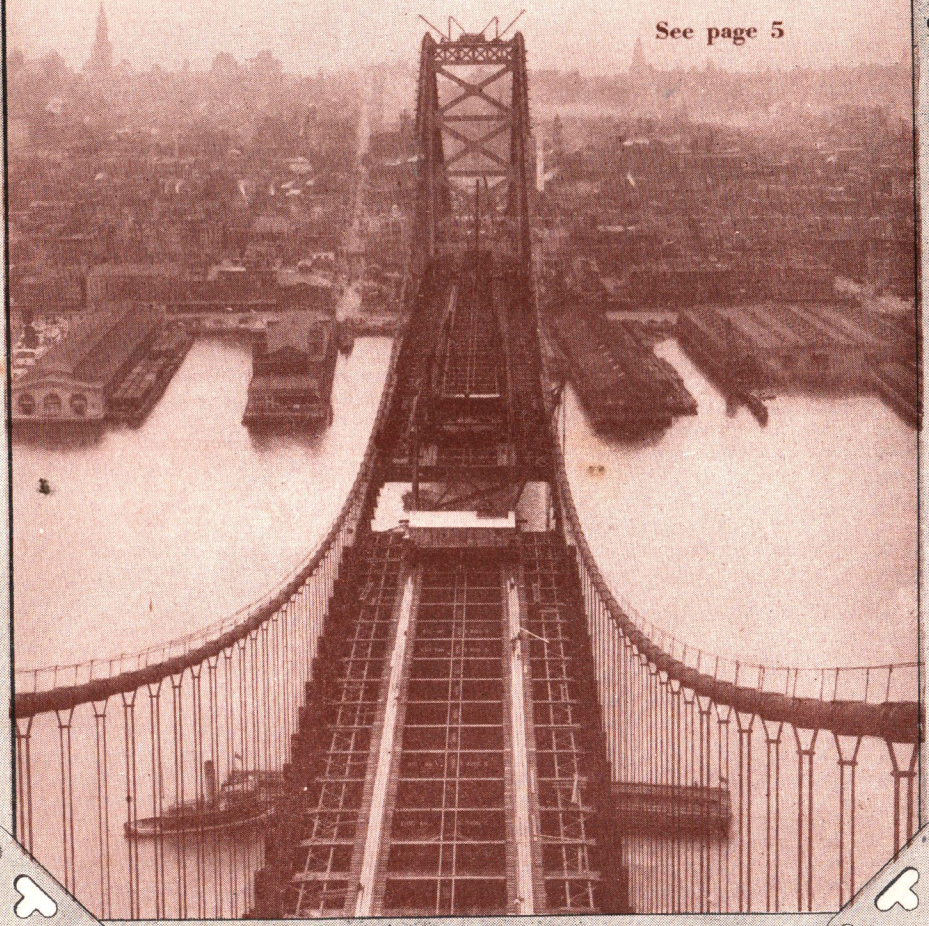
MECCANO MAGAZINE

for Boys

Vol. VI. No. 5 SEPT.—OCT. 1925 Price 6 cents

The Longest Suspension Bridge in the World

See page 5



A Heavy Mail Bag Since our last issue my mail bag has been exceptionally heavy, filled with letters from happy boys who wrote to say that the July "*M. M.*" was our best number by far. The Story of Iron and Steel came in for specially favorable comment and, in fact, there was scarcely a feature in the whole issue that was not the subject of some of my readers' letters. Letters from readers are not only welcome, but they are most helpful. I want to make the Magazine better and better. Tell me what you like or if there is anything you don't like. Already many correspondents refer to the "*M. M.*" as "Our Magazine" and that is the way I want you all to feel towards it.

Our Cover This month our cover has been devoted entirely to a remarkable photograph of the world's largest suspension bridge that is now in course of construction. The view shown is very unusual and the gigantic nature of the undertaking is very clearly shown. For this, as well as the other illustrations of this bridge, we are indebted to the Delaware River Bridge Commission. The story of this bridge is told on page 5 and it forms a splendid account of the skill and ingenuity of American engineering. Next month I shall have something to tell you about the part that Meccano played in influencing Uncle Sam to authorize the construction of two great bridges at New York.

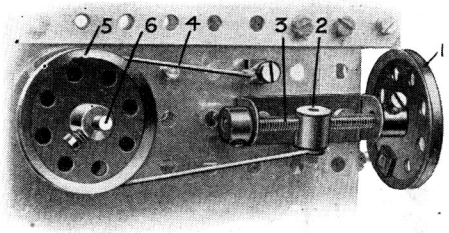
Spread the Good News There must be a great many boys who do not know the "*M. M.*," and if you will send me the names and addresses of any friends who, you think, ought to be subscribers, I shall be glad to send each one a sample copy. You will be doing them a good turn when you send me their names and at the same time you will be helping to increase the number of our subscribers. Naturally the more we have the bigger and better we can make the "*M. M.*" Write me today and send some names.

Our Big Christmas Number Already I am busy preparing for our Christmas number and this will be in every respect a special issue. It will be increased in size and will have many interesting features, including an excellent picture of Jackie Coogan playing with his Meccano. Jackie is a great little Meccano fan and—but I must reserve that story for the Christmas number.

Standard Mechanisms

The Brake

What a splendid thing it is to find such an increasing number of Meccano boys exploring new fields, experimenting and devising new models to illustrate some machine they have seen, or better still, work out some idea of their own invention. Frequently they write to us for assistance in working out their ideas and ask for methods of building different mechanisms. Our mail bag gives evidence of much interest in braking devices, and we give below particulars of a brake to govern or vary the speed of a shaft. It can be set at any desired pressure, and this will remain constant until changed by means of a hand-wheel.



How it is made

In the illustration the hand-wheel (1) causes the threaded boss (2) to travel in either direction along the threaded rod (3). Thus the grip of the cord (4) on the pulley (5) is increased or diminished according to the direction in which the hand-wheel is turned. The pulley (5) is fixed to the driven shaft (6), the speed of which may thus be varied as required. Due to the small "lead"—or distance between threads—of the threaded rod, the movement of the threaded boss is a very gradual one. The grip of the cord on the pulley can therefore be adjusted within very close limits and a fine control of the speed of the shaft is easily obtained.

A threaded pin is bolted to the hand wheel (1) to form a handle. In place of the pulley wheel used as the hand wheel (1) a bush wheel may be used.

A Valuable Reference Book

The foregoing is taken from a book which will be published shortly and will be called "Standard Mechanisms." It will form a ready reference book for Meccano boys and will give the most approved and tested methods of making various standard mechanisms—gear combinations, levers, pulley blocks, clutches, brakes, roller and ball bearings, and many others. This will be ready shortly and particulars will be announced in the "*M. M.*"

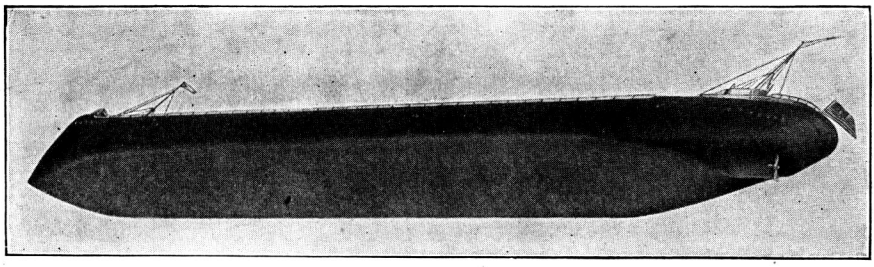
The Next Issue of the "M. M." will be a
Big Christmas Number
Be sure of your copy--Place Your Order Now

The Story of Iron and Steel

This story commenced in the July issue of the "*M. M.*" The different methods of extracting the iron ore from the earth were recounted and the start of the journey of the ore from the mine to the blast furnace was described.

In the last chapter we followed the ore from the mine to the trestle, where it was dumped into the bins below. The vessel is now ready to be loaded and a chute from the bin is lowered into each of the boat's hatches. Then a gate is opened in each chute and down thunders the ore—thousands of tons of it. A big boat can carry 12,000 to 14,000 tons, and it is loaded in a remarkably short space of time.

There is much competition among the loading crews to see who can make the best time in loading the ships, and some surprising records have been made. The steamer "Kerr" holds the record to date, having loaded 12,382 tons in 16½ minutes—over 750 tons a minute, or 12½ tons every second.



The Flat Bottom of an Ore-carrying Vessel

Now that the steamer is loaded, the chutes are withdrawn, the lines are cast off and soon she is in open water, steaming east to Chicago, Cleveland, Buffalo or some other lake port.

The ore vessels of the Great Lakes* must often navigate in shallow water, and for this reason they are built with flat bottoms, as shown in the view on this page. A further advantage of this method of construction is that the boats can be filled to maximum capacity and still be able to float in the locks of the Soo Canal.

How the Ore is Unloaded

Immediately the steamer arrives at her destination, the work of unloading is begun. Huge machines called Hueletts reach down into the hold and grab 10 tons of ore at a time, which is dumped in a pile nearby.

During the winter months the Great Lakes are covered with ice so that all of the ore to be used during the entire year must be shipped between May and December. This makes it necessary to unload the ore faster than the blast furnaces can consume it so that a substantial reserve may be stored in these great piles. Formerly the ore was unloaded from the boats into wheel-barrows and wheeled onto the storage piles by laborers. Of course this method was very slow and costly, so great "ore bridges" were designed to handle the ore more quickly. These ore bridges are almost identical with what Meccano boys know as gantry cranes—the difference being that the bridges are equipped with grab buckets in the place of magnets or hooks. The bridges are often 100 feet high, and like the Hueletts, they can take 10 tons of ore at one bite.

The ore bridges work incessantly, moving back and forth until the entire boat load has been thrown on the storage pile. And in the winter, after the lakes have frozen over, they are kept busy loading ore from the stock pile, into small cars to feed the ever-hungry blast furnaces. Night and day these monstrous furnaces melt the ore and deliver the product, pig-iron, to other plants to be refined into steel.

Iron Smelting

The ore is melted in the blast furnace first to remove the impurities that are mixed with it and secondly to add the correct amount of carbon, sulphur, and other elements that may be required. The impurities are usually clay, sand and other earthy matter and they are called the gangue of the ore; this comes to the surface when the ore is melted. The carbon, sulphur, etc., are loaded into the furnace before the blast is applied and the whole process is known as iron smelting.

The exact date when man first smelted iron is not known, but it is probably well over 6,000 years ago. From a modern viewpoint, early iron

*These vessels were described in the July issue.

The Story of Iron and Steel

(Continued from preceding page)

furnaces were crude affairs. The first were little more than piles of ore and wood or charcoal on the tops of hills where a good wind would make a hot fire. Later, with the invention of the bellows, the smelting was done in small holes in the sides of banks of clay, charcoal being used for fuel. Slowly but steadily improvements were made until today we have our modern Blast Furnace towering 90 to 100 feet above the ground, each one devouring approximately 1,200 tons of iron ore, 600 tons of coke and 300 tons of limestone every twenty-four hours. From such a load of materials about 600 tons of pig-iron are produced.

Description of the Blast Furnace

The blast furnace is the most important part of an iron smelting plant and consists of a cylindrical steel shell, 90 to 100 feet high, lined with fire-brick. It is divided into three sections, the lowest of which is called the hearth. In this section the molten metal settles until enough has accumulated to be tapped. Above the hearth is a section known as the "bosh" and the section above this is called the "stack."

The temperature within the furnace is tremendous and it is to protect the steel plates from this heat that the furnace is lined throughout with fire-brick. In addition, certain sections are provided with water-jackets, through which water is constantly circulating to keep down the temperature of the walls.

What Happens in the Furnace

The blast furnace is filled with layers of iron ore, coke and limestone. This load is called the "burden." Air heated under pressure is forced up through the blast furnace and unites with the hot coke, which it changes into gas. Some of this gas ignites and creates an intense temperature. As the materials settle in the furnace they become hotter and hotter until chemical changes take place, which form a gas known as carbon dioxide. This gas rises to the top of the furnace and passes up and out of the stack into the "down comer," a pipe which leads to a dust-catcher. The iron ore gradually melts and, being heavier than the coke and limestone, trickles through to the bottom of the hearth, where it remains in a molten mass.

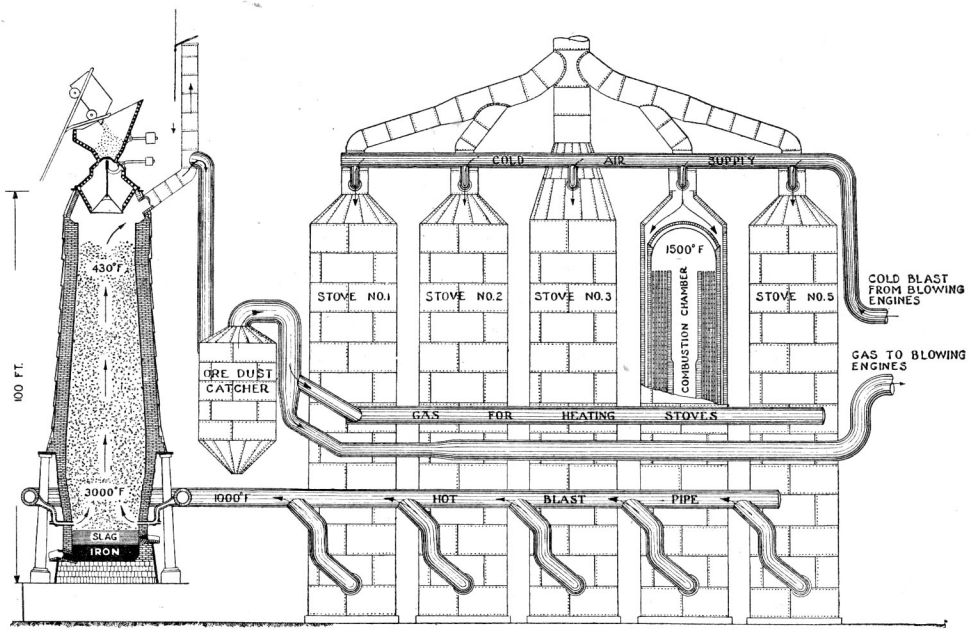


Diagram of a Blast Furnace

The limestone, which has been introduced with the burden, is changed into lime and combines with the sulphur and other impurities in the ore. It slowly drops to the bottom of the furnace and floats on top of the molten iron, thus making what is known as "slag."

We mentioned above that air heated under pressure is introduced into the furnace. This enters near the bottom through twelve pipes called

(Continued on page 8)

The Longest Suspension Bridge in the World

When John Roebling proposed to build a mammoth bridge suspended from wire cables across the East River at New York in 1867, his plan was ridiculed by the foremost engineers of the day. But with full confidence in his design he overcame all opposition. The famous Brooklyn Bridge, the first large suspension bridge, stands today as a monument to his genius.

The Brooklyn Bridge proved that Roebling's faith in the suspension type of bridge was justified for, after more than 40 years of service, it is as strong as ever. Other great suspension bridges have followed it, and now comes a new giant to claim the honor of having the longest suspended span in the world. This is the Delaware River Bridge, connecting Camden, N. J., with Philadelphia, Pa., and now well towards completion.

The Delaware River Bridge in Course of Construction

18,666 Wires in Each Cable

Our illustrations show that the bridge is suspended from two mighty cables. The great strength of these cables is shown by the fact that each is composed of 18,666 individual wires, all compressed within a radius of 30 inches. The towers are steel posts rising 347½ feet from the concrete piers, and the cross-section of each post increases from 7 x 12 feet at the top to 7 x 40 feet at the base. The cables are firmly fixed to their saddles at the top of the piers, instead of having movable saddles on rollers. The towers are so designed that they will bend as required to compensate for the expansion and contraction of the cables due to temperature changes.

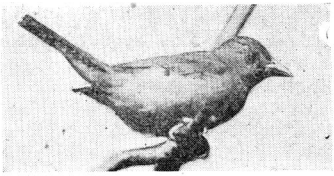
My readers will notice that the center span is extraordinarily long, being, in fact, 1750 feet. This is 150 feet more than the former largest span. It allows ample clearance for the largest vessels, as the deck is 135 feet above high water line. The graceful sweep of the cables is clearly shown in the illustration and the sag is 200 feet. To support the deck of the bridge hangers are used and these are spaced about 20 feet apart. Each one consists of four galvanized wire ropes 2⅝" in diameter, attached to cast-steel saddles. A roadway width of 57 feet has been provided so that six lanes of traffic can be accommodated and on either side of this roadway is a trolley car track. Outside of the line of the cables is a rapid transit track on each side. The pedestrian walks are on the upper truss, above the trolley tracks.

When completed, the bridge will have used 33,000 tons of steel and the cost will be about $37,211,000—an increase of $8,340,000 over the original estimate prepared in 1921. This increase is due to the increase in cost of construction and of real estate required.

The Romance of Bridge Building

Imagine yourself perched atop the tower from which our cover photograph was taken—over three hundred feet in the air! You are quite certain "to hang on for dear life," and not have time or desire to do anything else except to see that you are not blown off by the force of the wind.

(Continued on page 9)



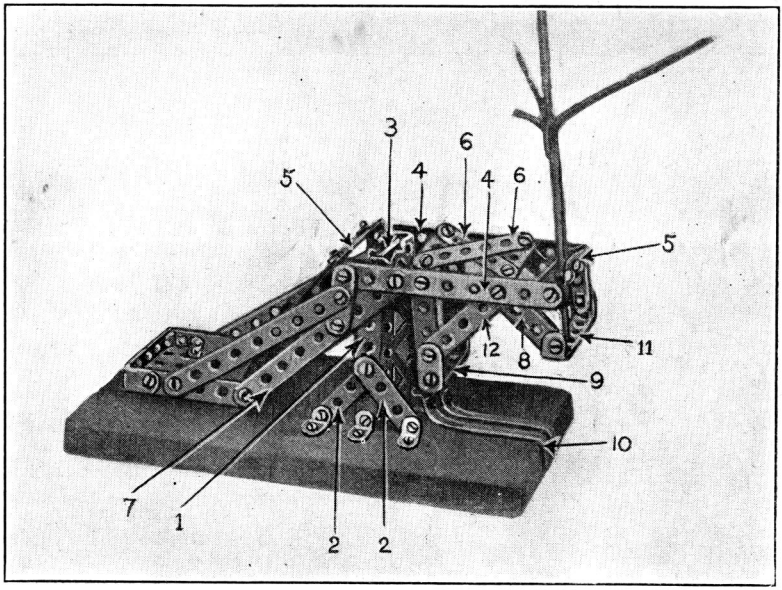
How Birds take thei

There is a particular fascination about photographs of birds, es described a model by means of which birds are made to take the to wire, and full instructions are given below. A prize is off

The base of the model is a board about 7" x 10", on which is screwed the center upright post (1). This is formed by two 3½" angle girders with a 3½" braced girder bolted between them. The girders are secured to the board by screws in the angle brackets, which are bolted to the angle girders and supporting strips (2).

the center hole of each of these strips a 4½" strip is fastened and extends to the tray, supporting the outer end.

The twig is gripped between the outer double angle strip (5) and a similar strip bolted through the same holes in the strips (4) but in the reverse position. Two ¾" bolts are used to draw



The Meccano Model

A 3½" axle rod (3) passes through the upper holes in the angle girders, and carries the balancing portion of the model. This consists of two 4½" strips (4), spaced at each end by a 2½" x ½" double angle strip (5). Similar angle strips are bolted to the main strips and braced by 3" strips (6) to insure rigidity.

Two 4½" strips (7) are fastened to the main strips (4) and carry at their lower end a tray composed of a 2½" x 2½" flat plate with four 2½" x ½" angle strips forming the sides. These are fixed to the flat plate by angle brackets. A 1½" strip is screwed to the end hole of strip (4) and to the strip (7) on each side, as shown. To the two angle strips together to hold the twig securely.

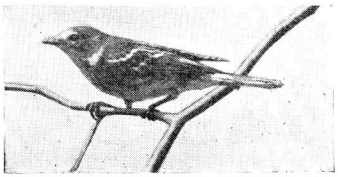
Extending arms (8) carrying still another angle strip (11) are bolted to the strips (6), and the twig may be whittled to a point and wedged through the center hole of the angle strip (11) to hold it in position.

Two 2½" strips form the contact arm, to the lower ends of which are bolted a 2½" x 1" angle strip (9), and is held rigid by a strip on each side (12).

When a twig is fastened to the model its weight should cause the model to balance evenly. If the twig is too heavy, pebbles may be placed in the

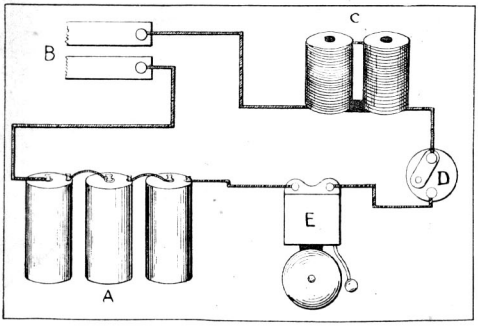
r Own Photographs

specially those taken in their natural haunts, and in July we
ir own pictures. This model is quite easy to build and simple
ered for the best photograph taken with this device.



tray to counterbalance it. It is important that the model be in perfect balance for successful operation.

To the base of the model are screwed two brass or copper strips (10), about ½" wide, and thin enough to be bent very easily. The inner ends of



these strips are bent upward and slightly behind the contact strip (9) when the model is evenly balanced. This completes the construction of the model.

Wiring the Model

The wiring of the model presents no difficulties. Three dry cells are needed, and these are wired in "series"—that is, the outer or negative terminal of one cell is connected to the center or positive terminal of the next cell, and the process repeated between the second and third cells, as shown in the diagram herewith. Connect the center (positive) terminal of the first cell to one of the brass strips and the outer (negative) terminal of the third cell to one terminal of the bell—the other being wired to a small switch. The remaining switch terminal is connected to one wire of the magnets used to operate the shutter, and the other magnet is wired to the remaining brass strip in the model. In the diagram on this page, A represents the dry cells, B the brass strips, C the magnets, D the switch and E the bell.

The action of the device is simple yet effective. When a bird alights on the twig his weight causes the end of the model to be depressed enough to allow the contact strip (9) to touch the brass strips (10). This closes the electrical connection (provided the switch D is also closed) and causes the magnets C to operate the shutter. At the same time the bell E rings.

The construction of the device for releasing the shutter of the camera will vary with the several varieties of shutter-release on different kinds and makes of cameras, and it will be necessary to leave the design of this device to the ingenuity of each individual builder. In most cases a simple bell crank arrangement will be sufficient. This will require merely a framework to support the camera and magnets, and a bell crank, one arm of which will throw the shutter-release arm or button when the magnets exert a pull on the other arm.

Place the model where birds are known to congregate, such as near a bird-house, fountain, or similar spot. The camera should be properly focussed on the twig, which should be small enough to be entirely included in the view-finder of the camera. It is necessary to have a fast shutter and rapid lens in order to obtain sharp pictures. The camera need not be covered, but the model should be concealed under a box having a covering of bark, with only the twig projecting, so that the birds are prevented from alighting on any other part than the twig.

When you are ready to take a photograph, close the switch D. As soon as a bird has snapped his own picture the bell will ring, and the switch should be opened at once to prevent another exposure being made on the same film. It is also possible to select from the birds that alight on the twig the ones of which pictures are desired, for as long as the switch is open no picture is taken.

Many beautiful pictures of birds have been made by means of this device. Two of these are shown on these pages; the one in the upper left hand corner of page 6 is of a female Scarlet Tanager and a Myrtle Warbler is illustrated at the top of this column. In this instance a Graflex camera was used.

A Prize for the Best Picture

No doubt many of our readers will build this model and we are sure that it will give them a great deal of pleasure. We look forward to receiving photographs of birds taken by means of this device, and offer a prize of $1.00 for the best illustration obtained with it which we receive before December 31, 1925.

The Story of Iron and Steel

(Continued from page 4)

"tuyeres." These are spaced equally around the bosh in a large pipe which surrounds the furnace. Two of the pipes are visible, above the section of slag, in the illustration on page 4. This air is heated to a temperature of about 1000 degrees before it is forced into the furnace, and this heating is done in high cylindrical stacks called "stoves," made of brick. These are heated by gas and the air is heated by forcing it through the stoves and past the hot brick, and then to the tuyeres.

Using the By-Products

The gas which rises to the top of the furnace contains carbon-monoxide, which will burn, and also carries coke, iron ore and lime dust. Old fashioned blast furnaces allowed these hot gases and dust to escape into the air through a valve in the top of the furnace, but the modern practice is to pipe the gas and dust down through a dust-catcher, where the dust and gas are separated. The gas is then piped to the huge stoves, where it is burned to heat the blast, and also is used to heat the boilers that supply the blowing engines which compress the air. The dust is returned to the furnace after having been made into briquettes.

Thus there are four things that enter the blast furnace—iron ore, coke, limestone and air. There are also four things that come out—iron, slag, dust and gas. The iron is used to make steel, the slag is crushed and used to make roadways, and the dust and gas are used to help make more iron.

Drawing Off Slag and Iron

Although iron ore, coke and limestone are being continually dumped into the top of the furnace, the iron and slag accumulate slowly and they are drawn off only at regular intervals. As the slag is lighter than the iron it floats on top of it, and it is removed from time to time through a hole in the side of the blast furnace. It is then run through troughs to ladles which carry it to the slag-crusher.

When a sufficient amount of the iron has accumulated a hole known as the "iron notch" in the base of the furnace is opened and the iron runs out into troughs which guide the molten metal into waiting ladles. These ladles carry the metal either to the steel mills, to be used while still molten, or they pour it into moulds that allow the iron to cool. These moulds form small chunks which are called "pigs" and are stored, to be refined into steel.

In the Next Installment

Making Cast and Wrought Iron

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.

Wilfred Burning, San Francisco, Cal.—"Your little magazine gives me much enjoyment, especially such articles as the 'Torque Converter' and the Hydraulic Crane." Thank you, Wilfred. I hope you will build the Torque Converter and see how splendidly it works. The parts price-list you asked for has been mailed to you.

* * *

Ludwig Bogovich, Turtle Creek, Pa.—The Puzzle you sent is hardly suitable for the "*M.M.*," but try again, Ludwig.

* * *

John S. Damon, Sonyea, N. Y.—"I like your Limerick Contest and hope you will have another soon." We will, John, for it is our most popular contest.

* * *

Wilson G. Walters, Rochester, N. Y., says of the Story of Iron and Steel, "I think it is great because aside from being very interesting, it contains a great deal of information about the source of these metals. I am always looking for the next issue of OUR MAGAZINE." Write again, Wilson, you are certainly entitled to sign yourself as you do, "a thoroughbred Meccano Boy."

* * *

Reynold Kittle, Toledo, Ohio.—"I am going to be an electrical engineer and I know Meccano will help me. I have had an additional set and parts each Christmas since I was 5 years old." Yes, Meccano will help you very much in your work and evidently your parents think so, too. You are lucky to have so much Meccano.

* * *

Andrew Brown, Nashville, Tenn.—"I'm a little eleven year old boy who has got more pleasure out of my Meccano than anything I ever had. I'm now in need of a number of parts and wish to know if I will be safe in sending a money order for the parts I need." Most certainly, Andrew, we are always happy to supply boys direct when their dealers cannot supply them.

(Continued on next page)

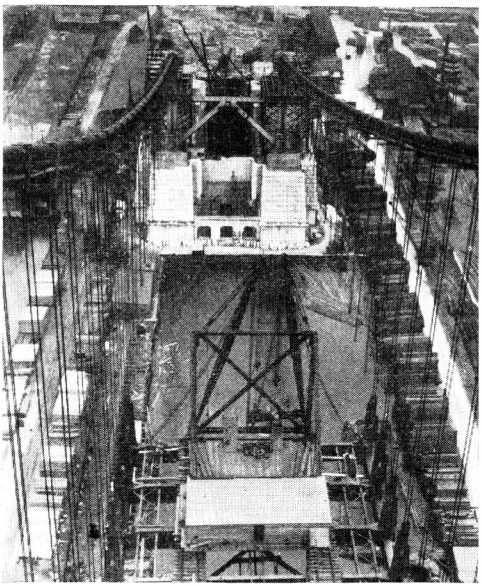
The Longest Suspension Bridge

(Continued from page 5)

Yet this is merely every-day routine in the life of a bridge-builder. And not only is he in such precarious positions all day long, but his work is exacting and severe. He must have steady nerves and a clear head, lest a slight mis-step sends him hurtling to instant death hundreds of feet below.

The Price of Progress

Naturally bridge workers become very expert at maintaining their balance in climbing about the structure, and this expertness leads at times to over-confidence. The consequence of this is that they tend to become careless and take unnecessary risks. Unfortunately every great construction of this kind is accompanied by a loss of life, and in the course of the erection of this new bridge 12 lives have been lost already.



Construction of the Camden Anchorage

In spite of the great dangers which they must face daily, bridge-builders are a happy, good-natured lot of fellows. When one of their number pays with his life for being too reckless or clumsy, they mourn his loss—and then go right back to their hazardous labors, each knowing that the same fate might overtake him at any moment. Still they will not change to other occupations; there is a fascination in bridge-building, they say,

(Continued at bottom of next column)

Our Mail Bag

(Continued from preceding page)

L. V. Harris, Newport News, Va.—Mr. Harris says "My kids are the proud owners of a No. 5 Meccano outfit and I may add that they make good use of it. In fact, there is always a great rush for the manuals." Thank you for your letter, Mr. Harris. I rather suspect that your boys are not the only ones who make good use of that outfit.

* * *

Kenneth Carlisle, Staten Island, N. Y., is a recent arrival from England where he bought Meccano, and wanted to know if the English Meccano is the same as the American. Yes, Kenneth, Meccano is the same all over the world and wherever you travel you can buy additional parts.

* * *

Malcolm B. Robinson, Dumont, N. J., is very enthusiastic about his Meccano motor and writes, "I find it all that you claim. It is strong as well as fast." It is a splendid motor, Malcolm, and is the result of the greatest care in manufacturing. Any boy who doesn't have one is missing some of the best of Meccano fun.

* * *

George H. Ashton, Paducah, Ky.—George is quite a rhymster and in sending his motor for repair wrote his instructions in splendid verse! Limerick contestants, watch out for George!

Coming in the November "M. M."
The Story of Jackie Coogan

Jackie is a great Meccano fan and our next number will contain an interesting story of his visit to Meccano Headquarters.

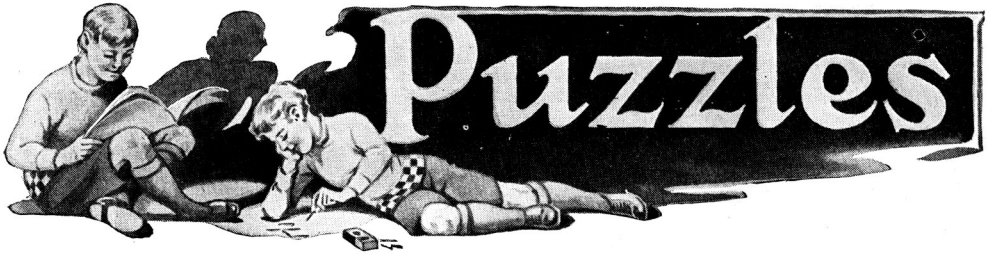
Watch for His Picture in the Christmas Number

The Longest Suspension Bridge

(Continued from preceding column)

that cannot be equalled in any other form of construction work.

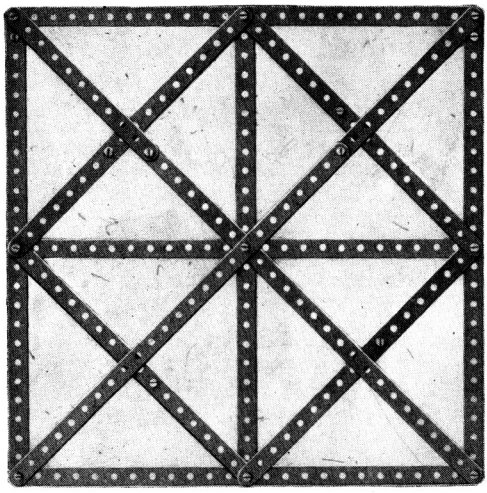
They carry on, undaunted by the searing bite of icy steel in winter and the radiating heat of metal girders baked by the blazing sun of midsummer. Their work must continue at all costs, there must be no delay, for an impatient people demands that the structure be completed in the least possible time, that progress and industry may profit by the results of their labors.



Triangles Everywhere

Puzzle No. 18.

Here is a puzzle that will be of particular interest to those who have grappled with the problems of a certain unpopular gentlemen of by-gone days, by name Mr. Euclid. How many different triangles can you count in the square illustrated?



In the construction of this figure the following Meccano parts have been used: 15 of No. 1, 5 of 1a, 5 of 1b, 36 of 37a, 6 of 111a, 30 of 111b. If you find this one too easy, watch for the harder one to appear in the next issue.

* * *

No. 19.

Which color is easier to spell, "red" or "green?"

* * *

No. 20.

I am a word of five letters meaning to frighten. Behead me and I am anxiety, again behead me and I become a part of the verb "to be." What is my name?

This one looks easy, but—

No. 21.

How many times can you find "Hannah" in this square:

H A N N A H
H A N N A H
H A N N A H
H A N N A H
H A N N A H
H A N N A H

Counting is allowed backwards and forwards and diagonally or zig-zag, but no letter can be used twice in the same word. Try it; the result will surprise you.

* * *

No. 22.

The missing words in the following sentences each consist of the letter or letters of the previous missing word, plus one extra letter: "Yes, . think he .. a great man, ..., and that he will .... to take the ..... of Government, helping to revise many Acts of Congress. For he will .... of ..... in the Statutes, and, by the ..... of faulty clauses he will improve our laws."

* * *

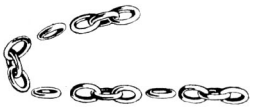
Answers to Puzzles in the Last Issue

No. 13.

(1) time, emit; (2) now, won; (3) not, ton; (4) pot, top; (5) dim, mid.

No. 14

The illustration at the right shows how the jeweler repaired the chain. He broke all three links of one of the sections and used these links to join together the other four sections.



No. 15.

Bill is still living with Jim Smith in this big city.

No. 16.

When they are cross-roads.

No. 17.

There were eight persons in the room. These were an old lady, one of her daughters with two sons, another daughter with two daughters, and the daughter of a daughter who was not present.

Our Contest Column

The Third Limerick Contest

So insistent has been the demand for still more Limerick Contests that we announce here another one for our readers to solve.

Any reader may enter as many last-lines as he wishes, and there are no entrance fees. The prizes to be awarded are as follows:

First Prize.....No. 2 Clockwork Motor
Second Prize.....No. 1 Meccano Outfit

The uncompleted Limerick appears below, and the prizes will be awarded for the best lines submitted to complete it.

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

.....

The contest closes on November 15th, 1925, and the list of prize winners and the winning answers will be published in the "*M. M.*" Each entry should bear the competitor's full name and address, together with his age, and should be addressed: "Third Limerick Contest, Meccano Magazine, Elizabeth, N. J."

* * *

Awards in the Second Meccano Limerick Contest

The Second Limerick Contest, which closed on September 1st, was even more successful than the first, judging by the deluge of "last lines" that poured in. The first prize—A No. 2 Clockwork Motor—was awarded to

Frederick Quebe, Box 1515, Waco, Texas

The completed Limerick, with the prize-winning last line, is as follows:

Meccano Boys are a happy throng,
Building and playing the whole day long,
"It's more than a toy,"
Is the cry of each boy.
"For it's good, substantial and strong."

Charles W. Rockwood, 3299 Glencairn Road, Cleveland, Ohio, won the second prize—A Meccano Builder's Cabinet. His last line was

"It's a game and a school; come, belong!"

Limericks seem to have captured the hearts of our readers, and last lines for this Second Contest came from boys in all parts of the country. Some sent in three or four lines, and one boy actually submitted *twenty-two* of them. Many are the requests that have come to us for more limerick contests, and we are not going to disappoint our readers. A third Limerick Contest is announced elsewhere on this page—and we are looking forward to receiving some very interesting solutions.

MECCANO MAGAZINE
for Boys

Published every second month throughout the year by MECCANO COMPANY, INC., ELIZABETH, N. J.
Subscription price, 25 cents for six issues

All correspondence should be addressed to "The Editor, *Meccano Magazine*, Elizabeth, N. J." Subscriptions may be paid by stamps or money order; if a receipt is desired a stamped addressed envelope should be enclosed.

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.

How Keen Are Your Eyes?

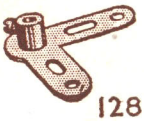
Do you pay close attention to what you read? In the July "*M. M.*" there were several words misspelt and some printer's errors, which were not discovered until too late for correction.

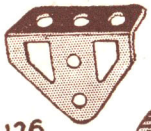
Now, look back over your July "*M. M.*" and see how many mistakes you can find. Then write them on a piece of paper (giving the number of the page in the "*M. M.*" on which each appeared) and send them in with an essay of not more than 100 words on "The Importance of Spelling Correctly."

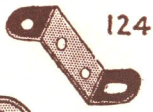
For the longest lists of errors and the best essays the following prizes will be awarded:

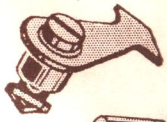
First Prize.....Meccano Builder's Cabinet
Second Prize.....Electrical Accessory Outfit

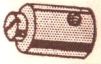
The contest closes on December 1st, 1925, and the winners will be announced in the "*M. M.*" Each entry must be addressed to "Sharp Eyes Contest," Meccano Magazine, Elizabeth, N. J. Write your name, address and age clearly on each sheet.

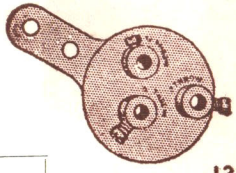












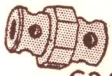
MECCANO

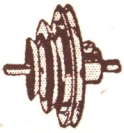
Separate Parts

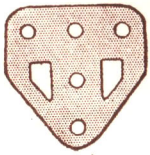
No.			Price
33	Pawls (complete)	each	.15
57b	Hooks (loaded)	"	.15
63a	Octagonal Couplings	"	.20
63b	Strip Couplings	"	.20
63c	Threaded Couplings	"	.20
64	Threaded Bosses	"	.06
115	Threaded Pins	"	.05
116	Fork Pieces	"	.10
118	Hub Discs, 5½" diam.	"	.50
119	Channel Segments	"	.15
120a	Spring Buffers	per pair	.25
123	Cone Pulleys	each	.50
124	Reversed Angle Brackets, 1"–½ doz.		.25
126	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, 2¾" 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

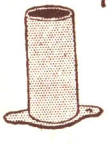
Get these new Meccano parts from your dealer. If he cannot supply you, write us.

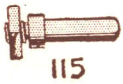
Meccano Company, Inc., Elizabeth, N. J.

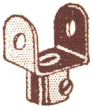


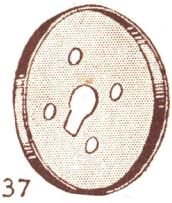


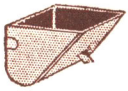


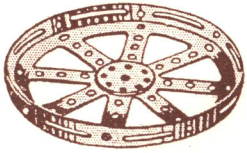


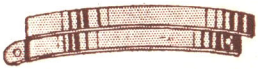


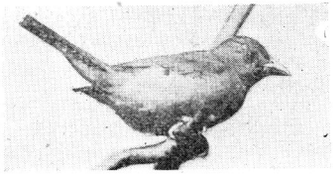




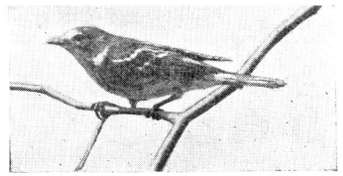






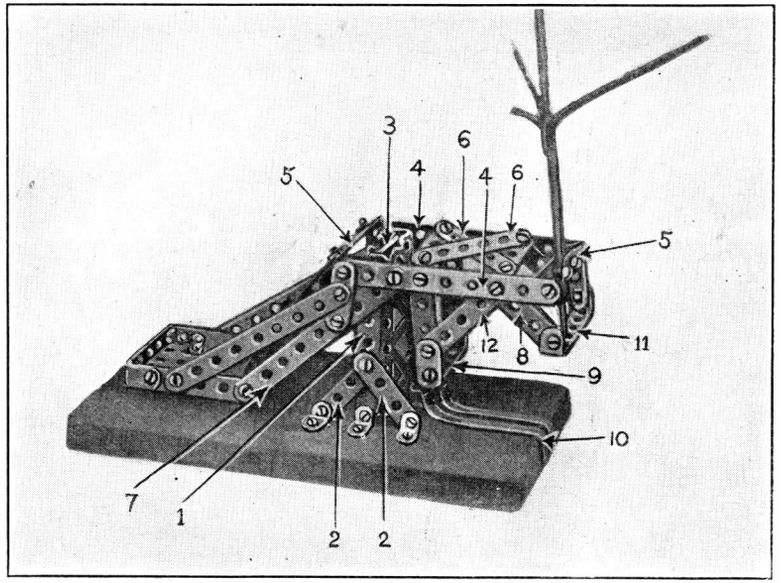


How Birds take their Own Photographs



There is a particular fascination about photographs of birds, especially those taken in their natural haunts, and in July we described a model by means of which birds are made to take their own pictures. This model is quite easy to build and simple to wire, and full instructions are given below. A prize is offered for the best photograph taken with this device.

The base of the model is a board about 7" x 10", on which is screwed the center upright post (1). This is formed by two 3½" angle girders with a 3½" braced girder bolted between them. The girders are secured to the board by screws in the angle brackets, which are bolted to the angle girders and supporting strips (2).



The Meccano Model

A 3½" axle rod (3) passes through the upper holes in the angle girders, and carries the balancing portion of the model. This consists of two 4½" strips (4), spaced at each end by a 2½" x ½" double angle strip (5). Similar angle strips are bolted to the main strips and braced by 3" strips (6) to insure rigidity.

Two 4½" strips (7) are fastened to the main strips (4) and carry at their lower end a tray composed of a 2½" x 2½" flat plate with four 2½" x ½" angle strips forming the sides. These are fixed to the flat plate by angle brackets. A 1½" strip is screwed to the end hole of strip (4) and to the strip (7) on each side, as shown. To the center hole of each of these strips a 4½" strip is fastened and extends to the tray, supporting the outer end.

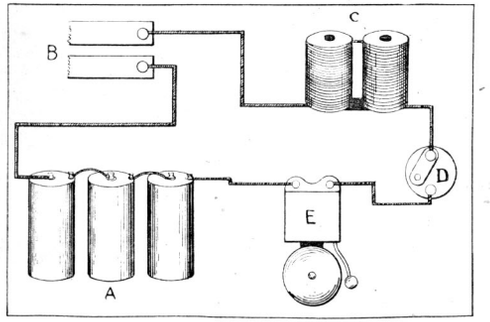
The twig is gripped between the outer double angle strip (5) and a similar strip bolted through the same holes in the strips (4) but in the reverse position. Two ¾" bolts are used to draw the two angle strips together to hold the twig securely.

Extending arms (8) carrying still another angle strip (11) are bolted to the strips (6), and the twig may be whittled to a point and wedged through the center hole of the angle strip (11) to hold it in position.

Two 2½" strips form the contact arm, to the lower ends of which are bolted a 2½" x 1" angle strip (9), and is held rigid by a strip on each side (12).

When a twig is fastened to the model its weight should cause the model to balance evenly. If the twig is too heavy, pebbles may be placed in the tray to counterbalance it. It is important that the model be in perfect balance for successful operation.

To the base of the model are screwed two brass or copper strips (10), about ½" wide, and thin enough to be bent very easily. The inner ends of these strips are bent upward and slightly behind the contact strip (9) when the model is evenly balanced. This completes the construction of the model.



Wiring the Model

The wiring of the model presents no difficulties. Three dry cells are needed, and these are wired in "series"—that is, the outer or negative terminal of one cell is connected to the center or positive terminal of the next cell, and the process repeated between the second and third cells, as shown in the diagram herewith. Connect the center (positive) terminal of the first cell to one of the brass strips and the outer (negative) terminal of the third cell to one terminal of the bell—the other being wired to a small switch. The remaining switch terminal is connected to one wire of the magnets used to operate the shutter, and the other magnet is wired to the remaining brass strip in the model. In the diagram on this page, A represents the dry cells, B the brass strips, C the magnets, D the switch and E the bell.

The action of the device is simple yet effective. When a bird alights on the twig his weight causes the end of the model to be depressed enough to allow the contact strip (9) to touch the brass strips (10). This closes the electrical connection (provided the switch D is also closed) and causes the magnets C to operate the shutter. At the same time the bell E rings.

The construction of the device for releasing the shutter of the camera will vary with the several varieties of shutter-release on different kinds and makes of cameras, and it will be necessary to leave the design of this device to the ingenuity of each individual builder. In most cases a simple bell crank arrangement will be sufficient. This will require merely a framework to support the camera and magnets, and a bell crank, one arm of which will throw the shutter-release arm or button when the magnets exert a pull on the other arm.

Place the model where birds are known to congregate, such as near a bird-house, fountain, or similar spot. The camera should be properly focussed on the twig, which should be small enough to be entirely included in the view-finder of the camera. It is necessary to have a fast shutter and rapid lens in order to obtain sharp pictures. The camera need not be covered, but the model should be concealed under a box having a covering of bark, with only the twig projecting, so that the birds are prevented from alighting on any other part than the twig.

When you are ready to take a photograph, close the switch D. As soon as a bird has snapped his own picture the bell will ring, and the switch should be opened at once to prevent another exposure being made on the same film. It is also possible to select from the birds that alight on the twig the ones of which pictures are desired, for as long as the switch is open no picture is taken.

Many beautiful pictures of birds have been made by means of this device. Two of these are shown on these pages; the one in the upper left hand corner of page 6 is of a female Scarlet Tanager and a Myrtle Warbler is illustrated at the top of this column. In this instance a Graflex camera was used.

A Prize for the Best Picture

No doubt many of our readers will build this model and we are sure that it will give them a great deal of pleasure. We look forward to receiving photographs of birds taken by means of this device, and offer a prize of $1.00 for the best illustration obtained with it which we receive before December 31, 1925.