

A MECCANO WALL CLOCK

I HAVE received so many requests recently for details of clock mechanisms that I am reprinting here details of a Meccano Wall Clock featured as the "Model of the Month" about five years ago. I am doing this in order to satisfy the hundreds of correspondents who write to me on this subject, and I hope that those readers who saw the original article will forgive me repeating the model.

The Wall Clock illustrated here is one of the easier Meccano clocks to build and adjust, and it should appeal to all who are interested in this kind of model-building.

The Clock Frame

Each side of the frame consists of a $9\frac{1}{2}$ " Angle Girder 1, a $7\frac{1}{2}$ " Angle Girder 2 and a $7\frac{1}{2}$ " Angle Girder 3 connected at their upper ends by a $3\frac{1}{2}$ " Angle Girder, and level with the lower ends of the $7\frac{1}{2}$ " Angle Girders by a $3\frac{1}{2}$ " Strip. The side is braced by a $5\frac{1}{2}$ " Strip.

BY SPANNER

The two sides are connected by four $3\frac{1}{2}$ " Strips and a $9\frac{1}{2}$ " Strip bolted to the Girders 1. Three of the $3\frac{1}{2}$ " Strips are numbered 4, 5 and 6, and the $9\frac{1}{2}$ " Strip is indicated at 7. The upper ends of the Girders 3 are connected by a $3\frac{1}{2}$ " Angle Girder, with 2" Strips bolted between it and the $3\frac{1}{2}$ " Angle Girders of the sides. The lower ends of the Girders 3 are connected by a $3\frac{1}{2}$ " Strip, and $3\frac{1}{2}$ " Strips are arranged between the Girders 3 and the upper $3\frac{1}{2}$ " Angle Girder to brace the rear of the frame. The front of the frame is braced by 3" Strips bolted to the Girders 1 and to the $3\frac{1}{2}$ " Strip used to connect their lower ends. A Semi-Circular Plate 8 is attached to $\frac{1}{2}$ " Reversed Angle Brackets bolted to the Girders 1. Four $3\frac{1}{2}$ " Strips numbered 9, 10, 11 and 12, are fixed between the Girders 2.

Arrangement of the Gearing

The driving shaft is a 2" Rod 13 mounted in the Strips 4 and 9. The Rod carries a Ratchet Wheel 14 and a 57-tooth

Gear 15 fixed in place, with a loosely mounted $1\frac{1}{2}$ " Sprocket 16 placed between them. An Angle Bracket is lock-nutted to the Sprocket Wheel but is spaced from it by a Washer. A short length of wire is cut from a Heald, and is shaped so that when one end is bolted to the Sprocket 16, the other end passes through the free hole in the Angle Bracket and presses the latter part against the teeth of the Ratchet Wheel 14. The piece of Heald acts as a light spring and can be replaced by a length of spring wire if desired.

The Gear 15 drives a $\frac{1}{2}$ " Pinion on a 2" Rod that carries also a 57-tooth Gear 17. The $\frac{1}{2}$ " Pinion engages another 57-tooth Gear 18 on a 3" Rod fitted with a $\frac{1}{2}$ " Pinion 19. The Gear 18 is loose on the Rod, but a 1" Pulley 20 fitted with a Rubber Ring is pressed against the Gear to provide a light friction drive.

The Gear 17 drives a $\frac{1}{2}$ " Pinion on a $2\frac{1}{2}$ " Rod mounted in Strips 7 and 11 and held in place by a Collar. The $2\frac{1}{2}$ " Rod carries a $2\frac{1}{2}$ " Gear that engages a $\frac{1}{2}$ " Pinion on a $2\frac{1}{2}$ " Rod 21 supported in the Strips 6 and 12. A 50-tooth Gear on Rod 21 drives a $\frac{3}{4}$ " Pinion 22 on a 2" Rod that also is mounted in Strips 6 and 12. The last-mentioned Rod carries a 2" Sprocket 23 that forms the escapement wheel.

It should be noted that Washers are placed at suitable positions on the Rods to ensure that the various Gears and Pinions do not rub against the frame or each other. The exact positions and the number of Washers used are best found by experiment, as individual models may vary slightly in this respect. It is essential for the complete gear train to be perfectly free-running, and it is advisable to duplicate the grub screws in the Gears and Pinions in the main gear train to avoid any tendency to slip.

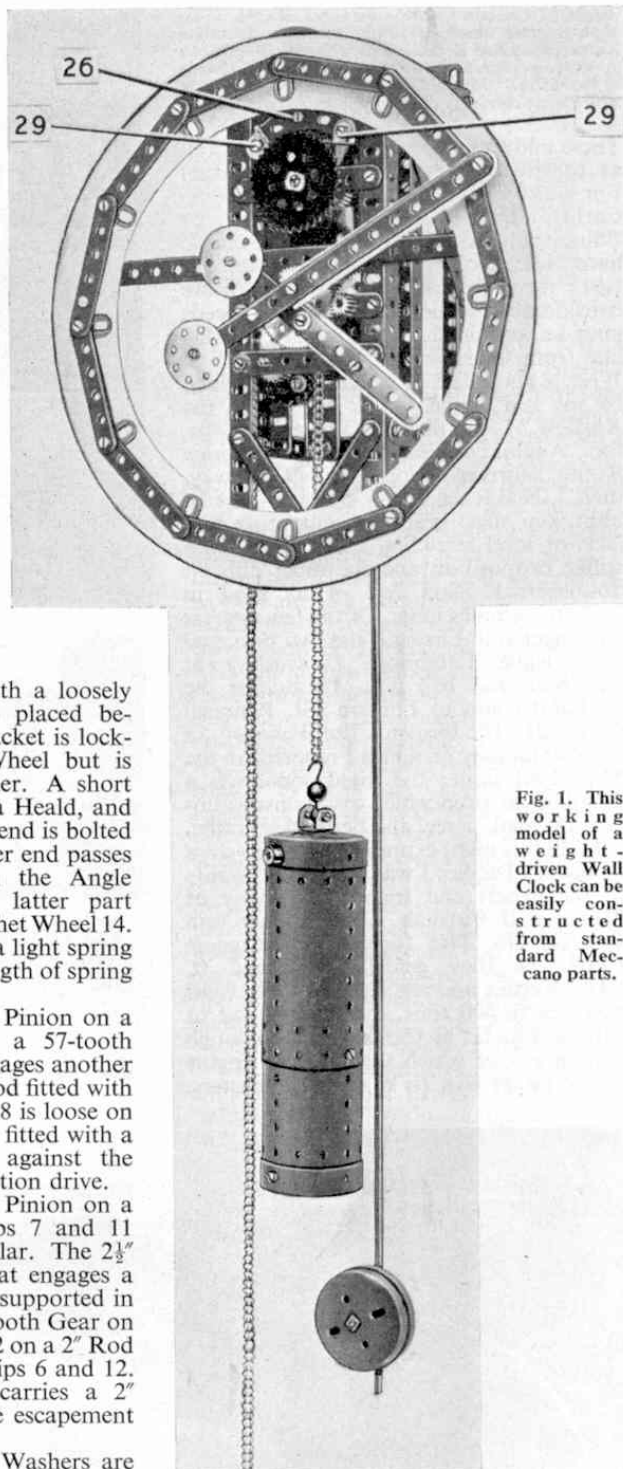


Fig. 1. This working model of a weight-driven Wall Clock can be easily constructed from standard Meccano parts.

Details of the Hands

The hour hand is a $5\frac{1}{2}$ " Strip bolted to a Single Bent Strip that is fixed to a 60-tooth Gear. A Wheel Disc is attached to one end of the Strip, and a piece of white cardboard can be bolted to the other end to outline the hand. The 60-tooth Gear is mounted freely on the 3" Rod that carries the Pinion 19, and it engages a

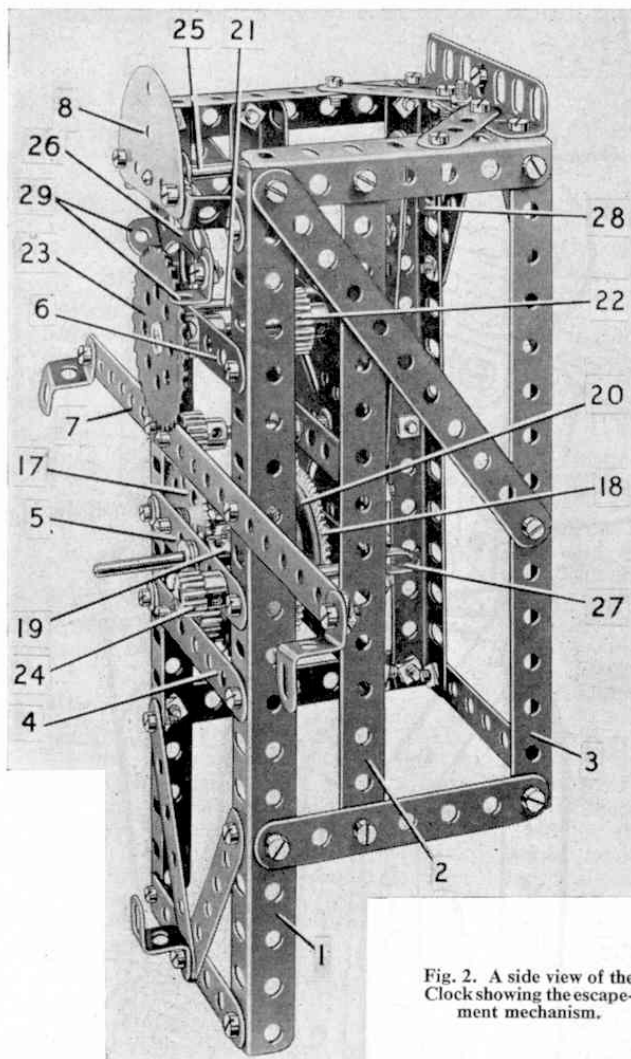


Fig. 2. A side view of the Clock showing the escapement mechanism.

$\frac{7}{16}$ " Pinion 24 on a 2" Rod mounted in the Strips 5 and 10. A 57-tooth Gear on the 2" Rod meshes with the $\frac{1}{2}$ " Pinion 19. This gearing provides a 12:1 ratio between the 3" Rod and the 60-tooth Gear that carries the hour hand.

The minute hand is a $7\frac{1}{2}$ " Strip bolted to a Double Arm Crank, which is fixed at the end of the 3" Rod. The Strip is fitted with a Wheel Disc and can be outlined with white cardboard in the same way as the hour hand.

The friction drive between the Pulley 20 and the Gear 18 allows the hands to be moved without affecting the main gear train.

The Escapement Mechanism

A 4" Rod 25 is mounted in the Semi-Circular Plate 8 and in an Angle Bracket attached to the rear of the clock frame by a $\frac{3}{8}$ " Bolt. The Angle Bracket should be spaced from the frame by Washers until Rod 25 is horizontal. Two Cranks are fixed to the Rod so that they hang vertically. One of the Cranks carries a $2\frac{1}{2}$ " Stepped Curved Strip 26 and the other supports a $5\frac{1}{2}$ " Strip, to the lower end of

which an Angle Bracket 27 is bolted. A Rod and Strip Connector 28 is placed on Rod 25, between one of the Cranks and the Angle Bracket that supports the Rod.

Two Angle Brackets 29 are fixed to the Curved Strip 26, in the positions indicated in Figs. 1 and 2.

The Clock Face, Weight and Pendulum

The clock face consists of twelve 3" Strips bolted to a ring of white cardboard as shown in Fig. 1, with Fishplates held by the bolts used to connect the Strips together. The face is bolted to $\frac{1}{2}$ " Reversed Angle Brackets fixed to the Strip 7 and to the $3\frac{1}{2}$ " Strip between the lower ends of the Girders 1.

The weight consists of two Boilers bolted together to form a long cylinder. A Boiler End is attached to one end of this, and the cylinder should be filled with suitable ballast to form a weight of between $4\frac{1}{2}$ lb. and 5 lb. A Boiler End, to which a Double Bracket is bolted, is fitted over the upper end of the cylinder and is held in place by a $2\frac{1}{2}$ " Rod and two Collars. A small Loaded Hook is placed on a $\frac{3}{4}$ " Bolt held in the

Double Bracket by lock-nuts, and is connected to a long length of Sprocket Chain. The Chain is passed round the $1\frac{1}{2}$ " Sprocket 16.

The pendulum consists of two $11\frac{1}{2}$ " Rods and a $3\frac{1}{2}$ " Rod joined by Rod Connectors. It is passed through the Angle Bracket 27 and is inserted in the Rod and Strip Connector 28. The bob weight is formed by a Boiler End and a Wheel Flange held together by a 1" Screwed Rod. A nut is placed at one end of the Screwed Rod, which then is passed through the Boiler End, the Wheel Flange and a $\frac{3}{4}$ " Washer and screwed into a Collar. The Collar is placed on the lower end of the pendulum and is fixed in position by its grub screw.

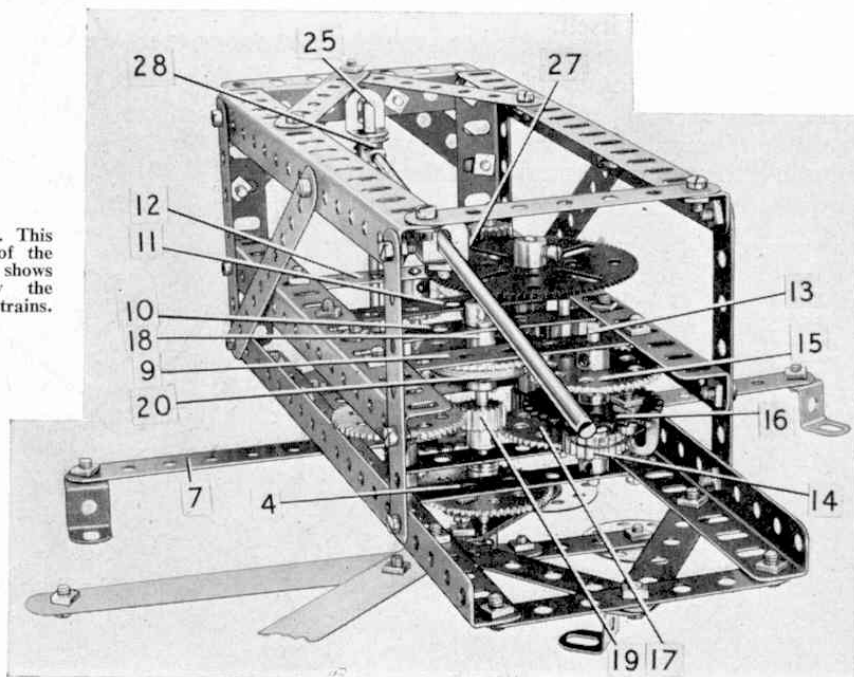
Adjusting the Mechanism

The positions of the Angle Brackets 29 must be adjusted so that as the Curved Strip 26 is rocked by the swing of the pendulum the Angle Brackets allow the escapement wheel 23 to rotate one tooth at a time. One Angle Bracket should just clear the teeth of the wheel when the other is fully engaged between two teeth. This adjustment is very critical, and it may be necessary to experiment for a while in order to find the best setting for the Angle Brackets. Once this setting is obtained and a smooth, even escapement movement results, the bolts holding the Angle Brackets should be tightened firmly to prevent the Angle Brackets slipping.

The timekeeping of the Clock can be adjusted by altering the position of the bob weight on the pendulum. Raising the weight will speed up the mechanism if the Clock is losing time, but if it is gaining the weight should be lowered.

Parts required to build the Meccano Wall Clock: 1 of No. 1a; 1 of No. 1b; 4 of (Continued on page 258)

Fig. 3. This view of the Clock shows clearly the gear trains.



Road and Track—

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variety of surfaces. After spending a night at the famous Hostellerie du Prieure overlooking the banks of the Loire, where the food and wines are magnificent, I hurried back to England.

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My next drive was in the new Mark III 100 m.p.h. Ford Zodiac, which made a very good impression. Power of its 2.6 litre, six-cylinder engine is increased to 114 b.h.p., giving lightning acceleration, comparable with many sports cars. This new Zodiac goes from a standstill to 80 m.p.h. in only 26 seconds. Along the M1 I recorded a maximum of 103 m.p.h. and cruised for mile after mile at 90 m.p.h. Vacuum servo assisted brakes with 9 $\frac{3}{4}$ -inch front discs are well able to cope with frequent hard braking.

This new Mark III Zodiac is a major break-through by Fords in luxury motoring at a challenging (after-Budget) price of £1,070 15s. 3d., tax paid. There is a choice of Borg Warner automatic transmission or a four-speed, all-synchromesh, manual gear box, with steering column control, but the clutch pedal has rather a long travel.

Distinguished by its smart, new-style, full six-seater body, with modern front grille and four headlamps, this is easily the best equipped and most luxurious car Fords have ever built.

Along the Conqueror's Coast—

(Continued from page 225)
feature is that twice within 30 miles on the S.R. it reverses direction and receives a fresh engine at the other end. This happens at Redhill owing to the junction layout there, and at Brighton terminal.

On summer Saturdays many regular or relief holiday services running into Brighton and out again, and some which reverse at Eastbourne, present a variety of carriage stock, and pose not a few operating problems as they mostly travel nearly the whole length of the main Victoria tracks. By means of the West London labyrinth of connecting lines from Clapham Junction through Olympia, they proceed, for example, northbound via High Wycombe towards Birmingham, W.R. or Sheffield E.R. by the ex-Great Central route, or through Willesden Junction L.M.R. for Coventry and beyond.

For Gallantry—(Continued from page 235)

yards until he knew the fire could do no further damage. Then he collapsed. He died after a fortnight's fight for his life, having saved not only the aircraft but the lives of all in the vicinity.

It was not until March 26, 1950 that another George Cross came to the R.A.F., this time following an outstanding display of gallantry at the flying boat base, Seletar, where young Aircraftman Ivor Gillett was seriously wounded when the

Sunderland on which he was working, in preparation for an anti-terrorist patrol, exploded at her moorings. A lifebelt was thrown to him but he was seen to hand it to a seriously-injured corporal in the water, enabling the rescuers to save this man's life. In the meantime, Gillett disappeared. Two days later his body was washed ashore.

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The most recent George Cross to be awarded to the R.A.F. was appropriately won in the air, on August 13, 1951. A Wellington with a complement of navigators under special training was flying high over Yorkshire. A young Air Training Corps cadet was seated in the rear of the aircraft, having his first air experience in the capable hands of Flight-Lieutenant John Quinton, D.F.C., a wartime night-fighter ace who had only rejoined the service six weeks earlier. Without warning, there was a terrible crash—another aircraft had collided with the "Wimpey", which broke up in mid-air. As the wrecked bomber spiralled towards earth, Quinton, with superhuman speed, clipped on his own parachute to the cadet's harness and pushed the boy through the gaping hole in the fuselage. All eight officers in the Wellington were killed and Derek Coates, the cadet, was the only survivor. From his hospital bed he selected the photograph of Quinton as the man who had saved him. At the inquest, the Coroner said of Quinton, "He was a very gallant gentleman."

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The story of the George Cross awards to the men and women of the Royal Air Force and the Royal Canadian Air Force is a glorious page in our history—one of great self-sacrifice and courage, and from torture and certain death from which these heroes did not flinch. Most of them lost their lives, and in dying left us an example we would do well to emulate, for as St. John said, "Greater love hath no man than this, that a man lay down his life for his friends."

Railway Notes—

(Continued from page 241)
down to the Teviot Valley and to Hawick, where the water tank in the corridor tender was re-filled. A shunting engine gave assistance in rear just to get us under way on to the severe, winding eleven-mile ascent, amid desolate mountain terrain, to Whitrope Tunnel and the summit just beyond, where the weather can be appalling! Harder work for locomotive and fireman was involved than on the climb to Falahill; yet, with similar speeds and handling, with something to spare, we were over the top in 26 minutes.

* * * *

Now came a long, thrilling descent, with numerous brake applications, when we seemed to be hurtling down the very slopes of the Cheviots in the midnight blackness, with the Kettles in calm and

competent control. So we came into the Lowlands. Twenty miles of varying speed, with changes of regulator and reversing screw according to the grades, brought us across the English border and the outpost lights of Carlisle.

Finally, after crossing the main Glasgow lines by flyover bridge and threading its way, with signal checks, through various junctions, Captain Cuttle was pulled up in the long No. 2 platform at Carlisle, used for either way expresses, within a minute of working time, which was then less than it is now. The engine was detached, ready to return to Carlisle Canal Shed after its round trip to Edinburgh and back—a strenuous journey for both engine and crew.

The A3 locomotives continued to be a mainstay of the "Waverley" until quite recently, when diesels began to take a greater share in the workings, but ex-L.N.E.R. Pacifics are still seen.

A Unique Frontier Road—

(Continued from page 237)
last vehicle made its run along the plank highway. A public thoroughfare of this type will probably never exist again, even in the remote Queen Charlotte Islands for there, today, the price of lumber has risen to the point where a 14-mile plank road would be too costly an enterprise.

Now, this gleaming white route of fourteen straight miles has become Canada's most remarkable monument—and probably its only horizontal one. It may still be traversed by the curious visitor, by old residents, or by those who once lived there and return after many years, driven by nostalgia.

A ghostly remnant now, it will long continue under the summer sun, or the glitter of frosty mornings, cutting a straight line to the pale horizon, always bright against the grim line of the evergreens.

While it cannot endure in such a manner as the Appian Way, it will linger in the memory of many a frontiersman and pioneer in British Columbia as a helpful pathway, and the most unusual one on which he has ever travelled.

A Meccano Wall Clock—

(Continued from page 243)
No. 2; 13 of No. 3; 14 of No. 4; 2 of No. 6; 2 of No. 8a; 4 of No. 8b; 3 of No. 9b; 12 of No. 10; 1 of No. 11; 5 of No. 12; 2 of No. 13; 1 of No. 15b; 1 of No. 16; 3 of No. 16a; 1 of No. 16b; 4 of No. 17; 1 of No. 22; 2 of No. 24a; 1 of No. 25; 4 of No. 26; 1 of No. 26c; 1 of No. 27; 4 of No. 27a; 1 of No. 27d; 1 of No. 27c; 87 of No. 37a; 79 of No. 37b; 20 of No. 38; 1 of No. 38d; 1 of No. 57c; 8 of No. 59; 2 of No. 62; 1 of No. 62b; 1 of No. 82; 1 of No. 90a; 2 of No. 94; 1 of No. 95; 1 of No. 95a; 1 of No. 101; 1 of No. 102; 1 of No. 111; 1 of No. 111a; 4 of No. 111c; 3 of No. 125; 1 of No. 137; 1 of No. 148; 1 of No. 155; 2 of No. 162; 1 of No. 212; 2 of No. 213; 1 of No. 214.