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meccano magazine

October

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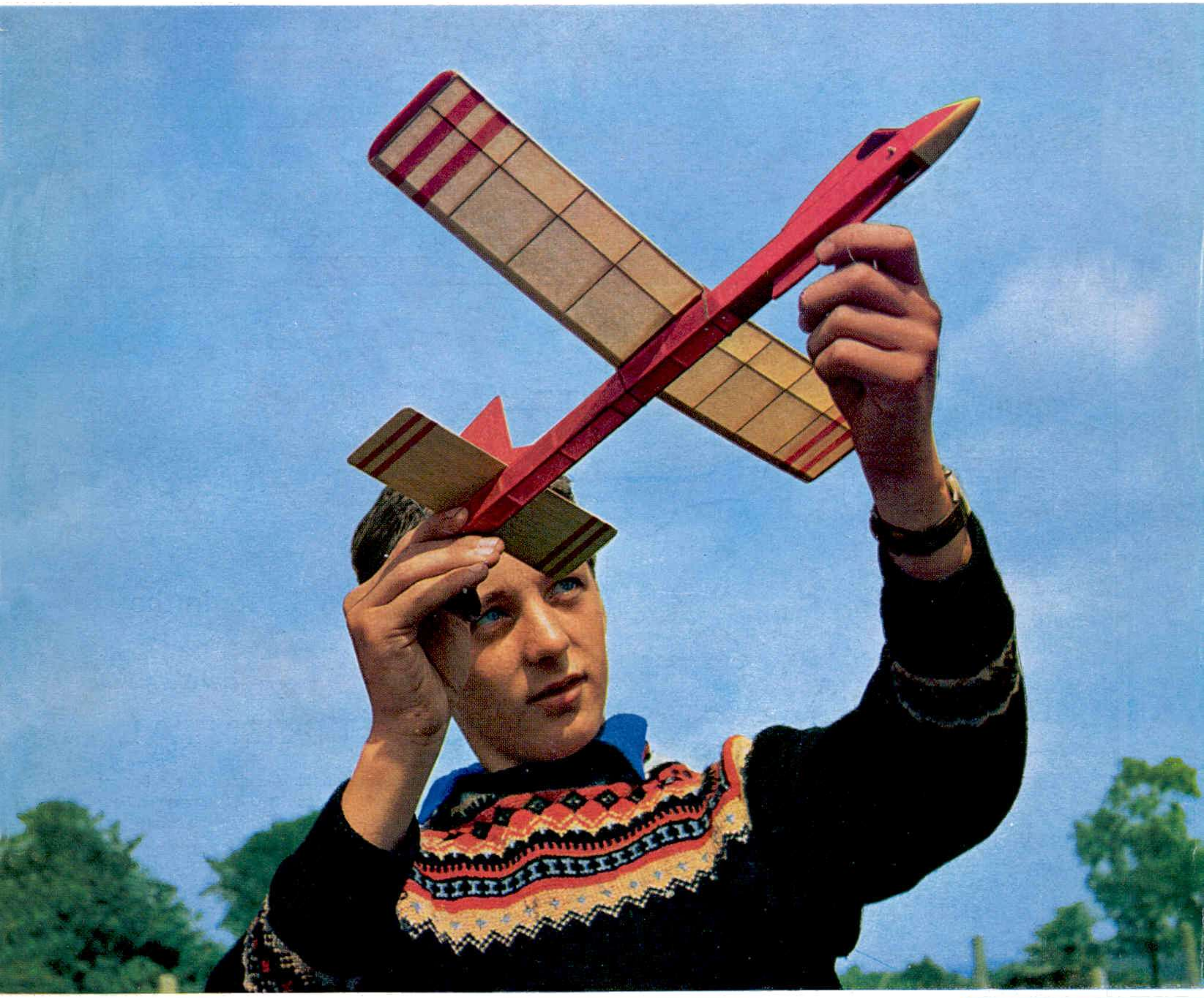

the practical boy's hobbies magazine

1964

IN THIS ISSUE

- Introduction to Electronics
- Man on the Moon

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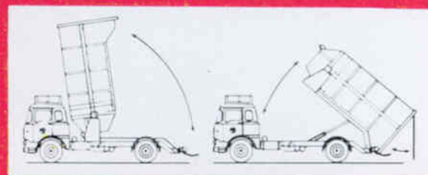

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St Alphage House, Fore Street, London EC2
phone: NATional 4050 Grams: Desollar London EC2

meccano magazine
the PRACTICAL BOY'S HOBBIES MAGAZINE

October 1964 ■ Vol. 49 ■ No. 8 ■ Published monthly

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Ordering the Meccano Magazine overseas

Readers overseas can order the *Meccano Magazine* from Meccano dealers or direct from the publishers. The subscription rate for 12 months is the equivalent of 20/- sterling at the current rate of exchange.

Bigger and Better

EIGHT extra pages have been added to this month's Meccano Magazine! This means that *your* magazine is now bigger and better than ever and contains more features, more facts and more practical hobbies articles for you to enjoy. However, as the decision to increase the number of pages was only made just over two weeks ago, I was unable, last month, to announce the larger size issue or the fact that there was to be a slight increase in the price. I would like to apologise for this unavoidable omission and confirm that as from this month Meccano Magazine will cost 1s. 6d. This threepenny increase will not only help cover the extra eight pages, but also the ever-increasing production costs.

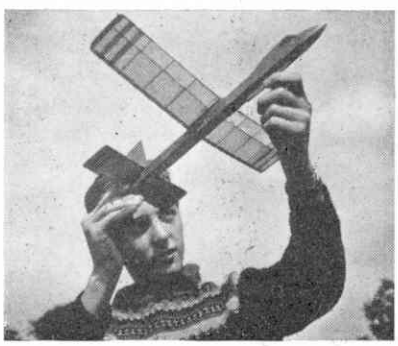
With this increase in size, I have been able to include the first of a new series of articles on radio hobbies, plus full-scale plans of a unique pusher-type model aircraft, especially designed for Meccano Magazine by our aeromodelling enthusiast Mr. Ray Malmstrom. I feel that both of these new features will prove extremely interesting and after taking a quick look at next month's radio feature, I can tell you briefly that it shows in detail how to build a small transistor radio for approximately 15s. There are no complicated wiring diagrams to decipher, so even the most inexperienced novice will be able to make this super working model.

By the way, I hope that you all enjoyed last month's special supplement about Raceways and Model Cars, for which many of the photographs were supplied by Model Roads and Racing, the magazine for the miniature car and raceways enthusiasts. The reason I mention this supplement is because next month, there will be another special section in the magazine, this time devoted to cycling. This section will show the vast range of bicycles on the market, how to choose the correct size machine and also, how properly to maintain your new bicycle.

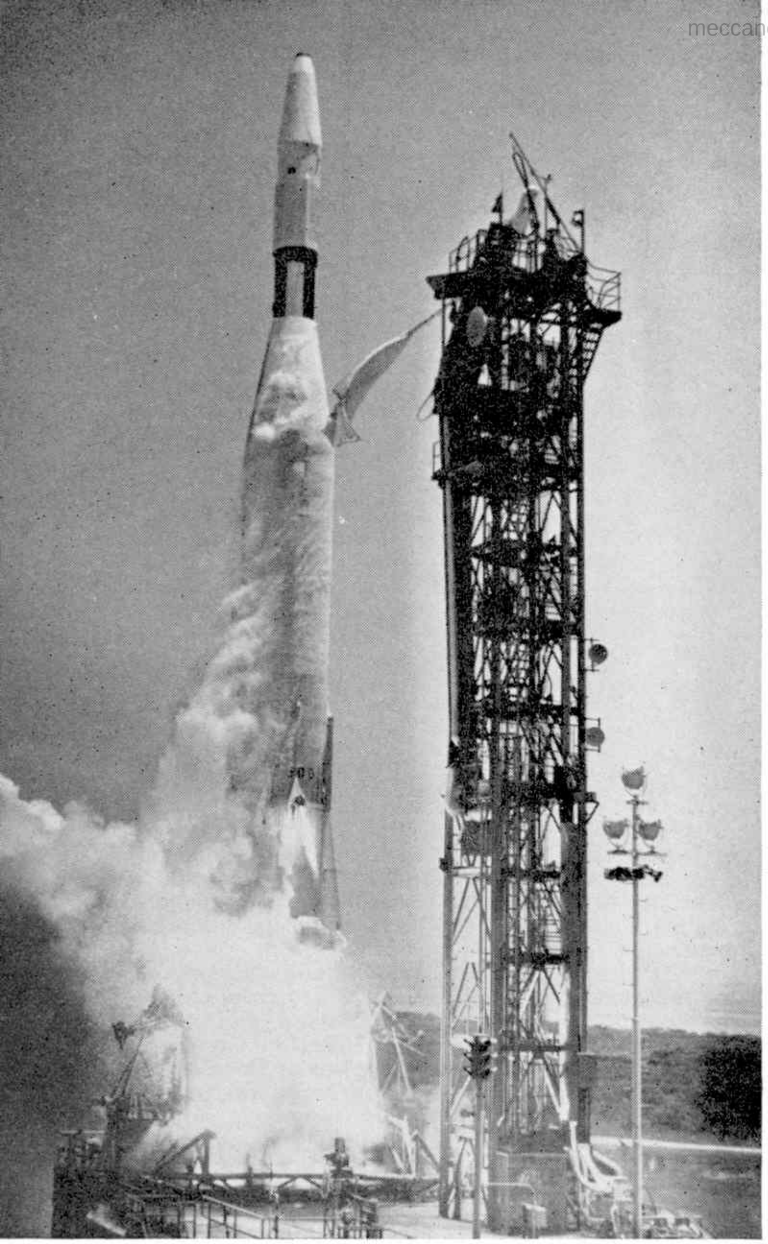
As you can see, there are many new features coming your way in the near future. Already I am planning the special Christmas issue, plus articles on camping and careers. Oh!—I almost forgot, next month I shall be giving the results of the photographic competition which appeared in the August issue. If you entered, be sure to get a copy to see if you've won a prize. If you didn't enter, order a copy of Meccano Magazine from your newsagent anyway. Already the popularity of the 'new-look' M.M. is growing and in some areas people are being disappointed by being told, 'Sorry, sold out!'

If you have any ideas how I might improve your magazine still further, please write and let me know. I am always pleased to receive your letters and read with interest your criticisms of the magazine.

the Editor

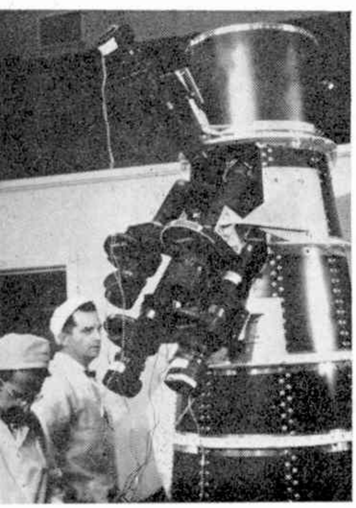


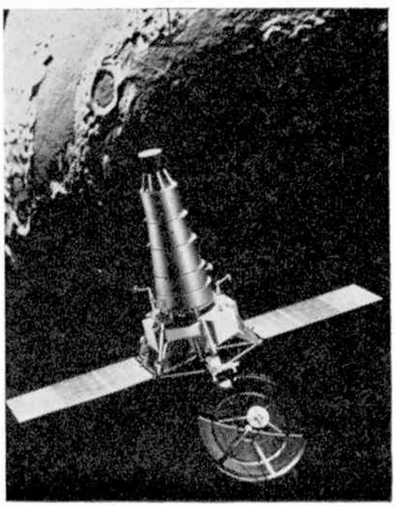
Cover picture:
Build the Marquita! Full scale plans are given in this issue to build the model pusher aircraft shown on the front cover. This model was built especially for M.M. by our aeromodelling author, Ray Malmstrom.



Lift off! The Atlas/Agena vehicle roars off the launching pad at Cape Kennedy, Florida on July 28th, 1964, starting the Ranger 7 spacecraft on its historic flight to the moon.

Left: Technicians check out the six television cameras on the spacecraft prior to launching. Right: A drawing of Ranger 7 in flight, approaching the moon.





by **Charles E. Deane**

MAN ON THE MOON

HOW long will it be before man takes his first step on to the surface of the moon? Well, if everything goes according to plan, the Americans hope to achieve this first step in man's conquest of space sometime in 1970. However, before this fantastic feat may be accomplished, there is still a vast amount of exploratory work to be carried out.

Already seven Ranger spacecraft have been launched to gain vital information on conditions in space and on the moon. A further two Ranger space vehicles are planned to be launched next year. Rangers 1 and 2 were development launches with the mission of proving the space flight concept which was used to aim Rangers 3, 4 and 5 at the moon. The missions for Rangers 3, 4 and 5 were to make rough landings on the moon and return seismic information as well as television pictures of the moon's surface.

Unfortunately, Ranger 3 was given excessive velocity by the launch vehicle and crossed the moon's orbital path too soon. However, Ranger 4 reached the moon, but due to a fault in the control mechanism, no radioed information was received from the craft. Similar faults occurred in Rangers 5 and 6, and no television pictures were forthcoming.

It wasn't until July 31st, 1964, that six television cameras aboard Ranger 7 took the world's first close-up photographs of the moon's surface. This Ranger performed without flaw from lift-off Cape Kennedy, Florida, at 1650.07 GMT Tuesday, July 28th, until it crashed on the moon's "Sea of Clouds" at 1325.40 GMT Friday, July 31st, within eight to ten miles of its exact target area.

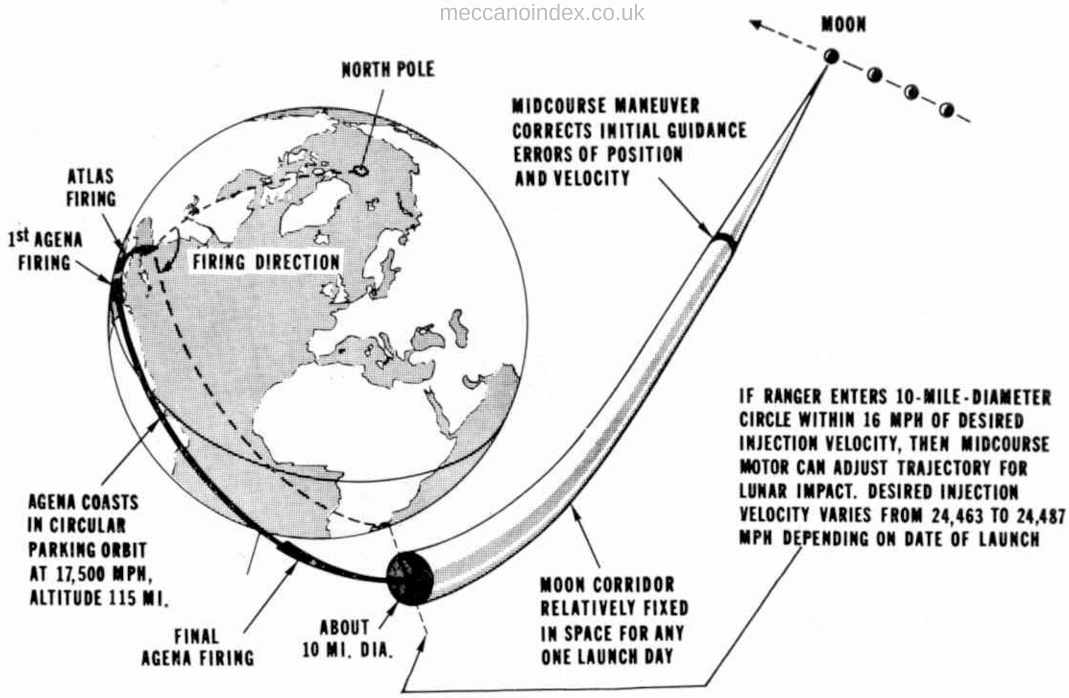
Aiming into Space

Achieving a landing on the moon, as well as obtaining close-up photographs of the lunar surface is a miracle of modern space technology. To land any object on the moon needs precise calculation, for it isn't simply a matter of aiming the rocket at the moon and launching. Basically, the principle is as follows: an Atlas booster rocket lifts the space vehicle vertically until, at a predetermined time, the vehicle pitches over at an angle which will take it into orbit around the earth. A ground guidance system sends commands by radio which cut off and jettison the Atlas booster engines and shortly afterwards cut off its main engine.

After an adjustment of velocity, the first stage Atlas rocket separates from the second stage Agena rocket. The Agena engine then fires until the orbital speed of 17,450 m.p.h. is reached. The Agena engine then cuts off while the spacecraft coasts over the Atlantic Ocean in what is termed as a "parking" orbit. At the end of this coasting period, at a predetermined time, the Agena engine then re-ignites and burns until the injection velocity of 24,500 m.p.h. is reached. This second burst of speed enables the spacecraft to break free of the gravitational pull of Earth and, after separating from the Agena rocket, the Ranger continues its flight towards the moon.

It is only by precise control of the angle of orbit and the firing of the rockets to attain an accurate speed of between 24,463 and 24,487, m.p.h. that it is possible to send a space vehicle to the moon. It is necessary to launch the Ranger into a very narrow "moon corridor" which is only ten miles wide in space and can be likened to getting a bull's eye on a dartboard with a dart from a hundred yards.

Once the Ranger is on the correct course, it is really a matter of waiting, for the journey to the moon takes approxi-



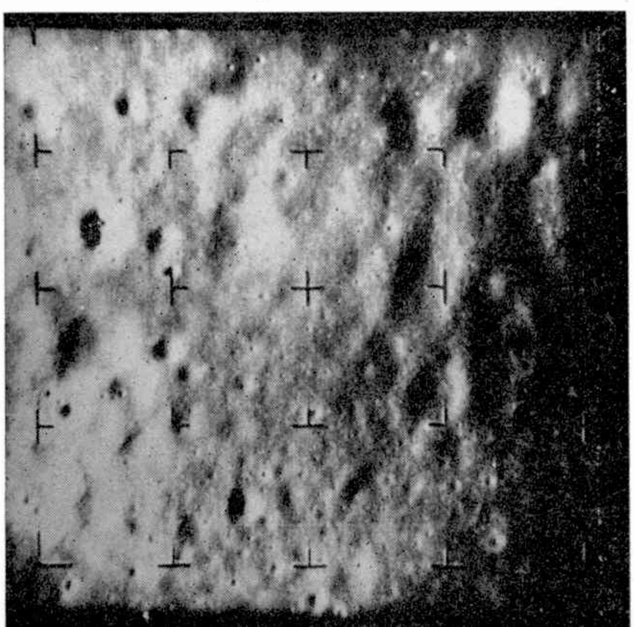
mately 68 hours, depending on the day of the launch. However, should there be *slight* errors of position and velocity these can be corrected in mid-flight.

The next stage in the flight of the spacecraft towards the moon takes place about an hour before the vehicle actually hits the moon. At approximately 3,940 miles above the moon's surface, the spacecraft is manoeuvred into a position where the television cameras on board face towards the lunar surface. Then, fifteen minutes before impact with the moon, the six television cameras take photographs which are then transmitted back to earth during the last minutes of the dying spacecraft's flight. During this period, some four thousand pictures are radioed back to earth, where they are recorded on magnetic tape and 35-millimetre film.

With Ranger 7, the pictures taken by the television cameras in the spacecraft were better, and showed in greater detail the lunar surface, than any photographs taken from telescopes on earth.

The Sea of Clouds, one of the moon's many dry seas, was selected as the target for Ranger 7 because the surface, as seen from the Earth, appears smooth, making it a possible site for the manned spacecraft landings scheduled for 1970. The main object of the Ranger 7 was to get a closer look at this seemingly smooth surface to see whether there are rocks, boulders or lots of craters, which could prove a danger to landing space vehicles. The work carried out by Ranger 7 was a complete success and scientists now know the problems involved in landing a spacecraft on the Sea of Clouds.

A close-up photograph of the moon's surface taken 3 miles up by Ranger 7. The smallest craters are only 30 feet in diameter and 10 feet deep. Crater at left towards top is about 300 feet in diameter.



The Ranger 7, which successfully completed its mission, was in many ways similar to its predecessors. The Ranger is five feet in diameter at its hexagonal base and is eight-and-a-quarter feet high.

Two solar panels, which convert sunlight into electricity for operating the spacecraft instruments, are folded up like butterfly wings during the launching and extend to 15 ft. across during flight. There are also two antenna on the craft, one which is an omni-directional unit for transmitting and receiving during the launch and the other, which is a dish-shaped, high-gain, directional antenna, is employed in the cruise and final phases of the vehicle's landing on the moon.

The dish antenna has an earth sensor and drive mechanism which keeps the antenna pointed towards earth. This ensures that all transmissions are beamed directly at the earth.

Apart from the six television cameras, two radio antennas and solar light cells already mentioned, the Ranger contains a vast array of other complicated gear, including equipment for measuring flight temperatures, vehicle attitude controls, encoders and, of course, transmitters for relaying all the information back to earth.

During the flight, it is essential for the solar panels to face towards the sun, in order to provide electricity to operate equipment on board the craft. Therefore, stabilization and manoeuvring equipment has been fitted and interconnected with sun sensors. These sensors select the source of the sun's rays and then manoeuvre the spacecraft in order that the solar panels face the sun.

This, then, deals briefly with the Ranger spacecraft, but to get this comparatively small vehicle into space takes two fairly large rocket units. The first is the Atlas booster, which is approximately sixty-six feet high, weighs 260,000 pounds and has a thrust of 370,000 pounds. The second stage is called the Agena and this unit is twenty-one feet high, weighs 16,000 pounds and gives 16,000 pounds of thrust in space.

The combined height of the Atlas/Agena/Ranger space vehicle is approximately 104 feet and the three units weigh a total of 277,000 pounds.

What, then, is the next step towards the moon? Within the next two or three years it is hoped to make a "soft" landing on the moon. In other words, America wants to send a spacecraft to the moon which will, with the aid of retro-rockets, land gently on the moon. Once they have achieved this and found a way of retrieving a vehicle that has landed on the moon, then will come man's attempt at flying to the moon and back! When one stops to think about it, it's really amazing—space fiction is now becoming space fact!

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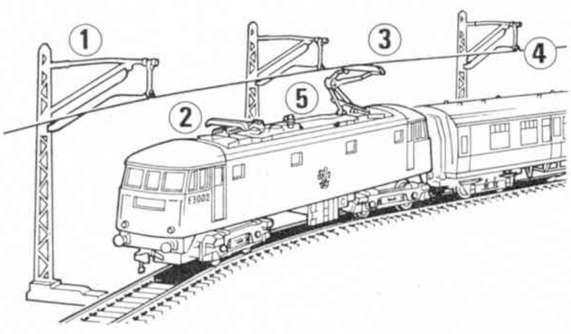

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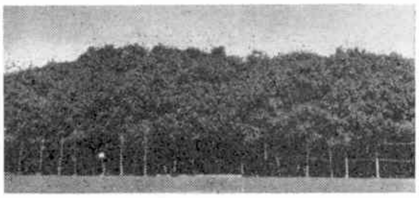
Anything interesting . . . write about it to the editor

THE GREAT BANYAN TREE— The Botanical Gardens at Howrah, Calcutta, have become very famous, for at one end is to be found a magnificent banyan tree, the largest known tree of its kind in India and perhaps in the whole world. A banyan tree differs from other trees in that it has a large number of aerial roots, which are actually branches that grow downwards and strike roots into the ground. In time, these roots become tree trunks, whose branches, in turn, develop new stems. Thus the tree keeps spreading in all directions—and the tree at Howrah is still growing.

The 'Great Banyan Tree', as it is called, is over 200 years old and resembles a small forest more than a single tree. Some idea



of its vastness can be gauged from the photograph, which shows only a part of it. Another interesting fact is that it is now living, in perfect vigour, without its original trunk, which decayed and had to be removed in 1925. The circumference of the original trunk, at a height of 5½ ft. from the ground, was 51 ft. The present circumference of the tree's crown is approximately 1,330 ft. The maximum height attained by one of its branches is 98 ft.

In an overcrowded industrial city such as Calcutta, the botanical gardens make an ideal picnic spot and the Great Banyan Tree is the chief attraction.

Many people in India hold the banyan tree in special reverence and will seldom cut even a branch of it. *S. R. Vatcha, Bombay.*

CARN BREA CASTLE—Behind the Lizard and desolate Goonhilly lies the area of derelict mine workings from which rises Carn Brea. Deep down in the valleys and against the slopes of Carn Brea

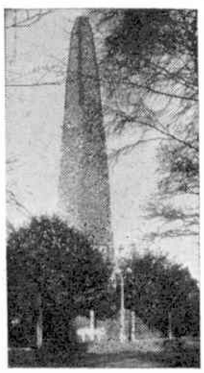
are the brown, battered ruins of Wheal Uny and Wheal Basset. And under these there still lies a fortune in tin and uranium, for experts agree that there is more mineral beneath Cornwall's soil than has ever been taken from it.

Carn Brea has a history older than we know, for the men of the heathen religions practised on this hill before the first saints landed on Cornish shores. The hilltop was densely populated for many Neolithic huts have been excavated in the area. The stone walls of an Iron Age fort on Carn Brea are 1,100 ft. long and within these walls are traces of Roman occupation as well as a medieval castle and a chapel.

The old hill track over which the pilgrims tramped, on their way to the coast and St. Michael's Mount, remains in use. At Magor, a few miles away, lies the remains of the most westerly Roman villa in Britain.

Carn Brea itself takes the form of a saddle. On one side is the present castle and a hunting lodge built by Lord Dunstanville, while on the other side of the hill is a monument to Lord Dunstanville, who spent thousands of pounds in developing Cornish metallurgical mining. *S. P. Smerdon, Camborne.*

MAGNIFICENT MILESTONES— While travelling in the Home Counties recently, I was most amused to see the two milestones shown in the photographs. At Chalfont St. Peter stands what I believe must be the largest milestone in Britain. It was erected in 1785 by Sir H. T. Gott after he had lost his way when returning home one night. Meanwhile, a few miles on towards Oxford, just outside the village of West Wycombe stands a



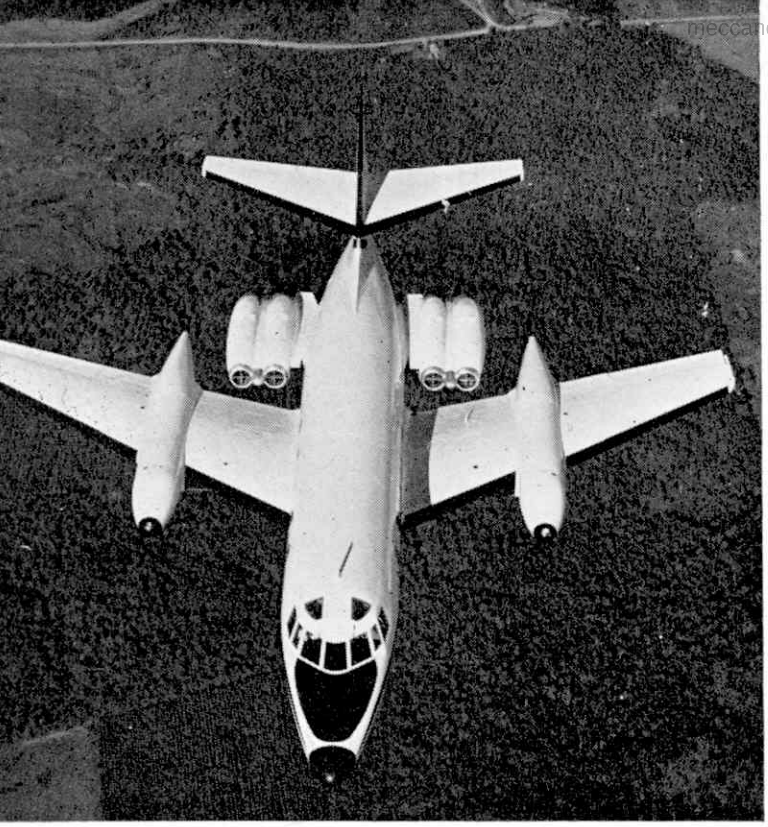
milestone which is something of a mystery. Its imposing appearance belies its usefulness, for it simply records the number of miles to 'The City', 'The County Town' and the 'University'. Road-users are left to their own devices to work out that the places are respectively London, Aylesbury and Oxford. Are these eccentric milestones an example of British humour? *I. E. Broadhead, Dringhouses, York.*

OLDEST CHURCH CLOCK?—On a recent trip to the ancient Cinque Port of Rye in Sussex, I visited the Parish Church of St. Mary, which has been called the 'Cathedral of East Sussex'. The church is of great historic interest and is a large cruciform building of stone in the Norman, decorated and perpendicular styles. The church tower houses the oldest church clock, which still includes the original works. The clock was purchased by the church wardens in 1560 and has a pendulum eighteen feet long which swings inside the church tower. On each side of the dial are quarter-boys which strike the quarter hours on bells with hammers. The church is 162 feet long and the walls are from three to four feet thick. *J. A. Fleming, London, N.W.3.*

BOYS AT TRUELOVES—Among the avid readers of Meccano Magazine are the 46 boys, most of them crippled with muscular dystrophy, at the 'Trueloves

Homes', Ingatestone, Essex. In the home the boys do normal schooling and their hobbies include model railways, photography, radio stamps and gardening. They have waist high gardens which they are able to tend in their wheelchairs. Often they are taken for outings and their first choice is always a visit to an airfield. Last year, for instance, they were entertained by the R.A.F. at Abingdon and this year by R.A.F. Bicester and the Skyfame Museum at Staverton. The problem of transportation is solved by the use of two coaches for boys and staff and a large van for the forty-odd wheel chairs. Sainsburys, the grocers, usually pay for the coaches and also send the van for the wheel chairs. Friends of the home are trying to raise money for a Mini-bus. Readers who wish to help these boys are invited to donate stamps, unwanted Meccano and other items and should address them to: The Superintendent, Trueloves Homes, Ingatestone, Essex.

By the way, while driving through Ingatestone recently, on my way to visit the boys at the Home, I was halted by a TRAM! It seems that the lorry carrying this old London veteran had taken the wrong turning at Ingatestone roundabout and when the driver entered Ingatestone High Street, the top of the tram became entangled in the telephone wires. *L. Hunt, Leigh-on-Sea, Essex.*



The American Lockheed Jet Star.

by **John W. R. Taylor**

BATTLE OF THE BABY JETS

AT this moment there is a fierce jet battle in progress all over the world. The weapons being used are not guns, rockets and bombs, but sales catalogues and persuasive talk. The prize awaiting the victor is a thriving market for one or other of the baby jet-planes now in production for wealthy businessmen who want a 500 m.p.h. personal transport.

It all started in 1957, when the American Lockheed company flew the prototype of their JetStar. Initially, it was like a miniature Caravelle, with two jet-engines mounted on the sides of its rear fuselage. However, after development it grew two more engines, VC10 fashion and a pair of huge torpedo-shape fuel tanks on its wings. In this form, it can carry its owner and seven of his friends for 2,185 miles at nearly 500 m.p.h., cruising in comfort six miles high, "above the weather"—provided he can afford over half a million pounds to buy the aircraft and a fuel consumption of about a gallon a mile.

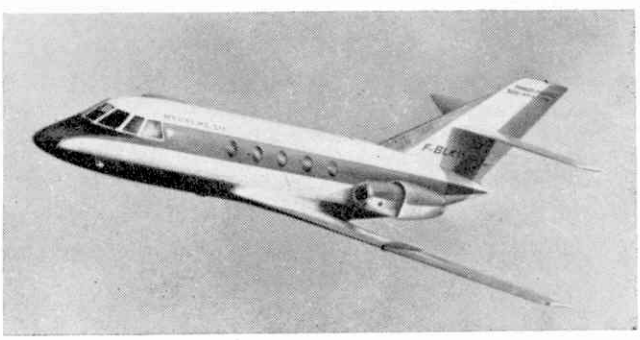
The JetStar was before its time and only about 30 have so far been delivered to private customers. Other aircraft companies realised that Lockheed had been over-ambitious and decided to produce competitors for the JetStar that would be only half its weight and half its price, with half as many engines. Unfortunately, far too many designers got the same idea at the same time and there were soon more than a dozen twin-jet business-planes in various stages of design and construction in America, Britain, Germany, France, Spain, Italy, Switzerland and even Israel.

There was no possibility of all of them selling in large enough numbers to cover their development costs and several manufacturers dropped out of the contest. The majority of those that remain have a special reason for so doing. Dassault of France may complete production of their Mirage III fighters and Mirage IV bombers next year and need something to keep their factories busy. Piaggio of Italy have been able to share the development costs of their PD-808 with the great Douglas company of America. North American have simply produced a commercial version of their Sabreliner military trainer. Morane-Saulnier of France have enlarged their little four-seat, mainly-military Paris II trainer/liaison aircraft into the six-seat Paris III with more powerful engines.

It is too early to say for sure which of the nine types now flying will be successful. The American Aero Jet Commander, JetStar and Lear Jet 23 have been ordered in sufficient quantities to keep production jogging along for a while; but the leaders in the race may prove ultimately to be Britain's Hawker Siddeley (formerly de Havilland) 125, the French Dassault Mystère 20 and Germany's HFB 320 Hansa.

One of the problems in designing these baby jet-liners was to strike a balance between high speed and comfort. Lear Jet Corporation decided to produce the fastest aircraft on the business market. They could have achieved this either by fitting more powerful engines than the 2,850-3,000 lb thrust turbojets chosen by their competitors, which would have increased the aircraft's running costs, or by cutting its size and weight to an absolute minimum. They chose the second method and the crew of two and seven passengers in a Lear Jet 23 are able to hurtle along at a top speed of 569 m.p.h., at the cost of sitting in a cabin with only 4 ft. 6 in. headroom.

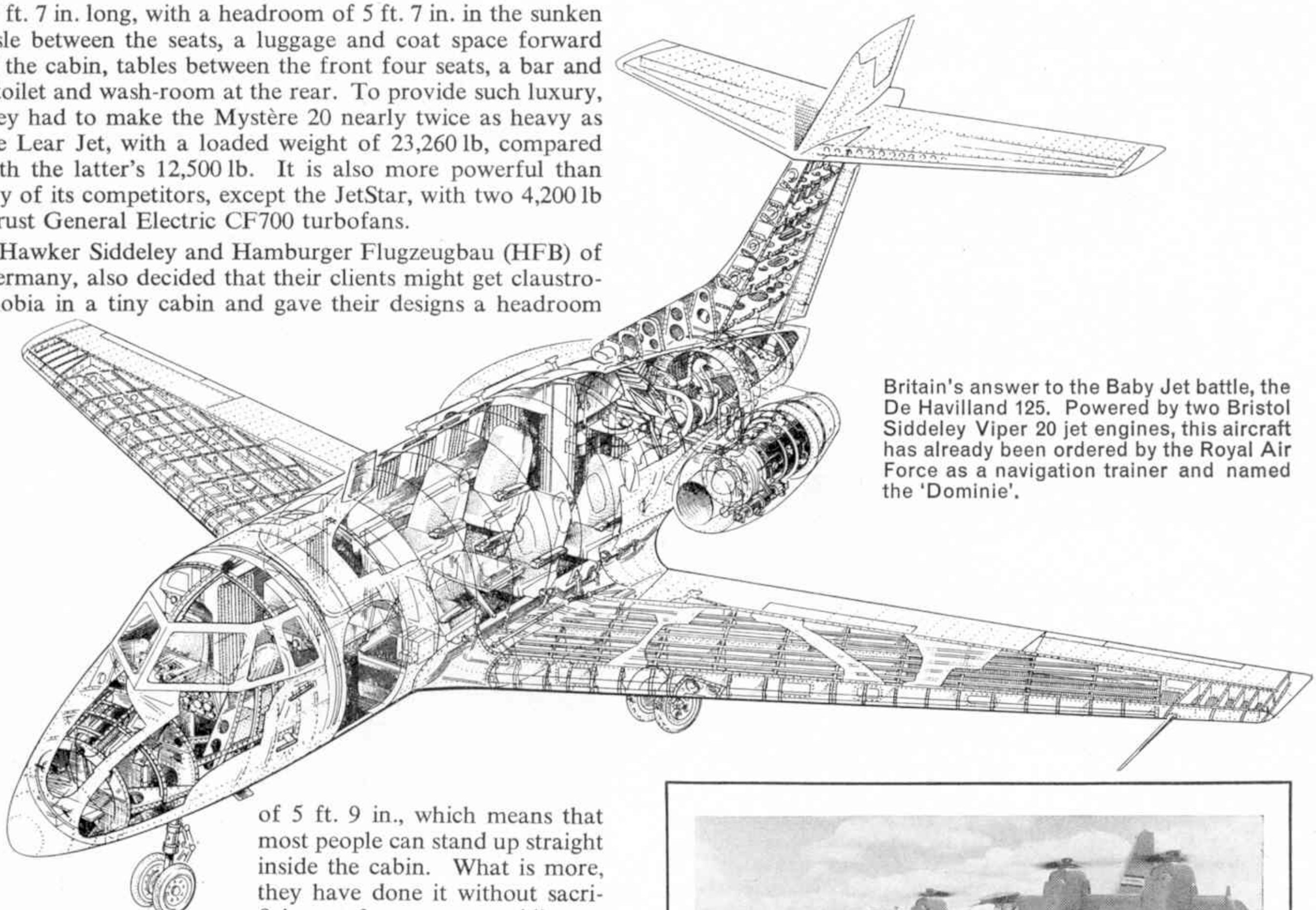
Dassault, on the other hand, decided that any person or company wealthy enough to buy a business jet would be willing to pay extra for a higher standard of comfort. So they gave their eight-passenger Mystère 20 a roomy cabin,



Above: Mystère 20. *Below:* HFB 320 Hansa.

15 ft. 7 in. long, with a headroom of 5 ft. 7 in. in the sunken aisle between the seats, a luggage and coat space forward of the cabin, tables between the front four seats, a bar and a toilet and wash-room at the rear. To provide such luxury, they had to make the Mystère 20 nearly twice as heavy as the Lear Jet, with a loaded weight of 23,260 lb, compared with the latter's 12,500 lb. It is also more powerful than any of its competitors, except the JetStar, with two 4,200 lb thrust General Electric CF700 turbofans.

Hawker Siddeley and Hamburger Flugzeugbau (HFB) of Germany, also decided that their clients might get claustrophobia in a tiny cabin and gave their designs a headroom of 5 ft. 9 in., which means that most people can stand up straight inside the cabin. What is more, they have done it without sacrificing performance or adding so much weight that high-powered engines are needed.



Britain's answer to the Baby Jet battle, the De Havilland 125. Powered by two Bristol Siddeley Viper 20 jet engines, this aircraft has already been ordered by the Royal Air Force as a navigation trainer and named the 'Dominie'.

The eight-passenger H.S.125 weighs 20,500 lb fully loaded, cruises at up to 472 m.p.h. and is powered by two 3,120 lb thrust Bristol Siddeley Viper 521 turbojets. Its designers avoided the inconvenience of passing the wing spars through the cabin by letting the whole fuselage 'sit' on top of the wing. This gives the H.S.125 a curious fat-tummied look, but makes possible a roomy, uncluttered cabin.

HFB have adopted an even more unorthodox wing position to achieve the same result and the Hansa is the first civil aeroplane to go into production with a sharply swept-forward wing. This looks a little startling, but it is as efficient as the more usual swept-back wing, leaves a clear cabin as the spars pass through the fuselage behind the cabin and gives the passengers an unusually good view downward. Nor does performance suffer, as the 18,100 lb Hansa, powered by 2,850 lb thrust General Electric CJ601 turbojets, will carry seven passengers at up to 506 m.p.h. Like most of the other types, it can carry a larger number of passengers in less luxurious accommodation.

These then, are some of the baby jets that are competing for the favours of businessmen throughout the world. All offer their own particular attractions and Hawker Siddeley's production line has been given a good start by an Air Ministry order for 20 H.S.125's which the R.A.F. will use as navigation trainers, under the name 'Dominie'.

Dassault have done even better by securing an order for 40 Mystère 20's from the newly-formed Business Jets Division of Pan American World Airways, with an option on 120 more if sales go well.

Going up

June 17, 1964, was an important date in the history of VTOL (vertical take-off and landing) flight, as the LTV-Hiller-Ryan XC-142A tilt-wing transport left the factory and made its first engine runs on that day. The photograph on this page shows the aircraft with its wing tilted up in the take-off position: the propellers of the four 2,850 h.p. General Electric T64 turboprops then act as helicopter rotors to raise it off the ground. At a safe height, the wing is gradually tilted down, and in cruising flight it provides all the necessary lift, while the propellers drive the aircraft forward in the normal way.

The XC-142A weighs 18½ tons and is designed to carry 32 fully-equipped soldiers or four tons of cargo. It combines the helicopter's ability to go anywhere with a top speed of over 400 m.p.h.

The name's the game

Airlines have to be careful how they abbreviate their names. When the former French colony of Madagascar achieved independence it called its national airline 'Madair'. The name was painted on the cabins of the company's DC-3s until somebody suggested it might make English-speaking travellers prefer another form of transport! The airline is now Air Madagascar.

Gibraltar Airways also have had trouble with their abbreviation 'Gibair'. Before one of their aircraft was able to leave for Tangier recently, staff had to erase the work of overnight jokers who had transformed the airline into 'YoGibair'.

by **Jerry Ames**

BEHIND THE SCENES OF A MOTOR RACE

'MOTOR racing is dangerous.' You will see this notice displayed all round the racing circuits. It originated after a crash in the 1929 Double-Twelve-Hours sports car race at Brooklands, when two Talbot 90's collided whilst braking in the old Finishing Straight, one demolishing part of the timing box, the other crashing into the rails and injuring a number of spectators. Motor racing is also very expensive. Did you know it costs more than £50,000 to stage a Grand Prix? This year's British and European Grand Prix set the organisers back considerably more, just for the expenses of the meeting.

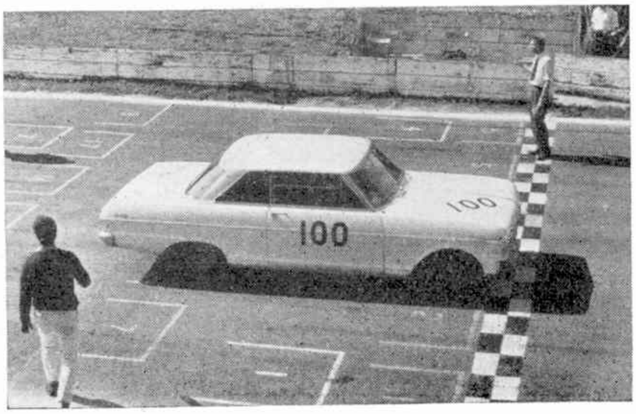
Motor racing expenses are going up all the time and if you think the bulk of the money goes to the drivers, you would be very wrong. There are such items as ambulances, fire engines, breakdown tenders, police by the score, doctors, nurses and first-aid men; some are voluntary, but many have to be paid for by the organisers. Even the telephone bill can be enormous, with dozens of long distance calls going out, some to foreign countries. But, if organisers cannot keep down expenses, they are at least making each meeting safer and better, both for spectators and drivers. This, in turn, attracts the top drivers who, in turn, draw bigger gates—and that is how the organisers hope to recoup their money.

Quite often one of the big daily newspapers will sponsor a meeting to the tune of many thousands of pounds; in other words, they act as a kind of banker for the organisers, guaranteeing that payments will be met, whatever the size of the gate. When a big national newspaper sponsors a Grand Prix, it ensures the meeting will be given plenty of advance publicity in its columns and usually over radio and television; the object being to whet the appetite of the general public and help swell the gate.

Even those closely connected with the race hear little about the string pulling that goes on behind the scenes. There is often much hard bargaining to get top overseas drivers and manufacturers along, especially if there are a number of supporting races. In fact, it is by no means unknown for aeroplanes to be specially chartered to fly foreign cars and teams to a meeting and back again to the works. Wheels have to be set in motion months beforehand, to ensure the meeting runs like clockwork and to time on the great day.

Once practice begins, usually two or three days before the race, the marshalls appear on the scene, to ensure the day to day organisation operates smoothly. Without them it would be virtually impossible these days to stage a big race, for on their efficiency depends much of the success of the meeting.

Grid Marshalls line up the cars on the starting grid.



How many cars make one? It is difficult to tell when you look at this photograph of *three* cars, line astern, hurrying through one of the many bends in the twisting Monaco circuit.

What is a Marshall?

Who are the marshalls and what do they do? There are hundreds at a big meeting and they run the paddock, the start line, the pits, operate the international flags to tell a driver when someone is trying to overtake, or warn him of an incident on the course. From their posts they are in immediate telephone communication with race control, the nerve centre of every meeting and again staffed by marshalls. They can get doctors, ambulances, fire or breakdown wagons on the spot of an accident. Others feed information to the press and commentators. In fact, wherever there's an interesting job to do, apart from driving in the race, it falls to the lot of a marshall to carry it out.

Their work is jolly interesting and in this I can speak from experience; for instance, it is largely due to close co-operation between the paddock and start line marshalls that the meeting begins and runs to time. The start line marshall must indicate to a driver his exact position on the grid and see that he gets to it without delay. Out on the course, flag marshalls need to concentrate on scraps going on between the various cars. If a driver, trying to make up lost time, gets held up by a slower car, he naturally feels rather indignant if a flag marshall takes no notice. In fact, he may even show his annoyance by making gestures the next time round.

Experienced drivers of all nations will tell you that British marshalls are the best in the world; they concentrate on their jobs, but they enjoy doing them, because most are knowledgeable enthusiasts who are a very essential part of the motor racing fraternity. Today, most of them belong to the British Motor Racing Marshalls' Club, an organisation intent on improving the already high standard of marshalling, which supplies experienced volunteers to meetings all over Britain. They have been asked many times by continental organisers for advice. Now there is every likelihood of the British Club supplying experienced marshalls with expenses paid to foreign meetings.

Book on Marshalling

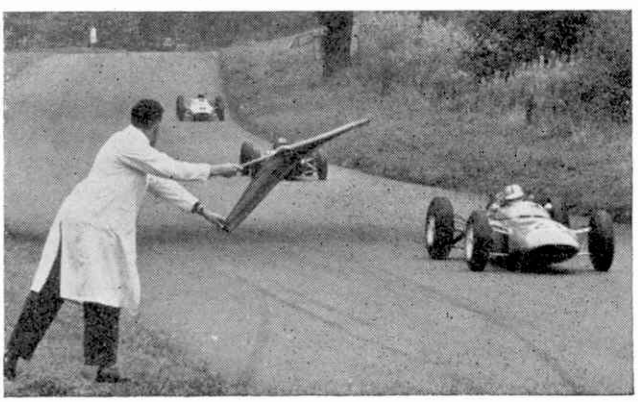
Not everyone can be a driver, but marshalling offers a variety of interesting jobs connected with motor racing and there's plenty of scope if you really want to get into the sport. Really it is a vast subject, but it is dealt with in great detail by a book produced this year by the British Motor Racing Marshalls' Club and published by Ford's of Britain This book, entitled 'How to Run a Motor Race,' is already regarded as the standard work on marshalling. Modestly priced at 10s. 6d., it is a mine of information and has a foreword by Stirling Moss.

I like Graham Hill's chapter where he says, 'I am forever grateful for the marshall who gets the oil flag out immediately the offending liquid reaches the circuit,' and concludes with, 'Future co-operation between the Grand Prix Drivers' Association and the British Motor Racing Marshalls' and similar clubs in other countries could do much to improve racing.' This tells exactly how highly the top drivers value good marshalling.

In addition to some of the jobs I have mentioned, there are others for those with specialist qualifications, such as scrutineering and time-keeping. On one depends the acceptance of car and driver in a race and on the other, the official speeds and results on which World Championships may be decided. So, you see, there is a good deal more in a motor race than meets the eye.

Paddock Marshalls usher the cars out of the paddock and on to the circuit. They ensure the races run to time and according to the programme.

Track Marshalls warn cars of any impending danger on the circuit or if they are about to be overtaken.



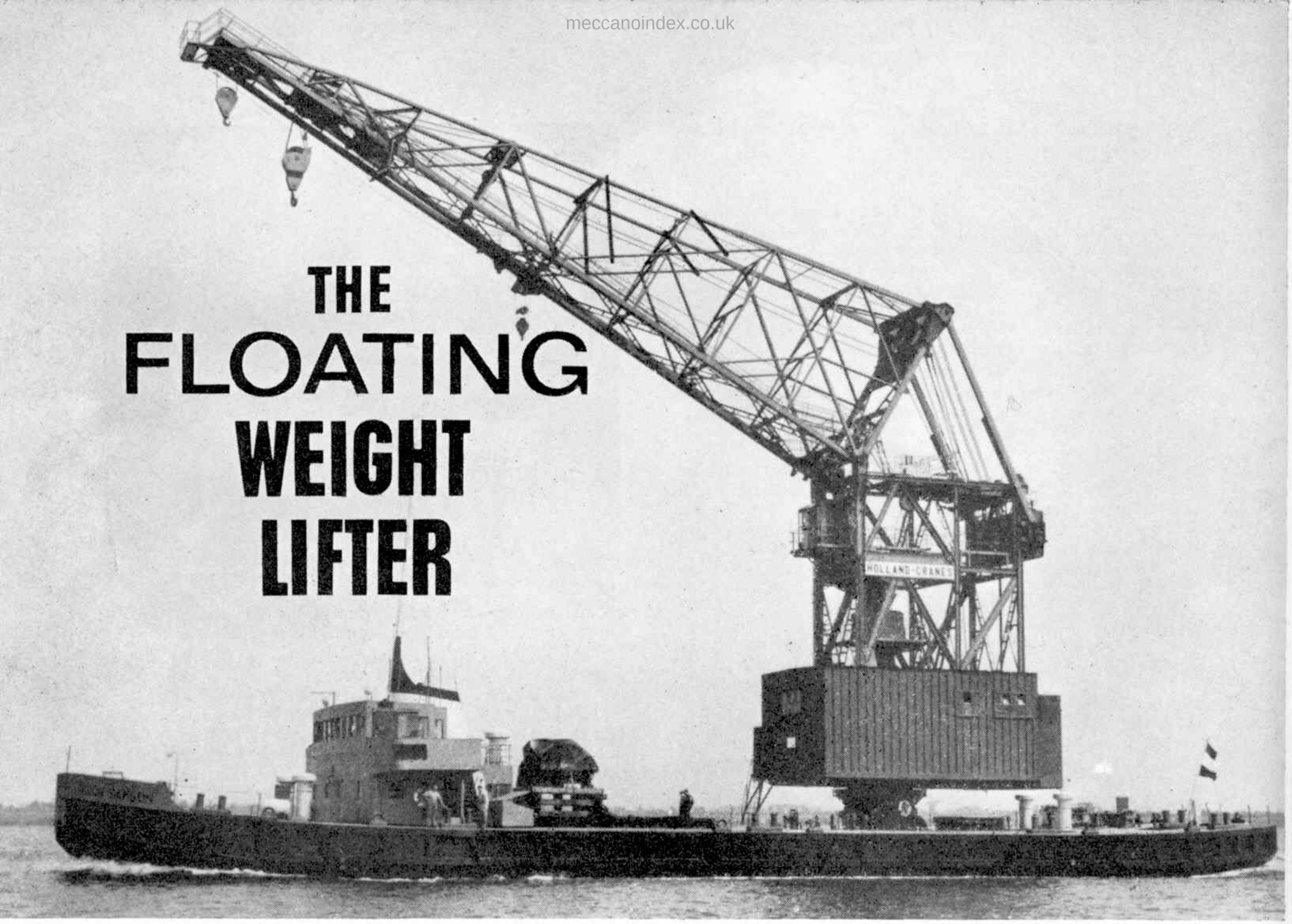
Timekeepers are essential to racing and rallying to keep a check of the times.

Triumph 2000 on Test

A modestly priced family saloon with plenty of punch is how I would describe the 6 cylinder, 2 litre, Triumph 2000. I have been driving the model with four speed, all synchromesh, manual gear box and overdrive on third and top. It has a maximum of 96 m.p.h., goes to 74, 49 and 31 m.p.h. in the three lower ratios and has a fuel consumption in the mid-twenties. Satisfying acceleration takes it from standstill to 50 m.p.h. in 9½ seconds and the servo-assisted, disc-drum brakes provide smooth, progressive stopping with light pedal pressures.

All independent suspension contributes to very good road-holding, although the rack and pinion steering is low geared, but precise. The seating is above average. The Triumph 2000 needs minimum servicing and is one of the best saloons in its price range.

THE FLOATING WEIGHT LIFTER



The Port of London Authority's heavy lift crane 'London Samson'.

AT some time or other, the majority of people must have seen the tall, sentry-like cranes quietly standing on the quayside in dockland. They vary considerably in size and design and some of the more modern ones, particularly the ones in the London docks manufactured by Stothert and Pitt Ltd., remind me very much of four-legged robots awaiting their master's orders. However, apart from vertical and horizontal movement of the jib and hook, in the main, these cranes are restricted to travelling on rails.

In contrast to the dockside cranes, which have to have their work delivered to them, there are a few unusual cranes working in the waterways which are very manoeuvrable and travel to their work. These are the floating cranes.

Last year, a completely revolutionary floating crane was delivered to the Thames and her arrival marked the completion of a project commenced in the Port of London Authority Chief Engineer's Department some years previously. The advanced design incorporated features which had their genesis then, but already seem to have evoked the compliment of imitation elsewhere.

One very remarkable characteristic of the vessel, which is known as the LONDON SAMSON, is her ability, in spite of elephantine proportions, to pirouette like a dancer in her own length. This is achieved by her two Voith Schneider cycloidal propulsion units, one aft and one forward. These units give such a high degree of manoeuvrability, which is extremely important within the confines of a busy dock system, that she can even 'park' sideways.

Briefly, the propulsion from the Voith Schneider unit is obtained by blades set in a circle on a disc that revolves horizontally, not vertically as with normal propellers. The position of the blades on the disc can be adjusted so as to give a pushing force in any required direction. This means that the normal steering gear is dispensed with and the units are controlled directly from the wheelhouse or bridge of the vessel.

Similar to Thames' barges and also resulting from extensive tank tests, the hull was designed to be 'swim-ended'. In fact, a primary requirement for the 'London Samson' was that she would be able to operate without the aid of tugs, in all weathers, up to the Beaufort wind scale force 7 in the docks or tidal rivers. Also, with a speed of nine knots, she is capable of sailing between the up-river docks and Tilbury, irrespective of the state of the tide.

The crane itself is controlled from a cabin mounted high above the deck. Here the engineer has an unobstructed view and he operates the jib by way of 'joy-stick' controls situated either side of the driving seat-cummaster controller. The master controller ensures that lifting operations are smoothly carried out, aided by a device that automatically provides a correct relationship between hook speeds and loads.

The main hoist, which has a capacity of 60 tons, can raise its load to 100 feet above and lower to 40 feet below water level at any radius between 35 feet and 90 feet. There is also an auxiliary hoist of 20 tons capacity, while a small Jigger hoist is fitted to lift a maximum of five tons. In addition, by double reeving, the main hoist block permits 120 tons to be lifted at approximately half the normal working radius.

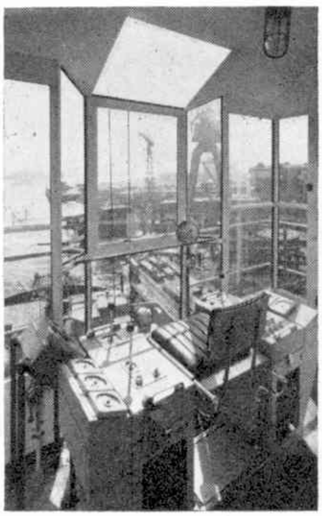
To the layman's mind, all this must seem an astonishing achievement, yet despite the towering structure of the crane rising to about 130 feet above water level, the maximum angle of heel is less than four degrees.

The specially strengthened hull measures 180 feet long by 58 feet 6 inches beam and approximately 200 tons load can be carried on board the 'London Samson'. No wonder the great hull feels almost immovable as dry land!

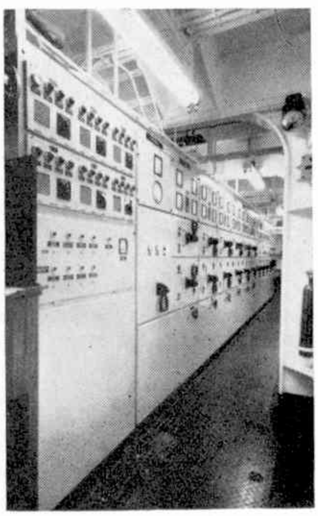
In the engine room, the control board gives the impression of a miniature power station. This, of course, is in many ways true, for everything is electrically operated.

The crew's accommodation is of a high standard, comparable with many of the modern sea-going ships with which the 'London Samson' has to deal.

On the day following the 'London Samson's' arrival in the Thames, there came her first task. This was to lift a 24-ton cylinder from a barge on to the s.s. *City of Birmingham* in the Royal Albert Dock. The cylinder measured 32 feet long and was for an oxygen



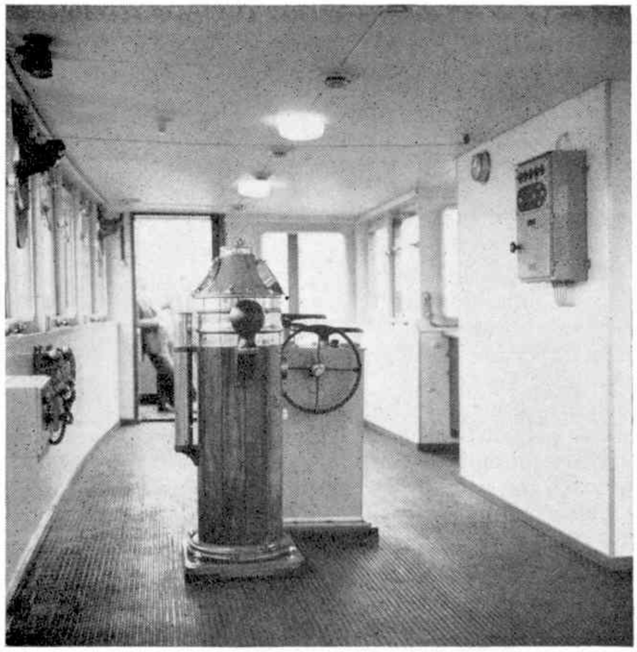
The crane driver's cab.



Engine room switchboard.

plant in South Africa. When one stops to think, it is quite interesting to speculate what other duties she will have to perform during her career of weight-lifting on the River Thames.

Before signing off this month, I would like to thank the Port of London Authority and their journal 'The P.L.A. Monthly' for the assistance they gave in helping me prepare this article for you, the readers of Meccano Magazine.—**Robert Gore.**



The navigating bridge of the London Samson.

TUG ON TEST

AN unusual feature of the Thames-built tug 'Ledum', for service in Nigeria, is the all-welded, aluminium alloy hull, claimed to be the largest of its type to be constructed in the United Kingdom.

Built by Whittingham & Mitchell Ltd., Chertsey, Surrey, the vessel is equipped with a 53 feet 6 inches long hull constructed from light alloy. Displacing 18 tons, with a loaded draft of 18 inches, the tug was ordered by the Niger Delta Development Board through the Crown Agents.

It was designed for towing or pushing up to four, 25 ton capacity, light alloy barges, loaded with fuel oil and drinking water for servicing launches operating in the Niger Delta on survey work.

Twin Caterpillar diesels each developing 165 b.h.p. at 2,000 r.p.m. and driving through 2 to 1 reduction gearboxes give the vessel a cruising speed of 10 knots. The engines and gearboxes are remotely controlled from the tug's wheelhouse.

To facilitate steering and manoeuvring when pushing pontoons carrying high loads, which could obstruct the wheelhouse view, a flying bridge has been provided. Provision has been made for a crew of six whilst air-conditioned accommodation is included for a survey officer.

by **Michael Rickett**

Riding the Footplate

THE most noticeable change between present conditions on the footplate of a locomotive and those of the past is that modern diesel and electric locomotives allow drivers to wear a white collar and shirt—something quite unknown in the days when steam was the only source of power!

To acquire information for 'M.M.' readers about the exciting life that the modern locomotiveman leads, I recently travelled on the footplate of a 25 kV 3,300 h.p. electric locomotive hauling the 9.45 a.m. train from Liverpool to Crewe. Aboard the loco was Inspector Norman of Mossley Hill, who introduced me to the driver, Mr. J. Lee, of Liverpool. The cab was quite comfortable, and two plush-lined seats were provided for the crew, for although the loco is normally handled only by the driver, double-manning is usually employed for journeys of over 100 miles.

The control panels at both ends of the locomotive are neatly laid out, and the controls are conveniently positioned, as our picture shows. The handle on the extreme left of the panel is the vacuum brake for the complete train. Above it you see the main air brake for the locomotive only and the A.W.S. visual warning apparatus. Just above the driver's seat, but not in the photograph, are the audible warning devices of the system—a bell for all-clear, and a buzzer for danger.

To the right and above the air brake you will see four dials. The one immediately on the left measures the air pressure used for raising the pantographs, and to the right of it is the air brake gauge for the locomotive. Next to this is the vacuum gauge, then comes the speedometer, and below these are push buttons to control the exhaust, the raising and lowering of the pantographs, and the train heating.

The lever below the buttons controls the horn and the knob to the left of this operates the window wipers. A button controlling an anti-slip device is positioned next to this. Below the speedometer and partly hidden by the large handle in the foreground, is the rheostatic proportional brake. This applies air brakes on both the locomotive and the train.

Below this control again is the acceleration lever, which has six positions. The left notch is 'off', and the two notches immediately to its right are 'run' down and 'notch' down, for use when the train is decreasing speed. The next position is 'hold', and then, to the right, are 'notch' up and 'run' up, for acceleration.

If the driver were to turn the lever to 'run' up, the locomotive would continuously accelerate to top speed, but this would only normally be done when the line was known to be clear for a distance. 'Notching' up or down is accomplished by switching from 'hold' to 'notch', and back to 'hold'. This can be repeated until top or bottom speed is reached.

The lever on the left of the large accelerator is the direction lever. Next to the speedometer are two curved ammeter panels which show the driver the amount of current taken from the overhead catenary. The ammeter is also the only indication the driver has when wheel slip is occurring. The curved dial to the right of the two ammeters tells the driver the percentage of acceleration or deceleration at which the locomotive is travelling. To the right of this again are three indicator lamps—one to inform the

The IG 11 9.45 from Lime Street to Crewe'

driver that the pantograph is collecting current from the overhead catenary, one to notify him of any fault, and one to remind him that the train heating is on. The four remaining knobs to the right control the lighting of the instruments on the panel. Underneath the control panel is a pedal which must be depressed by the driver's foot during the journey. This is known as 'the driver's safety device', and would stop the train in three seconds if the driver were to take his foot off it.

Extra safety device

The A.W.S. is an additional safety device, and prevents the locomotive entering a section which is blocked. A bell is rung in the cab when the section ahead is clear, and a buzzer sounds when the train approaches an occupied section. This warning must be cancelled within three seconds, by depressing a button to the right of the locomotive brake; otherwise the train will stop.

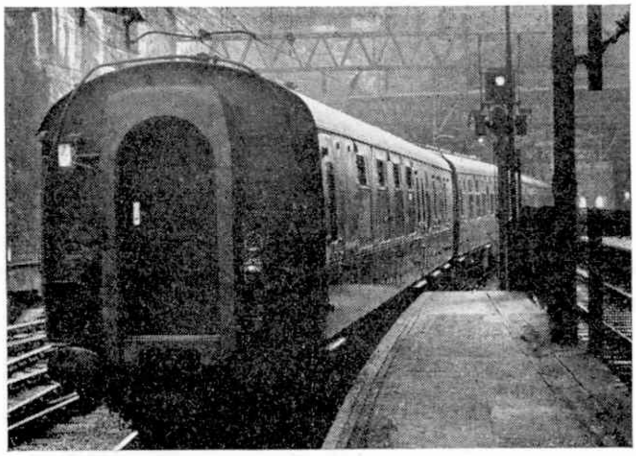
When the train on which I was travelling had received the 'right away', Driver Lee notched the acceleration lever up three times, which was sufficient to start the train moving slowly towards the tunnels at the throat of Lime Street Station. The acceleration lever was once more notched up, to give the train a speed of 25 m.p.h., which was maintained up the steep gradient to Edge Hill Station, where a permanent way speed restriction was in force. We began gaining speed shortly afterwards, and Mossley Hill Station was passed at 70 m.p.h. Considering that the train consisted of nine coaches of 350 tons tare, the acceleration to this speed from the 25 m.p.h. restriction was no mean feat.

The locomotive was allowed to accelerate to 75 m.p.h.

The cab of the 25 kV, 3,300 h.p. electric locomotive.

as we approached West Allerton, and this speed was maintained through Allerton Station. The scheduled timings for the remainder of the journey to Crewe were: Weaver Junction, 10.11 a.m.; Winsford Junction, 10.18 a.m.; Crewe, 10.33 a.m.; with one minute recovery time at Weaver Junction and seven minutes' recovery time at Winsford Junction. Ditton Junction was passed at over 80 m.p.h., and soon we were crossing the Widnes-Runcorn Bridge where our speed dropped to 40 m.p.h.

A further restriction because of permanent way work was met after the bridge was crossed, and we were forced to reduce our speed to 25 m.p.h. before drawing up at Runcorn Station. Once on the way again, we began accelerating swiftly, as Driver Lee notched up the locomotive. Norton Tunnel was entered $1\frac{3}{4}$ miles out of Runcorn, and shortly afterwards the train ran over the River Weaver Bridge near Sutton Weaver. A notice on



Passing the starter colour light signal.

the left of the track indicated that the speed restriction had ended, and that we could proceed unchecked.

As our speed gradually increased we passed Ditton Wood—which is preserved as a bird sanctuary—on the right and shortly afterwards crossed the Weaver Canal over the viaduct. Our speed at this point was 90 m.p.h. and shortly afterwards we passed Hartford Junction Signal Box and Hartford Station. This station is on the outskirts of Delamere Forest and further along the line lies the picturesque Vale Royal viaduct, which we travelled over at a fine turn of speed.

As we entered Winsford Junction, I noticed that the time was 10.18 a.m.—which meant we were right on schedule. Shortly afterwards, however, we slowed down to 40 m.p.h. for Winsford Station. The last stretch of line lay ahead and we travelled at a steady speed until the approaches to Crewe coalyard were reached, when we once more had to reduce speed. A little further on we were held by a signal and Mr. Lee left the cab to ask for instructions, using the telephone which is part of the equipment of most automatic signals. This setback resulted in our arriving in Crewe Station three minutes late.

A typical day's work for our driver, Mr. Lee, would begin at 8.40 a.m., when he would report to Lime Street Station and prepare his locomotive until his train was due out at 9.45 a.m. He would drive to Crewe and from there to Nuneaton, where he would leave his loco in a siding and go for lunch. His next turn of duty would be to take the 2.20 p.m. train from Nuneaton back to Liverpool, where he would arrive at 3.52 p.m., and here, after his locomotive had been detached from the train and secured, his day would end. It can be seen that the life of the average British Railways crew is infinitely more comfortable than it was in the past.

Mr. Lee started work in 1916 on the London and North Western Railway, where his first duties were to clean locomotives, which he did for eight years. He was then promoted to cleaning, firing and general shed duties. His first important promotion came when he began as fireman on shunting locomotives. Further promotion to extra fireman—any class of work, goods train working, double-trip working to London and fireman on passenger trains—followed. He was then promoted to passed fireman or spare driver, and from there gradually worked his way through different promotion levels until he finally began to drive passenger trains regularly. In 1955 he became a top link driver on both steam and diesel locomotives and 14 months ago he was trained and passed to work on the new electric locomotives operating between Liverpool and London.

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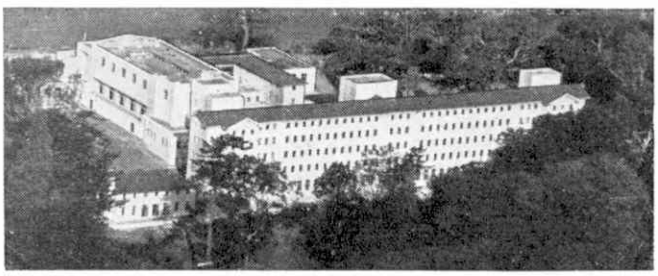

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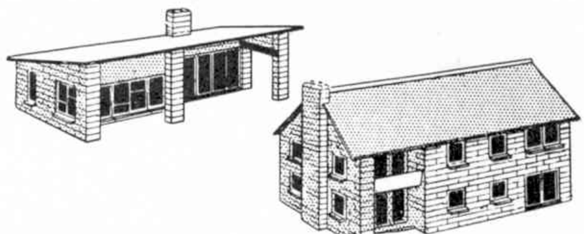

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Ask Tom Sheridan and he will do his best to answer it. If he cannot, and he thinks one of our readers might be able to help, he will print your query in this feature. Questions should be sent on postcards bearing your full name and address (but these will not be published if you put them in brackets and just add your initials or a pen name). Address them to Tom Sheridan, *Meccano Magazine*, Thomas Skinner and Co. (Publishers) Ltd., St Alphage House, Fore Street, London, E.C.2.
You may submit as many questions as you like. We will deal with as many as possible each issue.

Calling the Earth

Q. *Is it true that people on other planets are signalling the Earth?—'Astronome', Eastleigh, Hants.*

A. We cannot say; because, if they are, we have not been able to recognise their signals. But the increasing use of radio telescopes may increase the chance of our intercepting any intelligible signals originating on distant worlds which may have produced life. Attempts to produce a 'cosmic language', based on mathematics, have already been made. A Dutch scientist, Professor Hans Freudenthal, worked out a system called Lincos in great detail and America's Space Administration experts are also working on the problem. However, we cannot be certain that extra-terrestrial forms of life, even if highly intelligent, would necessarily think and communicate in the same way that we do.

Letters by Air

Q. *When was the first airmail flight made in Britain?—A. K. Pudsey, Yorks.*

A. On September 9, 1911, when a Bleriot monoplane piloted by Gustav Hamel carried official letters from Hendon to Windsor. Public mail was carried on seven later journeys from London to Windsor on September, 11 and 12.

Steam cars

Q. *Who designed and produced the first automobile?—L. P. B., Warrington, Lancs.*

A. A French artillery officer, Joseph Cugnot, built the first experimental on record, in 1769. It was a massive, three-wheeled, steam-propelled vehicle, mainly intended to tow guns and its maximum speed was less than three miles an hour. At its second trial it blew up and was abandoned as impracticable. In 1786 William Symington, famed for his steamboat, built a working model of a steampowered road vehicle. At about the same time, William Murdoch, inventor of coal-gas, demonstrated a three-wheeled automobile driven by steam; and in 1803 Richard Trevithick, originator of the steam locomotive, produced a steam-powered road vehicle which ran at nine m.p.h. and drew a coach through London streets. (see below.)

Melting metals

Q. *Which metals are the easiest to melt?—Stephen Hertz, North Finchley, London.*

A. The melting point of metals varies over a wide range of temperature—from mercury, which melts from the frozen state to a liquid at 39 deg. below zero Centigrade, to tungsten, which melts at about 3,300 deg C; hence its use in electric lamps. Sulphur melts at 113 deg, tin at 231 deg, lead at 327 deg, zinc at 419 deg, and aluminium at 660 deg C. The melting point of silver is 961 deg; of copper, 1,083 deg, and of iron, 1,535 deg C.

Pen Pal

Q. *How can I find a pen friend overseas?—'Teenager', Rochford, Essex.*

A. Write to the International Friendship League, 21 Wyndham Road, Birmingham, 16. Give your full name and address, age, and interests, say whether you wish to correspond with a boy or girl and in which country. If you are over 16, you should enclose 2s; if under 16, the service is free. In any case, send a stamped, self-addressed envelope. Countries where the League may find you a pen friend who can write to you in English include Sweden, Holland, Germany, Italy, Turkey, Thailand and Japan—and, of course, U.S.A. But you need not limit yourself to these countries.

Deadly Frog

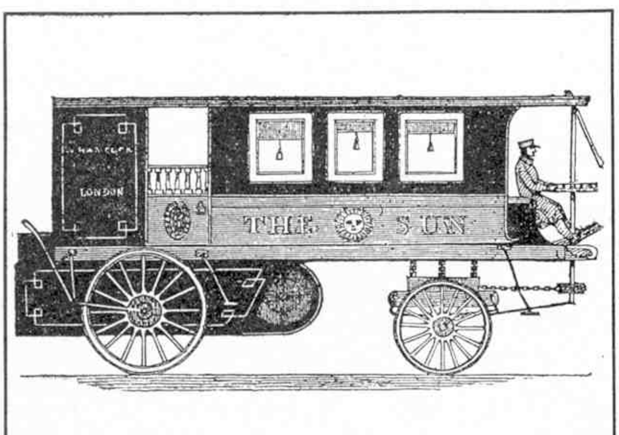
Q. *Which reptile has the most deadly poison?—'Snake lover', Horsham, Sussex.*

A. Of some 1,500 species, about one-third of the world's snakes are poisonous. In Africa, the most deadly are the horned viper and the puff adder; in India, the cobras and keraits are the most venomous, and Russell's viper claims thousands of victims every year—yet its poison has proved valuable in treating sufferers from haemophilia. The ten-foot king cobra of Malay is another dreaded killer. But a frog found in Columbia, *Phyllobates bicolor*, possesses a poison stronger than any snake's. It carries it in its skin, and a few millionths of a gramme is enough to kill a rabbit.

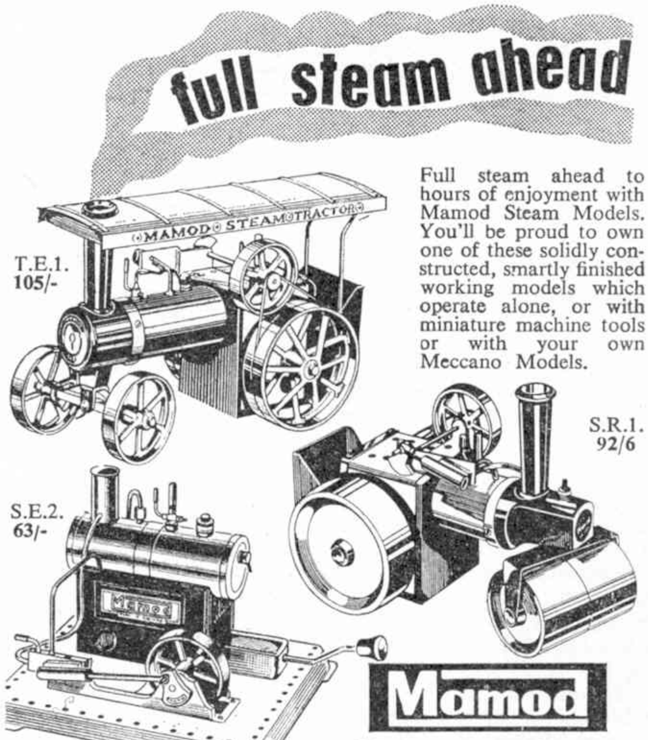
Handsome Jack

Q. *How long was Jack Hawkins in films before he became a star?—K. M. T., Tamworth, Staffs.*

A. A Londoner, Jack Hawkins was on the stage before he made his film debut in *The Lodger* in 1932. His first big screen chance came in *State Secret* in 1950, when he was entering his 40s. Three years later, he was a top star at the box office. Among his successes are *No Highway*, *Mandy*, *The Seekers*, *The Long Arm*, and *Land of the Pharaohs*.



full steam ahead



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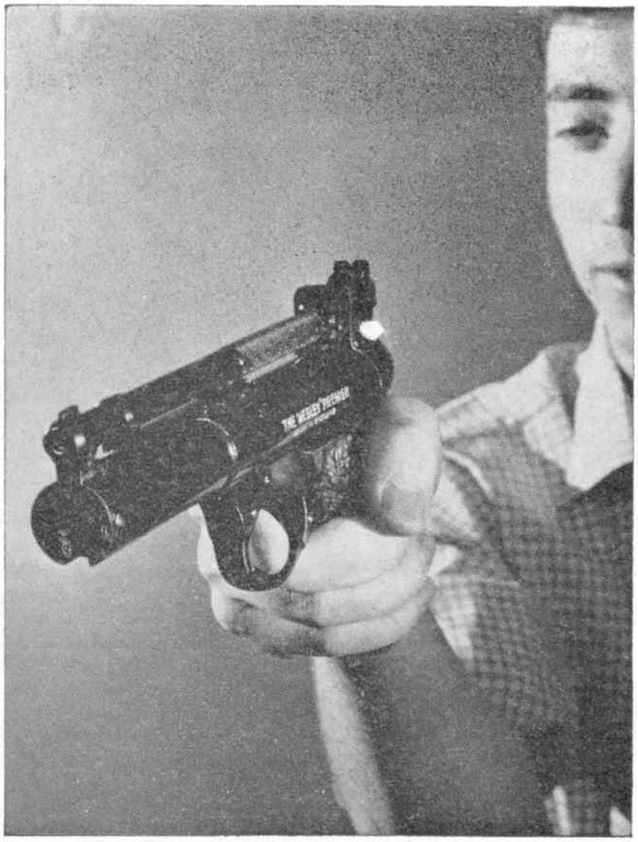

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Camera angle by **Paul Dong**

Correct Exposure

WE see objects because the light that falls on them is reflected into our eyes. But not all objects reflect the same amount of light; some absorb light, while others, such as white-washed walls, snow, the sea, and objects such as silver and chromium plate, reflect nearly all of the light that falls on them. Trees, bushes and dark cloth reflect very little light, so they appear darker.

This difference in reflective properties of various subjects and the further effects of the brightness of the light which falls on them is coped with pretty efficiently in our eyes by the iris. This built-in light control automatically opens and closes according to light conditions. However, it can sometimes be subjected to more light than it can control, on a sunny day for example, and then we have to wear sunglasses.

The actions of the iris can be seen very clearly in a cat. In daylight it is just a narrow slit, but at night it opens to a large hole to allow as much light as possible to pass. A similar principle to that described above is used to control the light that enters a camera, but unless we have one of the new, automatic cameras, we have to make our own adjustments on the controls provided.

Correct exposure is the foundation of good photography; if your negative is over- or under-exposed, the prints must suffer. Exposing a film in a camera is similar to filling a bucket; you need just the right amount, and this can be controlled in two ways: one is the length of time the tap is turned on and the other is the volume of the flow of water. On the camera our two controls are the shutter, which allows the light to pass for a set time, and the aperture, or iris, which adjusts the strength or volume of the light.

The shutter is usually scaled as follows: 1 second, 1/2, 1/5, 1/10, 1/25, 1/50, 1/100, 1/200. Speeds may differ slightly, but are usually in a set sequence so that each step is half the preceding one. The aperture is recognisable by the fact that the number is prefixed by the letter f. A typical sequence is f4, 5.6, 8, 11, 16, 22. The lower the number, the larger the aperture and consequently the strength or volume of the light allowed into the camera. Again this series of numbers may vary according to the camera, but each step up the scale means half the amount of light . (A limited number of cameras were made in earlier years with the apertures numbered 1, 2, 3, 4, etc. If your is like this you will need a conversion scale in order to use modern methods.)

When we have assessed the correct amount of exposure for a given subject and light condition, we can make use of these controls to give special results. Suppose our exposure is 1/50th sec. at f8 and the subject to be photographed is a person running. With this slow shutter speed we will not be able to stop the action and will get a blurred photograph. By using a speed of 1/100th of a second, we can stop the action, but have to open the aperture to compensate for the loss of light passed, to f5.6.

If our subject is static, a view of a country lane, for example, we need a small aperture and a slow shutter speed to obtain depth of field (as mentioned last month).

The correct amount of light required to produce a good negative is called the 'exposure value' and a number of cameras are now being made which, once the exposure is set and the mechanism locked, if either the shutter or aperture is adjusted, the other is automatically altered with it.

Exposure Value

By now you are probably wondering how to find the correct exposure value? There are two simple methods. One is either to guess, which will waste a lot of film, the other is to use the little piece of paper packed with the film. Unfortunately, there is not much space on this piece of paper, so the manufacturers can only give information for a few possible light and subject conditions.

The expensive answer is the photo-electric exposure meter costing several pounds which, although the most accurate method, takes some getting used to and must be used with great care, otherwise it will give false results. It works by the action of light on a cell which generates a small electric current according to the strength of the light. This shows on a scale and when you have set this figure on the dial, you can read off the exposure required round the edge. But don't forget to set it to the film you are using before you start.

Because it is a delicate instrument, the meter must never be dropped or knocked. When in use, it should be pointed slightly towards the ground, otherwise it will pick up some of the direct light from the sky instead of the reflected light from your subject and give the wrong result. The sky is usually two or three times as bright as the object on the ground.

The most economical method and one which is certainly accurate enough for the majority of subjects, is an exposure calculator which costs five shillings. This is a small plastic disc on which you set the weather and subject, speed of film and time of day. The correct exposure can then be read off. These calculators are made in several types for daylight, indoors, flash and colour photography.

In well-lit interiors expose as for close-up subjects in light shade. If sun is streaming in expose for close-up in unshaded area. 1/25 at f8

Choice of Film

There is a variety of films on the market, the black and white films being split into three main categories: slow, medium and fast, according to their 'speed' or sensitivity to light.

The most popular for box camera owners is the medium film such as Verichrome-pan. These cameras are not equipped with any of the controls we have mentioned and this is a good average film. For high speed photography, such as sports, or working in poor light conditions, which we can certainly get in an English winter, the faster films, such as Ilford H.P.3, are needed. At the other end of the scale are the slower films such as Panatomic X.

Exposure of subjects taken against the light should be calculated in the normal way unless the sun is obscured, then you can open the aperture one stop. Use a lens hood to protect from direct sunlight. This photograph was 1/100th at f16

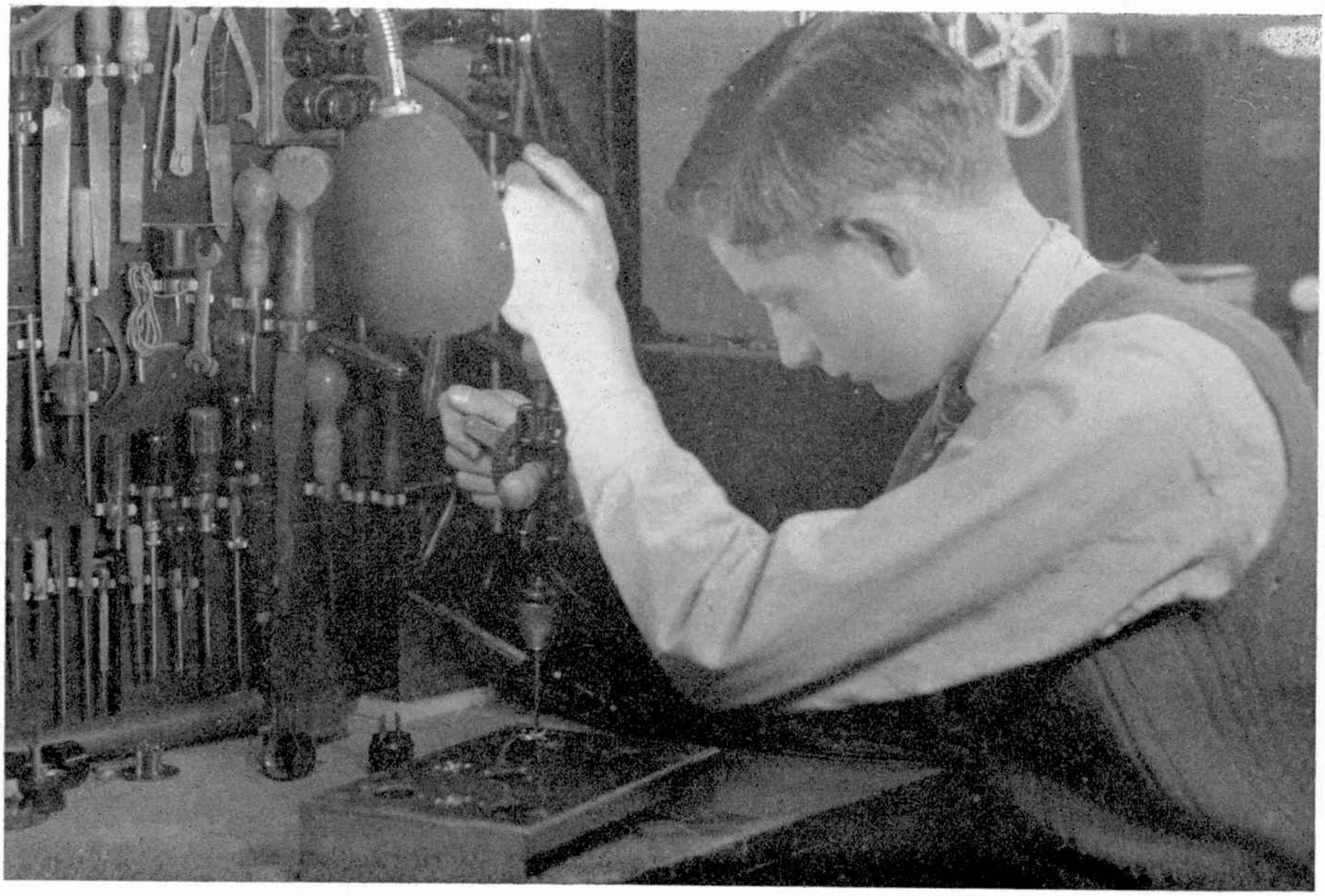
This film is ideal in very bright conditions or when big enlargements are needed.

If we look at a negative under a powerful magnifying glass, we can see that the picture is not solid, but is made up of a large number of grains similar to the dots in a newspaper picture, but much smaller. If we use a fast film and the wrong developer, it is possible to see the grainy effect on even a medium enlargement, so people with 35 mm. cameras, who want to avoid this effect, usually use the slower and less grainy film whenever possible.

Films also vary slightly in the way they reproduce different colours, so if you don't like the results you are getting with your normal film, try another.

If, on the other hand, you are in the habit of buying any film that the chemist or photographer has in stock, study your results carefully and decide which you prefer and stick to it.

People who don't know what they are talking about say there is no difference in the various films made, but there is and if you look closely at two different types you can see the difference. All good photographers have their own pet film, developer and type of camera.



Introduction to ELECTRONICS

This month, F. C. Judd, A.Inst.E., begins a brand-new series of Radio Hobbies' articles which will show how to construct various types of electronic equipment, from a simple transistor radio to a record player . . . .

HOW would you like to build your own transistor radio set or even a radio control unit for the model aircraft you have just completed? Once you have a basic understanding of electronics, this work becomes extremely easy, providing you have the necessary components and diagrams to complete the task.

Over the next few months I hope to be able to pass on to you the necessary know-how and knowledge for you to build these working units and I will describe each step in detail so that even the complete novice can tackle the work without trouble.

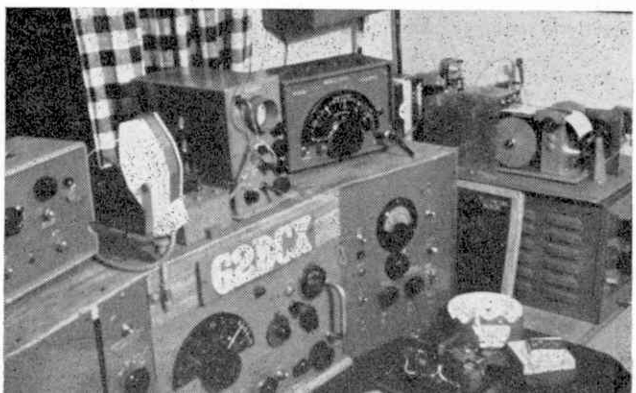
Personally, it was over 30 years ago, after reading a book similar to Meccano Magazine, that I first became interested in radio. In fact, I found this 'new' hobby so interesting that within a few years, I proudly gained a Post Office Amateur Radio Licence under the call-sign G2BCX, a licence which I still hold and use. Eventually, this hobby led to a career in radio and later, the more sophisticated branch of the profession called Electronics.

Many leading radio and electronics engineers of today began their careers in a similar manner to that which I have described, although some were simply introduced to the hobby by a friend. However, no matter how you become interested in radio, you will find that all who practice this hobby, especially the radio amateurs, are friendly and always ready to lend a helping hand and pass on the benefit of their knowledge. Perhaps I should mention here and now that there are many radio clubs in this country, including the Radio Society of Great Britain, which are open to people of all ages, but more of this later.

Taking up Radio

Firstly, your head is probably full of questions about radio or electronics. What does it offer? What does it

Part of the Author's Radio Station—G2BCX.



cost? Can it be practised without very special knowledge? How much space is needed for a workshop? Is it dangerous? No doubt there are also many other questions you would like to ask and I hope to answer these as we progress. However, at the moment, I will deal with the important ones above.

What exactly do radio and electronics offer? Building radio sets for example or radio control units for your models. Perhaps you would even like to communicate by radio with other enthusiastic radio transmitting amateurs. There are already quite a number of licensed transmitting amateurs in this country between the ages of 14 and 16 who operate their own stations. But don't rush out and buy a transmitter yet, because you have to pass a technical examination and a test in sending and receiving the morse code at 12 words per minute, before you can hold the coveted licence.

I could go on almost indefinitely about the different branches of radio and electronic hobbies. Electronic gadgets for instance that operate at the touch of a button or by voice control, electronic music and musical instruments, Hi-Fi sound, tape recording and even computers—all are within reach of the keen amateur. I've no doubt that some of the photographs with this article will fire your imagination, but let's not be too hasty, for one has to begin, as with all things, at the beginning.

Is it Expensive

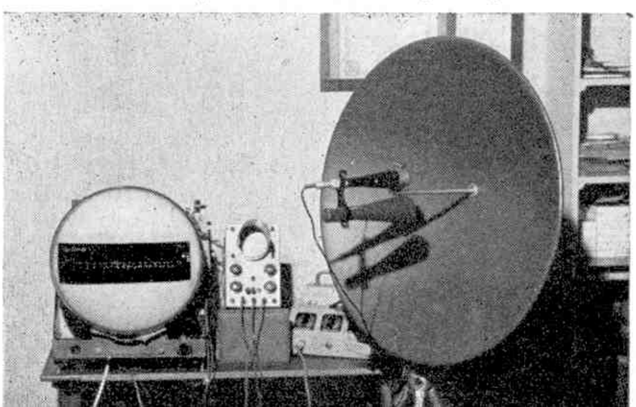
The next question was about cost and this can be answered in a very few words; as much as you wish to spend or as little as you can afford. During this series I will let you into a few secrets on how and where to get components, valves, transistors, and so on cheaply, but of the right kind.

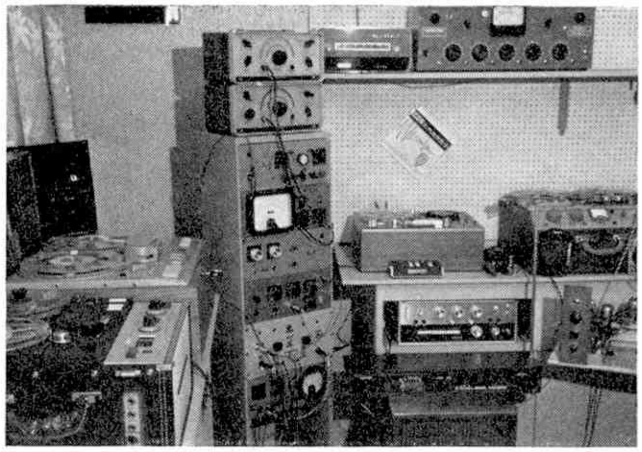
Do you require special knowledge? Well, this depends; you don't need a great deal at first, because fairly simple gadgets and radio sets can be built from special plan diagrams which show how the components and other parts are assembled and how they are wired. Later, you may find that you can build from a 'theoretical' circuit and become a real expert in designing your own equipment. To be an expert in any subject only comes from practice and knowledge.

The question about workshop space I will leave until last and deal with the question—IS IT DANGEROUS? The answer to this is definitely NO. Even when you progress and use higher working voltages with your equipment, the answer is still no, providing you take simple precautions. Fortunately, in this age of transistors, there is rarely need to use anything other than ordinary dry batteries to supply the necessary electricity. However, if at some later date you finally progress to transmitting, Hi-Fi or recording, you will be expert enough to handle high voltages.

The Editor has asked me to deal each month with something that can be built for very little outlay, but which can be used later as progress is made. But, before you can make anything, you will require a few tools and a workbench. My first workbench was a kitchen table and a large box in which to store the tools and parts.

Equipment for measuring the speed of sound





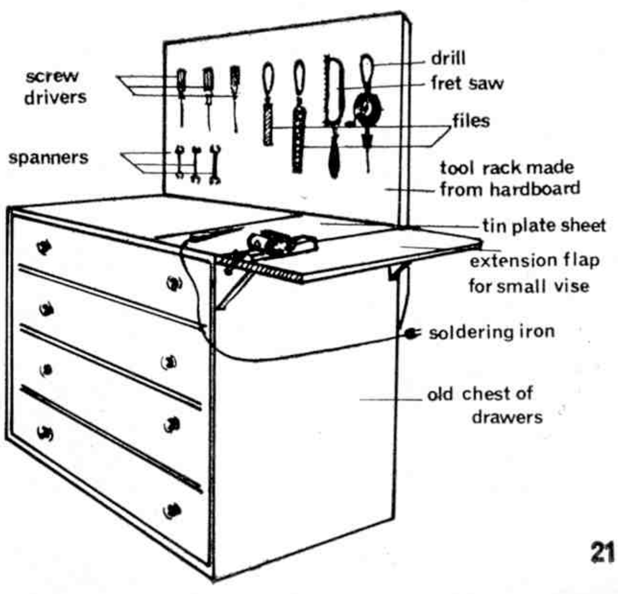
Studio for recording and electronic music.

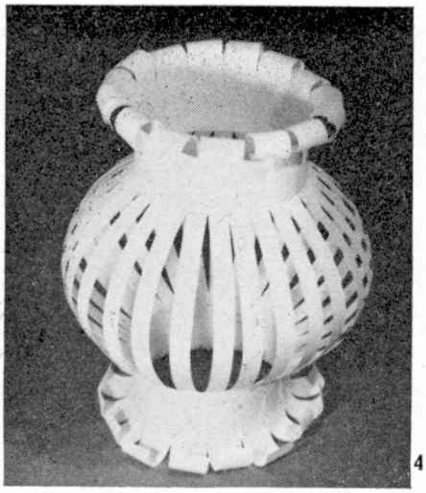
If you are lucky enough to find a corner in a spare room or a shed in the garden, you have the ideal work place. An old chest of drawers makes a fine workbench and also provides storage for tools etc. Below, I have outlined a typical tool bench layout for those who have a little space. In radio and electronics it pays to *be tidy and keep all things in their rightful places,* especially the tools.

Do you have a birthday coming? If you have, get someone to buy you an electric soldering iron and a reel of resin-cored solder, which needs no flux and is used by all radio enthusiasts for solding wires and parts. You can get an excellent *pencil-bit iron* for less than a pound made by Solon. Most electrical shops and ironmongers sell them. One important point is to make sure you have it properly connected to a *three pin plug.*

The soldering iron is the most important tool, but second to this come a pair of side-cutters or thin-nosed pliers with side cutters, or both, a screwdriver with a $\frac{3}{16}$ in. blade for larger screws and a small screwdriver with a $\frac{1}{8}$ in. blade. For drilling holes you might temporarily borrow a wheel brace and some drills, although it will be necessary to eventually obtain your own brace and a set of drills from about $\frac{1}{16}$ in. up to $\frac{1}{4}$ in.

Next month, we can make a start with something practical by building a simple radio set from plan diagrams.

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The thick dotted lines indicate scoring on the front of paper, thin dotted lines indicate scoring on back. Thin continuous lines show where you should cut through the paper.

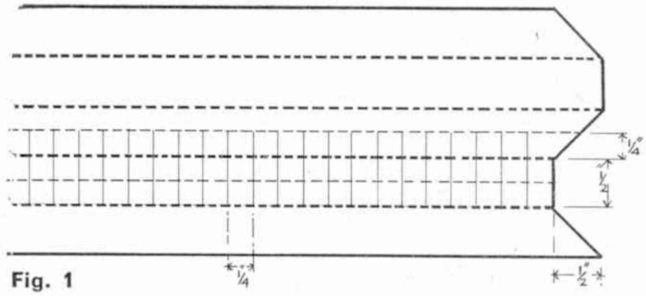


Fig. 1

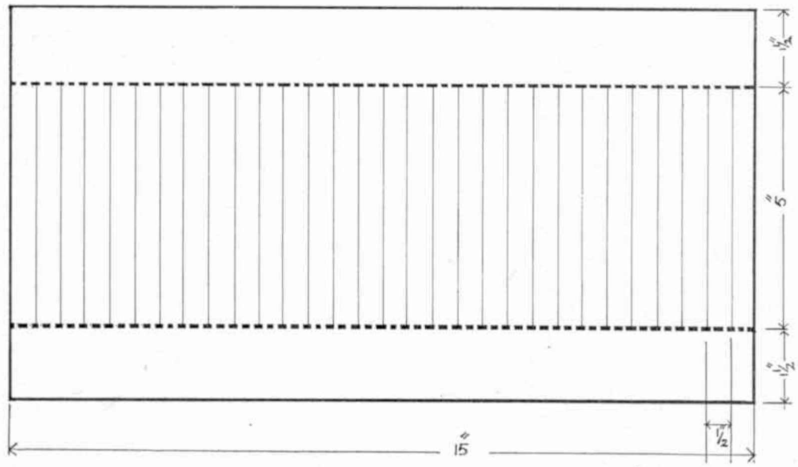


Fig. 2

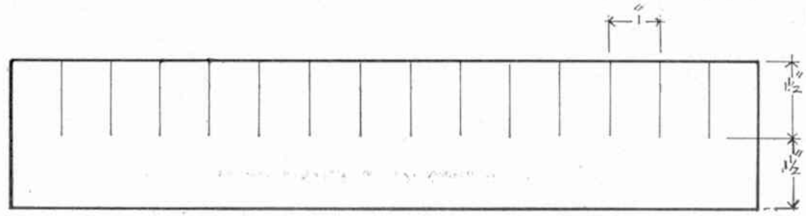


Fig. 3

Frames and Lanterns

LAST month, as an introduction to paper modelling, I showed how to make a simple picture frame. In this issue I will take you a step further and show how to make more complicated frames, as well as a Chinese lantern.

Some of these models will involve techniques you have not yet learnt, but the principle of the rectangular frame can easily be adapted to making triangular, pentagonal, hexagonal, or for that matter, circular sectioned frames. All you have to do is decide the number of sides you require on your frame, add one extra for the joining flap, score the lines and join as illustrated last month. Thus, for a triangular frame you need to draw three sides, plus one for the joining flap.

Ribbed Frames

In last month's exercise we only scored the paper on one side to make the rectangular frame. Can you imagine what happens if we score the paper on alternate sides and then crease it away from the scored lines? Try it. You'll find that this is where paper-modelling begins to get interesting. Figure 1 shows the working drawing for a ribbed frame, employing the technique of scoring on both sides of the paper. Do not cut along the vertical line if you require only a ribbed frame. While following it, make sure that you fold the paper away from the scored side. Photograph 1 (top) shows the unit when joined together with clear glue or Bostik.

Ribbing and Cutting

Some very fascinating effects can be obtained by combining ribbing with cutting. Follow figure 1, score the paper where indicated and mark out vertical lines at quarter-inch intervals and cut along them. Now fold and join the frame unit. With a pointed tool press the alternate cuts inwards (see photograph 2) so they set back in the frame. Photograph 1 (bottom) shows the decorative effect you should achieve if you follow the instructions correctly.

Making Chinese Lanterns

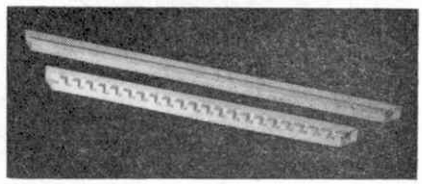
The idea of making Chinese lanterns is very useful for cheering up the decor at a birthday or Christmas party. Although the lantern illustrated is one of the simplest to make, you may vary the dimensions of your model to make different shapes. Naturally, you can also use different coloured papers for different lanterns, or even for the components of one lantern.

Follow figure 2, score and cut where indicated. Roll it in a cylindrical shape and staple it together with a stapling machine. This will give you the basic Chinese lantern shape.

In order to complete the last stage and add extra decoration to the lantern, follow figure 3, and cut the paper where indicated. The technique of 'curling' paper, which is the last stage in mastering paper sculpture, is achieved by inserting the paper between the thumb and the edge of a ruler or paper knife, and gently pulling the paper through. This has the effect of moulding the paper. The depth and strength of the moulding can be varied both by the pressure and the angle at which the paper is pulled between the thumb and tool.

To play safe, experiment with a couple of strips of spare paper before you actually mould the model. When you have attempted to curl the model, you may accentuate the curls with your fingers. After you have completely curled all the cut sections of paper, you may assemble them around the basic lantern you have already made. Photograph 4 shows the completed model.

M. Jones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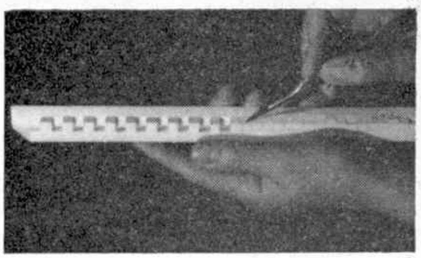
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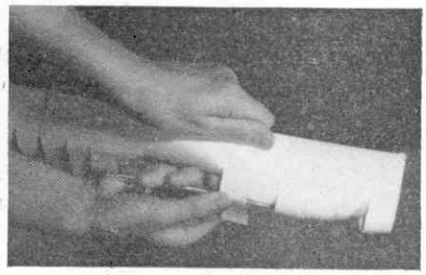
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by **John Crossman**

Keep it fine

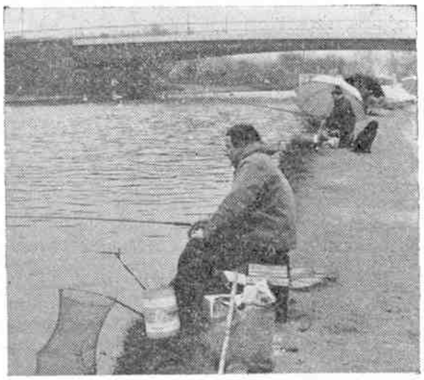
'FISH fine for fine fish', is one of the oldest of anglers' sayings and, applied with commonsense, it is also one of the soundest. Fishing fine means to use a line and hook-length of as small a diameter as possible without running the risk of having your tackle snapped by the fish you hope to catch.

Many successful anglers also make it a rule to fish as 'light' as they can, that is, to use the minimum load of split-shot necessary to cast where they want and to present the bait correctly.

Other anglers claim that fish are not 'tackle shy'—only 'man shy'. To test which is superior I suggest that you fish with a companion—one using coarse line and heavy tackle, the other fishing light and fine. On nine out of ten waters I'm sure that finesse will give the best results—certainly it will result in more bites.

Let's consider the advantage of using a 3 lb. breaking strain nylon monofilament line compared with a 6 lb. line. The diameter of the lighter line will be about 0·008 in., compared with 0·011 in.

The thicker line weighs heavier and



A week-end scene on the River Thames near Oxford. Fine line fishing is essential in spots such as these.

because of its bulk offers greater resistance when moving through air or water. Translated into fishing terms, the lighter line will permit a longer cast (presuming the load of shot on each line is identical), a faster strike (especially when the line is submerged in the water) and will present the bait in a more natural manner.

Theoretically, the lighter line should be less visible, but I doubt whether scientists will ever create a line that is truly invisible to fish. More important is this question of resistance when a fish takes the bait. One of the faults of nylon monofilament — though improvements are constantly being made—is that the heavier the gauge — the stiffer the line becomes. In the finer sizes, below about 4 lb. breaking strain, it is wonderfully soft and supple and is ideal from the angler's viewpoint.

Most fish suck food into their mouths and are capable of drawing in small food items in much the same way that a vacuum hose can suck in dust particles which are several inches away.

Fish feeding on maggots, wheat, or hempseed thrown in by an angler, expect the bait to come easily into their mouths. If it doesn't, because it is tethered to a thick and clumsy line, they either eject the bait instantly or scorn it altogether.

When larger baits are used, such as potatoes when carp fishing, the fish seem to expect greater resistance and their suspicions are not aroused so quickly by a comparatively thick line.

As a guide to suitable line strengths, I seldom use a heavier line than 2½ lb. breaking strain when roach fishing. The only time I would change to something slightly stronger would be when extremely long casting was necessary or when fishing in or near weed beds. It is worth noting that the shock of casting a leger weight or a couple of swan shot (the largest size of split-shot there is) can break lines of less than 3 lb. breaking strain.

For tench fishing I generally use a 4 lb. line, but again, in heavily-weeded swims I do not hesitate to use a stronger line. I know that with the latter I will not get so many bites, but at least I will have a good chance of landing any fish I hook.

I don't think it necessary to explain in detail why heavy shotting should be avoided if possible. Experience will soon convince you that in waters of moderate depth, fish become alarmed by the disturbance of large floats landing just above their heads. I will discuss shotting arrangements in a later article.

by **David Kaye**

Highland Buses

I did not expect to find many buses at Fort William, when I chose this spot as my centre for touring the West Highlands of Scotland last Whitsun. However, I quickly discovered that, at certain times in the day, Gordon Square, down on the shores of Loch Linnhe, became a hive of public service vehicle activity. There can surely be few places in Britain more picturesque and breathtaking than this scene, where road, rail and steamers terminate within a matter of yards of one another?

The trains are on the West Highland line of British Railways, which runs out from Fort William to Inverlochy Junction, where the single tracks fork left for Mallaig and right for Glasgow. It is along the former

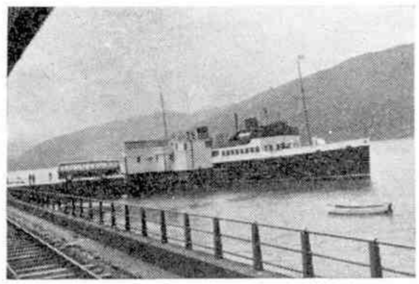
MacBrayne No. 47. (WGG 636) A.E.C. 'Reliance' with a Duple C41F body by Fort William Pier.

branch that the famous ex-Coronation Scot observation coach runs every day to give the passengers unsurpassed scenic thrills. Nevertheless, Dr. Beeching has his eye on the line and in the near future it is likely that the intermediate stations will close, one of which, Locheilside, was built during the last war for commandos and another is a privately owned halt. In this eventuality, David MacBrayne will link their Fort William to Glenfinnan and Mallaig to Arisaig services to give a through route across this sparsely populated area. On both these separate routes I saw some of the Company's useful little Bedford C5Z coaches with 29-seat Duple bodies.

MacBraynes also run the steamer services in the West Highlands and these link up with buses at not only Fort William, but also at places like Ballachulish Ferry. Another unusual feature of these green and red buses is that they all bear the legend 'Royal Mail' on their rears. One night, returning from the local cinema at Fort William, I spotted No. 95 (848 HUS) squeezing down the alley from behind the G.P.O. This Bedford VAS1 has a Duple body, the front half of which has seats for 12 passengers, whilst the stern section has reinforced glass and inside was a pile of mail bags. This was in fact the 10.15 p.m. to Kingussie, which starts the return journey at the unearthly hour of 4 a.m.!

Although the fleet numbers of MacBraynes reach 193, many of these are not p.s.vs, but lorries and vans engaged in yet another side of the Company's activities—the general carrier and haulage business.

Fort William itself is growing quite fast



Midland Red Coach 4227 (UHA 227) alongside the T.S.M.V. 'Lochfyne'.

as an industrial and tourist centre. A new paper and pulp mill is under construction, whilst the Caledonian Canal is being widened and deepened to take Scandinavian timber ships to supply the raw material. Since the town stretches for several miles along the shores of Loch Linnhe and Loch Eil, there are a surprising number of buses employed on local routes out to the suburb of Corpach. These are made up of a mixed bag of Maudslay 'Marathons', A.E.C. 'Regal IVs' and A.E.C. 'Reliances'.

MacBraynes began as early as 1851 when it was decided to build the 'Mountaineer' steamer; long before any railway engine had penetrated to this remote region. The first bus, a second-hand Daimler from the Isle of Wight, arrived in 1906 and was soon followed by a new, chain-driven Albion, with a 14-seater toast rack body (C 1327). One hundred and thirteen years is a long time, but it looks as if MacBraynes will still be serving the West Highlands in 2077, probably with monorail and hovercraft.

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The Kit complete with Jaguar ·177 calibre Rifle, Target Holder, Target Cards, Tin of Pellets, Pack of Darts, Webley Oil Bottle.
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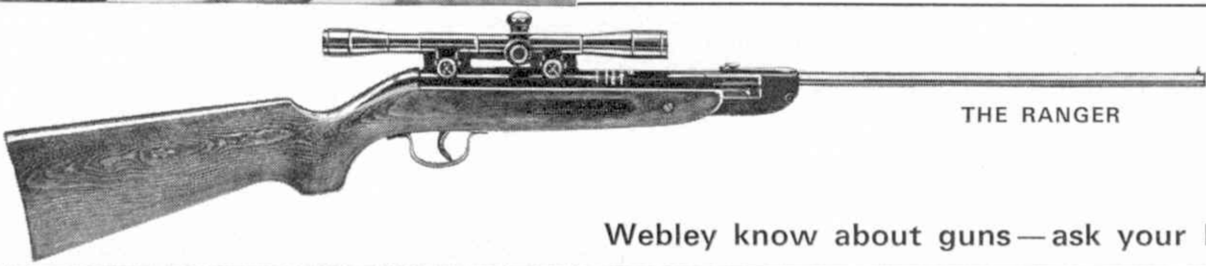

THE RANGER

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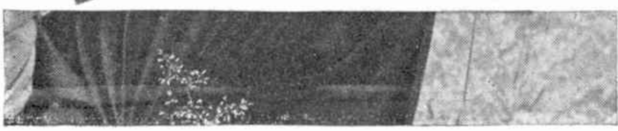

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Cycle care

Check your bearings

IS your bike hard to pedal? Do your pedals grate and rumble? If so, when did you last look at the races in your bottom bracket? It could be that they are badly worn and in need of attention. The job of getting the unit to work smoothly is basically a simple one and need not be expensive. The unit shown in our photographs was a write-off and had to be completely replaced. Sometimes one can get away with a new spindle and ball bearings—a matter of a few shillings.

To start work, find a few bricks or blocks of wood and use them to support the bottom bracket spindle while the cotter pins are tapped free. The best way to do this is to unscrew the nut a couple of turns and then, using a drift as shown in the photograph, hit it hard to jar the pin free. Once released, the pin can be gently tapped out with a punch. If this method is used carefully, it is possible to re-use the cotter pins.

Tap the locking ring round anti-clockwise on the side opposite the chainwheel. Then use a spanner similar to the one shown to unscrew the adjustable race. The final dismantling job is to use a large spanner or an adjustable to remove the fixed race.

Next, clean up the races and the spindle with paraffin and inspect them for damage. (I hope yours are not in the state of those in the photograph!) If they are, it will cost you a little over eight shillings for a new spindle, cups, ball bearings, lock ring and cotter pins.

New race and spindle?

Any sign of pitting in the case hardening on the track, where the ball bearings run inside the races, means a new race and the same thing applies to the spindle. New ball bearings should be fitted in any case. This will avoid trouble later.

While everything is dismantled, use a toothbrush and paraffin to clean up the threads inside the bottom bracket shell and try the new cups to make sure they are free running.

Load the fixed race with grease and position the **eleven** ball bearings around it. Lay the bike down and screw in from underneath. Make sure it goes in the chainwheel side and remember it is a **left-hand** thread.

Put the spindle in position and use it to hold the bearings in place while you turn over the bike. Still holding the spindle, screw the other cup in place, similarly equipped with grease and ball bearings. Remember, when fitting the spindle, that the long side goes on the chainwheel side.

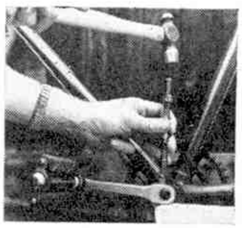
Tighten the adjustable ball race until there is no play in the spindle and then lock in position with the locking ring.

Refit the cranks, making sure that the cotter pins go in the correct way round. The nut should be on top as the pedal is pressed down.

Fitting new cotter pins is not just a matter of bashing them home. Brute force is of little avail. It is most unlikely that a new cotter pin will fit right away. Tap it lightly into position first and when it jams reverse the crank and tap it free again. You will see how far in it went by the mark on the tapered flat.

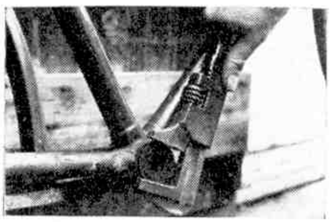
Put the cotter in the vice and file some metal off the flat, making sure it is kept level and smooth. Do this two or three times until the cotter fits. Remember to support the spindle on blocks every time you hammer a cotter pin. The cotter pins, of course, are fitted through their respective cranks in opposite directions.

The final job is to check the adjustment of the bearing. It is almost certain to be loose. Loosen the locking ring and adjust the race until there is no play but the spindle is free to turn, then lock up tight. The work is now complete and your pedals should run smoothly.

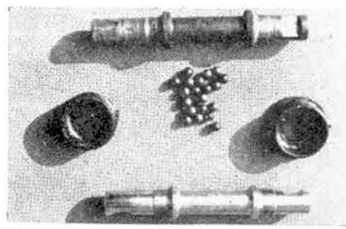


Most important when removing cotter pins is the support beneath the spindle end of the crank. Build up bricks or blocks of wood. Unscrew the nut a couple of turns and use a drift to free the cotter pin.

With cranks and chainwheel removed, the bottom bracket itself can be tackled. Use a hammer and punch to unscrew the locking ring and then the two pegs of a special S spanner to unscrew the adjustable ball race.

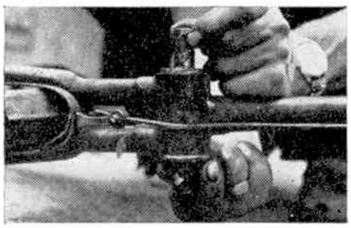


With this unscrewed, the bottom bracket spindle can be withdrawn and probably most of the ball bearings will fall out. The race on the other other side can be unscrewed using an adjustable spanner. The thread is left hand.

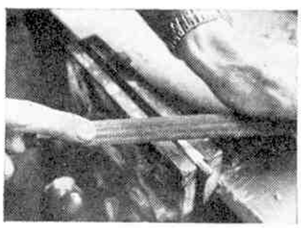


The horrible state of the bearings can be seen here. Grease has hardened on the spindle and there is rust everywhere. The case hardening inside the races and also on the bearing surfaces of the spindle has worn through.

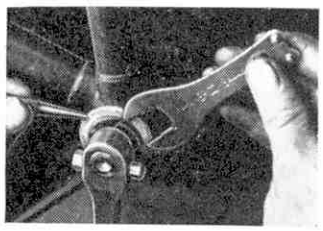
The new fixed race is wiped clean and filled with clean new grease. Eleven ¼ in. ball bearings are carefully placed round the race. Lay the bike on the ground and screw the race in from underneath.



Fill the adjustable race with grease and lay it handy. Push the spindle into the bottom bracket from the top and holding it in place, turn the bike over. Now, as shown, the adjustable race can be screwed in from beneath.



When all is screwed up hand tight and the locking ring has been positioned, the cranks can be refitted. New cotters are unlikely to fit straight away and must be filed until they fit properly.



At this stage, even if the bearings have been adjusted before, some slack will probably be noticed. Loosen the locking ring, tighten the adjustable race and then retighten the locking ring.

Designed especially for Meccano Magazine, by Ray Malmstrong, this unusual pusher-type, rubber powered model is robust and very easy to build . . .

BUILD the MARQUITA

IF you are looking for a model aeroplane that combines simplicity of construction with a good flying performance and one which will attract a lot of attention when you take it on to the flying field, then the Marquita is definitely *your* model. It is a pusher-type aircraft and is certainly an out-of-the-rut model to make. Materials for building are cheap and easily obtainable from your local aeromodelling or hobby shop and construction takes only a few evenings.

The plan given overleaf is full size and, because I want to give you some fairly detailed flying notes, I am keeping the written building instructions to a minimum. The 'easi-build' sketches and illustrations should provide you with all the necessary information to complete the model. You start construction of the fuselage by laying your balsa strips over the plan, separate them carefully and join with cross pieces to form a square section. Cement together and then add $\frac{1}{16}$th sheet side pieces, cabin, nose block and skid as shown after construction.

Cover and Dope

Next cover the fuselage with tissue, the technique of which was shown in last month's Meccano Magazine. Brush tissue with water and, when dry, give one coat of clear dope. Cut out fin and tailplane parts and also give one coat of clear dope, pinning them to board while drying to avoid warping. Finally, cement the fin and tailplane in position on the rear of the fuselage.

The propeller block, which fits at the rear of the model, is made on $\frac{1}{4}$ in. balsa sheet. The $\frac{1}{32}$ in. ply discs give added strength. After constructing the propeller block, drill it accurately and screw in an 18 standard wire gauge (s.w.g.) brass bush. Before fitting the K.K. plastic propeller, you will need to cut or file off the spinner portion to provide a flat surface. Assemble propeller and cup washers on the drive shaft and insert the shaft through the bush. Finally, form a hook on the shaft, checking that it does not touch the inside of the fuselage when turning. The propeller block should be a tight fit in the end of the fuselage and can be given two coats of dope.

Make a tracing of the wing panel from the plane and reverse it for building the right-hand wing section. Build the wing in two halves and then join them by cementing together the centre ribs. Add the leading and trailing edge (L.E. and T.E.) centre pieces. Pin the centre section to the building board and check, before the cement dries, that you have 2 in. clearance under each wing tip. This dihedral is important.

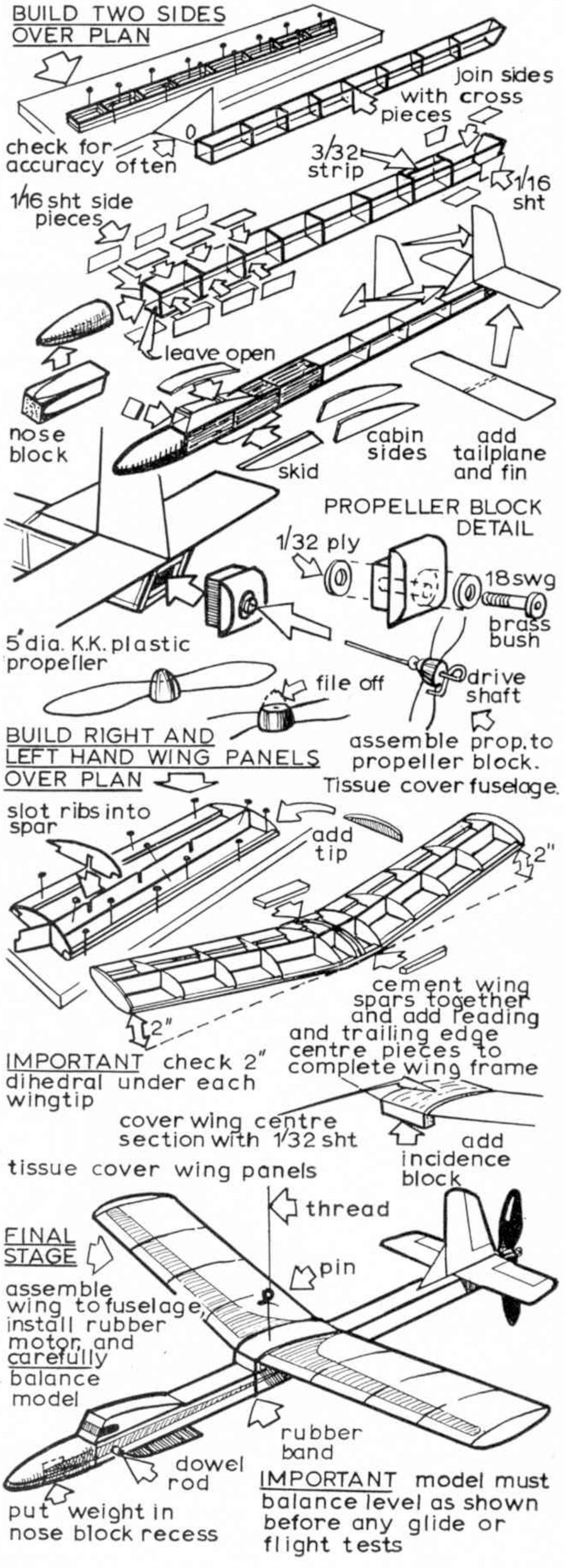
Cover wing panels with four pieces of tissue. Water shrink as described and then give one coat of dope. An important point when shrinking and doping is to do ONE panel at a time and during drying, pin panel to the building board, raising it on small balsa blocks as shown on plan to prevent the under-surface sticking to the board. Pinning down ensures a warp-free wing. Cover centre section with $\frac{1}{32}$nd sheet balsa and cement incidence block in place. Assemble wing to fuselage in position shown on plan with a not-too-tight rubber band.

Take 36 in. of $\frac{3}{16}$ in. strip rubber and tie to form an 18 in. loop. Apply some rubber lubricant (4d. a tube) and with the aid of a weighted length of thread, pull the rubber motor through the fuselage. Anchor at the front with a dowel rod and fit the other end over the drive-shaft hook. Wind the propeller a few turns to take up the motor slack and push the propeller block into place at the end of the fuselage.

Now comes the very important business of balancing your model. *Do not attempt any flying before doing this.* Add lead or a piece of old, rolled-up cement tube to the recess in the nose block, until the model hangs level when suspended from the point marked C.G. (centre of gravity or balance point) on the plan. Your model should then be perfectly balanced.

Flying your model

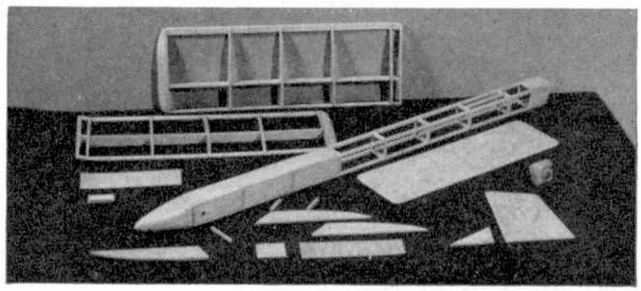
Choose a calm day and a field with long grass for your first flight. Hold the model by the propeller and rear end in one hand. You'll soon get the knack of this! Then, gently push the model forward and let go. If a breeze is blowing, launch the model into the wind. If the model dives, move the wing slightly forward. If it stalls (nose goes up and it slides back on its tail before diving to the ground) move the wing slightly back. The perfect launch,



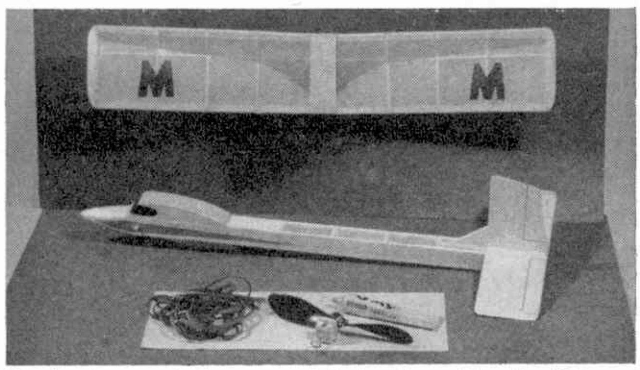
from a height of five to six feet, should provide a straight glide with the model landing about 10 yards away.

Before trying a 'powered' flight, it will be necessary to cement a $\frac{1}{16}$th square strip of balsa to the *left-hand* side of the propeller block (viewed from rear) for 'trimming' your model. Once you have done this, you may wind on about 150 to 200 turns on the propeller (anti-clockwise) and launch your model as already described. Avoid throwing the model and as each successful flight is completed you may increase the number of turns on the motor to a maximum of 650. Although the Marquita is only small it flies quite a long way, so make sure that the field you fly in is large or you might easily lose your new model.

6 strips $\frac{3}{32}$ in. by $\frac{3}{32}$ in. by 36 in. medium grade balsawood.
1 sheet $\frac{1}{16}$ in. by 3 in. by 36 in. medium grade balsawood.
1 small block $1\frac{1}{2}$ in. by 1 in. by 1 in. medium grade balsawood.
Scrap pieces of $\frac{1}{32}$ in., $\frac{1}{8}$ in. and $\frac{1}{2}$ in. sheet balsawood.
Small piece of $\frac{1}{32}$ in. plywood.
1 sheet lightweight tissue (white)
1 sheet lightweight tissue (coloured) if trim is desired.
1 18 S.W.G. brass bush.
1 6 in. length cup washers.
36 in. length $\frac{3}{16}$ in. strip rubber.
1 4 in. approx. rubber band.
1 in. length of $\frac{1}{8}$ in. diameter dowel rod.
1 5 in. diameter K.K. plastic propeller.
1 medium size tube balsa cement.
1 small tube tissue adhesive.
1 small tube rubber lubricant.
1 small bottle clear dope.
Modelling pins, tracing paper, razor blades (single-edge), build-board, drill, small pair of pliers, medium file, 45° set square, pencil and a soft brush.

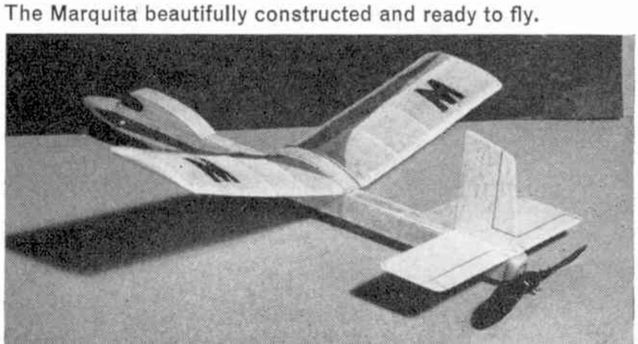


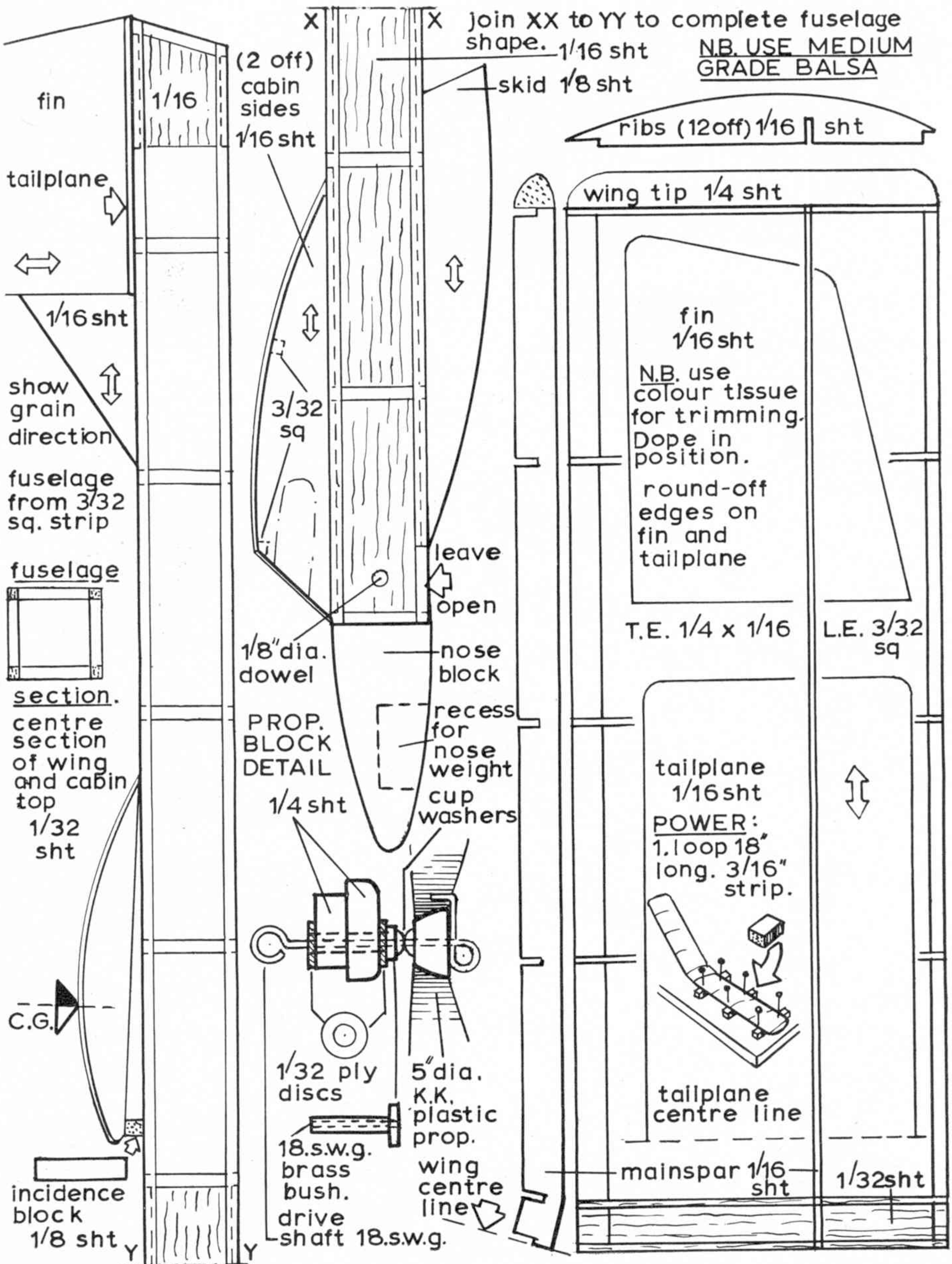
The balsa sections ready for final assembly.



The fuselage and wings completed and awaiting the fitting of the rubber motor.

The Marquita beautifully constructed and ready to fly.




X
X
join XX to YY to complete fuselage shape.
1/16 sht
N.B. USE MEDIUM GRADE BALSA
fin
1/16
(2 off) cabin sides 1/16 sht
skid 1/8 sht
ribs (12off) 1/16 sht
tailplane
wing tip 1/4 sht
1/16 sht
fin 1/16 sht
show grain direction
3/32 sq
N.B. use colour tissue for trimming. Dope in position.
fuselage from 3/32 sq. strip
round-off edges on fin and tailplane
leave open
fuselage section.
1/8"dia. dowel
nose block
T.E. 1/4 x 1/16
L.E. 3/32 sq
centre section of wing and cabin top 1/32 sht
PROP. BLOCK DETAIL
recess for nose weight
cup washers
1/4 sht
tailplane 1/16 sht
POWER: 1. loop 18" long. 3/16" strip.
C.G.
1/32 ply discs
5"dia. K.K. plastic prop.
tailplane centre line
18.s.w.g. brass bush.
wing centre line
mainspar 1/16 sht
1/32sht
incidence block 1/8 sht
drive shaft 18.s.w.g.
Y
Y

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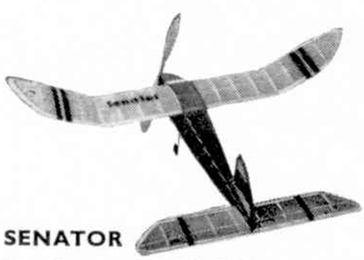
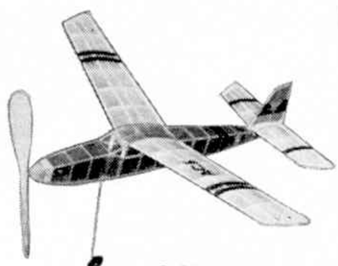


SENATOR

Novel contest model which is capable of a fine performance. Features a single leg undercarriage. Wingspan 32 in. **8/9**



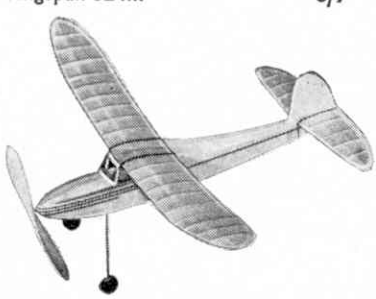
ACE

Sleek cabin model. Construction is very simple, and the number of cut-out sheet parts have been kept to a minimum. Wingspan 30 in. **7/7**

KEILKRAFT *Gemini*

GEMINI

Beginners duration model with fuselage parts, tailplane and fins, in pre-cut pre-decorated sheet balsa. Wingspan 22 in. **9/2**



COMPETITOR

The pleasing lines of this model have made it one of the most popular in the K-K range. Performance is outstanding. Wingspan 32 in. **10/10**

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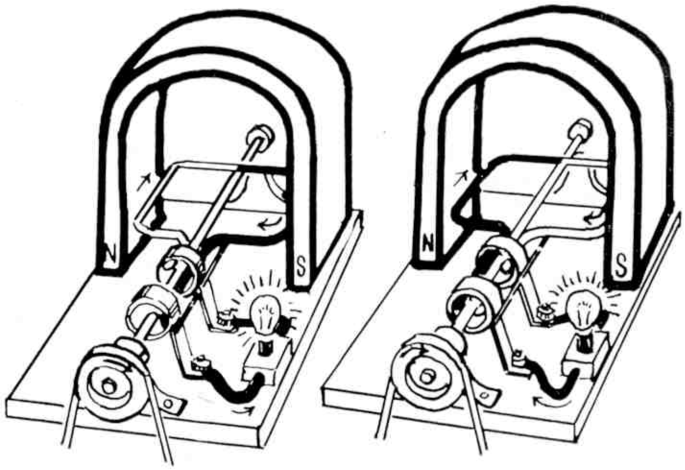
How Electricity is Produced



In fig. A the current flows up the white half of the wire and down the black. In fig. B the current reverses direction. This is known as alternating current.

A B

CAN you imagine what life would be like without electricity? There would be no cars, no television or radio, no telephones and no electric lighting. In fact, modern everyday life would practically grind to a halt if electricity was to suddenly become non-existent. An example of how much we rely on electricity is shown when a power cut takes place. People sit miserably at home without fires or television, trying to read newspapers in front of dimly glowing candles, while the refrigerator starts to defrost and mother glowers at a cooker which won't even heat a kettle to make a cup of tea.

The question now, of course, is: when was this form of power first discovered and how is it produced? The answer to the first part of the question is fairly simple. Between 1800 and 1830, it was discovered that there was a definite relationship between magnetism and electricity. It had been shown that a flow of electric current through a wire which was free to move in the vicinity of a permanent magnet would cause the wire to move.

Taking these theories a step further, Michael Faraday held the view that the reverse should also be possible. In other words, if you rotated a wire between the poles of a magnet, then electricity should be produced. His next step was to put his theories into practise by building the first generator. This was completed in 1831 and was the forerunner of the giant generators which now supply the whole country with electricity.

Michael Faraday proved that when a conductor is revolved in the 'field' of a magnet an electric current is set up in the conductor. The more powerful the magnet, or the faster the rotation of the conductor, the greater the amount of electricity produced. Another interesting fact is that the direction of the flow of electrical current depends on the direction of movement of the conductor. If the conductor moves from right to left, the current travels one way and if the conductor moves the other way, the current, too, reverses direction.

Figures A and B, which illustrate a very simple dynamo or generator, clearly show the flow of current. In figure A, the current flows up the white half of the wire and down the black. This is collected by the two slip rings and fed to an electric light. When the coil of wire rotates inside the magnet to the position shown in figure B, the current changes direction, flowing up the black wire and down the white. The current at the bulb is also flowing in the opposite direction. This form of electricity is known as alternating current (A.C.) and is the most widely used form of electricity.

The ordinary bicycle dynamo produces alternating current and the actual flow of the current can be seen by turning the drive shaft very slowly. The bulb in the headlamp will pulsate the light rather than give a continuous glow.

Chemical Electricity

There is a second type or form of electrical current, which flows in one direction only, known as direct current. This form of current is normally supplied by batteries or by dynamos which have rectifying equipment fitted. The rectifier ensures that the output of current flowing from the dynamo only travels in one direction.

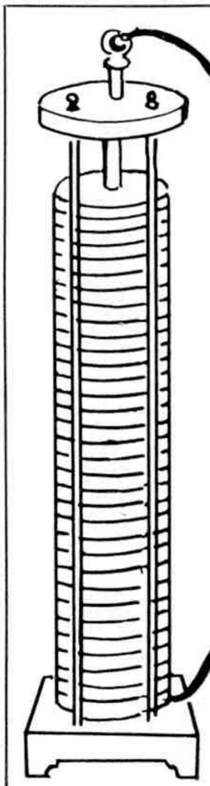
Dynamos produce electrical current mechanically, while batteries produce electricity by the chemical action of various acids upon metal. In actual fact, it was only a few years prior to Faraday's experiments with the generator that Alessandra Volta invented the first battery. It consisted of a pile of alternate silver and zinc discs with pieces of cloth moistened in brine between every other disc. If the top and bottom discs were touched at the same time, a shock was felt.

This, in the year 1800, was astonishing, for it was the first real source of electricity which was created without movement, friction or heat. What was more important, the charge did not leak away or disappear in a flash. It lasted, weakening only as the cloth discs dried.

Sulphuric acid soon replaced the cloth discs and different metals were tried. The end result, of course, is the dry battery of today, which is used in torches, portable radios, etc.

Unfortunately, batteries of this type eventually lose their charge due to their metal plates being attacked and eaten away by the chemicals used in their construction. Once exhausted they cannot be used again. This difficulty was overcome in the mid-1800's by a Frenchman named Planté, who found that two thin plates immersed in sulphuric acid, would store up the electricity that was fed into them, due to the chemical changes which took place.

This meant that batteries could be charged, exhausted and re-charged with electricity. In fact, the more the battery was used, the more effective it became. This advantage of being able to store and supply electricity, as well as being able to absorb energy to replace that which has been used, has proved of great value. The Planté battery was the forerunner of all the batteries now in use on motor vehicles throughout the world.



The world's first electric battery. Made by Volta with silver and zinc discs and pieces of cloth, it was the first source of continuous electrical energy.

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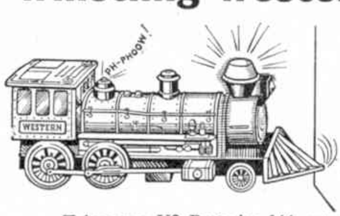
Whistling Western Locomotive



Features are an oscillating boiler front with a flashing light in the smoke stack. Its "woo-woo" whistle switches on and off automatically and the auto steering device enables it to negotiate obstacles in its path. Length 14 in. from cab to cowcatcher. This novelty loco is coloured Green, Black and Red.

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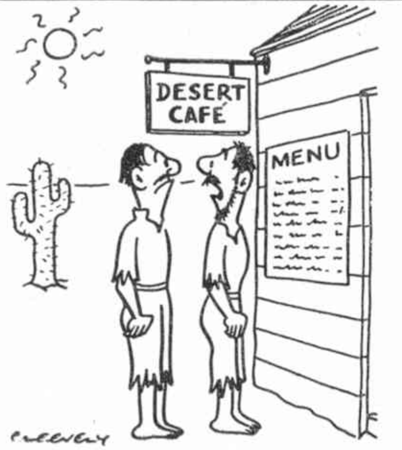
If you know any good jokes which you think will make other readers laugh, write them down on a postcard and send them in to: Meccano Magazine, Thomas Skinner & Co. (Publishers) Ltd., St. Alphage House, Fore Street, London, E.C.2. The best ones will be selected for publication.

HEARD THIS ONE?



"There's boiled cactus or fried cactus or grilled cactus or ......"

Don't get the yoke

What is yellow, turns at a constant thirty-three and a third revolutions a minute and could get into the hit parade?
That's right—a long playing omelette!

Hard one to swallow

What is the difference between a pill and a mountain?
One is hard to get down and the other is hard to get up!

Down on the farm

Why is it difficult to keep a secret when you live in the countryside?
Potatoes have eyes! Corn has ears! Beans-talk!

What a game

Why is tennis a noisy game?
Because all the players raise a racket!
(*Sent in by Warwick Cartwright, Little Chalfont, Bucks.*)

One jump ahead

An American was visiting Australia for the first time and was being shown around the country by an Australian friend. However, during the course of their travels, the American continually boasted about how much bigger and better everything was in America. He wasn't even impressed by the magnificent Sydney Harbour suspension bridge.

Then, after suffering the American's caustic comments for three days, the Australian decided to take his friend to see one of the vast sheep farms. Suddenly, as they were driving along a rough stretch of outback road, a kangaroo came hopping out of the bushes in front of them. As the car screeched to a halt to avoid hitting the creature, the American's eyes almost popped out of his head.

'Gee, Mac!' exclaimed the American. 'What in tarnation was that?'

'Only a grasshopper, Cobber,' smiled the Australian. 'Just wait till you see the size of our sheep!'

It's a whopper

How can you tell the difference between a male whale and a female whale?
It's simple really. You drop some whale bait over the edge of the boat and if he comes it's a male whale and if she comes it's a female whale!

Caught out

A postman was walking along a road when he saw a little boy standing on tip-toes trying to reach the knocker on the front door of a house. As the knocker was just a little beyond the reach of the boy, the postman kindly decided to help the lad gain entrance to the building.

'Allow me,' said the postman, as he gave four very loud thumps on the knocker.

'Ta very much,' smiled the boy. 'And now, like me, you'd better run like the devil!'

"Did you ever buy that trampoline you used to talk about getting?"

All tied up

From time to time we all encounter trick questions for which there appears to be no answer. However, M.M. reader, Peter Broome, suplies the answer to the age-old question—'How long is a piece of string?'

Peter's answer—'How big is the parcel?'

Don't say a word

The boy had been sitting in the corner of the railway carriage completely engrossed in a book, when his father began to get curious as to what was keeping his lad so quiet for so long. 'What's that you're reading, Tony?' asked dad.

'Umm—oh, a dictionary, dad!' replied the boy.

'Is it any good?' asked Dad.

'Dunno,' replied Tony. 'The author keeps changing the subject!'

"It's a self-winding clock!"

A dead loss

'My name is Willie Jones. I live at 10 Market Road. I seem to be losing my memory—I think,' said the lad as he entered the doctor's surgery, immediately after being briefed by his mother in the waiting room.

'Now, Willie,' said the doctor. 'What did you say your complaint was?'

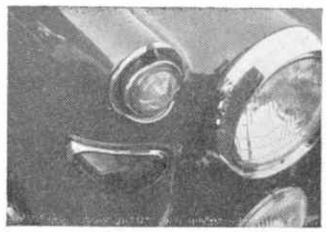
'Complaint?' puzzled Willie. 'What complaint?'

Scratched out

What is the difference between a flea and an elephant?
An elephant can have fleas, but have you ever seen a flea with elephants?

Car Quiz No. 1.

How good are you at recognizing cars? Each month on this page we will feature a close-up photograph of part of a modern car. See if you know the make and model of this vehicle. The answer is given upside-down at the bottom of the page.



Answer: Rover 3 litre

by **Michael Brown**

BOY WITH A DOLPHIN

Nick Jackson watches two of the dolphins being sponged down.

NICK JACKSON is a 14-years-old English schoolboy whose ambition in life is to be able to talk with dolphins! This may seem an odd ambition and one which many people might think impossible, but there are eminent scientists who confidently believe that one day man and dolphin will be able to talk intelligently with each other. Naturally, when that day arrives, Nick Jackson hopes he will be among the first to accomplish this unusual feat.

Many of you are probably wondering what is so special about Nick Jackson. Well, if we tell you that his father, Mr. Nick Jackson, is head of the newly-opened Marineland in Morecambe, which is to become the centre of scientific study in the 'humanisation' of dolphins, you will see that Nick has a fair advantage over any other would-be dolphin conversationalists. In fact, Nick Jackson probably already knows more about dolphins than any other schoolboy, or adult, in Britain.

Nick first became acquainted with his dolphin friends earlier this year, when his father took him to one of the showplaces of the United States — the exotic Seaquarium just outside Miama, Florida. This marine 'zoo' was built at a cost of nearly three million dollars and now houses one of the most startling collections of marine life.

While his father was choosing the eight bottle-nosed dolphins that were to be the first inhabitants of Morecambe's Marineland and discussing with experts the delicate problems involved in air-lifting the mammals some 4,500 miles to Manchester, then by road to Morecambe, Nick spent hours watching the Seaquarium trainers putting their charges through their exciting repertoire.

The Seaquarium at Miami, Florida, with dolphins in action.

He found that there is a never-ending fascination about this circus of the sea. The dolphins are trained to do many tricks, including leaping out of the water to a height of more than 20 ft., jumping through hoops, ringing bells, playing water polo and taking cigarettes out of the mouth of their trainer. In fact, Nick soon found that these natural-born comics don't just limit themselves to the tricks they have been taught to perform. Their playful antics never stop and when they are not entertaining the visitors, they are usually to be found chasing round their sea water tank making up games of their own.

The Flying Dolphins

However, there was nothing very playful about the eight chosen for export to Britain, when the time arrived for them to leave their Florida homeland. Like animals boarding a modern Noah's Ark, they were loaded two-by-two into huge, plastic-foam-lined, plywood boxes. There they were to lie motionless for the entire 4,500-mile trip, draped from blowhole to tail in soaking-wet sheets.

The 15-hour flight by windowless freighter was no pleasure trip for Nick, either. He had very little sleep and spent most of the time helping sponge down the mammals, for while they do not need to be completely immersed in water for travelling, their skin has to be kept damp.

On the plane's arrival at Manchester airport, the dolphin party were greeted by batteries of television and film cameras, as well as dozens of photographers and reporters. Surprisingly, the dolphins, lying quietly in their boxes, were not the only centre of attention. Nick was himself besieged by photographers and reporters all seeking interviews.

Today, of course, the dolphins have made themselves quite at home in Morecambe's Marineland. Playful as ever, they delight and intrigue the thousands of visitors that go to see them.

But *tursiops truncatus,* as the friendly dolphin is known scientifically, could have a far greater role to play than just entertaining the tourists, for the ability to talk is just one of the many fascinating developments the scientists are predicting.

One man who has no doubts at all that we are on the threshold of remarkable discoveries is Dr. John Lilly, who has his own dolphin laboratory in the Virgin Islands. He believes not only that man may be able to establish communication with dolphins, but that they will finally be able to reveal for us the answers to centuries-old mysteries of the deep.

They could help oceanographers by learning how to measure and map surface currents and temperatures. They could revolutionise the fishing industry, for we know already that no human can ever hope to be as competent as the dolphin in not only detecting and tracking schools of fish, but also in hunting, herding and catching them.

A dolphin's hearing is much more acute than that of any other animal and far superior than man-made sonar underwater detection devices, which work by reflecting echoes from submerged objects. One experiment showed that a dolphin took less than 20 seconds to locate a small ball-bearing that had been dropped into the far end of its pool—70 ft. away!

Some scientists want to turn this uncanny ability to military advantage—by training dolphins to detect submarines and report their findings back to their handlers.

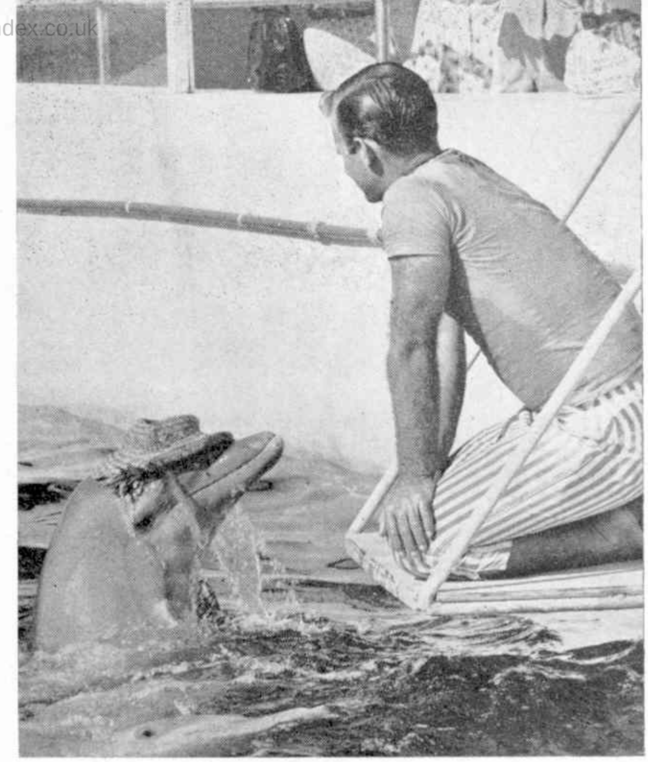
Dr. Lilly goes even further. He forecasts dolphins being used to rescue survivors of plane crashes and shipwrecks, retrieve nose-cones of missiles or capsules of orbiting satellites and to act as underwater demolition teams or in harbour work.

However, before any of these dreams may come true, the first breakthrough will have to be in communicating with dolphins, either by learning 'dolphinese' ourselves or by teaching the animals to speak like us.

The noises dolphins make among themselves are like whistles and grunts and a weird sound best described as like 'a rusty door hinge'. Dolphins are also great mimics and in several oceanaria in America, similar to Morecambe's Marineland, scientists have recorded dolphins not only imitating human speech but also other everyday sounds like the rattling of buckets! Is Dr. Lilly right? Are we on the verge of being able to communicate, for the first time, with another species?

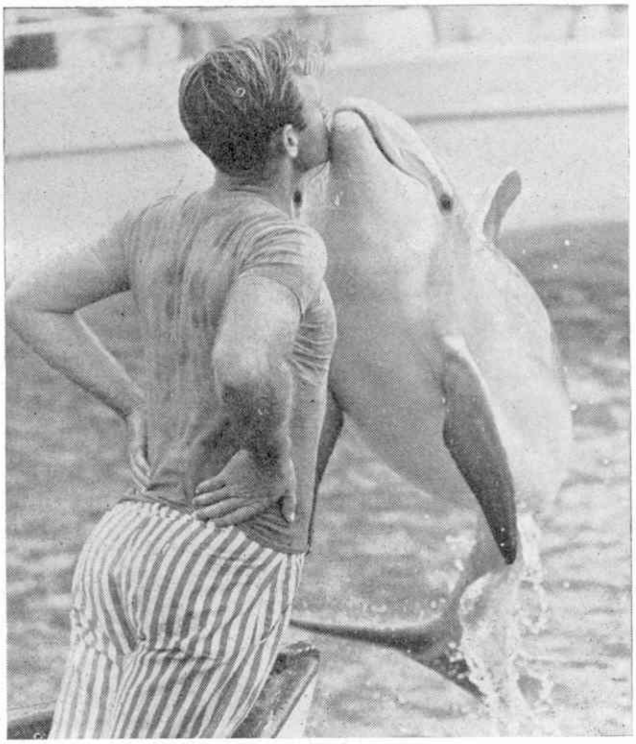
I put these questions to one of the greatest dolphin

Going to bed? Two dolphins ready for transporting.



Dolphin tricks! Wearing an Easter bonnet.

Taking a cigarette from the trainer's lips.

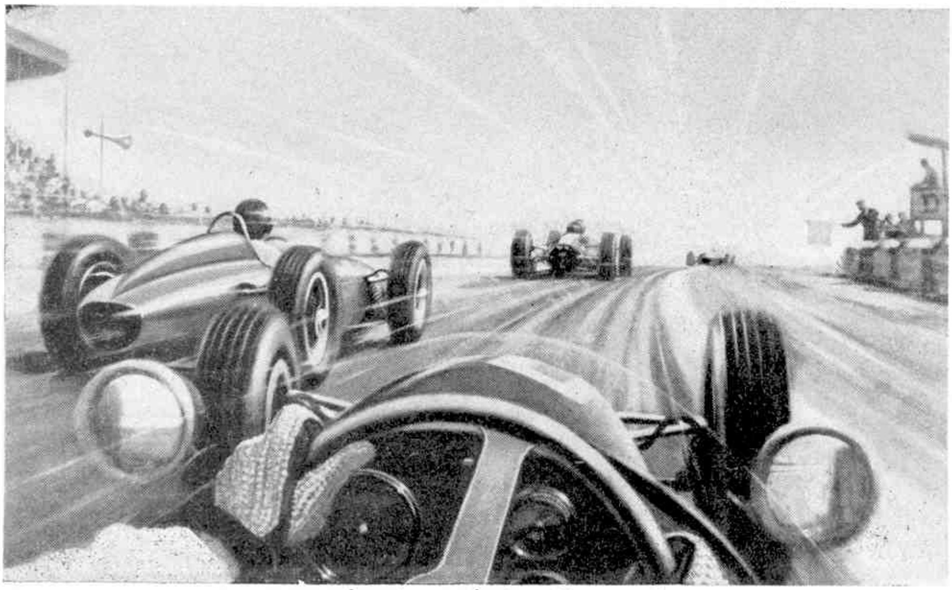


fishermen of all time, 75-years-old Captain William Gray, who has spent the last 60 years chasing these and other marine creatures, all over the Gulf of Mexico, the Caribbean, the Pacific and the Atlantic. Now Director of Collections and Exhibitions at the Miami Seaquarium, he travelled over here with the Morecambe dolphins and helped to get them acclimatised.

'Talk?' he snorted. 'Bunk! Absolute bunk! Oh, yes, they can make noises all right. Pigs speak and grunt when they can make noises all right. Pigs speak and grunt when you put food in front of them. But no one suggests that pigs will be able to talk and the same goes for dolphins.' Meanwhile, Nick Jackson just listens respectfully to both sides of the argument. And wonders . . . .

FAB! NEW! CHAMPION Motor racing

Grand Prix racing at your fingertips!



Champion! That's the new electrically powered racing track system! Hold exciting Grand Prix races with two or four cars zooming round—in your own home!

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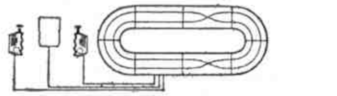
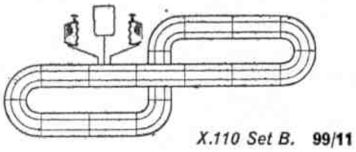
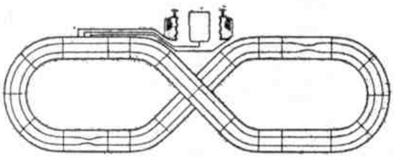
3 Champion sets to pick from!

Contents include: 1 $10\frac{1}{8}$" Straight, 2 $10\frac{1}{8}$" Crossover Straights, 1 $10\frac{1}{8}$" Terminal Track, 4 Curved Inner Tracks 90°, 2 Controllers, 4 Crash Barriers, 1 E-type Jaguar, 1 Mercedes 300 SL, 12 Track Clips. Area of Track: 36" x 15". Transformer not included.	 *X.100 Set A.* **79/11**
Contents include: 9 $10\frac{1}{8}$" Straights, 1 $10\frac{1}{8}$" Terminal Track, 6 Curved Inner Tracks 90°, 2 Controllers, 6 Crash Barriers, 1 BRM, 1 Ferrari, 4 Support Ramps, 24 Track Clips. Area of Track: 66" x 25". Transformer not included.	 *X.110 Set B.* **99/11**
Contents include: 5 $10\frac{1}{8}$" Straights, 2 $10\frac{1}{8}$" Chicane Straights, 1 $10\frac{1}{8}$" Terminal Track, 4 $4\frac{3}{4}$" Short Straights, 12 Curved Outer Tracks 45°, 2 Controllers, 12 Crash Barriers, 1 BRM (plated), 1 Ferrari (plated), 4 Support Ramps, 30 Track Clips. Area of Track: 83" x 25". Transformer not included.	 *X.120 Set C.* **130/-**

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19/11d. *Also Hard Top version.*

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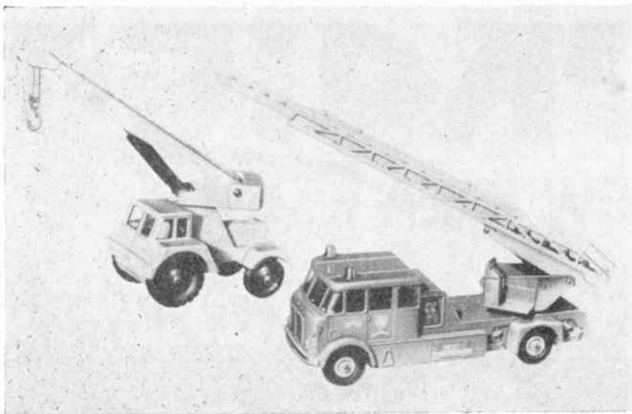
window SHOPPING

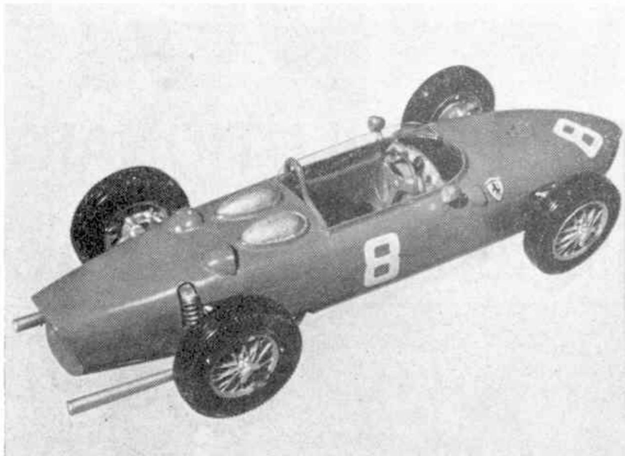
kits and models on the market



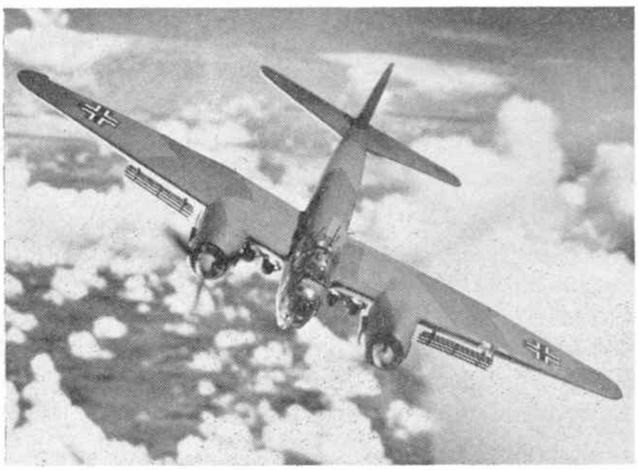
One of the more popular model series among collectors are those produced by Lesney Products. The latest in the 'Matchbox' range is a superb King Size Merryweather Fire Engine. In a scale of 60 to 1, this model has a revolving turn-table ladder which extends to almost 12 inches. Other features include fully independent suspension, tinted cab windows, authentic fire service transfers and plated fire bells on the roof. Overall length of the model is 6$\frac{1}{8}$ inches and the price **6s. 11d.**
The second model to be released this month is a replica of the popular Jumbo Crane. Features on this model include an unbreakable plastic hook on a jib which revolves through a full circle and also elevates by means of a hydraulic ram. In a scale of 84 to 1, the model measures 3 inches long and costs **1s. 11d.**

One of the latest Corgi model cars on the market is the luxurious Buick Riviera. The model has fully-spoked wheels, spring suspension, plated grille and bumpers, a towing hook, full interior detail, plus 'Trans-O-Lite' simulated lighting for both tail and headlights. Length of model is 4$\frac{1}{4}$ inches. **Price 5s 6d.**

Motorisation kits from Airfix are now available to convert Airfix models of the Zodiac, Rapier, Jaguar E-type and Mini Minor to raceway specifications. Each kit contains wheels and tyres, motor, pick-up braids, chassis sub-frame, steering gear and driver. Prices for the motorisation kits are **16s. 11d.** for Mini Minor, Jaguar E-type and Rapier, while the Zodiac conversion costs **17s. 11d.**



The latest release from Auto-kits is the 1961 2$\frac{1}{2}$ litre Ferrari World Championship Winning Car as driven by Phil Hill. This is the third all-metal kit from Auto-Models, 70 Finsbury Pavement, London, E.C.2., and the model is beautifully detailed with wire wheels, snout nose and sprung suspension. This model, similar to the B.R.M. and Lotus 25 in the series, is priced at **£2 9s. 6d.**, plus **2s. 0d.** post and packing for the kit.



The latest warplane to join the Airfix 1/72nd scale series is the Junkers JU-88 A-4. This kit contains 125 pieces, with fully operating dive brakes beneath the wings and variable pitch ailerons. Full construction instructions, plus transfers and suggested colour schemes are contained in the kit and the price is **4s. 6d.**

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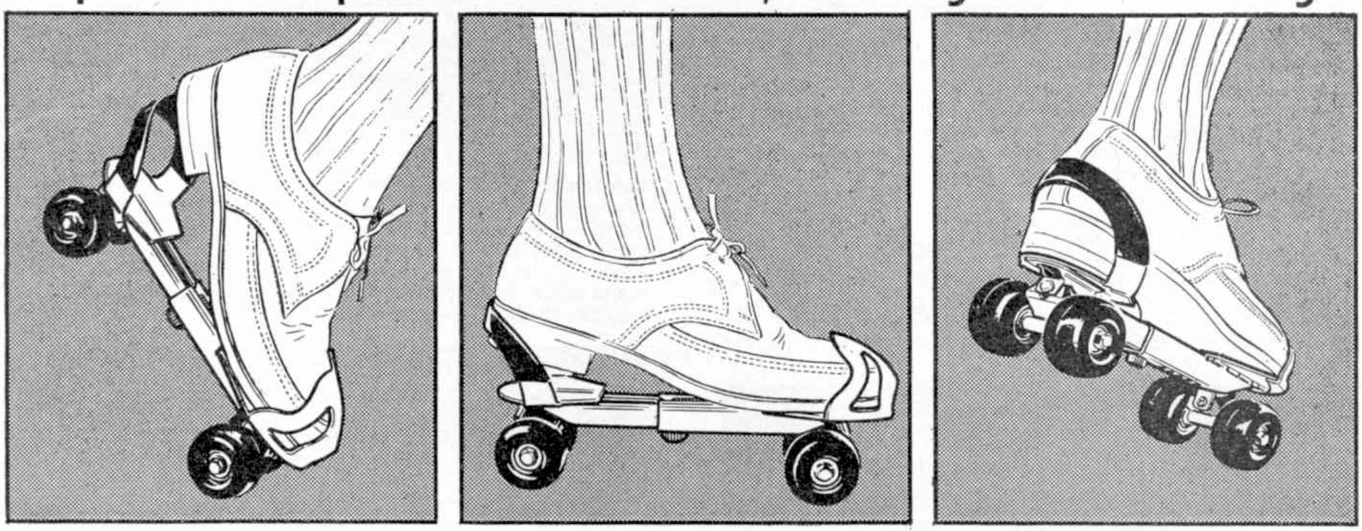

Much better than skating — try super-skating. On Super-Skates there's only a 4 second countdown and you're away! Just pick 'em up, click 'em on and skate. No straps, No keys, No maintenance. Super-Skates can't come off accidentally. And they're built extra-tough to last. **49/6**

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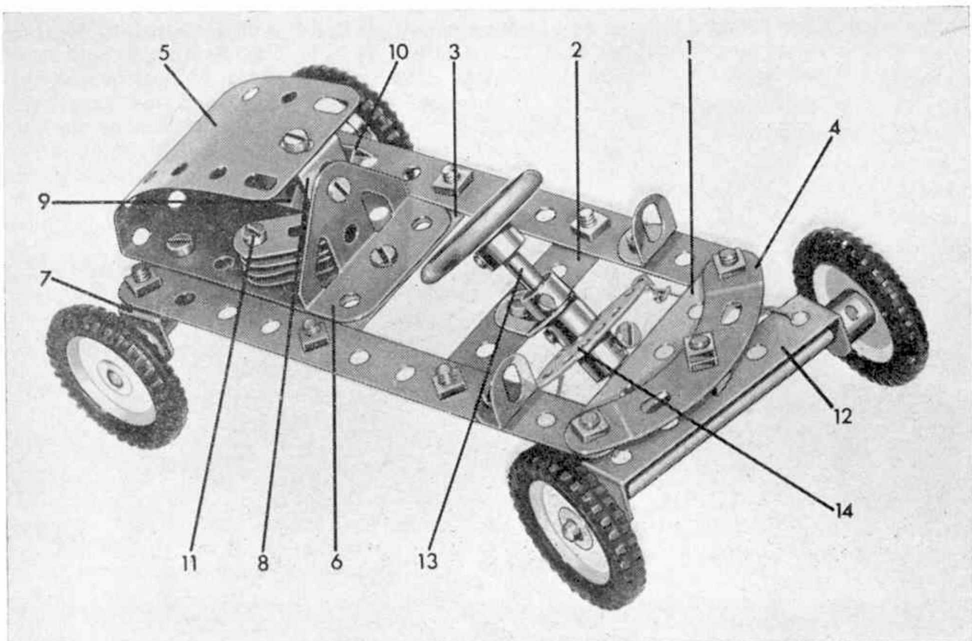
A simple *Go-Kart*

SOME months ago, I gave instructions for a finely-detailed Go-Kart, powered by an Emebo Motor. This proved highly popular with builders everywhere but, since then, I have received many letters from younger readers wanting to build a Kart, who unfortunately do not possess sufficient parts to complete the existing example. Therefore, this month I give details of an easy-to-build model that uses only a few parts while still being quite realistic. Although simple in design, it incorporates a basic, but serviceable, steering arrangement, as the photograph shows.

Two 5½ in. Strips are connected by four 2½ in. Strips 1, 2, 3, and the fourth is bolted between the end holes at the back of the Kart. The Bolts holding Strip 1 also hold a 2½ in. Stepped Curved Strip 4 in position. Next, a 5½ in. by 1½ in. Flexible Plate 5, curved as shown, is bolted to Strip 3 at its front end, at the same time fixing a Trunnion 6 in place, and it is also bolted to the rear 2½ in. Strip, these Bolts, in turn, securing a 2½ in. by ½ in. Double Angle Strip 7. This is spaced from the Strip by one nut on the shank of each Bolt. Plate 5 is then bolted to the Trunnion 6 by an Angle Bracket 8, this Bolt fixing, in addition, a ½ in. Reversed Angle Bracket through one of its end lugs to the back of Angle Bracket 8. It should be slanted towards the rear off-side wheel. An Angle Bracket 9 is fixed to the other lug of the Reversed Angle Bracket while another Angle Bracket 10 is bolted through its remaining centre hole. A ½ in. Bolt 11, carrying four Fishplates, each separated by a nut, is fixed in Plate 5.

Steering arrangement

Front axle bearings are provided by a 2½ in. by ½ in. Double Angle Strip 12 lock-nutted to the Curved Strip 4 by a ½ in. Bolt. The Double Angle Strip should, of course, pivot freely. The steering arrangement, itself, consists of a 2 in. Rod 13, held by collars in an Obtuse Angle Bracket bolted to the Strip 2, which has an eight-holed Bush Wheel 14 secured on it. Two pieces of Cord connect two diametrically opposite holes in this Bush Wheel with the two end holes in Double Angle Strip 12. A 1 in. Pulley with Rubber Ring serves as the steering wheel. Two Angle Brackets are fixed to the 5½ in. Strips to represent the brake and accelerator, and the wheels are 1 in. Pulleys with Tyres fixed on 3½ in. Rods, journalled through the Double Angle Strips 7 and 12.

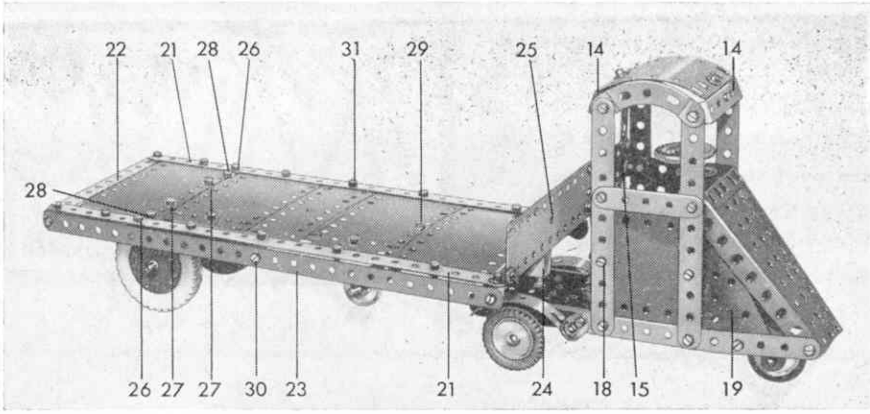


The easy-to-build Meccano Go-Kart described by 'Spanner'

Parts required.—2 of No. 2; 4 of No. 5; 4 of No. 10; 5 of No. 12; 1 of No. 12c; 2 of No. 16; 1 of No. 17; 5 of No. 22; 1 of No. 24; 28 of No. 37a; 17 of No. 37b; 4 of No. 38; 2 of No. 48a; 2 of No. 59; 1 of No. 90a; 2 of No. 111a; 1 of No. 125; 1 of No. 126; 4 of No. 142c; 1 of No. 155; 1 of No. 189.

by **Spanner**

A Mechanical Horse and Trailer



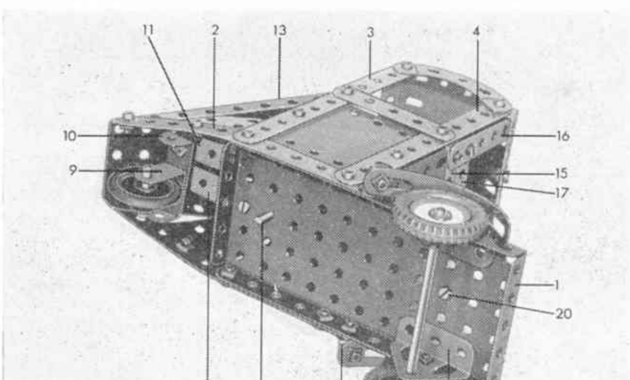
You can build this fine Mechanical Horse and Trailer from a No. 4 Meccano Outfit, plus a 1" Pulley and a 2½" by 2½" Transparent Plastic Plate.

I HAVE not included an Outfit model in these pages for several months now, as I find that most constructors like the challenge of modifying my instructions to suit the parts they have available. Understandably, however, some readers find this a little difficult; therefore, in this case, I will describe the alterations I would make to construct the attractive load-carrying vehicle illustrated here.

Basically, the model can be built from Outfit No. 4 with the addition of one 1 in. Pulley and one 2½ in. by 2½ in. Transparent Plastic Plate—as is evident from the parts list. Looking at the illustrations, however, we see that the extra Pulley is used as a steering wheel. Immediately the question is raised, 'Is there another part which could be used?' Answer: 'Yes—Outfit 4 contains a spare Bush Wheel that would serve perfectly well as a steering wheel'. Straightaway, the problem is half-solved, leaving only the Transparent Plate to be dealt with. But the Plate is only used as a window, and this is not really essential, so just forget about it and the model can be finished.

When building the model it is best to start with the tractor unit. Three 5½ in. Strips 2, 3 and 4 are bolted to each side of a 5½ in. by 2½ in. Flanged Plate 1. In the end hole of the 5½ in. Strips 2, an Angle Bracket 5, which supports the Formed Slotted Strips 6, serving as the mudguards, is fixed and two Trunnions 7 are also bolted to the Flanged Plate to act as bearings for the rear axle, which is a 3½ in. Rod carrying two 1 in. Pulleys with Tyres. A 2½ in. Strip 8 is bolted to the centre of the Flanged Plate 1, then a 1 in. by ½ in. Double Bracket 9 is tightly fixed to a 1½ in. by ½ in. Double Angle Strip 10 using a ⅜ in. Bolt. The whole assembly is now lock-nutted through the end hole of the 2½ in. Strip 8. A 2½ in. Strip 11 is cranked slightly and loosely attached to the Double Angle Strip 10 by a ⅜ in. Bolt with a nut on either side of the Double Angle Strip locked together. The other end of the Strip 11 is lock-nutted

This view of the underside of the Mechanical Horse shows the constructional detail.



to a Bush Wheel mounted on a 4 in. Rod 12. A Fishplate, bolted to an Obtuse Angle Bracket, is fastened to a Flanged Sector Plate 13, the same Bolt securing a 2½ in. by 2½ in. Transparent Plastic Plate in position. The 4 in. Rod 12 is journalled in this Fishplate and the Flanged Plate 1, as shown. The steering wheel is represented by a 1 in. Pulley with Rubber Ring secured to the end of the Rod. Each side of the cab is filled in by a 2½ in. by 2½ in. Flexible Plate, a 2½ in. by 2½ in. Transparent Plastic Plate, a 2½ in. Strip and a 2½ in. Stepped Curved Strip. The sides are joined together by three 2½ in. by ½ in. Double Angle Strips 14 and 15.

How to build the roof

The roof is formed by a 2½ in. by 2½ in. Curved Plate, attached to the Double Angle Strips 14 by Obtuse Angle Brackets. Two 2½ in. Strips 16 are bolted to the Double Angle Strip 15 and a further 2½ in. Strip 17 is fastened to the 2½ in. Strips 16. A 2½ in. by ½ in. Double Angle Strip is bolted to a 2½ in. by 2½ in. Flexible Plate and attached to the 5½ in. Strips 4 by the Bolts 18. A 2½ in. by 1½ in. Flexible Triangular Plate 19, on each side, is bolted to the 5½ in. Strip 2, which can then be fastened to the Flanged Sector Plate.

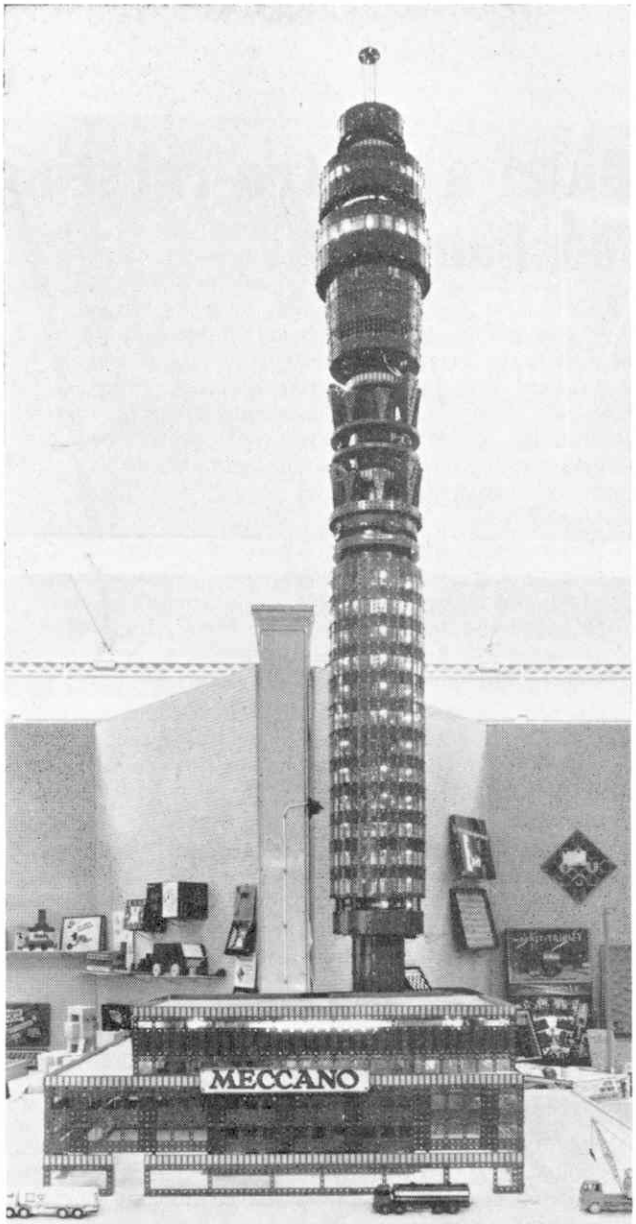
A ⅜ in. Bolt 20 is fastened to the Flanged Plate, as shown, on which to hook the trailer. This finishes the tractor, thus leaving the trailer to be built. Two 12½ in. Strips 21 are joined together at each end by two 5½ in. Strips 22 with an Angle Bracket at each corner on which to fasten the 12½ in Strips 23. Two ½ in. by ½ in. Reversed Angle Brackets 24 are bolted to the front 5½ in. Strip 22 and a 5½ in. by 1½ in. Flexible Plate 25 is attached by Angle Brackets. The trailer platform is filled in with two 5½ in. by 2½ in., one 5½ in. by 1½ in. and two compound 5½ in. by 2½ in. flexible plates. The last-named items are built up from two 4½ in. by 2½ in. and two 2½in. by 1½ in. Flexible Plates. Two 3½ in. Strips are attached to the underside of the platform by the Bolts 26, while Bolts 27 fasten a 2½ in. by ½ in. Double Angle Strip to these 3½ in. Strips. Flat Trunnions, bolted to the lugs of the Double Angle Strips, support a 4 in. Rod carrying two 2½ in. Road Wheels. Formed Slotted Strips, attached by Bolts 28, represent the mudguards. To strengthen the main platform, a 2½ in. by 1½ in. Double Angle Strip and a Double Bracket are fixed in its centre by Bolts 30 and 31.

A Double Bracket secured by the Bolt 29 has a 2½ in. Strip bolted to each lug, and these support a 1 in. Pulley on a 1½ in. Rod.

Parts required.—4 of No. 1; 8 of No. 2; 2 of No. 3; 9 of No. 5; 1 of No. 10; 2 of No. 11; 1 of No. 11a; 8 of No. 12; 3 of No. 12c; 2 of No. 15b; 1 of No. 16; 1 of No. 18a; 1 of No. 18b; 5 of No. 22; 1 of No. 24; 4 of No. 35; 85 of No. 37a; 79 of No. 37b; 8 of No. 38; 1 of No. 48; 6 of No. 48a; 1 of No. 52; 1 of No. 54; 2 of No. 90a; 3 of No. 111c; 2 of No. 126; 2 of No. 126a; 2 of No. 142c; 2 of No. 155; 2 of No. 187; 2 of No. 188; 2 of No. 189; 3 of No. 190; 2 of No. 191; 2 of No. 192; 3 of No. 193a; 1 of No. 200; 4 of No. 215; 2 of No. 221.

The exhibition centrepiece

G.P.O. TOWER
in MECCANO



LONDON'S new G.P.O. Radio Tower, off Tottenham Court Road, now well on the way to completion, captures the interest of everyone who sees it and at the 'Toys of Today' show, which is being held at Bethnal Green Museum until October 18, a Meccano model of the G.P.O. tower is the centrepiece of the show.

The actual radio tower is 580 feet high and carries a revolving restaurant close to the top. In the construction of the tower itself, 685 tons of mild steel have been used and the tower and its foundations will weigh about 13,000 tons.

The Meccano model stands 11 feet high and is built to scale. Constructed in the Model Room at the works of Meccano Limited in Binns Road, Liverpool, it took a month to erect and contains an estimated 25,000 Meccano parts, including nuts and bolts. The all-round windows, which are a feature of the transmitting floors of the actual tower, are reproduced in the Meccano model by use of plastic plates. As in the real tower, the imitation restaurant revolves and the whole model—offices, tower and restaurant —is illuminated.

The 'Toys of Today' exhibition was opened on July 23 by Marie Odette, G.C., M.B.E. (Mrs. Geoffrey Hallowes), the famous wartime heroine. The display, sponsored by the British Toy Manufacturers' Association, covers an intriguing array of British products ranging in size from Dinky Toys to a Tri-ang Minic Narrow Gauge railway with its Golden Arrow locomotive and neatly-modelled Pullman cars. Outdoor toys are displayed in a playground.

To provide contrast, some toys from a bygone age are also on show, including children's books from the early days of this century from countries such as Russia, Holland, Italy, Sweden and Denmark. A doll's house from Nuremburg dated 1673 contrasts sharply with one of up-to-the-minute design and a wax doll produced about 1880 is on display with dolls of the modern age such as the famous Sindy doll made by Tri-ang. Also on show are motorways, soldiers and mechanical toys.

Above: The Meccano-built G.P.O. Tower—outstanding feature of the 'Toys of Today' exhibition. *On the left:* A general view of the attractive toy display which can be seen at Bethnal Green Museum.

by **Spanner**

Build a Contra-rotating Mechanism

At first glance, the Contra-rotating Mechanism detailed here may appear to serve no useful purpose and, in fact, it does not have many uses in the average private model. However, if you like to build moving structures that seem complicated to the spectator or, more particularly, if you sometimes supply local shops with animated display stands, then this amazingly simple arrangement will prove invaluable.

The sort of display stand I have in mind consists of a large revolving disc with, above this, another smaller disc revolving in the opposite direction. General goods to be displayed could be placed on the lower disc, while the centre-piece of the display would be given the more prominent and eye-catching spot on the upper disc.

You will see that, in our model, Helical Gears are used, but their place could be taken by several alternative parts, such as Contrate Wheels and Pinions, or even Worms and Gear Wheels. Anyway, I am sure you could adapt it to suit the parts you possess.

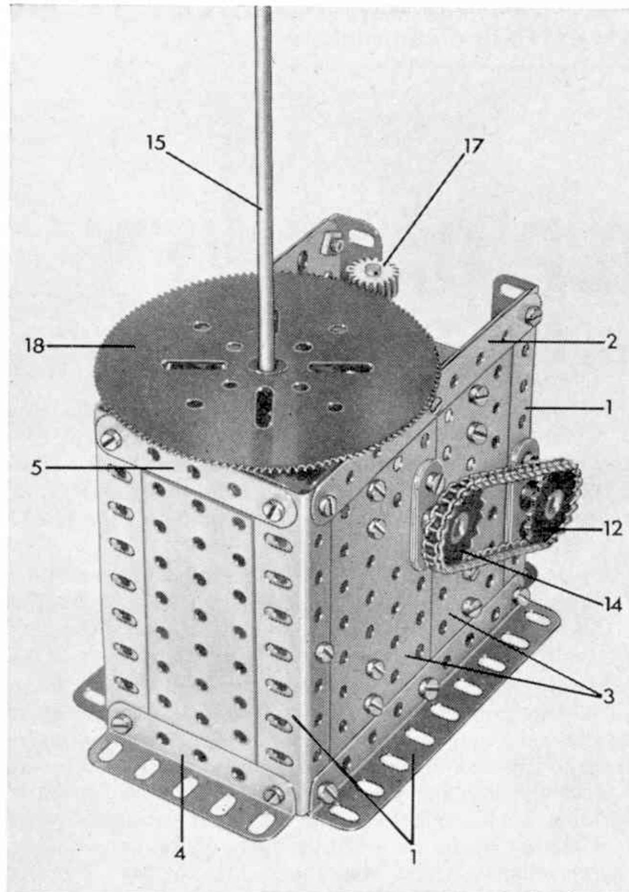
Constructional details are as follows: Two similar sides are built up from 4½ in. Angle Girders 1, a 4½ in. Strip 2 and two 4½ in. by 2½ in. Flat Plates 3. These sides are then connected, at one end, by a 2½ in. Angle Girder 4, a 2½ in. Strip 5 and another 4½ in. by 2½ in. Flat Plate. At their other end, they are joined by a 2½ in. Angle Girder 6, braced by 2 in. Strips, as shown, while further strengthening is supplied, inside, by four 2½ in. by 1 in. Double Angle Strips 7, 8 and 9. Note, incidentally, that these Double Angle Strips are fixed by bolts through *both* the holes in each of their lugs.

To both sides of the model, two sets of three 1½ in. Strips are bolted, and two 3½ in. Rods 10 and 11, each carrying a ½ in. Helical Gear, are journalled in the centre holes of these Strips. Rod 10 is held in place by a 1 in. Sprocket Wheel 12 and a 1½ in. Sprocket Wheel 13, whereas Rod 11 is held by a Collar and a 1 in. Sprocket Wheel 14. Next, further sets of three 1½ in. Strips are bolted to all the Double Angle Strips 7, 8 and 9. An 11½ in. Rod 15, carrying a 1½ in. Helical Gear to mesh with the Gear on Rod 11, is mounted in 1½ in. Strips fixed to one pair of Double Angle Strips, and a 5 in. Rod 16, also carrying a 1½ in. Helical Gear, is mounted in the other pair. Both Rods are held in place by Collars.

A ½ in. Pinion 17 is fixed tightly on Rod 16 and this meshes with the 3½ in. Gear 18 which is *free* on Rod 15. Sprocket Chain connects Sprocket Wheels 12 and 14.

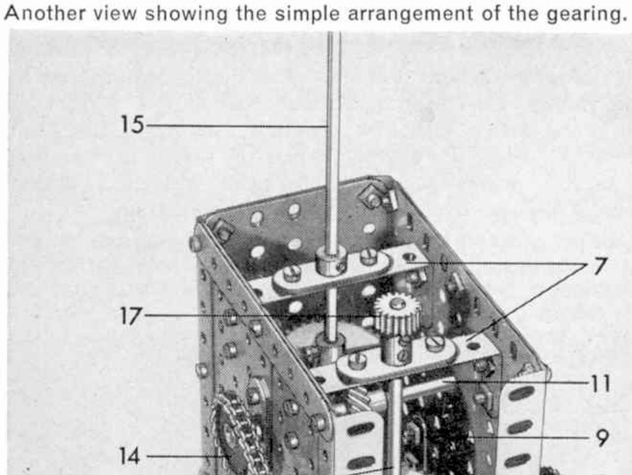
If the mechanism is to be used for the purpose I mentioned, the large turntable is mounted on Gear Wheel 18 while the upper platform or object is fixed on Rod 15. A Face Plate or Bush Wheel would be a useful means of attaching it to the Rod.

Parts required.—2 of No. 2a; 1 of No. 5; 2 of No. 6; 24 of No; 6a; 6 of No. 9a; 2 of No. 9d; 1 of No. 13; 1 of No. 15; 2 of No. 16; 1 of No. 26; 1 of No. 27b; 54 of 37a; 54 of No. 37b; of 4 No. 46: 5 of No. 53a; 5 of No. 59; 1 of No. 94; 1 of No. 95a; 2 of No. 96. 2 of 211a; 2 of No. 211b.



This mechanism is ideal for mechanised display stands.

Another view showing the simple arrangement of the gearing.



by **Spanner**

Build a Cutting Machine

THE cutting machine described here gives an interesting and very useful example of the Meccano system's possibilities, incorporating an idea which could be used in many other constructions. Serious builders must surely have discovered that an invaluable mechanism is one that gives a continuous drive to a Gear, or similar part, mounted on a flexible arm which is constantly moving, and such a feature is present in the model described below.

The base of the model is formed from a 5½ in. by 2½ in. Flanged Plate 1, to which is bolted a 5½ in. Angle Girder 2, two 3½ in. by 2½ in. Flanged Plates 3 and 4, and a 5½ in. by 2½ in. Flat Plate 5. One of the bolts holding this Flat Plate also passes through the end hole of the Trunnion 6, a bolt in the other end hole fixing it firmly to the Flat Plate. A further Trunnion 7 is bolted to the Flanged Plate 3 by one of the bolts holding Flanged Plate 3 on to Flanged Plate 1. A 2½ in. by 2½ in. Flat Plate 8 is joined to Plate 5 by Angle Brackets.

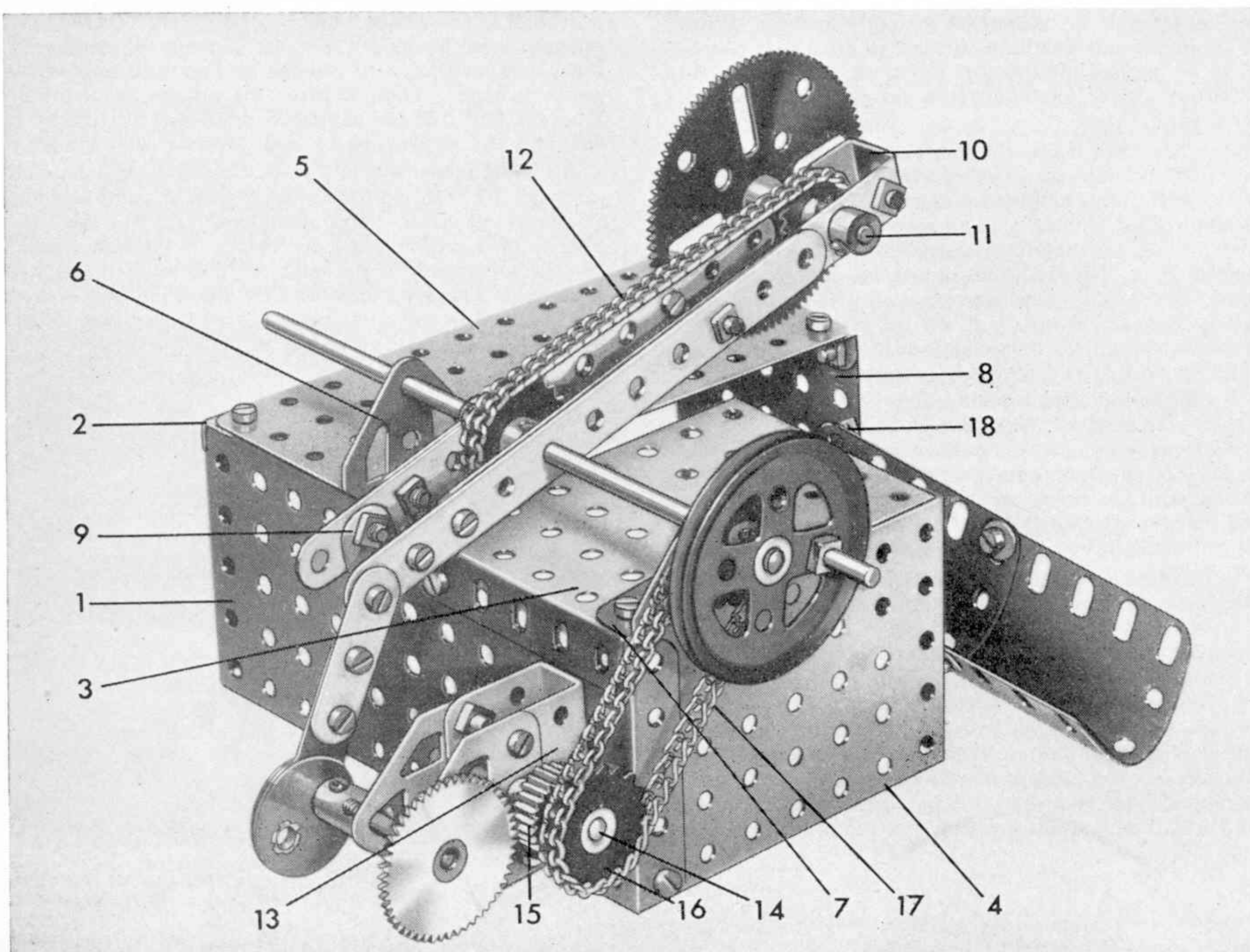
A 6½ in. Rod carrying a Collar, two 1 in. Sprocket Wheels, a 2 in. Pulley and two compound 6½ in. Strips each made up of two 5½ in. Strips, is journalled in the Trunnions 6 and 7. The compound strips are free to move vertically, but are stopped from sliding along the Rod by the Collar and one of the Sprocket Wheels. A Threaded Pin is bolted to the 2 in. Pulley to form a handle.

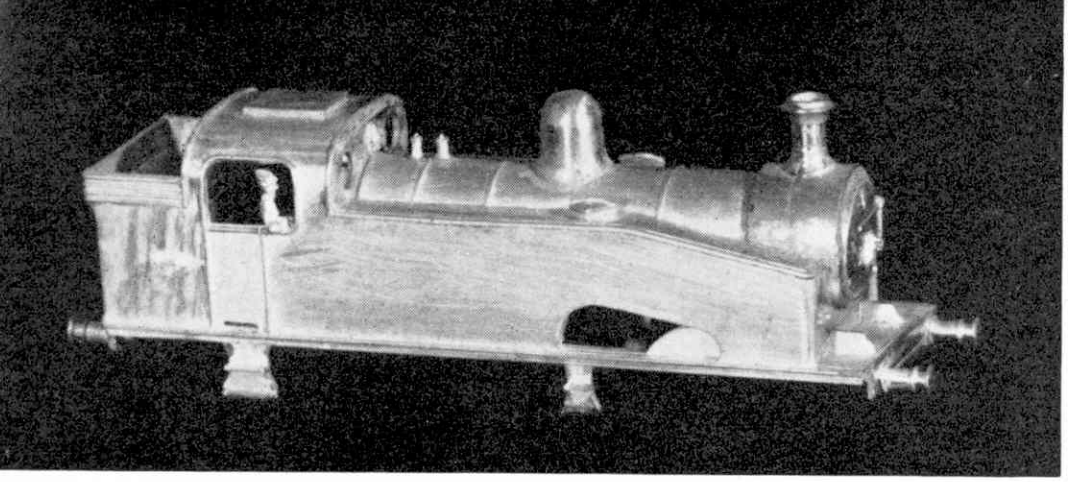
Two Double Brackets 9 and 10 connect the compound strips and a 1½ in. Rod 11, carrying a Collar, a ¾ in. Sprocket Wheel and a 2½ in. Gear Wheel which forms the cutting blade, is journalled in the second hole from the ends. A length of Sprocket Chain 12 is passed around the 1 in. Sprocket Wheel on the 6½ in. Rod and the ¾ in. Sprocket Wheel on Rod 11.

Next, Channel Bearing 13 is bolted to the Flanged Plate 1 and two Flat Trunnions are attached to it. A 2 in. Rod 14, carrying a ¾ in. Pinion 15 and a 1 in. Sprocket Wheel 16, is mounted as shown, and is kept in place by a Collar, then a 1½ in. Rod is journalled in the apex holes of the Trunnions. This carries a Single Throw Eccentric, a Collar and a 1¼ in. Gear Wheel that meshes with the ¾ in. Pinion 15. The Eccentric is pivotally connected to the compound strip by a 1½ in. Strip. A length of Sprocket Chain 17 connects Sprocket Wheel 16 to the other Sprocket Wheel on the 6½ in. Rod.

The chute which catches the sawn material as it is cut consists of two U-section Curved Plates that are joined to the rest of the mechanism by an Obtuse Angle Bracket, bolted through the centre hole of the flange on Plate 4, and by a Reversed Angle Bracket 18, bolted to the Flat Plate 8. When the 2 in. Pulley is turned, the 6½ in. compound strips move up and down and, at the same time, the 2½ in. Gear Wheel forming the cutting blade rotates.

Parts required.—4 of No. 2; 1 of No. 6a; 1 of No. 9; 2 of No. 11; 2 of No. 12; 1 of No. 12c; 1 of No. 14; 1 of No. 17; 2 of No. 18a; 1 of No. 20a; 1 of No. 25; 1 of No. 27; 35 of No. 37a; 35 of No. 37b; 3 of No. 38; 1 of No. 52; 1 of No. 52a; 2 of No. 53; 4 of No. 59; 1 of No. 72; 1 of No. 94; 3 of No. 96; 1 of No. 96a; 1 of No. 115; 1 of No. 125; 2 of No. 126; 2 of No. 126a; 1 of No. 130a; 1 of No. 160; 2 of No. 199.





by **Linesman**

The J.50 0-6-0 tank body made by Messrs. K's. The locomotive is almost finished, and the gaps have been stopped, as described in the article.

Locomotive Kit Construction

LAST month, I dealt with the types of locomotive kit available to fit both Hornby-Dublo and Tri-ang chassis, and readers will by now be familiar with the wide variety of kits available. This month, I shall deal with the constructional methods involved in assembling a sample kit from each range of locomotives.

The method of assembling white metal kits varies according to the kit, but many common features can be found. The kits, for instance, have to be assembled with an adhesive and should not be soldered. As I mentioned in last month's article, I have used Evostik throughout, although Bostik, Araldite, Pafra, or H.M.G. would do equally well.

The glue has to be applied sparingly on both surfaces to be joined and should be allowed to dry before the two parts are pressed together. If too much glue is applied to the parts, a thick joint will result, leaving an unnecessarily large gap.

The K's J.50 kit was the first to be assembled. This is one of the 'bodyline' series of kits and is intended to fit on to a Hornby-Dublo 0-6-0 chassis. The kit should be assembled first without glue, to make quite certain that no major filing or alteration is needed. This procedure is known as a 'dry run' and should be used for all kits wherever possible. The first operation with this and other kits is to clean off the 'flash' on the castings. ('Flash' is surplus metal on the mouldings and can usually be recognised by its thin and ragged appearance.)

An old needle file or a modelling knife should be used to clean the flash off and care must be taken to ensure that no damage is done to the casting proper. In addition to cleaning off the flash, I make a point of cleaning the casting surface with fine emery paper whenever the finished surface will be seen. This helps paint to 'take' to the casting and also prevents it from peeling at a later date.

When the casting includes fine detail such as rivets and axleguards, it is safer to leave the casting surface, since it is extremely easy to damage the fine detail that manufacturers often cast into their kits.

The next most important step in the construction of the J.50 tank is to glue an 8 B.A. nut into the smoke-box top, to allow the fixing screw to hold the body to the chassis. The nut must be positioned before any further assembly takes place. The piece resting between the two sides at the rear of the locomotive is located, and the back of the bunker and tank fronts are then glued into position. The boiler top, the spectacle plate, and the cab roof are also fixed.

Any surplus glue is wiped off the surfaces of the joints and the assembled parts are set aside and allowed to dry. The chimney, smoke-box casing, dome and safety valves are then glued into position on the boiler tops. This completes the assembly of the model, except for the addition of the rear spectacle plate and the front buffer beam. The whole model should then be set aside to allow the glue to harden.

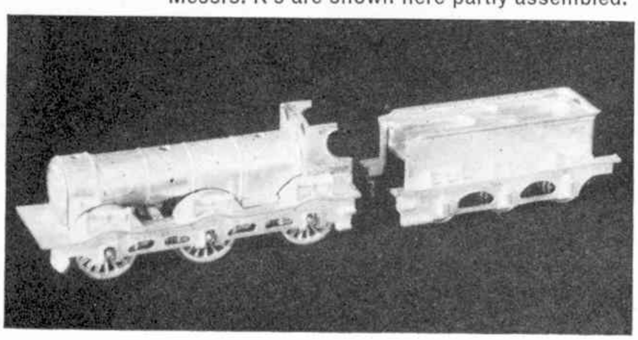
You will invariably find that small gaps exist in the joints between parts. This is almost unavoidable, irrespective of the accuracy with which parts are glued together. The answer to this problem is to fill these gaps with a stopper such as H.M.G. cellulose stopper, or Joyplane filler. These substances can be applied over the joints in the metal with a pin or a piece of wire and can be smoothed over afterwards to leave a filling between the two pieces of metal. You will find that the substance dries rock hard after a time and any surplus can be filed down.

The entire model should then be cleaned in readiness for painting. I use an old toothbrush dipped in a stiff solution of 'Vim' and water. This should be mixed to the consistency of a creamy paste for it to give the best results. Dip the toothbrush in the mixture, then brush the model vigorously. This gives the completed kit a shiny appearance and also cleans off any grease, surplus glue and other foreign matter which may spoil the final painting.

Building the Kirtley 0-6-0

The other K's locomotive kit to be assembled was from their range of locomotives supplied with its own chassis and the model I selected is the recently-introduced Kirtley 0-6-0 goods locomotive. This is a beautifully-cast kit and

The 0-6-0 Kirtley locomotive and tender made by Messrs. K's are shown here partly assembled.



includes an abundance of rivet detail, especially on the tender, where it is very noticeable. The first stage in the construction of the locomotive body is to have a 'dry run' with all the component parts, making sure they all fit. You will probably find that a small gap exists at the bottom edges of the firebox. This can be reduced by filing the rear of the boiler, or by filling the gap with a stopper as before. I chose the latter course, which is most effective.

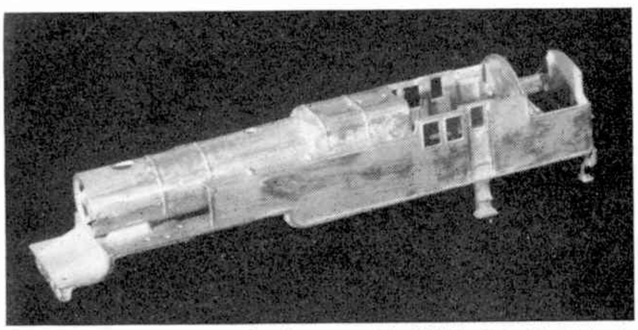
The photograph of this locomotive shows the gaps in the places mentioned and I think you will agree they would mar the model's appearance if left in that condition. After making sure that all flash has been dealt with in the manner already described, the two halves of the cab may be glued together and the smoke-box front and the back of the fire-box, may also be added. When these four parts have dried, the two footplate and cab side parts can be glued to the boiler and cab front. Extreme care must be taken to ensure that the boiler fits properly in between the two footplate parts. The cab and the spacer between the footplate sides which has to have an 8 B.A. nut glued into the hole provided, are glued in position and the assembly set aside to dry.

The footplate front, the cab roof and the boiler fittings can now be fitted. Make sure that the boiler fittings sit squarely on top of the boiler and do not lean over at an angle.

This practically completes the construction of the loco-motive body and work on the tender may now be started. This is fairly straightforward and consists of only ten parts. I found it easier to assemble this on its side, glueing on the back and front first. Make sure that these two parts are level with the raised edge on the inside of the tender side. The tender top can be glued into position, the wheels can be placed in the axle holes and the second side glued on. Next, the engine coupling is secured to a pin on the front tender beam, which is then glued on. The remaining tender parts can then be added.

The Wills 2-6-4 kit

The Wills 2-6-4 tank kit was next assembled. This is intended to be used with the Hornby-Dublo 2-6-4T chassis. Once again, the 'dummy run' should be carried out. The lower part of the boiler, the top boiler half and the firebox are first glued together and allowed to dry. The footplate front, the two cab sides and the bunker back are then all glued together, but before glueing the bunker back between

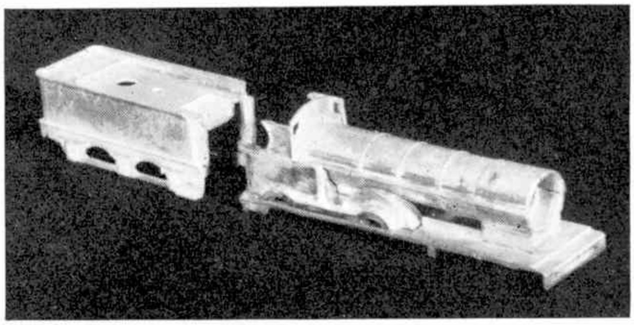


Partly-assembled Wills 2-6-4 tank body.

the two cab sides, make sure that the mechanism mounting plate is in position in the slots provided in the sides of the cab. The various parts should be lined up and then allowed to dry. Glue the rear spectacle plate and bunker tops into place and also the inside plate in the bunker. The front spectacle plate can now be added and you should make certain that the top bearing on the Hornby-Dublo motor is not fouled by this piece. You can now add the cab roof and boiler fittings, having ascertained that no flash exists under the chimney and other fittings that would prevent them from sitting squarely on the boiler.

Tank locomotive by Bec

The J.50 tank locomotive made by Bec is intended for use on TT gauge railways and should be fitted with a Tri-ang TT chassis. The construction of the locomotive body is very simple and should begin with the glueing together of the front and one of the sides. The back and the other side are then glued on to the footplate and the



The L.N.W.R. 'Precursor' 4-4-0 locomotive kit made by Gem.

boiler top is glued on to the top of the tanks, in the recess provided.

The cab top is then fixed in the space between the boiler and the bunker, in the four appropriate recesses. The chimney, dome and bunker back can then be added and the whole assembly set aside to dry. Any gaps should be filled as described previously. You will find it unnecessary to force any of the parts into their places; indeed, the kit almost built itself! As in other kits, the flash must first be removed before assembly can begin.

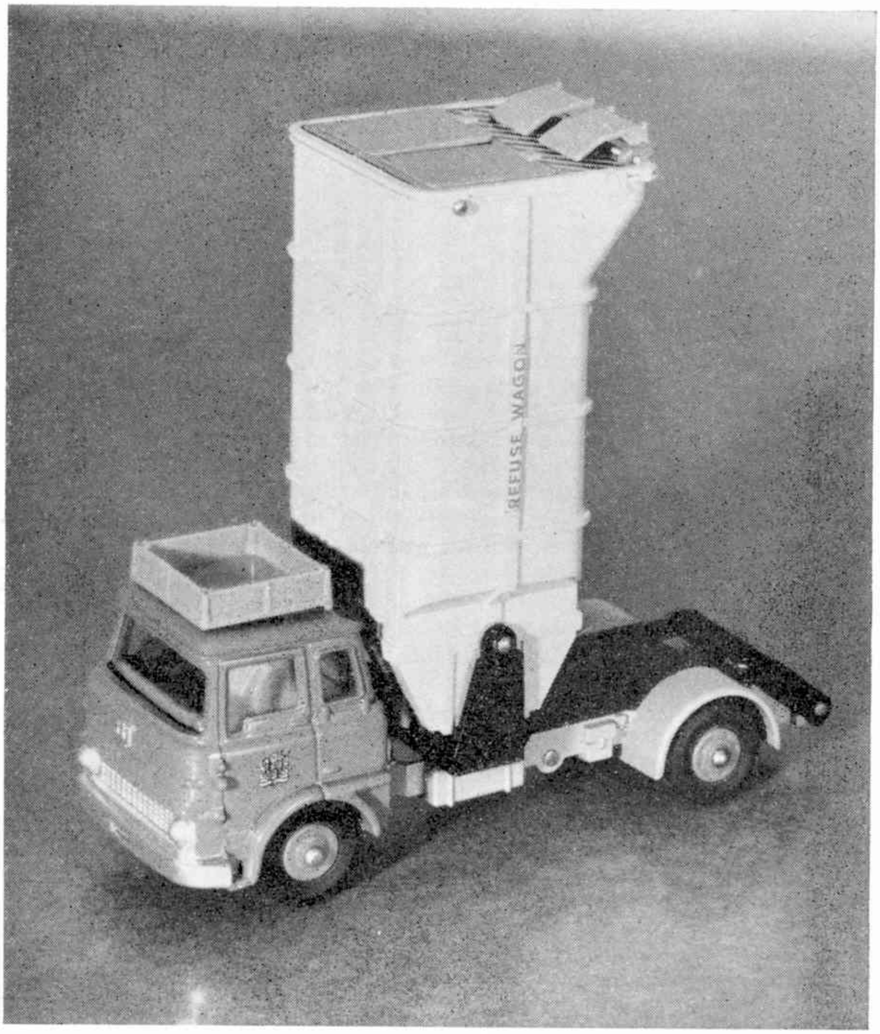
The delightful model of the L.N.W.R. 'Precursor' loco-motive made by Gem is also produced for TT gauge but, unlike the last kit, does not fit on a Tri-ang chassis. A chassis casting is instead provided, but the builder has to buy the wheels separately. The makers recommend the use of balsa cement or a similar adhesive, rather than any of the impact adhesives.

Assembly should start by glueing the two halves of the boiler together and the smoke-box door to the boiler. Splasher and cab side units should then be glued to the footplate, making sure that the curved rear end of the splasher unit coincides with the curve on the valance rail of the footplate. This ensures that these two units are correctly positioned. The boiler assembly can then be fixed to the footplate. The firebox end should rest firmly against the cab front and the front end of the smoke-box should meet two raised lugs on the footplate.

The cab front fits inside the two cab sides and this is an excellent way of judging whether the parts are properly aligned. The cab roof and covers should then be glued into position and the fittings, chimney, dome, safety valve, steps and buffers should then be located. As before, make quite certain that the chimney and dome are sitting correctly on the boiler.

The tender consists of six parts, including coal and no difficulty should be experienced in making the parts fit. The Tri-ang TT motor bogie is intended to be screwed into the tender unit. The sides and ends should be glued together first of all and then the top added.

Next month, I will write about the construction of chassis kits, painting and lining models.

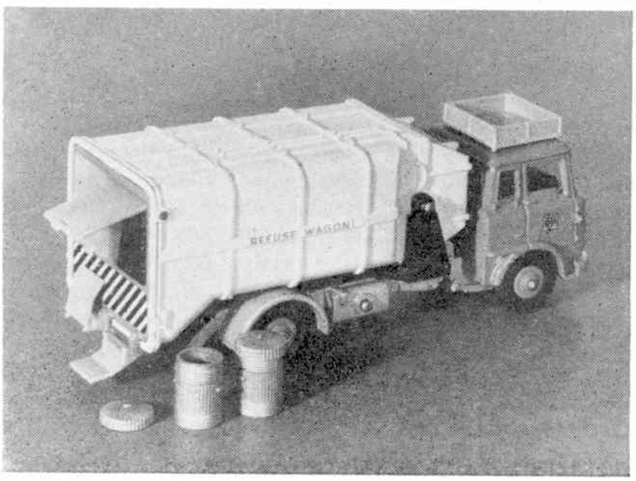


3 NEW MODELS FROM DINKY

THREE new Dinky Toy models make their appearance in October, one of them timed specifically for the month in which Britain is to have a General Election, while the others are a private car and a 'bin lorry'. All are built to 1/42nd. scale and have features that will greatly appeal to all Dinky Toy enthusiasts.

It is difficult to decide which to mention first, but probably the most outstanding from a constructional standpoint is a Refuse Wagon based almost entirely on the Shelvoke and Drewry type 'TW' Fore and Aft Tipping Refuse Collector.

Small doors at the back open independently.



This vehicle is used by a very high proportion of municipal authorities throughout the length and breadth of Great Britain and is very modern in its design and method of operation.

The Dinky model reproduces the authentic tipping action of its full-size counterpart. The highly-detailed, toughened plastic body hinges forward on a metal sub-frame, or can be tilted in the reverse direction, by use of simulated hydraulic rams, complete with the sub-frame on which it rests.

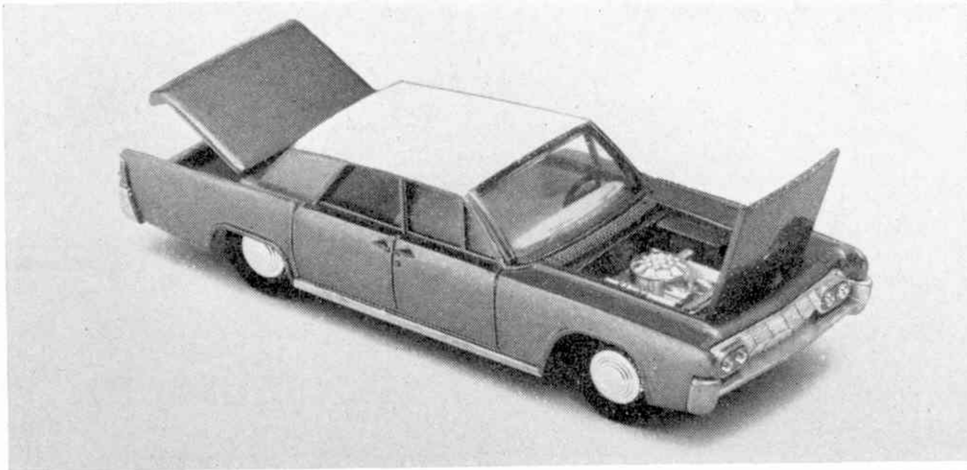
When the real refuse wagon starts its rounds, the body is horizontal on the framework and the binmen tip their loads through two small doors which open independently and are, in fact, part of a larger door at the back of the vehicle. As waste material begins to accumulate in the wagon the body is hinged forward into a completely vertical position which compresses the load and the body is then returned to the horizontal.

When the refuse is to be discharged at the tipping ground, the large rear door is opened and the body is tilted rearwards by the action of the two hydraulic rams, so that the waste material shoots out on to the ground. All these movements are incorporated in the Dinky version, which comes complete with two scale-size dustbins, the lids of which can be removed, as you can see from one of our pictures. It is finished in grey with a bright green cab which carries a corporation crest on each side door.

The cab itself is based on the Bedford unit used so successfully on such outstanding models as the T.K. Crash Truck, T.K. Coal Wagon, etc. The interior of the cab is fitted with red seats and steering wheel and on the cab roof is a paper salvage rack made from plastic.

At the base of the rear door is a black and yellow warning

After refuse has been loaded into the wagon, the body is tipped forward in a vertical position so that the load is compressed. (on the left)



Twin-jewelled headlights, plated radiator and bumpers, opening boot and bonnet are some of the attractive features of the new Dinky model of the Lincoln Continental. (on the right)

sign, and beneath these are clip-on plastic access steps which fold neatly upwards when the vehicle is running between stops. Approximate dimensions are: length $6\frac{9}{64}$ in.; width $2\frac{3}{32}$ in.; height $2\frac{31}{64}$ in.; wheelbase $3\frac{1}{4}$ in.

A topical model

The second Dinky Toys model this month is timed specifically for October and the General Election; indeed, it is a topical model in every sense of the word, being an Election Van based on the well-known B.M.C. Mini-Van. Carrying list No. 492, it is fitted with all the components of a fully-fledged public address system. The rear doors open to reveal a detailed amplifying unit, and on the roof is fixed a loudspeaker system making use of twin speakers similar to those in common use today.

On both sides of the model are green and white election posters carrying the straightforward slogan 'Vote for Somebody'—a gentle reminder to those entitled to the vote that it is their privilege to exercise their franchise. To add a still greater air of realism, the van is sold with a 'candidate', dressed in grey jacket and trousers and holding a detachable microphone. A lead attached to the 'mike' plugs into the amplifying unit inside the van itself. Finish is in white with a bright orange loudspeaker unit.

American model car

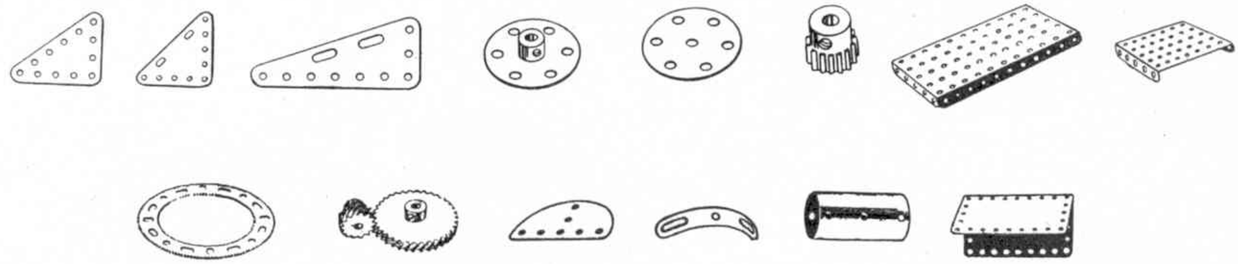
This brings me on to the third new model this month, a private car, and, although it can be easily recognised as an American job, the particular make may not be evident, from the accompanying illustration, to some of my readers in Britain. The model is, in fact, a Lincoln Continental, marketed under sales number 170. Lincoln describe the actual Continental as 'the world's finest automobile'—and the same phrase might well be used in connection with the Dinky Toy replica, speaking in the world of die-cast models, of course.

Features include all the usual Dinky standards—Prestomatic steering, 4-wheel suspension, windows and interior fittings—plus opening bonnet, opening boot, twin-jewelled headlamps, a detailed engine and a strong baseplate, die-cast in mazak. Finish is bright and typically American—a high lustre flamboyant orange body, with white roof and blue seats; plated radiator, bumpers and engine; gleaming metal wheel hubs.

From the measurements of the actual vehicle, given below, you will see that the Continental is a big car and correspondingly the Dinky Toy version is also a big model. Approximate overall dimensions are: length $5\frac{1}{16}$ in.; width $1\frac{7}{8}$ in.; height $1\frac{21}{64}$ in.; wheelbase $2\frac{31}{32}$ in. Turning to the real-life car, this is produced by the Lincoln Mercury division of the Ford Motor Company, Detroit, Michigan. Power is supplied by a V-8 engine of 430 cu. in. capacity that develops 300 b.h.p. and automatic transmission is fitted as standard. Overall, the prototype is 17 ft. 9 in. long, 6 ft. 6-3/5 in. wide and 4 ft. 6-7/10 in. high, with a wheelbase of 10 ft 3 in.

When preparing this article, I came across a fact concerning the real Continental which particularly impressed me. Lincoln sell the car complete with a two-year or 24,000 miles guarantee, whereby they will not only replace any defective part but will also pay for labour costs incurred in fitting it. In this country, most manufacturers will replace any defective part under guarantee, but the car owner, generally, must pay for its fitting —a state of affairs which, I think, could be remedied.

The Dinky Toys Election Van has posters, a loudspeaker unit, and a 'candidate' who carries a microphone so that he can put over his speech.



Dealers who specialise in Meccano spare parts

Listed below are some of the dealers who sell Meccano accessories and spare parts. This is intended to aid enthusiasts—and there are many of them—who constantly require additional spare parts for their Sets. All dealers can order Meccano spare parts for their customers, but those listed here are among our spare part specialists.

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R. M. HILL & SONS
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W. PAINE & CO. LTD.
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Walther & Stephenson Pty. Ltd.
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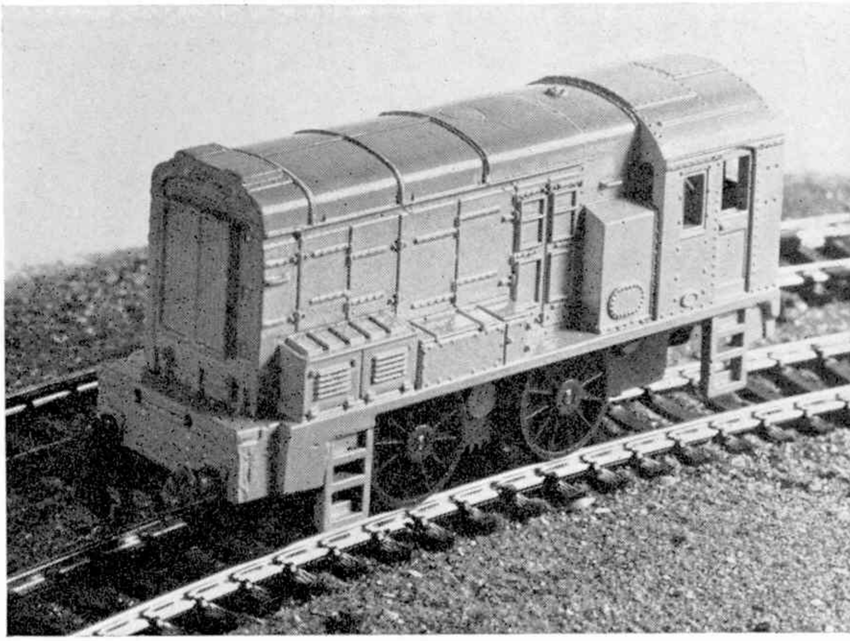
by **Layoutman**

READY TO RUN HORNBY-DUBLO



The 0-4-0 Diesel Locomotive supplied in the 2004 ready-to-run set.

THE already extensive range of Hornby-Dublo Train Sets has been still further enlarged by the introduction of a new ready-to-run train set, under sales no. 2004.

The new set is supplied complete with Hornby Power Unit, giving four different speeds, plus reverse, locomotive, rolling stock and track. It has sufficient track to form a circle 3 feet in diameter and a departure from other Hornby-Dublo train sets is that only eight sections of track are needed to form a circle, instead of twelve.

This new forty-five degree curved track will not change the geometry of existing layouts and no difficulty should be encountered with plans in Hornby-Dublo layout booklets. Full running instructions are provided with the set.

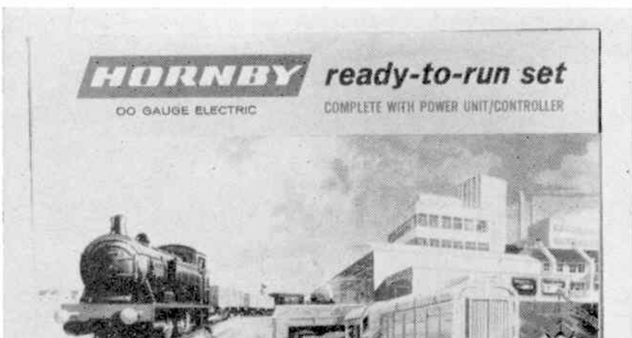
The new four-wheel diesel locomotive is finished in attractive yellow and, in keeping with other Hornby-Dublo locomotives, has a high standard of detail. An open wagon, a mineral wagon and a brake van are included in the set.

The 2004 Set forms an excellent introduction to the Hornby-Dublo track system and the circle of track supplied can be extended with the aid of Hornby-Dublo Track Packs, the uses of which are illustrated on the back of the box, as one of our pictures shows. For instance, Track Pack No. 1 (sales no. 2801) provides a sufficient number of points and straight track for the basic circle to be extended to an oval, approximately 6 feet in length, containing two sidings. If Track Pack No. 2 (sales no. 2802) is also added, sufficient track will be available for a further oval to be assembled outside the existing one. A crossover may also be added between the two ovals.

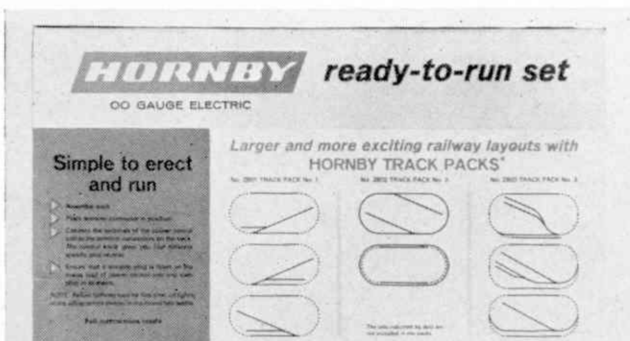
More straight rails are also included in this track pack and these can either be saved for a further addition to the layout or added on to existing sidings to give more shunting space. Alternatively, the entire layout may be lengthened by fitting the extra pieces of straight track in the two ovals.

Track Pack No. 3 (sales no. 2803) is the most complete of all and provides a further three points. With the curves supplied in the 2004 Train Set, Track Pack No. 3 can form a complete model railway system.

The front of the box in which the 2004 Train Set is supplied.



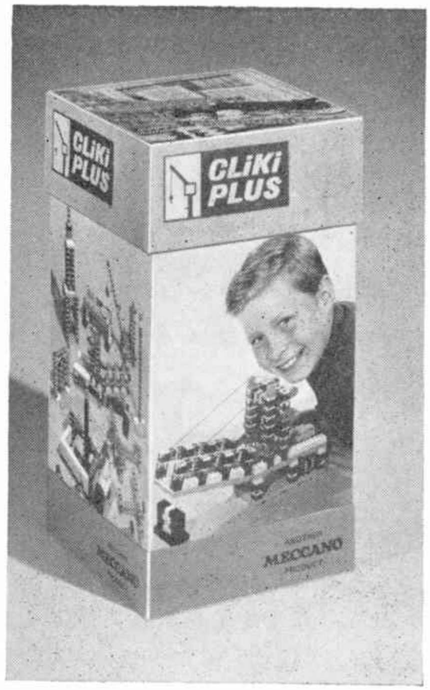
The back of the train set box gives various layout formations.



by **The Editor**

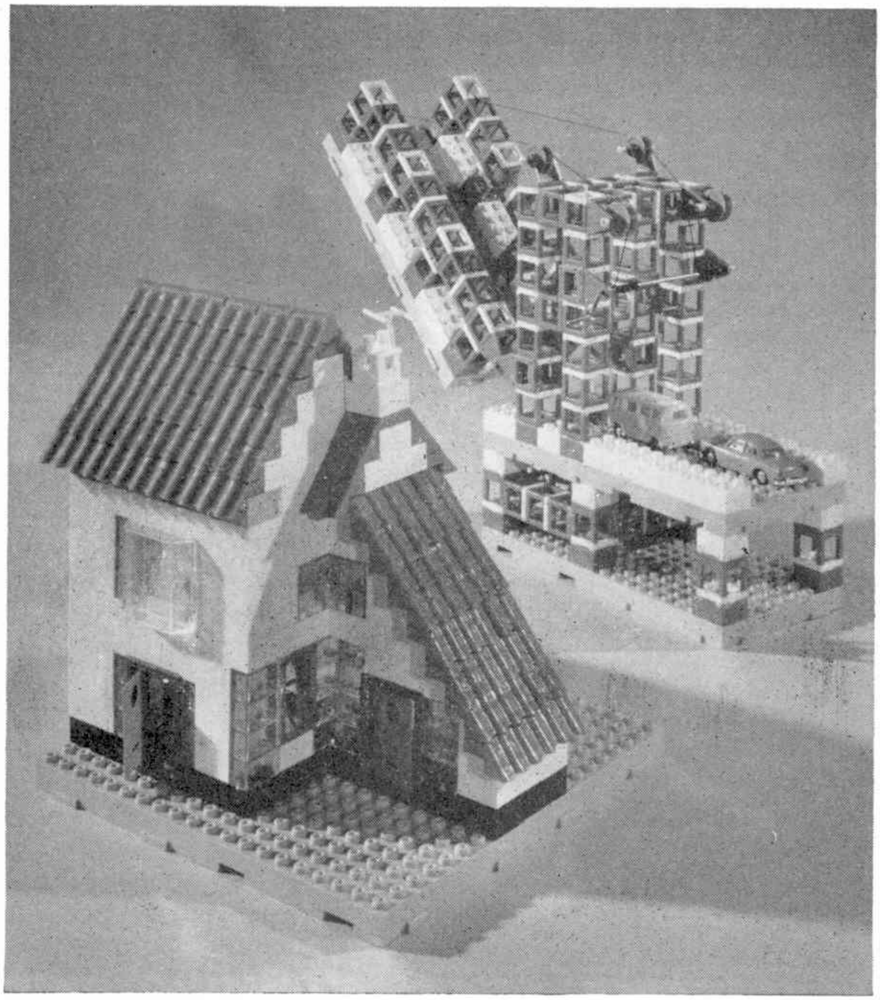
NEW
CLIKI CONSTRUCTION SETS

With Cliki, you can build houses, hotels, shops and small 'push-alongs'.



Cliki-Plus is used for building cranes, bridges, roundabouts, swings and engineering models.

The house was built with Cliki, the lift-bridge with Cliki-Plus.



TWO new attractive construction sets to be marketed by Meccano Limited are Cliki and Cliki-Plus, which you see illustrated here. Both sets include a wide variety of bright and colourful plastic parts. Cliki, which was used to build the modern-type house in the bottom picture, has roof tiles that really look real. Special self-locking base plates, opening doors, glazed bay windows, chimney stacks and TV aerials are some of the features of this intriguing toy and each set will make a wide range of models including houses, bungalows, garages and hotels.

An additional attraction is that every set contains wheels, axles and axle blocks to enable pull-along toys to be made. There are four sets in all, starting with C1 outfit, costing 9/11d. in the U.K. The C2 set is priced at 15/6d., C3 is 25/0d. and C4 at 42/6d.

The lift bridge in the background was built with Cliki-Plus, a unique building toy which is a development of Cliki, with a definite engineering slant. With it you can make such realistic models as cranes, swing bridges, lifts, roundabouts and—bringing your building plans right into the modern context—a rocket-launching site.

Pulleys, cranks, hooks, etc., are included in the Cliki-Plus sets to enable the builder to construct a variety of operational models. Cliki-Plus comes in three sets, CP11, priced in the United Kingdom at 14/0d., CP12, which is 37/6d. and CP13, costing 69/6d.

Future issues of the "M.M." will contain more details of these two fascinating constructional outfits which will soon be on sale, in the striking boxes illustrated here, at Meccano dealers throughout the country.

In the case of both Cliki and Cliki-Plus, the composition of the sets is such that they enable complete models to be made without the use of extra parts. However, "Add-On" packets at 2/6d. each contain additional items which can be usefully employed to extend still further the types of models you can construct.

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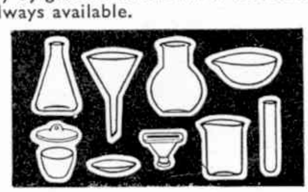

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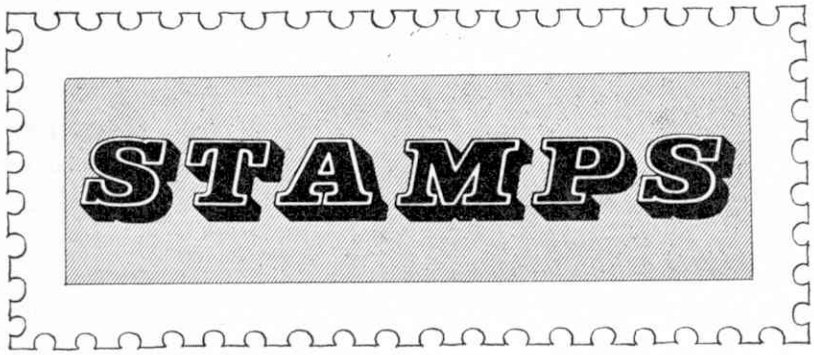


by **F. E. Metcalfe**

United Nations philately

COLLECTORS ARE often surprised when they come across postage stamps which are only used internally (such as the now obsolete stamps of the Indian Native States) and, as these stamps are in every way officially issued, they wonder why they are not valid for postage on letters going outside the country of issue. This limitation is because the country concerned is not a member of the Universal Postal Union, that institution which meets from time to time to settle postal issues. Such meetings generally result in a set of stamps, released by the host country, to mark the event.

While it is a general rule that, for stamps to have world-wide validity, a country must be a member of the Universal Postal Union, there is one single exception to this rule—the United Nations. The result of this is that you can form a most colourful collection of postage stamps—which have full recognition in every sense—which do not even belong to a country, let alone the Universal Postal Union. Moreover, these stamps can be used on letters in the U.S.A. (where, as we all know, the headquarters of U.N. is situated) in the ordinary way, and very frequently are, for more than 10,000,000 letters bearing U.N. stamps pass through the post every year.

The first U.N. stamps

The first U.N. postage stamps consisted of a set of six values and were issued on October 24, 1951. That is only twelve years ago, yet in that relatively short period, U.N. stamps have grown very popular. In fact, when a million miniature sheets of a particular issue were released just over a year ago, there was such a rush to obtain supplies that not only were they all sold in a jiffy, but there was quite a rumpus, because it was claimed that not enough had been issued to meet demands. Of course, the big demand for such items is in the U.S.A. and the practice of people obtaining U.N. stamps and using them on their own letters has probably helped the cult. But equally, of course, the stamps are collected in other countries as well.

Here in Britain they are fairly popular and what helps is the fact that dealers can obtain supplies at face value in London from the Crown Agents and thus the stamps are freely available. However, don't you try to buy from the Millbank Institution, for they only serve dealers who are registered with them.

The idea of U.N. having its own stamps was first discussed in 1947 and it was the Argentine delegation which first submitted a resolution on the question of a postal administration for the international body. The idea was a good one and a year later was approved. Next, the Universal Postal Union was approached and their help sought to start a postal service. A good deal of discussion then took place between U.N. and the United States' Government, for the plan was to work the projected postal service in conjunction with that of the U.S.A. itself and in 1951 the agreement was signed. That was in March and by November of that year, the first set of stamps which did not belong to any particular country, but which were accorded full postal status were issued. It is more or less true to say that this and succeeding U.N. issues have never looked back and that collectors have thus indirectly added quite a few million dollars to U.N. funds through their philatelic purchases.

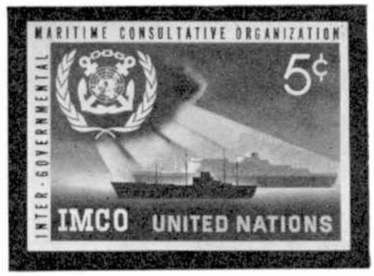
I have mentioned the first U.N. issue, which more or less set the pattern for subsequent releases. Various printers have prepared the stamps. There have been a number of designers, of various nationalities, and yet there is a something about these stamps which tells you, at a glance, to whom they belong. Perhaps this is not as strange as it might seem, for I have noticed that although a country may have its stamps printed abroad, they still seem the work of the issuing state.

In all, the U.N. has issued almost 100 stamps in the twelve years it has been operating philatelically. I am, I think, quite justified in putting it like that, for without a doubt all those stamps must have been issued with not just one eye on the collector potential. If this had not been the case, then there would have been no need for a tenth of the stamps which have been made available.

And what have been the ostensible objects behind all these issues? Well, the U.N. is an institution which works in many fields, as these stamps show. Here are some of the headings which they are given in the catalogues to mark the issues: 'Human Rights Day', 'Technical Assistance for Underdeveloped Areas,' (this has to do with a very important part of the institution's work), 'Food and Agriculture Organisation', 'International Labour Organisation', 'International Civil Aviation', 'World Health Organisation', etc., etc.,

As a matter of fact, this organisation furnishes services for a hundred vital causes and this is where the stamps play their part, for they mark these good causes so graphically. Don't overlook that, in buying yourself some of the world's most attractive issues, you are indirectly contributing to the upkeep of an institution that is very worthy of that help. Yes, U.N stamps have everything possible to commend them to *your* attention as a collector.

Four samples of the United Nations Stamps available to collectors.



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REARDON SMITH NAUTICAL COLLEGE, FAIRWATER, CARDIFF

Principal:
Capt. J. N. Rose, R.D., J.P., M.I.N., Master Mariner

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Prospectus and further information may be obtained from the Principal.

Robert E. Presswood,
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Around the SOCIETIES

REGIONAL NOTES

Undenominational Schl. Worcester M.C.

THIS GROUP has been very active. An experiment was carried out linking Meccano model making with other crafts including card, papier mache and balsa media. This was done with a model of a Canadian logging camp, where an excellent tug was constructed for towing logs. A fire watch tower and a bridge over a river were also modelled. The whole task was a most satisfying class activity and other such combined efforts will follow in the course of the next year. President, E. C. M. Baker; Leader, Alan Williams; Secretary, Robert Bromage. Average attendance 100 per cent.

The Continental Railway Circle

THE CIRCLE was founded four years ago to bring together people living in and around London who are interested in foreign railway systems. Meetings are held once a month from September to June at the Fred Tallant Hall, 153 Drummond Street, London, N.W.1 (five minutes walk from Euston Station) and commence at 7.15 p.m. Newcomers are always welcome. For those who, by reason of distance or other commitments, are unable to attend the meetings, the Circle publishes a journal twice annually. This is divided into two sections dealing with main lines and minor railways, edited by A. E. Durrant and W. J. K. Davies respectively. The annual subscription for the journal is 3s. post free, and any reader of the 'Meccano Magazine' who wishes to subscribe, or wants further particulars of the Circle, is invited to write, enclosing a stamped addressed envelope, to the Hon. Secretary, Mr. L. King, of 25, Woodcock Dell Avenue, Kenton, Harrow, Middx.

The Gauge O Guild

THE NINTH annual general meeting of the Gauge O Guild will take place on Saturday, October 10 at 2.30 p.m. at Keen House, Calshot Street, London, N.1. (near King's Cross Station). This meeting is the major event in the calendar of the Guild, which is the biggest model railway society or group in the British Isles, and it is earnestly requested that as many members as possible attend. Once the official business is over, members will have the opportunity of holding discussion, and also of 'running' on the test track, kindly made available by the Model Railway Club. As on previous occasions, members are cordially invited to bring along models, both for running and for static display. Further details of the Guild's activities are available from the Hon. Secretary, Mr. H. F. Bower, of 81, The Drive, Bexley, Kent.

East Ham and District Model Railway Club

THE TRACK on the OO layout was completely relaid, using a soldered construction type of track. This was done during the summer, and the new track should give satisfactory running for many years. A further section of scenery was made, with the object of giving the layout a more spacious look. The electricians will shortly be wiring up all points, sections of track, switches and an internal telephone service. This work should continue until Christmas, when training of operators will start in readiness for the 1965 exhibitions. The fulfilment of this programme will take many hours of work, and if you think you can help, come along one Monday evening to the club room at St. Gabriel's Church Hall, Aldersbrook Road, Wanstead, London, E.11 (101 bus to the door from East Ham, Manor Park and Wanstead Stations). Alternatively, further details may be obtained from the Hon. Sec., Mr. G. R. Lloyd, of 32a Goldsmith Road, London, E.10.

The Locomotive Club of Great Britain

THIS CLUB is to organise 'The Vectis Rail Tour' on Sunday, October 4. This will give enthusiasts what may be a farewell visit to the historic lines of the Isle of Wight. An interesting outward route, and a return run via the now 'electric only' Portsmouth direct route are also included in the tour. The special train will depart from Waterloo Station at 0905 hours and will run via Twickenham, Staines, Virginia Water, Frimley Junction, Aldershot (reverse), Ash, Guildford (reverse). Reading Old Junction, Basingstoke, Eastleigh, and Fareham to Portsmouth Harbour. After crossing by steamer to Ryde Pier Head, the party will travel over the I.O.W. lines to Ventnor and Cowes. On returning to the mainland, the train will depart from Portsmouth Harbour at 1917 hours, reaching Waterloo at 2047 hours. The locomotives to haul the train at various stages of the journey will be a Q1 class 0-6-0, 'Britannia' class 4-6-2 and on the Isle of Wight lines, an 02 class 0-4-4T. A full meal service (breakfast, 8s. 6d., lunch, 13s. 6d., and dinner, 15s.) is available and must be ordered when booking tickets, but no money should be sent for these meals when ordering tickets. Fares are: Adults 48s., accompanied juveniles 26s. Tickets are available from Mr. D. Murphy of 28, Belgrave Crescent, Donnington, Chichester, Sussex, enclosing a foolscap addressed envelope and a 4½d. stamp for each ticket required. Remittances will not be acknowledged unless an s.a.e. or stamped postcard is enclosed. Tickets and itineraries will be sent out prior to the tour.

Wakefield Railway Modellers Society

THIS SOCIETY is to hold a one day exhibition on Saturday, November, 28, in the British Barnsley Co-operative Hall, Westgate, Wakefield. The exhibition will be open between the hours of 9.30 a.m. and 9.00 p.m. Admission will be, adults 1s. 6d., children 1s. Advance tickets are obtainable at reduced rates from the Secretary, Mr. L. Speakman, of Ribblesdale, Southfield Close, Hobury, Wakefield. Running layouts in OO, TT and OOO Gauges will be on show, and there will also be a display of static models.

Irish Railway Record Society

THE IRISH Record Society was founded in 1946 to bring together all those interested in the railways of Ireland—past or present. Members receive, twice annually, a printed journal, composed mainly of articles of a historical nature, while a bulletin, also issued twice a year, gives news of current happenings on Irish Railways. Other activities include outings to places of railway interest and rail tours of Irish lines, with steam motive power whenever possible. Regular meetings of the society are held in Dublin, Belfast, Cork and London. Visitors are always welcome at the London area meetings, which are held at the Fred Tallant Hall, 153 Drummond Street, London, N.W.1 and begin at 7.15 p.m. Prospective members and visitors should write to the Secretary, Mr. L. Hyland, of 40 Old Finglas Road, Glasnevin, Dublin.

Visit to a locomotive depot

MEMBERS OF the East Ham and District Model Railway Club, and friends recently visited the Eastleigh Works and Shed. The many members and guests taking part assembled at Waterloo Station to catch the 9.33 a.m. train to Southampton. This left on time with 'Battle of Britain' class locomotive No. 34086 '219 squadron' in charge. During the journey to Southampton, efforts were made to introduce the 90 enthusiasts on board to each other, and so help to make a more convivial journey.

The train arrived at Southampton a few minutes late, and the result was that the party missed the connecting train to Eastleigh. Although British Railways officials made efforts to put matters right, the party had to wait for the next train. On arrival at Eastleigh the weather broke and rain descended steadily for the remainder of the journey to Eastleigh Shed. Many steam locomotives were in the works, and it was a pleasant sight to see such well known locomotive types as 'Merchant Navy' class Pacifics Nos. 35011/2/3/6/21; also Nos. 34002/32/55/7/64/6/82/103 and S.15 4-6-0 No. 30834 (which was in the process of being re-wheeled and returned to traffic). There were also several British Railway standard designs of the 73XXX, 75XXX, 76XXX and 80XXX series. Other parts of the workshops, where locomotive component parts are made and repaired, were also visited, and proved to be of great interest to members.

The running shed was the next place to be visited, and the party were fortunate in seeing 'Schools' class No. 30930, which was still almost intact. Seven 'Terrier' locomotives Nos. 32636/40/6/50/62/70/8, two class B4 0-4-0T, M7 No. 30133; W class 31911; Q class 30548; 700 class 30700; U class 31627; S.15 class 30512/840; N class 31829/33/6/9/44, were all in the running shed, and could be viewed freely by members of the party. Many Bulleid Pacifics were also to be seen, and a large number of British Railway types were in steam waiting for their respective trains.

When the tour of the running shed had been concluded, and all photographs taken, the party travelled to the Isle of Wight, via Lymington, for the remainder of the afternoon. The train to Brockenhurst was again hauled by a steam locomotive—on this occasion No. 34095 'Brentor', and on arrival at this junction members were surprised to see the 'Hampshire Hog' rail tour which was in the care of M7 0-4-4 No. 30480.

The journey through the New Forest to Lymington was very pleasant as this old locomotive pulled the train at a steady speed through most attractive countryside. One member, the envy of the party, was fortunate in having permission to travel on the footplate for the entire journey. On arrival at Lymington the party took the ferry boat to Yarmouth, Isle of Wight. Other members of the party travelled up to Brockenhurst and back behind the M7 tank locomotive, and yet another 30 members from the party went along to see the workshops of the Hampshire Narrow Gauge Society. The 0-4-0ST locomotive 'Cloister' (late of the Dinorwic Slate Quarry, Snowdonia) owned by this society, was towed out of its shed by a petrol locomotive 'Agwi Pet' for the visiting members to photograph it.

Separate trips were also arranged to the Hythe Pier and Railway, and also to Cowes, Isle of Wight, where the many guests spent a most enjoyable afternoon. The return journey was made behind locomotive No. 34086, and the party made a prompt arrival at Waterloo.


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Published by Thomas Skinner & Co. (Publishers) Ltd., St. Alphage House, Fore St., London, E.C.2. Printed by James Cond Ltd., Charlotte St., Birmingham 3