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CHRISTMAS DOUBLE NUMBER

MECCANO

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for Boys

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Jackie Coogan
Visits Meccano

—See page 3



The Editor's Own Page

Christmas Greetings

By the time this issue is published, the Christmas season will be close upon us and I wish each of my readers a very Happy Christmas and a New Year filled with real Meccano joy. Many of you are reading the Meccano Magazine for the first time and to you I should like also to extend a hearty welcome to our rapidly growing family of "M.M." readers. Take the "M.M." regularly and not only join in our good times but contribute to them. Let me have your suggestions for the improvement of the "M.M.", tell me what you would like and send me an article relating some of your experiences that would be of interest to other Meccano boys. We of the "M.M."—your Editor, his staff and readers—are one big happy family, happy because we are all working together for a bigger and better Magazine for all.

Jackie Coogan—a Meccano Boy

It will interest my readers to know that Jackie Coogan is not only one of the greatest juvenile movie actors, but that he is also a keen Meccano boy and I know that many of you will prize the excellent picture of him that appears on our cover this month. I wish you could all meet Jackie in person and have a chat with him, as I have done, but unfortunately that is not possible. On the next page commences Mr. Hornby's interesting account of Jackie's visit to him at the Meccano factory and I am sure this will help you all to know Jackie better and to understand the sterling qualities that have made for his success—his strong character, fine imagination and keen sense of observation—qualities that Meccano helps to develop in all boys.

More Mechanisms

On pages 8 and 20 are illustrated and described four more examples of standard movements in Meccano. These are taken from the new book to be published early in 1926, and which will be called "Meccano Standard Mechanisms." As announced in the September "M.M.", 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. The book will be especially valuable to the boy who invents his own models. We hope to announce the publication date in the February "M.M." Watch for it.

The "M.M." for 1926

Our next issue will be out on February 1st and, commencing with that number, the size of the Magazine will be increased to 16 pages. This is just twice the size of the "M.M." of a year ago and I am sure we are all proud of the growth of our Magazine. We have in preparation some excellent new features and there will be splendid new models, interesting articles and puzzling competitions. Any boy who does not get every single issue is going to miss some splendid reading. For the present there will be no increase in price but as we shall print only enough copies to fill our orders, we urge every reader to make sure of his by subscribing in advance.

“When Jackie Coogan Visited Me”

By FRANK HORNBY, *Inventor of Meccano*

MOST of us, I suppose, enjoy going to the Movies and I must confess that this is one of my favorite forms of recreation. The films I like best are those that deal with children and their doings, and I suppose that is quite natural, as most of my life has been spent in caring for boys and studying and providing for their well-being and enjoyment.

Once or twice during the last few years I have experienced the very pleasant surprise of discovering in some little domestic scene depicted on the screen, a boy or a number of boys playing with Meccano models. When this has happened I have felt an almost irresistible and, of course, ridiculous desire to step around to the back of the stage and have a little talk with them.

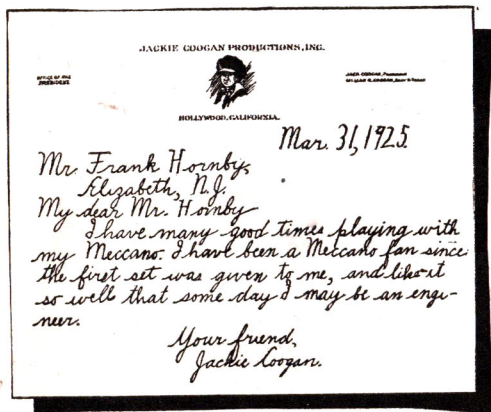
The films that have given me a very real and genuine pleasure are those that depict that wonderful genius Jackie Coogan, going through all manner of extraordinary experiences in that daring, clever, and lovable way with which we are familiar. The first picture that I saw him in was “The Kid,” and I remember wondering at that time if he had ever heard of Meccano and if he enjoyed playing with it like all other millions of boys do. I decided that no doubt he had had so busy a life thrust upon him that he would not have much time for any form of recreation and that his companions would be much older people who would have no sympathy with regular boyish pursuits. I remember thinking what a pity it was that we could not get hold of him and pitch him in among a bunch of boys of his own age and give him a great time playing Meccano and trains and baseball and fishing.

I have seen Jackie Coogan on the screen a number of times since then and each time the same thoughts have run through my head, so you can imagine the keen pleasure I experienced when, one day early this year, I received a very kindly and appreciative letter from Jackie’s father telling me how much his son



“The Kid” himself!

enjoyed playing with Meccano. I wrote back to Mr. Coogan at once telling him how glad I was to receive his letter and telling him also of the great interest with which I had followed the work of his clever son. Very shortly he sent me another letter telling me more about the fine models that Jackie had made. He also gave me full permission to reproduce his first letter and to tell all the other Meccano boys that Jackie was one of them. Better still came a letter from Jackie



Here is the letter that Jackie sent me.

himself, which I am printing here, and I am sure Jackie will be very proud to see his letter reproduced in the "M.M."

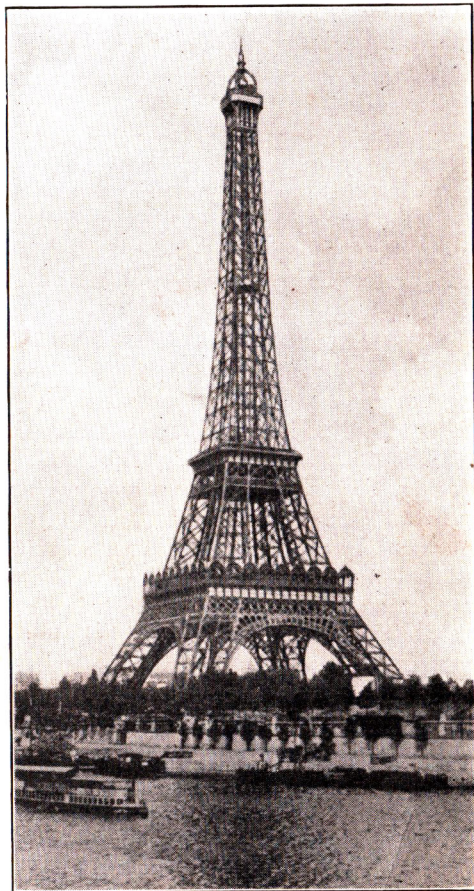
Jackie Wants to be an Engineer

Like all other keen Meccano boys Jackie just naturally wants to become an engineer. That is one of his wishes that I hope will not be gratified, because, although we might discover in him a great engineer, we should certainly lose one of the most lovable laughter-makers the world has ever known.

In one of his letters Jackie expressed the hope that some day, in some part of the world, we might meet, because there were a lot of things concerning Meccano that he wanted to ask me about. Whilst I entertained the same wish perhaps even more keenly than Jackie himself, I thought it very unlikely that he and I would ever be within a thousand miles of each other. It came as a great surprise to me therefore, to receive a letter about a month later to say that Jackie was in New York and that he wanted to come over to Elizabeth to inspect the Meccano Factory with me, if it could be managed.

It did not take long to fix up arrangements and within a day or two I had the pleasure

of welcoming both Jackie and his father at my office. Jackie got to work at once with his questions, and I soon realized that there was very little I could tell him about Meccano models or Meccano parts and their uses. He was thoroughly familiar with them all and could intelligently discuss the construction of an Auto Chassis, the Meccano Loom, the Clock, and he could tell me the functions of various cranes and discuss the details with me. What I liked best about him, though, was his fine imagination. He told me he had been to Paris and that when he saw the Eiffel Tower he felt sure it had been designed from Meccano. He said he had a notion that he could build an exact model of the Eiffel Tower



The Eiffel Tower in Paris

himself every bit as big, if only he had enough parts and enough time, and then he added
(Continued on page 15)



III. How Cast Iron is Made

SO far we have followed the ore from the mines of the Northwest Great Lakes Region to the docks, learned of the special type of ore-carrying boats used to bring it to the Lower Lakes ports, and then into the mighty blast furnaces where coke, limestone, and the air at high temperature combine to flux off the impurities and we can tap a ladle full of iron.

If this iron is to be further refined into steel, it may be sent to the steel works while still in a molten condition and thus save the fuel required to re-melt it. However, if we are to ship it any great distance, as to a

phorus and sulphur. The amount of each of these substances that is in the iron has a great effect on the hardness, strength and brittleness

The huge ladles that carry the molten metal to the steel mills



Photo courtesy American Steel & Wire Co.

foundry or puddling mill, it is poured while hot into small holes in the big sand floor of a building. After cooling, it is in the shape that is known as a "pig."

These "pigs" are then shipped in open hopper cars to the mill or foundry where they are to be further refined. The metal in these pigs cannot be used for machinery parts of automobiles or other mechanisms that have to take sudden loads and shocks, for it is not uniform, that is, the iron has in it such impurities as silicon, carbon, manganese, phos-

phorus and sulphur. The amount of each of these substances that is in the iron has a great effect on the hardness, strength and brittleness

of the metal, and while these same substances are always found in iron as we see it being used, the amount is closely controlled so that we get an iron or steel whose physical characteristics are what we want.

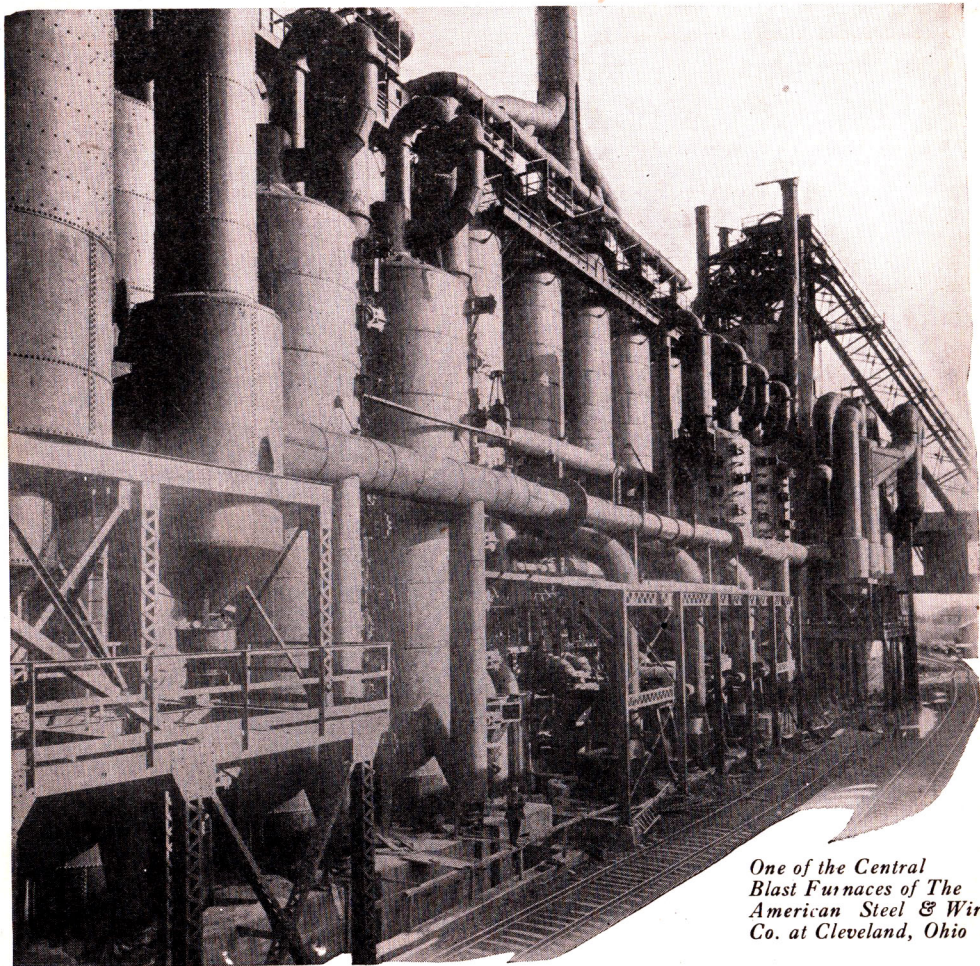
This "pig iron" or "direct metal," as it is often called, is only suitable for such castings as bases of "safety zone" standards used in our streets, counterweights for lift bridges, sash weights, and such things where they do not have to possess any great strength or toughness.

In a foundry this pig iron, together with scrap iron (pieces of broken or worn out machines that the rag peddler collects from our homes) is melted in a furnace called a cupola and poured into a sand mould of the same shape as the casting is to take.

In its appearance and method of melting and refining, a cupola is similar to a blast furnace but it is very much smaller in size. We see the cylindrical steel shell lined with

(slag, etc.) remaining in the cupola is dumped out each night.

When starting up a cupola, a bed of shavings and kindling wood is placed on the bottom, followed by heavier wood, then small sized coke, and finally the regular sized fuel. The tuyere doors are opened, the shavings lighted, and after the coke fuel is well started, the tuyere doors are closed and regular charging is begun.



One of the Central Blast Furnaces of The American Steel & Wire Co. at Cleveland, Ohio

fire brick, an iron notch near the bottom, sometimes a slag notch, tuyeres for introducing the air, and usually an open top where the pig iron, scrap, coke, and limestone are dumped in. The cupola is set up on four or more cast iron columns a few feet above the floor level, and the bottom plate is hinged so that it can be swung down; any material

The charge consists of a layer of pig iron and scrap carefully and evenly placed, then a layer of coke, then another layer of iron and scrap, and so on until the stack is filled. Quite often limestone (for a flux) is added, usually about one-half to one and one-half percent. of the weight of the iron and scrap. This is put on top of each layer of iron. (*Cont'd p. 9*)

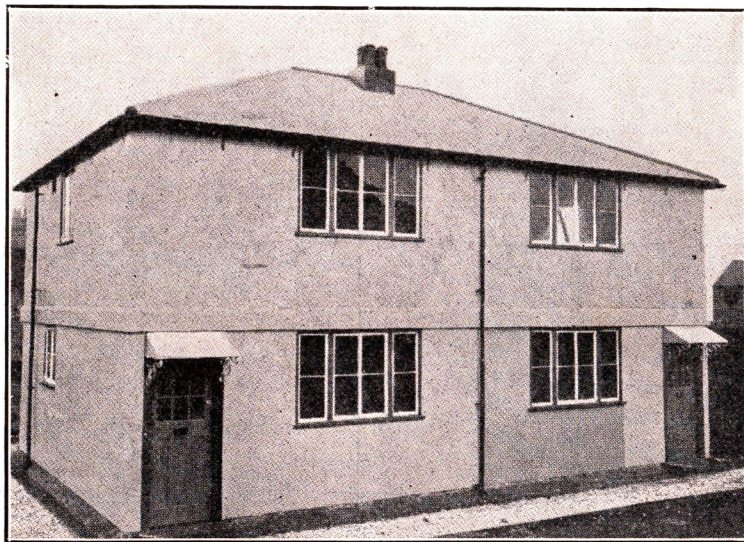
Houses Built on the Meccano Idea

Meccano has been the inspiration for a great many inventions, and now comes a new one, the most remarkable of all—houses of steel built on the Meccano principle. The article on this page is reprinted from the "Westminster (England) Gazette."

HOUSES put together like a Meccano set enabling father and son to bring their happy experience of playtime to the making of a permanent home are the very latest invention.

Perhaps the new demand for steel houses was bound to bring this development about in time, but an eminent engineer, Mr. J. C.

This astonishing Telford patent provides for an all-steel house which a youth, who has played with a good set of Meccano, can construct. In the course of a few hours father and son working together, and getting great fun out of the job, can put together a complete and commodious villa to house permanently the entire family. It is actually the



The Telford All-steel "Meccano" House

Telford, O.B.E., has been the first to apply the Meccano idea to the solution of the housing problem. He has been so successful in the attempt that Birmingham, which had refused to have anything to do with steel houses, has placed an order for three pairs of experimental villas, and other corporations have followed this lead.

Much is being written about steel houses, but as a fact few of the structures under discussion are really steel bungalows. They are steel and cardboard, or steel and wood, or steel and concrete, and nearly all require a certain amount of expert labor in construction.

first real revolution to home-making since the housing problem became acute.

There is no skilled labor required from beginning to end, and another of the advantages is that there are no wet materials employed that have to be dried out before the new home can be occupied. When pater and Johnny have done their job of work and play, the house that Johnny built is immediately available for residence.

Mr. Telford explained his momentous invention to a correspondent in an interview, and particularly stressed the fact that the whole fabric is made on the fascinating Meccano principle. *(Continued on page 18)*

Four More Examples of STANDARD MECHANISMS Made with Meccano

Screw-operated Jib-raising Gear

This detail illustrates a method by which Screw Gear may be employed in elevating the jib of a heavy crane, or similar work, and incidentally forms a very fine model of the type of gear used in the majority of the world's largest cranes.

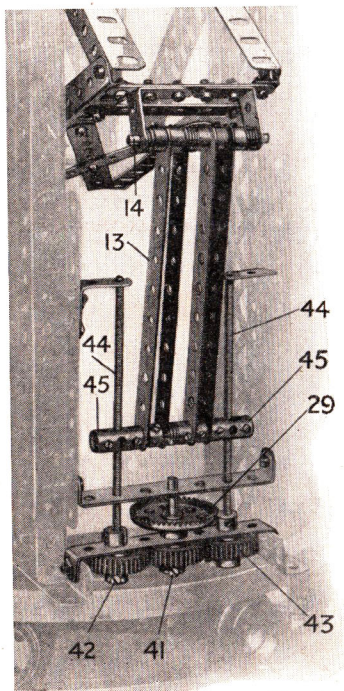


Fig. 1

The drive is led by way of the $1\frac{1}{2}$ " Contrate wheel (29) and 1" Gear Wheel (41) secured to a Short Rod (42) to further 1" Gear Wheels (42 and 43) carried on the vertical Threaded Rods (44). The latter engage the threaded borings of two Couplings (45), and as they rotate these Couplings are forced slowly up or down. The Links (13), pivotally attached at their lower ends to a Rod secured between

the Couplings (45) and at their upper ends to a Rod (14), transmit this movement to levers which in turn are pivotally attached to the jib of the crane. The jib is therefore raised or lowered in consequence of the movement of the Couplings (45).

Screw Adjustment

The Meccano Threaded Rod is employed in this example as a device for adjusting the table of a drilling or boring machine, etc. The Table (1) is bolted to a Threaded Crank (2), the boss of which engages the

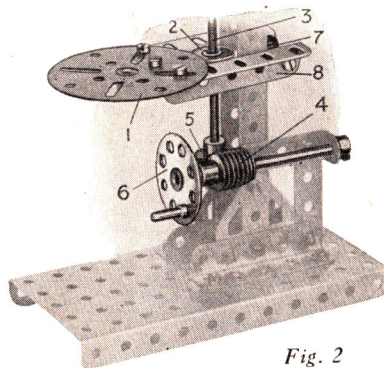


Fig. 2

vertical Threaded Rod (3). The latter carries a Pinion (5), which gears with the Worm Wheel (4) on the shaft of the Hand-wheel (6). $2\frac{1}{2}$ " Angle Girders (8) bolted to the Table and connected by a Double Bracket (7) slide upon the Vertical Girders, and form guides to hold the Table in position.

The Table is raised or lowered according to the direction of rotation of the Hand-wheel.

Note:—Where a Threaded Rod is required to rotate in bearings, it should be first connected by Couplings to ordinary Axle Rods, if possible, so that the latter may be journalled in the bearings instead of the Threaded Rod; it will be found that this results in better and smoother working. (Continued on page 20)

The Story of Iron and Steel

(Continued from page 6)

The nature of the materials charged into the cupola has a strong effect on the character of the iron tapped out. A good melter can tell, by the looks of a broken piece of pig iron, just about what it contains in elements. Hence different grades of pig iron are mixed in proper proportion with the grades of scrap iron, so that the iron is suitable for the castings to be made.

About fifteen to twenty minutes after the air blast is turned into the tuyeres, the iron will start to melt and trickle down through the cupola to the bottom or crucible zone. If the metal is allowed to run out of the spout continuously, this zone of molten iron will be very short, but by stopping the flow of iron out of the iron notch, the iron inside will collect and fill the space between the bottom of the cupola and tuyere. A slag may be formed in the process due to impurities in the iron and scrap, dirt, sand, ash in the coke, etc., together with limestone. This will collect on top of the iron in the bottom and can be tapped out through a slag or cinder notch from time to time as it forms.

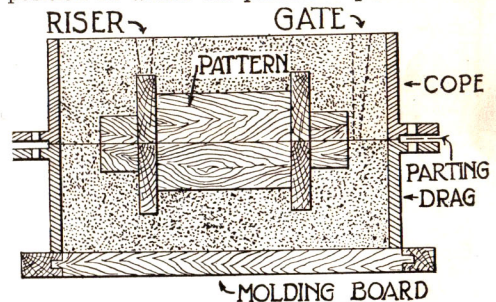
The chemical changes that take place in a cupola are for the most part incidental to the process. The iron may pick up sulphur from the fuel as it trickles down through the incandescent coke. It may also be oxidized by the excess of air. The limestone is decomposed as in a blast furnace and may absorb some sulphur from the iron, the oxides of iron, any rusty iron, and, of course, the ash from the coke.

How Castings are Made

The iron formed in the cupola is tapped out into ladles. Sometimes a large quantity, several tons or more, is tapped into a ladle swung on a crane so that it can be transported conveniently about the foundry floor. If small castings are to be made, that is, pieces from one-quarter pound up to forty or fifty pounds, small ladles are filled and poured by a man, as you see in the illustration. This is hard work; the weight of the iron, its high heat, often two thousand degrees or more, and the necessity of moving fast from the big ladle to the mould so that no heat will be lost, combine to make a job that is extremely difficult, especially in warm-weather.

For making an iron casting, it is necessary first to have a wooden pattern which must be exactly the same size and shape as the desired casting. This is then placed in a mould, which consists of a board called the "moulding board" on which rests a box with only four sides. This box is split in two along the

line called a "parting line." The wooden pattern is embedded in sand closely packed in each half of the mould. The illustration below shows the various parts of the mould and the position in which the pattern is placed. The



pattern is also split in two, and may be removed when the box is opened by lifting the "cope," or upper section.

Preparing the Mould

When the pattern is taken out, we have exactly the same shaped hole in the sand as the outline of the pattern formed. The moulder puts two holes through the cope down to a groove in the parting so that the hot iron can be poured in after the pattern has been removed and the cope replaced on top of the drag. The second hole, called the "riser" allows the air to escape as the iron fills the mould.



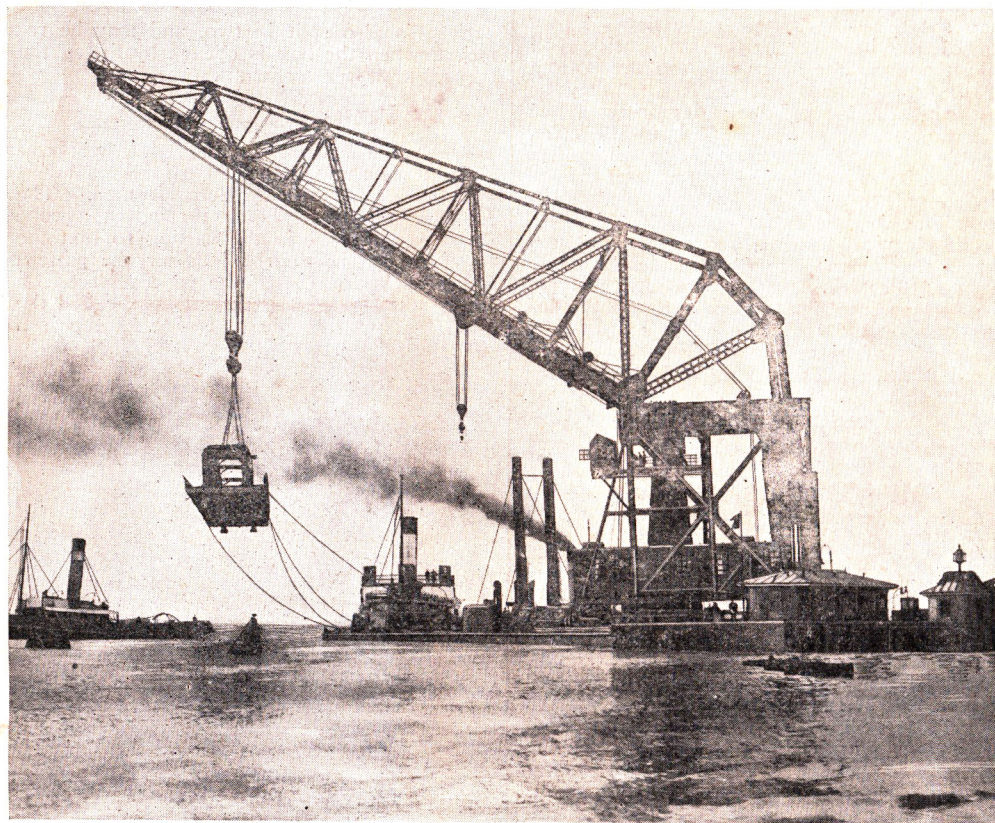
Pouring a casting

Of course all castings are not as simple as the one shown—sometimes they must be hollow or have large holes through them. This
(Continued on page 21)

A Monster Floating Crane "The Mammoth"

DURING recent years there have been constructed a number of huge cranes mounted on pontoons or barges, and which are capable of proceeding under their own power to their fields of operations.

wide. The crane-arm is so placed that the maximum reach may be obtained either over the side or over the stem of the vessel. Thus the crane is able to handle loads in narrow entrances or in restricted places.



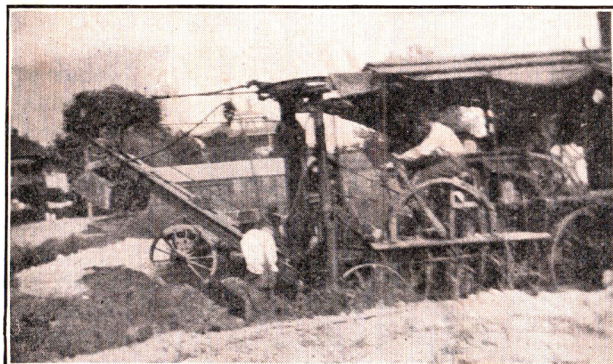
Among the giants of this class is the one illustrated above, and which is known as "The Mammoth." It is owned by the Mersey Docks and Harbour Board in England, to whom we are indebted for our photograph.

"The Mammoth" is of the dericking-jib type and is capable of handling loads up to 200 tons. The huge crane is carried on a self-propelled pontoon, 154 feet long and 88½ feet

A tower 66 feet high forms the framework, upon which the jib is connected at the front by two pins, and two links connect it to a movable counterweight situated between the platforms at the rear. This weight is operated by vertical worm shafts, the rotation of which raises the counterweight, thus lowering the jib, and vice versa.

(Continued on page 20)

Prize Winners in Our Photographic Contest

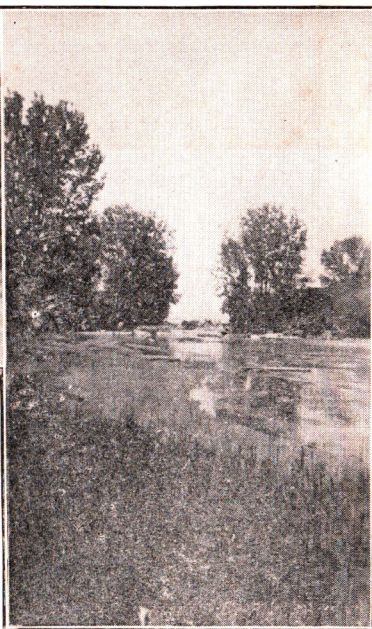


Our First Photographic Contest closed on September 30th, and a number of good entries were received. The prize (a No. 2 Clockwork Motor) for the best photograph in the section devoted to machinery, etc., was awarded to

J. G. Baker, 3920 W. Chestnut St., Louisville, Ky.
for the picture of the steam-shovel illustrated above.

In the section devoted to landscapes,

D. F. Mulvihill, 6809 Indiana Ave., Chicago, Ill.
was awarded the prize (an Electrical Outfit) for the view at the right.



For our New Readers

Those of our readers who are interested in photography and who have not seen previous issues of the Meccano Magazine, will find in the May and July issues an article which describes the construction of a Meccano model by means of which birds are made to take their own photographs. A few copies of these issues are still available and will be supplied at the regular price of 5c. each.

A New Limerick Contest

We have now had three contests for supplying the last lines to limericks. Now we want our readers to try their skill at composing *complete* limericks. Instead of furnishing only the last line, it is necessary to make up and send in complete five-line limericks. Those having Meccano as their subject will be given preference over those of a general nature. The limerick in the next column will serve as an example.

The Prizes will be as follows:

First Prize:

Meccano Goods to the value of \$5.00

Second Prize:

Meccano Goods to the value of \$3.00

Any reader may enter—there are no fees or restrictions. Each entry should bear the

Awards in the Third Limerick Contest

The Third Meccano Limerick Contest brought in a flood of replies and the judges have decided to award the first prize—a No. 2 Clockwork motor—to

Richard N. Wimpless, Hohokus, N. J.

The Completed Limerick, with the prize winning last line, is as follows:—

*Bob Smith and Jim Jones are two boys
Who possess a great number of toys
But above all the rest
Stands the one they like best
Meccano, which doubles their joys.*

The Second Prize—a No. 1 Meccano Outfit, was awarded to

Raymond Meines, Washington, D. C.

for this line which he submitted:—

Meccano! The greatest of toys.

We congratulate the winners on their success and urge them, as well as all the unsuccessful contestants, to enter the new Limerick Contest announced on this page.

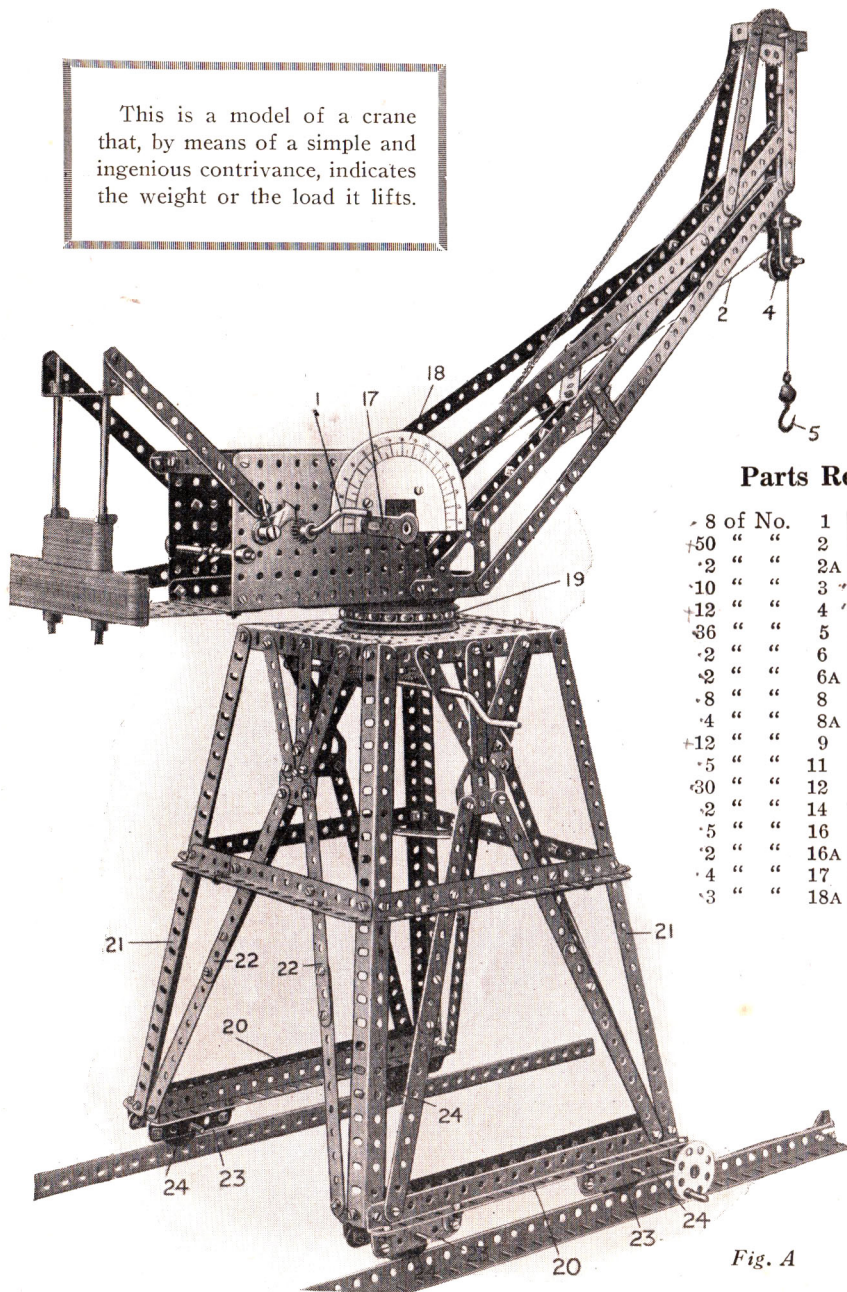
contestant's name, address and age, and should be sent to Contest Editor, Meccano Magazine, Elizabeth, N. J. The Contest closes on February 15th, 1926.

A Crane That W

This is a model of a crane that, by means of a simple and ingenious contrivance, indicates the weight or the load it lifts.

This is a sim
our illustration
details. The p
rails built up f
extended to an

The wheel
mounted in bea
to the girders (
Wheels is con
operation of w
model along th
nected at the



Parts Required

8 of No.	1	2 of No.	19
+50 "	2	12 "	19B
2 "	2A	4 "	20
10 "	3	4 "	22
12 "	4	2 "	22A
36 "	5	1 "	24
2 "	6	1 "	25
2 "	6A	2 "	26
8 "	8	1 "	27
4 "	8A	2 "	27A
+12 "	9	1 "	32
5 "	11	1 "	33
30 "	12	9 "	35
2 "	14	198 "	37
5 "	16	7 "	38
2 "	16A	1 "	40
4 "	17	1 "	43
3 "	18A	1 "	46
		4 "	48A
		3 "	52
		2 "	52A
		1 "	57B
		15 "	59
		+3 "	62
		2 "	63
		1 "	70
		2 "	77
		27 "	94
		1 "	95A
		1 "	96
		2 "	108
		2 "	115
		21 "	117
		3 "	125
		4 "	126A
		+1 "	137

Fig. A

+ NOT ENOUGH
• ENOUGH
! NOT SURE

Weighs As It Lifts

simple and very interesting model to build, and shows very clearly most of the constructional pedestal upon which it is mounted runs upon four Angle Girders, which, of course, may be of any desired length.

Constructing the Model

The base consists of four Flanged Wheels (24), Springs (23) formed from $2\frac{1}{2}$ " Strips connected (20) by Angle Brackets. One of these Flanged Wheels is connected by gears to a handwheel (Fig. C), the which imparts the traversing movement to the rails. The upright columns (21) are supported by $5\frac{1}{2}$ " Girders, and at the wheel base, where they are slightly splayed-out, by $9\frac{1}{2}$ " Girders. The construction of the strengthening struts is clearly shown.

The crane rotates on ball bearings (19) carried on an upper platform consisting of two $5\frac{1}{2}$ " Flanged Plates, bolted between the upper $5\frac{1}{2}$ " Angle Girders.

The lower fixed race of the ball bearings is formed by bolting a Wheel Flange and 3" Pulley Wheel to the platform, and in the channel thus formed the Meccano Steel Balls are inserted. A further 3" Pulley Wheel is bolted to the under-side of the crane, and an Axle Rod secured in this wheel passes freely through the 3" Pulley fixed to the platform.

A 57-toothed Gear Wheel carried on this Rod is engaged by a Worm Wheel mounted on the Crank Handle seen just below the platform in the large illustration.

The Load Indicator

The load is raised or lowered by the operation of the Crank Handle (1), upon which is wound a lifting cord (2, Fig. B), passing round a 1" Pulley (3) and over another 1" Pulley (4) at the jib head (Fig. D, page 23) to the loaded Hook (5).

This Pulley (4) is mounted in two Cranks (6) carried by means of a Coupling from the $3\frac{1}{2}$ " Rod (7) which is slideable in two Double Brackets (8).

A Sprocket Chain (9) is connected to a Collar mounted on the Rod (7) and passing round a $1\frac{1}{2}$ " Sprocket Wheel (10) and under the 1" Sprocket Wheel (11, Fig. B), is connected to a Spring (12) secured to a $3\frac{1}{2}$ " Rod (13). (Continued on page 19)

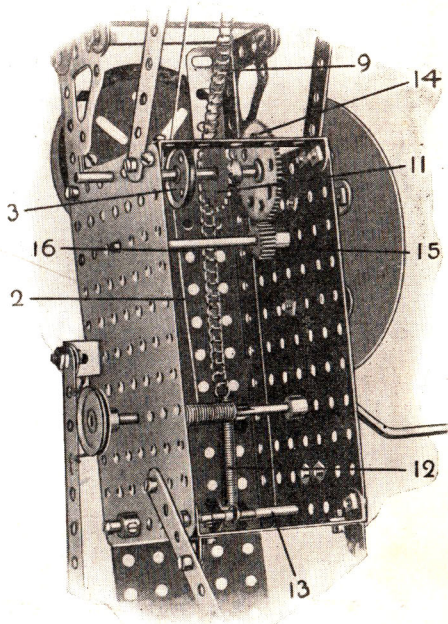


Fig. B

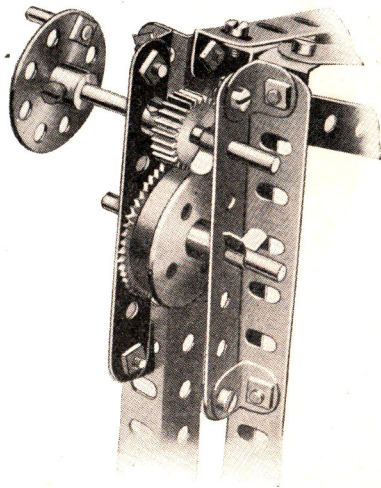


Fig. C

Meccano Helps Army Engineers

From time to time Meccano has played important roles. How scale models built with Meccano were used to obtain the War Department's authority to construct bridges is the interesting story that follows.

TO those who are not familiar with the metropolitan district of New York it will probably be a surprise to learn that Staten Island—a part of New York City proper—is nearer to the New Jersey coast than it is to the remainder of New York City. A channel that is only 700 feet wide separates it from Elizabeth and nearby New Jersey cities, whereas it is about a mile across the harbor to the nearest point in New York.

Of course pedestrians and autoists both in Staten Island and the bordering towns and cities of New Jersey are in favor of these two bridges as they will materially reduce the delay and inconvenience in crossing the "Arthur Kill" as the channel is called. But considerable opposition has arisen from shipping and towboat men who objected to the bridges because some of the piers would be placed in the channel and might prove to be

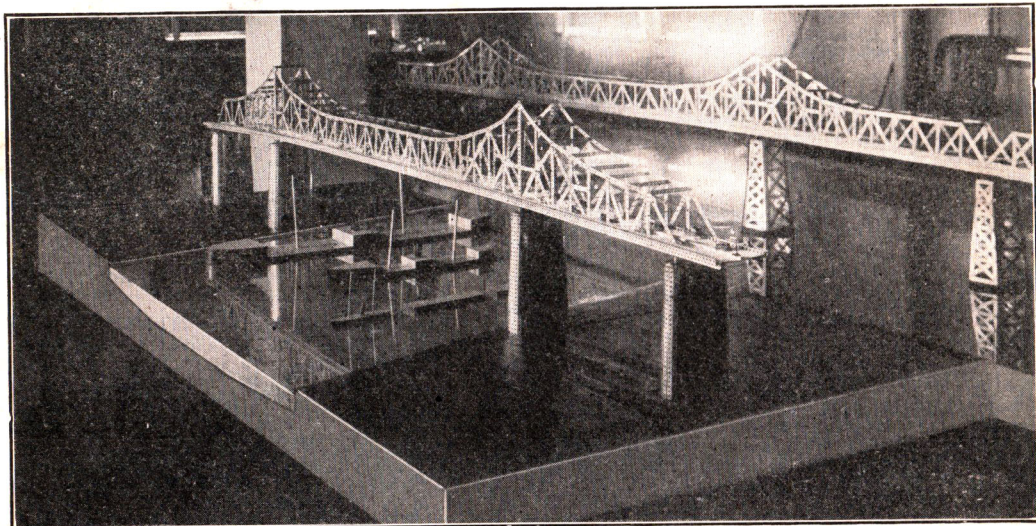


Photo courtesy of the Udel Studios

Access from the Island to New Jersey is by means of two ferry boat lines. The traffic has increased so much within the past few years that the ferry boats are quite unable to cope with it without long delays.

Realizing that better means of carrying the traffic across the channel are necessary, the Port of New York Authority—a Board of Engineers appointed to study Greater New York's traffic problems and to devise solutions for them—has recommended that two bridges be built across this narrow strait. Their plans call for "high-level" bridges so that any vessel can pass under them. One of these bridges is to be at Elizabeth and the other at Perth Amboy.

obstructions to shipping traffic. The cost of constructing bridges which would entirely span the waterway without any piers in the water would be far greater than that of the proposed bridges, and could not be financed.

The U. S. War Department has control over all water ways and their sanction must be obtained before a bridge can be erected over any navigable water. Before making a decision the War Department must carefully consider the whole matter, and accordingly a hearing was arranged in order to give both those in favor of the bridge plans and those against them the opportunity to state their views before the War Department Engineers.

(Continued on page 21)

"When Jackie Visited Me"

(Continued from page 4)

"Wouldn't it be fine if Meccano boys could run it and operate the elevators, and let all the other Meccano boys who came, examine the machinery and explain it all to them."

"And what would your part in the matter be, Jackie," I asked. "Oh!" he replied, "I would be an elevator boy and would say 'Step right in; this is free day to Meccano boys; and it's all quite safe, everything's made of Meccano.'"

I could tell by the look of pleasure on Mr. Coogan's face, that while the idea amused him, he was proud of his boy's intelligence. "Jackie has been drumming this kind of stuff into me ever since he came back from Europe," he said. "Everyone in Hollywood knows of Jackie's keenness on building Meccano models. He has asked our art director next time they need a miniature bridge to use Meccano to make it. The art director tells me that many of his suggestions are on really practical lines, and he will be able to make use of a number of them."

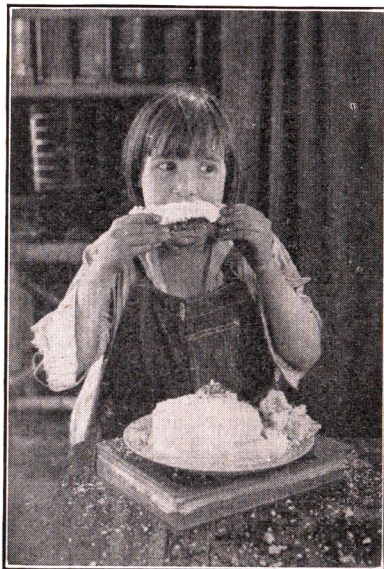
"Jackie has read somewhere that many architects and builders use Meccano parts for modelling out their structures in the first place, and that a big firm of makers of giant cranes build up special models of anything new they may be designing, with Meccano parts, and so try out the movements and mechanism first in this way; and he sees no reason why we in our business should not make similar good use of Meccano. He is especially keen on a plan for making slow-motion pictures of a boy building models with Meccano in order to show other boys how easy and delightful the work is. Don't you think, Mr. Hornby, that something like that would be useful?"

I, of course, agreed that the suggestion was a good one and that it might be worth planning out something of the kind. I was especially pleased to see that Jackie was so familiar with the many commercial uses to which Meccano has been applied.

All the while his father was speaking there was a grave expression on Jackie's face as he looked at us glancing from one to the other, that showed he was anxious that his ideas should be taken very seriously. The long talk that we had together gave me all the clues I needed to his strong character and showed me plainly enough why his personality and genius have impressed themselves in so marked a fashion on his audiences all over the world.

How Jackie Got His Start

I expressed the wish to know something of his short and wonderful career, and his father told me, with a twinkle in his eye, that his first appearance in a theatre was when he was twenty months old. Mr. Coogan himself was on the stage at the time, when he noticed that



"Coconut Cake, yum, yum!"

the audience was laughing, applauding something at the back of him. He looked round and beheld Jackie toddling towards him. It appears that his mother had taken Jackie to the theatre that day and as he was standing in the wings he evidently felt that he would like to have a talk with his father, so he walked out to him. Mr. Coogan made the best of the situation, introduced his son to the laughing audience, and set him doing some of the dance steps which he had learned at home.

He Meets Charlie Chaplin

At the age of four he appeared on the stage with Annie Kellerman and it was while he was doing some of his dance steps in this performance that he attracted the attention of Charlie Chaplin. Chaplin recognized in him the boy whom he had sought for years. The history of the production of "The Kid" is no doubt common knowledge all over the world but I was very interested to have this

and much other information regarding Jackie's career first hand.

Jackie Arrives at the Meccano Factory

We went through the Meccano factory and Jackie revelled in all that he saw. The giant power presses, noisily blanking out Rectangular and Sector Plates, filled him with wonder, and he was fascinated by the working of the safety guards with which they are all

confess that to this day these wonderful machines fascinate me.

The drilling and tapping machines proved to be hardly less interesting and even the machines that assemble the set screws into the wheels so rapidly were not overlooked.

Jackie Does Some Nickel Plating

In the Nickel Plating Department Jackie felt like a little chemist and he plated a complete batch of work himself. He was handed a rack of parts ready for plating and, having



The Meccano Factory at Elizabeth, N. J.

equipped. These guards are to prevent accidents to the operators of the presses and are so arranged that they automatically push the operator's hands out of danger as the ram of the press descends.

The Wonderful Screw Machines

From the presses we turned to the Automatic Department, and here the steady hum of the screw machines was in marked contrast to the clanking of the presses. Jackie marvelled at the automatic screw machines. To see a brass rod fed into the machine at one end and a completely fashioned worm wheel drop out at the other end every few seconds, seemed like a bit of magic, and I assured him that many people much older than he were just as much mystified. For myself, I must

immersed them in the hot cleaning vat, which not only removes dirt but adds a deposit of copper before the parts are plated with nickel, he exclaimed with glee at the quick change in the appearance of the parts. When he immersed them they were a dull steel color; when he took them out they had a bright copper tint. Then he put the rack of parts in the nickel bath, rinsed them afterwards, dried them in heated sawdust, and with a roguish smile, turned to me and said, "That's easy, isn't it."

Jackie would have liked to linger a while in each department but time was pressing and we were able to make only a brief visit to the Packing Department. Like all other visitors to our factory, Mr. Coogan and Jackie were amazed at the precision and accuracy with which each little part of the Meccano system is produced. (Continued on page 19)

MECCANO

REAL ENGINEERING FOR BOYS

Meccano Means A Happy Christmas

There can be no surer guarantee of a happy Christmas than a gift of a Meccano Outfit. It will give endless pleasure to a boy not only on Christmas day but on every day throughout the year. There is an Outfit to suit every purse—from \$1.00 to \$45.00, and we illustrate at the right a very attractive one—the No. 2x Outfit, at \$8.50.

For the boy who already has Meccano, give him an Accessory Outfit that will convert the set he has into the next higher size. Add "A" to the number of whatever set he owns to determine which is the proper Accessory Outfit to give him. Thus, if he has a No. 2, give him a No. 2A; if he has a No. 3, give him a No. 3A, etc.

Make This A Meccano Christmas

Meccano Prices

No. 00 Outfit.....\$1.00	No. 3 Outfit....\$ 9.00
No. 0 " " " " 2.00	No. 3x* " " " 11.50
No. 1 " " " " 3.00	No. 4* " " " 15.00
No. 1x* " " " " 5.00	No. 5* " " " 25.00
No. 2 " " " " 6.00	No. 6* " " " 45.00
No. 2x* " " " " 8.50	* Has electric motor.

Accessory Outfits

No. 0A makes a No. 0 into a No. 1.....\$1.25
No. 1A " " " 1 " " " 2..... 3.00
No. 2A " " " 2 " " " 3..... 3.00
No. 3A* " " " 3 " " " 4..... 6.00
No. 4A† " " " 4 " " " 5..... 7.50
No. 5A " " " 5 " " " 6.....20.00

* Except motor. † Except transformer.

Meccano is for sale at most toy and hardware stores. Sent prepaid on receipt of price if not at your dealers.



The No. 2x Meccano Outfit

Contains a great assortment of parts and powerful electric motor. Builds hundreds of fine models. Manual included. No. 2x Outfit, complete....\$8.50

A Meccano Hydraulic Crane



Houses Built on the Meccano Idea

(Continued from page 7)

"Each house consists of a living-room, kitchen, bathroom, pantry, and cupboard on the ground floor," he said, "with three good bedrooms above. Everything possible is made of steel, even to the staircase and every component part is made on the mass-production principle and has only to be fixed in place by bolts exactly as the boy makes his wonderful bridges and cranes in the playroom. Even pipes for water, gas, or electricity are already fixed on the steel plates and have only to be joined by a screw union.

The Houses have Hollow Walls

"The houses are made with a six-inch cavity wall, which is in contact with the roof and also the exterior of the chimney flues. The latter are made of cast-iron pipes, and any heat transmitted by the chimney is transmitted round the house by virtue of the contact of these flue pipes."

The whole structure is made of pressed steel plates, and no stanchions are required, as the plates are pressed in the form of a box and bolted together by the turned-in flanges. It is the simple Meccano idea all through.

Bay Windows can be Fitted

This being so, it is possible for each amateur or professional assembler to add bay windows or turrets or any other fanciful features his taste may direct. He may also exercise personal judgment in treating the interiors, and the happy use of such durable and adaptable material as wall board will give a strong, non-conducting, and artistic alternative lining. The commonly heard objection to steel houses that they must have a monotonous uniformity is therefore removed.

A confidential report from the Ministry of Health indicates that these Meccano villas are likely to be regarded with warm approval. Municipalities desiring to erect sample houses for demonstration purposes will be granted a subsidy by the Ministry so that these novel Meccano houses may be accepted as one of the approved solutions of the housing problem.

A Grand Model-building Contest

In response to many requests we are going to have another grand Model-building Contest. Full particulars will be announced in the next issue.

Watch for the February "M.M."

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.

Carl W. Beese, Hamilton, Ont.—Your letter of praise, "with perhaps a word of criticism" of the "M.M." was read with great pleasure. We admire your enthusiasm in wanting the "M.M." restricted solely to Meccano news and Meccano models, but we think that on the whole it is strengthened by being edited on broad lines. * * *

Mrs. C. M. Dravis, Los Angeles, Calif.—writes, "My boys will be heartbroken if they do not receive the big Christmas number of the magazine, about which they have been talking so much." Thank you for your interest, Mrs. Dravis—we hope your boys' anxiety has now been relieved and that they are pleased with our efforts. * * *

Winslow Stuart, St. Petersburg, Fla.—Glad you liked the Seaplane story, Winslow, and the article on the most powerful locomotive. There are more stories just as interesting to be published in future issues. Your friend George had better subscribe at once if he does not want to miss them. * * *

John Intiso, Bronx, N. Y.—My goodness, John, you certainly must think a great deal of the "M.M." to call it "wonderful." The Editor can hardly conceal a blush of pride at such praise—and he is doing all he can to make it even more "wonderful" in future. * * *

William Meyer, Gross Point, Ill.—William clipped a picture of Jackie Coogan playing with Meccano from one of the big Meccano advertisements in a magazine and mounted it on cardboard. Good idea, William; I wonder if any other boys thought of this? * * *

Sidney Olhousen, Galveston, Texas.—Has had two Meccano outfits for two years and has built scores and scores of models with them. In all this time he has lost only one part—a ½" pulley wheel. Can anyone beat this record?

"When Jackie Visited Me"

(Continued from page 16)

As we passed through the Printing Department, we stopped to watch the automatic presses at work. An issue of the Meccano Magazine was just being finished, and a copy was handed to Jackie and his father. Jackie has been a steady reader of the "M.M." for some time, and he told me he would not be without it.

Jackie was a little surprised to learn we have other factories besides the one in Elizabeth and that Meccano is manufactured in

A Crane that Weighs

(Continued from page 13)

Thus, when a load is being raised, the increased tension on the Hoisting Cord (2) tends to pull down the Pulley (4); the movement consequently imparted to the Chain (9) extends the Spring (12) and in doing so rotates the Sprocket Wheel (11).

The movement of this Sprocket Wheel is magnified to one three times as great by means of the 57-toothed Gear Wheel (14) and the 19-toothed Pinion (15). On the same Rod as the latter a Crank (17) is secured, which



Jackie and his pal reading the Meccano Magazine

Liverpool, England, where 1,000 people are employed by the firm, and that there is another large factory in Paris. On his next trip to Europe he intends visiting both of these factories, and as we said goodbye, he told me that, although he had met kings and princes, had been entertained as no visiting potentate is entertained, had had gifts of all kinds lavished upon him, his greatest thrill had come to him on his visit to the Meccano factory.

Frank Hornby

sweeps round the graduated dial (18), so registering the movements of the Chain (9).

The dial may be quite easily constructed by cutting out a semi-circular piece of cardboard and marking it in suitable degrees in order to indicate the weight of the load that is being lifted.

In the first place, with a view to ascertaining the correct position for the graduated divisions on the dial, a few experiments should be carried out with some known weights, and the respective positions of the pointer in re-

(Continued on page 23)

Meccano Standard Mechanisms

(Continued from page 8)

Roller Bearings

Where a heavy mass is to be rotated about an axis, it is necessary to devise some method of relieving the tremendous strain that would be imposed upon that axis. The usual procedure is to distribute the weight of the mass over wheels or rollers arranged at a distance from and rotating around the center pivot. The illustration shown in Figure 3 is an excellent example of the type of roller or wheel

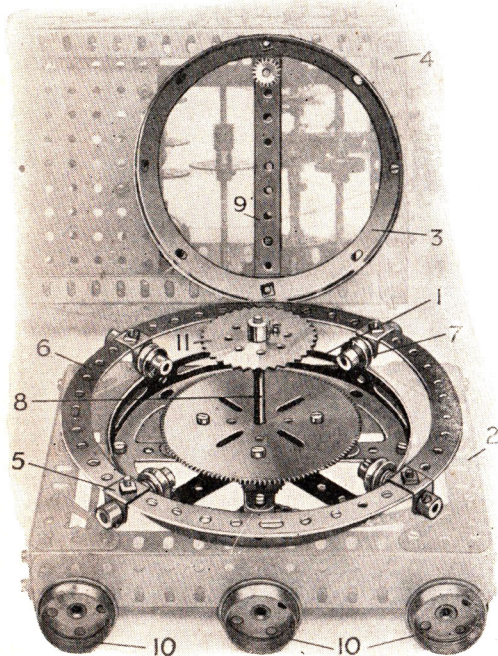


Fig 3

bearings frequently used for the rotation of cranes, steam shovels, and the like.

The Hub Disc (1) is bolted to the base (2) of the model and forms a guide upon which runs the wheel-race constructed from four $\frac{1}{2}$ " Pulleys (7), pivotly carried from a Circular Strip (6). A Circular Girder (3) bolted to the upper Platform (4) of the model rests upon the Pulleys (7). The model pivots about the Rod (8), which passed through the Girder (9), but the weight of the rotating body is distributed over the Pulleys (7), so obviating the strain that would otherwise centre upon the Pivot (8).

Power Driven Truck

Four trucks similar to that shown in Fig. 4 are frequently employed as the wheel base of gantries, travelling cranes, etc. The drive from the motive power is carried by chain to the Sprocket Wheel (2) and is transferred

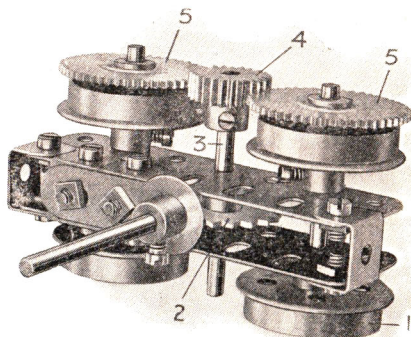


Fig. 4

to the running wheels (1) by means of the $\frac{1}{2}$ " Pinion (4) and Gear Wheels (5). The wheels (1) may be adapted to run on rails made of strips or angle girders, or the regular tracks supplied for toy train sets can be used.

A Monster Floating Crane

(Continued from page 10)

Two pairs of lifting blocks are provided, the larger pair is fixed, but the other can be traversed throughout the full length of the jib. Loads up to 60 tons are dealt with by the latter pair, while loads over 60 tons and up to 200 tons are taken by the pair of fixed blocks.

The crane can be turned through a complete circle and all of the movements are electrically driven by ten electric motors. The pontoon is propelled by twin screws, driven by two sets of engines. Built in Holland, the crane attained on a trial trip an average speed of 4.85 miles per hour.

Although not the largest pontoon crane in existence at the present time, the "Mammoth" is exceptional so far as heights of lifting and radii of action are concerned. It is capable of lying alongside the largest vessel afloat and delivering loads up to 60 tons from the hold of the vessel direct on to the quay.

"The Mammoth" furnishes a fine subject for a Meccano model, and we are sure that many of our readers will derive much pleasure from building a replica of it with Meccano.

The Story of Iron and Steel

(Continued from page 9)

requires the use of sand cores to fill up the space where we do not want the iron. After the castings cool off, these cores are removed by breaking out the hard sand. Again some castings, as for instance car and train wheels, may require an extremely hard rim to stand the wear. This is done by placing a metal band in the sand mould where the rim of the wheel will be. This metal band will cool the iron very much faster than the sand will so that the outside will be harder.

Certain kinds of cast iron, when cooled quickly, become extremely hard. By placing these cooling bands or plates at certain places in the mould, we can cause the casting to be hard at any spot desired, and still keep the rest of it soft enough to machine.

In the February issue

"How Wrought Iron is Made"

The New Pawl and Ratchet Wheel

The illustration below shows the new Pawl (Part No. 147) in combination with the new Ratchet Wheel (Part No. 148). These parts have recently been added to the Meccano system and are now ready for distribution.



By the use of these parts the shaft carrying the Ratchet Wheel is allowed to rotate in one direction only. The advantages of such an arrangement are obvious, especially when attached to model cranes, hoisting tackle, etc., where the Pawl and Ratchet Wheel prevent the load from falling back as it is hoisted.

It is sometimes found advantageous to apply slight pressure on the Pawl—by means of a spring or weighted lever—to insure its engagement with the teeth of the Ratchet Wheel.

The prices of these new parts are:

No. 147 Pawls.....each .10
No. 148 Ratchet Wheels.... " .30

Meccano Helps Army Engineers

(Continued from page 14)

At the request of a committee formed by the municipalities in favor of the bridge, scale models of them were built by Meccano Company and were on exhibition during the hearing. One of the models is 21 ft. long and built to a scale of 100 ft. to one foot. Wooden bases covered with plate glass to represent water were provided upon which the models were placed and the depths of the river at various distances from each shore were plainly marked. In addition, scale models representing various types of vessels from small tugboats to the largest cargo carriers were placed on the glass "water."

The model in the foreground of our illustration is of the Elizabeth bridge, the shorter of the two, and to which little objection has been raised as the piers are not to be placed in the water. The two piers at the right of the larger model are the ones which are causing the opposition, as they are to be placed in the water, which, however, at these points is shallow and is not part of the dredged channel.

These models came in for considerable favorable comment on the part of the Engineers as well as others attending the hearing and seemed to prove without a doubt that the objections to the bridges raised by the shipping interests were not well founded, as the piers as shown by those in the models did not appear to form a reasonable amount of obstruction to traffic.

Just as this issue of the "M.M." is about to go to press comes the news from Washington that the War Department has approved the plans and sanctions the construction of the two bridges.

Mr. M. D. Griffith, Chairman of the Committee referred to above, in a letter to Meccano Company pays the following tribute to the assistance that the Meccano models gave:

"The Meccano models undoubtedly played a prominent part in strengthening the claims of the Port Authority that the bridges would not obstruct traffic; they certainly were of the greatest assistance in helping the engineers and others interested in the project to visualize the bridges as they will appear when completed."

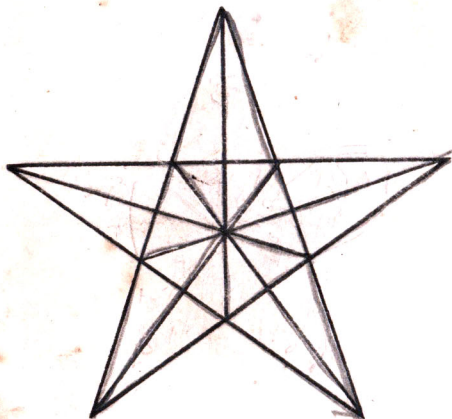
Immediately upon receipt of the "O.K." the Port Authority set in motion the preliminary work necessary before actual construction can be commenced. It is estimated that three years will be required to build the bridges and the long approaches.



Still More Triangles

Puzzle No. 23

The triangle puzzle in our last issue created quite a bit of interest and in this issue we are giving one which is possibly more difficult. This five-pointed star puzzle can be built in



Meccano or you can draw it on a large sheet of paper. If you decide to draw it, remember that the bisecting lines must all meet at a common point in the center of the star. When you have completed the figure see how many different triangles you can find in it, then pass it on to a friend and see what answer he gets.

* * *

But Yes!

No. 24

The following lines seem to have been set up by a printer who stutters, or at any rate who is not very clear as to what he really wants to say! The addition of the necessary punctuation marks, however, will make a perfectly intelligible sentence. What is your solution of this puzzle?

Were but and and and but but but and and were and and but and and and but but and and and but and but but and and and and and and but but and but

Hidden Names

No. 25

A good form of puzzle is that of hidden names, and in the following four lines the names of four animals are hidden. The letters of the names run one after the other in their correct order. Can you find these names?

- (a) Poor wretch! A moisture filled his eye.
- (b) Do not rebuff a lowly boy.
- (c) Said he, "If ere I sink and die."
- (d) Your smile, O padre, will be joy.

* * *

No. 26

There are sixty-four squares on a drawing board. On the first square you place a cent, on second place two cents, on the third four, the fourth eight, and so on. Keep doubling the last amount with each successive square. How much would it come to?

* * *

Word Squares

No. 27

The puzzle is to fill in the blanks with letters which themselves form a complete word and yet allow the columns to read from top to bottom as they do from left to right.

E	S	C	A	P	E
S					S
C	.	.	.	.	T
A	.	.	.	.	E
P	.	.	.	.	E
E	S	T	E	E	M

* * *

No. 28

What is it that will go up down, but will not come down up?

Answers to Puzzles in the Last Issue

- No. 18—44 triangles.
- No. 19—"Green"; because it is spelt with more ease (e's).
- No. 20—Scare, care, are.
- No. 21—The word can be found 1200 times.
- No. 22—The missing words are: I, is, sir, rise, reins, insert, entries, interest, resetting.

A Crane that Weighs

(Continued from page 19)

gard to certain loads must be carefully recorded.

A friction brake is provided to control the hoisting cord. As may be seen from Fig. B, this brake consists of the usual lever and cord engaging a 1" Pulley mounted on the end of the Crank Handle (1).

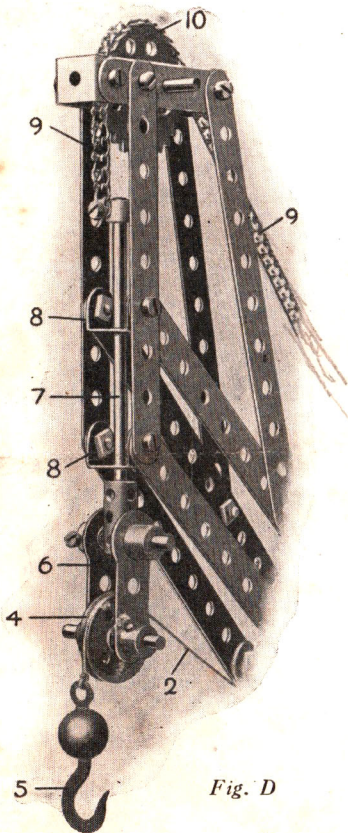


Fig. D

It should be noted that the Balls (19) in the Crane bearings have been only recently added to the Meccano system and have not yet been included in the outfits, but they may be obtained separately. The model works well, of course, if the Jib is mounted on an ordinary swivel bearing, but its operation is greatly improved and better realism effected by the use of the ball bearings.

A counter-balance, consisting of a number of $5\frac{1}{2}$ " and $2\frac{1}{2}$ " Strips, is mounted at the rear of the jib, with the object of relieving the strain imposing upon the swivel-bearing.



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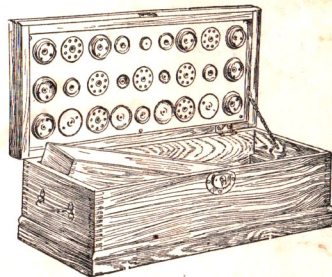
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Change of Address.—Subscribers should notify the Editor at once of any change of address. Send a postcard,—giving both old and new addresses,—so that our records can be kept up-to-date.

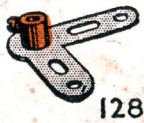
A Splendid Christmas Present for a Meccano Boy

Every boy wants to have a place of his own for storing his belongings, and especially is this so with Meccano boys; they want a permanent place to keep their Meccano supplies that they can keep under lock and key. The

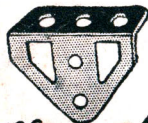


The Meccano Builder's Cabinet
Reduced to \$3.50

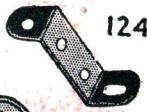
Meccano Builder's Cabinet is a handsome container sturdily built of quartered oak and fitted with a lock and key. It contains a removable tray and will hold the contents of the largest Meccano outfit. The inside of the cover is fitted with a metal plate arranged to hold a large number of Meccano Wheels, Gears, Pinions, etc., which are fastened securely in place, but still instantly removable. Price, including tray and wheel plate but without Meccano parts—reduced to \$3.50.



128



126



124



129



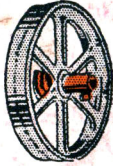
33



125



114



132



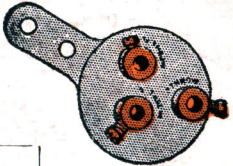
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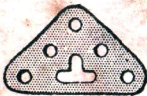
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144



130



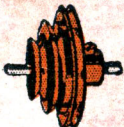
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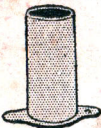
120A



57B



123



138



136

MECCANO

New Separate Parts

Get these new Meccano parts from your dealer. If he cannot supply you, write us.

No.	Price
33	Pawls (complete).....each .15
57b	Hooks (loaded)....." .15
63a	Octagonal Couplings....." .20
63b	Strip Couplings....." .20
63c	Threaded Couplings....." .20
64	Threaded Bosses....." .06
114	Hinges.....per pair .20
115	Threaded Pins.....each .05
116	Fork Pieces....." .10
118	Hub Discs, 5 1/2" diam....." .50
119	Channel Segments....." .15
120a	Spring Buffers.....per pair .25
123	Cone Pulleys.....each .50
124	Reversed Angle Brackets, 1" 1/2 doz. .25
126a	Trunnions.....each .10
126a	Flat Trunnions....." .06
127	Simple Bell Cranks....." .10
128	Boss Bell Cranks....." .15
129	Rack Segments, 3" diam....." .20
130	Triple Throw Eccentrics....." .45
131	Dredger Buckets....." .15
132	Flywheels, 2 3/4" diam....." .75
133	Corner Brackets....." .10
136	Handrail Supports....." .10
137	Wheel Flanges....." .15
138	Ship Funnels....." .25
139	Flanged Brackets (right)....." .10
139a	Flanged Brackets (left)....." .10
140	Universal Couplings....." .30
144	Dog Clutches....." .30



63B



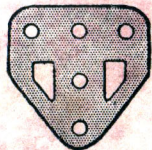
127



63C



63A



126A



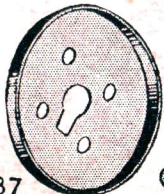
115



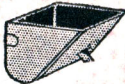
139A



116



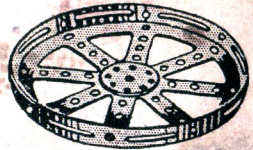
137



131



119

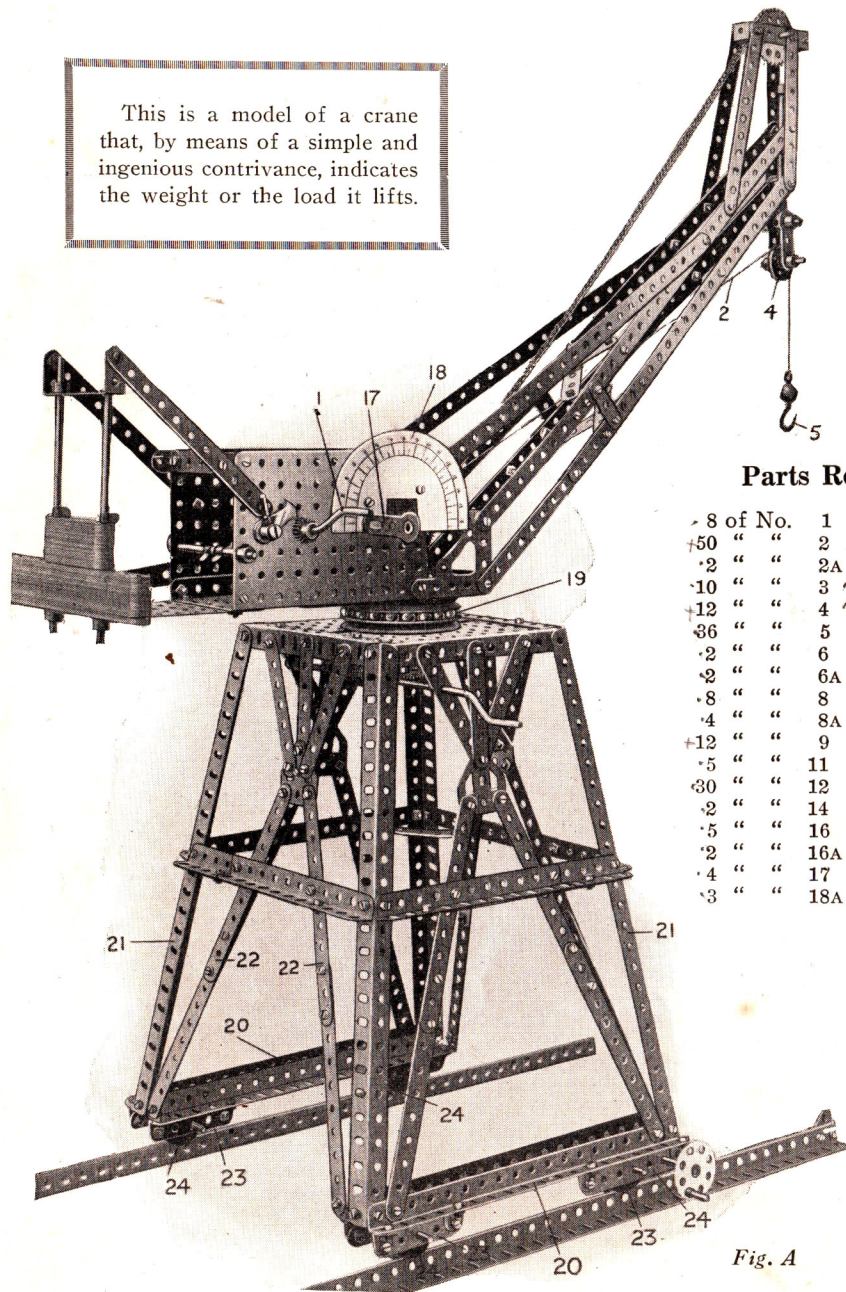


118

Meccano Company, Inc., Elizabeth, N. J.

A Crane That Weighs As It Lifts

This is a model of a crane that, by means of a simple and ingenious contrivance, indicates the weight or the load it lifts.



Parts Required

- 8 of No.	1	2 of No.	19
+50 " "	2	12 " "	19B
- 2 " "	2A	- 4 " "	20
- 10 " "	3	- 4 " "	22
+12 " "	4	- 2 " "	22A
- 36 " "	5	- 1 " "	24
- 2 " "	6	+1 " "	25
- 2 " "	6A	- 2 " "	26
- 8 " "	8	- 1 " "	27
- 4 " "	8A	- 2 " "	27A
+12 " "	9	- 1 " "	32
- 5 " "	11	- 1 " "	33
- 30 " "	12	- 9 " "	35
- 2 " "	14	- 98 " "	37
- 5 " "	16	- 7 " "	38
- 2 " "	16A	- 1 " "	40
- 4 " "	17	- 1 " "	43
- 3 " "	18A	- 1 " "	46
		- 4 " "	48A
		- 3 " "	52
		- 2 " "	52A
		- 1 " "	57B
		- 15 " "	59
		+3 " "	62
		- 2 " "	63
		- 1 " "	70
		- 2 " "	77
		- 27 " "	94
		- 1 " "	95A
		- 1 " "	96
		- 2 " "	108
		- 2 " "	115
		- 21 " "	117
		- 3 " "	125
		- 4 " "	126A
		+1 " "	137

Fig. A

+ NOT ENOUGH
- ENOUGH
! NOT SURE

This is a simple and very interesting model to build, and our illustration shows very clearly most of the constructional details. The pedestal upon which it is mounted runs upon rails built up from Angle Girders, which, of course, may be extended to any desired length.

Constructing the Model

The wheel base consists of four Flanged Wheels (24), mounted in bearings (23) formed from 2 1/2" Strips connected to the girders (20) by Angle Brackets. One of these Flanged Wheels is connected by gears to a handwheel (Fig. C), the operation of which imparts the traversing movement to the model along the rails. The upright columns (21) are connected at the top by 5 1/2" Girders, and at the wheel base, where they are slightly splayed-out, by 9 1/2" Girders. The construction of the strengthening struts is clearly shown.

The crane rotates on ball bearings (19) carried on an upper platform consisting of two 5 1/2" Flanged Plates, bolted between the upper 5 1/2" Angle Girders.

The lower fixed race of the ball bearings is formed by bolting a Wheel Flange and 3" Pulley Wheel to the platform, and in the channel thus formed the Meccano Steel Balls are inserted. A further 3" Pulley Wheel is bolted to the under-side of the crane, and an Axle Rod secured in this wheel passes freely through the 3" Pulley fixed to the platform.

A 57-toothed Gear Wheel carried on this Rod is engaged by a Worm Wheel mounted on the Crank Handle seen just below the platform in the large illustration.

The Load Indicator

The load is raised or lowered by the operation of the Crank Handle (1), upon which is wound a lifting cord (2, Fig. B), passing round a 1" Pulley (3) and over another 1" Pulley (4) at the jib head (Fig. D, page 23) to the loaded Hook (5).

This Pulley (4) is mounted in two Cranks (6) carried by means of a Coupling from the 3 1/2" Rod (7) which is slideable in two Double Brackets (8).

A Sprocket Chain (9) is connected to a Collar mounted on the Rod (7) and passing round a 1 1/2" Sprocket Wheel (10) and under the 1" Sprocket Wheel (11, Fig. B), is connected to a Spring (12) secured to a 3 1/2" Rod (13). (Continued on page 19)

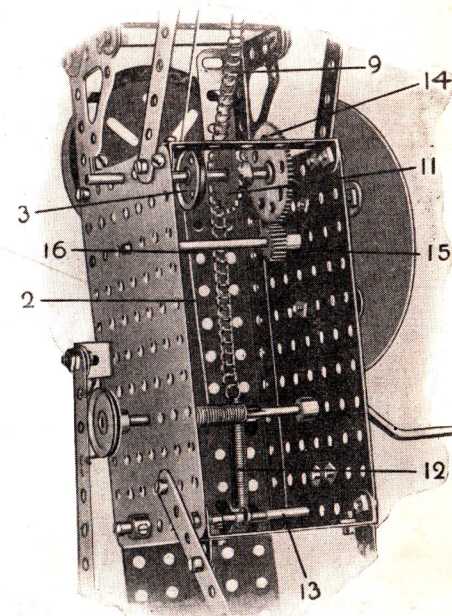


Fig. B

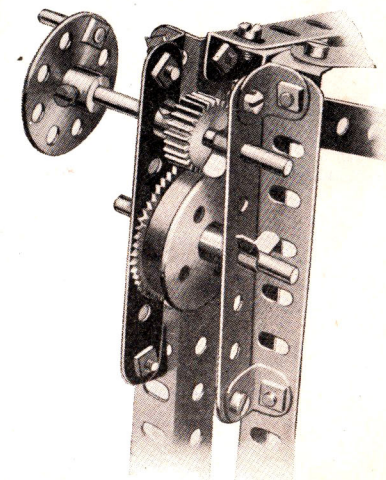


Fig. C