

# Among the Model-Builders

By "Spanner"

## Two-Speed and Reverse Gear-Box

The gear-box shown in Figs. 1 and 2 is simple in design and easy to assemble. It provides two forward speeds and a single reverse speed, and is suitable for use in quite small vehicles.

The framework for the gear-box housing consists of two  $2\frac{1}{2}'' \times 1\frac{1}{2}''$  Double Angle Strips arranged with their lugs overlapping. A  $1\frac{1}{2}''$  Flat Girder is bolted to each end of the frame by its slotted holes, and is adjusted so that

adjusted so that  $\frac{1}{2}''$  and  $\frac{3}{4}''$  Pinions on the main shaft

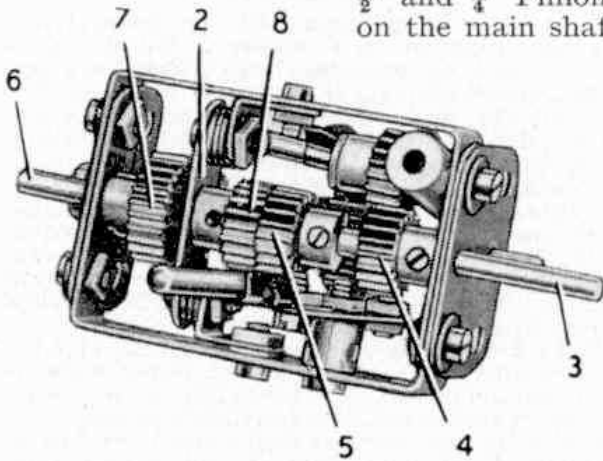


Fig. 1. A compact two-speed and reverse gear-box suitable for model vehicles.

and the layshaft will mesh accurately. At one end of the frame a bolt is screwed tightly into a centre threaded hole of a Coupling 1. A  $1\frac{1}{2}''$  Strip 2 is spaced from two Angle Brackets by four Washers on each of the  $\frac{3}{8}''$  Bolts that hold it in place. The Angle Brackets are fixed to the sides of the frame.

The driving shaft is numbered three in the illustrations and it carries two  $\frac{1}{2}''$  Pinions 4 and 5, but it should be noted that it projects only halfway into the bore of Pinion 5. The output shaft 6 is mounted as shown and is fitted with a  $\frac{3}{4}''$  Pinion 7 and a  $\frac{1}{2}''$  Pinion 8. Rod 6 extends into the free portion of the bore of Pinion 5. The layshaft 9 carries a Collar 10, two Washers, a  $\frac{3}{4}''$  Pinion 11, a  $\frac{1}{2}''$  Pinion 12 and a second Collar. A reverse  $\frac{1}{2}''$  Pinion 13 is mounted freely on a  $1\frac{1}{2}''$  Rod fixed in the Coupling 1, and is held on the Rod by a Spring Clip.

The gear ratios are obtained by sliding the layshaft in its bearings. When the shaft is at the extreme right (Fig. 1), Pinion 11 meshes with Pinion 13, which is in constant

mesh with Pinion 4. The Pinion 12 engages the Pinion 7, and so provides the reverse drive. When the layshaft is moved to the left (Fig. 2), Pinion 11 disengages Pinion 13 and neutral gear is obtained.

Further movement of the layshaft to the left brings Pinion 11 into mesh with Pinion 5, but Pinion 12 still engages Pinion 7. This provides first or low gear. When the layshaft is moved to the extreme left Pinion 12 slides out of mesh with Pinion 7 and Pinion 11 engages both the Pinions 5 and 8. Thus a direct drive is obtained to give top or high gear.

The sliding movement of the layshaft is controlled by a Rod held in a Rod and Strip Connector bolted to a Double Arm Crank. The Double Arm Crank is held by a nut on a Pivot Bolt in one side of the frame. A  $\frac{3}{8}''$  Bolt in the free arm of the Double Arm Crank engages between the Collar 10 and the Washers placed next to Pinion 11.

## Meccano Helps a Convalescent

Convalescing from an illness which had incapacitated him for many months, Mr. F. Needle, Watford, found that time passed all too slowly. Reading he found difficult, due no doubt to the fact that

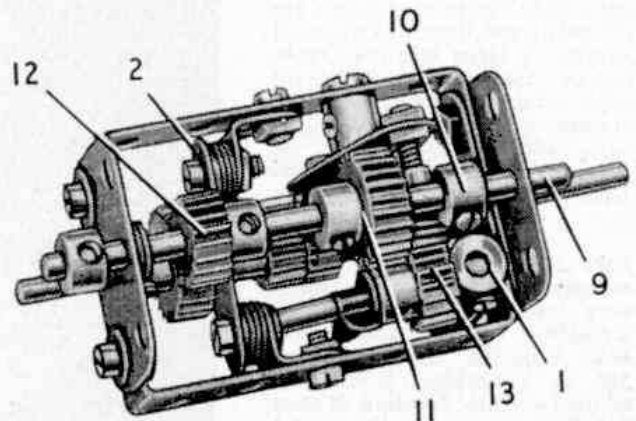


Fig. 2. An underneath view of the gear-box showing the sliding layshaft and the reverse pinion.



Edgard Lefevre, Brussels, is one of many Belgian Meccano boys who submit entries for M.M. Competitions. Edgard is only ten years of age and already his name has appeared in our prize lists.