

# The New Meccano Motor Chassis

## An Example of the Latest Meccano Construction

THE Meccano Motor Chassis forms not only an excellent example of the adaptability of the Meccano parts but also a striking illustration of the educational value of the Meccano system. It shows how, with the aid of a number of ordinary Meccano parts, any intelligent boy may build a complete working model that demonstrates the principles of modern motor engineering so well that replicas of it have been used to instruct pupils in numerous technical schools.

The motor chassis about to be described embodies numerous improvements upon models of a similar type that have been published previously, and it may be regarded as representing the latest Meccano practice. Amongst the improvements may be mentioned the unit principle of construction that has been adopted. The motor, clutch and gearbox are all mounted on a rigid frame, which may be detached from the chassis merely by loosening two or three screws. The differential and rear axle casing, with torque rods, etc., also form a complete unit, the removal of which is the work of a few seconds only.

The gearbox provides three speeds forward and reverse gear, and is controlled by a central gear-change lever sliding in a quadrant that retains it in position after each change is effected. The clutch is controlled by a foot pedal and providing that a small rubber ring is used in the manner to be described later, the drive from the motor may be taken up very smoothly and gradually and transmitted to the road wheels. The differential gear has been improved and made more compact. The back axle unit is mounted on cantilever springs and any twisting tendency set up by the thrust of the propeller shaft is counteracted by torque rods attached to the main frame by a spring connection.

The steering gear is designed according to the Ackermann principle, which provides for a different angle of turning movement in each front road wheel. Internal expanding brakes are attached to the rear wheels and a pedal-operated brake is fitted to the cardan shaft immediately in front of the universal joint. Other refinements of the model include a radiator cooling fan and a motor starting switch mounted on the dashboard.

The chassis will carry easily the weight of the Meccano 8 ampere-hour Accumulator, even on top gear. The Accumulator should

be placed on the luggage carrier at the rear of the model, thus converting the chassis into a self-contained power unit. A complete list of parts required to build the model will be found at the end of this article.

### The Frame and Springs

The construction of the model should be commenced by building the main frame, which is shown more clearly in Fig. 2. Each side consists of two  $12\frac{1}{2}$ " Angle Girders 1 bolted together in the form of a channel section to give maximum rigidity. The side girders are held together by a cross member 2 composed of a  $5\frac{1}{2}$ " Angle Girder and their front ends are extended by  $5\frac{1}{2}$ " Curved Strips to carry the ends of the front semi-elliptic springs. Each inner  $5\frac{1}{2}$ " Curved Strip is secured to the upper Girder of its respective side member by means of two Angle Brackets. Two of the bolts that serve to secure the Curved Strips also serve as pivots for the shackles (Flat Brackets 3) supporting the rear ends of the front springs (see also Figs. 4 and 6). The bolts should be secured to the side members by two locked nuts (see Meccano Standard Mechanism No. 262) so that the Flat Brackets are quite free to turn on their shanks.

The main frame is extended and carried over the back axle by means of a series of  $2\frac{1}{2}$ " large radius Curved Strips 4 bolted together in the manner shown. The luggage carrier 5 is composed of two 3" Strips connected by four  $4\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strips. The carrier is bolted to the end holes in the main frame, and nuts on bolts 6 inserted in the end holes of the 3" Strips strike against the Curved Strips 4 and thereby maintain the carrier in a horizontal position. The carrier is designed to hold the Meccano 8 amp. Accumulator, and when not in use it may be folded back.

The radiator is represented by a  $3\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flanged Plate 7 with two  $3\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strips bolted at the sides. It is secured to a  $4\frac{1}{2}$ " Strip 7a secured between the front  $5\frac{1}{2}$ " Curved Strips of the frame. The  $5\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flat Plate 8 is secured to a  $5\frac{1}{2}$ " Angle Girder bolted to the main side Girders 1 and is extended at the top by a  $5\frac{1}{2}$ " Strip 9 secured at each end by Flat Brackets. The dashboard 10 consists of a  $5\frac{1}{2}$ " Strip and a  $5\frac{1}{2}$ " Curved Strip attached

Fig. 3. Diagram showing car in act of turning

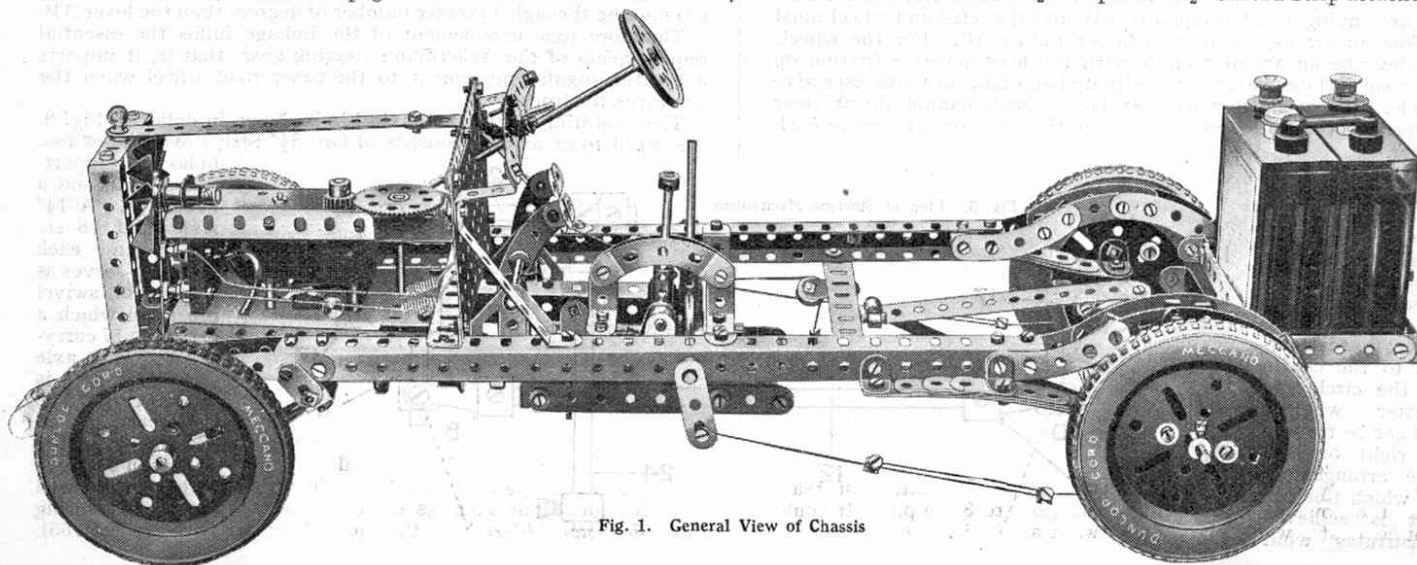
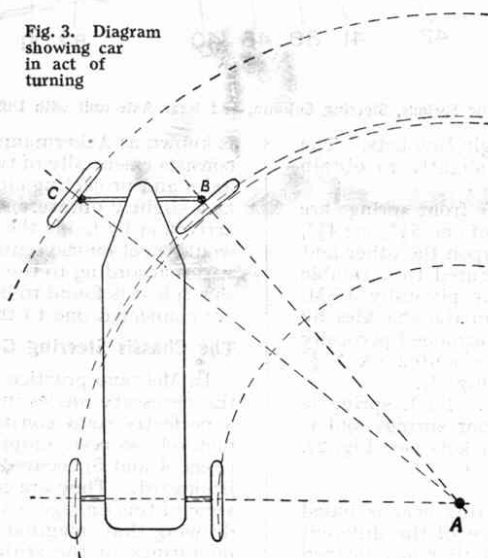


Fig. 1. General View of Chassis