

MECCANO MAGAZINE

for Boys

Vol. VII, No. 2

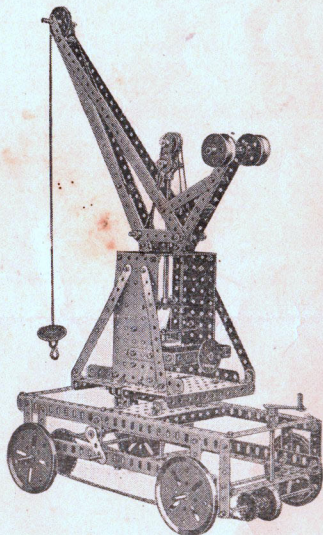
MARCH 1925

Price 5 cents

Adventures in Meccanoland

by "Spanner"
(continued)

In this story, which started in the January number, the writer tells of his visit to the Meccano headquarters, where he inspected some of the entries in the last Meccano model-building contest.



IT seemed to me to be a wonderful thing to have the work of all these vigorous young brains brought together in this way. There were many entries—thousands of them—from every country, each entrant striving to create something new, to invent something worthy of commendation, and which would give an added pleasure to dwellers in "Meccanoland."

I examined the entries that had won the major prizes and I am sorry that I cannot describe them here, for each one would require a page or more to do it justice, I must say how excellent they all were, however, and how much I admired the ingenuity shown in their construction.

(continued on the next page)

EDITORIAL



MY first words this month must be of thanks—sincere thanks to my many readers who wrote me such delightful letters about the first issue of the new "M.M." Your letters gave me much pleasure and it made me quite proud to know how well you had liked our first number. There are many good things in store for future numbers, and you can rely on your magazine becoming better and better.

And now I have some good news for you boys. Commencing with the May issue, the size of the "M.M." will be increased to 12 pages. This will enable us to introduce some new features, and I should like very much to hear from my readers what they would like best—a serial story, a stamp column or more new models. There is much that I would like to add, but the space is limited and so I must be satisfied for the present to print what appeals to the greatest number of boys.

I want to direct special attention to the article on the next page, entitled "Automobiles without Gears."

A Wonderful Invention

This deals with an invention of the greatest importance,—the Torque Converter—a device with which power may be transmitted with varying force without the use of gears. To illustrate this, imagine driving an automobile without a clutch or gears; to be able to slow down in traffic, to speed up going up a hill, or to come to a complete standstill with the engine running! And all controlled by the throttle alone! The article in this issue explains the principle of the Torque Converter and in our next issue we shall reproduce a Meccano model, with full instructions, to illustrate exactly how the Converter works. Watch for the May issue.

During the past few weeks my mail bag has grown bigger and bigger with the many interesting letters that Meccano boys send me. They come from every state in the country and from abroad, and many and varied are the messages of fun and happiness that they bring. One of my greatest pleasures is to read these letters from my Meccano boy friends, and I should like nothing better than to have each one of my readers write to me.

My Heavy Mail Bag

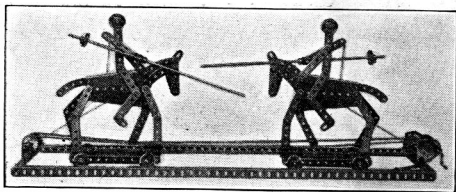
While on the subject of letters, please be sure to write your name clearly on each sheet when writing or sending in subscriptions. It would surprise you to know how often this important information is omitted.

humorous. Very complete instructions were attached to the entry, and I am quite sure that the model works very nicely.

Adventures in Meccanoland

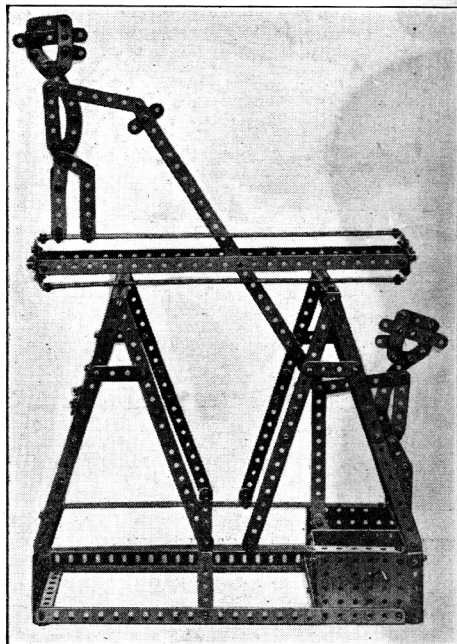
(Continued from page 1)

In the previous installment I showed some of the humorous models I had noticed in looking through the entries. There were many hundreds of models in this class, and one that struck me as particularly novel was the effort of a boy who sent in this model



of knights jousting, and which he appropriately called "The Tournament." Both of the knights in armor and their fiery steeds are very life-like, and by turning a handle they can be made to tilt at each other in a very realistic manner.

From Holland came the entry of the "Log Sawyers" illustrated below. R. Wijffels, of St. Kruis, Zeeland, who sent in this model, demonstrated that he has an eye for the grotesque as well as for the



NOTE—Another interesting installment of this story will appear in our May issue.—Ed.

Automobiles without Gears!

A Remarkable Invention Reproduced in Meccano

RECENTLY a new invention called the "Torque Converter," created a considerable sensation in engineering circles, and as this device shows remarkable possibilities we are sure that our readers will be interested in it. The inventor of the new Converter is Mr. Constantinesco, who is well known among engineers for many valuable contributions which he has made to science through his many inventions.

There are two main ideas behind the "Torque Converter." One is that it makes possible the construction of automobiles without clutches or gears, and the other that it fulfils the purpose of an infinitely variable gear that will automatically adjust itself to the condition of the road on which the car is travelling and by the load on the car itself. Automobiles fitted with this device are therefore controlled simply by the hand throttle or the foot-accelerator, either of which governs the engine speed. The inventor recently declared that he believed his Torque Converter will revolutionize all forms of transportation, for it is not confined to automobiles alone, but can be applied with equal success to locomotives, tractors, airplanes and all similar forms of vehicles.

One of the great advantages of such an invention is that vehicles will require engines of only about half the size of those used today. Not only will there be a saving in the amount of gasoline and oil used, but the complicated engines of four, six and eight cylinders will be eliminated and a single-cylinder engine may be sufficient to drive almost any vehicle.

A Highly Technical Device

In an interview Mr. Constantinesco told us that, without falling back on higher mathematics and highly technical engineering knowledge it was impossible for him to explain how he obtained his results in such a manner that the non-technical reader could understand. If the inventor himself found it impossible to give this information, our readers will readily realize that we are confronted with a very difficult task in endeavoring to explain the principle of the Torque Converter! We propose therefore, to simplify matters by confining our explanation to the working of the Meccano model of it.

The Meccano Model

It has always been claimed that any movement

known in mechanics can be reproduced in model form with Meccano. A striking vindication of this claim is furnished by the model of the Converter. The fact that it is possible to reproduce in Meccano so highly technical a piece of apparatus is in itself a tribute to the Meccano system. For some time past our model-building department has been at work endeavoring to build a model of the Converter in Meccano. After considerable experiment we have succeeded in perfecting a model which, although not built exactly the same as the actual Constantinesco Converter, yet admirably fulfils the purpose of demonstrating the remarkable principle on which the original Converter is based.

This model will be of general interest to readers of the "M.M." More especially will it interest those who are planning to build the Meccano Auto Chassis model and who desire to eliminate the standard gear-box and clutch, and incorporate the latest invention instead. Those who have already constructed the Chassis can build the Converter into their existing model without difficulty, as no changes in the frame of the chassis are necessary.

The Converter requires few parts and will well repay every reader for the time spent in building it and incorporating it in his model; it will enable him to explain the working of the Converter to his parents and friends when he finds it referred to in the newspapers.

The Principle of the Model

A diagram of the working of the model is given in Fig. 1. The crank (A) driven by the engine, is connected to a lever (B) to the lower end of which is fixed a heavy weight (C) forming a pendulum. The other end of the lever (B) is connected to two rods (D and E) carrying pawls (F and G) which bears on a ratchet wheel (J). In this manner the "torque," or twisting effect, is delivered to the rod (K) and through it by bevel gears and shaft (L) to the differential on the rear axle (not shown in the diagram). No matter whether the rods (D and E) be pushed towards the ratchet or pulled away from it, the turning motion imparted by the pawls to the rod (K) is always in the same direction, as one pawl is always in engagement with the ratchet wheel (J).

(Continued on page 6)

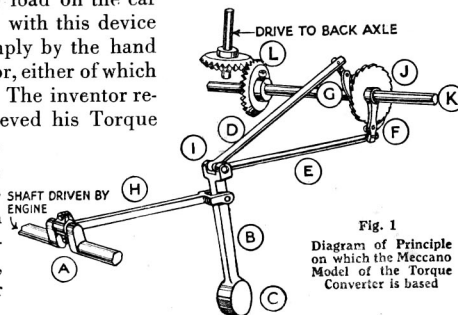
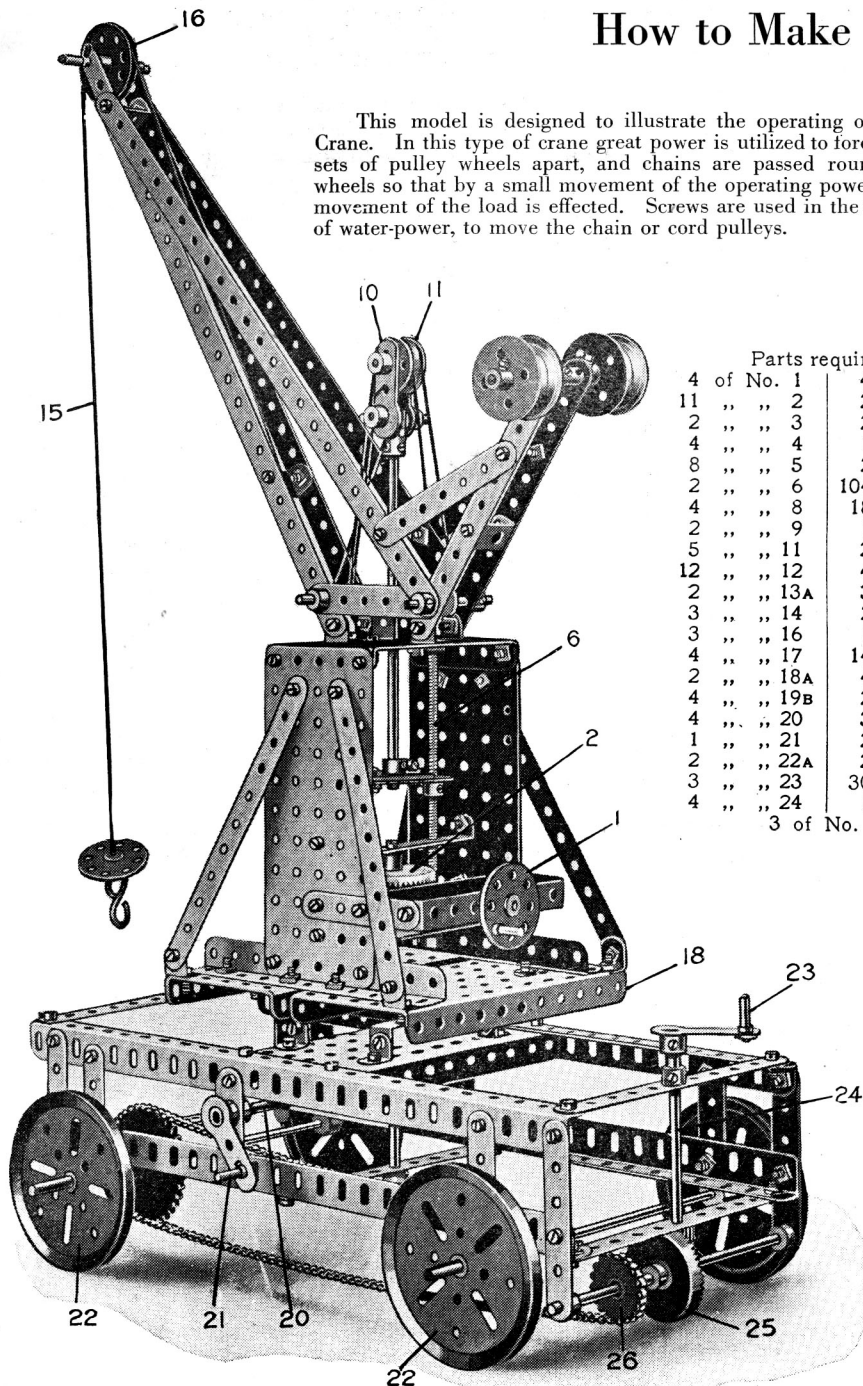


Fig. 1
Diagram of Principle
on which the Meccano
Model of the Torque
Converter is based

How to Make a Model Hydraulic Crane

Model No. 724

This model is designed to illustrate the operating of a Hydraulic Crane. In this type of crane great power is utilized to force two or more sets of pulley wheels apart, and chains are passed round the pulley wheels so that by a small movement of the operating power a very great movement of the load is effected. Screws are used in the model instead of water-power, to move the chain or cord pulleys.



Parts required :

4 of No. 1	4 of No. 26
11 " " 2	2 " " 27A
2 " " 3	2 " " 28
4 " " 4	1 " " 32
8 " " 5	2 " " 35
2 " " 6	104 " " 37
4 " " 8	18 " " 38
2 " " 9	1 " " 45
5 " " 11	2 " " 48A
12 " " 12	4 " " 48B
2 " " 13A	3 " " 52
3 " " 14	2 " " 53
3 " " 16	1 " " 57
4 " " 17	14 " " 59
2 " " 18A	4 " " 62
4 " " 19B	2 " " 62A
4 " " 20	3 " " 63
1 " " 21	2 " " 70
2 " " 22A	2 " " 80
3 " " 23	30" " " 94
4 " " 24	1 " " 95
	3 of No. 115

Hydraulic Crane

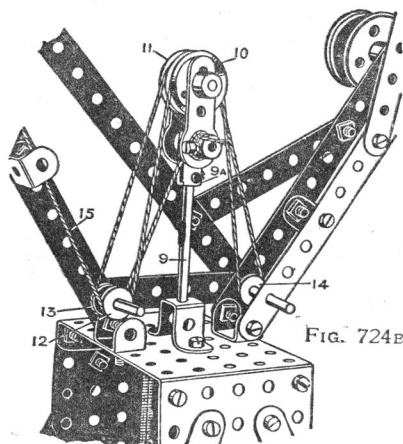


FIG. 724B

The weight is raised or lowered by operating the hand-wheel 1. The rod of this wheel carries a pinion which gears with a $1\frac{1}{2}$ " contrate wheel 2. On the rod of the contrate wheel is a lower 57-toothed gear wheel 3, which engages two $\frac{1}{2}$ " pinions 4 and 5, secured on vertical screwed rods 6, so that these rods are rotated in the same direction on the turning of the handle 1. The rods engage the bosses of threaded cranks 7, secured on a bush wheel 8, in the boss of which is fixed a 6" rod 9. This rod at the top is secured in a coupling 9a, to which are connected on a 1" transverse rod two cranks which support another 1" rod, forming a bearing for two 1" loose pulleys 10 and 11. Two $\frac{1}{2}$ " pulleys 12 and 13 are loosely mounted on a 2" rod at the base of the jib on one side, and a single $\frac{1}{2}$ " pulley 14 on another 2" rod at the other side.

The cord 15 passes over the pulley 16 at the top of the jib, round the pulley 12, up round the pulley 10, round the lower pulley 14, back round the other pulley 11, round the small pulley 13, and is made fast to the coupling 9a. By turning the handle 1 the contrate wheel 2 is rotated, thus driving the pinions 4 and 5 and rotating the screwed rods, which causes the threaded cranks to be raised or lowered, and the rod 9, carrying the pulleys 10 and 11, also to be raised and lowered. As the pulleys 10 and 11 are forced up, the cord 15 travels round all the pulleys and, due to the number of loops of the cord, the small movement of the top pulleys 10 and 11 results in a larger movement of the crane hook.

The rod of the bush wheel 1, which carries a $\frac{1}{2}$ " pinion, is journalled in a coupling 17, above and beneath which are placed two washers. The rod is held in position by the wheel 1 on one side of the cross strip, and by a collar on the other side.

The crane is carried on a platform 18, pivoting about a vertical rod 19, on which is a 57-toothed gear wheel engaged and driven by a worm on a rod 20, on the end of which is the operating handle 21.

The crane is caused to travel on the wheels 22 by the handle 23, a $\frac{1}{2}$ " pinion at the foot of its rod 24 driving a $1\frac{1}{2}$ " contrate wheel 25 on the rod 26, coupled by chain and sprocket wheels to the front wheels 22.

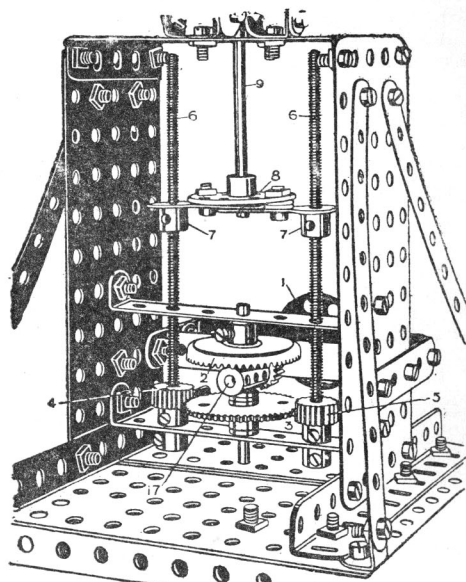


FIG. 724C

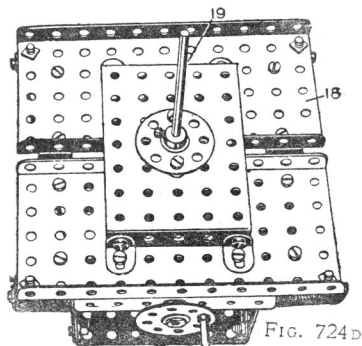


FIG. 724D

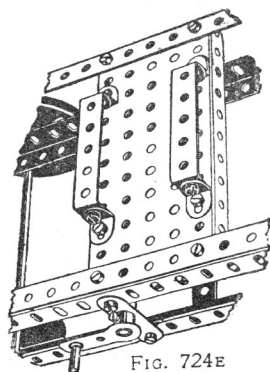


FIG. 724E

Automobiles without Gears!

(Continued from Page 3)

A Simple Analogy

Our readers will obtain a clearer idea of the working principle of the converter by taking a cane or walking stick with a heavy knob and suspending it with the knob downwards, as shown in Fig. 2. With the left hand take hold of the stick a few inches

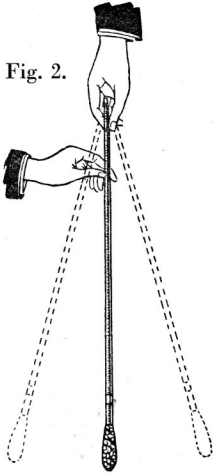


Fig. 2.

below the tip and swing it gently to and fro. Notice that it swings evenly and pivots in the thumb and finger of the right hand.

As long as the impulses given to the left hand are not excessive, the swinging of the stick will be easy and pendulum-like. If the frequency of the impulses be increased, then a different state is set up, as is evidenced by an increase in pressure conveyed to the right hand acting as a pivot for the stick. As the impulses increase in frequency, a change in equilibrium takes place. Instead of the stick tending to pivot between the finger and thumb of the right hand, the pivot shifts down the stick, until at last—given a sufficiently high frequency—it moves to the opposite end of the stick and the heavy knob at the end of the stick becomes the pivotal point, while the pendulum-like movements are now carried out by the hand in which the stick originally pivoted.

An Irresistible Force

This change is made manifest in a remarkable manner to the person holding the stick. As the impulses increase in intensity, the hand holding the tip of the stick finds itself compelled to yield to an irresistible increasing pressure. It is moved backward and forward by a powerful superior force, oscillating this way and that, with a degree that depends entirely on the frequency of the impulses received by the stick.

The original conditions have thus become entirely reversed. Instead of the knob oscillating to and fro and the right hand pivoting in the finger and thumb, the knob ceases to oscillate and becomes the point on which both stick and supporting hand now pivot. The oscillations originally performed by the knob are transferred to the other end of the stick and are now performed by the right hand. Expressed in engineering language, the fulcrum has receded.

It is important to realize that the pivotal point does not change suddenly from the tip of the stick to the knob, but moves slowly from one to the other, according to the frequency of the impulses received by the stick. If these are not sufficient the fulcrum may never reach the knob. If the frequency varies, the position of the fulcrum will vary also every instant, its location alternating momentarily between the tip and the knob. If the oscillations decrease in intensity beyond a certain point, the pivotal point returns to the tip and the original order of things is restored.

This is the principle on which the Constantinesco Torque Converter is based, and the Meccano model works on the same principle. In it the hand moving the stick is replaced by the connecting rod (H Fig. 1) coupled to a crank (A). The place of the hand forming the pivot is taken by the bolt (I) which carries the rods (D and E) in our diagram. Impulses from the crank are transferred to the pawls (F and G), which in turn pass on the impulses—now converted into a turning movement—to the driving shaft, and thus to the rear wheels.

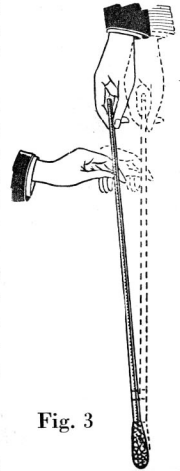


Fig. 3

"How It Works"

When the engine is running slowly only a slight swinging movement is given to the lever carrying the weight, which movement is not sufficient to move the pawls on the gear wheels. As the speed of the engine increases, however, the weight is compelled to swing faster and faster, imposing an increasingly heavy force or load upon the pawls. At length this load becomes so great that the resistance of the back axle is overcome; the pawls move the gear wheel and the driving shaft, and the car moves slowly forward, to gather speed subsequently.

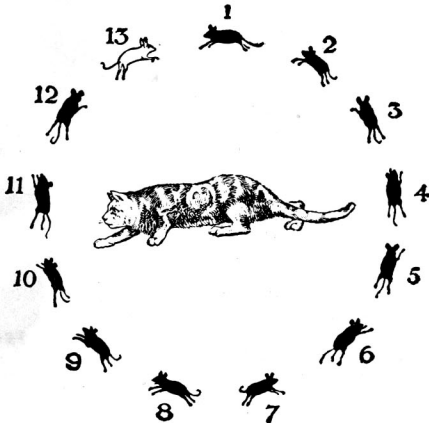
The conditions of our analogy in Fig. 2 are simulated when the weight (C, Fig. 1) swings without imparting any movement to the shaft, through the ratchets. On the other hand, when the engine is running rapidly the fulcrum recedes and weight (C) becomes the pivot, as it cannot respond to the rapidly-repeated impulses of the rod (H) with sufficient rapidity.

The condition illustrated in Fig. 3 arises when the resistance caused by starting up the car is overcome, and when the lever pivots on the weight (C). In these circumstances the drive from the engine is practically a direct drive to the rear axle.

Full instructions for building the Meccano model of the Converter will be published in the next issue.



The Cat and the Mice



Puzzle No. 6

The above diagram shows a cat with thirteen mice (twelve of which are black and the thirteenth white) arranged in a circle around her. She catches them one by one, starting to count at a certain mouse and counting to the thirteenth mouse each time. She kills the thirteenth and proceeds each time to count from the next living one, and the puzzle is to find from which mouse she must start to count in order that she may kill the white mouse last.

No. 7

What seven letters did Old Mother Hubbard use when she looked into the cupboard?

No. 8

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

No. 9

What is it that asks no questions, but that you have to answer frequently?

Answers to the above puzzles will be printed in the next issue.

Solutions to Puzzles in the last Issue

Here are the answers to the puzzles which were printed in the January number. Did you solve all of them correctly?

The Meccano Cross-word Puzzle

1	B	E	A	M		3	B	O	L	T	5			
	O		N		6	T		C			A			
	A		7	G	O	R	G	E			N			
	T			L	A		A				K			
			8	M	E	C	C	A	N	9	O			
				A		T					R			
			10	T	I	N		O		11	A	G	E	
				N		12	A	R	13	E		A		
			14	K	E	E	L			15	H	A	N	K

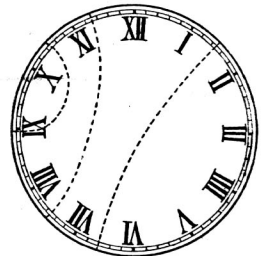
The Deer and the Wolf—The wolf caught the deer in seventy-two leaps.

The Five Discs—The least possible number of moves is thirty-one.

The Name and Address in code—They are: John Underwood, Andover, Mass. ("John" under "Wood" and over "Mass.")

The Broken Watch Face

The illustration at the right shows how the face of the watch was broken into four pieces, the numbers on each piece adding up to twenty.



Boys, send in your puzzles. The Editor will pay \$1.00 for each one accepted and published.

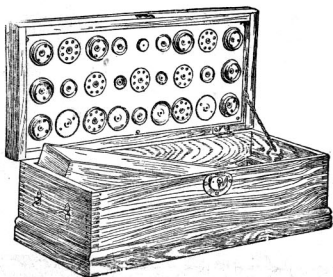


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Change of Address—Subscribers should notify the Editor at once of any change of address. Send a postcard,—*giving both old and new addresses*,—so that our records can be kept up-to-date.

A Special Offer



The Meccano Builder's Cabinet

A handsome container, sturdily built of quartered oak, and fitted with lock and key. Contains a removeable 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 removeable. Price—including tray and wheelplate, but without Meccano parts—reduced to \$3.50.

The Next Issue of the M.M. will contain 12 Pages

A splendid Meccano model of the Torque Converter will be described; there will be another installment of *Spanner's Adventures in Meccanoland*; new cross-word puzzles and other attractive features. Better make sure of your copy by subscribing today.

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 week, and correspondents will help him if they will write in ink and only on one side of the paper.

Philip Henderson, Detroit, Mich.—Thanks, Philip for your complimentary remarks on the "M.M." You think the Revolving Crane is one of the best models we have ever had. It is a good one, Philip, but there are lots more coming out soon that are every bit as good. Watch our future issues.

* * *

Wilson Walters; Rochester, N. Y.—"I think I can honestly say that Meccano was the origin of my taking to mechanical arts." Nothing gives us more pleasure than the knowledge that Meccano has been an inspiration to boys in choosing a career. You are right, Wilson—you will never be too old for Meccano. Write again soon and tell us how you progress in your studies. The sample copy of the "M.M." has been mailed to your friend.

* * *

Harry Davis; Mechanic Falls, Me.—"I have been a Meccano boy for 10 years and 4 months now and will continue 10 years more and maybe 10 years more after that." That's the right spirit, Harry. More power to you. Meccano is a fascinating hobby for for men as well as boys.

* * *

Sylvan E. Arnold, Decatur, Ill.—Sylvan is in the first grade at high school and uses his Meccano to make draw-bridges, signals and tunnels for his toy railroad. He uses a spring motor to turn his draw-bridge. Glad to hear from you, Sylvan. Won't you send us some photographs of your models?

* * *

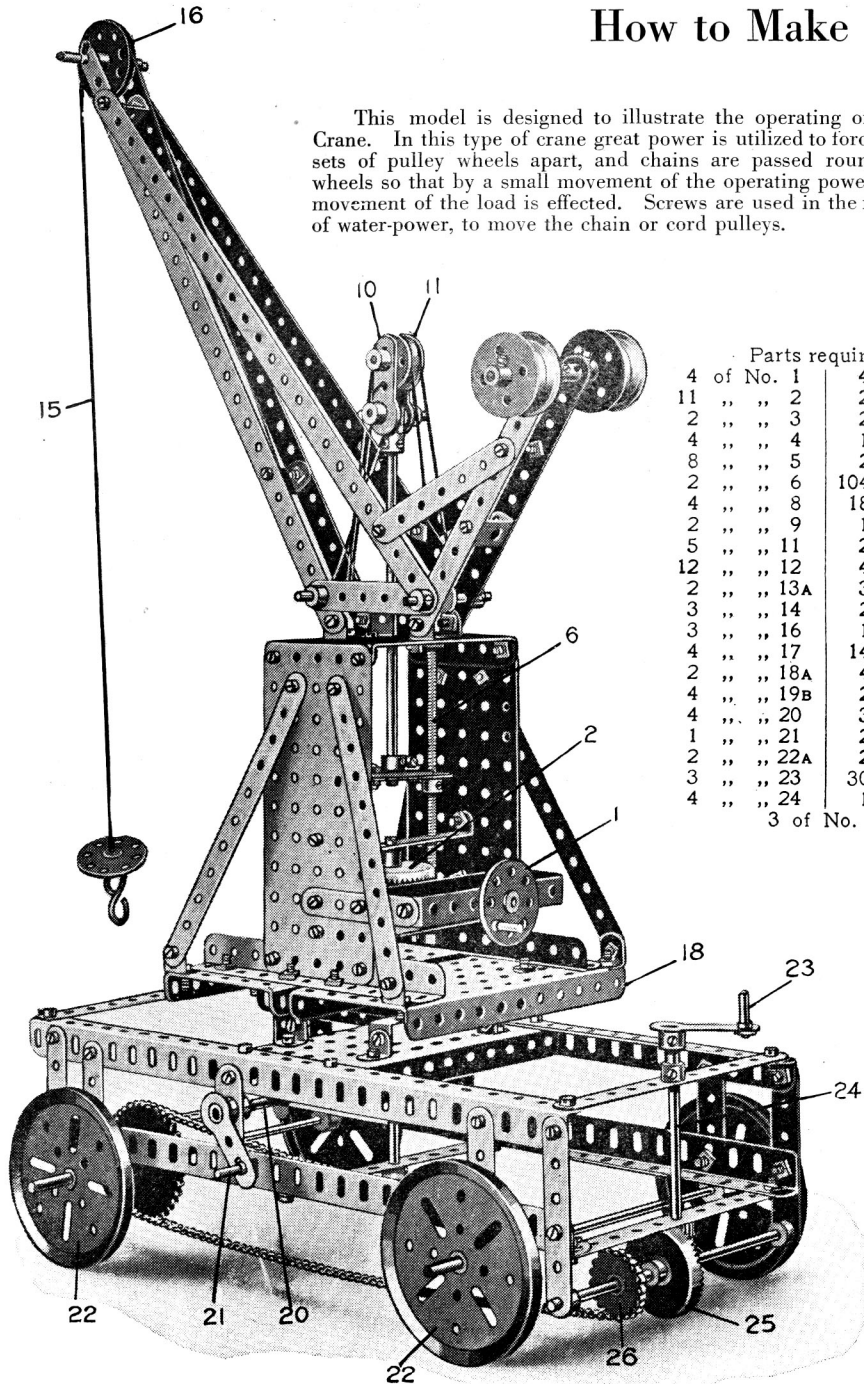
J. Millhauser; New York City—Sends in a suggestion for a Meccano flag, "a gold M on a silver field, standing for brass and nickel-plated parts." A happy idea; what do our other readers think?

* * *

Theodore S. Jacques; Portland, Ore.—Theodore started with a 1x Outfit five months ago, has already converted it into a No. 4, added a Transformer, and now writes: "as soon as I get \$7.50 I am going to get a 4A and then have a No. 5 set." Your ambition is certainly praiseworthy, Theodore. I have sent a copy of the "M.M." to your friend Courtney.

How to Make a Model Hydraulic Crane Model No. 724

This model is designed to illustrate the operating of a Hydraulic Crane. In this type of crane great power is utilized to force two or more sets of pulley wheels apart, and chains are passed round the pulley wheels so that by a small movement of the operating power a very great movement of the load is effected. Screws are used in the model instead of water-power, to move the chain or cord pulleys.



Parts required:

4 of No. 1	4 of No. 26
11 " " 2	2 " " 27A
2 " " 3	2 " " 28
4 " " 4	1 " " 32
8 " " 5	2 " " 35
2 " " 6	104 " " 37
4 " " 8	18 " " 38
2 " " 9	1 " " 45
5 " " 11	2 " " 48A
12 " " 12	4 " " 48B
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	3 of No. 115

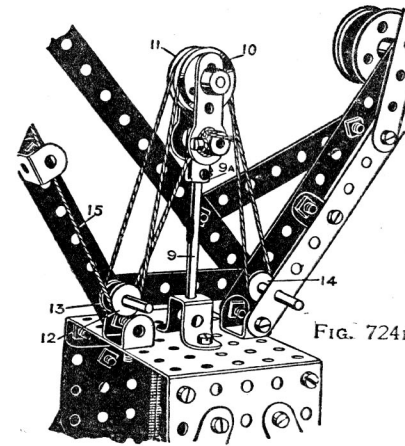


FIG. 724B

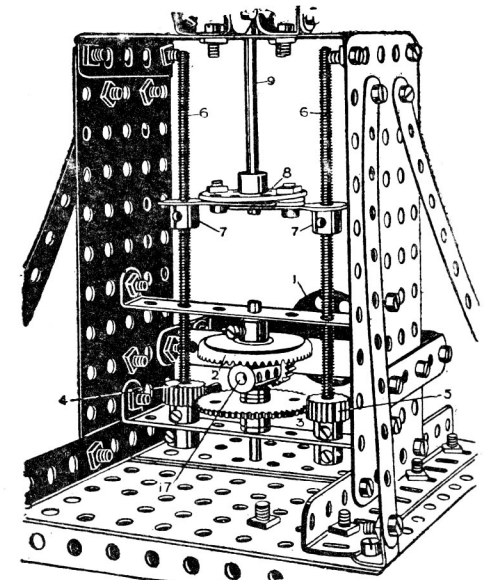


FIG. 724C

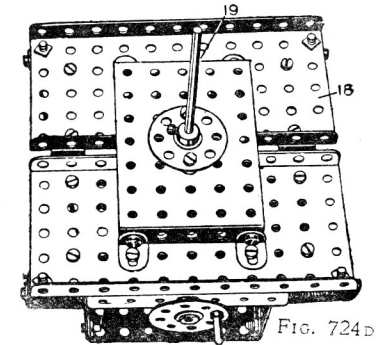


FIG. 724D

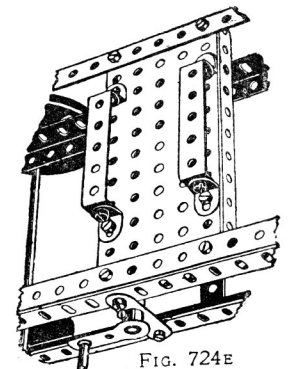


FIG. 724E

The weight is raised or lowered by operating the hand-wheel 1. The rod of this wheel carries a pinion which gears with a 1½" contrate wheel 2. On the rod of the contrate wheel is a lower 57-toothed gear wheel 3, which engages two ½" pinions 4 and 5, secured on vertical screwed rods 6, so that these rods are rotated in the same direction on the turning of the handle 1. The rods engage the bosses of threaded cranks 7, secured on a bush wheel 8, in the boss of which is fixed a 6" rod 9. This rod at the top is secured in a coupling 9a, to which are connected on a 1" transverse rod two cranks which support another 1" rod, forming a bearing for two 1" loose pulleys 10 and 11. Two ½" pulleys 12 and 13 are loosely mounted on a 2" rod at the base of the jib on one side, and a single ½" pulley 14 on another 2" rod at the other side.

The cord 15 passes over the pulley 16 at the top of the jib, round the pulley 12, up round the pulley 10, round the lower pulley 14, back round the other pulley 11, round the small pulley 13, and is made fast to the coupling 9a. By turning the handle 1 the contrate wheel 2 is rotated, thus driving the pinions 4 and 5 and rotating the screwed rods, which causes the threaded cranks to be raised or lowered, and the rod 9, carrying the pulleys 10 and 11, also to be raised and lowered. As the pulleys 10 and 11 are forced up, the cord 15 travels round all the pulleys and, due to the number of loops of the cord, the small movement of the top pulleys 10 and 11 results in a larger movement of the crane hook.

The rod of the bush wheel 1, which carries a ½" pinion, is journaled in a coupling 17, above and beneath which are placed two washers. The rod is held in position by the wheel 1 on one side of the cross strip, and by a collar on the other side.

The crane is carried on a platform 18, pivoting about a vertical rod 19, on which is a 57-toothed gear wheel engaged and driven by a worm on a rod 20, on the end of which is the operating handle 21.

The crane is caused to travel on the wheels 22 by the handle 23, a ½" pinion at the foot of its rod 24 driving a 1½" contrate wheel 25 on the rod 26, coupled by chain and sprocket wheels to the front wheels 22.