

# MECCANO

## MAGAZINE

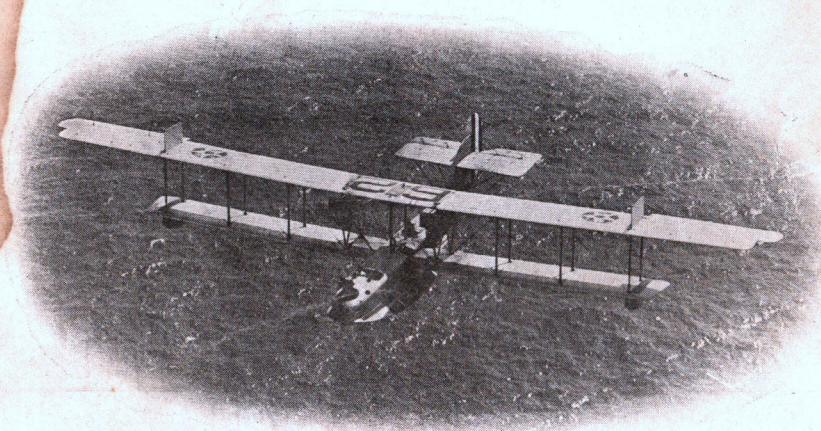
for Boys

Vol. VII, No. 3

MAY 1925

Price 5 cents

### My first adventure in a Seaplane



**F**OR weeks I had been worrying my friend, Lieutenant Henderson, a veteran aviator and war ace, to take me for a flight in an airplane. And now, at last, the much coveted permission had been given. The lieutenant had just phoned me that he would take me up at 4 o'clock that afternoon. He was to call for me at 3:30, so we should have plenty of time to get to the station.

How the time dragged!

It seemed as though half-past three would never come. But at last it did, and with it came the lieutenant in a speedy roadster.

Needless to say, I was all ready to go

as soon as he arrived, and it took us only a few minutes to drive to the big air station, which was on the waterfront only a mile or so beyond the city line.

*What Meccano boy has not wished he could have a ride in an airplane? Here is the story of one whose wish came true, and what a thrilling flight he had. The plane fell and he—but read it yourself!*

The seaplane assigned for the flight was of the naval observation type. As we approached her I could not help giving a cry of admiration. She rested so lightly on the water and looked for all the world like a monster dragon-fly, her silvery

body, or "fuselage," shimmering in the sunlight. A mechanic was busy warming up her powerful motor, while some other mechanics (continued on page four)



With this issue the "M. M." takes another step along the highway of progress, and appears with twelve pages. It is the same "M. M.," devoted to giving boys the things they like, but with greater capacity and a firmer determination to become the boy's best magazine. We are proud of this progress in such a short space of time and thank you, readers, for your generous support that has made it possible.

On pages 6 and 7 we print instructions for building a Meccano model to illustrate the principle of the Torque Converter. *The Torque Converter* The article on this great invention that appeared in the March issue has attracted widespread attention, and not only boys, but even engineering firms, have written to us about it. One Meccano boy sent a diagram to show how the torque converter could be adapted to act as a speed controller on a motor, and I hope to publish his diagram in a future issue.

A number of requests have been received for a story to appear in the "M. M.," and a very interesting one begins on the *An Adventure in Flying* first page. It would be difficult, I suppose, to find a boy who has not, at one time or another, longed for a trip in the air. I can heartily recommend this story of a "first ride" and the thrills that accompanied it.

On the "Puzzles" page a new competition is announced, and my readers will now have an opportunity of testing their skill *A New Contest* at Limericks. Many and various are the last lines that will be suggested, and I can promise much fun and amusement to all who try it.

Plans are under way for a number of new features to appear in the "M. M." In July, details of a photographic contest will be announced and I am giving *More Good Things Coming* this early notice so that my readers may bear this in mind on their vacations or trips to the shore, country or even visits to the "ole swimmin' hole." Another feature to commence in the next issue will be a story entitled "Dick's Visit to Meccanoland." This story was published a few years ago in book form and we have received many requests that it be reprinted in the "M. M." It is a very interesting tale and I know my readers will enjoy it.

## Philadelphia Department Store holds Meccano Model-building Contest

A Meccano model-building contest was held recently by Strawbridge & Clothier, one of the leading department stores of Philadelphia. The contest was a very successful one and a number of excellent models were submitted. The contestants were divided into two groups according to age and prizes were awarded for the best two models in each group.

The first prize in Group 1, for boys over twelve years old, was awarded to Madison Egner for his model "Meccano Power Plant." Robert Lafel won the second prize with a model Dump Truck.

In the group for boys under 12 years old William Suters was awarded first prize for the model Electric Hoist that he entered. The second prize was awarded to Robert Reitheimer, who entered a model Delivery Truck.

\* \* \*

## Meccano Boy wins Distinction

Jack Sims is an enthusiastic Meccano boy who lives in Colorado Springs, Colo. A short while ago, Jack became a radio fan, and he would not be satisfied until he had a set of his own. So he built one himself, and with Meccano parts. So



well did it work that expert radio men who inspected it pronounced it perfect. Now Jack tunes in station KFFQ and other broadcasting stations and writes that the set has given him and his friends a great deal of pleasure.

So great was the interest aroused by Jack's model that the *Colorado Springs Gazette* wrote a three-column article on it and printed the photograph as above. We congratulate Jack on this honor.

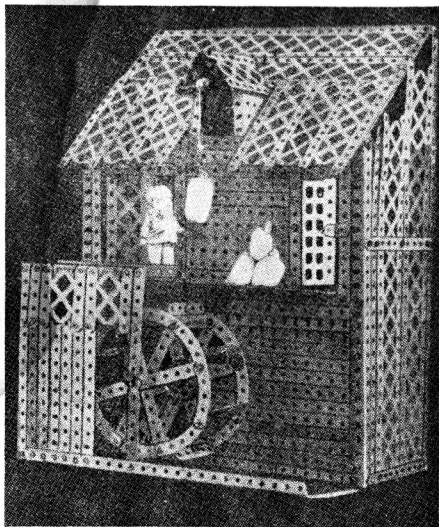


## Adventures in Meccanoland

by "Spanner"

"Spanner" paid a visit to Meccano headquarters and there he saw hundreds of models that had been entered in the last model-building contest. In our January number "Spanner" commenced a most interesting account of his visit and what he saw, and the story was continued in the March issue. The final instalment follows.

I noticed that many entrants in the competition had utilized Meccano parts for constructional purposes, and in the majority of cases had met with considerable success. Take, for instance, the model "Water Mill" shown below. Here we see the miller on a platform over the water-wheel; he is wearing a snow-white suit and hat, and is evidently counting



*The Water Mill*

the bags of flour beside him. I am inclined to think that the designer of this model had some help from his mother or sister in making the miller's clothes.

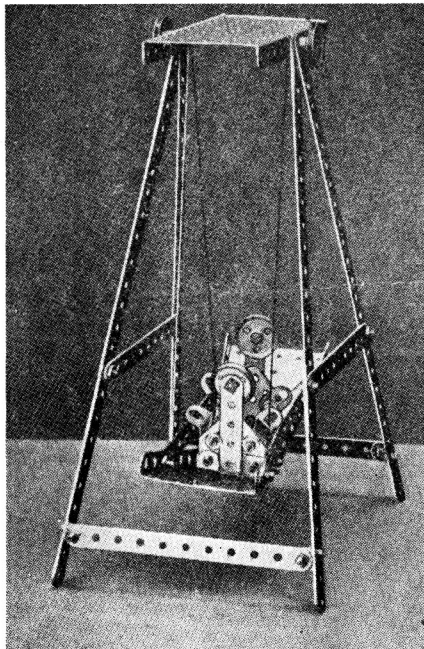
In describing his model the entrant states that it is operated by a Meccano electric motor and that with each turn of the wheel the sack of flour is raised and lowered.

There is quite a lot of fun to be had from models of this kind, and I should very much like to see the idea further developed.

Another rather humorous model is "The Meccano Twins in a Lawn Swing," submitted by M. Manning, who also sent in the model of "A Meccano Boy's First Ride," illustrated in the January number. This competitor appears to have a strong leaning towards models of this kind, and certainly possesses considerable skill in designing them. He even goes as far as to suggest that Meccano Company, Inc. should feature humorous models more strongly, on the ground that such models would appeal to the

younger Meccano boys. I think it is quite probable that Master Manning is not very far wrong in this idea.

There were so many thousands of entries in the various sections of the competition that, in order to get through them in a reasonable time, I could only devote a very few moments to each one, how-



*The Meccano Twins in a Lawn Swing*

ever excellent and novel it might be. At the same time there were a few I did linger over a little, not because they possessed any particular mechanical originality or merit, but because they showed what seemed more than usual imagination. I should like nothing better than to build each one by myself with the aid of the photographs and drawings that accompanied them. I wish I had room to go on and tell my readers about each one of them, but I am afraid I have already exceeded the space that the Editor has put at my disposal. Mr. Hornby informs me that all the prize-winning models will be built up, photographed and published in due course, as soon as opportunity allows this considerable task to be undertaken.

## My first adventure in a Seaplane

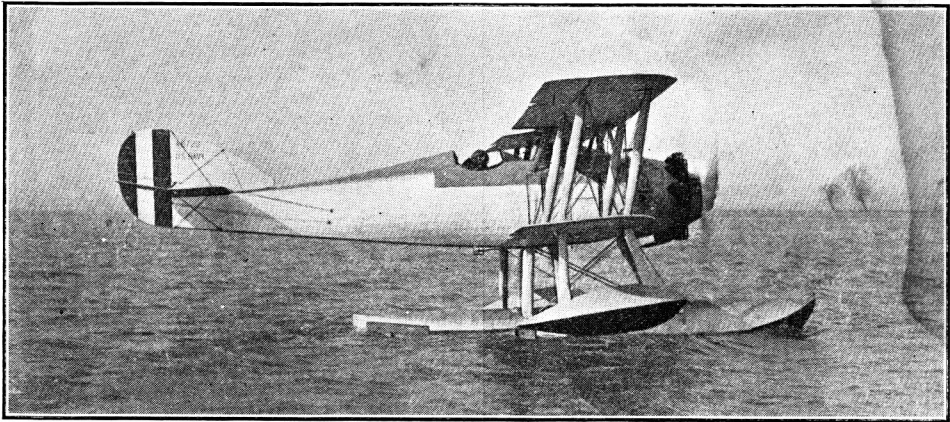
(Continued from first page)

were testing each guy wire and strut to make sure that everything was in perfect condition.

In size our plane is a pigmy among aircraft. Her wing span is only 34 feet and she is but 28 feet long over all. But the great power of her engine—a 200 horse power Wright, aircooled—can send her along at a speed of 120 miles an hour—two miles a minute! They told me that she can readily be converted into a land plane by substituting undercarriage and wheels for the pontoons with which she is equipped for the water. Planes of this type are used primarily as ship-board spotting planes; they

The plane seemed to ride right on the crest of the waves, and then gradually, without any apparent reason, the water below us seemed to fall away. As I peered over the side I saw it drop down, down. Only then did it dawn on me that we were rising from the water. The sudden realization that I was really flying in the air, supported only by the fragile wings that extended on each side, gave me a thrill that I will not soon forget. Yes, I was actually flying!

Up we went, higher and higher. Now the plane tilted to one side at an angle that must have been at least 45 degrees, and we made a



*"We were 'taxiing' out over the water"*

are carried on battleships and cruisers, and launched into the air by means of a catapult. Notwithstanding her small size, she has a "flight endurance"—that is, can carry enough fuel to keep her in the air—of four hours.

I lost no time in getting into a suit of flying togs, fixed a helmet on my head and climbed into the observer's seat, behind the lieutenant, who had already gone aboard and was testing the controls. The safety belt was snapped into place, and I was ready for the flight. The mechanics cast off the mooring lines, called out, "all free, Sir," and we were off.

Immediately a terrifying din broke out. It seemed to me as though all the machine guns on earth were firing at once, and it was some seconds before I realized that all this noise came from the engine on our plane. During the preparations she had been idling slowly, but now the lieutenant had "given her the gun," and she was swishing the propeller through the air at 1,500 revolutions a minute. We were "taxiing" out over the water, our speed increasing every second.

graceful curve in the air. What interested me was the fact that I felt just as secure in my seat at this precarious angle as though we were flying in a horizontal position. I realized then the great power of centrifugal force—that mysterious natural phenomenon which acts on a body moving in a curve and tends to throw it outwards from its circular course. It was this power that held me fast to my seat and kept me from danger of falling out of the plane.

I wondered how the lieutenant made the plane bank and presumed that there must be some manipulation of the wings to effect this result. I decided to watch the wings carefully the next time we banked to see if I could detect how it was done. The tips of the wings had hinged sections called ailerons, and when we banked again I noticed that the lieutenant raised the aileron on one wing by means of a control in the cockpit. This reduced the supporting surface of that wing and increased the resistance of the air above, and this wing was thus forced down. At the same time, the aileron on the





## BRIGHT IDEAS

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

*Chas. Murdock, Boston, Mass.*—The inclusion of a pinion smaller than half-inch would not be practical, as it would depart from our half-inch standard.

*Henry Wilson, Buffalo, N. Y.*—Face plates, joined by double angle strips of the desired length, give a fairly good representation of a locomotive boiler.

*H. S. Mason, Batavia, N. Y.*—We already list a single crankshaft (No. 134). Connecting rods may be made from our standard rods with a coupling as connection.

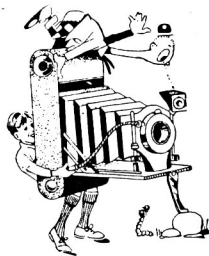
*George Roberts, Denver, Colo.*—An internal-toothed wheel would be too expensive to make and its advantages are somewhat doubtful.

*Adam Wetzel, Milwaukee, Wis.*—We shall soon introduce a Dog Clutch to take the place of the leather-lined wheels you suggest in so far as an auto clutch is concerned. We do not think there is any scope in the part you mention when used in the capacity of a friction drive.

*Andrew Michels, Medicine Lake, Mont.*—Your suggestion for a reel to be made from special parts would not have sufficient application to warrant making the changes in the bush wheels and coupling.

*Claude Owen, Kansas City, Mo.*—Your suggestion for spring steel strips will be given due consideration.

*Marcus Woodward, Inglewood, Cal.*—A rail-joint such as you suggest can be made by using a short angle girder in the place where you have shown the "fish-joint." Strips are not very satisfactory for use as tracks and we do not recommend them for this purpose.



## Get out your Camera!

*A Photographic Contest coming*

This is the time of year when we all turn to the great out-doors. Nature now looks at her best, and whether our interests lean toward the hills or the sea, there are many delightful pictures to be had.

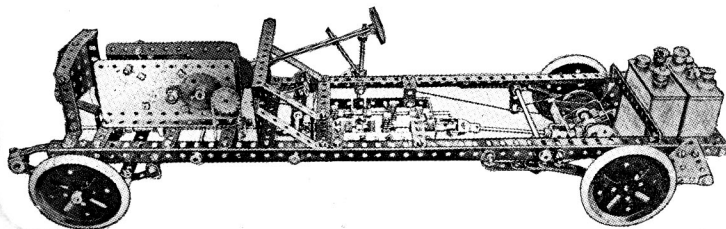
Possibly you have neglected your camera during the winter months. If so, get it out, load it up and stand by for the big Photographic Contest to be announced in the next "M. M." Any style camera can be used, film-pack, roll-film or plate—and there will be no restrictions as to size. Valuable prizes will be offered, and any Meccano boy can enter. Watch for full details in the July issue.

## New Instruction Leaflets for the Meccano Auto Chassis

A new and revised edition of the instructions for building the Meccano Model Auto Chassis is now being printed and will be ready for distribution by the time this issue reaches you. The instructions are fully illustrated with large detail views which show clearly how each part is assembled. A list of the parts required to build the model is included, as well as particulars of other special models for which full instructions are available.

If you have not already built the Chassis, by all means get a copy of the instructions now and do so. It is one of the most interesting models ever designed, and Meccano boys can spend many hours of keen enjoyment with it. The Torque Converter, as described in this issue, can readily be built into the Chassis and offers a great field for experimenting.

The instructions for the Chassis will be mailed, postpaid, to any address on receipt of 15 cents.



The Meccano model of the Torque Converter may be constructed as follows: The rod 1 (Fig. 4) is rotated by a sprocket chain from the electric motor fitted to the chassis. This rod carries a triple throw eccentric (2) which is connected by a 3" strip (3) to the centre of a face plate (4). A short rod (5) passes through the lower hole of the face plate and carries two flanged wheels (6) which act as the pendulum weight. The rod (5) and the weights (6) are suspended by two cranks (7) from the short pivotal rod (8) mounted on the main member of the frame as shown. Two 4½" strips (9) are connected to the top hole of the face plate (4) and their other ends are connected to elements each formed by two couplings (10) secured on short rods, the couplings rocking loosely on the driven rod (11)

## A Meccano Model of

Constantinesco's marvellous invention of the Torque Converter. It was explained how this new device makes it possible to transmit power to automobiles and to obtain the widest possible speed range. This article tells how to build a Meccano model to illustrate

the pendulum tends to oscillate about the rod (8) and little, if any, movement is imparted to the pawls; this corresponds to a low power. Should the resistance to movement in the rear axle be great, however, the fulcrum recedes towards the weight (5). Owing to the inertia or reluctance to vibrate quickly the face plate

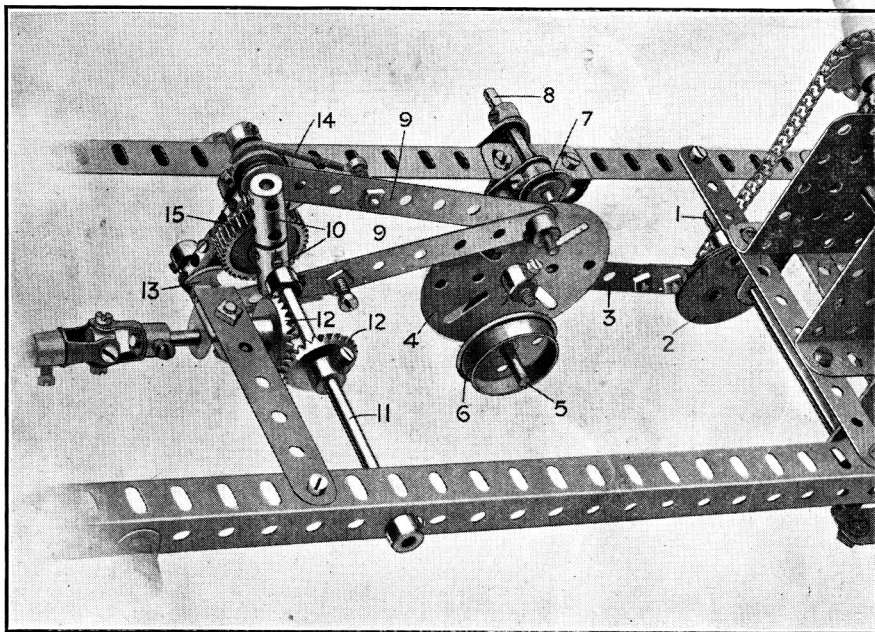


Fig. 4 The Converter in Meccano

from which the drive to the differential is conveyed through the bevels (12). Two pawls (13) are mounted on short rods secured in the outer holes of the coupling (shown more clearly in Fig. 5), these pawls, being controlled by short tension springs (14) so that they are kept in contact with a 1" gear wheel (15). When moving in one direction they trail idly over this gear wheel, but when moving in the other direction, they drive the gear wheel (15) and consequently the rod (11) to which the wheel is secured.

Technically, the theory of the mechanism is as follows: When the motor is running slowly

then pivots about the weight and a greater force is exerted on the strips (9) to drive the shaft (10). In this way the gear accommodates itself automatically to the work to be done.

In operation the rod (1) is rotated by the motor, the eccentric (2) tends to drive the strips (9) to and fro as the weight oscillates. This to and fro movement of the strips (9) results in a corresponding movement of the pawls. As the pawls are mounted to lie in opposite directions round the gear wheel (15) the latter is driven in one constant direction in a series of pulsations.

An interesting detail is the remarkable in-



## the Torque Converter

The Converter was described in the March "M.M." as being possible to do away with the gear-box and clutch of a motor car and control merely by the use of the throttle. This illustrates the action of this wonderful device.

increase in power obtainable even from so small a form of Converter as that adopted in the Meccano model. This is demonstrated by jacking up the rear axle to allow the driving wheels to freely rotate, when it has been found impossible to prevent the revolution of the driving shaft when gripped with the finger and thumb below the universal joint. When it is remembered that the driving force is obtained only

the pawls to the gear wheels. In the Meccano model these impulses vary from about twelve teeth of the gear wheels (on what is equivalent to high gear) to one or two teeth, when great power is required to overcome considerable resistance.

In the Meccano model of the Converter we have used a ratchet composed of pawls and gear wheel. It should be pointed out that in the actual Constantinesco Torque Converter ratchets and gear wheels are not employed for the drive. Instead a system of "uni-directional valves" is being perfected by Mr. Constantinesco, and these form the subject of a separate patent.

As mentioned in the previous installment, the fact that it has been possible to build this Torque Converter with Meccano is a splendid illustration of the adaptability of Meccano parts. There is

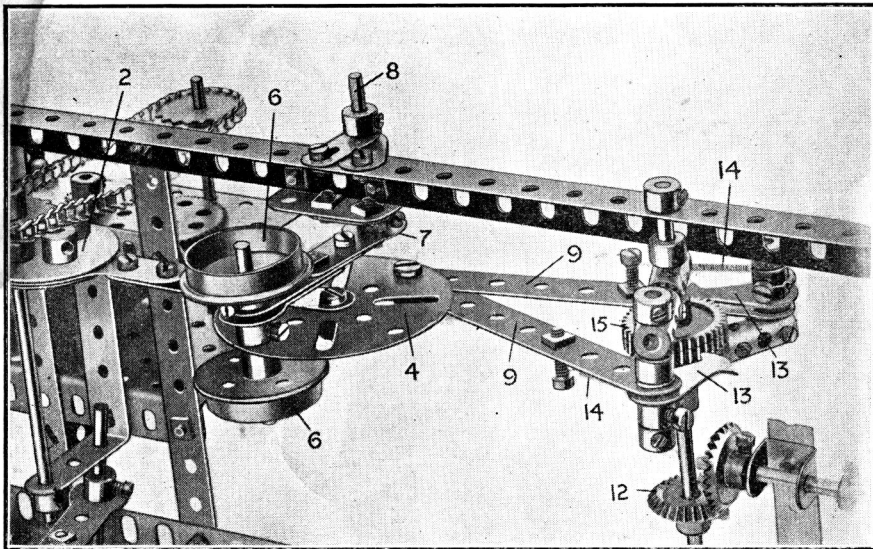


Fig. 5 Underneath view of Converter

from a small electric motor driven by dry batteries or a Meccano Transformer, the remarkable power imparted by the Torque Converter becomes apparent. By holding the shaft with greater or less degree of pressure the Converter may be made to demonstrate its automatic adjustment to a varying load or resistance in a remarkably effective manner.

The automatic adjustment of the gear to the load and to the gradient is one of the most interesting features of this Meccano model, and to watch it operate is a fascination that will delight everyone with engineering interests. The turning movement delivered to the back axle is in the nature of a number of impulses given by

no movement known to which the Meccano system may not be applied with success, and as the Torque Converter will undoubtedly be very much in evidence in engineering in the future we earnestly commend every Meccano boy to study this remarkable invention. There is no better method of understanding the working principle of the Converter than that of building this model with standard Meccano parts. Better still, build it right into a model Auto Chassis and watch how smoothly and freely it operates. This is the best way to study the principle, and the time spent will well repay every reader, and will enable him to explain the working of the Converter to his parents and friends when next it is mentioned in the newspapers.

# OUR MAIL BAG



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

*W. H. Cabrera, Ponce, P. R.*—By all means send us a photograph of your new model. The back number of the "M. M." has been mailed to you.

*Wm. Meyer, Gross Point, Ill.*—"Grip" is a nasty complaint, William, as we know from experience. We were very pleased to receive your letter mailed the first day you could go out.

*Fred Lawson, Spokane, Wash.*—Is confined to a wheelchair with Infantile Paralysis and sent us one of the cheeriest and most welcome letters we received this month. Many thanks, Fred. We hope you are getting along nicely and will write us again. We shall always be glad to hear from you.

*Stanley Stephanus, West Orange, N. J.*—You will find the answers to the puzzles on page 10. You did not do badly for a start. Now try the Limerick.

*Gordon P. Hentz, Brewster, N. Y.*—Your complimentary remarks about the "M. M." are greatly appreciated. Have you made any new models with your No. 4?

*Donald H. Brooks, Plattsburg, N. Y.*—Sent a subscription for six issues and wrote: "I think the 'M. M.' is a great magazine and I don't want to miss a copy." Judging by the growing number of subscribers, many others are of the same opinion. Donald adds that he has been collecting and boiling maple sap to make maple syrup. How we envy you, Donald!

*Claude Owen, Kansas City, Mo.*—Likes the article on the Torque Converter and asks for more articles like it—"not necessarily new inventions but models of various movements." Meccano is very useful for all kinds of standard mechanisms and we shall bear this request in mind.

## More New Meccano Parts

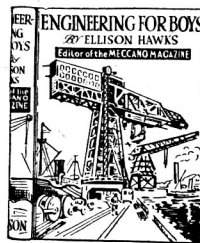
The following parts have recently been added to the system and are now ready for distribution.

Part No.	Description	Price
27b	Gear Wheels, 133 teeth, ... .. each .65 (to gear with ½" pinion)	
103k	Flat Girders, 7½" long ... .. each .12	
144	Dog Clutches, ... .. " .30	
145	Circular Strips, 7" diam. (over all) " .50	
146	" plates, 6" " " " .60	
147	Pawls, (new style) ... .. " .10	
148	Ratchet Wheels, ... .. " .30	

\* \* \*

## A Book for Boys

Recently we received from Messrs. Nelsons, the publishers, New York, a copy of "Engineering for Boys," by Ellison Hawks. Mr. Hawks is editor of the English Meccano Magazine and his book was published in England. It proved to be so popular there that the publishers have now brought it to America.



"Engineering for Boys" recounts in an interesting style and in non-technical language the progress of engineering from the very earliest times down to the present day. It is most comprehensive in scope and is evidently the result of a good deal of research work. Many excellent illustrations accompany the text.

(Thos. Nelson & Sons, New York. Price \$2.50.)

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## Back Numbers of the "M. M."

There are still a few copies remaining of the January and March issues, and readers who desire to complete their files are urged to obtain their copies at once, before the limited supply is exhausted.

*Cuthbert R. Rowe, Easthampton, N. Y.*—"I have an electric train and a No. 5 Outfit and I find I can make a great many models that I can use with the train." Yes, Cuthbert, Meccano doubles the fun you can have with a train. Have you any snap-shots of the railroad models you have developed?

\* \* \*

*Karl Baldwin, Jr., Washington, D. C.*—Karl is taking up engineering and writes, "Without Meccano I would be back in the primary class. I wouldn't sell my set for a million dollars." Glad you value Meccano so highly, Karl. Write again—we shall be pleased to hear of your progress.



## My first adventure in a Seaplane

(Continued from page 4)

other wing was lowered, which made it offer resistance to the air on the under side of the wing and so force that wing upward. These movements, together with the turning of the rudder, made the plane swing in a curve with the lower wing innermost.

Presently the ailerons straightened out again and the plane came back to horizontal—we had stopped circling and were again flying “on an even keel.”

Incautiously I peered over the side and was greeted by a blast of wind that almost blew my head off. I jerked my head back quickly, you may be sure, and was thankful for the protection that the windshield offered.

As I looked around, what a beautiful sight met my eyes! Far below was the clear blue ocean, dotted by myriads of little white caps of foam that gleamed and sparkled in the sunlight. Here and there was a speck on the surface—motorboats, I presumed. Farther off were several large steamers and sail boats, looking like little toys from this great height.

I turned to look at the coast line, stretched out at my left. The shore was spotted with towns, spread out as though on a relief map, and it was quite easy to trace the railroad tracks from town to town, as they appeared like thin threads of silk glistening in the sunshine. Far off in the distance was the city, with the railroad tracks and highways radiating from it in all directions—just like a spiderweb, I thought. How I wished that all Meccano boys could be with me, to see this wonderful view and enjoy the novel experience.

Now we banked again, turning in the direction of the station. Hardly had we straightened out when I noticed a speck far off in the sky coming towards us. Rapidly it grew in size and the speck of only a moment ago was transformed into a giant seaplane. What a monster it was! Fully three times the size of our plane, it rode the air with perfect grace. It was a beautiful sight and my readers can gain some little idea of it from the illustration on page 1. We passed above and slightly to the right of it and with a roar from its mighty engines it disappeared beneath us. I heard later that it was a Naval patrol plane with a wing-spread of 103 feet and driven by two Liberty engines of 400 horse power each. It is capable of carrying a useful load of over two tons, and has a speed of 89 miles an hour.

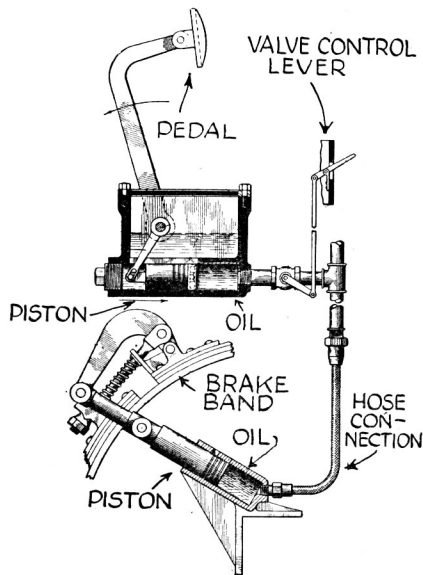
Suddenly the monotonous roar of the engine, to which I had now become accustomed, ceased. “Something has happened to the engine,” I thought, and quick as a flash there rushed before my mind the many accidents I had heard of, caused by stalling engines.

The plane seemed to hesitate a moment and shiver, then it pitched downwards. Now I was

## How Hydraulic Brakes Work

The almost universal adoption of 4-wheel brakes on automobiles has directed attention to the principle of the hydraulic brake, and many boys (and grown-ups, too!) have been puzzled to know just how they work. The diagram below shows the action.

The brake pedal is fixed to a piston which operates in a cylinder filled with oil. This is connected by a flexible hose to a cylinder on each brake drum.



In each is a piston connected to the brake band. When the brake pedal is depressed the oil is driven through the hose and moves these pistons; they in turn draw the ends of the brake bands together, causing them to grip the drums and so bring the car to a stop.

The amount of pressure required on the pedal to operate the brakes is readily adjusted by a valve to regulate the flow of oil.

One of the great advantages of hydraulic brakes is that they automatically equalize themselves. In other words, it is impossible to have one brake band lock its wheel while the other wheel is not locked—one of the main causes of skidding.

looking directly into the water more than a thousand feet below. Down we went, down, down, gaining speed every second until I could scarcely breathe. The water seemed to be rushing up to meet us. Surely nothing could stop this wild dive, hurtling through the air. This was the end, I thought, and gripping the sides of the plane, I shut my eyes and waited for the crash.

(To be continued)



### A Meccano Limerick Contest

Have you ever tried to complete a "Limerick"? It's really very fascinating and many boys prefer it to working cross-word puzzles. In order to give our readers a chance to see what they can do with one we are printing a Meccano limerick below, and will award the following prizes for the best answers:

- First Prize . . . . . No. 2 Clockwork Motor
- Second Prize . . . . . Builder's Cabinet
- Third Prize . . . . . Electrical Accessory Outfit

For the benefit of those who are not familiar with this type of puzzle, we will explain that a limerick is a humorous verse of five lines; the first line rhymes with the second and the fifth, while the third and the fourth rhyme with each other. Four lines of the contest limerick are printed below; the problem is to supply the fifth line.

*A bright little fellow named Ray  
Built a truck with Meccano one day.  
He had so much fun  
By making it run,*

The contest closes on July 1st, 1925, and the list of prize-winners and the winning answers will be published in the "M.M." as soon thereafter as possible. Each entry should bear the competitor's full name and address, together with his age, and should be addressed: "Limerick Contest, Meccano Magazine Elizabeth, N. J." Send in your entries, boys!

### Can you solve this one?

**Puzzle No. 10**  
Arrange the following letters to form four words:  
An R and an N and W, U, A  
You mix with four T's in the right sort of way;  
Three S's, two O's and two H's and E's,  
The answer encompasses all land and seas.

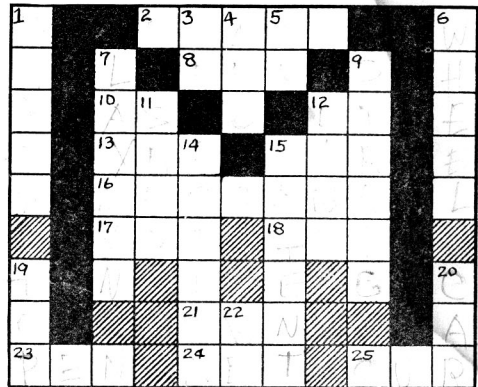
### What can it be?

**No. 11**  
Ten men's length, ten men's strength, ten men can't tear it; a little boy walks off with it.  
Submitted by Forrest W. Schroer, Duluth, Minn.

**No. 12**  
What is it that is full of holes, yet holds water and will not leak?

### Another Cross-word Puzzle

Here is a new cross-word puzzle to test your skill. It was sent in by Herbert Brown, of Lexington, Mass. who has been awarded a prize of \$1.00 as offered in our last issue.



- | HORIZONTAL            | VERTICAL                 |
|-----------------------|--------------------------|
| 2 Used with nuts      | 1 A much-used part       |
| 8 Opposite to near    | 3 About                  |
| 10 Like               | 4 Used in varnish        |
| 12 Lieutenant (abbr.) | 5 "Teddy's" initials     |
| 13 Yes                | 6 Used on an axle        |
| 15 Equal value        | 7 A non-professional     |
| 16 A famous toy       | 9 Powerful               |
| 17 A small insect     | 11 Observed              |
| 18 A number           | 12 A path                |
| 21 Belonging to one   | 14 Movement              |
| 23 Used for writing   | 15 Inventor's protection |
| 24 Helpful in fishing | 19 A covering            |
| 25 Possessive pronoun | 20 A vehicle             |
|                       | 22 You and I             |

Q.—Why is it that a black cow gives white milk that makes yellow butter?

A.—For the same reason that blackberries are red when they are green.

### Answers to Puzzles in the last Issue

- No. 6. The cat begins to count from the sixth mouse.
- No. 7. OICURMT ("Oh, I see you are empty.")
- No. 8. The date on the cornerstone was 1881.
- No. 9. A door-bell.





# MECCANO MAGAZINE

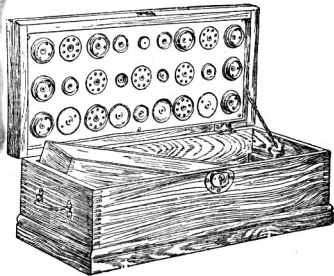
for Boys

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**Change of Address**—Subscribers should notify the Editor at once of any change of address. Send a postcard,—giving both old and new addresses,—so that our records can be kept up-to-date.

## A Special Offer



### The Meccano Builder's Cabinet

A handsome container, sturdily built of quartered oak, and fitted with lock and key. Contains a removable tray, and will hold the contents of the largest Meccano outfit. The inside of the cover is fitted with a metal plate arranged to hold a large number of Meccano wheels, gears, pinions, etc., which are fixed securely in place, but still instantly removable. Price—including tray and wheelplate, but without Meccano parts—reduced to \$3.50.

### In the Next Issue

#### "Dick's Visit to Meccanoland"

The story of a boy's visit to the Meccano headquarters and what he saw there.

#### A Photographic Contest

An opportunity for Meccano boy photographers to win valuable prizes.

New Models, more Puzzles, etc.

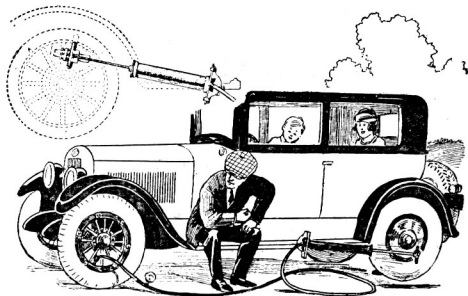
## With our Busy Inventors

Every day new inventions and ingenious labor-saving devices are being brought into existence. From time to time the most interesting of these will be described and illustrated in this column. Readers are invited to send particulars—accompanied, if possible, with photos sketches or clippings—of any interesting inventions or devices that may come to their attention.

\* \* \*

### Clamps for Tire Pump

A patent was recently granted for a set of clamps to permit the familiar hand pump to be driven by the engine of the automobile. One end of the pump

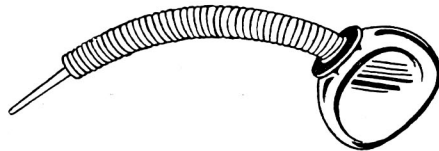


is secured on a swivel to the running board of the car; the handle is then fastened by another swivel clamp to one of the rear wheels, which is jacked up and turned by putting the gears in engagement and running the engine.

\* \* \*

### A Flexible Oil Can

An oil-can that will reach awkward places has recently been put on the market. Instead of the usual rigid metal nozzle, a flexible tube has been



fitted and this may be bent and pushed into out-of-the-way corners and yet allow a clear passage for the oil. Several sizes are to be made specially for the use of bicycle riders and automobilists.

\* \* \*

### Locking Device for Wood Screws

A wood screw which cannot work loose was the subject of a recent patent. It has a small hole drilled diagonally through the head and a small nail is driven through the hole into the wood after the screw has been turned home. As this nail enters the wood at an angle the screw is prevented from turning and so cannot get loose.

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# Plain Facts

The pioneer 20 years ago—the leader today

**M**ECCANO is the original steel construction toy. For more than twenty years it has been sold successfully all over the world (Meccano literature is published in 16 different languages). During that time other building toys have been tried but there has never been a steel construction toy that did not imitate some Meccano parts. That's how good Meccano is.

Made right at the start, it is right to-day, and the Meccano perforated strip has become the recognized standard for all steel construction toys. Other makers have copied this and other Meccano parts—and then featured the improvement these parts made to their line. What a tribute to Meccano leadership!

Be sure to get the genuine Meccano. You will readily recognize it by its fine brass wheels ~~and the~~ sturdy perforated strips with smooth, carefully finished edges; and then, the Meccano label is on every box.

The Popular  
Number 1x  
Meccano Outfit



Has a strong  
Electric Motor  
Price . . \$5.00

This is a very popular Outfit. It contains a good range of parts and a fine Meccano Electric Motor. Complete with a Manual of Instructions illustrating more than 100 models that can be built with it. Price \$5.00

*For sale by department stores, toy, hardware and sporting goods dealers.*

# MECCANO

Engineering for Boys

MECCANO COMPANY, INC.,

ELIZABETH, NEW JERSEY



The Meccano model of the Torque Converter may be constructed as follows: The rod 1 (Fig. 4) is rotated by a sprocket chain from the electric motor fitted to the chassis. This rod carries a triple throw eccentric (2) which is connected by a 3" strip (3) to the centre of a face plate (4). A short rod (5) passes through the lower hole of the face plate and carries two flanged wheels (6) which act as the pendulum weight. The rod (5) and the weights (6) are suspended by two cranks (7) from the short pivotal rod (8) mounted on the main member of the frame as shown. Two 4½" strips (9) are connected to the top hole of the face plate (4) and their other ends are connected to elements each formed by two couplings (10) secured on short rods, the couplings rocking loosely on the driven rod (11)

the pendulum tends to oscillate about the rod (8) and little, if any, movement is imparted to the pawls; this corresponds to a low power. Should the resistance to movement in the rear axle be great, however, the fulcrum recedes towards the weight (5). Owing to the inertia or reluctance to vibrate quickly the face plate

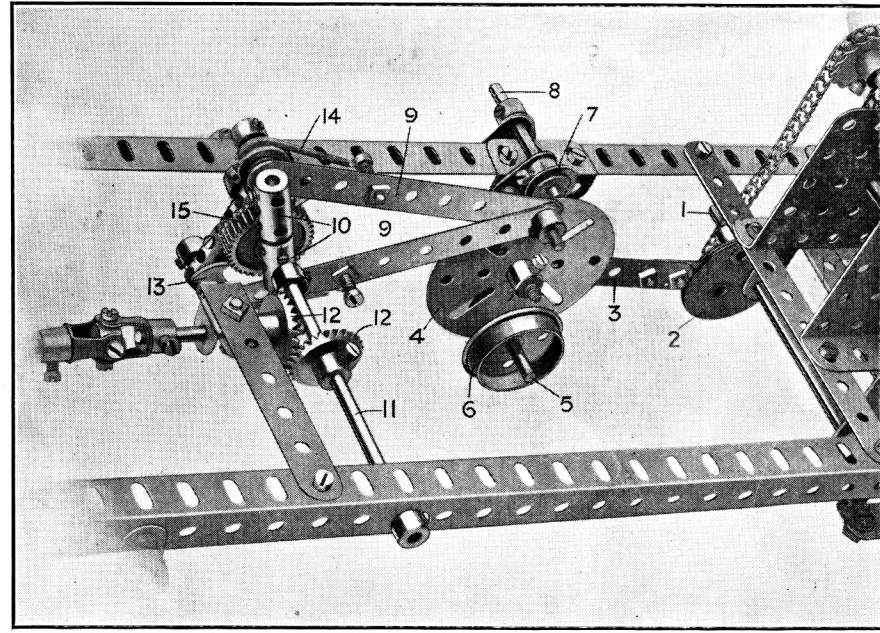


Fig. 4 The Converter in Meccano

from which the drive to the differential is conveyed through the bevels (12). Two pawls (13) are mounted on short rods secured in the outer holes of the coupling (shown more clearly in Fig. 5), these pawls, being controlled by short tension springs (14) so that they are kept in contact with a 1" gear wheel (15). When moving in one direction they trail idly over this gear wheel, but when moving in the other direction, they drive the gear wheel (15) and consequently the rod (11) to which the wheel is secured.

Technically, the theory of the mechanism is as follows: When the motor is running slowly

then pivots about the weight and a greater force is exerted on the strips (9) to drive the shaft (10). In this way the gear accommodates itself automatically to the work to be done.

In operation the rod (1) is rotated by the motor, the eccentric (2) tends to drive the strips (9) to and fro as the weight oscillates. This to and fro movement of the strips (9) results in a corresponding movement of the pawls. As the pawls are mounted to lie in opposite directions round the gear wheel (15) the latter is driven in one constant direction in a series of pulsations.

An interesting detail is the remarkable in-

### A Meccano Model of the Torque Converter

Constantinesco's marvellous invention of the Torque Converter was described in the March "M.M." It was explained how this new device makes it possible to do away with the gear-box and clutch of automobiles and to obtain the widest possible speed control merely by the use of the throttle. This article tells how to build a Meccano model to illustrate the action of this wonderful device.

crease in power obtainable even from so small a form of Converter as that adopted in the Meccano model. This is demonstrated by jacking up the rear axle to allow the driving wheels to freely rotate, when it has been found impossible to prevent the revolution of the driving shaft when gripped with the finger and thumb below the universal joint. When it is remembered that the driving force is obtained only

the pawls to the gear wheels. In the Meccano model these impulses vary from about twelve teeth of the gear wheels (on what is equivalent to high gear) to one or two teeth, when great power is required to overcome considerable resistance.

In the Meccano model of the Converter we have used a ratchet composed of pawls and gear wheel. It should be pointed out that in the actual Constantinesco Torque Converter ratchets and gear wheels are not employed for the drive. Instead a system of "uni-directional valves" is being perfected by Mr. Constantinesco, and these form the subject of a separate patent.

As mentioned in the previous installment, the fact that it has been possible to build this Torque Converter with Meccano is a splendid illustration of the adaptability of Meccano parts. There is

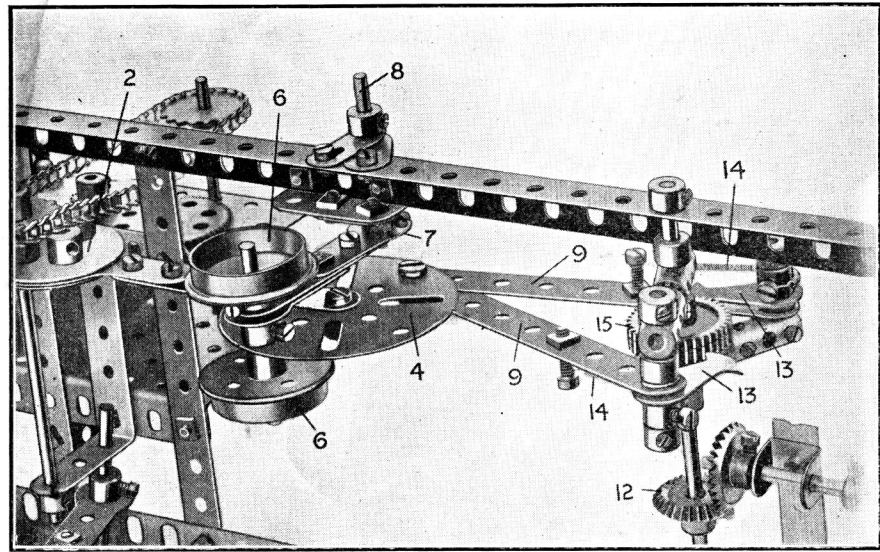


Fig. 5 Underneath view of Converter

from a small electric motor driven by dry batteries or a Meccano Transformer, the remarkable power imparted by the Torque Converter becomes apparent. By holding the shaft with greater or less degree of pressure the Converter may be made to demonstrate its automatic adjustment to a varying load or resistance in a remarkably effective manner.

The automatic adjustment of the gear to the load and to the gradient is one of the most interesting features of this Meccano model, and to watch it operate is a fascination that will delight everyone with engineering interests. The turning movement delivered to the back axle is in the nature of a number of impulses given by

no movement known to which the Meccano system may not be applied with success, and as the Torque Converter will undoubtedly be very much in evidence in engineering in the future we earnestly commend every Meccano boy to study this remarkable invention. There is no better method of understanding the working principle of the Converter than that of building this model with standard Meccano parts. Better still, build it right into a model Auto Chassis and watch how smoothly and freely it operates. This is the best way to study the principle, and the time spent will well repay every reader, and will enable him to explain the working of the Converter to his parents and friends when next it is mentioned in the newspapers.