

Meccano "X" Series Models

A New System of Model Construction

THE illustrations on this and the opposite page show examples of the models that can be built with the new Meccano "X" Series Outfits. These Outfits contain an entirely new series of parts that

make possible the construction of an almost unlimited range of models. Model-building with these parts is so simple that even our youngest readers will be able to start building immediately. "X" Series parts are perforated with the Meccano system of equidistant holes, but each Strip is provided with three rows of holes, and the perforations are spaced apart $\frac{1}{4}$ " between centres. The Strips are each $\frac{3}{4}$ " wide and are available in the lengths shown in the panel on this page. The Wheel Discs are not provided with bosses, and Screwed Rods are used for Axles. To fix the Discs on the Rods two nuts are used, one being held tightly against each side of the Disc.

The Screwed Rods can be utilised for a number of purposes, and are useful as spacing members instead of Double Angle Strips. If Double Angle Strips are used in addition, they should be bolted in place first so that they are in the correct position before the nuts on the Screwed Rods are tightened up. The 1" Screwed Rods can be used for crank handles by fixing them to $1\frac{1}{4}$ " Discs, and in No. 1 Outfit models a bolt shank may be used instead for the same purpose.

The method of making a pulley wheel is extremely simple. A large pulley can be made by placing two $\frac{3}{4}$ " Discs close together on a Screwed Rod and mounting a large Disc on each side. Two nuts lock the four Discs together to form the complete pulley. A smaller pulley can be made from two $\frac{3}{4}$ " Discs and a Washer; such a pulley is used at the jib head of the Steam Shovel (Fig. 3) and Derrick Crane (Fig. 9). In each case the Screwed Rod carrying the Discs holds the side members of the jib together and does not rotate. A little clearance is allowed between the $\frac{3}{4}$ " Discs and the nuts securing the Strips, so that the pulley rotates freely on the Rod, but the clearance should not be excessive or the cord will slip off the Washer and drop

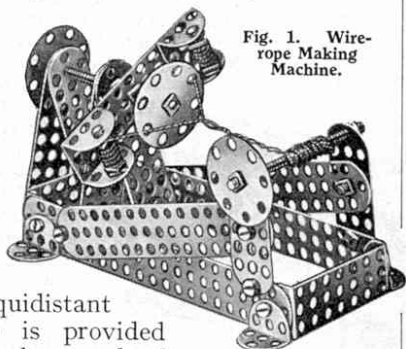


Fig. 1. Wire-rope Making Machine.

between it and one of the side Discs.

Pivoted joints are made by passing a bolt through one part and securing it to the other by two nuts. This will be made clear on reference to Fig. 5. The Double Angle Strip carrying the front pair of wheels is free to swing to steer the model, and the bolt holding this passes through the end hole in the $4\frac{1}{4}$ " Strip and is secured by nuts above and below the Double Angle Strip. The same form of pivot is used for connecting the bucket arm to the jib of the Steam Shovel (Fig. 3), and also at the top and bottom of the vertical member of the Derrick Crane (Fig. 9).

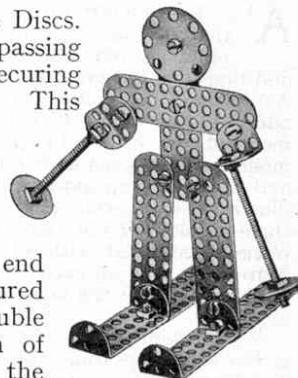


Fig. 2. Ski Runner.

As the chief characteristic of the "X" Series Models is simplicity, no gears are included in the range of parts.

For transmitting the drive between two shafts, built-up pulleys should be used, with a rubber band for the belt. Rubber gives more satisfactory results than cord, as the knot in the latter does not ride easily over the pulleys. A right-angle drive may be obtained by means of friction gearing, and this form of drive transmission gives very good results in the small models.

In Fig. 8 a Roundabout model is shown incorporating a right-angle drive between the shaft of the hand-wheel and the vertical shaft carrying the arms from which the boats are suspended. The Screwed Rod to which the crank handle is fitted carries a $1\frac{1}{4}$ " Disc, and a $\frac{3}{4}$ " Disc on the lower end of the vertical Screwed Rod rests on this part. The weight of the revolving arms and flyboats

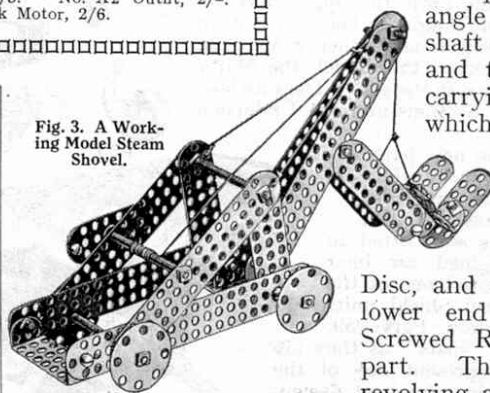


Fig. 3. A Working Model Steam Shovel.

keeps the $\frac{3}{4}$ " Disc pressed closely to the edge of the large Disc, and as the latter is rotated it causes the small Disc to rotate also. By using a driving Disc larger than the driven Disc a "step-up" ratio is provided, that is, one in which the driven shaft rotates faster than the driving shaft. By interchanging the Discs a reduction ratio is obtained, in which the driven shaft rotates slower than the driving shaft.

An interesting mechanical movement is utilised for operating the model Stamping Mill (Fig. 4). The stamp consists of a $\frac{3}{4}$ " Disc mounted on the lower end

Meccano "X" Series Parts		
Part No.	X404	Perforated Strips, $5\frac{1}{4}$ "
" "	X405	" " $4\frac{1}{4}$ "
" "	X407	" " $2\frac{3}{4}$ "
" "	X409	" " $1\frac{1}{4}$ "
" "	X421	Angle Brackets.
" "	X435	Screwed Rods, $2\frac{1}{2}$ "
" "	X438	" " 1"
" "	X455	Double Angle Strips, $1\frac{3}{4}$ " x $1\frac{1}{2}$ "
" "	X457	" " $1\frac{1}{4}$ " x $1\frac{1}{2}$ "
" "	X475	Discs, $1\frac{1}{4}$ "
" "	X477	" " $\frac{3}{4}$ "
" "	X491	Combined Spanner and Screwdriver.
" "	37a	Nuts.
" "	37b	Bolts, 7/32".
" "	38	Washers.
" "	57c	Hooks (loaded).
Prices:	No. X1	Outfit 1/3. No. X2 Outfit, 2/-.
		X Clockwork Motor, 2/6.

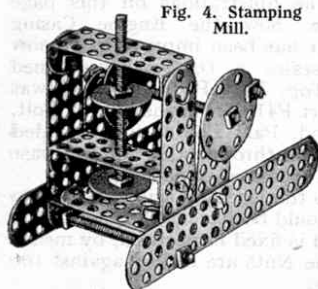


Fig. 4. Stamping Mill.

of a Screwed Rod that is free to slide up and down in its bearings. A $1\frac{1}{4}$ " Disc on the driving Rod is provided with a bolt, the shank of which is arranged to strike the underside of a second $\frac{3}{4}$ " Disc on the sliding Rod. As the large Disc rotates it raises this Rod until the bolt releases the small Disc and allows the stamp to drop. When the hand-wheel is rotated the bolt strikes the small Disc a rapid succession

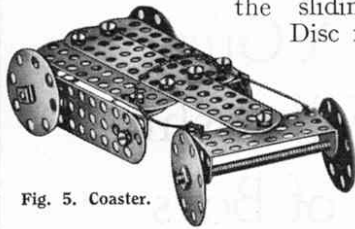
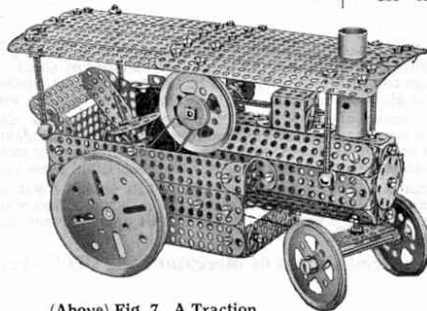


Fig. 5. Coaster.

of blows, so that the stamp moves quickly up and down.

Although only two different "X" Series Outfits are available, there is no limit to the size of the models that can be built. Splendid models of a great variety of types can be produced by combining the contents of several Outfits. The Traction Engine model (Fig. 7) is an example of what can be done in this way, and it also shows how effectively standard Meccano parts can be incorporated in "X" Series models. For this traction engine four No. 2 "X" Outfits are used, in addition to various standard Meccano parts, and the combination produces an extremely realistic appearance. For the road wheels 3" and 2" Pulleys are used, and a further 2" Pulley forms the flywheel. A $1\frac{1}{2}$ " and a 1" Pulley are carried on the rear axle inside the side frames, and the drive from the small Pulley on the driving spindle of the Clockwork Motor is conveyed by a rubber band to the $1\frac{1}{2}$ " Pulley on the axle. The 1" Pulley on this Rod is connected to a built-up pulley on the Screwed Rod carrying the flywheel. A neat chimney is formed from Meccano Sleeve Pieces and Chimney Adaptors.



(Above) Fig. 7. A Traction Engine built by combining the contents of several Outfits. Note the uses of standard Meccano parts. (Right) Fig. 8. A No. 2 Outfit model Roundabout.

Standard Meccano parts will be found very useful in the making of many of the larger "X" Series models, and model-builders will find also that "X" Series parts can be applied usefully in many ways in standard Meccano models.

A Clockwork Motor has been designed specially for driving the small "X" models, and its use in a No. 1 "X" Outfit model is illustrated in Fig. 10. A Pulley Wheel and a rubber driving band are supplied with the Motor, the

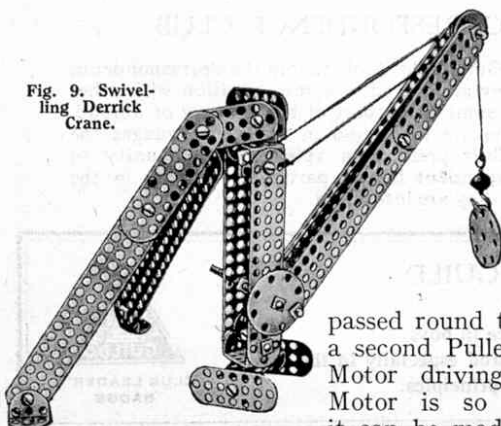


Fig. 9. Swivelling Derrick Crane.

Pulley having a threaded bore so that it can be screwed on the Rod and locked in place by one nut. The rubber band is passed round this Pulley and a second Pulley fixed on the Motor driving shaft. The Motor is so designed that it can be made to form part

of the model into which it is built, and this effects a considerable saving in parts.

An interesting working model is shown in Fig. 1. This represents a type of machine used for making multiple strand wire rope from the single strands of wire. In the model two bobbins are formed from 1" Screwed Rods with two nuts locked together at each end, and placed in position between $\frac{3}{4}$ " x $\frac{1}{2}$ " Double Angle Strips. Fine wire or cord is wound on these Rods, and passes through holes in a $1\frac{1}{4}$ " Disc on the same Rod that carries the $2\frac{3}{4}$ " Strip to which the bobbins are attached. The two cords are tied to a Rod at the other end of the model, and as they are twisted together this Rod is slowly rotated so that the finished "rope" is wound in, and more cord is paid off the bobbins.

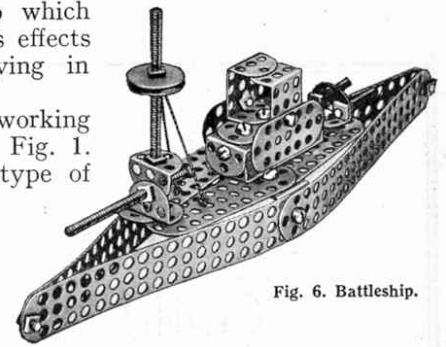
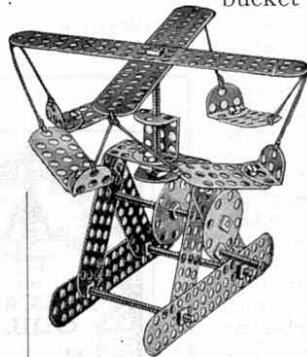


Fig. 6. Battleship.

The Mechanical Excavator (Fig. 3) is operated by a $1\frac{1}{2}$ " Strip forming the crank handle, and attached to a Screwed Rod to which a length of cord is tied. The cord passes over the Pulley at the jib head and is tied to the digger bucket that can be raised or lowered by turning the handle. The nuts at the end of the winding shaft should be placed tightly against the Strips to prevent the cord from coming unwound when not required.



Many types of ship models can be built with "X" Series parts. A realistic Battleship is shown in Fig. 6. The construction of this is quite clear and requires little description. The after pair of guns consist of 1" Screwed

Rods mounted on an Angle Bracket that is made to swivel by a bolt and two nuts.

The Derrick Crane (Fig. 9) is intended to be screwed down to a baseboard, and for this purpose Angle Brackets are placed at the foot of the sheerlegs. The object of this is to prevent the crane from overbalancing when handling a load. The vertical member is pivoted at the top and the bottom in the manner already explained. A $2\frac{1}{2}$ " Screwed Rod is journalled between the vertical Strips and carries a Disc to which a bolt is fixed for a handle. Free rotation of the Screwed Rod is prevented by placing lock nuts close against the Strips, so that although the Rod can be rotated by hand, the load on the hook is insufficient to cause the cord to be paid out. The jib is retained at a fixed angle by two lengths of cord attached to the vertical member of the crane. The sheerlegs are each made by extending a $5\frac{1}{4}$ " Strip with a $2\frac{3}{4}$ " Strip to which a shorter Strip is bolted at an angle. These are held together by two Angle Brackets which carry the pivot for the swivelling post.

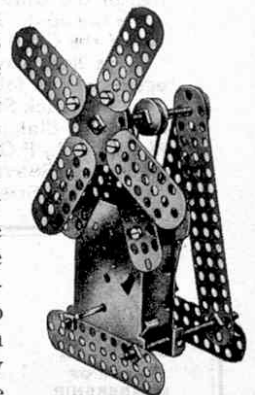
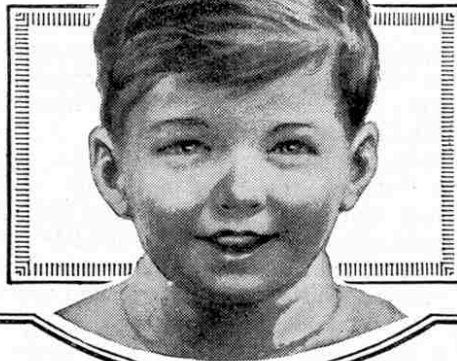


Fig. 10. Windmill with Clockwork Motor.

The Meccano Guild



A Great Fellowship of Boys

President: Mr. Frank Hornby

—Inventor of Meccano

What the Guild Means

The Meccano Guild is an organisation for boys, started at the request of boys, and conducted as far as possible by boys. In joining the Guild a Meccano boy becomes a member of a great brotherhood of world-wide extent, every member of which has promised to observe its three great objects: wherever he happens to be—even in strange countries—he will know he has met a friend whenever he sees the little triangular badge. The Meccano Guild is bringing together Meccano boys all over the world, and is helping them to get the very best out of life.

How it Commenced

More than a million boys derive their greatest indoor pleasure from Meccano. Before the Guild was formed, hundreds of these Meccano boys wrote to us every week. They told us how they wished they could be put into communication with other Meccano boys and how they longed to be able to meet them. They asked if arrangements could be made so that their wishes might become an accomplished fact. We responded to their repeated and increasingly numerous appeals, and as a result the Meccano Guild came into being.

Why You Should Join

Every Meccano boy should be a member of the Meccano Guild. All who have studied its objects must agree that the Guild cannot fail to have a profound effect for good on the lives of its members. It is ready to be of service to each individual member—to help or give advice whenever requested. At the head—guiding and controlling, and taking a personal interest in this great movement—is the President, Mr. Frank Hornby, Inventor of Meccano and Managing Director of Meccano Limited.

The Headquarters of the Meccano Guild are at the Head Offices of Meccano Ltd., Old Swan, Liverpool, England.

THE GUILD BADGE

Membership of the Guild is open to every boy possessing a Meccano Outfit or Hornby Train Set who satisfactorily fills in the application form. The only conditions are that members shall promise to observe the objects of the Guild and to wear their badges on all possible occasions.

The Meccano Guild badge is beautifully enamelled in blue and white. The ordinary form is made for wearing in the lapel of the coat, but brooch badges are issued to members who prefer to pin them in position, and applicants who wish to have this form of badge should indicate this when sending in their forms. In addition to the badge, each member receives a handsome Membership Certificate printed in orange and black. This is illustrated in the centre of the page.

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MECCANO CLUBS

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Every Guild member should join a club if possible, for only in association with other Meccano boys is he able to obtain the greatest fun from his hobby. If the nearest club is too far away for him to join, or if he is unable to join it for any other reason, he should consider the possibility of forming a new club in his own district. A special booklet entitled "How to run a Meccano Club" is now ready, and will be sent to any reader (post free) on receipt of 2d. in stamps.

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THE CORRESPONDENCE CLUB

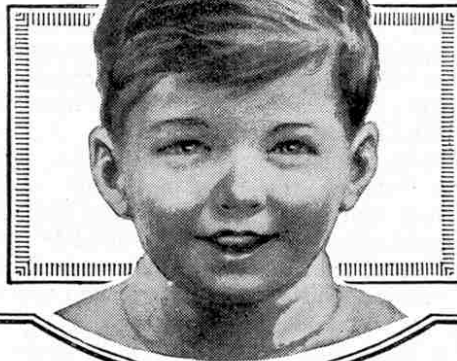
Members of the Guild are eligible to join the Correspondence Club, by which they are placed in communication with other Guild members in some other part of the country or abroad. To those boys who are interested in foreign languages the Correspondence Club presents a splendid opportunity of obtaining a correspondent in the particular country in the language of which they are interested.

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- (1) To make every boy's life brighter and happier.
- (2) To foster clean-mindedness, truthfulness, ambition, and initiative in boys.
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Meccano "X" Series Models

Further Examples of Model Construction

The Meccano "X" Series Outfits contain an entirely new set of parts that make possible the construction of an almost unlimited range of models. Although the "X" parts are on a smaller scale than standard Meccano Parts, they embody the same system of equidistant holes, but the perforations are spaced only $\frac{1}{4}$ " apart and there are three rows to each Strip. This new system of parts simplifies model-building so that even our youngest readers will have no difficulty in constructing working models, which may be set in motion by an "X" Clockwork Motor. The "X" Series Parts can be used in conjunction with standard Meccano parts.

LAST month we gave details of the new Meccano "X" Series Outfits and explained the uses of the various parts. We illustrate here more examples of models built with these small Outfits, and readers who have not yet become acquainted with the "X" Series parts will be able to understand the general principles of model-building with them from the new models described below.

Water-Chute

The fascinating model shown in Fig 1 represents the popular pleasure beach attraction well known to most Meccano boys. The chute is made by bolting a $5\frac{1}{4}$ " Strip to each end of a $2\frac{3}{4}$ " Strip for each side member, and the two long strips so formed are bolted at each end to $\frac{3}{4}" \times \frac{1}{2}"$ Double Angle Strips. At one end Angle Brackets are fixed to the Strips, and the other end is raised by $4\frac{1}{4}"$ Strips braced by the addition of $1\frac{1}{4}"$ Discs. A $2\frac{1}{2}"$ Screwed Rod spaces the lower ends of the Strips, and also holds an Angle Bracket at each end.

The boat is constructed by bolting two $1\frac{3}{4}" \times \frac{1}{2}"$ Double Angle Strips between two $1\frac{3}{4}"$ Strips, and to each Double Angle Strip is bolted an Angle Bracket carrying a further $1\frac{3}{4}"$ Strip. The bolts holding the Angle Brackets in position also hold two $2\frac{3}{4}"$ Strips to the underside of the boat. These Strips fit between the Strips forming the sides of the chute and serve as guides for the boat. To make it slide freely a little oil should be applied to the top edges of the sloping Strips.

Parts required for the Water-Chute model:—4 of No. X404; 2 of No. X405; 4 of No. X407; 4 of No. X409; 6 of No. X421; 1 of No. X435; 2 of No. X455; 2 of No. X457; 2 of No. X475; 28 of No. 37a; 24 of No. 37b.

Pen Rack

The simple model shown in Fig. 2, if put to practical use, will prove a boon to those forgetful Meccano boys who are always mislaying their pens and pencils!

A frame is built up by securing $1\frac{3}{4}" \times \frac{1}{2}"$ Double Angle Strips across the ends of two $4\frac{1}{4}"$ Strips. A $2\frac{3}{4}"$ Strip is bolted to each and made to slope backward, and four $1\frac{3}{4}"$ Strips are secured in the positions shown to support the pens. A piece of cardboard may be fixed in the bottom of the rack so that the frame forms a receptacle for pins, paper clips, etc.

Parts required for the Pen Rack:—2 of No. X405; 2 of No. X407; 4 of No. X409; 2 of No. X455; 8 of No. 37a; 8 of No. 37b.

Spinning Top

The Top (Fig. 3) consists of four $1\frac{1}{4}"$ Discs and two $\frac{3}{4}"$ Discs fixed near the end of a

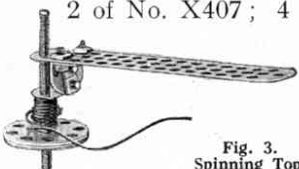


Fig. 3. Spinning Top.

Screwed Rod by two nuts. A $4\frac{1}{4}"$ Strip forms the handle and a bearing for the Rod is made by means of two Angle Brackets. To spin the Top a length of Cord is wound round the Screwed Rod, as shown, and given a sharp pull before the handle is removed.

Parts required for Spinning Top:—1 of No. X405; 2 of No. X421; 1 of No. X435; 4 of No. X475; 2 of No. X477; 6 of No. 37a; 4 of No. 37b; Length of Cord.

Step Ladder

Little description is necessary for the model illustrated in Fig. 4. The Double Angle Strips should be placed in position first, and afterwards a $2\frac{1}{2}"$ Screwed Rod inserted through holes in the side members to carry a $2\frac{3}{4}"$ Strip at each end. A second Screwed Rod connects these Strips lower down, and they are also tied to the ladder by short lengths of cord.

Parts required for Step Ladder:—2 of No. X405; 2 of No. X407; 2 of No. X435; 2 of No. X455; 12 of No. 37a; 4 of No. 37b; short length of Cord.

Catapult

The model Catapult appearing in Fig. 5 will project small missiles quite a considerable distance. The base is made of two $5\frac{1}{4}"$ Strips secured to $1\frac{3}{4}" \times \frac{1}{2}"$ Double Angle Strips, and each carrying two $2\frac{3}{4}"$ Strips. The latter Strips form bearings for the $2\frac{1}{2}"$ Screwed Rod that carries the moving arm. Each end of the Rod is fitted with lock-nuts to hold it in place.

Two $5\frac{1}{4}"$ Strips are spaced apart at one end by a $\frac{3}{4}" \times \frac{1}{2}"$ Double Angle Strip and at the other by a 1" Screwed Rod. A $4\frac{1}{4}"$ Strip is placed between them and secured by Angle Brackets, and a $\frac{3}{4}" \times \frac{1}{2}"$ Double Angle Strip and two Angle Brackets are fixed at the top to form a receptacle for missiles. Several rubber bands are placed between the 1" Screwed Rod at the lower end of the arm, and a Rod fixed to the $5\frac{1}{4}"$ Strips of the base.

Small objects such as bolts should be placed at the top of the arm, which is then depressed. When it is released, the rubber bands bring it up sharply until the lower end strikes the $2\frac{1}{2}"$ Screwed Rod and the missiles are shot forward.

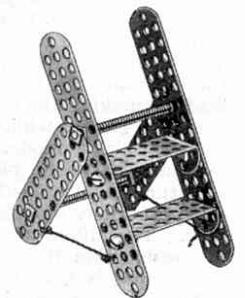


Fig. 4. Step Ladder.



(Above) Fig. 1. Water-Chute. (Below) Fig. 2. A useful Pen Rack.

Parts required for Catapult:—4 of No. X404 ; 1 of No. X405 ; 4 of No. X407 ; 4 of No. X421 ; 2 of No. X435 ; 1 of No. X438 ; 2 of No. X455 ; 2 of No. X457 ; 27 of No. 37a ; 11 of No. 37b ; Rubber Bands.

Coster's Barrow

To construct this model (Fig. 6) the $4\frac{1}{4}$ " Strips forming the sides should first be secured to a $1\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strip, and the same securing bolts hold the $1\frac{3}{4}$ " Strips forming the legs of the barrow. The $2\frac{3}{4}$ " Strips at the other end are spaced apart by a Double Angle Strip, and their lower ends form bearings for a Screwed Rod carrying a $1\frac{1}{4}$ " Disc at each end. The $2\frac{3}{4}$ " Strips are braced by the addition of $1\frac{3}{4}$ " Strips held in place by a Screwed Rod, which also adds additional strength to the side members. Two $2\frac{3}{4}$ " Strips serve as the platform and are fixed at one end to the Double Angle Strip, and at the other to Angle Brackets.

Parts required for Coster's Barrow:—2 of No. X405 ; 4 of No. X407 ; 4 of No. X409 ; 2 of No. X421 ; 2 of No. X435 ; 2 of No. X455 ; 2 of No. X475 ; 18 of No. 37a ; 10 of No. 37b.

Jack Knife Bridge

In actual practice bridges of this type are used for spanning waterways where it is necessary to raise the roadway for river traffic. In Fig. 7 is illustrated a model of one of these bridges. The central vertical member is made of two $4\frac{1}{4}$ " Strips connected at the top by two $\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strips which are spaced apart by a Washer. A Screwed Rod is used for spacing the lower ends apart and carries two Angle Brackets; and a second Screwed Rod passed through the Strips carries two pairs of $5\frac{1}{4}$ " Strips that form the sides of the lifting roadway, and are held at their outer ends by Screwed Rods. The Rod about which they pivot carries a handwheel consisting of a $1\frac{1}{4}$ " Disc and 1" Screwed Rod, and forms the winding "drum" for the cords which raise the bascules. Pieces of cardboard should be placed between the $5\frac{1}{4}$ " Strips for the roadway.

The end piers are made of $1\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strips and $1\frac{3}{4}$ " Strips, and if sufficient parts are available approaches may be made by securing longer Strips in position for the sides.

Parts required for Jack Knife Bridge:—4 of No. X404 ; 2 of No. X405 ; 4 of No. X409 ; 6 of No. X421 ; 4 of No. X435 ; 1 of No. X438 ; 2 of No. X455 ; 2 of No. X457 ; 1 of No. X475 ; 38 of No. 37a ; 15 of No. 37b ; a short length of Cord ; Cardboard.

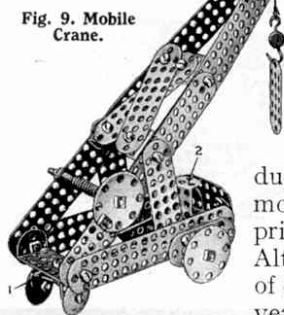


Fig. 9. Mobile Crane.

Beam Engine

A type of steam engine that was most successful in the early days of steam is reproduced in model form in Fig. 8. This model shows the general working principles of the beam engine. Although rarely used now, this type of engine proved its utility for many years until replaced by the modern

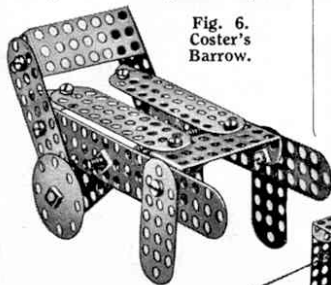
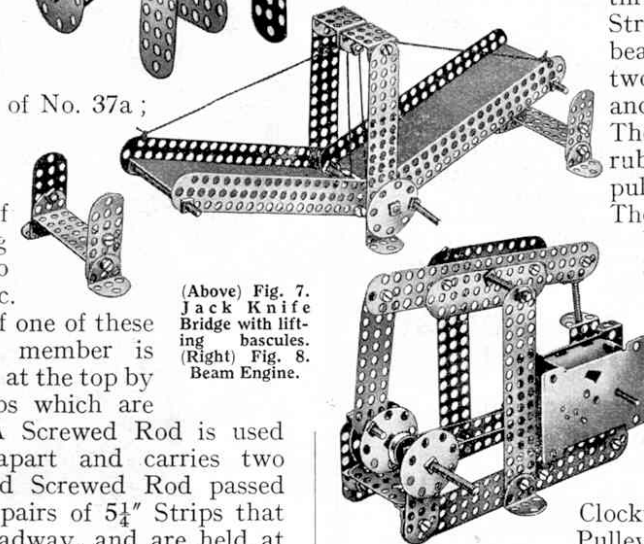


Fig. 6. Coster's Barrow.



(Above) Fig. 7. Jack Knife Bridge with lifting bascules. (Right) Fig. 8. Beam Engine.

horizontal engines that occupy far less space.

To build the model the frame should first be put together, and for the base of this two $5\frac{1}{4}$ " Strips are spaced apart $1\frac{3}{4}$ ". The Double Angle Strip at one end supports a second similar Strip representing the cylinder. A Screwed Rod slides in this and carries at its upper end an Angle Bracket that is pivoted to the beam. The latter is made of one $5\frac{1}{4}$ " Strip and two $2\frac{3}{4}$ " Strips, and a $2\frac{1}{2}$ " Screwed Rod held in the centre is supported at each end on $4\frac{1}{4}$ " Strips that are bolted vertically to the base.

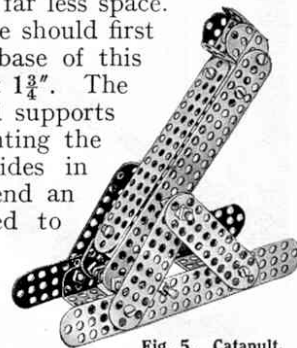


Fig. 5. Catapult.

Bearings for the crankshaft are formed by two $1\frac{3}{4}$ " Strips, and the crankshaft is made up of a $2\frac{1}{2}$ " and a 1" Screwed Rods, each of which carries a $1\frac{1}{4}$ " Disc at its inner end. The two Discs serve as cranks and are connected by a 1" Rod that forms the crank-pin. This is held in position by two nuts at each end and passed through the end hole of a $2\frac{3}{4}$ " Strip, pivoted to the end of the beam. The crankshaft also carries two Discs serving as a flywheel, and a $\frac{1}{2}$ " Pulley fixed by a nut. The Pulley is connected by a rubber band to the driving pulley on the Clockwork Motor. The Motor is fixed in position by bolting it to the Double Angle Strips and an Angle Bracket.

Parts required for the Beam Engine:—3 of No. X404 ; 2 of No. X405 ; 3 of No. X407 ; 3 of No. X409 ; 6 of No. X421 ; 3 of No. X435 ; 2 of No. X438 ; 2 of No. X455 ; 4 of No. X477 ; 39 of No. 37a ; 16 of No. 37b.

Clockwork Motor complete with Pulley and Driving Band.

Mobile Crane

The travelling body is made of two $4\frac{1}{4}$ " Strips that are bolted at each end to $1\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strips. At the front a $1\frac{3}{4}$ " Strip secured to Angle Brackets forms the dashboard. Two $1\frac{3}{4}$ " Strips bolted to the side members carry a $2\frac{1}{2}$ " Screwed Rod, on each end of which is a $1\frac{1}{4}$ " Disc. Two $\frac{3}{4}$ " Discs are free to rotate on bolts that are each fixed by two nuts to the $\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strip 1, which is pivotally attached to the Double Angle Strip holding the sides together. Two cords are attached to the part 1 and also to a similar part 2, which is pivoted by a 1" Rod to the Double Angle Strip at the front of the model.

Parts required for Mobile Crane:—4 of No. X404 ; 2 of No. X405 ; 4 of No. X407 ; 4 of No. X409 ; 6 of No. X421 ; 2 of No. X435 ; 2 of No. X438 ; 2 of No. X455 ; 2 of No. X457 ; 3 of No. X475 ; 2 of No. X477 ; 39 of No. 37a ; 23 of No. 37b ; 1 of No. 38 ; 1 of No. 57c ; Short length of Cord.

Machine Gun

Parts required:—4 of No. X407 ; 1 of No. X409 ; 2 of No. X421 ; 1 of No. X435 ; 2 of No. X455 ; 1 of No. X477 ; 13 of No. 37a ; 3 of No. 37b.

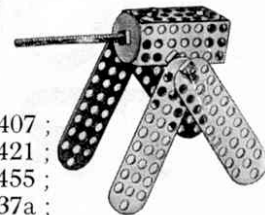


Fig. 10. Machine Gun.

Hornby Locomotives are the
Longest Running and
Strongest Pulling
Locomotives
in the
World

NEW LOCOMOTIVES FOR OLD

Boys! Here is a plan to secure a fine new Hornby Locomotive in exchange for your old one.

First of all, study carefully the latest Hornby Train Catalogue, and select from it the new up-to-date Hornby Locomotive you want. Then pack up your old Hornby Locomotive and send it to us addressed "Special Service Department," Meccano Ltd., Old Swan, Liverpool. Your order for the new Locomotive and the necessary remittance should be enclosed. You can easily ascertain how much to send by deducting the part exchange allowance indicated in the list given below from the price of the new Locomotive, and adding 1/- for postage on the new model you purchase. It is important to note that the catalogue price of the new Hornby Locomotive you purchase **must not be less than double the Part Exchange allowance made for your old Locomotive.**

If you prefer to do so, you can effect the exchange through your dealer, who will be very pleased to give you a descriptive leaflet and any other information you require.

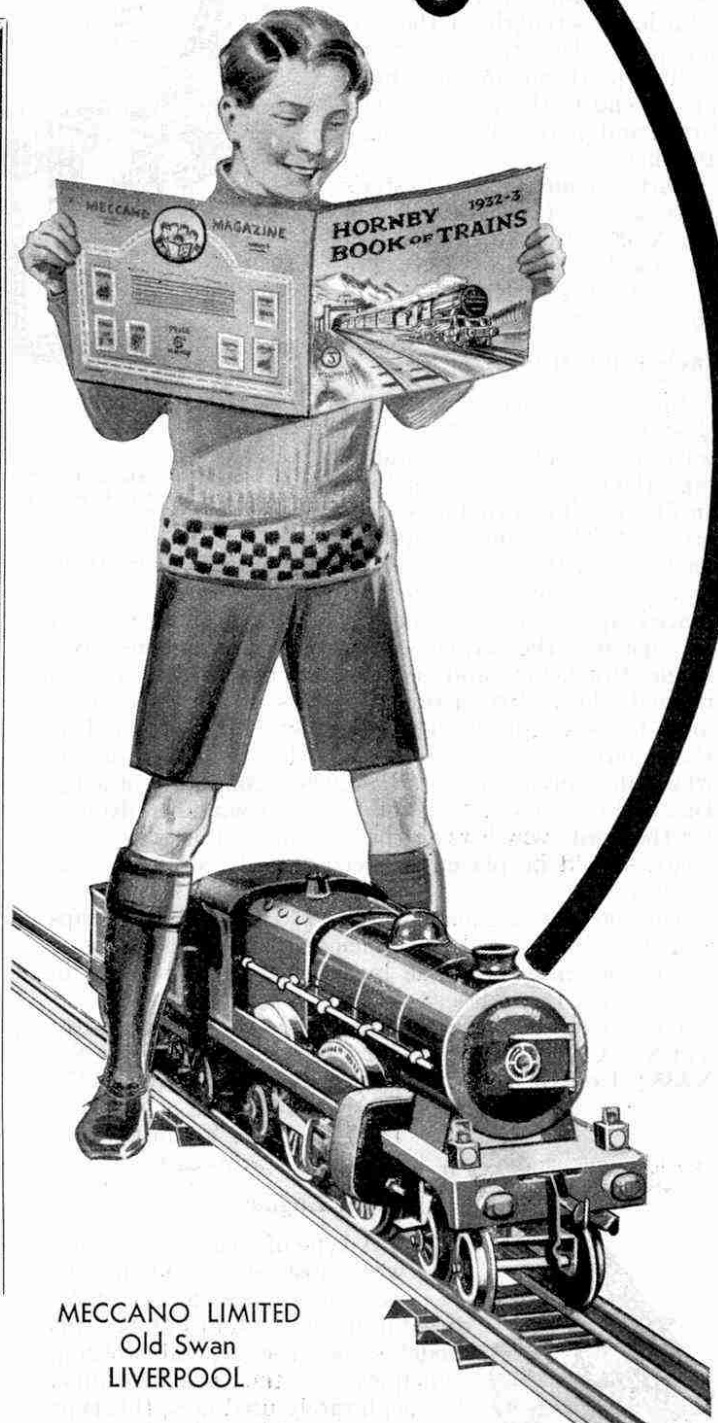
EXCHANGE YOUR OLD HORNBY LOCOMOTIVE TO-DAY!

Part Exchange Allowances for Hornby Locomotives

CURRENT TYPES		
M2930 Locomotive	...	1/-
M0 Locomotive	...	1/4
M1/2 Locomotive No. 3031	...	2/3
M3 Tank Locomotive	...	3/9
No. 0 Locomotive	...	5/3
No. 1 Tank Locomotive	...	6/3
No. 1 Locomotive	...	6/3
No. 1 Special Locomotive	...	8/3
No. 1 Special Tank Locomotive	...	8/3
No. 2 Special Locomotive	...	11/3
No. 2 Special Tank Locomotive	...	11/3
No. 1 Electric Tank Locomotive, Permanent Magnet	...	12/6
No. 2 Electric Tank Locomotive	...	18/9
No. 3E Locomotive	...	18/9
No. 3E Riviera "Blue" Locomotive	...	18/9
No. 3C Locomotive	...	13/9
No. 3C Riviera "Blue" Locomotive	...	13/9
Metropolitan C Locomotive	...	11/3
Metropolitan	...	20/-
OBSOLETE TYPES		
George V Locomotive	{ These models were identical }	3/3
No. 00 Locomotive	{ identical }	4/3
M3 Locomotive	...	5/3
Zulu Locomotive	...	6/3
Zulu Tank Locomotive	...	6/3
No. 2 Locomotive	...	10/-
No. 2 Tank Locomotive	...	11/3
No. 1 Locomotive, fitted for Hornby Control	...	7/6
No. 1 Tank Locomotive, fitted for Hornby Control	...	7/6
No. 2 Locomotive, fitted for Hornby Control	...	11/3
No. 2 Tank Locomotive, fitted for Hornby Control	...	12/6
Metropolitan	...	20/-

HORNBY TRAINS

BRITISH AND GUARANTEED



MECCANO LIMITED
Old Swan
LIVERPOOL

"New Year" Model-Building Contest

For Models Built from Standard Meccano Parts

There must be many thousands of boys who received presents of Meccano Outfits at Christmas and are now enjoying their first experience of the pleasures of model-building. We wish to encourage these newcomers to Meccanoland to use their imagination and inventiveness in building models from their own ideas, and accordingly we announce a competition in which prizes are offered for the most original and best-built models sent to us. Every competitor has an equal chance in this Contest, no matter what size of Outfit he possesses, and the conditions of entry have been made as simple as possible.

All a competitor has to do is to think of a new model and then to set to work to construct it as neatly and realistically as possible from standard Meccano parts.

When the model is completed it is only necessary to obtain either a photograph or a good drawing of it and send this to us. *The actual model must not be sent.* The photograph or drawing need not be the competitor's own work, but it is absolutely essential that the model itself should be the result of his or her own unaided efforts. Entry forms are not required and there are no fees to be paid. The competition is open to readers of all ages living in any part of the world.

The judges will award the prizes for those models that are the most original in subject and are neatly designed and proportioned, and which are built on correct mechanical principles.

The Contest will be divided into the following three Sections:—A, for competitors living in the British Isles and over 14 years of age; B, for those living in the British Isles and under 14; C, for competitors of all ages living Overseas. A separate set of prizes as announced in the accompanying panel on this page will be awarded in each Section.

Models of any kind whatever may be submitted, so that competitors have a very wide choice of subjects. Those that really "work," or that may be put to some practical use, will stand a better chance of winning prizes than models that are not built to work or which do not reproduce the movements of their prototypes. Any number of parts may be used in building models, but good solid construction will count more than mere size alone.

Before posting their entries competitors must take care to write their age, name and full address clearly on the back of each photograph or drawing submitted. Entries from competitors living in the British Isles must be marked with a large letter "A" or "B" indicating the Section for which they are intended. Overseas entries must be marked with a letter "C."

Home competitors entering Sections A and B must post their entries in time to reach this office not later than 28th February, 1933. The closing date for Overseas competitors is 29th April, 1933. Envelopes should be addressed "New Year" Model-Building Contest, Meccano Ltd., Binns Road, Old Swan, Liverpool.

"New Year" Model-Building Contest

The prizes in Sections A and C are:—
First Prize, Cheque for £3-3s.-0d.
Second Prize, Cheque for £2-2s.-0d.
Third Prize, goods value £1-1s.-0d.
Ten Prizes of goods value 5/-.
Ten Prizes of "Famous Trains," by C. J. Allen.

The prizes in Section B are:—
First Prize, Cheque for £2-2s.-0d.
Second Prize, goods value £1-1s.-0d.
Third Prize, goods value 10s.-6d.
Ten Prizes of "Famous Trains" by C. J. Allen.
Ten Prizes of Meccano Engineer's Pocket Books.

Prizes for Models Built from Meccano "X" Series Parts

Large numbers of readers will now be proud possessors of the new Meccano "X" Series Outfits, and for their benefit we announce this month a special model-building competition. In this Contest only models built entirely from "X" Series parts may be submitted; models built partly of standard Meccano parts are not eligible.

To enter the Contest it is only necessary to build a new model of any kind whatever, and then to send either a photograph or a drawing of the model to us. The model must be built by the competitor himself, but the drawings or photographs may be prepared by the competitor's parents or friends if necessary. *The actual model must not be sent.*

The Contest will be divided into three Sections—A, for competitors under 10 living in the British Isles; B, for competitors over 10 living in the British Isles; and C, for competitors of all ages living Overseas.

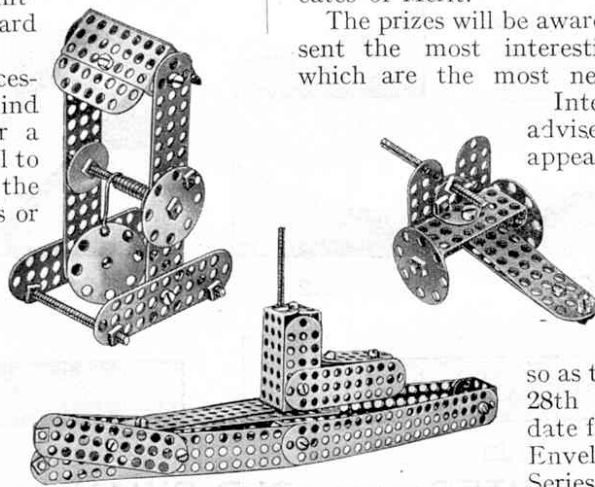
The following prizes will be

awarded in each Section:—First, Meccano or Hornby goods value £2-2s.; Second, goods value £1-1s.; Third, goods value 10/6. Ten Prizes of goods value 5/-. Ten Prizes of Meccano Engineer's Pocket Books and Certificates of Merit.

The prizes will be awarded for those models that represent the most interesting and novel subjects and which are the most neatly and solidly constructed.

Intending competitors will be well advised to refer to the article that appeared on pages 960 and 961 of the December 1932 "M.M.," and also the article on page 48 of this issue, which contain hints on building models with the "X" Series parts.

Competitors in Sections A and B must post their entries so as to reach this office not later than 28th February, 1933. The closing date for Section C is 29th April, 1933. Envelopes should be addressed "X Series" Model-Building Contest, Meccano Ltd., Old Swan, Liverpool.



Models of a Well Windlass, Submarine and Field Gun, built from Meccano "X" Series Parts.

Meccano "X" Series Models

Further Examples of Model Construction

The Meccano "X" Series Outfits contain an entirely new set of parts that make possible the construction of an almost unlimited range of models. Although the "X" parts are on a smaller scale than standard Meccano Parts, they embody the same system of equidistant holes, but the perforations are spaced only $\frac{1}{4}$ " apart and there are three rows to each Strip. This new system of parts simplifies model-building so that even our youngest readers will have no difficulty in constructing working models, which may be set in motion by an "X" Clockwork Motor. The "X" Series Parts can be used in conjunction with standard Meccano parts.

THIS month we illustrate the third group of examples of models built with the new Meccano "X" Series Outfits. Readers who have not yet become acquainted with the "X" Series parts will be able to understand the general principles of model-building with them from the new examples given below.

Glider

The simple glider shown in Fig. 1 is built by forming the fuselage from two $1\frac{3}{4} \times \frac{1}{2}$ " Double Angle Strips bolted together and extended by a pair of $4\frac{1}{4}$ " Strips. The wings consist of four $2\frac{3}{4}$ " Strips, and a short Strip represents the tail plane, with an Angle Bracket fixed in place to serve as a rudder.

Parts required for Model Glider :
 2 of No. X405 ; 4 of No. X407 ;
 1 of No. X409 ; 1 of No. X421 ;
 2 of No. X455 ; 5 of No. 37a ;
 5 of No. 37b.

Double Arm Signal

This model will be found useful by model railway enthusiasts. It is a type of signal used in cases where the arrangement of the track necessitates the placing of "distant" and "home" signals together. From these the engine driver is able to ascertain if the next "home" signal is at "line clear," and adjust his speed accordingly.

The signal post is attached to the base by a $\frac{3}{4} \times \frac{1}{2}$ " Double Angle Strip bolted to the larger Double Angle Strip forming the end of the base frame. Two pairs of $1\frac{3}{4}$ " Strips carry a $2\frac{1}{2}$ " Screwed Rod on which the operating levers are pivoted. Each lever, consisting of a $2\frac{3}{4}$ " Strip, is held in place by lock-nuts on each side. The nuts should be placed close against the sides of the Strips, but should not grip them firmly. A second Screwed Rod limits the movement of the levers, to the lower end of which cords are attached and tied to the signals.

The signal arms are pivoted on bolts fixed to the vertical post. They should be free to move up and down so that the

weight of the signal arm keeps the cord tight, and drops the signal as soon as the lever is moved over. The cords are passed beneath a third $2\frac{1}{2}$ " Screwed Rod immediately behind the post.

Parts required for Double Arm Signal : 3 of No. X404 ; 2 of No. X405 ; 4 of No. X407 ; 4 of No. X409 ; 3 of No. X435 ; 2 of No. X455 ; 1 of No. X457 ; 33 of No. 37a ; 13 of No. 37b. Cord.

Truck Propelled by Hand Lever

In Fig. 3 is shown a type of truck that is propelled by operating a hand lever to and fro. The steering is operated by a loop of cord. The frame is made by spacing two $5\frac{1}{4}$ " Strips apart at one end by a $1\frac{3}{4} \times \frac{1}{2}$ " Double Angle Strip. At the opposite end the two Strips each carry a $1\frac{3}{4}$ " Strip fixed at right-angles, and an Angle Bracket. The Brackets are connected by a short Strip, and a seat is made from two $2\frac{3}{4}$ " Strips. The front wheels are mounted on a Screwed Rod journaled in a $1\frac{3}{4} \times \frac{1}{2}$ " Double Angle Strip that is pivoted at its centre to the front of the frame. A length of Cord is tied at both ends to the pivoted Strip.

The rear wheels are arranged in the following manner. The left-hand wheel is fixed on a Screwed Rod passed through the vertical $1\frac{3}{4}$ " Strip at the rear of the model, and retained in position by lock-nuts. The other wheel is held in a similar manner, but the Rod carries on the inside a $\frac{3}{4} \times \frac{1}{2}$ " Double Angle Strip. As can be seen in the illustration, this forms a crank that is connected to the lower end of the hand-lever by a $4\frac{1}{4}$ " Strip.

Parts required for Hand Car : 3 of No. X404 ; 1 of No. X405 ; 4 of No. X407 ; 4 of No. X409 ; 4 of No. X421 ; 2 of No. X435 ; 2 of No. X438 ; 2 of No. X455 ; 1 of No. X457 ; 4 of No. X475 ; 36 of No. 37a ; 15 of No. 37b. Cord.

Mechanical Excavator

Excavators of the type reproduced in Fig. 4 are used extensively wherever digging operations are carried out on a large scale. The actual machines are capable of handling up to 16 tons of material at one scoop, and are of immense value in the

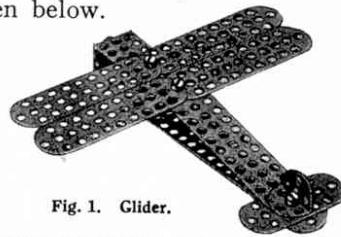


Fig. 1. Glider.

Meccano "X" Series Parts

Part No.	X404	Perforated Strips, $5\frac{1}{4}$ "
"	X405	" " $4\frac{1}{4}$ "
"	X407	" " $2\frac{3}{4}$ "
"	X409	" " $1\frac{3}{4}$ "
"	X421	Angle Brackets.
"	X435	Screwed Rods, $2\frac{1}{2}$ "
"	X438	" " 1"
"	X455	Double Angle Strips, $1\frac{3}{4} \times \frac{1}{2}$ "
"	X457	" " $\frac{3}{4} \times \frac{1}{2}$ "
"	X475	Discs, $1\frac{1}{2}$ "
"	X477	" " $\frac{1}{2}$ "
"	X491	Combined Spanner and Screwdriver.
"	37a	Nuts.
"	37b	Bolts, 7/32".
"	38	Washers.
"	57c	Hooks (loaded).

Prices : No. XI Outfit, 1/3. No. X2 Outfit, 2/-.
 X Clockwork Motor, 2/6.

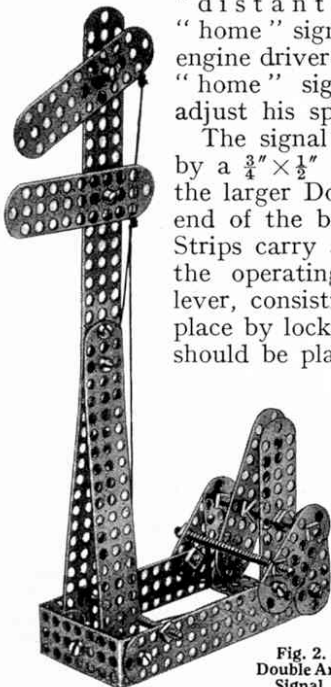


Fig. 2. Double Arm Signal.

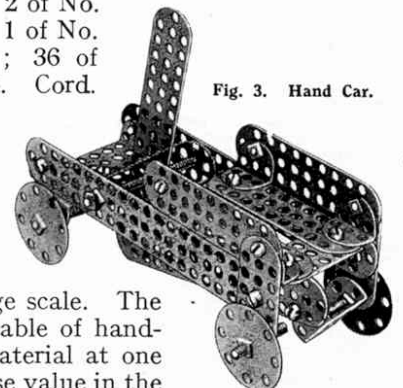


Fig. 3. Hand Car.

construction of canals, cuttings, etc.

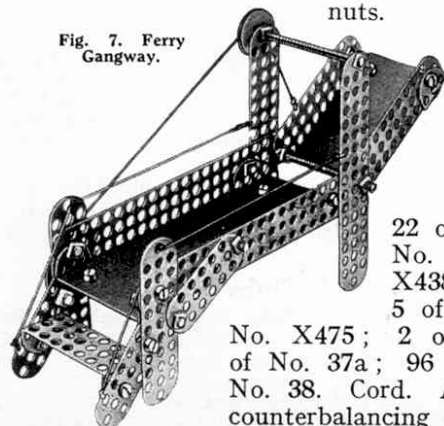
The model can be built by combining the contents of four No. X2 Outfits. The travelling base and superstructure are shown separately in Fig. 5, which gives a good idea of the construction of the model. The base is made by forming angle girders from two pairs of $4\frac{1}{4}$ " Strips, and connecting them by $2\frac{3}{4}$ " Strips. Each wheel is made up of three $1\frac{1}{4}$ " Discs carried on a 1" Rod secured to the sides of the truck. The Discs are held on the Rods by means of lock-nuts.

The sides of the superstructure are made by extending $5\frac{1}{4}$ " Strips with $2\frac{3}{4}$ " Strips, and as will be seen from Fig. 5 these compound strips are connected by $2\frac{3}{4}$ " Strips fitted at each end with Angle Brackets. To one of these short Strips a $\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strip is fixed, and the jib is secured to it. For the jib two pairs of $5\frac{1}{4}$ " Strips are used and spaced apart at the upper end by a further Double Angle Strip. The jib is supported by two cords that are tied to the triangular frames, and the tops of the frames are connected by a $2\frac{1}{2}$ " Screwed Rod. Two $5\frac{1}{4}$ " Strips are bolted at the base of the jib and their other ends are supported by $1\frac{3}{4}$ " Strips secured vertically to a $\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strip bolted to the third $2\frac{3}{4}$ " Strip from the rear of the model. Two $4\frac{1}{4}$ " Strips are fitted to the upper edge of the $5\frac{1}{4}$ " Strips, and a $2\frac{1}{2}$ " Screwed Rod is journalled between them, and carries a hand-wheel formed from a $1\frac{1}{4}$ " Disc and a bolt. The Rod carries the cord that passes over a built-up pulley at the jib head and is tied to the digger bucket.

The bucket is made from $1\frac{3}{4}$ " Strips bolted to $1\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strips. A $\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strip secures the bucket to the digger arm, consisting of $4\frac{1}{4}$ " Strips and pivoted to the jib by bolts and lock-nuts. The bottom of the bucket is hinged by tying it with loops of cord, and a $2\frac{1}{2}$ " Screwed Rod slides in a Double Angle Strip. This Rod forms the bolt, and engages a $1\frac{3}{4}$ " Strip at the front of the bucket to hold the bottom in position. A cord is attached to the bolt and this is pulled when it is required to discharge the contents of the bucket.

The superstructure pivots on a Double Angle Strip that can be seen in Fig. 5. The bolt in the centre hole of this Strip is passed through the centre of the travelling base and provided with lock-nuts.

Fig. 7. Ferry Gangway.



Parts required for Mechanical Excavator: 16 of No. X404; 6 of No. X405; 11 of No. X407; 15 of No. X409; 22 of No. X421; 4 of No. X435; 8 of No. X438; 4 of No. X455; 5 of No. X457; 15 of No. X475; 2 of No. X477; 149 of No. 37a; 96 of No. 37b; 4 of No. 38. Cord. A small weight for counterbalancing the jib.

A Simple Type of Travelling Crane

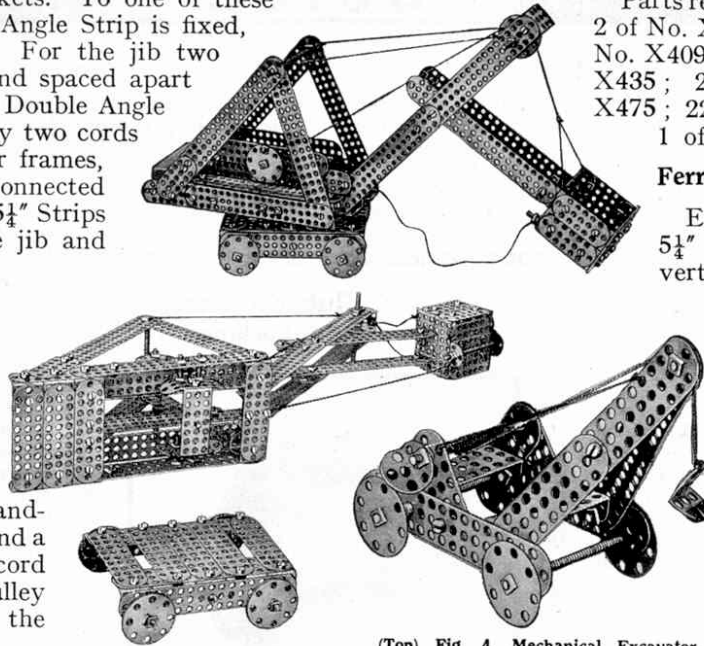
To construct the miniature crane illustrated in Fig. 6, two $4\frac{1}{4}$ " Strips are spaced apart by two $1\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strips. The jib is made of two pairs of $2\frac{3}{4}$ " Strips, which are held together at the top by a bolt, but spaced by a Washer to allow the hoisting cord to pass between them. The winding shaft is journalled between $1\frac{3}{4}$ " Strips at the rear of the crane, and an Angle Bracket forms a crank handle. Two short cords secured to the $1\frac{3}{4}$ " Strips are also tied to the jib to support it. A hook is formed from an Angle Bracket and bolt, and the entire model travels on four wheels fixed to $2\frac{1}{2}$ " Screwed Rods.

Parts required for Travelling Crane: 2 of No. X405; 4 of No. X407; 4 of No. X409; 2 of No. X421; 3 of No. X435; 2 of No. X455; 4 of No. X475; 22 of No. 37a; 10 of No. 37b; 1 of No. 38. Cord.

Ferry Gangway

Each side is built up from a $5\frac{1}{4}$ " Strip with a $4\frac{1}{4}$ " Strip fixed vertically at one end and a $2\frac{3}{4}$ " Strip at the other end. The two sides are held together by a Double Angle Strip and $2\frac{1}{2}$ " Screwed Rods. A step is formed from a Double Angle Strip bolted between two $1\frac{3}{4}$ " Strips. Cardboard is bolted in position to form a platform. One of the $2\frac{1}{2}$ " Rods carries two $2\frac{3}{4}$ " Strips that are free to pivot about the Rod, and the ends of the Strips are connected by a $1\frac{3}{4}$ " Strip fixed by Angle Brackets.

(Top) Fig. 4. Mechanical Excavator. (Left) Fig. 5. View of Excavator before final assembly. (Right) Fig. 6. Travelling Crane.



A piece of cardboard is bolted to these.

To operate the gangway a lever is fitted on the right-hand side, as can be seen in Fig. 7. This consists of a $2\frac{3}{4}$ " Strip fitted with a bolt and carried on a $2\frac{1}{2}$ " Screwed Rod. The other end of the Rod carries a $1\frac{1}{4}$ " Disc connected by cord to the hinged portion. The cord passes over a pulley consisting of two $\frac{3}{4}$ " Discs placed on either side of a Washer, and held in position on the $2\frac{1}{2}$ " Rod by locknuts.

Parts required for Ferry Gangway: 2 of No. X404; 2 of No. X405; 4 of No. X407; 4 of No. X409; 4 of No. X421; 3 of No. X435; 2 of No. X455; 1 of No. X475; 2 of No. X477; 35 of No. 37a; 17 of No. 37b; 1 of No. 38. Cardboard.

Jumping Jack

For the arms $2\frac{3}{4}$ " Strips are used and are pivoted on a bolt that is fixed by two nuts to the body, which is represented by a $4\frac{1}{4}$ " Strip. The leg joints are pivoted in a similar manner. A head is made from a $1\frac{1}{4}$ " Disc and a length of cord is attached to it, further cords being attached to the arms and legs.

Parts required for Jumping Jack: 1 of No. X405; 4 of No. X407; 3 of No. X409; 1 of No. X475; 1 of No. X477; 9 of No. 37a; 5 of No. 37b. Cord.

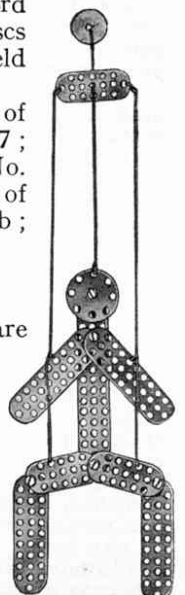


Fig. 8. Jumping Jack.

Model-Building Contest Results

By Frank Hornby

"X Series" Competition

The illustrations on this page show examples of models that can be made with the Meccano X Series Outfits. They were built by competitors in the "X Series" Model-Building Contest, and each has won a handsome prize for its builder. As this was the first competition organised specially for models built entirely from X Series parts, I did not expect a very large number of entries or a very high standard of work. I am glad to say, however, that I was quite surprised with the fine collection of models submitted, and with the ingenuity and clever manner in which the parts had been used. Some of the models sent in were obviously the work of inexperienced model-builders, but the majority were well constructed, and showed that really interesting models can be made from the X Series parts.

The list of principal prizewinners in the Contest is as follows.

Section A (for competitors under 10 years of age).

FIRST PRIZE, Meccano or Hornby goods value £2-2s.: B. George, Oswestry; **SECOND PRIZE**, goods value £1-1s.: P. le Fevre, Aldeby, Suffolk. **THIRD PRIZE**, goods value 10/6: R. Adams, Ipswich.

FIVE PRIZES of Meccano or Hornby goods value 5/-: N. Henton, Thornton Heath, Surrey; R. N. Atkins, Dover; G. Toft, Oldham; D. Smith, London, W.5; F. Morley, Hinckley, Lincs.

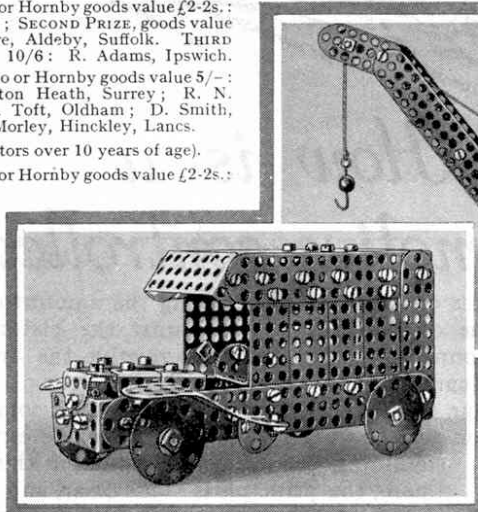
Section B (for competitors over 10 years of age).

FIRST PRIZE, Meccano or Hornby goods value £2-2s.:

H. Howell-Jones, Gt. Crosby, Liverpool. **SECOND PRIZE**, goods value £1-1s.: K. Chapman, Poole, Dorset. **THIRD PRIZE**, goods value 10/6: C. Spencer, Warsash, Hants.

TEN PRIZES of Meccano or Hornby goods value 5/-: D. A. Limpus, Penryn, Cornwall; J. A. Kennett, Richmond, Surrey; H. Skinner, Deal, Kent; M. K. Smith, Clare Priory, Suffolk; H. Sorton, Salford; J. Foster, Tonbridge, Kent; H. Beard, Oldham; E. Parvin, Selby, Yorks.; Miss Doreen Daniel, Staunton, Glos.; E. B. Bottomley, Manchester.

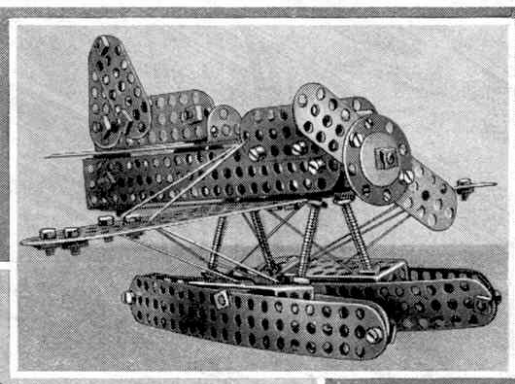
Three of the chief prizewinning models are illustrated here. The first is a railway breakdown crane, which won First Prize for Hugh Howell-Jones of Liverpool. The illustration shows clearly the sound constructional details of the chassis and jib, and I think



readers will agree that a very neat and realistic appearance has been obtained.

A model of a quite different type is the motor delivery van sent in

by K. Chapman, of Poole, and a close examination of the accompanying illustration will reveal many clever applications of the X Series parts. C. Spencer, the winner of Third Prize, submitted the model seaplane illustrated. This is a splendid piece of work, and would have



won a bigger prize but for the fact that in judging the models the judges had to take into consideration the ages of the competitors, and as Spencer is considerably older than Howell-Jones and Chapman, due allowance had to be made in allocating the prizes.

Eric Parvin sent a miniature model of a motor fire engine. It is fitted with a hose reel made from two $\frac{3}{8}$ " Discs and a Screwed Rod, and the ladder is formed from two $\frac{1}{4}$ " Strips, between which are

Three prizewinning examples of models built from Meccano X Series parts. (Top) Seaplane (C. Spencer); (Centre) Railway Breakdown Crane (H. Howell-Jones); (Bottom) Delivery Van (K. Chapman).

placed 1" Screwed Rods to represent the rungs.

Another interesting entry is a motor lorry and breakdown crane sent by Barrie George, Oswestry, who was awarded First Prize in Section A. Probably the most original model in this Section of the Contest is that which won Second Prize for Peter le Fevre. It is a miniature working lawn mower, and is mounted on wheels formed with two $1\frac{1}{4}$ " and two $\frac{3}{8}$ " Discs. The knife unit is represented by a Double Angle Strip lock-nutted on a $2\frac{1}{2}$ " Screwed Rod that forms the axle of the small Discs.

Third Prize in Section A was awarded for a portable crane.

"Familiar Home Objects" Competition. (Overseas Section)

As almost every home contains dozens of objects suitable for modelling in Meccano, I had looked forward to a record entry in this Contest, but unfortunately the number of models submitted did not come up to expectations. The entries that were received however, are quite interesting and I think, more original than those submitted in the Home Section. The principal prizes have been awarded as follows:—

FIRST PRIZE, cheque for £3-3s.: T. C. Brook, Merrivale, Natal, S.A. **SECOND PRIZE**, Meccano or Hornby goods value £2-2s.: D. W. Johnston, Wellington, N.Z. **THIRD PRIZE**, goods value £1-1s.: E. Cauchi, Sliema, Malta. **FIVE PRIZES** of goods value 10/6: R. J. Ranikhetvala, Bombay; B. Hyde, Johannesburg, S.A.; J. McClymont, Toronto; D. Hill, Takaka, N.Z.; W. Scott, Quebec.

The most praiseworthy entry is a tiny model of a Chappel baby grand piano, sent by Thomas C. Brook, Natal, S. Africa. A remarkable feature of this entry is the fact that it will play four notes; Doh, Me, Soh, Doh, in the key of B flat! The "strings" are short pieces of Meccano Spring Cord secured in place by hooks also made from Spring Cord, and tensioned so as to produce the required notes. Each hammer is made from a piece of wood fastened to the end of a $3\frac{1}{2}$ " Strip, which is pivoted $2\frac{1}{2}$ " from one end. The other end of the Strip represents the key. The top of the piano opens sideways and is propped up by a Rod.

The fall is hinged to open backward to allow the music rack to be pulled forward and opened up. Pedals are made from $1\frac{1}{2}$ " Strips, pivoted at their centres and fitted with damper rods. When the pedals are pressed the rods move up and down, but the dampers themselves are not fitted. Although the model is so small notes can be heard quite clearly when the keys are played.

D. W. Johnston submitted a replica of a bedroom complete with a bed and a full suite of furniture, all built entirely from Meccano parts. Edgar Cauchi's entry represents a drawing room complete with door, window, fireplace, chimney and electric lighting. The furniture includes a radio-gramophone, centre table, two armchairs, four small chairs, two flower-pot stands and six pictures. To make his model even more realistic Cauchi has added a mantel clock, mirror and a carpet!

Both these models are beautifully designed and contain many ingenious uses for Meccano parts. For example, the centre table in Cauchi's drawing room is made from a Hub Disc and a Circular Plate mounted on a short Rod, and the familiar out-curving legs are represented by small Curved Strips. Curved Strips are also made use of by D. W. Johnston to form the frame of a dressing mirror.

Meccano X Series Models

Motor Lorry—Baggage Truck—Well Driller—Guillotine, etc.

The Meccano X Series Outfits contain an entirely new set of parts that make possible the construction of an almost unlimited range of models. Although the X parts are on a smaller scale than standard Meccano Parts, they embody the same system of equidistant holes, but the perforations are spaced only $\frac{1}{2}$ " apart and there are three rows to each Strip. This new system of parts simplifies model-building so that even our youngest readers will have no difficulty in constructing working models, which may be set in motion by an X Clockwork Motor. The X Series Parts can be used in conjunction with standard Meccano parts.

THERE is a great deal of fun to be derived from the construction of small simple models. Many constructors frequently overlook the fact that to build a small but realistic model from a limited number of parts can be just as interesting as the building of a large model from a large supply of parts. When only a few parts are available each one must be used to the best possible advantage, and if a little thought is given to the design of a new model it will be well repaid by the appearance of the model when completed. The Meccano X Series Outfits are especially suitable for building small models of fairly simple design, and the illustrations on these pages show that some very interesting results can be obtained with only a small number of parts.

Motor Lorry

The model shown in Figs. 1 and 2 is driven by a Meccano X Series Clockwork Motor that serves to represent the bonnet at the front of the lorry. The first step in constructing this model is to bolt a $5\frac{1}{4}$ " Strip at each side of the Clockwork Motor. The Strips are extended by $2\frac{3}{4}$ " Strips, and two $1\frac{3}{4} \times \frac{1}{2}$ " Double Angle Strips serve as spacing members and also carry the platform body. This body is built up of two $4\frac{1}{4}$ " Strips spaced apart at one end by a $1\frac{3}{4}$ " Strip, and with two $2\frac{3}{4}$ " Strips filling up the space between them. The platform is bolted to the two Double Angle Strips. The driver's seat is made by fixing two $\frac{3}{4} \times \frac{1}{2}$ " Double Angle Strips to $1\frac{3}{4}$ " Strips, and bolting a $1\frac{3}{4}$ " Strip to Angle Brackets to form the back.

The wheels consist of $1\frac{1}{4}$ " Discs, each fixed to its axle by two nuts. The rear axle carries the special pulley supplied with the Clockwork Motor, and the rubber driving band is passed round this and round the Motor Pulley. To finish the model a 1" Screwed Rod is fitted to the brake lever on the Motor to facilitate control. This can be seen in Fig. 1 immediately in front of the driver's seat.

Parts required for Motor Lorry:—2 of No. X404; 2 of No. X405; 4 of No. X407; 4 of No. X409; 2 of No. X421; 2 of No. X435; 1 of No. X438; 2 of No. X455; 2 of No. X457; 4 of No. X475; 37 of No. 37a; 26 of No. 37b; 1 Clockwork Motor complete with special Pulley and rubber Driving Band.

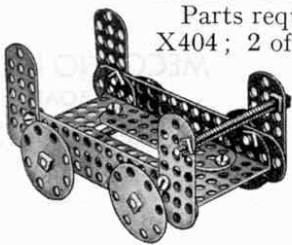
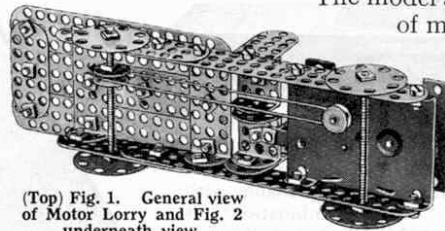
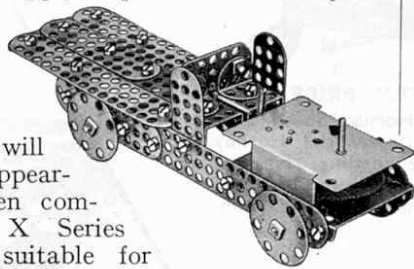


Fig. 3. Baggage Truck.



(Top) Fig. 1. General view of Motor Lorry and Fig. 2 underneath view.

Baggage Truck

This type of hand truck is frequently to be found in railway goods stations, factories, etc., where quantities of small merchandise have to be handled. The model shown in Fig. 3 will be found very useful by Hornby Railway enthusiasts. Its construction is quite clear from the illustration, two $1\frac{3}{4} \times \frac{1}{2}$ " Double Angle Strips being used for spacing apart two $4\frac{1}{4}$ " Strips to each of which two $1\frac{3}{4}$ " Strips are bolted. Two $2\frac{3}{4}$ " Strips are used to fill in the bottom of the truck.

Parts required for Baggage Truck:—2 of No. X405; 2 of No. X407; 4 of No. X409; 3 of No. X435; 2 of No. X455; 4 of No. X475; 20 of No. 37a; 8 of No. 37b.

Well Driller

The model appearing in Fig. 4 represents the type of machine used for boring oil wells. Each side of the model is composed of a vertical $4\frac{1}{4}$ " Strip with two $2\frac{3}{4}$ " Strips bolted at right angles. The other ends of the shorter Strips are connected by a $1\frac{3}{4}$ " Strip, and the two sides are held together at the base by $1\frac{3}{4} \times \frac{1}{2}$ " Double Angle Strips. A $2\frac{1}{2}$ " Screwed Rod is

journalled near the top of the vertical Strips and carries two $1\frac{1}{4}$ " Discs with two $\frac{3}{4}$ " Discs placed between them. The Discs are held together by two nuts. A short length of cord is passed over the pulley so formed, and is tied at one end to a $2\frac{1}{2}$ " Screwed Rod, and at the other end to a $1\frac{3}{4}$ " Strip that is pivoted to the side of the model. A Screwed Rod is journalled in the side frames at the rear of the model and carries two $1\frac{1}{4}$ " Discs, one inside and one outside the frames. Each Disc is fitted with a nut and bolt; one serves as a handwheel, and the other is arranged so that as it rotates a bolt strikes the pivoted $1\frac{3}{4}$ " Strip and forces it down. This movement raises the drill, and as the Disc continues to rotate, the Strip and the Drill descend.

Parts required for Well Driller:—2 of No. X405; 4 of No. X407; 3 of No. X409; 3 of No. X435; 2 of No. X455; 4 of No. X475; 2 of No. X477; 21 of No. 37a; 9 of No. 37b; 1 of No. 38; short length of cord.

Porter's Truck

A simple model of a porter's truck is shown in Fig. 5. Two $4\frac{1}{4}$ " Strips are spaced apart by a $1\frac{3}{4} \times \frac{1}{2}$ " Double Angle Strip, and a $2\frac{1}{2}$ " Screwed Rod secures two $1\frac{3}{4}$ " Strips in position for handles. Two further $1\frac{3}{4}$ " Strips

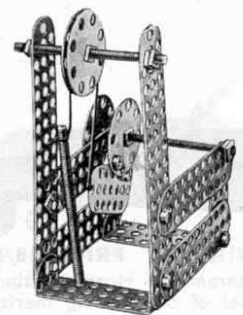


Fig. 4. Well Driller.

are fitted at the other ends of the side members, and are spaced apart by a second Double Angle Strip. These Strips form journals for the Rod carrying the wheels, and Angle Brackets support two $2\frac{3}{4}$ " Strips that complete the truck.

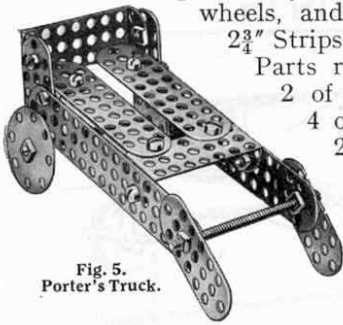


Fig. 5. Porter's Truck.

Parts required for Porter's Truck:—
2 of No. X405; 2 of No. X407;
4 of No. X409; 2 of No. X421;
2 of No. X435; 2 of No. X455;
2 of No. X475; 18 of No. 37a; 10 of No. 37b.

Guillotine

The somewhat gruesome model shown in Fig. 6 recalls the manner in which people were put to death during the French Revolution. The Guillotine is still used in France as a means of capital punishment.

The two vertical posts serving as slides for the "knife" are bolted at top and bottom to $1\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strips, and a base is formed from pairs of $5\frac{1}{4}$ " Strips and $4\frac{1}{4}$ " Strips. The knife is represented by a $1\frac{3}{4}$ " Strip carried in a frame formed by connecting two $2\frac{3}{4}$ " Strips at each end by a $\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strip. An Angle Bracket is bolted to the centre of one of these Strips, and a second Angle Bracket, tied to a length of cord, is placed under this for raising the knife. The cord passes over a pulley formed from two $\frac{3}{4}$ " and two $1\frac{1}{4}$ " Discs, and is tied to a Screwed Rod fitted with a handwheel. When the frame is raised the Angle Bracket is released as soon as it reaches the Pulley Wheel, so that the knife suddenly descends, with unpleasant results for the unfortunate victim!

Parts required for Guillotine:—
2 of No. X404; 2 of No. X405;
4 of No. X407; 2 of No. X421;
2 of No. X435; 1 of No. X438;
1 of No. X455; 2 of No. 457; 3 of No. X475; 2 of No. X477;
28 of No. 37a; 15 of No. 37b; short length of cord.

Derrick Crane

Although only two complete outfits are included in the X Series, it is possible to build quite large models by combining the contents of several Outfits. Fig. 7 shows an example of the results that can be achieved in this way, three No. 2 X Outfits being necessary to build this model.

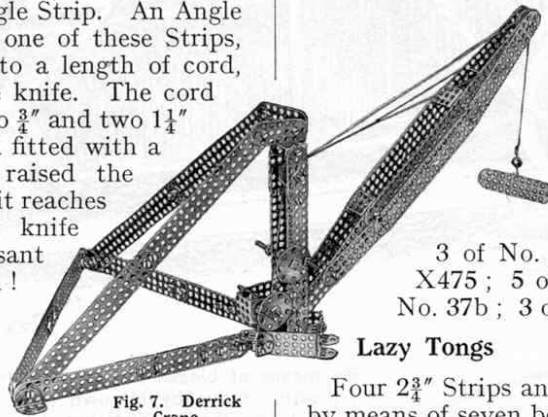


Fig. 7. Derrick Crane.

The jib is made of two pairs of $5\frac{1}{4}$ " Strips spaced apart by means of $\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strips, and extended at the top by $4\frac{1}{4}$ " Strips and at the bottom by $2\frac{3}{4}$ " Strips. The $2\frac{3}{4}$ " Strips are bolted to $1\frac{3}{4}$ " Strips, and these are pivoted to the vertical member of the crane, for which two $5\frac{1}{4}$ " and two $1\frac{3}{4}$ " Strips are connected at top and bottom by $\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strips. Near the base of this vertical post are two additional $1\frac{3}{4}$ " Strips bolted at right angles and carrying a $2\frac{1}{2}$ " Screwed Rod to which the hoisting cord is fastened. The luffing cord is tied to a second Screwed Rod journalled in the two $5\frac{1}{4}$ " Strips of the vertical post. Both cords are passed over pulleys consisting of washers on each side of which are $\frac{3}{4}$ " Discs. A single Pulley made in the same way is placed at the

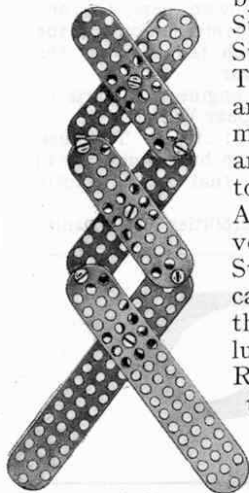


Fig. 8. Lazy Tong.

jib head for the hoisting cord.

The lower end of the vertical member is pivoted to a $1\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strip that is carried in a frame of $1\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strips and $1\frac{3}{4}$ " Strips. The upper end pivots about a bolt locked by two nuts to two Angle Brackets to which the tension arms are fixed. These retain the centre post in a vertical position, and each arm is made up of two $5\frac{1}{4}$ " Strips and one $1\frac{3}{4}$ " Strip, their lower ends being attached to a framework of Strips. Angle Brackets are provided for screwing the model down to a baseboard to prevent it from overturning when handling heavy loads.

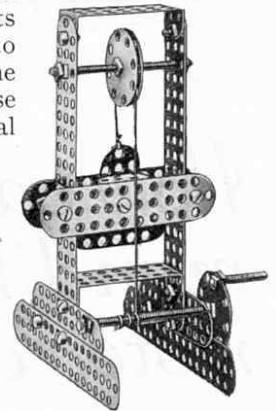


Fig. 6. Guillotine.

Cranes of this type are used extensively in building operations, and are frequently seen mounted at the top of structures in course of erection. Here they raise the building materials from ground level, and by means of the slewing and luffing gear deposit them where they are required, within the working radius of the crane.

Parts required for Derrick Crane:—12 of No. X404; 3 of No. X405; 8 of No. X407; 12 of No. X409; 14 of No. X421; 2 of No. X435; 6 of No. X438; 3 of No. X455; 5 of No. X457; 2 of No. X475; 5 of No. X477; 97 of No. 37a; 67 of No. 37b; 3 of No. 38; 1 of No. 57c; cord.

Lazy Tong

Four $2\frac{3}{4}$ " Strips and two $4\frac{1}{4}$ " Strips are pivoted together by means of seven bolts in the positions shown in Fig. 8. The bolts are inserted through the upper Strips, and a nut is then threaded on the shank of each. The lower Strips are placed in position and a second nut on each bolt holds them in place. The two sets of nuts should be locked tightly against the lower Strips, but the upper set of Strips should be allowed a little play so that by moving the two $4\frac{1}{4}$ " Strips together, the frame extends.

Parts required for Lazy Tong:—2 of No. X405; 4 of No. X407; 14 of No. 37a; 7 of No. 37b.

High Wing Cabin Monoplane

To construct the fuselage of the model monoplane illustrated in Fig. 9, a $\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strip is bolted to each end of a $5\frac{1}{4}$ " Strip. This Strip forms the top of the fuselage, and each side is made up of two $2\frac{3}{4}$ " Strips, one $4\frac{1}{4}$ " Strip and one $1\frac{3}{4}$ " \times $\frac{1}{2}$ " Double Angle Strip. A 1" Screwed Rod holds the $4\frac{1}{4}$ " Strip to the Double Angle Strip and a $1\frac{1}{4}$ " Disc is free to rotate between two sets of lock nuts that hold it in position.

Parts required for Monoplane:—
4 of No. X404; 2 of No. X405;
4 of No. X407; 4 of No. X409; 4 of No. X421; 1 of No. X435; 2 of No. X438; 2 of No. X455; 2 of No. X457; 2 of No. X475; 2 of No. X477; 30 of No. 37; 14 of No. 37b.

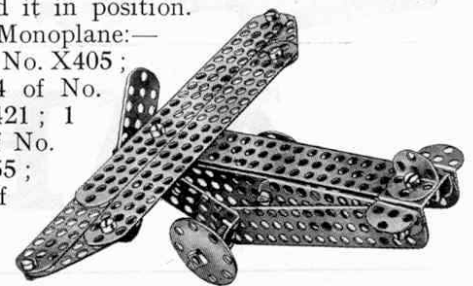


Fig. 9. High Wing Cabin Monoplane.