

A Splendid Train Book

As announced last month we have in active preparation a special publication entitled, "*The Hornby Book of Trains*." This is being issued to commemorate this year's centenary of the railway and we advised our readers to make sure of their copy by booking their order. Since that announcement appeared we have been inundated with letters from all parts of the country and over 20,000 books have already been ordered! As the number to be printed will be limited, readers who have not already done so are advised to order their copy at once, and thus prevent disappointment by being unable to obtain a copy when the book is issued.

The "*Hornby Book of Trains*" will be a splendid production in every way, and we are sparing no effort to make the publication worthy of the name it bears. It will consist of 40 pages, the measurements of which are 11" x 8½", of special art paper.

The first half of the book will contain an account of the story of the locomotive from its earliest days, dating back to before the time of the opening of the Stockton and Darlington Railway. Details of the pioneer work of Trevithick, Murdoch, and Stephenson will be given, with illustrations of the early locomotives as contrasted with the present-day giants. Particulars will be given of the leading locomotive types, such as the L.N.E.R. "Pacifics" and the Great Western "Castles"; methods of locomotive classification; some account of the rise and growth of the great railway companies; and other matters of interest to railway enthusiasts.

The second half of the book will be devoted to a beautifully illustrated description of all the Hornby Trains and the latest Hornby Rolling Stock and Accessories. These illustrations will be printed in four colours and the reproduction of the Hornby Trains will be most realistic. Thus not only will the book be an interesting souvenir of the Centenary, but it will also be the finest train catalogue that has ever been issued in any country.

Owing to the great cost of production and distribution, the number of copies printed will be limited, and orders will be executed in strict rotation. It will be a case of "first come—first served."

How to Order the Book.

Address your orders to "Hornby Book," Meccano Limited, Binns Road, Liverpool, and please write your name and address clearly.

The price of the book is 3d. (post free), which may be sent in stamps. There is no reduction if more than one copy is ordered. Orders will not be acknowledged.

We hope to have the Hornby Book of Trains ready for delivery at the end of September or early in October, but further details will be announced next month. Meantime, orders will be entered and executed in the rotation received.

Orders from Overseas.

There will be a special edition of the "*Hornby Book of Trains*" for Overseas readers. The price for all orders from outside the United Kingdom is 6d. Overseas orders should be addressed to our overseas agencies as below.

AUSTRALIA: Messrs. E. G. Page & Co., 52, Clarence Street, Sydney, N.S.W.

NEW ZEALAND: Messrs. Brownings, Ifweron Ltd., P.O. Box 129, Auckland.

SOUTH AFRICA: Mr. A. E. Harris (P.O. Box 1199), Textile House, Von Brandis St., Johannesburg.

OUR MAIL BAG



In this column the Editor replies to letters from his readers, from whom he is always pleased to hear. He receives hundreds of letters each day, but only those that deal with matters of general interest can be dealt with here. Correspondents will help the Editor if they will write neatly in ink and on one side of the paper only.

R. W. Godwin (Southborough).—"I hope you do not mind my stringing you off a letter like this, but it's all your fault because you should not get up such 'bon' things!" We do not mind a bit, Ronald, and we assure you that we intend to get up many things quite as 'bon,' or even 'bonner'! Many other readers have expressed a desire for the Hornby Train articles to be continued and we hope to arrange this before very long. The 24" Meccano Girder Bridge will improve your railway greatly.

G. Hollingworth (Kingsgrove).—Your suggestion for a series of articles describing how Meccano is made is quite good and it is one we intend to adopt later. We quite agree that such articles would be very popular with our readers. We are glad to have your "good wishes for the "M.M.," and to hear that you "wouldn't dream of stopping reading it."

E. Scott (Horsham).—We are sorry that you were disappointed when the Giant Block-setting Crane articles ceased, but you will understand that we cannot give more than a certain amount of space to any one subject because we have so many others waiting their turn. We have not yet decided about a Nature Study page, but if we do start one you may be sure that we shall give a fair amount of attention to butterflies and moths—meantime the Aquarium articles should interest you.

Helen Holtby (Worthing).—"Thanks awfully for your letter and congratulations. I did grin when I heard that I had won a prize. It is the first really decent prize that I have ever won, so I am feeling very bucked." We are delighted to hear this, Helen, and we hope you will be successful in other competitions. Evidently Dad is as keen on the "M.M." as you are, which is saying a good deal. We are interested to hear that you are always wishing you were a boy, but at any rate you are as enthusiastic about Meccano as any boy could be, and perhaps sometime you may decide that, after all, you are glad you are a girl!

D. Cox (Griffithstown).—"I am delighted with the "M.M." you have sent me as it is the first I have had. I am going to be a Meccano boy and join in the fun the other boys have in the competitions." We hope that before long you will be successful in winning a prize, Douglas. We try to make the Magazine really helpful and we quite agree with your remark: "Why get a useless comic paper when for a penny more you can get a real Magazine?"

J. Dewar (Edinburgh).—There seems to be more enthusiasm than ever in the letters we are reading this morning, and we were interested to find in your bright note: "I can hardly control my feelings about the "M.M." We work very hard to make the "M.M." better and better month by month, and letters such as yours encourage us greatly. We may be able to introduce a serial story later, but many of our readers strongly disapprove of fiction.

N. White (Liverpool).—"Just a line to let you know how much I appreciate the "M.M."—the book that never grows stale." Your suggestion for an article describing how the "M.M." is compiled, edited, printed and delivered is quite good, and we agree that many readers would be interested in it. We shall keep this idea in mind and probably put it into action later.

C. E. Munro (Lomas, Argentine).—We were very glad to have your interesting letter. Your visit to the Central Argentine Railway Works must have been very enjoyable, and we were very interested to know that almost all the machinery is worked by compressed air. You must have been proud that your models of a cable winder and a girder crane pleased the Governor of the Province so much that he had a long chat with you. Thousands of Meccano boys all over the world will agree with you that "Meccano doesn't fail in anything!"

K. Yoshida (Tokyo).—We are glad to hear of your enthusiasm for studying insects and we do not think you could have a better hobby to come after Meccano. Your method of work—collecting the insects, sketching them and then letting them go—must make you quite popular in the insect world! We agree that it is fine to be able to collect pictures of insects without having to kill the creatures. Write again soon and send us a photo and particulars of your airship.

The Conquest of the Air

VI. The De Haviland "Moth"

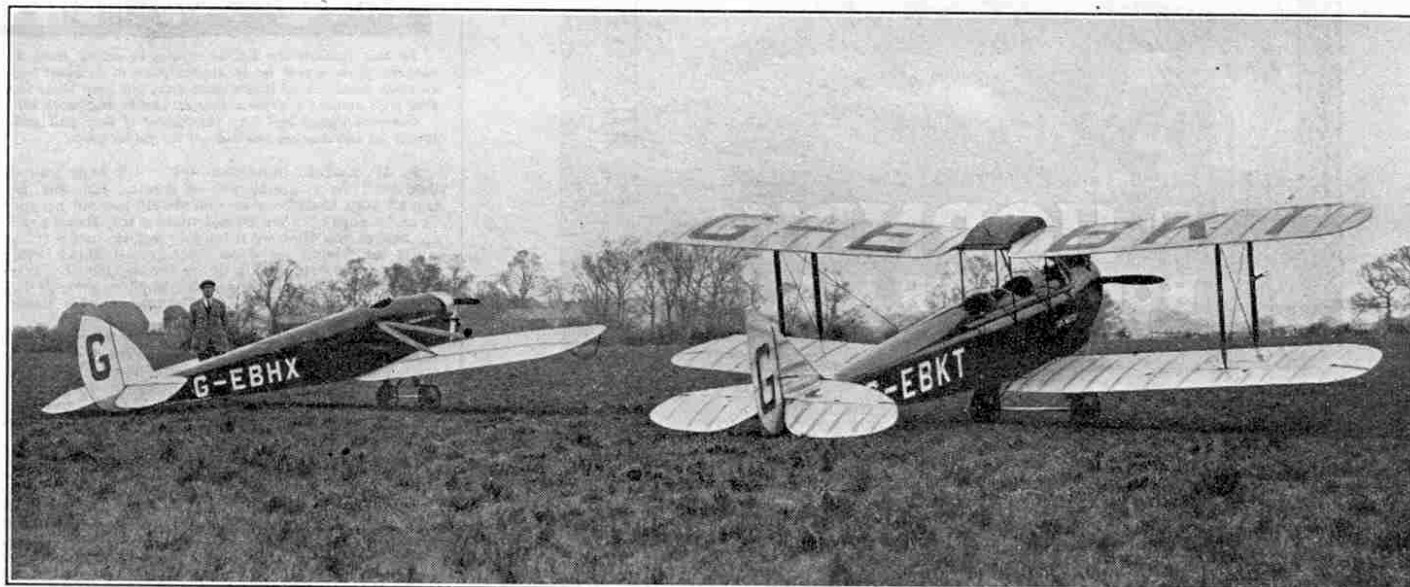


Photo courtesy]

[De Haviland Aircraft Co. Ltd.

DH Type 53, "Humming Bird," (696 c.c. Blackburn engine) and DH Type 60, "Moth" (27-60 h.p. Cirrus engine)

THE De Haviland Type 60 two-seater light aeroplane, popularly known as the "Moth," is of particular interest for more than one reason. In the first place, the machine is unique in the fact that the planes are arranged to fold back along the fuselage to facilitate housing and transport. Not only does the folding of the wings allow the aeroplane to be stored in an ordinary garage, but it also allows the machine to be easily towed behind a motor-car along a road of ordinary width on which there is other traffic. Thus, supposing there be an aviation ground in a certain district, anyone living within easy access could own and fly a De Haviland "Moth" and store the machine at home, taking it by road to and from the aerodrome without any trouble.

London to Zurich and Back in a Day

The open span of 29 ft., required by the aeroplane in flight, is reduced to 9 ft. 8 in., with the wings folded back. The operation of folding the wings, or the alternative of spreading them, is not a long job requiring a number of mechanics, as might perhaps be supposed. It is claimed that it can be performed by one person in less than three minutes.

It was on an aeroplane of this type that Mr. Allan Cobham recently made his remarkable flight from Croydon to Zurich and back—a distance

of about 1,000 miles—in one day. If any proof were needed that the "Moth" is capable of sustained flight, this feat surely affords it, for the outward flight occupied six hours and the homeward journey eight hours.

In order to make the journey without landing, an extra petrol tank was carried instead of a passenger, and for the whole flight the consumption of fuel worked out at 20 miles to the gallon. This is, of course, even better than is achieved by motor cars of the same horse-power.

The flight was undertaken purely and simply as a demonstration of the "Moth-Cirrus" combination, and upon his return Mr. Cobham reported that he did not suffer one moment's anxiety as to the

ultimate success of the flight. The engine ran without a falter for the whole fourteen hours and the ease of control of the machine, combined with the comfort of the cockpit, made the journey a very pleasant one. It is interesting to note also that this was the first occasion on which Mr. Cobham had flown for fourteen hours in one day.

"M.M." Readers May Fly a "Moth"

The "Moth" was produced in the first place for use of private owners and Light Aeroplane Clubs, and it has been adopted as the standard equipment of the clubs recently formed in London, Manchester, Leeds, Birmingham, and Newcastle. These Light Aeroplane Clubs are being formed in different parts of the country with the support of the Air Ministry, and at the meeting of the Royal Aero Club this month one race is being specially organised for their members. No doubt, in a few years' time these clubs will be very popular and as aeroplanes of the "Moth" type will be largely used it is possible that quite a number of the readers who are perusing this page may in a few years' time be flying "Moths" through the medium of one or other of the new flying clubs. In this connection, it is interesting to learn that it has recently been stated that on an average about five hours' instruction only is required to learn to fly, and this instruction can be obtained



Mr. Allan Cobham in the machine in which he flew to Zurich and back in a day

through these clubs at a cost of about £10 or £12.

A Low Compression Engine Desirable

The "Moth" is by no means a frail craft demanding highly skilled attention, but has been designed on simple and robust lines to give reliability of running, ease of handling, and economical maintenance. It is fitted with one of the new 27/60 h.p. four-cylinder Cirrus engines, noted for their smooth and vibrationless running.

The petrol tank is divided into main and reserve compartments, the former having sufficient spirit for a three hours' flight, and the latter for half-an-hour. It is stated that when carrying auxiliary petrol tanks in place of a passenger, a flight can be made from London to Glasgow and back without stopping, and that the machine can remain in the air for over twelve hours without landing.

Owing to the limitation of 1,100 cc. at the last Lympne trials, engine-makers were forced to develop a high-compression engine with a high piston-speed, whereas the ideal engine for club and private work is rather on the low side as regards compression and piston speed. An engine of this type gives reliability over long periods without overhauls.

The "Moth" scores heavily because the power unit is of generous proportions, developing over 60 h.p. This has enabled the aeroplane to be planned on more ample lines and enables 50% of the h.p. in reserve to be obtained in level flight at about 70 to 75 miles an hour, an important feature that cannot be over-estimated. In the early days of the new flying clubs it will be far better to employ an engine which, although not so economical on petrol consumption, has the more important consideration of reduced risk of engine failure and the compensating advantage of much less time and money spent on maintenance.

The Hand Starter for Engine

As already mentioned, the "Moth" is a two-seater, the pilot's and passenger's cockpits being placed in tandem. There is also accommodation in each for light luggage. Flying is particularly easy with light and effective control down to the lowest speeds and no peculiarities of behaviour.

The undercarriage, which employs rubber in compression, will absorb the shocks of landing on the roughest ground. With full load—that is, pilot, passenger and 60 lbs. of luggage—the stalling speed is 40 miles an hour. Its top speed is over 90 miles per hour.

A noticeable feature of the engine is the hand starter, which is operated by the pilot from his seat. Generally, the starting of an aeroplane engine requires the assistance of at least two men besides the pilot. The engine of the "Moth"

can be started-up without any exertion or difficulty, however, and the pilot can handle and manoeuvre the machine on the ground without assistance.

"I recently saw for the first time," a correspondent writes, "a simple hand-starter provided for starting an aeroplane. When I went up in a "Moth" with Mr. Hubert Broad, he merely pulled a lever twice and the engine began to tick over gently. Even when cold a few preliminary turns of the propeller, to suck

"The weather was somewhat bumpy, but the machine was surprisingly steady, and Mr. Broad stated that it was exceedingly comfortable to fly. On his previous flight alone he had shown its powers by looping, spinning, and carrying out Immelman turns at about 1,000 ft. up with perfect ease.

The Strongly-Designed Engine

"The engine that makes all this possible is the 60 h.p. Cirrus, an air-cooled four-cylinder in-line type. The engine is rated to give 65 h.p. at 2,000 revolutions, and may be run at 2,100 in short bursts. Its normal 60 h.p. is delivered at 1,800, and at 1,700 giving the cruising speed already referred to, it is only being asked to deliver 33 h.p. It is then consuming a gallon of petrol per 25 miles flown, and its oil-consumption is a pint an hour.

"It is clear that the engine is normally not being taxed at all hardly—it is certainly a very comfortable engine to sit behind—and apart from that, as it is in part based upon the 120 h.p. Airdisco air-cooled engine, which in turn is based on the old Renault engine, some of the working parts have a very large margin of structural strength. The crankshaft, bearings, and connecting rods, for instance, are taken from the 120 h.p. engine and have passed the Air Ministry type tests in the larger engine and have stood the strain of working at 145 h.p. for an hour on the test bench."

Interesting Details of the "Moth"

Admittedly the engine is on the heavy side at 260 lb., for its 65 h.p., but this is really of small account if it can be relied upon to run with the minimum of attention day after day under the conditions of club and amateur work. It is hoped it will run 200 hours or more between overhauls, and this translated into mileage means 15,000 miles at a conservative estimate.

Particulars of the D.H.60

"Moth."
Speed at Ground Level 91 m.p.h.

Cruising Speed at 80% full power 80 m.p.h.
Stalling Speed 40 m.p.h.

Rate of Climb at Ground Level per minute ... 430 feet

Height attained at 500 yards from standstill ... 120 feet
Distance to Unstick (in calm) 120 yards
Run on Ground on Landing (in calm) ... 80 yards

Ceiling (absolute) ... 13,000 feet
Range at Cruising Speed ... 4 hours
Petrol Consumption per gal. 20 miles
Oil Consumption per hour 1 pint

Weights.
Weight Empty ... 770 lbs.
Weight of Petrol (15 gallons) 110 lbs.
Weight of Oil (1½ gallons) ... 10 lbs.
Weight of Pilot ... 160 lbs.

(Continued on page 427)



Photo courtesy]

[De Havilland Aircraft Co. Ltd.]

Front view of the "Moth"

in gas were sufficient to prepare the way for the hand-starter."

A Trial Flight Described

Further describing his experience our correspondent writes:—"The passenger's cockpit, over the centre of gravity, is by far the most comfortable I have experienced. Even with a heavy coat there is no difficulty in accommodating oneself, and the cowl and windscreen make the use of goggles quite unnecessary.

"When I made my trial flight, the getting-off conditions were bad, owing to the aerodrome being waterlogged.



Photo courtesy]

[De Havilland Aircraft Co. Ltd.]

Rear view of the "Moth"

We only got off after a much longer run than usual, but once off the machine had a very good rate of climb.

"It was doing 60 miles air speed with the engine revolution counter at between 1,550 and 1,600. At 1,650 the speed rose to about 65 m.p.h. and then we cruised round with the air speed anything from 70 to 75 m.p.h. with 1,650 to 1,700 revolutions indicated—just 300 short of the usual maximum and 400 below the absolute maximum. We landed at just under 50 miles an hour, but under better conditions its low speed is stated to be 38 miles an hour, while the top speed is 90.



II. A TOUR THROUGH SOMERSET AND DEVON: CHEDDAR AND WELLS

WHEN riding long distances I usually divide the route into sections as equal in mileage as the various towns or villages en route will permit. It may be that I make, say, four sections. I know then, that my first stop represents one quarter of the whole journey, my second half and so on. The advantage of this plan lies in the fact that I make my trip a number of short rides, instead of one long one.

Watching Milestones

The very fact that you always have in mind the total number of miles you intend to travel tends to hasten fatigue and then, its generally "good-bye to pleasure." With my plan, however, you relegate the total distance to the background of your mind, and think chiefly of your first place of call. When you reach it you refresh yourself and rest awhile, forgetting such things as the miles already covered. Then you make a fresh start on your next short ride to the second stop. With experience, I am able to allot myself exactly the distances I know I can manage—always allowing something to spare, however, for reasons that will be obvious.

Some riders tell me that they never look at milestones. That is not always avoidable—in fact, it is sometimes very necessary and very desirable to watch the milestones—but it is surprising how fatiguing it becomes if we are *always* watching the milestones—something like a workman who keeps his eye on the clock all through the day waiting for the hour to "down tools." To him the days pass very slowly, but to those who get on with their jobs the times passes all too quickly.

Well, what about a short rest on that inviting mossy bank? There's a farmhouse over there and I am sure we shall be able to get a drink of good milk.

Cheddar Gorge and Wells

We are now rather more than halfway to Wells, and right on the Mendip Hills. Here everything seems to be much as it was in the time of the Ancient Britons and the Romans. I always look out for flint arrow-heads when I pass this way, but instead I

generally run over a big stone or into a huge pot-hole! By the way, that reminds me that these Hills are full of wonderful

This is the second instalment of "Rover's" article on an enjoyable tour. The reader is to imagine that he is accompanying our contributor on a few days' cycling tour in Somerset and Devon. "Rover," who has averaged 5,000 miles a year for many years, is endeavouring to give helpful advice from time to time, as the reader pedals along in his company.

The start last month was made from Bristol and it is intended to make for the south-coast, and then to strike westward to Torquay, returning to Bristol by the main road through Exeter and Taunton.

water-holes and there are one or two most interesting books published about them. They are well worth reading, when you have the opportunity.

doubt, and the surface is splendid.

We must go carefully here, for three roads cross ours at fairly close intervals. As ours is on the down grade it is wise to ease up a little before we reach the crossings. Single file here, please, so I will drop behind you while this motor passes us. It is always best to move as quickly as possible to the side of the road, especially if the road is narrow, for even the driver of a Rolls Royce sometimes becomes impatient! It is not very nice to have a car going at well over 20 m.p.h. just grazing your elbow!

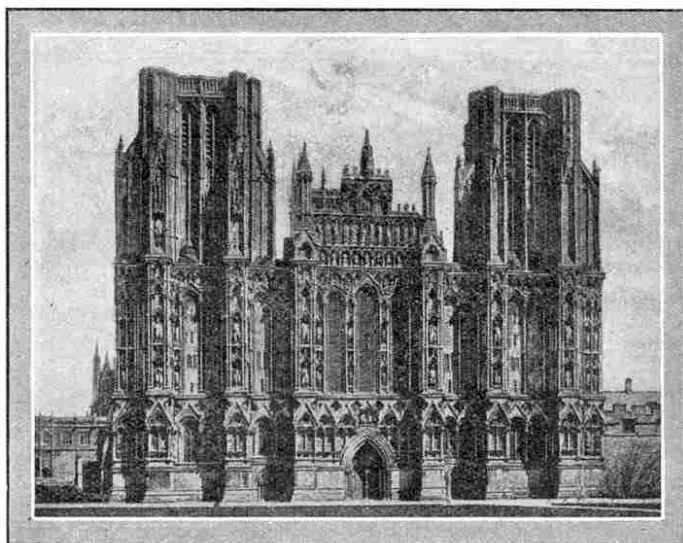
Through a Tunnel of Trees

Here is another instance where it pays to be cautious. This flock of sheep ahead, advancing in "massed formation," is perhaps more dangerous than the fast car—which you see has only just now got through and is away again on the far side of the flock. In each case the cyclist must give way, and it is a small matter to do so and not to be considered when you think of the risk incurred by being obstinate.

We come now to a rather awkward piece of down-hill for a mile or more. Fortunately, there are plenty of warnings and it is well not to ignore them—even should the danger not be as great as that threatened on the signs. Here we run through a large wood, where the trees almost form a solid archway overhead—which means, that from brilliant sunshine, we enter an almost dark tunnel. This is likely to cause trouble with an inexperienced rider but once we are accustomed to the gloom—and that doesn't take more than a moment—it is beautifully cool and refreshing in the "tree-tunnel."

Keep your machine well under control—for, apart altogether from possible obstruction, we may want to dismount. Woods are very tempting on a hot day, and many a pleasant rest have I taken by the side of a little waterfall that comes tumbling down, all unsuspected, in places similar to this. . . . There! we're out into the sunlight again, which seems all the hotter after that run through shadowland.

(Continued on next page)



West Front, Wells Cathedral

Cheddar, with its world-famous Gorge and Caverns, lies a few miles over there on our right. I am hoping to bring you back that way, by way of making a good finish. . . . Well! if you are fit we will go forward once more.

We have to climb another hill, rising just a little more, to something like 800 ft., and then we drop down into Wells. See how this road stretches straight ahead. It is an old Roman road without any

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TELLS YOU :—

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SALES LTD. (Dept. 31a),
5, Point Hill, Greenwich, S.E.10.

The Open Road—(continued from page 398)

A Quaint Old Town

Although we may fancy the road here to be quite level, it really has a decided gradient, with the result that our machines rapidly increase in speed. Applying both brakes frantically may easily bring about your downfall. Keep as cool as you can and put your brakes on gradually. There is quite a lot to be said on this point, but, as we have so successfully navigated that difficult piece, I will leave my remarks for another time.

Our road now joins the more popular one, and we are barely a mile from Wells. Here we come to a right-angle turn, so steady up, ring your bell, and keep well over to your left, so that we take a good wide sweep into the other road.

Here we are running into the little town itself, where we shall spend at least an hour. We will put up our bikes where they will be quite safe, and where we shall not have to worry about them.

The Famous Wells Clock

What a quiet, peaceful place Wells is. It almost seems as though it has not altered since the Middle Ages. The quaint shops and old fashioned Market Place, with the stream running down either side of the main street. Here is the Cathedral, with the magnificent West Front and the famous Wells clock. If we hurry round to the North side we shall see the figures outside strike the three-quarters with their battle-axes. Inside the Cathedral all is delightfully cool and so calm and peaceful too, that we can almost imagine ourselves back in the old world some centuries ago.

It is difficult to realise that there was once a stern and terrible fight on this very spot, yet in Cromwell's day a battle was fought here. Here is the famous Clock with quite a number of interesting things to see on the dial alone. On the top, the Knights circle around and at each stroke of the hour one unseats another from his horse, (I believe its the same one that gets thrown each time, poor fellow!) but he regains his seat as he passes out of sight round the back! That quaint figure up in the niche strikes the quarters.

There are many old houses and other interesting things to be seen in this old world town, but unfortunately we cannot see them all to-day and we must reluctantly take our departure.

We now turn our faces towards Glastonbury, scarcely more than half-an-hour's ride, where we shall have a really good feed—I know we shall be ready for it by then.

(To be continued)

Toy Casting Moulds

The casting moulds for toys supplied by A. Rodway (102, Long Street, Birmingham) continue to increase in number and interest and the latest catalogue to hand shows a really remarkable variety of patterns, ranging from soldiers and sailors to tanks and battle-ships, and from domestic animals to very realistic lions, tigers and elephants. The inevitable Red Indians also are not forgotten. The moulds continue of the same high standard and accuracy and the production of castings by means of them is a fascinating and profitable pastime.

Igranic Fixed Condensers

Fixed condensers are an essential part of wireless sets of any pretensions. In order to be of real value the capacities of such condensers must be known accurately, and the construction must be such that moisture or atmospheric conditions do not affect the working. The Igranic-Freshman fixed condensers are guaranteed to have capacities within five per cent. of their nominal values and their all-round quality and reliability is shown by their growing popularity. The Igranic Electric Co. Ltd., inform us that in order to meet the demand for these condensers they are now carrying 100,000 as a minimum stock.

Rover's Replies

J. Littlewood (Burnley).—You should really oil your machine regularly each week or before starting on a long run. Use only oil of good quality and take care to wipe away any excess oil each time.

T. Thistlewaite (Birmingham).—Perhaps the best way of keeping the nickelled parts of your bicycle bright and free from rust, with the least expenditure of energy, a smearing of vaseline should be applied once a week when you give the machine a good clean and overhaul.

Harry Thorpe (London, S.E. 1).—It is most necessary, Harry, that you should have your wheels "dead true." If I were you I should have the wheels seen to at once before anything serious happens.

W. Brown (Manchester).—It is almost impossible to answer your query regarding how long tyres should serve, for this naturally depends upon the quality of your tyres and the amount of cycling you do. I advise you to use some good British tyre, and not to have anything to do with unknown makes. If you wish to calculate the wearing qualities of the particular tyres on your bicycle, the best thing to do is to have a cyclometer fitted to show how many miles you ride before the tyre is worn out.

T. Linthorpe (Middleton).—"As I am having a bicycle built and cannot at the moment have a three-speed gear fitted, will you please tell me which is the best gear to have, high or low." If you can only have one gear you should certainly choose a medium one. A high gear is very nice on the level or downhill but is very tiring for hill-climbing and you will put up a better average speed with a medium gear.

R. Jackson (Newcastle).—"Are the puncture-sealing solutions I see advertised really satisfactory." There is no doubt whatever that these solutions are thoroughly satisfactory. Two well-known makes have been advertised regularly in the "M.M." for a long time and I have not yet had anything but good reports regarding these solutions. Follow the instructions carefully and you will say "goodbye to puncture troubles."

John Edwards (Welshpool).—In answer to your query regarding your driving chain, the harsh cracking sounds you hear while pedalling show that the links have a tendency to mount the cogs of the chain wheel. To remedy this you should first take off the chain, place it in paraffin oil and leave it there to soak all night. Then clean it thoroughly and replace, adjusting it so that there is from 1/2" to 1" play about half way between the chain wheels. If the noise has not disappeared the trouble is almost certainly due to worn links and the chain should be renewed.

Don't be Let Down by Punctures!

Use Fibermetic in your Motor Cycle or Cycle Tubes and NEVER be let down by Punctures. INSTANTLY AND PERMANENTLY stops air leaks up to 1/2 inch. Ends puncture mending and patching. NEVER GOES BAD—NEVER STOPS FUNCTIONING. Will last for years. Non-injurious to rubber. Complete satisfaction or money returned.

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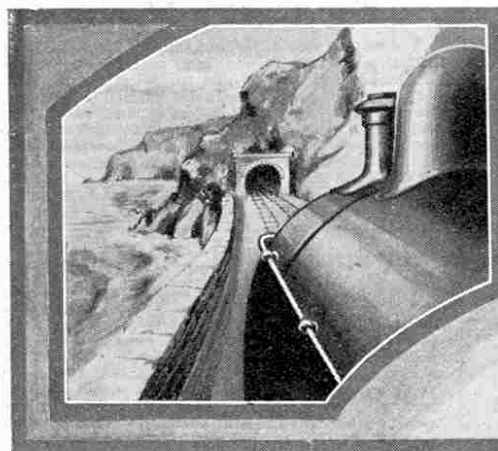
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Railway News of the Month

L.N.E.R. Loco Notes

New 4-4-0 locos of the "Director" (Great Central) pattern are being used extensively on the North British section. In addition to being capable of excellent work they are very popular with the drivers and firemen. Names are being given to these locos, and are inscribed in gold lettering on the driving-wheel splashers.

Following upon the original North British locos of the "Scott" class, the names of these new locos are also taken from the characters in Sir Walter Scott's novels and poems. Among those so far christened are 6378, "*Bailie Macwhheeble*"; 6379, "*Baron of Bradwardine*"; 6380, "*Evan Dhu*"; 6382, "*Colonel Gardiner*"; 6383, "*Johnathan Oldbuck*"; 6397, "*Lady of the Lake*"; 6385, "*Luckie Muckle-backit*"; 6398, "*David of Balmawhapple*"; 6400, "*Roderick Dhu*"; 6401, "*James Fitz-James*."

On a recent day of special excursion traffic the following locos from other sections of the L.N.E.R. were seen at King's Cross, London:—N.E. Section class R1 4-4-0's Nos. 1204, 1236, and 1239; Class Z "Atlantics," Nos. 704, 2200, and 2211; Great Central 4-cylinder 4-6-0 No. 5482. On the same day the G.W.R. 4-6-0 "*Pendennis Castle*" was at King's Cross Shed in connection with her trials over the L.N.E.R. main line.

Locos passing through the repair shops at Gorton and elsewhere are being fitted with the new standard chimney, which is of the built-up pattern and rather similar to the styles adopted on the late Great Northern and North British sections.

For suburban work, 0-6-2 tank locos of Doncaster design are working on the Glasgow-Helensburgh residential trains. Tank locos of similar wheel arrangement, but of Great Eastern design, take a share in local trains in the Leeds and Bradford district.

New G.W.R. Locos

New locomotives of the "Castle" class are No. 4083, "*Abbotsbury Castle*"; 4084, "*Aberystwyth Castle*"; 4085, "*Berkeley Castle*"; and 4086, "*Builth Castle*." No. 4009, "*Shooting Star*," has been rebuilt with a larger boiler and other alterations which make it standard with the "Castle" class.

World's Biggest Excursion

The world's biggest excursion was entrained at Swindon on Thursday, July 2nd, when the G.W.R. mechanics and their families began their annual holiday. To convey them, 31 special trains, consisting of 415 coaches, left Swindon between 8.30 p.m. on July 2nd and 7.5 a.m. the next morning for seaside and inland towns all over the Great Western System.

Some 19,000 adults and 10,000 children took part in the excursion, and the works were entirely closed while the employees were on holiday.

Railway Mileage in America

Alaska ...	799	Honduras ...	559
Argentina ...	23,156	Jamaica ...	199
Barbados ...	498	Martinique ...	139
Bolivia ...	1,502	Mexico ...	16,443
Brazil ...	18,704	Newfoundland ...	951
British Guiana ...	104	Nicaragua ...	200
Colombia ...	926	Panama ...	298
Canada ...	39,540	Paraguay ...	309
Chile ...	5,301	Peru ...	1,988
Costa Rica ...	546	Porto Rico ...	340
Cuba ...	3,005	Salvador ...	256
Dominican Republic ...	408	Trinidad ...	108
Dutch Guiana ...	37	United States ...	251,437
Ecuador ...	652	Uruguay ...	1,653
Guatemala ...	613	Venezuela ...	660
Haiti ...	167		
Hawaii ...	243	Total	371,741

New Australian Railways

Among the new railways to be constructed in New South Wales, for which the necessary approval has been given by the N.S.W. Public Works Department, is a line 161 miles in length between Grafton and Killarney, at a cost of £3,529,190. Also an electric railway from St. Leonards to Eastwood, a distance of between 8 and 9 miles, costing £649,600, and another from Inverell to Ashford, costing £224,000.

A 12-Ton Wagon every 25 Minutes!

The Derby works of the L.M.S. are now turning out 12-ton merchandise wagons at the rate of one every 25 minutes, this time allowing for a first coat of paint. Vestibule passenger coaches, minus the upholstery, are assembled at the rate of one every half-hour. The doors for these carriages are put together in less than a minute each and through careful standardisation they can be fitted, without adjustment, into any carriage doorway.

German Turbine Loco

The first German locomotive to be driven by a condensing steam turbine has forward and reverse turbines, each developing 2,000 h.p. at 6,800 r.p.m. with double-gear reduction to the driving wheels. Part of the steam from either turbine passes through the casing of the other on its way to the condenser. The condenser consists of two cylindrical chambers connected one behind the other.

New U.S. Railway Station

Every effort is being made to make the new Union passenger station at present under construction in Cleveland, Ohio, one of the most convenient stations in the United States. The new station will take between 10 and 15 years to build and will cost approximately £6,000,000.

Race for Life with Train

Passing under a railway bridge at Cherry Tree Junction, on the Chorley-Blackburn line, a railwayman saw a semi-conscious man lying with his neck on the rail and a heavy goods train a few yards away.

A race between the railwayman and the train ended in the former dragging the man from the metals a few seconds before the engine thundered past.

G.W.R. Buy Government Locos

Eighty of the remaining 2-8-0 ("W.D.") type, heavy freight locomotives, have been purchased by the G.W.R. from the Government. These locos are of former Great Central Railway type, but were fitted with Westinghouse brake and side couplings for working troop-trains of French rolling stock.

World's Non-Stop Record

Although much attention has been drawn recently to the new L.M.S. nightly express which has no booked stop between Crewe and Perth (290 miles), the longest actual non-stop run remains that of the G.W.R. "Cornish Riviera" (Paddington-Plymouth, 225 miles), as the West Coast route train stops to change locos outside Carlisle station.

G.W.R. Mineral Loco Hauls Express

A recent unusual sight was that of a 2-8-0 mineral loco of the "2800" class completing the journey of a main line express, the loco of which had developed a slight defect. The "2800" class have coupled wheels of only 4 ft. 7½ in. diameter.

Remarkable French Locomotives

The first of a new type of exceptionally powerful locomotives has recently been put to work on the Paris, Lyons and Mediterranean Railway. The new loco is a four-cylinder compound of the "Mountain" (4-8-2) type, and is intended for main-line express service between Laroche and Dijon, between which points there are severe grades.

A feature of the design is the location of the two high-pressure cylinders. These are placed between the frames and at the rear of the bogie, driving the second pair of coupled wheels, and the valve motion of all four cylinders consists of two outside sets of Walschaerts pattern, each set also working one inside cylinder.

An exceptionally large boiler is fitted, its working pressure being 227 lb. per sq. in., and the grate area, 54 sq. ft., is stated to be the largest in Europe.

The new locos are being built by the celebrated firm of Schneider et Cie of Creusot, and their regular task will be to haul trains weighing 600 tons at 75 to 80 kilometres (46½ to 49½ miles) per hour on the severe grades, and at 68½ m.p.h. on the level. The first of the class weighs 115 tons 3½ cwt. without tender.

New L.M.S. Plans in Derbyshire

The L.M.S. are about to undertake widening and other works on an extensive scale near Chesterfield. Owing to the increasing traffic on the old Midland system between Chesterfield and Leeds, via Masborough, it is intended to widen the line from a point near Tapton Junction. New Whittington Station is to be rebuilt on a site some little distance south of the existing station. It is also proposed to construct a large concentration yard in the same vicinity, which will provide facilities for more expeditious marshalling of traffic from the congested Clowne and Doe Lea Branches. The project further provides for additional locomotive sheds at Barrow Hill (Staveley Works).

Fashion Parade at 60 M.P.H.

A distinct novelty was introduced lately by the L.N.E.R. in the form of a parade of mannequins. This took place in a reserved saloon on the 11.15 Pullman express from King's Cross to Leeds and Harrogate. As the express gathered speed through the tunnels outside London, invitations to view the display of fashions were issued to lady passengers, and a picturesque array of hats and frocks took place before an appreciative audience while the "Flier" was working up to maximum speed. The display is claimed to be a distinct success, and is a high tribute to the smooth travelling of London and North Eastern expresses.

Southern Loco News

Large 4-6-0 locos of the "King Arthur" type now take their turn with the Boat expresses of the former S.E. & C. system. The introduction of such powerful locos will be an advantage in view of the heavy loads on these services during the summer months. Nos. 763 and 764 were recently seen passing a station on the Great Western Railway, with their coupling rods removed, and hauled by a G.W. loco. Nos. 765 and

Southern Railway Veterans

A fair number of famous old Stroudley 0-4-2 express locos of the Brighton line are still in service. These veterans, although too light for working regularly under modern express conditions, are often to be seen on fast secondary expresses, sometimes hauling a considerable load.

Few classes of locos have ever attained the popularity of the celebrated Stroudley "Terriers" of the old Brighton line.

These little 0-6-0 T machines must surely rank among the strongest ever built. Although they have now almost entirely disappeared from their original main line, the survivors of the class are to be found working on smaller branch lines and independently-owned railways. Two of them—formerly Nos. 638 and 683 (built in 1878 and 1880 respectively), have been purchased from the Government Surplus Depot at Dalmeir (Scotland) for working on the Shropshire and Montgomeryshire Light Railway. They are now renumbered 8 and 9 and bear the names "Dido" and "Daphne." S. & M. No. 7, "Hecate," is also an ex-Brighton "Terrier."

* * * *

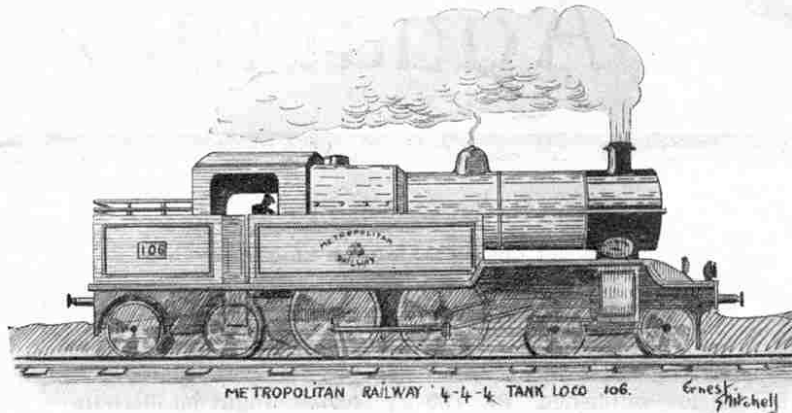
The New Ashover Light Railway

A new light railway 7½ miles in length and of 2 ft. gauge was opened in April between Ashover and Clay Cross (Derbyshire). At the latter place there are coal mines founded by George Stephenson in 1837 and still in operation. These, together with limestone, pig-iron, bricks, chemicals, tar, etc., form a considerable local industry and the primary reason for the Ashover Light Railway was to supply from the quarries at Milltown and Ashover, limestone for the furnaces and tar macadam plant, also for bringing down fluor spar and lead.

There are twelve stations and halts along the line, which traverses some beautiful scenery and is steeply graded in parts, banks of 1 in 37, 1 in 42, and 1 in 77 being encountered. In each case the gradient favours the heavy traffic and in the case of minerals only empties have to surmount the steep banks.

To work the line there are six 4-6-0 type tank engines built in 1917 by the Baldwin Loco Works of Philadelphia, U.S.A. for working British military light railways overseas. These fine little machines are painted in the new L.M.S. style and have driving wheels 1 ft. 11½ in. diameter, bogie wheels 1 ft. 4 in. diameter and outside cylinders 9 in. x 12 in. Their boilers are of 2 ft. 9 in. diameter and contain 83 tubes, while the steam pressure is 180 lbs. per square inch.

Passenger carriages are surprisingly comfortable and well-fitted for such a narrow gauge, and during the first three days after opening no less than 5,500 passengers were carried.



This drawing of a Metropolitan 4-4-4 Tank Loco, by Ernest Mitchell (age 15) of Chester, was awarded Second Prize, Class B, in our Second Drawing Contest.

766 were also noted crossing the River Mersey at Warrington in tow of a L.M.S. goods loco.

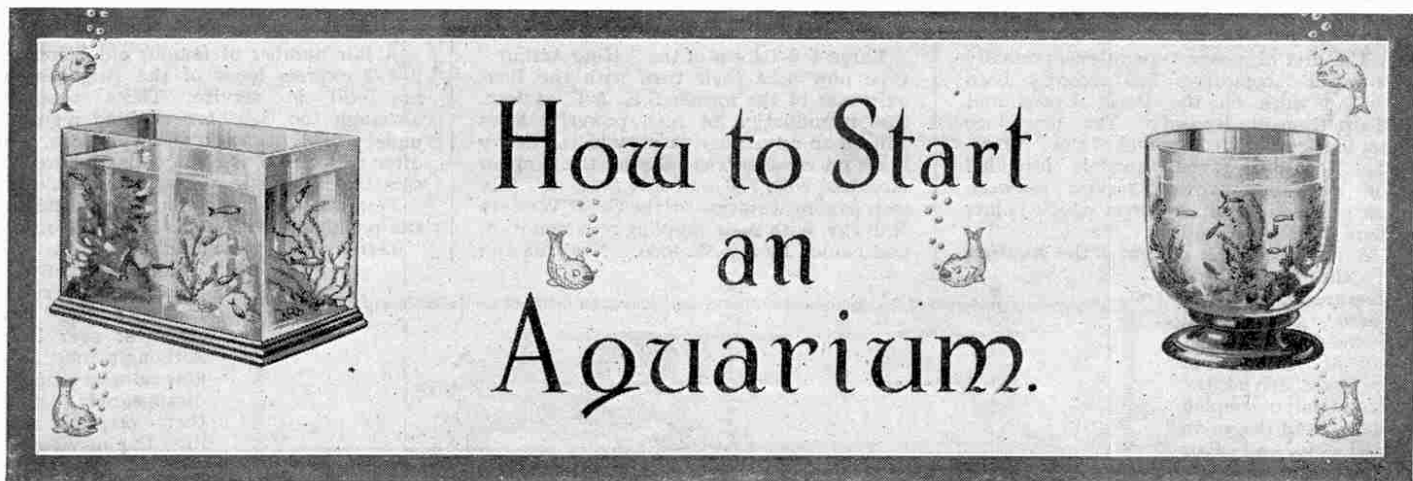
On the L.N.E.R., three of the new 2-6-4 locos, "River Arun," "River Ouse," and "River Rother" were also seen being hauled "dead" by a L.N.E.R. loco. All these locos, of course, were en route from their respective builders to the Southern Railway, but it is a coincidence that they should have been seen passing over each of the other great main lines at approximately the same date.

The miscellaneous tank locos, mostly of very old-fashioned design and manufacture, which formerly worked the various services in the Isle of Wight, have now been largely replaced by 0-4-4 T locos of the former L. & S.W.R. type.

* * * *

More Articulated Trains

A new train, constructed on the articulated principle, has commenced running between Paddington and Weymouth in connection with the G.W.R. new daylight service between Weymouth and the Channel Islands. The train consists of three units, the centre one consisting of first and third-class dining saloons with a kitchen car between. The three coaches are carried on four 4-wheeled bogies, one at each end and one at the point between each saloon and the kitchen car. The result is increased flexibility and freedom from oscillation, for, as we have explained in former articles on articulated trains, the whole train becomes a unit, and passengers experience a greater ease and smoothness than in carriages of the ordinary type. Trains built on this system are in increasing use on the East Coast Route expresses of the L.N.E.R., also on the London Suburban services of the former G.E.R. section.



By W. COLES-FINCH

(Resident Engineer, Chatham etc. Water Co.)

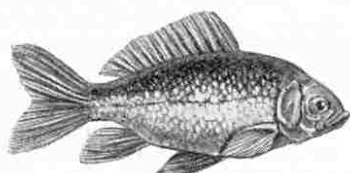
III. SOME SUITABLE FISHES

HAVING filled and prepared the tank on the lines described in the article published in the May "M.M.," the water should be bright and clear. If the plants are thriving, they should give off beads of oxygen from time to time, which rise to the surface of the water in a silvery stream. When we see this, we may rest assured that all is well and if fishes are introduced there will be no distressing indications of suffocation by the little creatures swimming with their mouths close to the surface, as already described.

The great factor to be borne in mind is proportion—that is, a small aquarium demands small inmates. Nothing is more unsatisfactory from all points of view as a small aquarium overstocked with fishes that are too large and unable to move about more than, say, three times their own length in any one direction. It is far better to have small fishes, for to watch these darting about here and there pleases the eye far more than the sight of one large creature moving slowly and sluggishly only a few inches.

Hardy Fishes

There are many kinds of fishes that are suitable for the tank, but our first experience should be gained with



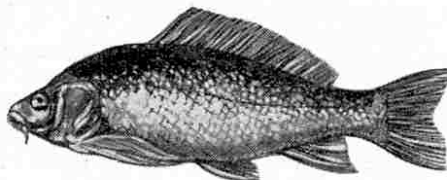
Golden Carp
(*Cyprinus auratus*)

the more hardy specimens. Golden Carp (*Cyprinus auratus*); Common Carp (*Cyprinus carpio*); Prussian Carp (*Cyprinus gibelio*), and a little group of the graceful Minnow (*Leuciscus phoxinus*) should

suffice excellently for a time. These fishes must of necessity be small and few in number, for any attempt to crowd the tank is certain to result in failure. The thing to aim at is not a tank of imprisoned fish, but rather a miniature portion of a typical stream, with its thriving plants and healthy inmates.

Later, when the first fishes have settled down comfortably and made themselves at home, and if there is

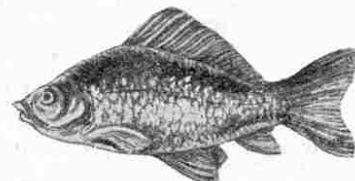
yet room to spare, a couple of Golden Orfe (*Leuciscus orfus*) might be introduced. These fishes are of lemon-gold colour, slim and graceful, quick in movement and superior in many ways to the sluggish, lazy Goldfish. They deserve to be much better known, for they are hardy, and the writer kept a pair of them, in company with other fishes, in his aquarium for ten years. At first they were tiny creatures about two inches in length, but they grew until they became too large for their home and they were then placed in a garden pond, where they lived for several years.



Common Carp
(*Cyprinus carpio*)

Refreshing the Aquarium

Even if the balance of plant and animal life in a tank is satisfactorily maintained, as described in our first article, it is desirable occasionally to take a little water from the tank and replace it by fresh water. Both operations should be carefully carried out by the use of a small siphon. Emptying the tank entirely should be carefully avoided. The shock due to the change of temperature alone is very distressing to the fishes and there is also the general disturbance of the plants, which checks their growth and upsets their natural form and beauty. A small syringe may be brought into use at times to revivify the water by withdrawing some of it and squirting it back again with as much force as possible. This operation has the effect of driving air under the water, which takes up the oxygen and thus becomes more fit to support life.



Prussian Carp
(*Cyprinus gibelio*)

If the glass becomes dull by reason of too much conifer-void growth—probably induced by too much bright light—the natural growth of the plants will be checked. In this case the excessive growth may be removed quite easily by means of a toothbrush or a piece of sponge attached to a stick.

Food for Fishes

Fishes need very little food. Some of them are more particular than others, but generally speaking ants' "eggs"—which are really the pupæ of the ants—are welcome, forming excellent food.

Other suitable foods are finely chopped shrimp, raw meat, hard-boiled egg, small worms, or finely broken vermicelli. Small crustaceans and larvæ and pupæ of water flies from ponds and ditches would be a luxury but they are not a necessity. The eggs and fry of the water snails living in the tank also provide wholesome food for the fish.



Minnow
(*Leuciscus phoxinus*)

An Unpleasant Experience

In reference to ants' "eggs," care should be taken to make certain that they have been "kiln-dried" and their fertilisation destroyed. A sixpenny box of "eggs" once cost the writer £15! They had not been correctly prepared, and the whole lot hatched out and took up their residence behind the skirting board beneath the floor of the room!

At night the ants came out in battalions and covered the walls of the room, disappearing when daylight came. Every effort to get rid of them failed. As fast as some were killed a still greater number filled their ranks and nothing seemed to have any effect on them. Finally floors and skirting had to be taken up and the walls and all cavities treated with chemicals, and in this way the ants were finally destroyed.

Removing Uneaten Food

On no account must small particles of food be left in the tank to decay. These particles may be removed quite easily, without disturbing the occupants of the tank, by means of a narrow glass tube, used as a "pipette." The top end of the tube is closed by pressure of the finger and the other end is lowered into the tank until it is just above the particle to be removed. The finger is then lifted and water rushes up into the tube carrying with it the offending particle. The top of the tube is again closed with the finger and the tube, with its contents, are then withdrawn from the tank.

A Pressure Jet

If a tank is of sufficient size to warrant the step, greater pleasure may be obtained and more creatures kept in healthy condition by laying on town's water. The jet, which need be no larger in diameter than a

darning needle, may be turned downward so as to impinge upon the surface of the water. This tiny pressure jet will drive a stream of silvery air bubbles far beneath the surface of the water and the Minnows will gambol and rush up the glistening track in the most delightful manner. The downward jet may be removed and a fountain jet screwed on at will.

Such a jet provides a splendid means of aerating the water, but it does not obviate the necessity for maintaining healthy conditions by means of plant life. The jet merely enables an increased number of inmates to live in the tank and makes easier the task of balancing the vegetable and the animal life.

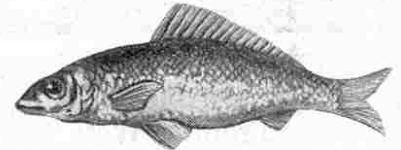
Under these favourable conditions and when more experience has been gained, we may introduce Gudgeon, Chub, Stone Loach, Rudd and the sluggish Tench. It will be fatal to the small members of the aquarium, however, if large specimens of these fishes are introduced among them. A fish in doubtful health should never be placed in the aquarium, but should be kept in a separate vessel until there is no doubt that it is healthy and above suspicion.

A Word of Warning

One word of warning must be given here. No risk should be taken by indiscriminately placing in the tank every aquatic creature that comes to hand, otherwise it may be discovered, all too late, that wolves have been placed with lambs, with an obvious and unfortunate result! For this reason it is not wise to risk the presence of water bugs, beetles or scorpions among the peaceful members of the tank until some knowledge of their various habits has been attained.

Over-feeding is bad for fishes and must be carefully avoided and, as already stated, any particles of food not consumed should be removed immediately before they have time to decay and pollute the water.

On the other hand, if fishes are not sufficiently fed they may be driven to cannibalism or to devour and exterminate smaller and weaker specimens of other species.



Golden Orfe
(*Leuciscus orfus*)

NEXT MONTH:—

POND LIFE IN THE AQUARIUM

The Highest Structure in the World

(Continued from page 385)

It was one of the first models, and although it has been improved on several occasions, it necessarily retains many of its original features. In fact, it is one of the few models that have not been improved out of all recognition from the early days of "Mechanics Made Easy." The model has appeared in Meccano advertising, on Outfit labels, and in other printed matter for many years, and in this manner has reached every civilised country in the world. It has even been said that were

Meccano Limited ever to adopt a trademark, the model of the Eiffel Tower would admirably serve the purpose.

The construction of the model requires very little description, because it is so clearly evident from the accompanying photograph. As is the case in the real Eiffel Tower the Meccano model carries a lift electrically operated by the Meccano motor mounted at the base. The lift-carriage is raised or lowered by a sprocket chain, which passes over a sprocket wheel at the top of the tower, mounted on a rod journalled as shown in Fig. A. The sprocket chain is driven by the motor

through worm-gearing as shown in Fig. B. The lift-carriage is guided by cords stretched from the top to the bottom of the tower.

The two detailed views make the construction quite clear and there should be no difficulty whatever in building this model, which is capable of further improvement and elaboration—as, for instance, the fitting of an automatic reversing switch to mechanically reverse the motor when the lift-carriage reaches the base of the tower, and to operate it again when the carriage reaches the top of the Tower. Other elaborations will readily occur to our readers.



FROM OUR READERS

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of general interest. These should be written neatly on one side of the paper only, and they may be accompanied by photographs

or sketches for use as illustrations. Articles that are published will be paid for at our usual rates. Statements contained in articles submitted for this page are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

From a West Indian Reader

I have been asked by the Editor to write a short description of the island of St. Vincent, where I live. This island, which owes its name to being discovered by Columbus on St. Vincent's day 22nd January 1498, is one of the lesser Antilles and is only 18 miles in length and 11 miles in breadth.

When discovered it was in the hands of the Caribs, and it remained so until 1627. In 1773 a treaty was concluded by which the Caribs acknowledged themselves to be British subjects, and in return were granted a large tract of land in the north-east of the island. In 1779 the island was surrendered to the French, but it was restored to the British four years afterwards by the Treaty of Versailles. The Caribs overran the island in 1795, but this rising was suppressed by Sir Ralph Abercromby in the following year. Afterwards most of the Caribs were taken to the Island of Baliceaux—one of the Grenadines, away to the South—and then sent to the Island of Ruatan in the Bay of Honduras.

St. Vincent is very far behind the times and the capital Kingstown, where I live, is a quiet little town situated at the head of Kingstown Harbour and surrounded by a magnificent ring of mountains, dominated by Mount St. Andrew. It has three main streets running parallel to each other and intersected by smaller ones, and in spite of its small size it possesses the finest cathedral in the West Indies.

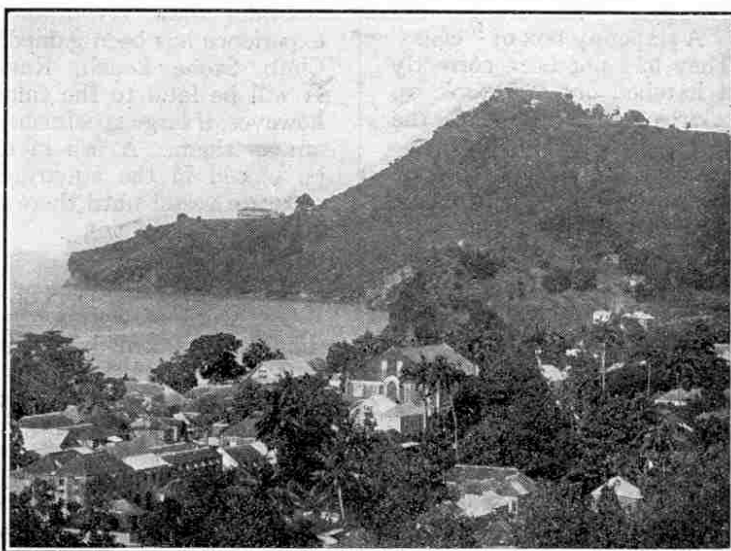
I spend most of my spare time, when not building Meccano models, in bathing, rowing, fishing and sailing. The bathing is specially glorious, and those of you who have read R. M. Ballantyne's book, "*Coral Island*," will understand what it is like. My chums and I have a special place for bathing called "Flat Rock." The main rock consists of a number of ledges off which we dive and try to reach bottom, which no one has yet succeeded in doing. The rock cannot be reached by land, so we often hire a boat and row over to spend a day there, and it may be guessed what a fine time we have!

There are many points of interest about our island. The most prominent is the crater of the volcano "Soufrière," which erupted in 1902 and caused much damage and loss of life, especially among the Caribs who lived just under the mountain. The Caribs, of whom there are now only a few left, are most interesting to talk to, and the men for the most part are handsome. At our public library may be seen many of the stones that the Caribs used in their warfare. They are all shapes and sizes and are highly polished, with one side ground to the shape of a hatchet with a sharp cutting edge.

There are many small islands and rocks around the coast of St. Vincent. One of them, Fort Duvernette, a large rock situated on the south side of the island not far from Kingstown, was fortified in the reigns of George II. and George III., and the old guns are still to be seen there.

Whale fishing is carried on extensively among the Grenadines and St. Vincent, and it is interesting to watch the native fishermen at work. It is a dangerous sport and one gets quite excited while looking on. The natives live largely on fish, which they catch from their little "catamarans," or rafts.

G. BLENOWE, Kingstown.



View of Kingstown, showing Fort Charlotte in the distance

An Early Iron Bridge

I was very interested to read a reference to the Iron Bridge across the River Severn at Broseley, in a recent number of the "*M.M.*," and I think that some readers will like to have some further details regarding this bridge. I should therefore like to give a description from a book, called "*The Wilkinsons*," by John Randall, in which this bridge is described. Here it is:—

"On the abutments of the stone work are placed iron plates, with mortices, in which stand two upright pillars of the same. Against the foot of the inner pillar the bottom of the main rib bears on a base plate. This rib consists of two pieces connected by a dovetail joint in an iron key and fastened by screws. Each piece is 70 ft. in length. The shorter ribs pass through the pillar, the back rib in like manner, without coming down to the plate. The cross-stays, braces, circle in the spandrels, and the brackets connect the larger pieces so as to keep the bridge perfectly steady, while diagonal and cross-stays and top-plates connect the pillars and ribs together in opposite directions.

"The whole bridge is covered with top-plates, projecting over the ribs at each side, and on this projection stands the balustrade of cast iron. The road over the bridge, made generally of iron slag, is 24 ft. in width and 1 ft. in depth. The span of the arch is 100 ft. 6 in. and the height from the base line to the centre is 40 ft. The weight of iron in the whole is 378 tons 10 cwt.

"On the largest or exterior rib is inscribed in capitals 'This bridge was cast at Coalbrookdale, and erected in the year 1779.'"

A toll is still taken (1d.) but the bridge is but little used because of the erection of what is known as the "Free Bridge."

It is interesting to note that the first iron barge was built at Broseley in 1787 and that the first iron railway lines were made and laid down at Coalbrookdale about 1760. The first iron pot was made in this district, although I regret I do not know the date of this latter achievement. E. L. BRAY, Horsehay, Salop.

A Chat About Caves

Nearly all boys, like myself, are interested in caves. By caves I do not mean miserable little holes in the side of a cliff, but grand caves such as the Adelsberg Cave in Austria and Fingal's Cave on the Island of Staffa.

Many caves are very beautiful, especially those hollowed out of limestone rock by the action of water. Carbonic acid in the water dissolves the limestone, and thus the constant dripping into the cave forms stalactites which hang downwards from the roof, and stalagmites which rise up from the floor below. Sometimes after a great number of years the two meet and form pillars of the most marvellous shapes, which sometimes defy even the cleverest sculptor to copy. The caves in the Cheddar Cliffs are like this.

Our British caves, however, cannot rival the caves on the Continent and elsewhere abroad. The cave of Adelsberg, for instance, mentioned above, is such a wonderful place that it is impossible for a boy like myself to give a good description of it. Close to the entrance it is of a dull stone colour, but further in the pillars are of the purest white. Some of the stalagmite beds have been tinged red, and the crystalline fragments produce the effect of diamonds on a red cushion. In some places the stalactites take the form of thin sheets which, when struck, give forth a musical sound. The chain of vaults extends several miles underground. The great beauty of it all is very bewildering, and you are constantly going into different vaults each of which seems to be more beautiful than the last.

The cave of Adelsberg is in fact one of the wonders of the world.

W. H. WATERS, Clapham, London.

How Iron Wire is Made

From the Ingot to the Finished Product

by J. W. Taylor

MOST metals can be drawn out into wire to some extent, this depending upon what is called the "ductility" of the metal. Metals that are extremely hard, such as antimony and bismuth, can only be drawn with very great difficulty. On the other hand, the soft metal lead cannot be drawn into wire at all. Different methods are employed for drawing out metals for different purposes, and the following article describes briefly the method usually employed for the manufacture of ordinary iron wire.

First of all a mixture of pig iron, red ore and hammer slag is placed in a reverberatory furnace and rabbled into three white-hot balls of metal. This process, which is known as "puddling," was described in the "M.M." for June 1924. The three balls of metal are then withdrawn from the furnace and taken to a steam hammer. The metal is manipulated beneath the hammer by a man known as a "shingler," who also instructs the hammer driver as to the weight of blow required. The metal emerges as a solid bar of about 2 ft. by 4 in. by 4 in.

From the hammer the bar is taken away to be rolled, and it retains sufficient heat for this process to be carried out without reheating. The rollers, which are three in number and placed one above the other, are pinion-driven and grooved to depths varying from approximately 2 in. to $\frac{3}{4}$ in. The bar is passed through the centre and lower rollers and returned through the centre and top rollers, and after having passed through each groove in turn it measures about 11 ft. by 4 in. by $\frac{3}{4}$ in.

Scale Removed by Acid

The bar is now sheared into 1 ft. lengths and taken to the ball furnace, in which the lengths are piled in fives or sixes according to the gauge of rod required. In the furnace each pile becomes welded into a white hot "bloom," which is then passed through other rollers in order to reduce the section evenly until a rod with a 1 in. section is produced. This in turn is taken through a smaller set of rollers, the grooves of which are more semi-circular. While passing through the next set of

rollers, which are self-feeding, the scale on the metal is loosened by water dripping on to the rollers and is then removed by a scraper. This precedes the entry to the final set of rollers wherein the required gauge is set. A circular drum about 30 in. in diameter coils the rod as fast as it is completed.

The rod, in coils of about 100 yards, is now ready for the wire factory, its gauge

drawn through the plate, on each occasion through a smaller hole. When No. 8 gauge is reached the ripper binds with tie bands the coil of wire thus drawn.

It will be appreciated that, as the diameter of the wire is now less than half the diameter of the rod, the coil is increased considerably in length, and also that, owing to the pressure exerted upon the wire, the coil is now warm and hardened

in temper. In order to restore the wire to its former pliable condition it is necessary for it to be annealed in a vertical tubular furnace, which is usually fired for about four hours and then allowed to cool gradually for eight hours. After the wire is removed from this furnace the cleaning process already described is again carried out.

The wire is now ready for finer drawing and unless an intermediate gauge is required it is drawn in two stages down to No. 12. If a still finer gauge is desired it is usual to re-anneal and clean

the wire before proceeding in order to prevent the wire breaking under the strain, a risk that becomes greater proportionately with the fineness of the wire.

Galvanised, Tinned and Japanned Wire

Unless the wire is of exceptional quality it cannot be reduced more than four stages at one time without re-annealing and cleaning. After leaving the wire drawer for the last time the wire must once more be annealed unless it is required to be "bright" or "copper-coated." If required "bright" no further work is entailed, but if the wire is to be copper-coated it is necessary, before the final drawing, to steep the coil in a vat containing a specially-prepared copper sulphate solution.

The appliances used for wire drawing become considerably lighter from No. 14 gauge upward, the blocks being reduced to 16 in. in diameter up to No. 19 gauge and 9 in. diameter beyond, the smallest size, known as a "jigger block," being capable of dealing with the finest wire made.

Other classes of wire not yet mentioned include galvanised, tinned and japanned wire. In the case of galvanised wire,

(Continued on page 426)



Photo courtesy]

[Longford Wire Co. Ltd., Warrington

Interior of a Wire-Drawing Mill

being approximately $\frac{1}{4}$ in. in diameter. In the factory the ends of each coil are pointed in a machine specially constructed for this purpose and the coil is then taken to the cleaning shed and lowered into a vat of acid in order that all remaining scale may be removed. After this process the coils are well rinsed with water to remove any traces of acid and then, to prevent rust, are steeped in hot lime water and immediately removed to a drying shed.

The coil now reaches the wire drawers, the first of whom is called a "ripper," and his duty is to reduce the gauge of the rod down to No. 8. This is done in two or more stages according to the initial size of the rod.

Annealing and Cleaning

The gauge is reduced by drawing the rod through a drawer's plate—set by the wire drawer to various sizes according to the gauge required, and lubricated by Russian tallow—on to a steel drum known as the "block," which is about 24 in. in diameter and revolves at the rate of about 20 revolutions per minute. During the first stage the machine is hand fed, but for subsequent drawing the coil is taken off the block and placed on a drum at the side of the bench, from which it is again

In the Land of the Rising Sun

Greetings to "M.M." Readers from the East

MOST of our readers know that the Meccano Manuals and other publications are printed in 16 languages, and that Meccano depôts are to be found in all parts of the world. We wonder how many of our readers understand exactly what this means, and if they realise how wide-spread the Kingdom of Meccano really is.

When you sit in your home in England, or Canada, or Australia, or wherever it is that you live, do you ever think of the boys of other nations who are also building Meccano models? Many of these boys are situated in vastly different surroundings, and play under very different conditions from your's—yet you all enjoy the same hobby, face the same mechanical difficulties, and learn the same lessons.

From time to time we have published photographs of Meccano boys in the Argentine, in New Zealand, in Australia, and in other distant parts of the world. This month we are pleased to be able to reproduce some photographs of two of our young friends in Japan.

These photographs reached us from the "Land of the Rising Sun" at a time when it was cold and wet in England, and they brought a ray of joyous sunshine into the Editorial office. They made us realise there is a land where the sun often shines, and if it is not shining out-of-doors, we feel confident it shines wherever the smiling faces of our two happy little friends may be!

Some time ago Mr. S. Sakurai wrote us a very interesting letter from Nakayamate-dori, Japan, telling us how his two sons spent many happy hours with Meccano; how they thought out new models; and how they

endeavoured to improve upon the models shown in our Manuals, as all true Meccano boys should!

Kenichi, the elder of the two boys, is nine years of age, and he has been a Meccano boy for eighteen months. He is already quite a clever young engineer and has built many fine models, Ships, Locomotives, Swing-Bridges, Pit Head Gears—but the models in which he is most interested are Cranes of all types.

Kenichi's younger brother (aged six) caught "Meccanoitis" while watching him at work, and now the brothers have great fun seeing who can invent and build the finest model without assistance!

Mr. Sakurai very kindly sent us several photographs, five of which are reproduced here in a group. The top left-hand photograph shows Kenichi on his bicycle outside his home in Nakayamate-dori. It is interesting to note that although he is riding his bicycle, Kenichi is wearing the little wooden Japanese sandals. In the centre photograph our young friends are shown together in the sunshine, having been persuaded to leave their Meccano for a few moments in order to be photographed

out of doors. The other three photographs are typical of several, which show Kenichi and his brother at work on their models.

But what pleased us nearly as much as the charming photographs was a letter from Kenichi himself. Although we have become fairly expert in deciphering Meccano boys' letters—in all kinds of bad writing and in all manner of languages—we must confess that we couldn't make head or tail of Kenichi's message.



TWO HAPPY
MECCANO BOYS
IN THE LAND OF
THE RISING SUN

Masters Sakurai,
of Nakayamate-dori
Japan.

Kenichi, aged nine, &
his young brother
spend many hours
enjoying MECCANO
fun. Our photographs
show that they
are as clever at
model-building
as western boys

It really was fortunate that his father had expected this, and enclosed a translation, as otherwise there would have been some considerable delay in our discovering the meaning of the letter!

This is what Kenichi wrote to us, reproduced exactly as it appears, each letter and each word a work of art in itself.

メツカノヲチサマ

櫻井憲一

お手紙ありがとうございました。僕は今年夏休みをメツカノ組立で非常に愉快に暮したことをよろこんで居ます。尚此後も弟と色々工夫して組立て見やうと思つて居ります。宅へ来られる父のお友達に見せますと皆々えん好いおもちやだと思ひされて居ります。私共は一人でもメツカノ黨のふえる様心がけたいと思つて居ます。

大正十三年十一月廿二日

Kenichi Sakurai's Letter to the Editor of the "M.M."

"Dear Uncle Meccano,

"I thank you for your letter. I am delighted to say that I have had most pleasant times throughout my last summer vacation in working up your Meccano models. And from now on I am going to continue this interesting work, together with my brother, making interesting structures to the best of our ability.

"I always show the models to the friends of my father when they call, and am very pleased to hear their admiration of the excellent toy.

"To increase the number of Meccano engineers is our wish, and we are always keeping it in our mind."

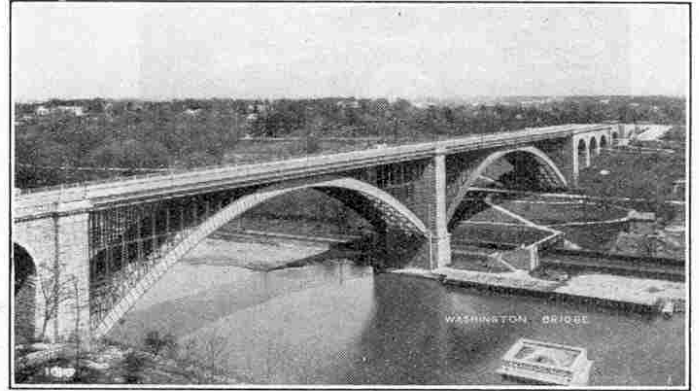
Yours truly,

Kenichi Sakurai.

We know that Meccano boys in all parts of the world will join in extending the hand of good-fellowship to our little friends, thousands of miles away in Sunny Japan. We welcome them to Meccanoland and hope that there are many happy days in store for them.

FAMOUS BRIDGES—No 4

Washington Bridge and High Bridge, New York



Our cover this month shows two famous bridges, Washington Bridge in the foreground and High Bridge in the distance beyond.

Washington Bridge, to which a brief reference was made in our article last month, was constructed at a cost of over £600,000 and required two years to complete. Work was commenced in July 1886 and the Bridge opened for traffic in December 1888.

The Bridge crosses the River Hudson from Manhattan to New York, at a point where the river is 400 ft. in width. It is built in two tremendous steel arches, the span of each being 508 ft. One arch spans the river and the other bridges the land adjoining the water's edge. There is a clearance of 133 ft. under the bridge at high water, the length of the whole structure from end to end—including the masonry approaches—being 2,375 ft. and the width 86 ft. 7 in.

The accompanying photograph, published by the courtesy of the Department of Plant and Structures City of New York, gives an excellent idea of the unusual grace and beauty of this bridge and of the length of the two steel arches. The Bridge is, indeed, an excellent instance showing how nothing of beauty and grace of line need be sacrificed to gain requisite strength.

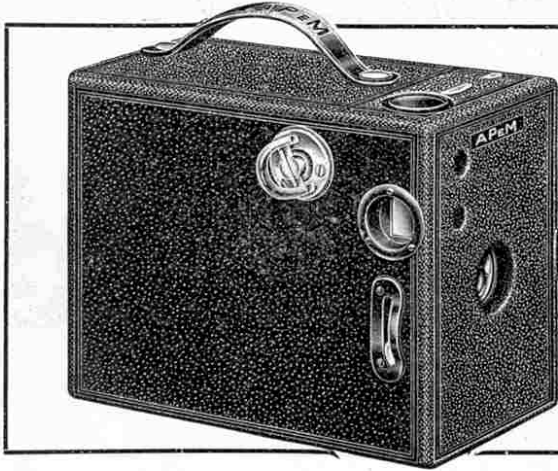
High Bridge, New York

The many-arched bridge in the background on our cover design is the High Bridge. This bridge was built in 1848, as part of the old Croton Aqueduct and carries three water mains with a water-carrying capacity of 90,000,000 gallons of water per day.

The Federal Government consider this bridge a menace to navigation, and plans have now been made for the removal of four of the masonry piers. These will be substituted by a steel cantilever arch of 420 ft. span with a rise of 103 ft., leaving an unobstructed waterway and removing the menace to navigation.

A depth of 15 ft. of water is provided at low water and the estimated cost of remodelling the Bridge is £200,000. The new steel arch, a cantilever, will be sprung from rock to rock, and will eliminate any danger of the future settling of High Bridge.

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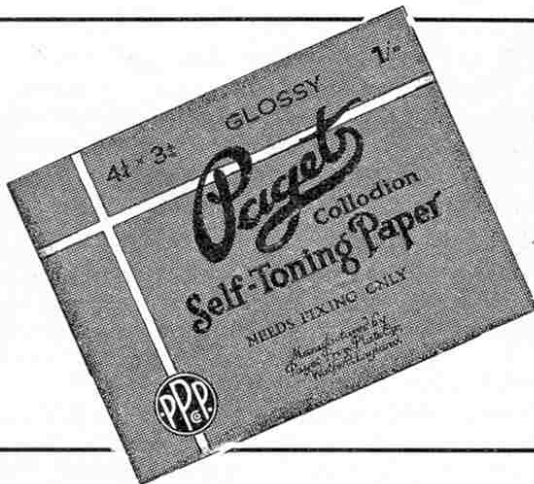
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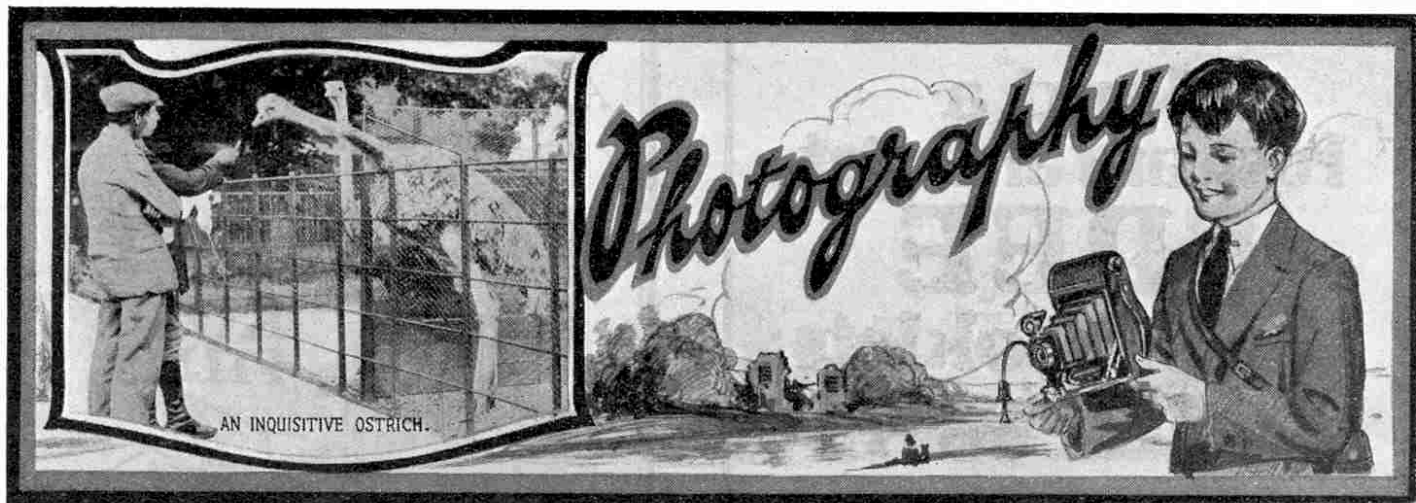
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V. SEASIDE AND HOLIDAY PHOTOGRAPHY

DURING this month and next, our readers will be on holiday, most of them no doubt at the seaside.

As the majority of them will have taken cameras—in many cases for the first time—we propose to devote this article to the subject of holiday photography at the seaside.

Brilliance of Light

The most noticeable difference between photography at the seaside and in inland towns is in the strength of the light. The intense brilliance of the light at the seaside, which is trying to the eyes until one gets used to it, is due to the clearness of the air and the large amount of light reflected from sea and sky. On this account seaside photography is comparatively easy as regards the exposure problem, and even those with the cheapest types of camera are able to secure good results without difficulty. Indeed, in the late morning and early afternoon hours, when the sun is blazing down from a cloudless sky, it becomes really difficult to under-expose on such subjects as open beach scenes or ships in the open.

Low Viewpoint for Waves

The sea offers boundless opportunities to a keen photographer but it is remarkable how seldom it is really well depicted. The great secret in photographing breaking waves is holding the camera low down, the lower the better. Waves photographed from a high viewpoint become flattened and appear insignificant in size, but on the other hand waves may be made to appear much bigger than they actually are by utilising the lowest possible position for the camera.

Many of the most striking seaside photographs are those of a combination of sea and rocks, and if a really rough sea occurs during one's holidays the chance of making striking pictures should be seized immediately.

Blank Skies

No photograph in which the sky is represented by blank white paper can be considered successful and this is particularly the case with seascapes. The low horizon at the seaside, with the corresponding vast expanse of sky, affords an ideal opportunity of obtaining good cloud photographs either in combination with the sea and shipping or just alone. It might be thought

that the photography of clouds was monotonous, but as a matter of fact it is extremely interesting, and as no two clouds are ever exactly alike, the variety is infinite.

There are two methods of obtaining clouds in a photograph. The first is to secure both cloud and landscape or seascape together on the plate or film, and the second is to "print-in" the clouds from another negative.

Clouds and Landscape

The main difficulty of securing cloud and landscape together is that the correct exposure for the clouds is so very much shorter than that for the landscape. Consequently, if the exposure for the clouds is correct the landscape is hopelessly under-exposed, and if correct exposure for the landscape is given, the clouds, unless they are of a very heavy type, are so much over-exposed as to be

practically invisible in a print.

Generally speaking, in order to secure cloud and landscape together, what are known as "orthochromatic" plates or films must be used. The majority of films made to-day are orthochromatic and practically all plate-makers have one or two brands of orthochromatic plates of different speeds. Having obtained orthochromatic plates or films we shall probably find on trial that they do not give a noticeably better rendering of clouds. In order to secure the real benefit of these plates it is necessary to place in front of the lens a

(Continued on page 411)

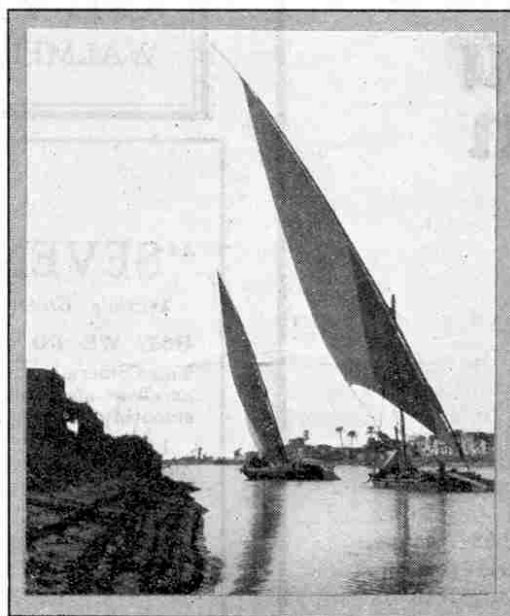


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[Aly A. Shawky

Native boats sailing up the Nile, a print entered in one of our recent Photographic Competitions

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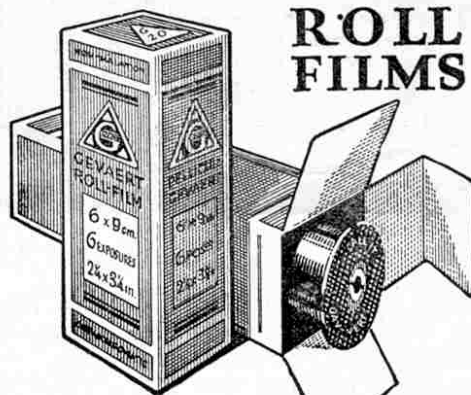
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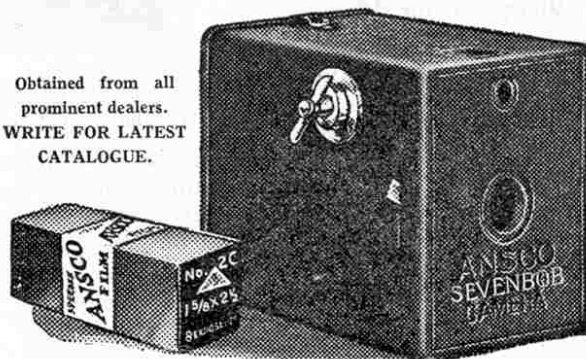
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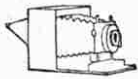
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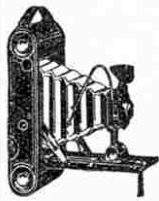
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Photography—(cont. from page 409)

"colour screen" or filter. The effect of such a screen is to make a longer exposure necessary, the actual increase depending upon the colour depth of the screen. For hand camera purposes a screen that requires an exposure three times the normal length is as deep as can be used as a general rule.

Screened Ortho Plates

There are also certain plates that are specially made to do away with the necessity of using a colour screen. These plates incorporate in the film a kind of yellow dye that acts in much the same way as a pale colour screen. These plates are known by various names indicating their peculiar type, such as Messrs. Gevaert's "Filtered Ortho," Messrs. Paget's "Orthochromatic Self-Filter" and Messrs. Wellington and Ward's "Anti-Screen." By the use of orthochromatic plates with a colour screen or of the screened plates we have just described, a great improvement in the rendering of clouds will be observed.

There is another method of securing the same result however, and this is by the use of a screen that is not of the same tint all over, but commences with clear glass and gradually increases in depth up to a fairly deep yellow. When this screen is placed in front of the lens the light from the sky passes through the yellow upper part while the light from the landscape passes through the colourless lower part. The result is that the light from the sky is, as it were, held back, and some approach to equality in exposure for clouds and landscape is attained.

The subject of orthochromatic or colour-correct photography is very fascinating and next month we shall deal with it in detail and show what remarkable results may be obtained.

Clouds on Separate Negatives

Even when we have overcome the difficulty of obtaining fairly good clouds along with our landscapes, we are still faced with the difficulty that when we want to photograph a particular landscape or seascape the cloud combinations are very seldom ideal for the purpose. Holidays, unfortunately, are strictly limited as regards time, and therefore one cannot wait indefinitely for suitable clouds to put in an appearance. The most satisfactory method of dealing with this problem is that of printing into the landscape suitable clouds from a specially-taken cloud negative. In doing this care must be taken that the clouds and the landscape are suited to one another. Photographers who print in clouds regularly take every opportunity of securing good cloud negatives so that they have a selection to choose from.

The actual photographing of clouds is not difficult because correct exposure can be given. Any landscape that may appear on the negatives is not required and the fact that it may be hopelessly under-exposed does not matter. In photographing clouds for the purpose of printing-in, a note should be made of the direction from which the light is coming, the time of day and the comparative height of the clouds. A note of this description will prevent the common fault of printing-in clouds illuminated from the right on a landscape illuminated from the left, or using sunset clouds for a landscape obviously taken at midday!

Printing-in

When it is desired to print-in clouds, the landscape is first printed and masked so as to leave the sky portion unaffected by the light. In order to do this take a thin piece of cardboard and draw across it a line roughly corresponding with the sky line and the landscape. Then cut the cardboard along this line and keep both pieces. The landscape negative is then placed in a printing frame, the sky portion of it is covered by the upper half of the sheet of cardboard, and a print is made. This print therefore will have the sky portion absolutely white and unaffected by light. Next place the cloud negative in the frame, place the print in the correct position over it, cover up the landscape portion of the print with the other piece of cardboard and print the clouds on the sky portion of the print.

In order to avoid producing a sharp horizon line across the print the cardboard masks should be used about a quarter-of-an-inch away from the glass. This method is quite easy to manipulate with printing-out papers, but in using gaslight or other papers on which the image does not show before development, it is necessary to mark the paper to show the exact position of the sky line.

Unlimited Range of Subjects

The range of photographic subjects at the seaside is practically unlimited. If the coast round about be wild and rugged, with huge cliffs towering upward from the water's edge, there will be ample scope for many exposures. If the coast is low and sandy its beauties are not so obvious, but such a coast line generally affords compensations in regard to crowded beach scenes with their great variety of amusements and the constant coming and going of small boats taking passengers for a sail or for fishing.

Yachts or sailing boats are excellent subjects for the camera and as a rule are not difficult to take. Sometimes they may be photographed from a pier, but usually a better result is obtained by snapping them from the shore or from a small boat. A three-quarters view gives the best effect, and it will be found that a broadside view is disappointing. The arrivals and departures of passenger steamers also provide material for interesting and amusing snapshots, and at all times the local boatmen and fishermen at work are worthy of an exposure or two.

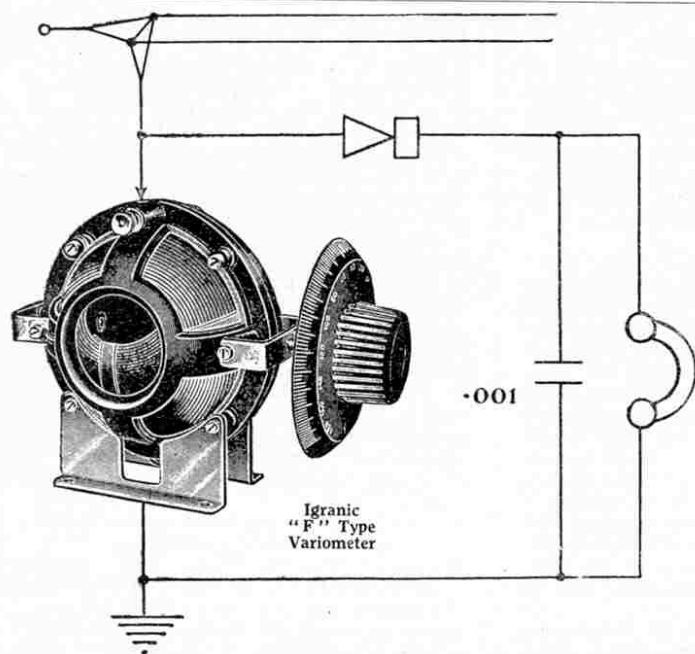
It may be worth while to mention that interesting snapshots may be obtained of the shore as seen from a small boat.

Lifeboat practice affords a particularly fine opportunity for snaps, and it is very interesting to take a series of pictures covering the whole practice from the launch of the lifeboat to its return.

In addition to all this there are the many interesting and amusing pictures to be made of one's friends, but on this matter no advice is needed.

Note to Competitors

We have recently received a considerable number of photographs obviously intended to be competition entries, but which did not state the particular competition for which they were entered. In many cases, owing to the nature of the subject of the photographs, we have found it difficult to determine for which contest the photographs were intended. We therefore wish to draw the attention of all entrants for our photographic competitions to the necessity of writing on the back of the print the number of the contest for which the print is an entry.



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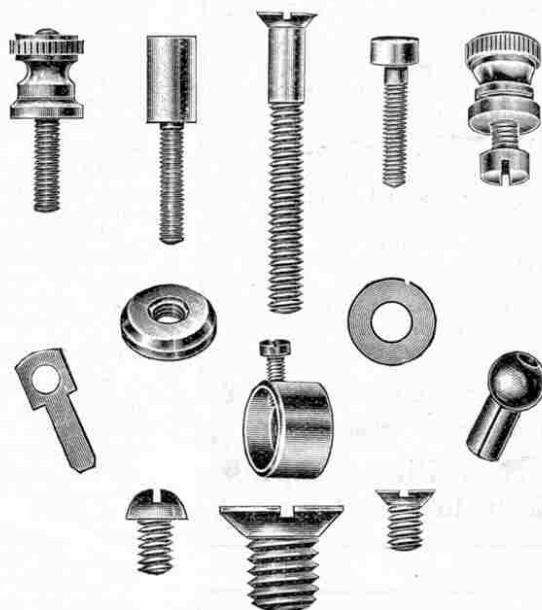
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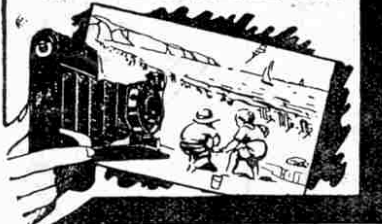
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PEELING & VAN NECK LTD.,

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Burn PARAFFIN. No
Loose Oil. Special Absorbent
Imperishable Wick. No
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Fogging. Ideal when travel-
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PRICE ... 3/-
**EXTRA RUBY or YELLOW
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From all Dealers or
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Messrs. Taylor Bros., Art Printers and Publishers, Leeds, are always glad to have submitted to them Photos of attractive subjects suitable for publication, and invite correspondence.

Eighteenth
Photo Competition

Our photographic article this month is devoted to holiday photography and we are arranging our Eighteenth Photo Competition to be in keeping with it. We have decided to offer a choice of subjects in order to try to attract readers of various tastes.

These alternative subjects are: "A LANDSCAPE (OR SEASCAPE) WITH CLOUDS," and "A BEACH ENTERTAINMENT."

The former will afford scope for those who intend to profit by the advice given in this month's photographic article, and the latter gives an opportunity for everybody at the seaside, since everything from a Punch and Judy show to Pierrots comes within its scope.

Each competitor must decide which of the subjects he prefers, and no competitor may enter for both subjects. Prints may be of any size and made by any process, and the work may be done by the competitor himself or by a photographic dealer. In the event of a tie for a prize preference will be given to prints that have been made by the competitor himself, and therefore every entrant must state on the back of his print by whom it has been made. In addition each print submitted must bear the name, address and age of the competitor clearly written.

The competition will be divided into two sections (A) For competitors of 16 and over. (B) For those under 16. Four prizes are offered—Photographic Goods to the value of £1/1/- and 10/6, to be chosen by the winners, as first and second prizes respectively in each section.

Closing date: 30th September (Overseas: 31st December).

Results

Fifteenth Photo Contest

Our Fifteenth Photo Competition, "MY FAVOURITE PET," brought in a really surprising array of animal portraits. There were ponies, horses, donkeys and goats, dogs fetching their masters' slippers, and a well-groomed black cat begging like a dog! Puppies of various ages were snapped while engaged in their favourite pastime of tearing things to bits, and from the look of anticipation on the faces of some of the pets we suspect the old trick of balancing a dainty morsel on the camera itself! Some of the sitters were so excited that they moved at the critical moment, thereby spoiling their portraits, and one competitor complained that her dog would persist in yawning just as the snap was being made!

Prizes were awarded as follows:—G. H. WALKER (Westgate-on-Sea), photographic goods value £1/1/-, and L. J. HAYNES (Putney), photographic goods value 10/6.

Sixteenth Photo Contest

The popularity of the subject for our Sixteenth Photo Contest, "A JUNE LANDSCAPE," was indicated by the entries which began to accumulate within a week of publication of our June issue. A welcome feature about the photographs submitted was the high percentage that were entirely the work of the competitors.

One of the commonest faults among the entries was that of including too much. In very many cases a great improvement would have been effected by trimming down the print, and thus getting rid of details that were not an essential part of the landscape and only served to distract attention. Still another fault was that of skies represented by blank white paper, giving the photographs an unnatural appearance. It is curious to notice how few amateur photographers ever think of trimming away the sky altogether, and yet it is surprising to notice the improvement brought about by so doing. This question of skies is dealt with this month in our photographic article (page 409) and it is hoped that all our photographic readers will read this section of the article carefully and try to improve their photographs in this respect.

It was no easy task to select the winners, but after careful consideration it was decided that the con-

ditions of the contest were best fulfilled by F. G. BROOK (Ipswich), Section A, and G. W. MORGAN (New Cross), Section B, to each of whom prizes of Photographic Goods value £1/1/- have been awarded. The second prizes of photographic goods value 10/6 went to J. SANDHAM, JR. (Preston), Section A, and Miss DIANA MEEK (Stroud), Section B.

The special additional prize offered by Messrs. Gevaert Ltd. has been awarded to F. G. BROOK (Ipswich), whose study of "The Gainsborough Country," which won the first prize in section A, was printed on Gevaert Self-Toning Paper.

Overseas Results

Twelfth Photographic Contest

Some remarkably fine photographs were submitted in this competition, and the greatest care had evidently been taken in their finishing and mounting. We hope to publish one or two of the winning photographs before long.

Prizes have been awarded to the following:—M. STEVENSON (Cronalla, N.S.W.) and LEE EN KENG (Singapore), first prizes in Sections A and B respectively (Meccano Goods value 10/6). ALI A. SHAWKY (Cairo) and F. HARPER (Christchurch, N.Z.), second prizes in Sections A and B respectively (Meccano Goods value 5/-).

"Photographic Signposts"

For many years Burroughs Wellcome & Co., have made it an annual practice to issue a most attractive and really useful booklet on photography. The wonder is that each succeeding booklet is so fresh and that the story of the usefulness of 'Tabloid' Photographic Chemicals can be retold in a way so different and yet so fascinating. This year we are given a historical survey and then a number of practical photographic signposts pointing out the correct roads to success in exposure, development, toning, intensification and reduction. A new technique of sensitising so that development may be carried out by subdued white or yellow light, even when using colour-sensitive plates, is also described.

A copy of the booklet will be sent post free to any reader on mentioning the "M.M." Apply to Messrs. Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C.1.

A Holiday Photo Competition

Five prizes of one guinea each for the five best holiday snaps taken this month are being offered by Messrs. Burroughs Wellcome & Co. Typical holiday photographs are required and prints (of any size) only must be sent in the first instance. Each print submitted must be accompanied by the July or August light table, from the 'Wellcome' Photographic Exposure Calculator, Handbook and Diary 1925. Negatives must be developed with "Tabloid" Developer and those from which winning prints are made must be loaned for one month to Burroughs Wellcome & Co., who are to have the sole right of reproduction. Negatives will be returned if desired.

Entries should be addressed to "Photo Competition," Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C.1, and sent on or before September 12th. There is no entrance fee and entry forms will be sent on application to Messrs. Burroughs Wellcome & Co. at the above address.

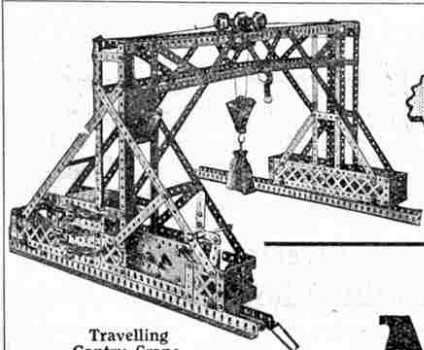
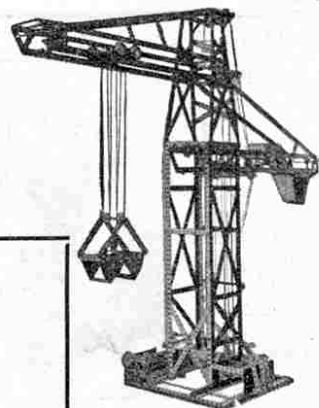
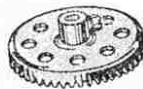
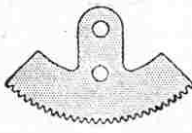
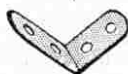
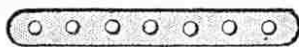
Ensign Speedy Roll Film

The makers of the famous Ensign Roll Film (Messrs. Houghton Ltd., 88-89, High Holborn, London, W.C.1), announce a splendid Photographic Judging Competition with handsome cash prizes.

To every reader who sends a postcard asking for particulars of this Competition they will also send an interesting illustrated booklet, entitled "How to take Photographs," full of practical and really helpful information for the amateur photographer. A fully illustrated catalogue will also be sent to every enquirer, together with the leaflet giving details of the Competition, which is a particularly easy and interesting one, the competitors not being required to take photographs, but to judge the merit of photographs already taken.

Lott's Bricks' Competition

The proprietors of Lott's Bricks have decided to extend and widen the scope of their Bridge-building Competition, recently announced in the Magazine. The revised conditions will permit of Meccano boys of all ages entering the various sections of the Competition and full particulars of the new rules will be announced in an early issue of the "M.M." Intending competitors should watch Messrs. Lott's advertisements for this announcement.

Travelling
Gantry CraneHigh-Speed
Ship-Coaler

MECCANO

ENGINEERING FOR BOYS

Meccano this year is heaps more fun than it has ever been before. Many new parts have been added recently, and this, of course, means new and better models.

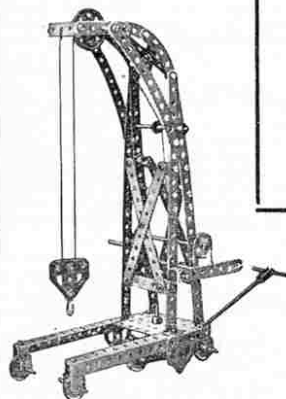
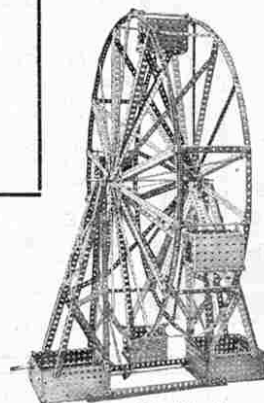
There is no limit to the number of models any boy can build with a Meccano Outfit. The hundreds shown in the Instruction Manuals are just suggestions and no boy ever stops when he has built them—he goes on building new models that he invents himself.

That's why Meccano is such splendid fun. The Crane you build to-day is a Tower to-morrow, a Motor Chassis the next day and so on. You can build a new model every day for years, if you wish! They will be real models, too, all sturdy and strong because they are built of steel. Meccano parts are exactly similar to the parts used by real engineers, only smaller. That's why Meccano Cranes lift and swing heavy loads, Meccano clocks keep perfect time, Meccano motor-cars run, and Meccano Looms weave real fabrics.

Meccano models are easy to build—you only require a spanner and screw-driver and these are provided in every Outfit.

COMPLETE OUTFITS			
No. 00	...	...	3/6
No. 0	...	...	5/-
No. 1	...	...	8/6
No. 2	...	...	15/-
No. 3	...	...	22/6
No. 4	...	...	40/-
No. 5 (in well-made carton)	...	...	55/-
No. 5 (in superior oak cabinet with lock and key)	...	...	85/-
No. 6 (in well-made carton)	...	...	105/-
No. 6 (in superior oak cabinet with lock and key)	...	...	140/-
No. 7 (in superior oak cabinet with lock and key)	...	...	370/-

ACCESSORY OUTFITS			
No. 00a	...	...	1/6
No. 0a	...	...	4/-
No. 1a	...	...	7/6
No. 2a	...	...	8/6
No. 3a	...	...	18/6
No. 4a	...	...	15/-
No. 5a (in well-made carton)	...	...	50/-
No. 5a (in superior oak cabinet with lock and key)	...	...	80/-
No. 6a (in superior oak cabinet with lock and key)	...	...	210/-
Electrical Outfit	...	...	42/-

Platform
Crane

Big Wheel