TIME PLEASE?

BY SPANNER

Right: a close-up view of the switch controlling the winding mechanism, and below right: a rear view of the 'gearbox' showing the escapement

CLOCKS of all kinds have always proved popular with advanced Meccano model-builders, perhaps because a reasonably accurate clock is a useful thing to have around, but more probably because the intricate and critical nature of its construction provides a challenge, besides resulting in an immense feeling of satisfaction if successfully completed. Ever alert to the requirements of its readers, Meccano Magazine has published details of several clocks over the years, all of which have been well received. Now we feature another working model which we believe to be a particularly excellent example. Congratulations and full credit go to its builder, Mr. R. A. Fail of Bedford, who not only designed the clock, but who has spent several years modifying and improving it.

Mr. Fail's model is similar to several past Meccano clocks in that it is pendulum controlled and is driven by a large weight, but here the similarity ends. Whereas all earlier weight-driven clocks needed frequent winding, Mr. Fail's example will run indefinitely without attention—it's self-winding! A cleverly-designed mechanism, powered by a Meccano E15R Electric Motor, automatically raises the weight when it reaches the end of its drop. What's more, the mechanism is so arranged that the drive to the clock remains in operation when winding is in progress, thus removing the danger of the clock stopping at this time.

I have prepared the following article from notes and photographs kindly supplied by Mr. Fail. Not actually having the model itself, however, I have been unable to complete step-by-step instructions, but these are not necessary as construction is fairly evident from the photographs. I have described the sections where difficulty is likely to be encountered, of course, and have also included a couple of diagrams which should prove helpful.

Generally speaking, the model can be divided into three sections—the main framework, the 'gearbox' at the top of the main framework, and the switch mechanism for the winding operation, situated part-way up the main framework.

In the case of the main framework, the accompanying photographs are sufficiently well-detailed to give you a good idea of its construction. Basically, it consists of four 43 in. Compound Angle Girders 1, joined by suitable Angle Girders, Strips and Plates. Each Compound Girder is obtained from a 24½ in. and an 18½ in. Angle Girder, placed end to end and 'butt-jointed' by another smaller Angle Girder. Plenty of cross bracing is provided down three sides of the model by various Strips, the majority of the fourth side being left open so as not to interfere with the 'forks' controlling the winding movement.

Construction of the 'gearbox' is, again, fairly obvious from the illustrations. Compound Girders 1 at the front are joined by a 5½ in. by 3½ in. Flat Plate 2 while Girders 1 at the rear are joined by a 5½ in. by 2½ in. Flat Plate 3 and a 5½ in. Angle Girder 4. Two 7½ in. Angle Girders 5 are bolted between 5½ in. Angle Girders 6 joining the sides then Angle Girders 5 are joined by two 5½ in. by 3½ in. Flat Plates 7. A 1½ in. Flat Girder 8 is added to one of the rear Girders 1.

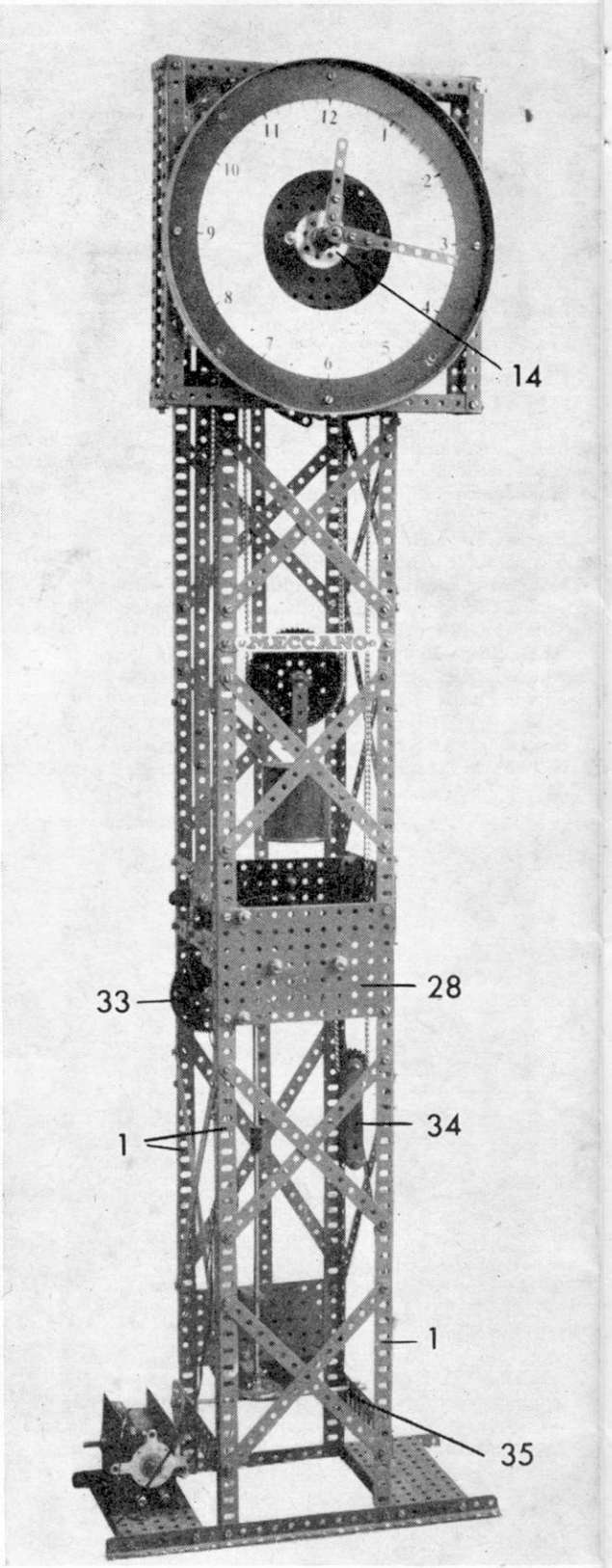
Two Squares 9 are now built up each from four 9½ in. Angle Girders, then they are connected together at the corners by 1½ in. Angle Brackets. The complete arrangement is fixed to Front Girders 1 and to a 9½ in. Strip 10, bolted across the middle of Flat Plate 2.

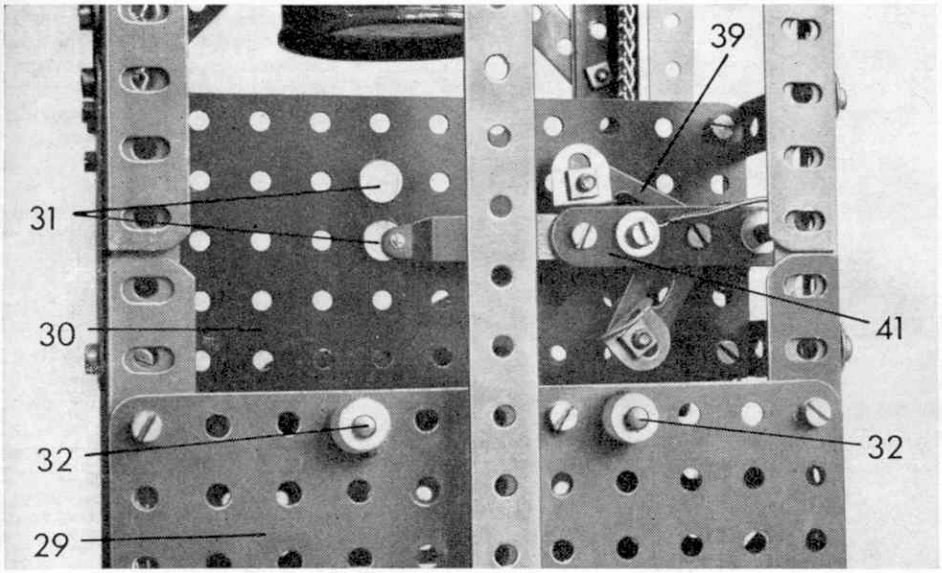
Gear assembly

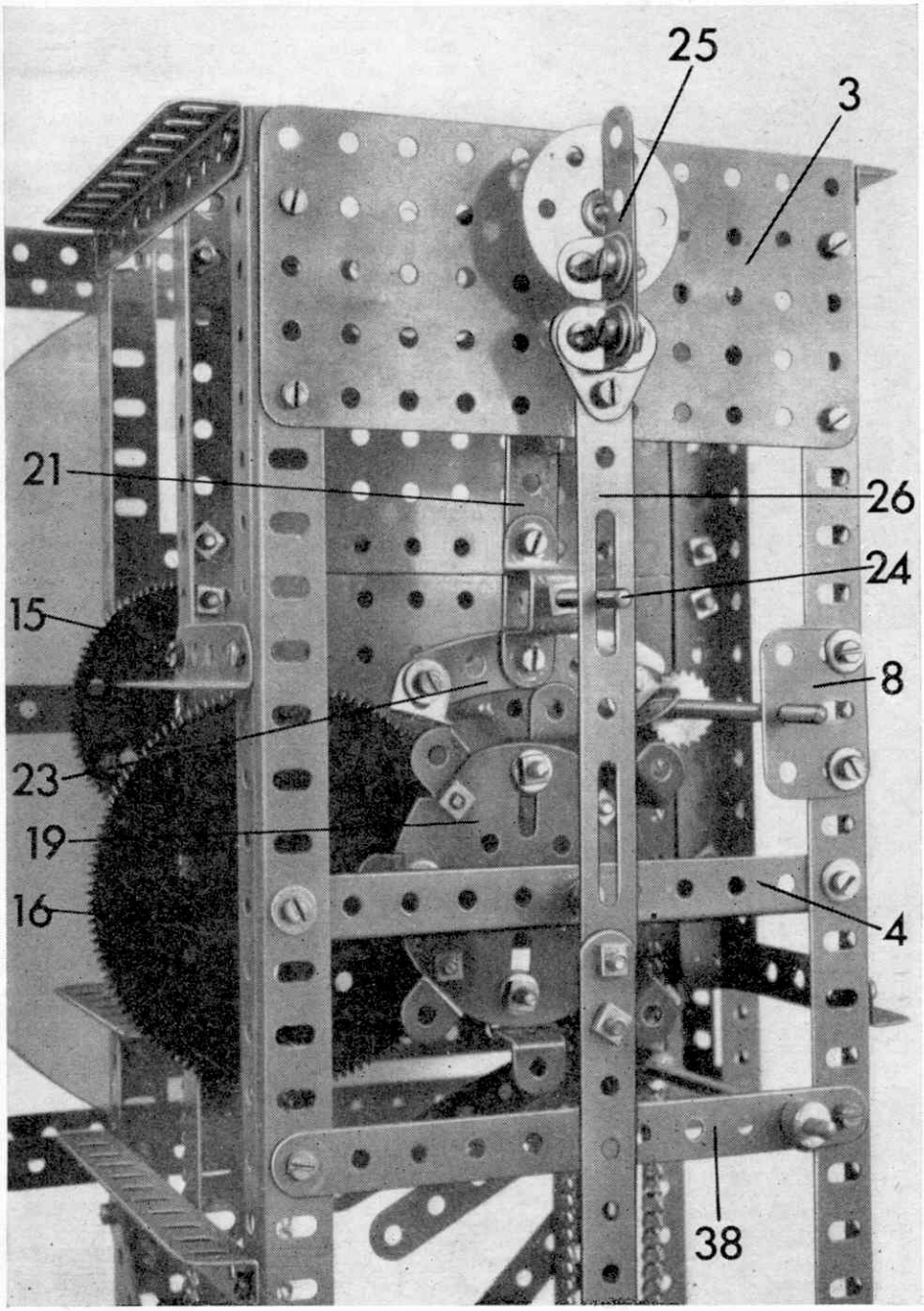
A suitable Rod A (Fig. 1), carrying a ½ in. Pinion 11 and a 3½ in. Gear Wheel 12, is journalled in the centre hole of Plate 2 and in the corresponding hole of lower Plate 7. Pinion 11 meshes with a 57-teeth Gear Wheel 13 on a short Rod B (Fig. 1), journalled in Plate 2 and a Double Bent Strip bolted to the front of the Plate. Rod B also carries a $\frac{7}{16}$ in. Pinion C (Fig. 1), on its outside end, that meshes with a 60-teeth Gear Wheel 14, loose on Rod A. Gear 12 meshes with a ½ in. Pinion D (Figs. 1 and 2), also journalled in Plates 2 and 7 on a level with Rod A. In addition to ½ in. Pinion D, Rod E carries a 1 in. Sprocket Wheel F (Figs. 1 and 2) and a 2½ in. Gear Wheel 15, the latter in mesh with a second ½ in. Pinion G (Figs. 2 and 3) on a fourth Rod H (Figs. 2 and 3) journalled in Plates 2 and 7. Mounted on the end of this Rod, behind Plate 7, is a 3½ in. Gear Wheel 16. A 6½ in. Rod, carrying a 1 in. Sprocket Wheel 17 and a Ratchet Wheel 18, is journalled in Flat Plate 2 and Flat Girder 8. A Pawl fixed to lower Plate 7 engages with the Ratchet.

Escapement

An Escapement Wheel is now produced by bolting eight ½ in. Reversed Angle







Brackets to a Face Plate 19. This is a critical part of the mechanism, therefore the Brackets must be exactly placed with identical distances between their free lugs. The completed wheel is mounted on a 2 in. Pivot Rod J (Fig. 3), as also is a ½ in. Pinion 20, and the Rod is then positioned in the clock, being held by Pivot Bolts, one fixed in lower Plate 7 and the other in Angle Girder 4. Pinion 20 meshes with Gear Wheel 16. The escapement lever consists of a 4½ in. Strip 21 mounted on a 3½ in. Rod 22, journalled in upper Plate 7 and Plate 3. A 2½ in. Curved Strip 23, to each end of which an Angle Bracket is fixed, is bolted to the lower end of the 4½ in. Strip, at the same time securing a Double Bent Strip in place. A long Threaded Pin 24 is attached to this Double Bent Strip.

To build the pendulum, a 2 in. Flexible Strip 25 (Elektrikit part No. 530) is attached to a 6-hole Bush Wheel by an Angle Bracket. Fixed by Angle Brackets to the lower end of this Strip is a 1 in. Triangular Plate, to which a 5½ in. Slotted Strip 26 is bolted. Threaded Pin 24 engages in the upper slot in this Strip, which is extended by Ordinary Perforated Strips. The pendulum 'bob' consists of a 6 in. Circular Plate, to which six 2½ in. by 2½ in. Flat Plates are bolted. The distance from the centre of the bob to the pivot should be about 37½ in. The 6-hole Bush Wheel, incidentally, is fixed on a Threaded Pin mounted in Flat Plate 3.

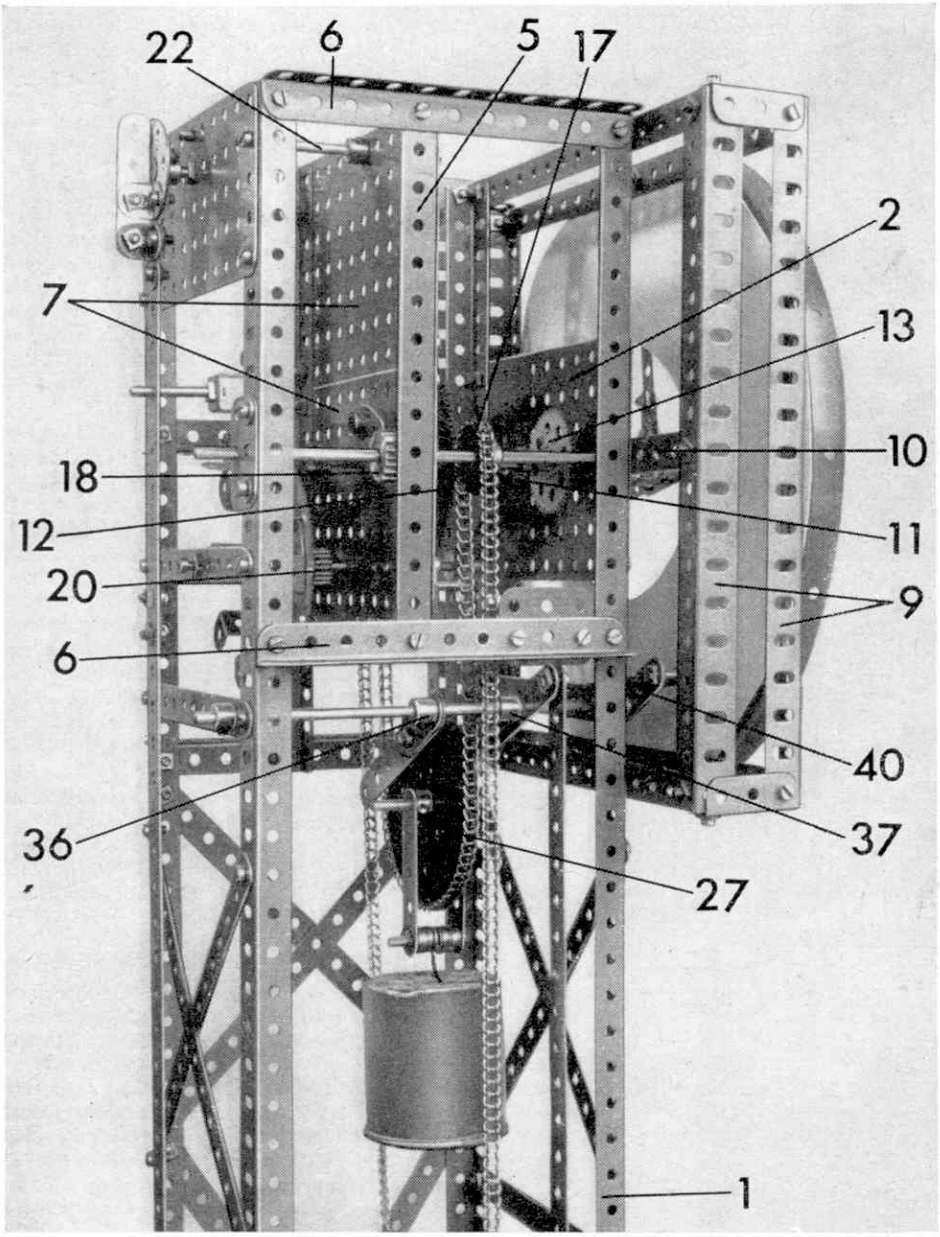
It is interesting to note that coarse adjustment of the time-keeping can be made by altering the length of the pendulum in half-inch steps and finer adjustment by moving one or more of the 2½ in. by 2½ in. Flat Plates up or down.

Drive and winding arrangements

As already mentioned, power for the clock is provided by a large weight which, in fact, is the only non-Meccano part other than the cardboard face used in the model. It is obtained by melting about 3 lb. of lead into a can with a diameter of approximately 2 in. and a depth also of 2 in. Before the lead solidifies a piece of wire must be buried in it to act as an attachment for fixing by a 1½ in. Bolt to a couple of 2½ in. Strips. Mounted between these Strips is a 3 in. Sprocket Wheel 27 on a 2½ in. Rod, journalled in the end holes of the Strips.

Bolted part way up the mainframe between front girders 1 is a 5½ in. by 3½ in. Flat Plate 28, while a 5½ in. by 2½ in. Flat Plate 29 is bolted between girders 1 at the rear. The front and rear girders are then joined at one side by another 5½ in. by 2½ in. Flat Plate and at the other side by a couple of 5½ in. Strips. Fixed between these Strips and the Plate is a 5½ in. by 2½ in. Insulating Flat Plate 30, attached by 2½ in. Angle Girders. Two Contact Studs 31 are bolted to this Plate.

Journalled in Plates 28 and 29 are two 6½ in. Rods 32, each carrying a 1 in. Sprocket Wheel. Another 6½ in. Rod carrying a 2½ in. Gear Wheel 33 and a 1 in. Sprocket Wheel is also journalled in the Flat Plates. A 90 in. (approx.) length of Sprocket Chain is now passed round the 1 in. Sprocket Wheel on the Rod carrying Gear Wheel 15; is taken down and around 3 in. Sprocket Wheel 27; is brought up and passed round 1 in. Sprocket Wheel 17; is taken down and around the 1 in. Sprocket Wheel on the Rod carrying Gear Wheel 33; is brought up and taken over the 1 in. Sprocket Wheels on Rods 32; is taken round a 1 in. Sprocket Wheel in a special



tensioning weight 34, after which the ends of the Chain are joined together to form an endless belt. The tensioning weight is obtained by bolting several 2½ in. Strips together between two 3½ in. Strips and by mounting the 1 in. Sprocket Wheel on a Rod journalled in the end holes of these 3½ in. Strips.

Two 12½ in. Angle Girders joined by two 5½ in. by 2½ in. Flanged Plates are bolted to the lower ends of compound girders 1 to provide a base, and an E15R Motor is mounted on one of the Flanged Plates. Girders 1 are connected at the sides by two 5½ in. Flat Girders 35 in which a 6½ in. Rod carrying a 57-teeth Gear Wheel and a ½ in. Bevel Gear, is journalled. The 57-teeth Gear meshes with a ½ in. Pinion on the Motor output shaft, while the Bevel Gear meshes with a 1½ in. Bevel on the end of a vertically-mounted compound rod. A Worm fixed on the other end of this Rod meshes with a 2½ in. Gear Wheel 33.

Winding control

Perhaps the most critical part of the model is the switch arrangement controlling the automatic winding of the clock. Two similar "forks" are both built up in the same way. A Crank 36 and a Double Arm Crank 37 are fixed approximately 1½ in. apart on an Axle Rod. The Crank is extended by a 3½ in. Strip, while a 4½ in. Strip is bolted to the Double Arm Crank so that it protrudes backwards two holes. One of the Rods is now journalled in 5½ in. Strips 38, while the other Rod is journalled in Plates 28 and 30, then the extended arms of the Double Arm Cranks are coupled together by a 16½ in. compound strip, lock-nutted in place. A Bell Crank 39, to each arm of which an Angle Bracket is bolted, is fixed on the inside end of the lower Rod, while an ordinary Crank 40 is fixed on the outside end of the upper Rod. A Threaded Pin, carrying a Tension Spring, is attached to the arm of this Crank. The other end of the Tension Spring is secured to the further vertical Girder 9.

Bolted through the centre end hole of Insulating Plate 30 is a long Threaded Pin on which a 2½ in. Insulating Strip 41 is pivotally held by Collars. This Strip is

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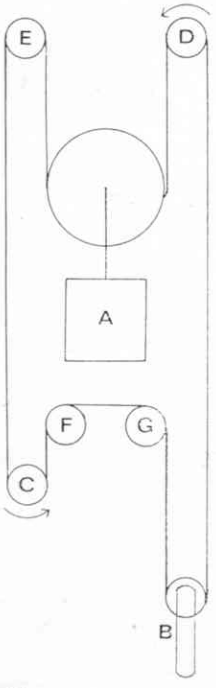


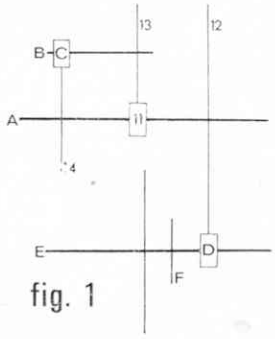


fig. 1

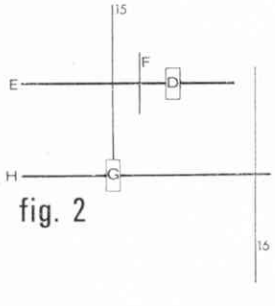


fig. 2

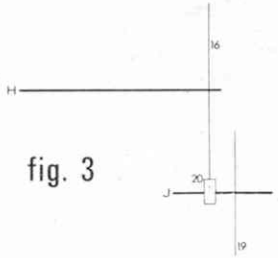


fig. 3

Left: this diagram shows the Sprocket-and-Chain driving and winding arrangement. A—driving weight; B—tensioning weight; C—winding drive Sprocket; D—'gearbox' drive Sprocket; E. F. G—free-running Sprockets. Figs. 1, 2 and 3 show the layout of the 'gearbox' in diagrammatical form. The numbered and lettered parts are referred to in the text, but note that Sprocket Wheel 17 is not shown

Above: in this view of the clock, the construction of the 'gearbox' can be clearly seen

Parts required

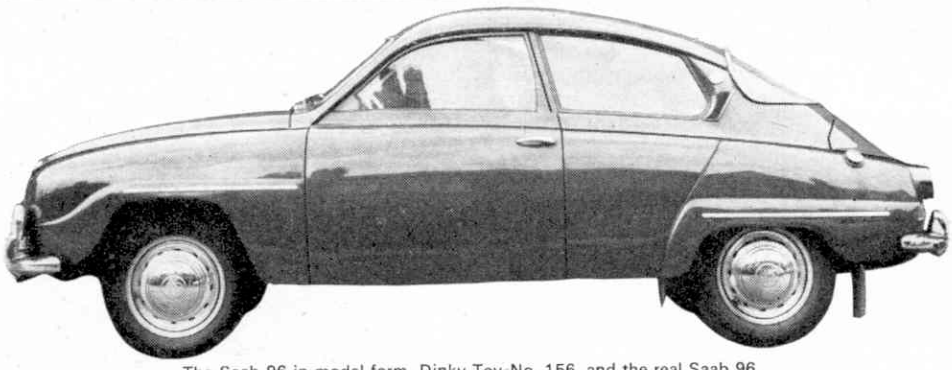
3 of No. 1	1 of No. 24b	2 of No. 103
15 of No. 1a	5 of No. 26	3 of No. 103h
8 of No. 1b	1 of No. 26c	1 of No. 109
8 of No. 2	2 of No. 27a	2 of No. 115
3 of No. 2a	2 of No. 27b	2 of No. 115a
4 of No. 3	2 of No. 27c	1 of No. 120b
8 of No. 5	1 of No. 27d	8 of No. 125
4 of No. 6a	1 of No. 30a	1 of No. 128
4 of No. 7	1 of No. 30c	1 of No. 146
4 of No. 7a	1 of No. 32	1 of No. 155
6 of No. 8	1 of No. 43	1 of No. 167b
9 of No. 8a	2 of No. 45	1 of No. 171
1 of No. 8b	2 of No. 52	1 of No. 230
6 of No. 9	5 of No. 52a	1 of No. 231
1 of No. 9b	1 of No. 55	1 of No. 235
1 of No. 9d	16 of No. 59	1 of No. 235b
12 of No. 12	8 of No. 62	1 of No. 502
2 of No. 13a	2 of No. 63	1 of No. 510
7 of No. 14	1 of No. 70	1 of No. 530
1 of No. 15a	6 of No. 72	1 of No. 533
1 of No. 16	1 of No. 77	2 of No. 544
1 of No. 16b	1 of No. 90	2 of No. 545
2 of No. 18a	90 in. of No. 94	1 of No. 549
1 of No. 18b	1 of No. 95b	1 E15R Electric Motor
1 of No. 22	6 of No. 96	

size tractor is its easily-operated four-in-one hydraulic system, referred to as 'Selectamatic'. This system incorporates four separate hydraulic circuits — depth control, height control, traction control and external services control—all selected by a simple dial and controlled by a single quadrant lever. As the David Brown people themselves say, 'For years farm tractor hydraulic systems have tended to become more complex and more bewildering to the average tractor driver. Now David Brown engineers have produced the simplest, most foolproof hydraulic control system yet devised . . . Operation is ultra-simple. The driver dials the hydraulic service required and then controls the implement or attachment by means of a single control lever.' It certainly sounds easy!

So much for the new release No. 325. Now, what about No. 156? A glance at the accompanying illustration will show you that this model is based on Sweden's Saab 96, which must be one of the most widely known cars in the world today, thanks to its enormous success in past Monte Carlo Rallies. The specific cars which have achieved so much success in international sporting events may, perhaps, have been tuned up to a certain extent, but the standard production version is still an amazing vehicle. Power is supplied by a 3-cylinder, two-stroke engine of 841 c.c. capacity developing a power output of 40 b.h.p. to give the car a maximum speed in excess of 75 m.p.h. Two of these facts are surprising. Excluding 3-wheelers, virtually all standard British cars have four-stroke engines and all, to my knowledge, have at least four cylinders. The thing I found most surprising about such a comparatively small car, however, is the fact that it is fitted with triple carburettors — presumably one for each cylinder, which is unknown on even the most sophisticated high-performance sports cars in this country.

Dinky's Saab 96 is a charming and substansive replica of very good quality. All the distinctive body features of the original are, of course, faithfully reproduced right down to the door handles. The doors themselves open to reveal considerable detail on their insides, as well as giving access to the tipping backs of the front seats. Windows and a steering wheel are also fitted inside the model while, outside, it sports plated bumpers and radiator grille, 4-wheel suspension, and number plates. In addition, rear-view mirror and windscreen wiper representations appear on the windscreen moulding.

Back in the full-size world, the Saab 96 is a fairly common sight on Britain's roads. I, myself, have seen several, and I did notice that they were all finished in red. This seems the most popular colour for them, therefore, it is hardly surprising that the new Dinky Toy should also be red. To be exact, in fact, it is finished in flamboyant carmine with off-white interior—very striking, indeed!



The Saab 96 in model form, Dinky Toy No. 156, and the real Saab 96.
'One of the most widely known cars in the world today'

The David Brown **Selectamatic 990** Tractor as it appears in real life

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extended by an Elektrikit Wiper Arm which is so arranged that it makes contact with Contact Studs 31. The Wiper Arm is connected by insulated wire to one terminal of the Motor, while the lower Contact Stud 31 only is connected by insulated wire to one terminal of the power source. The other terminal of the power source is connected direct to the other terminal of the Motor.

The winding switch is, of course, activated by the weight coming in contact with either of the two 'forks". Movement of the forks causes Bell Crank 39 to move which, in turn, moves the Insulating Strip/Wiper Arm arrangement, thus switching the Motor on or off.

All that now remains to be fitted are the hands and face. The hour hand, consisting of a Crank extended by a $2\frac{1}{2}$ in. Narrow Strip, is loosely mounted on the Rod A carrying Gear Wheel 12 and is attached to 60-teeth Gear Wheel 14, while the minute hand, consisting of a Crank extended by a $3\frac{1}{2}$ in. Narrow Strip is fixed tightly on the Rod. The face is obtained from a circular piece of card, suitably marked and edged by a $9\frac{7}{8}$ in. Flanged Ring.

It is a good idea to include a friction drive in the model, which would allow the hands to be easily set and, in fact, Mr. Fail's model does include such a mechanism. It is obtained by substituting a Rod with Keyway for the Rod A carrying Gear Wheel 12. A Collar, a Compression Spring, and a 1 in. Pulley with Rubber Ring, the latter carrying a Keybolt in its boss, are added to the Rod. The Collar presses the Compression Spring against the Pulley which, in turn, is forced against Gear Wheel 12, but remember that Gear Wheel 12 must be loose on the Rod, in this case. The Keyway Rod can be extended to the required length by an ordinary Rod and Coupling.