to the range this month. They are the Austin A30 Saloon (Dinky Toys No. 160) and the Sunbeam Rapier Saloon (Dinky Toys No. 166). The Austin A30 is seen in the lower picture on the opposite page and the Sunbeam Rapier is seen in both pictures on this page.

Since the first Dinky Toys car fitted with glazed windows appeared in April I have received hundreds of letters from collectors expressing their delight at this latest Dinky Toys development and it is obvious therefore that the Sunbeam Rapier is going to be extremely popular if only because it too has fully glazed plastic windows. But it will be welcomed also as one of the most beautiful of the Dinky Toys private cars, its distinctive appearance and delightfully clean moulded outline placing it in the forefront of the Dinky Toys reproductions of high-class cars.

The Sunbeam Rapier is available in two colour schemes. In one the body is finished in two shades of blue, with blue wheels and black tyres, silver grille, etc., while in the second colour scheme the model has a cream or stone coloured top with the lower part of the bodywork in deep yellow. Black tyres are fitted and the headlamps, grille and bumper are finished in aluminium.

The Austin A30 is a smaller car than the Sunbeam, but it has been a favourite among small cars for a long time. There has indeed been such a big demand from collectors for a Dinky Toys



All the dignity and grace of the new Sunbeam Rapier (Dinky Toys No. 166) is splendidly displayed in this picture of the car.

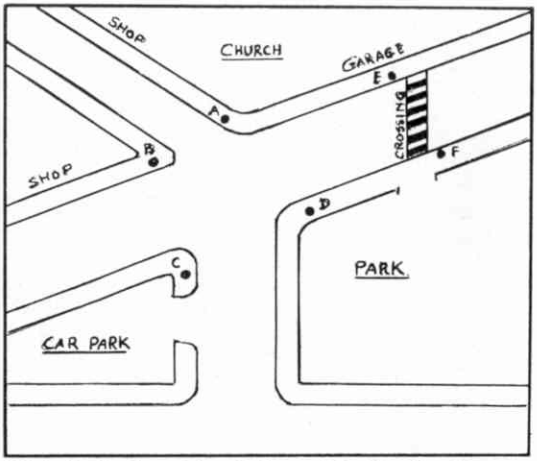
miniature of it that its popularity is already assured. This model also is available in two different body colour finishes, turquoise blue and stone. The A30 has moulded plastic wheels and tyres.

One of the most frequent requests made to me by Dinky Toys collectors is for advice and suggestions on the making of simple layouts, and I am sure therefore that many readers will be interested to see how I set about planning up a layout.

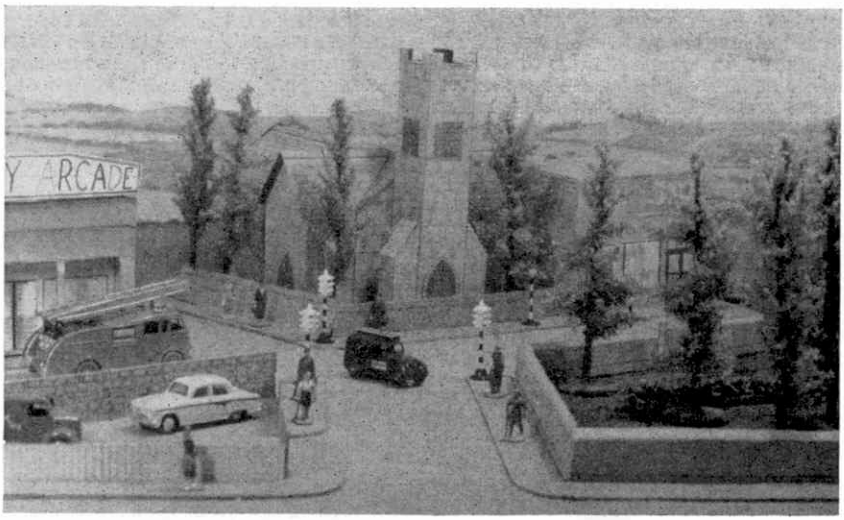
I first draw a plan with a simple system of roads that I can easily lay out with strips of cardboard glued or pinned to a baseboard. Using this plan as a guide I then go on to make up the buildings, with good card as the chief material, and place these at the points I have marked on the plan. Sometimes I move the buildings about to make sure that the general effect is real in appearance, and here I may add that I always include a small park area, and if possible a car park, to give a fairly open outlook. A layout without views is never satisfactory, unless one is content with streets on which vehicles can only be seen from the sky! The best viewpoint is from only a little above street level.

The trees shown in the layout were some I had by me, but other types of tree can be obtained or, if preferred, substitutes can be made up from pieces of thickish stranded wire about 5 in. long. The upper $1\frac{1}{2}$ in. of the wire should be untwisted and splayed out and bent to form branches. Bits of dyed cotton wool can then be artistically arranged on the branches to form the foliage. The lower end of the trunk can be stuck into a piece of cork about $\frac{1}{4}$ in. thick,

As an example, above is one of my plans and below is the resulting layout.



This is the simple road layout plan used for the attractive scene shown in the illustration below.



This realistic scene shows what can be done with a simple road layout of the kind illustrated in the plan above.

"Tommy Dodd" writes about:

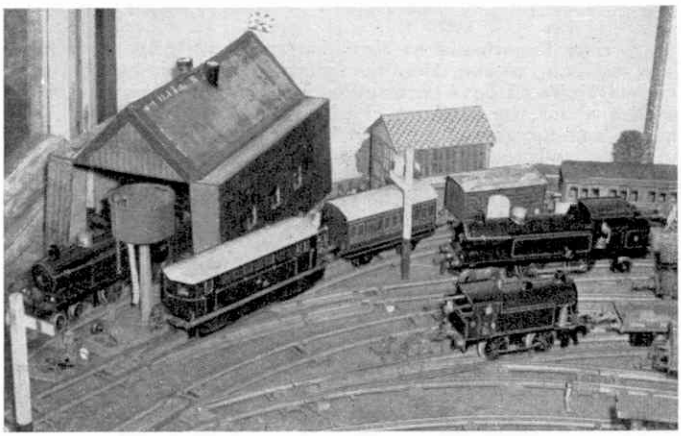
The Old and the New

IT is a remarkable fact that interest in railway matters, once developed, usually lasts a lifetime. And it is the same with miniature railway affairs, if my correspondence is any guide. Although in our talks we usually deal with the Hornby railway equipment at present available, I know that many readers still have in use older engines and stock, family treasures as it were, often bequests from older members of the family, who usually are still ready at any time to join in the fun of running them. Look at the engines on the layout on this page, for instance. I am sure that they give untold satisfaction to their owner, Mr. K. Adams, Gloucester, although some of them were running long before many of my readers were born!

The fact that these veterans can still work, and work well, says a great deal for the hard-wearing qualities of Hornby Trains. Careful attention and use, of course, has helped considerably to keep on the run such engines as the two brass-domed No. 2 Tanks that appear in the picture, one on the right and the other emerging from the engine shed. These work quite happily alongside the 0–4–0 Tank also shown. Even this is six years old and corresponds to the present-day No. 40 in the Hornby range.

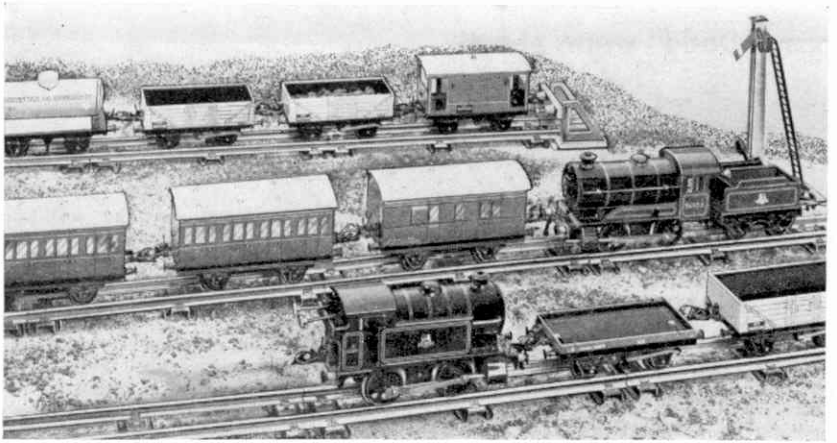
You will notice by the corner of the engine shed an engine that strongly resembles a modern diesel-electric. This does not mean a new Hornby Gauge 0 development. The engine is actually the once familiar Hornby Metropolitan-type Locomotive, based on the well-known electrics of the Metropolitan Line.

There were several versions of this Locomotive in the Hornby range in days gone by, but the one shown in the picture is unusual in being a clockwork-driven representation of an electric engine. But it is not used as an "electric", because when the owner came across it recently, devoid of paint, but still in sound condition, it seemed to him that it had a general resemblance to a diesel! So a "diesel" it now is, in black livery with grey roof and trimmings. Thus an ancient specimen of Hornby motive power has become quite modern and it makes a pleasing contrast with the steam type engines also on duty on the line. The system is then a really fascinating one to work, with its eleven engines, numerous bogie passenger vehicles, and well assorted goods stock.



Veteran Hornby Clockwork Locomotives are still giving excellent service on the very busy layout of Mr. K. Adams, Gloucester.

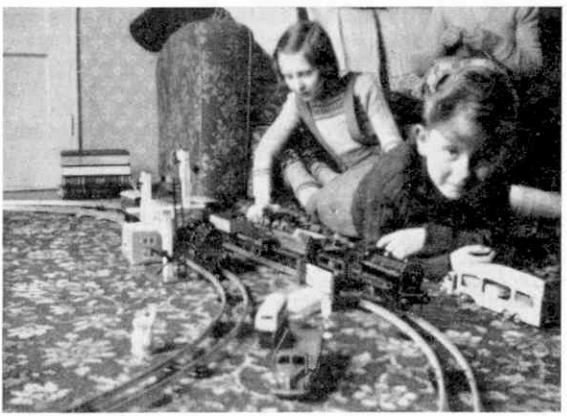
Now there is every reason why your present-day Hornby Locomotives and rolling stock should give you long and satisfactory service. The hard-wearing qualities are built in, as they always have been, and normal repairs to engines of current types can always be effected by



Hornby Locomotives and rolling stock of current types on a busy system. The No. 41 Coaches are "empties", hauled by a No. 50 Locomotive running tender first.

the Service Department at Headquarters. The rest is up to you, Hornby enginemen and engineers. I have on many occasions spoken about the need for cleaning and oiling, and for generally careful handling of engines and stock, and attention to these points makes for long engine life. Avoid accidents, too, by exercising proper care in running your railways. There is no real fun in having collisions or other mishaps, but there is a risk of damage not easily repaired.

I am sure that no serious mishaps occur on the layout operated by Raymond Flintoft, of York, whom you see in the lower illustration on this page, along with his sister Margaret. These two are obviously enjoying their railway and road traffic working, for the system includes not only Hornby Train equipment, but a splendid collection of Dinky Toys. Although Margaret seems to be running a road vehicle in the illustration, I suspect that she often lends a hand with the running of the trains, and I am assured in a letter from our friends that their father also is keenly interested. This, of course, is all to the good and makes it quite certain that the *R.F.* (*Hornby*) *Railroad and Dinky Transport Co.*, to quote its business-like title, will have a future full of interesting developments.



Raymond and Margaret Flintoft, of Acomb, York, busy with their Hornby railway and fleet of Dinky Toys.

Present-day Hornby rolling stock, especially the new ones of the No. 50 series that became available during last year, show many improvements on the older types. These include the use of tinprinted bodywork on many of the Wagons, the introduction of better bases, with really strong buffer beams and buffers die-cast as one unit, and the fitting of fine easy-running moulded wheels that are smooth and quiet in operation.

Of course these wheels are fitted to the No. 41 and No. 51 Passenger Coaches and Brake Vans too, so that Hornby passengers have a really smooth ride.

Of General Interest

"Mechanical Men" at work on the railway. B.R. Southern Region photograph.

THE picture on the right will perhaps puzzle some readers. To others it will be easier, especially when they realise that a rail of some kind is suspended from the line of mechanisms straddling the railway line. Each of these is being operated by two men, and all are obviously working in unison.

The mechanisms are known as "Mechanical Men," and they are being employed in work required in electrifying a railway line. In the scene in the picture a 300 ft. length of conductor rail that has been raised from the ground by the Mechanical Men is being lowered on to the insulators that will carry it.

The track being electrified is on the Kent coast line of the Southern Region at Sittingbourne, Western Junction. Of the two men to each unit, one is operating the wheel that controls the movement across the track of the support for the rail, and the other is raising or lowering this as needed.

Is this the narrowest street in England? Photograph by C. E. Wrayford, Bovey Tracey.

I wonder how many readers know the street shown in the lower illustration on this page. It does not perhaps look like a street, but it is one, and it is indeed a lighted highway. But at the nearest end in the picture it is only 2 ft. wide. I can imagine that it would be a tight squeeze for many people, and one-way traffic must almost be the rule in it, as there is scarcely room for two grown up persons to pass each other.

This curious highway is Parliament Street, in Exeter, near the old Guildhall of that city. It is said to be the narrowest street in England. Can any reader produce a picture of one that is narrower?

Almost the World's Longest!

Four Mile Bridge Crossing San Francisco Bay

The bridge from Richmond to San Rafael stretches across the northern part of San Francisco Bay. It is 21,343 ft. in length, and in this respect is exceeded only by the San Francisco-Oakland Bay bridge, which is 1,377 ft. longer. The Richmond-San Rafael Bridge is roughly 3½ times as long as the Forth Bridge and 13 times as long as the great bridge across Sydney Harbour, in Australia.

HERE in the picture on this page is a bridge that is really long. It is an example of a type of structure that has been built in several places in the United States where there are very wide stretches of water to be crossed. A glance at the picture too will show that its long line of truss and girder spans is interrupted by what can readily be recognised as cantilever spans, and that on each side the bridgework rises from shore level to that of the cantilever decks. The purpose of this of course is to provide ample headroom for vessels passing up and down the main channels of the great area of water visible in the picture.

This magnificent long distance crossing of a waterway is in the northern stretch of San Francisco Bay, connecting San Rafael on the western side with Richmond on the eastern. Most of you will know that the entrance to the Bay from the Pacific Ocean is an opening known as the Golden Gate, which is said to have received its name because outgoing vessels in the evening sailed into the sunset. It is the site of a wonderful suspension bridge, with a span that is the longest in the world. Within the Golden Gate the Bay opens out northward and southward, extending for many miles in each case.

The Bay of course is a very large and picturesque expanse of water, but it is a serious obstacle to movement between San Francisco and the mainland. For this reason another bridge from San Francisco has been built as well as the Golden Gate structure. This was opened in 1936, a year before the Golden Gate Bridge. It crosses the southern arm of the Bay by way of a small island to Oakland, on the mainland. And now there is a third bridge, which does for the northern section of San Francisco Bay what the San Francisco-Oakland Bridge has done for the southern section.

The San Francisco-Oakland Bridge is the longest overwater crossing in the world. From end to end it measures 22,720 ft., which is getting on for four and a quarter miles. The total length of the new bridge shown in our illustration is 21,343 ft., that is a little over four miles, so that it is shorter than the Oakland crossing. Those who like arguments may assert that it *has* the distinction of being the longest overwater crossing in the world, because about halfway along the Oakland bridge crosses an island by way of a tunnel, which seems to be a rather queer place for a bridge. This tunnel section has a length of 540 ft. on the island, but when it is omitted the total length of bridge structure is still greater than that of the new bridge. The San Francisco-Oakland Bridge is a continuous highway, however, and it is much larger too than the new bridge. It

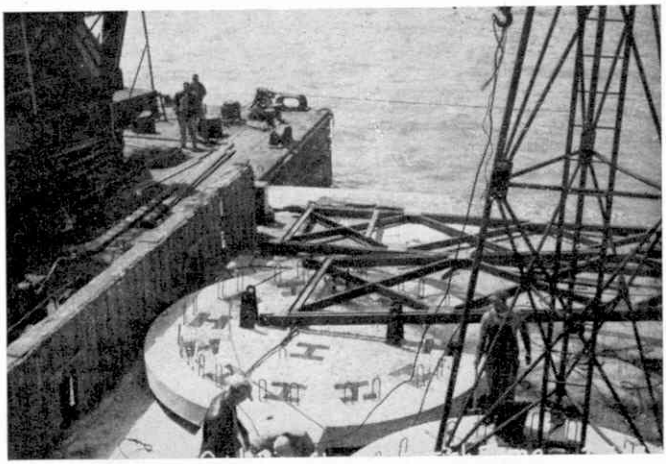
provides for nine lines of road traffic, three of them for heavy vehicles, and carries also two inter-urban railway tracks.

If the Richmond-San Rafael bridge is not to be regarded as the longest overwater crossing in the world, it is certainly a very remarkable one. It has two decks, one above the other, and this means that at each end the decks have had to be opened out at an angle, so as to bring traffic to the same level at the toll gates. Each of the decks has three traffic lanes, cars and other vehicles travelling in opposite directions on the two decks, from Richmond to San Rafael on the western side of the Bay on the upper deck and from San Rafael to Richmond on the lower one.

The collection of tolls on this bridge is a matter of great importance, as they provide the only source of revenue to repay the money that has been advanced to pay for the bridge. So every possible device was introduced to ensure that all revenue is properly reported and everything is carried through with the greatest possible efficiency. The electrical and mechanical devices involved were so designed that they can be interlocked, so that traffic passes through and collection is carried out only in accordance with a very definite scheme. All collections are made from the driver's side, and an interesting point is that means of earthing cars are provided to prevent toll collectors and drivers receiving shocks from static electrical charges that may be accumulated on moving vehicles.

Now let us have a look at the bridge itself. The illustration on the opposite page is from a photograph taken from the Richmond or eastern end, and shows clearly the many lanes leading to and from the toll booths. From this end there are 17 plate girder spans of 100 ft. length, and these are followed by 13 simple truss spans of 289 ft. each. This brings us to the nearer of the two cantilever sections, each of which provides a clear opening 1,000 ft. wide for vessels travelling up and down the Bay. The clearance of the first as far as height is concerned is 135 ft., and that of the second, which crosses the main channel, is 185 ft.

Between the two cantilever structures there are more 289 ft. truss spans, and northward from the second cantilever are a further number of these, followed by 19 girder spans of 100 ft. each. Beyond these the bridge comes to an end with a length of 2,800 ft. of trestle approach.



One of the reinforced concrete base grids of the piers of the bridge, showing the H shaped slots that were used as guides when driving the steel piles that support the pier down to hard ground.

It will be seen from the picture of the bridge that it is curved beyond the second of these cantilever structures. The reason for this is that the line was planned to make sure that the bridge crossed all waterways at right angles to the current.

The piers supporting the bridges are founded on steel piles driven into hard foundations below the soft clays and silts, or sands and gravels, that form the actual bed of the Bay. The steel superstructure that they carry weighs 48,400 tons, and the full amount of structural and reinforcing steel used is 62,200 tons.

The decks of the bridge are reinforced concrete slabs 36 ft. wide and from 6 to 10½ in. thick. The upper one was opened in 1956, and the lower deck was completed and opened to traffic on 20th August of last year. In the first year of operation, using only the upper deck, 2,600,000 vehicles made use of the bridge.

Among the Model-Builders

By "Spanner"

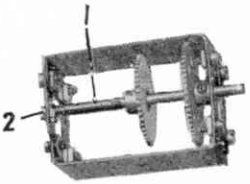


Fig. 1. The novel bearing suggested by C. Cohen, Cape Peninsula Meccano Club, South Africa.

An Internal Bearing for Mechanisms

In many mechanisms, it is an advantage to mount the shafts within the framework of the housing. Mr. C. Cohen, Secretary of the Cape Peninsula Meccano Club, suggests the neat and effective arrangement using a Rod Connector reproduced in Fig. 1.

A Rod Connector 1 is slipped over the end of the Rod to be supported and is passed over a Bolt 2 fixed by a nut in the housing. If the Bolt is adequately lubricated it will be found to provide a smooth and free-running bearing. A similar bearing for a sliding shaft can be arranged by using $\frac{1}{2}$" or $\frac{3}{4}$" Bolts, but of course the sliding movement is limited as approximately half of the Rod Connector must be passed over the Rod to obtain sufficient strength and grip. I am sure that readers will find this novel suggestion a quite useful one.

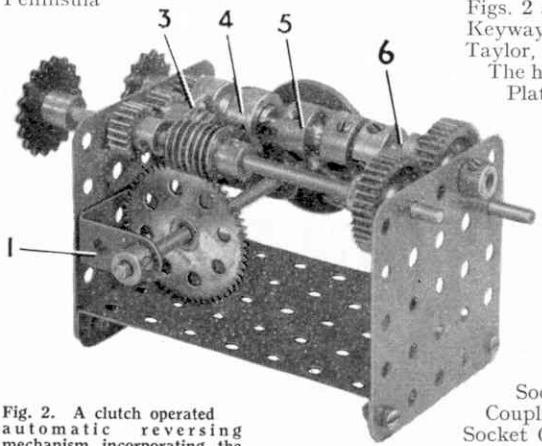


Fig. 2. A clutch operated automatic reversing mechanism incorporating the Rod with Keyway. It was designed by H. H. Taylor, Huddersfield.

A Clutch Operated Automatic Reversing Mechanism

The automatic reversing mechanism shown in Figs. 2 and 3, makes use of a 4" Rod with Keyway, and was suggested by Mr. H. Taylor, Huddersfield.

The housing consists of two $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flat Plates bolted to the flanges of a $3\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate. A $2\frac{1}{2}" \times 1"$ Double Angle Strip 1 is bolted to one of the Flat Plates. The input shaft 2 is fitted with a $\frac{1}{2}"$ Pinion, a Worm Gear and a 1" Gear. An idler $\frac{1}{2}"$ Pinion is mounted on a $\frac{3}{4}"$ Bolt fixed in one of the Flat Plates by a nut, with a Fishplate 3 clamped between two nuts at the inner end of the Bolt.

The output shaft is a 4" Rod with Keyway that carries a $\frac{1}{2}"$ Pinion held in a Socket Coupling 4, a Socket Coupling 5, and a Socket Coupling 6 fitted with a 1" Gear. The Socket Coupling 5 carries at each end the male section of a Dog Clutch, the other sections of these Dog Clutches being fitted in the Socket Couplings 4 and 6. Socket

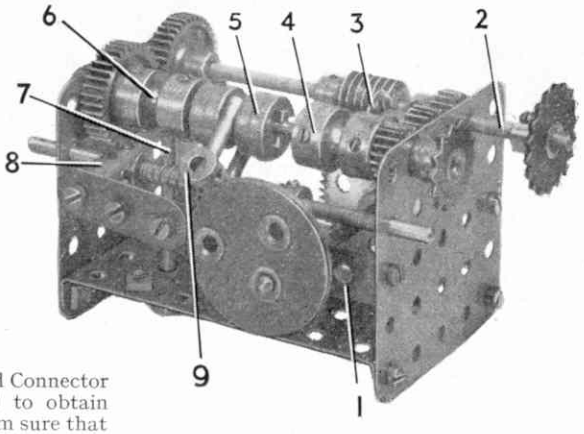


Fig. 3. Another view of the automatic reversing gear-box.

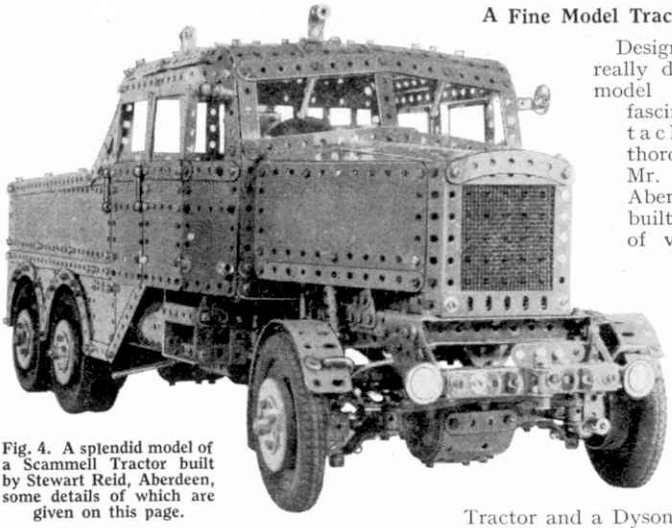


Fig. 4. A splendid model of a Scammell Tractor built by Stewart Reid, Aberdeen, some details of which are given on this page.

Coupling 5 is made to turn with the output shaft by Key Bolts screwed into the male sections of the Dog Clutches. The Fishplate 3 engages the groove of Socket Coupling 4 and a Rod 7 similarly engages the Socket Coupling 6. The Fishplate 3 and Rod 7 prevent the Socket Couplings 4 and 6 from sliding along the output shaft.

The Worm Gear on the input shaft drives a 57-tooth Gear on a Rod mounted in the Double Angle Strip 1. The Rod carries a Triple Throw Eccentric extended by a 1½" Strip. A ⅜" Bolt is passed through the Strip and is fixed by a nut in a Threaded Coupling 8, which is locked on a 4½" Rod. The Rod carries a Coupling 9, mounted freely between Compression Springs. One of the Compression Springs bears against the Threaded Coupling 8 and the other presses against a Collar fixed on the 4½" Rod. Two 1" Rods held in the Coupling 9 are located in the groove of Socket Coupling 5.

The mechanism is adaptable to many types of models.

A Fine Model Tractor and Trailer

Designing and building a really detailed and accurate model vehicle can be a fascinating job if it is tackled in the very thorough way adopted by Mr. Stewart Reid of Aberdeen. Mr. Reid has built many fine models of various kinds in his career as a Meccano enthusiast, and one of his latest and best, or perhaps I should say, two of his latest and best, are the attractive reproductions of a Scammell Tractor and a Dyson Trailer shown in the two illustrations on this page.

Before commencing construction of these detailed models, Mr. Reid searched through transport magazines and other publications to get his data and details accurate, and spent quite a lot of time examining the actual vehicles on such odd occasions as fell to him. With the knowledge gathered in these ways, coupled with his expert knowledge of the use of Meccano parts, he was able to produce very fascinating miniatures. Unfortunately, I am unable to show the whole of the Dyson Trailer, but a picture of its rear end and bogie is reproduced below.

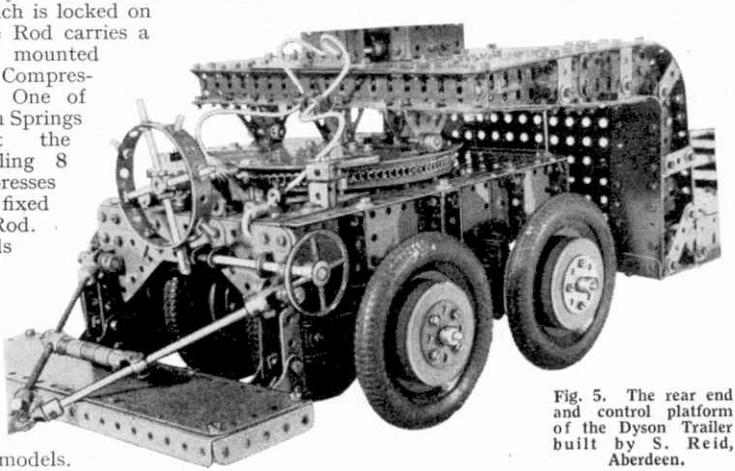


Fig. 5. The rear end and control platform of the Dyson Trailer built by S. Reid, Aberdeen.

Breakdown Lorry

A New Model for Outfit No. 5

MODEL-BUILDERS who possess an Outfit No. 5 or one larger should find plenty of interest and pleasure in building the attractive but simple Breakdown Lorry shown in its completed state in Fig. 1 on this page.

The chassis consists of two 12½" Strips 1 bolted at their rear ends to the lugs of a 2½" × ½" Double Angle Strip. The same bolts serve to fix also two Fishplates and two Semi-Circular Plates 2 in which the rear axle is mounted. A second bolt is used to attach the other end of each Semi-Circular Plate to the chassis. At the front ends they are connected by a 1½" × ½" Double Angle Strip and a 3" Formed Slotted Strip. The front wheels are mounted on a built-up Rod consisting of a 4" and a 1" Rod joined together by a Rod Connector. The Rod is mounted in two Flat Trunnions bolted to the chassis. These should be fixed in place at the same time as the 1½" × ½" Double Angle Strip and the 3" Formed Slotted Strip and it should be noticed that the holding bolt is used to fix also a 5½" × 2½" Flexible Plate and a 2½" Strip 3 on each side.

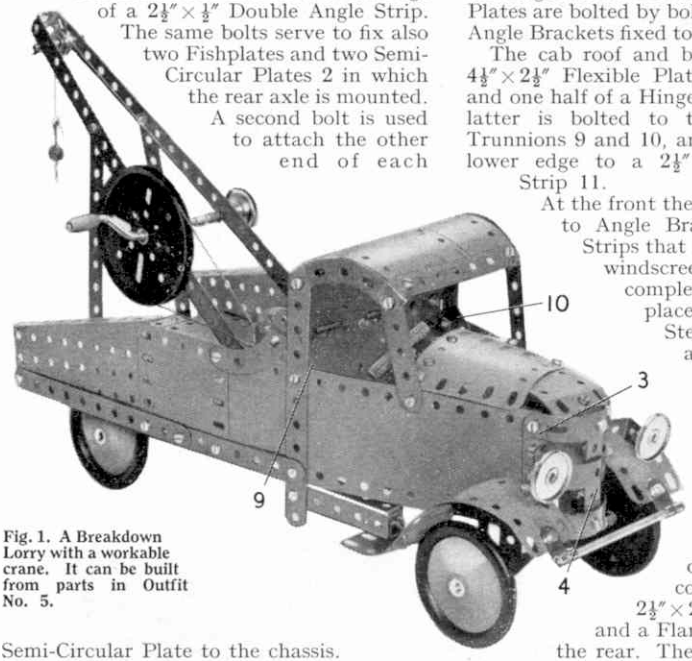


Fig. 1. A Breakdown Lorry with a workable crane. It can be built from parts in Outfit No. 5.

The radiator grille consists of two more 3" Formed Slotted Strips bolted at their centre holes to a 2½" Strip 4. The 2½" Strip is bolted at its upper end to an Angle Bracket 5 that serves as a means of attachment for the top of the bonnet. The bonnet top is formed from two 2½" × 2½" Flexible Plates and a 1½" × 2½" Flexible Plate. The latter is bolted at the front to the Angle Bracket 5 and the larger Flexible Plates are bolted by bolts 6 and 7 to Obtuse Angle Brackets fixed to each side of the cab.

The cab roof and back consists of two 4½" × 2½" Flexible Plates curved to shape and one half of a Hinged Flat Plate 8. The latter is bolted to the flanges of two Trunnions 9 and 10, and is attached at its lower edge to a 2½" × ½" Double Angle Strip 11.

At the front the cab roof is attached to Angle Brackets fixed to 2½" Strips that form the sides of the windscreen. The cab is completed by fixing in place at each side a 2½" Stepped Curved Strip, a 5½" Strip and a 3½" Strip. The steering wheel is a 1" Pulley with Tyre held by a bolt to an Obtuse Angle Bracket fixed to the top of the bonnet by the bolt 12. Each side of the vehicle is completed with two 2½" × 2½" Flexible Plates and a Flanged Sector Plate at the rear. The crane is supported on a base consisting of a 5½" × 2½" Flanged Plate 13. This is attached at its front and rear ends to Fishplates bolted to the chassis. The other half of the Hinged Flat Plate 14 is bolted as shown to the top of the Flanged Plate, and the Flanged Plate is extended at its front end by a 2½" × 1½" Flanged Plate 15.

The sides of the crane jib are 12½" Strips attached at their lower ends to the chassis by bolts 16. The upper ends are bolted to a Double Bracket. The jib is supported by two 5½" Strips 17. A Crank Handle with grip is mounted in the jib as shown and is held in place by a 3" Pulley and a 1" Pulley.

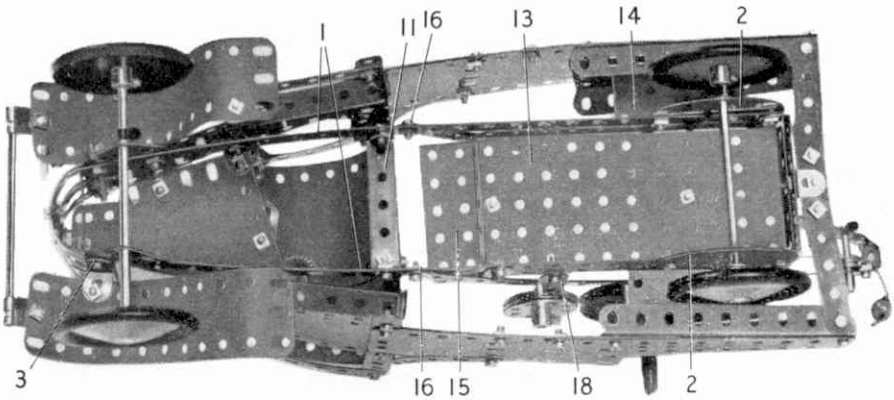


Fig. 2. An underneath view of the Breakdown Lorry.

A ½″ loose Pulley is mounted on a 1″ Rod at the jib head. A length of Cord is tied to the Crank Handle and then led over the ½″ Pulley and fitted with a small Loaded Hook.

A brake is provided by two Wheel Discs and a Bush Wheel bolted to the end of a 3½″ Strip 18. The Strip is pivoted at its lower end on a ⅜″ Bolt that is lock-nutted to the flange of the Flanged Plate 13. A length of Cord is passed around the 3″ Pulley and its ends are gripped between the Wheel Discs, which act as weights and keep the Cord taut around the 3″ Pulley.

Each mudguard is a 5½″ × 1½″ Flexible Plate bolted to an Angle Bracket attached to the vertical 2½″ Strips 3 on each side of the vehicle. The running boards are made up of two 2½″ × ½″ Double Angle Strips bolted together at one end and bolted to the 5½″ Strip. An Angle Bracket joins the running boards and mudguards together. The bumper is a 3½″ Strip held by two Rod and Strip Connectors bolted to the front edges of the mudguards.

The headlamps are 1″ Pulleys joined to Reversed Angle Brackets which are bolted to the 2½″ Strips 3.

Parts required to build the model Breakdown Lorry: 4 of No. 1; 8 of No. 2; 2 of No. 3; 8 of No. 5; 3 of No. 10; 1 of No. 11; 8 of No. 12; 4 of No. 12c; 2 of No. 15b; 1 of No. 16; 1 of No. 18a; 1 of No. 18b; 1 of No. 19b; 4 of No. 22; 1 of No. 23; 1 of No. 24; 2 of No. 24a; 5 of No. 35; 81 of No. 37a; 79 of No. 37b; 4 of No. 38; 1 of No. 48; 6 of No. 48a; 1 of No. 51; 1 of No. 52; 2 of No. 54; 1 of No. 57c; 4 of No. 90a; 3 of No. 111c; 2 of No. 125; 2 of No. 126; 2 of No. 126a; 1 of No. 142c; 4 of No. 147; 1 of No. 188; 2 of No. 189; 4 of No. 190; 2 of No. 191; 2 of No. 192; 1 of No. 198; 2 of No. 200; 2 of No. 212a; 2 of No. 214; 3 of No. 215.

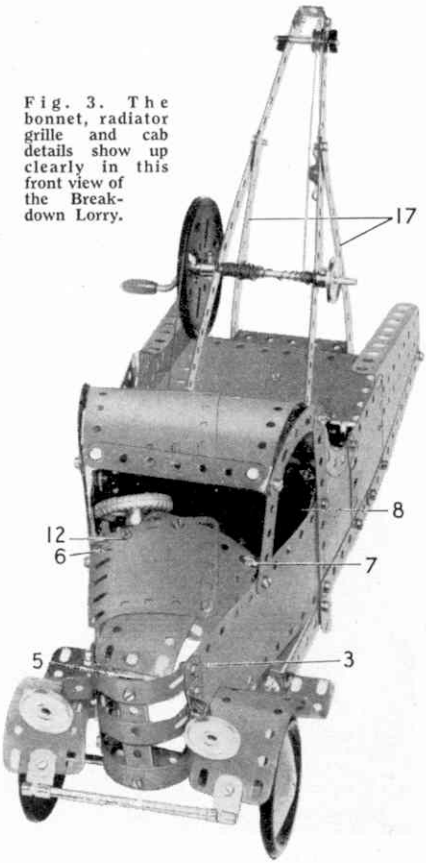


Fig. 3. The bonnet, radiator grille and cab details show up clearly in this front view of the Breakdown Lorry.

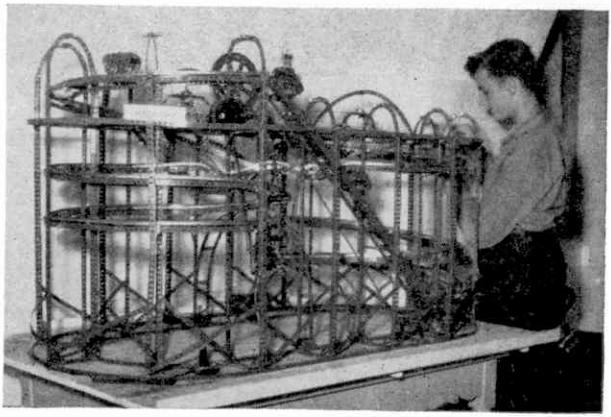
More Prize Models

Further Selections from the "September" Competition

ONE of the many attractive models among the prize-winning entries in the September Contest was a splendid scenic railway built by Alberto Zolla, Viterbo, Italy. It is illustrated on this page.

Models of this kind are not the easiest to construct in Meccano, and I do not think I am far wrong in placing Zolla's model among the very best of its kind that I have seen. It has a total track length of 42 ft. approximately and the curves and "dips" are excellently planned and carried into effect. The total height of the structure is about 2 ft. 9 in. and the cars run on model railway track.

A subject of this kind of course can only be tackled successfully by those who have a really big stock of Strips, Girders and other constructional parts at their disposal, so that it may be beyond the scope of many model-builders. It is a really attractive subject for those fortunate Meccanoites who are in a position to tackle it.

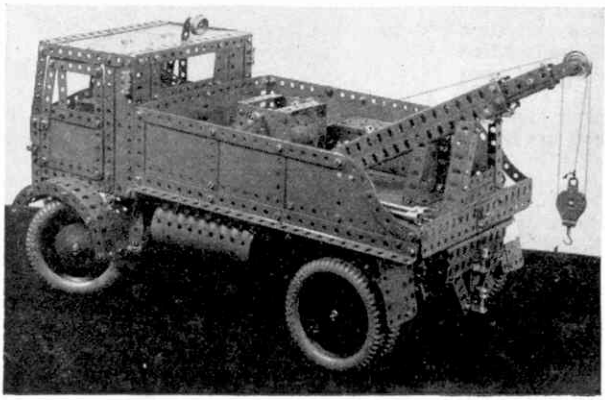


A fine scenic railway and its builder Alberto Zolla, Viterbo, Italy.

As usual, vehicles of all kinds were well represented among the prize-winning models. One of these was the very neat Breakdown Lorry built by Robert Smith, Aberdeen, also illustrated on this page.

It is based on the Albion C.X. type vehicle and is approximately 20 inches long and 9½ inches wide. The chassis is well-equipped, with Ackermann steering and other mechanisms, as can be seen in the underneath view of the model reproduced on the opposite page. The Electric Motor is controlled from a lever in the cab, which cannot be seen in the illustrations. Also in the cab is a speed-change lever that controls the four-speed gear-box.

The crane is controlled through a two-speed winding gear, and this together with a pawl and ratchet mechanism to control the crane drum, is mounted in a casing on the lorry platform as shown. The crane has an extendable jib and when the crane

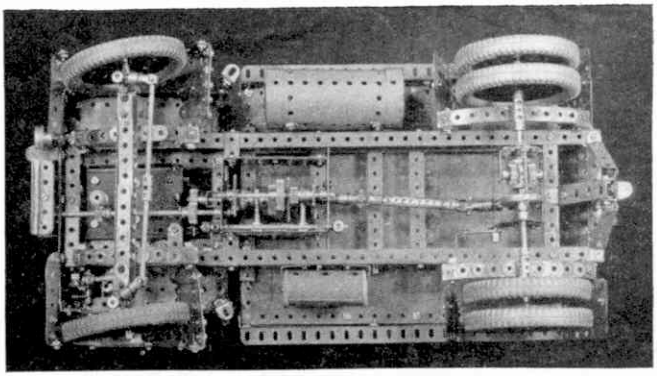


An attractive Breakdown Lorry built by Robert W. C. Smith, Aberdeen.

hook is not in use it is hooked into an Obtuse Angle Bracket fixed at the rear of the platform.

Two other entries that I feel are worthy of special mention are a striking model of an electrically-operated flat bed lathe built by B. W. Rowe, Newton Abbot, and a reproduction of a Wellman Mobile Forging Manipulator, which won an award for D. J. Horton, Walsall. Both of these were well built and full of detail and they owed their success to the care that had been taken to ensure that they "worked" as nearly as possible like the actual machines on which they were based.

Mr. Rowe's model has a bed length of nearly 4 ft. and the face plate is 6 in. in diameter. The model is fitted with a lead screw with change gears, a fully sprung countershaft, sight-feed lubricators and a belt-tensioning device adjusted by set screws. It is motor-driven, and in its various details it follows closely the original commercial lathe on which it is based.



The well-detailed chassis of the Breakdown Lorry built by Mr. Smith.

The model Mobile Forging Manipulator built by Mr. Horton represents a machine that is used for holding billets of hot metal and turning and otherwise manipulating them while being drop forged. The main feature of the machine is a pair of powerful steel jaws, which grip the billet and are attached to an arm that can be moved up and down as required. Provision is also made to allow the jaws to rotate so as to turn the billet as the forging process requires.

In the actual machine the opening and closing of the jaws and the other movements are hydraulically operated and controlled, but they are mechanically operated in the model, which is mounted on a wheeled chassis provided with a steerable castor.

Meccano Picture Competition

WE wish to remind model-builders that there is still time in which to prepare and send in entries for the Meccano Picture Competition that we announced in the May issue of the *M.M.*

In this Contest model-builders were invited to try their skill in making up flat "pictures" of any kind simply by bolting Meccano Strips and other suitable parts to a sheet of cardboard. An illustration of a suitable picture indicating the type of entry required, appeared on page 246 of the May issue. Other suitable subjects would be a scene from a football or cricket match, or some other sports activities, and there is also scope for making landscape scenes of various kinds. Quite realistic effects can be obtained using only a few simple parts, and we are offering a number of Cash Prizes as shown in the panel below for the best entries received.

After the "picture" has been completed it is only necessary to make a good sketch or take a photograph of it and send this to "Meccano Picture Competition, Meccano Ltd., Binns Road, Liverpool 13."

Entries must be received on or before 31st July next.

THE PRIZES OFFERED IN THIS COMPETITION

	£	s.	d.
First Prize, Cheque for	5	5	0
Second Prize, Cheque for	3	3	0
Third Prize, Cheque for	2	2	0
Fifteen Prizes, each of		10	0
Fifteen Prizes, each of		5	0

Closing date for Entries: 31st July, 1958.

HORNBY RAILWAY COMPANY

By the Secretary

Running Your Goods Trains

I HAVE more good news this month, especially for those who take a special interest in goods or freight train working in Hornby-Dublo. It is that another new Wagon is now available in the new range of Hornby-Dublo rolling stock with moulded bodies. This is the SD6 Standard 13-Ton Open Wagon, a picture of which appears on page xii in the advertisement section of this issue. Like the other stock in the same range, it is splendidly detailed and we must have a talk about it next month.

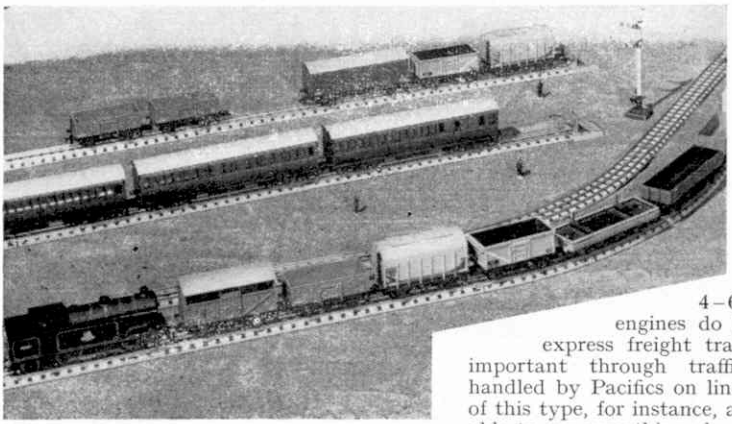
To add to the pleasure of those who are keen to run model railways that are right, I must add that there are now two new Hornby-Dublo Goods Train Sets, known respectively as the G16 and G19 Tank Goods Train Sets, both of which include examples of the new moulded SD6 stock, the finest of its kind yet produced. Here are two splendid Sets that will please everybody by their appearance and satisfy with their performance, and will be just the thing for those making a start with the ever popular "goods."

"Bristol Castle" leaves the yards at the head of an express freight train consisting entirely of Hornby-Dublo Vans.

But now it is time I came to our freight talk, and Goods Train Sets in particular. Many Hornby-Dublo owners started with one of these and learned a great deal from it. With it they got fine practice in engine control and in coupling operations and the skill they acquired was very much to the fore when their layouts became more extensive, with sidings, Uncoupling Rails and so on.

Just think what you can do with Uncoupling Rails. Last month you read about a Hornby-Dublo railway, that of Allan and Ian Melville of Edinburgh, on which practically every siding has an Uncoupling Rail. This is a really generous provision, but it does show how very useful indeed Uncoupling Rails are on a system where there is a good deal of rolling stock to be shunted and marshalled. You can leave a set of Coaches or a string of Wagons behind so easily when you wish, and the ability to drop a single vehicle into a siding during shunting operations is appreciated when a train in a particular formation is being built up.

Although some layouts have fairly extensive yards in which shunting work can be performed almost indefinitely, it is possible to have a lot of fun with a less elaborate one. Big trains for main line runs are made up in the yards, but in real practice before this can be done the vehicles composing them are usually brought in by a series of local goods trains covering the district that a big yard serves. So a lot of useful work is done by the ordinary local goods, which picks up a Wagon or two here



A local goods with several of the new SD6 moulded vehicles next to the engine swings round the curve in charge of a Hornby-Dublo 0-6-2T.

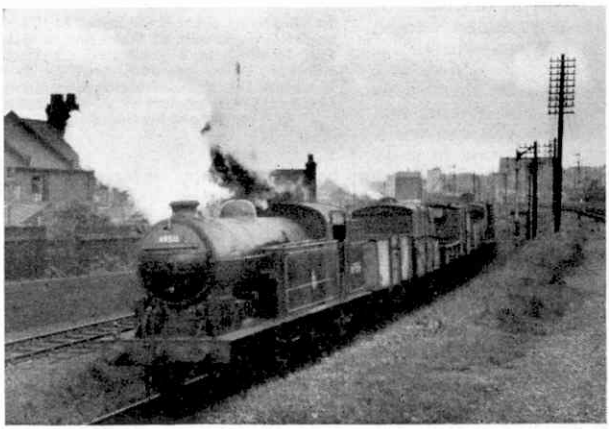
and leaves another one or two there. Sometimes an engine doing a job of this kind will set off with just a brake van and pick up its traffic at successive points as it makes its way along the line.

This local station working can be full of interest when reproduced in Hornby-Dublo. With Uncoupling Rails situated in the right places we can detach the Brake Van, leaving it on a running line if necessary, or in a loop if this is provided at our Station. Wagons waiting in the yard sidings can be picked up and perhaps their order may have to be changed before the Brake Van is again attached and the train sets off for another round or two of the track. If there are two stations on the layout so much the better, but it is possible to re-arrange the whole train in the course of successive visits to one stopping point. And of course the distribution of wagons from one main yard, the reverse of the process we have just described, can be carried out in a very similar manner.

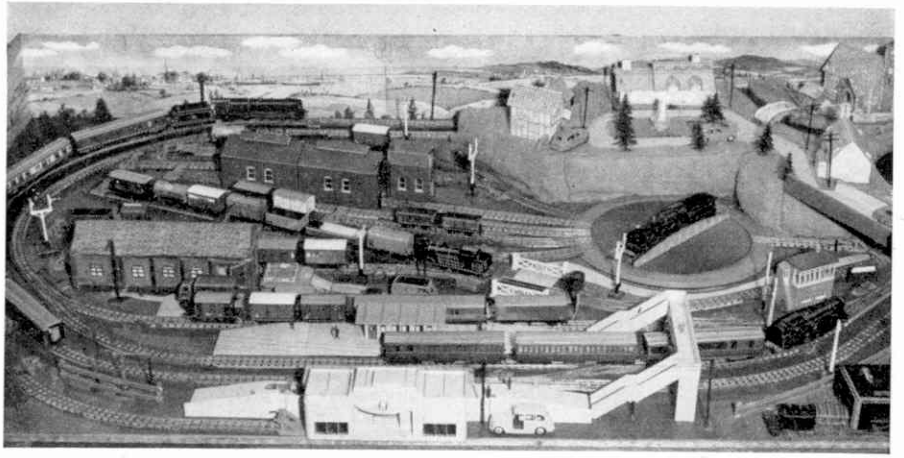
Our pictures for this month illustrate some of the points that I have been talking about, for in the first one there is an important main line freight train setting off behind *Bristol Castle*. The use of this engine is an indication of the class of train concerned and in no way lowers the dignity of an express passenger 4-6-0. Express engines do lend a hand in express freight train work. Some important through traffic is regularly handled by Pacifics on lines using engines of this type, for instance, and I hope to be able to say something about this in a later talk.

There is a homely touch about the lower picture on this page showing a typical local freight train. Special interest is lent to the picture by the use of an 0-6-2 Tank Locomotive of a class that the Hornby-Dublo EDL17 so closely resembles. Apart from the engine, several other items that are reproduced in the Hornby-Dublo range help to make up the train. For instance, next to the engine there is a B.R. Standard mineral wagon and the open wagon behind that again carries a container.

In Hornby-Dublo something of the same kind of thing is seen in the upper picture. There is special interest in this for the train includes several of the new SD6 vehicles.



A local freight train leaving Luton for Welwyn behind 0-6-2T No. 69516. Photograph by S. Creer.



Just About Baseboards

Varied Sites for Railway Making

THE hanging railway you read about in the April *M.M.* is a splendid example of the ingenuity that is so often exercised by Hornby-Dublo owners in finding accommodation for their layouts. The door on which it is mounted is really something special in the way of railway baseboards. In point of fact, there appears to be no limit to the types of railway bases developed by Hornby-Dublo engineers, and they show real enterprise in making them and fitting their tracks on them as well as in disposing of them if they have to be stored somewhere.

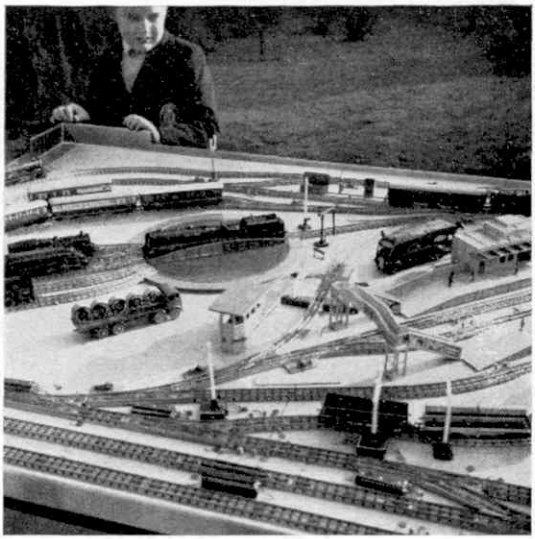
In the picture above is the layout of "M.M." reader C. C. French, of Wolverton, a system that incorporates a great deal of effective railway. Within the limits provided by the baseboard this includes a surprising amount of railway detail, together with many admirable scenic and lineside effects.

Let us look at baseboards themselves first. For making one of them you can use a thick plywood of good quality, but plywood does have a tendency to "drum" and the railway may be somewhat noisy. So many Hornby-Dublo owners use one or other of the various composition boards that are about. Whatever material is used you should make quite sure that adequate framing and stiffening by means of 2 in. by 1 in. timbers is provided. Otherwise the board will not retain its level and derailments may be experienced.

A fine example of what we may term a normal baseboard—this one by the way is on a permanent site—is that shown in the illustration at the head of the page. This is the work of our reader C. C. French, of Wolverton, who has been a Hornby-Dublo enthusiast for some six years. Needless to say the layout did not reach its present form all at once; like Topsy and all good Hornby-Dublo railways, it "just growed".

The base of the layout forms in effect a table top 6 ft. 4 in. by 3 ft. 10 in., and all the space available on it has been put to very good use. The surface material forming the miniature "ground" is suitably braced underneath and a neat finish is given to the outer edge by the beading that can be seen in the foreground of the picture.

A notable feature of the inner section of the layout is the Hornby-Dublo Turntable, serving a motive power depot that accommodates four engines. In addition to acquiring standard Stations and other Accessories, a good deal of home construction has been carried out. Apart from this actual modelling, about which we hope to say something more in a future issue, a splendid effect of depth is obtained by the use of background scenery. This is carried along one side and one end of the system, for the board is set



Vernon Jeffery, of Cuffley, can fit up his layout in the garden, and here he is seen ready to start running his trains on it.

into a corner of the room. In the picture you see the layout as the operator does, with the Controller and Switches convenient to hand on the right. For operating convenience, no attempt has been made to provide scenic features on the open side and end of the system.

With the coming of the summer months, one's thoughts turn to railway operations out of doors and readers will admire the fine portable baseboard shown in our next picture. Looking over his railway is the enthusiastic owner, Vernon Jeffery, of Cuffley. He is surely fortunate in having a baseboard that can be readily moved out of doors when the weather is suitable.

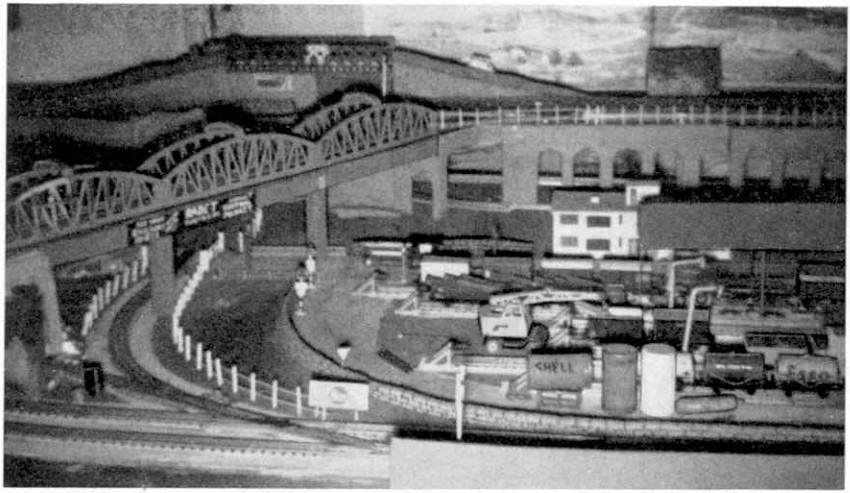
Vernon's father, Mr. S. E. Jeffery, takes a keen interest in developments and father and son are to be congratulated on the fine railway that they have produced and that they enjoy together. The line is in fact quite a family affair, as is often the case nowadays. Vernon's little sister Marion likes to see the trains running, although she does not yet lend a hand in their operation.

Examples of all the Hornby-Dublo products are included in the actual design of the track and the arrangement of lineside accessories. Varied running of a most interesting character results, and the realism as well as the fun is ensured by the inclusion of isolating sections in all appropriate places. There are two separate main circuits for control purposes and several Electrically Operated Signals, Uncoupling Rails and Points. These arrangements involve a fair number of D1 and D2 Switches, banked together in groups.

Now we come to a more unusual baseboard—that seen on the move in our final illustration. The direction of movement is really startling.

This railway belongs to Malcolm Saville, who with his sister Hazel has a great deal of fun running it, and when they have finished operations for the day as well, I think. Their board, necessarily well strengthened, is hung from the ceiling beams by means of ropes and pulleys, so arranged that the whole outfit can be hoisted up out of the way when train running is over. This is certainly an ingenious way of solving the space problem. The railway is only put to bed when it is time for it to start work!

Where do you put your layout when train running is over? Malcolm Saville, of Coventry, who has to move his out of the way, just hoists it to the ceiling.



Go Bridge Building!

THE East Coast route to Aberdeen has often been described as the "Great Bridges Route," and no one seeing the Forth Bridge or the other fine structures that are features of the journey would dispute the correctness of the title. On our miniature railways there has probably not been as much opportunity of erecting bridges as we should like, although excellent efforts have been made by many enthusiasts, using Meccano Parts, stripwood or similar materials.

Now all this has changed, for the Hornby-Dublo Girder Bridge introduced last year has allowed owners of Hornby-Dublo railways to go "bridge building." A really imposing example of their work is seen in the picture on this page, in which there is a three-span bridge built up by placing three standard Girder Bridges end to end.

The layout shown here is that of Mr. G. W. Wood, Nottingham, and his son. It is an extensive one and is laid out on two levels, which means that good bridgework is necessary. The high level section runs over the centre of the main low level oval on a many-arched viaduct structure and then crosses the low level tracks diagonally by means of the Girder Bridges. To the left of the corner shown in the illustration a branch from this high level track leads to a terminal station.

It is not surprising that local names have been chosen to distinguish the various stations on the railway. The terminus just mentioned, for instance, is known as *Nottingham* (*Victoria*), which is a good name although the actual station is a through one. Then, still on the high level section, there are *Burton Joyce* and *Newark* respectively, while on the lower level *Grantham* is an important centre from the railway point of view, as is the real station.

The layout includes a goods yard, carriage roads and locomotive accommodation, the latter with a Turntable of course so that engine changing and similar interesting operations can readily be carried out. Both lower and higher level lines are continuous, and working between them is possible by means of a somewhat sharply graded connection, but as a rule, the main line trains keep to their own levels.

Apart from the viaduct and the Girder Bridges, which are a necessary feature of the layout, plenty of attention has been given to the lineside generally. Storage tanks can be seen in the illustration, alongside the road that is reserved for Tank Wagons. As there is a level crossing on one of the low level tracks there is necessarily a certain amount of roadway, this serving more particularly the town section of *Grantham*, and giving access to the goods yard there.

There is plenty of variety in operation and the duties are shared by several different types of Hornby-Dublo engines.

Club and Branch News

WITH THE SECRETARY

A ROYAL VISITOR

On the 25th March last Her Royal Highness, the Princess Royal, officially opened the fine new Y.M.C.A. premises at Consett, Co. Durham. The Meccano Club associated with this Y.M.C.A. rose to the occasion with a splendid display of models which Her Royal Highness saw in the course of her tour of the premises. The display interested her so much that she spent over half an hour with the Club members, and asked them many questions about the working of the models. The "00" gauge model railway and other hobby displays by the members also captured her interest.

It was a thrilling occasion that the Club members will proudly recall in years to come, and I congratulate them on the splendid display that they put on.

PROPOSED H.R.C. BRANCH

ASH (Nr. Canterbury).—Mr. A. W. Spratt, 1 King Edward Cottage, New Street, Ash, Nr. Canterbury, Kent.

CLUB NOTES

ST. THOMAS (EXETER) M.C.—Attendance has been well maintained, with members from the farthest parts of Exeter coming in regularly. Meccano model-building is still going strong, and the outstanding models completed recently have included a large crane that can be rotated on a turntable, and a windmill. The construction of a model village has been started. *Secretary:* D. Morgan, 33 Cowick Road, St. Thomas, Exeter.

CONSETT Y.M.C.A. M.C. — The outstanding event recently was the visit of Her Royal Highness, the Princess Royal, when she opened the new Y.M.C.A. premises at Consett, in which this Club has its headquarters. A fine hobbies display was staged, and Her Royal Highness complimented the members on their model-building skill. An interesting summer programme is being planned, with the customary outdoor activities—rambles, cycling runs, swimming and outings to local industrial plants—as the main features. *Secretary:* D. Whitfield, Berry Edge Farm, No. One, Consett, Co. Durham.

MILE END (PORTSMOUTH) M.C.—A recent Open Day was very successful, and the many visitors greatly enjoyed the fascinating display of working model railways and Meccano models. *Ernie*, the Club's Meccano robot, handed out handbills, and a tape recorder was used for recorded announcements by Mr. A. J. Nicholson, the President and Secretary. The Information Bureau was again well patronised, and enabled visitors to learn the history of the Club and its associated H.R.C. Branch. Another fine and more ambitious Open Day—a two-day affair—is being planned for 5th and 6th August next. As usual, the event will take place in the Buckland Congregational Church Hall. *Secretary:* Mr. A. J. Nicholson, 213 Sultan Road, Buckland, Portsmouth.

Last month I reproduced a portrait of the Secretary of the Launceston M.C. Here is an excellent picture of Mr. B. Tunbridge, co-Leader of this young and flourishing Club.

AUSTRALIA

MAYLANDS M.C.—Models completed recently include a walking dragline, reaping machine, theodolite and horizontal steam engine. A party of five members visited the camp site at Brumby Flats to see if a recent bushfire had done any damage, and were pleased to find that the site was unharmed. The remainder of the day was spent in swimming and having races among the sandhills. Table tennis competitions are again in full swing. *Secretary:* T. Down, 31 Drummond Street, Bedford Park, Western Australia.

INDIA

MYSORE M.C.—The Club put up a good display at the Dasara Exhibition, and their splendidly arranged stall attracted many visitors, and won for the Club a "Certificate of Honour". The display included many electrically operated models. The Club accepted an invitation to take part in an Exhibition arranged in connection with the Founders Day Celebration of the National Institute of Engineering, Mysore. A recent outing much enjoyed was a picnic to Bandipur Forest and Game Sanctuary, about 50 miles from Mysore. Club officials kindly agreed to use their cars to take the members on this outing. *Secretary:* M. N. Radhakrishna, 16 Mothikhana Building, Santhepet, Mysore, India.

BRANCH NEWS

KIDDERMINSTER — Attendance at meetings has been well maintained. Mr. Mather, who has been with the Branch for over a year, has offered to construct four 8 ft. × 3 ft. tables to accommodate the increasing amount of track. His offer was promptly accepted, and the increased facilities will be very welcome. Meccano model-building continues to be prominent, with useful demonstrations by Messrs. Birch and Cox. The Branch are planning to have a display at a local Garden Fete this summer, and Mr. C. P. Harris is supervising the preparations. One of the highlights of an outing to London on Thursday of Easter Week was a visit to the annual Model Railway Exhibition in Central Hall, Westminster. *Secretary:* A. J. Potter, 35 Woodfield Crescent, Kidderminster, Worcestershire.

MILE END (PORTSMOUTH).—Extensions are being made to the Hornby-Dublo baseboard, and the track is being altered. There has been much "0" gauge activity, and more track and equipment have been bought. *Secretary:* A. H. Firman, 171 Fratton Road, Portsmouth.

POTTERS BAR (MIDDLESEX).—The Branch layout has been revised, and now extends partly round the walls of the room. The equipment so far put down includes two circles, a G.N. locomotive shed and a fine lift bridge. Cork ballast has been laid between the tracks and merges into green paint near the tunnel now under construction. *Secretary:* R. Woods, 120 The Walk, Potters Bar, Middlesex.

For other Stamp Advertisements see also pages 302 and xxiv

Stamp Collectors' Corner

By F. E. Metcalfe

WEST INDIAN FEDERATION CHANGES

On 22nd and 23rd April ten sets of stamps were issued in the British Commonwealth to herald the greatest event in West Indian history, for ten of our colonies were telling the world with stamps that they were following the fashionable trend by federating.

The colonies concerned were Antigua, Barbados, Dominica, Grenada, Jamaica, Montserrat, St. Kitts, St. Lucia, St. Vincent and Trinidad and Tobago. I have used the terms which the Crown Agents use in naming St. Kitts, but the full title of this colony is now St. Christopher, Nevis and Anguilla. No wonder the shorter term is used.

The merging colonies have each issued three stamps, all of the design seen in the lower left illustration, and I will have something to say about that in a moment. The values for all except Jamaica and Trinidad are 3c., 6c. and 12c., but for Jamaica, which does not use the dollar currency, the values are 2d., 5d. and 6d. For Trinidad they are 5c., 6c. and 12c. In the case of the latter, the variation in the lowest value was due to the fact, or so I understand, that whereas the local postal rate for letters is 3c. in the colonies that issued this value, in Trinidad and Tobago it is 5c.

And now, before we go further into matters, a word about the design used in common. When the QEII stamps for the various colonies were first issued, the designs met with a lot of criticism. It was pointed out that it was difficult to have new and original designs, however, while it was insisted upon that the Queen's portrait should be included. Others pointed out with justice that those small inset portraits do not look at all attractive. Now we get a real portrait of the Queen, an adaptation of the Annigoni painting, fitted in quite an attractive manner in a map of the Caribbean, which shows where all the colonies lie.

When the news broke that these colonies, popular with stamp collectors, were to merge, the many thousands who are interested in their postage stamps thought that they had about come to the end of their philatelic tether. As a matter of fact, what is going to actually happen is not yet clear. I don't think a decision whether each colony is to retain its own stamps, or to have one set for all, has yet been made. One editor of a West Indian stamp paper, who seems to get a lot of inside information, says that things will remain as they are for five years, and then there will be one set for all.

Well I just don't credit that. To be quite candid, postage stamps have been one of the most profitable exports of some of the smaller colonies, and I cannot see them all joining up on a single set. And there is no need for them to do so. As a matter of fact, there already exists a precedent for a plan that I think would suit collectors, as well as the various Colonial exchequers. This example to follow is supplied by Malaya. Last year the various Malayan States federated. Each of these—Johore, Kedah, Kelantan, Malacca, Negri Sembilan, Pahang, Penang, Perak, Perlis, Selangor and Trengganu—had its own sets of stamps, which by the way were then not by any means as popular with collectors as are the West Indian stamps. I say then, because latterly these Malayan stamps have become very popular indeed, for the 1949 issues produced some very fine shade varieties. It was rumoured that on federation they would have to forego their own particular issues, and join up with one. Actually they did nothing of the kind. They did share the same designs, which is what the West Indian colonies are doing over the commemorative issue, but their own names appeared on the stamps, and thus in effect we get separate sets.

There is no reason why the West Indian Colonies should not share common designs, and have their own names included on the stamps, as have the Malayan territories. From time to time they will want to show by their stamps that they are a federation, and then they can follow the Malayan lead by having a set, a short one, which they all issue together.

In the meanwhile the West Indians are gradually clearing their philatelic decks, to cope with the adjustments to be made, and recently the Cayman Islands and the Turks and Caicos Islands have separated from Jamaica, for these colonies are not going to form part of the federation. Another interesting West Indian development, which is all part of the changes that are taking place in that part of the world, will affect our stamp collections. On the current set of stamps of Montserrat the ½c. and 3c. stamps had the caption "Map of Presidency" and the 6c. and $4.80 values "Badge of Presidency." Now these captions are being altered to have the word colony substituted for presidency. While there seems to be none of the stamps of Cayman Islands that call for similar changes, in the set recently issued for Turks and Caicos Islands the handsome 10/– stamp has the word "Presidency" on it, so perhaps before very long that stamp also will be altered.

Reviewing those countries in the West Indies, as well as Malaya, where there are likely to be stamp changes in the not too distant future, I think it is safe to predict that before things settle down again, some

(*Continued on page 304*)

BARGAIN FOR STAMP COLLECTORS

includes UNITED NATIONS—First 2 stamps ever issued! GERMANY—unique Allied Military Government joint issue of U.S.A. and G.B. (6). POPE PIUS—giant triangle. STALIN-LENIN—Death Stamp. ISRAEL—Stag. ETHIOPIA—unissued Red X. JUGOSLAVIA—Red X issues complete (3). Dozens of other fascinating and unusual items. A wonderful start for a new collector. YOU'LL HAVE DAYS OF FUN JUST SORTING THIS GIANT LOT. Grand Total 215 all different stamps from all over the world. Usual 5/- value for just 1/- to introduce our Bargain Approvals. *Satisfaction Guaranteed.*

FREE! MIDGET ENCYCLOPÆDIA OF STAMPS.
SEND 1/- TODAY ASK FOR LOT MC32

486 OLD KENT ROAD, LONDON S.E. I

50 PICTORIAL STAMPS FREE

This packet of stamps is given absolutely **FREE** to all genuine applicants for my superior used British Colonial Approvals enclosing 4½d. in stamps for postage. Overseas Applications Invited.

D. L. ARCHER (M),
2 LITCHFIELD WAY, BROXBOURNE, HERTS.

100 Different Stamps FREE!

Request ¼d. upwards discount Approvals. British Colonials or Foreign. Wants lists welcomed. Don't delay—write today enclosing 3d. stamp for postage.

C. T. BUSH (MM),
53 Newlyn Way, Parkstone, Poole, DORSET

SPECIAL. To all approval applicants this month **FREE! KG VI VICTORY SET MINT.** 3d. Postage
A. CUNNINGHAM (Dept. MM), 36 Doonfoot Road, Ayr

RUSSIA 1946 RECONSTRUCTION PLAN

This fine complete set catalogued 2/10 offered FREE to approval applicants enclosing 3d. postage.

YULWONTMOR STAMPS (Dept. M),
29 Layton Avenue, Mansfield, Notts.

BRITISH Colonial, Foreign Spacefillers, 15 a 1d. Pictorials, Commemoratives, Colonials, Foreign, ¼d., ½d., 1d. Postcard secures hundreds approvals.
PILGRIM
Priory View Road, Moordown, Bournemouth

F R E E !

CATALOGUE VALUE 5/-

TO ALL APPLICANTS FOR OUR BRITISH COLONIAL APPROVALS ENCLOSING 3d. STAMP.

BARGAIN OFFER
BRITISH WEST INDIES
25 DIFFERENT 2/- PKT.
40 DIFFERENT 5/- PKT.

R. J. SMITH & SON
81 Redbreast Road, Bournemouth

DIAMOND PKT. 27 FREE MIRACLE OF LOURDES CENT.

Monaco Set, Diamond Giant-sized Statue Our Lady of Lourdes, 2 Pope's, 2 St. Bernadette, plus 25 others FREE. Send 3d. post and request approvals. **ROSEBERY STAMP SERVICE (Dept. B3), 37 Rosebery Road, Epsom, Surrey**

FREE! GEORGE CROSS COMMEM.

Malta G.C. recently issued a set of stamps to commemorate the award of the George Cross. One of these stamps is included in the **Bumper Q.E.II Packet** which will be given **absolutely free of charge** to applicants for my **New 6d. in 1/- Discount Approvals.** This stamp was only on sale for one week! Please enclose 3d. stamps for return postage.

M. THEOBALD (MM100)
4 SIPSON ROAD, WEST DRAYTON, MIDDLESEX

FREE! PICTORIAL PARCEL with Approvals 3d. stamp please.
ALLCOCK, 74 Tynyparc Rd., Rhiwbina, CARDIFF

110 DIFFERENT STAMPS FREE!

Foreign and Colonial including Pictorials, absolutely **free** to applicants requesting my famous discount approvals, enclosing 3d. for postage.

H. BANKS, 62 AVONLEA ROAD, SALE, CHESHIRE

British Empire Stamps on Paper—grand value 1 lb. **27/6,** ½ lb. **14/6,** 4 oz. **7/9.** World-wide on Paper—many countries, 1 lb. **22/6,** ½ lb. **12/-,** 4 oz. **6/6.** Gt. Britain, worth sorting for finds, 1 lb. **7/-,** ½ lb. **4/3.** Post Ex. Abrd. 1/-lb.
A. DAVIES, M/6, 3 Manor Road, Wroxall, I.O.W.

SERIOUS COLLECTORS SHOULD SEND A POSTCARD FOR FIRST-CLASS APPROVAL SELECTION STATING CHIEF INTERESTS.
H. B. LANG
BURNBANK — MAUCHLINE — AYRSHIRE

For other Stamp Advertisements see also pages 300 and xxiv

Stamp Gossip

EAST AFRICAN POSTS

Both collectors and stamp dealers got quite a surprise when the Crown Agents announced that two stamps of values 15c. and 40c. would be issued on 28th March for the East African Posts and Telecommunications Administration. The stamps duly appeared, and they proved to be for Kenya, Tanganyika and Uganda, another long name, but one that we know.

So the mystery was solved, and the net result was two more attractive specimens for collectors of British Commonwealth stamps.

I must say that I like the set to which these two new stamps belong, though it met with a lot of criticism when it first appeared in 1954. We had been led to expect something out of this world, to use an expression now very fashionable, and as there was nothing particularly outstanding about the designs, some disappointment was inevitable. But the set is gradually coming into favour, and as used stamps are cheap and easily come by, most collectors can afford to buy a set, even to the top value.

STEEL

We in Britain scarcely think about factories when we picture Mother India in our minds. We think of swaying palms and graceful buildings, etc. But that great country not only has some powerful industries already, but is also coming along in that respect at top speed.

A reminder of all this is provided by a stamp issued on 1st March to commemorate the 50th year of India's steel industry, and we have to thank our good friend Mr. E. Kooka, Bombay, for the specimen illustrated. It is not one of the Security Press's best efforts, for in the vermilion colour the attractive design does not show up very well. Incidentally, the inset portrait is that of the late Mr. J. N. Tata, who is considered as the founder of India's steel industry.

As I have previously remarked, India is turning out some quite nice commemorative stamps, and as they are generally of low face value, and easily obtainable, they are becoming very popular, as they well deserve. Keep it up, India.

GHANA

It will not have escaped the notice of some collectors that Ghana's stamps are no longer being handled by the Crown Agents, but by private firms. No one can grumble about the service these firms are giving, however, and if the habit doesn't spread, no harm will be done. In the meanwhile Ghana has followed up the "Black Star" issue, with one to commemorate the first anniversary of her independence.

I think the inhabitants of the new country are very proud of all these new stamps. I got evidence of this when I was in a stamp shop recently. In came a coloured man, with a grin from ear to ear, and he kicked off by asking if they had any new stamps from his country. "What country is that?" queried the assistant. "Why the first country in Africa to let go your hand, Ghana," was the reply. Oh yes, there was the new independence set, which the customer bought, and as he went out of the door, he turned round and said "And we ain't going to be the last country either to let go your hand." The assistant only smiled in reply, as she dropped his 4/6 into the till.

MORE INDUSTRY

We associate India with other things besides industry. Similarly, while Japan is very much an industrialised country, we would still prefer to think of it in terms of miniature gardens, etc. But Japan is not going to let us get away with such thoughts. She has reminded us that her iron industry is 100 years old by the issue of a stamp to commemorate its centenary. Modern Japanese stamp designs, apart from their outstanding artistry, generally have interesting points, as the stamp illustrates.

CANBERRA

Recently I received two stamps from a young collector who was apparently quite excited. The stamps were the Australian issue showing the War Memorial at Canberra. On one, the panels depicted a sailor and an airman, while on the other stamp they showed a soldier and a servicewoman. Well, both varieties are quite normal. Equal quantities of the two were issued, and the interesting point is that they were printed se-tenant, as collectors say, that is side by side and joined together. They should be mounted that way.

TIP OF THE MONTH

It is a fact that in ordinary sets of definitive stamps there is generally one value that is much scarcer used, than the rest. From time to time I will mention examples, but just to go on with here are three—our own 11d., South Africa 4½d., and Kenya 65c. Any copies of these, always providing that they are nicely cancelled—don't have bad copies, they will never be cheap at any price—should be tucked away in your little stock book. They will pay for their keep all right, for they don't eat much.

Glasgow Transport—(*Continued from page 262*)

the tramway routes shall be scrapped entirely over a period of years, and diesel buses, which now number almost 1,000, are replacing the trams on specified routes at convenient intervals. It is hoped to have withdrawn trams from the routes at present converging on King George V Bridge by the end of the present year.

The diesel bus fleet consists principally of Albion, Leyland, Daimler and A.E.C. vehicles carrying between 56 and 62 passengers, including the new regulation wider buses. There is also a fleet of Leyland, Daimler and Albion single-decked buses for operating on routes with low bridges or where a double decker would be uneconomical to run.

The tramcars have always been numbered irrespective of classification, but the motor buses have prefix letters indicating makes. Thus the prefix A denotes a motor bus built by the A.E.C. company; while the Albions, Daimlers and Leylands carry the prefixes B, D and L respectively before the numerals. Trolley buses have as a prefix the letter T, which is immediately followed by a second letter indicating the make. So there are the prefixes TB, TD and TG denoting the B.U.T., the Daimler, and the Guy (or Sunbeam) makes. In addition the three-letter prefix TBS is used on B.U.T. single-deck vehicles.

Space Notes—(*Continued from page 267*)

from a rocket is reduced by the pressure of the atmosphere by imagining in diagram (*b*) the pressure to be on the outside instead of the inside. It can readily be seen that a thrust would again be produced, but in the opposite direction. In fact a rocket gives about 15 per cent more thrust in space than it does at sea-level.

A simple hole is not the best shape for a rocket's exhaust gases to escape from, however. On leaving such a hole the gases still have a certain pressure and by shaping the exit to form a nozzle as shown in (*c*), this residual pressure can be used to provide up to 30 per cent more thrust.

Diesels in the Western Region—(*Continued from page 271*)

the inner pair of driving wheels at each end, and the drive from each hydraulic transmission to the outer geared axles is taken through universally jointed shafts. An engine is started when required by means of a dynostarter deriving power from a battery. It is then acting as a motor. When it is used as a generator it charges the battery and so provides for the electrical needs of the locomotive as a whole.

D600 can be driven from the cab at either end and the design allows for two or more locomotives to be operated together with a single control. Train heating is looked after by a centrally situated boiler which works automatically after its first lighting up.

As would be expected on the Western Region, automatic train control apparatus is fitted, indicating to the driver whether each distant signal is at "clear" or "caution". On receipt of the distinctive "caution" indication the brakes are applied unless the driver acknowledges receipt of the warning by re-setting the apparatus.

Braking on the locomotive is by Westinghouse air brake, with vacuum brake apparatus for the train.

Home-made Wings—(*Continued from page 265*)

Turbis are taking shape in this country, and some have already flown. A group, working together, can build one of these safe, sturdy, spritely little machines in about six months, and the engines for them are available off-the-shelf. Rollason at Croydon are building the 30 h.p. Ardem—a converted Volkswagen unit—for the Turbulent; while Coventry Victor have developed a 60 h.p. version of their fine Neptune industrial engine for the Turbi.

It is too soon yet to know whether all this will lead to a great rebirth of private flying; and this country is so small that there might be difficulties if the sky were filled with thousands of light planes, threatening to interfere with the continual comings and going of air liners from all over the world. But the movement is certainly growing. A group of students at Hatfield have built a Turbi; an Irish clergyman is working on a Turbulent; so is a 16-year-old lad at Spalding in Lincolnshire, who hopes to have it finished in time to fly when he is 17, the minimum age at which anyone can pilot a powered aircraft solo in the United Kingdom.

There are many more, and they will soon form a new fellowship of the air, holding their own flying meetings, rallies and tours, learning to enjoy the freedom of the skies while their less-venturesome friends travel bumper-to-bumper at holiday times on the overcrowded roads beneath their home-made wings.

Stamp Collectors' Corner—(*Continued from page 301*)

of the stamps will be in and out so quickly that they may turn out to be quite scarce in the end. For those who do not want to tackle such a wide range as all the countries in the British Commonwealth, they might do worse than take up the federated countries of Malaya and the West Indies, from the beginning of the present reign. If these countries are still too many, then the West Indies can be recommended with confidence.

The full sets go up to 10/– at least, and that is more than many readers will want to spend on bits of paper. So I suggest that if they go up to a shilling, or 24 c. in the case of the West Indians and 50c. with the Malayan, then they will have quite worth-while collections, which most can afford to finance. And in any event, shade varieties, that is stamps of subsequent printings, which differ somewhat in colour and which in consequence are listed in catalogues like the Commonwealth and Gibbons, should also be collected if possible.

Well, there you have the story about these Commonwealth federations, and how they are going to affect our hobby. Keep your eyes on the news, for big things are happening in those parts of the world, and you will certainly have a topical collection if you are collecting their stamps.

BICENTENARY TOUR OF MIDDLETON COLLIERY TRAMWAY

A tour of the Middleton Colliery Tramway, near Leeds, soon to be closed, has been arranged for Saturday, 7th June, by the Railway and Canal Historical Society and the Railway Correspondence and Travel Society, to mark the bicentenary of the passing of the Act for this historic line. The tour will begin at 2 p.m. and will last about three hours. For further details write (enclosing stamped addressed envelope) to Mr. R. K. Walton, 178 Wrose Road, Bradford 2, Yorkshire.

THIS MONTH'S SPECIAL ARTICLES

From Our Readers

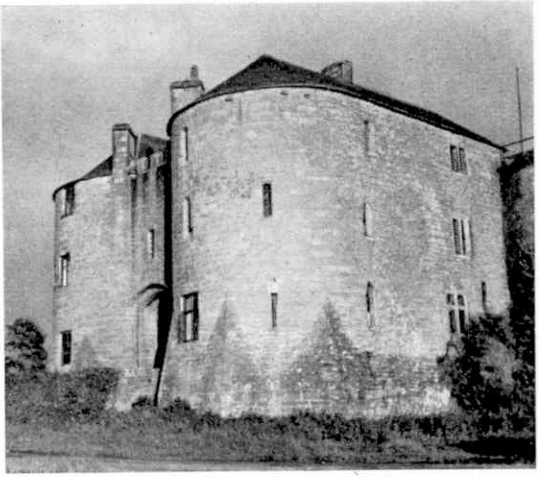
This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs 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.

Castle now a Youth Hostel

The Castle of St. Briavels stands high above the River Wye, on the western edge of the Forest of Dean. It is now a Youth Hostel, but was built by the Normans as a protection against marauders from across the Welsh border. Beneath what is now a dormitory is the dungeon, where Welshmen unfortunate enough to be captured were probably imprisoned, while on the walls of another are scratched the names, dates and messages of prisoners of the 17th and 18th centuries, when the castle was used as a debtors' prison.

The Constable of the Castle was usually also the Warden of the Forest of Dean. For more than seven centuries it was the administrative centre of the Forest, and the local courts were held in a large upstairs room in it. In the 12th and 13th centuries the building was used as a Royal Hunting Lodge, and King John was a frequent visitor.

J. M. CAPES (Paston).



St. Briavels Castle, Gloucestershire. Photograph by J. M. Capes, Paston, Norfolk.

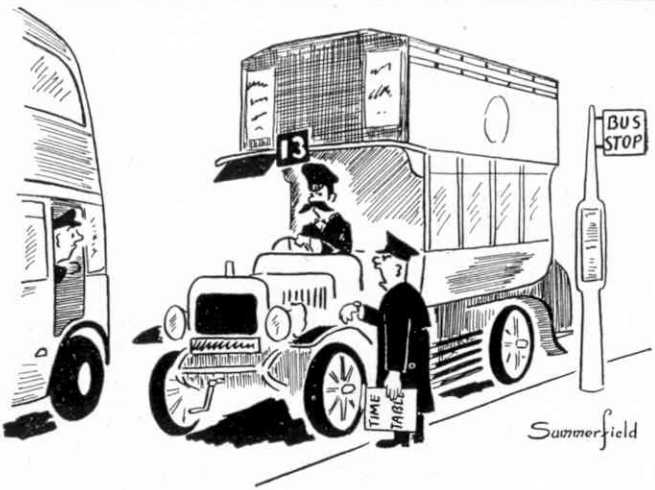
Badger Hunt with a Camera

Hebden Bridge lies in the Calder Valley, and the surrounding hill tops and thickly wooded slopes abound in the smaller of our British mammals, such as weasels, stoats, foxes, etc.

Reports of one of these animals in the locality led me to set out one afternoon to see if I could locate its haunts. On a piece of soft ground I eventually found tracks that had unmistakably been made by a badger, which clearly often crossed this spot. The same night, focusing my camera on a particular stone, I settled down to wait, hopefully. Some time elapsed, and then I heard a rustling in the nearby bracken and by the dim moonlight I could just discern the vague shape of the badger. As it passed the stone I pressed the release and my camera, aided by the blinding light from a flash bulb, rewarded me with this photograph.

A. CRABTREE (Hebden Bridge).

This flashlight photograph of a night prowler was taken by A. Crabtree, Hebden Bridge.



"Wher've you been? You're forty years behind schedule!"

Fireside Fun

Sergeant: "Don't you know how to stand at attention?"
Rookie in oversized uniform: "I am sir. It's my uniform that's at ease."

* * * *

"John was telling me you bought a car cheap the other day. How are you getting on with it?"
"Not at all. I'm just beginning to realise how hard it is to drive a bargain!"

* * * *

Rush: "What an awful gash you have on your forehead!"
Push: "Oh, next to nothing—next to nothing."

* * * *

A lion tamer said that his father before him had also been a lion tamer.
"Did you ever put your head in a lion's mouth?" he was asked.
"Only once," he said. "To look for dad."

* * * *

Father: "Well, what happened when you asked the boss for a rise?"
Son: "Why, he was like a lamb."
Father: "What did he say?"
Son: "Baa."

* * * *

Waiter: "Did you have turtle or oxtail soup, sir?"
Diner: "I don't know—it tasted like soap."
Waiter: "That was the turtle soup. The ox-tail tastes like paraffin."

* * * *

On mules we find two legs behind
And two we find before
We stand behind, before we find
What the two behind be fore!

* * * *

"What's your name?" asked the clerk. "Spell it, please."
"O double T I double U E double L double——"
"Just a minute. Begin again, please."
The man dutifully began again. "O double T I double U——"
"I give up. What is your name?"
"My name is Ottiwell Wood, spelled O, double T, I, double U, E, double L, double U, double O, D."

A doctor says that sherry is good for seasickness. Surely port is much better?

* * * *

Small Boy (to playmate, as pretty little girl passes by): "Boy! If I ever stop hating girls, she's the one I'll stop hating first!"

* * * *

BRAIN TEASERS

The names of four animals are hidden in the following sentences, one in each. What are they?

(1) Poor wretch! A moisture filled his eye.
(2) Do not rebuff a lonely boy.
(3) Said he "If ere I sink and die."
(4) This may be a very good one.

* * * *

WHAT AM I?

Strike me if you will
Treat me with disdain
Burn me, break me, still
Your equal I remain
What am I?

* * * *

SOLUTIONS TO LAST MONTH'S PUZZLES

An Anatomy Puzzle

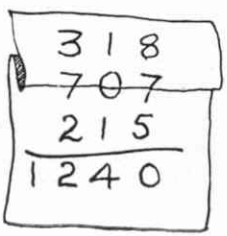
The solutions to the six clues given in last month's *M.M.* are as follows:—

(1) Nails.	(3) Teeth.	(5) Rib.
(2) Drum.	(4) Cheek.	(6) Hips.

* * * *

Magic Addition

The solution to this trick problem lies in folding the paper on which you have written the sum in the manner shown in the diagram alongside. The addition, when the paper is so folded, still comes to 1,240. Take care to draw the figures so that they line up correctly.



HORNBY LOCOMOTIVE PART EXCHANGE COUPON

Complete this coupon, and hand it, with your old clockwork locomotive, to your Meccano dealer, who will deduct the appropriate amount, as shown below, from the cost of a new Hornby-Dublo Locomotive or Train Set.

Old Loco	*Allowance*	*Indicated by cross which type exchanged*
MO or No. 20	3/–	.....
M1 or No. 30	5/–	.....
Nos. 101 or 40 Tank	7/6	.....
No. 501 or No. 50/51	9/–	.....

Type of Hornby-Dublo Locomotive or Train Set purchased in exchange.....

Purchaser's signature.....

Address .....

.....

DEALER'S CERTIFICATE

The above exchange has been effected in accordance with the terms of the Hornby Part-Exchange Scheme.

Signed.....
Meccano Dealer

Dealer's Name .....

Address .....

.....

Date.....

MECCANO MAGAZINE

Registered at the G.P.O., London, for transmission by Canadian Magazine Post.

EDITORIAL AND ADVERTISING OFFICES:
LIVERPOOL 13, ENGLAND.
Telegrams: "Meccano, Liverpool."

Readers' Sales and Wants. Private advertisements (i.e. not trade) are charged 2d. per word, minimum 2/–. P.O. with order. Readers' advertisements are published as soon as possible; inclusion on the first issue after receiving them cannot be guaranteed.

Advertisements of goods currently manufactured by Meccano Ltd. cannot be accepted.

READERS' SALES

Some 200 Chemicals and Apparatus for sale. Cheap prices, send for list.—Stewart Young, 6 Elms Road, Aldershot, Hants.

140 "M.M.s" 1944–1957, mostly mint condition. Offers to—Smith, 230 Soho Hill, Birmingham 19.

"M.M.s" 1947 and 1948 complete, bound officially, perfect. 30/– nearest.—20 Farnol Road, B'ham 26.

Tri-ang Railway items—S.A.E. details—M. Denny, 64 William Street, Long Eaton, Nottingham.

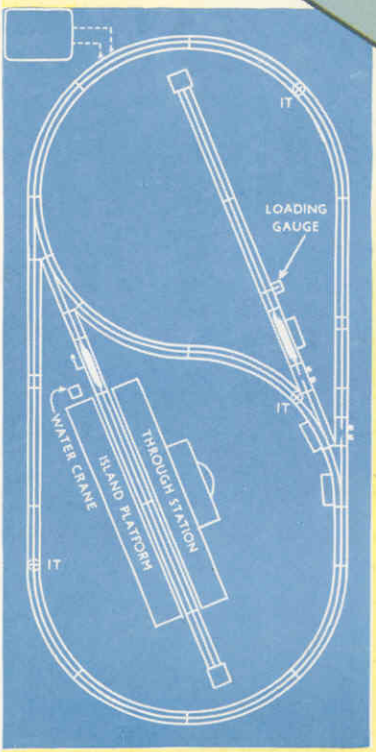
READERS' WANTS

Meccano Part No. 167 complete (167a, 167b and 167c). Any Price—Pierre Bouvard, 31 Place Aristide Briand, Valence (Drome), France.

£5 10s. paid for Geared Roller Bearing, Part 167, 192 teeth, in good condition. — C. Oldroyd, 14 Edinburgh Road, Quinton, Birmingham 32.

Planning your Hornby-Dublo Railway

No.1



By adding extra rails and points to the standard track of a Hornby-Dublo Train Set, a great variety of layouts can be planned.

Many suggestions are shown in the latest edition of Rail Formations Booklet (now available, price 6d. from Meccano Dealers or direct from Meccano Ltd.). An example from the booklet is illustrated on the left. How this layout appears when set out with rolling stock and accessories is seen above.

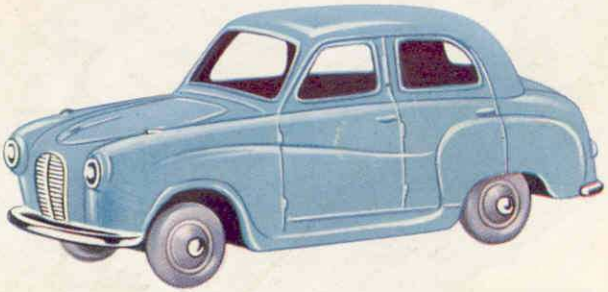
HORNBY DUBLO ELECTRIC TRAINS

MECCANO LIMITED · BINNS ROAD · LIVERPOOL 13

DINKY TOYS

TRADE MARK REGISTERED

New Ready during June

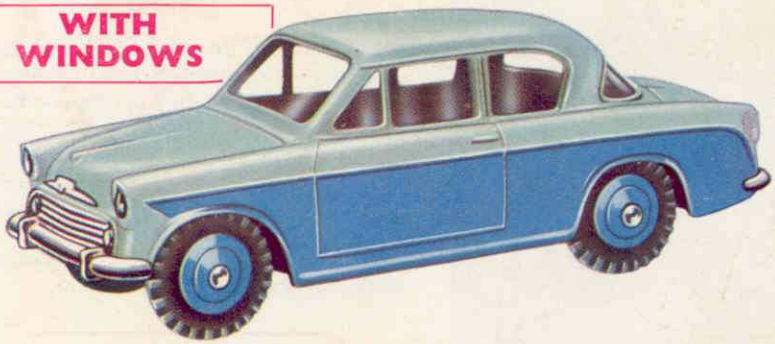


DINKY TOYS No. 160 AUSTIN A30 SALOON

Reliability and compact design have established the Austin A30 as a small car of big performance, and this excellent little model captures the character of the prototype. It is available in beige or light turquoise blue, and is fitted with non-scratch, one-piece moulded tyres and wheels.

Length 3 1/16 in. **U.K. Price: 2/4** (inc. Tax)

WITH WINDOWS



DINKY TOYS No. 166 SUNBEAM RAPIER SALOON

Look at the sleek lines of this new Sunbeam thoroughbred—the elegance and comfort of a saloon, plus sports car performance. Already it has rally successes to its credit. The model faithfully reproduces the distinctive original, even to the transparent windscreen and windows. Available in cream and chrome yellow or two shades of blue.

Length 3 9/16 in. **U.K. Price: 3/3** (inc. Tax)

MADE IN ENGLAND BY MECCANO LIMITED

PUBLISHED BY MECCANO LTD., BINNS ROAD, LIVERPOOL 13, ENGLAND
Printed by John Waddington Ltd., Leeds and London