

# Among the Model Builders with Spanner

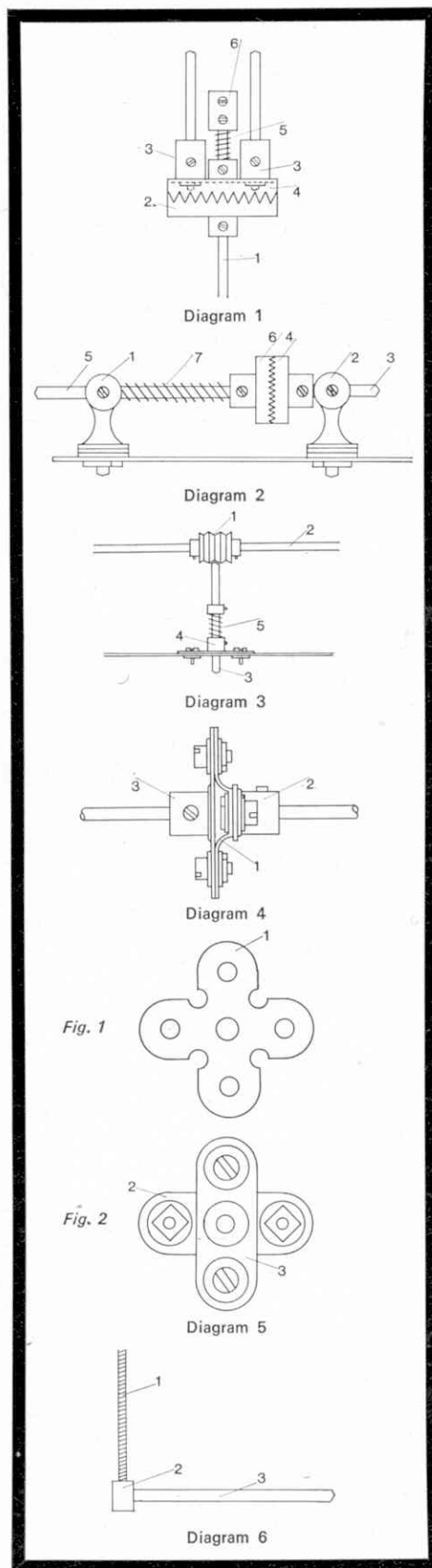
REGULAR readers of these pages will perhaps have noticed that, since we re-introduced 'Among the Model-Builders', I have devoted most of the allotted space to gear boxes and mechanisms which, although not complete models in themselves, were sufficiently self-contained to be incorporated as a whole in existing models. This month, therefore, I propose to feature two or three small units that will prove extremely useful in improving existing constructions, but which are not self-contained mechanisms.

Our first two offerings come from a very experienced modeller of longstanding, Mr. H. J. Halliday of London, S.E.15, and are both units specially designed for use with Meccanograph designing machines. The first (see diagram 1) is a modification to the type of 'crown head' found on Meccanographs in which the pen arm is given its oscillating sideways movement by the action of a built-up cam knocking against the pen arm. This system was actually used in the Spiralograph described in the M.M. last month, the 'cam' in that case being the two 8-hole Bush Wheels through the faces of which a number of Bolts were passed, the pen arm engaging with these Bolts. Mr. Halliday's modification greatly increases the fine, close-knit linework it is possible to produce as it allows a specific pattern to be drawn and then allows the pen to be moved without altering the setting of the model. The identical pattern can then be repeated, but in a different place, thus improving the whole effect.

To build the unit, the existing crown head or cam arrangement on the Meccanograph must be removed, leaving only the driven Rod 1. A  $1\frac{1}{2}$  in. Contrate Wheel 2 is then fixed tightly on this Rod, while eight Rod Sockets 3 are bolted to another  $1\frac{1}{2}$  in. Contrate Wheel 4. This latter Contrate is now mounted loose on the Rod, but is held in mesh with Contrate 2 by the action of half a Compression Spring 5, held on the Rod by a Short Coupling 6. Fixed in Rod Sockets 3 are a number of short Rods which replace the Bolts in the original crown head and which strike against the pen arm to provide the oscillating movement. The quantity and positions of the Rods naturally depend on the pattern you wish to produce, whereas the length of the Rods depends on the height of the pen arm.

How to use the modification is fairly obvious. Once the first standard pattern is finished, Contrate 4 is disengaged from Contrate 2 and is revolved a distance of one or more teeth. When the model is re-started, the pattern will be repeated, but in a slightly different position. In fact, Mr. Halliday sums up the matter admirably by saying, '... if the first design is left in place on the revolving table, and relative positions of Contrates 2 and 4 are altered each succeeding design with its slight variation will start in a slightly different place on the paper, and will build up into a design of close, fine lines, which can be terminated as soon as the design reaches the operator's satisfaction.' He went on to make the very important point. 'The pen, of course, should be removed from the paper while the Contrates are being altered, otherwise a 'drag' line occurs in the design.' A point which must be remembered.

Mr. Halliday's second mechanism (see diagram 2), in fact, could be used to overcome this problem, being chiefly designed to allow the pen of a Meccanograph to be moved clear of the revolving work table when the paper is being changed. In addition it can be used to increase the complexity of the pattern. A Handrail Support 1, carrying three spacing Washers, is fixed in the end hole of the pen arm, while another Handrail Support 2 is fixed in the fourth hole from the end. A 1 in. Rod 3, on which a  $\frac{3}{4}$  in. Contrate Wheel 4 is mounted, is secured in the latter Handrail Support. Free in



Handrail Support 1, on the other hand, is a  $1\frac{1}{2}$  in. Rod 5 that carries another  $\frac{3}{4}$  in. Contrate Wheel 6 on its inside end with a Compression Spring 7 between the Contrate and the Handrail Support. The Compression Spring keeps Contrate 6 in mesh with Contrate 4.

The pen holder is, of course, fixed on the outside end of Rod 5. For a pen holder, Mr. Halliday used the boss from an old 2 in. Pulley which he bored out to fit a ball-point pen, and which was mounted on the Rod by means of a Rod Socket screwed into one transverse tapped bore of the boss. I imagine, however, that a Small Fork Piece mounted on the end of the Rod would be quite suitable.

Operation of the attachment is simple. When the paper is to be changed, Contrate 6 is disengaged from Contrate 4. The pen is then turned to the horizontal position, and the Contrates are re-engaged. In normal operation, of course, the pen is in the vertical position so, to increase the complexity of the pattern, just move it slightly away from the vertical by turning Contrate 6 round a couple of teeth. As with the crown head, the same pattern will be drawn, but on a different line.

## POSITIVE GEAR CHANGE

On a different subject, one of the disadvantages of a Meccano gear box is that gear changes sometimes tend to be rather sloppy and also it is often rather difficult to hold a specific gear in mesh. Mr. T. Holland of Swinton, Yorkshire, has designed a simple and very useful mechanism (see diagram 3) that effectively solves the problem. It consists basically of a tension device acting on the sliding layshaft of the gear box. A number of  $\frac{1}{2}$  in. or 1 in. Pulleys without boss 1, one for each gear are, mounted free on the layshaft 2, being held in place by Collars. A Rod 3, the shorter the better, is then mounted loose in the boss of a Double Arm Crank 4 bolted to the frame of the gear box and a Compression Spring 5 is slipped onto this Rod to be held by a Collar. The end of the Rod simply engages with the Pulleys to hold the layshaft stationary. The Rod, however, must be able to slide from one Pulley to another, therefore, the Compression Spring must be adjusted so as to keep tension as light as possible.

## UNIVERSAL COUPLING

Diagrams 4 and 5 on this page shows an extremely useful, if slightly unusual, small universal coupling which has been designed by Mr. C. R. Jacob, of Streatham Hill, London, S.W.2. As Mr. Jacob points out, the standard Meccano universal joint is far too long for some models and, in such cases, the item illustrated makes an excellent substitute. The only disadvantage—if it can be called a disadvantage—is that it is rather large in diameter, but this is far outweighed by its short length.

It consists quite simply of a piece of leather 1 cut to the shape shown in fig. 1 (diagram 5) and bolted between two Double Arm Cranks 2 and 3 arranged at right-angles to each other. To avoid the smooth bores in the bosses of the Crank being out of line or 'eccentric', however, it is advisable to assemble the unit on a Rod. The first Crank is mounted on the Rod to be followed by the piece of leather, two opposite lugs of which are then bolted to the arms of the Crank with a Washer between the bolthead and Crank and another Washer between the leather and Nut. The second Double Arm Crank is then added to the Rod and similarly bolted to the other lugs of the leather piece. The thickness of the leather, incidentally, should be about 2 m.m., but this measurement is not critical.