

# MECCANOGRAPH PATTERN-DRAWING MACHINE

Designed and built by Colin Cohen from the No.5 and Gears Sets

Always fascinating subjects for modellers, Meccanograph Designing Machines have been featured in *Meccano Magazine* in very many different forms over the years, yet we cannot remember ever before having featured an effective working model built from such a low-numbered Standard outfit as this example. It is built from a No. 5 Set (1977-type), plus the Gears Set, and full credit, not only for the design and construction, but also for the following building instructions, goes to Mr. Colin Cohen of Vredehoek, Cape Town, South Africa.

## CONSTRUCTION

Beginning construction with the frame, this is built from four 12½" Strips with a 5½" x 2½" Flanged Plate and a 2½" x 1½" Flanged Plate 1 on top, and a 4½" x 2½" Flat Plate and two 2½" Strips on each side. The Bolts fixing the end 2½" Strips in place also hold Obtuse Angle Brackets to which an end 2½" Curved Plate is fixed, while 2½" Curved Strips 2 are held by the Bolts fixing the inner 2½" Strips in place.

Turning to the mechanism, an Angle Bracket on a Trunnion 3 and a 2½" Double Angle Strip 4 support a 2½" Strip. A 1½" Rod is then passed through the centre hole of the 5½" x 2½" Flanged Plate of the frame top and is fitted with, in order, a Washer, a Collar and a 1½" Contrate Wheel 5, after which the end of the Rod is located in the 2½" Strip. The Contrate Wheel meshes with a ¾" Pinion on a 3½" Rod 6 which also carries a ½" Pinion 7 and a ¾" Sprocket Wheel.

A Trunnion 8 fixed to the side of the frame supplies the lower journal for a 2" Rod

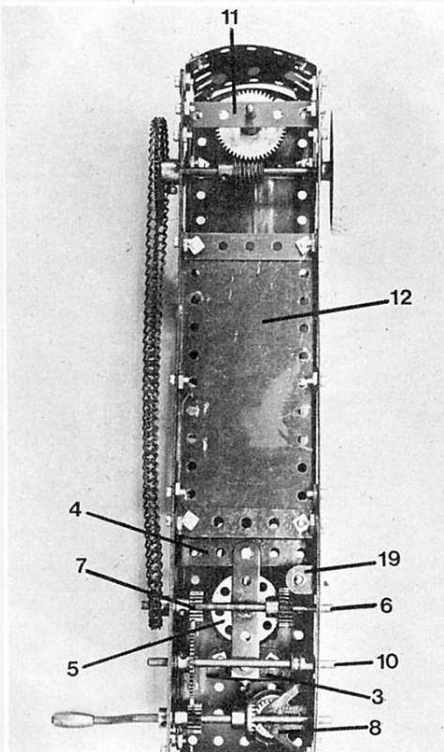
supporting a cam 9. The upper journal of the Rod is supplied by the 5½" x 2½" Flanged Plate and, between the journals, the Rod also carries a 1" Pulley and a ¾" Pinion. In mesh with this Pinion is a ¾" Contrate Wheel which, along with a ½" Pinion and a Collar, is fixed on a Crank Handle journalled in the frame sides. The ½" Pinion is linked to Pinion 7 by means of a 1½" Gear Wheel on a 3½" Rod 10 which is held in place by a ½" Pulley at its other end.

Located in the centre hole of Flanged Plate 1 is a 3½" Rod 11 which carries two 1" Pulleys - one either side of the Flange Plate to keep it in position - and 50-teeth Gear Wheel which meshes with a Worm on a 3½" Rod journalled in the centre holes of Curved Strips 2. This Rod also carries a Road Wheel and a 2" Sprocket Wheel which is connected to the earlier-mentioned ¾" Sprocket Wheel by Chain, as shown.

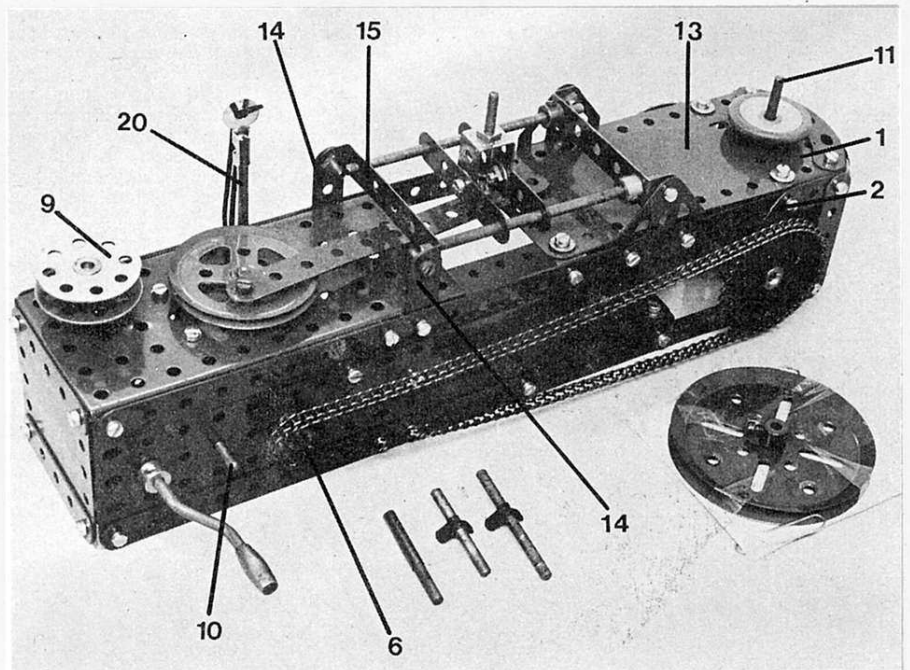
A 5½" x 2½" Flexible Plate 12 is now fixed to the base of the frame by two Double Angle Strips, while a 4½" x 2½" Flexible Plate 13 is fixed to the top of the frame, one end being

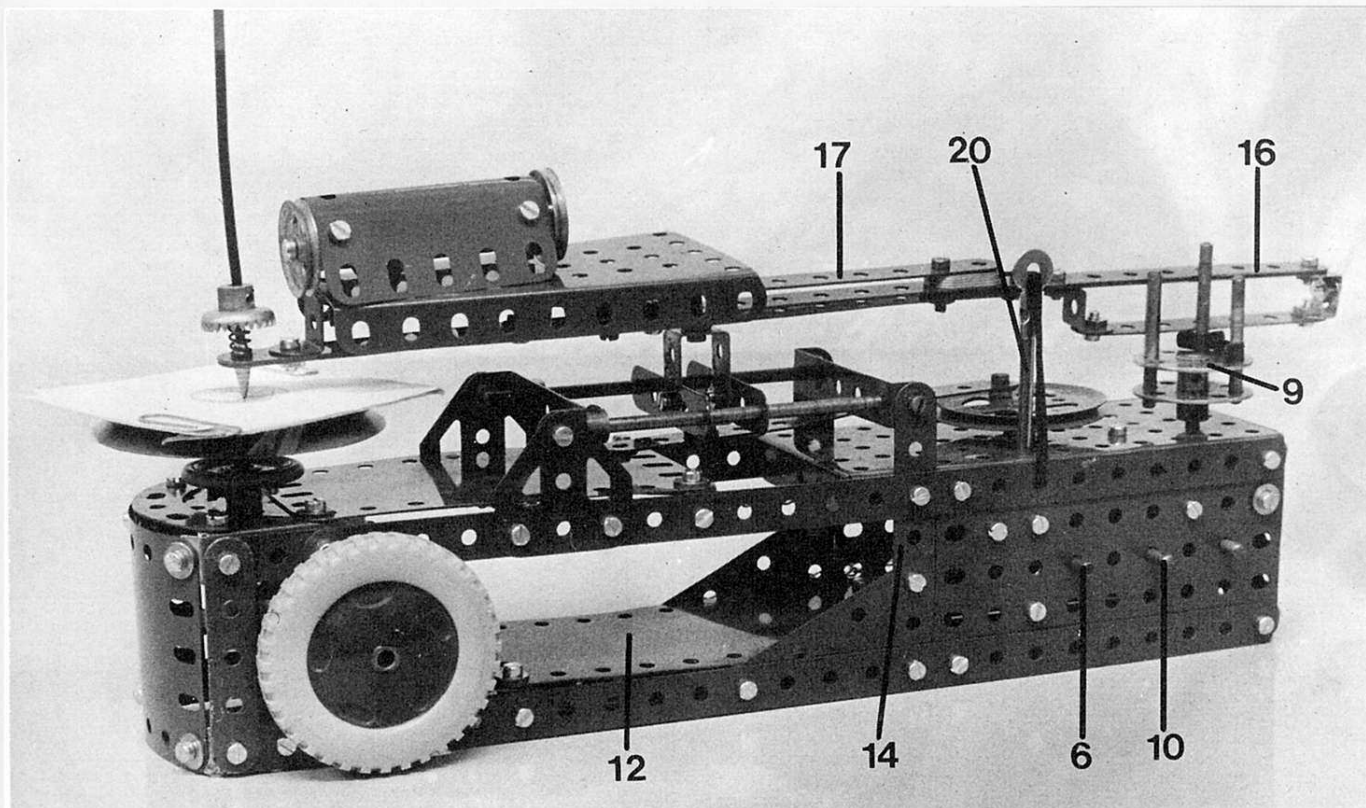
bolted to Flanged Plate 1 and the other being held in place by Angle Brackets. A Semi-Circular Plate linking the two Angle Brackets beneath the Flexible Plate adds rigidity to the structure.

Bolted to the sides of the frame in the positions shown are two 2½" Strips 14 supported at their lower ends by 2½" x 1½" Triangular Flexible Plates. The upper ends of these Strips at each side are connected by a 2½" x ½" Double Angle Strip 15, held in place by 3/8" Bolts. A second, similar, 2½" x ½" Double Angle Strip is attached to two Flat Trunnions bolted as shown to the sides of the frame. In this case, however, ordinary Bolts are used for fixing purposes, each Bolt being fitted with a Spacing Washer. Mounted in the end holes of the Double Angle Strips are two 4½" Rods on which the crosshead slides. The crosshead itself is built up from a ½" x ½" and a 1" x ½" Double Bracket, coupled by their lugs, together with two 2½" Strips. Pivottally attached to the smaller Double Bracket by a 3/8" Bolt passing through its



Pictured left is the Meccanograph viewed from beneath to show the transmission of drive from one shaft to another by means of the gears in the Gears Set. Below is a general view of the machine with the table removed to show the crosshead slides.





A general view, above, of a neat yet effective working Meccanograph designed and built by Colin Cohen of the Cape Town Meccano Club, South Africa. It is built from a No. 5 Set (1977-type) and a Gears Set

third hole is a  $5\frac{1}{2}$ " Strip, the other end of which is pivotally attached to a 2" Pulley fixed on the upper end of the Rod carrying Contrate Wheel 5. Note that the Strip must be bent slightly to allow for the difference in pivot levels. Fixed to the larger Double Bracket, shank upwards as shown, is a  $\frac{3}{4}$ " Bolt which later locates in the writing arm.

Turning to the writing arm, a  $3\frac{1}{2}$ " Strip is connected by a Reversed Angle Bracket, and two Angle Brackets arranged to form a Double Bracket, to two  $5\frac{1}{2}$ " Strips 16, one on top of the other. These Strips are extended by a further pair of  $5\frac{1}{2}$ " Strips, overlapped 3 holes, these Strips in turn being extended by another pair of  $5\frac{1}{2}$ " Strips also overlapped 3 holes. Another centrally-positioned  $5\frac{1}{2}$ " Strip 17 is fixed in the position shown, this being spaced from the other Strips by five Fishplates at one end and by a  $\frac{1}{2}$ " Pulley without boss at the other. A  $\frac{1}{2}$ " Bolt is used for fixing purposes in each case.

Attached to the writing arm by a Double Bracket and a Reversed Angle Bracket is a Flanged Sector Plate. Note that the Plate is attached to the Reversed Angle Bracket by Nuts on a  $\frac{3}{4}$ " Bolt, a Loaded Hook also being secured to the elevated head of the Bolt. (Mr. Cohen used an obsolete Hook in the model illustrated, but the modern version will do equally well). The Hook is concealed beneath a U-section Curved Plate, to each end of which a 1" Pulley without Boss is fixed by an Angle Bracket. A third Angle Bracket 18 is secured to the rear Pulley, this being used to fix the assembly to the Flanged Sector Plate by means of a  $\frac{3}{8}$ " Bolt which also serves to fix the Flanged Plate to the above-mentioned Double Bracket. Additional weights may be concealed beneath the Curved Plate if more pressure is required on the pen, but the pressure should be kept to a minimum.

The pen itself, is provided by a BIC-type ballpoint pen refill held in position in the end hole of the writing arm by a Compression Spring and a  $\frac{3}{4}$ " Contrate Wheel.

A  $1\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip 19, bolted to the inside of the frame, holds a Rod with

Keyway 20 which is prevented from slipping downwards by a Cord Anchoring Spring. A 6" Light Driving Band is passed through the side of the frame and looped around Rod 20, the other end being passed through a Rod and Strip Connector and then around the writing arm behind the Fishplates. This retains the arm against the cam. The cam itself comprises two Bush Wheels, a  $1\frac{1}{2}$ " and a 2" Rod, each with a Spring Clip, and a 1" Rod slipped part way into a Rod Connector. The table is a 3" square of strong cardboard stuck to a 3" Pulley Wheel with sellotape, and two paperclips attach the sheets of paper to the cardboard during operation.

## PARTS REQUIRED

4 - 1	1 - 20a	1 - 48	2 - 125
8 - 2	3 - 22	6 - 48a	2 - 126
1 - 3	2 - 22a	1 - 51	2 - 126a
9 - 5	1 - 23a	1 - 52	1 - 176
5 - 10	2 - 24	2 - 53a	1 - 186a
2 - 11	2 - 25	1 - 54	1 - 187
1 - 11a	2 - 26	1 - 57c	1 - 190
7 - 12	1 - 27	4 - 59	1 - 191
4 - 12c	1 - 27a	3 - 90a	1 - 192
2 - 15b	1 - 28	1 - 94	1 - 199
4 - 16	2 - 29	1 - 95	1 - 200
2 - 17	1 - 32	1 - 96a	1 - 212
2 - 18a	2 - 35	2 - 111	1 - 213
1 - 18b	95 - 37a	2 - 111a	1 - 214
1 - 19b	80 - 37b	5 - 111c	2 - 221
1 - 19s	18 - 38	1 - 120b	1 - 230

Pictured right are two views of the writing arm. In the upper picture the weight cover has been removed to show the Loaded Hook which is used as a tensioning weight for the pen. The Author's obsolete Hook can be replaced by the modern version if desired. Construction of the weight cover is clear from the lower picture. Note that the Sector Plate is fixed to the Double Bracket by Nuts on the shank of the weight cover's rear securing Bolt.

