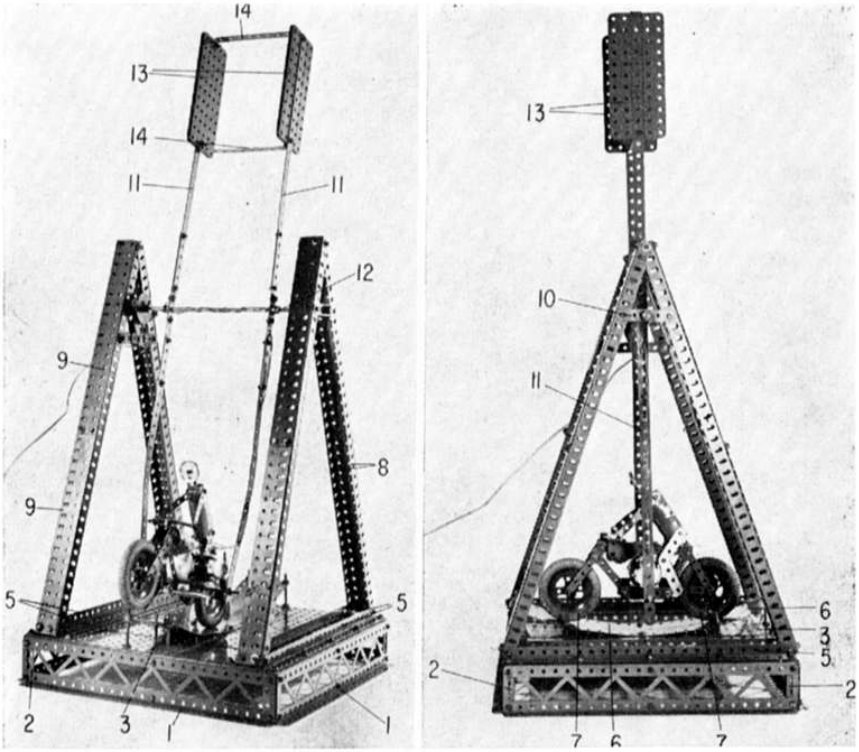
CENTRIFUGAL MOTOR CYCLIST

"A thoroughly enjoyable fun-piece" says Spanner



Spanner thinks that this is one of the most appealing "fun" models he's seen for a long time. The two views on the left give a hint of its function. Note the curved shape of Strip Plate 6.

WHEN I was first presented with the model featured in this article, I was puzzled. I could see it was some sort of motor-cycle. But, at first glance it seemed to have an exceedingly large framework for such a small—if realistic—presentation. At this stage, the motor-cycle was locked in position and consequently didn't appear to do anything in particular. I must admit I then made the classic mistake of pre-judging the model before having it explained to me: I was unimpressed—which just goes to show how wrong you can be! In due course, our builder released, not the motor-cycle, but the counter-weighted arm on which it was mounted, coupled up a power unit and proceeded to give me a working demonstration of one of the most appealing "fun" models I have seen for a long time. In very short order, he had me utterly captivated by the sight of his Centrifugal Motor-cyclist, as he called it, whirling round in a spinning vertical circle, controlled by a few skilful "bursts" on his power unit throttle. "A must for the Mag.", I thought, and now here it is!

Framework

Needless to say, with the spinning motorbike feature of this model, a really strong and rigid framework is required to carry it. A fairly heavy base is therefore built up from four 12½ in. Angle Girders 1, arranged in a square and connected together by being bolted to four vertical corner posts 2, supplied by 2 in. Angle Girders, the securing Bolts helping to hold four 12½ in. Braced Girders in position, as shown.

Another square, built up from four 12½ in. Angle Girders, is bolted to the top of the corner posts, the Braced Girders also being secured to this, then the whole top of the base frame is covered in by eight 5½ × 3½ in. Flat Plates and three 5½ × 2½ in. Flat Plates 3, all overlapping each other as required, with the smaller Plates 3 running in a centre strip from one side of the upper square to the other. Note that the ends of this "strip" are attached to the Girders, not by Bolts, but by 2 in. Screwed Rods 4, held in the Plates by Nuts, and note, too, that some of the other Plate fixing Bolts also hold four additional 12½ in. Angle Girders 5 in position, these being arranged in two pairs of two at parallel edges of the frame, with the Girders in each pair separated by a distance of three clear holes.

Secured by Nuts and Washers between the upper ends of Screwed Rods 4 at each side is a 12½ × 2½ in. Strip Plate 6. Taking full advantage of its slotted holes, this Plate is carefully curved so that its centre touches the Flat Plates, to which it is bolted, the curve being held between the centre and the ends by lock-nuts on 1⅛ in. Bolts 7 passed up through the Flat Plates and through the sixth holes from each end of the Strip Plate. Adjustment of Strip Plate height and curvature may be necessary at a later stage.

Two triangular mountings for the motor-cycle arm are next each built up from two compound channel girders each consisting of two 18½ in. Angle Girders 8 connected together to form the channel by two 9½ in. Flat Girders 9, using the circular-hole flanges of the Angle Girders. The upper ends of the channel girders are simply bolted together, while their lower ends are secured to the ends of Angle Girders 5 on the base. Bolted between the flanges of each pair of channel girders, seven holes from the top, are two 2½ in. Strips 10 which will later provide the bearings for the revolving arm pivot.

Revolving Arm

The revolving arm, itself, is produced from two 27 in. compound strips 11, each built up from a centre 7½ in. Strip extended 19 holes upward by a 12½ in. Strip and 20 holes downwards by another 12½ in. Strip. (For description purposes, I am regarding the lower end of the arm as that to which the motor-cycle will be fitted.) A Double Arm Crank 12 is bolted to the Centre of each 7½ in. Strip.

Counterweights to balance the motor-cycle must of course be provided at the upper end of the arm and, on our model, we found that twelve 4½ × 2½ in. Flat Plates 13 worked out splendidly. These are bolted—half each—to strips 11, the securing ½ in. Bolts also fixing two 4½ × ½ in. Double Angle Strips 14 between the Plates.

Motor-cycle

Turning, now, to the motor-cycle, this is built up round a

Meccano 3–12 volt Motor with Gearbox, as can be seen from the illustrations. Two Fishplates are first bolted to the top of the moulded base of the Motor, one each side, using the holes nearest the Gearbox end, then a Double Bracket 15 is fixed to the free end of each Fishplate. Secured to the lugs of the forward Double Bracket, not by Bolts, but by Nuts on a 3 in. Screwed Rod 16, are two $2\frac{1}{2}$ in. Narrow Strips 17 angled upwards to serve as part of the frame. Bolted to the end of these Strips are two 3 in. Narrow Strips 18, serving as the front forks, the securing Bolts passing through the second holes of the Strips and also fixing in place between the Strips a Double Bracket 19 with its lugs extended by Fishplates to strengthen the upper part of the fork assembly. The upper ends of these Fishplates and Strips 18 are connected by a Large Fork Piece 20, the securing Bolts in this case also holding two $4\frac{1}{2}$ in. Narrow Strips 21 in position to form the crossbar. The handlebars are simply supplied by a $2\frac{1}{2}$ in. Stepped Curved Strip bolted to the boss of the Fork Piece.

Secured to the lugs of rear Double Bracket 15, again using Nuts on a 3 in. Screwed Rod 22, are four $2\frac{1}{2}$ in. Narrow Strips arranged in two pairs, 23 and 24. Pair 23 project horizontally rearwards, while pair 24 project diagonally upwards, their upper ends being bolted, along with two more $2\frac{1}{2}$ in. Narrow Strips 25, to the rear ends of crossbar Strips 21, the securing Bolts also fixing a Double Bracket between Strips 21. A Flat Trunnion 26 is bolted to the back of this Double Bracket to serve as the seat. The crossbar Strips are further connected through the fourth holes from the rear by another Double Bracket, while the fuel tank is represented by two $2\frac{1}{2} \times 1\frac{1}{2}$ in. Triangular Flexible Plates 27, curved to shape and bolted to an Angle Bracket fixed to the crossbar.

The lower end holes in Strips 25 coincide with the end holes in Strips 23 to provide bearings for the rear axle: a 2 in. Rod held in place by Collars outside the Strips and carrying a Collar and a 2 in. Pulley with Motor Tyre between the Strips. A Cone Pulley 28 is fixed on the end of the Rod, the smallest pulley of the Cone being

Right, another view of the motor-cycle and rider, removed from the rotating arm. The realistic proportions have been achieved by the use of Narrow Strips for the motor-cycle frame. Far right, the apex of one of the triangular mounts, showing the Commutator and Wiper Arm used to take power to the motor-cycle.

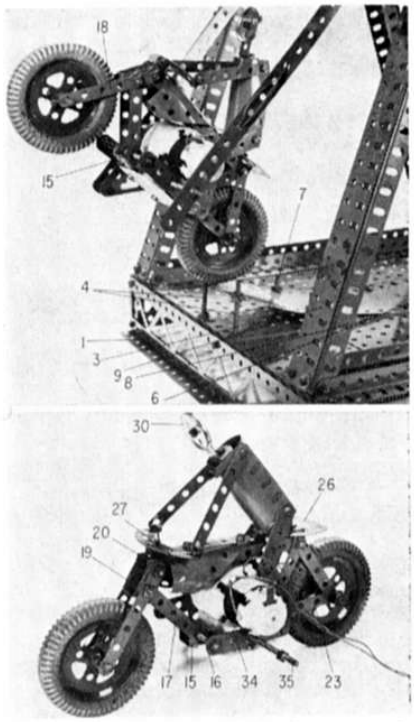
Above, a close up-view of the motor-cycle as it "climbs" upwards off its track. Below, the realistic features of the motor-cycle show up well in this view of the machine, removed from its rotating arm.

connected by a 6 in. Driving Band to a $\frac{1}{2}$ in. Pulley on the Motor output shaft. The front wheel is supplied by another 2 in. Pulley with Motor Tyre, mounted, along with a Collar, on a $1\frac{1}{2}$ in. Rod. journalled in the end holes of the front fork Strips.

This brings us to the motor-cyclist himself, and construction again is easy. His body consists of two "U"-section Curved Plates 29, bolted together, with two 3 in. Narrow Strips for arms and two 2 in. Strips, bolted together at an angle, for each leg. The head is a 1 in. Pulley without boss 30, fixed to the long lug of a $1 \times \frac{1}{2}$ in. Angle Bracket which is in turn fixed to an ordinary Angle Bracket bolted inside the upper edge of front Curved Plate 29. This latter Angle Bracket is spaced from the Plate by three Washers on the shank of the securing $\frac{3}{8}$ in. Bolt. The completed rider is attached by the lower edge of front Plate 29 to an Obtuse Angle Bracket bolted to the apex of Flat Trunnion 26, his arms being secured by short lengths of Cord to the handlebars of the bike.

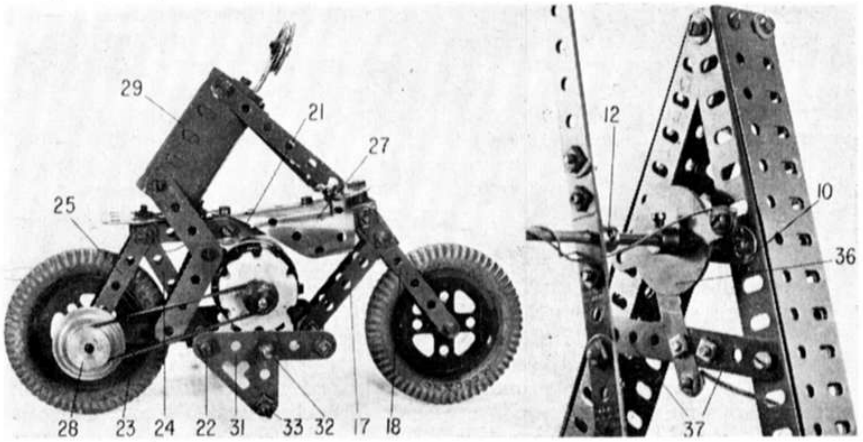
Fixing points to enable the bike to be attached to the rotating arm are now provided. At the right-hand, or Motor output side of the model, a $2\frac{1}{2}$ in. Strip, overlaid by a $1\frac{1}{2}$ in. Corner Bracket 31, is fixed by Nuts on the ends of Screwed Rods 16 and 22. Note that the Corner Bracket is secured to the centre of the Strip by a $\frac{3}{4}$ in. Bolt 32, shank outwards, another similar Bolt 33 being fixed in the lower corner hole of the Bracket.

At the opposite side of the model, a $2\frac{1}{2}$ in. Strip 34 is held by Nuts on the other ends of Screwed Rods 16 and 22, a 2 in. Screwed Rod 35 being fixed by Nuts in the centre



hole of this strip. The lower ends of compound strips 11 of the revolving arm are then curved inwards to the desired shape and the completed motor cycle is then fixed to the arm by locking the strips on Bolts 32 and 33 and Screwed Rod 35, using Nuts in the ordinary way.

With all stationary parts tightly bolted together to ensure rigidity the arm is now mounted in the framework by means of an $11\frac{1}{2}$ in. Rod fixed in Double Arm Cranks 12 and journalled, free, in Strips 10, being held in place by Collars. Also fixed on the Rod is a Flat Commutator 36 (Electrical Part No. 551), in contact with which is a 2 in. Wiper Arm (Electrical Part No. 533). This Wiper is bolted to two $2\frac{1}{2}$ in. Insulating Strips 37 (Electrical Part No. 502), fixed to nearby Angle Girders 8 of the frame through their tenth holes.



All that now remains to be completed is the wiring. The Motor leads are threaded up nearby strip 11 of the arm and wrapped around the 11½ in. Rod. One lead is then earthed by connecting it to one of the bolts in nearest strip 11, while the other lead is connected to one terminal of Commutator 36. Of the leads from the power source, one is connected to the Wiper Arm engaging with the Commutator, while the other is also earthed by connecting it to the frame.

Provided the model is built from current zinc-plated parts, no electrical circuit problems should arise. but if old enamelled parts are used, care must be taken to ensure that the earthed leads make proper contact with bare metal—even if it means removing some enamel. It would also be necessary to remove the enamel from inside the holes in which the 11½ in. Rod is journalled, otherwise the paint might insulate the Rod from the frame and thus prevent a complete circuit.

Operating the Model

Once the model has been built, some adjustments may be required before full-scale operation can begin. The revolving arm, for example, must turn freely, with minimum friction, and it should be fairly well-balanced, although perfect balance is not required. In fact, the motor-cycle must be slightly heavier than its counterweight to ensure that, without power, it will return to its track, i.e. to Strip Plate 6. Most important of all, however, the wheels must make contact with the full length of Plate 6, during operation, and they must do so with just the right amount of pressure—not so lightly that they hardly provide adhesion and yet not so heavily that the friction reduces performance. The height and curvature of the Plate can be altered, as required, by adjusting the fixing Nuts on Screwed Rods 4 and Bolts 7.

Operation itself is not simply a question of switching the motor "on" and watching the model whirl into action. It won't happen! The motor drives only the motor-cycle, therefore this machine must be skilfully manoeuvred until it gains sufficient momentum to "push" the revolving arm through a complete circle and, once done, to keep it spinning for as long as desired. To achieve this, a reversible power source is required, such as a Meccano Battery Box, or a suitable model railway power control unit. Failing this, a reversing switch in the power feed circuit would serve the same purpose, Model No. E3 in the Meccano 4EL Manual being an example of such a switch.

With everything set up, the driving sequence starts with a burst of forward power to the model. This sends the motor-bike forward, off Plate 6 and into the air, but not, at this stage, high enough to "go over the top". Power is cut as soon as the bike is clear of the Plate. Because the bike is heavier than its counterweight, it will swing backwards once its forward movement is exhausted. As soon as its back wheel contacts Plate 6—or slight beforehand—reverse power is fed to the model which, of course, boosts the bike backwards off the Plate. Power is again cut when the bike is clear and again, it will not yet have sufficient momentum to go over the top so and will swing downwards and forwards, As it hits the Plate another burst of forward power is applied and so on, backwards and forwards until the bike does go right over the top in a complete forward circle. From then on, short bursts of power as the bike crosses Plate 6 will keep it spinning indefinitely.

To stop the model, it is sufficient simply to keep power off, as the "dead" motor will act as a brake, but increased braking can be achieved by reversing drive at the appropriate moments. Starting or stopping, however, this model stands out as something really different and I, for one, can recommend it as a thoroughly enjoyable "fun-piece". Meccano Clubs, particularly, may like to study it, as it strikes me as being especially suitable for exhibitions, where members of the public are invited to "have a go". Purely an idea, of course . . .!

PARTS REQUIRED

4—1	1—17	12—70	1—133
2—1b	1—18a	2—80c	2—142a
6—5	2—20a	5—81	1—186a
4—6	1—22a	1—90a	1—197
8—7a	1—23a	4—99	2—199
13—8	190—37a	8—103a	2—222
4—9e	134—37b	2—111	8—235
4—10	50—38	2—111a	4—235a
5—11	2—48c	9—111c	2—235d
3—12	8—52a	4—111d	2—502
1—12b	3—53a	1—123	1—533
1—12c	8—59	1—126a	1—551
1—13	2—62b		

1—3-12 volt Motor with Gearbox.

AMONG THE MODEL BUILDERS (*continued from page* 227)

news to pass on to readers in the Chatham area. In January, Mr. Potter wrote to tell me that he and fellow enthusiasts in the area are forming a Meccano Club for adult enthusiasts over 15 years of age. Unfortunately, as I write this, I do not yet have any specific details as to Club title, officers, or venue, but Mr. Potter did tell me that, in the two months before he wrote to me, they were proving successful. Anyone interested in the Club should contact Mr. Potter at 8 Batchelor Street, Chatham, Kent.

Stevenage Club

Still on the subject of Clubs, I have received some further news of the Stevenage Meccano Club from Secretary, Mr. Dennis Higginson, 7 Buckthorn Avenue, Stevenage, Herts., who writes to tell me that 10-year-old member Geoff Long has developed an interesting way of meshing Part No. 25 with Part No. 31; Part No. 26 with Part No. 27 and Part No. 26c with Part No. 31. (Needless to say, these are parts which do not mesh together when standard Meccano spacing is used.)

I include an illustration of the demonstration mounting suggested to me and you will see from this that the secret of Geoff's success lies in the use of Wheel Discs—both 6-hole and 8-hole—for the Rod journals. By journalling the Rods carrying the gears in the Wheel Disc holes shown, the non-standard engagement can be achieved.

The demonstration mounting is simply produced from a 5½ × 2½ in. Flanged Plate, to which three pairs of 1½ × ½ in. Double Angle Strips are bolted to provide support for the Wheel Discs. Working from left to right, two 6-hole Discs 1 are bolted to the first pair of Double Angle Strips, two 8-hole Discs 2 to the centre pair and two more 8-hole Discs 3 to the right-hand pair. The left hand arrangement supports gears 25 and 31, the centre supports gears 26 and 27 and the right-hand supports gears 26c and 31, the particular holes used being clear from the illustration. Having myself built the unit illustrated from details supplied by Mr. Higginson, I can confirm that everything works as claimed and should consequently like to offer my hearty congratulations to young Geoff for his ingenuity. Well done!

Remaining with the Stevenage Meccano Club, I should like to close this month with an apology to Club member Peter Phillipson. Peter was mentioned in the January issue—only I referred to him as Phillip! My apologies, Peter.