

MECCANO

MAGAZINE

for Boys

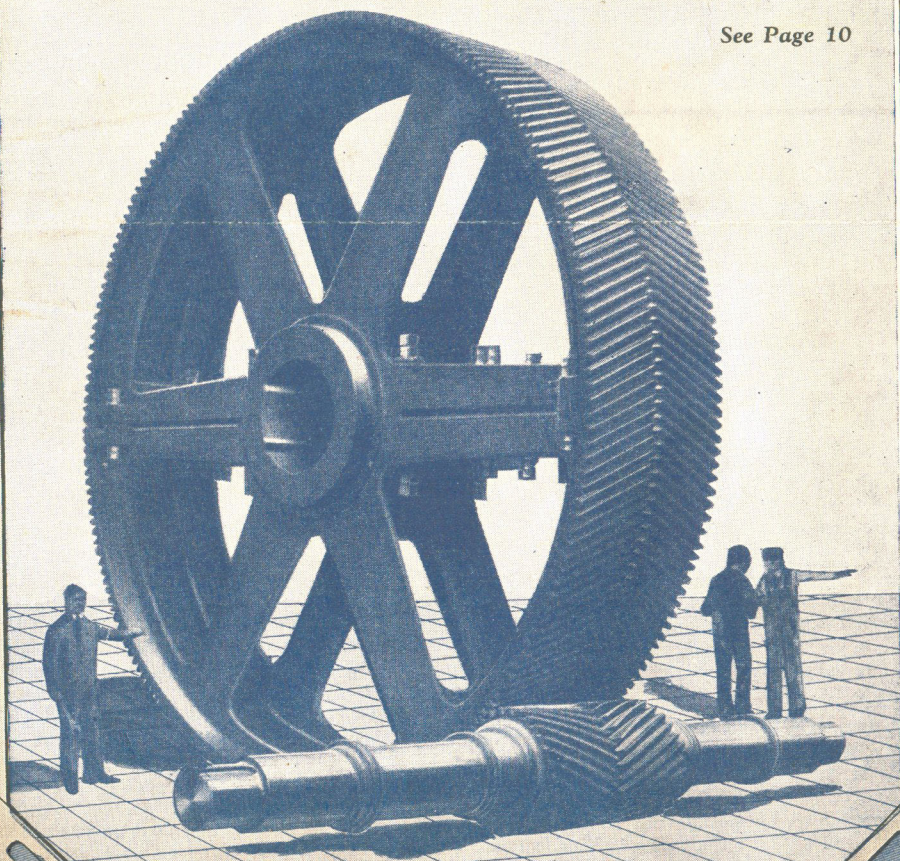
Vol. VIII. No. 1

JANUARY-FEBRUARY, 1926

Price 5 Cents

A Mammoth Double Helical Gear Wheel

See Page 10



The Editor's Own Page

Thank You for Your Greetings

I must admit that I was a very proud man on Christmas day. The great number of my readers who either wrote me or sent Christmas cards to express their good wishes was far beyond anything I could have imagined. To you all I say—Many Thanks. It warmed my heart to realize what fast friends we have become already and made me resolve anew to make the "M. M." better and to extend the growing family of "M. M." readers.

A Welcome to New Readers

With every new edition of the "M. M." we gain a lot of new friends and since our last issue an extra large number of bright eager inhabitants have been added to Meccanoland, the world of fun and sport. To these new friends the Editor extends a hearty welcome—he is only sorry that he cannot greet each boy personally, but of course that is impossible. If you are one of the new citizens of Meccanoland, the Editor would be happy to have you write him a letter, telling about the fun you are having with Meccano. Of course, letters from the older citizens are equally welcome—veteran Meccano boys know that without being told.

Our Cover Design

In this age, old records are being broken daily and new ones made. I think my readers will learn with surprise of the gigantic gear illustrated on our cover. This is one of the largest double-helical gears in the world and I believe the story of it on page 10 will be read with interest.

A New Model Building Contest

In this issue we are announcing a new Model-building contest, and all those boys who like to build original models will now have a chance to test of skill. We look forward to receiving a large number of new models from our readers.

In this connection the series of articles dealing with Standard Mechanisms will be of service to entrants in the Model-building contest, for they contain much information which the designer of new models will find very valuable. These articles make model-building with Meccano easier than ever, and permit the builder to incorporate in his models mechanical movements constructed on correct engineering principles.

New Parts for Old

I wish to remind my readers that if obsolete, damaged or rusty Meccano parts are returned to Meccano Company they will be exchanged for new and up-to-date parts on payment of half list price plus postage. A number of my readers have taken advantage of this offer, and I suggest that all who have old parts will avail themselves of this chance to freshen up their outfits. It must be understood, however, that new parts of the same kind only will be sent in exchange for old parts—if you send in an old bush wheel, for instance, we can send only a new bush wheel in its place, not a flanged wheel or other part.

In Every State in the Union

The family of "M. M." readers has grown rapidly and we now have subscribers in every state in the Union. While boys in Minnesota are reading this issue in front of the fireplace or huddled close to the radiator to keep warm, with the thermometer registering below zero outside, other boys in Florida will be reading their copies basking in the sun,—and in all probability eating an ice cream cone to help them "cool off." What a contrast! Yet North and South, East and West are all bound together by the same ties of Meccano fun and good fellowship.

Tell Your Friends about the "M.M."

Although our circulation during the past year has increased rapidly, I want to see it still further increased, and in this connection my readers can help me very considerably by obtaining new subscribers. There must be over a million Meccano boys in this country who would all enjoy the "M. M." if they only knew about it. Although we do everything possible to make the "M. M." known, it is a surprising fact that there are thousands of Meccano boys who do not know that such a magazine is published. If our present readers will show their "M. M." to their friends and mention it wherever possible, it will help me to make our Magazine more widely known. If every reader obtains only one new subscriber in this manner, we should double our circulation, and this would enable me to add more pages to each issue. If you have a friend who is not a regular reader of the "M. M." send me his name and address, and I will see that a sample copy is mailed to him.



How Jimmy Thornton Made Good

By HARRY R. WICKLINE

Jimmy Thornton's dad had been an engineer and had worked for the great steel company in his home town of Bridgeville. But the "Flu" came on and Jimmy was left to support Mother and little sister. Because his dad had worked for them, the Steel Company gave Jimmy a job in their offices as office boy. Here he was in his element because he was very much interested in mechanics. The company for which Jimmy worked made all kinds of Auto Trucks. In his spare time the lad would often go into the assembling department and watch the expert workmen put a truck together, engine, transmission, differential and what not grew from the finished material into a splendid and powerful Arrow Truck from the skilled fingers of the workmen.

In his leisure hours at home, Jimmy would get out his Meccano outfit and build model after model in which he strove to imitate in miniature the Arrow truck. His lessons from the assembling department were well learned because Jimmy wanted to be an automobile expert and did all he could to learn this fascinating business. Big Henderson the foreman took an active interest in the lad and Jimmy received many tips which helped him. And then that big Meccano contest! If he could but win that, it would mean a hundred whole dollars and how badly it was needed, for father good and kind as he was to them left them very little to fight the battle of life.

Jimmy and the force from the men who drew the plans down to the mechanics who assembled the trucks were fast friends. Soon Jimmy knew the Arrow truck by heart and could explain everything about them that an ordinary person would want to know. At home his model was perfected and he had the satisfaction of seeing it work just like its great counterpart.

One day Jimmy took his completed model to the plant and showed it to Big Henderson. That worthy looked at it and then said, "Lad, you are

a genius. It is the Arrow truck in miniature." Receiving this commendation he wrote for an entry blank in the Meccano contest and when it arrived he entered his truck. How he hoped it would take the first prize! It would mean so much to him and his mother. So Jimmy worked day after day, dreaming of becoming an automobile engineer and sometime to have an auto company of his own. Thus matters went on for several months and the great competition had closed. One day Jimmy received a long official looking envelope on which it bore the legendary letters, "Meccano Company." With eager fingers he tore it open and a check for \$75.00 fluttered out. He had received second prize on his truck and his joy knew no bounds.

Jimmy worked on and on after winning the prize. One day after he had just brought in the mail, Mr. Grose, the President of the Company, seemed to be in an excited state of mind. Such expressions as "That deal cannot be lost" and "Where is Dobson" (Dobson was the chief salesman for the Arrow truck) filled the air. "The boss must have important business on hand to be



One day Jimmy received a long envelope.

so excited" thought Jimmy as he went to his duties. Later he was summoned to the President's office and was sent with a telegram to Dobson. On coming back the President was pacing the floor and the General Manager and two of the Vice Presidents were there also.

(Continued on page 12)

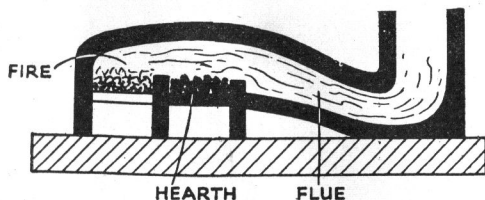


How Wrought Iron Is Made

It is correct to say that wrought iron is the purest form of iron used commercially today. Whilst steel is now gradually displacing it from the world's markets, a decade back most articles such as levers, pipes and plates, etc., were made of wrought iron.

The term "wrought iron" is commonly applied to that commercial form of iron which is obtained by the refining of a mixture of pig iron and scrap iron at a temperature not sufficient to maintain the metal in a molten state after the removal of its impurities, but only in a pasty condition, the iron being inter-mixed with a considerable amount of the slag formed in the process.

Wrought Iron is made on a hearth enclosed with fire brick walls and roof. It is heated by a coal fire at one end; the hot gases passing over the bed melt the pig iron and scrap. Then the air combines with such impurities as carbon,



A Puddling Furnace.

manganese and silicon in the molten iron oxidizing them so that, as they combine with the strong basic "fettling" on the bottom of the furnace, they form a slag. It is characteristic of iron that the freer it is of impurities the higher its melting point. The pig iron and scrap charged into the "puddling furnace," as this type of furnace is called, soon becomes molten. As the impurities are burned out, the heat of the furnace is not sufficient to raise the temperature of the iron to

its new melting point and the metal gradually becomes more or less pasty. As soon as it is in this condition, the puddler knows that all the impurities have been burned out.

By means of a long iron poker through the furnace door; the puddler "balls up" this iron into one or more balls, and with his tongs removes the balls from the furnace and places them in a press or squeezer. The object of this is to squeeze out the slag particles which have been included in the mass of iron. The resultant "puddled bloom" is rolled into a large bar called a "muck bar." The bars are cut into short lengths, piled up in bundles which are wired together, heated to a white heat (so they will weld) and again rolled down to smaller sizes called "merchant bars."

As the tonnage of the puddling furnace is limited by the capacity of the man handling the balls, it is evident that the production in quarter ton lots cannot compete in cost with steel made in from twenty-five to one hundred ton "heats" in the open hearth. Not only is the output of a puddling furnace small, but a high degree of skill and judgment is required in the "puddler," for a high-grade product.

Notwithstanding the advantages that steel possesses, wrought iron is still held in high favor for forging work where welding is required such as for horse-shoes, and for some grades of pipe that have to resist corrosion.

The Bessemer Converter

Pig Iron, as it is delivered by the blast furnace, is an impure mixture of about 94% iron and the remainder made up of Silicon, Carbon, Manganese, Sulphur, and Phosphorus. To convert Pig Iron into Steel, it is necessary to reduce the amount of the impurities to predetermined percentages; thus a steel such as is used for your Meccano parts, would contain about 10% Carbon, 25% Manganese, a trace of Silicon, 2½%

(Continued on page 7)

Meccano Standard Mechanisms

Belt and Rope Mechanism

In Meccano models, cords usually take the place of belts for this method of power transmission. Miniature belting may be made, however, from strips of tape, canvas, elastic bands, etc., in which case Flanged Wheels should be used either singly or in pairs, instead of grooved pulleys. The Meccano Spring Cord also forms an excellent means of connection between pulleys.

Open Belt Gear

The simplest form of belt drive mechanism is the open Belt gear. Fig. A shows an example of this type of belt mechanism. Here a 3" Meccano Pulley Wheel is coupled to a 1/2" Pulley Wheel by means of a cord. Due to the great difference

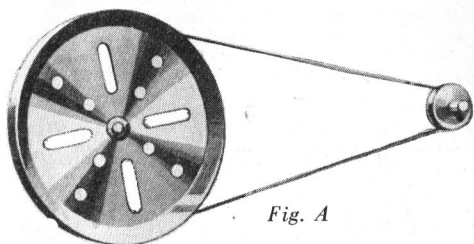


Fig. A

in size between the two pulleys one revolution of the larger one causes the smaller pulley to rotate six times. Vice versa, it takes six revolutions of the smaller pulley to cause the larger one to make a complete revolution. By employing wheels of the proper sizes any reasonable difference in speed between the two shafts can be obtained.

Reversing the Direction of Rotation

When it is necessary to have the driven shaft rotate in the opposite direction from that of the driving shaft, the method shown in Fig. B may



Fig. B

be used. This consists merely of crossing the belt, which gives the desired result.

Belt Reversing Gear

A belt reversing gear is illustrated in Fig. C. Two pairs of Flanged Wheels, 1 and 2, are fixed, and two pairs, 3 and 4, are loose on a driving

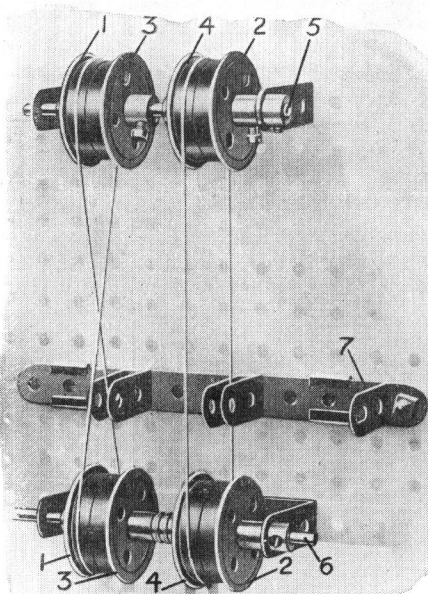


Fig. C

shaft 5 and a driven shaft 6. The wheels 1 are connected by a crossed belt, thereby reversing the motion of the driven shaft 6 (as in Fig. B), while the wheels 4 are connected by an open belt. The operation of a lever 7 brings one of these belts on a fixed pair of pulleys, at the same time throwing the other on to a loose pair, and

vice versa, thereby reversing the action of the driven shaft 6.

A Belt Clutch

In Fig. C the pulleys 4 and 2 also demonstrate the principle of a belt clutch. The driven shaft 6 may be thrown into gear with the shaft 5 by moving the belt on to the fixed pair of wheels 2, and by reversing the operation it may be thrown out of gear again without stopping the driving shaft 5.

Driving Shafts at Right Angles

Occasionally it is desirable to drive two shafts which are at right angles to each other. The

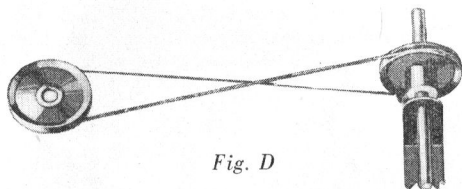


Fig. D

method employed for this is illustrated above in Fig. D.

When the Shafts are not in Line

An arrangement which may be adopted when the pulleys are not in line with one another is shown in Fig. E. The guide pulleys 1 ride freely upon the axle 2.

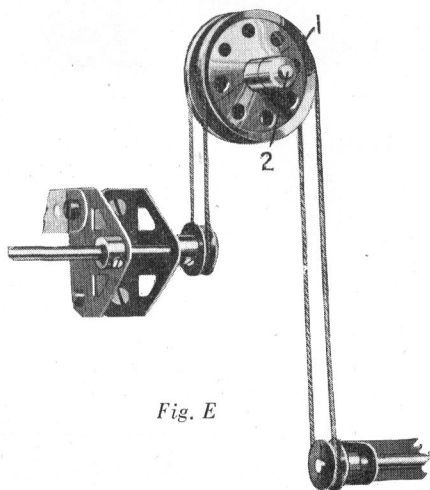


Fig. E

To Drive at an Obtuse Angle

Fig. F illustrates a method of transmitting the

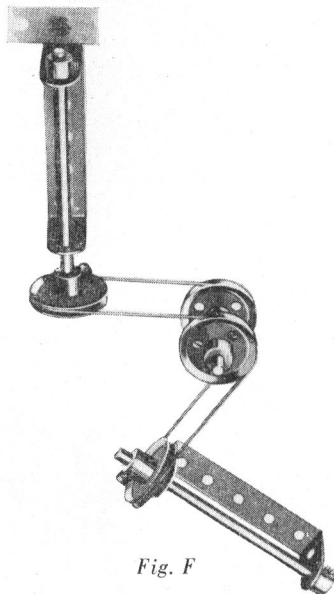


Fig. F

drive to a shaft placed at an obtuse angle. The belt is led around the 1" loose guide pulleys.

The foregoing examples are taken from a new Book entitled

MECCANO STANDARD MECHANISMS

This book will form a ready reference book for Meccano boys and will give the most approved and tested methods of making standard movements which can be built into Meccano models. It will be especially valuable to the boy who invents his own models. The book is now in preparation and an announcement will be made in the "M. M." as soon as it is ready for distribution.

Watch the "M.M." for Publication
Date

The Story of Iron and Steel

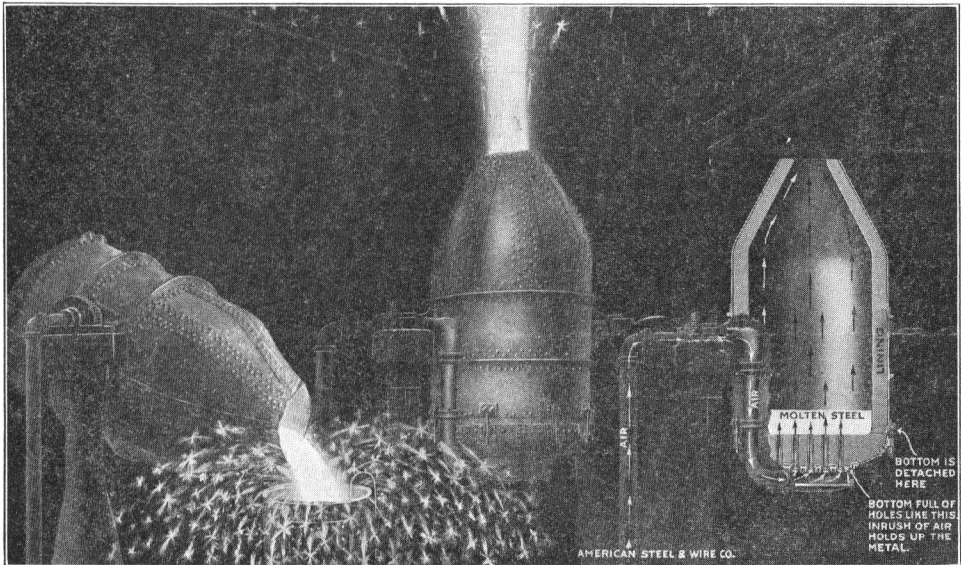
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Phosphorus, and 4% Sulphur, the balance being Iron. Although the foregoing analysis is of Open Hearth Steel, the Bessemer Process will first be described.

The process of converting the pig iron into steel is a refining process and is possible because most of these elements that make up the impurities can be removed by bringing them in contact with oxygen. The atmosphere or air contains about 21% of oxygen; therefore, the simplest way of

of certain kinds of brick known as refractory material. The Converter bottom is made of a number of cylindrical bricks held together by bonding material. Through each one of these bricks is a number of holes, and below this perforated bottom is a wind box through which air passes from the blowing engines up through these holes and then through the molten metal.

To explain all of the details of construction of the Converter would require more space than it



The Bessemer Converter.

bringing pig iron into contact with oxygen is to blow air through it while the iron is in a molten state.

It would seem perhaps that in doing this the iron would be cooled and would solidify. As a matter of fact, when these elements are oxidized or burned out they create a great quantity of heat, just the same as a piece of wood delivers much heat when it combines with oxygen in the process of burning.

The container necessary to carry on this process is a large pear-shaped vessel known as a Converter which is supported on two trunnions so that it may revolve. This Converter is made of heavy steel plate and lined with a thick lining

is thought desirable to devote to it here but a conception of the apparatus can be secured by referring to the illustration on this page.

A blast furnace is tapped every 5 to 6 hours to permit the iron to run out and each time the larger furnaces produce about 200 tons of molten iron. A Bessemer Converter can hold only about 15 tons at one time but delivers that amount in the form of steel every 10 to 15 minutes. With a condition like that it is necessary to have some form of a reservoir which will hold the iron, and at the same time keep it molten and deliver it to the Bessemer in the right quantities at the proper time. Such a reservoir is called a

(Continued on page 13)

An Improved Model

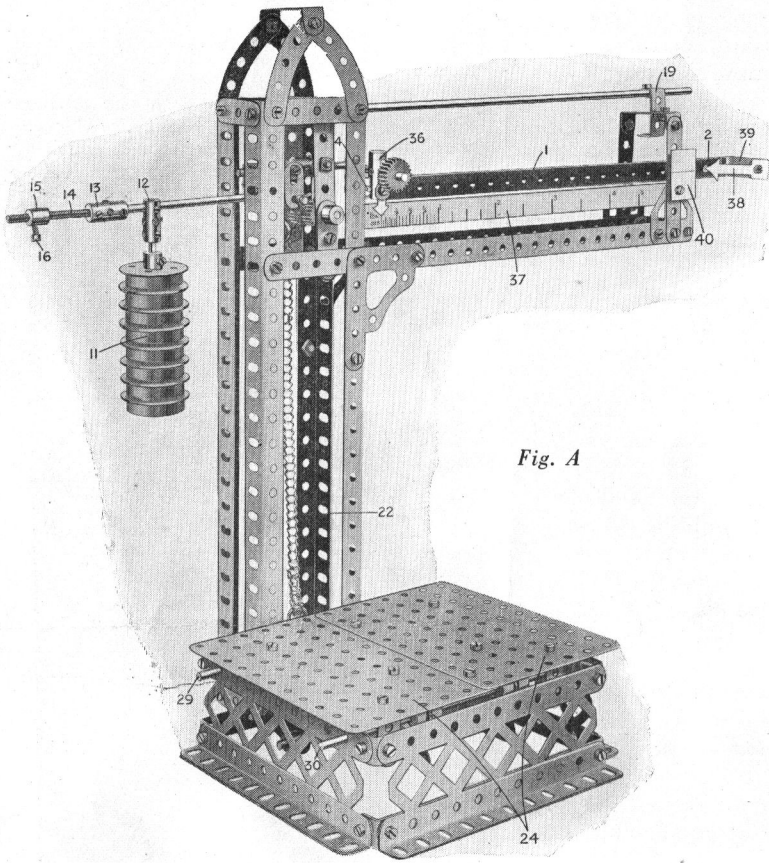


Fig. A

Parts required:

3 of No. 1	1 of No. 12A	2 of No. 26	1 of No. 63B
2 " " 2	3 " " 12B	8 " " 35	1 " " 64
2 " " 3	2 " " 13	78 " " 37	2 " " 65
2 " " 4	2 " " 14	14 " " 38	1 " " 81
3 " " 5	1 " " 15	1 " " 46	4 " " 90
2 " " 6	3 " " 16	3 " " 48	3 " " 100
6 " " 6A	2 " " 16B	4 " " 48D	2 " " 102
4 " " 8	1 " " 17	2 " " 52A	2 " " 108
2 " " 9	2 " " 18A	6 " " 57	1 " " 111
4 " " 10	1 " " 18B	20 " " 59	1 " " 111A
1 " " 11	8 " " 20	2 " " 62	2 " " 115
2 " " 12	1 " " 25	8 " " 63	2 " " 126A

The model Platform number of Meccano m the "old-timers," as it years. It has, however improvements have been will be found in the of the steelyard, and in providing for a free platform.

This improved constant ing from half an ounce accuracy.

The steelyard 1, centre extreme end at 2 to a Cou and at its other end Coupling is carried on further Couplings 7 and further Axle Rod 10 is weights 11 which may any position on the Rod by the Coupling 13 and 15, by which very accurate the steelyard is exactly position by the bolt 1

The fulcrum rests up Centre Forks secured between the teeth of two short Rod rigidly held Strips suspended from Rod 18. The steelyard Rod 18 under the stop

A Sprocket Chain 2 and Hook 21, connect (Fig. C). These levers carry a central 3" Rod a Double Bracket and 27 carried in the ends Hooks 28A. The 6½ mounted, are journal

The platform, shown Flat Plates overlapped 31 carried in a Double the Threaded Pins 33 upon the levers 28.

Platform Scales

Platform Scales is not a new addition to the great models—in fact, it may be considered one of the models which has appeared in the Manuals for a number of years, but has recently been redesigned and a number of improvements have been incorporated. The most important of these is the new arrangement of levers in the base, which allows lateral movement, as well as vertical, of the

platform. The construction of the model enables amounts varying from 1 lb. to 4½ lbs. to be weighed with remarkable accuracy.

The platform, consisting of a 12½" Strip, is bolted at its ends to a 11½" Rod 3, Fig. B, which is supported by a second Coupling 5 (Fig. B). This Rod 3 is supported by a short Rod 6 which passes through two Couplings 8 and enters another Coupling 9 in which a Pinion 10 is mounted. This Rod 10 carries the balance beam and is secured by means of the Coupling 12 in which a Threaded Rod 14 is mounted. The latter is also extended at the end to a Threaded Rod 14 carrying a Threaded Boss 16 for rate balance adjustment may be made. When the platform is balanced the Threaded Boss is secured in its position by means of a Nut 16.

The platform is supported upon a knife-edge bearing 17 consisting of two Couplings 7 in the Coupling 7, with their points resting upon ½" Pinions. These Pinions are bolted to a Rod 18 in two Cranks, which are attached to 3½" Cranks, which are attached to a Coupling mounted on the end of an 11½" Rod 19. This Rod 19 is lifted into position by placing the 11½" Rod 19 in the Coupling 19.

The platform is suspended by means of Flat Brackets 20 which are supported by the levers 23 in the base of the model. The levers 23 are then pivoted on Hooks 24 and 25 from which hangs a link 26 consisting of a ¾" Bolt. This link supports a further Rod 27 of another pair of levers 28 pivoted to the Rods 29 and 30, on which the Hooks are attached in the framework of the base.

The platform, as inverted in Fig. D, is composed of two large Flat Brackets 22 bolted together; the Axle Rod 23 rests upon the levers 23, while the Angle Strip 32 rests upon the levers 23, while the 1" by ½" Angle Brackets 34 rest upon the levers 23. Two Washers are placed on the bolts under-

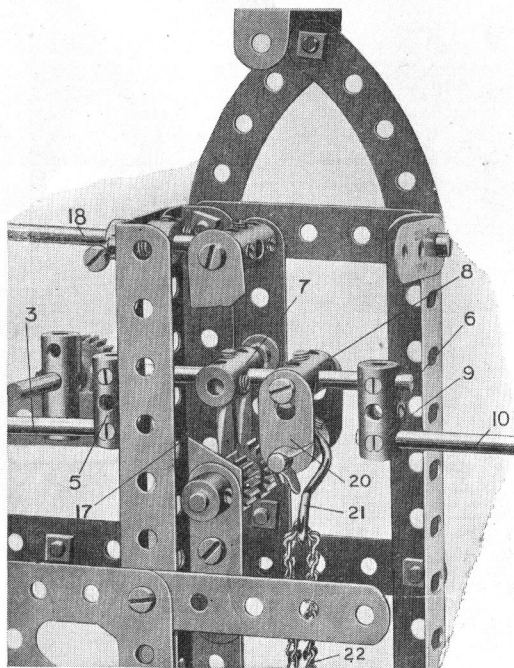


Fig. B

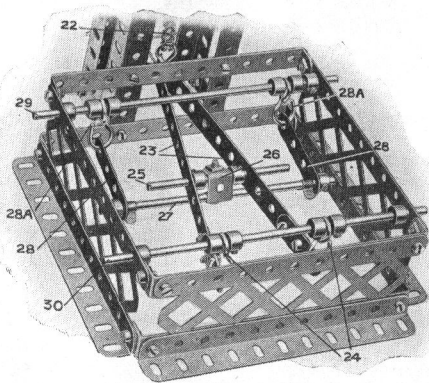


Fig. C

(Continued on page 12)

The Largest Gear Wheel in the World

We feel sure that our model-building readers, familiar with gear wheels in many forms and sizes, will be particularly interested in our cover this month. It shows one of the largest Double Helical Gears ever made. The larger wheel, measuring approximately 17 ft. in diameter and its face 4 ft. in breadth, is made from Siemens Martin cast steel. It consists of two pieces bolted together, the weight of each half of the wheel in the rough casting state being 15 tons. The pinion, made from a high carbon steel forging, is 18 ft. 6 in. in length and weighs $8\frac{1}{2}$ tons. The pair of gears is capable of transmitting up to 15,000 h.p. when reducing from 245 to 34.5 r.p.m.

These gigantic gears were made to drive a number of steel rolling mills employed in rolling corrugated sheets. A rolling mill resembles a huge mangle with the two rollers connected together by gearing and driven by an electric motor working through a totally-enclosed reduction gear. The mill rollers are of cast steel and may be raised or lowered, according to the desired thickness of the metal to be rolled. One reduction gear, similar to that illustrated, drives twelve rolling mills.

The Development of the Gear

From the very beginning of the age of machinery, gearing of one sort or another has been used. Generally this has been in the form of straight-toothed spur gears. In the early days when power was both generated and applied at comparatively slow speeds, the disadvantages of inefficient transmission were perhaps not very serious, and certainly they were not obvious. More recently, however, the development of such high-speed prime movers as the steam turbine and the electric motor, and their employment for driving slow speed machinery, has placed an entirely different complexion upon the question of power transmission.

Double Helical Gears are Smooth and Vibrationless

Noise and vibration are always present in straight-toothed gearing, even when used for low ratios. In the case of high ratios the defects are so apparent and serious that this form of gear is never considered as a practical proposition.

For high ratios and speeds greater than those that can be dealt with by straight-toothed gears, the machine-cut Double Helical Gearing has been introduced. The earliest examples of this form of gearing were comparatively crude and inaccurate, as judged by modern standards. They have constantly been improved and developed, however, until Helical Gears are now the only form of gear transmission to be considered by engineers when dealing with the transmission of high speeds.

To be satisfactory, Helical Gears must be correctly designed, the cutting must be meticulously accurate, and the lines of contact must have a path diagonally across the teeth at an angle with the axis in all planes. When these conditions are fulfilled Helical Gearing is the only type of gearing that has unvarying engagement and which gives a constant load carrying area.

How Meccano Gear Wheels are Made

Gear Wheels are indispensable elements in modern engineering practice, and they are equally indispensable in Meccano engineering. Meccano Gear Wheels are made in much the same manner as are the gears used in actual practice.

We believe all Meccano boys would like to watch a "No. 26" or "27" as it passes through the various stages of manufacture. It is certainly very interesting to observe solid pieces of brass being transformed with amazing rapidity into beautifully finished Gear Wheels, destined, in all probability, to provide many years of hard service in hoisting loads or working hammers, drills, lathes, engines, clocks, and automobiles, at the bidding of some happy Meccano boy!

The first process is the cutting and shaping of the wheel from bars of solid brass, boring out the centres, and cutting the thread to receive the set-screws. Next a number of these blanks—still quite unfamiliar in appearance to the Meccano boy—are placed face to face and inserted on a mandril in a wonderful machine-tool. Here a circular cutting tool, revolving at a high speed, passes along the row of brass discs, and in doing so cuts out a single tooth in each wheel. When the tool has reached the end of its stroke, the blanks are rotated slightly, and the tool, returning, cuts out the next tooth. This process is repeated until all the teeth are shaped.

MECCANO ACCESSORY PARTS

GEAR WHEELS

The method by which Meccano Gear Wheels are made is briefly described in this issue—how the teeth are cut, one at a time, in a machine that is a marvel of precision. The accuracy of this operation, together with the fact that they are made of the finest metals only, explains why Meccano gears work so smoothly. Most Meccano toothed wheels are made of solid brass, beautifully finished and polished, the exceptions being the 133-teeth Gear Wheel and Sprocket Wheels, which are of specially-fine steel and are equally well finished.

Meccano gears, like all other Meccano parts, are put to innumerable uses in addition to model-building. They are employed by engineers, students and professors of engineering, inventors, builders, and mechanics. Big engineering firms use them to demonstrate the working of the various machines they manufacture, as well as to try out new ideas, new movements, etc. They may be used with advantage in the construction of many devices outside the field of toy engineering.

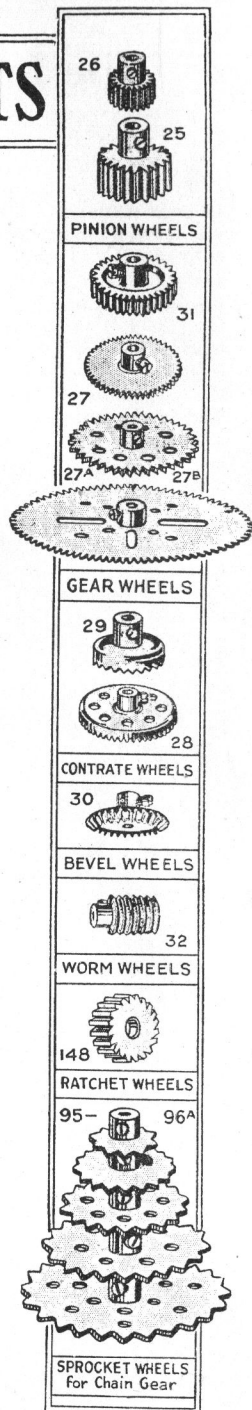
Price List of Meccano Toothed Wheels

No.	Description	Price
25.	Pinion Wheels, $\frac{3}{4}$ " diam., 25 teeth, (to gear with No. 27)	each .25
26.	" " $\frac{1}{2}$ " " 19 teeth, (" " 27A)	" .15
27.	Gear Wheel, 50 teeth, (to gear with $\frac{3}{4}$ " pinion)	" .30
27a.	" " 57 " (" " $\frac{1}{2}$ " ")	" .35
27b.	" " 133 " (" " $\frac{1}{2}$ " " $3\frac{1}{2}$ " diam.)	" .65
28.	Contrate Wheels, $1\frac{1}{2}$ " diam., 50 teeth	" .50
29.	" " $\frac{3}{4}$ " " 25 "	" .30
30.	Bevel Gears, 26 teeth (for right-angle drives)	" .55
31.	Gear Wheels, 1" diam., 38 teeth ($\frac{1}{4}$ " in width)	" .65
32.	Worm Wheels, (for big reduction gear, etc.)	" .25
95.	Sprocket Wheels (for Chain gear), 2" diam., 36 teeth	" .25
95a.	" " " " $1\frac{1}{2}$ " 28 "	" .25
95b.	" " " " 3 " 56 "	" .40
96.	" " " " 1 " 18 "	" .20
96a.	" " " " $\frac{3}{4}$ " 14 "	" .15
148.	Ratchet Wheels, (for Pawl and Ratchet Gear)	" .30

Meccano wheels can be purchased separately at any time and in any quantities. If your dealer cannot supply you, write us, enclosing remittance, and we will see that you are supplied.

MECCANO COMPANY, INC.

ELIZABETH, N. J.



How Jimmy Thornton Made Good

(Continued from page 3)

While on an errand for the Treasurer Jimmy heard voices from the President's office; Mr. Grose was talking and as Jimmy had his natural bump of curiosity he stopped to listen. Mr. Grose was saying: "We cannot lose this deal. It will bring us more business for the Koehler Company are the largest wholesale grocers in the country. To sell them a fleet of 100 Arrow trucks will bring our firm to the favorable notice of other truck buyers. Mr. Addison is to be here in the morning and if Dobson don't show up the deal is off. We must have someone to explain the truck to Addison. Big Henderson is sick, Williams is off on vacation (Williams was the General Engineer for the company). We simply cannot lose this deal. The Benton people are after it also and we will have to put this deal across."

Jimmy Offers To Help

Jimmy waited to hear no more, very timidly he opened the door and said in a weak voice, "Perhaps I can help you." "You," exclaimed the three in chorus. "What do you know about our trucks?" "Very little," said Jimmy, "but I believe I can explain the truck to Mr. Addison. I won a prize for a model of it from the Meccano Company, sir. It worked just like a real truck. Big Henderson also taught me a whole lot about it. Please, sir, let me try." "Hmm," mused the President, and then to Jimmy, "Meccano is that engineering toy for boys, isn't it?" "Yes, sir," returned Jimmy with pride. "You can make anything with Meccano." "Before I give you permission," said the President, "I would like to see your model." So Jimmy went home after his model. He explained it to the President and no doubt lingered in his mind, it was the Arrow truck in miniature. "Wonderful, Presto, you are a real mechanic," said the President "You may talk to Mr. Addison."

The Next Morning

The next morning Mr. Addison called and Jimmy was ready to receive him. Jimmy took his Meccano model of the Arrow truck and explained it so well that in an hour's time the President had the Koehler firm's order for the hundred trucks. After the interview, Mr. Addison was talking to the President. "Where did you get that lad?" The President told him and then Mr. Addison said, "He knows your truck from A to Z." "Yes," smiled the President. "He is our youngest engineer."

(Continued on page 15)

An Improved Model Platform Scales

(Continued from page 9)

neath each end of the Double Angle Strip 32 and four Washers are placed beneath each of the brackets 34. Single Bent Strips 35 form guides for the platform and fit over the Rod 30 in the base.

A weight 36 consisting of a Strip Coupling, short Rod, and $\frac{3}{4}$ " Pinion slides along the steelyard 1 and carries a small pointer, cut from

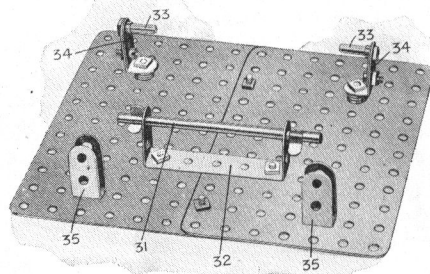


Fig. D

cardboard, which indicates the load being weighed by means of the graduated rule 37. A piece of cardboard 38 cut in the form of an arrow may be bolted to a 1" Reversed Angle Bracket 39 and arranged to rest against the cardboard indicator 40 when the scales are exactly balanced.

When the model is complete, and before commencing to weigh, care should be taken in balancing the steelyard by means of the weight 11 and adjustment 15, so that the arrow 38 rests on the line at 40 when the sliding weight 36 is at the "O" mark in the rule 37.

The graduated scale may be prepared by placing known weights on the platform, and accurately marking the position at which the sliding weight 36 must point in order to maintain the arrow 38 dead on the line at 40.

The model should be oiled at frequent intervals, and all working parts must be perfectly free to move. The fulcrum 7, especially, should not be allowed to make contact with the suspended $3\frac{1}{2}$ " Strips.

**In the Next Issue
Another New Model
Watch for it!**

The 1926 Model-Building Contest

Competitors may be of any age or either sex, and there are no restrictions or entrance fees. The ingenuity and originality shown will guide the judges in their decisions, and no preference will be given to large, elaborate or complicated models. A small model well constructed, and demonstrating an ingenious idea, stands just as good a chance of winning a prize as a large and intricate one.

A competitor may enter any number of models for competition and there is no restriction as to the number of parts or make of toy which may be used.

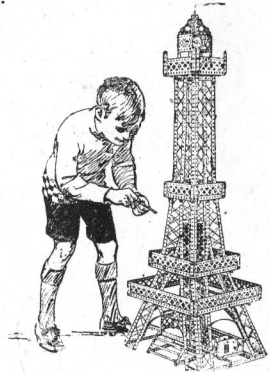
The Judge will be Frank Hornby, the inventor of Meccano, and his decision will be final. No photographs or sketches will be returned to competitors. No entry form is required, but each sheet or photo must bear the name and address of the entrant. The photographs or sketches need not be the work of the competitor.

THE PRIZES

First Prize	Meccano goods, value	\$25.00
Second Prize	“ “ “	15.00
Third Prize	“ “ “	10.00

The closing date for this contest is October 1st, 1926, and the list of prize winners will be printed in the "Meccano Magazine," as soon thereafter as possible.

The actual model should not be sent. A clear photograph or drawing is all that is required.



An Opportunity For You

We are always pleased to consider articles, photographs, and sketches for publication in the "M. M." Many articles are sent to us from time to time, but a number of these are not suitable, as they are not of sufficient general interest to the majority of our readers to enable us to print them. The articles that we want for publication are those that deal with any new engineering structure in your district, anything connected with Meccano—such as some new application or some particularly interesting movement—articles on railroads, automobiles, electricity, radio and similar subjects. These will all be welcome—the more so if your articles are typed or neatly written on one side of the paper only. In each case your name and address should be clearly given—and you would be surprised to know how often contributors forget these important details! Payment will be made at our usual rates for those articles that are published. All articles and sketches submitted should be original, that is, they must not be copied from an article already published.

The Story of Iron and Steel

(Continued from page 7)

Mixer and is a hollow ball or cylinder lined with some form of heat insulating material, either fire brick or mica schist.

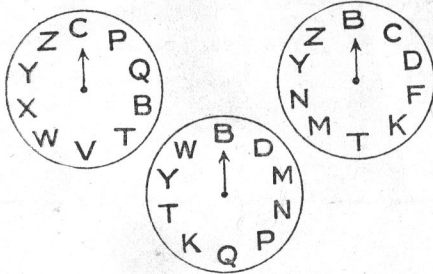
In order to put the molten iron into the Mixer and also to get it out, there are two openings on opposite sides. The ladles which have been transported from the blast furnace are hoisted by a crane and the molten iron poured from the ladle into one of these holes in the Mixer. The Mixer, due to its insulating lining, keeps the iron hot, but this lining is not a perfect insulator and in order to replace the heat which is lost, it is necessary to burn gas inside the Mixer. The Iron is thus in a condition to be delivered to the Bessemer at any time.

In the April Issue
"What Happens in the Converter"



Puzzle No. 29. Is It Safe?

A certain jeweler had a safe installed in which he placed his precious stones. In order to make the safe burglar-proof he had a combination lock fitted, which was operated by the pointers upon three dials. These three dials were lettered as shown in the diagram below and in order to open



the lock each pointer had to be moved to point to a certain letter. These three letters formed a word in the English language. What was the word?

* * *

No. 30 Over and Under

What sentence is represented by the following arrangement of words:

Stand	You	Take	To	Takings
I	Heard	And	Throw	Our

* * *

No. 31 What Am I?

I am found in England, Ireland, Scotland and Wales, but not in the United States. I am always in battles and brawls, never in peace and quietness, yet I have as much to do with the lamb as with the lion. You are all greatly indebted to me, for without me you could not have pleasure. I belong to a large family and am one of its tallest members. What am I?

No. 32 Dots and Vowels

In the following collection of letters and dots replace each dot by a vowel so as to form a sentence that reads the same both backward and forward:

R . DR., TP . T . PT., RD . R

* * *

No. 33 Poor Caesar!

A certain boy was told by his teacher in latin class to translate a passage of latin, writing his translation on the black-board. His efforts set the whole classroom in an uproar, for this is what he wrote:

"Caesar entered on his head, a crown upon his feet, sandals in his eyes, a look of stern determination."

Yet his translation would have been correct if he had punctuated the sentence properly. Can you do it?

A Prize of \$1.00 given for the First Set of Correct Answers to these Puzzles received by the Editor.

Answers to Puzzles in the Last Issue

No. 22—105 triangles.

No. 23—\$92, 233, 720, 368, 547, 758.08.

No. 24—Were "but" but "and" and "and" but "but"; "but and and" were "and and but," and "and and but" but "but and and," and "but and but" but "and and and," and "and and and" but "but and but!"

No. 25—(a) Chamois; (b) Buffalo; (c) Heifer; (d) Leopard.

No. 27—
 ESCAPE
 STOVES
 COVERT
 AVENUE
 PERUSE
 ESTEEM

No. 28—An umbrella, in a chimney.

Our Mail Bag

In this column the Editor replies to letters from his readers, from whom he is always pleased to hear. He receives a great many letters each day, and correspondents will help the Editor if they will write neatly in ink and on one side of the paper only.

Jack Pickin, Dayton, O.—"We were in England in September and visited the Meccano factory at Liverpool. We saw them making all the different parts and the Hornby trains. We shook hands with Mr. Hornby, who told us he was returning to America next day." You were indeed fortunate, Jack, to visit the English factory; next time pay a visit to the Elizabeth factory.

* * *

Alvin Josephy, New York—For a boy 10 years old, Alvin, you write a remarkably good letter and I am glad that you enjoy your Meccano so much. You have an added pleasure in store for you when you try the real Meccano electric motor.

* * *

Robert A. Bruce, Somerville, Mass.—Suggests a button or pin for subscribers to the "M. M." at a cost of, say 10 cents each. What do other readers think of this suggestion?

* * *

Ted Scholl, Allentown, Pa.—Thanks, Ted, for your suggestion. See answer to Robert Bruce above.

* * *

Bernard G. Clare, Detroit, Mich.—"Meccano is the greatest toy ever produced for boys (and girls, too) and is a toy that even some of the biggest engineers use daily to work out their problems. Perhaps in my next letter I'll tell you some interesting facts in regard to this." Thanks, Bernard, hurry along that next letter. The parts list you asked for has been sent. Watch the *M. M.* for new parts.

* * *

Jackson Beatty, Morris, Ill.—I had to write an essay on Electricity for Science and the article on the 'Largest Electric Locomotive in the World' in the Sept.-Oct. 'M. M.' helped me quite a lot." Glad you found the "M. M." so useful, Jackson, and that you enjoyed our articles on the "Mammoth Crane" and "Meccano Helps Army Engineers."

* * *

Arthur McCracken, Alliance, Ohio, is studying Mexico in school and would like to correspond with a Meccano boy in Mexico. We shall be glad to put any Mexican boys in communication with Arthur. Address letters care of the Editor.



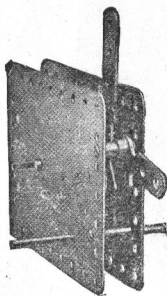
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CHANGE OF ADDRESS—Subscribers should notify the Editor at once of any change of address. Send a postcard,—giving both old and new addresses,—so that our records can be kept up-to-date.

The Meccano Clockwork Motor



Where electric current is not available, the Meccano Clockwork motor can be used for operating Meccano models. This motor is sturdily constructed and very powerful. The side-plates are perforated with the standard Meccano equidistant holes permitting extra gears to be attached for obtaining various ratios of speed and power. Fitted with reverse and control levers.

The Meccano Clockwork Motor, Price \$3.00

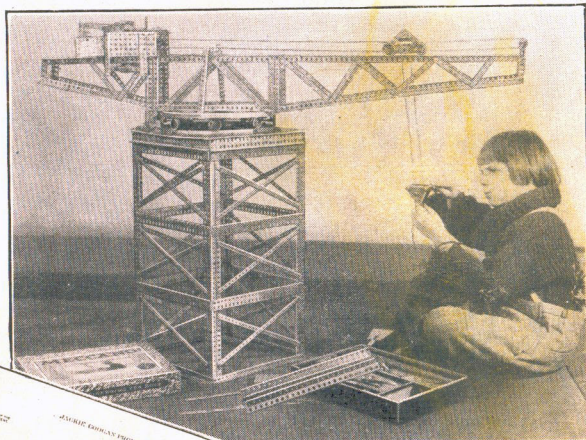
How Jimmy Thornton Made Good

(Continued from page 12)

From that time the President took an active interest in Jimmy. He learned the business thoroughly and stayed with the firm, with the exception of two years at the automobile school. Today Mr. James Thornton though only 20 years old is General Superintendent of the firm and bids fair to become a higher officer as the years come and go. In speaking of his success to his boy friends he would say, "It's all due to Meccano. Without my Meccano I wouldn't be where I am now. It was my Meccano that helped me to where I am now. Boys, if you want to be something get you a Meccano outfit and succeed." And he voiced the sentiments of a million other happy Meccano boys who in the future will rank as the world's greatest engineers.

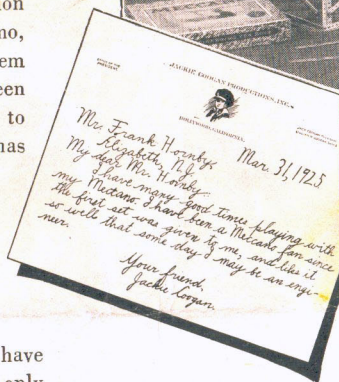
MADE FIRST—MADE BETTER—BUILDS MOST

*"I have been a
Meccano Fan
since I got
my first set"*
Jackie Coogan



Having a choice of all construction toys, Jackie Coogan selected Meccano, the original and "The Daddy of them all." More than once Jackie has been known to dash off between pictures to finish a Meccano model which he has designed himself.

Meccano has such a great variety of parts—that's why it will build more models than any other toy. The parts are all made of shining steel and solid brass, and fit together perfectly. Other toys have copied some of these parts, but only Meccano has them all. Don't be fooled—to build right you must have the genuine.



MECCANO

Engineering for Boys

Meccano never grows old. It is the most absorbing hobby in the world. Thousands of boys all over the country are having fun that never ends, playing with Meccano. And the sound engineering knowledge which they learn as they play will help them to become the world's great engineers of the next generation.

Meccano is for sale by most department stores, toy, hardware and sporting goods dealers. If you have difficulty in obtaining what you require, write us.

MECCANO COMPANY, INC.

ELIZABETH, NEW JERSEY

Some Exclusive Meccano Features

Only in Meccano can you get these parts



Other toy parts may look like Meccano, but place them side by side and judge for yourself

No. 00 Meccano Outfit	\$1.00
No. 0 Meccano Outfit	2.00
No. 1 Meccano Outfit	3.00
No. 1x (has Electric Motor)	5.00
No. 2 Meccano Outfit	6.00
and up to \$45.00	

AS EASY AS BUILDING WITH BLOCKS

