Price 3d.

THE MECCANO CLOCK

THE following instructions will enable any Meccano boy to build a "grandfather's clock" with Meccano. This clock stands well over 6 ft. in height and keeps perfect time. With the exception of the 18 lb. weight, the wire by which it hangs, the dial plate and the light spring (80 Fig. E), the model is made entirely of Meccano. The clock keeps perfect time, and is the outcome of experiments conducted in the Meccano model-building department. A large number of these clocks have been constructed, and have been tested-out very thoroughly. With careful adjustment every clock has been made to keep perfect time.

CONSTRUCTING THE FRAME

Commence by making the frame to carry the gear trains. This frame (shown in Fig. D) consists of vertical 12½" angle girders (1), connected by 5½" angle girders (2) and 5½" strips (3). Bolt three 5½" × 2½" flat plates (4) to the 5½" double angle strips (5) above and below, and two 2½" × 2½" flat plates (6) to the plates (4) but on the other sides of the lower double angle strips (5) and overlapped two holes with the larger plates (4). Cranks (7) bolted to flanged trunnions (8) on the top of the frame form the

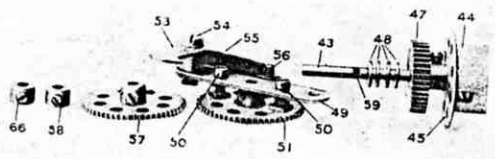

Fig. B

pivotal bearings for the pendulum A 12" strip (9) is bolted vertically to one of the trunnions and to the 5½" strips (10) to form bearings for the main gear train. A double bent strip (11) and a 1½" strip behind are bolted on the left side of the frame to form a bearing for the winding handle (65 Fig. E). A second double bent strip (12) is provided, to form a bearing for the shift gear that disconnects the driving train from the gearing of the hands, when the fingers are being set.

A flat trunnion (13 Fig. D) is bolted below the left perforated plate (6) to form a bearing for the lowest 3" rod of the clock train (18 Fig. E). The position of the other perforated strips will be easily seen from Fig. D

THE MAIN GEAR TRAIN

When the frame has been constructed, proceed to build the main driving gear train, as shown in Fig. E. This consists of three ½" pinions (14) connected with 57-toothed gear wheels (15) and three ¾" pinions (16) connected with 50-toothed gear wheels (17). These are secured on the rods 18, the top rod being 3½" long and the remainder 3" long. They pass through holes in the left-hand

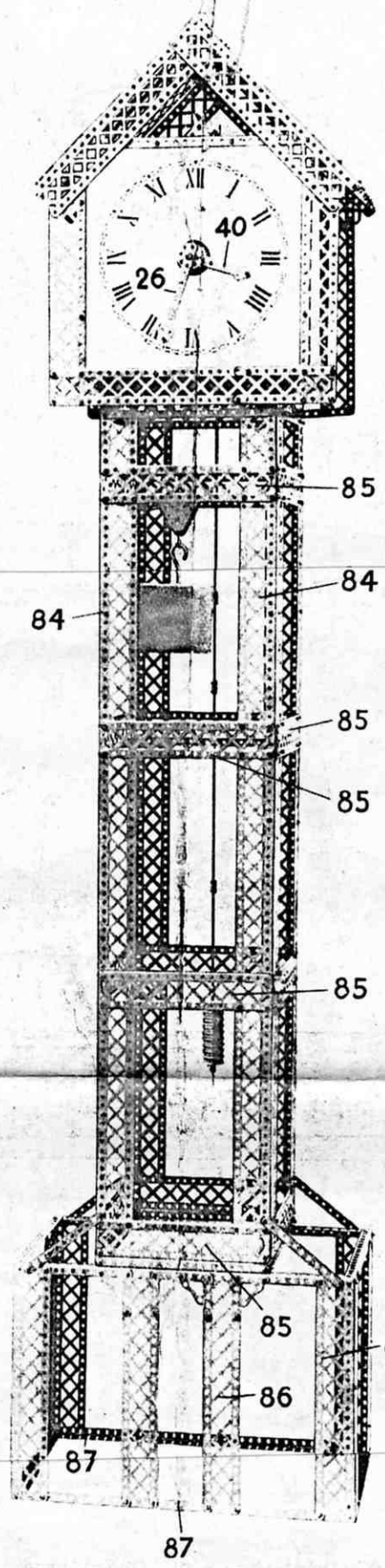

Fig. A

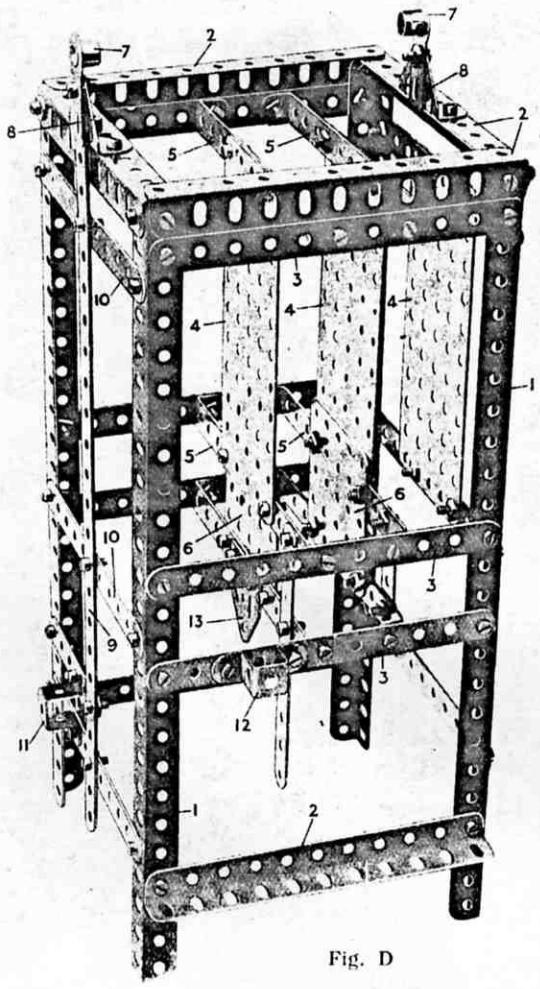

Fig. D

plates (4 and 6) and the strip 9, collars (10A) being fitted on each rod on each side of the strip 9. No collars are necessary at the other ends of the rods.

On the end of the 3½" rod (19) is a ¾" pinion (20), which is seen more clearly in Fig. G. This pinion gears with a 50-toothed gear wheel (21) fixed on a 2" rod (22) which is able to slide in the plates (6). On this rod also is a ½" pinion (23) geared with a 57-toothed wheel (24) on a 4½" rod (25) carrying the minute hand (26 Fig. E). The web of a crank (27 Fig. G), engages the 2" rod (22), the crank being bolted to a 3½" rod (28) carrying a double bracket bolted to a bell crank (29) and pivoted on a rod (30) in the double bent strip (12)

ADJUSTING THE HANDS

A cord (31) is connected to the bell crank (29) and by pulling on this cord, the rod (28) is caused to slide and move the gear (21) in or out of engagement with the pinion (20). This releases the driving train from the clock hands and enables the hands to be freely adjusted.

In order to drive the hour hand from the minute hand rod (25), a ½" pinion (32) on this rod drives a 57-toothed gear (33) mounted on a 2" rod. This engages a second 57-toothed gear (34 Fig. E), the ¾" pinion (35) on the same 2" rod driving a 50-toothed gear (36). Another ¾" pinion (see Fig. E) on this rod drives a 50-toothed gear (37). On the 2½" rod of this last wheel is a 1½" sprocket wheel (38 Fig. E and Fig. J) which is coupled to a similar sprocket (39) loose on the rod 25. The hour hand (40 Fig. J), consists of a 2½" strip and is connected by

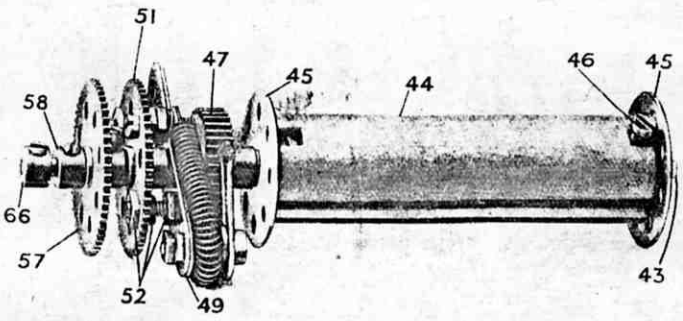

Fig. C

a ½" reversed angle bracket (41) to a 1½" strip (42). This is bolted to the sprocket wheel (39) and spaced by two washers to give clearance for the sprocket chain. The reversed angle bracket (41) is necessary to enable the hour hand 40 to be brought clear of the dial plate

RATCHET WINDING MECHANISM

The ratchet mechanism permitting the winding of the weight is built up as shown in Figs. B, C and F. As will be seen from the two first-mentioned, the complete ratchet element is made by passing a 6" rod (43 Fig. B) through a wood roller (44), the ends of which are clamped between two bush wheels (45) secured on the rod. The bosses of the bush wheels are entered into the ends of the wood roller and the bolts (46) engage in the end notches of the wood roller to key the roller to the bush wheel (45).

A 1" gear wheel (47) is then bolted on the rod (43) with its boss close against the end bush wheel (45). Four washers (48) are then threaded on the rod.

The element shown in the centre of Fig. B is next passed over the rod. This element is made as follows: Two 2½" strips (49) are bolted by ¾" bolts (50) to a 57-toothed gear wheel (51), lock-nuts (52 Fig. C) being fitted on the bolts on each side of the gear wheel (51) and also beneath the strips (49). A pawl (53) is pivoted at (54) in the end hole of the strips (49) and a spring (55) is connected to the pawl boss by a screw, and also to a ¾" bolt (56) on the gear

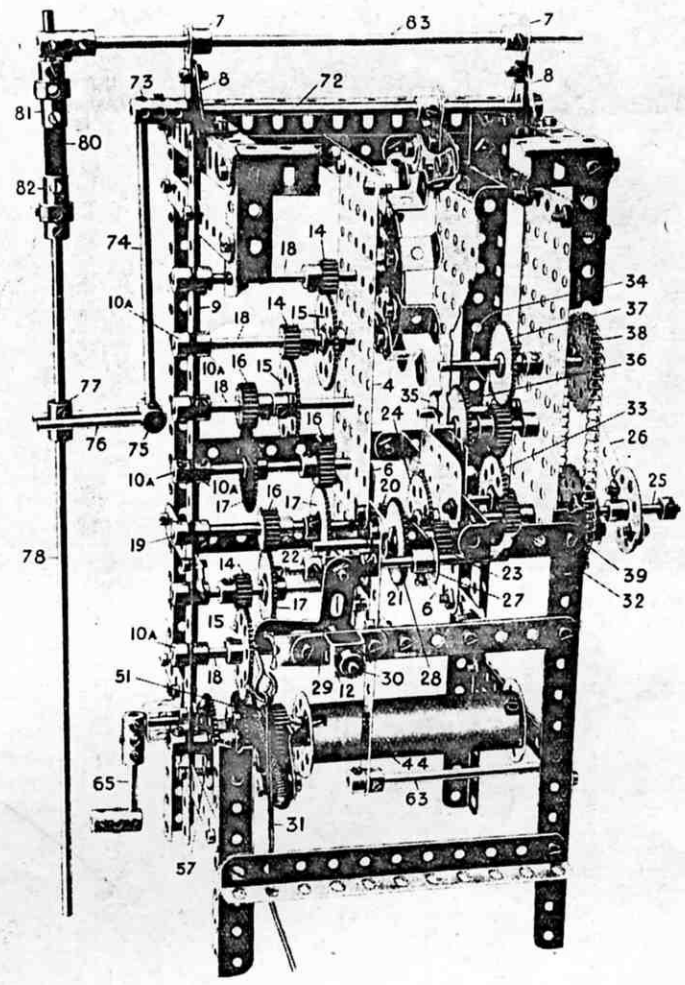

Fig. E

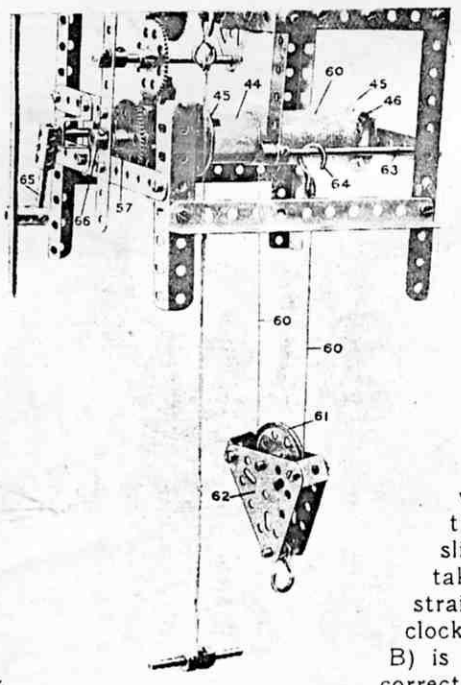

Fig. F

wheel (51) and lock-nutted. The element so built up is passed over the rod (43), being loose thereon, and the pawl engaged with the gear wheel (47) (see Fig. C).

NON-SLIPPING DEVICE

A 57-toothed gear wheel (57 Fig. F) is passed over the rod and bolted thereon, and a collar (58 Fig. C) is bolted outside the gear wheel (57). In order that the gear wheel (57) may not slip on the rod (43) when taking the whole of the strain in winding the heavy clock weight, a flat (59 Fig. B) is filed on the rod in the correct position for being engaged by the screw of the gear wheel (57). This gives the wheel a secure grip on the rod.

WINDING THE CLOCK

A stranded wire cord (60) is wound on the wood roller (44) and passes round a pulley (61) in the pulley block (62). This is made up of two 2½" triangular plates bolted together with double brackets, and carries the 1½" pulley wheel (61). The other end of the cord (60) is hooked (at 64) over the rod (63).

After the wood roller (44) has been inserted in place, another collar (66) is secured on the extreme end of rod (43 Fig. F). The clock is wound by a crank handle (65) provided with a ½" pinion (not visible in the photograph), which engages the gear wheel (57). The roller (44) drives the main gear train, by reason of its gear wheel (51) engaging the first gear (15) of the train

THE ESCAPEMENT WHEEL AND PALLET

Next, proceed to construct the escapement, which consists of an escapement wheel and a pallet mechanism. The former (Fig. K) consists of a face plate (66a) to which are attached eight ½" reversed angle brackets (67). In order that these shall not move, they are pressed hard against the circular edge of the plate, and then bolted in position with washers (68) beneath the bolt-heads.

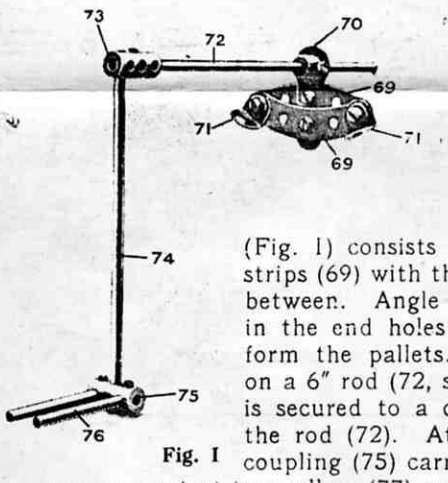

Fig. I

The pallet mechanism (Fig. I) consists of two 2½" reversed curved strips (69) with the web of a crank (70) bolted between. Angle brackets (71) are bolted in the end holes of the curved strips which form the pallets. The crank (70) is bolted on a 6" rod (72, see Fig. E) and a 5" rod (74) is secured to a coupling (73) on the end of the rod (72). At the lower end of this is a coupling (75) carrying two 2" rods (76) which engage against two collars (77) on the pendulum rod (78).

THE PENDULUM

As shown in Fig. H. the pendulum consists of four 11½" (78, 78a, 78c, and 78d) and a 5" rod (78b) connected by couplings. As also shown in Fig. H, the pendulum is connected to the lower end of the 11½" rod (78) (see Fig. E).

The pendulum weight (79) is made up of ten flanged wheels. A light spring (80) connects the strip couplings (81 and 82), the coupling (81) being connected to the 8" rod (83) which is secured in the bosses of the cranks (7). The spring (80) is necessary in order to provide for an easy escapement movement of the pendulum.

CONSTRUCTING THE MAIN FRAME

The main frame may now be built. This consists of two 24½" angle girders at each vertical corner, overlapped three holes. To these are secured 12½" braced girders (84) connected by 9½" horizontal braced girders (85). The base consists of 12½" vertical braced girders (86) and horizontal 18½" angle girders (87), at the front and back.

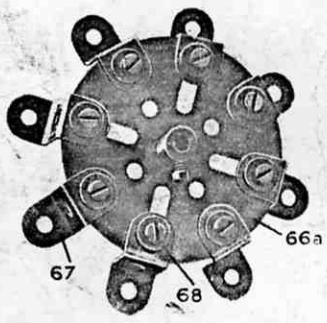

Fig. K

The construction of the head of the clock will be clearly seen from Fig. L. It is

78a
78b
78c
78d
79

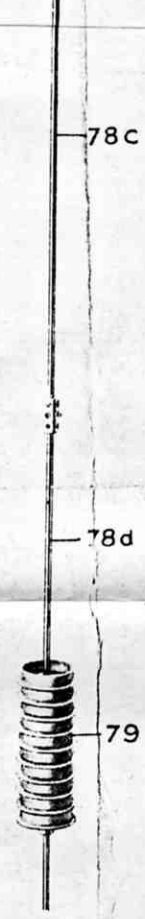

Fig. H

built up of 12½" angle girders (88) front and back, while 9½" angle girders (89) connect the front and back girders. The feet of the vertical angle girders (Fig. D) of the works casing are bolted by the bolts (91) to the 12½" angle girders (90). These rest on the top of the side angle girders of the main frame.

The dial should be attached and then the works casing placed in position from the rear. The hour and minute hands are then secured in place at the front of the dial and the model is complete.

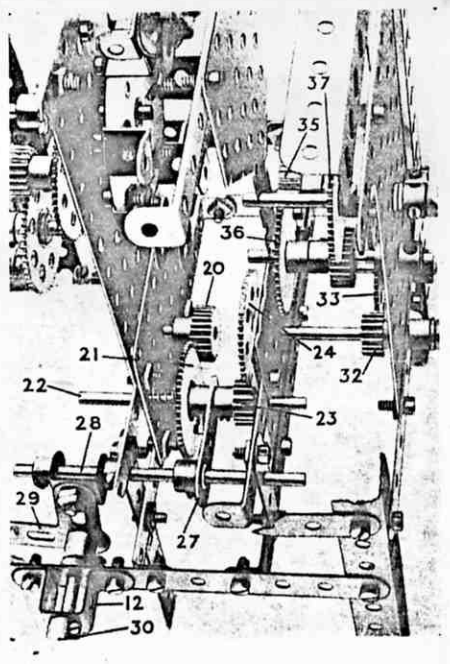

Fig. G

PARTS REQUIRED FOR CLOCKWORK MOVEMENT

1 Perf. Strip,	12½"
14 ,, ,,	5½"
1 ,, ,,	4½"
2 ,, ,,	3"
1 ,, ,,	2½"
1 ,, ,,	2"
2 ,, ,,	1½"
4 Angle Girders,	12½"
6 ,, ,,	5½"
3 Double Brackets	
2 Angle ,,	
4 Axle Rods,	11½"
1 ,, ,,	8"
2 ,, ,,	6"
3 ,, ,,	4½"
9 ,, ,,	3½"
1 ,, ,,	3"
1 ,, ,,	2½"
6 Double Angle Strips,	5½" × ½"
4 Cranks	
9 Couplings	
2 Strip Couplings	
3 Flat Plates,	5½" × 2½"
2 Flat Plates,	2½" × 2½"
2 Triangular Plates,	2½"
2 Triangular Plates,	1"
2 Curved Strips,	2½"
10" Sprocket Chain	
2 Sprocket Wheels,	1½"
1 Wood Roller	
1 Face Plate	
2 Bolts,	¾"
9 Reversed Angle Brackets,	½" × ½"
8 Axle Rods,	2"
2 ,, ,,	1½"
2 ,, ,,	1"
10 Fianged Wheels	
1 Pulley Wheel,	1½"
3 Bush Wheels	
5 Pinion Wheels,	¾"
6 ,, ,,	½"
8 Gear Wheels,	57 Teeth
5 ,, ,,	50 ,,
1 ,, ,,	38 ,,
1 Pawl	
106 Nuts and Bolts	
20 Washers	
1 Spring	
2 Double Bent Strips	
3 Hooks	
35 Collars	
2 Trunnions	
1 Flat Trunnion	
1 Boss Bell Crank	
10 ft. Flexible Steel Wire	
1 Face	

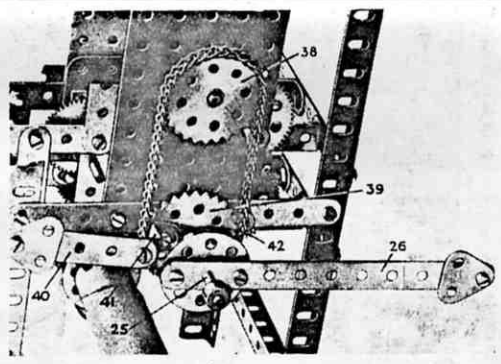

Fig. J

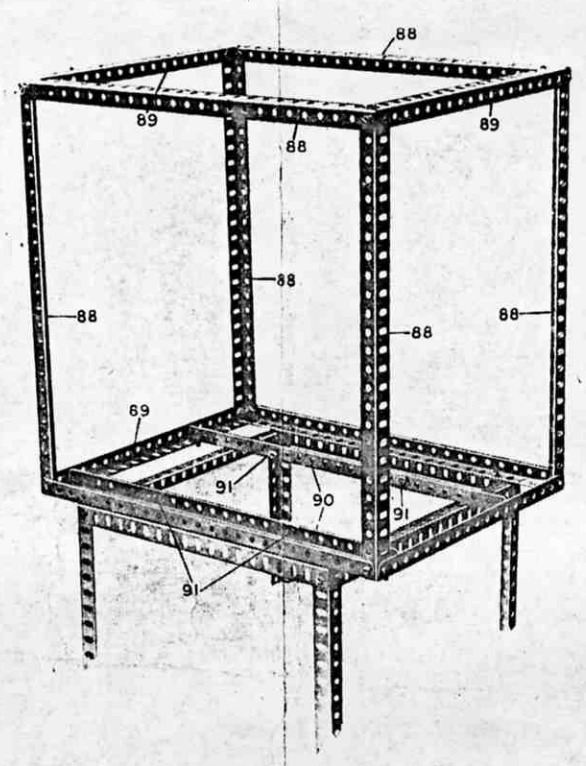

Fig. L

PARTS REQUIRED FOR CLOCK CASE AND FRAME

51 Braced Girders,	12½"
24 ,, ,,	9½"
8 ,, ,,	3½"
8 Angle Girders,	24½"
4 ,, ,,	18½"
14 ,, ,,	12½"
14 ,, ,,	9½"
4 Perforated Strips,	5½"
2 ,,	3½"
4 Architraves	
329 Nuts and Bolts	
8 Washers	
10 Angle Brackets	
1 18lb. Weight	