NEW MECCANO QUADRANT

described by Bert Love

IN VIEW of the interest aroused by the announcement of the new Meccano Large-toothed Quadrant last month and its tremendous value to the system, we felt that it would be well worthwhile if we studied it in greater detail here. Bert Love, with whose co-operation the Quadrant was developed by the production department at Liverpool, has supplied the illustrations and the following descriptions of the new part and some of its applications.

"The Meccano Large-toothed Quadrant, Part No. 167a", writes Bert, "fills a long-felt want among Meccano enthusiasts in providing a heavy-duty curved rack with which large turntables and other circular gearing can be constructed. When four of the Quadrants are bolted to a Flanged Ring, Part No. 167b, they form a perfect double circle of teeth making a rugged geared slewing ring, about which a superstructure may be rotated either by an internal or an external drive from the new special Pinion, Part No. 167c, as shown in Fig. 2.

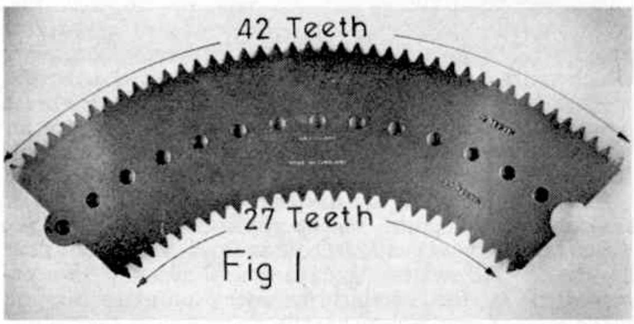

Fig 1

"The problem of getting the four Quadrants in perfect radial alignment without an overlapping join has been ingeniously solved in the basic design. It will be seen from Fig. 1 that at one end of the Quadrant there is a rounded nose while, at the other, there is a rounded recess. This ensures that the 'head' of one Quadrant is a snug fit into the 'tail' of the other and, when these are bolted in place round the Flanged Ring with Pivot Bolts and ¾ in. Washers, as shown, they form a perfect continuous circle.

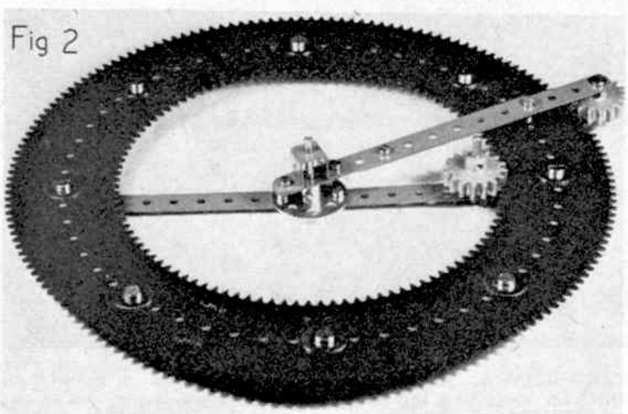
Fig 2

"Older enthusiasts will be interested to know that the new 167c Pinion is similar in size and design to its pre-war counterpart and within certain limits, the two are interchangeable. The new Pinion, however, follows standard engineering practice of being made with an involute tooth form, as are the teeth on the Quadrant. This ensures a very smooth meshing of Pinion and Quadrant. Furthermore, the face of the new Pinion is approximately 1/16 in. wider than that of the pre-war example so that the new part has a little more latitude in being set up.

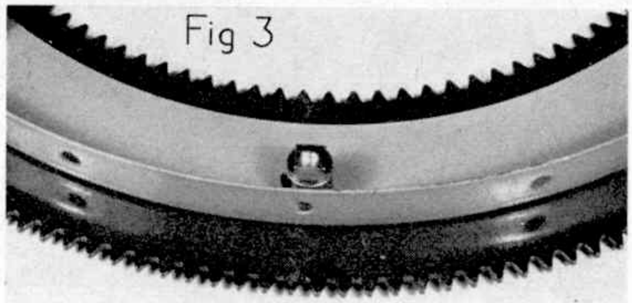
Fig 3

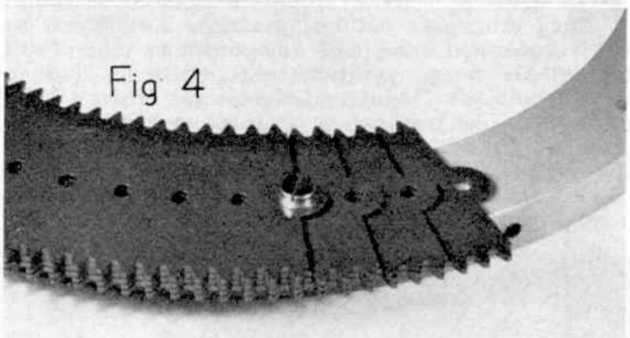
Fig 4

"Fig. 2 shows the spacing centres and radii for internal and external drives to the Quadrant, these radii being 3 in. and 6 in. respectively. At first glance this might convey the impression that the ratio of external teeth to internal teeth is 2 : 1 but the difference between internal and external gear-running must be borne in mind and, once again, it is a matter of 'counting the teeth'. Fig. 1 shows that four Quadrants would have 4×42 teeth = 168 externally and 4×27 teeth = 108 internally. This gives a ratio between the two circles of teeth as 168/108 = 14 : 9 = 1.555 (recurring) Pinion/Rack ratios are as follows:—External 168 : 16 = 10.5 : 1 (exactly); Internal 108 : 16 = 6.75 : 1 (exactly).

"Accurate tracking of the Quadrant teeth when formed to a complete circle is ensured by careful selection of tooth form and the precise division of the 'trough' between two teeth at either end of each Quadrant on both sets of teeth. Fig. 3 shows a close-up of the junction between two Quadrants bolted to a 167b as seen from below. Even at full-scale enlargement, it is very difficult to see the 'join' and continuity of the meshing as the Pinion rolls over the join is perfect. A further feature illustrated by Fig. 3 is the generous 'overhang' of the Quadrant beyond the flange of the 167b. This allows the application of 'hook' rollers when a circle of Quadrants is used in a crane turntable. The hook rollers would run round underneath the protruding edge of the Quadrant and