

## New Meccano Model

## Revolving Fly-Boats

(Concluded from last month)

IN last month's article dealing with the construction of this model we described the base frame, to which the main standards are secured, and also the eight passenger cars. The units now remaining to be built are the two main standards, the wheel frame, and the motor unit, and the construction of these is accordingly dealt with in this article.

## The Main Standards

In constructing the two main standards, reference should be made to the general view of the Flyboats that appeared in last month's article. Fig. 3 on this page shows the upper portion of one of these units. As will be seen from Fig. 1 channel-section girder construction has been employed in building the standards, this method eliminating any tendency to "whip" or twist when the wheel is in motion.

The standard proper consists of two pairs of  $18\frac{1}{2}$ " Angle Girders 13 (see Fig. 3) bolted together by means of  $9\frac{1}{2}$ " Flat Girders 14, Washers being placed under the heads of the bolts holding these to the Angle Girders in order to prevent the bolts slipping in the slots of the Flat Girders. The channel-section girders thus formed are bolted at the bottom to two  $12\frac{1}{2}$ " Angle Girders, which in turn are secured to the base frame of the model, while their upper ends are kept the correct distance apart by means of  $5\frac{1}{2}$ " Strips.

The bearings in which the axle carrying the wheel rotates consist of Girder Frames 16 (Fig. 3), these being bolted to the top holes of the vertical columns. Triangular Plates 17 are secured to the Girder Frames and also to the  $5\frac{1}{2}$ " Strips 15, and form the upper point of attachment for the two inclined columns or ties.

Each of the inclined columns consists of a rigid channel-section girder built from  $18\frac{1}{2}$ " Angle Girders 13 that are spaced apart by Flat Girders 14 bolted securely to their flanges. The columns are attached at the base to the lateral  $12\frac{1}{2}$ " Girders to which the vertical members are also bolted, while bolts passed through the 1" Triangular Plates 17 anchor them at the top.

In completing these units, great care should be exercised to see that everything is in alignment and that all bolts are screwed down firmly, as the true running of the wheel depends to a large extent on the rigidity of its journal supports.

## Building the Wheel Frame

The revolving wheel that carries the eight cars is shown in Fig. 4. Each side is composed of eight arms, each of which consists of a  $12\frac{1}{2}$ " Strip 18 that is secured by means of two bolts to a centre Face Plate 21.  $5\frac{1}{2}$ " Strips 20 bolted to the Strips 18 serve to hold the whole rigidly together.

After building two similar sides as described, they may be joined together by means of  $3\frac{1}{2}$ " Double Angle Strips 19, which are secured in position between each opposite pair of Strips 18. It is important that care is taken to ensure that the bosses and central bores of the two Face Plates are directly in line so that the wheel will revolve quite true about its axis when the various parts of the model are finally assembled. To align the Face Plates correctly it is advisable to place a length

of Meccano Rod through their bores and then carefully re-adjust the Double Angle Strips 19 until the wheel runs free and true on the temporary axle. A little care is all that is necessary to construct a perfectly balanced wheel that will run smoothly and evenly.

## Assembly of the Main Units

Having completed the various portions of the model it remains now to assemble them in their respective positions. The first step is to attach to the base the two vertical standards that support the wheel. As will be seen from the general view the standards are bolted one at either side

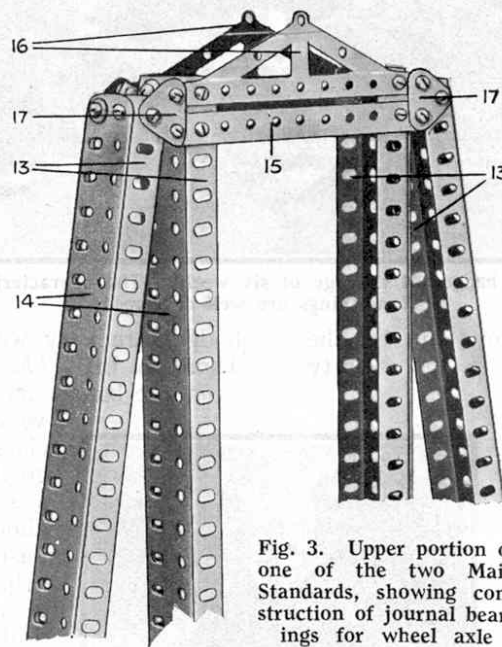


Fig. 3. Upper portion of one of the two Main Standards, showing construction of journal bearings for wheel axle

## PARTS REQUIRED:

16 of No. 1	4 of No. 9e	8 of No. 48b	2 of No. 97
20 " " 2	1 " " 13	8 " " 52a	1 " " 98
1 " " 2a	8 " " 15a	3 " " 53a	4 " " 99
32 " " 4	2 " " 16a	37 " " 59	16 " " 103a
32 " " 5	2 " " 17	3 " " 70	4 " " 108
20 " " 6	1 " " 26	8 " " 77	2 " " 109
32 " " 6a	2 " " 27a	32 " " 90a	4 " " 113
16 " " 7a	2 " " 30	4 ft. 2 in., 94	1 " " 126
15 " " 8	1 " " 32	1 " " 95	2 " " 161
3 " " 9	428 " " 37	1 " " 95b	6-Volt Motor
2 " " 9b	41 " " 38	1 " " 96	
9 " " 9d	48 " " 48a	1 " " 96a	

of the base. The bolts securing each standard pass through the lateral  $12\frac{1}{2}$ " Angle Girders and through the fourth and seventh holes of the Flat Plates 5, counting the holes from the sides of the base (see general view included in last month's article).

To ensure perfect rigidity it is advisable to further

secure each standard to the base by means of bolts and nuts passed through the  $12\frac{1}{2}$ " Girders about midway along their length. Having made sure that the main standards are perfectly secure, attention may be given to the moving parts of the model.

The wheel (Fig. 4) revolves on an  $11\frac{1}{2}$ " Rod and to place it in position between the standards, the Rod should first of all be passed through the apex holes of the Girder Frame 16 (Fig. 3) of the outer standard. The wheel may now be placed between the standards and the  $11\frac{1}{2}$ " Rods passed through the Face Plates 21 (Fig. 4), then through the apex holes of the Girder Frames capping the opposite standard. It is held in position by means of two Collars secured to the Rod one at each end and placed against the faces of the Girder Frames 16. The wheel should be secured centrally on the Rod by tightening the set-screws of the Face Plates 21.

The next step is to attach the cars to the arms of the wheel. Each car is suspended pivotally on a  $3\frac{1}{2}$ " Rod that is journalled in the end holes of the Strips 18 (Fig. 4) that form the arms of the wheel. This Rod passes through the upper end holes of the  $2\frac{1}{2}$ " Strips attached to the cars and is held in position in the arms of the wheel by means of two Collars. As all the cars are suspended freely on their respective pivot Rods it will be found that as the wheel is rotated the cars maintain a horizontal position.

### The Chain Drive Mechanism

The mechanism for rotating the wheel is very simple. A study of Fig. 1 in conjunction with the following description should make its arrangement quite clear.

The drive is taken from a 6-volt Meccano Electric Motor screwed down in the position shown to the wooden baseboard on which the model itself is mounted. On one end of the  $11\frac{1}{2}$ " Rod on which the wheel revolves is a 2" Sprocket Wheel that is connected by a length of Sprocket Chain to a 1" Sprocket that is secured to a short Rod carrying a 3" Sprocket. The Rod of the latter Sprocket is journalled in the centre holes of the Angle Girder 12 of the vertical standard and held in position by means of Collars.

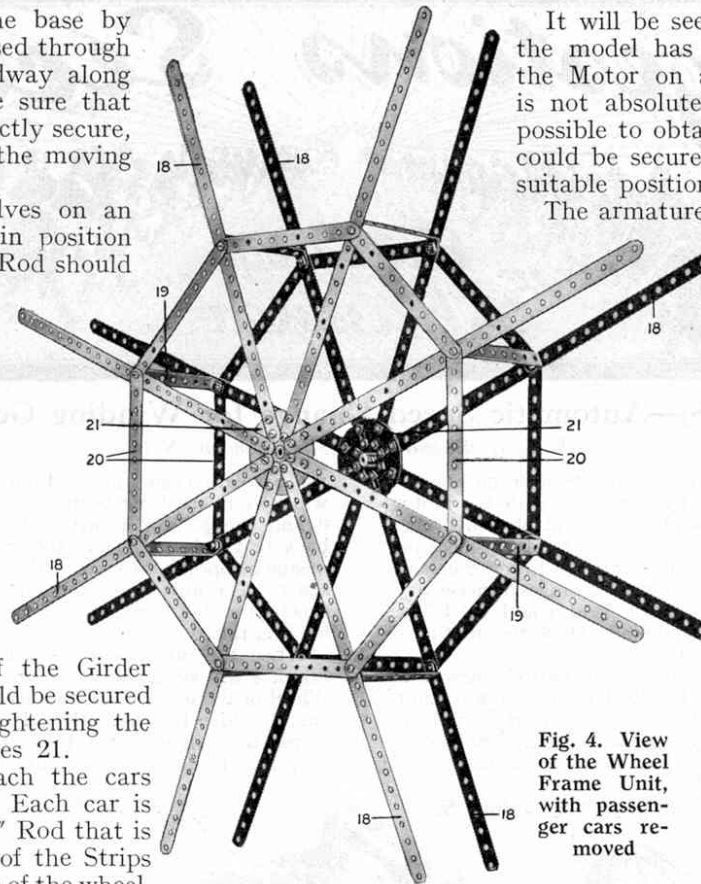


Fig. 4. View of the Wheel Frame Unit, with passenger cars removed

It will be seen from the general view that the model has been mounted together with the Motor on a wooden baseboard, but this is not absolutely essential, and if it is not possible to obtain a suitable board the Motor could be secured to a Flat Plate bolted in a suitable position to the base of the model.

The armature spindle of the Electric Motor 35 (Fig. 5) carries a Worm 36 that engages a 57-teeth Gear Wheel 37 that is secured on a Rod 38. This Rod is journalled in two Girder Brackets 38a, which are bolted to the Motor casing. Two or three 2" Strips are bolted to each face of the Girder Brackets in order to give additional bearing surface to the Rod. In addition to the Gear 37 the Rod 38 carries also a Bevel 39 that engages with a second Bevel secured on a Rod 40, on which is mounted also a  $\frac{1}{2}$ " Pinion 41. The Rod 40 is journalled in the side plates of the Motor and is held in position by a Collar placed on the end of the Rod opposite to the Bevel. It is advisable to place one or two Washers on the Rod 40 between the Bevel and the Motor, to ensure the proper engagement of the Bevel teeth.

The  $\frac{1}{2}$ " Pinion 41 engages a 57-teeth Gear 42 carried on a Rod that is journalled in a manner similar to the Rod 40. On this Rod, and placed outside the Motor casing, is a  $\frac{3}{4}$ " Sprocket 43, which is connected by a length of Sprocket Chain to the 3" Sprocket of the model driving mechanism (see Fig. 1).

In motion, this model presents a most pleasing sight and it is quite easy to believe that one is actually enjoying all the excitement and fun of a real fair ground. If it is possible to place a Meccano Roundabout, Joy Wheel, or Revolving Aeroplane, alongside the Flyboats a miniature fairground may readily be constructed and heaps of good fun and hours of pleasure will be obtained. The

No. 47 Meccano Instruction Manual contains full details for building the Revolving Aeroplanes, Joy Wheel, Big Wheel, and a Cake Walk, besides hundreds of other equally fascinating models.

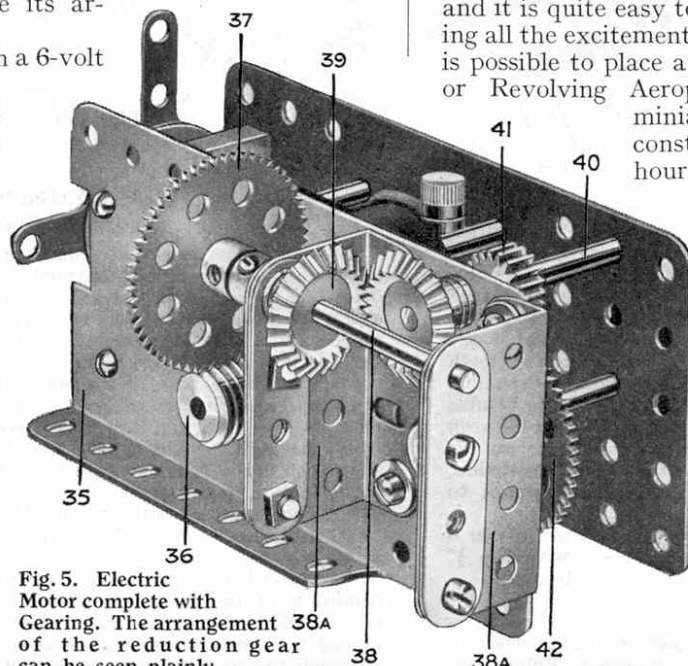


Fig. 5. Electric Motor complete with Gearing. The arrangement of the reduction gear can be seen plainly

Full instructions for building the Meccano Revolving Flyboats, together with sectional illustrations that make every detail clear, are contained in the Special Super Model Instruction Leaflet No. 33. In addition, the leaflet also deals with the construction of a larger model Flyboat incorporating two revolving wheels. The leaflet may be obtained from any Meccano dealer, price 3d., or direct from Meccano Ltd., Old Swan, Liverpool, price 3d. post free (Overseas 4d., Canada 8 cents).