VOL. XXXV. No. 8 AUGUST 1950

MECCANO MAGAZINE

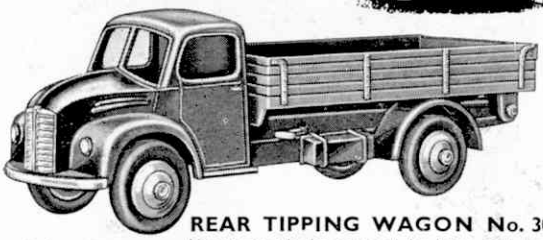
MOUNT VEYRIER CABLE RAILWAY

9D.

DINKY TOYS

READY DURING AUGUST

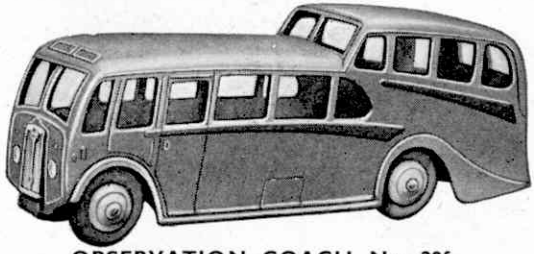
NEW



REAR TIPPING WAGON No. 30m

Prices later

Has tipping body operated by lever, and hinged tailboard. On Dodge chassis



OBSERVATION COACH No. 29f

A handsome model of a motor coach with rear section raised to give passengers good views in all directions

Estate Car
No. 27f

An attractive miniature of this popular general purpose vehicle

Price **2/10** each

Land-Rover
No. 27d

A fine model of a vehicle designed to go anywhere and do anything

Price **3/9** each

Daimler Ambulance
No. 30h

A beautiful model finished in cream with red wheels and the Red Cross on each side

Price **2/10** each

Hudson
"Commodore" Sedan
No. 139b

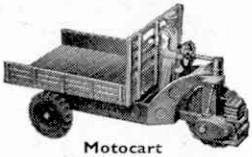
A fine miniature of a sleek American car, attractively finished in two colours

Price **2/9** each

Austin Wagon
No. 30j

This handsome model has the characteristic lines of its well-known prototype

Price **2/4** each



Motocart
No. 27g

Low loading three-wheeled truck. Tipping high-fronted body

Price **4/6** each

Farm Produce Wagon
No. 30n

Attractive model of all-purpose farm wagon

Price **3/3** each

Petrol Tanker
No. 30p

Realistic reproduction of a modern style tanker

Price **2/6** each

Morris Oxford Saloon
No. 40g

A splendid reproduction of a popular modern car

Price **1/11** each

THE ABOVE PRICES INCLUDE PURCHASE TAX

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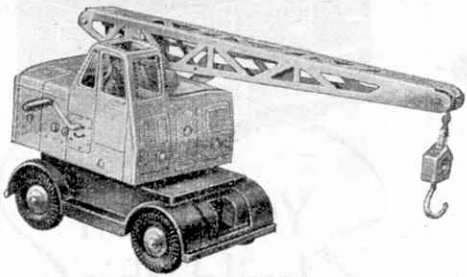
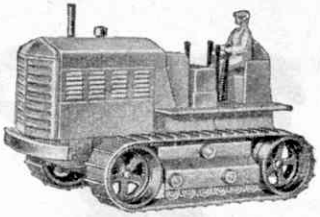
SUPERTOYS



Dinky Supertoys No. 571
Coles Mobile Crane
Hoisting, jib-raising and slewing movements
Price 9/11 each



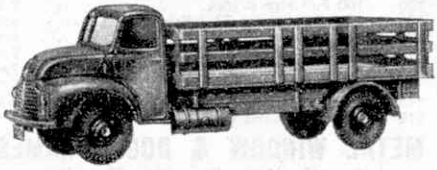
Dinky Supertoys No. 563
Heavy Tractor
Price 6/3 each

Dinky Supertoys No. 751
Lawn Mower
Price 5/6 each

Dinky Supertoys No. 504
Foden 14-ton Tanker
Price 9/- each

Dinky Supertoys No. 511
Guy 4-ton Lorry
Price 4/9 each

Dinky Supertoys No. 562 Dumper Truck
Adjustable front wheels, tipping bucket, reversible driving seat
Price 6/6 each



Dinky Supertoys No. 531
Leyland 'Comet' Lorry
Price 5/- each

Dinky Supertoys No. 514
Guy Van
Large capacity van body, with opening double doors at rear
Price 5/11 each

ALL PRICES INCLUDE PURCHASE TAX

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Next Month: "THE HERRING HARVEST." By James Worth

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With the Editor

"Comet" Jet Liner's Trips

Since Mr. D. M. Powell wrote his interesting article on the de Havilland "Comet," published in last month's issue, this successful British jet air liner has given further proof of what can be expected in the way of high-speed long-distance air travel when large jet air liners come into regular service.

The "Comet" recently returned to Hatfield after spending some 15 days in Egypt, the Sudan and Kenya, doing a comprehensive series of tropical flight trials and take-off and landing tests at high-altitude airports. The Eastleigh airport at Nairobi, for instance, where some of the tests were carried out, is 5,370 ft. above sea level, and only 1 deg. 18 min. south of the Equator. On the outward trip the "Comet" was flown from London to Cairo, just under 2,200 miles, in 5 hrs. 6 min., thence to Nairobi, a similar distance, in 5 hrs. 15 min., and finally from there to Khartoum in 3 hrs. 10 min. Each of these successive stages was flown in about half the time taken by present-day airlines, and similar fast times were recorded on the stages of the homeward flight.

Chief pilot throughout the venture was John Cunningham, who had a test crew of five, and there were 10 passengers, most of them senior de Havilland officials. Several thousand pounds' worth of special equipment were also carried in the aircraft.

British Motor Engineering Triumphs

On page 354 of this issue there are pictures of the largest and most powerful tractor ever designed and built in this country, which weighs 15½ tons, and can haul a total load of 100 tons. This giant is fittingly called "The Mighty Antar." The name is that of a great Arab warrior and poet, and the tractor is designed for use in constructing a new oil pipe line across the desert tracks and sandy wastes of the Middle East.

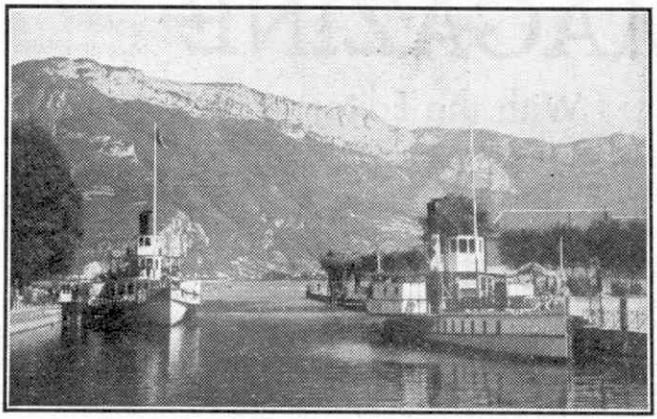
In future issues I hope to tell readers about others, such as the gigantic Dyson trailer, the purpose of which is to carry large excavators, and another tractor with four-wheel drive built by Scammell Lorries Ltd. that can literally go anywhere and was specially designed for difficult conditions in the Borneo area.

This Month's Contents

A Lake and Mountain Playground

By E. Emrys Jones

LAKE ANNECY is one of the smaller and less known of the Alpine lakes, yet it is undoubtedly one of the loveliest stretches of water in Europe. It lies 250 miles south east of Paris, in that part of France known as the Haute Savoie. The Swiss frontier is only about 30 miles away.



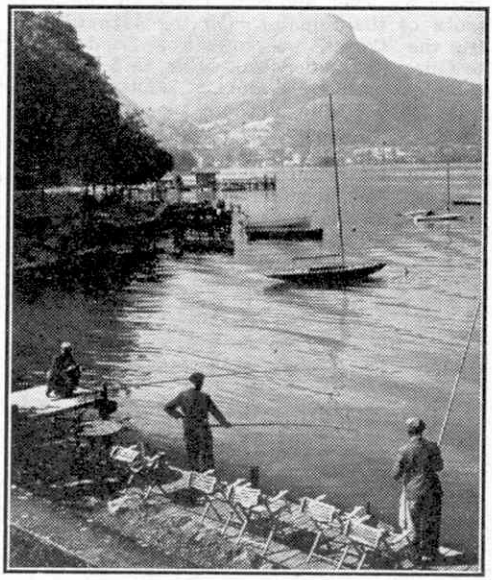
Paddle steamers provide a service between Annecy and the many small villages on the shores of Lake Annecy.

The lake itself is 15 miles long and about 2 miles wide, a truly beautiful azure blue sheet of water and a veritable paradise for the water lover. Holiday makers come here to bathe, fish and canoe, and for yacht racing and water ski-ing, and they can also traverse the lake by speed boat.

For the more leisurely type there is a fascinating paddle steamer service which travels across the lake in criss-cross fashion, calling at each small village in turn. The villages are on the edge of the lake, and yet they are at the feet of the huge mountains that surround it. On one side there is a magnificent range, the centre piece of which is the La Tournette group of mountains. Behind this range lies the Mont Blanc massif. On the other side of the lake is another range, the Semnoz group, which rises to over 5,000 ft., and at one end is the town of Annecy, with a population of 25,000.

Annecy is the main town of this interesting district, and it has been referred to as the Venice of France. Two canals add a picturesque note to an already picturesque town, the old quarters of which are really delightful. The newer and so called modern part of Annecy is just like any other French town, full of shops, cafes and restaurants.

As can well be imagined there is much scope for the climbing and walking enthusiast, as well as the water worshipper, in a holiday centre such as this. The rugged crags and pinnacles of La Tournette provide an opportunity for a display of stamina as well as mountaineering skill! More

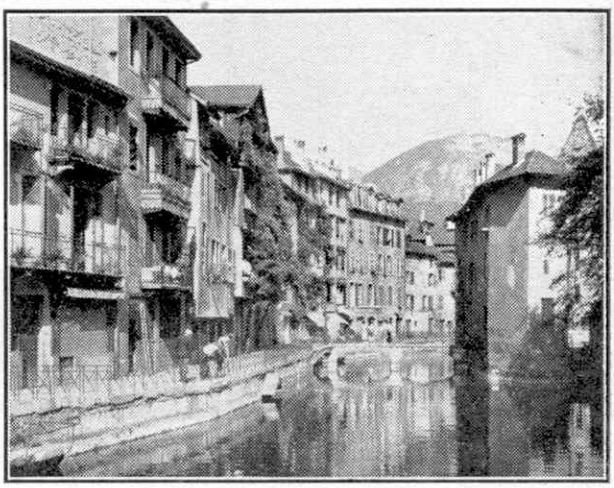


Fishermen in Talloires Bay, Lake Annecy.

lethargic members of the community prefer to make use of the myriads of footpaths that honeycomb the hills on both sides of the Lake. As one slowly ascends the mountain side by these handy paths, one cannot help but look behind continually at the indescribable beauty of the azure blue lake shining like a jewel in the sun. No one can be blamed for walking backward all the time!

From one lakeside village, Veyrier, the cable railway seen on our cover goes right to the summit of Mount Veyrier, a 4,000 ft. height from which there is a magnificent panorama of mountains, valleys and lakes. Thirty miles away is Mont Blanc, a giant amongst giants, glistening and snow-covered, and a veritable challenge to all able-bodied men and women.

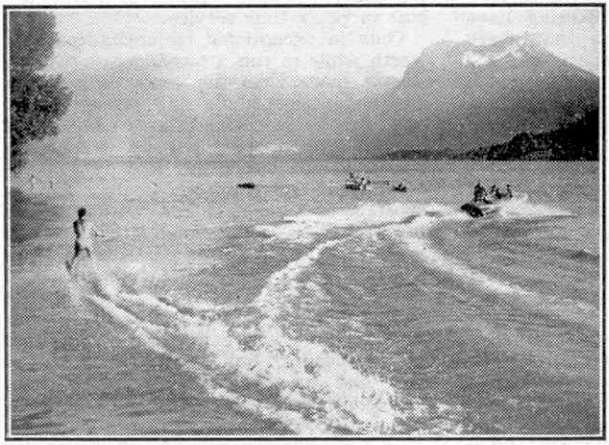
Lake Annecy is 1,000 ft. above sea level, in the centre of a great land mass and surrounded by mountains. Yet the winters are not severe, and the full heat of summer is easily tolerable. The Romans, who came to the district 2,000 years ago, were attracted by its mild climate, a most interesting fact when we remember its height. They had little interest in British districts which are as high as this!



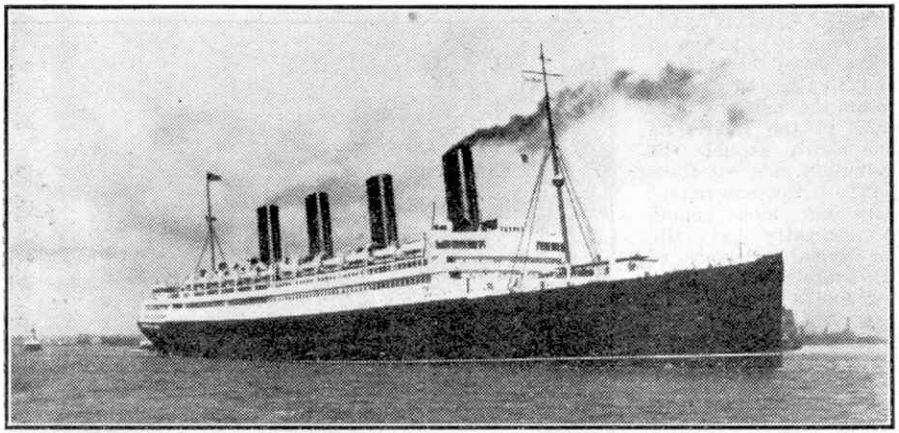
The Canal de Thiou passes through the picturesque old quarters of Annecy.

Those who want a perfect holiday centre on the Continent can find one here, whether they camp in one of the fields near the lakeside or indulge in the luxury of a hotel.

As a keen photographer as well as a hiker, I have found that the Lake Annecy district abounds with fine pictures. The light is really good from April until October, so an expensive camera with a fast lens is not essential. A simple folding camera, or even a box camera, will serve the purpose well. Exposures are generally about 1/50th at f11, and fine grain panchromatic films will give nice well graded negatives from which sparkling prints and enlargements can be made. The most important thing to remember is the need for taking the camera at all times, for all sorts of interesting things crop up in unexpected places. To miss them because the camera has been left behind is to lose some of the pleasure that living the grand times of a splendid holiday over again will give when the snapshots are developed and prints mounted in the album. For this a full record is essential.



Water ski-ing on the Lake is a favourite sport of visitors to Annecy.



The Cunard liner "Aquitania," a great favourite with transatlantic travellers for many years and an invaluable transport and hospital ship in war. The illustrations to this article are by the Nautical Photo Agency.

How Ships Wear Out

By F. C. Bowen

THE last voyage of the 36-year-old Cunard liner *"Aquitania"* to the shipbreakers' yard on the Clyde, and the extraordinary demonstrations of affection from seamen and passengers which were exhibited as soon as her end was announced, has made many people wonder why she was discarded, in spite of her age. It is obvious that the unparalleled popularity which she enjoyed even after her design had long been surpassed was a great asset to her owners on commercial service. Modern methods of ship repairing have been taken to such a pitch that every part can be replaced until she is like the traditional boy's pocket knife, in which the handle and blades are new but it is still the old knife. Why should the *"Aquitania"* not have been reconstructed and modernised?

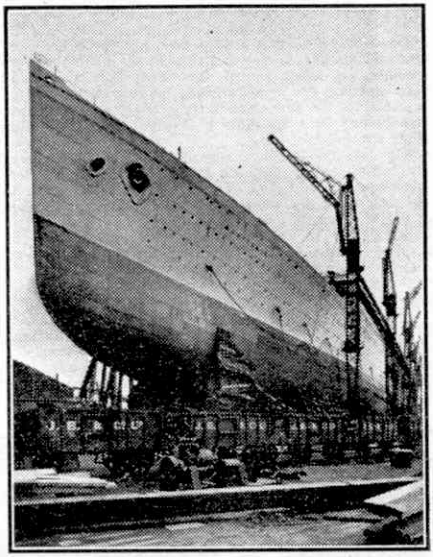
There are two reasons why an old ship is discarded; the first and more usual one is that she is worn out, and the second is that she is obsolete. The first is the concern of the authorities for the safety of those who travel in her; the second is the owners' business. It is physically possible to rectify both, but whether it will pay to do so is another matter. The fabric of a ship begins to wear almost as soon as she is launched, and it gets more rapid as her age increases; but periodical surveys by the experts of the Government, or Lloyd's Register, or other classification societies in other countries, keep the wear well within the limits of safety. Some ships, the *"Aquitania"* for instance, being built with far greater strength than the regulations demand, and then having constant care lavished on their structure, become obsolete before they are worn out; but no matter how much money is spent there comes a time when the demands of the surveyors will add up to a total which makes it impossible for them to earn enough to cover the cost in peace-time service.

Only in exceptional circumstances is it worth while to run a passenger ship when she is more than 20 years old. These circumstances include the strength and care already mentioned, large sums spent periodically to bring her up to date in her passenger amenities and reasonably economical in her machinery, and a shortage of tonnage on her route sufficient to make travellers moderate in their demands. In the latter part of the nineteenth century the first-class liners could be sure of further profitable years in the emigrant trade, particularly under continental flags where the authorities were not particular; but all that is changed now and practically every country has restrictive laws to prevent ships above a certain age being used for passenger work. At a time like the present, when war has reduced the number of available ships

while shipyard prices and shortage of material make it difficult to build new ones, these laws can prove very inconvenient; and the countries which have passed them are forced to put their ships under the flags of Panama, Honduras, Liberia and such countries as open the privileges of their flags freely to anybody who cannot register his ship in his own country. After a war like that of 1939–45 it is obvious that this flag camouflage is the only way in which many countries could keep their essential services going unless they repealed their laws; but it obviously permits the employment of worn-out ships to the danger of the people on board.

Britain has no rigid law limiting the age of the ship on passenger service. The very strict examination of every part of the ship from her laying down to her last voyage to the scrappers' yard is much more effective, for it prevents a worn-out ship from paying her way.

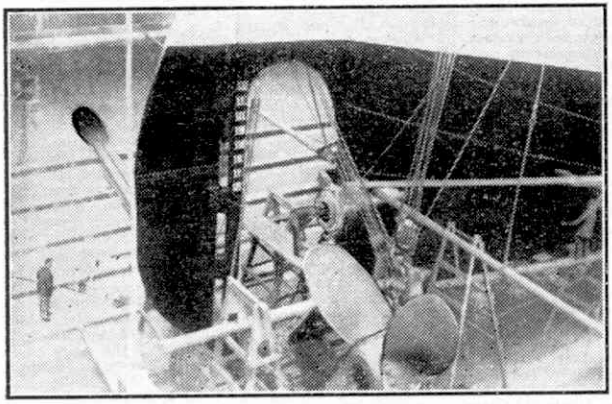
The system of surveys, and the cabalistic signs in the register book that convey their results to the underwriters and warn them against insuring a ship which is in poor condition, are something of a mystery to the layman. Before a ship can be laid down the plans must be approved. The main purpose of that is to avoid an unsafe design which would increase the chance of the ship foundering or capsizing, but it also ensures that every part is made of metal heavy enough to stand the strain and thick enough to allow for the inevitable wastage by corrosion without getting dangerously thin. These material standards are called the ship's scantlings.



The "Aquitania" on the stocks in 1913.

Once the ship is laid down there are surveys at every step to make sure that she will wear well. Every consignment of steel is liable to have samples taken at random and tested in every way. The progress of construction is carefully watched to ensure that the riveting or welding is carefully done. The surveyors satisfy themselves that the steel is properly treated before the paint is applied, otherwise corrosion may take place under the covering meant to protect it. After that she seems to spend most of her life being surveyed.

The ship taking out a passenger certificate has to go through a rigorous examination every year with special attention to the parts which are liable to deteriorate; while ships carrying emigrants have an additional examination before the start of every voyage and are not allowed to sail until anything worn out or missing is replaced. In addition, every ship which is classified—and one which is not has a poor chance of getting insured



Unshipping the propeller to draw the tail shaft to examine it where it is most likely to wear.

or finding a purchaser—has to go through the free-board or load line survey every four years. The whole of the ship's structure has to be exposed to the examination of experts, and a ship does not have her class restored to her in the register book until they are satisfied on every point. The propeller shafts and their bearings are most carefully examined, the plating is tested for any reduction in its strength and thickness, the boilers and machinery receive equal attention from specialists.

The examination is made more rigorous with each successive survey and the cost of rectifying matters increases accordingly, so that the owners have to consider carefully whether her remaining expectation of life will justify the expense or whether it is better to send her to the scrappers. In addition to the routine surveys, others are carried out whenever an accident makes it necessary to repair the ship, and although these are limited to the parts repaired they are equally carefully carried out.

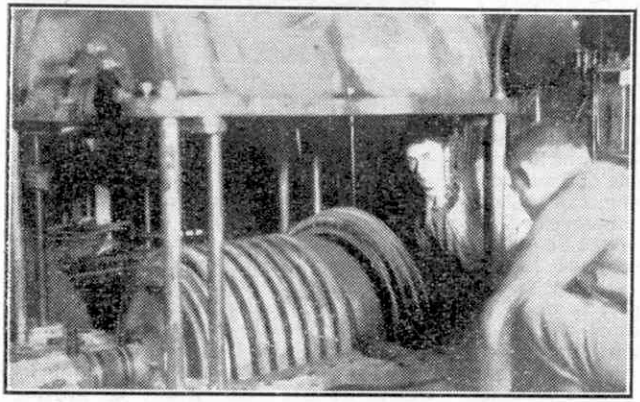
Apart from accidents, most of the trouble is caused by corrosion of the material, over-strain and fatigue of the metal being secondary reasons which normally affect only certain parts. The great task of those who issue rules for the guidance of surveyors is therefore to see that the metal is sufficiently thick to begin with to allow for a little inevitable corrosion without forcing the ship to carry round a lot of deadweight which is unnecessary. The great protection against corrosion is paint, of the special composition and quality which marine work demands; and the owner who economises is likely to find the surveyors demanding that certain plates shall be removed and replaced by new ones, which is a very expensive business. Corrosion is most troublesome at the waterline, where the coloured paint known as the boot-topping has to be of special quality, and at places where electrolytic action is liable to be set up by different metals being close to one another. The black patch of special composition under the stern of many ships is to prevent a bronze propeller setting up electrolytic action with the steel plating and corroding it rapidly.

The inner and outer plating under the boilers, affected by temperature as well as moisture, is another part which demands special attention and where replacement is very expensive. Rivet heads also are liable to corrode under the paint and to lose their efficiency in holding the ship together. Another trouble with rivets is that the "working" of the ship, described so graphically in Kipling's "*Ship that Found Herself*," is liable in time to enlarge the rivet holes; and once the two plates get the chance of moving they may act as a gigantic pair of scissors and shear the rivets in half. All rivets are subjected to special tests.

Wooden decks are examined just as carefully as steel plating, but in their case it is not corrosion but constant cleaning which wears them down. The hatches and hatch-covers are a special point because if they are weakened the ship may fill with water through them.

Engines and boilers are examined annually and the boilers may have to be replaced. As they wear, the surveyors reduce the maximum steam pressure to which they may be subjected, and that sends up the fuel bills and reduces the ship's speed. Other surveyors tackle all the life-saving appliances—lifeboats, davits and the like—steering gear, the pipes for sounding the holds, and any other part which is of particular importance to the safety of the ship or specially liable to wear.

All these precautions can check danger to the ship and her people through physical causes, but they cannot affect the influence of obsolescence on a ship's economics. Ordinary running expenses increased so steadily during the lifetime of the "*Aquitania*" as to make it necessary to secure economies in various directions to let any ship of her age pay her way. The "*Aquitania's*" hull is, to the seaman's eye, one of the most beautiful ever put afloat. Since it was designed, however, ceaseless experiment has shown how alterations to the lines below the water can greatly reduce the resistance offered, and therefore the horse-power necessary to drive the ship through the water at a given speed. Her old-fashioned, overhanging counter stern has been replaced by the modern cruiser type, which is another factor in obtaining speed economically. Her turbines were directly coupled to the shafts, but since 1914 gearing has become general. If a turbine is run too slowly it loses efficiency; so does a propeller when it is run too fast. In the "*Aquitania*" a compromise had to be found at 165 revolutions per minute, but in the new "*Caronia*" the high-pressure turbines run at 3,686 revolutions and the others at 1,990, while the screws revolve at 140. The "*Caronia's*" boiler pressure is 600 lb. per square inch compared with the "*Aquitania's*" 195. That not only makes the boilers very much more compact, leaving more space for earning money, but also it is more economical. In the matter of crew's accommodation immense strides have been made within the last few years.



The upper part of the turbine casing lifted to permit the blades to be surveyed.

From the viewpoint of the passenger, who neither knows nor cares about a ship's economics, the older ship has handicaps which cannot be altered, although in the "*Aquitania*" their effect was greatly reduced, with the older generation of passenger at least, by the feeling of strong personal affection. Her four funnels, of just the right size and rake, gave the ship a distinctive and very pleasing appearance; but, with the cowl ventilators round them, they took up a lot of deck space which in her newer consorts can be devoted to sports and amusements. Both public rooms and sleeping cabins, although they were altered and modernised appreciably during successive refits, were still based on the principles of 1914, and although many will maintain that they were the more comfortable for that, the views of the most modern passengers had to be considered.

Many will still ask why these factors should not be altered. In a few cases it cannot be done; in the others it can if it is worth while. There is no technical difficulty in moving a

(*Continued on page 382*)

BOOKS TO READ

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

"BRITISH ROAD RACING"

By JOHN DUDLEY
(Ian Allan. 2/-)

Motor racing is becoming increasingly popular, and Mr. Dudley has produced this book for the benefit of all who are attracted by the sport. He starts with the first road race from Paris to Rouen 56 years ago. The sport became an affair of enclosed circuits in 1903, and Grand Prix racing began in 1906.

Next we turn to British racing cars, a few details of earlier examples being followed by excellent accounts of the various types of E.R.A., which achieved a wonderful reputation at home and on the Continent, and of the Alta, a splendid car that was the first to be designed and put into quantity production here after the end of the war. An interesting development of recent years has been the growth of popularity of the 500 c.c. racing car, and here we have the story of two of these, the Cooper "500" and the Bond "500," which has a front wheel drive. Other British cars dealt with are the H.R.G., the Rover Special, and the B.R.M., which it is hoped will place the British car industry in the front ranks of road racing.

The competition that British racing cars have to meet is made evident in the next section, in which we have the stories of such famous cars as the Alfa-Romeo, the Maserati and the Ferrari, Italian products that have a long list of triumphs to their names. Other cars described in this section include the Bugatti and the Talbot-Lago. Finally readers are taken for "runs" around Silverstone and other British circuits.

A special feature of the booklet is the manner in which it is illustrated. There are splendid photographs of racing cars of all types in the paddocks, at full speed on the circuits or on famous hill climbs. Copies can be obtained from booksellers, or direct from the A.B.C. Books Mail Order Department, 33, Knollys Road, Streatham, London S.W.16, price 2/2½d. each including postage.

"THE L.M.R. LOCOMOTIVE REFERENCE BOOK"

By H. R. CHRISTIAN and R. P. SYKES
(British Locomotive Society. 3/-)

We have received the fourth edition of this very useful booklet, which gives a complete classified list of numbers and names of engines of the London Midland Region and of the former L.M.S. engines of the Scottish Region. Details of the shed allocations of all engines, including service locomotives, and the location of historic engines that are preserved also are supplied, all information being correct to 4th March, 1950. As is inevitable with a work of this kind, users will note that several changes have occurred since printing, but this does not detract from the value of the book.

A useful feature that will appeal to engine spotters is an up to date list of locomotive sheds, with the new shed numbers, of the London Midland, Eastern, North Eastern and Scottish Regions. Plenty of space is provided in the book for recording shed changes or any other details of special interest. There are no illustrations.

Copies of the book are obtainable from Mr. R. P. Sykes, 42, Coombe Road, Handsworth, Birmingham 20, price 3/- including postage.

"THE SHIPMODELLER'S WORKSHOP"

By R. K. BATTSON
(Percival Marshall. 3/6 net)

The author has been a keen shipmodeller for 25 years. His experience has shown that it is not difficult to obtain information on ships to model, but that information on practice in the workshop is scarce. He has therefore set out to guide the modeller in the actual work of translating a set of drawings into a satisfactory model.

The plan that Mr. Battson follows is to take the principal components of a ship, whether ancient or modern, in alphabetical order, and to describe briefly the methods he has found best and easiest for making them. He begins with anchors and ends with winches and yards, and the modeller can quickly find any particular item in between in which he is interested.

A frontispiece shows the author himself at work on a late 16th century galleon, and there are four other full page illustrations of excellent models, presumably constructed by Mr. Battson, in addition to 74 drawings in the text.

"BRITISH RAILWAYS"

By LEONORA FRY
(Methuen and Co. Ltd. 2/-)

This interesting book is one of the "Get-to-Know" series, small and handy volumes that can be carried easily, ready for reference on the spot and for use on holidays. They are intended for boys and girls with no previous knowledge of the subjects dealt with. In encouraging readers to "get to know" British Railways, the author points out that comparatively little has been written about the actual railways. In most books of this kind the emphasis is on locomotives and trains. Here these are ignored, and the concern is with track, signals, engineering works and stations, all dealt with as they can be seen from platforms and bridges, or over lineside fences.

The plan followed is to ask simple questions that boys and girls can answer by direct observation, each question being followed by notes that suggest what can be seen and giving explanations. For instance, the question: "How many lines are there?" leads to information on single, double and four-line tracks. An ample supply of line drawings and diagrams helps to fix interesting practical details in mind.

The booklet ends with notes on the development of railways, the great days of railway monopoly, the more recent rivalry of rail and road interests and the future of British Railways. There is a list of the opening dates of various lines from 1825 to 1848, and a useful index.

"WIGGLES THE WIZARD"

By MARJORIE R. WATSON (Harrap. 5/- net)

The adventures of Wiggles, whose real name is Bill Smith, are here told in five one-act plays. Each of these is complete in itself and can be used separately, but where a longer entertainment is planned the whole series can be presented as a five-act play.

Wiggles himself is an interesting boy who is suddenly transformed into a wizard and thrown into competition with Melchior the Magician. In each play there is plenty of fun, with some very startling magic, in which Wiggles really shines, to discover at the end that everything has just been a wonderful dream.

The plays read well and will be of interest to many younger "*M.M.*" readers. They should offer scope for amateur performance, and to help in this the author gives useful hints on production.

"OUR RAILWAYS IN VERSE FOR YOUNG AND OLD"

By ALAN F. SHOULTS (Edgar Backus. 2/6)

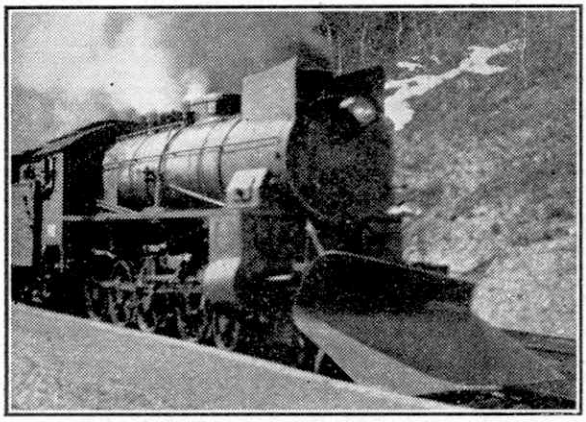
"*Our Railways*" contains 19 plates in colour depicting railway scenes of various kinds and opposite each one there are verses dealing with that particular feature. The subjects covered are fairly comprehensive and the youthful reader will learn a great deal from this book. It will appeal mainly to younger boys and girls and it would be an ideal companion for them on a train journey.

On the Footplate in Norway

By G. A. Bushell

DURING a cycling holiday in Norway a year or two ago I requested the head office in Oslo of the Norwegian State Railways for permission to travel on the footplate of the night sleeping car express from Oslo to Bergen. The fact that I was an English locomotive man seemed sufficient credentials for the authorities readily granted my request, subject to wiring through to Bergen for permission for the whole distance. They very kindly allowed me to travel free of charge and an official arranged for free transport for my cycle.

This section of the Norwegian Railways is 307 miles long and took 30 years to complete. It is interesting because it is the only railway in Europe which runs above the tree line; that is to say part of it runs through an area where there is always snow. Even in the middle of summer it is usual to get falls of snow from 8 ft. to 11 ft. deep. As is to be expected of a railway in such high country, tunnels are numerous. Apart from the many wooden snow sheds, there are 184 tunnels with a total length of 24 miles.



A Norwegian State Railways 4-8-0 compound locomotive No. 449, of the same class as the engine on which the author rode.

When I arrived at the terminus, my cycle was taken from me, labelled, and put aboard the train. A sleeping car attendant took my luggage and stowed it away. I then introduced myself to the driver. As he couldn't speak English I had to rely on my knowledge of his language, and although this was fair enough for general conversation, it was hardly suitable for asking questions about railway work.

Our engine for the first part of the journey was a 4-cylinder compound 4–8–0, No. 400 of the Class 31B. This type appeared to handle most of the passenger traffic on the line. The driving wheels seemed quite small, 4 ft. 5¼ in. in diameter, but they are not out of place on the heavy gradients of this route. The boiler pressure is 228 lb. per sq. in., and the high- and low-pressure cylinders have diameters of 16½ and 24¾ in. respectively, with a stroke of 23⅝ in. The high-pressure cylinders are between the frames, with the low-pressure ones outside. The high- and low-pressure pistons on each side are directly opposed and are served by one steam chest mounted almost over the low-pressure cylinders.

Promptly at 9.35 p.m. the conductor waved a green light round in a circle and we dug our toes in up the 1 in 40 incline out of Oslo Ostbanestasjon with our train of six sleeping cars, one baggage car and the conductor's car. No. 400 had a slight knock while she was being worked rather heavily and the driver referred to it rather apologetically, I thought.

Soon we left the suburbs of Oslo behind, and before long dusk gave way to darkness. The headlamp was switched on, and it was a novel experience to have the track ahead of the engine illuminated for a considerable distance. I noticed that different shaped boards giving speed restrictions, radii of curves and gradients were placed at cab-height and were easily readable as we passed them.

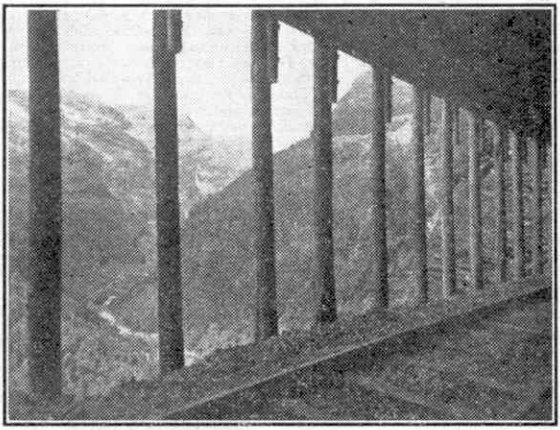
I found the cab very comfortable, being closed right in, with no dust blowing about in spite of the tender full of very small American coal; and there was ample ventilation in the roof. Electric lighting was provided for the water gauges, pressure

gauge, high- and low-pressure steam chest pressure gauges and for the general cab light. All these lamps, which were 32 volts, 15 watts, did not affect the visibility through the cab windows in the least. The only time when the look out was impaired was when the fire-hole door was open. This was normally kept closed and the driver opened and shut it between each scoopful of coal. I thought of the way we fumble around in the dark in England, especially so when I saw the light over the exhaust injector overflow.

Having reached the summit of one stiff climb, the driver shut off steam, put "the lever" to 50 per cent. and opened some anti-compression valves by means of a lever at the side of the cylinder cock rod. Although the driving wheels were so small the engine coasted very smoothly and easily, at about 50 m.p.h. in places. Soon after we started to coast, the driver, Norodd Tjönneland by name, stood up and motioned me to take his place. He gave me warning at several sharp curves where speed had to be reduced. Having been brought up on the vacuum brake, I found it rather ticklish getting the feel of his air brake which, while it has the five positions of the Westinghouse system, is slightly different and is known as the Hildebrand Knorr Brake. To add to my difficulties the brake pressure gauge was calibrated in kilograms per sq. cm. On the level again, I set the engine much the same as one would in England; but with the "lever" at 25 per cent. I just couldn't seem to get the regulator open the amount that I wanted it, so I am afraid that I was inclined to be rather "heavy handed."

I found this part of the journey rather weird. I was on a strange locomotive, I knew nothing of the signalling system, I had no idea of the gradients or anything else which comes with knowing the road. The impressions that I retain are of sharp curves following one on another, steep slopes dropping away from the track, rough-hewn tunnels lit up in the glare of the headlamp, flimsy-looking bridges over sheets of water, and the single-track road with an occasional passing loop.

At these points we would first come upon a green light at which the driver would whistle. About the middle of the loop would be a man standing on the platform holding a green light. He would give us a friendly wave to acknowledge our whistle and we would be out of the loop and away again. I felt relieved when the driver took charge of the train once more. The gradients and curves became more severe and demanded his thorough knowledge of the road.



A striking view from a snowshed on the Flaam branch. Photograph by courtesy of the Norwegian State Railways.

We reached Hönefoss, a comparatively large junction, 56 miles from Oslo, and came to a stand in one of the many platforms. The driver flicked a switch in the cab roof above his head and a light came on at the back of the tender. The engine was uncoupled and we rolled straight on to the locomotive depot where several men came to attend to it; one cleaned the fire, another shovelled the coal forward, while another filled the tank. More switches, and the motion was illuminated. I went with the driver as he walked round with his oilcan and adjustable spanner. The oiling points in the motion had metal pin trimmings in them, and in this comparatively short distance had used quite as much oil as would an L.M.R. Stanier type in running 300 miles.

With locomotive duties completed, we backed on to the train again, coupled up and were right away. For the next few miles there is a gradual climb up to Sokna and then a drop down into the Hallingdals, one of those long narrow valleys with a sheet of water in them, which seem to go on for ever. We made a stop for water at Nesbye, about 46 miles

from Honefoss. This was sufficient to last us to Aal, another 40 miles farther on. Despite the poor nature of the coal, the engine steamed well and made easy work of the long climb to Aal, 1,830 ft. above sea level and 142½ miles from Oslo. During this part of the journey I chatted with Norodd Tjönneland and discovered that he had been booked off at Oslo and was making the return trip to his home station. I also learned that he was the equivalent to a "passed fireman" in England. He pointed to the single white band round his cap and told me that drivers have two.

At Aal I said goodbye to this crew and climbed down to wait for the next engine to back on. This was No. 452 of the same class. Daylight had come and it was 4.0 a.m. when we set off on the hardest part of the run. We climbed steadily up into the mountains on a gradient which was mainly around 1 in 70. On our left side the ground rose in a tree-clad slope, while on the right it dropped away to the bottom of the valley. In the next 50 miles the line climbs from 1,830 ft. up to 4,332 ft. above sea level at Taugevand, and once above the tree line the track twists about, doubling back on itself through tunnels and wooden snow-sheds festooned with icicles. These melt during the day's sunshine and are arrested by the nightly freeze-up.

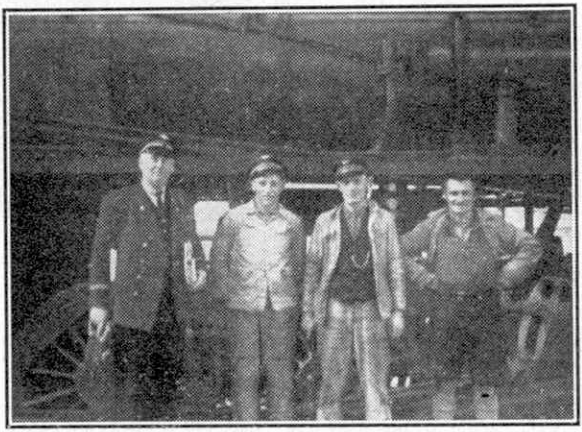
The engine was being worked over this section with a full regulator and the "lever" at 40 per cent.; even so, the needle of the speedometer was only hovering about the 32 kilometres per hour which is roughly about 20 m.p.h. My new driver had presented me with a large bottle of milk, and I found it a welcome change from the quart of coffee which I had brought and had kept hot on the "drip plate." From Geilo onward our progress seemed leisurely although we were working the engine so hard. Probably this was because stops were made at Ustaoset, Haugastol, Finse, Grjotruste and Hallingskeid before we got to Myrdal where a long stop was made. To an English railwayman accustomed to a milder climate, easy gradients and densely-populated country, this heavy climb among snow-covered barren wastes was quite an experience. When we were not passing through tunnels or snow sheds, all around us was a dazzling white with here and there a flat surface showing the position of a frozen lake.

At Finse we waited for the night train from Bergen to arrive before we took to the single track again and tackled the final climb to the summit at Taugevand. To the south of us I could see the height which I was told was the Hardanger Glacier, 6,150 ft. above the sea level. Somewhere along this section I took over the firing and although my first few rounds were successful my further efforts were not so good. However, we were able to pull her round during the next station stop and carried on in good order, although the fire was getting dirty and the fireman made frequent use of a short pricker, a practice of all the firemen on this trip.

Once over the summit, the regulator was shut and the anti-compression valves opened, the gradient of 1 in 47 making it possible for us to coast as fast as we were allowed to go. Nearing Myrdal, the driver drew my attention to the view to be seen through the openings in the snow sheds. Below us in what seemed a sheer drop was the Flaam Valley, the bottom of which was over 2,000 ft. below us. Parts of the various levels of the branch railway to Flaam could be seen spiralling in and out of the mountain-side. This line is electrified and descends 2,700 ft. from Myrdal to Flaam in a distance which is only 12 miles in a straight line.

At Myrdal water was taken and a man came and brought the coal forward, although a great deal wasn't needed for the down-grade run to Voss apart from the level pull through the Gravelhalsen tunnel. As soon as we left Myrdal we entered this tunnel, 17,240 ft. long, the longest in Scandinavia and 2,818 ft. above sea level. Leaving the level stretch through the tunnel at Upsete, the line continues its sharp downward drop to Voss which is only 188 ft. above the sea level. In the 47 miles from Taugevand the loss in height is over 4,000 ft., and of this distance 11¼ miles are covered in 12 tunnels. Our speed rarely exceeded 40 m.p.h. as the many sharp curves required constant braking of the train. At Voss, 239½ miles from Oslo, a fresh engine was waiting to take the train on its last 67½ miles to Bergen, so I thanked the crew and climbed down. They were now back at their home depot.

Our engine for the last lap was yet another of class 31B No. 453, and I was pleased when I found that the driver could speak English. Now I could



The guard and crew of No. 453 with the author, on arrival at Bergen. Note the small wheels and high-pitched running plate of the engine.

ask quite a number of questions which I had wanted to ask before but had been restricted by my limited vocabulary. We backed on, picked up a baggage car, then attached a "spisevogn" or dining car and backed on to the train. From Voss to Bergen there are no heavy gradients as the track follows the course of a river and, later, a fjord to quite near Bergen. Then it winds its way inland to enter Bergen from the south. There were however many sharp undulations with short-radius curves which meant a lot of regulator and brake work.

This section was originally completed in 1883 as a 3 ft. 6 in. line, which probably accounts for its tortuous path. I was told that in this 67½ miles were 83 tunnels. Had I not been feeling the effects of this 12-hour journey following a day spent sight-seeing in Oslo, I would have been more appreciative of the beauty of the blue fjord on one side and the green slopes on the other.

Nearing Bergen I washed the grime of the journey off my face and hands and dried myself on tissue paper, of which ample supplies were available. Indeed, the enginemen are supplied with large wads of it; cotton sponge cloths being a refinement limited to English railways I suppose. I still had not obtained any idea of the signalling system but by now I didn't feel like bothering about it, although my driver was only too willing to air his English. He told me that he also drove electric trains and looked forward to the time when the Norwegian

(*Continued on page 382*)

Dinky Toys Help to Develop Road Sense

KERB drill undoubtedly is one of the most successful means of reducing the number of accidents that take place on our roads, and to illustrate this and other safeguards on a road layout, with Dinky Toys buses, lorries and motor cars running on its highways, is far more effective than just giving lectures and talks. This is in fact a splendid way of developing true road sense on the part of schoolboys and schoolgirls.

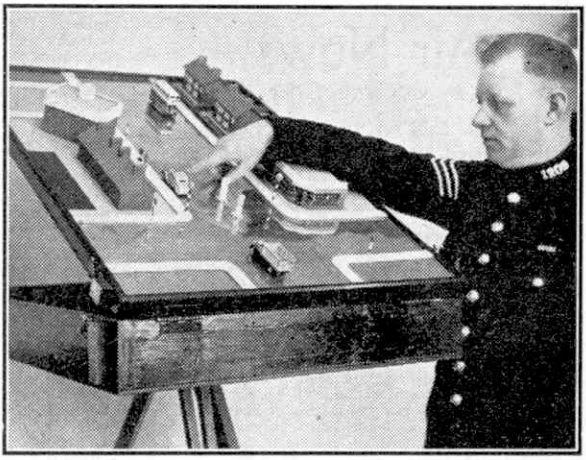
The Lancashire Constabulary have realised how effective demonstrations of this kind are and have worked out a very interesting way of turning real accidents to good account in suggesting what might have been done to prevent them. A lesson learned in this way is never forgotten.

In this scheme a road layout is designed to reproduce the scene of the accident chosen, with the appropriate Dinky Toys placed in position on it, and the boys and girls to whom the demonstration is given play the parts of coroner, jury and witnesses in a miniature inquest. The layout used is mounted on a tall tripod and sloped forward so that it is easily visible to an entire class. Some way of fixing the Dinky Toys on the sloping roadways was necessary, and the Schools Road Safety Department of the Lancashire police have found that small magnets fitted underneath the Dinky Toys keep them in position on the layout, which is constructed on a metal base. The people concerned in the accident are represented by miniature figures, and in their case it is sufficient to use a dab of Plasticine on their bases in order to fix them.

The course of a study of such an accident is best followed by an actual enquiry conducted by Sergeant Stead at the Whiston Girls Secondary Modern School, by kind permission of Miss M. McLean, M.B.E., Headmistress. The tragedy investigated in this instance occurred on a main road, with a secondary road crossing it at right angles. In the middle of the main road, at the junction, is a refuge, and at the time of the accident there was a car parked just beyond it, as can be seen in our illustration. The two vehicles concerned in the accident were a motor lorry and a bus. The motor lorry crossed over the junction and proceeded up the main road, swerving outward to avoid the parked car; the bus came slowly down on the opposite side, stopping at two points on its way. The positions of the vehicles, and of the girl and two boys concerned in it, were shown at each stage as the witnesses gave their evidence, so that the jury and members of the class were able to follow the sequence of events.

The first witness to step forward was a girl who stated that she was walking up the left-hand side of the main road on her way to the picture house. On the opposite side of the road she saw her brother, who called across to ask if he could go with her. She said yes, whereupon he looked both ways, saw that the bus was a good way off, and ran over. Then another boy who had been with him asked if he could go, and was told that he could. He too looked both ways, saw the bus approaching and waited until it passed. Then he ran across and came out suddenly from behind the bus. He had not seen the lorry and ran right under it. As the witness told her story the vehicles and figures were moved on the layout to give a graphic reproduction of the scene.

The girl was followed in the witness box by her younger brother and by the driver of the lorry. Each told his story, and members of the class, who jointly represented the coroner, asked questions about various points, with the result that every detail of what happened on that tragic afternoon was clearly brought out. Then the jury left the room to consider their verdict. While they were out other questions were raised, and Sgt. Stead drove home many useful points that the accident illustrated. The jury then returned, and the foreman gave the findings. In this instance the lorry driver was cleared of blame. It was pointed out that the girl who called out across the road should not have allowed the two boys to run across alone, but should have gone across to fetch them and to make sure that the way was clear.



A Dinky Toys layout used by the Schools Road Safety Department in road safety demonstrations. Sergeant Stead points out a carelessly parked car. This helped to create a dangerous situation that resulted in a serious accident in which a boy was killed.

An interesting point was that the driver of the parked car, who drove away before the police came on the scene and was never traced, was severely censured for his choice of parking position. This compelled the driver of the lorry to swing outward into the middle of the road, so that when he reached the bus he was too near it to take effective action when the boy suddenly ran across from behind it. It was agreed that the car should have been parked on the secondary road instead of the main road.

The witnesses had been provided with sheets on which their evidence was written, but they were not content merely to read these. They entered fully into the spirit of the inquest and gave their evidence clearly and unmistakeably, as if they had actually witnessed the scene. The members of the class asked shrewd questions that helped to clear up many points that had been left in doubt, and the complete and well-ordered verdict of the jury, who were left to reason things out for themselves, showed how carefully they had considered every point.

One of Shell's three Percival "Prince" aircraft is here shown at Goose Bay, Labrador, during delivery flight to their associate Company in Venezuela. Photograph by courtesy of Shell Refining and Marketing Co. Ltd.

Air News

By John W. R. Taylor

Shell buy "Princes"

Three Percival "Prince" light transports, ordered by the Shell Petroleum Company for communications work in their extensive overseas oilfields, are the first British civil aircraft of post-war design bought by Shell.

Two of the "Princes" have already been flown from Percival's airfield at Luton, Beds., to the Shell operating base at Maracaibo, Venezuela, by crews of Britavia Ltd., who reported as "completely uneventful" the 6,500-mile flight via Reykjavik (Iceland), Montreal, Washington, Miami and Kingston (Jamaica).

These Venezuelan machines, one of which is illustrated on this page, comprise one standard 8-passenger model and one 6-passenger "executive travel" version. The third Shell "Prince," a standard 10-passenger machine, will be flown to Sarawak by Group Capt. Douglas Bader, the famous Battle of Britain pilot, who is now on the staff of Shell's London Aviation Department.

Racing Car Flown as Cargo

B.E.A. recently helped Stirling Moss, the well-known amateur racing motorist, to solve the difficult problem of how to compete in races in Britain on Saturday and in Belgium on Sunday, by flying his diminutive 500 c.c. Cooper car from Northolt to Brussels aboard one of their night freighters.

After gaining second place in the 500 c.c. class contest at Silverstone, Mr. Moss had the car delivered quickly to the airport, from where it was flown to Belgium in plenty of time to compete in the International races at Mons next morning.

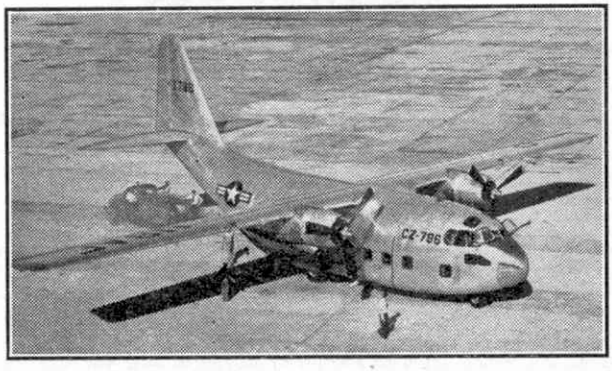
A Versatile American Transport

There is an old saying in the aircraft industry that, "We do the impossible quickly; the obvious takes a little longer." Its truth is certainly borne out by the new Chase XC-123 "Avitruc" transport aircraft, shown at the foot of this page, as this machine is more efficient than almost any previous type of cargo-'plane, yet a more logical and straightforward design could hardly be imagined.

The XC-123 owes much of its simplicity and versatility to the fact that its layout was designed originally for a military glider, the wartime Chase CG-18A. This machine had to be sturdy enough to withstand crash landings in open country carrying a full load of troops or supplies; of simple construction so that it could be mass-produced by semi-skilled labour; and arranged for quick and easy loading and unloading without special equipment.

The completed CG-18A so pleased the U.S.A.A.F. that, although the need for new gliders had passed by the time it flew, Chase were asked to investigate the possibility of converting it into a "utility" powered assault transport. The result was the highly successful C-122, fitted with two 1,100 h.p. Pratt and Whitney R-2000 engines. This machine could carry alternative loads of a 1½ ton lorry, several Jeeps, a Jeep and 75 mm. howitzer, or up to 30 troops.

The new XC-123 is about twice the size of the C-122, and has double its carrying capacity. In fact, it is bigger than a "Lancaster," with a wing span of 110 ft. and empty weight of 25,000 lb. Like the C-122, it can carry more than its own weight of useful load, in the form of cargo, 60 fully equipped troops, or 50 stretcher patients and 12 other passengers. Vehicles can be driven into its hold up a ramp which forms the bottom of its rear fuselage in flight.

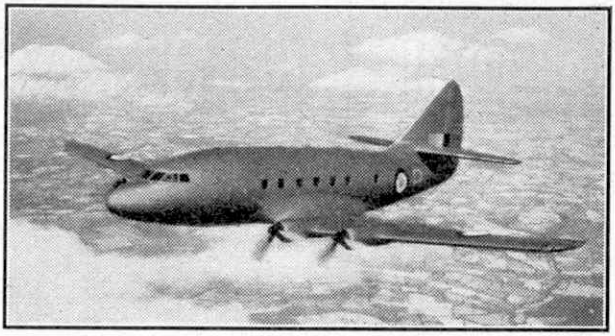


The Chase XC-123 "Avitruc" troop and cargo-carrying transport described on this page. Photograph by courtesy of Chase Aircraft Company, Inc., U.S.A.

Geography Lessons at 4,000 ft.

A Bristol "Freighter," operated by Cie Air Transport, is being used in France as a "flying classroom" for students of the Sorbonne Physical Geography Laboratories, Paris. On the first of the present series of flights from Le Bourget, it carried 37 passengers, consisting mainly of students from the Laboratories, but including a few radio reporters and newsreel cameramen.

Subject of this first flight was an aerial study of the geological and geographical characteristics of the Bassin Parisien, which M. Gandillot, Sorbonne Chief of Practical Studies, outlined in a brief talk before take-off. Later, as the "Freighter" cruised at 4,000 ft., the lecturer, a former commandant of the French Air Force, used a microphone to describe to his students the physical features of the country over which they were flying.



A new photograph of the Armstrong Whitworth "Apollo" air liner, which is powered by four Armstrong-Siddeley "Mamba" propjet engines. Photograph by courtesy of Sir W. G. Armstrong Whitworth Ltd.

Test Rig for "Princess" Engines

A full-size replica section of the inner wing of the giant Saunders-Roe "Princess" flying boat has been delivered to the Bristol Aeroplane Company's Engine Division, where it will be used for extensive installation test-running of a coupled "Proteus" propjet power unit. The "Princess" is designed to have four of these coupled units, plus a single "Proteus" outboard on each wing, making a total of 10 engines able to develop some 35,000 h.p.

This principle of test-running a new-type power unit in an actual wing section replica was used successfully for the "Brabazon's" twin-"Centaurus" power units, as described in the September 1949 "Air News."

Cheap Fares to Dublin

The combined attractions of the lowest airline fares in Europe and Dublin's famous steaks promise to make the new Aer Lingus night service between London and Dublin one of the most popular in the world.

As a start, two round trips a night are being run, leaving Dublin at 10 and 10.20 p.m., and leaving Northolt at 12.40 and 1 a.m. The single night fare of £4 5s. mid-week and £5 at week-ends is very much below the ordinary day rate of £7 10s., and is equivalent to a rate of 3½d. to 4d. a mile—the same as that charged for first-class rail travel in Britain. The return fare is double the single fare.

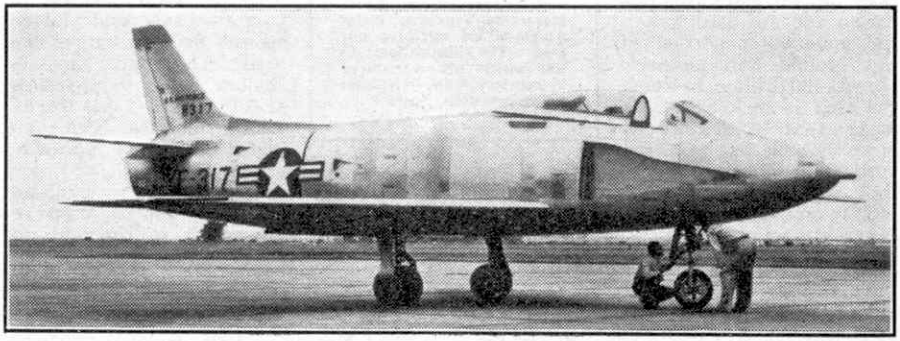
New U.S. Penetration Fighter

Latest development of the World Record-holding North American "Sabre" is the YF-93A penetration jet fighter, illustrated on this page. It is a good deal larger and heavier than the "Sabre," with a re-designed nose and bigger fuselage, housing a Pratt and Whitney J-48 (Rolls-Royce "Tay") jet engine, complete with after-burner. It thus revives the wartime North American-Rolls-Royce partnership that produced the "Merlin"-powered "Mustang," one of the War's finest fighters.

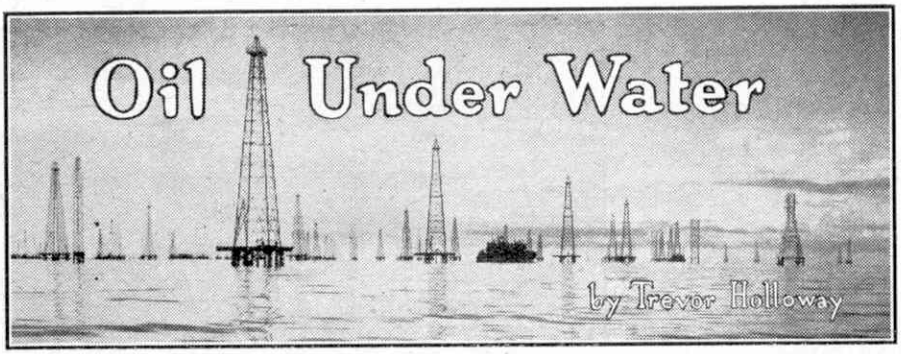
No performance figures for the YF-93A have been released, but its J-48 engine develops 6,250 lb. thrust without counting the added power of the after-burner, so its speed should be very high. More important for a penetration fighter is long range, for high-speed attack and bomber escort work; so the fact that the YF-93A is strongly favoured to win the forthcoming U.S.A.F. competition for this type of aircraft indicates that it must pack a lot of fuel as well as power inside its sleek fuselage and sweptback wings.

"Met." Forecasts for Pigeons

It is not widely known that the Air Ministry's Meteorological Office operates special weather forecasting services for pigeons! The forecasts, for which there is a considerable demand from owners of racing pigeons all over Britain, give special attention to such factors as wind speed and direction, cloudiness, visibility, and the chance of rain, fog or thunderstorms along the line of flight of pigeon races.



The North American Aviation YF-93A, U.S.A.F.'s newest jet penetration fighter. Official U.S. Air Force Photo.



IT is well known that "oil is where you find it." All the major oilfields have been discovered thousands of feet beneath the earth's surface, and oil is being produced from mountainous country, in desert and swamp, and from beneath the perpetual snows on the edge of Canada's Arctic Circle. Such adverse physical conditions add to the normal technical difficulties of drilling, especially where oilfields lie beneath rivers, lakes, or even under the sea. There methods specially devised for underwater drilling must be used.

For many years oil has been recovered in Lake Maracaibo, Venezuela, in the China Sea off British Borneo, off the Californian coast, in the Gulf of Mexico and in various inland waters. Although this production still accounts for only a small fraction of total world output, its importance is steadily increasing.

One method of underwater drilling is to build piers extending out from the shore. These piers can be seen in California, and also in British Borneo, where they run for 800 yards out to sea and are used to tap the underwater portion of the prolific Seria oilfield. Directional drilling, in which the well is inclined at an angle that sometimes is more than 60 deg. from the vertical, enables several wells to be drilled from the same pier.

This method, however, is limited to oil deposits lying close to the shore in shallow water. Where the drilling site lies too far from the shore for a pier to be practicable, island drilling platforms have been built from which oil drilling is carried on. The importance of this method lies in the fact that large oil reserves are believed to be contained within the Continental Shelf. This is the underwater extension of the world's land masses, which in some regions reach over 100 miles from the shore. Within these areas the sea bed slopes very gently until a depth of about 600 ft. of water is reached, at which point the ocean is reached and the depth increases rapidly.

Even before the war, underwater drilling from island platforms was a familiar feature of Venezuela's Lake Maracaibo, where to-day many hundreds of island derricks may be seen rising above the surface of the lake. Some stand in 100 ft. of water, many miles from the nearest land. The drilling platforms are erected on tall concrete caissons, sometimes 150 ft. in length. These are manufactured ashore in sections which are joined to the required length, carried by barge to the drilling site and hammered into position by means of heavy weights. When a well begins producing oil, it is connected to the shore by a pipeline, laid on the bed of the lake.

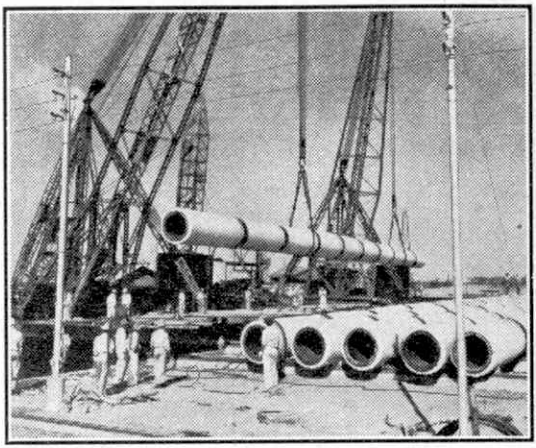
Above is a view of the oil well derricks in Lake Maracaibo, Venezuela, under which is an extensive oilfield. The illustrations to this article are reproduced by courtesy of the Petroleum Information Bureau.

In Louisiana, where oil is found in swampland and in coastal bays and inlets, special drilling barges are used. These are sunk in shallow water to provide a stable drilling platform. After drilling has been completed they are normally refloated for use elsewhere.

From experience gained in such inland waters, the special equipment used in drilling in the open sea of the Gulf of Mexico has been evolved. Here an area of well over 100,000 sq. m. of Continental Shelf adjoins the rich oil lands of America's Gulf Coast. Oil was first produced in the Gulf of Mexico in 1938, when a well was "brought in" about a mile from the shore

of Louisiana. Gradually the wells have been drilled farther out to sea, and largely as a result of an intensive post-war campaign of underwater drilling, about a dozen wells are now producing oil in the Gulf of Mexico. Drilling operations indeed are now being carried out at a distance of 30 miles from land.

The technique used in these operations has been developed from the simple barge operations used in neighbouring Louisiana, but in the open waters of the Gulf of Mexico, where tropical storms are often encountered, drilling is a far more hazardous undertaking than in sheltered inland waters. The drilling platforms used are often giant structures. One such platform, now drilling in 45 ft. of water, is designed to withstand waves more than 30 ft. high and winds with a force of 125 m.p.h. It is a completely self-contained unit, housing derrick and draw works, pipe racks, mud pumps and storage tanks for fuel, water, and more than 1,500,000 lb. of mud and cement. Crew quarters include offices, and living and sleeping accommodation for about 50 men. There are two decks, standing respectively 34 ft. and 48 ft. above water level, and the derrick itself is placed 60 ft. above the sea. The whole structure measures about 200 ft. by 100 ft., and with its associated equipment weighs 5,000 tons. The platform is supported by 100 piles, driven to a depth of between 150 ft. and 200 ft. into the sea bed. This single drilling platform cost the equivalent of £400,000 to instal.

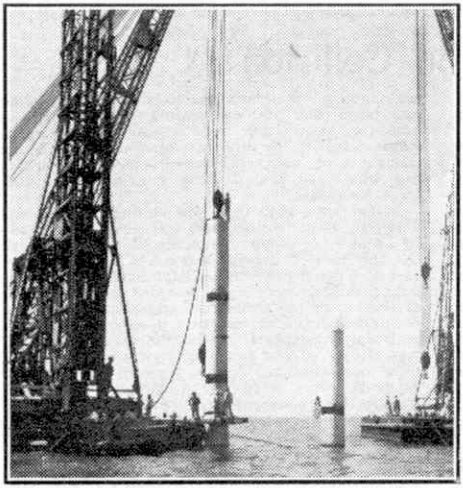


Lifting a 150 ft. caisson on to a barge for transport to a well site.

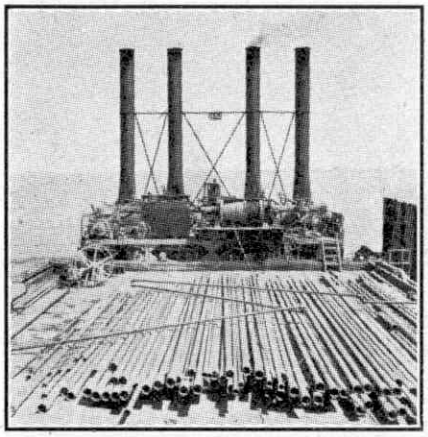
In many cases smaller platforms are used to reduce drilling costs. These contain only one derrick, engine and draw works for providing power, and a minimum of other equipment for emergencies. The remaining equipment, fuel, water and other supplies are stored in floating barges, which also contain the crew's quarters. Besides being considerably cheaper than a single large platform, there is the added advantage that the barge can pull ashore in cases of storm or other emergency.

A further reduction in average costs per well is achieved by using directional drilling; the smaller platforms can be used to drill at least three wells, while the giant structure described above is capable of sinking a minimum of seven wells to a depth of 14,000 ft.

Although the oil industry has made remarkable progress in underwater drilling in the Gulf of Mexico since the war, further progress may well be limited for economic reasons. Apart from the cost of erecting the drilling platform, the cost of sinking a single deep well may exceed £100,000. Transport of crude oil to the shore is also expensive. Hitherto, barges have been used. Consideration



Sinking caissons in readiness for boring for oil under Lake Maracaibo.



A drilling barge on Lake Maracaibo.

given to laying a pipeline to one producing well showed that the cost of the 25 mile line required would amount to another £150,000 at least. Owing to the existence of an important fishing industry in these waters, the line would have to be buried to a depth of 6 ft. to avoid fouling nets and anchors.

Prospecting for oilfields under the sea is also more costly than corresponding land operations. Geophysics naturally plays a leading part. Methods adapted to underwater search include the seismic method, in which recordings are made of the echoes created by an underwater explosion, from which details of the sub-surface strata to great depths are obtained.

Off the Bahamas, where an area of some 80,000 square miles of water was recently surveyed, a special diving bell was used in which a gravity meter was lowered to the ocean bed. Information on rock structure, causing slight surface changes in the force of gravity, was obtained from this instrument and correlated with seismic readings and with information on the magnetic properties of the soil obtained by means of an instrument known as a magnetometer, installed in an aircraft and flown over the area of search.

Although such scientific methods are an invaluable guide in underwater drilling for oil, they impose further heavy expenses upon operators. In the Gulf of Mexico alone, over £15,000,000 has already been spent since the war—an average of over £1,000,000 per oil well "brought in." At present it is estimated that it costs as much to provide a single ton of oil from the Gulf of Mexico as to supply six tons from a land oilfield.

Thus, though technically underwater drilling in the sea is an accomplished fact, future operations, other than as a scientific experiment, may well be limited unless means can be found to lower the cost considerably. The fact that proven reserves of oil on land are larger than they ever have been avoids the need to develop underwater oilfields unless this can be done on a competitive basis.

The Earth in Collision

There is little risk of a disastrous collision between the Earth and a body wandering through space, but there is no doubt that our planet does at times encounter meteorites large enough to crash down on its surface, where they can create havoc over a wide area. For most of these encounters the only evidence we have to-day is a hole in the Earth. One of the most famous of these is Meteor Crater, in Arizona, about a mile across and several hundred feet deep. In the belief that a huge mass of meteoritic iron containing nickel is buried under this crater several efforts have been made to discover it in order to make use of the valuable metal.

Huge masses of meteoritic iron were discovered in Greenland and one of these was brought to the United States by Peary, the first man to reach the North Pole. Another mass was discovered embedded in the Earth in South West Africa, and an even more interesting discovery was that of a group of craters made by meteorites in Australia. In this instance the Earth collided with a swarm of scattered meteorites, each of which dug its own hole in the ground.

Nobody witnessed these gigantic crashes. They occurred a very long time ago and the first fall of similar size that happened in historic times occurred in almost uninhabitated country in the forest region of Siberia in 1908. There were a few individuals who saw a gigantic glow in the far distance and who heard the rumble of what they took to be distant explosions, and when the site was visited later evidence of immense destruction was seen. The pressure waves created by the crashes affected the instruments of weather observers in Great Britain, but what had caused them remained a mystery for a long time.

In February 1947 there was another collision with a swarm of meteorites that was actually witnessed by a number of people. The scene was again in Siberia, but this time at a point a few hundred miles north east of Vladivostok. A brilliant flash and a ball of light rushing across the sky provided the first evidence of the fall of the meteorites, which had been raised to incandescence by the heat developed by friction with our atmosphere. When the area of the crash was discovered and examined it was seen that there were more than 100 craters, some of which were 30 to 40 ft. deep, while the ground was strewn with fragments of meteoritic iron. Some of these indeed were chunks weighing several hundred pounds. Rocks had been shattered and trees felled.

How bright the glowing mass of meteorites was is shown by the fact that a woodcutter 50 miles away was startled to notice that the trees suddenly cast a second shadow that moved round swiftly, and people even farther away saw what they described as a bright star although it was almost noon.

Engineering Notes

Mobile Crane for Harvesting Palm Nuts

Gathering palm nuts by ordinary means is a troublesome process. The natives who do this work either climb up the trunks of the palm trees or use long ladders to reach the nuts, which grow in clusters weighing about 40 lb. at the tops of the trees, at heights up to as much as 40 ft. To speed up the gathering and make it less costly requires a device that will lift the gatherer into a position where he can harvest the nuts quickly and easily, and place them in a container that can be lowered to the ground without delay.

A solution to this problem has been found by adapting a self-propelled diesel crane of the N.M. type produced by R. H. Neal and Co. Ltd., Ealing. The crane itself has four travelling speeds, both forward and reverse, and five separate motions are provided, all driven through independent friction clutches. The crane can be moved backward or forward and the jib can be slewed, derricked or telescoped, so that the gatherer, who sits on a platform on the jib head, can quickly be placed in any required position. The container into which he drops the nuts can be raised or lowered to the ground for unloading.

The platform remains horizontal at whatever angle the jib may be. In front of the gatherer is a hand wheel that he can turn to manœuvre himself into the most convenient position for cutting the nuts, and a foot brake holds the platform in any required position. When gathered the nuts are dropped down a chute into the container. The range of the machine is such that it can stand between two rows of trees and reach three of these at one operation.

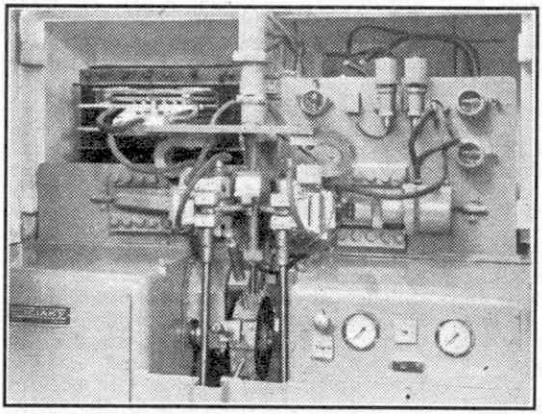
A specially equipped mobile crane designed for speeding up the harvesting of palm nuts. Photograph by courtesy of R. H. Neal and Co. Ltd., Ealing.

Resistance Welding in Production of Shock Absorbers

In recent times the growth of resistance welding has been very rapid, particularly during the war years, and it is now widely used in order to speed up production. This type of welding is brought about by the heat set up between two metal surfaces to be joined when a heavy current is passed between them, the high temperature being the result of the interfacial resistance. When the heated zone reaches the welding temperature the weld is consolidated, or forged, by pressure. The current required is produced by a step-down transformer, which gives current of high amperage and comparatively low voltage.

An interesting example of modern resistance welding is the manufacture of a shock absorber of the piston type, hydraulically operated, that is now being fitted extensively in motor cars, commercial vehicles and other engineering assemblies. Resistance welding is used in assembling the piston rod, in fitting the end pressing to the inner tube to make a pressure tight joint and in other stages of production, and machines specially designed to give the correct current and welding time and pressure are employed.

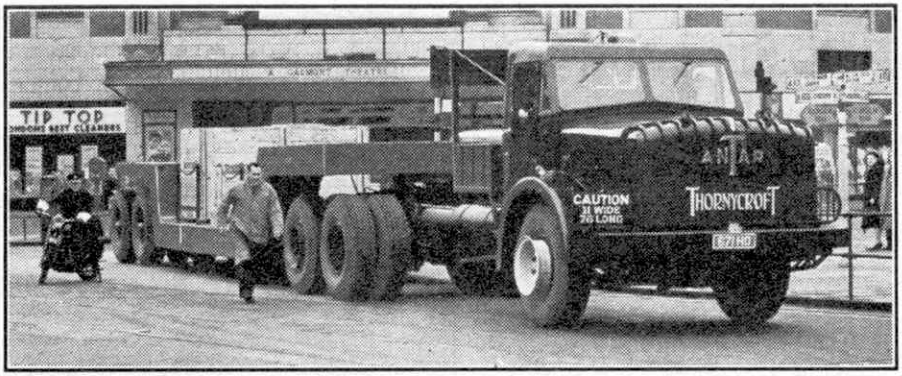
In the lower illustration on this page the tube is shown in one of these machines, in which it is being seam welded to the end pressing. The component parts are loaded on stations, as can be seen from our illustration, and each set in turn is indexed to the welding position, where the current is passed and the necessary pressure is applied. As the machine can be loaded while actually in operation it speeds up production considerably, and the floor to floor time for this process is only about 3 seconds. R. BUSHELL.



A special purpose resistance welding machine with a vertical indexing mechanism. Component parts are loaded on stations while the previous assembly is being welded.

The Engineer on the Farm

Before the war about 20,000 ploughs were produced annually in Great Britain; in 1948 the total was 87,000, most of which were for use with tractors. The output of milking machines has more than doubled in the same period, and other machines show large increases, while combine harvesters have been added to the range.



Britain's largest tractor, coupled to a 65-ton Crane low loading machinery-carrying semi-trailer at Edmonton on its way to London Docks for shipment to the Middle East.

The "Mighty Antar"

Britain's Most Powerful Tractor

THE gigantic six-wheeled tractor illustrated on this page is the first of a series of 32 large and powerful vehicles for use in constructing a pipe line 560 miles long from Kirkuk, in Iraq, to the Port of Banias, on the Eastern Mediterranean coast. It has been designed and built by Transport Equipment (Thornycroft) Limited, in co-operation with the engineers of the Iraq Petroleum Company, and although the largest and most powerful vehicle of its kind ever constructed in this country, with many new and striking features, it was actually completed in 10 months.

The tractor is named the "Mighty Antar," after a celebrated Arab warrior of the 6th century who was also a poet. It will be employed in carrying pipes over desert tracks and sandy wastes in the Middle East, in country rising in places to a height of 3,500 ft., and where the temperatures range from 20 deg. of frost in winter to 120 deg. in summer. It is itself capable of carrying loads of up to 32 tons, and for use in connection with it semi-trailers of special design are being built by Cranes (Dereham) Ltd. In addition there is a single low loading machinery trailer of 50 tons capacity, which will be used for the transport of oil-producing equipment.

The steel pipes that will form the chief load of the "Mighty Antar" and its semi-trailer are 93 ft. long and 2 ft. 6 in. in diameter. Each weighs 6¾ tons, and in the operations the aim is to complete 1½ million ton-miles of transport a month. The tractor and semi-trailer between them may be loaded up to a gross train weight of 100 tons.

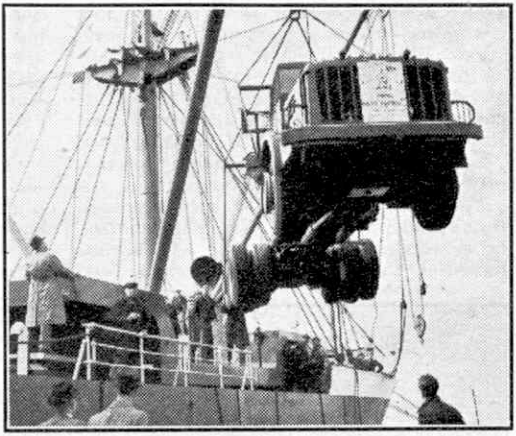
The first tractor, with low-loading trailer, was shipped to the Middle East in the "Kantara" and reached the port of Tripoli, in Syria, towards the end of April. There it was intended to run as many miles as possible before the pipe-stringing operation was started, so that their Arab drivers could gain valuable experience. Left-hand drive is fitted, and the cab is well insulated to give its occupants protection against extremes of temperature. The normal crew consists of two men.

The engine of the gigantic vehicle is a Meteorite Mark 101 diesel, with eight cylinders arranged in two blocks of four in V formation, at an angle of 60 deg. It has an output of 250 b.h.p. at 2,000 r.p.m. Fuel for the engine is drawn by means of two Duplex pumps from the tractor's two tanks, each of which holds 100 gallons. The bore and stroke of the cylinders are 5.4 in. and 6 in. respectively, and the capacity of the engine is 1,099 cu. in. or 18,000 c.c. The governed engine speed is 2,000 r.p.m. at full load, or 2,300 r.p.m. when running with no load. The actual highest speeds of the tractor are 20½ m.p.h. on direct drive and 28 m.p.h. on overdrive, and its great power allows it to climb a gradient of 1 in 2½.

Cooling required special attention in view of the high temperatures in which the vehicles are to work. The immense front grille actually covers large twin radiators, which work together as one unit. The total capacity of the cooling system is 26 gallons, and the flow of air through the radiators is maintained by two fans, each running in a cowl behind one of the radiators. A special oil cooler also is employed. This takes the form of a bank of horizontal tubes mounted on the front of the right hand of the two radiators. Below the latter is an arrangement of guards to protect them from brushwood and boulders.

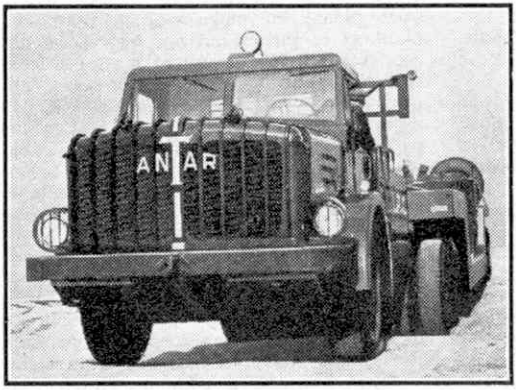
Another interesting point is that the flywheel, clutch and gear-box unit is mounted separately from the engine, which is thus relieved of the weight of these. One reason for this unusual arrangement is to provide easy access to the parts, and ventilation and cooling of the clutch also are improved. A short shaft of large diameter connects the unit to the engine. The main gear-box has four speeds forward and one reverse, and there is also an auxiliary gear-box with three speeds. Both gear-boxes are of the constant mesh type.

Among other special features of the tractor the steering gear may be noted. Steering is effected by means of a cam and double roller gear, and hydraulic power gives assistance to the driver, hand operation being applied at the left hand end of the front axle and power assistance at the right hand end. When the steering wheel is turned a hydraulic valve allows oil to flow under pressure to the one of two power cylinders that assists movement in the direction required. Power assistance only comes into play after the steering wheel has been turned through a certain angle, so that on a straight course ahead or on one with slight deviations the vehicle is entirely under hand control. The independence of the two systems ensures that a vehicle continues to be steerable even if the power system fails.



Hoisting the giant tractor on board s.s. "Kantara" in special slings. The illustrations to this article are reproduced by courtesy of Transport Equipment (Thornycroft) Ltd.

Full air pressure brakes are fitted to all wheels and there are also emergency and service line connections for operating the brakes of the trailer. A special dual valve operated by foot makes compressed air available for the trailer brakes slightly before that for the brakes of the tractor itself. If by any chance the trailer brakes do not act their failure does not affect tractor braking. The hand brake operates mechanically on all bogie wheels, and also operates air pressure brakes throughout. A notable point is that the handbrake cannot be released until air pressure is available. This means that after a long parking period the tractor cannot be driven away until there is sufficient air pressure for braking. A gear-box driven compressor provides air pressure.



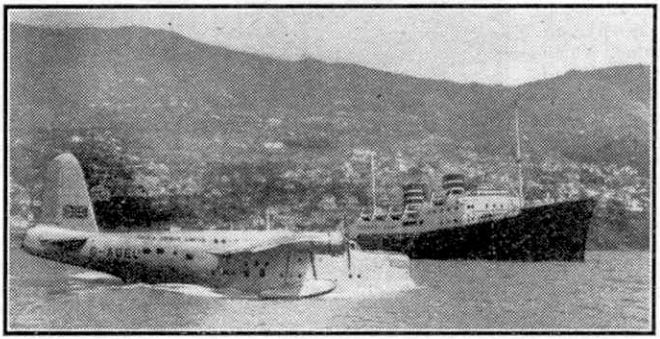
The "Mighty Antar," with low loading semi-trailer on its trials at Bagshot Heath, Surrey.

Flying Boat to Funchal

By John W. R. Taylor

"ARE you quite comfortable, Sir?" asked the stewardess. I replied that I was, and that was certainly no exaggeration. We were 9,000 ft. above the Bay of Biscay at the time, "we" consisting of myself, my friend Maurice, 13 other passengers and the crew of six of the Royal Mail Aircraft *"Hampshire,"* a "Hythe" flying boat belonging to the privately-run Aquila Airways.

We were on our way back to England from Madeira, full of happy memories of a wonderful holiday and a delicious luncheon that the stewardess had just conjured up in her tiny galley. And we reflected that Mr. Winston Churchill himself had travelled in this same cabin a few months earlier, en route from the quiet loveliness of Madeira to the bustle and excitement of a British General Election.



R.M.A. "Hampshire" of Aquila Airways taxying past H.M.S. "Venus" of Bergen Steamships Company.

Mr. Churchill had remarked afterwards that the journey home was the most comfortable of his life, an opinion that we could well appreciate, as *"Hampshire"* cruised smoothly and sedately above the clouds at 160 knots, her great expanse of wing shielding us from the warm sun that glinted on the rakish wing float a few yards from our windows.

There is nothing to compare with flying boat travel, for it combines the stately luxury of an ocean liner with the speed of flight. From the moment we had first entered the *"Hampshire"* at Berth 50, Southampton, for the outward journey, four days earlier, we had felt as safe and snug as if we were in our own homes. She had looked small from the quayside, but this proved deceptive for she is actually a double-deck air liner, divided up into a number of spacious cabins, each seating up to six passengers, and complete with a promenade deck, bar and midships galley.

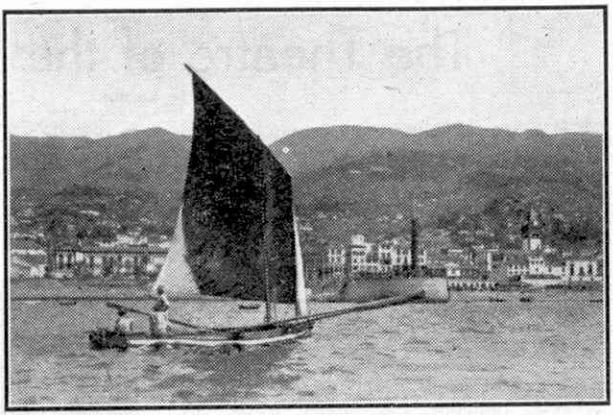
Our take-off had been typical of the remainder of the flight, so smooth that we could hardly have known what was happening but for the more urgent roar of the four "Pegasus" engines, and the creamy curtain of wake which streamed past our windows and suddenly seemed to give way to a glimpse of Southampton dropping away below our starboard wing tip.

Soon we were passing over the Isle of Wight, and a message was received from Captain Evans to say that we ought to arrive at Funchal Harbour, Madeira, at about 5.15 p.m. local time. We unfastened our seat belts, adjusted our chairs to a lazy angle and settled back to enjoy nearly ten hours non-stop cruising above an ocean of white and woolly clouds. There were plenty of magazines to read and blankets to put round our legs if we felt cool (we didn't!) Frequent messages from the pilot informed us that we were "approaching the Brest Peninsula" or "10 miles S.E. of Cape Finisterre," at which we looked down through the large cabin windows, past gaps in the clouds, to see the coast of France or the olive hills of Spain moving slowly beneath us like pictures on a vast cinema screen.

Morning coffee and cake were followed by lunch, then tea, and, eventually, we noticed a change in the steady, sturdy drone of the engines, as we began to descend almost imperceptibly through the clouds that hid Madeira from sight.

Then, through a gap, we caught our first exciting glimpse of dark green mountains, higher than the *"Hampshire,"* and

the bluest of blue seas, sparkling in the bright sun. Slowly we lost height, still hugging the coast, until Funchal itself came into sight, a pattern of little white and peach-coloured houses with red roofs, climbing from the smooth bay up the slopes of the mountains. A wide sweep out to sea, an eerie creaking noise as the wing flaps were lowered, and then a view of the water apparently coming up to meet us, slowly at first and then seeming to race past our floats at fantastic speed, until with a gentle swish our keel cut into the water and we were down, bang on 5.15, the time predicted by the navigator nearly ten hours earlier.



Typical local sailing vessel in Funchal Harbour.

Through the film of spray coating our windows, we saw a launch approaching to take us ashore—not a British launch with uniformed attendants, but a fascinating Funchal version of the same thing, carrying in addition to its crew a number of fierce-looking gentlemen with enormous revolvers and what appeared to be short swords. They were, we discovered later, local police, there to keep an eye on us as we went through Customs.

Our first taste of Funchal driving followed, when we climbed aboard a waiting taxi. The driver started the engine and slammed into reverse gear, with the result that the car hurtled backwards towards the edge of the quay. It stopped with its back overhanging the brink, but almost before we realised what had happened, it shot off round the edge of the harbour and up the steep hill leading to the Miramar Hotel. We discovered later that apparently it is quite within the law to go round corners on two wheels and hurtle through the main streets of Funchal at high speed; but it is a most serious offence to carry more than four persons in a taxi. As a result, on a later occasion, Maurice had to complete one journey curled up on the floor under our feet, while we dashed past a policeman with an assumed air of innocence.

One afternoon we were asked if we would like to go "mountaineering" in the hotel manager's car, a rather ancient, but very powerful open tourer. The road to the peaks developed after a time into a mere ledge clinging to the mountainside, with a sheer drop on the other side. We noticed that our host kept opening the car door and leaning out to look at his front off-side tyre. Not without a certain amount of trepidation, we asked him why, at which he stopped the car and said "Come and have a look." We did, and nearly passed out, for there was a large hole in the tread of the tyre, through which we could see the inner tube! Despite his assurances, we did the remainder of the journey with a "bandage" over the tyre, consisting of a torn-up tool-case, tied on with string and a couple of hairclips. Incidentally, new tyres cost £12 each in Madeira. (Cont. on p. 382)

The author, wearing native hat, in the company of a Portuguese soldier and some cheery native shoe-shine boys.

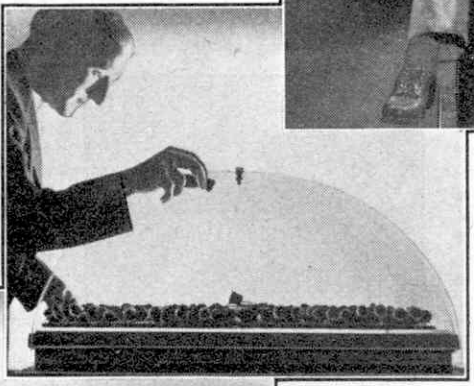
The Theatre of the Atoms

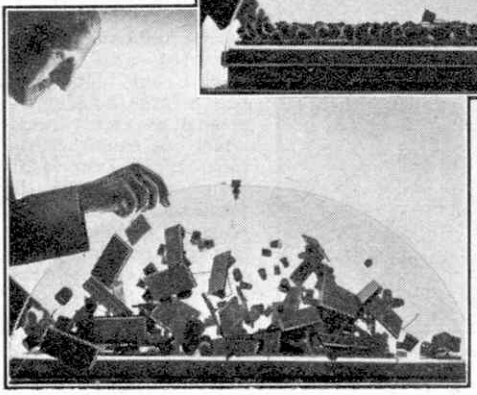
By M. Lorant

THE atomic bomb and predictions on the wonders of the coming atomic age have aroused in all of us a mighty curiosity about the nature of the tremendous power that is locked in particles that we cannot even see. To help to answer many of our questions, scientists at the American Westinghouse Research Laboratories have created a unique atomic show to which they have given the name "Theatre of Atoms."

With an assortment of stage props that includes Christmas tree balls, jet-propelled rockets, balloons and mouse traps, the "Theatre" traces the history of the atom from the time it was hardly more than a laboratory curiosity until the present day. It shows how scientists first began to knock chips out of it and how eventually they were able to blast their way into its nucleus. It also demonstrates the chain reaction that made the atomic bomb possible, shows how modern atom smashers work, and gives a fiery display of atomic fission. And it does it all in a way that everyone can understand.

To illustrate the working of the atomic bomb the model shown in the middle of our three illustrations has been prepared. In it there are 50 mouse traps, representing atoms of uranium 233 or of plutonium, of which the bombs that put Japan out of the war were made, and corks to represent the tiny particles called neutrons, which trigger off the atomic bomb, all locked together. Another cork is hurled in. This represents the neutron that starts the chain reaction and it springs the first mouse trap, the opening of which represents the break up of the first radioactive atom. The trap shoots out its corks, which hit other traps, and these in turn break up and release more corks, with the result that all the traps are sprung in rapid succession and the space above the model atom is filled with flying corks and mouse traps. This gives a vivid idea of what happens, at lightning speed, when a real atomic bomb explodes.





A 200,000 volt charge of electricity is hair-raising. On the left a cork "neutron" is about to fall into a model "atom" made of mousetraps and corks. The lower illustration shows the "atoms" disintegrating under the bombardment.

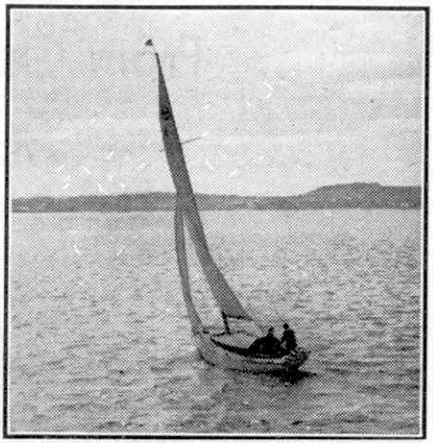
Camera Work in August

Seascapes

By John J. Curtis, A.R.P.S.

WHAT a delight it is to get away from town and work for a spell by those broad and expansive seascapes to be found around our coast, inviting us to ramble for miles along the cliff edge or on the sands, to indulge in a plunge in the sea or to scramble over the rocks and picnic on the beach, and to go for a sail.

Presuming that it is your aim to achieve pictorial results you will find it advantageous to ascertain soon after your arrival certain information that may prove very helpful. For instance, in which direction is the strongest light morning and afternoon; the time of high and low tide; the best spot on the beach for securing a view with boats without too many people in the foreground; and where an uninterrupted view can be obtained of rough seas with a background of cliffs. This information will help you to arrange your walks and picnics so that they will fit in with your camera work without detracting from the enjoyment of the other members of the party.



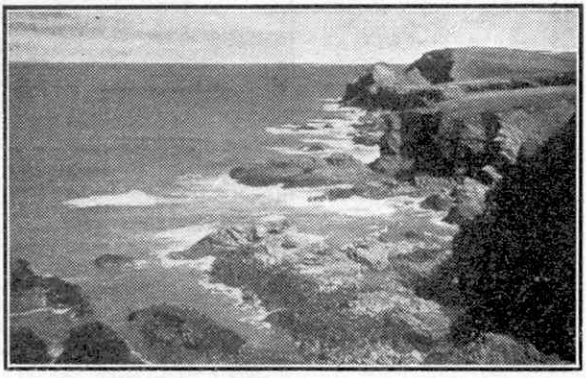
Yachting at Torbay. Photograph by W. Forsch, Stoke-on-Trent.

Wasted Energy! A photograph of rough sea at Kynance, taken by John J. Curtis, A.R.P.S.

This reminds me to make a suggestion or two with regard to the taking of snapshots of friends. We all like to have these records, but unfortunately so many of the results are so poor as to be discarded almost as soon as they are seen. A little thought might have made them very pleasing and interesting. When taking a beach group of a bathing party do it before they bathe; wet shivering bodies do not make good photographs! Do not allow them to collect in a bunch holding on to each other; separate them with some sitting and others looking down and talking to them. A group in a country lane can make a very interesting picture. Split the party into small conversational groups of three or even two. One of these could be leaning by a stile, another sitting on the grass, and so on. It will probably mean that you will have to go farther back with the camera to get them all in but it is worth it.

For rough seas the best position and time is when the wave is curling over, ready to break on the beach or rocks, if possible with a background of cliffs. Hold the camera low down; this will have the effect of making the wave look higher. Another good idea is to include some clouds whenever possible, as very often they are the making of a picture.

Above all, remember that the light at the seaside is very much stronger, photographically speaking, than it is inland and especially in towns. An exposure meter or calculator will soon pay for itself in preventing wasted films.



Typical North Cornish Coast, near Padstow. Photograph by John J. Curtis, A.R.P.S.

From Our Readers

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

An Interesting Narrow Gauge Railway

Anyone who is fortunate enough to be able to spend a holiday in the Austrian Tyrol should visit the beautiful lake called the Aachensee. It is reached by travelling along the main line of the Austrian State Railways from Innsbruck eastward until a little town called Jenbach is reached. Here a change is made to the narrow gauge mountain railway train of the Aachenseebahn. As can be seen from the accompanying illustration, the train, usually of two coaches, is handled by an 0-4-0 tank engine specially constructed for mountain work.

The train of the narrow gauge mountain railway that climbs to the Aachensee, in Tyrol. Photograph by E. C. Ive, Reading.

Immediately after leaving Jenbach station the line begins to climb and very soon rack and pinion working becomes necessary. The line climbs steeply, the engine pushing the train, until the rack section comes to an end at a little village called Eben. By this time we have climbed over 1,500 ft. above Jenbach. Most of the way has been through woods above which tower the crags of the surrounding mountains.

At Eben there is a short wait while the engine runs round the train and couples on in front, and it pulls the train the rest of the way to the lake.

E. C. Ive (Reading)

A Glimpse of Singapore

Recently I had the opportunity of looking round the town of Singapore and seeing the strange contrast that it provides between East and West. The town appears to be a mixture of British administration and Chinese commerce. Sampans and junks make their way into the harbour past large columned buildings such as those to be seen in London. The coolie, wearing only a loin cloth and a battered straw hat, takes little notice as a jet-fighter streaks across the sky. In places there are large European type shops, but native traders still sell their wares on the pavement, as the accompanying illustration shows.

A Chinese woman selling mangoes and other fruit in Singapore. Photograph by L. A. Turner, Worcester.

The large monsoon drains at each side of the road seem rather strange at first and one has to be careful to avoid falling down them. Many of them are several feet deep.

The streets are full of gaily painted Chinese signs and a ride through them in a trishaw, a bicycle with a side-car for two, provides a thrilling, though perhaps nerve-racking experience.

L. A. Turner (Worcester)

St. Peter's, Rome, the greatest church of the Christian world. Photograph by Vernon D. Shaw, Hale.

The World's Largest Church

St. Peter's, Rome, heart of the Roman Catholic Church throughout the world, is being visited this year by over two million pilgrims from other parts of Italy and from most foreign countries, on the occasion of the Catholic Holy Year. It is the largest church in the world, and stands on the site of the circus of Nero, where St. Peter is said to have been martyred in 67 A.D.

The present building was commenced in 1506 and took 176 years to build. It embodies the work of the most famous sculptors, architects and mosaic workers of the Renaissance Period. The façade is 130 ft. high, and is surmounted by figures of Christ and the Apostles, each 19 ft. high. The dome was designed by Michel Angelo, and the cross above it is 435 ft. from the ground. The bronze ball at the top is 8 ft. in diameter and can hold 16 persons. St. Peter's itself can accommodate 70,000 people. Adjoining the Cathedral is the Vatican, the Palace of the Pope.

VERNON D. SHAW (Hale)

The Cinque Ports Again

I was greatly interested in the article on the Cinque Ports in the "*M.M.*" for April last, and would like to add a few notes to it. Originally there were five of these Ports, but almost immediately after the Norman Conquest Winchelsea and Rye were added to the "Cinque Ports Confederation," and thereafter the precise title was "the five Cinque Ports and two ancient towns." Beside these seven ports there were eight corporate members and twenty-four non-corporate members of the Confederation and these lesser towns, for example, Deal, were called "limbs."

The freemen of the ports were allowed to trade free of toll in all English boroughs. They were exempt from military duty and all offences by them were tried before the Lord Warden. The right to hold a canopy of silk by four long lances over the King at his Coronation is another privilege still insisted upon and this act was performed at the Coronation of the present King in 1937.

M. BARTON (Gillingham)

Railway Notes

By R. A. H. Weight

Scottish Regional News

Additional main line trains are running during the summer season, especially at weekends, between Edinburgh-Glasgow-Fort William-Mallaig; Perth-Aberdeen; Edinburgh to Dundee and Stirling; Glasgow-Ayr, and elsewhere. The unusually routed scenic express between Glasgow (Queen Street) and Oban by way of the West Highland line, thence traversing the junction between the former L.N.E.R. and L.M.S. routes at Crianlarich, introduced last year, is being operated again during the holiday months.

Considerable accelerations have been effected in retiming a number of the Anglo-Scottish services on the East Coast route by dint of faster running and fewer stops, as well as by the saving in time resulting from the completion of new bridges north of Berwick. Various new local and cruising facilities are provided by the railway-operated steamships or motor vessels that are such a popular feature of the Firth of Clyde region.

An up train bound for Marylebone on Ruislip Troughs. The engine is L.N.E.R. type 2-6-4 T of Class L1, No. 67714. Photograph by C. R. L. Coles.

New locomotives lately placed in traffic are "B1" 4-6-0 Nos. 61401-4, stationed at 61A, Kittybrewster, and class "5" 4-6-0 Nos. 44674-7, 68A, Kingmoor. The last of the Highland "Loch" 4-4-0s, which was withdrawn for scrapping at Kilmarnock Works, was No. 14385 "*Loch Tay*," built in 1896, having outside cylinders, 6 ft. 3½ in. driving wheels and, in more recent years, Caledonian type boiler. "*Loch Tay*" was stationed at Forres.

New Steamers for Continental Services

The s.s. "*Brighton*," placed in service during June last on the Newhaven-Dieppe cross-channel route, is jointly owned by the British and French Railways. This fine vessel is the sixth ship to be so named, having been built by Messrs. William Denny and Bros., Dumbarton, and launched in October last. She has an overall length of 311 ft. and a speed of 24 knots and is designed to carry 1,450 passengers. Notable features include steel tripod masts, a streamlined funnel constructed in aluminium, four decks, radar, public address system, well-equipped lounge, public rooms and private cabins.

For the longer night voyages between Harwich and the Hook of Holland, the s.s. "*Amsterdam*" is the latest addition to the Eastern Region's fleet and may indeed be described as a "pocket luxury liner," as harbour conditions allow greater size than on the Newhaven route. Each of the 266 cabins is fitted with hot and cold running water, reading lamps, spring mattresses and individual control of heating and ventilation. Passengers may contact the mainland of Europe or England by radio telephone.

Eastern and North Eastern Regions

"A1" 4-6-2s have been reported carrying the following names: No. 60115, "*Meg Merrilies;*" No. 60139, "*Sea Eagle;*" No. 60141, "*Abbotsford;*" and No. 60120, "*Kittiwake.*" The one remaining G.N. "Atlantic" in service, No. 62822, was working various turns from Grantham during last spring. At that time six of the Great Central 4-4-2s remained, though nearly all that company's 4-6-0 types have been withdrawn.

New locomotives recently placed in service include "B1" 4-6-0s Nos. 61360-3, 30A, Stratford; Nos. 61364, 61405-6, 40A, Lincoln; Nos. 61365-6, 40B, Immingham; and Nos. 61367-9, 38A, Colwick. Others are "L1" 2-6-4Ts Nos. 67778-86, stationed at Neasden, 34E, Nos. 67787-9, 32A, Norwich; and Nos. 67790-1, 34D, Hitchin. A number of the earlier examples of this class have been transferred from Stratford to Ipswich. Several "N7" 0-6-2Ts have been moved from Boston and Ipswich to Stratford.

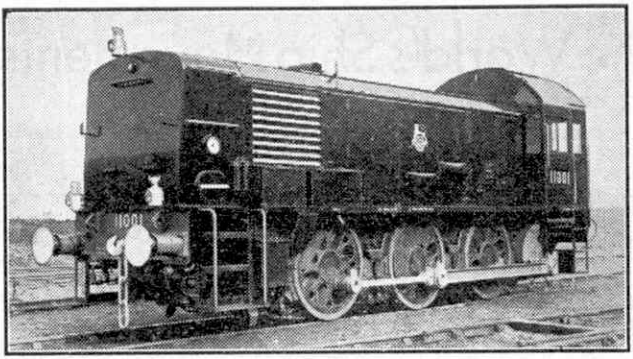
Considerable reallocation of "Pacific" engines has been taking place within the Eastern Region. There are more "A3s" at Leicester, G.C. Sec., more "A1s" at Copley Hill, Leeds, and more "A4s" and "A1s" at King's Cross, where there are fewer "A3s" and no "A2s." There are "A3s" only at Doncaster and a much reduced 4-6-2 stud at Grantham on account of more through engine running between London and York or Newcastle, which brings a good many N.E. Region "Pacifics" into King's Cross daily.

The "*Tees-Tyne Pullman*," which averages 57 m.p.h. over the 232¼ miles without stop between Darlington and King's Cross, is still worked throughout by King's Cross engines and men. No. 60149 recently completed the southbound run in exactly four hours, improving on the fastest schedule by 4-5 minutes. The northbound "*Norseman*," the Bergen Line boat express from King's Cross to Tyne Commission Quay, near Newcastle, is similarly fast, and has been noted hauled by a "V2" 2-6-2, formed of the latest style coaches that were finished in varnished teak carrying red nameboards with yellow lettering.

The "*Capitals Limited*" is generally worked as usual in summer by King's Cross and Haymarket "A4" engines alternatively. A Gateshead engine runs the southbound "*Flying Scotsman*" from Newcastle to King's Cross, with a stop only at Grantham at the time of writing.

A very fine effort by "A4" No. 60030 "*Golden Fleece*" just before the end of its long and successful period on those important duties as a Grantham engine, in charge of Driver Nixon of that shed, brought the down "*Flying Scotsman*," weighing 500 tons full, into Grantham 5¾ min. before time on the quickest booking of 2 hrs. for the 105½ miles from King's Cross.

Another good run of which we have notes includes that of "A4" No. 60029 "*Woodcock*," with a heavier 16-coach train, when Peterborough, 76¼ miles from London, was reached in 84¼ min.



B.R. No. 11001, a diesel-mechanical shunting locomotive, recently put into service on the Southern Region. The engine can operate over the bulk of Southern routes. British Railways Official photograph.

Diesel-Mechanical Locomotive on Trial

A diesel-mechanical 500 h.p. 0-6-0 locomotive No. 11001, has been designed and built at Ashford S.R. Works with the intention that it should be used for yard shunting, transfer trips or local freight running. At the time of writing it is on trial at Norwood in the busy South London area. Wheels are of the B.F.B. type, 4 ft. 6 in. in diam., and roller-bearing axleboxes are fitted in conjunction with underhung spring gear. The upper illustration on this page gives an idea of the general appearance. There are three gears designed to provide for various speeds and power outputs, and gearchanging is effected by the movement of one lever. Final drive to the centre wheels is through reduction gearing to the jackshaft, thence by means of balanced cranks and rods. Westinghouse air brake is fitted, powered from an auxiliary gearbox in front of the engine that also drives a cooling fan, water circulating pump, and two C.A.V. dynamos. There is electric starting and lighting, and food heating for the crew.

Southern Tidings

The electric locomotives are being painted black with "aluminium" roof, bogies, lettering, etc., as on diesels.

For use on the S.R., L.M.R. type class "4" 2-6-4Ts numbered 42096-106, are being built at Brighton as part of an order for 41 such engines. No. 34110, the last of the light 4-6-2s on order, was also in hand at the time of writing, and it was understood that it is to have a "Battle of Britain" name like No. 34109 "*Sir Trafford Leigh Mallory*," which has gone to Bournemouth, 71B, where the final six are being stationed. The name on No. 34092 has been altered from just "Wells" to "*City of Wells*." Names recently affixed include No. 34072 "*257 Burma Squadron*;" No. 34081 "*92 Squadron, East India*;" and No. 34108 "*Wincanton*."

"West Countries" work sometimes from Brighton to Willesden Junction, L.M.R., or Redhill on through trains from Sussex to the Midlands, which on various stages over the Southern system are hauled by many classes of locomotives. They also run regularly between Brighton and London over the main as well as the Oxted lines and haul excursions sometimes over unusual routes. L.M.R. class "5" 4-6-0s have been through to Brighton and Eastbourne on Wednesday excursions, by way of the West London connecting lines. No. 44833, in lined black with B.R. totem, was the first seen at Eastbourne, having worked from Watford.

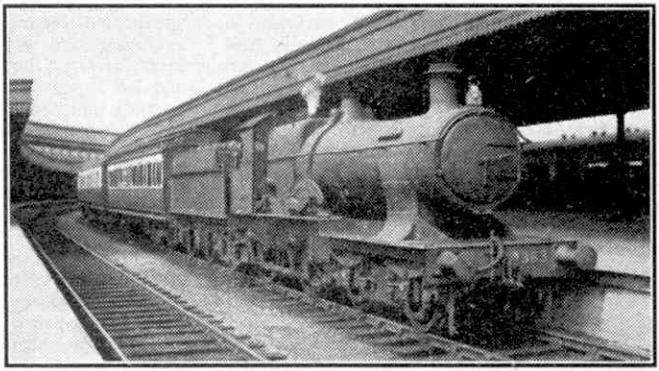
An Adams "Jubilee" 0-4-2, formerly L. & S.W.R. No. 612, was recently repaired at Eastleigh prior to returning to duty as a stationary boiler. This engine is no longer on the active stock list. A "G6" 0-6-0T, No. 258, was being repaired at Eastleigh in June, though this long-lived shunting type is being largely superseded. "H2" 4-4-2, 32426, also was being overhauled. The first "Leader," No. 36001, was engaged in some trial runs from Eastleigh during June last, when summer seasonal traffic on the Southampton-Bournemouth main line was becoming heavy, but not many "Merchant Navy" engines seemed to be working thereon just then, as several were under repair.

Bo-Peep Tunnel was re-opened for full traffic working on 5th June, so reuniting Hastings by train with London and the west, temporary termini and local special bus services being discontinued.

More B.R. Track-Laying Units

British Railways are building six more track-laying units for use in speedily relaying lengths of line with prefabricated track.

The new units will consist of vehicles equipped with cantilever lifting arms which can swing out over an adjoining track, lift out a 60 ft. length of track weighing 4½ tons, and replace it with a new section of pre-fabricated track. As this complete operation takes only about four minutes, relaying is speeded up and the period during which train services are interfered with is reduced. The units can work in tunnels where crane operation would be impossible.

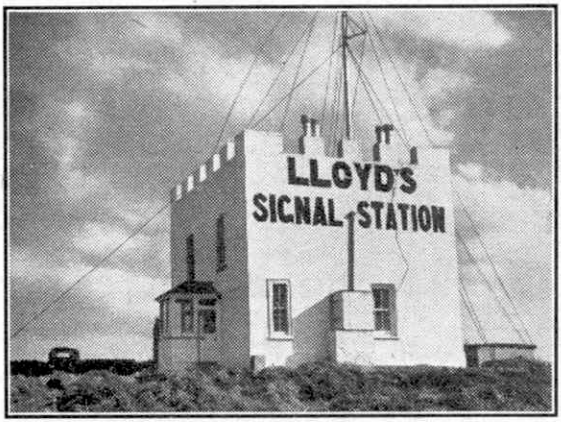


"Alfred Baldwin," No. 3363 of the former G.W.R. "Bulldog" class, at Bristol. This engine has been withdrawn since the photograph was taken. Photograph by C. R. L. Coles.

Reporting the World's Ship Movements

By Morrys Rodney

EVERY day thousands of ships of all types are navigating the Seven Seas, from proud passenger liners to wall-sided tramps and humble coasters. Many people are interested in their movements, quite apart from those folk who make a hobby of "watching the ships pass" from some point of vantage on the coast. Shipowners must have prompt and accurate news of each vessel engaged on a voyage, just as merchants want to know how their cargoes are progressing from one port to another. Harbour authorities must be kept informed of imminent arrivals in port so that berths can be got ready and dock labour arranged, and Customs and immigration officials, pilots, tugs, health inspectors and others all need to be posted on the latest shipping news. Relatives of those on board each ship follow her movements from day to day.



Lloyd's Signal Station at The Lizard, where a 24-hour service is maintained. Photograph by courtesy of Lloyd's.

No eyes scan the voyage reports more anxiously than those of underwriters, for they stand to lose vast sums of money in the event of casualties. Safety measures, combined with efficient navigation, have made a big difference to insurance risks. But there is always a chance of bad weather delaying a voyage for so long that a ship becomes overdue. Meanwhile, until news of her safety arrives, those who have accepted insurances on her hull and cargo may seek to transfer their liability by means of re-insurance, at a higher premium, with other underwriters. After an interval, if there is still no news, full enquiries are made about the overdue ship in case she has broken down and is drifting at sea, or has crawled into some isolated place with no means of communication with the outside world. The final step, only taken after every source of information has been tapped, is a "Posted Missing" notice, when all insurances become payable.

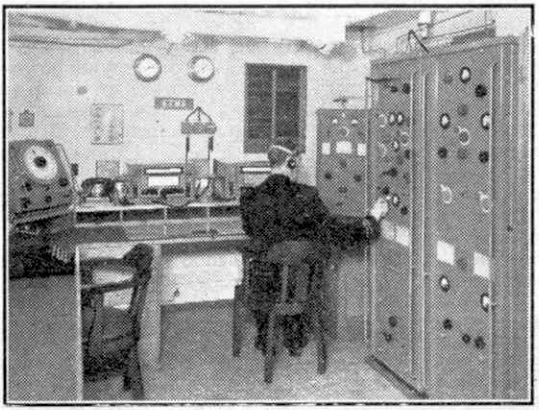
Fortunately, tragedies of this kind are now very rare, although collisions, strandings, machinery breakdowns and other mishaps make up the daily casualty list. In such cases prompt information about the accident is of vital importance, so that assistance can be sent without delay. Lloyd's agent in each locality is empowered to act for the underwriters, arranging salvage when necessary. Surveyors inspect the damage, reporting on its extent and giving an estimate of how long it will take to repair and how much it will cost. Further reports then come in as the work progresses to completion, until eventually the ship is again seaworthy and resumes her place among the routine movements.

Ship reporting is a highly specialised business, in which speed and accuracy are essential. Those engaged in it cannot afford to make mistakes, for a false report of an accident to an important ship will cause infinite trouble, in addition to starting needless anxiety among the relatives of those on board. These scares were not uncommon when ships were allowed to duplicate names, so that a favourite choice might apply to two or three ships on the same route. Duplication is now very strictly controlled under the British flag, a wise precaution since followed by other maritime nations. Should there still be more than one ship of the same name at sea, the report is always qualified by her nationality. If duplicate names under the same flag might be confused, the tonnage of the ship being dealt with clinches the matter.

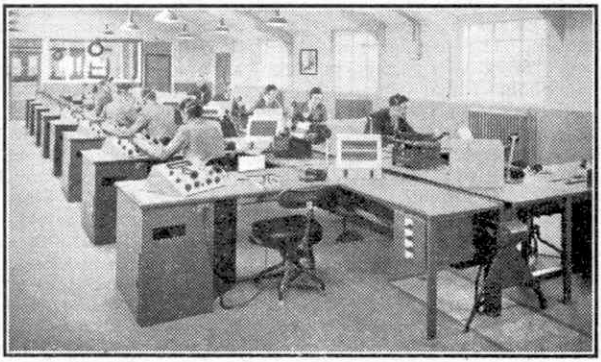
How did this fascinating work commence? Back in the 17th century several weekly newspapers began to publish news of shipping movements. They were meagre reports of arrivals and departures long after they had occurred, confined to the principal harbours in England. Communications were poor, and long passages even between coastal ports were the general rule. Samuel Pepys missed a chance of profiting from this state of affairs in 1663, when he was instructed to try fixing an insurance on a ship homeward bound from Archangel. He tells us in his Diary that a chance call at a London coffee house gave the first news that the ship had arrived safely at Newcastle. But, he regretfully confesses, he "went like an asse" to inform his superiors, instead of pretending to "have made an insurance and got £100 with the least trouble and danger in the whole world." Prior information like this was responsible for many frauds.

Edward Lloyd, the coffee house keeper who gave his name to the world-famous insurance corporation, saw the need for a regular supply of news about shipping movements. Having no agents to collect the information, he had to get it from Post Office and Customs officials at home ports. He started a weekly Marine List in 1734, and this steadily developed into the present-day *"Lloyd's List,"* its name still connecting it with its founder. Fees for news continued to be drawn by the Post Office until 1791, and even after they were stopped a number of Post Office clerks were able to publish a rival paper for some years. Indeed, so important was the Post Office as a source of information, that its paper often gave fuller reports than the one supported by the underwriters. When rivalry was ended in 1837, the Post Office editor took over the running of *"Lloyd's List,"* which then became daily.

By that time Lloyd's underwriters had built up regular channels of news, appointing agents at home and overseas to give reports on ships. Postal facilities were still the mainstay, although the introduction of inland telegraphs, followed by ocean cables, greatly speeded up the transmission of news. Lloyd's began to erect signalling stations at points on the English coast; so that ships could be reported in the course of their voyages. Other stations were established overseas for the same purpose. They were handicapped in poor visibility, when it was often impossible to identify a ship by telescope, let alone exchange signals by flags. Yet so complete was the chain made, that a ship missed by one station would almost certainly be picked up by the next one on her route.



The radio officer of a modern liner adjusting the Marconi "Worldspan" transmitter. Photograph by courtesy of The Marconi International Marine Communication Co. Ltd.



Operating positions at the G.P.O. Radio Station at Burnham-on-Sea. Photograph by courtesy of the Postmaster General.

The invention of radio communication started a revolution in method. Marconi's conversion of the signal station on Rathlin Island, off Northern Ireland, proved so successful that he secured a contract from Lloyd's to fit ten more of their stations with radio. For the time being, however, these stations mainly continued to give "passing" reports, comparatively few ships being fitted with radio transmission to enable them to exchange messages with the stations. By the time this important development was making real headway the Post Office secured a monopoly of radio communication, and Lloyd's stations passed into their hands. Arrangements were made so that Lloyd's continued to have the benefit of their enterprise, the Post Office supplying them with regular shipping reports. Similarly, when foreign countries also acquired radio stations from Lloyd's, the news facilities were continued.

Although the visual signalling stations maintained by Lloyd's remained in their hands, the growth of radio communication saw many of them become redundant, and they were closed down. Those that remain, about 30 in home waters, with others abroad, now serve to supplement the radio service. It must be remembered that many ships still have no radio equipment; even the latest Safety Convention has only extended radio-telephony to ships of over 500 tons gross, so that visual signalling is the only means of communication for some vessels. The backbone of the system is still provided by reports from agents, of whom Lloyd's employ about 1,500 in Britain and throughout the world. It is their daily cables and telegrams, pouring into the headquarters in London, which enable Lloyd's to give its unrivalled service of shipping intelligence.

But much happens before all this mass of scattered information reaches the reader in an intelligible form. It would be no use issuing these reports just as they come in from the agents or radio stations. Lloyd's, on a busy day, might handle 500 separate reports, all of which must be sorted out and arranged for publication. Efficient organisation and a highly skilled staff produce order out of chaos in a very short time. All of these messages must be put into print in several different forms, each in such a way that the movements of a particular ship can be followed with the least trouble. The two main publications are both dailies, *"Lloyd's List"* and *"Lloyd's Index."* The *"List"* can be bought by anybody for threepence, giving the latest report of shipping movements all over the world, arranged in geographical order. It also gives information of ships still in the principal British ports, together with news of those due to arrive.

By checking up the arrival of a ship at one port, it is only necessary to watch for her departure from there, note where she is bound, and then follow up in succeeding issues for the rest of her passage.

A section of the Intelligence Department at Lloyd's. The machine in the foreground is a teleprinter. Photograph by A. Louis Jarché.

The geographical system is a convenient means of studying movements for those with a little time to check through the ports. But when immediate information is required, the alphabetical system of the *"Index"* proves ideal. By running a finger down the list of names, it is very simple to get the latest information about any of the 13,000 or so ships that are listed. This publication, however, is on sale only to subscribers, each of whom undertakes not to divulge its information to outsiders. The reason for this secrecy is the heavy expense of running the intelligence service, making it necessary to get as much income as possible from the valuable *"Index."* A copy is placed each day on the desk of every underwriter at Lloyd's and thousands (Cont. on page 382)

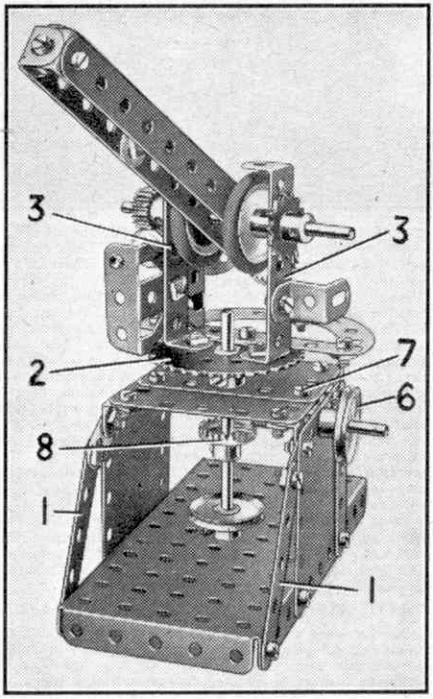
Using the Meccano Gears Outfit "A"

An Anti-Aircraft Gun for Outfit No. 2

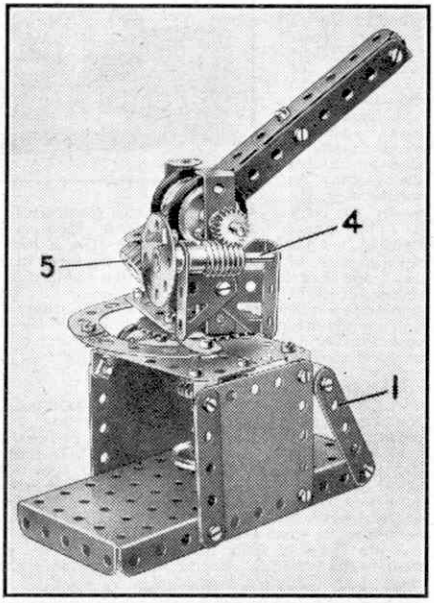
OWNERS of Outfit No. 2 and a Gears Outfit "A" will find the anti-aircraft gun shown in the pictures on this page a splendid subject for their attention. The use of gears enables the gun to be swivelled or the barrel to be elevated as required simply by turning a handwheel.

A 5½"×2½" Flanged Plate provides a solid base for the model and a tower built up from 2½"×2½" and 2½"×1½" Flexible Plates is bolted to it. Stays consisting of 2½" Strips 1 are then attached to the tower by Fishplates. The gun is made by bolting two 2½" Strips, overlapping three holes, to a 2" Sprocket Wheel 2, the Strips having two 2½" Curved Strips bolted to them. Two 2½"×½" Double Angle Strips 3 are also bolted to the Sprocket, and a pair of Trunnions, which form bearings for a 2" Rod 4, are attached to one of the Double Angle Strips. The Rod 4 is fitted with a Worm and can be rotated by a handle.

A ½" Pinion on a 3½" Rod engages with the Worm and the barrel of the gun is held on the Rod between two 1" Pulleys fitted with Rubber Rings. The barrel consists of three 5½" Strips, which are connected at the muzzle and in the centre by Angle Brackets, and two of them are bolted to the boss of a ¾" Pinion 5.



A swivelling and elevating anti-aircraft gun built from Outfit No. 2. It includes also some parts from a Gears Outfit "A."



In this view of the anti-aircraft gun the elevating gearing can be seen.

The gun is swivelled by turning a 1" Pulley 6, which is locked on a 2" Rod mounted in the side of the tower and in an Angle Bracket spaced from the 2½"×1½" Plates by a Washer. The Bolt that holds the Bracket is shown at 7. A ½" Pinion on the 2" Rod meshes with Contrate 8.

Parts required to build the Anti-Aircraft Gun: 3 of No. 2; 6 of No. 5; 2 of No. 10; 8 of No. 12; 2 of No. 16; 2 of No. 17; 4 of No. 22; 1 of No. 24; 34 of No. 37; 2 of No. 37a; 2 of No. 38; 2 of No. 48a; 1 of No. 52; 2 of No. 90a; 2 of No. 111c; 1 of No. 125; 2 of No. 126; 2 of No. 155; 2 of No. 188; 2 of No. 190; Gears Outfit "A."

Among the Model-Builders

By "Spanner"

WORKING MODEL LATHE

From time to time we have mentioned in the "*M.M.*" model machine tools such as drilling machines and lathes that could be put to practical use on light work. A further example of a model of this kind is the fine lathe shown in Figs. 1 and 2 on this page. This model was built by Miguel Anselmo Viglioglia, Buenos Aires, and we understand that it is capable of working satisfactorily on wood and very soft metals. The headstock mandrel is provided with a three-speed gear-box, and the tool carriage also is capable of operating at three different speeds, which are provided by a separate gear-box. All these drives can be reversed in direction.

A fractional horse-power electric motor is used for driving the model. As will be seen, the model is very neatly constructed and the close-up view of the carriage reveals excellent constructional features and some idea of the sturdy construction adopted. The model is one of the best of this kind that I have seen, and I congratulate its builder on his handiwork.

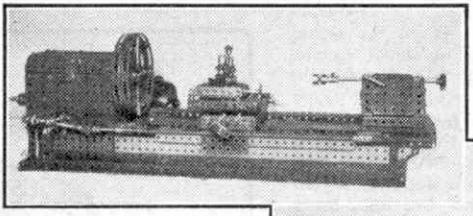


Fig. 1. A well-constructed lathe built from Meccano parts. A close-up view of the sliding carriage is seen in Fig. 2, on the right.

CREEPER TRACK

The construction of realistic creeper tracks using a minimum number of parts has always been a problem with Meccano enthusiasts. Suggestions have been made for creeper tracks built from Strips and using Sprocket Wheels and Chains, but the model-builder is apt to find that most of his Strips have been used up before he has made a track of the desired length. This method therefore is not suitable for owners of small Outfits.

A neat form of track that is suitable for use on medium-sized models, and to which this drawback does not apply to the same extent, is shown in Fig. 3. Two Driving Bands are threaded through the holes in Fishplates and held in place by short lengths of wire. The complete track is fitted so that the Driving Bands lie in the grooves of 1" Pulleys fixed on 1½" Rods journalled in the 2½" Strips. The 1" loose Pulleys support the centre portion of the track, and they are spaced apart by Washers. The short lengths of wire and the Driving Bands provide a good grip, and a model fitted with similar creeper tracks to these should be able to climb fairly steep inclines.

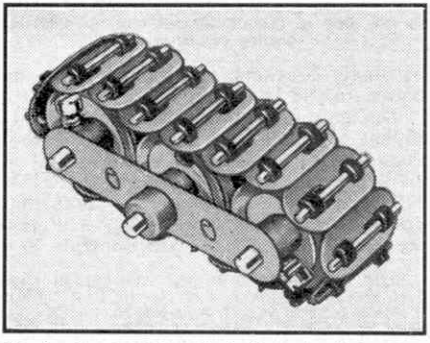
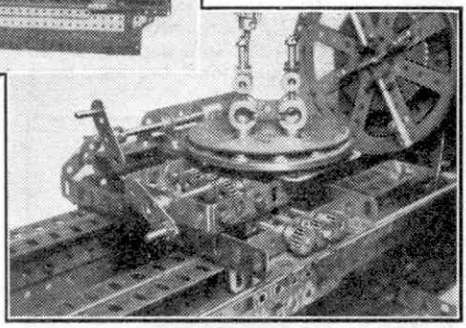


Fig. 3. A suggested method of constructing creeper track for a small model.

MECCANO MODEL ASSISTS IN ERECTION OF A NEW BRIDGE

The possibility of building Meccano cranes and similar models fairly accurately to scale has often led to the use of such models in connection with the development of actual engineering projects. One of the latest instances to come to my notice concerns the erection of a fine concrete bridge across the River Mersey at Carrington. Owing to certain peculiar conditions at the site it was essential to arrange matters so that all the erection operations could be carried out from one side of the river. The only crane the constructors had available was an electric derrick with a 120 ft. jib, and it was necessary that this should be positioned so that the whole of the work could be covered. It was in this connection that Meccano proved useful. The two sons of Mr. H. Woulds, a director of Harry Fairclough Ltd., Warrington, the contractors responsible for the erection of the bridge, are keen Meccano enthusiasts, and at his request they built a ½" scale model of the crane, which was then used in conjunction with a scale model of the bridge itself to determine the most suitable place on the river bank to erect the real crane when the construction operations began. The models are shown in Fig. 4 and I understand that they proved very helpful.



DERAILLEUR TYPE CHANGE-SPEED MECHANISM

Most readers will be familiar with the Derailleur type change-speed gears fitted to many modern bicycles, particularly sports machines. In this mechanism the gear change is effected by providing a series of different sized sprockets fixed to the hub of the rear wheel, so that the driving chain can be moved on to any one of the sprockets by means of a suitably placed lever. R. Wood, Shafton, near Barnsley, who

is an enthusiastic model-builder, has been experimenting with this type of mechanism in Meccano, and he recently sent me details of a simple change speed device based on the Derailleur principle. The mechanism is shown in Fig. 5.

The bicycle chain wheel is represented by a 3" Sprocket 1, fixed on a Rod mounted in two 5½" × 2½" Flanged Plates that are connected at each end by a 2½" × 1½" Flanged Plate. The Sprocket 1 is rotated by turning a handle 2 that drives the rod of the Sprocket through two ½" Pinions. This arrangement is used so that the handle can be turned in the usual clockwise direction.

The mechanism gives two ratios, which are provided by the 1½" Sprocket 3 and the 2" Sprocket 4. These are fixed on a Rod suitably mounted in the framework. Two small idler Sprockets are carried on a pivoted arm 5, which consists of a 3½" Strip bolted to a Crank. The Crank is fixed on a Rod that is free to slide laterally in its bearings, so that by moving the Rod the arm and Sprockets carry the Chain sideways. In this way the Chain can be transferred to either of the Sprockets 3 or 4, thus altering the ratio between these Sprockets and the Chain Wheel. The Chain is maintained at the proper tension by a Driving Band looped round the arm 5 and fixed at the rear of the mechanism.

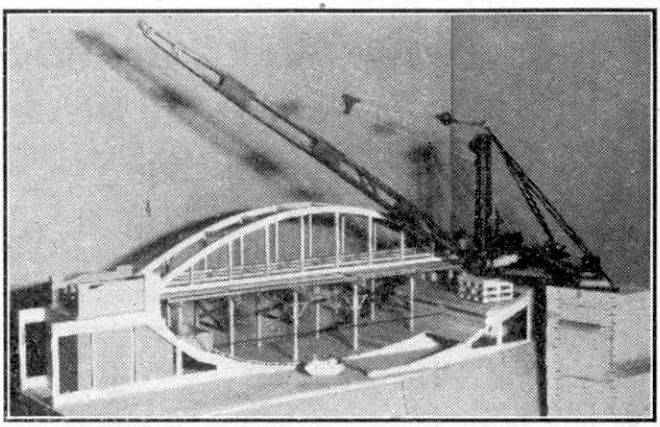


Fig. 4. A model of the Carrington bridge over the river Mersey, and the Meccano derrick crane that was built for experimental purposes in connection with the erection of the actual bridge.

SUMMER HOLIDAY SIMPLICITY CONTEST

This month we are announcing a special Simplicity Competition for models of subjects associated with summer holiday activities and pastimes. Many suitable subjects for this competition are to be found along the sea-front, and amusement machines seen in fairgrounds offer a particularly wide choice for displaying originality and novelty. Well posed groups of simplicity figures of people engaged in summer sports, also will make attractive entries.

Prizes will be awarded to model-builders who succeed in constructing the most ingenious and attractive models *using the smallest number of parts consistent with a realistic appearance.*

Competitors should send in either photographs or sketches of their models to "*Summer Simplicity Contest, Meccano Ltd., Binns Road, Liverpool 13,*" and the sender's age, name and address must be written clearly on each illustration submitted.

The competition will be in two Sections for Home and Overseas readers respectively, and the following set of prizes will be awarded in each Section. First, Cheque for £3/3/–; Second, Cheque for £2/2/–; Third, Cheque for £1/1/–. In addition there will be five prizes of Postal Orders for 10/6, and five of Postal Orders for 5/–. The closing dates are, Home, September 30th, Overseas, December 31st.

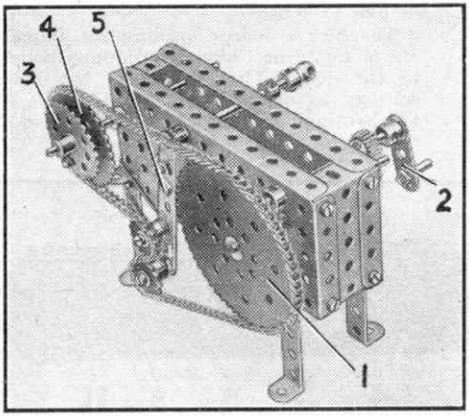


Fig. 5. A Derailleur type change-speed mechanism assembled on a demonstration framework.

MECCANO COMPETITION RESULTS

YULETIDE MODEL-BUILDING COMPETITION (HOME SECTION)

First Prize, Cheque for £3/3/–: C. J. C. Harden, Cambridge. Second Prize, Cheque for £2/2/–: B. R. Osborn, Solihull, Nr. Birmingham. Third Prize, Cheque for £1/1/–: P. A. Crumpton, Maidstone.

Five Prizes each of 10/–: G. Cruickshank, Glasgow S.4; J. Todd, Kingsland, Nr. Leominster; D. McRae, Maybole, Scotland; C. Cruickshank, Glasgow S.4; J. K. Wright, Hull.

Five Prizes each of 5/–: C. Fitzpatrick, Dublin; J. Muir, Purley, Surrey; D. Farrer, Cambridge; B. Davis, Blackpool, S.S.; D. Neale, Edinburgh 9; M. J. Murchie, Dumfries.

OUTFIT No. 3 MODEL-BUILDING COMPETITION (HOME SECTION)

First Prize, Cheque for £3/3/–: C. J. C. Harden, Cambridge. Second Prize, Cheque for £2/2/–: M. Macfarlane, Stafford. Third Prize, Cheque for £1/1/–: D. Thomas, Ilford.

Five Prizes, each of 10/6: R. Martin, Ewhurst, Surrey; C. E. Wrayford, Bovey Tracey, Devon; R. Towner, Harrow; D. Townson, Liverpool 11; M. G. Lyons, Norwich.

Five Prizes, each of 5/–: M. Gulliford, Taunton; D. J. Woolard, Green St. Green, Kent; M. J. Page, London S.W.16; E. D. Froggatt, Loscoe; D. Lindsay, West Lothian, Scotland.

New Meccano Models

Naval Destroyer—Pile Driver

OUR first new model this month is a miniature but realistic naval destroyer, seen in Fig. 1. An underneath view of the model, showing the interior construction of the hull, appears in Fig. 2.

The hull consists of four 12½" Strips connected at the stern by two Formed Slotted Strips. At the prow the Strips are bolted to a 1½" Strip 1, which carries also two 5½" Strips 2 that form each side of the fore-deck. The other ends of the 5½" Strips are joined by Fish-plates 3 to the upper 12½" Strips. The sides of the hull are spaced apart by two 1½"×½" Double Angle Strips 4 and 5 (Fig. 2).

The fore-deck consists of 3½" Strips bolted together at one end and attached at the other to a 1½" Strip 6 bolted by its centre hole to the apex hole of a Flat Trunnion. This Trunnion in turn is bolted to a 1½"×½" Double Angle Strip held by a Bolt 7 on each side of the vessel.

Two 2½"×1½" Flanged Plates 8 and 9 and two 1½" Flat Girders 10 fill in the remaining deck areas and the stern is filled in by a Wheel Disc 11 bolted to a 1"×½" Angle Bracket fixed to the Formed Slotted Strips that form the stern. The fore Flanged Plate is held by a Bolt to the Double Angle Strip 4, while the after Plate is held to one of the 1½" Flat Girders by means of a 3" Screwed Rod that forms the rear mast. This Rod passes through the Washers, Double Arm Crank 12 and 1½" Strips that represent the superstructure built around the mast, and a nut is tightened against the Washers. Another nut on the underside of the Flanged Plate makes the assembly secure.

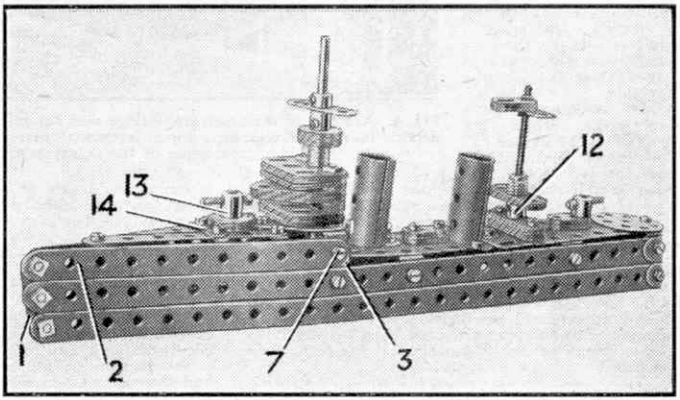


Fig. 1. This naval destroyer is a realistic subject for those who like constructing model ships.

The bridge superstructure consists of 1½" Flat Girders, Flat Trunnions and 1½" Strips, topped with six Washers and four or five ¾" Washers.

The Sleeve Pieces forming the funnels are mounted on Chimney Adaptors bolted to the deck. The gun 13 in the bows consists of a Threaded Boss, four ¾" Washers and a ¾" Bolt. A bolt passed through a 1" Corner Bracket 14 into the

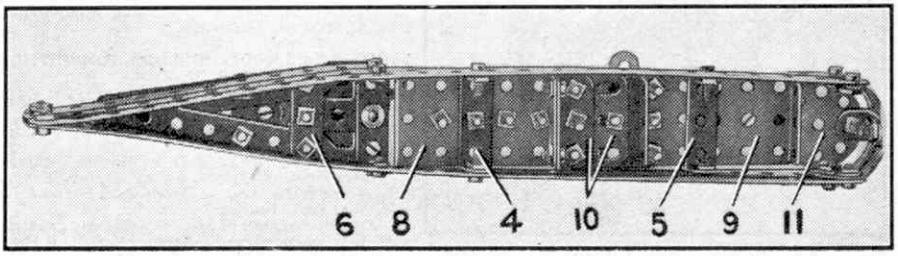


Fig. 2. An underneath view of the destroyer's hull.

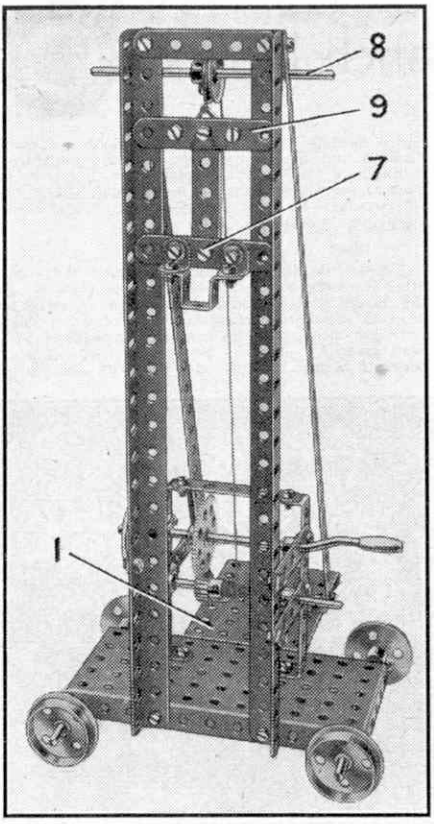


Fig. 3. General view of pile driver.

Threaded Boss holds the unit.

Parts required to build model Destroyer: 4 of No. 1; 2 of No. 3; 28 of No. 6a; 1 of No. 9f; 25 of No. 10; 1 of No. 12b; 1 of No. 16; 1 of No. 24a; 24 of No. 37a; 20 of No. 37b; 21 of No. 38; 11 of No. 38d; 3 of No. 48d; 2 of No. 51; 2 of No. 59; 2 of No. 64; 1 of No. 80a; 14 of No. 103h; 2 of No. 111; 3 of No. 111a; 14 of No. 111c; 6 of No. 126a; 1 of No. 133a; 2 of No. 163; 2 of No. 164; 2 of No. 215.

Our second new model this month is a pile driver of the kind used for driving steel piles or heavy timbers deep into the ground in preparing the foundations for bridges, large buildings and similar constructional work. Our model is operated by hand, but most actual machines are either electrically driven or operated by steam power. The pile driver consists essentially of a heavy block of steel which forms a hammer, and can be raised to a considerable height by hauling it up vertical guides that form the column of the machine. The block is then allowed to drop and strike the end of the pile, thus forcing it gradually further and further into the ground.

A $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate forms the base of the model and is extended by a $3\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate 1. Two $12\frac{1}{2}''$ Angle Girders bolted to the $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Plate are braced by two $12\frac{1}{2}''$ Strips attached to the top of the Girders and to Flanged Plate 1. Two $3\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strips 2 bolted to the $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate are attached to the Angle Girders by $2\frac{1}{2}''$ Strips that form bearings for a Crank Handle and a $4\frac{1}{2}''$ Rod 3. The Cord for hoisting the driver block 7 is tied to the Rod 3, and the Rod is rotated from the Crank Handle through a 57-tooth Gear that meshes with a $\frac{1}{2}''$ Pinion on the Rod 3. The Pinion can be engaged with the Gear at will by means of the lever 4. This is a 3″ Strip lock-nutted at 5 and held by a $2\frac{1}{2}''$ Strip 6, which is spaced from the $12\frac{1}{2}''$ Strip by one Washer.

The driving block 7 is formed by attaching a Double Bent Strip to a $2\frac{1}{2}''$ Strip by Angle Brackets, the bolts holding also a second $2\frac{1}{2}''$ Strip that is spaced from the first by two Washers. This forms the lower part of the slide frame and is connected to the other similarly constructed half by means of a vertical $2\frac{1}{2}''$ Strip. The Cord from Rod 3 is taken over a 1″ Pulley on a 4″ Rod 8 and tied to the driving block.

Parts required for model Pile Driver: 2 of No. 1; 1 of No. 3; 12 of No. 5; 1 of No. 6; 2 of No. 8; 6 of No. 12; 2 of No. 15; 2 of No. 15b; 1 of No. 19g; 4 of No. 20; 1 of No. 21; 1 of No. 22; 1 of No. 26; 1 of No. 27a; 4 of No. 35; 29 of No. 37; 4 of No. 37a; 16 of No. 38; 1 of No. 40; 1 of No. 45; 2 of No. 48b; 1 of No. 52; 1 of No. 53; 6 of No. 59; 4 of No. 111c.

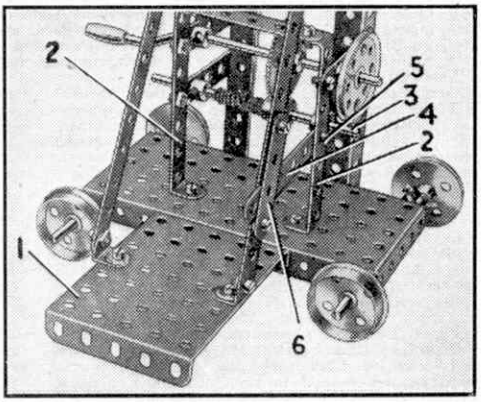


Fig. 4. Close-up of base of pile driver, showing winding mechanism.

Club and Branch News

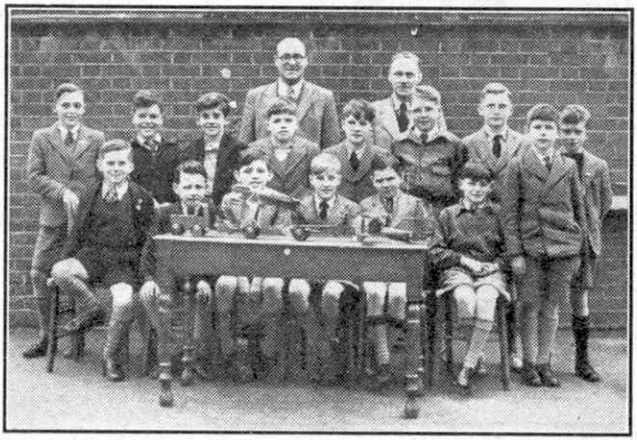
WITH THE SECRETARY

PLANNING THE RETURN TO THE CLUB ROOM

Something out of the ordinary should be attempted to wind up the summer programme. For instance, a really first-class pleasure excursion, say to some seaside resort, might be arranged, and in that case members could be invited to bring a few friends to introduce them to one of the delights of Club or Branch life. If a good excursion is impossible some ramble to a place where good fun can be enjoyed in games is always advisable, and for those who are more seriously minded a good works trip or a railway visit would be suitable.

A special celebration of one of the types suggested makes easy the transference from the outdoor world to the Club or Branch room, but this return must not be made without a definite programme in view. I am not in favour of a completely rigid scheme for Club meetings. I think it better to fix the general idea, and to introduce changes from time to time. These always stimulate interest, and they have the further advantage that their adoption pleases those members who have asked for them. It must always be impressed on members that suggestions from them are welcome and will be adopted if they are thought suitable by officials and other members. The best time for suggesting new ideas is the Annual General Meeting, which should be arranged early in September, but there is no point in suppressing a good idea until some such time as this; any member who has an inspiration should give his Club or Branch the benefit of it immediately.

Now is the time to begin planning programmes for the next three months. Members must be encouraged to think out schemes for themselves and to talk them over with others. Then it should not be difficult to frame a suitable programme at the usual meeting, and to enlist the enthusiastic support of all members in putting it into operation.



Members of the Junction Road Primary School (Brentwood) M.C., with Mr. J. E. Humphries, Leader, and Mr. A. Ramage, Assistant Leader. This fine school Club was affiliated in November 1949 under the Leadership of Mr. D. Millar. Excellent model-building has been carried on, with competitions that were keenly contested, and an attractive display was made at an Exhibition in April. A fine model of an aerodrome has been built, with hangars, perimeter track, runways, watch tower, model aircraft and road transport.

CLUB NOTES

CRYPT SCHOOL M.C.—Careful preparations were made for the Annual Exhibition held at the end of July. A Table Tennis Tournament is in operation, together with a competition for a special silver cup. Timed cycle trials of 25 or 50 miles have been organised. Club roll: 44. *Secretary:* D. H. Gettings, 17, Riversley Road, Gloucester.

MILE END (PORTSMOUTH) M.C.—The May Jumble Sale increased Club funds by over £1. Special preparations were made for the Club's first Exhibition, Meccano dealers co-operating by displaying notices, announcements also appearing in the local libraries. There was a splendid display of Meccano models and a Hornby Train Layout, with model aeroplane displays and a demonstration of radio apparatus. A publicity stall also was arranged with a view to encouraging applications for membership. Club roll: 15. *Secretary:* Mr. A. J. Nicholson, 213, Sultan Road, Buckland, Portsmouth.

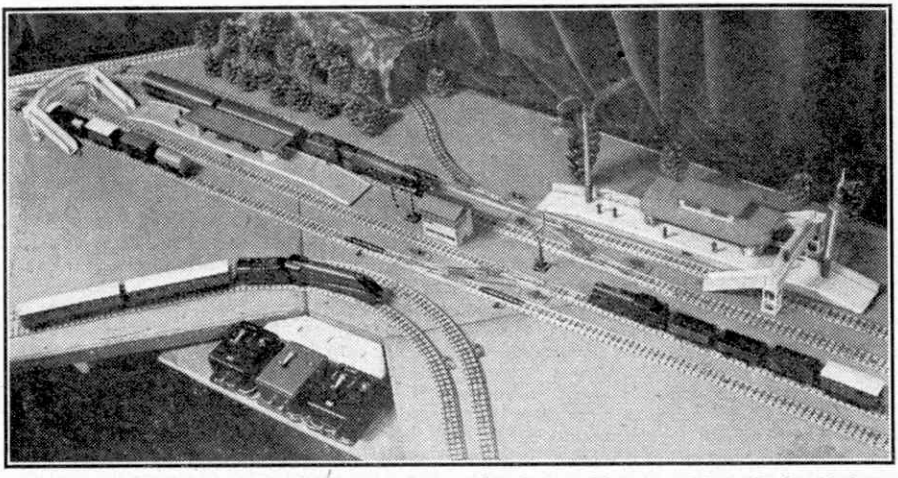
AUSTRALIA

THEBARTON BOYS' TECHNICAL SCHOOL M.C.—Another successful season has been enjoyed. About half the meetings have been devoted to construction projects, members working in groups of six or eight. At other meetings Talks and Demonstrations have been given by members on special mechanisms or personal hobbies. Films and Talks by visitors on engineering or scientific topics also have been enjoyed. Club roll: 40. *Secretary:* K. Amos, Thebarton Boys' Technical School, Ashley Street, Thebarton, South Australia.

BRANCH NEWS

WHITTINGTON—Good progress has been made with the Gauge 00 Railway, which is to be called the "North Derbyshire Joint Railway." Extensive constructional work is being undertaken, including the building of special coaches and wagons. *Secretary:* P. W. Sharp, 17, Hill Top Road, Old Whittington, Chesterfield.

HIGHGATE JUNIOR SCHOOL—Membership is increasing. A good track has been laid down, and a display on it was included in the July Exhibition. A Photographic Section has been formed and a competition is being organised. Good work is carried on in the Branch dark room. A Branch Library has been started and is very popular. *Secretary:* P. M. Cohen, 50, Middleway, Hampstead Garden Suburb, London N.W.11



An attractive Hornby-Dublo scene showing the main part of the layout of Stewart and Peter Craddy, Henleaze, Bristol. Note the convenient arrangement of the three Controllers side by side.

A Portable Hornby-Dublo Railway

WE illustrate above part of a Hornby-Dublo miniature railway system owned by "*M.M.*" readers Stewart and Peter Craddy of Henleaze, Bristol. This has been assembled, and is operated, with the enthusiastic help of their father. Apart from being a novel and fairly extensive portable layout, the system is notable for its location, which to a large extent has settled the general shape of the layout. The baseboard on which it is laid fits in the bay window of the lounge of the Craddy's home, so that the layout forms roughly what is sometimes known as the "Water Wings" shape. Each "wing" as it were forms one end of an oval track, the central connecting sections being laid as shown in the photograph. For convenience in handling, the baseboard has been made in three sections, two of which are rectangular, with a central section that is almost triangular.

The wiring and switching arrangements are carried out on the central section, with the Controllers mounted side by side on a sub-base. There is a double track main line, but on the central section the two tracks do not exactly follow one another, as the outer track is diverted to pass through a single-line tunnel. Both tracks have siding or platform roads taken off them, and arrangements are such that at the two stations illustrated through running is possible, yet it is quite easy to dispose of a train that happens to finish its journey at either of the platforms. These Stations and the Signal Cabin shown are pre-war products.

Each of the main lines forms a complete electrical section, and the sidings as a whole form another, and each of these has its own Transformer and Controller. The wiring and isolating arrangements of these follow standard Hornby-Dublo practice, as detailed in the article in the April "*M.M.*" of this year. Station working and the shunting or disposal of trains is helped considerably by the use of Hornby-Dublo Uncoupling Rails at suitable points. These in conjunction with the isolating arrangements, which are carried out with the standard Isolating Rails and Switches, make possible some most interesting operations.

Both L.M.S. and L.N.E.R. Passenger Train Sets are run on the system and the Hornby-Dublo Goods Train Set also in use has been extended, so that a varied selection of goods stock is available. Lineside effects have had careful attention, and good use is made of such recent Hornby-Dublo accessories as the Footbridge and the Water Crane. The model trees near the tunnel and station are effective, and the whole system has in fact a trim and well-arranged appearance.

Hornby Trains in the Garden

RUNNING Hornby trains out of doors is an attractive pastime when the weather is fine and warm. Somehow the very fact that the railway is in the open seems to make things more realistic than when the track is laid indoors. Anyone with a Hornby Train Set needs little or no extra equipment to enjoy outdoor running, for he can put his railway down outside on a fine dry day and bring it in again when running is over.

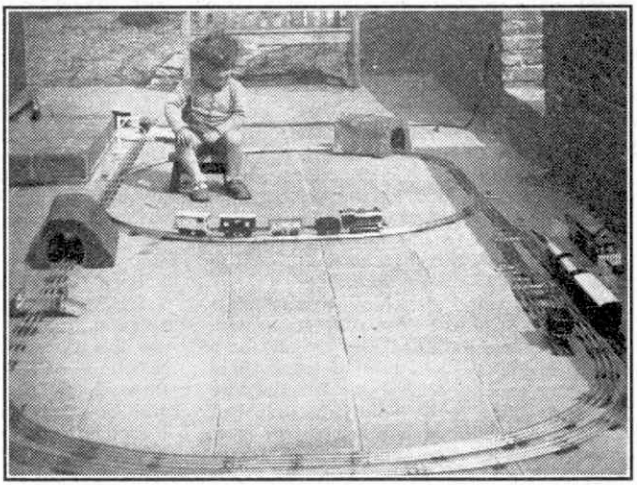
It is specially important to emphasize this temporary nature of Hornby layouts in the garden, because Hornby railway material, like all other equipment of its kind, is not suitable for permanent outdoor use. Rusting and other troubles brought on by damp would soon ruin the system, so that those who move into the open air when the weather is good should make sure that nothing is left out when the inevitable clearing up is tackled.

An important preliminary step is to obtain permission to lay down the railway in the garden, and the situation of the line itself and the layout of the rails must be considered. A level site is necessary and frequently the tempting expanse of the lawn will occur to mind. If this is quite level, well and good; but it is even more important perhaps that the grass should be closely cut, otherwise it is liable to interfere with the running of the locomotives and their trains. Unless the grass is really short stray bits will find their way into the mechanisms of the engines and the axle bearings of the rolling stock. If everything is satisfactory in this respect the lawn as a site has much to commend it. It provides a wide expanse of "green fields" in miniature, giving a pleasant natural appearance that will be still further improved by the use of the various Dinky Toys of agricultural interest that many boys possess.

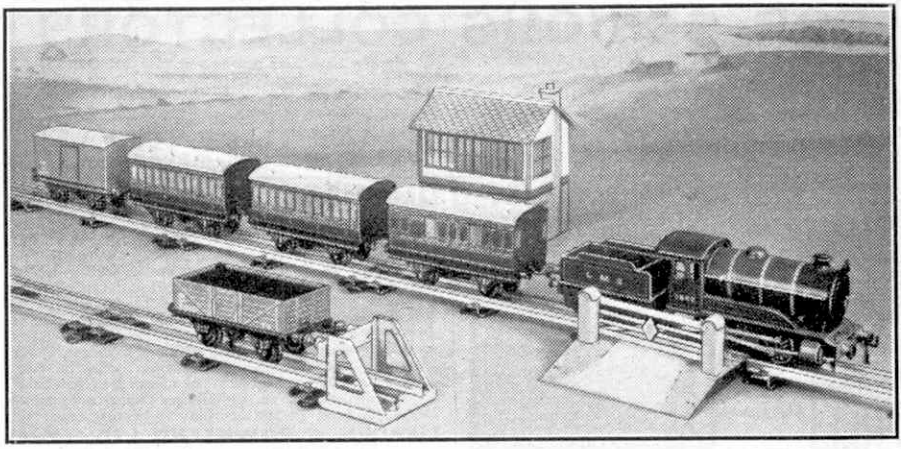
An alternative is to lay down the railway on a tiled or paved path, such as that seen in the accompanying illustration. As a rule this will provide a good level site and will make a good base for the buildings, stations and so on that form part of the railway equipment. If the track has to be laid entirely on a path, flower beds and other natural features alongside will help to give a good effect, and some enthusiasts may be able to plan an arrangement that includes both lawn and path, with perhaps a rough earth or a rockery section as well. When the latter is the case the rockery section will make an obvious location for a tunnel. The top covering of this can consist of similar stone to that of the rockery itself and the resulting appearance will be very effective.

Some readers have layouts of the semi-portable kind in which the track and accessories as well are mounted on a baseboard, probably in several sections. Where this is the case the arrangement of the railway out of doors is an easy matter.

Whichever method is followed it is a good plan to give all stock that has been in use a quick clean up; trains get dusty out of doors! If there is the slightest suspicion of damp an oily wipe is helpful for the track and any items that have been in actual contact with the ground.



Peter Lang, Sevenoaks, with his Hornby layout in the garden. Peter has some pre-war Hornby Electric Trains and other items not now in production.



A typical Hornby passenger train hauled by a No. 501 type Locomotive. The rear vehicle is a Goods Van attached for special traffic purposes.

Using Hornby Rolling Stock

SHORT distance expresses, which are fast trains but make several intermediate stops, are just the thing for a Hornby Clockwork railway. A typical train of this kind made up of Hornby No. 1 passenger stock will give quite a good effect with the tender engines included in the present day No. 501 Train Sets. Each stage of the run between intermediate stops can correspond with the length of run of the engine on one winding.

A miniature passenger train should have a Passenger Brake Van, several No. 1 Passenger Coaches, and another Passenger Brake Van in that order, after the engine. The exact number of vehicles forming the train will depend on the engine and stock available and the length of station platforms. It is very often convenient to keep to the same formation of vehicles for several trains, and this is good practice for on real railways a number of "set trains," as they are called, are maintained for particular duties.

If the layout is of the point-to-point kind, the running of non-stop expresses is a simple matter of letting the train travel from one end of the system to the other. On an oval continuous track we can give the engine its full wind for an express run and let it make several circuits of the track, the number depending on the size of the layout.

Some variety in train make-up is possible by adding one or more Goods Vans to a passenger train. The latest Hornby Vans suitable for passenger train running are provided with brackets so that they can display a tail lamp when running at the rear end of a passenger train.

Goods trains can be made up of a variety of Wagons and Vans in almost any order, as long as the Goods Brake Van is attached to the rear of the formation. It is however an advantage to place the heaviest vehicles immediately behind the engine, for this helps to give smooth operation when running on to curved track. Heavy stock at the rear of a train has a tendency to "pinch" the lighter stock ahead, and this can cause derailments. For similar reasons any pre-war vehicles that may have die-cast wheels should be coupled next to the engine.

There are three kinds of couplings used on Hornby rolling stock. The M0 vehicles are fitted with tinplate couplings and cannot be used in conjunction with any other Hornby vehicles. The M1 stock has the hook and link type of coupling, while the standard Hornby No. 1 vehicles are fitted with automatic couplings. This means that the standard Hornby No. 1 and No. 2 vehicles cannot be coupled successfully with M1 rolling stock. When purchasing new vehicles it is important to make sure that they have similar couplings to those already in use.

For other Stamp Advertisements see page 378

Stamp Collecting

The New Barbados Issue

By F. Riley, B.Sc.

ALTHOUGH the new Barbados stamps may never become as interesting to experts as the set they have displaced, they will be attractive to the general collector, for they have many good points of their own. The first thing to be noticed about them is that their values are not marked in the familiar shillings and pence. Instead of that we have dollars and cents. In other words, the colony has gone over to dollar currency.

Another point is that a new portrait of King George VI is used. This is full face, and in this reproduction it cannot be described as really successful. The stamps are nicely coloured, however, several of them indeed appearing in two colours. They have been printed by the recess process to which I referred last month. They are all of the same size, but three of them are of the vertical type. This gives rise to a difference in perforations. The horizontal stamps are perforated $11 \times 11\frac{1}{2}$, a very common measure with British Colonial stamps, but the vertical stamps are of perforation $13\frac{1}{2}$.

Barbados is the most easterly of the West Indies. Its area is only 166 square miles, and it has a population of just over 200,000. It is a tropical island, with an excellent climate, and it is interesting to find that it is said to owe its name to a bearded fig tree that grows on it, barbados being the Spanish word for bearded. It seems to have been discovered by the Portuguese more than 400 years ago, but it was not settled by Europeans until the time of King James I, when Sir Olave Leigh, a Kentish knight, landed and claimed the island. It has remained British ever since. In the civil wars that followed the accession of Charles I, those disaffected towards both the Commonwealth and the Restoration Governments were condemned to a kind of slavery in the plantations of Barbados. The island played a part in the sea warfare in the West Indies in the 18th century, this period coming to an end with Trafalgar, the battle in which the French and Spanish fleets were broken. Nelson served in the West Indies on many occasions, making his last visit, a short one, in his pursuit of the French fleet under Villeneuve before Trafalgar, and the people of Barbados erected a statue to his memory in Georgetown, the island's capital.

It will be realised that there is ample scope for pictorial designs in the history and the life of the island, and excellent use has been made of both in the present set. To many of my readers the 4 c. value, illustrated in ast month's *"Stamp Gossip,"* will be the most interesting. The Nelson statue has previously been the subject of a Barbados stamp design, on the seven values of the Nelson Centenary issue of 1906, and here is another view of it without the railings that appeared on the first issue. These have been removed.

The sea provides other excellent designs. On the 8c. value is a typical schooner of the type used for trade between the West Indian Islands. On the 6c. value, a fisherman is seen casting a surf net, an effective method in well stocked waters when carried out by an expert, and on the 12c. value there is a flying fish, a sea creature of the greatest importance to people of Barbados. Strictly speaking this does not fly; it glides, ending each air trip by diving or alighting to work up sufficient surface speed to become airborne once more. An unusual sea picture is provided by the 60c. value, under the title "Careenage." What this means is clearly shown by the picture, in which a schooner is seen hauled up on the beach and laid over on its side, the position given it for cleaning and caulking.

St. Michael's Cathedral appears on the 48c. value, and the 3c. stamp shows us the buildings in the centre of Bridgetown in which the two houses of the legislature meet and where the principal government offices are found. Historic buildings are illustrated on the 1c. and 24c. values. The former, reproduced in last month's *"M.M."*, shows Dover Fort, formerly a defence station, 12 miles north of Bridgetown. The latter is a reminder of the days when Barbados had a large garrison. The Old Main Guard Garrison, as it is called, was built of specially imported red brick, although the island possesses plenty of good building stone. The buildings are around a large open space on the edge of the capital and now serve various sporting and social purposes.

The 2c. value is particularly interesting nowadays. It shows sugar cane flowering at a station where new varieties are produced. The West Indies have long been a prolific source of sugar, and the cane is cultivated more intensively in Barbados than anywhere else in the world.

The two highest values are the $1.20 and $2.40 stamps. The former shows a map of Barbados, with a large wireless mast superimposed on it. The $2.40 stamp features the arms of the colony.

For other Stamp Advertisements see page 376

Stamp Gossip

and Notes on New Issues

By F. E. Metcalfe

AUSTRALIA seems to be able to keep in the stamp limelight, not by bringing out set after set, which would disgust many collectors, but by bringing out single stamps that please almost everybody. The latest emission is a new 1½d. value showing a very good portrait of Queen Elizabeth. The stamp, which is illustrated here, is in an attractive shade of light myrtle-green. If all the rest of the set, which is coming out bit by bit, is as nice—an 8½d. stamp is announced for August—Australia will have solved a problem that Great Britain never solved. That is how to have attractive stamps which are also inexpensive to produce. Incidentally, the 1½d. is on un-watermarked paper, so apparently the Australia post office has not yet made up its mind whether to use water-marked paper or not. It will be remembered that the 2½d. stamp, which we mentioned last month, was on watermarked paper. Perhaps old stocks are being used up.

Before we leave Australian stamps, note can be taken of the results of a competition held in Sweden to determine which was the best designed "U.P.U." stamps. Last month the writer of these notes gave his vote to the Australian stamp. Alas, the Swedes think otherwise, for they give Switzerland, French Colonies, Bahawalpur, South Africa, Austria, Iceland, Sweden and Turkey, in that order of merit.

Both the Bahawalpur and Iceland issues were produced by British printers. While it must be admitted that the stamps selected are attractive enough, few outside Sweden would have nominated that country for honourable mention. It is hard to get agreement on such matters, as it is mostly a question of personal taste; there are even people who think that our own set was a good one.

A collector who had been reading an old stamp magazine wants to know what a society that called itself the "S.S.S.S." stood for, and what the letters mean. Well over 50 years ago the "Society for the Suppression of Speculative Stamps" was formed. The speculative stamps were supposed to be those which were being produced for sale to collectors. All these stamps were going to kill the hobby, according to the sponsors, but later on collectors began to see that there was a great deal more to it than that and the society petered out after a rather inglorious existence. There would be very few collectors who mourned its demise. Meanwhile "speculative" stamps continue to be poured out in ever increasing numbers, and there were never more collectors than there are to-day.

There is a lot of nonsense talked about stamps being issued for sale to collectors; many of them of course are produced entirely for that purpose. So what? Collectors have no pressure placed on them whatever to buy. They take them or leave them entirely as they please, and if they insist in collecting all stamps of a country, well isn't that their own affair?

A lot more could be said on the subject, but it is sufficient to say, for the time being, that a lot of the attacks on modern stamps are anything but disinterested. The popularity of modern stamps shows how little effect these attacks have.

This month a nice variety is being illustrated. In the early twenties Kedah brought out a 2c. stamp, with the sheaf of rice design, and to-day that stamp is worth about 3d. But in 1940 the design of that stamp was redrawn and if you could come across a mint copy of that redrawn stamp, or die II as it is called, you would have something worth £25. A block of four was recently offered for £140. How do you tell the difference? Well carefully note the 2's in the illustration of parts of the two stamps on this page. The top portion is part of the die II stamp, the rarity, and it will be noted that the drops of the 2's are round, instead of oval as in the case of the lower portion, which is part of the original stamp. There are other slight differences, but the 2's are the clearest indication to go by. Used stamps are not particularly rare, and are only worth about 4/–. Still even these are worth looking for.

A new Austrian production is one of the rare examples of a stamp on a stamp. The first Austrian stamp appeared on 1st June, 1850, and to mark its centenary we have the stamp illustrated here, the design of which includes a reproduction of the 1850 issue.

The last illustration this month will interest many readers of the "*M.M.*" It is one from the U.S.A. issued in honour of the Railroad Engineers, and "Casey" Jones is the man who is given the spotlight. The folk song about his exploit is as well known over here as it is in America, as is the story of his exploit. He was driving the "*Cannonball Express*" on a stormy night of 29th April 1900. Seeing a goods train ahead, and knowing that he could not pull up in time to avoid a collision, he ordered his fireman to jump clear, whilst he stayed on at his post blowing his whistle, with the hope of giving the crew of the freight train a chance to escape. After the inevitable crash his hands were still tightly clutched on the brake and whistle. If stamp collecting is the reason for commemorative issues such as this, as is claimed, then stamp collecting is justified. "*M.M.*" readers will certainly want this fine railway issue.

Competitions! Open To All Readers

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

Make Up Your Own Crossword Puzzle

CLUES ACROSS

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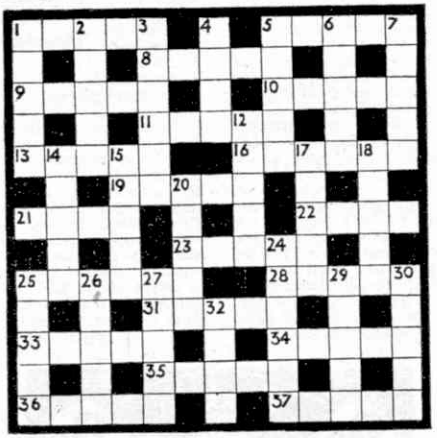

CLUES DOWN

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This month we are in a sense reversing the usua order of things, for instead of setting readers a puzzle we are asking them to produce one. The type of competition chosen for this interesting departure is the well-known crossword. On this page is a diagram and readers are asked to fill the vacant spaces in this with letters that form words both horizontally and vertically. What is then required is that each of these words shall have a clue assigned to it. The solution therefore will take the form of a series of horizontal and vertical clues, that is the well-known "Clues Across" and "Clues Down." The solution should be sent with the entry.

The diagram illustrated has been chosen to give an easy task, as with it no long words are required. The real ingenuity will probably be shown in the clues, which can be made puzzling, but must not be unfair. As in the case of the usual "*M.M.*" crosswords, every word in an entry must be included in Chambers or any other standard dictionary.

There will be the usual two sections in this competition, for Home and Overseas readers respectively, and in each there will be prizes of 21/–, 15/– and 10/6 for the best efforts. If necessary the judges will take the neatness and novelty of the entries into consideration. Competitors must not cut out the diagram from this page; all entries must be on separate sheets.

Entries should be addressed "*August Crossword Puzzle, Meccano Magazine, Binns Road, Liverpool 13.*" Closing dates: Home Section, 30th September; Overseas Section, 30th December.

What is Your Favourite Locomotive?

Railway enthusiasts often argue among themselves as to which are the most popular engines on British railways, and this month we present our readers with a contest that gives them opportunity of expressing their opinions and of settling disputes, as far as 10 typical classes of British locomotives are concerned. Below we give a list of these classes, with their wheel arrangements and regions, and each competitor is asked to state A, which of these is his favourite, and B, the order of popularity which he thinks the contest will reveal.

1.	Rebuilt "Royal Scot"	4–6–0	L.M.R.
2.	"Schools"	4–4–0	S.R.
3.	"King"	4–6–0	W.R.
4.	"County"	4–6–0	W.R.
5.	"Lord Nelson" ..	4–6–0	S.R.
6.	"West Country" ..	4–6–2	S.R.
7.	"A4"	4–6–2	E.R.
8.	"Sandringham" ..	4–6–0	E.R.
9.	"B1"	4–6–0	E.R.
10.	Stanier Class "5" ..	4–6–0	L.M.R.

This competition will be divided into the usual two sections, for Home and Overseas competitors respectively, and in each section there will be prizes to the value of 21/–, 15/– and 10/6, with consolation prizes for other good entries. Only the numbers of the various classes should be listed in entries, which should be written on postcards only, and these should be addressed "*August Locomotive Contest, Meccano Magazine, Binns Road, Liverpool 13.*" The closing dates are: Home Section, 30th September; Overseas Section, 30th December.

August Photographic Contest

The subject for our Photographic Contest this month, the 8th of the 1950 series, really selects itself. August is the great holiday month, and readers therefore are asked to enter holiday photographs of any kind, snapshots or specially studied scenes. The real holiday spirit will be looked for in judging entries.

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

Competition Results and Solutions

HOME

FEBRUARY 1950 CODE-PUZZLE

1st Prize: A. J. Sawyer, London S.E.24. 2nd Prize: P. D. Hancock, Edinburgh 9. 3rd Prize: A. J. Harris, Birmingham. Consolation Prizes: D. E. Pomeroy, Beckenham; P. W. Trown, Birmingham 28; Miss C. Barlow, Romiley; J. K. Tunstall, Leeds 6.

FEBRUARY 1950 RAILWAY CONTEST

1st Prize: W. Ashton, Doncaster. 2nd Prize: B. J. Hobden, Burgess Hill 3rd Prize: J. R. O. Ward, London N.14. Consolation Prizes: D. G. Malcolmson, Birmingham; A. W. Evans, Knowle; P. Smith, Biggleswade; B. Mann, Sheffield 6.

MARCH 1950 PHOTOGRAPHIC CONTEST

1st Prize, Section A: W. Forsch, Leigh; Section B: R. K. Evans, Hessle. 2nd Prize, Section A: F. J. Reynolds, Sidcup; Section B: I. Phillips, Elgin. 3rd Prize, Section A: E. Jones, Caernarvon; Section B: D. Hirst, Ilford. Consolation Prizes, Section A: H. North, F.R.G.S., Nottingham; I. Hudson, Purley; J. E. Bell, Isleworth; Section B: I. A. Pattullo, Edinburgh; F. Ashley, East Kirkby; T. Stevenson, Loughborough.

MARCH 1950 CROSSWORD PUZZLE

1st Prize: A. C. Farmer, Headley. 2nd Prize: R. C. Taylor, Sheffield 11. 3rd Prize: T. D. Tasker, Barnsley. Consolation Prizes: J. Jackson, Leicester; J. B. Moran, Taunton; N. Forrest, Glasgow S.W.2; J. E. Dykes, Plymouth.

MARCH 1950 DOUBLET CONTEST

1st Prize: C. Young, Bedford. 2nd Prize: D. B. Candlin, Stockport. 3rd Prize: D. C. Stickings, Bath. Consolation Prizes: K. Hewland, Kingston-Upon-Hull; A. M. Keen, Addiscombe; K. Duff, Thornton Heath.

APRIL 1950 THRILLS CONTEST

1st Prize: I. D. Fowler, Greenford. 2nd Prize: D. Blakely, London N.13. 3rd Prize: G. Rogers, London N.20. Consolation Prizes: D. Abbott, Raunds; J. A. Gray, Leeds 6; W. E. Baird, Leicester.

APRIL 1950 ENGINE PARTS CONTEST

1st Prize: J. Larmour, Hereford. 2nd Prize: M. Litherland, Stoke-on-Trent. 3rd Prize: A. J. Hareling, Stoke-on-Trent. Consolation Prizes: J. Peters, Woodbridge; W. Whittaker, Dewsbury.

APRIL 1950 PHOTOGRAPHIC CONTEST

1st Prize, Section A: J. P. Nicholson, Lincoln; Section B: P. Clifford, Wembley. 2nd Prize, Section A: P. Lambert, Harrogate; Section B: E. Wilson, Pudsey. 3rd Prize, Section A: I. Meiklejohn, London W.1; Section B: G. Scarborough, Nelson. Consolation Prizes, Section A: S. S. Pethybridge, Newton Abbot; S. J. Gray, Isle of Ely; D. Shaw, Altrincham; Section B: E. Bannister, Uckfield; R. E. Charles, Birmingham 30; P. Coles, Bredgar; R. J. Clement, Middlesbrough.

OVERSEAS

NOVEMBER 1949 LORRY FACES CONTEST

1st Prize: B. Sheane, Wicklow, Eire. 2nd Prize: D. F. Sutherland, Dunedin, N.Z. 3rd Prize: K. Froud, Salisbury, S. Rhodesia. Consolation Prizes: L. Alley, Durban, S. Africa.

DECEMBER 1949 ADVERTISEMENT CONTEST

1st Prize: K. K. Chan, Singapore 2. 2nd Prize: D. E. Cooper, Bombay 7, India. 3rd Prize: B. Carpinter, Christchurch, N.Z. Consolation Prizes: R. Kidd, Nairobi, E. Africa; J. A. Pithis, Alexandria, Egypt; J. C. Carter, Stellenbosch, S. Africa.

DECEMBER 1949 QUIZ CONTEST

1st Prize: B. Denton, Montreal, Canada. 2nd Prize: F. S. Wolfenden, Jersey City, U.S.A. 3rd Prize: C. L. Smith, Perth, Australia. Consolation Prizes: D. Ives, Calcutta 6, India; K. T. R. Wilkinson, Kampala, B.E. Africa.

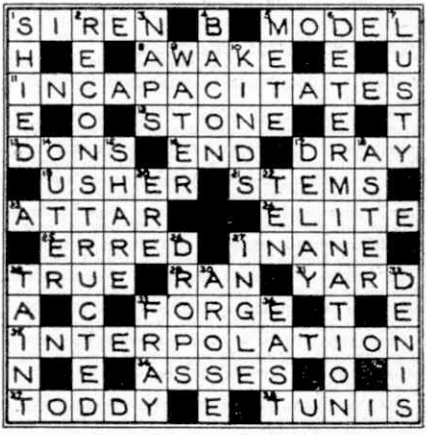
DECEMBER 1949 PHOTOGRAPHIC CONTEST

1st Prize, Section A: P. Harrison, Geneva, Switzerland; Section B: M. M. Murtagh, Montreal 5, Canada. 2nd Prize, Section A: H. Arnold, Dublin, Eire; Section B: K. Bell, Montreal, Canada. 3rd Prize, Section A: C. Johnson, Tamise, Belgium; Section B: C. Phelps, Melbourne, S.E.5, Australia. Consolation Prizes, Section A: C. A. Smyth, Accra, West Africa; D. Large, Calcutta, India; Section B: R. E. Russell, Lisbon, Portugal; P. M. Lyons, Rotterdam, Holland.

SOLUTIONS

FEBRUARY 1950 RAILWAY CONTEST

1. Home or Stop Signal; this refers to the crossover from main line to relief line. 2. Signal Post Finial; ornamental protection against weather for signal post top. 3. Track Circuit Indicator; this indicates that rule 55 is exempt. 4. Double Slip Crossing; enables movements to be made in eight directions. 5. Wooden Footboard; to provide a footway over signal wires and point rodding. 6. Trench for signal wires and point rodding. 7. Ground Disc Signal; this controls setting back movements over the crossover road. 8. Concrete Blocks for supporting point rodding. 9. Crossover Road; this enables trains to pass from one track to another. 10. Roller for point rodding; to allow easy movement of point connections. 11. Telegraph Pole; this carries wires for providing communication between signal boxes, and track circuit wiring. 12. Point Rodding; these operate points some distance away from the signal box.



March 1950 Crossword Puzzle Solution.

How Ships Wear Out—(*Continued from page 342*)

bulkhead with modern methods if it would result in making the accommodation more popular; but bulkheads are an integral factor in the strength of the ship and the authorities would probably prevent it. Engines and boilers can be replaced by those of modern design, the bow and stern can be cut off and ends with different lines grafted on to the old midship section. The whole of the passenger accommodation can be ripped out and replaced on modern ideas. Under some flags these major operations have been carried out, but nearly always at a colossal cost which has to be paid by the taxpayer; the British shipowner has to pay for such things out of his ships' earnings. And under the eagle eyes of the surveyors they would give the ship only a limited extension to her life, so that there would be no chance of her earning their cost.

So the "*Aquitania*," and other ships whose personality and comfort have made them nearly as well loved with travellers, have to go to the scrappers, and their material converted into new plates. But many a man who has served in them for years would far rather they went down to the bottom of the Atlantic.

On the Footplate in Norway—

(*Continued from page 346*)

Railways would be all electric.

Exactly at our scheduled time of 10.0 a.m. we arrived in Bergen. After spending a little time in giving the driver the English names of various parts of the engine I bade farewell to my fellow railwaymen, who were working back to Voss that afternoon. They told me that four such trips made up their work for that week.

I liked the cleanliness of the engines; they are painted a blue-grey with black framing outside but red inside the frames. The excellent state of maintenance was manifest by the absence of knocks and blows; yet I was surprised at the permitted wear on the tyres. One engine of which I took special note had hollows on the tyres quite a quarter of an inch deep. I can only assume that the wear is very rapid on account of the sharp curves. I liked, too, the friendliness displayed to me by all grades of the railway staff, which was characteristic of all the many Norwegian people with whom I came into contact during my fortnight's travel.

Reporting the World's Ship Movements—

(*Continued from page 366*)

of them are despatched to subscribers by hand or post.

Lloyd's also include tables of shipping movements in other publications, in addition to supplying them to contemporary newspapers and the general press. The staff at headquarters work in shifts all round the clock, the building being fully equipped with printing facilities, so that no time is lost in issuing the news. Lloyd's also receive messages from ships for transmission to the owners or other interested parties, and deliver urgent messages to them as required.

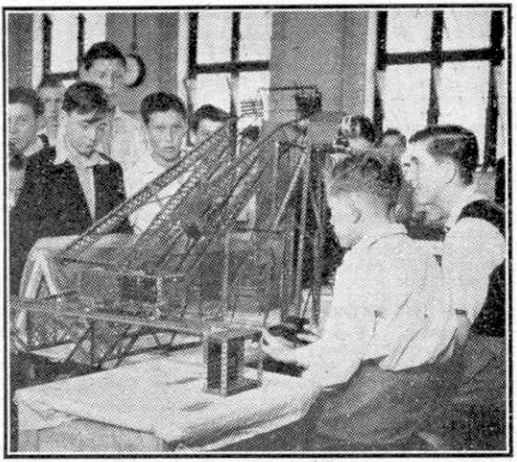
Although working in co-operation with Lloyd's the radio service is entirely separate. Communication with ships by radio telegrams, now developed to a high pitch of efficiency, is handled by the Post Office. No matter in what part of the world a ship may be, so long as she is fitted with radio, a message can always be got through. If her own equipment is not powerful enough to get the news direct, other ships are employed to pass it on.

The Post Office, by organising ship-to-shore facilities between its telegraph offices and ocean-going vessels, plays an invaluable part in keeping track of the world's ships. Its radio stations deal with hundreds of messages every day between ship and shore, good news and bad, or perhaps routine reports that are neither one nor the other. Marconi staff and equipment, which had so much to do with the pioneer work of ship reporting by radio, takes a big share of the credit for the modern organisation. Its smooth working and efficiency, day in and day out, is only achieved by full co-ordination between radio officers at sea and highly skilled staff at the shore stations.

Flying Boat to Funchal—

(*Continued from page 357*)

The afternoon was most enjoyable, however, and to show our appreciation we promised to send our host an aircraft altimeter to tell him exactly how high he climbs on future car trips into the hills.



A fine working model of the feed to a blast furnace, built by B. Twydall and B. Montague, of Eastcote Lane Secondary Modern School, South Harrow, after visiting the Workington Iron and Steel Works. The model is here seen demonstrated by its constructors at a School Exhibition.

Many memories remain of our four days in Madeira. Among them are the cheery, persistent shoe-shine boys who could make old shoes glisten like mirrors; our visit to the Cathedral, with its magnificent solid silver lamps, and vestments embroidered with real gold thread; long walks, during which pretty little native girls threw flowers to us from the high gardens of their homes; a tour of the local sugar factory, where we tasted our first sugar cane; swimming in the Lido; and, most unforgettable of all, long threads of street lamps winding like fairy lights up the side of the mountains at night, towards distant shrines, houses or vantage view-points.

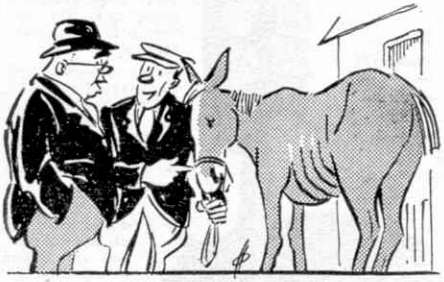
We found these lights so enchanting that on our last night in Funchal we were still following them up the mountainside in the early hours, looking down on the town we had come to know so well in such a very short time. Little wonder that we dozed on our homeward trip, as we recalled the excitement and loveliness of Madeira.

Suddenly we became aware that we were below the clouds, looked out of the window and saw below us the white cliffs and little green fields of the Isle of Wight, dotted here and there with tiny knots of houses grouped round the grey spire of a village church, the whole bathed in soft Spring sunlight. Such a view must be the loveliest in the world for an English traveller, and we felt very happy to be home again.

Fireside Fun

"I can't get to sleep at nights. What should I do?"
"Oh, just lie on the very edge of the bed and you'll soon drop off."

* * * *



"Twenty pounds! Why I can count his ribs."
"Well count them. There's none missing."

* * * *

"And now madam, what can we do for you?" said the helpful assistant in the toys and games shop. "Perhaps your little boy is fond of a game, dominoes or ludo or something like that."
"Oh, he would be pleased if you can really spare the time."

* * * *

"Have you ever heard of a bird that can't fly?"
"Of course. An ostrich."
"Well have you seen a fish that can't swim."
"No, there isn't one."
"Then you had better have a look in the fishmonger's window."

* * * *

"That man has an uninteresting job. He raises vegetables."
"But growing crops of any kind is a fine outdoor occupation, surely."
"Oh, he only loads them in the van that takes them to the station."

* * * *

"I'm really surprised at you, Billy. You're always wishing for something you haven't got."
"It's no use wishing for anything else, is it?"

* * * *

"Heavens! Look! Cannibals."
"All right. Don't get in a stew."

* * * *

"Your pulse is as regular as clockwork."
"That's my wrist watch, doctor!"

BRAIN TEASERS

MORE WAYS TO SPEND THEM

Given an ample supply of half crowns, florins and sixpences, in how many ways can you make up the sum of ten shillings from them?

What is the least number of each coin required to give these ways of making up the specified amount.

D.E.P.

* * * *

NOT TOMMY'S FAULT

Tommy is in despair. For his homework he has been given a sum in which he has to multiply a length by two, and to check his answer by dividing the result by two, which of course should give him the original length. But here is what he got.

	mls.	frlgs.	pls.	yds.	ft.	ins.
	1	7	39	5	1	9
						2
2)4	0	0	0	0	0	6
	2	0	0	0	0	3

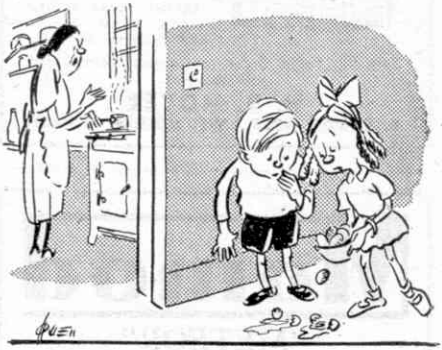
Can you help him? S.W.C.

* * * *

CAN NEVER BE SAID

WKLV LV QRW VR KDUG ZKHQ BRX NQRZ KRZ. This statement is perfectly true, but what on earth is it? M.B.

* * * *



"Any broken, Florence?"
"The shells have slipped off some, Mum!"

* * * *

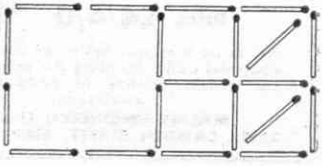
SOLUTIONS TO LAST MONTH'S PUZZLES

Our first puzzle last month was deliberately overladen with clues, and in effect was really a catch. The second sentence and the last but one give all the information that is required, and from them it is easy to see that there must have been 40 women and 20 men. Pencil and paper and elaborate calculations were unnecessary.

The diagram at the foot of the page shows how to arrange the 20 matches of our second puzzle. When the two diagonal matches are removed six squares are left.

The numbers 1 to 7 add up to 100 when arranged as follows: 1+23+4+5+67.

Unlike our first puzzle, our fourth last month does require some calculation, and the result of this shows that Albert spent 3/-, Bob 6/- and Charlie 9/-.



READERS' SALES AND WANTS

SALES

"M.M.s" February, August-December 1931; January-June 1932; 1934; October 1935; May-December 1940; 1941; 1942; 1943; January-August, October and December 1944; January-August, November and December 1945; 1946; 1947; January-July, September-December 1948; 1949. Good condition. 136 Magazines for 25/-. Carriage extra.—Lee, 9, Grasmere Road, Sale, Manchester.

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