The New Meccano Loom

A WONDERFUL MODEL THAT WEAVES REAL HATBANDS, NECKTIES, ETC., ETC.

SPECIAL FEATURES

The process of weaving is entirely mechanical. The shedding movement of the Heald Frames, the rocking of the Slay and Reed, the to and fro movement of the Shuttle, and the take-up motion by which the woven material is wound on to a roller, are all brought into operation on rotation of the Crank Handle. The material produced by the model is of excellent quality and can be used for practical purposes.

THE art of spinning and weaving is of great antiquity. Even at the time when Britain was covered with forest and its inhabitants were uncivilised and clothed in skins, the people of Eastern nations were wearing woven clothes.

Up to the year 1785 all weaving was done on hand-looms and indeed many of these machines are still in use in parts of Scotland and Ireland, and also in France. In the early days nearly every farmhouse in Lancashire was an independent little factory and hand-looms were to be found in most of the cottages and houses in the towns and villages. The weaver himself generally bought the raw cotton. This was picked by his children, spun into thread by his wife or his elder girls and then woven at the loom by his sons, whilst he carried it to the merchants to sell.

The earliest improvements in the hand-loom were those made in connection with that part known as the shuttle. To understand exactly the functions of the shuttle we must remember that a woven fabric is composed of two elements, the "warp" or longitudinal

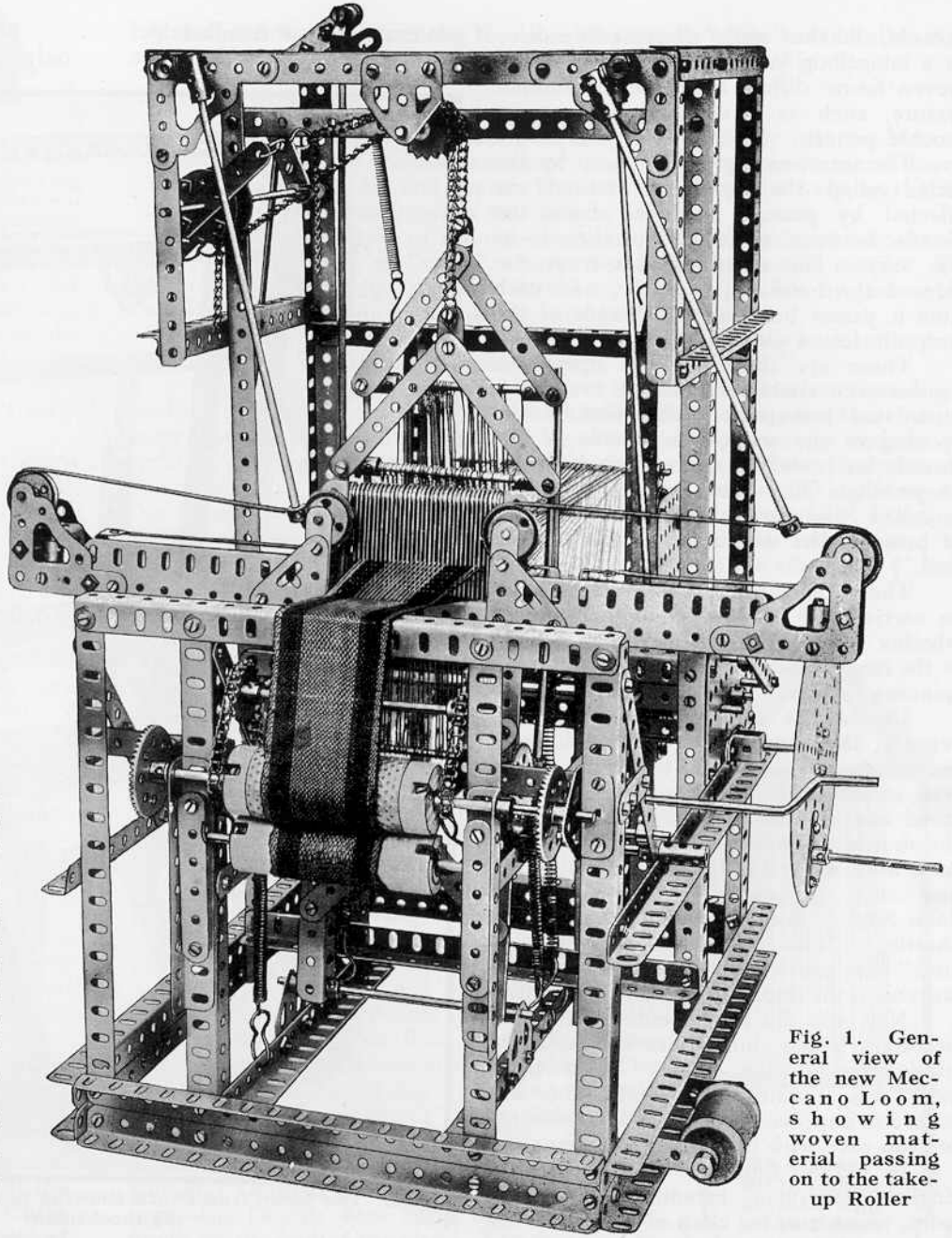

Fig. 1. General view of the new Meccano Loom, showing woven material passing on to the take-up Roller

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threads, and the "weft," or cross-threads. If you examine your handkerchief or a tablecloth, you will see exactly what is meant by this. Notice how a woven fabric differs from one of another texture, such as a stocking, jumper, or crochet pattern.

The interweaving of the warp by the weft, called the "picking motion," is effected by passing a thread from the shuttle between some of the threads of the warp. The shuttle moves from one side of the loom to the other, and each time it passes between the threads of the warp, it leaves behind a thread of weft.

There are three distinct operations necessary to enable the shuttle to accomplish this movement. The first is the opening of the warp, when some of the threads are raised for the second operation of picking. The third operation, which is called "beating up" the weft, consists of pressing the weft into position by the reed.

These three primary operations must be carried out on every loom, no matter whether it be the hand-loom of a cottage or the largest power-loom used in a modern spinning factory.

Up to the early part of the 18th century, the shuttle had to be "thrown" backward and forward by hand. This was accomplished by two persons, who stood one on each side of the loom. As the shuttle was heavy, throwing it was very hard work, as well as being a very laborious and slow process. In 1750, however, John Kay, of Bolton, invented the "flying" shuttle. This consisted of a "picking stick" that drove the shuttle and saved the weavers from throwing it with their hands.

Not only did the invention halve the necessary labour, but it also increased the production of the looms. Thus more yarn was required and attention was turned to improving the method of spinning, to keep pace with these increased demands.

In 1785 Edmund Cartwright, an English clergyman, invented the power-loom, which enabled cloth of more uniform texture to be produced at a lower cost and in greater quantities.

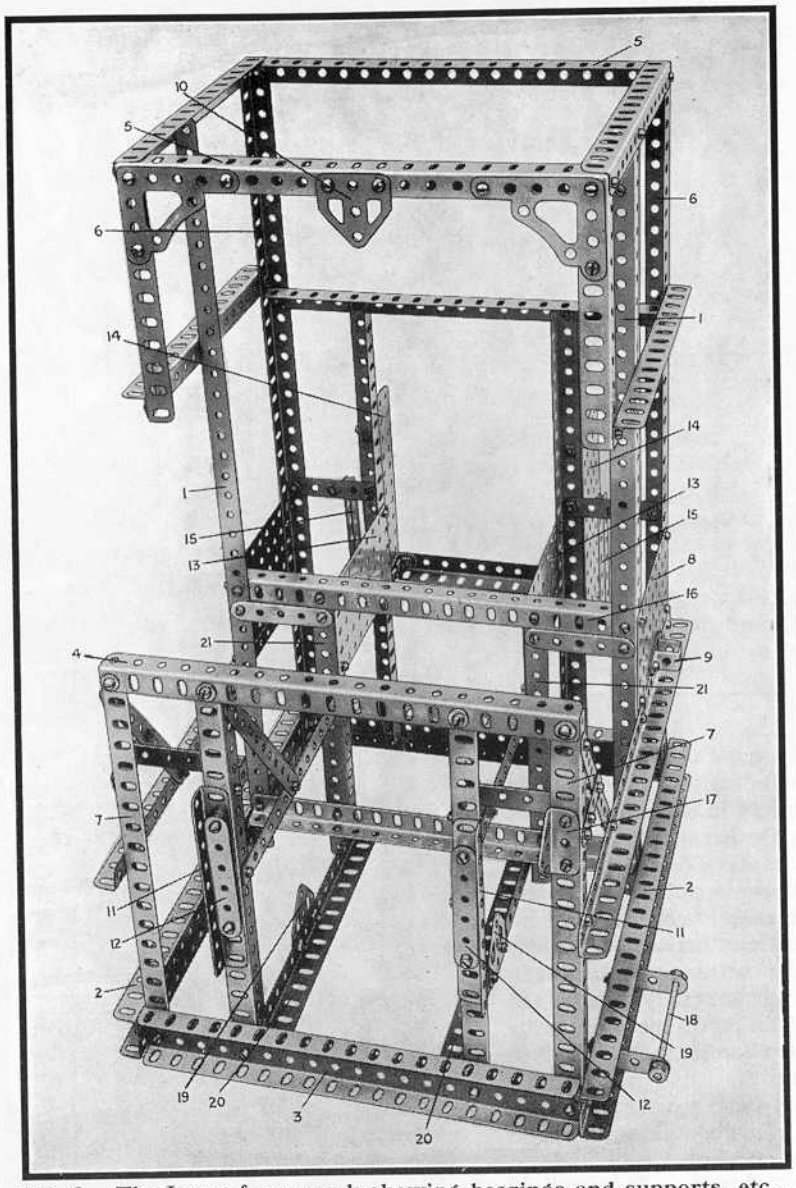


Fig. 2. The Loom framework showing bearings and supports, etc., for the mechanism

Strange though it may seem, yet it is a fact that the power-loom was only slowly taken up. It was first used in Glasgow about the end of the 18th century, but about a century ago it was rapidly adopted, especially after it was made so that the cloth was taken up mechanically, instead of having to be continually pulled forward by the weaver.

The Meccano Loom is designed exactly on the lines of the large power looms used in the cotton industry in Lancashire, and is capable of weaving excellent cloth.

Building the Meccano Loom

The construction of the Meccano model Loom is commenced by building up the main framework, which is shown in detail in Fig. 2. Four 18½" Angle Girders 1 and 6 are secured in a vertical position at one end of the base Girders 2, and two 9½" Girders 7 are bolted in position at their other ends, as indicated in the illustration. A 9½" Angle Girder 4 bridges the tops of the Girders 7, and two further 9½" Angle Girders bolted to it carry 4½" Angle Girders 11. The remainder of the framework may be successfully completed by studying carefully the illustrations.

The next step in the construction of the model is the assembling of the gearing, which is shown in Fig. 6. To make matters quite clear it must be mentioned that the gearing, as shown in the foreground, is duplicated, with the exception of the operating handle, at the other side of the model.

The operating handle (see Fig. 1), which consists of a Circular Plate with a 3" Rod attached to its face by a Double Arm Crank, is secured to a Rod carrying a ¾" Pinion that meshes with two 50-teeth Gears 62 and 63 fixed on separate Rods that run from side to side of the Loom. The first Rod has secured to it a cam 52 and the second Rod carries a Worm 56. Two cams are required, one at each end of the Rod, and they should be built up as shown in Fig. 8 and then secured rigidly to the Rod by duplicate set-screws in the bosses of the Bush Wheels, to prevent their rotation on the Rod.

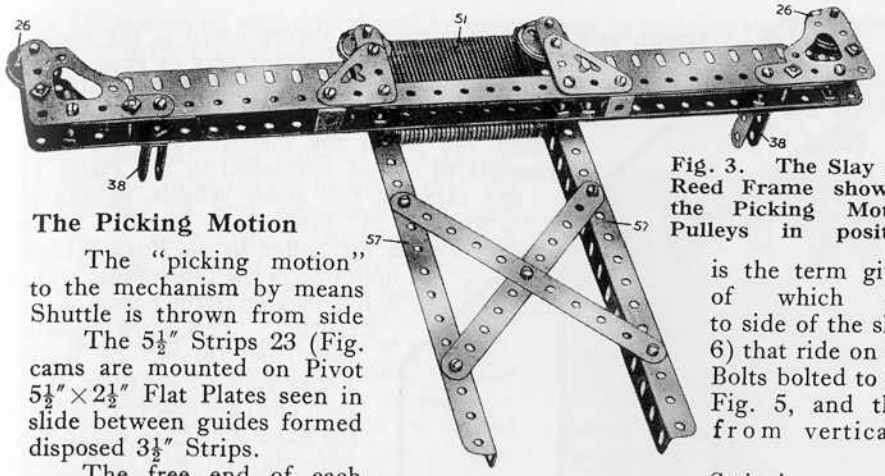


Fig. 3. The Slay and Reed Frame showing the Picking Motion Pulleys in position

The Picking Motion

The "picking motion" is the term given to the mechanism by means of which the Shuttle is thrown from side to side of the slay.

The $5\frac{1}{2}''$ Strips 23 (Fig. 6) that ride on the cams are mounted on Pivot Bolts bolted to the $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flat Plates seen in Fig. 5, and they slide between guides formed from vertically disposed $3\frac{1}{2}''$ Strips.

The free end of each Strip is connected by an End Bearing and a lock-nutted bolt to an $11\frac{1}{2}''$ Axle Rod 50 (Fig. 6), the upper end of which is attached in a similar manner to a built-up crank $1\frac{1}{2}''$ long that consists of two ordinary Cranks bolted together in such a manner that their bosses are at opposite ends. The composite crank is secured by double grub-screws to a Rod 22 (Fig. 5) in the upper part of the loom, which carries also a Crank 36. A Spring attached to the Crank serves the purpose of maintaining the Strips 23 in intimate contact with the cam.

A Coupling is secured on the end of each of the Rods 22, a Pivot Bolt being passed through its end transverse bore and inserted in the tapped bore of a Coupling on the upper extremity of a rod forming a "picking-stick." The bottom end of the picking-stick is later to be attached to a length of Spring Cord 25. The cams 52 are secured on their Rod in such a manner that the three Double Brackets forming the working face of one cam are diametrically opposite those of the other cam, so that the picking-sticks work alternately, and throw the Shuttle first to one end of the slay and then to the other.

The Take-Up Motion

The arrangement of the "take-up" motion that draws the woven cloth through the loom is indicated in Fig. 6. On the Rod of the 50-teeth Gear 63 is secured a Worm 56 that meshes with a $\frac{1}{2}''$ Pinion on a Rod 53. This Rod is duplicated on the far side of the model, and the ends of both Rods terminate in $\frac{1}{2}''$ Bevel Wheels that are in mesh with $1\frac{1}{2}''$ Bevels on the Rod of the upper take-up roller (Sand Roller, part No. 106a). Owing to the gearing employed, a slow "take-up" is imparted to the Sand Roller, and the woven material, after passing beneath it, is wound on to a lower roller (Wood Roller, part No. 106). The lower roller is rotated by frictional contact with the Sand Roller, and both Rollers are kept together by means of a spring tension device. The lower ends of two Tension Springs are hooked on to the frame of the model, and their upper ends are fitted with short lengths of Sprocket Chain which, after passing over 1" guide Sprockets above the Rollers, are attached to the lower Roller spindle by Hooks. The spindle of the lower Roller slides in a pair of guides 12 so that it is free to move vertically (Fig. 2).

The Heald Frames

As in actual practice, the healds are assembled vertically. In the Meccano Loom there are two frames, but there may be many more in actual looms. The healds serve to lift and depress alternate threads of the warp, so that the shuttle may be passed between the threads.

The healds consist of a number of wires called "leaches," each having in its centre an eye, or "mail," which resembles the eye of a needle. The depression of the warp, already referred to, is made possible by passing the warp threads through these mails.

The warp is the thread that runs longitudinally from the back to the front of the loom. The thread at right-angles to it is the "weft."

The construction of the Heald frames should be quite clear from Fig. 4 (which shows one of the frames removed from the Loom), and therefore we may pass on to their insertion into the Loom. Hooks on the ends of the Springs 59 (Fig. 4), depending from the lower extremity of the Heald frames, are attached to the Girders 20 (Fig. 2). The Flat Brackets 60 at the tops of the frames are bolted to lengths of Sprocket Chain 42 and 44 (Fig. 5) respectively. These Chains pass over 1" Sprocket Wheels 41 and 43, and are attached finally by Hooks to $2\frac{1}{2}''$ Strips 45 and 47 that are affixed by $\frac{3}{4}''$ Bolts and Nuts to two Bush Wheels secured rigidly to the Rod 49. The Rod carries an ordinary Crank, which is connected by a Rod 39 to a Crank 31 on one end of the camshaft. The attachment of the Rod 39 to the lower crank 31 is effected by means of a Swivel Bearing 30, and to the upper crank by an End Bearing 48.

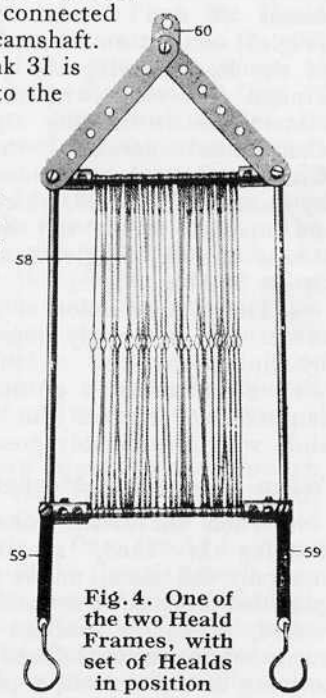


Fig. 4. One of the two Heald Frames, with set of Healds in position

Construction of the Slay

The main features of the slay will be clear by referring to Fig. 3. The portion of the slay upon which the Shuttle slides is a girder of channel section, consisting of two $12\frac{1}{2}''$ and two $2\frac{1}{2}''$ Angle Girders butted together. The Shuttle is prevented from leaving the slay by $5\frac{1}{2}''$ Flat Girders, which are bolted to the sides of the channel girder. Architraves at each end serve as bearings for the Rods of 1" loose Pulleys 26.

The Reed 51 consists of thirty-two $2\frac{1}{2}''$ Strips mounted on two Rods, each Strip being spaced apart the thickness of one Washer. The Reed is attached to the slay by passing the ends of the Rods carrying the $2\frac{1}{2}''$ Strips through the flanges of the $9\frac{1}{2}''$ Angle Girders 57. A length of Spring Cord 25 (Fig. 5) passes round each pair of 1" Pulleys and its ends are fixed to the lugs of a Double Bent Strip 27, which slides freely on the bed of the slay. The lower ends

of the picking-sticks will eventually be attached to the Spring Cord and in this manner the Double Bent Strips are made to flick backward and forward, so that when the shuttle is placed at one end of the slay, one of the Double Bent Strips will engage with the pointed end of the Shuttle and throw it to the opposite end of the slay. The other picking-stick and Double Bent Strip then return it.

The slay is mounted in place in the Loom by passing a Rod through the top holes of the Flat Trunnions 19 (Fig. 2) and through the bottom holes in the Girders 57 of the slay. The slay is rocked about its pivot by means of two Cranks 29 (Fig. 5) secured on the ends of the Rod carrying the $\frac{3}{4}$" Pinions that mesh with the 50-teeth Gears 63 (Fig. 6). Connection between the Cranks and the slay is formed by means of Strips 28, which are attached to the slay by means of the Single Bent Strips 38 (Fig. 5).

The picking action of the model may be greatly improved by lining the bed of the slay with a narrow strip of tin. This improvement enables the Shuttle to slide with considerably greater freedom.

Warp Tensioning Mechanism

When the heald frames descend after forming the "shed," the threads of the warp naturally fall slack, unless special mechanism is provided to remedy the matter. Slacking of the warp would, of course, prevent satisfactory work being turned out by the model, and in order to compensate for any sag of the threads, a particularly ingenious device known as a "warp tensioner" is incorporated in the model. This mechanism and its arrangement may be seen in the rear view of the model (Fig. 5), and a study of this illustration in conjunction with the following description will make the matter quite clear. It consists of a Rod journalled in the Plates 14 and carrying two Bush Wheels, to one of which a $2\frac{1}{2}$" Strip 33 is bolted. Two Cranks are bolted to the Bush Wheels as indicated in the illustration, and a Rod is secured in the bosses of the Cranks. The warp threads from the "beam" (a Wood Roller with a Face Plate 24 at each end) are first passed over the fixed Rod, then round the movable Rod, and again over the fixed Rod, to the Healds. The necessary tension is supplied by means of a Spring 34 attached to the Strip 33 as shown in fig. 5.

The beam is restrained from free rotation by a band brake consisting of a 2" Pulley secured to the beam spindle, and round which passes a cord. One end of the cord is attached to the frame of the model, and the other end is tied to a Spring that keeps the cord in a constant state of tension round the Pulley and thus supplies the required retarding effect.

The Beaming Frame

In order to turn out good work with the Loom, it is highly important that the threads of the warp should be wound on the beam evenly, and each individual thread must be laid on under exactly the same tension. For this purpose a beaming frame is employed. A Meccano model beaming frame is shown in Fig. 9. After a little study of

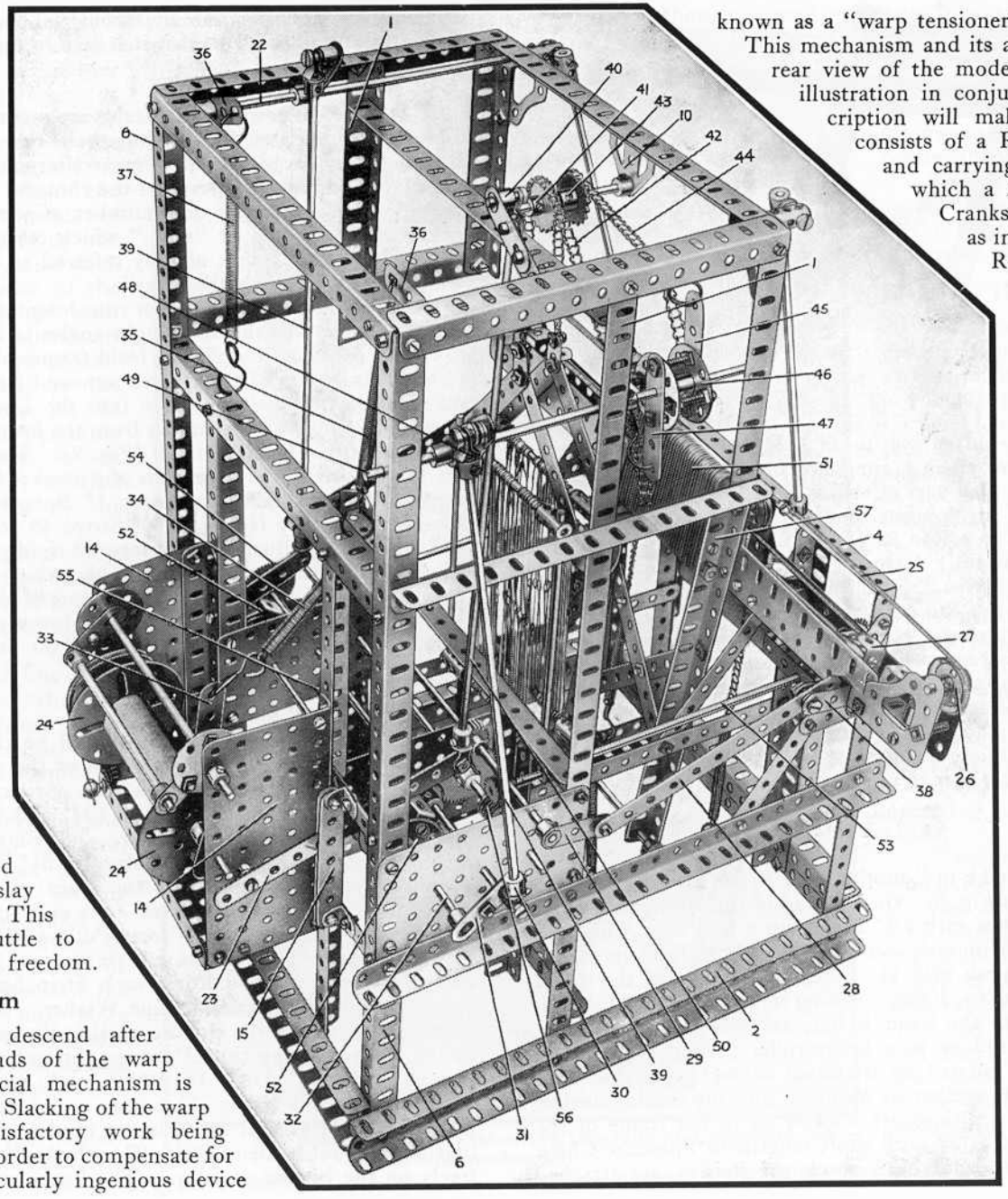


Fig. 5. View of the Loom mechanism from the rear

the illustration no difficulty should be experienced in building the framework, so we may devote our attention to the more obscure points in the construction of the model and its manipulation.

The rotating frame 1 on which the various skeins of silk are wound, consists of four 24½″ Angle Girders, bolts being inserted in the holes of each Girder throughout their length in order that the skeins may be kept separated from each other. A Face Plate 2, attached to each end of the frame, is secured to a Rod 3, which is journalled in the end holes of the vertical girders, and has brake drums in the shape of 3″ Pulleys 4 fixed at each end. Cords are passed round the Pulleys under tension, which is supplied by Springs.

Each of the warp threads is led behind the Rod 5, through the top hole of each weight 8, and in front of the Rod 7. After leaving the Rod 7 the thread passes behind the Rod 6, and is taken through a hole in the front Girder as shown before it is inserted in the reed 9. This process is repeated with each warp thread in turn. All the warps are then fastened to the beam 11 by clamping them with a Rod 10 in the groove of the Wood Roller. This Rod is held in position by a ⅝″ Rubber Ring, which is placed over each end of the Rod and the bosses of the Face Plates forming the end of the beam. A Pawl and Ratchet mechanism 12 is fitted to the beam spindle to prevent it from unwinding.

Each of the weights 8 is composed of a 5½″ Strip to which three 2½″ Strips are attached by five nuts and bolts. If the builder does not possess sufficient 2½″ Strips, it will be necessary to construct some of the weights with other Strips to an equivalent weight.

One or two precautions must be observed before attempting to remove the beam from the beaming frame for insertion in the Loom. If all the silk has not been wound off the frame 1, the threads must be cut. Prior to this, a Rod should be clamped over the threads on the beam in a similar manner to the Rod 10 (Fig. 9) in order to prevent the threads from becoming loose and deranged; and a pair of Strips should also be clamped above and below the warp, just in front of the reed. This is to prevent the warp threads from pulling out of the reed when the warp is severed. The beam may then be removed from the machine.

Care should be taken to replace the Rod holding in place the turns of warp on the beam, and it should be removed only when the warp is secure on the take-up rollers.

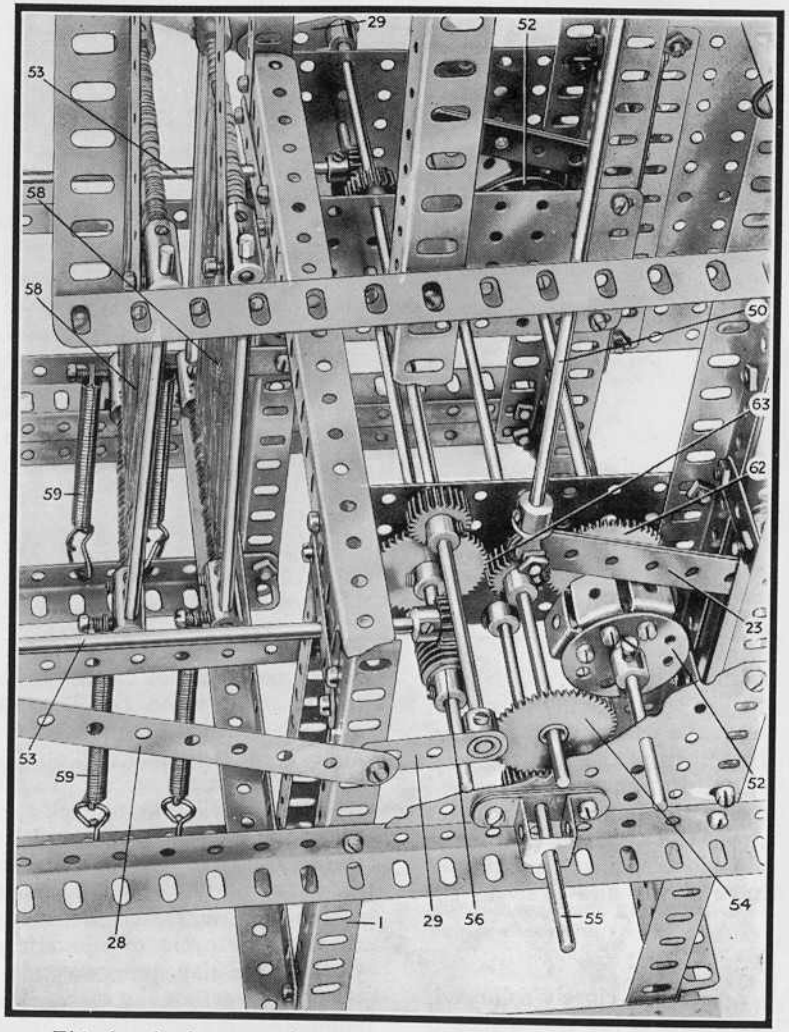


Fig. 6. A close-up view of the Picking Motion mechanism

Preparing to Weave

When the Loom has been completed, it becomes necessary to take into consideration the pattern to be woven. Whether it be a hat band or a tie that is to be the first effort, the choice of colours for the warp and the weft—particularly the former—will call upon the artistic ability of the user to no little extent, in addition to manipulative ability in the actual process of weaving.

The best material for use as the warp threads in the Meccano Loom is No. 8 "Star Sylko"; and for the weft No. 40.

Before threading the Healds, etc., it is of the utmost importance to see that the various movements of the model take place in their correct order. First, the Heald frames should both be arranged so that the mails or eyes of the respective groups of healds coincide when the Crank 31 (Fig. 5) is set vertically. Then, with one of the Heald frames raised and the other lowered to their greatest extent, the Cranks 29 should be turned so that the slay is as close as possible to the front heald frame. The Cranks are then secured on the Rod. At the same time the picking motion must throw the Shuttle across the slay, and this cycle of operations must take place with unfailing regularity. Having made quite sure that everything is correctly adjusted attention may be paid to the actual threading of the Healds.

A single warp thread is passed through each mail of the Healds, the threads passing through the mails of the two Heald frames alternately. Care should be taken to see that none of the threads cross. One or more threads may be passed through each division of the reed, and attached to the take-up Rollers. The Meccano Reed Hook will be found useful for passing the threads through the reed.

Sufficient warp thread should be unwound from the beam to allow the

Heads to be easily threaded, and the ends of the threads then clamped to the lower take-off roller, an operation that is accomplished in a similar manner to that adopted with the beam.

The Meccano Shuttle is illustrated in Fig. 7, from which it can be seen that it consists mainly of two parts, a shell and a "cop" on which the weft thread is wound. The latter may be quite easily removed from the shell, and may be wound with thread on the winding machine that is incorporated in the Loom. The winding machine consists of a Crank Handle (seen projecting from the right-hand side of the model in Fig. 1), on which is a 57-teeth Gear Wheel in mesh with a ½" Pinion on a secondary Rod. This Rod has also secured to its outer end a Coupling in which the cop is held during winding. The reel of thread is accommodated on a Rod 18, which is carried in a 2½"×1" Double Angle Strip bolted to the base Girders of the Frame. After winding, the loaded cop is inserted in its shell, the free end of the thread being passed through one of the holes in the side of the shell and allowed to trail freely alongside when the Shuttle is placed in the slay.

When the operating handle is turned, one of the Heald Frames rises and the other falls simultaneously, thus "shedding" the warp. The slay moves up to the Heald frames, and as it pauses before commencing its return journey the Shuttle is thrown across the slay between the parted warp threads, leaving in its wake a trail of weft thread. On the return of the slay the reed drives before it loose thread left by the Shuttle, so forming what is termed the "first pick" of the weft. By continuing to turn the handle the process is repeated, but this time the Shuttle is thrown from the opposite end of the slay. The reed then presses the second pick into place against the first.

The taking-off rollers in the meantime revolve slowly and draw in the woven fabric as weaving proceeds.

Parts required to build the Meccano Loom

2	of No.	1b	7	of No.	13a	102	of No.	38	2	of No.	102
12	,,	2	6	,,	14	10	,,	43	4	,,	103c
8	,,	3	5	,,	15	3	,,	45	1	,,	104
2	,,	4	6	,,	16	2	,,	46	2	,,	106
42	,,	5	3	,,	16a	1	,,	47	1	,,	106a
4	,,	6	1	,,	16b	4	,,	53a	6	,,	108
2	,,	6a	4	,,	18b	14	,,	57	2	,,	109
4	,,	7a	1	,,	20a	30	,,	58	2	,,	111
10	,,	8	4	,,	22a	24	,,	59	2	,,	111a
17	,,	8a	9	,,	24	13	,,	62	12	,,	111c
8	,,	8b	5	,,	25	1	,,	62b	1	,,	126
5	,,	9	4	,,	26	13	,,	63	3	,,	126a
2	,,	9a	5	,,	27	2	,,	64	2	,,	133
2	,,	9d	1	,,	27a	2	,,	70	1	,,	136
4	,,	10	2	,,	30a	8	,,	82	1	,,	146
8	,,	11	2	,,	30c	28	,,	94	6	,,	147b
6	,,	12	2	,,	32	4	,,	96	2	,,	155
2	,,	12b	202	,,	37	60	,,	101	6	,,	166
6	,,	13	28	,,	37a						

Getting the Best from the Loom

Providing that the instructions given in this Leaflet are closely followed, the actual construction of the Loom should offer little difficulty to the average Meccano model-builder; but there are one or two matters connected with the adjustment and working of the model on which some advice may be given to enable the builder to turn out really good material that may be put to some useful purpose.

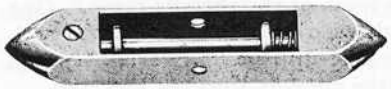


Fig. 7. The Meccano Loom Shuttle

First of all, it should be understood that adjustments to the finished model will be necessary to ensure that the different movements are timed correctly. For example, it is quite probable that in a newly-completed model some difficulty will be experienced in getting the Shuttle to work properly and regularly, and this, of course, is one of the most important movements of the whole machine. Careful attention, therefore, should be paid to this matter.

We have already mentioned that any trouble arising through the Shuttle sticking in the slay may usually be overcome by the simple expedient of lining the floor of the slay with a strip of cardboard, or better still a strip of tin. This will provide a smooth, even surface on which the Shuttle may slide easily to and fro. The next operation is to carefully adjust the springs controlling the picking motion, taking pains to ensure that the tension of both springs is equal. Several experiments may be necessary before the springs are in correct adjustment, but any trouble taken at this point will be amply repaid by the better quality of the woven cloth.

Another important point is the timing of the motion of the slay with that of the Shuttle. Here it may be mentioned that the Shuttle must shoot between the threads of the warp just at the moment when the latter are separated to their greatest extent, which coincides with the instant when the slay is nearest to the Heald Frame. This adjustment is best carried out by arranging matters so that the cams operating the picking-sticks are set in such a manner that the picking-sticks are released when the slay has completed two-thirds of its travel towards the Heald Frames. Thus the effect of the time-lag is counteracted, and the Shuttle passes across the warp at the correct moment.

It should be noted that the bottom set of warp threads, which are depressed by the appropriate Heald Frame during one cycle of operations, must lie closely on the floor of the slay, otherwise the Shuttle may foul them in its passage across the slay. The upper set of threads also should receive attention in order to ensure that the Shuttle has a clear path between the two sets of threads. The adjustments necessary to effect this may be carried out simply by varying the lengths of Sprocket Chain 42 and 44 that connect the Heald Frames to the arms 47 and 45.

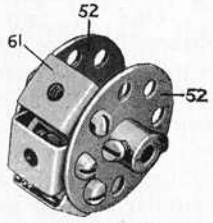


Fig. 8. Cam for operation of Picking Sticks

In order to obtain the sudden jerk of the picking-

sticks that is necessary to throw the Shuttle from end to end of the slay, the operating handle should be turned quickly at the point where the cam releases the picking-sticks. After a little practice the amateur weaver will find this quite easy.

An alternative method of accentuating this motion is to bolt a 2" Flat Girder against the face of each of the Strips 23 (Fig. 5), so that it projects below the bottom edge of the Strip. This modification will enable the Flat Girder to drop with extreme suddenness off the receding face of the cam, and will thus speed up the motion to a greater extent than would be possible by the Strip merely riding on the cam. In order to cause the Flat Girder to follow closely the contour of the cam, the Spring 37 may be duplicated.

Removing the Cop from the Shuttle

We have not yet explained how the cop may be removed from the Shuttle. This is accomplished by extracting the grub-screw seen at the left-hand end of the Shuttle in Fig. 7. The cop will then move to the left under the action of the spring, and the left-hand end of the cop will drop clear of the Shuttle. It is advisable to mention that the purpose of the spring is to prevent too free rotation of the cop, which would lead to uneven edges in the woven material. If the spring is too strong, on the other hand, the Shuttle will not travel completely across the slay, owing to the braking effect produced. The spring should press quite lightly on the end of the cop, and if it is judged to be too strong, a turn or two may be cut off.

It will be realised that considerable strain is placed upon some of the Gears and Rods of the mechanism, and in order to prevent the Gears slipping on their shafts, all set-screws must be secured very tightly. If any parts are still found to slip on their Rods, especially in connection with the picking motion mechanism, the set-screws should be duplicated, thereby doubling their powers of resistance.

Where considerable trouble is experienced from this cause, it is a good plan to file a small flat in the Axle Rods immediately beneath the set-screws, thus providing a better gripping surface.

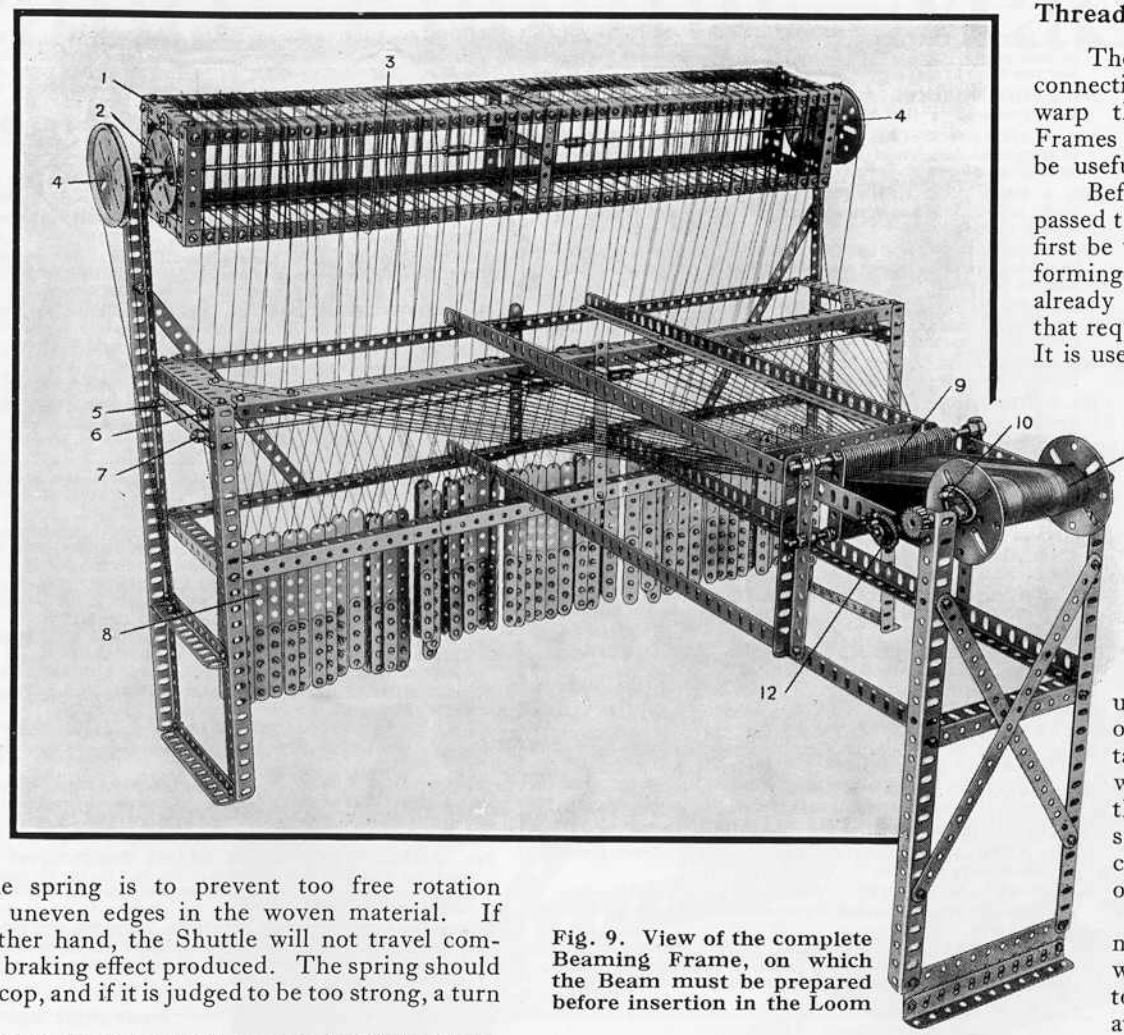


Fig. 9. View of the complete Beaming Frame, on which the Beam must be prepared before insertion in the Loom

Threading the Heald Frames

There are one or two matters in connection with the threading of the warp threads through the Heald Frames on which some advice may be useful.

Before the warp threads are passed through the Healds, they must first be wound on to the Wood Roller forming the beam, in the manner already described, and this is work that requires a great deal of patience. It is useless to try to rush the operation to completion, for this will lead only to unsatisfactory working of the loom, with consequent deterioration in the quality of the woven material produced. It should be borne in mind that much of the success of the model depends upon the warp threads being wound perfectly evenly upon the beam, and in carrying out this work care must be taken to see that the tension weights do not drop so far that they touch the floor, as the sudden release of tension causes uneven patches to occur on the beam.

It is perhaps scarcely necessary to add that all the working parts of the Loom are to be lubricated thoroughly at regular intervals.

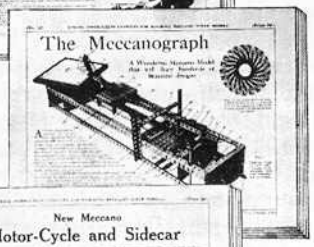
Parts required to build the Beaming Frame

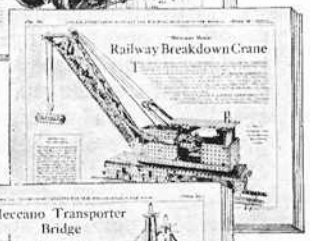
4	of No.	1a	15	of No.	9	594	of No.	37	8	of No.	63
62	,,	2	7	,,	9b	6	,,	37a	3	,,	103
10	,,	3	8	,,	13	90	,,	38	2	,,	109
2	,,	4	2	,,	14	1	,,	40	6	,,	111c
224	,,	5	1	,,	15	3	,,	43	1	,,	147a
12	,,	7	3	,,	16	2	,,	48b	8	,,	147b
2	,,	7a	2	,,	19b	21	,,	59	1	,,	148
6	,,	8									

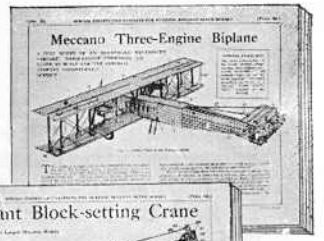
THE MECCANO SUPER MODEL LEAFLETS

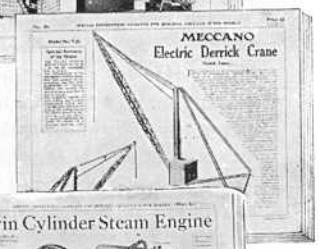
The range of Meccano Super Models now embraces no less than 38 superb examples of miniature engineering construction. A special instruction leaflet has been published for each of these super models and a selection of the leaflets is illustrated on this page.

A brief description of each model in the series is given below, while the prices of the leaflets are indicated at the foot of this page. Copies of any of the leaflets may be obtained from your dealer or direct from Head Office, post free, at the prices indicated.









No. 1 MOTOR CHASSIS. This model runs perfectly under its own power. It has Ackermann Steering, Differential, Gear Box and Clutch, etc.

No. 2 SHIP COALER. All the movements of a real ship-coaler are reproduced in this model.

No. 3 MOTOR CYCLE AND SIDECAR. The sidecar is of streamline design and is mounted on springs. The motor-cycle is complete with lamps, horn, exhaust pipes, etc.

No. 4 GIANT BLOCK-SETTING CRANE. This realistic model is fitted with an accurate reproduction of Fidler's block-setting gear.

No. 5 TRAVELLING BUCKET DREDGER. In this model trucks and wagons can run underneath the chute through which falls the material raised by the dredger buckets.

No. 6 STIFF-LEG DERRICK. This model has many interesting movements, including hoisting, luffing and swivelling, which are controlled by suitable levers.

No. 7 PLATFORM SCALES. This model will weigh articles up to 4½ lb. with remarkable accuracy.

No. 8 ROUNDABOUT. This model is most attractive when in motion. As the roundabout rotates the cars spin round and the horses rise and fall.

No. 9 BAGATELLE TABLE. This is an interesting model that will give hours of fun to the players.

No. 10 LOG SAW. In this model the saw is driven rapidly to and fro while the work table travels beneath it.

No. 11 SINGLE-CYLINDER HORIZONTAL STEAM ENGINE. Fitted with balanced crankshaft, crosshead and centrifugal governor.

No. 12 STONE SAWING MACHINE. The model is equipped with adjustable work table and overhead trolley with self-sustaining chain hoist.

No. 13 MECCANOGRAPH. This wonderful model will draw hundreds of beautiful designs.

No. 14a GRANDFATHER CLOCK. A practical example of Meccano model-building. The model keeps accurate time.

No. 15 BALTIC TANK LOCOMOTIVE. The driving wheels are operated by an Electric Motor. An accurate reproduction of Walschaerts' Valve Gear is fitted.

No. 16a LOOM. This is perhaps the greatest Meccano success. The model weaves beautiful material.

No. 17 PLANING MACHINE. Fitted with quick-return motion.

No. 18 REVOLVING CRANE. This model is fitted with screw-operated luffing gear.

No. 19 STEAM SHOVEL. This model embodies travelling, rotating, racking and digging movements, and jib hoisting and lowering gear.

No. 19a STEAM EXCAVATOR, OR MECHANICAL DIGGER. A Meccano Steam Engine is incorporated in this model and provides the power for operating the four movements.

No. 20 MOBILE CRANE. This model has hoisting, luffing, travelling and slewing movements. It is fitted with an automatic brake on the hoisting shaft, an internal expanding brake on the front axle, and a limit switch to prevent over-winding of the jib in either direction.

No. 21 TRANSPORTER BRIDGE. The carriage automatically travels to and fro for as long as the motor is driven, pausing for a few seconds at each end of its travel.

No. 22 TRACTION ENGINE. A remarkably realistic model that will pull a boy of average weight. Fitted with two speeds.

No. 23 VERTICAL LOG SAW. While the saws are in motion, the logs are fed slowly to them.

No. 24 TRAVELLING GANTRY CRANE. The movements of this model comprise the traversing of the entire gantry, hoisting and lowering, and the traversing of the crane trolley.

No. 25 HYDRAULIC CRANE. The hydraulic ram is represented realistically by a powerful screw mechanism.

No. 26 TWIN ELLIPTIC HARMONOGRAPH. Some beautiful designs may be produced with this model.

No. 27 DRAGLINE. This imposing model of a giant excavator is fitted with travelling, luffing, slewing, and dragging movements.

No. 28 PONTOON CRANE. The movements of this model include the operation of the two hoisting blocks, slewing of the entire crane, and luffing.

No. 29 HAMMERHEAD CRANE. This is a very realistic and powerful model, comprising traversing, hoisting and slewing motions.

No. 30 BREAKDOWN CRANE. This model is equipped with travelling, slewing, luffing, and hoisting motions, and also is fitted with laminated springs, brakes, out-riggers, etc.

No. 31 WAREHOUSE WITH ELEVATORS. The two cages are driven automatically and work alternately, pausing at top and bottom positions.

No. 32 TWIN CYLINDER STEAM ENGINE AND BOILER. This is a realistic working model of a complete steam plant, equipped with valve gear, governor, balanced cranks, etc.

No. 33 SINGLE AND DOUBLE FLYBOATS. These two models represent popular pleasure-fair attractions.

No. 34 THREE-ENGINE BIPLANE. This is a realistic model of an "Argosy" machine, and is fitted with ailerons, elevators and rudders.

No. 35 LEVEL LUFFING GRABBING CRANE. A large and imposing model of novel design. The crane incorporates a level luffing gear, while the balanced jib is operated by crank action and is fitted with a "single suspension" grab.

No. 36 ELECTRIC DERRICK CRANE (Scotch Type). This imposing model is built to a scale of ¾in. to 1 ft., the jib measuring 6 ft. in length. The movements include hoisting and lowering, luffing and slewing.

No. 37 6-in. HOWITZER, LIMBER AND TRACTOR. A splendid new working model of a complete mobile artillery unit. The Tractor incorporates "caterpillars" and the Howitzer will shoot accurately.

Prices of Meccano Super Model Leaflets :—

Leaflets Nos. 3, 5, 6, 7, 8, 9, 10, 11, 12, 14a, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 28, 29, 36, 37—United Kingdom 2d., Australia 4d., New Zealand and South Africa 3d., Canada 5 cents.

Leaflets Nos. 1, 2, 13, 15, 16a, 19a, 27, 30, 31, 32, 33, 34, 35—United Kingdom 3d., Australia 6d., New Zealand and South Africa 4d., Canada 8 cents.

Leaflet No. 4—United Kingdom 6d., Australia 1/–, New Zealand and South Africa 8d., Canada 15 cents.

MECCANO LIMITED, Old Swan, LIVERPOOL, ENGLAND