

# MECCANO

## MAGAZINE

PRICE  
1d

PUBLISHED IN THE INTERESTS  
OF BOYS.

## A Great Airman.

## THE LATE SIR ROSS SMITH AND HIS Flight from England to Australia.

(Continued)

At 9.10 a.m. on the 12th November, 1919, the great Vimy, carrying the four aviators, left Hounslow on its historic trip followed by the good wishes of everyone. Even though Sir Ross and his crew had had some experience of the route during their war service, there was no mistaking the magnitude of their task.

### Intense Cold Encountered.

After staying the previous night at Lyons, the adventurers arrived at Pisa at 2.40 p.m. on 13th November. Intense cold was experienced on the first day, "instruments frozen; machine covered with ice; food too frozen to eat; and much time wasted avoiding storms" says the diary. The next day was perfect for flying, however, and a successful landing was made at Rome on the 15th, followed by a departure on the following day for Taranto. Taranto, which was reached 11.45 a.m., is in the south of Italy, and was greatly used by British troops as a port of embarkation for the East during the War. The flight over Italy is briefly described in the diary:—"Passed over Capua and Naples. Turned east over mountains; air bumpy; frequently falling many feet. Flew low over Vesuvius. Good wind."

On the next day (the 17th) the aviators arrived at Suda Bay in Crete, having flown through rain all day. From Suda Bay a southerly course was taken, but the weather was again reported "bad, with rain across Mediterranean." The ground-speed and drift were checked by observations on two steamers, and the aeroplane then "crossed the coast at Sollum, flying east for Cairo, over Matruh and Wadinatron. "Hope land Damascus or Bagdad to-morrow," says the diary. "Thirty flying hours to Cairo. Vimy going perfectly."

### Over the Libyan Desert.

This part of the flight was of more than

ordinary interest to the party—for the gallant airmen had all had some experience of Egypt, and their return by air revived a local interest. During the War, the Libyan or Western Desert of Egypt was the scene of a campaign against the Senussi Arabs living in the oasis of Siwa, south of Sollum. The Australian Flying Corps, together with Armoured Car Patrols, played

longest period the machine remained in the air. It was necessary to fly at a high altitude on account of the desert dust, which caused Sir Ross some anxiety about his engines. On the following days Delhi, Calcutta and Rangoon were all reached in turn, and the following section of the flight is best described in the pilot's own words:—

### From the Aviator's Diary.

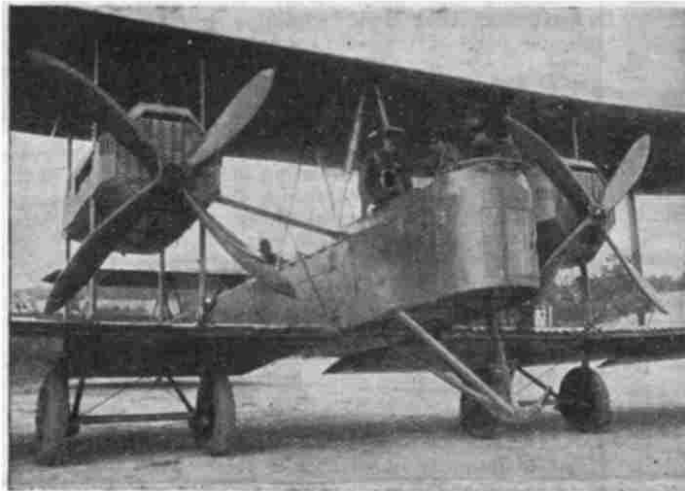
"We left Rangoon at 7 a.m. on 1st December arriving Bangkok at 1 p.m. We passed through a heavy storm above the mountains. South-east of Moulmein thick cloud delayed us. We climbed to 9,000 feet and got over the worst of it. Then we followed the River Menam south. Every convenience was prepared for us at Bangkok, the greatest assistance and courtesy being shown by Prince Pitsanoluke and the Siamese Aviation Corps. We left Bangkok for Singapore on 2nd December, and were escorted for the first 50 miles by four Siamese machines.

"The course south, along the east coast of Malay, for the first two hours was good, but we then met a heavy monsoon. The wind was strong and changeable, sometimes with us and sometimes against us. It was necessary to fly at a height of 500 feet for three

hours, following the coast. We were almost blinded by rain, but the country was impossible for landing, and we had to continue, hoping for the best in the worst flying conditions ever encountered. The aerodrome at Singora was bad and stumpy. We had to land in a cross wind on a small dry patch but came safely down. Later, however, in 'taxi-ing' the machine, the tail-skid caught a root and broke a fitting. The local population showed great interest at the sight of an aeroplane.

"Owing to the bad weather we found we could not reach Singapore without more petrol, and wired to the Asiatic Petroleum Company at Penang to send some urgently.

(Continued on page 3)



Photograph by (Messrs. Vickers Ltd.)  
Sir Ross and his brother, Sir Keith, with Sergt. Bennett preparing to leave Croydon Aerodrome on their great flight to Australia.

no small part in the success of these operations. The course of the Vimy across Libya lay over Moghara, a small oasis containing brackish water, that had been occupied by British troops during the Senussi operations.

The flight from England to Cairo took, in all, only thirty flying hours. It was indeed a fine feat, and one of which the party must have been justly proud.

Taking the air on the 19th, the Vimy steered a course from Cairo to Damascus, and the journey proceeded in stages until Karachi (India) was reached on the 24th. The flight to Delhi, on the following day, occupied 9½ hours and constituted the

## THE LATE Viscount Northcliffe.

### THE PASSING OF A GREAT JOURNALIST.

THE late Viscount Northcliffe may be described as having been one of the greatest, if not the greatest, of modern journalists.

The Viscount's first efforts in journalism were made in his school days, when he issued a successful weekly paper, which circulated among his school fellows. After he left school his interest continued to be centred in journalism. So closely did he apply himself to his work, that he eventually became the controller and proprietor of a very important group of newspapers. Through them he exercised a great influence on public affairs.



Only a few months before his death he had returned from an extended tour around the world, and Meccano Radio enthusiasts will be interested to know that as a result of this tour he predicted a great wireless boom in this country. He remarked that the proud position of the newspaper was about to be challenged by broadcast wireless. "Broadcasting wireless means," he said, "that everyone will one day be able to subscribe to a news agency and receive sporting, financial, political and general news spoken in their own homes by the wireless telephone." More recently he gave a lead in this country in Radio broadcasting by arranging for the *Daily Mail* concerts to be broadcasted twice a week from The Hague.

Viscount Northcliffe was ever mindful of the conditions of his workpeople and was always seeking to improve them. It is not surprising to find, therefore, that he was beloved by his many employees, to whom he was familiarly known as "The Chief." He was often to be found behind the scenes in his newspaper offices and was intimately acquainted with the members of his staffs.

In the building up of his great interests he was always on the look-out for initiative and enterprise. On one occasion he was so struck by the intelligent answer of a bright boy in the *Times* office that he caused him to be given every opportunity for advancement. That his judgment was sound is shown by the fact that this same boy is now a very capable sub-editor.



IT is a good thing for a boy to take an interest in everything that goes on around him. The faculty of observation counts more in the formation of character and in the shaping of a career than anything else I know. Every item of knowledge or information acquired is a stepping stone to further knowledge. If a boy learns where the sun rises and sets, and why, he is led on to enquire into all the wonderful ways in which the sun affects every moment of our lives. Knowledge of every little fact in connection with Engineering, Electricity, Botany, Geology, Chemistry, and similar subjects, that is acquired through a natural or a cultivated faculty of observation, opens up for exploration a new and delightful avenue of knowledge and interest.

There is no doubt whatever that the boy who lives the most enjoyable life is the boy with the widest range of interests. He has the biggest circle of admiring friends, gets on best after he has left school and takes up the big work to be done in life, incidentally making for himself the best position and the most money. This boy allows nothing of moment to pass him by without enquiring into its whys and wherefores.

Nature has given every boy some particular bent and inclination towards some part of the world's activities and happy is the boy who finds his direction early in life. As you grow older, you will observe the tragedy of men doing work for which they have neither inclination nor fitness. You will instinctively realise that these men might be happy and prosperous in a more congenial atmosphere. As it is, they are square pegs in round holes—men whose lives have gone awry, from lack of early direction.

What is your particular bent and natural inclination? In what work would you be most prosperous and successful?

Very few boys can answer these questions correctly and yet they are of immense importance to them. Progress or stagnation; prosperity or poverty; success or failure, depend upon them.

I am of opinion that a boy's hobbies and play-time pursuits have a greater influence on his career than any other factor. I would advise every boy to take up all those hobbies that appeal specially to him.

The naturally observant boy will have no difficulty in selecting attractive and enjoyable hobbies and these he will pursue keenly and with enthusiasm. More than this, he will acquire the habit of taking an intelligent and practical interest in everything in life, as it comes along. He will be capable of forming sensible opinions on most matters, and, when the time comes for the selection of his future career, his own views will count for more than a little in the choice.

Be  
Observant.

Square Pegs  
in  
Round Holes.

What is Your  
Natural Bent?

The Importance  
of  
Good Hobbies.

As a matter of fact, the successes of very many eminent men have been founded on the hobbies which they pursued as boys.

Select  
Your Hobbies  
Carefully.

You will remember that in the last issue of the "M.M." we referred to the fact that the great inventor Edison commenced work as a newsboy. His hobbies—chemistry, printing and physics—quickly altered the course of his life, and led him on to those wonderful inventions that are destined to be associated with his name for all time. We have only to read the lives of famous men—inventors, engineers and scientists—to find the tremendous influence that their boyish hobbies exercised over them. Once we realise this, we shall see how desirable it is for us to select our hobbies with care and to follow them keenly and thoroughly. The boy who masters his hobbies will master his business when he grows to be a man.

## A Successful Competitor



We have pleasure in publishing a photograph of Dr. E. C. Bairstow, who will be well known to many readers of the "M.M." as the organist of York Minster. Dr. Bairstow was successful in sharing the first prize in Section "C" (cash £20) with another competitor in our recent Competition. We feel sure that Meccano boys will be

interested in reading the following remarks from this well-known musician, and join us in congratulating him on his recent success.

"YORK.

"It has always been my custom to have on hand something that, whilst appealing to the imagination and general interest is in complete contrast to my usual work. The building of original models in Meccano has been the pleasantest of my hobbies during the last twelve years. The most interesting experience of all has been the building of the clock which won me the prize. There were many problems to solve and the solution of each one had to be attempted by several different methods before success was finally attained."

## Note These Dates.

The following are the dates on which the undermentioned Meccano Competitions close (For full particulars see page 4):—

1922.

- 31 Dec. "My Favourite Magazine."
- 31 " " "The Four Best Magazines."
- 31 " " "The Six Best Books."

1923

- 31 Jan. "Third Photo. Competition."
- 31 March. Inter-Club Competition (Guild).
- 15 April. £250 Model-building Competition.
- 30 May. £250 Model-building Competition (Overseas).



This Hydraulic Coal Hoist lifts a full truck of coals, weighing 30 tons, to a height of 60 ft.

## Giant Hoist Lifts 30 Tons

The modern tendency to handle merchandise in bulk grows stronger every year, as new devices are invented to speed up work in almost every branch of manufacture and industry.

We have pleasure in publishing a photograph of one of the three giant coal hoists recently erected by the Great Western Railway Company at Queen's Dock, Newport (Mon.). By means of these hoists full trucks of coal are elevated to a desired height and then tipped, causing their contents to slide down a shute into the ship's hold or bunkers, as the case may be.

Full trucks are conveyed to the hoist by rails running along the Quay side. After having been hoisted and tipped, the trucks leave the hoist at the upper, or gantry, level.

The gross lifting power of each hoist is 30 tons, the hoist motion being operated by twin hydraulic rams working downwards in cylinders. On the top of these cylinders there is a tipping cylinder, the ram of which works upwards, the lifting mechanism operating from the side of the hoist frame.

A tipping cradle is contained in the hoist carriage, and the tipping rope is so reeved that a truck may be tipped at any desired level within the lifting range of the hoist, namely from the quay level to 60 feet above.

The shute is capable of being moved vertically upon the hoist frame to any position within the tipping range, and its overhanging end is supported by chains that may be extended or withdrawn. In this way the incline may be varied as, and when, required.

The two cranes mounted at the top of the framework are for anti-breakage purposes. That is to say, they are used for discharging coal before the shute comes into operation. The cranes deposit small quantities of coal on board ship, and this coal forms a cone in the steamer's hold. By these means, less coal is broken in falling from the shute when the main tip is working.

### A Great Airman—(continued from page 1).

"During the night there were heavy squalls and the crew had to hold down the machine all through the night. Great assistance and kindly hospitality was given by Prince Yugula and the local officials.

### Road Cleared by Convicts.

"On 4th December (my birthday) we decided to try for Singapore. We left Singora at 10 a.m. and found the aerodrome very wet and the 'take-off' very rough, although convicts had cleared away the stumps. We were lucky to get off in a cross wind, and flew at a height from 2,000 to 5,000 feet all the way. We arrived at Singapore at 5 a.m., and had a great reception from a huge crowd. Hope to reach Java on the 6th and Port Darwin on the 10th. Vimy and crew all well."

Java was reached as anticipated and a good landing made at Surabaya, but owing to the aerodrome having been constructed on reclaimed land, the Vimy sank in the soft ground in "taxi-ing." The efforts of 200 coolies for seven hours were

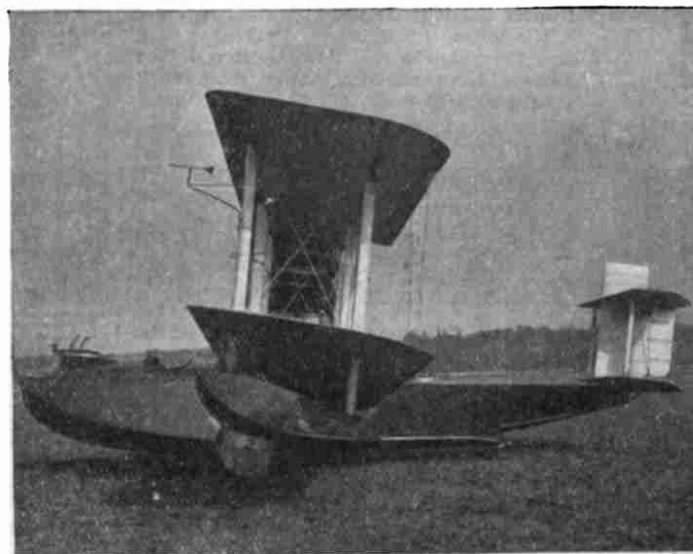
necessary to move the machine 400 yards, and to construct a road of bamboo mats for the "take-off." This road was

finished by dark next day, but on being tried, the machine swerved off the road and was again bogged. At noon another effort was made, this time successfully, and bamboo mats were sent flying in all directions as the machine took the air!

### Australia Sighted.

On the 10th, the plucky crew were thrilled at the sight of the Australian coast, gradually looming ahead. The coast was sighted fully forty miles away, and a landing having been made at Port Darwin, the England to Australia flight became an accomplished fact. The prize and the honour were won, and the whole world joined in well-deserved congratulations to the intrepid airmen. Captain Ross Smith—hailed by the New York Press as the world's foremost aviator—and his brother, Keith, received knight-hoods from the King in recognition of their wonderful work, being made Knights of the British Empire.

(To be concluded)



Photograph by [Messrs. Vickers Ltd.]  
The Vickers-Amphibian on which the late Sir Ross Smith intended to attempt his flight round the world.

## Essay Competition Result.

We have pleasure in announcing the result of the Photo-Essay Competition, particulars of which were given in No. 25 of the "M.M." The first prize of a Hornby No. 1 Clockwork Set has been awarded to Master C. R. Blanc, of Tullamore, Kings Co., Ireland, and the winning Essay is printed below. A tin-printed Clockwork Train Set has been awarded to Miss Winifred Hicks, London, N.W.11, and a similar prize has been despatched to Master G. P. West, of London, W.2.

The following entrants are honourably mentioned:—

- Master A. G. Sanders, London.
- .. B. L. Simmonds, Forest Hill, S.E.
- .. W. S. Mitchell, Edinburgh.
- .. J. B. Wilkinson, Blackburn.

### THE PRIZE-WINNING ESSAY.

## A Holiday in Ireland

By CHARLIE R. BLANC.

THIS year we spent our holidays at Wicklow, where we had a very enjoyable time. We expected to reach Wicklow during the evening but owing to our train being held up by Irish Irregulars, and some of our passengers searched, we missed our connections and had to stay the night at an hotel. We started early next morning, however, and reached Wicklow in time for a bathe. We went down every subsequent morning for a swim, although the weather was not always ideal for bathing.

My birthday happened to fall during the holidays and I was given a lovely little Brownie Camera, which I made good use of. Here is one of the photos that I took of a goat, as we were passing over the Golf Links on one of our rambles.



An Irish Goat.

The Wicklow Regatta was held during our stay, but when the day came, the weather turned out so bad that the event was not a very great success. This was a pity, because the Regatta is only held once a year and the event is anticipated with great expectation by every one. During the Regatta, big waves dashed right over the pier, and the sea was so rough that many of the races had to be abandoned. Because of the weather I think that more people went to some merry-go-rounds that happened to be in the town, than to the Regatta!

Near Wicklow, between the river and the sea, is a stretch of land called the

"Murrags." This was originally five miles long and quite broad, but the sea has so encroached on it during the last few years that most of it has now disappeared. The railings have had to be moved back ever so far, and even now many of the iron railings have become twisted and broken



The River at Wicklow.

by the force of the waves. Many of the houses near the sea once had large gardens, but now have only small strips of land, and most of them had to be rebuilt further back from the sea. This is not the end of the bad luck of the people in this district, for during a storm a few years ago, the

(Continued on page 10.)

## Best Books for Boys Competition.

Which are the six best books for boys is a difficult question to answer, for everything depends upon the taste of the individual reader.

We are anxious to find out just exactly what type of books readers of the "M.M." prefer—whether they prefer fiction to any other class and if so what type of fiction: school stories, adventures, historical novels, detective tales, etc. For this purpose we announce a Competition in which entrants should send a list of what they consider are the six best books for boys.

The books should be arranged in order of merit and the first prize, a No. 1 Hornby Train Set, will be awarded to the reader who places the six books in the order nearest to that order of merit voted for by all readers participating in the Competition.

The voting must be on post cards only and they should reach the Editor of the "M.M." before the 31st January next. Mark your postcards "Best Book Competition."

## Favourite Magazine Competition.

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 the 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."

## Third Photographic Competition.

Our second Photographic Competition has met with even greater success than the original competition. The results will be announced in our next issue.

We announce a third photographic competition for the best photograph of

### "A WINTER SCENE."

There are no restrictions or entry fees 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 is 31 January, 1923. The first prize will be a No. 1 Hornby Clockwork Train Set and other prizes will also be awarded according to merit.



## £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-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.



# RADIO SECTION

## The Thermionic Valve.

### THE INVENTION THAT MADE WIRELESS TELEPHONY POSSIBLE.

The following is the second instalment of an article specially written for the "Meccano Magazine," dealing with the principles of the Thermionic Valve, an important appliance in Radio. The following instalment describes the mysterious effect discovered by the famous scientist, Edison. Future instalments will detail the inventions that have led to the wonderful appliance that made possible the wireless telephony of to-day.

(Continued)

We are better able to imagine the extreme minuteness of the atom by using an illustration given by Lord Kelvin. This illustrious scientist estimated that if we could enlarge a rain drop until it is the size of the earth, each of the atoms of which it is composed would themselves be no larger than a marble!

When this comparison was made the existence of the electron was undreamed of. With the twentieth century came the discovery of Radium, and—as we have seen—the Atomic Theory gave place to the Electron Theory, which holds the field to-day. Existing estimates of the size of the smallest known particles went by the board, and new ideas were advanced to deal with the incredibly minute electrons.

Bearing in mind Lord Kelvin's illustration of the minuteness of the atom, let us see how the electron compares with it in size. It has been estimated that if an atom were enlarged to the size of St. Paul's Cathedral, an electron in comparison would be represented by the size of this printer's full stop (.) flying about in the inside of the building!

#### Each Atom a Miniature System.

Atoms contain varying numbers of electrons and these are arranged in different ways, depending on whether the substance that they form is a solid, a liquid or a gas. So far as is known, the smallest atom is that of hydrogen and this itself is composed of some 2,000 electrons.

It is believed that the electrons of an atom circulate or revolve around a common centre of gravity, thus forming a microscopic model of our own Solar system in which, as we all know, the planets revolve around the Sun. The electrons fly about within the confines of their microscopic system with such terrific power that the atom could be made to do all the work of the world—if we could but find the magic key to unlock the secret of the atom! Realising the great importance that this discovery would have upon the future of the world, the problem is engaging the attention of our greatest scientists.

Although many ingenious devices have been thought of, to test the properties of atoms and their component electrons, much important work remains to be accomplished in this mysterious yet fascinating branch of scientific research.

#### Electrons and Radio.

You will no doubt be saying to yourself that this is all very interesting and very wonderful, but what have atoms or electrons to do with Radio in general and with the Thermionic Valve in particular? When I mention that the Thermionic Valve is sometimes called the Electron Valve, and explain that electrons and electricity are as closely connected as their names are similar—just as are Radium and Radio—you will understand that there is a distinct connection between the two subjects. Indeed, there is more than a connection for a current (really a "running," as the name implies) of electricity is actually a stream of electrons passing through a conductor, the strength of the current



Our illustration shows Dr. J. R. Fleming, F.R.S., Professor of Electrical Engineering at the University College, London. Dr. Fleming invented the Thermionic Valve that revolutionised the practice of wireless telegraphy and telephony, both in transmission and reception. In our next issue we shall describe how Dr. Fleming was led to his discovery by adapting the mysterious effect, observed by Edison, that is described on this page.

depending upon the number of electrons that are flowing.

#### A New Aladdin's Lamp.

The Thermionic Valve has been called the modern Aladdin's lamp. All Meccano boys will have read in the "Arabian Nights" of the wonders that Aladdin was able to conjure up with the aid of his old lamp. The modern Aladdin's lamp brings even greater wonders within the grasp of its possessor—wonders so amazing that even the highly imaginative author of "A Thousand and One Nights" never dreamed of them.

In its outward appearance this wonderful appliance resembles a small electric lamp-globe. A closer inspection shows that, in addition to the filament (or fine thread of wire that becomes incandescent when the current is switched on) there are two other elements, called "the plate" and "the grid" (see page 6). In order that we may understand the purpose that they serve we must learn how they came to be adopted in the position we now find them.

#### A Mysterious Effect.

The incandescent electric lamp, in its earliest form had a thread of carbon placed in the vacuum inside the globe. In the early days, when he was experimenting with this carbon lamp, Edison discovered a peculiar action that he could not explain. He had noticed that by continual use of the lamp the inside of the globe became blackened, as if

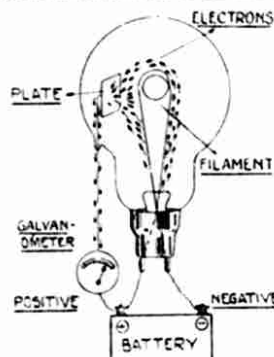


FIG. 1.

covered with a fine deposit. Indeed, in the course of time the globe became so blackened that the amount of light was considerably diminished.

Edison determined to investigate this curious action, and in order that he might do so, he fixed inside the lamp a small metal plate, near the filament but insulated from it. He was surprised to notice that when this plate was connected to the positive terminal of a battery a curious thing happened. Although there was

no metallic connection between the filament and the plate, an electric current passed along the wire from the plate. This was clearly shown by an instrument, called a galvanometer, connected between the plate and the battery (see Fig. 1).

In puzzling over this remarkable effect, Edison came to the conclusion that the current leaped from the filament across the gap to the plate. Continuing his experiments, he noticed that the current would not leap the gap when the negative terminal was connected to the plate. No matter how strong the current, the delicate galvanometer showed that not even the minutest current passed when the connection was made in this way (see Fig. 2).

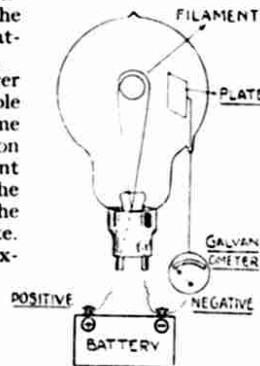


FIG. 2.

**The Thermionic Valve (continued).****Repulsion and Attraction.**

We have mentioned that an electric current is really a flowing stream of electrons—the smallest bodies known with a separate existence. We may now mention that an atom is believed to be composed of a nucleus of electrons, each of which carries a positive charge of electricity. This nucleus is surrounded by electrons, each carrying a charge of negative electricity.

Those of you who have made simple electrical experiments know that "like repels like" and that "unlikes attract each other." That is to say, that although one negatively-charged electron repels another negatively-charged electron, it will be attracted by an electron that carries a positive charge.

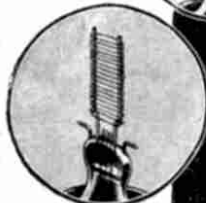
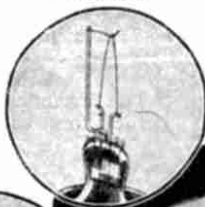
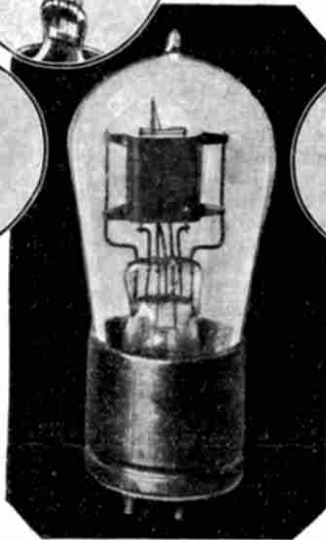
In substances that are electrical conductors there are always a great number of free electrons—electrons that are not attached to any of the atoms of which the conducting substance is composed. These free electrons, as their name implies, are moving about in all directions between the atoms of the conductor. When the conductor forms part of an electric circuit, however many of these free electrons are pushed along, as it were, by the electric current, and

are made to flow in one direction. It has been found that if the conducting substance is heated these movements of the free electrons become even more pronounced. If the substance be made very hot the electrons fly off from the conducting body and attach themselves to other near-by bodies.

**The Leaping Electrons.**

Although Edison did not know these things when he made his curious discovery in connection with the carbon filament lamp, they explain what was taking place between the filament and the positively-connected plate. When the filament was heated a stream of electrons

flew off and attached themselves to the near-by plate. They were encouraged to do this because the plate was charged with positive electrons and the electrons in the filament were all negative. Arrived at the plate, they continued their way to the positive terminal of the battery, and in passing through the galvanometer caused it to register their passage. When the plate was connected to the negative terminal of the battery it became charged with negative electrons. The electrons of the filament, being also negative, did not leap the gap between the filament and the plate for, as we have already seen, "like repels like."

*(To be continued)***Filament.****Grid.****Plate.**

Photograph by courtesy of "Popular Science Monthly."

**A typical Thermionic Valve.**

Showing the three essential parts: Filament, Grid and Plate. When in position as shown in the centre illustration, the Plate encloses the other two parts.



**Michael Petras** (Addlestone).—A lattice coil winder may be made from Meccano parts. Our experts are experimenting with yet another type of coil winder, which will be built up in the same way and more will be heard of this at a later date.

**W. J. Lovett** (Tilbury Docks).—You should be able to listen-in to Marconi House, as this is well within the 25 mile radius, which is usually looked upon as being the maximum range for telephony on a Crystal Receiver.

**Stanley Graham** (London, S.E.5).—It is possible to use more than one Crystal with the Meccano Crystal Receiver by fixing a bush wheel (No. 24) in the place of a single crystal cup and mounting on it four cups at opposite points. By turning the wheel it is possible to select any of the four crystals required.

**L. Harrison** (Leeds).—Detectors are sometimes more satisfactory when the crystals are supported in a vertical position.

**D. Taylor** (Middleton, near Manchester).—You should be able to receive Radio messages with an aerial 50 feet long, although it is desirable to use an aerial 100 feet in length with a Meccano Crystal Set.

**R. L. T. Harding** (London, N.6).—There is no reason why your Receiving Set should be absolutely stationary. It may be moved about provided that you do not alter the length of the down lead (the cable which connects the aerial to the condenser) which should always be kept as short as possible.

**F. J. Moss** (Salford).—A "wave" in wireless means the impulse, or power, that is sent out by the transmitter. I hope soon to publish an article on wireless waves, to explain them more fully.

**Brian Calverley** (Birmingham).—There is no necessity to have two telephone receivers for use with a wireless set. Provided you have good hearing, one will be quite sufficient.

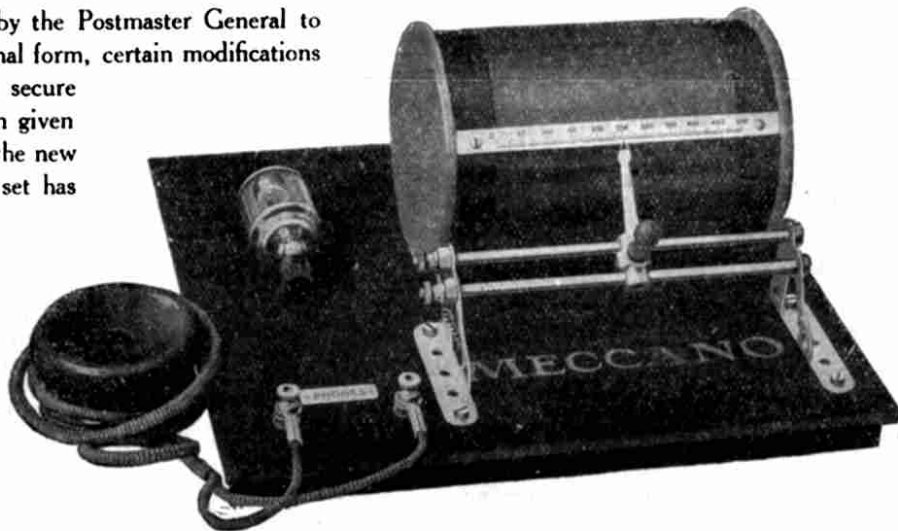
**E. K. Robeson** (London, W.2).—An indoor Frame Aerial can only be used with a Valve Set. You are the first person to my knowledge, to report a satisfactory result from a Frame Aerial used with a Crystal Receiver, and I shall be glad to have some further particulars of this interesting experiment.

**L. Baxter** (Birmingham).—You should be able to hear concerts on a Meccano Crystal Set when the Birmingham Broadcasting Station is transmitting.

**Eric Bygott** (Huddersfield).—(1) It is just possible that you might be able to receive the Manchester Broadcasting Station with a Crystal Receiving Set, as you are about 25 miles away. It would, however, be safer to instal a Valve Set, details and price of which will shortly be announced in the "M.M." (2) It is not possible to use a frame aerial with a Meccano Crystal Set. (3) Your suggested method of constructing an aerial by stretching the wire between the rafters of the roof, would not be satisfactory.

## The New Meccano Crystal Radio Receiving Set.

Technical objections having been raised by the Postmaster General to the Meccano Crystal Receiving Set in its original form, certain modifications have been made in the design in order to secure official approval. This approval has now been given and we have pleasure in illustrating herewith the new Meccano Crystal Receiving Set. The new set has been tested very thoroughly, receiving telephony and Morse with great clearness. It is wound to receive on wave lengths up to 500 metres. We believe that the alterations introduced constitute a great improvement and that our new Set is even better than the set announced in No. 26 of the "M.M." The price of the Set remains the same, 55/-, including single telephone receiver.



# Dr. Graham Bell

THE INVENTOR OF THE TELEPHONE.

All Meccano boys have noticed the blue enamelled sign which until recently was exhibited outside telephone call offices. The bell was the "trade mark" adopted because the telephone was invented by Dr. Bell. This article tells of the early life of this remarkable scientist.

OF the many hundreds of inventions brought out during the past century one of the most interesting and useful is the telephone. Within the space of fifty years this instrument has developed from a crude laboratory toy into a means of communication, involving millions of conversations every day throughout the world. To-day the telephone is so much used and so indispensable in our daily life that we are inclined to wonder how our grandfathers managed without it. Dr. Graham Bell, who died recently (2nd August last) on his estate in Nova Scotia, was the man who gave this wonderful invention to the world. We think our readers will be interested to read of his early work, for it enables us to learn something of the wonderful life and the brilliant achievements of a very charming man.

Dr. Alexander Graham Bell was born in Edinburgh in the year 1847, his father being a man of some distinction as a teacher of elocution and instructor of the deaf and dumb. Young Bell attended the Edinburgh High School, proceeding later to the Universities of Edinburgh and London. His father, who had visited America in connection with a system of 'visible speech,' or lip reading as it is sometimes called, removed to America in 1870. He was accompanied by his son, Alexander, who at that time was threatened with a serious illness.

In 1871 young Bell was employed teaching at Boston University, but later he established his own school where he taught his father's system of visible speech. In his spare time he experimented with tuning forks, magnets and electrical batteries. For three years he worked in this way and in 1874 evolved what he called the "harmonic telegraph," a device for sending ten or twelve Morse signals over a single wire at the same time, by utilising a peculiar phenomenon known as the law of sympathetic vibration. It was in the endeavour to develop this invention that Dr. Bell met his colleague, Mr. Thomas A. Watson.

## A HAPPY ACCIDENT.

It is a surprising fact that the means of transmitting sounds over wires was discovered by Dr. Bell through the result of an accidental misadjustment of his telegraphic apparatus. This happened one day in 1875 when, after a long series of experiments, one of the transmitter springs stuck, causing the magnetized steel to generate a current. Travelling over the wire this current caused a faint sound to be made in the receiver, and we can imagine the young scientist's excitement when he realised what this faint sound

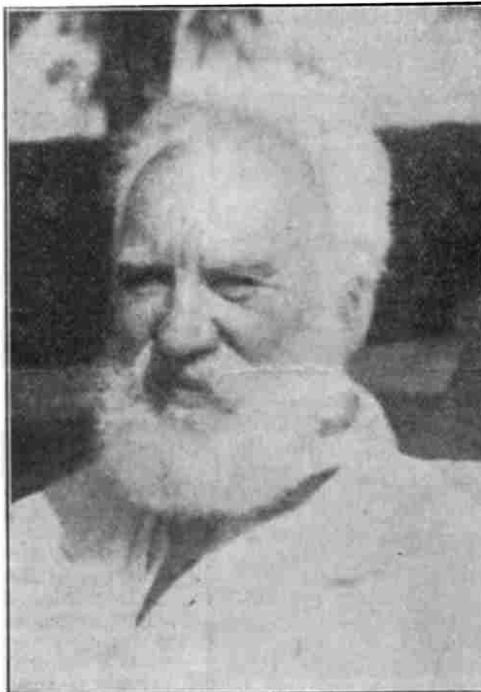
really meant. His dream of telephonic speech was within the bounds of possibility!

The principle once having been established, young Bell worked with a will to develop what he called the "talking telegraph," and on the 10th March, 1876, his efforts were crowned with success. On this memorable day Dr. Bell spoke into a telephone fixed in an attic:—

"Mr. Watson, come here. I want you!"

In the basement at the other end of 100 feet of wire his assistant listened, and then came rushing into the attic, shouting excitedly:—

"I heard you; I could hear what you said!"



Photograph [Underwood.]

## A recent photograph of the late Dr. Graham Bell.

This is the story of the birth of the telephone, as it was simply told by Dr. Bell himself. The inventor liked to add to it, however, by recalling that after English, the Japanese language was the next to be sent over the telephone. "I had two Japanese students," he said. "One of them asked me if the telephone could speak Japanese. I told him to try!"

## STARTLING AN EMPEROR.

Experiments proceeded apace until, on the 9th October, 1876, Dr. Bell and Mr. Watson made the first telephonic communication over a considerable distance. The conversation took place between Cambridge and Boston (U.S.A.). A short time afterwards the *Boston Globe* received the first telephonic newspaper report.

Remarkable though it now seems, Dr. Bell was at that time unable to interest anyone in his invention. Often on approaching business men they turned him away, saying that they had no time to bother with him or his "fool talking-machine."

At an exhibition held in 1876 at Philadelphia, however, the invention attracted the attention of Dom Pedro, Emperor of Brazil, who took up the receiver to listen to a voice speaking from the far end of the room. Hearing the voice, the Emperor dropped the receiver in a startled manner, and exclaimed "It speaks!" This event caught the popular fancy and drew more attention to the invention than all Bell's efforts with business men.

The first telephone company ever established, the Bell Telephone Association, was formed, and in 1877 there were 778 telephones in use. From that date the popularity of the telephone has continued to grow steadily, until to-day we find instruments installed in almost every office and place of business and in many private houses.

There is no doubt that the introduction and development of the telephone is one of the greatest triumphs of the twentieth century. Yet Dr. Bell, the scientist, was never interested in the commercial side of his invention. This was left to others to develop, while the inventor struck off into new fields. "It has always been that way," he said, "after I have made a discovery and got it under way, my interest in it lessens."

It is amusing to find that towards the close of his life Dr. Bell found the telephone such a source of annoyance that he had it removed from his room.

## DR. BELL DISCOVERS THE "PHOTOPHONE."

As a scientist Dr. Bell was always a strenuous and diligent worker. In addition to the telephone many other inventions and discoveries stand to his credit, including an instrument for transmitting sound by variations in a beam of light. This discovery was made in 1880, eight years before Hertz published his famous theory on "ether waves." It made possible telephony without wires, but by a different principle to that employed in Radio. The greatest distance over which it was used successfully in a large number of experiments was about 250 yards and thus, although the discovery was interesting from a scientific standpoint, it was not a commercial success.

Still intent on wireless telephony, Bell next invented the thermophone, which relied for its working basis on the variations in the intensity of heat waves. With this apparatus speech was transmitted over only 100 yards, so that it was not as effective as the photophone.

In his later years Dr. Bell spent some time investigating Radio matters, eventually becoming an ardent enthusiast.

## DR. BELL'S USEFUL LIFE.

Dr. Bell was truly a remarkable man, for not only was there no department in Physics that he had not touched, but he also found time to interest himself in the problems of mechanical flight. In the days when aviation was in its infancy he contributed valuable work in the attempt to conquer the air.

(Continued on page 10.)



A plan has been advanced in Chicago for equipping every policeman in the force with a miniature receiving set. It is suggested that the city should be divided into ten zones, each having its own wave length. Thus a central operator could immediately send messages concerning robberies or other crimes to the policeman in the districts in which the crimes had taken place.

Mr. Marconi recently said that it is beyond his power to picture what man will be doing with "the thunderbolt of Radio" during the next ten years.

The discovery of electro-magnetic waves in the ether is generally attributed to Hertz, but the Americans are endeavouring to claim the honour of the discovery for Professor Thompson, one of the first scientists to experiment with induction. These experiments, it is claimed, were made twelve years before those of Hertz.

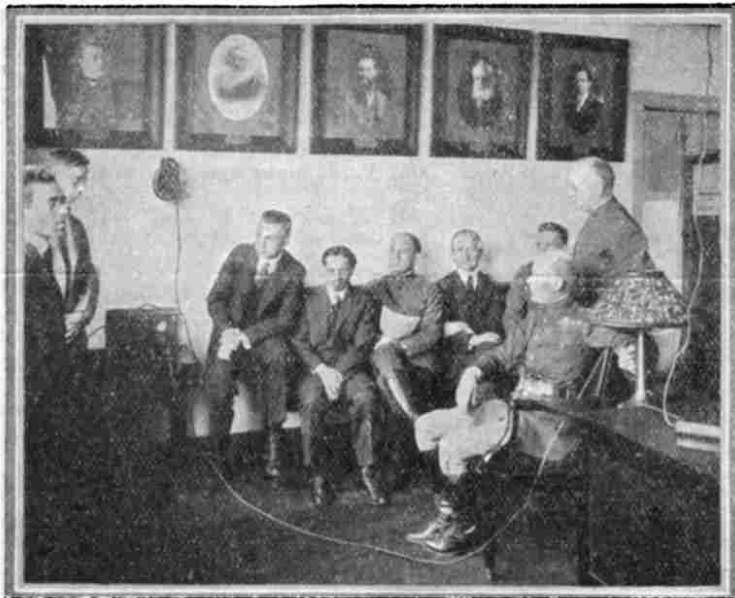
In this connection it may be remarked that the well-known inventor, T. A. Edison, discovered what he called an "Etheric force" as early as 1875. He arrived at the conclusion that a new force was present that would enable electrical currents to be induced without any connection with the source of the current.

In order to keep up to date, the Marconi Wireless Station at New Brunswick has had to be practically rebuilt three times within the last ten years. This has cost about £1,000,000.

A suggestion has been made that there will soon be placed upon the market a coin-in-the-slot Radio Receiver, to be installed in hotels, railway stations and other public places. All that will be necessary to enjoy a varied programme of music will be to drop a coin in the slot and "tune in," by adjusting a pointer on the apparatus until the required Broadcasting Station is heard.

Telephone messages, broadcasted from a distance of more than 100 miles, have recently been received on board a passenger train at San Francisco. The experiment marks a record as being the longest distance over which radio communication has been established on moving trains.

Mr. Marconi recently declared that Radio will have advanced to such an extent in the next ten years, that the apparatus now in use will be then practically worthless.



Photograph

["Illustrated World."]

General Squier, of the United States Army, demonstrating the possibility of using electric light wires in place of an aerial.

## A Novel Method of Reception RADIO CONCERTS RECEIVED ON ELECTRIC LIGHT WIRES.

One of the most interesting of the many recent inventions in Radio is that of Major-General Squier, Chief of the U.S. Army Signal Corps. General Squier recently demonstrated that Radio waves may be received by electric light wires and that when this method is employed the outdoor aerial is eliminated. To make this possible, of course, the transmitting station couples up to the electric light wires instead of to an aerial, the second connection being made to earth in the usual way.

Our illustration shows General Squier and his friends receiving a Radio concert by connecting the lead-in wire of his receiver to a lamp-socket. The impulses received over the light wires were amplified by the receiving apparatus on the table, conducted to the loud speaker on the wall, and, as soon as the switch was turned on, the room was flooded with music. This immediately ceased whenever the electric light switch was turned off.

It is scarcely necessary to add that we do not recommend any reader of the "M.M." to experiment in this direction, unless he is familiar with the working of an electric light circuit. He may not only damage his apparatus and fuse the lights of the house, but may also cause some injury to himself.

## Broadcasting News

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 wave lengths of from 60 to 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 440 metres.

The Hague Concerts are now broadcasted on Sundays during the afternoon from 3 to 5 p.m. on a wave length of 1,085 metres.

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.

Königswusterhausen, a station near Berlin, transmits telephony at 7 a.m. and 10.30 a.m. and may occasionally be heard speaking to Warsaw on a wave length of 2,800 and 4,100 metres. The speech is, of course, in German, and has been heard at the Meccano Works, Liverpool, on a three valve set.

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.

Broadcasting may be heard in the London area from Marconi House at intervals during the day and evening. The wave length is 360 metres and the call letters 2 L O.

Telephony is transmitted from the Eiffel Tower, Paris, at 7.20 and 11.15 a.m. daily on a wave length of 2,600 metres.

Music and speech is transmitted in the Newcastle area from 6 p.m. and 7.30 p.m. daily on a wave length of 440 metres, the call letters being 5 B A.





## THE SECRETARY'S NOTES.

I wish Guild members could look over my shoulder as I open my morning mail. They would read of Meccano Clubs in all parts of the world, busily engaged in the activities of the First Winter Session. They would see, too, hundreds of letters from Club members telling me how they look forward to Club Night and giving me details of the jolly times they are having. These activities are not all indoors, however, for the sports side is being well catered for. Meccano Clubs have their own Football Teams, Concert Parties, Hobbies Sections, Gymnastic Classes, etc., and every week the general scope of the Clubs increase in every way.

In an earlier issue of the Magazine I announced that two Meccano Lectures—namely, a revised edition of "Lives of Inventors" and an entirely new lecture "The Story of Our Ships"—were available for the use of Meccano Clubs. These lectures have met with a great reception from those Clubs who have already had copies. In this connection the Secretary of the "Oaklands (Motherwell) Meccano Club" writes:—"I return herewith your splendid lecture 'The Story of Our Ships' and I must say that from every point of view it has proved a complete success. The members of the Club shouted 'encore' and it had to be read all over again! The second reading was followed by an interesting discussion by the boys themselves. One of the members was particularly keen on having a copy of it and he wrote it out at my dictation; now, I learn, that every member has taken a copy from him. Some testimonial!"

Copies of both lectures are available singly, the only stipulation being that they are returned after the lecture is read so that they may be passed on to other Clubs.

Owing to the very extensive response to the announcement made in No. 26 of the "M.M." all the American Meccano boys who wished to correspond with English boys have been accommodated. The many English boys who have not been put into communication with American boys will be fixed up as soon as possible.

The Recruiting Campaign is again in full swing. In this connection I should like to impress upon members how essential it is that their names and addresses should appear on the back of each recruiting form as, otherwise, there is no means of recording their recruits. When a member has recruited three members a handsome Medallion is despatched to him. If he then obtains six additional recruits—making nine in all—he returns his Medallion to be engraved with his name and the words "Special Award." I shall be pleased to send further particulars on request.

As in previous years two Cash Prizes of £5 and £3 will be awarded for the best models built by Meccano Clubs during the Winter Session. The conditions of entry are that the model should be the joint work of the Club members and that it must be constructed at the Club meetings. There is no restriction as to the size or type of the model or to the number of parts used in its construction. The model itself is not to be sent in, but either a clear sketch or photograph submitted. The models will be judged by the President of the Guild, Mr. Frank Hornby, and the closing date of this Competition is 31 March, 1923.

Almost every day I hear from Guild Members who are interested in stamp-collecting—a hobby that has not only a fascination but one that is of great educational value. During the long winter evenings it is very delightful to turn over the pages of a well-filled album, examining the neatly mounted stamps. Historical events, geographical features and engineering structures are often depicted on stamps.

The Editor tells me that in the near future it may be possible to devote a column of the "M.M." exclusively to stamp-collecting. I am sure this will receive the warm support of many hundreds of Guild members. In the meantime I shall be pleased to do what I can to help stamp collectors by placing them in communication with fellow-enthusiasts.

Are You a Stamp Collector?

## The "Claygate Meccano Club's" Carnival.

During the past session the "Claygate Meccano Club" held a very successful Fancy Dress Carnival and Field Day. Both Sections (Boys and Girls) of the Club participated in the event, which was organised to wipe off the debt on the newly-erected Club premises.

The Claygate Brass Band was in attendance and in addition to a Fancy Dress Parade and Sports, the programme included numerous side shows and competitions. There were also Model Engineering, Needlework and Knitting Exhibitions and dancing was indulged in during the evening. Among the Meccano exhibits were a number of original models and in connection with this section eight cash prizes were awarded.

The day was thoroughly enjoyable and successful and is typical of the thorough-going and energetic "Claygate Meccano Club," which continues to make progress in every way.



## 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.

**Thornton Heath High School M.C.**—On 5 October the new Club-room, looking bright with Meccano posters, pictures and fresh paint, was opened, to the delight of all the members. At previous meetings there had been an interesting lantern lecture, "A Thousand Miles Through India." Another very enjoyable Lecture was given by the Librarian of Croydon, Mr. W. C. Berwick Sayers, F.L.A., on "Landmarks of Croydon History." The Football Team is in excellent form and the first match was won with a score of 6-3, the players being encouraged by shouts of "Play up the Guild" from the Club's enthusiastic supporters. Secretary: Master S. Sutton, 13, Campbell Road, Thornton Heath.

**St. Codd's M.C.**—The commencement of the Winter Session saw a new Club Leader installed—Mr. Woodhouse, of 52, Fisher Street, Plaistow. The Secretary of the Club was awarded a Special Merit Medallion at the close of the last Winter Session. Secretary: Master S. Elliott, 142, Beckton Road, Canning Town, London, E. 16.

**West Vlow M.C.**—A very successful exhibition was held on 19 October and a creditable display of Meccano models was shown. The electrical section included Burglary Alarm, Electric Bell, Telephone, etc., and during the early portion of the evening the room was illuminated with electric light, fitted up and connected by the boys themselves. A complete model of a Wireless Receiving Set was another special feature and models of Mountain Railway, Roundabout, Windmill, Motor Lorry, etc., were also on view. The Meccano Lecture, "The Story of Our Ships," Part 1, has been given, meeting with great enthusiasm. Leader: Mr. H. Cousins, 494, Mansfield Road, Sherwood, Nottingham.

**Waltreveden (Dutch East Indies) M.C.**—Continues to make excellent progress and at a recent Exhibition many fine models were shown, including Coal-tip, Dredger, Level Crossing, etc. A very interesting trip was made to a neighbouring town to see the Coal-bunkers there. The members watched with wonder the Grab lift coal out of the ship and haul it to the place where it had to be dropped. The Club also visited the Dry Docks. Secretary: Master R. E. Pilet, Raden Salehlaan, 54, Waltreveden, Java, Dutch East Indies.

### Clubs Recently Affiliated.

**1st Herne Bay M.C.**—This Club has been in existence since the beginning of the year and has now become affiliated with the Guild. Secretary: Master C. W. Russell, 4, Clifton Villas, South Road, Herne Bay, Kent.

**Calcutta (India) M.C.**—This is the second Indian Meccano Club to become affiliated with the Guild and it is entirely owing to the enthusiasm and hard work of the Secretary who has been endeavouring to get the Club established for some time past. Secretary: Master A. N. Roy Chowdury, 35/2, Beadon Street, Calcutta, India.

**1st Belfast M.C.**—Since this Club was first established accommodation has been kindly provided by the Strandtown Unionist Club. Many local gentlemen, interested in the Club, have kindly offered to deliver Lectures. The members are looking forward to a Lecture by Major Rupert Stanley, a prominent Naturalist. An interesting demonstration on Electric Bell Fitting and Wiring was recently given and was greatly appreciated by the members. Secretary: Master J. Sinclair, 39, Oakland Avenue, Bloomfield, Belfast.

**Central Secondary School (Sheffield) M.C.**—At the first meeting twenty-seven members were present, a very fine start for a newly-affiliated Club. All the members are enthusiastic and I feel confident that this Club will make rapid progress. Secretary: Master A. S. Taylor, Fern Lea Villas, 19, Roach Road, Eccleshall, Sheffield.

**Invercargill (New Zealand) M.C.**—Started at the suggestion of Master Arnold Laytham, this Club has now twenty-eight members and successful meetings are being held every week. Master Laytham has persuaded his father to act as Leader. Excellent progress is being made. Leader: Mr. W. H. Laytham, 10, Chelmsford Street, North Invercargill, Southland, New Zealand.

### Clubs Not Yet Affiliated.

**Birkenhead North End M.C.**—A Meccano Club has recently been established in Birkenhead and Meccano boys residing in the vicinity of Upper Brassey Street, Cloughton or North End, should communicate with the Secretary: Master Eric R. Hudson, 7, Upper Brassey Street, Birkenhead.

**Brixton M.C.**—A Club is being formed in Brixton and as soon as an adult Club Leader is obtained, affiliation will be granted. In the meantime meetings are being held regularly. Secretary: Master J. Slocombe, 30, Brixton Road, Brixton, London, S.W.9.

# 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.

**R. Stanbury (Tavistock).**—"Ybnr ohk narfdna on acce motkeu ldo ogl la."—We have passed your kind message on to the inventor of Meccano and he wishes us to thank you. Your code is not a very difficult one to discover and we wonder how many of our readers can decipher your message.

**G. Everts (Streatham).**—Thanks for your suggestions for Observation Cars, Cattle Trucks, etc., which shall have consideration.

**Mr. R. Samuel (Wallasey).**—"I have a keen Meccanoite in my son aged 7 years, who often falls asleep with his models at his side."—Your letter gave us much pleasure and we feel sure that the Liscard H.S. Meccano Club is fortunate in having secured your services as Leader.

**Gilley Kowitz (Muldu, Queensland).**—When our cars burn again we shall know that you are thinking of us, Gilley. We always thought that the rabbit was your biggest pest over there, but evidently the "Prickly Pear" runs it a close race. We have received all your letters and enjoyed them.

**W. Dixon (Norton-on Tees).**—We were very interested in hearing of your model of an overhead railway, which we can well believe works excellently. We may be able to publish the "Life Story of Meccano" in booklet form at some future date.

**J. P. Vevers (Bridlington).**—Thanks for photos of Bridlington Harbour, which unfortunately are not sufficiently clear for publication. Try again. We appreciate the kind things you say of the "M.M." and are glad to know that your Hornby train is such a success.

**A. W. Earls (Mortlake).**—Thank you for sending us cuttings from a wireless magazine describing a coil-winder made from Meccano parts. This and other useful radio fittings made from Meccano will be illustrated in forthcoming issues of the "M.M." Accept our congratulations on your school successes.

**E. W. Coney (Turner's Hill).**—The interest which older boys take in Meccano has been greatly extended by the introduction of the Meccano Radio Receiving Set, and you are now coming to the age when it will materially add to both your enjoyment and your knowledge. We shall always be very glad to help you with any model where you experience any difficulty.

**D. J. Grundy (Hendon).**—We are very sorry to hear that you have had such a severe attack of rheumatic fever, and we hope you will soon be quite well again. We are glad Meccano has helped to make the weary hours more pleasurable.

**R. Goodhan (Chatham).**—We had no idea dogs could be trained to work Meccano models. Yours is evidently more than usually intelligent.

**S. Graham (Camberwell).**—We are glad to know that Meccano has been the means of your securing a good berth, and we appreciate the many complimentary things you say about ourselves. Your queries are being dealt with by the Radio Editor. Thanks for Competition suggestions.

**B. H. Lord (Rochdale).**—You are right to work hard at your school lessons, even if you have to neglect Model building a little. Your new Magazine is a creditable first attempt. Let us see future numbers.

**F. A. Hill (Peckham).**—Your rebuke that we have not devoted the four extra pages to model railways would have hurt us very much indeed if we had not received so many letters of commendation for having given them over to radio matters! You are a voice in the wilderness, F. A., and the only thing left for you to do is to step into line and acquire a receiving set of your own. We are interested in the "Southern Express Railway" and especially in the news that yourself and co-directors have decided upon the addition of a Zulu Tank Loco to your rolling stock.

**T. H. Robinson (Bridlington).**—It is early yet to say whether you would be able to take up a position in our factory. As you are only 10 years of age you have some years of schooling to put in before you take up engineering as a profession. We are impressed by your earnestness, and advise you to pay close attention to your studies.

**R. K. Amisell (Elmina).**—"I have read your magazine with incredible gladness."—We read your letter with exactly the same feeling, R. K. Write us again.

## Good Things in Store.

The following articles will appear in future numbers of the *Meccano Magazine*.

- "Meccano Helps to Invent a Motor Cycle," by Lt.-Col. W. E. McKechnie.
- "A Giant Block-setting Crane."
- "The 1,000 h.p. Napier Aero Engine."
- "The World's Largest Liner."
- "Two Famous Locomotives, the *Great Bear* and the *Great Northern*."
- "How Jimmy Thornton Made Good."
- "Signalling by the Morse Code."

No Meccano boy should miss any of these interesting articles. A regular order for the "M.M." should be placed with your dealer or direct with this office.

## Loading Up a 'Plane.



The above photograph, taken on the sands near Swansea, shows an aviator filling up with petrol. The snap was contributed by Master James Yarnold, of Eastham Park, Wells, Tenbury Worc.

## New Meccano Manual.



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

## A Holiday in Ireland (continued from page 4).

river was swollen so much by the inrush of water from the sea that it burst its banks. Many of the adjacent houses were flooded out, and their occupants had to take refuge in the bedrooms and could not come downstairs until the storm had abated. Each morning on our way to the beach we had to cross a footbridge across the River Leitrim. There were four or five swans



Footbridge Across River Leitrim.

on the river and they were extraordinarily tame. When they saw anyone on the bridge they immediately came to be fed.

One day we went to see the lighthouse, and the keeper showed us over it. He even went to the trouble of lighting the lantern to show us how it worked. It was wonderful to see how the light was reflected from the upper and lower prisms of glass to the centre reflectors, of which there were three. The light was a revolving one and the reflector floated in a tank of mercury, to ensure smoothness in revolving. There have been two lighthouses at this spot but one was struck by lightning and the other was condemned because its beam was not visible from all directions.

Just before we left we made an expedition to the Silver Strand, a very beautiful place where there are many interesting caves. Its beauty is renowned even to American visitors, who seldom leave that part of Ireland without first seeing the Silver Strand.

Altogether we spent a very happy holiday and you may be sure we were sorry when the time came to go home.

## 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.

## Dr. Graham Bell (continued from page 7).

In looking back over Dr. Bell's career we cannot fail to realise the greatness of his work and of all that he has done for the world. Not only did he, as an inventor, "dream dreams," but he lived to see his dreams come true. A word-picture of him, drawn in the Autumn of his life, shows us a majestic figure—a strong commanding type of a man—tall and finely built, moving amongst a happy family group. His skin tanned by the open air, his thick white hair flung back, he still possessed the clear blue eye of a young man.

We are pleased to pay tribute to the memory of so devoted a scientist, whose career bore such wonderful fruit in the cause of science and the pursuit of knowledge.



## 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.

**Hugh King** (Farrington, Hants).—We shall give consideration to your idea for a 24" hexagon plate.

**Andrew A. Mellwraith** (Kilmarnock).—We regret that lack of space does not permit of the insertion of the photographs you mention.

**Dennis R. Marshall** (Leeds).—As an alternative to using a strip as a connecting rod you could employ a rod with a coupling at either end, connection being made horizontally through the end hole in the coupling by means of a 1/2" bolt. One or two spacing washers on the bolt would ensure free action. This is an instance of existing Meccano parts being adaptable and obviating the creation of special parts.

**Alan D. Low**.—We are contemplating the printing of a rule on the backs of all Manuals. We realise the help it will prove to all Meccano users. It already appears in the new No. 0 Manual.

**Harry J. Saker** (South Darent, Kent).—We doubt the usefulness of the forked flat bracket you suggest, but we shall give it careful thought.

**K. Lord** (Narborough, nr. Leicester).—The roller feeds for a cinematograph would only be useful for this one purpose. Any new part which we issue is designed for general use as far as possible. In any case, a successful working model of a cinematograph could not be made without a lens and this is out of our province.

**M. Peyron a Montcornet** (Aisne).—We have not yet decided to introduce a circular saw and the matter is still under consideration.

**R. Shank** (New Southgate, N.).—(1) We do not see that it is necessary to dispense with the boss in the crank piece you suggest for use as a connection for crane arm stays. (2) Models of motor vehicles vary so in size that we could not very well standardise radiators and bonnets. (3) Our 3" pulley wheel with a rubber ring makes an admirable motor car wheel. (4) We cannot follow the application of the eye piece and bracket you suggest.

**Owen Shaw** (Gravesend).—Face plates, joined by double angle strips of the desired length, give a fairly good representation of a locomotive boiler.

**David Gardner** (Fulham).—Many thanks for drawing of the improved vertical engine you suggest. No doubt some time in the future we shall turn our attention to the development of steam models.

**J. R. P. Edkins** (Baxenden).—The water motor did not meet with any great demand and was superseded by our electric motor.

**Ilan Raynaud** (Marseille).—The H. girder which you suggest would have a very limited use as a Meccano part. Our existing parts are capable of performing the functions you name.

**M. Lauvedot Brignois**.—We shall consider your suggestion for a large locomotive driving wheel.

**C. Basil de Lavray** (Wimbledon, S.W.).—We do not quite follow your suggestion for an acute angle bracket.

**A. Wedgewood** (Harrogate).—We are continually adding accessories to the Hornby Train system as opportunity occurs. No doubt we shall introduce a loco shed in due course.

**Collin Mackenzie** (Herne Bay, Auckland, N.Z.).—We are afraid your suggestion would be rather a difficult subject to incorporate in a film picture. It would scarcely be practical. Many thanks for your good wishes and we hope you had an enjoyable time at Rotorna.

**V. Georges Fromont**.—We have not yet found the need for a larger bevel gear. A 1 1/2" conical wheel operated by a 1/2" pinion would no doubt serve your purpose. We have in mind a flat loose pulley which between two flanged pulleys could be used for changing a belt drive. Curved strips are already contained in our list of parts and we think these could be used for the purpose you suggest. Your other suggestions will have our consideration.

**L. B. Holt**.—(1) We have in mind the addition of a flange to the clockwork motor. (2) Stainless steel has yet to be produced at a cost that will permit its use for general purposes. At present its production cost is very high. (3) Although not quite so realistic metal sleepers for rails, etc., have proved more satisfactory than wooden ones.

**Sidney Dalton** (Sheffield).—We do not supply rubber rings to represent motor tyres but they may be obtained from any rubber goods store. An expansion spring may be made into a compression spring by removing the end loops and stretching out the coils. The removal of the loops can easily be effected by the use of small shears or wire cutters.

## The New Meccano Building in Paris.

By FRANK HORNBY.

Boys in Great Britain have always followed the progress of Meccano in other countries with much keenness and I feel sure they will be interested to hear of the success that is crowning our efforts to make Meccano products as popular in France as they are in this country. In one way, at all events, the history of our career there, has been a repetition of our experience in England.

the War we were compelled to make the best of the situation. At the end of the War, we immediately searched for more commodious premises, but found nothing suitable. Shortly after, however, a very desirable piece of land came into the market in the Rue Rébeval, not far from the centre of Paris, and as soon as I heard of this I went over to inspect it. I saw that it was an exceedingly suitable position for the Meccano business, and

immediately effected a purchase. Without delay our architect prepared plans for a building that would give us the accommodation and facilities we desired. The work of erecting the building was pushed forward with all speed, and at the beginning of the present year it was completed and ready for our occupation.

I was most anxious that, in addition to the building being suitable for our business, spacious, well-lighted, etc., it should also possess some architectural beauty and merit, and I leave my readers to judge from the accompanying illustration how far our architect has succeeded in giving expression to my views. In a special article which appeared in *The Architect*, the writer, referring to the dignity and pleasing effect of the Meccano building, states that it has attracted considerable interest in Paris and that the French Authorities themselves have expressed their pleasure at such enterprise.



THE NEW MECCANO BUILDING IN PARIS.

The Meccano building covers 9,000 square feet, stands on an elevated

site, and is conveniently situated for the rapid distribution of our goods throughout France. We have now been in occupation of the premises for several months, and I foresee that large as they are, our French business will grow so rapidly that soon even this building will be none too commodious for us.

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**Stanley J. Graham** (Camberwell, S.E.).—The large circular plates which you mention are very limited in scope. In addition, their great size would offer difficulties in packing. For smaller circular constructions see our reply (above) to Owen Shaw, Gravesend.

**Rex A. Addison** (St. Leonards-on-Sea).—A guide rail in narrow gauge and radius rails is not practical. Furthermore, its addition would add considerably to the cost.

**Herbert Monsman** (Hammersmith, W.).—We should be interested to hear of any use you have found for the suggested double strip coupling. We are afraid such a piece would be very costly to make.

**Raymond Evans** (West Bromwich).—Our Manuals are undergoing complete revision. The model of the beam scales has been reconstructed on the lines of the scientific balance with the beam actuated by a lever.

**M. Thuault** (Blois).—We have under consideration the introduction of a 3 1/2" gear wheel. This will fill the requirements of your suggested piece precisely.

**B. Sewell** (St. Leonards-on-Sea).—The inclusion of a smaller pinion than half-inch would not be practical as it would depart from our half-inch standard.

**Harold Wise** (Grantham).—Quite a big proportion of your extensive suggestion list is dealt with in this column. You will doubtless recognise the subjects as you read through it. Electrical accessory parts may be purchased separately from any Meccano dealer.

**H. R. Dorsey** (Leeds).—We do not think that there is scope for a threaded washer. The ordinary nut would serve the same purpose.

**G. Speight** (Sheffield).—(1) The crank piece would serve the same purpose as your suggested strip with a boss for a bearing for a high-speed shaft. The method we usually adopt for heavy friction bearings is to superimpose strips. (2) We do not quite follow your reference to the pivots in the flanged wheel. Our present type of flanged wheel is pressed from one piece with the exception of the boss.

**H. Barton** (Swansea).—(1) We should be interested to hear of the precise application of the triangular plates you mention. (2) We have issued detachable flanges for attachment to Face Plates for making larger flanged wheels.

**Alan L. Gibson** (Halifax).—Perhaps some time in the future we shall manufacture a mechanical motor car, but not yet awhile.

# 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

**T**HE 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 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

**ZULU CLOCKWORK TRAIN PRICES.**

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



**MECCANO LIMITED Binns Road LIVERPOOL**

## 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.

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.

## New Meccano Outfits: Nos. 6a and 7.

We have pleasure in announcing two new Meccano Outfits, Nos. 6a and 7. No. 6a is, of course, an Accessory Outfit converting a No. 6 into a No. 7. The No. 7 is a complete and comprehensive Outfit, containing the Meccano parts necessary to build all the models in the new big Manual of Instructions. These include such special models as the Loom for real weaving, the Motor Chassis, Stiff Leg Derrick, Meccanograph, Eiffel Tower, High Speed Ship Cooler, Transporter Bridge, Forth Bridge, Hydraulic Crane, Dredger, etc.



The No. 7 Outfit also contains a Clockwork Motor, Electric Motor and a 4-volt Accumulator, a range of all the new Meccano parts, including electrical accessory parts, with full electrical instructions. The Outfit is contained in a beautifully finished oak cabinet with lock and key and makes an ideal present for a boy interested in mechanics and electricity.

**PRICES:**

Meccano Outfit No. 6a (for converting No. 6 into No. 7) .. ..	210/-
Meccano Outfit No. 7 (packed in beautifully-finished oak cabinet with lock and key .. ..)	370/-

## New Timber Wagon.



We have pleasure in announcing the introduction of a new timber wagon as illustrated above. The wagon is made in Gauge O and is beautifully enamelled in colours and stoved. It possesses the usual high finish.

Complete with load of timber, each 2/-.