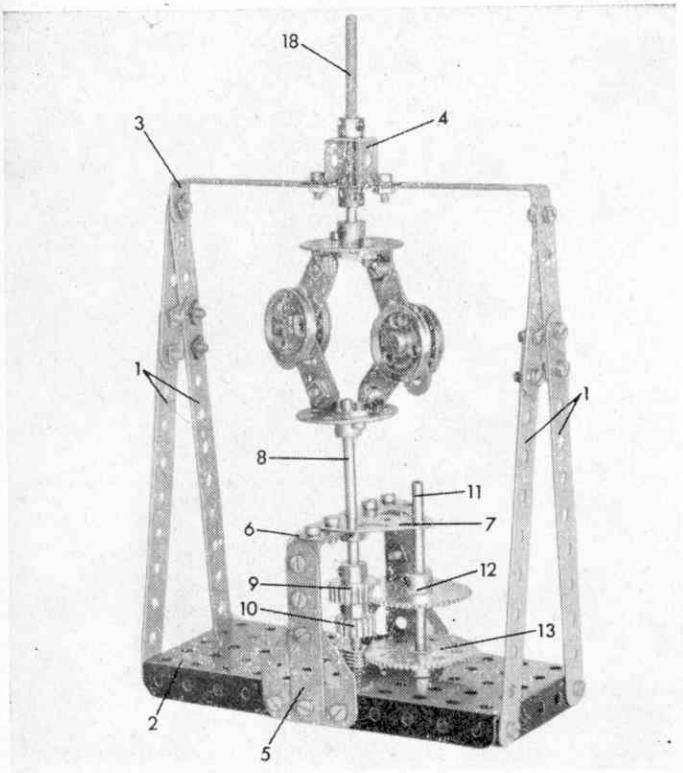
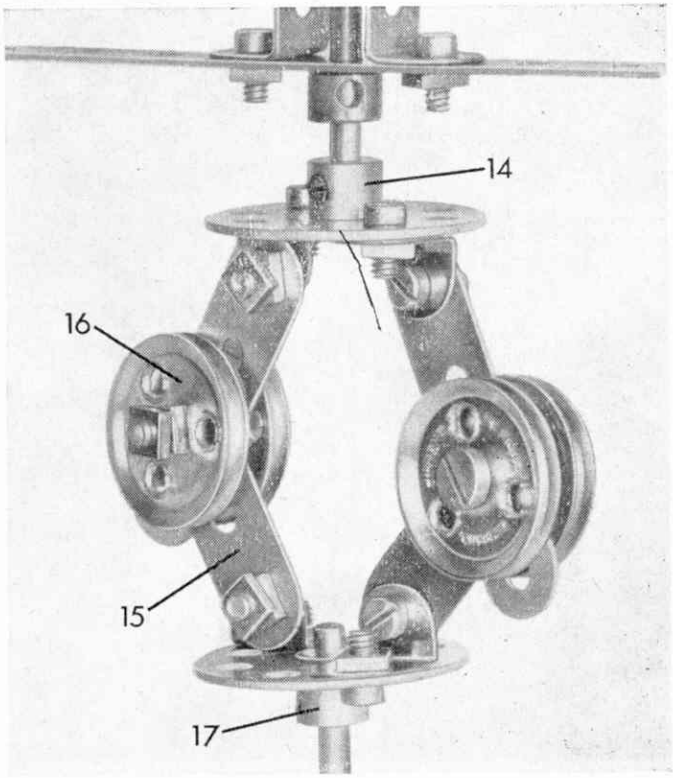




AMONG THE MODEL BUILDERS

AUTOMATIC gear boxes as fitted to motor cars are highly complex pieces of apparatus, but the basic principles of automatic gear-changing are not particularly complicated. With Meccano, it is quite easy to build a simple automatic gearbox and, in fact, the subject that I am covering this month is such a mechanism which has been designed and built by Messrs. C. and P. L. Woods, of Oadby, Leicestershire. The actual unit illustrated is one which I have built up from details kindly supplied by the designers, slightly modified, and I am pleased to say that they have come up with a very well-produced unit. Controlled by a simple governor, it is not only easy to build, but it is also extremely positive in operation.

A framework is built up from four 7 in. compound strips 1, obtained from 5½ in. Strips extended by 2½ in. Strips, bolted two to each end flange of a 5½ in. by 2½ in. Flanged Plate 2. The two strips at each end are brought together at the top, then the two pairs of strips are connected by a 5½ in. by ½ in. Double Angle Strip 3. A Double Bent Strip 4 is fixed to the centre of this Double Angle Strip, while a Flat Trunnion is bolted to the centre of each side flange of Plate 2. These serve as a firm base for 2½ in. Strips 5, to the top of which 1 in. by 1 in. Angle Brackets are attached. These Angle Brackets are joined by another 2½ in. Strip 6, in the centre of which a third Flat Trunnion 7 is bolted.

Once the framework has been finished, the gearing can be added. A 4 in. Rod 8, carrying a Collar, a ¾ in. Pinion 9, a ½ in. Pinion 10 and several Washers, is journalled in Flanged Plate 2 and Strip 3. The number of Washers determines the proportionate length of time the gearbox remains in first gear. The designers used five, but if a smaller number is used, first gear will remain engaged longer. The actual method of finding the position of the Pinions and Collar is as follows:

Place the framework on a flat surface and arrange the Rod so that its end does not quite touch the surface. Holding the Rod in this position, move Pinion 10 against the Washers with its boss uppermost and fix in place. Pinion 9, also with its boss uppermost, is fixed against Pinion 10. Now raise the Rod as far as possible without its lower end leaving the hole in the Flanged Plate, and tighten the Collar against the underside of 2½ in. Strip 6. This should give the Rod maximum movement without allowing it to leave its bearings.

Journalled in the apex hole of Flat Trunnion 7 and Flanged Plate 2 is a 3 in. Rod 11, carrying a 50-teeth Gear 12, a 57-teeth Gear 13 and a Collar, the latter beneath the Plate. Gear 13 is in contact with the Plate, while Gear 12 should be positioned so that it meshes with Pinion 9 a fraction after Pinion 10 disengages with Gear 13 when Rod 8 is raised.

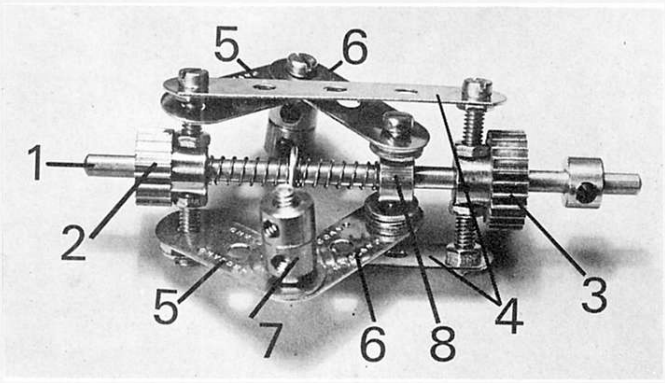
All that now remains to be built is the governor. Two Angle Brackets are bolted through diametrically opposite holes of an eight-hole Bush Wheel 14, then a 2 in. Strip is lock-nutted to the free lug of each of these Angle Brackets. A Pivot Bolt, carrying a 1 in. Pulley without boss, is now passed through the third hole in each of these Strips. A 1½ in. Strip 15 is added, followed by a second 1 in. Pulley without boss 16, after which the lock-nuts are fixed in place. The 1½ in. Strips 15 are lock-nutted to further Angle Brackets bolted through diametrically opposite holes of a second eight-hole Bush Wheel 17. This Bush Wheel is mounted on the upper end of Rod 8, while Bush Wheel 14 is mounted on the lower end of a 3 in. Rod 18, journalled in Double Angle Strip 3 and Double Bent Strip 4, and held in position by Collars. Rod 18 serves as the input shaft, with Rod 11 acting as the output shaft. Suitable Pulleys or Pinions must, of course, be mounted on these Rods to take the drives.

I should mention that the designers of the gearbox fitted a tensioning spring between the two 2 in. Strips in the governor. This is not essential, but is certainly advisable as it increases the speed (r.p.m.) required to raise Rod 8, thus ensuring that first gear remains in operation for a reasonable length of time. The tensioning spring was provided by a Meccano Tension Spring with 12 of the coils removed, but an elastic band should do just as well. The speed necessary to raise Rod 8 can be varied by altering the tensioning spring.

Messrs. Woods stress that an electric motor with variable speed should always be used to drive the gearbox. They used a Meccano Power Drive Unit operated from a model railway mains controller, with the Power Drive Unit in the 16 : 1 ratio. In this way, they were able to boost the power just as first gear was about to disengage, thereby causing the gearbox to change into second gear with a positive action. Incidentally, the box can be fitted with a third gear by mounting two 1 in. Gears, one above Pinion 9 and the other above Gear Wheel 12 on the respective Rods. The following parts list, however, applies only to the unit as it appears here.

Parts required

4 of No. 2	4 of No. 22a	5 of No. 38
7 of No. 5	2 of No. 24	1 of No. 45
2 of No. 6	1 of No. 25	1 of No. 48d
2 of No. 6a	1 of No. 26	1 of No. 52
4 of No. 12	1 of No. 27	3 of No. 59
2 of No. 12a	1 of No. 27a	3 of No. 126a
1 of No. 15b	40 of No. 37a	2 of No. 147b
2 of No. 16b	36 of No. 37b	



Pictured left is a simple, yet functional Two-speed Automatic Gearbox designed by 14 year old Jonathan Wynn of Caerleon, Newport, Gwent. Note that Pinions 2 and 3 are loose on their support Rod, while Collar 8 is fixed on the Rod. Note also that the 1½" strips in the centrifuge assembly should pivot freely.

by Sprocket Chain 94 which is passed under andover Rod 16b and is kept apart by a Washer 38. The Chain is then anchored at the top and bottom of the arm, and so forms a loop round one of two ¾" Sprockets fastened into a Socket Coupling (not shown). This Socket Coupling would be mounted, free to turn, on an Axle Rod forming the bearing for the lower end of a suitable jib. Chain drive from the parent model's gearbox would be taken to the second Sprocket Wheel in the Socket Coupling."

PARTS REQUIRED			
4 – 8	1 – 38	2 – 62	2 – 74
1 – 16b	2 – 59	1 – 62b	3 – 82
14 – 37c			1 – 94

FIFTY-FOUR AND GOING STRONG!

Make no mistake, this title does not refer to Mr. Henry Hudson's age (he is in fact a young sixty-four!) It refers to the neat and efficient Grandfather Clock featured in the accompanying illustrations. The Clock was built by Mr. Hudson last year in honour of the Queen's Jubilee, yet the particularly interesting thing about it is that, although built for the Jubilee, it is made from parts that are as old as the Queen herself!

In fact, Henry bought his vintage Meccano Set in 1923 and, since that date, he has made scores of different working models. The Jubilee last year gave him an incentive to make the Clock and, having made it, he presented it to his employers, a well-known cycle retailer in Lincoln City. The Company decided to put the Clock on display in the High Street and, as a result, Henry Hudson and his Clock have appeared on television, radio and in numerous newspapers, both local and national.

A modest man, Henry does not have much to say about the success he has achieved in modelling. However, he did explain to Ray Drury, a Lincolnshire journalist, how the Clock was made up. A 14 lb weight drives the Clock for 18½ hours. The pendulum is 5 feet 6 inches long and the only non-Meccano part used is the escapement wheel which is a 20-teeth cycle sprocket and this is understandable as Henry is the Manager of the Cycle Department of his employers' shop! Overall height of the Clock is 6 feet 4 inches.

I am indebted to Ray Drury for providing me with the above information and accompanying photographs.

AUTOMATIC GEARBOX

For our next offering I am indebted to Jonathan Wynn of Newport, Gwent. Jonathan is the designer of the Compact Two-Speed Automatic Gearbox featured here and he is to be congratulated on an efficient little unit.

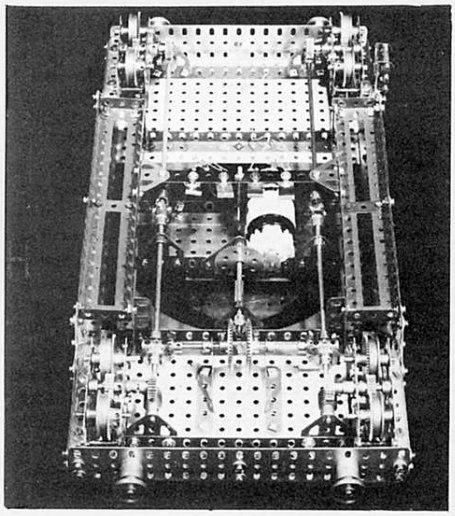
Carried in a suitable mounting, dependent upon the parent model, the unit consists of a centrifugally-operated sliding shaft 1 carrying a ½" Pinion 2 and a ¾" Pinion 3, spaced as shown but connected together by 2½" Strips and carried on ½" Bolts fixed in the bosses of the Pinions. Mounted loose on the Bolts fixed in the boss of Pinion 2 are two 1½" Strips 5 which are pivotally connected to two more 1½" Strips 6, using ¾" Bolts on each of which two Collars 7 are secured to serve as centrifuge weights. The ends of Strips 6 are pivotally attached to a Collar 8, being spaced from the Collar by two Washers on the shank of each securing Bolt. Two Compression Springs mounted on the shaft return the Gearbox to the lower ratio when the speed falls below the critical point. In operation, of course, Pinions 2 and 3 would engage with appropriate Gear Wheels mounted in appropriate positions.

PARTS REQUIRED			
2 – 5	1 – 25	2 – 37b	2 – 111
6 – 6a	1 – 26	6 – 38	4 – 111a
1 – 15b	10 – 37a	6 – 59	2 – 120b

GRABBING CRANE

Finally this month I draw your attention to the outstanding Grabbing Crane illustrated here. It was designed and built by long-time enthusiast Hans Hoch of Winterthur, Switzerland, and I think you will agree that, on its high-level platform, it makes a magnificent display piece.

Unfortunately, I am not able to give much information on the model as Hans has supplied only a few very general details, but it is based on a real life original which is described as a Greiferdrehkran 15t x 17.50m. The model performs all the movements of the original – hoisting, grab-opening, slewing and travelling – with each movement powered by its own motor: the Meccano Power Drive Unit. As can be seen, it is built mainly from Meccano parts, although Hans does admit that he used one or two competitors' parts in the base frame roller bearing. Still, nobody's perfect!



Below - two views of an excellent display piece in the shape of a large Grabbing Crane designed and built by Mr. Hans Hock of Winterthur, Switzerland. Above, an underside view of the travelling crane platform