MECCANO

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BEST BOY'S TOY

MANUAL OF INS[illegible]S

MECCANO No. 3

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MECCANO may be had in Six Progressive Boxes to make up these & many other Models.

MECCANO Ltd LIVERPOOL.

Meccano No. 3

THIS outfit comprises a variety of simple parts, which by the aid of the drawings and directions furnished, may be built up into a number of interesting and beautiful WORKING MODELS and structures. No tools are necessary beyond the appliances supplied, and the toy is well adapted for parlour use.

All parts are made to gauge, and the necessity for accuracy of work is clearly taught.

By means of additional parts as required, an almost endless variety of models may be built; the parts are of metal and almost unbreakable, and when one structure is finished the same parts can be used repeatedly for different structures.

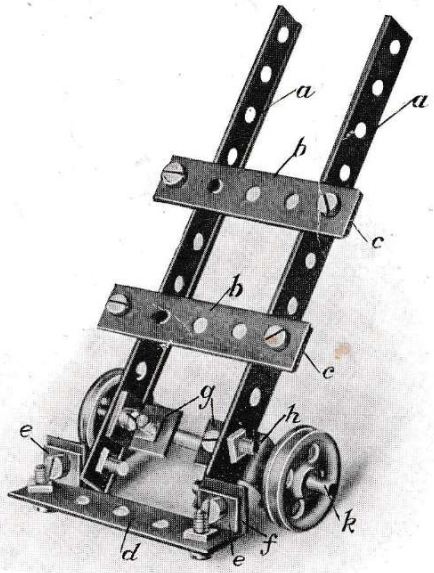
Parents will find co-operation with the Children an interesting and stimulating exercise and in many instances a pleasant mode of exercising their own inventive faculties.

The designs given have been accurately prepared from the actual structures themselves, and if in assembling the parts, care be taken to ensure that the proper sizes of strips are used, and that the bolts, brackets, and axles are attached to the proper holes as shown, little difficulty will be experienced in erecting. Care should be taken to count the holes, as they are uniformly spaced throughout, and so form a most excellent guide in erecting.

The simple designs should in all cases be proceeded with first, and skill gradually acquired in following the designs and correctly connecting the parts together. Strips when they require to be attached at right angles to each other, are attached by means of the angle brackets and screws and nuts, the nuts being preferably on the inside. The axles are adapted to fit any of the holes, and their positions in the various designs can always be ascertained by counting the holes.

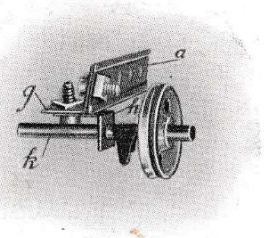
Successive lengths of strips may be united together by means of one or, where a very rigid connection is required, bolts.

Figure No. 1. Luggage Truck



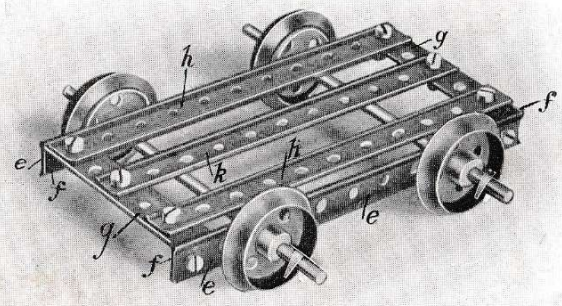
PARTS REQUIRED.

2	$5\frac{1}{2}''$ Perforated Strips.
3	$2\frac{1}{2}''$,, ,,
12	Angle Brackets.
1	$3\frac{1}{2}''$ Rod.
2	Wheels.
18	Nuts and Bolts.
2	Keys.



This is a simple and neat little model, very easily constructed. Commence by screwing the two cross pieces B to the two side frames A, four angle brackets and eight nuts and bolts are required for this. The lowest cross piece D may then be carried from the end holes of the frames A by a combination of the two angle pieces E F at each end, and the bearings for the wheel axle are each somewhat similarly constructed of two angle pieces G H, as will be readily understood by referring to the small detail view. When these are in place the axle K is inserted, keys L put over the ends, and the wheels secured thereon.

Fig. No. 2. Truck



PARTS REQUIRED.

5	$5\frac{1}{2}''$	Perforated Strips.
2	$2\frac{1}{2}''$	,, ,,
4		Angle Brackets.
2	$5''$	Rods.
4		Wheels.
10		Nuts and Bolts.
4		Keys.

This is an interesting model, which can easily be constructed by means of the following instructions :—

To construct this design, take a $5\frac{1}{2}''$ strip E and attach by means of screws and nuts an angle piece F at each end. Then take a second $5\frac{1}{2}''$ strip, and in the same way attach angle pieces at each end of it. These strips are to form the sides of the truck in which the axles of the wheels run. Now connect each end pair of angle pieces with two $2\frac{1}{2}''$ strips G at right angles to the $5\frac{1}{2}''$ strips forming the sides, and over these short strips G lay two $5\frac{1}{2}''$ strips H, fastening each corner of the truck, where the ends of the strips H and G overlay the angle pieces F, by means of screws and nuts. Now attach the $5\frac{1}{2}''$ piece K at each end to the centre hole of the strips G. This with the two pieces H forms the bottom of the truck. Next insert two axles, as shown, through the third holes from the ends of the side pieces E, then push on the four wheels and secure them in position by the keys.

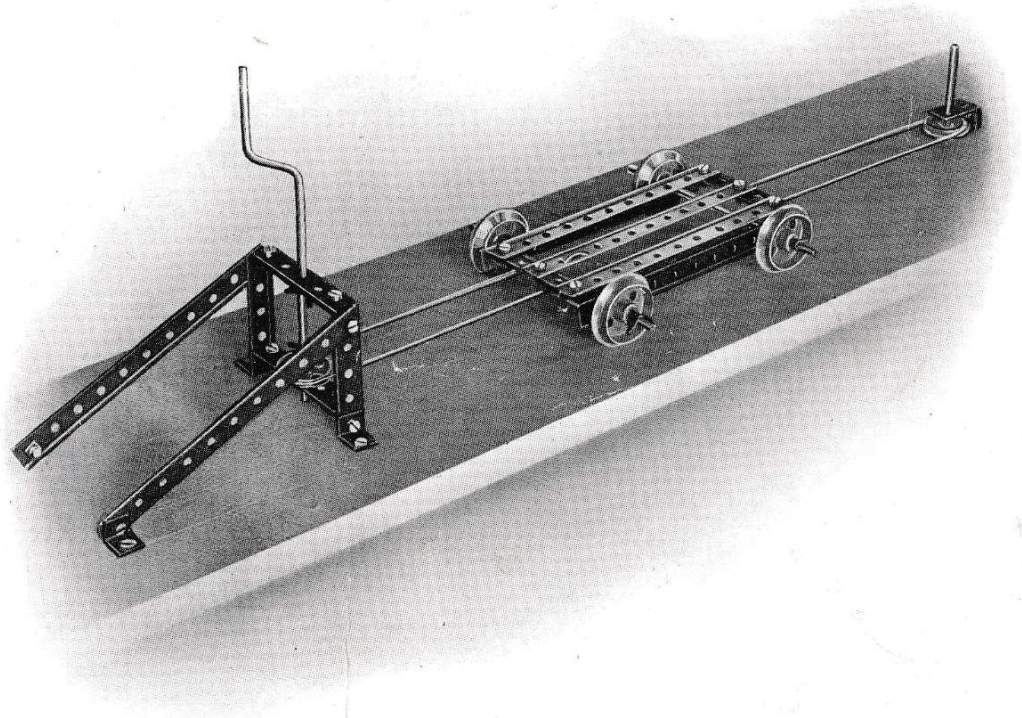
Fig. No. 3. Endless Rope Railway

PARTS REQUIRED.

7	$5\frac{1}{2}''$	Perforated Strips.
6	$2\frac{1}{2}''$	" "
13		Angle Brackets.
2	$5''$	Rods.
1	$2''$	Rod.
1		Crank Handle.
6		Wheels.
21		Nuts and Bolts.
5		Wood Screws.
6		Keys.

This is an attractive little combination working model, which will well repay a little trouble in making.

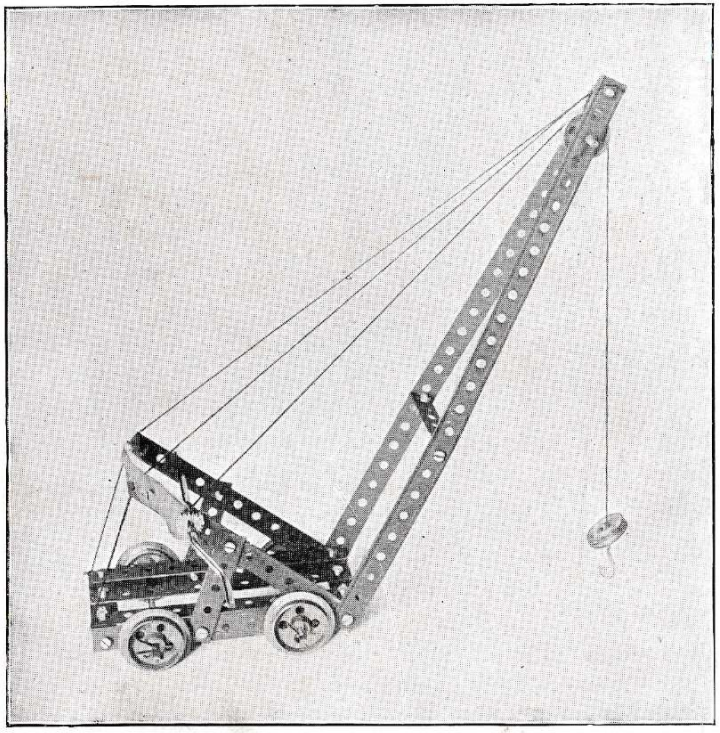
The truck made according to the previous design is used, and it is connected to an endless cord which passes from a pulley attached to the board to another pulley and shaft carried on the bracket shown. In the illustration, the two pulleys are shown close together to save space, but they may, of course, be placed at any distance desired.



The bracket is constructed as follows : Two vertical $2\frac{1}{2}''$ side pieces are connected together at the top and bottom by two more $2\frac{1}{2}''$ pieces attached by angle pieces as shown. From the angle pieces at the top, two $5\frac{1}{2}''$ pieces are carried down to two angle pieces screwed to the board as shown, and angle pieces are placed at the feet of the uprights, which are also screwed to the board. The pulley is keyed to the vertical spindle, which is threaded through the central holes of the two $2\frac{1}{2}''$ cross pieces, and a second pulley, attached to a U-shaped piece as shown, is screwed opposite to the bracket.

A piece of string is then formed into an endless rope running over the two pulleys, and the truck is attached to one side of the string, so that by rotating the handle in one direction or another, the truck is moved as desired.

Fig. No. 4. Travelling Jib Crane



PARTS REQUIRED.

2	$12\frac{1}{2}''$	Perforated Strips.	6		Wheels.
7	$5\frac{1}{2}''$	,, ,,	1	$\frac{1}{2}''$	Pinion.
6	$2\frac{1}{2}''$	,, ,,	1		Pawl.
8		Angle Brackets.	23		Nuts and Bolts.
2	$5''$	Rods.	1		Hook.
1	$2''$	Rod.	8		Keys.
1		Crank Handle.			

A very fine model which cannot fail to interest and instruct the budding mechanic. It is designed on thoroughly scientific lines, and it will teach a boy more about the principles of a crane's action than hours of book study.

The truck of Example 2 is used in the construction of the crane, with the following additions :—

Two $5\frac{1}{2}''$ strips sloping back to carry the spindle, and two $12\frac{1}{2}''$ strips to form the jib, are attached by the same screws to the end holes of the truck ; the two $5\frac{1}{2}''$ strips being braced to the truck by the two $2\frac{1}{2}''$ strips as shown, and being connected together at their ends by a $2\frac{1}{2}''$ strip and angle pieces.

The spindle, to which the pinion is keyed, is carried in the third pair of holes in the $5\frac{1}{2}''$ strips as shown, and the pawl is pivoted on the screw which holds the angle piece in position.

The jib is braced by a $2\frac{1}{2}''$ strip and angles at the ninth hole from the end, and the two sides are bolted together at the top hole, and the short spindle carrying the pulley is carried in the third hole from the top, over which pulley the string is passed and tied to the pinion spindle ; the whole structure is braced by tie rods formed of strings attached to the ends of the truck, the $5\frac{1}{2}''$ strips, and the jib.

Fig. No. 5. Windmill

PARTS REQUIRED.

4	12½″	Perforated Strips.
2	5½″	,, ,,
8	2½″	,, ,,
12		Angle Brackets.
1	3½″	Rod.
1		Crank Handle.
3		Wheels.
25		Nuts and Bolts.
8		Keys.

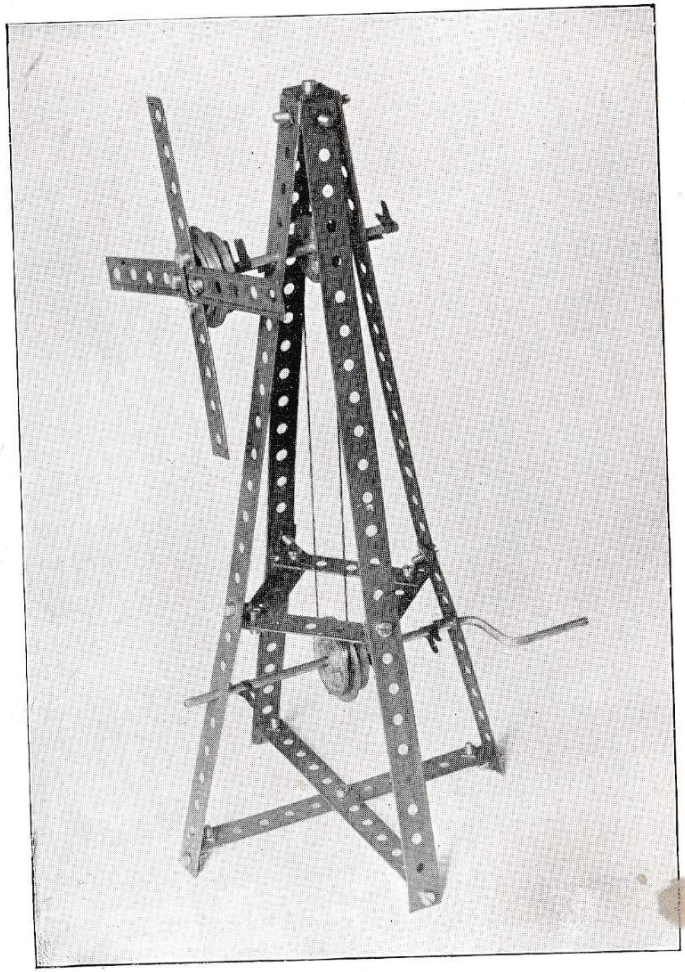
An effective model which calls for no special instructions to construct.

It will not be described quite so fully as the preceding ones, in order that its construction may be a test for the young model-maker, and may be of use in developing his faculties for constructional work.

It will suffice to say that the four 12½″ strips are formed at the top by four angle pieces, and are stiffened lower down by the four 2½″ strips formed into a square, the corners of which are connected by angle pieces to the 12½″ strips.

The wind sails are made by attaching four 2½″ strips to the bush wheel, and keying the latter to the spindle.

NOTE.—This spindle has a second pulley on the frame connected by the string band to the pulley on the spindle below.



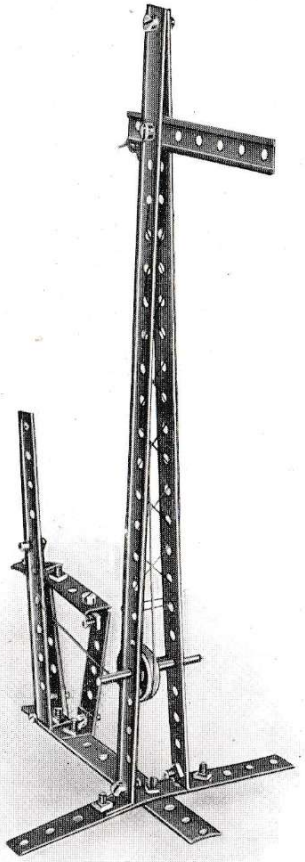


Fig. No. 6. Railway Signal

PARTS REQUIRED.

2	$12\frac{1}{2}''$	Perforated Strips.
3	$5\frac{1}{2}''$	,, ,,
1	$3\frac{1}{2}''$	,, ,,
3	$2\frac{1}{2}''$	,, ,,
8		Angle Brackets.
2	$2''$	Rods.
1		Wheel.
19		Nuts and Bolts.
1		Key.

A simple model which explains itself.

Very little difficulty will be found in constructing it after Model 5 has been accomplished. It will therefore form another test for the young model-maker.

In fixing the lever to the angle bracket at the bottom, lock the nuts so as to prevent the screw from working out.

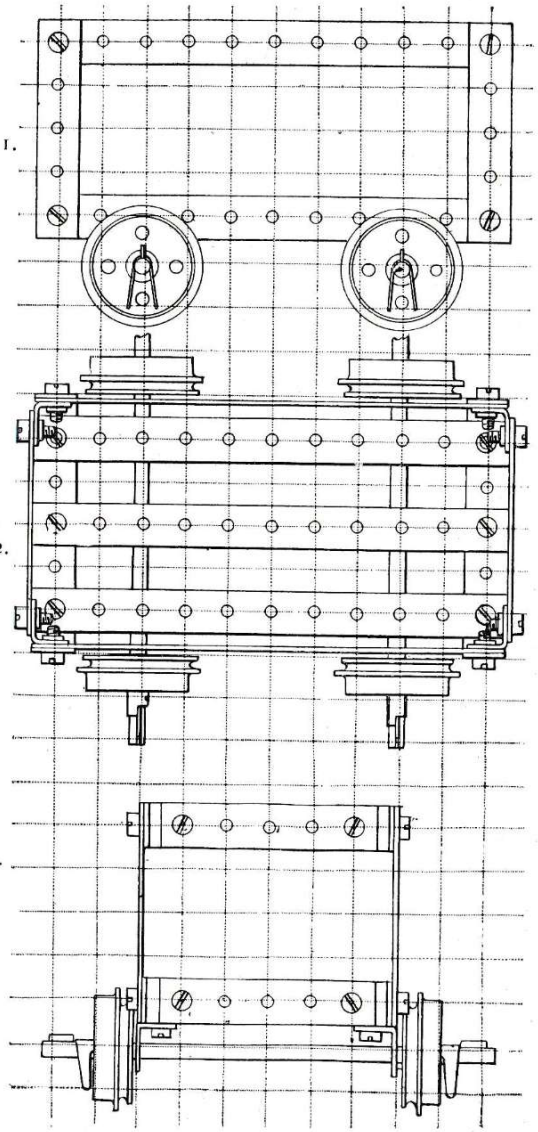
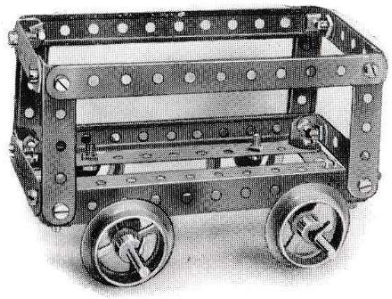


Fig. 1.

Fig. 2.

Fig. 3.

Fig. No. 7. Truck



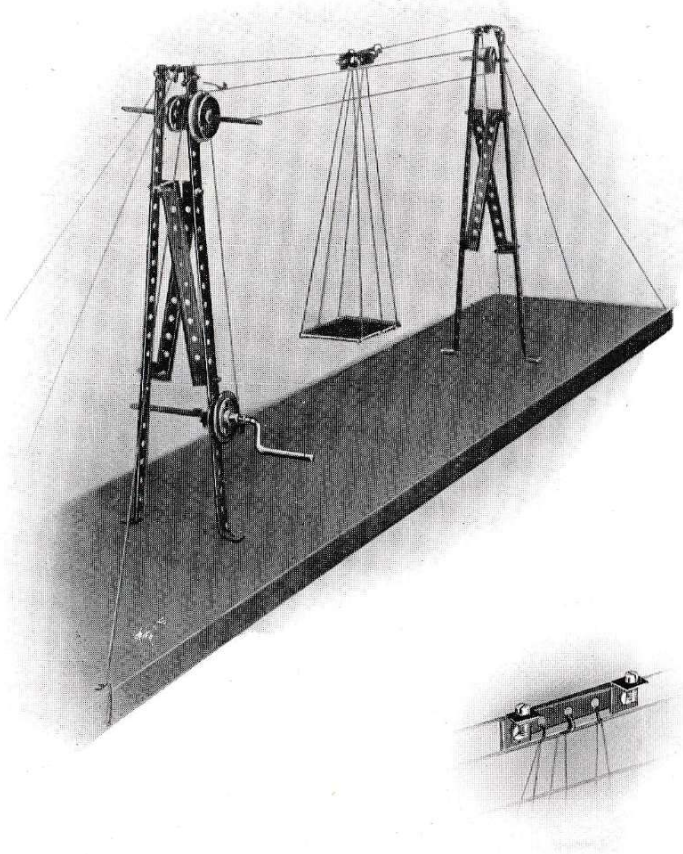
PARTS REQUIRED.

7	$5\frac{1}{2}''$	Perforated Strips.
10	$2\frac{1}{2}''$	" "
16		Angle Brackets.
2	$5''$	Rods.
4		Wheels.
22		Nuts and Bolts.
4		Keys.

We have given here an example of the actual kind of drawing which an engineer would make to represent such a model. The top figure would be called an elevation, the middle one a plan, and the lower one an end view. It will be noticed that the views are on squared paper, and the elevation and plan are projected from each other, as should be the case with all views on an engineering drawing.

This model is constructed in precisely the same way as preceding models, and we confidently leave our young friend to make it up for himself.

Fig. No. 8. Model of Telpher Span



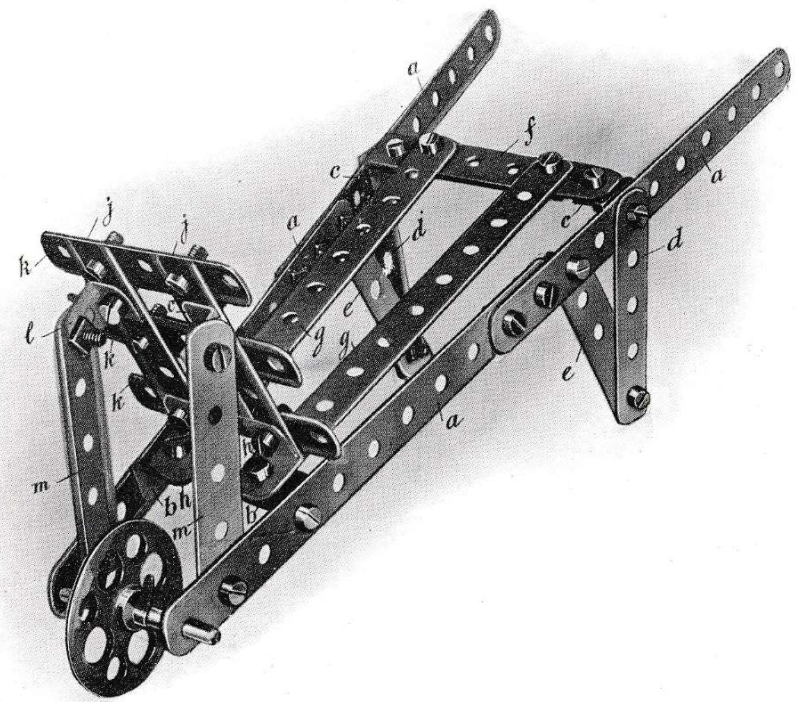
PARTS REQUIRED.

4	12½″	Perforated Strips.
4	5½″	,, ,,
1	2½″	,, ,,
18		Angle Brackets.
1	3½″	Rod.
1	2″	,,
1		Crank Handle.
4		Wheels.
30		Nuts and Bolts.
4		Wood Screws.
6		Keys.

For the information of our young friends we may say that Telpher is the name of the man who invented this device. It was designed to overcome the difficulty of transporting goods over hilly and difficult country. Its construction cannot fail to fix in the mind the principles on which it works.

We recommend that the standards be screwed down before connecting the cords. The crank-pulley cord may be wound twice around the pulleys to ensure a better grip.

Fig. No. 13. Luggage Barrow

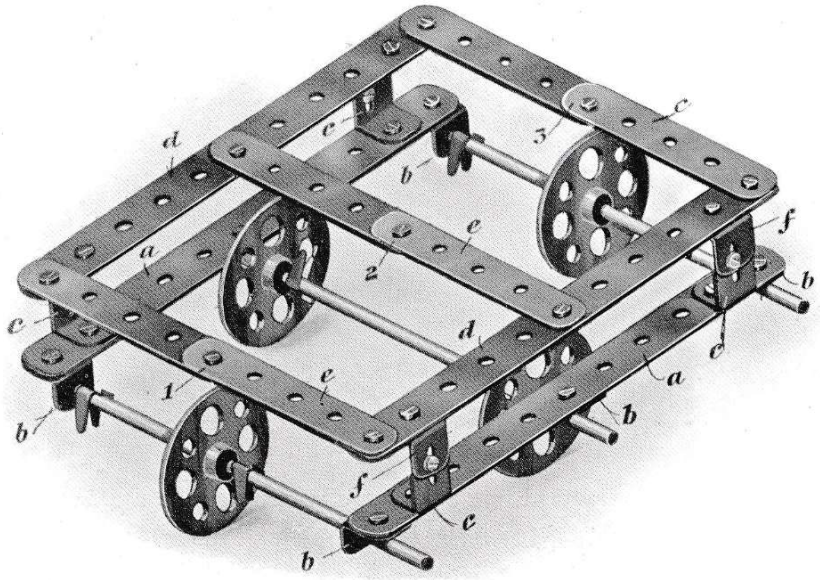


PARTS REQUIRED.

6	$5\frac{1}{2}''$	Perforated Strips.
13	$2\frac{1}{2}''$	,, ,,
8		Angle Brackets.
1	$2''$	Rod.
1		Bush Wheel.
30		Nuts and Bolts.
2		Keys.

Our illustration clearly shows how this model is built up, and no difficulty should be experienced with it. The two angle pieces C are connected together by two overlapping $2\frac{1}{2}''$ strips in F. The wheel is held in place by two keys which have their feathers turned *away* from the wheel, thus forming collars between which the wheel rotates.

Fig. No. 14. Revolver Truck

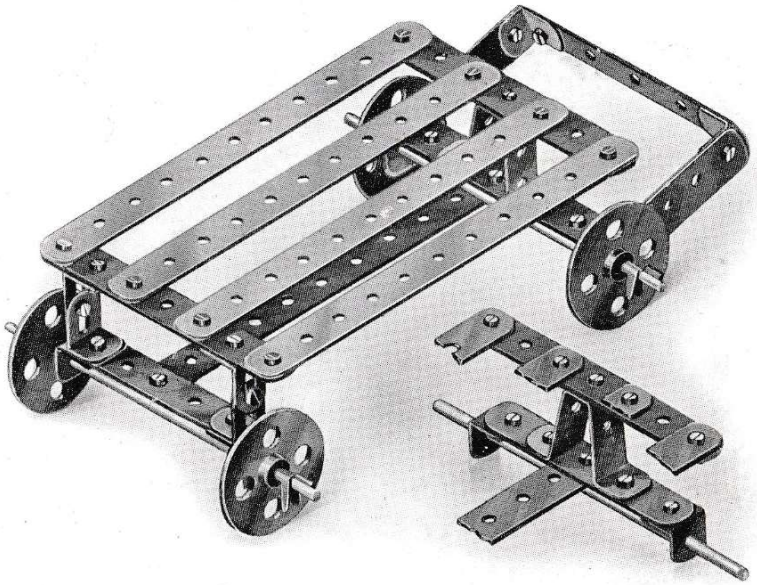


PARTS REQUIRED.

4	$5\frac{1}{2}''$ Perforated Strips.
6	$2\frac{1}{2}''$,, ,,
14	Angle Brackets.
3	$5''$ Rods.
4	Wheels.
27	Nuts and Bolts.
10	Keys.

In a Revolver Truck the two end wheels are always raised just a little higher than the two centre wheels. This enables the truck to be quickly revolved upon the centre wheels. The construction of this model is clearly shown in our illustration.

Fig. No. 15. Railway Waggon

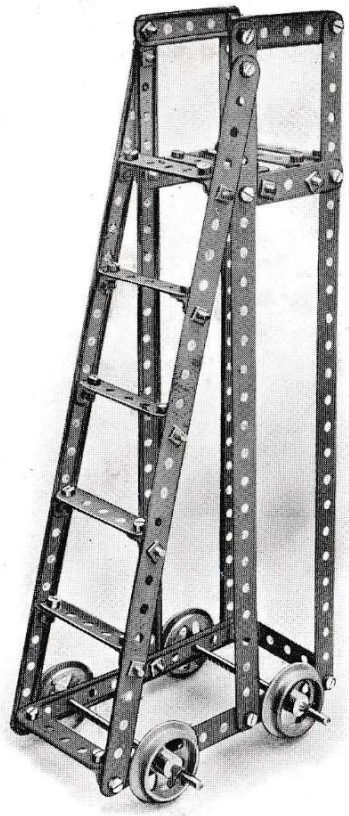


PARTS REQUIRED.

5	$5\frac{1}{2}''$	Perforated Strips.
2	$3\frac{1}{2}''$	,, ,,
5	$2\frac{1}{2}''$	,, ,,
10		Angle Brackets.
2	$5''$	Rods.
4		Wheels.
23		Nuts and Bolts.
4		Keys.

A very simple and attractive working model. The front swivelling support, of which a separate view is given, is formed from a $2\frac{1}{2}''$ strip bent to the shape indicated in the drawing. The rear axle frame is formed from a $2\frac{1}{2}''$ strip, and is held to the platform by two pairs of angle pieces. Both axles are carried in inverted angle pieces.

Fig. No. 16. Ladder on Wheels

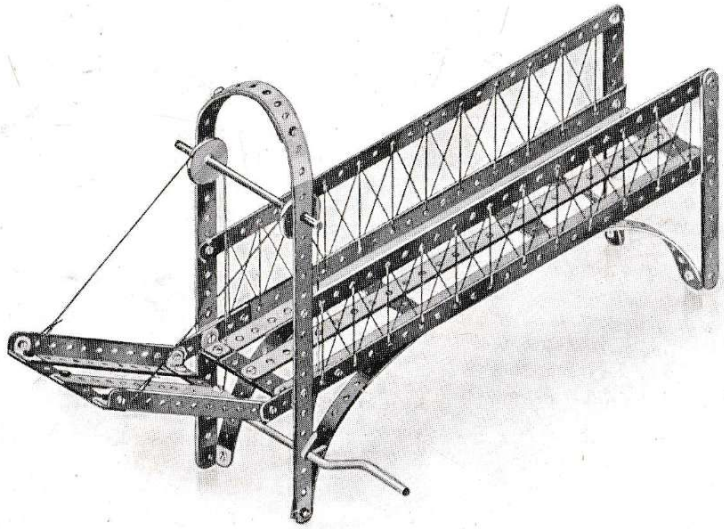


PARTS REQUIRED.

6	12½″	Perforated Strips.
2	5½″	,, ,,
13	2½″	,, ,,
18		Angle Brackets.
2	5″	Rods.
4		Wheels.
48		Nuts and Bolts.
4		Keys.

Another simple and effective model requiring no particular explanation. Each part is plainly shown in our illustration.

Fig. No. 17. Drawbridge

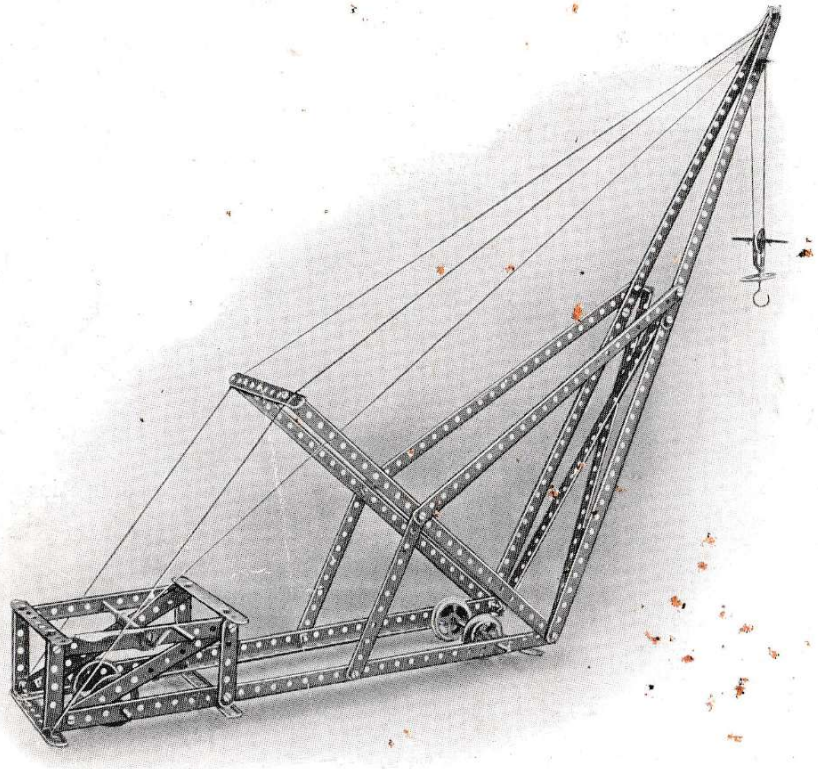


PARTS REQUIRED.

9	12½″	Perforated Strips.
11	5½″	,, ,,
8	2½″	,, ,,
12		Angle Brackets.
1	3½″	Rod.
1		Crank Handle.
2	1″	Pulley Wheels.
42		Nuts and Bolts.
2		Keys.

A most interesting model requiring a little more care in construction. The floor of the Bridge should be made first. Four 5½″ strips should then be bent so as to curve downwards to meet the supports. Two 12½″ strips bent over form the front arch and supports, and two 2½″ strips must be added and attached to the lower side strips to form projections to which the drawbridge is hinged. The cords after passing over the pulleys, should be wound on the centre portion of the cranked axle.

Fig. No. 18. Travelling Jib Crane



PARTS REQUIRED.

10	12½″	Perforated Strips.
14	5½″	,, ,,
5	2½″	,, ,,
2		Angle Girders.
16		Angle Brackets.
2	5″	Rods.
2	2″	,,
1		Crank Handle.
6		Wheels.
1		Bush Wheel.
1	½″	Pinion.
1		Pawl.
38		Nuts and Bolts.
1		Hook.
10		Keys.

This is so important a model that we have thought it best to give a detailed description of it, making use of engineering terms. It can be erected from a study of the illustration alone, but we strongly recommend our enthusiastic young friend to carefully read our instructions, and to make himself familiar with the correct technical description and terms. This model will well repay the time expended on a close and careful study.

The lower horizontal sides of the crane should first be put together. Each side consists of an angle

girder and a $5\frac{1}{2}''$ strip joined together, three holes overlapping. The winch frame at the end is formed of four $2\frac{1}{2}''$ strips secured to the side frames and connected together at their tops by two $5\frac{1}{2}''$ strips, the sides so constructed being united together by four $5\frac{1}{2}''$ strips connected to the angle pieces as shown at the third hole from each end; a fifth transverse $5\frac{1}{2}''$ strip is used to connect the other ends of the horizontal sides together as shown, and the wheel axles are inserted through appropriate holes in the ends of the horizontal frame.

The bearings for the winch handle are formed by two $5\frac{1}{2}''$ strips secured diagonally to the winch frame; the winch handle has a pinion, and a ratchet is pivoted to the right-hand diagonal, and a brake wheel and lever may be added if desired.

Each side of the jib is constructed of two $12\frac{1}{2}''$ strips, jointed together by overlapping; at the top where the sides meet a pulley is fixed on a short length of spindle, and at the bottom the two sides are respectively screwed to the two ends of the horizontal base.

The jib is braced by two diagonally arranged $12\frac{1}{2}''$ strips attached to the sides of the jib by angle pieces.

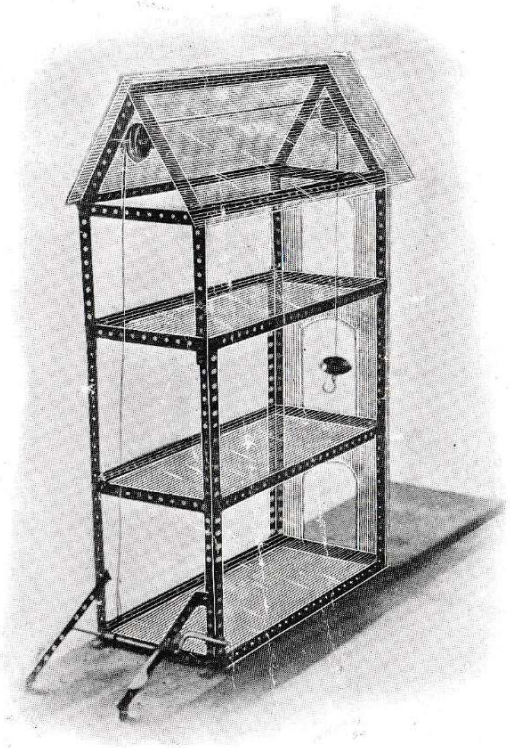
From each side of the jib two $12\frac{1}{2}''$ strips are carried to a truss member, formed of two $12\frac{1}{2}''$ strips united together, secured at one end to the screws at the base of the jib, and united at their other ends by a $5\frac{1}{2}''$ strip; the connection being made at the third hole from the end, as in the case of the other $5\frac{1}{2}''$ transverse strips. The truss frame is connected to the horizontal base by two $5\frac{1}{2}''$ strips as shown.

The rope by which the weight is raised has one end fixed to the end of the jib; it is then passed round the pulley block, then over the jib pulley, and finally connected to the winch handle.

The crane is further strengthened by strings to represent tie rods, which connect the ends of the jib, the truss frame, and the winch frame as shown.

If possible, the joint between the truss frame, the side frame, and the jib, should be made with a single pair of screws, which should also carry the angle pieces for the cross bracing of the crane.

Fig. No. 19. Warehouse with Hoist

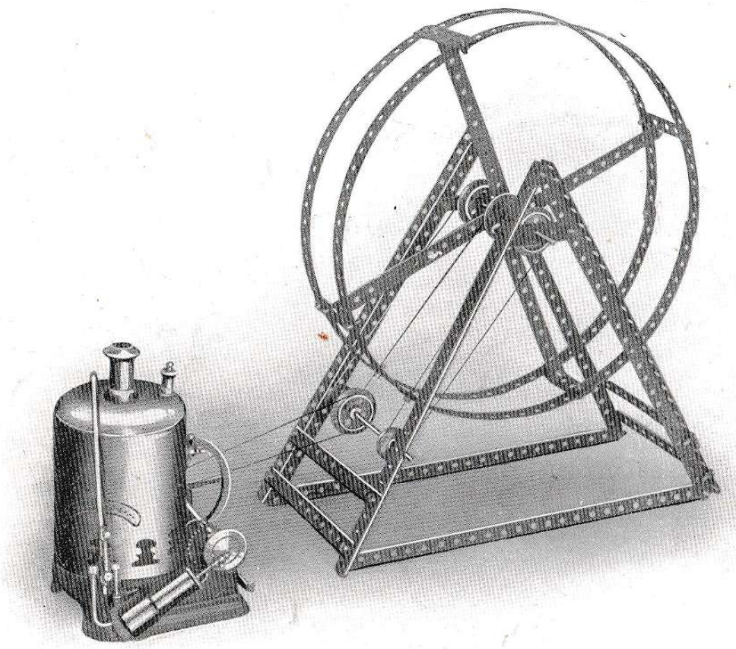


PARTS REQUIRED.

9	12½″	Perforated Strips
18	5½″	,, ,,
4		Angle Girders.
12		,, Brackets.
2	2″	Rods.
1		Crank Handle.
3		Wheels.
1		Pawl.
49		Nuts and Bolts.
6		Wood Screws.
1		Hook.
6		Keys.

The framework of this model is shown to assist in its construction. The roof and floors may be formed with either cardboard or wood.

Fig. No. 20. Wheel



PARTS REQUIRED.

8	12½″ Perforated Strips.
8	5½″ ,, ,,
6	2½″ ,, ,,
4	Angle Girders.
8	,, Brackets.
2	5″ Rods.
3	1½″ Pulleys.
2	1″ ,,
1	Bush Wheel.
48	Nuts and Bolts.
4	Wood Screws.
6	Keys.

We have shown this model with a toy engine added to work it. By extending the shaft additional pulleys may be used for driving small models.

Fig. No. 30. Cable Railway

	Parts Required.
6	$5\frac{1}{2}$″ Perforated Strips.
6	$3\frac{1}{2}$″ ,, ,,
12	$2\frac{1}{2}$″ ,, ,,
4	Angle Girders.
18	,, Brackets.
4	5″ Rods.
1	$1\frac{1}{2}$″ Pulley.
2	1″ ,,
2	$\frac{3}{4}$″ Pinions.
1	Gear Wheel.
2	$\frac{3}{4}$″ Contrite Wheels.
44	Nuts and Bolts.
12	Wood Screws.
13	Keys.

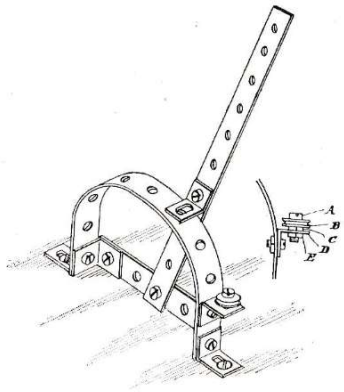


Fig. 30C.

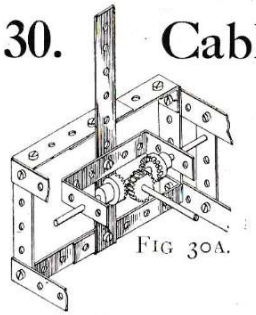


Fig 30A.

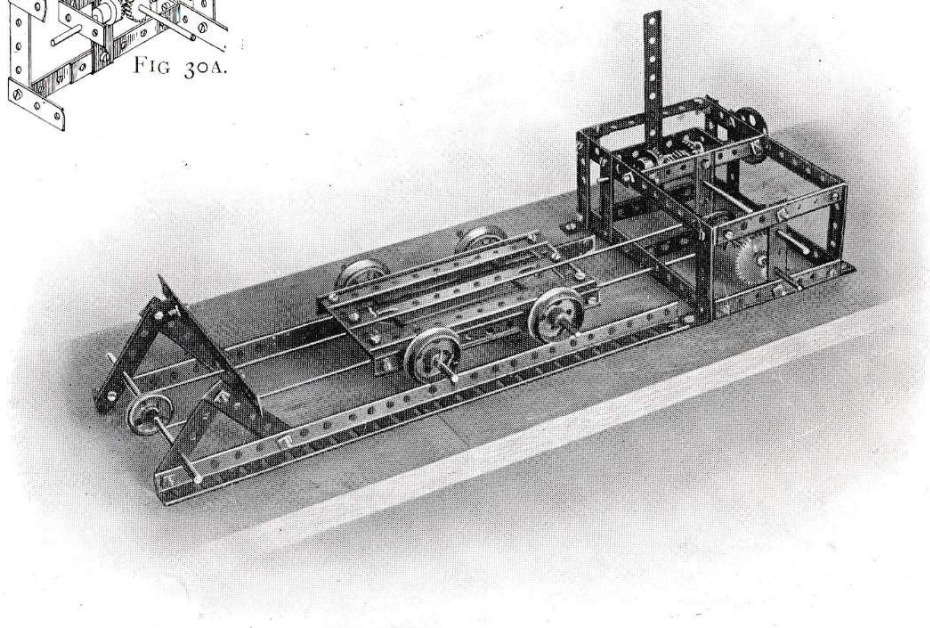


Fig. 30B.

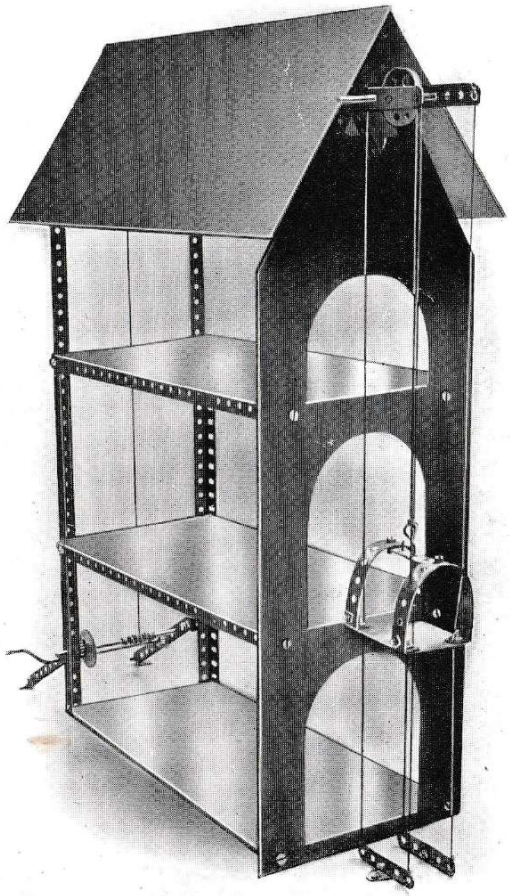
Our illustration hardly does this excellent model justice, owing to the parts having to be so crowded together. This is a very fine model, both instructive and highly interesting.

The driving power is received at the outer pulley, and is transmitted through the clutch mechanism (of which a separate detail is given) and the pair of gear wheels to the lower spindle on which the driving pulley is fixed, the driving rope passing round this pulley and the second pulley at the end of the rails, all as shown in the drawing.

In fixing the lever for operating the clutch mechanism, the nuts should be locked to prevent the screw working out. Only one section of rails is shown in the design, but they may be extended as desired.

Figure No. 30C is an example of a lever for operating signals at a distance. The bracket D is gripped between the top facing nut C and the lower locking nut E, which are threaded on the bolt A so as to leave sufficient play for the guide pulley B to rotate easily.

Fig. No. 31. Warehouse with Elevator



PARTS REQUIRED.

9	$12\frac{1}{2}''$	Perforated Strips.
16	$5\frac{1}{2}''$	,, ,,
4	$3\frac{1}{2}''$	,, ,,
16	$2\frac{1}{2}''$	,, ,,
4		Angle Girders.
42		,, Brackets.
1	$5''$	Rod.
1	$3\frac{1}{2}''$	,,
1	$2''$	,,
1		Crank Handle.
2	$1\frac{1}{2}''$	Pulley Wheels.
1	$\frac{3}{4}''$	Pinion.
1		Gear Wheel.[1]
1		Pawl.
68		Nuts and Bolts.
10		Wood Screws.
9		Keys.

This is a similar model to Figure 19, but with an elevator instead of a hoist.

The construction of the framework of the building is clearly shown in the picture, and should present no difficulties.

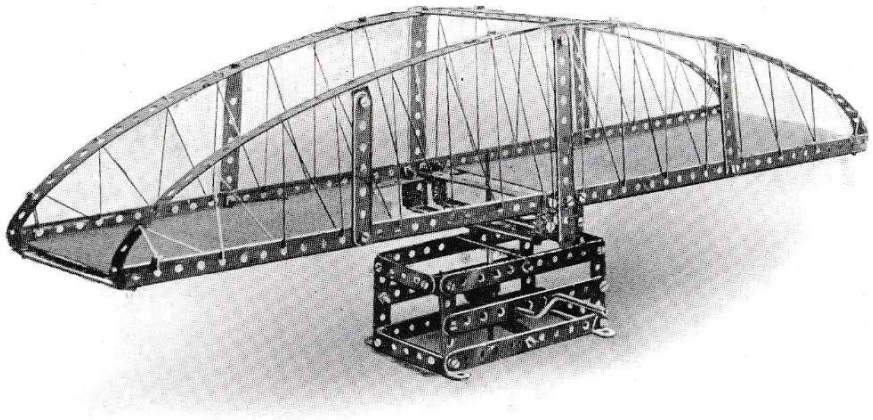
The cage of the elevator is formed by bending two $5\frac{1}{2}''$ strips, and connecting them together at the top by a $2\frac{1}{2}''$ strip. The floor is formed by connecting an angle bracket on the inside of each corner of the strip so bent, and attaching a piece of cardboard.

The cat-head at the top, to which the guides are attached, is formed by bolting an angle bracket on each side of the roof four holes down from the ridge, and to each of these attaching a $5\frac{1}{2}''$ strip bolted in the sixth hole and fastened at the back to two $5\frac{1}{2}''$ strips, connected with the eave and ridge of the roof. This, in addition to supporting the guides, also supports the pulley over which the winding rope passes. The guides at the bottom are connected to two $2\frac{1}{2}''$ strips screwed to the floor.

Fig. No. 32. Swing Bridge

PARTS REQUIRED.

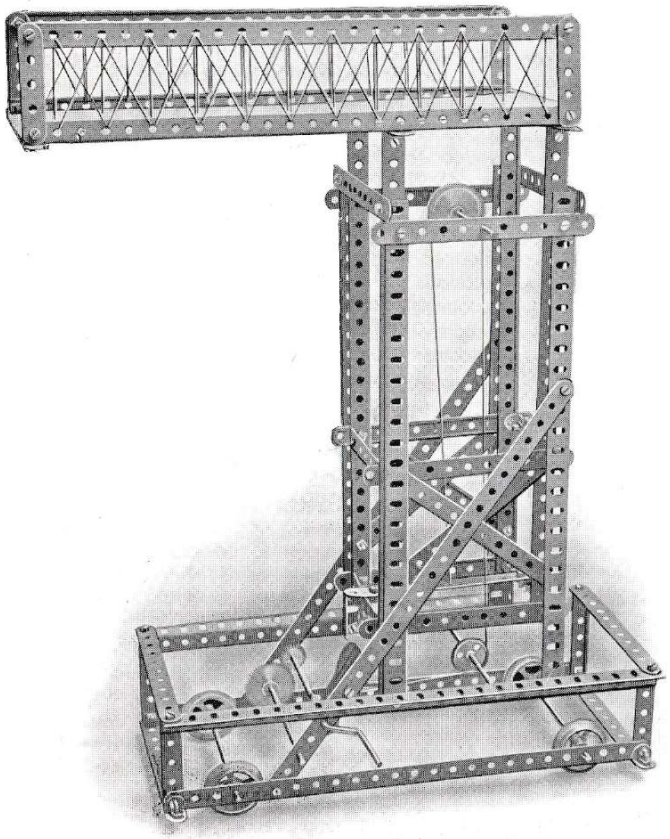
4	12½″ Perforated Strips.
16	5½″ ,, ,,
4	3½″ ,, ,,
10	2½″ ,, ,,
4	Angle Girders.
34	,, Brackets.
1	5″ Rod.
1	Crank Handle.
1	Bush Wheel.
1	½″ Pinion.
1	Worm Wheel.
78	Nuts and Bolts.
6	Keys.



This is a fine engineering model of the highest value to the young student, and any thought and care expended on its construction will be well repaid.

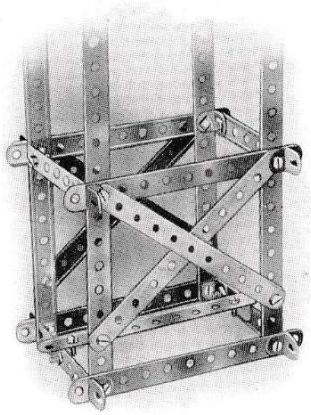
The base portion containing the perpendicular axle actuated by the worm and pinion should be constructed first. This, as will be seen by the illustration, is formed by connecting three 5½″ strips in alternate holes to two 2½″ strips, with an angle bracket at each corner to form one side. The other side is constructed in a similar manner. These two sides are then connected together by a 2½″ strip at each end, top and bottom. A 2½″ strip is then connected by two angle brackets to the two bottom 5½″ strips in the centre hole, and one in a similar position to the two top 5½″ strips. These carry the perpendicular axle upon which the bridge swings. A ½″ pinion is keyed to this axle, which is operated by the horizontal spindle upon which is keyed a worm wheel. The platform is constructed by connecting two angle girders in the third holes, then bending two 12½″ strips and one 5½″ strip to form the top side, which is connected to each end of the angle girders. This is further strengthened by attaching two 3½″ strips and one 5½″ strip as shown in the illustration, thus forming one side. The other side is formed similarly, and both are connected together by 5½″ strips at each end. The upper platform, it will be noticed, has, besides the framework forming the continuous floor, a secondary and shorter lower framework formed by two 5½″ strips connected at each end by two angle brackets. Into the centre of this lower framework is built the bush wheel upon which the platform rotates.

Fig. No. 33. Tower Waggon



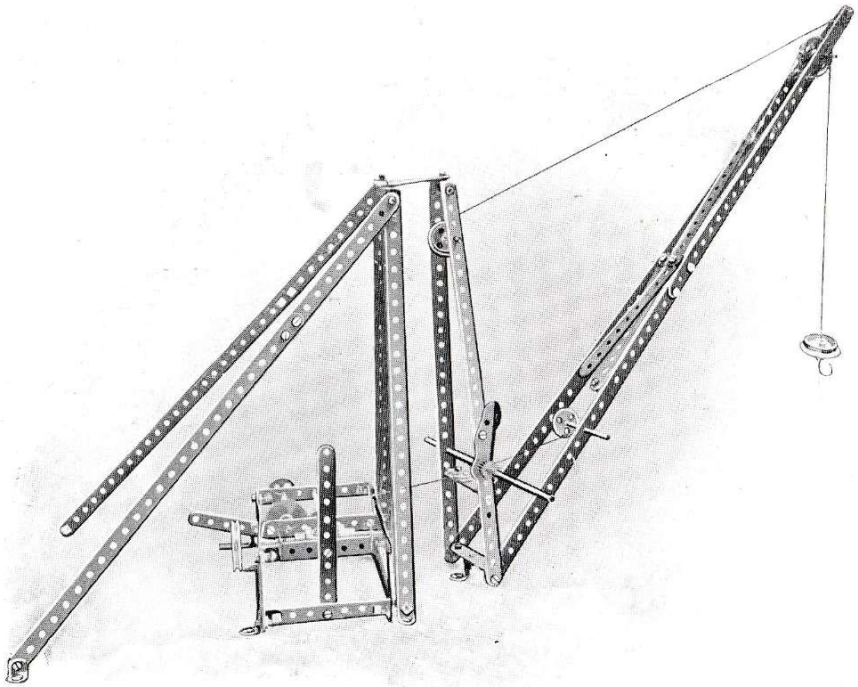
PARTS REQUIRED.

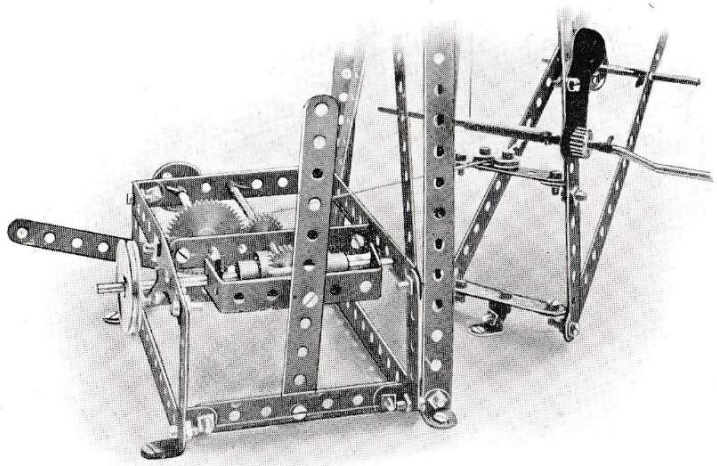
10	12½″ Perforated Strips.
20	5½″ ,, ,,
12	2½″ ,, ,,
8	Angle Girders.
24	,, Brackets.
1	6″ Rod.
4	5″ Rods.
1	Crank Handle.
5	Wheels.
1	1½″ Pulley.
1	¾″ Pinion.
1	Gear Wheel.
1	Pawl.
74	Nuts and Bolts.
12	Keys.



This is a representation of a wagon used for repairing overhead electrical wires carrying the current for street cars. Each part is shown clearly in our illustration, and little difficulty will be experienced in its construction.

Fig. No. 34. Swivelling and Luffing Jib Crane





PARTS REQUIRED.

12	12½″	Perforated Strips.	2	1″	Pulleys.
8	5½″	,, ,,	2	½″	,,
4	3½″	,, ,,	2	¾″	Pinions.
8	2½″	,, ,,	1	½″	,,
35		Angle Brackets.	1		Gear Wheel.
3	5″	Rods.	2	¾″	Contrites.
1	3½″	,,	1		Pawl.
2	2″	,,	71		Nuts and Bolts.
1		Crank Handle	6		Wood Screws.
2	1½″	Pulleys.	1		Hook.
			19		Keys.

This model is interesting as affording an example of a crane used to transport the load from, say, a ship's deck on to a quay, by " luffing " or altering the angle of the jib. The apparatus consists of two parts, a fixed frame and a swivelling and luffing jib. The construction of the fixed frame with the reversing frame and lever should present no difficulties.

The two 12½″ uprights are braced together as shown, and are held in vertical position by the two 12½″ connected to two 5½″ strips rearwardly sloping pieces, and from the structure so formed the reversing frame is carried.

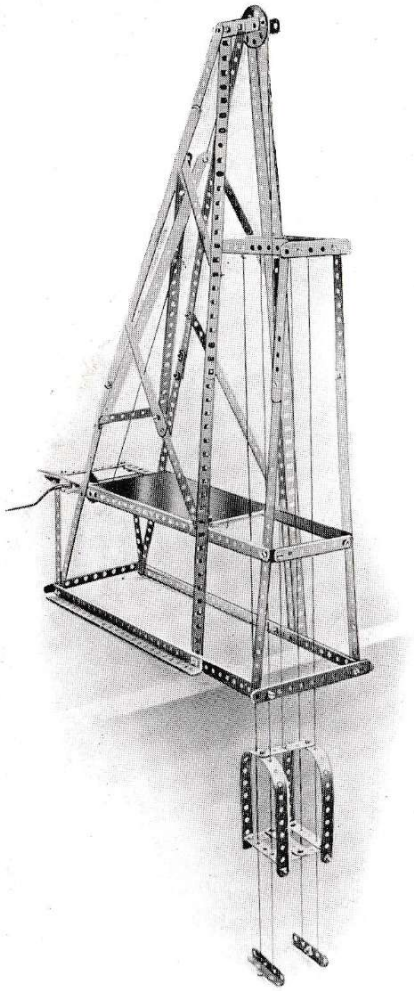
The swivelling piece of the jib consists of two $12\frac{1}{2}''$ pieces bent as shown, connected at the bottom by a $2\frac{1}{2}''$ piece. This $2\frac{1}{2}''$ piece is provided with a screw in the centre hole, which fits in a double angle bracket screwed to the bench, and this forms the lower pivot; the upper pivot is formed with an angle bracket, having a screw, carried in the triangle formed of $2\frac{1}{2}''$ pieces attached to the fixed frame.

The jib itself consists of two pairs of $12\frac{1}{2}''$ pieces connected and braced together as shown. The jib luffs about its connection to the swivelling frame, and is thus capable of two motions—a swivelling motion and a luffing motion.

The luffing motion is effected by the luffing rope, which is coiled round the handle shown, and then passes round the pulley at the top of the swivelling frame, the other end being attached to the head of the jib. In order to keep the hoisting rope in position when the crane is swivelled, the two guide rollers carried on the swivelling frame are provided. These are attached by screws to two angle brackets connected with a $2\frac{1}{2}''$ piece as shown.

By operating the luffing handle the jib may be put at any angle from nearly horizontal to nearly vertical, the crane thus acting as a transporter of the load.

Fig. No. 35. Pit Headgear



PARTS REQUIRED.

10	12½″	Perforated Strips.	1		Crank Handle.
20	5½″	,, ,,	1	1½″	Pulley.
4	3½″	,, ,,	1	¾″	Pinion.
1	3″	,, ,,	1	½″	,,
10	2½″	,, ,,	1		Gear Wheel.
8		Angle Girders.	1		Pawl.
20		,, Brackets.	76		Nuts and Bolts.
1	5″	Rod.	6		Keys.
1	2″	,,			

This is a most interesting model, showing the principle upon which minerals are raised from below the ground.

The front main uprights are formed by two angle girders overlapped in the third hole. Each of these two uprights are fastened together at the top by two angle brackets. Two 2½″ strips are bolted horizontally at the top to carry the wheel over which the winding rope runs, and to connect the diagonal stays. To stiffen the structure one 5½″ strip is fixed on each side connected in the eighteenth hole down on the upright, and the eleventh hole down on the stays. Two more 5½″ strips are bolted together, and fastened on each side lower down.

The framework in which the cage moves is formed by connecting a 5½″ strip with a 12½″ strip in the fourth hole to form the uprights. These are connected by 5½″ strips to the main uprights. The framework takes the same angle as the main uprights, and is connected in the front at the top by a 3″ strip bolted one hole from the end on each side of the strip. The next lower down is a 3½″ strip bolted at the extreme holes of the strip, and the bottom is a 5½″ strip.

The cage is formed by bending two 12½″ strips, and connecting them at the bottom by five 2½″ strips to form the floor, and one 2½″ strip to connect them at the top. The guide ropes are connected to the cross pieces at the top of the framework, passed through the holes at each side of the cage, and connected with two 2½″ strips screwed to the floor.

The hoisting mechanism is operated by the crank handle, upon which is keyed a ¾″ pinion engaging a gear wheel connected with the spindle over which the hoisting rope is wound.

Fig. No. 36. Level Crossing Gates

PARTS REQUIRED.

18	$5\frac{1}{2}''$ Perforated Strips.	32	Angle Brackets.
4	$3\frac{1}{2}''$,, ,,	4	1″ Pulley Wheels.
17	$2\frac{1}{2}''$,, ,,	75	Nuts and Bolts.
6	Angle Girders.		

This model, if constructed with care, is a most admirable one, as the gates are opened simultaneously by the operation of one lever.

To construct it, commence by taking two angle girders and connecting them together in the second hole at each end with a $5\frac{1}{2}''$ strip placed perpendicularly between them to form the supports of one pair of gates as shown in Figure A. The supports for the other pair of gates is arranged in a similar manner. These two structures are connected by two other angle girders, and braced by four $3\frac{1}{2}''$ cross pieces as shown in the illustration.

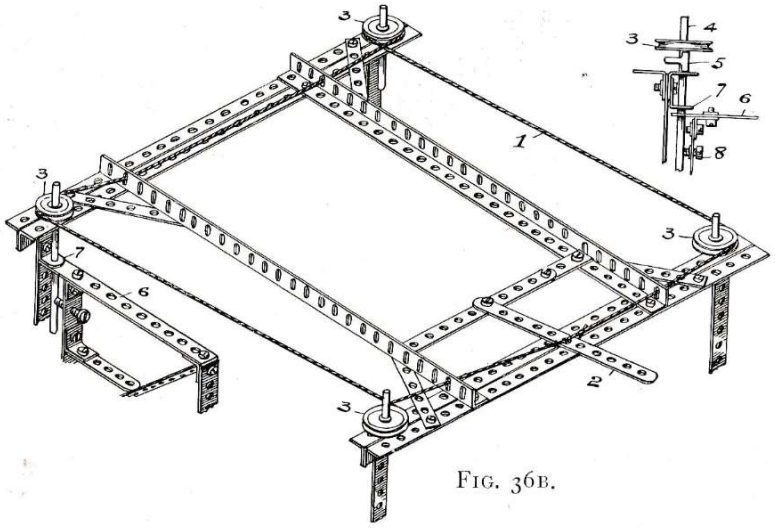


FIG. 36B.

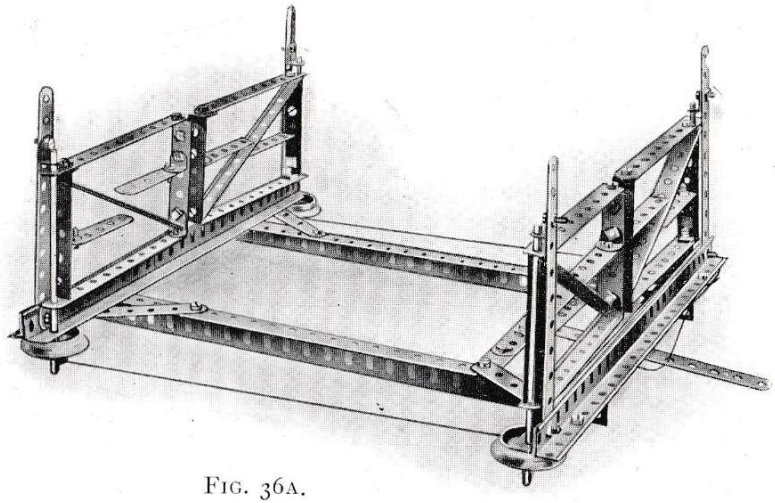


FIG. 36A.

The gates are formed by connecting two $5\frac{1}{2}''$ strips with a $2\frac{1}{2}''$ strip and angle brackets in the end holes at one side. At the other side the $2\frac{1}{2}''$ strip is connected in the second holes from the end to permit the axle rod to pass through upon which the gate swings.

Figure 36B is an inverted perspective view showing the arrangement of operating cord 1 which is passed from the operating lever 2, around the corner pulleys 3, and back to the lever 2. In order to obtain a better grip on the pulleys, it is desirable to wind the operating cord twice around them. It is to be noted that the cord 1 is wound in opposite directions around the diagonal pairs of pulleys 3.

Figure C is a side detail showing the method in which the operating pulley 3 is keyed upon the spindle 4 by the key 5. The gate 6 rests upon the angle bracket 7, and a pinching screw 8 is fitted in the inner side to grip it to the spindle 4, so that all rotate together.

Further Possibilities

Although this completes the models which we are able to illustrate here, it by no means exhausts the possibilities of MECCANO. For the guidance of our customers we have illustrated a number of elaborate and very beautiful working models, the construction of which will prove a never-ending source of delight and instruction. With each illustration will be found a list of the parts required, together with a list of the extra parts to a No. 3 MECCANO outfit, which it will be necessary to purchase before they can be made. All the parts may be purchased separately through any dealer, or direct from ourselves; and at the end of this book will be found a detailed price list, which we recommend our customers to study before ordering. We would add, that new and interesting models are constantly being designed by ourselves, and users of MECCANO, and we are at all times glad to receive suggestions and designs from our customers, and to criticise and help in any way in our power. If our instructions are carefully read and followed there should be no difficulty in building up any of the models illustrated; but we are at all times glad to answer any questions, and to give any further instructions necessary.

Fig. No. 40. Maxim Flying Machine

PARTS REQUIRED.

8	12½″ Perforated Strips.
15	5½″ ,, ,,
3	3½″ ,, ,,
4	2½″ ,, ,,
4	Angle Girders.
18	,, Brackets.
2	11½″ Rods.
1	Crank Handle.
2	Bush Wheels.
2	¾″ Pinions.
1	Gear Wheel.
1	1½″ Contrite.
72	Nuts and Bolts.
4	Wood Screws.
8	Keys.

List of Parts required in addition to Meccano No. 3.

1	11½″ Rod.
1	Bush Wheel.
1	1½″ Contrite Wheel.

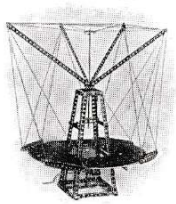


Fig. No. 41. Travelling Crane

PARTS REQUIRED.

14	12½″ Perforated Strips.
10	5½″ ,, ,,
4	3″ ,, ,,
8	2½″ ,, ,,
4	Angle Girders.
34	,, Brackets.
1	11½″ Rod.
2	5″ ,,
3	2″ ,,
3	Crank Handles.
8	Flanged Wheels.
1	1″ Pulley.
1	Bush Wheel.
1	¾″ Pinion.
5	½″ ,,
1	Gear Wheel.
1	Pawl.
82	Nuts and Bolts.
1	Hook.
18	Keys.

List of Parts required in addition to Meccano No. 3.

2	12½″ Perforated Strips.
4	3″ ,, ,,
1	2″ Rod.
2	Crank Handles.
4	Flanged Wheels.
4	½″ Pinion Wheels.
6	Nuts and Bolts.

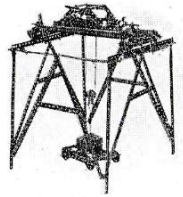


Fig. No. 42 Crane

PARTS REQUIRED.

18	12½″ Perforated Strips.
14	5½″ ,, ,,
2	3½″ ,, ,,
14	2½″ ,, ,,
40	Angle Brackets.
3	5″ Rods.
5	2″ ,,
2	Crank Handles.
8	Flanged Wheels.
2	1″ Pulleys.
2	¾″ Pinions.
1	½″ ,,
2	Gear Wheels.
1	Worm Wheel.
1	Pawl.
88	Nuts and Bolts.
1	Hook.
20	Keys.

List of Parts required in addition to Meccano No. 3.

6	12½″ Perforated Strips.
4	Angle Brackets.
2	2″ Rods.
1	Crank Handle.
4	Flanged Wheels.
2	Gear Wheels.
11	Nuts and Bolts.

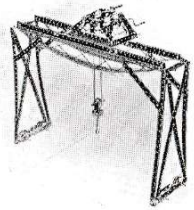
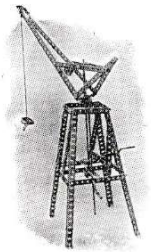
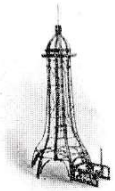


Fig. No. 43. Elevated Jib Crane



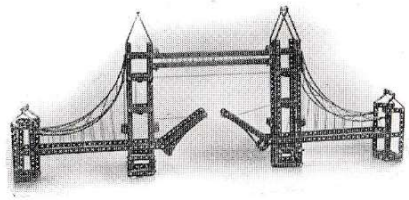
Parts Required.		*List of Parts required in addition to Meccano No. 3.*	
2	12½″ Perforated Strips.	1	11½″ Rod.
15	5½″ ,, ,,	1	1½″ Contrite Wheel.
6	3½″ ,, ,,		
2	2½″ ,, ,,		
4	Angle Girders.		
16	,, Brackets.		
2	11½″ Rods.		
1	3½″ ,,		
1	2″ ,,		
2	Crank Handles.		
2	1″ Pulleys.		
1	¾″ Pinion.		
1	½″ ,,		
1	Gear Wheel.		
1	1½″ Contrite.		
1	Worm Wheel.		
63	Nuts and Bolts.		
1	Hook.		
13	Keys.		

Fig. No. 50. Eiffel Tower



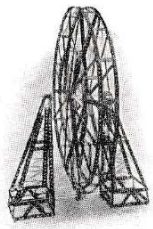
Parts Required.		*List of Parts required in addition to Meccano No. 3.*	
13	12½″ Perforated Strips.	1	12½″ Perforated Strips.
28	5½″ ,, ,,	7	5½″ ,, ,,
6	3½″ ,, ,,	13	3″ ,, ,,
13	3″ ,, ,,	16	2½″ ,, ,,
40	2½″ ,, ,,	46	Angle Brackets.
82	Angle Brackets.	1	1½″ Pulleys.
4	5″ Rods.	2	1½″ Contrite Wheels.
1	2″ ,,	111	Nuts and Bolts.
2	1½″ Pulleys.		
1	Bush Wheel.		
1	¾″ Pinion.		
1	½″ ,,		
2	1½″ Contrites.		
1	Worm Wheel.		
188	Nuts and Bolts.		
12	Keys.		

Fig. No. 51. Tower Bridge



Parts Required.		*List of Parts required in addition to Meccano No. 3.*	
35	12½″ Perforated Strips.	23	12½″ Perforated Strips.
28	5½″ ,, ,,	7	5½″ ,, ,,
66	2½″ ,, ,,	42	2½″ ,, ,,
8	1½″ ,, ,,	8	1½″ ,, ,,
92	Angle Brackets.	56	Angle Brackets.
5	3½″ Rods.	3	3½″ Rods.
1	Crank Handle.	137	Nuts and Bolts.
4	1″ Pulleys.	4	Wood Screws.
1	½″ Pinion.		
1	Worm Wheel.		
214	Nuts and Bolts.		
16	Wood Screws.		
15	Keys.		

Fig. No. 52. Big Wheel



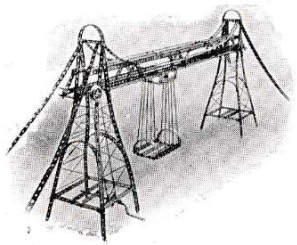
Parts Required.		*List of Parts required in addition to Meccano No. 3.*	
46	12½″ Perforated Strips.	34	12½″ Perforated Strips.
38	5½″ ,, ,,	17	5½″ ,, ,,
4	3½″ ,, ,,	18	3″ ,, ,,
18	3″ ,, ,,	2	2½″ ,, ,,
26	2½″ ,, ,,	60	Angle Brackets.
8	Angle Girders.	3	11½″ Rods.
96	,, Brackets.	2	Flanged Wheels.
4	11½″ Rods.	3	Bush Wheels.
1	6″ ,,	191	Nuts and Bolts.
6	Flanged Wheels.	1	Keys.
1	1½″ Pulley.	1	Length of Chain.
4	Bush Wheels.		
1	¾″ Pinion.		
1	Gear Wheel.		
268	Nuts and Bolts.		
23	Keys.		
1	Length of Chain.		
8	Wood Screws.		

Fig. No. 53. Transporter Bridge

	Parts Required.
20	12½″ Perforated Strips.
38	5½″ ,, ,,
2	3½″ ,, ,,
33	2½″ ,, ,,
12	Angle Girders.
32	,, Brackets.
1	5″ Rod.
1	3½″ ,,
1	Crank Handle.
2	1½″ Pulley Wheels.
2	1″ ,, ,,
4	½″ ,, ,,
167	Nuts and Bolts.
7	Keys.

List of Parts required in addition to Meccano No. 3.

8	12½″ Perforated Strips.
17	5½″ ,, ,,
9	2½″ ,, ,,
4	Angle Girders.
1	1½″ Pulley Wheel.
2	½″ ,, ,,
90	Nuts and Bolts.



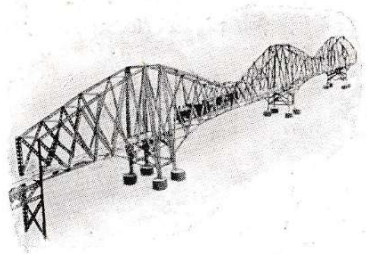


Fig. No. 60. Big Wheel

	Parts Required.
98	12½″ Perforated Strips.
193	5½″ ,, ,,
60	3½″ ,, ,,
120	3″ ,, ,,
194	2½″ ,, ,,
198	Angle Brackets.
6	11½″ Rods.
6	Flanged Wheels.
1	1½″ Pulley.
2	1″ ,,
2	¾″ Pinions.
3	Gear Wheels.
890	Nuts and Bolts.
8	Wood Screws.
20	Keys.
1	Length of Chain.

List of Parts required in addition to Meccano No. 3.

86	12½″ Perforated Strips.
172	5½″ ,, ,,
53	3½″ ,, ,,
120	3″ ,, ,,
170	2½″ ,, ,,
162	Angle Brackets.
5	11½″ Rods.
2	Flanged Wheels.
1	1½″ Pulley ,,
1	¾″ Pinion ,,
2	Gear ,,
813	Nuts and Bolts.
1	Length of Chain.

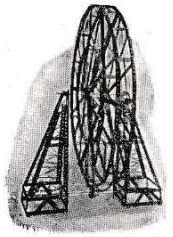


Fig. No. 61. Forth Bridge

	Parts Required.
164	12½″ Perforated Strips
264	5½″ ,, ,,
122	3½′ ,, ,,
112	2½′ ,, ,,
248	Angle Brackets.
850	Nuts and Bolts.

List of Parts required in addition to Meccano No. 3.

152	12½″ Perforated Strips.
243	5½″ ,, ,,
116	3½″ ,, ,,
88	2½″ ,, ,,
212	Angle Brackets.
773	Nuts and Bolts.

Contents of Box

No.	Description of Parts.
12	12½″ Perforated Strips.
21	5½″ ,, ,,
9	3½″ ,, ,,
24	2½″ ,, ,,
8	Angle Girders.
36	Angle Brackets.
1	11½″ Rod.
1	6″ ,,
5	5″ ,,
2	3½″ ,,
2	2″ ,,
1	Crank Handle.
4	Flanged & Grooved Wheels.
1	1½″ Pulley Wheel
3	1″ ,, ,,
2	½″ ,, ,,
1	Bush Wheel.
2	¾″ Pinion Wheels.
1	½″ ,, ,,
1	Gear Wheels.
2	¾″ Contrite Wheels.
1	Worm Wheel.
1	Pawl.
1	Spanner.
77	Nuts and Bolts.
12	Wood Screws.
1	Hook.
22	Keys.
1	Driver.
2	Hanks Cord
1	Ball Cord.
1	Book of Instructions.

Separate Parts


No. 21.


No. 28.


No. 27.


No. 1.


No. 9.


No. 23


No. 33.


No. 19.


No. 35.


No. 23.


No. 32.


No. 12.


No. 34.


No. 13.


No. 20.

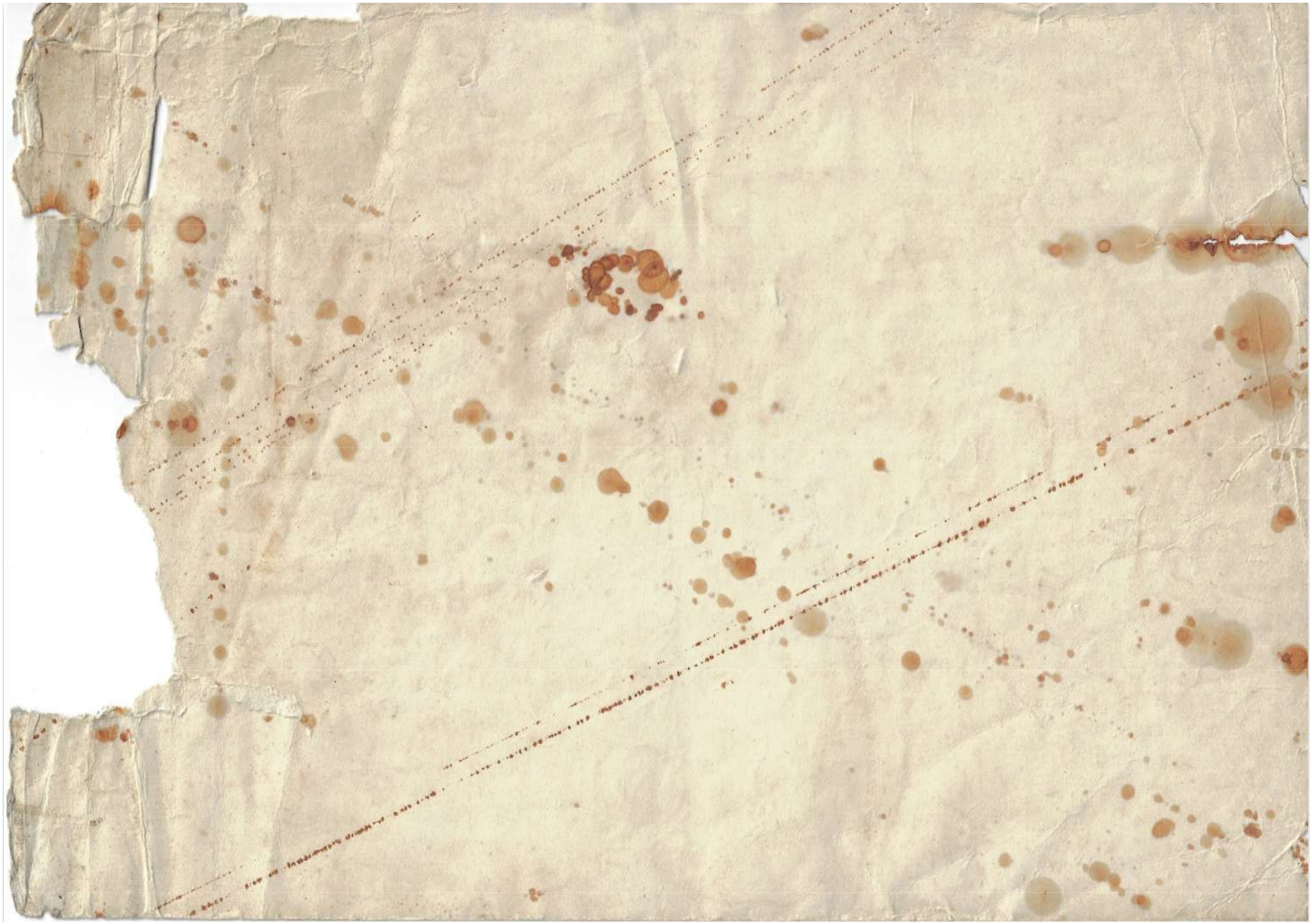

No. 24

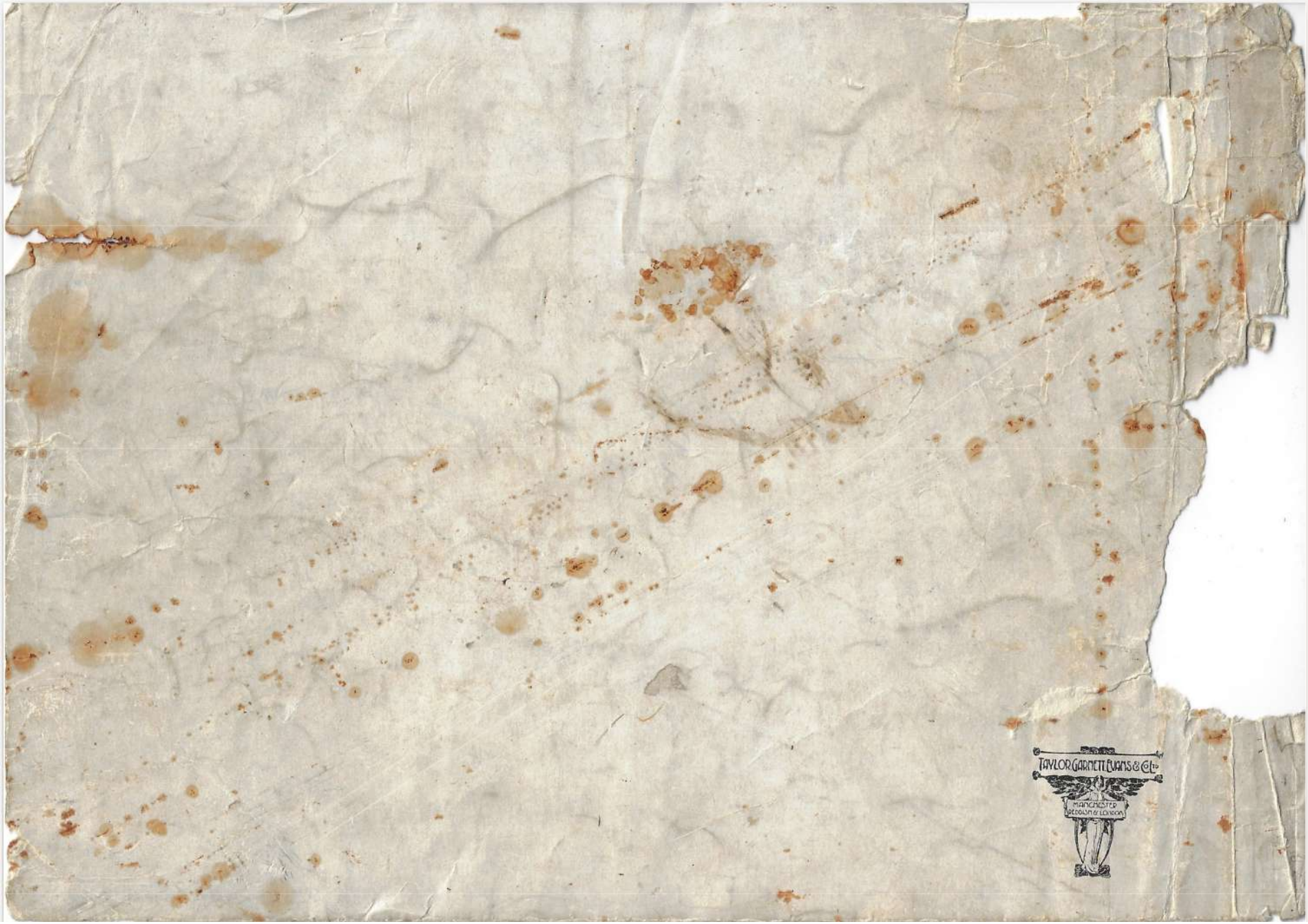
Price List of Additional Parts

	s.	d.
1.—Perforated Strips 12½″ long .. .. per ½ doz.	0	9
2.— ,, ,, 5½″ ,, ... ,,	0	4
3.— ,, ,, 3½″ ,, ... ,,	0	3
4.— ,, ,, 3″ ,, ... ,,	0	3
5.— ,, ,, 2½″ ,, ... ,,	0	3
6.— ,, ,, 2″ ,, ... ,,	0	3
9.—Angle Girders, 12½″ long .. .. ,,	1	0
12.—Angle Brackets .. .. .. per dozen	0	6
13.—Axle Rod, 11½″ long .. .. each	0	3
14.— ,, 6″ ,, ... ,,	0	2
15.— ,, 5″ ,, ... ,,	0	2
16.— ,, 3½″ ,, ... ,,	0	2
17.— ,, 2″ ,, ... ,,	0	1
19.—Crank Handle .. .. ,,	0	3
20.—Flanged and Grooved Wheel .. .. .. ,,	0	9
21.—Pulley Wheel, 1½″ long .. .. ,,	0	6
22.— ,, ,, 1″ ,, ... ,,	0	4
23.— ,, ,, ½″ ,, ... ,,	0	2
24.—Bush Wheel .. .. ,,	0	6
25.—Pinion Wheel, ¾″ long .. .. ,,	0	9
26.— ,, ,, ½″ ,, ... ,,	0	6
27.—Gear Wheel, 1½″ ,, ... ,,	0	10
28.—Contrite Wheel, 1½″ long .. .. .. ,,	1	3
29.— ,, ,, ¾″ ,, ... ,,	1	0
32.—Worm Wheel .. .. ,,	0	9
33.—Pawl .. .. ,,	0	3
34.—Spanner .. .. ,,	0	3
35.—Keys .. .. per dozen	0	6
36.—Turn Screws .. .. each	0	3
37.—Nuts and Bolts .. .. per 2 dozen	1	0
39.—Ball Cord (Special) .. .. each	0	2
40.—Hank Cord .. .. ,,	0	1

Price List

No. 1	Meccano Outfit	5/-
„ 2	„	10/-
„ 3	„	15/-
„ 4	„	25/-
„ 5	„	42/-
„ 6	„	84/-




TAYLOR GARNETT EVANS & Co Ltd
MANCHESTER
REDDISH & LONDON