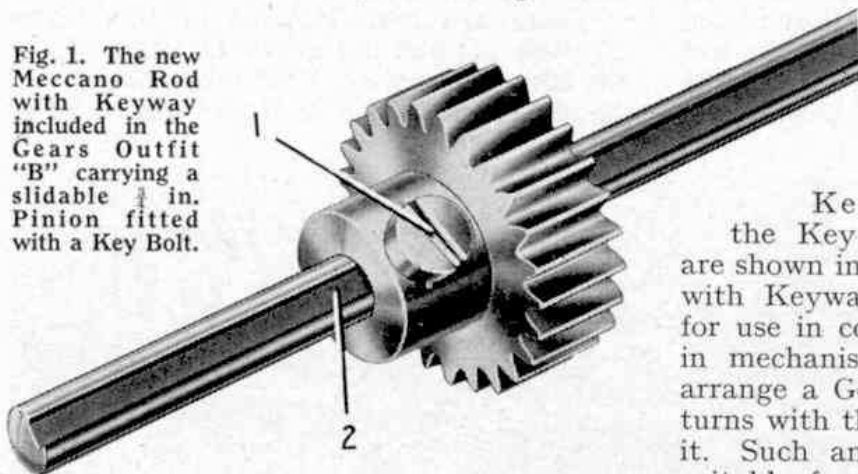


# A New Meccano Gears Outfit

## Exciting Possibilities for Model-Building

ONE of the most important additions to the range of Meccano Outfits in recent years was the Meccano Gears Outfit "A." Its appearance gave owners of smaller Meccano Outfits, containing either

Fig. 1. The new Meccano Rod with Keyway included in the Gears Outfit "B" carrying a slidable in. Pinion fitted with a Key Bolt.



no gears or only a few, the chance to build up more exciting drives for their models.

In the Meccano world we are always striving for improvement and now we have designed a new Gears Outfit, known as Gears Outfit "B," that will be even more valuable to model-builders. It contains a carefully selected assortment of standard Meccano gears and other parts designed to allow these to be used with the greatest effect. In addition, it includes two entirely new Meccano parts, known as the Rod with Keyway and the Key Bolt respectively, while a Compression Spring and four Collars also have been added. Every model-builder indeed should get the two new parts, for they will open up new fields for exciting experiments in the construction of mechanisms.

When a Clockwork or Electric Motor is used to drive a model, even a small and simple one, the best results are obtained when suitable speed reduction gearing is arranged in the drive. All the gears required to assemble such reduction gearing are provided in this Outfit, and in addition it is easy to

assemble with their aid many other types of gear mechanisms, such as gear-boxes, differentials, twin-drive, steering and reversing gears. Examples of all of these are fully described and illustrated in the very attractive Book of Instructions included in the Outfit.

Now I want to refer specially to the new Rod with Keyway (Part No. 230) and the Key Bolt (Part No. 231), which are shown in Fig. 1 on this page. The Rod with Keyway is 4" long and is intended for use in conjunction with the Key Bolt in mechanisms where it is necessary to arrange a Gear or Pinion so that while it turns with the Rod it is free to slide along it. Such an arrangement is particularly suitable for use in gear-boxes. The Key Bolt is marked 1 in Fig. 1, and the Rod with Keyway is marked 2.

To use the Key Bolt it is screwed into one of the threaded holes in the Gear or Pinion, so that the spigot at the end of

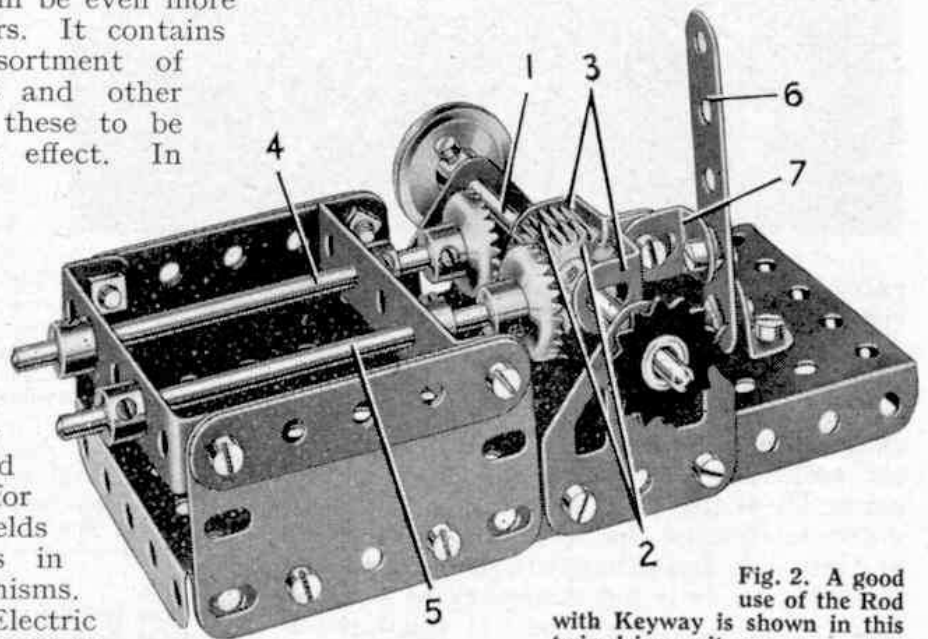


Fig. 2. A good use of the Rod with Keyway is shown in this twin-drive unit.

the Key Bolt enters the Keyway in the Rod with Keyway. The spigot does not grip the Rod, even when it is screwed down tight, but the fact that it projects into the Keyway or groove ensures that

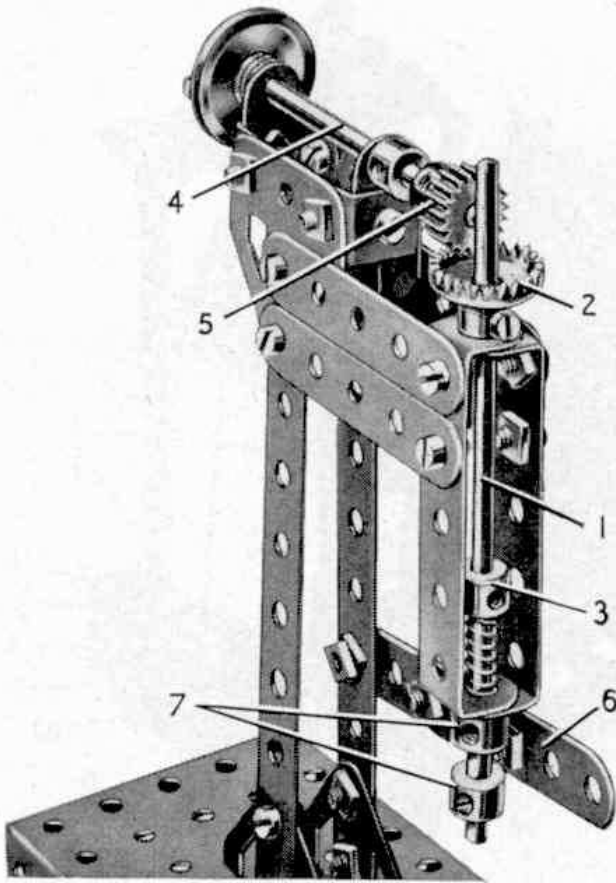


Fig. 3. An application of the Rod with Keyway to form the drill spindle of a model drilling machine. By its use the spindle is free to rise and fall without interruption to the drive.

the Gear or Pinion turns with the Rod. Several applications of the Rod with Keyway are shown in the Gears Outfit "B" Instructions Book and three examples are shown in Figs. 2, 3 and 4 on these pages.

Fig. 2, from the Instructions Book, illustrates how to build with the gears in the Outfit a Twin Drive Unit that will be found useful in many models such as cranes, in which it is necessary to drive two separate movements from a single Motor. With this mechanism a drive can be transmitted to two shafts, either independently or together; and one of these shafts can be used to operate the hoisting movement of a crane, while the other controls raising and lowering of the jib.

The second mechanism, also taken from the

Instructions Book, shows how a drive can be transmitted to a Rod that must be free to slide in its bearings. This particular example is a drive to the shaft of a model drill, and shows how the Rod with Keyway and the Key Bolt enable the shaft to be raised or lowered without affecting the drive.

The gear-box for model vehicles shown in Fig. 4 has been designed as a further example of the way in which the new Rod with Keyway can be used with standard Meccano gears in the assembly of compact mechanisms of various kinds. This gear-box provides three forward speeds and a reverse drive, and it requires a few gears in addition to those contained in the Gears Outfit "B." It serves to illustrate how easily the new parts can be used not only with the parts in the Gears Outfit but with other parts in the Meccano System.

Referring to Fig. 4 the gear-box input shaft is a Rod 1 that carries a  $\frac{1}{2}$ " Pinion in constant mesh with a 57-tooth Gear on a Rod with Keyway 2. The other gears on the Rod with Keyway are free to slide but they are made to turn with the Rod by Key Bolts screwed into their bosses. The sliding gears are grouped in pairs, and each pair is linked by connecting arms to a selector shaft. The sliding gears can be moved into mesh with corresponding gears on the output shaft 3. The movement of the selector shafts is controlled by the gear lever 4, which is universally mounted.

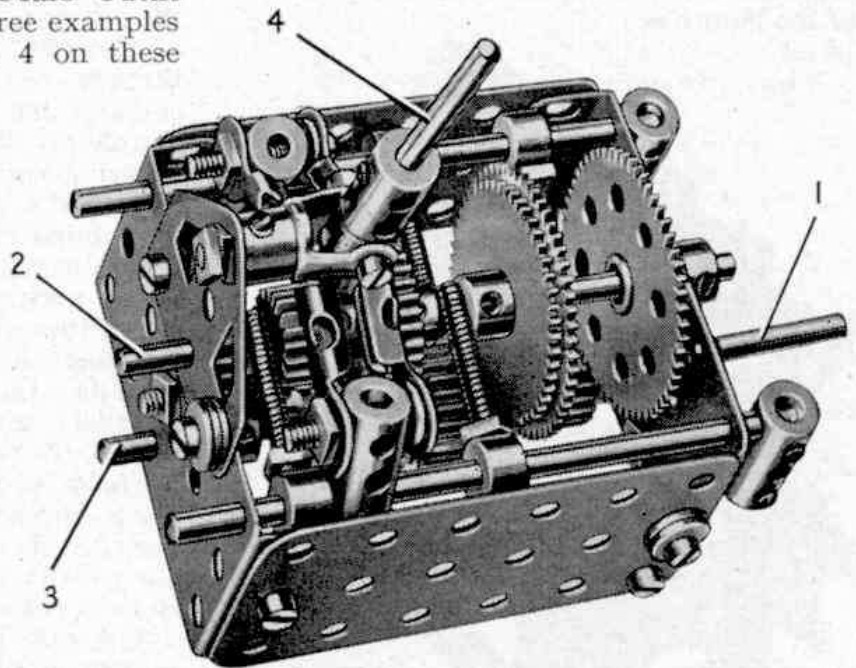


Fig. 4. One of the most useful applications of the Rod with Keyway is to be found in gear-boxes. It is used in this three-speed and reverse example, and helps in keeping it compact.

# 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

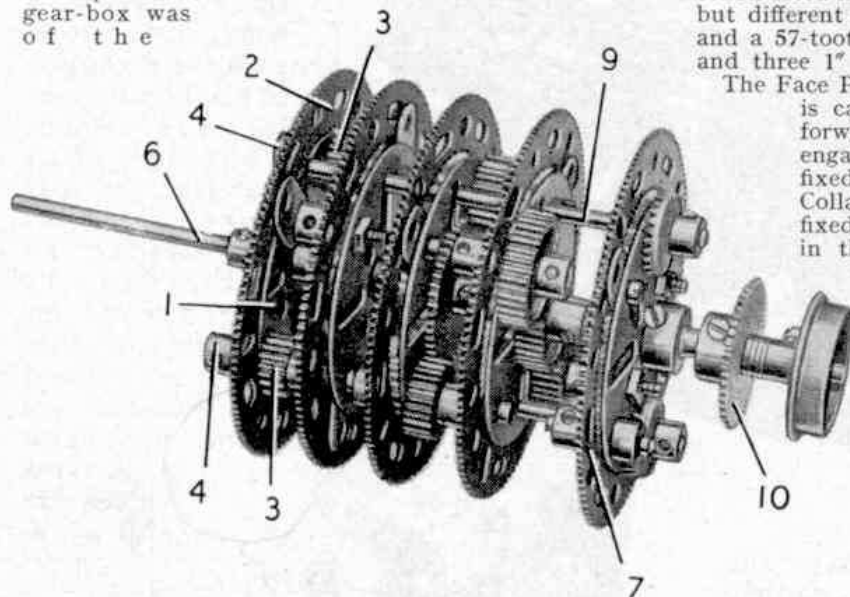


Fig. 1. A four-speed and reverse pre-selector gear-box designed and constructed by C. Horsford, Liverpool.

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  $3\frac{1}{4}$ " Rod that is

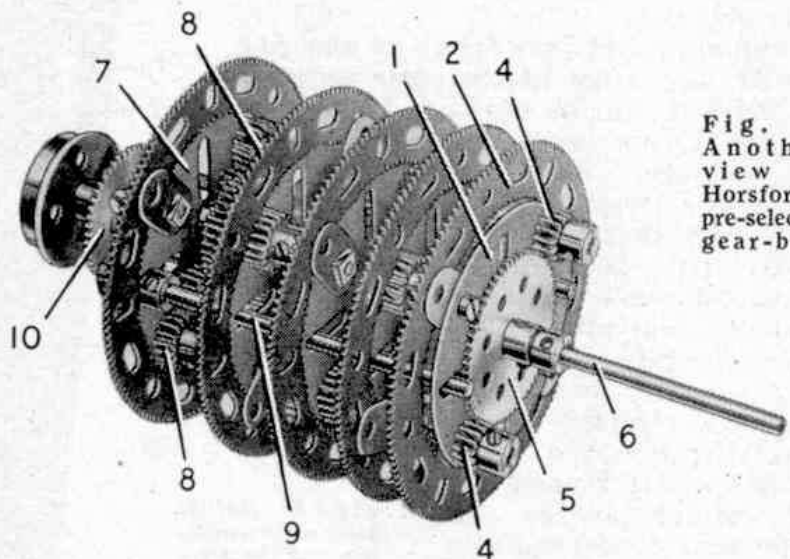


Fig. 2. Another view of Horsford's pre-selector gear-box.