

# A Simple Meccano Motor Chassis

## An Example of Compact Model Building

SINCE the introduction of the driving test for motorists there has been a greater demand than ever for some means of explaining simply and clearly how a motor car works. The standard Meccano Motor Chassis described in Super Model Instruction Leaflet No. 1A is ideal for this purpose. This model is largely used in driving schools, and generally for instructional purposes in engineering schools and colleges, and has given the greatest satisfaction, for it reproduces every important mechanism of a car in a realistic manner. Recently we have been asked to design a simpler chassis suitable for more elementary instruction, however, and the new model illustrated on this page is the result. It is well suited for its purpose, for it is complete in essential details, and it also is of the greatest interest as an example of neat and compact model-building that will appeal strongly to all Meccano enthusiasts. We are therefore giving a full description of its construction in order to enable model-builders to reproduce it.

Each main chassis member consists of one  $9\frac{1}{2}$ " and one  $5\frac{1}{2}$ " Angle Girder overlapping two holes. These side members are joined together at their centres and rear ends by means of  $3\frac{1}{2}$ " Strips, and in front the ends of the  $5\frac{1}{2}$ " Angle Girders are pulled towards each other until the gap between them can be spanned by a  $2\frac{1}{2}$ " Strip. A second Strip 1 is also bolted across the model as shown. A  $3\frac{1}{2}$ " x  $2\frac{1}{2}$ " Flanged Plate 2 is attached to the main frames in the position shown by means of two  $\frac{1}{2}$ " x  $\frac{1}{2}$ " Angle Brackets, and is braced to the frame by means of two  $3\frac{1}{2}$ " Strips. The E1 Motor is next fitted. This is clamped at its rear end, as shown in Fig. 2, between the central  $3\frac{1}{2}$ " Strip and  $1$ " x  $1$ " Angle Brackets 3 and 4. At its front end the Motor is bolted to a  $3$ " Strip attached to the frame.

The front  $2\frac{1}{2}$ " Strip of the frame has secured to it one  $1\frac{1}{2}$ " Angle Girder 5 that forms a point of connection for the radiator, represented by a  $2\frac{1}{2}$ " x  $1\frac{1}{2}$ " Flanged Plate. The upper end of this Flanged Plate is connected to the Plate 2 by a  $5\frac{1}{2}$ " Strip and a  $\frac{1}{2}$ " x  $\frac{1}{2}$ " Angle Bracket. A Double Angle Strip 6 is bolted to the side frame by a  $\frac{3}{8}$ " Bolt and spaced from it by three Washers. The purpose of this part will be described later.

A Worm on the motor armature shaft meshes with a  $\frac{1}{2}$ " Pinion 7 that drives a 57-teeth Gear 8 through a second  $\frac{1}{2}$ " Pinion. The two longitudinal Rods carrying the  $\frac{1}{2}$ " Pinions and the 57-teeth Gear 8 respectively are journaled at one end in the Angle Brackets 3 and 4, and at the other end in  $1$ " x  $\frac{1}{2}$ " Angle Brackets and Flat Brackets. The Gear 8 is locked on the Rod 9, on the rear end of which is mounted the driving member of the clutch. This consists of a large Flanged Wheel with two Flat Brackets attached on opposite sides of its boss. The slotted holes of the Flat Brackets accommodate two set-screws screwed into the Collar 10. Half a Compression Spring is fitted between the Collar 10 and the large Flanged Wheel, and a Rubber Ring, for  $1$ " Pulleys, is fitted inside the flange of the latter.

The gear-box is next built and this is formed from a  $2$ " Screwed Rod 11 carrying a Coupling 12. Two  $2\frac{1}{2}$ " and two  $2$ " Strips are attached to the Screwed Rod by means of this Coupling and as will be seen, the ends of these Strips are bolted to the main frames. The Screwed Rod carries two Flat Brackets 13 and also two pairs of Flat Brackets 14. In every case the Screwed Rod passes through the outer ends of the elongated holes of the Flat Brackets. The arrangement of the Rods and Gears of the gear-box will be understood on reference to Fig. 2. The gear lever, a  $2\frac{1}{2}$ " Strip, is pivotally mounted on a  $\frac{1}{2}$ " x  $\frac{1}{2}$ " Angle Bracket and carries at its lower end a Threaded Pin. This part is accommodated between the two Pinions of the sliding shaft of the gear-box.

The driving shaft of the gear-box carries a  $1$ " fast Pulley 15 that is held in contact with the Rubber Ring already mentioned by means of the half Compression Spring. The driven shaft

of the gear-box is coupled by means of two Universal Couplings and a  $1\frac{1}{2}$ " Rod to a short Rod carrying the  $\frac{1}{2}$ " Pinion 16.

The Pinion 16 is in constant mesh with a  $1\frac{1}{2}$ " Contrate Wheel forming part of the differential, and the construction of this mechanism is the next step in building the model. Two  $1\frac{1}{2}$ " x  $\frac{1}{2}$ " Double Angle Strips are fitted to the  $1\frac{1}{2}$ " Contrate Wheel by means of  $\frac{3}{8}$ " Bolts and spaced as shown by Collars and Washers. The opposite ends of the Double Angle Strips are bolted to a Bush Wheel, and Washers are used at this point for spacing. A Coupling 17 carries a  $2$ " Rod in its centre hole, and this Rod has mounted on it, at each end, two Washers and a  $\frac{1}{2}$ " Pinion. These Pinions mesh with  $\frac{3}{4}$ " Contrate

Wheels, each of which is locked on a Rod forming one side of the rear axle. The outer ends of these Rods are journaled in the bosses of Face Plates that are bolted to the Springs.

Each rear Spring is formed from a  $3\frac{1}{2}$ " and  $2\frac{1}{2}$ " Strip, curved to the correct shape. Each end of the  $3\frac{1}{2}$ " Strip has mounted on it a Double Bracket, the one at the rear end being linked to the frame by two pivotally connected Flat Brackets. The other Double Bracket has a  $\frac{3}{4}$ " Bolt passed through the holes in its upturned ends, the bolts being lock-nutted to a  $1$ " Triangular Plate on the main frame. The Face Plate is fitted as already described, and this carries internal expanding brakes similar to those described in S.M. 117. The brake cables are secured to  $\frac{3}{8}$ " Bolts screwed into the tapped holes of Collars, and these are locked on a transverse Rod 18. The brake lever is clamped to this Rod by means of a Coupling.

The front springs are built up and fitted in a similar manner to the rear springs, but the  $\frac{3}{4}$ " Bolts are replaced by the Rod 19. The front axle, a  $4\frac{1}{2}$ " Strip, is now fitted, and Cranks are secured to each end of this. The boss of each Crank forms a bearing for a short vertical Rod free to rotate, and Collars are fitted to each end of this. The  $\frac{3}{4}$ " Bolts 20 are screwed into the tapped holes of these Collars, and further Collars are mounted on their shanks to carry the track rod.

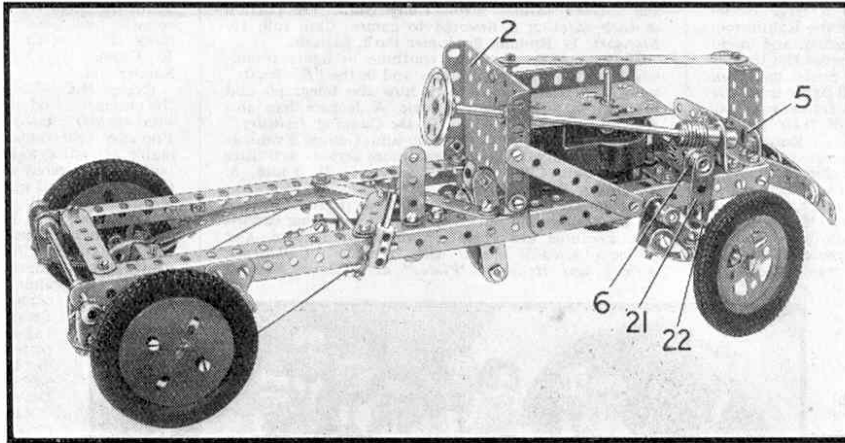


Fig. 1. A Motor Chassis that is simple but complete in all main details.

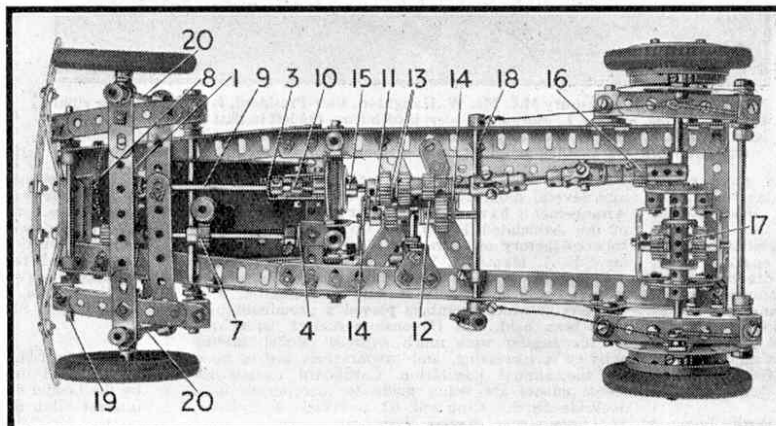


Fig. 2. An underneath view of the chassis, showing the clutch, gear-box, differential and springs.