

about 45 degrees, and for "all right" or "line clear" the arm was lowered until it was hanging down vertically and had practically disappeared inside a slot in the post. These three-position signals were abandoned after a time in favour of the two-position signals in use to-day.

It is interesting to note, however, that the three-position signal in an improved form has been re-introduced during recent years, but it is not in general use.

An Ingenious Porter

For some time the semaphore signals were operated by men stationed at the foot of the posts, each man having one or two posts to attend to. The next step was to operate the signals by mechanical means from signal boxes. The story goes that a porter who had two posts under his care got tired of walking backward and forward between them, and set his wits to work to discover some method of saving himself this trouble. Finally he thought out a scheme of ropes and wires connecting the signal arms on the two posts, by means of which he could manipulate the signals from his hut without any walking at all. An inspector chanced to come round and see this ingenious arrangement and reported the scheme to the railway company, and instead of being reprimanded the porter found his idea generally adopted. There is a good deal of doubt as to the accuracy of this story, but at any rate it is certain that the signals came to be operated by wires from signal boxes.

Interlocking and its Advantages

Afterwards came another great improvement known as "interlocking," which consists of the combination of signal and points levers.

The object of interlocking is to prevent a signalman from accidentally setting points and signals in conflicting positions, which might lead to serious results. For instance, the interlocking mechanism prevents a signalman from lowering a signal to allow a train to approach until after he has set the points in the correct position for it to pass, and also it makes it impossible for him to have two signals at the same moment in such positions as can lead to a collision between two trains. Further, once a signalman has lowered a signal to allow a train to pass, he is prevented from moving any points connected with the line on which the train is travelling. Interlocking mechanism is very complicated, but in a future article we shall explain the principle on which it is operated.

Present-day Signals

The great railways of to-day are provided with a wonderfully complete system of safety devices, and travelling by rail—even at the highest speeds—is as free from danger as human ingenuity can make it. Signalling methods have reached

the arm is in this position a red glass covers the light, also signifying danger. The "line clear" or "all right" indication is given by lowering the arm to an angle of about 60 degrees, and in this position a green glass is in front of the light. At one time a white light was used for this purpose, but its use proved to be dangerous.

Drivers found it extremely difficult to decide whether a particular light was their signal or not, and there was always the possibility of a light in the window of a house close to the line being mistaken for a signal, with possibly disastrous consequences.

Signals are also provided with a small white light showing at the back. These "back-lights" are for the purpose of enabling the signalman to tell at night whether the lamps of his signals are burning and also whether the signal arms are working correctly in cases where the signals are in such positions that he cannot

see the red and green lights.

A Safety Device

As we have already seen, the normal position of a signal arm is at danger, and the arm is held in this position by a weighted lever placed close to the foot of the post. Connection between the lever and the arm is made by means of an iron rod. Before the arm can be lowered the weighted end of the lever must be raised, and this is done by the movement of a lever in the signal box, which pulls a wire connected to a chain attached to the weighted lever at the opposite end to the weight. If the chain or the wire should break while the signal is in the "all right" position the weight on the lever will automatically raise the arm, and thus prevent the possibility of the signal still showing "all right" if the signalman does not immediately notice the breakage.

Signal arms are made either with square ends or "fish-tailed" ends. The square-ended arm is a stop signal and the fish-tailed arm is a "distant," or cautionary signal.

Why "Distant" Signals are Used

The first signal seen by the driver of a train approaching a signal-box is the fish-tailed "distant" signal, so called because it is the signal at the furthest distance from the box. The object of the "distant" signal is to warn the driver when the next or "home" signal is likely to be at danger, and so give him time to reduce the speed of his train ready to stop at the "home" signal if necessary.

(Continued on page 415)



Photo courtesy]

[L.N.E.R.]

Scarborough to Liverpool via Leeds. 3.30 p.m. leaving York

a very remarkable degree of perfection, and trains are shepherded from their starting point to their destination with unceasing watchfulness.

Signal boxes are placed at various points all along the line, and from them the signals and points are operated by specially trained signalmen. The signals themselves are in the form of semaphore arms fixed on high posts by the side of the line. These signal posts are usually placed at the left-hand side of the line of rails to which they refer, and the signal arms are on the left-hand side of the posts as seen by the driver of an oncoming train. There are thus separate sets of signals for both "up" and "down" lines, "up" lines being lines leading towards a main terminus and "down" lines those coming from such a terminus.

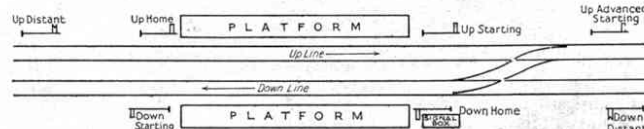


Fig. 1 Showing Position of Main Line Signals at a Small Station

Lights for Night Use

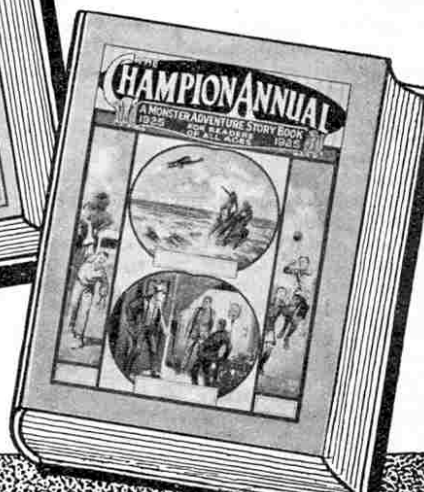
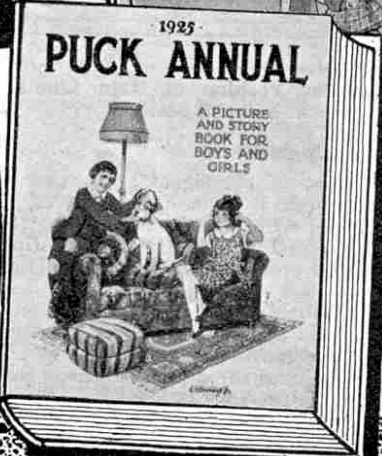
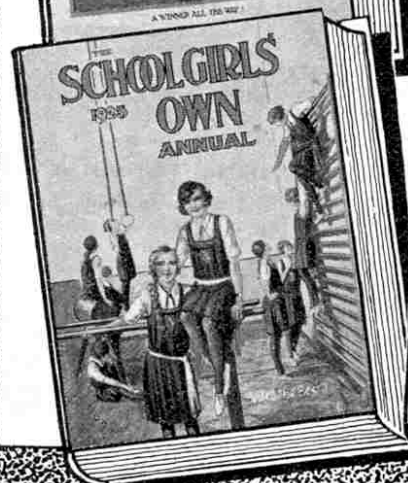
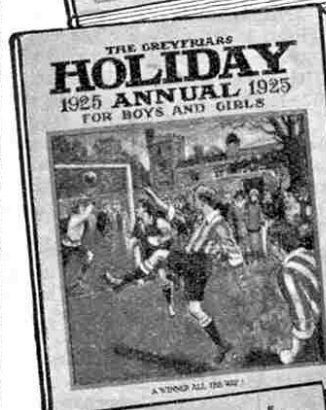
The front of the signal arms, that is the side seen by the engine driver, is painted red with a white stripe, and the back is painted white with a black stripe. Each signal post is also fitted with a lamp which is kept burning continuously and which requires replenishing with oil only about once a week. Coloured glasses, called "spectacles," are attached to the signal arms, and through these the engine driver views the light at night.

The normal position of a signal arm is horizontal, signifying "danger," and when

Ideal Xmas Gifts

For Boys and Girls of all Ages

THESE world-famous Annuals are packed from cover to cover with the jolliest of jolly stories—including ripping tales of School and Adventure—jokes, poems, riddles, games, etc., together with COLOURED PLATES and pictures. They are stout handsome volumes with heavy board covers, splendidly printed in full colours and with strong cloth backs. Not only will they last longer than the average toys but will outlive them in interest. If you want a present that will give you real pleasure this Christmas, ask Father or Mother for one of these delightful gift books. Choose the one you would like, from the small pictures of them given here, and make a note of the name.



6/- each.

On Sale at all Newsagents
and Booksellers, and
wherever books are sold.

The Amalgamated Press Ltd.
The Fleetway House,
London E.C.4.

A Novel Electric Motor

Easily Made with Meccano

Many readers will be interested in the following account showing how an interesting working model of an electric motor may be constructed from standard Meccano parts.

THIS motor is designed on quite unorthodox lines, but it is none the less interesting on that account. The armature in particular, which also does duty as the commutator, is distinctly novel. Although this motor has run at a speed of 600 revolutions per minute under test, it should be mentioned that it has very little power and is not capable of doing any useful work. Its interest lies in the fact that it demonstrates the principles on which more powerful motors are constructed. In passing, it may be mentioned that when running at 600 revolutions per minute the armature receives 9,600 pulls per minute, and the brush is making and breaking contact 4,800 times per minute, wonderful figures considering the small size and nature of the model.

Constructing the Motor

To construct the motor first build the frame as shown in the illustration. The switch arm (1) is a 3½" Strip pivoted to the base plate (2) by means of an ordinary Meccano Nut and Bolt. Two metal Washers are placed on this Bolt between the Strip (1) and the base plate (2). The switch slides over two Flat Brackets (3 and 4), of which (3) is bolted direct to the plate (2), one metal Washer being placed between it and the plate. Flat Bracket (4) is bolted to and insulated from the plate (2) by a 6 B.A. screw, a fibre bush being placed between it and the plate. These two Flat Brackets must not be allowed to touch each other, nor must the Flat Bracket (4) touch the plate (2). A 2" Strip (5) is bolted over the switch arm (1), being separated from the plate (2) by two metal Washers on each bolt.

The combined armature and commutator (6) consists of a Face Plate and four 5½" Strips. In each of the holes next to the boss of the Face Plate is a 6 B.A. screw, which is not insulated, as shown in Fig. 1.

How the Brush Makes Contact

The two magnets (7) are placed as shown, care being taken that the north pole of one and the south pole of the other are near the armature (6). Wind nine layers of No. 26 wire on each bobbin.

At the far end of the plate (2) are two terminals, both insulated from the plate. From one of them a wire goes to the 6 B.A. screw of the Flat Bracket (4) and from the other a wire goes to one of the wires from the lower magnet (7). Join the other wire from this magnet to one of the wires from the upper magnet. The other wire from the upper magnet is taken to the 6 B.A. screw (8), which is insulated from the main frame of the model in the usual way.

The brush (9) consists of 4" bare copper wire. Bend this wire into a semi-circle and fasten one end to the 6 B.A. screw (8) so that there is electrical connection with the upper magnet (7) but not with the main frame.

The free end of the wire (9) must brush against the commutator, which consists of the eight 6 B.A. screws on the Face Plate (6). The brush (9) must be adjusted so as to begin to touch one of the 6 B.A. screws of the commutator when two of the arms of the armature are equidistant from the magnets (7), and must break contact immediately the next arm of the armature comes opposite the magnets.

The Working of the Motor

The path of the current through the motor is as follows: From one of the terminals at the rear of the model the current passes along the wire to the lower magnet (7), and from there to the upper magnet (7), the insulated screw (8) and the brush (9). From the brush it passes to the commutator, the frame of the model and the switch arm (1), and then to the Flat Bracket (4) and the other terminal. In our illustration the switch is shown in the "off" position.

When the switch is "on," no current will flow unless the brush (9) is in contact with one of the 6 B.A. screws of the commutator. If brush (9) is in contact with one of these screws current will flow, the cores of the bobbins (7) will be magnetised, and an arm of the armature (6) will be drawn round until it is opposite the poles of the magnets. Immediately the armature reaches this position, however, the brush, if correctly adjusted, breaks contact, the current is thereby automatically switched off, and the cores of the bobbin (7) cease to be magnetic and no longer hold the armature. Being thus set free, the armature will "free-wheel" round on account of the impetus already given to it, the brush will make contact with the next 6 B.A. screw and the cycle of operations will be completed.

The motor can be built with Outfit No. 5, or Outfit No. 4 and a 2" Strip, or Outfit No. 3 and a 2" Strip and a Face Plate, and the Electrical Outfit.

Parts required:

6 of No. 2	1 of No. 109
5 " " 3	1 " " 115
1 " " 6	2 " " 301
2 " " 10	5 " " 302
1 " " 16	3 " " 303
30 " " 37	12 " " 304
5 " " 37A	13 " " 305
9 " " 38	2 " " 306
1 " " 48A	2 " " 308
1 " " 52	30 yds. " 313
2 " " 53	10" " 314
2 " " 59	4" " 315

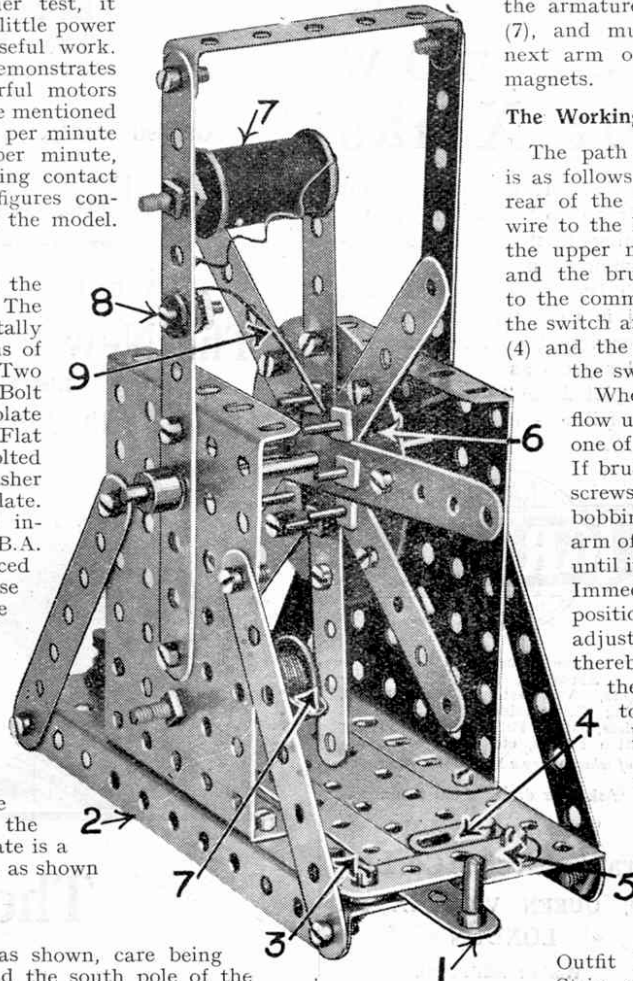
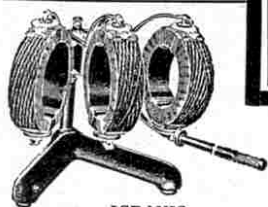


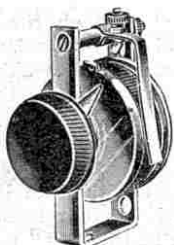
Fig. 1. Details of Commutator

IGRANIC Honeycomb COIL Gimbal Mounted.

Built on the same principles as the famous Igranic Honeycomb Plug Mounted Coil. In 20 sizes to cover wave-length ranges of 100 to 23,000 metres. Price from 4/10 to 15/- according to size.



**IGRANIC
Gimholder Coil Holder.**
With stand—for three coils.
Price 21/-
Without stand—for panel
mounting. Price 15/-



**IGRANIC
Filament Rheostat 30 ohms.**
Designed for controlling all types of Dull Emitter Valves. It is smoothly and evenly variable over its whole resistance range, and permits of very fine selectivity. Suitable for controlling up to four valves according to the type of valve used. Current carrying capacity 0.4 amp. Price, with screws and drilling template for panel mounting, 7/-



**IGRANIC
Auxiliary Rheostat 25 ohms.**
For joining in series with existing rheostats to obtain additional resistance for the control of Dull Emitter Valves. Any value of additional resistance up to 25 ohms may therefore be obtained. Easy to fit. No further control required. Price 1/3



IGRANIC VERNIER FRICTION PENCIL
Designed for use with variable condensers, variometers and similar apparatus to convert the plain instrument into vernier type. You merely drill a hole in the panel near the edge of the dials and press in one of the bushes supplied with the pencil. For fine adjustment the pencil is inserted in the bush—so that the rubber ring engages with the bevelled face of the dial—and rotated. By sliding the clip attachment towards the brass pin a pencil may be converted into an anti-capacity adjuster. Price complete with clip, spare rubber ring and 3 bushes, 2/-

Build your set now for Xmas

Time's short now if you want your set to "listen-in" to the coming Christmas broadcast programmes—but if you build with Igranic components there still is time, for you can rest assured that your set will be a real success as soon as you've completed the "wiring." Don't risk failure—see that you build a better set with



They include Honeycomb Coils, Filament Rheostats, Intervall Transformers, Variometers, Variocouplers, Bi-plug Coil Holders, Tri-plug Coil Holders, Battery Potentiometers, Vernier Friction Pencils, etc.

All of which carry a six months' guarantee

Ask your dealer about them.

Write for List Z.316

Igranic Electric Co. Ltd.
149, QUEEN VICTORIA ST.
LONDON

Works: BEDFORD.

Branches:

Birmingham, Bradford, Cardiff, Glasgow,
Manchester, Newcastle.

THE NEW PHOTOGRAPHER

FULLY ILLUSTRATED. 2^d

EVERY MONDAY

The Up-to-date Weekly Journal for all Photographers

Interesting Articles
Helpful Criticisms
The Best Pictures

Graded Competitions to suit All Workers

We Teach Photography

Write for a Free Specimen Copy to—

The New Photographer Ltd.,

Distribution Department,

41, North John Street, LIVERPOOL.



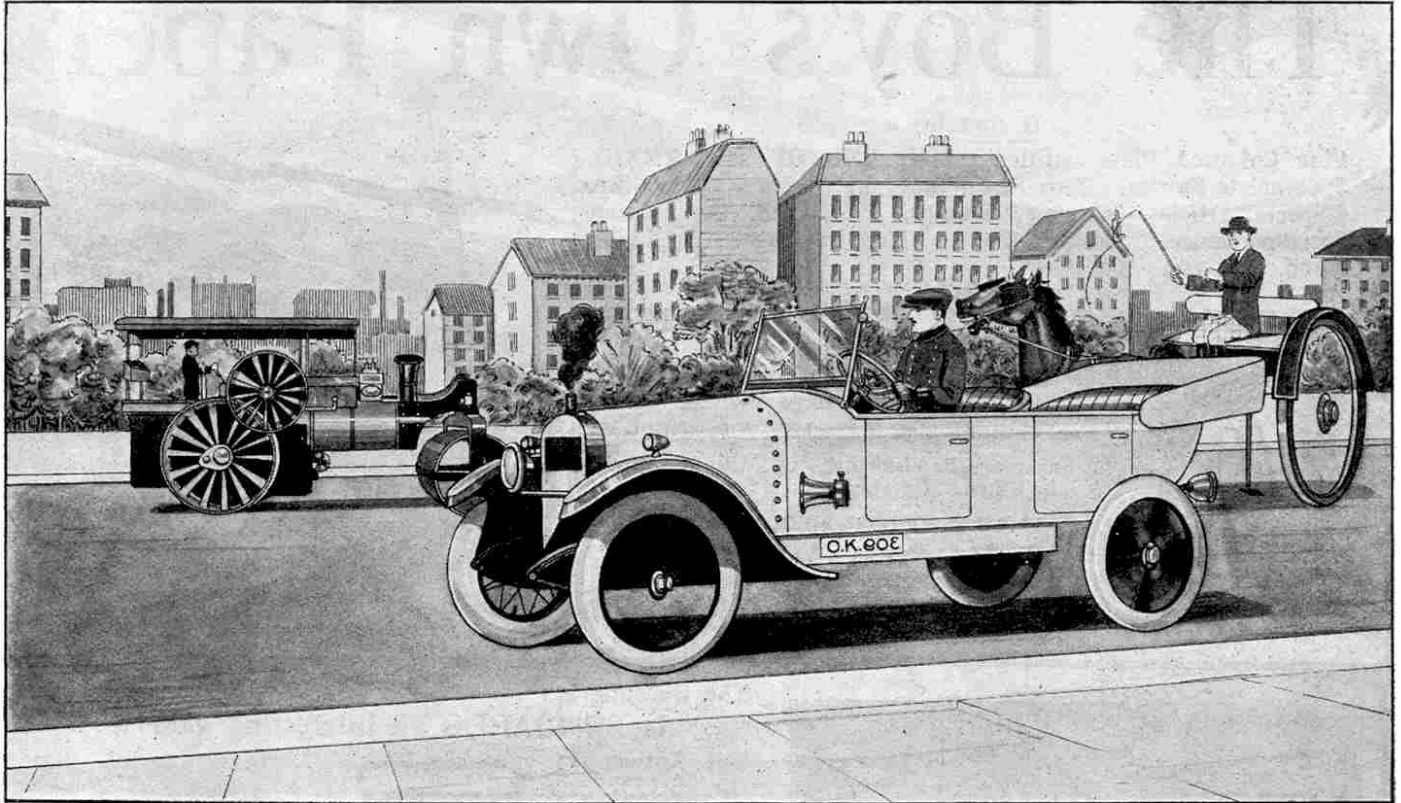
The Boy who built a Stage Coach

He was just an ordinary boy. Last week he bought a copy of "TOBY," and inside he found a coloured cut-out model. With scissors and paste he set to work and soon erected a gorgeous model of a stage coach.

Then he discovered many other good things in "TOBY"—the page telling how railways work, the stirring adventure stories, the puzzles, riddles, etc. You'll find them all in the enlarged December "TOBY," One Shilling.

Every number of "TOBY" contains a coloured cut-out model. Get the enlarged Christmas Number to-day, One Shilling, and ask your newsagent to deliver "TOBY" regularly—usual price—7d. monthly.

Competition Corner



Have You Sharp Eyes: How Many Mistakes Can You See?

THIS drawing will test your powers of observation in this respect, for it has been made specially with this object in view. As you will see, all kinds of mistakes have been made in the drawing, and prizes are offered for those readers who discover the greatest number of errors. The first prize will go to the reader whose list contains the largest number of errors and the second and third prizes to those readers who send in the next best lists.

Some time ago we had a similar Competition and it created very considerable interest. So sharp are the eyes of Meccano boys that the winner of the Competition actually found 184 mistakes, although the artist had intentionally made only 39! There *may* not be as many mistakes in the above picture as in the former contest, but at the same time we assure our readers that there are quite a good number!

Competitors should therefore carefully examine the drawing and make a note of every mistake as they find it. Each mistake should be numbered, and as far as possible they should be grouped together. For instance, all the mistakes in connection with the motor car should be placed together on your list. Each mistake should be described in the smallest possible number of words and the total number of mistakes found should be given at the foot of your list.

Entries may be sent in at any time, but must reach this office before the 31st January next. Those from Overseas readers must reach us before the 30th April next.

Don't forget to put your name and address on each sheet of paper, as sometimes entries become separated, and unless each sheet has on it the name and address of the entrant, it is impossible for us to identify it.

Another New Contest

In view of the great interest shown by thousands of our readers in Postage Stamps, and as our last "Bargain Hunt" was a great success, we are arranging another competition on similar lines. As before, this will take the form of a "bargain hunt" through the announcements of stamp dealers in this month's issue.

Competitors should carefully study each separate announcement, and from their knowledge and experience of stamps decide which dealer's announcement offers the greatest value. When

the best item has been decided upon, then a second and third must also be chosen. The three should then be written down in order of merit on a post-card, together with the name, address and age of the competitor. The entry must not carry any other correspondence.

The first prize in the contest will be a packet of stamps, value £1/1/-, or stamps to that value, to be chosen from any one firm advertising in the "M.M." The prize will be awarded to the entry that most nearly corresponds with the general order of voting. There will also be three other prizes for the next three competitors in order of merit, and these prizes will entitle the winners to a free advertisement (value 5/- each) in which to announce their own bargains or wants in our advertisement columns.

(Continued on page 413)

A Hearty, Happy Christmas

is assured, when you get the

SPECIAL DECEMBER-CHRISTMAS NUMBER

of

The Boy's Own Paper

It contains a

Fine Coloured Plate entitled "THE END OF THE TRAIL."
5 Complete Stories. New Serial Story by Major Charles Gilson.
6 Special Articles. Wireless. Stamps. Field Club. Competitions.
Correspondence. Editor's Page. Hobbies Page. In Lighter
Mood, etc., etc.

ALSO

SPECIAL COLOUR SUPPLEMENT

CONTAINING

"The Mystery of the White Clover." A Christmas Story, by G. GODFRAY SELICK.

"Some Christmas Nuts to Crack." A Page of Puzzles.

"A Snake and its Fishing." A Christmas Adventure in Natal. By H. LINDSAY SMITH (in colour).

Published at 4, BOUVERIE STREET, LONDON E.C.4.

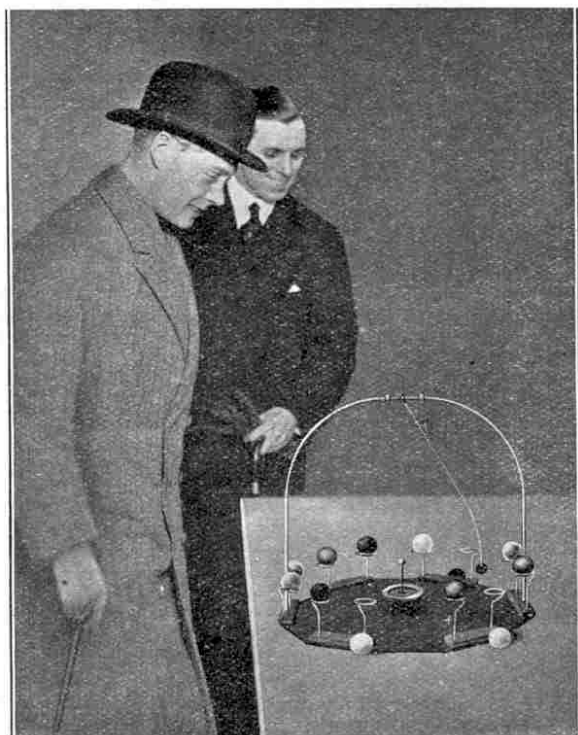
OF ALL NEWSAGENTS, etc.



1/6

net.

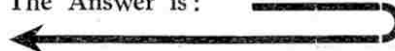
Do not delay—get it to-day.....



The Question is :

Is BOMBARDO an interesting game?

The Answer is :



Sizes and Prices :

No. 1 7/6 No. 2 10/6 No. 3 15/-



A PERFECT MINIATURE BILLIARD TABLE.

3ft. 0in. × 1ft. 6in.	30/-	3 Composition Balls, 2 Ash
3ft. 6in. × 1ft. 9in.	37/6	Cues, Marker, Chalk and
4ft. 0in. × 2ft. 0in.	45/-	Rules supplied with each.

Stocked and Sold by

Gamages, Harrods, Selfridges, etc.

or direct from

Made by

Disabled Soldiers & Sailors

THE LORD ROBERTS 122, Brompton Road,
MEMORIAL WORKSHOPS, London, S.W. 3.

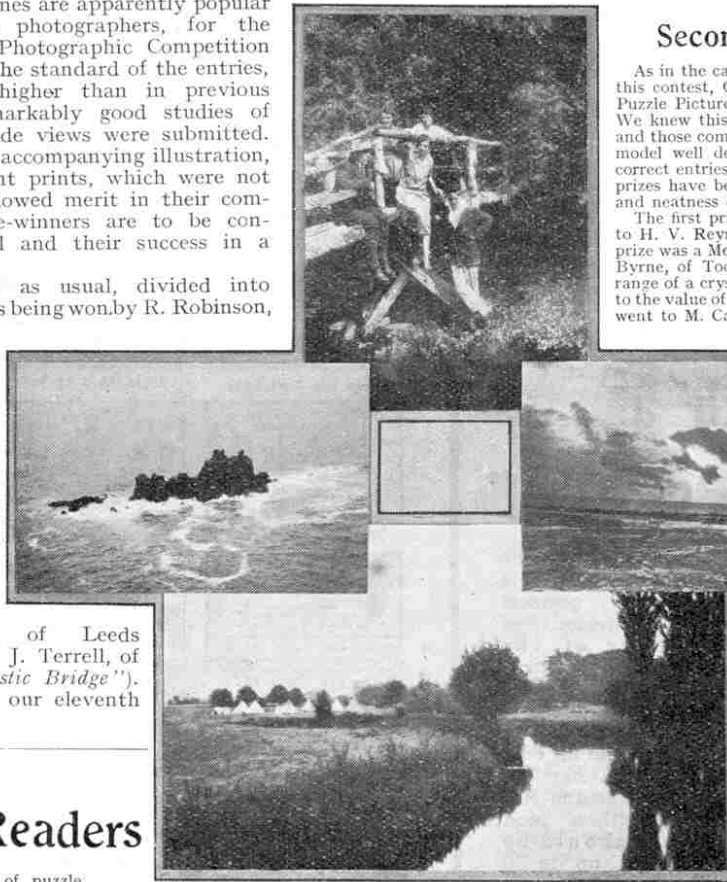
Result of 10th Photo Contest

"A Beach or Riverside Holiday Scene"

Beach and riverside scenes are apparently popular subjects with Meccano photographers, for the response to our Tenth Photographic Competition was very satisfactory. The standard of the entries, too, was considerably higher than in previous contests, and some remarkably good studies of country scenes and seaside views were submitted. As will be seen from the accompanying illustration, the winners sent excellent prints, which were not only well finished but showed merit in their composition also. The prize-winners are to be congratulated on their skill and their success in a very close contest.

The competition was, as usual, divided into two sections, the first prizes being won by R. Robinson, of Cheltenham ("Sunset over the Sea") and T. D. Meredith, of Bath ("Our Summer Camp") respectively, whose entries are fine examples of amateur photography. Meccano No. 1 Radio Receivers have been despatched to these boys, while Meccano goods to the value of 5/- have been awarded to the second prize-winners in each section—Harold Scott, of Leeds ("Breakers") and Basil J. Terrell, of Par, Cornwall ("The Rustic Bridge").

We hope to announce our eleventh contest next month.



(Top) The Rustic Bridge.
(Left) Breakers. (Right) Sunset over the Sea.
(Bottom) Our Summer Camp.

FOR Lynx-Eyed Readers

We give here the final set of puzzle pictures in our third contest for "Lynx-Eyed" Readers. As in the two sets previously illustrated, each of these pictures represents a part of some model in the 0-3 Manual of Instructions (Editions No. 23 or 24).

When the models to which these twelve parts belong have been identified, their numbers, together with those of the pictures illustrated in the last two issues, should be neatly copied on to a postcard. Each postcard must also bear the name, address and age of the entrant, but no other correspondence is to be written on the card. Type-written postcards are not allowed, as those who submit them have an unfair advantage over boys who are not fortunate enough to possess a typewriter. Any entry not fulfilling these conditions will be disqualified.

This Third Competition is certainly the most difficult yet announced in the "M.M.," but Meccano boys do not like "easy" contests, for they pride themselves on the fact that they have sharper eyes than any other boys! Perseverance and patience are needed to solve these puzzles, and if you find that, after all your efforts, you are unable to solve the whole of the 36 pictures, send in your entry just the same, as other competitors also may have been unable to complete their sets.

There are 27 splendid prizes offered in this competition and the first will be awarded to the entrant who succeeds in correctly solving all the 36 puzzle pictures. The other prizes will be given to the next nearest competitors in order of merit. If no reader is able to solve all the puzzles correctly, the first prize will go to the entrant whose solution is most nearly correct. In the event of a tie, neatness of writing will be taken into consideration in awarding the prizes. The Editor's decision is final in all cases.

Entries may be sent in at once and should be addressed to "Puzzle Pictures," Meccano Magazine, Binns Road, Liverpool, and must reach this office before the closing date, which in the United Kingdom is 31st December (Overseas Readers 30th April). (New readers may obtain copies of the October and November "M.M.," containing the first and second set of Puzzle Pictures, on application to the Editor. Price 3d. each, post free.)

FIRST PRIZE : Hornby No. 2 Pullman Set.
SECOND PRIZE : Meccano No. 1 Radio Receiver.
THIRD PRIZE : Pair Meccano Headphones.
CONSOLATION PRIZES : 12 Meccano Writing Pads;
12 Meccano New Complete Manuals (1924).

For Overseas Readers

Result of Second "Lynx-Eyed" Contest

As in the case of the entrants in the United Kingdom section of this contest, Overseas readers found that the Second Lynx-Eyed Puzzle Pictures required considerable perseverance to solve them. We knew this would be the case when we arranged the pictures, and those competitors who succeeded in correctly numbering every model well deserve to be congratulated. Altogether seventeen correct entries were received, and in accordance with the rules the prizes have been awarded in order of merit, the competitor's age and neatness of writing being taken into consideration.

The first prize of a Hornby No. 2 Tank Loco has been awarded to H. V. Reynolds, of Georgetown, British Guiana. The second prize was a Meccano No. 1 Radio Receiver, but as the winner, John Byrne, of Toowomba, Queensland, apparently lives outside the range of a crystal set, he is being asked to select Meccano products to the value of his prize. Third prize, Meccano Double Headphones, went to M. Cavalline, of Rome, Italy.

Consolation prizes of Meccano Complete Manuals or Writing Pads have also been awarded to the following competitors: Akbarali Abdulrahim (Karachi); T. S. Bilimoria (Bombay); Flip Begemann (Java); Carel Begemann (Java); Singh Dudhoria (Bengal); V. R. Heeramanek (Bombay); D. R. Heeramanek (Bombay); J. R. Heeramanek (Bombay); A. Johnston (Milan); A. F. Mody (Bombay); Henry Powell (Malta); James A. Saddler (Adelaide); H. Theissen (Groningen); Wm. T. Turnbull (Alberta, Canada).

The attention of our Overseas readers is drawn to the final set of Puzzle Pictures in our Third Competition for Lynx-Eyed Readers on this page. We hope that every Overseas reader of the "M.M." will enter this contest and we shall look forward to a record number of entries.

Result of Stamp "Bargain Hunt"

Overseas stamp-collectors agreed with Meccano boys at home that the packet of stamps offered by Nelson T. Hillier, in the August "M.M.," was the biggest bargain advertised. The order of voting gave him a clear majority, but there was a big difference of opinion as to the second and third bargains, showing that each advertisement had been very keenly studied. According to the number of votes received the correct list is as follows:—(1) Hillier, Horsmonden, Kent; (2) Witherick, Coventry; (3) Lisburn & Townsend, Liverpool. No entry was received giving these names in their correct order and the prize has therefore been awarded to the competitor who succeeded in placing the first two correctly.

The winner is J. P. Colman, of Johannesburg, South Africa, who is entitled to a 10/6 packet of stamps to be chosen from any advertiser in the "M.M." A free one-inch advertisement has also been awarded to the stamp dealer whose name heads the list of bargains.

A similar competition for stamp-collectors is announced on page 411 and Overseas readers will again have an opportunity of "sitting in judgment" on our advertisements.

Closing Dates for Competitions.

Planning a Hornby Railway : Overseas—28th February.
Third Lynx-Eyed Contest : Home—31st December. Overseas—30th April.
Tenth Photographic : Overseas—31st January.
Stamp Bargain Hunt : Home—31st December. Overseas—31st January.
Puzzle Picture Contest : Home—31st January. Overseas—30th April.

No. 25	No. 26	No. 27	No. 28	No. 29	No. 30
No. 31	No. 32	No. 33	No. 34	No. 35	No. 36

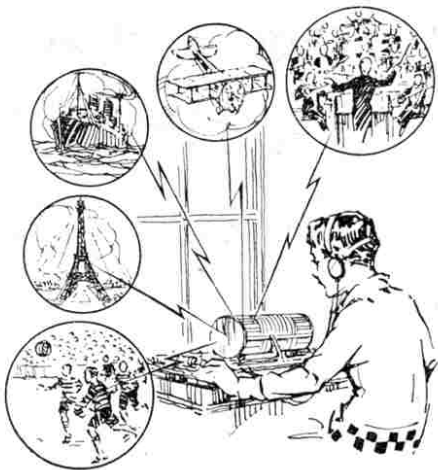
THIRD COMPETITION—FINAL SET.

Another New Contest—(continued from page 411)

Two further consolation prizes have also been offered by Nelson T. Hillier, whose stamp advertisements are familiar to readers of the "M.M." These will take the form of a collection of 1,000 different stamps to the best runner-up under 12, and a Standard Catalogue of Postage Stamps, 1925 Edition, to the best runner-up over 12 years of age.

The stamp dealer in whose advertisement the biggest bargain was found will have an advertisement, up to one inch space, inserted once free of charge.

Closing date 31st December, 1924 (Overseas 30th April, 1925).



Listen with a Meccano Receiver

The Meccano Crystal Receiver No. 1 is a highly-efficient and splendidly-finished instrument. The detector is enclosed in a glass chamber, which effectively protects it from dust and moisture. Two slides are provided, one on each side of the inductance, giving great selectivity and clearness of reception.



No. 1 RECEIVER

WAVE LENGTHS: Zero to 1,000 metres.
DIMENSIONS OF SET: 9½ in. x 8½ in. x 5 in.

R.S.1. (without 'phone) .. PRICE (Post free) 15/-

The Meccano Crystal Receiver No. 2 is of the constructional type, and is assembled from standard Meccano parts. It is specially adapted to the requirements of those who wish to carry out simple experiments.



No. 2 RECEIVER

WAVE LENGTHS: 300-400 metres.
(By adding additional inductances the wave length may be increased if desired).

R.S.2. Parts to make the No. 2 Receiver, complete in strong carton, including single 'phone, 2000 ohms resistance. PRICE (Post free) 22/6

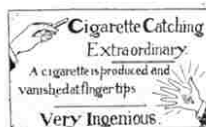
R.S.2A. Parts, as above, but without 'phone .. PRICE (Post free) 15/-

MECCANO DOUBLE HEADPHONES

British made, 4000 ohms resistance, and of the highest quality procurable, giving loud, clear and undistorted reception. Comfortable to wear and easily adjusted. PRICE (Postage paid) .. 15/-

MECCANO LTD. BINNS ROAD LIVERPOOL

TRICKS, JOKES & PUZZLES



Price 6d Post 2d.



Price 3d & 6d Post 2d



Price 6d Post 2d.



Price 6d. Post 2d.



Price 1/- Post 2d



Price 1/- Post 2d



Price 9d. Post 1d.



Price 3d & 6d Post 2d.



3d 6d & 1/- post 2d.



Price 2/- Post 2d.



Price 1/- Post 2d



Price 1/- Post 2d



Price 1/- Post 2d.



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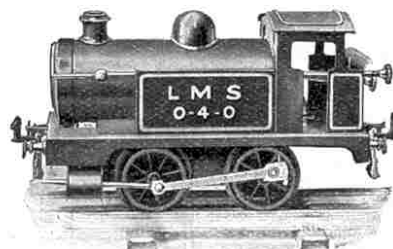


Price 6d. post 1d

L. Davenport & Co., 15, New Oxford St., London

Large Catalogue Tricks, Jokes and Puzzles, 3d. Small Lists Free

HORNBY TANK LOCOS



HORNBY No. 1 TANK LOCO

Strong and durable loco capable of any amount of hard work; richly enamelled and highly finished; fitted with reversing gear, brake and governor.

Gauge 0, in colours to represent L.M.S. or L.N.E.R. Companies' Locos 12/6



HORNBY No. 2 TANK LOCO

Powerful model embodying all the characteristics of the Hornby series. It is 11½" in length and is fitted at both ends with a four-wheeled bogey. Beautifully finished in colours; lettered L.M.S. or L.N.E.R., with reversing gear, brake and governor. Suitable for 2 ft. radius rails only. Price ... 30/-

FROM ALL MECCANO DEALERS

Lives of Famous Engineers*(Continued from page 373)*

bridging of this river was very difficult on account of the violence of the periodical floods. Telford designed a light cast-iron arch of 150 ft. span with a rise of 20 ft. The arch was composed of four ribs, each consisting of two concentric arcs forming panels, which were filled in with diagonal bars. The roadway was 15 ft. wide and was formed of another arch of greater radius, attached to which was an iron railing. Robert Stephenson objected to the use of two dissimilar arches as being liable to subject the structure to unequal strains, but nevertheless this bridge, like many others built by Telford on a similar plan, proved perfectly serviceable.

From the Atlantic to the North Sea

As soon as the construction of Highland roads and bridges was in progress, attention was given to the improvement of harbours around the coast. It would require too much space to describe the many harbours constructed or improved by Telford, but mention may be made of those at Aberdeen and Dundee which, after Leith, the port of Edinburgh, form the principal havens along the East coast.

The construction of a navigable highway through the chain of lochs crossing Scotland diagonally from the Atlantic to the North Sea had long been looked upon as a work of great national importance. As early as 1773 James Watt surveyed the country, pronounced the canal practicable and indicated the best means of construction, but nothing was done in the matter at the time. In 1801 Telford was requested to report on the project, and it is interesting to know that his survey, as regards the most important particulars, agreed closely with that of Watt.

Caledonian Canal Begun

This time the scheme took practical form, and early in 1804 work was begun by the formation of a dock or basin adjoining the intended tide-lock at Corpach near Bannavie. This basin formed the southernmost point of the intended canal. The difficulties of the undertaking were very great. For instance, the difference between the levels of Loch Eil and Loch Lochy was 90 ft., while the distance between them was less than eight miles, and it was necessary to climb up the side of the hill by means of a flight of eight huge locks which Telford named "Neptune's Staircase."

A Great Undertaking

Between the two extremities of the Canal, Corpach on the south-west and Clachnagarry on the north-east, extended the chain of fresh-water lochs. The whole length of the navigation was over 60 miles, of which the navigable lochs constituted about 40 miles, leaving only some 20 miles of canal to be constructed, but of unusually large dimensions and through a very difficult country. The summit loch was Loch Oich, 100 ft. above high-water mark both at Inverness and Fort William, and the navigation had to climb up to this sheet of water by a series of locks from both the eastern and western seas, the total number of these locks being 28.

The construction of all these works in such a wild country involved vast labour and a great deal of anxiety, and many



CHOOSE YOUR OWN CHRISTMAS PRESENT

An opportunity for "M.M." readers

It is a wonderful sensation to sit down and study illustrations and descriptions, and select your own Christmas present. Try it! In our pages this month there are advertisers' announcements of all kinds of splendid toys, books, and all manner of articles for giving pleasure to boys at Christmas. We are going to make at least one boy happy by giving him the very thing he wants, from amongst the articles advertised in our columns.

Let us know what you want—on a Postcard

Look carefully at *all* the advertisements and decide which article you would like the postman to hand to you on Christmas

morning. Write the name of it on the top of your postcard, marking it No. 1. Then write the name of the article that you would like second best and mark it No. 2. Do this with six articles altogether, write your own name and address at the bottom in very plain letters, and send the postcard to "Christmas Presents, Meccano Magazine, Binns Road, Liverpool."

To the sender of the list that corresponds most nearly in order of merit with the total voting we will post the article that heads his list, to reach him on Christmas morning.

"Christmas Presents" postcards must reach us not later than 20th December.

years elapsed before the task was completed. In the meantime the cost of construction had very greatly exceeded the original estimate, and after all, when the canal was opened, it was comparatively little used. This was a bitter disappointment to Telford, and he felt very keenly the attacks made upon the Government because of their expenditure on the undertaking. Telford, of course, was not in any sense responsible for the commercial success or failure of the canal. He was simply called upon to construct it, and having done so in the best possible manner his work was ended.

NEXT MONTH:— TELFORD BUILDS THE MENAI SUSPENSION BRIDGE.

Next Month:

Our next issue will be published on the 1st January. The price is 3d. and the Magazine will include the following splendid articles, in addition to our regular features:—

The World's Mightiest Electric Loco
Giant Block-setting Cranes and Their Work
The Menai Suspension Bridge
Stamp Tour Round the World
Discoveries in Meccanoland (Part II)
The New "Flying Scotsman"
Taking Care of Bicycles in Winter
The Triumphs of Famous Men over Poverty
Electric Signs and How they Work

Order your copy to-day from your
Meccano Dealer, or from any News-
agent

Miniature Railway System—

(Continued from page 407)

As the train is likely to be travelling at a high speed when the driver first sees the "distant" signal, it is clearly necessary that this signal should be sufficiently far in advance of the "home" signal to allow the driver time to pull up at the latter if required. The standard distances from "distant" to "home" vary from 600 yards on a rising gradient to 1,000 yards on a falling gradient.

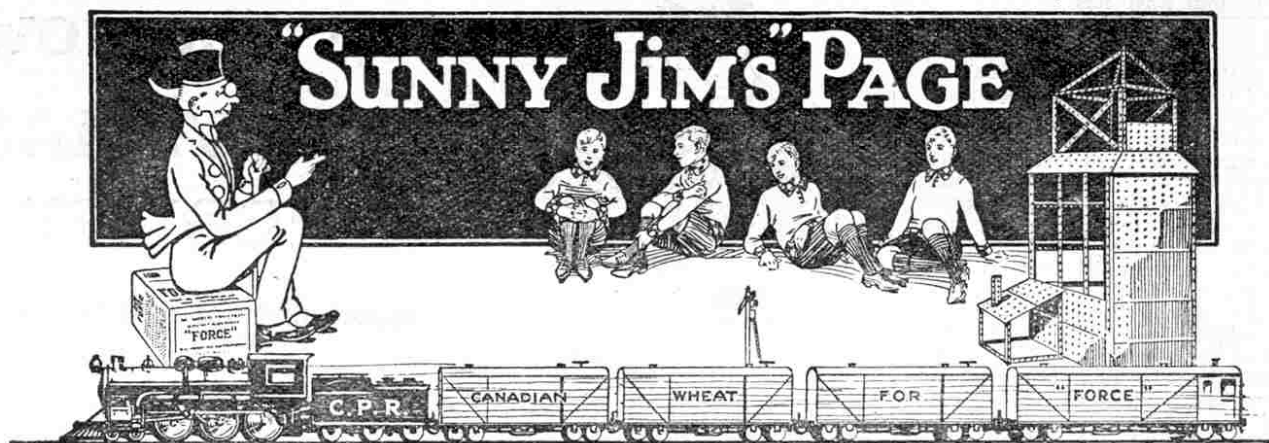
As long as the "home" signal is at danger the "distant" signal also is kept at danger, and the driver slows down and proceeds cautiously towards the "home" signal. If the latter is at danger when he reaches it he must stop dead, and must on no account go on until the signal is lowered to the "all right" position.

Starting Signals

The third signal to be reached is the "starting" signal, the function of which is to prevent a train that has passed the "home" signal from starting away until the line ahead is known to be clear. Sometimes there is a cross-over road or a siding connection ahead of the "starting" signal. In such cases a fourth signal is necessary and this is called an "advanced-starting" signal. The shape of "starting" and "advanced-starting" signals is similar to that of "home" signals. Fig. 1 shows the relative positions of the various main line signals at a small station.

NEXT MONTH:— SIGNALLING ON A MINIATURE RAILWAY

Are you having a Party at Christmas? Can you Act? Try! It's Easy—and Great Fun!



SOLUTION TO LAST MONTH'S PUZZLE (Sunny Jim had hundreds of solutions sent him):
 "FORCE" IS WHEAT—MADE NICE TO EAT, READY TO SERVE, WITH HOT MILK.

A CHARADE FOR CHRISTMAS!

(To take about 10 minutes).

Learn this and act it at the party. See if your friends can guess the hidden sentence. There's a hidden word in Act I, another in Act II., another in Act III., and the whole three words (*Everybody likes "FORCE"*) in Act IV.

You and a friend can do it. Only two characters are needed. A "stage" is easily rigged up. No scenery is required—just a curtain and someone to work it. Father Christmas's costume is easily made at home. Mother will make up Sunny Jim's suit from a paper pattern that can be had if you apply now to Dept. M.C. 4, c/o Sunny Jim, 197, Gt. Portland Street, London, W.1., and send with your letter four penny stamps and the lid of a "FORCE" packet. Send at once and have this jolly charade as a surprise for your Christmas party!

A Christmas Ad-venture

Characters:

Sunny Jim and Father Christmas.

ACT I.

Hidden word—(*Everybody*).

S.J. enters. (*To himself*) "High o'er the fence leaps 'Sunny Jim,' 'FORCE' is the food that raises him."

(*To audience*) Yes, and Sunny Jim is not the only one who was raised on "FORCE"—there's many a man to-day who can say the same. *Everybody* who tastes "FORCE" wants more—but I'm beginning to talk like an advertisement. I saw Father Christmas coming along the road a short time ago—why, here he is!

F.C. (*enters puffing under weight of well-loaded sack*). S.J. Hello, Daddy Christmas! You don't seem to be very happy. Trying to carry something for *everybody* I'll be bound.

F.C. (*lowering sack*). Ha! That's a weight off my chest.

S.J. You mean your back.

F.C. No, I can still feel the load in my bones (*swings his arm*). That's better! (*Sits on sack. Puts head in hands*).

S.J. You've not got rid of *all* your troubles, I can see. There's something on your mind. Now tell me, what's wrong?

F.C. My job is to be happy and to bring happiness to others, but there are so many boys and girls, and I can't get round to *everybody*. *Everybody* wants a present at Christmas Time and my poor feet get so tired.

S.J. You have a sledge.

F.C. That's no good from house to house.

S.J. Of course not. You should try my method. I give presents to *everybody*. *Everybody* knows "Sunny Jim," but I don't trudge round to *everybody* like you do. Listen.

(*Sits on sack with F.C. and acts as though talking to him*).

Curtain.

(*During interval audience has to guess hidden word*).

ACT II.

Hidden word—(*Likes*).

Curtain rises on S.J. and F.C. still talking.

F.C. I like your scheme, Sunny Jim.

It would save me heaps of time. You say that you regularly send free samples of "FORCE" to anyone who *likes* to ask. You simply wrap them up and put them in the post. The postman does the work of distributing.

S.J. Yes, that's it!

F.C. You say you post to whoever *likes* to enquire.

S.J. Certainly.

F.C. That's just what I'd like to do.

All I'd want, then, would be an office like yours. I could sell my reindeers.

S.J. You give the scheme a trial. *Everybody likes* receiving things through the post. It's so exciting. (*Both rise*).

F.C. Thanks for your advice, Sunny Jim. I'm glad I met you. You are the kind of man everyone *likes* to meet. Good-bye.

S.J. Good-bye.

(*Exit F.C.*)

S.J. And *everybody likes* Father Christmas. (*Curtain*).

(*Audience guesses hidden word*).

ACT III.

Hidden word—(*"FORCE"*).

Curtain rises on F.C. seated on sack.

F.C. I don't seem to be able to do things like Sunny Jim. He said this posting scheme served him successfully. We both give away presents—yet he succeeds where I fail. I can't get anyone to write to me! I suppose it's because they don't know my address. I'll have to buy my sledge back again and leave my card at every house. That's what I'll have to do!

Enter S.J.

S.J. What did you say you'd do? Nonsense! Do as I do, Father Christmas, *advertise*! I advertise in lots of ways, in the Meccano Mag., to tell Meccano boys all about "FORCE." Then they write to me for my free samples. Do as I do and you will find it as simple as serving "FORCE."

F.C. Without you to *force* me I'm afraid I'd not think of such things. How shall I start?

S.J. Like this. (*They both turn backs to audience while S.J. talks excitedly*).

Curtain.

Audience guesses hidden word.

ACT IV.

Hidden sentence—(*Everybody likes "FORCE"*).

S.J. and F.C. are seated on sack, backs to audience, both busy with paper and pencil.

S.J. *Everybody likes "force"* in an advertisement. Make it bold and strong.

F.C. *Everybody likes "FORCE"* in an advertisement? I'm advertising toys for Christmas!

S.J. I don't mean *real* "FORCE"—not the whole wheat flake food. I mean *strength*.

F.C. But "FORCE" gives strength to those who eat it.

S.J. Of course it does. I meant to say that everyone likes *vigour* energ—

F.C. Vigour, vim, per-fect trim, "FORCE" made him "Sunny Jim." Ha! Ha! (*Both rise and shake hands*).

S.J. You're right, Santa Claus. 'Vigour and Vim' is the "FORCE" slogan. You look full of it.

F.C. Well, I have it every day.

S.J. What, Vim?

F.C. No, "FORCE."

Both. The food *everybody likes*.

Curtain.

If you have never tasted "FORCE," send a Post Card to "Sunny Jim" and he'll send you a generous Free Sample.



This Month's Short Story

Boy, pliers,
Electric wires,
Blue flashes,
Boy ashes.

* * * *

At a certain hotel an Englishman, an Irishman and a Scotsman were arguing as to which of their respective countries had the lightest men.

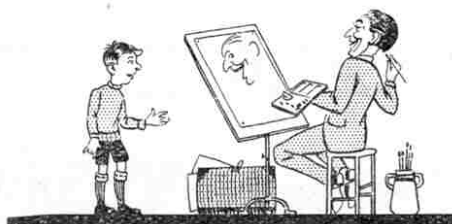
The Irishman said: "We have men of Cork."

"That may be," said the Scotsman, "but we have men of Ayr."

"Well," said the Englishman, "that is certainly very light, but we have lighter men on the Thames!"

* * *

VERY LIKELY!



Artist: "A clever artist, my boy, can turn a smiling face into a sad one with a few strokes of his brush."

Boy: "That's nothing to brag about; my father can do it with one stroke of his stick."

* * * *

Bootmaker (to applicant for job): "Do you know anything about boots, my boy?"

Boy: "Well guv'nor, I ought to, I've got the boot from every place I've had!"

* * * *

SHOT OR NOT?

A duel was fought in Texas recently by Alexander Shott and John S. Nott. Nott was shot and Shott was not. On the face of it, therefore, it is better to be Shott than Nott. A rumour has been circulated that Nott was not shot, but Shott declares that he shot Nott and therefore either the shot shot at Nott was not shot or Nott was shot notwithstanding. It may be that the shot Shott shot shot Nott, or possibly the shot Shott shot shot Shott, when the whole affair would resolve itself into its original elements, and Shott would be shot and Nott would be not. We think, however, that the shot Shott shot shot not Shott but Nott. Anyway, it is hard to tell who was shot and who was not.

(Contributed by J. E. Bentley, 81, Abbey Lane, Stretford).

Answers to Last Month's Puzzles

No. 37 Missing names of motor cars:—

Tom and I had a little argument and he spoke quite *CROSSLEY* to me. The trouble began about a man called *MORRIS*. *OXFORD* was written all over him, and although he had been a bit of a *ROVER* he was not a bad sort. He was a good *SINGER* and even if he were not a *STAR* his *STANDARD* was high. Tom, however, did not like him. One evening while Tom was on holiday in *ESSEX* he was crossing a stream at the *FORD* when he met this man. Tom was not *SWIFT* enough to *DODGE* him, and he had to stay and chat for a while. The only thing that made him feel resigned was the weather, for scarcely had the last *SUNBEAM* departed when the *MOON* rose, and occasionally a *METEOR* flashed.

* * * *

No. 38. Hidden names:—

(a) Emu. (b) Gnu. (c) Eland. (d) Shag. (e) Antelope. (f) Gnat. (g) Tiger. (h) Anaconda. (k) Armadillo.

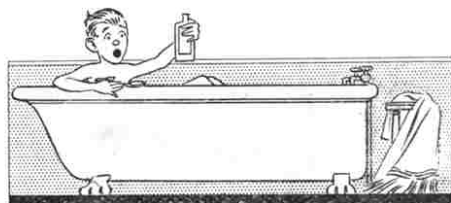
* * * *

No. 39.

The cat begins to count from the sixth mouse.

* * * *

No. 40 North, South, East and West.



Smith minor: "I hear the doctor has been to see you."

Jones minor: "Yes. I am having three baths every day."

Smith minor: "What on earth for?"

Jones minor: "The doctor gave me some medicine and told me to follow the directions on the bottle, which said: 'One tablespoonful to be taken three times a day in water.'"

* * * *

Lady (to mother of girl who has just been reciting): "Your girl recites very well."

Mother: "Yes, all she needs is a bit of electrocution to finish her off!"

* * * *

Q. When is a rest not arrest?

A. When the police are asleep.

* * * *

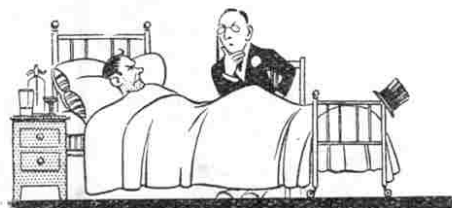
Q. What kind of dog is always 3 ft. long?

A. A yard dog!

THE weeks round about Christmas are essentially the time for jokes and laughter and also for testing the quickness of our wits by means of riddles and puzzles of all kinds. This month, therefore, I have decided to confine the "Fireside Fun" page entirely to jokes and riddles, together with the answers to last month's puzzles, and to devote the whole of another page to a big puzzle competition. I hope that a very large number of my readers will tackle these puzzles and send in their solutions according to the instructions on page 379.

From the letters I receive it is quite evident that the majority of my readers like to have a few good puzzles to worry out, and next year I hope to introduce a number of novelties in this direction. While on this topic I should like to draw the attention of my readers to the great possibilities of Meccano in connection with puzzles. One such puzzle is given on the page 379, and I shall be glad to receive any suggestions for others of a similar nature.

* * * *



Doctor: "I think you are coughing easier this morning."

Patient: "I ought to, considering the practice I have had during the night!"

* * * *

Foreman: "Why are you so late this morning, Murphy?"

Murphy: "Shure I overslept myself, sir. I dreamt I was at a football match that ended in a draw. The referee ordered extra time to be played, and I stayed to see the finish!"

* * * *

Q. What man is the slowest writer?

A. The convict; he sometimes spends 15 years on one sentence!

* * * *

Q. Which side of his face does the Meccano Guild Secretary shave first?

A. The outside, of course.

* * * *

Teacher: "Johnnie, what is 'velocity'?"

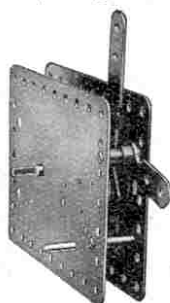
Johnnie: "What a man let's go of a bee with!"

Buy them all at Hobbies!

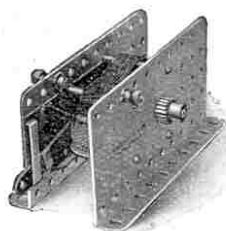
MECCANO



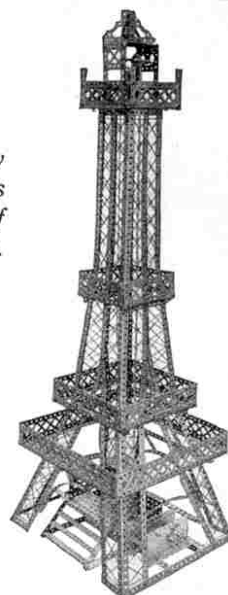
Whether it is a new Outfit or some tiny accessories, you should go to one of Hobbies Branches for them. They keep a large stock of everything or will obtain it for you by return.



CLOCKWORK MOTOR
Price 7/6



4-VOLT ELECTRIC MOTOR
Price 12/6



MECCANO PRICES

No. 00 Outfit ...	3/6	No. 4 Outfit ...	40/-
No. 0 " ...	5/-	No. 5 " (Carton) ...	55/-
No. 1 " ...	8/6	No. 5 " (Wood) ...	85/-
No. 2 " ...	15/-	No. 6 " (Carton) ...	105/-
No. 3 " ...	22/6	No. 6 " (Wood) ...	140/-
No. 7 Outfit (Wood) ...	370/-		

*Outfits,
Accessories,
and all
Latest Parts
are always
obtainable
at Hobbies
Branches.*

HORNBY CLOCKS WORK TRAINS



No. 2 PULLMAN SET

Well made and finished. Gauge 0. Each set contains Loco, Tender and two Coaches, 4 rails to form circle 4 ft. in diameter. Price 60/-



SIGNAL CABIN

Finished in colour and lettered "Windsor." Is 6½ in. high and 6½ in. long. Signal levers can be fitted if desired. Price 6/6



No. 2 TANK LOCO

A powerful locomotive, 11½ in. long, fitted with two four-wheel bogies, reversing gear, brake and governor. Price 30/-



GUNPOWDER VAN

Finished in Red and fitted with opening doors. Price 4/-



LATTICE GIRDER BRIDGE

This bridge is of the constructional type, strong and well proportioned. Price 10/6



HEAD OFFICE AND WORKS:
DEREHAM, NORFOLK

65, NEW OXFORD STREET	-	-	LONDON, W.C.
147, BISHOPSGATE	-	-	LONDON, E.C.
79, WALWORTH ROAD	-	-	LONDON, W.C.
326, ARGYLE STREET	-	-	GLASGOW.
10a, PICCADILLY	-	-	MANCHESTER.
9a, HIGH STREET	-	-	BIRMINGHAM.
214, WEST STREET	-	-	SHEFFIELD.
15, COUNTY ARCADE	-	-	LEEDS.
11, BRIDGE STREET	-	-	SOUTHAMPTON.
68, LONDON ROAD	-	-	BRIGHTON.

Fun with Bricks

Building houses with miniature bricks is a fascinating pastime that appeals to almost everyone. The artificial stone bricks made by Messrs. Lott's Ltd. (Watford, Herts.), are unique in their wonderful variety. The Tudor blocks are specially interesting, for by means of them realistic models of the old-fashioned half-timbered houses may be built and completed with trees, fences, etc. Lott's Bricks may be used with great success in making stone bridges, viaducts, and other accessories for use with a Hornby Railway.

25 Prizes!

We would draw our readers' attention to the Tan-Sad Picture Puzzle Competition advertised on page 424, in which 25 useful prizes are offered. The firm manufacture scooters, which toys do not appear to be losing any of their popularity. The various types produced by Messrs. Tan-Sad Ltd. are perfect little models. They are strongly made in various grades varying in price from 10/- to 21/-, and all are of good appearance. The 21/- model has a footboard mounted on spiral springs that absorb shocks on rough roads and enable a much greater speed to be attained.

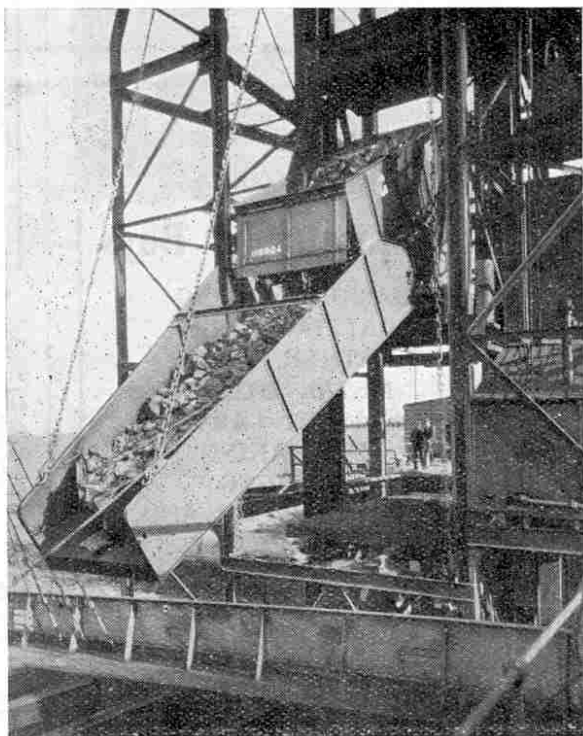
Can you Shoot?

The best games for winter evenings are those in which every member of the family can join. This means that the games must not be too complicated and must provide plenty of fun and excitement. With this end in view Messrs. Rickarby & Partner (37a, Finsbury Square, London, E.C.2) have produced two new games "Popskit" and "Popsnooka." The games consist of shooting a captive cork missile from a spring gun with the object of knocking down coloured skittles, which count different scores. The spring gun is strongly made and reliable, and considerable skill is required to make a good score. These games are very suitable also for bazaars, exhibitions, etc.

A Real Xmas Bazaar

There can be very few British boys who have not heard of Gamages wonderful Christmas bazaar, where every year there is an amazing display. Fortunately indeed are those boys who are able to visit this bazaar and see its treasures for themselves. For those who are unable to

High-Speed Ship-Coaling



Courtesy]

[G.W.R. Magazine

Tipping the first of the new 20-ton Coal Wagons at Port Talbot Docks. (See page 387)

do this, a large illustrated Xmas Bazaar catalogue has been prepared. This is packed with descriptions and illustrations of everything dear to the heart of every boy, and a copy will be sent to any reader who writes for it and mentions the "M.M." Apply promptly, as in spite of the enormous numbers printed, supplies will soon become exhausted.

Fine Model Launches

The fretwork outfits and materials manufactured by Messrs. Hobbies Ltd. (Dereham, Norfolk) are always in great demand for Christmas presents, and this year their quality and variety appear to be better than ever. We strongly advise readers interested in fretwork or carpentry to write for a copy of Messrs. Hobbies 1925 catalogue, which will be sent post free for 9d.

Those interested in model boats will find that Hobbies' launches (ranging in price from 9/6 to 30/-) represent remarkable value. Each launch is strongly made of the best materials and is sold under guarantee. The power units are unusually good, heat being generated by a well-designed lamp. A good head of steam is very quickly obtained, the lamp containing sufficient methylated spirit to drive the larger sized boats at a good speed for 20 minutes. "Peggy," for instance, price 22/6, will cover a mile on the straight at one fill.

A Rifle without a Licence

The B.S.A. bicycle has a big reputation behind it, due to the fact that the high standard of quality of the firm's machines has been consistently maintained in every detail. The various models cover a wide range to suit every requirement, whether touring or racing, a particularly interesting machine being the "All-Weather" bicycle, rust-proof finished throughout with very efficient mud-guarding.

Parents often hesitate to buy guns for their boys on account of the possible danger, but this objection is largely eliminated in the B.S.A. air rifle, which is perfectly safe to use. Although strong and accurate, it is sufficiently light for a boy or lady to handle easily. It is, of course, smokeless and practically noiseless and no cartridges or powder are required. The rifle is sufficiently powerful to kill a rook or sparrow at 50 yards, and at the same time is accurate enough for exacting target work. No licence is necessary to purchase or use it in house or garden in Great Britain.

Saving Life by Wireless—(cont. from page 389)

ablaze with light, and with their search-lights concentrated on the stricken vessel. Their decks were crowded with passengers, and it is estimated that some 7,000 spectators were watching the "Vollturno." Shortly before midnight an explosion destroyed the "Vollturno's" dynamos, extinguishing her lights and compelling her wireless operator to work on accumulators.

Meanwhile the "Carmania's" wireless operator had been sending out far and wide an urgent call for help from any oil tank steamer that might be in the neighbourhood, and presently a response came from the captain of the "Narragansett," "I will be with you by five o'clock." Steaming at her utmost speed, the "tanker" arrived at daybreak and at once commenced to pour out two great streams of oil, which formed a calm area of water at the stern of the "Vollturno." By this time also the gale had moderated a little and a great flotilla of boats put off from the various liners and gathered in the oil-calmed area. The work of rescue was quickly and skilfully carried out, and by nine o'clock in the morning the 521 passengers and crew were safely removed. Of the 136 persons who lost their lives, about 50 were killed by explosions and fire, and the remainder were drowned while endeavouring to launch boats before the arrival of the "Carmania."

These are two typical examples of the life-saving work of wireless telegraphy

in its early days. There have been many others since, and especially during the war, when ships were being sunk daily by enemy submarines. At that time "S.O.S." signals were very frequent, and it is believed that during the war-years alone the lives saved by means of wireless must number hundreds of thousands.

How an "S.O.S." is Sent Out

"S.O.S." does not stand for "save our souls" or "send out succour," nor indeed for any other similar phrase, as many people appear to believe. The three letters were chosen because they make a rhythmic signal in the Morse code. As most of our readers know, the "s" signal in Morse consists of three dots and the "o" signal of three dashes, so that when "...---..." is repeatedly sent out its peculiar rhythm at once attracts the attention of all who are listening. There is no pause between the letters, the three dots, three dashes and three dots being sent out as though they signified one letter only. The distress call is always sent out with the full power available and with untuned signals, and it thus "jams" all other stations within range, whatever their wave-length.

After repeating "S.O.S." several times, the ship gives her position in longitude and latitude and states briefly the nature of the trouble, how long she expects to remain afloat, and so on. The operator then switches over to his receiving set and listens for a reply. If none is received he repeats the original message.

DRAG-LINE CONTEST

The Result of this Contest will be announced next month

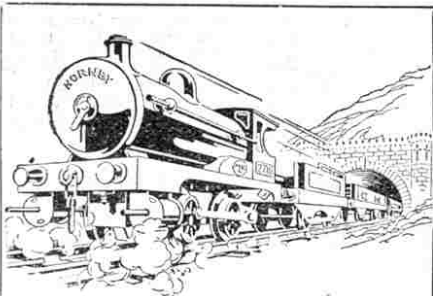
A New Meccano Model—(cont. from p. 387)

7 holes, and the truck runway Girders are secured to the inner ends of the grab runway rails (3) by two 12½" Strips (5), overlapped 7 holes.

The grab rails (3) are spaced centrally in the head of the tower by means of a Rod (6, Fig. A) which is passed through the second hole from the end of the Angle Girders, and fixed by Collars (7) on the outer ends of the Rod and by other Collars (8) which fit closely against the outer sides of the rails.

The extreme ends of the Angle Girders are connected by 3½" Strips (9a) and 3½" x ½" Double Angle Strips (9) connect the upper 12½" Strips (10). The lower truck rail Angle Girders (3) are maintained centrally in the tower by being bolted to the transverse Angle Girder (11) and the Strips (10) of the truck runway by means of Angle Brackets to the Angle Girder (2). The other details of construction of these rail arms and the tower and tower-head can be clearly followed from the illustrations.

(To be continued)



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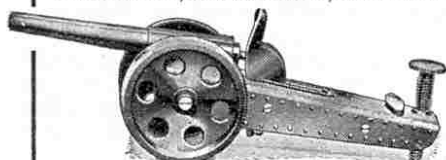
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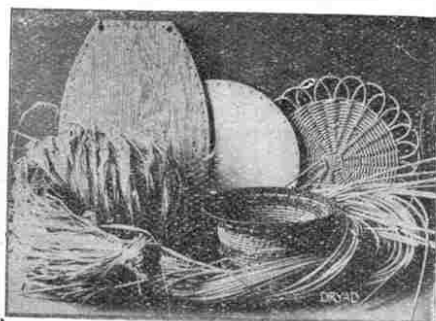
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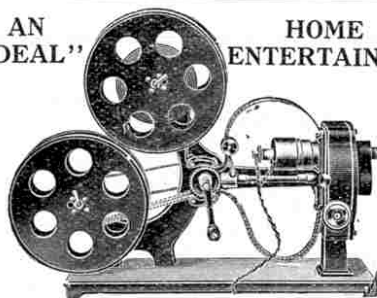
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BOY HEROES OF THE MONTH

In every community there are boy heroes whose deeds are unknown beyond a small radius. Boys are but men in the early stages and their personal courage does not lose anything by comparison with that of men. Some boys even succeeded in joining the Army during the war by all manner of daring expedients and acquitted themselves like men in France and elsewhere—there were Jack Cornwalls in every branch of the Service.

In time of peace there is no dearth of boy heroism and as opportunity allows I propose to describe on this page any brave deeds that come to my notice. I shall be pleased to receive from readers of the "M.M." descriptions or news cuttings of any such deeds that they consider will be of general interest.—The Editor.

A fine example of bravery and devotion to animals is shown by the gallant action of an old "Warspite" boy. Glencoe Veness had been out fishing with a friend when he heard the bark of a dog coming from a cliff about 150 ft. in height. Making their way to the top of the cliff, the boys found that a sheep-dog had fallen over the edge of the cliff and landed on a ledge some 50 ft. from the top. A rope was obtained and Veness, being the heavier of the two, lowered his friend down the face of the cliff. It was a difficult and dangerous task to secure the frightened animal, but it was finally accomplished, and the dog was soon safely hauled up the cliff. Although uninjured except for some slight cuts on his front paws, he was found to be so weak from starvation that he was scarcely able to stand. The R.S.P.C.A. have heard of the incident and Veness and his friend have been awarded medals for their brave rescue.

Dives Under Barge

A gathering of heroes took place recently in the old County Hall, London, when 71 boys were awarded framed certificates for deeds of valour. Among this gallant group was William Blench, aged 14, who saved the life of a little girl when she fell into the Thames and was carried under a barge. Without a moment's hesitation Blench threw off his coat and plunged in to her rescue. He had to dive under the barge several times before he finally managed to reach her.

Performing a Public Duty

The power of observation of two London boys, aged nine and eleven, succeeded recently in bringing a thief to justice, and is well worthy of mention in these columns. The boys Bernard Rowlands and James Sutherland, were playing in the road when they saw a man take a coat from a motor-car. Recognising him as a labourer who lived not far from their home, they informed the police, and the thief was arrested and charged with theft. On sentencing him to imprisonment the magistrate complimented the boys on their action. "You are only schoolboys," he said, "but you have performed a public duty, and we greatly appreciate your action."

Two Young Heroes

A gallant feat, which at first sight seems to be almost incredible, is that of Joseph Fitzmaurice, of Tyldesley, Lancashire. Although only six years of age, he recently saved the lives of two girls who were drowning in the river Glass. Unfortunately, we have not been able to obtain

the full particulars of this brave deed, but there is little doubt that Joseph is one of the youngest heroes in the world.

Frank Harmer, of Shotton, near Chester, dived twice into the river Dee in a heroic but unsuccessful attempt to save a school chum from drowning. He has been awarded the Royal Humane Society's vellum certificate with the additional honour of having it autographed by the Prince of Wales.

Saves Kitten

Another striking example of bravery and devotion is that of Frederick Blake, a newsboy of Chertsey, who, at imminent risk of his own life, rescued a kitten from the track of an express. Blake, who is a member of the Boy's Brigade, has been promoted to the rank of Corporal in recognition of his gallant action—an honour that he well deserves.

Scout Stops Runaway Horse

Boy Scouts and Wolf Cubs are always to the fore in brave deeds, and the following instance has been brought to my notice by a Scoutmaster.

During a recent sports-day, held by the Romford Wolf Cubs, a large van was standing near the race track, which was lined with spectators. Suddenly something startled the horse and it bolted, heading straight for the crowd of people, who were so absorbed in watching a race that they did not realise their imminent danger. Assistant Cub-Master A. C. M. Gooding grasped the situation, however, and ran to meet the galloping animal. Hanging on to its head he diverted it from the spectators and was finally able to bring it to a standstill. We are pleased to record that in recognition of his bravery and presence of mind, Gooding has been awarded the Silver Cross by Sir Robert Baden Powell, the Chief Scout.

Saves Sister from Fire

Another instance of prompt action is furnished by the deed of Patrol-Leader Joseph Farrar, attached to the South-East Leeds (Stourton) troop. His sister was bending over a fire in the house when her clothing caught fire. Farrar immediately dashed into the room and succeeded in extinguishing the flames, though in doing so he was badly burned. The brave deed was well worthy of the Gilt Cross that was presented to Farrar by the Commissioner for South-East Leeds.

Scout Heroes

Two boy members of the 1st Hather-sage B.P. Cub Pack have also received public recognition for their bravery in saving a boy from drowning. Thomas

Dobson, a 15-year-old Newcastle boy, has been awarded the Royal Humane Society's vellum and a silver medal for a similar brave deed.

Other awards made by the Royal Society include three certificates presented to the following 13-year-old boys: John Selby, of Limehouse; John Toothill, Shoreditch; and Jack Emmerton, of Paddington. Their names are to be inscribed on the brave deeds boards at their respective schools for gallantry in saving life from drowning.

Fire at Reformatory

Some time ago a serious outbreak of fire occurred at the Adel Reformatory School near Leeds, and was only extinguished by the bravery of the boys. Official recognition of their gallantry was made by the Home Secretary, who in a letter to the managers requested that the boys be given a half-holiday. "The behaviour of the whole school was worthy of the high tradition of the school," wrote the Home Secretary, "and the boys who were specially chosen to cope with the fire not only showed an admirable contempt of danger, but also worked with such intelligence that a large amount of material was saved from destruction." Perhaps even more appreciated by the boys than the half-holiday was the £10 note sent by the Home Secretary to supplement their usual pocket-money!

A Modern Hercules

A London reader sends us a note regarding Saxon Brown, a 19-year-old boy who possesses great strength. At first Saxon Brown was a weakly boy, but by means of exercises devised by himself he has become wonderfully strong and hard. Now, for two minutes, he is able to bear on his chest an anvil weighing a quarter of a ton, while four men rain blows upon it with 10-lb. sledge hammers! He can also support a bridge on his chest while a motor car drives across it! Other feats that this modern Hercules performs are tearing a pack of cards in two; nailing three thick boards together with a single blow with his fist; making a spring of an iron rod, by twisting it round his wrist; breaking chains with his teeth; tying iron bars into knots; lifting five men; and holding ten men pulling in opposite directions. Saxon Brown claims to be the strongest boy in the world, and we don't think there are many readers of the "M.M." who would care to challenge his right to the title!

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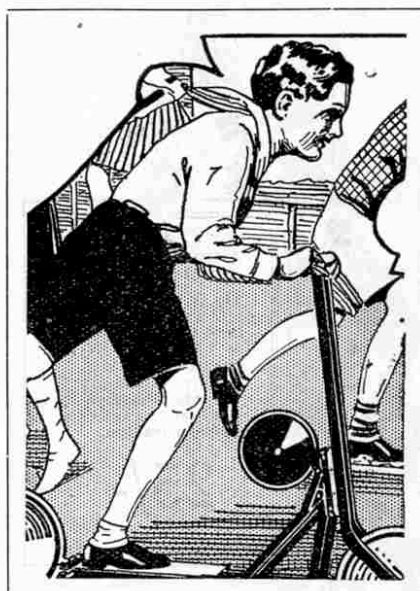
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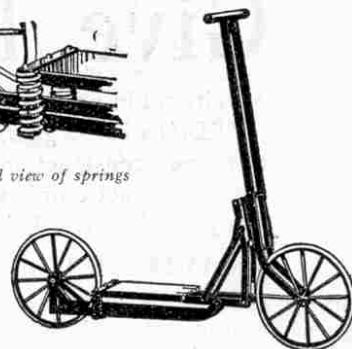
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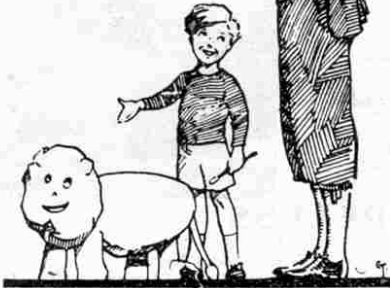
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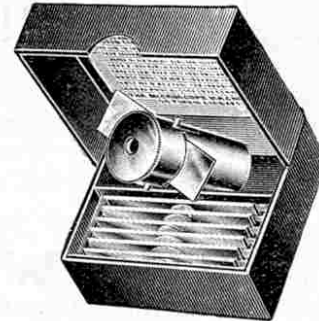
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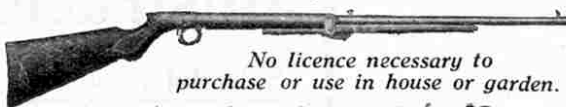
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