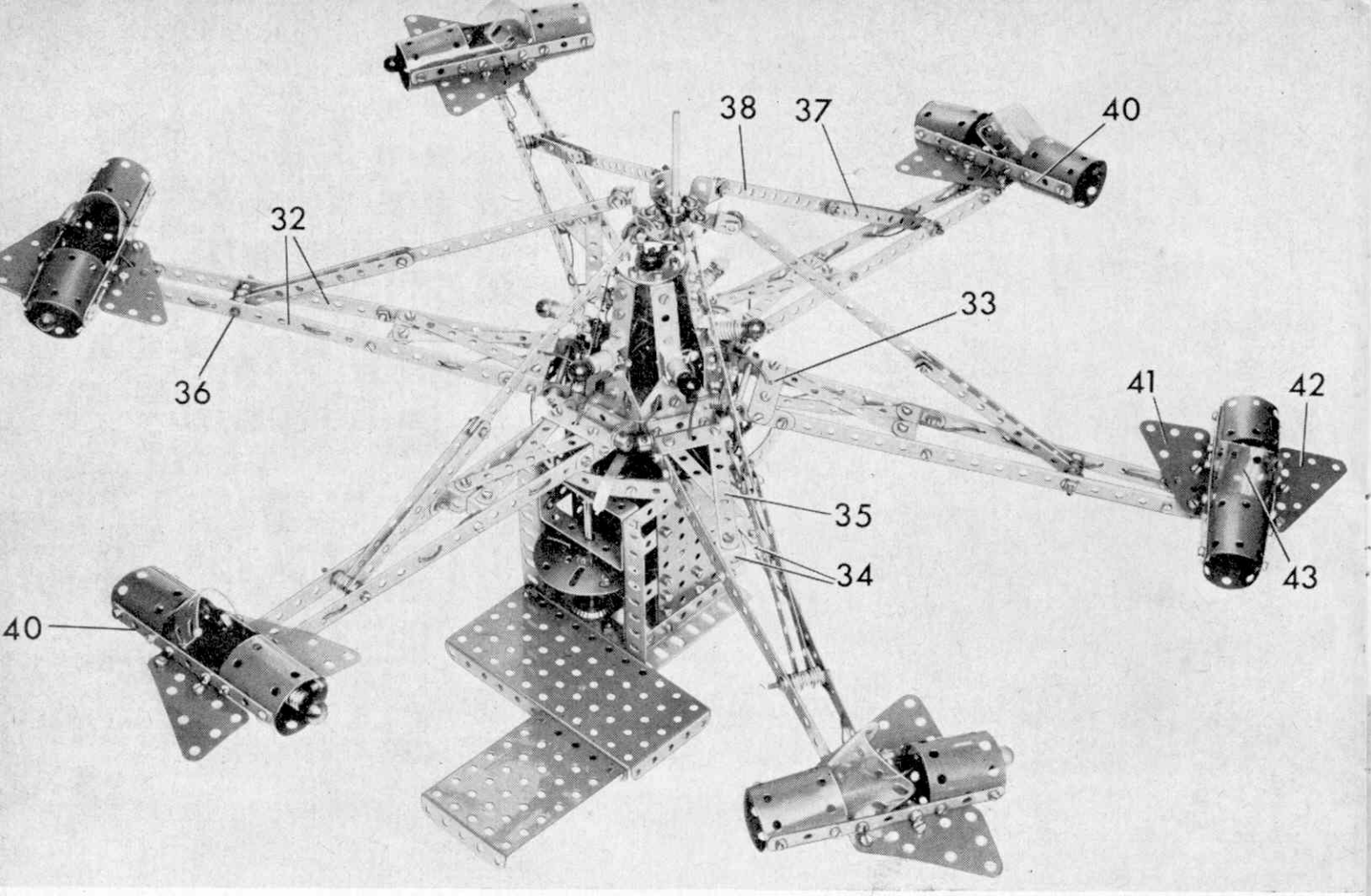
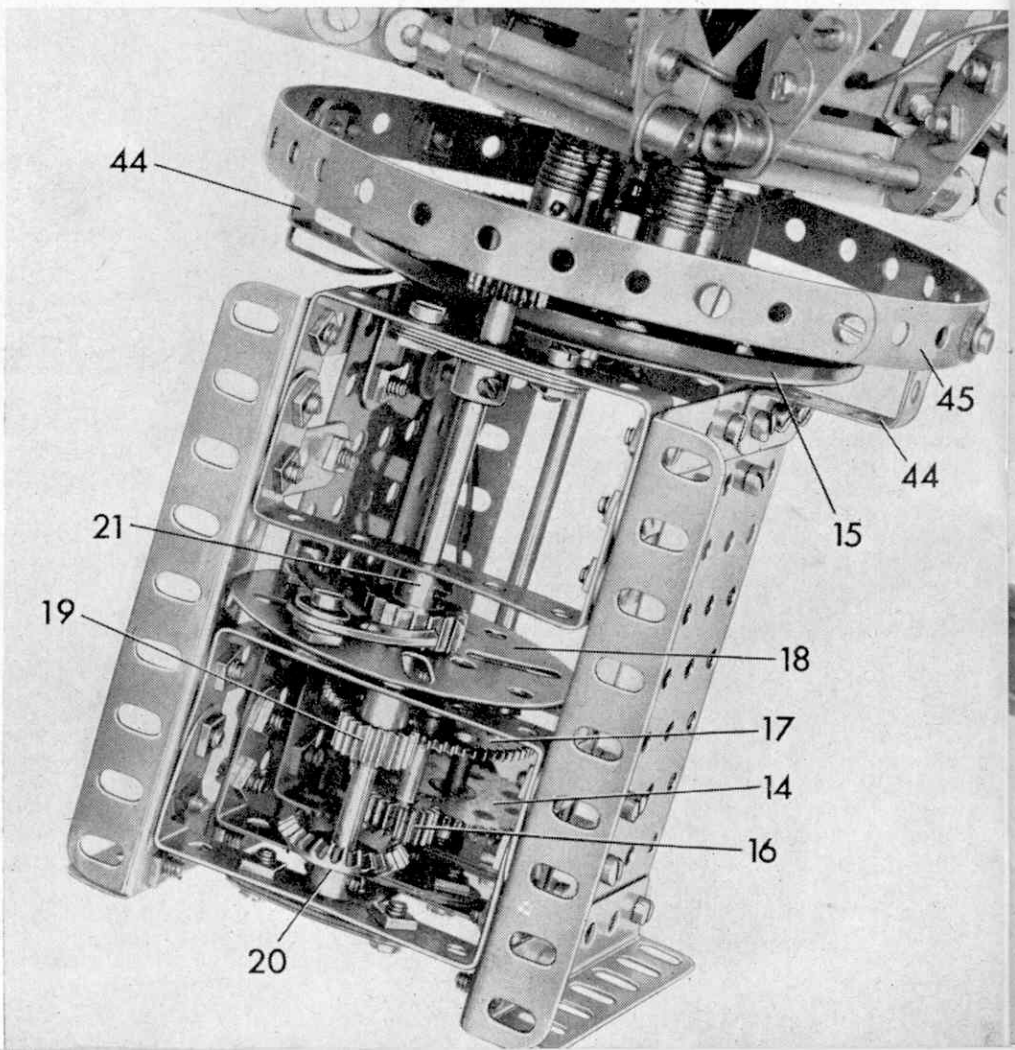


FAIRGROUND OCTOPUS IN MECCANO

BY SPANNER

MECCANO LIMITED'S stand at last year's National Model Show in London featured an attraction that drew and captivated visitors of all ages. On show was a striking miniature fairground, consisting of three specially-designed, large display models —a Dive-bomber, an Octopus Roundabout and a Big Wheel. Since the exhibition, Meccano Magazine has been inundated with requests from readers, asking for building instructions for these models, and in response to these requests we described the Big Wheel in last December's issue. This month it's the turn of the Octopus Roundabout.

It must be stressed that the Roundabout is a special model, designed for display at exhibitions or in shop windows, where it is required to operate continuously for several



hours at a time. Because of this, a special low-speed, fractional-horse-power motor was incorporated, rather than one of the standard Meccano power units, none of which should be run for extended periods. Both the motor and the model were mounted on a wooden baseboard, but I have removed this and added a couple of Flanged Plates to provide an anchoring point for any suitable motor that you might possess. The drive, incidentally, is transferred to the model via the $\frac{7}{8}$ in. Bevel Gear, numbered 20 in the illustrations.

Looking at the illustrations, you will notice that the model incorporates some rather unusual lamp holders. This is because it was designed before the introduction of the Elektrikit, when the standard Meccano Lamp Holders were not in production. The standard Holders can easily be fitted, however, perhaps with a few minor modifications in the construction of the aeroplanes, but the following building instructions apply to the Roundabout, as illustrated.

Base and Gear Box

A box framework is built up from four $4\frac{1}{2}$ in. Angle Girders 1 joined along three sides at the bottom by one $2\frac{1}{2}$ in. and two $3\frac{1}{2}$ in. Angle Girders. On the fourth side Girders 1 are joined by a $5\frac{1}{2}$ in. by $2\frac{1}{2}$ in. Flanged Plate, extended by a $3\frac{1}{2}$ in. by $2\frac{1}{2}$ in. Flanged Plate, and a $2\frac{1}{2}$ in. by 1 in. Double Angle Strip 2, a similar Double Angle Strip 3 being bolted in position at the top. A further two $2\frac{1}{2}$ in. by 1 in. Double Angle Strips 4 and 5 are added as shown. These Flanged Plates, incidentally, provide the base for the motor.

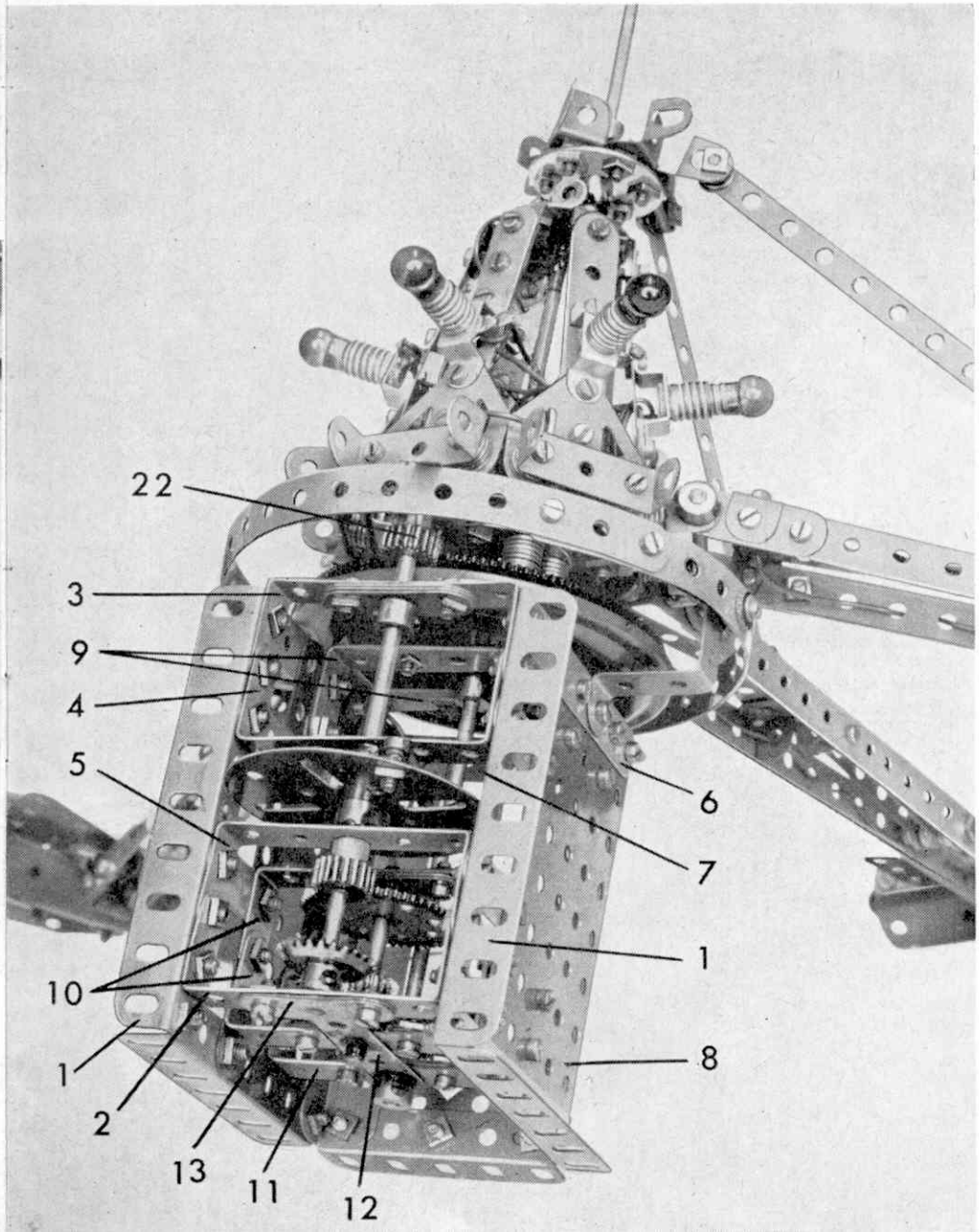
At the top, Girders 1 are connected on two opposite sides by $3\frac{1}{2}$ in. Strips 6, and on the third side by $2\frac{1}{2}$ in. Angle Girders 7. Bolted between each Strip 6 and the corresponding $3\frac{1}{2}$ in. Angle Girder is a $4\frac{1}{2}$ in. by $2\frac{1}{2}$ in. Flat Plate 8, which is also connected to the front Angle Girder 1 by two $1\frac{1}{2}$ in. Strips. Two $2\frac{1}{2}$ in. by 1 in. Double Angle Strips 9 are then bolted between the Flat Plates at the top, while another two $2\frac{1}{2}$ in. by 1 in. Double Angle Strips 10, arranged to form a square, are bolted between the Plates at the bottom.

Yet another Double Angle Strip 11 is added and this is connected to Double Angle Strip 2 by a $2\frac{1}{2}$ in. Strip 12. This is not, itself, bolted in position, but is trapped against Double Angle Strip 2 by two $1\frac{1}{2}$ in. Strips 13, which are bolted in place. Another two $1\frac{1}{2}$ in. Strips are bolted to Double Angle Strip 10 to provide extended bearings for a $10\frac{1}{4}$ in. Rod that carries a 57-teeth Gear Wheel 14 above the $1\frac{1}{2}$ in. Strips and a Collar below the Double Angle Strip. It is this Collar which fixes Strip 12 to Double Angle Strip 11. The $10\frac{1}{4}$ in. Rod, incidentally, is obtained by sawing down a $11\frac{1}{2}$ in. Rod. The Rod is also journalled in a Ball Thrust Race Flanged Disc 15, bolted to Double Angle Strips 9 and carrying a Ball Cage, and is held in place by a Collar beneath the Flanged Disc.

Another four $1\frac{1}{2}$ in. Strips are fixed, two to each Double Angle Strip 10, to provide extended bearings for a 2 in. Rod, carrying a $\frac{1}{2}$ in. Pinion 16 and a 57-teeth Gear 17. Pinion 16 is in constant mesh with Gear Wheel 14. A $2\frac{1}{2}$ in. Rod, carrying a Face Plate 18, a $\frac{1}{2}$ in. Pinion 19 and a $\frac{7}{8}$ in. Bevel Gear 20 is then journalled in Double Angle Strips 2 and 5. A small part of the Rod must project above the Face Plate, and this is slipped part way into a Ratchet Wheel 21. Three $1\frac{1}{2}$ in. Strips are bolted to the underside of Double Angle Strip 3 to provide extended bearings for a $2\frac{1}{2}$ in. Rod journalled in this Double Angle Strip and Double Angle Strip 4. The lower end of the Rod is fixed in the remaining part of Ratchet Wheel 21. A Collar and a $\frac{1}{2}$ in. Pinion 22 are mounted on the Rod, the former beneath the $1\frac{1}{2}$ in. Strips and the latter at the very top of the Rod.

A $\frac{3}{8}$ in. Bolt, carrying a Pawl, is fixed in Face Plate 18, a short length of Spring Cord attached to another $\frac{3}{8}$ in. Bolt being used to hold the Pawl against the Ratchet Wheel.

Designed by Mr. Bob Moy, Head of Meccano Limited's Model-building Department, this large Octopus Roundabout was built specially for display purposes. Top left: A close-up view of the model showing the sturdy construction of the base. In the views below, the compact gear arrangement is clearly shown



Revolving Pillar

The central revolving pillar to which the arms or 'tentacles' will later be attached is built up from a 6-hole Wheel Disc to which eight 1 in. by 1 in. Angle Brackets are bolted. The horizontal lugs of these Angle Brackets are then joined and braced by six $1\frac{1}{2}$ in. Strips. It is important to note that two adjacent 1 in. by 1 in. Angle Brackets and two opposite adjacent Angle Brackets are fixed to the Bush Wheel by $\frac{3}{4}$ in. Bolts. Nine Washers are placed on the shank of each $\frac{3}{4}$ in. Bolt, beneath the Bush Wheel, the Bolt then being screwed tightly into a Threaded Boss. A $3\frac{1}{2}$ in. Gear Wheel 23 is secured to the other ends of two of the Threaded Bosses by Bolts passed through the Gear and into the corresponding Bosses. The other two Threaded Bosses are 'trapped' against the Gear.

A $3\frac{1}{2}$ in. Strip 24 is attached to the free vertical lug of each 1 in. by 1 in. Angle Bracket, at the same time bolting a Flat Trunnion 25 and a lamp holder 26 in place. One terminal of each lamp holder must be insulated from the rest of the model. If Elektrikit Lamp Holders are used, this can be done by securing one terminal with thin (6 B.A.) bolts, insulating the terminal and securing nut from the model with fibre washers. Strips 24 are attached at the top to another 6-hole Wheel Disc 27, three by $\frac{1}{2}$ in. by $\frac{1}{2}$ in. Angle Brackets and three by 1 in. by $\frac{1}{2}$ in. Angle Brackets.

The complete arrangement is now mounted, free, on the long $10\frac{1}{4}$ in. Rod, Gear Wheel 23 meshing with Pinion 22. Five Washers are placed on the rod above Wheel Disc 27, after which a Coupling 28 is fixed in place. Note that the Rod is secured in one end transverse smooth bore of this Coupling. In the other end transverse smooth bore of the Coupling, a $3\frac{1}{2}$ in. Rod 29 is fixed. A 6-hole Bush Wheel is loosely mounted on this Rod, being held in place by a Collar 30. Loosely

mounted on ⅜ in. Bolts held by Nuts in the holes of the Bush Wheel are six left-hand Corner Angle Brackets 31, which will later be used as one of the arm anchoring points.

Revolving Arms

Six arms are similarly built, each being constructed from two 9½ in. Strips 32, extended one hole by a 1½ in. Strip, at the same time bolting a 1½ in. by ½ in. Double Angle Strip 33 between the 9½ in. Strips. At their other ends the Strips are joined by a 1 in. by ½ in. Double Bracket at the same time bolting one right-hand Corner Angle Bracket and one left-hand Corner Angle Bracket, respectively, in place. The aeroplane will later be fixed to these Corner Angle Brackets.

Another two Corner Angle Brackets 34, one right-hand and one left-hand, connected by a Fishplate, are bolted through the eighth holes of Strips 32. These are then joined to Double Angle Strip 33 by two crossed-over 3½ in. Narrow Strips 35. Fixed by Nuts between Strips 32 is a 1⅛ in. Bolt 36, passed through the fourteenth holes of the Strips. Between the Strips, this Bolt carries, in order, a Nut, three Washers, a 4½ in. Narrow Strip, four Washers, another 4½ in. Narrow Strip, another three Washers and, finally, another Nut. The two Narrow Strips, numbered 37 in the illustrations, are lock-nutted by a ⅜ in. Bolt to a 5½ in. Narrow Strip 38.

At this stage, a 1½ in. by ½ in. Double Angle Strip 39, is fixed by ½ in. Bolts to each Flat Trunnion 25, but is separated from it by five Washers on the shank of each Bolt. The arms are then pivotally joined to these Double Angle Strips by 2 in. Rods held in place by Collars, while Narrow Strips 38 are lock-nutted by ⅜ in. Bolts to the corresponding Corner Angle Brackets 31.

Aeroplanes

Each of the six aeroplanes fixed to the arms are similar in design. The fuselage consists of one 2½ in. by 2½ in. and four 2½ in. by 1½ in. Flexible Plates arranged as shown and connected by two 4½ in. Narrow Strips 40. The right-hand Strip is bolted direct to the two Corner Angle Brackets at the end of the arm, as also is a 2½ in. by 1½ in. Triangular Flexible Plate 41, serving as the starboard wing. Another 2½ in. by 1½ in. Triangular Flexible Plate 42, fixed to left-hand Strip 40 by Angle Brackets, represents the port wing, while the windscreen is obtained from a 2½ in. by 1½ in. Transparent Plastic Plate 43.

A lamp holder is mounted on Angle Brackets inside the rear part of the fuselage. If an Elektrikit Lamp Holder is used, however, this cannot be mounted actually inside the fuselage, but it can be fixed to the rear of the fuselage by Angle Brackets, again remembering to insulate one of the terminals from the rest of the model.

Electrical System

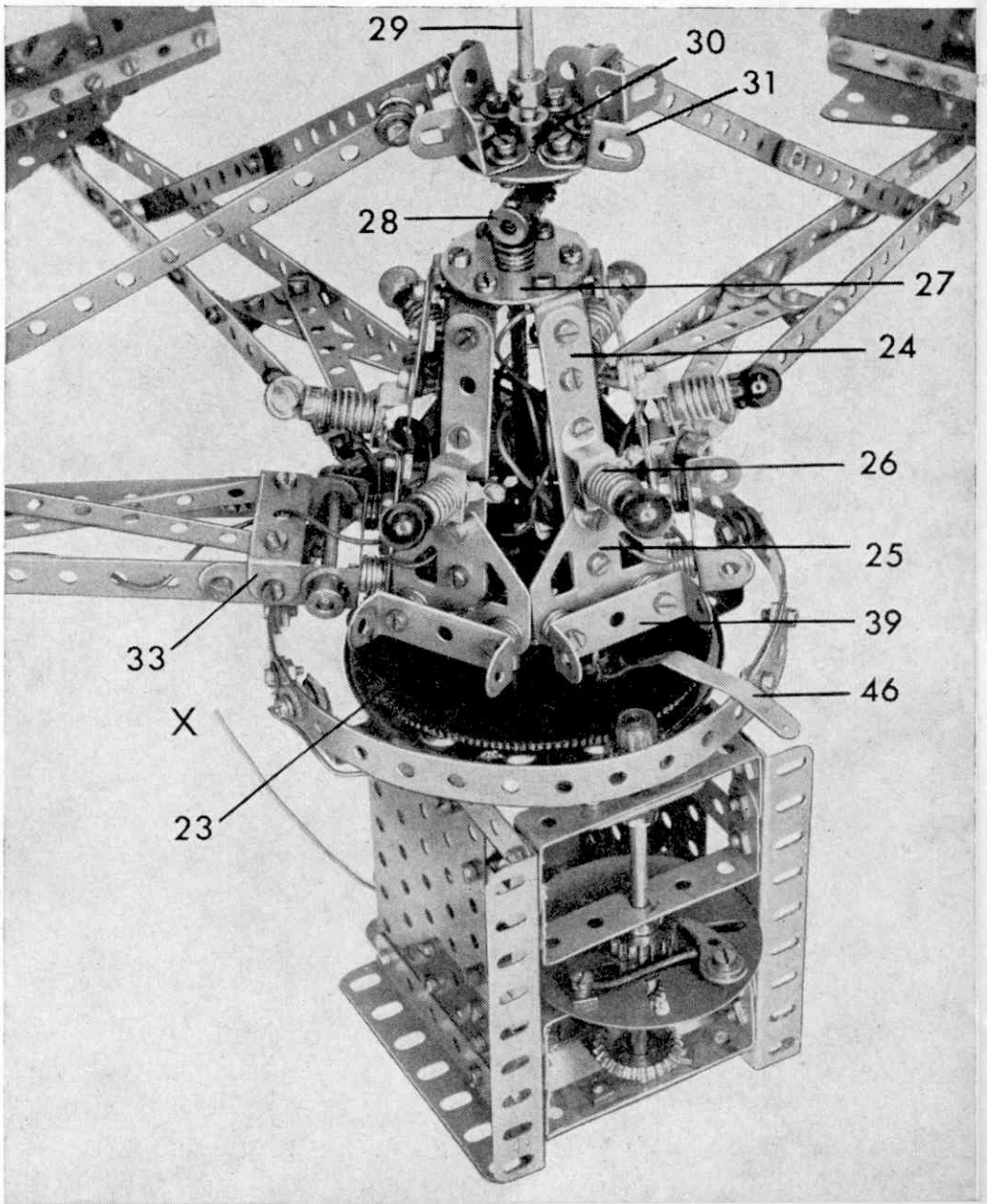
The electrical circuit of the Octopus works on the 'live chassis' principle, which means that only one terminal of the lamp holders needs to be connected to the power source by wire. Current is carried to the other terminal by passing through the model itself. In other words, this terminal is 'earthed' by connecting it direct to the metal of the model.

You will remember that the model illustrated was designed before the introduction of the Elektrikit, therefore, it incorporates a built-up commutator, as opposed to the ready-made Elektrikit Commutator. Three 1 in. by 1 in. by ½ in. Reversed Angle Brackets 44 are obtained by bending 2½ in. Strips, and these are bolted, one each, to Strips 6 and the third to Angle Girder 7. Two 9½ in. Strips 45 are then curved and bolted together to form a circle with a circumference of 32 holes. This is then fixed to Reversed Angle Brackets 44, but is insulated from them by fibre washers on 6 B.A. bolts. In turn, a Wiper 46 is secured to Gear Wheel 23, but is also insulated from it by fibre washers on 6 B.A. bolts. The wiper is placed in contact with built-up Commutator 45, from the upper edge of which the enamel must be removed so that current can pass from one to the other.

We now come to the actual wiring, which is really not as complicated as it looks. Theoretically, lengths of insulated wire are taken from Wiper 46 to the insulated terminal of each of the lamp holders fixed to the revolving pillar. Having been connected, the wire is continued along the appropriate 'tentacle' and is finally connected to the insulated terminal of the lamp holder in the aeroplane. This can be done, but, in practice, results in too many wires being attached to the wiper, thus increasing the danger of a short circuit. The difficulty is overcome, therefore, by taking only one wire from the wiper to a small terminal block, to which the lamp holder wires are also connected.

Another length of insulated wire X is connected to the commutator, while a final length is taken to any part of the base framework, making certain that a good electrical contact results. These two wires are connected to the terminals of the power source.

Parts Required

14 of No. 1a	1 of No. 30	12 of No. 154a
8 of No. 3	387 of No. 37a	18 of No. 154b
4 of No. 5	313 of No. 37b	1 of No. 168a
2 of No. 6	209 of No. 38	1 of No. 168c
33 of No. 6a	9 of No. 46	24 of No. 188
4 of No. 9a	12 of No. 48	6 of No. 190
2 of No. 9b	1 of No. 52	6 of No. 193
2 of No. 9d	1 of No. 53	12 of No. 221
6 of No. 10	2 of No. 53a	12 of No. 235b
6 of No. 11a	1 of No. 58	24 of No. 235d
27 of No. 12	17 of No. 59	6 of No. 235f
6 of No. 12a	1 of No. 63	1 rod 10½ in. long
3 of No. 12b	4 of No. 64	12 lamps
1 of No. 16	1 of No. 109	12 lamp holders
1 of No. 16b	4 of No. 111	1 wiper
8 of No. 17	12 of No. 111a	14 fibre washers
1 of No. 24b	20 of No. 111c	6 bolts (6 B.A.)
2 of No. 24c	6 of No. 111d	8 nuts (6 B.A.)
3 of No. 26	6 of No. 126a	
2 of No. 27a	1 of No. 147a	
1 of No. 27b	1 of No. 148	

Below: The central revolving pillar. It looks complicated, but is simply a question of building six identical assemblies