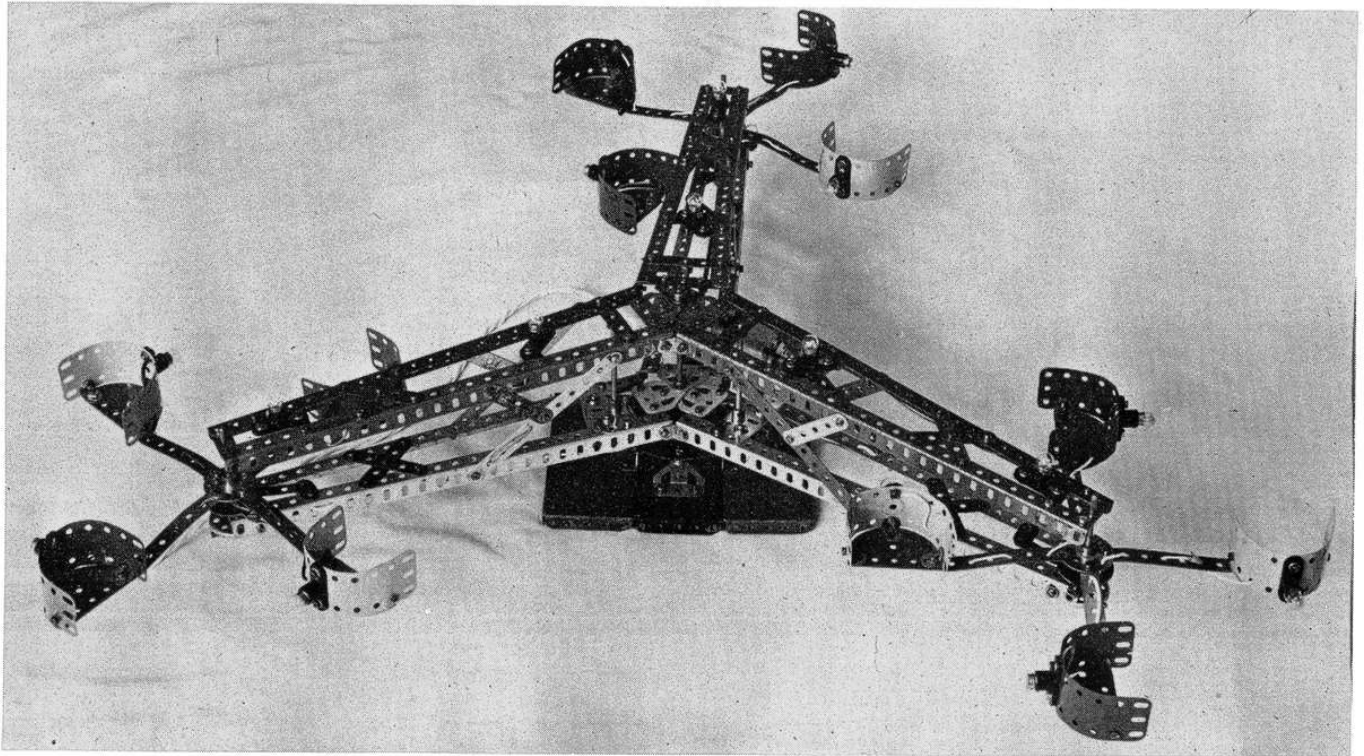# MULTIPLE ROUNDABOUT

ALL THE FUN OF THE FAIR!

by G.G. Morgan

FAIRGROUND AMUSEMENTS, have always fascinated me (writes Mr. Morgan, of Ruislip, Middlesex), and I keep an eye open for any Meccano models of them. Over the years models have appeared of almost all fairground "rides", but, as far as I know, this Multiple Roundabout is a new one to Meccano.

The main roundabout rotates, as well as the small ones on the ends of the arms. The model is based fairly accurately on the prototype in that the method of transferring the rotary motion to the mini-roundabouts is copied from it. Construction is fairly straightforward. In the description which follows, "centre" refers to the centre of the whole model, and all holes are counted along the Angle Girders from their ends nearest the centre.

BASE

The base can be completely separated from the roundabout and is very simple since the motor is on the roundabout itself.

A support for the central Rod is built from two 2½" x 1" Double Angle Strips 1, bolted at right angles to the underside of a 2½" x 2½" Insulating Plate 2, the securing Bolts also fixing two 3½" Strips 3 to the upper surface of the Plate, directly above the Double Angle Strips. It is important to ensure that the holes through all five pieces at the centre of the Plate are lined-up so that a Rod can rotate freely in them.

Bolted to two opposite corner holes of the Insulating Plate are two 1" Flexible Wiper Arms 4. These will later have to be adjusted so that they touch on the continuous band of a Commutator under the roundabout, without fouling the Commutator Bolts, or touching any metal parts. Two Wiper Arms are used to ensure a smooth flow of current to the motor. 12V. D.C. power is supplied across the Wiper Arms and the metal of the base. The model takes 1.3A. A Gear Ring 5 is fixed to the end holes of Strips 3, being spaced away from them by three Washers at each fixing point. Trunnions are then attached to lugs of the Double Angle Strips, and the whole is bolted centrally on three 5½" x 2½" Flanged Plates fixed side by side.

MINI-ROUNDABOUTS.

For each of the three mini-roundabouts, two 12½" Strips are bolted at right angles across an 8-hole Bush Wheel. It will later be found necessary to bend these slightly so that the cars will pass through the space in the main roundabout. Each car consists of a 2½" Semi-circular Plate, around which is curved a 5½" x 1½" Plastic Plate, fixed to the

Above, a general view of the author's Multiple Roundabout. Comparatively easy to build, it makes a fine working model.

Semi-circular Plate by three Angle Brackets 6. The Bolts through the front two of these Brackets also fix the cars to the 12½" Strips. Due to the low clearances in the main roundabout, the Bolts in the bases of the cars should pass upwards. One should make sure that the cars face in the same direction on all the mini-roundabouts.

Bolted to the back of each car is a Lamp Holder, the lower securing Bolt in this case also fixing the centre Angle Bracket to the back of the car and hence earthing one Lamp Holder terminal to the metal of the model. As the back Plate is plastic, the Holder is not short-circuited, and a wire is taken from the upper Lamp Holder Bolt back to a Flat Commutator 7 mounted, face downwards, immediately underneath the Bush Wheel on a 3½" Rod.

MAIN ROUNDABOUT

Moving to the main roundabout section, this is most easily built as upper and lower frameworks which are later joined together. Initially, two frameworks are each built from three Flat Trunnions 8 fixed radially onto a 6-hole Bush Wheel 9, the Bolts passing through the centre holes of the Flat Trunnions into the Wheel. The central Rod 10 will later locate in the apex holes of the Trunnions. A 2½" x ½" Double Angle Strip 11 is bolted centrally under the base of each Flat Trunnion, then two 12½" Angle Girders 12, with their circular holes horizontal, are fixed to the lugs of the Double Angle Strips. Girders 12 in adjacent arms are connected by Obtuse Angle Brackets 13, but note
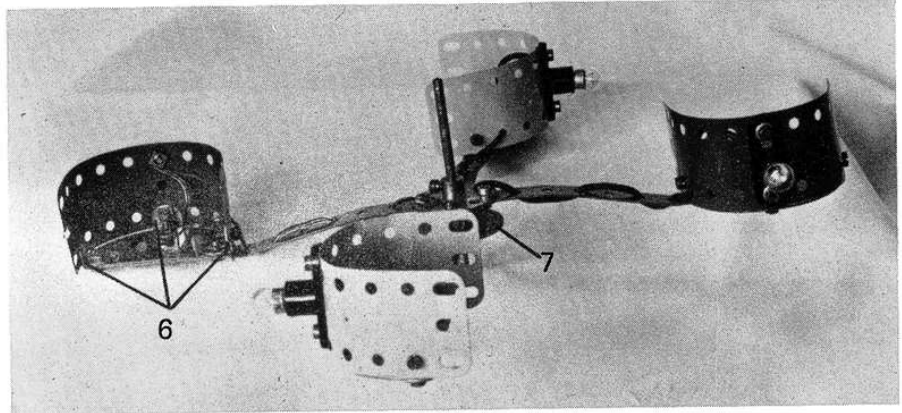
A close-up view of one of the three identical mini-roundabouts.

that the Bolts in these Brackets are not tightened at this stage.

The ends of the Angle Girders in each arm are joined by 1½" Strips 14, while bracing 2½" Strips 15 join the fifteenth hole of one Girder to the eighteenth hole of the other Girder, a Bolt being placed through their point of intersection. This fit is not perfect, but Meccano Bolts will still pass through the holes.

In the upper framework of each arm a 2½" Strip 16 is bolted through the third holes of the two Angle Girders, while a Lamp Holder is secured towards the outer end of the arm by a Fishplate 17 fixed through the twenty-third hole of one Angle Girder, and by an Insulating Fishplate 18 fixed through the twenty-first hole of the other Girder. Similarly, an inner Lamp Holder is bolted to an ordinary Fishplate in the seventh hole of one Girder, and an Insulating Fishplate in the eighth hole of the

other. To reduce the length of wires, the Insulating Fishplates should be on the same side for both Lamp Holders.

To the lower framework in each arm a 2½" Flat Girder 19, with round holes towards the centre, is fixed by Bolts through its end round holes and the third holes of each Angle Girder 12. A Trunnion 20 just rests across the Angle Girders, being slightly wider than the gap between them, but is bolted to the elongated holes of the Flat Girder, as near to the centre of the roundabout as possible. Two Angle Brackets 21 are attached by their elongated holes to the back ends of another Trunnion 22, being tightly bolted through the twenty-fourth elongated holes of the Angle Girders. This method of fixing overcomes the problem of the separation of the holes in the Angle Girders.

A 1½" Flexible Wiper Arm 23 is fixed by an Insulating Fishplate to

Below, the base, removed. Below right, the base and central gearing, assembled.
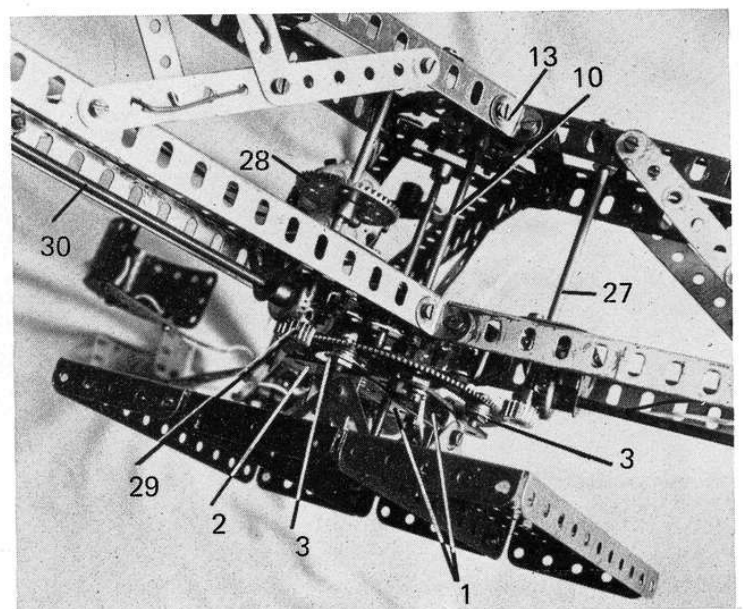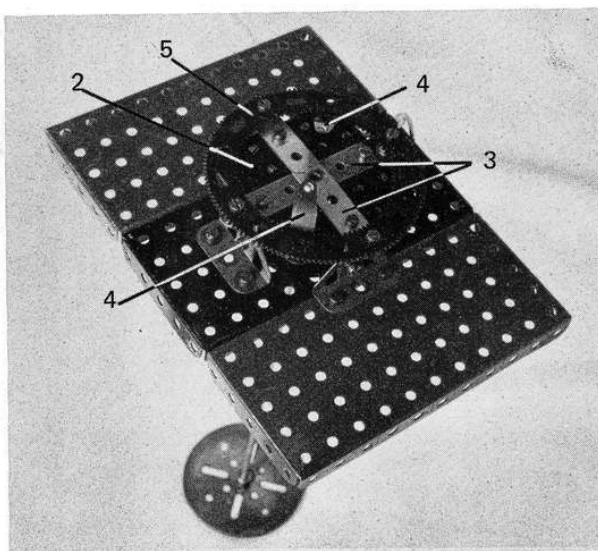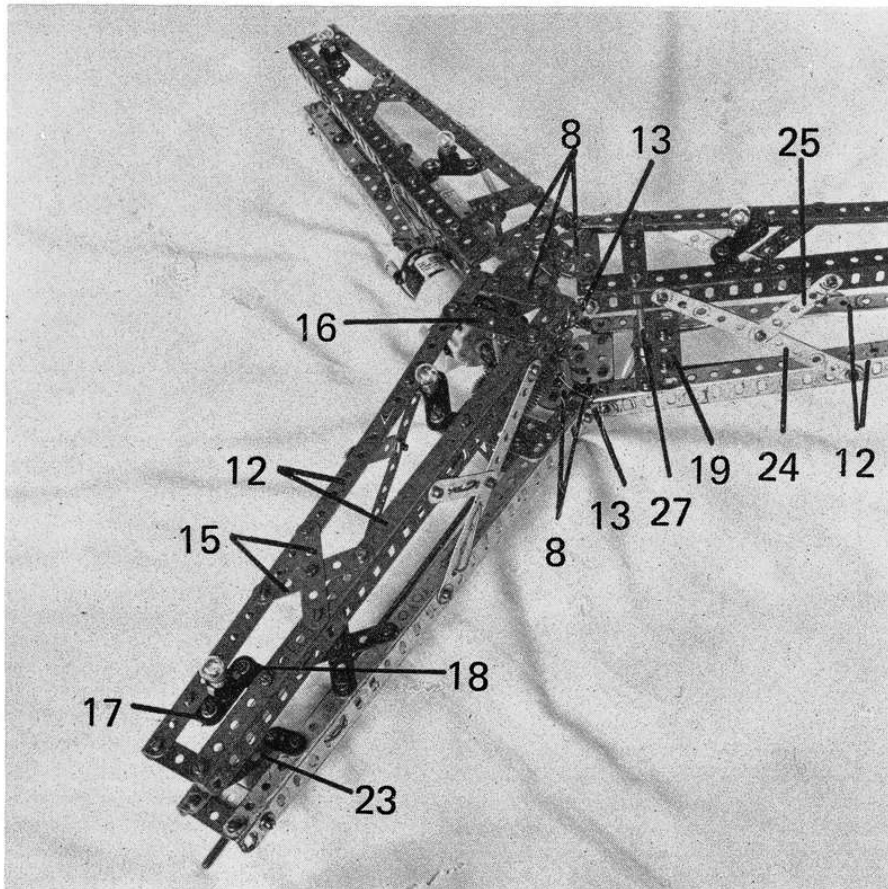
A detail top view of the main roundabout, from which the mini-roundabouts have been removed. Note the use of cross-bracing to strengthen the connections between Girders.

An underside view of the roundabout with the base removed to show the drive mechanism. The Flat Commutator is required to carry power to the lamps on the mini-roundabout chairs.
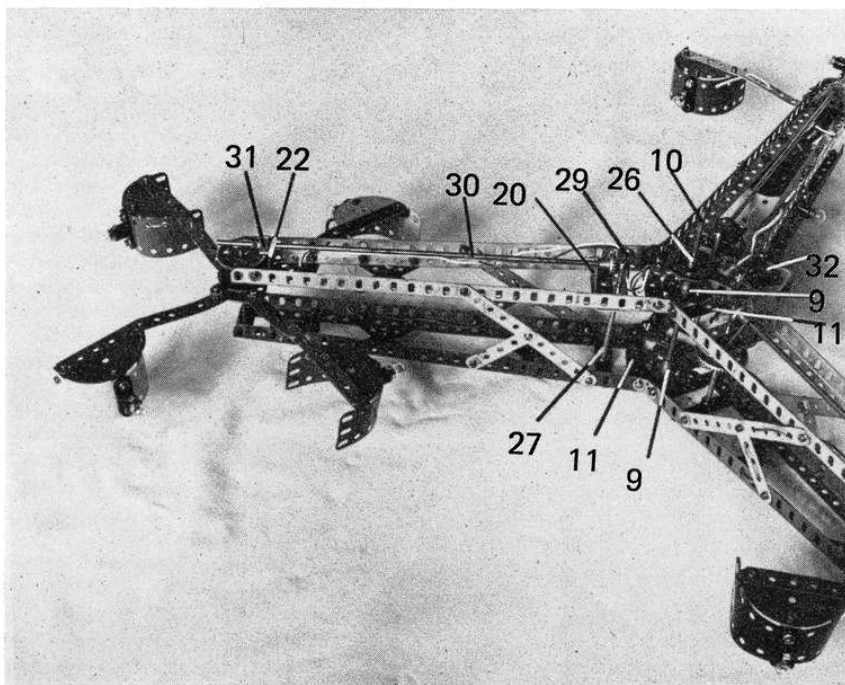
the twenty-first hole of one of the Angle Girders. This must later be adjusted to make contact with the Commutator on the mini-roundabout. I suggest positioning the Wiper Arm to touch on the inner segmented bend of the Commutator, so that the lights on the mini-roundabouts will flash as they rotate.

The upper and lower frameworks are now located on a 6½" central Rod 10 and a Collar placed over Flat Trunnions 8 on each framework to hold them firmly down. At the centre of the model the bottom of upper Angle Girders 12 should be 2½" from the top of lower Girders 12. The frameworks are then joined by a 5½" Strip 24 running from the fourth hole of the upper Angle Girder to the twelfth hole of the lower one, on each side of each arm. The 5½" Strips are anchored by 2½" Strips 25 running from their centre holes to the eleventh holes of the upper Angle Girders. The Bolts in these Strips and in the Obtuse Angle Brackets 13 should only be tightened when the spacing between the upper and lower frameworks has been adjusted to 1-5/8" at the ends. This gives an elegant slope, but leaves space for the cars to pass through. It is important that the lower Angle Girders do not slope downwards, otherwise the gears will not mesh properly.

A Flat Commutator is fixed under the roundabout on central Rod 10, with a gap of about 3/16" between its boss and that of Bush Wheel 9. Wires are taken from this Commutator to Wiper Arms 23, and up Strips 24 and 25 to the Lamp Holders on each arm. Below the Commutator is one Washer, and then a Collar 26, upon which the roundabout rests. The main roundabout can now be placed in the base.

DRIVE MECHANISM

In producing the drive mechanism three 4½" Rods 27 are journalled, one each in Strip 16 and Flat Girder 9, in each arm of the model, being held in place by Collars at top and bottom. A 1½" Bevel Gear 28 is secured on one only of these Rods, while mounted on the lower ends of all the Rods are ½" Pinions 29 which engage with the Gear Ring on the base. They also mesh with ½" Contrate Wheels on the ends of 11½" Rods 30, journalled in Trunnions 20 and 22 in the arms. The Contrate Wheel on each arm is spaced from Trunnion 20 by a Washer, while mounted on each Rod, boss **outwards**, against Trunnion 22 is a ½" Pinion 31.

The mini-roundabouts can now be positioned in the arms, their axles

being journalled in 1½" Strips 14. Mounted on the lower end of each axle is a 1½" Contrate Wheel, the weight of the mini-roundabout keeping this engaged with nearby Pinion 31. The mechanics of the model should now work if rotated by hand. Operational power, however, is supplied by a Motor-with-Gearbox bolted

PARTS REQUIRED

6- 1	1-14	295- 37a	6-126a
6- 2	3-15a	285- 37b	1-180
2- 3	3-16	36- 38	12-194d
21- 5	3-24	2- 46	12-214
6- 6a	2-24b	6- 48a	1-511
12- 8	6-26	3- 52	9-513
6-10	3-28	9- 59	2-531
42-12	3-29	3-103f	3-532
6-12c	1-30a	10-111c	18-539
3-13	1-30c	11-126	18-540
			4-551

1 – Motor with Gearbox.

to a Trunnion which is in turn bolted to one lower Angle Girder 12 through its second and third holes. (Angle Girder 12 and Flat Girder 19 are not sufficiently aligned to enable a Bolt to be passed through the fourth hole of the Girder). A ½" Bevel
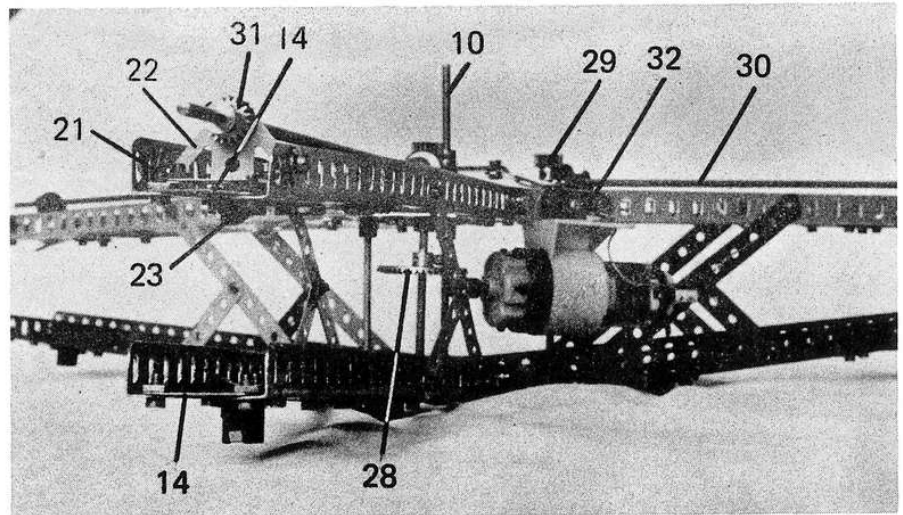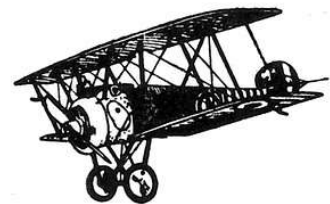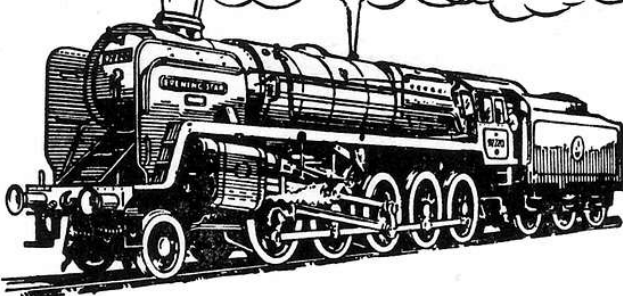

A detail view showing construction of the arms of the main roundabout.

Gear on the Motor shaft engages with Bevel Gear 28. These Bevel Gears are not quite in line, but are near enough to function quite satisfactorily. One terminal of the Motor is connected by insulated wire to the Commutator under the roundabout while the other terminal is earthed to the metal frame of the model.

I found the model would work without strain on the motor in any gearbox ratio of more than 6:1 but it is necessary to "catch" the roundabout as one disconnects the power after it has been run at high speeds to prevent the flywheel action of the model driving back on the Motor Gearbox and damaging it.