

# 'TWO FROM FOUR'

TWO entirely new models built from the current series No. 4 Meccano Outfit, designed, constructed and described by Dr. Keith Cameron of Florida, U.S.A.

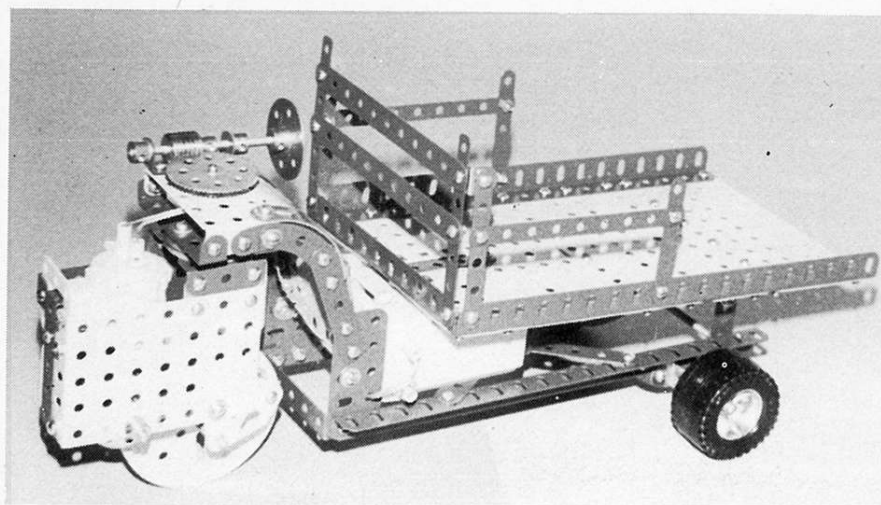
## TIPPING MOTOCART

THIS model closely follows the lines of the 1950 Dinky Toy No. 27g. In a similar manner to the prototype, it is powered by a drive to the large single front wheel, which is steered by an operator standing on the chassis. This is connected to the steering head by a 'swan neck'. The model is self-contained, the motor deriving its power from a battery box on the frame, under the tipping body.

### FRONT WHEEL UNIT

A 4.5 volt motor, (Junior Power Drive Unit Mk. II), with a  $\frac{1}{2}$ " Pinion on its drive shaft, is bolted to the inner face of the upper two holes of the front flange of a  $3\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flanged Plate, spaced by a washer on each Bolt. A vertical  $2\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip is also bolted to the motor base plate and lies parallel to the flange, its upper lug contained within the cavity of the motor base plate. This Double Angle Strip is also affixed, below, to the flange of the plate by a 1" Corner Bracket, (not shown in some illustrations). A lower Bolt secures a  $3\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip by its front lug, its rear lug being bolted to the rear flange of the plate by a Bolt that also passes through the centre hole of a Double Bracket.

Flat Trunnions are fixed to the lugs of the Double Bracket and, these are further secured by means of Bolts passed through their formed holes to the  $3\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip in



LEFT-hand view of completed model.

the case of one, and to the  $3\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flanged Plate on the other; in such a way that a 3" Pulley on a  $\frac{1}{2}$ " Axle Rod journalled through the apex holes just clears a  $2\frac{1}{2}$ " Axle Rod journalled through the third hole from the front of the Double Angle Strip. This  $2\frac{1}{2}$ " Axle Rod carries a Contrate Gear between the Flanged Plate and the Double Angle Strip, and this engages with the  $\frac{1}{2}$ " Pinion on the motor shaft. A  $3\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip is bolted to the motor base plate, and is fixed by its rear lug to a  $1\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flat Plate bolted to the rear flange of the  $3\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flanged Plate.

A  $1\frac{1}{2}$ " Pulley, boss down, is bolted to the centre elongated holes of two  $1\frac{1}{2}$ " Angle Girders, using washers to ensure that the bolt shanks do not project beyond the Nuts on the upper surface of the  $1\frac{1}{2}$ " Pulley. The  $1\frac{1}{2}$ " Angle Girders are fixed by means of four Fish-plates to the Double Angle Strip and the Flanged Plate. A  $2\frac{1}{2}$ " Axle Rod is then fixed using two Grubscrews in the boss of the  $1\frac{1}{2}$ " Pulley, position the Pulley so the Grubscrews are accessible.

The large front wheel is represented by a 3"

Pulley on a  $1\frac{1}{2}$ " Axle Rod, secured by a Collar and spaced by three Washers, in the apex holes of the two Flat Trunnions. This is driven by a 6" Driving Band in its groove and this is passed over the  $2\frac{1}{2}$ " Axle Rod carrying the Contrate Gear, powered by the  $\frac{1}{2}$ " Pinion on the motor shaft. The gearing can then be concealed by a  $1\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flat Plate passed over the  $2\frac{1}{2}$ " Axle Rod and secured by means of a lock-nutted  $\frac{3}{4}$ " Bolt to the forward hole of the lower  $3\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip.

### STEERING HEAD

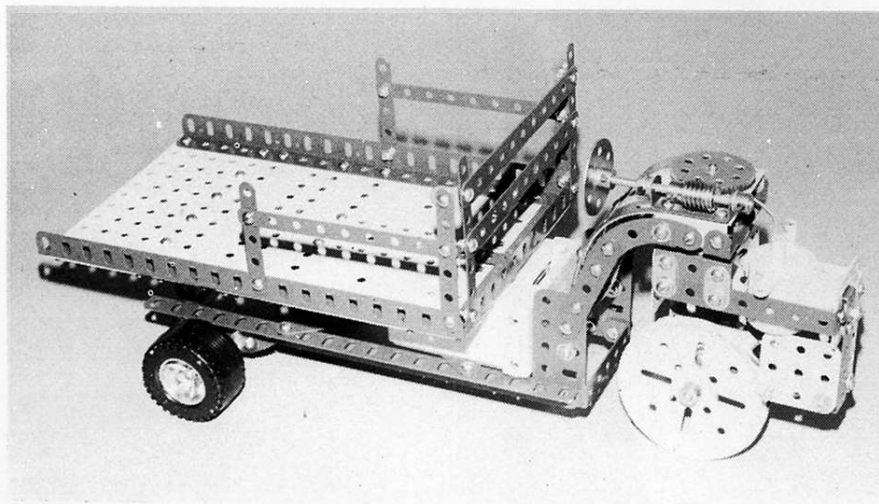
This comprises a  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flanged Plate, to the flanges of which are bolted two  $2\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strips. A  $1\frac{1}{2}$ " Pulley, boss up, is affixed to the centre holes of these two Double Angle Strips in the manner previously described, ie using Washers for spacing purposes. To the flanges are also affixed, two  $2\frac{1}{2}$ " Stepped Curved Strips, by their end two holes, and to the upper surface of the plate is bolted a  $1\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip.

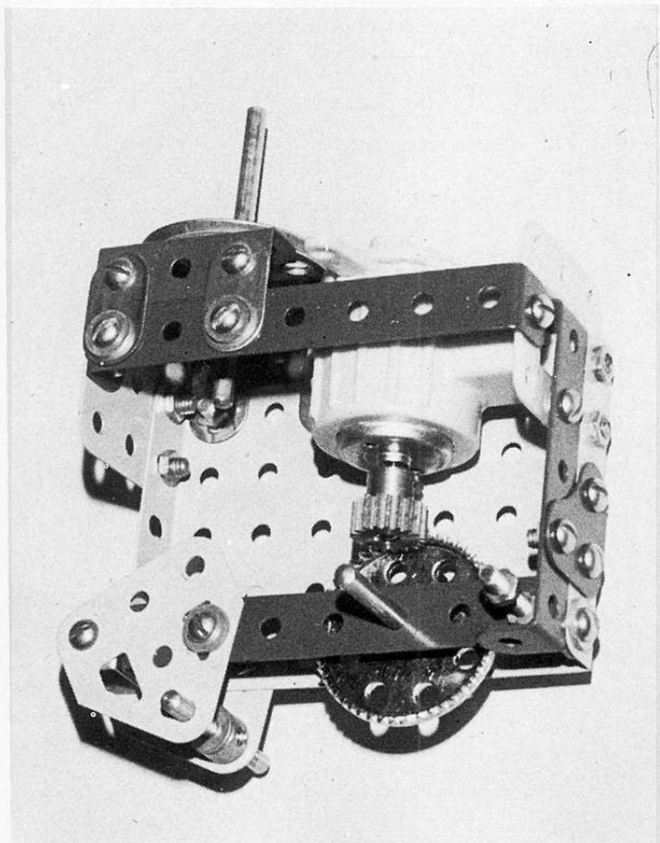
This holds a 3" Axle Rod, journalled through its lugs, and carrying a Worm Gear, two Collars, spacing Washers and a Bush Wheel. To the rear upper surface of the  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flanged Plate are secured two Formed Slotted Strips, bracing a  $2\frac{1}{2}$ " x  $2\frac{1}{2}$ " Plastic Flexible Plate, down and to the rear. These are extended below by another  $2\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flexible Plate edged by two  $2\frac{1}{2}$ " Perforated Strips and, above, by a  $2\frac{1}{2}$ " Narrow Strip, the securing Bolts of which also hold  $\frac{1}{2}$ " x  $\frac{1}{2}$ " Angle Brackets.

These Brackets are affixed to the lower holes of the two  $2\frac{1}{2}$ " Stepped Curved Strips, which are lengthened by  $2\frac{1}{2}$ " Perforated Strips bolted at an angle to the two upper slotted holes of  $2\frac{1}{2}$ " Flat Girders, secured below to the  $9\frac{1}{2}$ " Angle Girders forming the main chassis members. A  $2\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strip is used to provide bracing between the forward holes of the two  $9\frac{1}{2}$ " Angle Girders at this point.

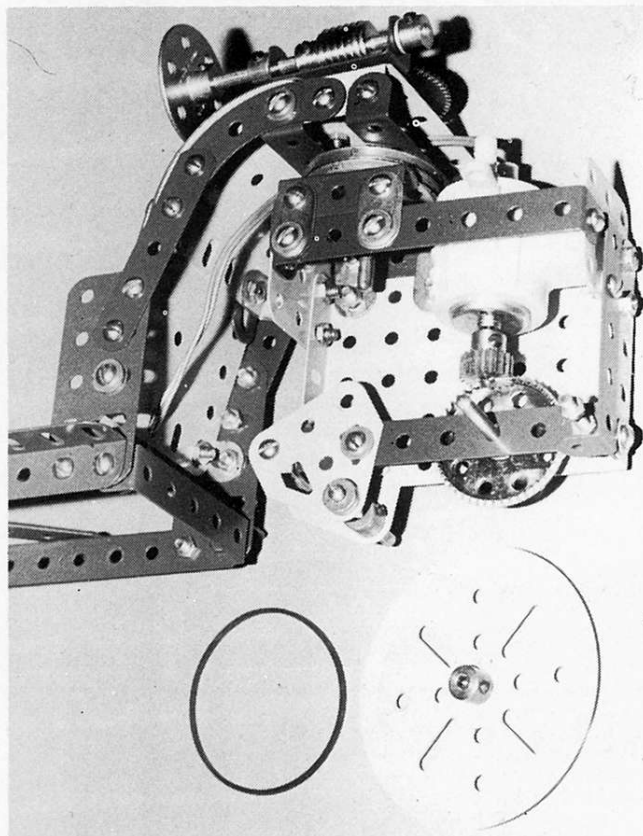
The  $2\frac{1}{2}$ " Axle Rod, held in the boss of the front wheel unit  $1\frac{1}{2}$ " Pulley, is passed through the central hole of the  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flanged Plate and the  $1\frac{1}{2}$ " Pulley affixed to it. A 57t Gear Wheel is then attached by using two grubscrews, this engages with the Worm Gear on the steering shaft.

GENERAL view of the right hand side of the Tipping Motocart. Note that the tipping body rests on the battery box.





CLOSE-up of the motor drive unit showing careful positioning of two Flat Trunnions.



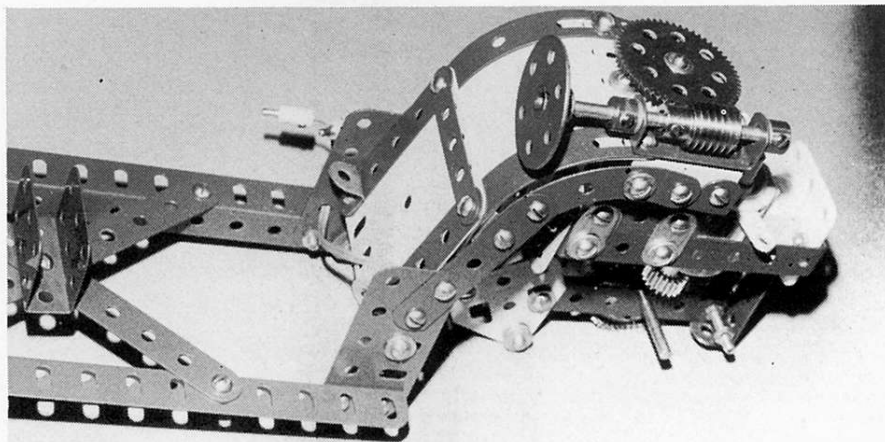
DRIVE unit and 'swan neck'. The 3" Pulley is shown separately to avoid obstruction of detail.

#### THE FRAME

The two 9½" Angle Girders comprising the main frame chassis members are braced by two 5½" Perforated Strips, crossed over. The road wheels are free to revolve on the shanks of two 1½" Bolts, lock-nutted to the centre holes of two Double Bent Strips, themselves held by two 2½" Stepped Curved Strips bolted to the rear of the frame, their rear holes secured by lock-nuts on a crosswise 3" Screwed Rod. A Channel Bearing is bolted to the point at which the two 5½" Perforated Strips cross.

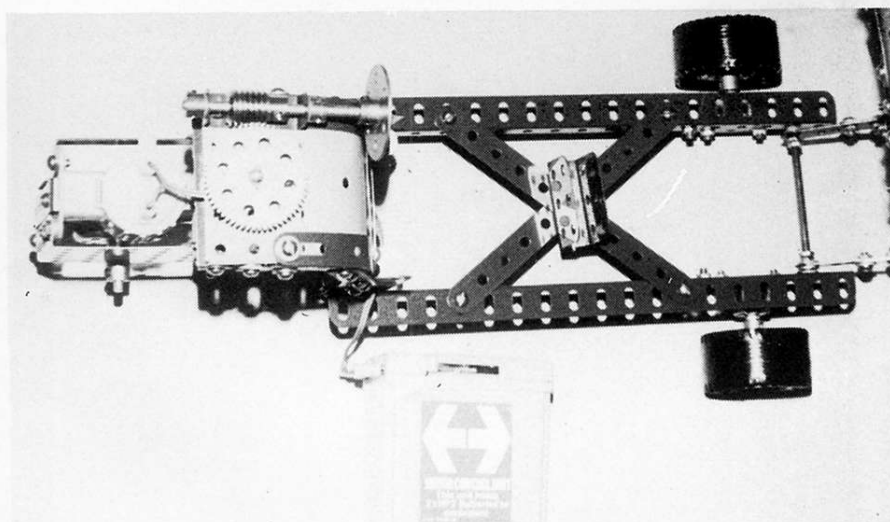
#### THE TIPPING BODY

The floor of this consists of, (from front to rear), two 2½" x 1½" Plastic Flexible Plates, two 3½" x 2½" Flexible Plates, (between these, a further 2½" x 1½" Flexible Plate), two



DETAIL view of rear of 'swan neck', note arrangement of steering column.

VIEW from above with tipping body raised. The battery box fits in between the Channel Bearing supported on the crossed 5½" Strips, and the rear of the 'swan neck'.



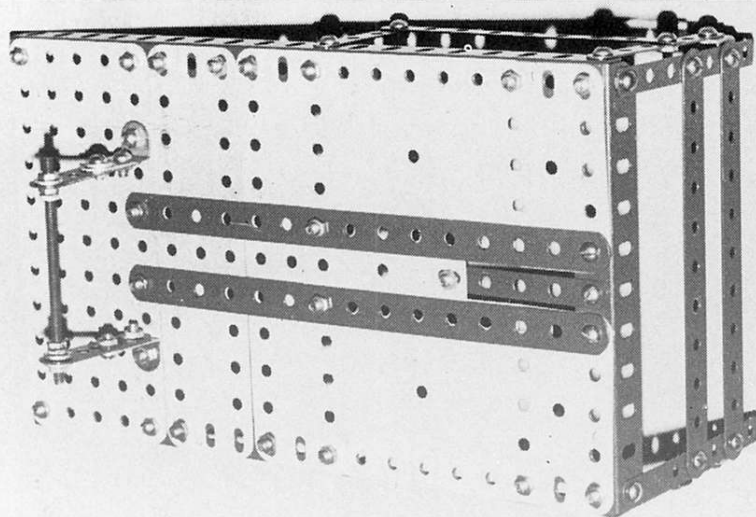
5½" x 1½" Flexible Plates, and a 5½" x 2½" Flat Plate, lined up as shown and braced on either side and in front by two 9½" Angle Girders and one 5½" Angle Girder respectively. Two 7½" Perforated Strips are employed to brace the underside of floor, and a 2½" Narrow Strip partly fills the gap between the four forward Flexible Plates.

Two 2" Perforated Strips, fixed by two 1" x ½" Angle Brackets to the underside forward holes of the 5½" x 2½" Flat Plate, pivot by their lower holes on the 3" Screwed Rod connecting the rear of the two 9½" Angle Girder chassis members. Side and front framing for the tipping body is made up from 2½", 3", 3½" and 4½" Narrow Strips, two 5½" Perforated Strips and two ½" x ½" Angle Brackets.

#### OPERATION

A Battery Box will fit snugly between the Channel Bearing and the two 2½" Flat Girders on the chassis frame. Two wires connect the motor and Battery Box, these can be passed under the steering head.



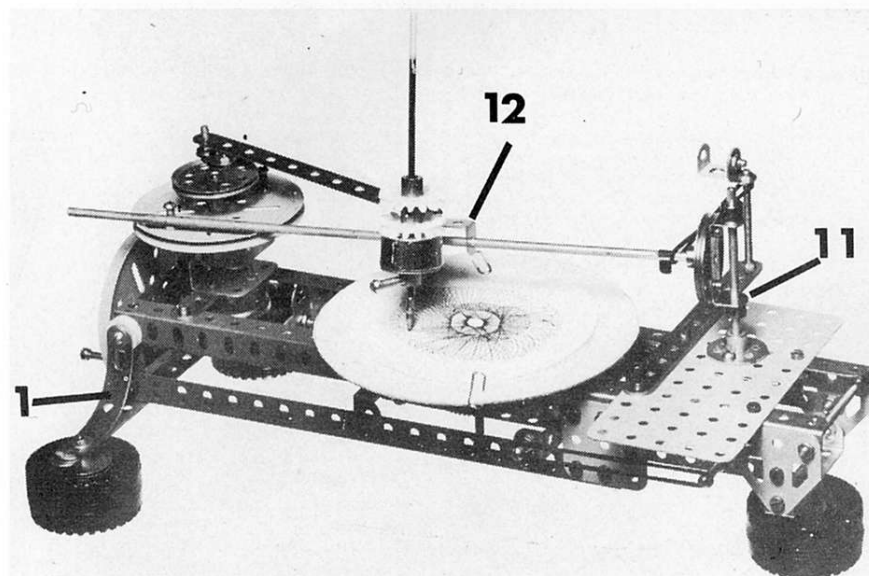


THE underside of the tipping body.

**PARTS REQUIRED:**

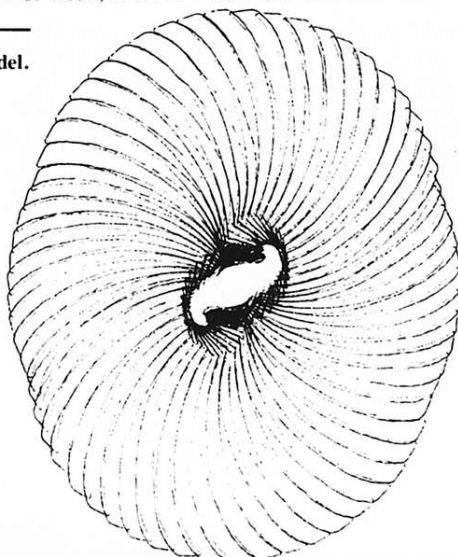
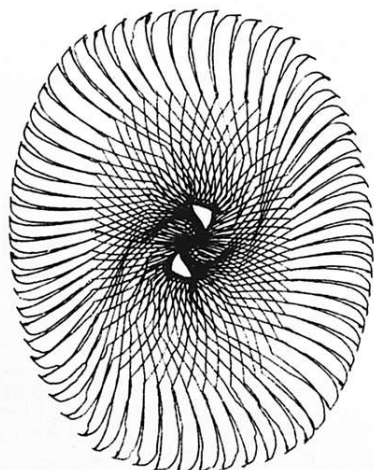
2 of No. 1B	1 of No. 53
4 of No. 2	4 of No. 59
4 of No. 5	1 of No. 70
2 of No. 6	2 of No. 74
4 of No. 8A	1 of No. 80C
1 of No. 9	4 of No. 90A
2 of No. 9F	2 of No. 103F
4 of No. 10	1 of No. 111
1 of No. 11	8 of No. 111A
6 of No. 12	2 of No. 111D
2 of No. 12B	2 of No. 126A
2 of No. 16A	1 of No. 133A
1 of No. 16B	1 of No. 160
1 of No. 18A	1 of No. 186A
1 of No. 19B	2 of No. 189
2 of No. 21	2 of No. 190A
1 of No. 24B	3 of No. 194
1 of No. 26	2 of No. 194A
1 of No. 27A	2 of No. 215
1 of No. 28	4 of No. 235
1 of No. 32	2 of No. 235A
110 of No. 37B	2 of No. 235B
125 of No. 37C	2 of No. 235D
36 of No. 38	4 of No. 611
2 of No. 45	1 of No. 618
1 of No. 48	1 of No. 11053
4 of No. 48A	1 of No. 136 24
2 of No. 48B	2 of No. 187C
1 of No. 51	1 motor and accessories

# MECCANOGRAPH



A GENERAL view of Dr. Cameron's Meccanograph, built from the current series No. 4 outfit, plus a 5" diameter design table made of thick card or wood, and two rubber bands.

SOME of the fine designs produced on this model.



THIS machine produces a wide range of designs mostly resembling flowers. It requires a designing table which is easily made from 1/4" plywood, although thick card was substituted for photographic expediency in the illustrations. Two rubber bands and ball-point pen refills are also necessary.

## THE FRAME

This is composed of four 9 1/2" Angle Girders bolted at one end to a 2 1/2" x 1 1/2" Flanged Plate. All four Girders are secured to the flanges by their elongated holes, using a Washer in between for spacing purposes. The upper two Girders are held by 1/2" Bolts that first pass through a Washer, then the end slot of a 3" Formed Slotted Strip 1, and a 1/2" Pulley, remembering the Washer for spacing purposes between the 9 1/2" Angle Girder and the 2 1/2" x 1 1/2" Flanged Plate.

A 7 1/2" Perforated Strip 2, is then fixed to the end round holes of the lower two 9 1/2" Angle Girders, extending five holes either side. Two 'feet' for the Meccanograph are formed, each in the following manner. A 1 1/8" Bolt is passed up in succession through a Road Wheel Centre, a hard Plastic Tyre, a 1" Pulley, the next to the

