

**String along with MMQ and try our**

# TRIPLE-STRAND PLAITING MACHINE

*says 'Spanner'*

**A good working display model**

THERE'S NOTHING like a working model to attract attention at an exhibition and you may be sure that, on our Company Stands at the various Toy Trade shows we attend, we always have a good supply of Meccano display models to draw the crowds.

Display models come in a wide variety of shapes and sizes, and we've had some veritable 'giants' in our time - fifteen, twenty, and even thirty feet high! As many readers will know from experience, however, a model does not *need* to be a giant to

be a successful display piece. A giant may excite comment, but a small, intricate, *moving* structure can often attract as much attention, and frequently more genuine interest from a viewer. On our Company Stand at the Nuremburg Toy Fair this year, for instance, we exhibited (among many other things, of course!) a little Plaiting Machine. Only sixteen inches tall, it was neat, compact and comparatively uncomplicated, yet I think it drew more attention than any of the other, bigger models on display.

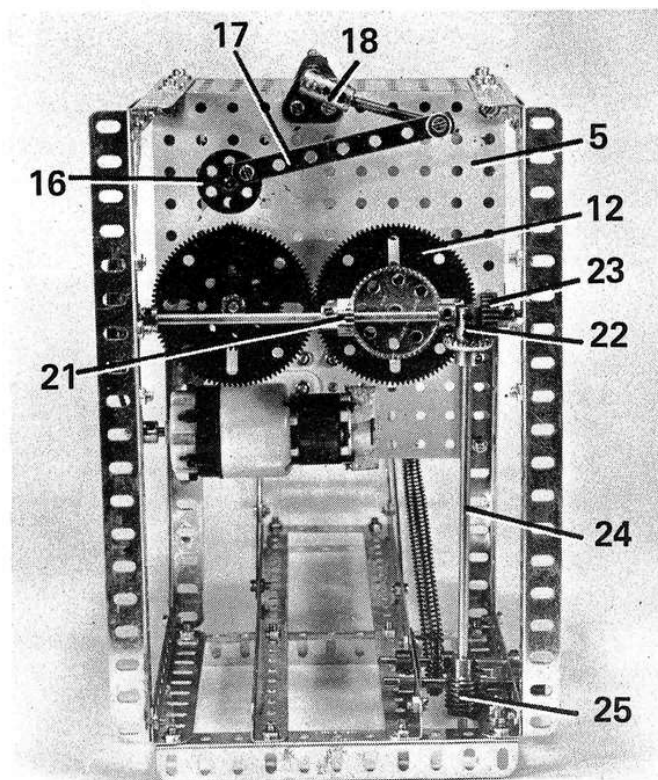
Instead of just looking at it, people stopped and *studied* it, and this, I feel, is a good sign of display success.

If buyers at a Toy Fair found the Machine interesting, we thought, how much more would MMQ readers. Indeed, many readers are now active exhibitors in the display field themselves, and the Machine has already proved its value in this area. So, we said, it's one for the Magazine - and here it is, slightly modified to run from a 6-speed Motor.

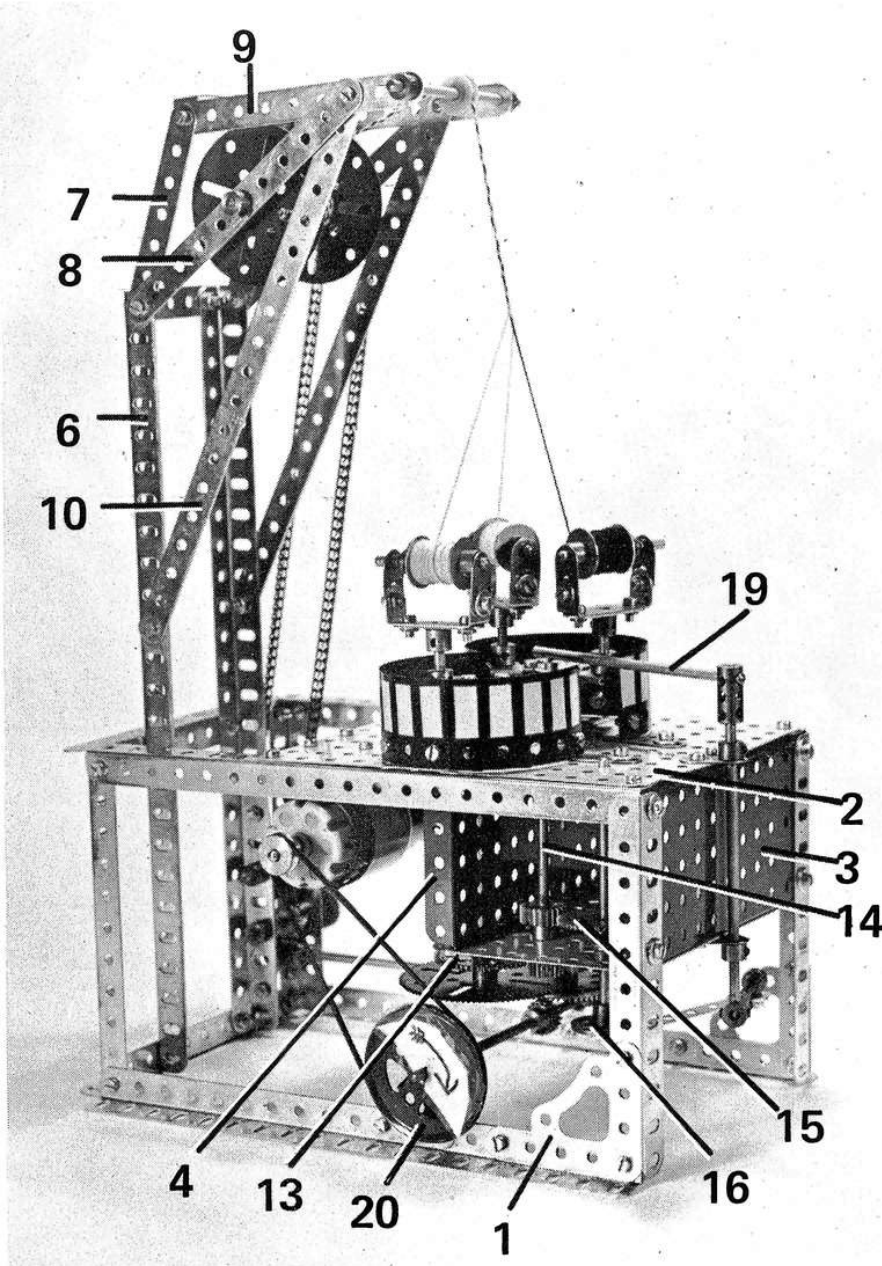
## CONSTRUCTION

A 9½" x 5½" x 5½" rectangular box framework is built up from Angle Girders, as shown in the illustrations, the lower end of the front 5½" uprights being braced by Corner Gussets 1. Two 5½" x 3½" Flat Plates 2, overlapped one hole, are secured to the top of the frame, while a 5½" x 2½" Flanged Plate 3 is bolted between the upper ends of the front uprights. Another 5½" x 2½" Flanged Plate 4 is bolted to the underside of the top Girders, seven holes in from the front, and a 5½" x 3½" Flat Plate 5 is bolted to the lower flanges of this Plate and Plate 3.

Secured to the rear of the frame are two vertical 12½" Angle Girders 6, connected at the top by a 2½" Strip. Bolted to the upper end of each of these Girders are a 3½" Strip 7 and a 5½" Strip 8, arranged as shown, the upper ends of these Strips being bolted to a horizontal 4½" Strip 9, at the same time fixing a 9½" Strip 10 in place to provide additional bracing. The lower end of this Strip is bolted through the eleventh hole of Angle Girder 6. The Bolts connecting Strips 7 and 9 also fix a 2½" x ½" Double



An underside view of the Triple-strand Plaiting Machine described in this article. A general view of the machine is shown on the opposite page. The original model was displayed on the Meccano Stand at this year's Nuremburg Toy Fair, where, despite its small size, it attracted a great deal of attention from trade buyers visiting the show.



Angle Strip in place between the Strips at each side of the assembly.

Two locating heads for the bobbin units are each built up from a 6-hole Bush Wheel, to the face of which three 2" Strips 11 are bolted as shown. Note that Washers and/or electrical Thin Washers are used as spacers under these Strips, as necessary, to ensure reasonably horizontal lie. When completed, one of the heads is fixed on the upper end of a vertical 5" Rod held by Collars in the fourth holes in the flanges of Plate 4. Fixed on the Rod beneath the lower Collar is a 2½" Gear Wheel 12 which meshes with another 2½" Gear Wheel on a vertical 4½" Rod journalled in the third holes from the other end in the flanges of Plate 4. This Rod is held in place by a Collar above Plate

2, but, below Plate 5, by a 57-teeth Gear Wheel 13. The second bobbin unit locating head is fixed on the upper end of the Rod.

Gear Wheel 13 meshes with a ½" Pinion on a 3" Rod 14 journalled in Plates 2 and 5. Fixed on this Rod is a ¾" Pinion which meshes with a 50-teeth Gear Wheel 15 on a 4" Rod also journalled in Plates 2 and 5; where it is held in place by a Collar. An electrical 1" Bush Wheel 16 is fixed on the lower end of the Rod. Lock-nutted through one hole in this Bush Wheel is a 3½" Narrow Strip 17, the other end of which is pivotally connected to a Collar on a Flexible Coupling Unit fixed in a Coupling 18. This Coupling is in turn fixed on the lower end of a vertical 5" Rod held by Collars in two 1" Triangular Plates

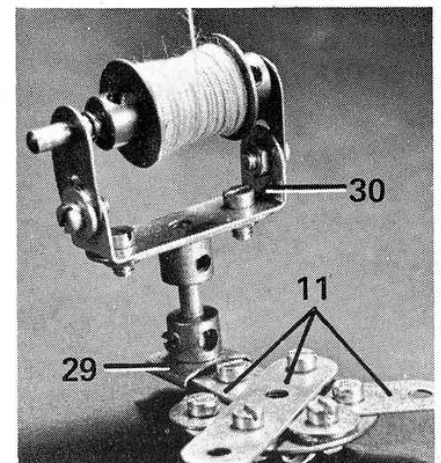
bolted to the front edges of Flat Plates 2 and 5. Another Coupling on the upper end of the Rod carries a horizontal 4" Rod 19 which serves as the 'change-over' sweep.

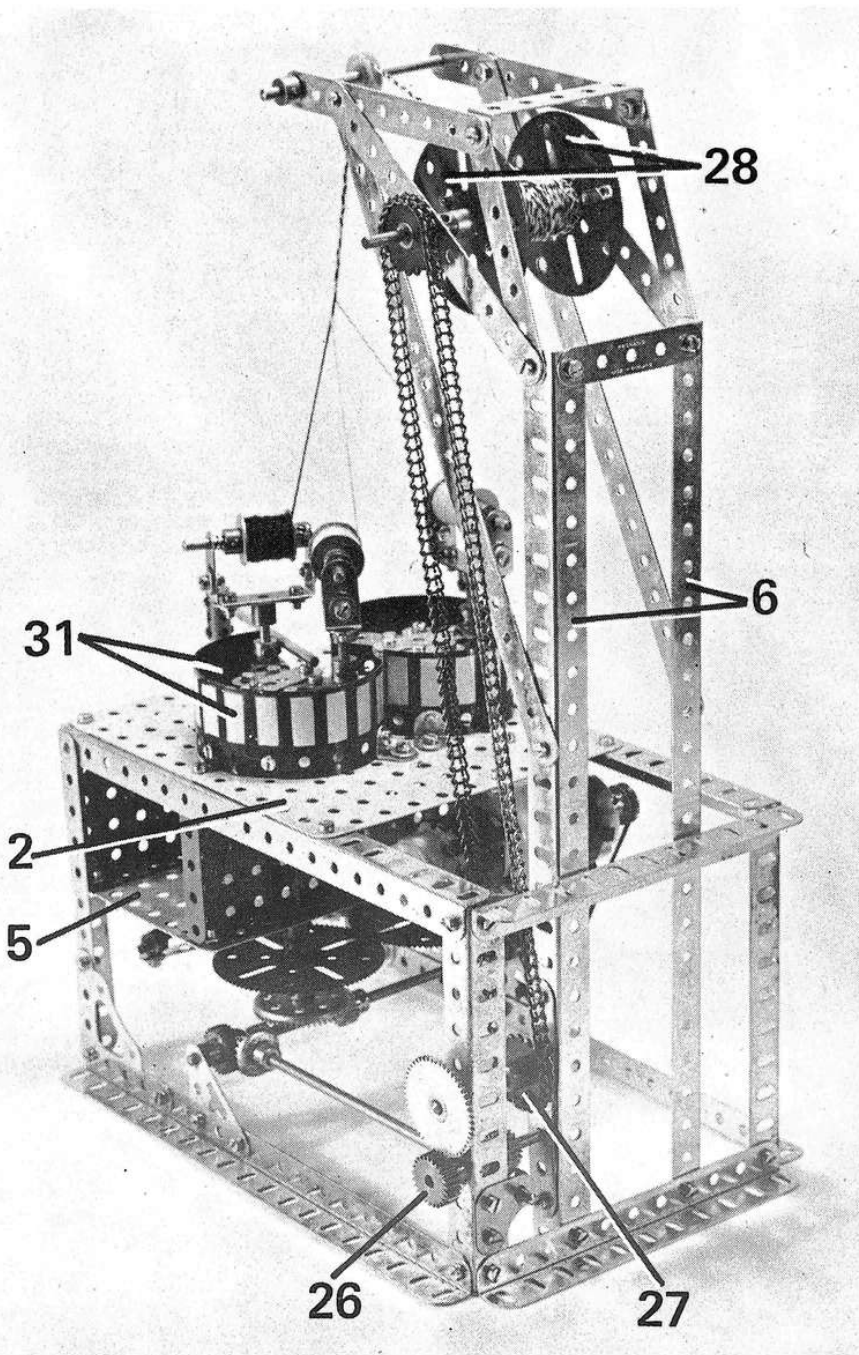
#### MOTOR AND DRIVE

A 6-speed Motor, set in the 60: 1 ratio, is now bolted to the underside of one Flat Plate 2 in the position shown. A ½" Pulley on the Motor output shaft is connected by a 10" Driving Band to a 2" Pulley 20 fixed on the end of a 6½" Rod journalled in two 1½" Corner Brackets bolted to the lower Girders of the frame. Also carried on this Rod are a fixed ½" Pinion 21, a fixed Collar, a loose Short Coupling 22 (the Rod passing through one transverse bore of the Coupling) and a fixed ¾" Pinion 23. The latter Pinion and the Collar hold the Short Coupling 21 in position on the Rod. Pinion 21 meshes with a 1½" Contrate Wheel fixed on the lower end of the 5" Rod carrying one of the bobbin unit locating heads, Pinion 23, on the other hand, meshes with a ¾" Contrate Wheel fixed on a 6½" Rod 24 journalled in the longitudinal bore of Short Coupling 22 and in a 1" Corner Bracket bolted to the appropriate corner upright of the framework. Also fixed on the Rod is a Worm 25 which meshes with a ½" Pinion on a 2½" Rod held by a Collar and a ¾" Pinion 26 in the fourth holes of the corner upright and nearby Angle Girders 6. (As the elongated holes of Girder 6 face the upright, a 3½" Strip is bolted to the Girder to provide the circular hole for the Rod). Pinion 26 meshes with a 50-teeth Gear on another 2½" Rod mounted higher up the Girders, this Rod also carrying 1" Sprocket 27.

Drive from Sprocket Wheel 27 is transferred by Sprocket Chain to another 1" Sprocket Wheel on the shaft carrying the take-up spool for

One of the three bobbin assemblies.





A rear view of the Plaiting Machine showing the drive to the cord take-up spool.

the plaited cord. The spool consists quite simply of two Face Plates 28, separated by a Sleeve Piece on Chimney Adaptors, fixed on a 4" Rod held by Collars in the centre holes of Strips 8. The cord is fed on to the spool over a 1/2" plastic Pulley on a 3 1/2" Rod held by Collars in the end holes of Strips 9.

**BOBBIN UNITS**

Each of the three bobbin units consists of a Slide Piece 29 fixed on the lower end of a 1" Rod. Fixed on the upper end of the Rod is a

Double Arm Crank, to which a 1 1/2" x 1/2" Double Angle Strip 30 is bolted. The lugs of this Double Angle Strip are extended by Fishplates, ensuring that the circular holes in the Fishplates remain free to receive the bobbins. Each bobbin is supplied by two 3/4" Washers held by Collars on a 2" Rod, with suitable thread being wound on the Rod between the Washers. Note that the Collars are so positioned on the Rod that a length of approximately 1/8" of Rod protrudes at one end, while approximately 1/2" of Rod protrudes at the other end. This ensures that the bobbin can be removed from

the Fishplates, the side-play being taken up under operating conditions by a half of a Compression Spring carried on the longer end of the Rod between the appropriate Fishplate and Collar.

The bobbin units are mounted on their locating heads, two on one, and one on the other. Guards round the heads to prevent the bobbin units from slipping off are each built up from two Windmill Sails 31, overlapped three holes, curved to shape and attached to the top of Flat Plates 2 by a 1/2" x 1/2" and a 1" x 1/2" Angle Bracket in each case.

**TIMING**

When the model is operating, the bobbin units are transferred in sequence from one locating head to the other by means of Rod 19 which oscillates back and forth, and it is essential that the operation is correctly timed for the model to prove successful. Individual motions *must* be adjusted to ensure that, at the moment Rod 19 swings across to move a bobbin from one head to the other, the appropriate pair of 2" Strips 11 in each head are in line with each other. Some careful adjustment may be necessary here, but once the correct timing has been achieved and all Grub Screws tightly locked, the model should operate for substantial periods without giving any trouble. However, if the drive should be inadvertently reversed, then the whole sequence can be thrown out of phase, therefore it is most important to ensure that the model be driven *only* in the one direction indicated by the arrow marked on Pulley 20. Another point to watch out for, incidentally, is the tension on the bobbins. This should be sufficient to hold the bobbins in their mountings, but not so great as to prevent the bobbins revolving easily as the plaited cord is taken-up.

PARTS REQUIRED				
2- 1a	3-16	100-37b	2- 77	
2- 2	1-16b	100-37c	1- 94	
2- 2a	3-17	24-38	2- 96	
3- 3	3-18b	6-38d	2-108	
1- 5	1-20a	3-48	2-109	
6- 6	2-23a	1-48a	6-111c	
2- 8	2-24	3-50	3-120b	
4- 8a	3-25	2-52	2-133	
6- 9	3-26	3-52a	1-133a	
6-10	2-27	16-59	1-163	
2-12	1-27a	4-61	1-164	
2-12b	2-27c	3-62b	1-171	
2-14	1-28	2-63	1-175	
1-15	1-29	1-63d	1-235b	
1-15a	1-32	24-69a	1-518	
3-15b			16-561	
			1 6-Speed Motor	