THE NEXT NUMBER OF THE "M.M." WILL BE ISSUED ON 15th NOVEMBER.

No. 27 OCTOBER, 1922

MECCANO MAGAZINE

PRICE 1d

PUBLISHED IN THE INTERESTS OF BOYS.

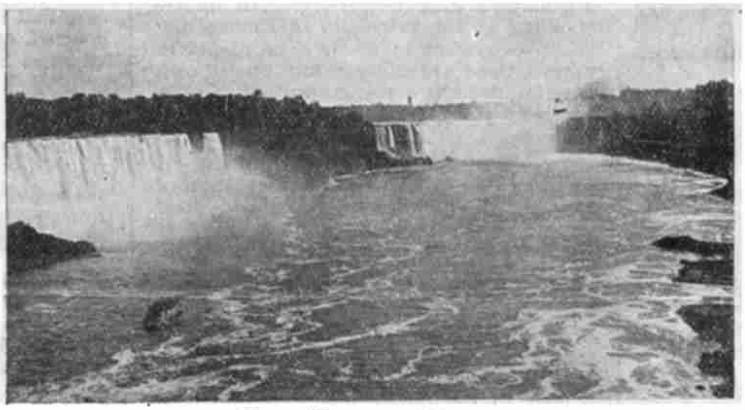
In America and Canada

BY THE EDITOR.

(Concluded.

WE left Toronto feeling that the value of Meccano was becoming fully recognised throughout Canada, and that our future there is a particularly bright one.

We had decided to visit Niagara Falls on our way back to New York, and instead of returning by train we took the boat at Toronto, making the passage across the end of Lake Ontario to Lewiston. This is a small town about five miles below the Falls on the American side of the Lake. From here a tramway line runs to the town of Niagara Falls, and we took our seats in the car awaiting the arrival of our boat.



THE NIAGARA FALLS.

To the left is shown the famous steamer "Maid of the Mist," which takes visitors close to the Falls.

The day was wonderfully fine and sunny, and the conditions were ideal for seeing the Falls. Our tram ran along the side of the River Niagara all the way up and we thus had an opportunity of watching the rapid course of the stream at close quarters.

THE NIAGARA FALLS.

Mr. Hornby had already seen the Falls a number of times, but this was my first visit. I followed every foot of the mighty torrent as eagerly as any of you Meccano boys would have done, had you been there with us.

The River Niagara flows into Lake Ontario between Lewiston and Queenston on the Canadian side and here it is a wide stream giving but little outward evidence of its great strength.

As we proceeded up the river from Lewiston, the river narrowed, causing an enormous increase in the rapidity and strength of the current. We passed "Devil's Hole" on our left, where in 1763 a number of British soldiers were ambushed and massacred by Red Indians.

THE FAMOUS RAPIDS.

Soon we came to the famous Whirlpool and the Whirlpool Rapids, which appeared to me second only to the Falls themselves in grandeur. As the great river tumbled and tossed over its rocky bed, I wondered that the very boulders themselves were not up-rooted and hurled into the Lake below, so great seemed to be the power of the current.

A CLOSE VIEW OF THE FALLS.

100,000,000 *tons of water pass over the Falls every hour.*

Leaving the tram car, on reaching the town of Niagara Falls, we walked down to the bridge spanning the river to the Canadian shore. Looking up the river from the centre of this bridge we had our first view of the Falls. From there, walking up the river on the Canadian side for about a mile, we saw them from every point of vantage in all their wonderful glory.

I could quote you figures giving the height of the Falls and the volume of the water passing over them each minute but in a case of this kind mere figures do not impress or mean much. I can only tell you that I saw an immense Lake pouring its contents over a precipice of great height in a graceful curve and, on its outward plunge, breaking up into a glorious white curtain. As it fell on the rocks below it threw up a cloud of spray that rose much higher than the Falls themselves.

As the sunshine fell on the spray a wonderful rainbow formed and seemed to embrace the whole of the Falls, presenting a scene of surpassing beauty.

HYDRO-ELECTRIC POWER.

One feature of the Falls that will appeal specially to Meccano boys is that the enormous energy is now being utilised for generating electricity for power and lighting purposes. At the present time there are eight large stations on the edge of the Falls and the River. These deliver a total of 1,295,000 h.p., and new and larger plant is now in course of erection. In a short time the whole of the power and lighting in the Province of Ontario will be generated from the Niagara Falls.

We left Niagara in the evening and proceeded by express tram car to Buffalo, where we boarded the night train for New York.

The remainder of our stay in America was devoted to planning the future of Meccano in that country and enquiring more closely into the situation in regard to Radio. The result of our investigations

In America and Canada (*cont.*)

will reveal themselves to you boys in due course in the columns of the "*M.M.*" and in the special Radio apparatus that is now being manufactured in our factories.

RETURN TO LIVERPOOL.

We sailed for Liverpool on 25th June on the "Adriatic," having as our companions

THE WHIRLPOOL RAPIDS.

at the Captain's table, Sir Arthur and Lady Conan Doyle. Sir Arthur is, of course, the writer of the famous Sherlock Holmes stories and I may say that we found his conversation even more stimulating and interesting than his writings. He is deeply interested in Radio at the present time, and he carried a receiving set with him, which—with the aid of a temporary aerial erected for him by the ship's wireless operator—he had opportunities of testing on the voyage across.

We arrived in Liverpool on 2nd July and were glad to be back again at the home of Meccano—glad to engage ourselves once more in the big problem of how to fill the lives of Meccano boys in this and every country in the world with interest, happiness and fun.

THE END.

Good Things in Store.

There are many interesting articles and splendid illustrations in store for future numbers of the "*M.M.*" We are shortly to have articles dealing with the famous locomotives the "*Great Bear*" and the "*Great Northern*," the most recently-built locomotive in this country. We are also arranging for an article describing the world's greatest liner the "*Majestic*." Articles dealing with giant cranes, turbines, and other remarkable machinery are only waiting an opportunity to be published.

In the Radio Section we are commencing in this issue a splendid article on the Thermionic Valve, which explains, in as simple a manner as possible, this highly technical piece of apparatus. This article will be continued over our next two or three issues. Articles are also in hand dealing with the Morse Code and with the invention of the telephone—both subjects of great interest to Radio enthusiasts.

Several short stories are also to be published and as soon as space permits I am hoping to be able to include a splendid Red Indian story from the pen of a well-known writer.

WHAT an extraordinary world this would be without Engineering! There would be no trains, trams or motor cars; no steamships; no large buildings; no telegraphs or telephones; no cutlery, except such primitive stuff as could be made by hand. There would be none of the thousand-and-one machine-made contrivances that contribute so much to our daily comfort and convenience. Worst of all there would be no Meccano.

Engineering Essential to Modern Life.

Without question Engineering is one of the most important factors in our ever-day life, and the boy who goes through life without acquiring a measure of knowledge of this great and fascinating subject is an anomaly—almost a tragedy. An understanding of the principles of Engineering is an enjoyment in itself. The ability to apply these principles for one's own entertainment is a joy known only to the boy who pursues the Meccano hobby.

It Pays to Learn.

I hold pronounced views on the question of boys possessing a good working-knowledge of machines and of the work they do. For instance any boy who has been well grounded in this subject will recognise instantly a well-produced article, when making a purchase; he will refuse anything that he sees has been badly made. There is a great deal of shoddy merchandise offered to the public nowadays, but the boy who knows something of how such merchandise is produced does not buy it.

Knowledge Gives More Enjoyment to Life.

I have often been greatly struck when travelling in the company of boys, by the marked intelligence that they display as each fresh engineering work is encountered. They know how a telpher railway works. They give names to the various types of cranes they see and describe how they function. They are familiar with the various methods of constructing bridges and discuss the comparative merits and advantages of different types. They tell me how a motor develops its power and the functions of each unit, and know under what circumstances a hydraulic is better than an electric elevator.

Their interest in life and in all the wonderful things around them is enormous, and because their minds have been stimulated by their engineering hobby, they derive untold pleasure and additional knowledge every day that goes by.

* * *

Boys and Reading.

What omnivorous readers boys are! I have known one of them read a book a day for weeks on end and, what is even more strange, he could describe to me every incident in any of the books he had read without making a mistake! I consider reading to be one of the greatest joys given to us, and I am always glad to meet and talk with boys who are fond of books. Such boys talk intelligently on a wide range of subjects and usually are able to express themselves with greater clearness than boys who have no love for reading.

Don't Waste Time Reading Second-rate Books.

I like boys who read books, but the books they read must be good books, or they are assuredly wasting their time and missing the true enjoyment that should be their's. When I speak of good books I do not necessarily mean books dealing with religious matters—although these undoubtedly have their place and value—but have in mind more particularly books written by first-class writers. Books of travel and adventure; of home and school life. Books on historical and even technical subjects, written by wise men who, despite their learning and experience, have still retained the boyish mind and outlook. What a range of such writers there is to choose from: Charles Dickens, R. L. Stevenson, Ballantyne, Mayne Reid, G. A. Henty, Kingston, Mark Twain, Jules Verne, Talbot Baines Reed and a score of others—all writers of strong moving stories of adventure that no boy can read without feeling spurred on to lead a better and more vigorous life.

Which Are the Best Boys' Books?

It would be difficult to say which is the best type of books for boys. Everything depends on the individual taste, and the range to select from is just as wide as the tastes and preferences of the boys themselves. At all events a competition that will be announced in the next number of the "*M.M.*" will reveal to us the kind of books that boys prefer to read. I want all my readers to look for this competition, and to urge the claims of their own favourite books.

The First Photographic Competition.

OVERSEAS SECTION.

The Overseas Section of the First Photographic Competition closed on 1 September and the above is a reproduction of the winning entry. This is a photograph of the Tamil Arch at Singapore, erected in honour of H.R.H. The Prince of Wales, on his recent visit to the Straits Settlements. The prize-winner is Master C. Marcus, 31, Selegie Road, Singapore, S.S.

I would remind readers that our Second Photographic Competition is now in progress. Full particulars are announced elsewhere in these columns.

BRIGHT IDEAS

These columns are reserved for dealing with suggestions sent in by Meccano users for new parts, new models and new ways of making Meccano model-building attractive. We are always pleased to hear from any Meccano boy who has an idea which he considers will be useful in the Meccano system.

C. L. Bowyer (Exeter).—(1) We are interested in your suggested 2½" curved slotted strip. (2) We should very much like to see a photograph of your model of Stephenson's reversing link motion or any other model incorporating this principle. (3) It is unnecessary to join a pulley to a pinion by means of a peg connection between the bosses, for use in a back-geared lathe. Both wheels may be secured in the normal way to the rod upon which they are mounted. We should be glad to hear of any further instances where this particular connection could be employed.

Sigbert Leach (Newtown, N. Wales).—Perhaps at some later date we may consider the introduction of dogs as an adjunct to the various Meccano cranes.

F. E. R. Nunn (Colchester).—We shall give consideration to your idea for wire tie rods of varying lengths.

Edward Clarke (Leicester).—Curved strips such as you suggest would be confined to definite diameters. The trouble will be in determining the most useful diameters, but shall go into the matter.

Frank Littlewood (Slaithwaite).—Your idea for a 4-volt motor driving a dynamo to generate current for the motor raises the old question of perpetual motion. It cannot be obtained this way, Frank!

P. Crees (Nottingham).—A strong application of your screwdriver and spanner to the nut and bolt securing the present type of hinge will give you a firm fastening.

Edwin Richardson (Louth).—We shall go carefully into your idea for a tractor wheel.

E. Greaves (Leeds).—We are continually adding to our list of train accessories. Perhaps at a later date we may include a departure indicator.

W. O. Sharp (Purley).—(1) If the present type of buffer (No. 120) were any longer it would be out of proportion. (2) See our reply to F. E. R. Nunn (above) re wire stays.

Donald Crowther (Leamington Spa).—(1) We are afraid that we cannot promise to publish a diary at present. (2) A good representation of a boiler may be made with two face plates joined together by double angle strips of the desired length.

John Dewing (Crouch End, N.)—We have in mind the introduction of a station for Hornby Trains. We do not quite follow your second suggestion.

Denzil Matkin (Liverpool).—The Editor is contemplating publication in the "*M.M.*" of a series of interesting articles on electricity as soon as opportunity permits.

Fred Wingfield (Sheffield).—Re diary, see reply to D. Crowther (above). We regret there is not at present space in the "*M.M.*" for a jokes column.

Robert A. Childers (Dublin).—The present threaded boss is quite large enough for making a joint between two threaded rods. A nut on both rods screwed tightly against the ends of the boss will give a secure fastening.

Cecil Beaven (Trowbridge).—We are afraid the present design of clockwork motor is not adaptable to a speed regulator. Its power is limited and any check put upon the spring would decrease the efficiency of the motor.

D. Askerley (Eccles).—We have in mind an extension of the range of bevel gears, but we must first determine the most useful ratios.

E. Diaper (Southampton).—We are already making a modification in our spanner in order to fulfil the requirements you suggest.

W. E. Pickard (Prestwick).—Thanks for your explanation of the suggested spiral spring. As you probably know, this type of spring is only used for very small and weak movements. Further, we do not favour a spring as a separate unit for power on account of the danger of sudden expansion, through perhaps an accidental release. Many serious accidents have occurred from this cause.

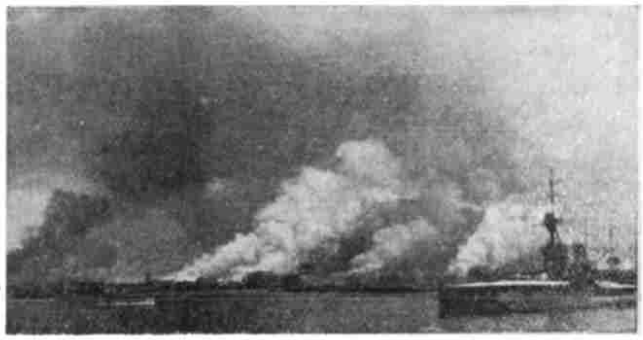
F. Moore (Southport).—(1) Two or three turns round the crank-handle and than a tight knot will prevent the cord from slipping. (2) What use do you suggest for a rack strip with teeth on both edges? (3) You will find that the architrave (No. 108) or the trunnion (No. 126) make excellent corner brackets.

Wm. and Lloyd Oppalt (Wambi, S. Aus.).—We are at the moment exploring the possibilities of a spiral gear. All the effects of a crown wheel as described by you can be obtained by a 50-toothed gear-wheel meshing with a ½" pinion or a 57-toothed gear-wheel meshing with a ¼" pinion.

Alex. M. Hardie (Aberdeen).—We are afraid a crankshaft of the type you mention will be too costly to manufacture.

A Meccano Boy in Burning Smyrna.

All Meccano boys will have read in the newspapers last month how the Turkish army defeated the Greeks and captured Smyrna, as well as many other towns and villages in Asia Minor. In the course of these operations Smyrna was destroyed by a great fire and readers of the "*M.M.*" will be interested to see the accompanying photograph which has been sent by a Meccano boy who lived at Smyrna. Master Alec Issigorins—our friend in question—is an enthusiastic reader of the "*M.M.*" and he writes as follows:—



THE TOWN OF SMYRNA IN FLAMES.

H.M.S. "Maine,"

14th September, 1922.

DEAR MR. EDITOR,

I have found some spare time, and I decided to sit down and give you some terrible news, for at this moment I am about 700 miles away from home, and by to-morrow I shall have reached Malta! As you will already have learned, it is no use my explaining the retreat of the Greek army, and the danger of Smyrna. All the English subjects received orders from the British Consulate that we were to leave Smyrna in a special boat. I feel lost without my Meccano Outfit and I do not suppose I shall see it again or any of my drawings of models that I have invented.

"I wonder what the Turks will think when they find my Meccano Sets and if they will suppose that they are an enemy wireless apparatus or some form of infernal machine.

"You will not be able to communicate with me because I have no address at the present moment. I shall let you have it as soon as possible and then I hope you will write to me, for a letter from you will cheer me up immensely.

Good-bye,
Yours sincerely,
ALEC ISSIGORINS.

Since the above letter was written I have received a second letter from Master Issigorins, who is now at Valetta, Malta, along with many other refugees from Smyrna, who are being accommodated in Lazzaretto. His enthusiasm is demonstrated by the fact that in spite of his being a refugee, and having gone through some terrible experiences during the last week or two, one of the first things he did was to obtain from the Meccano Depôt at Valetta, competition entry forms, catalogues, etc., to replace those that had been destroyed in the fire at Smyrna. Master Issigorins is a keen member of the Meccano Guild and is now endeavouring to form a Meccano Club in Valetta.

I feel sure that our readers will extend to him their sympathy on account of the fact that he has lost all his Meccano and other possessions and also will wish him every success in his attempt to form a Club in his new surroundings.

M. Ninet (Nancy).—(1) The Triple Throw Eccentric will give the same movement as your suggested wheel with the displaced centre. (2) The hexagonal plate has already been suggested to us. We shall go carefully into the matter of its adaptability.

C. C. M. Giffin (Letchworth).—What is the application of your suggested spring catch?

——— (White Swan Hotel, Alnwick).—Two face plates connected by double angle strips make a good representation of a large roller or boiler.

A. Armstrong (Loughborough).—If any scope for circular plates develops we shall introduce them, but at present we have found no special use for them.

R. Freeman (Finchley, N.).—Thanks for your explanation of the curved or bent strip. As many Meccano users require different diameters to their curves the question of bending is best left to individual requirements.

J. Hazlewood and Friend (Coventry).—Many thanks for the suggestion of the securing nut, prior to the assembling of the boiler and movement of the Hornby engine. We shall pass this on to the Works for their consideration.

H. S. Thornely (Horwick, near Bolton).—Some years ago we used to keep a stock of rubber rings for tyres, etc., for models, but since they very quickly perished, we ceased holding stocks.

J. N. Crorks (Shipley).—(1) The making of models to scale is a specialised business. (2) Our tank loco is similar in style and finish to Hornby Engines. (3) We shall see what we can do in the way of introducing miniature milk cans.

L. Dennis (Sherwood, Notts.).—(1) We hope to bring out an electric train this year. (2) A bush wheel and threaded pin will give you the same effect as the double boss you suggest.

James Adams (Motherwell).—(1) The type of hook you suggest would be a little costly to produce and not very adaptable to quantity production. (2) A buffer beam may be constructed from a 2½" strip with our standard buffers fastened to it.

Robert M. Dickie (Muswell Hill, N.).—(1) Your idea for a 2½" × 2½" flanged plate has already been anticipated. See our reply to John Sackett, in No. 22 of the "*M.M.*" (2) We have recently designed a model of a ship and for the rudder we used a rod with a triangular plate fastened to it by means of two collars. It would not be worth while introducing a special rudder piece.

N. J. Clerke (Wokingham, Berks.).—We are experimenting at the moment on a 3½" gear wheel.

Robert Higgins (Lassodie, Dunferm.).—Regret, but space does not permit of our running a sale and exchange column in the "*M.M.*"

M. Revenet (Versailles).—Your suggested toothed-wheel, 75 mm. diameter and 2 cm. thick with five faces, would be an extraordinarily costly article and would not justify its restricted application.

M. Hirtzeberger (Paris).—As our 25 mm. Pinion Wheel with the pawl makes a perfect rachet action, there would be no advantage in introducing the rachet wheel you suggest.

Walter S. Warmes.—Sorry, but we do not understand what you mean by a "worm-and-worm" wheel.

Hubert Manson (Liverpool).—We do not advocate the use of strips and girders for railways track. They are not altogether satisfactory, but if the scope of curved sections increases in other directions we shall certainly consider their introduction.

L. Hawkins (Reading).—(1) The adaptability of Meccano is such that very good representations of cylinders and pistons may be constructed from it. To introduce made-up cylinders and pistons as you suggest would only be duplication. (2) The couplings on the Hornby Trains are made long to permit of free action of the carriage on the narrow radius curves, otherwise the buffers would foul each other.

W. Schofield (Paignton, S. Devon).—The question of curved plates and sections would require very careful thought. It would be necessary to have these adaptable to general use.

A. W. Elwell (Linfield).—Thanks for your idea for obtaining a low gearing on the clockwork motor. We shall go into this and, if practical, communicate it to other Meccano users.

G. Anderson (Chatham).—(1) The latest type of rachet gear on the Hornby Trains is similar to that on the clockwork motor. (2) and (3) We are introducing an electric Hornby Train this year, also a greater variety of trucks. (4) A spring buffer stop is now included in our list of parts.

A Great Airman: The Late Sir Ross Smith.

and his

Flight from England to Australia.

All Meccano boys will share the general regret expressed recently on the occurrence of the accident that ended in the tragic deaths of Sir Ross M. Smith and his friend and engineer, Lieutenant J. M. Bennett. The accident arose during a test flight of the Vickers-Amphibian bi-plane at Brooklands, and science generally and aerial navigation in particular, will feel the sad loss of these courageous and accomplished airmen.

The tragedy is more closely brought home to readers of the *Meccano Magazine* for the Editor was in correspondence with the gallant Sir Ross the day before his death, with a view to obtaining for the pages of the "*M.M.*" some particulars of his contemplated great flight around the world, for which he was testing his machine when he met his death.

A GREAT FLIGHT.

Sir Ross Smith and Lieutenant Bennett won undying fame in 1919 by flying from England to Australia. In this adventure they were joined by Sir Keith Smith—brother to Sir Ross—and Sergeant Shiers. This great flight was a remarkable performance, for although the whole journey across half the globe took less than 28 days, the actual flying time was only 124 hours, during which time a distance of over 11,000 miles was covered. We are able to give our readers some particulars of this wonderful achievement, in which we feel sure they will be interested.

THE AIRMAN'S WAR SERVICE.

Sir Ross McPherson Smith, K.B.E., M.C. and bar, D.F.C. 2 bars, A.F.C., Order of Nahda, was born in Adelaide, South Australia, on 4th December, 1892, of Scottish parents. He and his brother were educated at Queen's School, Adelaide, and at Warriston School, Moffat, Scotland.

At the outbreak of the war, he enlisted in the Australian Light Horse and served at Gallipoli and at Sinai. Subsequently while serving with the Australian Flying Corps in Palestine, he gained numerous distinctions as a bombing aviator. Still later, with Sergeants Bennett and Shiers, and accompanied by Air Marshal Sir W. Salmond, he made the first air flight from Cairo to Calcutta, for which he was awarded the Air Force Cross. Such was his ability and strength of character, that in a comparatively short flying career, he had already made his mark, and was rightly considered one of the premier aviators in the world. Later further pioneer work fell to his lot, and he made long reconnaissances with General Borton for suitable places for aerodromes in Burma, Siam, Malay and the Dutch East Indies.

THE LATE SIR ROSS SMITH.

SERGEANT BENNETT.

Sergeant J. M. Bennett, M.S.M., A.F.M., was born at St. Kilda, Melbourne, in 1892. After receiving a thorough and early training in motor engineering, he was employed with several prominent motor firms in Australia. He enlisted in the motor transport of the Australian Imperial Forces, sailing as a 1st class Air Mechanic in No. 1 Squadron Australian Flying Corps. After serving in Egypt and Palestine, he took part in the Cairo to Calcutta flight, already mentioned, and received the Air Force Medal. He also served with the North West Forces in the recent Afghan War.

A £10,000 PRIZE.

After the War, the possibilities of commercial aviation became a popular topic, and to stimulate enterprise various prizes were offered for certain specific flights. First, attempts were made to fly the Atlantic, and, after Hawker's dramatic failure through engine trouble, success came to two plucky Britishers, the late Sir John Alcock and his navigator, Sir Whitten Browne.

The Australian Government then offered a prize of £10,000 for a successful flight from England to Australia, the conditions being that it was to (1) be made on the same machine; (2) take no longer than 28 days, and (3) be limited to Australian subjects.

As was only natural, this competition attracted the attention of Captain (as he was then) Ross Smith, his brother Keith and Sergeant Bennett, all of whom were ready and anxious to further the interests of flying. Quickly deciding to make the attempt, Sir Ross prepared for the flight, securing a Vickers-Vimy machine from Messrs. Vickers Ltd., by whose courtesy we are able to reproduce a photograph of the machine and its crew.

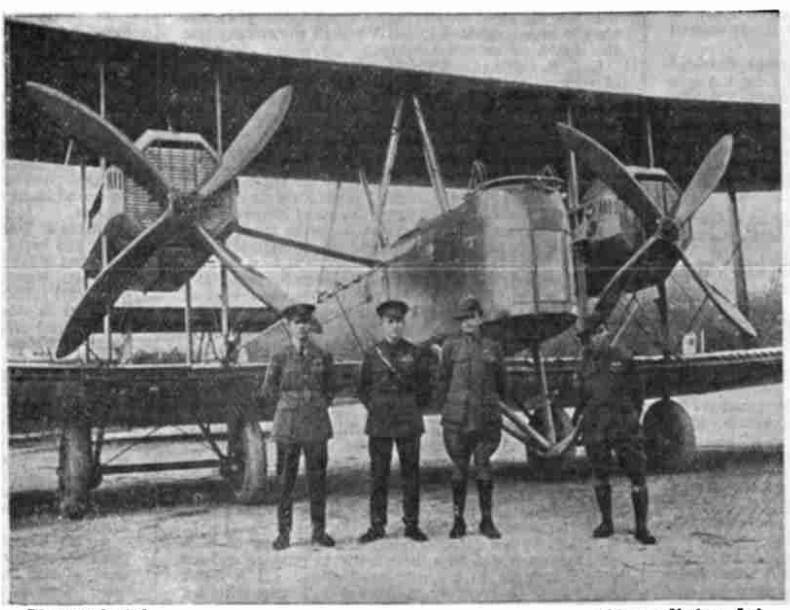
THE VICKERS-VIMY.

Except that it carries a smaller quantity of petrol, this machine was of a similar type to the Royal Air Force aeroplanes built for long-distance bombing, and to that used by Sir John Alcock in his Atlantic flight. It was fitted with two 350 H.P. Rolls-Royce "Eagle" Mark VIII engines. Petrol was drawn from the main tanks by two petrol pumps, and delivered to the service tank fixed on the top planes: from here it fell by gravity to the engines.

The Vimy had a span of 67 feet, a height of 15 feet, and an overall length of 42 feet 8 inches, and when fully loaded with stores and crew of four, it weighed 5 tons.

Sir Ross Smith soon found he was not to have things all in his own hands, for others were also attempting the Australian flight. It may be mentioned, however, that on the 13th of November, 1919, these other competitors (Lieutenant Roger Douglas and Lieutenant J. L. Ross) crashed with their machine, an "Alliance" driven by a 450 h.p. Napier Aero engine, and were killed at Surbiton just after setting out for Australia.

(To be continued)



Photographs by [*Messrs. Vickers, Ltd.*

THE FLIGHT TO AUSTRALIA.

Sir Keith Smith, the late Sir Ross Smith and Sergeants Bennett and Shiers, in front of the Vickers-Vimy on which the great flight to Australia was made. The photograph was taken immediately before the departure of the intrepid airmen.

RADIO SECTION

The Thermionic Valve.

THE INVENTION THAT MADE WIRELESS TELEPHONY POSSIBLE.

THE reader of any recent Radio book or periodical is certain to come across references to the "Thermionic Valve," an appliance that is one of the most notable discoveries of modern science. It is important for all interested in Radio to understand exactly what this wonderful valve is, and to know how it works. In order to do this, however, it will be necessary to deal with one or two matters that apparently have no bearing on the subject. For example, at first sight it may not seem that the discovery of the new element called Radium could bear any relationship to Wireless. Yet it has, as a matter of fact, an important connection with the scientific side of the subject, as we shall shortly see.

Elements and Atoms.

It has been established that everything — stars, planets, minerals, animals, and vegetables—is made up of one or more elements, existing either alone or combined in a thousand different ways to form compounds. Those of you who are studying Chemistry will know that it is possible to analyse, or break up, compounds. Water, for instance, may be broken up into the gases Hydrogen and Oxygen, there being two parts of the former to one of the latter. You will also know that there are substances, called "elements," that cannot be broken up. At present 81 of these elements are known and they include such substances as Aluminium, Gold, Hydrogen, Iron, Mercury, Oxygen, Platinum, Silver and Zinc.

Elements are built up of the same substance throughout. Nothing but iron can be got out of iron, nothing but silver out of silver; and no matter what heat or what other means are applied, the result is always the same.

Elements Bound by Chemical Force.

These elements combine in varying proportions and form compounds, the nature and appearance of which may be very different from the elements they contain. In everyday life, when things are simply mixed together, you generally know what the mixture will be like when it is made. (What cook would dare to make a plum pudding if this were not true!)

Elements are not simply mixed together, however, but are bound together by what is called chemical force. This causes such amazing changes to take place that no one—not even the most expert cook!—could guess beforehand what the resulting compound would be like.

Elements may be compared with the letters of the alphabet and compounds with the words formed by joining the letters together. There is one great difference, however, which is that though you may count how many letters there are in a word, you cannot see how many elements there are in a compound.

Knowing that the twenty-six letters of the alphabet may be used to form thousands of words, we are better able to realise the enormous number of compounds to which the eighty-one elements lend themselves.

When Thomas Alva Edison, the greatest inventor of all time, commenced his scientific experiments he was engaged as a newsboy. Chemistry, printing and physics engaged his attention in turn, and his inventions in connection with electricity alone are numbered by the hundred.

The second instalment of this article *"The Thermionic Valve"* will appear in the November *"M.M."* and it will describe how Edison accidently made a curious discovery that has since been developed to become of the greatest importance to Radio.

Elements are Built of Atoms.

If we were ignorant of the number of letters in the alphabet it would not be a difficult matter to obtain the required information by taking a book and writing down in a separate place each different letter as it occurs. Soon all the twenty-six letters would have been written down, although we should find that some of the letters were rarer than others—q, x and z, for example.

The world resembles a book and the objects in it are built up of elements. By analysing or pulling them to pieces we are able to discover the elements of which they are composed.

As we have already seen, there are 81 elements. Some of these, such as iron and gold, are comparatively common and so were discovered long ago. Others (as the letters q, x and z) are rare; a few are very rare indeed. Perhaps there are still a few even rarer elements that remain undiscovered, waiting until science advances yet further before they can be made to disclose their secrets and their hiding places.

Elements themselves are built up of atoms. Until recent years atoms were believed to be the smallest possible particles to have a separate existence. Those of you who are studying chemistry will be familiar with this belief, which is called the "Atomic Theory."

Radium and Electrons.

In 1898 Professor and Madam Curie, two eminent French physicists, startled the scientific world by discovering a new element. This was called Radium, and it is one of the rarest elements and one of the most difficult to purify.

The discovery of Radium completely upset many accepted ideas, included in which was the Atomic Theory. The belief that the atom is the smallest body that could have a separate existence has now been superseded by the Electron Theory, first advanced by Professor J. J. Thompson in 1899. This theory holds that atoms themselves are composed of even yet smaller bodies, which Professor Thompson named "corpuscles." These small bodies are now called "electrons" and they form the foundation on which the "Electron Theory" is based.

The Incredibly Minute Electron.

It is wonderful to think of the triumph of scientific investigation that enables us to learn about the inconceivable minuteness of these tiny particles. Even the atom is so minute as to be far beyond the range of our most powerful microscopes—instruments that will take photographs of the corpuscles in our blood so that when the films are thrown upon the screen each corpuscle appears as large as a cart-wheel!

(To be continued.)

This article, which has been specially written for the "Meccano Magazine," deals with the principles of the Themionic Valve, an important appliance in Radio. The above instalment describes Atoms and Electrons, the minutest known bodies. Future instalments will detail the inventions that led up to the wonderful appliances that have made possible the wireless telephony of to-day.

M. Plen (Pretoria, S.A.).—(1) The plates with equidistant holes, now made in Specially Prepared Fibre, will overcome the insulation difficulty to which you refer. (2) Brass terminals are already included in the list of Meccano Electrical parts. They are, of course, applicable to Radio use. (3) A condenser may be made from 2½" triangular plates (No. 76) as was illustrated in No. 26 of the "*M.M.*" (4) Special inductances are listed under No. 407 of the Radio parts. (5) Full particulars of the Meccano Radio Set, embodying the above-mentioned parts, were given in the issue already mentioned. We hope that you will obtain a considerable amount of pleasure from your Meccano Receiving Set.

W. E. Blandford (Stourbridge).—We are pleased to have the Radio news paragraphs you contribute and we shall endeavour to use them in some future issue of the "*M.M.*" We trust that your interest in Radio matters will continue to grow.

J. Batcup (Swansea).—(1) Although it will be quite possible for you to make your own inductance coil, you will find the Meccano Inductance Discs (No. 407) eminently suitable. (2) If you are in any difficulty with your wiring, write us again and we shall be pleased to help you if possible. (3) A licence is necessary to use any Radio Receiving Set and the Meccano Set is no exception to this regulation.

C. Udall (Saltley, Birmingham).—We are pleased to note you are interested in Radio and your suggestion that we should issue a small book dealing with the subject will certainly receive consideration. Full particulars how to make a Meccano Receiving Set are given in the special Radio Instruction Leaflet (price 3d. post free).

W. B. G. Henderson (Airdrie).—"We are running a wireless section with the Airdrie Meccano Club, combined with Meccano. We have commenced to erect our aerial and hope to finish it next week. Our Set at present is a Crystal Set, but by Christmas we shall have a Valve Set."—We are pleased to hear of this enterprise of the Airdrie Meccano Club and no doubt many other Clubs will also open Radio sections during the coming winter. Your suggestion that a special badge should be issued for Meccano Radio Enthusiasts is having consideration.

Mr. R. Samuel (Wallasey).—"I am glad you intend to develop the Wireless side of Meccano. My brother-in-law was the senior officer of the "Lusitania" when she was sunk and you can easily imagine how greatly the death roll would have been increased but for having the means of sending out that wonderful S.O.S."—We are interested to hear of your connection with the sinking of this great liner and hope you will be able to prevail upon your relation to send us an account of his experiences. We feel sure they would be of particular interest to Meccano boys.

W. Goodhead (Aston).—The Meccano Crystal Receiving Set does not include an aerial. A complete aerial set is sold separately, however, as announced elsewhere in this issue.

G. A. C. Lynch (Crosby).—Under present arrangements the nearest Broadcasting Station to Crosby will be Manchester. A suggestion has been made, however, that a broadcasting station be established at Seaforth, but on this point we have, as yet, no official information.

R. Harrison (Creek Road, ———?).—The Meccano Valve Set is not yet on the market. It will be announced in the "*M.M.*" as soon as ready. Your letter does not give a complete address and if you will forward this the Radio Instruction Leaflet ordered will be sent to you.

J. Nolan (Poplar).—It would be quite possible to make a Transmitting Set with Meccano parts but in view of the difficulty that users would have in obtaining from the Post Office a licence for transmitting, we do not contemplate such a development at present.

G. Fletcher (Chesterfield).—Your nearest broadcasting station will be Manchester, although Birmingham is only slightly further away. As Manchester is about 70 miles from Chesterfield you will require a valve set to receive telephony.

T. Grenfell (Wimbledon).—A list of Meccano Radio parts appeared in No. 26 of the "*M.M.*," a copy of which is being sent you. You will find a photograph of the Meccano Crystal Set in the same Magazine.

E. W. Adams (North Ferriby).—Instructions how to make a variable condenser are contained in the Radio leaflet. An illustration of a condenser made from Meccano parts appeared in the last number of the Magazine, and full particulars of Meccano Radio parts were also announced. There is no Radio Manual of Instructions yet. We may issue one in the future.

F. Williams (Warrington).—"Although the proposed broadcasting station at Manchester is not yet set up, there is nothing like being prepared."—We congratulate you on your enterprise, Frank, and note you intend having a Meccano Crystal Set in the near future.

H. A. Bungard (Scarboro').—(1) The nearest broadcasting station to Hove is Marconi House, London, about 60 miles distant. You will require a valve set to receive Telephony at that distance. (2) Croydon is not a broadcasting station, although telephony is transmitted from the Aerodrome there to pilots crossing the Channel nearly the whole of the day.

R. Richardson (Wolverhampton).—We have no information of a broadcasting station at Castle Bromwich. The official station will be established at Birmingham but it is possible that amateurs living in Castle Bromwich are transmitting telephony.

H. C. Wilkinson (Bedale).—We are pleased to hear of your enthusiasm to learn more about Radio. We note you "predict a great epidemic of 'Radioitis' among Meccano boys and that the only antidote to the epidemic will be a Crystal Receiving Set for each patient!"—Fortunately this disease, although very catching, is unlike most diseases in that it has beneficial effects!

H. Ashworth (Blackpool).—(1) No doubt you will be able to build the Meccano Receiving Set from the Meccano parts that you already have in your Outfit with the addition of a few special parts such as crystal, telephone ear-piece, etc. Full particulars are being sent you. (2) A receiving licence costs 10/- per annum and you should apply for particulars to the Post Office.

R. Part (Brighton).—Regarding your query about the nearest broadcasting station, see reply to H. A. Bungard (above). The same remarks apply to Brighton as to Hove.

H. A. Langley (Croydon).—(1) In regard to your query re licence, see reply to J. A. H. Arkwright (page 7). (2) Articles on Radio will continue to be published in the "*M.M.*" and we shall deal with the theory of wireless in the near future.

(Continued on page 7).

Radio Receiver De Luxe.

Photo by] [Mr. P. Edelman.

The receiving of Radio messages is generally associated with complicated apparatus, tuning coils or inductance discs, condensers, thermionic valves and a multiplicity of other appliances. Such an array of apparatus is not always necessary, as is demonstrated by the accompanying illustration, which shows a Radio receiver with a neat and handsome appearance.

The problem of avoiding the very forbidding appearance of the usual apparatus to which many people object, has been solved by placing the receiver in a cabinet which closely resembles a gramophone cabinet. The batteries are contained in the left-hand side, while the receiving apparatus and loud speaker are on the right. Hidden wires connect to the aerial, and altogether this form of receiving apparatus is suitable for installation in a drawing room. It has the additional advantage that the delicate elements are protected both from dust and damage and the idea is one that will commend itself to tidy and methodical Meccano boys.

There is a rumour that the very powerful French Station at Sainte Assise will shortly broadcast telephony. Full particulars will be announced in the "*M.M.*" as soon as they are made known.

• • •

Concerts are sent out from Writtle, Chelmsford, at 8 p.m. on Tuesdays on a wave length of 400 metres.

• • •

In London music and telephony may be heard on almost any evening between 8 and 10 p.m. on a wave length of 400 metres, being sent out by many amateurs who have transmitting licences.

• • •

Music is also transmitted by Messrs. Burnham from Blackheath about 9 p.m. every evening, on a wave-length of 400 metres.

• • •

The Hague Concerts are still broadcasted from 8 p.m. to 9 p.m. on Sundays and also during the afternoon at 2.30 and 5.30 p.m. The wave-length remains 1,085 metres. Concerts are also sent out on Thursdays from 8 p.m. to 9 p.m. on the same wave-length.

Königswusterhausen, a station near Berlin, transmits telephony at 8 a.m. and 11.30 a.m. and may occassionally be heard speaking to Warsaw on a wave-length of 2,500 and 4,100 metres. The speech is, of course, in German, and has often been heard at the Meccano Works, Liverpool, on a three valve set.

• • •

Unfortunately, the Broadcasting Company that is being organised is meeting with some difficulties and until these are settled broadcasting cannot commence. It is hoped that the difficulties will be adjusted at an early date and full particulars of broadcasting will be published in these columns as soon as they are made known.

• • •

Weather reports are broadcasted each day from the Air Ministry, the Eiffel Tower and other European Stations. The messages are sent in code, but any amateur may pick them up and translate them, thus drawing up his own weather forecast.

• • •

Those Meccano boys who live near Croydon and possess a receiving apparatus tuned to receive a wave length of 900 metres, will be able to hear throughout the day the Air Station speaking to aeroplanes engaged in the Cross-Channel service. It is wonderful to think that the pilots are in constant telephonic touch with the Aerodrome and that it is even possible for a passenger to send a message to his office in the City, when flying several thousand feet in the air over the English Channel.

• • •

According to present arrangements the official stations from which concerts, etc., will be broadcasted are London, Birmingham, Manchester, Newcastle, Plymouth, Edinburgh or Glasgow, and Aberdeen.

The Mystery of Radio: Scientists Puzzled.

MESSAGES TRANSMITTED BY AN UNKNOWN FORCE.

IN times gone by the greatest mystery that our forefathers could imagine was the appearance of the family ghost at night in the corridors of the Moated Grange and the whispering of a message of warning from beyond the grave. Such happenings as these are mysteries no longer, but to-day we have a more mysterious voice, which, travelling through space, brings us messages of cheer that originate in some far-off town or country.

This wonderful voice, carried by wireless telephony, is made possible by a force of which we know but little. It is strange that even in this twentieth century, with our many scientific attainments, we have to admit defeat in this matter. Our greatest scientists have endeavoured—and are still endeavouring—to solve the riddle of this mysterious force, which you have probably guessed is electricity. Although we are more or less ignorant of the nature and composition of the force that we are employing, we are able to use it to light and heat our towns and cities and to work the machinery of our factories. We know how to make, or "generate," it and we know how to store it and conduct it from one place to another, but what electricity actually is we do not know.

WONDERFUL ELECTRONS.

It is believed and explained in another article in this issue that all matter is composed of minute particles called "atoms," and that atoms themselves are composed of electrons, or smaller particles. Electrons exist everywhere and it is by gathering them in a power-house that we obtain a supply of electricity. We apply electrons in a certain way and compel them to radiate heat or light at our will. By applying them to particular mechanism we obtain power to move our machinery. It is electrons that carry voices a thousand miles, or flash messages across continents and oceans.

It is the same mysterious force that accomplishes any of these things, the only difference being in the mechanism to which the force is attached and the method in which it is applied.

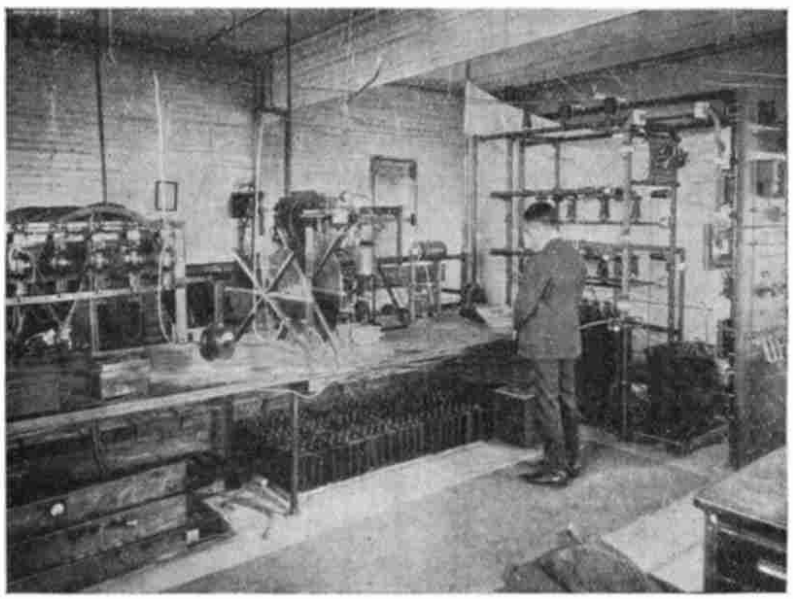
RADIO TRAVELS EVERYWHERE.

One of the most wonderful things about Radio is the fact that when a broadcasting station sends out a message it travels in all directions. A message sent out from a station situated in London, for instance, may be picked up with suitable apparatus in any part of the room in which you are sitting. Not only that, but it may be picked up in any room in your house, in any house in your street, or in any street in your town, in any town in your country and in any country in the world. More than this, it may be picked up by a ship on the ocean, or by an aeroplane flying thousands of feet above the earth's surface. Recent experiments have proved that wireless messages may be received even at the bottom of a mine-shaft, hundreds of feet below the ground.

THE MYSTERIOUS ETHER

The transmission of messages is accomplished through a mysterious medium called the ether, the nature of which no one can explain. Ether is supposed to fill all space — not only the space between worlds, but the space between the atoms of matter of which, as we have seen, solid objects are composed. It is by means of this all-pervading ether that wireless impulses are able to travel through solid objects such as the walls of a house.

Closely associated with the transmission of wireless impulses through the ether is the transmission of light and heat, each of these subjects obeying the same peculiar laws. We shall have an opportunity of learning more about this curious relationship in a future article in these columns.



The Interior of a Broadcasting Station.

This photograph shows the interior of the most powerful Radio Broadcasting Station in America. The aerial of this Station, (which is owned by the General Electric Company at Schnectady, New York,) was illustrated in the last number of our Magazine.

The apparatus shown amplifies the voice or music several thousand times before throwing it into space.

Recently, telephony from this station was picked up by an hotel at Santa Clara, Cuba, 1,450 miles away. The management cabled to the Broadcasting Station saying "Do not stop your music, we are dancing to it down here."

In the centre of the illustration are shown the tuning inductances and on the left are some of the large amplifying valves.

RADIO REPLIES (*Continued from page 6*)

J. A. H. Arkwright (Blackburn).—(1) The nearest broadcasting station to Blackburn will be Manchester. (2) The range of any crystal receiving set is limited to approximately 25 miles from the broadcasting centre, although telephony has been received over a greater distance than this on some occasions. Morse signals (i.e. telegraphy) may be received with a crystal set perhaps up to and over 100 miles. (3) According to present arrangements the wave lenth for broadcasting will be 450 metres. (4) You will require a licence for receiving with any instrument, whether it is a crystal or valve. (5) At present we do not list a double headgear but you can easily make one by attaching two of our single phones to a 12½" Meccano strip.

R. Johnson (Eccles).—We are pleased to hear of your interest in Radio and that your patience was not entirely exhausted before the publication of particulars of the Meccano Receiving Set. We note that you consider your prophecy, that "the Meccano Set would be better than any other," has been fulfilled.

A. W. Earland (Matlock).—Thank you for the cuttings showing the honeycomb coil-winder made from Meccano parts, which we had already seen. This is a further illustration of the universal adaptability of the Meccano system to any and every purpose.

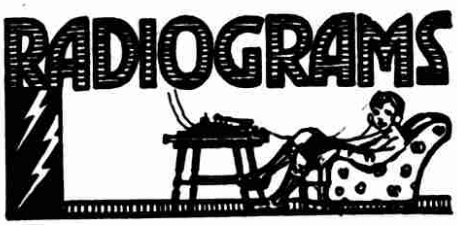
R. Hillair (Southampton).—We were particularly interested to hear of your friend having constructed a Radio earphone from a tooth-paste tin and that it gave clear signals and should be pleased to have full particulars. We feel sure that the result of his ingenuity will interest readers of the "*M.M.*" Perhaps you will be able to arrange for the information to be sent along.

G. R. Perkins (Friddington).—Broadcasting stations are not yet in regular operation. When they are established the nearest station to your home will be Birmingham.

G. Dalziel (Glasgow).—Full particulars of the Meccano Radio Set were announced in No. 26 of the "*M.M.*" We trust that your ambition to own a Radio Receiving Set will soon be realised.

J. R. Smith (South Shields).—See our reply (above) to G. Dalziel. We are interested to hear that you have constructed a Crystal Receiving Set. The information you require was contained in No. 26 of the "*M.M.*", a copy of which is being sent you. You should now send for a copy of the Radio Instruction Leaflet (price 3d., post free).

W. G. Symons (London).—It is only certain crystals that require a battery. The efficiency of silicon and of crystals containing fused silica (such as carborundum) is considerably increased in this way. Meccolite, made by Meccano Limited, gives good results without the aid of additional current.



Wireless is being increasingly used in Germany, especially in communicating with the United States. In 1920 two-and-a-half million words were transmitted and last year the total reached eight-and-a-half millions. The existing Company, which has stations at Nauen, Teltow and Hanover, is extending its apparatus to cope with the increased demand.

* * *

Wireless telephonic communication is to be established between the town of Winnipeg and the great Hydro-Electric Power House, 80 miles distant.

* * *

It has been suggested that insects may communicate by some form of wireless. The suggestion opens up a wide field for considerable research on a very interesting subject. Whether or not insects are fitted with transmitting sets we do not know, but most insects have at least two antennae!

* * *

An American boy has recently made a Radio receiving apparatus that is contained in a pickle bottle. It is fitted with a crystal detector and is claimed to give good results.

A wireless set has recently been installed at Wennington Road School, Southport, by one of the masters interested in Radio. It is proposed to use the installation for educating the scholars in the new science.

* * *

The progress of the machines in the recent air race was "wirelessed" to the Air Ministry from six stations in different parts of the country. Frequent reports of the weather en route were also received by Radio. Those boys living in London were able to follow the machines competing in the race by means of a special map placed in a window in Kingsway.

* * *

There has recently been held a Wireless Exhibition at the Central Hall, Westminster. One of the features that attracted considerable attention was a model airship, controlled by wireless.

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It is not a difficult thing to construct the necessary apparatus to enable this to be done. Those who prefer to do so, might adapt the apparatus to control an electric train or other model.

* * *

In America, where many of the sets in use are of the valve type, valves are known as vacuum tubes. The great popularity of Radio in that country may be judged by the fact that the present output of valves in the States is about 200,000 per month.

* * *

It is now claimed that in addition to travelling through the ether, wireless waves also travel through the earth. An American scientist states that in long-distance transmission, the waves never reach the receiving antennæ through the air at all, but are received at the base of the aerial.

The messages transmitted by the new British station at Leafield, near Oxford, to Halifax, Nova Scotia, have been distinctly heard at Melbourne, Perth and Sydney (Australia), over 11,000 miles distant. They have also been heard in South Africa. This is especially interesting as Leafield is not an extraordinarily powerful station.

* * *

The construction of a new British station is under consideration by the Government. As the plans at present stand, it will be at least seven times as powerful as the station at Leafield.

* * *

The generators at the powerful Sainte Assise Radio Station are driven by 1,800 h.p. Diesel engines—a type of oil engine that is rapidly coming to the fore in engineering. Diesel engines are now being used for propelling certain classes of ships, instead of steam engines or turbines. They are also proving very satisfactory in their even more recent application, that of generating power for Radio transmission.

* * *

The French Government Station at Bordeaux, and the Radio Central of the United States, were the most powerful stations in the world, until the building of the great station at Sainte Assise. Those who are able to receive signals from the Eiffel Tower know that it is a very powerful station. Sainte Assise, however, is nearly forty times more powerful.

* * *

The Sainte Assise Station, the most powerful in the world, will, when finally completed, be capable of direct communication with Saigon in Indo-China, 8,000 miles distant.

* * *

Mr. Marconi is at present paying special attention to experiments with radio waves of short wave length. This type of wave has been found more adaptable than the longer waves for transmitting across short distances on land, or between ships close together at sea.

Guild Members Hear Parisian Concert.

The members of the Exeter Meccano Club recently had an opportunity of listening-in to a wireless concert, broadcasted from Paris.

They were enabled to do this by the use of a three valve receiver set, with an additional outside loose-coupled tuning inductance. This set is installed at the house of a local gentleman who takes a great interest in the Club.

Master Bowyer, the enthusiastic secretary of the Exeter Meccano Club, tells me he is making a receiving set for installation at his school. This set is to be of the two-valve type having one rectifying and one amplifying valve. The loose-coupled tuning inductance, consisting of a coil, has a number of "tappings" taken from it to a switch, sliding inside another coil of a similar type but of larger diameter. When the large coil is not enclosing any of the turns of wire of the smaller coil, it is said to be "loose-coupled," and when completely enclosed it is "tight-coupled."

We feel sure that our readers will be pleased to hear from Master Bowyer again, when the set is installed, and to know something of the results obtained from it.

Meccano Receiving Set.

The Meccano Crystal Receiving Set has been thoroughly tested and has received concerts, music, etc., broadcasted in London, Paris and New York. It is suitable for receiving telephony (speech, music, etc.) or telegraphic messages (Morse) on a wave length of approximately 450 metres.

Readers of the "*M.M.*" who have not yet obtained the Meccano Radio Leaflet, which gives full instructions for making this splendid receiving set, should send for a copy at once. (Post free 3d.)

The New Meccano Book.

A beautiful new Meccano book has been compiled and should be in the hands of every Meccano boy. It illustrates and describes each Outfit and gives full particulars of the Meccano Clockwork and Electric Motors. It also includes details of the Hornby and Zulu Clockwork Trains, Tin Printed Trains and a full list of Meccano Rails, Points and Crossings. A valuable feature also is a fully illustrated list of the entire range of Meccano parts, including all the new and valuable parts added to date.

Every reader of the *Meccano Magazine* should possess one of these beautiful new booklets. A copy will be sent free on receipt of a postcard and as the demand will be very great, you should take advantage of this splendid offer and write at once for your copy. Put "*M.M.*" after your name for reference.

The Photographic Competition.

Our Second Photographic Competition was announced in No. 26 of the "*M.M.*" It is divided into three sections :—

(1) ARCHITECTURAL. (2) NATURE STUDY. (3) MISCELLANEOUS.

There are no restrictions and any type of camera may be used. Prints may be of any size and finished in any way, it being immaterial whether they are mounted or not. The photographs must be taken by the competitor but the developing and printing may be done by others. The entries will be judged on their pictorial merit.

The closing date for the United Kingdom is 1st November and for Overseas 31st December next. The first prize will be a No. 1. Hornby Clockwork Train Set and the second prize a Tin Printed Train Set. Other prizes will also be awarded according to merit.

THE SECRETARY'S NOTES.

A Meccano Guild for France. British Meccano boys will be interested to know that, owing to the numerous and persistent appeals from Meccano boys living in France, a Meccano Guild is being inaugurated in that country, with Headquarters at Paris. French Meccano boys will now form Clubs, hold Meetings, Lectures, Debates, Concerts, Exhibitions, etc., and many happy times are ahead for them. The French Guild will, of course, be affiliated to our own organisation, and Guild members will join me in extending their congratulations to fellow members in France, and in wishing the French Meccano Guild every success.

A Year of Progress. The activities of Meccano Clubs have commenced and members are already enjoying the opening nights of the first Winter Session. I feel sure that the present year will be the most progressive yet known by the Guild. Every day large numbers of new members are enrolled and in many districts local gentlemen are evincing interest in, and paying tribute to, the splendid work done by the various Clubs. The Clubs already formed are increasing in their enthusiasm for Club work, and many new Clubs are being established in connection with Schools, Scout Troops and other similar organisations.

The Guild and Radio. There appears to be no limit to the wonders of electricity and development succeeds development with bewildering rapidity. It is wonderful to think that it is now within the power of every Guild member to receive wireless messages with the aid of the new Meccano Crystal Receiving Set. I am sure that all Guild members will be greatly interested in this, the latest addition to the Meccano hobby, and several Clubs are installing special Receiving Sets and arranging one night each week as a Radio evening.

Correspondence between Members. I am pleased to notice the increased activities in connection with the Correspondence Club. Guild members have long felt that they belonged to a great brotherhood of boys, each having the same thoughts, sharing the same pleasures, and thrilled by the same ambitions. They often think of other Guild members in far corners of the earth, and wish that they might learn something of what they are doing in those far off countries. The Guild Correspondence Club makes this possible, and already many lasting friendships have been formed through its medium. Those members who are interested, and wish to take advantage of this opportunity of exchanging letters with other Guild members, should write to me for further particulars.

A Warning. I have several times had occasion to warn Guild members against begging letters received from abroad, and as the practice seems to be on the increase I am again mentioning the matter. The letters come principally from native boys on the West Coast of Africa who see the names and addresses of Meccano boys in the *Meccano Magazine*, either as prize-winners or in connection with the Guild. Sooner or later they ask for presents of fountain pens, silk handkerchiefs, etc., and offer to exchange native baskets and monkey-skins. I advise all Meccano boys to ignore communications of this type. If any doubtful correspondence is received it should at once be forwarded to me.

An Interesting Letter from a Guild Member.

MR. R. ROBINSON, OF BECCLES.

Mr. R. Robinson of Beccles is a keen Meccano Guild member and the following extract from one of his letters will, I think, be of general interest :—

> "The emotions I experienced upon reading your letter were many and varied. Perhaps the predominant one was pride—pride intermingled with elation. Another and deeper emotion was stirred when I thought of the fine spirit of fellowship which must animate the Guild, that its Secretary should write to a member at such length and with such careful wording, as he did to me. My expression may be clumsy but I am sure you will appreciate my feelings. Your letter seemed like one from an old friend rather than from the Secretary of a big organisation. I am not, I hope, a sentimentalist but I thought these feelings, occasioned by your letter, might interest the writer."

This is just the spirit that the Guild strives to promote—a spirit of comradeship and good-feeling. I am pleased to think that Guild Members regard me as a friend who is ready to lend a helping hand and to put things right as far as lies within my power, when they are in difficulty.

Special Merit Medallions.

AWARDED AGAIN THIS SESSION.

I am particularly desirous of encouraging members to read instructive papers on subjects that interest them. It is excellent training for boys to stand up before their friends and to address them in this way. A popular and instructive discourse should be aimed at, to last from a quarter to half an hour. A discussion may follow, the other members adding some interesting facts to those dealt with by the member who reads the paper.

PREPARING THE PAPERS.

In getting up such papers the great secret is thorough preparation. Facts should be sought for from every possible source such

THE SPECIAL MERIT MEDALLIONS.

as parents, libraries, teachers, fellow-workers, and chums. The facts thus obtained should be set down briefly and clearly, in proper order, and the whole paper should be rehearsed and correctly timed. It may be illustrated by working models.

There are a great number of subjects to choose from in all branches in engineering and science, and I am sure that Club Secretaries will be very pleased to hear from members who will offer to read such papers at their Clubs.

In order to offer encouragment I am this session again allotting one Special Medallion to each Club, to be given to the member who delivers the best paper. After the papers have been read at the Club meetings they must be sent to me (with any comments by the Secretary or Leader) at the end of each session. I trust that all Club Leaders will help me to make this valuable part of the Meccano Club work a great success.

The Recruiting Campaign.

Enthusiastic members may do a good turn to the Guild movement by recruiting new members, and I want all Meccano boys to understand the objects of the Guild. Once they realise for what the Meccano Guild stands they will join its ranks enthusiastically and without hesitation. There are many thousands of Meccano boys in this country who, strange to say, have never yet heard either of the Meccano Guild nor the *Meccano Magazine*! This scarcely seems possible, to widely do we endeavour to make both known, yet the numerous enquiries I receive every day show this to be the case. I want all to help me to spread the knowledge of the Guild far and wide.

THE RECRUITING MEDALLION.

Every member should endeavour to enrol at least three new members. To each member who obtains three new members for the Guild a handsome medallion will be awarded. This Medallion (which is here illustrated, actual size) is one of which any boy may well be proud.

Send for full particulars of the Recruiting Campaign to the Guild Secretary.

CLUB NOTES

Short reports of Club doings are printed in this column. Should any Guild member desire to join any of the Clubs mentioned he should write for particulars to the Club Secretary, whose name and address is given.

Loughborough M.C.—There is every prospect of a fine Club being established in Loughborough, for the enthusiastic Secretary has obtained a Club-room and an adult Club Leader. Members are now wanted and any Meccano boy living in Loughborough should immediately write to, or call upon, Master S. W. Goodman, 15, Oxford Street, Loughborough, for full particulars.

Parkstone Congregational M.C.—The first Winter Session commenced on 16 September. It is hoped to hold an Exhibition and Concert early in the New Year and to this end the members are working enthusiastically. The members endeavour to remember the Club motto, "*Perseverantia Vincit*" in everything they undertake. *Secretary:* Master F. Brumwell, Fernside Avenue, Parkstone.

St. Mary with St. Gabriel M.C. (London, S.E.11).—Programme for the Session includes Lantern Lectures, Fret-work and the usual Club work. This Club is combining with the Holy Trinity Meccano Club in a joint Club Exhibition to be held on 28 October. A bright and interesting magazine is run in connection with the Club. *Secretary:* Mr. C. Curle, 37, Pullens Buildings, Peacock Street, London, S.E.

West View M.C. (Nottingham).—Only a small Club as yet but has already made quite good progress. Interesting Lectures and Competitions have been arranged for the Session just started and Meccano boys living in the vicinity of Sherwood, Nottingham, are invited to join. *Secretary:* Mr. H. W. R. Cousens, 494, Mansfield Road, Sherwood, Nottingham.

Kilmarnock (Riccarton) M.C.—It has been arranged that visitors may call on Club nights to see the work being done by the members and later on it is hoped to set apart a definite Club night for visitors. An interesting programme has been drawn up and it is proposed that an Exhibition be held in the near future. *Secretary:* Master A. Todd, 98, Campbell Street, Riccarton, Kilmarnock.

Airdrie Meccano and Wireless Club.—The name of the "Airdrie Y.M.C.A. Meccano Club" has been changed as shown, a Radio Section having been introduced. Although at present the Club only possesses a Crystal Set, they hope by Christmas to have one that is more powerful. Club work is also being followed with enthusiasm. *Secretary:* Master W. B. Gardner Henderson, "Rosehall," Airdrie.

King Street (Luton) M.C.—This Club is also giving attention to Radio, and several evenings are being devoted to this subject in the programme for the coming Session. Extensive alterations have been made to the Club premises and the Session is now in full swing. *Secretary:* Mr. S. Burgoyne, 58, Wellington St., Luton.

Cobham M.C.—An excellent start has been made and the Club is fortunate in having Colonel Trollope as President. Lectures, Social Evenings, Exhibitions and Model Building are being arranged, and the Club is making rapid progress. *Secretary:* Master Wm. Phillips, The Fox and Hounds, Cobham, Surrey.

Exeter M.C.—At a recent Fête held in Exeter a Meccano model-building competition was arranged and quite a number of the members of the Club participated. Recently an attempt was made to establish another Club in Exeter but this has now joined the (then) St. Thomas (Exeter) M.C. and the club re-named "Exeter Meccano Club." *Secretary:* Master C. L. Bowyer, 5, Silver Terrace, Richmond Road, Exeter.

Kenyon Hall College M.C.—Owing to examinations, etc., during the past two sessions, no great amount of Club work has been done. The members are all keen and enthusiastic however, and in this connection two of the boys, Masters J. S. Kelsall and J. W. Mayhew were awarded Special Merit Medallions. *Secretary:* Master J. W. Mayhew, Kenyon Hall College, Kenyon, near Manchester.

Club Recently Affiliated.

1st Herne Bay M.C.—Through the united efforts of Mr S. J. Sims and Master C. W. Russell this Club has become affiliated with the Guild and already rapid progress has been made. *Secretary:* Master C. W. Russell, 4, Clifton Villas, South Road, Herne Bay.

Cheadle Hulme Boys' School M.C.—This Club was first formed during the last Winter Session, but it has remained inactive during the summer months. The members were all keen to start the Winter Session in real earnest, however, and since affiliation has been granted the Club work has been going ahead with full swing. The meetings are held on a Saturday in the schoolroom and occasionally additional Lectures will be given on Friday evenings. *Secretary:* Master J. Wilson, "Nidis," Bramhall Lane, Bramhall, Cheshire.

£250 IN PRIZES.

Meccano Model-building Competition.

Cash prizes to the value of £100, Meccano Outfits, Inventors' Accessory Outfits, Hornby Trains and Zulu Trains to the value of £150.

These prizes will be awarded in the next Meccano Model-building Competition, for which every Meccano boy should enter. As was the case last year, the Competition will be divided into three sections (1) for boys under 10 years of age, (2) for boys between 10 and 14 years of age and (3) for boys over 14 years of age.

There are no restrictions and no entrance fees. Full particulars and entry form will be sent on application. The closing date for the Competition will be 15th April, 1923, for entries from the United Kingdom and the 30th May, 1923, for entries from Overseas.

Meccano Minstrels at Princes Risborough.

I have pleasure in publishing a photograph of the Minstrel Troupe organised in connection with the "Princes Risborough Meccano Club," the members of which are as jolly a set of minstrels as they look. The Princes Risborough Meccano Minstrels have already given several entertainments, all of which have been eminently successful, and have added the sum of over £17 to the Club funds. Part of the amount has been devoted to purchasing the necessary instruments for a Drum and Fife Band and this is now well in hand practising having commenced.

MR. ROBERT BAILEY

Under the capable direction of Mr. Robert Bailey, the enthusiastic Leader, the Princes Risborough Meccano Club has become one of the most progressive of our Clubs. They have a very fine Football Team, and during the coming winter it is proposed to introduce a Hand work-Class in addition to the ordinary Club work.

THE PRINCES RISBOROUGH MINSTRELS.

All the members are now working enthusiastically for an Exhibition and Sale of Work that is being arranged to take place about Christmas time

Clubs Not Yet Affiliated.

Birkenhead North End M.C.—A Meccano Club is being established in Birkenhead and any boys living in the vicinity of Upper Brassey Street, Claughton or North End should communicate with the *Secretary:* Master E. Roland Hudsom, 7 Upper Brassey Street, Birkenhead.

Soerabaia (Java) M.C.—This Club (Dutch East Indies) is being organised by a Dutch member of the Guild. He is working enthusiastically so that the Club may become affiliated with the Guild and, doubtless, before long this will be brought about. *Secretary:* Mijn Heer J. G. Wijnen, R., Sumatradwarsstr, 4, Soerabaia (Java), Dutch East Indies.

Names Wanted.

I have several letters and application forms for membership of the Meccano Guild that have been received with incomplete addresses, and it is, of course, quite impossible for me to reply to them. The undermentioned boys should send me their full address, when their letters will be dealt with and the applications sent forward:—

Albert Keen, ——?, Tamworth.
Arthur Jackson, ——?
Kenneth Hudson, Washing Street, ——?
Malcolm Macdonald, Dunnikier House, ——?
William Goad, Prince Roack, ——?
J. V. Braithwaite, ——?
B. D. Molesworth, ——?
R. Harrison, Creek Road, ——?
F. Brockway, Bourne St., ——?

A Joint Club Exhibition

To be held by the

HOLY TRINITY MECCANO CLUB.

On 28 October next a joint Exhibition will be held in the Holy Trinity Parish Hall, Barnsbury, N 1., by the "Holy Trinity" and the "St. Mary-with-St. Gabriel" Meccano Clubs. A hearty invitation is extended to any Meccano boy in London who is interested.

In addition to the usual Exhibition it is hoped to include Radio and Lantern Demonstrations and from letters which I have received everything augurs well for a really enjoyable and successful Exhibition.

A small charge is being made for admittance: 8d. for adults and 4d. for boys under 14. The Exhibition lasts from 3 p.m. to 10 p.m.

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, and 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.

C. W. Udall (Saltley).—

"A Meccano boy is always happy,
Merry, bright and cheerful,
He is always buying spare parts
And never is he tearful."

This is not quite a poetic gem, Charles, but the facts as you state them are beyond dispute. We are pleased you are progressing so well in your studies. You will be able to obtain all the information on Radio for which you ask in this and succeeding numbers of the "*M.M.*"

J. Green. Jr. (Biggar).—So many suggestions are now being sent in to us that we are unable to reply to them immediately in our "Bright Ideas" column. You must exercise just a little patience, Joseph. Now that the "*M.M.*" is to be issued monthly during the winter, we shall doubtless be able to keep this useful column more up to date.

C. C. H. Weeks (Norfolk).—In the event of a Guild Badge being lost, a new one can be obtained from the Guild Secretary by sending a remittance to cover the cost. We have sent by separate post all the literature you asked for.

H. Stephens (Castleford).—"I enjoy Meccano better than anything else. When it rains it makes it brighter." We welcome you into the Meccano fold, Herbert, and we prophecy much enjoyment and fun for you as you settle down to life in Meccanoland.

A E Drew (Birmingham).—

"Beside unfinished homework he lay,
His pencil in his hand.
His dream was fair, his thoughts were there
In Happy Meccanoland.
Again in the mist of shadow and sleep
He saw his favourite land."

Your other verses are equally good, but we cannot find space for them all. We note that they are after Longfellow, but we rather suspect that if he could read them, Longfellow would be after you!

Dickie Jones (Cleeve Hill).—We are glad to have more of your bright breezy letters, and to hear of the splendid times you had at the sea. We may start a Stamp Collector's corner in the "*M.M.*" later.

F. W. Stephenson (Preston).—Sorry we could not come over to the Preston Guild, but we read all about it in the papers and were much impressed. We should certainly like to see the photos you took of this great event.

A. E. Rough (Wakefield).—We congratulate you on having won a City Minor and Stonie Scholarship. You will enjoy Meccano model building all the more after your enforced rest. We hope you will take a keen interest in Radio during the coming Winter.

Two New Competitions

WHICH IS YOUR FAVOURITE MAGAZINE?

The amount of literature written and offered to the British boy for his amusement and instruction is nothing short of colossal. It is safe to say that there is not a boy in the country who does not regularly read one or more weekly or monthly publications.

We are anxious to find out just what class of reading our readers like best, and we are therefore offering a prize of a No. 1 Hornby Train Set for the best article (consisting of not more than 100 words) on—

"MY FAVOURITE MAGAZINE AND WHY I LIKE IT."

Any weekly or monthly magazine printed and published in Great Britain may be dealt with *but not the "Meccano Magazine."* This Competition will close on 31 December, 1922. Mark your envelope "Favourite Magazine Competition."

I also invite my readers to send me a list of what in their opinions are

THE FOUR BEST MAGAZINES

for boys, published in this country, in what they consider to be the order of merit.

A Meccano Clockwork Motor will be awarded to the boy who places the four magazines nearest to the list of best magazines, as voted for by all readers participating in this competition. *The name of the "Meccano Magazine" must not appear in lists submitted.*

The voting must be on postcards only, which must be received not later than 31 December, 1922. Address postcards Meccano Ltd., Binns Road, Liverpool, and mark them "Best Magazines Competition."

A Successful Competitor

Master Fred. C. Rogers, of Providence, Rhode Island, U.S.A.

who won one of the cash prizes in Section B in the recent Meccano Model Building Competition. The successful entry was a model of a Track Laying Machine.

New Meccano Rails.

Owners of Gauge 0 clockwork and steam trains will be pleased to hear that the Meccano Curved Rails and Points may now be obtained in 9 in. radius, giving a circle of 1 ft. 6 in. diameter. Particulars and prices are given below.

(For 1 ft. 6 in. diameter circle.)

A9. Curved Rails (9 in. radius) per doz. 3/-
PR9. Right hand point „ each 2/6
PL9. Left „ „ „ „ 2/6

New Electric Rails

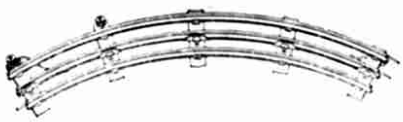
(For 2 ft. diameter circle.)

EA1. Curved Rails (1 ft. radius) per doz. 8/-
EA1½. „ Half Rails ... ... „ 5/-
EA1¼. „ Quarter „ ... ... „ 4/6

(For 4 ft. diameter circle.)

EA2. Curved Rails (2 ft. radius) per doz. 8/-
EA2½. „ Half Rails ... ... „ 5/-
EA2¼. „ Quarter „ ... ... „ 4/6
EB1. Straight Rails ... ...per doz. 7/-
EB½. „ Half Rails ... „ 4/6
EB¼. „ Quarter „ ... „ 4/-

Terminal Rails.



EAT1. Curved Rail with Terminals (1 ft. radius) ... each 1/2
EAT2. Curved Rail with Terminals (2 ft radius) ... each 1/3

New Meccano Manuals.

There are three Manuals, the 0 Manual for simple models built with the 0 Outfit, the 0-3 Manual comprising models built with any of the Outfits from 0-3 and the Complete Manual, which comprises a selection of models that may be built with every Outfit from 0-7. This latter Manual is a very fine publication and should be in the hands of every Meccano boy. It includes instructions for building most of the models shown in the present No. 3 Manual. A limited supply of the No. 3 Manual is still available.

PRICES OF MANUALS:	s.	d.
0 Manual ... ... post free ...	0	6
0-3 „ ... ... „ ...	1	2
Complete Manual ... „ ...	2	10
No. 3 Manual ... ... „ ...	1	4½

Change of Address.

Subscribers should immediately notify the Editor of any change of address. Send a Postcard *giving the old and new address*, so that records may be kept up to date.

MECCANO

Engineering for Boys

REAL ENGINEERING. The reason why you can build such wonderful models with Meccano is that every part is a real engineering piece—each perfectly designed and accurately made. You can build hundreds of models with Meccano—you never come to the end of Meccano fun.

ANYWHERE BETWEEN 5 and 70 is the correct age to start Meccano. The youngest boy can begin to build the moment he gets his Outfit.

FULL INSTRUCTIONS. A big illustrated Book of Instructions goes with each Outfit, making everything perfectly clear.

MECCANO PRICES

No. 0 Outfit	5/-	No. 3 Outfit	22/6
No. 1 "	8/6	No. 4 "	40/-
No. 2 "	15/-	No. 5 (carton)	55/-
No. 5 Presentation Outfit	... ...		85/-
No. 6 " "	... ...		140/-
No. 7 " "	... ...		370/-

Any Boy can build this Wonderful Revolving Crane

HORNBY CLOCK WORK TRAINS

THE TRAIN WITH A GUARANTEE

A MOST valuable and remarkable feature of the Hornby Train is that it can be taken to pieces and rebuilt just as may a Meccano model. All the parts are standardised and there is as much fun taking Loco, Tender, Coaches and Wagons to pieces and rebuilding them as there is in playing with them. Any lost or damaged parts may be replaced with new ones.

The clockwork is a splendid piece of mechanism with accurately-cut gears, ensuring smooth running, and the workmanship and finish are of the highest quality. The Loco is fitted with reversing-gear, brake and governor.

PERFECT MECHANISM: BEAUTIFUL FINISH: STANDARDISED PARTS

HORNBY CLOCKWORK TRAIN PRICES.

No. 1. SET.		No 2. SET.	
Passenger Sets each	35/-	Pullman Sets each	70/-
Goods " "	25/6	Goods " "	45/-
Locos " "	16/	Locos " "	30/-
Tenders "	3/6	Tenders "	4/-
Passenger Coaches	6/6	Pullman Cars "	16/-
Wagons	3/9	Wagons "	3/9

ZULU CLOCK WORK TRAINS

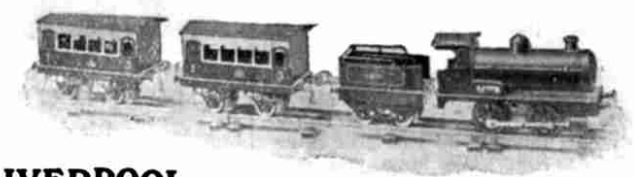
THE Zulu Clockwork Train is a new and cheaper type of mechanical train, the chief characteristics of which are fine and durable mechanism and immense strength of construction in all parts. The Zulu Loco is well designed and efficient, and will give long and excellent service. Richly enamelled and highly finished, fitted with brake and governor, non-reversing.

ZULU CLOCKWORK TRAIN PRICES.

Passenger Sets	each	25/-
Goods Sets	"	18/6
Locos	"	10/6
Passenger Coaches	"	5/-
Tenders	"	2/6
Wagons	"	3/-

ZULU TANK LOCO

A STRONG and durable Loco capable of any amount of hard work; richly enamelled and highly finished; fitted with reversing gear, brake and governor. Gauge O in black only. 12/6



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