

# Among the Model-Builders

By "Spanner"

## A COMPACT EPICYCLIC GEAR-BOX

In the February, 1956, issue I included pictures and brief details of an interesting four-speed and reverse pre-selector gear-box constructed recently by C. Horsford Liverpool. The gear-box was of the

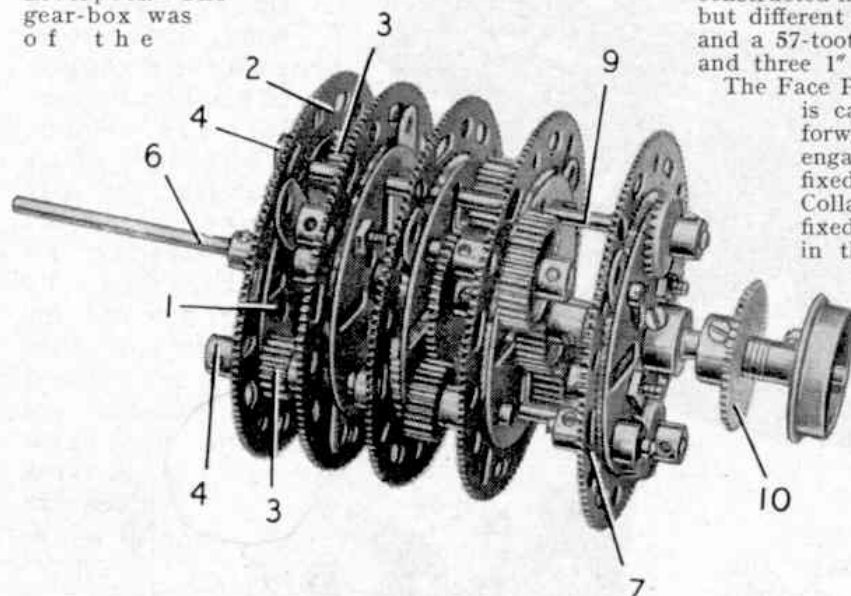


Fig. 1. A four-speed and reverse pre-selector gear-box designed and constructed by C. Horsford, Liverpool.

epicyclic type and was arranged in a special housing so that it could be used for demonstration purposes. The gear-box itself however was unsuitable for use in a model vehicle owing to its size. Since the original mechanism appeared I have had another visit from Horsford, who brought along an improved version of the gear-box with the important advantage that the overall size had been greatly reduced. Although still large compared with the more usual type of gear-box, the size has been reduced to proportions that permit the mechanism to be fitted to large models of vehicles such as tankers, where the arrangement of the body provides sufficient room. The improved epicyclic gear-box is shown in Figs. 1 and 2.

As in the case of the previous mechanism a separate epicyclic assembly is used for each ratio. The assemblies for each of the four forward speeds are similar in general design and differ only in the sizes of the Gears and Pinions used. It is necessary therefore to describe only one forward gear train and the reverse gear assembly in detail.

Each of the forward speed gear trains consists of a Face Plate 1 located inside a Gear Ring 2 by two pairs of Fishplates bolted to the Face Plate. The Fishplates in each pair are spaced apart by two Washers on the bolt and are arranged so that they are located one on each side of the Gear Ring. Two  $\frac{1}{2}$ " Pinions 3 are fixed on 1" Rods mounted in holes in

the Face Plate, and these Rods carry also two  $\frac{7}{16}$ " diameter Pinions 4. The Pinions 3 mesh with the inner teeth of the Gear Ring and the Pinions 4 engage a 60-tooth Gear 5 fixed on the input shaft 6. This assembly provides the top gear train of the mechanism.

The three remaining forward gear trains are constructed in the same way as the top gear assembly, but different ratios are obtained by using  $\frac{1}{2}$ " Pinions and a 57-tooth Gear,  $\frac{3}{4}$ " Pinions and a 50-tooth Gear and three 1" Gears.

The Face Plate assembly of the reverse gear train 7 is carried out in the same way as for the forward gears, but two  $\frac{1}{2}$ " Pinions 8 that engage the inner teeth of the Gear Ring are fixed on 1" Rods held in the Face Plate by Collars. The Pinions 8 engage similar Pinions fixed on Threaded Pins passed through holes in the Face Plate, and the latter Pinions mesh with another  $\frac{1}{2}$ " Pinion fixed on the input shaft 6. When all the gear trains are mounted on shaft 6, the five Face Plates are coupled together by two 4" Rods 9 held in the reverse gear Face Plate by a Collar and a  $\frac{3}{4}$ " Contrate each. The drive from the gear-box is taken from a Gear 10 coupled to the reverse gear Face Plate by a Socket Coupling.

The gear required is engaged by preventing the appropriate Gear Ring from turning by

means of a suitable selector mechanism.

## A NOVEL TOY FOR YOUNG MODEL-BUILDERS

Fig. 3 illustrates a simple but effective model of a ticket issuing machine of the kind used by many public transport companies. This attractive little model is the result of a combined effort by Mr. J. H. Hammond, Slough, and his son. The main details of the machine will be clear from the picture, but the following notes may be helpful to model-builders who wish to make the machine for themselves or for younger brothers and sisters.

A roll of paper is carried on a  $3\frac{1}{2}$ " Rod that is

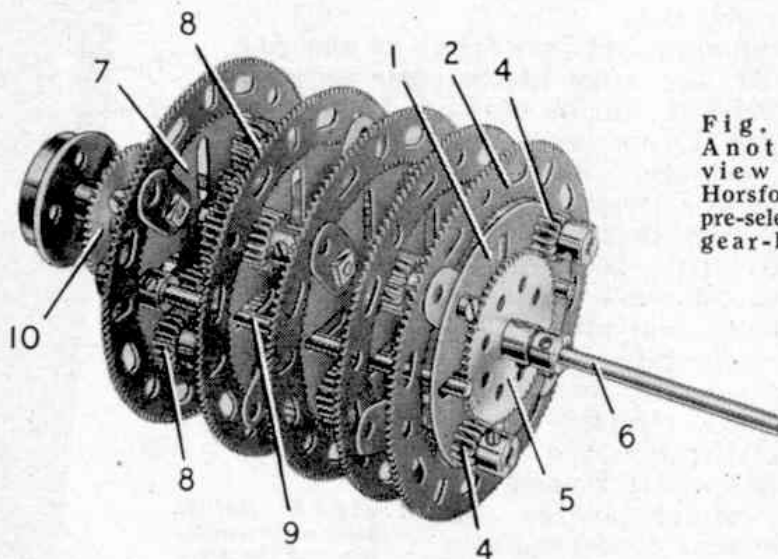


Fig. 2. Another view of Horsford's pre-selector gear-box.