

required on this class of goods include opening of cases, examining for damaged tins, removal of blown tins, labelling, etc.

Grain, which is packed in bags, has to be carefully stored to prevent bursting. Before the war there was a tradition that it should never be piled more than five bags high. This, of course, involved a great loss of space, and during the war, when all available space was required, this convention came to an end, and in some cases the grain was stored over 80 bags high! If the piling is done by machinery under expert supervision, there is no real risk of danger.

Cold Storage

A detailed description of all the many classes of goods dealt with in docks and warehouses would take up a great deal of space and be very monotonous, but our article would not be complete without some mention of cold storage. Varying degrees of low temperature are required for different kinds of traffic.

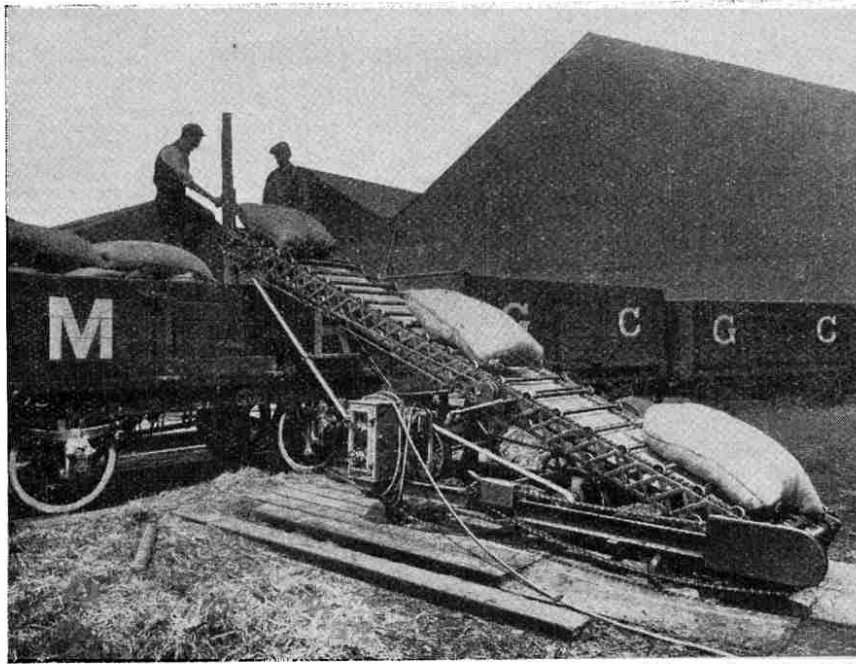


Photo courtesy]

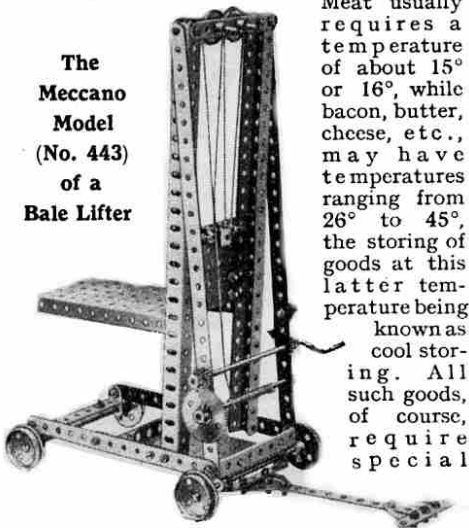
[Messrs. Henry Simon Ltd.

Loading Railway Wagons

course, to be paid for. The first charge incurred is that for port dues payable on all goods entering the particular port. Next is the landing charge, which at some ports is charged on all goods and at others only on goods that actually touch the quay. This charge also covers rent for the use of the quay during the few hours the traffic remains there.

It is not easy in a short article to give an adequate idea of the intensely interesting methods and mechanism employed in handling goods at docks and in warehouses, but it is hoped that enough has been said to encourage Meccano boys to take the first opportunity that comes along to see these things for themselves.

The Meccano Model (No. 443) of a Bale Lifter



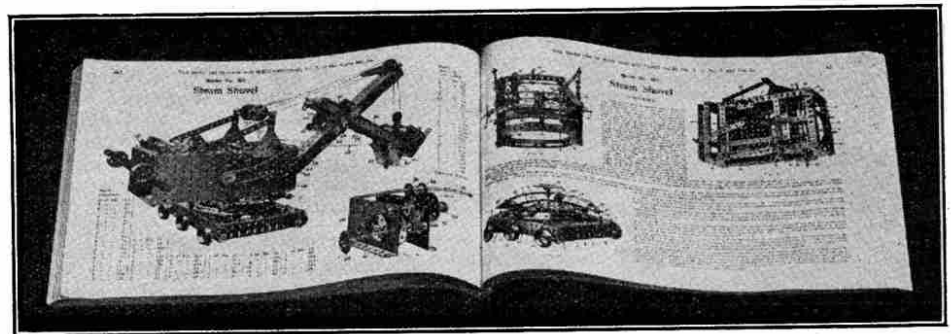
Meat usually requires a temperature of about 15° or 16°, while bacon, butter, cheese, etc., may have temperatures ranging from 26° to 45°, the storing of goods at this latter temperature being known as cool storing. All such goods, of course, require special

handling. Refrigerated meat, for instance, has to be transported in insulated vans, either railway or motor. The interior of these vans is entirely covered with cork to prevent a rise in temperature, and the vans are specially locked.

The cold storage of eggs is a specially difficult problem. A temperature of a little over 30° is required, and only a margin of about one-eighth of a degree can be allowed either way. If the eggs are kept at too low a temperature they crack, while if the temperature is too high they go bad. In order, therefore, to keep a close watch on the temperature, an electric alarm is installed which automatically gives warning by means of a bell whenever the safe limits are exceeded.

All the various services carried out at docks and in warehouses have, of

The New Meccano Manual



There are three Manuals, the 0 Manual for simple models built with the 00 and 0 Outfits, the 0-3 Manual comprising models built with any of the Outfits up to and including No. 3, and the Complete Manual, which comprises a selection of models that may be built with every Outfit up to a No. 7.

This latter Manual is a very fine publication and should be in the hands of every Meccano boy. It includes instructions for building 389 models, including most of the models shown in the former No. 3 Manual, the publication of which is now discontinued. The new edition (No. 24)

of the Complete Manual is beautifully illustrated in half-tone and most of the models have recently been revised, and very greatly improved by the introduction of new parts that have been added to the Meccano system during the past year. Several new models have been included for the first time, including some of those published in recent numbers of the "M.M."

Prices of Manuals.

0 Manual	(postage free)	6d.
0-3 "	"	1/2
Complete Manual	"	2/10

How to Run a Miniature Railway

(Continued from page 81)

their designers pay little attention to appearance so long as the locos do their work satisfactorily. British loco designers, while equally keen on efficiency, always endeavour to secure a good appearance for their engines by placing as much of the mechanism as possible under cover, and giving the whole loco a high outward finish. American and Canadian engines on the other hand appear to have as much as possible of their mechanism on the outside.

American and Canadian locos are, of course, much larger than ours—a direct result of the scale on which the bridges in these countries are built. The British designer is severely limited by the "loading gauge," that is the height that must not be exceeded by any railway vehicle. On British railways the gauge is 13 ft. 5½ in., whereas in America it is 16 ft.

American locos differ from ours also in another respect. British locos are built with a view to each one having a very long working life, whereas in America 10 years is considered a good life for any loco, after which it is ready to be scrapped to make way for something more up-to-date.

NEXT MONTH:

The Use of Meccano in Miniature Railways

Lucky Dundee Boys

That enterprising firm of Meccano dealers, Messrs. Draffen and Jarvie Ltd. (Nethergate, Dundee), recently organised a Puzzle Competition in which a special Meccano Cross-Word Puzzle was drawn up and printed on sheets that were given to applicants at the toy store. To every boy who correctly solved the puzzle a free subscription to the *Meccano Magazine* for a whole year was awarded. The Competition was a great success and we congratulate the organisers on their enterprise in this connection. We think it would certainly be a good idea if every other toy store followed this example.

Typewriting for Authors

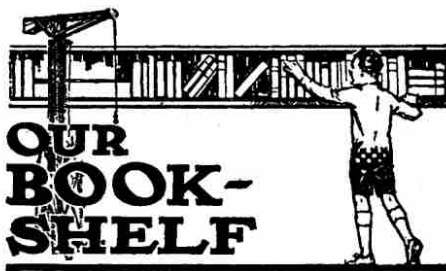
The value of typewriting to anyone with literary aspirations cannot be over-estimated. Editors have such an enormous amount of material to read through day by day that, as a rule, they insist on all contributions being typewritten. The fact that a contribution submitted to an editor is typewritten may indeed secure its acceptance where the same article, if hand-written, would have been pushed on one side without consideration. Messrs. A. W. North (47, Parchment Street, Winchester), who are regular advertisers in our columns, have opened a typewriting department for the quick and accurate copying of articles, letters, circulars, etc., and any of our readers who require service of this kind would do well to communicate with this firm.

Block-Setting Cranes—(Continued from page 55)

however, and it was decided to call in engineers from abroad to repair the damage and to report on the improvement of the work generally, as no English engineers had had any experience of this class of work.

During the reigns of Elizabeth and James, various additions to the harbour works were made, and subsequently such distinguished engineers as Perry, Smeaton, Rennie, and Telford all examined the question. Subsequently, considerable sums were spent on improving and extending the harbour works, but no satisfactory results were obtained until after the invention of Portland Cement, which revolutionised this branch of engineering.

(To be continued)



Readers frequently write to me asking if I can recommend books that are both of interest and of use. In this column I hope to review books that I consider specially appeal to Meccano boys. I do not actually supply these books, which may be obtained either through any book-seller or direct from the publishers.—EDITOR.

Stamp Collecting for All

By Stanley Phillips.

(Stanley Gibbons Ltd., London, W.C.2, price 1/-).

To the boy first taking up stamp collecting this fascinating hobby appears fairly simple and straightforward, but as a matter of fact there are many difficulties which, if not properly explained, are apt to cause the young collector to lose heart and abandon the hobby. "Stamp Collecting for All," by Stanley Phillips, is specially written to make the way easy for the beginner, and to point out the various pitfalls so that they may easily be avoided. The book is well illustrated and can be recommended strongly to any boy who has just commenced, or who is thinking of commencing, this delightful hobby.

The Radio Year Book

(Sir Isaac Pitman & Sons Ltd., London, price 1/6).

This handy volume, now in its third year, fully maintains its value as a book of reference for all interested in radio. The amount of ground it covers is remarkable, and this result has been attained by skilful condensation. All radio enthusiasts, whether interested in broadcasting or in the more technical aspects such as wireless television, are fully catered for, and broadcasting enthusiasts will examine with interest the photographs of various announcers and "uncles" at the B.B.C. stations, and of a number of the favourite broadcasting artists. The book includes a list of stations and radio societies and a useful trade directory.

Photographic Handbook

(Burroughs & Wellcome Ltd. Price 1/6).

The "Wellcome" Photographic Handbook in its pleasant green cover comes year by year as an old friend to all photographers desirous of getting the most out of their hobby. The 1925 edition retains all the valuable features of the past, and in addition has many interesting new features. Pages packed with information on the most accurate and at the same time the simplest methods of development and printing are followed by tables giving the comparative speeds of all well-known makes of plates, films and bromide and gaslight papers, and at the back of the book is the well-known "Wellcome" Exposure Calculator, possibly to many readers the most valuable feature of the book.

Radio for the Millions

(Hodder & Stoughton Ltd., London. Price 2/6).

"Radio for the Millions who Listen" is the title of an interesting book by "Experimenter" of the Manchester Evening News.

In this delightful book the author aims at assisting two classes of amateurs—those who are intending to take up wireless, and those who already possess some apparatus and desire to know more intimately how it works. For either of these readers this book can be recommended. It is written in a clear and easy style, and even the most complicated subjects are placed before the reader in an admirably lucid manner.

"The Story of Broadcasting."

By Arthur Burrows.

(Cassell & Co. Price 3/6).

Mr. Burrows, once familiarly and even affectionately known throughout Great Britain as "Uncle Arthur" at 2LO, is now one of the senior officials of the British Broadcasting Company. In this volume he presents information on subjects interesting to hundreds of thousands of listeners. He explains in a homely way the theory of wireless; sketches its development in peace and in war; reveals many romantic facts associated with the growth of broadcasting in Britain, and takes readers behind the scenes at the London and Provincial Broadcasting Stations. Finally there are startling speculations upon the future. Every page has a strong appeal for all wireless enthusiasts and the book will prove very interesting even to the general reader.

"Wireless World."

The latest issue of the *Wireless World* to hand—No. 283—contains detailed instructions for making up a high-grade power amplifier having two low frequency stages. The design is not at all complicated, and the average beginner should not find it difficult to make this apparatus. The mechanical construction of a new electron relay, invented by an American is described, and the applications of the relay are discussed. Among the interesting illustrations is one shown of Mr. Max Howden (3 BQ) of Box Hill, Victoria, the first Australian amateur to effect two-way communication with America. The photograph shows the simplicity of the apparatus used by Mr. Howden. The regular features of the paper are fully up to their usual high standard of interest.

A Useful Transformer

We have recently tested a transformer made by the Electro Supplies Co. (of 19a, The Broadway, Wimbledon, S.W.19). This transformer is a well-constructed piece of apparatus wound for a primary current of from 200 to 220 volts and gives a secondary current of 6v. 5 amps. It was tested on 100v. and gave 3v., which current remained practically constant as the load increased. After two hours on full load (5 amps.) there was no heating-up, showing that the transformer is decidedly well-insulated. An interesting feature is the wide contacts of the adapter with which the transformer is fitted, this being a great improvement on the usual style.

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Competition Corner

"MY FAVOURITE RAILWAY" ESSAY COMPETITION

Essay Competitions appeal strongly to a large section of our readers, particularly when the subject is something of an engineering nature. This month we announce an Essay Competition on the following subject: "MY FAVOURITE RAILWAY AND WHY I PREFER IT."

The competition will be divided into two sections—(A) for those of 14 and over, and (B) for those under 14, and four prizes will

be awarded—Meccano goods to the value of £1/1/0 and 10/6 for the first and second in each section respectively.

Essays must not exceed 1,000 words in length and must be neatly written on one side of the paper only, with the competitor's name, address and age on the back of each sheet.

Closing date, 28th February (overseas, 31st May).

Third Drawing Competition

Our second Drawing Competition has produced quite a deluge of entries, the majority of them good and many of them really excellent. We are now announcing a Third Contest, the subject of which is: "AN ELECTRIC TRAMCAR WITH OVERHEAD TROLLEY." Drawings may be made either in pencil or ink.

The contest will be divided into class (A) for those of 16 years and over, and class (B) for those under 16. There will be four prizes—Meccano products, to be chosen from our current catalogue by the winners, to the value of 10/6 and 5/- respectively for the first and second in each section.

Closing date, 28th February (Overseas, 31st May).

12th Photo Competition

The demand for more Photographic Competitions continues unabated, and this month we are announcing our Twelfth Competition. The subject is "A BRIDGE, VIADUCT, OR AQUEDUCT." Almost every reader lives within reach of various structures of this kind, and it is hoped that there will be a good entry for this contest even if the photograph shows only the footbridge at the local railway station!

Following our usual procedure the contest will be divided into two sections—(A) competitors under 14 years of age, and (B) competitors 14 years and over.

Every competitor must write his name, address and age on the back of every photograph he submits, and must also state by whom the photo was developed and printed. In the event of a tie for a prize, photographs that have been developed and printed by the competitor himself will receive preference. Envelopes containing entries should be marked "Photo Contest" in the top left-hand corner.

Four prizes are offered in this contest—Meccano Goods to the value of 10/6 and 5/- as first and second prizes respectively, in each section.

The closing date for readers in the United Kingdom is 31st March, and for readers Overseas, 30th June.

"Suggestion" Competition

From time to time we receive various suggestions for new forms of competition. Many of these are of little use, either because we have already had such a competition in the past, or because the scheme proposed is impracticable for various reasons. In order to try to find out what ideas our readers really have on this matter, we have decided to institute this month a special "Suggestion" competition, the subject being: "MY SUGGESTION FOR A NEW COMPETITION SUITABLE FOR THE 'M.M.'"

The description of the competition suggested should be as brief as possible, consistent with clear explanation. If the suggestion is based upon a competition recently seen by a reader in another paper or magazine, this should be stated when submitting the idea.

We draw the attention of intending competitors to the fact that the following competitions have already been conducted in the "M.M.": Lynx-Eyed (identification of fragments of models from the Meccano Manual); Sharp Eyes (finding mistakes in drawing); Photographic; Essays; Drawing; Stamp Bargain Hunt.

A Meccano Radio Receiver or pair Double Headphones (at the winner's choice) will be awarded to the four most original, and at the same time, practicable suggestions.

Last date for receiving entries, 28th February (Overseas, 31st May).

Competition Closing Dates :

Eleventh Photo.	28th February.
"My Favourite Railway" Essay	28th February.
Third Drawing	28th February.
"Suggestions"	28th February.
Twelfth Photo.	31st March.

OVERSEAS :

"Sharp Eyes"	30th April.
Bargain Hunt	30th April.
Second Drawing	30th April.
Third Drawing	31st May.
Eleventh Photo.	31st May.
Cycling Hints	31st May.
"Suggestions"	31st May.
Twelfth Photo.	30th June.

Result : Christmas Puzzle Contest

We expected our Christmas puzzle contest to prove popular, but we were more than surprised at the remarkably large number of entries that poured in from boys and girls of all ages. This big response entailed an enormous amount of work, as we make a point of examining closely every individual entry. Several competitors sent in correct solutions to all the puzzles they selected, and the standard of excellence in general was very high. After consideration, and in accordance with the rules governing this contest, in which neatness played an important part, the prizes have been awarded as follows:—

FIRST PRIZE (Hornby No. 2 Goods Set), G. E. Selby, Ben Rhydding, Yorkshire; SECOND PRIZE (Hornby No. 2 Tank Loco), W. Renshaw, Sheffield. Meccano Radio Receivers or Headphones—S. R. Mc E. Porter, Northfield, Birmingham, T. W. Gribble, Ipswich, and W. Clark, Grove Hill, Middlesbrough.

We congratulate these competitors on their success, and hope that those who were not successful on this occasion will have better luck in future competitions.

Result : "Bargain Hunt"

Evidently most of our readers interested in stamp collecting took part in the second "Bargain Hunt" Contest. Several competitors agreed as to the first two bargains, but there were varied opinions about the third.

All votes were carefully counted with the following results:—(1) Messrs. Amber & Wright (London); 2, Messrs. Lisburn & Townsend (Liverpool); 3, Nelson T. Hillier (Horsmonden). The only entry bearing these names in their correct order was sent in by J. W. Johnson (Wimbleton, London), who has therefore been awarded the first prize of a packet of stamps, value £1 ls., or stamps to that value, to be chosen from any one firm advertising in the "M.M."

As no other competitors sent in correct entries the remaining three prizes have been awarded to those whose post-cards corresponded most closely with the general order of the voting. Therefore C. J. Miller (Southampton), H. W. Deyer (Exeter), and J. S. Lowe (Caithness), are each entitled to a free advertisement in the "M.M." in which to announce their own bargains or wants. The prize for the dealer in whose advertisement the biggest stamp bargain was found has been awarded to Messrs. Amber & Wright (London), who are regular advertisers in the "M.M."

The two consolation prizes offered by Nelson T. Hillier to the best "runners-up" under and over 12 years of age respectively have been won by E. J. Baxter (New Ferry, Cheshire), collection of 1,000 different stamps; T. W. Gribble (Ipswich), standard catalogue of postage stamps, 1925 edition.

Result : Third "Lynx-Eyed Contest"

The numerous entries received in this competition prove that its popularity is undiminished. Although many hours were spent in trying to make these puzzle pictures much more difficult than the last set, no less than 32 competitors succeeded in solving them all! The correct solutions of the three sets of puzzle pictures will be published in the May issue of the "M.M."

In order that each of the 32 successful entrants should receive a prize, the number of consolation prizes has been increased to 29. According to the rules governing a tie, neatness of writing has been taken into consideration. The prize winners are as follows:—

FIRST PRIZE (Hornby No. 2 Pullman Set), C. G. Emmett, West Kensington, London, W.14.

SECOND PRIZE (Meccano No. 1 Radio Receiver), to F. L. Jones, Thornton Heath, Surrey.

THIRD PRIZE (Pair Meccano Headphones), to E. Watson, Blackburn.

Consolation Prizes of Meccano New Complete Manuals or Meccano Writing Pads have been awarded to the following competitors: H. C. Ager (Northampton); N. F. Beckett (Bromley); T. C. Bell-Curr (Arbroath); E. H. Bradshaw (Sheffield); W. A. Bradshaw (Sheffield); P. T. Bourne (Birmingham); A. Bulmer (Tantobie); L. Chilvers (Norwich); C. J. Christmas (Hereford); N. M. Douglas (Inverness); M. S. Y. Fowler (Teddington); L. Fuller (Henfield); R. Harvey (Harrow); R. H. Herbert (Wallasey); R. Hill (W. Smethwick); G. W. Hook (Honiton); P. Horner (Cross Hills); H. Hunter (Belfast); C. B. Kirby (Burton-on-Trent); R. E. M. Lane (Burton-on-Trent); F. Longley (Dobcross); S. Marsh (Thornton-le-Fylde); R. H. Masters (Ilford); H. Milnes (Barnsley); I. H. Ronald (Arbroath); R. W. Selby (Chard); K. Seymour (London); L. W. Welland (Thames Ditton); R. Wiegold (Luton).

OUR BUSY INVENTORS

RECENT INTERESTING PATENTS

Every day new inventions and ingenious labour-saving devices are being brought into existence, and from time to time the most interesting of these inventions are described and illustrated in these columns. Readers are invited to send particulars (accompanied, if possible, by photographs or rough sketches) of any interesting inventions or devices that may come to their notice. Payment will be made for any contributions used.

Among recent minor inventions the following are perhaps of the greatest general interest:—

A life-saving suit, made of a special mixture of asbestos cloth, that successfully resists heat and flame while also protecting the wearer from the effects of smoke. Clothed in this suit the inventor recently entered a blazing building after it had collapsed, and lay down in the glowing embers without injury.

* * *

A wonderfully-constructed timepiece, in which there are no hands or gears and which takes its reading by the sun's position in the sky. The instrument is a combination of sun-dial and compass, and is adjusted for the latitude of the particular country in which it is used. The device may be carried in the vest pocket, and is said to be as accurate as more complicated timepieces.

* * *

A radio receiver that does away with the ordinary head-pieces and allows greater freedom of movement. The ear is entirely enclosed in this new device, and as all external noises are shut out music sounds more natural.

Useful for Motorists

One of the disadvantages of a flash-lamp is the fact that the user must either give up one hand to hold it or else rig up a temporary stand for the light. Even then, this is not always satisfactory, as the light remains fixed upon a single spot instead of following the work. An ingenious device for overcoming this difficulty has recently been placed on the market. In it the flash-lamp is attached to a pair of goggles. The lamp is placed out of the line of vision and a shield protects the eyes from the light to prevent dazzling. Current is supplied from a battery attached to the lamp by means of a flexible wire from the bulb down to the coat pocket. The device ensures that the light will shine exactly in the direction in which the wearer is looking.

Counting Revolutions

An instrument, called the "Oscilloscope," for studying rapidly-moving machinery, has just been perfected. By means of this invention a crankshaft turning at 3000 revolutions a minute is made to appear as if revolving only 30 times a minute. The Oscilloscope will prove of great use in the study of the machinery used in cotton-spinning and similar trades, as any machine running at full speed may be made to look as if it were running at only one hundredth the actual speed. The invention will also be useful in the study of automobile engines and aeroplane motors.

How to Count Banknotes!

This invention is useful to bookkeepers, printers, bank cashiers, and others who turn over pages or papers at speed. The invention consists of a finger moistener that fits in the palm of the hand, the fingers being kept damp by touching them against a piece of sponge mounted on a small metal water reservoir, as shown in the illustration.



Hot Drink Machine

An Italian inventor has made an automatic machine that prepares a cup of hot cocoa by first powdering the cocoa, and adding water and milk, boiled in a separate container. A cup of cocoa will be found ready twelve seconds after a coin has been inserted. The correct amount of milk is heated by a steam jet, and the cocoa and sugar being added, the mixture is well stirred before being deposited in the cup. There are already many slot machines—such as American Soda Fountains—from which a drink may be obtained by the insertion of a coin, but this is the first machine to concoct the drink before serving it.

A Double Lock Bolt

This bolt is a recent engineering patent. It has two nuts, both of which turn in the same direction. But while one is screwed upward, the other is screwed downward until the two lock at the desired point. This movement is the result of the positions of the threads. Any pressure exerted on the nuts only tends to lock them more firmly together. When adjusted they are secure and are not affected by jars or vibrations.

Fool-Proof Screw

To prevent unauthorised people from removing screws from machinery, packing-cases, etc., an inventor has recently devised a screw in which both sides of the head are filed down to an angle, as shown in the accompanying illustration. The blade of the screwdriver engages the screws when turning clockwise, but slips when turning in the opposite direction. This ingenious device ensures that screws may be screwed down tightly, but prevents them being removed with a screwdriver.



OUR MAIL BAG



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

B. Jordan (Derby).—"I think a Bright Idea is to publish the 'M.M.' once a fortnight or once a week. My friends think so too, as it is such a long time to wait until the next number is published." We cannot adopt your "bright idea" just yet, Bob!

R. J. Peace (Halifax).—"You have expressed your desire to make the 'M.M.' the biggest and brightest boys' paper. That it is the brightest is certain, but until each issue is many times its present size, I am afraid Meccano boys will not be satisfied. Cannot you work overtime?" We do that already, Robert!

P. Evans (Leicester).—"Thank you for the cutting you have sent us. You have discovered an error that shows a sad lack of knowledge of the mercantile marine. The error is all the more glaring because the article is supposed to be written by an 'expert.' Anyone who knows anything at all about ships knows that the 'Majestic' is not 'easily distinguishable by her three red funnels!' The 'Majestic' is not a Cunarder but is, of course, a White Star boat, and all vessels belonging to this line have yellow funnels with black tops.

E. Horsley (Newcastle).—"I am sure Meccano boys would willingly pay 6d. or 1/- per month if you would only make the Magazine three or four times the present size. I earnestly counsel you to consider this suggestion." We are always pleased to hear from our readers, Eric, but if you only realised the work that would be entailed in acceding to your request we feel sure you would not be quite so ambitious in your demand. However, the 'M.M.' is going forward, and without doubt will continue to grow!

F. Roberts (Batley).—"We congratulate you on your success in combining Meccano with your Hornby Train Set. Your goods station with its warehouse and cranes must add very greatly to the interest of your railway, and loading and unloading the miniature sacks must be great fun. Write again soon and give us further details.

G. Watson (Barnstaple).—"We hope that by this time you are quite well again and able to look after your large family of pets. The doctor seems to have been fascinated with the Meccano models you built during your long stay in bed. Apparently, he had been under the impression that Meccano was just a toy for children, and we are glad that you were able to put him right!

W. Wilkins (Gloucester).—"We are glad that you have 'dared' to write again. We never get 'fed up' with letters from Meccano boys, and we do not 'rave and tear our hair when we see the big pile of letters waiting to be opened each morning.' The only time we get really wild is when a boy writes us an interesting letter and forgets to give his address, so that we cannot reply to him!

G. R. Turnbull (Leicester).—"We greatly appreciate your opinion that the 'M.M.' is the best Magazine in the world. We are afraid, however, that it will be some time before we can make it also the biggest in the world, as you desire. During the coming year we are certainly going to 'cram the old Mag.' with engineering articles, and we shall be glad to hear your opinion of these from time to time.

R. K. Price (Hull).—"Our holiday gave us a lot of health and strength, but not enough to publish the 'M.M.' fortnightly, Ronald! We may be able to do so a little later, however. If our growth in the future is as rapid as it has been during the last few years, your ideal of 100 pages may soon be reached.

D. S. Zerner (Queensland).—"All our readers are keenly interested in kangaroos, and emus, and wild parrots, so tell us all about them and all about your country. If you will send us photos along with your notes we will endeavour to publish them in the 'M.M.' Thanks for puzzles, which we may be able to use.

T. McGeorge (Maxwelltown).—"Cards of Hornby Trains and rolling stock would make a popular series, Tom, but we think boys are rather tired of them after the flood of cigarette cards that has been poured on them during the last few years.

F. Ward (Halifax).—"There is to be no big Competition this season, but there will be a number of smaller ones, all of which will be announced in these pages in good time. We hope this good news will turn you from your determination to 'lay you doon and dee.'"

Lives of Famous Engineers—*(Continued from page 63)*

Brunel's block-making machinery was adopted by the Government, and his prospects seemed bright, but as a matter of fact his troubles were only just beginning. He had the utmost difficulty in finding competent men to work his machines, and added to this was the prolonged delay on the part of the Government in remunerating him for his invention and his services. It was not until 1810, after seven years of desperately hard work and continual worry which seriously affected his health, that he received a final payment, the sum allotted to him being £17,663.

Saw-Mills Disaster

Brunel's other inventions were so numerous that we can only deal with a few of the more important of them. He took out a number of patents for saw-mills, including a method of cutting very thin boards or veneers by means of circular saws of large diameter. To this improvement was due very largely the subsequent extensive application of veneers to wood for ornamental furniture.

About 1806, Brunel commenced the erection of saw-mills at Battersea, in which he invested practically the whole of his available money. Many important processes of mechanical wood-working were carried out for the first time at these mills. Eventually, however, financial difficulties occurred, and these were brought to a head in 1814 by a disastrous fire that resulted in the almost total destruction of the works, which were valued at £24,000.

Invents Shoe-Making Machinery

In 1811, Brunel took out patents for machinery for making shoes. This machinery was so simply constructed that it could be worked by invalid or even crippled soldiers, and the shoes turned out were vastly superior in strength and durability to those made previously, besides being very much cheaper. In the following year Brunel, relying upon the very favourable opinions expressed by various individual members of the Government, prepared machinery sufficient to supply the whole of the Army. A large order was given by the Government and duly executed, but when everything was in full swing the war came to an end, and the Government decided that they no longer required machine-made shoes. The consequence was that Brunel was left with a large stock of shoes, and with heavy liabilities regarding his factory.

Arrested for Debt

The losses incurred at the saw mills and the shoe-making factory combined were very serious. Brunel's conduct throughout the various transactions was thoroughly honourable, but unfortunately some of those to whom he confided his financial interests failed to carry out the duties they had undertaken. The failure of a bank brought about a hopeless state of affairs, and in 1821 Brunel was arrested for debt. As soon as his desperate position became known his numerous and influential friends put forward every effort to help him, and ultimately, in consideration of his distinguished services, particularly in regard to the block-making machinery, the Government voted the sum of £5,000 to discharge his debts.

*(Continued in next column)***"M.M." Binders**

This spring-back binder for *Meccano Magazines* has a strong stiff back, covered with imitation leather, tastefully tooled. It takes a large number of copies and keeps them neat and clean. In black, lettered gold. Price 3/- each, post free.

MECCANO LTD., LIVERPOOL.**Designs Suspension Bridges**

In 1821 the French Government decided upon the erection of two suspension bridges on the island then called Bourbon, but since 1848 known as Reunion. This island is one of the Mascarene group in the Indian Ocean some 420 miles off Madagascar. The span of these bridges was not great, being only a little over 122 ft., but the bridges had to be made sufficiently strong to resist the destructive hurricanes to which the island was subject, in some of which the wind reached a velocity of from 82 to 102 miles per hour.

Brunel submitted designs for these bridges, each bridge being divided into two roadways suspended by six chains $1\frac{1}{2}$ in. in diameter, with suspension rods of $1\frac{1}{2}$ in. diameter. His designs were accepted and a contract was signed in 1822. The work was to be executed in four months, and Brunel anticipated little difficulty in carrying this out, but his bad fortune followed him in this project also. Vexatious delays occurred, greatly adding to his difficulties and causing him to protest bitterly. He records in his journal on the 15th January, 1823, that "the cold was so intense that cast iron 15×10 ins. was broken." A good deal of the material supplied by the contractors proved defective, and it was not until towards the end of 1823 that the bridges were finally shipped to their destination.

Liquefied Gas as Motive Power

In 1823 Sir Humphrey Davy communicated to the Royal Society the results of Faraday's experiments showing that, by the combined application of high pressure and low temperature, certain gases could be liquefied. Brunel at once conceived the idea of utilising liquefied carbonic acid gas as a source of motive power, but after a great expenditure of time and money, and the overcoming of one mechanical difficulty after another, he had to admit that his scheme was impracticable.

NEXT MONTH:—
THE THAMES TUNNEL

The Story of Copper—(cont. from p. 75)

vats, pans, and strainers used in such industries. Copper pans are also largely used in sugar refineries for boiling purposes.

The applications of copper in the construction of scientific instruments, and in plumbing fixtures, are fairly well known and are far too numerous to mention. For many of these purposes there is no satisfactory substitute for copper.

Value for Domestic Utensils

Copper is particularly well adapted for the manufacture of domestic utensils. Articles of the most complicated forms can be produced by hammering or spinning, and the metal offers no difficulty in brazing. The slight danger of corrosion of copper owing to the possible absence of ordinary cleanliness is overcome by tinning the interior of the vessels. In addition to their long life, copper kitchen utensils result in a considerable saving of gas or other fuel on account of their high conductivity for heat. Large up-to-date bathrooms contain a considerable amount of copper in the form of hot water tanks, polished or plated water pipes and water taps. Copper is also largely used for ornamental purposes, the artistic appearance of beaten copper work being universally admired.

Copper has a special value for outdoor use on account of its freedom from anything more than surface corrosion, and no doubt it would be much more extensively used but for its high cost. It is particularly well adapted for the ornamental frontages of business places, doors, grills, etc., and for such purposes it affords the skilled workman more scope for artistic design than the commoner metals. Copper is also used to a small extent in this country and to a greater extent in the United States for the roofing of public buildings, and when these roofs have been exposed to the weather for some little time, their coat of verdigris gives a very pleasing effect.

NEXT MONTH:—
COPPER MINING

The Open Road—(cont. from page 83)

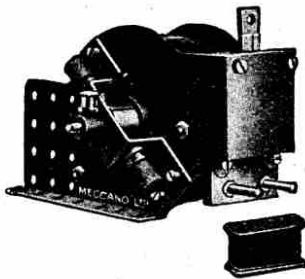
always be found useful in the cycle-shed at home.

The Rear Lamp Question

Finally—and the subject has been left to the last so that its importance may be emphasised—every cyclist should carry a rear light. For some time past there have been heated arguments in the press as to the necessity of this precaution, but there is little hope of these discussions serving any useful purpose. Meanwhile, no sensible boy will risk unnecessarily his limbs and machine when, by fitting a red rear lamp or even an ordinary red glass reflector, he can make night riding safer, not only for himself, but also for all other road users.

NEXT MONTH:—
CYCLING TOURS AND ROAD MAPS

A New Meccano Motor



The above is an illustration of the 100/230-volt Meccano Electric Motor. It may be employed for any purpose for which a small motor is suitable, but it is specially adapted for running Meccano models. The side plates are perforated with standard equidistant holes, thus allowing the motor to be built into any Meccano model.

The motor is specially designed for connection with the electric light main, and is supplied for 100/120 volts or 200/230 volts (alternating or direct). It is fitted with a length of flex (6 feet), an insulated plug for connection with the motor terminals, and an adaptor for connection with an ordinary lamp socket.

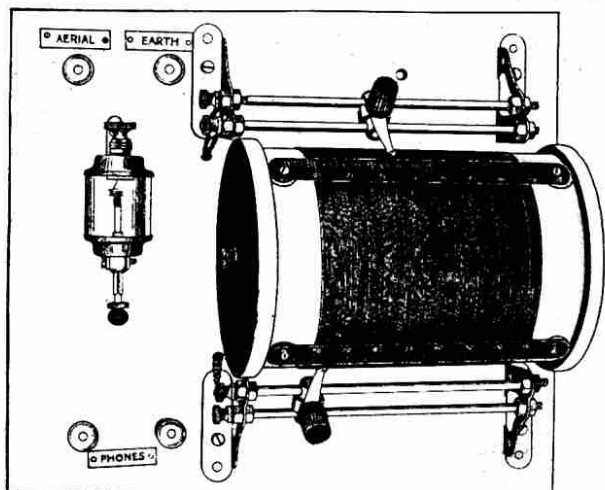
A suitable resistance is required when the motor is run with a 200/230-volt current. This is supplied by connecting a 60-watt lamp in series with the motor. A board, on which are mounted a suitable lamp holder (lamp not included), and a switch is provided separately.

100/230-volt Motor, price 32/6

Lamp Board (with Lamp Holder and Switch)
price 4/6

FROM ANY MECCANO DEALER

LISTEN WITH MECCANO RECEIVER No. 1



The Meccano No. 1 Receiver is a highly efficient and splendidly finished instrument. The crystal detector is exceptionally sensitive and is enclosed in a glass chamber. Two slides are provided, one on each side of the inductance, giving greater selectivity and clearness of reception. Wave length: zero to 1,000 metres.

Dimensions of Set: 9 $\frac{3}{4}$ " x 8 $\frac{1}{4}$ " x 5".

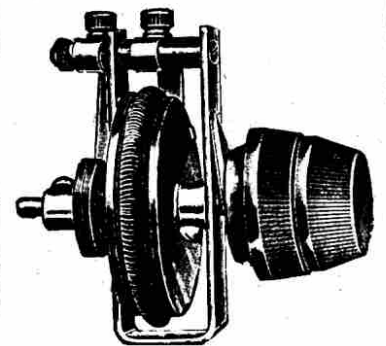
PRICE, post free (as illustrated), 15/9.

Meccano Ltd., Binns Road, Liverpool

IGRANIC Filament Rheostat (vernier type) Pat. No. 195903

The perfect "control" for Dull Emitter Valves operated by 2-volt battery and Bright Emitter Valves with 4 or 6 volt battery. Supplied with 4, 6, 8 or 10 ohms resistance. Specially suitable for detector filament control and critical control of regeneration.

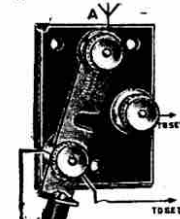
Price with fixing screws and drilling template for panel mounting, 7/-



IGRANIC Audio-Frequency Amplifying Transformer Type E Pat. No. 205013.

Noted for its distortionless reproduction of speech and music. The metal shroud effectively shields from external interference so that a number may be mounted closely for multi-stage amplification. The impedance at speech frequency is suitable for most types of valves. Made in ratios of 1:5 for first stage and 1:3 for subsequent stages.

Prices:
Ratio 1:5 ... 21/-
" 1:3 ... 19/6



IGRANIC Earthing Switch
will protect both your home and set. The terminals are of a patented improved type and carry the spring switch contacts which ensure perfect electrical conductivity. Mounted on solid ebonite base with three fixing holes. Price 3/-



IGRANIC Vernob
For fitting to any rotary tuning device in order to obtain fine vernier adjustment. It is designed to fit $\frac{1}{4}$ " spindles, but with a liner will fit $\frac{3}{16}$ " spindles. Price complete with liner and 180° scale ... 6/-

Build a better radio set with



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If you would enjoy, to the fullest possible extent, the undoubted advantages of Radio Broadcasting, you *must* use components embodying the most up-to-date principles in design and construction.

The name IGRANIC represents the last word in *efficiency, quality, and reliability*. The design, workmanship and materials used in IGRANIC components are enabling thousands of wireless enthusiasts throughout the British Isles to build *better* radio receivers.

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Obtainable of all reputable dealers.

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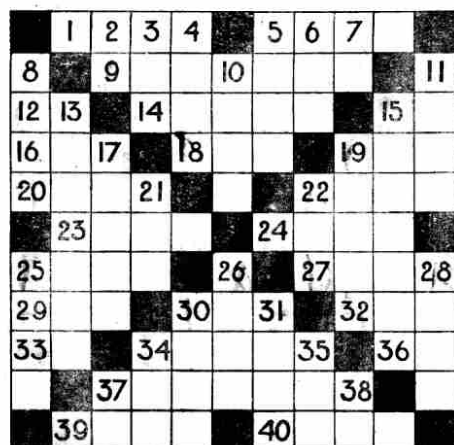
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Puzzle No. 60.

**HORIZONTAL**

1. Vehicles; 5. Extremity of a limb; 9. Inexhaustible source of fun; 12. Conjunction; 14. Linger; 15. Personal pronoun; 16. Purpose; 18. On the surface of cloth; 19. An animal; 20. Instrument of manual operation; 22. To weary; 23. Row; 24. Row; 25. Got up; 27. An animal; 29. To expel; 30. An ugly old woman; 32. A pen; 33. Pronoun; 34. Road well known to "M.M." readers; 36. To such degree; 37. A cloth hanging; 39. Finished; 40. A weight.

VERTICAL

2. Part of verb "to be"; 3. Wager; 4. Examine; 5. Musical instrument; 6. Some; 7. Denial; 8. Vessel; 10. Measure; 11. Festival; 13. Tumultuous; 15. Selling places; 17. Damp; 19. Parts of a skeleton; 21. Sheltered quarter; 22. Not nice; 25. To defeat utterly; 26. Deficiency; 28. Hindu cultivator of the soil; 30. Wages; 31. Insect; 34. Small sweet cake; 35. Word of respect; 37. Company; 38. Refusal.

Puzzle No. 62.

A certain building erected many years ago was totally wrecked in a very bad storm. The contractors who were employed to re-build it were asked to retain in its place the original foundation stone which bore the date of erection. They carried out this request, but unfortunately they laid the stone upside down, yet nobody noticed the mistake. What was the date on the stone?

Puzzle No. 63.

A printer had an order for 10,000 Bill Forms per month to be printed with the name of the current month. Thus he printed 10,000 forms with the word January, 10,000 with the word February, and so on. The particular types to be used for printing the names of the months were expensive and he therefore purchased only just enough to enable him to print the whole of the months of the year, using capitals throughout. How many separate types did he purchase?

Puzzle No. 64.

A certain number consists of two figures. Add these two figures together and multiply the result by itself and the result is the same two figures but in reverse order. What is the number?

Puzzle No. 65.

Three boys robbed an orchard and put all the apples in a bag. The first boy divided the apples into three parts, and as there was one over he threw it away. He then took one part and put the remaining two parts back in the bag. The second boy also divided the apples into three parts, threw the odd one away, took one part and put two parts back. The third boy did the same. Then all three divided the remaining apples into three parts, took one part each and still threw the odd one over away. How many apples were there to begin with?

Cross Word Puzzle Competition.

First Prize: Meccano Goods value £1:1:0

Second Prize: Meccano Goods value 10/6

Third Prize: Meccano Goods value 5/-

EVERY reader who wishes to enter for this competition must send in the solutions of the two Cross Word Puzzles, Nos. 60 and 61, together with a Cross Word Puzzle of his own invention.

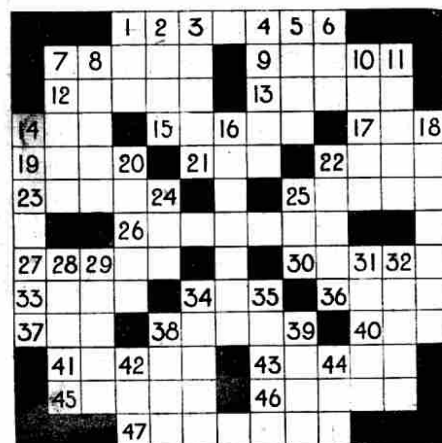
All puzzles submitted must be original and must not have been published previously. They must not contain Christian names, and if the names of any historical characters are used these must be thoroughly well known. Slang words must not be used, and all abbreviations employed must be specified as such unless they are in common every-day use.

The diagrams of Puzzles 60 and 61 are on much too small a scale for actual working. They should not be cut out of the page, therefore, but should be copied at least four times the size on to a sheet of paper. If an entry includes more than one sheet of paper, the name and address of the competitor must appear on each sheet.

For the information of new readers who may not be familiar with the method of working Cross Word Puzzles, we would point out that a specimen puzzle, fully explained and worked out, was given in last month's issue.

Entries for this competition must reach this office not later than 28th February.

Puzzle No. 61.

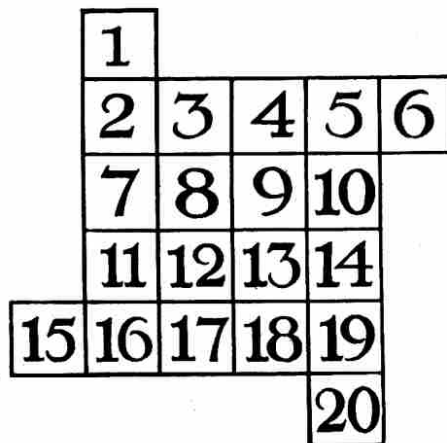
**HORIZONTAL**

1. Winding course; 7. Sudden panic; 9. Expel; 12. South American animal; 13. Warning on a chart; 14. A vaporous substance; 15. Polite; 17. A fish; 19. Ceremony; 21. A fish; 22. A document; 23. One who is proficient; 25. Part of the name of a well-known Scottish islet; 26. A navigable vessel; 27. Possession; 30. A bird; 33. To elate; 34. A fish; 36. Reputation; 37. Consume; 38. Key note; 40. Disease of sheep; 41. Hebrew stringed instrument; 43. Throughout; 45. Relating to a family of nations; 46. An ancient language; 47. To cheer.

VERTICAL

1. Describe clearly; 2. Blood fine in old Irish law; 3. House perched on a high place; 4. Method of cooking; 5. Wicked; 6. A frolic; 7. Grave; 8. Indicating social distinctions; 10. Variety of onion; 11. Things long and hanging; 14. To seize; 16. An account; 18. Cajoling talk; 20. An astronomical term; 22. A spur; 24. A bond; 25. To display; 28. A climbing plant; 29. Later; 31. Storage places; 32. An idol; 34. An Essex river; 35. A goddess; 38. A bird; 39. Fluid matter concreted; 42. Term in cricket; 44. Source of metals.

Puzzle No. 66.



Twenty men were imprisoned in a fortress containing twenty cells as in the plan below. There were four British, four French, four German, four Russian and four Italian prisoners. They were so placed that none had one of his own countrymen in an adjoining cell. How was this done?

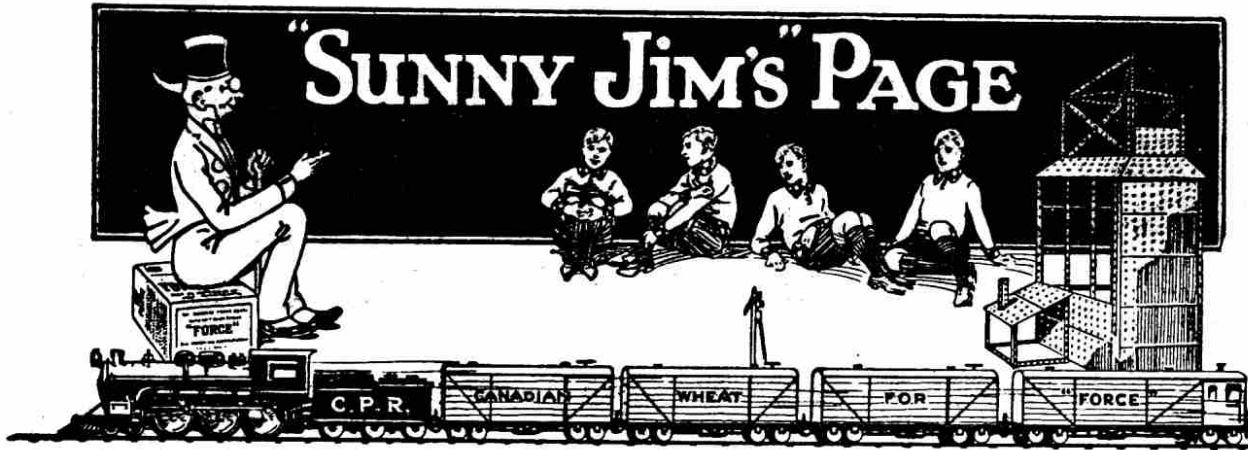
Puzzle No. 67.



The little man shown in this picture has the whole alphabet in his bag. What one letter must he take from it to complete the nine syllables shown in the picture?

Puzzle No. 68.

The initials and finals, spelt downwards, of the seven words indicated by the following definitions give the names of two vegetables:—1. To summon; 2. Not asleep; 3. A useful fastener; 4. A stain; 5. A son of Aaron; 6. A vegetable; 7. Appreciated after toil.



**SUNNY JIM
HAS NO
BUTTONS
ON HIS
WAISTCOAT!**

There are 11 other
omissions in this
picture.
Can you find them?



"FORCE" for breakfast

Did you notice it?

In last month's cross-word puzzle on this page there was a "printer's error!" There! I've said it now. You see it's always safe to blame Mr. Printer because he can't answer back. Your Editor says the fault was mine—in fact he wrote to tell me about it. When I read his letter I went hot and cold all over. I had visions of thousands of Meccano boys working day and night trying to solve a pesty cross word puzzle that just would not come right, simply because it was wrong. When I asked my chief assistant, he said it was the office boy's fault. The office boy said he'd never seen the puzzle

before, so it was no use blaming him. Then I was struck with a bright idea! Call it a "printer's error!" Ha! that sounded better. So a "printer's error" it is.

"What is the error," did you ask? Well, somehow or other a silly figure 2 pushed its way into the space that was really reserved for figure 4 in the "Horizontal" column of the clues. The correct solution to the puzzle is as follows:—

HORIZONTAL.

1. Hits. 4. Maj. 7. How. 9. Sis. 11. Go.
12. Ha! 13. Mud. 15. FORCE. 17. No.
18. I.o. 19. Oar. 20. Inn. 21. Adult.
22. Boy. 23. Bon. 24. Eve. 25. Tease.

VERTICAL.

1. Ho. 2. Thor. 3. So. 5. As. 6. Jim.
8. Wheat. 10. Sunny. 11. Good.
14. Don. 15. Flake. 16. Cold.
20. Ions. 22. Boa. 23. Be.

THANKS!

I want to thank all those boys and girls who found the mistake and corrected it for me. They may be interested to hear that there were hundreds who did not see it, or if they did, said nothing about it when they sent in their solutions.

MY PICTURE.

Now I suppose you are wondering why I have published such a large picture of myself on my "page" this month! The picture, as you will see, shows two Meccano Boys with whom I stayed recently, getting up on a cold morning to have their "FORCE" breakfast. You should have seen them eating "FORCE" with hot milk! One said that he had never tasted anything he liked better in all his life, and the other said something that sounded like "scrumptious," but he was too busy eating "FORCE" for me to hear clearly what he really did say. It was certainly something nice about "FORCE!"

ARE YOUR EYES GOOD?

This picture is more than an ordinary picture, however, because I have specially asked the artist to leave out parts of his drawing so that you Meccano boys can amuse yourselves by discovering the missing parts. It is a good test for keen eyesight, and I specially expect to receive solutions from you boys who failed to notice the "printer's error" which appeared in last month's number. Send your solutions to me at my office, Dept. Mc.5, 197, Gt. Portland St., London, W.1., and I will send you a free sample of "FORCE," provided, of course, that you have not

had a sample before. You are sure to like "FORCE," and here is an excellent opportunity for you to show mother what lovely food it is for either breakfast or supper. If you like, you can eat "FORCE" with stewed fruit.

Remember that "FORCE" is the whole of the wheat malted for easy digestion and ready cooked and toasted for delicious flavour. Ask mother to serve it for you whenever you like. Take my tip, boys, and get going on "FORCE" every morning of the week. It does you good.

Yours forcefully,

Sunny Jim



This Month's Short Story

Felix walking
On the rail,
Came a train,
Lost his tail.

* * * * *

Isaacs: "My son gets 3d. a day for his pocket money."

Jacobs: "3d. a day, and only six years old?"

Isaacs: "Yes, but you see he puts the money into the gas meter, he thinks it is a money box!"

* * * * *

SAFETY FIRST!

Anxious customer: "Are you a chemist and druggist?"

Chemist: "Yes."

A.C.: "Have you been in business for a number of years?"

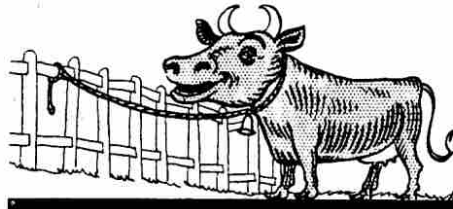
Chemist: "Yes."

A.C.: "Is that your diploma hanging there?"

Chemist: "Yes."

A.C.: "Then give me threepennyworth of tooth powder!"

* * * * *



Teacher: "Tommy, give me a sentence containing a conjunction."

Tommy (after prolonged thought): "The cow is tied to the fence with a rope."

Teacher: "Well, where's the conjunction?"

Tommy: "'Rope.' It connects the cow to the fence."

* * * * *

Q. Which is the most learned county in England?

A. Berkshire, because a large town in it is always Reading.

* * * * *

Q. How many feet have 40 sheep, a shepherd, and his dog?

A. Two. Sheep have trotters and the dog has paws.

* * * * *

Q. What is it that is taken from you before you get it?

A. Your portrait.

* * * * *

Q. Why does a railway official punch a hole in your ticket?

A. To let you go through.

Answers to Last Month's Puzzles

No. 54.

A	T	O	N	E		S	H	U	N	S
L	O	R	E			E	P	I	C	
O	R		T	A	M	E	R		L	O
E	E	L		R	A	M		H	E	N
S		O	R	E		U	S	A		E
		D	O			P	I			
B		G	A	S		R	O	T		A
A	M	E	R	I	C	A	N	I	S	M
N	O		I	R	O	N	S		H	E
D	O	N			O		A	N		
S	N	A	G	S		T	R	A	M	S

No. 55.

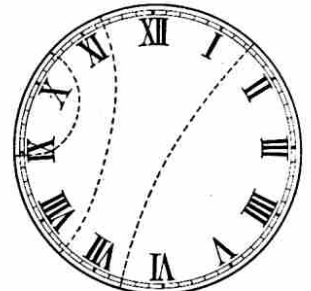
16	3	2	13
5	10	11	8
9	6	7	12
4	15	14	1

No. 56.

- | | |
|----------------|---------------------|
| 1. Draw-bar. | 7. Spark-arrester. |
| 2. Guard-iron. | 8. Tender-coupling. |
| 3. Smoke-box. | 9. Ash pan. |
| 4. Sand-pipe. | 10. Footboard. |
| 5. Fire-door. | 11. Handrail. |
| 6. Cab-roof. | 12. Headlight. |

No. 57. Habit—Abit—Bit—It—T.

No. 58. Where the cracks came:—



No. 59. A map of the world.

Teacher (to scholars): "I will give a crown to any one of you who can ask me a question that I cannot answer."

Georgie: "Please teacher, why am I like the Prince of Wales?"

Teacher: "I am afraid that beats me, Georgie, what is the answer?"

Georgie: "Please teacher, because I am waiting for the crown."

Georgie got his money!

THE introduction of Cross Word Puzzles has met with quite a chorus of approval from our readers, and entries for last month's contest have come in in very large numbers. Many of the original puzzles submitted were very ingenious, but others showed that the competitors had not fully grasped the method of working. One of the most common defects was that of giving bad definitions. Although it is perfectly legitimate to give as a definition an uncommon meaning of a word, at the same time the definition must be such that careful thought should lead to the discovery of the word. Some of the definitions I have examined were absolutely wrong, and I advise those who intend to take part in future Cross Word Puzzle Competitions to consult a dictionary whenever they have any doubt as to the real meaning of any unusual word they use in their own puzzles.

I must also draw attention to the necessity for competitors to write their names and addresses on every sheet of paper included in their entries. In many cases the name and address appeared only on the first sheet of paper, and when the other sheets got separated from this—as is always liable to happen when large numbers of entries are being dealt with—the Puzzle Editor had to put himself to an enormous amount of extra trouble in order to try to connect the pages together by comparing the hand-writing. I hope competitors will remember this point in future.

This month I am offering prizes for another Cross Word Puzzle Competition, and I hope to receive a large number of entries. Full particulars will be found on the Puzzle Page.



First Boy: "My father's a doctor, so that I can be ill for nothing."

Second Boy: "That's nothing to swank about; my father's a parson, so I can be good for nothing!"

Q. Why would a sparrow be angry if you called him a pheasant?

A. Because you would be making game of him.

JAEGER

Pure Wool

The New "Meccano" Jersey

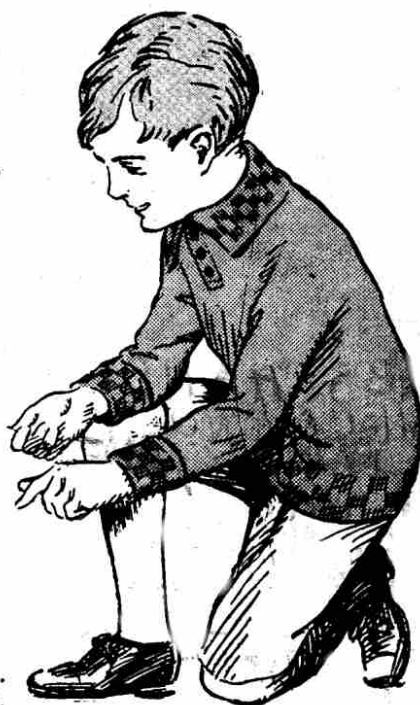
A Jaeger "Meccano" Jersey is made in the special "Meccano" pattern. It wears splendidly and prevents the frequent chill a boy gets when hot, as every boy will sooner or later. The "Meccano" Jersey appeals to every boy at once as well as to the "grown-ups" who study the health and happiness of their children.

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8/3	9/-	9/9	10/6

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MADE

OF ARTIFICIAL STONE

WILL MAKE YOUR MODEL RAILWAY MORE REALISTIC.

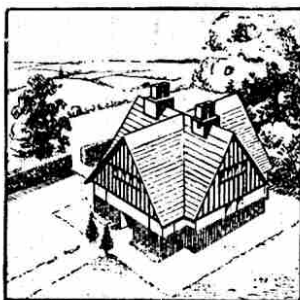
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Some Examples of what can be done with this delightful Constructional Toy. Write for complete Illustrated List, and name of your nearest Agent.

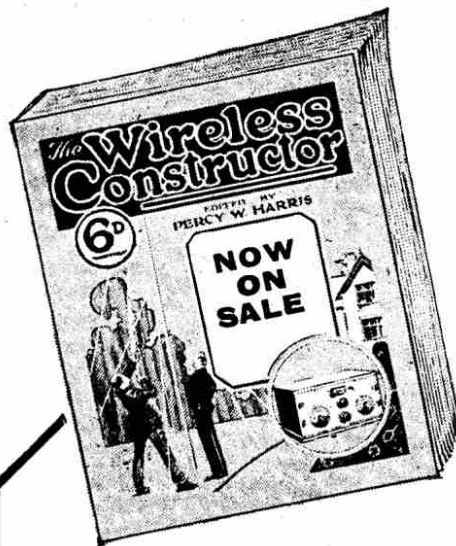
**Four-Cabled House.**

Box 2. Bricks, Roofs and designs for 12 Models.
 Plans are enclosed for larger models using Boxes 1 and 2 in combination.

Model
from
Box 2.
Tudor
Blocks.Price
7/6**Village Hall.**

Containing 18 original designs and Bricks with Thatched and other Roofs. Packed in well-made wooden box with lift-out tray containing Trees and Fences.

Benettink & Co. Ltd., Cheapside, E.C.
 J. Barker & Co. Ltd., Kensington.
 A. W. Gamage Ltd., Holborn, E.C.
 Harrods Ltd., Brompton, S.W.
 Hamleys Ltd., Regent Street, W.
 Hamleys Ltd., High Holborn.
 Jones Bros., Holloway, N.
 Selfridge & Co. Ltd., Oxford St., W.
 The Pygmalion, Leeds.

Model
from
Box 3.
Tudor
BlocksPrice
17/6**LOTT'S BRICKS LTD., WATFORD, England****FREE**Blue Print given away
with this issue.**MAKE SURE
OF YOUR COPY****Choose Your Set**

from the wide range of wireless receivers—crystal to super-valve sets—which are clearly described and fully illustrated in this and previous issues of the **WIRELESS CONSTRUCTOR**. Make one in your own home. It is the cheapest and most efficient method of getting a set, which, when instructions are followed, will give you guaranteed results.

There is no need for expensive tools or a special knowledge of wireless, as all instructions given are clear and concise. Photos, drawings and diagrams explain everything.

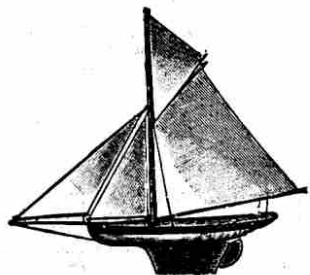
6^{D.}
MONTHLY**The Wireless
Constructor****6^{D.}**
MONTHLY

This issue of the **WIRELESS CONSTRUCTOR** has been enlarged to no less than 108 pages; full of interesting and instructive articles, suitable for the absolute beginner, the crystal or valve user, as well as numerous other articles and much useful information for those who, at the moment, are only interested in receiving their local station.

The **WIRELESS CONSTRUCTOR**, published monthly at 6d., is by far the most popular wireless magazine in existence. Start **NOW** by getting this February issue, and at the same time also order the three previous issues. Obtainable from local newsagents, booksellers, book-stalls, wireless dealers, or 8/3 per annum, post free, from: Radio Press Ltd., Bush House, Strand, London, W.C.2.

Advt. of The Radio Press Ltd., Bush House, Strand, London, W.C.2. The Largest Wireless Publishers in the world.

KENSINGTON MODEL DOCKYARD



Sailing Yachts and Fittings

MOTOR & STEAM LAUNCHES
ELECTRIC & MECHANICAL TOYS
CINEMATOGRAPHS CAMERAS
INDOOR GAMES CUTLERY & TOOLS
OUTDOOR SPORTS FRET OUTFITS
AIR GUNS FISHING TACKLE
HORNBY TRAINS
MECCANO OUTFITS & PARTS
Always in Stock.

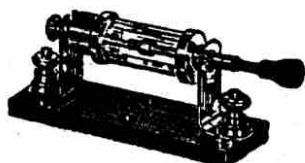
Send 1½d. Stamp for List "M."

C. H. LORBERG
185, Kensington High St., London, W.8.

Use a SERVICE Detector

and get the maximum amount
of satisfaction.

Crystal replaced in a few seconds.
NO SOLDER BEING REQUIRED.
Not affected by vibration.



Patented Micrometer Adjustment
(Prov. Pat. No. 15224/24).

Glass enclosed and dustproof. Spring
for holding crystal in place. Highly
polished nickel-plated or gold lacquered
finish. Undoubtedly finest value
obtainable.

Obtainable at all Wireless Stores.

Price 2/9. For Panel Mounting 2/6.
SERVICE RADIO CO. LTD.,
67, Church Street, Stoke Newington.
LONDON, N.16.

THE PRACTICAL ELECTRICIAN'S POCKET-BOOK—1925

is the best practical book for
all interested in electrical work.
570 pages
for 3s. 4d. post free.

S. RENTELL & CO. LTD.
86, MAIDEN LANE LONDON, W.C.2
Specialists in books or the City and Guilds
Ask for catalogues.

Meccano boys win cash prizes. See page 104.



MODEL WITH HARBUTT'S PLASTICINE

10 Colours - Clean in Use - Ever Plastic

Sample Rainbow Box with 6 Colours, 9d., or Post Free 1/-

Write Us for Illustrated Circulars:

HARBUTT'S PLASTICINE LTD.
99, BATHAMPTON, BATH

BOYS! Now's your chance

We are selling New
Goods at Reduced Prices

Write for list—post free.

6/- Boys' Books ... each 4/-
30/- Traction Engines each 10/-
Model Railway Goods (Not Meccano)
Reduced 3d. in the 1/-

G.O. Lines, curved only, each 1½d.
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£3/3/- Steam Locos £2/-/-

Cinemas, Films, Tools.
Wireless Goods and Sets.

WONDERFUL BARGAINS.
Postage extra.

C. LUCAS, Hobbies Depots,
35, MANCHESTER STREET,
LIVERPOOL.



YOU
can build a 40 Gramophone
with our Scale Drawings
and Fittings for 40/-.
Our Large Illustrated
Catalogue of Gramophones,
Motors and Tonearms, etc.
will interest you. Post
Free 2d.
Harmony Gramophone Co.,
366, York Rd., London, S.W.1

TURNYTOVER

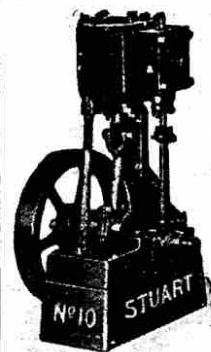
The Game that is different.

HELMET POOL. The new all season game for
all ages. Mr. TURNYTOVER and 12 coloured
Metal Helmets in tin box.

Post Paid 2/-.

AGENTS WANTED.

Makers:
FORGE & CO., Eastham Ferry, Cheshire.



Stuart Engines

You can build
with just a few
hand tools.

Send a stamp
for List No. 12M
—better still,
send 6d. for the
Complete Stuart
80 page Cata-
logue.

We illustrate the Stuart No. 10.

Completely Machined Parts
(no Lathe required)

21/-
Post Free

Box Bed 2/6 extra.

Engines from 5/- Boilers 8/-.

Stuart Turner Ltd.
HENLEY-ON-THAMES

Wireless Cabinets YOU Want



PICKETT'S Cabinets—they're good
value, from 1/6 each, highly
polished.

Write for Constructor's List Free.

Cabinet (M.C.) Works, Almon Rd. Bexley Heath, S.E.

HAVE YOU HAD A COPY OF OUR 1925 CATALOGUE?

IT'S FREE.

Contains an interesting selection of Lighting
Sets from 2/6, Electric Motors from 3/3, Dynamos
from 4/6, and hundreds of Electrical Novelties
of 1925.

SEND NOW FOR A COPY.

Note New Address:

A. W. NORTH, 6, High Street, Petersfield, Hants.

MAKE YOUR OWN ELECTRIC LIGHT



These wonderful dynamos light brilliantly 4-6
volt lamps, and are very easy to work ... 5/-
"DE LUXE" model, larger, and giving
approx. three times output, wonderful value 10/-
"SUPER DE LUXE" model, larger still,
giving approx. five times output ... 15/-
All Post and Packing Free. Send for FREE Lists.
GREENS (Dept. A.N.), 85, New Oxford
Street, LONDON.



Readers' Sales & Wants



If you have anything to sell or wish to buy anything take advantage of the service offered by a small advertisement in these columns.

The "M.M." is read by approximately 100,000 people every month. It circulates in every country where the English language is spoken. If you wish to sell your duplicate stamps, your rabbits, or your tools, or to purchase a loud speaker, a steam engine, a model yacht, or a hundred-and-one other things, you will be able to do so through the columns of the "M.M."

The rates are one penny per word, with a minimum

IMPORTANT.—Advertisements dealing with any article in the Meccano catalogue cannot be accepted.

PLEASED ADVERTISERS

We are getting far more enquiries than is usually the case. N. & Co.

I find your periodical very satisfactory. W.D.Ltd.

The business resulting from the February advertisement was so good that I had to miss your March issue—in fact, replies are still coming in. E.W.P.

I am satisfied with the results of my previous advertisement. H.J.H.

The small space we had with you brought in a fair number of replies. H.P.Ltd.

From my second advertisement in your paper I obtained about one hundred and twenty replies—including thirty-two from abroad. I shall have no hesitation in coming to you again next season. S.H.C.

We have received quite a number of orders for our apparatus this morning as a result of your advertisement. P. & T.Ltd.

I am a confirmed advertiser now in the "M.M." and so far have had very satisfactory results. A.W.N.

We have no hesitation in asserting that our clients are convinced that your Magazine is one of the best pullers in which they advertise. B.D. & Co. Ltd.

We know from the results attained by our advertising in your Journal that your readers are most keenly interested in our goods. A.R.

I had great success with the last advertisement I inserted in your columns. L.F.

Recent advertisements in the "M.M." have brought us satisfactory results, both numerically and in regard to the class of readers replying. S.G.Ltd.

We really are getting splendid results. F.Co.

I do not doubt for one moment that $\frac{1}{2}$ in your paper equals $\frac{1}{4}$ page in many purely philatelic journals. S.H.C.

My insertion in your November number produced very satisfactory results. E.C.C.

Owing to the great number of replies in consequence of my advert. in November I was unable to advertise in December number. Yours is undoubtedly the finest advertising medium I have ever tried. P.J.D.

We regret to say that we shall be absolutely unable to take space in your February issue owing to the fact that we have had a really enormous number of replies from our Christmas insertion. These are still coming in. To be quite frank we did not really expect so many, and in consequence are slightly disappointed. A. & W.

A 2/- advertisement, three months ago, produced so many replies, and repeat orders, that I was unable to deal with them all. I am still supplying collectors with fresh selections every fortnight, and they are regular buyers. J.B.

READERS' SALES

(Rate: 1d. per word, min. 1/-).

B.S.A. Rear Cycle Wheel, complete with free wheel, practically new, £1.—J. Dorey, Salway Ash, near Bridport, Dorset.

Will sell my fine Valve Wireless Instrument for 32/-, post free, fine condition, worth treble.—Waine Compton, Wolverhampton.

For sale, 250 ft. film, The Gaumont Graphic, what offers. Also small Pocket Telescope, 1/6.—Write first. B. Loveland, Gordon Villa, Mayburn Hill, Woking.

"Meccano Magazines" for sale. Absolutely clean. Numbers 2-35, 6d. each (old issues). Numbers July 1923-June 1924, 1/- the lot. Total 18/—Smith, 20, Greenbank Road, B'head, Ches. Postage paid.

Wanted—Meccano Tension Dynamometer (47), disc weights (49) of 1914 lists, also No. 1 Manuals, 1900 to 1912, 1915, 1916, 1917, 1918, and No. 2 1918, all English editions.—James Saddler, Myall Avenue, Kensington Gardens, Adelaide, South Australia.

Ten-Shilling Combined Cinema Magic Lantern, 300 ft. standard film, slides. Lot 6/—Three home-bound volumes "Scout," good condition, 9/—Evans, 19, Uphill Park, Weston-s-Mare.

of 1/- (cash with order).

Your advertisement must be received before the 10th of the month for insertion in the following month's issue.

If a Box Number is used, 4d. should be added to cover the cost of postage of the letters to the advertiser from this office. The letters will be posted one week after the advertisement appears, and a second batch a month after the advertisement appears. They will be sent more frequently if additional postage is included with the advertisement.

Will anyone exchange George V. Set, good order, for 2 dynamos, 4-volts, nearly new.—Bowdrey, 78, Bridge Road, Uxbridge.

Bassett-Lowke Steam Locomotive, 4-4-0, Gauge 0. Beautiful model, cost £6/6/-, 1923. In excellent condition. £3 or near offer.—Jefferson, Pyrford Woking, Surrey.

Open Wagons, Gauge 0 (1 1/4"), 1 L.N.W. and 1 M.R. Tinplate—Bassett-Lowke, 3/3 each, post free.—Fuller, Wandsworth Road, Station Cottage, Clapham.

For Sale. High-class Steam Locomotive and Tender. Length 13 inches. Perfect condition. Cost 28/6. Bargain for 15/—Baxter, Castletown, I.O.M.

Back Numbers "Meccano Magazine," 11, 12, 15 to date. Offers to—Brake, Tansley, Matlock.

SMALL ADVERTISEMENTS

(Rate: 1/- per line).

Patents, Advice, Handbook and Consultations Free. B. T. King, C.I.M.E., Regd. Patent Agent, 146a, Queen Victoria Street, London, E.C.4. 38 years' reference.

EDISON 4 minute Blue Amberol Phonograph Records, reduced prices. New goods now arriving. Lists.—A. Robinson, 333, Hainton Avenue, Grimsby.

Gent's Strong Nickel Keyless Watch, 4/11 each, post paid. (Worth double).—G. Banks, Drub Lane, Gomersal, Leeds.

LIVING STICK INSECTS from East Indies and Mesopotamia. Very curious. Perfectly harmless. From 1/6 doz; Eggs 8d. doz. British and Exotic Flying Pupae, Aquarium Fish, etc., Lists Stamp. Silkworms' Eggs, 1/- 100. Rare Exotic Living Arachnida.—Rose, Alexandra Road, Tonbridge.

Toy Soldiers. Make your own. [Moulds hired, 1/6 week.—Kearley, 142, Purvis Road, Willesden.]

Gent's 9-Carat Gold Watches, 15 Jewel Lever-Movement, £5 10s. 0d., post paid. Guaranteed.—Banks, Drub Lane, Gomersal, Leeds.

CINEMA FILMS.

SALE—HIRE—EXCHANGE, also Machines, Re-winders and Accessories. Good Sample Film, 1/- Post Paid.

LISTS FREE.

Filmeries, 57, Lancaster Rd., Leytonstone, London, E.11

CINEMA FILMS, 100 ft. 1/-, 1,000 ft. 6/-, delivered. —Phillips, 64, Ewart Street, Brighton.

LOOK BOYS! Comic Films 2/- each, post free. World Film Exporters.—Photoplays, Pinden, near Dartford.

Cinematograph Films Cheap. Sale-Hire-Exchange. 100 ft. sample 10d. Projectors and Accessories.—Don Cinematograph Supply, 96, High Street, Penge, S.E.

Home Cinematographs. Great Clearance Sale. Your opportunity to secure large Cinema or Films cheap. Lists Free.—Pictures, 109, Kenlor Road, Tooting.

ENORMOUS STOCK OF CINEMA FILMS FOR SALE. 1 reel dramas only, in good condition. 8/6 each, post free. No lists. Order early.—G. Hare, 36, Willes Road, Leamington.

CINEMATOGRAPH FILMS, Machines, Accessories, Bargains. 100 ft. Film and List 1/-.—Tottenham Film Exchange. Offices, 2, Ascot Rd., S. Tottenham, N.15.

CINEMA FILMS, MACHINES, ACCESSORIES, 100ft. film and lists, 1/- Stamp brings Wireless Lists.—J. Humphreys, 40, Davenant Road, London, N.19.

Home Cinema Machines, Films. Bargain Lists free.—Universal, 112, Newington Causeway, S.E.1.



Registered at G.P.O., Lo
transmission by Canadian
Post.

EDITORIAL AND ADVERTISING OFFICES:—

BINNS ROAD, LIVERPOOL.

Telegrams: "Meccano, Liverpool."

Publication Date. The "M.M." is published on the 1st of each month and may be ordered from any Meccano dealer, or from any bookstall or newsagent, price 3d. per copy. It will be mailed direct from this office, 2/- for six issues and 4/- for twelve issues.

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

Binding Cases. Spring-back Binders to take a number of "M.M.'s" are supplied, covered with imitation leather and lettered in gold, price 3/- each (post free).

Meccano Writing Pads. Fifty sheets of tinted bank paper, each printed with Meccano boy at head, 1/- (post free) large size, and 6d. (post free) smaller size.

Advertisements

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

Small Advertisements. 1/- per line (average seven words to the line), or 10/- per inch (average 12 lines to the inch). Cash with order.

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

Press Day, etc. Copy must be received not later than 10th of each month for publication in following issue. Half-tone blocks up to 100 screen.

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

Voucher Copies. Sent free to advertisers one inch or over. Other advertisers desiring $\frac{1}{2}$ should add 4d. to their remittance and should voucher copy at same time.

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

Obtaining the "M.M." Overseas

Readers Overseas and in foreign countries may order the Meccano Magazine from regular Meccano dealers, or direct from this office. The "M.M." is sold Overseas at 3d. per copy, or mailed (post free) direct from Liverpool, 2/- for six issues, or 4/- for twelve issues.

IMPORTANT.

Overseas readers are reminded that the prices shown throughout the "M.M." are those relating to the home market. Current Overseas Price Lists of Meccano Products will be mailed free on request to any of the undermentioned agencies. Prices of other goods advertised may be obtained direct from the firms.

CANADA: Meccano Ltd., 45, Colborne Street, Toronto.

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

NEW ZEALAND: Messrs. Browning Iwerson Ltd., P.O. Box 129, Auckland.

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

£7 a week for life, £10 a week for five years. These huge prizes to be won by readers of "Pearsons" and "Tit-Bits." A "Meccano Guild" member is willing to send solutions of these competitions (which are closing shortly), for a small fee of 2/- and S.A.E. for either list with alternatives of these "catchy" competitions.—Ivan Potter, Hawkhurst, Kent.

CUT THIS OUT. 'Meccano' Pen 3d.

Send 5 of these coupons with only 2/9 direct to the Fleet Pen Co., Fleet Street, E.C.4. You will receive by return a splendid British 14 ct. Gold Nibbed Fleet Fountain Pen value 10/6 (Fine, Medium, or Broad Nib). If only 1 coupon is sent the price is 3/9. 3d. less for each extra coupon up to 4 (Pocket Clip 4d.). Satisfaction guaranteed. Your own name gilt letters, either pen or Lever Self-Filling Model with Safety Cap.

RIDE A FAIRYCYCLE

Regd. Trade Mark

It's Great Fun!

PRICE NOW

49'6

ONLY



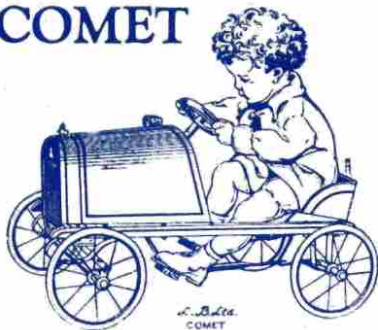
The Manufacturers are giving the public the benefit of reduced costs due to larger production.

If only you had a FAIRYCYCLE just think what fun you could have, and what splendid exercise you would get in riding it.

The FAIRYCYCLE is a real Cycle—not a make-believe. It is beautifully constructed, runs with remarkable ease, and is safe because the low riding position makes it easy to control. And it is BRITISH.

BE SURE YOU RIDE A FAIRYCYCLE

The COMET



This natty little racing model is the very thing for the youngsters. It is built for sturdy boys and girls, and will stand any amount of rough wear. The double crank movement makes it very speedy.

Look for the
Triangle
Trade Mark
on all these
toys



The PEDAL FAIRYKAR

Regd.
Trade
Mark



Baby will love this Pedal Fairykar. There is nothing to beat it. It is beautifully painted a bright red with nickel-plated handle bar and stem, rubber pedals, etc. A splendid health-giving toy.

OBTAINABLE FROM ALL GOOD TOYSHOPS

Sole Manufacturers:

LINES BROS. LTD., 9, FORE STREET, LONDON, E.C.2

Make this Summer the Best You've Known!

Just come along to Holborn and take a look round Gamages! . . You'll declare it to be an afternoon WELL SPENT, and what's more, you'll see all those things you've been wanting for so long but have been unable to get elsewhere. Whether it be Fishing, Cricket, Tennis, Cycling, Chemistry, Photography you'll find

All Your Requirements for Summer are at

GAMAGES



Cricket Balls

The "Referee" (Regd.) A fine quality match ball. Perfect in shape, unbeaten in quality. Hand-made. Price 11/6. Post free. Also The Special Crown, extra special match ball. Full size 12/6 each.

Among the departments to interest you are Photographic and Optical, Sports and Games, Cycling, Fishing and Guns, Scouting, etc., and, of course, the Zoo. You never saw such a collection of good things as are on show at Gamages!



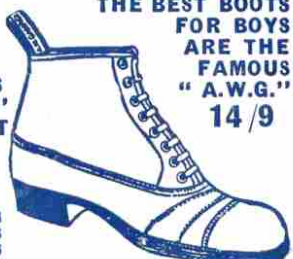
FULL SIZE CLUB BAGS

The very thing for a Junior Club. Strong Brown Canvas, whole cut, double handles, straps and buckles. Size 36" x 12" x 8" 12/6. Top lock and key, good lining. Size 36" x 12" x 8" 12/6. Strong Carpet Bag, full size, double handles, lock and key, two end straps, strong lining, leatheroid bottom. Size 36" x 12" x 5". Price 18/6

CRICKET BAT OIL—in Tins

7 oz. Tin, each 8d. Pint Tin, each 1/9. Quat. Tin, each 3/- Carriage extra.

THE BEST BOOTS FOR BOYS ARE THE FAMOUS "A.W.G." 14/9



THE FAMOUS "A.W.G." CRICKET BATS For boys and youths.

Rubber and cane handles. No. 4 ... 10/6. No. 5 ... 11/6. No. 6 ... 12/6. Postage 6d.

FORCE CRICKET BATS

As illustrated. Every bat autographed and tested by Jack Hobbs of Surrey XI. fame. Size 4 ... 17/6. Size 5 ... 19/- Postage 6d. Size 6 ... 21/-

Uppers of the finest quality Stout White Canvas, stout 1" Butt leather soles, heavily stitched, splendid wearing and very comfortable. Boys' sizes 2, 3, 4 and 5 per pair 14/9

Men's sizes ... 16/9. Also in cheaper qualities, 12/9 and 10/9, post free.

STRONG BATting GLOVES

Featherweight, good tan cape, hair stuffed fingers, strong elastic. Youths' size, 4/6 per pair. Men's size, 5/6 per pair.



Gamages "Referee" TENNIS BALL

A good medium priced ball, very suitable for Junior Clubs, covered good strong cloth, cemented and sewn. Price 13/6 doz. Post 9d.

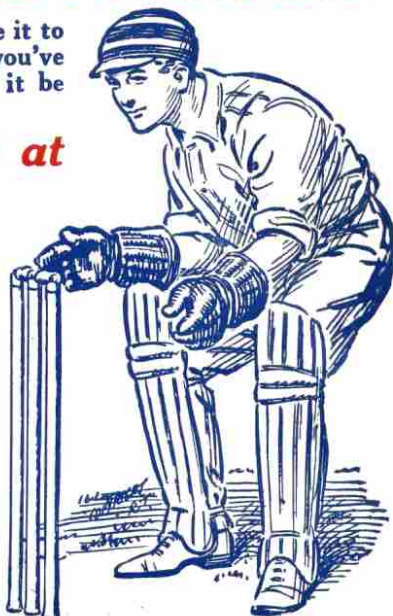


THE "SCHOOL" TENNIS RACQUET

Very strong and serviceable, strung red and white with double centre mains, hollow wedge and double gut bound shoulders. Price 12/6. Post 6d.

THE "CHAMPION" TENNIS RACQUET

With ordinary or round handle, strung with good quality red and white gut, double centre mains, reinforced oval wedge, silk and gut bound shoulders. Price 17/6. Post 6d.



Cricket Kit!

This is the best equipment of its kind on the market, yet prices are low. Visit us to see the value offered.

WICKET KEEPING GLOVES

Special Tan Cape Gauntlets, very strong and serviceable for the wicket keeper. Well ventilated rough palms. - 8/6. Youths' size, per pair ... 8/6. Men's size, per pair ... 8/11. Postage 6d.

LEG GUARDS

Youths' Strong White Drill Leg Guards, 14", per pair ... 6/6. Boys' size, per pair ... 5/9. Postage 6d.

Very superior quality, 10 Rib Leg Guards in White Canvas, per pair 10/6. Postage 6d.

SHIRTS

Well made, very comfortable and smart in appearance. All sizes, in white matt. Prices 6/6 5/6 and 4/6

CRICKET TROUSERS

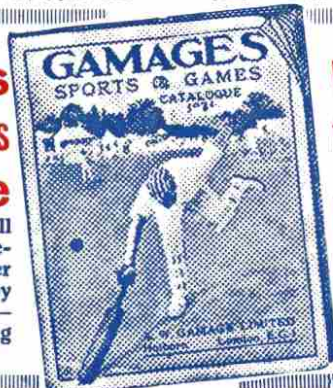
Youths' White Cricket, made from thoroughly shrunk cloth. Side straps and permanent turnups. Sizes to fit boys from 10 to 18 years in three qualities. Per pair. 18/6 15/6 and 10/6

STRIPED BLAZERS

In various colours. All-wool flannel to fit ages 4 to 18 ... 14/6 each

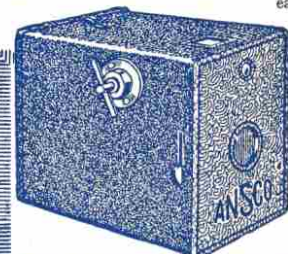
Gamages Summer Sports Catalogue

is now out! In it you'll find every possible requirement for every Summer Sport under the sun. No boy should be without a copy—it's the finest guide to buying you can possibly have.



WRITE TO-DAY for this Splendid 50-page BOOK

Beautifully illustrated, with a coloured cover, it is no trouble at all to obtain. Just write and ask for a copy (a card will do) and we will send you one per return—QUITE FREE!



The "Seven Bob" Camera

Daylight Loading Roll Film Camera, 2 1/4" x 1 1/8" (Standard Vest Pocket Size) film. Covered black leatherine, splendid lens, Dimensions 7 1/2" x 3 1/2" x 4 1/2". Price 7/-

Post free. Films 1/2 per spool of eight (any make).

A. W. GAMAGE LTD., HOLBORN, LONDON, E.C.1

City Branch: BENETFINKS, CHEAPSIDE, E.C.2.