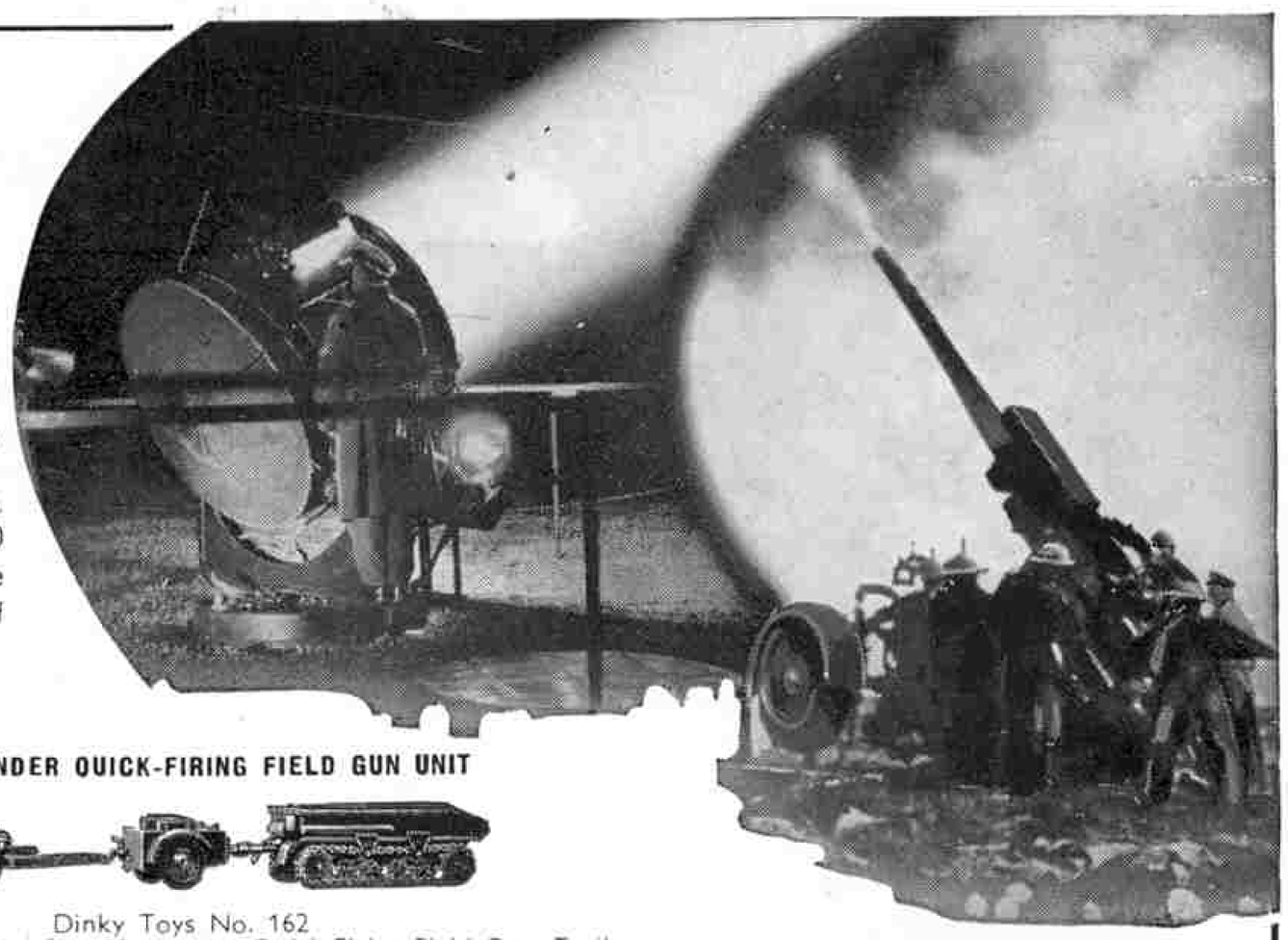
VOL. XXVI. Nº 4. APRIL 1941

MECCANO MAGAZINE

A SEAPLANE TENDER

6D.

DINKY TOYS



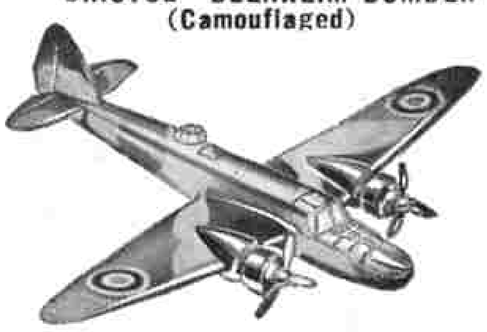
THE FASCINATING COLLECTING HOBBY

Dinky Toys owe their popularity to their scale proportions, wealth of detail, and attractive finish. There are over 300 items now in the range. Ask your dealer for prices or write direct to Meccano Ltd., Binns Road, Liverpool, for a copy of the latest complete price list

VICKERS SUPERMARINE "SPITFIRE" FIGHTER (Camouflaged)

Dinky Toys No. 62e
Scale model of the Vickers-Supermarine "Spitfire," one of the fastest fighter aircraft used by the Royal Air Force.
No. 62e Camouflaged
List Price **8d.** Price with Tax **10d.**
No. 62a Aluminium Finish
List Price **8d.** Price with Tax **10d.**

"BRISTOL" BLENHEIM BOMBER (Camouflaged)

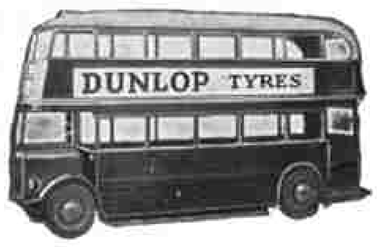


Dinky Toys No. 62d
Realistic model of the latest "Bristol" Blenheim Bomber extensively used by the Royal Air Force.
No. 62d Camouflaged
List Price **1/0½**. Price with Tax **1/3**
No. 62b Aluminium Finish
List Price **1/0½** Price with Tax **1/3**

BOEING "FLYING FORTRESS"

Dinky Toys No. 62g
Scale model of Boeing B-17 "Flying Fortress," one of the fastest bombers in the world, and extensively used by the United States Army Air Corps.
List Price **1/10** Price with Tax **2/3**

DOUBLE DECKER BUS

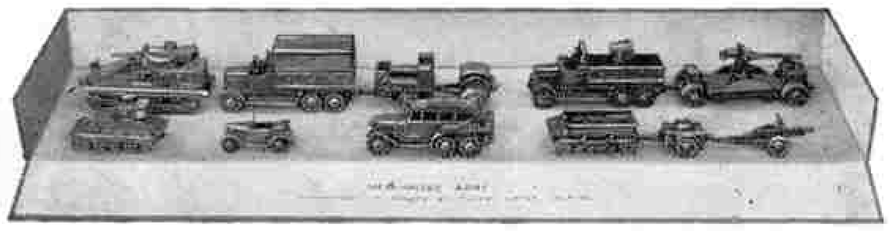


Dinky Toys No. 29c
Assorted colours.
Fitted with detachable rubber tyres.
List Price **2/1½** Price with Tax **2/7**

18-POUNDER QUICK-FIRING FIELD GUN UNIT

Dinky Toys No. 162
Comprises scale models of an 18-pounder Quick-Firing Field Gun, Trailer and "Light Dragon" Motor Tractor.
162a "Light Dragon" Tractor Price **2/8** with Tax **3/3**
162b Trailer Price **10d.** with Tax **1/-**
162c Gun " **10d.** " **1/-**
Complete Set Price **4/4** with Tax **5/3**

MECHANISED ARMY



Dinky Toys No. 156
This fine set contains the principal units of a modern mechanised army. It includes the following items:
Royal Tank Corps Medium Tank Set (Dinky Toys No. 151) without driver.
Royal Tank Corps Light Tank Set (Dinky Toys No. 152) without driver.
Mobile Anti-Aircraft Unit (Dinky Toys No. 161).
18-Pounder Quick-Firing Field Gun Unit (Dinky Toys No. 162).
Complete Set List Price **20/6** Price with Tax **25/-**

SHIPS OF THE BRITISH NAVY

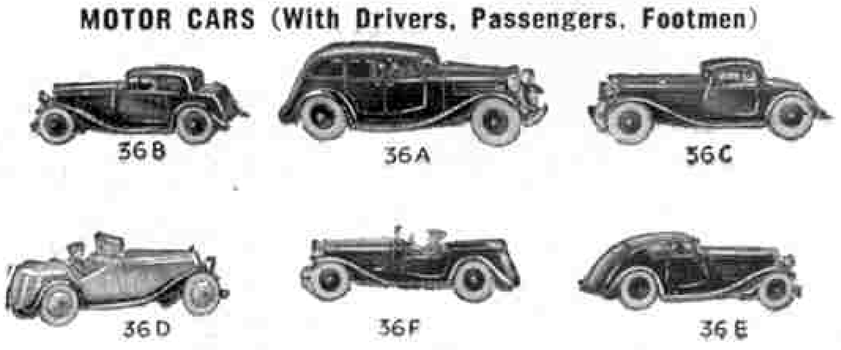
50c 50e

Dinky Toys No. 50
No. 50a Battle Cruiser "Hood"; No. 50b Battleships, "Nelson" Class (2)*; No. 50c Cruiser; No. 50d Cruiser "York"; No. 50e Cruiser "Delhi"; No. 50f Destroyers, "Broke" Class (3); No. 50g Submarine, "K" Class; No. 50h Destroyers "Amazon" Class (3); No. 50k Submarine, "X" Class.

50a	Price **10d.**	with Tax **1/-**		50f	Price **1½d.**	with Tax **2d.**
50b	" **8d.**	" **10d.**		50g	" **1½d.**	" **2d.**
50c	" **7½d.**	" **9d.**		50h	" **1½d.**	" **2d.**
50d	" **7½d.**	" **9d.**		50k	" **1½d.**	" **2d.**
50e	" **5½d.**	" **7d.**				

Complete Set Price **4/11** with Tax **6/-**

MOTOR CARS (With Drivers, Passengers, Footmen)



36B 36A 36C

36D 36F 36E

Dinky Toys No. 36
Fitted with detachable rubber tyres. Silver-plated true-to-type radiators.
No. 36a Armstrong-Siddeley (Limousine) with driver and footman
No. 36b Bentley (Two-seater Sports Coupé) with driver and passenger
No. 36c Humber (Vogue Saloon) with driver and footman
No. 36d Rover (Streamlined Saloon) with driver and passenger
No. 36e British Salmson (Two-seater Sports) with driver
No. 36f British Salmson (Four-seater Sports) with driver

36a	Price **1/5½**	with Tax **1/9**		36d	Price **1/5½**	with Tax **1/9**
36b	" **1/5½**	" **1/9**		36e	" **1/5½**	" **1/9**
36c	" **1/5½**	" **1/9**		36f	" **1/5½**	" **1/9**

Complete Set Price **8/8** with Tax **10/6**

HAWKER "HURRICANE" SINGLE-SEATER FIGHTER (Camouflaged)

Dinky Toys No. 62h
Scale model of the Hawker "Hurricane" single-seater Fighter extensively used by the R.A.F.
List Price **9d.** Price with Tax **11d.**

ARMSTRONG WHITWORTH "WHITLEY" BOMBER (Camouflaged)

Dinky Toys No. 62t
Scale model of the "Whitley" long-range heavy bomber adopted by the R.A.F.
List Price **1/7½** Price with Tax **2/-**

FAIREY "BATTLE" BOMBER (Camouflaged)

Dinky Toys No. 60s
Scale model of the well-known medium bomber used in large numbers by the R.A.F.
List Price **11½d.** Price with Tax **1/2**

SIX-WHEELED WAGON

Dinky Toys No. 25s
An interesting model of a modern three-ton wagon. In assorted colours.
List Price **1/7½** Price with Tax **2/-**

DINKY TOYS ARE MANUFACTURED BY MECCANO LTD., LIVERPOOL

Find out how to sail a boat with HAMLEYS MODEL YACHTS

The first step to owning a real sailing boat is knowing how to manage and set the sails and tiller of a model yacht. Real sailors in wartime have sent secret messages by sailing a tiny model yacht from ship to ship.

Hamleys have a wonderful collection of yachts at all prices—write for their catalogue.

"K" MODEL
White metal hull, blue lines:
12" price **5/6**
14" price **7/6**
16" price **9/6**
18" price **11/6**
20" price **15/6**
24" price **24/6**
* AS ILLUSTRATED *

"C" MODEL
Green metal hull, black lines:
18" price **9/6**
20" price **12/6**
24" price **19/6**

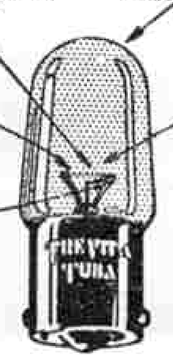
"Y" MODEL
20" wood hull, price **24/6**

"ELIZABETH" YACHT
20" wood hull, automatic steering, price **29/6**

Postage 9d., under £1

Hamleys Estd 1760
HAMLEY BROTHERS LTD — **Our Only Address**
200-202, REGENT STREET, LONDON W.1

THE FINEST CYCLE DYNAMO HEAD BULBS PROCURABLE

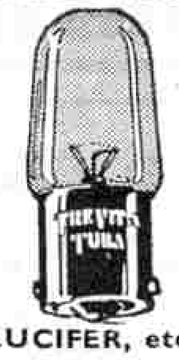


Regd. Des. 828997

THE SUMMARISED ADVANTAGES: A Brighter and Better Light at All Speeds. A Light at Walking Speed, when with other Bulbs there is no light. A Voltage of over 13 Volts from 6V 3W Dynamos, giving much more Brilliant Light—the Voltage upon N.P.L. tests having been Certified at over 13 Volts. A Stronger and Brighter Light, giving Longer Life in actual Usage. A Light which Penetrates Fog.

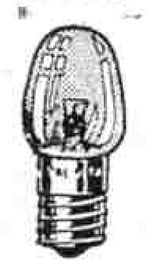
BAYONET CAPPED BULBS (i.e. push-in) For LUCAS, MILLER, etc.

Description	Ref. No.	Frosted or Clear	Price
For use with Lucas 6V 3W or Miller 6V 3.24W	LSC LSF	Clear Frosted	1/- 1/1½
For use with Lucas 1.8W Dynamos	L9C L9F	Clear Frosted	1/- 1/1½
For use with Miller 6V 3W Dynamos	MSC MSF	Clear Frosted	1/- 1/1½
For use with V.E.C. or Miller 6V 6W	M9C M9F	Clear Frosted	1/- 1/1½



M.E.S. CAPPED (i.e. screw-in) For BEMO-STARLITE, LUCIFER, etc.

For use with 6V .3A (1.8W) Dynamos	852 851	Clear Frosted	7½d. 9d.
Specially for Bemo or Starlite	862 861	Clear Frosted	7½d. 9d.
For use with 6V .5A (3W) and Philidyne Dynamos	872 871	Clear Frosted	7½d. 9d.
Specially for Lucas 6V 3W or Miller 6V 3.24W when M.E.S. needed	874 873	Clear Frosted	7½d. 9d.



With all Tuba use 6V .04A Rear Bulbs, excluding Bemo, for which use 2.5V 3A. Price 7½d.

The Purchase Tax upon 7½d. to 9½d. is 2d.; upon 10d. to 1/- is 2½d.; upon 1/0½ to 1/2 is 3d.; upon 1/2½ to 1/4½ is 3½d. Send for Special Leaflet. Send for Price List. Individual Bulbs Supplied. No Charge for Postage.

VITALITY BULBS LTD., NEVILLE PLACE, LONDON N.22

BRITISH MADE **ASTRA** TOYS OF QUALITY

ROUND BASE SEARCHLIGHT
CATALOGUE No. 15
Beautifully finished and fitted with elevating gear, this searchlight throws a very penetrating beam. Height 3½ in.
PRICE, complete with battery, **6'6**

GUNS
from
3'11 to **42'-**
Searchlights
from
4'6 to **22'6**

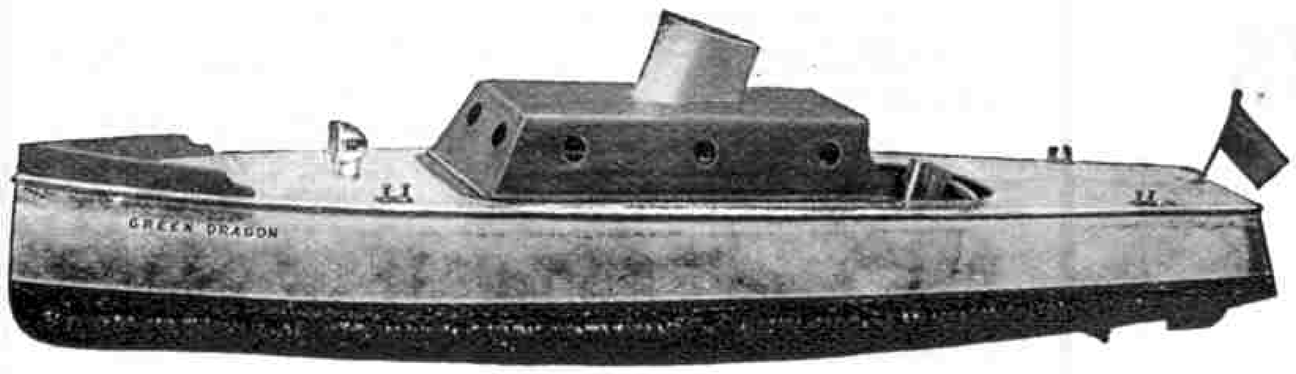
ALL PRICES ARE SUBJECT TO PURCHASE TAX INCREASE

ASTRA FORT GUN
A high grade cap-firing gun in effective cupola mounting, which shoots projectiles up to 20 yards. Quick loading. Ideal for use with forts and toy soldiers. Height 2½ in.
PRICE, complete with projectiles, **3'11**

WRITE NOW for our illustrated catalogue, post free from the sole manufacturers, patentees and distributors—
ASTRA PHAROS LTD., Dept. M, Landor Works, Askew Road, London W.12 Telephone: Sheperds Bush 2472

OBTAINABLE AT ALL GOOD STORES AND TOY SHOPS

MODEL BOATING DAYS ARE HERE AGAIN!

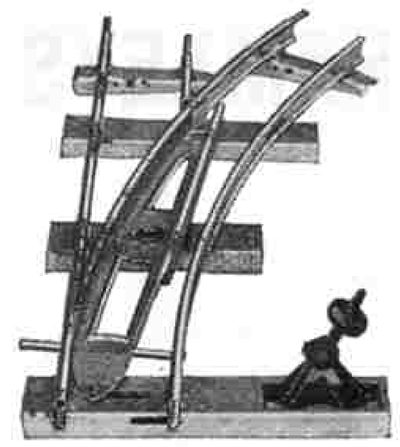


A Fine Steamboat Free of PURCHASE TAX.

The "GREEN DRAGON"—29 inches long with hand-carved hull, and Model M.E.1 marine steam engine plant . . . smart engine casing and modern funnel finished in buff . . deck fitted with ventilators, bollards, and fairleads.
In three colours—the "Green Dragon," the "Red Dragon," the "Blue Dragon." Price **60/–** each.
In clockwork or electric is Super Motor Boat "IOLANTHE II." Price **50/–** in either drive.

Wonderful Bargains in Gauge "0" Tin-plate Rails & Points
from the pioneers of high-grade tin-plate track in this country.
4 ft. dia. circle (12 pieces—5d. per curve) **5/–**
Parallel Points (right or left hand) ... ... **2/6** each
Acute and Right Angle Crossings ... ... **3/6** each
Points for Curves **3/6** each
Half Curves ... **3d.** each
(All for 4 ft. diameter).

GR.17. Latest Gauge "0" Railways Catalogue, 6d.
TT.17. Up-to-date Gauge "00" Catalogue, **3d.** post free.
S.17. Catalogue of Model Ships and Fittings, **6d.**

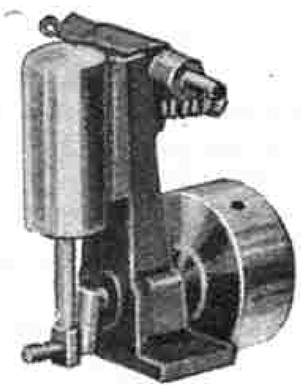


Standard Points (as illustrated, right or left hand) **3/–** each

BASSETT-LOWKE LTD., NORTHAMPTON
LONDON: 112, HIGH HOLBORN, W.C.1
MANCHESTER: 28, CORPORATION ST.

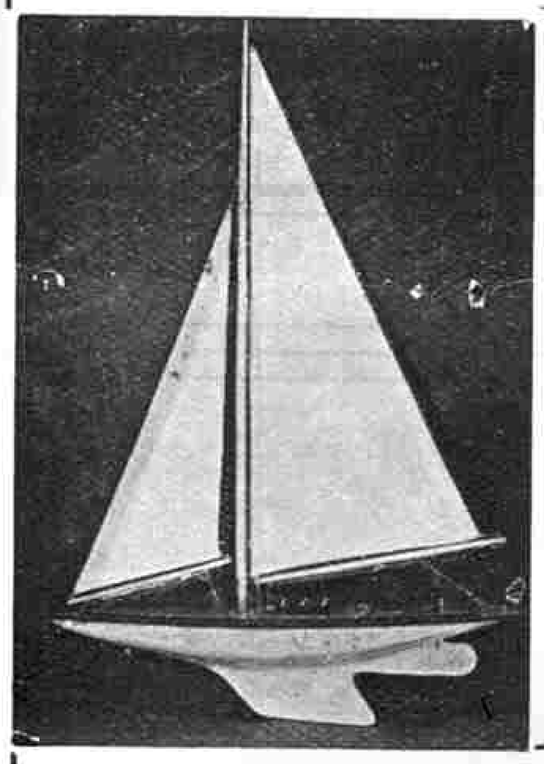
OSCILLATING STEAM ENGINES

These engines have been completely re-designed throughout to get higher speed and more power. The main engine standard is now made from a hot brass stamping and is complete with pipe unions. The cylinder and pistons are machined from solid brass. All engines are fitted with large flywheels.



W252. OSCILLATING MARINE ENGINE. Single oscillating type. ⅜-in. Bore, ⅜-in. Stroke. Suits Boats 18 in. long **5/–**

W253. OSCILLATING MARINE ENGINE. Oscillating Single Acting Cylinder. ½-in. Bore, ⅝-in. Stroke. Suits Boats 24 in. long Price **6/8**



"ENDEAVOUR" YACHTS

These new Yachts are the latest thing for fast racing work. All of the hulls are hand made in best yellow pine. Cabin skylight extra.

Prices:

17-in. Yacht with automatic rudder **16/–**
21-in. Yacht with automatic rudder **24/9**
27-in. Yacht with Braine type steering **54/9**
36-in. Yacht with Braine type steering **100/–**
Carriage extra.

Bond's New Catalogue **will be ready shortly.** Send 8½d. for same and secure your copy, it will be sure to interest you.

BONDS O' EUSTON ROAD LTD.
357, Euston Road, London N.W.1
Telephone: EUSton 5441-2. *Est. 1887*

Your camera need not be idle during the coming months. There are plenty of good subjects "ready to hand" and simply demanding to be taken. You can be confident that good negatives will result if you use Johnsons Tanks and Chemicals. Free booklet telling all about Home Photography will readily be sent on application to E/M Dept.
Johnsons Adjustable Tank takes five popular sizes of films **17/6**
Time and Temperature Calculator **2/6**

Special Offer
For a 1/7 P.O. Johnsons will send you a trial set of Chemicals, including: 1-oz. bottle of AZOL, to develop eight spools 2¼ × 3¼; 4-oz. tin ACID-FIXING, making 30-60 oz. solution; one packet M.-Q. DEVELOPER, enough for 36 gaslight prints. Address E/M Dept.

JOHNSON & SONS Manufacturing Chemists LTD., HENDON, N.W.4

THE "WINSTON"

A SURE WINNER • PREMIER OF THE SKIES
A Wakefield Type, 50 inch span Flying Model
Complete Kit, including Plan and Printed Sheets
15′7 Post Free
Plan and Printed Sheets only, 3′6 Post Free

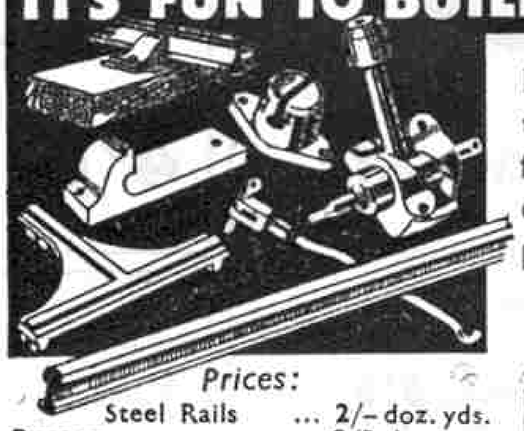
SPITFIRES, HURRICANES, etc., etc.
Flying Models, from 4′6 Post Free

Solid Scale Kits of every kind, from 1′6 Post Free

Send **3d.** for **NEW CATALOGUE,** illustrating a full range of Kits from **1′3** to **21′-**. All prices subject to 25% Purchase Tax.

ELITE MODEL AIRPLANE SUPPLIES 14, BURY NEW ROAD MANCHESTER 8

IT'S FUN TO BUILD YOUR OWN TRACK



Run your model railway on the right track—built yourself with MILBRO famous Track parts. Rails, sleepers, chairs, fishplates—all true-to-scale—perfect replicas of the real thing.

Send 6d. for 100-page catalogue.

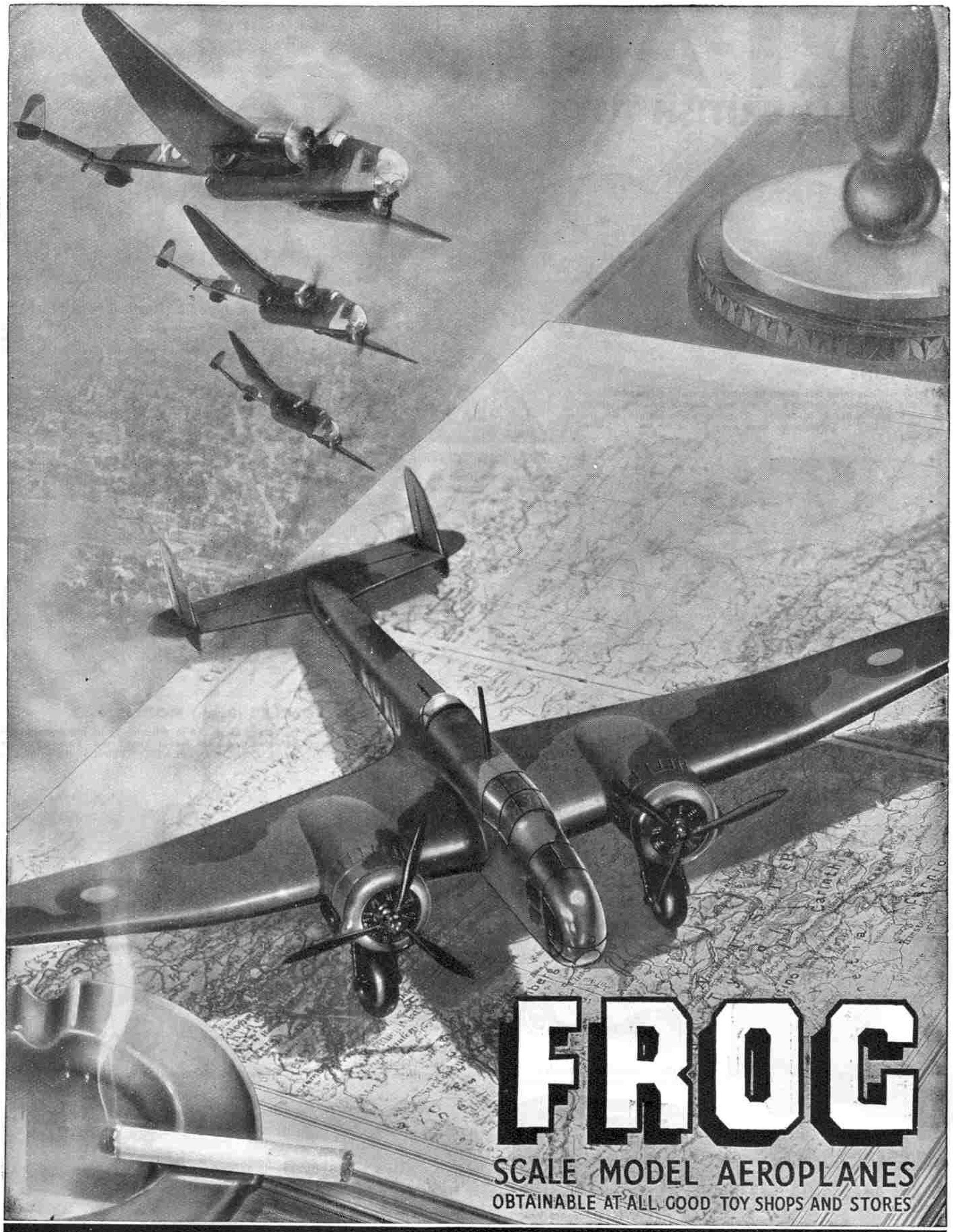
Prices:

Steel Rails	... 2/– doz. yds.
Battens	... 2/3 doz.
Sleepers... ...	... 2/– per 100
Steel Fishplates	... 5d. per doz.
Die Cast Chairs	... 1/9 per 100
Point Levers ...	... 1/– each

All prices subject to 15% increase.

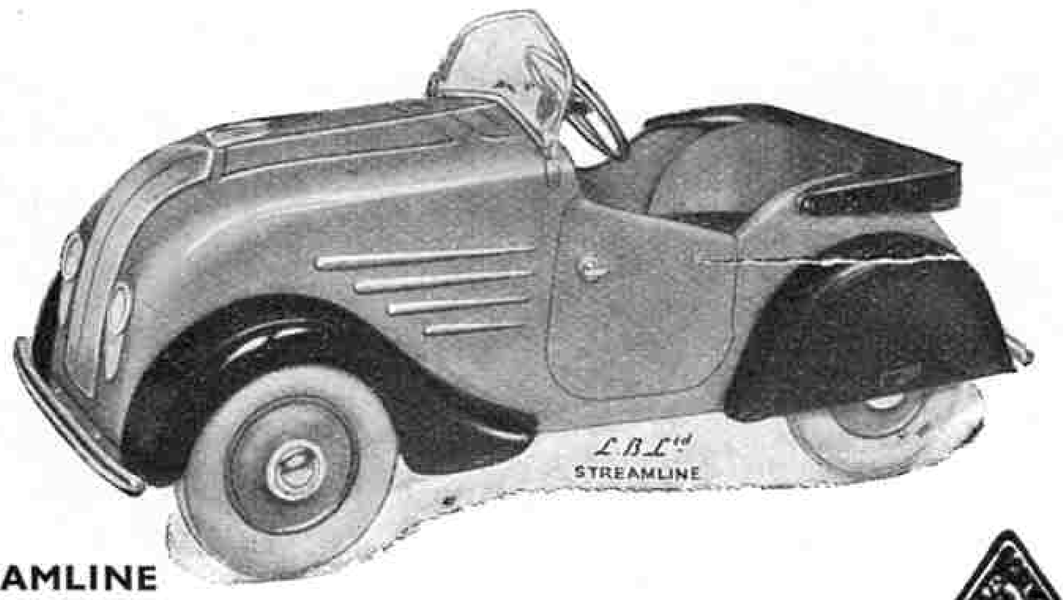
MILBRO
TRUE-TO-SCALE TRACK PARTS

MILLS BROS. (Model Engineers) LTD., Dept. M.M., ST. MARY'S ROAD, SHEFFIELD
London Showrooms: 2, Victoria Colonnade, Victoria House, Southampton Row, W.C.1


FROG
SCALE MODEL AEROPLANES
OBTAINABLE AT ALL GOOD TOY SHOPS AND STORES
MADE IN ENGLAND BY INTERNATIONAL MODEL AIRCRAFT LTD
For the Sole Concessionaires. LINES BROTHERS LTD., TRI-ANG WORKS, MORDEN ROAD, MERTON, S.W. 19

TRI-ANG

ALL BRITISH TOYS



STREAMLINE

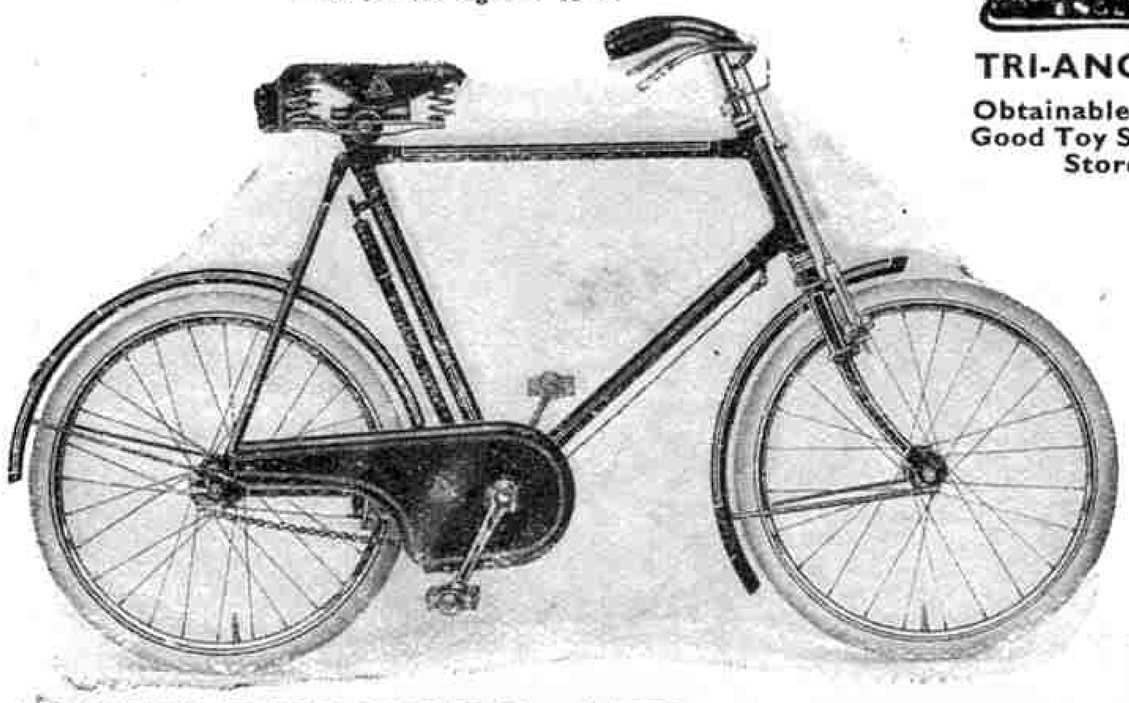
Steel body with opening side door, upholstered seat. Adjustable wind screen and direction indicators. 9 in. new type easy-clean wheels with malleable hubs, ⅛ in. tyres. Hand brake. Length 44 ins. Suitable for ages 4 to 7.

TRI-ANG TRICYCLE No. E2 (Regd. Trade Mark)

Cycle chain drive with free-wheel. Frame and forks best quality weldless cycle tubing. 16 in. front and rear wheels. 1⅜ in. jointless sponge-rubber tyres. Roller lever brake. Ball-bearings throughout. Coil spring saddle. CHROMIUM FITTINGS. Black, blue or maroon.

TRI-ANG TOYS

Obtainable from all Good Toy Shops and Stores.



"UNITY" BOY'S CYCLE No. 16 PB

16 in. frame. Finest quality British tube. Wheels 16 in. x 1⅜ in. CHROMIUM PLATED rims. Dunlop pneumatic tyres. Roller lever pattern brakes. Three-coil saddle. ½ in. x ⅛ in. roller chain. Ball-bearings throughout. Complete with equipment and finished in black, blue or maroon. All usual bright parts CHROMIUM-PLATED. Ages 7 to 11.

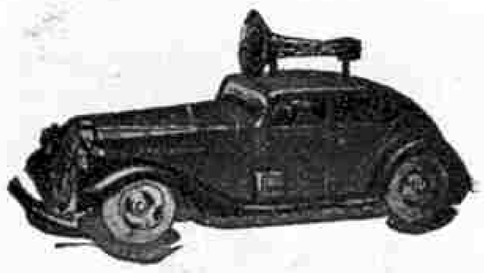
"FAIRYCYCLE" (Regd.) MODEL No. 2

Cycle tubular frame and forks. 14 in. wheels. 1⅜ in. jointless sponge-rubber tyres. Ball-bearing pedals. Roller lever brake. Two-coil saddle. Chain cover. Stand. CHROMIUM-PLATED FITTINGS. Black, blue or maroon.

MINIC

ALL TO SCALE CLOCKWORK TOYS

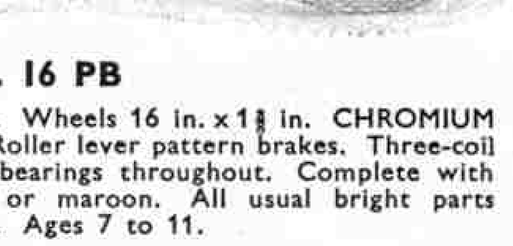
Almost every type of road transport is represented. Each model is strongly constructed and fitted with long-running mechanism and some are fitted with electric lights.



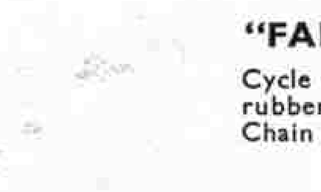
MINIC Traffic Control Car.

MINIC Mechanical Horse and Lorry with Barrels.

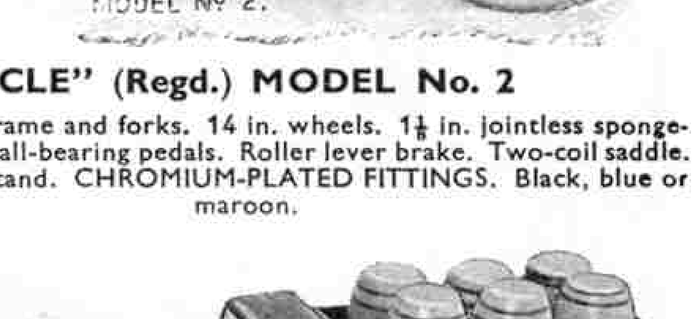
MINIC Canvas Tilt Lorry. Obtainable in camouflage colours.



MINIC Vauxhall Cabriolet. Obtainable in camouflage colours.



MINIC Tank. Length 3¼ ins. Obtainable in camouflage colours.



MINIC Mechanical Horse and Milk Tanker.

MINIC Transport Van.

MINIC Six Wheel Army Lorry.

MINIC Farm Lorry.

ASK YOUR DEALER TO SHOW YOU THE RANGE OF MINIC GARAGES

Made by

LINES BROS. LTD., Tri-ang Works, LONDON S.W.19

MECCANO MAGAZINE

Editorial Office:
Binns Road, Liverpool 13
England

Vol. XXVI. No. 4
April 1941

With the Editor

A Smaller "M.M."

Beginning with this month I am obliged to reduce the "*M.M.*" to 40 pages on account of the acute paper shortage. I am very sorry to have to do this, but it is absolutely necessary. Once more I shall have to make certain re-arrangements, but even with this reduced number of pages I hope to be able to continue all the regular features, although perhaps in shorter form, and to include just as many special articles. To do this I shall have to economise in space by using smaller type and in various other ways. I am determined that the "*M.M.*" shall remain as interesting as ever; and further, I do not intend to increase the price.

I still continue to receive urgent requests for particular numbers of the "*M.M.*" from readers who have not placed a regular order. In many cases I cannot supply the required copies, so that these readers are unable to complete their volumes. It is now more necessary than ever that every reader should place a regular order with his dealer or newsagent, or send a direct subscription to the Editorial Office.

Finally, I must warn readers that it is now impossible for me to guarantee that they shall receive their copies on the first of the month. My printers and distributers work like heroes, but the transport difficulties are very great.

The Use of Cameras

Many readers apparently are still under the impression that photography is prohibited during the war. This is not the case. It is not an offence to carry a camera; the only restrictions are in regard to the objects photographed. Photographs must not be made of anything connected in any way with the war, which means that railway photography must be left severely alone. Some notes on this matter will be found on page 128. Carry your camera openly, use commonsense in your choice of subject, and all will be well.

Leaders in the War

XVII.—Sir H. R. M. Brooke-Popham

Air Chief Marshal Sir Henry Robert Moore Brooke-Popham was born in 1878 and was educated at Haileybury and Sandhurst, and the Army Staff College. He was gazetted to the Oxfordshire Light Infantry in May 1898. He became very keenly interested in flying, and took part in the manœuvres of 1911 in which aircraft were used for the first time. In 1912 he transferred to the Air Battalion, Royal Engineers, and thence to the Royal Flying Corps formed later in the same year, and thus was one of its pioneers. He was given command of No. 3 Squadron. In the war of 1914-18 he was one of the first six airmen to bomb the German lines. He held a succession of important positions in the Royal Flying Corps in France, and won the Air Force Cross and D.S.O.

Air Chief Marshal Sir Henry Robert Moore Brooke-Popham, G.C.V.O., K.C.B., C.B., C.M.G., D.S.O., A.F.C., Commander-in-Chief of the British Forces in the Far East.

After the war he transferred permanently to the Royal Air Force, with the rank of Air Commodore. Few officers in the Service have held such a variety of responsible positions as this tall, fair haired man with the twinkling eyes. For five years from 1921 he was Commandant of the R.A.F. Staff College, and afterwards for two years was Air Officer Commanding Fighting Area Defences of Britain. Then followed a brief period abroad as Air Officer Commanding, Iraq Command, and in 1930 he returned home to become Commandant of the Imperial Defence College. Three years later he was appointed Air Officer Commanding-in-Chief, Air Defence of Great Britain, and in this capacity he planned in 1935 the first big air exercises held in this country. When promoted to Inspector-General of the R.A.F. later that year he made a tour of the Empire's air stations.

Last autumn Sir Henry was appointed Commander-in-Chief in the Far East, with headquarters at Singapore, and has supreme command of our armed forces in Singapore, the Malay States, Burma, and Hong Kong. This is a vast area which later may become of vital importance.

Unusual Types of Commercial Motor Vehicles

Labour Saving Devices for Handling Loads

DURING the past two years tremendous strides have been made with respect to the manner in which different types of loads and commodities can be handled both on and off the bodies of commercial motor vehicles. Formerly all types of loads had to be man-handled on and off such vehicles, which naturally meant that the procedure was both long and costly. The only form of labour-saving device for discharging loads in those days was the old type of two-wheeled horse-drawn cart carrying coal. On this cart the body was balanced on the axle so that when the driver removed a securing pin at the front end, and gave the front end a lift up with his shoulder, the whole body turned over by balance tipping and discharged the lot.

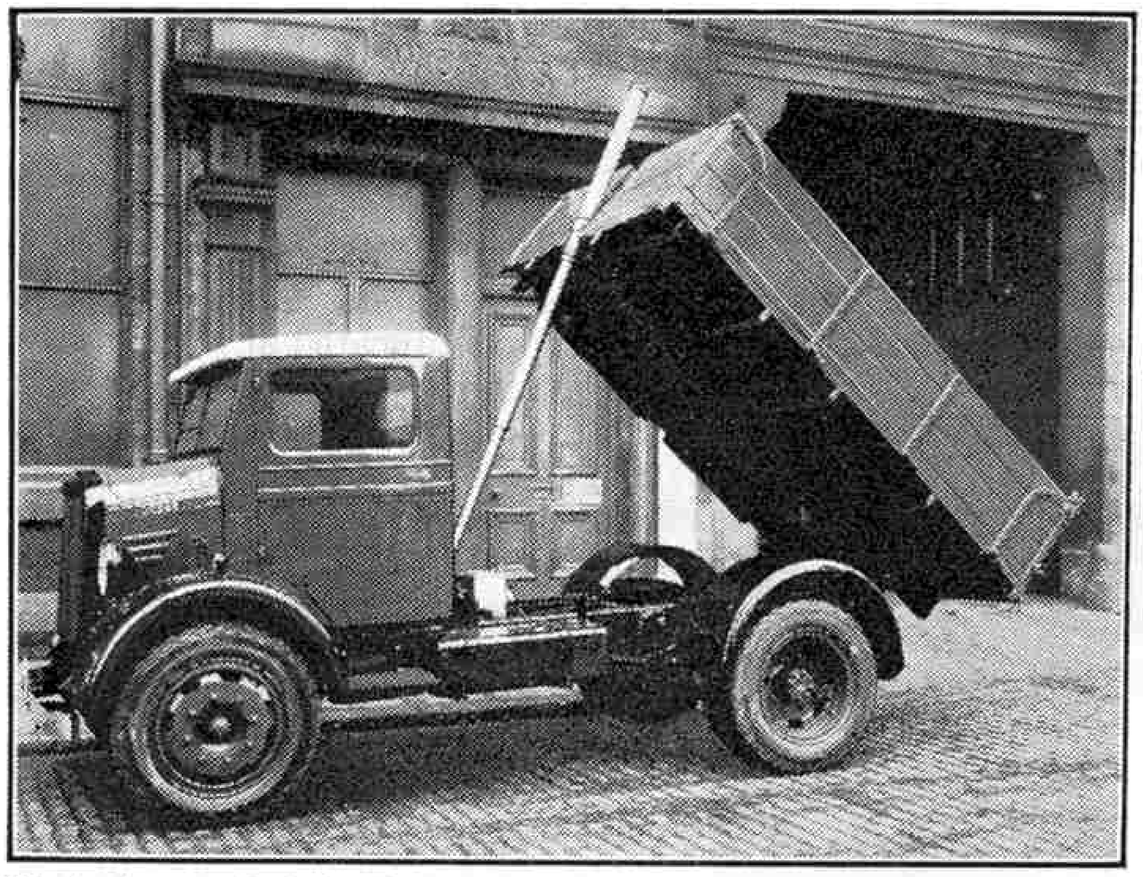


Fig. 1. Lorry with hydraulically-operated tipping gear. The photographs to this article are reproduced by courtesy of Bromilow and Edwards Ltd.

Nowadays wherever one goes different forms of special mechanisms are to be seen handling efficiently all classes of loads. The most common method of discharging bulk loads from commercial vehicles is by power-operated end tipping. Fig. 1 shows a typical example of this mechanism. Briefly it is a hydraulically-operated tipping gear comprising a unit on the gear-box of the vehicle by which the engine power is transmitted through spur gears to an output auxiliary drive spindle. The drive is then taken to a high-speed high-pressure oil pump that draws oil from a suitable reservoir and transmits it under pressure to a hydraulic ram situated at the front end of the body. This ram is made in either double or triple telescopic form so that its overall length is not excessive, while at the same time the ram travel allows an adequate angle of tip to be obtained, and thus permits the load to be discharged cleanly from the body. The ram is attached to the front end of the body through a universal joint to allow for any undue chassis or ground distortion, while the body is fulcrumed at its rear end on hinge brackets. The rear end of the body is made with a tail door that can be easily released or secured, thus allowing the load to be discharged very rapidly.

Fig. 2 shows another very popular and essential type of tipping mechanism. This is a power-operated three-way tipping gear which, as the name implies, allows the load to be discharged to the rear of the vehicle or, if so desired, to either side of it. It will readily be appreciated that on arterial roads or on road repairs it would be impracticable where there is a large amount of traffic to let a vehicle get across the road to end tip the load at the side of the road. Instead, the vehicle draws up at the side of the road, and by operating a side-tipping mechanism can discharge the load off the side of the body without holding up the whole traffic. Fig. 2 shows a three-way tipping vehicle with the body end tipped.

Fig. 3 shows the details of the hydraulic rams on the three-way type of tipper. These, it will be seen, are of a telescopic type, consisting of an outer case held in a suitable cradle assembly on the chassis frame members. The outer case accommodates intermediate and inner telescopic rams so that these

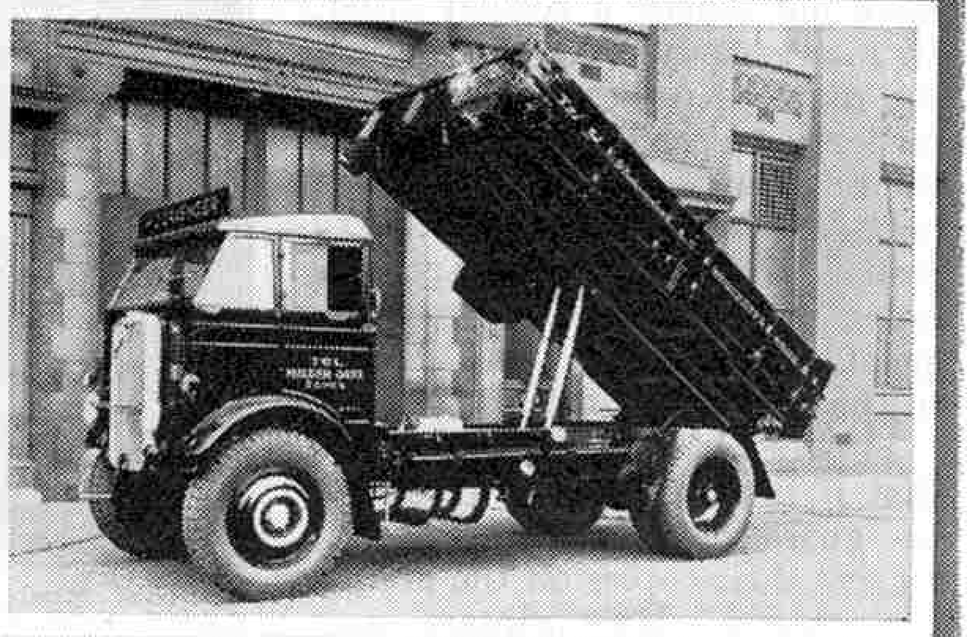


Fig. 2. A power-operated three-way tipping gear.

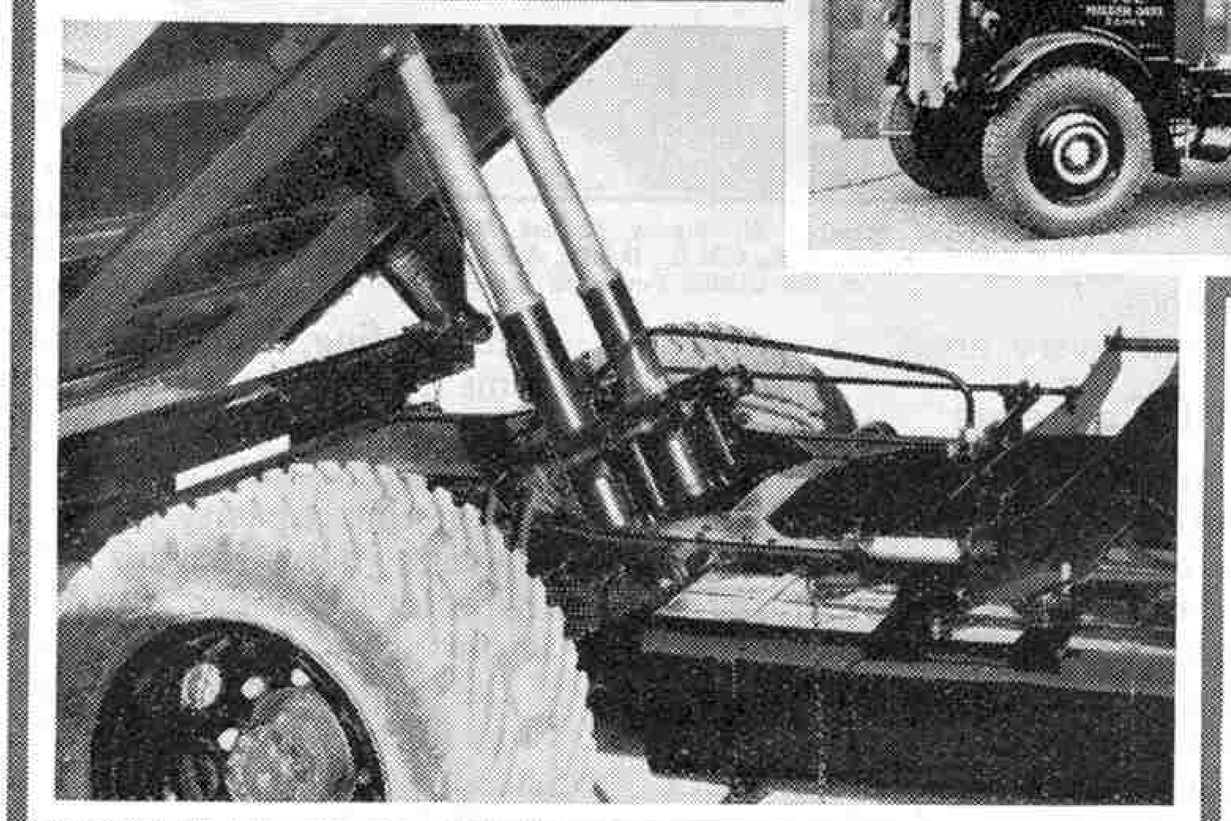


Fig. 3. Details of the hydraulic rams used on the three-way tipper.

rams, being double telescopic, are of reasonable overall length and therefore do not project too low and thus cause fouling if the vehicle is operating on uneven ground. The rams are universally trunnioned in their ram cradle assembly; that is, they are free to swing to the rear for end tipping, and furthermore are capable of trunnioning or swinging to the sides when the vehicle is on side tip.

Fig. 5. Body tipped to near side.

Three-way tipping is carried out as follows. The rams are mounted near to the centre line of the body and, as already stated, are universally trunnioned. The body is mounted on the chassis through four hinges, one situated at each corner of the body. These hinges can be secured down to suitable outrigger brackets on the chassis by means of locking pins. The tipping gear is also made up with an oil pump driven from the engine or through the gear-box of the vehicle with suitable pipe line overload and trip valves, etc. When the operator wants to tip the load to the rear he secures the two hinges at the rear end of the vehicle and withdraws the locking pins from the two front hinges. When the pump is started up the oil is forced into the rams and, as the body is held down at the rear, causes the rams to swing over, taking the line of least resistance, and thus the load is discharged to the rear. If the operator wishes to discharge the load to the near side, then the two hinges on the near side are locked down and the two on the off side are released. Again the rams operate and take the line of least resistance, tipping the body to the near side. The same operation can take place to the off side by locking the off side hinges and freeing those on the near side.

Fig. 4 shows the three-way tipping gear tipping to the off side, and in this illustration it should be specially noted how the body sides are lowered level with the floor so that the load is shot, on side tip, well clear of the rear wheels. This is absolutely necessary, for otherwise the load would pile up round one of the rear tyres, and this would make it very difficult for the vehicle to be drawn out after side tipping had taken place. Further, it will be seen that there is a very close join between the floor of the body and the side doors when lowered. This is necessary to prevent fine materials such as sand from spilling through the gap, and thus blocking up the rear wheels.

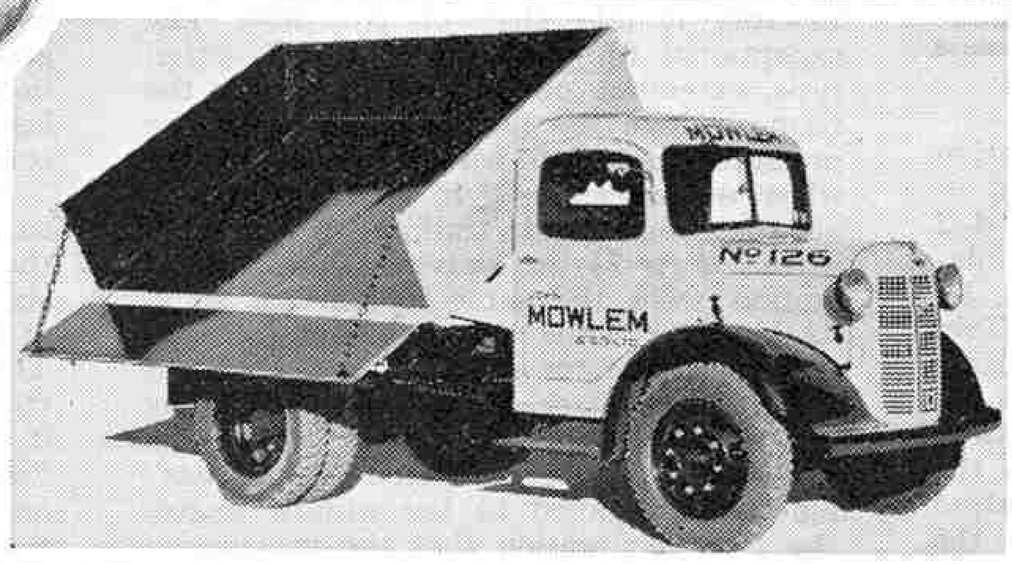


Fig. 4. Tipping to the off side, showing how the body sides are lowered level with the floor so that the load is shot clear of the rear wheels.

Fig. 5 shows a three-way tipping mechanism with the body tipped to the near side. Here the two off side hinges can be seen released from the securing outrigger brackets; further, the hydraulic rams are seen swivelled or trunnioned over to the near side.

All the mechanisms so far mentioned are products of Bromilow and Edwards Ltd., of Foundry Street, Bolton, Lancs. We come now to a product of an associated company, Wood Hoists Ltd. of the same address. This mechanism is shown in Fig. 6. It is an end-discharge mechanism known as the Wood Hoist, and is not made to discharge the load in three directions as can be done with the Bromilow and Edwards' equipment. It is a power-operated mechanism with a pump, a power take-off drive for obtaining motive power from the engine of the vehicle. With this particular mechanism the piston and cylinder are situated either horizontally or at a flat angle very close to the horizontal.

Fig. 6 shows a horizontal type of cylinder where the end of the piston is fitted with a crosshead and rollers, etc., operating on a roller track and against two cams that are built into the body underframe. Thus, when this mechanism is operated, the hydraulic ram forces the piston along the roller track and causes a wedging action to take place through the cams, thus tipping the body about suitable hinge brackets at the rear end of the chassis.

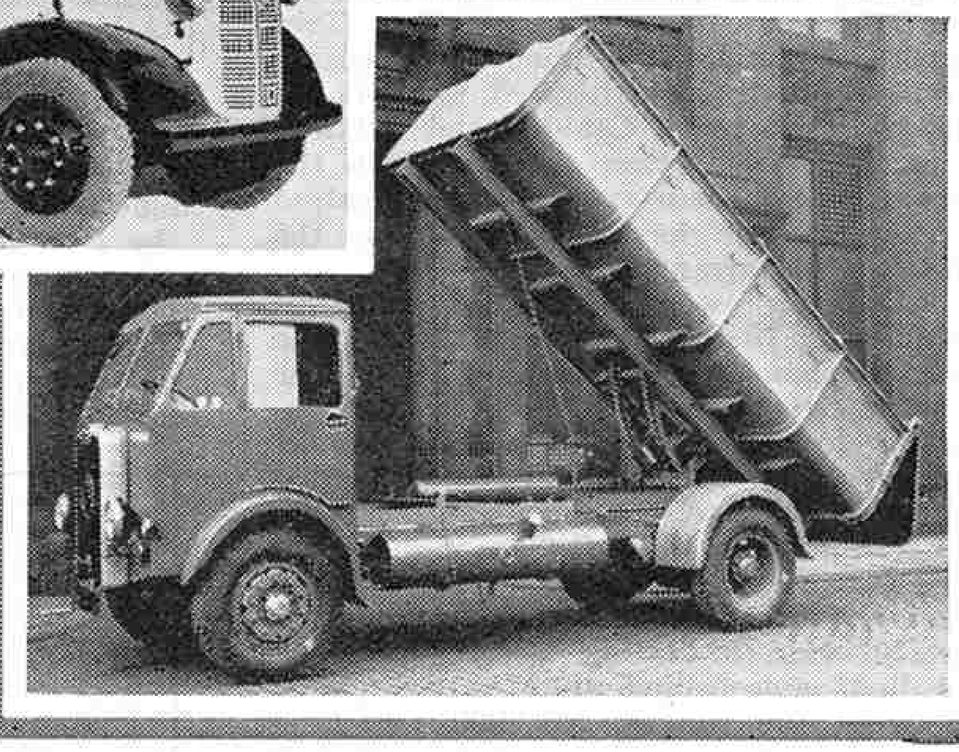
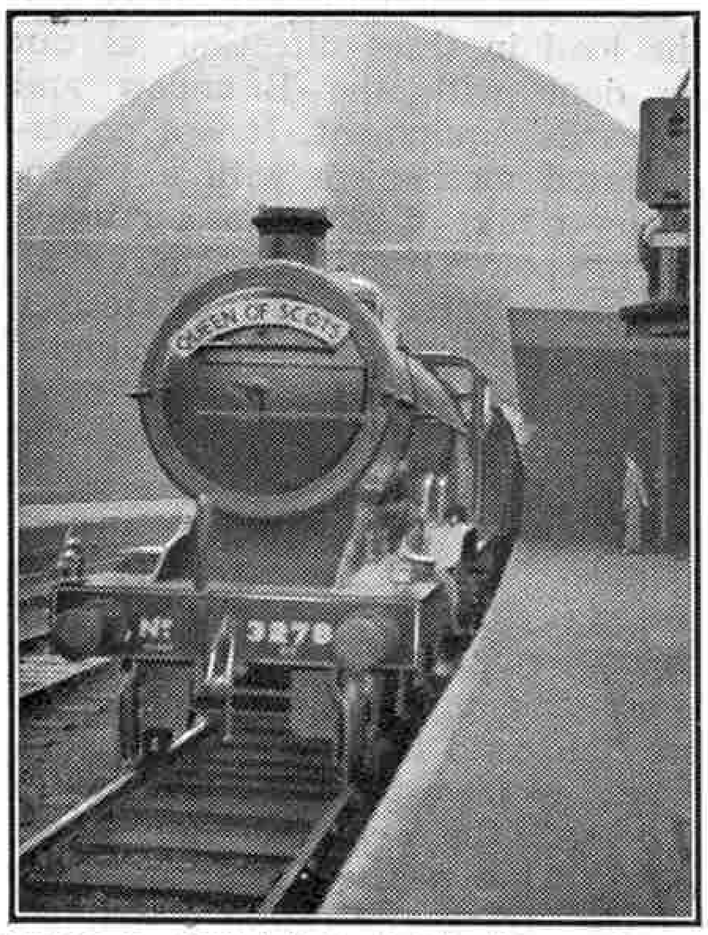


Fig. 6. End discharge mechanism known as the Wood Hoist.

The hoist shown in Fig. 6 is operating a special end-discharge all-steel electrically-welded body that was constructed to carry liquid and semi-liquid of an offensive nature. The body was built of U-shaped cross-section construction, with an angle and steel plate splash guard built at 40 degrees all round the top of the body to prevent any undue splash or liquid surging when the vehicle is in motion. The tail door was made with watertight sealing strips all round the outside edge so that when the tail door is closed and the lock device pressed home, no liquid can escape while the vehicle is in transit.

Next month we shall describe some interesting vehicles used by the big oil and gold companies.



L.N.E.R. No. 3278 at the head of the "Queen of Scots" Pullman, a train on which the "Atlantics" maintained a special reputation for many years.

A Famous Locomotive Class

The Story of the Ivatt G.N.R. "Atlantics"

By R. A. H. Weight

MOST of the names by which locomotive wheel types are known originated in the United States. In 1895 some 4–4–2 express engines were built for the Philadelphia and Reading Railroad, U.S.A., by the Baldwin Locomotive Works. Two further examples built in 1896 became famous for their high-speed exploits on daily runs between Camden and Atlantic City which were then the fastest in the world. From these sprang the indication "Atlantic" for locomotives having the 4–4–2 wheel arrangement.

"Atlantics" were introduced into this country in 1898 by Mr. H. A. Ivatt, who was Locomotive Superintendent of the former Great Northern Railway at Doncaster from 1896 to 1910. The pioneer engine was No. 990, which caused a great stir at the time. The boiler barrel was 14 ft. 8 in. long, and 4 ft. 8 in. in diameter; the two outside cylinders of 18¾ in. diameter, with a stroke of 24 in., drove the second pair of driving wheels by means of link motion and slide valves placed between the frames. No. 990 was later named *"Henry Oakley"* after a famous General Manager of the company, being the only named engine on the G.N.R. until the first Gresley "Pacific" was built in 1922.

There were afterwards 21 more small "Atlantics," as they came to be known—or else by their popular nickname "Klondykes" after a catchword of the period connected with the gold rush to the Klondyke valley of the Yukon. One of the 22, No. 271, was the subject of several experiments; first as a four-cylinder engine, subsequently as a most successful rebuild with two inside cylinders, with modernised features such as piston valves and superheater. At any rate until 1914-5, the small "Atlantics" took an important share in the working of some of the heaviest East Coast expresses between London and York. They were seen also on long runs such as King's Cross to Doncaster, or Leeds and back with fast trains of moderate weight. Only five now remain at work, and are found mainly in Lincolnshire. No. 990 herself, however, is preserved in the Railway Museum at York.

The "Klondykes" were only a stepping stone to something much more outstanding. Full use was made of such a long and capacious frame by Mr. Ivatt in 1902 when he brought out No. 251, his first large "Atlantic," which by standards of the period was an enormous-looking engine. The steel boiler 16 ft. long in the barrel and 5 ft. 6 in. in diameter, had its centre line as much as 8 ft. 8½ in. above rail level. Its full length contained 248 iron tubes of larger diameter than on the 990 class. The total heating surface, at 2,359 sq. ft., was more than double that of any G.N.R. engine built up to six years previously under the supervision of Mr. Ivatt's famous predecessor, Patrick Stirling, and well on towards double that of No. 990. The exceptional fire-box was of the Wootten type, extending out on each side over the frames where the heat is greatest. Boiler pressure was 175 lb. per sq. in. The driving wheel diameter was 6 ft. 7½ in., and that of the bogie and trailing or carrying wheels 3 ft. 7½ in.; valves, cylinders and motion were the same as on the small "Atlantics." Thus the cylinders were on the small side for so big a boiler, but it was the remarkable steam-producing capacity that marked their success in service. The large-boilered "Atlantics" indeed exemplified to the utmost degree the Ivatt contention that the measure of a locomotive's power was its "capacity to boil water."

The large "Atlantics" became most popular engines and in the peacetime days up to 1914 tackled every kind of express passenger and fast freight duty on the G.N.R. main line at a time when loads were increasing owing to the development of modern corridor and restaurant car stock; and when traffic was growing, services were being accelerated, and braked goods trains were being introduced on a growing scale. During the next decade, which included the war period and the difficult years immediately before and after grouping, many timings were slower but loads much heavier.

By 1908 no less than 83 large "Atlantics" had been built, numbered 272-301 and 1400-51, in addition of course to No. 251. Nos. 292 and 1421 were four-cylinder compounds with two high and two low-pressure cylinders. They were also the subjects of several experiments in valve gear, dimensions, boiler pressure, and so on. The object of compounding is to utilise the steam again after it has been partially expanded and exhausted from the high-pressure or normal original cylinders into a receiver, then to obtain a certain amount of work from it again in the low-pressure cylinders. These it is usually considered shall be of considerably greater volume than the high-pressure, because the steam would by then have lost a good deal of pressure and be partially condensed.

At this period the steam on almost all engines was being carried straight from the boiler to the cylinders in a saturated state, containing a considerable amount of moisture which restricted power output. The G.N.R. was early in the field with trials of superheating the steam by passing it through nests of small pipes or "elements" in close contact with the heat and gases from the fire. The steam when reaching the cylinders is thus much drier and more in the nature of a gas capable of greater expansion and leading to much economy in coal and water consumption. The last 10 of the ultimate total of 93 large "Atlantics," built in 1910 and numbered 1452-61, were superheated on the Schmidt principle, but boiler pressure was temporarily reduced to 150 lb. "It makes two coaches difference to her pulling power." said an old driver in the early days of superheaters; sometimes more than that, one would suggest!

Gradually the large "Atlantics" were provided with new boilers containing 24 superheater elements, and later the present standard 32-element superheater; that is to say there are 32 large flue tubes, each

This engine has its boiler mountings and cab altered to suit the loading gauge of the Northern Area of the L.N.E.R. Photograph by W. H. Whitworth.

5¼ in. in diameter, the number of ordinary small tubes being reduced to 134. Nowadays for engines of the size and age of the "Atlantics" the degree of superheat is high, and the locomotives' performances have been remarkably improved as a result. In conjunction with this modernisation, most of the big "Atlantics" have had new cylinders of the larger diameter of 20 in. fitted, the stroke remaining as before. A further improvement was the replacing at the same time of the original balanced slide valves by piston valves in accordance with current practice. So, under Sir Nigel Gresley's direction, a good, well-proportioned design had been turned into something really outstanding with a new lease of life and usefulness. Indeed, during the last fifteen years or so when loads and speeds have been placing more demands on locomotive power the "Atlantics'" abilities seem to have increased as more and more feats of remarkable performance have stood to their credit.

Various individual engines deserve special attention, though probably some little anecdote might be written about each of such a long-lived class. There was, for instance, No. 1442, for long the "Royal" engine of the G.N.R., and the pride of King's Cross for many years. It was exhibited at the "White City" Exhibition at Shepherd's Bush, London, in 1909, and was distinguished from the other big "Atlantics" by the G.N.R. coat-of-arms on the trailing splashers. This adornment as L.N.E.R. No. 4442 it still carries, but the brass rims originally fitted to the wheel splashers, another feature peculiar to this engine, are now painted over. It was on the footplate of this engine that, as I recorded in the "*M.M.*" of November 1929, I had a stirring trip from Leeds up to King's Cross in company with the redoubtable "Bill" Sparshatt and his fireman Waddingham. On that occasion, with 240 tons on the then "'*Harrogate' Sunday Pullman*," we covered the 186-odd miles at an average speed of 59.9 m.p.h. arriving six min. early in spite of delays costing 12 min. in all!

Years before, in 1916 in fact, No. 1442 had worked a "special" northward in connection with the last tragic journey of Lord Kitchener; from King's Cross to Grantham, an engine-changing station in those days, the Royal "Atlantic" ran at an average of approximately 65 m.p.h.

No. 1449 in 1909 took part in a locomotive exchange for trial purposes, being on duty temporarily on the old L.N.W.R. main line between Euston and Crewe. Here it showed to advantage in comparison with the "competing" L.N.W.R. engine.

No. 292, which had remained a compound, was scrapped in 1927. All the others are still "going strong," although the youngest is over 30 years old. All except three have the familiar Ivatt appearance. No. 4419 is furnished with a large side-window cab. For some years this engine carried a "booster" attachment, making the trailing wheels available for auxiliary adhesion when starting or going slowly uphill. Another, No. 3279, was for over 20 years a solitary four-cylinder non-compound example. In 1937 it was rebuilt with two 20 by 26 in. cylinders with piston valves actuated by Walschaerts gear as on the "K2" 2–6–0 class. It has also a larger cab now and raised framing. The other erstwhile compound, No. 1421, was converted to normal simple propulsion with the standard modernisations. No. 4447 soon after grouping was provided with cut-down boiler mountings and an altered cab roof to suit the loading gauge of the Northern Area.

In 1924-5, under the L.N.E.R. renumbering scheme, 3000 was added to all existing G.N.R. engine numbers. It will be noticed that the references to 4419, 4447 and 3279 just now indicate the present group numbering, which will be used in the remainder of the article.

Under L.N.E.R. auspices, Ivatt "Atlantics" have worked a good deal on the G.C. section in the Midlands. They have often been seen as far west as Swindon, having worked one of the through L. N. E. R. - G.W.R. services via Banbury by a running-power arrangement. They have drifted also on to the former North Eastern metals and penetrated to Liverpool, though their chief sphere continues to be the former G.N.R. main and principal branch lines. Quite a number have been stationed at the same shed, such as King's Cross, Grantham and so on, throughout the whole of their service which may extend to more than 35 years, and have covered some millions of miles. Even if they have been superseded by "Pacifics" and "Green Arrow" 2–6–2s on the heaviest and longest turns, there is still plenty of work for them, ordinary and special.

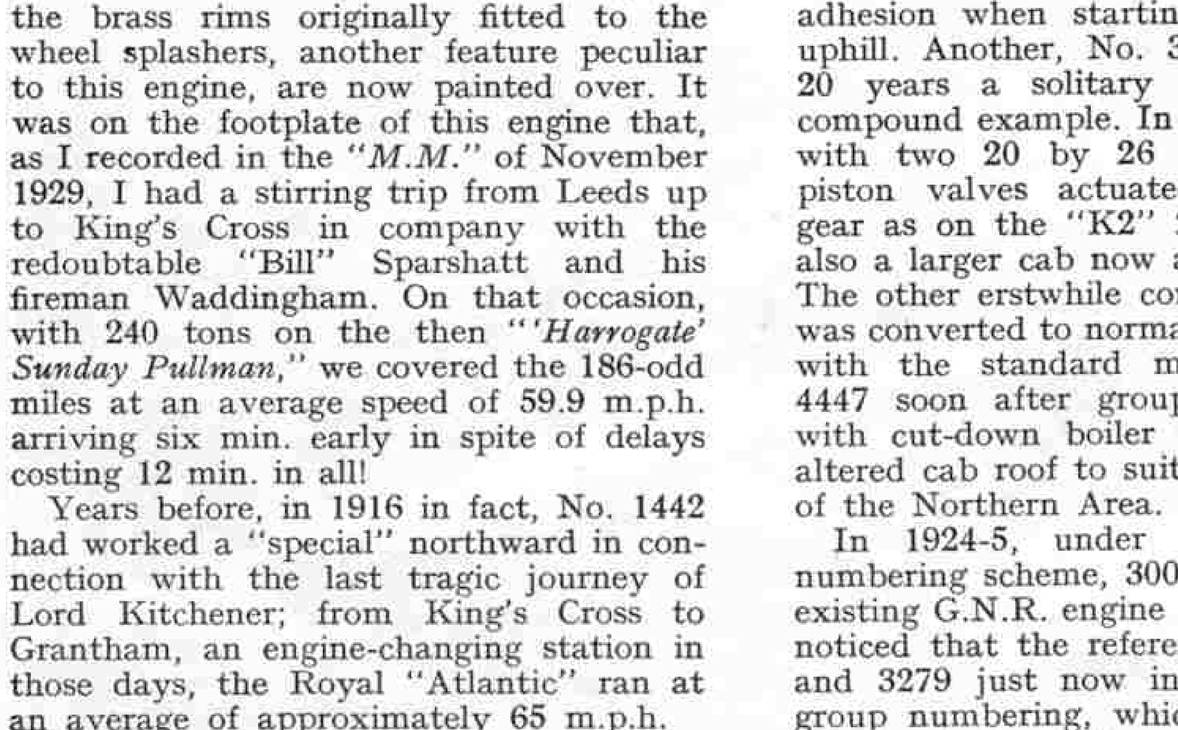
Among their most remarkable feats in their "old age" may be mentioned the daily running of the Pullman expresses between London and Leeds during the years 1925-37 at speeds accelerated up to 57-58 m.p.h. average, with loads round about 300 tons. Many splendid feats of time recovery were achieved by keen drivers on these duties, the old "Atlantics" seeming to take a delight in creating new records and then beating them. When they have been called upon to deputise for "Pacifics" that had "run hot" or suffered some temporary disability from time to time, really phenomenal achievements have been recorded behind Ivatt 4–4–2s.

No. 4404 worked a 17-coach "*Scotsman*" weighing 585 tons full from Grantham to York, 82¾ miles, in 87½ min. start to stop, or 2½ min. under schedule. It averaged 64 m.p.h. over 63¼ miles between Barkston and Brayton junction in spite of 1 in 200 adverse gradients and Doncaster service slack. Including the tender and train, this 69-ton locomotive, with only 36 tons adhesion weight, was hauling about nine times its own weight, yet it never appeared to be in difficulty for steam. No. 4415 also in an emergency did similarly well with one coach less on the same train, her time from Grantham to York being 87 min. with 540 tons gross.

No. 4452 ran the "*Silver Jubilee*" streamliner of 220 tons tare, or 235 full, over the Doncaster-King's Cross stretch at an average of over 67 m.p.h. start to stop. The 156 miles took 139 min., and only about 10 min. were lost on the high-speed timing, without allowing for gaining speed after the out-of-course stop at Doncaster. Some of the finest Pullman exploits were on a similar plane.

The "Atlantics" shone also between 1932-9 on the King's Cross-Garden Cities and Cambridge buffet expresses. With a load of eight corridor coaches, or two more than the intended maximum load when the timings were (*Continued on page 138*)

A G.N.R. scene showing "Atlantic" No. 1400 on a heavy express. Photograph by O. Johnson.



One of the early large-boilered "Atlantics," No. 3284, being prepared to take an up express from Leeds to London. This illustration shows how the wide fire-box extends almost the full width of the engine.

The Loss of the Flying Boat "Clyde"

During an exceptionally severe storm at Lisbon on the 15th February last, the British Airways flying boat *"Clyde,"* riding at anchor in the harbour there, broke from her moorings and sank, and a Portuguese watchman on board was drowned. The storm was the worst experienced at Lisbon for nearly 90 years, and did a great deal of damage.

The *"Clyde"* became well known last summer when she took part in the British transatlantic flights between England and the United States, and the photograph on this page shows her over Long Island Sound, U.S.A., during a homeward flight last October. In August 1940, in command of Capt. A. C. Loraine, she made a pioneer flight from Lisbon to West Africa, and afterward was employed on the regular service that became established over this route. Under the command of Capt. Dudley Travers, the *"Clyde"* was on her way back to England on one of these service flights when she was sunk.

R.A.F. Bomber Crew's Night of Adventure

A Royal Air Force bomber crew had an exciting night recently, and here is the Sergeant Pilot's account of it.

"We were on the outward journey, about 30 miles from the English coast, when we were attacked by a "Messerschmitt 110" which fired three bursts at us. One burst went across our tail and the others over and below the starboard wing. Five minutes after the first burst, the wireless operator saw an aircraft falling in flames 10 miles astern of us.

"We then flew on to bomb certain military objectives in Düsseldorf, but when we arrived there we found that the town was entirely covered by low clouds. We cruised about looking for a gap, and after some time gave up the search and flew on to Munchen-Gladbach, where we hoped to find better conditions. However the low clouds covered the whole town.

"On we went, and when at last we flew out of the clouds the navigator reported a main line railway bridge crossing a river below us. We made straight for this and dropped our bombs. Imagine our disappointment when the rear gunner reported that there were no signs of bomb bursts. We circled round once more, and passed over the bridge to see if it was still intact; far from being intact, it had collapsed altogether.

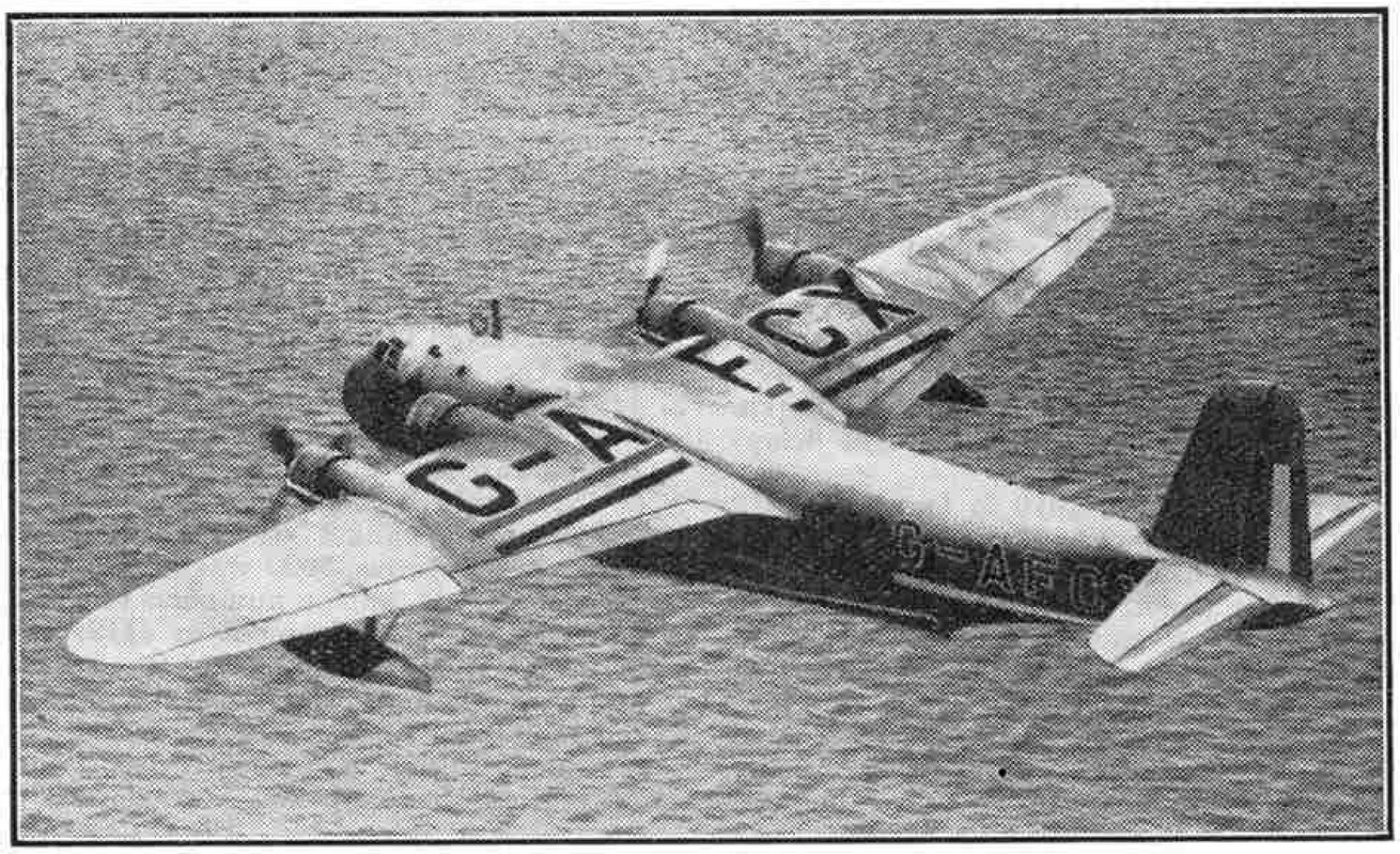
"We still had our incendiaries, and farther on we saw a goods train steaming slowly along, so we dropped them immediately ahead of it. The engine fouled the incendiaries, the train piled up in the centre and toppled over on top of the blazing bombs, and burst into flames.

"We then set course for home."

Lockheed "Lodestars" in South Africa

Lockheed "Lodestar" twin-engined transports delivered to South African Airways are giving excellent service, and one of them has flown from Capetown to Pretoria, a distance of 813 miles, in 3 hrs. 4 min., an average speed of 265 m.p.h. Another recently flew from Pretoria to Nairobi, 2,000 miles, in 10½ hrs., the first time that this route had been flown in one day.

General J. C. Smuts, who is both Prime Minister of the Union of South Africa and Commander-in-Chief of the South African forces, travelled in one of these machines when he flew from Pretoria to Khartoum.



The British Airways flying boat "Clyde," which sank in Lisbon harbour during an exceptionally severe storm last February. Photograph by courtesy of British Overseas Airways Corporation.

A photograph of a Lockheed "Lodestar" was reproduced in the *"Air News"* pages of the July 1940 *"M.M."*

* * * *

A Lockheed "Hudson" bomber has been presented to the Royal Air Force by the employees of the Lockheed Aircraft Corporation and its associated concern the Vega Airplane Company. It is named *"The Spirit of Lockheed Vega Employees,"* and was delivered recently to an R.A.F. Squadron.

* * * *

A new air service established by Royal Dutch Airlines links the Moluccas, or "Spice" islands, and New Guinea. From Batavia to Macassar the service is operated with Lockheed 14 machines, which make the trip by way of Bali, and the remainder of the air route is flown by Grumman amphibians.

Success of Air Training Schemes

In Canada the Empire Air Training Scheme is making rapid progress, and 80 of the 119 units to be established under the scheme were in operation by the end of December 1940. It is expected that the full number of training establishments will be completed by next September instead of by the spring of 1942, as originally planned.

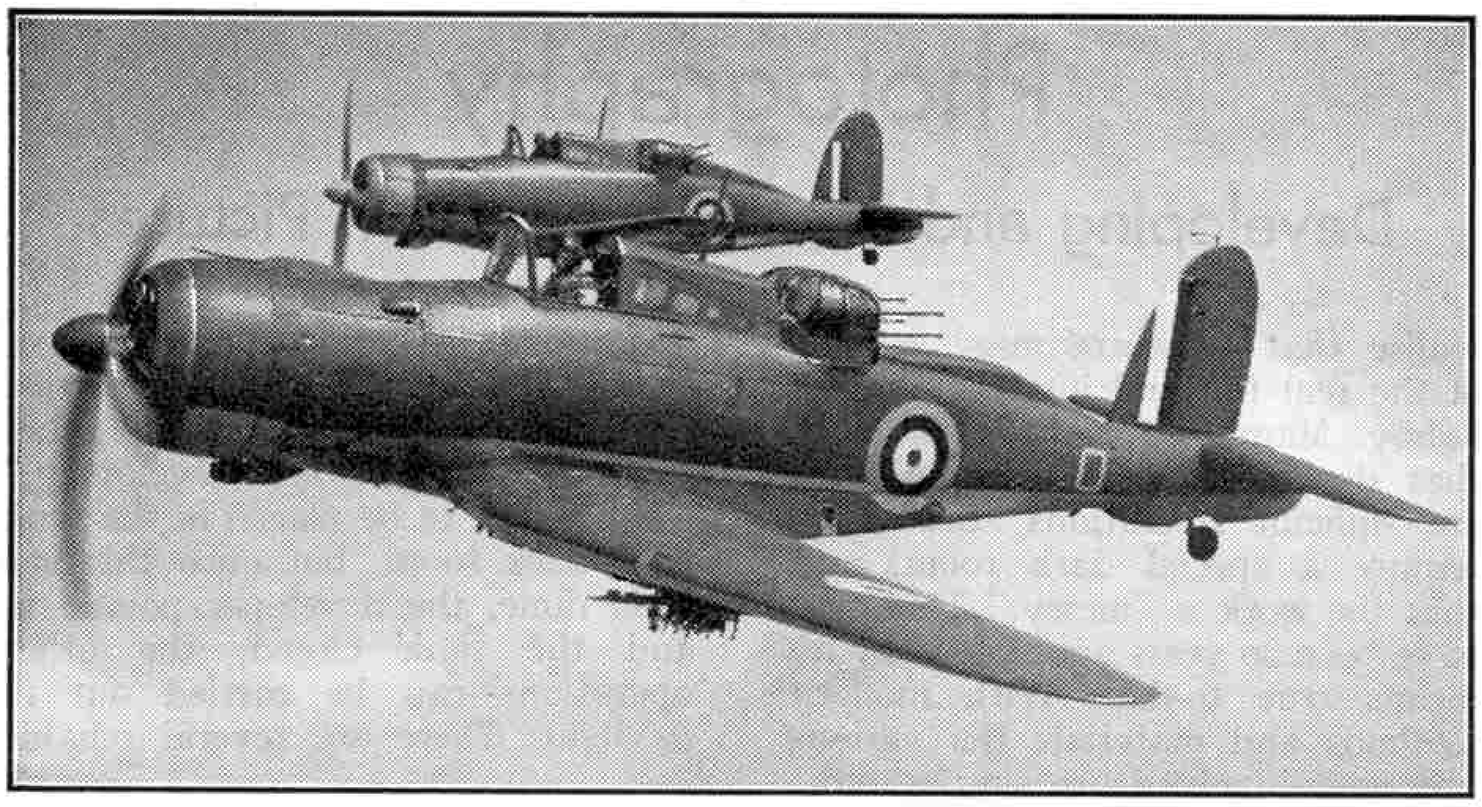
In Great Britain the more recent Air Training Corps Scheme, by which boys aged 16 years and upward who are physically fit can receive pre-entry training for the Royal Air Force or the Fleet Air Arm, has made a fine start. By the beginning of last month 756 local squadrons had been registered.

A newly designed badge and buttons for wear with the uniform of this Corps has been approved by the Air Council. They are of white metal, chromium plated. The badge is circular, and its design incorporates an eagle in flight, the emblem of the R.A.F., and the name "Air Training Corps." The uniform is of Air Force blue, similar to that of the old Air Defence Cadet Corps, but members of University Air Squadrons, which are affiliated to the Air Training Corps, will wear a slightly different uniform that is similar to that of R.A.F. airmen.

New American High-Altitude Fighter

The Republic "Lancer," a new high-altitude single-seater monoplane fighter, has been undergoing test flights in the United States. Details of its performance are secret, but it is known that during the trials its performance was well in excess of that calculated by the designers, and that the top speed attained exceeded the guaranteed figure by more than 20 m.p.h. Maximum efficiency was obtained at sub-stratosphere heights. During these test flights the instrument readings were recorded photographically on a film.

The new fighter has a span of 36 ft. and is 22 ft. 10½ in. long. It is fitted with a 1,100 h.p. Pratt and Whitney "Twin Wasp" engine, and its armament includes guns of 30 and 50 calibre, and other special equipment. The original "Lancer" made its first flight in 1939, and the type has now reached the quantity production stage.



Blackburn "Roc" 4-gun Fighters of the Fleet Air Arm. Photograph by courtesy of "The Aeroplane."

Canadian Air Watch on the Pacific

Canada is sending all available help eastward across the Atlantic to the Mother Country, but she is not neglecting the security of her Western seaboard, and the 600 miles of British Columbia's coastline are under the close watch of the Royal Canadian Air Force, Western Air Command. There are more than 6,000 miles of shoreline to be patrolled, including inlets, fiords, and the thousand islands that fringe the coast.

Giant flying boats and seaplanes fly hundreds of miles out over the Pacific on patrol duty or guarding convoys. The pilots who are selected for this work have to undergo special training, and they are sent to the Seaplane Training School at Jericho Beach, on the Pacific coast, for a course. The training includes practice patrols over 400 or 500 miles of ocean, during which the men take part in anti-submarine operations and convoy protection, and learn the methods of search, ship recognition, and sea reconnaissance. They must also become proficient in practical photography.

Flocking Home to Fly

Four young residents of the Bahamas have arrived in England to train for flying duties in the Royal Air Force. All have had flying experience in light aircraft, having learned to fly at their own expense, and one holds a Canadian running record. They are typical examples of the fine type of men coming to this country under the Overseas Recruiting Scheme, by which British subjects abroad who volunteer for air crew duties are provided with passage home. Over 80 per cent. of the men who have arrived have been accepted for training as pilots.

One man, a Scotsman living in Patagonia, rode hundreds of miles on horseback to catch a ship for England at Buenos Aires. He has now been joined by another British resident from the same remote region. One stage of this man's trip to Buenos Aires was made by air, and during the last part of the long sea voyage his ship was dogged by submarines, but was not attacked. The journey from Patagonia to England took three months.

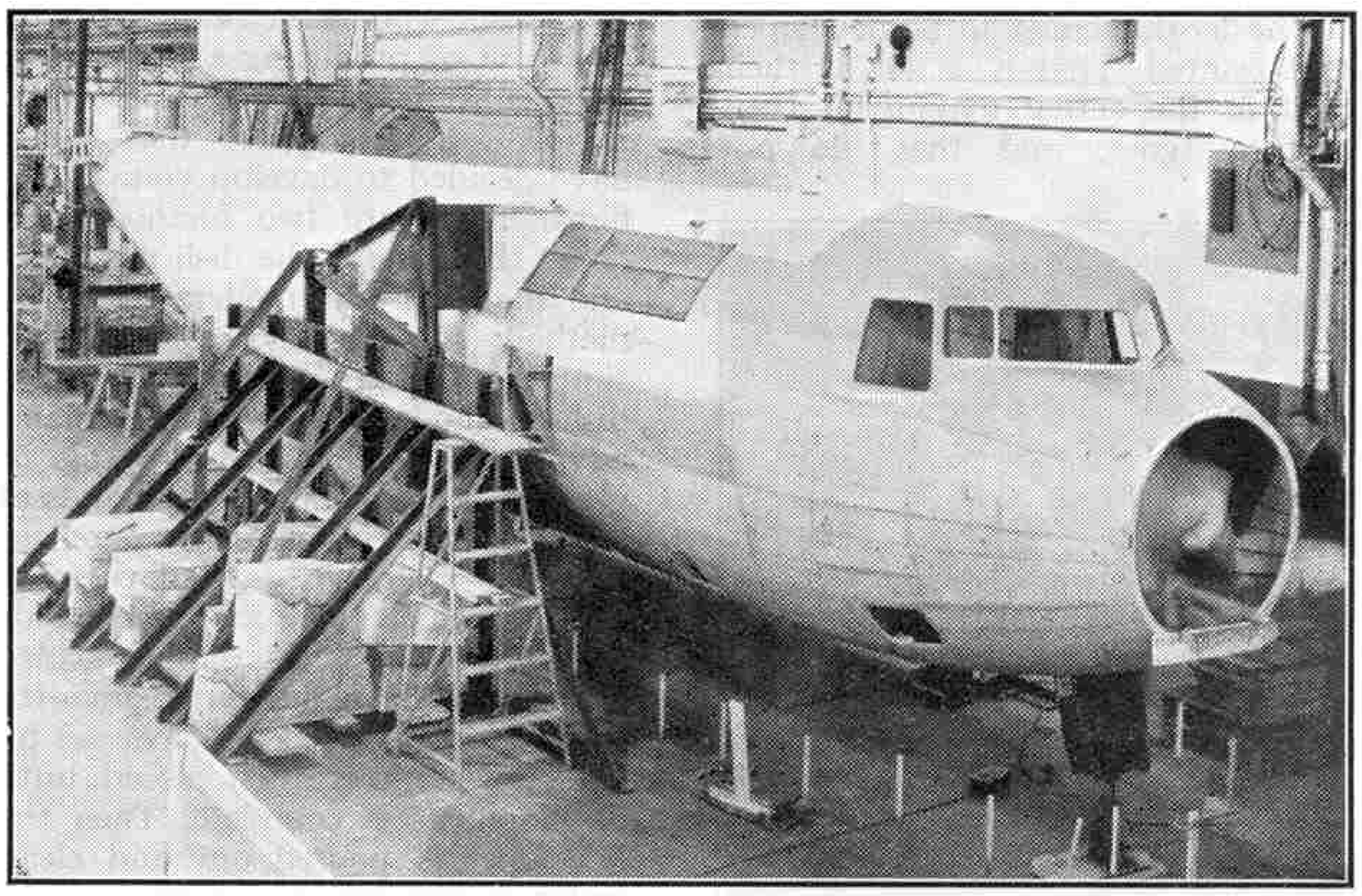
* * * *

The Douglas DC-3 air liners of Transcontinental and Western Air, Inc., are being fitted with more powerful engines. The new type are Wright G-200 "Cyclones," rated at 1,200 h.p.

Qantas Empire Airways News

The Qantas Empire Airways air liner "*Melbourne*" has been handed over to the Royal Australian Air Force. During more than five years' service on Qantas air routes it has flown over 788,000 miles without a forced landing or crash. "*Melbourne*" and four other machines of the same type operated the Brisbane-Singapore section of the England-Australia air route until superseded by the Empire flying boats, which operate to and from Sydney. Since then "*Melbourne*" has flown on the company's internal air service from Brisbane.

An agreement has been reached between Australia and the Portuguese Government by which Qantas Empire Airways will operate an air mail and passenger service between Australia and Portuguese Timor.



The 60 ft. fuselage of the first Douglas DC-5 air liner under test. The completed machine carries 16 passengers and a crew of three. Photograph by courtesy of the Douglas Aircraft Corporation.

Under this agreement the company's flying boats on the Sydney-Singapore service will call once a fortnight at Dilli, in Netherlands Timor. Dilli is already an important call point, as Royal Dutch Airlines are operating a regular air service between there and Kupang, connecting with their Java-Australia service.

A Promising Father

A young N.C.O. instructor at a Technical Training School of the R.A.F. took over a class of new recruits, and found that among the entrants was his father. The older man had joined up to complete a family of father and two sons in the Services, and entirely by chance he had been posted to the school at which his son was an instructor. The son says that he thinks his father is "quite promising," and hopes that he will pass out as a Fitter Aircraftman 1st Class.

600 Weather "Climbs" to 25,000 ft.

An R.A.F. officer recently broke the record for the Meteorological Flight by making 587 weather "climbs" to 25,000 ft. By now he has made 600. The previous individual best was 586. The record-breaking pilot is a Flight Lieutenant who was recently promoted to command the Flight, which he had joined as a Sergeant Pilot in March 1939.

In just over four years the "Met" fliers have not missed a single scheduled flight in a total of 2,376 climbs.

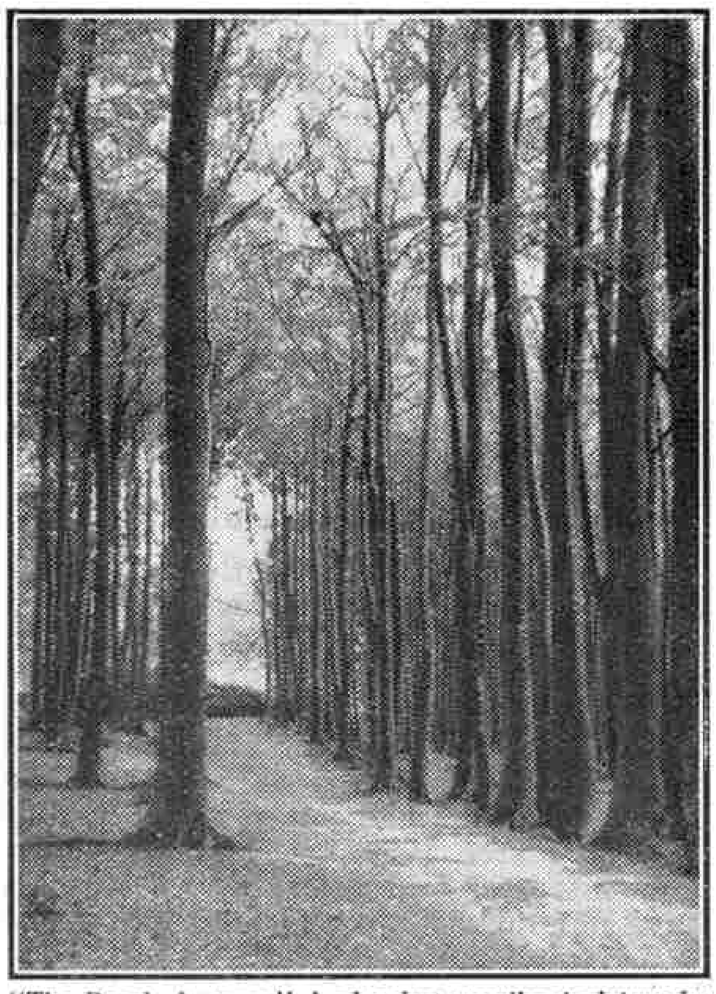
Glider Training for Air Pilots

The South African Defence authorities, in co-operation with the Glider Club of that country, have commandeered all gliders in South Africa, where gliding is to become part of the training of air personnel.

In India also the Government have recognised the importance of gliding, and the Indian Gliding Association has been given a contract to train 300 pilots. A fleet of sailplanes has been ordered from the United States for this work.

New High-Tensile Steel for Aircraft Production

Reports from the United States tell of a new high-tensile stainless steel that should be excellent for aircraft production. It is claimed for this steel that it can be produced thinner than paper, and that it is three times stronger than the aluminium alloys used so extensively in aircraft construction. It is said to have a tensile stress of 185,000 lb. per sq. in., and to be twice as difficult to bend as duralumin.



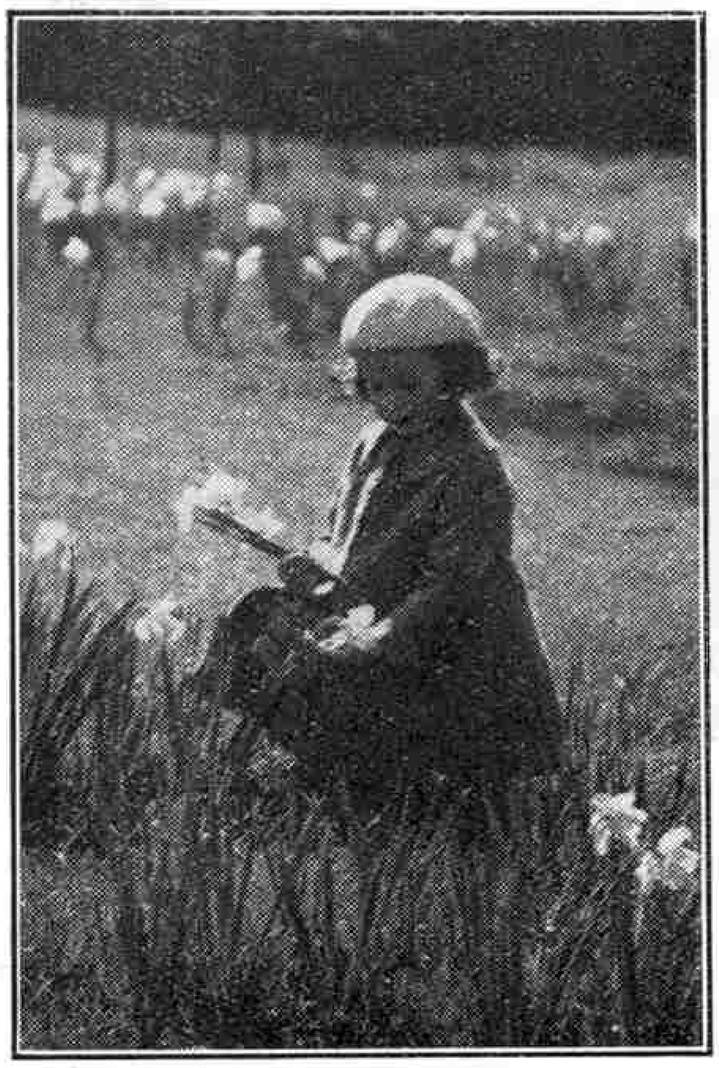
"The Beech Avenue." A pleasing woodland picture by M. K. Tucker, Reigate.

Photography

Developing and Printing Your Own Pictures

WITH the coming of April most keen photographers look forward to taking up their outdoor activities again, and during the next few weeks many cameras that have been stored away in safe places during the winter will be taken from their hiding places and brought into use again.

For many years past now it has been the custom for very many camera owners merely to "press the button" and then hand their films to the local chemist to be developed and printed. That is as far as their part in the actual making of their pictures goes, and they do not realise that they are missing most of the real fun and interest of their hobby. Many people have the idea that developing and printing films are difficult operations, that they require a special dark room, and that the work is "messy." This may have been so years ago, but is by no means true to-day. With modern methods and materials the various processes involved are simple and straightforward, and there is no reason why the slightest mess should be made in carrying them out.



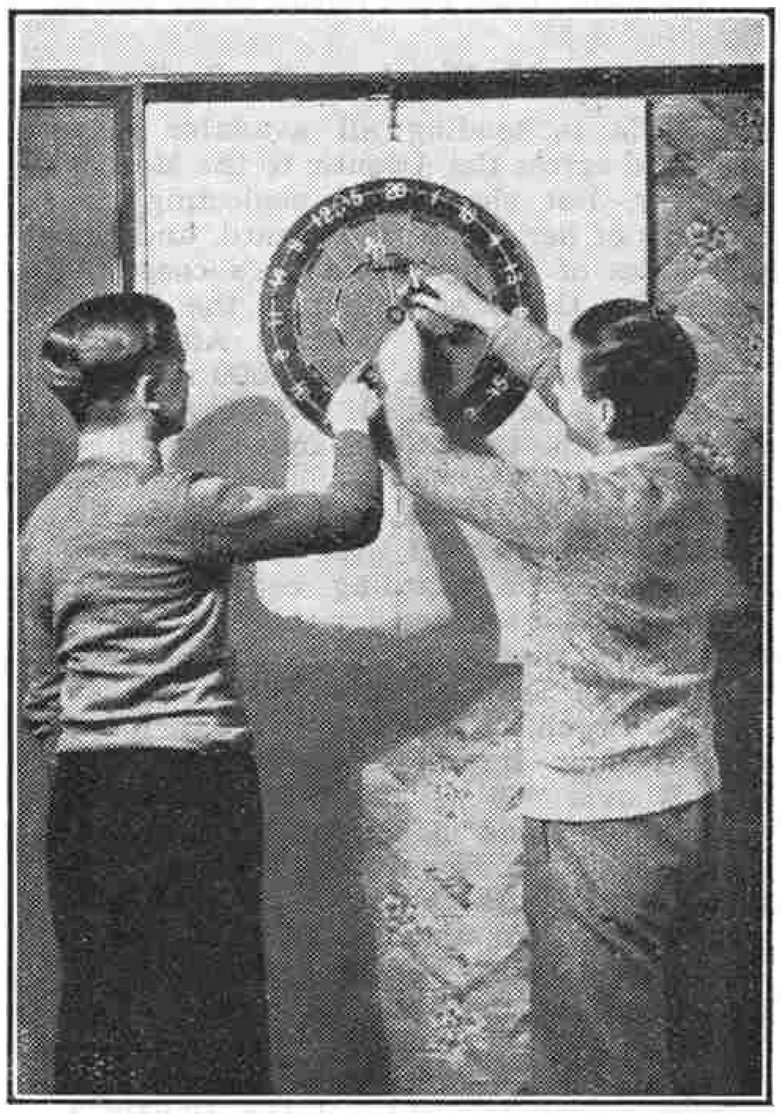
"Daffodil Time." A charming Spring picture by A. G. Dell, West Norwood, London S.E.27.

As for a special dark room, this is very useful and nice, but is certainly not a necessity, for perfect negatives and prints can be produced in any ordinary room that can be temporarily darkened for a short time. In these days of perfect "blackouts" this should cause no difficulty in any home!

At the start of this new outdoor photographic season, therefore, make up your mind to be a real photographer, and not merely a "button-pusher," for full enjoyment of the hobby can be realised only by those who have experienced the thrill of producing a first-class print entirely by their own efforts.

Now let us suppose that you have decided to develop your own films. There are two methods of doing this. One is the dish method and the other the modern "tank" method. The tank system is much simpler and easier than the older dish method, and one of its many advantages is that it is capable of giving perfect results in the hands of a beginner. It involves the purchase of what is known as a developing tank, of which there are many kinds and types. The film is simply loaded into the tank, a measured quantity of developing solution is poured in, and the tank is then closed until development is complete. Then the developer is poured out and clean water is run into the tank to rinse the film; the tank is again emptied and a fixing solution poured in. When the fixing is complete the film is washed in running water and then hung up to dry out ready for printing.

There are two main classes of tanks. Those known as "daylight loading" permit the whole of the operations, including the placing of the film in the tank, to be carried out in ordinary light. With the other type, known as "daylight developing," the film has to be placed in the tank in a dark room, but once this has been done, the developer poured in and the tank closed, the other operations can be carried out in daylight. There are several reliable



Darts players "checking up." This indoor picture, taken by artificial light, is the work of L. E. Dyer, Chelmsford.

makes of roll film tanks available at reasonable prices, and full instructions for their use are given with them all, so that no one need have the slightest difficulty in their operation. One particularly popular tank is the Johnson Tank, which is frequently advertised in our pages. This is marketed by Johnson and Sons Ltd., the well-known chemical manufacturers, who supply also suitable developing and fixing solutions for use with it. Tables are supplied with each bottle of developer to ensure correct development without calculations. The whole process is exceedingly simple.

I am sure that readers who take my advice to do their developing and printing will never regret it. There is a wonderful thrill in a good print that is entirely one's own work.

Fairey "Albacore" and "Fulmar"

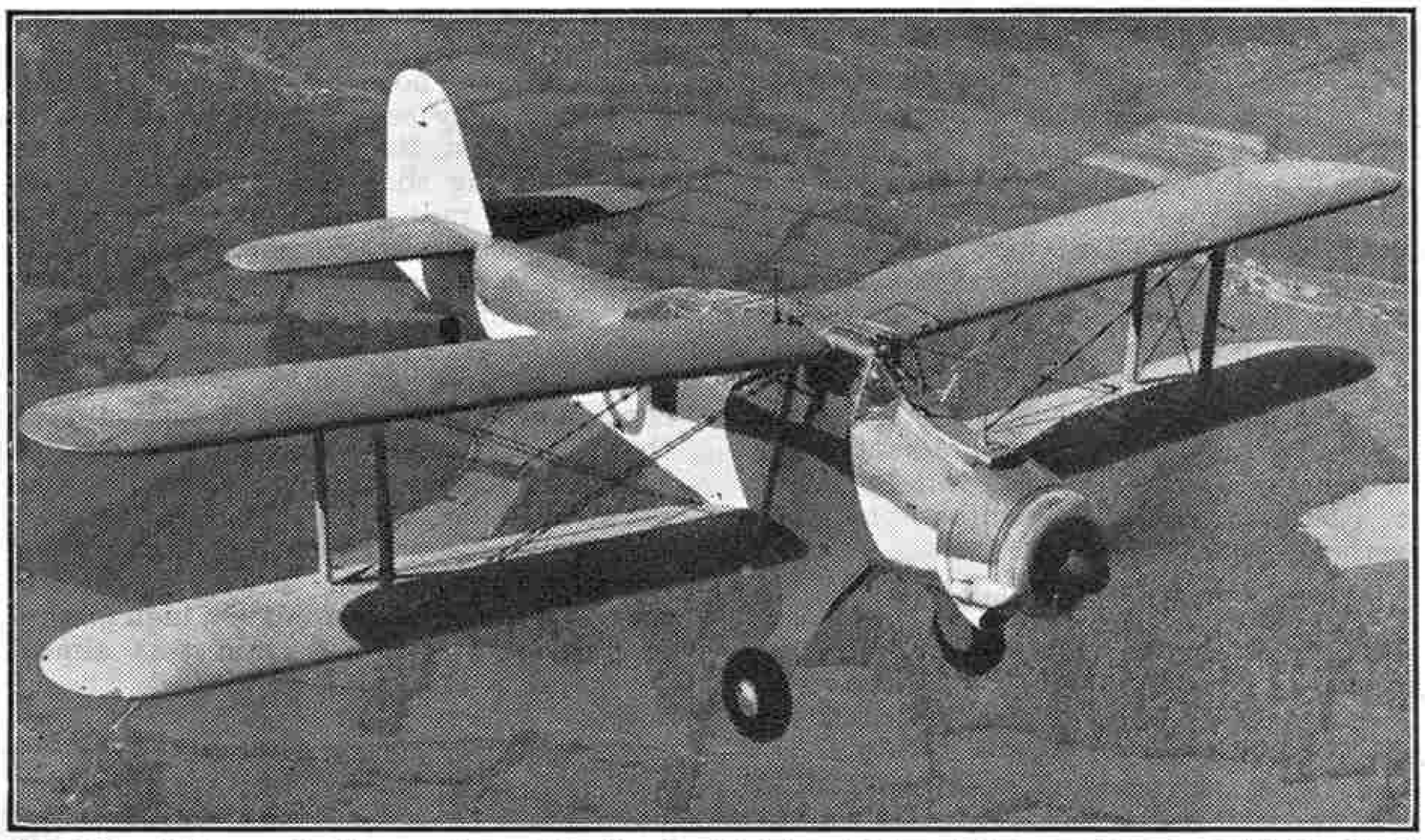
New Aircraft for the Fleet Air Arm

THE Fleet Air Arm has been greatly strengthened by new and powerful aircraft which have already scored notable successes in action against the enemy. The Fairey "Albacore" and "Fulmar," illustrated on this page, are two of these new types, and are produced by the builders of the famous Fairey "Swordfish" torpedo, spotter, reconnaissance biplanes that wrought havoc upon the Italian fleet in Taranto harbour last November.

The "Albacore" is the successor to the "Swordfish," and the aircraft are similar in most respects. The new machine is designed for dive-bombing in addition to torpedo, reconnaissance, and fleet spotting duties. Details of its performance are secret, but it can be said that it has come up to the highest expectations of the builders, both when used as a landplane from aircraft carriers or as a twin-float seaplane from other ships.

The pilot, high up in the fuselage and forward of the wings, has the best possible view in all directions. The other members of the crew occupy the rear cockpit, just behind the wings, with the navigator's seat in the cabin section, the centre of the necessary equipment. The gunner's position is at the rear end of this cockpit. Both cockpits carry full equipment for navigation, wireless telegraphy, observing, bombing, and fighting, and are covered by transparent hooding in which are sliding panels to permit rapid entry or exit by the crew.

When a full bombing load is not carried a torpedo is suspended between the fixed legs of the undercarriage. Incidentally the "Albacore" has done much destructive work against German naval vessels by means of this weapon. The dinghy for emergency "evacuation" of the machine is carried in the rear part of the fuselage.



The Fairey "Albacore," which can be used for dive-bombing, torpedo dropping, reconnaissance, and fleet spotting. It is an equal-span biplane. Photographs by courtesy of the Fairey Aviation Co. Ltd.

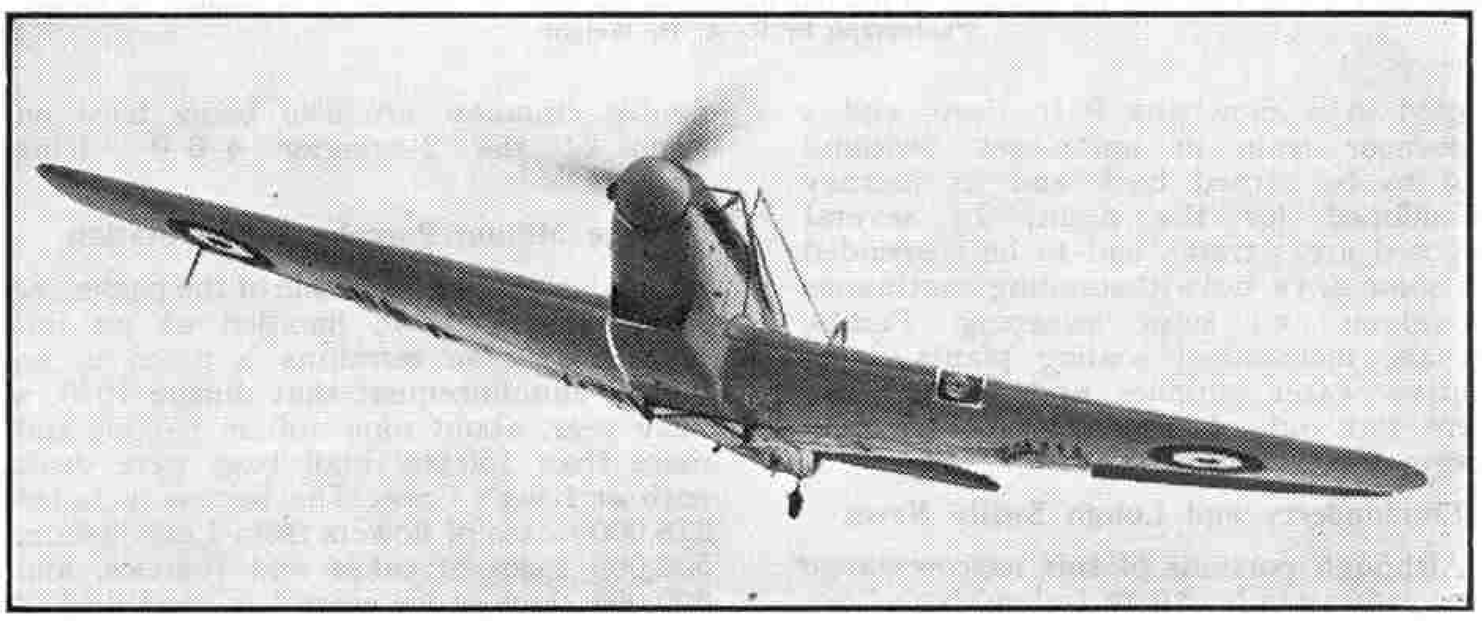
The fuselage is of stressed skin construction, and the wings and control surfaces have metal frames and fabric covering. A Bristol "Taurus" engine is fitted.

The Fairey "Fulmar," shown in the lower photograph, is a great contrast to the "Albacore" both in design and purpose. It is a two-seater fleet-fighter monoplane, and is the fastest and most formidable aircraft that the Fleet Air Arm has ever possessed. The forward armament of eight guns in the wings make it the most heavily armed aircraft of its kind in the world, and it had no sooner undergone its "baptism of fire" than it was very aptly nicknamed the "Spitfire of the Sea."

The "Fulmar" has been developed from the Fairey P.4/34, which was flying in the early part of 1937 and attracted considerable attention at the Brussels Aero Show in July 1939. The P.4/34 outclassed anything of its type in the world, with a top speed of 284 m.p.h. at 17,200 ft., carrying a full bomb load of 1,000 lb. It had a range of about 1,000 miles, at 230 m.p.h.

In developing the "Fulmar" from this machine important improvements in design were achieved, with resulting all-round increase in performance, and it was modified from the earlier machine to make it suitable for Naval work. The chief changes are the fitting of eight guns in the wings, the provision of catapult points and a deck arresting hook, and room for a dinghy to be stowed aft of the cockpit. To improve production round-head rivets instead of the flush type were used in those parts where they do not interfere seriously with performance. A 1,145 h.p. Rolls-Royce "Merlin" X 12-cylinder Vee liquid-cooled engine, with two-speed supercharger, is fitted and drives a three-bladed constant-speed airscrew.

The pilot both flies the machine and fires the guns, and the second man is radio operator and observer. There is no rearward armament. The enclosed cockpit has a transparent sliding hood over the pilot and a tip-up windscreen over the observer. The undercarriage retracts inward.



Fairey "Fulmar," the Fleet Air Arm's fastest two-seater Fighter. It has eight machine guns in the wings.

RAILWAY NEWS

Main Line Electrification

Work on the complete electrification of the Manchester-Sheffield main line is suspended for the duration of the war, and it has also been decided not to proceed yet with the construction of the remaining new locomotives. The first of the new standard mixed traffic bogie electric engines has been completed for trial purposes, however. This is No. 6701, painted green, and is designed for speeds up to 65 m.p.h. and for working 1,000-ton mineral trains over steep gradients and for general service. Current will be taken at 1,500 v. D.C. by pantograph from overhead cables.

New Industrial Locomotives

Many of the private railways owned by large industrial and utility concerns are particularly busy at the present time. Among new engines that we have noticed at work on private freight lines recently have been an 0–6–0 inside-cylinder saddle tank, No. 13, painted black with red coupling rods, built by the Hunslet Engine Co. Ltd. for the Mersey Docks and Harbour Board; two outside-cylinder 0-4-0Ts fitted with cranes by Robt. Stephenson and Hawthorns Ltd. for a well-known north-east coast firm of shipbuilders, and two 0–6–0Ts, named "*Peplow*" and "*Denna*," respectively, from the shops of Hudswell Clarke Ltd. for a Potteries firm.

Many Broccoli Specials

Broccoli-growing in Cornwall has developed from small beginnings during the last few years to an important British food production industry, in which the G.W.R. have given active co-operation. In the early months of each year wagons loaded at many country stations in the far west are formed into fast special goods trains bound for London or other large towns and markets, and deliveries up to 300 miles away have been effected within 24 hours of cutting the vegetable.

Little "Green Arrows"

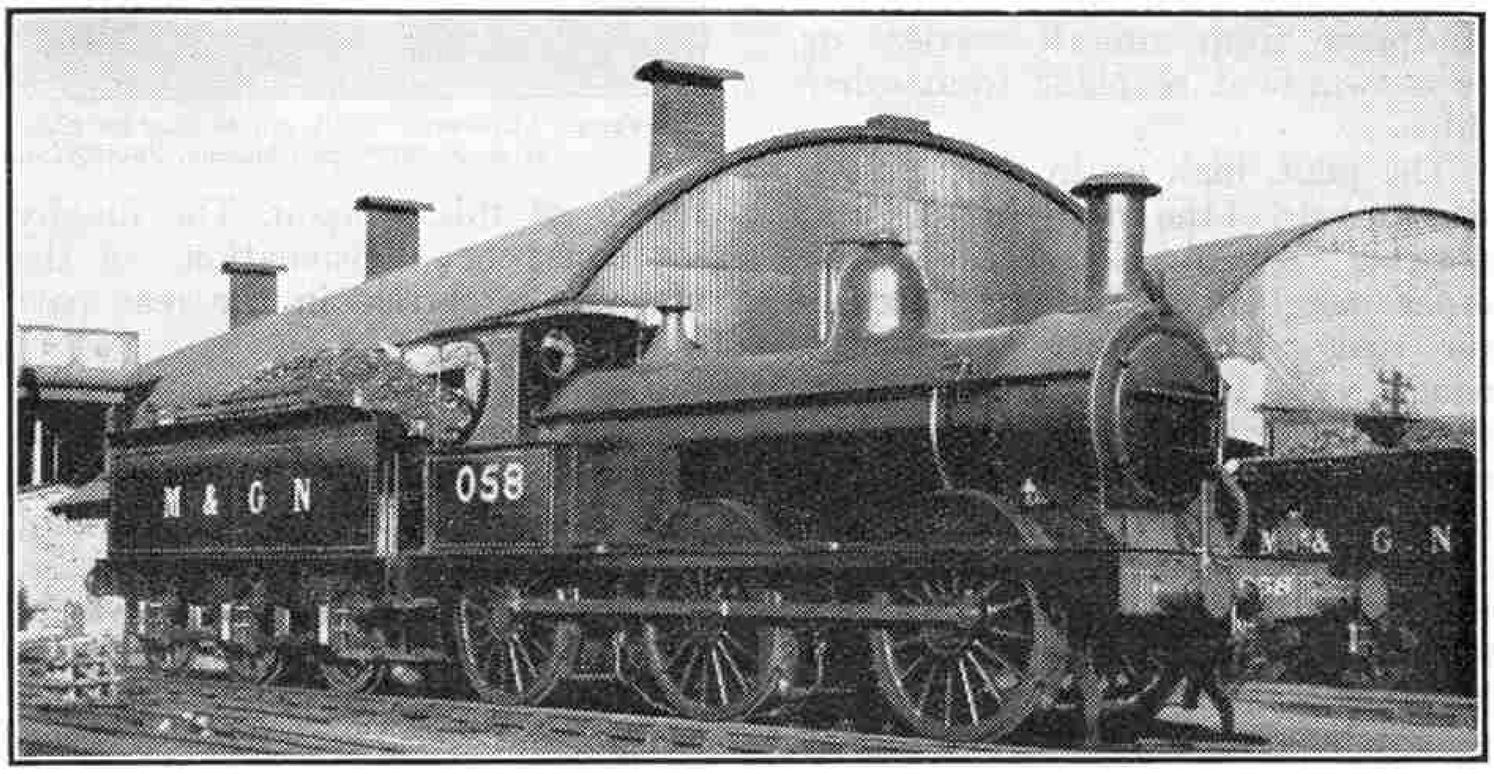
"*Bantam Cock*" is the appropriate name of the first of the two new "V4" class 3-cyl. 2–6–2 mixed traffic locomotives just placed in service by the L.N.E.R. They are smaller versions of the very successful "V2" or "Green Arrow" class, weighing with tender 113 tons compared with the 145 tons of the "V2." Although very powerful, they will be within the weight limits of many secondary routes or main lines along which at present the running of "Green Arrow" and "Pacific" engines is prohibited.

With over 2,000 engines of the 2–6–0 and 0–6–0 type already in existence, together with 118 "V2s" and their new smaller sisters, the company possesses a comprehensive stud of goods and mixed traffic locomotives, now much in demand.

Fighting the Snow Fiend

The Censor now permits us to report that extremely severe weather conditions in January last, though not so continuously bad as during the previous winter, interfered with railway services over many parts of Scotland and northern England. This made necessary strenuous efforts on the part of the staff and soldiers who assisted to get the lines cleared.

In Scotland 13 snow ploughs were continuously at work for a fortnight on the L.N.E.R., one becoming damaged at a level crossing through frost causing railway sleepers to rise. Hundreds of miles were covered by locomotives that ran up and down branch lines to keep them clear and prevent drifts forming. On high ground in Yorkshire a goods train was almost buried in a snowbank 9 ft. deep, and a passenger train in north-east Scotland had to be turned back and its journey abandoned for the night. In several exposed areas traffic had to be suspended for some days, notwithstanding continuous ploughing and snow sweeping. Points, signals, mechanical coaling plants, locomotive water supplies and so on, also were put out of action temporarily by severe frost.



A standard 0-6-0 of Midland design as provided for service on the Midland and Great Northern Joint line. Since the L.N.E.R. took over the operation of this line the engine has had "0" prefixed to its number, as shown. Photograph by R. A. H. Weight.

Londonderry and Lough Swilly News.

Although portions of this narrow gauge light railway in Northern Ireland have been closed, passenger trains still work between Londonderry and Buncrana. Freight only is now carried between Londonderry and Letterkenny. Four locomotives were sold in 1940; 11 remain and these are of the 4-6-0, 4-6-2 and 4-8-4 tank classes built between 1899 and 1904.

Striking S.R. Locomotive Improvement

The steaming capacity of the "Lord Nelson" class 4-cylinder 4–6–0 express locomotives has been greatly increased as the result of modifications, following extensive trial and experiment. Heavier trains can now be handled at higher speeds, and with loads equal to those formerly taken these engines can do their work at from 5-10 per cent. earlier cut-off than before the re-designing of the front end, so that they are more economical. The steam and exhaust port areas have been increased; the piston valves are now 10 in. in diameter instead of 8 in.; the steam passages have been re-shaped with easier bends; and the new large chimney, which is being placed above a Lemaitre multiple-jet blast pipe, has a diameter of 25 in.

As there are no Continental expresses over the heavily-graded Folkestone-Dover routes, the "Lord Nelsons" at present work almost entirely from Waterloo to Bournemouth and Salisbury. The photograph reproduced on page 119 by courtesy of the Editor of "*Railways*" shows the pre-war "*Bournemouth Belle*" Pullman express getting into speed, hauled by one of these modified engines, which have the new style lettering.

Blast pipes of the Lemaitre type in conjunction with large chimneys are also appearing on many more of the "Schools" class 3-cylinder 4–4–0 engines. Similar developments, as well as an experimental double chimney, are also being tried on some of the 2-cylinder 4–6–0 "King Arthurs."

Nine Million Parcels at One Station

An idea of the magnitude of the passenger train parcels traffic handled at an important London terminus is given in an official announcement that during 1940, a busy year, about nine million parcels and more than 100,000 mail bags were dealt with at King's Cross. The parcels included 276,000 boxes of flowers from Lincolnshire, 500,000 cases of cakes and pastries, and 800,000 cases of ice cream! A good deal of the sorting, unloading and dispatching had to be done in difficult black-out conditions.

There are 550 platform barrows at King's Cross, including mechanically-propelled conveyors for parcels. Improved subway and parcel office facilities are partially completed.

"Brighton Atlantics"

At the end of 1905 Mr. Earle Marsh's first new design for the former London, Brighton and South Coast Railway was an engine of considerable size and power for a line of comparatively short express routes. As a 4–4–2 or "Atlantic" express locomotive it was to a great extent a replica of the by then famous Ivatt Doncaster type on the Great Northern Railway, though with the higher boiler pressure of 200 lb. per sq. in. Numbered 37-41, afterwards 2037-41, five of these "H1" Atlantics were built. They introduced the umber brown painting style on the L.B.S.C., replacing the once familiar Stroudley yellow.

Six more engines, classed "H2," appeared in 1911-2, provided with cylinders 21 in. in diameter instead of the previous 19 in., superheaters and 10-in. piston valves. In accordance with the custom of the period the engines of the first batch were not superheated and had slide valves. The "H2s" were originally numbered 421-6 and are now S.R. Nos. 2421-6. They are painted green, and carry names of well-known headlands in the southern counties. The boiler pressure of the superheated engines was 170 lb. per sq. in., but has lately been increased on most of them to 200 lb. per sq. in. The "H1" batch have also been superheated, and several detailed changes in outside dimensions have been effected in order to render both series suitable for running on any main section of the S.R. The "H2" engines have a straight raised frame forward from the rear splasher; the "H1s" have frames raised in front of the splashers only.

In L.B.S.C. days Hasler speed recorders were fitted, also the Westinghouse brake, which was then universal on that system. They now retain the air brake on the engine, acting in conjunction with standard vacuum throughout the train. They have been and still are very good engines. After their displacement from the most important London-Sussex coast express duties by "King Arthurs" and subsequent electrification they did a good deal of work on the Eastern Section main line, but are now found often on the Western division.

Right up to the war the "Atlantics" were constantly employed to haul the Victoria-Newhaven boat expresses, which frequently were loaded heavily. They also took a considerable share in working the through L.M.S. and G.W. services to Brighton and other resorts in the south east, as well as in handling various special steam trains.

S.R. "Atlantic" No. 2426 "St. Albans Head" on a Kent Coast express leaving Bromley South. Photograph by J. Sturt.

Electric Sleet Locomotives

One of the problems of railway electric traction in the open is the possibility that ice or snow adhering to the conductor rails may impede or stop the flow of current to the shoes carried on the motor coaches or electric locomotives. The London Passenger Transport Board have recently converted some old motor coaches to form new bogie "Sleet Locomotives," equipped with apparatus to spray anti-freezing mixture from a 75-gall. tank on to the live rails, whether they be on the right or left-hand side of the vehicle. The sprayers are controlled from the driving cab. Pneumatically-operated wire brushes and ice crushers also are fitted to aid in clearing any snowbound sections of rails during severe weather.

A new sleet van for haulage in an electric train on a similar mission has just been added to the L.M.S. stock.

BEATING THE BLACK-OUT AND THE "BLITZ" ENGINE DEPOTS "CARRY ON"

One of the most outstanding features of the transport services is the good work that is being done at the locomotive depots of the railways, where the problems both of the black-out and the air "blitz" are being tackled and beaten every night. Normally the engine sheds and the adjoining tracks are brightly illuminated at night, but now everything is carried out under subdued lighting systems controlled by master switches, which are brought into use at a moment's notice to black out the lights when air raids occur.

More work is being carried out during daytime where possible, but there is much that has to be done during the night hours. Engines coming off the trains to be "stabled" require attention. Clinker and ashes are dropped into shallow pits between the rails, partially filled with water that instantly dims the glowing embers. A visit is made to the coal stage, or coaling plant and water column for refuelling; to the turntable, and thence to one of the lines in the engine shed, where fitters and boilermakers deal with any defects that have been reported.

Whitewashed walls and locality marks assist the work, and although air raid shelters are provided, things have to become pretty hot, as they sometimes do, before the men cease work. Groping through the black-out is not an easy matter these nights, and the spirit of the enginemen reminds one of the early days of the first railway in the world, when Timothy Hackworth, the engine superintendent of the Stockton and Darlington line, and his band of workers straggled and sweated by night in the first railway engine shed at Shildon in County Durham, to keep his fleet of locomotives in running order for the haulage of coal trains on the line the following day.

Wartime brings sudden calls to the depots, and although it normally takes three hours for a locomotive to obtain a proper "head" of steam, the systems of distribution are now elastic so that engines rostered for routine trips may be changed over to other duties at short notice. "Government traffic" is the discreet description for many of the special trains for which engine power is needed, and heavy coal trains also are making increasing calls for locomotive energy.

So that the engine drivers may have their trains always fully under control in the event of a sudden emergency, freight trains travel during night "alerts" at speeds up to 10 m.p.h. and passenger trains up to 15 m.p.h. During daylight air raids passenger trains and braked goods trains travel at speeds up to 25 m.p.h. and other goods trains up to 15 m.p.h. Experience is showing the value of these rules, although there obviously must be variations in the running times and passengers may be delayed. Enginemen reporting for duty for certain trains may also be affected by air raids occurring in other districts, and alternative duties have to be arranged wherever possible.

Improvement works carried out at many locomotive depots before the war are saving much time and avoiding heavy labour. Automatic coaling and water-softening plants are proving their worth, and the additional breakdown trains are doing excellent work.

To-day the enthusiasts who followed with interest and fascination the activities of railway locomotives are for the time being unable to practise their hobbies to the same extent as in peacetime. This is largely due to the need, for reasons of national security, of refraining from the disclosure of details of railway traffics.

The pre-war "Bournemouth Belle" Pullman express, hauled by a fine modified "Lord Nelson" with new style lettering. Illustration by courtesy of the Editor of "Railways."

Hunting for "Flying Tigers"

Interesting Caterpillars that can be Found This Month

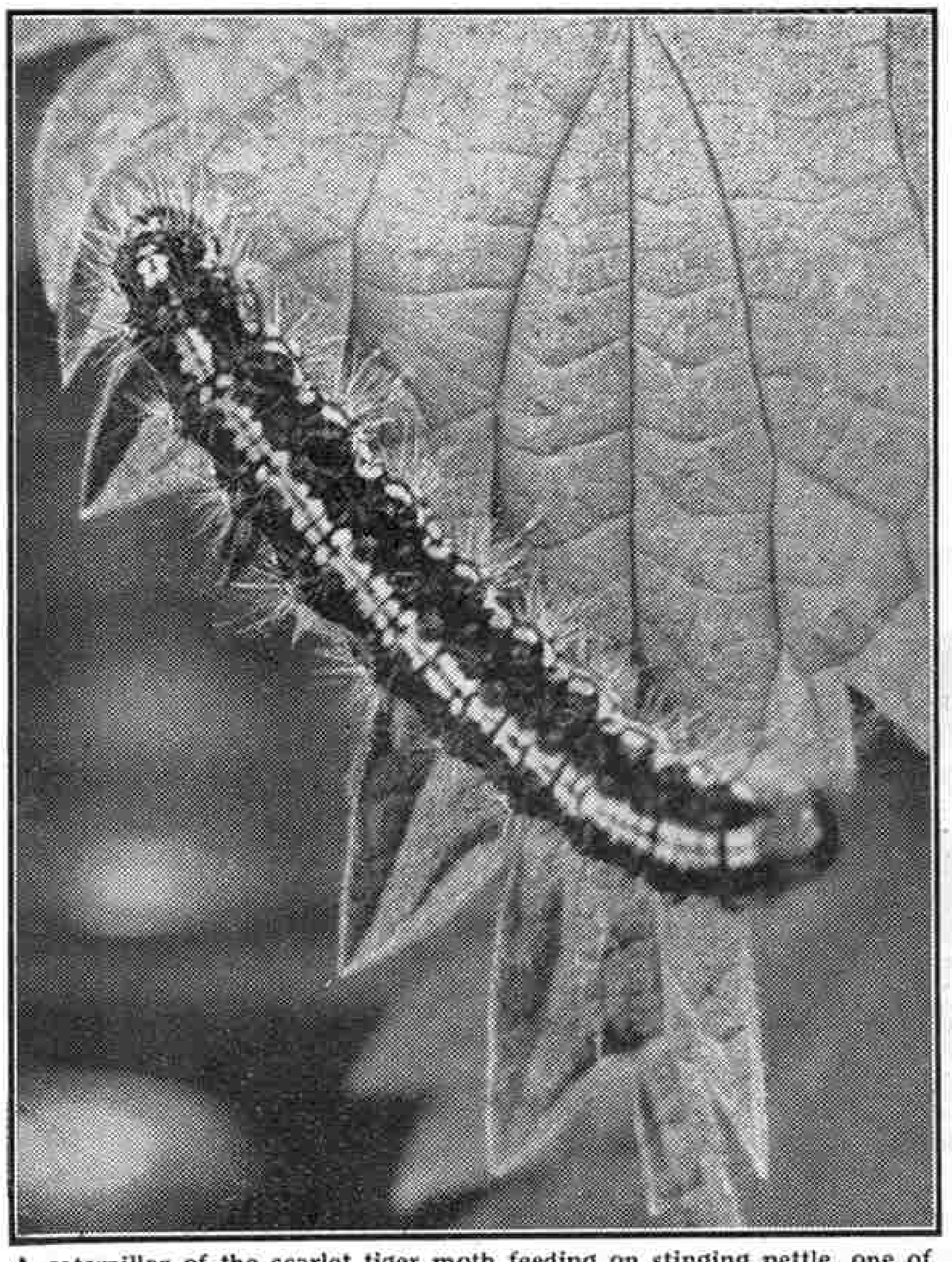
By L. Hugh Newman

HUNTING for Tiger Moths is not as difficult as you might imagine, as unlike most moths they do not sleep all day, but delight in buzzing around in the sunshine. Some of you may have even mistaken these "flying Tigers" for large-bodied butterflies when you saw them for the first time in country lanes, fields and woods, because of their richly coloured wings. If you want to breed any of these Tigers this summer, now is the time to start looking for the caterpillars. I think the easiest to find is the woolly bear, which some of you may know eventually turns into the common Garden Tiger Moth.

This Tiger has been very badly named, as it certainly is not a garden moth at all. The sort of place where you find these woolly bear caterpillars is on beds of stinging nettles in farmyards, where colonies of them feed, or out in a field near a haystack, as they like to be close to some sheltered spot to which they can crawl if it turns very cold, as it so often does in the spring. They have, of course, been hibernating all the winter, curled up in tiny furry balls, either in the hay or in some dried leaves lying about in the farmyard.

The Garden Tiger Moth is a handsome creature; it has chocolate fore-wings, patterned with creamy-white veins, and brick red underwings dotted with dark blue eye spots. The female lays her eggs in batches of about 20 to 100 on a leaf or stem of any common hedgerow weed, and consequently the caterpillars will eat a variety of food plants besides nettles. They thrive equally well on dock, dandelion, dead nettle, and low growing hawthorn bushes.

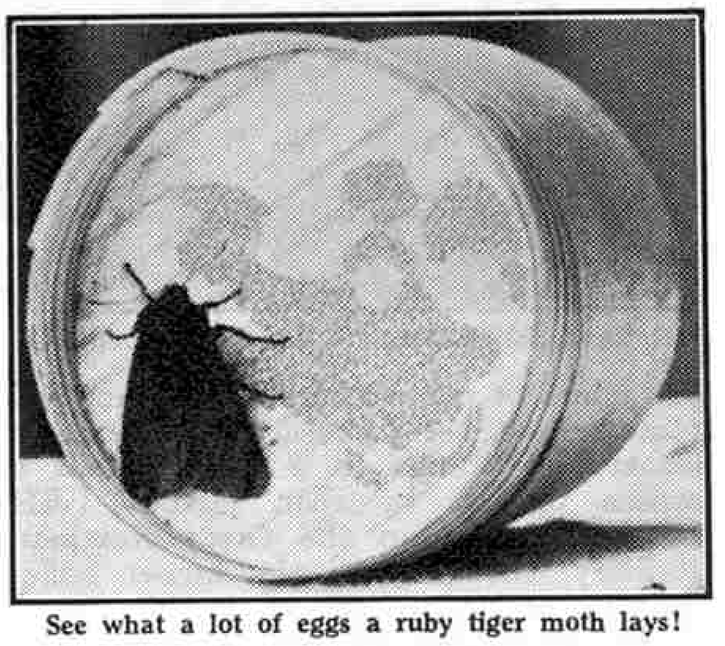
While you are out searching for Garden Tiger Moth caterpillars you may easily find one or two of a rarer Tiger Moth, the Cream Spot Tiger. Instead of brilliant reddish underwings, this moth has creamy-yellow ones with black eye spots dotted about on them, but it gets its name from its upper wings, which are a lovely velvety-black, veined and splotched with cream-coloured markings.



A caterpillar of the scarlet tiger moth feeding on stinging nettle, one of the common weeds that this family of moths always choose.

The caterpillars of this rarer moth live in much the same surroundings as the Garden Tiger, but they are particularly fond of sunning themselves on the edge of a roadway. You can sometimes come across them squashed flat on the road by a passing motor car, but if you find a live one try and pick it up and you will get a great surprise. You will find it is as slippery as an eel, despite its furry coat, and it will run for all it is worth!

I think this is one of the ways you can tell the difference between these two Tiger Moth caterpillars when they are small. The Cream Spot Tiger always "makes a bolt for it," while the Garden Tiger prefers to curl up in a ball like a hedgehog. When they are both in their last skin, before changing into pupæ, there is no mistaking them. The Cream Spot Tiger caterpillar is bitter chocolate brown, with rather short, bristly hair all over it, while the Garden Tiger appears in a superb long silky coat, waved and silvery at the tips, and marked in rich chestnut brown and black on its body.



See what a lot of eggs a ruby tiger moth lays!

Perhaps my favourite among all the Tigers is that very local one called the Scarlet Tiger. This moth is well and truly named after its colour, as the underwings really are vivid scarlet. I know of only one case of a yellow Scarlet Tiger ever having been caught on the wing, and my father, who caught it, told me it was the most curious thing he had ever seen—one Tiger with bright, primrose yellow wings flying about among dozens of typical scarlet ones.

From this one specimen my father managed to breed a whole race of yellow Tigers, and by careful selection over very many years he even managed to breed orange ones as well! At present we have a race of black Scarlet Tigers on our "Butterfly Farm." By black I do not mean they have no other colour at all, but the pale markings on the upper wings that are so characteristic of most of the Tiger Moth family have been eliminated. When the moth is at rest, with its upper wings folded over its brilliant lower ones, it looks as if it were all black, and you would hardly recognise it as a Tiger at all.

When I said that Scarlet Tigers were very local I meant that the females never stray very far to lay

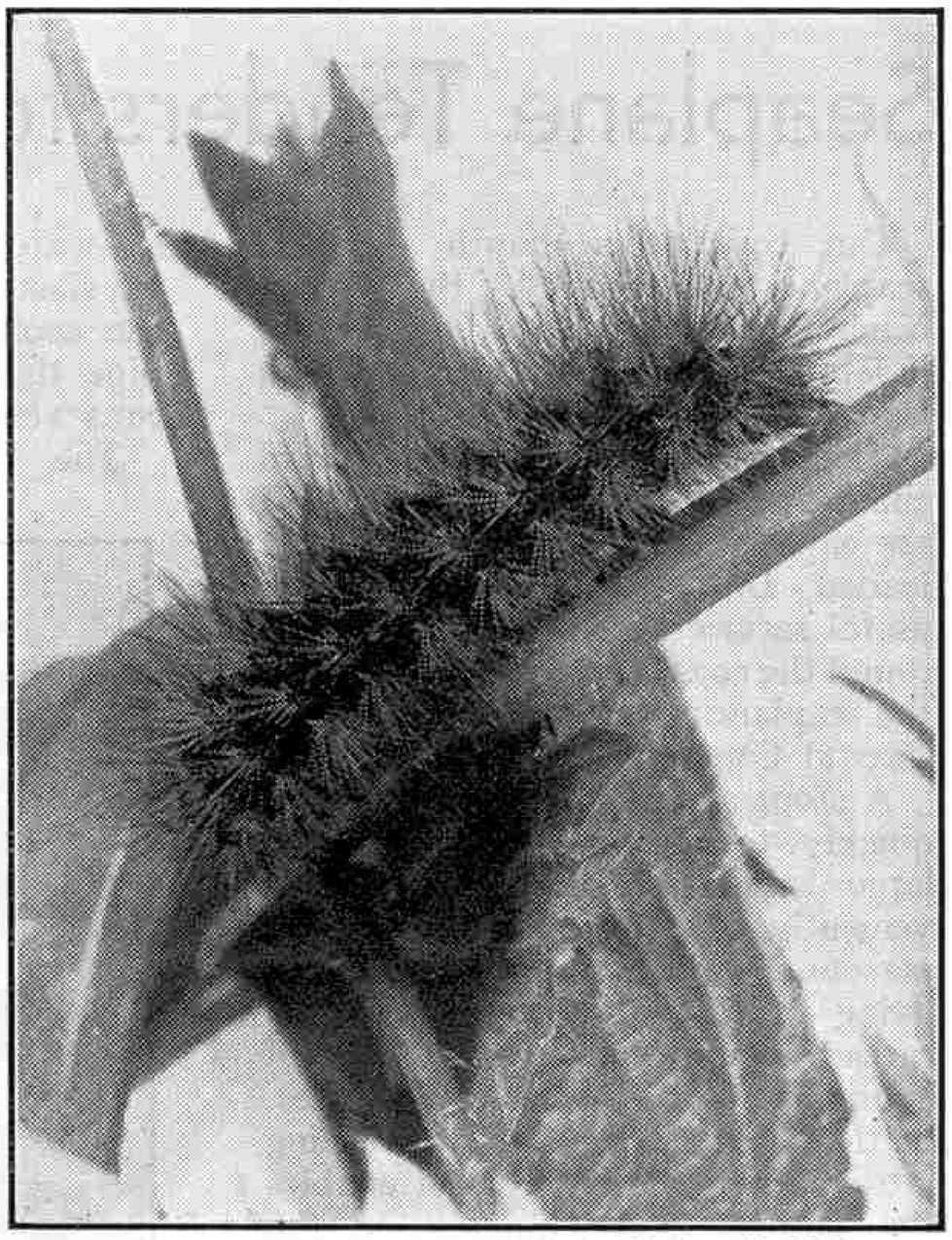
their eggs, and so the moths have the peculiar habit of sticking to the same place to live and breed in year after year. There is a little cove between St. Margaret's Bay and Deal in Kent where you can see thousands of the spiny grey and yellow caterpillars of this Tiger feeding on the weeds that grow at the foot of the high chalk cliffs. But if you walk round into the next cove you won't see a single Scarlet Tiger moth caterpillar. To my knowledge they have been in this same place for more than a quarter of a century, and according to butterfly and moth books published over 100 years ago they appear to have been just as common there in those days as they are now.

Although Scarlet Tigers are numerous enough when you do happen to stumble upon one of their natural "homes," they are really rare, as the moth occurs in very few localities. I know of only four or five places where it can be seen in Southern England.

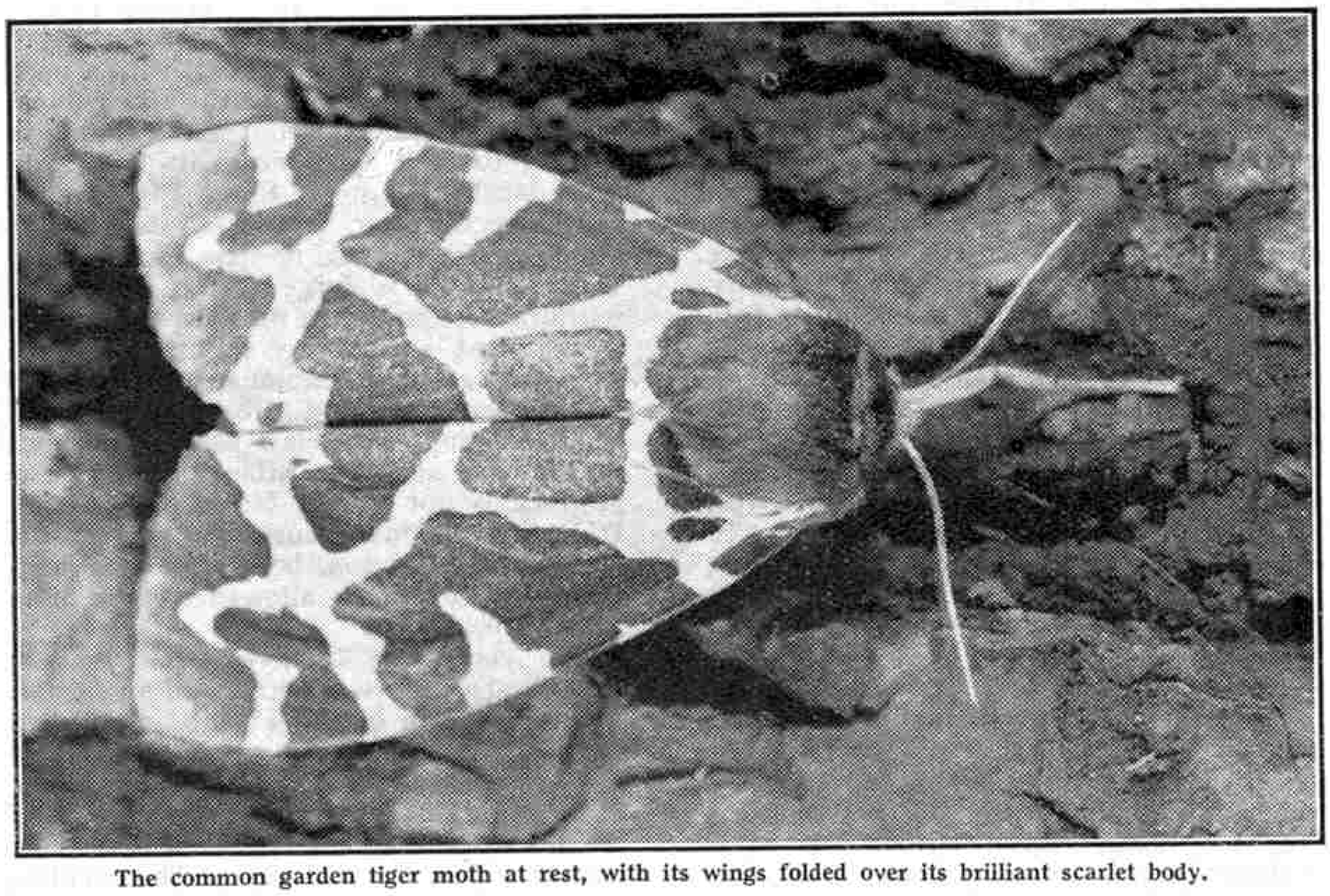
From its name you would not think the fourth on our list was a British Tiger moth at all; it is called the Jersey Tiger, which sounds as if it should come from the Channel Islands. As a matter of fact it is very common over there, but you can find it also along the coastline of Devon and Cornwall. Scientists still argue as to whether it is really a British species, or if a few of them were once introduced to this part of our country by some keen naturalists. There is also the remote possibility that a female Jersey Tiger may have been blown over the Channel in a gale and laid her eggs on arrival, so forming the nucleus of our British race.

There is one point in the life history of the Jersey Tiger that makes it different from all the others. The caterpillars are not true hibernators. The female lays her eggs in August and these begin to hatch out in 10 days to a fortnight. They like the weeds that all the other Tiger moths feed on, but they also take readily to honeysuckle or bramble leaves in the autumn. These alternative foods are not of very much use when breeding Jersey Tigers in captivity, however, as they have the annoying habit of wanting to feed on and off throughout the whole winter, and so it is best to start them off on something like dead nettle or dandelion, which is fairly easy to find even in frosty weather. Probably the reason why they do not hibernate properly is that the climatic conditions in which they normally live do not necessitate a winter sleep, and they have not yet had time to acclimatise themselves.

The last two Tigers found in England are both small ones, and are named the Ruby and the Wood Tiger respectively. Needless to say the Ruby Tiger is deep ruby red in colouring, with lots of tiny black pin points all over its wings, which give it a sooty appearance. You are not so likely to see the little Wood Tiger, which is rather shy in its habits and lives in woods, as the name implies. It is double-brooded, and is seen on the wing in May and again in August.



The cream spot tiger caterpillar is a typical "woolly bear." Birds never eat larvæ of this kind as the hairs would stick in their throats.



The common garden tiger moth at rest, with its wings folded over its brilliant scarlet body.

And here I had better warn you that it is no good looking for the Tigers in woodland glades feeding from flowers, as the various kinds of butterflies always do in summer. Tiger Moths have no tongues, so that flowers have no attraction for them, and naturally their life, without any form of nourishment, is very brief.

Now that I have told you something about each one of the Tigers, you will know what to look out for this summer. But don't forget to search for woolly bear caterpillars now, during April, and if you find some you can keep them in a cardboard box or a breeding cage.

You must give them fresh food every day. The best way is to dig up a root of dandelion or dead nettle and put it in a bottle of water, and stand it in your cage. Plug the sides of the bottle with cotton wool, as caterpillars sometimes "commit suicide" by crawling down between the stems of their food and drowning. Before long they will be full grown, and begin to spin cocoons in the corners of the cage. Then, within a fortnight, they will start to emerge and turn into "real" Tigers!

Seaplane Tenders for the R.A.F.

Our cover this month shows a seaplane tender built by the Walton Yacht Works Ltd., to whom we are indebted for the illustration on which the picture is based.

These boats are built on the hard chine or semi-planing principle, and are capable of 30 m.p.h. when fully loaded. Dozens of them are doing useful service at R.A.F. Stations all round the coast and overseas, tending the seaplanes and flying boats of the Coastal Command.

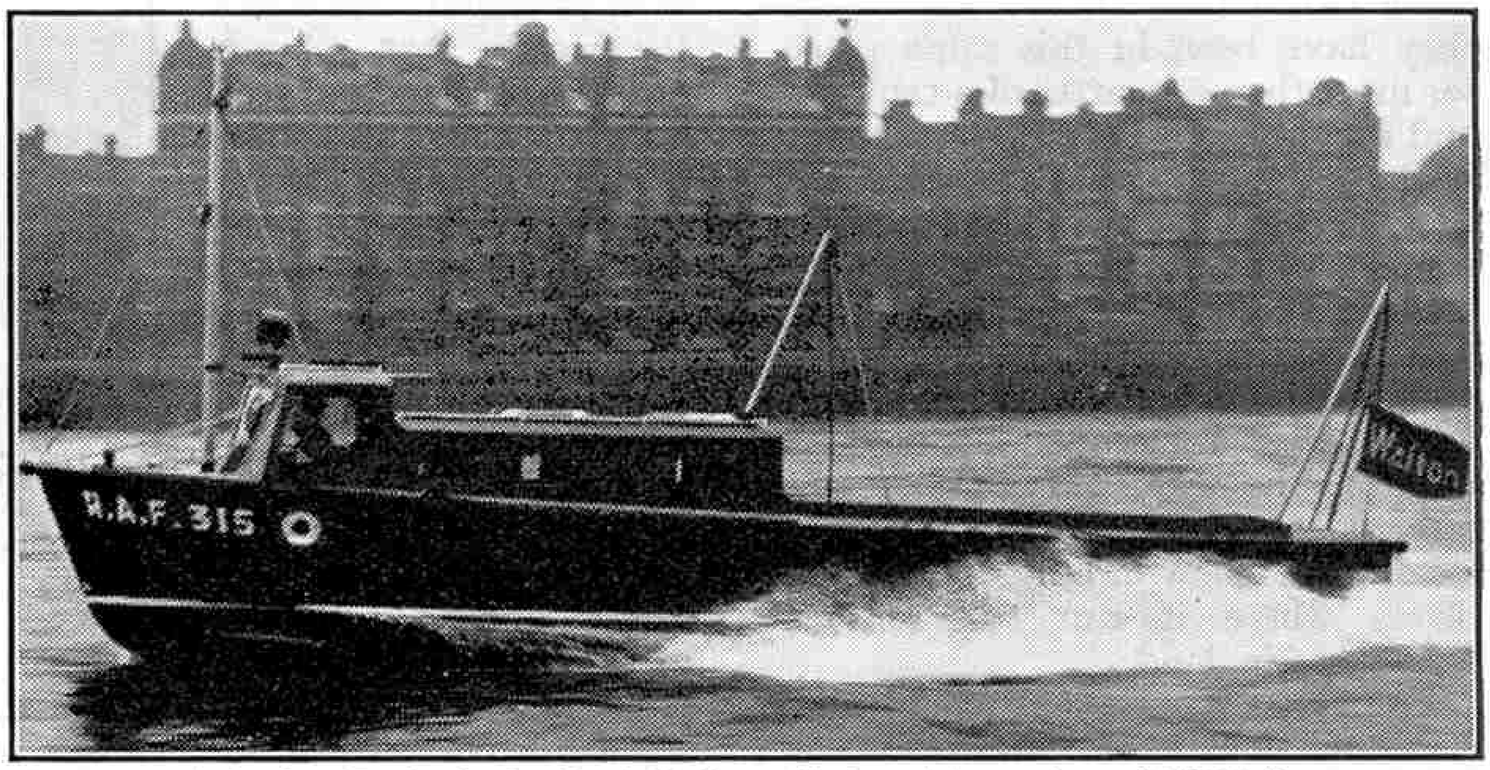
A stout sampson post is fitted for quickly towing machines, and the large cabin and cockpit are conveniently arranged for ferrying personnel and equipment between flying boat and store. The boat carries also an enormous amount of equipment for use in emergencies. In the event of an aeroplane crashing into the sea, the high speed enables the launch to be quickly on the scene. Collapsible frames in the cabin accommodate four stretchers, and for repairs to damaged aircraft a platform can be rigged outside the boat just above the water level.

The propelling machinery consists of two Perkins Diesel engines delivering 130 h.p. each at 2,250 r.p.m. Cooling is looked after by pumping sea-water around the cylinder jackets. No silencer is fitted, but by injecting the cooling water into the exhaust pipe this is cooled, and the engine runs very quietly.

The boat is constructed almost entirely of mahogany, with brass or copper fastenings. The frames are assembled upside down on a jig, and not turned over until the planking is fitted and the hull complete. The hull is then set up on stools, and work on the interior commences. Engine beds extend almost the whole length of the boat, and add considerably to its strength. Meanwhile, the cabin and wheelhouse has been built separately, and is dropped in place as soon as the decks are laid.

The normal crew is three men, and a small galley and lavatory is fitted, but the boat is not fitted for them to live aboard. Fuel is carried to give a radius of 200 miles at full speed, and a transmitting and receiving wireless set is carried.

For the information contained in this article we are indebted to the courtesy of the Walton Yacht Works Ltd., Walton Bridge, Shepperton, Middlesex.



A Seaplane Tender for the Royal Air Force. Photograph by courtesy of "Flight."

How Fast is a Flash of Lightning?

We speak of something happening as quickly as a flash, but few realise how short a time this really is. Lightning usually consists of many successive discharges travelling along the same path, and these may occupy a second altogether. The time required for the passage of a single flash is very much less however, and probably is about one hundred-millionth of a second.

It is amazing that so much energy can be concentrated into so short a time, and can do so much damage. The passage of the discharge causes intense pressure to be developed, and this may rise to its full extent in a few millionths of a second. This pressure is the cause of the thunder and gives rise to much of the damage that occurs when a tree or a wooden building is struck, the vaporisation of moisture in the wood adding to the pressure. The strength of the current of a flash varies widely. It may be one of 1,000 amp. or even less, but it may be as much as 200,000 amp.

High voltage electricity of all kinds is not easy to control, and efforts are continually being made to devise better methods of installation. An interesting scheme that has been put into practice by the Westinghouse Electric and Manufacturing Company, East Pittsburgh, in the United States, makes use of porcelain insulators stamped out of damp material. The mixtures so far employed in the manufacture of porcelain insulators have contained 30 and 21 per cent. of water. The new porcelain is called Prestite. The porcelain clay mixture from which it is made is poured into a steel die and moulded by intense hydraulic pressure. It dries quickly and yields a sturdy porcelain that is not porous, and is a stronger barrier against the flow of electricity than ordinary insulating porcelain. As it is so much more effective it can be used in thinner sections. There is no difficulty in moulding it into intricate shapes, and little trimming is required before the moulded insulator is glazed and fired, or baked. To begin with it is being used in manufacturing parts for high voltage equipment such as fuse boxes, switch bases and lightening arrester caps. Suspension insulators for overhead wires to carry high voltage currents also are being made of it.

The World's Largest Tuna

The largest tuna ever caught by rod and line was landed at Wedgeport, on the coast of Nova Scotia, in September, 1939. It weighed 890 lb. Bigger fish have been caught by commercial fishermen, who have captured tuna weighing over 1,000 lb., the record for this kind of fishing being one of 1,130 lb. that was harpooned and landed at Wedgeport. This place is very popular with tuna fishermen, who with rod and line during two summer months last year collected 69 tuna with a total weight of 35,237 lb. or nearly 160 tons. The biggest of these weighed 815 lb.

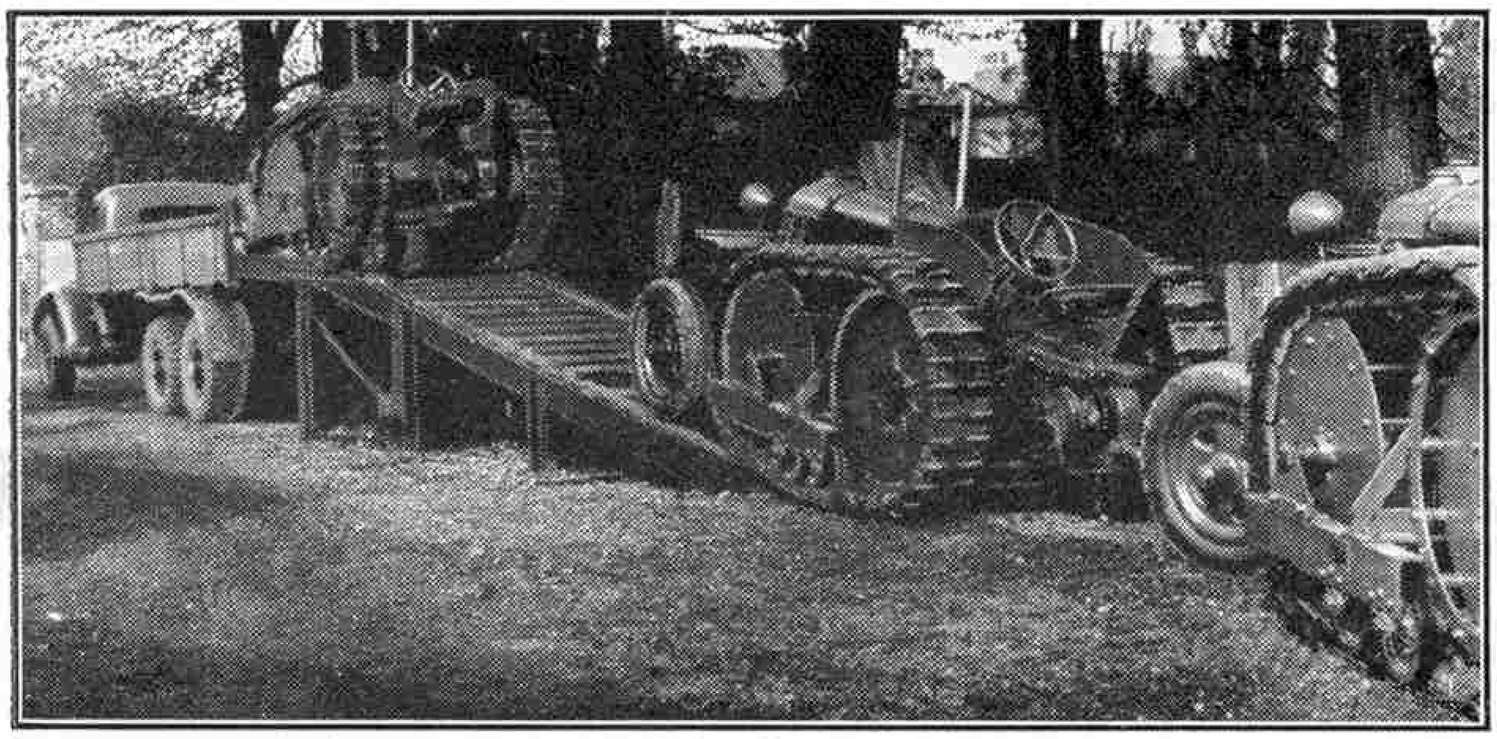
Notes on Canadian Wild Life

British Columbia has a clam with a neck 3 ft. long. This is known as the gooey-duck, or geoduck, and it is not very abundant or easy to find, as it buries itself in sand to a depth of 3 ft. It has a rugged shell nearly rectangular in shape, and this is always open, showing its light brown body. The "neck" is so large that it cannot be withdrawn completely into the shell.

The meat of this huge clam is excellent, as is that of other Canadian clams, which are either marketed fresh or canned. There are important clam fisheries on both the Pacific and the Atlantic coast. The geoduck is not sought for food, however. It is regarded as a curiosity, and in the State of Washington, bordering on British Columbia, nobody is allowed to take more than three a day.

The clams are bivalves, that is they have a shell in two pieces, like an oyster. The giant clam of the Pacific and Indian Oceans often grows to measure 2 ft. to 3 ft. across, and to weigh 400 lb. or more.

To round off this note on Canadian wild life is a story of a cackling goose that made friends with a flock of sheep. The cackling goose is the smallest of Canadian birds of this group, and the goose referred to alighted beside the sheep and decided to remain in their company. It followed them about on the grassy slopes leading to the sea, and remained there even when curious onlookers came near. The sheep actually became nervous before the goose.



A portable ramp for loading tractors on to motor lorries. Photograph reproduced by courtesy of Roadless Traction Ltd., Hounslow.

Engineering News

A Quick Way of Loading Tractors on to Lorries

The upper illustration on this page shows a novel method of loading tractors on to lorries for transport over long distances, which is a great time saver when several tractors have to be dealt with. The system makes use of a portable ramp that provides an inclined plane up which the tractor can travel under its own power to approximately the level of the lorry platform. At the highest point of the ramp there is a hinged counter-balanced flap, and when the front wheels of the tractor pass on to this it gently settles down on to the lorry platform. As soon as the rear end of the tractor has passed over the flap the counter-balance weights bring the flap back to its original position ready for the next tractor. The moment the hinged flap is released by the tractor the lorry can drive away and its place can be taken by another. The illustration shows one tractor loaded on the lorry, which is ready to move off, and a second tractor moving up the slope.

The ramp is constructed so that it can easily be moved to any desired position by means of a tractor. If an axle and a pair of wheels are put under one end and a single castor wheel under the other end, it can be moved and steered over hard ground; while if the ground over which it must travel is too soft or rough for small diameter wheels, small girder track units can be substituted for the wheels. The wheels or tracks of course can be removed when the ramp is in the desired position, so as to allow it to rest on the ground.

A tractor is not a particularly easy thing to lift, particularly where there is not much head room. The ramp described not only eliminates this and other difficulties, but effects a considerable saving in time.

We are indebted for these details and illustration of the ramp to Roadless Traction Ltd., Hounslow.

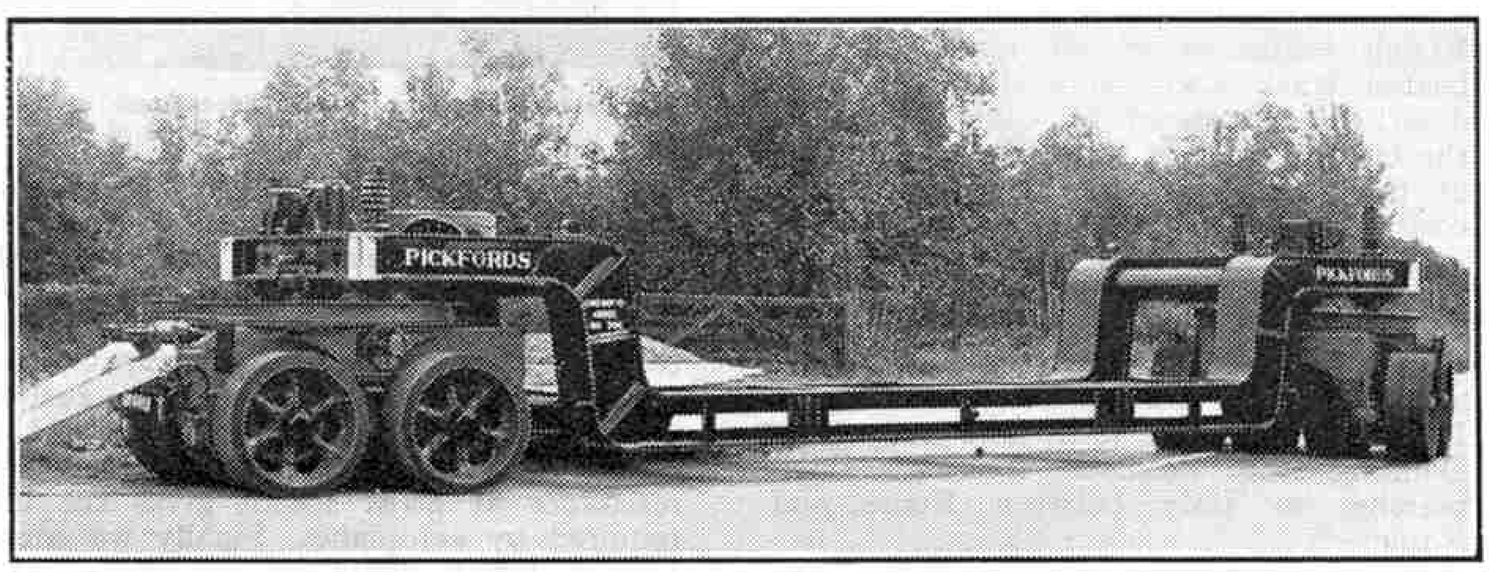
Giant Lorry for 80-ton Loads

An important addition to their wide range of special purpose vehicles has recently been made by Cranes (Dereham) Ltd. This takes the form of a double cranked multi-wheeled trailer designed for carrying loads up to 80 tons. It is shown in the lower illustration on this page, and is a double-ended 16-wheeled vehicle fitted with two bogies, each mounted on eight solid tyred wheels. The bogies are identical in every respect and either can be used as front or rear. The overall length of the trailer, excluding the drawbar, is 42 ft. 2 in., and the overall width is 7 ft. 9 in. The length of the main deck is 18 ft. 6 in.

The main frame is constructed from mild steel plates welded together to form two box-section girders, and it is strengthened by four torsion resisting cross tubes, each 12 in. diameter and $\frac{1}{2}$ in. thick. The ground clearance under the main frame is normally 9 in., but this can be increased to 15 in. when necessary.

Particular care has been taken to ensure that as far as possible the wheels conform to the contour of uneven roads, and all the axles are mounted on underslung springs.

Each bogie can be steered either by drawbar or by means of hand-operated gear, which works on a novel system in conjunction with a special form of turntable.



A 16-wheeler girder frame trailer designed for carrying loads up to 80 tons. It was built by Cranes (Dereham) Ltd., to whom we are indebted for our illustration.

The wheel brake shoes are 20 in. diameter and 4 in. wide, and operate in cast steel drums. Those at one end are operated mechanically, while those at the other end are operated hydraulically. If desired the brakes on any particular row of wheels can be controlled individually.

World's Fastest Motorship for War Service

The 19,850 ton Dutch liner *"Oranje,"* which is the world's fastest motorship, is to be converted into a hospital ship and then presented to the British Government for the evacuation of British casualties in the Near East. The *"Oranje"* was built at Amsterdam in 1939 for service to the Dutch East Indies via Genoa, and on trial reached 26.3 knots, a record speed for motorships. The cost of fitting out the ship for her war duties will be borne by the Dutch East Indies Government.

Metal Tape for Sound Records

Some of the metal tape used for sound recording at the New York World's Fair last year was only 1/20 in. in width and 1/500 in. thick. It was made of "Vicalloy," an alloy capable of being rolled and drawn, and which is intended for the manufacture of permanent magnets. The name is derived from the initial letters of vanadium, iron and cobalt, the three constituents of the alloy.

The World's Tallest Building

A definite stage has now been reached in the construction of the great Palace of the Soviets that is being erected in Russia. The engineers have completed the foundations, which were begun in 1935, and work is in progress on the building itself. It will be more than 1,300 ft. high, and will be the world's tallest man-made structure, surpassing by over 50 ft. the Empire State Building, New York, which is at present the tallest building in the world. The work now in progress consists of the erection of two circles of steel columns, which will form the building's central shaft.

A Novel Bridge

A small bridge recently built at Madison in the United States is constructed on a very interesting system. It consists of two arches 73 ft. long made from 1 in. by 8 in. pine boards bent to the required curvature, and bonded together with casein glue. The arches are spaced 6 ft. apart, and are braced with metal ties to guard against sway. The floor consists of 3 in. by 8 in. redwood planks attached to the arches with wood screws.

Port of Yokohama to be Extended

The Japanese claim that Yokohama will be the largest port in the world when a new plan of harbour construction now to be undertaken has been carried out. The plan aims at an enlargement of the port to make it capable of accommodating any large ocean-going vessel. Two canals are to be built to connect Yokohama with Tokyo and a harbour is to be constructed in Tokyo itself. The scheme includes also the reclamation of a vast tract of ground along the Tokyo waterfront.

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With the exception of those issued by the Scientific and Children's Book Clubs, which are available only to members, we can supply copies of these books to readers who cannot obtain them through the usual channels. Order from Book Dept., Meccano Limited, Binns Road, Liverpool 13, adding 1/– for postage to the price. Postage on different books varies, but any balance remaining will be refunded.

"Boys' Book of Roads"

By C. Boff. (Routledge. 6/– net)

We already owe to Mr. Boff excellent books on tunnels, bridges, fire-fighting and other subjects of interest to boys, and in his present volume he has turned with equal success to roads. We usually take our highways for granted, travelling over them with little thought for the engineering skill behind them, or for the astonishing and often thrilling history of travel in bygone ages. Mr. Boff reveals the full romance of the story of the road, while giving his readers accurate accounts of the work of road engineers in all parts of the world.

The author begins with the solid highways of the Romans, built 2,000 years ago, but still to be traced in various parts of our road system. Then he records the decay of roads in the Middle Ages, and of their revival and development as wheeled vehicles were improved. The coming first of the stage coach, and then of the modern motor-car and lorry, imposed entirely new standards on the road engineer, and we are told how the needs of the day were met by road builders such as Blind Jack Metcalf of Knaresborough, Macadam, who has given his name to an excellent way of building roads, and Telford. No modern road engineers are named, but their concrete highways are built at a speed that would have been thought miraculous by the famous road engineers of the past, and they look ahead and make plans for safely accommodating denser and faster traffic than ever.

Stories of famous highways in all parts of the world are given in the book. We read of the Finnish Government Highway, 330 miles long, that has been driven beyond the Arctic Circle to the frozen ocean; and of the road driven through the mountain passes of the North West frontier of India, where natives handle modern tools, such as compressed air drills, and shatter the rocks by explosives. Rough highways of all kinds off the beaten track also are dealt with, from desert roads crossed by camel trains to the historic trails of North America, many of them now important modern roads, over which in the past Indian war parties and prairie schooners passed. Roads in fact are seen to be needed everywhere, and the road engineer plays a prominent part in many of man's triumphs, including such events as transforming the Zuyder Zee into productive farm land and of reclaiming the desolate malaria-ridden marshes in Italy between Rome and Naples.

An absorbingly interesting story ends with a picture of coaching days before the coming of the railway. As the writer says, coaching may have been not too trying on good roads and in fine summer weather, but it clearly was intensely uncomfortable and even dangerous in winter, and over badly kept stretches of highway. Stranding in snowdrifts was a common occurrence and there was always the prospect of a hold-up by a highwayman.

The book is illustrated by 31 full-page plates.

"The Air and Its Mysteries"

By C. M. Botley, F.R.Met.Soc. (Scientific Book Club. Members only, 2/6)

Miss Botley's book, now made available for members of the Scientific Book Club at the low price of 2/6, was reviewed in our September 1938 issue on its first appearance. It is pleasantly written, with a wealth of myths and weather lore, but at the same time is a mine of accurate information.

The lower atmosphere is first dealt with. We see how it sustains life, and learn how it comes to be the home of cloud and rain, dust and disturbances of all kinds from the mild lightning of harvest time to the tornado and the typhoon. Special sections are given to weather and climate, and these will give readers an entirely new and comprehensive idea of all that is involved in the weather forecasts of the kind with which they were familiar before the war. The air also is a carrier of sound and the cause of many strange light effects, the stories of which are told before the author turns to what is usually described as the conquest of the air, and shows us how air resistance at great speeds gives the lift required by aeroplanes. Finally we come to the latest phase of air study, the exploration of the stratosphere and even higher regions of the atmosphere, a remarkable story that is full of surprises. There are 16 full-page plates and many explanatory diagrams.

"Flying Model Planes"

By Harry McDougall. (Lutterworth Press. 6/– net)

This addition to the rapidly growing number of text-books on model aircraft construction is intended for the newcomer to this fascinating hobby. The author first gives in simple terms an account of the principles on which all successful model aircraft are built and flown, and then deals with materials, construction and assembly, always keeping in mind that he is guiding the novice. How models are tested and adjusted in actual flight is explained, and finally come details of two models, one a general purpose design and the other a light weight model of higher performance.

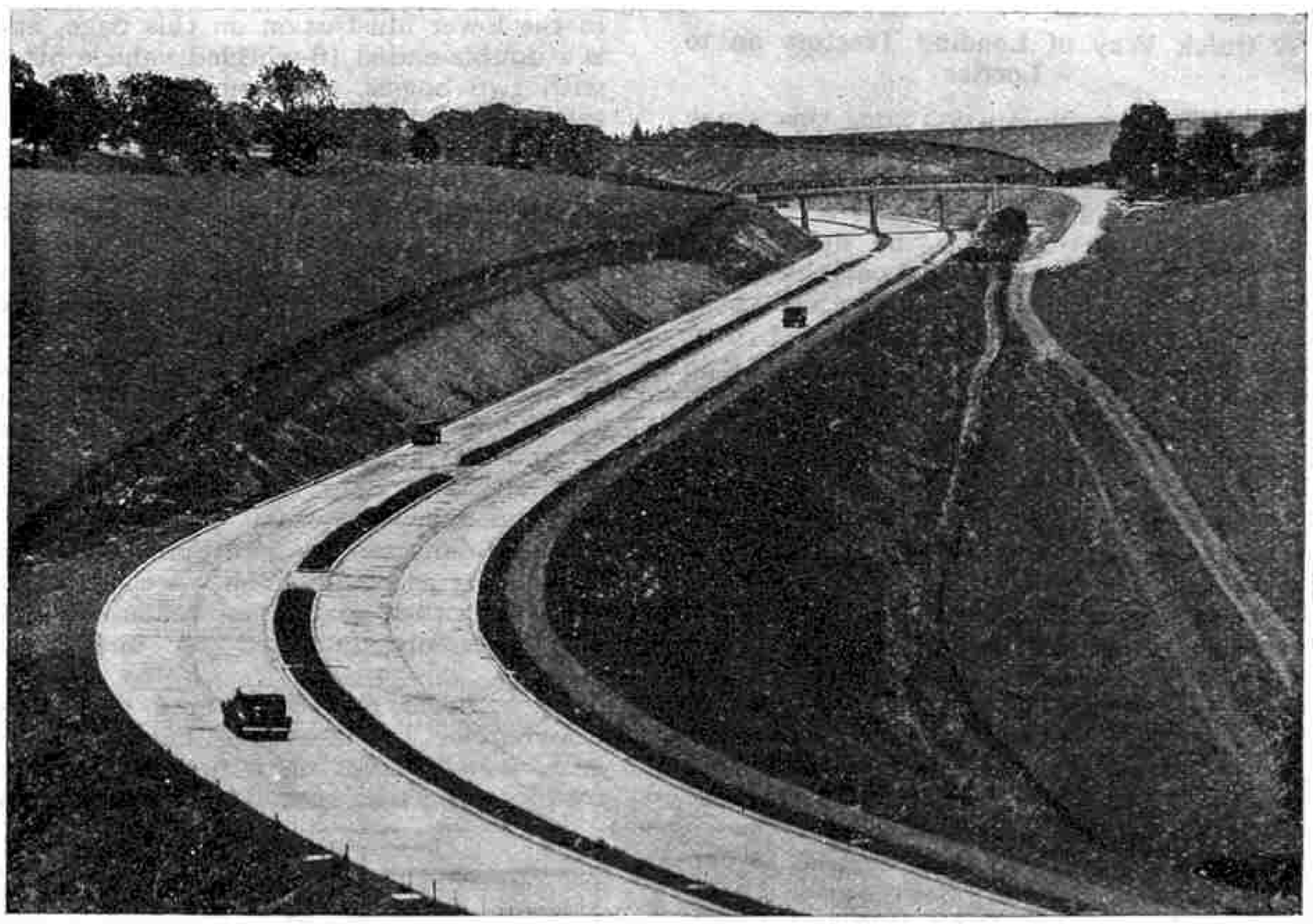
There are more than 130 excellent diagrams, and the reader who has followed Mr. McDougall's explanations, and has gained practical experience under his guidance, will be ready to set about the design and construction of models for himself.

Heroes of the Fighting R.A.F.

By Leonard R. Gribble. (Harrap. 5/– net)

This book by an author who has made a name for himself as a writer of first-rate "thrillers" is proof that truth can be quite as exciting as fiction. It is an account of great achievements in the air by men of the Royal Flying Corps and Royal Naval Air Service, and of the Royal Air Force, which was formed by the fusion of those two Services in April 1918. The heroic deeds in the war of 1914-18 of Capt. Albert Ball, who did not live to receive the V.C. he had won; of Capt. W. A. Bishop, V.C., now an Air Marshal and Director of Royal Canadian Air Force Recruiting in Canada, and of many others are told with rare vividness.

The author then goes on to relate some of the thrilling achievements of the Royal Air Force in the present war. The exploits of "Cobber" Kain, Squadron Leader Doran and others who have added glory to the Service in this war here find a place, and we read also of bombers over Germany, diving to destroy bridges of vital importance to the enemy and boring their way in tight formation through hordes of attacking fighters going all out to shoot them down. The dramatic part played by the R.A.F. in the evacuation from Dunkirk also is well told and there are many other dramatic stories.



The Caterham by-pass, a splendid example of the modern road planned to avoid traffic delays. From "Boys' Book of Roads," reviewed on this page.

A Fine New Special Model

Big Wheel with Electric Drive

THE model Big Wheel shown in Fig. 1 is a splendid subject for model-builders interested in amusement devices and is most fascinating to watch in motion. It is easy to assemble and its construction will provide a pleasant pastime for those who have a good supply of Angle Girders and Flat Plates at their disposal.

Construction is commenced by building the base. This consists of four $12\frac{1}{2}''$ Angle Girders, which are bolted together to form a square. The Girders forming the sides and the one forming the back of the base have their flanges facing outward, but the front Girder 1 is secured in place by $\frac{1}{2}''\times\frac{1}{2}''$ Angle Brackets in the position shown in Fig. 1. Three $12\frac{1}{2}''$ Angle Girders and four $18\frac{1}{2}''$ Angle Girders are bolted to the side Girders in the positions shown, and the space between each pair of $18\frac{1}{2}''$ Angle Girders is filled in with a $12\frac{1}{2}''$ Strip Plate, two $5\frac{1}{2}''\times2\frac{1}{2}''$ Flexible Plates and a Semi-Circular Plate.

The corresponding pairs of legs forming the towers are joined at their upper ends by $5\frac{1}{2}''$ Strips, Girder Frames and 1″ Triangular Plates 2, and the structure is held rigid by $18\frac{1}{2}''$ Angle Girders bolted at their lower ends to the base, and at their upper ends to the $5\frac{1}{2}''$ Strips and Girder Frames. The inner pairs of $18\frac{1}{2}''$ Angle Girders are braced by $5\frac{1}{2}''$ Strips, but two $4\frac{1}{2}''\times2\frac{1}{2}''$ Flexible Plates and a $5\frac{1}{2}''$ Curved Strip 3 are bolted to the front pair of Girders.

The upper ends of the $18\frac{1}{2}''$ Angle Girders are spaced apart by $2\frac{1}{2}''$ Angle Girders.

Two $5\frac{1}{2}''\times2\frac{1}{2}''$ Flat Plates and a $2\frac{1}{2}''\times2\frac{1}{2}''$ one are bolted to the base as shown. A step leading to the loading platform is constructed by bolting a $4\frac{1}{2}''\times2\frac{1}{2}''$ Flat Plate 4 to the base, and a $4\frac{1}{2}''\times1\frac{1}{2}''$ compound Flat Plate, consisting of two $3''\times1\frac{1}{2}''$ Flat Plates overlapped, is attached to this Plate 4 by two $1''\times\frac{1}{2}''$ Angle Brackets. The compound Plate is flanged on one side by a $4\frac{1}{2}''$ Angle Girder 5. A $4\frac{1}{2}''\times3\frac{1}{2}''$ compound Flat Plate 6 made up from two $4\frac{1}{2}''\times2\frac{1}{2}''$ Flat Plates forms the loading platform, and this is joined to the $18\frac{1}{2}''$ Angle Girders by two $3\frac{1}{2}''$ Angle Girders. Two $3\frac{1}{2}''$ Braced Girders are bent as shown, and are also bolted to the $18\frac{1}{2}''$ Angle Girders. The guard rails consist of $3\frac{1}{2}''$ and 4″ Rods held in Handrail Supports bolted to the towers. The front of the model is completed by attaching a 3″ Curved Strip to the Girder Frame by means of two $1\frac{1}{4}''$ Discs, and a similar Disc is then secured to the Curved Strip.

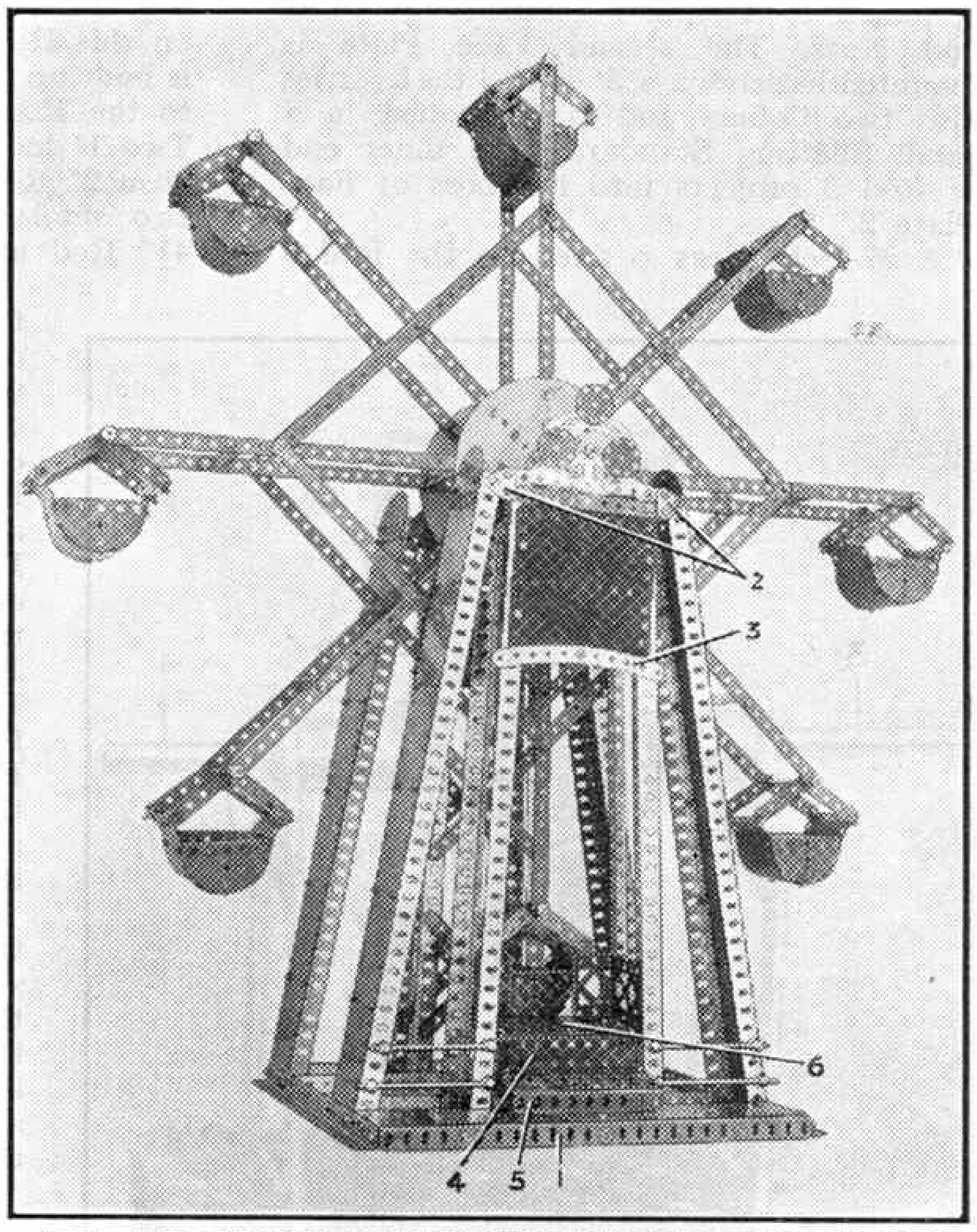


Fig. 1. A fine Meccano model Big Wheel driven by an Electric Motor.

An E120 Electric Motor 7 is bolted to one of the rear pairs of $18\frac{1}{2}''$ Angle Girders, as shown in Fig. 2, and a 1″ Sprocket on its armature shaft is connected by Sprocket Chain to a $1\frac{1}{2}''$ diam. Sprocket on a 3″ Rod 8, which is journalled in the $5\frac{1}{2}''$ Strips at the top of the rear tower. A Worm on Rod 8 meshes with a $\frac{1}{2}''$ Pinion secured on a $4\frac{1}{2}''$ Rod 9, which also carries a Worm that drives a 57-teeth Gear 10 fixed on the axle of the Wheel. Each side of the Wheel is made by bolting a Bush Wheel to a 6″ Circular Plate, to which eight $12\frac{1}{2}''$ Strips are bolted. These Strips are strengthened by four more $12\frac{1}{2}''$ Strips, and the two sides are joined together by $3\frac{1}{2}''\times\frac{1}{2}''$ Double Angle Strips.

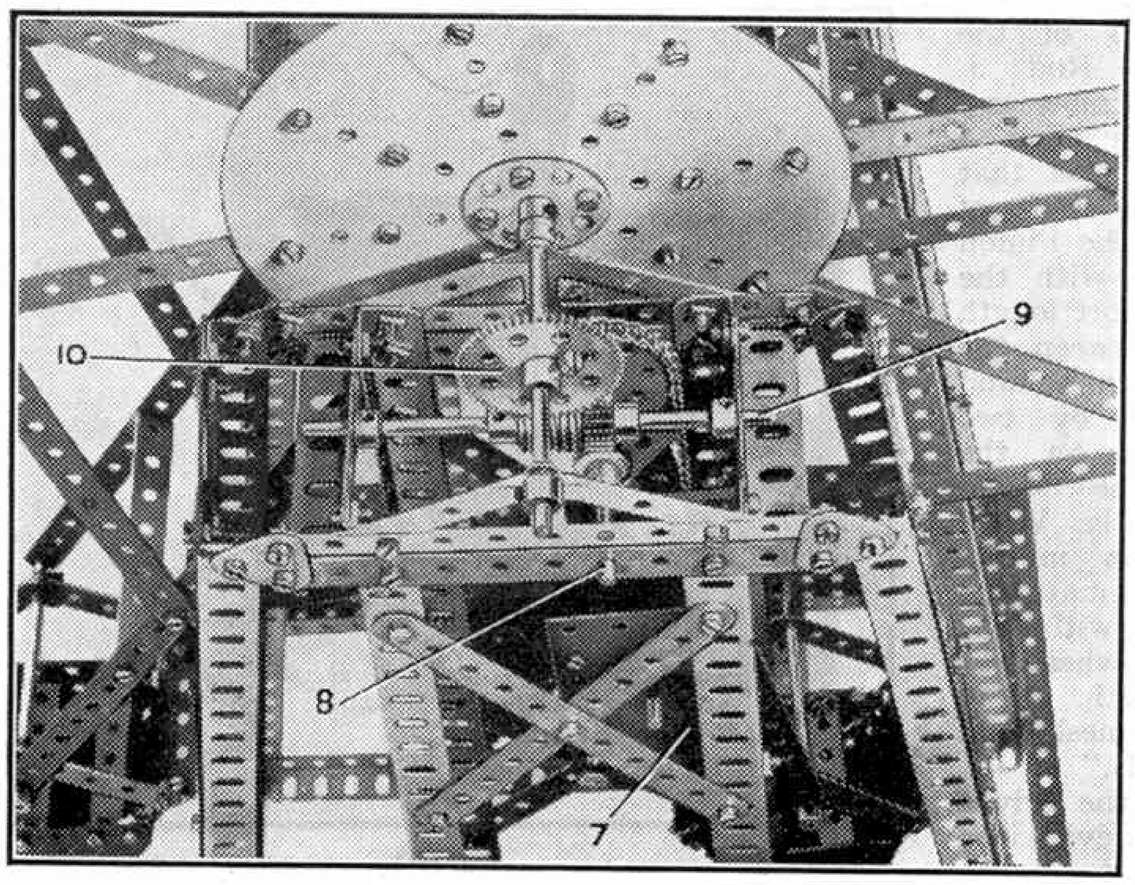


Fig. 2. The rear of the Big Wheel, showing the drive from the Electric Motor.

Each of the passenger cars consists of a $5\frac{1}{2}''\times2\frac{1}{2}''$ and a $2\frac{1}{2}''\times1\frac{1}{2}''$ Flexible Plate, overlapped one hole and bent to the shape shown in Fig 1. The sides of the cars are Semi-Circular Plates secured to the compound Plate by $\frac{1}{2}''\times\frac{1}{2}''$ Angle Brackets. The seats are $2\frac{1}{2}''\times\frac{1}{2}''$ Double Angle Strips. Four $2\frac{1}{2}''$ Strips are attached to the corners of each car by $\frac{1}{2}''\times\frac{1}{2}''$ Angle Brackets, and they form links by means of which the car is suspended from its arm of the Wheel. A 4″ Rod is pushed through the end hole in the appropriate arm of the Wheel and through the end holes of the $2\frac{1}{2}''$ Strips. The axle of the Wheel is held in position in its bearings by means of Collars.

Parts required to build the big wheel: 24 of No. 1; 16 of No. 2; 32 of No. 5; 16 of No. 7a; 7 of No. 8; 1 of No. 9a; 2 of No. 9b; 8 of No. 9d; 82 of No. 12; 2 of No. 12b; 1 of No. 13; 1 of No. 15a; 10 of No. 15b; 2 of No. 16; 1 of No. 16b; 2 of No. 24; 1 of No. 26; 1 of No. 27a; 2 of No. 32; 32 of No. 35; 486 of No. 37a; 478 of No. 37b; 30 of No. 38; 19 of No. 48a; 16 of No. 48b; 3 of No. 53a; 23 of No. 59; 2 of No. 70; 1 of No. 72; 2 of No. 73; 8 of No. 77; 1 of No. 89; 1 of No. 89a; 1 of No. 94; 1 of No. 95a; 1 of No. 96; 2 of No. 97; 4 of No. 113; 8 of No. 136; 2 of No. 146; 8 of No. 188; 2 of No. 191; 16 of No. 192; 4 of No. 197; 20 of No. 214; 3 of No. 217a. 1—E120 Electric Motor.

Suggestions Section

By "Spanner"

(501) A Centrifugal Clutch

(A. Cole, Broadchalk)

Fig. 501 shows a novel centrifugal clutch based on an actual mechanism introduced a few years ago. The 2″ Rod 1 forming a driving shaft, carries a Face Plate 2 that is joined to a similar Plate by ¾″ Bolts and Nuts. The second Face Plate is mounted loosely on a 3″ Rod 3 that carries also two Collars and is journalled in a small Shafting Standard. The inner end of Rod 3 projects into the boss of Face Plate 2.

A 57-teeth Gear is fixed on the Rod 3 and meshes with two ½″ Pinions 4 secured on 1½″ Rods held in the Face Plates, as shown. These Rods are retained in place by Couplings, which serve also as weights. When the Face Plates are rotated at low speed by turning the Rod 1 the ½″ Pinions run around the 57-teeth Gear, and the shaft 3 remains stationary. As the speed of the driving shaft 1 increases, however, centrifugal force acting upon the Couplings tends to prevent the Pinions rotating, thus causing them to transmit the drive to shaft 3 through the 57-teeth Gear.

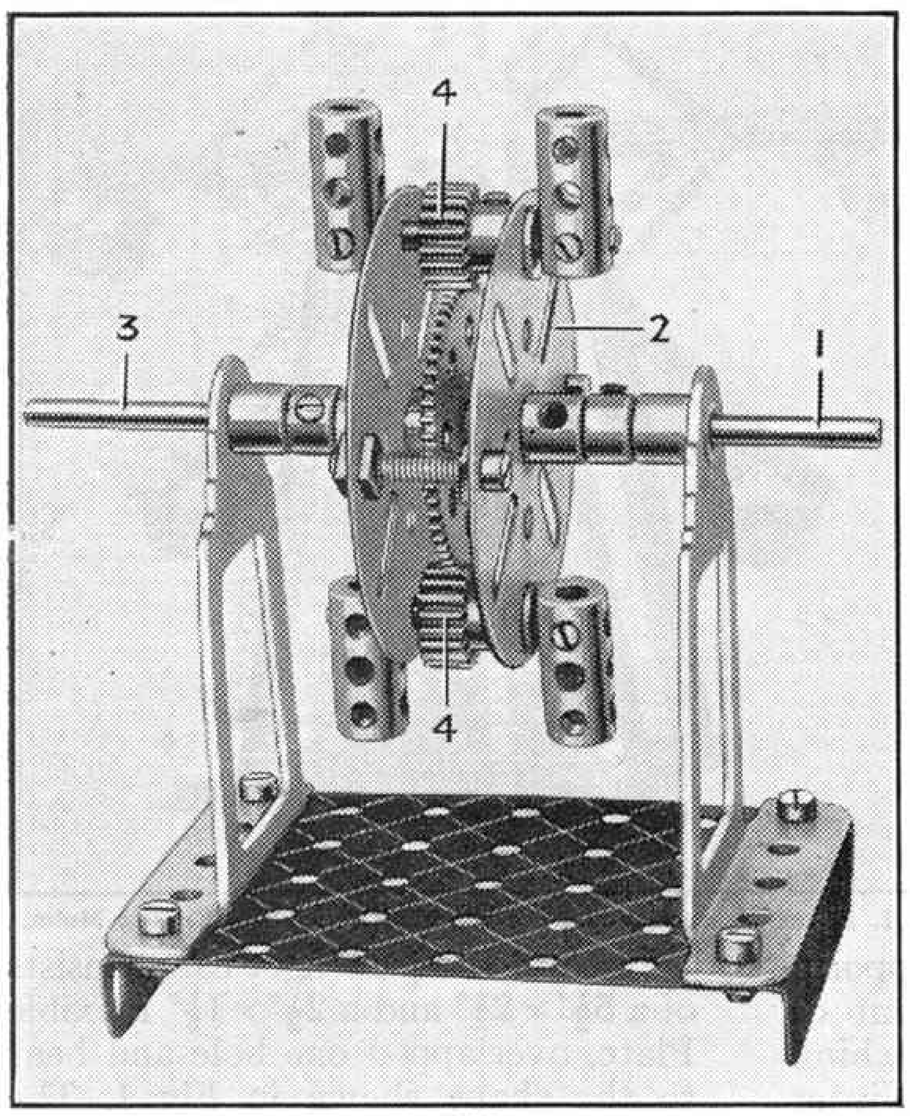


Fig. 501.

(502) Automatic Reversing Hoist

("Spanner")

The mechanism shown in Fig. 502 is a simple device by means of which an elevator, funicular railway, or similar model may be made to work for an indefinite period without attention, the cage or train continuing to ascend and descend so long as the driving motor is in motion.

The drive is taken to the mechanism from the Motor armature shaft through a ½″ Pinion that engages with a 57-teeth Gear Wheel 1, then by means of a ½″ Pinion on the opposite end of the Rod carrying this Gear. This second Pinion meshes with a 57-teeth Gear on a 2″ Rod 2. On the Rod 2 is a Worm 3 meshed with a ½″ Pinion fixed to a vertical 3″ Rod 4, which carries at its upper end a second Worm meshed with a ½″ Pinion on the 3½″ Rod 5. Mounted on this Rod is a rotating arm 6, which is built up from 5½″ Strips secured rigidly to the Rod by means of Bush Wheels. Two 1″ loose Pulleys 7 are free to turn on a 2″ Rod journalled in the arm, and two similar Pulleys are mounted on a 4½″ Rod attached to the Motor.

The spindle of the Pulleys 7 follows the circular path traced out by the end of the arm 6, while the 4½″ Rod carrying the other 1″ Pulleys is fixed. The cord, which is attached to the lift cage or train, is led down and over one of the 1″ loose Pulleys on the 4½″ Rod, around one of the Pulleys 7, back to the remaining Pulley on the 4½″ Rod and thence to the second 1″ Pulley 7. After passing around the latter, it is secured to a Flat Bracket 8. As the arm 6 rotates, the cord is alternately drawn in and paid out, thus working the cage or train up and down.

The extent of the travel of the cage or train may be varied considerably by altering the length of the arm 6 carrying the Pulleys 7, adding to the length to increase the travel and decreasing it to shorten the movement.

(503) A Free Wheel Device for a Clockwork Motor

(T. A. Wade, Johannesburg)

A 2½″ Rod 1 replaces the driving shaft of the Clockwork Motor and carries a 57-teeth Gear 2, two Collars and two Cranks that have Flat Brackets bolted to them. The bosses of the Cranks grip a 1½″ Rod 3, which carries a ½″ Pinion and a Collar. A 50-teeth Gear 4 is mounted on a 4″ Rod that represents the driven shaft of the model. Normally the Pinion is held out of mesh with the 50-teeth Gear by a short length of elastic gripped between the bosses of the Cranks and attached to a Rod by two Collars. The Collars on the driving shaft of the Motor grip the Cranks slightly. When the Motor is set in motion the Pinion is automatically brought into mesh with the 50-teeth Gear, but when the Motor stops the elastic draws the Pinion out of mesh and the model "free wheels."

A brake fitted on the driven Rod will convert the device into a simple clutch.

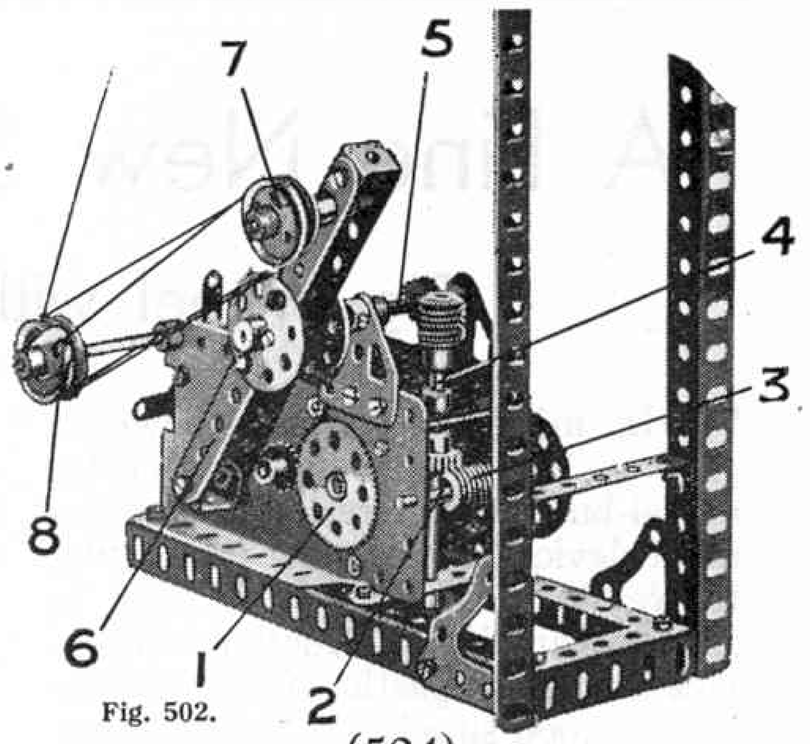


Fig. 502.

(504)

A Novel Indicator for Cranes

In model cranes employing multi-sheave Pulley Blocks it is essential that the hoisting cord always remains taut, otherwise it is likely to slip off the pulleys and become entangled. It is necessary therefore to ensure that when the pulley block reaches the ground the hoisting barrel is immediately stopped from paying out. Suitable devices for ensuring this are quite easy to arrange, and usually they take the form of an indicator, which shows when the load hook is relieved of its load. The device described below is of this type, and it also ensures that the cord is kept taut if the drum pays out a little too much. The device consists of an Axle Rod pivoted near the centre of the jib, and carrying at its lower end a Worm or other suitable weight. An End Bearing at the upper extremity of the Rod carries a ½″ loose Pulley. The hoisting cord passes over the Pulley, and the weight of the load hook should be sufficient to hold the lever in a position almost parallel to the jib.

As soon as the hoisting cord is relieved of its weight when the Pulley Block reaches the ground, the Worm at the end of the lever returns it to the vertical position, thus taking up the slack in the cord and giving the crane operator warning to apply the brake.

There are of course many other methods by which the desired result can be obtained and model-builders will find it interesting to devise alternative mechanisms based on their own ideas.

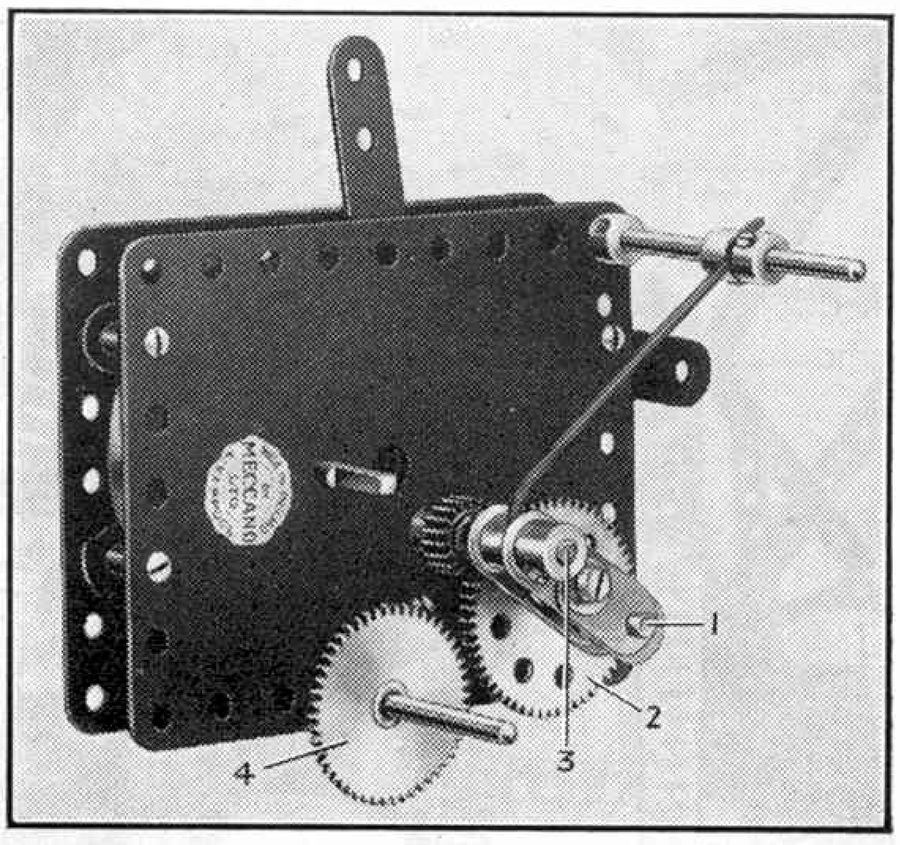


Fig. 503.

Michael Gainsborough-Waring, Shepperton, with his fine model fire escape.

Meccano "Originality" Contest

This competition, which was first announced in the *"M.M."* last month, is still open for entries, and full details of how these should be prepared and submitted are repeated below for the benefit of readers who did not see the previous issue and who wish to send in an entry. The prizes will be awarded for Meccano models of an original nature. Models of any type and size may be entered, and the judges will base their awards mainly on novelty in choice of subject and in the use of Meccano parts. Although new and unusual subjects should be looked for, those of the more ordinary type such as ships, locomotives and motor cars are not excluded, but readers who build models of this kind should endeavour to introduce some new method of construction.

The Contest will be divided into two sections. A, for competitors living in the British Isles, and B, for competitors living Overseas. The prizes to be awarded in each section are as follows. First, Cheque for £2/2/–; Second, Cheque for £1/1/–; Third, Postal Order for 10/6. There will be also several consolation prizes.

Readers should send in photographs or good drawings of their models, together with any explanations that may be necessary. although the latter should be made as brief as possible. Each competitor must write his full name and address on each sheet of his entry and on the back of each photograph or drawing, and his age must be stated. Envelopes containing entries should be addressed *"Originality Competition, Meccano Ltd., Binns Road, Liverpool 13."*

Section A will close for entries on 30th April, but the Overseas Section will remain open until 31st August.

Meccano Competitions

By "Spanner"

Results of "Winter" Model-Building Competition

The complete list of prize-winners in the Home Section of the "Winter" Model-building Competition, which was announced in the November 1940 issue of the *"M.M."* is as follows:

First Prize, Cheque for £3/3/–: P. Shovelton, Dursley; 2nd, Cheque for £2/2/–: M. Gainsborough-Waring, Shepperton; 3rd, Cheque for £1/1/–: C. Scott, Wakefield.

Postal Orders for 10/6: J. Kennett, Gerrards Cross; O. Nichols, London N.1; D. Thorne, Liverpool; T. Jones, Barmouth; A. Page, Taunton; C. Tuck, Manchester; P. Barton, Liverpool; R. Caton, Wolverhampton; G. Walton, Stocksbridge; D. Gunn, Timperley.

Postal Orders for 5/–: J. Tucker, Ivybridge; R. Warrington, Huddersfield; R. Davison, Crewe; T. Laming, Noss Mayo, Nr. Plymouth; G. Debenham, Ealing, W.5; W. Parkinson, Cardiff; A. Foster, Tring; L. Baker, Plymouth; D. Carson, Southampton; T. Macnamara, Totnes.

The First Prize was awarded to P. L. Shovelton, Dursley, for a model of a giant bucket excavator, which is shown in the lower illustration on this page. This model includes in its construction several unique features, and it was these that earned it a place at the head of the list. It is based on Europe's largest excavator, which was illustrated on page 630 of the *"M.M."* for November 1935.

The model is driven by two E20B Electric Motors and is entirely remote-controlled through a trailing cable corresponding to the power cable used in the actual machine. The gear-box provides five motions, which include travelling, slewing, luffing, hoisting and racking, by means of a solenoid that operates the layshaft through a ratchet and crank system. The gear in action at any time is indicated on a control panel by a multi-position switch, which sends the operating impulse to the solenoid. The gear box is arranged so that the sequence of engagements caused by the movement of the ratchet follows the normal operations of digging and emptying the bucket. Reversing action for each motion is obtained by coupling the Motors, the reversing switch on each being set so that it rotates in the opposite direction to its fellow. By means of a switch either of the Motors can be energised at will to obtain the required direction of drive.

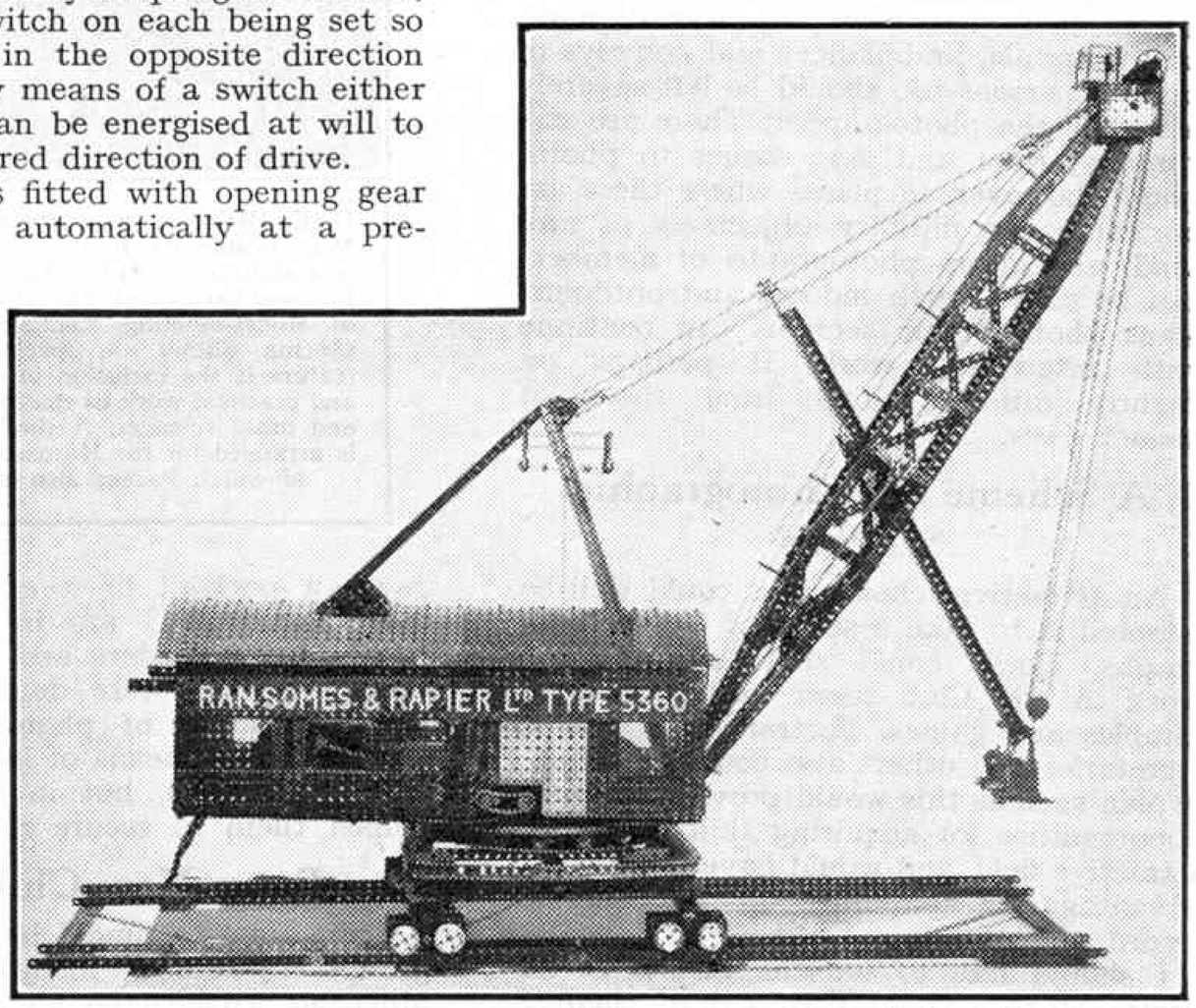
The bucket is fitted with opening gear which operates automatically at a predetermined hoist angle. It is also self closing. Screw operated band brakes are fitted to the luffing and hoisting drums.

The bodywork of the model was built in three sections comprising the two sides and the rear, each of which can be easily removed by withdrawing two bolts, so that any necessary adjustments may be made to the mechanism.

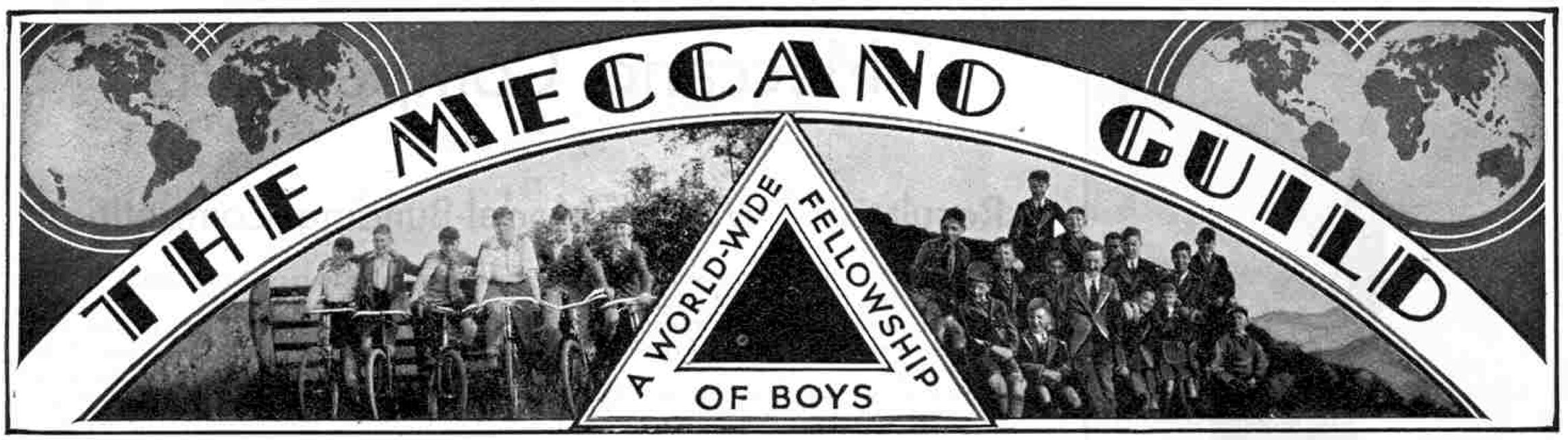
A rather curious feature of this competition was that both the Second and Third prizes were awarded for model fire escapes, built by M. Gainsborough-Waring and C. Scott, respectively. The ladder of Gainsborough-Waring's model extends to a height of 5 ft. 6 in., and the various motions of the chassis and escape mechanism are driven by an E6 Electric Motor. Among the features of the model are a radius indicator to show the angle of the ladder while it is being raised or lowered. This consists of a Rod pivoted near the lower end of the ladder and weighted with a Worm. A Centre Fork on the other end of the Rod moves over a scale marked with angles of elevation, which is fixed to the side of the ladder.

C. Scott's model has double rear wheels, which are driven by a No. 2 Clockwork Motor through reduction gearing. The ladder is pivoted on a turntable consisting of a Ball Bearing, and it is extendable to a height of 6 ft., this operation being carried out by turning a handle. The handle also rotates a Rod that raises and lowers the ladder. A ratchet mechanism on this Rod holds the ladder in any desired position.

Among the many other interesting entries in this Competition were several models of the famous Handley Page *"Hampden"* Bomber. The outstanding features of most of these are their neat appearance and sturdy construction, obtained by the use of Strips and Flexible Plates, and the abundance of detail. Many models of warships also were submitted and in one of these interesting details were a searchlight, fitted with a lamp from a Meccano Lighting Set, and anchors hung from the bows by chain secured to capstans on the deck.



A splendid working model of a giant bucket excavator. It was built by P. Shovelton, Dursley, who was awarded First Prize in the "Winter" Competition.



What to Do in the Outdoor Season

It is time to think of this year's summer programme. Many things usually included are impossible this year, but there is no reason whatever why every Club should not have a thoroughly enjoyable and profitable time. Members, especially the older ones, have many calls on their time for war work of some kind, but the rest can enjoy rambles, excursions and outdoor games in fine weather, and the Seniors no doubt will find opportunities from time to time for joining with them. Visits of course will be restricted. For instance, these are not the times to inspect goods yards and stations, and such pursuits as taking notes of engines and trains must be abandoned during the war. Any effort to indulge in them will only lead to trouble, and the resumption of these interesting occupations must be left for the days of peace that we hope will not be long in coming.

Photography can still be carried on, but here again great care must be taken. Photographing anything connected with the Army, the Navy or the Air Force is prohibited, as one would expect. In addition such places as docks or harbours, factories and munition works, electricity, gasworks, waterworks and reservoirs must not be photographed, and the greatest care must be taken that any of these places do not appear in the background of a scene that is to be photographed.

Cameras also must not be used in areas where there has been any war damage, and hospitals, ambulances and convoys of injured persons too should be left severely alone by the photographer. There are still country, river and lake scenes to photograph, however, in places where there are no camps or military objectives of any kind, and group photographs of members can be taken, both indoors and outdoors. Thus photographic sections can continue with interesting work, if perhaps on slightly different lines from those of former days.

A Scheme for Photographic Sections

An attractive scheme that could well be adopted is to take a series of Club photographs. These could show members at work in the Club room, or engaged in rambles and games. Portraits of Leaders, secretaries and others also could be taken. A plan such as this would provide splendid opportunities for acquiring skill in a very attractive field, and would have the further advantage of building up a valuable record of club life.

I should like to see the results of all efforts of this kind. The best of them I should use in the Guild pages of the Magazine, and it will be found that special interest will be taken by all concerned when they know that there is this possibility. Many officials do not realise the value of Club photographs from this point of view. Whenever I reproduce in these pages a portrait or a group photograph from any Club I am invariably told in letters from Leaders and secretaries that their members were delighted, and that the publication of photographs has not only been the means of increasing interest within the club, but in many cases has helped them to secure recruits.

Meccano Club Secretaries
No. 56. D. E. Parker

D. E. Parker is secretary of the Hornsea M.C., Leader Mr. R. W. Shooter. This Club was affiliated in April 1930 and has always followed varied and interesting programmes of Model-building, Lectures, Games and Cinema Shows. A specially interesting feature is the inclusion of demonstrations and practical work in electricity, chemistry and other sciences. A similar programme is arranged for the Hornsea Evacuee Club of which Parker also is secretary.

Form New Clubs Now

From time to time I hear news of little groups of Guild members and other Meccano enthusiasts who are meeting together in their homes. These small Clubs interest me very greatly for two reasons. One is that those who meet in this way are acting in the true spirit of the Guild, helping each other to make the most of their hobby and forming firm friendships at the same time. The other is that little groups are the beginnings of larger Clubs qualifying for affiliation. This should always be kept in mind. When the enthusiasm of the members of such a Club is recognised they usually find some older person to take an interest in them, giving them advice, supplying them with information that is useful in model-building and in carrying on other pursuits, and perhaps providing them with more spacious accommodation. From this it is a simple step to affiliation, for a friend of this kind usually is prepared to act as Leader.

All Clubs of this kind should let me know at once what they are doing, and should keep me in touch with their progress. I can help them in many ways. For instance I can write to a prospective Leader to explain what the Guild means, and to tell him what other Clubs have done and are doing. Notes on proceedings also can be included in the *"Club Notes"* pages under the heading *"Clubs Not Yet Affiliated."* This will have the effect of introducing new members, for Meccano boys generally read the Magazine and the prospect of being able to join with others is always an attractive one.

It must not be thought for a moment that a Club of this kind is too small to arouse my interest. I follow the proceedings of every little Club with as much interest as those of the larger and well-established organisations, and look forward to hearing of the formation of many more of them. Now is a good time to make a start, with games, walks and other outdoor activities to bring members together. If this is done the next indoor season should see the establishment of a successful Club, with members enjoying happy times during the next indoor season.

Proposed Branches

STORNOWAY—I. Horne, 35, Nicolson Road, Stornoway, Isle of Wight.

ICKENHAM—B. D. O'Leany, 10, The Chase, Ickenham, Hillingdon, Middx.

KEYNSHAM—J. Partington, "Budlea," Bath Hill E., Keynsham, Nr. Bristol.

SHEFFIELD—J. S. Andrews, 328, Baslow Road, Totley, Sheffield.

MANCHESTER—S. Purcell, 10, Hassall Avenue, Withington, Manchester 20.

Branches Recently Incorporated

402. GUILDFORD—Mr. P. Martin, 8, Nightingale Road, Guildford, Surrey.

403. HIGH WYCOMBE—Mr. O. J. Aldridge, Boneta, Mill End Road, High Wycombe, Bucks.

Club and Branch News

Branch News

Blackfriars School (Kettering).—Many improvements have been carried out. An extra room is now available and the main terminus has been placed in it, with lines running into it from the room housing

A group of members of the Coloured Mission (Cardiff) M.C., with their secretary D. H. Binstead. This Club was affiliated in May 1937 under the Leadership of Mr. T. H. Binstead, and has been very successful. Our photograph was taken during one of the many trips by road into the country that form a feature of the Club programme. In normal times model-building is keenly pursued, and very successful Exhibitions have been arranged.

the track already existing. At this main terminus there are many sidings and it is hoped to add a turntable. One station now has both high and low level lines, and a village formerly surrounding this has grown into a large town. A Hornby "*Royal Scot*" has been added to the locomotive stud. Scenery has been provided, and good use is being made of Dinky Toys for operating connecting bus services. The track is to be inspected at regular intervals, and stock is to be constantly overhauled and kept in good running order. *Secretary:* W. A. Cleaver, Blackfriars School, Laxton, Kettering, Northants.

Clyde College.—The Branch layout is being steadily extended. The Chief Engineer has inspected and overhauled rolling stock and the Station Master has drawn up a timetable. Efforts are now being made to devise a simple system of lighting a station. Photographs of Branch members and of the layout are to be taken. *Secretary:* W. Binnie, Clyde College, Routenburn, Largs, Ayrshire.

Martinwhite.—Members continue to be very active. An Exhibition raised the sum of 11/-, which was contributed to British Red Cross Funds. Discussions on track formations have taken place, and the layout has been extended as a result. Lectures also have been arranged, and a special Branch visit to a cinema show was very enjoyable. All have been very busy, and a wide range of activities has been carried out by members working together. *Secretary:* T. M. White, Bingham Stoke Road, Guildford.

Monkstown (Co. Dublin).—Interesting operations were carried out at meetings when special timetables were in force to cope with heavy special traffic. For another meeting a timetable was introduced to suit a "push and pull" service with which the Branch is experimenting. Trains were able to begin their return journey within half a minute, considerable time being saved in comparison with services in which the engine runs round its train. Arrangements are made for visits to various factories. *Secretary:* R. D. Pierce, 20, Monkstown Road, Monkstown, Co. Dublin.

Folkestone.—Track operations are carried on in a new Branch room and are proving very successful. New signal boxes have been brought into use, and each station now has a water tower, a footbridge and other necessary accessories. More models of "Spitfires" have been constructed. *Secretary:* F. E. Saunders, 79, Dover Road, Folkestone.

Club Notes

Barnard Castle School M.C.—More members are bringing their Meccano Outfits to school to allow them to join in club model-building. Two excellent crane models have been built, one of a luffing crane and the other of a mobile type. An Exhibition is being arranged. Club Roll: 20. *Secretary:* R. Churchill, Barnard Castle School, Barnard Castle.

Moston M.C.—Meetings continue to be held satisfactorily on Saturdays. Many games have been played, including "Codes," in which one section of the Club invents a cipher and gives a message written in it to the other to be de-coded. Model-building and general activities also continue. A collection is being made for the Meccano "Spitfire" Fund. Club roll: 6. *Secretary:* J. Roberts, 20, Worsley Avenue, Moston, Manchester 10.

South Elmsall M.C.—Two sections, the "Nuts" and "Bolts," have been formed, and there is keen competition in model-building. Cranes, lorries, naval guns and anti-aircraft guns have been constructed, and another outstanding model has been a large travelling jib crane. A Library is being formed, and members are showing great keenness to enlarge this. Club roll: 8. *Secretary:* R. Mozley, "Roxburgh," High Street, South Elmsall, Nr. Pontefract.

York M.C.—The Winter Sessions have been outstanding for the extent and quality of the model-building carried on. Models constructed have included a tractor, log saw, platform scales, fretsaw and a Doxford engine, which was on show for a week in York and aroused the greatest interest. The design of all the models showed great ingenuity and enterprise, especially in the construction of automatic mechanisms. More attention is being given to the Club's Hornby Railway now that the evenings are lighter. *Secretary:* G. A. Hodgson, 1, Sunnyside, Heslington Lane, Fulford, York.

Totnes M.C.—Excellent models built for entry in competitions have included a dockside crane and a breakdown wagon. A Table Tennis Tournament also has been held. In all contests points were given to the winning members. The proceedings of this Club are business-like, and Mr. L. Pascall, President, has kindly presented books for minutes and for keeping the Club accounts. Hornby Railway operation is being added to the general activities, and incorporation with the H.R.C. is to be sought. Club roll: 20. *Secretary:* T. J. Macnamara, "Gables," Totnes.

Ecclesall (Sheffield) M.C.—In spite of difficulties very successful Winter Sessions have been held, the chief feature being the excellent models built by members. These have included a big wheel and a steam tractor. In one contest members were asked to build models of an unusual type. Every model built by a member is carefully examined by officials, and the marks awarded are entered on a certificate. Meccano Signals have been built for the Club's Hornby Railway, and most of the rolling stock has been overhauled. The "*Meccanitian*," the Club's magazine, continues to be successful, and exchanges of magazines with other Clubs are being arranged. Club roll: 8. *Secretary:* T. K. Jones, 327, Millhouses Lane, Sheffield 11.

A cheerful group of members of the Tynecastle School (Edinburgh) M.C. with aeroplane models they have built for the sport of pole-flying described in the Guild pages of the December 1940 "M.M." Seated on the left is J. Morgan, treasurer, and on the right, holding a Meccano lathe used for turning small aeroplane parts, is M. Love, secretary. The founder and Leader of the Club is Mr. W. C. Stephen, B.Sc. Meetings are held in the School workshop.

Blundellsands M.C.—Meetings have been held on Saturday afternoons because of blackout conditions, but evening meetings are now being arranged. Model-building has been carried on by members at home, and enthusiasm is growing as opportunities for working increase. Club roll: 37. *Secretary:* J. K. Noel, 24, Lancaster Avenue, Crosby, Liverpool 23.

Hillside (Whitefield) M.C.—Model-building competitions have been the chief features of meetings, and excellent models have been exhibited. Lectures have been given on "*Commercial Motor Vehicles*" and "*The Police Flying Squad.*" First Aid practice continues and instruction has been given on dealing with incendiary bombs. The Club has shown a good example by taking in a London evacuee as a member. A Social has been held and Games enjoyed, and a short play has been presented. Models of a railway character were entered in a specially interesting competition, the first prize being awarded for a fine model of a complete electric railway. The Library is proving very successful. Club roll: 12. *Secretary:* D. I. Johnson, Burkewood, 27, Hillside Avenue, Whitefield, Nr. Manchester.

Oakfield School (Newquay) M.C.—Many good meetings have been held and recruits are coming in quickly. The proceeds of an interesting exhibition were forwarded to the Meccano "Spitfire" Fund, and the Club has now sent handsome contributions to this and to the "*M.M.* Radio Fund." Model-building contests are being arranged, with small prizes for the winners, and interesting excursions have been planned. *Secretary:* T. L. Higgins, Endsleigh Hotel, Bay View Terrace, Newquay, Cornwall.

Acton.—One of the Club's soldier members home on leave was invited to take the chair at a monthly business meeting. Among Meccano models constructed on a recent model-building evening was an interesting reproduction of an Anglepoise lamp. Film shows continue to be successful and great fun was enjoyed in a "Spot the Stars" contest, in which entrants had to identify the voices of 25 famous film stars from short extracts from the sound tracks of various films. Progress with the first section of the new Club Hornby Train layout continues to be satisfactory. A feature of the work is the thoroughness with which carefully made plans are carried out. *Secretary:* S. W. Simmons, 37, Derwentwater Road, Acton, London W.3.

CEYLON

Colombo M.C.—A novel feature of the programme of this Club has been an athletic meeting, which is to be held annually. Model-building has been taken up with great vigour, and there were many excellent entries in a special Model-building Contest, the judges having difficulty in deciding which models were the best. Mr. S. Perera, President, has given a Lantern Lecture on "*Stars*" and the Head Master of a local school has given a talk on "*Great Men—What Their Lives Teach Us.*" Club roll: 26. *Secretary:* S. L. Abeysinghe, "Simpson Villa," Udahamulla, Nugegoda, Colombo, Ceylon.

SOUTH AFRICA

Malvern (Johannesburg) M.C.—Meetings are being well attended and a comprehensive programme of Model-building Evenings, Talks, Competitions, Games, etc. is being pursued. Excellent models built by members were exhibited at a Bazaar in aid of the Red Cross. The Annual Open Night was equally successful, with stalls, side shows and a display of super models. The sum of £10 was raised for the Christmas Party given to the children of the Epworth Homes. Comforts are sent regularly to members serving in the Forces, who number 34. *Leader:* E. W. Sykes, P.O. Box 8, Cleveland, Johannesburg.

LAKES

How many lake stamps can you find? Make your collection more interesting by introducing a little variety. Begin at once by applying for our packet of 6 beautiful stamps from Austria, Switzerland, Poland and Kenya supplied free to all applicants for our World-Famous Approval Sheets enclosing 3d. to cover cost of postage.

Offer is for 30 days, abroad 60 days.

Dept. 348, ERRINGTON & MARTIN
South Hackney, London E.9. Est. 1880

THE FIRST STAMP EVER ISSUED

(British 1840 Penny Black) for P.O. **4/6!** It is guaranteed genuine in every respect. Its companion stamp (1840 2d. blue) for a further **6/9** (cat. 17/6! Other "Classics" which every collector should have are the **Cape of Good Hope Triangulars**; we offer 1d. rose (cat. 40/-) for **12/6**; 4d. blue (cat. 15/-) for **5/-**; and 6d. pale lilac (cat. 40/-) at **15/-**. Superb approvals of any country against approved English References or a deposit. **Full Lists Free.**

NORRIS & CO. (Dept. M), Somercotes, Derbyshire

FREE WONDERFUL 1941 OFFER 10 NEW ISSUES AND NOVELTIES

including Czecho-Slovakia (Masaryk), Denmark, **Dominica K.G.VI**, Greece (Charity, Queens Olga and Sophia), Jugo-Slavia (late King Alexander), Morocco Agencies (1d. black Centenary), Turkey (G.P.O. Constantinople). I will send this gift **absolutely free** to all stamp collectors sending 2½d. postage.

G. P. KEEF, WILLINGDON, EASTBOURNE

UNUSED AFRICAN PACKET

Fine packet of unused African stamps from Belgian Congo (river scene), Morocco Agencies King George VI, already obsolete, Italian East Africa (Abyssinia, etc.), Sudan, Somali Coast, Algeria, Cameroons, a fine set of 5 Ivory Coast, new issue, inscribed in error 'Baloue Woman' for 'Baoule Woman'—one is already obsolete—and another set, only just issued, of French Guinea, Mozambique, etc., etc., 30 stamps in all, sent free to all genuine applicants for approvals enclosing 2½d. postage. Only one gift to each applicant.

R. D. HARRISON — ROYDON — WARE

HOSPITAL STAMPS

75 Different Foreign and Colonial Stamps selected from Collections presented to Hospital. Send 6d. and stamped addressed envelope to:

SECRETARY.
Memorial Hospital Hall, Woolwich, LONDON S.E.18
An approval sheet from our limited number will be sent on request.

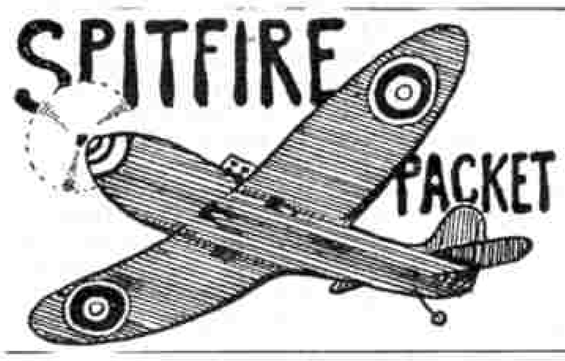
WHY NOT TRY OUR APPROVALS?

You will not be disappointed. Selections for all. Please state interests and if beginner or advanced.

E. & N. GREY, 9, ROSEMARY AVENUE HOUNSLOW

STAMPS! Penny pictorials, some thirtieth catalogue! 3d. postage please. J. Baguley, Westoncolville, Cambs.

SPITFIRE PACKET



PACKET contains 36 air, triangular, and stamps with aeroplanes on, etc.—2 LIBERIA triangular (with aeroplane), usually sold at 7d.; NIGERIA (Geo. VI); COSTA-RICA triangular (fish); URUGUAY INDIA (mail train); ROUMANIA (Carol); 8 CANADA (a fine set including large Royal Visit pictorial); 2 TANGANYIKA; 3 PALESTINE (pictorials); 6 BRAZIL (including airpost and aeroplane design); 5 U.S.A. (obsolete); 2 JAVA; COSTA-RICA (Exhibition triangle) and MOROCCO, LARGE PICTORIAL; Peru New Issue; GERMANY (airpost); COCHIN (large) and IRAQ.—Price 5½d., postage 2½d. extra, abroad 3½d. extra. Money back if you are not satisfied. Applicants for approvals receive 8 Peru FREE (catalogued at 9d.) and in addition, those sending addresses of stamp collecting friends get an additional set of 4 GEORGIA. FOR EVERY PACKET SOLD I AM GIVING THE PROFIT TO THE "SPITFIRE FUND," SO YOU WILL BE HELPING TO WIN THE WAR.

BARGAINS—100 B. Colonials 1/-; 6 Triangular 7d.; 18 Georgia 10d.; 20 Rhodesia 1/2; 14 new Geo. VI 1/2.

H. C. WATKINS, Stamp Importer (M.M. Dept.), Granville Road, BARNET

NORTH BORNEO & WAR MEMORIAL PKT. FREE

This is the finest we have ever offered. 24 different, including North Borneo (beautiful mint pictorial) a submarine cable, and overprinted issues. Sets of Canadian, Australasian and scarce Bohemian, Jugo-Slavia, Ukraine, Roumania and Italian, a fine Oriental set, also Philippines. Finally, a fine stamp depicting our War Memorial in London. Send 2½d. postage, requesting approvals—

LISBURN & TOWNSEND LTD. (MM), LIVERPOOL 3

STAMP COLLECTIONS PURCHASED. Prompt Cash

MINT HIGH VALUE STAMPS

Australia 1937/8 1/-, 1/2 each; 5/-, 5/9 each; 10/-, 11/- each: Bermuda 1936 1/-, 2/- each; 1/6, 2/- each: Br. Honduras 1922/3 25c., 12/6 each: Burma 1937 10 rupees 27/6 each; 5 rupees Service 20/- each: France 1f. 75c. Royal Visit 9d. each: Gt. Britain 2/6 Postage Due E8R 5/- each: Newfoundland 4c. on 5c. Royal Visit 1/6 each: Nova Scotia 1860/3 2c., 4/- each: Seychelles 1938 30c. 1/- each; 75c., 2/3 each: Sierra Leone 1904/5 1d., 1/- each: Transvaal 1885/93 1/-, 4/- each: U.S.A. 1938 6c. Air 6d. each. Post extra.

HARROWVEN (MM), 29, Berners Close, NORWICH

6 Beautiful UNITED STATES COMMEMORATIVES FREE

These SIX stamps will please you I know, and they are FREE to all applicants who send 2½d. for postage and ask to see a selection of my "WORTH WHILE" approval sheets. **J. H. Gaze, 10, Pimlico Rd., Clitheroe, Lancs.**

50 STAMPS FREE

and 1 Canadian "Royal Visit" 1939 and 2 Indian Silver Jubilees 1935. This gift will be sent with approval books containing stamps from ½d. A good discount is allowed and a list is sent (including complete Coronation sets and Jubilees) which may be obtained free by further purchases. Please send 3d. for postage. Packet without approvals 9d. post free.

C. A. RUSH, 8, Birley Road, Whetstone, LONDON N.20

★ NOW ★

FREE!! Send **NOW** for our **FREE APRIL PACKET.** It contains **JAMAICA**; a **NEW ZEALAND** Pictorial Set; **CHINA** (Martyr); a **FRENCH** "Peace" Issue; **TRANSVAAL**; **AUSTRALIA** (King & Queen Elizabeth); **PORTUGAL** (Harvester); two nice Map stamps; a **CZECHO-SLOVAKIA** Hero issue; **TRAVANCORE**; **ITALY** (Emperor); an old **CANADIAN** Set; modern **NIGERIA**; an **EIRE** Sports stamp; **INDIA** (King & Elephants); **RUSSIA** (Pre-Communist); **UNITED STATES** (First President); **AFRICAN** Pictorial; and an old **SWITZERLAND** issued 59 years ago. Send us postage 3d. stamps and we will send you our Bargain Approvals with this lovely Packet **ABSOLUTELY FREE.**

WINDSOR STAMP CO. (DEPT. M), UCKFIELD, SUSSEX

STAMPS AT WAR PRICES

Owing to the War we offer our APPROVALS to pick any **7/6** as priced for **2/6.** Any **£1** as priced for **5/-.** Please name countries required.

G. W. SAUNDERS LTD., 57-59, Ludgate Hill, London E.C.4

CEYLON RARITIES

Queen Victoria unused Postal Stationery. Six different postcards and letter-cards including surcharged and reply letter-cards for 1/-. Postage extra. Very uncommon.

FRED HARLOW, B.P.A.
133, Bradbourne Vale, Sevenoaks, Kent

Chums, I am going into the army soon so I am disposing of my collection in lots of 1/8½, 2/8½d, so here's your opportunity to get real value. Write Collector, 83, Duke's Drive, Chesterfield (no callers).

A Complete Sheet of Triangulars Free!

Approval applicants enclosing postage, will receive full details of how to obtain a complete sheet of triangular Costa Rica at absolutely no cost to themselves.

Wessex Stamp Service (Dept. M), Parry's Close, Bristol 9

FREE 50 BRITISH COLONIALS FREE

To all applicants requesting approvals 50 British Colonials will be sent absolutely free. Don't delay, send at once and secure these valuable free stamps. Liberal discount on purchases off the approvals.

MARTIN COURTNEY (M.M.), 36, Albert Street, WARWICK

100 DIFFERENT STAMPS FREE
to applicants for ½d. approvals.
COX, 17, STONELEIGH PARK ROAD, EWELL.

WHEN WRITING TO ADVERTISERS

Readers are urged to observe the following points when writing to advertisers:

1. **Mention the "M.M." and any special reference number quoted in the advertisement. This helps the advertisers to give prompt attention.**
2. **See that the full amount of the price and any postage is included. It is unfair to expect advertisers to fulfil their undertakings promptly if short remittances are sent.**
3. **Give your full address, and most important of all, WRITE PLAINLY.**
4. **Take care that your own letter is fully stamped.**

For SERIOUS COLLECTORS

Our Bargain "Discount" Approvals contain a fine range of picked Modern and New Issues, Pictorials and Commemoratives, etc., from 1d.—6d. each, less a generous discount. Send to-day with confidence. Approvals or details are post free, and we do NOT send again unless requested. State whether you want British Colonials, Foreign or both. **POSTAL BUSINESS ONLY**

THE BIRKDALE STAMP CO. (P.T.S.),
Dept. M, 104, Liverpool Road, Southport, Lancs.

STAMP COLLECTING

Propaganda in the Stamp Album

THE hardest used word in common use to-day is "propaganda." It is synonymous with "lie" in the minds of most people, for so much propaganda circulated in recent years has been based on falsehood. In fact, any attempt to persuade the views of a mass of people is propaganda, whether the attempt is based on truth or lies. A business firm's advertising is propaganda, no less than the Nazi claims for the benefits to be conferred by their "New Order."

The simple postage stamp is one of the commonest forms of propaganda, and an example of unobtrusive use in this direction is the appearance of King George's portrait on most British Colonial stamps. This is a direct declaration of loyalty to the Crown. The Nazi chiefs, who reckoned on the disaffection of Britain's Dominions and Colonies if the Mother Country became involved in a European war, might have learnt a valuable lesson from that piece of symbolism.

Almost every country has at some time or another used its postage stamps to give publicity to some national object. The stamps of Germany have bellowed the might and power of the Third Reich deliberately, as part of the campaign to overawe its neighbours as much as to stimulate the national consciousness of its own people. One has but to glance at the designs of the 1936 Nuremberg Congress and the 1937 Air Defence League issues, to sense the sinister.

In a less oppressive style Italy too has waged a propaganda war. Most of her issues of recent years have featured designs the object of which has been to foster popular pride in the arts, the literature and the history of ancient Rome, and the sports and industries of modern Italy. Every design has had for a prominent feature the bundle of fasces or rods bound around an axe that was carried before the higher magistrates of ancient Rome as a symbol of authority. It is from the fasces that the name of the Fascist movement is derived.

Russia is another country that has made great use of stamps for propaganda purposes. Its most striking issue, a subtle hint of the power of Russia's armed forces, was the Anti-war issue of January 1935, in which all the designs were devoted to illustrating the horrors of modern warfare. One of the stamps, symbolising war clouds from which bombs were falling on a great city, was illustrated in these pages in the November 1940 "*M.M.*"

Happily stamps have been used as propaganda carriers mostly for peaceful purposes. They have been employed to advertise scenic beauties and to attract tourist traffic, to raise funds and promote interest in national charities, to promote national industries, and to stimulate national pride by featuring historic incidents or the achievements of great national figures in the realms of art, letters or science.

Britain has done very little in any of these directions. Apart from demonstrations of loyalty to the throne, as shown in the 1935 King George V Silver Jubilee issues, and the 1937 set, celebrating the Coronation of King George VI and Queen Elizabeth, our only propaganda issues have been the 1924 and 1925 Wembley Exhibition issues.

Britain's Dominions and Colonies make a better showing. The most famous British propaganda issue probably was the Newfoundland issue of January 1928, which is commonly known as the "publicity" issue. This consisted of a series of 15 values, with designs ranging from portraits of

King George V and Queen Mary, the Prince of Wales, now the Duke of Windsor, a big hotel, transport facilities and Alcock's Vickers-Vimy aeroplane, which made the first transatlantic crossing, to views of important buildings and a map of the Dominion. The whole issue was an open attempt to secure the interest of tourists and attract them to Newfoundland. Later issues have been devoted to advertising the country's beauty spots and industries, an activity that has been copied in almost every British Colonial pictorial set of recent years.

Canada has been only a little way behind in its use of stamp publicity. The many Canadian pictorials of the last 12 or 13 years have been truly beautiful miniature posters that would be worthy claimants to a place in any exhibition of commercial art. Best of all Canada's designs, in our opinion, were the 10c. of 1935, showing a Canadian "Mounty," and the 20c. of the 1930-31 issue, a prairie harvesting scene.

Australia has concentrated largely on incidents in the history of the Commonwealth, but the MacArthur centenary set of 1934, showing a merino ram, had the indirect object of publicising the great Australian wool industry. Issues of recent years have made a great show of many of the unusual birds and animals to be found on the Continent.

New Zealand too has introduced many historical incidents into its stamp designs, but its Chamber of Commerce issue of 1936 and its Dunedin Exhibition set of 1925 were instances of direct advertising that enjoyed great popularity with stamp

collectors everywhere.

All of these stamp issues have been what might be termed indirect. The designs have been left to speak for themselves, and there has been no accompanying inscription to force the publicity motive into the beholder's eye. But many countries have had no qualms on this score and examples of open advertising are abundant.

There was an amusing coffee war among certain of the South (*Continued on page 132*)

Stamp Collecting—(*Continued from page 131*)

American republics a few years ago. Salvador's 35c. of 1924 showed a charming girl with sprigs of the coffee plant entwining her head, and the picture was accompanied by the words *"El mejor café—the best coffee."* The 20c. of the same series showed a balsam tree with the inscription *"Solo el Salvador produce el Balsamo del Peru"* which means *"Only Salvador produces Peruvian balsam."* We understand that seemingly odd claim is literally correct, the name Peruvian balsam being a misnomer.

The Salvadorian coffee claim was too much for the patriots and business men of Guatemala, and after Hayti had stepped in with a coffee design on a 35c. stamp, issued in February 1928, Guatemala bestirred itself and produced an air mail stamp in June 1930, showing an aeroplane flying over the slopes of Mt. Agua. Across the foot of the stamp, in English wording, was the inscription *"Guatemala produces the best coffee in the World."*

The important Chilean nitrate industry also was given a valuable piece of advertising in 1930. The designs used showed a wheatfield with upstanding ears of corn, and a sower scattering seed. The first design bore the slogan *"Salitre significa pro sperìdad,"* which tells us that *"Nitrates mean prosperity."*

For many years we have been engaged in building a subject collection showing how the posts have been used as publicity media. We are all familiar with the many advertising postmarks that appear on cancelling stamps, and the advertising devices and slogans that individual firms use with their meter cancelling machines. Less familiar are postage stamps with advertisements attached, as in stamp booklets of many countries. There have been many cases of such advertisements being attached to stamps sold over the counter of a post office by arrangement with the authorities.

One of the most interesting of these was the Italian issue of 1924-25, which bore a Singer Sewing Machine label as part of the stamp. There was no intervening perforation. The stamps were dropped in deference to public opinion, only 100,000 being issued.

New Zealand once tried out this idea as a means of increasing national revenue. In 1893 the backs of New Zealand stamps were adorned with announcements of several firms. These too provoked a public outcry and disappeared after about 12 months. The makers of Pear's Soap tried to persuade the British Post Office to give the idea a trial, but their scheme did not meet with approval.

Stamp Gossip

and Notes on New Issues

Hong Kong Centennials

The latest British Colonial series is the long-awaited series in celebration of the centenary of Hong Kong's entry to the British Commonwealth. The designs, five of which are illustrated here, are well up to the standard of the magnificent series of Colonial pictorials and are as follows: 2c., a street scene in the chief shopping centre of Victoria; 4c., a view of the harbour showing a liner and a junk; 5c., the University, founded in 1913, the principal Western educational centre in the Far East; 15c., the harbour as viewed from the "Peak"; 25c., the Hong Kong Bank building in Victoria; and $1, the *"China Clipper"* and a sailing vessel, typifyng the advance in mail transport during the century.

N.Z. Ban on Stamp Exports

Recently the New Zealand Government placed a ban on the export of postage stamps, except unused copies despatched direct from the Stamps Branch of the Wellington Post Office. A deputation from the New Zealand philatelic societies, visiting the Chief Censor in an effort to secure a modification of the restrictions, was informed that these were imposed purely for purposes of censorship. Attempts had been made to use postage stamps as a means of conveying information of value to the enemy through a South American country. Happily the attempt had failed and the perpetrators arrested.

The ban had been made solely on export by private persons and it is hoped as a result of the deputation's pressure to secure the introduction of a scheme similar to that now operating in Britain, in which all stamps to be exported must be passed through a bureau under the control of the British Philatelic Association in London.

While the stamps are in the hands of the B.P.A., their invoice value is checked, to ensure that true values have been placed on the stamps, and censors examine the consignments to assure themselves that the stamps are not being used to convey messages abroad, as was done by spies in the last war. Finally when payments for the stamps reach Britain, these are checked in order to make sure that the full value has been returned to Britain.

Further War Provisionals

The Bermudas war provisional illustrated in our last issue has been quickly followed by others. The Bahamas found it necessary to overprint the current 2½d. stamp in November to meet a shortage of supplies following the raising of the foreign postage rate from 2½d. to 3d. A total of 4,000 sheets of 60 stamps was overprinted by a local printing firm, but so far no errors or varieties have been discovered. A specimen of this interesting provisional is illustrated on this page.

Ceylon also found it necessary to overprint in November, the occasion being a shortage of 3c. values. The overprinting was applied to the 20c. value, sufficient copies being produced to last for three weeks only.

Stamps on the Dollar Front

One of Britain's crying needs is a good supply of dollars to meet expenditure on war supplies from the United States, and our readers will be glad to know that stamps are playing a prominent part in raising those funds. Two of London's leading auctioneers are holding auctions of British collections in New York, and it is anticipated that over a million dollars a year will be raised from these auctions when their schemes are in full working.

In addition many British dealers are exporting considerable parcels direct to American collectors and thus adding a substantial sum to Britain's credits. It is perhaps to be regretted that so many of Britain's stamp treasures are passing out of our hands, but in this connection it is important to remember that London has always been the centre of the world's stamp trade and stocks in Britain are enormous.

New Stamp Issues

Among several striking air mail designs of recent months are two from Cuba, showing a fine view of the Niagara Falls and a portrait of the poet Jose Maria Heredia. The stamps are in commemoration of the centenary of the poet's death. Mexico issued a set of three stamps to celebrate the inauguration of the new President, Manuel Avila Camacho. The design shows a helmsman at a ship's wheel during a gale. Costa Rica has issued two stamps, old designs overprinted in commemoration of Pan-American Health Day. The design shows a sanatorium, and was originally prepared for the corresponding celebration in 1939.

COMPETITIONS! OPEN TO ALL READERS

An Attractive Missing Words Contest

Competitions in which readers are asked to choose the right words for expressing simple ideas have always attracted large entries, and here is an opportunity for all interested in such contests to show their skill and knowledge. In the panel in the centre of the page is a passage from which 21 words have been taken out, their places being indicated by dashes. Below is a list of the 21 words, and these have to be fitted into their proper places.

The words removed are given in alphabetical order. Every one must be inserted in the passage, but each must be put in only as often as it appears in the list. Thus the word "pilots" appears twice in the list. It must therefore be used twice in filling in the gaps. Every reader will find it simple to find where to put in the missing words. The passage deals with a subject in which all are interested, and every entrant will have a splendid chance of winning one of the many prizes offered.

The — flown by British pilots in the — for the — Trophy in 1927, 1929 and 1931 were marvels of concentrated energy. High powered — and small — were necessary in order to give the — required, and the — surfaces were not ideal for taking off or alighting, since they were designed to be effective at high speed. Thus the greatest care and — were necessary, but the — were highly skilled, and their handling of their machines was —.

The 1927 contest was won by Flt.-Lt. A. M. Webster in a Supermarine S5 with a — engine, at an average speed of 281.68 m.p.h. Two years later the winning speed rose to 328.63 m.p.h., the successful pilot being Fl.-Off. H. R. D. Waghorn in a Supermarine S6, — fitted with a Rolls-Royce engine. In both contests there was Italian —, chiefly from Macchi — , but in 1931 the Supermarine S6B — by Flt.-Lt. J. N. Boothman had only to complete — — , which he did at 340.08 m.p.h., as the Italian challengers failed to start. Thus Great Britain won the Trophy — .

Although Italy was beaten in two contests, and was not represented in the third, her — and — showed what they were capable of by setting up speed records later, an Italian flier achieving the — speed of 440.6 m.p.h. in 1934.

AGAIN	JUDGMENT	SCHNEIDER
CONTESTS	MAGNIFICENT	SEAPLANES
CONTROL	OPPOSITION	SEAPLANES
COURSE	OUTRIGHT	SPEED
DESIGNERS	PILOTS	SPLENDID
ENGINES	PILOTS	THE
FLOWN	ROLLS-ROYCE	WINGS

When the position for each of the 21 words has been found, the entire passage should be written out clearly, with the inserted words underlined, and addressed to *"Missing Words, Meccano Magazine, Binns Road, Liverpool 13."* Competitors must take care to write their names and addresses on each sheet of their entry.

There will be two sections, for Home and Overseas readers respectively, and in each prizes of 21/–, 15/–, 10/6 and 5/– respectively will be awarded to the senders of the four best solutions. In addition there will be consolation prizes for meritorious efforts, so every reader should send in his effort, even if he is doubtful of the accuracy of some of his placings. Neatness and novelty will be taken into consideration in the event of ties for any of the prizes.

The closing date in the Home Section is 30th April, and that in the Overseas Section 30th August.

HORNBY RAILWAY CONTESTS

Do You Know These Famous Railway Names?

Every member of the H.R.C. and indeed every reader of the *"M.M."* should be familiar with the names of the men who have given us our railways or have designed famous locomotives, from pioneer days right down to the present time of monster "Pacifics." They can use their knowledge in the easy and interesting puzzle that forms this month's railway competition.

Below are given 24 jumbled words formed by mixing the letters of the names of famous railway men. For instance, the first in the list is "BBWE." It is easy to see that by rearranging the letters this can be transformed into "WEBB," the name of a famous locomotive chief of the former L.N.W.R. for many years, during which he built a series of compound engines that attracted the greatest interest. The other names may be a little more difficult to disentangle from the jumbles, but we are sure that our readers will enjoy trying to do this. All they then have to do is to make a list of the names in the order given, and to send this to *"Jumbled Names Contest, Meccano Magazine, Binns Road, Liverpool 13."* The name and full address of the entrant must be written clearly on each sheet of paper used.

Here is the list of jumbled names: BBWE; DIELLUB; LENURB; ITBTUC; SOPSEJ; LHAEW; SNAMNO; APRERK; RAKBER; BPOSKLENIN; CKITH-ERTVI; GHUHSE; IRUE; YSEARBS; OGOHC; KRITYEL; WOLFER; LOCELTT; ORTSYLEUD; LPLOITT; THROHWACK; PSANILLA; SELNOGVI; YLEERGS.

Remember that every reader of the *"M.M.,"* whether he is a member of the H.R.C. or not, can enter this contest. There will be two sections, for Home and Overseas readers respectively, and in each prizes of 21/–, 15/–, 10/6 and 5/– will be awarded to the senders of the four best entries in the order of merit. Consolation prizes also will be awarded to efforts that are deserving of recognition, and novelty and neatness will be taken into consideration if there is a tie for any prize. The latest dates on which entries can be received are 30th April in the Home section and 30th August in the Overseas section.

H.R.C. Competition Results

HOME

January "Missing Words" Contest.—1. C. E. Wrayford (Bovey Tracey); 2. G. V. Buck (Rawdon); 3. T. E. Bladun (Chester). Consolation Prizes: I. G. Richards (Nantwich); R. P. Walford (Lustleigh).

January "Railway Voting" Contest.—1. A. Pike (Torquay); 2. J. Payne (Redmile, Notts.); 3. H. Hill (London S.E.22). Consolation Prize: J. Sanders (Birmingham 23).

OVERSEAS

November "Locomotive Designing" Contest.—1. F. Jowett (Toronto); 2. D. C. Norris (Brisbane, Australia); 3. H. Ekwensi (Gusau, Nigeria).

April Photographic Contest

This month we announce the first of our series of photographic competitions for 1941, which we shall continue throughout the summer. The conditions ruling in this contest are very simple. Competitors are asked to submit photographs in each contest, and the prizes will be awarded to the best sent in. Entries may be outdoor scenes, or examples of indoor photography, but in each case an appropriate title must be written on the back of each. An entry may consist of more than one photograph, but no competitor can be awarded more than one prize in any one monthly contest. It is not necessary that an entrant should have developed or printed his own efforts. The only essential is that he shall have made the exposure.

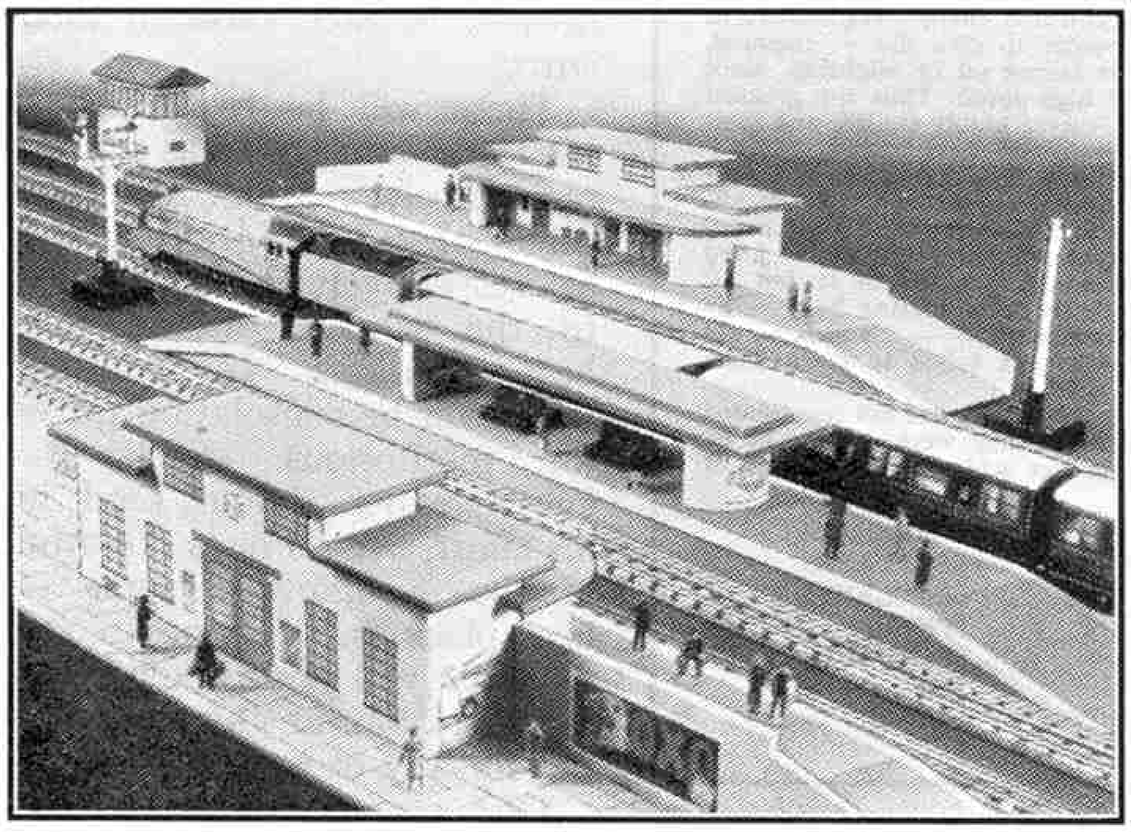
War conditions have brought certain restrictions on outdoor photography. These apply to military, naval and Air Force subjects, and readers should take care to avoid photographing such things as docks, barracks, aerodromes and troops on the march.

Each month's entries will be divided into two sections, A for readers aged 16 and over, and B for those under 16, and in each section prizes of 15/– and 7/6 respectively will be awarded. There will be two similar sections with prizes of the same value for Overseas readers.

Entries in this month's competition should be addressed *"April Photo Contest, Meccano Magazine, Binns Road, Liverpool 13."* The closing date in the Home section is 30th April and that in the Overseas section is 30th August.

Stations and Other Buildings on Hornby-Dublo Railways

IN planning the operations that are to be carried out when a miniature railway system is being developed one is apt to take for granted the station buildings and other structures that are really necessary for the effective running of trains. In this article, as a change from the operations dealt with last month, we will talk about station arrangement and other lineside features.



A typical four-road station with a Hornby-Dublo express dashing through on the fast line. Two Main Line Stations and an Island Platform make an effective "outer suburban" or "residential" station.

The Hornby-Dublo railway owner is well provided for in the matter of stations, and by varying the manner of their use it is possible to secure quite a number of effective results. In addition, as we shall see, by means of a certain amount of "makeshift," any "sameness" of arrangement is avoided, and this makes for increased realism.

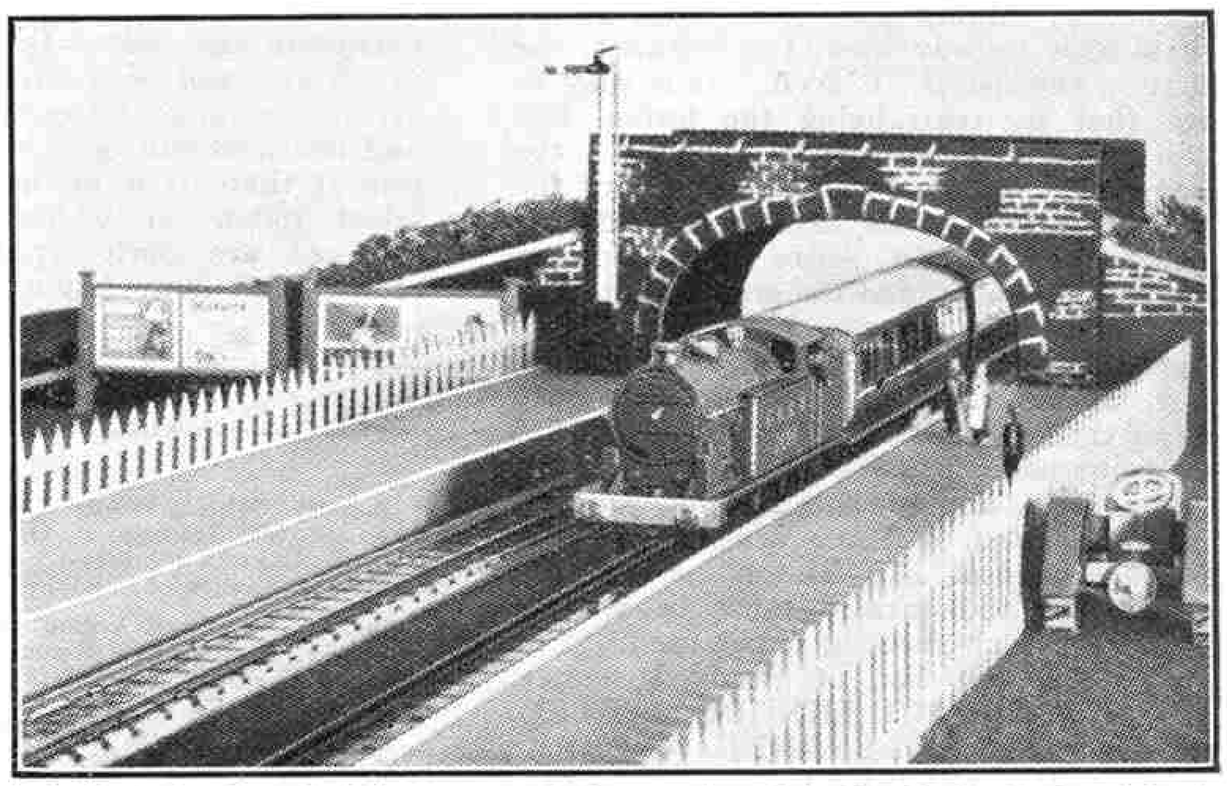
In the Hornby-Dublo System there is first the standard Main Line Station. This is a complete and self-contained station that can be used quite effectively alone alongside a single-track railway. It is modern in design and finish and attractive in appearance, and makes an effective halting place of the rather more important roadside or suburban type. Where the main line is double track, or even if double track is only provided "through the platforms" by means of a passing loop, two Main Line Stations used together opposite one another reproduce a typical situation that is quite commonly found on all the British main lines.

An alternative scheme is to make use of the Hornby-Dublo Island Platform. This is made to fit between two main lines, an arrangement that saves space and is therefore valuable to the miniature railway owner, who rarely has room enough to bring all his favourite schemes into being. It is quite a realistic scheme too, for, to give only one instance, most of the stations south of Nottingham on the Great Central Section of the L.N.E.R. are of the island type.

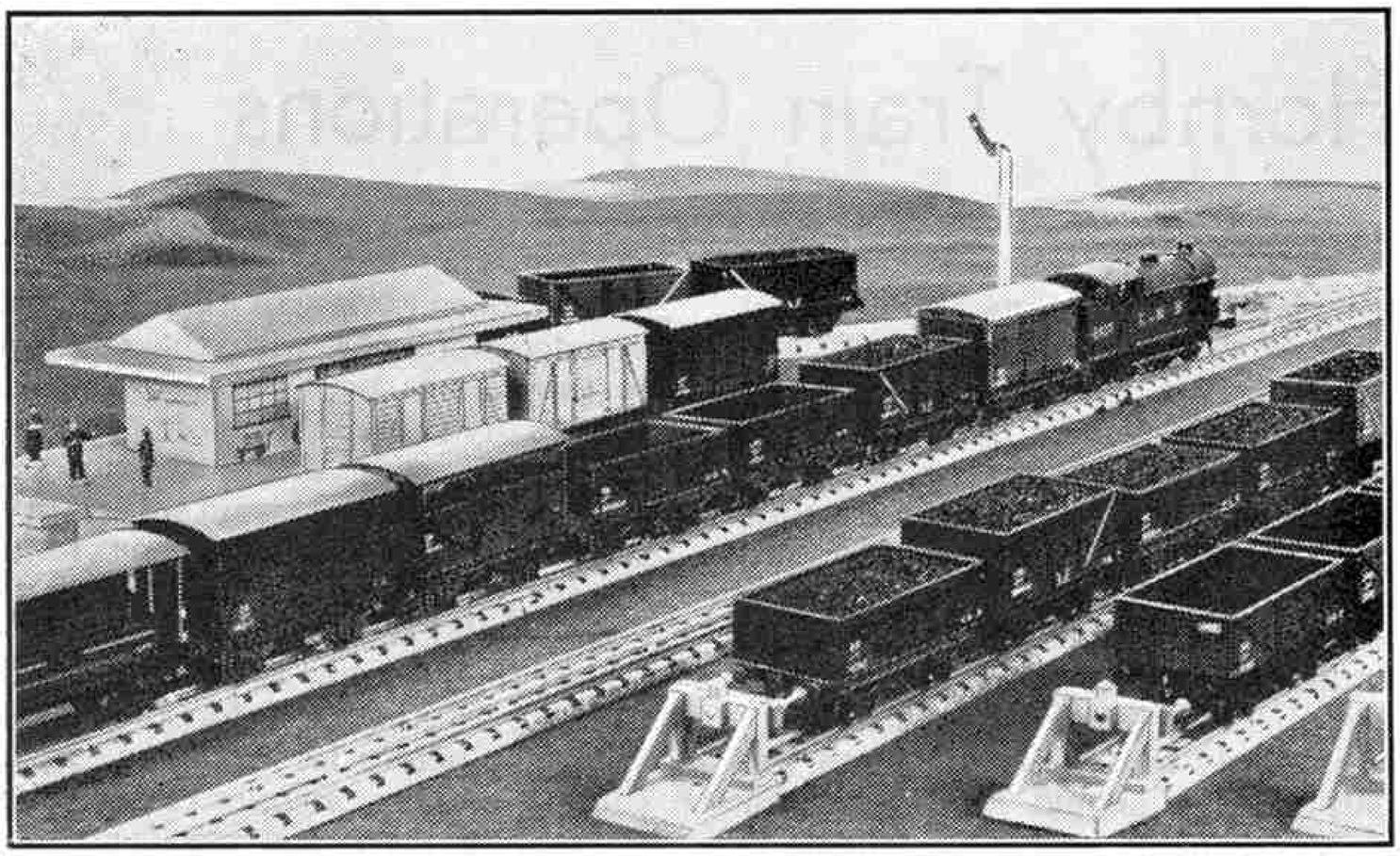
The Island Platform can be used also in conjunction with the Main Line Station. Its platform is the same length and it is of similar general design so that the two match one another very well. Often by the time a layout has been extended from single track to double track there is not much room to spare between the outer track and the edge of the table or baseboard on which the railway is situated. Then the Island Platform, by reason of its restricted width, is very useful. It can be used to form one side of a two-platform station by being placed on the outside of the track, a standard Main Line Station inside the track forming the other side of the complete station. Another advantage is that the Island Platform, having no buildings on it but only an open awning, does not spoil one's view of the trains or of the other side of the station.

On a big railway with separate tracks up and down for fast and slow traffic stations become rather elaborate. Two Island Platforms can be used, one between each pair of tracks. Alternatively the outer tracks can each serve a Main Line Station placed outside of them in each case, and the inner tracks can run on each side of an Island Platform. This gives a busy and realistic effect as will be seen from the upper illustration on this page. In this instance the tracks for fast traffic are those farthest away from the camera.

Another arrangement is possible where the secondary tracks form loop lines off the main up and down lines perhaps only for the distance through a station. Then platforms can be provided outside the outer tracks only for the accommodation of stopping trains, the main lines carrying straight on and having no platforms at all. This loop road scheme is a useful one, for it makes it possible for a slow train to run into a loop of this kind and stop at the platform; while standing there it can be overtaken by a fast non-stopping train. In situations like this on electric layouts the Isolating Rails are most useful, one being provided at each end of the loop. Only one such Rail need be connected to the controlling Switch, the other forming a permanent break in the centre rail circuit. There the



A simple station formed of the separate platform section of the City Station Outfit. A local stopping train is approaching.



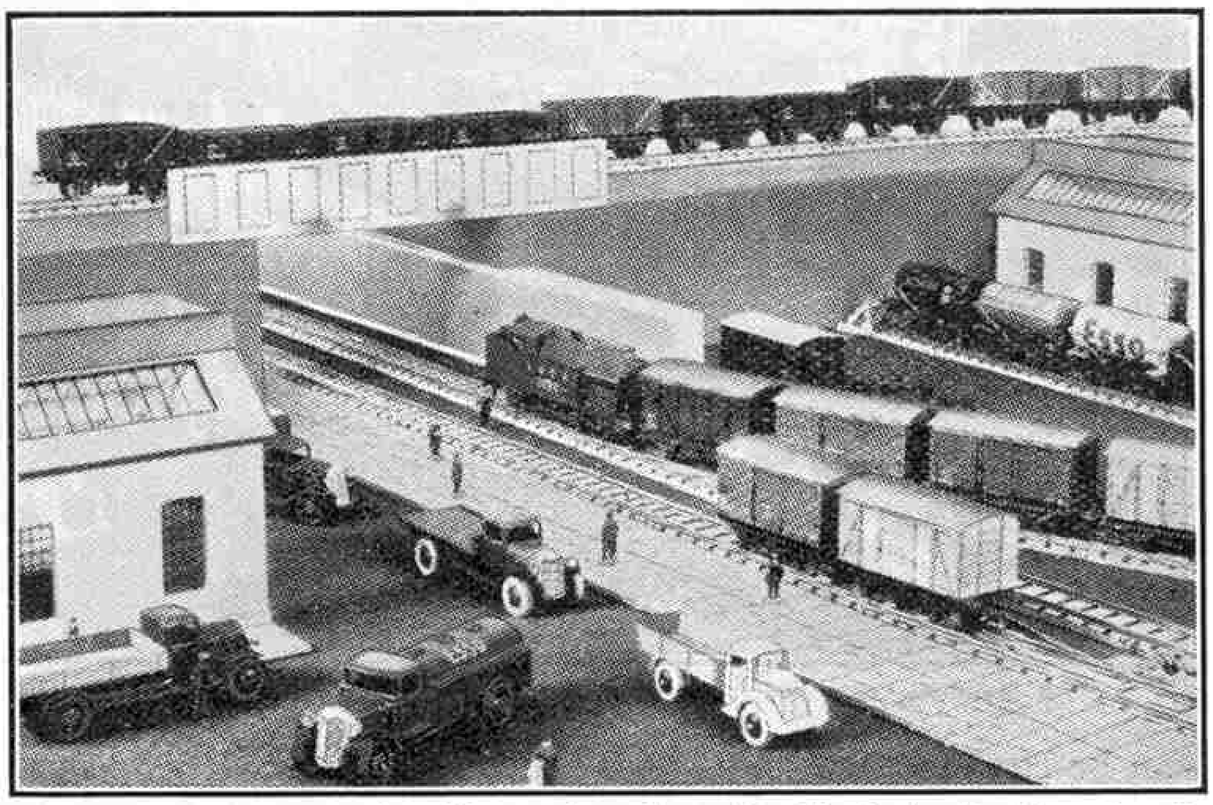
An effective arrangement for a wayside goods depot. The Hornby-Dublo Goods Station is well served by sidings, and there are additional tracks available in the foreground.

loop line can be electrified or cut out at will according to the requirements of the operator.

For stations of the more important terminus or junction type there is the splendid Hornby-Dublo City Station Outfit. Most readers will be familiar with the fact that this is made up of a number of separate components that can be assembled to form an imposing three-road terminus or, by a slight alteration of certain pieces, a through station. The Outfit has very wide possibilities, and attention has been drawn to various schemes incorporating the different components from time to time in these pages. One novel scheme makes one of the side platforms suitable for the handling of perishable traffic. The removable panels in one of the main walls supporting the roof are withdrawn; this leaves openings at platform level up to which Dinky Toys road vehicles can be backed for loading and unloading the various kinds of perishable freight for which Vans are available in the Hornby-Dublo range. A train of Meat Vans, Fish Vans and so on can therefore be dealt with at one of the side platforms and this will add variety and realism to the operations carried out at the station, whether it is arranged as a terminus or a through station.

The main platform sections of the City Station Outfit can also be used separately to form a station or halting place of the simple kind. The lower illustration on the opposite page shows them used in this way to make up a small country station. The railings used at the back of the platforms are the standard Hornby Gauge 0 Paled Fencing lengths. These are placed behind the Dublo platform sections, not planted on to them, so that their height is not excessive. This is quite an effective arrangement for a small station in the country districts served by the line.

In the illustration just referred to a splendid touch of realism is given by the road overbridge under which the train is passing. This is a "home-made" item, and together with its approaches can easily be made from cardboard or thin wood. No dimensions need be given as these will vary according to the particular spot in which the structure is to be placed. The brick construction can be imitated by painting when the bridge is finished; alternatively "brick paper" can be glued on to finish the job.



A busy scene showing a train pulling out from the yards. The Engine Shed is used on the left-hand side of the photograph to represent a goods depot.

For general goods traffic as opposed to the special "perishables" mentioned in connection with the City Station Outfit and its uses there is a realistic Goods Depot. The upper illustration on this page shows one of these accessories in use as a wayside goods depot.

For the larger depots such as are found in towns and cities, or at points where a great deal of traffic is transferred from one site to another, the Hornby-Dublo Engine Shed can be used very effectively. In the lower illustration on this page, an Engine Shed is shown used as a small oil depot on the right-hand side of the illustration. On the other side another Shed is employed as a goods warehouse and station.

A Hornby-Dublo railway on which special attention has been given to lineside buildings and so on is that of our reader P. B. Lee of Coventry. He describes his layout as follows: "The track is composed of a continuous oval with a loop line. Off the latter there is a siding running through the main station to the goods station and engine sheds further along. Clockwork was adopted for the motive power and a Hornby-Dublo Passenger Train Set and the Goods Set were obtained, the latter in L.M.S. style. Various other items of rolling stock were added. Then my next task was to make some buildings. All of these were made out of cardboard. Then I obtained a piece of drawing paper about 4 ft. long by 3 ft. high for the background, and on this I painted a picture of the sea and cliffs.

"A home-made station was installed and from this I have expanded with my buildings so that the whole looks very businesslike. Opposite the station is a bus depot, theatre and a General Post Office where there is plenty of bustling about going on so as to get the mail transferred to waiting trains. On some ground outside the main track itself there is a Dinky Toy Army. There are many motor cars and lorries to help the realism of a busy city."

Interesting Hornby Train Operations

IN our Hornby Train article last month we concluded with details of various operations connected with the storage of empty stock used for special traffic purposes. Actually the working of empty vehicles and their accommodation in sidings in between runs should not be confined to the operation of special traffic. The normal working of a passenger train service in miniature calls for a certain amount of "empty mileage," and the performance of the correct operations adds to the interest and realism of the running programme.

Sometimes, owing to lack of space, trains have to be stored when not in use alongside the platforms of a miniature terminus station. There they are certainly ready for their next turn of duty, but they prevent any other trains using the platforms. It is better if at all possible to have a siding or two where the vehicles can be concentrated and where they can, if necessary, be assembled into various types of trains according to the requirements of the timetable or working scheme.

In real practice this marshalling work is performed normally by a "carriage pilot," as a rule a tank locomotive that fills in most of its time on this work. Sometimes however a regular main line engine will be used to assemble a train and take it down empty to the terminus, afterwards taking up its ordinary turn of duty when released by the departure of the train. This is a scheme that can be made good use of in miniature, for it saves engine power and avoids a certain amount of "light engine" running. The only objection is that the use of a tender engine may restrict the length of the train unless the terminal platforms are of a fair length.

Similarly at the end of a run the empty stock should be disposed of in a reasonable way. One scheme is to allow the engine that has brought the train in to back out the empty stock all the way to the sidings. This is quite satisfactory, although if the journey is of any length along the main line a "carriage pilot" engine should be attached at the head of the train in order to lead it along. On clockwork railways this is easy enough to do, but on an electric system it is not possible unless a double output Transformer is in use, and there is no break between the individual tracks.

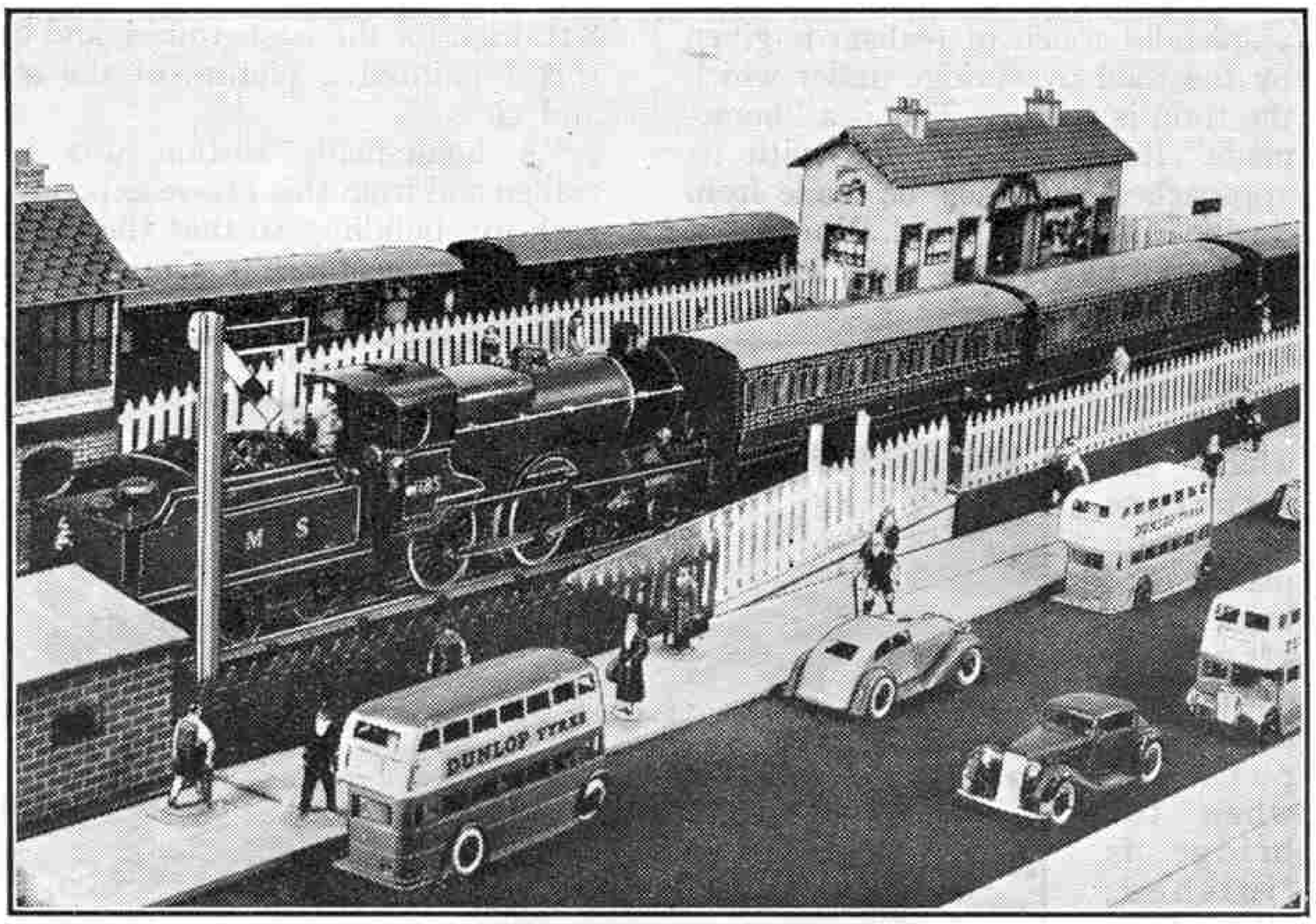
If the arriving engine is to be turned at the station, however, ready for a further journey, it will be uncoupled from the train on arrival. The empty train is then drawn out by another engine and taken away. Alternatively, if the arriving engine can run round its train at the end of the journey, it can then make a "tender-first" run with the coaches to the sidings.

Actually this last form of operation is that shown in the illustration on this page. Here a train of empty stock is being worked along to a storage point by a Hornby Standard Compound Locomotive. Having disposed of the train the engine will then go to the shed for the usual attention before its next run. In a similar manner engines that have themselves been "released" at terminal stations, by the working away of the trains they have brought in, can then be used to take out other "empties," and so perform useful work on their way to the Engine Shed. Exactly how the work is carried out will depend on the running programme and the relation to one another of the various engines' duties.

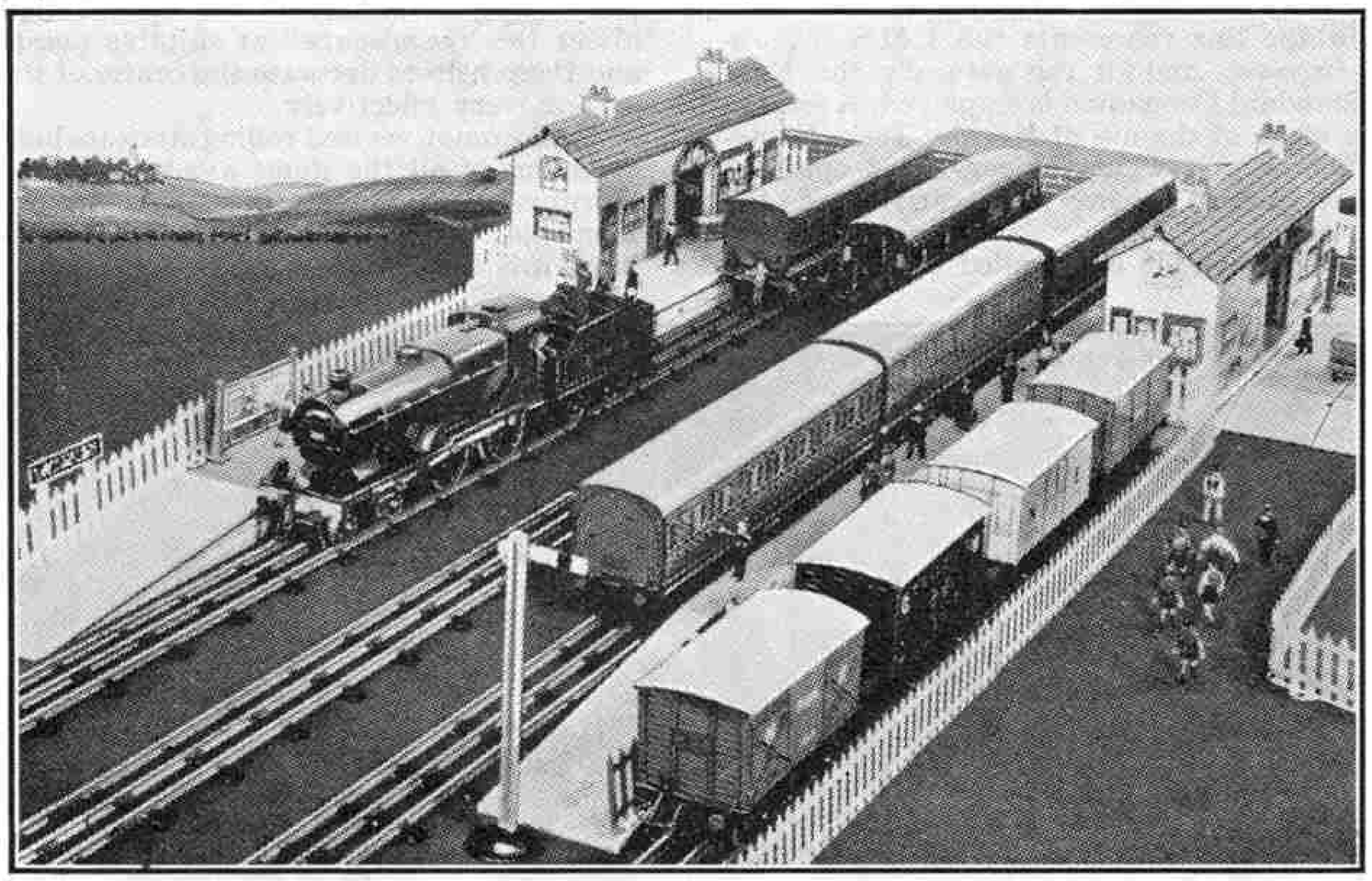
The working of a terminal station involves quite a number of interesting operations which, if properly carried out, add to the fun and the realism of the running programme. In addition to the operations just described in connection with empty coach working, there are also interesting things to do at times in connection with the departure of trains. For instance, if extra traffic suddenly has to be dealt with on a certain train, an additional vehicle will have to be coupled up to the normal formation. This extra coach may be standing several roads away from the departure platform, and as a rule the engine that is to take the train will deal with the attachment of the vehicle concerned.

On the other hand, the extra coach may be a "through" vehicle that reverses its direction of travel at the terminus, which thus becomes a junction point. The coach is worked in by one train and is then worked out by another. This is quite an interesting scheme, especially if there is a branch line connected to the main track from which the through coach has come. Real and imaginary "through" services of this kind can be reproduced in miniature, and the shunting and so on necessary to work the through vehicles from one train to another at a busy station often present the operator with fascinating problems.

If the through vehicle belongs to



A Standard Compound, running tender first, works an empty train to the carriage sidings.



Miniature terminal working. The engine is backing on to a vehicle at the far platform in order to add it to the train already waiting on the departure track.

the railway the practice of which is followed in miniature it is quite good fun. More interesting still, and more suggestive of "distance," is the use of another company's stock. Probably most miniature systems possess one or two coaches in a different finish from those of the "owning company." Sometimes these have been presents from relatives who do not know the actual railway represented; at other times changes in the whole scheme of the line result in a certain mixture of rolling stock. Whatever the reason, the working of through services provides a realistic way of employing the coaches in question.

It may often happen that the through vehicle is a corridor coach; such coaches are most usually used for through working on real railways. If the train by which it is to be conveyed is also a corridor one, then the Corridor Connections should be coupled up throughout the train. If not, then Corridor End Plates must be fitted at each end of the through corridor coach for the safety of its "passengers." Detail operations of this kind are all part of the working of through coaches, and make train running all the more interesting.

In the upper illustration on this page a miniature terminal station is shown. A train getting ready for departure is alongside the near platform, while the engine is backing down another road to pick up an additional coach. The scene is realistic and is typical of the operations required in the working of a station as just described. One point that deserves notice is the centre road between the two platform lines. This is a useful feature where space permits it to be included, especially for accommodating odd vehicles not in use for the moment, such as those normally kept for "strengthening" purposes. Engines waiting for trains also can stand there, or through coaches awaiting transfer from one train to another.

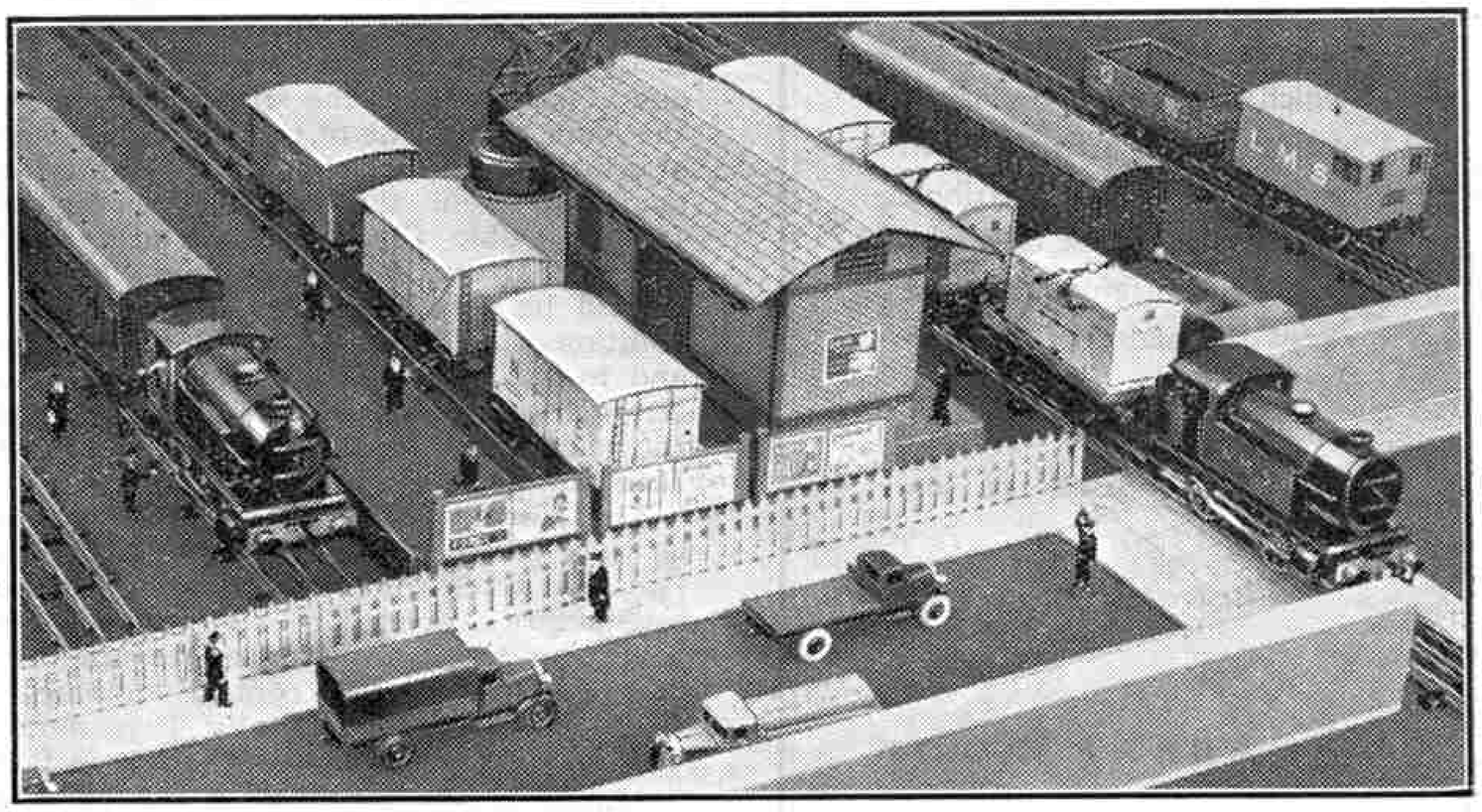
Many interesting schemes of various kinds can be worked out in connection with the freight side of the miniature railway business. The loading of goods wagons was referred to last month and we have previously described schemes for shunting and so on. The lower illustration on this page shows something more novel however.

Lines used for goods traffic frequently have to wander in and out of strange places, especially tracks that connect the main yards with depots or factories, warehouses and other premises. This is often useful to the miniature railway owner, for the shape of the space available for his system is not always ideal, and a certain amount of twisting and turning may be necessary in order to work in the track required.

Occasionally one finds a goods connecting line crossing a roadway or even running alongside it for some distance. This is a feature that can be reproduced effectively in miniature, and our illustration shows a goods track connecting two yards crossing a road on the level. No crossing gates are used, so that special measures are necessary in order to protect road traffic when there is a train movement on the railway. Therefore a "flagman" in the shape of a Dinky Toys Guard is standing by the rails in order to warn road vehicles. Anyone adopting this scheme should repaint the Guard's flag red instead of its normal green colour. The same figure can be used as a look-out man when any work is in progress on the track.

Usually the rail traffic on goods connecting lines, dock railways and so on, is worked by small tank engines suitable for the sharp curves often found on such tracks. On any Hornby layout incorporating lines of this kind —and many layouts include harbours or dockside features—the M3 Tank type of Locomotive is most suitable. It can traverse 1 ft. radius curves if necessary, but even if these are not used the small size and general handiness of the engine make it very useful as a "dock shunter."

On a large layout serving any special premises, one M3 Tank might be reserved for work of this kind. If representing a privately owned engine it may be painted in any special livery according to the wishes of the model railway operator.



A goods track crossing a road on the level. Road traffic is held up by a "flagman" while the "goods" passes.

Colin Hope and his Trains

The layout shown in the accompanying illustration owned by Colin Hope, of Newcastle-under-Lyme, is unusual in incorporating both Hornby Gauge 0 trains and Hornby-Dublo equipment. The outer main track and goods yard are Gauge 0, laid in Hornby solid steel rails. This main track is oval in form and encircles the Dublo layout which makes a compact system in the centre of the baseboard. The complete layout occupies a space approximately 12 ft. long and over 6 ft. wide.

The Gauge 0 track consists of a single main line serving a Hornby No. 4E Station fitted with electric light. In fact stations, yards, Buffer Stops and Signal Cabins on the Gauge 0 system are electrically illuminated. The No. 4E Station is situated on one of the long sides of the oval. Near to it there branches off a goods and rolling stock siding, which runs parallel to the main track and reaches well round to the opposite side of the layout. On this side there also branch off a pair of sidings between which is placed a length of standard Hornby Platform, and this is devoted to the handling of goods traffic. A tunnel placed close to the passenger station previously mentioned adds variety to the scene and one of the imposing Hornby Signal Gantries spans the track at a point where the main line and one of the goods lines run side by side.

Although the Gauge 0 part of this system is simple it carries heavy traffic, and there are three Hornby Electric Locomotives available to deal with this. Pride of place is taken by a 4–6–2 *"Princess Elizabeth"* engine. This is usually used on a train of Hornby Pullmans, and the combination is extremely effective. Another famous train on the line represents the L.M.S. *"Yorkshireman,"* and for this naturally the E220 Standard Compound is employed. A feature is made of the use of Hornby Train Nameboards, and whatever service is operated the correct boards are carried on the coaches.

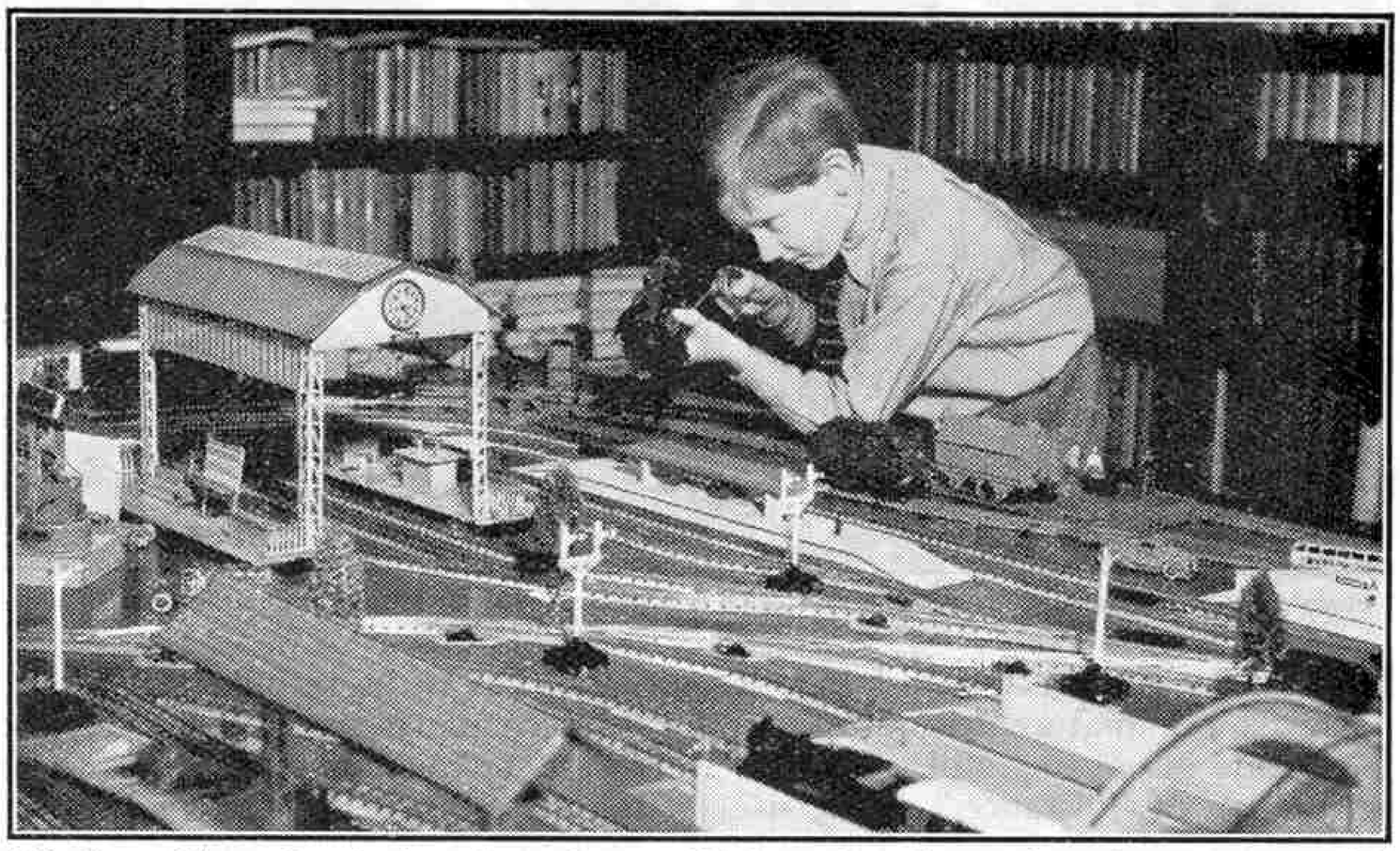
Goods traffic is attended to by an E220 Special Tank Locomotive. The wagons in use include several of special types such as Tank and Cement Wagons, and Flat Trucks and Lumber Wagons also are run. A Breakdown Van and Crane is stationed on one of the siding tracks ready to deal with any emergency.

Current is supplied to the track by a standard Meccano Transformer and both this and the electrical equipment for the Hornby-Dublo system are placed in a compact group at one side of the railway. The centre rail on the Gauge 0 system is provided with insulating gaps at suitable spots so that individual sections and the engines on them can be electrically isolated from the remainder of the track.

The Hornby-Dublo section of the layout consists of an oval-shaped main line with double track connected by both facing and trailing crossovers. The inner main track again has a diagonal track connecting its opposite straight sides. On each side of this diagonal there branch off various dead-end roads which serve two terminal stations, one at each end of the space enclosed by the main track. One of these stations, part of which can be seen in the illustration is made up from the components of the Hornby-Dublo City Station Outfits. By way of contrast the other is quite different, as will be seen from the illustration. In addition other lines lead to a Goods Station and to an Engine Shed respectively. The latter also serves as a carriage depot. On the main track there is a standard Main Line Station, also an Island Platform.

The Hornby-Dublo part of the system is very fully signalled and there are Isolating Rails where necessary to ensure satisfactory operation. The Switches governing these are grouped together in line near to the other control equipment. Good use is made of Dinky Toys motor vehicles of different kinds. There is in fact near one of the terminals a car parking "ground," and this includes a petrol station and garage. Hornby Trees are dotted about the "Landscape" at suitable points and these help to decorate the centre of the system very effectively.

The locomotives and rolling stock include examples of all the items available in the Hornby-Dublo range. Express trains are invariably taken by the splendid streamlined L.N.E.R. *"Sir Nigel Gresley"* and at the same time owing to the use of Isolating Rails goods trains can be dealt with on another track or shunted in the sidings by either an L.M.S. or an L.N.E.R. 0–6–2 Tank Locomotive.



Colin Hope of Newcastle-under-Lyme busy with one of his locomotives. The complete railway system described on this page includes both Hornby Gauge 0 and Hornby-Dublo equipment. Photograph reproduced by courtesy of Staffordshire Sentinel Newspapers Ltd.

Stories of air-aces from Capt. Ball, V.C. to "Cobber" Kain

Heroes of the Fighting R.A.F.

L. R. GRIBBLE

"Deeds are recorded here which will never grow old or cease to make a Briton swell with pride. . . . Mr Gribble has recounted these tales with colour and imagination. These deeds of a quarter of a century ago live again through the medium of his vivid pen."

—TIMES LIT. SUP.

Illustrated 5/- net

A HARRAP BOOK

A Famous Locomotive Class

(*Continued from page 113*)

framed, weighing 265 tons full, No. 4436, southbound from Cambridge, gained 2½ min. on the first stage to Letchworth stop after fine climbing and an easy descent; it kept the 5 min. schedule for the 2½ miles on to Hitchin and then, though making a spirited effort with a flying finish, lost slightly on the very sharply-booked 11½-mile stage with an uphill start to the next call at Welwyn Garden City for which only 14 min. were allowed. The last 20¼ miles into King's Cross, however, were covered in no more than 20½ min., Finsbury Park, 17¾ miles, being passed in 16 min. 52 sec. after 65-62 m.p.h. had been maintained up to Potter's Bar, followed by a rapidly-attained 85 m.p.h. maximum on the descent to Wood Green. The engine had thus improved on a difficult booking to the extent of 3¼ min. on this comparatively short run with three stops, still further proving the versatility of the literally "evergreen" G.N.R. "Atlantics," with the day-to-day work of which the present writer was closely in touch for a quarter of a century.

Aeroplane Photographs

Every boy is interested in aircraft, especially military machines, and is keen to acquire pictures of them. The aeroplane photographs published by our advertisers Real Photographs Company, Cooper's Buildings, Church Street, Liverpool 1, are ideal for building up a representative collection of views of British and foreign aircraft, and are also useful to spotters of enemy aeroplanes. The latest list (No. 11), just published, contains over 1,000 titles of famous civil and military aircraft, and interesting details of cabinets and albums in which to store the photographs.

FIRESIDE FUN

IT LOOKED WELL

An old miser was nearing his end and was dictating his will.

"And to each of my employees who has been with me five years or more I bequeath the sum of £2,000," he said.

"That is most generous," said the lawyer.

"Not at all," answered the sick man. "There's not one of them who has been with me for more than a year, but it will look well in the papers."

* * * *

Bill was limping badly.

"What's up?" asked the foreman. "Hurt yourself?"

"No, got a nail in my boot," replied Bill.

"Why don't you take it out, then?"

"What! in my dinner hour?"

* * * *

Visitor: "I'm glad to hear that you're out of danger."

Invalid: "I'm not, yet. The doctor says he'll have to call two or three times more."

* * * *

Convict No. 123: "It's no good taking any notice of those advertising slogans. I followed the advice of one, and here I am."

Convict No. 321: "Which one was it."

Convict No. 123: "Make money at home."

* * * *

The manager of an Aberdeen firm called his book-keeper into his private room. "Sandy," he said, "the accountant is leaving and I'm gaun tae gie you his job."

The young book-keeper's face lit up with expectation.

"Thank you, sir," he replied. "And what will the salary be now?"

"The same as you're getting, but ye'll ha'e a hat-peg to yourself," he returned.

* * * *

Rambler: "Is it far to the next village?"

Yokel: "Well, it seems further'n what it be, but it bain't."

* * * *

The two tramps had just left the small town behind them.

"What happened when you asked the cook at the doctor's house for some pie?" demanded one.

"I received a tart reply," said the other.

* * * *

Father (sternly): "Henry, I promised to give you a bicycle for your birthday if you passed your examination. Now I see that you have failed. You should have studied more at home. What have you been doing in your spare time?"

Henry: "Learning to ride a bicycle, father."

* * * *

Visitor (to retainer in old country mansion): "They tell me this place is haunted. Do you believe in ghosts?"

Retainer: "No, sir! But I'm afraid of them."

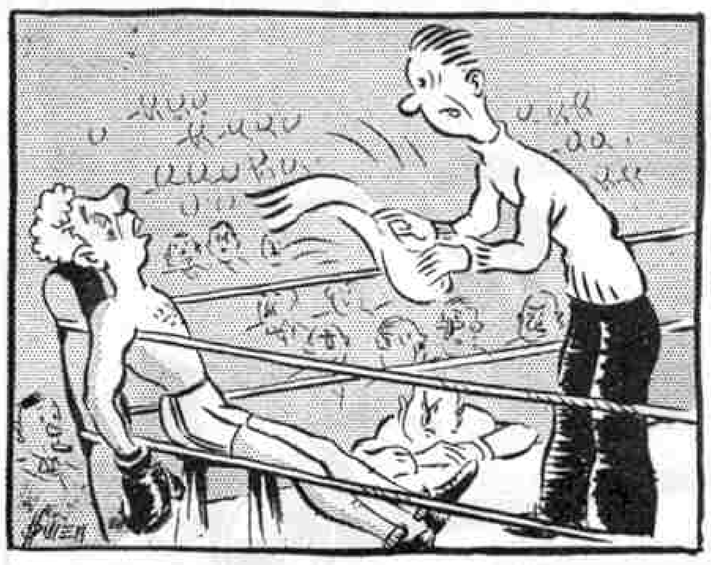
* * * *

Bill: "What's the best way to keep a fire hot, Jim?"

Jim: "I should say to keep it frequently 'coaled'!"

* * * *

MUTUAL FEELINGS



Second: "You're all right, Bill, the crowd's with you!"
Battered Boxer: "I wish I was with them!"

A WEIGHTY CONVERSATION

"You say your friend speculated on a large scale," remarked the waggish one. "May I ask what was the use of the large scale?"

"Certainly," replied the cheerful idiot. "He needed it to weigh the consequences."

* * * *

Teacher (during English lesson): "In this stanza what is meant by the line 'The shades of night were falling fast'?"

Modern Boy: "The people were putting the black-out up, sir."

* * * *

EARNING HIS PAY

"Mighty mean man I'm working for."
"What's the matter?"
"He took the legs off the wheelbarrow so's I can't set it down and rest."

* * * *

Bill: "Last night I saw a real man-eating tiger."

Dick: "That's nothing, in a restaurant just now I saw a man eating chicken."

* * * *

During a tour of Scotland that was being made by a travelling circus, one of the gorillas caught a chill and died. It was left by the roadside, and a short time later a native passing along the road saw it. He scratched his head, and considered for a moment.

"It's no a McKenna and it's no a Macintosh," he exclaimed. "I'd better gang up to the Hall and see if any of the English visitors are missing."

* * * *

An Englishman was walking along a river bank in Ireland when it started to rain. Presently he found an Irishman fishing with his line under a bridge.

"Why" he asked, "have you got your line there?"

"Sure, yer honour," replied the angler, "won't the fishes be crowdin' in out of the wet?"

* * * *

Distant Voice: "Are you Exchange 4372?"

Telephone Subscriber: "No, but yours is the nearest guess to-day so far!"

* * * *

A centenarian was being interviewed.

"And to what do you attribute your being 100 years old to-day?" he was asked by the young reporter.

"Well, zur," replied the old man, "I suppose it's because I was born in 1841."

* * * *

Landlady: "I'm sorry you don't like the cakes. Why, I've built up my boarding-house on my cooking."

Guest: "I don't doubt it, madam. With a few more cakes like this you could build a hotel."

* * * *

The Scotsman, having made his pile in America, returned to Aberdeen. At the station he was met by his two stay-at-home brothers. Both wore heavy beards.

"It's gran' tae see ye," exclaimed the wanderer, "but why the beards?"

"Dinna ye mind, Donal'?" they replied. "Ye took the razor with ye when ye went awa'!"

* * * *

THIS MONTH'S HOWLER

In America people are put to death by elocution.

AN ARMY CONTRACT

"Shine, please, boy," said the six-foot-five soldier to the shoeblack.

The boy looked down at the vast expanse of boot before him. Then: "Bert," he called out to another boy, "Gimme an 'and—I've got an army contract!"

* * * *

Pat: "What would ye do if ye should meet a real, live ghost?"

Mike: "Faith an' I'd drop down dead and run for me loife."

* * * *

Prospective Employer (discussing applicant for work over the telephone): "Tell me, is the boy steady?"

Late Employer: "Rather! If he were any steadier he'd be motionless."

* * * *

Magistrate: "And is this the first occasion on which you have appeared before the Court?"

Prisoner: "Say, guv'nor, do I look like an amateur?"

* * * *

The newly-rich man was mapping out his first tour abroad and was scanning a map of Russia.

"Where's Moscow?" he demanded. "I can't find it anywhere."

"Of course you can't" replied his daughter, just home from school. "It was burnt down in 1812 when Napoleon went there."

* * * *

A traveller seeking advertisements for a local paper called on the village grocer. Upon presenting his card, he was surprised when the grey-headed proprietor said, "Nothing doing. Been established 80 years, and never advertised."

Turning to leave, the traveller said, "Excuse me, sir, but what is that building on the hill?"

"The village church," said the grocer.

"Been there long?" asked the traveller.

"About 300 years."

"Well," replied the traveller, "they still ring the bell."

* * * *

"Name?" inquired the customs officer.

"Sneeze," replied the Chinese proudly.

The official looked at him hard. "Is that your real name?" he asked.

"No. English name," said the Oriental blandly.

"Then let's have your native name."

"Ah Choo."

* * * *

Abe was about to depart on a holiday to the Continent. Sol had come to the station to wish him good-bye. As the train was about to move off, Sol said: "Vel, cheerio, old chap, and remember the old proverb, 'Ven in Rome, do the Romans'."

* * * *

Mrs. Murphy: "It's a nice house ye've got, Mrs. Riley—but what a dreadful noise the children make outside!"

Mrs. Riley: "Sure, and ye're quite right. The only peace we get is when a tramcar drowns the row."

* * * *

"Thank you for the presents, auntie."

"Oh, they are nothing to thank me for."

"That's what I thought, but Mother told me to thank you all the same."

* * * *

Bill: "I woke up last night with a terrible feeling that my watch was gone. The impression was so strong that I got up and looked."

Tom: "Well, was it gone?"

Bill: "No; but it was going!"

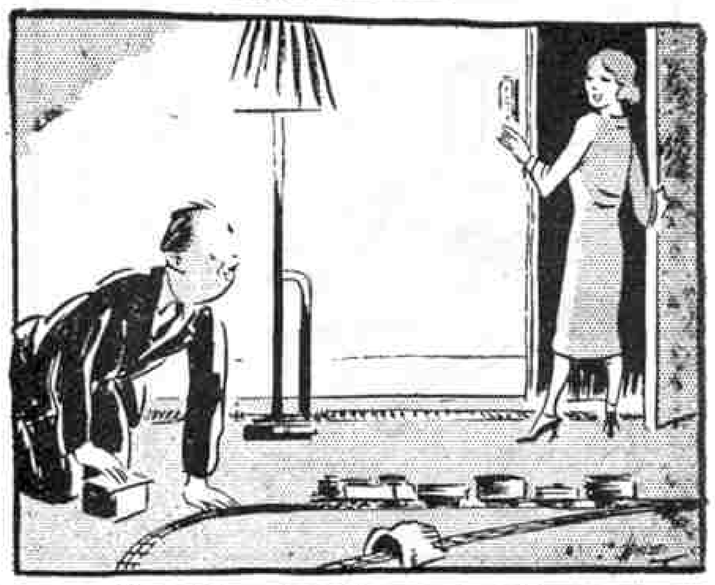
* * * *

An unpopular naval officer had fallen overboard into the sea, whence he was rescued by one of the sailors. When he had thoroughly recovered he said: "To-morrow morning I will thank you for saving me, before all the crew."

"Don't do that, sir," the sailor replied. "If you do they'll half kill me."

* * * *

"ALL CLEAR!"



Dad: "Are the children asleep?"
Mother: "Yes, dear!"
Dad: "Well, switch on!"

From Our Readers

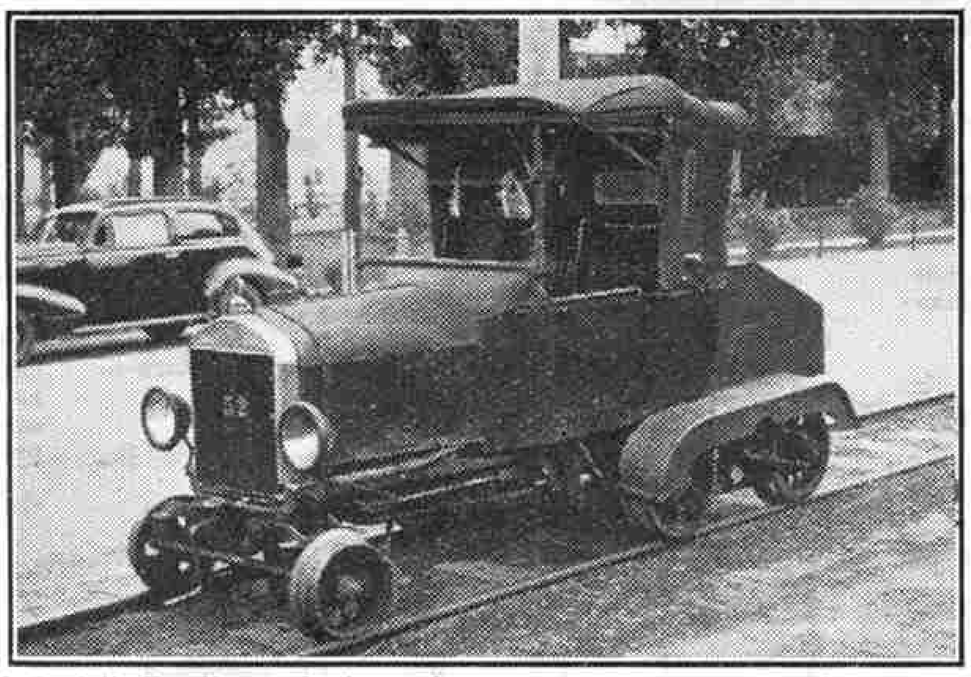
This section is reserved for articles from readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs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

Novel Use for a Motor Car

The photograph on this page shows an old Ford car of the famous Model T that has been converted to railway use. It ran on the Uintah Railway, Colorado, in the United States. This is a 3-ft. gauge line built chiefly for the conveyance of mineral traffic; there was some passenger traffic, but this was of secondary importance. The mines served became worked out and the line was abandoned when they were closed, most of the locomotives and rolling stock being sold for use on other lines of the same gauge. There are many small American railways of similar gauge to the Uintah line that are now handling only goods traffic.

In order to fit it for its new use the Ford car had the steering wheel removed, and the front wheels were made rigid to run on the track. The rear wheels were chain coupled and driven in the usual manner by the engine unit. The resulting novel "railcar" was employed for inspection purposes, and the photograph of the vehicle that is reproduced on this page shows how well adapted it is to its special purpose.

H. E. MEATS (Birmingham).



A Ford "railcar" used for inspection purposes on an American 3-ft. gauge line. Photograph by H. E. Meats, Birmingham.

A Famous Limestone Cavern

A visit to Kent's Cavern is always a great attraction to Torquay holiday visitors. The wonderful formations of stalactites and stalagmites to be seen there are the result of the wearing away of the limestone rocks countless years ago by water containing carbon dioxide in solution.

The Great Chamber, just inside the tiny entrance, is very impressive because of its size. There are soft electric lights and the caves are dry and even in temperature. To the right is the Long Arcade, where the guide points out a great boss of limestone, some 43 ft. round and 12 ft. high, which reminds one of the lions in Trafalgar Square. Inscriptions can be seen on the top of the boss, the earliest dating back to 1615.

Again to the right, in the Great Stalactite Chamber, are formations that are said to resemble a wedding cake, a frozen waterfall, a Chinese pagoda and even a dried haddock; and a small hole gives a view of the Organ Chamber, so called because the rock formations in it look like the pipes of a gigantic organ.

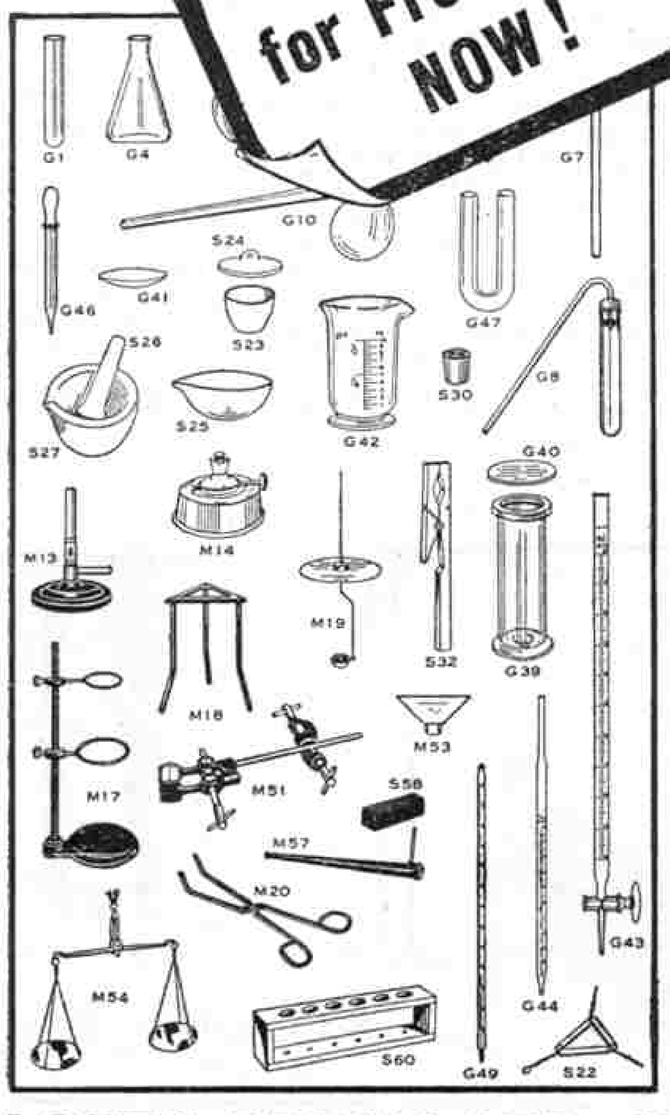
One of the most interesting chambers is the Bear's Den, where bones of great cave bears of prehistoric times have been discovered. The jaws and teeth of a cave bear and the eight-inch tooth of a sabre-toothed tiger can be seen embedded in the roof, and tools of primitive men and a skull have been excavated by the British Association explorers. The discovery of animal remains was made by Rev. J. MacEnery, who found thousands of teeth and bones packed close together in enormous numbers. They included those of the cave hyena, the wild cat and many other creatures that roamed the country in prehistoric times, and implements of bone as well as stone also have been found.

B. E. KINGDON (Paignton).

LOTT'S

Write for Free Lists NOW!

CHEMISTRY SPARES



Boys make sure of a good supply of lab. apparatus. You get full value for your money when you buy these first-class spares. You can get them piece by piece or in sets corresponding to Lott's Chemistry boxes. Write for a Spares List now!

Just think what fun you could have with the extra apparatus illustrated here. Exactly what you have always been wanting. You'll be able to invent a great many new and interesting experiments and learn to be a real scientist.

★ *Ask your toy dealer for full particulars, or write to the manufacturers (Dept. MM) for name of nearest agent and for this illustrated Chemistry Spares List—2d. stamp on P.C. or 2½d. stamp on letters, please.*

LOTT'S BRICKS LTD., Watford, Herts.

MECCANO

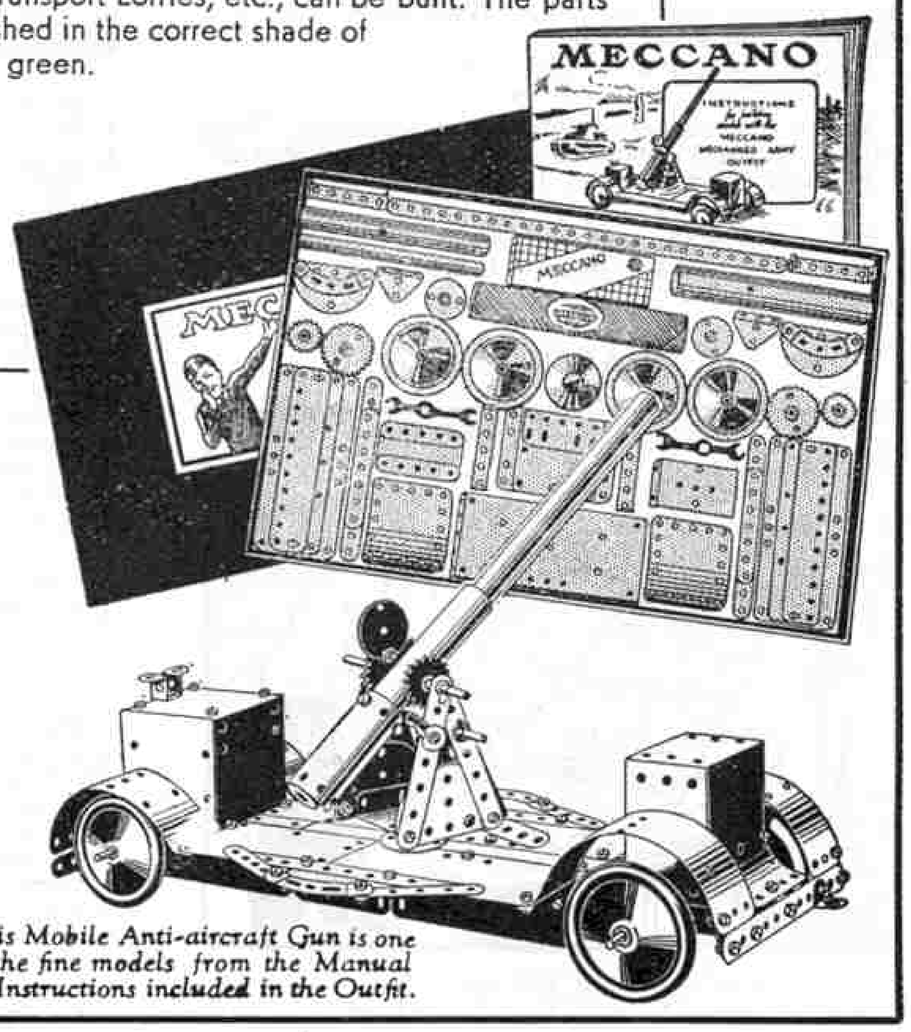
MECHANISED ARMY OUTFIT

This special Meccano Outfit makes possible the building of models of a variety of Mechanised Army prototypes.

It contains a big assortment of specially designed Meccano Parts, including gun barrels, with which realistic models of Tanks, Anti-Aircraft Guns, Field Guns, Transport Lorries, etc., can be built. The parts are finished in the correct shade of Service green.

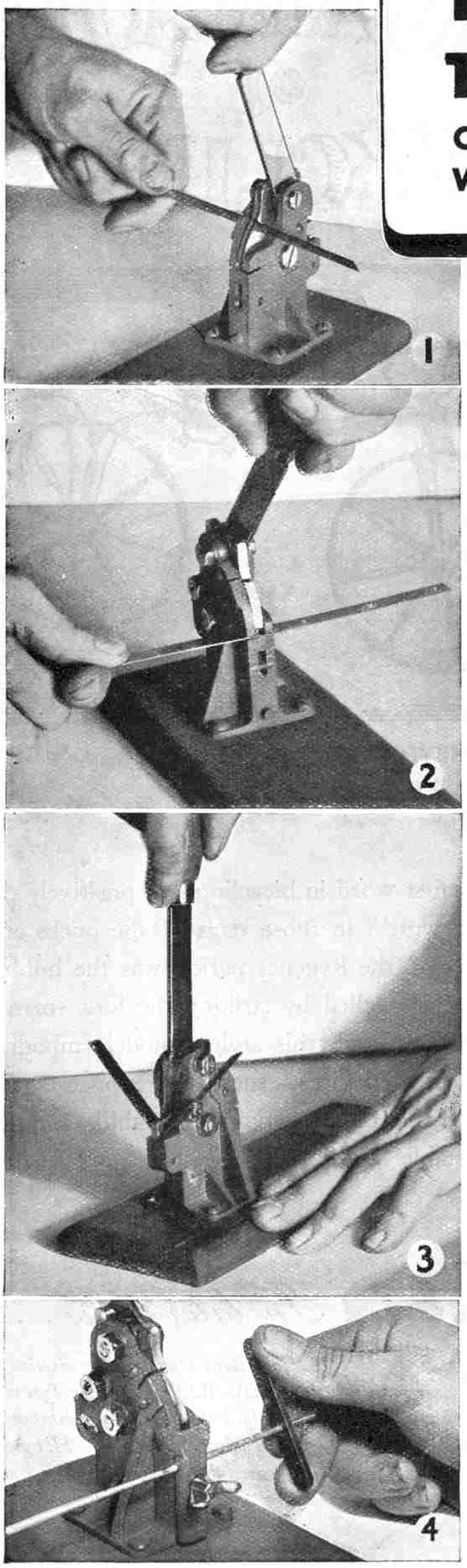
Price **17/3**

With Purchase Tax **21/-**



This Mobile Anti-aircraft Gun is one of the fine models from the Manual of Instructions included in the Outfit.

JUNEERO IN ACTION—1. Shearing Strip. 2. Punching Strip. 3. Bending Strip. 4. Threading Rod.



THE SHAPE OF THINGS TO COME . . .

CONSTRUCTED WITH JUNEERO

THESE are thrilling days—all sorts of new mechanical ideas and gadgets are in demand. Perhaps you have some bright ideas yourself, ideas for something new or for improving something. Try it out, make it yourself in metal to see if it works.

The photos show how versatile is the ingenious Juneero multi-purpose tool which will do almost anything with Juneero strip and rod! With this tool and Juneero materials you can make a host of useful and interesting things—models, utility articles and repairs. Numerous designs sheets are now available at 1d. each from your Juneero dealer.

JUNEERO SETS are supplied by Juneero dealers at the following prices, ranging in size from the multi-purpose tool and essential materials in No. 1 set to the wealth of tools and materials in the Engineers Set. No. 1 Set 15/–. No. 2 Set 30/–. Workshop Set 60/–. Engineers Set 84/–. If owing to war conditions you have any difficulty in obtaining, send remittance to us plus 1/– for packing and postage on Nos. 1 and 2 sets, 2/– for larger sets (abroad 5/6 and 10/6 extra).

MANY FAMOUS ENGINEERING FIRMS now using JUNEERO

THIS ENGINEERS' SET

containing magnificent variety of tools and materials is the Juneero outfit par excellence. Packed in a heavy gauge metal box, price, complete

84/-

JUNEERO IS FREE OF PURCHASE TAX

COUPON: Write Name and Address in Margin BLOCK LETTERS

To JUNEERO LTD., Stirling Corner, Boreham Wood, Herts.
Please send me particulars of Juneero Sets and name of nearest dealer.

A CHALLENGE !

Like the Knights of old, Seccotine sends out a challenge to Trial by Strength! There isn't another adhesive dare accept, for Seccotine is twice as strong as any of them. There's no exaggeration about that, because it has been proved by laboratory tests. You wouldn't find people like the Air Force and the Navy using Seccotine if it were not the best.

It's been the best since your Grand-dad's days—over fifty years ago, and it has never been beaten. There's one thing you must be careful about though—don't be put off with anything in a tube. It must be real Seccotine with the name clearly on the tube. Just keep your eyes open for the real thing.

Obtainable in tubes, 4½d., 7d. and 10d., from all good Stationers, Ironmongers and General Stores.

MADE BY BRITISH WORKPEOPLE.

SECCOTINE

THE DOUBLE STRENGTH ADHESIVE

STICKS EVERYTHING

POST THIS COUPON to Dept. M.,

M'Caw, Stevenson & Orr Ltd., Belfast.

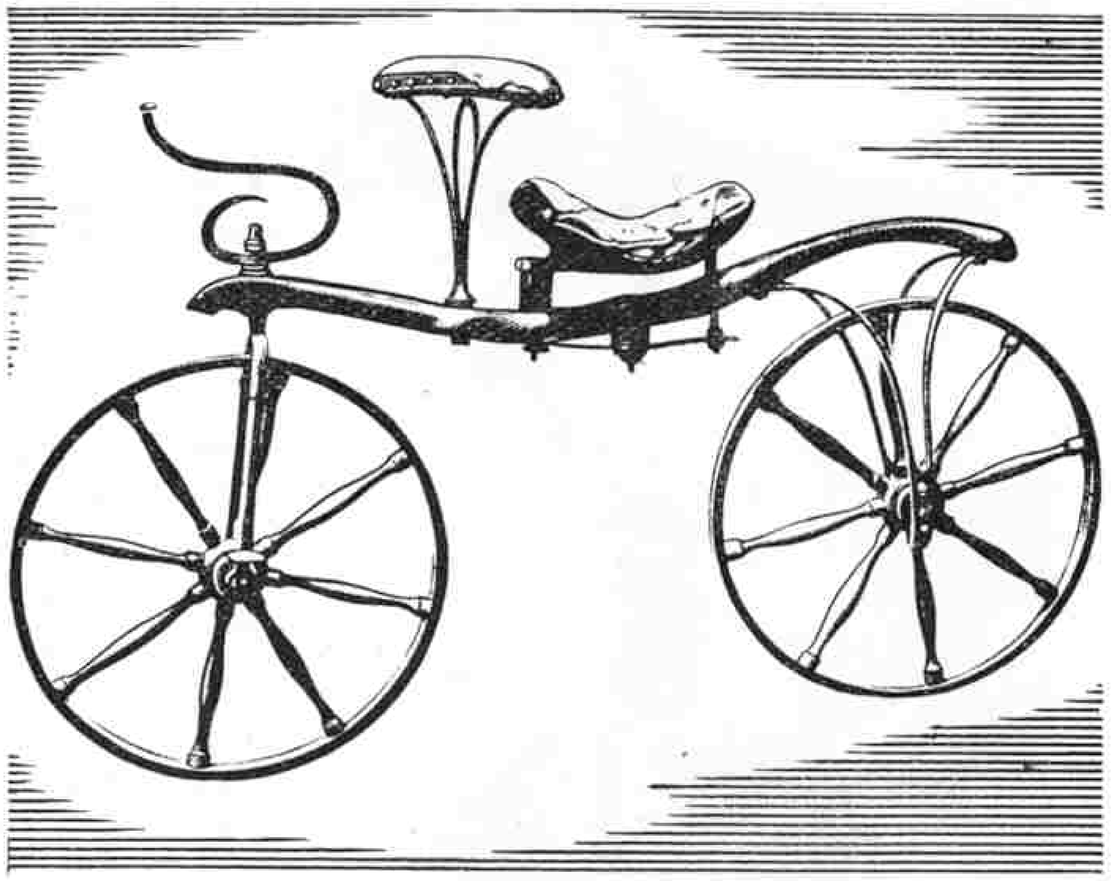
I should like to have, post free, a copy of your Free Booklet.

NAME.....

ADDRESS.....

.....

CAVALCADE OF CYCLING



THE HOBBYHORSE *(circa 1818) Presented to the Bartleet Collection of Historic Cycles by Lord Iliffe.*

The first word in bicycling, and positively the "last word" in those days of the bucks and beaux of the Regency period was the hobby-horse. Propelled by striking the foot smartly on the ground, this stylish model embodied the latest devices, such as foot-rests for the thrill of "coasting" downhill, and an adjustable saddle!

In later days . . .

John Boyd Dunlop's introduction of the DUNLOP *Pneumatic Tyre was destined completely to revolutionise mechanical transport. His great pioneering achievement was, and remains, the most outstanding in the history of cycling.*

1H/301

OPAL PEA LAMPS.

Ideal for your models. Complete with flex and adaptor. Operate from **4 volt battery.** Suitable for Aeroplanes, Railway Signals, Stations, Coaches, etc.

6 for **3/-**, **12** for **5/-** or **24** for **9/-**. Post free.

Send 2½d. stamp for Bargain Offer of Copper Instrument Wire, D.C.C. and D.S.C. or for motor enquiries.

L. WILKINSON GUILDFORD PLACE HIGH STREET, TAUNTON

MODEL AEROPLANES

Send Penny Stamp for our Lists. Flying and Non-Flying Kits. "FROG"—"PENGUIN"—"SKYBIRDS." Balsa Wood. Cements. Dopes. If interested, ask for Chemistry List. Owing to high cost of printing, stamp should be sent.

GEORGE D. CAMPBELL
46, HIGH STREET, DUMFRIES

ALL Gauges, Makes and Types bought, sold and part exchanged. Large stocks. Lists free. Watford Model Exchange, 29, Queen's Road, Watford, Herts.

TIGER MOTHS

A complete collection of these gaudy moths for only 3/6 (post free). Woolly bear caterpillars, cocoons, etc., all ready now! Also silk-worms' eggs (hatch in May) 50 for 1/- (post free) with pamphlet on how to rear them FREE. Write for our NEW SPRING LIST (enclose 1d. stamp).

From **L. HUGH NEWMAN**
"The Butterfly Farm," Bexley, Kent

WHEN WRITING TO ADVERTISERS PLEASE MENTION THE "MECCANO MAGAZINE"

How to obtain the "M.M."

The "*M.M.*" may be ordered from all Meccano dealers, or from any newsagent or bookstall. Price 6d. per copy. As a rule, back numbers cannot be supplied, because we print only sufficient copies to fill our standing orders. To prevent disappointment, therefore, place a regular order either with your dealer, newsagent, or direct with this office.

MECCANO LIMITED, BINNS ROAD, LIVERPOOL 13

BINDING THE "M.M."

Binding cases for back numbers of the Magazine may be obtained from Messrs. O. H. Bateman and Co., 23, Hanover Street, Liverpool. These are supplied in two sizes (1) for six copies price 3/3 and (2) for twelve copies price 4/9, post free in each case. The binding cases are supplied in what is known as "Quarter Basil, full cloth"—that is to say three-quarters of the sides are dark crimson cloth and the back and a quarter of the sides are dark crimson leather as shown here. The case is tastefully embossed in gold with the name "Meccano Magazine," and on the back is the name and volume number.

Binding 6 and 12 copies. These binding cases are supplied so that readers may have their Magazines bound locally, but where desired, the firm mentioned above will bind Meccano Magazines at a charge of 5/9 for six issues or 7/6 for twelve issues, including the cost of the binding and also return carriage. The covers of the Magazines may be included or omitted as required, but in the absence of any instructions to the contrary they will be included.

Whilst the binding of the twelve Magazines is quite satisfactory, they form a rather bulky volume and for that reason arrangements have been made to bind six months' Magazines where so desired, as explained above.

SCALE BUILDINGS
FOR
HORNBY DUBLO LAYOUTS
Each Model Detailed

PLATELAYERS' HUTS	2'3 each
COAL OFFICES	2'9 "
WATER TOWERS	4'6 "
WATER TANKS	6'- "
BUNGALOWS	6'6 "
FOOTBRIDGES	17'6 "

Postage Extra.

BOOKS:
"Signals and Signalling" **1/-**, by post **1/3**
"Designing Loco. Bodies" **6d.**, by post **9d.**
"Track Electrification" **6d.**, by post **9d.**
"Electric Model Railways" **2/-**, by post **2/4**
Also our usual range of Building Papers.

Tyldesley & Holbrook, 109, Deansgate, Manchester 3

ELECTRADIX

still leads in offers of real bargains: radio & electrical

DYNAMO BARGAIN. 100 volts 1 amp., D.C. shunt ballbearing "Croydon," 15lbs., 6in. x 5in., **12/6** post free.
A.C. MOTORS.—Start on full load 1/60 h.p. with pulley. Type 50, 1,500 revs., **18/6.** 1/25 h.p., Type 36.G, 3,500 revs., **27/6.** 1/4 h.p., 2,000 revs., **45/-.** Squirrel Cage 1/10 h.p. Motors, 2,500 revs., **35/-.**
D.C. MOTORS.—1/40 h.p., 110 or 220 volts, series, Type K.B., 1,750 revs., **15/-.** Type C, 1/35 h.p., 2,000 revs., **16/-.** 1/12 h.p. Type C, 110 or 220 v. shunt, 1,700 revs., **30/-.** Tiny Motors, 6 v., **12/6.** 50 v., **14/-.** 100 v., **15/-.** Electric Fans, **12/6. MOTOR GENS.**—220 v. A.C. to 100 v. 1 amp., D.C., **60/-.** Big stock all types.
CLEARANCE Speakers, moving coil, mains energised, **4/6.** With speech transformer, **6/6.** Postage on either **1/-.**
F.1 and TRUVOX P.A. Speaker Moving Coil Units for Large Horns, 6 volts, **12/6.**
HIGH RESISTANCE AND RADIO 'PHONES. The finest always is the adjustable Browns A Reed Phone, Aluminium swivel headband, 4,000 ohms, **35/6.** 1,500 ohms, **21/6.** 120 ohms, **17/6.** Cords **1/9.**
Various Makes. Second-hand Head-phones in good order. 2,000 ohms and 4,000 ohms, **6/6** and **7/6**, with cords. Western Electric, 2,000 ohms, **4/6.**
LEARNERS' MORSE PRACTICE SET. No. 3A Duplex with Key, Buzzer and Lamp for sound and visual, line plug on base. **7/-.**
MORSE KIT. Key on moulded base; buzzer and lamp, **4/6.** Townsend high-note tuning buzzer, **10/-.**
MORSE KEYS. First class at low prices. A good small key on moulded base is the TX pivot arm, excellent for learners, **3/6.** Full size, well finished key, all brass, solid pivot bar, adjustable tension, etc., B.2, **7/6.** Superior Type P.F., fully adjustable, nickel finish, **9/6.** High Grade Type IV., plated fittings, polished wood base, a fine key, **10/6.** Special Key on 3-switch box for buzzer and 2 lamps, C.A.V., **6/6.**
BELLS. G.P.O. type trembler Circular Desk Bell, with movement in gong, **1/6.** Wall Bells, trembler, **2/6.** Ditto, large size, **7/6.** Signal Bells, large metal, 12-volt single stroke Bells, **10/-.**
ALARM BELLS. Small and large. Battery or mains D.C. or A.C., 10 in. gong, Domestic Bells and Fire Bells, cheap. Please state wants. Single Bell Wire, **1/6** per 100 yds.
ACCUMULATORS. for stand-by H.T., at **6d.** per volt. 3 amp. hours, in 24 volt unit crates, glass cells, **12/-** each. Can be parallel charged off 12 volts.

ELECTRADIX RADIOS
218, Upper Thames St., London E.C.4
Telephone: Central 4611

CHEMISTRY EXPERIMENTS
IN YOUR OWN LABORATORY

Post Free OFFER of SAMPLE PARCEL containing many useful pieces of
CHEMICAL APPARATUS
2'9
Write also for FREE PRICE LIST of other Sets.

BECK (Scientific Dept. G), 60, High St., Stoke Newington, London N.16.

SPITFIRE, Wellington Bomber, Castings, Scale Mascots, Pair, Brass 10/6, Bronze 12/6. Catalogue 3d. Butlers Novelties, Littleover, Derby.

This is Fighting Talk

If You're Lazy you won't read far in this talk. If you're not—if you have the courage to face facts—you will want to know what special effort on your part will enable you to get on.

If You're a Shirker you'll always wish for success but never do anything about it. The earth is cluttered with that kind of man.

But, if You're a Fighter you *will* set about doing something. You'll get the special *necessary* training that fits you for a good position and good pay.

The I.C.S.—International Correspondence Schools—offers you that training. There is none better, none more convenient for the student. Let us tell you all about it. Just fill in the coupon below or write to us in any other way.

COUPON FOR FREE BOOKLET

INTERNATIONAL CORRESPONDENCE SCHOOLS LTD.
Dept. 218, International Buildings
Kingsway, London W.C.2

(Use PENNY Stamp on UNSEALED Envelope)

Please send me free booklet describing I.C.S. Courses in the subject I have marked X. I assume no obligation.

ACCOUNTANCY	JOURNALISM
ADVERTISING	LETTERING
AERONAUTICAL ENG.	MARINE ENGINEERING
AGRICULTURE	MECHANICAL ENG.
AIR CONDITIONING	MINING
ARCHITECTURE	MOTOR ENGINEERING
BOOK-KEEPING	RADIO
BUILDING	SALESMANSHIP
BUSINESS TRAINING	SANITARY ENG.
CHEMICAL ENG.	SCIENTIFIC M'G'MENT
CIVIL ENGINEERING	SECRETARIAL WORK
COMMERCIAL ART	SHORT-STORY WRITING
DIESEL ENGINEERING	SURVEYING
DRAUGHTSMANSHIP	TELEVISION
ELECTRICAL ENG.	TEXTILE MANUF'G
FRENCH AND SPANISH	WINDOW DRESSING
GENERAL EDUCATION	WOODWORKING
HORTICULTURE	WORKS MANAGEMENT
INSURANCE	

EXAMINATIONS:
Technical. Professional. Civil Service. Matriculation.

State your Exam. here.....

Name.....*Age*.....

Address.....

.....

Greatest, largest and most famous of all institutions devoted to spare-time training by the postal method. Branches in 30 countries, students in 50.

I.C.S.

READERS' SALES AND WANTS

Readers should note that all advertisements of Hornby Trains and other Meccano products included in this column relate to items no longer featured in the catalogue. Advertisements of current products cannot be accepted for this column.

Wanted. Model Aircraft Petrol, Gas or Compressed Air Motors. Apply, stating full particulars.—Raper, Woodlands, Wellington, Somerset.

1,250 Stamps in album. Cat. £12, take £2.—Wooller, 7, Neptune House, Rotherhithe, London.

Sale. "Outline of Nature." "Shipping Wonders of the World." Both complete, unbound, new condition. What offers.—Crowther, Littlemoor, Mirfield.

Sale. 40 Modern Wonder Cards. 33 Animal, 18 Soldiers, 50 Soldiers in cigarette Album.—Main, Eildon Lodge, Galashiels.

Two pairs Boxing Gloves plus Punching Ball. Brand new, 30/-.—Haward, 9, Moorfield Road, West Didsbury, Manchester 20.

Sale. "M.M.'s", unbound, good condition; 1933-1938, except May, June, August, 1934, and April, May, 1938. Offers?—M. Grierson, 12, Knowles Hill Road, Newton Abbot, Devon.

Wanted. B.S.A. Air Rifle.—Walsh, 111, Chanctonbury Way, Woodside Park, London N.12.

Wanted. Meccano Steam Engine, perfect condition.—Renyard, King's College Hospital, London S.E.5.

Wanted. Trix 4-6-2 and 4-4-0 Locos., Points, Signals, Model Railway Books—Stott, 71, Broadway, Morecambe, Lancs.

Sale. Large quantity Red/Green Meccano. Sold separately. Stamp for list.—J. Lock, "Lochain" Priors Road, Cheltenham.

Wanted. Steam Loco. Traction Engine. Steam models.—Neesom, 11, Rushford Street, Longsight, Manchester 12.

Wanted. Skybirds or any other small scale Lead Models, particularly army models. Also Skybirds or other 1/72 scale model Aircraft. Write giving list and prices required to—Hodges, 77, Verulam Road, St. Albans, Herts.

Wanted. Super Instruction Leaflets, Nos. 1a, 4, 14a, 15, 16a, 19, 22, 27. State price required.—Frank Harrison, 16, Bristol Avenue, Levenshulme, Manchester 19.

Sale. Gauge 1 4-6-2 Steam Locomotive, L.N.E.R., in perfect condition, £10; 3 Coaches, £3; 60 feet Rails and Signals, £2. Also gauge "0" Stephenson 4-6-4 2-speed Clockwork Engine, £3.—Francis, South Hill Road, Thorpe, Norwich.

Wanted. Electric gauge "0" Bassett-Lowke Locomotive, Steel Track, Rolling Stock, etc. Also "Trix" "00" model Railway.—Williams, Grocers, Station Hill, Porthcawl, Glam.

Wanted. 20-volt Transformer, A.C. mains, 230 volts, 50 cycles; Bassett-Lowke with controller if possible.—A. Elliott, 62, Gaer Park Road, Newport, Mon.

Sale. Hornby Clockwork Locomotives, Rolling Stock, Bowman Steamboat, Meccano Magazines 1934/37, 6v. Transformer Rectifier, Railcar, 0-6-0 Tank, Track, Toy Gramophone, Typewriter, Wireless Accessories, Tools. Excellent Condition. Details (Stamp)—"Belmont," Brancaster Lane, Purley, Surrey.

M.Ms., Aug. 1938-Dec. 1940. 8 others. 7/6, Perfect—30, Bridport Road, Thornton Heath, Surrey.

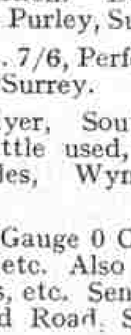
Sale. Trix. Including Diesel Flyer, Southern Electric Motor Coach, Rails, etc., Little used, cost £10. Accept £6/10/0.—E. Smailes, Wynsley, Barcombe Heights, Paignton.

Sale. Large stock of Bassett Lowke Gauge 0 Clockwork and Electric track, Locomotives etc. Also Bing Cinematograph, Boxing Gloves, Stamps, etc. Send for List.—Ronald Sutton, 117, Chelmsford Road, South Woodford, E.18.

This Space is set to ½ inch s.c. and costs 8/- per month. The sum is the 50th of £20, the price of a whole page advertisement. Over 100,000 boys and parents read the "*Meccano Magazine*" each month. You can therefore reach this exclusive public for less than a penny a thousand.

MECCANO LUBRICATING OIL

Before commencing to operate a Meccano model, or to run a Hornby Train, all gears and bearings should be oiled thoroughly with Meccano Lubricating Oil. This oil is specially prepared and is of the right consistency for the purpose.
Price per bottle, 10d.
(*Purchase Tax 2d. extra*).



Meccano Ltd., Binns Road Liverpool 13

This Month's Special Articles

	Page
Air News	114
Books to Read	124
Competitions Page	133
Engineering News	123
Fairey "Albacore" and "Fulmar"	117
Famous Locomotive Class	112
Fireside Fun	139
From Our Readers	140
Guild and H.R.C. News	128–9
Hornby Railway Company Pages	134–7
Hunting for "Flying Tigers"	120
Meccano Model-Building Competition and Results	127
Meccano Model Big Wheel	125
Mechanical Handling of Motor Loads	110
Photography	116
Railway News	118
Seaplane Tenders for the Royal Air Force	122
Stamp Collecting	131
Stamp Gossip	132
Suggestions Section	126

REAL PHOTOGRAPHS

AEROPLANES. Over 1,500 titles, including latest bombers, etc.
RAILWAYS. Over 2,500 titles, trains and engines, including historical, pre-grouping, latest expresses.
SHIPS. Over 1,000 titles, naval vessels, liners, sailing ships, tankers, etc.

Send 4d. for list (stating which section) and specimen photograph. All photographs postcard size, 4d. each or 3/- per doz.
Real Photographs, 4th Floor, Cooper's Bldgs., Liverpool

FOYLES
BOOKSELLERS TO THE WORLD
New and second hand Books on every subject.
Stock of nearly three million volumes.
JOIN THE CHILDREN'S BOOK CLUB!
113-125, CHARING CROSS ROAD, LONDON W.C.2
Telephone: Gerrard 5660 (16 lines)

"MECCANO MAGAZINE" SPRING BACK BINDER

There is no better way of keeping your Magazines clean and tidy than by binding them in one of the special binders we supply.

These binders have strong stiff backs, covered with black imitation leather, tastefully tooled, and are lettered in gold. The large binder holds 12 Magazines — price 4/- (*Purchase Tax 11d. extra*) post free. The small binder holds 6 Magazines — price 2/9 (*Purchase Tax 7d. extra*) post free.

MECCANO LTD.
BINNS ROAD, LIVERPOOL 13

MECCANO MAGAZINE

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

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

Publication Date. The "*M.M.*" is published on the 1st of each month and may be ordered from any Meccano dealer, or from any bookstall or newsagent, price 6d. per copy. It will be mailed direct from this office, 4/- for six issues and 8/- for twelve issues.

To Contributors. The Editor will consider articles and photographs of general interest and payment will be made for those published. Whilst every care will be taken of articles, etc., submitted, the Editor cannot accept responsibility for any loss or damage. A stamped addressed envelope of the requisite size should be sent where the contribution is to be returned if unacceptable.

Readers' Sales and Wants. Private advertisements (i.e., not trade) are charged 1d. per word, minimum 1/-. Cash with order. Editorial and Advertising matters should not be dealt with on the same sheet of paper.

Small Advertisements. 1/6 per line (average seven words to the line), or 16/- per inch (average 12 lines to the inch). Cash with order.

Display. Quotations for space bookings, and latest net sale figures, will be sent on request.

Press Day, etc. Copy should be sent as early in the month as possible for insertion in following issue. We usually close for press on or before 6th of each month for following issue. Half-tone blocks up to 100 screen.

Proofs of advertisements will be sent when possible for space bookings of not less than half-an-inch.

Voucher copies. Sent free to advertisers booking one inch or over. Other advertisers desiring vouchers should add 8d. to their remittance and should order voucher copy at same time.

Remittances. Postal Orders and Cheques should be made payable to Meccano Ltd.

Ordering the "M.M." Overseas

Readers Overseas may order the "*Meccano Magazine*" from regular Meccano dealers or direct from this office. The price and subscription rates are as above, except in Australia, where the price is 1/- per copy (postage extra), and the subscription rates 7/- for six months and 14/- for 12 months (post free), and Canada, where the price is 10c. per copy, and the subscription rates 65c. for six months, and $1.25 for 12 months (post paid).

The U.S.A. price is 15c. per copy, and the subscription rates $1 and $2 for 6 and 12 months respectively (post free).

Overseas readers are reminded that the prices shown throughout the "*M.M.*" are those relating to the United Kingdom and Northern Ireland. Current Overseas Price Lists of Meccano products will be mailed free on request to any of the undermentioned agencies. Prices of other goods advertised may be obtained direct from the firms concerned.

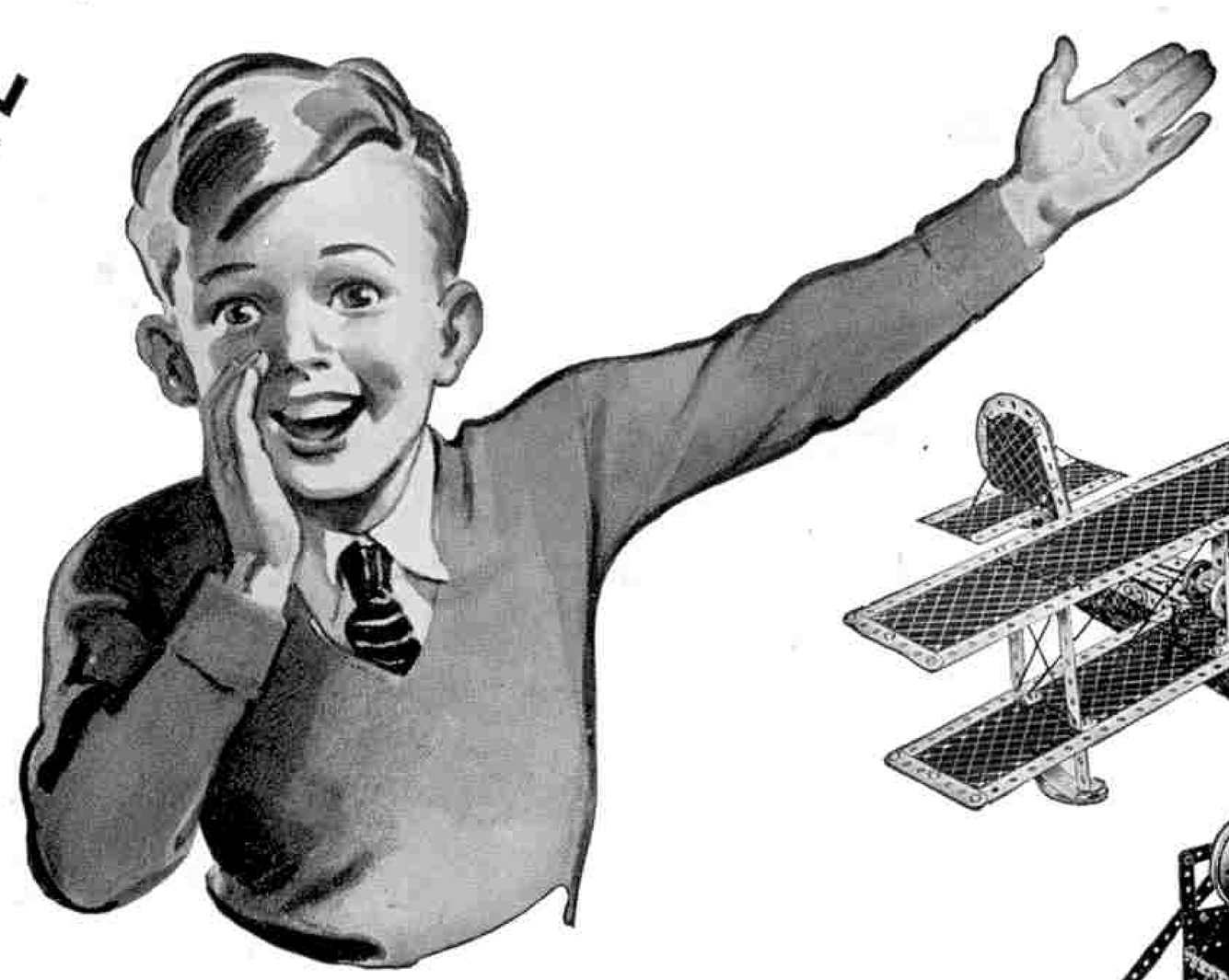
CANADA: Meccano Ltd., 187-189, Church St., Toronto.
UNITED STATES: Meccano Co. of America Inc., New Haven, Conn., Meccano Co. of America Inc., 200, Fifth Av., New York.
AUSTRALIA: Messrs. E. G. Page & Co., 52, Clarence Street, Sydney, N.S.W.
NEW ZEALAND: Models Limited, Third Floor, Paykel's Buildings, 9, Anzac Avenue (P.O. Box 129), Auckland, C.I.
SOUTH AFRICA: Mr. A. E. Harris (P.O. Box 1199), 142, Market Street, Johannesburg.
INDIA: Karachi: Daryanamal & Bros., Elphinstone Street. Bombay: Bombay Sports Depot, Dhobi Talao. Calcutta: Bombay Sports Depot, 2, Lindsay Street. Madras: Bombay Sports Depot, 162, Mount Road.

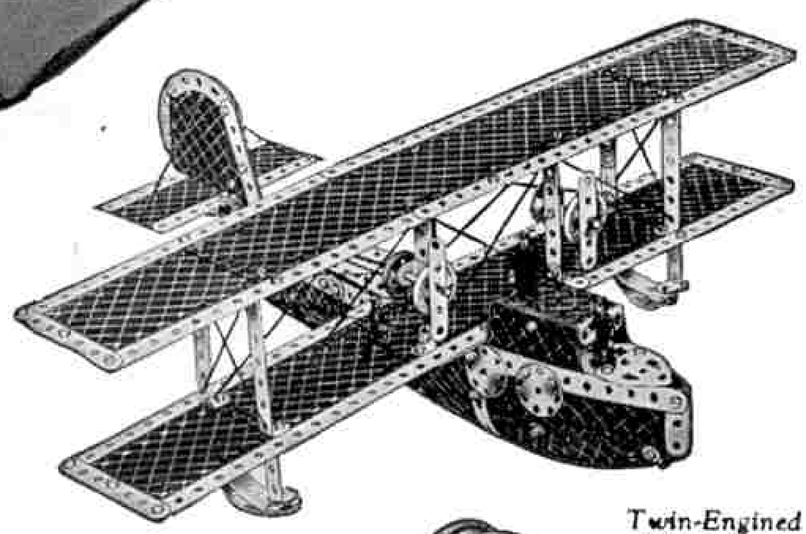
SPECIAL NOTICE

THE HORNBY & MECCANO PART-EXCHANGE SCHEMES HAVE BEEN TEMPORARILY SUSPENDED

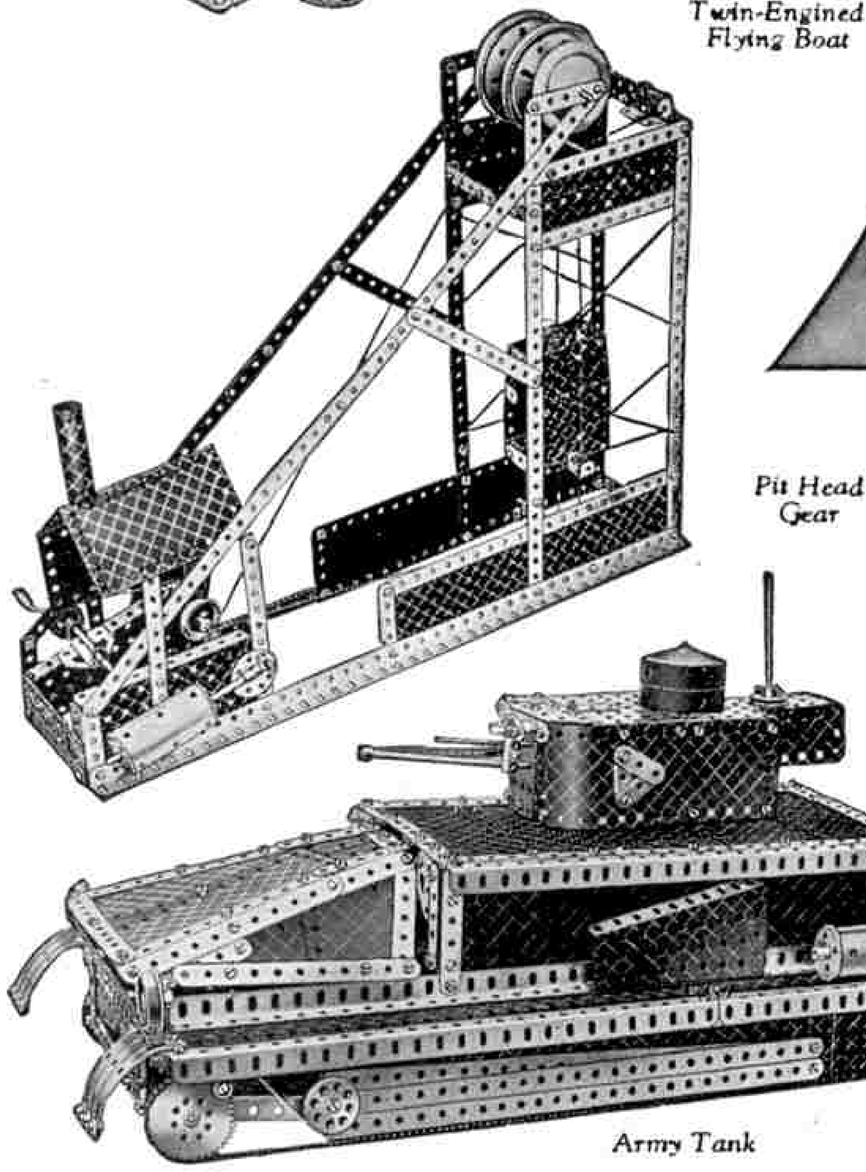
MECCANO LTD. — BINNS ROAD — LIVERPOOL 13

THE KING OF INDOOR HOBBIES





Twin-Engined Flying Boat



Pit Head Gear

Army Tank

No other hobby touches Meccano for fun, interest and entertainment. It's thrilling to build grand working models of cranes, bridges, engines and hundreds of other engineering marvels in miniature. It's better still to make the finished models work just like the real thing! There's simply no end to the things you can make and invent with Meccano!

Ask your dealer for prices or write direct to Meccano Ltd., Binns Road, Liverpool, for a copy of the latest price list.

MECCANO LIMITED, BINNS ROAD, LIVERPOOL 13

MECCANO

☆ MODEL RAILWAY FUN *for blackout nights*

HORNBY TRAINS

There is nothing to touch Hornby models for realism and thrills. You can start a Hornby Railway with a passenger locomotive, a few coaches and a guard's van. Later you can add a goods train and then put on a crack passenger service with a model of a famous express. To make the realism more complete you can keep adding Hornby signals, stations, engine sheds, level crossings, turntables and many other wonderful accessories that are included in the Hornby system—the most perfect miniature railway system in the world.

GAUGE 'O'

Ask your dealer for prices or write to Meccano Ltd., Binns Road, Liverpool 13, for the latest price list.

HORNBY DUBLO

GAUGE '00'

THE PERFECT TABLE RAILWAY

The Hornby-Dublo Railway System Gauge 00, provides a perfect home railway. With these wonderful small scale models a complete model railway can be planned on a dining table. Ideal where space is limited. Available in Clockwork or Electric. Built to scale. Realistic detail. Simple and safe. Automatic couplings. Remote Control.

Hornby-Dublo Electric Trains operate on Direct Current at 12 volts. The current can be obtained from Alternating Current Mains Supply through a Dublo Transformer and a Dublo Controller No. 1.

MANUFACTURED BY MECCANO LIMITED, BINNS ROAD, LIVERPOOL 13

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